YAMAHA

FZ6-SS
FZ6-SSC

SERVICE MANUAL

LIT-11616-17-50

5VX-28197-10

EAS00010

FZ6-SS/FZ6-SSC
SERVICE MANUAL

First edition, November 2003

Printed in U.S.A.
P/N LIT-11616-17-50

EAS00030

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.

EAS00040

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!

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

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

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

EAS00007

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.

① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter.
Refer to “SYMBOLS”.

② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 (“PERIODIC CHECKS AND ADJUSTMENTS”), where the sub-section title(s) appears.

③ Sub-section titles appear in smaller print than the section title.

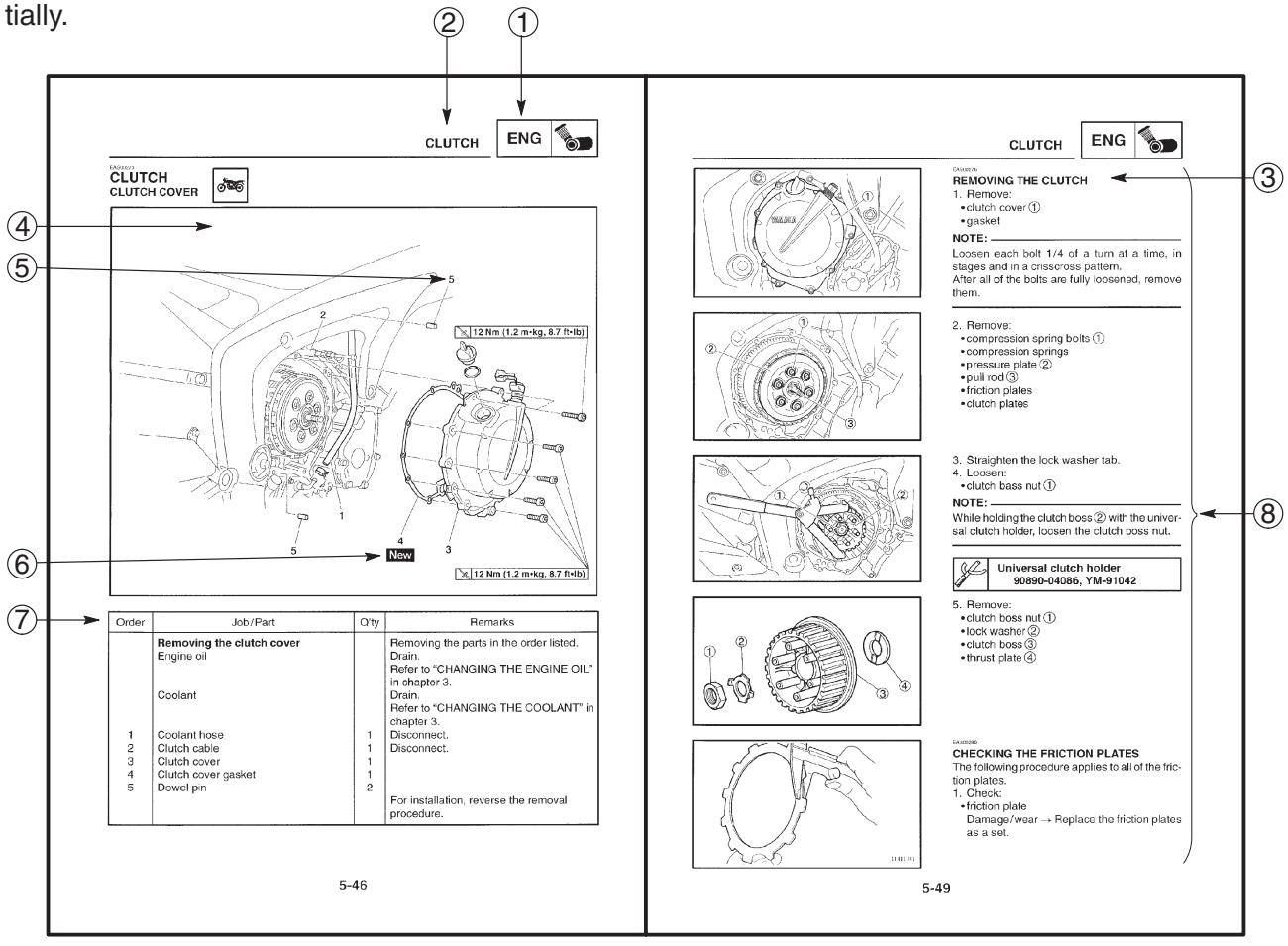
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

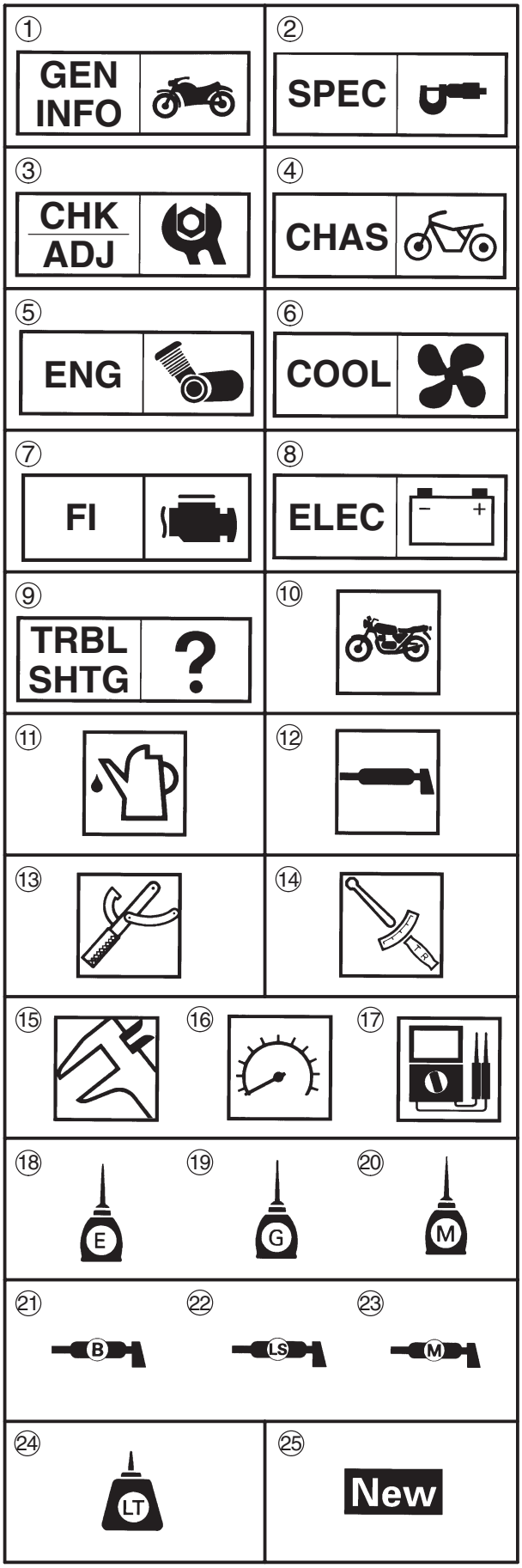
⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

⑥ Symbols indicate parts to be lubricated or replaced.
Refer to “SYMBOLS”.

⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

⑧ Jobs requiring more information (such as special tools and technical data) are described sequentially.





EAS00008

SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑨ indicate the subject of each chapter.

① General information
② Specifications
③ Periodic checks and adjustments
④ Chassis
⑤ Engine
⑥ Cooling system
⑦ Fuel injection system
⑧ Electrical system
⑨ Troubleshooting

Symbols ⑩ to ⑰ indicate the following.

⑩ Serviceable with engine mounted
⑪ Filling fluid
⑫ Lubricant
⑬ Special tool
⑭ Tightening torque
⑮ Wear limit, clearance
⑯ Engine speed
⑰ Electrical data

Symbols ⑱ to ㉓ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑱ Engine oil
⑲ Gear oil
⑳ Molybdenum-disulfide oil
㉑ Wheel-bearing grease
㉒ Lithium-soap- based grease
㉓ Molybdenum-disulfide grease

Symbols ㉔ to ㉕ in the exploded diagrams indicate the following.

㉔ Apply locking agent (LOCTITE®)
㉕ Replace the part

EAS00012

TABLE OF CONTENTS

CHAPTER 1
GENERAL INFORMATION

CHAPTER 2
SPECIFICATIONS

CHAPTER 3
PERIODIC CHECKS AND ADJUSTMENTS

CHAPTER 4
CHASSIS

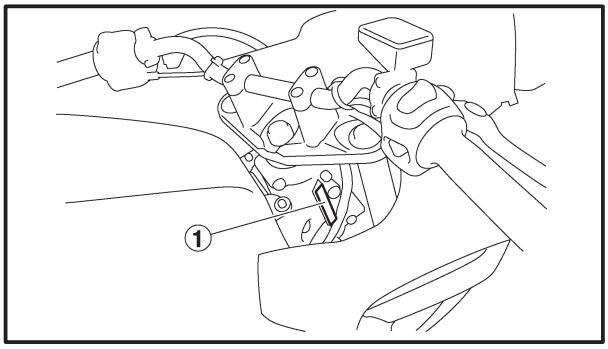
CHAPTER 5
ENGINE

CHAPTER 6
COOLING SYSTEM

CHAPTER 7
FUEL INJECTION SYSTEM

CHAPTER 8
ELECTRICAL SYSTEM

CHAPTER 9
TROUBLESHOOTING



EAS00014

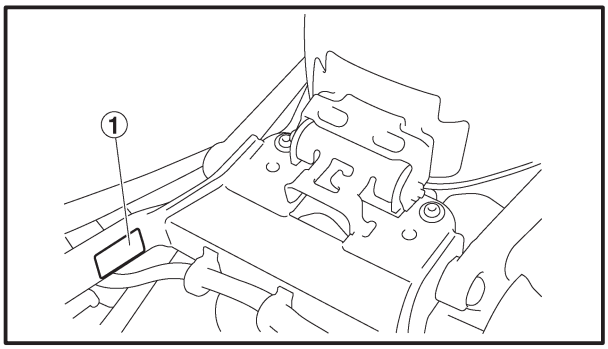
GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

EAS00017

VEHICLE IDENTIFICATION NUMBER

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

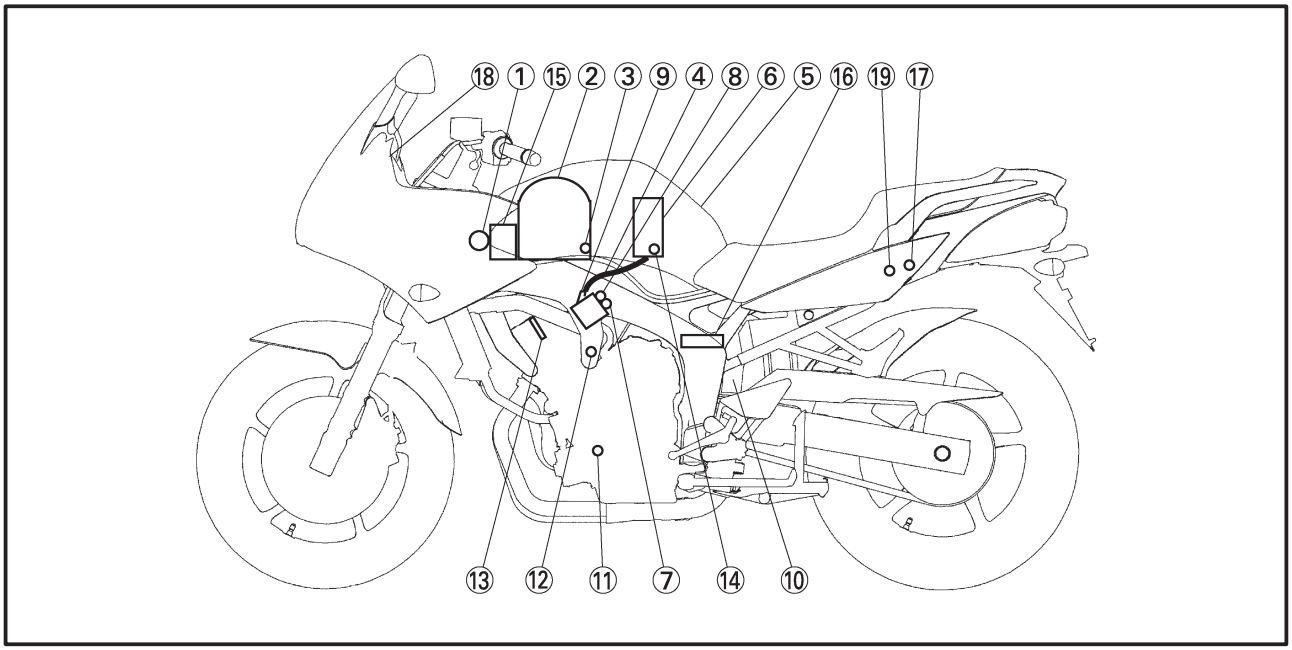


EAS00018

MODEL LABEL

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

EAS00896
FEATURES
OUTLINE OF 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. Furthermore, the air induction system (AI system) has been placed under computer control together with the FI system in order to realize cleaner exhaust gases.



① Ignition coil
② Air filter case
③ Intake air temperature sensor
④ Fuel delivery hose
⑤ Fuel tank
⑥ Fuel pump
⑦ Intake air pressure sensor
⑧ Throttle position sensor
⑨ Fuel injector
⑩ Catalytic converter
⑪ Crankshaft position sensor
⑫ Coolant temperature sensor
⑬ Spark plug
⑭ Pressure regulator
⑮ Battery
⑯ ECU
⑰ Fuel injection system relay
⑱ Engine trouble warning light
⑲ Lean angle cut-off switch

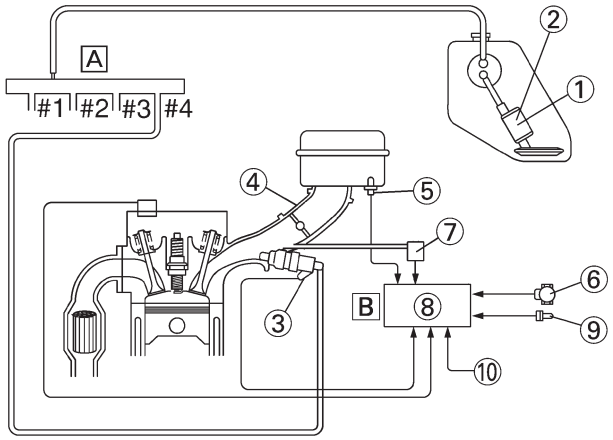
EAS00897

FI SYSTEM

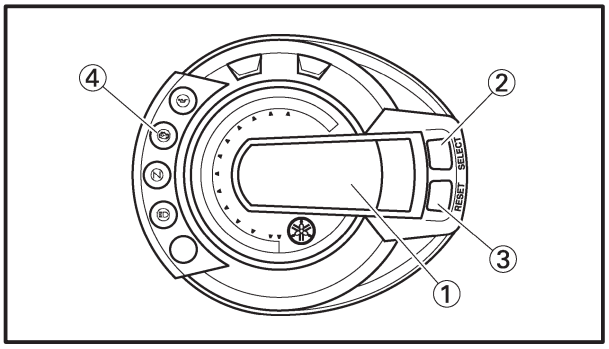
The fuel pump delivers fuel to the injector via the fuel filter. The pressure regulator maintains the fuel pressure that is applied to the injector at only 250 kPa (2.5 kg/cm^2). Accordingly, when the energizing signal from the ECU energizes the injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remains open. Therefore, the longer the length of time the injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the injector is energized (injection duration), the lesser the volume of fuel that is supplied.

The injection duration and the injection timing are controlled by the ECU. Signals that are input from the throttle position sensor, crankshaft position sensor, intake air pressure sensor, intake 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.

Illustration is for reference only.



① Fuel pump
② Pressure regulator
③ Fuel injector
④ Throttle body
⑤ Intake air temperature sensor
⑥ Throttle position sensor
⑦ Intake air pressure sensor
⑧ ECU
⑨ Coolant temperature sensor
⑩ Crankshaft position sensor
A Fuel system
B Control system



① Multi-function display
② "SELECT" button
③ "RESET" button
④ Engine trouble warning light

INSTRUMENT FUNCTION
Multi-function display
The multi-function display is equipped with the following:
- a speedometer (which shows the riding speed)
- an odometer (which shows the total distance traveled)
- two tripmeters (which show the distance traveled since they were last set to zero)
- a fuel reserve tripmeter (which shows the distance traveled since the bottom segment of the fuel meter started flashing)
- a tachometer (which shows the engine speed)
- a fuel meter
- a water temperature
- a clock
- a intake air temperature
- a self-diagnosis device

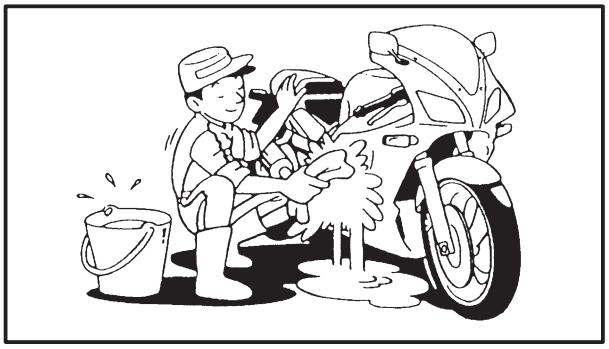
NOTE:
- Be sure to turn the key to "ON" before using the "SELECT" and "RESET" buttons.
- For the U.K. only: To switch the speedometer and odometer/tripmeter display between kilometers and miles, press the "SELECT" button for at least two seconds.

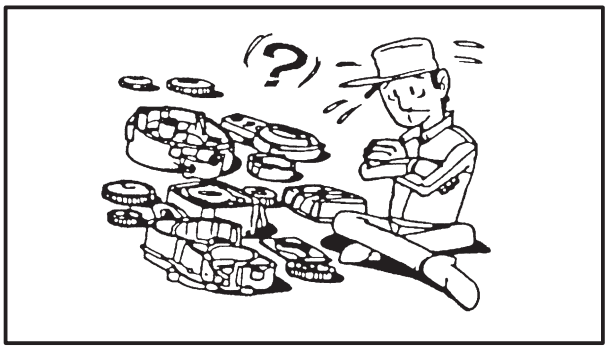
Odometer, tripmeter and tachometer modes
Pushing the "SELECT" button switches the display between the odometer mode "ODO" and the tripmeter modes "TRIP 1" and "TRIP 2" and the tachometer mode "E" is the following order:
ODO → TRIP 1 → TRIP 2 → (TRIP F) → E → ODO
When approximately 3.6 L of fuel remain in the fuel tank, the bottom segment of the fuel meter will start flashing, and the odometer display will automatically change to the fuel reserve tripmeter mode "TRIP F" and start counting the distance traveled from that point. In that case, pushing the "SELECT" button switches the display between the various tripmeter and odometer modes in the following order:
TRIP-F → E → ODO → TRIP 1 → TRIP 2 → TRIP F
To reset a tripmeter, select it by pushing the "SELECT" 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 (3.1 mi).
Tachometer mode
Displays the digital indication of the engine speed on the odometer section.
Air intake temperature indicator.
When "ODO" is displayed, pressing the "RESET" for a long time allows the indicator to switch displays between Clock and Air intake temperature. (It activates the clock indication when the main switch is turned OFF.)
In the Co adjustment mode, the indication automatically changes from clock (Air intake temperature) to the engine speed.

Clock mode

To set the clock:

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



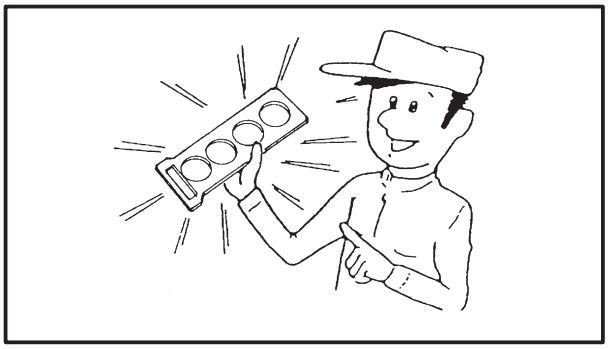


EAS00020

IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

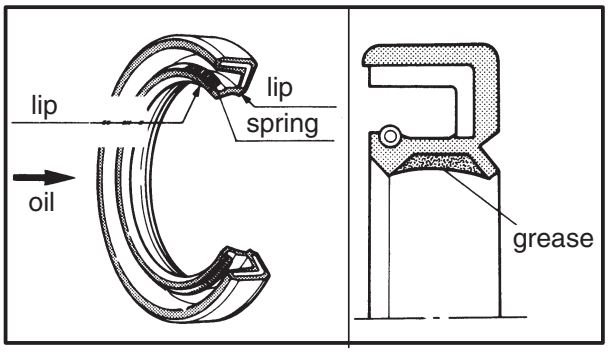
1. Before removal and disassembly, eliminate all dirt, mud, dust and foreign material.
2. Use only the proper tools and cleaning equipment.
   Refer to the “SPECIAL TOOLS”.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been “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.



EAS00021

REPLACEMENT PARTS

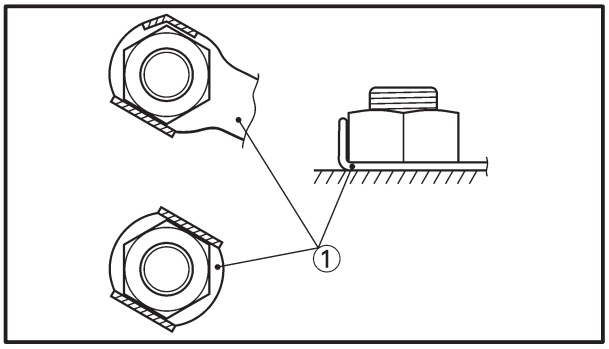
Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



EAS00022

GASKETS, OIL SEALS AND O-RINGS

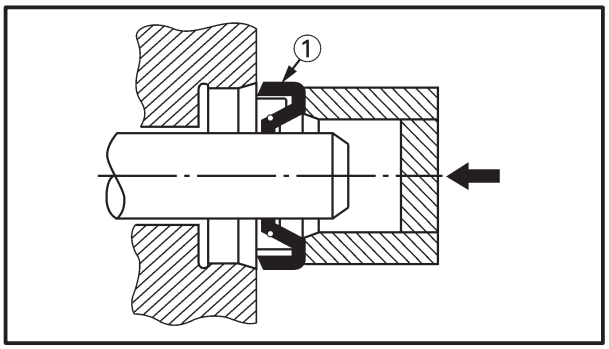
1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



EAS00023

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.



EAS00024

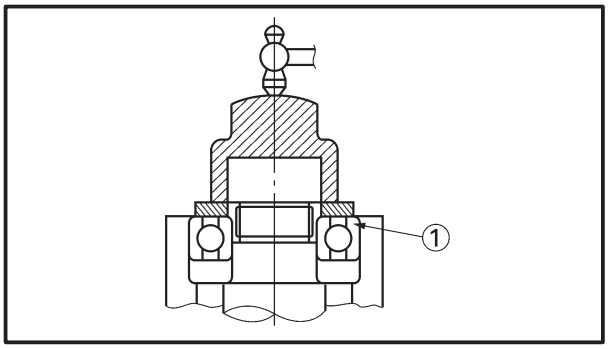
BEARINGS AND OIL SEALS

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

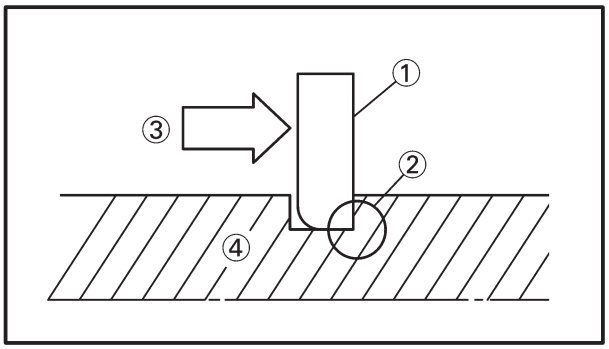
① Oil seal

CAUTION:

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



① Bearing

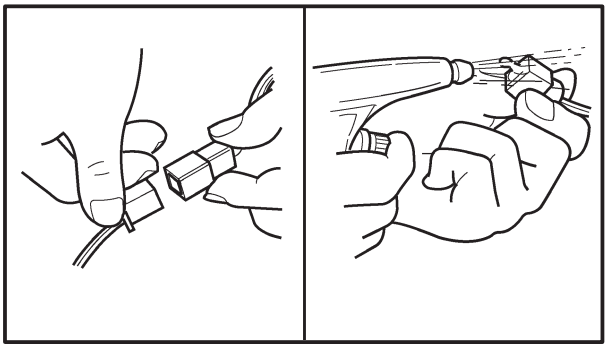


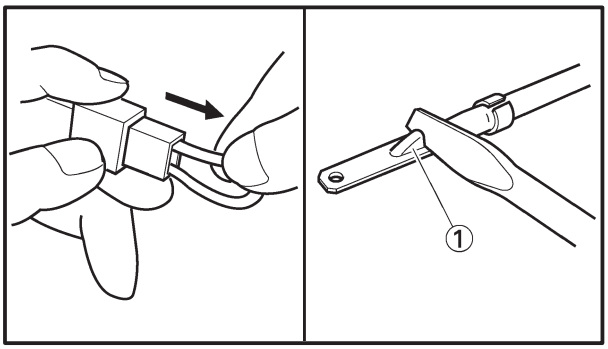
EAS00025

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.

④ Shaft





EAS00026

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.

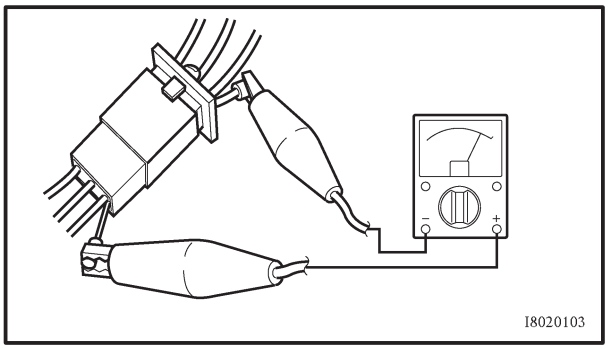
NOTE:

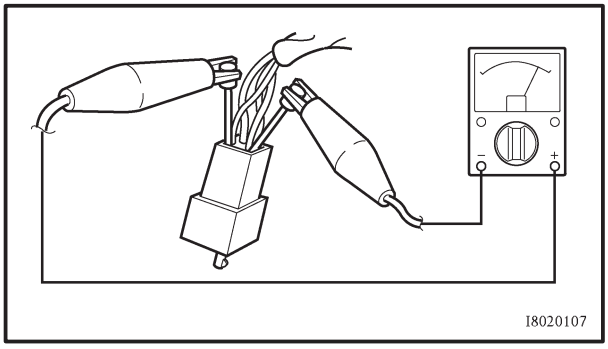
If the pin ① on the terminal is flattened, bend it up.

4. Connect:
   - lead
   - coupler
   - connector

NOTE:

Make sure all connections are tight.





5. Check:
   - continuity

   (with the pocket tester)

Pocket tester
90890-03112, YU-3112

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.

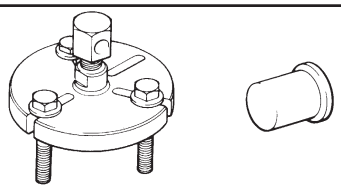
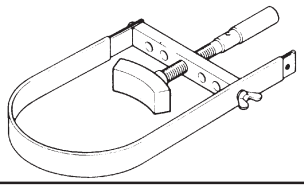
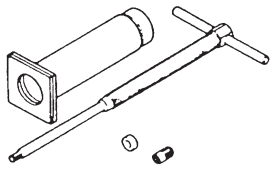
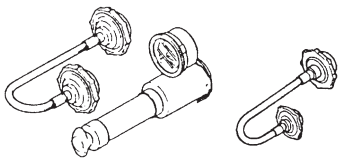
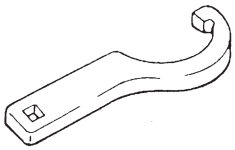
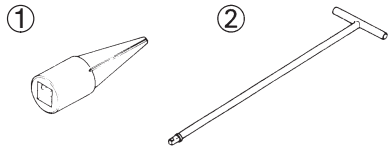
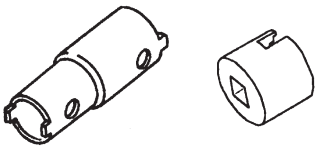
EAS00027

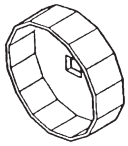
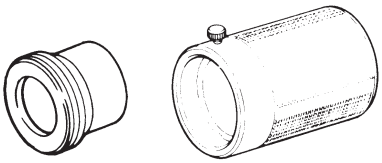
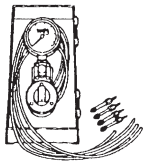
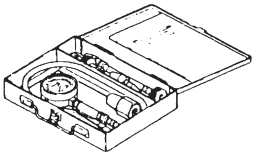
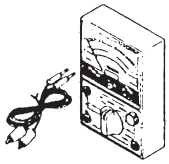
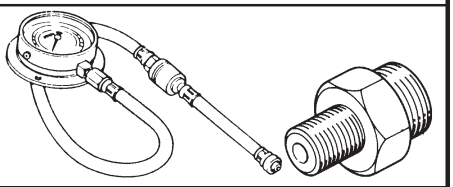
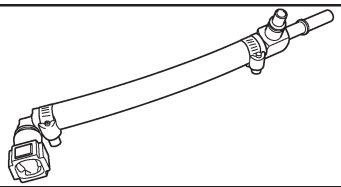
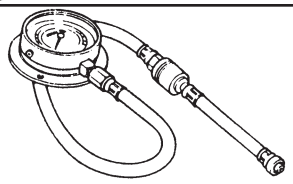
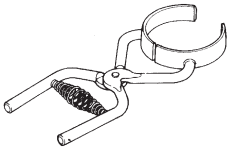
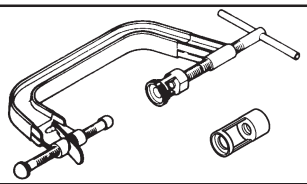
SPECIAL TOOLS

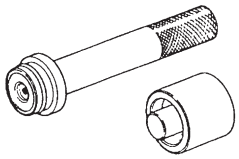
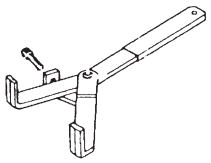
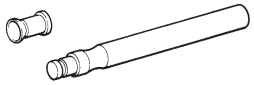
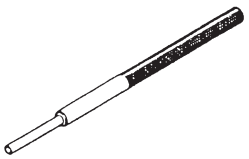
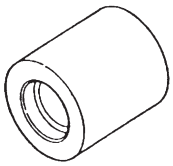
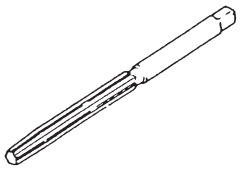
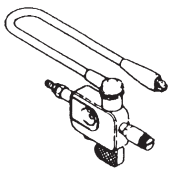
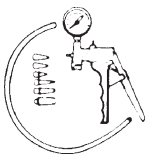
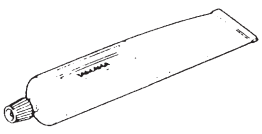
The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country. 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 No.	Tool name/Function	Illustration
Flywheel puller 90890-01362 YU-33270-B Adapter 90890-04089 YM-33282	Flywheel puller Adapter This tool is used to remove the generator rotor.	
90890-01701 YS-01880-A	Sheave holder This tool is used to hold the generator rotor when removing or installing the generator rotor bolt or pickup coil rotor bolt.	
90890-01304 YU-01304	Piston pin puller This tool is used to remove the piston pins.	
Radiator cap tester 90890-01325 YU-24460-01 Adapter 90890-01352 YU-33984	Radiator cap tester Adapter These tools are used to check the cooling system.	
90890-01403 YU-33975	Steering nut wrench This tool is used to loosen or tighten the steering stem ring nuts.	
90890-01460 -01326	Damper rod holder ① T-handle ② These tool are used for holding the damper rod when removing or installing the damper rod.	
Pivot shaft wrench 90890-01471 YM-01471 Pivot shaft wrench adapter 90890-01476	Pivot shaft wrench Pivot shaft wrench adapter This tool is used to loosen or tighten the pivot adjust bolt and engine mount adjust bolt.	

Tool No.	Tool name/Function	Illustration
90890-01426 YU-38411	Oil filter wrench This tool is needed to loosen or tighten the oil filter cartridge.	
Fork seal driver 90890-01367 YM-33963 Fork seal driver attachment 90890-01374 YM-8020-A	Fork seal driver weight Fork seal driver attachment This tool is used to install the front fork's oil seal and dust seal.	
Vacuum gauge 90890-03094 YU-08030	Vacuum gauge This gauge is used to synchronize the carburetors.	
Compression gauge 90890-03081 YU-33223 Adapter 90890-04136	Compression gauge Adapter These tools are used to measure engine compression.	
90890-03112 YU-3112	Pocket tester This tool is used to check the electrical system.	
Oil pressure gauge 90890-03153 YU-03153 Adapter 90890-03139	Oil pressure gauge Adapter These tools are used to measure engine oil pressure.	
90890-03176 YM-03176	Fuel pressure adapter This tool is needed to measure fuel pressure.	
90890-03153 YU-03153	Pressure gauge This tool used is to measure fuel pressure.	
90890-04044 YM-04044	Piston ring compressor This tool is used to compress piston rings when installing the cylinder.	
Valve spring compressor 90890-04019 YM-04019 Attachment 90890-04108 YM-01253	Valve spring compressor Attachment These tools are used to remove or install the valve assemblies.	

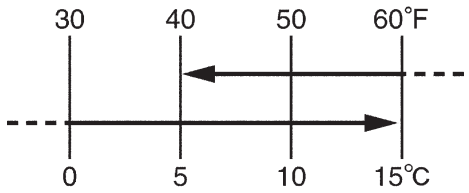
Tool No.	Tool name/Function	Illustration
Middle driven shaft bearing driver 90890-04058 YM-4058 Mechanical seal installer 90890-04078 YM-33221	Middle driven shaft bearing driver Mechanical seal installer These tools are used to install the water pump seal.	
90890-04086 YM-91042	Clutch holding tool This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
90890-04101	Valve lapper This tool is needed to remove and install the valve lifter.	
90890-04111	Valve guide remover (ϕ4) This tool is used to remove or install the valve guides.	
90890-04112	Valve guide installer (ϕ4) This tool is used to install the valve guides.	
90890-04113 YM-04113	Valve guide reamer (ϕ4) This tool is used to rebore the new valve guides.	
90890-06754 YM-34487	Ignition checker This tool is used to check the ignition system components.	
90890-06756 YB-35956	Vacuum/pressure pump gauge set This tool used to measure the vacuum pressure.	
90890-85505 ACC-11001-05-01	Yamaha bond No. 1215 This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	

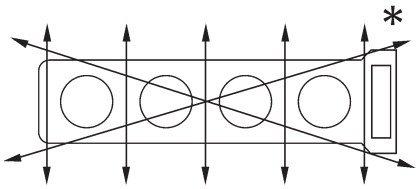
SPECIFICATIONS

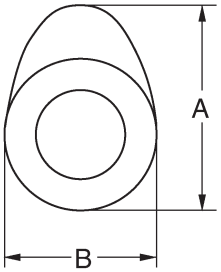
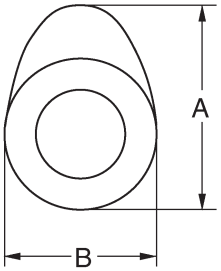
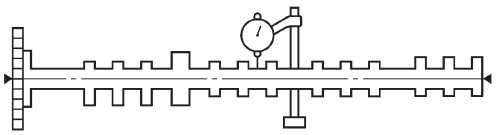
GENERAL SPECIFICATIONS

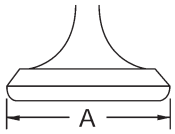
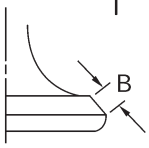
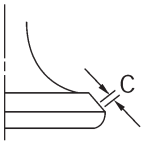
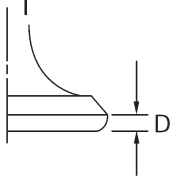
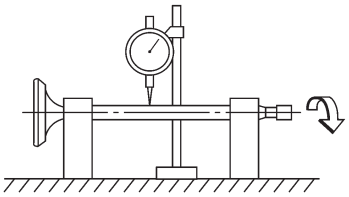
Item	Standard	Limit
Model code	5VX3 (USA except for CAL) 5VX4 (CAL)	•••
Dimensions		
Overall length	2,095 mm (82.5 in)	•••
Overall width	750 mm (29.5 in)	•••
Overall height	1,215 mm (47.8 in)	•••
Seat height	795 mm (31.3 in)	•••
Wheelbase	1,440 mm (56.7 in)	•••
Minimum ground clearance	145 mm (5.71 in)	•••
Minimum turning radius	2,800 mm (110.2 in)	•••
Weight		
Wet (with oil and a full fuel tank)	207 kg (456 lb) (USA except for CAL) 208 kg (459 lb) (CAL)	••• •••
Maximum load (except motorcycle)	190 kg (419 lb) (USA except for CAL) 189 kg (417 lb) (CAL)	

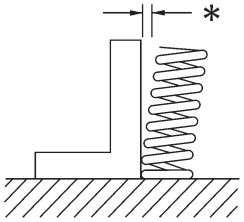
ENGINE SPECIFICATIONS

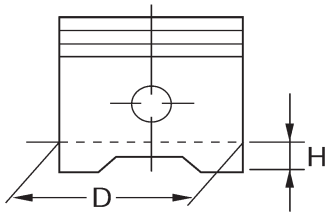
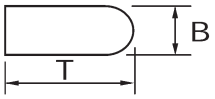
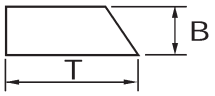
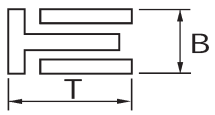
Item	Standard	Limit
Engine		
Engine type	Liquid-cooled, 4-stroke, DOHC	•••
Displacement	600 cm^3 (36.61 cu.in)	•••
Cylinder arrangement	Forward-inclined parallel 4-cylinder	•••
Bore × stroke	65.5 × 44.5 mm (2.58 × 1.75 in)	•••
Compression ratio	12.2 : 1	•••
Engine idling speed	1,250 ~ 1,350 r/min	•••
Vacuum pressure at engine idling speed	29 kPa (218 mmHg, 8.6 inHg)	•••
Standard compression pressure (at sea level)	1,550 kPa (15.50 kg/cm^2,15.50 bar, 220.46 psi) at 400 r/min	•••
Fuel		
Recommended fuel	Unleaded gasoline only	•••
Fuel tank capacity		
Total (including reserve)	19.4 L (4.25 Imp gal, 5.1 US gal)	•••
Reserve only	3.6 L (0.79 Imp gal, 0.9 US gal)	•••
Engine oil		
Lubrication system	Wet sump	•••
Recommended oil		
	At 5°C (40°F) or higher	•••
	Yamalube 4 (20W40) or SAE 20W40 type SE motor oil	•••
	At 15°C (60°F) or lower	•••
	Yamalube 4 (10W30) or SAE 10W30 type SE motor oil	•••
Quantity	3.4 L (2.99 Imp qt, 3.59 US qt)	•••
Total amount	2.5 L (2.20 Imp qt, 2.64 US qt)	•••
Without oil filter cartridge replacement	2.8 L (2.47 Imp qt, 2.96 US qt)	•••
With oil filter cartridge replacement	240 kPa at 6,600 r/min	•••
Oil pressure	(2.4 kg/cm^2 at 6,600 r/min)	
	(2.4 bar at 6,600 r/min)	
	(34.1 psi at 6,600 r/min)	
	96°C (205°F)	•••
Engine oil temperature	450 ~ 550 kPa (4.5 ~ 5.5 kg/cm^2,	
Relief valve opening pressure	4.5 ~ 5.5 bar, 65.3 ~ 79.8 psi)	

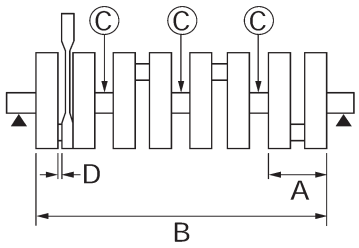
Item	Standard	Limit
Oil filter		
Oil filter type	Formed	•••
Bypass valve opening pressure	80 ~ 120 kPa (0.8 ~ 1.2 kg/cm^2, 0.8 ~ 1.2 bar, 11.6 ~ 17.4 psi)	•••
Oil pump		
Oil pump type	Trochoid	•••
Inner-rotor-to-outer-rotor-tip clearance	0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in)	0.15 mm (0.0059 in)
Outer-rotor-to-oil-pump-housing clearance	0.03 ~ 0.08 mm (0.0012 ~ 0.0032 in)	0.15 mm (0.0059 in)
Cooling system		
Radiator capacity	2.0 L (1.76 Imp pt, 2.11 US qt)	
Radiator cap opening pressure	93.3 ~ 122.7 kPa (0.93 ~ 1.23 kg/cm^2, 0.93 ~ 1.23 bar, 13.5 ~ 17.8 psi)	•••
Radiator core		
Width	300 mm (11.81 in)	•••
Height	188 mm (7.4 in)	•••
Depth	24 mm (0.94 in)	•••
Coolant reservoir		
Capacity	0.27 L (0.24 Imp qt, 0.29 US qt)	•••
Water pump		
Water pump type	Single suction centrifugal pump	•••
Reduction ratio	86/44 × 31/31 (1.955)	•••
Max. impeller shaft tilt	•••	0.15 mm (0.006 in)
Starting system type	Electric starter	
Spark plugs		
Model (manufacturer) × quantity	CR9EK (NGK) × 4	•••
Spark plug gap	0.6 ~ 0.7 mm (0.0236 ~ 0.0276 in)	•••
Cylinder head		
Volume	10.3 ~ 10.9 cm^3 (0.63 ~ 0.67 cu.in)	•••
Max. warpage	•••	0.05 mm (0.002 in)
		

Item	Standard	Limit
Camshafts		
Drive system	Chain drive (right)	•••
Camshaft cap inside diameter	23.008 ~ 23.029 mm (0.9058 ~ 0.9067 in)	•••
Camshaft journal diameter	22.967 ~ 22.980 mm (0.9042 ~ 0.9047 in)	•••
Camshaft-journal-to-camshaft-cap clearance	0.028 ~ 0.062 mm (0.0011 ~ 0.0024 in)	0.08 mm (0.0032 in)
Intake camshaft lobe dimensions		
		
Measurement A	32.45 ~ 32.55 mm (1.278 ~ 1.282 in)	32.40 mm (1,276 in)
Measurement B	24.95 ~ 25.05 mm (0.982 ~ 0.986 in)	24.90 mm (0.980 in)
Exhaust camshaft lobe dimensions		
		
Measurement A	32.45 ~ 32.55 mm (1.278 ~ 1.282 in)	32.40 mm (1.276 in)
Measurement B	24.95 ~ 25.05 mm (0.982 ~ 0.986 in)	24.90 mm (0.980 in)
Max. camshaft runout	•••	0.06 mm (0.0024 in)
		

Item	Standard	Limit
Timing chain		
Model/number of links	92RH2015/120	•••
Tensioning system	Automatic	•••
Valves, valve seats, valve guides		
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		
 Head Diameter	 Face Width	 Seat Width	 Margin Thickness
Valve head diameter A		
Intake	24.9 ~ 25.1 mm (0.9803 ~ 0.9882 in)	•••
Exhaust	21.9 ~ 22.1 mm (0.8622 ~ 0.8701 in)	•••
Valve face width B		
Intake	1.14 ~ 1.98 mm (0.0449 ~ 0.0780 in)	•••
Exhaust	1.14 ~ 1.98 mm (0.0449 ~ 0.0780 in)	•••
Valve seat width C		
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
Valve margin thickness D		
Intake	0.6 ~ 0.8 mm (0.0236 ~ 0.0315 in)	0.5 mm (0.02 in)
Exhaust	0.6 ~ 0.8 mm (0.0236 ~ 0.0315 in)	0.5 mm (0.02 in)
Valve stem diameter		
Intake	3.975 ~ 3.990 mm (0.1565 ~ 0.1571 in)	3.95 mm (0.1555 in)
Exhaust	3.960 ~ 3.975 mm (0.1559 ~ 0.1565 in)	3.935 mm (0.1549 in)
Valve guide inside diameter		
Intake	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)	4.042 mm (0.1591 in)
Exhaust	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)	4.042 mm (0.1591 in)
Valve-stem-to-valve-guide clearance		
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0032 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.10 mm (0.0039 in)
Valve stem runout	•••	0.04 mm (0.0016 in)
		
Valve seat width		
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)

Item	Standard	Limit
Valve springs		
Free length		
Intake (inner)	37.0 mm (1.46 in)	35.2 mm (1.39 in)
(outer)	38.4 mm (1.51 in)	36.5 mm (1.44 in)
Exhaust	41.8 mm (1.65 in)	39.7 mm (1.56 in)
Installed length (valve closed)		
Intake (inner)	30 mm (1.18 in)	•••
(outer)	32.5 mm (1.28 in)	•••
Exhaust	36.1 mm (1.42 in)	•••
Compressed spring force (installed)		
Intake (inner)	69.0 ~ 79.0 N (7.03 ~ 8.05 kg, 15.50 ~ 17.75 lb)	•••
(outer)	114.0 ~ 132.0 N (11.62 ~ 13.46 kg, 25.63 ~ 29.67 lb)	•••
Exhaust	160 ~ 184 N (16.32 ~ 18.76 kg, 35.97 ~ 41.36 lb)	•••
Spring tilt 		
Intake (inner)	•••	2.5°/1.6 mm (0.06 in)
(outer)	•••	2.5°/1.7 mm (0.07 in)
Exhaust	•••	2.5°/1.8 mm (0.07 in)
Winding direction (top view)		
Intake (inner)	Counter clockwise	•••
(outer)	Clockwise	•••
Exhaust	Clockwise 	•••
Cylinders		
Cylinder arrangement	Forward-inclined, parallel 4-cylinder	•••
Bore × stroke	65.5 mm × 44.5 mm (2.58 × 1.75 in)	•••
Compression ratio	12.2 : 1	•••
Bore	65.50 ~ 65.51 mm (2.5787 ~ 2.5791 in)	•••
Max. out-of-round	•••	0.05 mm (0.002 in)

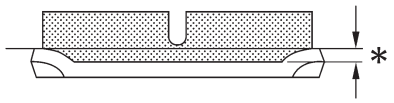
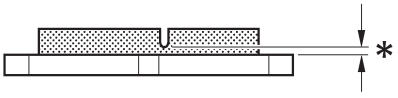
Item	Standard	Limit
Piston		
Piston-to-cylinder clearance	0.010 ~ 0.035 mm (0.0004 ~ 0.0014 in)	0.055 mm (0.0022 in)
Diameter D	65.475 ~ 65.490 mm (2.5778 ~ 2.5783 in)	•••
		
Height H	4 mm (0.16 in)	•••
Piston pin bore (in the piston)		
Diameter	16.002 ~ 16.013 mm (0.6300 ~ 0.6304 in)	16.043 mm (0.6316 in)
Offset	0.5 mm (0.0197 in)	•••
Offset direction	Intake side	•••
Piston pins		
Outside diameter	15.991 ~ 16.000 mm (0.6296 ~ 0.6299 in)	15.971 mm (0.6288 in)
Piston-pin-to-piston-pin-bore clearance	0.002 ~ 0.022 mm (0.0001 ~ 0.0009 in)	0.072 mm (0.0028 in)
Piston rings		
Top ring 		
Ring type	Barrel	•••
Dimensions (B × T)	0.90 × 2.45 mm (0.04 × 0.10 in)	•••
End gap (installed)	0.25 ~ 0.35 mm (0.0098 ~ 0.0138 in)	0.60 mm (0.0236 in)
Ring side clearance	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.115 mm (0.0045 in)
2nd ring 		
Ring type	Taper	•••
Dimensions (B × T)	0.8 × 2.5 mm (0.03 × 0.10 in)	•••
End gap (installed)	0.7 ~ 0.8 mm (0.0276 ~ 0.0315 in)	1.15 mm (0.0453 in)
Ring side clearance	0.030 ~ 0.065 mm (0.0012 ~ 0.0026 in)	0.125 mm (0.0049 in)
Oil ring 		
Dimensions (B × T)	1.5 × 2.0 mm (0.06 × 0.08 in)	•••
End gap (installed)	0.10 ~ 0.35 mm (0.0039 ~ 0.0138 in)	•••

Item	Standard	Limit
Connecting rods		
Crankshaft-pin-to-big-end-bearing clearance	0.028 ~ 0.052 mm (0.0011 ~ 0.0020 in)	0.08 mm (0.0032 in)
Bearing color code	1 = Blue 2 = Black 3 = Brown 4 = Green	•••
Crankshaft		
		
Width A	51.85 ~ 52.55 mm (2.04 ~ 2.06 in)	•••
Width B	268.8 ~ 270.0 mm (10.58 ~ 10.63 in)	•••
Max. runout C	•••	0.03 mm (0.0012 in)
Big end side clearance D	0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in)	•••
Big end radial clearance	0.028 ~ 0.052 mm (0.0011 ~ 0.0020 in)	•••
Small end free play	0.32 ~ 0.50 mm (0.01 ~ 0.02 in)	•••
Crankshaft-journal-to-crankshaft-journal-bearing clearance	0.034 ~ 0.058 mm (0.0013 ~ 0.0023 in)	0.10 mm (0.0039 in)
Bearing color code	0 = White 1 = Black 2 = Brown 3 = Green 4 = Yellow	•••
Clutch		
Clutch type	Wet, multiple disc	•••
Clutch release method	Outer pull, rack and pinion pull	•••
Clutch release method operation	Cable operation	•••
Operation	Left-hand operation	•••
Clutch cable free play (at the end of the clutch lever)	10 ~ 15 mm (0.39 ~ 0.59 in)	•••
Friction plates		
Color code	Brown	•••
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)
Plate quantity	6	•••
Color code	Purple	•••
Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.112 in)	2.8 mm (0.110 in)
Plate quantity	2	•••
Clutch plates		
Thickness	1.9 ~ 2.1 mm (0.07 ~ 0.08 in)	•••
Plate quantity	7	•••
Max. warpage	•••	0.1 mm (0.0039 in)
Thickness	2.2 ~ 2.4 mm (0.086 ~ 0.095 in)	•••
Plate quantity	1	•••
Max. warpage	•••	0.1 mm (0.0039 in)
Clutch springs		
Free length	55 mm (2.17 in)	52.3 mm (2.06 in)
Spring quantity	6	•••

Item	Standard	Limit
Transmission		
Transmission type	Constant mesh, 6-speed	•••
Primary reduction system	Spur gear	•••
Primary reduction ratio	86/44 (1.955)	•••
Secondary reduction system	Chain drive	•••
Secondary reduction ratio	46/16 (2.875)	•••
Operation	Left-foot operation	•••
Gear ratios		
1st gear	37/13 (2.846)	•••
2nd gear	37/19 (1.947)	•••
3rd gear	28/18 (1.556)	•••
4th gear	32/24 (1.333)	•••
5th gear	25/21 (1.190)	•••
6th gear	26/24 (1.083)	•••
Max. main axle runout	•••	0.02 mm (0.0008 in)
Max. drive axle runout	•••	0.02 mm (0.0008 in)
Shifting mechanism		
Shift mechanism type	Shift drum/Guide bar	•••
Max. shift fork guide bar bending	•••	0.05 mm (0.002 in)
Air filter type	Oil-coated paper element	•••
Fuel pump		
Pump type	Electrical	•••
Model (manufacturer)	5VX (DENSO)	•••
Output pressure	250 kPa (2.5 kg/cm^2, 2.5 bar, 36.3 psi)	•••
Throttle position sensor		
Resistance	4.0 ~ 6.0 kΩ at 20°C (68°F)	•••
Output voltage (at idle)	0.63 ~ 0.73 V (Adjusted by tachometer)	
Throttle bodies		
Model (manufacturer) × quantity	36EIDW (MIKUNI) × 2	•••
Intake vacuum pressure	29 kPa (218 mmHg, 8.5038 inHg)	•••
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm (0.12 ~ 0.20 in)	•••
ID mark	5VX1 00 (5VX3) 5VX4 10 (5VX4)	•••
Throttle valve size	#50	•••

CHASSIS SPECIFICATIONS

Item	Standard	Limit
Frame		
Frame type	Diamond	•••
Caster angle	25°	•••
Trail	97.5 mm (3.84 in)	•••
Front wheel		
Wheel type	Cast wheel	•••
Rim		
Size	17 M/C × MT3.50	•••
Material	Aluminum	•••
Wheel travel	130 mm (5.12 in)	•••
Wheel runout		
Max. radial wheel runout	•••	1 mm (0.04 in)
Max. lateral wheel runout	•••	0.5 mm (0.02 in)
Rear wheel		
Wheel type	Cast wheel	•••
Rim		
Size	17 M/C × MT5.50	•••
Material	Aluminum	•••
Wheel travel	130 mm (5.12 in)	•••
Wheel runout		
Max. radial wheel runout	•••	1 mm (0.04 in)
Max. lateral wheel runout	•••	0.5 mm (0.02 in)
Front tire		
Tire type	Tubeless	•••
Size	120/70 ZR17 M/C (58W)	•••
Model (manufacturer)	BT020F GG (BRIDGESTONE) D252F (DUNLOP)	•••
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	225 kPa (2.25 kgf/cm^2, 2.25 bar, 33 psi)	•••
90 ~ 190 kg (198 ~ 419 lb)	250 kPa (2.5 kgf/cm^2, 2.5 bar, 35.6 psi) (except for CAL)	•••
90 ~ 189 kg (198 ~ 417 lb)	250 kPa (2.5 kgf/cm^2, 2.5 bar, 35.6 psi) (CAL)	•••
High-speed riding	225 kPa (2.25 kgf/cm^2, 2.25 bar, 33 psi)	•••
Min. tire tread depth	•••	1.6 mm (0.06 in)

Item	Standard	Limit
Rear tire		
Tire type	Tubeless	•••
Size	180/55 ZR17 M/C (73W)	•••
Model (manufacturer)	BT020R GG (BRIDGESTONE) D252 (DUNLOP)	•••
Tire pressure (cold)		
0 ~ 90 kg (0 ~ 198 lb)	250 kPa (2.5 kgf/cm^2, 2.5 bar, 35.6 psi)	•••
90 ~ 190 kg (198 ~ 419 lb)	290 kPa (2.9 kgf/cm^2, 2.9 bar, 41.3 psi) (except for CAL)	•••
90 ~ 189 kg (198 ~ 417 lb)	290 kPa (2.9 kgf/cm^2, 2.9 bar, 41.3 psi) (CAL)	•••
High-speed riding	250 kPa (2.5 kgf/cm^2, 2.5 bar, 35.6 psi)	•••
Min. tire tread depth	•••	1.6 mm (0.06 in)
Front brakes		
Brake type	Dual disc brake	•••
Operation	Right hand operation	•••
Recommended fluid	DOT 4	•••
Brake discs		
Diameter × thickness	298 × 5 mm (11.73 × 0.20 in)	•••
Min. thickness	•••	4.5 mm (0.18 in)
Max. deflection	•••	0.1 mm (0.004 in)
Brake pad lining thickness	6.0 mm (0.24 in)	0.8 mm (0.03 in)
		
Master cylinder inside diameter	16 mm (0.63 in)	•••
Caliper cylinder inside diameter	30.2 mm and 25.4 mm (1.19 in and 1.00 in)	•••
Rear brake		
Brake type	Single disc brake	•••
Operation	Right foot operation	•••
Brake pedal position (below the bottom of the footrest bracket)	25.8 mm (1.02 in)	•••
Recommended fluid	DOT 4	•••
Brake discs		
Diameter × thickness	245 × 5 mm (9.65 × 0.20 in)	•••
Min. thickness	•••	4.5 mm (0.18 in)
Max. deflection	•••	0.15 mm (0.006 in)
Brake pad lining thickness	6.0 mm (0.24 in)	1.0 mm (0.04 in)
		
Master cylinder inside diameter	12.7 mm (0.5 in)	•••
Caliper cylinder inside diameter	38.1 mm (1.5 in)	•••

Item	Standard	Limit
Front suspension		
Suspension type	Telescopic fork	•••
Front fork type	Coil spring/oil damper	•••
Front fork travel	130 mm (5.12 in)	•••
Spring		
Free length	354.0 mm (13.94 in)	347 mm (13.66 in)
Spacer length	131.5 mm (5.18 in)	•••
Installed length	347.0 mm (13.66 in)	•••
Spring rate (K1)	7.4 N/mm (0.75 kg/mm, 42.25 lb/in)	•••
Spring rate (K2)	11.8 N/mm (1,20 kg/mm, 67.38 lb/in)	•••
Spring stroke (K1)	0 ~ 70 mm (0 ~ 2.76 in)	•••
Spring stroke (K2)	70 ~ 130 mm (2.76 ~ 5.12 in)	•••
Inner tube outer diameter	43 mm (1.69 in)	•••
Inner tube bending limit	•••	0.2 mm (0.01 in)
Optional spring available	No	•••
Fork oil		
Recommended oil	Suspension oil “01” or equivalent	•••
Quantity (each front fork leg)	0.467 L (0.41 lmp qt, 0.49 US qt)	•••
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	134 mm (5.28 in)	•••

Item	Standard	Limit
Steering		
Steering bearing type	Angular bearing	•••
Rear suspension		
Suspension type	Swingarm (monocross)	•••
Rear shock absorber assembly type	Coil spring/gas-oil damper	•••
Rear shock absorber assembly travel	50 mm (1.97 in)	•••
Spring		
Free length	185.0 mm (7.28 in)	•••
Installed length	172.0 mm (6.77 in)	•••
Spring rate (K1)	127.4 N/mm (12.99 kg/mm, 727.45 lb/in)	•••
Spring stroke (K1)	0 ~ 50 mm (0.00 ~ 1.97 in)	•••
Optional spring available	No	•••
Standard spring preload gas/air pressure	1,200 kPa (12 kg/cm^2, 12 bar, 170.7 psi)	•••
Spring preload adjusting positions		
Minimum	1	•••
Standard	3	•••
Maximum	7	•••
Swingarm		
Free play (at the end of the swingarm)		
Radial	•••	1.0 mm (0.04 in)
Axial	•••	1.0 mm (0.04 in)
Drive chain		
Model (manufacturer)	50V4 (DAIDO)	•••
Link quantity	118	•••
Drive chain slack	45 ~ 55 mm (1.77 ~ 2.17 in)	•••
Maximum ten-link section	•••	150.1 mm (5.91 in)

ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	•••
Ignition system		
Ignition system type	DC. T.C.I.	•••
Ignition timing	5° BTDC at 1,300 r/min	•••
Advancer type	Digital	•••
Crankshaft position sensor resistance/color	248 ~ 372 Ω at 20°C (68°F)/Gy-B	•••
T.C.I. unit model (manufacturer)	F8T811 (MITSUBISHI)	•••
Ignition coils		
Model (manufacturer)	JO383 (DENSO)	•••
Minimum ignition spark gap	6 mm (0.24 in)	•••
Primary coil resistance	1.53 ~ 2.07 Ω at 20°C (68°F)	•••
Secondary coil resistance	12.0 ~ 18.0 kΩ at 20°C (68°F)	•••
Spark plug cap		
Material	Resin	•••
Resistance	10.0 kΩ at 20°C (68°F)	•••
Charging system		
System type	A.C. magneto	•••
Model (manufacturer)	F5VX (MORIC)	•••
Normal output	14 V/310 W at 5,000 r/min	•••
Stator coil resistance/color	0.22 ~ 0.34 Ω at 20°C (68°F)/W-W	•••
Rectifier/regulator		
Regulator type	Semi conductor short circuit	•••
Model (manufacture)	SH719AA (SHINDENGEN)	•••
No-load regulated voltage	14.1 ~ 14.9 V	•••
Rectifier capacity	18 A	•••
Withstand voltage	240 V	•••
Battery		
Battery type	GT12B-4	•••
Battery voltage/capacity	12 V/10 Ah	•••
Specific gravity	1.320	•••
Manufacturer	GS	•••
Ten hour rate amperage	1.0 A	•••
Headlight type	Halogen bulb	
Bulbs (voltage/wattage × quantity)		
Headlight	12V 60 W/55 W × 1	•••
	12 V 55 W × 1	•••
Tail/brake light	12 V 5 W/21 W × 1	•••
Front turn signal/position light	12 V 21 W/5 W × 2	•••
Rear turn signal light	12 V 21 W × 2	•••
Licence light	12 V 5 W × 1	•••
Meter light	EL	•••

Item	Standard	Limit
Indicator light (voltage/wattage × quantity)		
Neutral indicator light	LED × 1	•••
High beam indicator light	LED × 1	•••
Oil level warning light	LED × 1	•••
Turn signal indicator light	LED × 2	•••
Engine trouble warning light	LED × 1	•••
Electric starting system		
System type	Constant mesh	•••
Starter motor		
Model (manufacturer)	SM-14 (MITSUBA)	•••
Power output	0.6 kW	•••
Brushes		
Overall length	10 mm (0.39 in)	3.5 mm (0.14 in)
Spring force	7.16 ~ 9.52 N (730 ~ 971 g, 25.77 ~ 34.27 oz)	•••
Armature coil resistance	0.0012 ~ 0.0022 Ω at 20°C (68°F)	•••
Commutator diameter	28 mm (1.1 in)	27 mm (1.06 in)
Mica undercut	0.7 mm (0.03 in)	•••
Starter relay		
Model (manufacturer)	MS5F-441 (JIDECO)	•••
Amperage	180 A	•••
Coil resistance	4.18 ~ 4.62 Ω at 20°C (68°F)	•••
Horn		
Horn type	Plain	•••
Model (manufacturer) × quantity	HF-12 (NIKKO) × 1	•••
Max. amperage	3 A	•••
Performance	105 ~ 118 db/2 m	•••
Coil resistance	1.01 ~ 1.11 Ω at 20°C (68°F)	•••
Turn signal relay		
Relay type	Full transistor	•••
Model (manufacturer)	FE246BH (DENSO)	•••
Self-cancelling device built-in	No	•••
Turn signal blinking frequency	75 ~ 95 cycles/min.	•••
Wattage	21 W × 2 + 3.4 W	•••
Oil level switch		
Model (manufacturer)	5VX (SOMIC ISHIKAWA)	•••

Item	Standard	Limit
Fuses (amperage × quantity)		
Main fuse	30 A × 1	•••
Fuel injection system fuse	10 A × 1	•••
Headlight fuse	20 A × 1	•••
Signaling system fuse	10 A × 1	•••
Ignition fuse	10 A × 1	•••
Radiator fan motor fuse	20 A × 1	•••
Backup fuse (odometer and clock)	10 A × 1	•••
Taillight fuse	10 A × 1	•••
Reserve fuse	30 A, 20 A, 10 A	•••
Fuel level sender		
Model (manufacture)	5VX (DENSO)	•••
Sender unit resistance-full	20 ~ 26 Ω	•••
Sender unit resistance-empty	134 ~ 140 Ω	•••
Starting circuit cut-off relay		
Model (manufacture)	G8R-30Y-S (OMRON)	•••
Coil resistance	162 ~ 198 Ω	•••
Headlight relay, Radiator fan motor relay		
Model (manufacture)	ACM33211M05 (MATSUSHITA)	•••
Coil resistance	86.4 ~ 105.6 Ω	•••
Fuel injection system relay		
Model (manufacture)	G8R-30Y-R (OMRON)	•••
Coil resistance	162 ~ 198 Ω	•••
Water temperature sensor		
Model (manufacture)	K003T20191 (MITSUBISHI)	•••
Resistance	0.290 ~ 0.354 Ω at 80°C (176°F)	•••

EAS00028

CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.
Use this table to convert METRIC unit data to IMPERIAL unit data.
Ex.

METRIC		MULTIPLIER		IMPERIAL
** mm	×	0.03937	=	** in
2 mm	×	0.03937	=	0.08 in

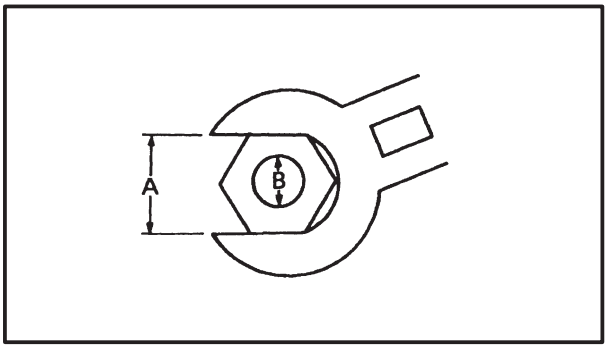
CONVERSION TABLE

METRIC TO IMPERIAL			
	Metric unit	Multiplier	Imperial unit
Tightening torque	m•kg m•kg cm•kg cm•kg	7.233 86.794 0.0723 0.8679	ft•lb in•lb ft•lb in•lb
Weight	kg g	2.205 0.03527	lb oz
Speed	km/hr	0.6214	mph
Distance	km m m cm mm	0.6214 3.281 1.094 0.3937 0.03937	mi ft yd in in
Volume/ Capacity	cc (cm^3) cc (cm^3) lt (liter) lt (liter)	0.03527 0.06102 0.8799 0.2199	oz (IMP liq.) cu•in qt (IMP liq.) gal (IMP liq.)
Misc.	kg/mm kg/cm^2 Centigrade (°C)	55.997 14.2234 9/5+32	lb/in psi (lb/in^2) Fahrenheit (°F)

EAS00030

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

TIGHTENING TORQUES

ENGINE TIGHTENING TORQUES

Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Spark plugs	–	M10	4	18	1.8	13	
Cylinder head	Bolt	M10	10	1st 19	1.9	14	
				2nd 50	5.0	36	E
	Bolt	M6	2	12	1.2	8.7	
Camshaft caps	Bolt	M6	20	10	1.0	7.2	
Cylinder head cover	Bolt	M6	6	12	1.2	8.7	
Camshaft cap oil check bolt	Bolt	M8	1	20	2.0	15	
Air indication system reed valve cover	Bolt	M6	4	10	1.0	7.2	Yamaha bond No.1215
Air-cut valve stay	Bolt	M6	1	10	1.0	7.2	LT
Camshaft sprockets	Bolt	M7	4	20	2.0	15	
Connecting rod caps (except for CAL)	Nut	M7	8	15 + 150°	1.5 + 150°	11 + 150°	M
Connecting rod caps (for CAL)	Bolt	M7	8	15 + 120°	1.5 + 120°	11 + 120°	M
Generator rotor	Bolt	M12	1	75	7.5	54	E
Timing chain tensioner	Bolt	M6	2	12	1.2	8.7	
Timing chain tensioner cap bolt	Bolt	M6	1	7.0	0.7	5.1	
Thermostat cover	Bolt	M6	2	12	1.2	8.7	LT
Coolant hose joint	Bolt	M6	2	10	1.0	7.2	LT
Water pump cover	Bolt	M6	2	10	1.0	7.2	
Water pump	Bolt	M6	2	12	1.2	8.7	LT
Thermo sensor	Bolt	M12	1	18	1.8	13	
Coolant hose drain bolt (water pump)	Bolt	M6	1	10	1.0	7.2	
Radiator and frame	Bolt	M6	2	7.0	0.7	5.1	
Radiator stay and crankcase	Bolt	M6	1	10	1.0	7.2	
Oil pump cover	Bolt	M6	3	12	1.2	8.7	
Oil pump	Bolt	M6	3	12	1.2	8.7	
Oil pan	Bolt	M6	12	12	1.2	8.7	
Oil pan (center)	Bolt	M6	1	12	1.2	8.7	LT
Oil cooler	Bolt	M20	1	63	6.3	46	
Engine oil drain bolt	Bolt	M14	1	43	4.3	31	
Oil filter union bolt	Bolt	M20	1	70	7.0	51	
Oil filter	–	M20	1	17	1.7	12	E
Oil pump chain guide	Bolt	M6	2	12	1.2	8.7	LT
Oil pipe	Bolt	M6	2	12	1.2	8.7	LT
Throttle body joint	Bolt	M6	8	10	1.0	7.2	
Air filter case cover	Screw	M5	6	1.2	0.12	0.9	
Throttle body and throttle body joint	Clamp	M4	4	3.0	0.3	2.2	
Throttle body and air filter case	Clamp	M5	4	3.0	0.3	2.2	
Exhaust pipe and cylinder head	Nut	M8	8	20	2.0	15	
Exhaust pipe and exhaust pipe stay	Bolt	M8	1	20	2.0	15	
Catalyst pipe and catalyst pipe stay	Bolt	M8	1	20	2.0	15	
Muffler joint	Bolt	M8	1	20	2.0	15	See NOTE 1
Catalyst joint	Bolt	M8	1	20	2.0	15	See NOTE 1
Exhaust stay and frame	Bolt	M8	1	34	3.4	25	
Catalyst pipe stay and frame	Bolt	M8	1	20	2.0	15	
Muffler stay and frame	Bolt	M8	2	20	2.0	15	

Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Crankcase (main journal)	Bolt	M8	10	See NOTE 2			E
Crankcase	Bolt	M6	2	14	1.4	1.0	E
Crankcase	Bolt	M6	13	12	1.2	8.7	E
Crankcase	Bolt	M8	2	24	2.4	17	E
Generator rotor cover	Bolt	M6	9	12	1.2	8.7	
Clutch cover	Bolt	M6	7	12	1.2	8.7	
Clutch cover	Bolt	M6	1	12	1.2	8.7	Yamaha bond No.1215 LT
Pickup coil rotor cover	Bolt	M6	7	12	1.2	8.7	
Clutch cable holder	Bolt	M6	2	12	1.2	8.7	
Pickup coil rotor cover	Bolt	M8	1	15	1.5	11	
Shift shaft cover	Bolt	M6	6	12	1.2	8.7	
Breather plate	Screw	M6	3	12	1.2	8.7	LT
Stator coil	Screw	M6	3	10	1.0	7.2	LT
Pickup rotor cover and clamp	Screw	M6	1	7.0	0.7	5.1	
Drive sprocket cover	Bolt	M6	3	10	1.0	7.2	
Oil gallery bolt	–	M16	2	8	0.8	5.8	
Generator rotor cover and stator coil lead clamp	Screw	M6	1	10	1.0	7.2	
Breather hose cover	Bolt	M6	4	12	1.2	8.7	
Oil pipe	Bolt	M6	2	12	1.2	8.7	LT
Crankshaft position sensor	Bolt	M6	2	10	1.0	7.2	
Starter clutch	Screw	M8	3	32	3.2	23	LT
Starter motor cover bolt	Bolt	M6	2	3.4	0.34	2.5	
Clutch pressure plate	Screw	M6	6	8.0	0.8	5.8	
Clutch boss	Nut	M20	1	90	9.0	65	Use a lock washer
Drive sprocket	Nut	M18	1	90	9.0	65	Use a lock washer
Transmission bearing housing	Screw	M6	3	12	1.2	8.7	LT
Shift drum retainer	Bolt	M6	2	10	1.0	7.2	LT
Shift shaft spring stopper	Screw	M8	1	22	2.2	16	LT
Shift rod	Nut	M6	1	7	0.7	5.1	Left thread
Shift rod	Nut	M6	1	7	0.7	5.1	
Shift rod joint	Bolt	M6	1	10	1.0	7.2	LT
Shift arm	Bolt	M6	1	10	1.0	7.2	
Pickup coil rotor	Bolt	M8	1	35	3.5	25	
Starter motor	Bolt	M6	2	10	1.0	7.2	
Neutral switch	–	M10	1	20	2.0	14	
Oil level switch	Bolt	M6	2	10	1.0	7.2	
Speed sensor	Bolt	M6	1	10	1.0	7.2	

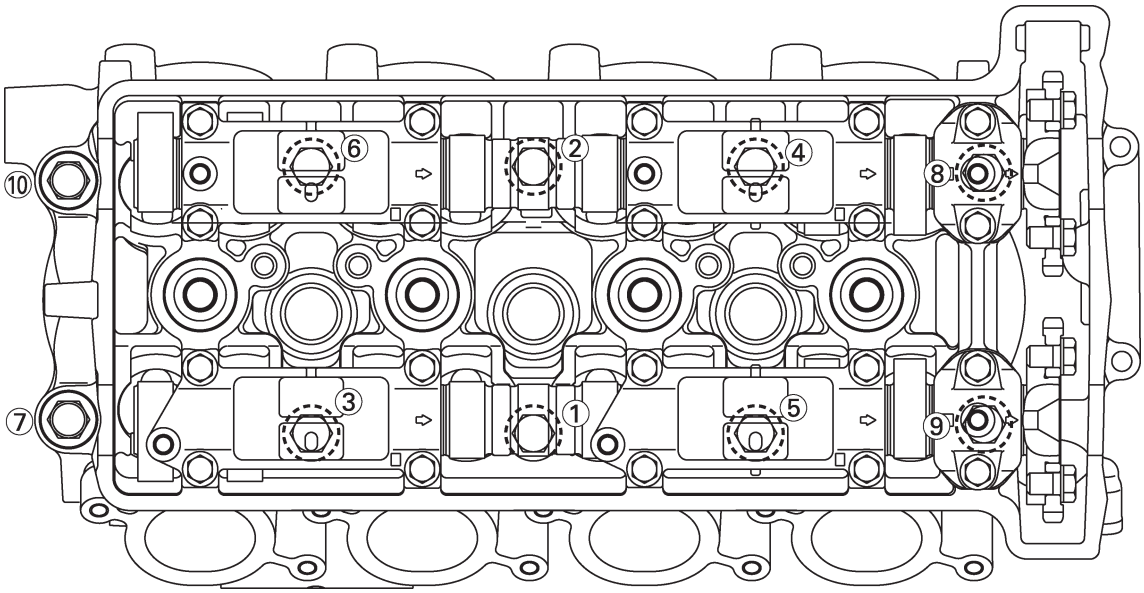
NOTE 1:

Retighten the bolt at 1000 km (600 ml).

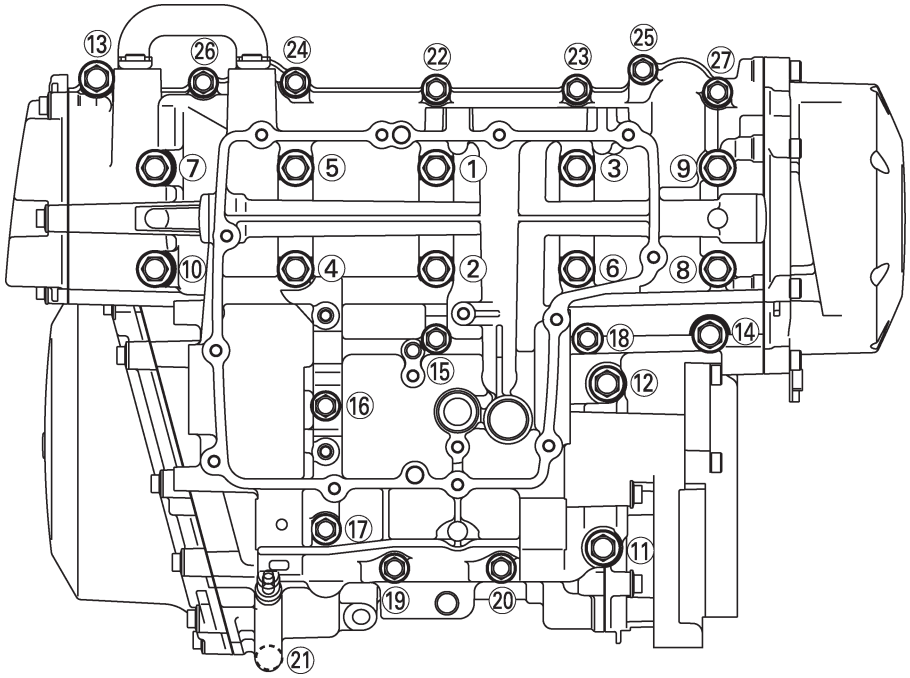
NOTE 2:

1. First, tighten the bolts to approximately 12 Nm (1.2 m•kg, 8.7 ft•lb) with a torque wrench. (Following the tightening order)
2. Retighten the bolts 25 Nm (2.5 m•kg, 18 ft•lb) with a torque wrench.
3. Loosen the all bolts one by one following the tightening order and then tighten them to 27 Nm (2.7 m•kg, 20 ft•lb) again.

Cylinder head tightening sequence:



Crankcase tightening sequence.



CHASSIS TIGHTENING TORQUES

Item	Thread size	Tightening			Remarks
		Nm	m•kg	ft•lb	
Upper bracket pinch bolt	M8	30	3.0	22	
Steering stem nut	M22	110	11	80	
Upper bracket and upper handlebar holder	M8	23	2.3	17	
Under bracket pinch bolt	–	30	3.0	22	
Lower ring nut	M25	18	1.8	13	See NOTE 1
Front fork cap bolt	M35	24	2.4	17	
Damper rod assembly bolt	M10	23	2.3	17	
Pinch bolt (front wheel axle)	M8	23	2.3	17	
Front brake master cylinder and master cylinder bracket	M6	10	1.0	7.2	
Front brake master cylinder cap screw	M4	2	0.2	1.4	
Front brake hose union bolt	M10	30	3.0	22	
Front brake hose holder and front fork	M6	10	1.0	7.2	
Front cowling stay and frame	M8	33	3.3	24	
Front cowling bracket and frame	M6	7	0.7	5.1	
Front fender and front fork	M6	6	0.6	4.3	
Clutch lever holder pinch bolt	M6	11	1.1	8.0	
Engine mount bolts (left of front side)	M10	55	5.5	40	
Engine mount bolts (left of rear side)	M10	55	5.5	40	
Engine mount bolts (right of front side)	M10	55	5.5	40	See NOTE 2
Engine mount self locking nut (upper)	M10	55	5.5	40	
Engine mount self locking nut (lower)	M10	55	5.5	40	
Fornt frame and rear frame (upper)	M10	41	4.1	30	E
Front frame and rear frame (lower)	M10	41	4.1	30	See NOTE 3 LT
Pivot shaft and frame	M18	120	12	87	
Rear shock absorber and frame	M10	40	4.0	29	
Rear shock absorber and rear arm	M10	40	4.0	29	
Seal guard and rear arm	M6	7	0.7	5.1	
Rear fender and rear arm	M6	7	0.7	5.1	
Rear brake hose holder and rear arm	M6	7	0.7	5.1	
Fuel tank bracket and frame	M6	7	0.7	5.1	
Fuel tank bracket and fuel tank	M6	7	0.7	5.1	
Fuel tank and rear frame	M6	7	0.7	5.1	
Fuel tank and fuel tank cap	M5	6	0.6	4.3	
Fuel pump and fuel tank	M5	4	0.4	2.9	
Ignition coil and battery box	M6	7	0.7	5.1	
Seat lock and frame	M6	7	0.7	5.1	
Rotor and mud guard	M6	3	0.3	2.2	
Licence plate light and flap	M5	4	0.4	2.9	
Front side reflector and front brake hose holder	M5	4	0.4	2.9	
Rear side reflector and stay	M5	3	0.3	2.2	
Rear reflector and flap	M5	4	0.4	2.9	
Flap and bracket 6	M6	7	0.7	5.1	
Blacket 6 and rear frame	M6	19	1.9	14	
Seat handle and tail/brake right unit	M6	3	0.3	2.2	
Rear fender cover and seat handle	M5	4	0.4	2.9	
Seat handle bolt	M8	23	2.3	17	
Muffler and rear fender	M6	7	0.7	5.1	

Item	Thread size	Tightening			Remarks
		Nm	m•kg	ft•lb	
Side cover and rear frame	M6	10	1.0	7.2	
Rear mud guard and rear frame	M6	7	0.7	5.1	
Engine stop switch and frame	M4	2	0.2	1.4	
Coolant reserver tank bracket and stay 1, 2	M6	10	1.0	7.2	
Stay 1, 2 and frame	M6	10	1.0	7.2	
Coolant reserver tank bracket and coolant reserver tank	M6	4	0.4	2.9	
Canister and canister bracket (for CAL)	M6	7	0.7	5.1	
Canister bracket and coolant reserver tank bracket (forCAL)	M6	7	0.7	5.1	
Front wheel axle shaft and bolt	M18	72	7.2	52	
Front wheel axle pinch bolt	M8	23	2.3	17	
Front brake caliper and front fork	M10	40	4.0	29	
Front brake disc and front wheel	M6	18	1.8	13	LT
Brake caliper bleed screw	M7	6	0.6	4.3	
Rear wheel axle nut	M24	120	12	87	
Rear brake disc and rear wheel	M8	30	3.0	22	LT
Rear brake caliper bolt front and rear brake caliper bracket	M8	27	2.7	20	
Rear brake caliper bolt rear and rear brake caliper bracket	M8	22	2.2	16	
Rear wheel sprocket and rear wheel drive hub	M10	100	10	72	
Chain adjusting bolt lock nut	M8	16	1.6	12	
Rear brake hose union bolt	M10	30	3.0	22	
Sidestand bolt lock nut	M10	46	4.6	33	
Sidestand bracket and frame	M10	63	6.3	46	
Sidestand switch screw	M5	4	0.4	2.9	
Footrest bracket and frame	M8	30	3.0	22	
Rear brake reserver tank and coolant reserver tank bracket	M6	3	0.3	2.2	
Rear master cylinder and footrest bracket	M8	23	2.3	17	
Mainstand and nut	M10	73	7.3	53	
Footrest and footrest bolt	M8	10	1.0	7.2	
Brake pedal and brake shaft	M6	8	0.8	5.8	

NOTE 1:

1. First, tighten the ring nut to approximately 52 Nm (5.2 m•kg, 38 ft•lb) with a torque wrench, then loosen the ring nut completely.
2. Retighten the lower ring nut to specification.

NOTE 2:

Refer to “INSTALLING THE ENGINE” in chapter 5.

NOTE 3:

To repair, make sure to apply the liquid fixing agent to the bolt without fixing agent (90149 – 10001) and use it.

EAS00031

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

Lubrication point	Lubricant
Oil seal lips	LS
O-rings	LS
Bearings and bushes	E
Crankshaft pins	E
Piston surfaces	E
Piston pins	E
Connecting rod bolts	M
Crankshaft journals	E
Camshaft lobes	M
Camshaft journals	M
Valve stems (intake and exhaust)	M
Valve stem ends (intake and exhaust)	E
Valve lifter surface	E
Piston cooler (O-ring)	E
Oil pump rotors (inner and outer)	E
Oil pump housing	E
Oil strainer	E
Clutch (pull rod)	LS
Starter clutch idle gear inner surface	E
Starter clutch assembly	E
Primary driven gear	E
Transmission gears (wheel and pinion)	M
Main axle and drive axle	M
Shift drum	E
Shift forks and shift fork guide bars	E
Shift shaft	E
Shift shaft boss	E
Cylinder head cover mating surface	Yamaha bond No.1215
Cylinder head cover semicircular	Yamaha bond No.1215
Crankcase mating surface	Yamaha bond No.1215
Generator rotor cover (stator coil assembly lead grommet)	Yamaha bond No.1215
Pickup rotor cover (crankshaft position sensor lead grommet)	Yamaha bond No.1215

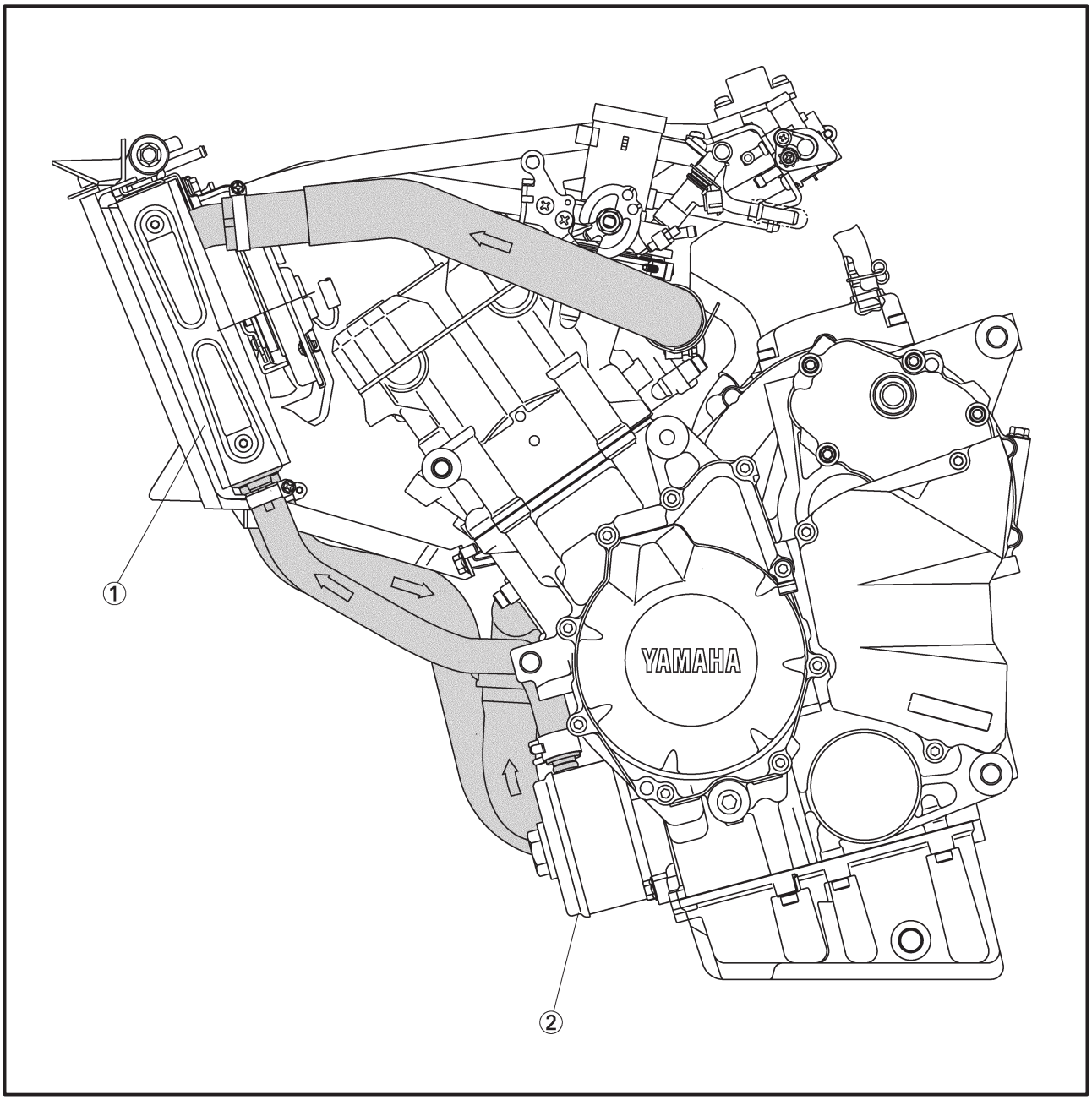
EAS00032

CHASSIS

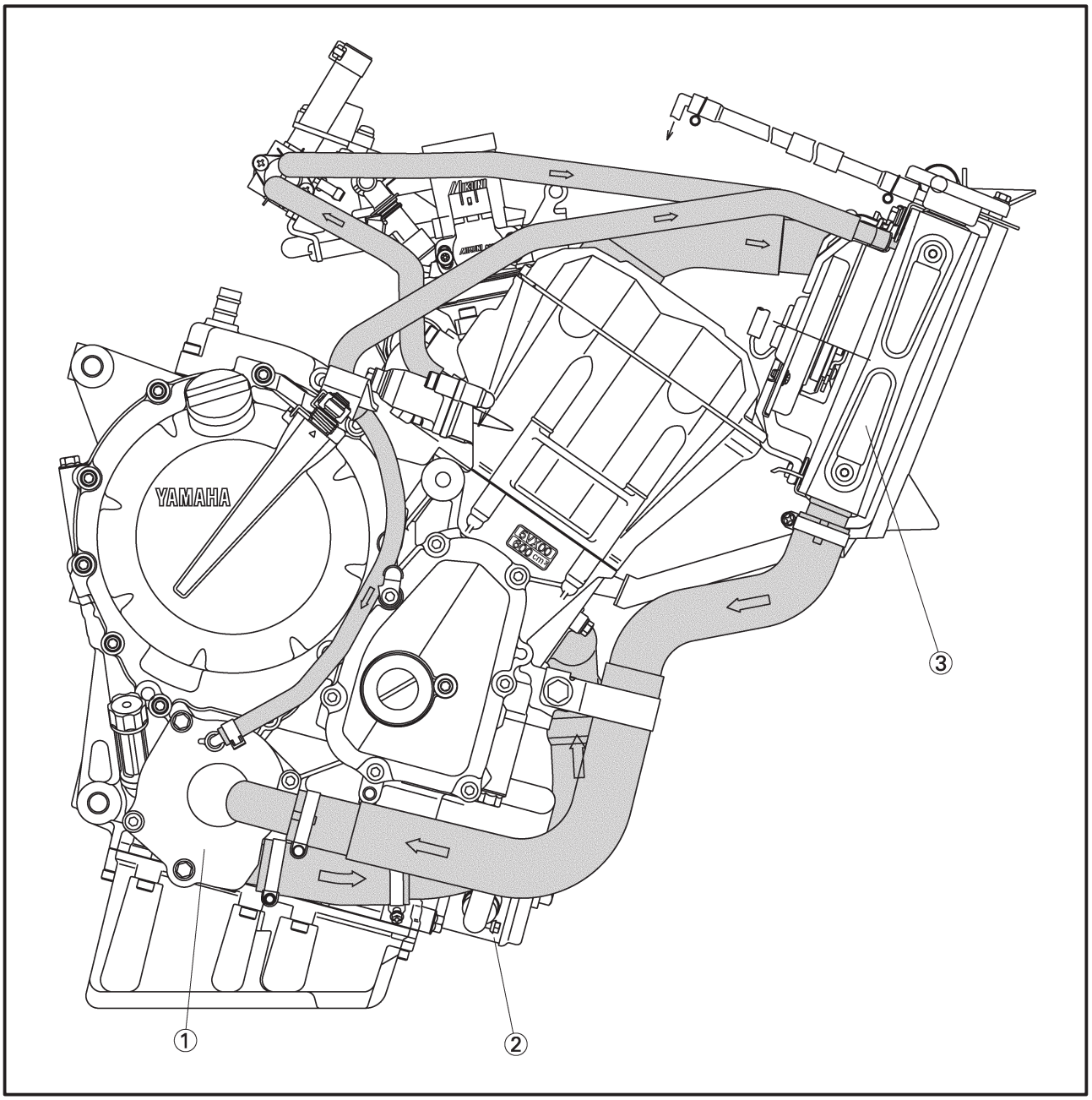
Lubrication point	Lubricant
Steering bearings and bearing races (upper and lower)	LS
Front wheel oil seal (right and left)	LS
Rear wheel oil seal	LS
Rear wheel drive hub oil seal	LS
Rear wheel drive hub mating surface	LS
Rear brake pedal shaft	LS
Sidestand pivoting point and metal-to-metal moving parts	LS
Link and sidestand switch contact point	LS
Throttle grip inner surface	LS
Brake lever pivoting point and metal-to-metal moving parts	LS
Clutch lever pivoting point and metal-to-metal moving parts	LS
Rear shock absorber collar	LS
Pivot shaft	LS
Swingarm pivot bearing	LS
Swingarm head pipe end, oil seal and bush	LS
Engine mount bolts (rear upper and lower)	LS
Shift pedal shaft	LS
Shift shaft joint	LS
Rear footrest ball and metal-to-metal moving parts	LS
Main stand metal-to-metal moving parts	LS

COOLING SYSTEM DIAGRAMS

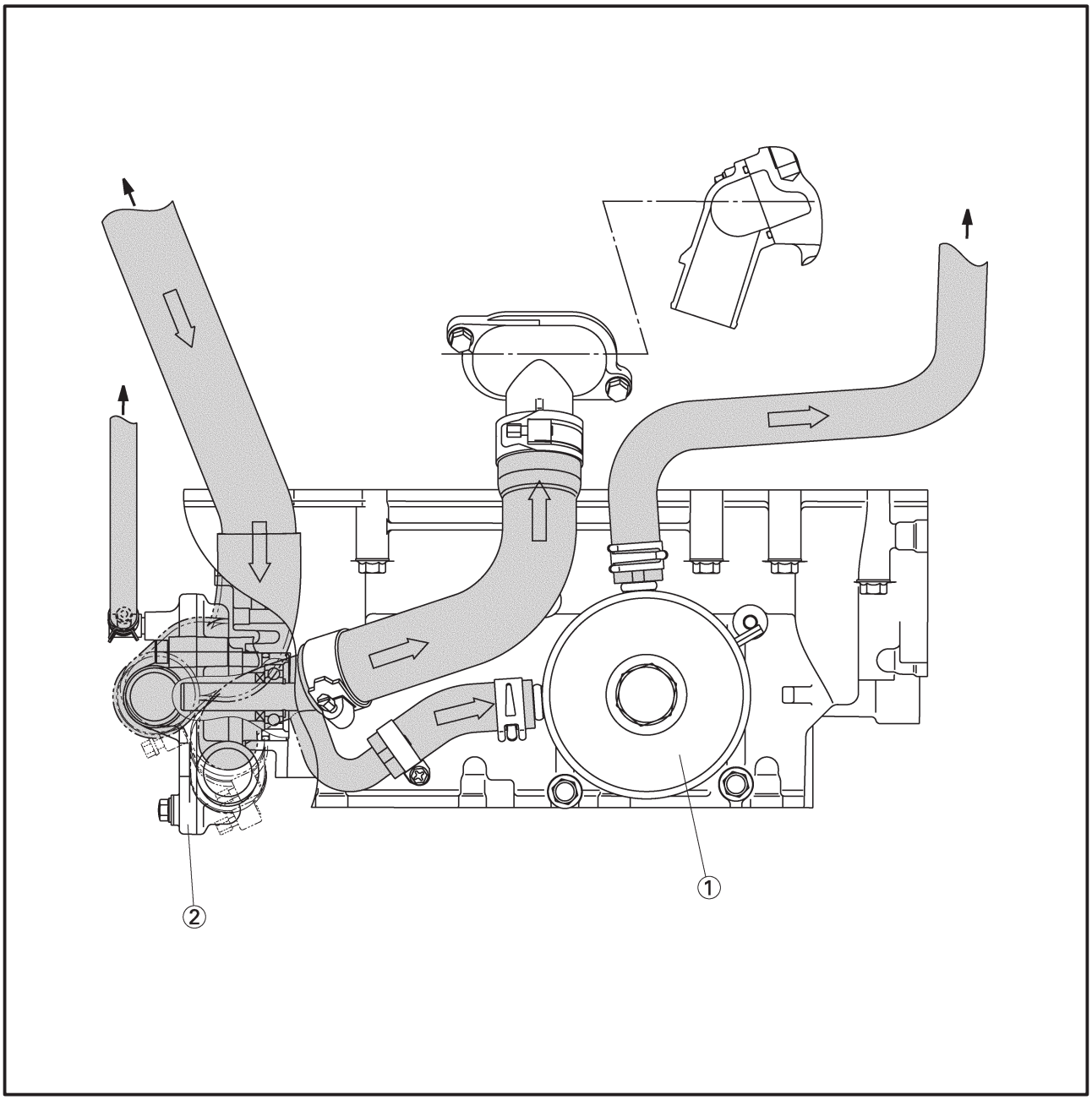
① Radiator
② Oil cooler



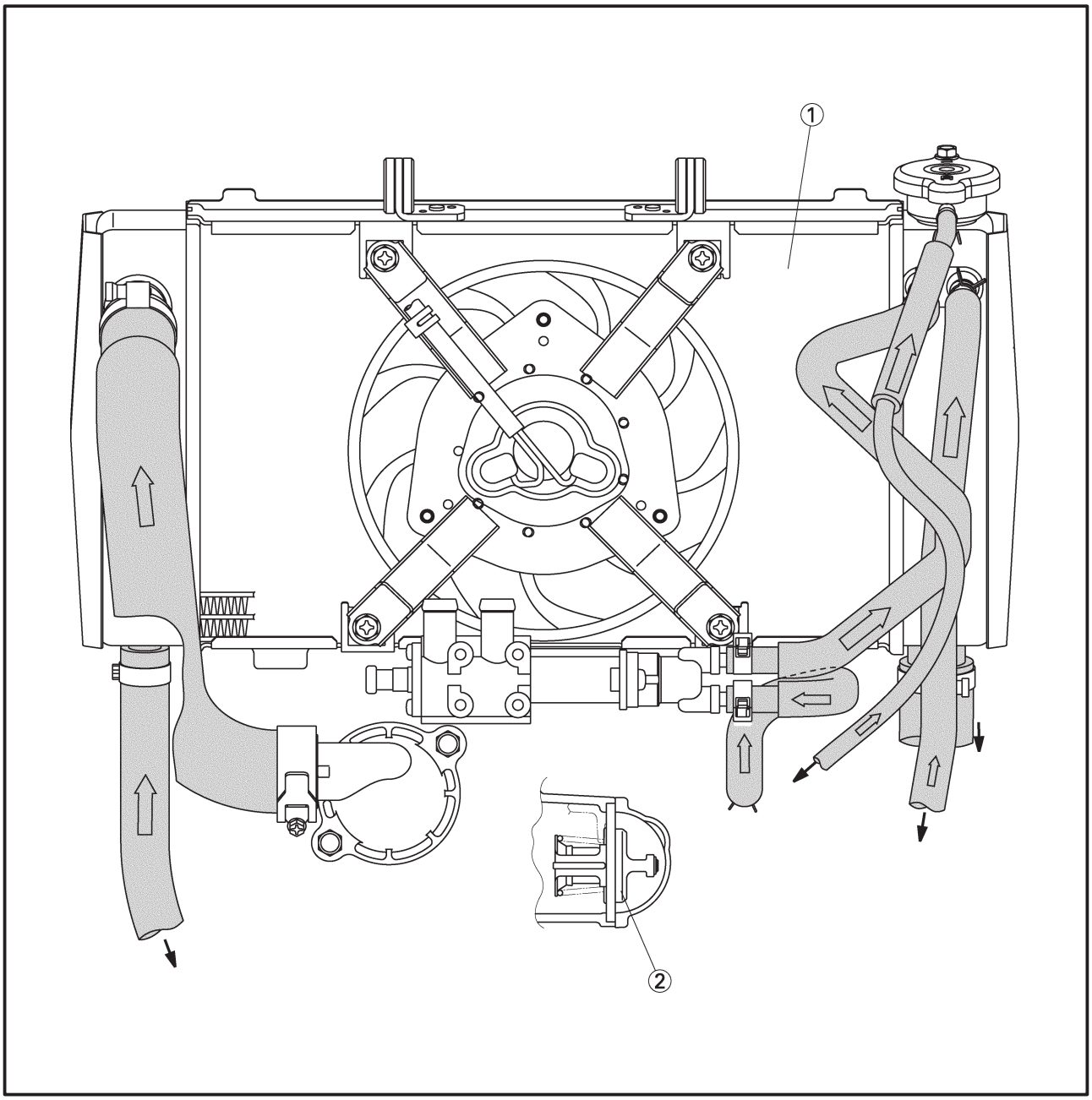
① Water pump
② Oil cooler
③ Radiator



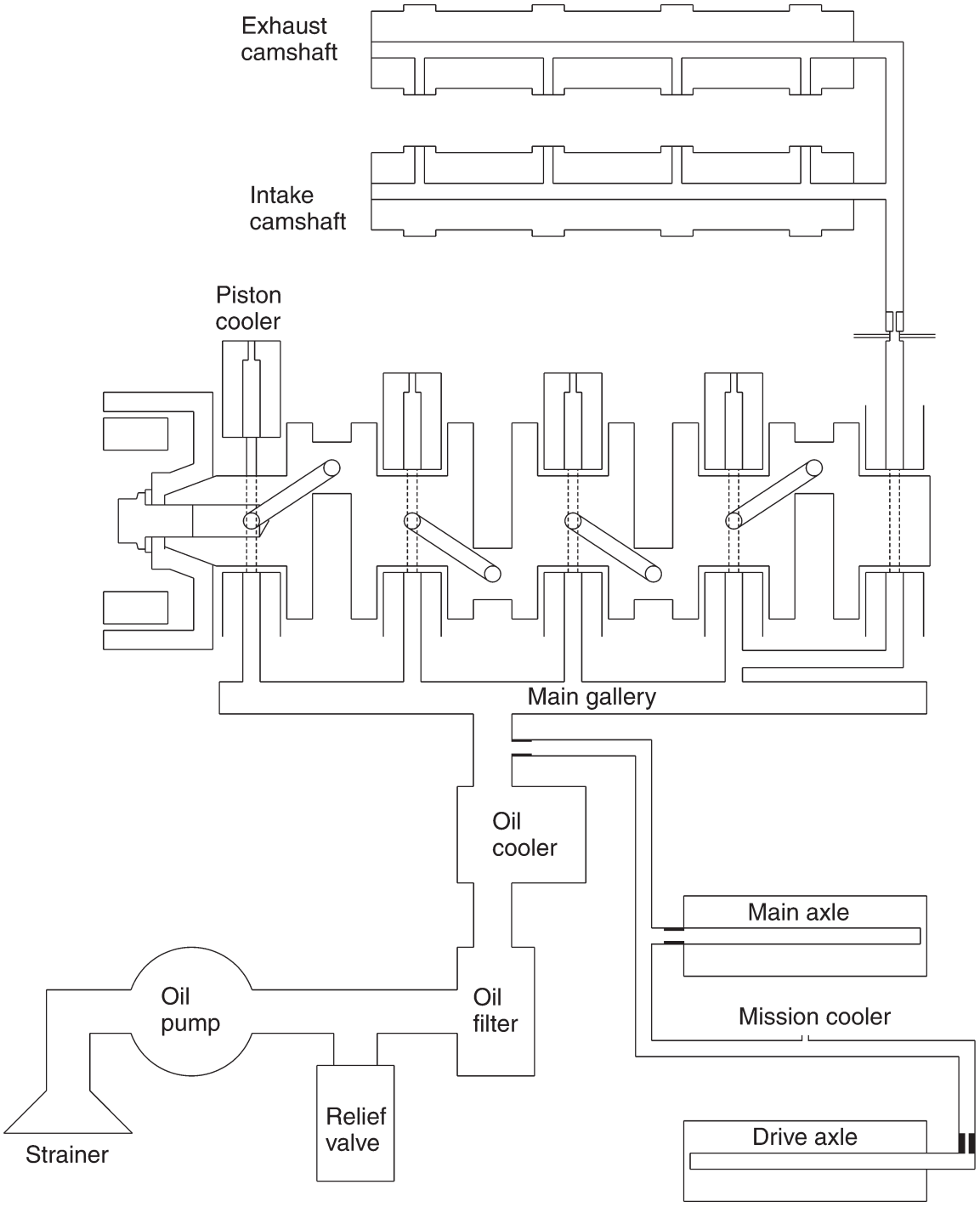
① Oil cooler
② Water pump



① Radiator
② Thermostat

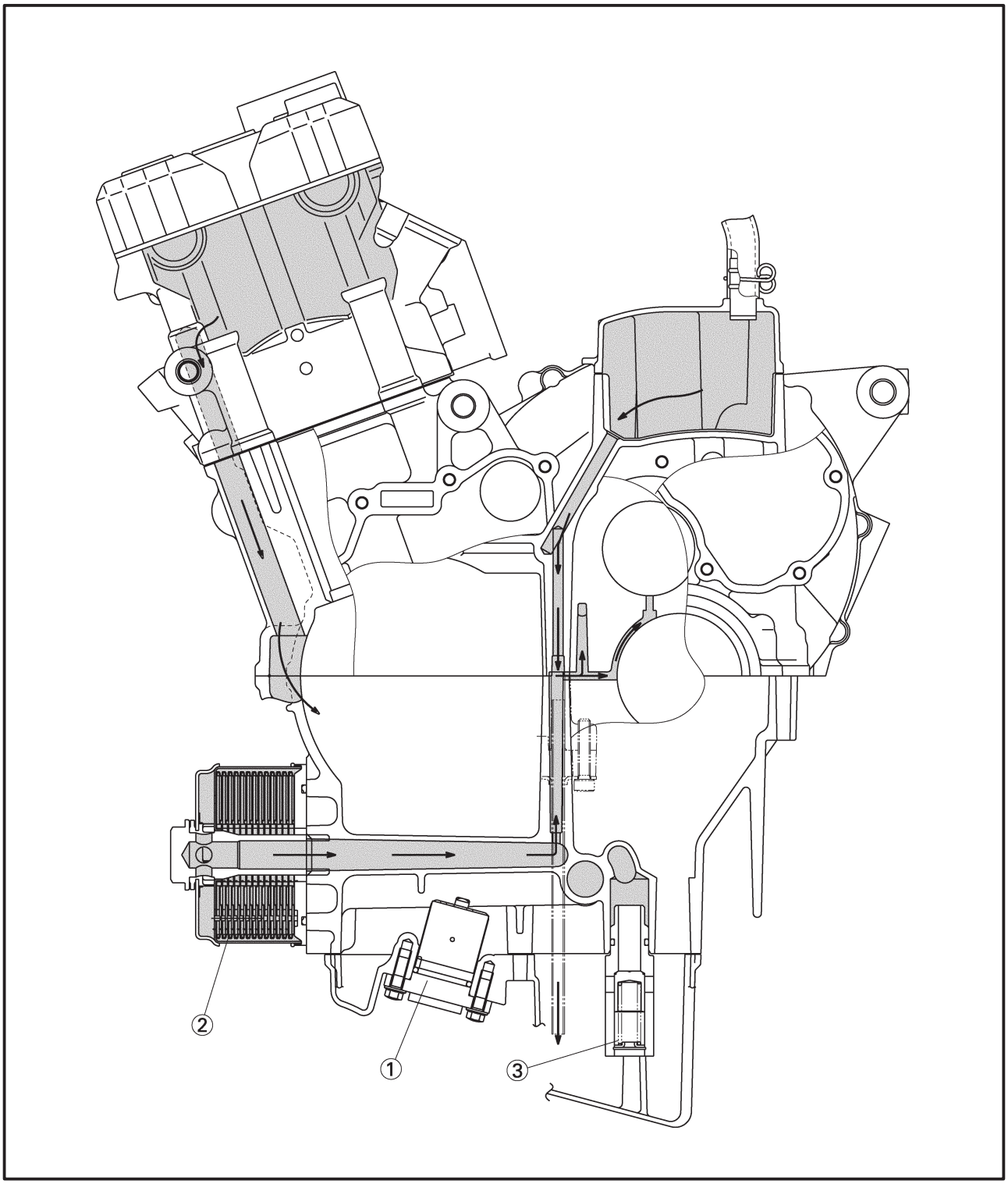


ENGINE OIL LUBRICATION CHART

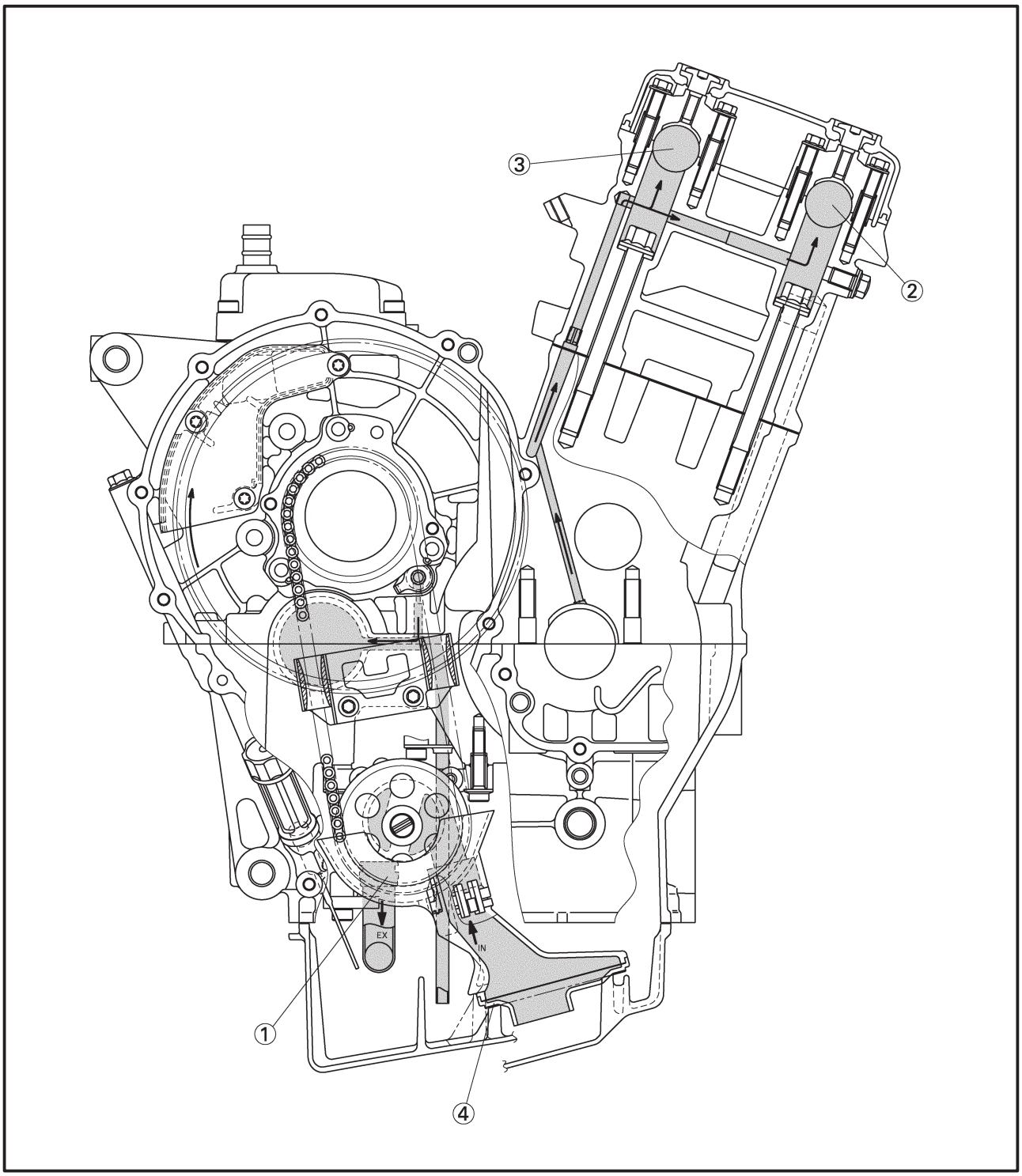


LUBRICATION DIAGRAMS

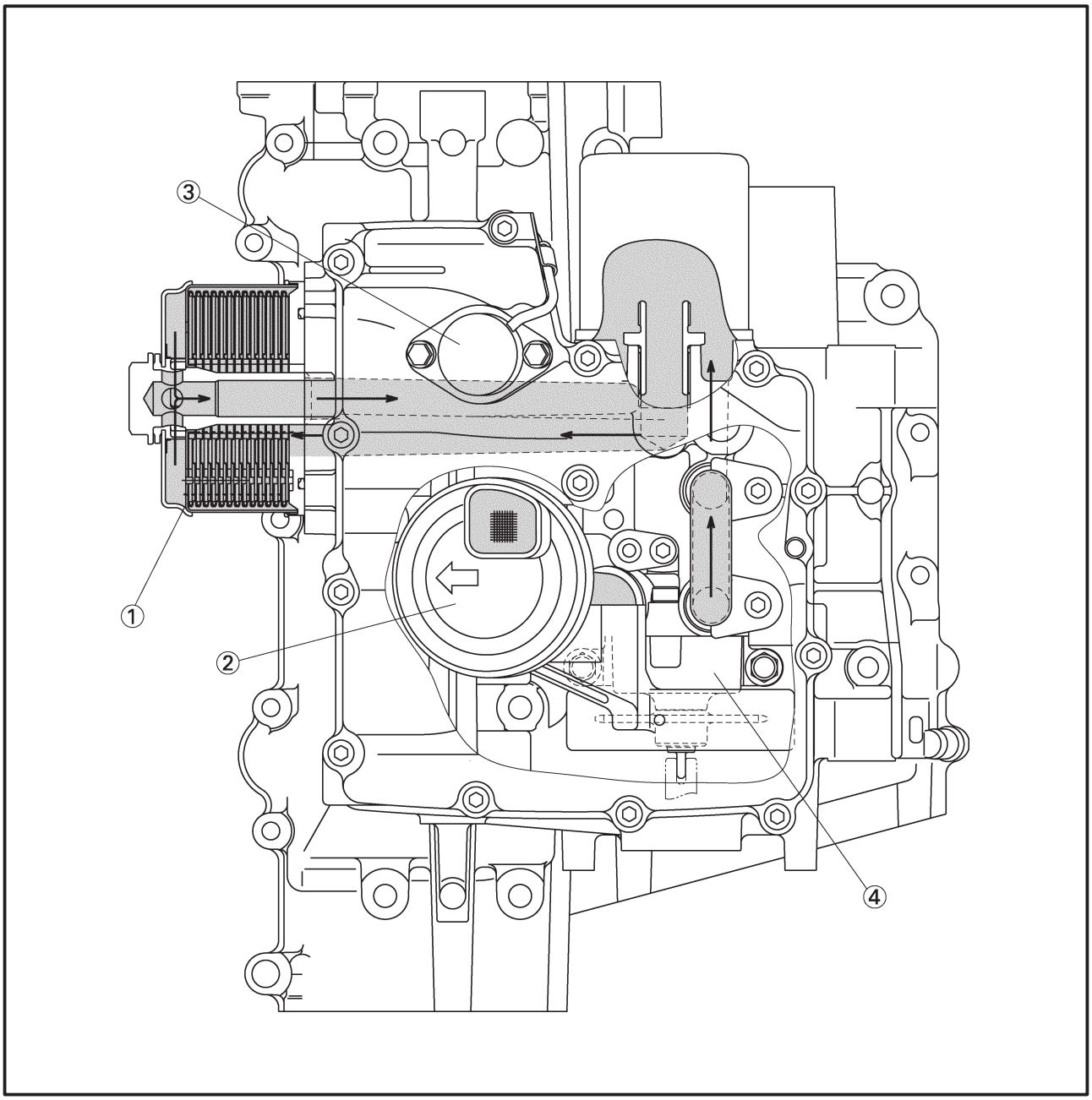
① Oil level switch
② Oil cooler
③ Relief valve



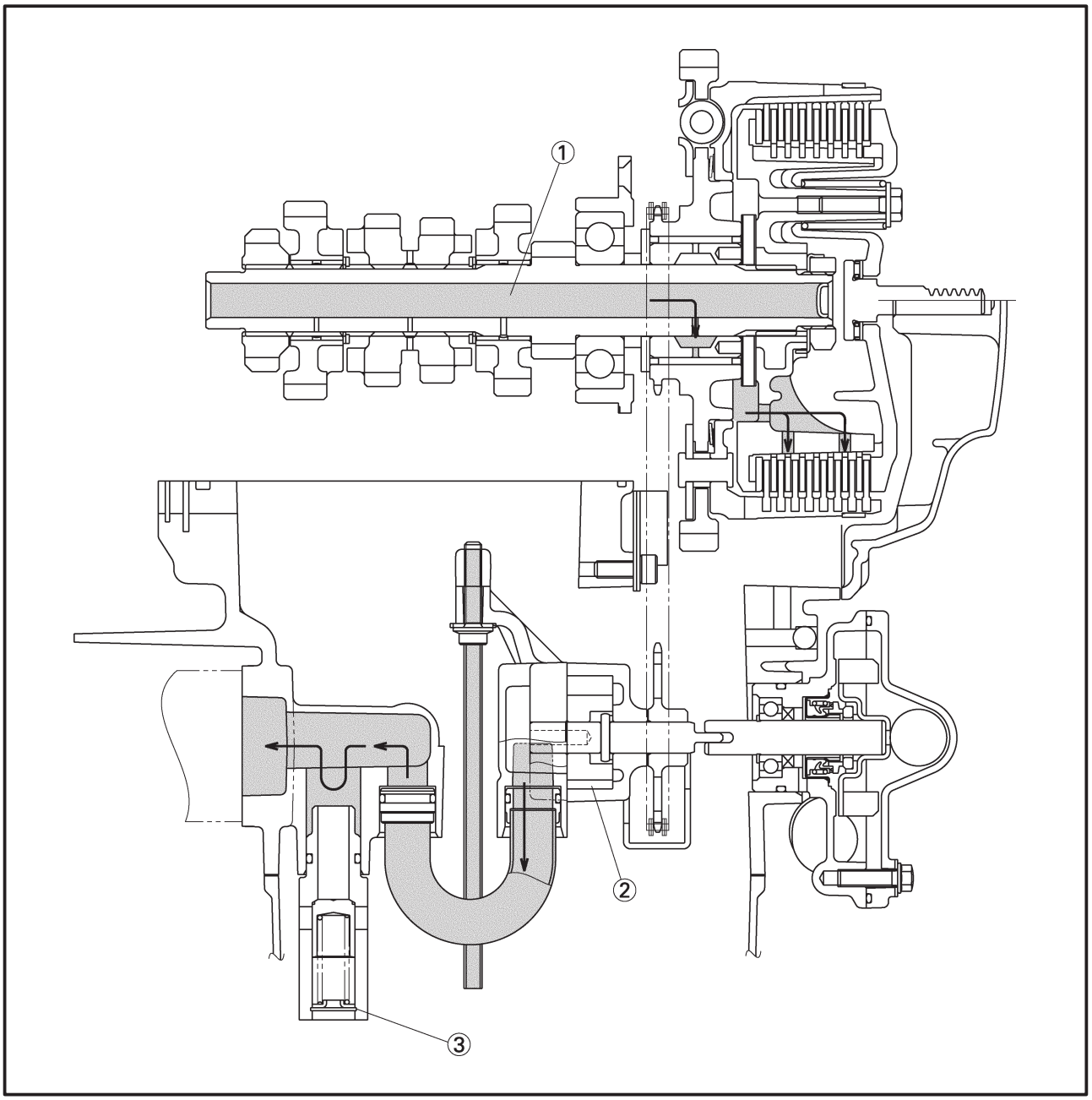
① Oil pump
② Exhaust camshaft
③ Intake camshaft
④ Oil strainer



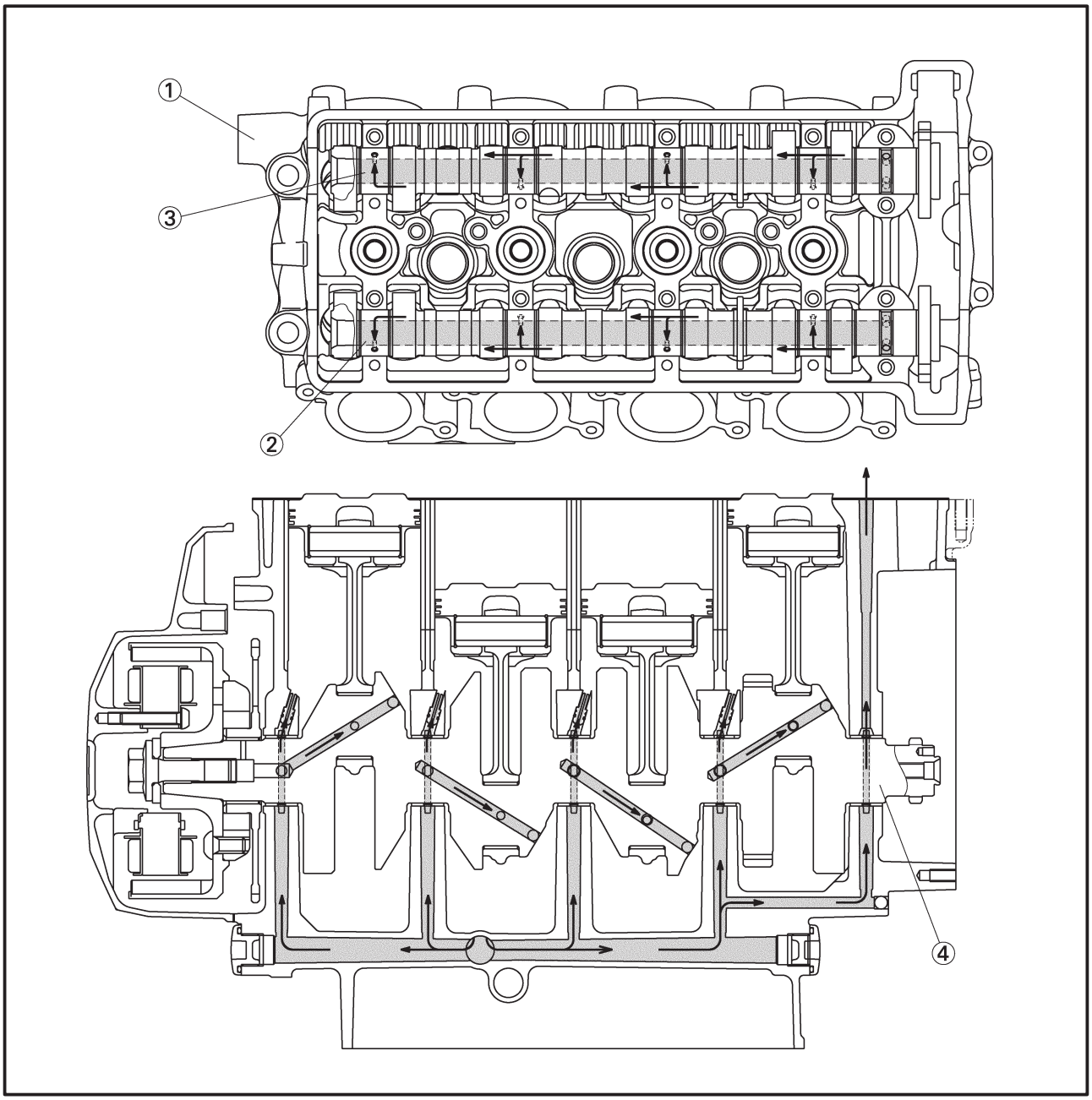
① Oil cooler
② Oil strainer
③ Oil level switch
④ Oil pump



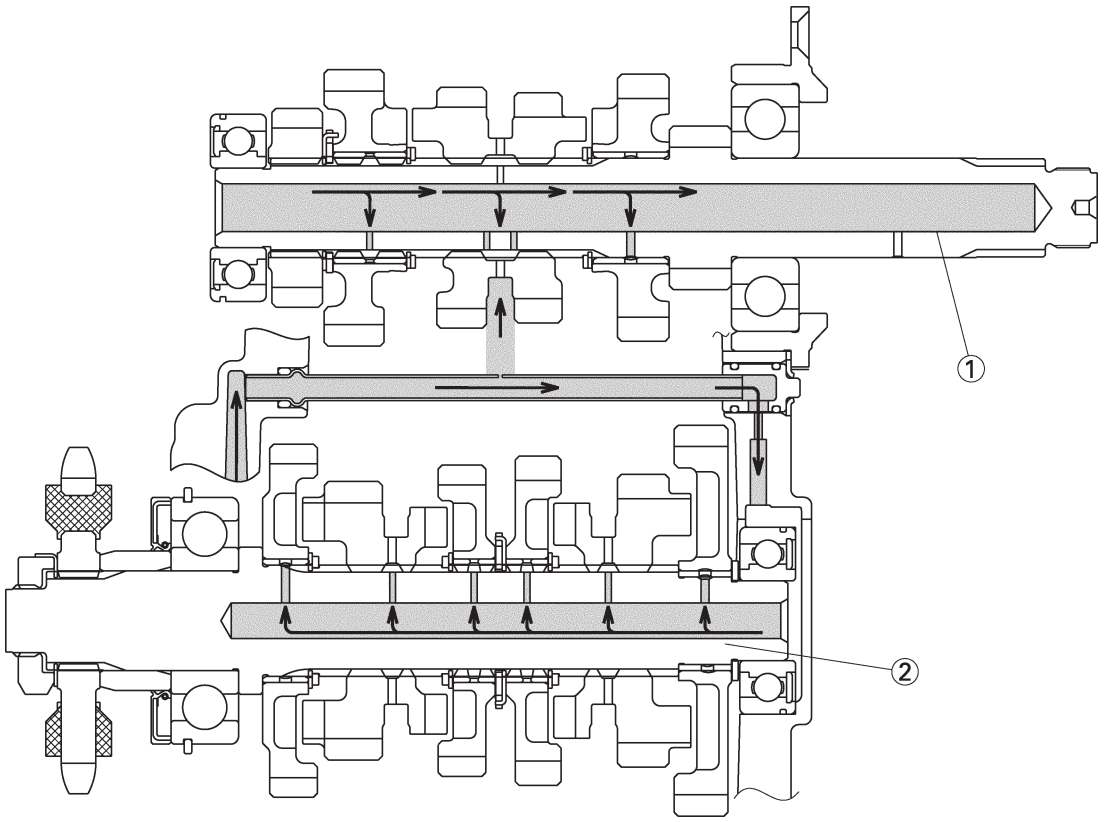
① Main axle
② Oil pump
③ Relief valve



① Cylinder head
② Intake camshaft
③ Exhaust camshaft
④ Crankshaft



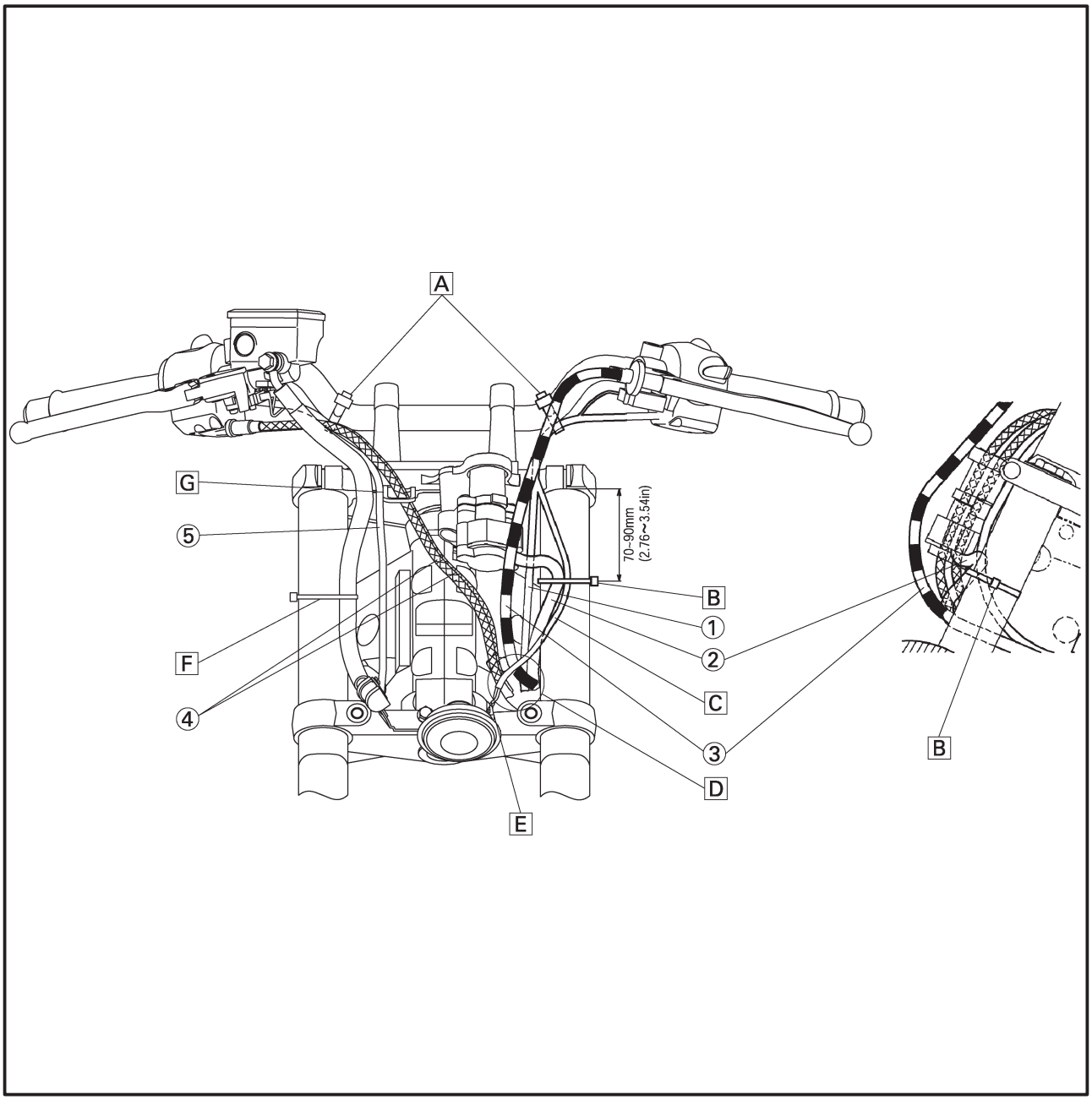
① Main axle
② Drive axle



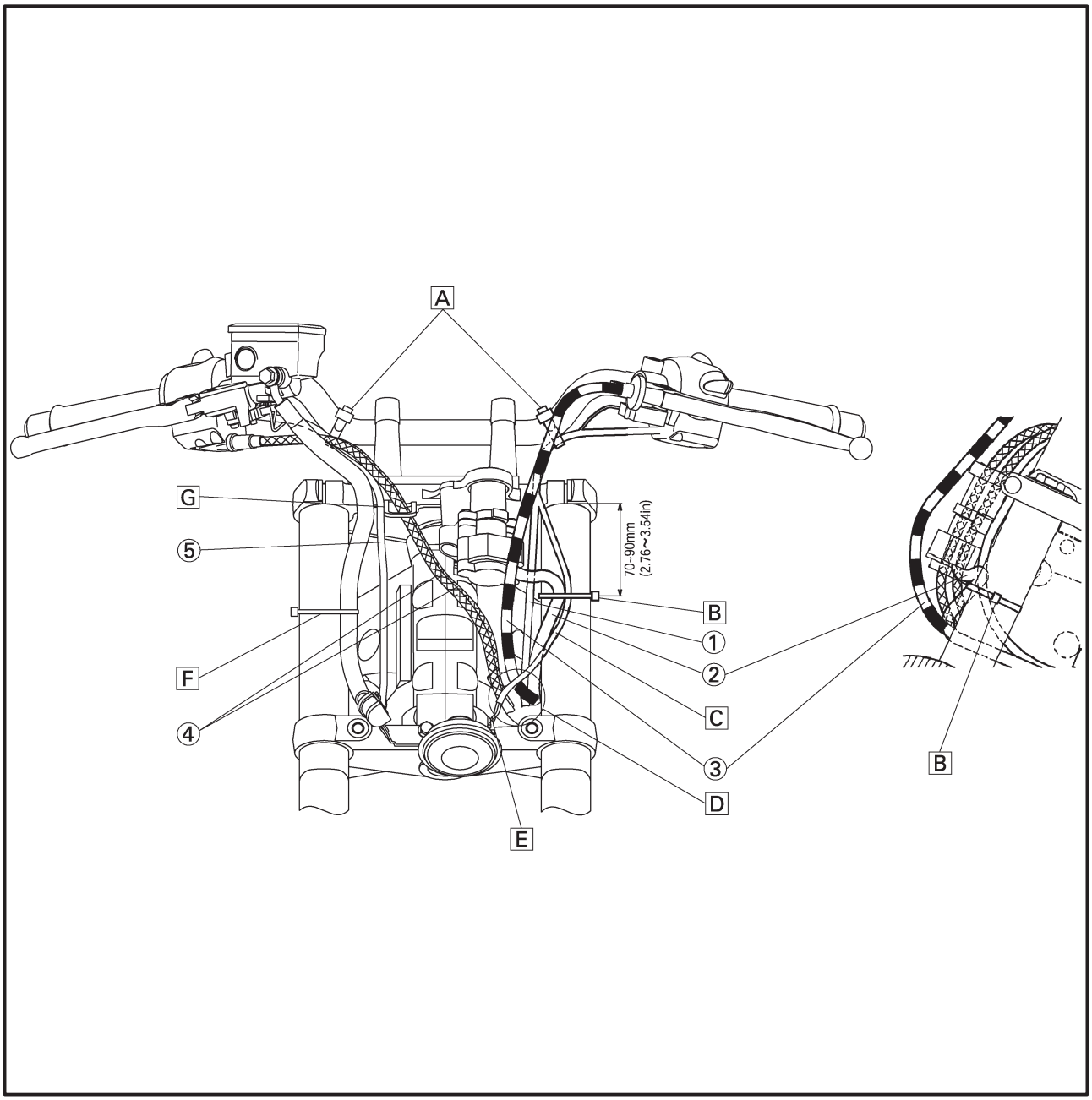
CABLE ROUTING

① Left handlebar switch lead
② Main switch lead
③ Clutch cable
④ Throttle cables
⑤ Right handlebar switch lead

A Clamp the right and left handlebar switch leads and handlebars. Point the tip of the clamp downward in front of the handlebars.
B Clamp the horn lead and main switch lead to the inner tube. Point the binding section to the outside of the vehicle body and cut the tip down to the length of 1 to 5 mm (0.04 to 0.20 in).
C Route the horn lead by the headmost side.
D Pass the throttle cables, wire harness lead, clutch cable, main switch and immobilizer lead and left handlebar switch lead in order through the frame hole from the inner side of the vehicle.
E Point the lead, which comes from the terminal, to the front side of the vehicle body.

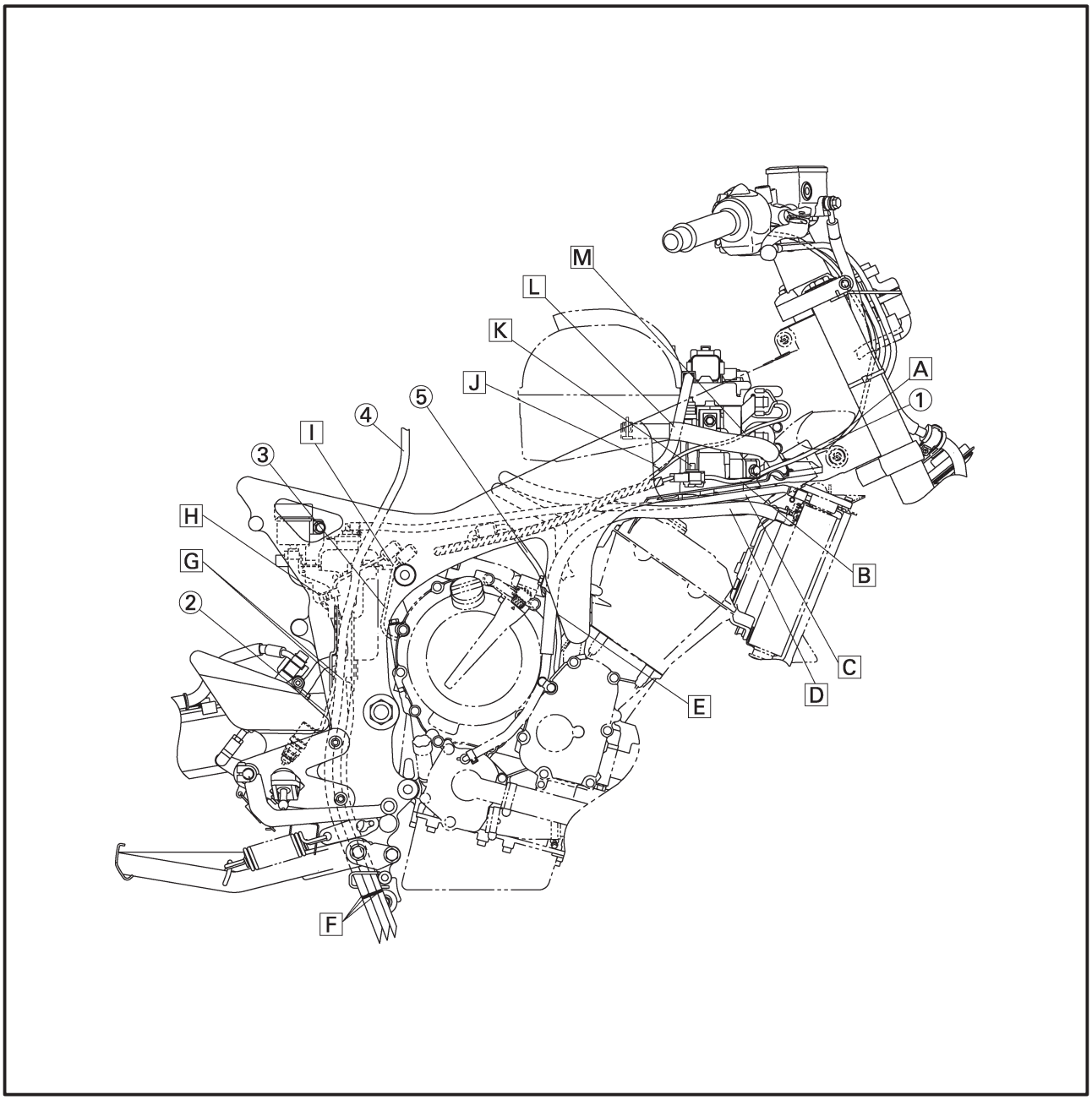


F Clamp the brake hose to the inner tube. Point the binding section to the outside of the vehicle body and cut the tip down to the length of 1 to 5 mm (0.04 to 0.20 in).
G Pass the throttle cables through the wire guide. Route the right handlebar switch lead by the outside of the wire guide.

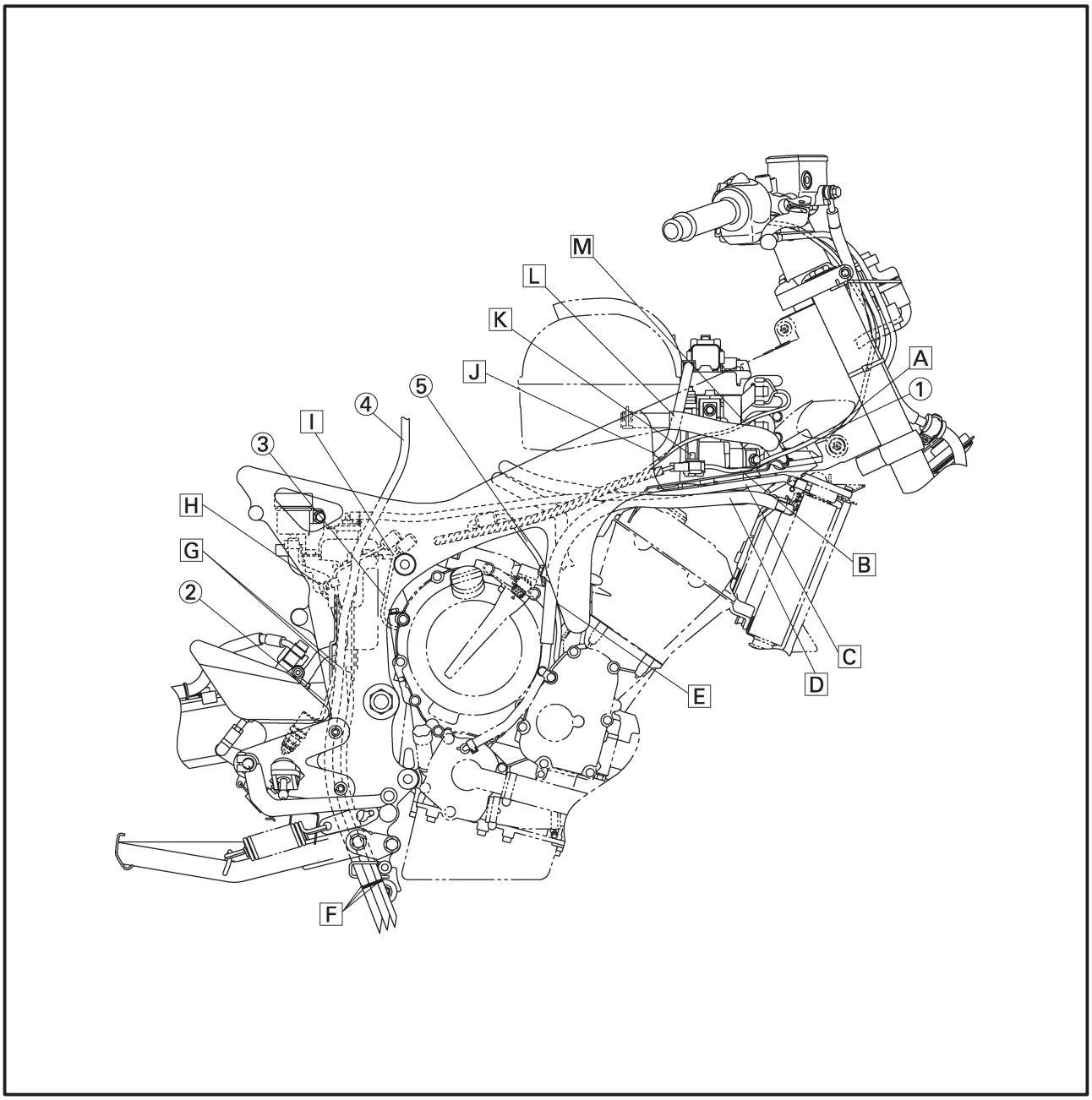


① Right handlebar switch lead
② Rear brake light switch lead
③ Neutral switch lead
④ Fuel tank breather hose
⑤ Crankshaft position sensor lead

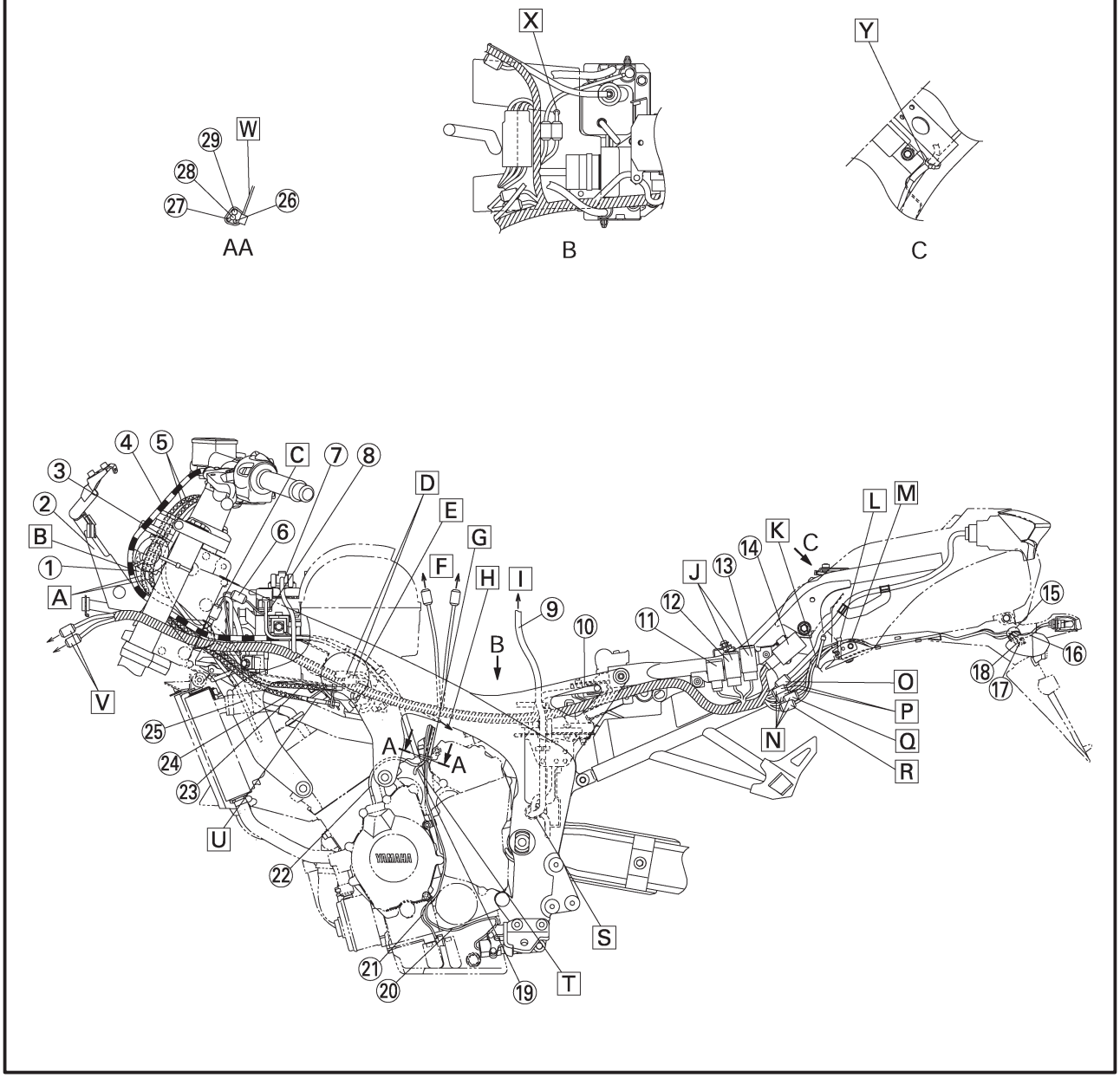
A Pass the right handlebar switch lead through the hole located on the right side of the frame.
B Route the right handlebar switch lead under the bracket 2.
C Route the coolant reservoir tank hose under the cover 2. Route the radiator hose (outside) inner side.
D Route the radiator hoses (2 pieces) under the cover 2.
E Route the crank shaft position sensor lead inner side of the radiator hose.
F Pull down the mark-painted sections of the fuel tank breather hose, fuel tank drain hose and coolant reservoir tank breather hose to be lower than the clamp position of the muffler stay. Any order to take out the fuel tank breather hose and fuel tank drain hose can be accepted.
G Pass the fuel tank breather hose, fuel tank drain hose, coolant reservoir tank breather hose and brake right switch lead through the guide of the stay assembly 2.
H Clamp the tail brake light switch lead together with the brake fluid fluid reservoir hose.



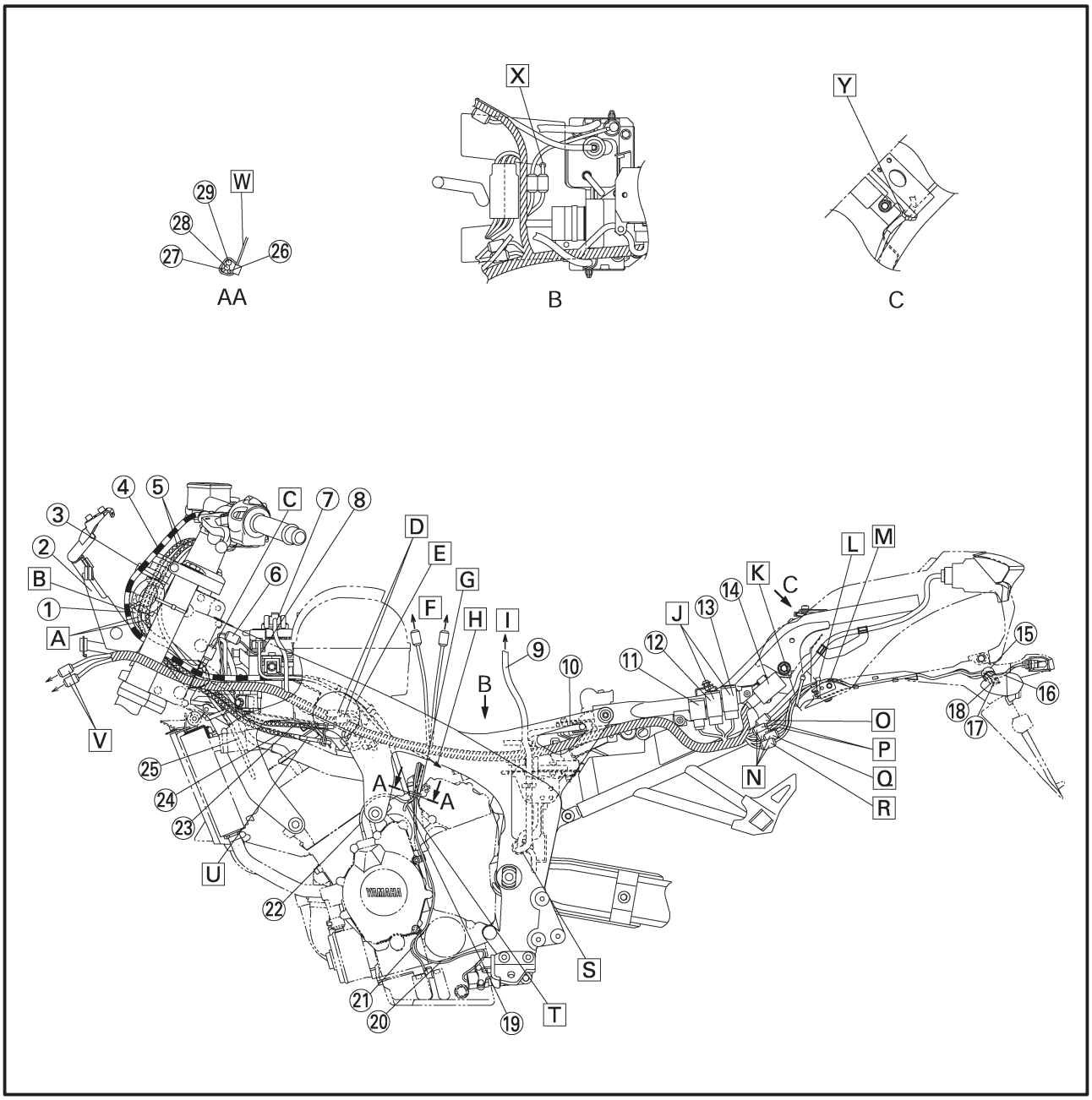
I Pass the neutral switch lead between the engine and coolant reservoir tank bracket.
J To the starter motor.
K Install the right handlebar switch lead coupler through the hole of the bracket 2 from the downside.
L Route the starter motor lead by the inner side of the air cut-off valve hose.
M Pass the ignition coil leads #1 and #4 through inner side of the air cut-off valve hose, and then between the frame and bracket 2.



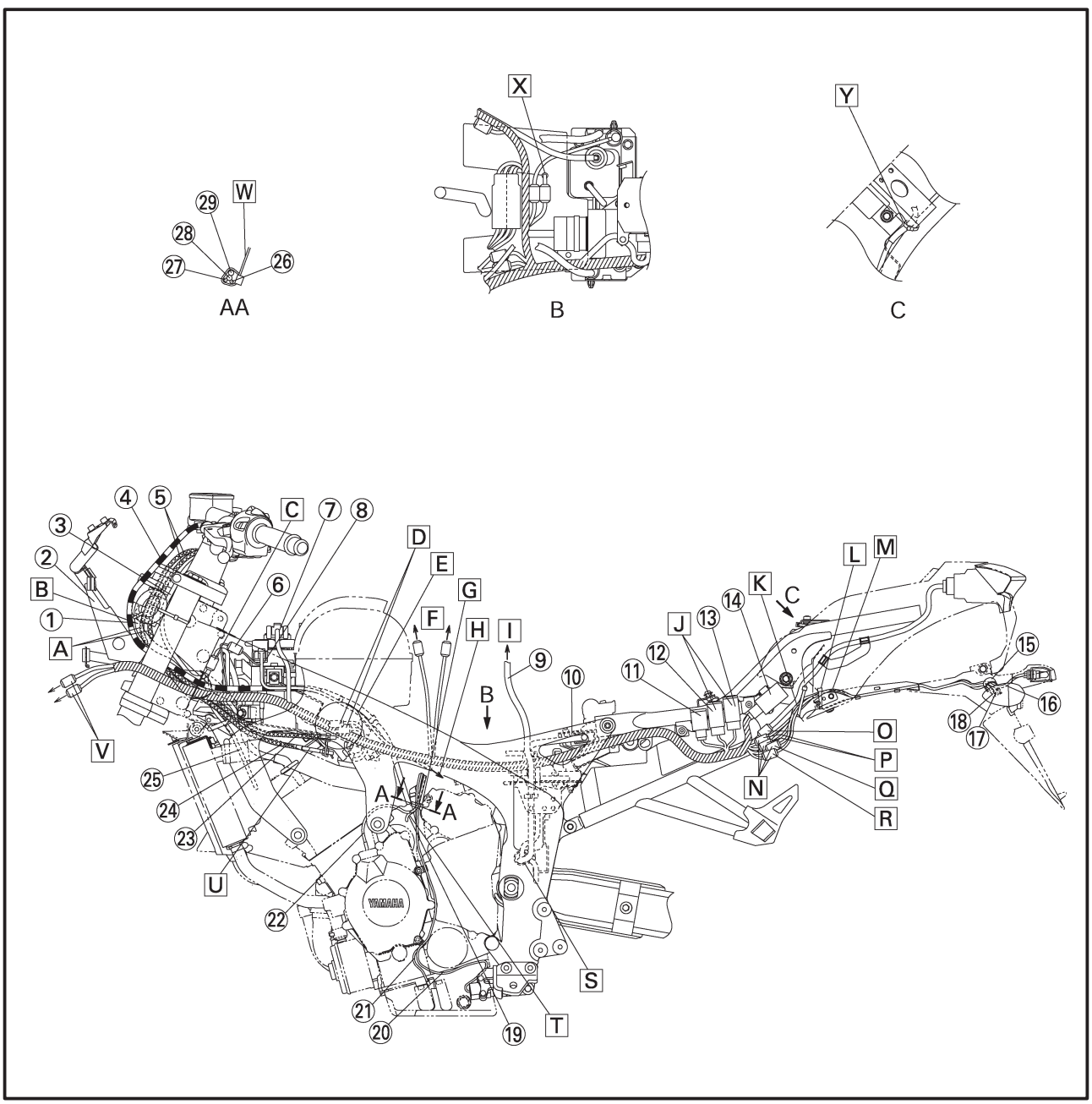
1. Main switch lead
2. Stay assembly
3. Left handlebar switch lead
4. Clutch cable
5. Throttle cables
6. Battery negative lead coupler
7. Starter relay lead
8. Battery negative lead
9. Fuel tank drain hose
10. Rectifier/regulator
11. Turn signal relay
12. Radiator fan motor relay
13. Dimmer relay
14. Starting circuit cut-off relay
15. Clamp
16. License plate light lead
17. Rear turn signal light lead (right)
18. Rear turn signal light lead (left)
19. Speed sensor lead
20. Side stand switch lead
21. Oil level switch lead
22. A.C. magneto lead
23. Throttle cable (return side)
24. Throttle cable (pull side)
25. Radiator fan motor lead
26. Oil level gauge lead
27. Sidestand switch lead
28. A. C. magneto lead
29. Speed sensor lead



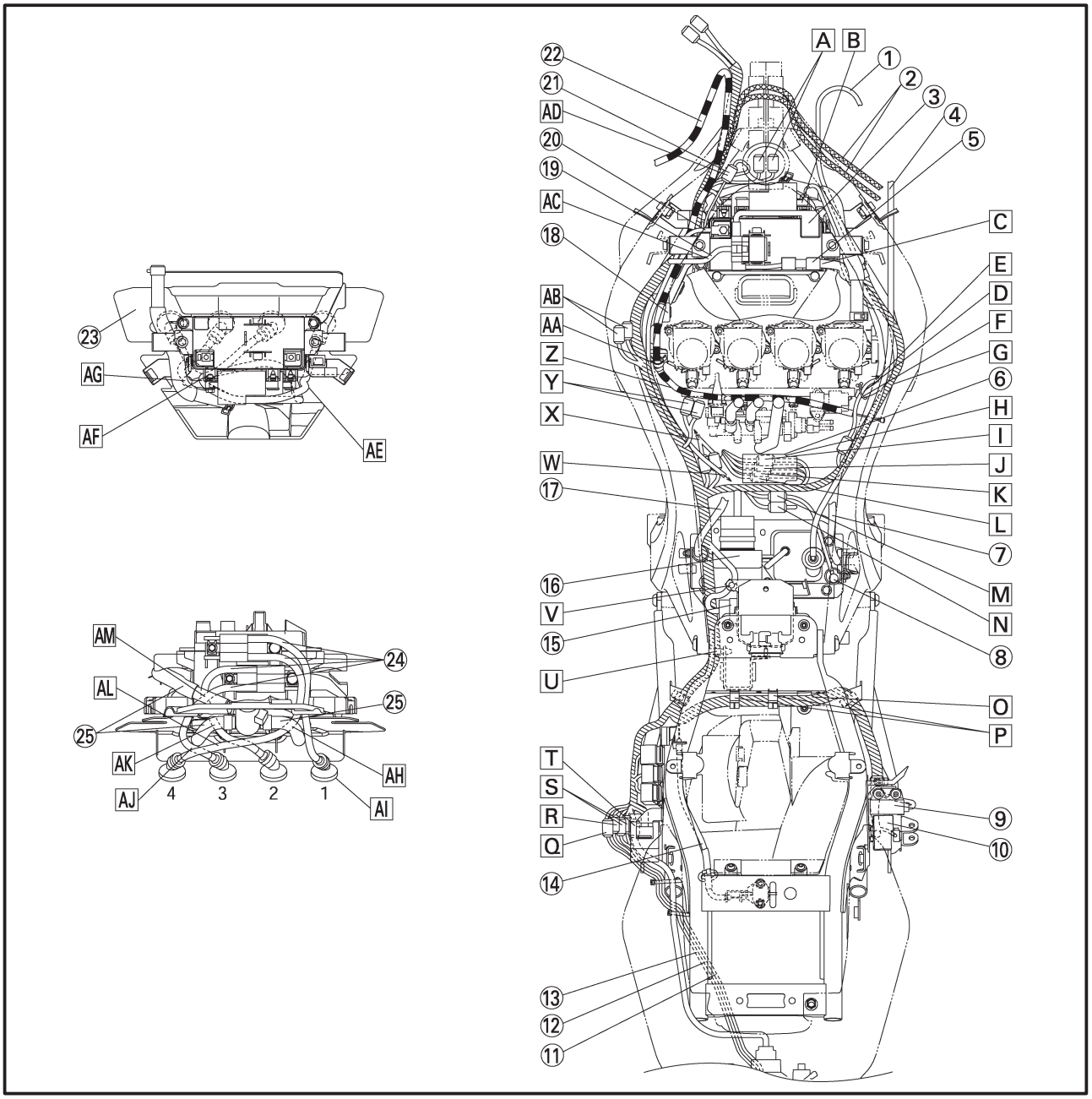
[A] Route the throttle cables above the stay assy 1.
[B] Route the main switch lead above the clutch cable.
[C] Line up the left handlebar switch lead coupler and fan motor lead coupler behind the head pipe.
[D] To the main switch.
[E] Place three couplers on the flange of the cover.
[F] To the fuel pump.
[G] Clamp four wire leads. There should be no excessive slack on the wire leads.
[H] To the engine.
[I] To the fuel tank.
[J] Either installation position can be accepted, but make sure that the leads are not crossed.
[K] Clamp the rear turn signal lead and license plate light lead to the frame. Hook the clamp to the bracket. Pull out the lead sufficiently to the frame side and route it along with the side of the back stay. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in) upward.
[L] Clamp the rear turn signal lead and license plate light lead to the frame. Cut the tip of the clamp to be between 1 and 5 mm (0.04 and 0.20 in).
[M] Gap between the lead and muffler should be 10 mm (0.39 in) or more.
[N] Coupler should not run on the relay assembly.
[O] To the tail/brake light.
[P] To the license plate light.
[Q] To the rear turn signal light. (right)



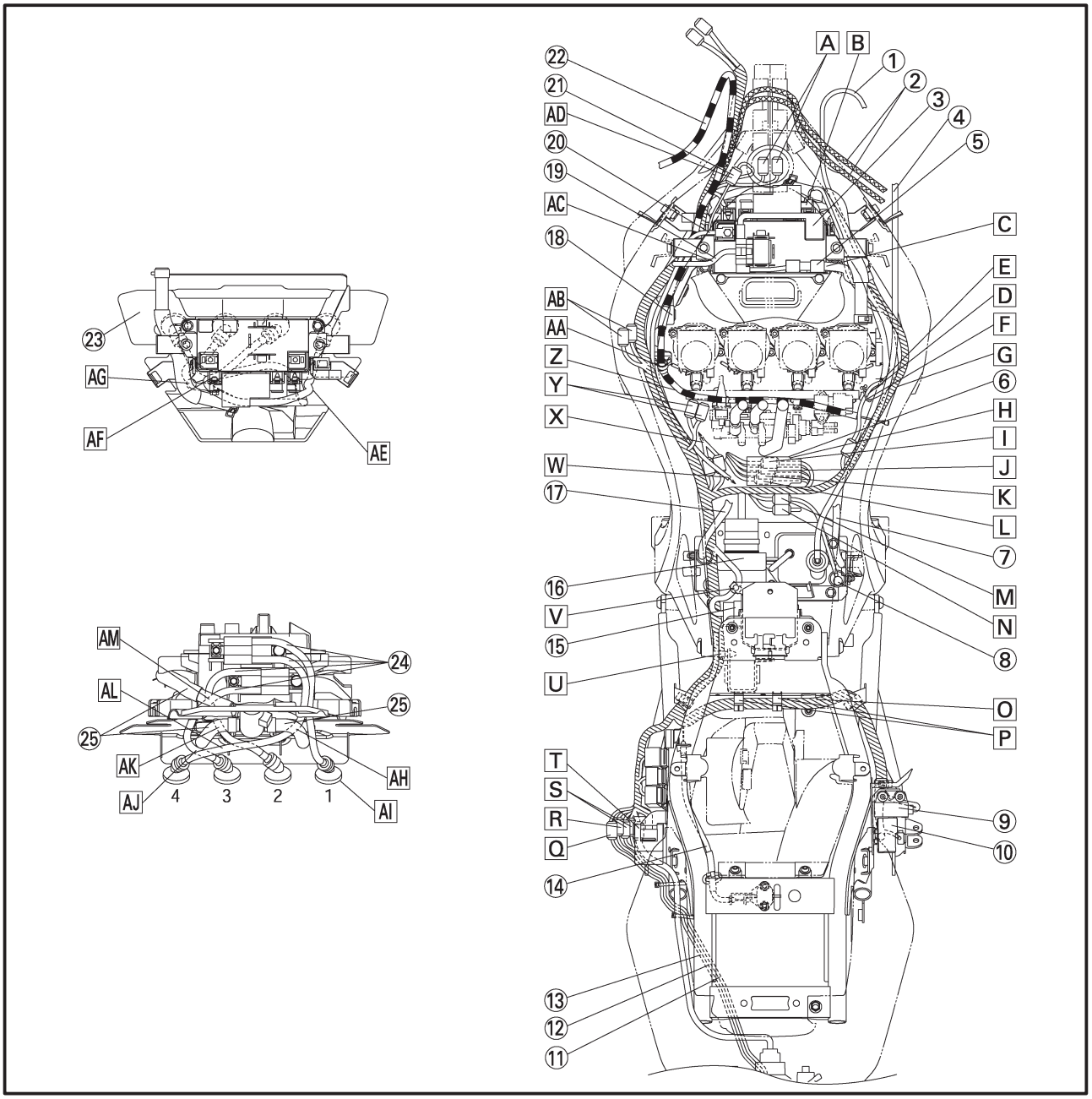
[R] To the rear turn signal light (left)
[S] Pass the fuel tank drain hose through the clamp located under the coolant reservoir tank.
[T] Route it behind the starter motor lead.
[U] Point the bend-R section of the throttle cable (pull side) to the inner side horizontally. It is also possible to visually check the bend-R section.
[V] To the headlight lead.
[W] Point the tip of the clamp to the inner side of the vehicle body.
[X] Make sure to pass the neutral switch lead through the hole of the flap.
[Y] Clamp the seat lock wire to the frame as shown in the illustration. Secure the clamp to the weld of the cross member with the frame. Position the binding section in front of the vehicle body and cut the tip to be between 1 and 5 mm (0.04 and 0.20 in).



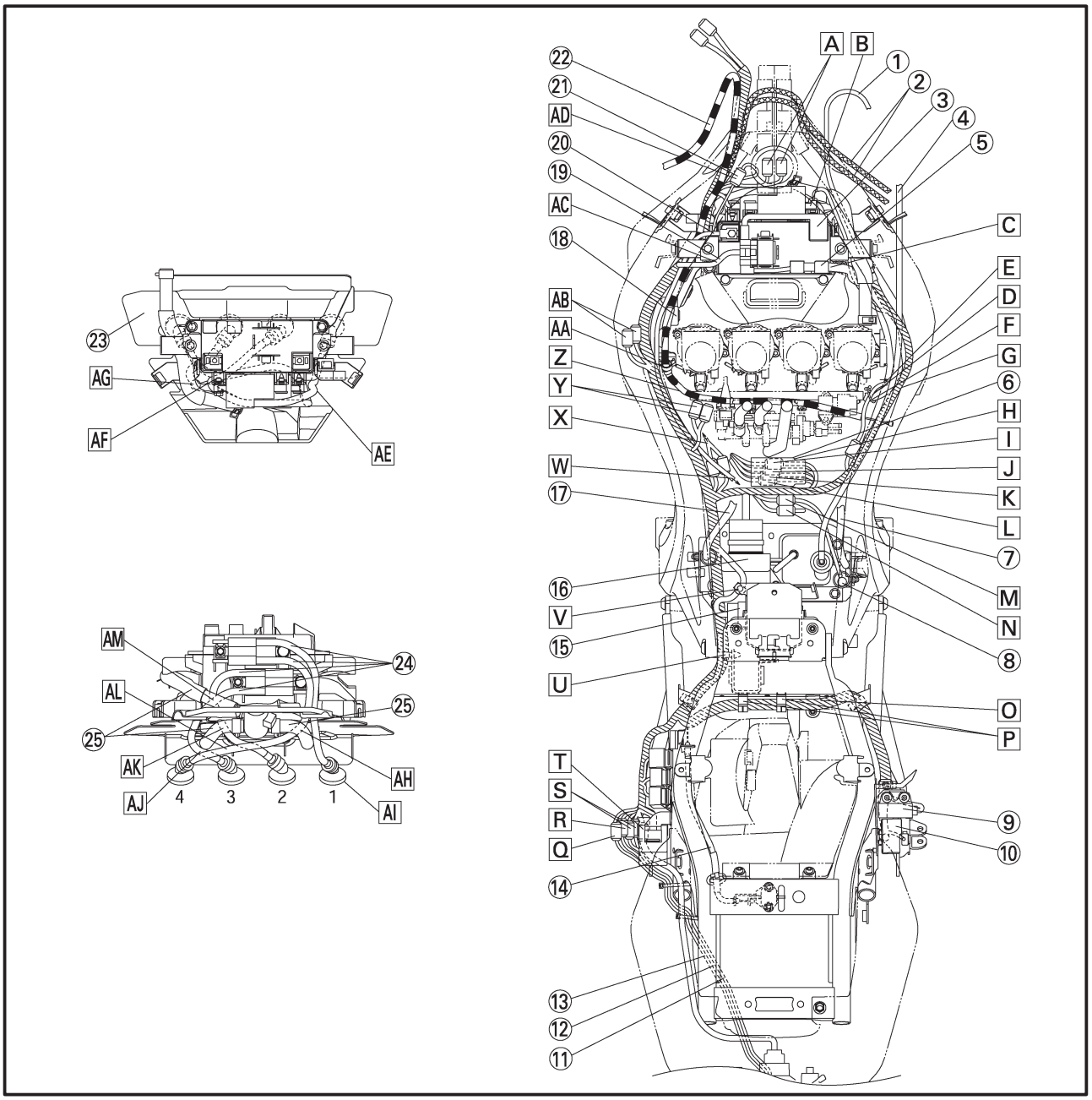
① Right handlebar switch lead
② Throttle cables
③ Battery positive lead
④ Coolant reservoir tank hose
⑤ Battery cover
⑥ Connecter cover
⑦ Fuel tank breather hose
⑧ Brake fluid reservoir hose
⑨ Lean angle cut-off switch
⑩ Fuse box
⑪ Rear turn signal light lead (right)
⑫ Rear turn signal light lead (left)
⑬ License plate light lead
⑭ Seat lock cable
⑮ Rectifier/regulator
⑯ E.C.U
⑰ Fuel tank drain hose
⑱ Cover
⑲ Starter relay lead
⑳ Battery negative lead
㉑ Battery negative lead coupler
㉒ Clutch cable
㉓ Cover 2
㉔ Spark plug lead
㉕ Air cut-off valve hose



[A] Either right or left side arrangement for the left handlebar switch lead coupler and radiator fan motor coupler can be accepted.
[B] Point the L-shape terminal to the front side of the vehicle.
[C] Hook the starter motor lead to the alternate pawls on the battery cover.
[D] Route the crank shaft position sensor lead above the starter motor leads.
[E] To the crankshaft position sensor.
[F] Clamp the starter motor lead and crank shaft position sensor lead. Point the projected part of the tip to the inner side of the vehicle.
[G] Pass the radiator hose, coolant reservoir hose, wire harness and starter motor lead in order through the lower side of the vehicle.
[H] Set the 4-pin coupler in the connector cover after wiring it.
[I] To the sidestand switch.
[J] To the speed sensor.
[K] To the A.C. magneto.
[L] To the oil level gauge.
[M] To the rear brake/light switch.
[N] To the neutral switch.
[O] Push the wire harness in the groove of the mud guard.
[P] Point the opening section of the clamp upward.
[Q] To the rear turn signal (right)
[R] To the rear turn signal (left)

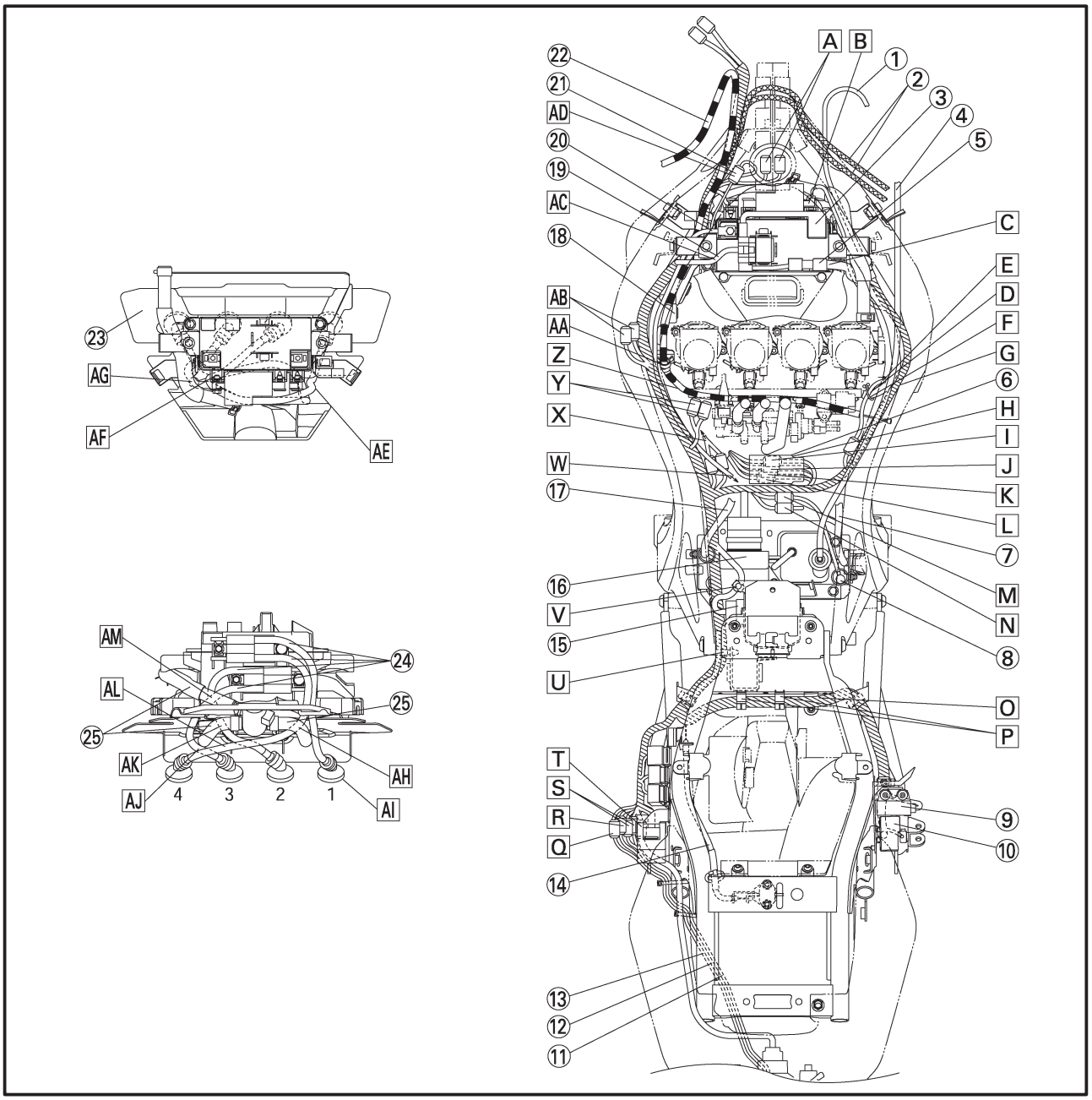


[S] To the license plate light.
[T] To the tail/brake light.
[U] Insert the enwinding clamp of the wire harness into the hole of the rear frame.
[V] Attach the rectifier regulator lead to the clamp of the rectifier bracket.
[W] To the engine ground.
[X] To the fuel injection.
[Y] To the fuel pump.
[Z] Route the clutch cable under the fuel injection lead.
[AA] Pass the clutch cables through the clamp, and then install the clamp to the cover. Position of the clamp is forward of the cable stopper.
[AB] To the main switch.
[AC] Route the starter relay lead outside of the main switch.
[AD] Press the battery negative lead into the space between the ribs of the frame.
[AE] Pass the spark plug leads #1 and #4 through the slit of the cover 2.
[AF] Pass the spark plug lead #2 through the inner hole of the cover 2.
[AG] Pass the spark plug lead #3 through the outer hole of the cover 2.
[AH] Route the spark plug lead #4 behind the air cut-off valve hose.
[AI] Point the spark plug caps of #1 to #4 to the direction as shown in the illustration.
[AJ] Route the spark plug lead #3 under the air cut-off valve hose.
[AK] Route the spark plug lead #2 behind the air cut-off valve hose.



AL Route the spark plug lead #4 by the front side of the spark plug leads #2 and #3.

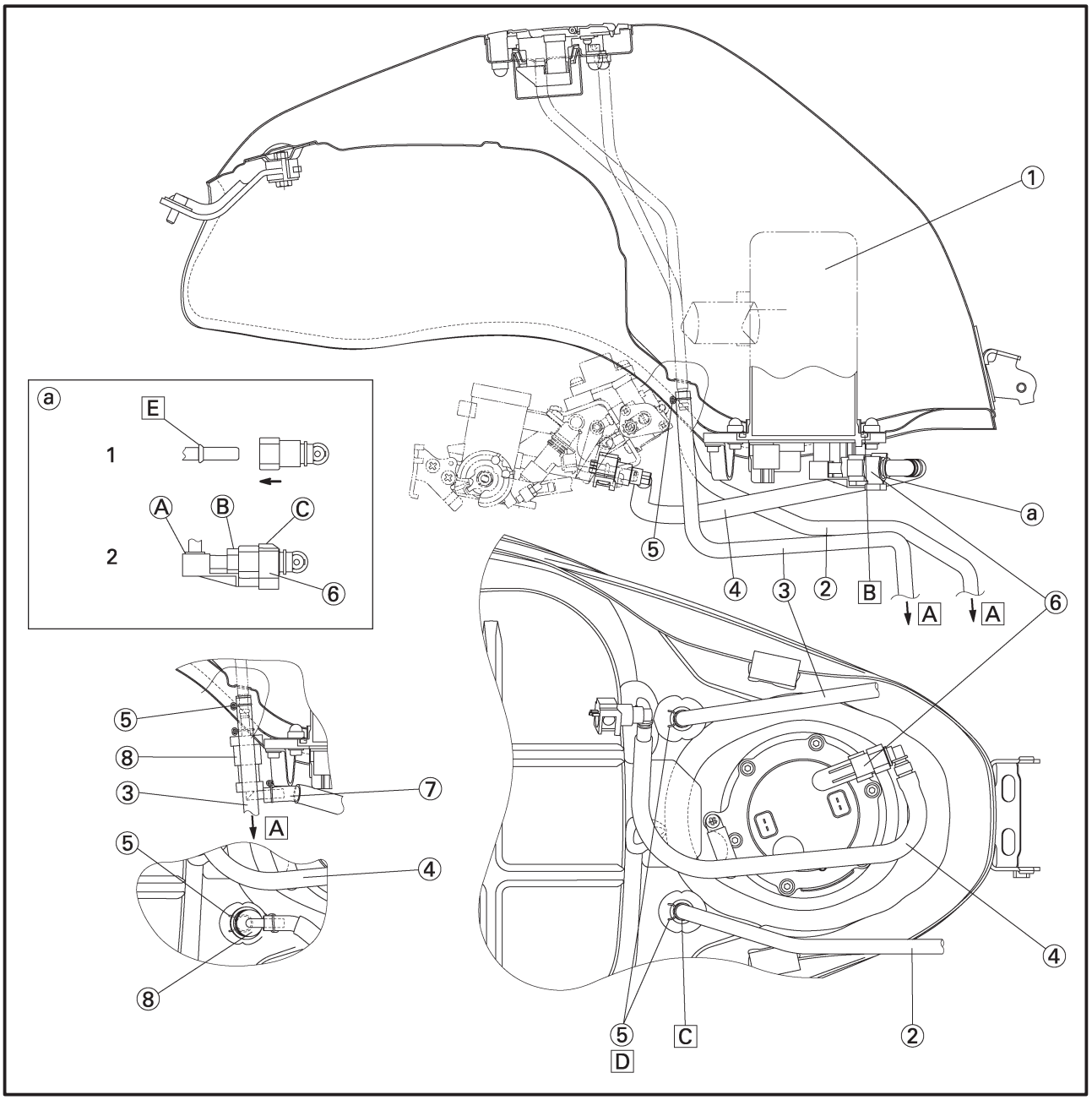
AM Route the spark plug leads #2 and #3 behind the air cut-off valve hose.



① Fuel pump assembly
② Fuel tank breather hose (except for CAL)
③ Fuel tank drain hose
④ Fuel hose
⑤ Clip
⑥ Clamp
⑦ Charge hose (for CAL)
⑧ Roll over valve (for CAL)

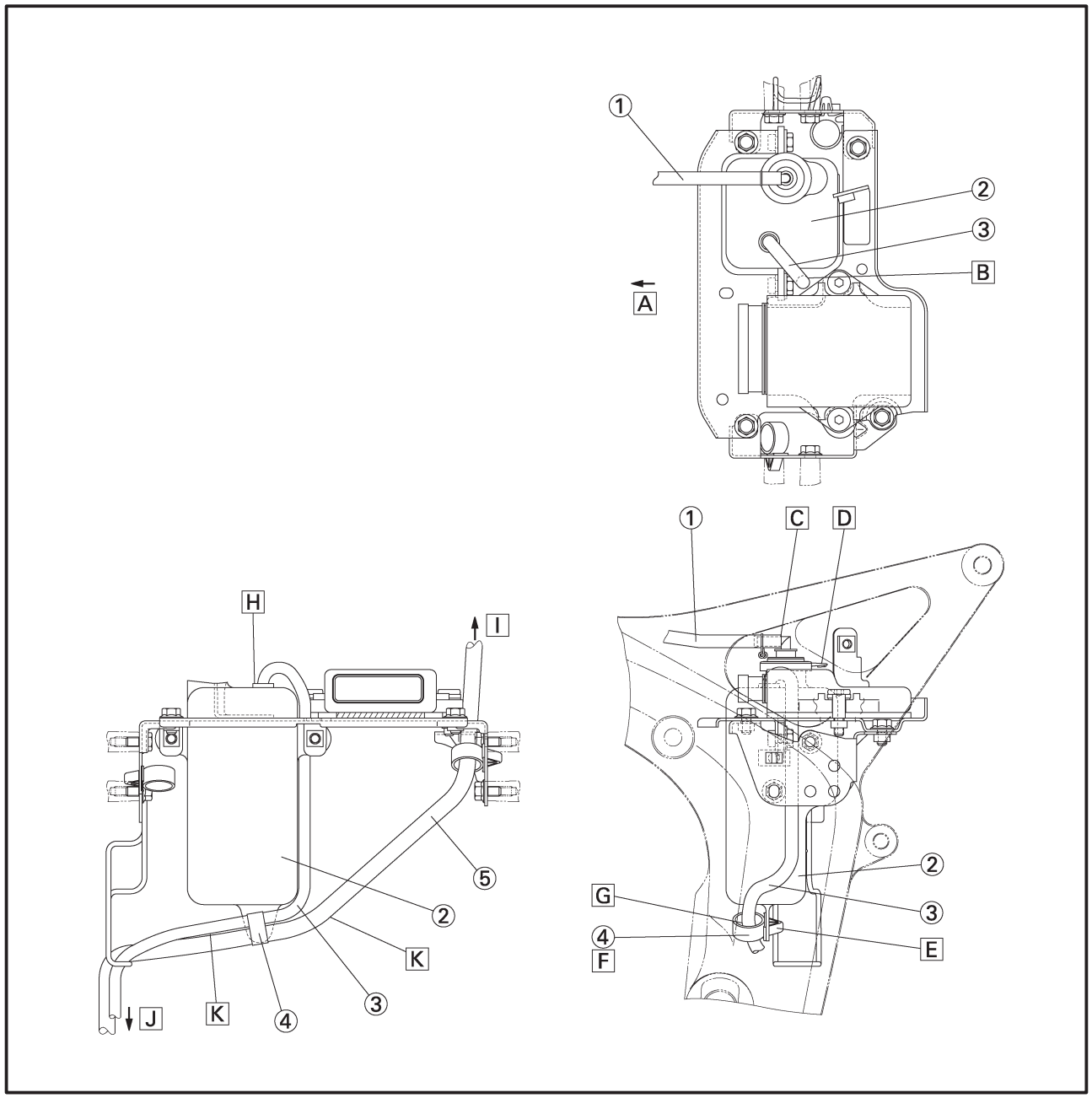
[A] Air opening.
[B] Install the O-ring with its lip pointed upward.
[C] Fuel tank breather hose has a white point mark.
[D] Point the knob of clip front side.

ⓐ Fuel piping connector attachment directions. (fuel pump side)
1. It is inserted until it makes a click sound the connector, and it checks that a connector does not fail out. It takes care that a foreign substance does not enter into a seal portion. (Working gloves should not be used at the time of work.)
[E] It prevents that this portion falls out.
2. The clamp is attached from the bottom after the work of "1".
It checks being completely equipped with Ⓐ, Ⓑ and Ⓒ section.



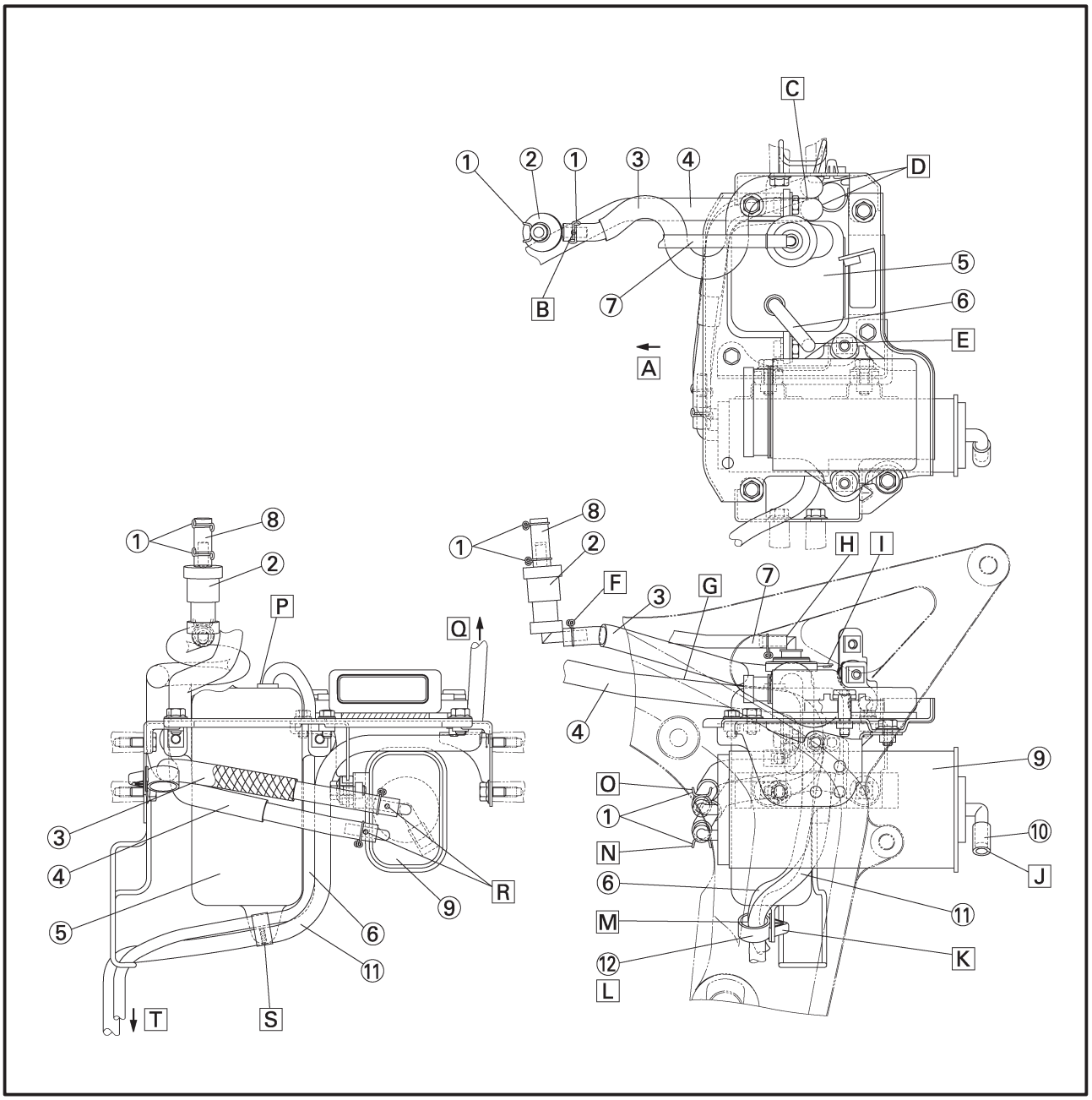
except for CAL
① Coolant breather hose
② Coolant reservoir tank
③ Coolant reservoir tank hose
④ Clamp
⑤ Fuel tank drain hose

A Front side.
B Pass the coolant reservoir tank hose hangs down downward from back of the bolt.
C Insert this portion securely.
D Spittle is turned back.
E Insert the clamp certainly.
F It may open and close to direction of which. All notches gear at the time of attachment.
G Pass the coolant reservoir tank hose inside of the clamp.
H Insert in certainly.
I To the fuel tank drain tube.
J Air opening.
K There should be no slacking of the hose when it is routed.

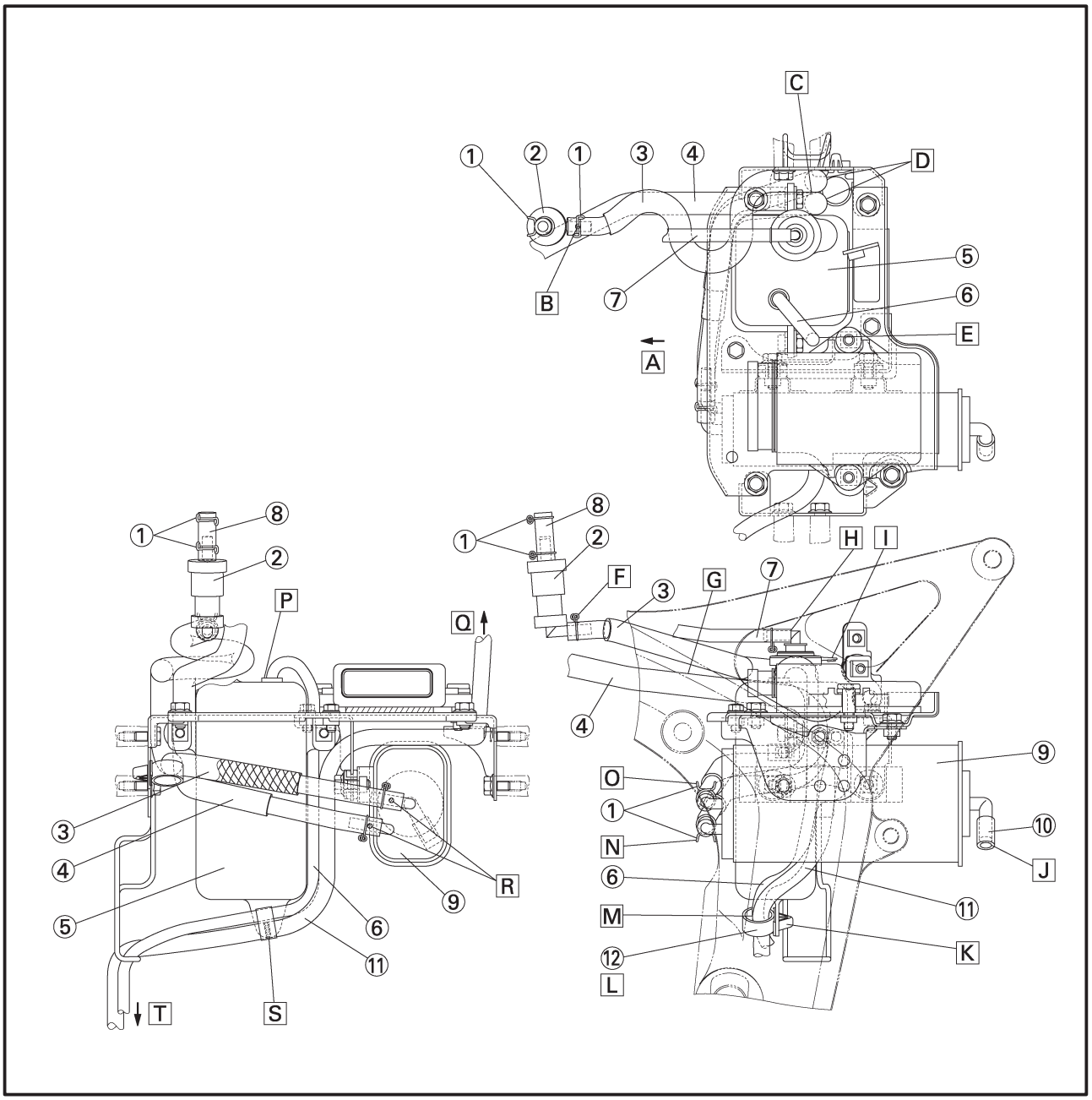


for CAL
① Clip
② Roll over valve
③ Canister hoes
④ Balance hose
⑤ Coolant reservoir tank
⑥ Coolant reservoir tank hose
⑦ Coolant breather hose
⑧ Roll over valve hose
⑨ Canister
⑩ Hose
⑪ Fuel tank drain hose
⑫ Clamp

[A] Front side.
[B] Point the paint marking upward.
[C] Pass the canister hose and balance hose behind the bolt.
[D] Pass the canister hose outside, pass the balance hose inside.
[E] Pass the coolant reservoir tank hose hangs dowm downward from back of the bolt.
[F] Point the knob of the clip upward. The application of water is possible at the time of attachment.
[G] Pass the balance hose under the canister hose.
[H] Insert this portion securely.
[I] Spittle is turned back.
[J] Insert to the back, but the tip of the nipple should not come out from the hose.



K Insert the clamp certainly.
L It may open and close to direction of which. All notches gear at the time of attachment.
M Pass the coolant reservoir tank hose and the fuel tank drain hose inside of the clamp.
N Point the knob of clamp downward.
O Point the knob of clamp upward.
P Insert in certainly.
Q To the fuel tank drain tube.
R Point the paint marking (both white) front side. The application of water is possible at the time of attachment.
S Clamp the fuel tank drain hose, then the paint mark of the central part is united.
T Air opening.



EAS00036

PERIODIC CHECKS AND ADJUSTMENTS

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.

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

NO.		ITEM	REMARKS	INITIAL	ODOMETER READINGS				
				600 mi (1,000 km) or 1 month	4,000 mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months
1	*	Fuel line (See page 3-35)	• Check fuel and vacuum hoses for cracks or damage. • Replace if necessary.		√	√	√	√	√
2	*	Spark plugs (See page 3-23)	• Check Condition. • Adjust gap and clean. • Replace every 8000 mi (13000 km) or 12 months.		√	Replace.	√	Replace.	√
3	*	Valve clearance (See page 3-11)	• Check and adjust valve clearance when engine is cold.	Every 26,600 mi (42,000 km)					
4	*	Crankcase breather system (See page 3-35)	• Check breather hose for cracks or damage. • Replace if necessary.		√	√	√	√	√
5	*	Electronic fuel injection (See page 3-17, 19)	• Check and adjust engine idle speed and synchronization.	√	√	√	√	√	√
6	*	Exhaust system (See page 3-36)	• Check for leakage. • Tighten if necessary. • Replace gasket(s) if necessary.	√	√	√	√	√	√
7	*	Evaporative emission control system (For California only)	• Check control system for damage. • Replace if necessary.				√		√
8	*	Air induction system (See page 7-32)	• Check the air cut-off valve, reed valve, and hose for damage. • Replace any damaged parts if necessary.				√		√

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

GENERAL MAINTENANCE AND LUBRICATION CHART

NO.		ITEM	REMARKS	INITIAL	ODOMETER READINGS				
				600 mi (1,000 km) or 1 month	4,000 mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months
1	*	Air filter element (See page 3-33)	• Check condition and damage.		√				√
			• Replace if necessary.				√		
2	*	Clutch (See page 3-32)	• Check operation. • Adjust or replace cable.	√	√	√	√	√	√
3	*	Front brake (See page 3-42, 44, 46)	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	√	√	√	√	√	√
4	*	Rear brake (See page 3-43, 44, 46)	• Check operation, fluid level, and for fluid leakage. • Replace brake pads if necessary.	√	√	√	√	√	√
5	*	Brake hoses (See page 3-46)	• Check for cracks or damage.		√	√	√	√	√
			• Replace.	Every 4 years					
6	*	Wheels (See page 4-3)	• Check runout and for damage. • Replace if necessary.		√	√	√	√	√
7	*	Tires (See page 3-54)	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
8	*	Wheel bearings (See page 4-3)	• Check bearings for smooth operation. • Replace if necessary.		√	√	√	√	√

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

NO.		ITEM	REMARKS	INITIAL	ODOMETER READINGS				
				600 mi (1,000 km) or 1 month	4,000 mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months
9	*	**Swingarm pivot bearings (See page 4-70)**	• Check bearing assemblies for looseness. • Moderately repack with lithium-soap-based grease.			√		**Repack.**	
10		**Drive chain (See page 3-49, 50)**	• Check chain slack/alignment and condition. • Adjust and lubricate chain with a special O-ring chain lubricant thoroughly	**Every 600 mi (1000 km) and after washing the motorcycle or riding in the rain**					
11	*	**Steering bearings (See page 3-51)**	• Check bearing assembly for looseness. • Moderately repack with lithium-soap-based grease every 16000 mi (25000 km) or 24 months.	√	√	√	√	**Repack.**	√
12	*	**Chassis fasteners (See page 2-21)**	• Check all chassis fitting and fasteners. • Correct if necessary.		√	√	√	√	√
13		**Brake and clutch lever pivot shafts (See page 3-58)**	• Apply lithium-soap-based grease (all-purpose grease) lightly.		√	√	√	√	√
14		**Brake and shift pedal pivot shafts (See page 3-58)**	• Apply lithium-soap-based grease (all-purpose grease) lightly.		√	√	√	√	√
15	*	**Centerstand and sidestand pivots (See page 3-58)**	• Check operation. • Apply lithium-soap-based grease (all-purpose grease) lightly.		√	√	√	√	√
16	*	**Sidestand switch (See page 3-58, 8-4)**	• Check operation and replace if necessary.	√	√	√	√	√	√
17	*	**Front fork (See page 3-53)**	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√
18	*	**Shock absorber assembly (See page 3-54, 4-65)**	• Check operation and for oil leakage. • Replace if necessary.		√	√	√	√	√
19	*	**Rear suspension link pivots (See page 4-70)**	• Check operation. • Correct if necessary.			√		√	
20		**Engine oil (See page 3-27, 28)**	• Change (warm engine before draining.)	√	√	√	√	√	√
21	*	**Engine oil filter cartridge (See page 3-28)**	• Replace.	√		√		√	
22	*	**Cooling system (See page 3-37, 38)**	• Check hoses for cracks or damage. • Replace if necessary.		√	√	√	√	√
			• Change with ethylene glycol antifreeze coolant every 24 months.					**Change.**	
23	*	**Control cables (See page 3-58)**	• Apply Yamaha chain and cable lube or engine oil SAE 10W-30 thoroughly.	√	√	√	√	√	√
24	*	**Throttle grip housing and cable (See page 3-20)**	• Check operation and free play. • Adjust the throttle cable free play if necessary. • Lubricate the throttle grip housing and cable.		√	√	√	√	√

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

NOTE:

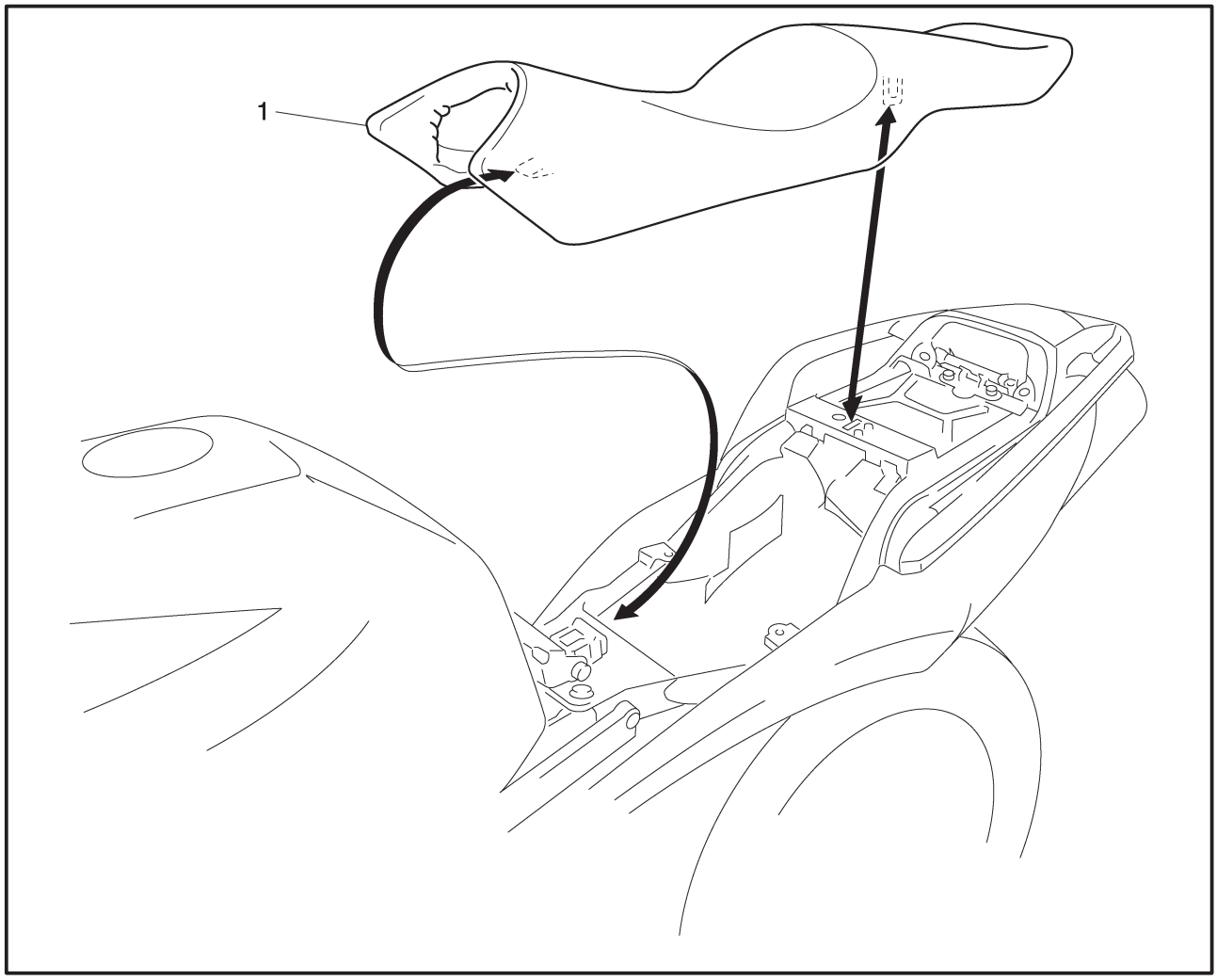
From 24000 mi (37000 km) or 36 months, repeat the maintenance intervals starting from 8000 mi (13000 km) or 12 months.

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.

EAS00038

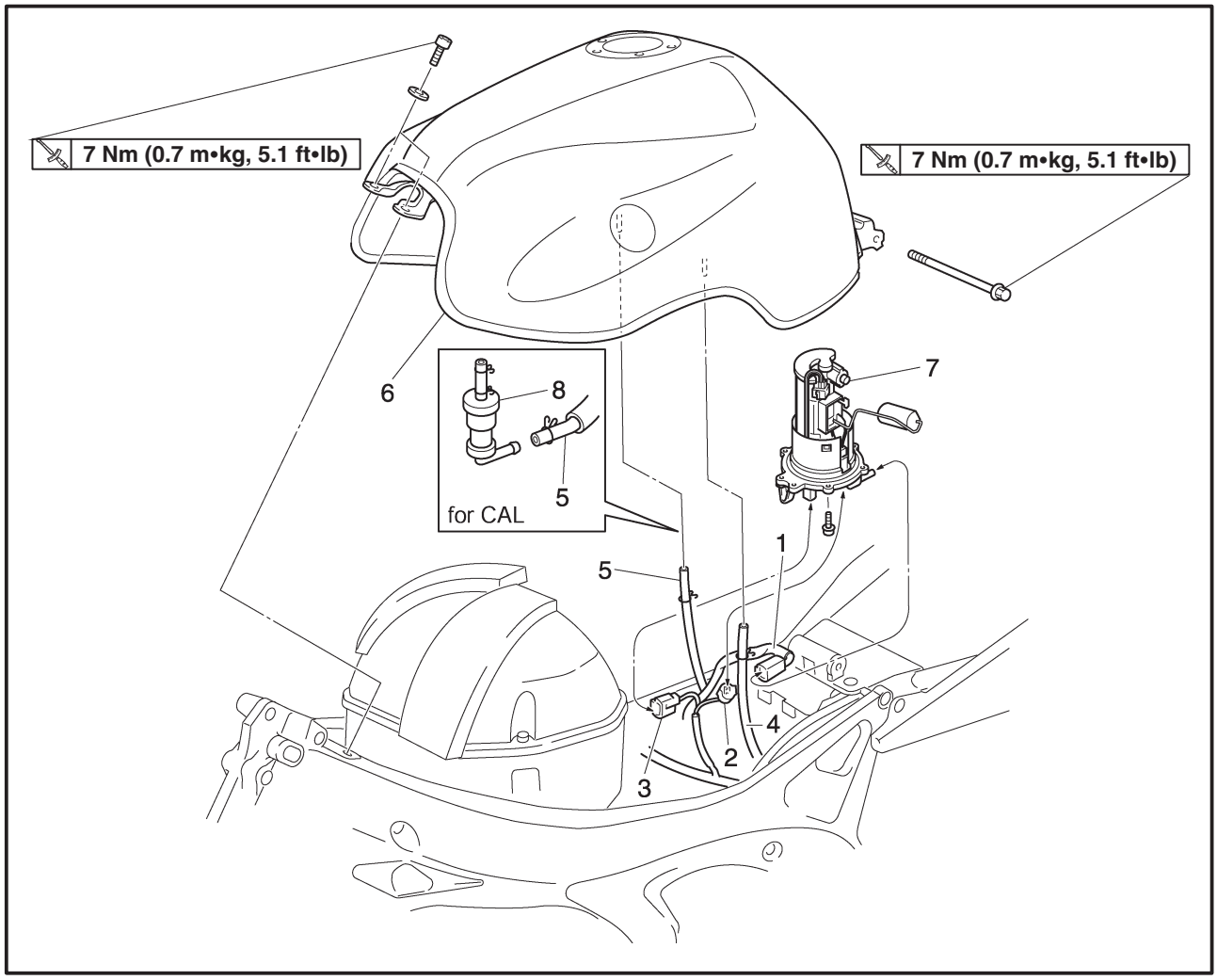
SEAT



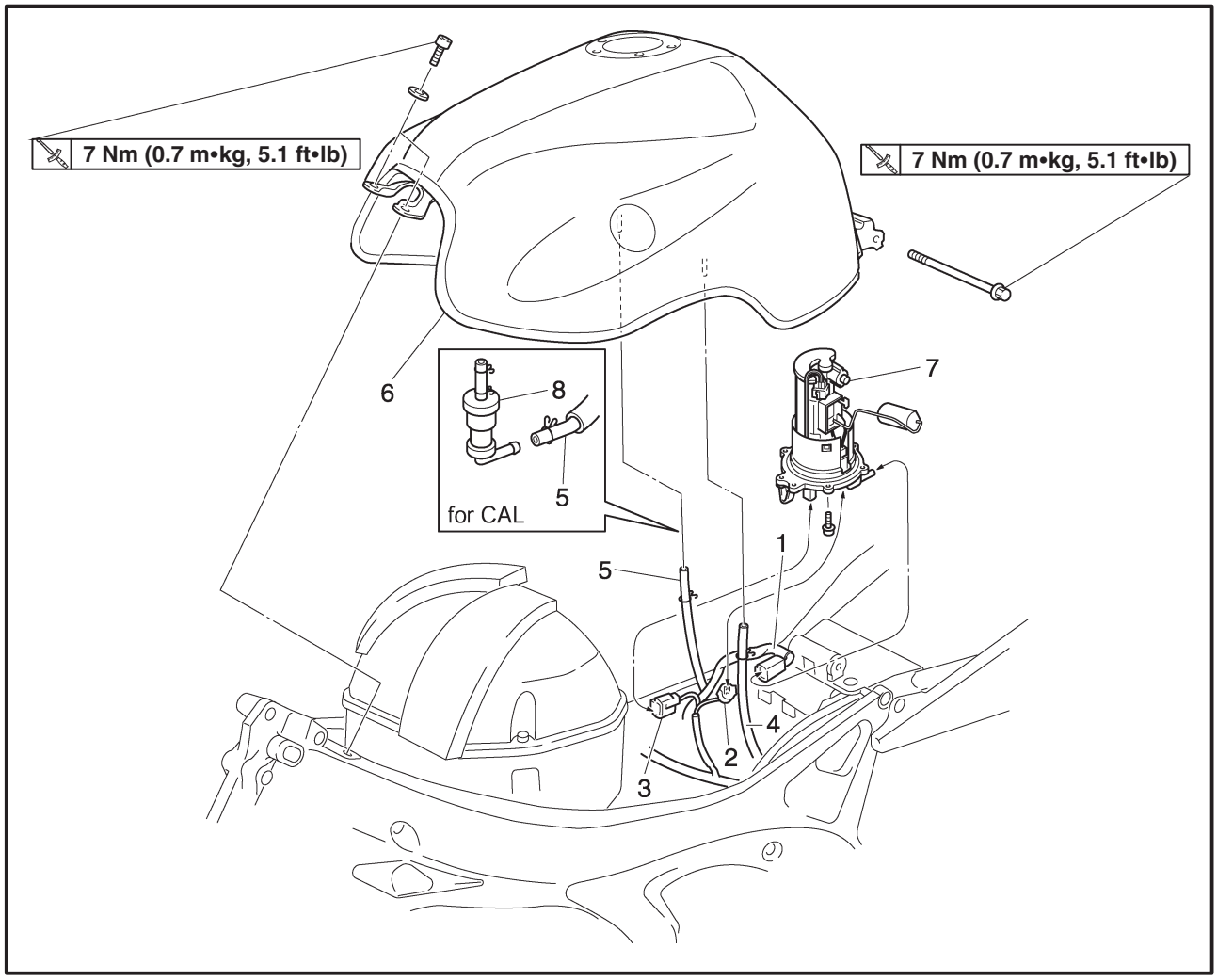
Order	Job/Part	Q'ty	Remarks
1	**Removing the seat** Seat	1	Remove the parts in the order listed. For installation, reverse the removal procedure.

EAS00040

FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the fuel tank		Remove the parts in the order listed. Disconnect.
	Seat		Refer to "SEAT".
	Front cowling inner panel (left and right)		Refer to "COWLINGS".
1	Fuel hose	1	
2	Fuel sender coupler	1	
3	Fuel pump coupler	1	
4	Fuel tank drain hose	1	
5	Fuel tank breather hose (except for CAL) Canister hose (for CAL)	1	**NOTE:** There is a white paint mark on the fuel tank breather hose.
6	Fuel tank	1	
7	Fuel pump	1	



Order	Job/Part	Q'ty	Remarks
8	Roll over valve (for CAL)	1	For installation, reverse the removal procedure. Refer to the CABLE ROUTING for how to attach a hose.

REMOVING THE FUEL TANK

1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
2. Remove:
   • fuel hose

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:

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

3. Remove:
   • fuel tank

NOTE:

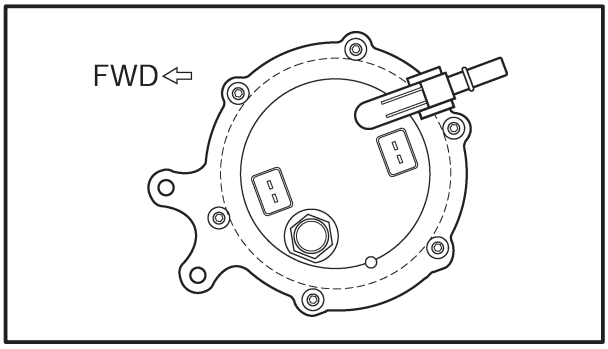
Do not set the fuel tank down so that the installation surface of the fuel pump is directly under the tank. Be sure to lean the fuel tank in an upright position.

REMOVING THE FUEL PUMP

1. Remove:
   • fuel pump

CAUTION:

- **Do not drop the fuel pump or give it a strong shock.**
- **Do not touch the base section of the fuel sender.**



INSTALLING THE FUEL PUMP

1. Install:
   • fuel pump — **4 Nm (0.4 m•kg, 2.9 ft•lb)**

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.
- Tighten the fuel pump bolts in stages in a criss-cross pattern and to the specified torque.

INSTALLING THE FUEL TANK

1. Install:
   • fuel hose

CAUTION:

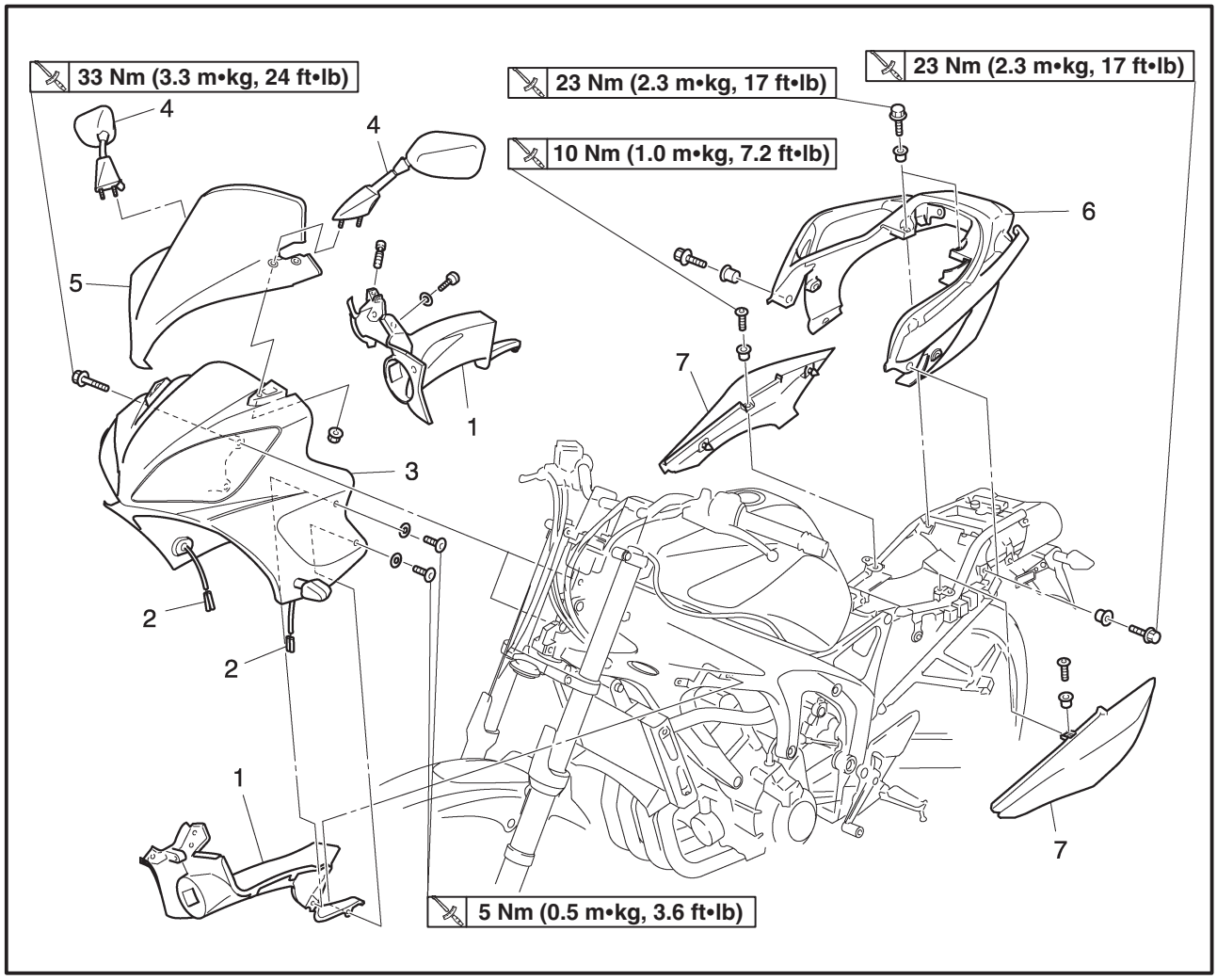
When installing the fuel hose, make sure that it is securely connected, and that the fuel hose holders are in the correct position, otherwise the fuel hose will not be properly installed.

2. Install:
   • fuel sender coupler
   • fuel pump coupler
   • fuel tank breather hose (except for CAL)
   • fuel tank drain hose

NOTE:

There is a white paint mark on the fuel tank breather hose (except for CAL).
Refer to “CABLE ROUTING” in chapter 2.

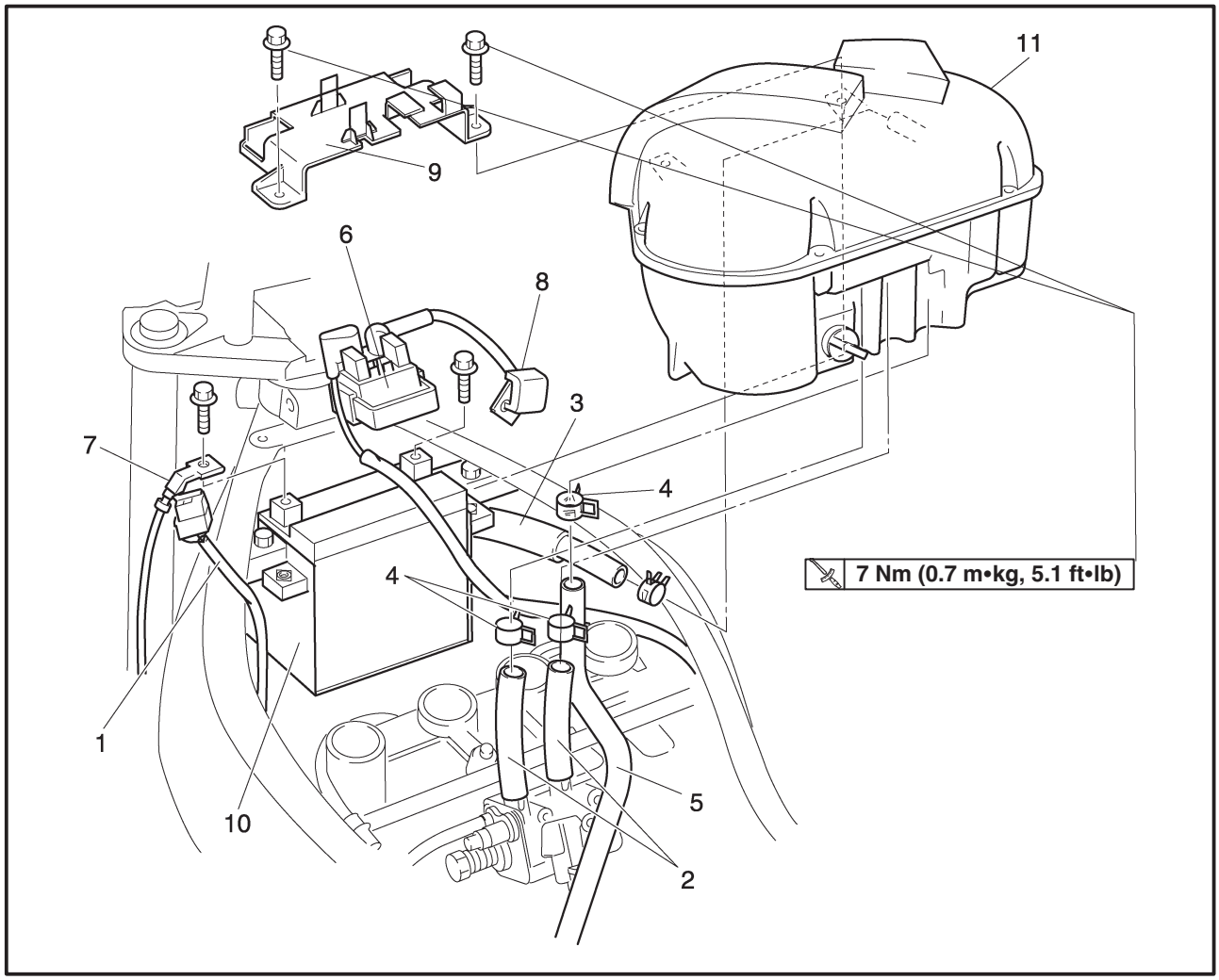
COWLINGS



Order	Job/Part	Q'ty	Remarks
	Removing the cowlings		Remove the parts in the order listed.
	Seat		Refer to "SEAT".
1	Front cowling inner panel (left and right)	2	
2	Front turn signal light lead couplers	2	Disconnect.
3	Front cowling	1	
4	Rear view mirrors (left and right)	2	
5	Windshield	1	
6	Rear cowling	1	
7	Frame side cover	2	
			For installation, reverse the removal procedure.

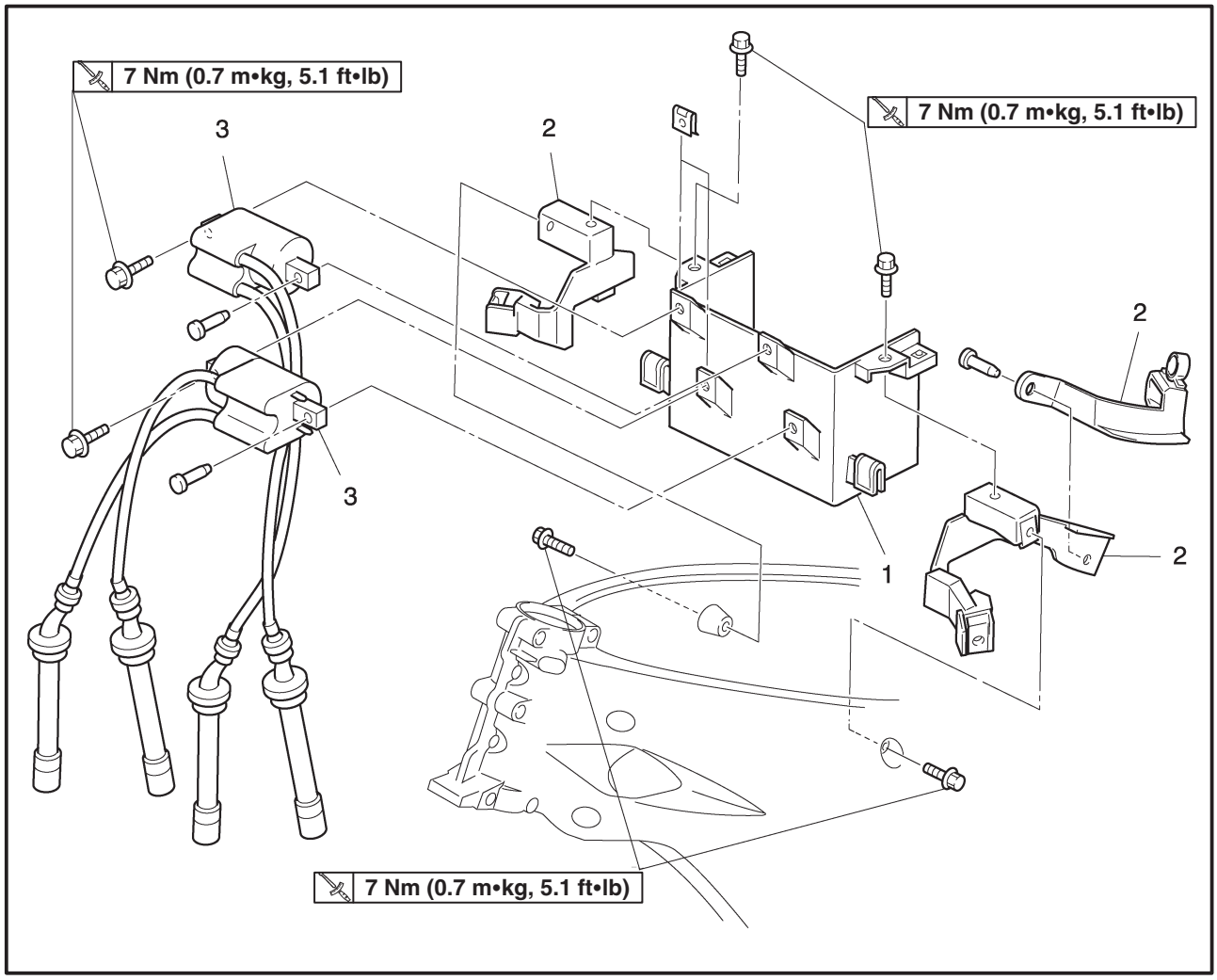
EAS00043

AIR FILTER CASE



Order	Job/Part	Q'ty	Remarks
	Removing the air filter case		Remove the parts in the order listed.
	Seat		Refer to "SEAT".
	Front cowling inner panel (left and right)		Refer to "COWLINGS".
	Fuel tank		Refer to "FUEL TANK".
1	Intake temperature sensor coupler	1	Disconnect.
2	Throttle body hose	2	Disconnect.
3	Air induction system hose	1	Disconnect.
4	Clamp	4	Loosen.
5	Crankcase breather hose	1	Disconnect.
6	Starter relay	1	
7	Battery negative lead	1	Disconnect.
8	Battery positive lead	1	Disconnect.
9	Battery cover	1	
10	Battery	1	
11	Air filter case	1	
			For installation, reverse the removal procedure.

BATTERY BOX AND BATTERY BOX BRACKET



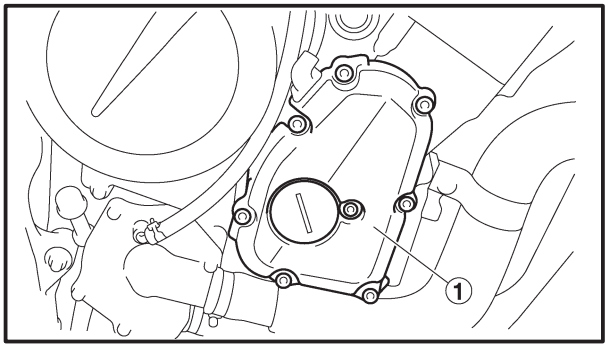
Order	Job/Part	Q'ty	Remarks
1	Battery box	1	Remove the parts in the order listed. **NOTE:** This part has to be set properly.
2	Battery box bracket	3	
3	Ignition coil assembly	2	For installation, reverse the removal procedure.

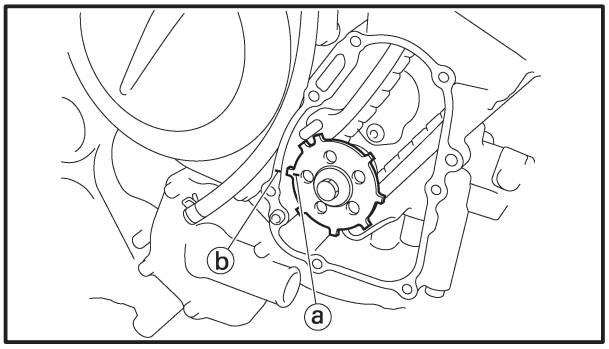
EAS00045
ENGINE
ADJUSTING THE VALVE CLEARANCE
The following procedure applies to all of the valves.

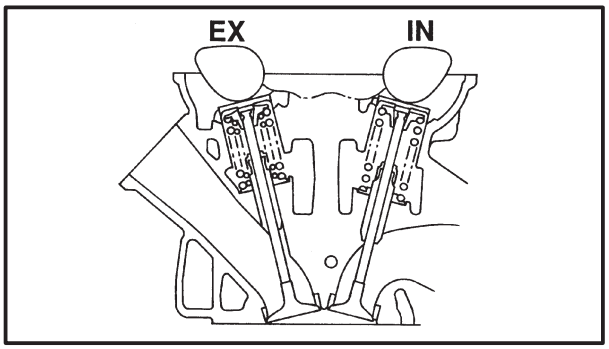
NOTE:
- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.

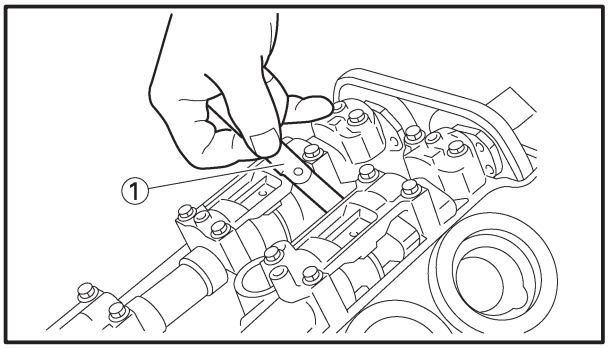
1. Remove
   - seat
     Refer to “SEAT”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - fuel tank
     Refer to “FUEL TANK”.
   - battery
     Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   - air filter case
     Refer to “AIR FILTER CASE”.
   - battery box
   - battery box bracket
     Refer to “BATTERY BOX AND BATTERY BOX BRACKET”.
   - throttle body assembly
     Refer to “THROTTLE BODIES” in chapter 7.
   - air cut-off valve
     Refer to “AIR INDUCTION SYSTEM” in chapter 7.
   - radiator
   - radiator fan motor
     Refer to “RADIATOR” in chapter 6.

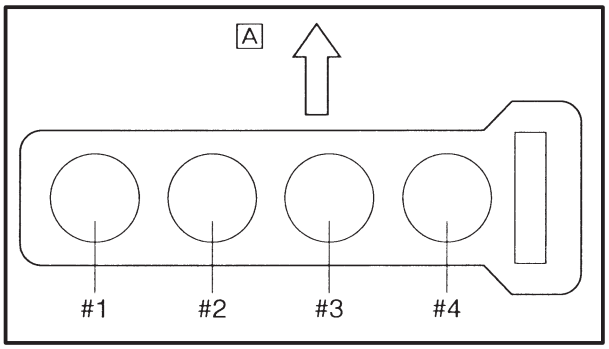
2. Remove
   - ignition coils
   - spark plugs
   - cylinder head cover
   - cylinder head cover gasket
     Refer to “CAMSHAFTS” in chapter 5.
3. Remove
   - pickup rotor cover ①

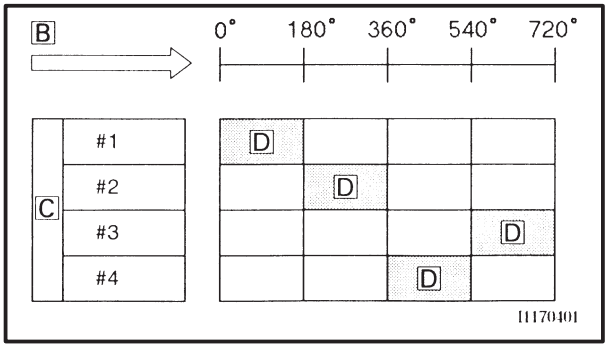












4. Measure:
   • valve clearance
   Out of specification → Adjust.

Valve clearance (cold)
Intake valve
0.13 ~ 0.20 mm
(0.0051 ~ 0.0079 in)
Exhaust valve
0.23 ~ 0.30 mm
(0.0091 ~ 0.0118 in)

a. Turn the crankshaft counterclockwise.
b. When piston #1 is at TDC on the compression stroke, align the TDC mark ⓐ on the pickup rotor with the crankcase mating surface ⓑ.

NOTE:

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

c. Measure the valve clearance with a thickness gauge ①.

NOTE:

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

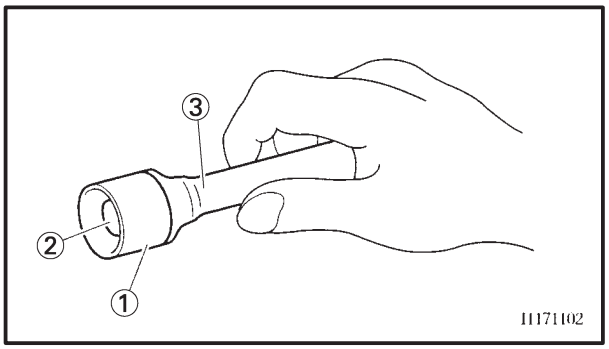
Valve clearance measuring sequence
Cylinder #1 → #2 → #4 → #3

A Front
d. To measure the valve clearances of the other cylinders, starting with cylinder #1 at TDC, turn the crankshaft counterclockwise as specified in the following table.
B Degrees that the crankshaft is turned counterclockwise
C Cylinder
D Combustion cycle

Cylinder #2	**180°**
Cylinder #4	**360°**
Cylinder #3	**540°**

5. Remove:
   • camshafts

NOTE:
- Refer to "CAMSHAFTS" in chapter 5.
- When removing the timing chain and camshafts, fasten the timing chain with a wire to retrieve it if it falls into the crankcase.

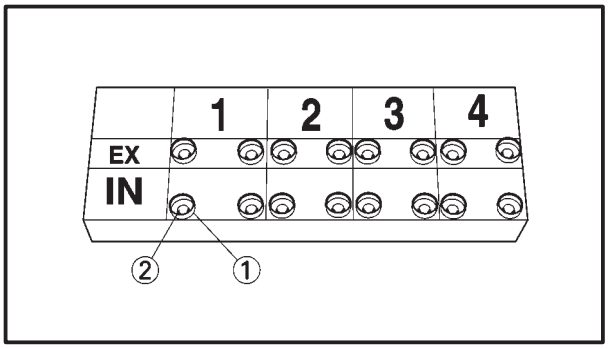


6. Adjust:
   • valve clearance

a. Remove the valve lifter ① and the valve pad ② with a valve lapper ③.

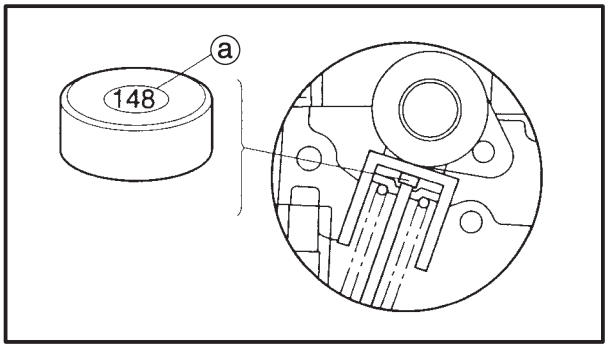
	Valve lapper **90890-04101**

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.



b. Select the proper valve pad from the following table.

Valve pad thickness range		Available valve pads
Nos. 120 ~ 240	1.20 (0.0472) ~ 2.40 mm (0.0945 in)	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.

c. Round off the original valve pad number according to the following table.

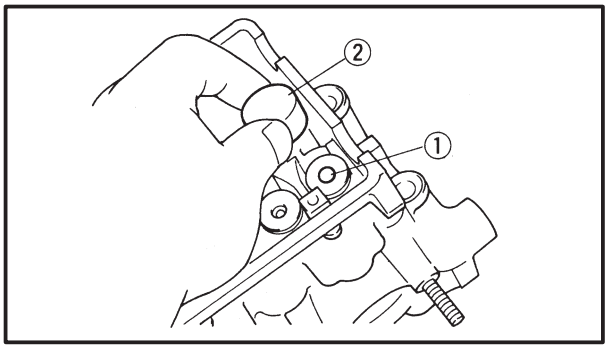
Last digit	Rounded value
0 or 2	0
5	5
8	10

EXAMPLE:
Original valve pad number
= 148 (thickness =1.48 mm (0.058 in))
Rounded value = 150

d. Locate the rounded number of the original valve pad and the measured valve clearance in the valve pad selection table. The point where the column and row intersect is the new valve pad number.

NOTE:

The new valve pad number is only an approximation. The valve clearance must be measured again and the above steps should be repeated if the measurement is still incorrect.



e. Install the new valve pad ① and the valve lifter ②.

NOTE:

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

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

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

NOTE:

- Refer to “CAMSHAFTS” in chapter 5.
- Lubricate the camshaft bearings, camshaft lobes and camshaft journals.
- First, install the exhaust camshaft.
- Align the camshaft marks with the camshaft cap marks.
- Turn the crankshaft counterclockwise several full turns to seat the parts.

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

INTAKE

MEASURED CLEARANCE	INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.03 ~ 0.07			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.08 ~ 0.12		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.13 ~ 0.20	STANDARD CLEARANCE																								
0.21 ~ 0.25	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.26 ~ 0.30	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.31 ~ 0.35	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.36 ~ 0.40	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.41 ~ 0.45	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.46 ~ 0.50	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.51 ~ 0.55	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.56 ~ 0.60	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.61 ~ 0.65	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.66 ~ 0.70	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.71 ~ 0.75	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.76 ~ 0.80	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.81 ~ 0.85	185	190	195	200	205	210	215	220	225	230	235	240													
0.86 ~ 0.90	190	195	200	205	210	215	220	225	230	235	240														
0.91 ~ 0.95	195	200	205	210	215	220	225	230	235	240															
0.96 ~ 1.00	200	205	210	215	220	225	230	235	240																
1.01 ~ 1.05	205	210	215	220	225	230	235	240																	
1.06 ~ 1.10	210	215	220	225	230	235	240																		
1.11 ~ 1.15	215	220	225	230	235	240																			
1.16 ~ 1.20	220	225	230	235	240																				
1.21 ~ 1.25	225	230	235	240																					
1.26 ~ 1.30	230	235	240																						
1.31 ~ 1.35	235	240																							
1.36 ~ 1.40	240																								

VALVE CLEARANCE (cold):
0.13 ~ 0.20 mm (0.0051 ~ 0.0079 in)
Example: Installed is 175
Measured clearance is 0.27 mm (0.0106 in)
Replace 175 pad with 185 pad
Pad number: (example)
Pad No.175 = 1.75 mm (0.0689 in)
Pad No.185 = 1.85 mm (0.0728 in)

EXHAUST

MEASURED CLEARANCE	INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02						120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.03 ~ 0.07					120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
0.08 ~ 0.12				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.13 ~ 0.17			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.18 ~ 0.22		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.23 ~ 0.30	STANDARD CLEARANCE																								
0.31 ~ 0.35	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.36 ~ 0.40	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240		
0.41 ~ 0.45	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.46 ~ 0.50	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.51 ~ 0.55	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.56 ~ 0.60	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.61 ~ 0.65	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.66 ~ 0.70	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.71 ~ 0.75	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.76 ~ 0.80	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.81 ~ 0.85	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.86 ~ 0.90	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.91 ~ 0.95	185	190	195	200	205	210	215	220	225	230	235	240													
0.96 ~ 1.00	190	195	200	205	210	215	220	225	230	235	240														
1.01 ~ 1.05	195	200	205	210	215	220	225	230	235	240															
1.06 ~ 1.10	200	205	210	215	220	225	230	235	240																
1.11 ~ 1.15	205	210	215	220	225	230	235	240																	
1.16 ~ 1.20	210	215	220	225	230	235	240																		
1.21 ~ 1.25	215	220	225	230	235	240																			
1.26 ~ 1.30	220	225	230	235	240																				
1.31 ~ 1.35	225	230	235	240																					
1.36 ~ 1.40	230	235	240																						
1.41 ~ 1.45	235	240																							
1.46 ~ 1.50	240																								

VALVE CLEARANCE (cold):
0.23 ~ 0.30 mm (0.0091 ~ 0.0118 in)
Example: Installed is 175
Measured clearance is 0.35 mm (0.0138 in)
Replace 175 pad with 185 pad
Pad number: (example)
Pad No.175 = 1.75 mm (0.0689 in)
Pad No.185 = 1.85 mm (0.0728 in)

7. Install:
   • all removed parts

NOTE:

For installation, reverse the removal procedure.

SYNCHRONIZING THE THROTTLE BODIES

NOTE:

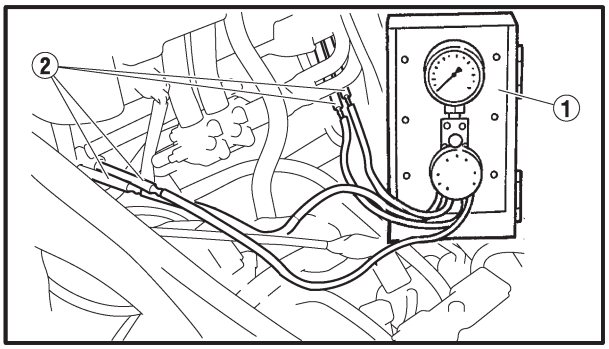
Prior to synchronizing the throttle bodies, the valve clearance and the engine idling speed should be properly adjusted and the ignition timing should be checked.

1. Stand the motorcycle on a level surface.

NOTE:

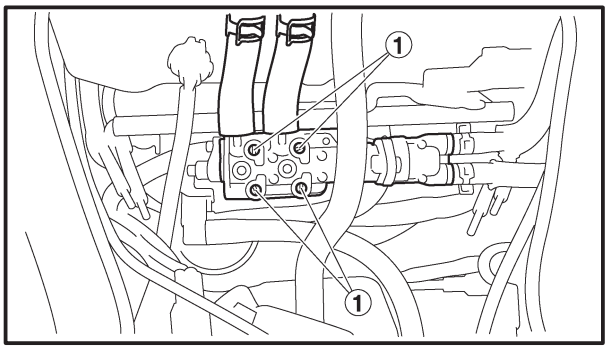
Place the motorcycle on a suitable stand.

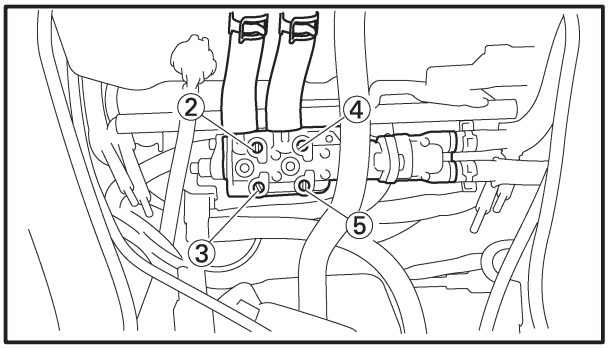
2. Remove:
   • seat
     Refer to “SEAT”.
   • front cowling inner panel (left and right)
     Refer to “COWLINGS”
   • fuel tank
     Refer to “FUEL TANK”.
   • air filter case
     Refer to “AIR FILTER CASE”.
3. Install:
   • vacuum gauge ①
     (onto the synchronizing hose ②)



	**Vacuum gauge** **90890-03094, YU-08030**

4. Install:
   • air filter case
     Refer to “AIR FILTER CASE”.
   • fuel tank
     Refer to “FUEL TANK”.
   • changing the meter display.
     Refer to “FEATURES” in chapter 1.
5. Start the engine and let it warm up for several minutes.





6. Measure:
   • engine idling speed
   Out of specification → Adjust.
   Refer to "ADJUSTING THE ENGINE IDLING SPEED".

Engine idling speed
1,250 ~ 1,350 r/min

7. Adjust:
   • throttle body synchronization

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. With throttle body #1 as standard, adjust throttle bodies #2, #3, and #4 using the air screws ①.
   #1 ②, #2 ③, #3 ④, #4 ⑤

NOTE:

- After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.
- If the air screw is removed, turn the screw 3/4 turn in and be sure to synchronize the throttle body.

CAUTION:

Do not use the throttle valve adjusting screws to adjust the throttle body synchronization.

Vacuum pressure at engine idling speed
29 kPa
(218 mmHg, 8.5827 inHg)

NOTE:

The difference in vacuum pressure between two throttle bodies should not exceed 1.33 kPa (10 mmHg, 0.39 inHg).

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00052

ADJUSTING THE ENGINE IDLING SPEED

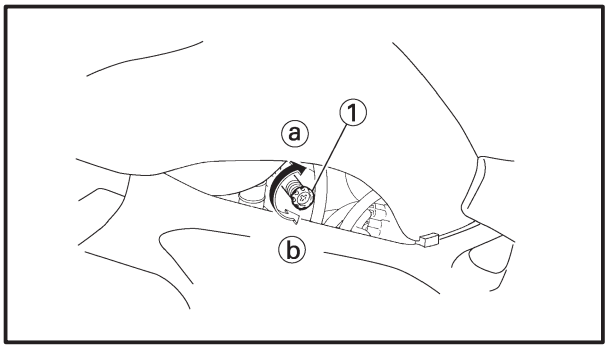
NOTE:

Prior to adjusting the engine idling speed, the throttle bodies synchronization should be adjusted properly, the air filter element should be clean, and the engine should have adequate compression.

1. Start the engine and let it warm up for several minutes.
2. Check:
   - engine idling speed
     Out of specification → Adjust.

	Engine idling speed **1250 ~ 1350 r/min**

3. Adjust:
   - engine idling speed



a. Turn the idle adjusting screw ① in direction ⓐ or ⓑ until the specified engine idling speed is obtained.

Direction ⓐ	**Engine idling speed is increased.**
Direction ⓑ	**Engine idling speed is decreased.**

4. Adjust:
   - throttle cable free play
     Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY".

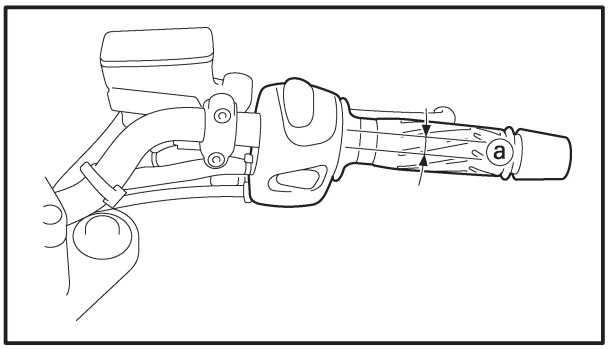
	Throttle cable free play **(at the flange of the throttle grip)** **3 ~ 5 mm (0.12 ~ 0.20 in)**

EAS00055

ADJUSTING THE THROTTLE CABLE FREE PLAY

NOTE:

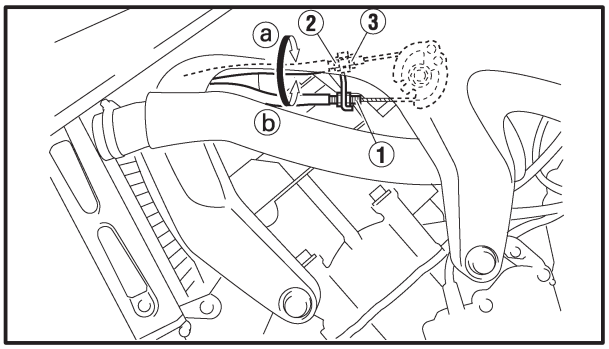
Prior to adjusting the throttle cable free play, the engine idling speed and throttle bodies synchronization should be adjusted properly.



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

Throttle cable free play
(at the flange of the throttle grip)
3 ~ 5 mm (0.12 ~ 0.20 in)

2. Remove:
   - seat
     Refer to “SEAT”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - fuel tank
     Refer to “FUEL TANK”.
   - air filter case
     Refer to “AIR FILTER CASE”.
   - battery
     Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
3. Adjust:
   - throttle cable free play



NOTE:

When the throttle is opened, the accelerator cable ① is pulled.

Throttle body

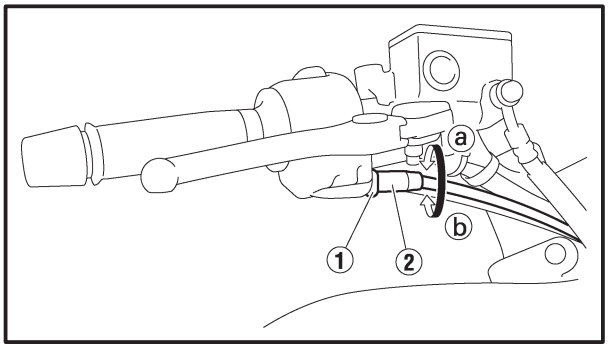
a. Loosen the locknut ② on the decelerator cable.
b. Turn the adjusting nut ③ in direction ⓐ or ⓑ to take up any slack on the decelerator cable.

Direction ⓐ	**Throttle cable free play is increased.**
Direction ⓑ	**Throttle cable free play is decreased.**

c. Tighten the locknuts.

NOTE:

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



Handlebar side

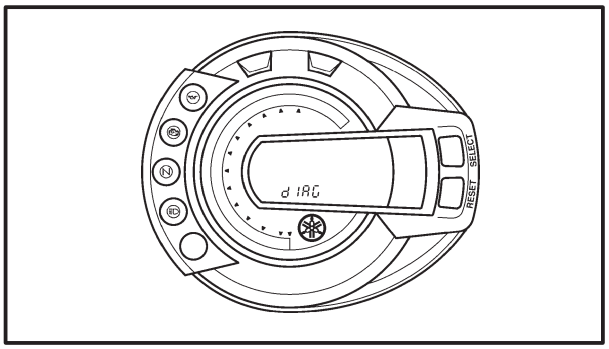
a. Loosen the locknut ①.
b. Turn the adjusting nut ② in direction ⓐ or ⓑ until the specified throttle cable free play is obtained.

Direction ⓐ	**Throttle cable free play is increased.**
Direction ⓑ	**Throttle cable free play is decreased.**

c. Tighten the locknut.
4. Install:
   - battery assembly
     Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.
   - air filter case
     Refer to "AIR FILTER CASE".
   - fuel tank
     Refer to "FUEL TANK".
   - front cowling inner panel (left and right)
     Refer to "COWLINGS".
   - seat
     Refer to "SEAT".

⚠ WARNING

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



ADJUSTING THE EXHAUST GAS VOLUME

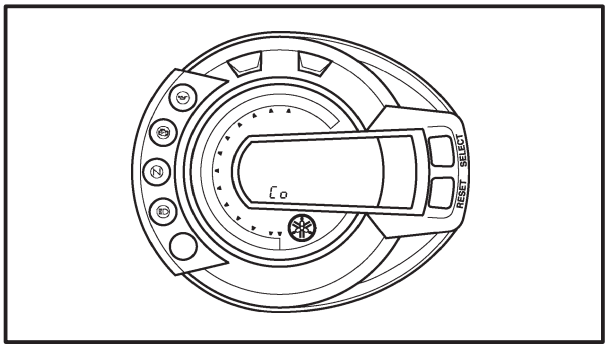
NOTE:

Be sure to set the carbon monoxide density to standard, and then adjust the exhaust gas.

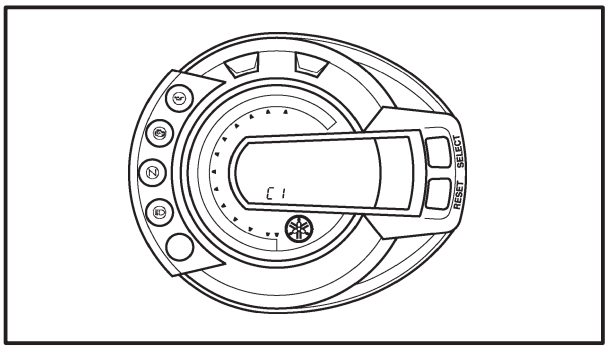
1. Turn the main switch to "OFF" and engine stop switch "ON".
2. While keeping the "SELECT" and "RESET" buttons pressed simultaneously, turn "ON" the main switch (keep them pressed for 8 seconds or more).

NOTE:

- All indications on the meter disappear except the clock and trip indications.
- Letters "dIAG" appear on the odo meter LCD.



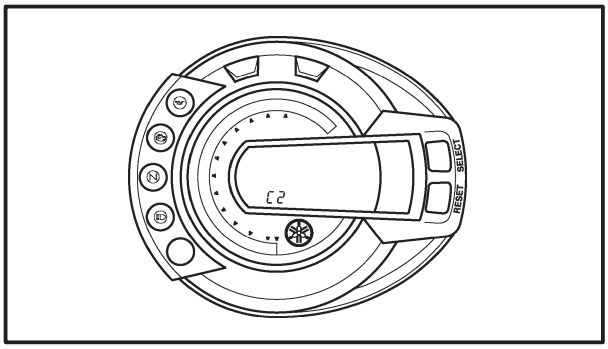
3. Using the “SELECT” button, select either the Co adjustment mode (which appears as “Co”) or the diagnosis mode (which appears as “dIAG”)
4. After “Co” appears as a result of pressing the “SELECT” button, simultaneously press the “SELECT” and “RESET” buttons for 2 seconds or more to excute the selection.



5. Press the “SELECT” or “RESET” buttons to select the “C1” or “C2”.
   C1=“#1” and “#4”
   C2=“#2” and “#3”

NOTE:

- The adjustment cylinder appears on the odometer LCD.
  “RESET” button = decrement
  “SELECT” button = increment

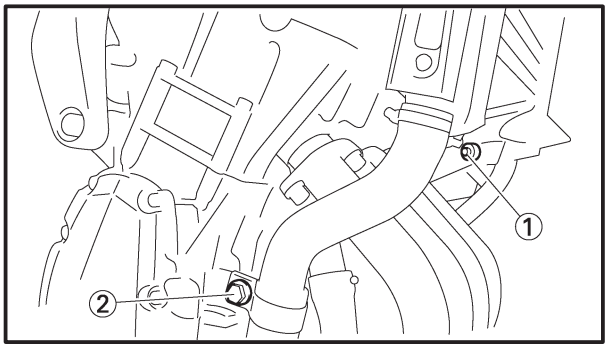


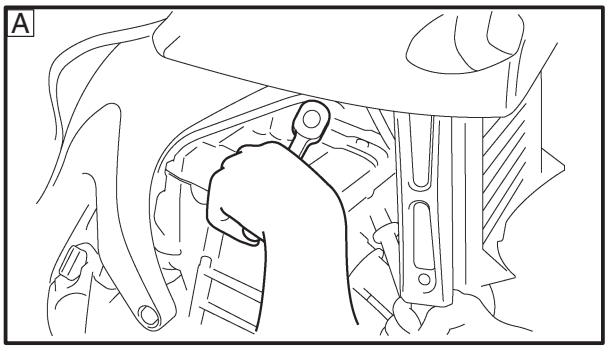
6. Execute the selection of the cylinder by simultaneously pressing the “SELECT” and “RESET” buttons for approximately 2 seconds.
7. After selecting the adjustment cylinder, change the “Co” adjustment volume by pressing the “SELECT” and “RESET” buttons.

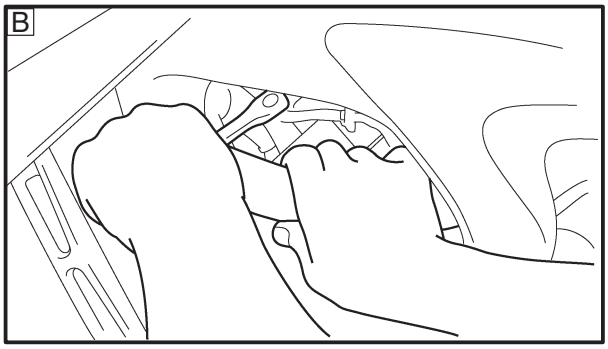
NOTE:

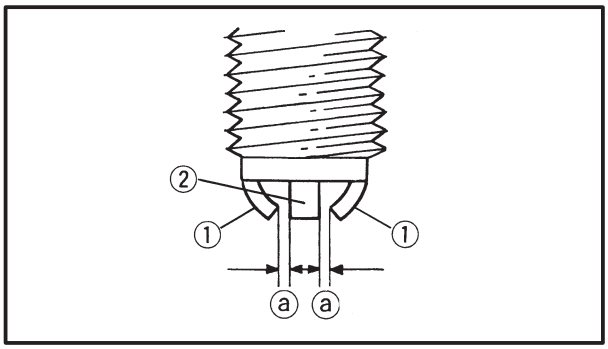
- The Co adjustment volume appears on the odo meter LCD.
  “RESET” button = decrement
  “SELECT” button = increment

8. The selection is executed upon releasing the finger from the switch.
9. Simultaneously press the “SELECT” and “RESET” buttons to return to the cylinder selection. (step 5)
10. Cancel the mode by turning “OFF” the main switch.









EAS00059

CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

1. Remove:
   - radiator lower bolt ①
   - radiator lower hose bracket bolt ②
2. Remove:
   - spark plug caps
   - spark plugs

A Right side #1 and #2 and #3
B Left side #4

CAUTION:

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

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

Spark plug type (manufacturer)
CR9EK (NGK)

4. Check:
   - electrode ①
     Damage/wear → Replace the spark plug.
   - insulator ②
     Abnormal color → Replace the spark plug.
     Normal color is medium-to-light tan.
5. Clean:
   - spark plug
     (with a spark plug cleaner or wire brush)
6. Measure:
   - spark plug gap ⓐ
     (with a wire Thickness gauge)
     Out of specification → Regap.

Spark plug gap
0.6 ~ 0.7 mm
(0.0236 ~ 0.0276 in)

7. Install:
   • spark plug — 18 Nm (1.8 m•kg, 13 ft•lb)
   • spark plug caps

NOTE:

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

8. Install:
   • radiator lower hose bracket bolt
   • radiator lower bolt

EAS00065

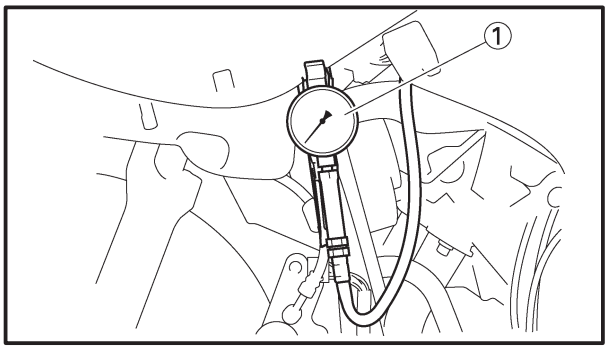
MEASURING THE COMPRESSION PRESSURE

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”.
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Remove:
   • rider seat
   Refer to “SEAT”.
   • front cowling inner panel (letf and right)
   Refer to “COWLINGS”.
   • fuel tank
   Refer to “FUEL TANK”.
   • air filter case
   Refer to “AIR FILTER CASE”.
   • battery
   Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   • battery box
   • battery box bracket
   Refer to “BATTERY BOX AND BATTERY BOX BRACKET”.
   • heat protector plate
4. Remove:
   • cover
   • ignition coils
   • spark plug caps
   • spark plugs



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.

5. Install:
   - compression gauge ①
   - adapter

Compression gauge
90890-03081, YU-33223
Adapter
90890-04136

6. Measure:
   - compression pressure
     Out of specification → Refer to steps (c) and (d).

Compression pressure
(at sea level)
Minimum
1,350 kPa (13.50 kg/cm^2, 13.50 bar, 191.87 psi)
Standard
1,550 kPa (15.50 kg/cm^2, 15.50 bar, 220.46 psi)
Maximum
1,736 kPa (17.36 kg/cm^2, 17.36 bar, 246.92 psi)

a. Turn the main switch to "ON".
b. With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.

⚠ WARNING

To prevent sparking, ground all spark plug leads before cranking the engine.

NOTE:

The difference in compression pressure between cylinders should not exceed 100 kPa (1 kg/cm^2, 1 bar, 14.22 psi).

c. If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces and piston crown for carbon deposits.
   Carbon deposits → Eliminate.

d. If the compression pressure is below the minimum specification, pour a teaspoonful of engine oil into the spark plug bore and measure again.
Refer to the following table.

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

7. Install:
   • spark plug — **18 Nm (1.8 m•kg, 13 ft•lb)**
8. Install:
   • spark plug caps
   • ignition coils
9. Install:
   • heat protector plate
   • battery box bracket
   • battery box
   Refer to “BATTERY BOX AND BATTERY BOX BRACKET”.
   • battery
   Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.
   • air filter case
   Refer to “AIR FILTER CASE”.
   • fuel tank
   Refer to “FUEL TANK”.
   • front cowling inner panel (letf and right)
   Refer to “COWLINGS”.
   • rider seat
   Refer to “SEAT”.

EAS00069

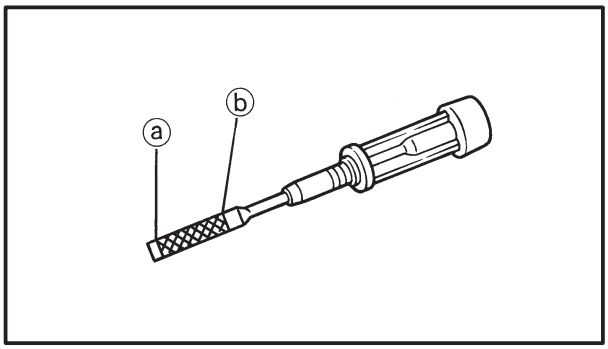
CHECKING THE ENGINE OIL LEVEL

1. Stand the motorcycle on a level surface.

NOTE:

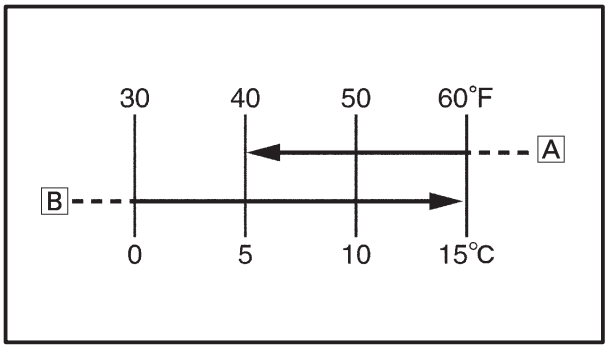
- Place the motorcycle on a suitable stand.
- Make sure the motorcycle is upright.

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



3. Check:
   - engine oil level

   The engine oil level should be between the minimum level mark ⓐ and maximum level mark ⓑ.
   Below the minimum level mark → Add the recommended engine oil to the proper level.



Recommended oil

AT 5°C (40°F) or higher A
Yamalube 4 (20W40) or SAE 20W40 type SE motor oil

AT 15°C (60°F) or lower B
Yamalube 4 (10W30) or SAE 10W30 type SE motor oil

NOTE:

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

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

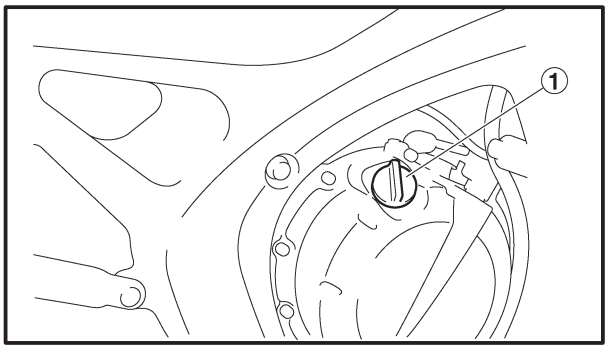
NOTE:

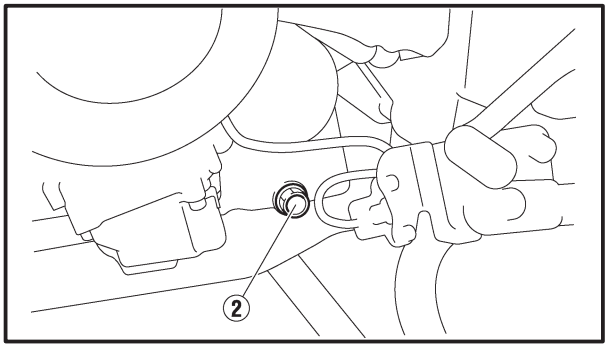
Before checking the engine oil level, wait a few minutes until the oil has settled.

EAS00074

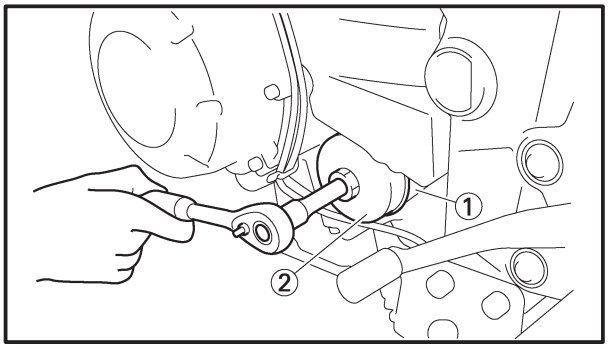
CHANGING THE ENGINE OIL

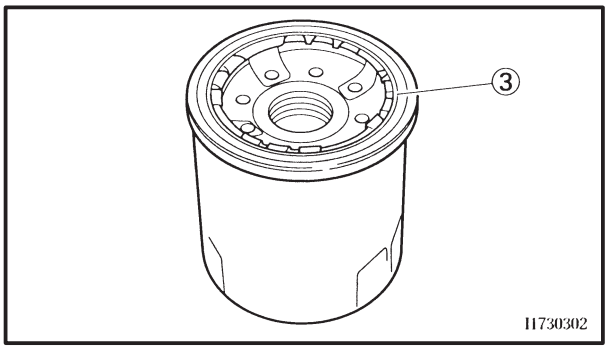
1. Start the engine, warm it up for several minutes, and then turn it off.
2. Place a container under the engine oil drain bolt.





3. Remove:
   - engine oil filler cap ①
   - engine oil drain bolt ②
     (along with the gasket)
4. Drain:
   - engine oil
     (completely from the crankcase)





5. If the oil filter cartridge is also to be replaced, perform the following procedure.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the oil filter cartridge ① with an oil filter wrench ②.

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

b. Lubricate the O-ring ③ of the new oil filter cartridge with a thin coat of engine oil.

CAUTION:

Make sure the O-ring ③ is positioned correctly in the groove of the oil filter cartridge.

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

	Oil filter cartridge **17 Nm (1.7 m•kg, 12 ft•lb)**

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

6. Replace:
   - engine oil drain bolt gasket New
7. Install:
   - engine oil drain bolt
     (along with the new gasket)

43 Nm (4.3 m•kg, 31 ft•lb)

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

	Quantity **Total amount** **3.4 L (2.99 Imp qt, 3.59 US qt)** **Without oil filter cartridge replacement** **2.5 L (2.20 Imp qt, 2.64 US qt)** **With oil filter cartridge replacement** **2.8 L (2.47 Imp qt, 2.96 US 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".

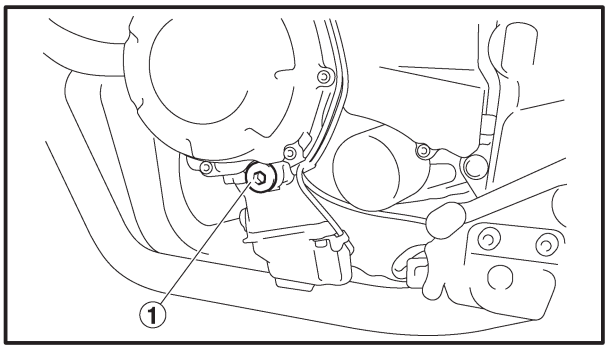
EAS00077

MEASURING THE ENGINE OIL PRESSURE

1. Check:
   • engine oil level
     Below the minimum level mark → Add the recommended engine oil to the proper level.
2. Start the engine, warm it up for several minutes, and then turn it off.

CAUTION:

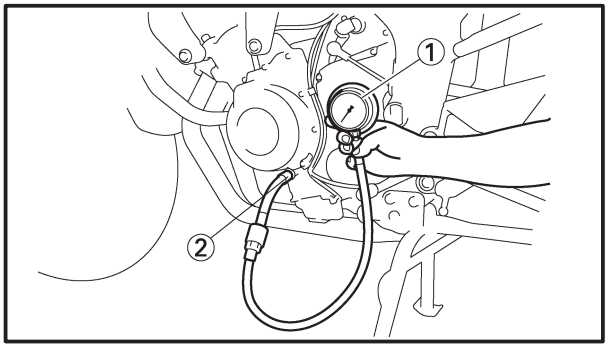
When the engine is cold, the engine oil will have a higher viscosity, causing the engine oil pressure to increase. Therefore, be sure to measure the engine oil pressure after warming up the engine.



3. Remove:
   • oil gallery bolt ①

⚠ WARNING

The engine, muffler and engine oil are extremely hot.



4. Install:
   • oil pressure gauge ①
   • adapter ②

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

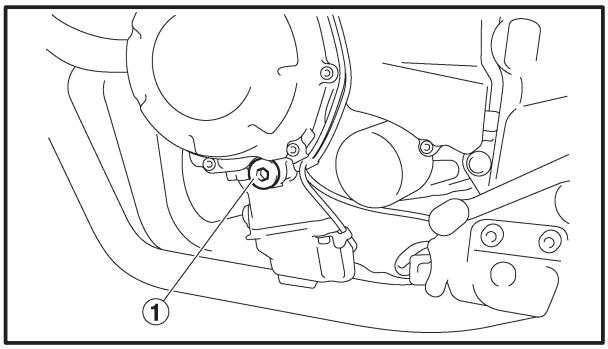
5. Measure:
   • engine oil pressure
   (at the following conditions)

Engine oil pressure
240 kPa
(2.4 kg/cm^2, 2.4 bar, 34.1 psi)
Engine speed
Approx. 6,600 r/min
Engine oil temperature
96°C (205°F)

NOTE:

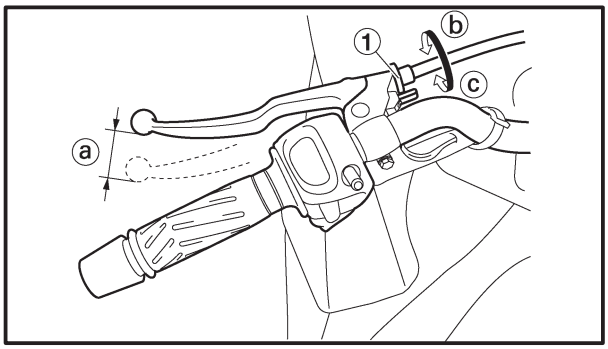
Regarding the oil pressure as its own data may fluctuate depending on the oil temperature and viscosity, the oil pressure may fluctuate when measuring. The following data should be used only as a reference when measuring the engine oil pressure.

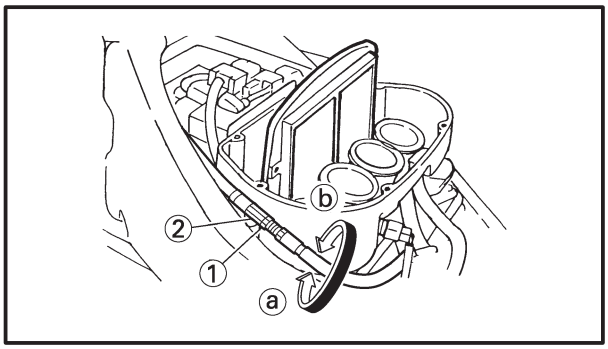
Engine oil pressure	Possible causes
Below specification	Faulty oil pump
	Clogged oil filter
	Leaking oil passage
	Broken or damaged oil seal
Above specification	Leaking oil passage
	Faulty oil filter
	Oil viscosity too high



6. Install:
   • oil gallery bolt ①

8 Nm (0.8 m•kg, 5.8 ft•lb)





EAS00078

ADJUSTING THE CLUTCH CABLE FREE PLAY

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

Clutch cable free play (at the end of the clutch lever)
10 ~ 15 mm (0.39 ~ 0.59 in)

2. Adjust:
   - clutch cable free play

Handlebar side

a. Turn the adjusting dial ① in direction ⓑ or ⓒ until the specified clutch cable free play is obtained.

Direction ⓑ	**Clutch cable free play is increased.**
Direction ⓒ	**Clutch cable free play is decreased.**

NOTE:

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

Engine side

3. Remove:
   - seat
     Refer to “SEAT”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - fuel tank
     Refer to “FUEL TANK”.
   - air filter case
     Refer to “AIR FILTER CASE”.

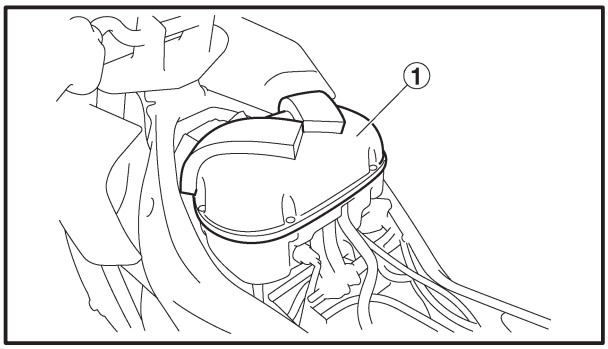
a. Loosen the locknuts ①.

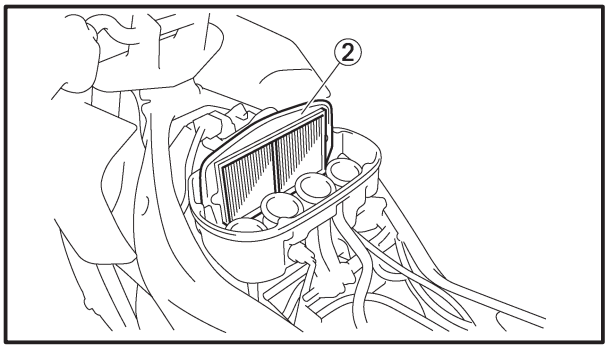
b. Turn the adjusting nut ② in direction ⓐ or ⓑ until the specified clutch cable free play is obtained.

Direction ⓐ	**Clutch cable free play is increased.**
Direction ⓑ	**Clutch cable free play is decreased.**

d. Tighten the locknuts.

4. Install:
   - air filter case
     Refer to “AIR FILTER CASE”.
   - fuel tank
     Refer to “FUEL TANK”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - seat
     Refer to “SEAT”.





EAS00086

CLEANING THE AIR FILTER ELEMENT

1. Remove:
   - rider seat
     Refer to “SEAT”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - fuel tank
     Refer to “FUEL TANK”.
2. Remove:
   - air filter case cover ①
   - air filter element ②
3. Clean:
   - air filter element ②
4. Check:
   - air filter element
     Damage → Replace.
5. Install:
   - air filter element ②
   - air filter case cover ①

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 the throttle bodies tuning, leading to poor engine performance and possible overheating.

NOTE:

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

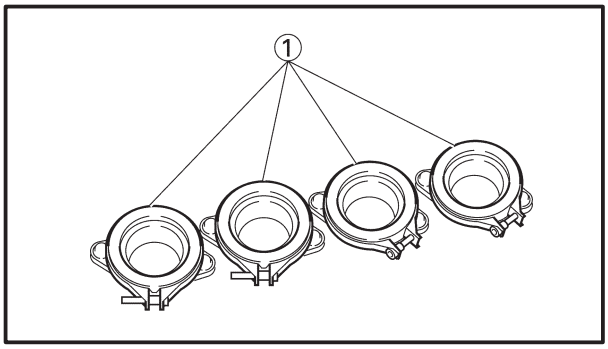
6. Install:
   - fuel tank
     Refer to “FUEL TANK”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - rider seat
     Refer to “SEAT”.

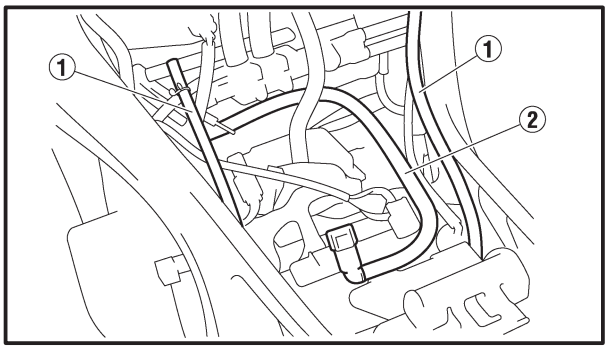
EAS00095

CHECKING THE THROTTLE BODY JOINTS

The following procedure applies to all of the throttle body joints and intake manifolds.

1. Remove:
   - throttle bodies
     Refer to “THROTTLE BODIES” in chapter 7.
2. Check:
   - throttle body joints ①
     Cracks/damage → Replace.
3. Install:
   - throttle bodies
     Refer to “THROTTLE BODIES” in chapter 7.





EAS00096

CHECKING THE FUEL AND BREATHER HOSES

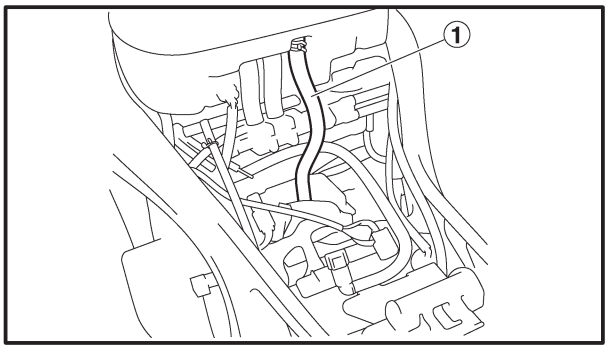
The following procedure applies to all of the fuel and breather hoses.

1. Remove:
   - rider seat
     Refer to “SEAT”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”
   - fuel tank
     Refer to “FUEL TANK”.
2. Check:
   - breather hose ①
   - fuel hose ②
     Cracks/damage → Replace.
     Loose connection → Connect properly.

NOTE:

- Before removing the fuel hose, place a few rags in the area under where it will be removed.
- There is a white mark on the fuel tank breather hose.
  Refer to “CABLE ROUTING” in chapter 2.

3. Install:
   - fuel tank
     Refer to “FUEL TANK”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - rider seat
     Refer to “SEAT”.



EAS00098

CHECKING THE CRANKCASE BREATHER HOSE

1. Remove:
   - rider seat
     Refer to “SEAT”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - fuel tank
     Refer to “FUEL TANK”.
2. Check:
   - crankcase breather hose ①
     Cracks/damage → Replace.
     Loose connection → Connect properly.

CAUTION:

Make sure the crankcase breather hose is routed correctly.

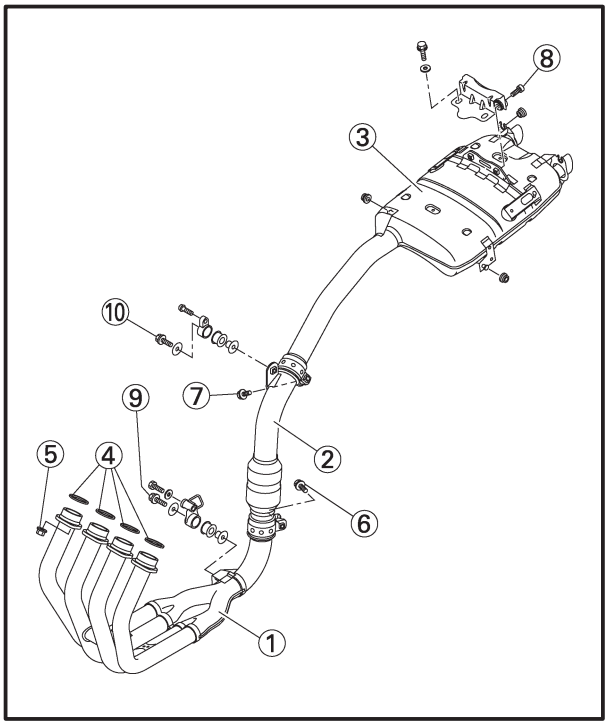
3. Install:
   • fuel tank
     Refer to “FUEL TANK”.
   • front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   • rider seat
     Refer to “SEAT”.

EAS00099

CHECKING THE EXHAUST SYSTEM

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

1. Remove:
   • radiator
     Refer to “RADIATOR” in chapter 6.



2. Check:
   • exhaust pipe ①
   • catalyst pipe ②
   • muffler ③
     Cracks/damage → Replace.
   • gasket ④
     Exhaust gas leaks → Replace.
3. Check:
   • tightening torque

Exhaust pipe nut ⑤
20 Nm (2.0 m•kg, 15 ft•lb)
Catalyst joint bolt ⑥
20 Nm (2.0 m•kg, 15 ft•lb)
Muffler joint bolt ⑦
Muffler and muffler stay ⑧
20 Nm (2.0 m•kg, 15 ft•lb)
Exhaust pipe and exhaust pipe stay ⑨
20 Nm (2.0 m•kg, 15 ft•lb)
Catalyst pipe and catalyst pipe stay ⑩
20 Nm (2.0 m•kg, 15 ft•lb)

4. Install:
   • radiator
     Refer to “RADIATOR” in chapter 6.

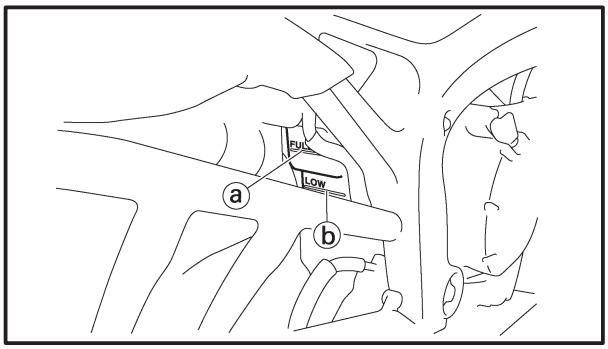
EAS00102

CHECKING THE COOLANT LEVEL

1. Stand the motorcycle on a level surface.

NOTE:

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



2. Check:
   - coolant level

   The coolant level should be between the maximum level mark ⓐ and minimum level mark ⓑ.

   Below the minimum level mark → Add the recommended coolant to the proper level.

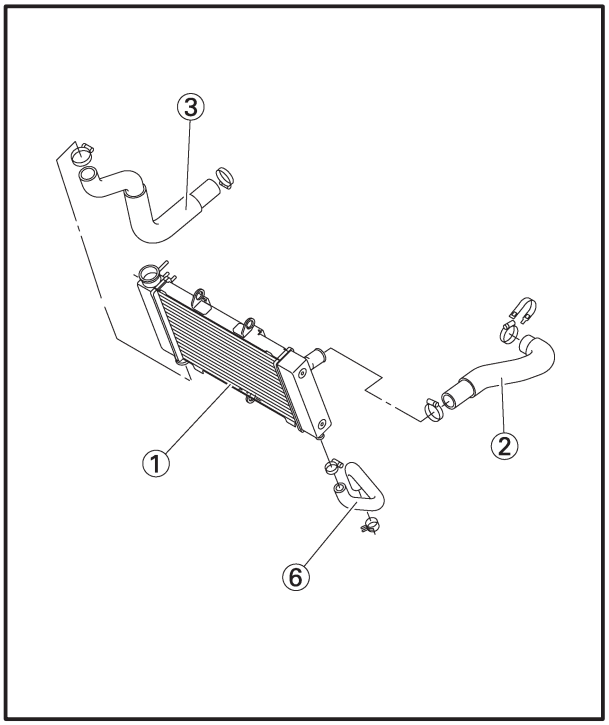
CAUTION:

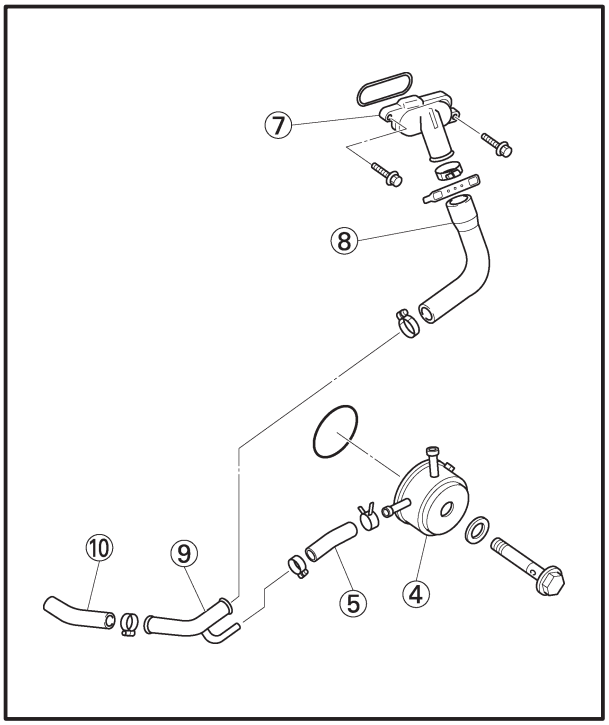
- **Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.**
- **Use only distilled water. However, if distilled water is not available, soft water may be used.**

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

NOTE:

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





EAS00104

CHECKING THE COOLING SYSTEM

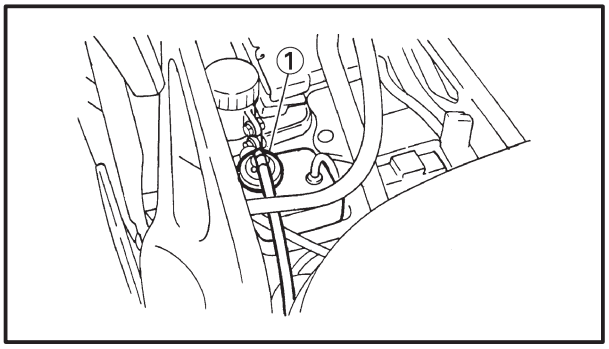
1. Check:
   - radiator ①
   - radiator inlet hose ②
   - radiator outlet hose ③
   - oil cooler ④
   - oil cooler inlet hose ⑤
   - oil cooler outlet hose ⑥
   - water jacket outlet joint ⑦
   - water jacket hose ⑧
   - water pump outlet pipe ⑨
   - water pump outlet hose ⑩

   Cracks/damage → Replace.
   Refer to “COOLING SYSTEM” in chapter 6.

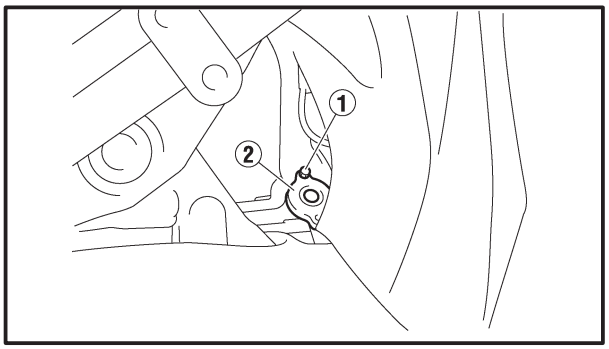
EAS00105

CHANGING THE COOLANT

1. Remove:
   - seat
     Refer to “SEAT”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - fuel tank
     Refer to “FUEL TANK”.
2. Remove:
   - coolant reservoir tank



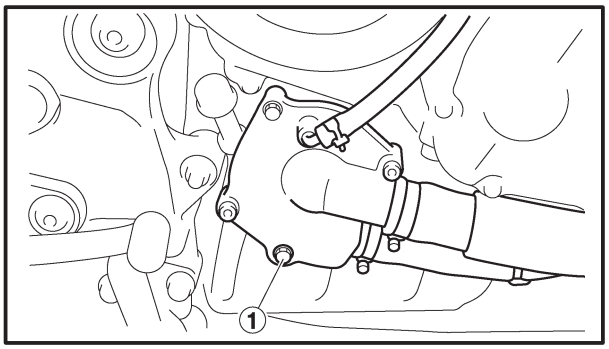
3. Disconnect:
   • coolant reservoir cap ①
4. Drain:
   • coolant
   (from the coolant reservoir tank)



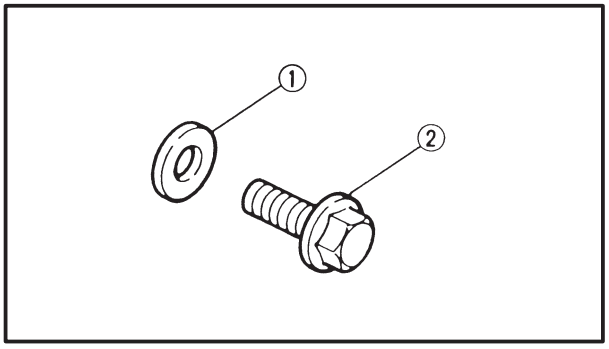
5. Remove:
   • radiator cap lock bolt ①
   • radiator cap ②

CAUTION:

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.



The following procedure applies to all of the coolant drain bolts and copper washers.
6. Remove:
   • coolant drain bolt (water pump) ①
   (along with the copper washer)



7. Drain:
   • coolant
   (from the engine and radiator)
8. Check:
   • copper washer ① New
   (coolant drain bolt-water pump ②)
9. Install:
   • coolant drain bolt (water pump)
   (with copper washer)

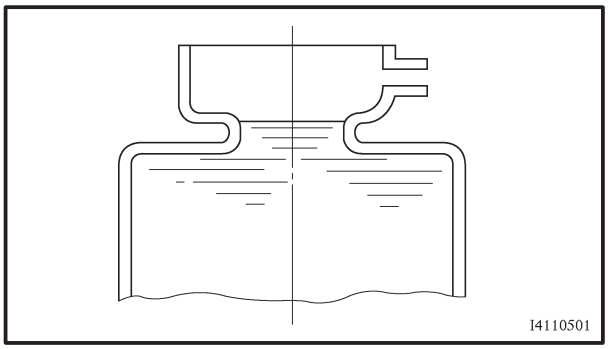
10 Nm (1.0 m•kg, 7.2 ft•lb)

10. Install:
    • coolant reservoir tank
11. Connect:
    • coolant reservoir hose

12. 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)
Quantity
Total amount
2.0 L (1.76 Imp qt, 2.11 US qt)
Coolant reservoir capacity
0.27 L (0.24 Imp qt, 0.29 US qt)

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



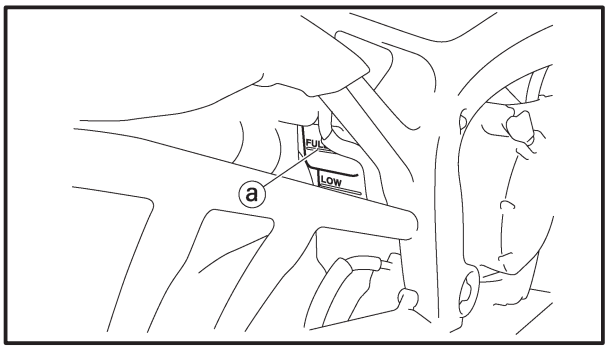
⚠ WARNING

- **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.**

CAUTION:

- **Adding water instead of coolant lowers the antifreeze content of the coolant. If water is used instead of coolant check, and if necessary, correct the antifreeze concentration of the coolant.**

- **Use only distilled water. However, if distilled water is not available, soft water may be used.**
- **If coolant comes into contact with painted surfaces, immediately wash them with water.**
- **Do not mix different types of antifreeze.**



13. Install:
    - radiator cap
14. Fill:
    - coolant reservoir tank
      (with the recommended coolant to the maximum level mark ⓐ)
15. Install:
    - coolant reservoir cap
16. Start the engine, warm it up for several minutes, and then stop it.
17. Check:
    - coolant level
      Refer to “CHECKING THE COOLANT LEVEL”.

NOTE:

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

18. Install:
    - fuel tank
      Refer to “FUEL TANK”.
    - front cowling inner panel (left and right)
      Refer to “COWLINGS”.
    - seat
      Refer to “SEAT”.

EAS00107

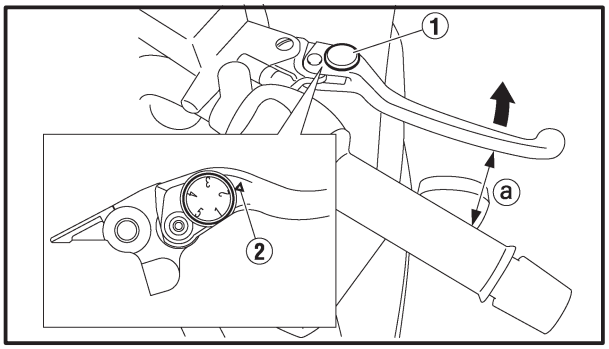
CHASSIS

ADJUSTING THE FRONT BRAKE

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

NOTE:

- While pushing the brake lever forward, turn the adjusting dial ① until the brake lever is in the desired position.
- Be sure to align the setting on the adjusting dial with the arrow mark ② on the brake lever holder.



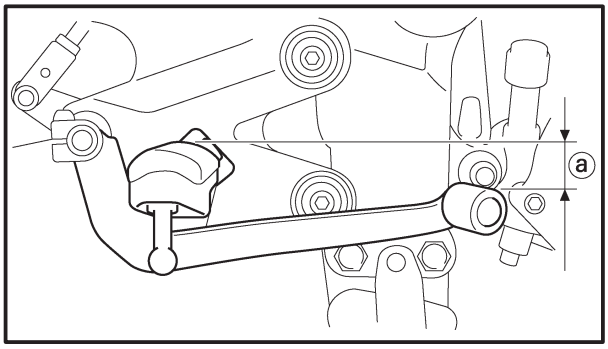
Position #1	**Distance ⓐ is the largest.**
Position #5	**Distance ⓐ is the smallest.**

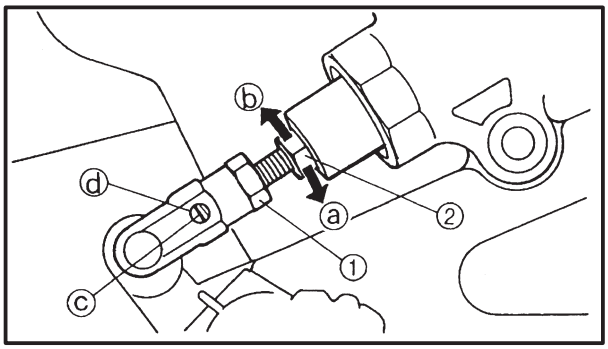
⚠ WARNING

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

CAUTION:

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





EAS00110

ADJUSTING THE REAR BRAKE

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

Brake pedal position (below the top of the rider footrest)
25.8 mm (1.02 in)

2. Adjust:
   - brake pedal position

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

Direction ⓐ	**Brake pedal is raised.**
Direction ⓑ	**Brake pedal is lowered.**

⚠ WARNING

After adjusting the brake pedal position, check that the end of the adjusting bolt ⓒ is visible through the hole ⓓ.

c. Tighten the locknut ① to specification.

Locknut
18 Nm (1.8 m•kg, 13 ft•lb)

⚠ WARNING

A soft or spongy feeling in the brake pedal can indicate the presence of air in the brake system. Before the vehicle is operated, the air must be removed by bleeding the brake system. Air in the brake system will considerably reduce braking performance and could result in loss of control and possibly an accident. Therefore, check and, if necessary, bleed the brake system.

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”.

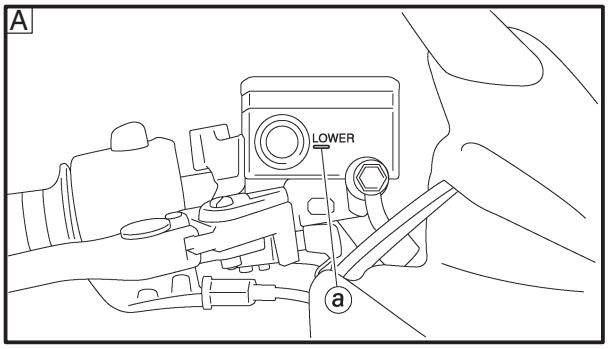
EAS00115

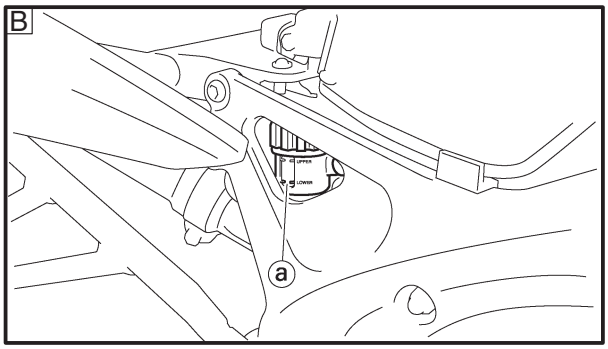
CHECKING THE BRAKE FLUID LEVEL

1. Stand the motorcycle on a level surface.

NOTE:

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





2. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.

Recommended brake fluid
DOT 4

A Front brake
B Rear brake

⚠ 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.**

CAUTION:

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

NOTE:

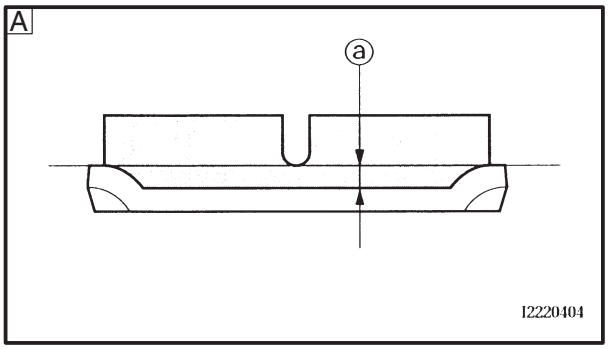
In order to ensure a correct reading of the brake fluid level, make sure the top of the brake fluid reservoir is horizontal.

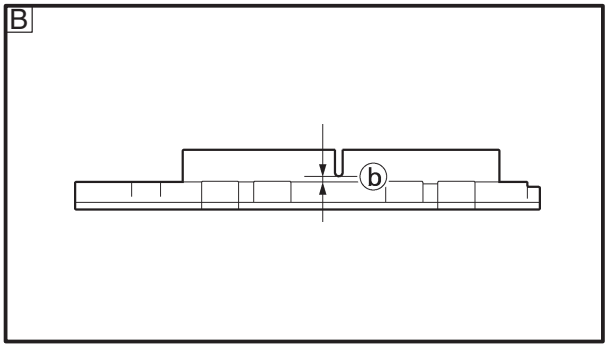
EAS00118

CHECKING THE FRONT AND REAR BRAKE PADS

The following procedure applies to all of the brake pads.

1. Operate the brake.





2. Check:
   - front brake pad
   - rear brake pad

   Brake pad wear limit ⓐ, ⓑ
   Wear limit reached → Replace the brake pads as a set.
   Refer to “FRONT AND REAR BRAKES” in chapter 4.

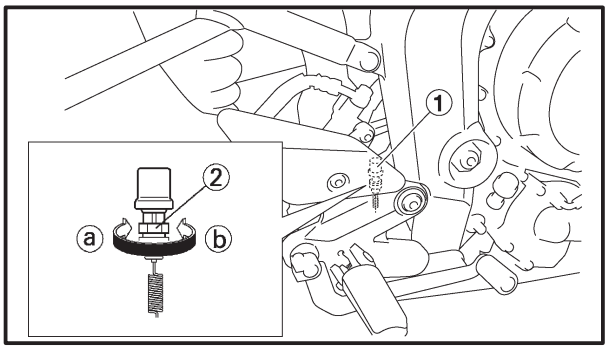
A Front brake
B Rear brake

EAS00128

ADJUSTING THE REAR BRAKE LIGHT SWITCH

NOTE:

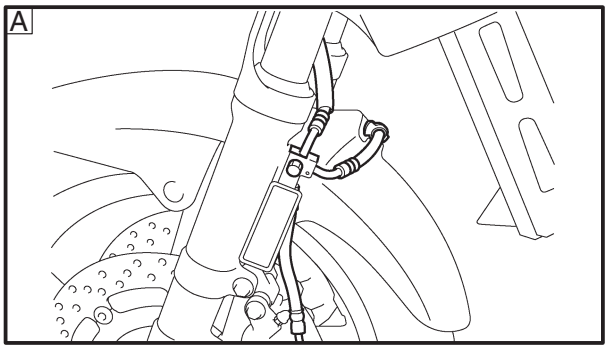
The rear brake light switch is operated by movement of the brake pedal. The rear brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.

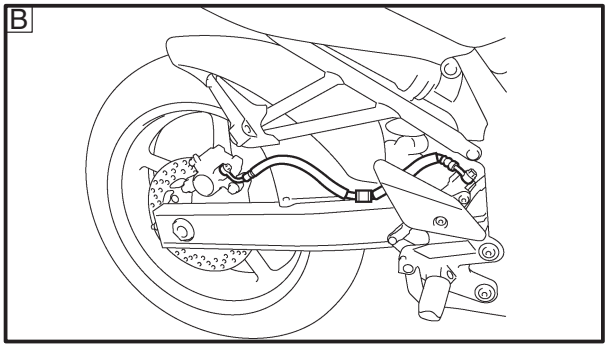


1. Check:
   - rear brake light operation timing
     Incorrect → Adjust.
2. Adjust:
   - rear brake light operation timing

a. Hold the main body ① of the rear brake light switch so that it does not rotate and turn the adjusting nut ② in direction ⓐ or ⓑ until the rear brake light comes on at the proper time.

Direction ⓐ	**Brake light comes on sooner.**
Direction ⓑ	**Brake light comes on later.**





EAS00131

CHECKING THE FRONT AND REAR BRAKE HOSES

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

1. Check:
   - brake hose
     Cracks/damage/wear → Replace.

A Front
B Rear

2. Check:
   - brake hose clamp
     Loose → Tighten the clamp bolt.
3. Hold the motorcycle upright and apply the brake several times.
4. Check:
   - brake hose
     Brake fluid leakage → Replace the damaged hose.
     Refer to “FRONT AND REAR BRAKES” in chapter 4.

EAS00135

BLEEDING THE HYDRAULIC BRAKE SYSTEM

⚠ 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.**

NOTE:
- Be careful not to spill any brake fluid or allow the 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.

1. Bleed:
   - hydraulic brake system

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

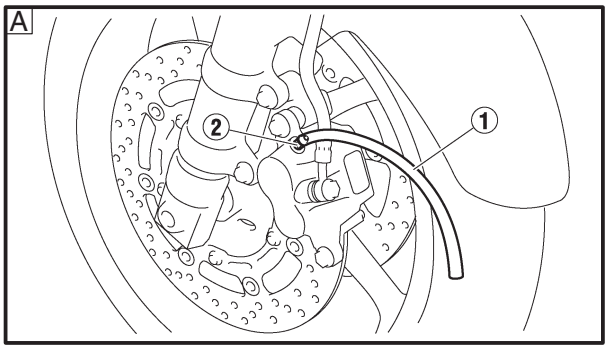
a. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
b. Install the brake fluid reservoir diaphragm.
c. Connect a clear plastic hose ① tightly to the bleed screw ②.

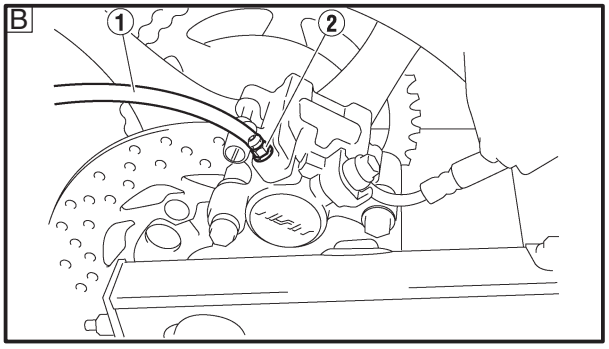
A Front
B Rear

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.

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

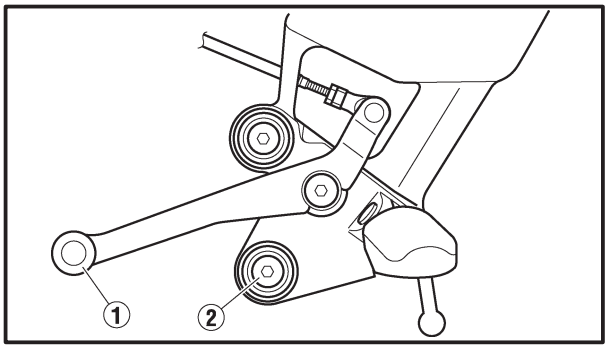
k. Fill the brake fluid reservoir to the proper level with the recommended brake fluid.
Refer to "CHECKING THE BRAKE FLUID LEVEL".

⚠ WARNING

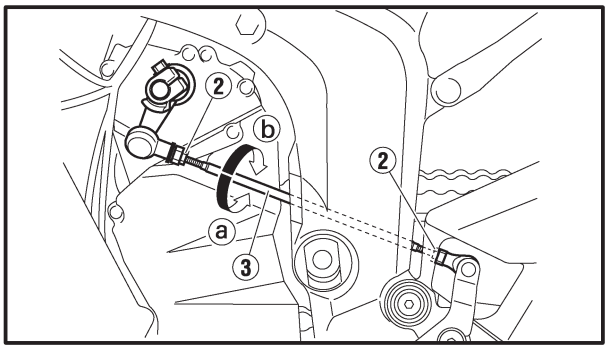
After bleeding the hydraulic brake system, check the brake operation.

EAS00136

ADJUSTING THE SHIFT PEDAL



1. Check:
   • shift pedal position
   Align the center of shift pedal ① and center of footrest bracket bolt ② in a straight line.
   Incorrect → Adjust.



2. Adjust:
   • shift pedal position

a. Loosen both locknuts ②.
b. Turn the shift rod ③ in direction ⓐ or ⓑ to obtain the correct shift pedal position.

Direction ⓐ	**Shift pedal is raised.**
Direction ⓑ	**Shift pedal is lowered.**

c. Tighten both locknuts.

EAS00140

ADJUSTING THE DRIVE CHAIN SLACK

NOTE:

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

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 swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

1. Stand the motorcycle on a level surface.

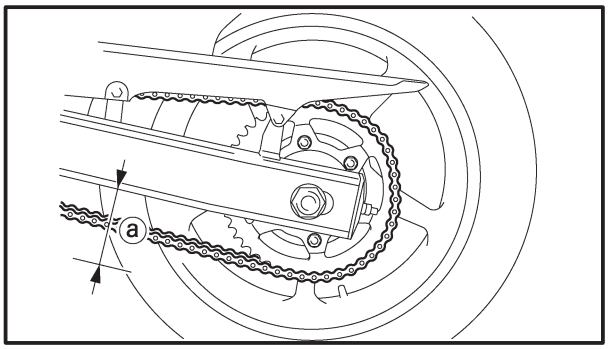
⚠ WARNING

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

NOTE:

Place the motorcycle 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 ⓐ
     Out of specification → Adjust.

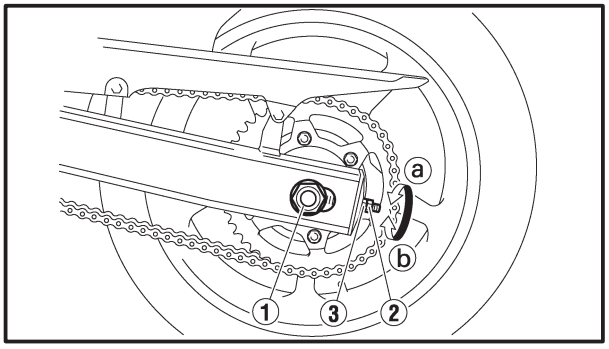


	Drive chain slack **45 ~ 55 mm (1.77 ~ 2.17 in)**

4. Adjust:
   - drive chain slack

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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



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

NOTE:

To maintain the proper wheel alignment, adjust both sides evenly.

f. Tighten both locknuts to specification.

Locknut
16 Nm (1.6 m•kg, 12 ft•lb)

g. Tighten the wheel axle nut to specification.

Wheel axle nut
120 Nm (12 m•kg, 87 ft•lb)

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00143

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 motorcycle is used in dusty areas.

Use only kerosene to clean the drive chain. Wipe the drive chain dry and thoroughly lubricate it with engine oil or chain lubricant that is suitable for non-O-ring chains.

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

EAS00146
CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the motorcycle on a level surface.

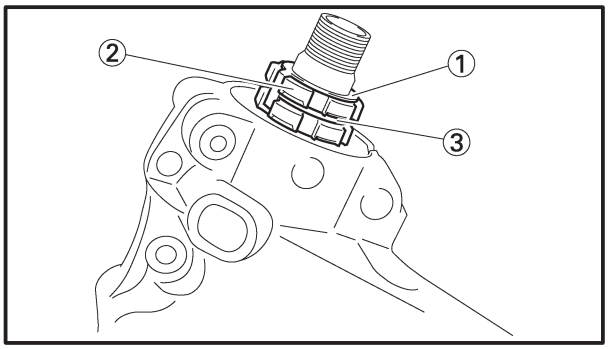
⚠ WARNING

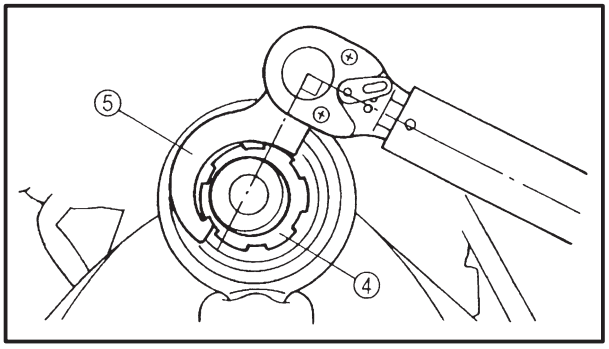
Securely support the motorcycle so that there is no danger of it falling over.

NOTE:

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

2. Check:
   - steering head
     Grasp the bottom of the front fork legs and gently rock the front fork.
     Binding/looseness → Adjust the steering head.
3. Remove:
   - upper bracket
     Refer to "HANDLEBAR" and "STEERING HEAD" in chapter 4.





4. Adjust:
   - steering head

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the lock washer ①, the upper ring nut ②, and the rubber washer ③.
b. Loosen the lower ring nut ④ and then tighten it to specification with a steering nut wrench ⑤.

NOTE:

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

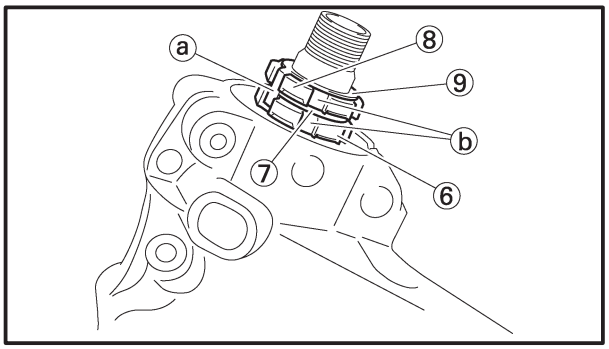
	Steering nut wrench **90890-01403, YU-33975**
	Lower ring nut **(initial tightening torque)** **52 Nm (5.2 m•kg, 38 ft•lb)**

c. Loosen the lower ring nut ⑥ completely, then tighten it to specification.

⚠ WARNING

Do not overtighten the lower ring nut.

Lower ring nut
(final tightening torque)
18 Nm (1.8 m•kg, 13 ft•lb)



d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings.
Refer to "STEERING HEAD" in chapter 4.
e. Install the rubber washer ⑦.
f. Install the upper ring nut ⑧.
g. Finger tighten the upper ring nut ⑧, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
h. Install the lock washer ⑨.

NOTE:

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

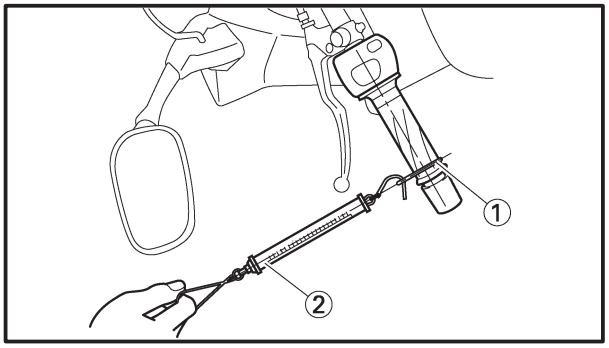
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

5. Install:
   • upper bracket
   Refer to "HANDLEBAR" and "STEERING HEAD" in chapter 4.
6. Measure:
   • steering head tension

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

NOTE:

Make sure all of the cables and wires are properly routed.

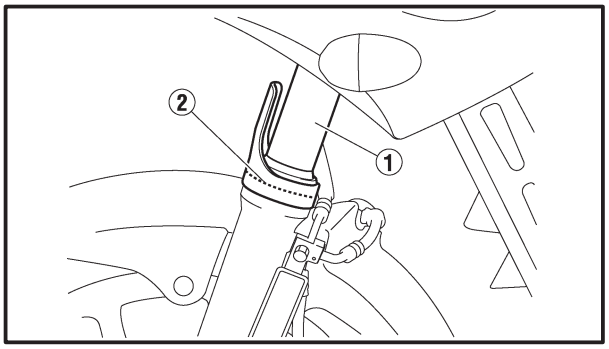


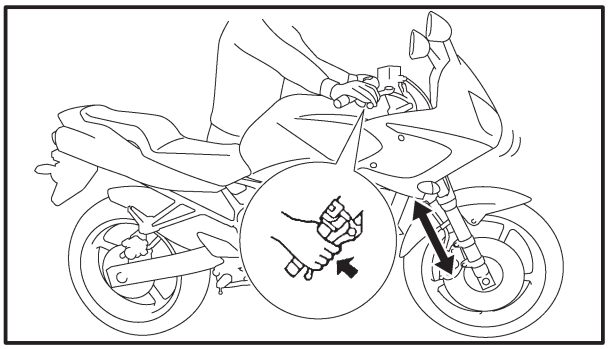
a. Point the front wheel straight ahead.
b. Install a plastic locking tie ① loosely around the end of the handlebar as shown.
c. Hook a spring gauge ② onto the plastic locking tie.
d. Hold the spring gauge at a 90° angle from the handlebar, pull the spring gauge, and then record the measurement when the handlebar starts to run.

Steering head tension
200 ~ 500 g

e. Repeat the above procedure on the opposite handlebar.
f. If the steering head tension is out of specification (both handlebars should be within specification), remove the upper bracket and loosen or tighten the upper ring nut.
g. Reinstall the upper bracket and measure the steering head tension again as described above.
h. Repeat the above procedure until the steering head tension is within specification.
i. Grasp the bottom of the front fork legs and gently rock the front fork.
   Binding/looseness → Adjust the steering head.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲





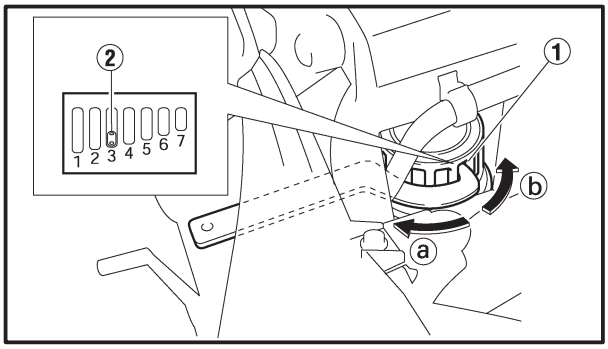
EAS00149
CHECKING THE FRONT FORK

1. Stand the motorcycle on a level surface.

⚠ WARNING

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

2. Check:
   - inner tube ①
     Damage/scratches → Replace.
   - oil seal ②
     Oil leakage → Replace.
3. Hold the motorcycle 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” in chapter 4.



EAS00156

ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY

⚠ WARNING

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

Spring preload

CAUTION:

Never go beyond the maximum or minimum adjustment positions.

1. Adjust:
   • spring preload

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Adjust the spring preload with a ring nut wrench.

	Ring nut wrench **90890-01268, YU-01268**

b. Turn the adjusting ring ① in direction ⓐ or ⓑ.
c. Align the desired position on the adjusting ring with the stopper ②.

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

Adjusting positions
Minimum: 1
Standard: 3
Maximum: 7

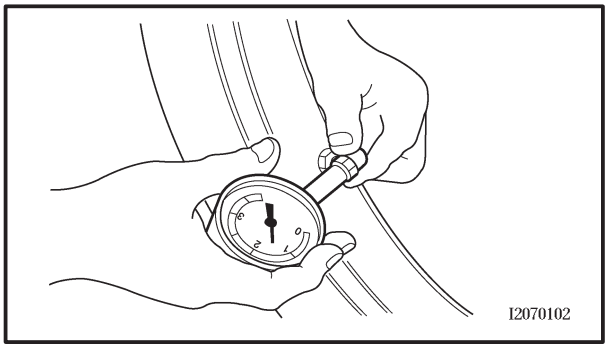
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00162

CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Check:
   • tire pressure
   Out of specification → Regulate.



⚠ WARNING

- **The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.**
- **The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.**
- **Operation of an overloaded motorcycle could cause tire damage, an accident or an injury.**

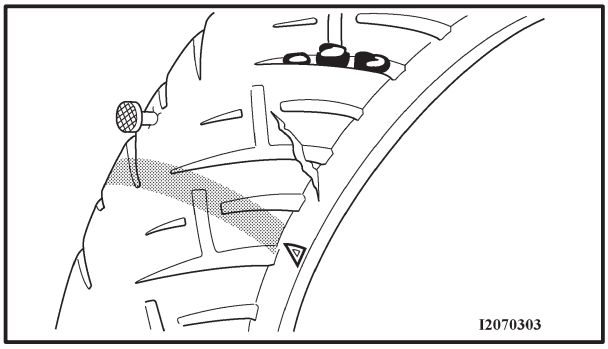
NEVER OVERLOAD THE MOTORCYCLE.

Basic weight (with oil and a full fuel tank)	**207 kg (456 lb) 208 kg (459 lb) for CAL**	
Maximum load*	**190 kg (419 lb) 189 kg (417 lb) for CAL**	
Cold tire pressure	**Front**	**Rear**
Up to 90 kg (198 lb) load*	**225 kPa (2.25 kgf/cm^2, 2.25 bar, 33psi)**	**250 kPa (2.5 kgf/cm^2, 2.5 bar, 35.6 psi)**
90 kg ~ 190 kg (198 ~ 419 lb) 90 kg ~ 189 kg (198 ~ 417 lb) for CAL maximum load*	**250 kPa (2.5 kgf/cm^2, 2.5 bar, 35.6 psi)**	**290 kPa (2.9 kgf/cm^2, 2.9 bar, 41.3 psi)**
High-speed riding	**225 kPa (2.25 kgf/cm^2, 2.25 bar, 33 psi)**	**250 kPa (2.5 kgf/cm^2, 2.5 bar, 35.6 psi)**

* Total weight of rider, passenger, cargo and accessories

⚠ WARNING

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



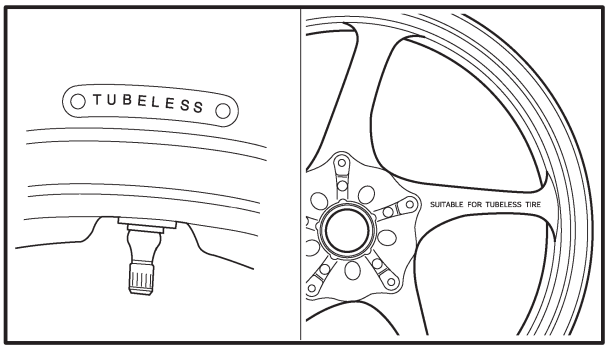
2. Check:
   • tire surfaces
   Damage/wear → Replace the tire.

	Minimum tire tread depth **1.6 mm (0.06 in)**

① Tire tread depth
② Sidewall
③ Wear indicator

⚠ 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 Tire
B Wheel

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

⚠ 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 motorcycle.**

Front tire

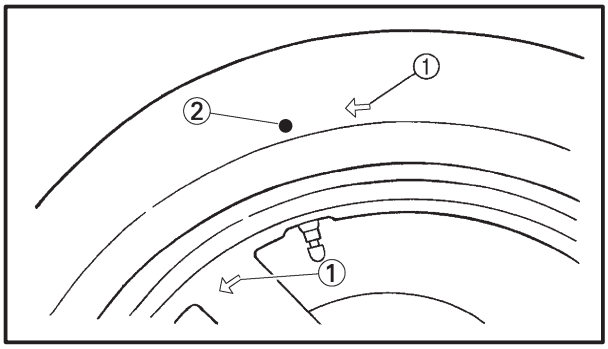
Manufacturer	Size	Model
BRIDGESTONE	120/70ZR 17 M/C (58W)	BT020F GG
DUNLOP	120/70ZR 17 M/C (58W)	D252F

Rear tire

Manufacturer	Size	Model
BRIDGESTONE	180/55ZR 17 M/C (73W)	BT020R GG
DUNLOP	180/55ZR 17 M/C (73W)	D252

⚠ WARNING

New tires and wheels 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.

EAS00168

CHECKING THE WHEELS

The following procedure applies to both of the wheels.

1. Check:
   - wheel
     Damage/out-of-round → Replace.

⚠ 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.

EAS00170

CHECKING AND LUBRICATING THE CABLES

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

⚠ 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.

EAS00171

LUBRICATING THE LEVERS AND PEDALS

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

Recommended lubricant
Lithium-soap-based grease

EAS00172

LUBRICATING THE SIDESTAND

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

Recommended lubricant
Lithium-soap-based grease

EAS00173

LUBRICATING THE CENTERSTAND

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

Recommended lubricant
Lithium-soap-based grease

EAS00174

LUBRICATING THE REAR SUSPENSION

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

	Recommended lubricant **Molybdenum disulfide grease**

EAS00178

ELECTRICAL SYSTEM

CHECKING AND CHARGING THE BATTERY

⚠ WARNING

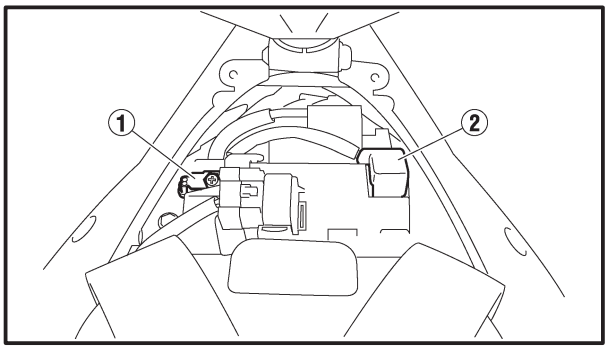
Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid.
Therefore, always follow these preventive measures:
- **Wear protective eye gear when handling or working near batteries.**
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).**
- **DO NOT SMOKE when charging or handling batteries.**
- **KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.**
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**

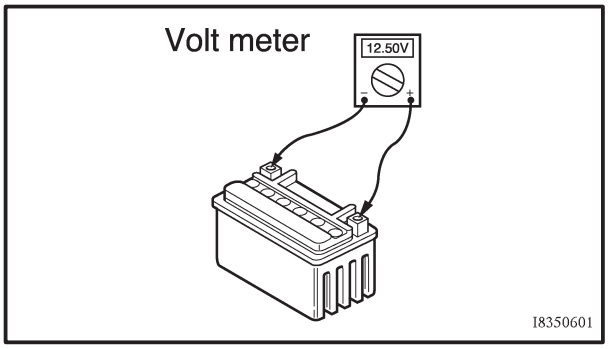
FIRST AID IN CASE OF BODILY CONTACT:
EXTERNAL
- **Skin – Wash with water.**
- **Eyes – Flush with water for 15 minutes and get immediate medical attention.**

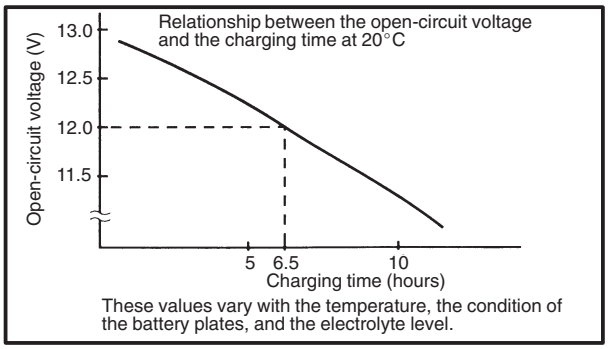
INTERNAL
- **Drink large quantities of water or milk followed with milk of magnesia, beaten egg or vegetable oil. Get immediate medical attention.**

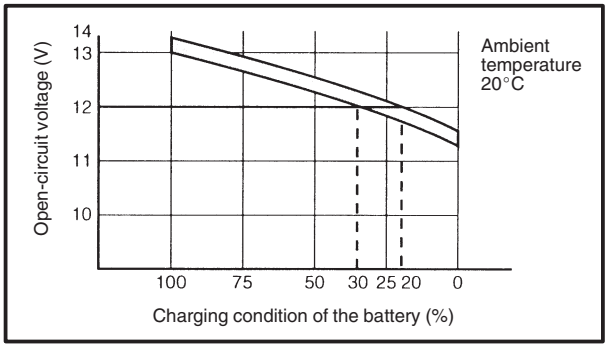
CAUTION:

- **This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.**
- **Charging time, charging amperage and charging voltage for an MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.**









NOTE:

Since MF batteries are sealed, it is not possible to check the charge state of the battery by measuring the specific gravity of the electrolyte. Therefore, the charge of the battery has to be checked by measuring the voltage at the battery terminals.

1. Remove:
   - rider seat
     Refer to “SEAT”.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS”.
   - fuel tank
     Refer to “FUEL TANK”.
2. Disconnect:
   - battery leads
     (from the battery terminals)

CAUTION:

First, disconnect the negative battery lead ①, and then the positive battery lead ②.

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

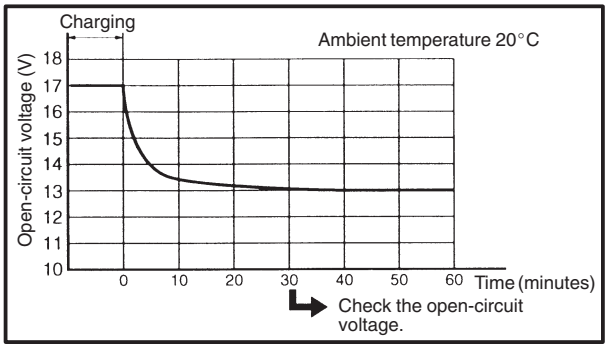
NOTE:

- 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

c. Open-circuit voltage = 12.0 V
d. Charging time = 6.5 hours
e. Charge of the battery = 20 ~ 30%



5. Charge:
   • battery
   (refer to the appropriate charging method illustration)

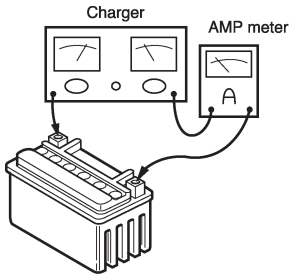
⚠ WARNING

Do not quick charge a battery.

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 motorcycle. (If charging has to be done with the battery mounted on the motorcycle, 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 battery cool before reconnecting it. Hot batteries can explode!**
- **As shown in the following illustration, the open-circuit voltage of an MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.**

Charging method using a variable-current (voltage) charger



I8350101

Measure the open-circuit voltage prior to charging.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped.

Connect a charged and AMP meter to the battery and start charging.

NOTE:
Set the charging voltage at 16 ~ 17 V. (If the setting is lower, charging will be insufficient. If too high, the battery will be over-charged.)

Make sure that the current is higher than the standard charging current written on the battery.

YES

NO

By turning the charging voltage adjust dial, set the charging voltage at 20 ~ 24 V.

Monitor the amperage for 3 ~ 5 minutes to check if the standard charging current is reached.

YES

Adjust the voltage so that the current is at the standard charging level.

NO

If the current does not exceed the standard charging current after 5 minutes, replace the battery.

Set the time according to the charging time suitable for the open-circuit voltage.
Refer to “Battery condition checking steps”.

If charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, readjust the voltage to obtain the standard charging current.

Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.
12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

Charging method using a constant voltage charger

Measure the open-circuit voltage prior to charging.

NOTE:
Voltage should be measured 30 minutes after the machine is stopped.

Connect a charger and AMP meter to the battery and start charging.

Make sure that the current is higher than the standard charging current written on the battery.

YES

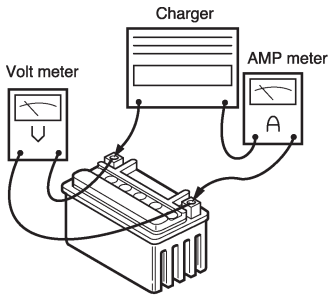
Charge the battery until the battery's charging voltage is 15 V.

NOTE:
Set the charging time at 20 hours (maximum).

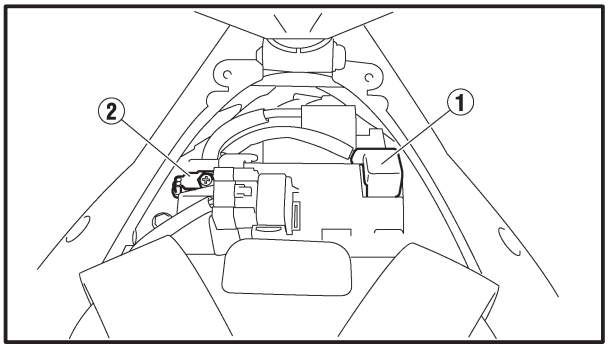
Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.
12.8 V or more --- Charging is complete.
12.7 V or less --- Recharging is required.
Under 12.0 V --- Replace the battery.

NO

This type of battery charger cannot charge the MF battery. A variable voltage charger is recommended.



I8350102



Charging method using a variable-current (voltage) charger
Charging method using a constant voltage charger

6. Install:
   - battery
7. Connect:
   - battery leads
     (to the battery terminals)

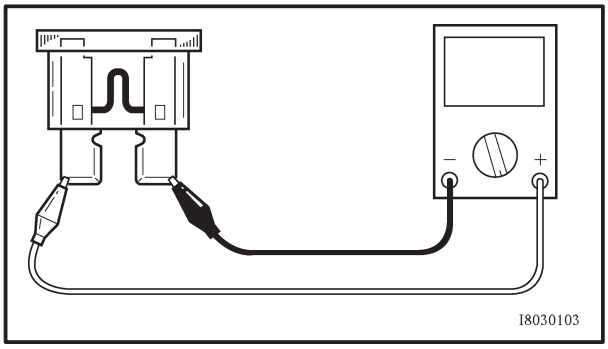
CAUTION:

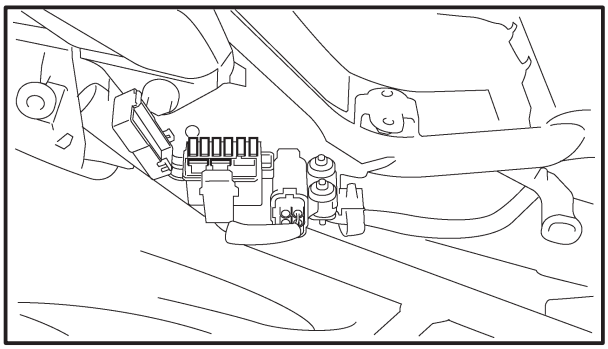
First, connect the positive battery lead ①, and then the negative battery lead ②.

8. Check:
   - battery terminals
     Dirt → Clean with a wire brush. Loose connection → Connect properly.
9. Lubricate:
   - battery terminals

	Recommended lubricant **Dielectric grease**

10. Install:
    - fuel tank
      Refer to “FUEL TANK”.
    - front cowling inner panel (left and right)
      Refer to “COWLINGS”.
    - seat
      Refer to “SEAT”.





EAS00181
CHECKING THE FUSES
The following procedure applies to all of the fuses.

CAUTION:

To avoid a short circuit, always set the main switch to "OFF" when checking or replacing a fuse.

1. Remove:
   • right side cover
   Refer to "COWLINGS".
2. Check:
   fuse

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Connect the pocket tester to the fuse and check the continuity.

NOTE:

Set the pocket tester selector to "Ω × 1".

	Pocket tester **90890-03112, YU-3112**

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.

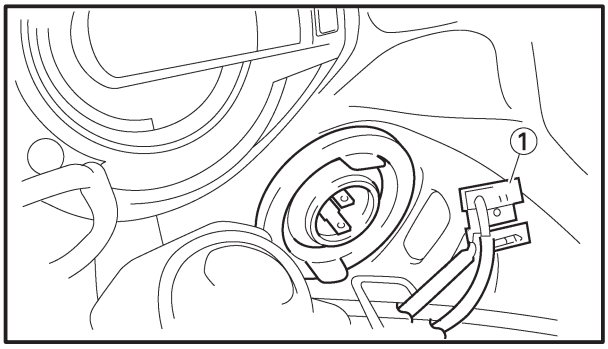
Fuses	Amperage rating	Q'ty
Main	30A	1
Headlight	20A	1
Signaling system	10A	1
Ignition	10A	1
Fuel injection	10A	1
Radiator fan motor	20A	1
Tail	10A	1
Back up	10A	1
Reserve	10A, 20A, 30A	1

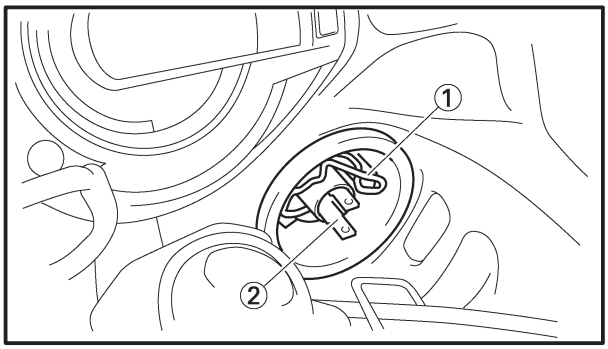
⚠ WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

4. Install:
   • right side cover
   Refer to “COWLINGS”.





EAS00183

REPLACING THE HEADLIGHT BULBS

The following procedure applies to both of the headlight bulbs.

1. Remove:
   - front cowling inner panels
     Refer to “COWLINGS”.
2. Disconnect:
   - headlight bulb cover
   - headlight coupler ①
3. Remove:
   - headlight bulb holder ①
4. Remove:
   - headlight bulb ②

⚠ WARNING

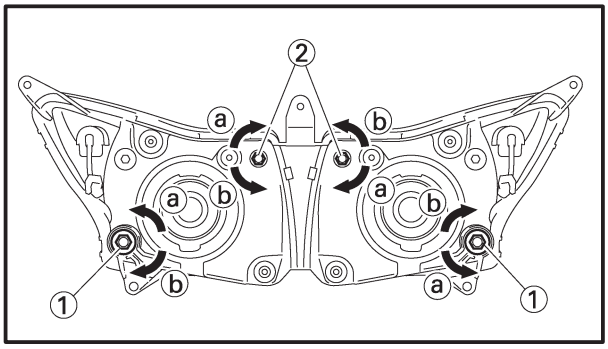
Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.

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

CAUTION:

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

6. Install:
   - headlight bulb holder
7. Install:
   - headlight bulb cover
8. Connect:
   - headlight coupler
9. Install:
   - front cowling inner panels
     Refer to “COWLINGS”.



EAS00185

ADJUSTING THE HEADLIGHT BEAMS

The following procedure applies to both of the headlights.

1. Adjust:
   • headlight beam (vertically)

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

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

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

2. Adjust:
   • headlight beam (horizontally)

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Turn the adjusting knob ② in direction ⓐ or ⓑ.

Left headlight

Direction ⓐ	**Headlight beam moves to the right.**
Direction ⓑ	**Headlight beam moves to the left.**

Right headlight

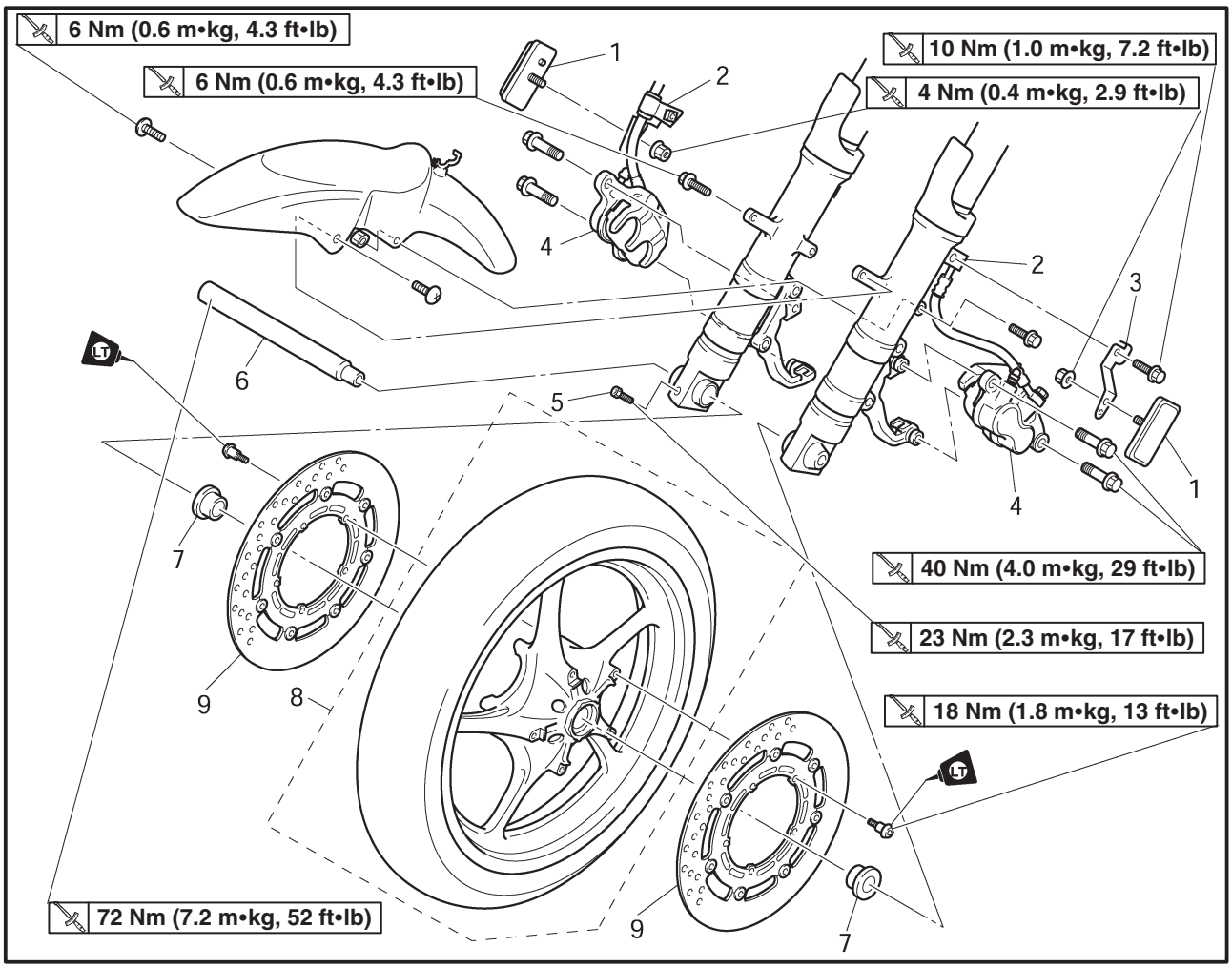
Direction ⓐ	**Headlight beam moves to the left.**
Direction ⓑ	**Headlight beam moves to the right.**

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00514

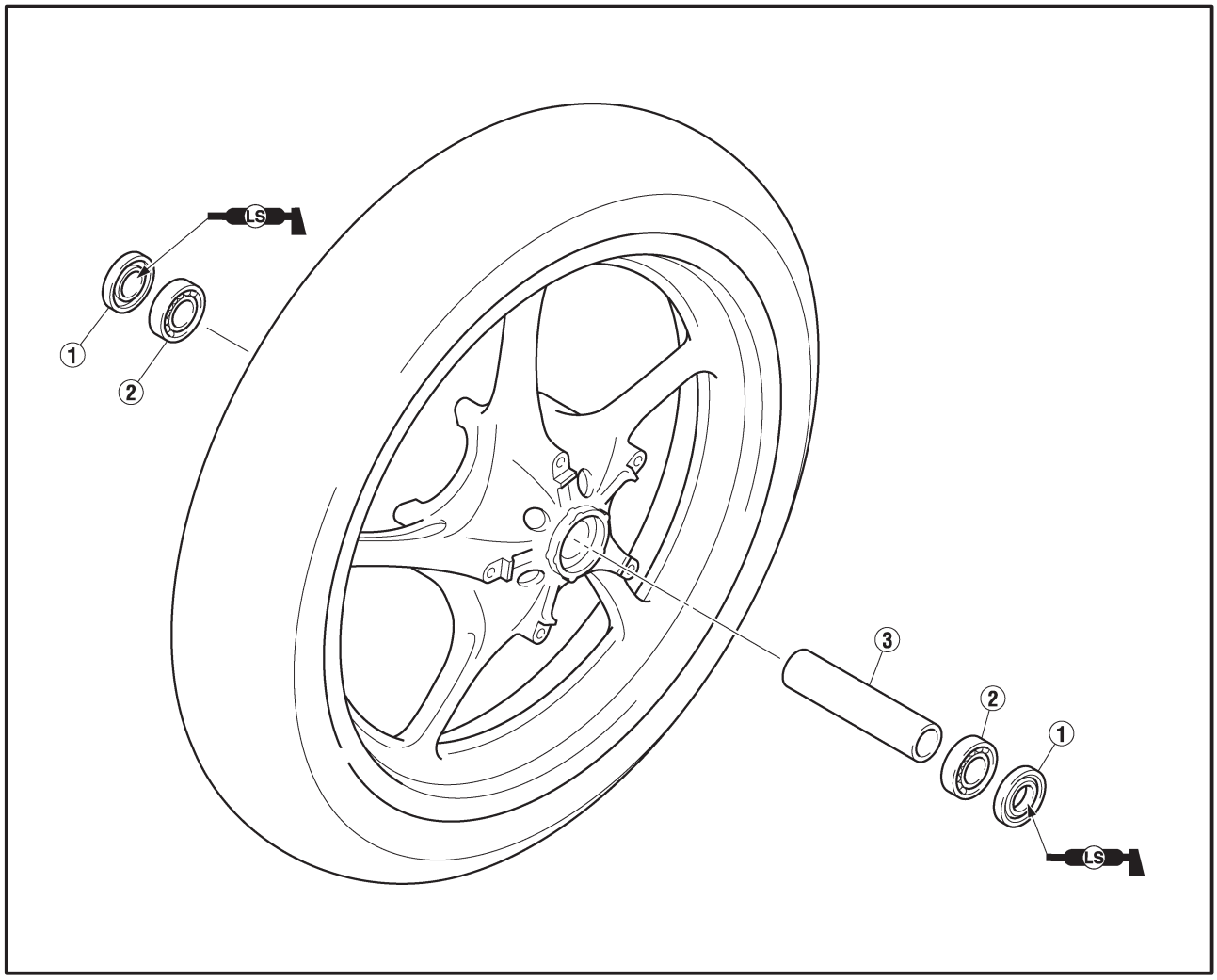
CHASSIS

FRONT WHEEL AND BRAKE DISCS



Order	Job/Part	Q'ty	Remarks
	Removing the front wheel and brake discs		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the front wheel is elevated.
1	Side reflector (left and right)	2	
2	Brake hose holder (left and right)	2	
3	Side reflector bracket	1	
4	Front brake caliper (left and right)	2	
5	Front wheel axle pinch bolt	1	Loosen.
6	Front wheel axle	1	
7	Collar (left and right)	2	
8	Front wheel	1	
9	Front brake disc (left and right)	2	
			For installation, reverse the removal procedure.

EAS00518



Order	Job/Part	Q'ty	Remarks
	Disassembling the front wheel		Disassemble the parts in the order listed.
①	Oil seal (left and right)	2	
②	Wheel bearing (left and right)	2	
③	Spacer	1	
			For assembly, reverse the disassembly procedure.

EAS00521
REMOVING THE FRONT WHEEL

1. Stand the motorcycle on a level surface.

⚠ WARNING

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

NOTE:

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

2. Remove:
   - left brake caliper
   - right brake caliper

NOTE:

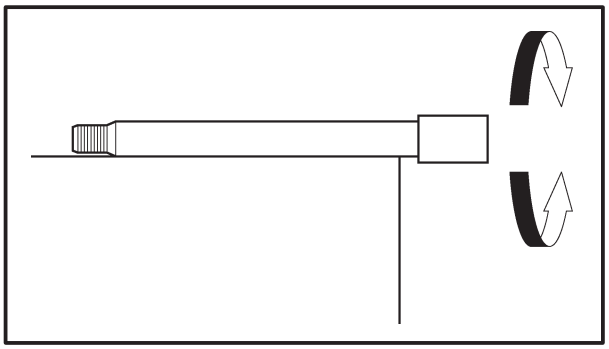
Do not apply the brake lever when removing the brake calipers.

3. Elevate:
   - front wheel

NOTE:

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

4. Loosen:
   - front wheel axle pinch bolt
5. Remove:
   - front wheel axle
   - front wheel



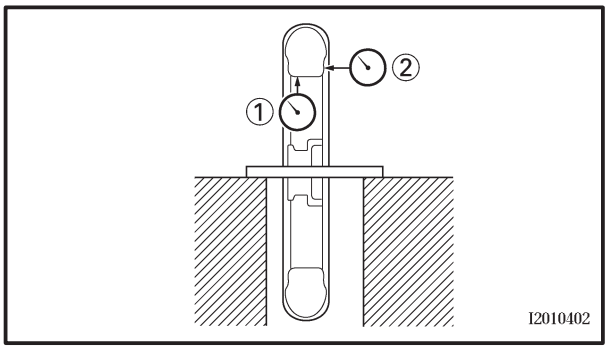
EAS00525
CHECKING THE FRONT WHEEL

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

⚠ WARNING

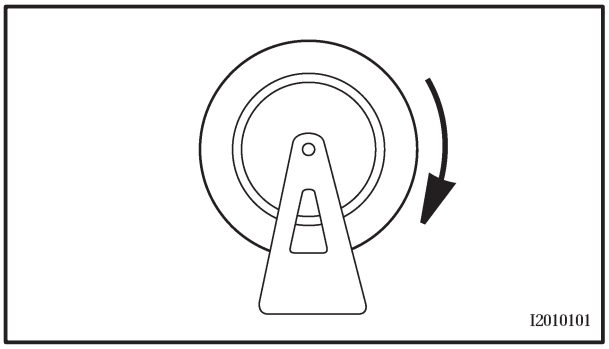
Do not attempt to straighten a bent wheel axle.

2. Check:
   • tire
   • front wheel
   Damage/wear → Replace.
   Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.

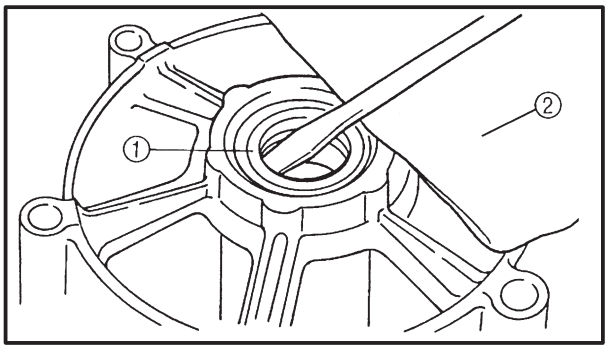


3. Measure:
   • radial wheel runout ①
   • lateral wheel runout ②
   Over the specified limits → Replace.

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



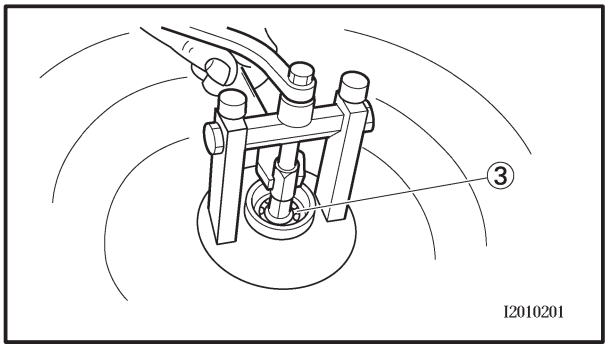
4. Check:
   • wheel bearings
   Front wheel turns roughly or is loose → Replace the wheel bearings.
   • oil seals
   Damage/wear → Replace.

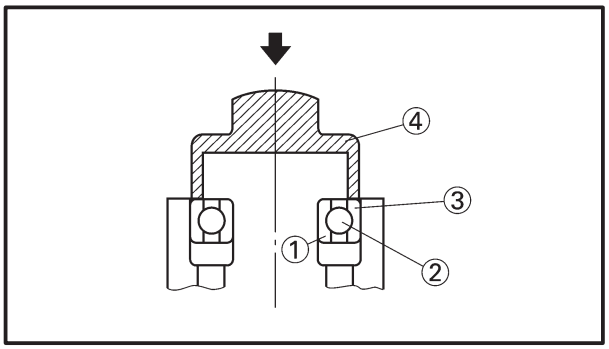


5. Replace:
   • wheel bearings New
   • oil seals New

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 ③ with a general bearing puller.
d. Install the new wheel bearings and oil seals in the reverse order of disassembly.

CAUTION:

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

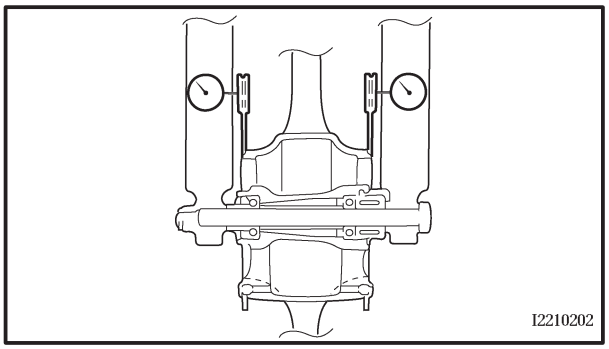
Use a socket ④ that matches the diameter of the wheel bearing outer race and oil seal.

EAS00531

CHECKING THE BRAKE DISCS

The following procedure applies to all of the brake discs.

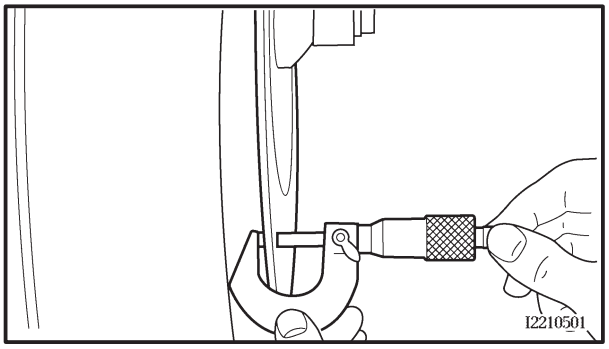
1. Check:
   - brake disc
     Damage/galling → Replace.

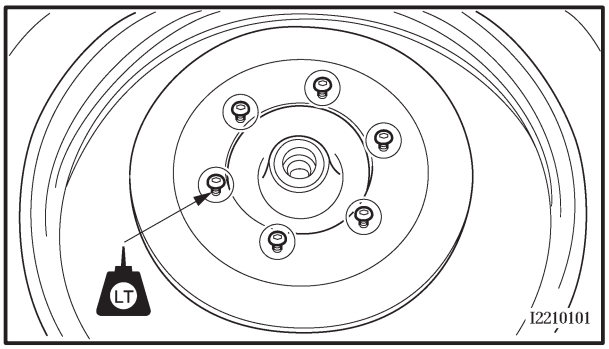


2. Measure:
   - brake disc deflection
     Out of specification → Correct the brake disc deflection or replace the brake disc.

Brake disc deflection limit (maximum)
Front: 0.1 mm (0.004 in)
Rear: 0.15 mm (0.006 in)

a. Place the motorcycle on a suitable stand so that the 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 2 ~ 3 mm (0.08 ~ 0.12 in) below the edge of the brake disc.





3. Measure:
   • brake disc thickness
   Measure the brake disc thickness at a few different locations.
   Out of specification → Replace.

Brake disc thickness limit (minimum)
Front: 4.5 mm (0.18 in)
Rear: 4.5 mm (0.18 in)

4. Adjust:
   • brake disc deflection

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the brake disc.
b. Rotate 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
18 Nm (1.8 m•kg, 13 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.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00545

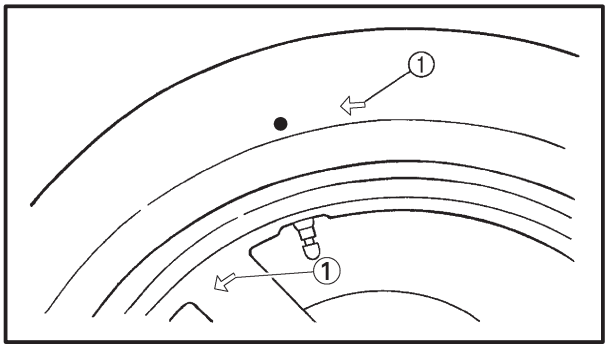
INSTALLING THE FRONT WHEEL

The following procedure applies to both brake discs.

1. Lubricate:
   • wheel axle
   • oil seal lips

Recommended lubricant
Lithium-soap-based grease

2. Lift the wheel up between the fork legs.



3. Insert the wheel axle.

NOTE:

Install the tire and wheel with the mark ① pointing in the direction of wheel rotation.

4. Lower the front wheel so that it is on the ground.
5. Tighten:
   - wheel axle — **72 Nm (7.2 m•kg, 52 ft•lb)**
   - wheel axle pinch bolt — **23 Nm (2.3 m•kg, 17 ft•lb)**

CAUTION:

Before tightening the wheel axle pinch bolt, push down hard in the handlebar several times and check if the front fork rebounds smoothly.

6. Install:
   - brake calipers (left and right) — **40 Nm (4.0 m•kg, 29 ft•lb)**

NOTE:

Make sure that there is enough space between the brake pads before installing the brake calipers onto the brake discs.

7. Install:
   - brake hose holder — **10 Nm (1.0 m•kg, 7.2 ft•lb)**

⚠ WARNING

Make sure the brake hose is routed properly.

EAS00549

ADJUSTING THE FRONT WHEEL STATIC BALANCE

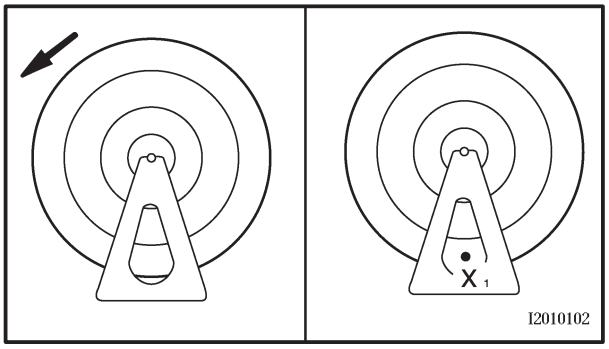
NOTE:

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

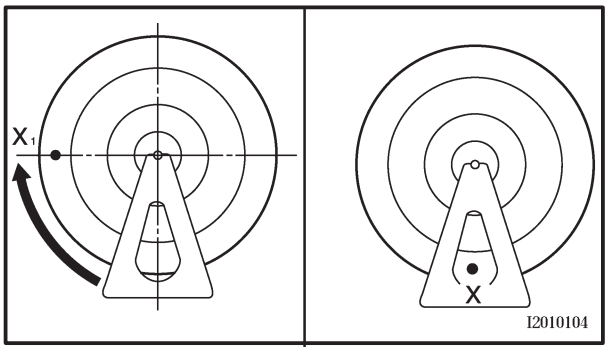
1. Remove:
   - balancing weight(s)
2. Find:
   - front wheel's heavy spot

NOTE:

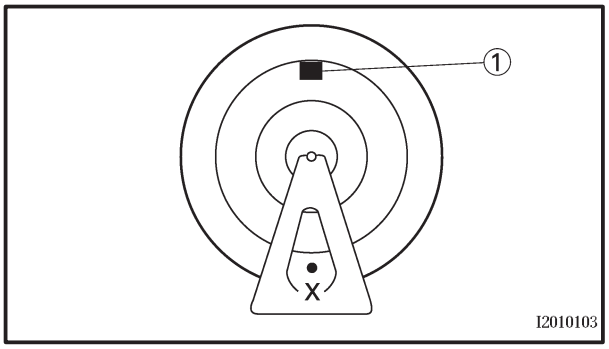
Place the front wheel on a suitable balancing stand.



a. Spin the front wheel.
b. When the front wheel stops, put an "X_1" mark at the bottom of the wheel.
c. Turn the front wheel 90° so that the "X_1" mark is positioned as shown.
d. Release the front wheel.
e. When the wheel stops, put an "X_2" mark at the bottom of the wheel.
f. Repeat steps (d) through (f) several times until all the marks come to rest at the same spot.
g. The spot where all the marks come to rest is the front wheel's heavy spot "X".



3. Adjust:
   • front wheel static balance

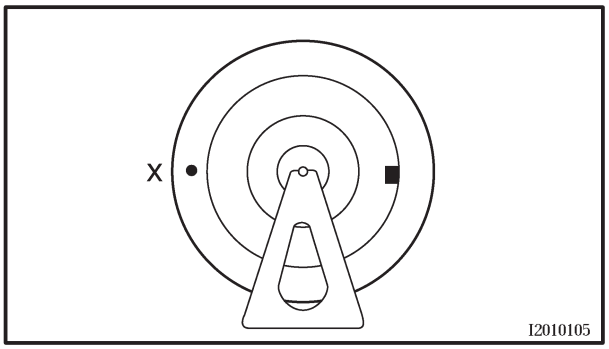


a. Install a balancing weight ① onto the rim exactly opposite the heavy spot "X".

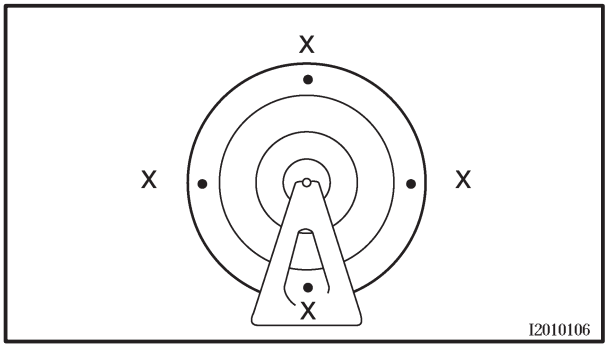
NOTE:

Start with the lightest weight.

b. Turn the front wheel 90° so that the heavy spot is positioned as shown.
c. If the heavy spot does not stay in that position, install a heavier weight.
d. Repeat steps (b) and (c) until the front wheel is balanced.



4. Check:
   • front wheel static balance

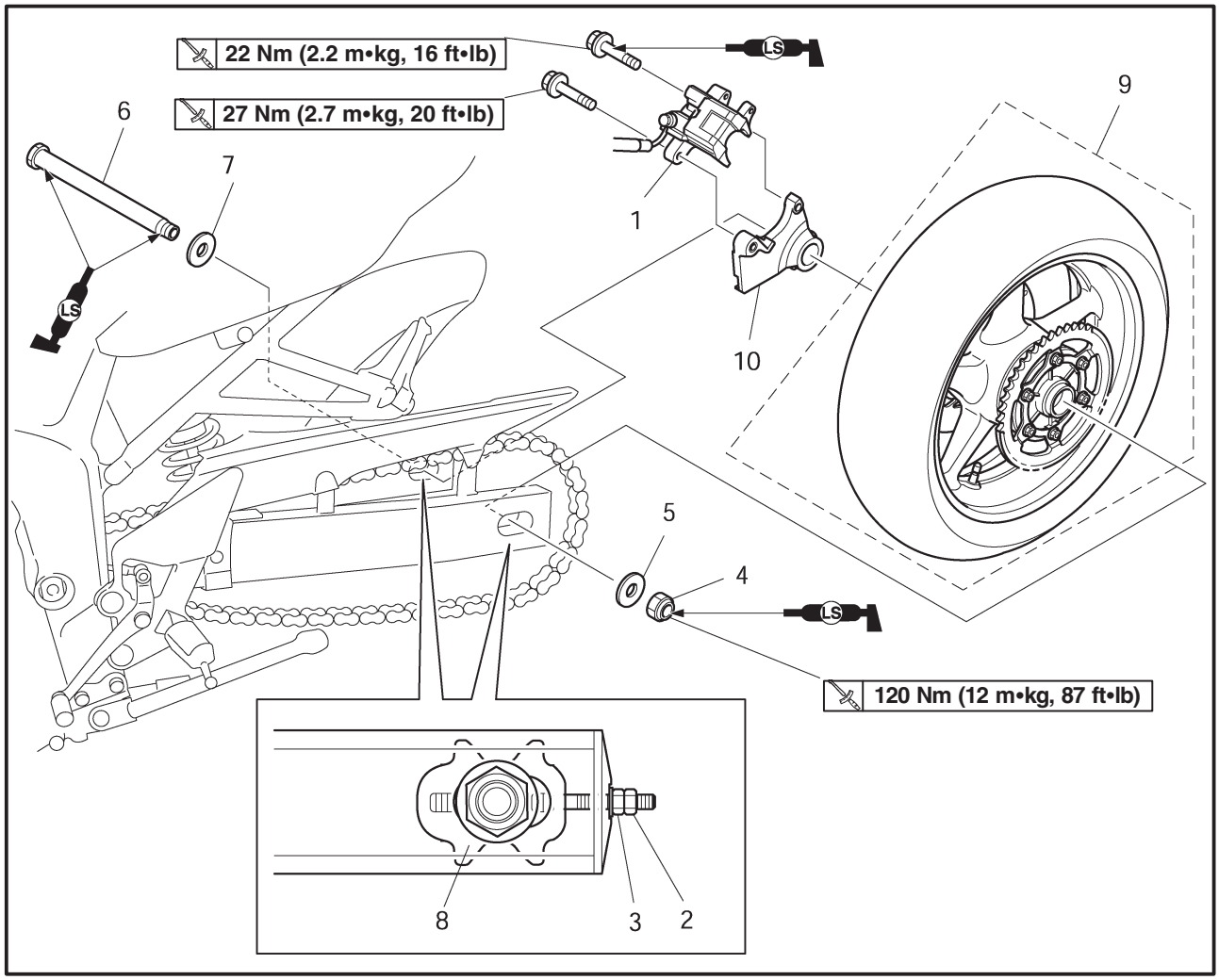


a. Turn the front wheel and make sure it stays at each position shown.
b. If the front wheel does not remain stationary at all of the positions, rebalance it.

EAS00551

REAR WHEEL AND BRAKE DISC

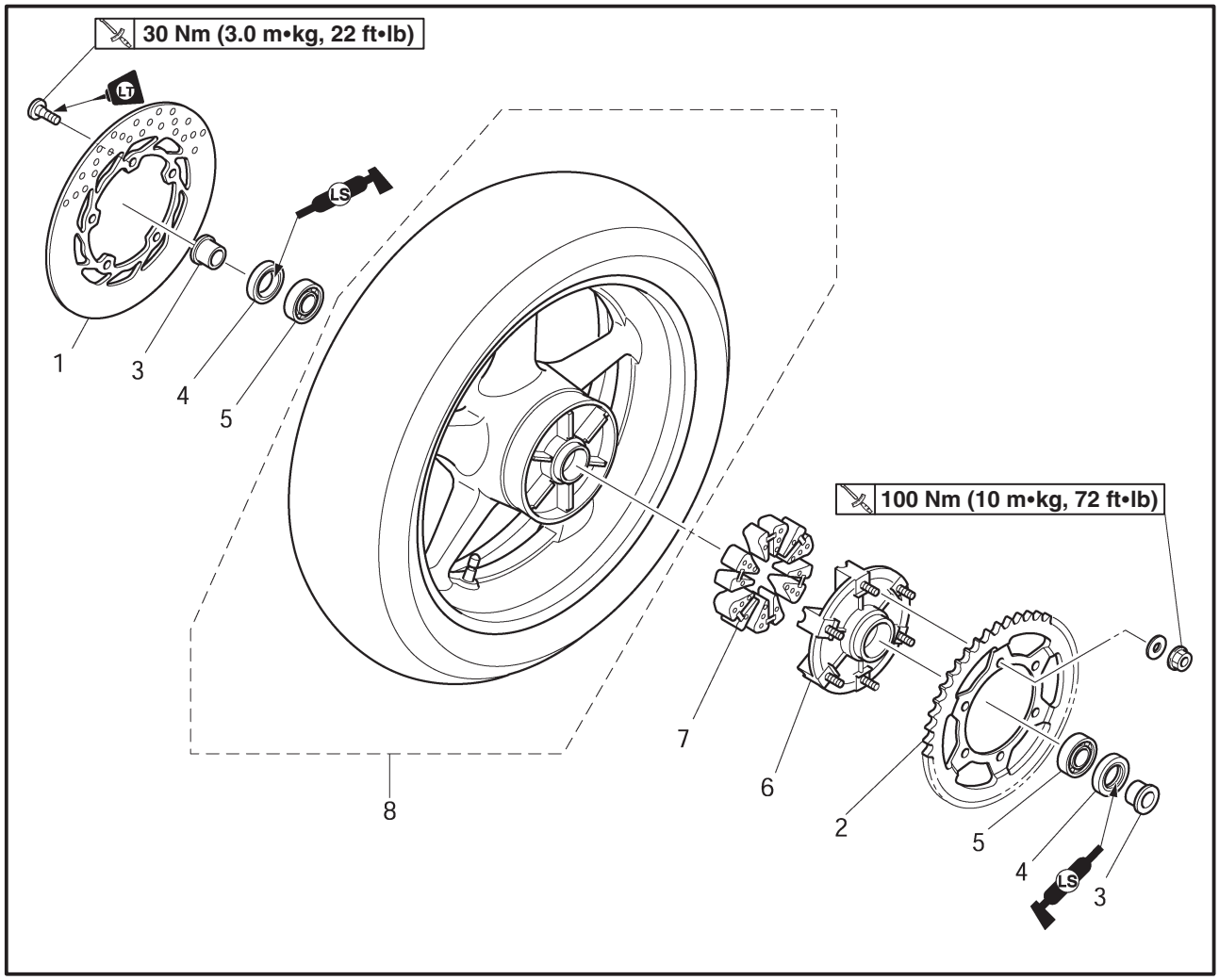
REAR WHEEL



Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel		Remove the parts in the order listed. **NOTE:** Place the motorcycle on a suitable stand so that the rear wheel is elevated.
1	Brake caliper	1	
2	Lock nut (left and right)	2	Loosen.
3	Adjusting nut (left and right)	2	Loosen.
4	Wheel axle nut	1	
5	Washer	1	
6	Rear wheel axle	1	
7	Washer	1	
8	Drive chain puller (left and right)	2	
9	Rear wheel	1	
10	Rear brake caliper bracket	1	
			For installation, reverse the removal procedure.

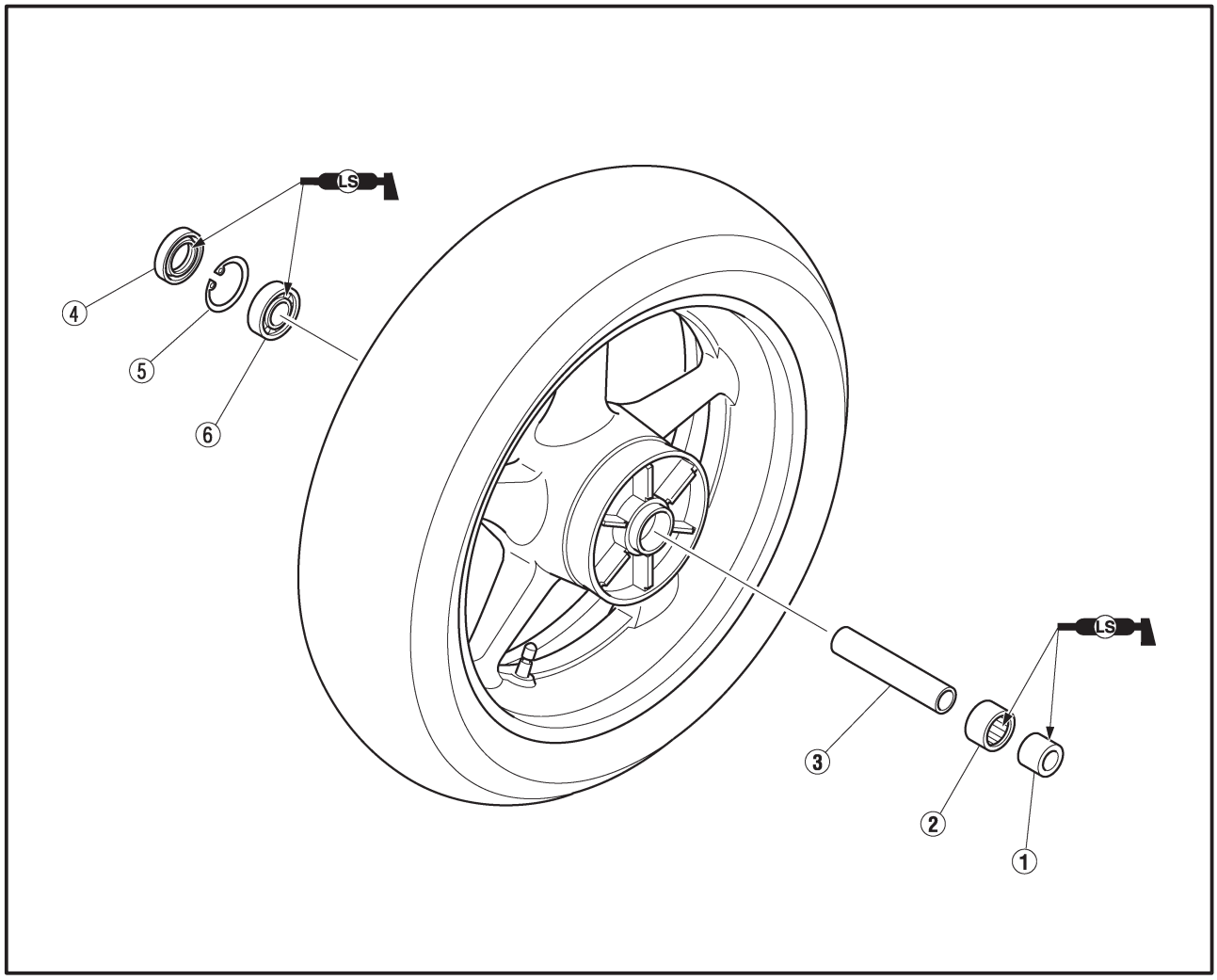
EAS00556

REAR BRAKE DISC AND REAR WHEEL SPROCKET



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake disc and rear wheel sprocket		Remove the parts in the order listed.
1	Rear brake disc	1	
2	Rear wheel sprocket	1	
3	Collar	2	
4	Oil seal	2	
5	Bearing	2	
6	Rear wheel drive hub	1	
7	Rear wheel drive hub damper	6	
8	Rear wheel	1	
			For installation, reverse the removal procedure.

EAS00560



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear wheel		Disassemble the parts in the order listed.
①	Collar	1	
②	Bearing	1	
③	Spacer	1	
④	Oil seal	1	
⑤	Circlip	1	
⑥	Bearing	1	
			For assembly, reverse the disassembly procedure.

EAS00561

REMOVING THE REAR WHEEL

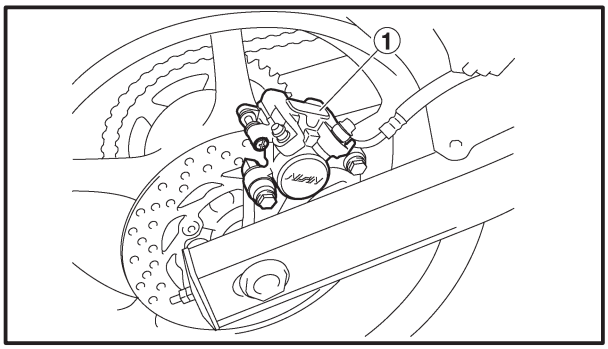
1. Stand the motorcycle on a level surface.

⚠ WARNING

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

NOTE:

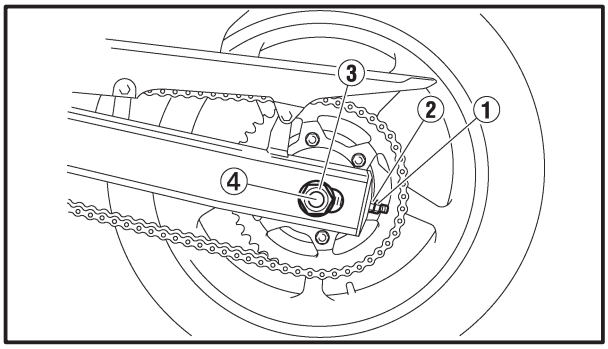
Place the motorcycle on a suitable stand so that the rear wheel is elevated.



2. Remove:
   - brake caliper ①

NOTE:

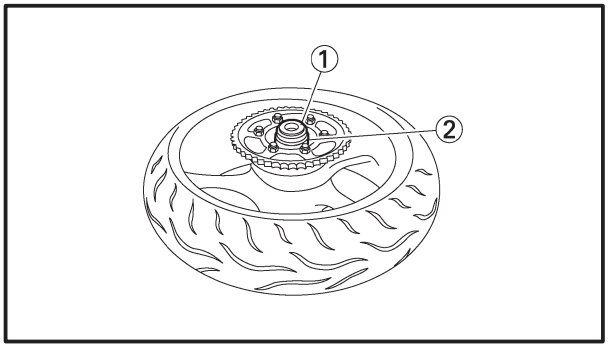
Do not depress the brake pedal when removing the brake caliper.



3. Loosen:
   - locknut ①
   - adjusting nut ②
4. Remove:
   - wheel axle nut ③
   - wheel axle ④
   - washer
   - rear wheel

NOTE:

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



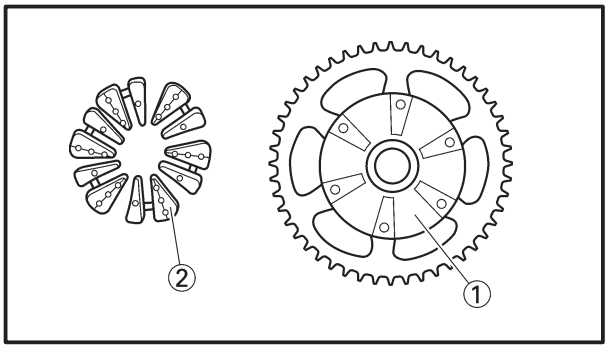
5. Remove:
   - left collar ①
   - rear wheel drive hub ②
   - rear wheel drive hub damper
   - right collar

EAS00565
CHECKING THE REAR WHEEL
1. Check:
   - wheel axle
   - rear wheel
   - wheel bearings
   - oil seals

   Refer to “CHECKING THE FRONT WHEEL”.
2. Check:
   - tire
   - rear wheel

   Damage/wear → Replace.
   Refer to “CHECKING THE TIRES” and “CHECKING THE WHEELS” in chapter 3.
3. Measure:
   - radial wheel runout
   - lateral wheel runout

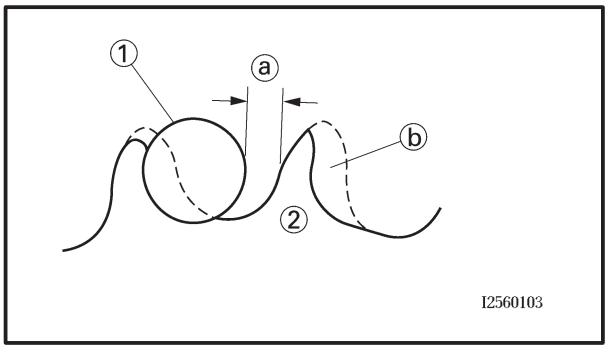
   Refer to “CHECKING THE FRONT WHEEL”.



EAS00567
CHECKING THE REAR WHEEL DRIVE HUB
1. Check:
   - rear wheel drive hub ①

     Cracks/damage → Replace.
   - rear wheel drive hub dampers ②

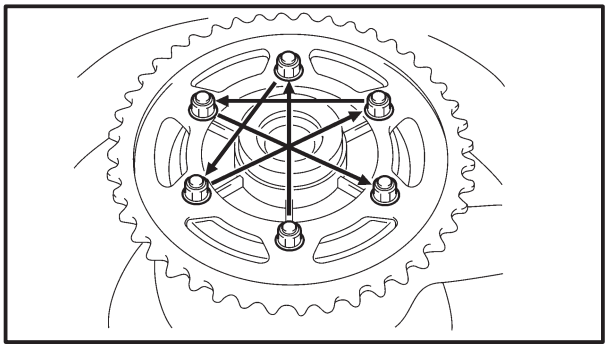
     Damage/wear → Replace.



EAS00568
CHECKING AND REPLACING THE REAR WHEEL SPROCKET
1. Check:
   - rear wheel sprocket

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

ⓑ Correct
① Drive chain roller
② Rear wheel sprocket



2. Replace:
   • rear wheel sprocket

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

Rear wheel sprocket self-locking nut
100 Nm (10 m•kg, 72 ft•lb)

NOTE:

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

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00572

INSTALLING THE REAR WHEEL

1. Lubricate:
   • wheel axle
   • wheel bearings
   • oil seal lips

Recommended lubricant
Lithium-soap-based grease

2. Install:
   • collars
   • rear brake caliper bracket
   • rear wheel
   • washer
   • rear wheel axle
3. Adjust:
   • drive chain slack

Drive drain slack
45 ~ 55 mm (1.77 ~ 2.17 in)

Refer to “ADJUSTING THE DRIVE CHAIN SLACK” in chapter 3.

4. Tighten:
   • wheel axle nut — **120 Nm (12 m•kg, 87 ft•lb)**
   • brake caliper bolts (front) — **27 Nm (2.7 m•kg, 20 ft•lb)**
   • brake caliper bolts (rear) — **22 Nm (2.2 m•kg, 16 ft•lb)**

EAS00575

ADJUSTING THE REAR WHEEL STATIC BALANCE

NOTE:

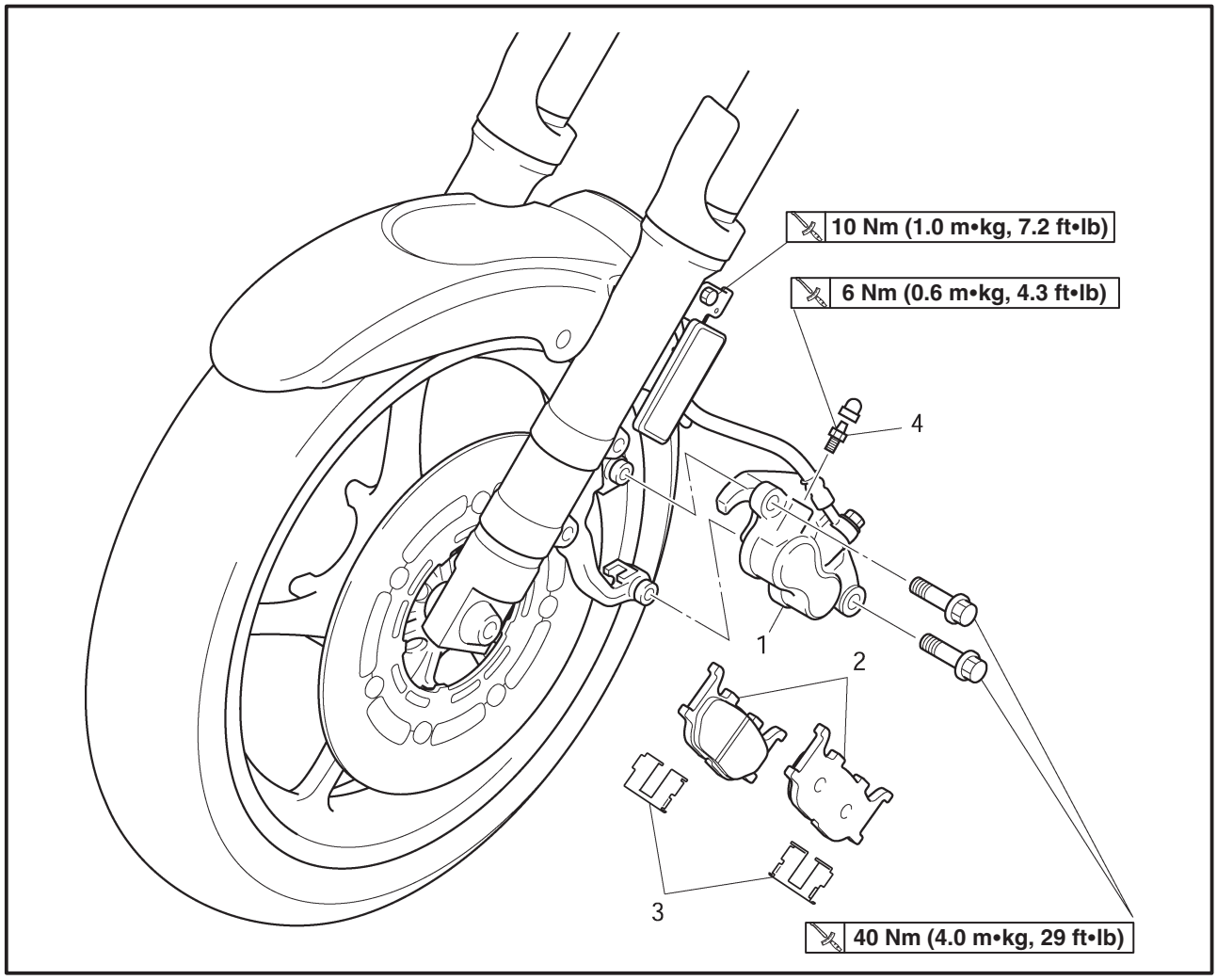
- After replacing the tire, wheel or both, the rear wheel static balance should be adjusted.
- Adjust the rear wheel static balance with the brake disc and rear wheel drive hub installed.

1. Adjust:
   - rear wheel static balance
     Refer to "ADJUSTING THE FRONT WHEEL STATIC BALANCE".

EAS00577

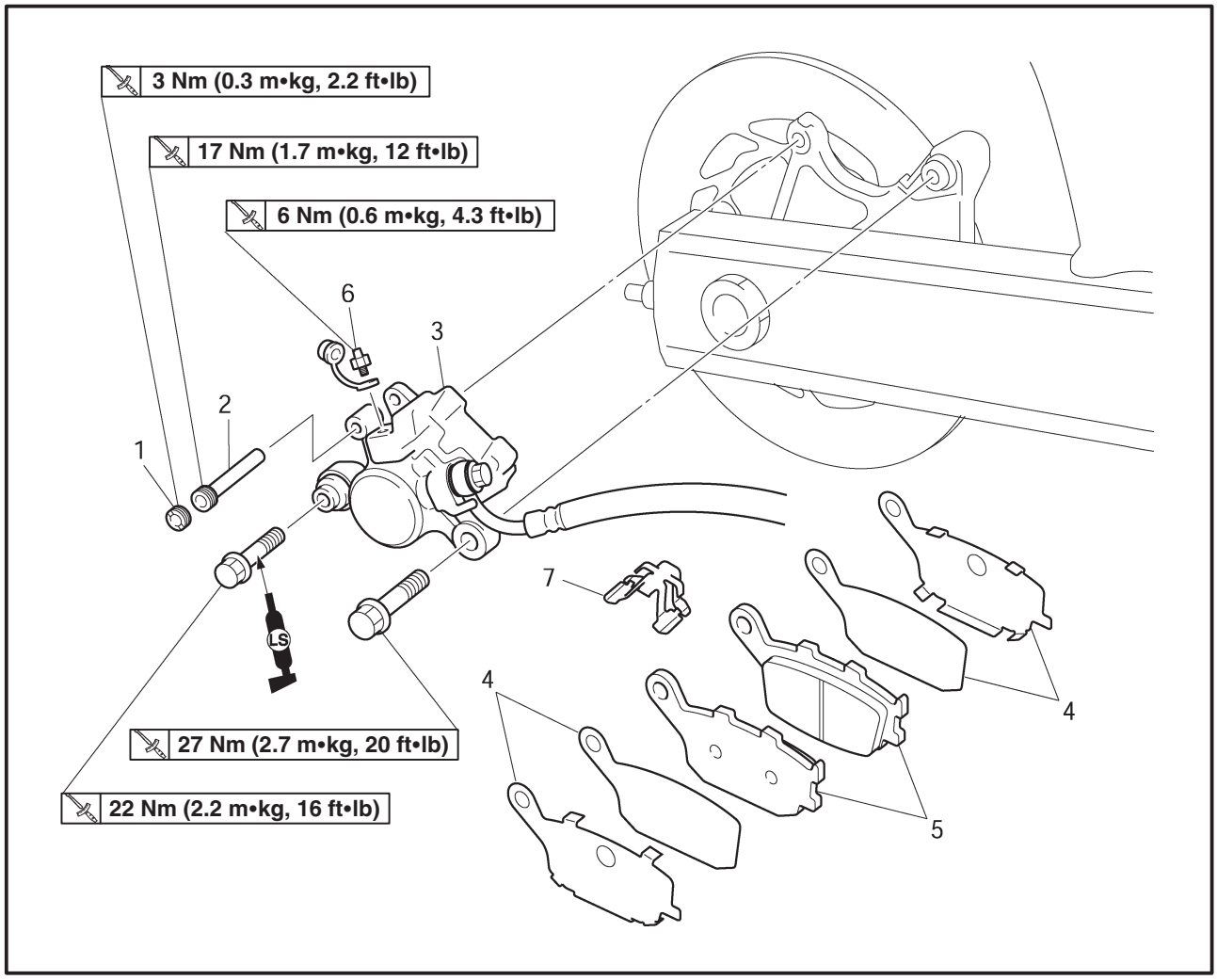
FRONT AND REAR BRAKES

FRONT BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		Remove the parts in the order listed. **NOTE:** The following procedure applies to both of the front brake calipers.
1	Front brake caliper	1	
2	Brake pad	2	
3	Brake pad spring	2	
4	Bleed screw	1	
			For installation, reverse the removal procedure.

REAR BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads.		Remove the parts in the order listed
1	Screw plug	1	
2	Brake pad pin	1	
3	Rear brake caliper	1	
4	Brake pad shim	4	
5	Brake pad	2	
6	Brake screw	1	
7	Brake pad spring	1	
			For installation, reverse the removal procedure.

EAS00579

CAUTION:

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

⚠ WARNING

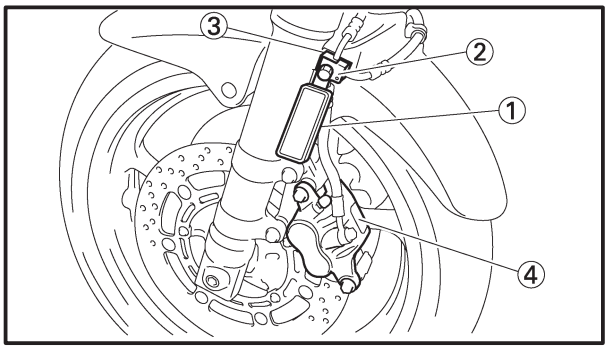
- **Never disassemble brake components unless absolutely necessary.**
- **If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.**
- **Never use solvents on internal brake components.**
- **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.**

EAS00582
REPLACING THE FRONT BRAKE PADS

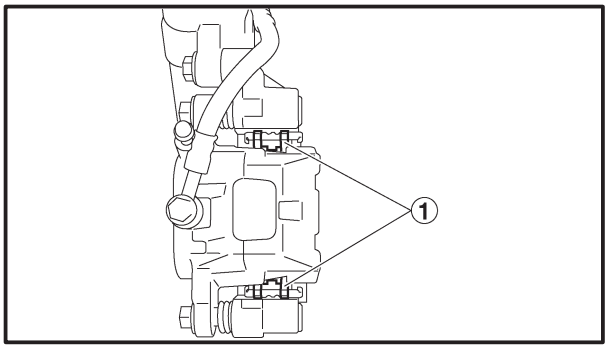
The following procedure applies to both brake calipers.

NOTE:

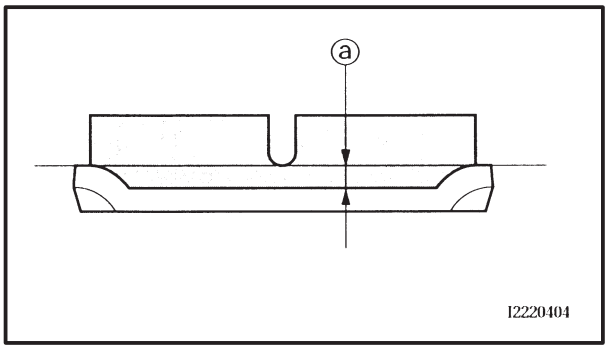
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.



1. Remove:
   - side reflector ①
   - side reflector bracket (left side only) ②
   - brake hose holder ③
   - brake caliper ④



2. Remove:
   - brake pads ①
     (along with the brake pad shims)
   - brake pad shims
     (onto the brake pads)
   - brake pad spring



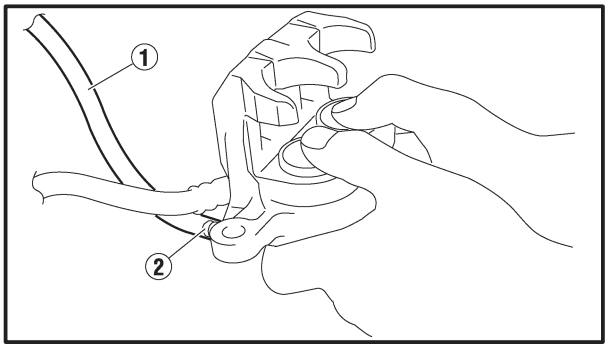
3. Measure:
   - brake pad wear limit ⓐ
     Out of specification → Replace the brake pads as a set.

Brake pad wear limit
0.8 mm (0.03 in)

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

NOTE:

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

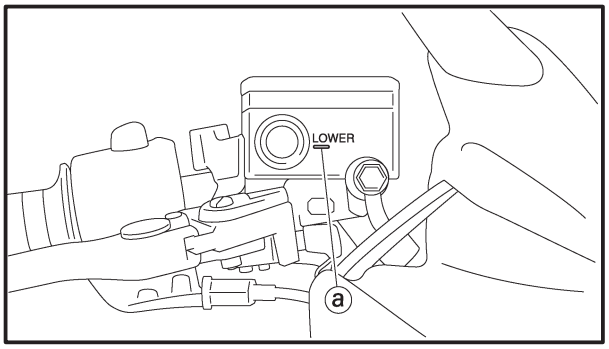


a. Connect a clear plastic hose ① tightly to the bleed screw ②. Put the other end of the hose into an open container.
b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
c. Tighten the bleed screw.

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

d. Install a new brake pad shim onto each new brake pad.

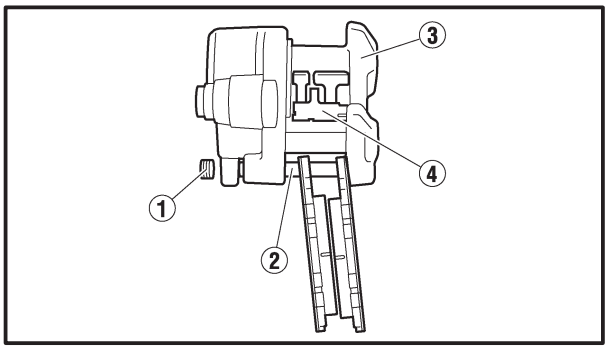
5. Install:
   • brake caliper — **40 Nm (4.0 m•kg, 29 ft•lb)**



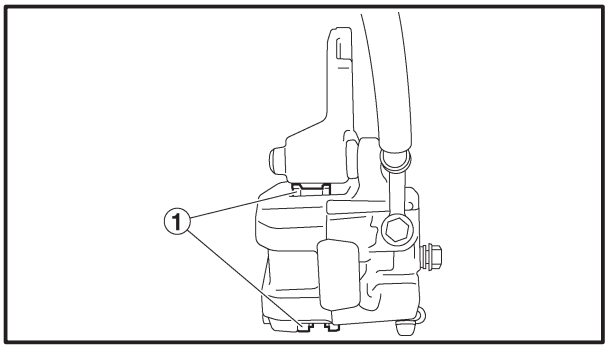
6. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
7. Check:
   • brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

EAS00583
REPLACING THE REAR BRAKE PADS

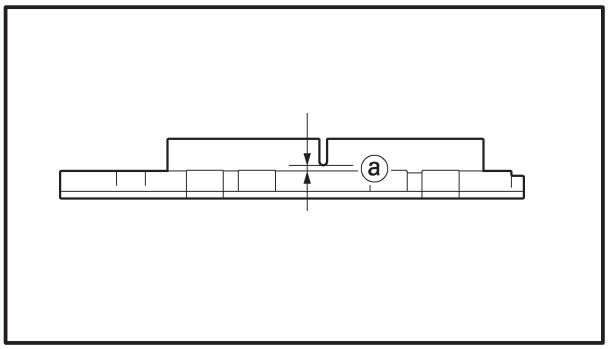
NOTE:
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.



1. Remove:
   - screw plug ①
   - brake pad pin ②
   - brake caliper ③
   - brake pad spring ④

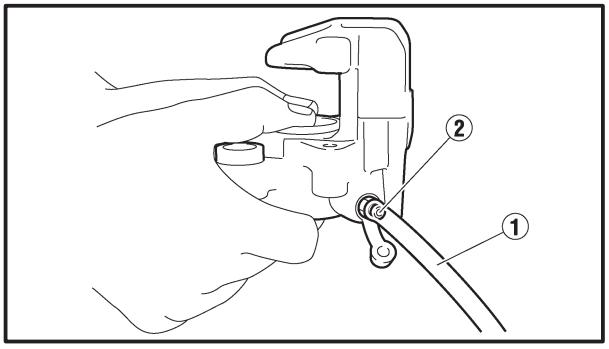


2. Remove:
   - brake pads ①
     (along with the brake pad shims)



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

Brake pad wear limit
1.0 mm (0.04 in)

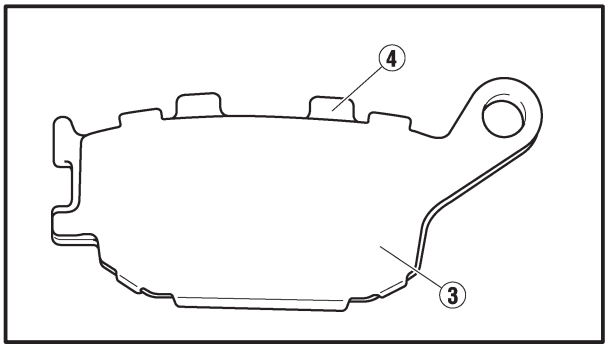


4. Install:
   - brake pad spring
   - brake pad shims
     (onto the brake pads)
   - brake pads

NOTE:
Always install new brake pads, brake pad shims, 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)**

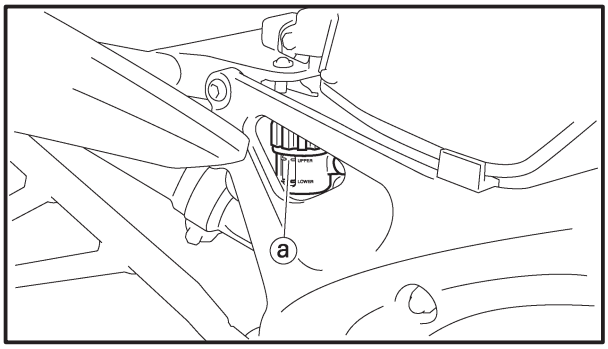
d. Install a new brake pad shim ③ onto each new brake pad ④.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

5. Install:
   - brake pad cover
   - brake caliper

(front)	**27 Nm (2.7 m•kg, 20 ft•lb)**
(rear)	**22 Nm (2.2 m•kg, 16 ft•lb)**

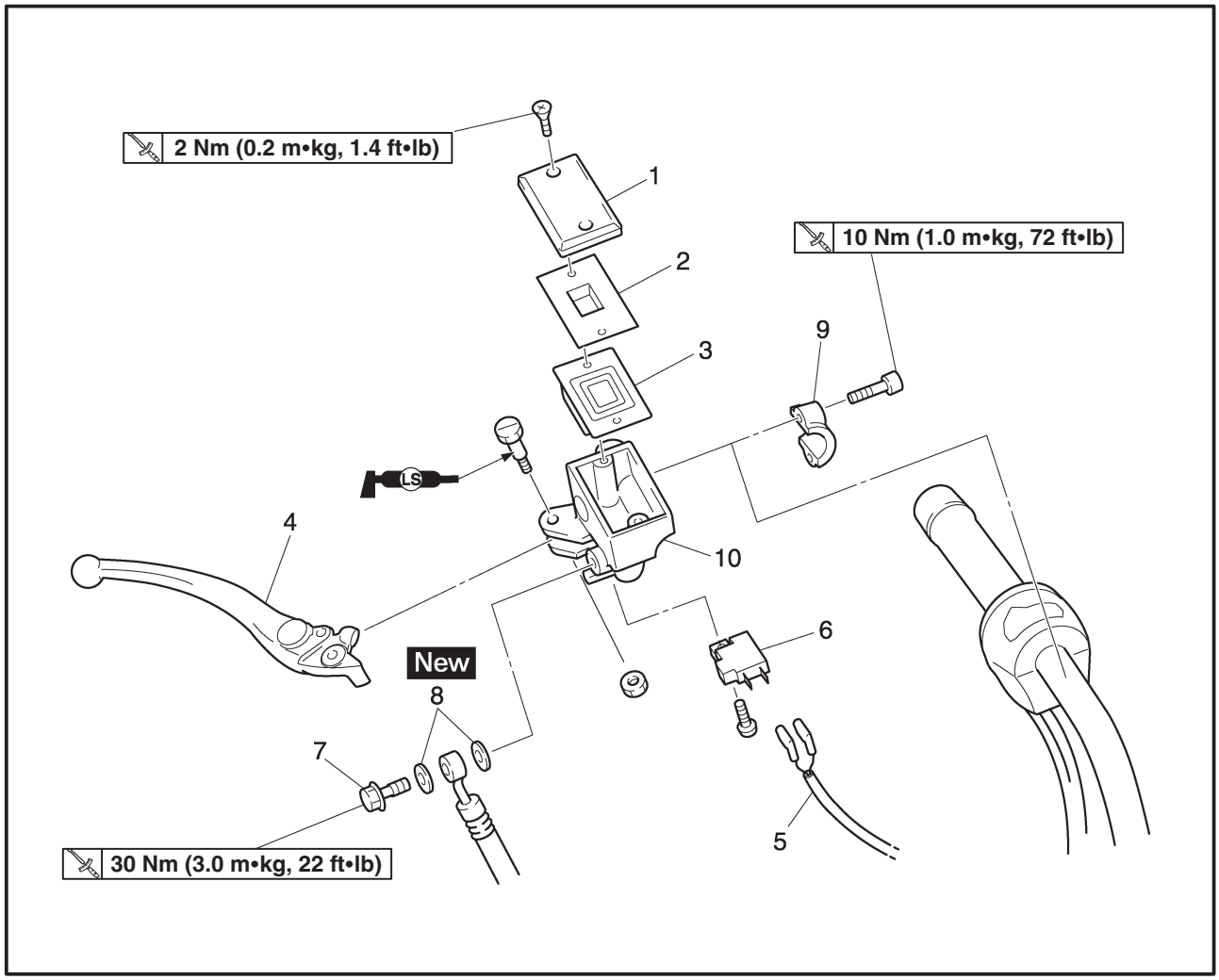
   - brake pad pin — **17 Nm (1.7 m•kg, 12 ft•lb)**
   - screw plug — **3 Nm (0.3 m•kg, 2.2 ft•lb)**



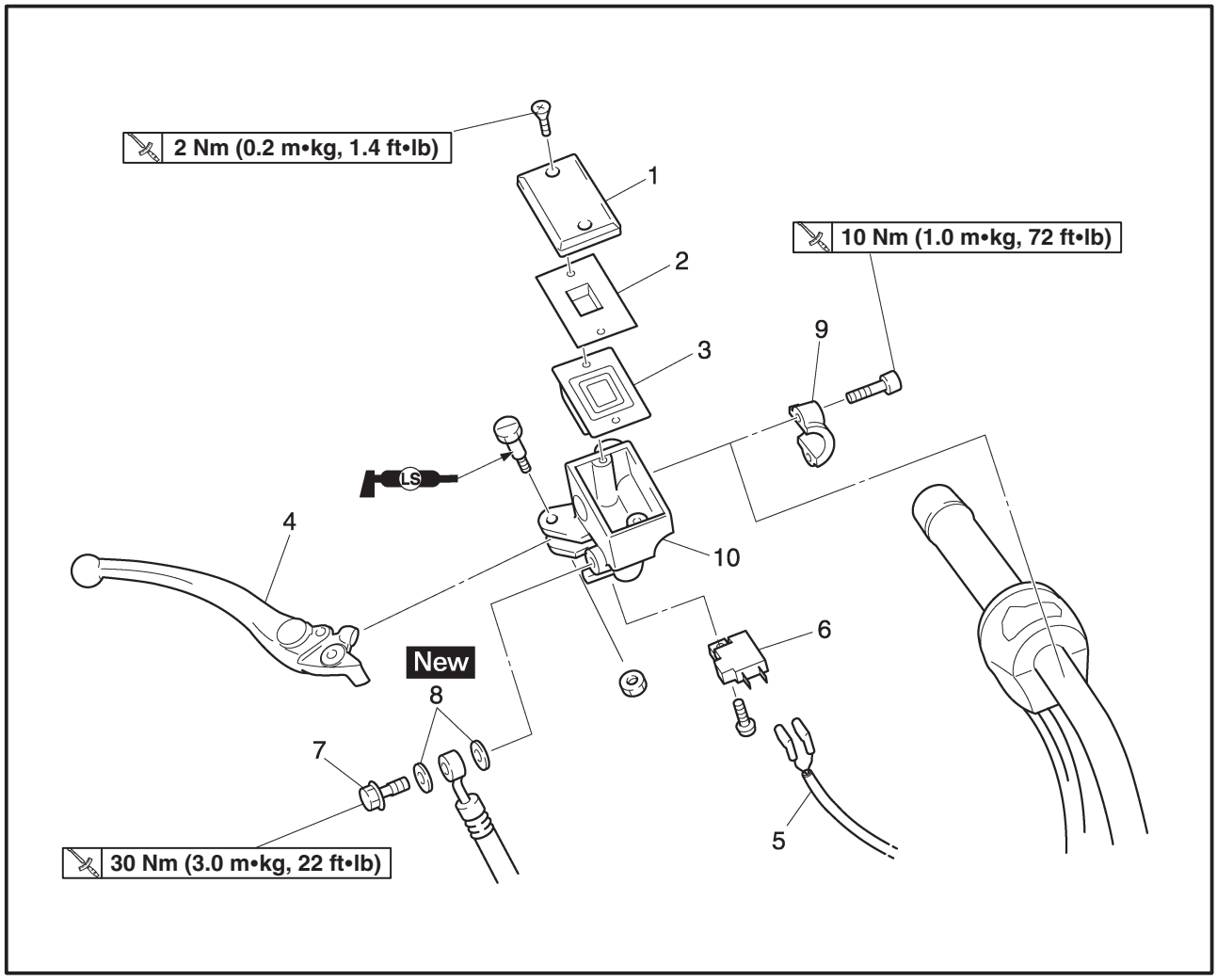
6. Check:
   - brake fluid level
     Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
     Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
7. Check:
   - brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

EAS00584

FRONT BRAKE MASTER CYLINDER

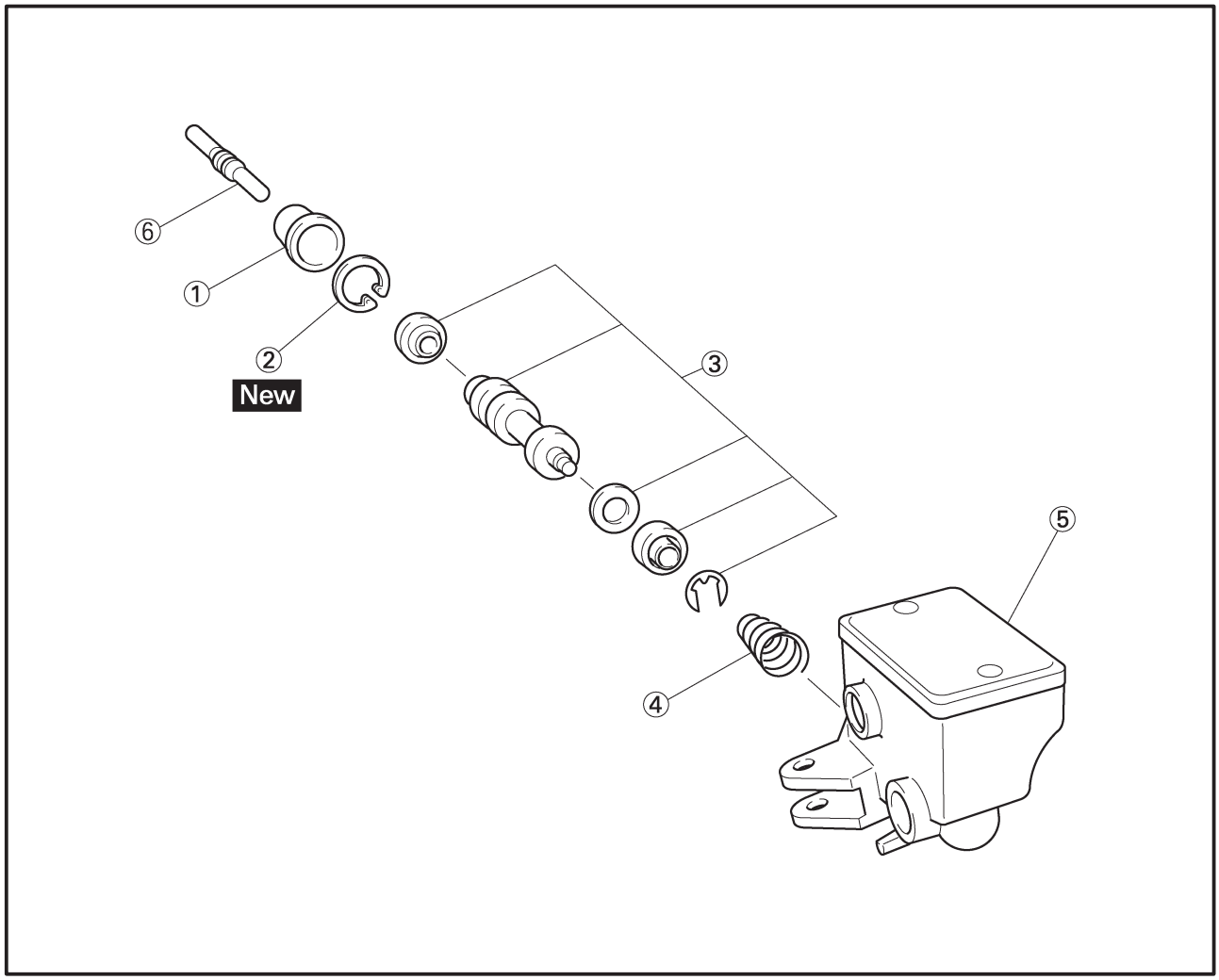


Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Brake master cylinder reservoir cap	1	
2	Brake master cylinder reservoir diaphragm holder	1	
3	Brake master cylinder reservoir diaphragm	1	
4	Brake lever	1	
5	Front brake light switch lead coupler	1	Disconnect.
6	Front brake light switch	1	
7	Union bolt	1	
8	Copper washer	2	
9	Master cylinder holder	1	



Order	Job/Part	Q'ty	Remarks
10	Master cylinder assembly	1	For installation, reverse the removal procedure.

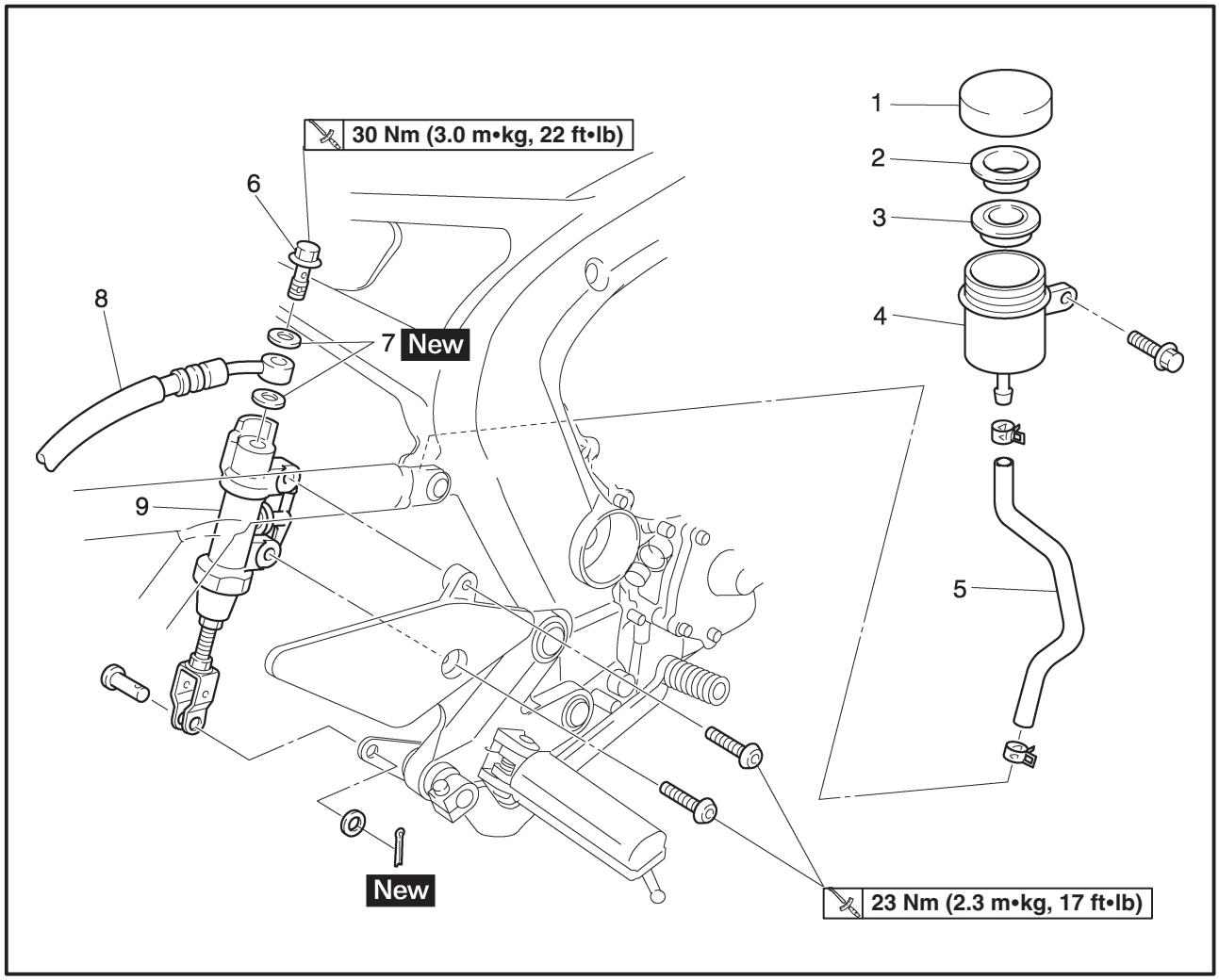
EAS00585



Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake master cylinder		Disassemble the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Master cylinder kit	1	
④	Spring	1	
⑤	Master cylinder	1	
⑥	Push rod	1	
			For assembly, reverse the disassembly procedure.

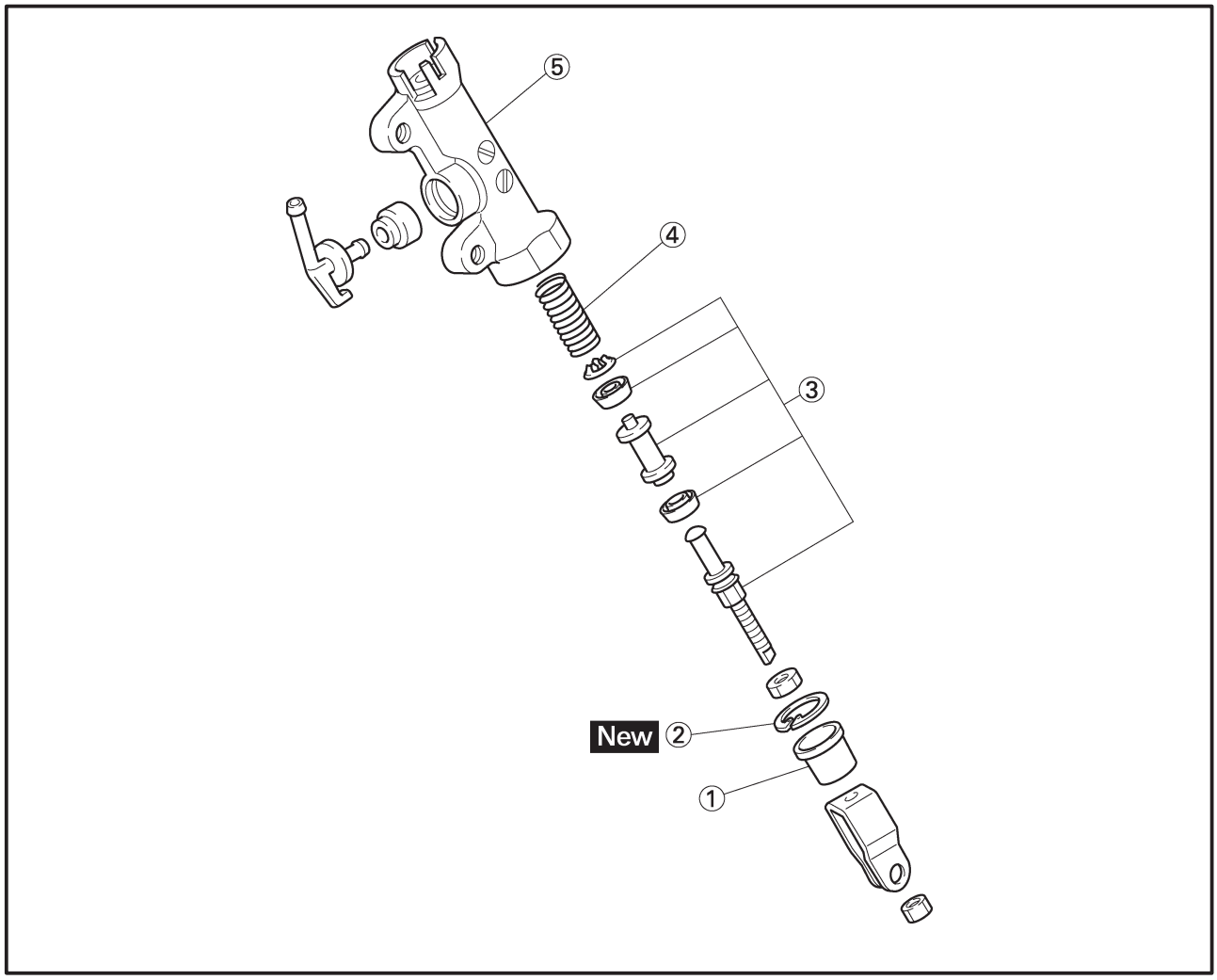
EAS00586

REAR BRAKE MASTER CYLINDER



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Brake fluid reservoir cap	1	
2	Rear brake fluid reservoir diaphragm holder	1	
3	Rear brake fluid reservoir diaphragm	1	
4	Brake fluid reservoir tank	1	
5	Brake fluid reservoir hose	1	
6	Union bolt	1	
7	Copper washer	1	
8	Brake hose	1	
9	Master cylinder assembly	1	
			For installation, reverse the removal procedure.

EAS00587

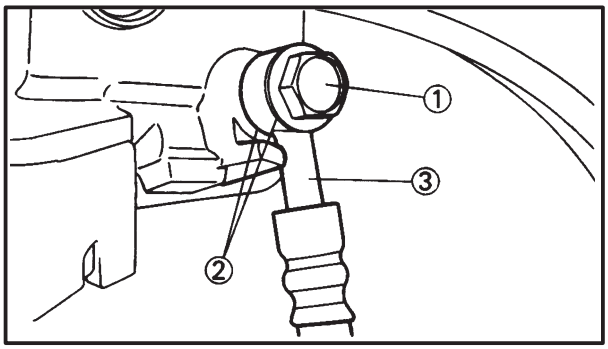


Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake master cylinder		Disassemble the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Master cylinder kit	1	
④	Spring	1	
⑤	Master cylinder body	1	
			For assembly, reverse the disassembly procedure.

EAS00588
DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

NOTE:

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

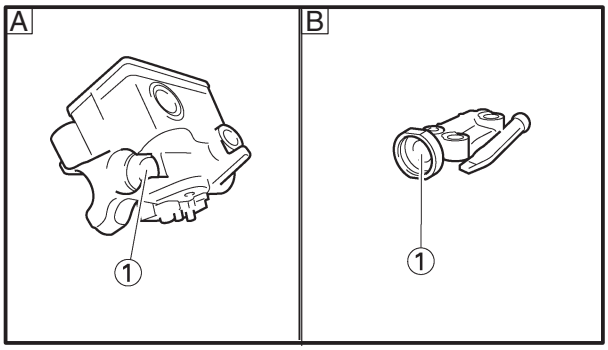


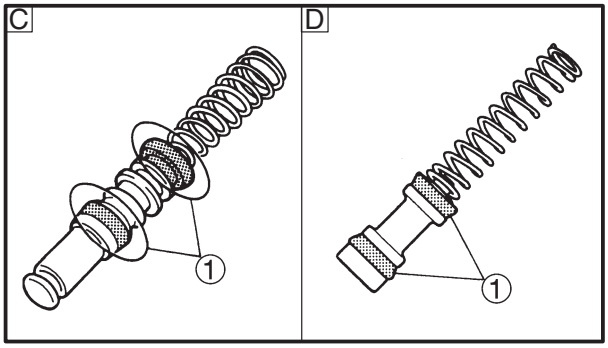
1. Disconnect:
   - brake light switch coupler ①
     (from the brake light switch)
2. Remove:
   - union bolt ①
   - copper washers ②
   - brake hoses ③

NOTE:

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

3. Remove:
   - brake lever
   - master cylinder bracket
   - master cylinder assembly
4. Remove:
   - circlip (from the master cylinder assembly)
   - master cylinder kit





EAS00592
CHECKING THE FRONT AND REAR BRAKE MASTER CYLINDERS

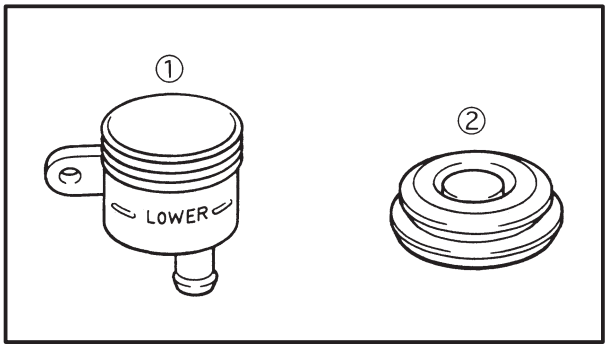
The following procedure applies to the both of the brake master cylinders.

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

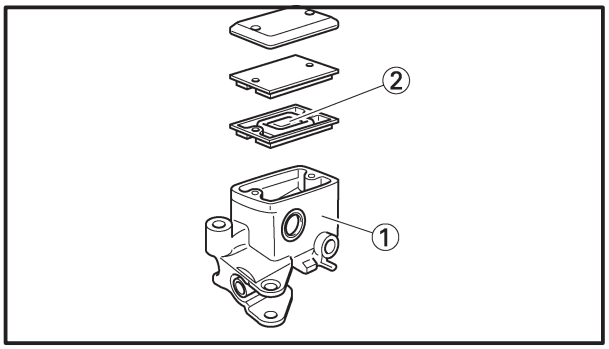
A Front
B Rear

2. Check:
   - brake master cylinder kit ①
     Damage/scratches/wear → Replace.

C Front
D Rear

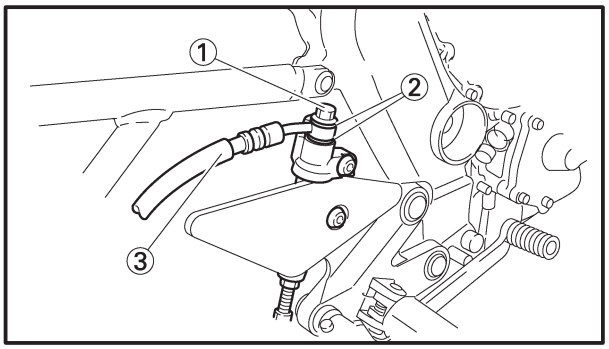


3. Check:
   • rear brake fluid reservoir ①
     Cracks/damage → Replace.
   • rear brake fluid reservoir diaphragm ②
     Cracks/damage → Replace.



4. Check:
   • front brake master cylinder reservoir ①
     Cracks/damage → Replace.
   • front brake master cylinder reservoir diaphragm ②
     Damage/wear → Replace.

5. Check:
   • brake hoses
     Cracks/damage/wear → Replace.
     Refer to "CHECKING THE FRONT AND REAR BRAKE HOSES" in chapter 3.



EAS00589

DISASSEMBLING THE REAR BRAKE MASTER CYLINDER

1. Remove:
   • union bolt ①
   • copper washers ②
   • brake hose ③

NOTE:

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

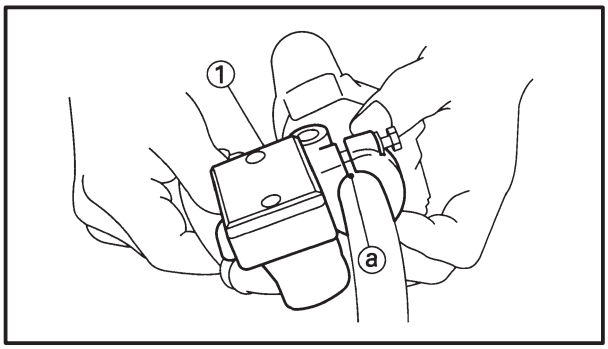
2. Disconnect:
   • brake fluid reservoir hose
3. Remove:
   • pin (from the brake pedal link)
4. Remove:
   • rear brake master cylinder assembly
5. Remove:
   • circlip (from the rear brake master cylinder assembly)
   • master cylinder kit

EAS00598

ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

⚠ 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.**

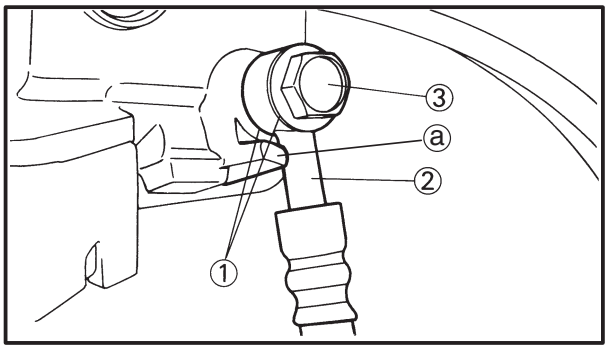


Recommended brake fluid
DOT 4

1. Install:
   - master cylinder kit
   - circlip New
   - brake master cylinder ①

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 ⓐ on the handlebar.
- First, tighten the upper bolt, then the lower bolt.



2. Install:
   - copper washers ① New
   - brake hose ②
   - union bolt ③

30 Nm (3.0 m•kg, 22 ft•lb)

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING" in chapter 2.

CAUTION:

When installing the brake hose onto the brake master cylinder, make sure that the brake pipe touches the projection ⓐ on the brake master cylinder.

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.

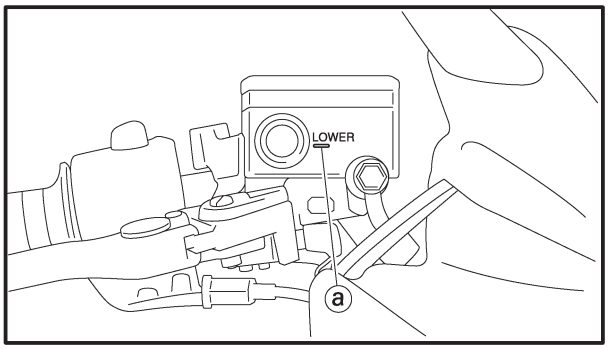
3. Fill:
   - brake master cylinder reservoir
     (with the specified amount of the recommended brake fluid)

Recommended brake fluid
DOT 4

⚠ 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.**

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" in chapter 3.
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" in chapter 3.
6. Check:
   - brake lever operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

EAS00608
ASSEMBLING THE REAR BRAKE MASTER CYLINDER

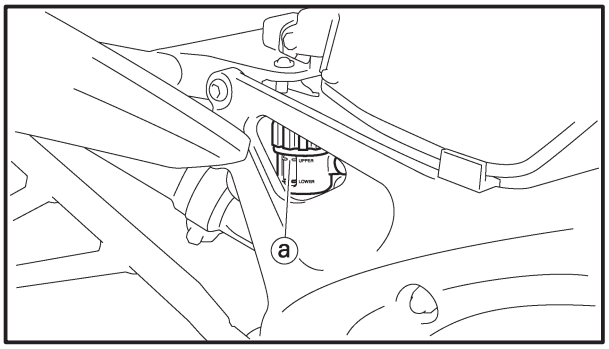
1. Install:
   - brake master cylinder kit
   - circlip
   - dust boot
2. Install:
   - copper washers New
   - brake hoses
   - union bolt — 30 Nm (3.0 m•kg, 22 ft•lb)

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING" in chapter 2.

CAUTION:

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



3. Fill:
   - brake fluid reservoir
     (to the maximum level mark ⓐ)

Recommended brake fluid
DOT 4

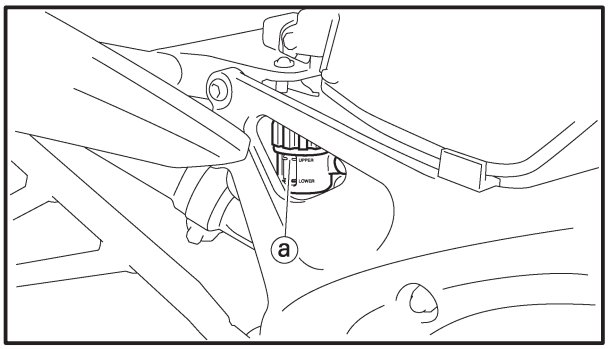
⚠ WARNING

- **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.**

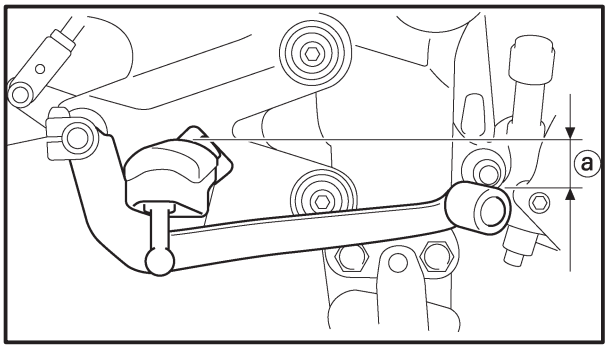
CAUTION:

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" in chapter 3.



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" in chapter 3.



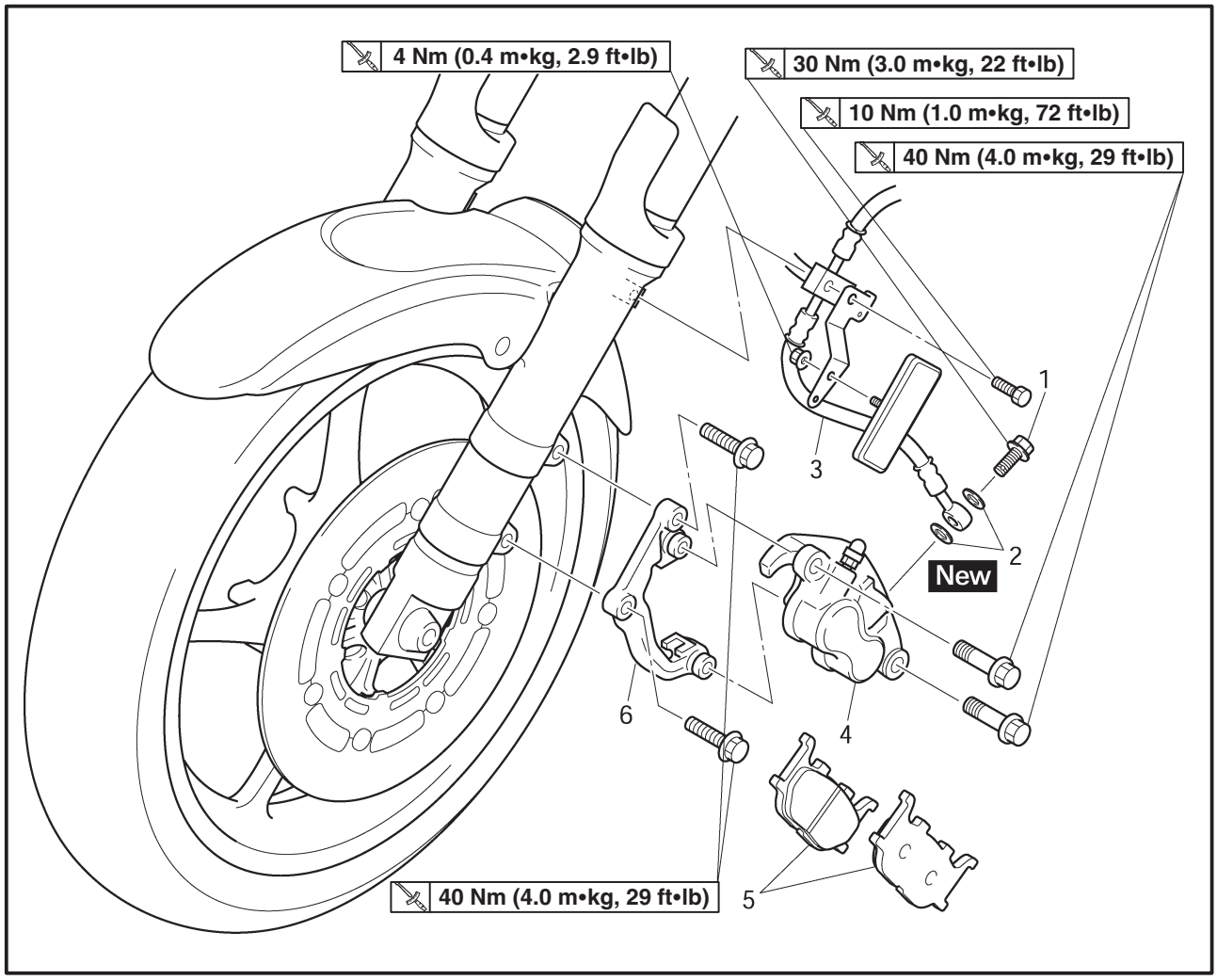
6. Adjust:
   • brake pedal position ⓐ
   Refer to "ADJUSTING THE REAR BRAKE" in chapter 3.

Brake pedal position (below the top of the rider footrest)
25.8 mm (1.02 in)

7. Adjust:
   • rear brake light operation timing
   Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH" in chapter 3.

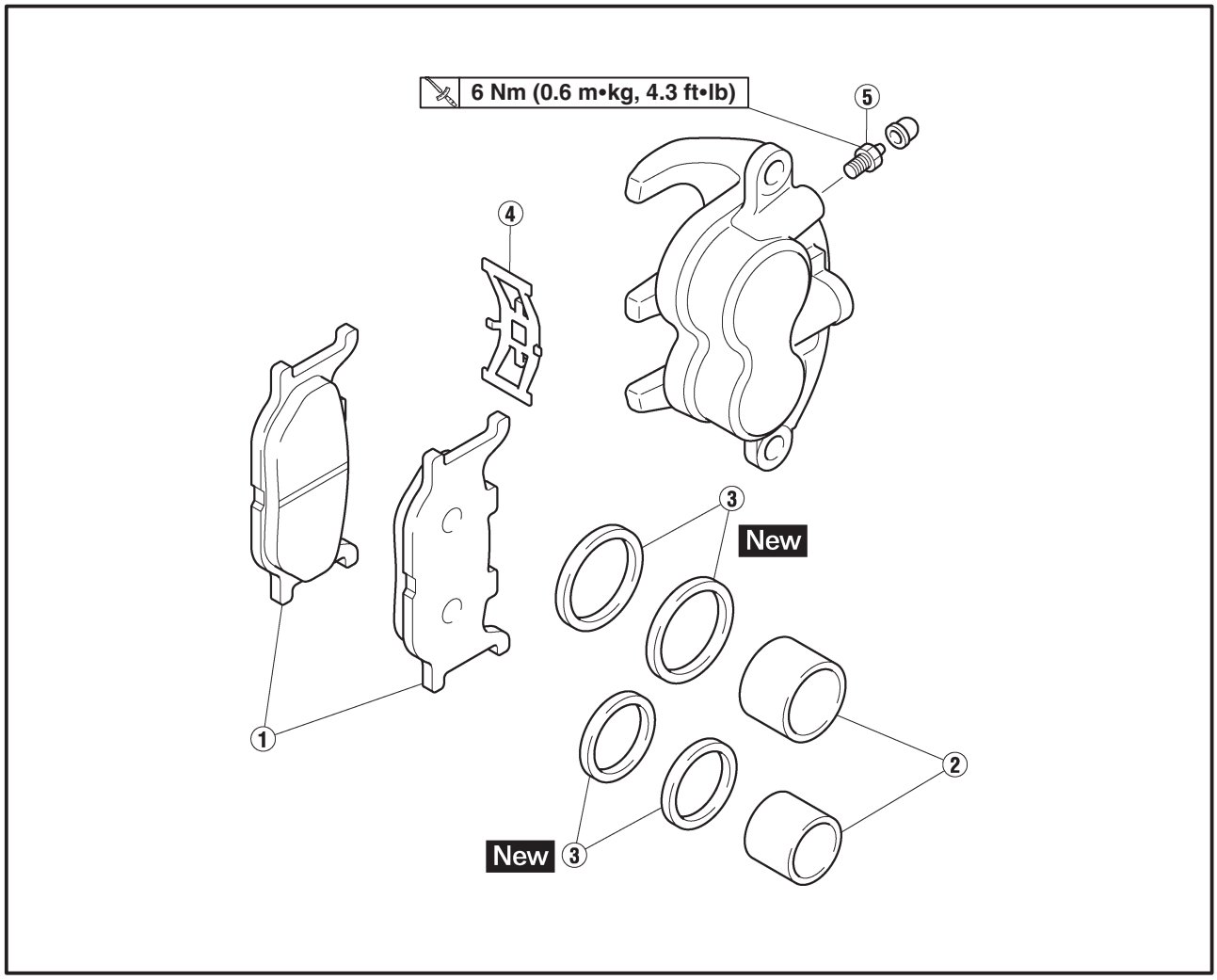
EAS00613

FRONT BRAKE CALIPERS



Order	Job/Part	Q'ty	Remarks
	Removing the front brake calipers		Remove the parts in the order listed. **NOTE:** The following procedure applies to both of the front brake calipers.
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Union bolt	1	
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper	1	
5	Brake pad	2	
6	Brake caliper bracket	1	
			For installation, reverse the removal procedure.

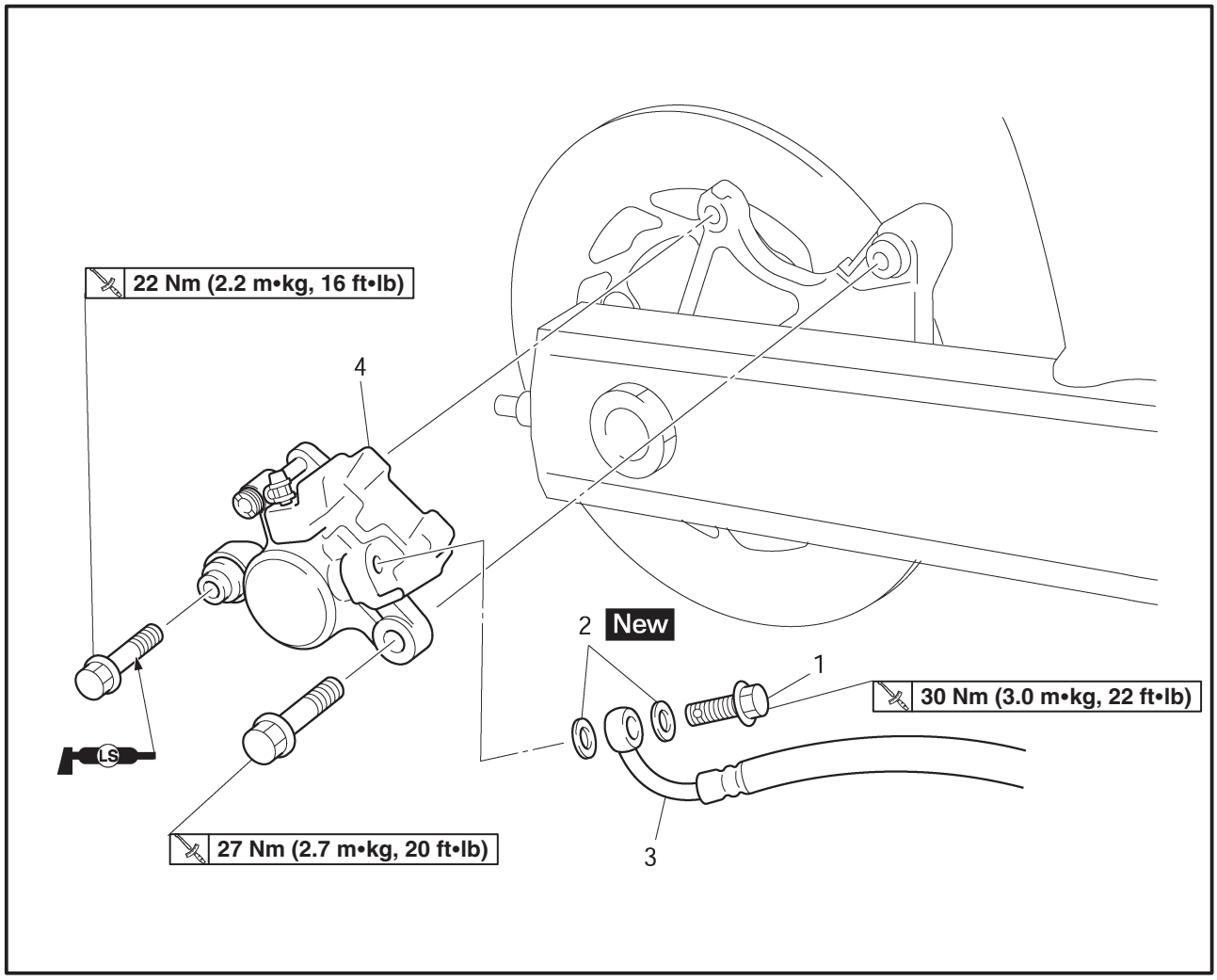
EAS00615



Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake calipers		Disassemble the parts in the order listed. **NOTE:** The following procedure applies to both of the front brake calipers.
①	Brake pad	2	
②	Brake caliper piston	2	
③	Brake caliper piston seal	4	
④	Brake pad spring	1	
⑤	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

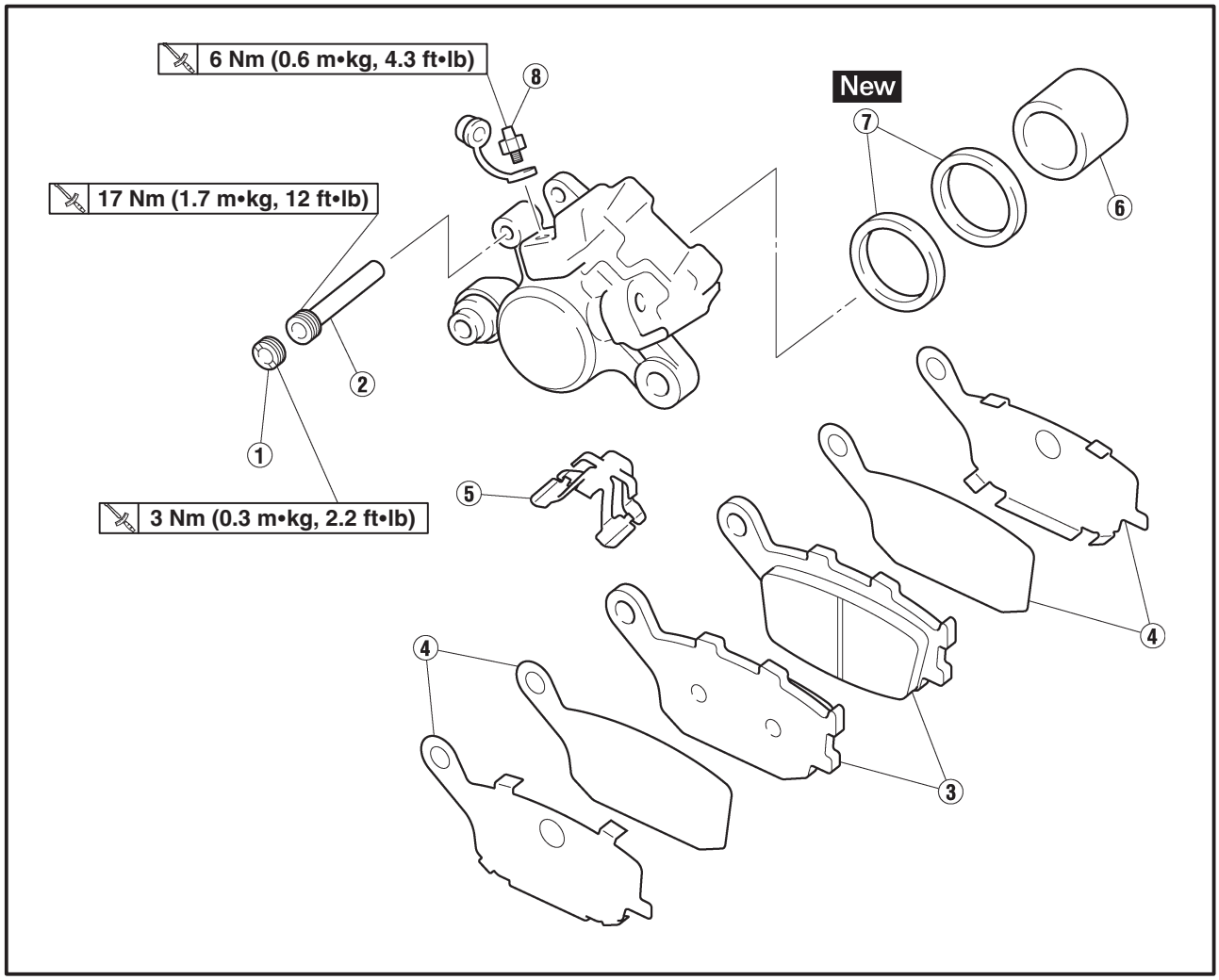
EAS00616

REAR BRAKE CALIPER



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake caliper Brake fluid		Remove the parts in the order listed. Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
1	Union bolt	1	
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper	1	
			For installation, reverse the removal procedure.

EAS00617



Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake caliper		Disassemble the parts in the order listed.
①	Screw plug	1	
②	Brake pad pin	1	
③	Brake pad	2	
④	Brake pad shim	4	
⑤	Brake pad spring	1	
⑥	Brake caliper piston	1	
⑦	Brake caliper piston seal	2	
⑧	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

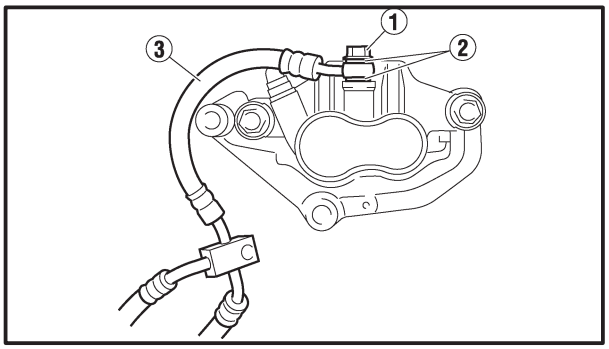
EAS00625

DISASSEMBLING THE FRONT BRAKE CALIPERS

The following procedure applies to both of the brake calipers.

NOTE:

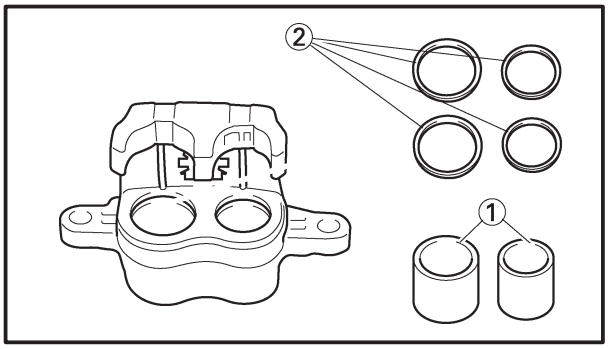
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.



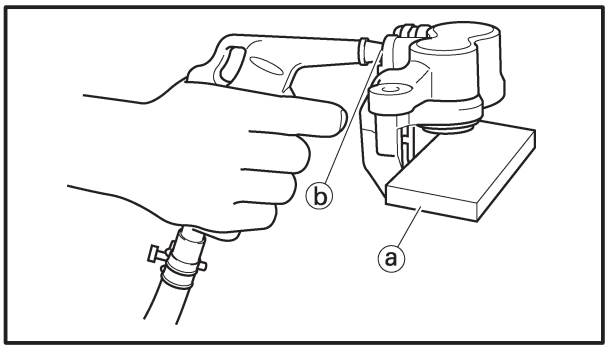
1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③

NOTE:

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



2. Remove:
   - brake caliper pistons ①
   - brake caliper piston seals ②



a. Secure the right side brake caliper pistons with a piece of wood ⓐ.
b. Blow compressed air into the brake hose joint opening ⓑ to force out the left side pistons from the brake caliper.

⚠ WARNING

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

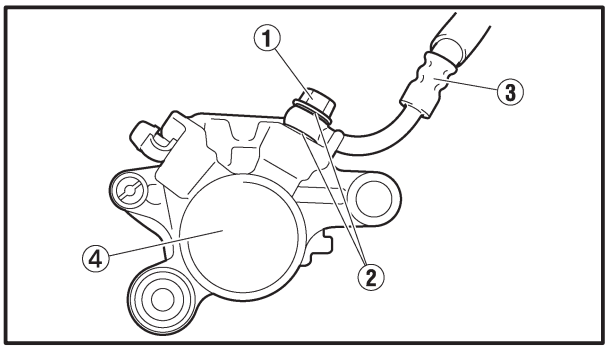
c. Remove the brake caliper piston seals.

EAS00627

DISASSEMBLING THE REAR BRAKE CALIPER

NOTE:

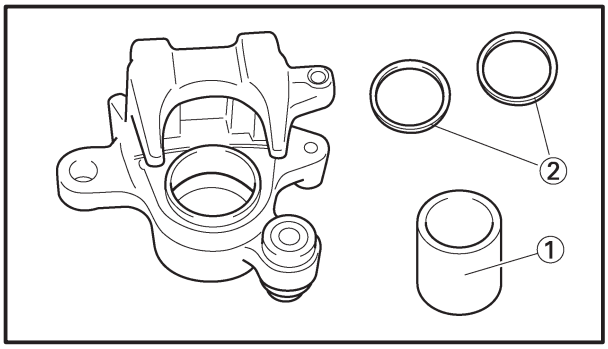
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.



1. Remove:
   - union bolt ①
   - copper washers ②
   - brake hose ③
   - brake caliper ④

NOTE:

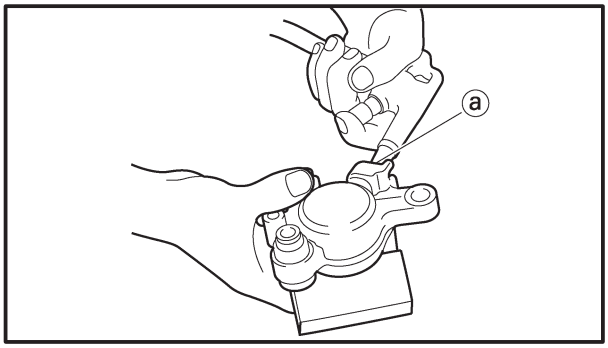
Put the end of the brake hose into a container and pump out the brake fluid carefully.



2. Remove:
   - brake caliper piston ①
   - brake caliper piston seals ②

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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



⚠ WARNING

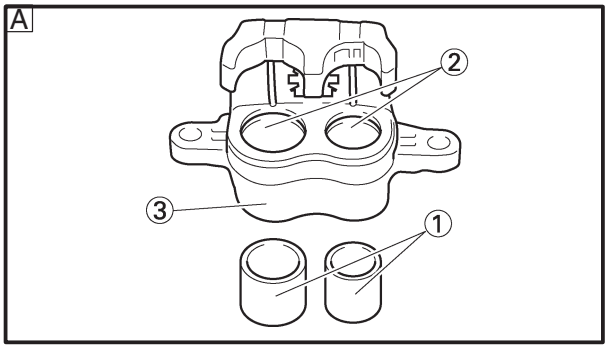
- **Cover the brake caliper piston with a rag. Be careful not to get injured when the pistons are expelled from the brake caliper.**
- **Never try to pry out the brake caliper pistons.**

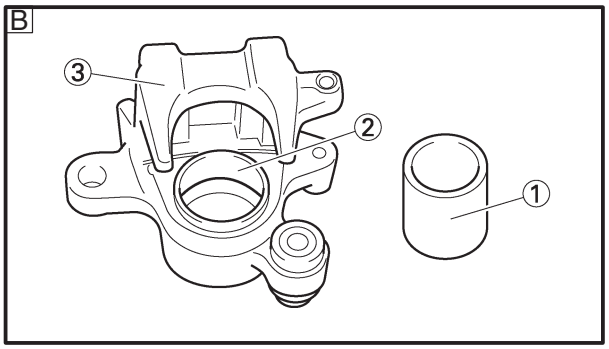
b. Remove the brake caliper piston seals.

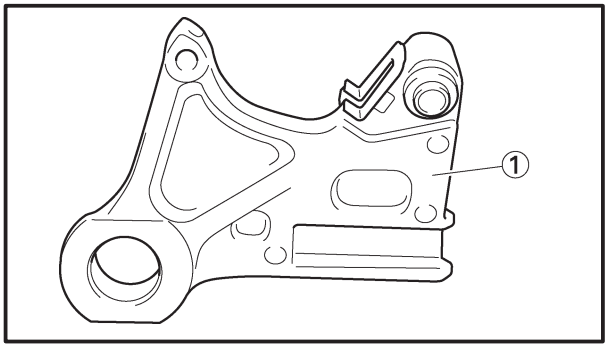
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00633
CHECKING THE FRONT AND REAR BRAKE CALIPERS

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.

⚠ WARNING

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

A Front
B Rear

2. Check:
   - Rear brake caliper brackets ①
     Cracks/damage → Replace.

EAS00638

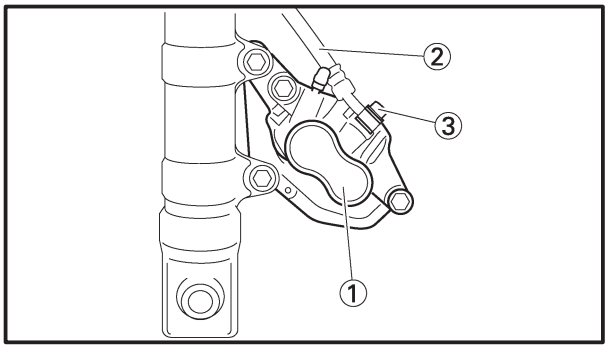
ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPERS

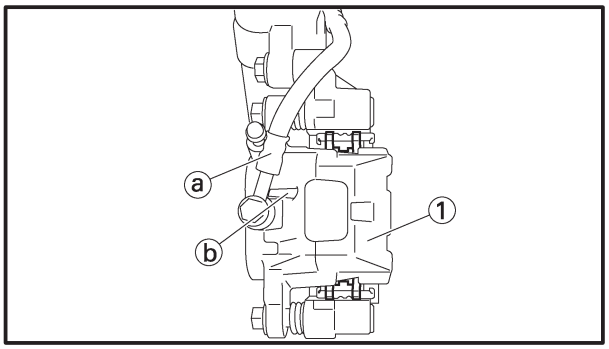
The following procedure applies to both of the brake calipers.

⚠ 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 brake fluid
DOT 4





1. Install:
   - brake caliper bracket — **22 Nm (2.2 m•kg, 16 ft•lb)**
   - brake pads
   - brake caliper ① — **40 Nm (4.0 m•kg, 29 ft•lb)**
   - copper washers — New
   - brake hose ②
   - union bolt ③ — **30 Nm (3.0 m•kg, 22 ft•lb)**

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING" in chapter 2.

CAUTION:

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

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

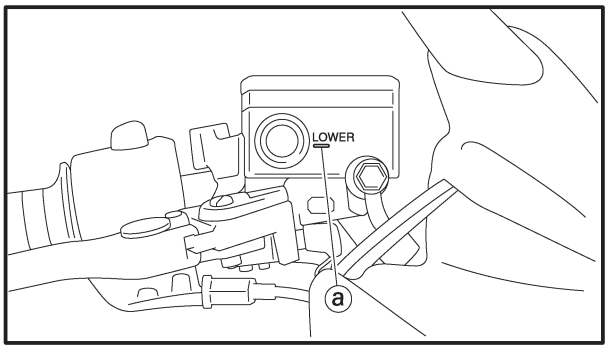
	Recommended brake fluid **DOT 4**

⚠ 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.**

CAUTION:

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



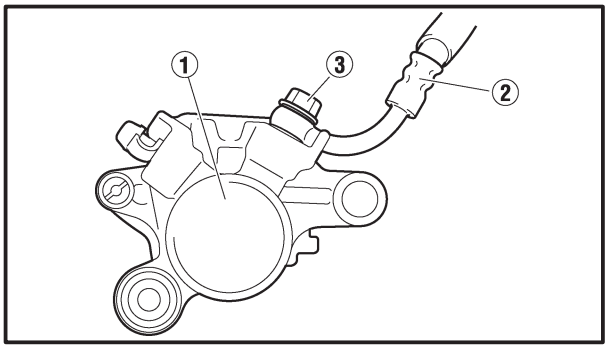
3. Bleed:
   • brake system
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
4. Check:
   • brake fluid level
   Below the minimum level mark ⓐ → Add the recommended brake fluid to the proper level.
   Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.
5. Check:
   • brake lever operation
   Soft or spongy feeling → Bleed the brake system.
   Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

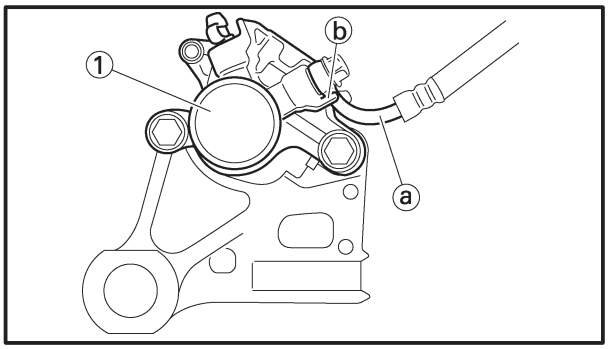
EAS00642
ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

⚠ 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 brake fluid
DOT 4





1. Install:
   - brake caliper ①
     (front) **27 Nm (2.7 m•kg, 20 ft•lb)**
     (rear) **22 Nm (2.2 m•kg, 16 ft•lb)**
   - brake pad pin
   - screw plug
   - copper washers New
   - brake hose ②
   - union bolt ③ **30 Nm (3.0 m•kg, 22 ft•lb)**

⚠ WARNING

Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".

CAUTION:

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

2. Fill:
   - brake fluid reservoir
     (with the specified amount of the recommended brake fluid)

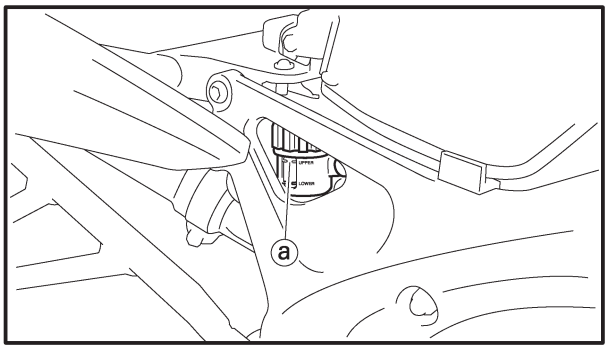
Recommended brake fluid
DOT 4

⚠ 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.**

CAUTION:

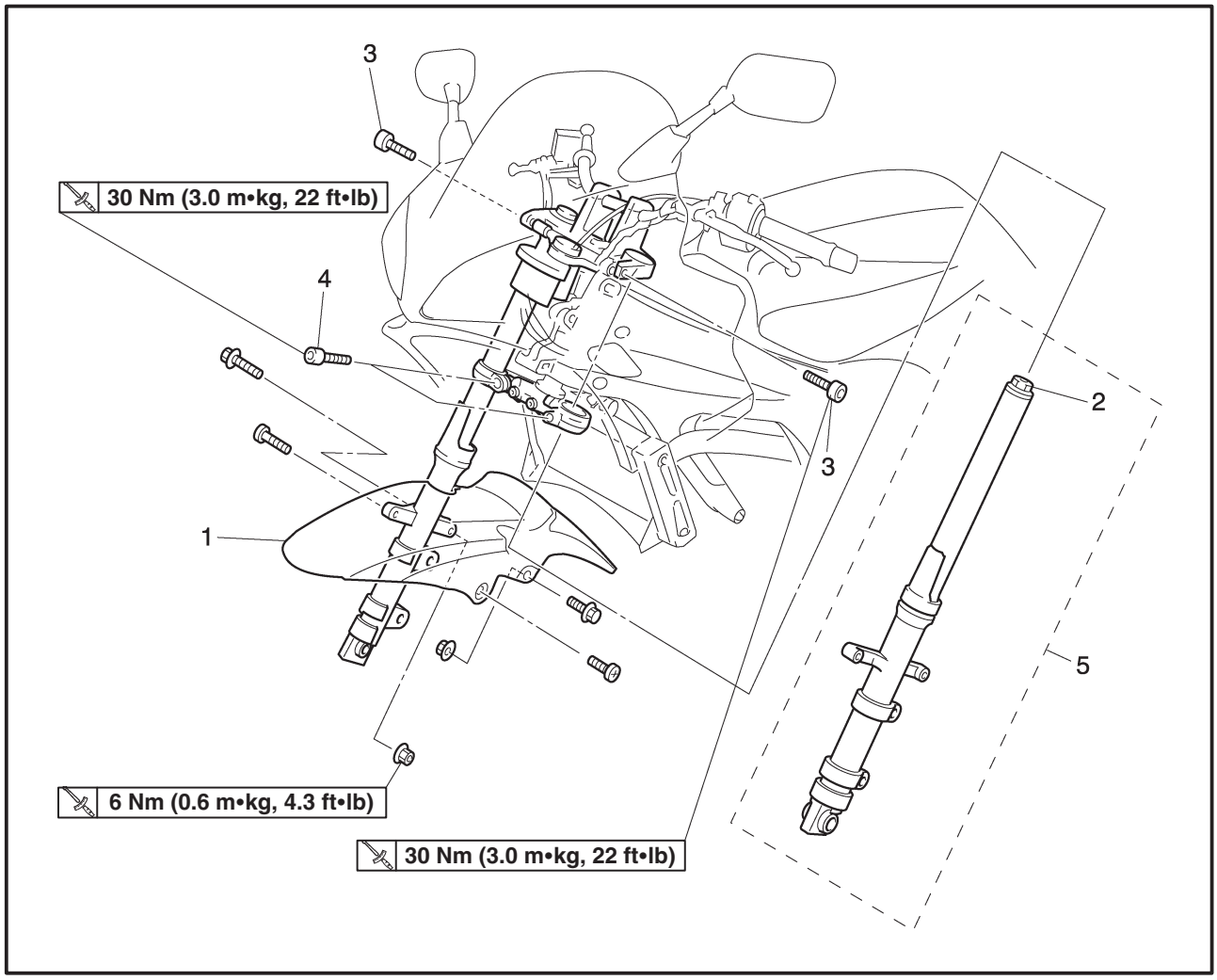
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.



3. Bleed:
   - brake system
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.
4. 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" in chapter 3.
5. Check:
   - brake pedal operation
     Soft or spongy feeling → Bleed the brake system.
     Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

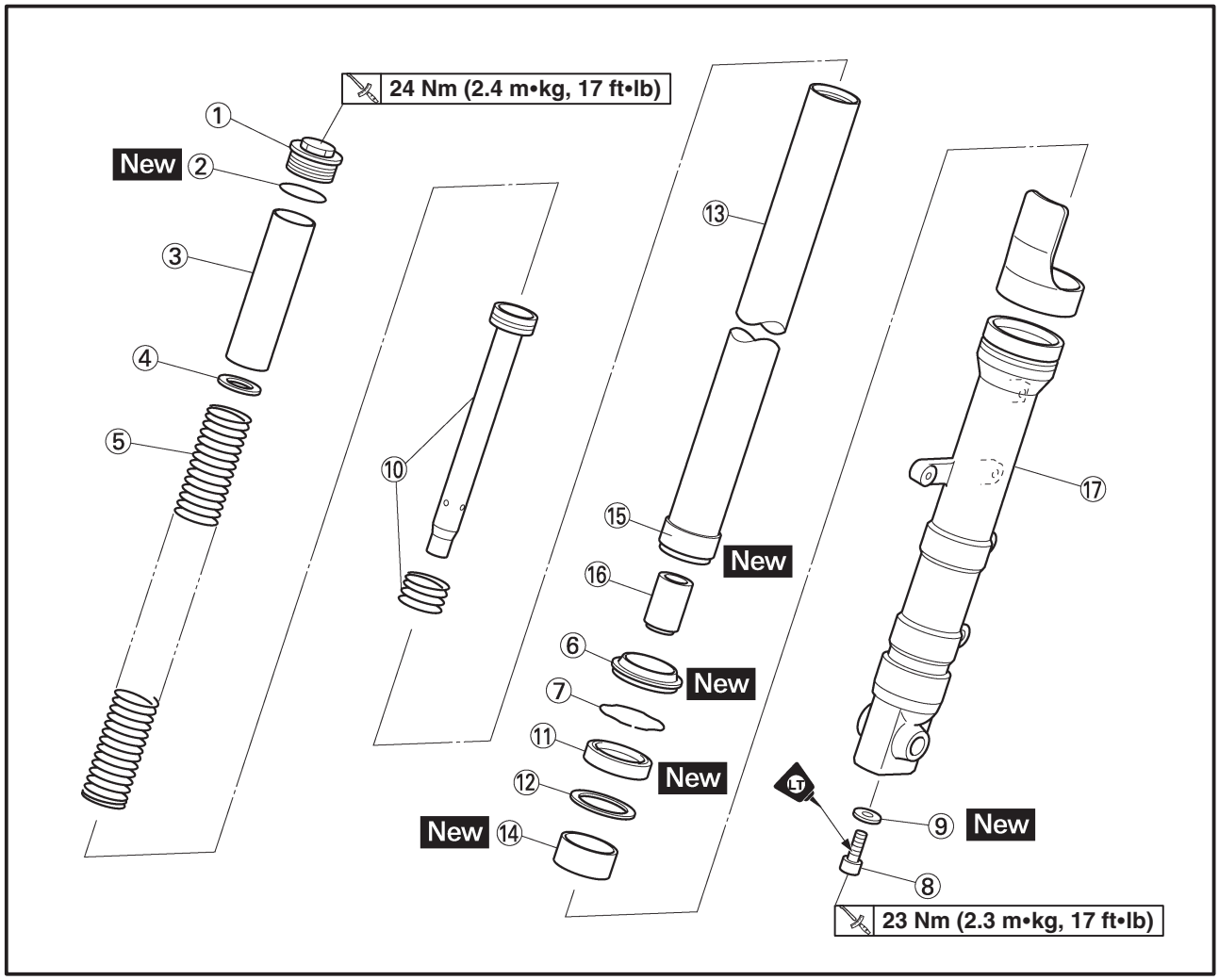
EAS00647

FRONT FORK
FRONT FORK LEGS

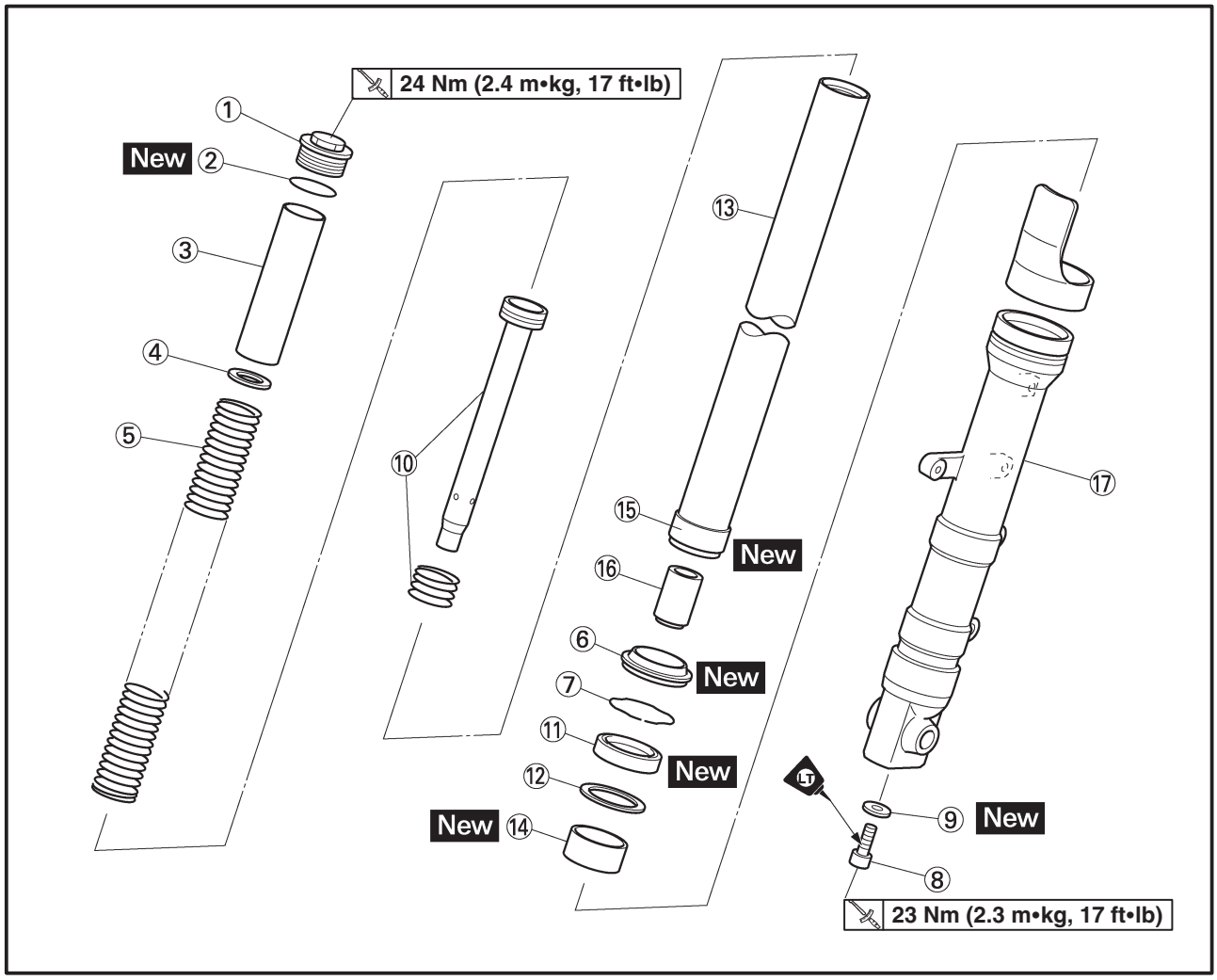


Order	Job/Part	Q'ty	Remarks
	Removing the front fork legs		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front brake calipers		Refer to "FRONT AND REAR BRAKES".
1	Front fender	1	
2	Cap bolt	1	Loosen.
3	Upper bracket pinch bolt	1	Loosen.
4	Under bracket pinch bolt	1	Loosen.
5	Front fork leg	1	
			For installation, reverse the removal procedure.

EAS00648



Order	Job/Part	Q'ty	Remarks
	Disassembling the front fork legs		Disassemble the parts in the order listed. **NOTE:** The following the procedure applies to both of the front fork legs.
①	Cap bolt	1	
②	O-ring	1	
③	Spacer	1	
④	Washer	1	
⑤	Front fork spring	1	
⑥	Dust seal	1	
⑦	Oil seal clip	1	
⑧	Damper rod assembly bolt	1	
⑨	Copper washer	1	
⑩	Damper rod assembly	1	
⑪	Oil seal	1	
⑫	Washer	1	

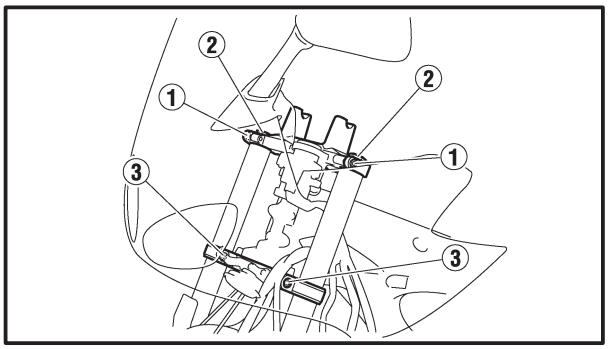


Order	Job/Part	Q'ty	Remarks
⑬	Inner tube	1	
⑭	Outer tube bushing	1	
⑮	Inner tube bushing	1	
⑯	Oil flow stopper	1	
⑰	Outer tube	1	
			For assembly, reverse the disassembly procedure.

EAS00649
REMOVING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.
1. Stand the motorcycle on a level surface.

⚠ WARNING

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



Place the motorcycle on a suitable stand so that the front wheel is elevated.
2. Loosen:
   - upper bracket pinch bolt ①
   - cap bolt ②
   - under bracket pinch bolt ③

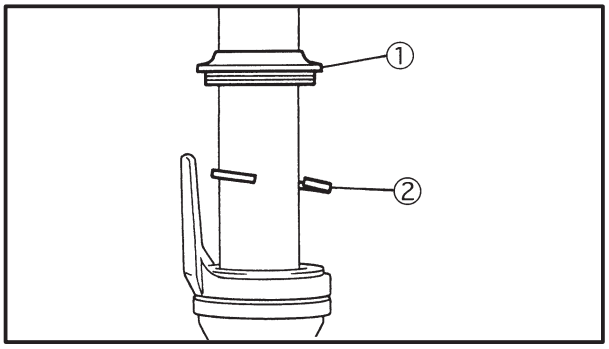
⚠ WARNING

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

3. Remove:
   - front fork leg

EAS00652
DISASSEMBLING THE FRONT FORK LEGS
The following procedure applies to both of the front fork legs.
1. Remove:
   - cap bolt
   - washer
   - spacer
   - fork spring
2. Drain:
   - fork oil

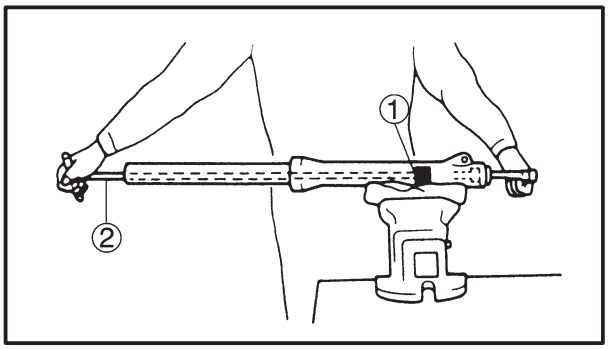
NOTE:
Stroke the inner tube several times while draining the fork oil.



3. Remove:
   • dust seal ①
   • oil seal clip ②
   (with a flat-head screwdriver)

CAUTION:

Do not scratch the inner tube.

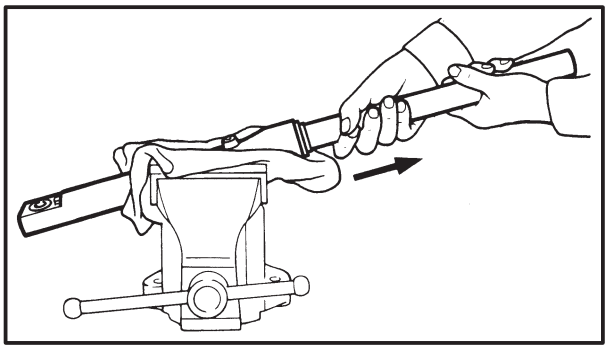


4. Remove:
   • damper rod assembly bolt

NOTE:

While holding the damper rod assembly with the damper rod holder ① and T-handle ②, loosen the damper rod assembly bolt.

Damper rod holder
90890-01294
T-handle
90890-01326

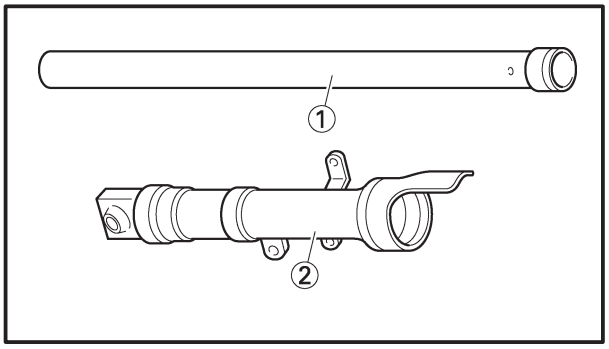


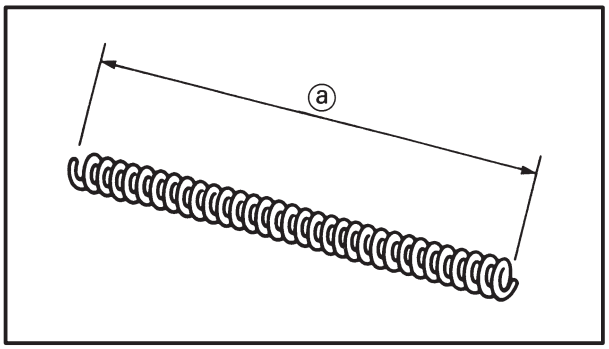
5. Remove:
   • inner tube

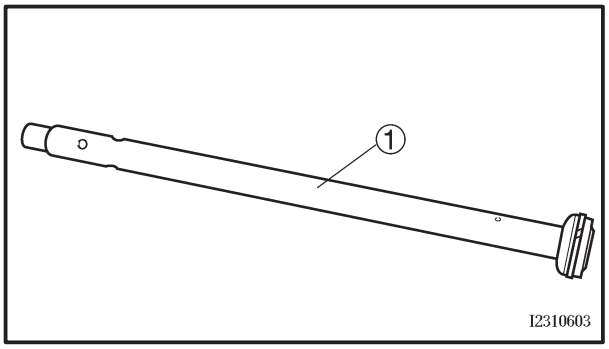
a. Hold the front fork leg horizontally.
b. Securely clamp the brake caliper bracket in a vise with soft jaws.
c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

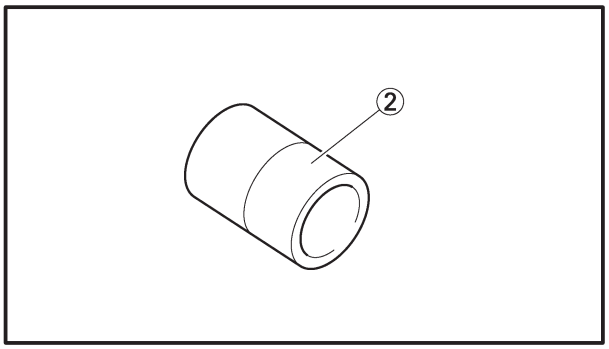
CAUTION:

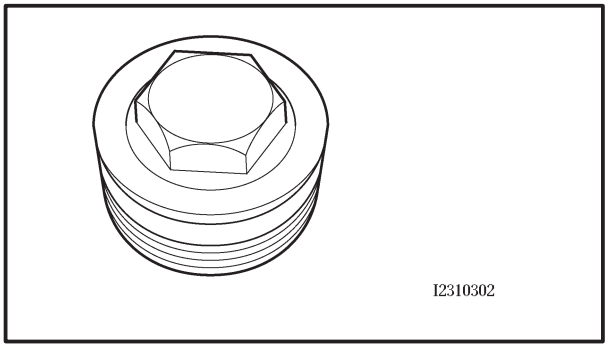
- **Excessive force will damage the oil seal and bushing. A damaged oil seal or bushing must be replaced.**
- **Avoid bottoming the inner tube into the outer tube during the above procedure, as the oil flow stopper will be damaged.**











EAS00657
CHECKING THE FRONT FORK LEGS

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

1. Check:
   - inner tube ①
   - outer tube ②

   Bends/damage/scratches → Replace.

⚠ WARNING

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

2. Measure:
   - spring free length ⓐ

   Out of specification → Replace.

Spring free length
354 mm (13.94 in)
<Limit> : 347 mm (13.66 in)

3. Check:
   - damper rod ①

   Damage/wear → Replace.
   Obstruction → Blow out all of the oil passages with compressed air.
   - oil flow stopper ②

   Damage → Replace.

CAUTION:

- **The front fork leg has a built-in damper adjusting rod and a very sophisticated internal construction, which are particularly sensitive to foreign material.**
- **When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.**

4. Check:
   - cap bolt O-ring

   Damage/wear → Replace.

EAS00659
ASSEMBLING THE FRONT FORK LEGS

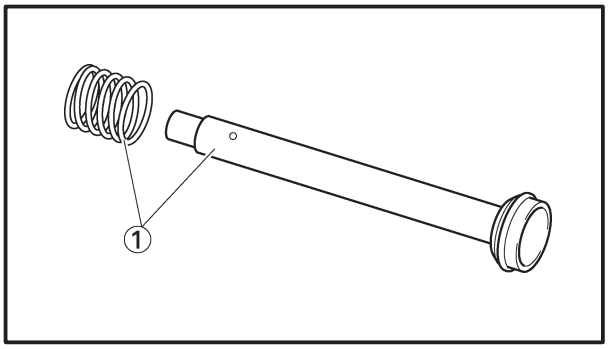
The following procedure applies to both of the front fork legs.

⚠ 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:
  - inner tube bushing
  - outer tube bushing
  - oil seal
  - dust seal
  - before assembling the front fork leg, make sure all of the components are clean.



1. Install:
   - inner tube busing
   - outer tube busing
   - oil flow stopper
   - damper rod assembly ①
   - copper washer New

⚠ WARNING

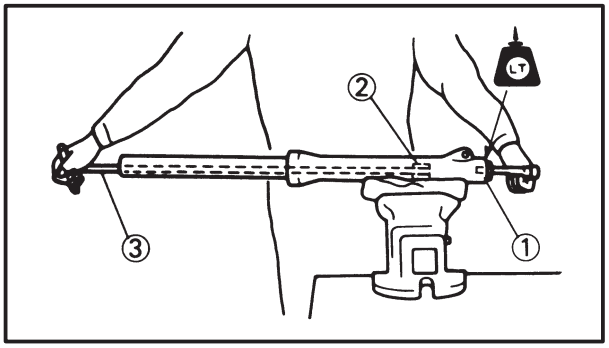
Always use new copper washer.

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

Recommended lubricant
Suspension oil "01" or equivalent



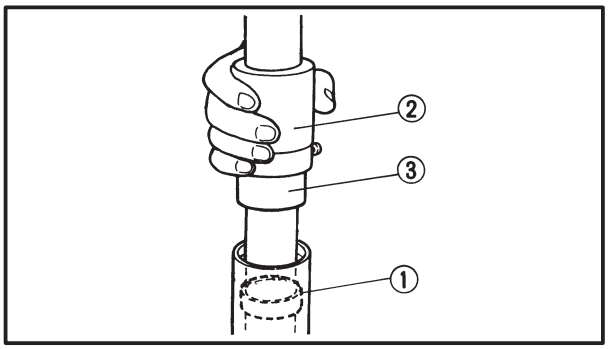
3. Tighten:
   - damper rod assembly bolt ①

23 Nm (2.3 m•kg, 17 ft•lb)
LOCTITE®

NOTE:

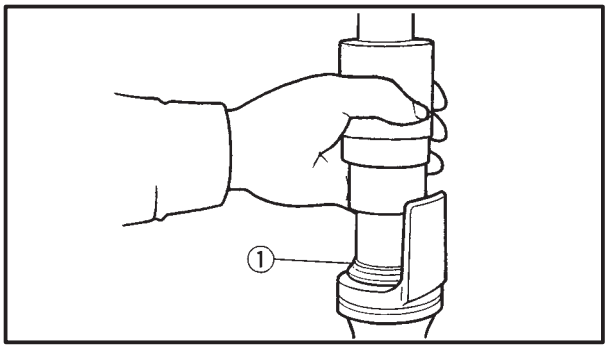
While holding the damper rod assembly with the damper rod holder ② and T-handle ③, tighten the damper rod assembly bolt.

Damper rod holder
90890-01294
T-handle
90890-01326



4. Install:
   • outer tube bushing ①
   (with the fork seal driver weight ② and fork seal driver attachment ③)

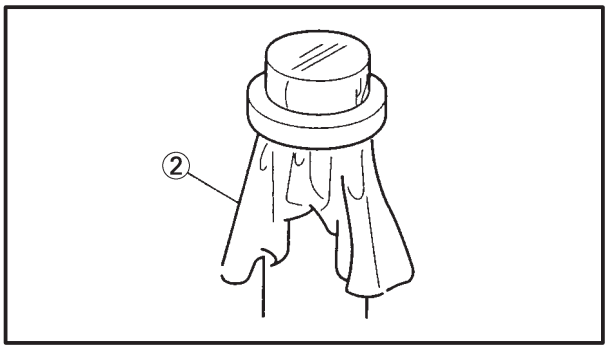
Fork seal driver weight
90890-01367
Fork seal driver attachment
90890-01374



5. Install:
   • washer
   • oil seal ①
   (with the fork seal driver weight and fork seal driver attachment)

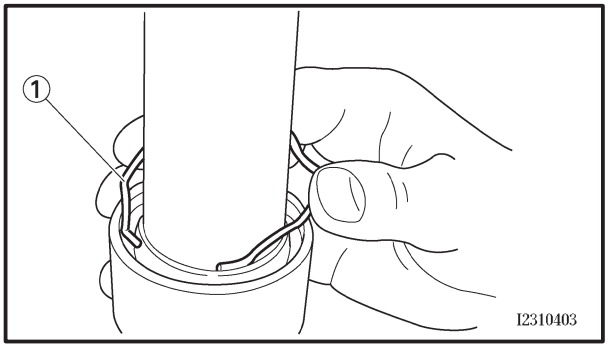
CAUTION:

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



NOTE:

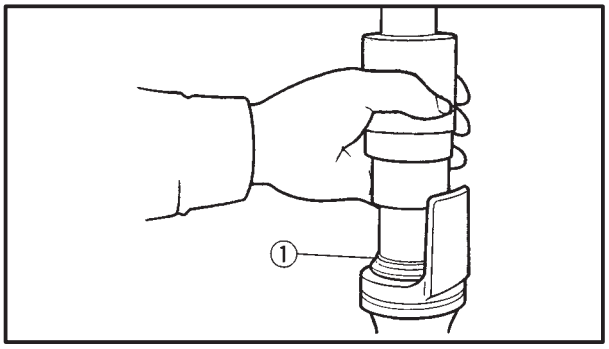
- Before installing the oil seal, lubricate its lips with lithium-soap-based grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag ② to protect the oil seal during installation.



6. Install:
   • oil seal clip ①

NOTE:

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



7. Install:
   • dust seal ①
   (with the fork seal driver weight)

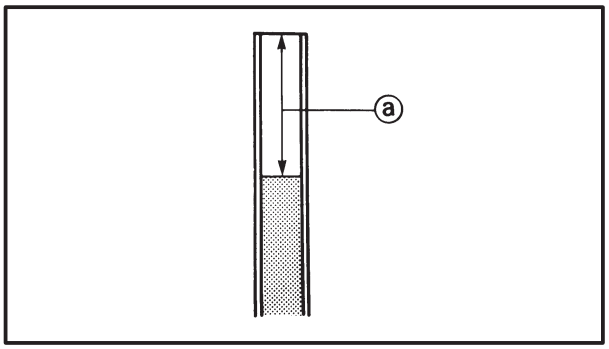
Fork seal driver weight
90890-01367

8. Fill:
   • front fork leg
   (with the specified amount of the recommended fork oil)

Quantity (each front fork leg)
0.467 L (0.41 Imp qt, 0.49 US qt)
Recommended oil
Suspension oil "01" or equivalent

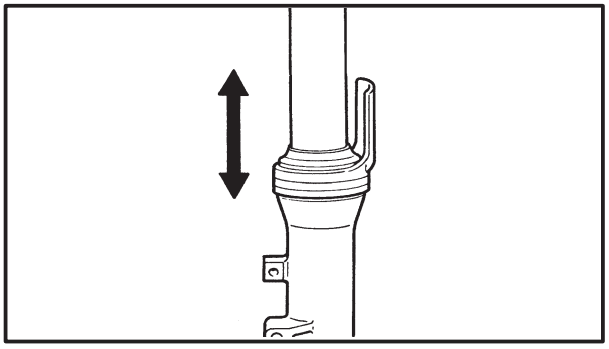
CAUTION:

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



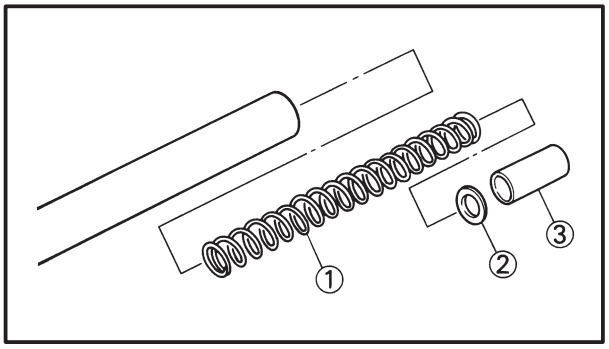
9. Measure:
   • front fork leg oil level ⓐ
   Out of specification → Correct.

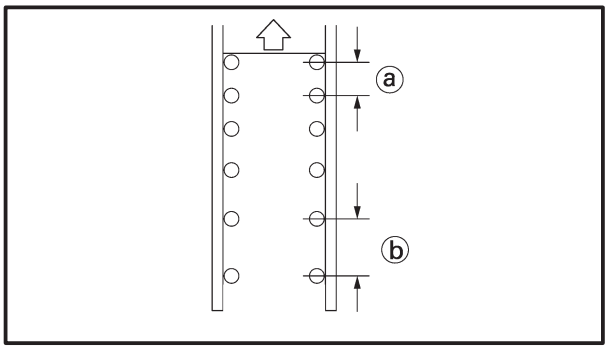
Front fork leg oil level (from the top of the inner tube, with the inner tube fully compressed and without the fork spring)
134 mm (5.28 in)



NOTE:

- While filling the front fork leg, keep it upright.
- After filling, slowly pump the front fork leg up and down to distribute the fork oil.





10. Install:
    - spring ①
    - spring seat ②
    - spacer ③
    - cap bolt

NOTE:

- Install the spring with the smaller pitch ⓐ facing up.
- Before installing the cap bolt, lubricate its O-ring with grease.

ⓑ Larger pitch

EAS00662

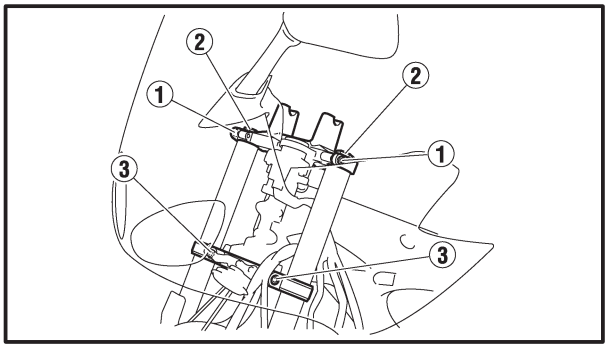
INSTALLING THE FRONT FORK LEGS

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

1. Install:
    - front fork leg
      Temporarily tighten the upper and under bracket pinch bolts.

NOTE:

Make sure the inner fork tube is flush with the top of the upper bracket.



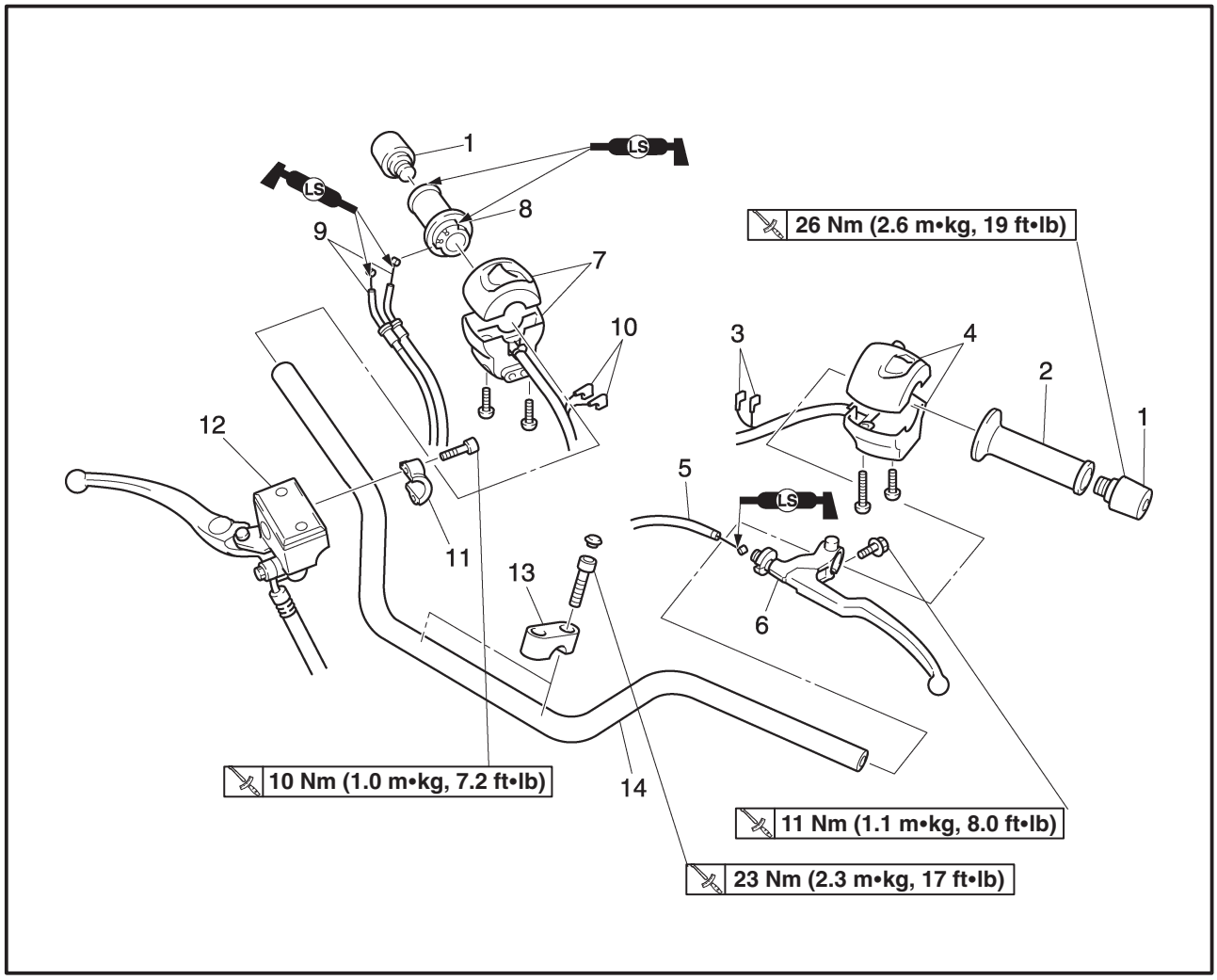
2. Tighten:
    - under bracket pinch bolt ①
      30 Nm (3.0 m•kg, 22 ft•lb)
    - cap bolt ②
      24 Nm (2.4 m•kg, 17 ft•lb)
    - upper bracket pinch bolt ③
      30 Nm (3.0 m•kg, 22 ft•lb)

⚠ WARNING

Make sure the brake hoses are routed properly.

EAS00664

HANDLEBAR

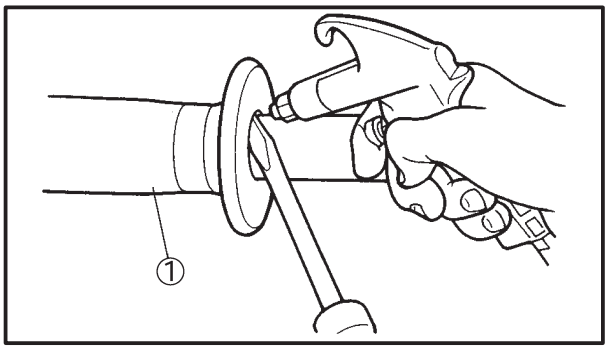


Order	Job/Part	Q'ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
1	Grip end	2	
2	Handlebar grip (left)	1	
3	Clutch switch connector	1	Disconnect.
4	Left handlebar switch	1	
5	Clutch cable	1	
6	Clutch lever	1	
7	Right handlebar switch	1	
8	Throttle grip	1	
9	Throttle cable	2	
10	Front brake light switch connector	1	Disconnect.
11	Front brake master cylinder holder	1	
12	Front brake master cylinder	1	
13	Upper handlebar holder	2	
14	Handlebar	1	
			For installation, reverse the removal procedure.

EAS00666
REMOVING THE HANDLEBAR
1. Stand the motorcycle on a level surface.

⚠ WARNING

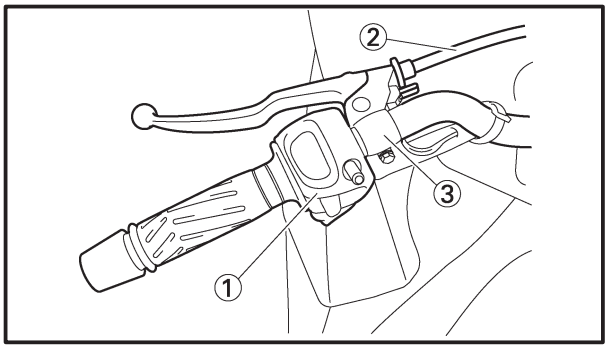
Securely support the motorcycle so that there is no danger of it falling over.



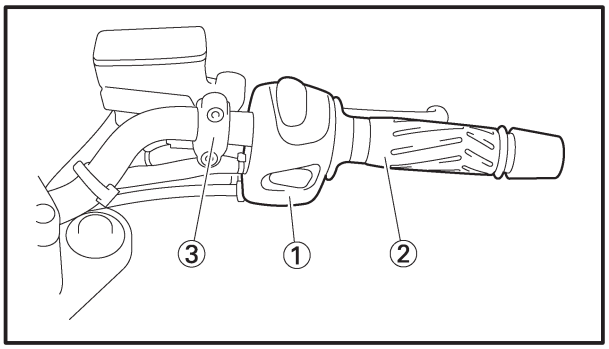
2. Remove:
   - grip end
   - handlebar grip ①

NOTE:

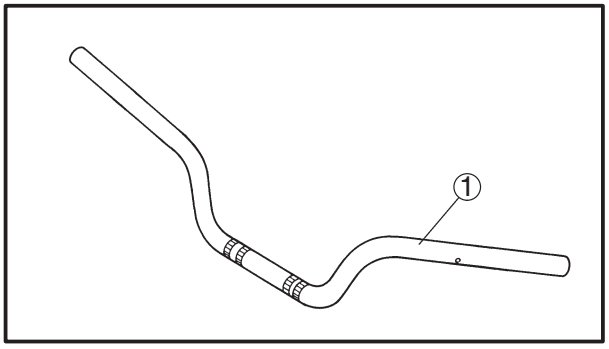
Blow compressed air between the handlebar and the handlebar grip, and gradually push the grip off the handlebar.



3. Disconnect:
   - clutch switch connector
4. Remove:
   - left handlebar switch ①
   - clutch cable ②
   - clutch lever holder ③



5. Remove:
   - grip end
   - front brake light switch connector
   - right handlebar switch ①
   - throttle grip ②
   - front brake master cylinder holder ③
   - front brake master cylinder



EAS00668
CHECKING THE HANDLEBAR
1. Check:
   - handlebar ①
     Bends/cracks/damage → Replace.

⚠ WARNING

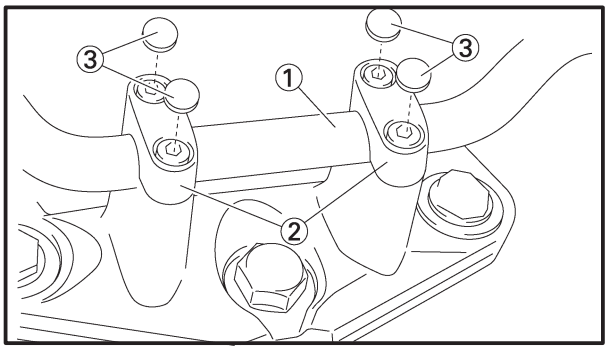
Do not attempt to straighten a bent handlebar as this may dangerously weaken it.

EAS00672
INSTALLING THE HANDLEBAR

1. Stand the motorcycle on a level surface.

⚠ WARNING

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

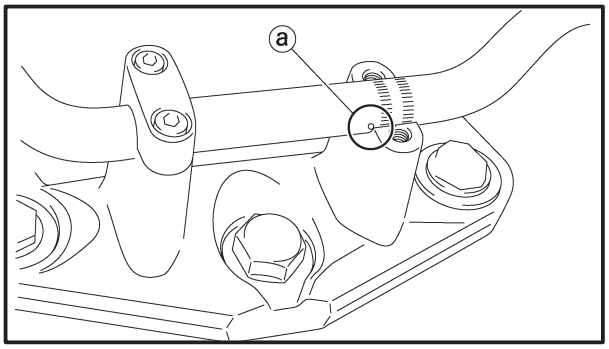


2. Install:
   - handlebar ①
   - upper handlebar holders ②

     23 Nm (2.3 m•kg, 17 ft•lb)
   - upper handlebar holder caps ③

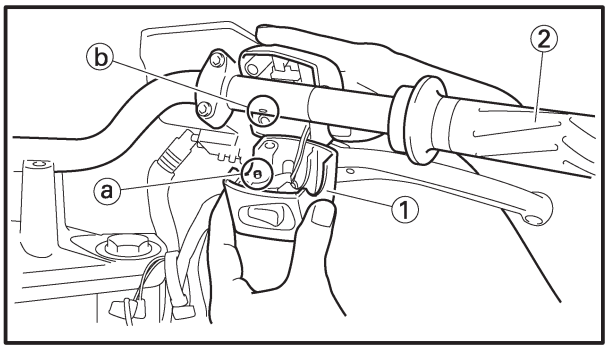
CAUTION:

- **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.**



NOTE:

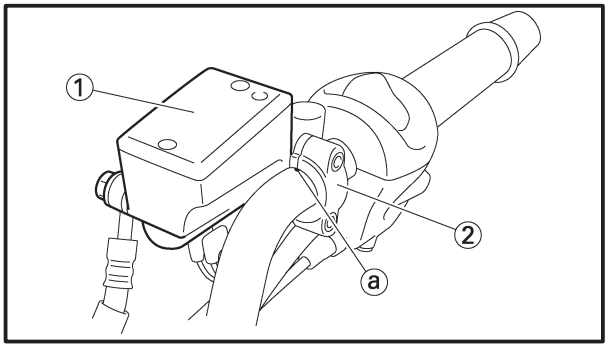
Align the match marks ⓐ on the handlebar with the upper surface of the lower handlebar holders.



3. Install:
   - throttle cables
   - right handlebar switch ①
   - throttle grip ②

NOTE:

Align the projections ⓐ on the handlebar switch with the holes ⓑ in the handlebar.



4. Install:
   - front brake master cylinder ①
   - front brake master cylinder holder ②

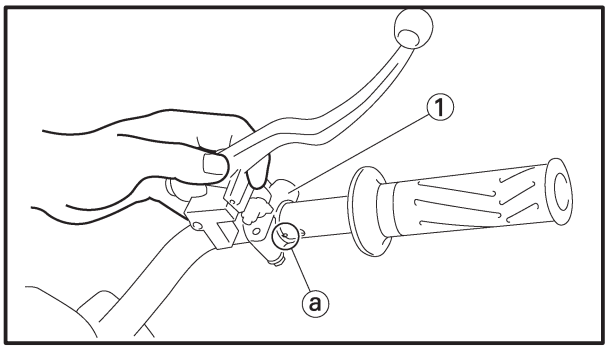
     Refer to “ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER”.

NOTE:

- There should be 17 mm (0.67 in) of clearance between the right handlebar switch and front brake master cylinder.
- Align the mating surfaces of the master cylinder bracket with the punch mark (right handlebar switch side) ⓐ on the handlebar.

5. Install:
   • grip end — 26 Nm (2.6 m•kg, 19 ft•lb)
6. Adjust:
   • throttle cable free play
   Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

Throttle cable free play (at the flange of the throttle grip)
3 ~ 5 mm (0.12 ~ 0.20 in)

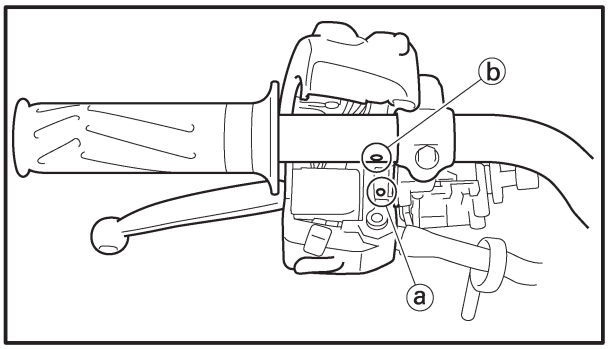


7. Install:
   • clutch lever holder ①
   • clutch cable

NOTE:
Align the slit on the clutch lever holder with the punch mark ⓐ on the handleban.

8. Adjust:
   • clutch cable free play
   Refer to "ADJUST THE CLUTCH CABLE FREE PLAY" in chapter 3.

Clutch cable free play (at the end of the clutch lever)
10 ~ 15 mm (0.39 ~ 0.59 in)



9. Install:
   • left handlebar switch

NOTE:
Align the projection ⓐ on the left handlebar switch with the hole ⓑ on the handlebar.

10. Install:
    • handlebar grip
    • grip end — 26 Nm (2.6 m•kg, 19 ft•lb)

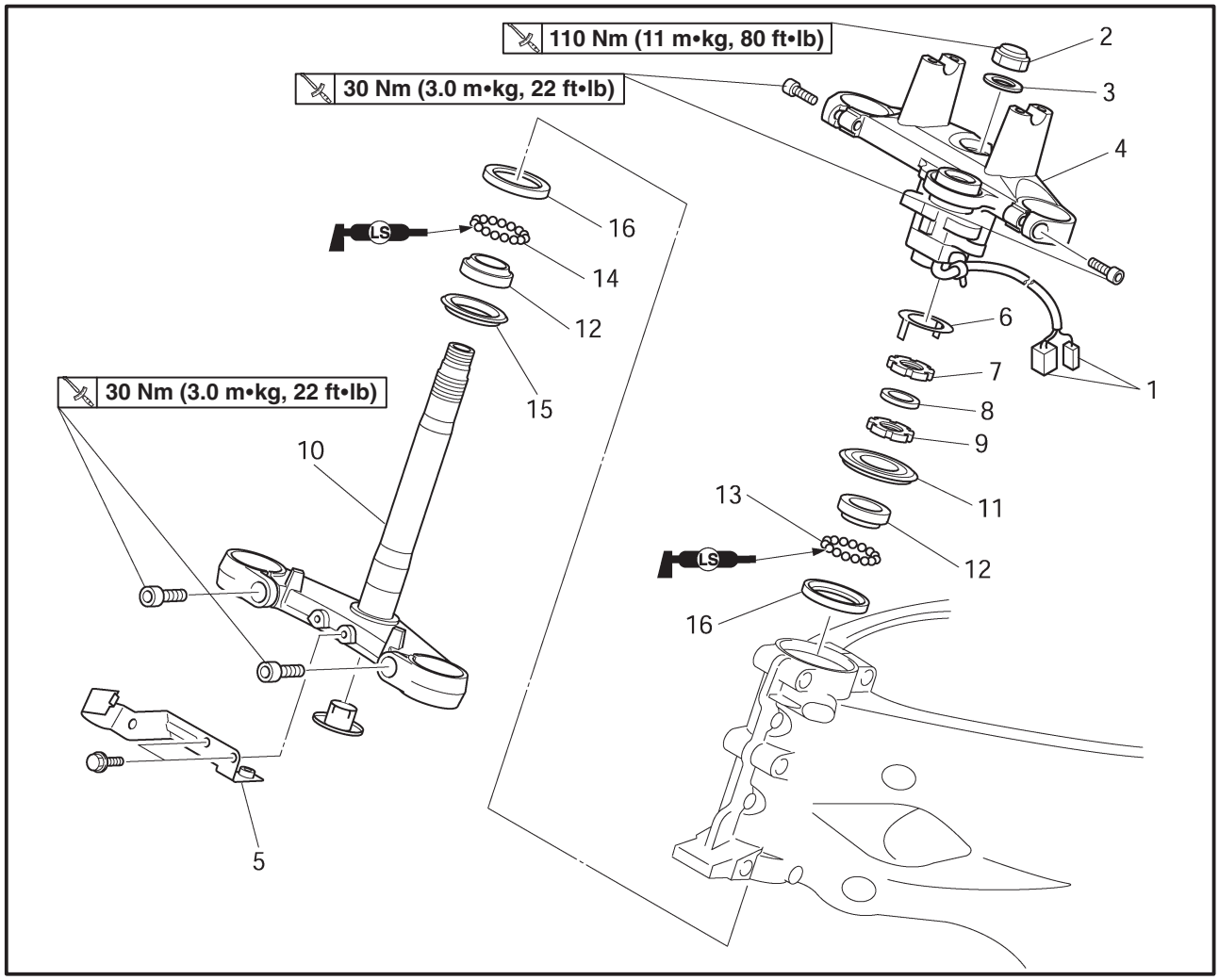
a. Apply a thin coat of rubber adhesive onto the left end of the handlebar.
b. Slide the handlebar grip over the left end of the handlebar.
c. Wipe off any excess rubber adhesive with a clean rag.

⚠ WARNING

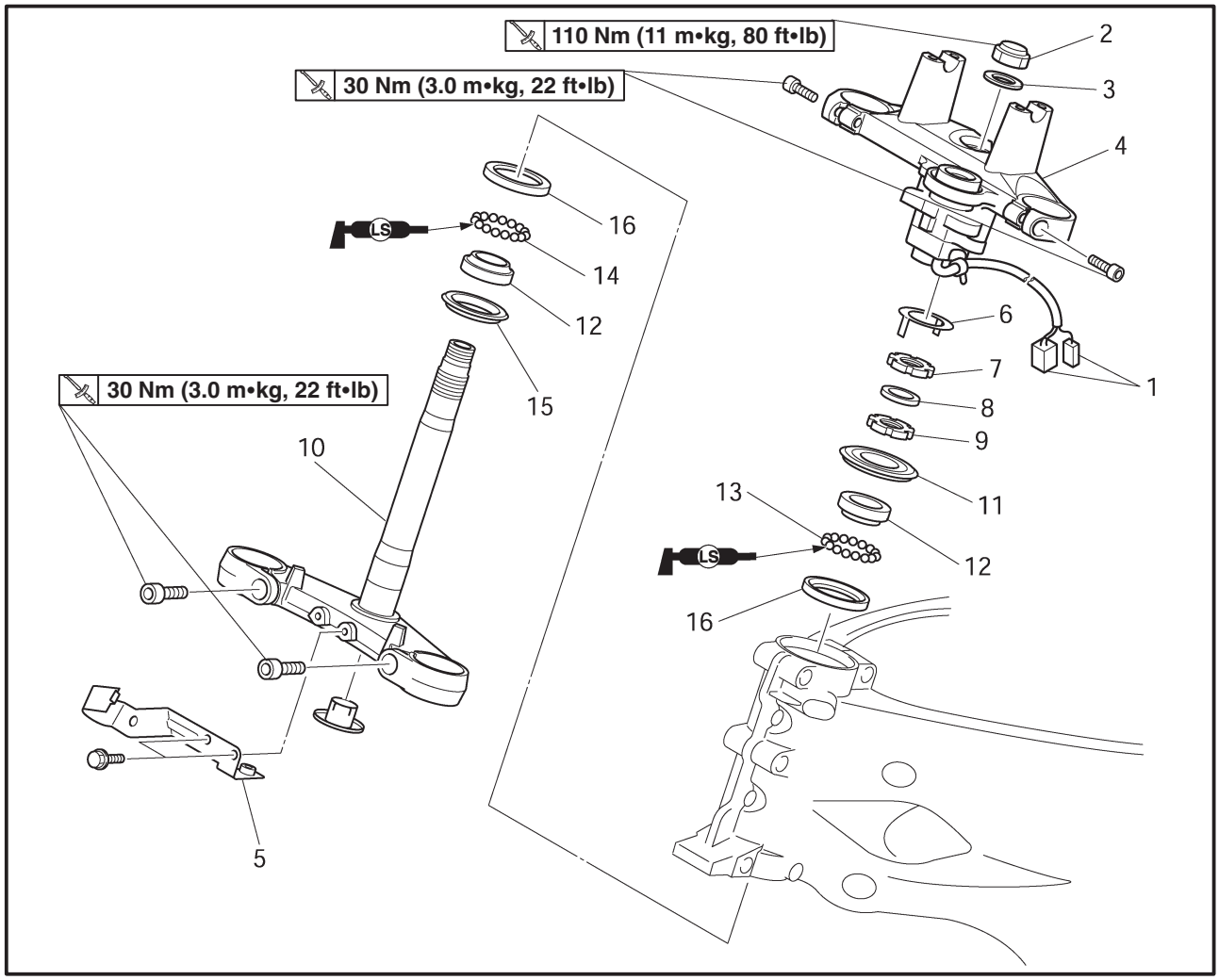
Do not touch the handlebar grip until the rubber adhesive has fully dried.

EAS00676

STEERING HEAD
UNDER BRACKET



Order	Job/Part	Q'ty	Remarks
	Removing the under bracket		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISCS".
	Front fender		Refer to "FRONT FORK".
	Front fork		
	Handlebar		Refer to "HANDLEBAR".
	Front cowling inner panel (left and right)		Refer to "COWLINGS" in chapter3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
1	Main switch coupler	2	Disconnect.
2	Steering stem nut	1	
3	Washer	1	
4	Upper bracket	1	
5	Horn stay	1	
6	Lock washer	1	

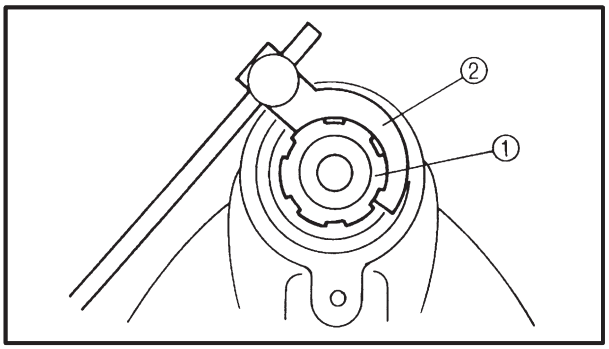


Order	Job/Part	Q'ty	Remarks
7	Upper ring nut	1	
8	Rubber washer	1	
9	Lower ring nut	1	
10	Under bracket	1	
11	Bearing cover	1	
12	Bearing inner race	2	
13	Upper bearing	1	
14	Lower bearing	1	
15	Dust seal	1	
16	Bearing outer race	2	
			For installation, reverse the removal procedure.

EAS00677
REMOVING THE UNDER BRACKET
1. Stand the motorcycle on a level surface.

⚠ WARNING

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



2. Remove:
   - steering stem nut
   - washer
   - upper bracket
   - lock washer
   - rubber washer
   - ring nut ①
     (with the steering nut wrench ②)

NOTE:

Hold the lower ring nut with the exhaust and steering nut wrench, and then remove the upper rung nut with the ring nut wrench.

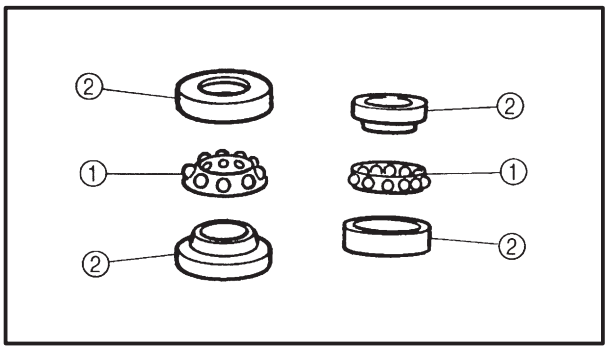
	Steering nut wrench **90890-01403, YU-33975**

⚠ WARNING

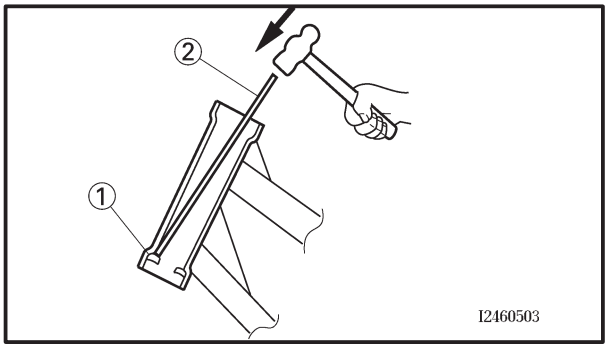
Securely support the under bracket so that there is no danger of it falling over.

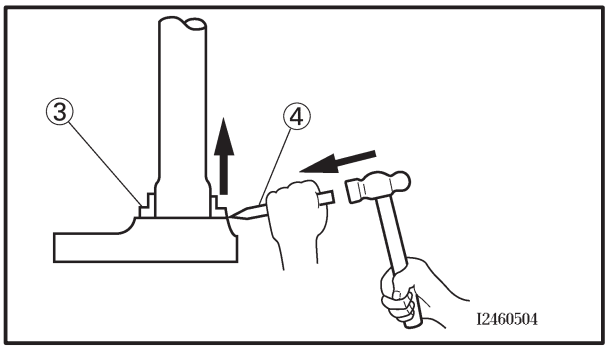
EAS00682
CHECKING THE STEERING HEAD
1. Wash:
   - bearing balls
   - bearing races

	Recommended cleaning solvent **Kerosene**



2. Check:
   - bearing balls ①
   - bearing races ②
     Damage/pitting → Replace.





3. Replace:
   - bearing balls
   - bearing races

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

CAUTION:

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

NOTE:

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

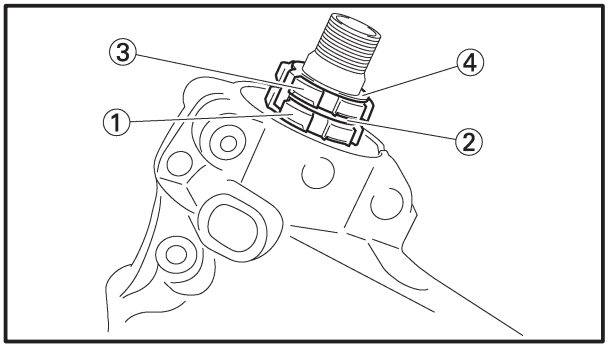
4. Check:
   - upper bracket
   - lower bracket
     (along with the steering stem)
     Bends/cracks/damage → Replace.

EAS00683

INSTALLING THE STEERING HEAD

1. Lubricate:
   - upper bearing
   - lower bearing
   - bearing races

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



2. Install:
   - under bracket
   - lower ring nut ①
   - rubber washer ②
   - upper ring nut ③
   - lock washer ④
     Refer to “CHECKING THE STEERING HEAD”.

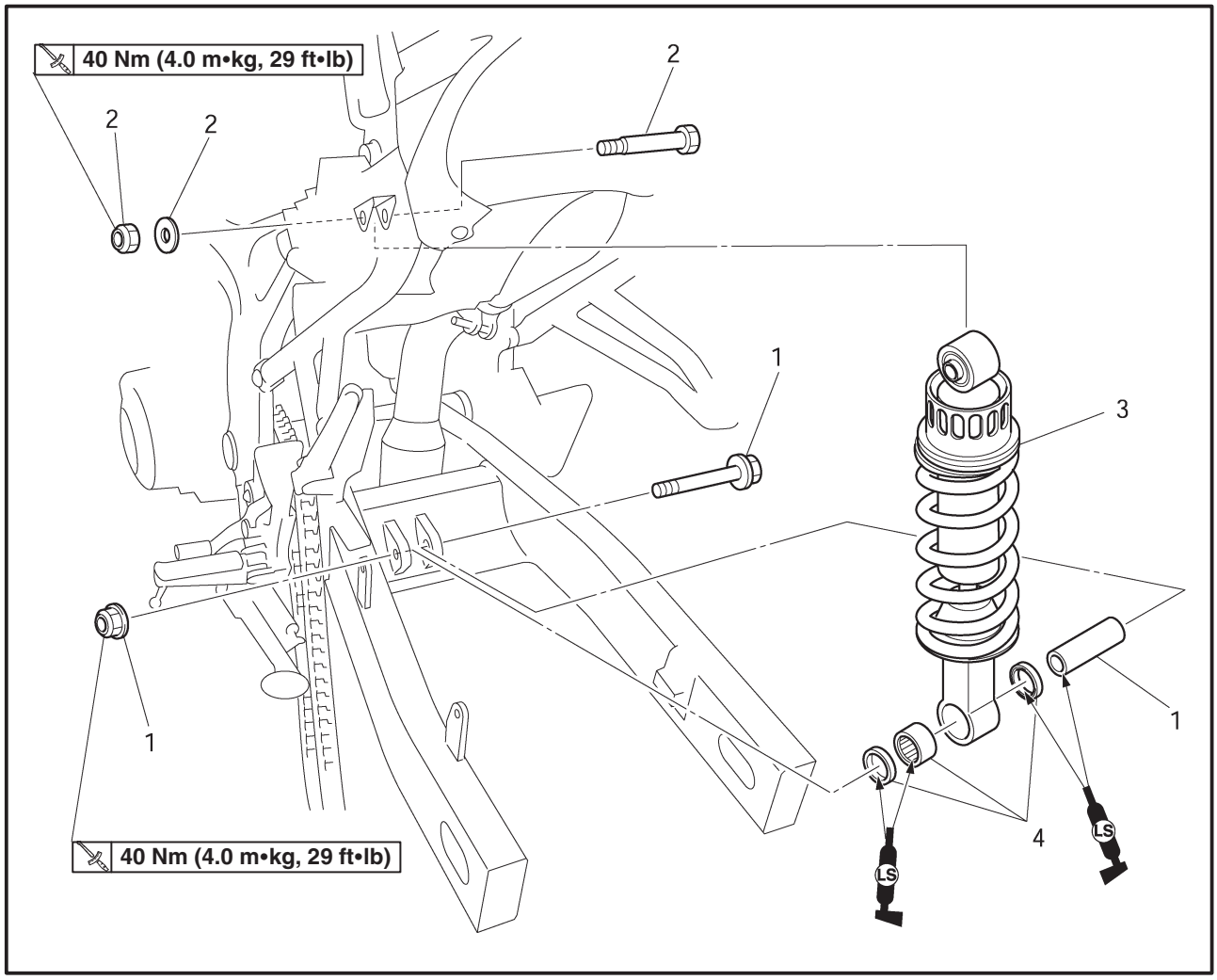
3. Install:
   - upper bracket
   - washer
   - steering stem nut

   110 Nm (11 m•kg, 80 ft•lb)
4. Install:
   - front fork legs

   Refer to “INSTALLING THE FRONT FORK LEGS”.

EAS00685

REAR SHOCK ABSORBER ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber assembly		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL AND BRAKE DISC".
1	Self-locking nut/collar/bolt (Swingarm-rear shock absorber)	1/1/1	
2	Self-locking nut/washer/bolt (Frame-rear shock absorber)	1/1/1	
3	Rear shock absorber	1	
4	Oil seal/bearing	2/1	
			For installation, reverse the removal procedure.

EAS00694

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the motorcycle on a level surface.

⚠ WARNING

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

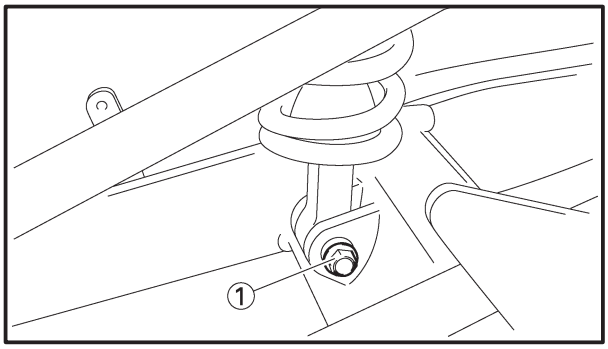
NOTE:

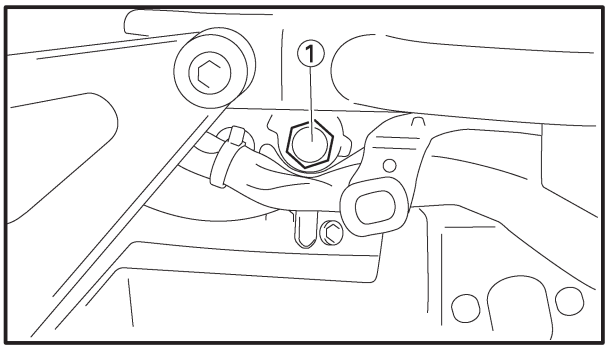
Place the motorcycle on a suitable stand so that the rear wheel is elevated.

2. Remove:
   - rear wheel
     Refer to "REAR WHEEL AND BRAKE DISC".
3. Remove:
   - rear shock absorber assembly lower bolt ①

NOTE:

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



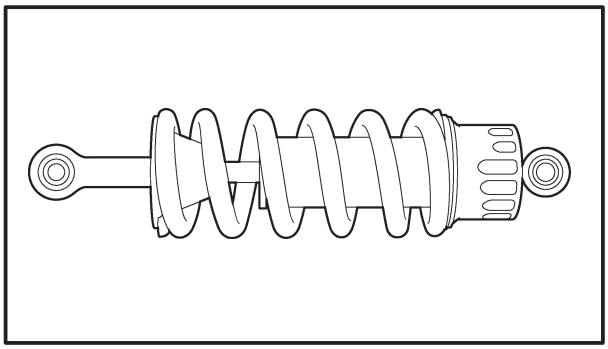


4. Remove:
   - rear shock absorber assembly upper bolt ①
   - rear shock absorber assembly

EAS00686
HANDLING THE REAR SHOCK ABSORBER

⚠ 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.**



EAS00688
DISPOSING OF A REAR SHOCK ABSORBER

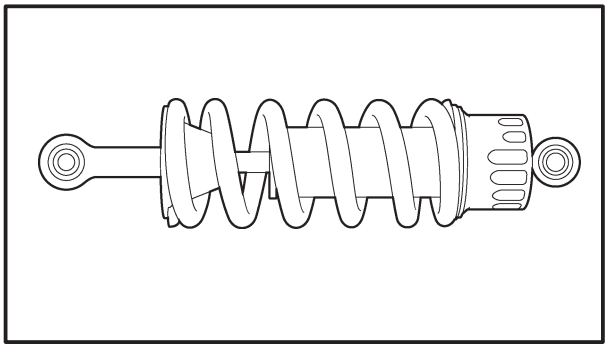
Gas pressure must be released before disposing of a rear shock absorber. To release the gas pressure, drill a 2 ~ 3 mm hole through the rear shock absorber at a point 15 ~ 20 mm from its end as shown.

⚠ WARNING

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

EAS00695
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.



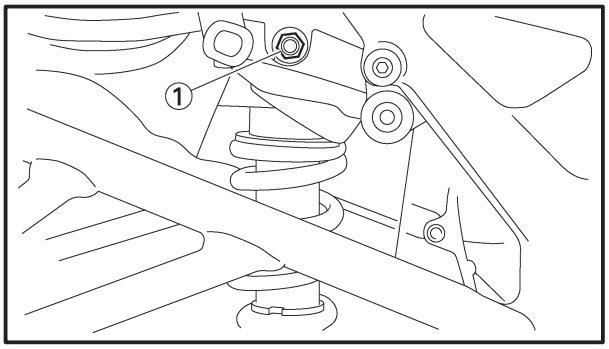
- spring
  Damage/wear → Replace the rear shock absorber assembly.
- bushings
  Damage/wear → Replace.
- dust seals
  Damage/wear → Replace.
- bolts
  Bends/damage/wear → Replace.

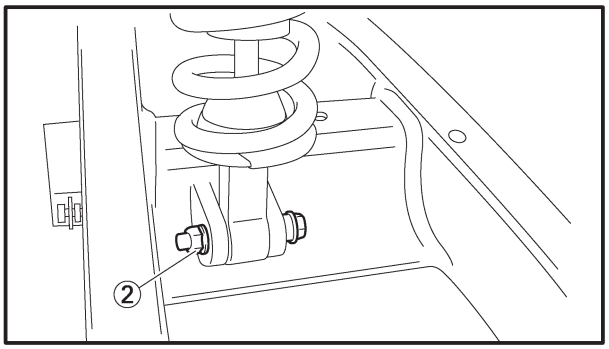
EAS00697

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:
   - collar
   - bearings
   - oil seals

Recommended lubricant
Lithium-soap-based grease





2. Install:
   - collar
   - rear shock absorber assembly

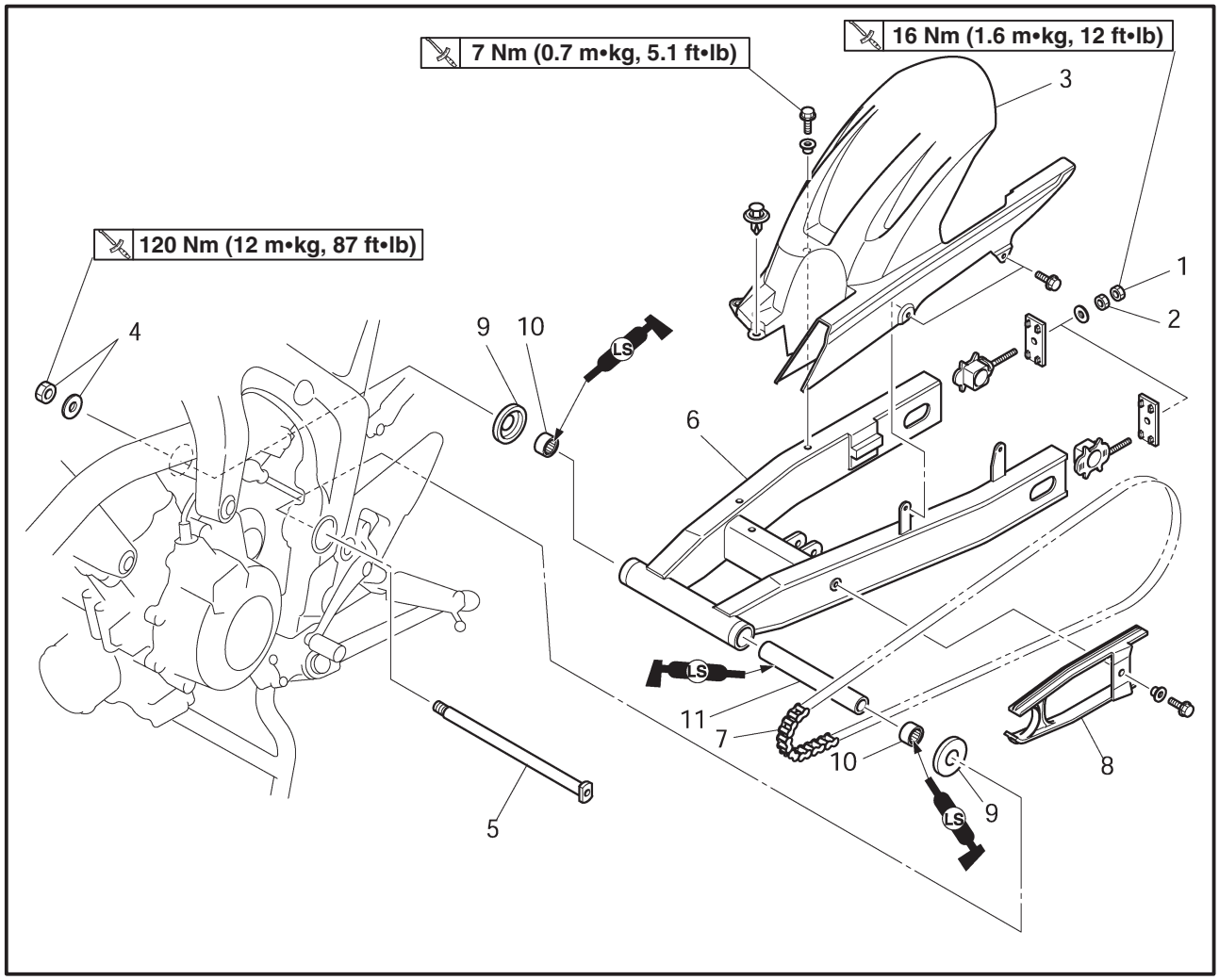
NOTE:

When installing the rear shock absorber assembly, lift up the swingarm.

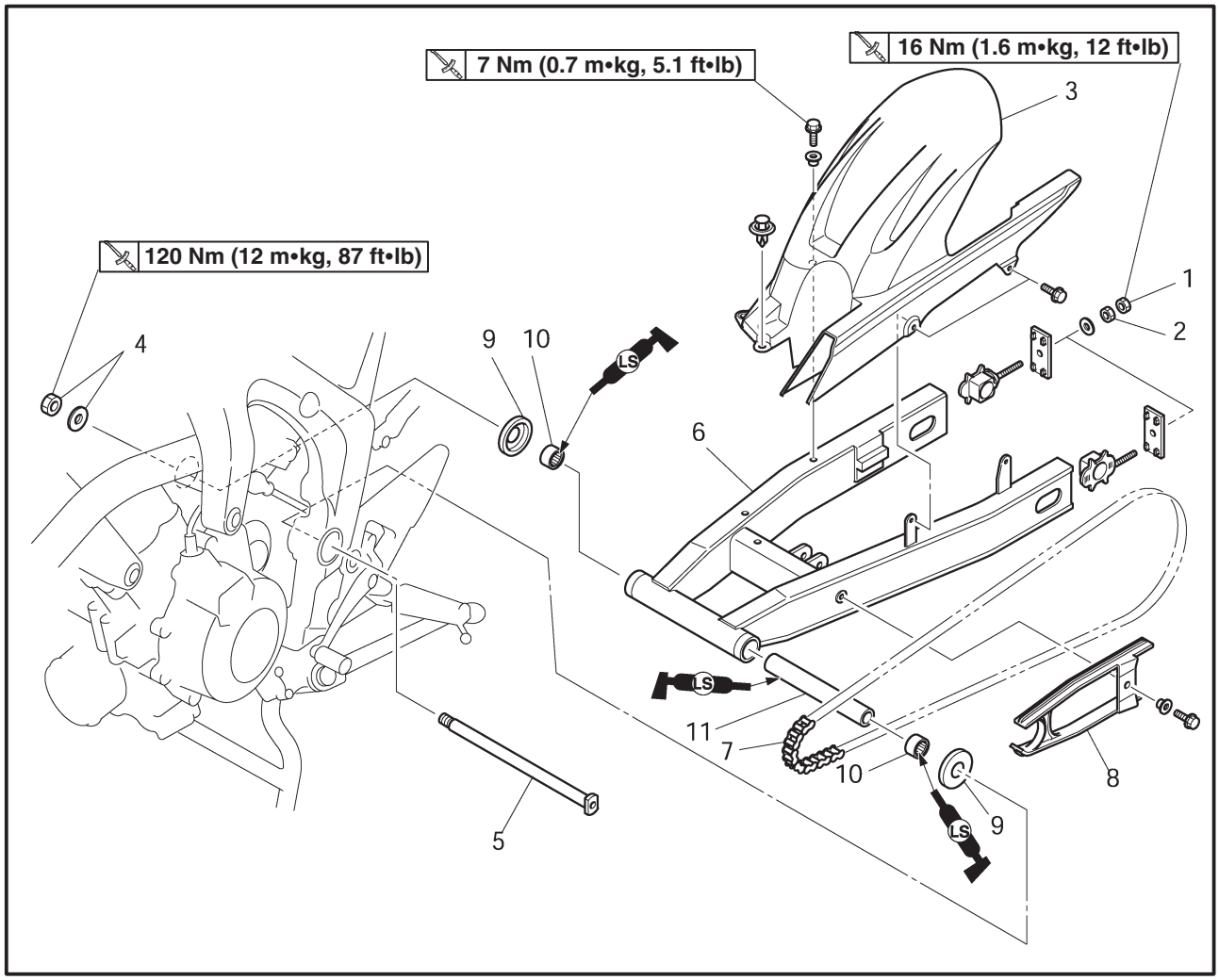
3. Tighten:
   - rear shock absorber assembly upper nut ①
     40 Nm (4.0 m•kg, 29 ft•lb)
   - rear shock absorber assembly lower nut ②
     40 Nm (4.0 m•kg, 29ft•lb)
4. Install:
   - rear wheel
     Refer to “REAR WHEEL AND BRAKE DISC”.
5. Adjust:
   - drive chain slack
     Refer to “ADJUSTING THE DRIVE CHAIN SLACK” in chapter 3.

Drive chain slack
45 ~ 55 mm (1.77 ~ 2.17 in)

SWINGARM AND DRIVE CHAIN



Order	Job/Part	Q'ty	Remarks
	Removing the swingarm and drive chain		Remove the parts in the order listed.
	Muffler assembly Catalyst assembly Exhaust pipe assembly		Refer to "EXHAUST PIPE" in chapter 5.
	Rear wheel		Refer to "REAR WHEEL AND BRAKE DISC".
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY".
	Drive sprocket cover		Refer to "ENGINE" in chapter 5.
1	Lock nut	2	Loosen.
2	Adjusting nut	2	Loosen.
3	Rear fender	1	
4	Pivot shaft nut/washer	1/1	
5	Pivot shaft	1	
6	Swingarm	1	
7	Drive chain	1	



Order	Job/Part	Q'ty	Remarks
8	Drive chain guide	1	
9	Dust cover	2	
10	Bearing	2	
11	Spacer	1	
			For installation, reverse the removal procedure.

EAS00703

REMOVING THE SWINGARM

1. Stand the motorcycle on a level surface.

⚠ WARNING

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

NOTE:

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

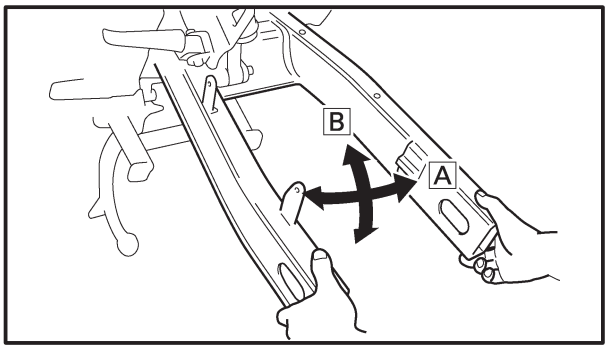
2. Remove:
   - rear wheel
     Refer to "REAR WHEEL AND BRAKE DISC".
   - rear shock absorber assembly
     Refer to "REAR SHOCK ABSORBER ASSEMBLY".
3. Measure:
   - swingarm side play
   - swingarm vertical movement

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

Pivot shaft nut
120 Nm (12 m•kg, 87 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.



Swingarm side play
(at the end of the swingarm)
1.0 mm (0.04 in)

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 spacer, bearings, and dust covers.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00704
REMOVING THE DRIVE CHAIN
1. Stand the motorcycle on a level surface.

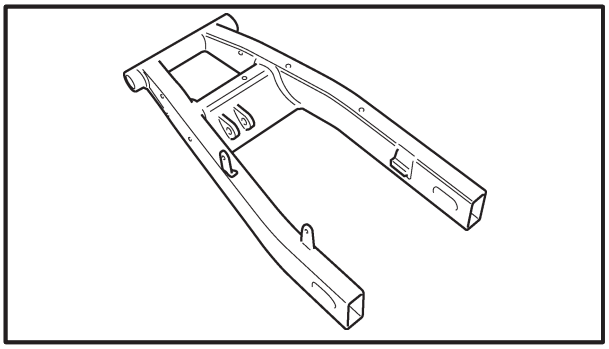
⚠ WARNING

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

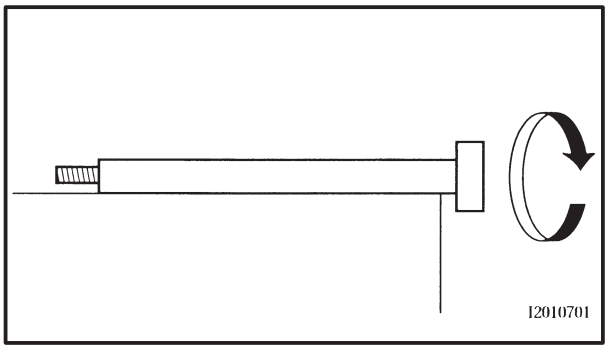
NOTE:

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

2. Remove:
   - drive chain (with the drive chain cutter)



EAS00707
CHECKING THE SWINGARM
1. Check:
   - swingarm
     Bends/cracks/damage → Replace.



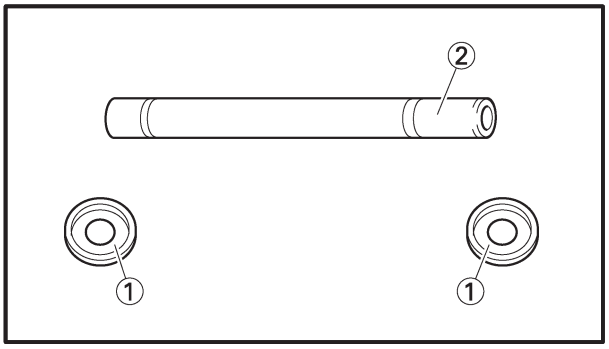
2. Check:
   - pivot shaft
     Roll the pivot shaft on a flat surface.
     Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent pivot shaft.

3. Wash:
   - pivot shaft
   - dust covers
   - spacer
   - washers
   - bearings

	Recommended cleaning solvent **Kerosene**

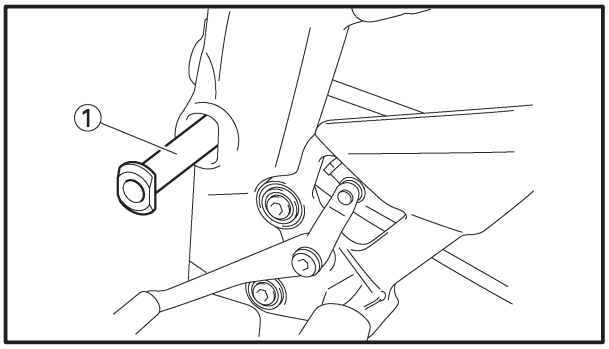


4. Check:
   • dust covers ①
   • spacer ②
     Damage/wear → Replace.
   • bearings
     Damage/pitting → Replace.

AS00711
INSTALLING THE SWINGARM

1. Lubricate:
   • bearings
   • spacer
   • dust covers
   • pivot shaft

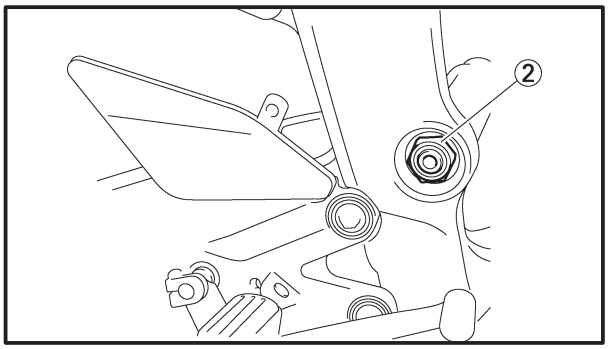
	Recommended lubricant **Lithium-soap-based grease**



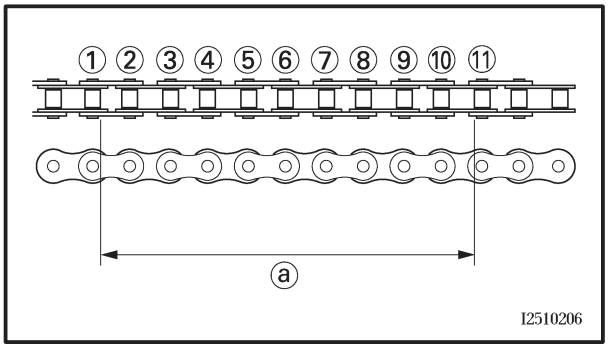
2. Install:
   • swingarm ①
   • pivot shaft nut ②

120 Nm (12 m•kg, 87 ft•lb)

3. Install:
   • rear shock absorber assembly
   • rear wheel
     Refer to “INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY” and “INSTALLING THE REAR WHEEL”.
4. Adjust:
   • drive chain slack
     Refer to “ADJUSTING THE DRIVE CHAIN SLACK” in chapter 3.



	Drive chain slack **45 ~ 55 mm (1.77 ~ 2.17 in)**

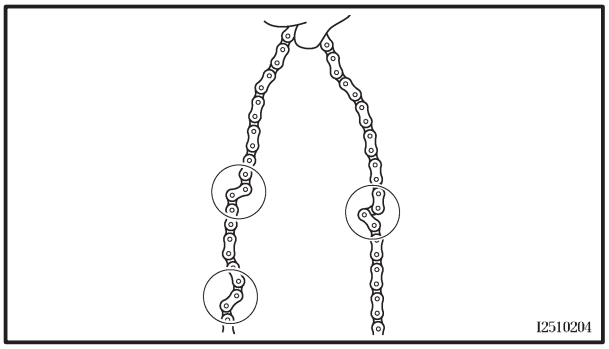


EAS00709
CHECKING THE DRIVE CHAIN

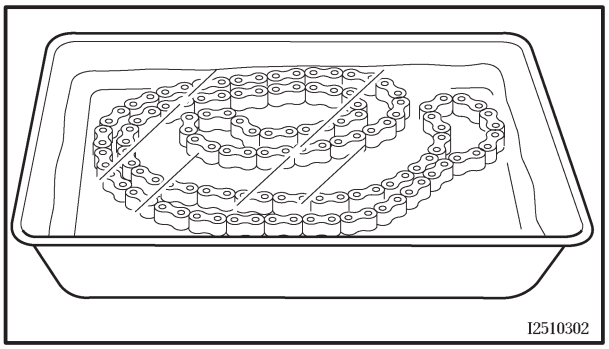
1. Measure:
   • ten-link section ⓐ of the drive chain
   Out of specification → Replace the drive chain.

Ten-link drive chain section limit (maximum)
150.1 mm (5.91 in)

NOTE:
- While measuring the ten-link section, push down on the drive chain to increase its tension.
- Measure the length between drive chain roller ① and ⑪ as shown.
- Perform this measurement at two or three different places.



2. Check:
   • drive chain
   Stiffness → Clean and lubricate or replace.

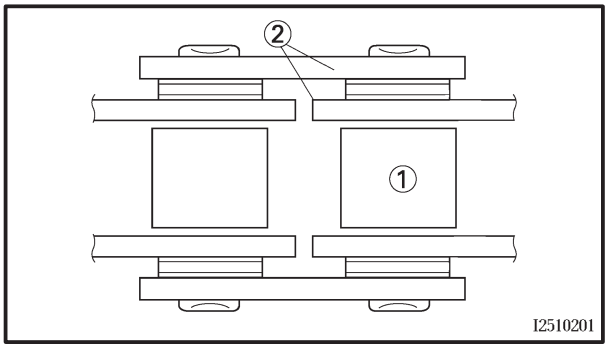


3. Clean:
   • drive chain

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

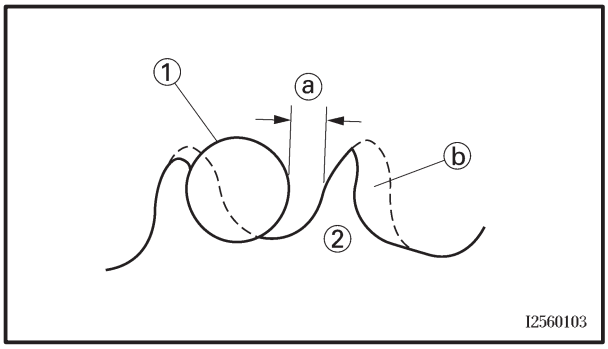
a. Wipe the drive chain with a clean cloth.
b. Put the drive chain in kerosene and remove any remaining dirt.
c. Remove the drive chain from the kerosene and completely dry it.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



4. Check:
   • drive chain rollers ①
     Damage/wear → Replace the drive chain.
   • drive chain side plates ②
     Damage/wear → Replace the drive chain.
     Cracks → Replace the drive chain and make sure the battery breather hose is properly routed away from the drive chain and below the swingarm.
5. Lubricate:
   • drive chain

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



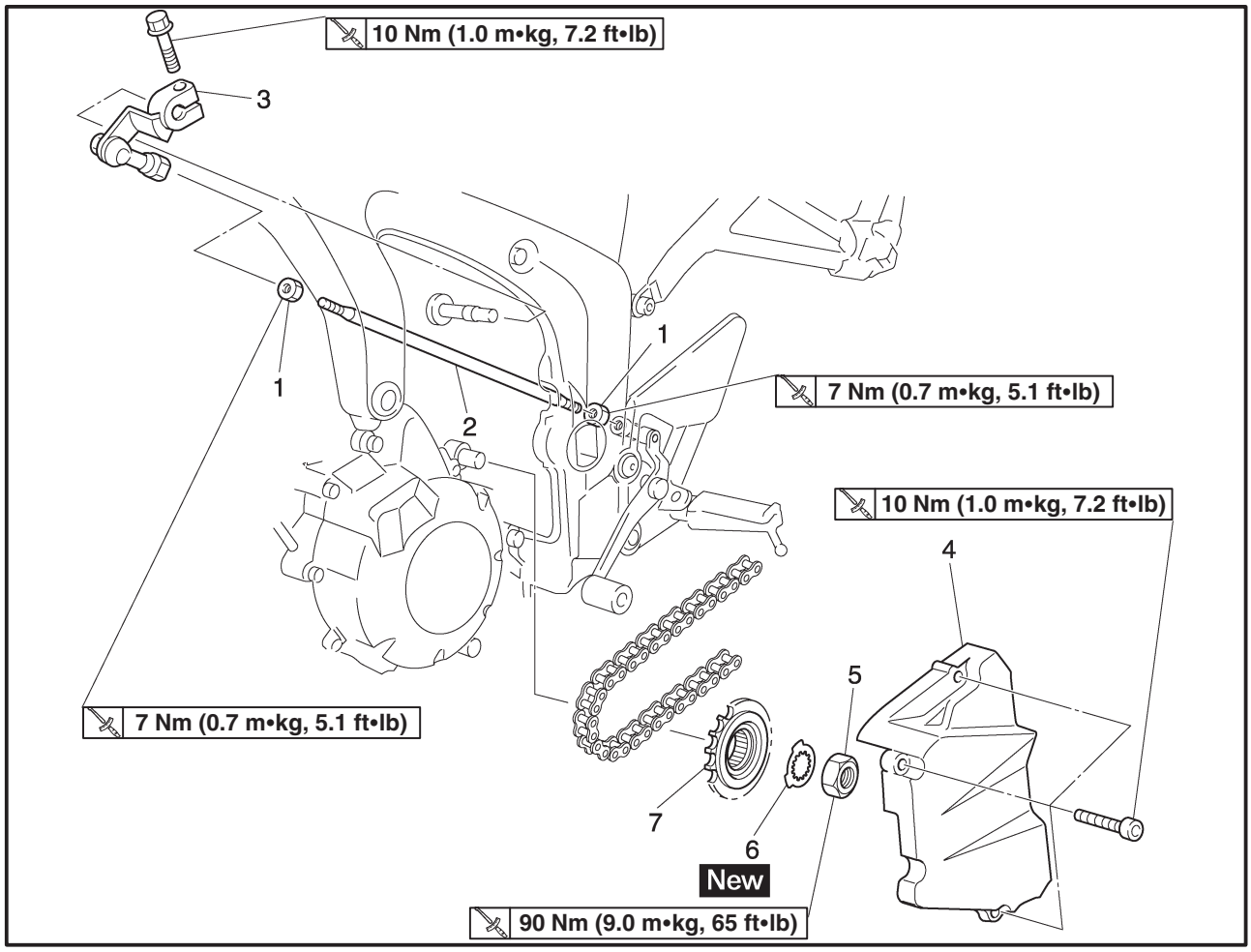
6. Check:
   • drive sprocket
   • rear wheel sprocket
     More than 1/4 tooth ⓐ wear → Replace the drive chain sprockets as a set.
     Bent teeth → Replace the drive chain sprockets as a set.

ⓑ Correct
① Drive chain roller
② Drive chain sprocket

EAS00188

ENGINE

ENGINE
DRIVE SPROCKET

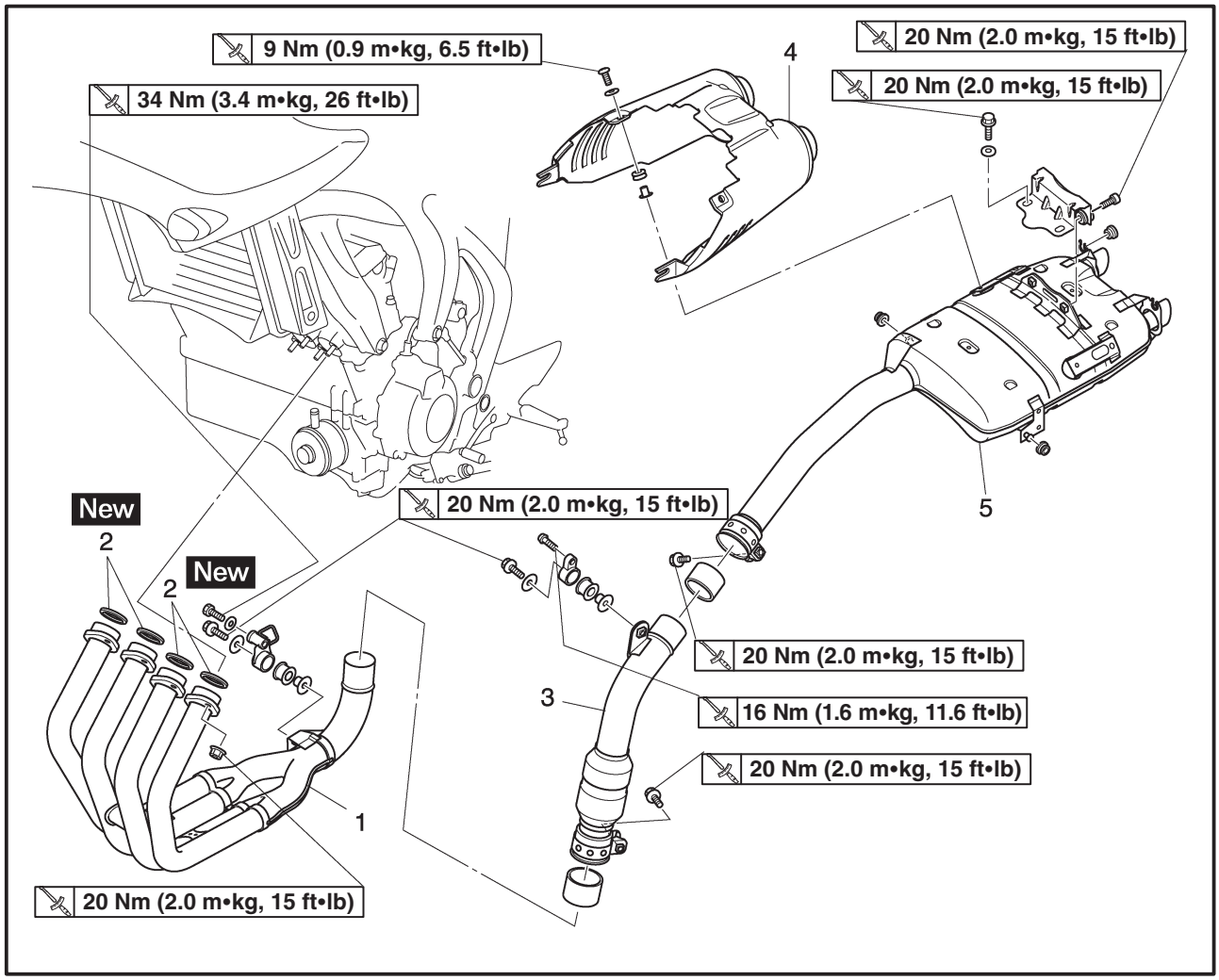


Order	Job/Part	Q'ty	Remarks
	Removing the drive sprocket		
	Drive chain		Loosen. Refer to "ADJUSTING THE DRIVE CHAIN SLACK" in chapter 3.
1	Lock nut	2	Loosen.
2	Shift rod	1	
3	Shift arm	1	
4	Drive sprocket cover	1	
5	Nut	1	
6	Lock washer	1	
7	Drive sprocket	1	
			For installation, reverse the removal procedure.

5

EAS00189

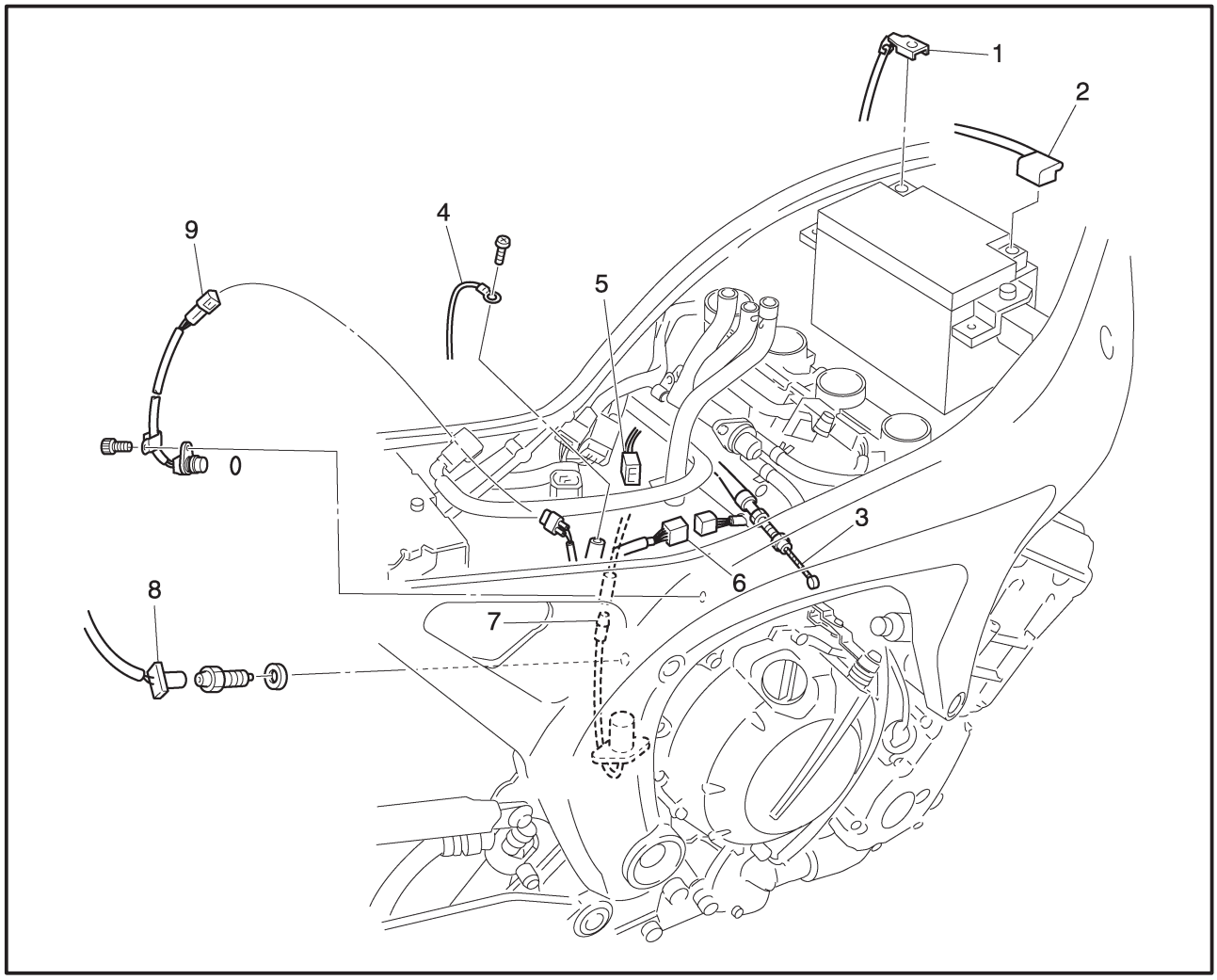
EXHAUST PIPE



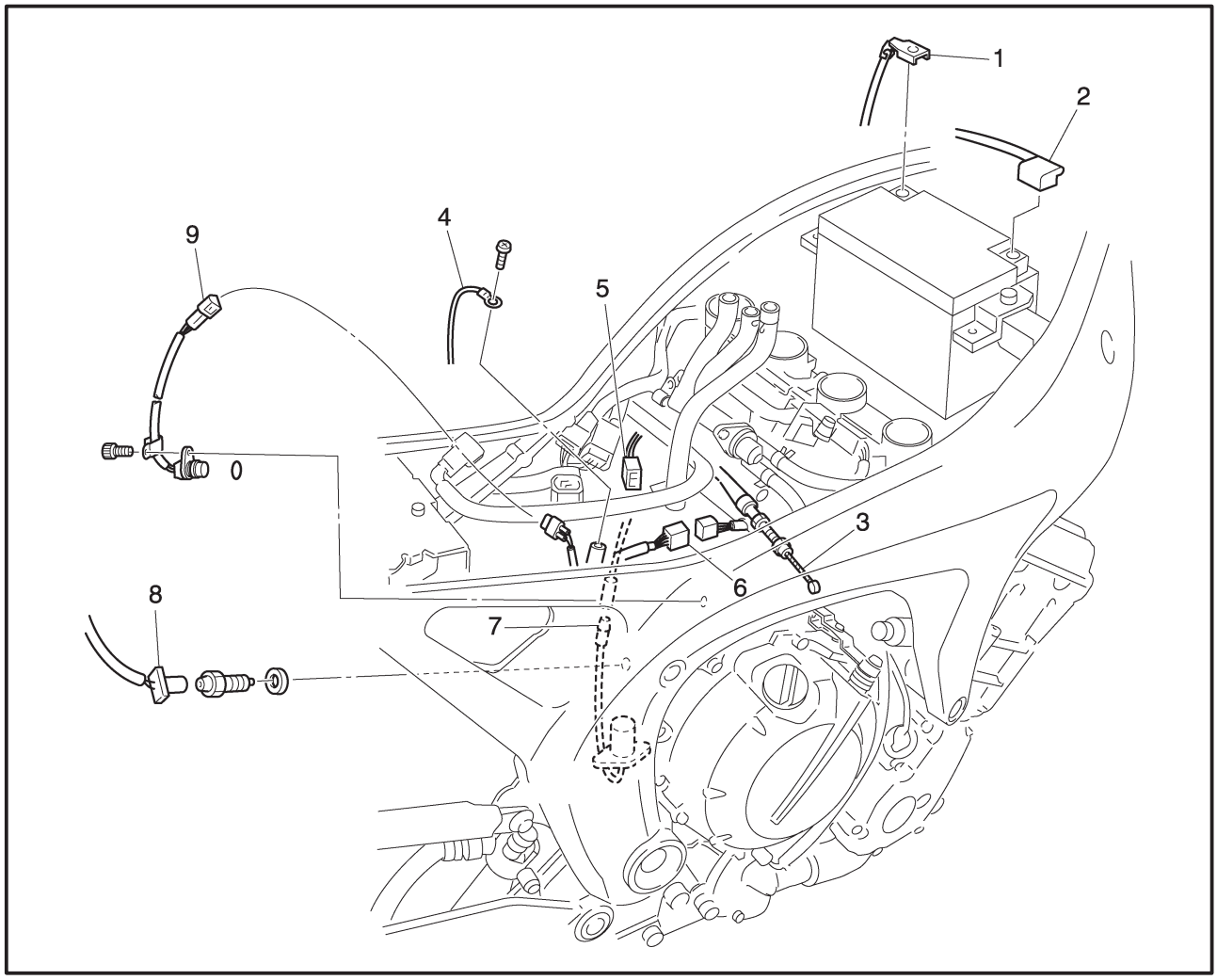
Order	Job/Part	Q'ty	Remarks
	Removing the exhaust pipe		Remove the parts in the order listed.
1	Exhaust pipe assembly	1	
2	Exhaust pipe gasket	4	
3	Catalyst pipe assembly	1	
4	Muffler protector assembly	1	
5	Muffler	1	
			For installation, reverse the removal procedure.

EAS00191

LEADS AND HOSES



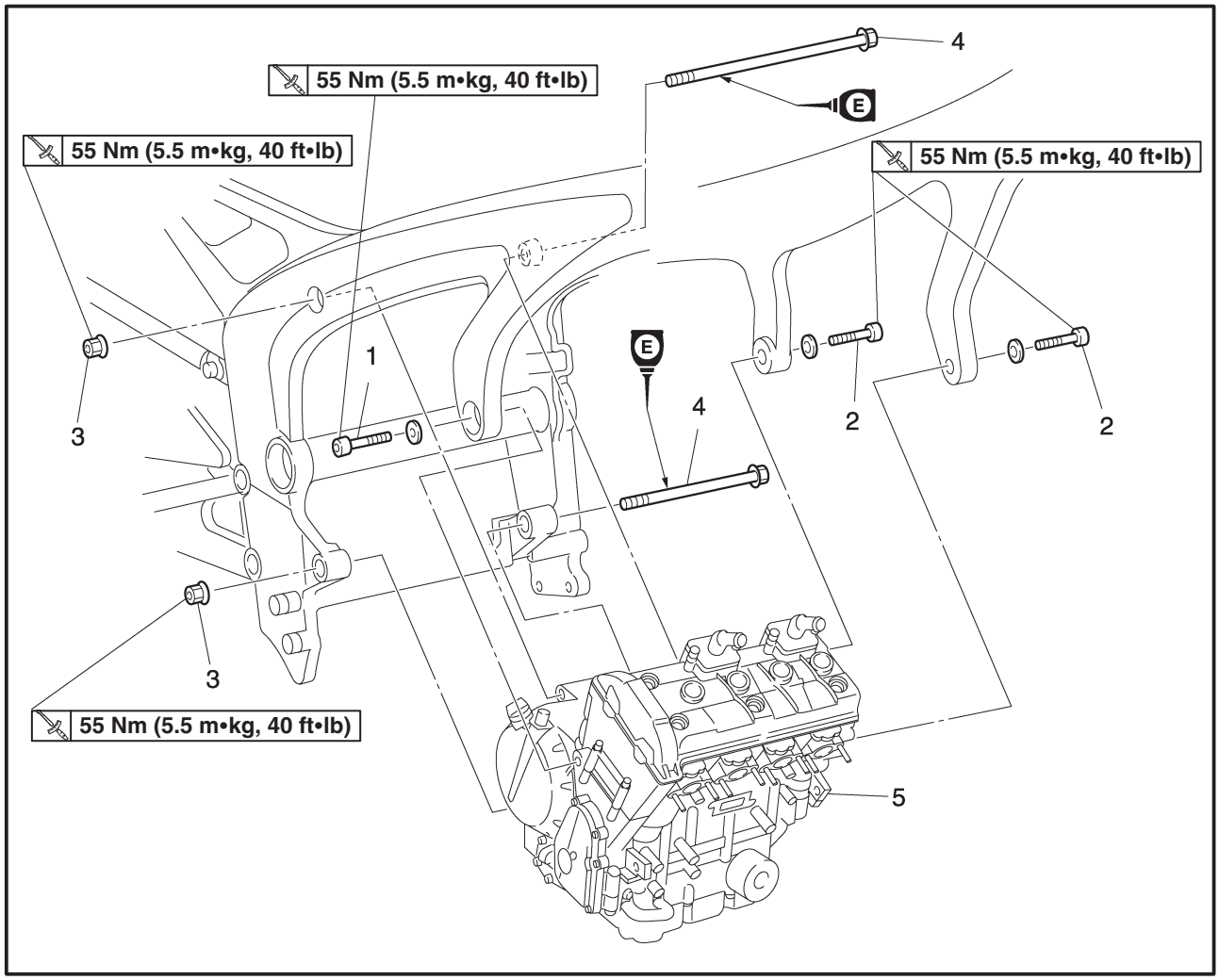
Order	Job/Part	Q'ty	Remarks
	Disconnecting the leads and hoses		Disconnect the parts in the order listed.
	Seat		Refer to "SEAT" in chapter 3.
	Front cowling inner panel (left and right)		Refer to "COWLINGS" in chapter 3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Battery		Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Battery box and battery box bracket		Refer to "BATTERY BOX AND BATTERY BOX BRACKET" in chapter 3.
	Throttle body assembly		Refer to "THROTTLE BODIES" in chapter 7.
	Engine oil		Drain
	Oil filter cartridge		Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Oil cooler		Refer to "OIL COOLER" in chapter 6.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" in chapter 7.



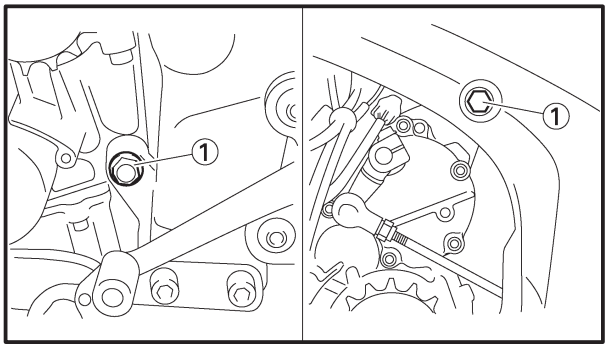
Order	Job/Part	Q'ty	Remarks
	Radiator		Refer to "COOLING SYSTEM" in chapter 6.
	Starter motor		Refer to "STARTER MOTOR" in chapter 8.
1	Battery negative lead	1	
2	Battery positive lead	1	
3	Clutch cable	1	
4	Ground lead	1	
5	Stator coil assembly coupler	1	Disconnect.
6	Crankshaft position sensor coupler	1	Disconnect.
7	Oil level switch connector	1	Disconnect.
8	Neutral switch connector	1	Disconnect.
9	Speed sensor coupler	1	Disconnect.
			For installation, reverse the removal procedure.

EAS00191

ENGINE



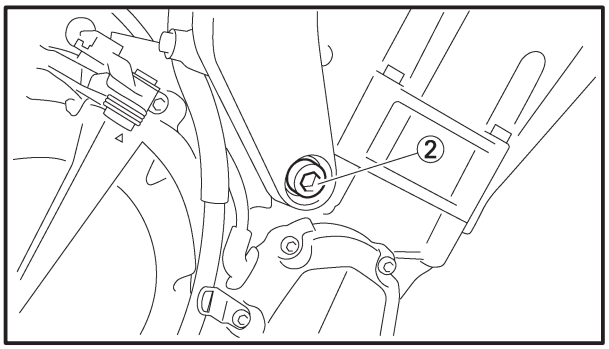
Order	Job/Part	Q'ty	Remarks
	Removing the engine		Remove the parts in the order listed. **NOTE:** Place a suitable stand under the frame and engine.
1	Right front engine mounting bolt	1	Refer to "INSTALLING THE ENGINE".
2	Left front engine mounting bolt	2	
3	Self locking nut	2	
4	Rear engine mounting bolt	2	
5	Engine	1	
			For installation, reverse the removal procedure.



EAS00192
INSTALLING THE ENGINE

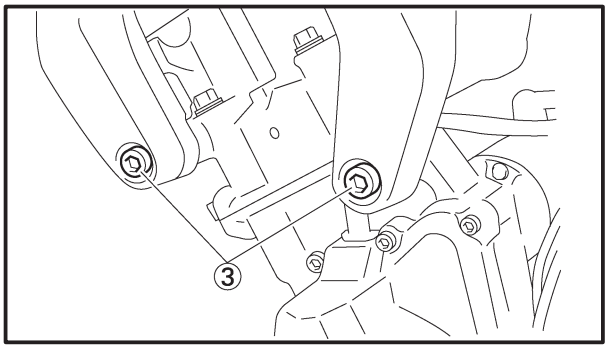
1. Install:
   • rear engine mounting bolts ①

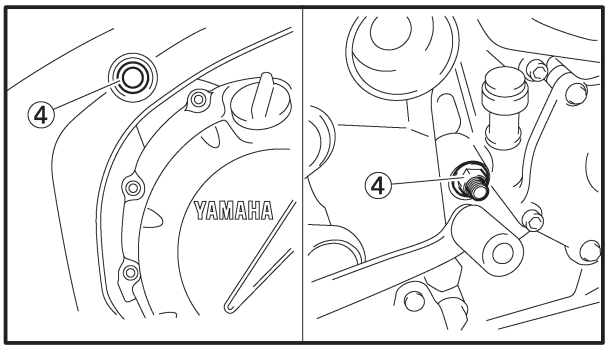
NOTE:
Lubricate the rear engine mounting bolt threads with lithium-soap-based grease.



2. Install:
   • right front engine mounting bolt ②
   • left front engine mounting bolts ③

NOTE:
Do not fully tighten the bolts.

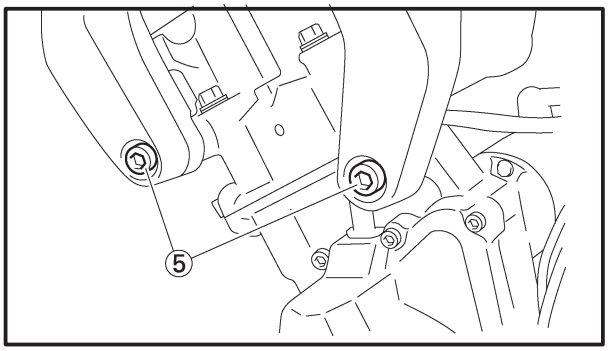




3. Tighten:
   • self-locking nut ④

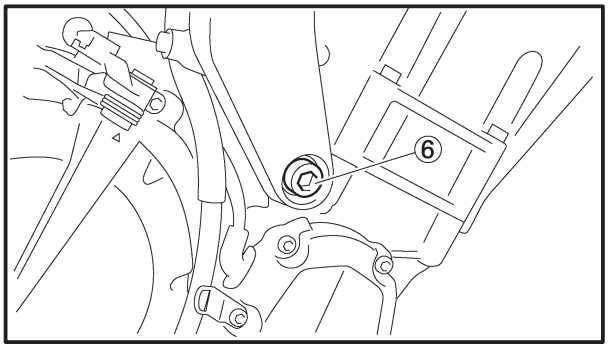
55 Nm (5.5 m•kg, 40 ft•lb)

NOTE:
First tighten the lower self-locking nut.



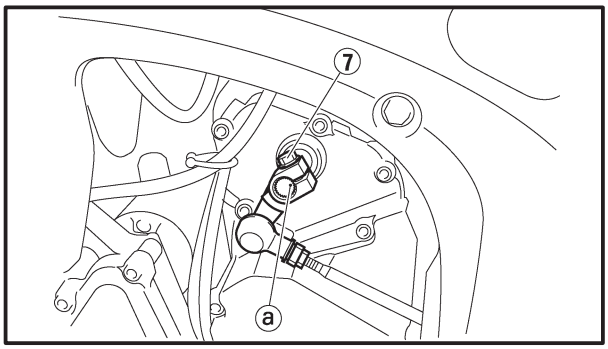
4. Tighten
   • left front engine mounting bolts ⑤

55 Nm (5.5 m•kg, 40 ft•lb)



5. Tighten
   • right front engine mounting bolts ⑥

55 Nm (5.5 m•kg, 40 ft•lb)



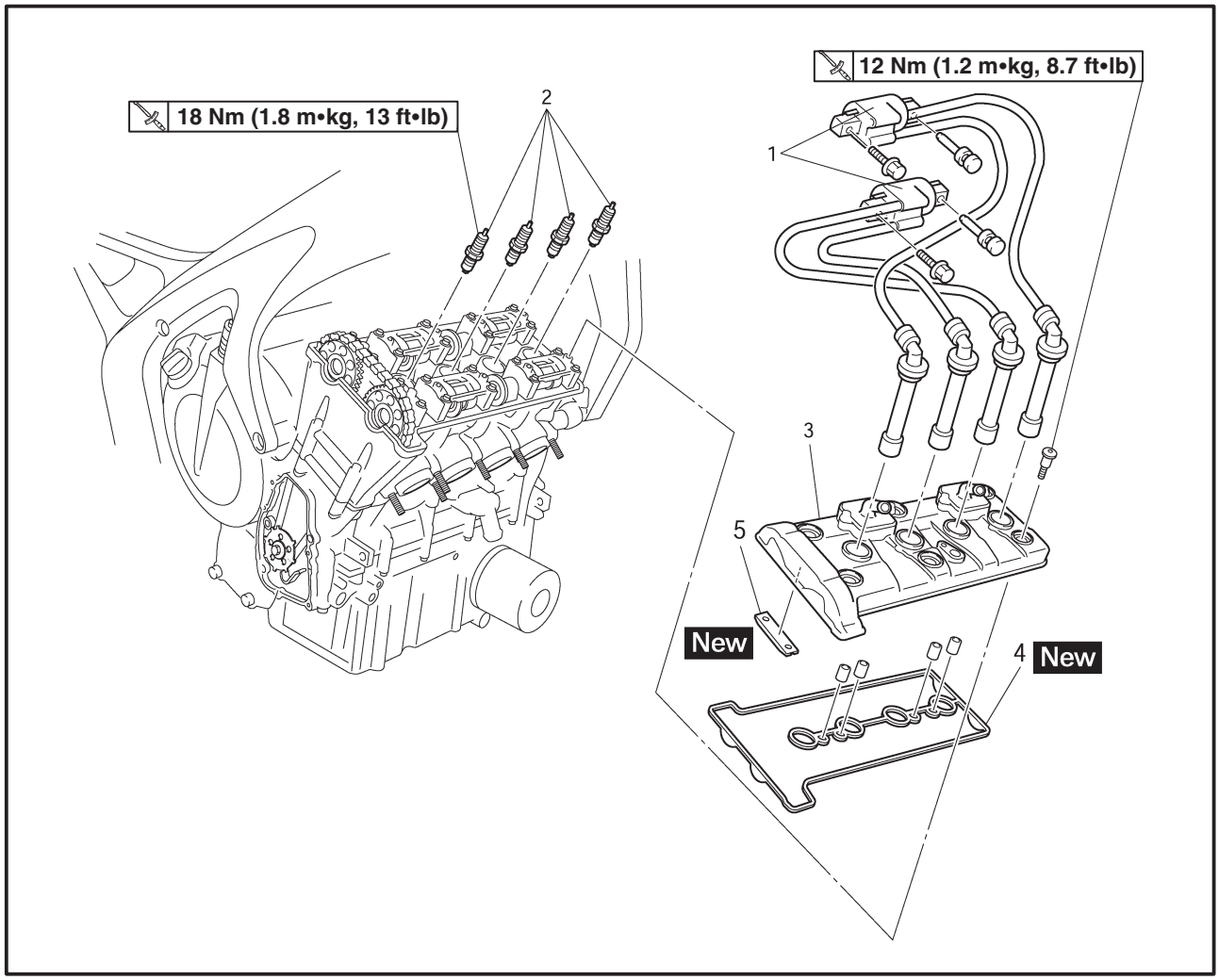
6. Install:
   • shift arm ⑦

10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

- Align the punch mark ⓐ in the shift shaft with the slot in the shift arm.
- Align the bottom edge of the shift pedal with the mark on the frame-to-swingarm bracket.

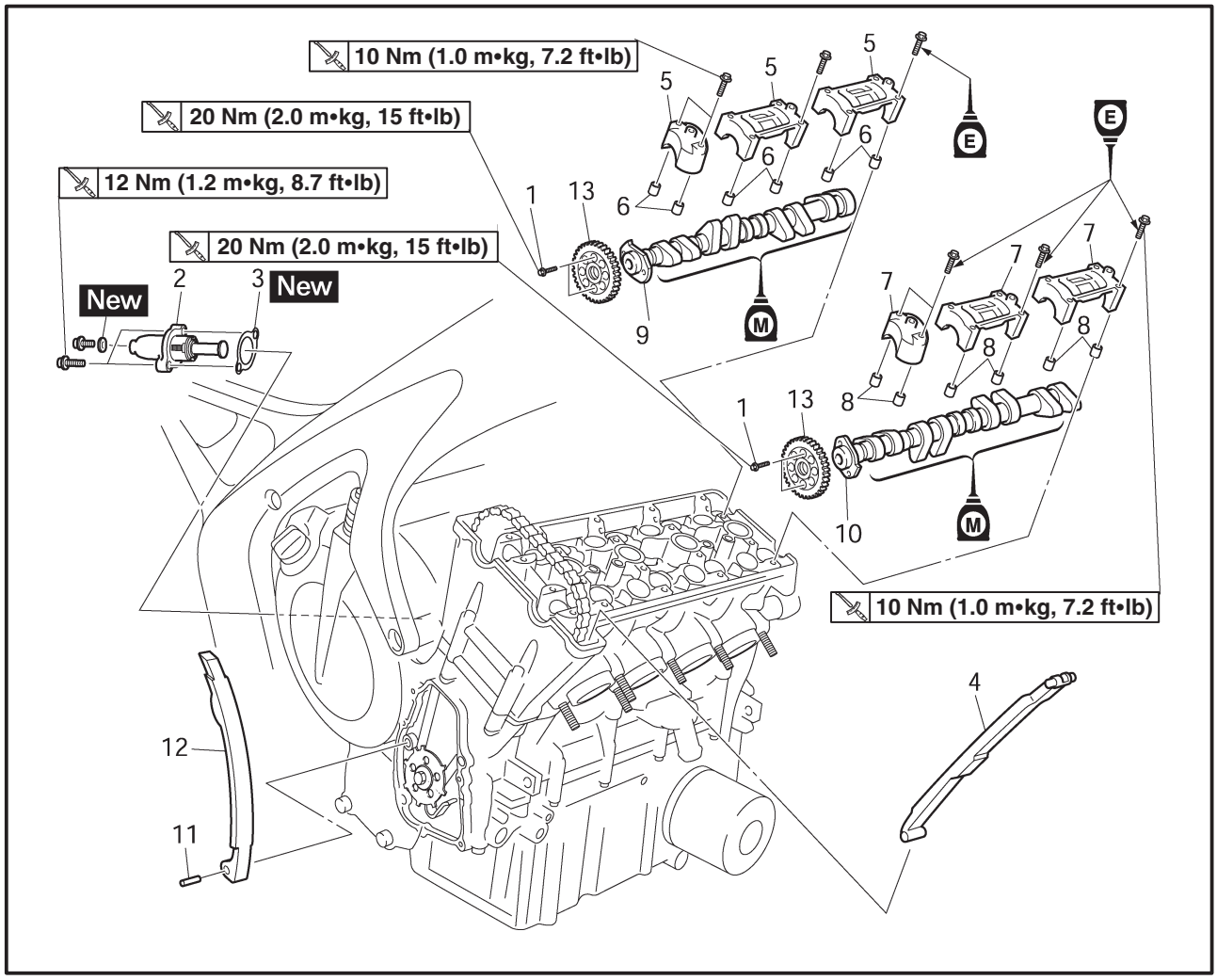
EAS00194
CAMSHAFTS
CYLINDER HEAD COVER



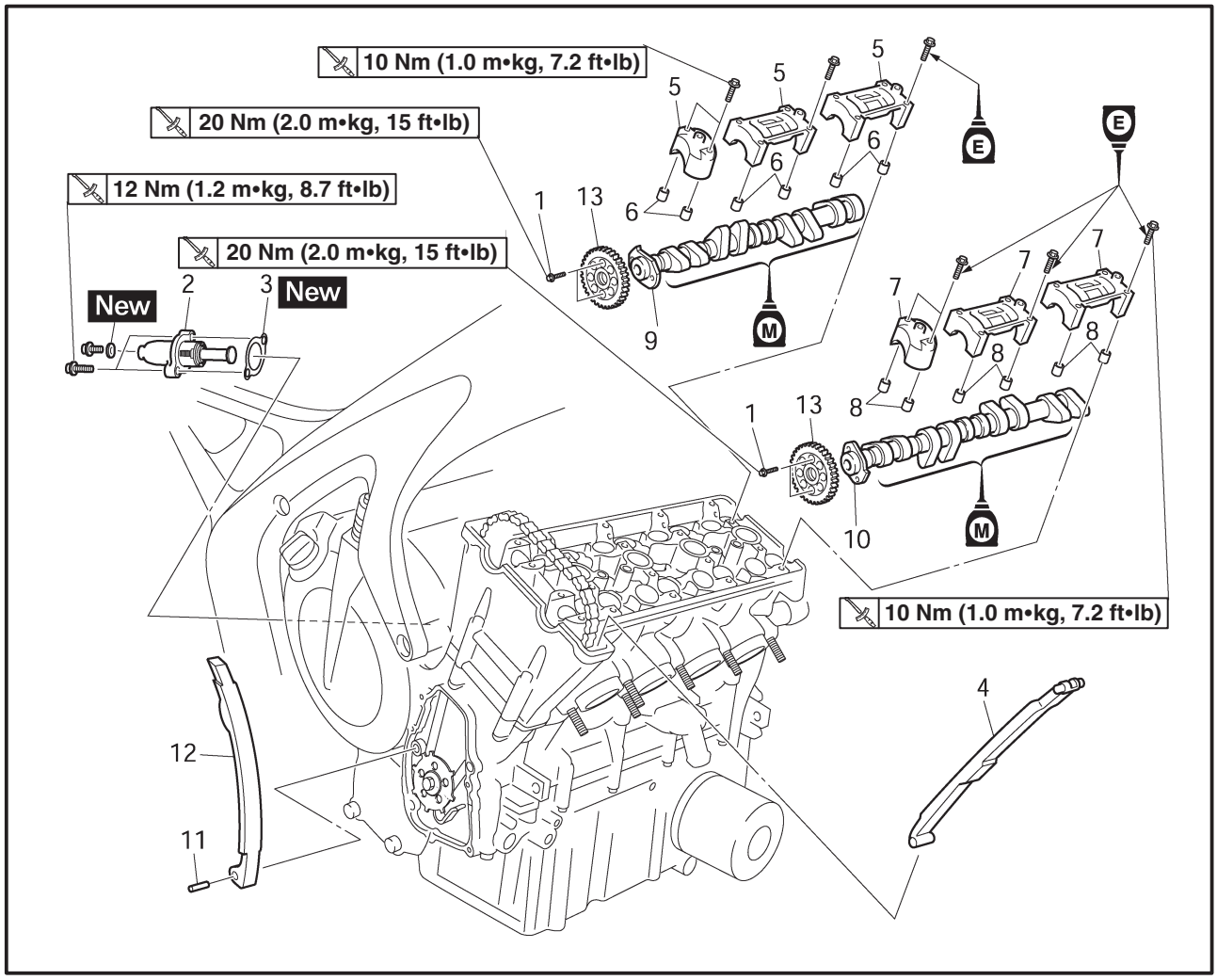
Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head cover		Remove the parts in the order listed.
	Battery		Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Battery box and battery box bracket		Refer to "BATTERY BOX AND BATTERY BOX BRACKET" in chapter 3.
	Throttle body assembly		Refer to "THROTTLE BODIES" in chapter 7.
	Radiator assembly		Refer to "COOLING SYSTEM" in chapter 6.
	Air cut-off valve		Refer to "AIR INDUCTION SYSTEM" in chapter 7.
1	Ignition coil	4	
2	Spark plug	4	
3	Cylinder head cover	1	
4	Cylinder head cover gasket	1	
5	Timing chain guide (top side)	1	
			For installation, reverse the removal procedure.

EAS00196

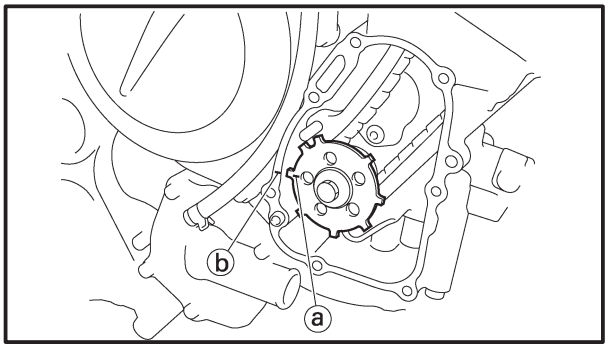
CAMSHAFTS



Order	Job/Part	Q'ty	Remarks
	Removing the camshafts Pickup rotor cover		Remove the parts in the order listed. Refer to "CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR"
1	Camshaft sprocket bolt	4	Loosen.
2	Timing chain tensioner	1	
3	Timing chain tensioner gasket	1	
4	Timing chain guide (exhaust side)	1	
5	Intake camshaft cap	3	**NOTE:**
6	Dowel pin	6	During removal, the dowel pins may still be connected to the camshaft caps.
7	Exhaust camshaft cap	3	
8	Dowel pin	6	
9	Intake camshaft	1	



Order	Job/Part	Q'ty	Remarks
10	Exhaust camshaft	1	
11	Pin	1	
12	Timing chain guide (intake side)	1	
13	Cam sprocket	2	
			For installation, reverse the removal procedure.



EAS00198
REMOVING THE CAMSHAFTS

1. Remove:
   - pickup rotor cover
     Refer to "CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR".
2. Align:
   - "T" mark ⓐ on the pickup rotor
     (with the crankcase mating surface ⓑ)

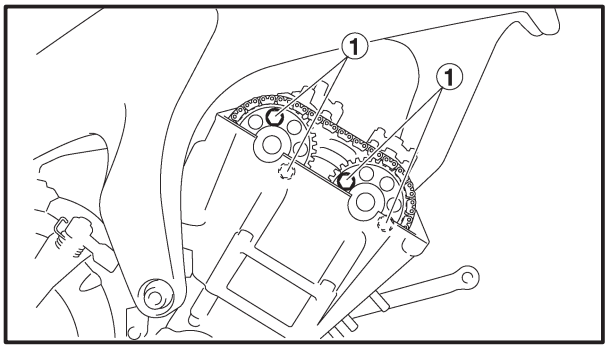
▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Turn the crankshaft clockwise.
b. When piston #1 is at TDC on the compression stroke, align the "T" mark ⓐ on the pickup rotor with the crankcase mating surface ⓑ.

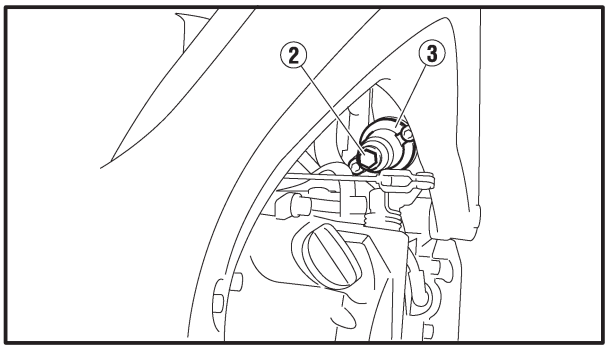
NOTE:

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

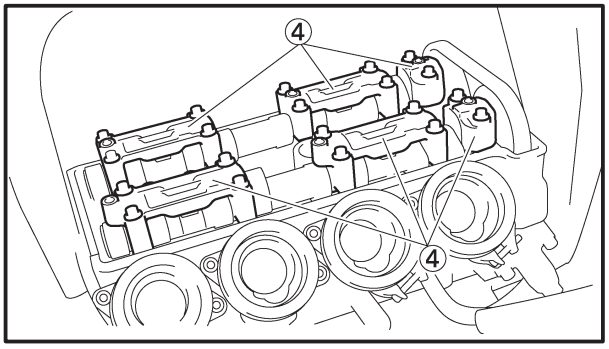
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



3. Loosen:
   - camshaft sprocket bolts ①



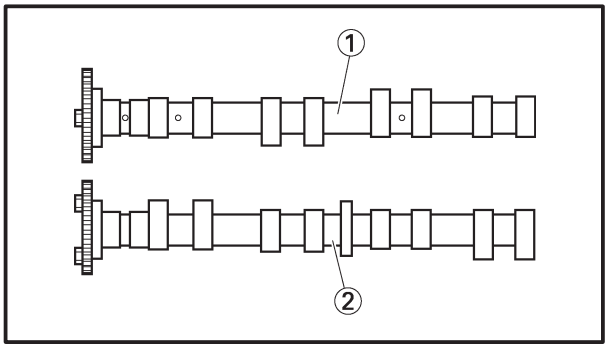
4. Loosen:
   - cap bolt ②
5. Remove:
   - timing chain tensioner ③
   - gasket



6. Remove:
   - timing chain guide (exhaust side)
   - camshaft caps ④
   - dowel pins

CAUTION:

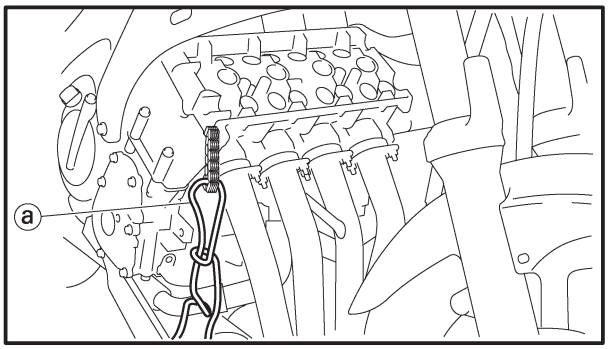
To prevent damage to the cylinder head, camshafts or camshaft caps, loosen the camshaft cap bolts in stages and in a crisscross pattern, working from the outside in.



7. Remove:
   • intake camshaft ①
   • exhaust camshaft ②

NOTE:

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

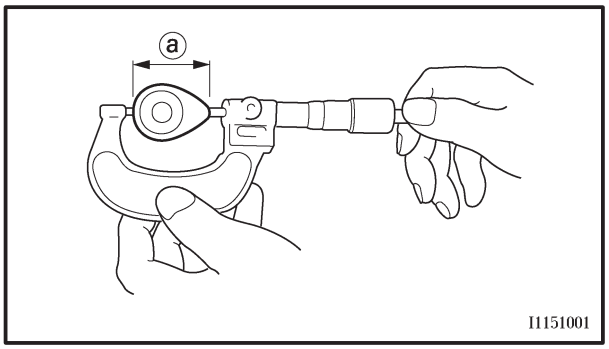


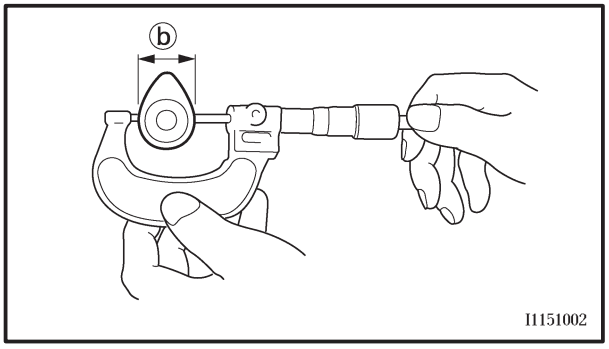
8. Remove:
   • camshaft sprockets

EAS00204

CHECKING THE CAMSHAFTS

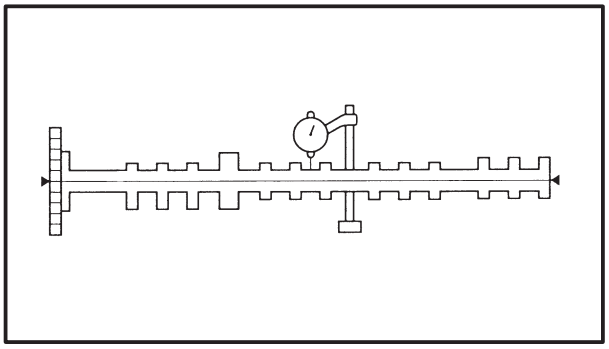
1. Check:
   • camshaft lobes
   Blue discoloration/pitting/scratches → Replace the camshaft.





2. Measure:
   • camshaft lobe dimensions ⓐ and ⓑ
   Out of specification → Replace the camshaft.

Camshaft lobe dimension limit
Intake camshaft
ⓐ 32.45 ~ 32.55 mm (1.278 ~ 1.282 in)
<Limit>: 32.40 mm (1.276 in)
ⓑ 24.95 mm ~ 25.05 mm (0.982 ~ 0.986 in)
<Limit>: 24.90 mm (0.980 in)
Exhaust camshaft
ⓐ 32.45 ~ 32.55 mm (1.278 ~ 1.282 in)
<Limit>: 32.40 mm (1.276 in)
ⓑ 24.95 ~ 25.05 mm (0.982 ~ 0.986 in)
<Limit>: 24.90 mm (0.980 in)

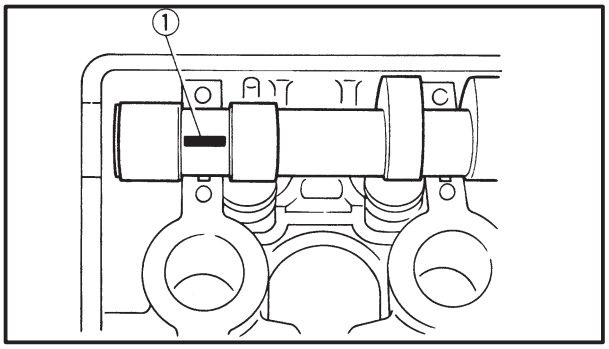


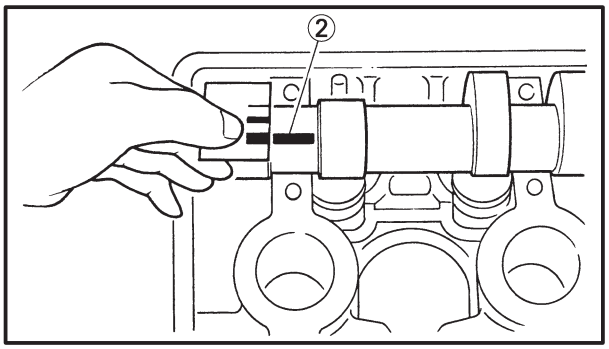
3. Measure:
   • camshaft runout
   Out of specification → Replace.

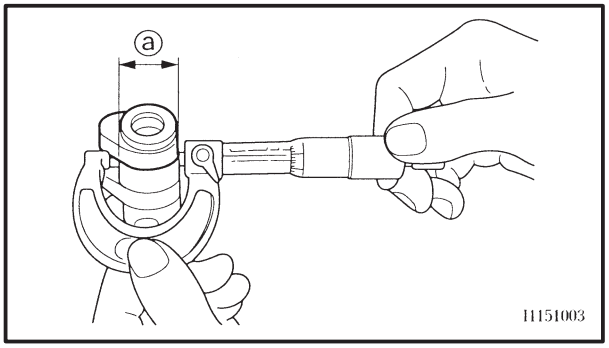
Camshaft runout limit
0.06 mm (0.0024 in)

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 (0.0032 in)







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

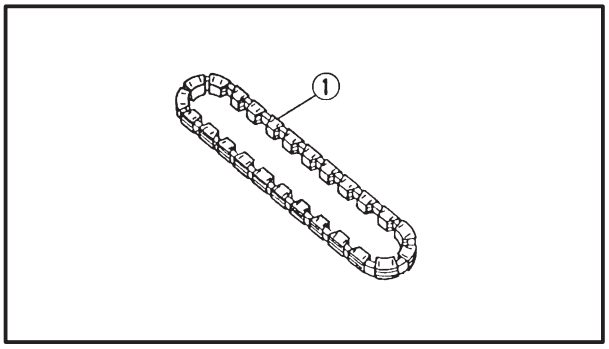
NOTE:
- Tighten the camshaft cap bolts in stages and in a crisscross pattern, working from the inner caps out.
- Do not turn the camshaft when measuring the camshaft journal-to-camshaft cap clearance with the Plastigauge®.

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

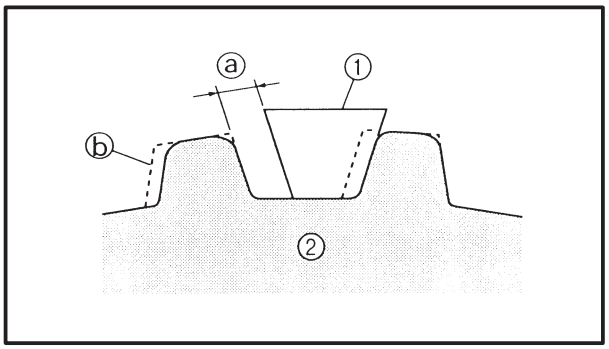
d. Remove the camshaft caps and then measure the width of the Plastigauge® ②.

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

Camshaft journal diameter
22.967 ~ 22.980 mm
(0.9042 ~ 0.9047 in)

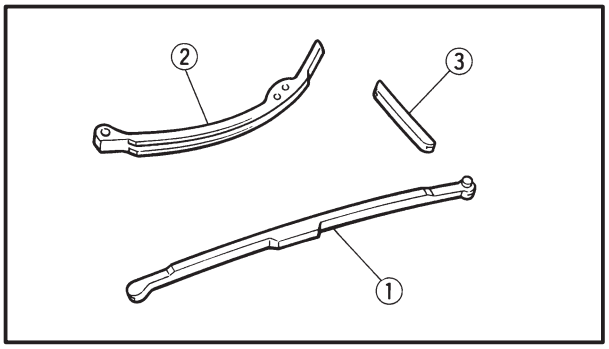


EAS00208
CHECKING THE TIMING CHAIN, CAMSHAFT SPROCKETS, AND TIMING CHAIN GUIDES
The following procedure applies to all of the camshaft sprockets and timing chain guides.
1. Check:
   • timing chain ①
   Damage/stiffness → Replace the timing chain and camshaft sprockets as a set.

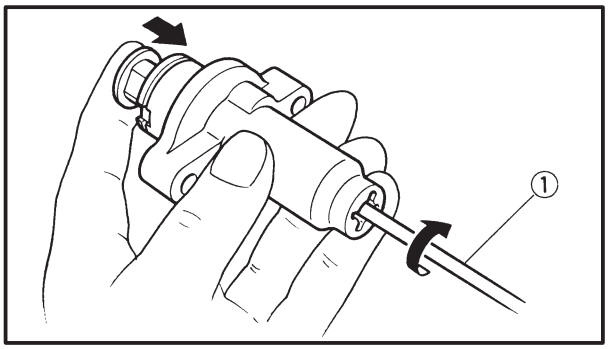


2. Check:
   • camshaft sprocket
   More than 1/4 tooth wear ⓐ → Replace the camshaft sprockets and the timing chain as a set.

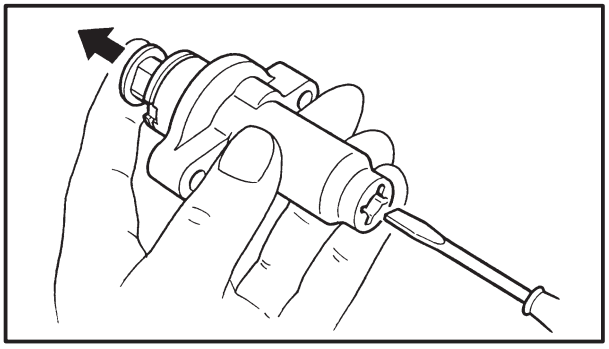
ⓐ 1/4 tooth
ⓑ Correct
① Timing chain roller
② Camshaft sprocket



3. Check:
   • timing chain guide (exhaust side) ①
   • timing chain guide (intake side) ②
   • timing chain guide (top side) ③
   Damage/wear → Replace the defective part(s).



EAS00210
CHECKING THE TIMING CHAIN TENSIONER
1. Check:
   • timing chain tensioner
   Cracks/damage → Replace.
2. Check:
   • one-way cam operation
   Rough movement → Replace the timing chain tensioner assembly.

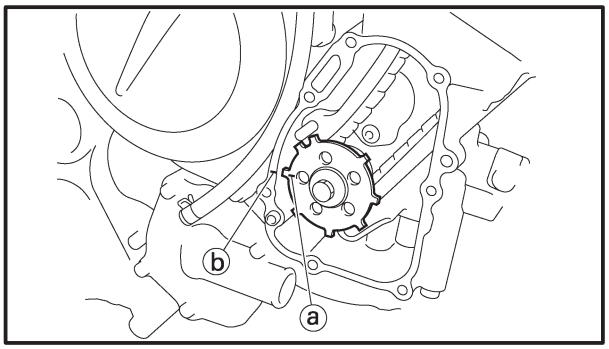


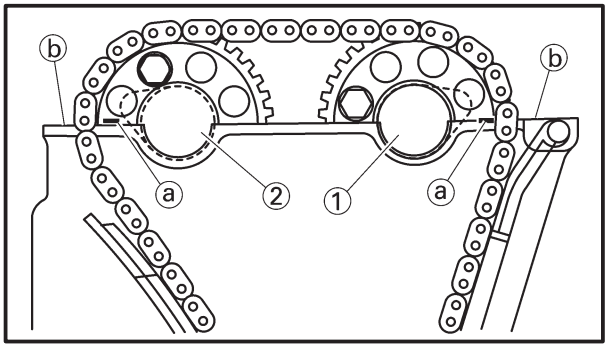
a. Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.

NOTE:
While pressing the timing chain tensioner rod, wind it clockwise with a thin screwdriver ① until it stops.

b. Remove the screwdriver and slowly release the timing chain tensioner rod.
c. Make sure that the timing chain tensioner rod comes out of the timing chain tensioner housing smoothly. If there is rough movement, replace the timing chain tensioner.

3. Check:
   • cap bolt
   • aluminum washer New
   • gasket New
   Damage/wear → Replace the defective part(s).





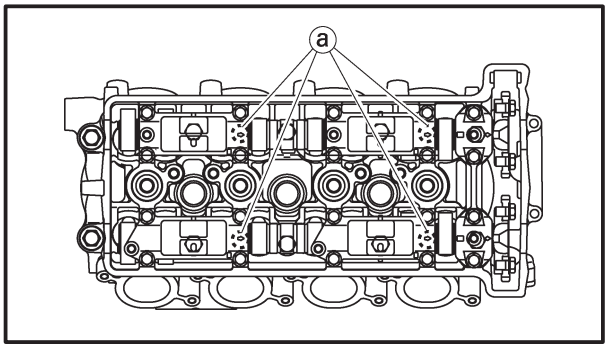
EAS00215
INSTALLING THE CAMSHAFTS

1. Align:
   • "T" mark ⓐ on the pickup rotor
   (with the crankcase mating surface ⓑ)

a. Turn the crankshaft clockwise.
b. When piston #1 is at TDC, align the "T" mark ⓐ with the crankcase mating surface ⓑ.

2. Install:
   • exhaust camshaft ①
   • intake camshaft ②
   (with the camshaft sprocket temporarily tightened)

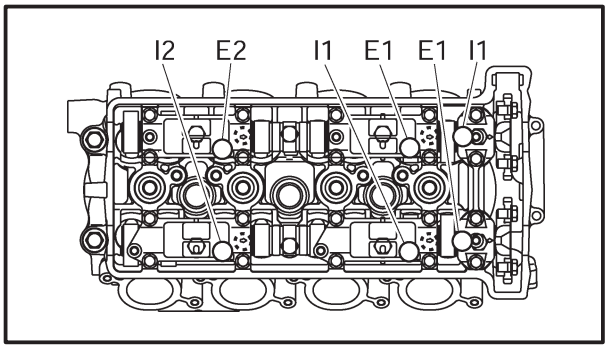
NOTE:
Make sure the match mark ⓐ on the camshaft sprocket is aligned with the cylinder head edge ⓑ.



3. Install:
   • dowel pins
   • exhaust camshaft caps
   • intake camshaft caps

NOTE:

- Make sure each camshaft cap is installed in its original place.
- Make sure the arrow mark ⓐ on each camshaft cap points towards the right side of the engine.



4. Install:
   • camshaft cap bolts

10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

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

I1, I2: Intake side camshaft cap mark
E1, E2: Exhaust side camshaft cap mark

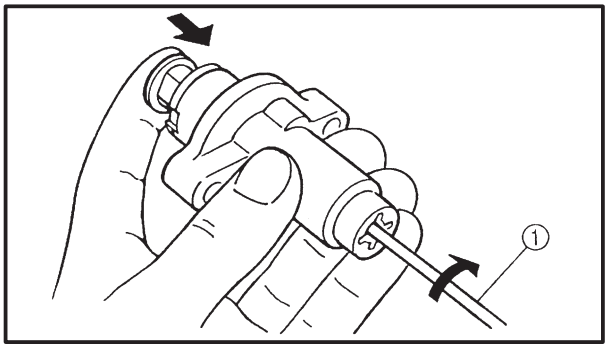
CAUTION:

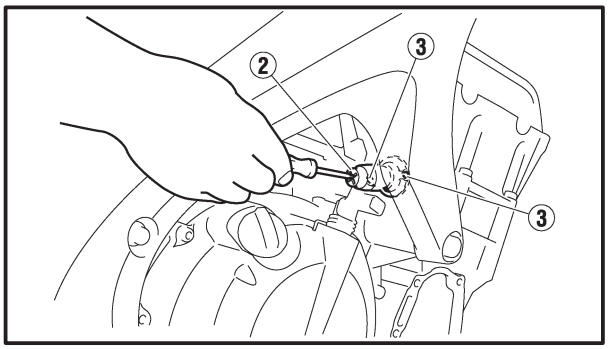
- **Lubricate the camshaft cap bolts with the engine oil.**
- **The camshaft cap bolts must be tightened evenly or damage to the cylinder head, camshaft caps, and camshafts will result.**
- **Do not turn the crankshaft when installing the camshaft to avoid damage or improper valve timing.**

5. Install:
   • timing chain guide (exhaust side)

NOTE:

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





6. Install:
   • timing chain tensioner

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

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

⚠ WARNING

Always use a new gasket.

c. Tighten the timing chain tensioner bolts ③ to the specified torque.

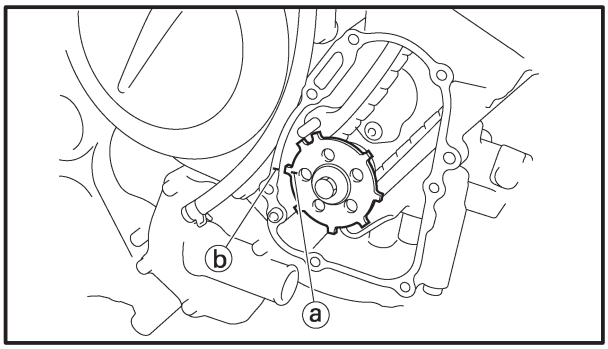
	Timing chain tensioner bolt **12 Nm (1.2 m•kg, 8.7 ft•lb)**

d. Remove the screwdriver, make sure that the timing chain tensioner rod releases, and then tighten the cap bolt to the specified torque.

	Cap bolt **7 Nm (0.7 m•kg, 5.1 ft•lb)**

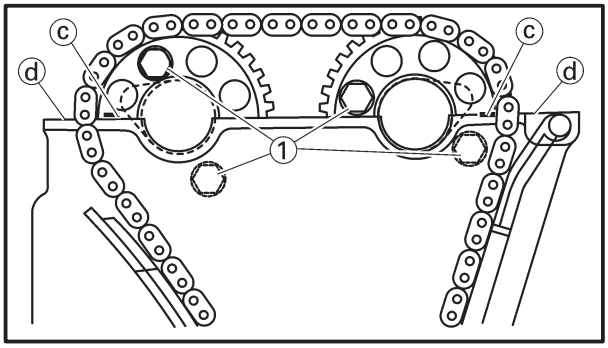
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

7. Turn:
   • crankshaft
   (several full turns clockwise)



8. Check:
   • "T" mark ⓐ
   Make sure the "T" mark on the pickup rotor is aligned with the crankcase mating sure face ⓑ.
   • camshaft sprocket match mark ⓒ
   Make sure the match marks on the camshaft sprockets are aligned with the crankcase mating surface ⓓ.
   Out of alignment → Adjust.
   Refer to the installation steps above.
9. Tighten:
   • camshaft sprocket bolts ①

	20 Nm (2.0 m•kg, 15 ft•lb)

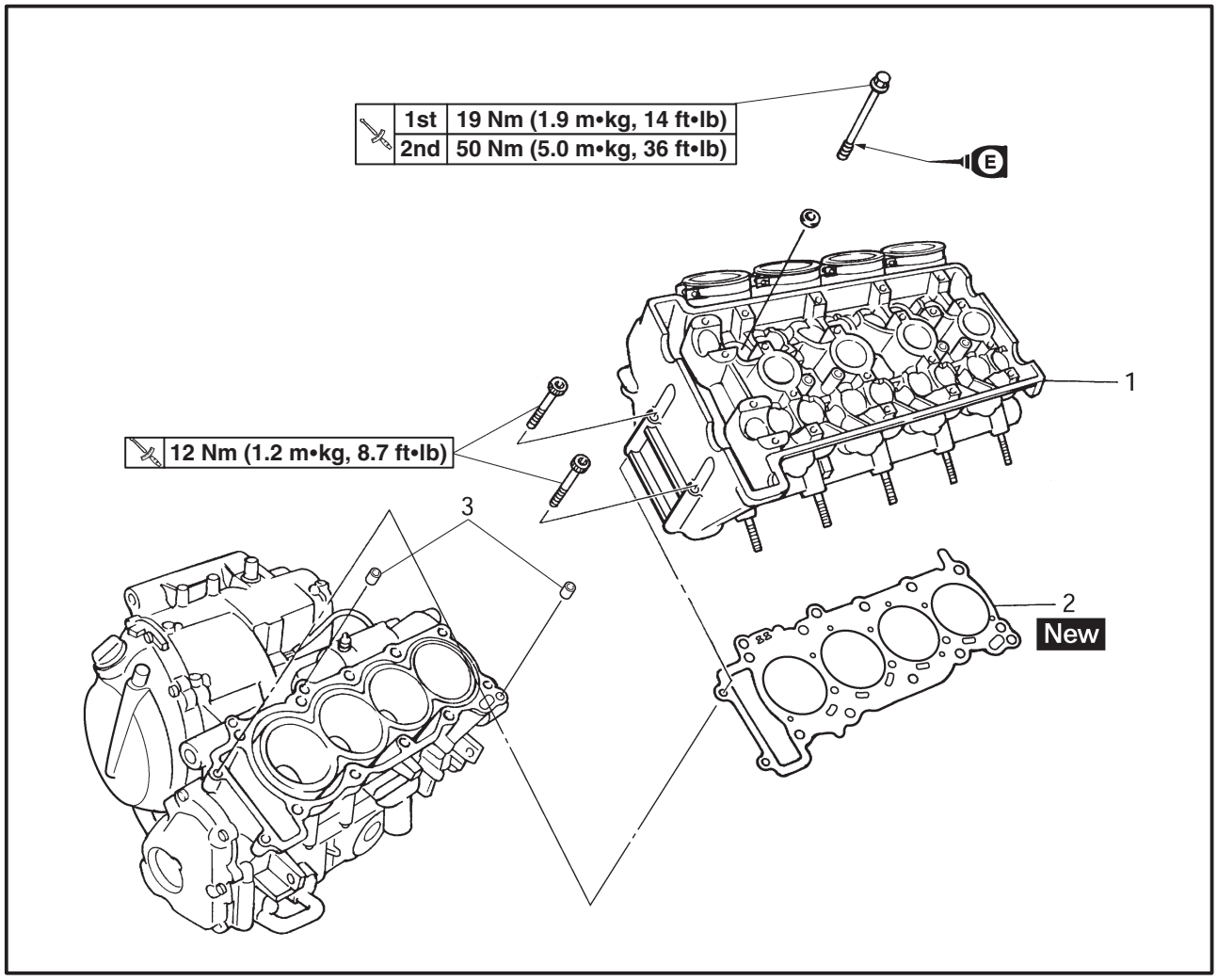


CAUTION:

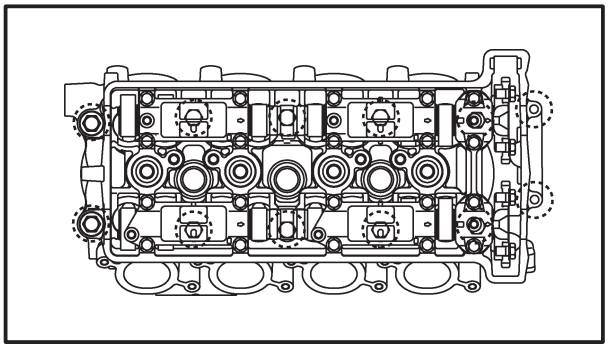
Be sure to tighten the camshaft sprocket bolts to the specified torque to avoid the possibility of the bolts coming loose and damaging the engine.

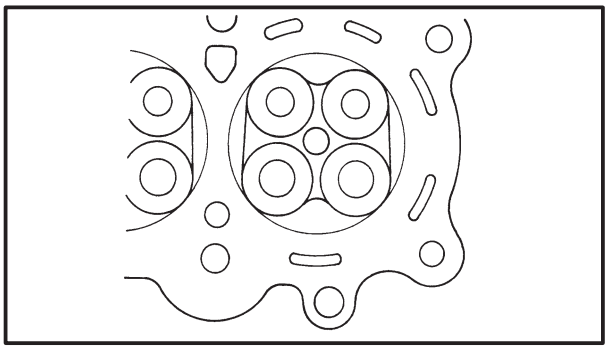
10. Measure:
    • valve clearance
      Out of specification → Adjust.
      Refer to “ADJUSTING THE VALVE CLEARANCE” in chapter 3.

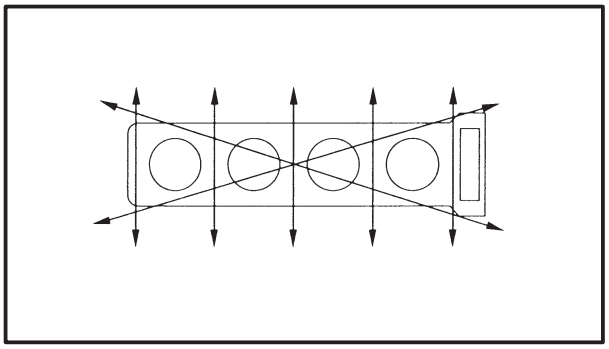
EAS00221
CYLINDER HEAD

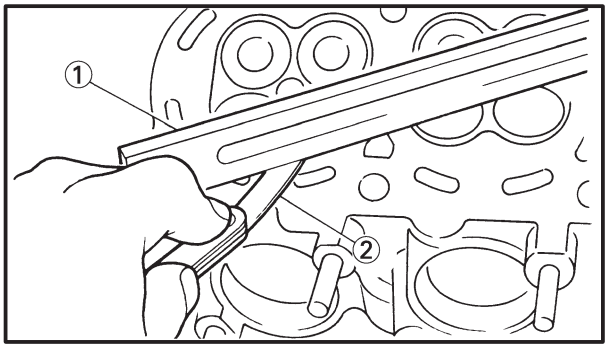


Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head		Remove the parts in the order listed.
	Intake and exhaust camshaft		Refer to "CAMSHAFTS".
	Engine bracket		Refer to "ENGINE".
1	Cylinder head	1	
2	Cylinder head gasket	1	
3	Dowel pin	2	
			For installation, reverse the removal procedure.









EAS00222
REMOVING THE CYLINDER HEAD

1. Remove:
   • cylinder head bolts

NOTE:

• Loosen the bolts in the proper sequence as shown.
• Loosen each bolt 1/2 of a turn at a time. After all of the bolts are fully loosened, remove them.

EAS00229
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

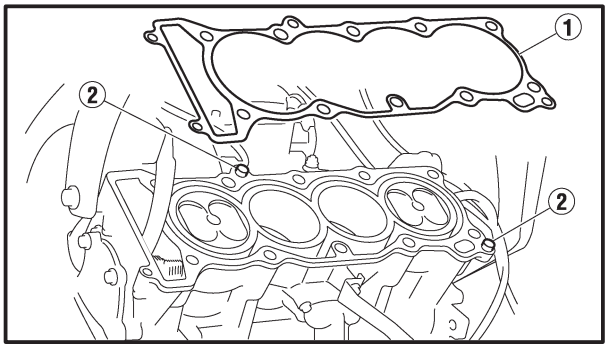
2. Check:
   • cylinder head
     Damage/scratches → Replace.
   • cylinder head water jacket
     Mineral deposits/rust → Eliminate.
3. Measure:
   • cylinder head warpage
     Out of specification → Resurface the cylinder head.

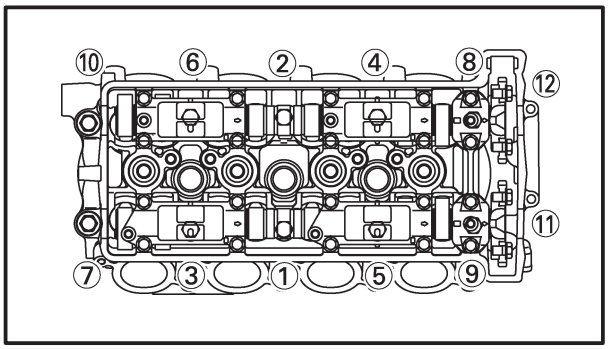
Maximum cylinder head warpage
0.05 mm (0.002 in)

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

NOTE:

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





EAS00233
INSTALLING THE CYLINDER HEAD

1. Install:
   - gasket New ①
   - dowel pins ②
2. Install:
   - cylinder head

NOTE:

Pass the timing chain through the timing chain cavity.

3. Tighten:
   - cylinder head bolts ① ~ ⑩

1st	19 Nm (1.9 m•kg, 14 ft•lb)
2nd	50 Nm (5.0 m•kg, 36 ft•lb)

   - cylinder head bolts ⑪, ⑫

	12 Nm (1.2 m•kg, 8.7 ft•lb)

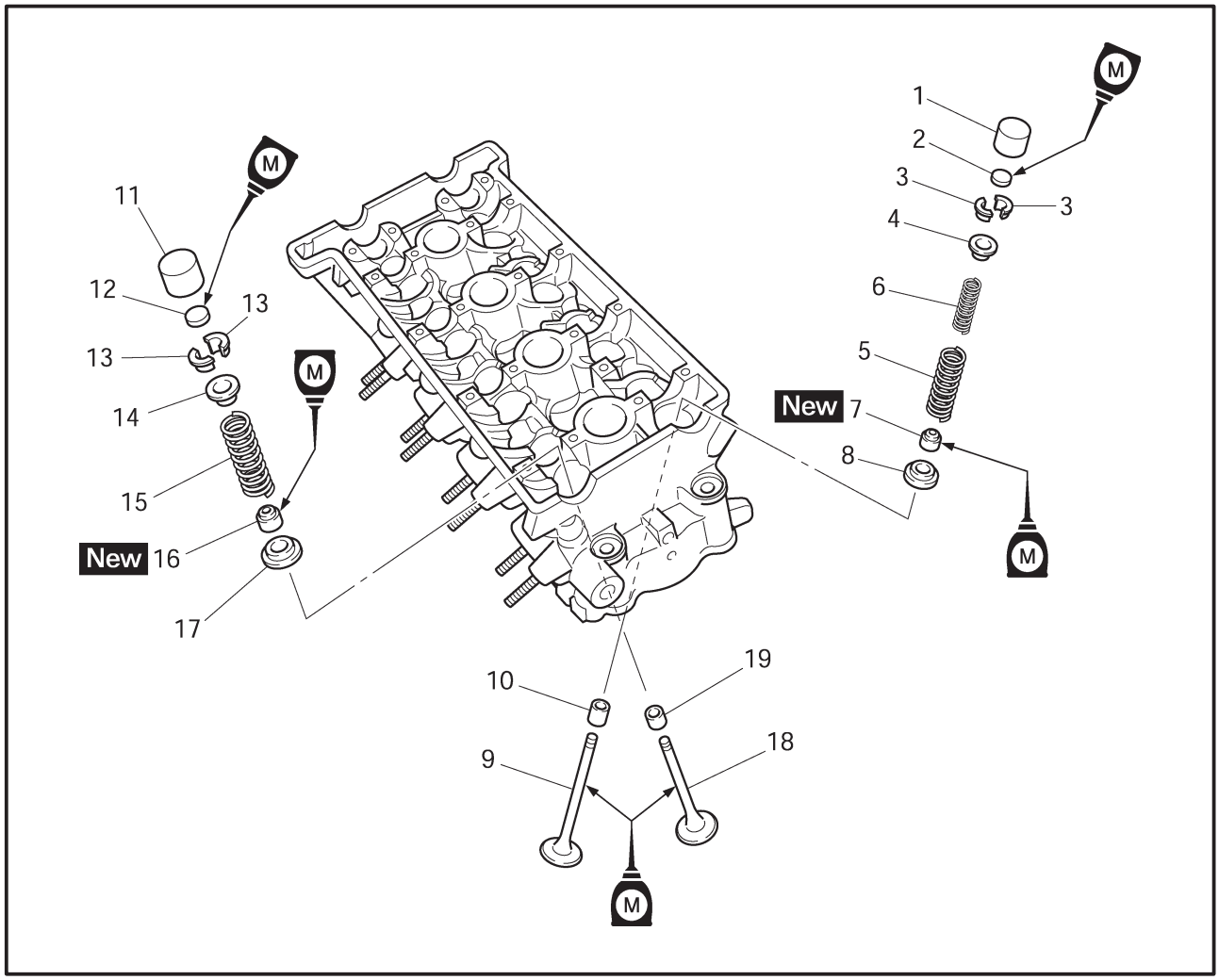
NOTE:

- 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.
- First, tighten the bolts ① ~ ⑩ to approximately 19 Nm (1.9 m•kg, 14 ft•lb) with a torque wrench and then tighten the 50 Nm (5.0 m•kg, 36 ft•lb).

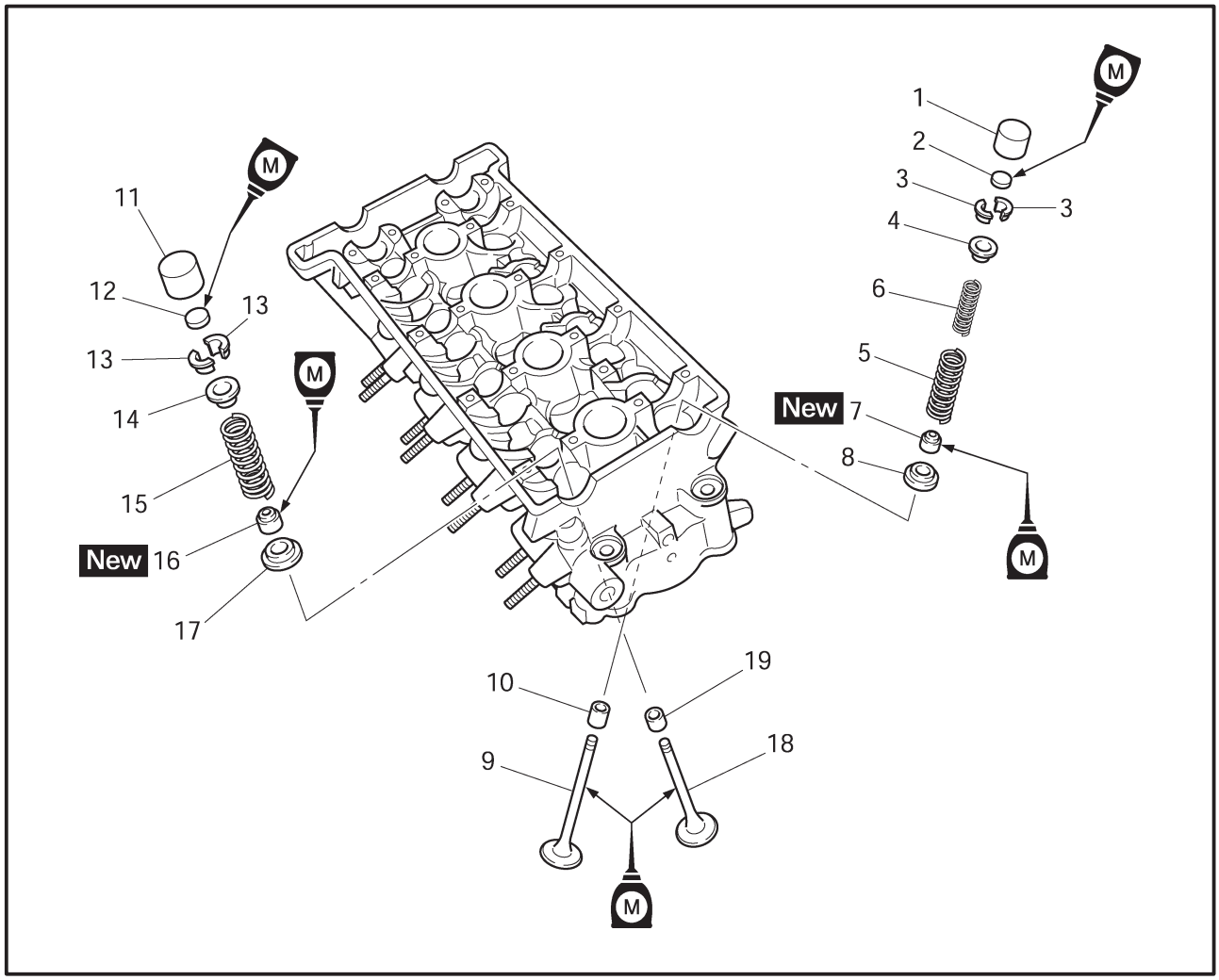
4. Install:
   - exhaust camshaft
   - intake camshaft

   Refer to “INSTALLING THE CAMSHAFTS”.

EAS00236
VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	Remove the valves and valve springs		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Intake valve lifter	8	
2	Intake valve pad	8	
3	Intake valve cotter	16	
4	Intake valve upper spring seat	8	
5	Intake valve spring outer	8	
6	Intake valve spring inner	8	Refer to "REMOVING/INSTALLING
7	Intake valve stem seal	8	THE VALVES".
8	Intake valve lower spring seat	8	
9	Intake valve	8	
10	Intake valve guide	8	
11	Exhaust valve lifter	8	
12	Exhaust valve pad	8	
13	Exhaust valve cotter	16	



Order	Job/Part	Q'ty	Remarks
14	Exhaust valve upper spring seat	8	Refer to "REMOVING/INSTALLING THE VALVES".
15	Exhaust valve spring	8	
16	Exhaust valve stem seal	8	
17	Exhaust valve lower spring seat	8	
18	Exhaust valve	8	
19	Exhaust valve guide	8	
			For installation, reverse the removal procedure.

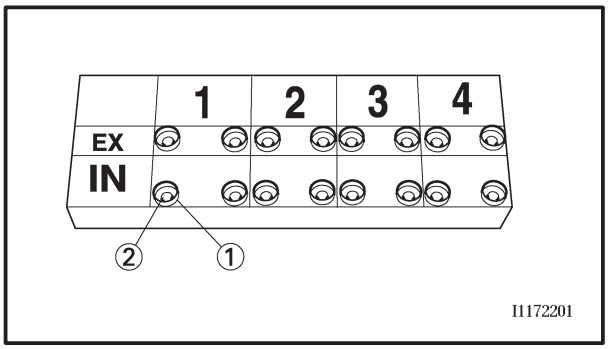
EAS00238

REMOVING THE VALVES

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

NOTE:

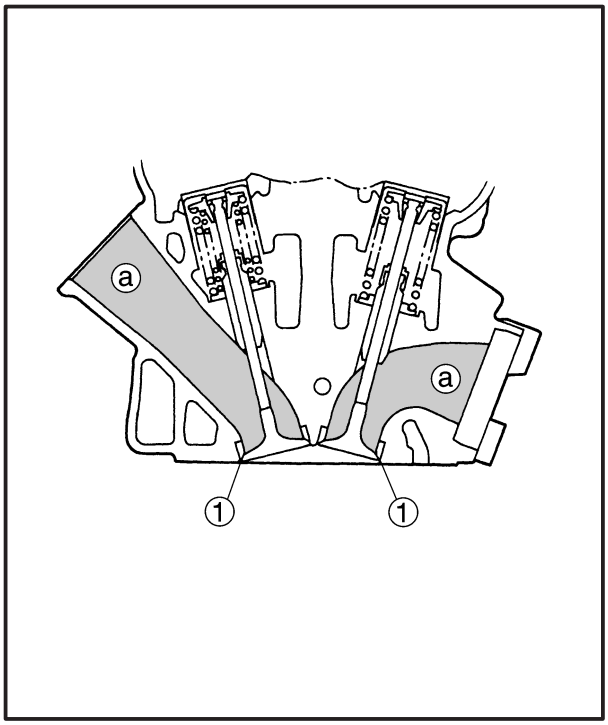
Before removing the internal parts of the cylinder head (e.g., valves, valve springs, valve seats), make sure the valves properly seal.



1. Remove:
   - valve lifter ①
   - valve pad ②

NOTE:

Make a note of the position of each valve lifter and valve pad so that they can be reinstalled in their original place.



2. Check:
   - valve sealing
     Leakage at the valve seat → Check the valve face, valve seat, and valve seat width.
     Refer to "CHECKING THE VALVE SEATS".

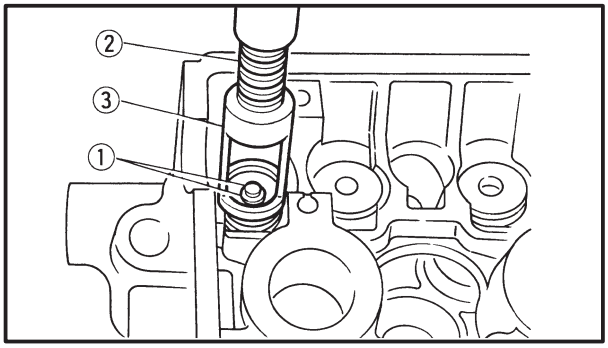
▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Pour a clean solvent ⓐ into the intake and exhaust ports.
b. Check that the valves properly seal.

NOTE:

There should be no leakage at the valve seat ①.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

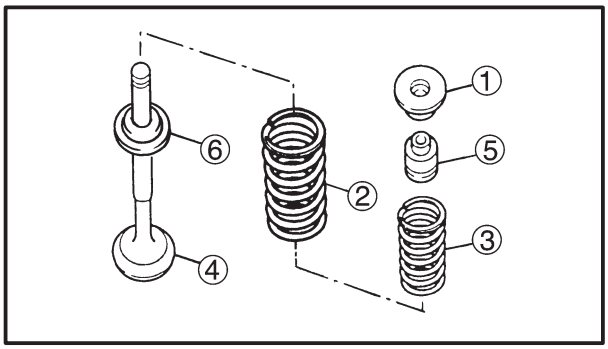


3. Remove:
   - valve cotters ①

NOTE:

Remove the valve cotters by compressing the valve springs with the valve spring compressor ② and the valve spring compressor attachment ③.

Valve spring compressor
90890-04019, YM-04019
Valve spring compressor attachment
90890-04108, YM-01253



4. Remove:
   - upper spring seat ①
   - valve spring outer ②
   - valve spring inner (intake only) ③
   - valve ④
   - valve stem seal ⑤
   - lower spring seat ⑥

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

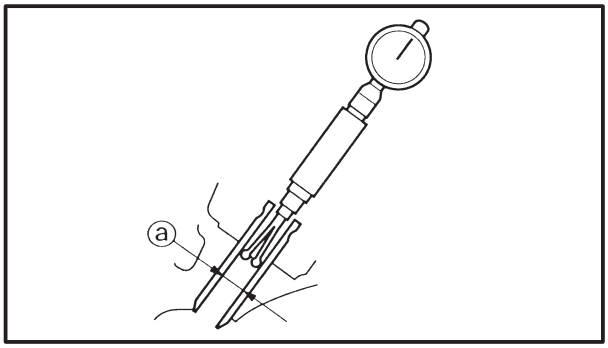
EAS00239
CHECKING THE VALVES AND VALVE GUIDES

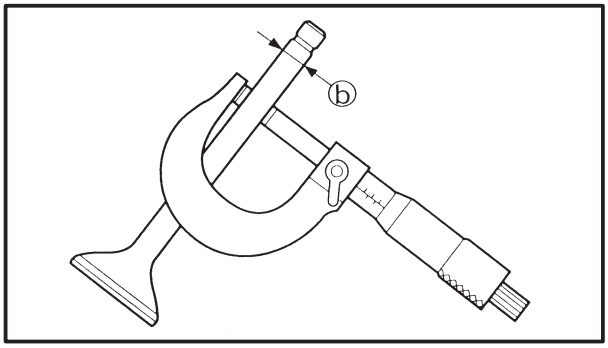
The following procedure applies to all of the valves and valve guides.

1. Measure:
   - valve-stem-to-valve-guide clearance

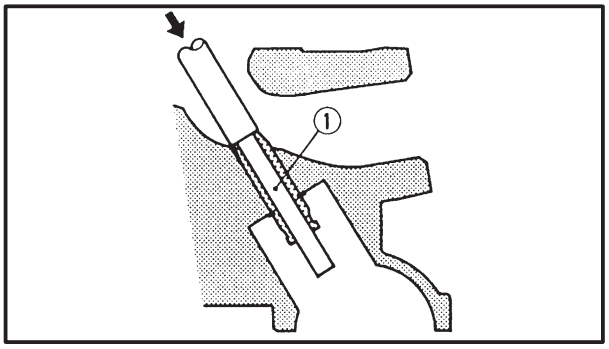
Valve-stem-to-valve-guide clearance = Valve guide inside diameter ⓐ – Valve stem diameter ⓑ

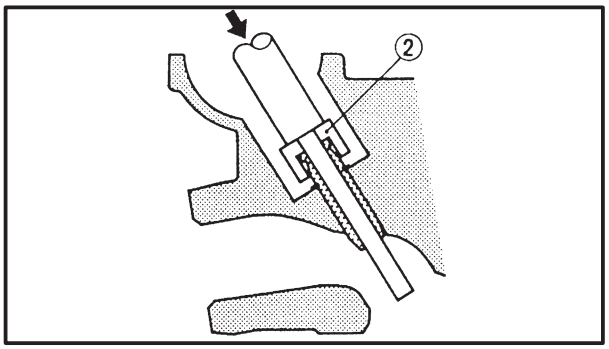
Out of specification → Replace the valve guide.

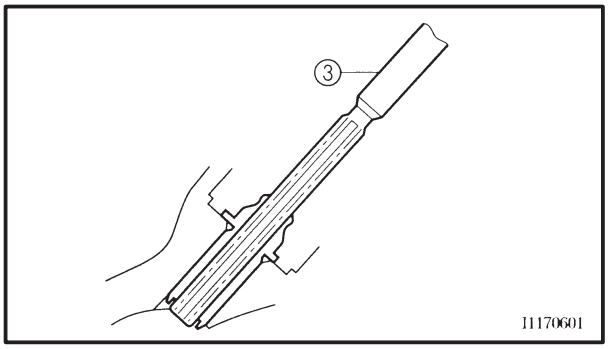




Valve-stem-to-valve-guide clearance
Intake
0.010 ~ 0.037 mm
(0.0004 ~ 0.0015 in)
<Limit>: 0.08 mm (0.0031 in)
Exhaust
0.025 ~ 0.052 mm
(0.0010 ~ 0.0020 in)
<Limit>: 0.10 mm
(0.0039 in)







2. Replace:
   • valve guide

NOTE:

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

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the valve guide with the valve guide remover ①.
b. Install the new valve guide with the valve guide installer ② and valve guide remover ①.
c. After installing the valve guide, bore the valve guide with the valve guide reamer ③ to obtain the proper valve-stem-to-valve-guide clearance.

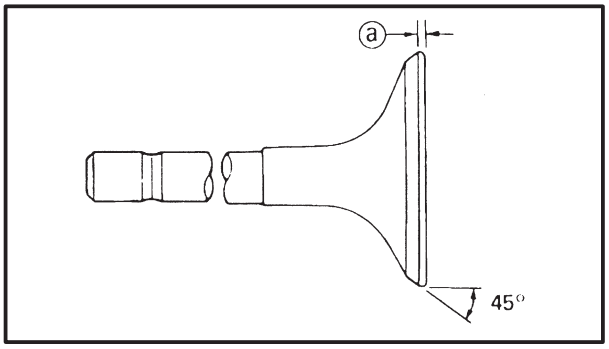
NOTE:

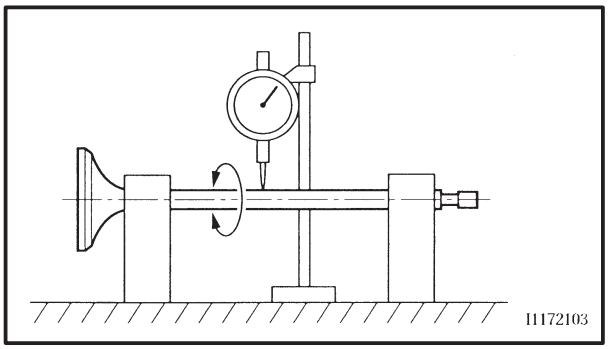
After replacing the valve guide, reface the valve seat.

Valve guide remover
(4 mm, 0.16 in)
90890-04111,
Valve guide installer
(4 mm, 0.16 in)
90890-04112,
Valve guide reamer (4 mm, 0.16 in)
90890-04113, YM-04113

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

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 ⓐ
   Out of specification → Replace the valve.

Valve margin thickness
0.6 ~ 0.8 mm
(0.0236 ~ 0.0315 in)
<Limit>: 0.5 mm (0.02 in)

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

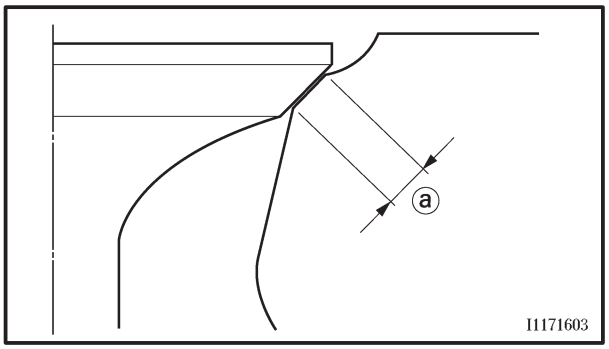
NOTE:
- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the oil seal.

Valve stem runout
<Limit>: 0.04 mm (0.0016 in)

EAS00240
CHECKING THE VALVE SEATS

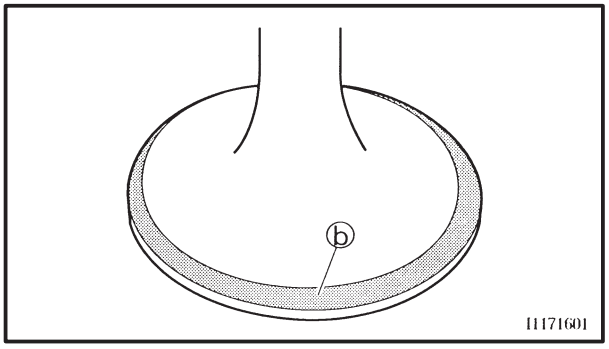
The following procedure applies to all of the valves and valve seats.

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 ⓐ
   Out of specification → Replace the cylinder head.

Valve seat width
0.9 ~ 1.1 mm
(0.0354 ~ 0.0433 in)
<Limit>: 1.6 mm (0.06 in)



a. Apply Mechanic's blueing dye (Dykem) ⓑ onto the valve face.
b. Install the valve into the cylinder head.
c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
d. Measure the valve seat width.

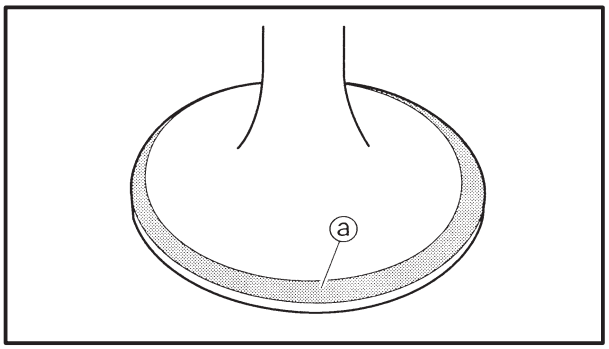
NOTE:

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

4. Lap:
   - valve face
   - valve seat

NOTE:

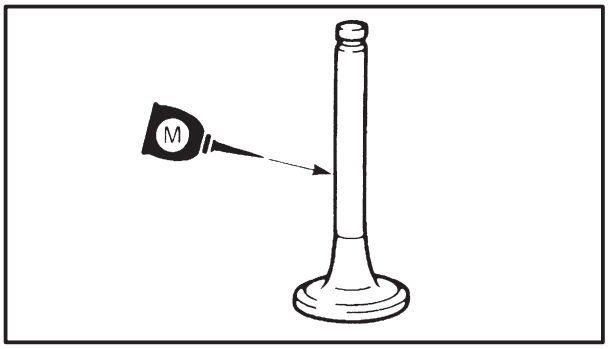
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.



a. Apply a coarse lapping compound ⓐ to the valve face.

CAUTION:

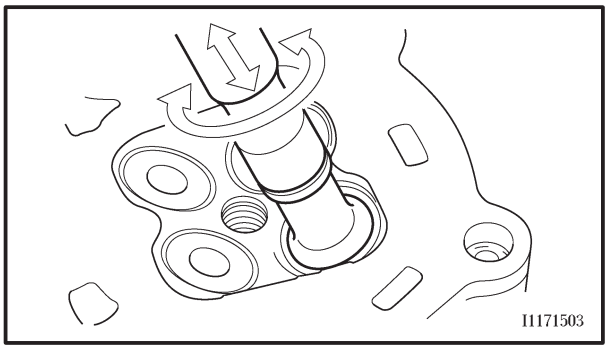
Do not let the lapping compound enter the gap between the valve stem and the valve guide.



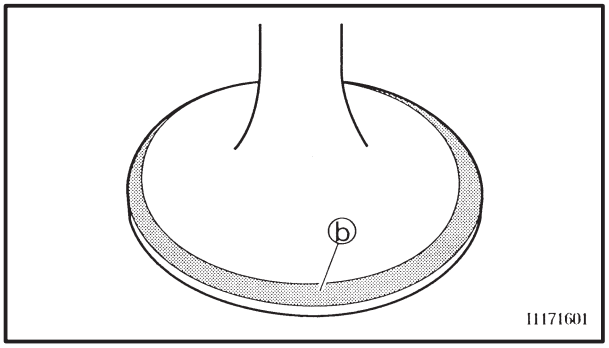
b. Apply molybdenum disulfide oil onto the valve stem.
c. Install the valve into the cylinder head.
d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

NOTE:

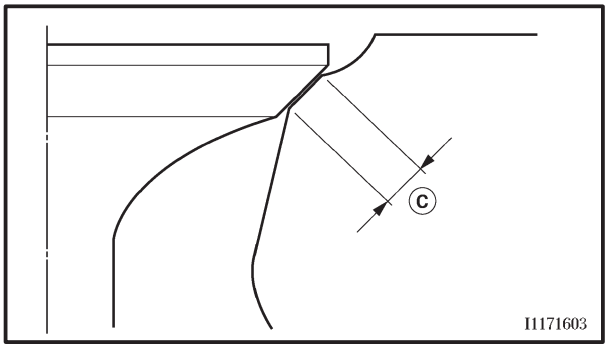
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



e. Apply a fine lapping compound to the valve face and repeat the above steps.
f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.

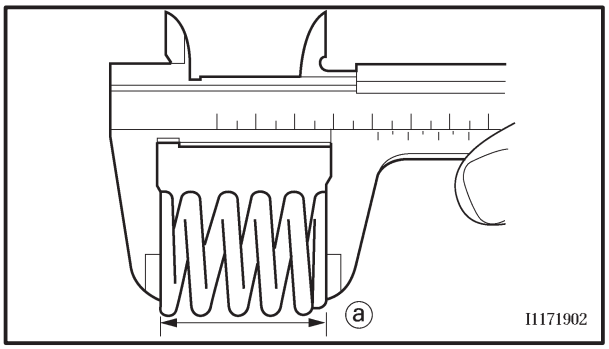


g. Apply Mechanic's blueing dye (Dykem) ⓑ onto the valve face.
h. Install the valve into the cylinder head.
i. Press the valve through the valve guide and onto the valve seat to make a clear impression.



j. Measure the valve seat width ⓒ again. If the valve seat width is out of specification, reface and lap the valve seat.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



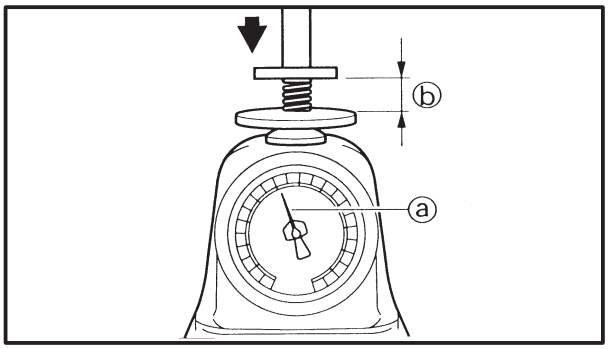
EAS00241

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

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

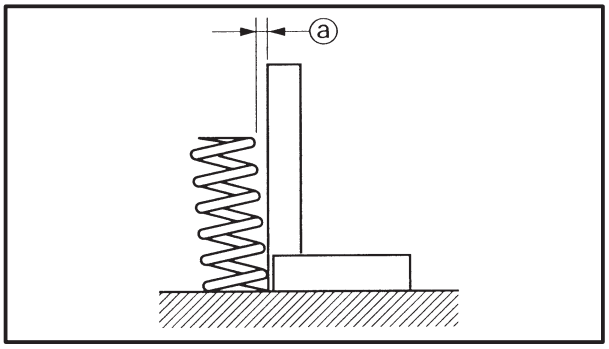
Valve spring free length
Intake valve spring (inner)
37.0 mm (1.46 in)
<Limit>: 35.2 mm (1.39 in)
Intake valve spring (outer)
38.4 mm (1.51 in)
<Limit>: 36.5 mm (1.44 in)
Exhaust valve spring
41.8 mm (1.65 in)
<Limit>: 39.7 mm (1.56 in)



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

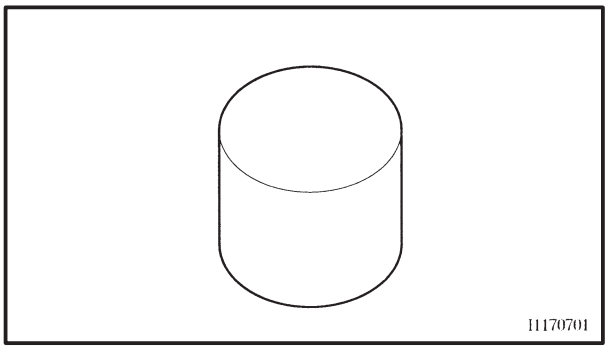
ⓑ Installed length

Compressed valve spring force (installed)
Intake valve spring (inner)
69.0 ~ 79.0 N
(7.03 ~ 8.05 kg,
15.50 ~ 17.75 lb)
Intake valve spring (outer)
114.0 ~ 132.0 N
(11.62 ~ 13.46 kg,
25.63 ~ 29.67 lb)
Exhaust valve spring
160 ~ 184 N
(16.32 ~ 18.76 kg,
35.97 ~ 41.36 lb)

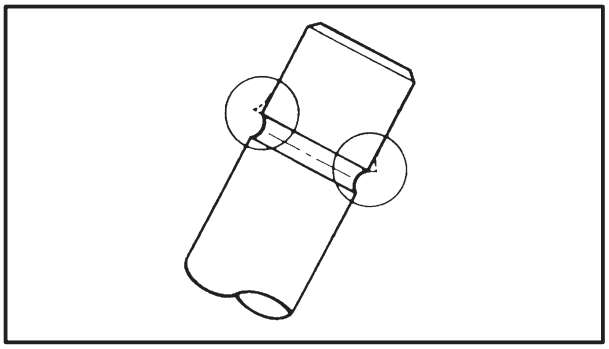


3. Measure:
   • valve spring tilt ⓐ
   Out of specification → Replace the valve spring.

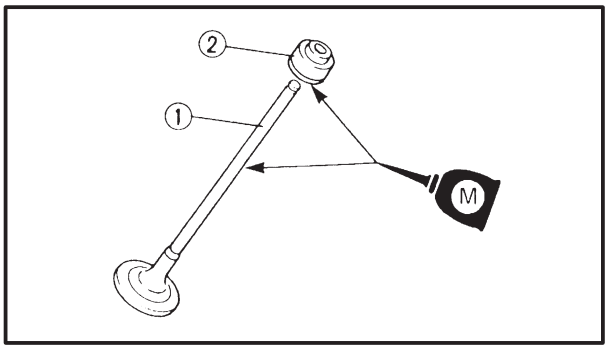
Spring tilt limit
Intake valve spring (inner)
2.5°/1.6 mm (0.06 in)
(outer)
2.5°/1.7 mm (0.07 in)
Exhaust valve spring
2.5°/1.8 mm (0.07 in)



EAS00242
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.

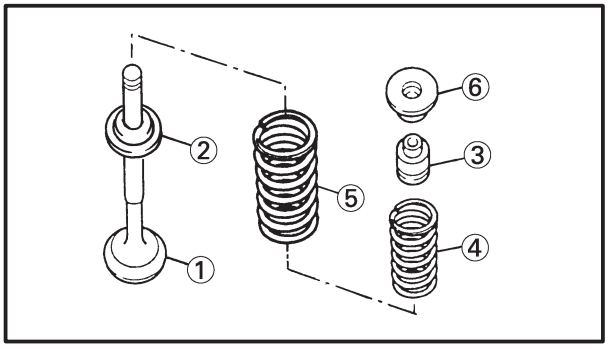


EAS00246
INSTALLING THE VALVES
The following procedure applies to all of the valves and related components.
1. Deburr:
   • valve stem end
   (with an oil stone)

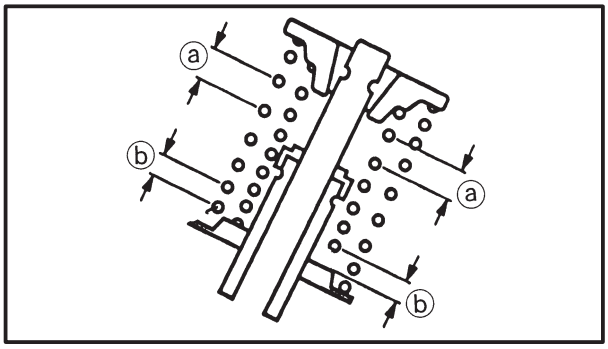


2. Lubricate:
   • valve stem ①
   • valve stem seal ②
   (with the recommended lubricant)

Recommended lubricant
Molybdenum disulfide oil

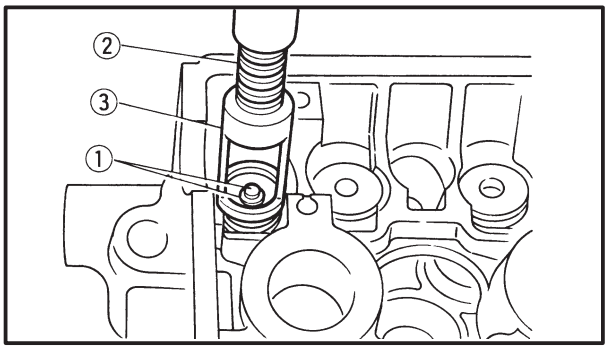


3. Install:
   • valve ①
   • lower spring seat ②
   • valve stem seal ③
   • valve spring inner (intake only) ④
   • valve spring outer ⑤
   • upper spring seat ⑥
   (into the cylinder head)



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

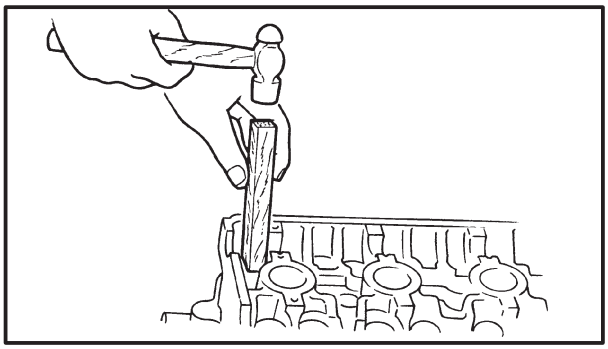
ⓑ Smaller pitch



4. Install:
   - valve cotters ①

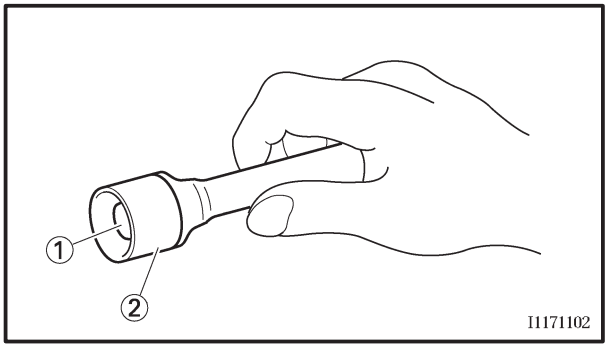
NOTE:
Install the valve cotters by compressing the valve springs with the valve spring compressor ② and the valve spring compressor attachment ③.

Valve spring compressor
90890-04019, YM-04019
Valve spring compressor attachment
90890-04108, YM-01253



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

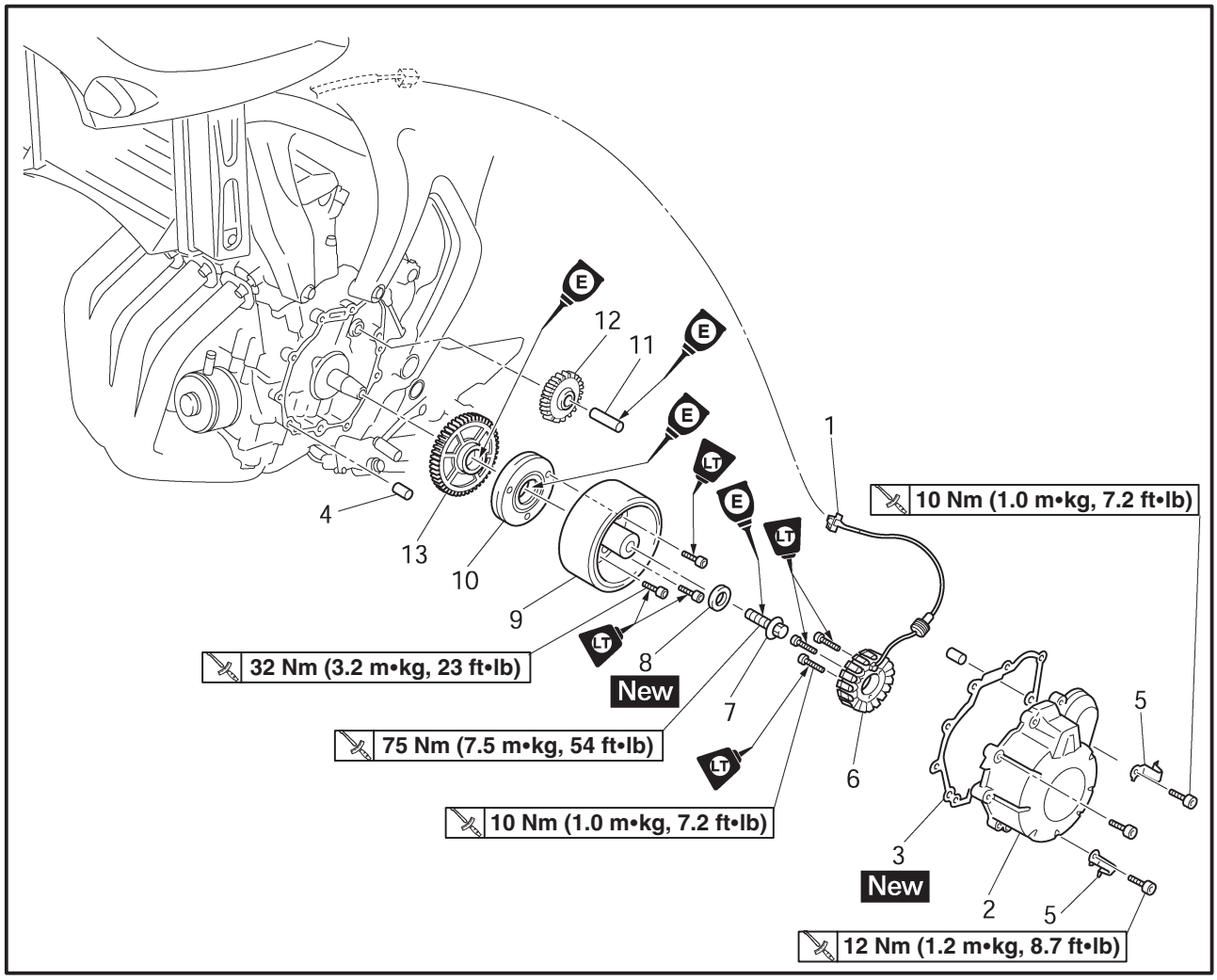
CAUTION:
Hitting the valve tip with excessive force could damage the valve.



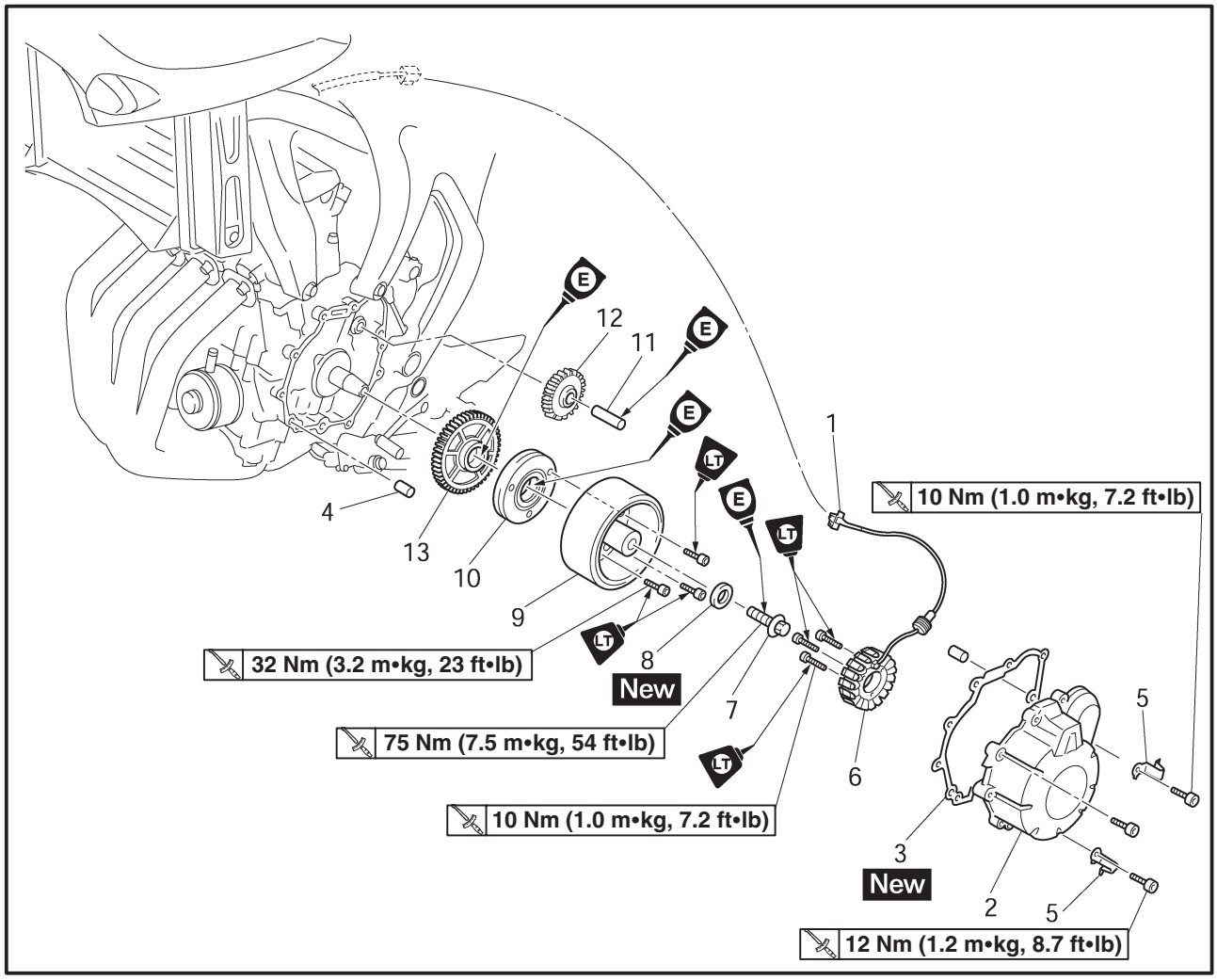
6. Install:
   - valve pad ①
   - valve lifter ②

NOTE:
- Lubricate the valve lifter and valve pad with molybdenum disulfide oil.
- The valve lifter must move smoothly when rotated with a finger.
- Each valve lifter and valve pad must be reinstalled in its original position.

EAS00341
STARTER CLUTCH AND GENERATOR
STATOR COIL ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	Removing the stator coil assembly		Remove the parts in the order listed.
	Seat and fuel tank		Refer to "SEAT" and "FUEL TANK" in chapter 3.
	Coolant		Drain.
	Coolant reservoir tank		Refer to "CHANGING THE COOLANT" in chapter 3.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Stator coil assembly coupler	1	Disconnect.
2	Generator rotor cover	1	
3	Generator rotor cover gasket	1	
4	Dowel pin	2	
5	Stator coil assembly lead holder	1	



Order	Job/Part	Q'ty	Remarks
6	Stator coil assembly	1	
7	Generator rotor bolt	1	Refer to "REMOVING/INSTALLING THE GENERATOR".
8	Washer	1	
9	Generator rotor	1	
10	Starter clutch assembly	1	
11	Idler gear shaft	1	
12	Idler gear	1	
13	Starter clutch drive gear	1	For installation, reverse the removal procedure.

EAS00347
REMOVING THE GENERATOR

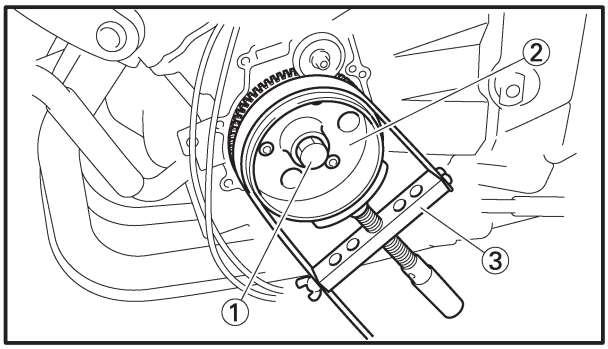
1. Remove:
   - seat
     Refer to “SEAT” in chapter 3.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS” in chapter 3.
   - fuel tank
     Refer to “FUEL TANK” in chapter 3.

2. Drain:
   - coolant
     Refer to “CHANGING THE COOLANT” in chapter 3.
   - engine oil
     Refer to “CHANGING THE ENGINE OIL” in chapter 3.

3. Remove:
   - generator rotor cover

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.

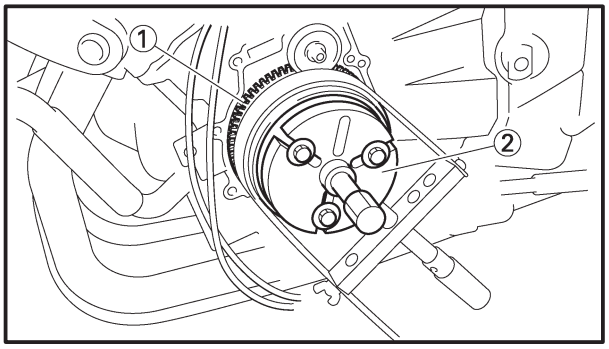


4. Remove:
   - generator rotor bolt ①
   - washer

NOTE:

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

	Sheave holder **90890-01701, YS-01880-A**



5. Remove:
   - generator rotor ①
     (with the flywheel puller ② and flywheel puller attachment)
   - woodruff key

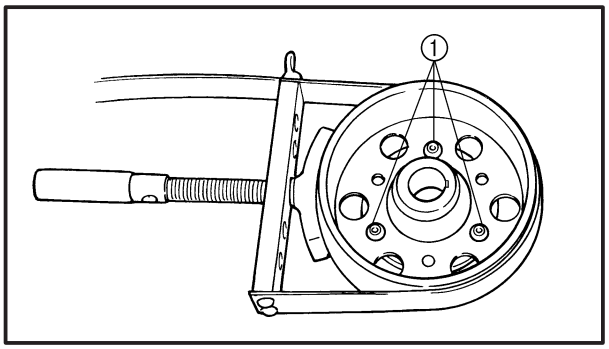
CAUTION:

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

NOTE:

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

Flywheel puller
90890-01362, YU-33270
Flywheel puller attachment
90890-04089, YM-33282



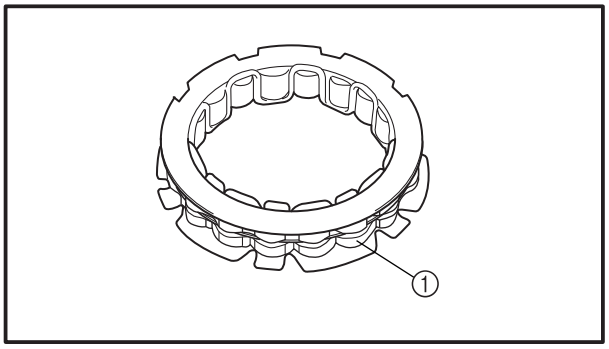
REMOVING THE STARTER CLUTCH

1. Remove:
   - starter clutch bolt ①

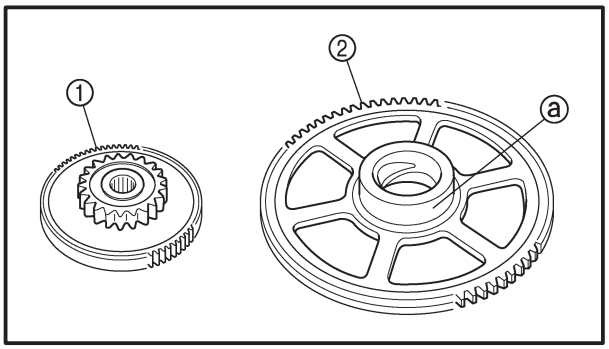
NOTE:

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

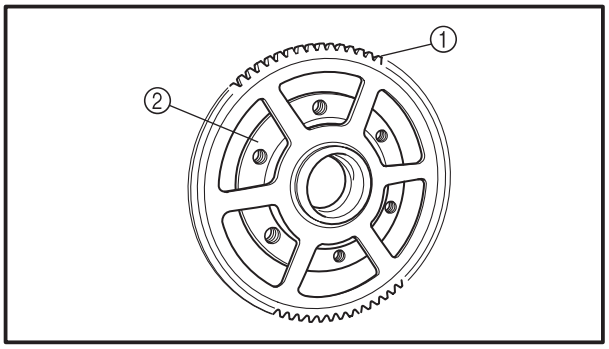
Sheave holder
90890-01701, YS-01880-A



EAS00351
CHECKING THE STARTER CLUTCH
1. Check:
   • starter clutch rollers ①
   Damage/wear → Replace.



2. Check:
   • starter clutch idle gear ①
   • starter clutch drive gear ②
   Burrs/chips/roughness/wear → Replace the defective part(s).
3. Check:
   • starter clutch gear's contacting surfaces ⓐ
   Damage/pitting/wear → Replace the starter clutch gear.

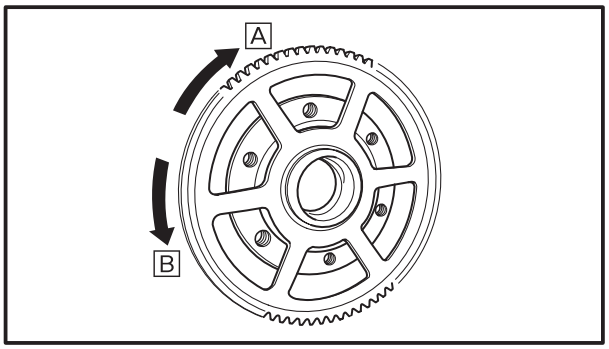


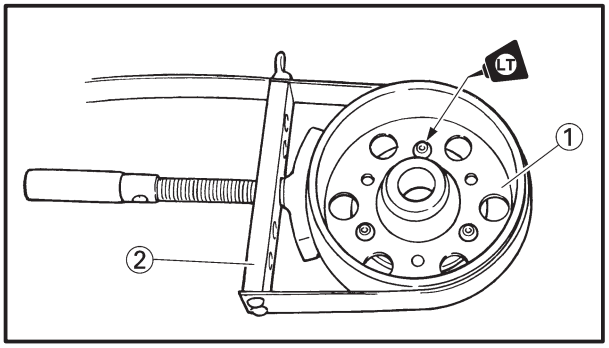
4. Check:
   • starter clutch operation

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Install the starter clutch drive gear ① onto the starter clutch ② and hold the starter clutch.
b. When turning the starter clutch drive gear clockwise [A], the starter clutch and the starter clutch drive gear should engage, otherwise the starter clutch is faulty and must be replaced.
c. When turning the starter clutch drive gear counterclockwise [B], it should turn freely, otherwise the starter clutch is faulty and must be replaced.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲





EAS00355
INSTALLING THE STARTER CLUTCH
1. Install:
   • starter clutch

	32 Nm (3.2 m•kg, 23 ft•lb) **LOCTITE®**

NOTE:
• While holding the generator rotor ① with the sheave holder ②, tighten the starter clutch bolt.

• Do not allow the sheave holder to touch the projection on the generator rotor.

Sheave holder
90890-01701, YS-01880-A

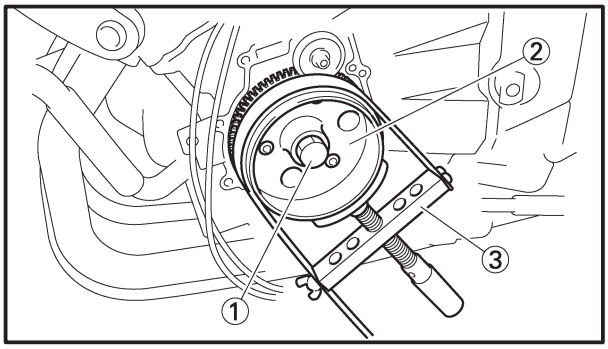
EAS00354

INSTALLING THE GENERATOR

1. Install:
   • generator rotor
   • washer New
   • generator rotor bolt

NOTE:

• Clean the tapered portion of the crankshaft and the generator rotor hub.
• Replace the washer with a new one.

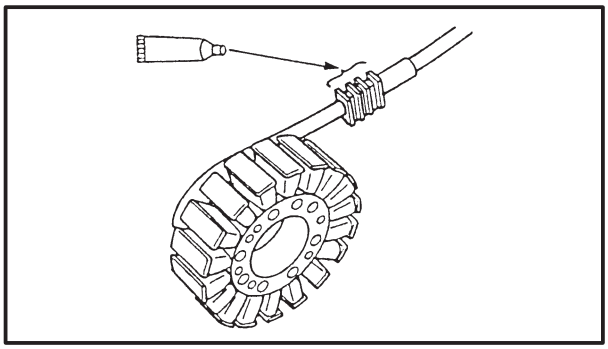


2. Tighten:
   • generator rotor bolt ①

75 Nm (7.5 m•kg, 54 ft•lb)

NOTE:

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



Sheave holder
90890-01701, YS-01880-A

3. Apply:
   • sealant
   (onto the stator coil assembly lead grommet)

Yamaha bond No.1215
90890-85505, ACC-11001-05-01

4. Install:
   • stator coil
5. Install:
   • generator rotor cover

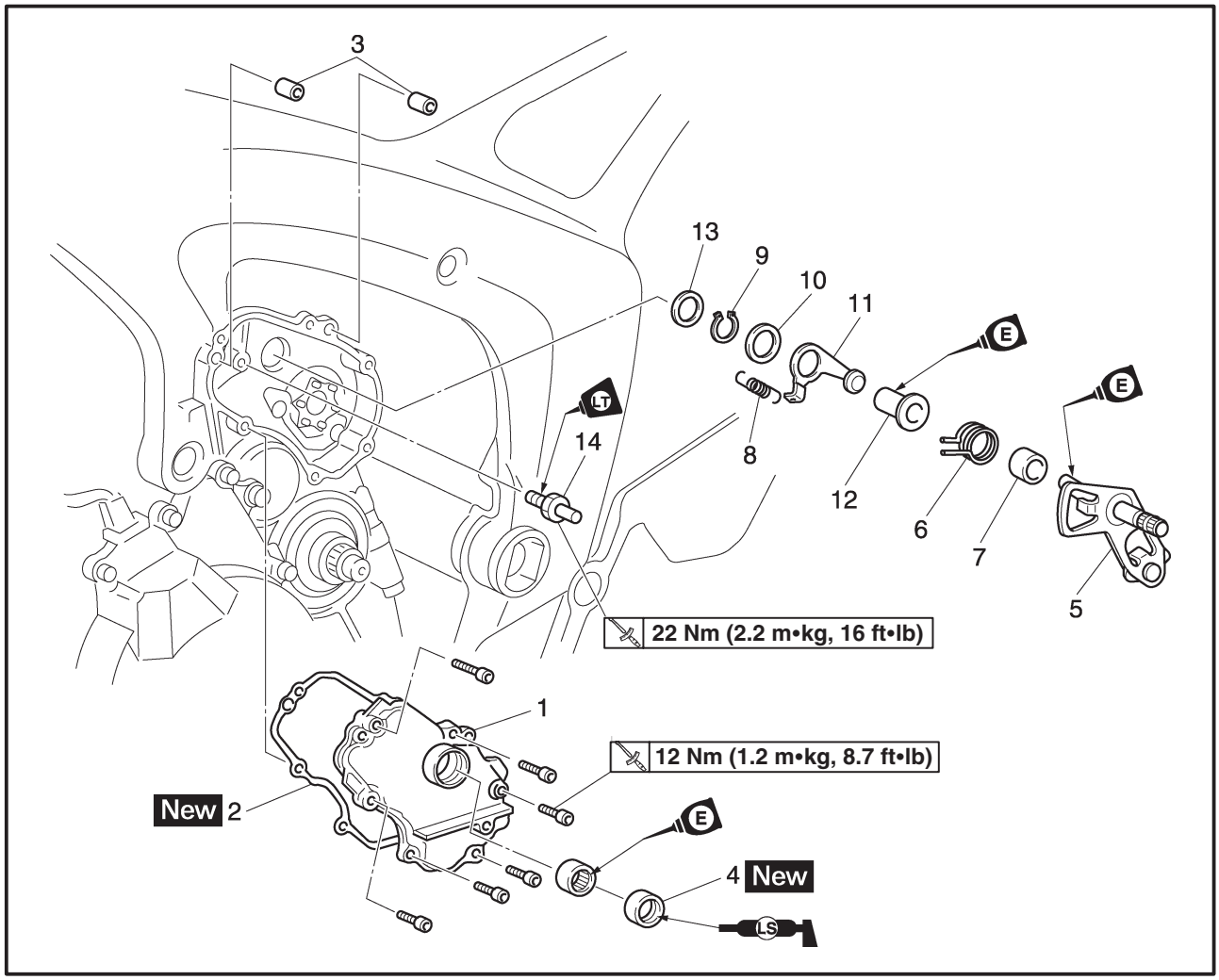
12 Nm (1.2 m•kg, 8.7 ft•lb)

NOTE:

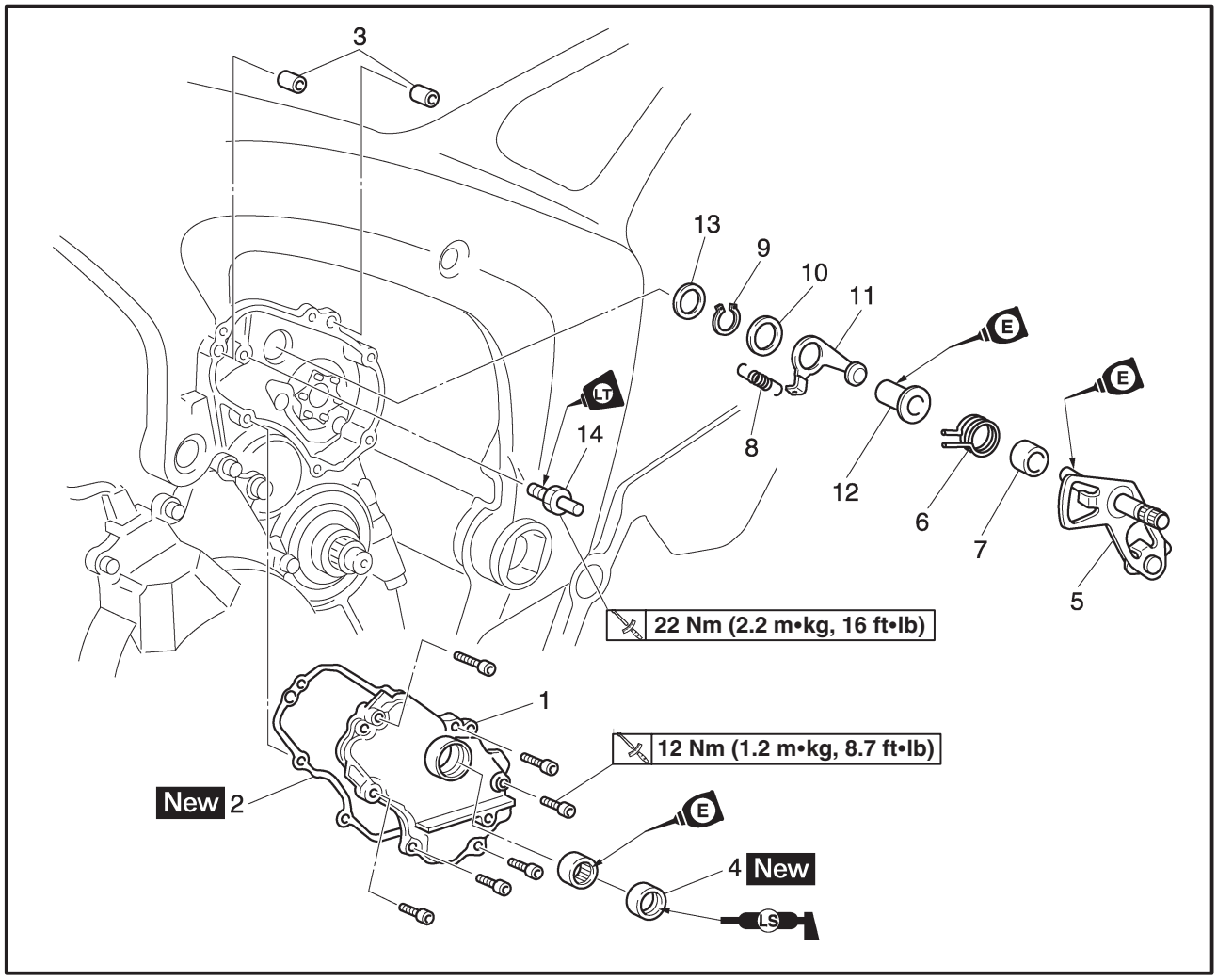
Tighten the generator rotor cover bolts in stages and in a crisscross pattern.

6. Fill:
   - engine oil
     Refer to “CHANGING THE ENGINE OIL” in chapter 3.
   - coolant
     Refer to “CHANGING THE COOLANT” in chapter 3.
7. Install:
   - fuel tank
     Refer to “FUEL TANK” in chapter 3.
   - front cowling inner panel (left and right)
     Refer to “COWLINGS” in chapter 3.
   - seat
     Refer to “SEAT” in chapter 3.

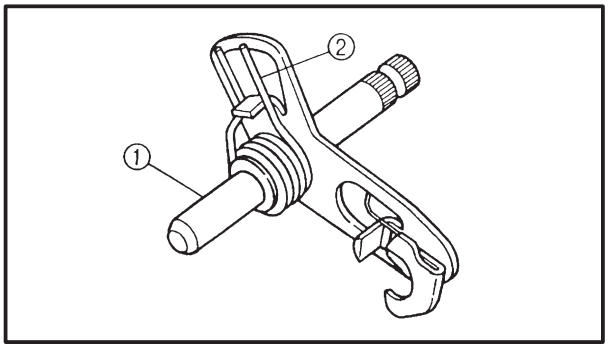
EAS00327
SHIFT SHAFT
SHIFT SHAFT AND STOPPER LEVER



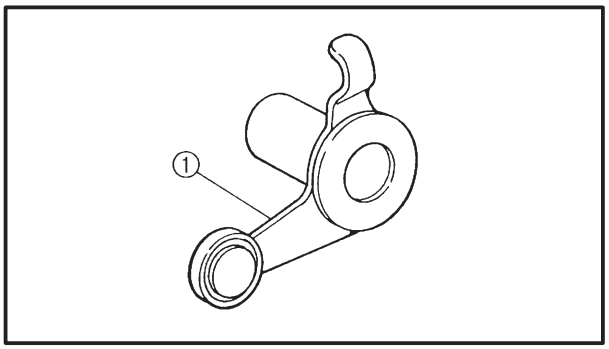
Order	Job/Part	Q'ty	Remarks
	Removing the shift shaft and stopper lever		Remove the parts in the order listed.
	Coolant		Drain.
	Coolant reservoir tank		Refer to "CHANGING THE COOLANT" in chapter 3.
	Drive sprocket cover		Refer to "ENGINE".
1	Shift shaft cover	1	
2	Shift shaft cover gasket	1	
3	Dowel pin	1	
4	Oil seal	1	
5	Shift shaft	1	
6	Shift shaft spring	1	
7	Collar	1	
8	Stopper lever spring	1	
9	Circlip	1	
10	Washer	1	



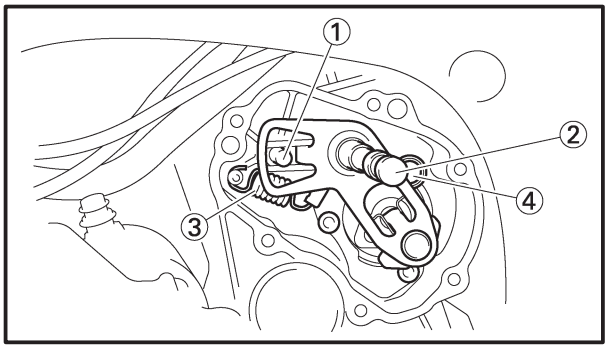
Order	Job/Part	Q'ty	Remarks
11	Stopper lever	1	
12	Collar	1	
13	Washer	1	
14	Shift shaft spring stopper	1	
			For installation, reverse the removal procedure.



EAS00328
CHECKING THE SHIFT SHAFT
1. Check:
   - shift shaft ①
     Bends/damage/wear → Replace.
   - shift shaft spring ②
     Damage/wear → Replace.



EAS00330
CHECKING THE STOPPER LEVER
1. Check:
   - stopper lever ①
     Bends/damage → Replace.
     Roller turns roughly → Replace the stopper lever.



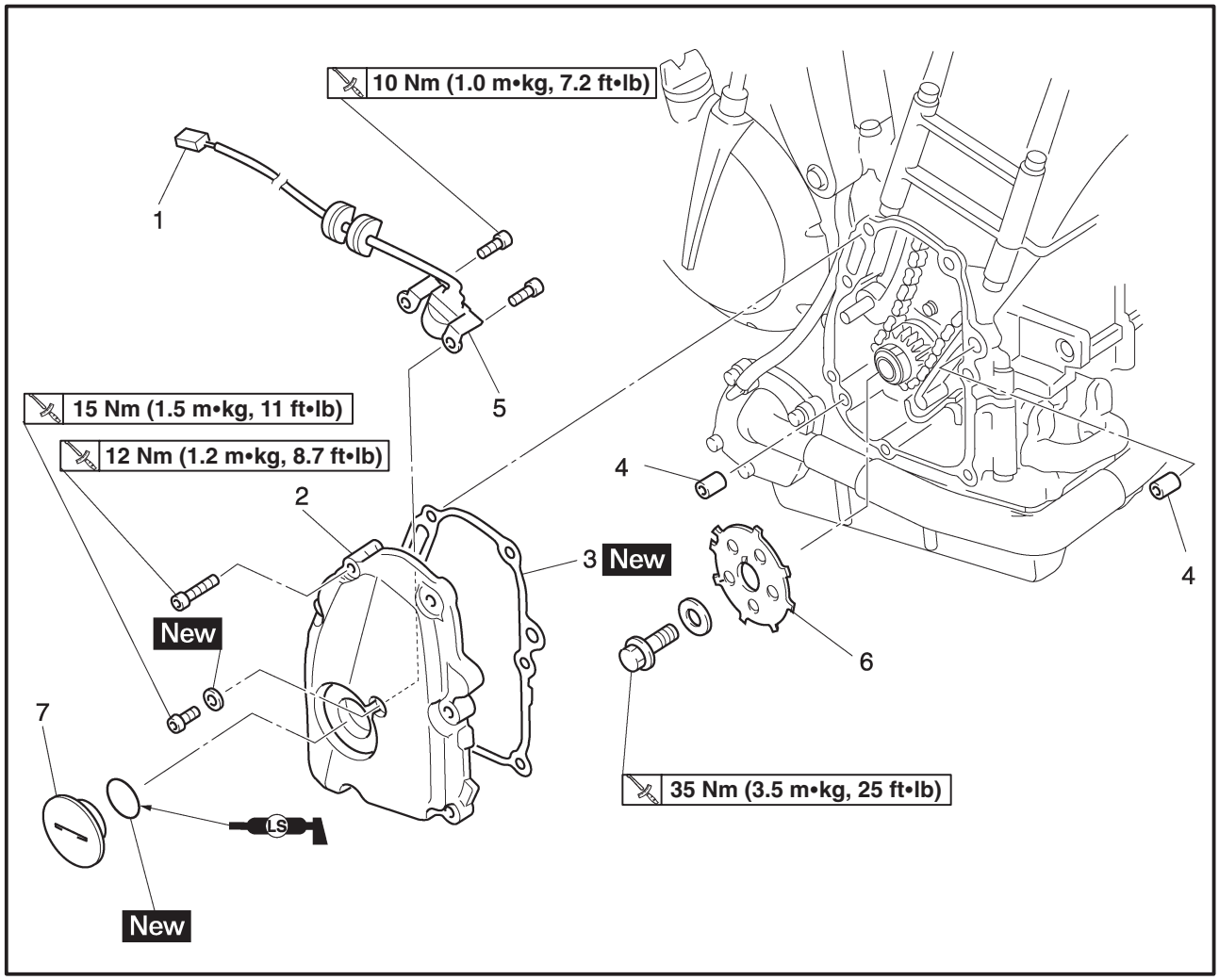
EAS00332
INSTALLING THE SHIFT SHAFT
1. Install:
   - shift shaft spring stopper ①
     22 Nm (2.2 m•kg, 16 ft•lb)
   - washers
   - shift shaft ②

NOTE:
- Apply LOCTITE® to the threads of the shift shaft spring stopper.
- Hook the ends ③ of the stopper lever spring onto the stopper lever ④ and the crankcase boss.
- Mesh the stopper lever with the shift drum segment assembly.

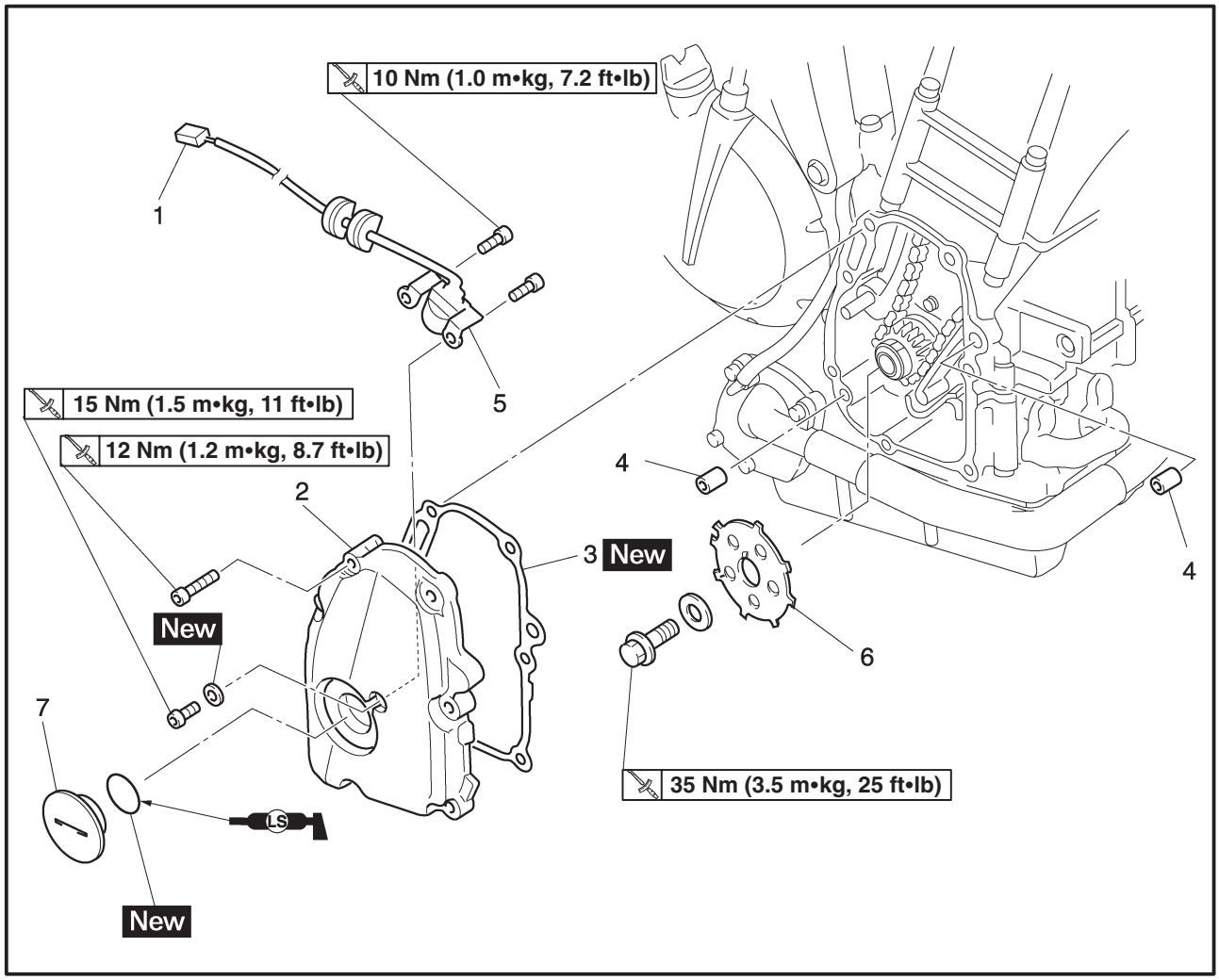
2. Install:
   - shift shaft cover

NOTE:
Lubricate the oil seal lips with lithium-soap-based grease.

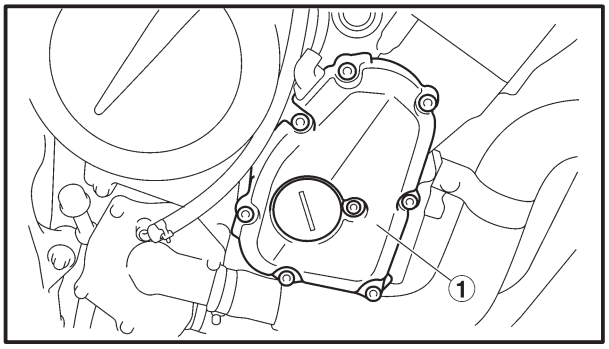
CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR

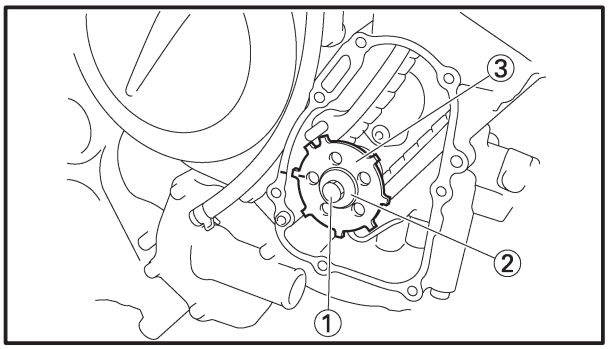


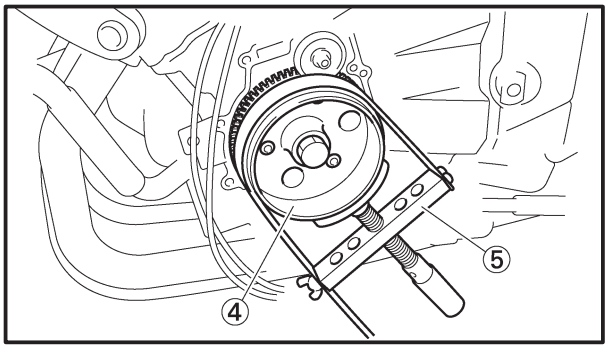
Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft position sensor and pickup rotor		Remove the parts in the order listed.
	Seat		Refer to "SEAT" in chapter 3.
	Front cowling inner panel (left and right)		Refer to "COWLINGS" in chapter 3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Generator cover		Refer to "STARTER CLUTCH AND GENERATOR".
1	Crankshaft position sensor lead coupler	1	Disconnect.
2	Pickup rotor cover	1	
3	Pickup rotor cover gasket	1	
4	Dowel pin	2	

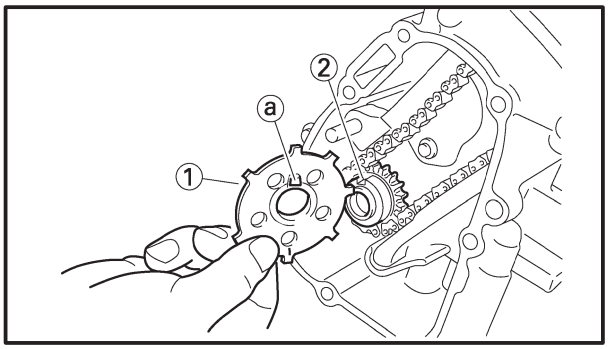


Order	Job/Part	Q'ty	Remarks
5	Crankshaft position sensor	1	
6	Pickup rotor	1	
7	Plug screw	1	
			For installation, reverse the removal procedure.









REMOVING THE PICKUP ROTOR

1. Remove:
   - pickup rotor cover ①

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. Remove:
   - pickup rotor bolt ①
   - washer ②
   - pickup rotor ③

NOTE:

While holding the generator rotor ④ with the rotor holding tool ⑤, loosen the pickup rotor bolt.

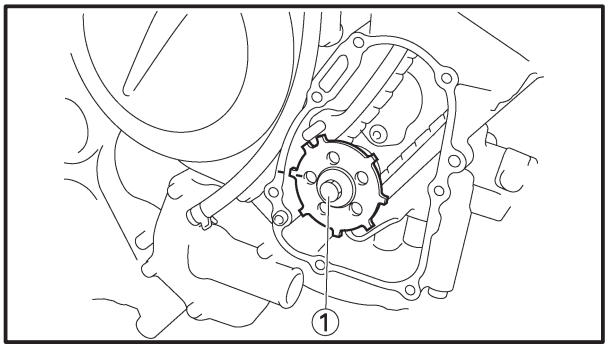
	Sheave holder **90890-01701, YS-01880-A**

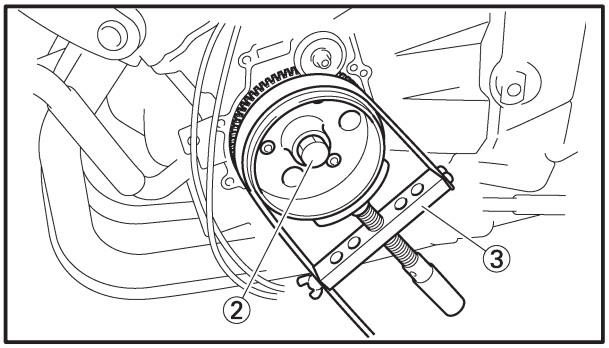
INSTALLING THE PICKUP ROTOR

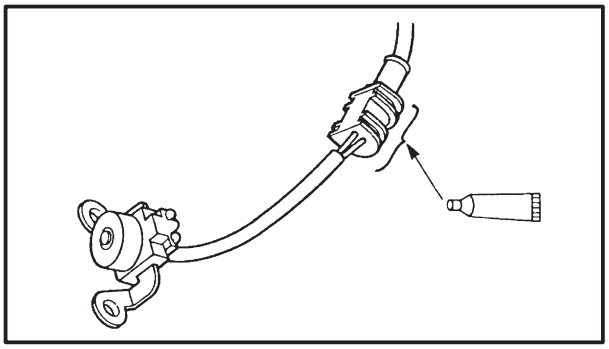
1. Install:
   - pickup rotor ①
   - washer
   - pickup rotor bolt

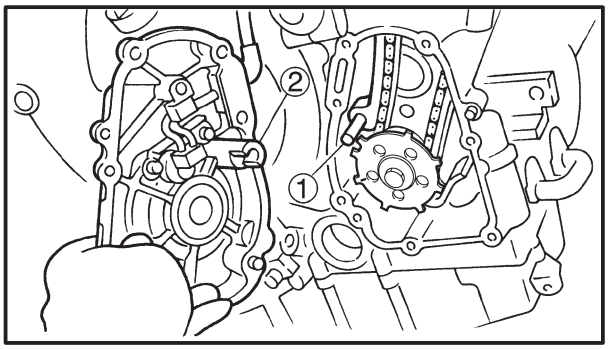
NOTE:

When installing the pickup rotor, align the groove ② in the crankshaft sprocket with the point ⓐ in the pickup rotor.









2. Tighten:
   • pickup rotor bolt ①

35 Nm (3.5 m•kg, 25 ft•lb)

NOTE:

While holding the generator rotor ② with the sheave holder ③, tighten the pickup rotor bolt.

Sheave holder
90890-01701, YS-01880-A

3. Apply:
   • sealant
   (onto the crankshaft position sensor lead grommet)

Yamaha bond No.1215
90890-85505, ACC-11001-5-01

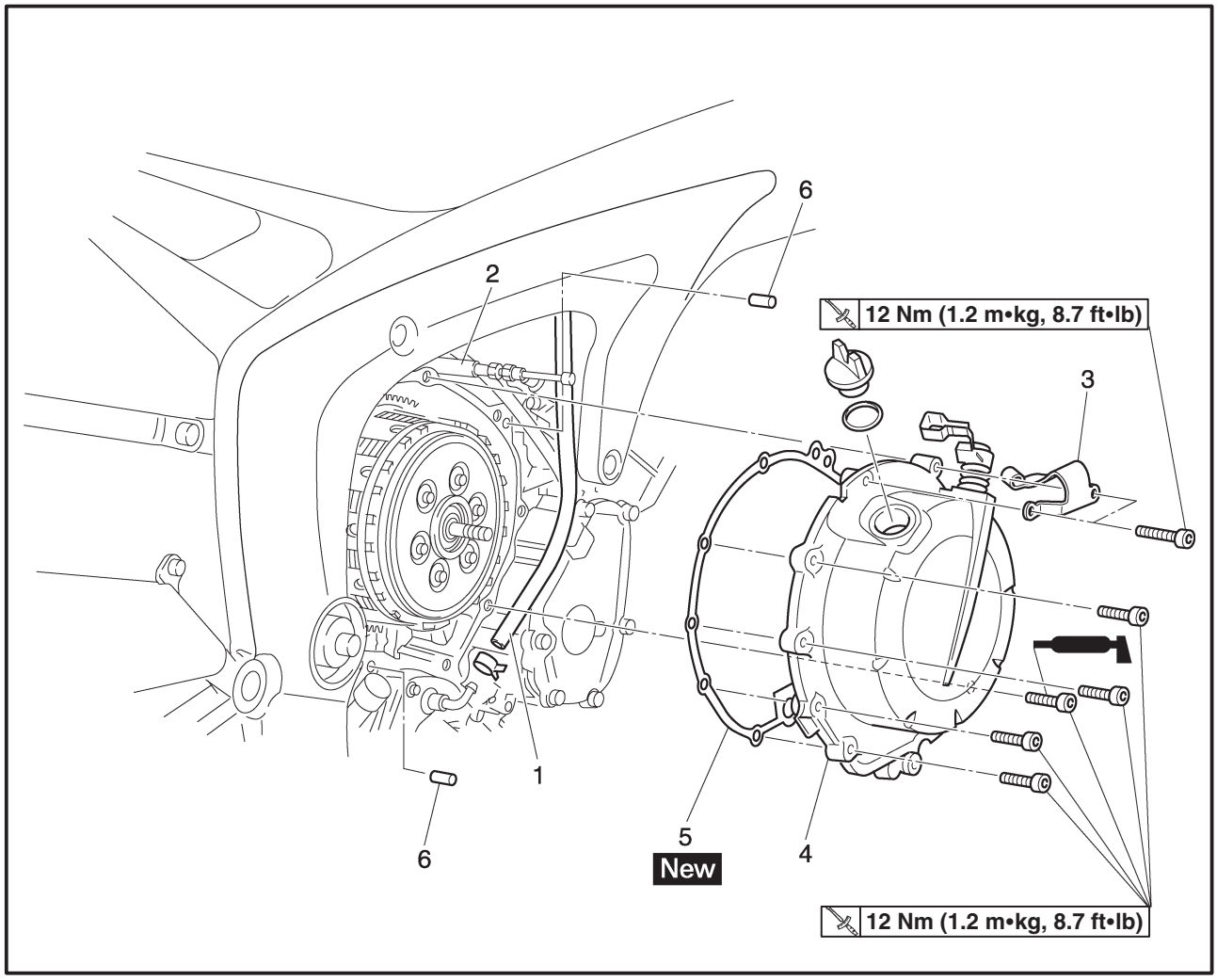
4. Install:
   • pickup rotor cover
   • gasket New

NOTE:

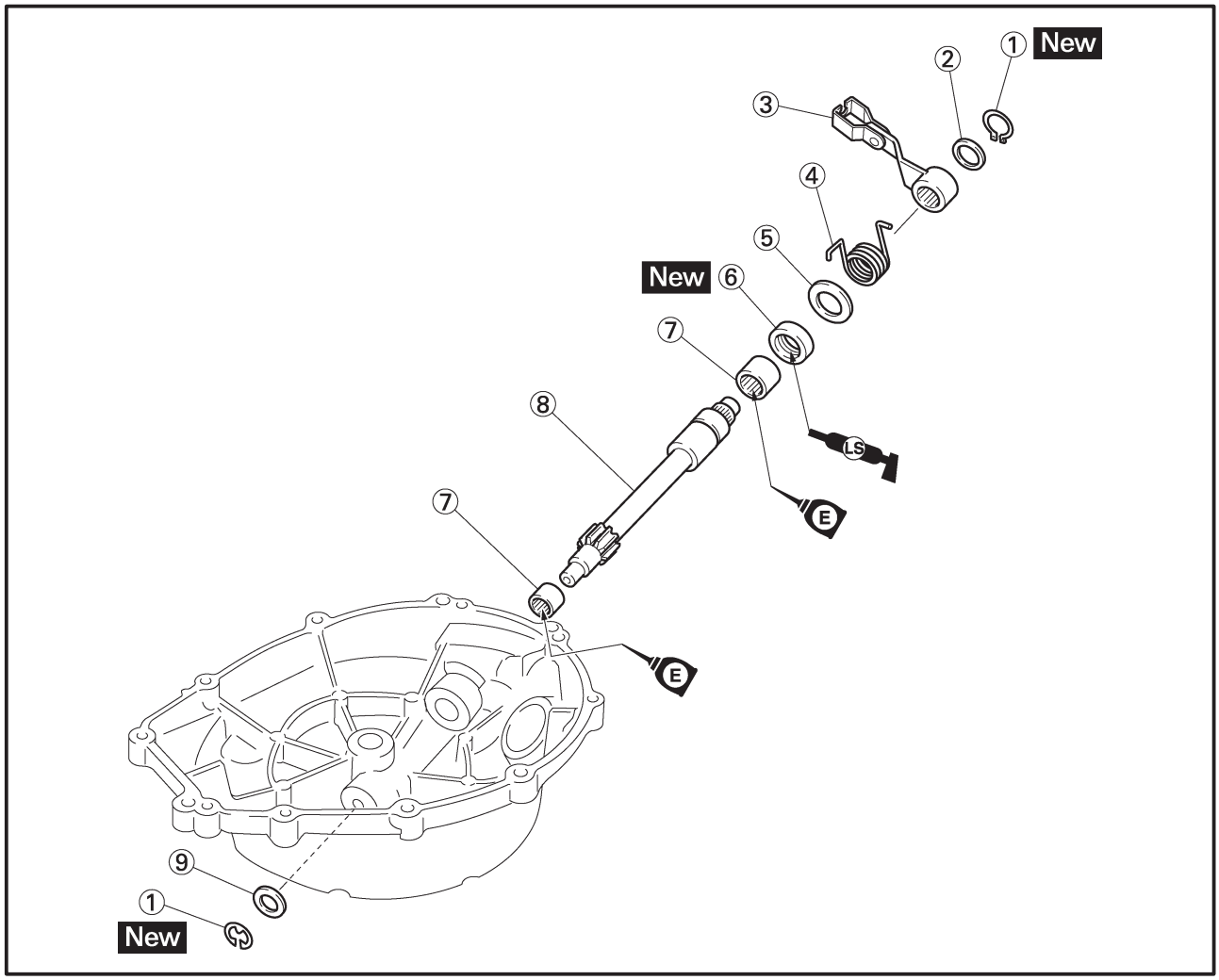
- When installing the pickup rotor cover, align the timing chain guide (intake side) pin ① with the hole ② in the pickup rotor cover.
- Tighten the pickup rotor cover bolts in stages and in a crisscross pattern.

EAS00273
CLUTCH
CLUTCH COVER

: YAMAHA BOND No. 1215



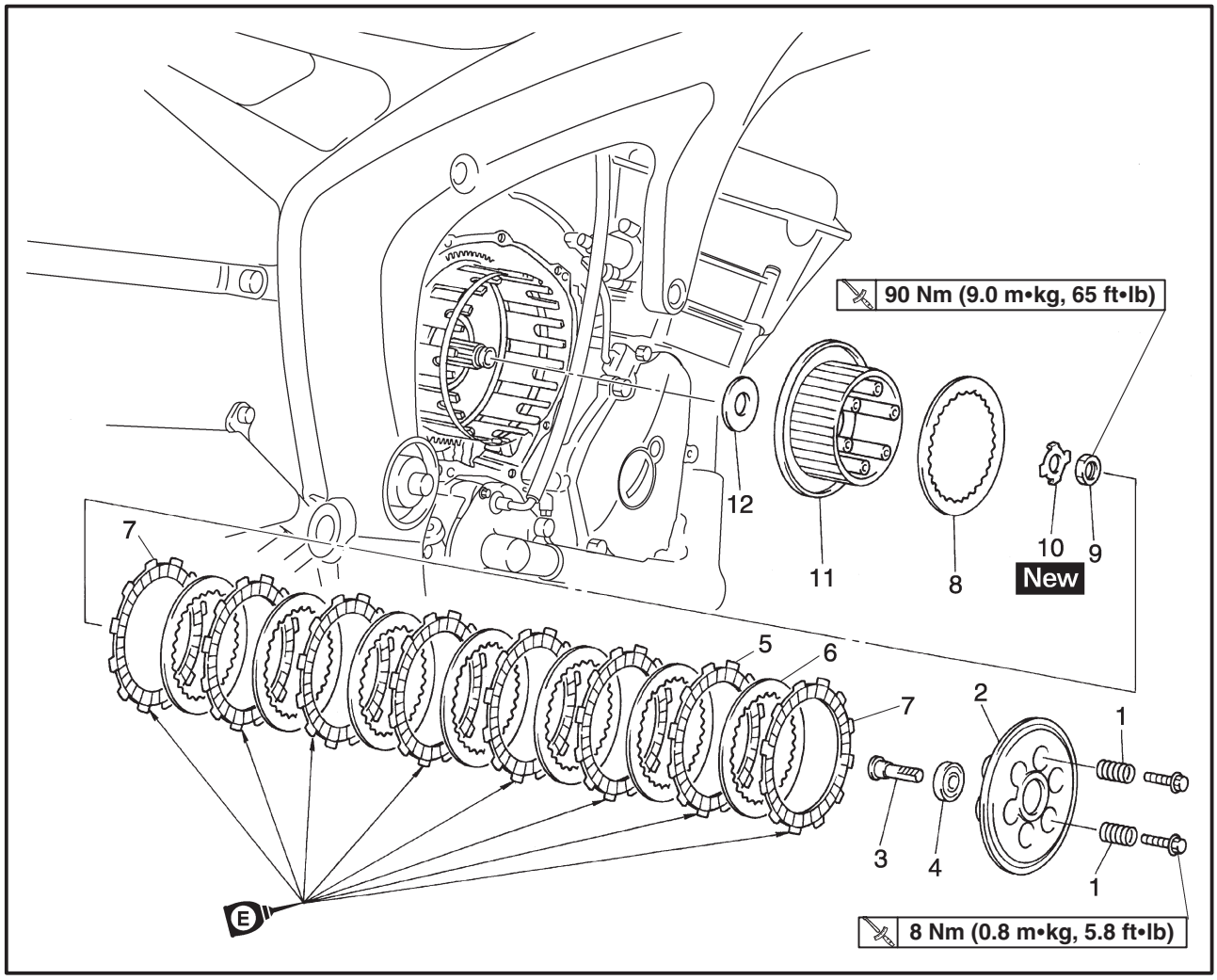
Order	Job/Part	Q'ty	Remarks
	Removing the clutch cover		Remove the parts in the order listed.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Coolant hose	1	Disconnect.
2	Clutch cable	1	Disconnect.
3	Clutch cable holder	1	
4	Clutch cover	1	
5	Clutch cover gasket	1	
6	Dowel pin	2	
			For installation, reverse the removal procedure.



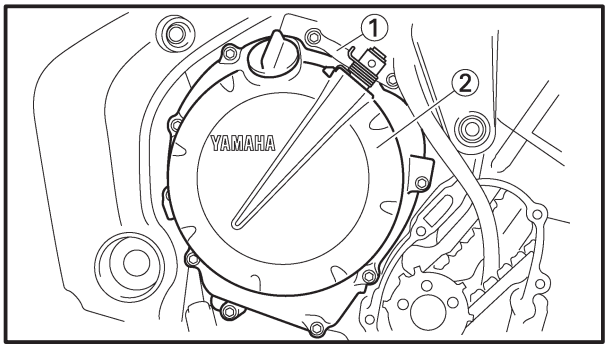
Order	Job/Part	Q'ty	Remarks
	Disassembling the clutch cover		Disassemble the parts in the order listed.
①	Circlip	2	
②	Washer	1	
③	Pull lever	1	
④	Pull lever spring	1	
⑤	Washer	1	
⑥	Oil seal	1	
⑦	Bearing	2	
⑧	Pull lever shaft	1	
⑨	Washer	1	
			For assembly, reverse the disassembly procedure.

EAS00274

CLUTCH

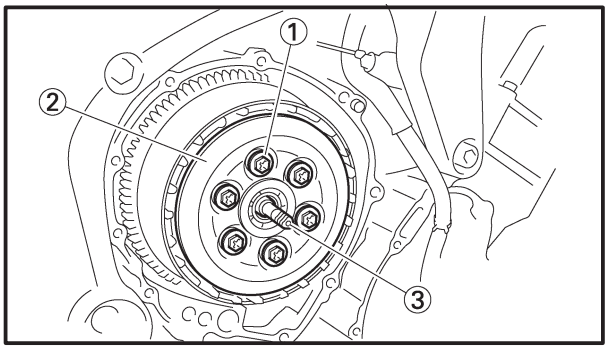


Order	Job/Part	Q'ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
1	Compression spring	6	
2	Pressure plate	1	
3	Pull rod	1	
4	Bearing	1	
5	Friction plate (Brown)	6	
6	Clutch plate (t=2.0 mm, 0.08 in)	7	
7	Friction plate	2	
8	Clutch plate (t=2.3 mm, 0.09 in)	1	
9	Clutch boss nut	1	
10	Lock plate	1	
11	Clutch boss	1	
12	Thrust plate	1	
			For installation, reverse the removal procedure.

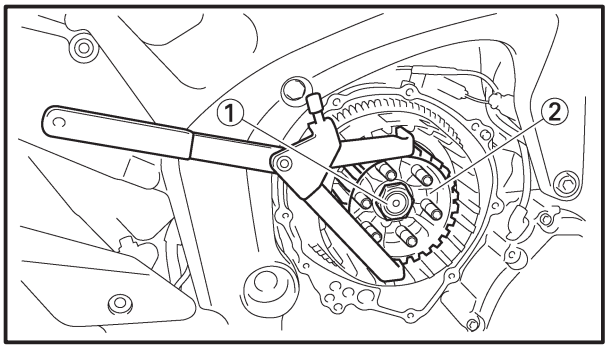


EAS00276
REMOVING THE CLUTCH
1. Remove:
   - clutch cable holder ①
   - clutch cover ②
   - gasket

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.



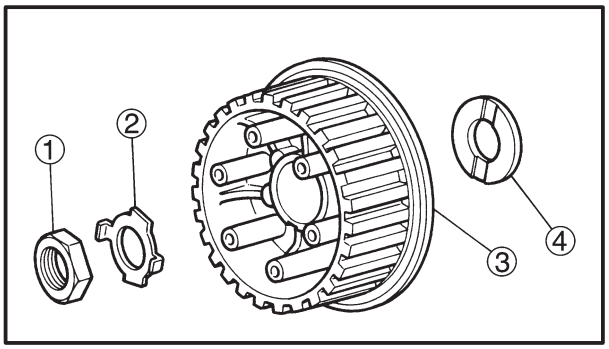
2. Remove:
   - compression spring bolts ①
   - compression springs
   - pressure plate ②
   - pull rod ③
   - friction plates
   - clutch plates



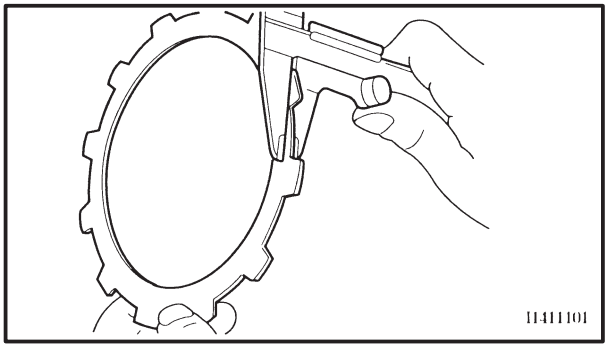
3. Straighten the lock washer tab.
4. Loosen:
   - clutch boss nut ①

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

Universal clutch holder
90890-04086, YM-91042



5. Remove:
   - clutch boss nut ①
   - lock washer ②
   - clutch boss ③
   - thrust plate ④



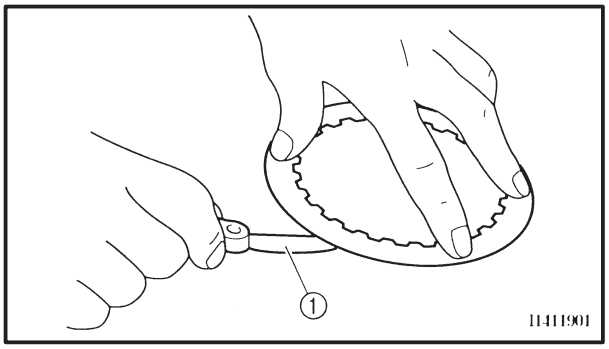
EAS00280
CHECKING THE FRICTION PLATES
The following procedure applies to all of the friction plates.
1. Check:
   - friction plate
     Damage/wear → Replace the friction plates as a set.

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
2.9 ~ 3.1 mm (0.114 ~ 0.122 in)
<Limit>: 2.8 mm (0.110 in)



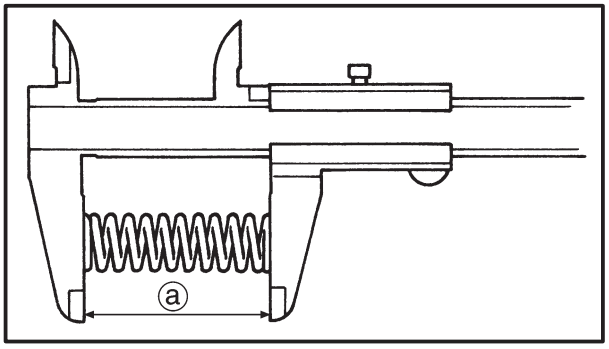
EAS00281

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.

Clutch plate warpage limit
0.1 mm (0.0039 in)



EAS00282

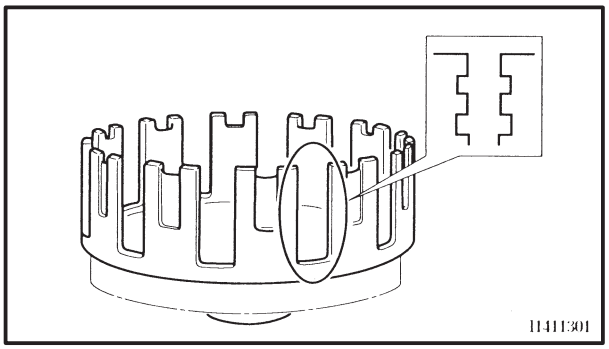
CHECKING THE CLUTCH SPRINGS

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
55 mm (2.17 in)
<Limit>: 52.3 mm (2.06 in)



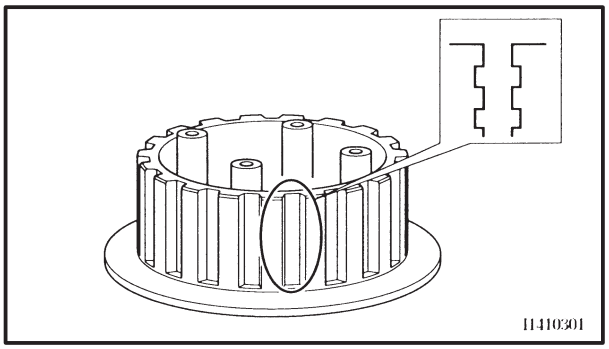
EAS00284
CHECKING THE CLUTCH HOUSING

1. Check:
   • clutch housing dogs
   Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

NOTE:

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

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

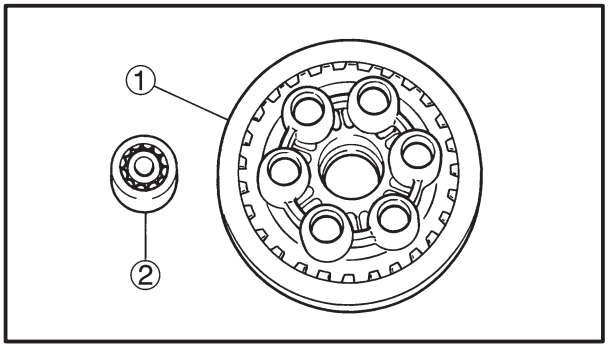


EAS00285
CHECKING THE CLUTCH BOSS

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

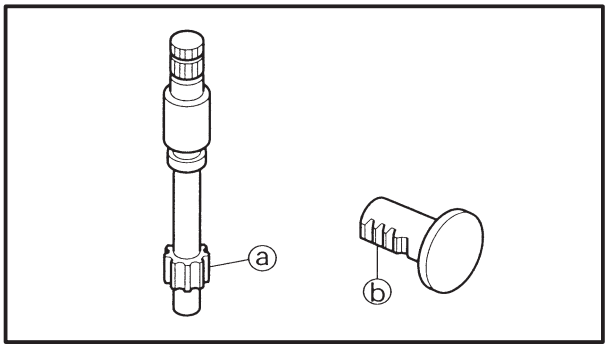
NOTE:

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

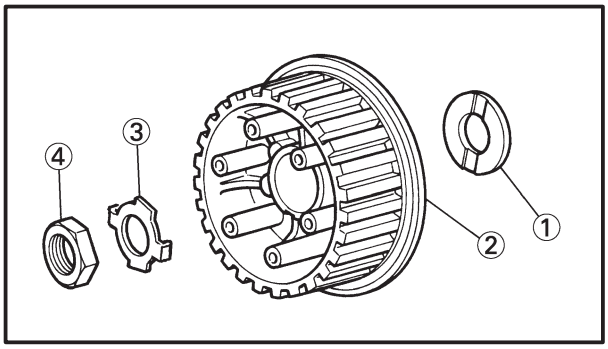


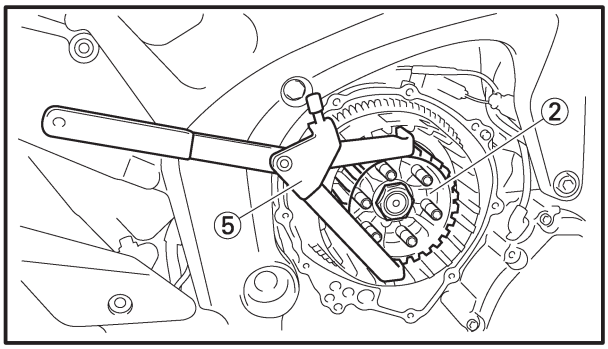
EAS00286
CHECKING THE PRESSURE PLATE

1. Check:
   • pressure plate ①
   Cracks/damage → Replace.
   • bearing ②
   Damage/wear → Replace.



EAS00287
CHECKING THE PULL LEVER SHAFT AND PULL ROD
1. Check:
   - pull lever shaft pinion gear teeth ⓐ
   - pull rod teeth ⓑ
   Damage/wear → Replace the pull rod and pull lever shaft pinion gear as a set.
2. Check:
   - pull rod bearing
   Damage/wear → Replace.





EAS00299
INSTALLING THE CLUTCH
1. Install:
   - thrust plate ①
   - clutch boss ②
   - lock washer ③ New
   - clutch boss nut ④

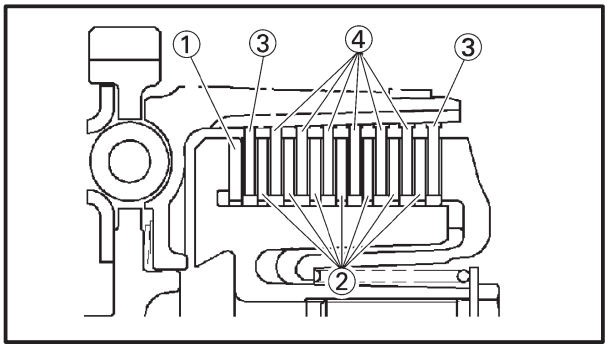
90 Nm (9.0 m•kg, 65 ft•lb)

NOTE:
While holding the clutch boss ② with the clutch holding tool ⑤, tighten the clutch boss nut.

Universal clutch holder
90890-04089, YM-91042

2. Bend the lock washer tab along a flat side of the nut.
3. Lubricate:
   - friction plates
   - clutch plates
   (with the recommended lubricant)

Recommended lubricant
Engine oil



4. Install:
   • friction plates
   • clutch plates

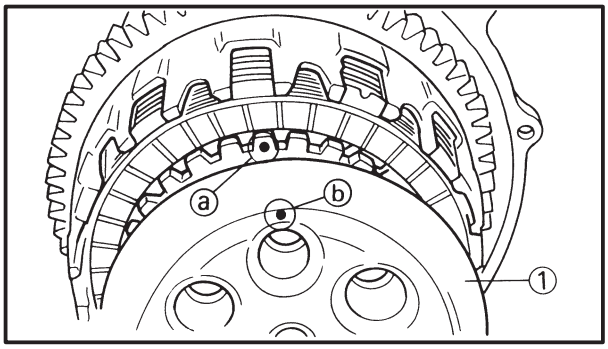
NOTE:

First, install a clutch plate and then alternate between a friction plate and a friction plate.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Install the clutch plate and friction plate as shown in the illustration.
   Clutch plate ①: t=2.3 mm (0.09 in)
   Clutch plate ②: t=2.0 mm (0.08 in)
   Friction plate ③
   Friction plate ④: Color/Brown

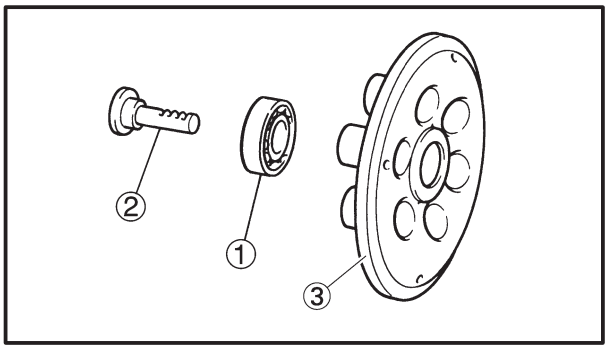
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



5. Install:
   • pressure plate ①

NOTE:

Align the punch mark ⓑ in the pressure plate with the punch mark ⓐ in the clutch boss.



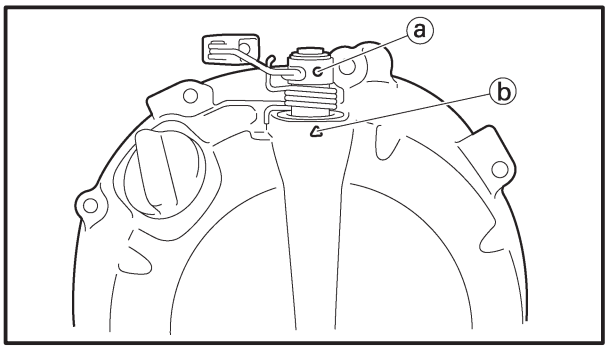
6. Install:
   • bearing ①
   • pull rod ②
   • pressure plate ③
   • clutch springs
   • clutch pressure plate screw

8 Nm (0.8 m•kg, 5.8 ft•lb)

NOTE:

Tighten the clutch spring bolts in stages and in a crisscross pattern.

7. Install:
   • pull lever



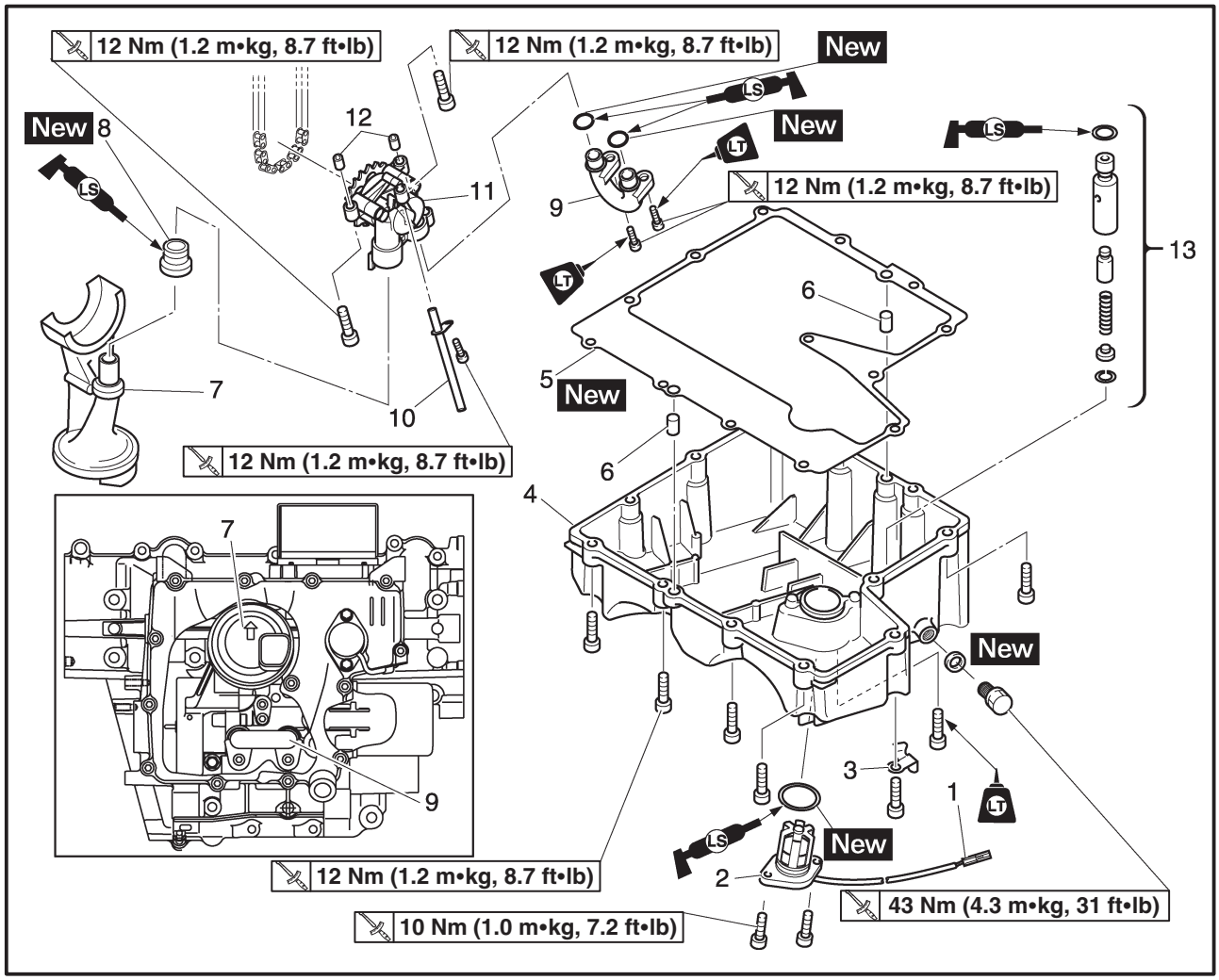
8. Install:
   - clutch cover
   - gasket New
   - clutch cable holder

NOTE:

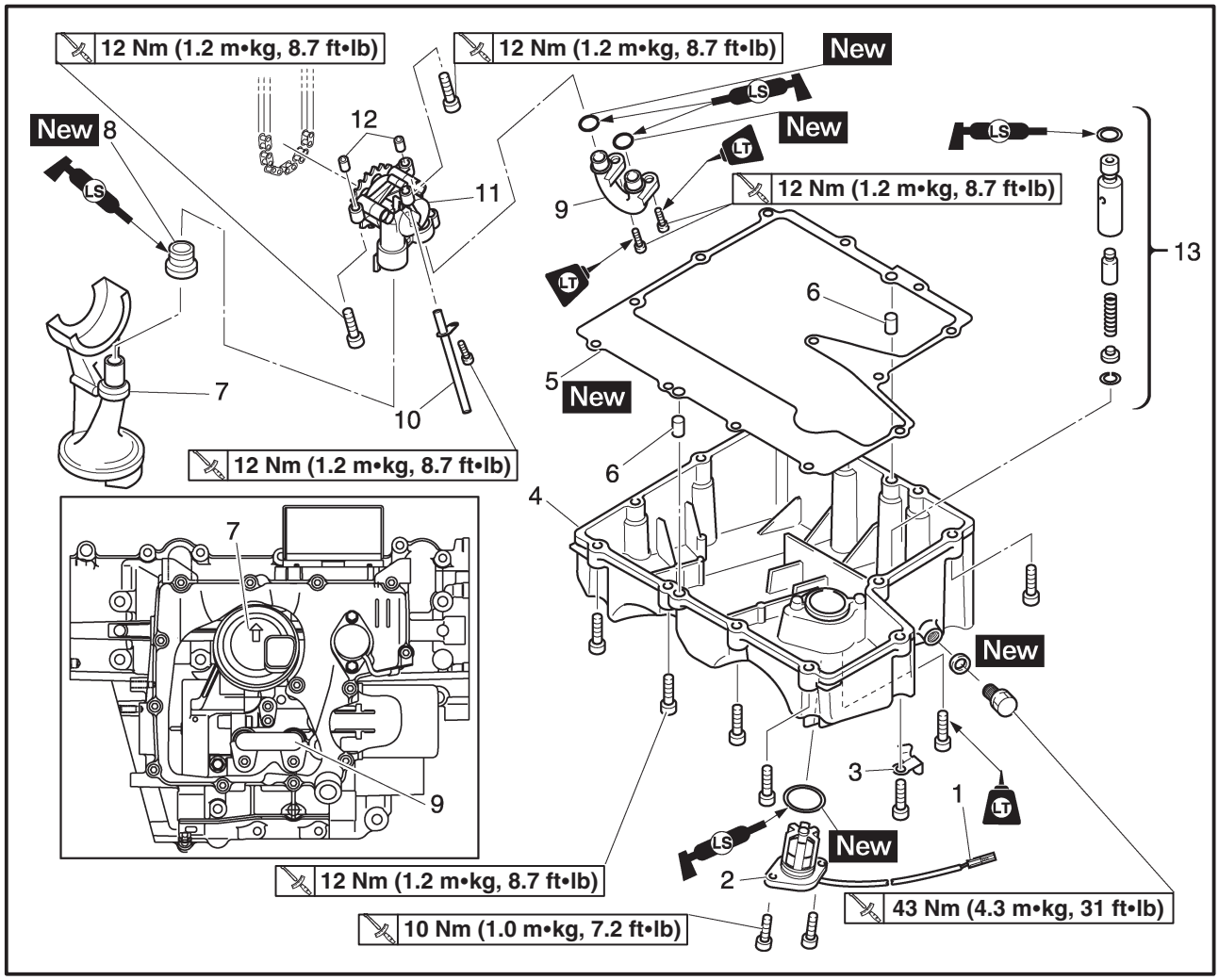
- Install the pull rod so that the teeth a face towards the rear of the motorcycle. Then, install the clutch cover.
- Apply oil onto the bearing.
- Apply molybdenum disulfide grease onto the pull rod.
- When installing the clutch cover, push the pull lever and check that the punch mark ⓐ on the pull lever aligns with the mark ⓑ on the clutch cover. Make sure that the pull rod teeth and pull lever shaft pinion gear are engaged.
- Tighten the clutch cover bolts in stages and in a crisscross pattern.

9. Adjust:
   - clutch cable free play
     Refer to "ADJUSTING THE CLUTCH CABLE FREE PLAY" in chapter 3.

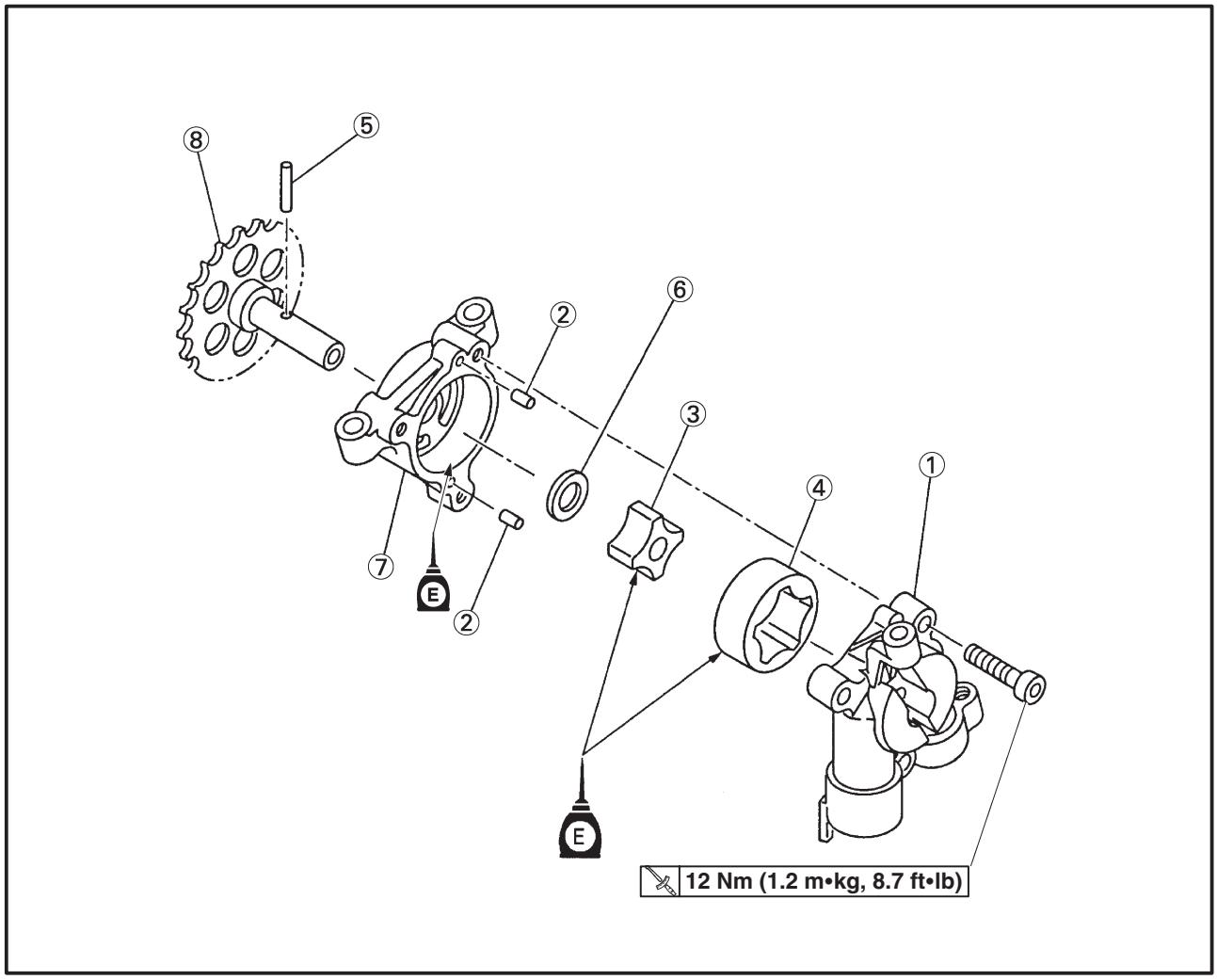
EAS00356
OIL PAN AND OIL PUMP



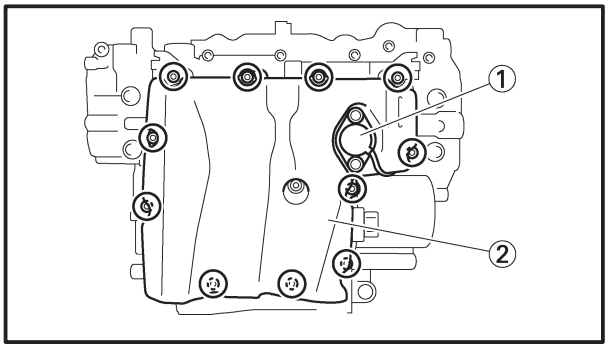
Order	Job/Part	Q'ty	Remarks
	Removing the oil pan and oil pump		Remove the parts in the order listed.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Coolant		Refer to "CHANGING THE COOLANT" in chapter 3.
	Exhaust pipe assembly		Refer to "ENGINE".
	Water pump		Refer to "WATER PUMP" in chapter 6.
1	Oil level switch coupler	1	Disconnect.
2	Oil level switch	1	
3	Oil level switch lead holder	1	
4	Oil pan	1	
5	Oil pan gasket	1	
6	Dowel pin	2	
7	Oil strainer	1	
8	Oil strainer gasket	1	



Order	Job/Part	Q'ty	Remarks
9	Oil pipe	1	
10	Oil delivery pipe	1	
11	Oil pump assembly	1	
12	Dowel pin	2	
13	Relief valve assembly	1	
			For installation, reverse the removal procedure.

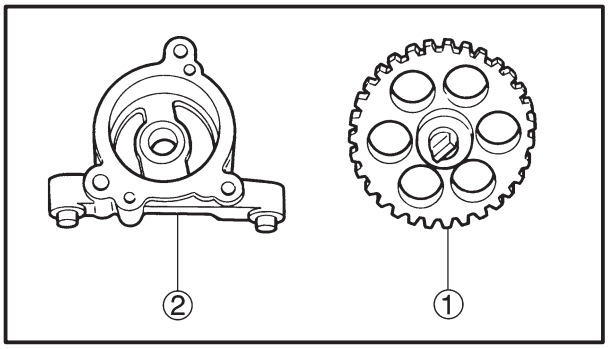


Order	Job/Part	Q'ty	Remarks
	Disassembling the oil pump assembly		Disassemble the parts in the order listed.
①	Oil pump cover	1	
②	Pin	2	
③	Oil pump inner rotor	1	
④	Oil pump outer rotor	1	
⑤	Pin	1	
⑥	Washer	1	
⑦	Oil pump rotor housing	1	
⑧	Oil pump driver sprocket	1	
			For assembly, reverse the disassembly procedure.

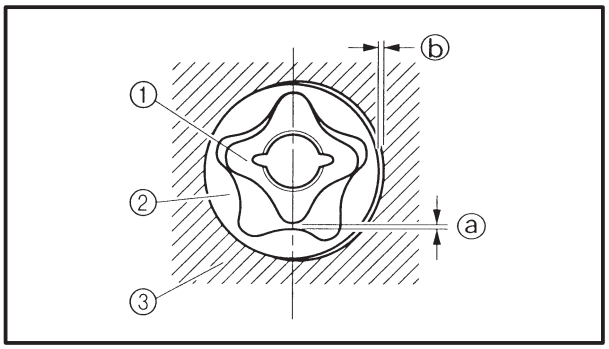


EAS00362
REMOVING THE OIL PAN
1. Remove:
   - oil level switch ①
   - oil pan ②
   - oil pan gasket
   - dowel pins

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.



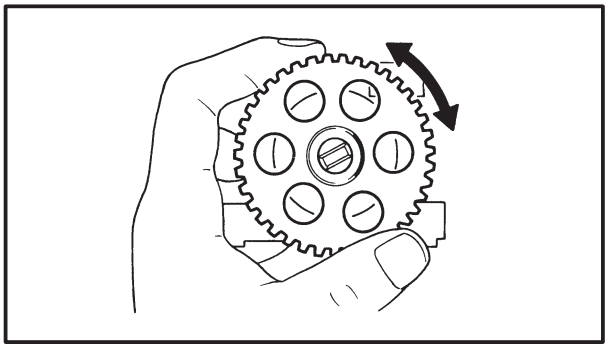
EAS00364
CHECKING THE OIL PUMP
1. Check:
   - oil pump driven gear ①
   - oil pump rotor housing ②
   - oil pump cover
     Cracks/damage/wear → Replace the defective part(s).



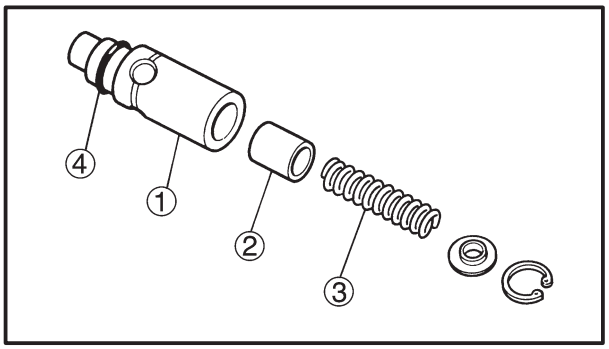
2. Measure:
   - inner-rotor-to-outer-rotor-tip clearance ⓐ
   - outer-rotor-to-oil-pump-housing clearance ⓑ

① Inner rotor
② Outer rotor
③ Oil pump housing

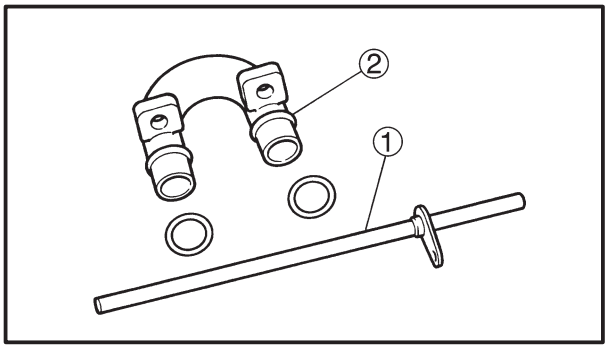
Inner-rotor-to-outer-rotor-tip clearance
0.03 ~ 0.09 mm
(0.0012 ~ 0.0035 in)
<Limit>: 0.15 mm (0.0059 in)
Outer-rotor-to-oil-pump-housing clearance
0.03 ~ 0.08 mm
(0.0012 ~ 0.0032 in)
<Limit>: 0.15 mm (0.0059 in)



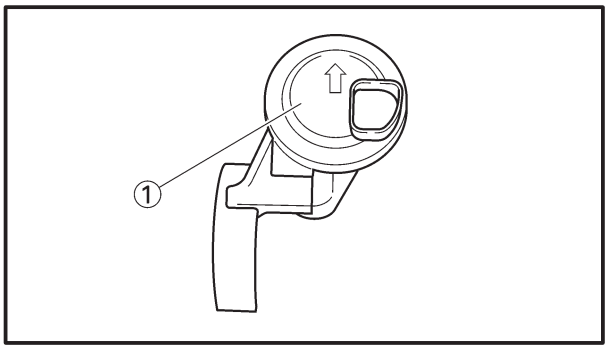
3. Check:
   • oil pump operation
     Rough movement → Repeat steps (1) and (2) or replace the defective part(s).



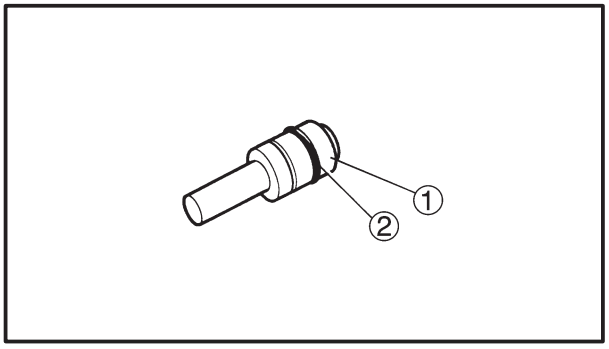
EAS00365
CHECKING THE RELIEF VALVE
1. Check:
   • relief valve body ①
   • relief valve ②
   • spring ③
   • O-ring ④
     Damage/wear → Replace the defective part(s).



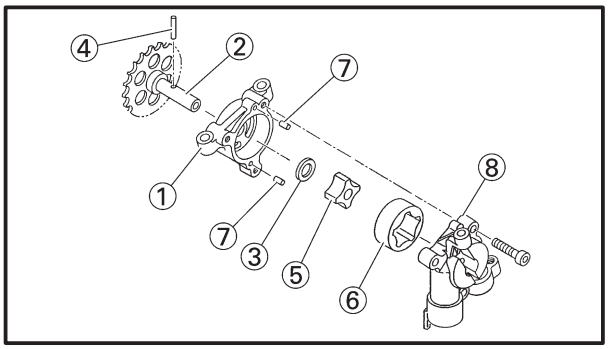
EAS00367
CHECKING THE OIL DELIVERY PIPE AND OIL PIPE
1. Check:
   • oil delivery pipe ①
   • oil pipe ②
     Damage → Replace.
     Obstruction → Wash and blow out with compressed air.



EAS00368
CHECKING THE OIL STRAINER
1. Check:
   • oil strainer ①
     Damage → Replace.
     Contaminants → Clean with solvent.



EAS00373
CHECKING THE OIL NOZZLES
The following procedure applies to all of the oil nozzles.
1. Check:
   • oil nozzle ①
     Damage/wear → Replace the oil nozzle.
   • O-ring ②
     Damage/wear → Replace.
   • oil nozzle passage
     Obstruction → Blow out with compressed air.



EAS00374
ASSEMBLING THE OIL PUMP

1. Lubricate:
   - inner rotor
   - outer rotor
   - oil pump shaft
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

2. Install:
   - oil pump housing ①
   - oil pump shaft ②
   - washer ③
   - pin ④
   - inner rotor ⑤
   - outer rotor ⑥
   - dowel pins ⑦
   - oil pump cover ⑧

12 Nm (1.2 m•kg, 8.7 ft•lb)

NOTE:

When installing the inner rotor, align the pin ④ in the oil pump shaft with the groove in the inner rotor ⑤.

3. Check:
   - oil pump operation
     Refer to “CHECKING THE OIL PUMP”.

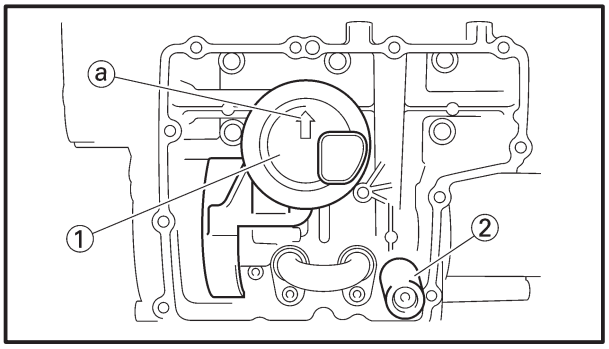
EAS00376
INSTALLING THE OIL PUMP

1. Install:
   - oil pump drive chain
   - gear cover
   - oil pump

12 Nm (1.2 m•kg, 8.7 ft•lb)

CAUTION:

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

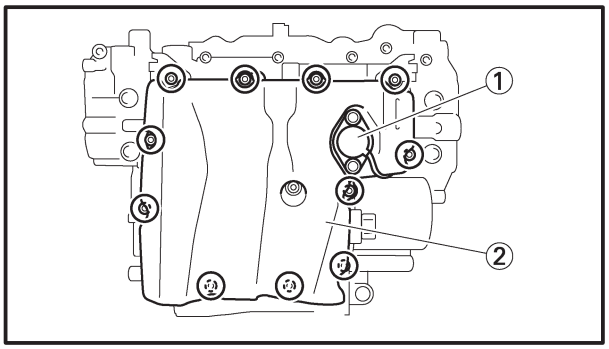


EAS00378
INSTALLING THE OIL STRAINER
1. Install:
   - oil strainer ①
   - relief valve ②

NOTE:

Make sure to check the arrow mark ⓐ located on the oil strainer housing for the front and rear direction of the engine and then install the oil strainer so that its arrow mark points to the front side of the engine.

EAS00380
INSTALLING THE OIL PAN
1. Install:
   - oil pipe
   - oil delivery pipe
2. Install:
   - dowel pins
   - gasket New
   - oil pan ① **12 Nm (1.2 m•kg, 8.7 ft•lb)**
   - oil level switch ② **10 Nm (1.0 m•kg, 7.2 ft•lb)**
   - engine oil drain bolt **43 Nm (4.3 m•kg, 31 ft•lb)**



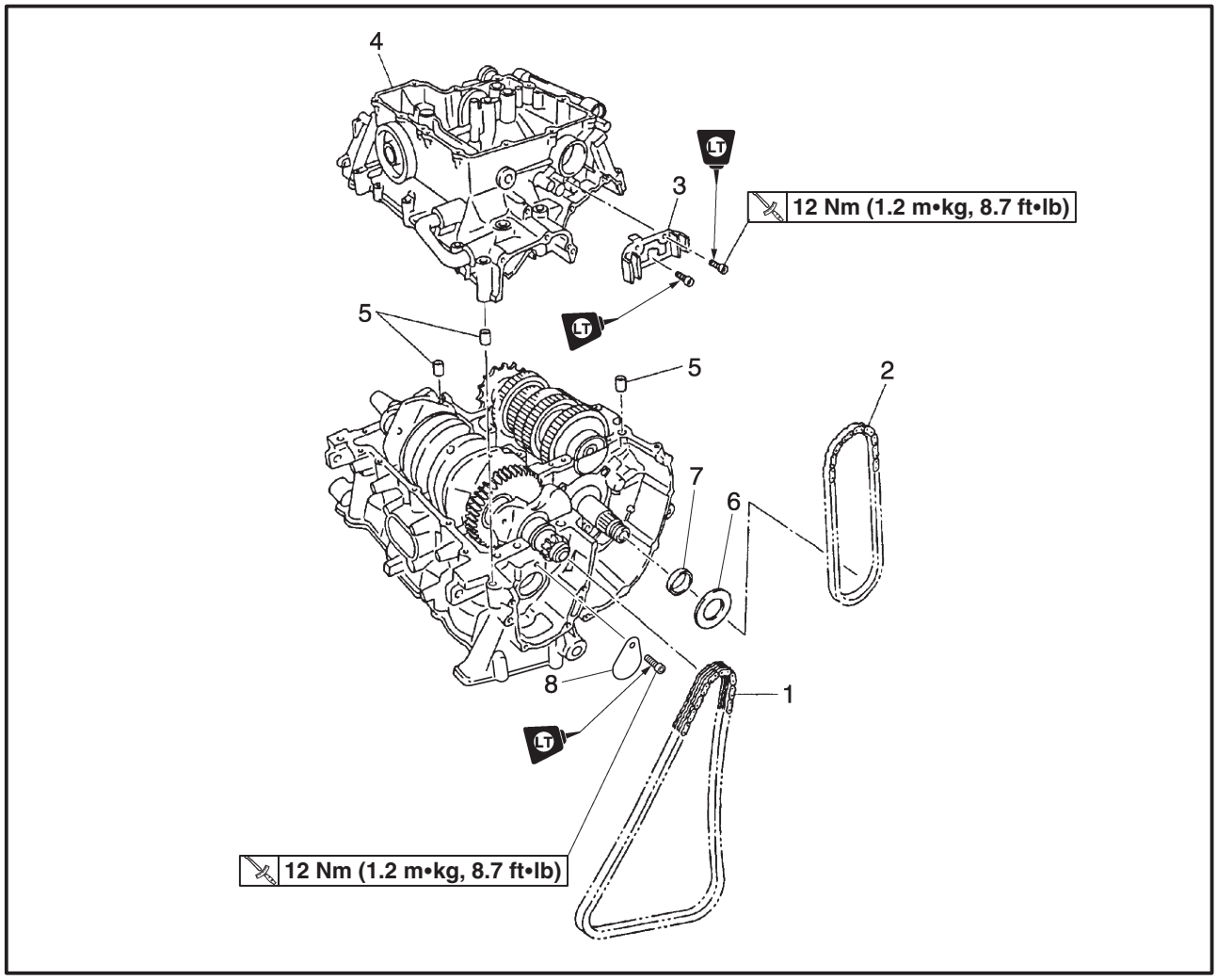
⚠ WARNING

Always use new copper washers.

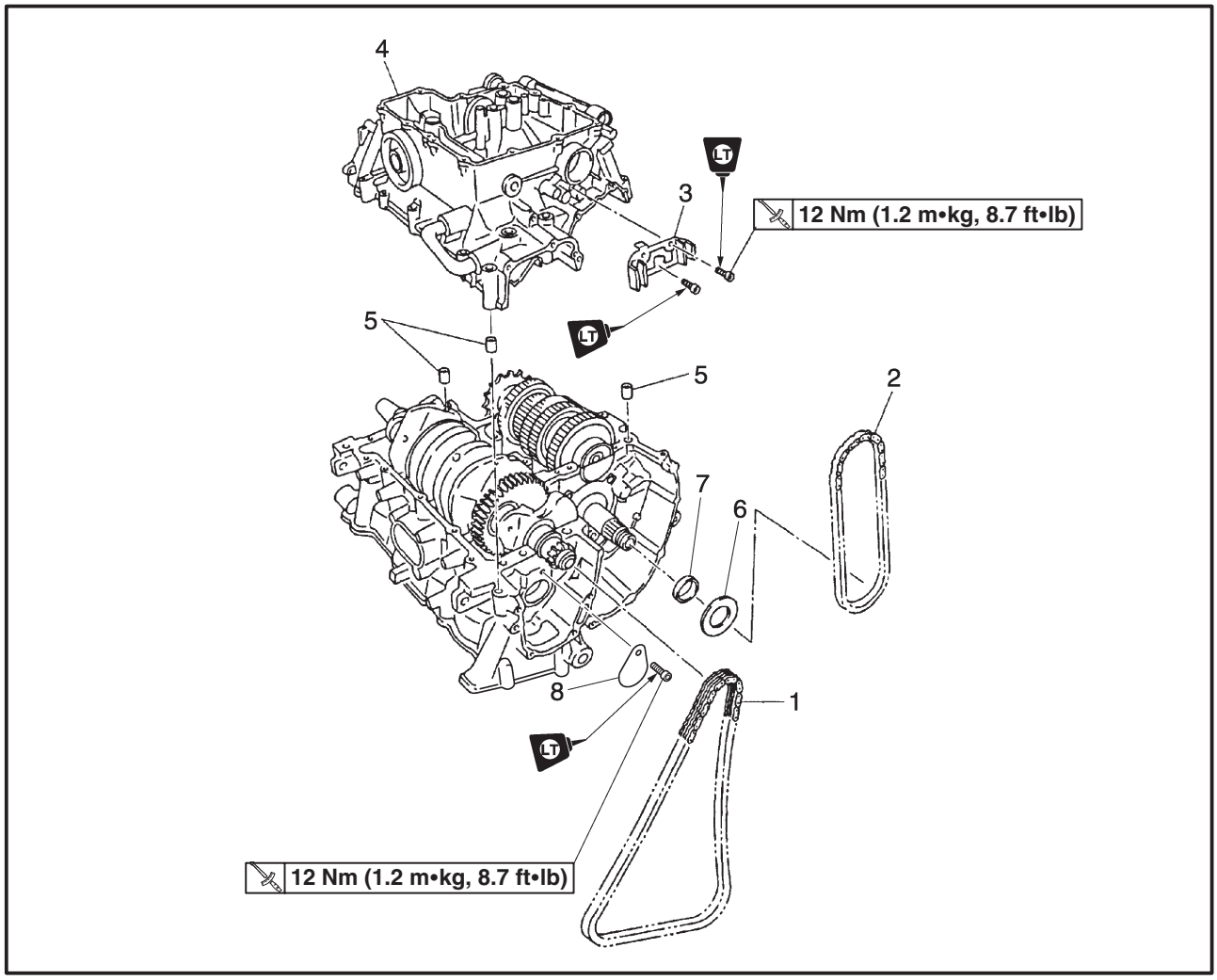
NOTE:

- Tighten the oil pan bolts in stages and in a crisscross pattern.
- Lubricate the oil level switch O-ring with engine oil.

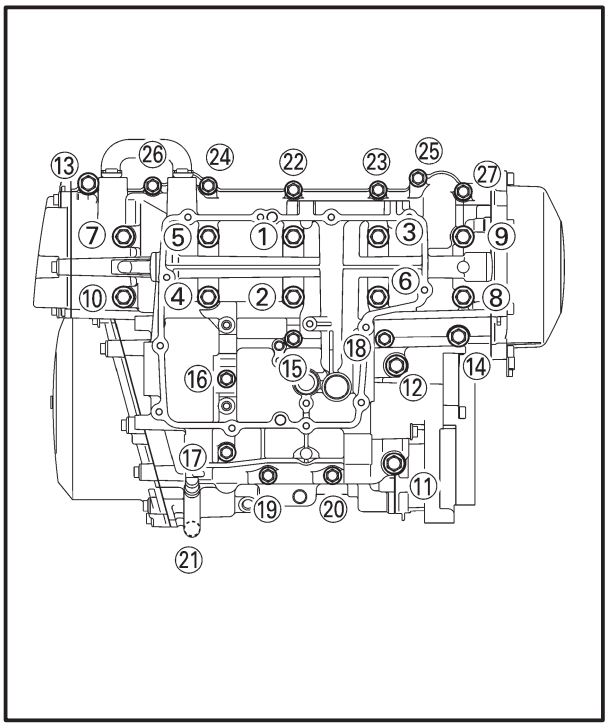
CRANKCASE



Order	Job/Part	Q'ty	Remarks
	Removing the crankcase		Remove the parts in the order listed.
	Engine		Refer to "ENGINE".
	Cylinder head		Refer to "CYLINDER HEAD".
	Starter clutch and generator		Refer to "STARTER CLUTCH AND GENERATOR".
	Shift shaft		Refer to "SHIFT SHAFT".
	Crankshaft position sensor and pickup rotor		Refer to "CRANKSHAFT POSITION SENSOR AND PICKUP ROTOR".
	Clutch		Refer to "CLUTCH".
	Water pump assembly		Refer to "WATER PUMP" in chapter 6.
	Oil pan and oil pump		Refer to "OIL PAN AND OIL PUMP".
1	Timing chain	1	
2	Oil pump drive chain	1	
3	Oil pump drive chain guide	1	
4	Lower crankcase	1	
5	Dowel pin	3	



Order	Job/Part	Q'ty	Remarks
6	Thrust plate	1	
7	Washer	1	
8	Plate	1	
			For installation, reverse the removal procedure.



EAS00384

DISASSEMBLING THE CRANKCASE

1. Place the engine upside down.
2. 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.
- Loosen the bolts in decreasing numerical order (refer to the numbers in the illustration).
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.

M8 × 85 mm (3.3 in) bolts: ① ~ ⑦, ⑩
M8 × 115 mm (4.5 in) bolts: ⑧, ⑨
M8 × 65 mm (2.6 in) bolts: ⑪, ⑫
M6 × 65 mm (2.6 in) bolts: ⑬, ⑭
M6 × 55 mm (2.2 in) bolts: ⑮, ㉒ ~ ㉖
M6 × 45 mm (1.8 in) bolts: ⑯, ⑲, ⑳
M6 × 65 mm (2.6 in) bolts: ⑰, ㉗
M6 × 75 mm (3.0 in) bolt: ⑱
M6 × 100 mm (3.9 in) bolts: ㉑

3. Remove:
   - lower crankcase

CAUTION:

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

4. Remove:
   - dowel pins
5. Remove:
   - crankshaft journal lower bearing (from the lower crankcase)

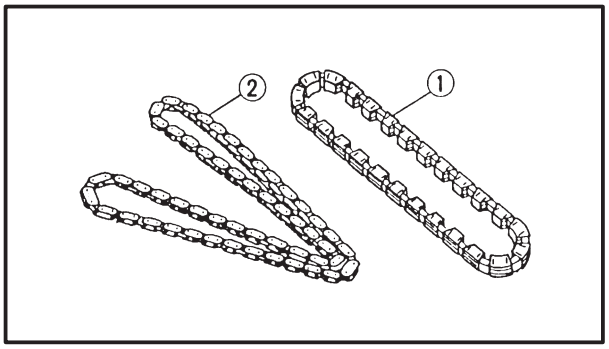
NOTE:

Identify the position of each crankshaft journal lower bearing so that it can be reinstalled in its original place.

EAS00399
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.

EAS00401
CHECKING THE BEARINGS AND OIL SEALS
1. Check:
   - bearings
     Clean and lubricate the bearings, then rotate the inner race with your finger.
     Rough movement → Replace.
2. Check:
   - oil seals
     Damage/wear → Replace.

CHECKING THE TIMING CHAIN
1 Check:
- timing chain ②
  Damage/stiffness → Replace the timing chain and crankshaft sprocket as a set.
- oil/water pump assembly drive chain ①
  Damage/stiffness → Replace the oil/water pump assembly drive chain and oil/water pump assembly drive sprocket as a set.

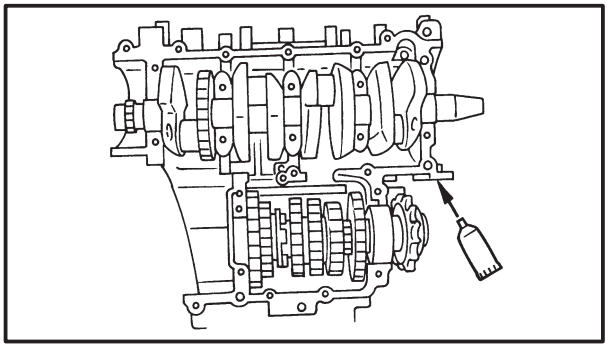


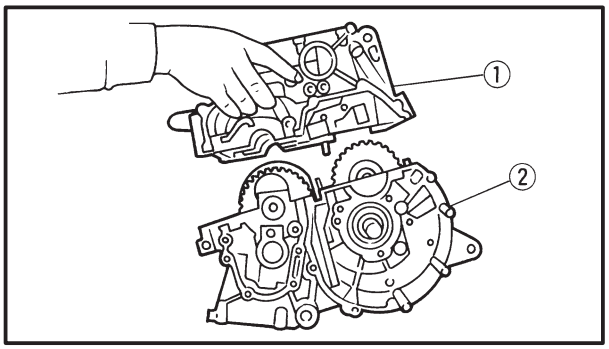
ASSEMBLING THE CRANKCASE
1. Lubricate:
   - crankshaft journal bearings
     (with the recommended lubricant)

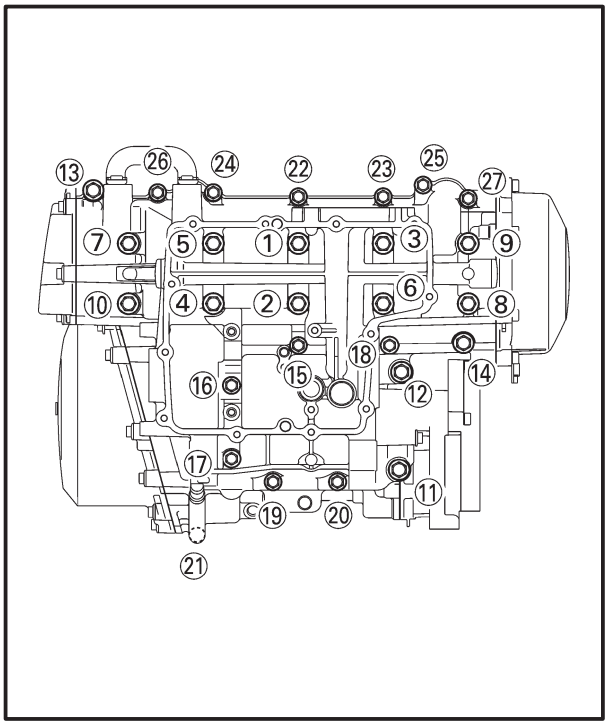
	Recommended lubricant **Engine oil**

2. Apply:
   - sealant

	Yamaha bond No. 1215 **90890-85505, ACC-1109-05-01**







NOTE:

Do not allow any sealant to come into contact with the oil gallery or crankshaft journal bearings. Do not apply sealant to within 2 ~ 3 mm of the crankshaft journal bearings.

3. Install:
   • dowel pin
4. Set the shift drum assembly and transmission gears in the neutral position.
5. Install:
   • lower crankcase ①
   (onto the upper crankcase ②)

CAUTION:

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

6. Install:
   • crankcase bolts

NOTE:

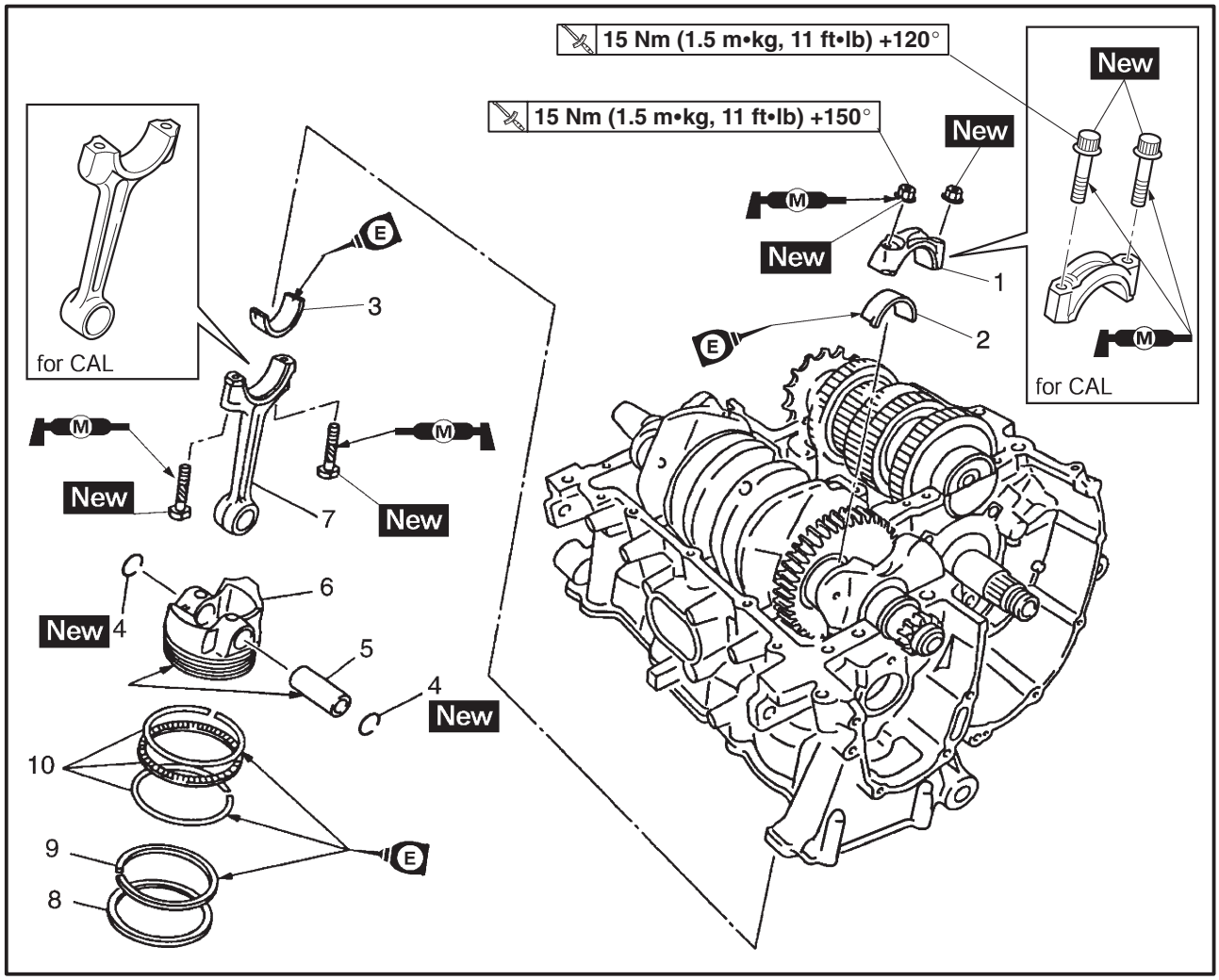
- Lubricate the bolt threads with engine oil.
- Install a washer on bolts ① ~ ⑩.
- Seal bolt ⑱
- Tighten the bolts in the tightening sequence cast on the crankcase.

M8 × 85 mm (3.3 in) bolts: ① ~ ⑦, ⑩
M8 × 115 mm (4.5 in) bolts: ⑧, ⑨
M8 × 65 mm (2.6 in) bolts: ⑪, ⑫
M6 × 65 mm (2.6 in) bolts: ⑬, ⑭
M6 × 55 mm (2.2 in) bolts: ⑮, ㉒ ~ ㉖
M6 × 45 mm (1.8 in) bolts: ⑯, ⑲, ⑳
M6 × 65 mm (2.6 in) bolts: ⑰, ㉗
M6 × 75 mm (3.0 in) bolt: ⑱ G
M6 × 100 mm (3.9 in) bolt: ㉑

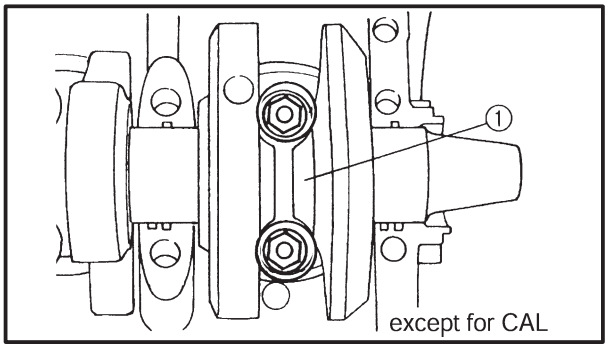
Crankcase bolt
Bolt ① ~ ⑩
1st: 12 Nm (1.2 m•kg, 8.7 ft•lb)
2nd: 25 Nm (2.5 m•kg, 18 ft•lb)
***3rd: 27 Nm (2.7 m•kg, 20 ft•lb)**
Bolt ⑪, ⑫
24 Nm (2.4 m•kg, 17 ft•lb)
Bolt ⑬, ⑭
14 Nm (1.4 m•kg, 1.0 ft•lb)
Bolt ⑮ ~ ㉗
12 Nm (1.2 m•kg, 8.7 ft•lb)

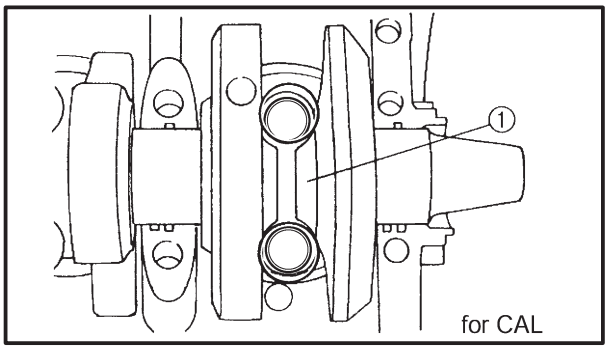
* Loosen the bolts following the tightening order and then tighten to specification torque.

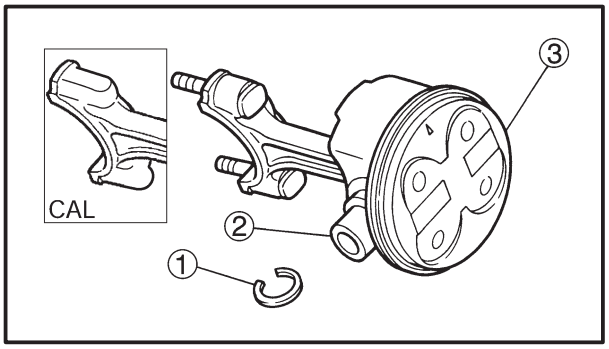
EAS00252
CONNECTING RODS AND PISTONS

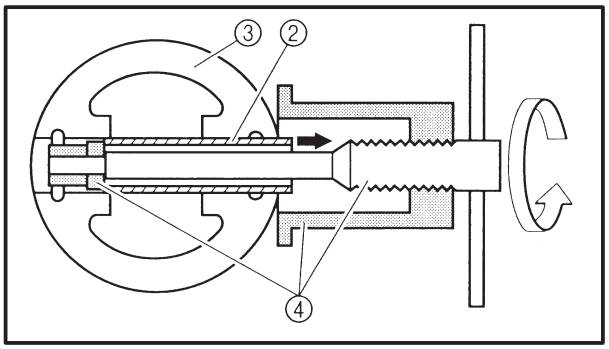


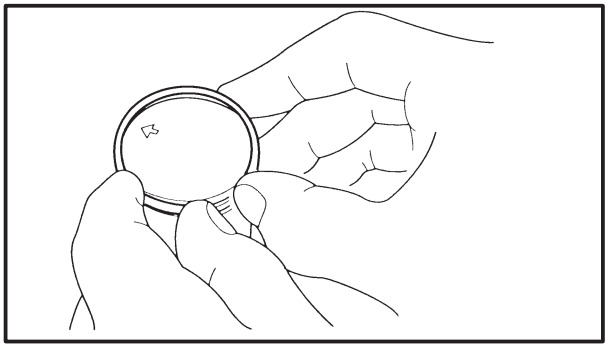
Order	Job/Part	Q'ty	Remarks
	Removing the connecting rods and pistons		Remove the parts in the order listed.
	Lower crankcase		Refer to "CRANKCASE".
1	Connecting rod cap	4	
2	Big end lower bearing	4	
3	Big end upper bearing	4	
4	Piston pin clip	8	
5	Piston pin	4	
6	Piston	4	
7	Connecting rod	4	
8	Top ring	4	
9	2nd ring	4	
10	Oil ring	4	
			For installation, reverse the removal procedure.











EAS00393

REMOVING THE CONNECTING RODS AND PISTONS

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

1. Remove:
   - connecting rod cap ①
   - big end bearings

NOTE:

Identify the position of each big end bearing so that it can be reinstalled in its original place.

2. Remove:
   - piston pin clips ①
   - piston pin ②
   - piston ③

CAUTION:

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

NOTE:

- For reference during installation, put identification marks on the piston crown.
- Before removing the piston pin, deburr the piston pin clip groove and the piston pin bore area. If both areas are deburred and the piston pin is still difficult to remove, remove it with the piston pin puller set ④.

	Piston pin puller set **90890-01304, YU-01304**

3. 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.

EAS00387
REMOVING THE CRANKSHAFT ASSEMBLY

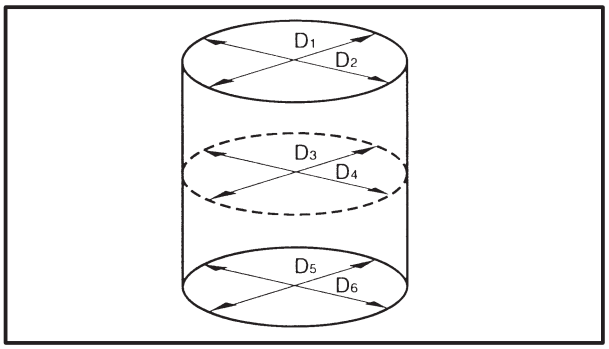
1. Remove:
   - crankshaft assembly
   - crankshaft journal upper bearings (from the upper crankcase)
     Refer to “CRANKSHAFT”.

NOTE:

Identify the position of each crankshaft journal upper bearing so that it can be reinstalled in its original place.

EAS00261
CHECKING THE CYLINDER AND PISTON

1. Check:
   - piston wall
   - cylinder wall
     Vertical scratches → Replace the cylinder, and the piston and piston rings as a set.



2. Measure:
   - piston-to-cylinder clearance

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Measure cylinder bore “C” with the cylinder bore gauge.

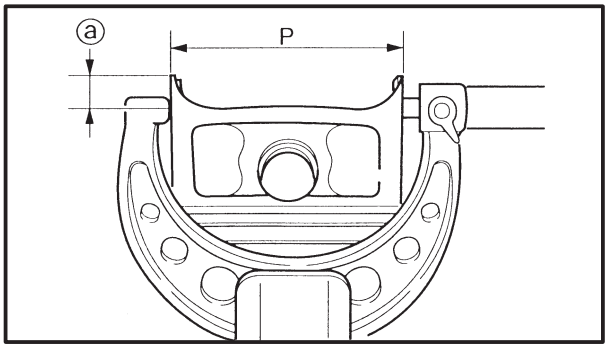
NOTE:

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

Cylinder bore "C"	**65.50 ~ 65.51 mm (2.5787 ~ 2.5791 in)**
Wear limit	**65.56 mm (2.5811 in)**
Taper limit "T"	**0.05 mm (0.002 in)**
Out of round "R"	**0.05 mm (0.002 in)**

"C" =	**maximum of D_1 ~ D_6**
"T" =	**maximum of D_1 or D_2 – maximum of D_5 or D_6**
"R" =	**maximum of D_1 D_3 or D_5 – minimum of D_2 D_4 or D_6**

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



ⓐ 4 mm (0.16 in) from the bottom edge of the piston

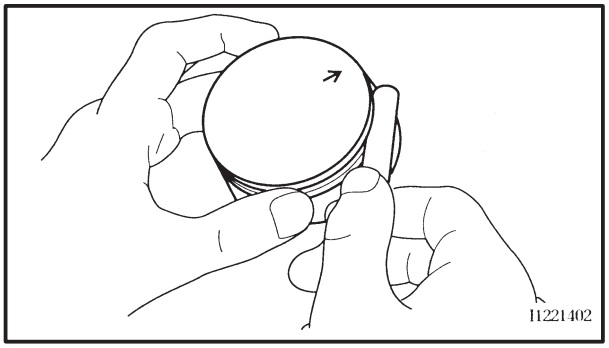
Piston size "P"
65.475 ~ 65.490 mm
(2.5778 ~ 2.5783 in)

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

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

Piston-to-cylinder clearance
0.010 ~ 0.035 mm
(0.0004 ~ 0.0014 in)
<Limit>: 0.055 mm (0.0022 in)

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



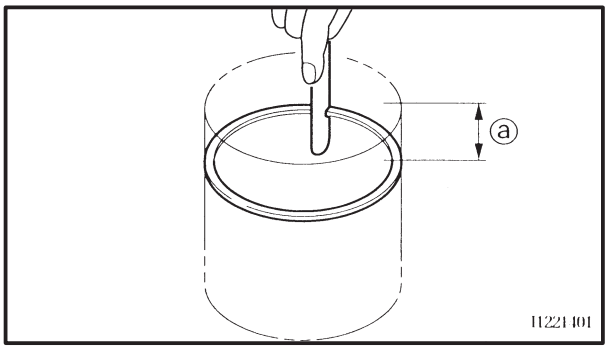
EAS00263
CHECKING THE PISTON RINGS

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
0.030 ~ 0.065 mm
(0.0012 ~ 0.0026 in)
<Limit>: 0.115 mm (0.0045 in)
2nd ring
0.030 ~ 0.065 mm
(0.0012 ~ 0.0026 in)
<Limit>: 0.125 mm (0.0049 in)



2. Install:
   • piston ring
   (into the cylinder)

NOTE:

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

ⓐ 5 mm (0.20 in)

3. Measure:
   • piston ring end gap
   Out of specification → Replace the piston ring.

NOTE:

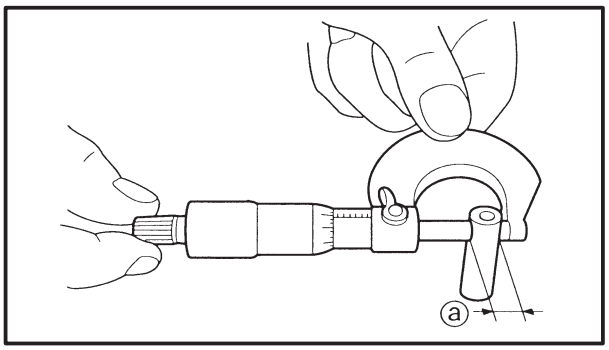
The oil ring expander spacer's end gap cannot be measured. If the oil ring rail's gap is excessive, replace all three piston rings.

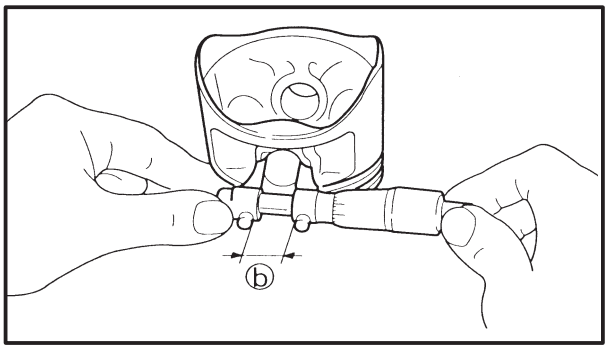
Piston ring end gap
Top ring
0.25 ~ 0.35 mm
(0.0098 ~ 0.0138 in)
<Limit>: 0.60 mm (0.0236 in)
2nd ring
0.7 ~ 0.8 mm
(0.0276 ~ 0.0315 in)
<Limit>: 1.15 mm (0.0453 in)
Oil ring
0.10 ~ 0.35 mm
(0.0039 ~ 0.0138 in)

CHECKING THE PISTON PINS

The following procedure applies to all of the piston pins.

1. Check:
   • piston pin
   Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.





2. Measure:
   • piston pin outside diameter ⓐ
   Out of specification → Replace the piston pin.

Piston pin outside diameter
15.991 ~ 16.000 mm
(0.6296 ~ 0.6299 in)
<Limit>: 15.971 mm (0.6288 in)

3. Measure:
   • piston pin bore inside diameter ⓑ
   Out of specification → Replace the piston.

Piston pin bore inside diameter
16.002 ~ 16.013 mm
(0.6300 ~ 0.6304 in)
<Limit>: 16.043 mm (0.6316 in)

4. Calculate:
   • piston-pin-to-piston clearance
   Out of specification → Replace the piston pin and piston as a set.

Piston-pin-to-piston clearance =
Piston pin bore size –
Piston pin outside diameter
Piston-pin-to-piston clearance
0.002 ~ 0.022 mm
(0.0001 ~ 0.0009 in)
<Limit>: 0.072 mm (0.0028 in)

CHECKING THE BIG END BEARINGS

1. Measure:
   • crankshaft-pin-to-big-end-bearing clearance
   Out of specification → Replace the big end bearings.

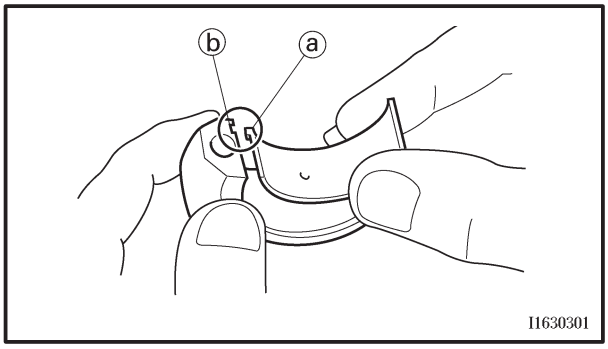
Crankshaft-pin-to-big-end-bearing clearance
0.028 ~ 0.052 mm
(0.0011 ~ 0.0020 in)

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

The following procedure applies to all of the connecting rods.

CAUTION:

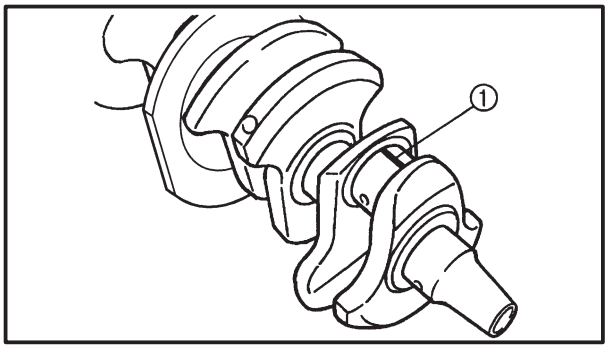
Do not interchange the big end bearings and connecting rods. To obtain the correct crankshaft-pin-to-big-end-bearing clearance and prevent engine damage, the big end bearings must be installed in their original positions.



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

NOTE:

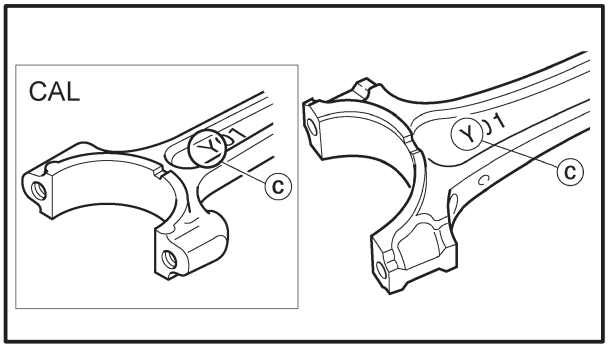
Align the projections ⓐ on the big end bearings with the notches ⓑ in the connecting rod and connecting rod cap.

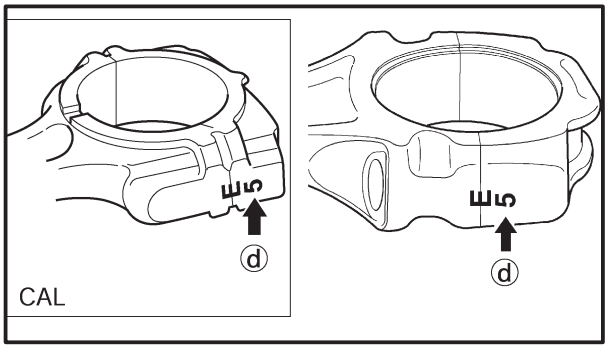


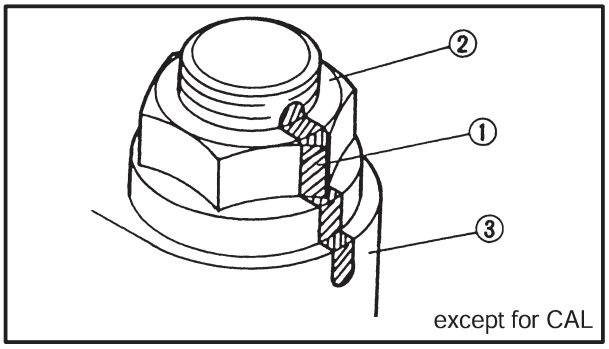
c. Put a piece of Plastigauge® ① on the crankshaft pin.
d. Assemble the connecting rod halves.

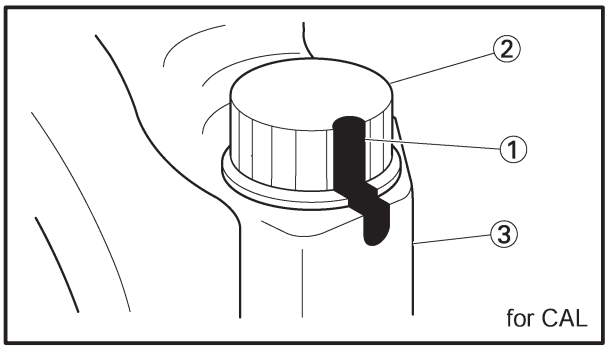
NOTE:

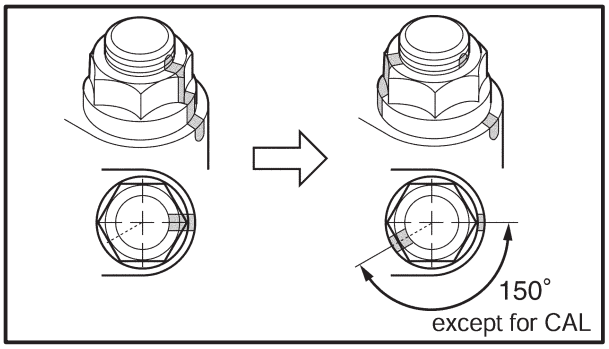
- Do not move the connecting rod or crankshaft until the clearance measurement has been completed.
- Lubricate the bolt threads and nut seats with molybdenum disulfide grease.
- Make sure that the "Y" mark ⓒ on the connecting rod faces towards the left side of the crankshaft.
- Make sure that the characters ⓓ on both the connecting rod and connecting rod cap are aligned.

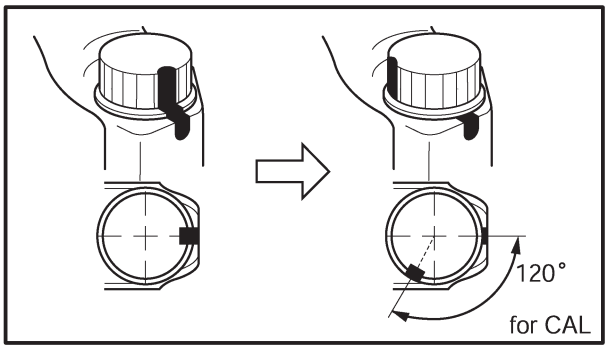












e. Tighten the connecting rod nuts (except for CAL) or bolts (for CAL).

Connecting rod nut
(except for CAL)
15 Nm (1.5 m•kg, 11 ft•lb) + 150°
Connecting rod bolt (for CAL)
15 Nm (1.5 m•kg, 11 ft•lb) + 120°

f. Replace the connecting rod bolts with new ones.

CAUTION:

Tighten the connecting rod bolts using the plastic-region tightening angle method.
Always install new bolts and nuts.

g. Clean the connecting rod bolts and nuts. (except for CAL)
Clean the connecting rod bolts. (for CAL)
h. Tighten the connecting rod nuts. (except for CAL)
Tighten the connecting rod bolt. (for CAL)
i. Put a mark ① on the corner of the connecting rod nut ② and the connecting rod ③. (except for CAL)
Put a mark ① on the corner of the connecting rod bolt ② and the connecting rod ③.(for CAL)
j. Tighten the nut (except for CAL) or bolt (for CAL) further to reach the specified angle (150° except for CAL, 120° for CAL).

⚠ WARNING

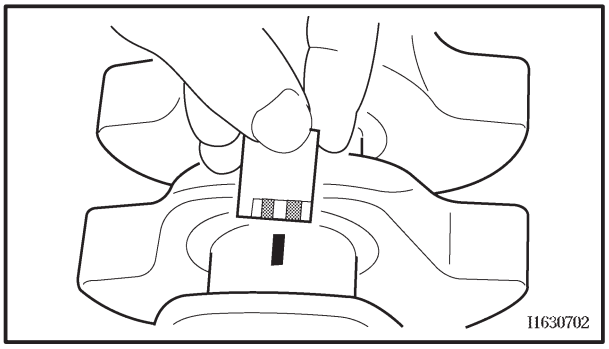
When the nut (except for CAL) or bolt (for CAL) is tightened more than the specified angle, do not loosen the nut (except for CAL) or bolt (for CAL) and then retighten it.
Replace the bolt with a new one and perform the procedure again.

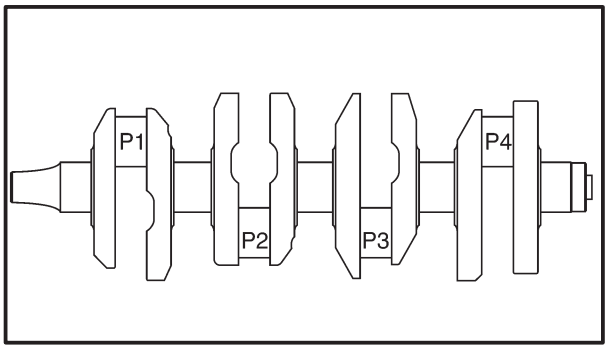
CAUTION:

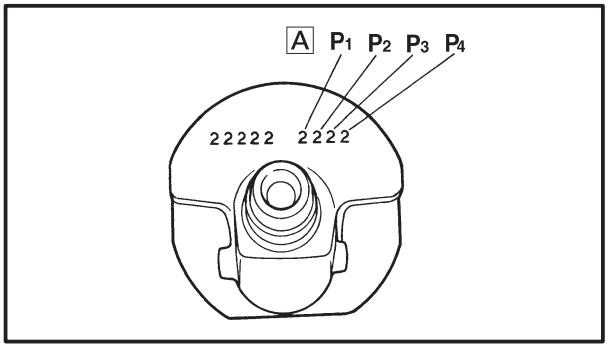
- **Do not use a torque wrench to tighten the nut (except for CAL) or bolt (for CAL) to the specified angle.**
- **Tighten the nut (except for CAL) or bolt (for CAL) until it is at the specified angles.**

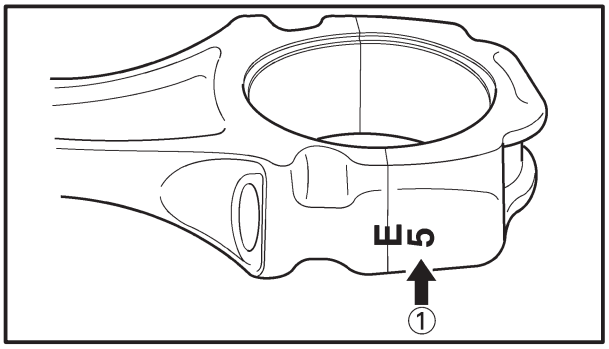
NOTE:

When using a hexagonal nut, note that the angle from one corner to another is 60° (except for CAL).









k. Remove the connecting rod and big end bearings.
   Refer to "REMOVING THE CONNECTING RODS AND PISTONS".
l. Measure the compressed Plastigauge® width on the crankshaft pin.
   If the crankshaft-pin-to-big-end-bearing clearance is out of specification, select replacement big end bearings.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

2. Select:
   • big end bearings (P1 ~ P4)

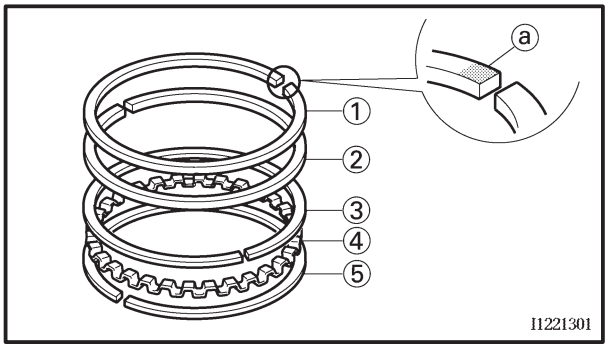
NOTE:

- The numbers [A] stamped into the crankshaft web and the numbers ① on the connecting rods are used to determine the replacement big end bearing sizes.
- "P1" ~ "P4" refer to the bearings shown in the crankshaft illustration.

For example, if the connecting rod "P_1" and the crankshaft web "P_1" numbers are "5" and "2" respectively, then the bearing size for "P1" is:

"P_1" (connecting rod) – "P_1" (crankshaft) =
5 – 2 = 3 (brown)

BIG END BEARING COLOR CODE	
1	Blue
2	Black
3	Brown
4	Green



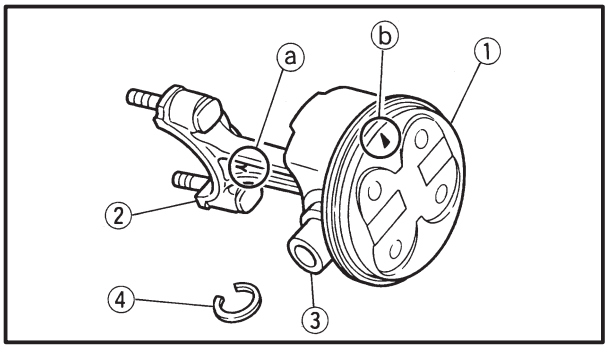
INSTALLING THE CONNECTING ROD AND PISTON (except for CAL)

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

1. Install:
   - top ring ①
   - 2nd ring ②
   - upper oil ring rail ③
   - oil ring expander ④
   - lower oil ring rail ⑤

NOTE:

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



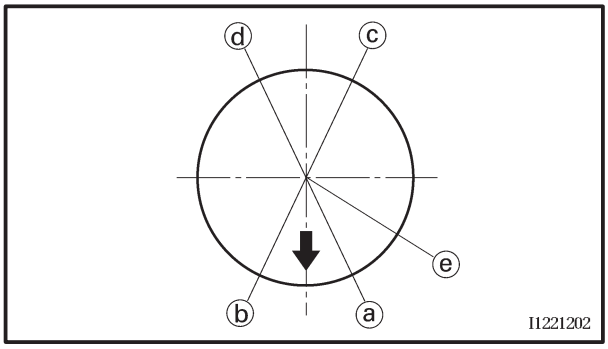
2. Install:
   - piston ①
     (onto the respective connecting rod ②)
   - piston pin ③
   - piston pin clip New ④

NOTE:

- Apply engine oil onto the piston pin.
- Make sure that the "Y" mark ⓐ on the connecting rod faces left when the arrow mark ⓑ on the piston is pointing up. Refer to the illustration.
- Reinstall each piston into its original cylinder (numbering order starting from the left: #1 to #4).

3. Lubricate:
   - piston
   - piston rings
   - cylinder
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**



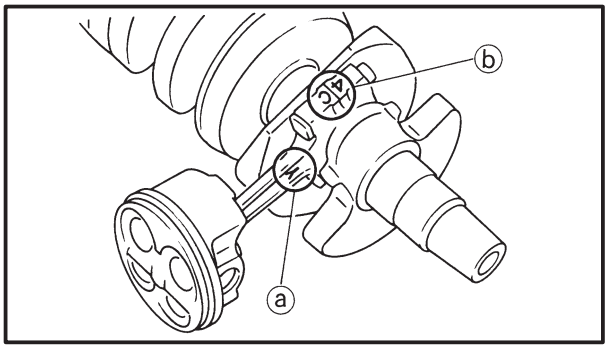
4. Offset:
   • piston ring end gaps

ⓐ Top ring
ⓑ Lower oil ring rail
ⓒ Upper oil ring rail
ⓓ 2nd ring
ⓔ Oil ring expander

5. Lubricate:
   • crankshaft pins
   • big end bearings
   • connecting rod big end inner surface
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

6. Install:
   • big end bearings
   • connecting rod assembly
     (into the cylinder and onto the crankshaft pin)
   • connecting rod cap
     (onto the connecting rod)



NOTE:

- Align the projections on the big end bearings with the notches in the connecting rods and connecting rod caps.
- Be sure to reinstall each big end bearing in its original place.
- While compressing the piston rings with one hand, install the connecting rod assembly into the cylinder with the other hand.
- Make sure that the "Y" marks ⓐ on the connecting rods face towards the left side of the crankshaft.
- Make sure that the characters ⓑ on both the connecting rod and connecting rod cap are aligned.

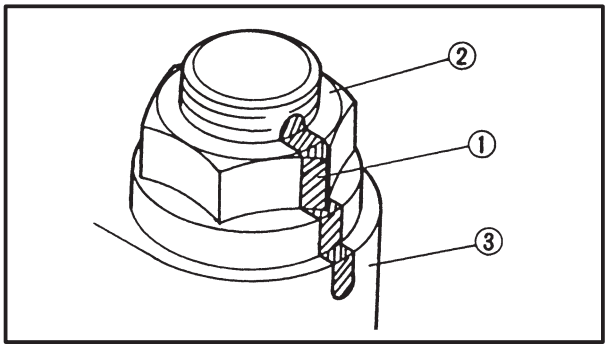
7. Align:
   • bolt heads
     (with the connecting rod caps)
8. Tighten:
   • connecting rod nuts

15 Nm (1.5 m•kg, 11 ft•lb) + 150°

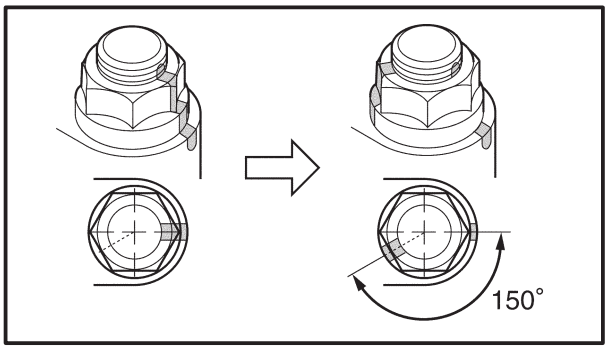
a. Replace the connecting rod bolts and nuts with new ones.

CAUTION:

Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts and nuts.



b. Clean the connecting rod bolts and nuts.
c. Tighten the connecting rod nuts.
d. Put a mark ① on the corner of the connecting rod nut ② and the connecting rod ③.



e. Tighten the nut further to reach the specified angle (150°).

⚠ WARNING

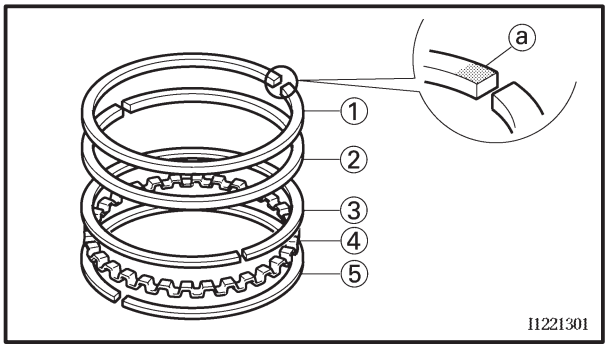
When the nut is tightened more than the specified angle, do not loosen the bolt and then retighten it.
Replace the bolt with a new one and perform the procedure again.

CAUTION:

- **Do not use a torque wrench to tighten the nut to the specified angle.**
- **Tighten the nut until it is at the specified angles.**

NOTE:

When using a hexagonal nut, note that the angle from one corner to another is 60°.



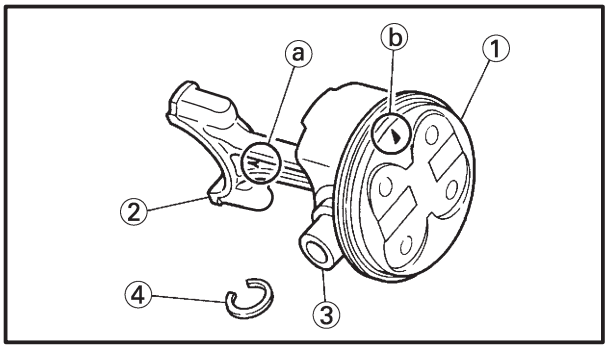
INSTALLING THE CONNECTING ROD AND PISTON (for CAL)

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

1. Install:
   - top ring ①
   - 2nd ring ②
   - upper oil ring rail ③
   - oil ring expander ④
   - lower oil ring rail ⑤

NOTE:

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



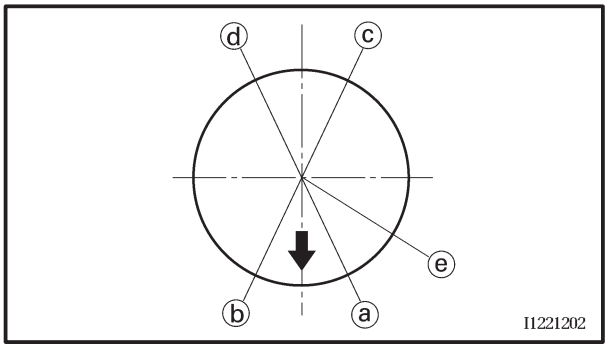
2. Install:
   - piston ①
     (onto the respective connecting rod ②)
   - piston pin ③
   - piston pin clip New ④

NOTE:

- Apply engine oil onto the piston pin.
- Make sure that the "Y" mark ⓐ on the connecting rod faces left when the arrow mark ⓑ on the piston is pointing up. Refer to the illustration.
- Reinstall each piston into its original cylinder (numbering order starting from the left: #1 to #4).

3. Lubricate:
   - piston
   - piston rings
   - cylinder
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**

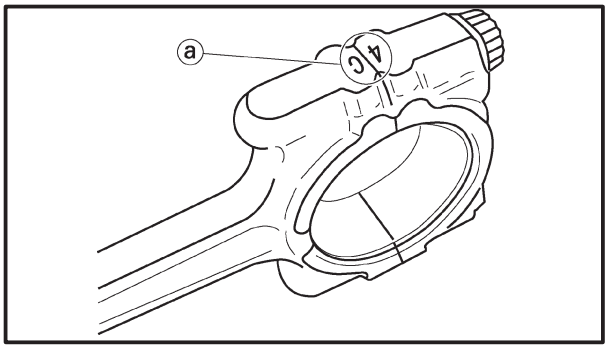


4. Offset:
   • piston ring end gaps

ⓐ Top ring
ⓑ Lower oil ring rail
ⓒ Upper oil ring rail
ⓓ 2nd ring
ⓔ Oil ring expander

5. Lubricate:
   • crankshaft pins
   • big end bearings
   • connecting rod big end inner surface
     (with the recommended lubricant)

	Recommended lubricant **Engine oil**



6. Install:
   • big end bearings
   • connecting rod cap
     (onto the connecting rod)

NOTE:

- Align the projections on the big end bearings with the notches in the connecting rods and connecting rod caps.
- Make sure that the characters ⓐ on both the connecting rod and connecting rod cap are aligned.

7. Tighten:

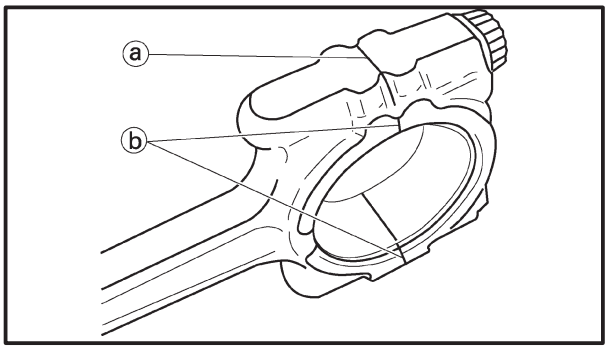
NOTE:

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

- connecting rod bolts.

24.5 Nm (2.5 m•kg, 17.7 ft•lb)

a. Replace the connecting rod bolts with new oncs.



CAUTION:

Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts.

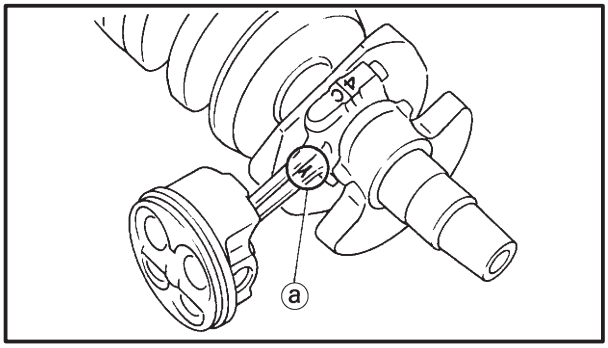
b. Clean the connecting rod bolts.
c. After installing the big end bearing, assemble the connecting rod and connecting rod cap once using a single unit of the connecting rod.
d. Tighten the connecting rod bolt while checking that the sections shown ⓐ and ⓑ are flush with each other by touching the surface.
   - Side machined face ⓐ
   - Thrusting faces (4 places at front and rear) ⓑ

NOTE:

To install the big end bearing, care should be taken not to install it at an angle and the position should not be out of alignment.

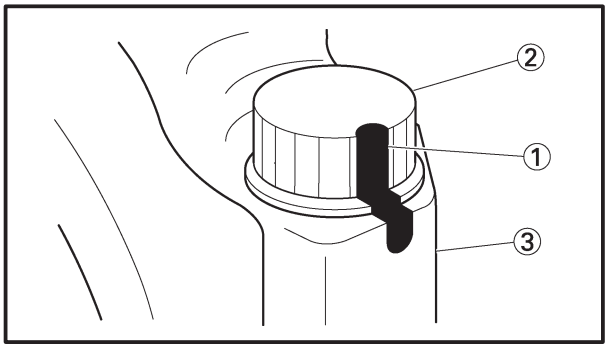
e. Loosen the connecting rod bolt, remove the connecting rod and connecting rod cap and install these parts to the crankshaft with the big end bearing kept in the current condition.

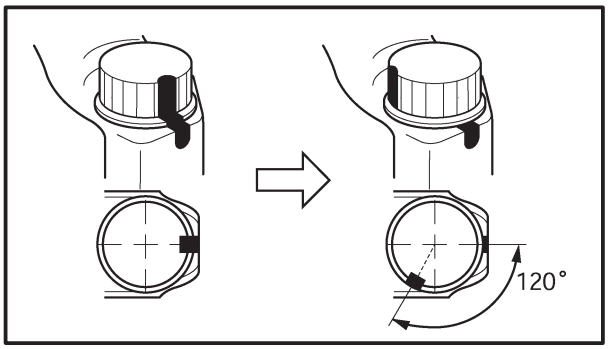
8. Install:
   - connecting rod assembly
     (into the cylinder and onto the crankshaft pin)

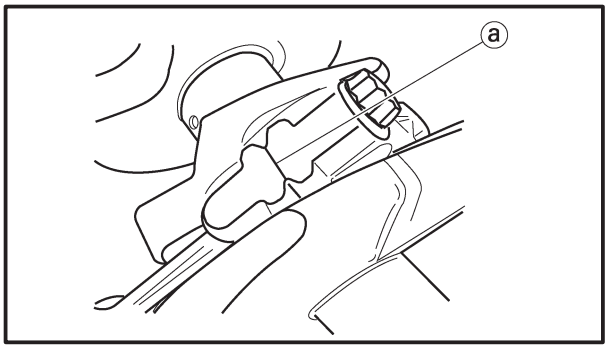


NOTE:

- Be sure to reinstall each big end bearing in its original place.
- While compressing the piston rings with one hand, install the connecting rod assembly into the cylinder with the other hand.
- Make sure that the "Y" marks ⓐ on the connecting rods face towards the left side of the crankshaft.







9. Tighten:
   • connecting rod bolts

15 Nm (1.5 m•kg, 11 ft•lb) + 120°

a. Clean the connecting rod bolts.
b. Tighten the connecting rod bolts.
c. Put a mark ① on the corner of the connecting rod bolt ② and the connecting rod ③.
d. Tighten the bolt further to reach the specified angle (120°).

e. After the installation, check that the section shown ⓐ is flush with each other by touching the surface.
   • Side machined face ⓐ

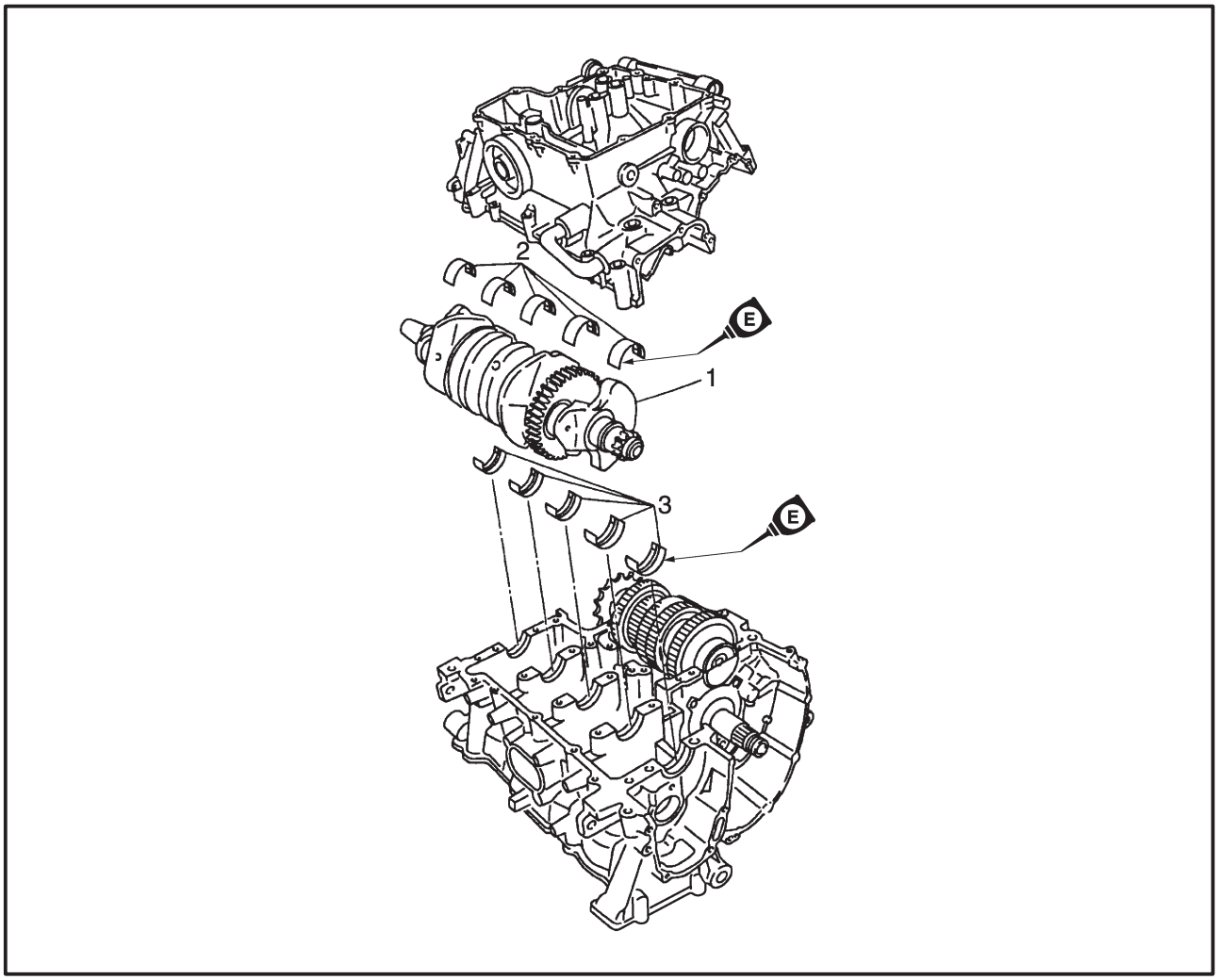
⚠ WARNING

- **When the bolt is tightened more than the specified angle, do not loosen the bolt and then retighten it.**
  Replace the bolt with a new one and perform the procedure again.
- **If they are not flush with each other, remove the connecting rod bolt and big end bearing and restart from step "7". In this case, make sure to replace the connecting rod bolt.**

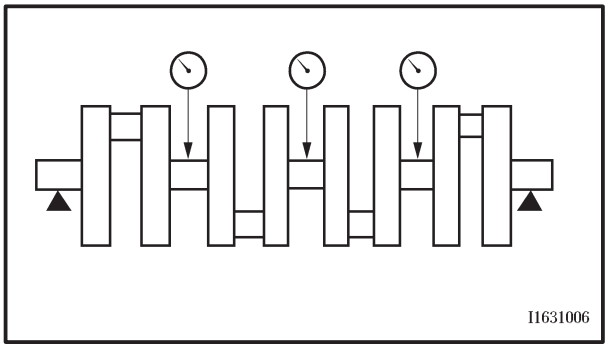
CAUTION:

- **Do not use a torque wrench to tighten the nut to the specified angle.**
- **Tighten the bolt until it is at the specified angles.**

EAS00381
CRANKSHAFT



Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft Crankcase Connecting rod caps		Remove the parts in the order listed. Separate. Refer to "CRANKCASE". Refer to "CONNECTING RODS AND PISTONS".
1	Crankshaft	1	
2	Crankshaft journal lower bearing	5	
3	Crankshaft journal upper bearing	5	
			For installation, reverse the removal procedure.



EAS00395
CHECKING THE CRANKSHAFT
1. Measure:
   • crankshaft runout
   Out of specification → Replace the crankshaft.

Crankshaft runout
Less than 0.03 mm (0.0012 in)

2. Check:
   • crankshaft journal surfaces
   • crankshaft pin surfaces
   • bearing surfaces
   Scratches/wear → Replace the crankshaft.

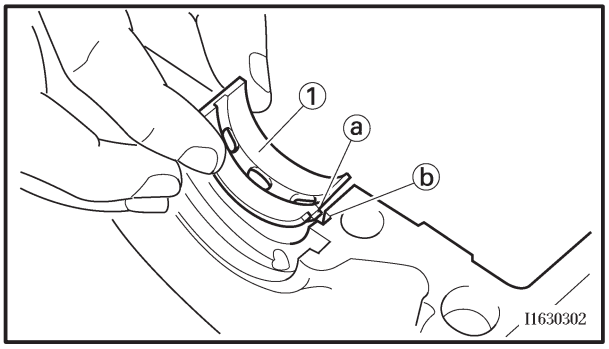
CHECKING THE CRANKSHAFT JOURNAL BEARINGS
1. Measure:
   • crankshaft-journal-to-crankshaft-journal-bearing clearance
   Out of specification → Replace the crankshaft journal bearings.

Crankshaft-journal-to-crankshaft-journal-bearing clearance
0.034 ~ 0.058 mm
(0.0013 ~ 0.0023 in)

CAUTION:

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

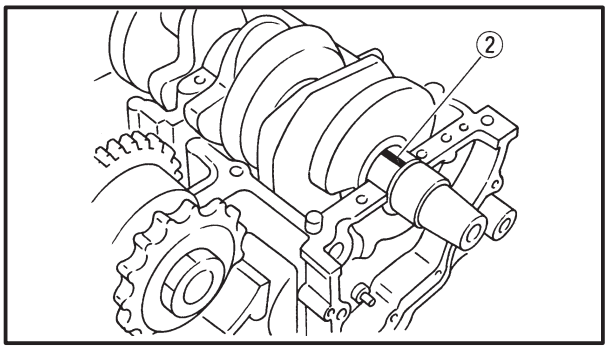
a. Clean the crankshaft journal bearings, crankshaft journals, and bearing portions of the crankcase.
b. Place the upper crankcase upside down on a bench.



c. Install the crankshaft journal upper bearings ① and the crankshaft into the upper crankcase.

NOTE:

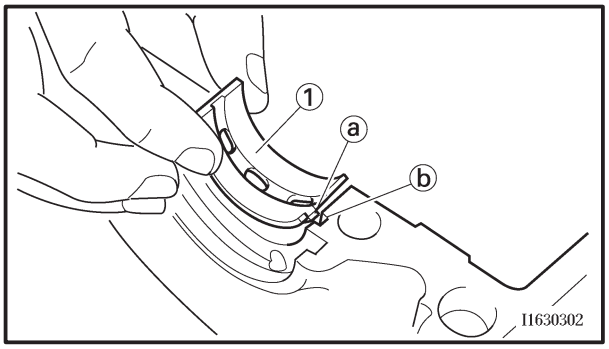
Align the projections ⓐ on the crankshaft journal upper bearings with the notches ⓑ in the upper crankcase.



d. Put a piece of Plastigauge® ② on each crankshaft journal.

NOTE:

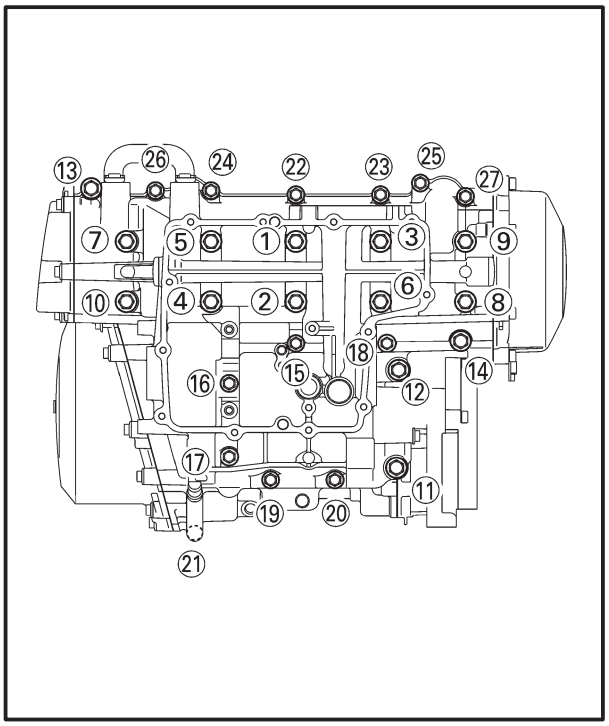
Do not put the Plastigauge® over the oil hole in the crankshaft journal.



e. Install the crankshaft journal lower bearings ① into the lower crankcase and assemble the crankcase halves.

NOTE:

- Align the projections ⓐ of the crankshaft journal lower bearings with the notches ⓑ in the lower crankcase.
- Do not move the crankshaft until the clearance measurement has been completed.



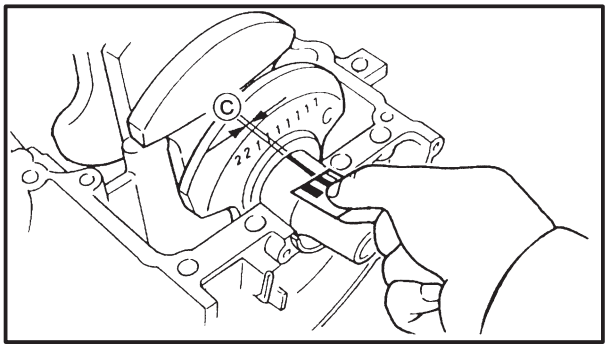
f. Tighten the bolts to specification in the tightening sequence cast on the crankcase.

Crankcase bolt
Bolt ① ~ ⑩
1st: 12 Nm (1.2 m•kg, 8.7 ft•lb)
2nd: 25 Nm (2.5 m•kg, 18 ft•lb)
***3rd: 27 Nm (2.7 m•kg, 20 ft•lb)**
Bolt ⑪, ⑫
24 Nm (2.4 m•kg, 17 ft•lb)
Bolt ⑬, ⑭
14 Nm (1.4 m•kg, 1.0 ft•lb)
Bolt ⑮ ~ ㉗
12 Nm (1.2 m•kg, 8.7 ft•lb)

* Loosen the bolts following the tightening order and then tighten to specification torque.

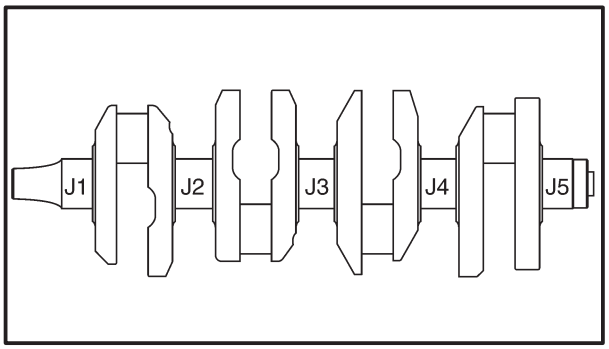
NOTE:

Lubricate the crankcase bolt threads with engine oil.
Refer to “CRANKCASE”.



g. Remove the lower crankcase and the crankshaft journal lower bearings.
h. Measure the compressed Plastigauge® width Ⓒ on each crankshaft journal.
If the crankshaft-journal-to-crankshaft-journal-bearing clearance is out of specification, select replacement crankshaft journal bearings.

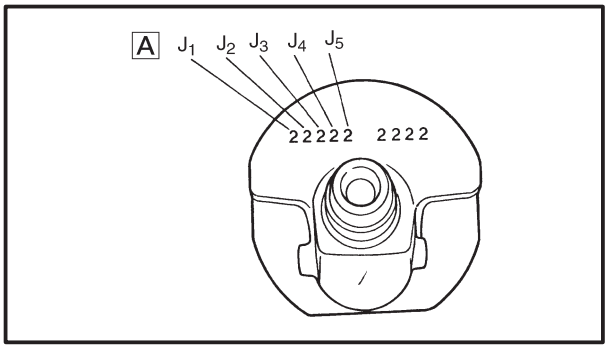
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



2. Select:
• crankshaft journal bearings (J1 ~ J5)

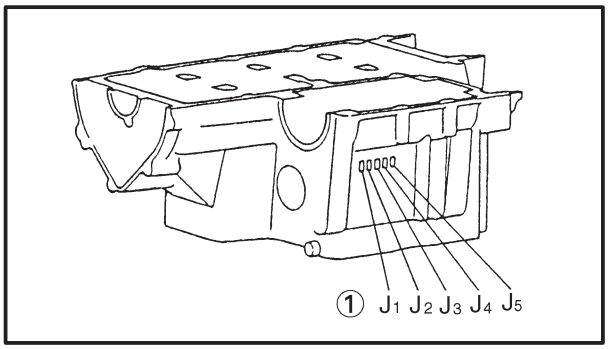
NOTE:

- The numbers [A] stamped into the crankshaft web and the numbers ① stamped into the lower crankcase are used to determine the replacement crankshaft journal bearing sizes.
- "J1 ~ J5" refer to the bearings shown in the crankshaft illustration.
- If "J1 ~ J5" are the same, use the same size for all of the bearings.
- If the size is the same for all "J_1 to J_5" one digit for that size is indicated. (Crankcase side only)

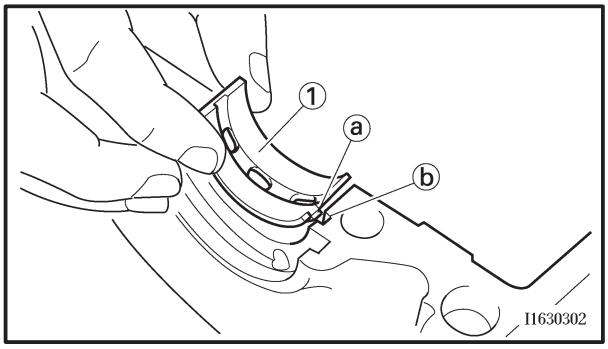


For example, if the crankcase "J_1" and crankshaft web "J_1" numbers are "6" and "2" respectively, then the bearing size for "J1" is:

"J_1" (crankcase) – "J_1" (crankshaft web) – 1 = 6 – 2 – 1 = 3 (brown)



CRANKSHAFT JOURNAL BEARING COLOR CODE	
0	White
1	Black
2	Brown
3	Green
4	Yellow



EAS00407

INSTALLING THE CRANKSHAFT

1. Install:
   - crankshaft journal upper bearings ①
     (into the upper crankcase)

NOTE:

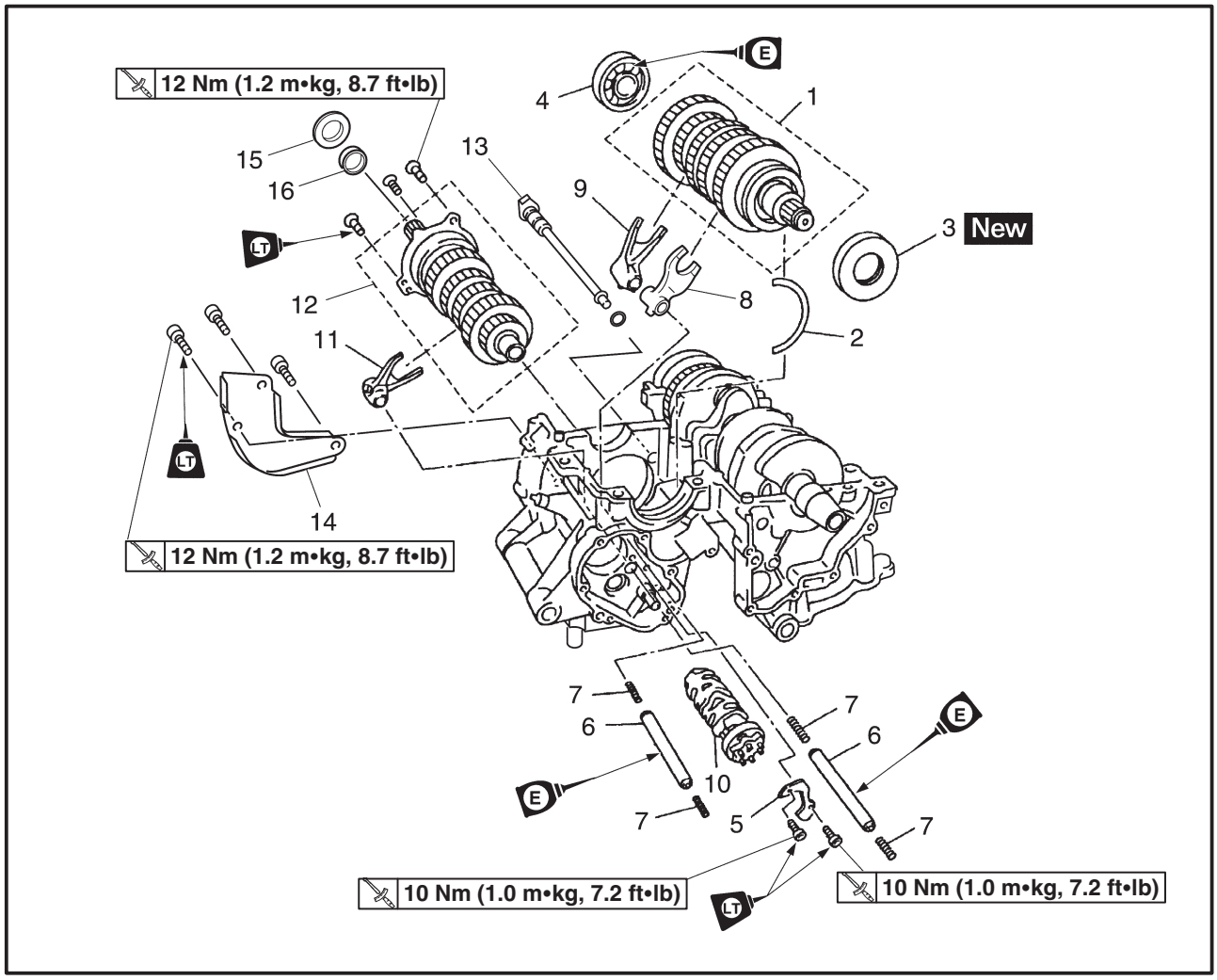
- Align the projections ⓐ on the crankshaft journal upper bearings with the notches ⓑ in the upper crankcase.
- Be sure to install each crankshaft journal upper bearing in its original place.

2. Install:
   - crankshaft
3. Install:
   - crankcase (lower)
     Refer to “CRANKCASE”.

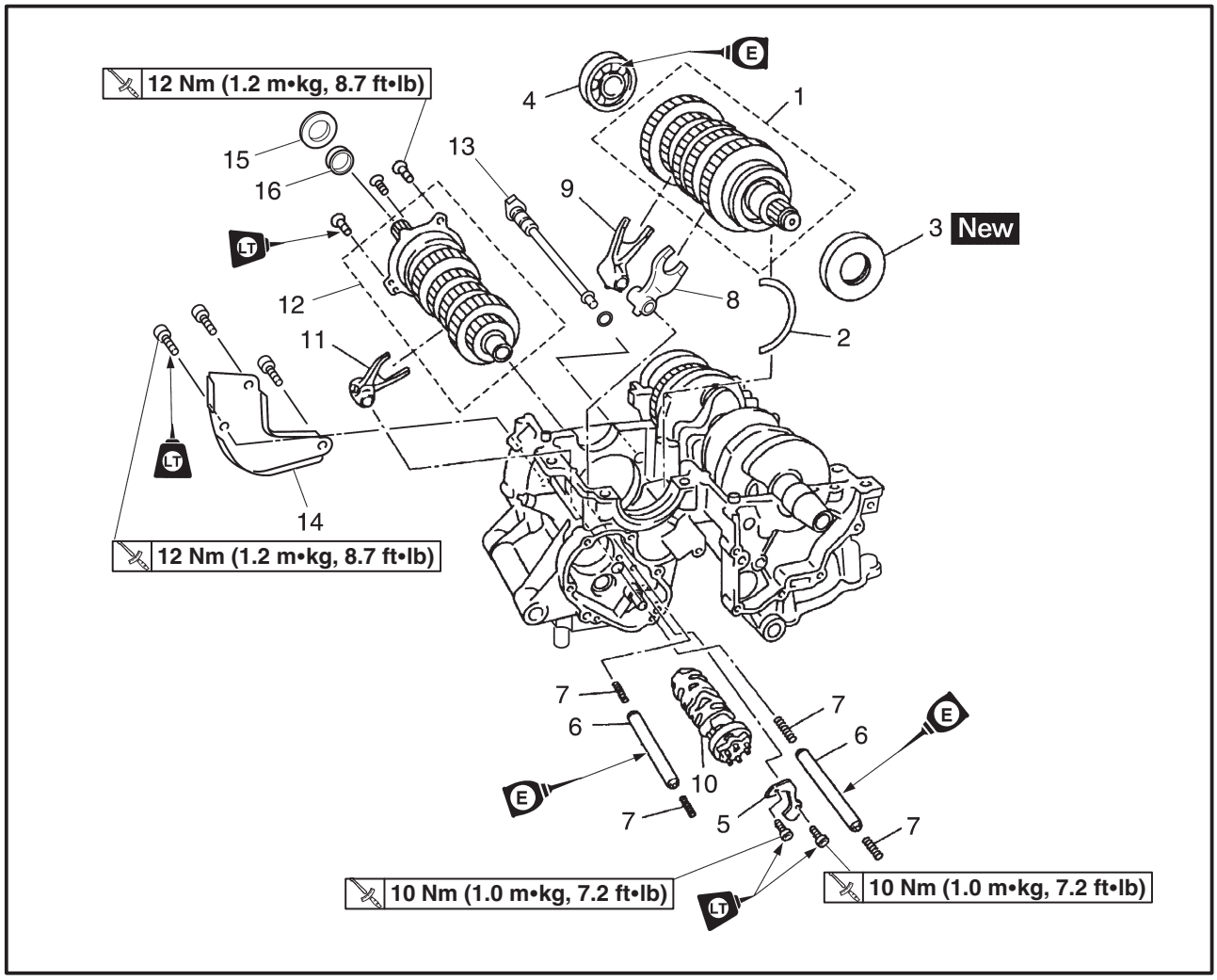
EAS00419

TRANSMISSION

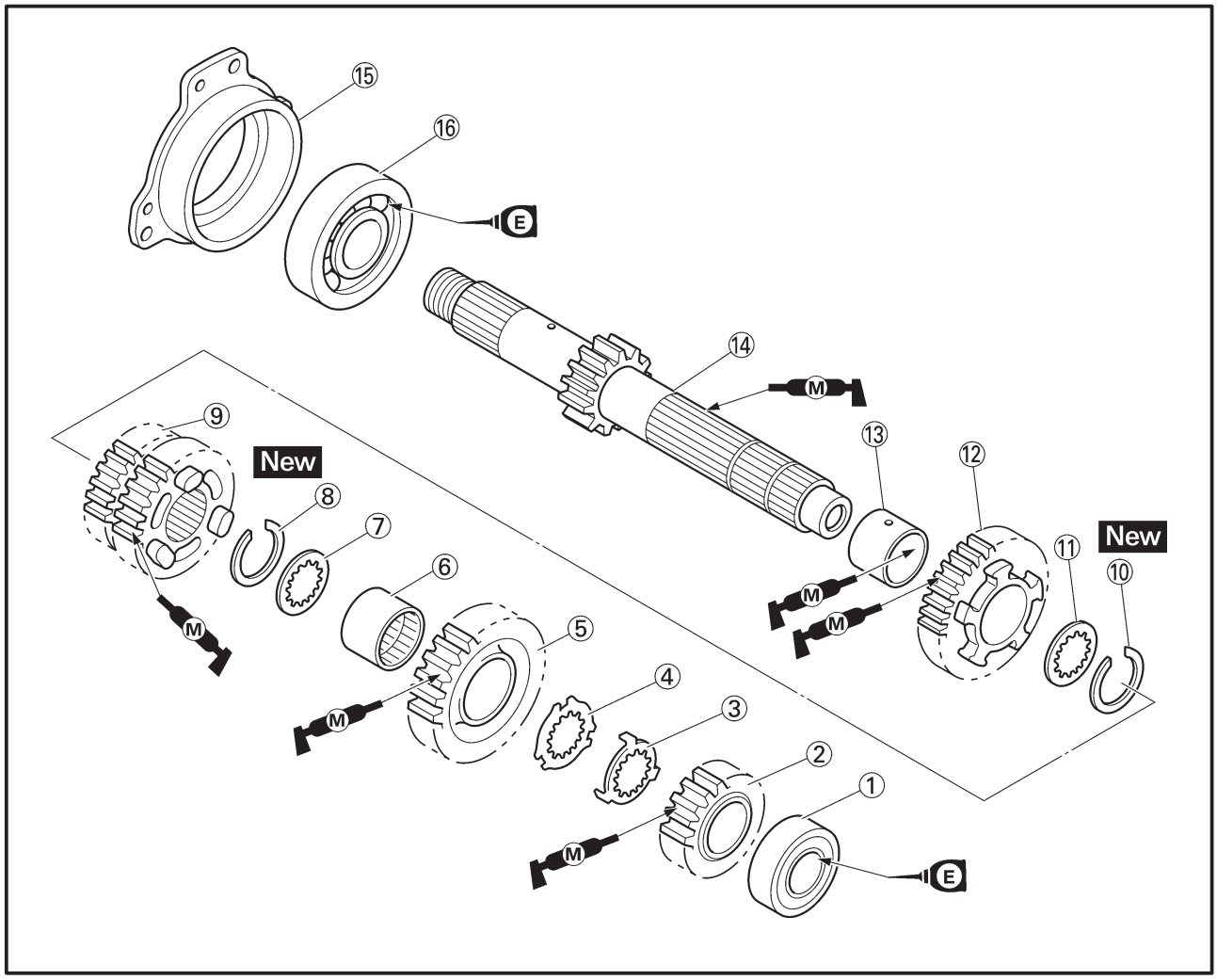
TRANSMISSION, SHIFT DRUM ASSEMBLY AND SHIFT FORKS



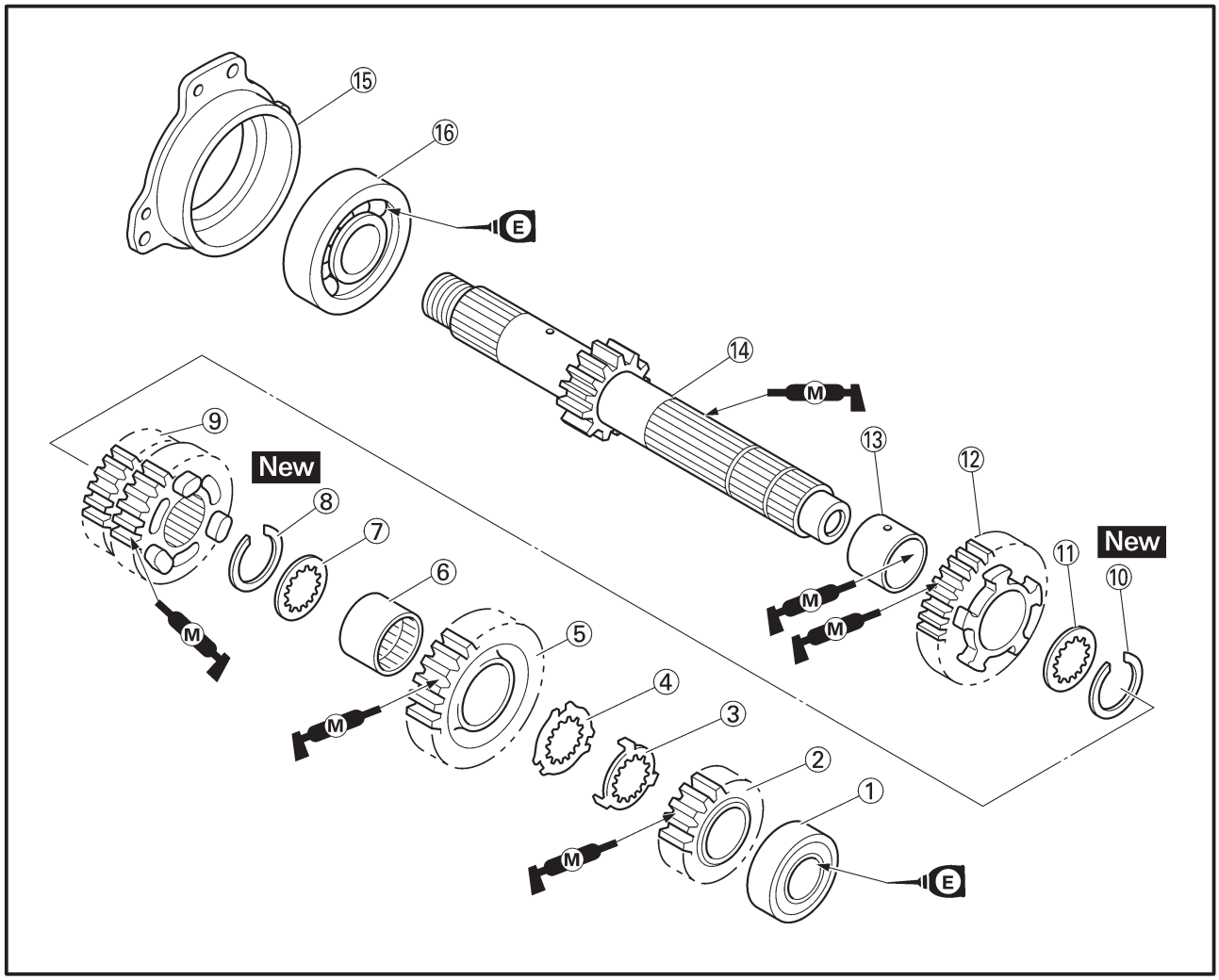
Order	Job/Part	Q'ty	Remarks
	Removing the transmission, shift drum assembly, and shift forks		Remove the part in the order listed.
	Crankcase lower		Separate. Refer to "CRANKCASE".
1	Drive axle assembly	1	
2	Circlip	1	
3	Oil seal	1	
4	Bearing	1	
5	Shift drum retainer	1	
6	Shift fork guide bar	2	
7	Spring	4	
8	Shift fork "L"	1	
9	Shift fork "R"	1	
10	Shift drum assembly	1	
11	Shift fork "C"	1	



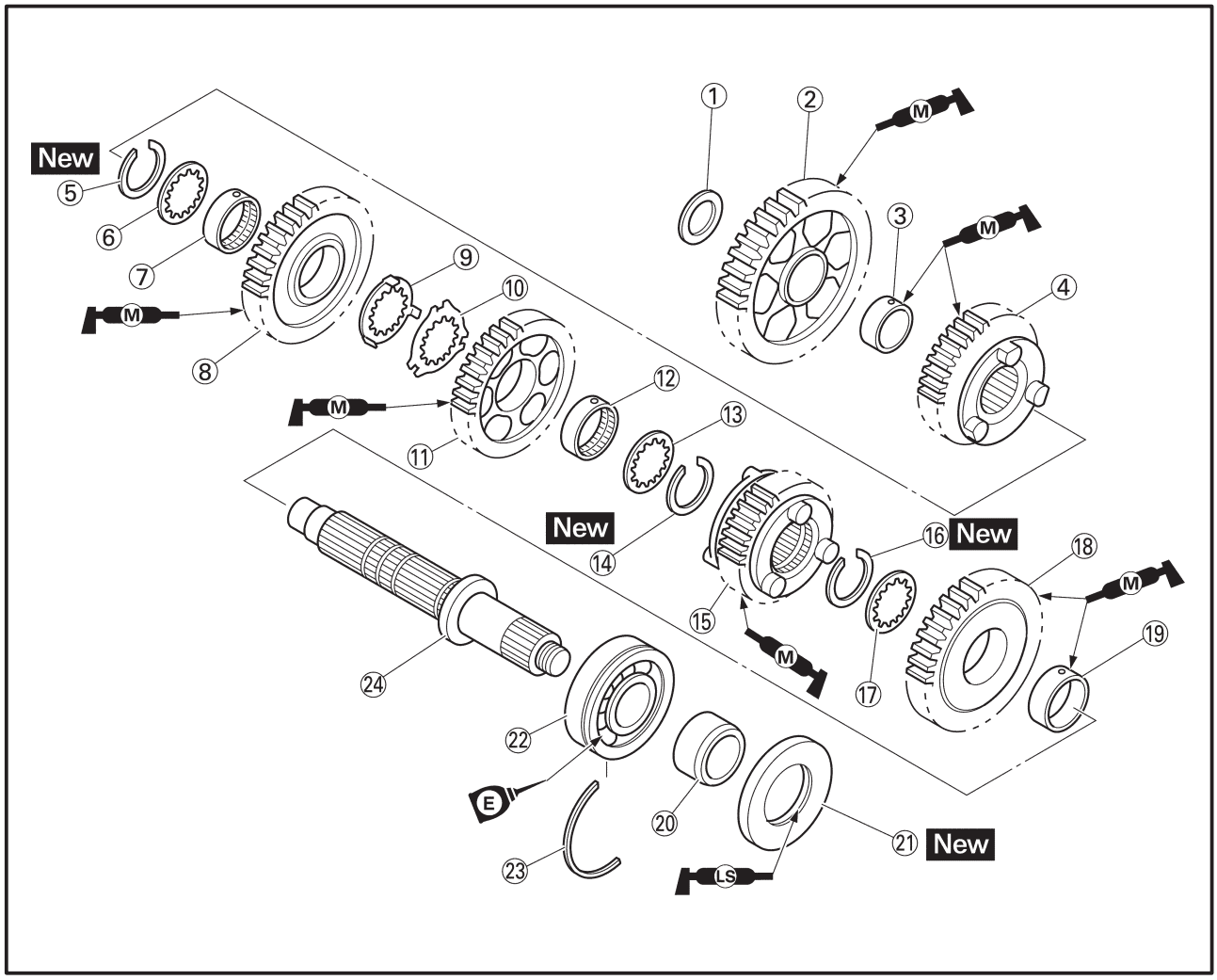
Order	Job/Part	Q'ty	Remarks
12	Main axle assembly	1	
13	Oil pipe	1	
14	Oil baffle plate	1	
15	Thrust plate	1	
16	Washer	1	
			For installation, reverse the removal procedure.



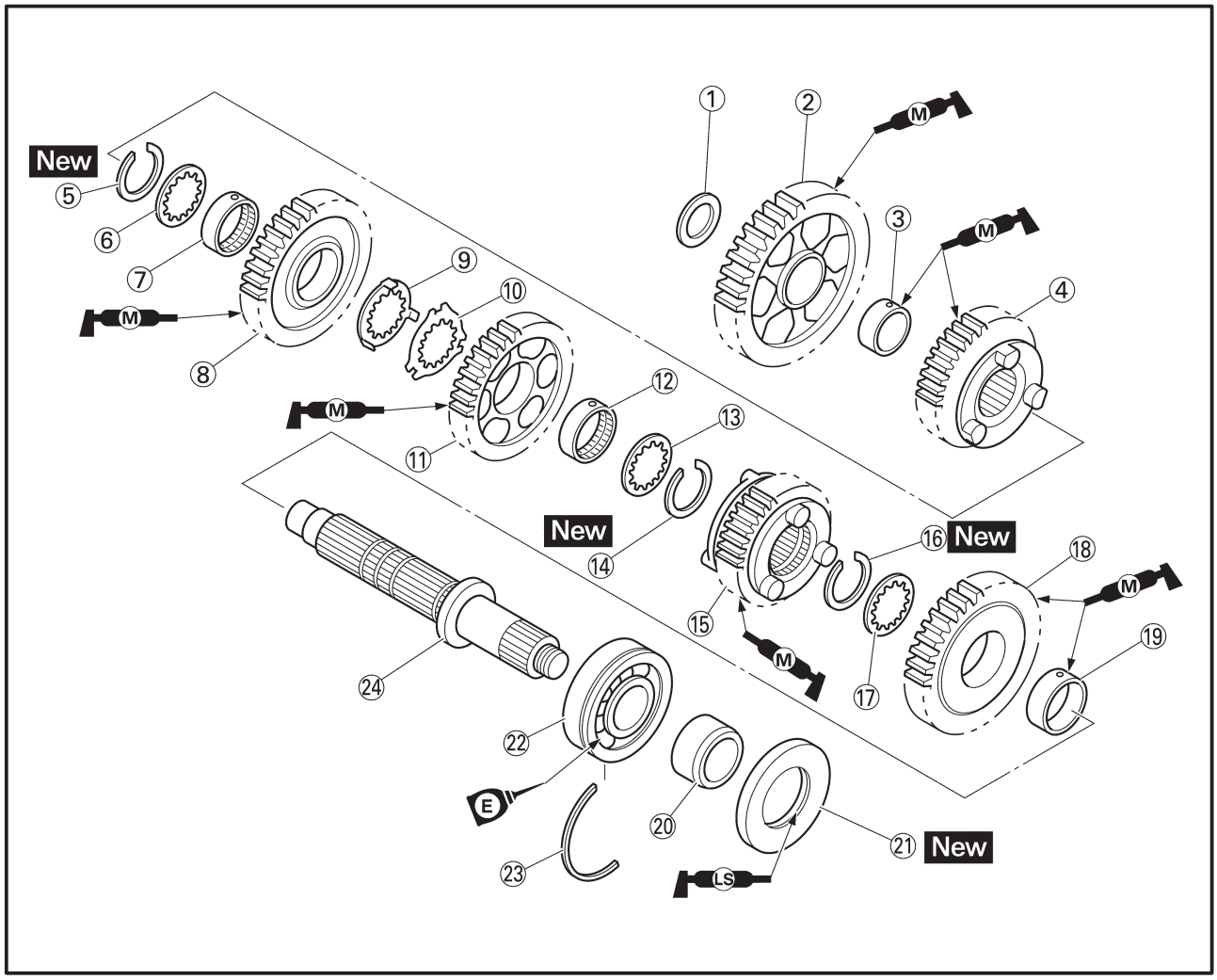
Order	Job/Part	Q'ty	Remarks
	Disassembling the main axle assembly		Disassemble the parts in the order listed.
①	Bearing	1	
②	2nd pinion gear	1	
③	Toothed lock washer	1	
④	Toothed lock washer retainer	1	
⑤	6th pinion gear	1	
⑥	Collar	1	
⑦	Washer	1	
⑧	Circlip	1	
⑨	3rd pinion gear	1	
⑩	Circlip	1	
⑪	Washer	1	
⑫	5th pinion gear	1	
⑬	Collar	1	
⑭	Main axle	1	



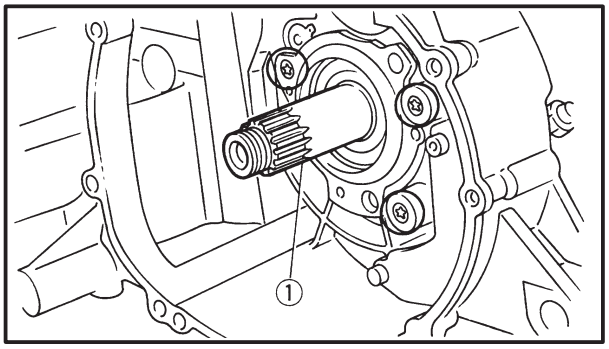
Order	Job/Part	Q'ty	Remarks
⑮	Bearing housing	1	
⑯	Bearing	1	
			For installation, reverse the removal procedure.

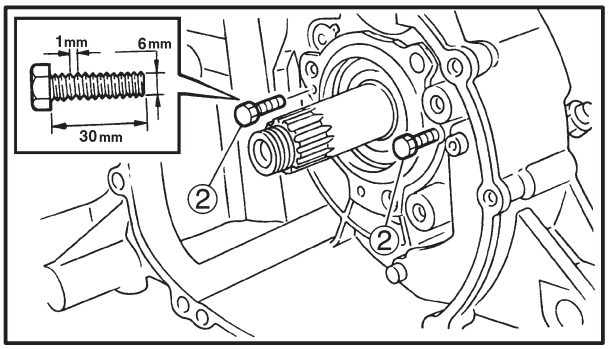


Order	Job/Part	Q'ty	Remarks
	Disassembling the drive axle assembly		Disassemble the parts in the order listed.
①	Washer	1	
②	1st wheel gear	1	
③	Collar	1	
④	5th wheel gear	1	
⑤	Circlip	1	
⑥	Washer	1	
⑦	Collar	1	
⑧	3rd wheel gear	1	
⑨	Toothed lock washer	1	
⑩	Toothed lock washer retainer	1	
⑪	4th wheel gear	1	
⑫	Collar	1	
⑬	Washer	1	
⑭	Circlip	1	



Order	Job/Part	Q'ty	Remarks
⑮	6th wheel gear	1	
⑯	Circlip	1	
⑰	Washer	1	
⑱	2nd wheel gear	1	
⑲	Collar	1	
⑳	Collar	1	
㉑	Oil seal	1	
㉒	Bearing	1	
㉓	Circlip	1	
㉔	Drive axle	1	
			For installation, reverse the removal procedure.





EAS00420

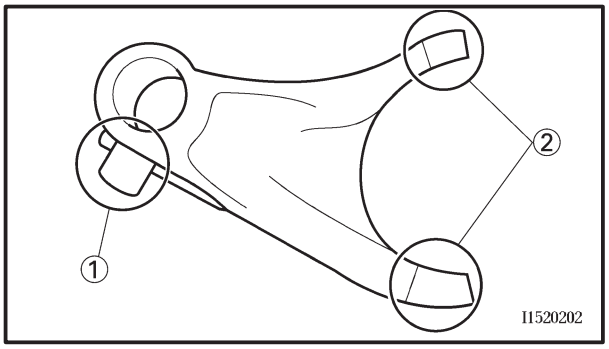
REMOVING THE TRANSMISSION

1. Remove:
   • main axle assembly ①
   (with the Torx® wrench T30)

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Insert two bolts ② of the proper size, as shown in the illustration, into the main axle assembly bearing housing.
b. Tighten the bolts until they contact the crankcase surface.
c. Continue tightening the bolts until the main axle assembly comes free from the upper crankcase.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

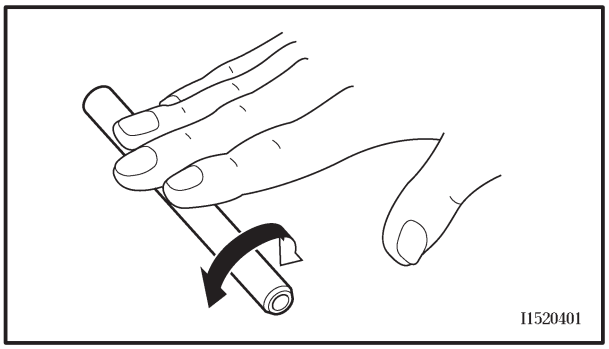


EAS00421

CHECKING THE SHIFT FORKS

The following procedure applies to all of the shift forks.

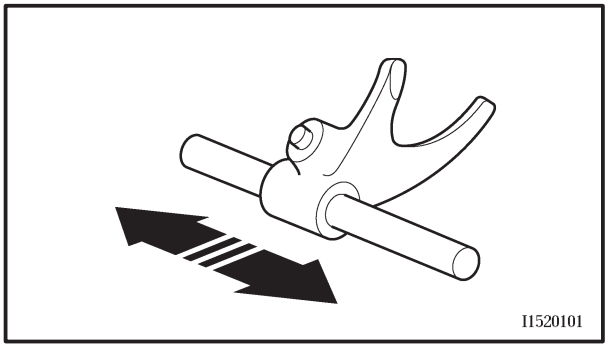
1. Check:
   • shift fork cam follower ①
   • shift fork pawl ②
   Bends/damage/scoring/wear → Replace the shift fork.



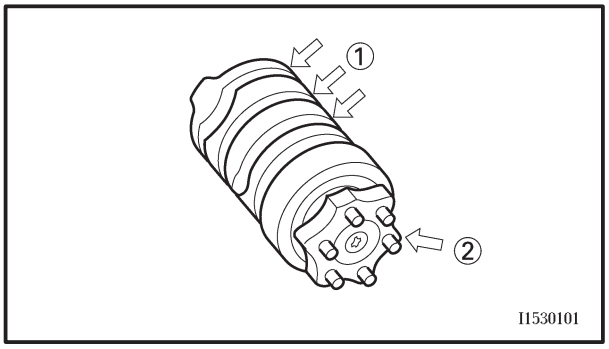
2. Check:
   • shift fork guide bar
   Roll the shift fork guide bar on a flat surface.
   Bends → Replace.

⚠ WARNING

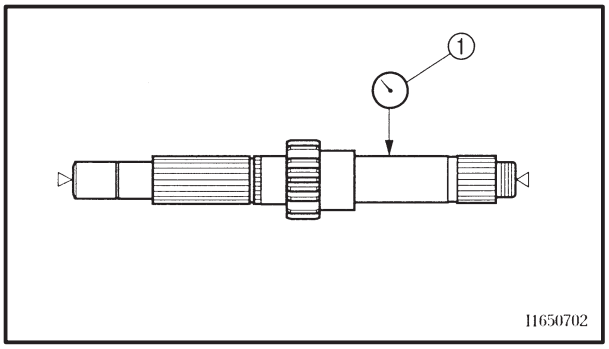
Do not attempt to straighten a bent shift fork guide bar.



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.

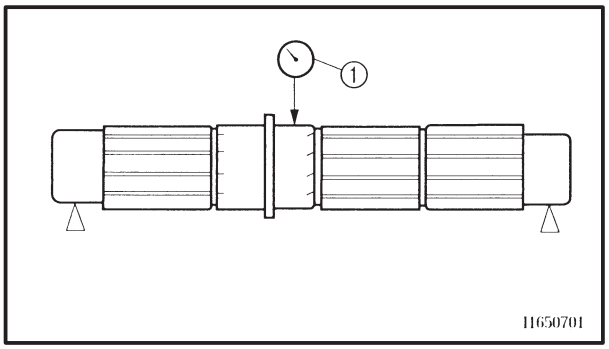


EAS00422
CHECKING THE SHIFT DRUM ASSEMBLY
1. Check:
   - shift drum grooves
     Damage/scratches/wear → Replace the shift drum assembly.
   - shift drum segment ①
     Damage/wear → Replace the shift drum assembly.
   - shift drum bearing ②
     Damage/pitting → Replace the shift drum assembly.



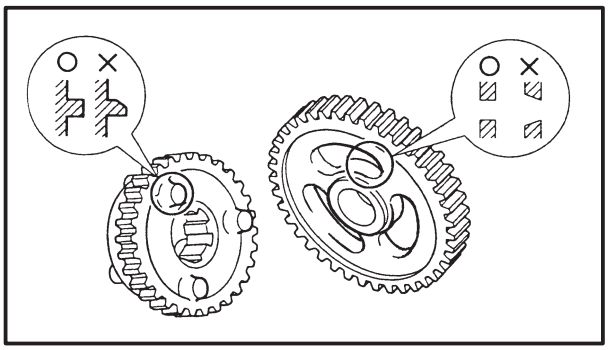
EAS00425
CHECKING THE TRANSMISSION
1. Measure:
   - main axle runout
     (with a centering device and dial gauge ①)
     Out of specification → Replace the main axle.

Main axle runout limit
0.02 mm (0.0008 in)



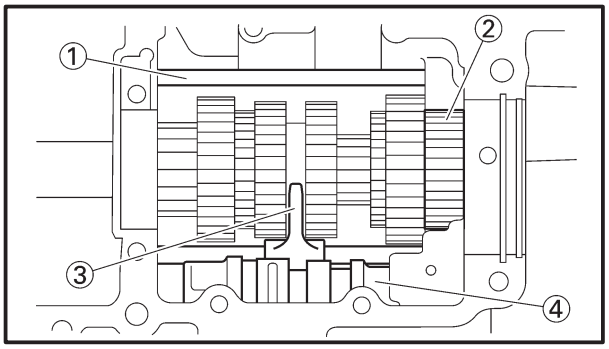
2. Measure:
   - drive axle runout
     (with a centering device and dial gauge ①)
     Out of specification → Replace the drive axle.

Drive axle runout limit
0.02 mm (0.0008 in)



3. Check:
   - transmission gears
     Blue discoloration/pitting/wear → Replace the defective gear(s).
   - transmission gear dogs
     Cracks/damage/rounded edges → Replace the defective gear(s).

4. Check:
   • transmission gear engagement
   (each pinion gear to its respective wheel gear)
   Incorrect → Reassemble the transmission axle assemblies.
5. Check:
   • transmission gear movement
   Rough movement → Replace the defective part(s).
6. Check:
   • circlips
   Bends/damage/looseness → Replace.



EAS00430
INSTALLING THE TRANSMISSION

1. Install:
   • oil pipe ①
   • main axle assembly ②
   (with the Torx® wrench T30)

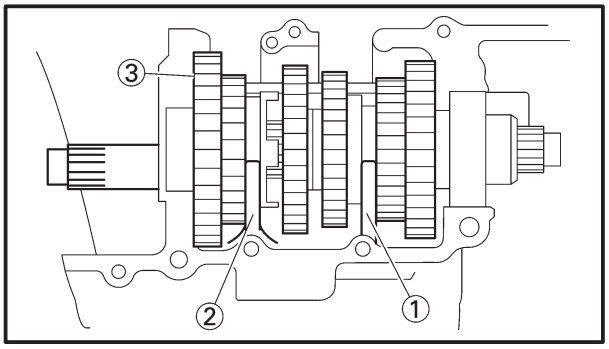
NOTE:

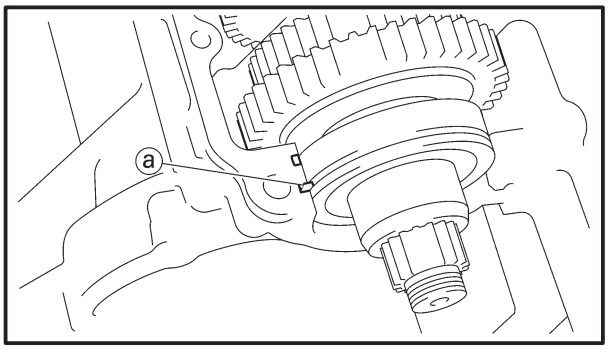
Make sure to caulk the bolts at three positions after installing the bearing housing.

2. Install:
   • shift fork "C" ③
   • shift drum assembly ④
   • shift fork guide bar

NOTE:

- The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: "R", "C", "L".
- Carefully position the shift forks so that they are installed correctly into the transmission gears.
- Install shift fork "C" into the groove in the 3rd and 4th pinion gear on the main axle.





3. Install:
   - shift fork “R” ① and “L” ②
   - drive axle ③
   - shift fork guide bar
   - shift drum retainer

10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

- Install shift fork “L” into the groove in the 6th wheel gear and shift fork “R” into the groove in the 5th wheel gear on the drive axle.
- Make sure that the drive axle bearing circlip ⓐ is inserted into the grooves in the upper crankcase.

4. Check:
   - transmission
     Rough movement → Repair.

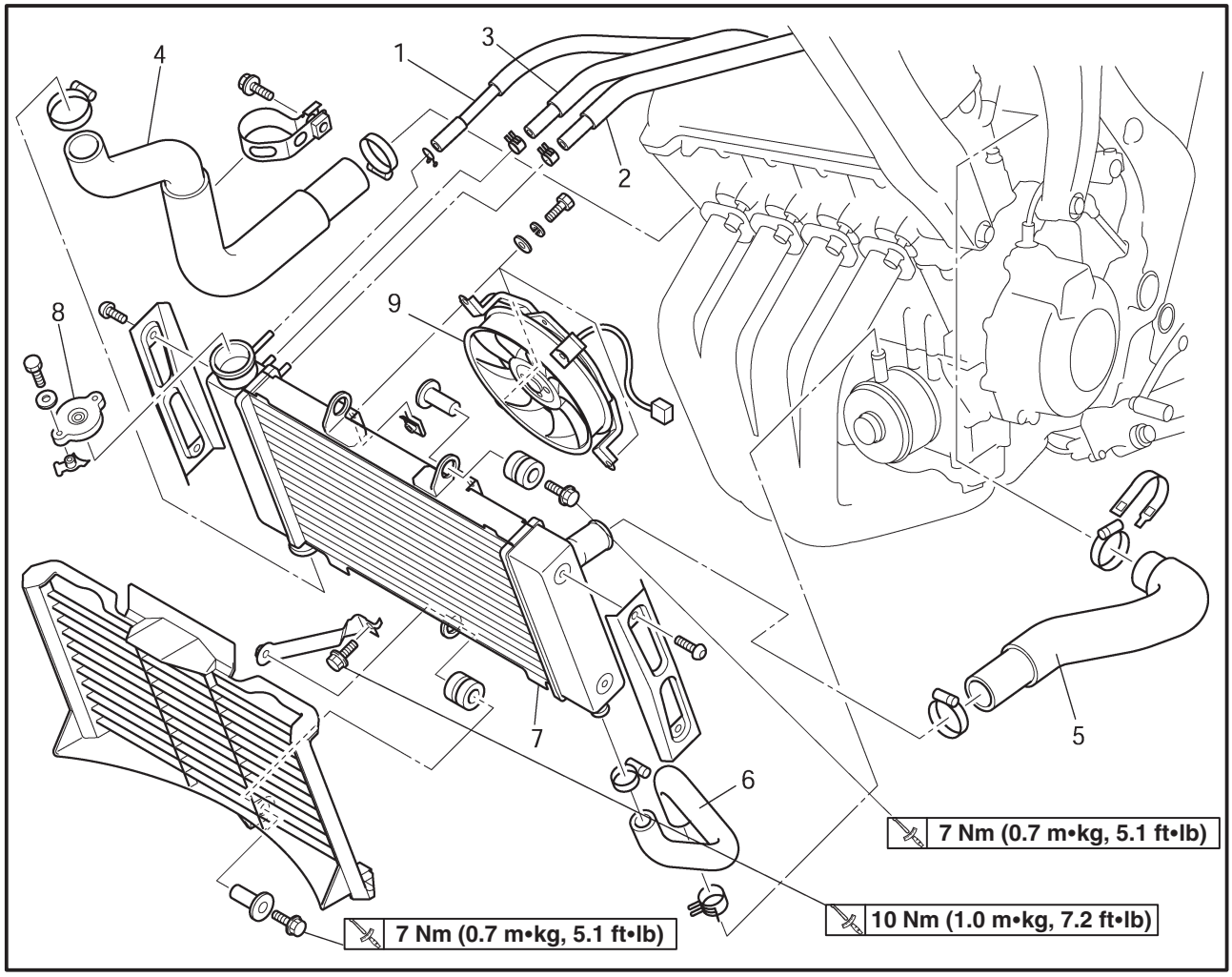
NOTE:

Oil each gear, shaft, and bearing thoroughly.

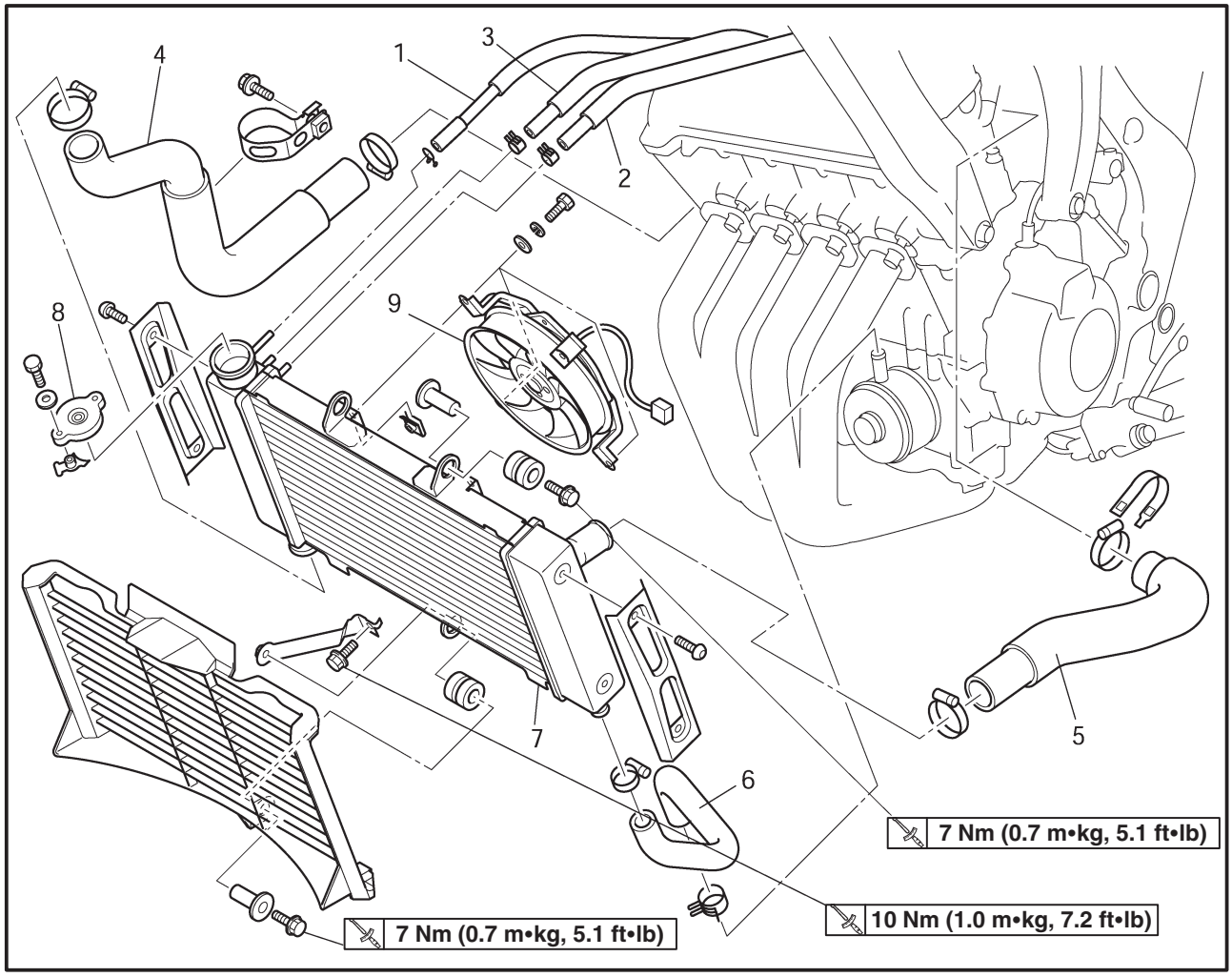
EAS00454

COOLING SYSTEM

RADIATOR

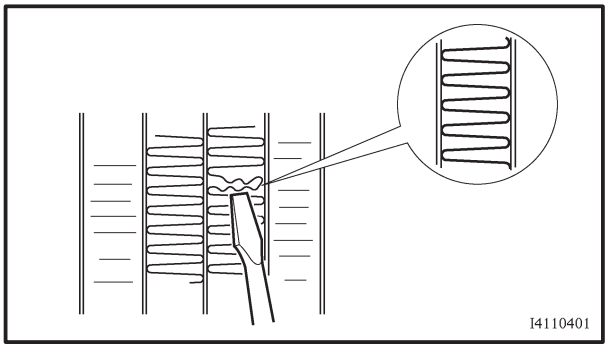


Order	Job/Part	Q'ty	Remarks
	Removing the radiator		Remove the parts in the order listed.
	Seat		Refer to "SEAT" in chapter 3.
	Front cowling inner panel (left and right)		Refer to "COWLINGS"
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Coolant reservoir hose	1	Disconnect.
2	Throttle body hose	1	Disconnect.
3	Water pump breather hose	1	Disconnect.
4	Radiator outlet hose	1	
5	Radiator inlet hose	1	
6	Oil cooler outlet hose	1	
7	Radiator	1	
8	Radiator cap	1	



Order	Job/Part	Q'ty	Remarks
9	Radiator fan	1	For installation, reverse the removal procedure.

6



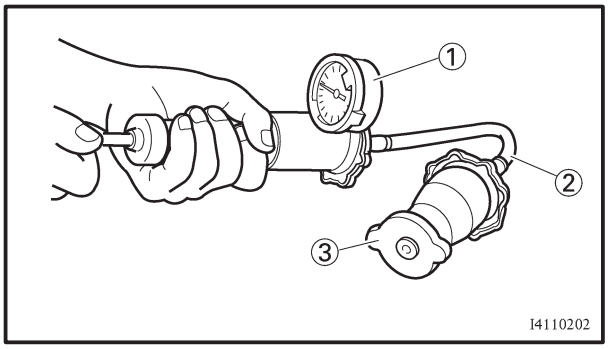
EAS00455
CHECKING THE RADIATOR

1. Check:
   • radiator fins
   Obstruction → Clean.
   Apply compressed air to the rear of the radiator.
   Damage → Repair or replace.

NOTE:

Straighten any flattened fins with a thin, flathead screwdriver.

2. Check:
   • radiator hoses
   • radiator pipes
   Cracks/damage → Replace.



3. Measure:
   • radiator cap opening pressure
   Below the specified pressure → Replace the radiator cap.

Radiator cap opening pressure
93 ~ 123 kPa
(0.93 ~ 1.23 kg/cm², 13.2 ~ 17.5 psi)

a. Install the radiator cap tester ① and radiator cap tester adapter ② to the radiator cap ③.

Radiator cap tester
90890-01325, YU-24460-01
Radiator cap tester adapter
90890-01352, YU-33984

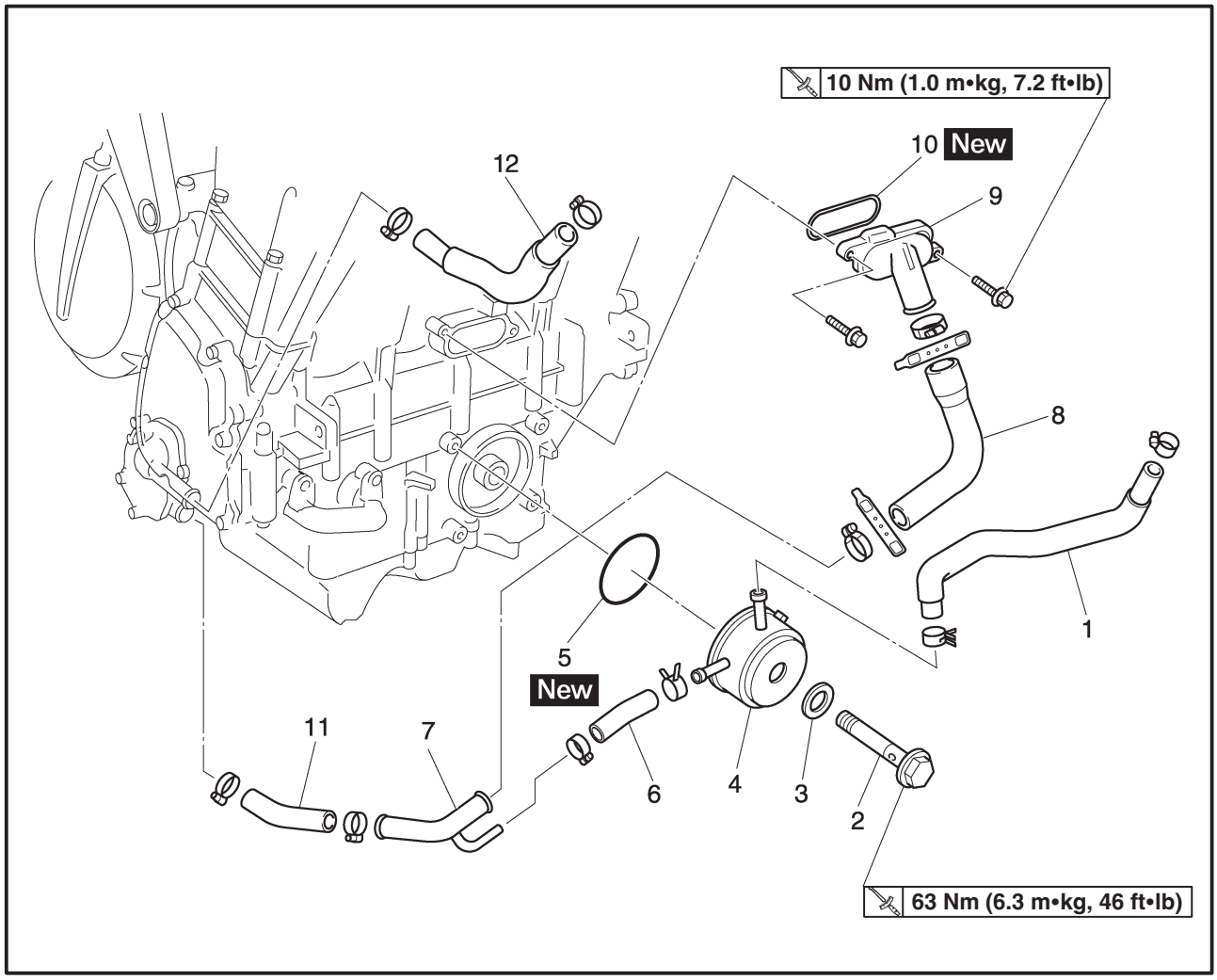
b. Apply the specified pressure for ten seconds and make sure there is no drop in pressure.

4. Check:
   • radiator fan
   Damage → Replace.
   Malfunction → Check and repair.
   Refer to “COOLING SYSTEM” in chapter 8.

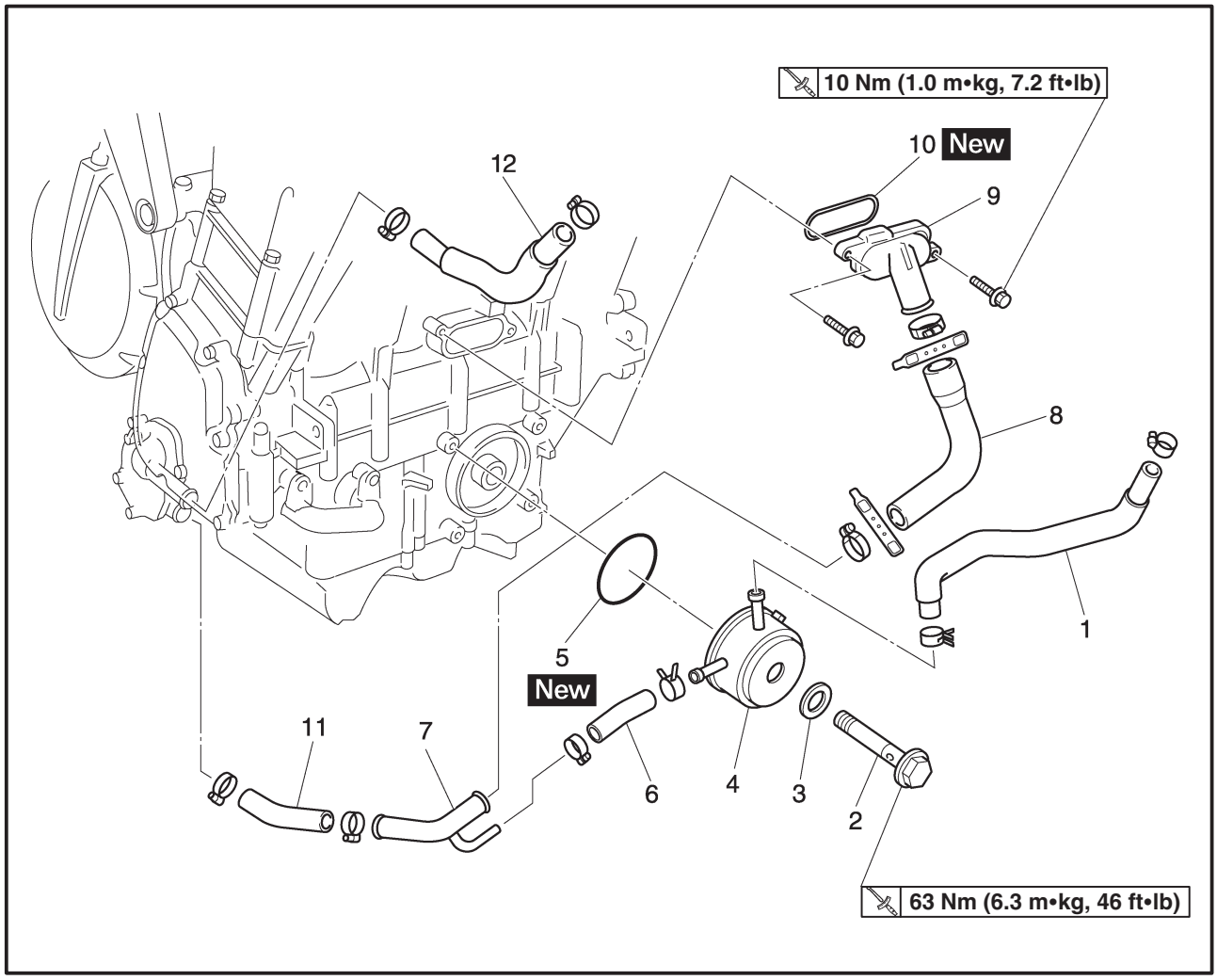
EAS00456
INSTALLING THE RADIATOR

1. Install:
   - radiator
   - coolant hoses
2. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” in chapter 3.
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”.

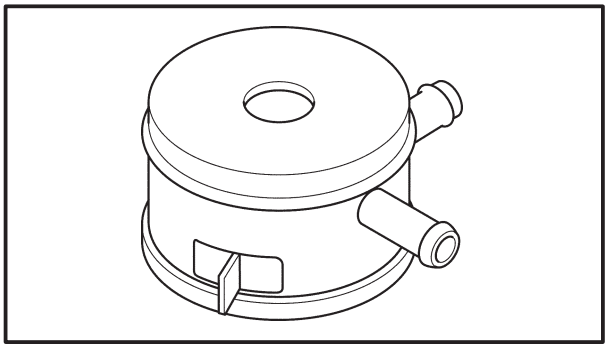
EAS00457
OIL COOLER



Order	Job/Part	Q'ty	Remarks
	Removing the oil cooler Radiator assembly Engine oil		Remove the parts in the order listed. Refer to "RADIATOR". Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Oil cooler outlet hose	1	
2	Union bolt	1	
3	Washer	1	
4	Oil cooler	1	
5	O-ring	1	
6	Oil cooler inlet hose	1	
7	Oil cooler inlet pipe	1	
8	Water jacket joint hose	1	
9	Water jacket joint	1	

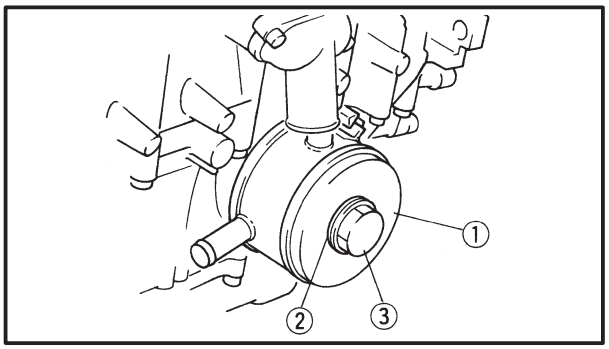


Order	Job/Part	Q'ty	Remarks
10	O-ring	1	
11	Water pump outlet hose	1	
12	Radiator outlet hose	1	
			For installation, reverse the removal procedure.



EAS00458
CHECKING THE OIL COOLER
1. Check:
   - oil cooler
     Cracks/damage → Replace.
2. Check:
   - oil cooler inlet hose
   - oil cooler outlet hose
     Cracks/damage/wear → Replace.

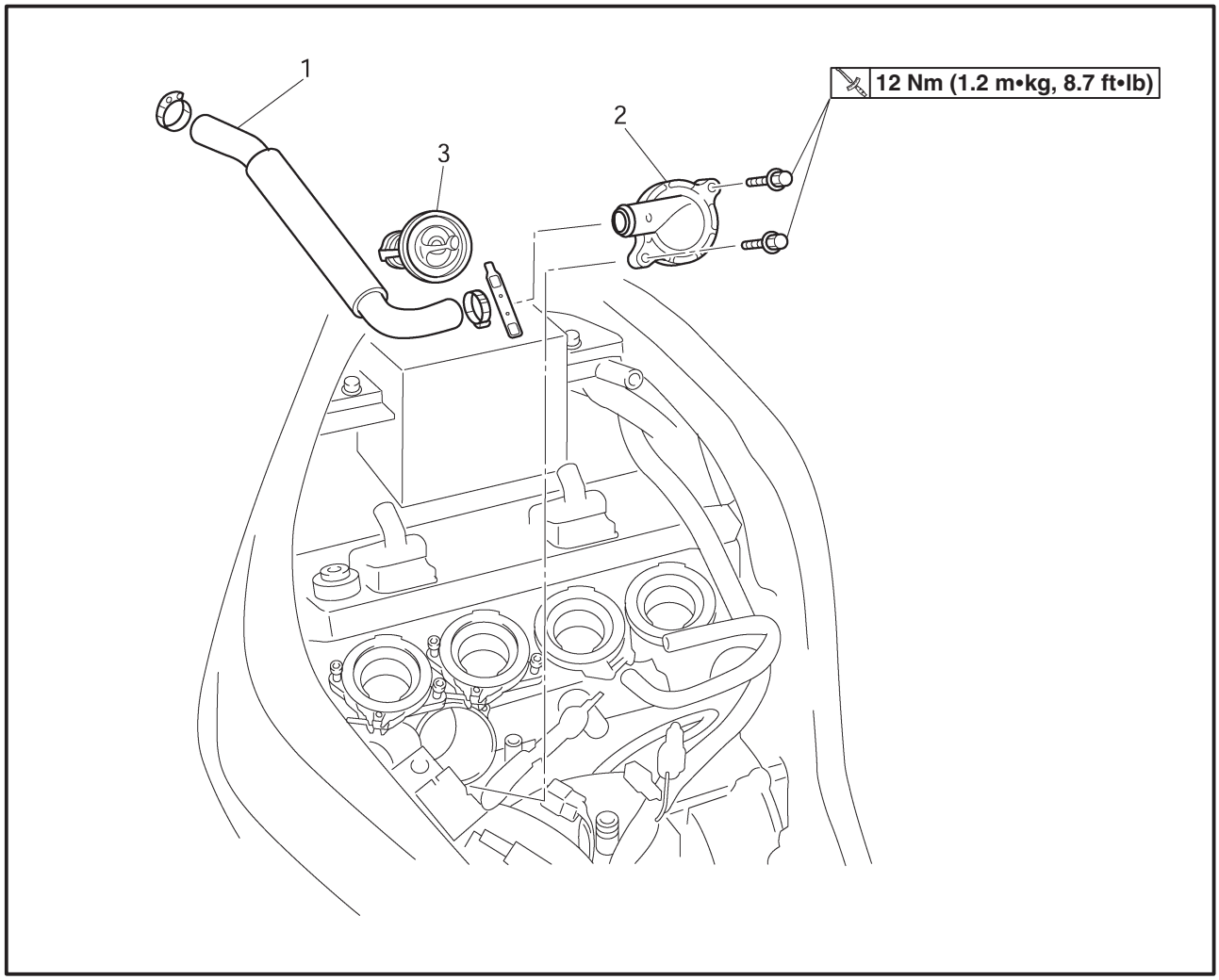
EAS00459
INSTALLING THE OIL COOLER
1. Clean:
   - mating surfaces of the oil cooler and the crankcase
     (with a cloth dampened with lacquer thinner)
2. Install:
   - O-ring New
   - oil cooler ①
   - washer ② New
   - union bolt ③ **63 Nm (6.3 m•kg, 46 ft•lb)**



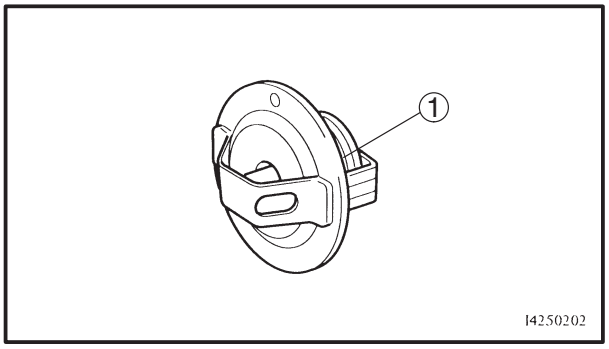
NOTE:
- Before installing the oil cooler, lubricate the union bolt and O-ring with a thin coat of engine oil.
- Make sure the O-ring is positioned properly.

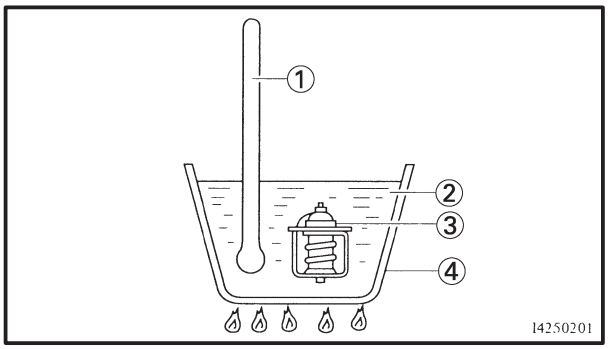
3. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” in chapter 3.
4. Fill:
   - crankcase
     (with the specified amount of the recommended engine oil)
     Refer to “CHANGING THE ENGINE OIL” in chapter 3.
5. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.
6. Measure:
   - radiator cap opening pressure
     Below the specified pressure → Replace the radiator cap.
     Refer to “CHECKING THE RADIATOR”.

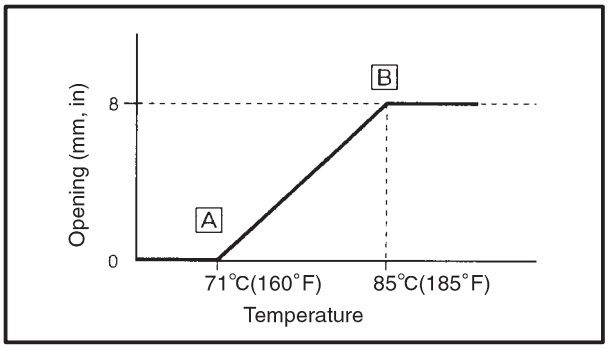
EAS00460
THERMOSTAT

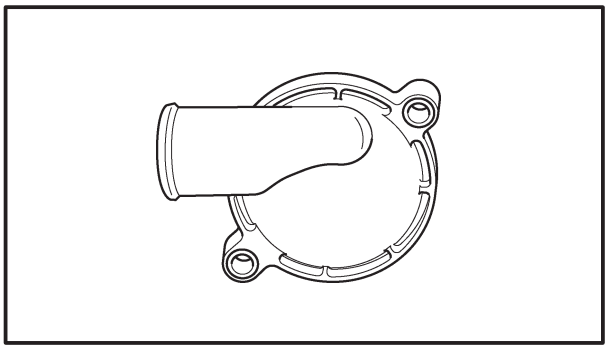


Order	Job/Part	Q'ty	Remarks
	Removing the thermostat		Remove the parts in the order listed.
	Seat		Refer to "SEAT" in chapter 3.
	Front cowling inner panel (left and right)		Refer to "COWLINGS"
	Fuel tank		Refer to "FUEL TANK"
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Throttle body assembly		Refer to "THROTTLE BODIES" in chapter 7.
1	Radiator inlet hose	1	
2	Thermostat cover	1	
3	Thermostat	1	
			For installation, reverse the removal procedure.









EAS00462
CHECKING THE THERMOSTAT

1. Check:
   • thermostat ①
   Does not open at 71 ~ 85°C (160 ~ 185°F)
   → Replace.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Suspend the thermostat in a container filled with water.
b. Slowly heat the water.
c. Place a thermometer in the water.
d. While stirring the water, observe the thermostat and thermometer's indicated temperature.

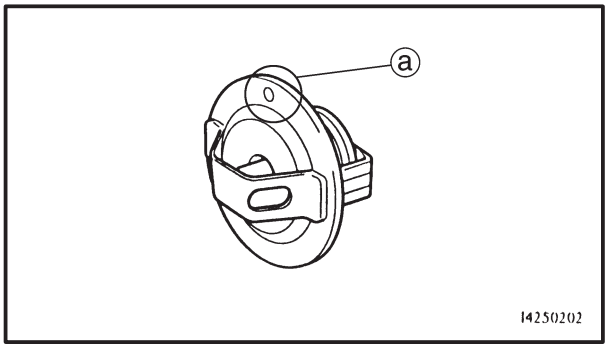
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

① Thermometer
② Water
③ Thermostat
④ Container
A Fully closed
B Fully open

NOTE:

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

2. Check:
   • thermostat cover
   Cracks/damage → Replace.



EAS00466
INSTALLING THE THERMOSTAT

1. Install:
   • thermostat

NOTE:

Install the thermostat with its breather hole ⓐ facing up.

2. Install:
   • thermostat cover

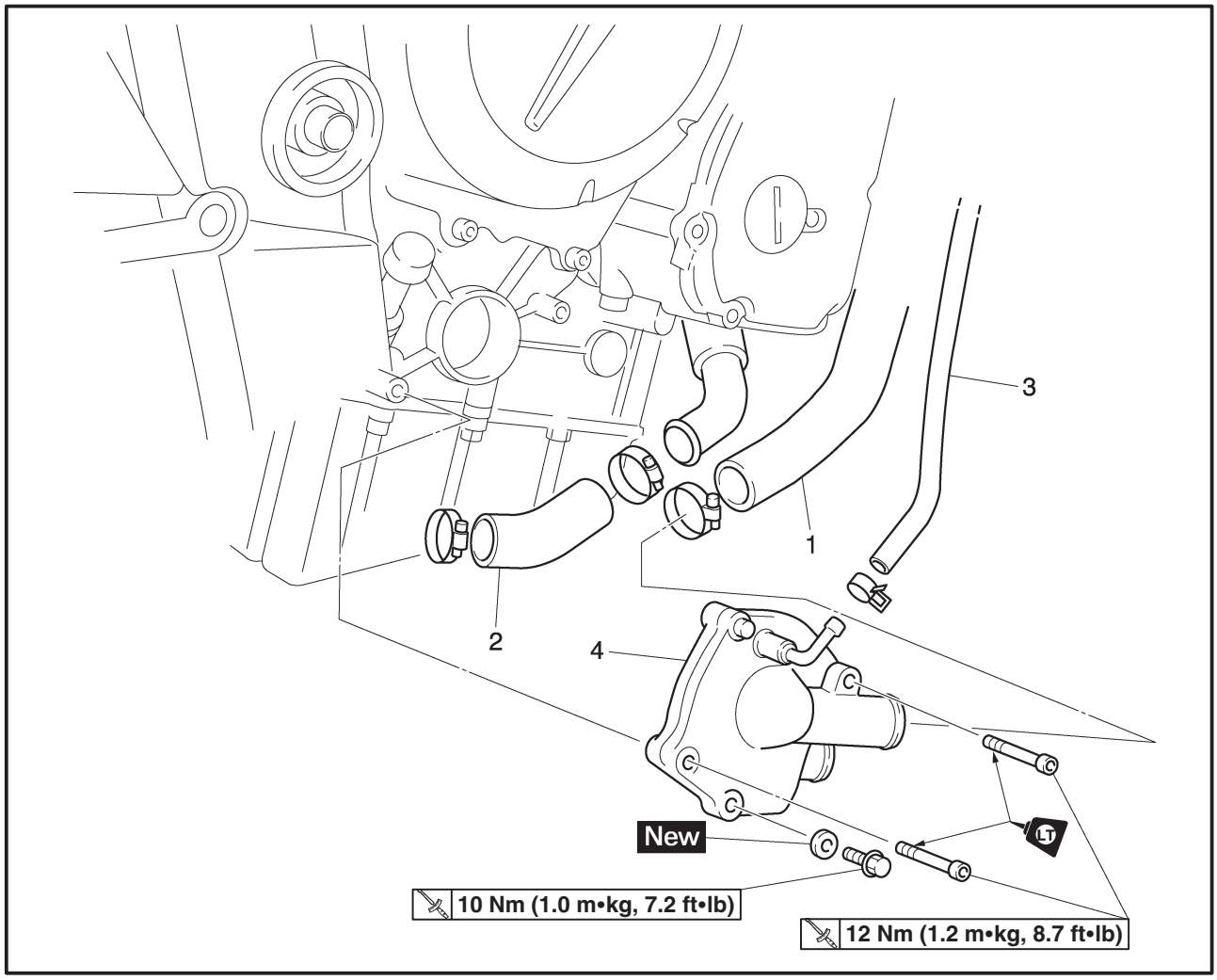
12 Nm (1.2 m•kg, 8.7 ft•lb)

NOTE:

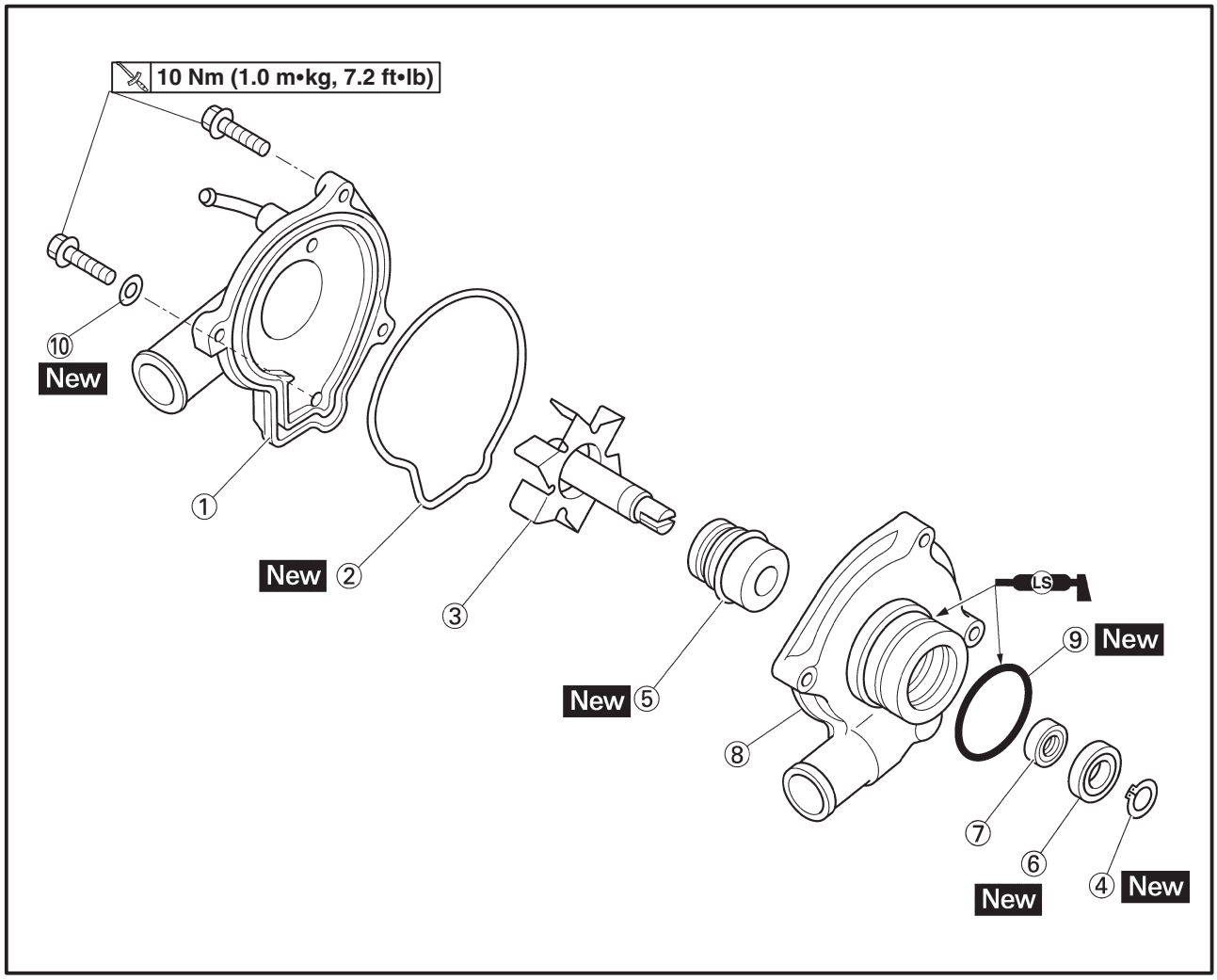
Before installing the thermostat cover to the cylinder head, lubricate the O-ring with a thin coat of lithium soap based grease.

3. Fill:
   • cooling system
   (with the specified amount of the recommended coolant)
   Refer to "CHANGING THE COOLANT" in chapter 3.
4. Check:
   • cooling system
   Leaks → Repair or replace any faulty part.
5. Measure:
   • radiator cap opening pressure
   Below the specified pressure → Replace the radiator cap.
   Refer to "CHECKING THE RADIATOR".

EAS00468
WATER PUMP



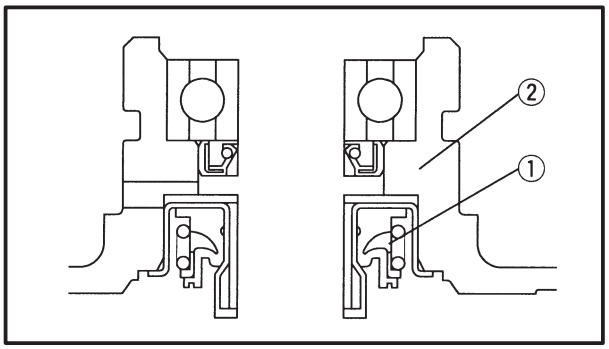
Order	Job/Part	Q'ty	Remarks
	Removing the water pump		Remove the parts in the order listed. **NOTE:** It is not necessary to remove the water pump unless the coolant level is extremely low or the coolant contains engine oil.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
1	Radiator outlet hose	1	Disconnect.
2	Water pump outlet hose	1	
3	Water pump breather hose	1	Disconnect.
4	Water pump	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Disassembling the water pump		Disassemble the parts in the order listed.
①	Water pump cover	1	
②	O-ring	1	
③	Impeller shaft	1	
④	Circlip	1	
⑤	Water pump seal	1	
⑥	Oil seal	1	
⑦	Bearing	1	
⑧	Water pump housing	1	
⑨	O-ring	1	
⑩	Copper washer	1	
			For assembly, reverse the disassembly procedure.

EAS00471
DISASSEMBLING THE WATER PUMP

1. Remove:
   - water pump cover
   - O-ring
   - circlip
   - impeller shaft

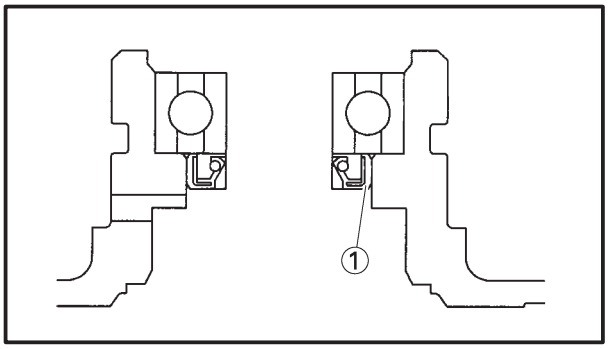


2. Remove:
   - water pump seal ①

NOTE:

Remove the water pump seal from the outside of the water pump housing.

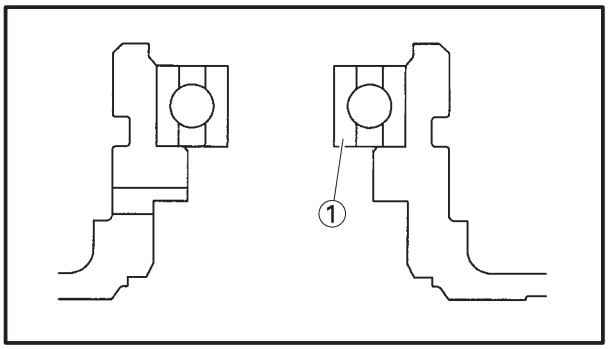
② Water pump housing



3. Remove:
   - oil seal ①
     (with a thin, flat-head screwdriver)

NOTE:

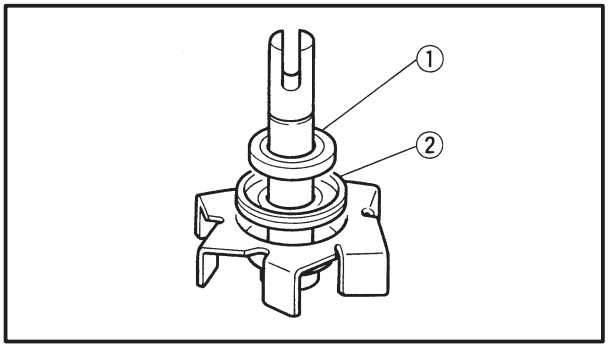
Remove the oil seal from the outside of the water pump housing.



4. Remove:
   - bearing ①

NOTE:

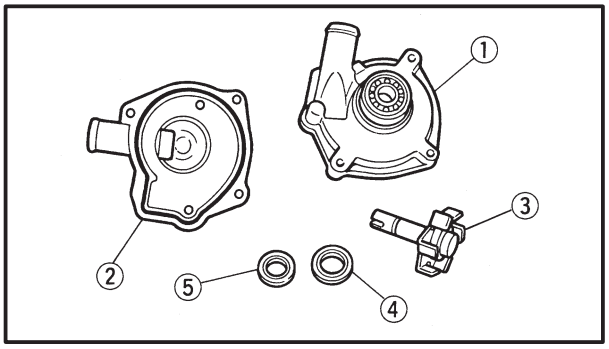
Remove the bearing from inside of the water pump housing.



5. Remove:
   - rubber damper holder ①
   - rubber damper ②
     (from the impeller, with a thin, flat-head screwdriver)

NOTE:

Do not scratch the impeller shaft.

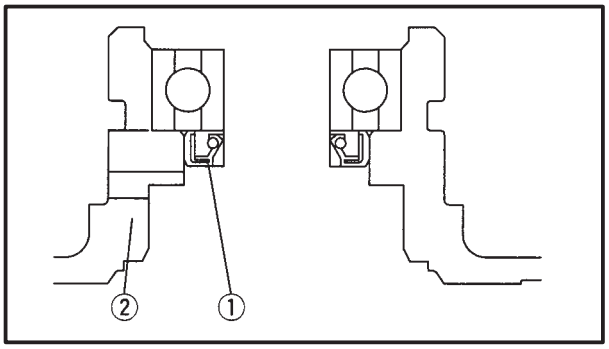


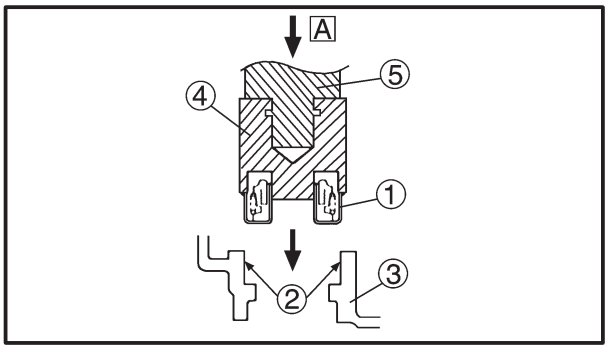
EAS00473
CHECKING THE WATER PUMP
1. Check:
   - water pump housing ①
   - water pump cover ②
   - impeller ③
   - rubber damper ④
   - rubber damper holder ⑤
   - water pump seals
   - oil seal

   Cracks/damage/wear → Replace.
2. Check:
   - bearing

   Rough movement → Replace.
3. Check:
   - water pump outlet hose
   - radiator outlet hose

   Cracks/damage/wear → Replace.





EAS00475
ASSEMBLING THE WATER PUMP
1. Install:
   - bearing
   - oil seal New ①

   (into the water pump housing ②)

NOTE:
- Before installing the oil seal, apply tap water or coolant onto its out surface.
- Install the oil seal with a socket that matches its outside diameter.

2. Install:
   - water pump seal New ①

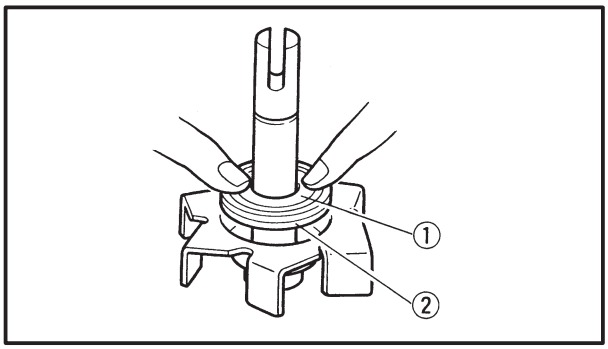
CAUTION:

Never lubricate the water pump seal surface with oil or grease.

NOTE:
- Install the water pump seal with the special tools.
- Before installing the water pump seal, apply Yamaha bond No.1215 or Quick Gasket ② to the water pump housing ③.

Mechanical seal installer
90890-04078, YM-33221 ④
Middle driven shaft bearing driver
90890-04058, YM-04058 ⑤
Quick Gasket
ACC-11001-05-01
Yamaha bond #1215
90890-85505

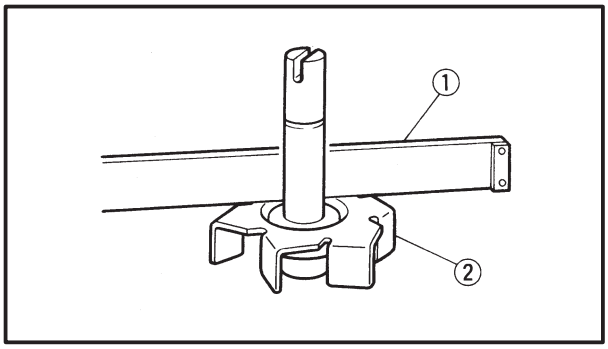
A Push down.



3. Install:
   - rubber damper New ①
   - rubber damper holder New ②

NOTE:

Before installing the rubber damper, apply tap water or coolant onto its outer surface.



4. Measure:
   - impeller shaft tilt
     Out of specification → Repeat steps (3) and (4).

CAUTION:

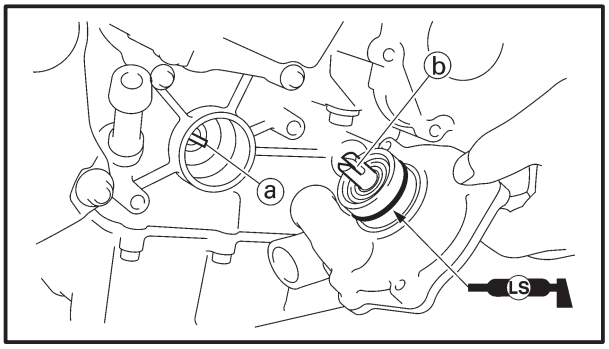
Make sure the rubber damper and rubber damper holder are flush with the impeller.

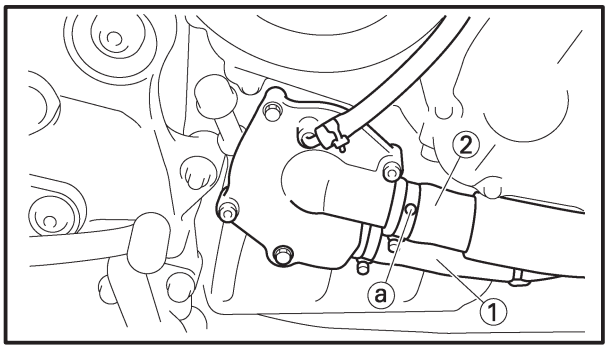
Impeller shaft tilt limit
0.15 mm (0.006 in)

① Straightedge
② Impeller

5. Install:
   - impeller shaft
   - circlip New
   - O-ring New
   - water pump cover

10 Nm (1.0 m•kg, 7.2 ft•lb)





INSTALLING THE WATER PUMP

1. Install:
   - O-ring New
   - copper washer New
   - water pump assembly

   10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

Align the projection ⓐ at the oil pump shaft and water pump shaft groove ⓑ.

2. Install:
   - water pump outlet hose ①
   - radiator outlet hose ②

NOTE:

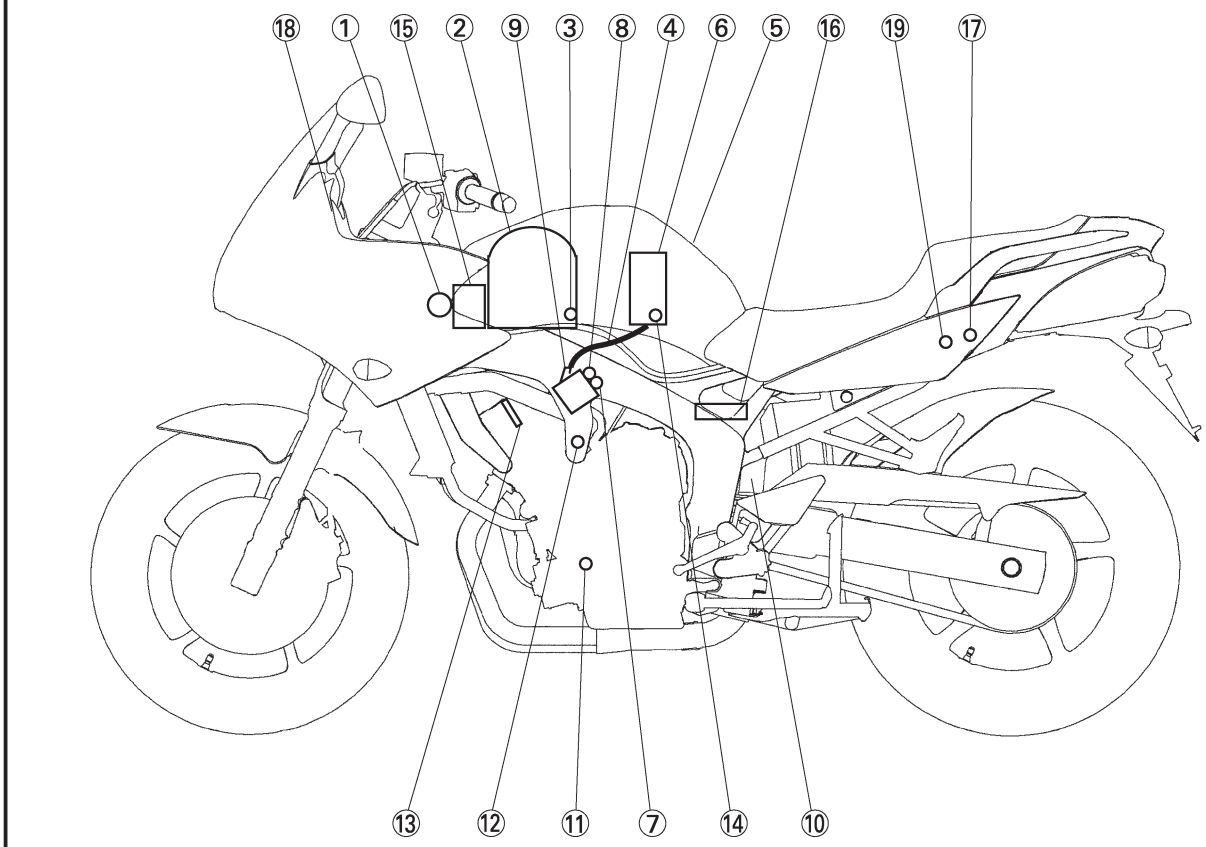
- Install the radiator outlet hose with white ⓐ mark positioned outside.
- Install the hose clamp with its screw head pointed to the inner side.

3. Fill:
   - cooling system
     (with the specified amount of the recommended coolant)
     Refer to “CHANGING THE COOLANT” in chapter 3.
4. Check:
   - cooling system
     Leaks → Repair or replace any faulty part.
5. Measure:
   - radiator cap opening pressure
     Below the specified pressure !I! Replace the radiator cap.
     Refer to “CHECKING THE RADIATOR”.

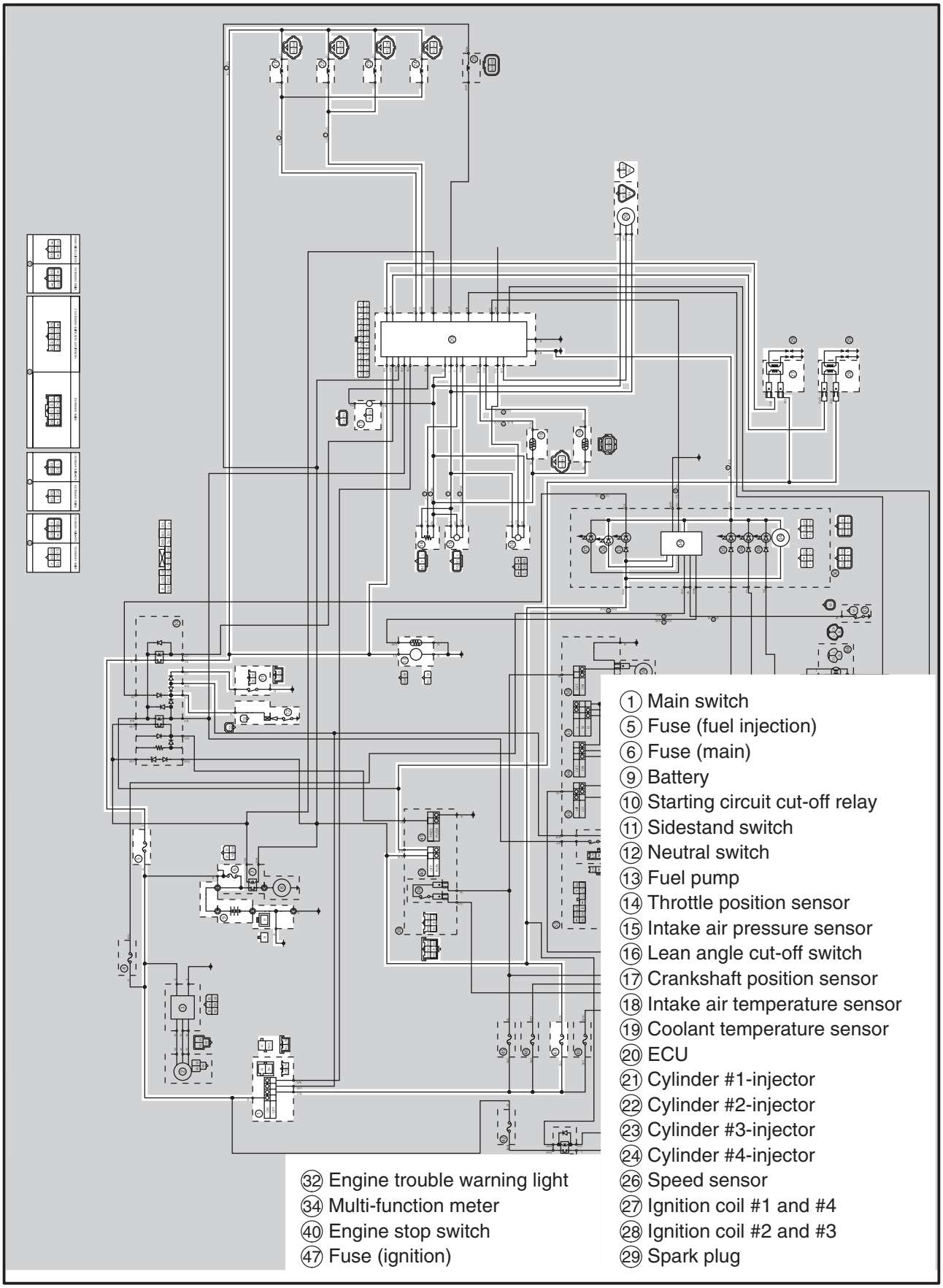
FUEL INJECTION SYSTEM

FUEL INJECTION SYSTEM

① Ignition coil
② Air filter case
③ Intake air temperature sensor
④ Fuel delivery hose
⑤ Fuel tank
⑥ Fuel pump
⑦ Intake air pressure sensor
⑧ Throttle position sensor
⑨ Fuel injector
⑩ Catalytic converter
⑪ Crankshaft position sensor
⑫ Coolant temperature sensor
⑬ Spark plug
⑭ Pressure regulator
⑮ Battery
⑯ ECU
⑰ Fuel injection system relay
⑱ Engine trouble warning light
⑲ Lean angle cut-off switch



WIRING DIAGRAM



7

EAS00899

ECU'S SELF-DIAGNOSTIC FUNCTION

The ECU is equipped with a self-diagnostic function in order to ensure that the engine control 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, this mode provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminating an engine trouble warning light.
- After the engine has been stopped, the lowest fault code number appears on the LCD meter. Once a fault code has been displayed, it remains stored in the memory of the ECU until it is deleted.

EAS00900

Engine trouble warning light indication and FI system operating condition

Warning light indication	ECU's operation	FI operation	Vehicle operation
Flashing*	Warning provided when unable to start engine	Operation stopped	Unable
Remains ON	Malfunction detected	Operated with substitute characteristics in accordance with the description of the malfunction	Able/Unable depending on the self-diagnostic 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

19: Sidestand switch (open circuit in wire to ECU)

30: Lean angle cut-off switch (latch up detected)

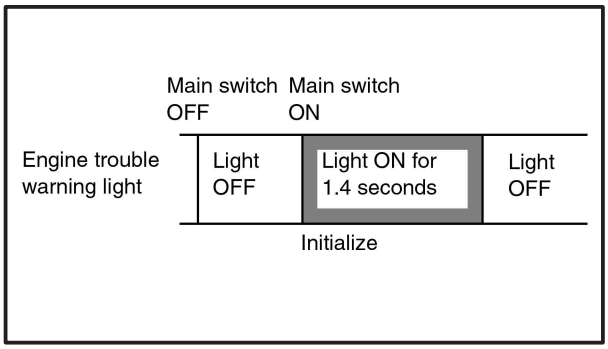
41: Lean angle cut-off switch (open or short circuit)

50: ECU internal malfunction (memory check error)

EAS00901

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 "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.



EAS00902

ALTERNATE INSTRUCTIONS OPERATION CONTROL (FAIL-SAFE ACTION)

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.

FAIL-SAFE ACTIONS TABLE

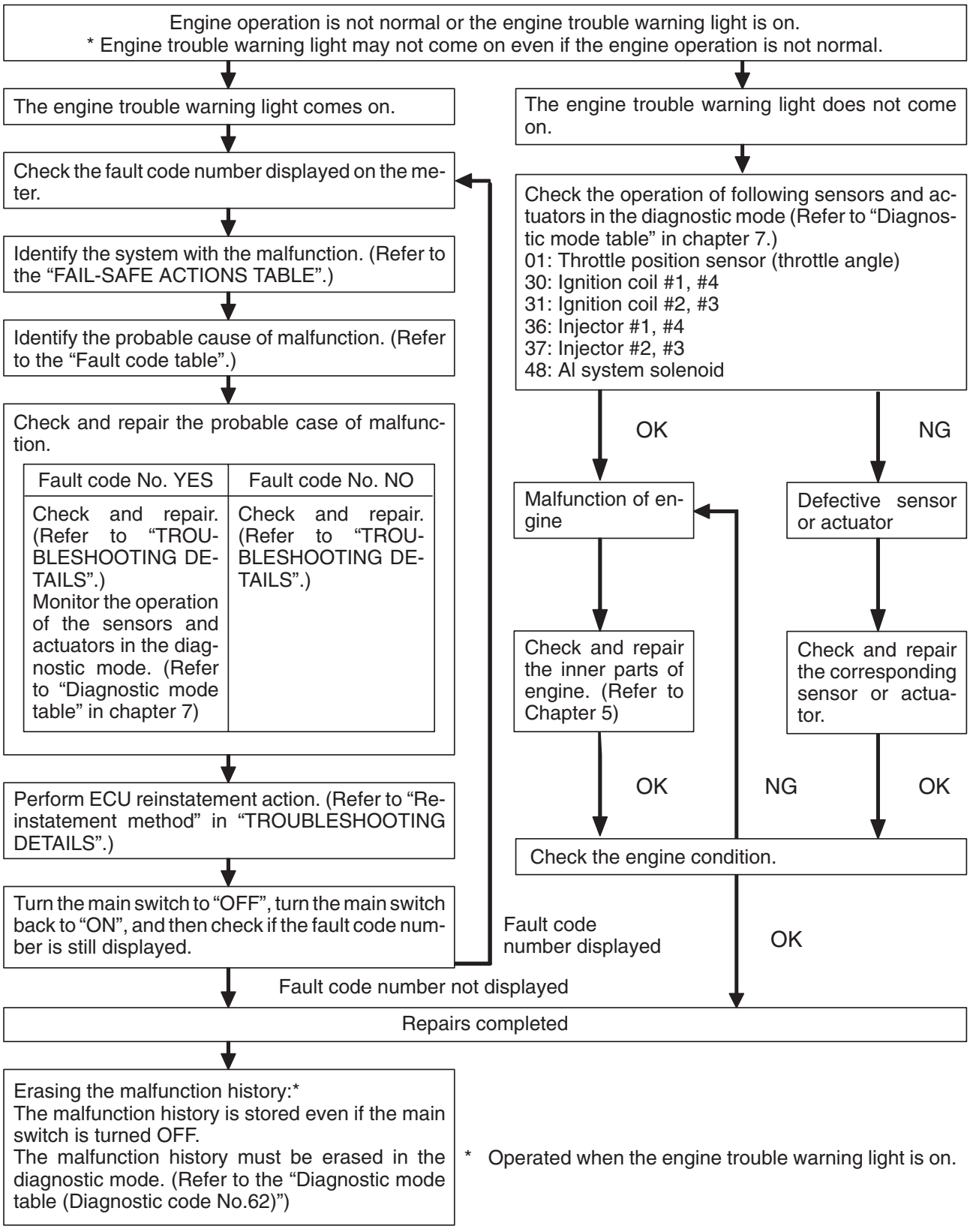
Fault Code No.	Item	Symptom	Fail-safe action	Engine startability	Vehicle drivability
12	Crankshaft position sensor	No normal signals are received from the crankshaft position sensor.	• Stops the engine (by stopping the injection and ignition).	Unable	Unable
13 14	Intake air pressure sensor (open or short circuit) (pipe system)	Intake air pressure sensor-open or short circuit detected. Faulty intake air pressure sensor pipe system.	• Fixes the intake air pressure to 101.3 kpa.	Able	Able
15 16	Throttle position sensor (open or short circuit) (stuck)	Throttle position sensor-open or short circuit detected. A stuck throttle position sensor is detected.	• Fixes the throttle position sensor to fully open.	Able	Able
19	Sidestand switch (open circuit in wire to ECU)	Open circuit in the input line of ECU No.4 terminal is detected when the start switch is pressed.	-- (No start)	Unable	Unable
21	Coolant temperature sensor	Coolant temperature sensor-open or short circuit detected.	• Fixes the coolant temperature to 60°C.	Able	Able
22	Intake temperature sensor	Intake temperature sensor-open or short circuit detected.	• Fixes the intake temperature to 20°C.	Able	Able
33	Faulty ignition	Open circuit detected in the primary lead of the ignition coil. (#1, #4)	• Cut the injection of other cylinder in the same group with the cylinder that the error is detected. (Example: when the #1 cylinder is defective cut the injection of #1 and #4 cylinders) • Turn on the power to the air induction solenoid to always cut-off the air.	Able (depending on the number of faulty cylinders)	Able (depending on the number of faulty cylinders)
34		Open circuit detected in the primary lead of the ignition coil. (#2, #3)			
30 41	Lean angle cut-off switch (latch up detected) (open or short circuit)	The motorcycle has over turned. Lean angle cut-off switch-open or short circuit detected.	• Turns OFF the fuel injection system relay of the fuel system.	Unable	Unable
42	Speed sensor, neutral switch	No normal signals are received from the speed sensor; or, an open or short circuit is detected in the neutral switch.	• Fixes the gear to the top gear.	Able	Able
43	Fuel system voltage (monitor voltage)	Supply power to the injector and fuel pump is not normal.	• Fixes the battery voltage to 12 V.	Depending on the malfunction case.	Depending on the malfunction case.
44	Error in writing the amount of CO adjustment on EEPROM	An error is detected while reading or writing on EEPROM (CO adjustment value).	--	Able	Able
46	Vehicle system power supply (Monitor voltage)	Power supply to the FI system not normal	--	Able	Able
50	ECU internal malfunction (memory check error)	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the meter.	• Shut down all functions except the communication with the meter.	Unable	Unable
—	Start unable warning	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, 43 or 50.	Engine trouble warning light flashes when the start switch is turned ON.	Unable	Unable

Communication error with the meter

Er-1	ECU internal malfunction (output signal error)	No signals are received from the ECU.	–	Unable	Unable
Er-2	ECU internal malfunction (output signal error)	No signals are received from the ECU within the specified duration.	–	Unable	Unable
Er-3	ECU internal malfunction (output signal error)	Data from the ECU cannot be received correctly.	–	Unable	Unable
Er-4	ECU internal malfunction (input signal error)	Non-registered data has been received from the meter.	–	Unable	Unable

EAS00904

TROUBLESHOOTING CHART

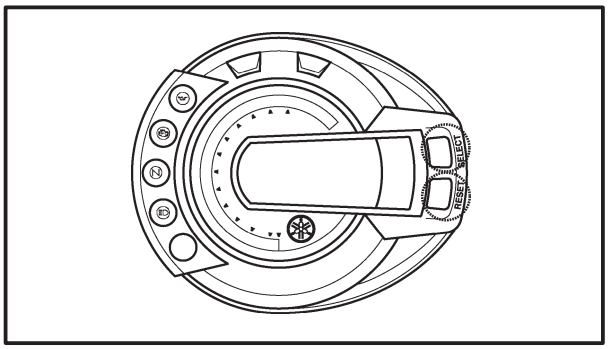


* Operated when the engine trouble warning light is on.

EAS00905

DIAGNOSTIC MODE

It is possible to monitor the sensor output data or check the activation of actuators without connecting the measurement equipment by simply switching the meter indication from the normal mode to the diagnostic monitoring mode.



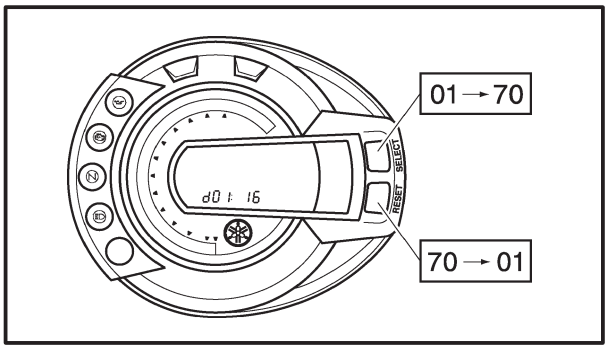
Setting the diagnostic mode

1. Turn the main switch to “OFF” and set the engine stop switch to “OFF”.
2. Disconnect the wire harness coupler from the fuel pump.
3. Simultaneously press and hold the “SELECT” and “RESET” 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 LCD meter.

4. Press the “SELECT” 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. Select the diagnostic code number that applies to the item that was verified with the fault code number by pressing the “SELECT” and “RESET” buttons.



NOTE:

- The diagnostic code number appears on the LCD meter (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 numbers.

7. 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.
   * If the engine stop switch is set to “ON”, set it to “OFF”, and then set it to “ON” again.
8. Turn the main switch to “OFF” to cancel the the diagnostic mode.

NOTE:

To perform a reliable diagnosis, make sure to turn “OFF” the power supply before every check and then start right from the beginning.

Fault code table

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code
12	No normal signals are received from the crankshaft position sensor.	• Open or short circuit in wiring 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.	• Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective intake air pressure sensor. • Malfunction in ECU.	03
14	Faulty intake air pressure sensor pipe system • detected hose • clogged hose	• Intake air pressure sensor hose is detached, clogged, kinked, or pinched. • Malfunction in ECU.	03
15	Throttle position sensor-open or short circuit detected.	• Open or short circuit in wiring sub lead. • Open or short circuit in wiring harness. • Defective throttle position sensor. • Malfunction in ECU. • Improperly installed throttle position sensor.	01
16	A stuck throttle position sensor is detected.	• Stuck throttle position sensor. • Malfunction in ECU.	01
19	Open circuit in the input line of ECU No4 terminal is detected when the start switch is pressed.	• Open circuit in wiring harness (ECU coupler). • Malfunction in ECU.	20
21	Coolant temperature sensor-open or short circuit detected.	• Open or short circuit in wiring harness. • Defective coolant temperature sensor. • Malfunction in ECU. • Improperly installed sensor.	06
22	Intake air temperature sensor-open or short circuit detected.	• Open or short circuit in wiring harness. • Defective intake temperature sensor. • Malfunction in ECU. • Improperly installed sensor.	05
30	The motorcycle has overturned.	• Overturned. • Malfunction in ECU.	08
33	Open circuit is detected in the primary lead of the ignition coil (#1, #4).	• Open circuit in wiring harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	30
34	Open circuit is detected in the primary lead of the ignition coil (#2, #3).	• Open circuit in wiring harness. • Malfunction in ignition coil. • Malfunction in ECU. • Malfunction in a component of ignition cut-off circuit system.	31
41	Lean angle cut-off switch-open or short circuit detected.	• Open or short circuit in wiring harness. • Defective lean angle cut-off switch. • Malfunction in ECU.	08
42	No normal signals are received from the speed sensor; or, an open or short circuit is detected in the neutral switch.	• Open or short circuit in wiring harness. • Defective speed sensor. • Malfunction in vehicle speed sensor detected unit. • Defective neutral switch. • Malfunction in the engine side of the neutral switch. • Malfunction in ECU.	07 21
43	Supply power to the injector and fuel pump is not normal	• Open circuit in wiring harness. (red/blue line or blue/yellow line) • Malfunction in ECU.	09
44	An error is detected while reading or writing on EEPROM.	• Malfunction in ECU. (The CO adjustment value is not properly written on or read from the internal memory).	60
46	Power supply to the FI system is not normal.	• Malfunction in “CHARGING SYSTEM”.	—

Fault code No.	Symptom	Probable cause of malfunction	Diagnostic code
50	Faulty ECU memory. When this malfunction is detected, the code number might not appear on the meter.	• Malfunction in ECU. (The program and data are not properly written on or read from the internal memory.)	—
Er-1	No signals are received from the ECU.	• Open or short circuit in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-2	No signals are received from the ECU within the specified duration.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-3	Data from the ECU cannot be received correctly.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—
Er-4	Non-registered data has been received from the meter.	• Improper connection in wiring sub lead. • Malfunction in meter. • Malfunction in ECU.	—

EAS00907

Diagnostic mode table

Switch the meter display from the regular mode to the diagnostic mode. To switch the display, refer to "DIAGNOSTIC MODE".

NOTE:

- Check the intake air temperature and coolant temperature as close as possible to the intake air temperature sensor and the coolant temperature sensor respectively.
- If it is not possible to check the intake air temperature, use the ambient temperature as reference.

Diagnostic code	Item	Description of action	Data displayed on meter (reference value)
01	Throttle angle	Displays the throttle angle. • Check with throttle fully closed. • Check with throttle fully open.	0 ~ 125 degrees • Fully closed position (15 ~ 17) • Fully open position (97 ~ 100)
03	Intake air pressure	Displays the intake air pressure. Engine stop switch is on. * Generate the pressure difference by cranking the engine with the starter, without actually starting the engine.	• Not cranking-atmospheric pressure • Cranking-intake air pressure It changes at the value whitch is smaller than in the atomospheric pressure.
05	Intake air temperature	Displays the intake air temperature. * Check the temperature in the air cleaner case.	Compare it to the value displayed on the meter.
06	Coolant temperature	Displays the coolant temperature. * Check the temperature of the coolant.	Compare it to the value displayed on the meter.
07	Vehicle speed pulse	Displays the accumulation of the vehicle pulses that are generated when the tire is spun.	(0 ~ 999; resets to 0 after 999) OK if the numbers appear on the meter.
08	Lean angle cut-off switch	Displays the lean angle cut-off switch values.	Upright: 0.4 ~ 1.4 V Overturned: 3.7 ~ 4.4 V
09	Fuel system voltage (battery voltage)	Displays the fuel system voltage (battery voltage). Engine stop switch is on.	0 ~ 18.7 V Normally, approximately 12.0 V
20	Sidestand switch	Displays that the switch is ON or OFF. (When the gear is in a position other than neutral.)	Stand retracted: ON Stand extended: OFF
21	Neutral switch	Displays that the switch is ON or OFF.	Neutral: ON In gear: OFF
30	Ignition coil #1, #4	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates ignition coil #1 and #4 for five times every second and illuminates the engine trouble warning light. * Connect an ignition checker. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check that spark is generated, 5 times with the engine stop switch ON.
31	Ignition coils #2, #3	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates ignition coil #2 and #3 for five times every second and illuminates the engine trouble warning light. * Connect an ignition checker. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check that spark is generated, 5 times with the engine stop switch ON.
36	Injector #1, #4	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the injector #1 and #4 five times every second and illuminates the engine trouble warning light. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the operating sound of the injector five times with engine stop switch ON.
37	Injector #2, #3	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the injector #2 and #3 five times every second and illuminates the engine trouble warning light. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the operating sound of the injector five times with engine stop switch ON.

Diagnostic code	Item	Description of action	Data displayed on meter (reference value)
48	AI system solenoid	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the AI system solenoid five times every second and illuminates the engine trouble warning light. * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the operating sound of the AI system solenoid 5 times with the engine stop switch ON.
50	Fuel injection system relay	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the fuel injection system relay five times every second and illuminates the engine trouble warning light (the light is OFF when the relay is ON, and the light is ON when the relay is OFF). * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the fuel injection system relay operating sound 5 times with the engine stop switch ON.
51	Radiator fan motor relay	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the radiator fan motor relay five times every 5 seconds and illuminates the engine trouble warning light. (ON 2 seconds, OFF 3 seconds) * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the radiator fan motor relay operating sound 5 times with the engine stop switch ON. (At that time, the fan motor rotates.)
52	Headlight relay 1	After 1 second has elapsed from the time the engine stop switch has been turned from OFF to ON, it actuates the headlight relay five times every 5 seconds and illuminates the engine trouble warning light. (ON 2 seconds, OFF 3 seconds) * If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	Check the headlight relay operating sound 5 times with the engine stop switch ON. (At that time, the headlight turns ON.)
60	EEPROM fault code display	• Transmits the abnormal portion of the data in the EEPROM that has been detected as a fault code 44. • If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.	(01 ~ 02) Displays the cylinder number. 01: #1 and #4 02: #2 and #3 (00) Displays when there is no malfunction.
61	Malfunction history code display	• Displays the codes of the history of the self-diagnosis malfunctions (i.e., a code of a malfunction that occurred once and which has been corrected). • If multiple malfunctions have been detected, different codes are displayed at 2-second intervals, and this process is repeated.	12 ~ 50 (00) Displays when there is no malfunction.
62	Malfunction history code erasure	• Displays the total number of codes that are being detected through self diagnosis and the fault codes in the past history. • Erases only the history codes when the engine stop switch is turned from OFF to ON. If the engine stop switch is ON, turn it OFF once, and then turn it back ON.	00 ~ 17 (00) Displays when there is no malfunction.
70	Control number	• Displays the program control number.	00 ~ 255

EAS00908

TROUBLESHOOTING DETAILS

This section describes the countermeasures per fault code number displayed on the meter. Check and service the items or components that are the probable cause of the malfunction following the order. After the check and service of the malfunctioned part has been completed, reset the meter display according to the "Reinstatement method".

Fault code No.:

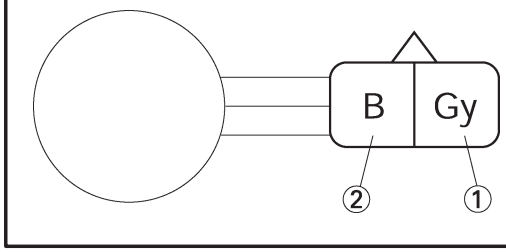
Fault code number displayed on the meter when the engine failed to work normally. (Refer to the "Fault code table".)

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. (Refer to "DIAGNOSTIC MODE".)

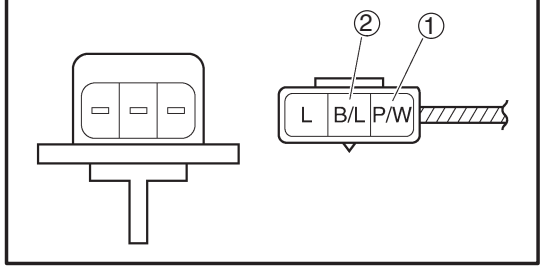
Fault code No.	12	Symptom	No normal signals are received from the crankshaft position sensor.

Used diagnostic code No. – –

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of sensor.	Check the installed area for looseness or pinching.	Reinstated by cranking the engine.
2	Connected condition of connector. Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler. **NOTE:** When installing or removing the connector, main switch turn to "OFF".	If there is a malfunction, repair it and connect it securely. Crankshaft position sensor coupler Main wiring harness ECU coupler	
3	Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit between the main wiring harnesses. Between sensor coupler and ECU coupler. Gray - Gray Black/Blue - Black/Blue	
4	Defective crankshaft position sensor.	Replace if defective. 1. Disconnect the crankshaft position sensor coupler from the wire harness. 2. Connect the pocket tester (Ω × 100) to the crankshaft position sensor coupler as shown. **Tester positive probe → gray ①** **Tester negative probe → black ②**  3. Measure the crankshaft position sensor resistance.  **Crankshaft position sensor resistance** **248 ~ 372 Ω at 20°C (68°F)** **(between gray and black)** 4. Is the crankshaft position sensor OK?	

Fault code No.	13	Symptom	Intake air pressure sensor - open or short circuit detected.

Used diagnostic code No. 03 (intake air pressure sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler. **NOTE:** When installing or removing the connector, main switch turn to “OFF”.	If there is a malfunction, repair it and connect it securely. Intake air pressure sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by turning the main switch ON.
2	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler Black/Blue - Black/Blue Pink/White - Pink/White Blue - Blue	
3	Defective intake air pressure sensor	Execute the diagnostic mode (code No. 03) Replace if defective. 1. Connect the pocket tester (DC 20 V) to the intake air pressure sensor coupler terminal as shown. **Tester positive probe → pink/white ①** **Tester negative probe → black/blue ②**  2. Set the main switch to “ON”. 3. Measure the intake air pressure sensor output voltage.  **Intake air pressure sensor output voltage** **3.75 ~ 4.25 V** 4. Is the intake air pressure sensor OK?	

Fault code No.	14	Symptom	Intake air pressure sensor - hose system malfunction (clogged or detached hose).

Used diagnostic code No. 03 (intake air pressure sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Intake air pressure sensor hose detached, clogged, kinked, or pinched. Intake air pressure sensor malfunction at intermediate electrical potential.	Repair or replace the sensor hose. Inspect and repair the connection.	Reinstated by starting the engine and operating it at idle.
2	Connected state of connector Intake air pressure sensor coupler Main wiring harness ECU coupler	Check the coupler for any pins that may have pulled out. Check the looking condition of the coupler. If there is a malfunction, repair it and connect it securely.	
3	Defective intake air pressure sensor.	Execute the diagnostic mode (code No. 03) Replace if defective. Refer to “Fault code No. 13”.	

Fault code No.	15	Symptom	Throttle position sensor - open or short circuit detected.

Used diagnostic code No. 01 (throttle position sensor)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of throttle position sensor.	Check the installed area for looseness or pinching. Check that it is installed in the specified position. Refer to “THROTTLE BODIES” section.	Reinstated by turning the main switch ON.
2	Connected condition of connector Inspect 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. Throttle position sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
3	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue - black/blue yellow - yellow blue - blue	
4	Throttle position sensor lead wire open circuit output voltage check.	Check for open circuit and replace the throttle position sensor. Black/Blue - Yellow	

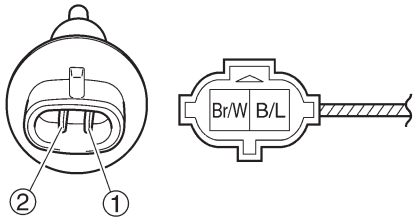
Open circuit item	Output voltage
Ground wire open circuit	5 V
Output wire open circuit	0V
Power supply wire open circuit	0V

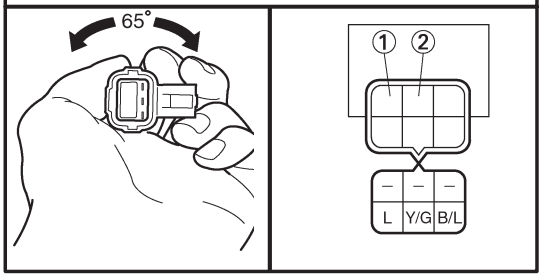
5	Defective throttle position sensor.	Execute the diagnostic mode (code No. 01) Replace if defective. Refer to “THROTTLE BODIES” section.	

Fault code No.	16	Symptom	Stuck throttle position sensor detected.
Used diagnostic code No. 01 (throttle position sensor)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of throttle position sensor.	Check the installed area for looseness or pinching. Check that it is installed in the specified position. Refer to “THROTTLE BODIES” section.	Reinstated by starting the engine, operating it at idle, and then racing it.
2	Defective throttle position sensor	Execute the diagnostic mode (code No. 01) Replace if defective. Refer to “THROTTLE BODIES” section.	
3	When detecting fault code No. 15	Refer to “Fault code No. 15”.	Refer to “Fault code No. 15”.

Fault code No.	19	Symptom	Open circuit in the input line of ECU No. 4 terminal is detected.
Used diagnostic code No. 20 (sidestand switch)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected state of connector Main wiring harness ECU coupler (No. 4 pin)	Execute the diagnostic mode (code No. 20) Check the coupler for any pins that may have pulled out. Check the locking condition of the coupler. If there is a malfunction, repair it and connect it securely.	If the transmission is in gear, it is reinstated by retracting the sidestand. If the transmission is in neutral, it is reinstated by reconnecting the wiring.
2	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open circuit. Sidestand switch signal input line of ECU coupler black/red	

Fault code No.	21	Symptom	Open or short circuit is detected from the coolant temperature sensor.
Used diagnostic code No. 06 (coolant temperature sensor)			
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Installed condition of sensor	Check the installed area for looseness or pinching.	Reinstated by turning the main switch ON.
2	Connected condition of connector Inspect 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. Coolant temperature sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler	
3	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue - black/blue green/white - green/white	
4	Defective coolant temperature sensor.	Execute the diagnostic mode (code No. 06) Replace if defective. Refer to “COOLING SYSTEM” in chapter 8.	

Fault code No.	22	Symptom	Open or short circuit detected from the intake air temperature sensor.	
Used diagnostic code No. 05 (intake air temperature sensor)				
Order	Inspection operation item and probable cause	Operation item and countermeasure		Reinstatement method
1	Installed condition of sensor	Check the installed area for looseness or pinching.		Reinstated by turning the mainswitch ON.
2	Connected condition of connector Inspect 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. Intake air temperature sensor coupler Main wiring harness ECU coupler Sub-wire harness coupler		
3	Open or short circuit in wiring harness and/or sub lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler black/blue - black/blue brown/white - brown/white		
4	Defective intake air temperature sensor.	Execute the diagnostic mode (code No. 05) Replace if defective. 1. Remove the intake air temperature sensor from the air filter case. 2. Connect the pocket tester (Ω × 100) to the intake air temperature sensor terminal as shown. **Tester positive probe → brown/white ①** **Tester negative probe → black/blue ②**  3. Measure the intake air temperature sensor resistance.  **Intake air temperature sensor resistance** **2.2 ~ 2.7 kΩ at 20°C (68°F)** **⚠ WARNING** **• Handle the intake air temperature sensor with special care.** **• Never subject the intake air temperature sensor to strong shocks. If the intake air temperature sensor is dropped, replace it.** 4. Is the intake air temperature sensor OK?		

Fault code No.	30	Symptom	The motorcycle has overturned.	
Used diagnostic code No. 08 (lean angle cut-off switch)				
Order	Inspection operation item and probable cause	Operation item and countermeasure		Reinstatement method
1	The motorcycle has overturned.	Raise the motorcycle upright.		Reinstated by turning the main switch ON (however, the engine cannot be re-started unless the main switch is first turned OFF).
2	Installed condition of the lean angle cut-off switch	Check the installed area for looseness or pinching.		
3	Connected condition of connector Inspect 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. Lean angle cut-off switch coupler Main wiring harness ECU coupler		
4	Defective lean angle cut-off switch	Execute the diagnostic mode (code No. 08) Replace if defective. 1. Remove the lean angle cut-off switch from the motorcycle. 2. Connect the lean angle cut-off switch coupler to the wireharness. 3. Connect the pocket tester (DC 20 V) to the lean angle cut-off switch coupler as shown. **Tester positive prove → blue ①** **Tester negative prove → yellow/green ②**  4. When turning the lean angle cut-off switch approx. 65°, the voltage reading change from 1.0 V to 4.0 V. 5. Is the emergency stop switch OK?		

Fault code No.	33	Symptom	Malfunction detected in the primary lead of the ignition coil (#1, #4).

Used diagnostic code No. 30 (ignition coil #1, #4)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect 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. Ignition coil primary side coupler - orange/black Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by starting the engine and operating it at idle. In case of multiple cylinder open or short circuit in lead, make sure to turn ON and OFF the main switch after each time of cranking.
2	Open or short circuit in lead.	Repair or replace if there is an open or short circuit. Between ignition coil coupler (#1 and #4) and ECU coupler/main harness orange/black – orange/black red/black – red/black	
3	Defective ignition coil (test the primary and secondary coils for continuity).	Execute the diagnostic mode (code No. 30) Replace if defective. Refer to “IGNITION SYSTEM” in chapter 8.	

Fault code No.	34	Symptom	Malfunction detected in the primary lead of the ignition coil (#2, #3).

Used diagnostic code No. 31 (ignition coil #2, #3)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect 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. Ignition coil primary side coupler - gray/black Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by starting the engine and operating it at idle. In case of multiple cylinder open or short circuit in lead, make sure to turn ON and OFF the main switch after each time of cranking.
2	Open or short circuit in lead wire.	Repair or replace if there is an open or short circuit. Between ignition coil coupler (#2 and #3) and ECU coupler/main harness gray/black – gray/black red/black – red/black	
3	Defective ignition coil (test the primary and secondary coils for continuity).	Execute the diagnostic mode (code No. 31) Replace if defective. Refer to “IGNITION SYSTEM” in chapter 8.	

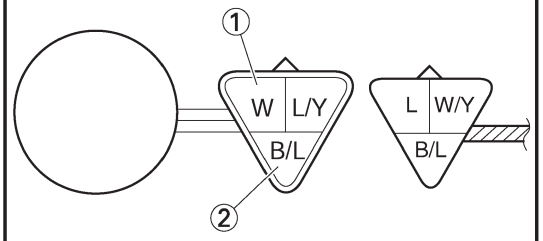
Fault code No.	41	Symptom	Open or short circuit detected in the lean angle cut-off switch.

Used diagnostic code No. 08 (lean angle cut-off switch)

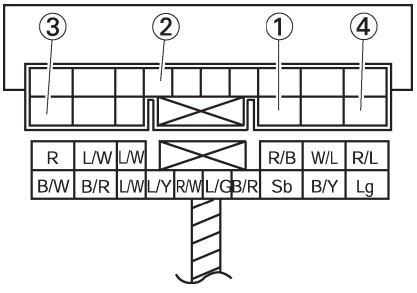
Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.	If there is a malfunction, repair it and connect it securely. Lean angle cut-off switch coupler Main wiring harness ECU coupler	Reinstated by turning the mains witch ON.
2	Open or short circuit in wiring harness.	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 cut-off switch	Execute the diagnostic mode (code No. 08) Replace if defective. Refer to Fault code No. 30.	

Fault code No.	42	Symptom	1 No normal signals are received from the speed sensor. 2 Open or short circuit is detected in the neutral switch.

Used diagnostic code No. 07 (speed sensor) → A1 ~ A4
No. 21 (neutral switch) → B1 ~ B4

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
A1	Connected condition of speed sensor connector Inspect 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. Speed sensor coupler Main wiring harness ECU coupler	Reinstated by starting the engine, and inputting the vehicle speed signals by operating the motorcycle at a low speed of 20 to 30 km/h.
A2	Open or short circuit in speed sensor lead.	Repair or replace if there is an open or short circuit. Between sensor coupler and ECU coupler. blue - blue white/yellow - white/yellow black/blue - black/blue	
A3	Gear for detecting vehicle speed has broken.	Replace if defective. Refer to "TRANSMISSION" in chapter 5.	
A4	Defective speed sensor	Execute the diagnostic mode (code No. 07) Replace if defective. 1. Measure the speed sensor output voltage. 2. Connect the pocket tester (DC 20 V) to the speed sensor coupler terminal as shown. **Tester positive probe → white ①** **Tester negative probe → black/blue ②**  3. Measure the speed sensor output voltage. **Speed sensor output voltage** **When sensor is on** **DC 4.8 V or more** **When sensor is off** **DC 0.6 V or less** 4. Is the speed sensor OK?	

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
B1	Connected condition of connector Inspect 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. Neutral switch connector Main wiring harness ECU coupler	Reinstated by starting the engine, and inputting the vehicle speed signals by operating the motorcycle at a low speed of 20 to 30 km/h.
B2	Open or short circuit in neutral switch lead.	Repair or replace if there is an open or short circuit. Between switch connector and ECU coupler sky blue - black/yellow	
B3	Faulty shift drum (neutral detection area)	Replace if defective. Refer to "TRANSMISSION" in chapter 5.	
B4	Defective neutral switch	Execute the diagnostic mode (code No. 21) Replace if defective. Refer to "CHECKING THE SWITCHES" in chapter 8.	

Fault code No.	43	Symptom	The ECU is unable to monitor the battery voltage.	
Used diagnostic code No. 09 (fuel system voltage)				
Order	Inspection operation item and probable cause	Operation item and countermeasure		Reinstatement method
1	Connected condition of connector Inspect 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 circuit cut-off relay coupler (fuel injection system relay) Fuel pump coupler Injector coupler ECU coupler		Reinstated by starting the engine and operating it at idle.
2	Malfunction in ECU	Fuel injection system relay is on.		
3	Open or short circuit in the wiring harness.	Repair or replace if there is an open or short circuit. Between starting circuit cut-off relay (fuel injection system relay), fuel pump, injector (#1 ~ #4) red/blue – red/blue		
4	Malfunction or open circuit in fuel injection system relay	Execute the diagnostic mode (code No. 09) **NOTE:** When the leads are disconnected, the voltage check by the code No. 09 is impossible. Replace if defective. 1. Disconnect the starting circuit cut-off relay from the wire harness. 2. Connect the pocket tester (Ω × 1) and battery (12 V) to the starting circuit cut-off relay terminals as shown. **Battery positive terminal → red/black ①** **Battery positive terminal → blue/yellow ②** **Tester positive probe → red ③** **Tester negative probe → red/blue ④**  3. Does the starting circuit cut-off relay have continuity between red and red/blue?		

Fault code No.	44	Symptom	Error is detected while reading or writing on EEP-ROM (CO adjustment value).

Used diagnostic No. 60 (EEP-ROM improper cylinder indication)

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Malfunction in ECU	Execute diagnostic code 60 1. Check the faulty cylinder. (If there are multiple cylinders, the number of the faulty cylinders appear alternately at 2-second intervals.) 2. Readjust the CO of the displayed cylinder. Refer to “ADJUSTING THE EXHAUST GAS VOLUME” in chapter 3. Replace ECU if defective.	Reinstated by turning the main switch ON.

Fault code No.	46	Symptom	Power supply to the FI system relay is not normal.

Used diagnostic code No. – –

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect 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. ECU coupler.	Reinstated by starting the engine and operating it at idle.
2	Faulty battery	Replace or change the battery Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.	
3	Open or short circuit in wiring harness.	Repair or replace if there is an open or short circuit. • Between battery and main switch red – red • Between main switch and fuse (ignition) brown/blue – brown/blue • 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.)

Used diagnostic code No. – –

Order	Inspection operation item and probable cause	Operation item and countermeasure	Reinstatement method
1	Malfunction in ECU	Replace the ECU.	Reinstated by turning the main switch ON.

Fault code No.	Er-1	Symptom	No signals are received from the ECU.	
Used diagnostic code No. – –				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect 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. Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by turning the main switch ON and receives a normal signal.
2	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between meter coupler and ECU coupler yellow/blue - yellow/blue black/white - black/white	
3	Malfunction in meter		Replace the meter.	
4	Malfunction in ECU		Replace the ECU.	

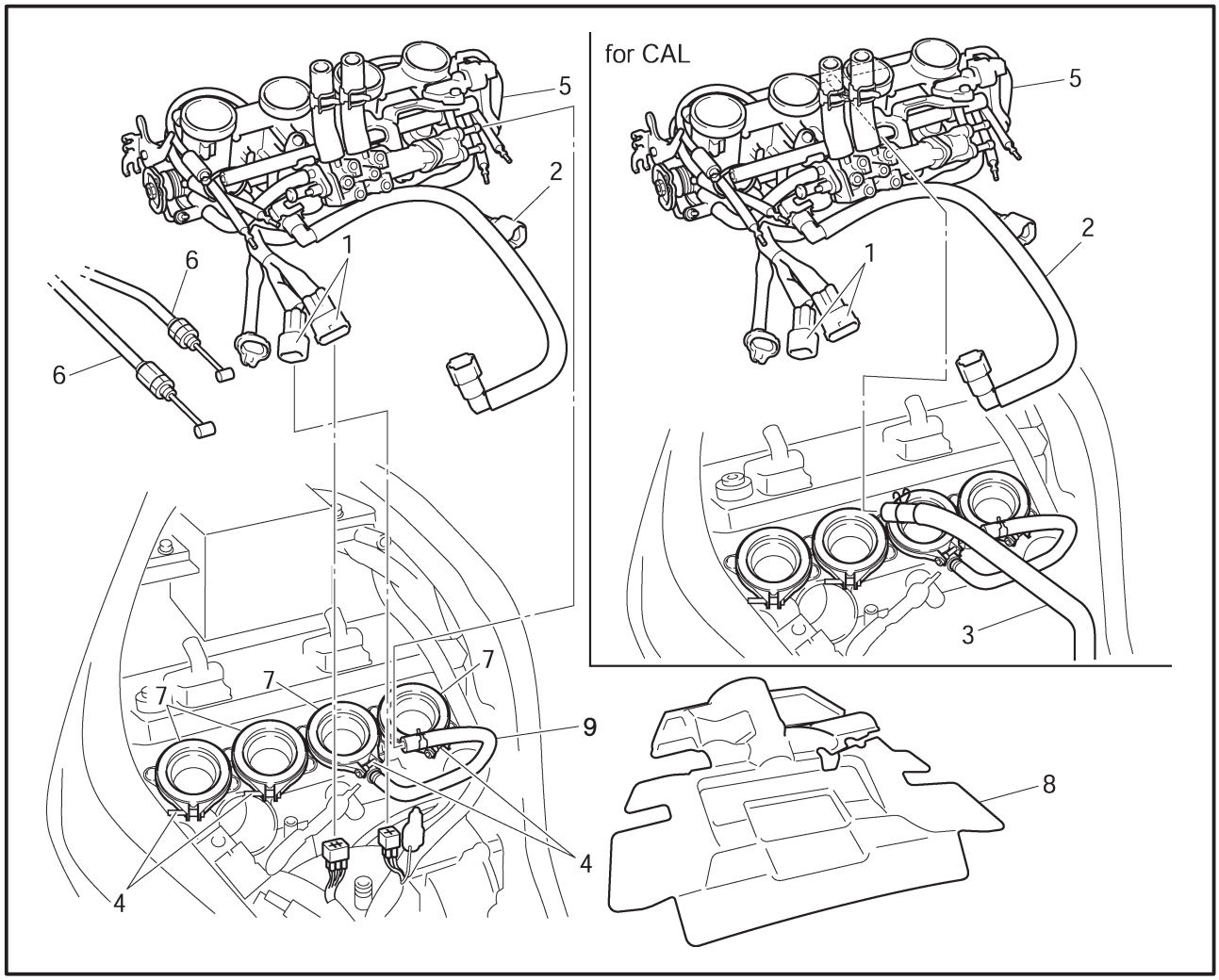
Fault code No.	Er-2	Symptom	No signals are received from the ECU within the specified duration.	
Used diagnostic code No. – –				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.		If there is a malfunction, repair it and connect it securely. Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by turning the main switch ON and receives a normal signal.
2	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between meter coupler and ECU coupler yellow/blue - yellow/blue black/white - black/white	
3	Malfunction in meter		Replace the meter.	
4	Malfunction in ECU		Replace the ECU.	

Fault code No.	Er-3	Symptom	Data from the ECU cannot be received correctly.	
Used diagnostic code No. – –				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect 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. Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by turning the main switch ON and receives a normal signal.
2	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between meter coupler and ECU coupler yellow/blue - yellow/blue black/white - black/white	
3	Malfunction in meter		Replace the meter.	
4	Malfunction in ECU		Replace the ECU.	

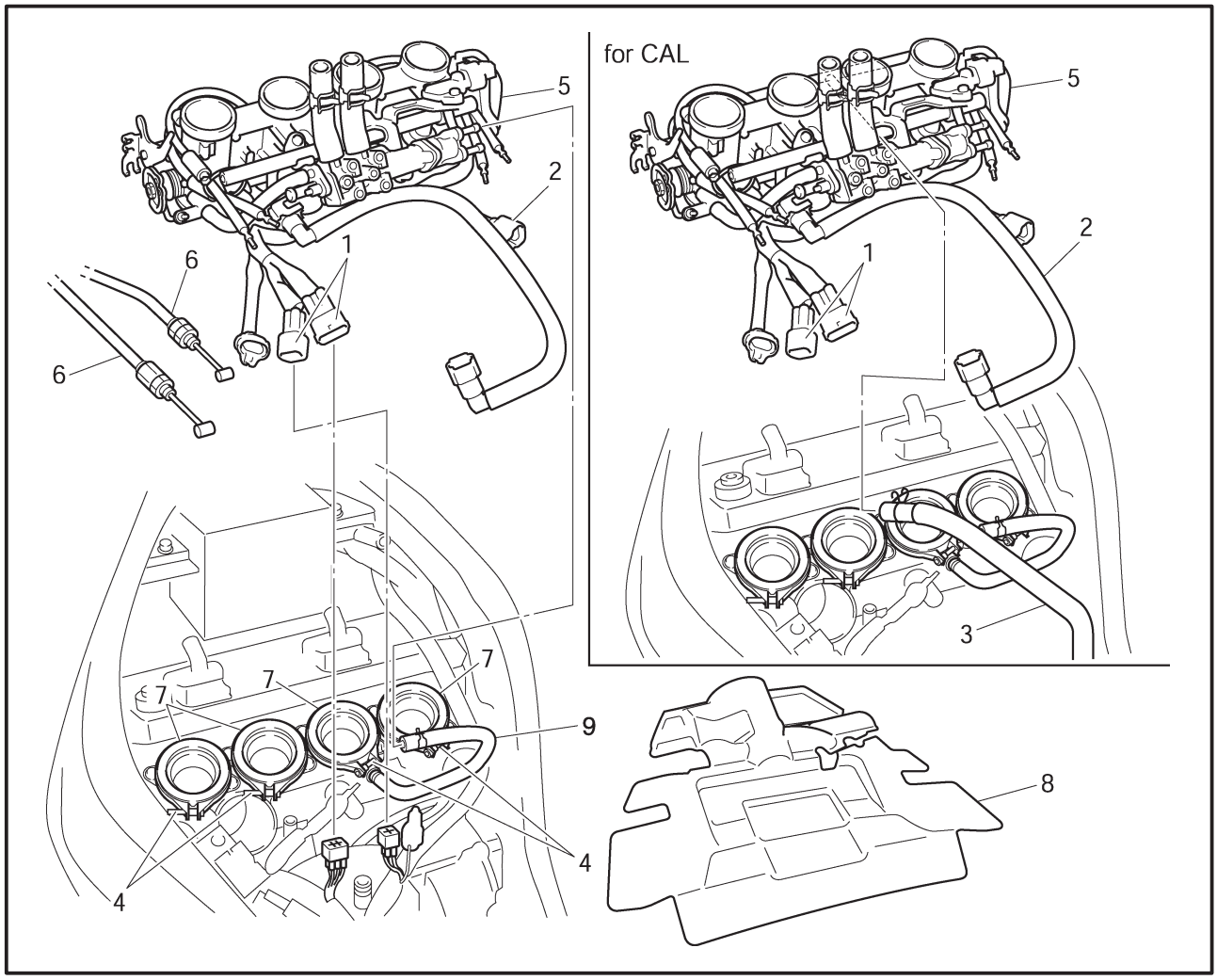
Fault code No.	Er-4	Symptom	Non-registered data has been received from the meter.	
Used diagnostic code No. – –				
Order	Inspection operation item and probable cause		Operation item and countermeasure	Reinstatement method
1	Connected condition of connector Inspect the coupler for any pins that may have pulled out. Check the locking condition of the coupler.		If there is a malfunction, repair it and connect it securely. Main wiring harness ECU coupler Sub-wire harness coupler	Reinstated by turning the main switch ON and receives a normal signal.
2	Open or short circuit in wiring harness and/or sub lead.		Repair or replace if there is an open or short circuit. Between meter coupler and ECU coupler yellow/blue - yellow/blue black/white - black/white	
3	Malfunction in meter		Replace the meter.	
4	Malfunction in ECU		Replace the ECU.	

EAS00909

THROTTLE BODIES

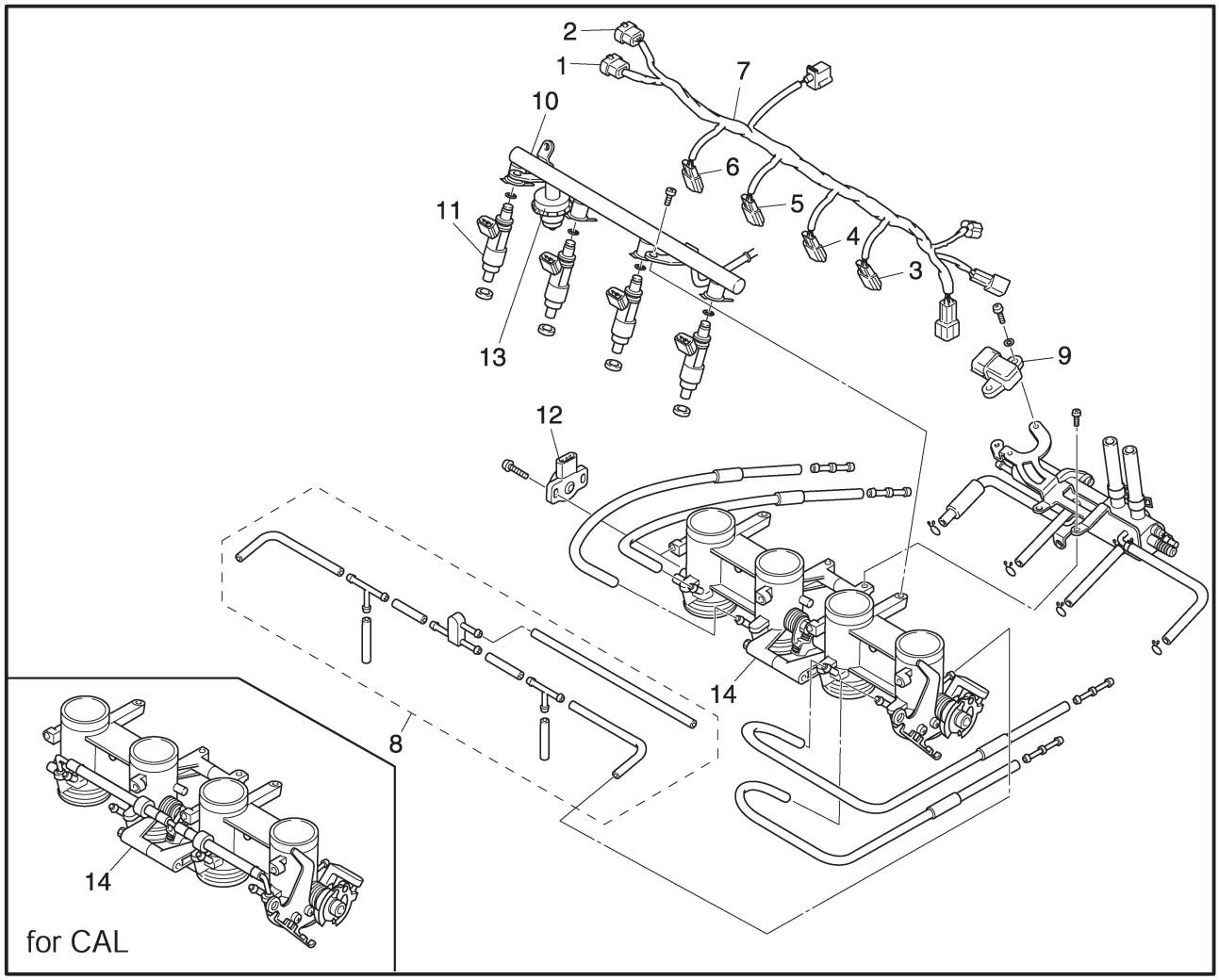


Order	Job/Part	Q'ty	Remarks
	Removing the throttle bodies		Remove the parts in the order listed.
	Seat		Refer to "SEAT" in chapter 3.
	Front cowling inner panel (left and right)		Refer to "COWLINGS" in chapter 3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Battery		Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.
	Air filter case		Refer to "AIR FILTER CASE" in chapter 3.
	Battery box and battery box bracket		Refer to "BATTERY BOX AND BATTERY BOX BRACKET" in chapter 3.
1	Sub-wire harness coupler	2	Disconnect
2	Coolant temperature sensor coupler	1	Disconnect
3	Balance hose (for CAL)	1	Disconnect
4	Throttle body joint clamp screw	4	
5	Throttle bodies	1	
6	Throttle cable	2	Disconnect
7	Throttle body joint	4	
8	Heat protector	1	



Order	Job/Part	Q'ty	Remarks
9	Plunger control unit hose	1	Disconnect For installation, reverse the removal procedure.

EAS00910
INJECTORS

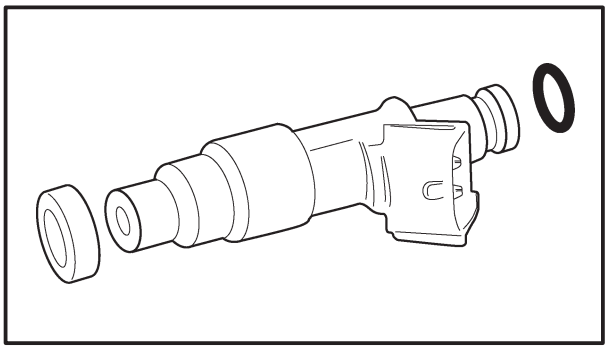


Order	Job/Part	Q'ty	Remarks
	Removing the injectors		Remove the parts in the order listed.
1	Throttle position sensor coupler	1	Disconnect
2	Intake air pressure sensor coupler	1	Disconnect
3	Cylinder #1-injector coupler	1	
4	Cylinder #2-injector coupler	1	
5	Cylinder #3-injector coupler	1	
6	Cylinder #4-injector coupler	1	
7	Sub wire harness	1	
8	Negative pressure hose	1	
9	Intake air pressure sensor	1	
10	Fuel distributor	1	
11	Injector	4	
12	Throttle position sensor	1	
13	Fuel pulsation damper	1	
14	Throttle body assembly	1	
			For installation, reverse the removal procedure.

EAS00911

CAUTION:

The throttle bodies should not be disassembled.



EAS00912

CHECKING THE INJECTORS

1. Check:
   - injectors
     Damage → Replace.

EAS00913

CHECKING THE THROTTLE BODIES

1. Check:
   - throttle bodies
     Cracks/damage → Replace the throttle bodies as a set.

2. Check:
   - fuel passages
     Obstructions → Clean.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

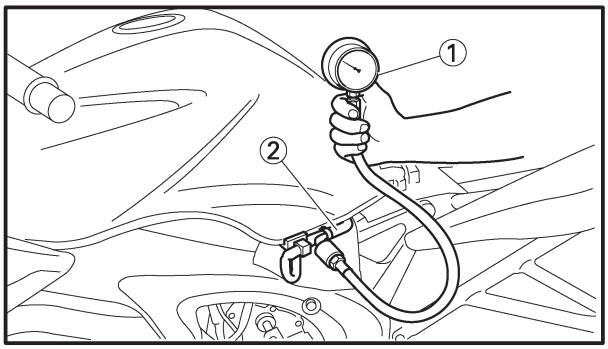
a. Wash the throttle bodies in a petroleum-based solvent.
   Do not use any caustic carburetor cleaning solution.
b. Blow out all of the passages with compressed air.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

   - fuel pulsation damper

CAUTION:

Do not adjust the fuel pulsation damper.



CHECKING THE FUEL PUMP AND PRESSURE REGULATOR OPERATION

1. Check:
   • fuel pump operation
   Refer to "FUEL TANK" in chapter 3.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the seat fuel tank.
   Refer to "SEAT AND FUEL TANK" in chapter 3.
b. Connect the pressure gauge ① and adapter ② onto the fuel injection pipe.

Pressure gauge
90890-03153, YU-03153
Adapter
90890-03176, YM-03176

c. Install the fuel tank.
   Refer to "FUEL TANK" in chapter 3.
d. Start the engine.
e. Measure the fuel pressure.

Fuel pressure
250 kPa (2.5 kg/cm^2, 36.3 psi)

Faulty → Replace the fuel pump assembly.

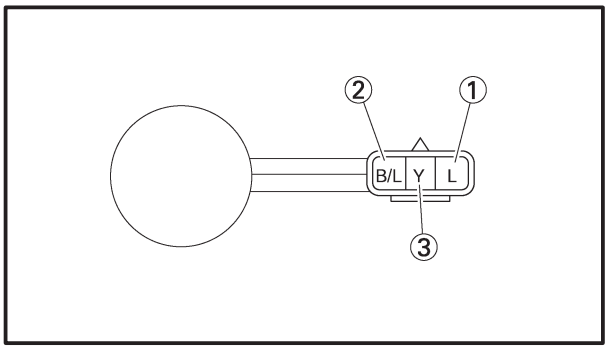
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

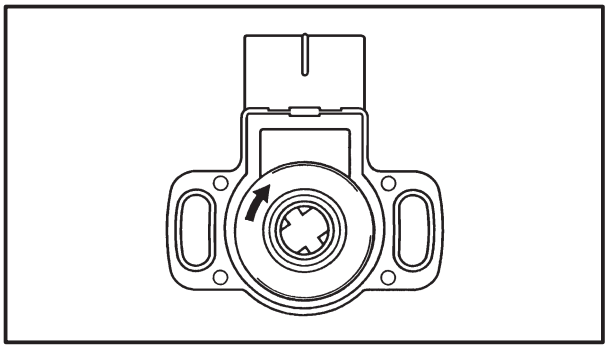
EAS00916

CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR

NOTE:

Before adjusting the throttle position sensor, the engine idling speed should be properly adjusted.





1. Check:
   • throttle position sensor

a. Disconnect the throttle position sensor coupler.
b. Remove the throttle position sensor from the throttle body.
c. Connect the pocket tester (Ω × 1k) to the throttle position sensor.

Positive tester probe → blue terminal ①
Negative tester probe → black/blue terminal ②

d. Measure the maximum throttle position sensor resistance.
   Out of specification → Replace the throttle position sensor.

Maximum throttle position sensor resistance
3.5 ~ 6.5 kΩ at 20°C (68°F)
(blue - black/blue)

e. Connect the pocket tester (Ω × 1k) to the throttle position sensor.

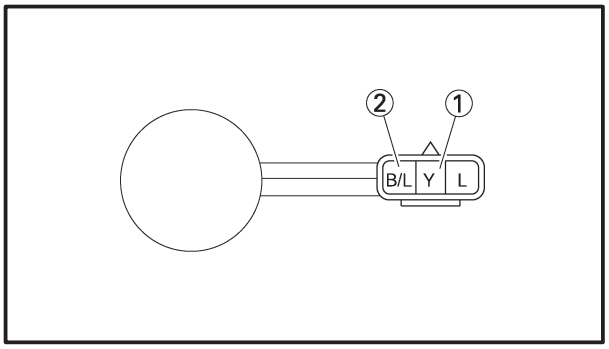
Positive tester probe → yellow terminal ③
Negative tester probe → black/blue terminal ②

f. While slowly opening the throttle, check that the throttle position sensor resistance is within the specified range.
   The resistance does not change or it changes abruptly → Replace the throttle position sensor.
   The slot is worn or broken → Replace the throttle position sensor.

NOTE:

Check mainly that the resistance changes gradually when turning the throttle, since the readings (from closed to wide-open throttle) may differ slightly from those specified.

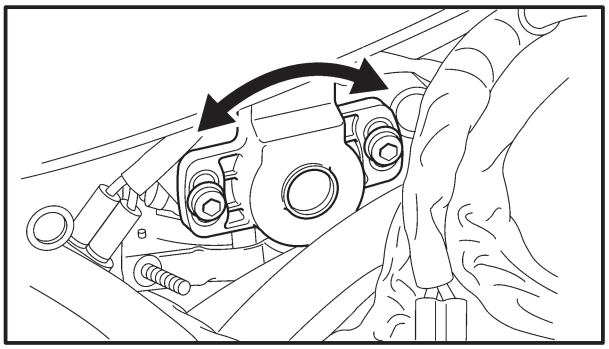
Throttle position sensor resistance
0 ~ 5 ± 1.5 kΩ at 20°C (68°F)
(yellow – black/blue)



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.

Tester positive probe → yellow terminal ①
Tester negative probe → black/blue terminal ②



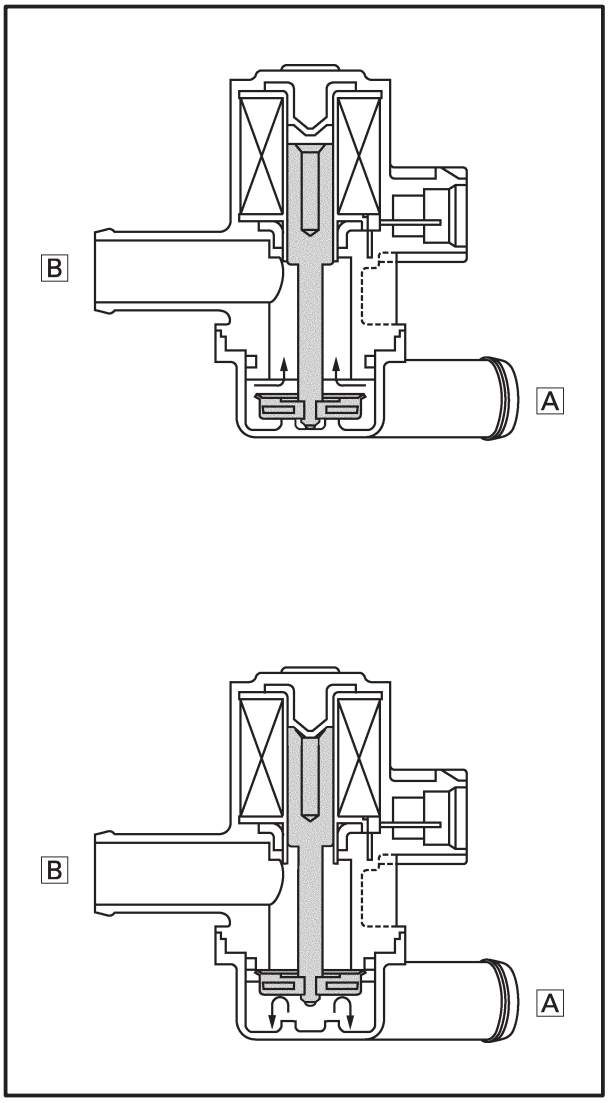
Digital circuit tester
90890-03174

c. Measure the throttle position sensor voltage.
d. Adjust the throttle position sensor angle so the measured voltage is within the specified range.

Throttle position sensor voltage
0.63 ~ 0.73 V
(yellow – black/blue)

g. After adjusting the throttle position sensor angle, tighten the throttle position sensor screws.

EAS00507
AIR INDUCTION SYSTEM
AIR INJECTION
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 (1112 to 1292°F).

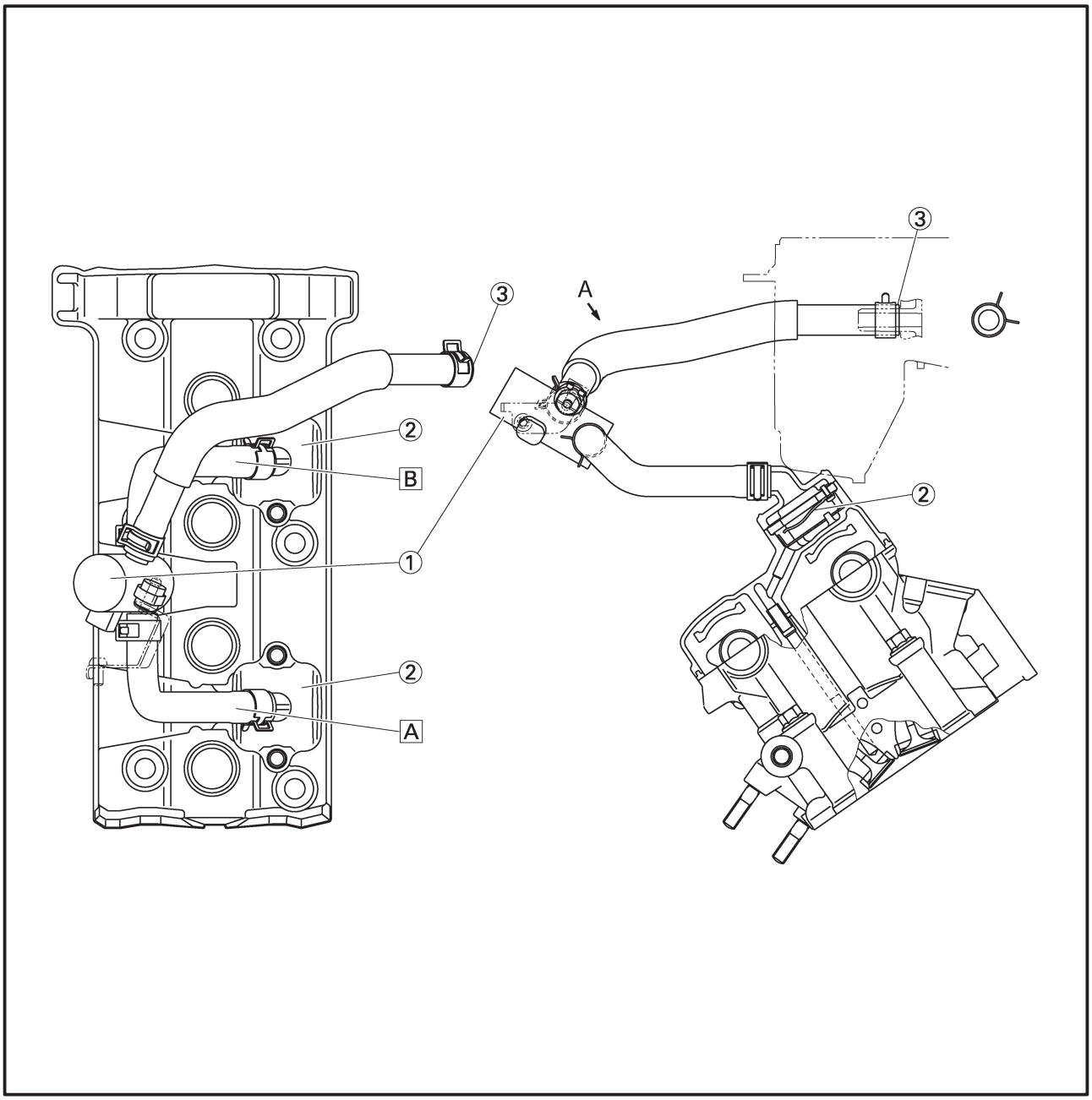


EAS0097
AIR CUT-OFF VALVE
The air cut-off valve is controlled by the signals from the ECU in accordance with the combustion conditions. Ordinarily, the air cut-off valve opens to allow the air to flow during idle and closes to cut-off the flow when the motorcycle is being driven. However, if the coolant temperature is below the specified value, the air cut-off valve remains open and allows the air to flow into the exhaust pipe until the temperature becomes higher than the specified value.
A From the air cleaner
B To the cylinder head

EAS00509

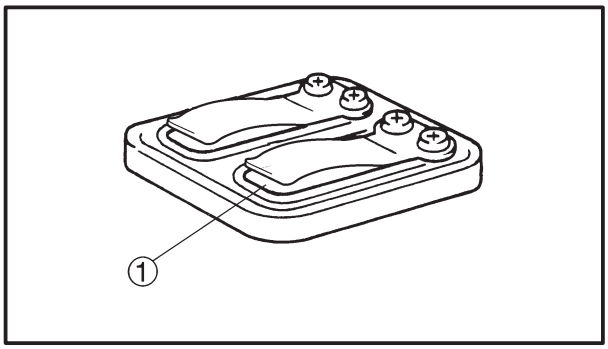
AIR INDUCTION SYSTEM DIAGRAMS

① Air cut-off valve
② Reed valve
③ To air filter case
A To cylinder #1 and #2
B To cylinder #3 and #4

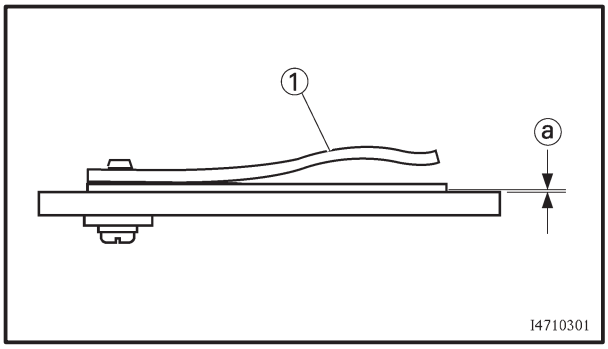


EAS00510
CHECKING THE AIR INDUCTION SYSTEM

1. Check:
   - hoses
     Loose connection → Connect properly.
     Cracks/damage → Replace.
   - pipes
     Cracks/damage → Replace.



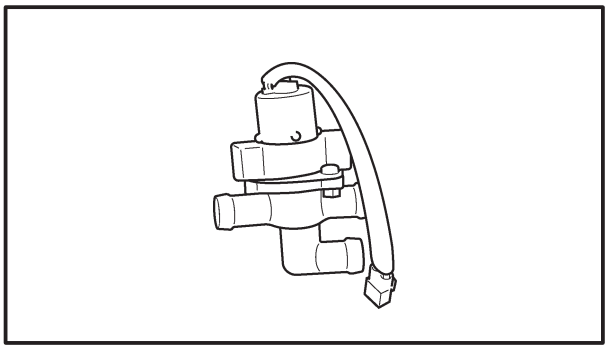
2. Check:
   - reed valve ①
   - reed valve stopper
   - reed valve seat
     Cracks/damage → Replace the reed valve.



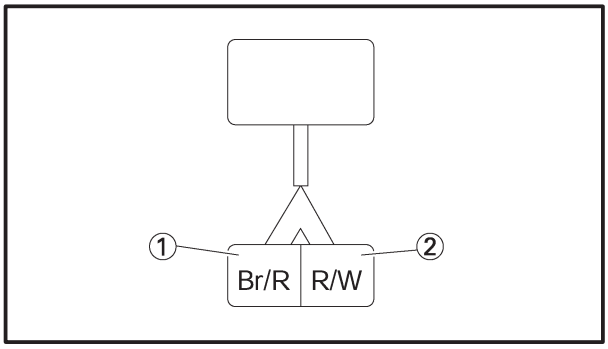
3. Measure:
   - reed valve bending limit ⓐ
     Out of specification → Replace the reed valve.

Reed valve bending limit
0.4 mm (0.016 in)

① Surface plate



4. Check:
   - air cut-off valve
     Cracks/damage → Replace.



5. Check
   • AI system solenoid

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Remove the AI system solenoid coupler from the wire harness.
b. Connect the pocket tester (Ω × 1) to the AI system solenoid terminal as shown.

Tester positive probe → brown/red ①
Tester negative probe → red/white ②

c. Measure the AI system solenoid resistance.

AI system solenoid resistance
18 ~ 22 Ω at 20°C (68°F)

d. Out of specification → Replace.

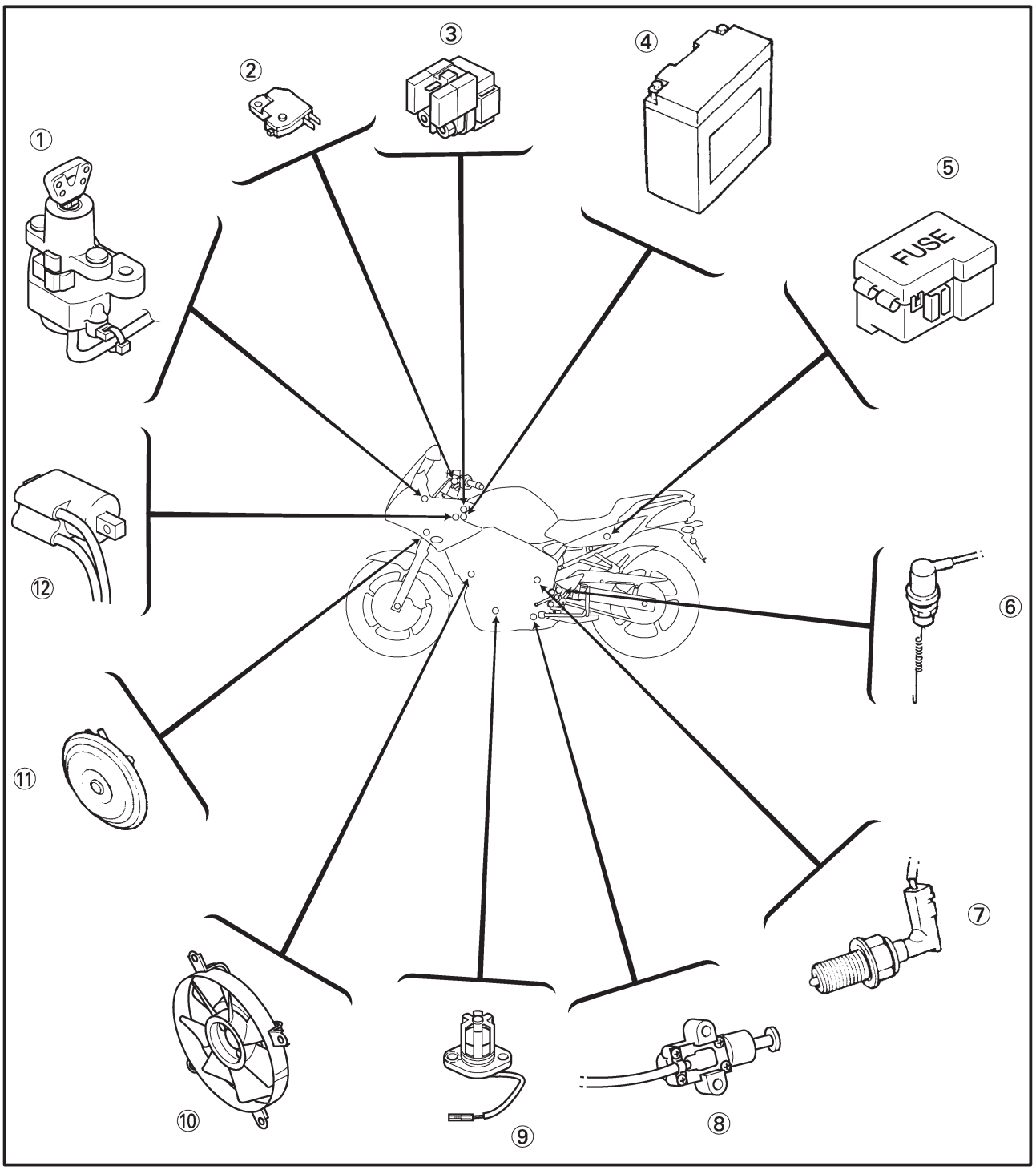
▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00729

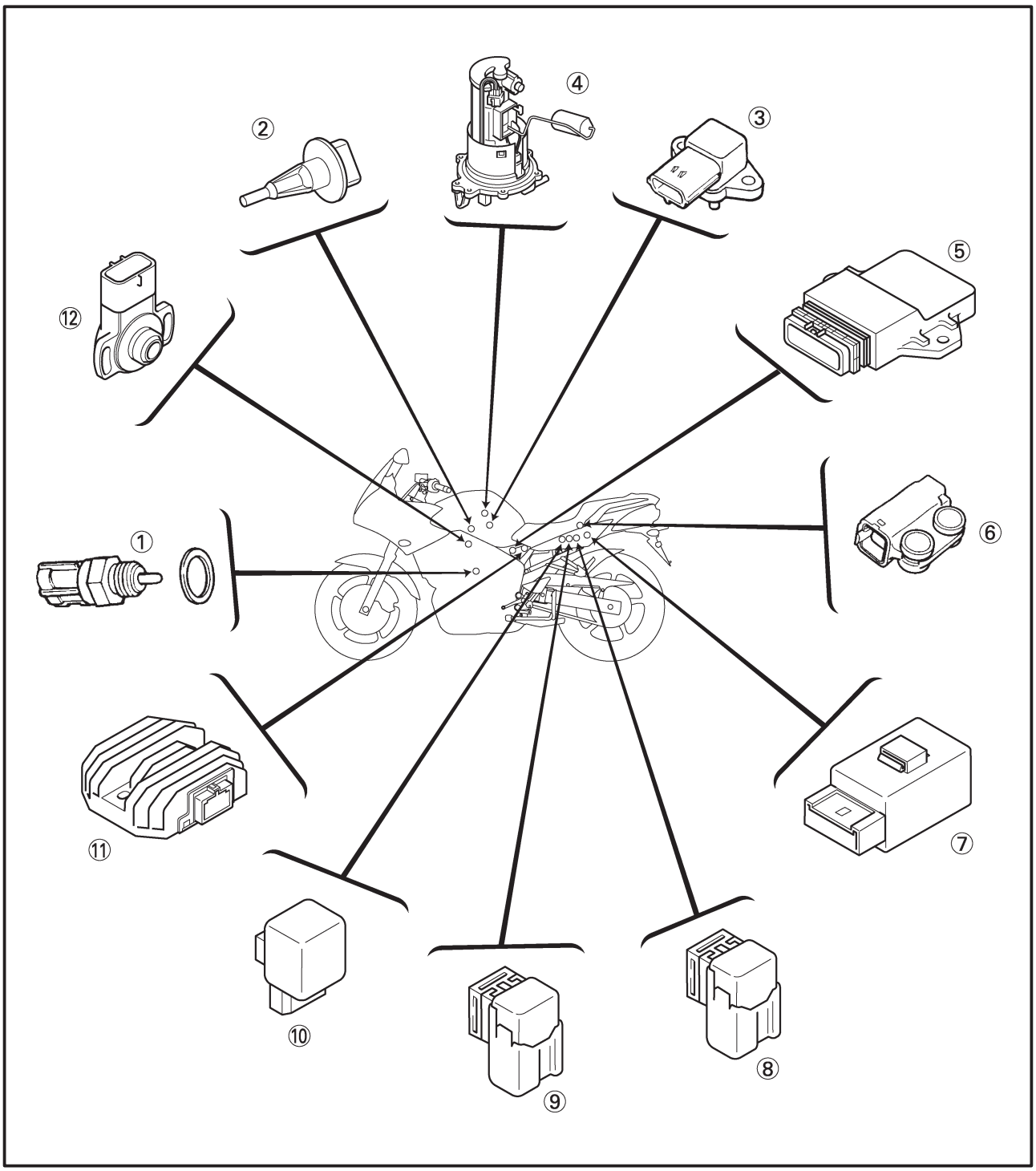
ELECTRICAL SYSTEM

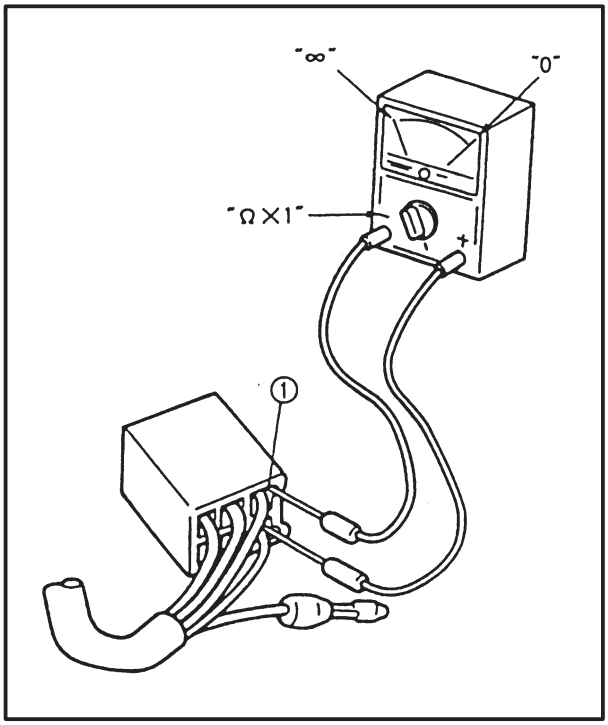
ELECTRICAL COMPONENTS

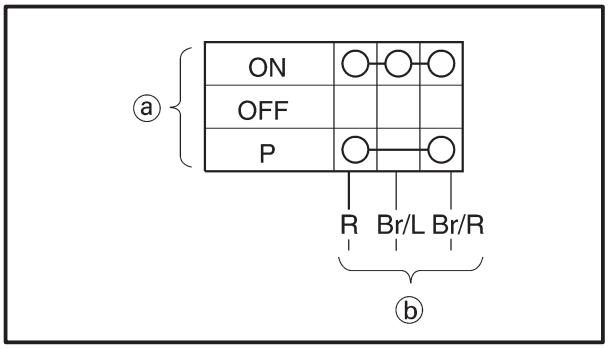
① Main switch
② Front brake light switch
③ Starter relay
④ Battery
⑤ Fuse box
⑥ Rear brake light switch
⑦ Neutral switch
⑧ Sidestand switch
⑨ Oil level switch
⑩ Radiator fan motor
⑪ Horn
⑫ Ignition coil



① Coolant temperature sensor
② Intake air temperature sensor
③ Intake air pressure sensor
④ Fuel pump
⑤ ECU
⑥ Lean angle cut-off switch
⑦ Starting circuit cut-off relay
⑧ Dimmer relay
⑨ Radiator fan motor relay
⑩ Turn signal relay
⑪ Rectifier/regulator
⑫ Throttle position sensor







EAS00730

CHECKING SWITCH CONTINUITY

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.

CAUTION:

Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end of the coupler ① taking care not to loosen or damage the leads.

Pocket tester
90890-03112, YU-3112

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω × 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 the left.
The switch positions ⓐ are shown in the far left column and the switch lead colors ⓑ are shown in the top row in the switch illustration.

NOTE:

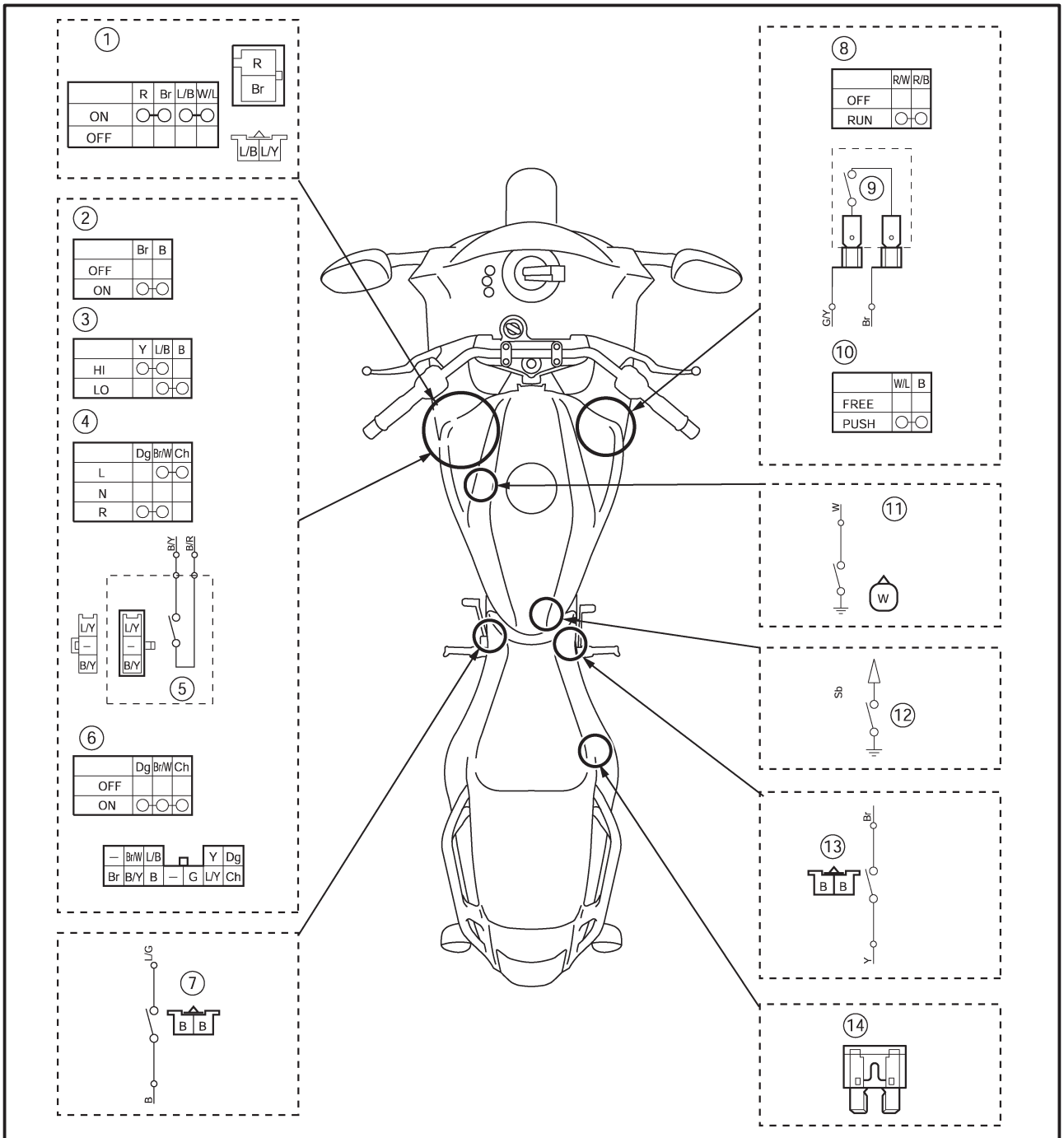
"○——○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:
There is continuity between red and brown/red when the switch is set to "P".
There is continuity between red, brown/blue and brown/red when the switch is set to "ON".

EAS00731

CHECKING THE SWITCHES

Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to “CHECKING SWITCH CONTINUITY”.
Damage/wear → Repair or replace.
Improperly connected → Properly connect.
Incorrect continuity reading → Replace the switch.

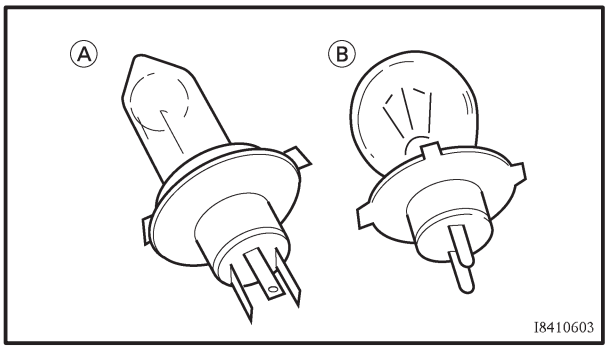


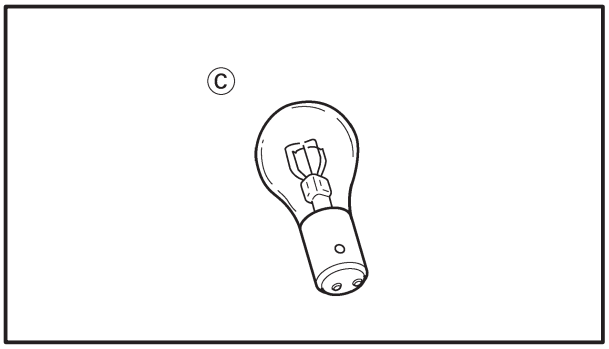
① Main switch
② Horn switch
③ Dimmer switch
④ Turn signal switch
⑤ Clutch switch
⑥ Hazard switch
⑦ Sidestand switch
⑧ Engine stop switch
⑨ Front brake light switch
⑩ Start switch
⑪ Oil level switch
⑫ Neutral switch
⑬ Rear brake light switch
⑭ Fuse box

EAS00732

CHECKING THE BULBS AND BULB SOCKETS

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.
Damage/wear → Repair or replace the bulb, bulb socket or both.
Improperly connected → Properly connect.
No continuity → Repair or replace the bulb, bulb socket or both.





TYPES OF BULBS

The bulbs used on this motorcycle are shown in the illustration on the left.

- Bulbs Ⓐ and Ⓑ are used for the headlights and usually use a bulb holder that must be detached before removing the bulb. The majority of these types of bulbs can be removed from their respective socket by turning them counterclockwise.
- Bulbs Ⓒ are used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.

CHECKING THE CONDITION OF THE BULBS

The following procedure applies to all of the bulbs.

1. Remove:
   - bulb

⚠ WARNING

- **Since the headlight bulb gets extremely hot, keep flammable products and your hands away from the bulb until it has cooled down.**
- **When changing the tail/brake light bulb, comfirm that the frame has cooled according to the warning label and change the tail/brake light bulb.**

CAUTION:

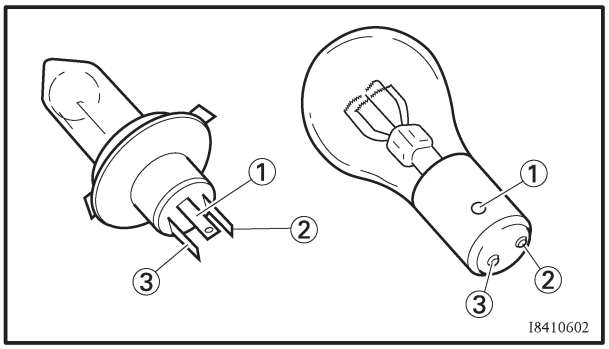
- **Be sure to hold the socket firmly when removing the bulb. Never pull the lead, otherwise it may be pulled out of the terminal in the coupler.**
- **Avoid touching the glass part of the headlight bulb to keep it free from oil, otherwise the transparency of the glass, the life of the bulb, and the luminous flux will be adversely affected. If the headlight bulb gets soiled, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.**

2. Check:
   - bulb (for continuity)
     (with the pocket tester)
     No continuity → Replace.

Pocket tester
90890-03112, YU-3112

NOTE:

Before checking for continuity, set the pocket tester to "0" and to the "Ω × 1" range.



▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

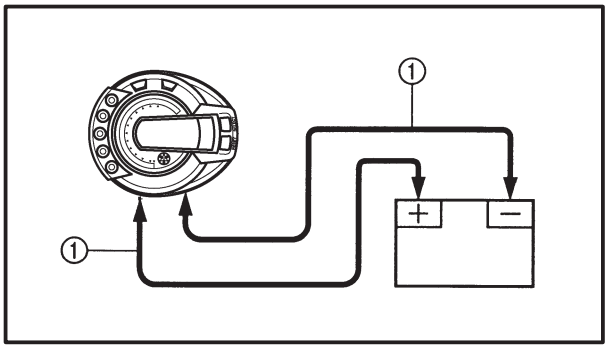
a. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ②, and check the continuity.
b. Connect the positive tester probe to terminal ① and the negative tester probe to terminal ③, and check the continuity.
c. If either of the readings indicate no continuity, replace the bulb.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

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, YU-3112

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.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

CHECKING THE LEDs

The following procedures applies to all of the LEDs.

1. Check:
   • LED (for proper operation)
   Improper operation → Replace.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Disconnect the meter assembly coupler (meter assembly side).
b. Connect two jumper leads ① from the battery terminals to the respective coupler terminal.

NOTE:

As for connecting with which coupler terminal, refer to “CABLE ROUTING” in chapter 2.

⚠ WARNING

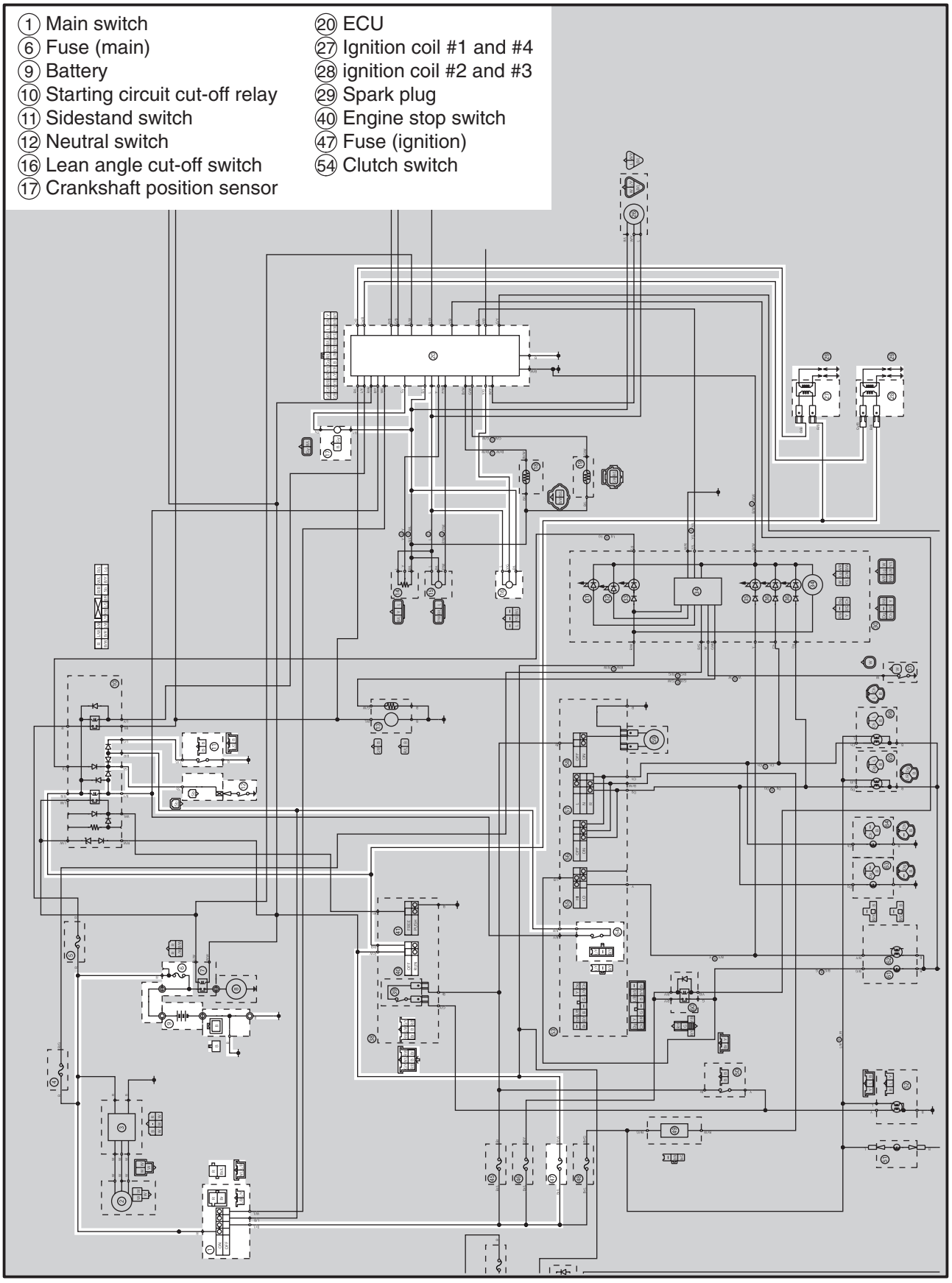
- **A wire that is used as a jumper lead must have at least the same capacity of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.**

c. When the jumper leads are connected to the terminals the respective LED should illuminate.
   Does not light → Replace the meter assembly.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

EAS00735

IGNITION SYSTEM
CIRCUIT DIAGRAM



EAS00737
TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:
1. main and ignition fuses
2. battery
3. spark plugs
4. ignition spark gap
5. spark plug cap resistance
6. ignition coil resistance
7. crankshaft position sensor
8. main switch
9. engine stop switch
10. neutral switch
11. sidestand switch
12. clutch switch
13. starting circuit cut-off relay (diode)
14. lean angle cut-off switch
15. wiring connections
    (of the entire ignition system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. seat
2. fuel tank
3. side cowlings

- Troubleshoot with the following special tool(s).

Dynamic spark tester
YM-34487
Ignition checker
90890-06754
Pocket tester
90890-03112, YU-3112

EAS00738

1. Main and ignition fuses

- Check the main and ignition fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main and ignition fuses OK?

YES

NO → Replace the fuse(s).

EAS00739

2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00741

3. Spark plugs

The following procedure applies to all of the spark plugs.
- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap.
  Refer to "CHECKING THE SPARK PLUGS" in chapter 3.

Standard spark plug
CR9EK (NGK)
Spark plug gap
0.6 ~ 0.7 mm (0.0236 ~ 0.0276 in)

- Is the spark plug in good condition, is it of the correct type, and is its gap within specification?

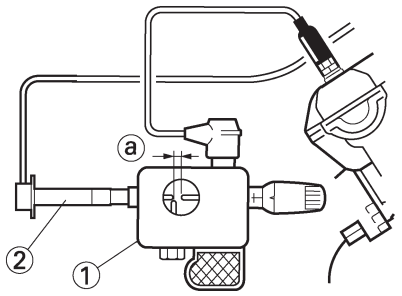
YES

NO → Re-gap or replace the spark plug.

EAS00743

4. Ignition spark gap

The following procedure applies to all of the spark plugs.
- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① and spark plug cap ② as shown.
- Set the main switch to "ON".
- Measure the ignition spark gap ⓐ.
- Crank the engine by pushing the starter switch and gradually increase the spark gap until a misfire occurs.



I8110202

Minimum ignition spark gap
6 mm (0.24 in)

- Is there a spark and is the spark gap within specification?

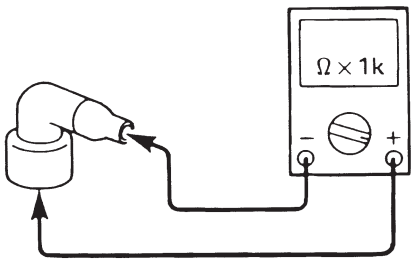
NO → The ignition system is OK.

YES

EAS00745

5. Spark plug cap resistance

The following procedure applies to all of the spark plug caps.
- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester (Ω × 1k) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



Spark plug cap resistance
10 kΩ at 20°C (68°F)

- Is the spark plug cap OK?

YES

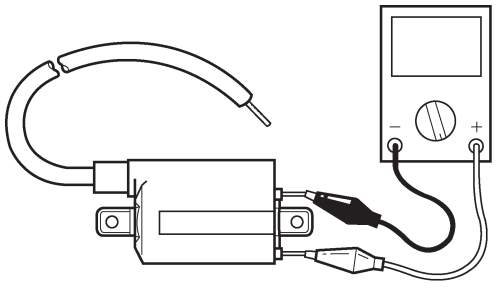
NO → Replace the spark plug cap.

EAS00747

6. Ignition coil resistance

The following procedure applies to all of the ignition coils.
- Disconnect the ignition coil leads from the wire harness.
- Connect the pocket tester (Ω × 1) to the ignition coil as shown.

Positive tester probe → red/black
Negative tester probe → orange/black (gray/black)



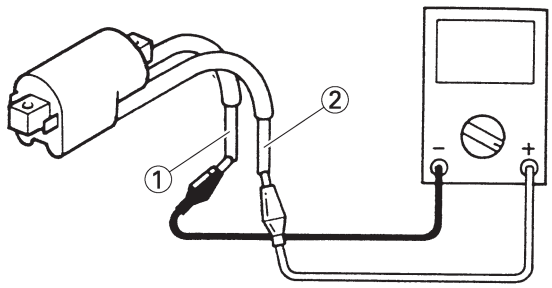
I8110104

- Measure the primary coil resistance.

Primary coil resistance
1.53 ~ 2.07 Ω at 20°C (68°F)

- Connect the pocket tester (Ω × 1k) to the ignition coil as shown.

Negative tester probe →
spark plug lead ①
Positive tester probe →
spark lug lead ②



• Measure the secondary coil resistance.

Secondary coil resistance
12 ~ 18 kΩ at 20°C (68°F)

• Is the ignition coil OK?

YES

NO

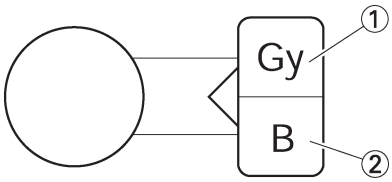
Replace the ignition coil.

EAS00748

7. Crankshaft position sensor resistance

• Disconnect the crankshaft position sensor coupler from the wire harness.
• Connect the pocket tester (Ω × 100) to the crankshaft position sensor coupler as shown.

Positive tester probe → gray ①
Negative tester probe → black ②



• Measure the crankshaft position sensor resistance.

Crankshaft position sensor resistance
248 ~ 372 Ω at 20°C (68°F)
(between gray and black)

• Is the crankshaft position sensor OK?

YES

NO

Replace the crankshaft position sensor.

EAS00749

8. Main switch

• Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
• Is the main switch OK?

YES

NO

Replace the main switch.

EAS00750

9. Engine stop switch

• Check the engine stop switch for continuity. Refer to “CHECKING THE SWITCHES”.
• Is the engine stop switch OK?

YES

NO

Replace the right handlebar switch.

EAS00751

10. Neutral switch

• Check the neutral switch for continuity. Refer to “CHECKING THE SWITCHES”.
• Is the neutral switch OK?

YES

NO

Replace the neutral switch.

EAS00752

11. Sidestand switch

- Check the sidestand switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the sidestand switch OK?

YES ⇩ NO ⇩

Replace the sidestand switch.

EAS00763

12. Clutch switch

- Check the clutch switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the clutch switch OK?

YES ⇩ NO ⇩

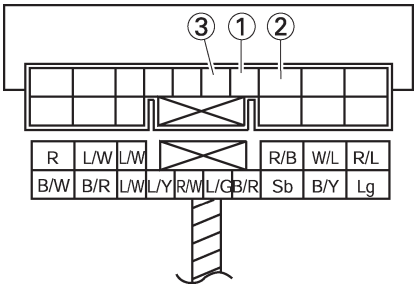
Replace the clutch switch.

EAS00753

13. Starting circuit cut-off relay (diode)

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the starting circuit cut-off relay coupler as shown.
- Check the starting circuit cut-off relay for continuity.

Positive tester probe → sky blue ② **Negative tester probe → black/red ①**	**Continuity**
Positive tester probe → black/red ① **Negative tester probe → blue/green ③**	
Positive tester probe → sky blue ② **Negative tester probe → black/red ①**	**No continuity**
Positive tester probe → blue/green ③ **Negative tester probe → black/red ①**	



NOTE:
When you switch the positive and negative tester probes, the readings in the above chart will be reversed.

- Are the tester readings correct?

YES ⇩ NO ⇩

Replace the starting circuit cut-off relay.

14. Lean angle cut-off switch

- Check the lean angle cut-off switch. Refer to “FUEL INJECTION SYSTEM” in chapter 7.
- Is the lean angle cut-off switch OK?

YES ⇩ NO ⇩

Replace the lean angle cut-off switch.

EAS00754

15. Wiring

- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?

YES

Replace the ECU.

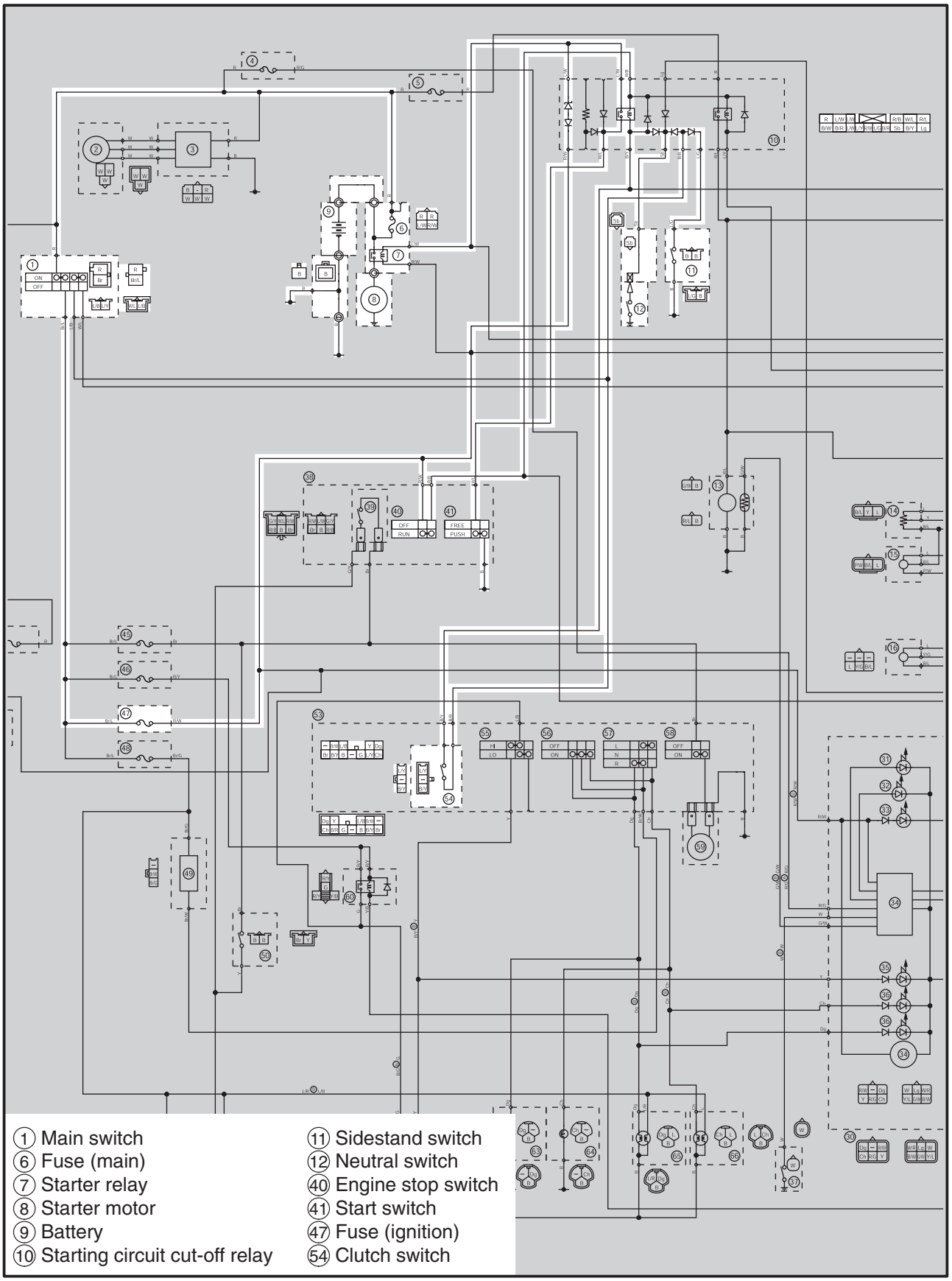
NO

Properly connect or repair the ignition system's wiring.

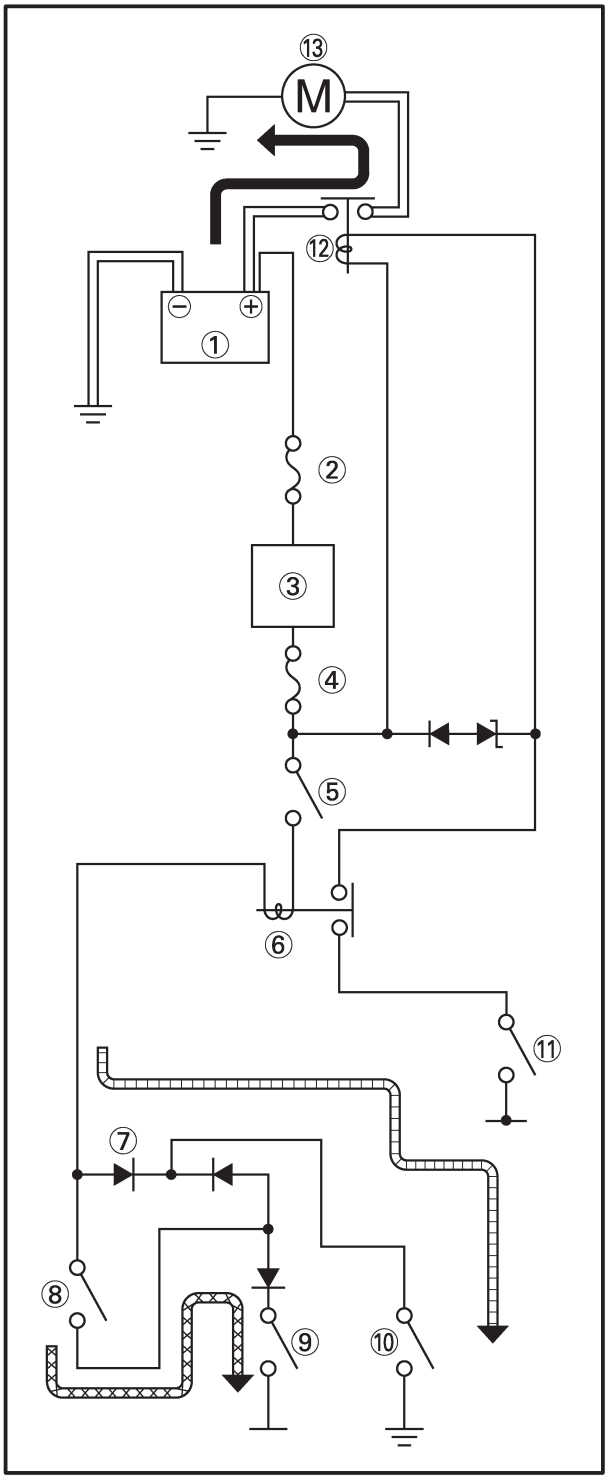
EAS00755

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM



① Main switch
⑥ Fuse (main)
⑦ Starter relay
⑧ Starter motor
⑨ Battery
⑩ Starting circuit cut-off relay
⑪ Sidestand switch
⑫ Neutral switch
㊵ Engine stop switch
㊶ Start switch
㊼ Fuse (ignition)
㊹ Clutch switch



EAS00756

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.

⟸ WHEN THE TRANSMISSION IS IN NEUTRAL

⟸ 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 Diode
⑧ Clutch switch
⑨ Sidestand switch
⑩ Neutral switch
⑪ Start switch
⑫ Starter relay
⑬ Starter motor

EAS00757
TROUBLESHOOTING

The starter motor fails to turn.

Check:
1. main and ignition fuses
2. battery
3. starter motor
4. starting circuit cut-off relay
5. starter relay
6. main switch
7. engine stop switch
8. neutral switch
9. sidestand switch
10. clutch switch
11. start switch
12. wiring connections (of the entire starting system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. seat
2. front cowling inner panel (left and right)
3. fuel tank
4. left side cover

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-3112

EAS00738
1. Main and ignition fuses
- Check the main and ignition fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the main and ignition fuses OK?

YES

NO → Replace the fuse(s).

EAS00739
2. Battery
- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

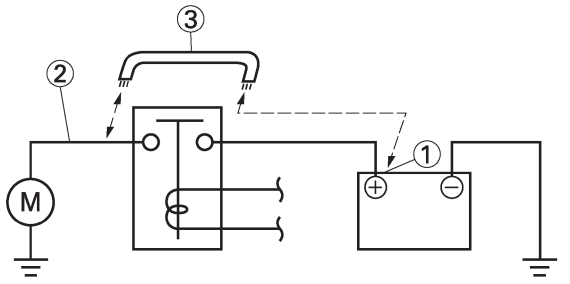
Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00758
3. Starter motor
- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.



18210801

⚠ WARNING
- **A wire that is used as a jumper lead must have at least the same capacity or more as that of the battery lead, otherwise the jumper lead may burn.**
- **This check is likely to produce sparks, therefore make sure nothing flammable is in the vicinity.**

- Does the starter motor turn?

YES

NO → Repair or replace the starter motor.

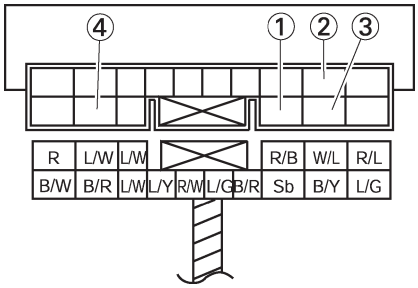
EAS00759

4. Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starting circuit cut-off relay coupler as shown.

Positive battery terminal → red/black ①
Negative battery terminal → black/yellow ②

Positive tester probe → white/blue ③
Negative tester probe → blue/white ④



- Does the starting circuit cut-off relay have continuity between white/blue and blue/white?

YES → Replace the starting circuit cut-off relay.

NO

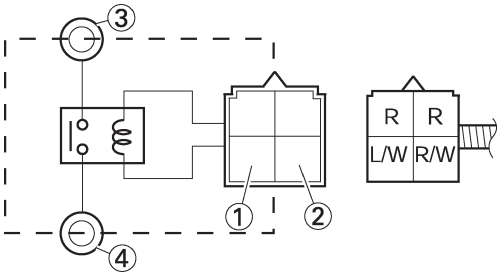
EAS00761

5. Starter relay

- Disconnect the starter relay coupler from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the starter relay coupler as shown.

Positive battery terminal → red/white ①
Negative battery terminal → blue/white ②

Positive tester probe → red ③
Negative tester probe → black ④



- Does the starter relay have continuity between red and black?

YES

NO → Replace the starter relay.

EAS00749

6. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES

NO → Replace the main switch.

EAS00750

7. Engine stop switch

- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the engine stop switch OK?

YES

NO → Replace the right handlebar switch.

EAS00751

8. Neutral switch

- Check the neutral switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

YES

NO → Replace the neutral switch.

EAS00752

9. Sidestand switch

- Check the sidestand switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the sidestand switch OK?

YES

NO → Replace the sidestand switch.

EAS00763

10. Clutch switch

- Check the clutch switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the clutch switch OK?

YES

NO → Replace the clutch switch.

EAS00764

11. Start switch

- Check the start switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the start switch OK?

YES

NO → Replace the right handlebar switch.

EAS00766

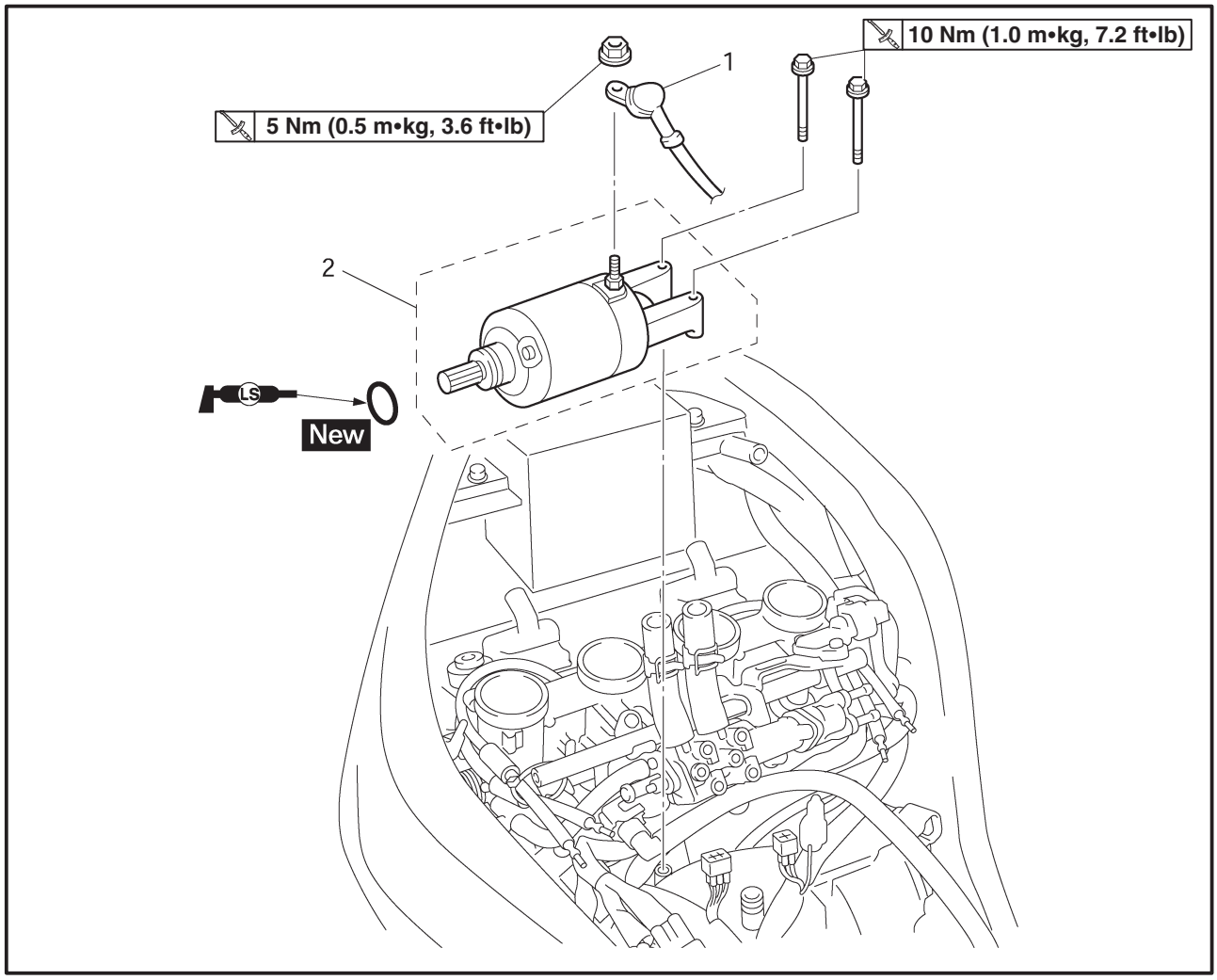
12. Wiring

- Check the entire starting system’s wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the starting system’s wiring properly connected and without defects?

YES → The starting system circuit is OK.

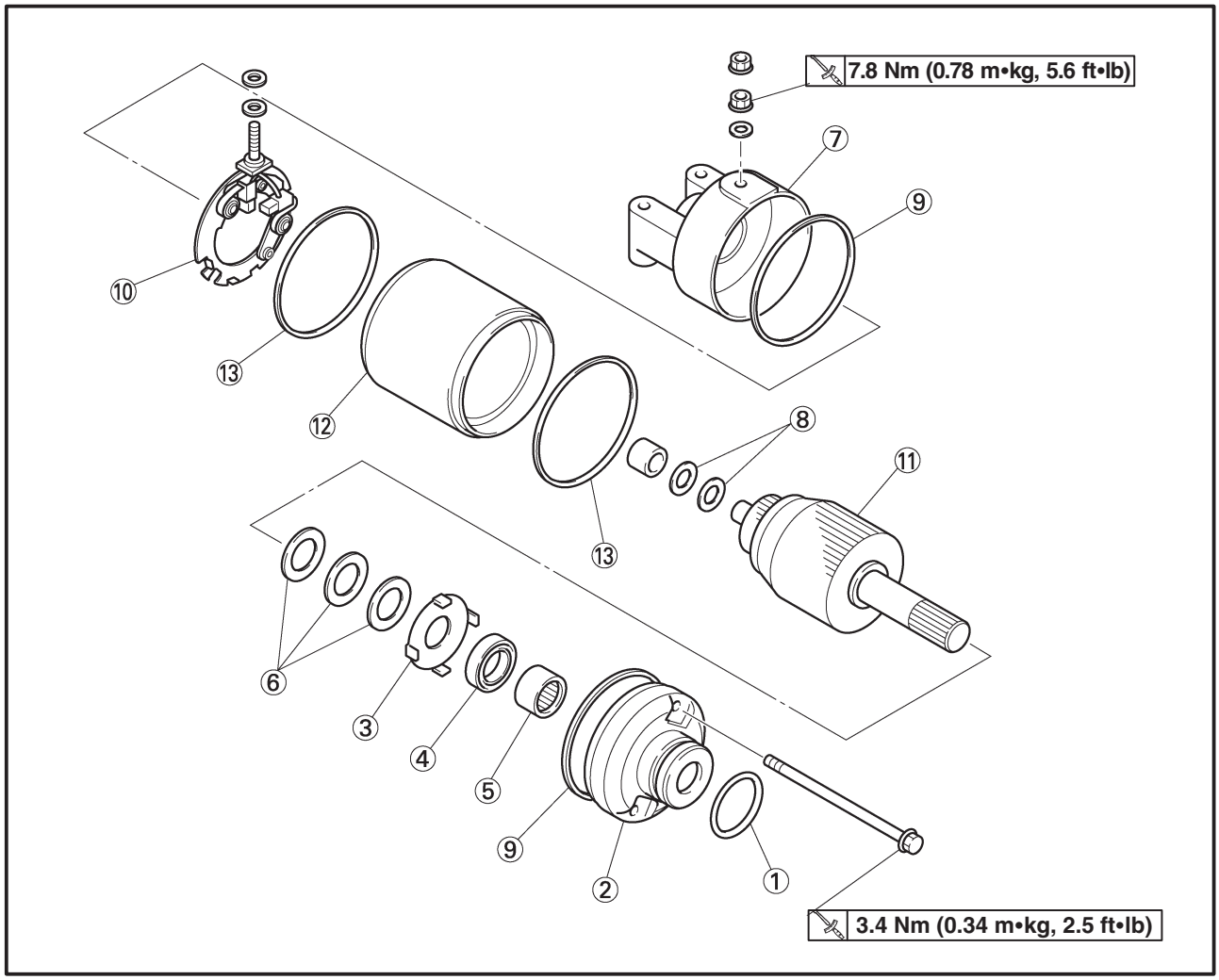
NO → Properly connect or repair the starting system’s wiring.

EAS00767
STARTER MOTOR

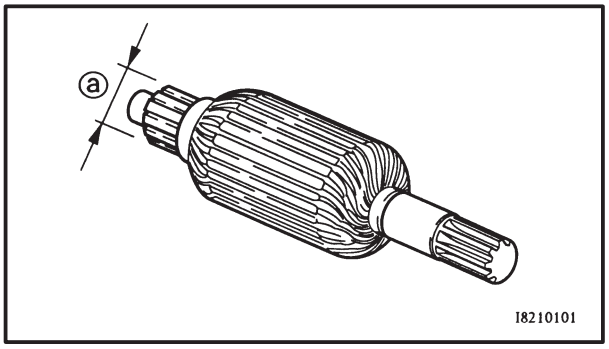


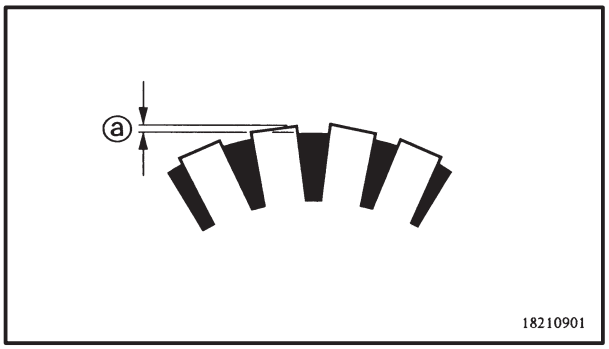
Order	Job/Part	Q'ty	Remarks
	Removing the starter motor		Remove the parts in the order listed.
	Seat		Refer to "SEAT" in chapter 3.
	Front cowling inner panel (left and right)		Refer to "COWLINGS" in chapter 3.
	Fuel tank		Refer to "FUEL TANK" in chapter 3.
	Throttle bodies		Refer to "THROTTLE BODIES" in chapter 7.
1	Starter motor lead	1	
2	Starter motor	1	
			For installation, reverse the removal procedure.

EAS00768



Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Disassembly the parts in the order listed.
①	O-ring	1	
②	Front cover	1	
③	Lock washer	1	
④	Oil seal	1	
⑤	Bearing	1	
⑥	Washer set	1	
⑦	Rear cover	1	
⑧	Washer set	1	
⑨	O-ring	2	
⑩	Brush holder	1	
⑪	Armature assembly	1	
⑫	Starter motor yoke	1	
⑬	O-ring	2	
			For assembly, reverse the disassembly procedure.





EAS00770
CHECKING THE STARTER MOTOR

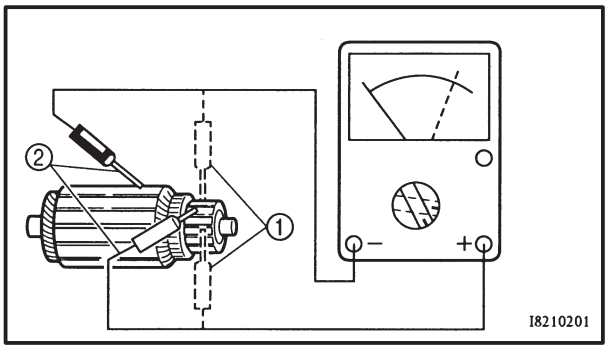
1. Check:
   • commutator
   Dirt → Clean with 600 grit sandpaper.
2. Measure:
   • commutator diameter ⓐ
   Out of specification → Replace the starter motor.

Commutator wear limit
27 mm (1.06 in)

3. Measure:
   • mica undercut ⓐ
   Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.

Mica undercut
0.7 mm (0.03 in)

NOTE:
The mica of the commutator must be undercut to ensure proper operation of the commutator.



4. Measure:
   • armature assembly resistances (commutator and insulation)
   Out of specification → Replace the starter motor.

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

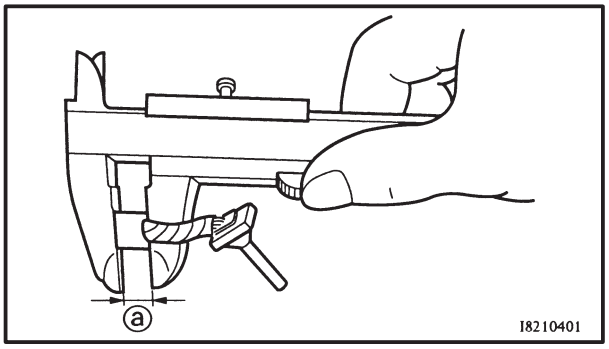
a. Measure the armature assembly resistances with the pocket tester.

Pocket tester
90890-03112, YU-3112

Armature coil
Commutator resistance ①
0.0012 ~ 0.0022 Ω
at 20°C (68°F)
Insulation resistance ②
Above 1 MΩ at 20°C (68°F)

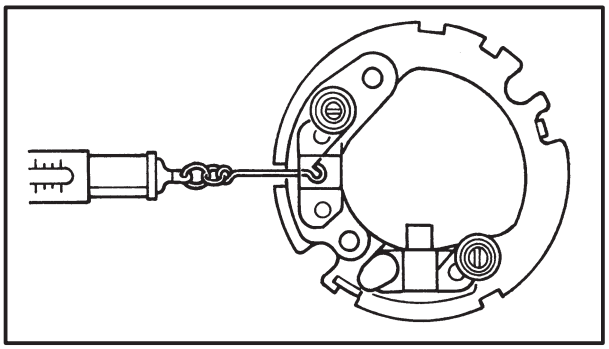
b. If any resistance is out of specification, replace the starter motor.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲



5. Measure:
   • brush length ⓐ.
   Out of specification → Replace the brushes as a set.

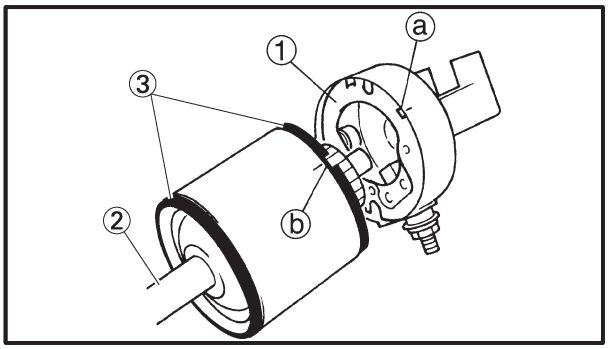
Brush length wear limit
3.5 mm (0.14 in)



6. Measure:
   • brush spring force
   Out of specification → Replace the brush springs as a set.

Brush spring force
7.16 ~ 9.52 N
(730 ~ 971 gf, 25.77 ~ 34.27 oz)

7. Check:
   • gear teeth
   Damage/wear → Replace the gear.
8. Check:
   • bearing
   • oil seal
   Damage/wear → Replace the defective part(s).

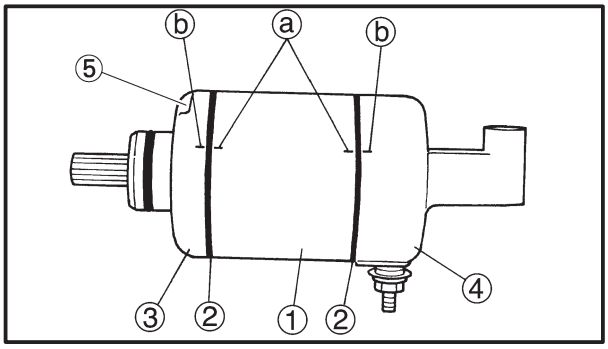


EAS00772
ASSEMBLING THE STARTER MOTOR

1. Install:
   • brush seat ①
2. Install:
   • armature ②
   • O-ring ③ New

NOTE:

Align the tab ⓐ on the brush seat with the slot ⓑ in the starter motor rear cover.



3. Install:
   - starter motor yoke ①
   - O-ring ② New
   - front cover ③
   - rear cover ④
   - bolts ⑤

3.4 Nm (0.34 m•kg, 2.5 ft•lb)

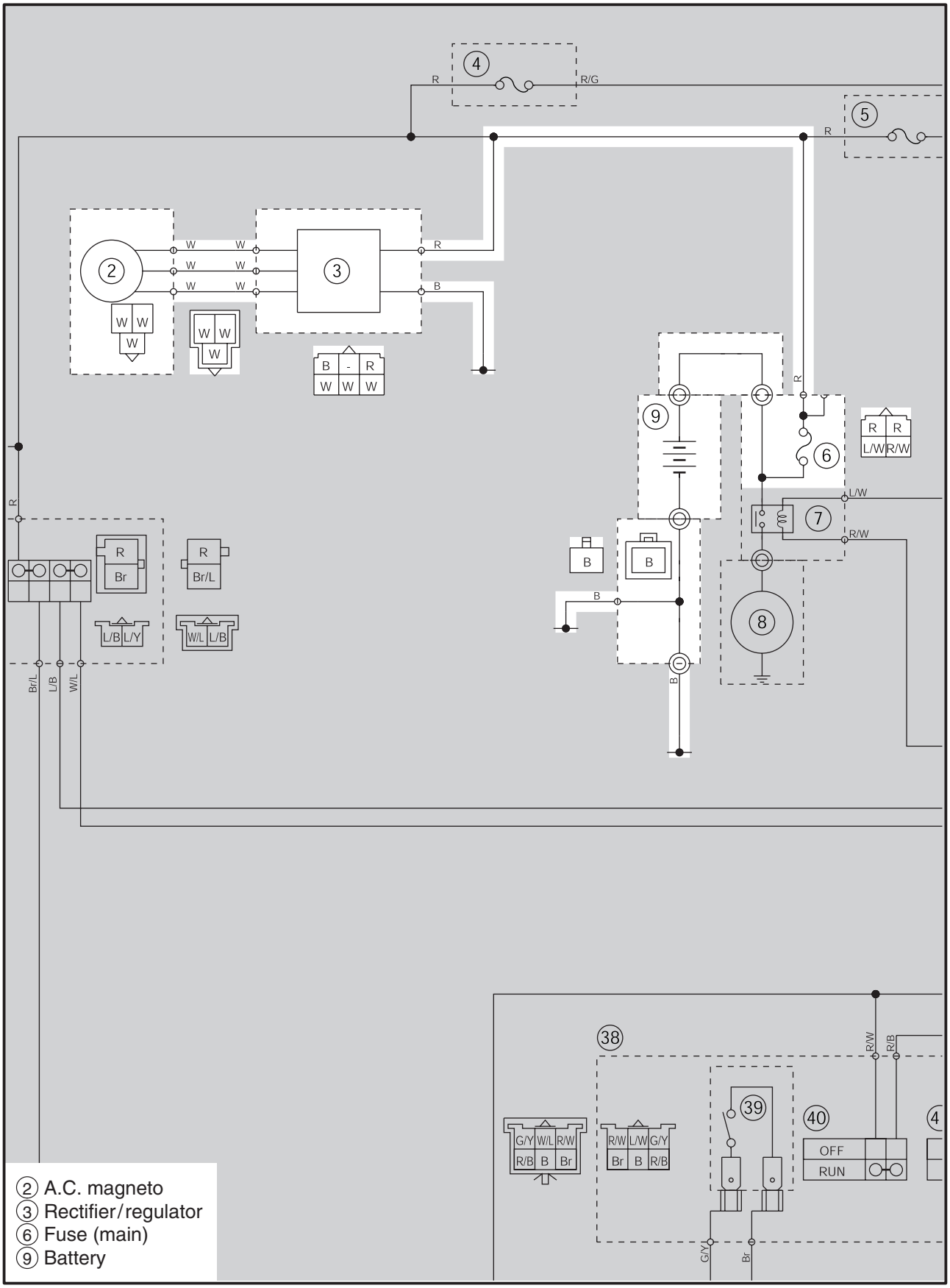
NOTE:

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

EAS00773

CHARGING SYSTEM

CIRCUIT DIAGRAM



EAS00774
TROUBLESHOOTING

The battery is not being charged.

Check:
1. main fuse
2. battery
3. charging voltage
4. stator coil lead
5. stator coil resistance
6. wiring connections
   (of the entire charging system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. seat
2. front cowling inner panel (left and right)
3. fuel tank

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-3112

EAS00738
1. Main fuse

- Check the main fuse for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Is the main fuse OK?

YES

NO → Replace the fuse.

EAS00739
2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

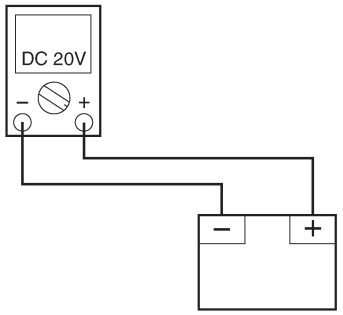
YES

NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00775
3. Charging voltage

- Set the engine tachometer to the ignition coil of cylinder #1.
- Connect the pocket tester (DC 20 V) to the battery as shown.

Positive tester probe → positive battery terminal
Negative tester probe → negative battery terminal



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.

Charging voltage
14 V at 5,000 r/min

NOTE:
Make sure the battery is fully charged.

- Is the charging voltage within specification?

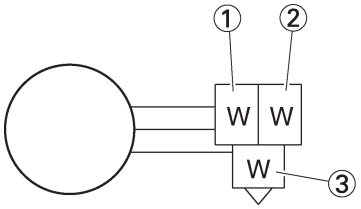
NO

YES → The charging circuit is OK.

4. Stator coil lead

- Disconnect stator coil lead coupler.
- Connect the pocket tester (Ω × 1) to the stator coil lead coupler as shown.

Positive tester probe → white ① **Negative tester probe → ground**	**No continuity**
Positive tester probe → white ② **Negative tester probe → ground**	
Positive tester probe → white ③ **Negative tester probe → ground**	



- Are the tester readings correct?

YES → NO

Replace the stator coil lead.

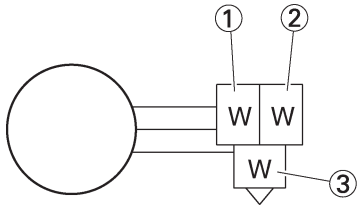
EAS00776

5. Stator coil resistance

- Remove the generator cover.
- Connect the pocket tester (Ω × 1) to the stator coils as shown.

Positive tester probe → white ①
Negative tester probe → white ②

Positive tester probe → white ①
Negative tester probe → white ③



- Measure the stator coil resistances.

Stator coil resistance
0.22 ~ 0.34 Ω at 20°C (68°F)

- Is the stator coil OK?

YES → NO

Replace the stator coil assembly.

EAS00779

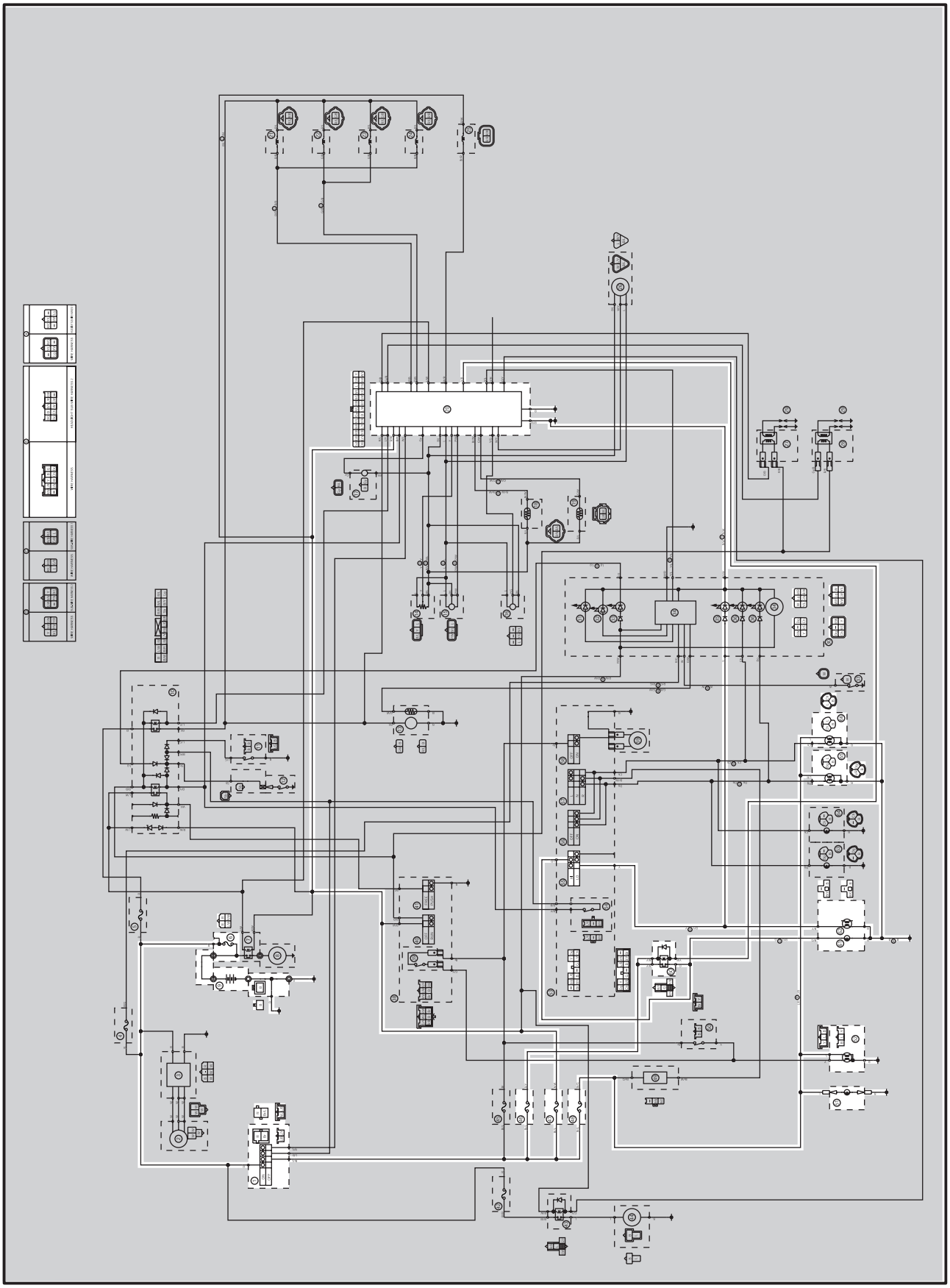
6. Wiring

- Check the wiring connections of the entire charging system.
  Refer to "CIRCUIT DIAGRAM".
- Is the charging system's wiring properly connected and without defects?

YES → Replace the rectifier/regulator.

NO → Properly connect or repair the charging system's wiring.

EAS00780
LIGHTING SYSTEM
CIRCUIT DIAGRAM



① Main switch
⑥ Fuse (main)
⑨ Battery
⑳ ECU
㉟ High beam indicator light
㊻ Fuse (headlight)
㊼ Fuse (ignition)
㊽ Fuse (tail)
㊶ License plate light
㊷ Tail/brake light
㊺ Dimmer switch
㊵ Dimmer relay
㊶ Headlight (high beam)
㊷ Headlight (low beam)
㊺ Front turn signal/position light (right)
㊻ Front turn signal/position light (left)

EAS00781
TROUBLESHOOTING

Any of the following fail to light: headlight, high beam indicator light, taillight, licence light or meter light.

Check:
1. main, tail, ignition and headlight fuses
2. battery
3. main switch
4. dimmer switch
5. dimmer relay
6. wiring connections
   (of the entire lighting system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. seat
2. front cowling inner panel (left and right)
3. fuel tank
4. side cover

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-3112

EAS00738
1. Main, headlight, ignition and tail fuses

- Check the main, tail, ignition and headlight fuses for continuity.
  Refer to “CHECKING THE FUSES” in chapter 3.
- Are the main, tail, ignition and headlight fuses OK?

YES ⇩ NO ⇩

Replace the fuse(s).

EAS00739
2. Battery

- Check the condition of the battery.
  Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

YES ⇩ NO ⇩

- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749
3. Main switch

- Check the main switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

YES ⇩ NO ⇩

Replace the main switch.

EAS00784
4. Dimmer switch

- Check the dimmer switch for continuity.
  Refer to “CHECKING THE SWITCHES”.
- Is the dimmer switch OK?

YES ⇩ NO ⇩

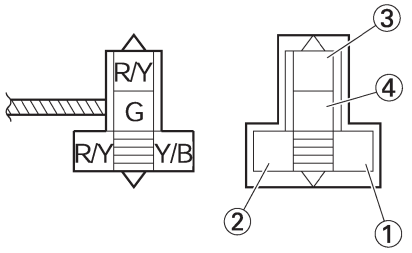
The dimmer switch is faulty. Replace the left handlebar switch.

5. Dimmer relay

- Disconnect the dimmer relay from the coupler.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the dimmer relay as shown.

Positive battery lead → red/yellow ①
Negative battery lead → yellow/black ②

Positive tester probe → red/yellow ③
Negative tester probe → green ④



- Does the dimmer relay have continuity between red/yellow and green?

YES

NO

Replace the dimmer relay.

EAS00787

6. Wiring

- Check the entire lighting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the lighting system's wiring properly connected and without defects?

YES

NO

Check the condition of each of the lighting system's circuits. Refer to "CHECKING THE LIGHTING SYSTEM".

Properly connect or repair the lighting system's wiring.

EAS00788
CHECKING THE LIGHTING SYSTEM

1. The headlight and the high beam indicator light fail to come on.

1. Headlight bulb and socket

- Check the headlight bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the headlight bulb and socket OK?

YES

NO

Replace the headlight bulb, socket or both.

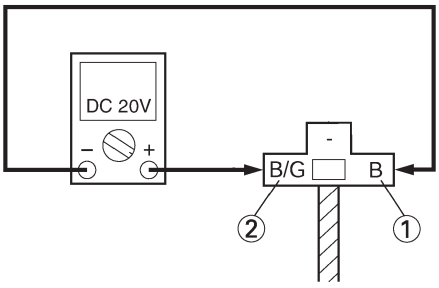
2. Voltage

- Connect the pocket tester (DC 20 V) to the headlight and meter assembly couplers as shown.

A When the dimmer switch is set to " ≣D "
B When the dimmer switch is set to " ≣D "

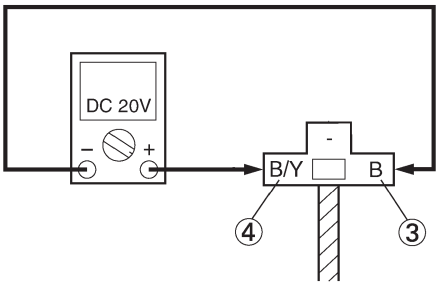
Headlight
Positive tester probe → black ①
Negative tester probe → black/green ②

Headlight coupler (wire harness side)
A Low beam



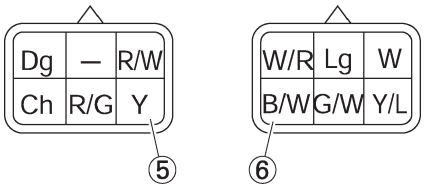
Headlight
Positive tester probe → black ③
Negative tester probe → black/yellow ④

Headlight coupler (wire harness side)
B High beam



High beam indicator light (LEDs)
Positive tester probe → yellow ⑤
Negative tester probe → black/white ⑥

Meter assembly coupler (wire harness side)



- Turn the main switch to "ON".
- Start the engine.
- Set the dimmer switch to " ≣D " or " ≣D ".
- Measure the voltage (DC 12 V) of black/green ② or black/yellow ④ on the headlight coupler (wire harness side).
- Is the voltage within specification?

YES

NO

This circuit is OK.

The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.

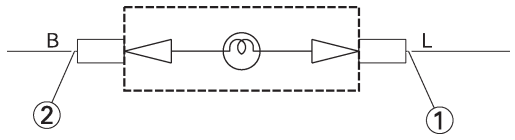
EAS00792
2. The license plate light fails to come on.

1. License plate light bulb and socket
• Check the license plate light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”. • Are the license plate light bulb and socket OK?

YES

NO

Replace the license plate light bulb, socket or both.

2. Voltage
• Connect the pocket tester (DC 20 V) to the license plate light coupler (wire harness light side) as shown.
Positive tester probe → blue ① **Negative tester probe → black ②**

• Turn the main switch to “ON”. • Measure the voltage (DC 12 V) of blue ① on the license plate light coupler (wire harness side). • Is the voltage within specification?

YES

NO

This circuit is OK.

The wiring circuit from the main switch to the license plate light coupler is faulty and must be repaired.

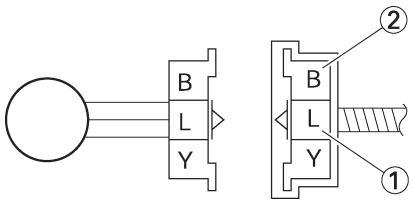
EAS00790
3. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket
- Check the tail/brake light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the tail/brake light bulb and socket OK?

YES
NO → Replace the tail/brake light bulb, socket or both.

2. Voltage
- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → blue ①
Negative tester probe → black ②



- Turn the main switch to "ON".
- Measure the voltage (DC 12 V) of blue ② on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.
NO → Wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00791
4. The turn signal/position light fails to come on.

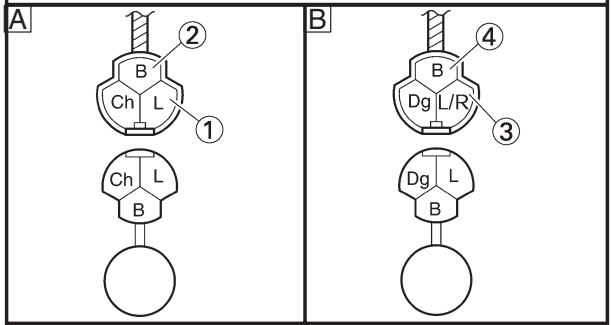
1. Turn signal/position light and socket
- Check the turn signal/position light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the turn signal/position light bulb and socket OK?

YES
NO → Replace the turn signal/position light bulb, socket or both.

2. Voltage
- Connect the pocket tester (DC 20 V) to the turn signal/position light coupler (wire harness side) as shown.

A Left turn signal/position light
B Right turn signal/position light

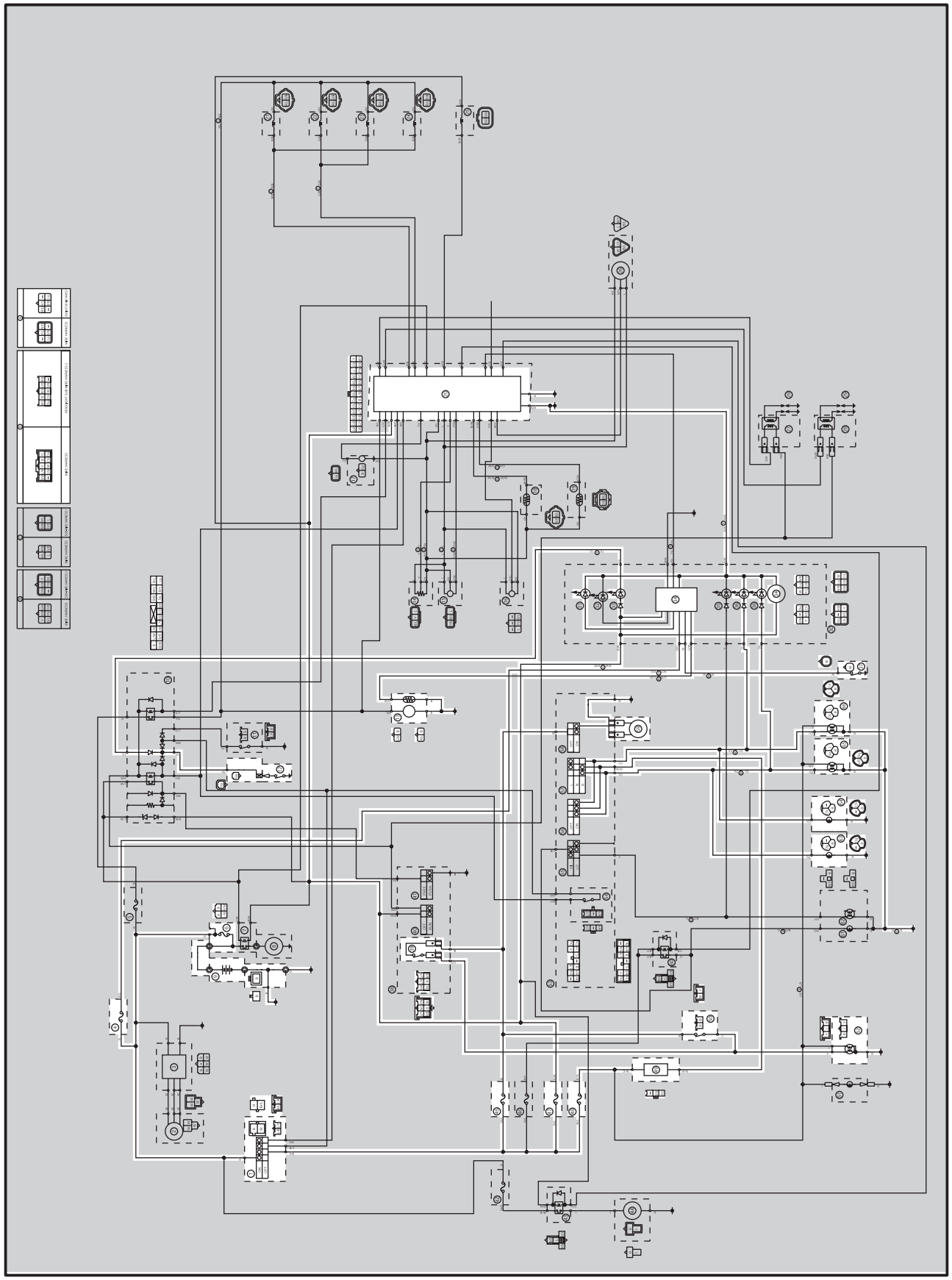
Left turn signal/position light
Positive tester probe → blue ①
Negative tester probe → black ②
Right turn signal/position light
Positive tester probe → blue/red ③
Negative tester probe → black ④



- Turn the main switch to "ON".
- Measure the voltage (DC 12 V) of blue ① or blue/red ③ on the turn signal/position light coupler (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.
NO → The wiring circuit from the main switch to the turn signal/position light coupler is faulty and must be repaired.

EAS00793
SIGNALING SYSTEM
CIRCUIT DIAGRAM



① Main switch
④ Fuse (backup)
⑥ Fuse (main)
⑨ Battery
⑩ Starting circuit cut-off relay
⑫ Neutral switch
⑬ Fuel pump
⑳ ECU
㉛ Oil level waning light
㉝ Neutral indicator light
㉞ Multi-function meter
㊱ Turn signal indicator light
㊲ Oil level switch
㊴ Front brake light switch
㊺ Fuse (signal)
㊼ Fuse (ignition)
㊽ Fuse (tail)
㊾ Turn signal relay
㊿ Rear brake light switch
(52) Tail/brake light
(56) Hazard switch
(57) Turn signal switch
(58) Horn switch
(59) Horn
(63) Rear turn signal light (right)
(64) Rear turn signal light (left)
(65) Front turn signal/position light (right)
(66) Front turn signal/position light (left)

EAS00794
TROUBLESHOOTING

• Any of the following fail to light: turn signal light, brake light or an indicator light.
• The horn fails to sound.

Check:
1. backup, main, ignition, signal, and tail fuses
2. battery
3. main switch
4. wiring connections
   (of the entire signaling system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. seat
2. front cowling inner panel (left and right)
3. fuel tank
4. side cover

- Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-3112

EAS00738
1. Backup, main, ignition, signal and tail fuses

- Check the backup, main, ignition, signal and tail fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.
- Are the backup, main, ignition, signal and tail fuses OK?

YES → NO: Replace the fuse(s).

EAS00739
2. Battery

- Check the condition of the battery.
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

YES → NO:
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749
3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the main switch OK?

YES → NO: Replace the main switch.

EAS00795
4. Wiring

- Check the entire signaling system's wiring.
  Refer to "CIRCUIT DIAGRAM".
- Is the signaling system's wiring properly connected and without defects?

YES: Check the condition of each of the signaling system's circuits. Refer to "CHECKING THE LIGHTING SYSTEM".
NO: Properly connect or repair the signaling system's wiring.

EAS00796
CHECKING THE SIGNALING SYSTEM
1. The horn fails to sound.

1. Horn switch

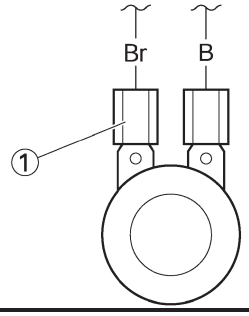
- Check the horn switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the horn switch OK?

YES → NO: Replace the left handlebar switch.

2. Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.

Negative tester probe → ground
Positive tester probe → black/white ①



- Turn the main switch to "ON".
- Push the horn switch.
- Measure the voltage (DC 12 V) of black/white at the horn terminal.
- Is the voltage within specification?

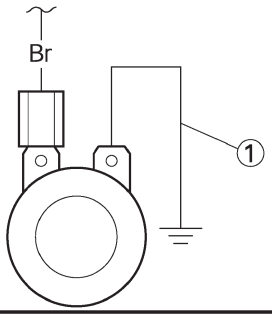
YES

The wiring circuit from the main switch to the horn connector is faulty and must be repaired.

NO

3. Horn

- Disconnect the black connector at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Turn the main switch to "ON".
- Push the horn switch.
- Does the horn sound?



YES

The horn is OK.

NO

Replace the horn.

EAS00797
2. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket

- Check the tail/brake light bulb and socket for continuity.
  Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the tail/brake light bulb and socket OK?

YES

NO

Replace the tail/brake light bulb, socket or both.

2. Brake light switches

- Check the brake light switches for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the brake light switch OK?

YES

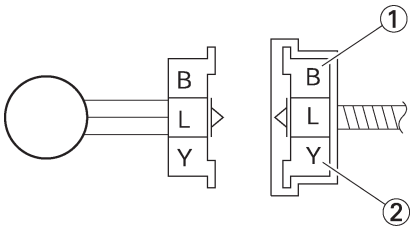
NO

Replace the brake light switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Negative tester probe → black ①
Positive tester probe → yellow ②



- Turn the main switch to "ON".
- Pull in the brake lever or push down on the brake pedal.
- Measure the voltage (DC 12 V) of yellow ② on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00799

3. The turn signal/position light, turn signal indicator light or both fail to blink.

1. Turn signal indicator light (LEDs)

- Check the turn signal indicator light for continuity.
  Refer to "CHECKING THE LEDs".
- Are the turn signal indicator light OK?

YES

NO

Replace the meter assembly.

2. Turn signal switch

- Check the turn signal switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the turn signal switch OK?

YES

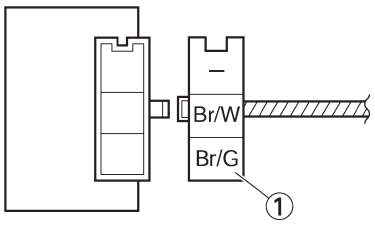
NO

Replace the left handlebar switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Negative tester probe → ground
Positive tester probe → brown/green ①



- Turn the main switch to "ON".
- Measure the voltage (DC 12 V) on brown/green ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES

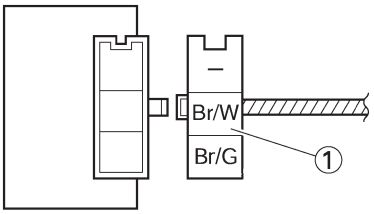
NO

The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

4. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → ground
Negative tester probe → brown/white ①



- Turn the main switch to "ON".
- Measure the voltage (DC 12 V) on brown/white ① at the turn signal relay coupler (wire harness side).
- Is the voltage within specification?

YES

NO

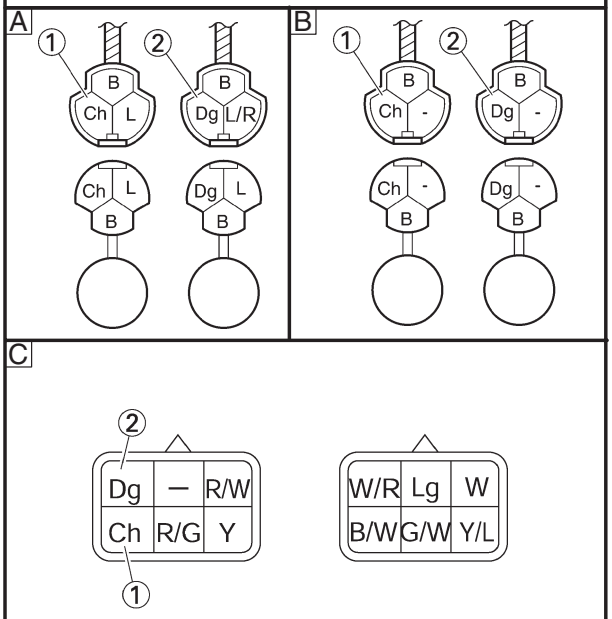
The turn signal relay is faulty and must be replaced.

5. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal/position light connector or meter assembly coupler (wire harness side) as shown.

A Front turn signal/position light
B Rear turn/signal light
C Turn signal indicator light

Left turn signal/position light
Positive tester probe → ground
Negative tester probe → chocolate ①
Right turn signal/position light
Positive tester probe → ground
Negative tester probe → dark green ②



- Turn the main switch to "ON".
- Set the turn signal switch to "⇦" or "⇨".
- Measure the voltage (DC 12 V) of the chocolate ① or dark green ② at the turn signal light connector (wire harness side).
- Is the voltage within specification?

YES → This circuit is OK.

NO → The wiring circuit from the turn signal switch to the turn signal light connector is faulty and must be repaired.

EAS00801

4. The neutral indicator light fails to come on.

1. Neutral indicator light (LEDs)

- Check the neutral indicator light for continuity.
  Refer to "CHECKING THE LEDs".
- Are the neutral indicator light OK?

YES → NO → Replace the meter assembly.

2. Neutral switch

- Check the neutral switch for continuity.
  Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

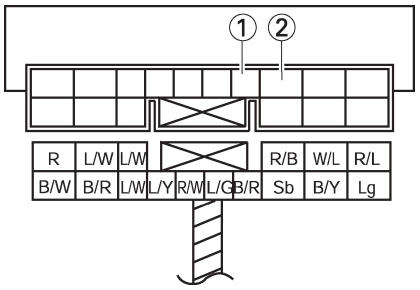
YES → NO → Replace the neutral switch.

EAS00753

3. Starting circuit cut-off relay (diode)

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the starting circuit cut-off relay coupler as shown.
- Check the starting circuit cut-off relay for continuity.

Positive tester probe → black/red ① **Negative tester probe → sky blue ②**	**Continuity**
Positive tester probe → sky blue ② **Negative tester probe → black/red ①**	**No continuity**



NOTE:
When you switch the positive and negative tester probes, the readings in the above chart will be reversed.

• Are the tester readings correct?

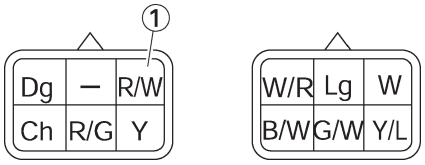
YES ⇩ NO ⇩

Replace the starting circuit cut-off relay.

4. Voltage

• Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Negative tester probe → ground
Positive tester probe → red/white ①



• Turn the main switch to "ON".
• Measure the voltage (DC 12 V) of red/white at the meter assembly coupler (wire harness side).
• Is the voltage within specification?

YES ⇩ NO ⇩

This circuit is OK.

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EAS00802

5. The oil level warning light fails to come on.

1. Oil level warning light (LEDs)

• Check the oil level warning light for continuity.
When the main switch is turn to "ON", the oil level warning light is come on.
• Are the oil level warning light OK?

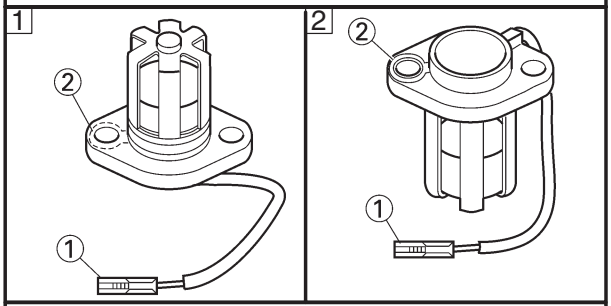
YES ⇩ NO ⇩

Replace the meter assembly.

2. Oil level switch

• Drain the engine oil and remove the oil level switch from the oil pan.
• Connect the pocket tester (Ω × 100) to the oil level switch as shown.

Positive tester probe →
Connector ① (white)
Negative tester probe → Body ground ②



• Measure the oil level switch resistance.

Oil level switch resistance
1 114 ~ 126 Ω at 20°C (68°F)
2 484 ~ 536 Ω at 20°C (68°F)

• Is the oil level switch OK?

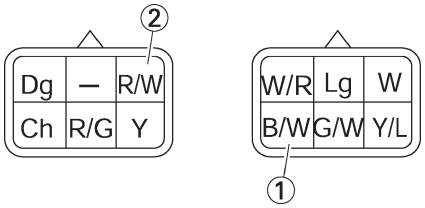
YES ⇩ NO ⇩

Replace the oil level switch.

3. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Positive tester probe → black/white ①
Negative tester probe → red/white ②



- Turn the main switch to "ON".
- Measure the voltage (DC 12V) of black/white ① and red/white ② at the meter assembly coupler.
- Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the meter assembly is faulty and must be repaired.

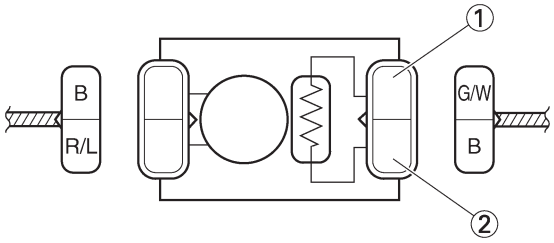
EAS00803

6. The fuel level warning light fails to come on.

1. Fuel sender

- Drain the fuel from the fuel tank and remove the fuel pump from the fuel tank.
- Disconnect the fuel sender coupler from the wire harness.
- Connect the pocket tester (Ω × 10) to the fuel sender terminals as shown.

Tester positive probe → green/white ①
Tester negative probe → black ②



- Measure the fuel sender resistances.

NOTE:

Measure the resistances when the float arm is in contact with the full position and empty position of the stopper.

Fuel sender resistance
Full position of the float
20 ~ 26 Ω at 20°C (68°F)
Empty position of the float
134 ~ 140 Ω at 20°C (68°F)

- Is the fuel sender OK?

YES

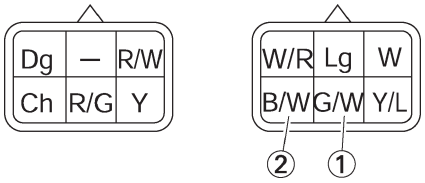
NO

Replace the fuel pump.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

Positive tester probe → green/white ①
Negative tester probe → black/white ②



- Turn the main switch to "ON".
- Measure the voltage (DC 12 V) of green/white ① and black/white ② at the meter assembly coupler.
- Is the voltage within specification?

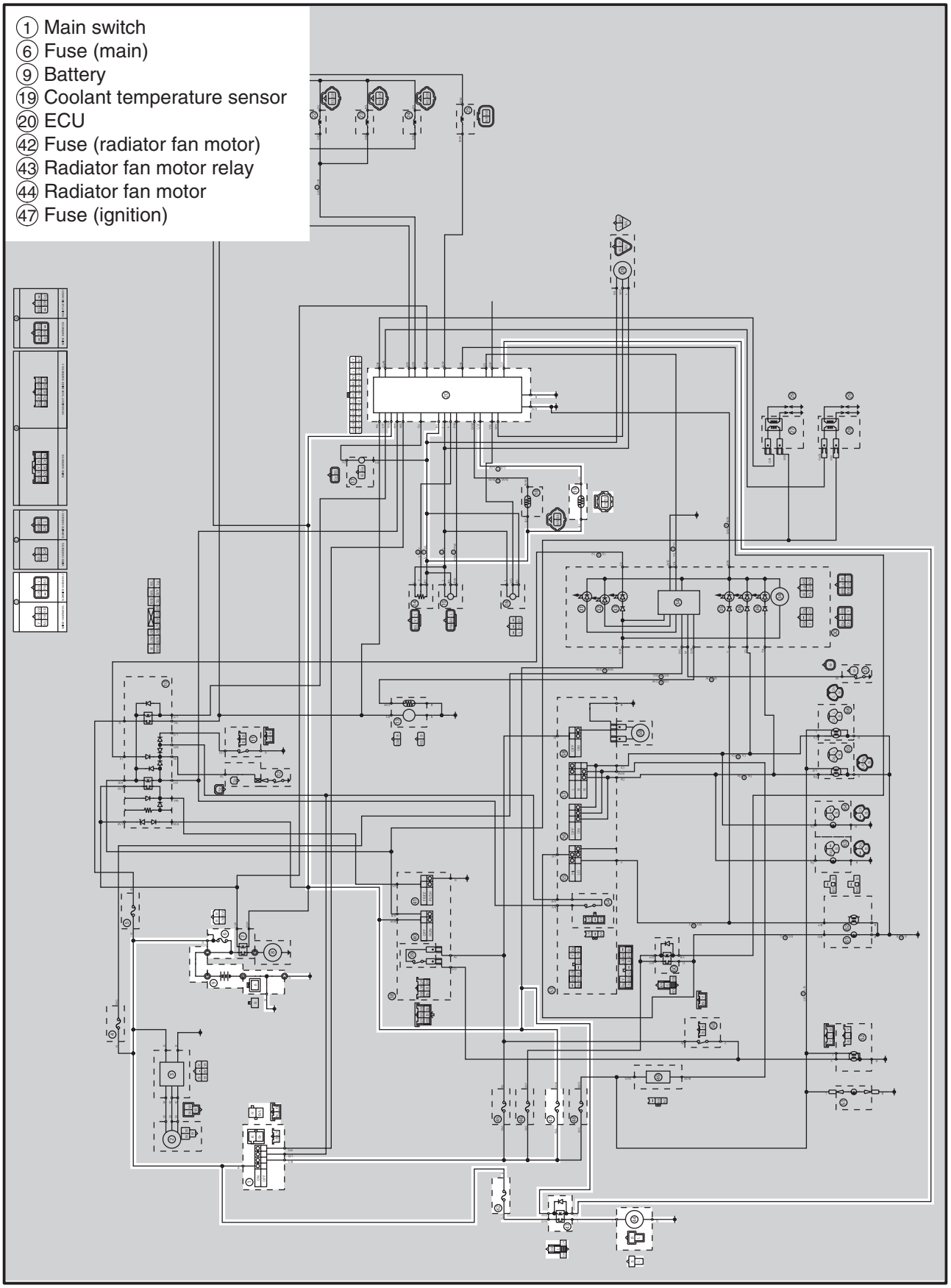
YES

This circuit is OK.

NO

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.

EAS00807
COOLING SYSTEM
CIRCUIT DIAGRAM



EAS00808
TROUBLESHOOTING

• The radiator fan motor fails to turn.
• The coolant temperature indicator light fails to light when the engine is warm.

Check:
1. main, ignition, and radiator fan motor fuses
2. battery
3. main switch
4. radiator fan motor
5. radiator fan motor relay
6. coolant temperature sensor
7. wiring connections
   (the entire cooling system)

NOTE:
• Before troubleshooting, remove the following part(s):
1. seat
2. front cowling inner panel (left and right)
3. fuel tank
4. side cover

• Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-3112

EAS00738
1. Main, ignition and radiator fan motor fuses

• Check the main, ignition and radiator fan motor fuses for continuity.
Refer to “CHECKING THE FUSES” in chapter 3.
• Are the main, ignition and radiator fan motor fuses OK?

YES

NO

Replace the fuse(s).

EAS00739
2. Battery

• Check the condition of the battery.
Refer to “CHECKING AND CHARGING THE BATTERY” in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

• Is the battery OK?

YES

NO

• Clean the battery terminals.
• Recharge or replace the battery.

EAS00749
3. Main switch

• Check the main switch for continuity.
Refer to “CHECKING THE SWITCHES”.
• Is the main switch OK?

YES

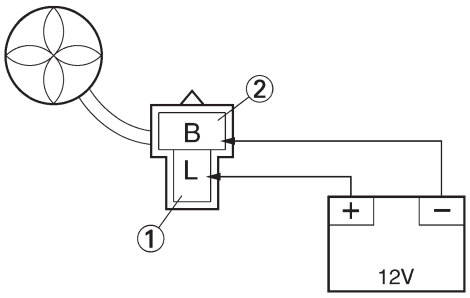
NO

Replace the main switch.

EAS00809

4. Radiator fan motor

- Disconnect the radiator fan motor coupler from the wire harness.
- Connect the battery (DC 12 V) as shown.



Positive battery lead → blue ①
Negative battery lead → black ②

- Does the radiator fan motor turn?

YES

NO

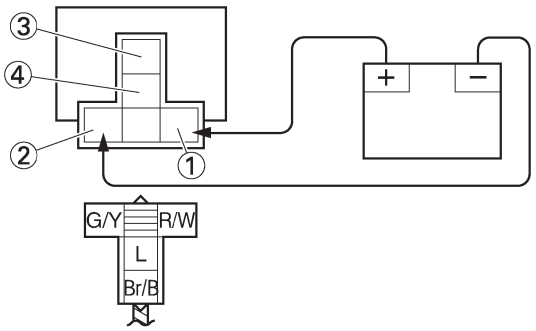
The radiator fan motor is faulty and must be replaced.

5. Radiator fan motor relay

- Disconnect the radiator fan motor relay form the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12 V) to the radiator fan motor terminal as shown.
- Check the radiator fan motor for continuity.

Battery positive terminal → red/white ①
Battery negative terminal → green/yellow ②

Tester positive probe → brown/black ③
Tester negative probe → blue ④



- Does the radiator fan motor relay have continuity between brown/black and blue?

YES

NO

Replace the radiator fan motor.

EAS00812

6. Coolant temperature sensor

- Remove the coolant temperature sensor.
- Connect the pocket tester (Ω × 1k) to the coolant temperature sensor ① as shown.
- Immerse the coolant temperature sensor in a container filled with coolant ②.

NOTE:
Make sure the coolant temperature sensor terminals do not get wet.

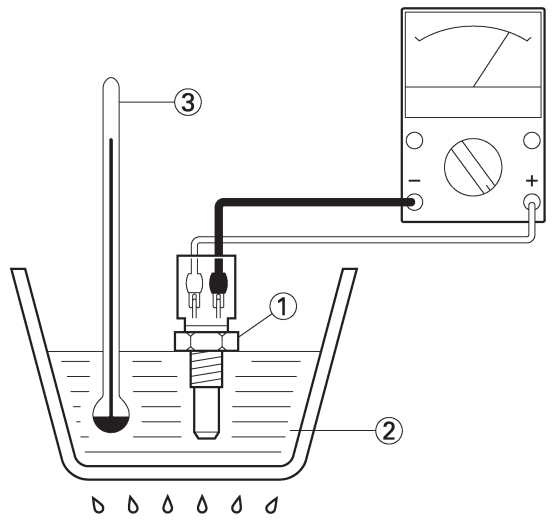
- Place a thermometer ③ in the coolant.
- Slowly heat the coolant, and then let it cool to the specified temperature indicated in the table.
- Check the coolant temperature sensor for continuity at the temperatures indicated in the table.

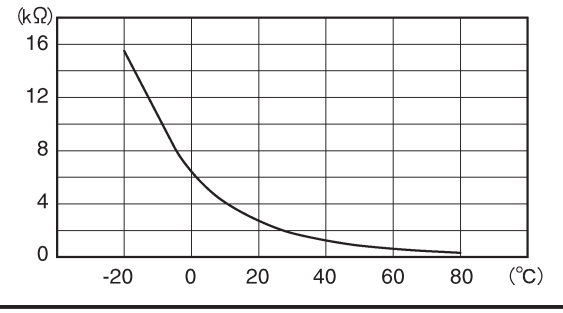
Coolant temperature sensor resistance
0°C (32°F): 5.21 ~ 6.37 kΩ
80°C (176°F): 0.29 ~ 0.35 kΩ

⚠ 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.**

Coolant temperature sensor
20 Nm (2.0 m•kg, 14 ft•lb)
Three bond sealock® 10





- Does the coolant temperature sensor operate properly?

YES → This circuit is OK.

NO → Replace the coolant temperature sensor.

EAS00813

7. Wiring

- Check the entire cooling system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the cooling system's wiring properly connected and without defects?

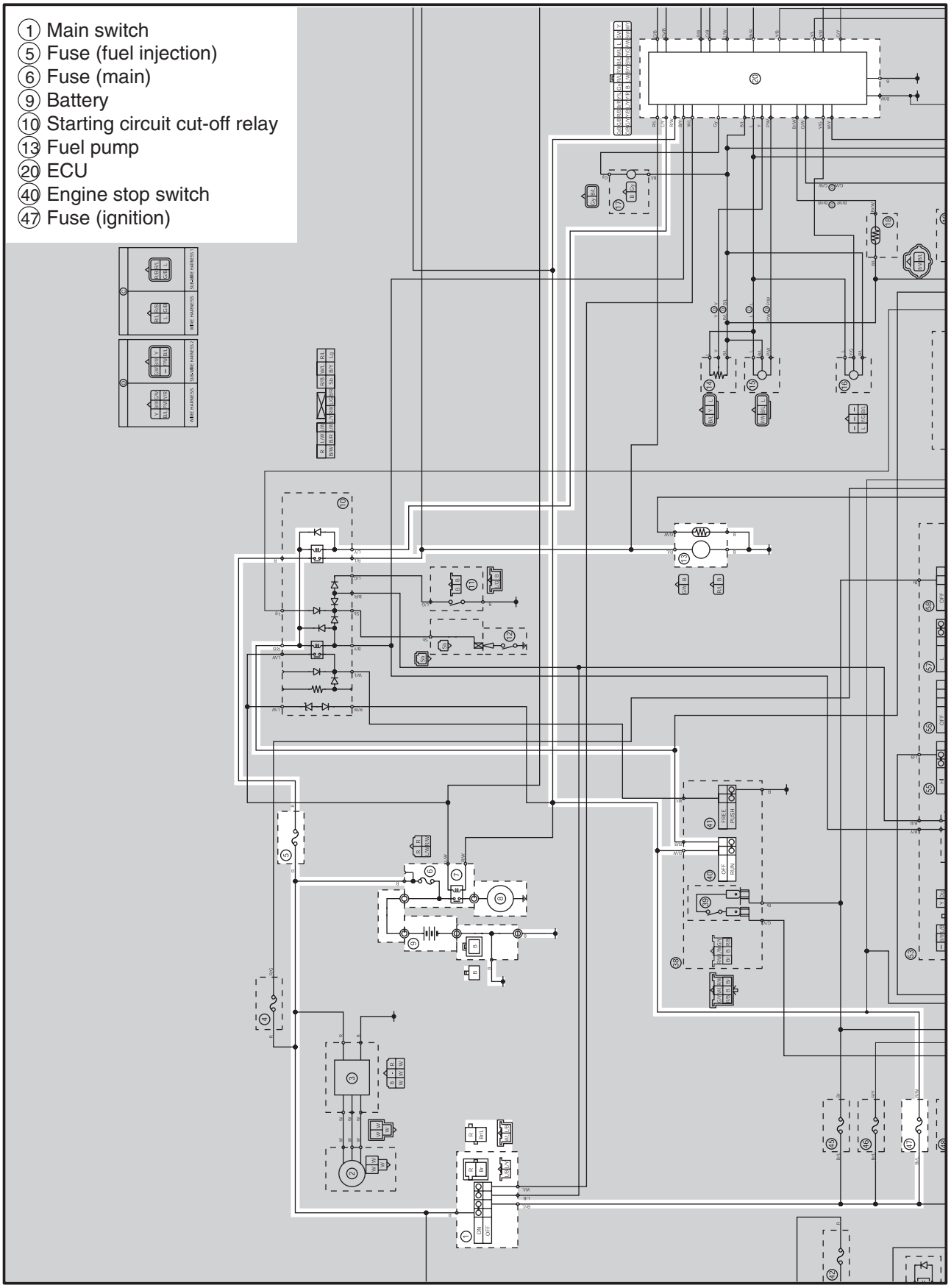
YES → This circuit is OK.

NO → Properly connect or repair the cooling system's wiring.

EAS00814

FUEL PUMP SYSTEM

CIRCUIT DIAGRAM

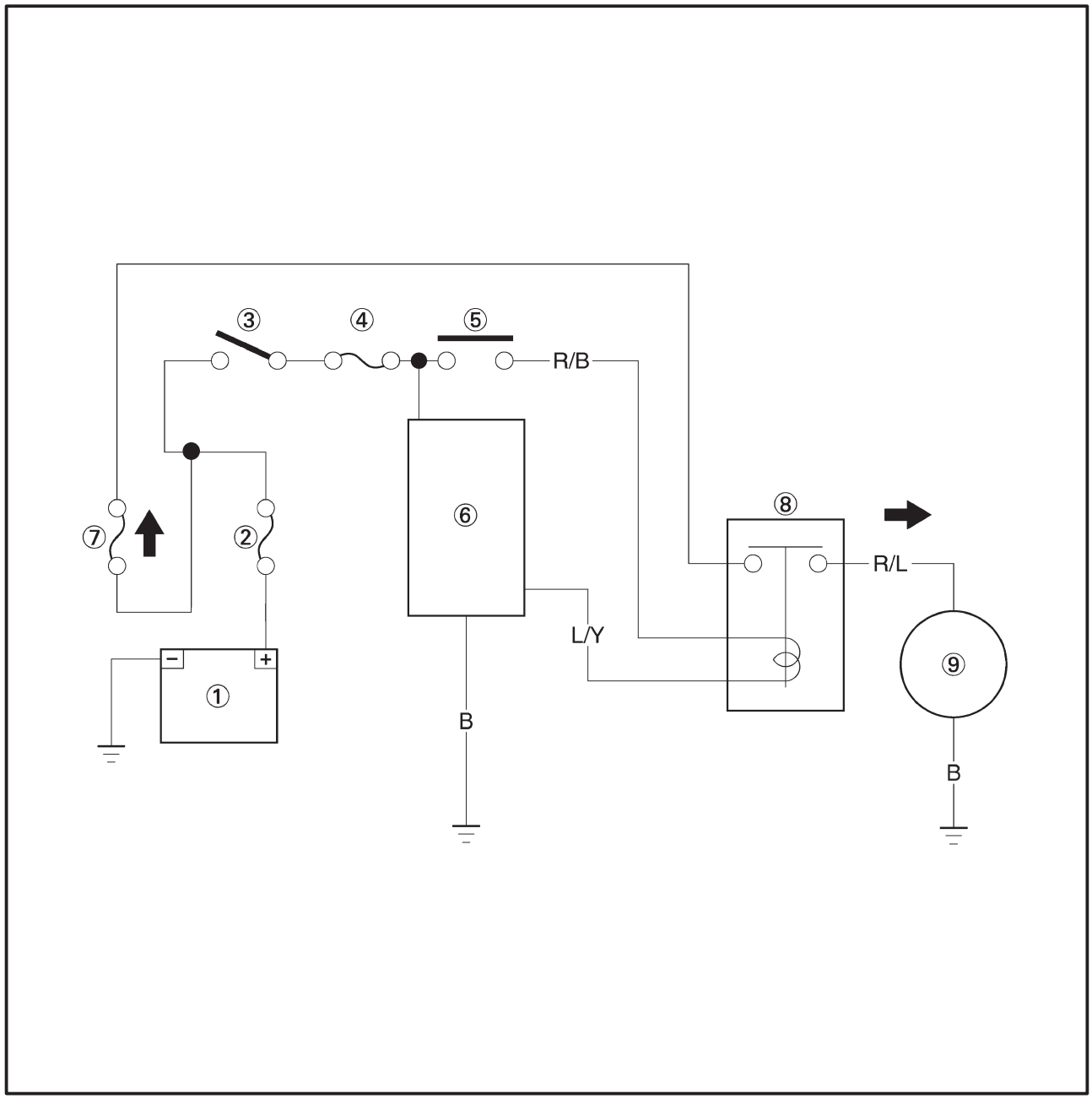


EAS00815

FUEL PUMP SYSTEM

The ECU includes the control unit for the fuel pump.

① Battery
② Fuse (main)
③ Main switch
④ Fuse (ignition)
⑤ Engine stop switch
⑥ ECU
⑦ Fuse (fuel injection)
⑧ Starting circuit cut-off relay (fuel injection system relay)
⑨ Fuel pump



EAS00816
TROUBLESHOOTING

If the fuel pump fails to operate.

Check:
1. main, ignition and fuel injection fuses
2. battery
3. main switch
4. engine stop switch
5. starting circuit cut-off relay (the fuel injection system relay)
6. fuel pump
7. wiring connections (the entire fuel system)

NOTE:
- Before troubleshooting, remove the following part(s):

1. seat
2. front cowling inner panel (left and right)
3. fuel tank

Troubleshoot with the following special tool(s).

Pocket tester
90890-03112, YU-3112

EAS00738

1. Main, ignition and fuel injection system fuses

- Check the main, ignition and fuel system fuses for continuity.
  Refer to "CHECKING THE FUSES" in chapter 3.

- Are the main, ignition and fuel injection system fuses OK?

YES → NO → Replace the fuse(s).

EAS00739

2. Battery

- Check the condition of the battery
  Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

Minimum open-circuit voltage
12.8 V or more at 20°C (68°F)

- Is the battery OK?

YES → NO →
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00749

3. Main switch

- Check the main switch for continuity.
  Refer to "CHECKING THE SWITCHES".

- Is the main switch OK?

YES → NO → Replace the main switch.

EAS00750

4. Engine stop switch

- Check the engine stop switch for continuity.
  Refer to "CHECKING THE SWITCHES".

- Is the engine stop switch OK?

YES → NO → Replace the right handlebar switch.

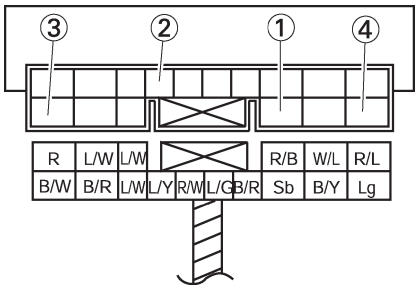
EAS00759

5 Starting circuit cut-off relay (fuel injection system relay)

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester (Ω × 1) and battery (12V) to the starting circuit cut-off relay coupler as shown.

Positive battery lead → red/black ①
Negative battery lead → blue/yellow ②

Positive tester probe → red ③
Negative tester probe → red/blue ④



- Does the starting circuit cut-off relay have continuity between red and red/blue?

YES → NO

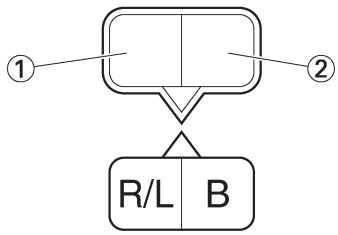
Replace the starting circuit cut-off relay.

EAS00817

6. Fuel pump resistance

- Disconnect the fuel pump coupler from the wire harness.
- Connect the pocket tester (Ω × 1) to the fuel pump coupler as shown.

Positive tester probe → red/blue ①
Negative tester probe → black ②



- Measure the fuel pump resistance.

Fuel pump resistance
0.2 ~ 3.0 Ω at 20°C (68°F)

- Is the fuel pump OK?

YES → NO

Replace the fuel pump.

EAS00818

7. Wiring

- Check the entire fuel pump system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the fuel system's wiring properly connected and without defects?

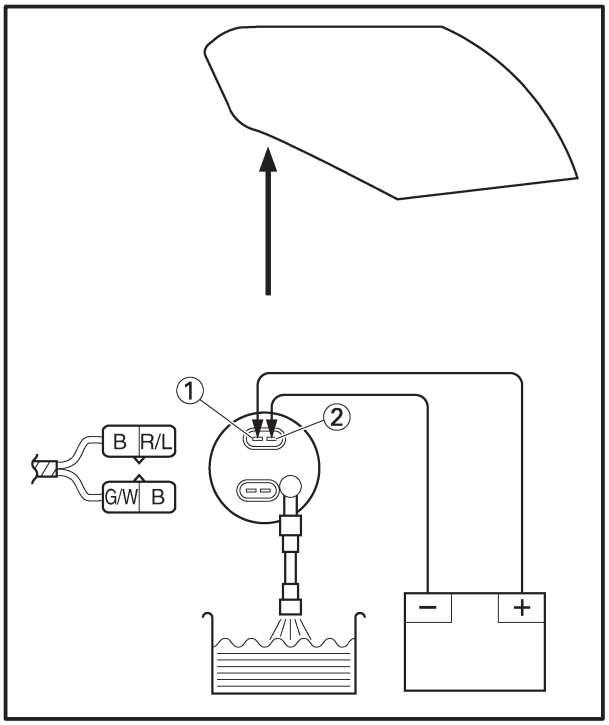
YES → Replace the ECU.

NO → Properly connect or repair the fuel system's wiring.

EAS00819
CHECKING THE FUEL PUMP

⚠ WARNING

Gasoline is extremely flammable and under certain circumstances there can be a danger of an explosion or fire. Be extremely careful and note the following points:
- **Stop the engine before refueling.**
- **Do not smoke, and keep away from open flames, sparks, or any other source of fire.**
- **If you do accidentally spill gasoline, wipe it up immediately with dry rags.**
- **If gasoline touches the engine when it is hot, a fire may occur. Therefore, make sure the engine is completely cool before performing the following test.**



1. Check:
   - Fuel pump operation

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Fill the fuel tank.
b. Put the end of the fuel hose into an open container.
c. Connect the battery (DC 12 V) to the fuel pump coupler as shown.

Positive battery lead → red/blue ①
Negative battery lead → black ②

d. If fuel flows out of the fuel hose, the fuel pump is OK. If fuel does not flow, replace the fuel pump.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

SELF-DIAGNOSIS

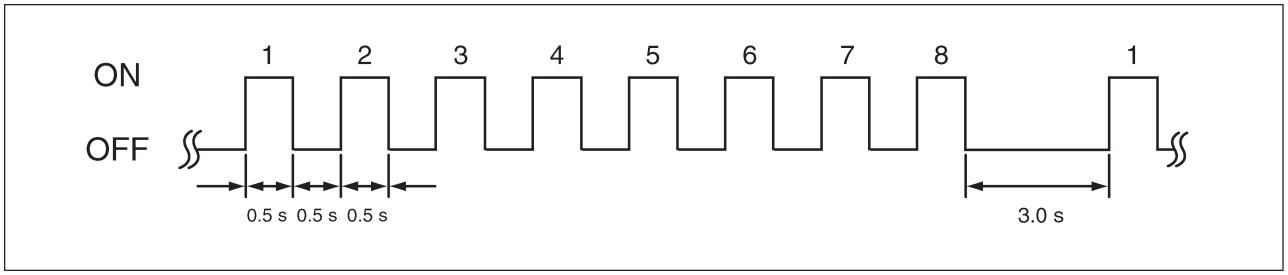
The FZ6-SS/FZ6-SSC features a self-diagnosing system for the following circuit(-s):

- Fuel pump thermistor
- Oil level switch

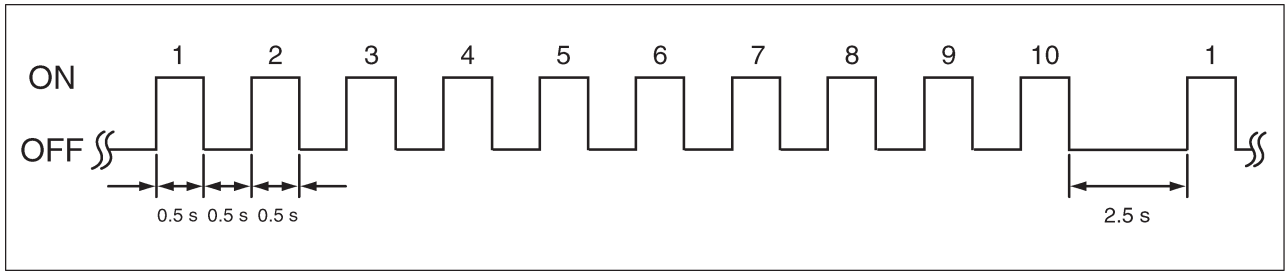
If any of these circuits are defective, their respective condition codes will be displayed on the warning light when the main switch is turned “ON” (irrespective of whether the engine is running or not).

Circuit	Defect(-s)	System response	Condition code
Fuel pump thermistor	• Open-circuit • Short-circuit	• The fuel warning light indicate the condition code.	Refer to *1
Oil level gauge	• Open-circuit • Short-circuit	• The oil level warning light indicate the condition code.	Refer to *2

*1 Condition code
Fuel warning light



*2 Condition code
Oil level warning light



TROUBLESHOOTING

The warning light starts to indicate the self-diagnosis sequence.

Check:
1. fuel pump thermistor
2. oil level switch

NOTE:

- Before troubleshooting, remove the following part(-s):

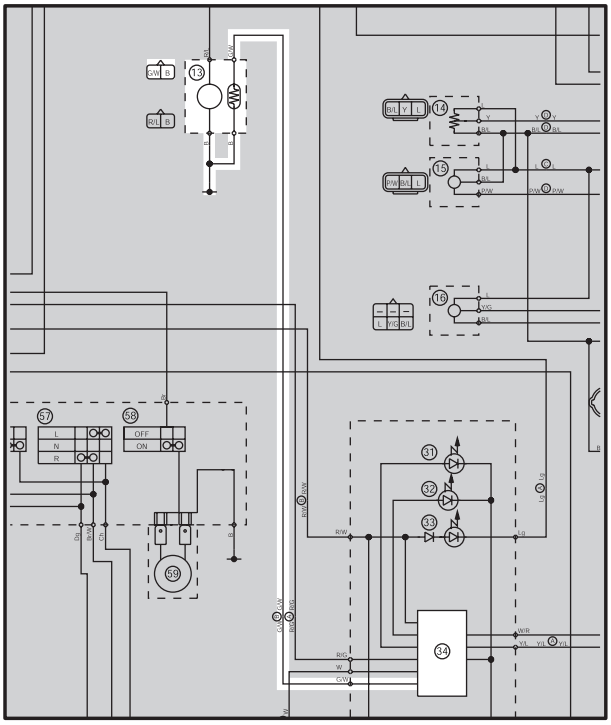
1. seat
2. front cowling inner panel (left and right)
3. fuel tank

- Troubleshoot with the following special tool(-s).

Pocket tester
90890-03112, YU-3112

1. Fuel pump thermistor

CIRCUIT DIAGRAM



⑬ Fuel pump
㉞ Multi-function meter

1. Wire harness

- Check the wire harness for continuity. Refer to “CIRCUIT DIAGRAM”.
- Is the wire harness OK?

YES

NO → Repair or replace the wire harness.

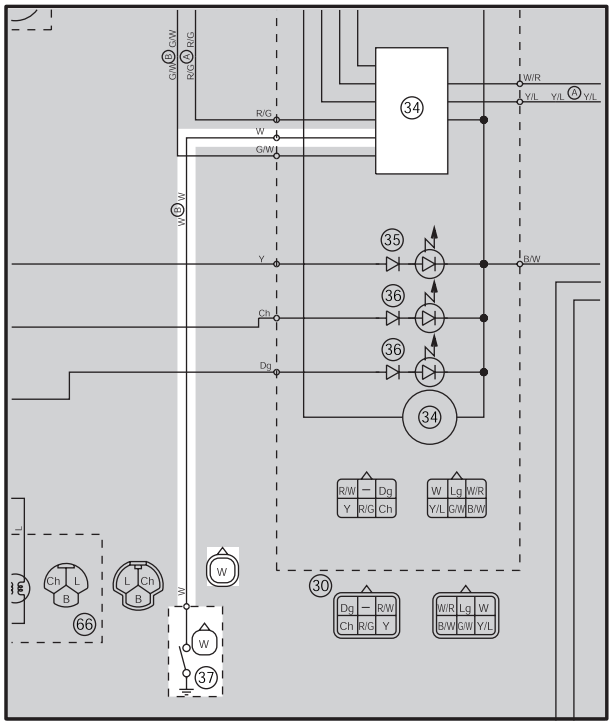
2. Fuel pump thermistor

- Check the fuel pump thermistor for continuity. Refer to “The fuel level indicator light fails to come on”.
- Is the fuel pump thermistor OK?

YES → Replace the multi-function meter.

NO → Replace the fuel pump.

2. Oil level switch
CIRCUIT DIAGRAM



34 Multi-function meter
37 Oil level switch

1. Wire harness
• Check the wire harness for continuity. Refer to “CIRCUIT DIAGRAM”. • Is the wire harness OK?

YES → NO

Repair or replace the wire harness.

2. Oil level switch
• Check the oil level switch for continuity. Refer to “The oil level warning light fails to come on”. • Is the oil level switch OK?

YES → NO

Replace the multi-function meter.	Replace the oil level switch.

EAS00844

TROUBLESHOOTING

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.

STARTING FAILURES

ENGINE

Cylinder(s) and cylinder head(s)
- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head 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

Piston(s) and piston ring(s)
- Improperly installed piston ring
- Damaged, worn or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter
- Improperly installed air filter
- Clogged air filter element

Crankcase and crankshaft
- Improperly assembled crankcase
- Seized crankshaft

FUEL SYSTEM

Fuel tank
- Empty fuel tank
- Clogged fuel filter
- Clogged fuel tank drain hose
- Deteriorated or contaminated fuel

Fuel pump
- Faulty fuel pump
- Faulty fuel pump relay

Throttle body(-ies)
- Deteriorated or contaminated fuel
- Sucked-in air

ELECTRICAL SYSTEMS

Battery
- Discharged battery
- Faulty battery

Fuse(s)
- Blown, damaged or incorrect fuse
- Improperly installed fuse

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

Ignition coil(s)
- Cracked or broken ignition coil body
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

Ignition system
- Faulty ECU
- Faulty crankshaft position sensor

Switches and wiring
- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty sidestand switch
- Faulty clutch switch
- Improperly grounded circuit
- Loose connections

Starting system
- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cut-off relay
- Faulty starter clutch

EAS00846

INCORRECT ENGINE IDLING SPEED

ENGINE

Cylinder(s) and cylinder head(s)
- Incorrect valve clearance
- Damaged valve train components

Air filter
- Clogged air filter element

FUEL SYSTEM

Throttle body(-ies)
- Damaged or loose throttle body joint
- Improperly synchronized throttle bodies
- Improperly adjusted engine idling speed (throttle stop screw)
- Improper throttle cable free play
- Flooded throttle body
- Faulty air induction system

ELECTRICAL SYSTEMS

Battery
- Discharged battery
- Faulty battery

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

Ignition coil(s)
- Broken or shorted primary or secondary coils
- Faulty spark plug lead
- Cracked or broken ignition coil

Ignition system
- Faulty ECU
- Faulty crankshaft position sensor

EAS00849

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURES”.

ENGINE

Air filter
- Clogged air filter element

FUEL SYSTEM

Fuel pump
- Faulty fuel pump

EAS00850

FAULTY GEAR SHIFTING

SHIFTING IS DIFFICULT

Refer to “CLUTCH DRAGS”.

SHIFT PEDAL DOES NOT MOVE

Shift shaft
- Improperly adjusted shift rod
- Bent shift shaft.

Shift drum and shift forks
- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission
- Seized transmission gear
- Foreign object between transmission gears
- Improperly assembled transmission

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

EAS00852

FAULTY CLUTCH

CLUTCH SLIPS

Clutch
- Improperly assembled clutch
- Improperly adjusted clutch cable
- Loose or fatigued clutch spring
- Worn friction plate
- Worn clutch plate
- Damaged clutch release cylinder

Engine oil
- Incorrect oil level
- Incorrect oil viscosity (low)
- Deteriorated oil

CLUTCH DRAGS

Clutch
- Unevenly tensioned clutch springs
- Warped pressure plate
- Bent clutch plate
- Swollen friction plate
- Bent clutch push rod
- Damaged clutch boss
- Burnt primary driven gear bushing
- Match marks not aligned

Engine oil
- Incorrect oil level
- Incorrect oil viscosity (high)
- Deteriorated oil

EAS00855

OVERHEATING

ENGINE

Clogged coolant passages
- Cylinder head(s) and piston(s)
- Heavy carbon buildup

Engine oil
- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

COOLING SYSTEM

Coolant
- Low coolant level

Radiator
- Damaged or leaking radiator
- Faulty radiator cap
- Bent or damaged radiator fin

Water pump
- Damaged or faulty water pump
- Thermostat
- Thermostat stays closed
- Oil cooler
- Clogged or damaged oil cooler
- Hose(s) and pipe(s)
- Damaged hose
- Improperly connected hose
- Damaged pipe
- Improperly connected pipe

FUEL SYSTEM

Throttle body(-ies)
- Damaged or loose carburetor joint

Air filter
- Clogged air filter element

CHASSIS

Brake(s)
- Dragging brake

ELECTRICAL SYSTEMS

Spark plug(s)
- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system
- Faulty ECU

Cooling system
- Faulty radiator fan motor relay
- Faulty coolant temperature sensor
- Faulty ECU

EAS00856

OVERCOOLING

COOLING SYSTEM

Thermostat
- Thermostat stays open

EAS00857

POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper kit
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EAS00861

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
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS00862

UNSTABLE HANDLING

Handlebar

- Bent or improperly installed handlebar

Steering head components

- Improperly installed upper bracket
- Improperly installed lower bracket (improperly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

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

Swingarm

- Worn bearing or bushing
- Bent or damaged swingarm

Rear shock absorber assembly(-ies)

- Faulty rear shock absorber spring
- Leaking oil or gas

Tire(s)

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

EAS00866

FAULTY LIGHTING OR SIGNALING SYSTEM

HEADLIGHT DOES NOT COME ON
- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

HEADLIGHT BULB BURNT OUT
- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Faulty light switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT COME ON
- Wrong tail/brake light bulb
- Too many electrical accessories
- Incorrect connection
- Burnt-out tail/brake light bulb

TAIL/BRAKE LIGHT BULB BURNT OUT
- Wrong tail/brake light bulb
- Faulty battery
- Incorrectly adjusted rear brake light switch
- Tail/brake light bulb life expired

TURN SIGNAL DOES NOT COME ON
- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

TURN SIGNAL BLINKS SLOWLY
- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

TURN SIGNAL REMAINS LIT
- Faulty turn signal relay
- Burnt-out turn signal bulb

TURN SIGNAL BLINKS QUICKLY
- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

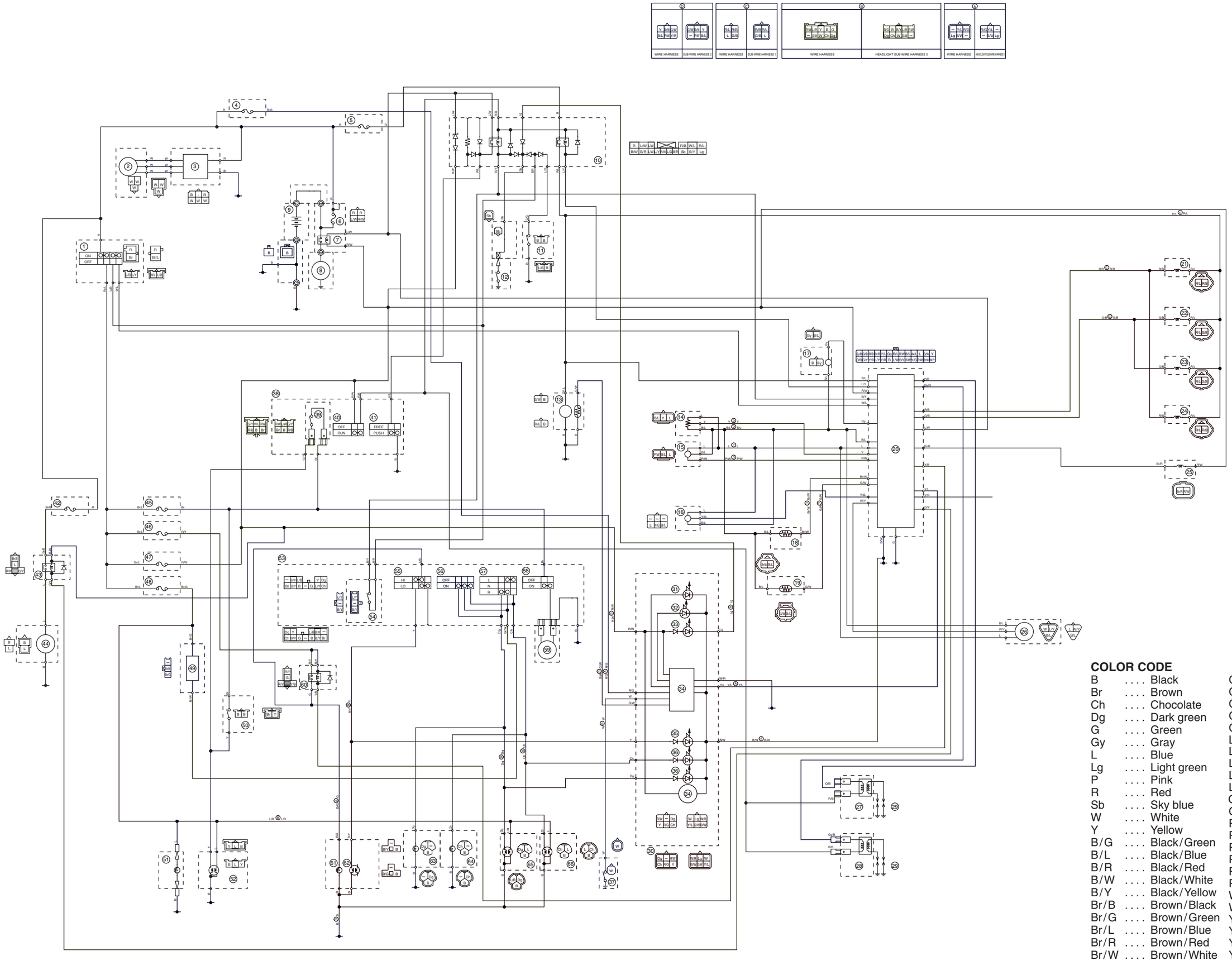
HORN DOES NOT SOUND
- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness

FZ6-SS/FZ6-SSC WIRING DIAGRAM

1. Main switch
2. A.C. magneto
3. Rectifier/regulator
4. Fuse (backup)
5. Fuse (fuel injection)
6. Fuse (main)
7. Starter relay
8. Starter motor
9. Battery
10. Starting circuit cut-off relay
11. Sidestand switch
12. Neutral switch
13. Fuel pump
14. Throttle position sensor
15. Intake air presser sensor
16. Lean angle cut-off switch
17. Crankshaft position sensor
18. Intake air temperature sensor
19. Coolant temperature sensor
20. ECU
21. Cylinder #1-injector
22. Cylinder #2-injector
23. Cylinder #3-injector
24. Cylinder #4-injector
25. Air cut-off valve
26. Speed sensor
27. Ignition coil #1 and #4
28. Ignition coil #2 and #3
29. Spark plug
30. Meter assembly
31. Oil level warning light
32. Engine trouble warning light
33. Neutral indicator light
34. Multi-function meter
35. High beam indicator light
36. Turn signal indicator light
37. Oil level switch
38. Right handlebar switch
39. Front brake light switch
40. Engine stop switch
41. Start switch
42. Fuse (radiator fan motor)
43. Radiator fan motor relay
44. Radiator fan motor
45. Fuse (signal)
46. Fuse (headlight)
47. Fuse (ignition)
48. Fuse (tail)
49. Turn signal relay
50. Rear brake light switch
51. License plate light
52. Tail/brake light
53. Left handlebar switch
54. Clutch switch
55. Dimmer switch
56. Hazard switch
57. Turn signal switch
58. Horn switch
59. Horn
60. Dimmer relay
61. Headlight (high beam)
62. Headlight (low beam)
63. Rear turn signal light (right)
64. Rear turn signal light (left)
65. Front turn signal/position light (right)
66. Front turn signal/position light (left)

YAMAHA MOTOR CO., LTD.
2500 SHINGAI IWATA SHIZUOKA JAPAN

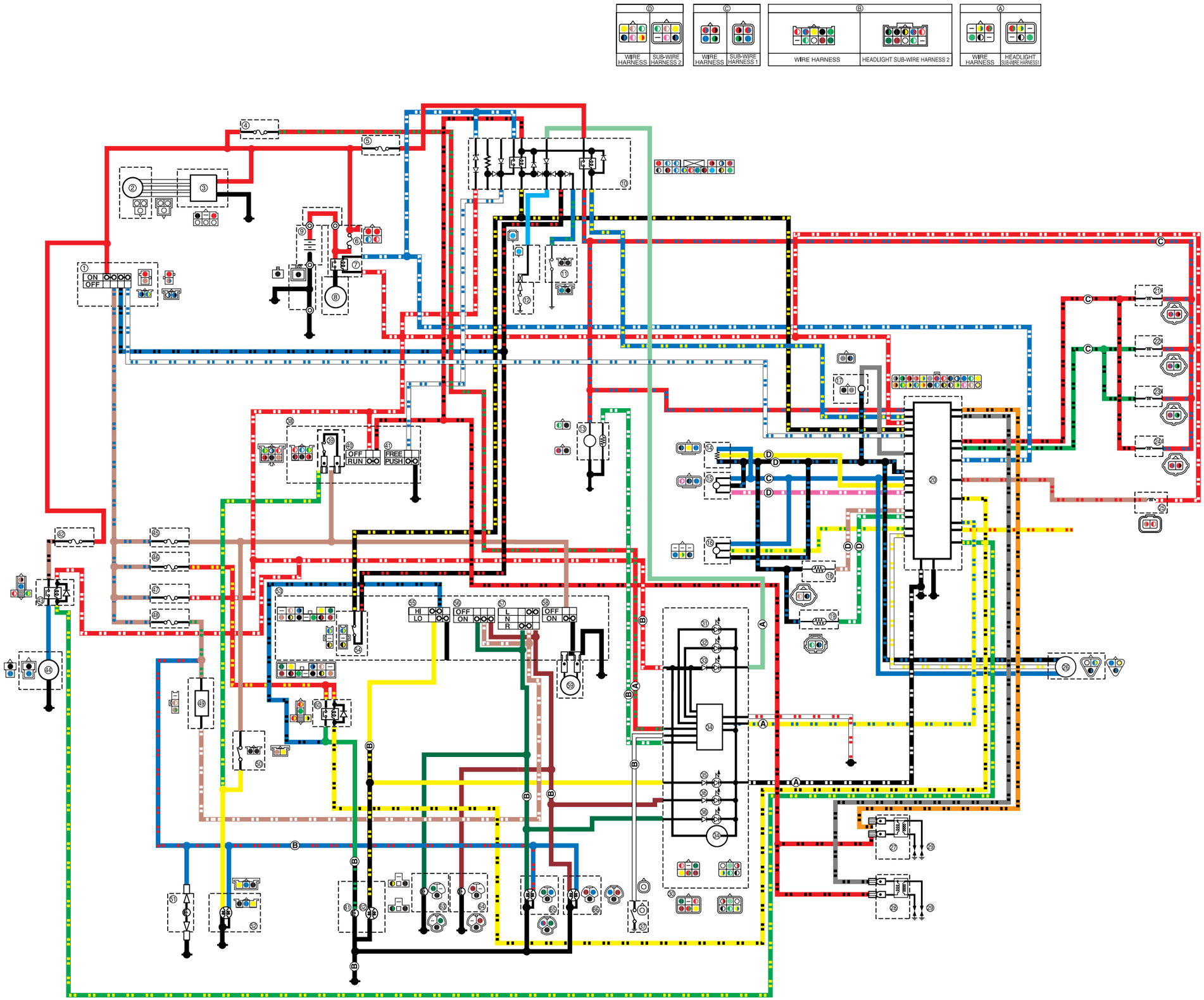
FZ6-SS/FZ6-SSC WIRING DIAGRAM



COLOR CODE

B	.... Black	G/B	.... Green/Black
Br	.... Brown	G/L	.... Green/Blue
Ch	.... Chocolate	G/W	.... Green/White
Dg	.... Dark green	G/Y	.... Green/Yellow
G	.... Green	Gy/B	.... Gray/Black
Gy	.... Gray	L/B	.... Blue/Black
L	.... Blue	L/G	.... Blue/Green
Lg	.... Light green	L/R	.... Blue/Red
P	.... Pink	L/W	.... Blue/White
R	.... Red	L/Y	.... Blue/Yellow
Sb	.... Sky blue	O/B	.... Orange/Black
W	.... White	O/R	.... Orange/Red
Y	.... Yellow	P/W	.... Pink/White
B/G	.... Black/Green	R/B	.... Red/Black
B/L	.... Black/Blue	R/G	.... Red/Green
B/R	.... Black/Red	R/L	.... Red/Blue
B/W	.... Black/White	R/W	.... Red/White
B/Y	.... Black/Yellow	R/Y	.... Red/Yellow
Br/B	.... Brown/Black	W/L	.... White/Blue
Br/G	.... Brown/Green	W/Y	.... White/Yellow
Br/L	.... Brown/Blue	Y/B	.... Yellow/Black
Br/R	.... Brown/Red	Y/G	.... Yellow/Green
Br/W	.... Brown/White	Y/L	.... Yellow/Blue
		Y/R	.... Yellow/Red

FZ6-SS/FZ6-SSC WIRING DIAGRAM



COLOR CODE

Black	Green/Black
Brown	Green/Blue
Chocolate	Green/White
Dark green	Green/Yellow
Green	Gray/Black
Gray	Blue/Black
Blue	Blue/Green
Light green	Blue/Red
Pink	Blue/White
Red	Blue/Yellow
Sky blue	Orange/Black
White	Orange/Red
Yellow	Pink/White
Black/Green	Red/Black
Black/Blue	Red/Green
Black/Red	Red/Blue
Black/White	Red/White
Black/Yellow	Red/Yellow
Brown/Black	White/Blue
Brown/Green	White/Yellow
Brown/Blue	Yellow/Black
Brown/Red	Yellow/Green
Brown/White	Yellow/Blue
	Yellow/Red