



**YAMAHA**

**2005**

**YBR125ED**

**3D9-F8197-E0**

**SERVICE MANUAL**

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EAS00000

**YBR125ED 2005  
SERVICE MANUAL  
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## 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.

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:**

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Designs and specifications are subject to change without notice.

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## 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 vehicle operator, a bystander or a person checking or repairing the vehicle.

**CAUTION:**

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

**NOTE:**

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

# 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.

CYLINDER AND PISTON ENG

EAS00007  
CYLINDER AND PISTON ENG

5 - 29

CYLINDER AND PISTON ENG

EAS00007  
REMOVING THE CYLINDER AND PISTON

1. Remove:

- piston pin clips ①
- piston pin ②
- piston ③

**CAUTION:**

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

**NOTE:**

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

2. Remove:

- top ring
- 2nd ring
- oil ring

**NOTE:**

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

EAS00007  
CHECKING THE CYLINDER AND PISTON







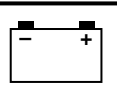















1. Check:

- piston wall
- cylinder wall

Vertical scratches → Replace the cylinder, and the piston and piston rings as a set.

5 - 30



① GEN INFO 	② SPEC 	
③ CHK ADJ 	④ CHAS 	
⑤ ENG 	⑥ CARB 	
⑦ ELEC 	⑧ TRBL SHTG ?	
⑨ 	⑩ 	
⑪ 	⑫ 	
⑬ 	⑭ 	
⑮ 	⑯ 	
⑰ 	⑱ 	⑲ 
⑳ 	㉑ 	㉒ 
㉓ 	㉔ <b>New</b>	

EAS00009

## SYMBOLS

The following symbols are not relevant to every vehicle. Symbols ① to ⑧ indicate the subject of each chapter.

- ① General information
- ② Specifications
- ③ Periodic checks and adjustments
- ④ Chassis
- ⑤ Engine
- ⑥ Carburetor
- ⑦ Electrical system
- ⑧ Troubleshooting

Symbols ⑨ to ⑯ indicate the following.

- ⑨ Serviceable with engine mounted
- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Special tool
- ⑬ Tightening torque
- ⑭ Wear limit, clearance
- ⑮ Engine speed
- ⑯ Electrical data









Symbols ⑰ to ㉒ in the exploded diagrams indicate the types of lubricants and lubrication points.

- ⑰ Engine oil
- ⑱ Gear oil
- ⑲ Molybdenum-disulfide oil
- ㉑ Wheel-bearing grease
- ㉒ Lithium-soap-based grease
- ㉓ Molybdenum-disulfide grease

Symbols ㉓ to ㉔ in the exploded diagrams indicate the following.

- ㉓ Apply locking agent (LOCTITE®)
- ㉔ Replace the part

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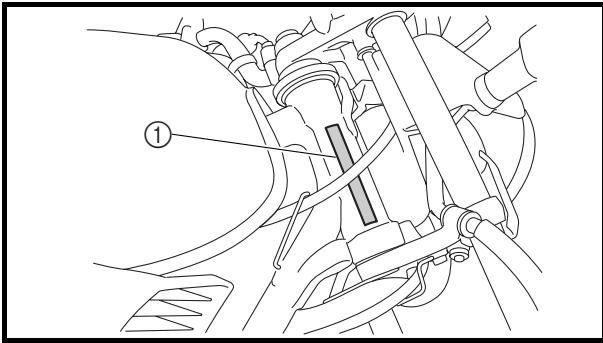
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# CHAPTER 1

## GENERAL INFORMATION

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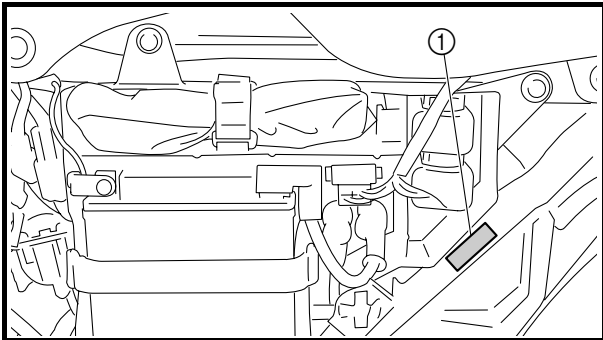
EAS00014

## GENERAL INFORMATION VEHICLE IDENTIFICATION

EAS00017

### VEHICLE IDENTIFICATION NUMBER

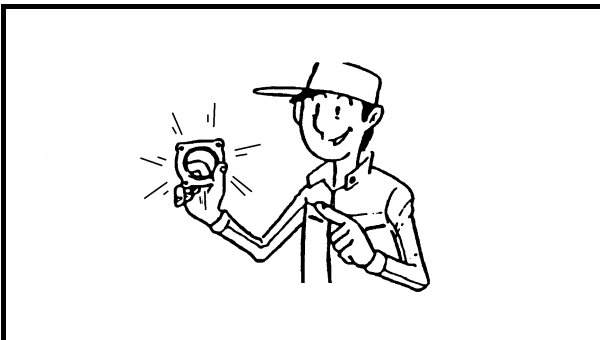
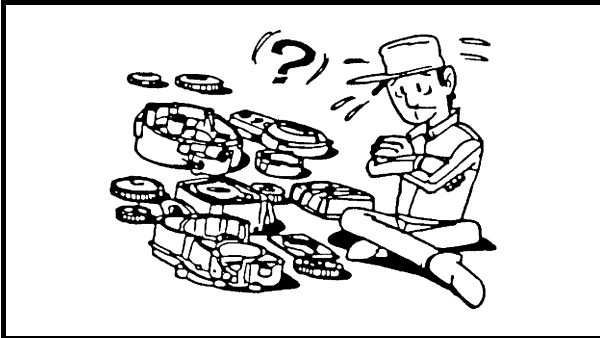
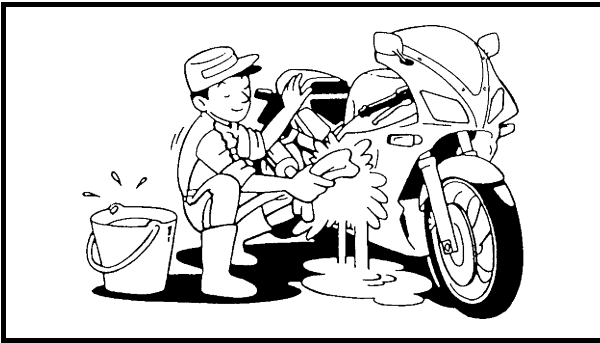
The vehicle identification number ① is stamped into the right side of the steering head pipe.



EAS00018

### MODEL LABEL

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



EAS00020

**IMPORTANT INFORMATION  
PREPARATION FOR REMOVAL AND  
DISASSEMBLY**

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.
2. Use only the proper tools and cleaning equipment.  
Refer to 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.

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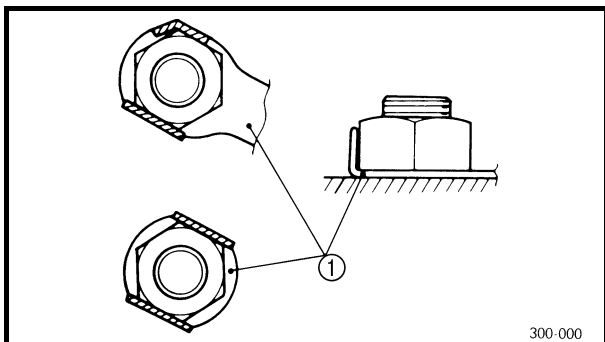
**REPLACEMENT PARTS**

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

EAS00022

**GASKETS, OIL SEALS AND O-RINGS**

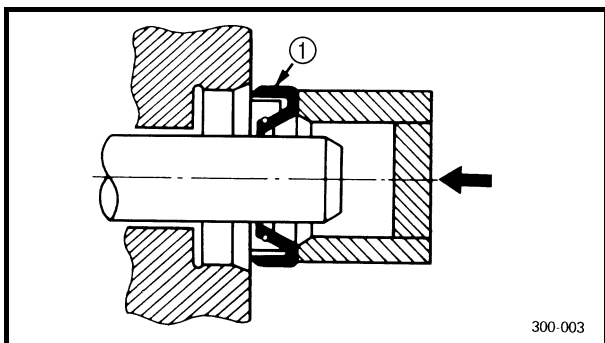
1. When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



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

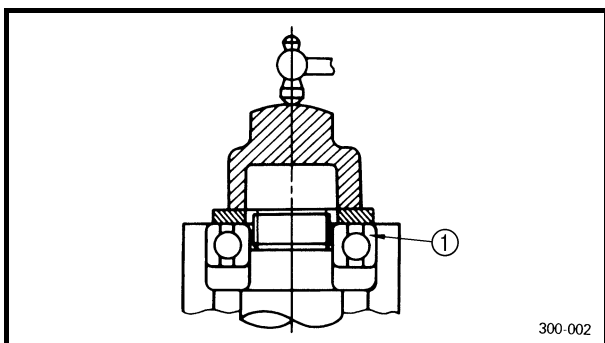
**BEARINGS AND OIL SEALS**

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.

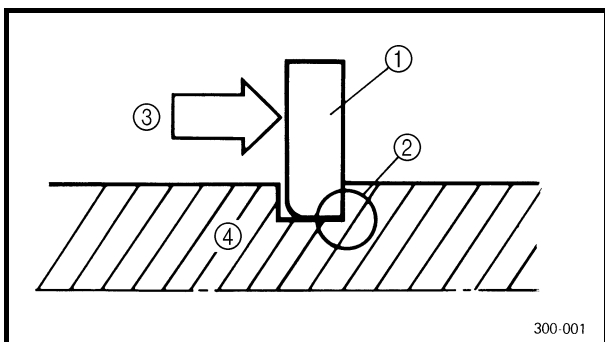
① Oil seal

**CAUTION:**

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



① Bearing

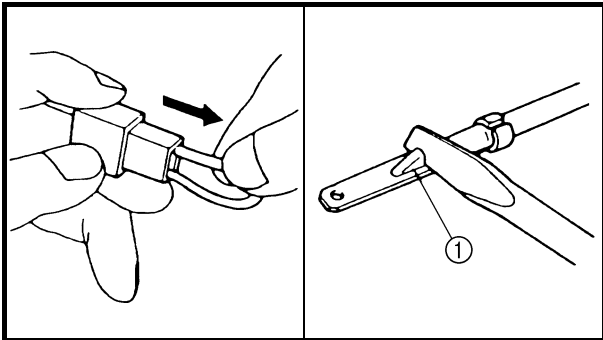
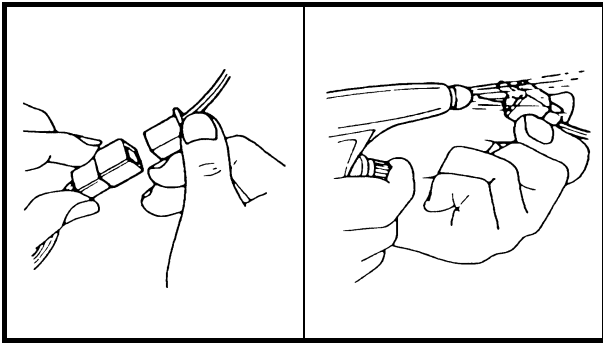


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**CIRCLIPS**

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:** \_\_\_\_\_

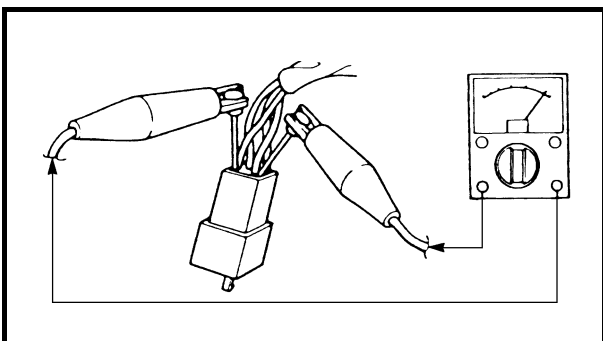
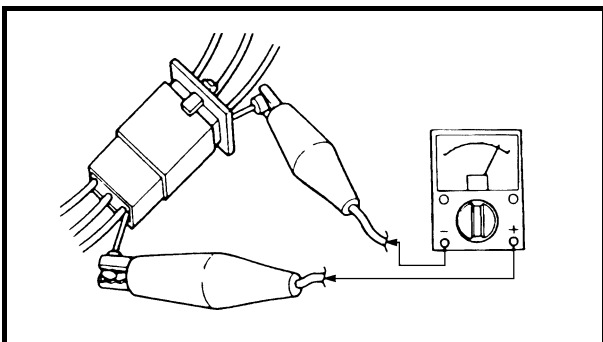
If the pin ① on the terminal is flattened, bend it up.

4. Connect:

- lead
- coupler
- connector


**NOTE:** \_\_\_\_\_

Make sure all connections are tight.



5. Check:

- continuity  
(with the pocket tester)

	<b>Pocket tester</b> 90890-03112, YU-03112-C
---	---

**NOTE:** \_\_\_\_\_

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

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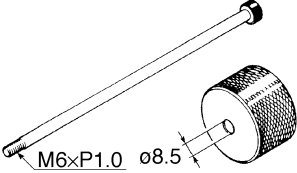
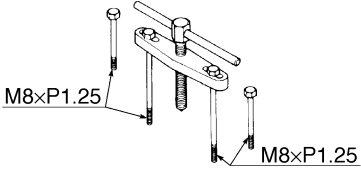
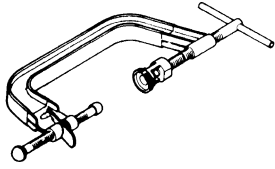
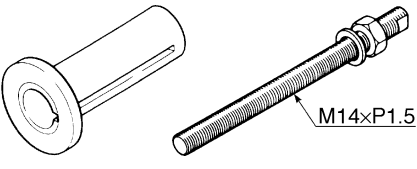
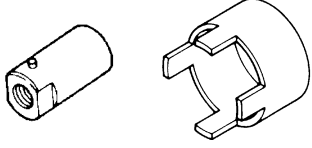
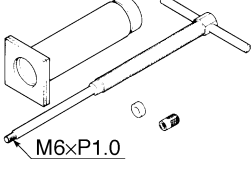
**SPECIAL TOOLS**

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.

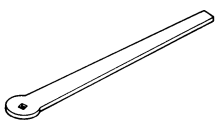

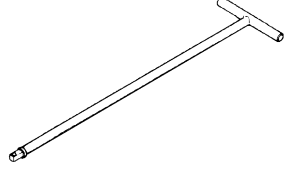
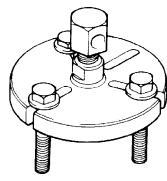
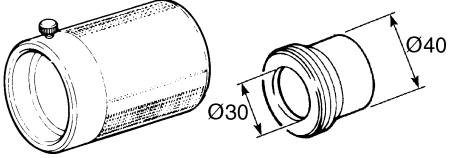
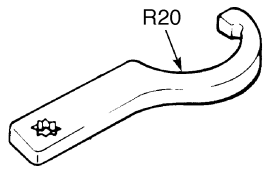
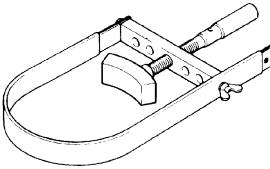
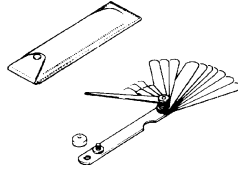
When placing an order, refer to the list provided below to avoid any mistakes.

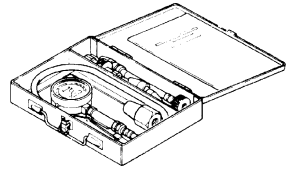
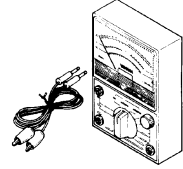
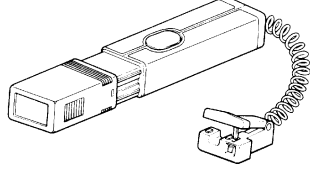
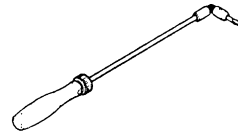
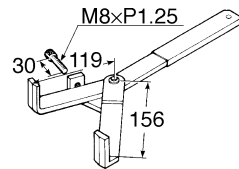
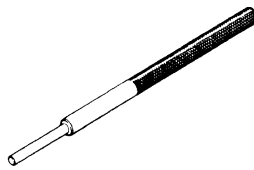
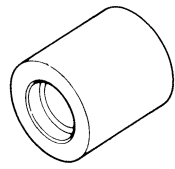
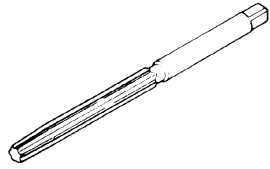
**NOTE:**

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

Tool No.	Tool name/Function	Illustration
Slide hammer bolt 90890-01083 YU-01083-1 Weight 90890-01084 YU-01083-3	Slide hammer bolt Weight  These tools are used to remove or install the rocker arm shafts.	
90890-01135 YU-01135-B	Crankcase separating tool  This tool is used to remove the crankshaft.	
90890-04019 YM-04019	Valve spring compressor  This tool is used to remove or install the valve assemblies.	
Pot 90890-01274 YU-90058 YU-90059 Bolt 90890-01275 YU-90060	Crankshaft installer pot Crankshaft installer bolt  These tools are used to install the crankshaft.	
Adapter 90890-01278 YU-90063 Spacer 90890-04081 YM-91044	Adapter (M12) Spacer (crankshaft installer)  These tools are used to install the crankshaft.	
90890-01304 YU-01304	Piston pin puller set  This tool is used to remove the piston pin.	

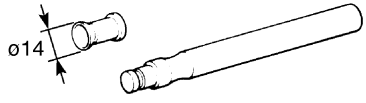
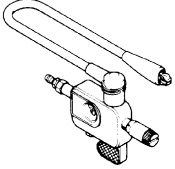
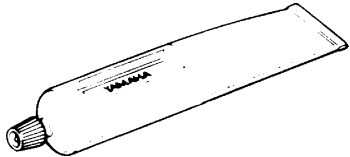


Tool No.	Tool name/Function	Illustration
90890-01311 YM-08035-A	<p>Tappet adjusting tool</p> <p>This tool is used to adjust the valve clearance.</p>	
90890-01312 YM-01312-A	<p>Fuel level gauge</p> <p>This gauge is used to measure the fuel level in the float chamber.</p>	
90890-01326 YM-01326	<p>T-handle</p> <p>This tool is used to hold the 14 mm hexagon nut/socket wrench when removing or installing the damper rod.</p>	
90890-01362 YU-33270-B	<p>Flywheel puller</p> <p>This tool is used to remove the generator rotor.</p>	
<p>Weight 90890-01367 YM-A9409-7 YM-A5142-4 Attachment 90890-01400</p>	<p>Fork seal driver weight Fork seal driver attachment (ø30)</p> <p>These tools are used to install the oil seal, dust seal, and the outer tube bushing of the front fork legs.</p>	
90890-01403 YU-33975	<p>Steering nut wrench</p> <p>This tool is used to loosen or tighten the steering ring nuts.</p>	
90890-01701 YS-01880-A	<p>Sheave holder</p> <p>This tool is used to hold the A.C. magneto rotor when loosening or tightening the A.C. magneto rotor nut.</p>	
90890-03079 YM-34483	<p>Thickness gauge</p> <p>This tool is used to measure the valve clearance.</p>	

Tool No.	Tool name/Function	Illustration
90890-03081 YU-33223	<p>Compression gauge</p> <p>These tools are used to measure the engine compression.</p>	
90890-03112 YU-03112-C	<p>Pocket tester</p> <p>This tool is used to check the electrical system.</p>	
90890-03141 YU-03141	<p>Timing light</p> <p>This tool is used to check the ignition timing.</p>	
90890-03158	<p>Carburetor angle driver</p> <p>This tool is used to turn the air screw when adjusting the engine idling speed.</p>	
90890-04086 YM-91042	<p>Universal clutch holder</p> <p>This tool is needed to hold the clutch boss when removing or installing the boss nut.</p>	
90890-04097 YM-04097	<p>Valve guide remover (ø5)</p> <p>This tool is needed to remove and install the valve guides.</p>	
90890-04098 YM-04098	<p>Valve guide installer (ø5)</p> <p>This tool is needed to install the valve guides.</p>	
90890-04099 YM-04099	<p>Valve guide reamer (ø5)</p> <p>This tool is needed to rebore the new valve guides.</p>	

# SPECIAL TOOLS

<b>GEN INFO</b>	
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Tool No.	Tool name/Function	Illustration
90890-04101	<p>Valve lapper</p> <p>This tool is used for lapping the valves.</p>	
90890-06754 YM-34487	<p>Ignition checker</p> <p>This tool is used to check the ignition system components.</p>	
90890-85505	<p>Yamaha bond No. 1215</p> <p>This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).</p>	

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## **CHAPTER 2 SPECIFICATIONS**

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## SPECIFICATIONS

## GENERAL SPECIFICATIONS

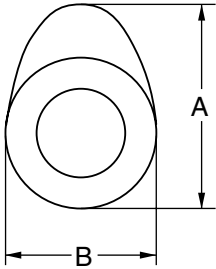
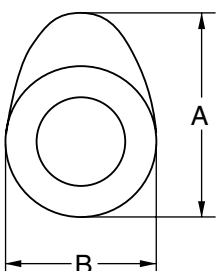
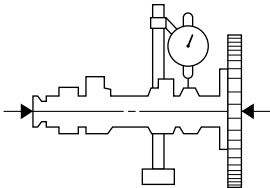
Model	YBR125
<b>Model code</b>	3D91
<b>Dimensions</b>	
Overall length	1,980 mm (78.0 in)
Overall width	745 mm (29.3 in)
Overall height	1,080 mm (42.5 in)
Seat height	780 mm (30.7 in)
Wheelbase	1,290 mm (50.8 in)
Minimum ground clearance	175 mm (6.89 in)
Minimum turning radius	1,750 mm (68.9 in)
<b>Weight</b>	
Wet (with oil and full fuel tank)	120.0 kg (265 lb)
Maximum load (total of cargo, rider, passenger, and accessories)	200.0 kg (441 lb)



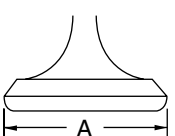
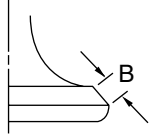
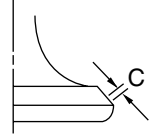
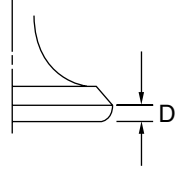
**ENGINE SPECIFICATIONS**

Item	Standard	Limit
<b>Engine</b>		
Engine type	Air-cooled 4-stroke, SOHC	----
Displacement	123.7 cm <sup>3</sup> (7.55 cu.in)	----
Cylinder arrangement	Forward-inclined single cylinder	----
Bore × stroke	54.0 × 54.0 mm (2.13 × 2.13 in)	----
Compression ratio	10.0 : 1	----
Standard compression pressure (at sea level)	1,200 kPa (12.0 kgf/cm <sup>2</sup> , 170.7 psi)	----
Starting system	Electric starter and kickstarter	----
<b>Fuel</b>		
Recommended fuel	Regular unleaded gasoline only	----
Fuel tank capacity	12.0 L (2.64 Imp gal, 3.17 US gal)	----
Fuel reserve amount	3.0 L (0.66 Imp gal, 0.79 US gal)	----
<b>Engine oil</b>		
Type	SAE10W30, SAE10W40, SAE15W40, SAE20W40 or SAE20W50	----
Recommended engine oil grade	API service SE, SF, SG type or higher	----
Lubrication system	Wet sump	----
Engine oil quantity		
Total amount	1.20 L (1.06 Imp qt, 1.27 US qt)	----
Periodic oil change	1.00 L (0.88 Imp qt, 1.06 US qt)	----
Oil filter type	Wire mesh	----
<b>Oil pump</b>		
Oil pump type	Trochoid	----
Inner-rotor-to-outer-rotor-tip-clearance	0.07 mm (0.0028 in)	0.15 mm (0.0059 in)
Outer-rotor-to-oil-pump-housing clearance	0.13 ~ 0.19 mm (0.0051 ~ 0.0075 in)	0.26 mm (0.010 in)
Oil pump-housing-to-inner-rotor-and-outer-rotor clearance	0.06 ~ 0.10 mm (0.0024 ~ 0.0039 in)	0.17 mm (0.0067 in)
<b>Spark plug</b>		
Model/manufacturer	CR6HSA/NGK	----
Spark plug gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)	----
<b>Cylinder head</b>		
Volume	15.20 ~ 15.60 cm <sup>3</sup> (0.93 ~ 0.95 cu.in)	----
Maximum warpage *	----	0.05 mm (0.0020 in)



Item	Standard	Limit
<b>Camshaft</b>		
Drive system	Chain drive (left)	----
Intake camshaft lobe dimensions		
		
Measurement A	25.881 ~ 25.981 mm (1.0189 ~ 1.0229 in)	25.851 mm (1.0178 in)
Measurement B	21.194 ~ 21.294 mm (0.8344 ~ 0.8383 in)	21.164 mm (0.8332 in)
Exhaust camshaft lobe dimensions		
		
Measurement A	25.841 ~ 25.941 mm (1.0174 ~ 1.0213 in)	25.811 mm (1.0162 in)
Measurement B	20.997 ~ 21.097 mm (0.8267 ~ 0.8306 in)	20.967 mm (0.8255 in)
Maximum camshaft runout	----	0.03 mm (0.0012 in)
		
<b>Timing chain</b>		
Model/number of links	92RH2005-90M/90	----
Tensioning system	Automatic	----
<b>Rocker arm/rocker arm shaft</b>		
Rocker arm inside diameter	10.000 ~ 10.015 mm (0.3937 ~ 0.3943 in)	10.030 mm (0.3949 in)
Rocker arm shaft outside diameter	9.981 ~ 9.991 mm (0.3930 ~ 0.3933 in)	9.950 mm (0.3917 in)
Rocker-arm-to-rocker-arm-shaft clearance	0.009 ~ 0.034 mm (0.0003 ~ 0.0013 in)	0.080 mm (0.003 in)



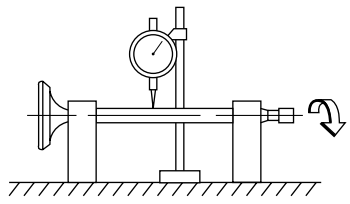
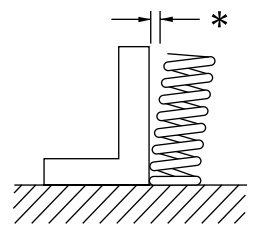
Item	Standard	Limit
<b>Valves, valve seats, valve guides</b>		
Valve clearance (cold)		
Intake	0.08 ~ 0.12 mm (0.0031 ~ 0.0047 in)	----
Exhaust	0.10 ~ 0.14 mm (0.0039 ~ 0.0055 in)	----
Valve dimensions		
 Head Diameter	 Face Width	 Seat Width
		 Margin Thickness
Valve head diameter A		
Intake	25.90 ~ 26.10 mm (1.0197 ~ 1.0276 in)	----
Exhaust	21.90 ~ 22.10 mm (0.8622 ~ 0.8701 in)	----
Valve face width B		
Intake	1.100 ~ 3.000 mm (0.0433 ~ 0.1181 in)	----
Exhaust	1.700 ~ 2.800 mm (0.0669 ~ 0.1102 in)	----
Valve seat width C		
Intake	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	----
Exhaust	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	----
Valve margin thickness D		
Intake	0.40 ~ 0.80 mm (0.0157 ~ 0.0315 in)	----
Exhaust	0.80 ~ 1.20 mm (0.0315 ~ 0.0472 in)	----
Valve stem diameter		
Intake	4.975 ~ 4.990 mm (0.1959 ~ 0.1965 in)	4.945 mm (0.1945 in)
Exhaust	4.960 ~ 4.975 mm (0.1953 ~ 0.1959 in)	4.930 mm (0.1941 in)
Valve guide inside diameter		
Intake	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)	5.050 mm (0.1988 in)
Exhaust	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)	5.050 mm (0.1988 in)
Valve-stem-to-valve-guide clearance		
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.080 mm (0.0032 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.100 mm (0.0039 in)



# ENGINE SPECIFICATIONS

**SPEC**

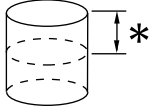
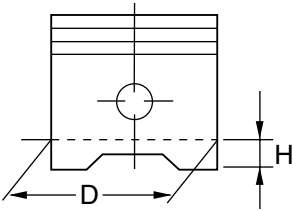
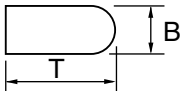


Item	Standard	Limit
Valve stem runout 	----	0.010 mm (0.0004 in)
Valve seat width (cylinder head side) Intake	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
Exhaust	0.90 ~ 1.10 mm (0.0354 ~ 0.0433 in)	1.6 mm (0.06 in)
<b>Valve springs</b>		
Free length Intake	47.06 mm (1.85 in)	44.71 mm (1.76 in)
Exhaust	47.06 mm (1.85 in)	44.71 mm (1.76 in)
Installed length (valve closed) Intake	25.6 mm (1.01 in)	----
Exhaust	25.6 mm (1.01 in)	----
Spring rate Intake (K1)	8.01 N/mm (0.82 kg/mm, 45.74 ft · lb)	----
Exhaust (K1)	8.01 N/mm (0.82 kg/mm, 45.74 ft · lb)	----
Intake (K2)	9.33 N/mm (0.95 kg/mm, 53.27 ft · lb)	----
Exhaust (K2)	9.33 N/mm (0.95 kg/mm, 53.27 ft · lb)	----
Compressed spring force (installed) Intake	160.0 ~ 184.0 N (16.32 ~ 18.76 kg, 35.97 ~ 41.36 lb)	----
Exhaust	160.0 ~ 184.0 N (16.32 ~ 18.76 kg, 35.97 ~ 41.36 lb)	----
Spring tilt * 		
Intake	----	2.5°/2.1 mm (2.5°/0.08 in)
Exhaust	----	2.5°/2.1 mm (2.5°/0.08 in)
Winding direction (top view) Intake	Clockwise	----
Exhaust	Clockwise	----

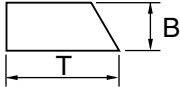
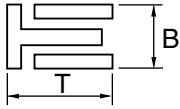
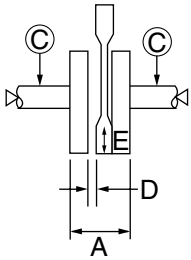
# ENGINE SPECIFICATIONS

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Item	Standard	Limit
<b>Cylinder</b>		
Bore	54.024 ~ 54.056 mm (2.1269 ~ 2.1282 in)	54.156 mm (2.1321 in)
Measuring point *	40 mm (1.57 in)	----
		
<b>Piston</b>		
Piston-to-cylinder clearance	0.019 ~ 0.035 mm (0.0007 ~ 0.0014 in)	0.15 mm (0.0059 in)
Diameter D	53.997 ~ 54.029 mm (2.1259 ~ 2.1271 in)	----
		
Height H	4.8 mm (0.19 in)	----
Piston pin bore (in the piston)		
Diameter	15.002 ~ 15.013 mm (0.5906 ~ 0.5911 in)	15.043 mm (0.5922 in)
Offset	0.50 mm (0.0197 in)	----
Offset direction	Intake side	----
Piston pin		
Outside diameter	14.991 ~ 15.000 mm (0.5902 ~ 0.5906 in)	14.971 mm (0.5894 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)	1.00 × 2.10 mm (0.039 × 0.082 in)	----
End gap (installed)	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.55 mm (0.022 in)
Ring side clearance	0.035 ~ 0.070 mm (0.0014 ~ 0.0028 in)	0.120 mm (0.0047 in)



Item	Standard	Limit
<p>2nd ring</p>  <p>Ring type</p> <p>Dimensions (B × T)</p> <p>End gap (installed)</p> <p>Ring side clearance</p> <p>Oil ring</p>  <p>Dimensions (B × T)</p> <p>End gap (installed)</p>	<p>Taper</p> <p>1.00 × 2.10 mm (0.039 × 0.082 in)</p> <p>0.30 ~ 0.45 mm (0.012 ~ 0.018 in)</p> <p>0.020 ~ 0.060 mm (0.0008 ~ 0.0024 in)</p> <p>2.00 × 2.25 mm (0.079 × 0.089 in)</p> <p>0.20 ~ 0.70 mm (0.008 ~ 0.028 in)</p>	<p>----</p> <p>----</p> <p>0.80 mm (0.031 in)</p> <p>0.120 mm (0.0047 in)</p> <p>----</p> <p>----</p>
<p><b>Crankshaft</b></p>  <p>Width A</p> <p>Maximum runout C</p> <p>Big end side clearance D</p> <p>Big end radial clearance E</p>	<p>46.95 ~ 47.00 mm (1.848 ~ 1.850 in)</p> <p>----</p> <p>0.150 ~ 0.450 mm (0.0059 ~ 0.0177 in)</p> <p>0.010 ~ 0.021 mm (0.0004 ~ 0.0008 in)</p>	<p>----</p> <p>0.030 mm (0.0012 in)</p> <p>----</p> <p>----</p>
<p><b>Balancer</b></p> <p>Balancer drive method</p>	<p>Gear</p>	<p>----</p>
<p><b>Clutch</b></p> <p>Clutch type</p> <p>Clutch release method</p> <p>Clutch cable free play (at the pivot bolt of the clutch lever)</p> <p>Friction plate thickness</p> <p>Plate quantity</p> <p>Clutch plate thickness</p> <p>Plate quantity</p> <p>Maximum warpage</p>	<p>Wet, multiple-disc</p> <p>Inner push, cam push</p> <p>10 ~ 15 mm (0.39 ~ 0.59 in)</p> <p>3.00 mm (0.118 in)</p> <p>4 pcs</p> <p>1.60 mm (0.06 in)</p> <p>3 pcs</p> <p>----</p>	<p>----</p> <p>----</p> <p>----</p> <p>2.80 mm (0.110 in)</p> <p>----</p> <p>----</p> <p>----</p> <p>0.20 mm (0.0079 in)</p>

# ENGINE SPECIFICATIONS

**SPEC**



Item	Standard	Limit
Clutch spring		
Free length	29.30 mm (1.15 in)	27.84 mm (1.10 in)
Spring quantity	4 pcs	----
Long clutch push rod bending	----	0.500 mm (0.0197 in)
<b>Transmission</b>		
Transmission type	Constant mesh 5-speed	----
Primary reduction system	Helical gear	----
Primary reduction ratio	68/20 (3.400)	----
Secondary reduction system	Chain drive	----
Secondary reduction ratio	45/14 (3.214)	----
Operation	Left foot operation	----
Gear ratio		
1st	37/14 (2.643)	----
2nd	32/18 (1.778)	----
3rd	25/19 (1.316)	----
4th	23/22 (1.045)	----
5th	21/24 (0.875)	----
Main axle runout limit	----	0.03 mm (0.0012 in)
Drive axle runout limit	----	0.03 mm (0.0012 in)
<b>Shifting mechanism</b>		
Shift mechanism type	Shift drum and guide bar	----
Shift fork thickness	4.76 ~ 4.89 mm (0.1874 ~ 0.1925 in)	----
<b>Kickstarter</b>		
Kickstarter type	Kick and mesh	----
Kickstarter pinion gear clip friction force	8 ~ 12 N (0.82 ~ 1.22 kgf, 1.80 ~ 2.70 lb)	----
<b>Air filter</b>		
Air filter element	Dry element	----

# ENGINE SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Carburetor</b>		
Type/quantity	VM22SH/1	----
Manufacturer	MIKUNI	----
ID mark	3D91 00	----
Main jet	#97.5	----
Main air jet	ø0.9	----
Jet needle	5EJ7-2	----
Needle jet	N-7M	----
Pilot air jet 1	#60	----
Pilot air jet 2	ø1.3	----
Pilot outlet	ø1.0	----
Pilot jet	#15	----
Pilot screw turns out	1-1/2	----
Valve seat size	ø1.8	----
Starter jet 1	#25	----
Starter jet 2	ø0.5	----
Throttle cable free play (at the flange of the throttle grip)	3 ~ 7 mm (0.12 ~ 0.28 in)	----
Fuel level (below the float chamber mating surface)	6.0 ~ 7.0 mm (0.24 ~ 0.28 in)	----
<b>Idling condition</b>		
Engine idling speed		
Air induction system ON	1,400 ~ 1,500 r/min	----
Air induction system OFF	1,350 ~ 1,450 r/min	----
CO% (air induction system OFF)	3.0 ~ 4.0%	----
Intake vacuum	26.8 ~ 32.2 kPa (201.5 ~ 242.1 mmHg, 7.93 ~ 9.53 inHg)	----
Oil temperature	75 ~ 85 °C (167 ~ 185 °F)	----



## CHASSIS SPECIFICATIONS

Item	Standard	Limit
<b>Frame</b>		
Frame type	Diamond	----
Caster angle	26.33°	----
Trail	90.0 mm (3.54 in)	----
<b>Front wheel</b>		
Wheel type	Cast wheel	----
Rim		
Size	J18 × 1.60	----
Material	Aluminum	----
Wheel travel	110.0 mm (4.33 in)	----
Wheel runout		
Maximum radial wheel runout	----	1.0 mm (0.04 in)
Maximum lateral wheel runout	----	0.5 mm (0.02 in)
<b>Rear wheel</b>		
Wheel type	Cast wheel	----
Rim		
Size	J18 × 1.85	----
Material	Aluminum	----
Wheel travel	105.0 mm (4.13 in)	----
Wheel runout		
Maximum radial wheel runout	----	1.0 mm (0.04 in)
Maximum lateral wheel runout	----	0.5 mm (0.02 in)
<b>Front tire</b>		
Tire type	With tube	----
Size	2.75-18 42P	----
Manufacturer/model	CHENG SHIN/SAKURA S-901 PIRELLI/CITY DEMON	----
Tire pressure (cold tire)		
0 ~ 90 kg (0 ~ 198 lb)	175 kPa (1.75 kgf/cm <sup>2</sup> , 25 psi)	----
90 kg ~ Maximum load (198 lb ~ Maximum load)	175 kPa (1.75 kgf/cm <sup>2</sup> , 25 psi)	----
Minimum tire tread depth	----	1.6 mm (0.06 in)

# CHASSIS SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Rear tire</b>		
Tire type	With tube	----
Size	90/90-18 57P	----
Manufacturer/model	CHENG SHIN/SAKURA S-180 PIRELLI/CITY DEMON	----
Tire pressure (cold tire)		
0 ~ 90 kg (0 ~ 198 lb)	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)	----
90 kg ~ Maximum load (198 lb ~ Maximum load)	280 kPa (2.80 kgf/cm <sup>2</sup> , 41 psi)	----
Minimum tire tread depth	----	1.6 mm (0.06 in)
<b>Front brake</b>		
Brake type	Single-disc brake	----
Operation	Right-hand operation	----
<b>Front disc brake</b>		
Diameter × thickness	245.0 × 4.0 mm (9.65 × 0.16 in)	----
Minimum thickness	----	3.5 mm (0.14 in)
Maximum deflection	----	0.15 mm (0.0059 in)
Brake pad lining thickness-inner	6.0 mm (0.24 in)	0.8 mm (0.03 in)
Brake pad lining thickness-outer	6.0 mm (0.24 in)	0.8 mm (0.03 in)
Master cylinder inside diameter	12.70 mm (0.50 in)	----
Caliper cylinder inside diameter	35.03 mm (1.3791 in)	----
Recommended fluid	DOT 3 or 4	----
<b>Rear brake</b>		
Brake type	Drum brake	----
Operation	Right-foot operation	----
Brake pedal position	13.5 mm (0.53 in)	----
Brake pedal free play	20 ~ 30 mm (0.79 ~ 1.18 in)	----
<b>Rear brake drum</b>		
Drum brake type	Leading, trailing	----
Drum inside diameter	130.0 mm (5.12 in)	131.0 mm (5.16 in)
Lining thickness	4.0 mm (0.16 in)	2.0 mm (0.08 in)
Shoe spring free length	50.5 mm (1.99 in)	----

## CHASSIS SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Steering</b>		
Steering bearing type	Ball and race bearing	----
Lock-to-lock angle (left)	47°	----
Lock-to-lock angle (right)	47°	----
No./size of steel balls		
Upper	16 pcs 0.250 in	----
Lower	16 pcs 0.250 in	----
<b>Front suspension</b>		
Suspension type	Telescopic fork	----
Front fork type	Coil spring/oil damper	----
Front fork travel	120.0 mm (4.72 in)	----
Spring		
Free length	337.0 mm (13.27 in)	330.3 mm (13.00 in)
Installed length	318.9 mm (12.56 in)	----
Spring rate (K1)	7.37 N/mm (0.75 kgf/mm, 42.08 lb/in)	----
Spring rate (K2)	10.78 N/mm (1.1 kgf/mm, 61.55 lb/in)	----
Spring stroke (K1)	0 ~ 75 mm (0 ~ 2.95 in)	----
Spring stroke (K2)	75 ~ 120 mm (2.95 ~ 4.72 in)	----
Optional spring available	No	----
Fork oil		
Recommended oil	Fork oil 10W or equivalent	----
Quantity (each front fork leg)	0.154 L (0.136 Imp qt, 0.163 US qt)	----
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	166 mm (6.54 in)	----
Inner tube outer diameter	30 mm (1.18 in)	----
Inner tube bend limit	----	0.2 mm (0.008 in)
<b>Rear suspension</b>		
Suspension type	Swingarm	----
Spring/shock absorber type	Coil spring/oil damper	----
Rear shock absorber assembly travel	90.0 mm (3.54 in)	----
Spring		
Free length	226.5 mm (8.92 in)	222.0 mm (8.74 in)
Installed length	219.5 mm (8.64 in)	----
Spring rate (K1)	13.30 N/mm (1.36 kgf/mm, 75.94 lb/in)	----
Spring rate (K2)	16.20 N/mm (1.65 kgf/mm, 92.50 lb/in)	----
Spring rate (K3)	24.30 N/mm (2.48 kgf/mm, 138.75 lb/in)	----
Spring stroke (K1)	0 ~ 7 mm (0 ~ 0.28 in)	----
Spring stroke (K2)	7 ~ 47 mm (0.28 ~ 1.85 in)	----
Spring stroke (K3)	47 ~ 90 mm (1.85 ~ 3.54 in)	----
Optional spring available	No	----



## CHASSIS SPECIFICATIONS



Item	Standard	Limit
<b>Swingarm</b>		
Free play limit (at the end of the swingarm)-radial	----	1.0 mm (0.04 in)
Free play limit (at the end of the swingarm)-axial	----	1.0 mm (0.04 in)
<b>Drive chain</b>		
Type/manufacturer	DID428V2/DAIDO	----
Link quantity	118	----
Drive chain slack	20 ~ 30 mm (0.79 ~ 1.18 in)	----
15-Link length limit	----	191.5 mm (7.54 in)



## ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
<b>System voltage</b>	12 V	----
<b>Ignition system</b>		
Ignition system type	DC. C.D.I.	----
Ignition timing (B.T.D.C.)	7.0° at 1,400 r/min	----
Advanced type	Digital	----
<b>DC.C.D.I.</b>		
Pickup coil resistance/color	248 ~ 372 Ω at 20 °C (68 °F)/white-red	----
C.D.I. unit model/manufacturer	3D9-00/SHY	----
<b>Ignition coil</b>		
Model/manufacturer	5VL/SHY	----
Minimum ignition spark gap	6.0 mm (0.24 in)	----
Primary coil resistance	0.32 ~ 0.48 Ω at 20 °C (68 °F)	----
Secondary coil resistance	5.68 ~ 8.52 kΩ at 20 °C (68 °F)	----
<b>Spark plug cap</b>		
Material	Resin	----
Resistance	4.0 ~ 6.0 kΩ at 20 °C (68 °F)	----
<b>Charging system</b>		
Type	A.C. magneto	----
Model/manufacturer	3D9/SHY	----
Standard output	14 V 115 W at 5,000 r/min	----
Charging coil resistance/color	0.64 ~ 0.96 Ω at 20 °C (68 °F)/white-white	----
<b>Rectifier/regulator</b>		
Regulator type	Semi conductor-short circuit	----
Model/manufacturer	SANXIN	----
No load regulated voltage (DC)	13.7 ~ 14.7 V	----
Rectifier capacity	8.0 A	----
Withstand voltage	200 V	----
<b>Battery</b>		
Model/manufacturer	CB5L-B/TIANJIN TONG YEE INDUSTRIAL	----
Battery voltage/capacity	12 V/5.0 Ah	----
Specific gravity	1.280	----
<b>Headlight</b>		
Bulb type	Krypton bulb	----
<b>Bulbs (voltage/wattage × quantity)</b>		
Headlight	12 V 35 W/35 W × 1	----
Auxiliary light	12 V 5 W × 1	----
Tail/brake light	12 V 5 W/21 W × 1	----
Front turn signal light	12 V 10 W × 2	----
Rear turn signal light	12 V 10 W × 2	----
Meter lighting	12 V 1.7 W × 4	----

# ELECTRICAL SPECIFICATIONS

**SPEC**



Item	Standard	Limit
<b>Indicator lights (voltage/wattage × quantity)</b>		
Neutral indicator light	14 V 3 W × 1	----
Turn signal indicator light	14 V 3 W × 2	----
High beam indicator light	14 V 3 W × 1	----
<b>Electric starting system</b>		
System type	Constant mesh	----
<b>Starter motor</b>		
Model/manufacture	3D9/SHY	----
Power output	0.4 kW	----
Armature resistance	0.017 ~ 0.021 Ω	----
Brushes		
Overall length	10.0 mm (0.39 in)	3.5 mm (0.14 in)
Spring force	5.52 ~ 8.28 N (563 ~ 844 gf, 19.87 ~ 29.80 oz)	----
Commutator diameter	22.0 mm (0.87 in)	21.0 mm (0.83 in)
Mica undercut	1.5 mm (0.06 in)	----
<b>Starter relay</b>		
Model/manufacture	SANXIN	----
Amperage	150 A	----
Coil resistance	3.6 ~ 4.4 Ω	----
<b>Horn</b>		
Horn type	Plane	----
Model/manufacture × quantity	YF-12/NIKKO × 1	----
Maximum amperage	3.0 A	----
Coil resistance	1.15 ~ 1.25 Ω	----
Performance	105 ~ 120 dB/2 m	----
<b>Turn signal relay</b>		
Relay type	Condenser	----
Self-cancelling device built-in	No	----
Turn signal blinking frequency	75 ~ 95 cycles/min.	----
Wattage	10 W × 2 + 1.7 W	----
<b>Fuel gauge</b>		
Model/manufacture	LOCAL MADE	----
Sender unit resistance- full	4 ~ 10 Ω at 20 °C (68 °F)	----
Sender unit resistance- empty	90 ~ 100 Ω at 20 °C (68 °F)	----
<b>Fuses (amperage × quantity)</b>		
Fuse	15 A	----
Spare fuse	15 A	----

# CONVERSION TABLE/ GENERAL TIGHTENING TORQUE SPECIFICATIONS



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

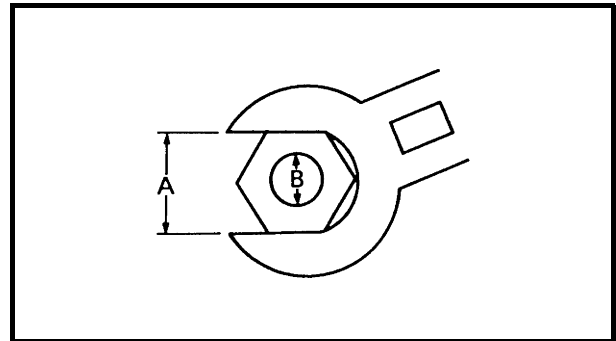
## CONVERSION TABLE

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

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## 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



## TIGHTENING TORQUES ENGINE TIGHTENING TORQUES

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m · kg	ft · lb	
Cylinder head	Bolt	M8	4	22	2.2	16	
	Bolt	M6	2	10	1.0	7.2	
Oil gallery bolt	Bolt	M6	1	7	0.7	5.1	Sealant
Spark plug	—	M10	1	13	1.3	9.4	
Camshaft sprocket cover	Bolt	M6	2	10	1.0	7.2	
Tappet cover (intake and exhaust side)	—	M45	2	18	1.8	13	
A.C. magneto rotor	Nut	M12	1	70	7.0	50	
Timing chain guide (intake side)	Bolt	M6	1	10	1.0	7.2	
Valve adjusting screw locknut (intake and exhaust side)	Nut	M5	2	8	0.8	5.8	
Camshaft sprocket	Bolt	M8	1	20	2.0	14	
Camshaft retainer	Bolt	M6	1	10	1.0	7.2	
Timing chain tensioner cap	Bolt	M6	1	8	0.8	5.8	
Timing chain tensioner	Bolt	M6	2	10	1.0	7.2	
Oil pump assembly	Screw	M6	2	7	0.7	5.1	
Oil pump housing cover	Screw	M5	2	5	0.5	3.6	
Engine oil drain bolt	Bolt	M12	1	20	2.0	14	
Intake manifold (cylinder head side)	Bolt	M6	2	10	1.0	7.2	
Intake manifold (carburetor side)	Bolt	M6	2	10	1.0	7.2	
Carburetor joint clamp	Screw	M4	1	2	0.2	1.4	
Air filter case	Bolt	M6	2	7	0.7	5.1	
Exhaust pipe and cylinder head	Bolt	M6	2	10	1.0	7.2	
Muffler and passenger footrest bracket	Bolt	M8	1	22	2.2	16	
Exhaust pipe protector	Screw	M6	2	8	0.8	5.8	
Muffler protector	Screw	M6	4	8	0.8	5.8	
Air cut-off valve assembly	Screw	M6	2	7	0.7	5.1	
Air induction system pipe and cylinder head	Bolt	M6	2	10	1.0	7.2	
Crankcase	Bolt	M6	10	10	1.0	7.2	Sealant
A.C. magneto rotor cover	Bolt	M6	7	10	1.0	7.2	
Clutch cover	Bolt	M6	9	10	1.0	7.2	
Stator coil lead holder	Screw	M6	1	7	0.7	5.1	
Timing mark accessing screw	—	M14	1	7	0.7	5.1	
Crankshaft end accessing screw	—	M32	1	7	0.7	5.1	
Kickstarter lever	Nut	M12	1	50	5.0	36	
Starter clutch idle gear holder	Screw	M6	2	7	0.7	5.1	
Starter motor	Bolt	M6	2	10	1.0	7.2	
Starter clutch	Bolt	M8	3	30	3.0	22	Stake
Primary drive gear	Nut	M12	1	70	7.0	50	

## TIGHTENING TORQUES

**SPEC**






Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m · kg	ft · lb	
Clutch pressure plate	Screw	M5	4	6	0.6	4.3	
Clutch boss	Nut	M12	1	60	6.0	43	
Short clutch push rod locknut	Nut	M6	1	8	0.8	5.8	
Bearing retainer	Bolt	M6	2	7	0.7	5.1	
Shift pedal	Bolt	M8	1	10	1.0	7.2	
Shift drum segment	Screw	M6	1	12	1.2	8.7	
Stopper lever	Bolt	M6	1	10	1.0	7.2	
Pickup coil	Bolt	M6	2	10	1.0	7.2	
Neutral switch	—	M10	1	4	0.4	2.9	
Stator coil	Bolt	M6	3	10	1.0	7.2	

# TIGHTENING TORQUES

**SPEC**



## CHASSIS TIGHTENING TORQUES

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m · kg	ft · lb	
Engine mounting:					
Front mounting bolt	M8	38	3.8	27	
Lower engine bracket and frame	M10	55	5.5	40	
Rear mounting bolt	M8	38	3.8	27	
Upper mounting bolt	M8	38	3.8	27	
Left upper engine bracket and frame	M8	38	3.8	27	
Right upper engine bracket and frame	M8	38	3.8	27	
Brake caliper bracket bolt	M10	35	3.5	25	
Brake disc and front wheel	M8	23	2.3	17	
Front wheel axle and front wheel axle nut	M14	59	5.9	43	
Brake hose holder and front brake hose guide	M6	7	0.7	5.1	
Brake caliper and brake caliper bracket	M8	23	2.3	17	
Brake hose union bolt (to front brake caliper)	M10	25	2.5	18	
Brake caliper holding bolt	M8	23	2.3	17	
Bleed screw	M6	6	0.6	4.3	
Rear wheel axle and rear wheel axle nut	M14	91	9.1	66	
Brake torque rod and brake shoe plate	M8	19	1.9	13	
Chain puller locknut	M8	16	1.6	11	
Rear wheel sprocket and rear wheel drive hub	M8	40	4.0	29	
Rear brake camshaft lever and rear brake camshaft	M6	10	1.0	7.2	
Brake master cylinder and brake master cylinder holder	M6	10	1.0	7.2	
Brake hose union bolt (to brake master cylinder)	M10	26	2.6	19	
Front brake master cylinder and brake lever	M6	10	1.0	7.2	
Front fender and front fork	M6	10	1.0	7.2	
Upper bracket pinch bolt	M8	23	2.3	17	
Lower bracket pinch bolt	M10	30	3.0	22	
Front fork cap bolt	M25	23	2.3	17	
Damper rod bolt	M10	23	2.3	17	
Handlebar holder and upper bracket	M8	23	2.3	17	
Steering stem nut	M22	110	11.0	80	
Lower ring nut	M25	—	—	—	See NOTE.
Headlight assembly and headlight bracket	M10	9	0.9	6.5	
Front turn signal light assembly and lower bracket	M6	13	1.3	9.4	
Wire harness/clutch cable guide and upper bracket	M6	7	0.7	5.1	
Meter assembly and upper bracket	M6	7	0.7	5.1	
Front turn signal light and headlight bracket	M12	7	0.7	5.1	
Drive sprocket cover	M6	7	0.7	5.1	
Drive sprocket	M6	10	1.0	7.2	

## TIGHTENING TORQUES

**SPEC**



Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m · kg	ft · lb	
Passenger footrest bracket (left and right), center-stand and frame	M8	26	2.6	19	
Brake torque rod and swingarm	M8	19	1.9	13	
Pivot shaft and pivot shaft nut	M12	59	5.9	43	
Rear shock absorber assembly and swingarm	M10	32	3.2	23	
Rear shock absorber assembly and frame	M10	40	4.0	29	
Fuel tank and frame	M8	16	1.6	11	
Fuel tank and fuel cock	M6	7	0.7	5.1	
Fuel sender and fuel tank	M5	4	0.4	2.9	
Carrier and frame	M8	30	3.0	22	
Seat and frame	M6	7	0.7	5.1	
Battery box and frame	M6	7	0.7	5.1	
Rear fender and frame	M6	7	0.7	5.1	
Tail/brake light assembly and frame	M6	7	0.7	5.1	
Rear turn signal light and frame	M12	7	0.7	5.1	
Rider footrest and frame	M8	23	2.3	17	
Rectifier/regulator	M6	4	0.4	2.9	
Ignition coil and frame	M6	4	0.4	2.9	

**NOTE:**





























1. First tighten the lower ring nut 33 Nm (3.3 m · kg, 24 ft · lb) with a torque wrench, then loosen the ring nut 1/4 turn.
2. Retighten the lower ring nut to 22 Nm (2.2 m · kg, 16 ft · lb) with a torque wrench.



EAS00031

## LUBRICATION POINTS AND LUBRICANT TYPES

### ENGINE

Lubrication Point	Symbol
Oil seal lips	
O-rings	
Bearings	
Cylinder head tightening bolts and washers	
Crankshaft pin	
Connecting rod big end thrust surface	
Piston pin	
Piston and ring groove	
Cylinder inner surface	
Balancer weight surface	
Camshaft lobes	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Rocker arm shaft	
Rocker arm inner surface	
Kickstarter shaft	
Kickstarter idle gear	
Starter clutch idle gear inner surface	
Starter clutch gear (inner and outer)	
Starter clutch assembly	
Push lever	
Primary driven gear	
Short clutch push rod	
Long clutch push rod ends and ball	
Transmission gears (wheel and pinion)	
Main and drive axle	
Shift forks and shift fork guide bars	
Shift drum	
Crankcase mating surface	Yamaha bond No.1215
A.C. magneto lead grommet (A.C. magneto cover)	Yamaha bond No.1215

# LUBRICATION POINTS AND LUBRICANT TYPES



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## CHASSIS

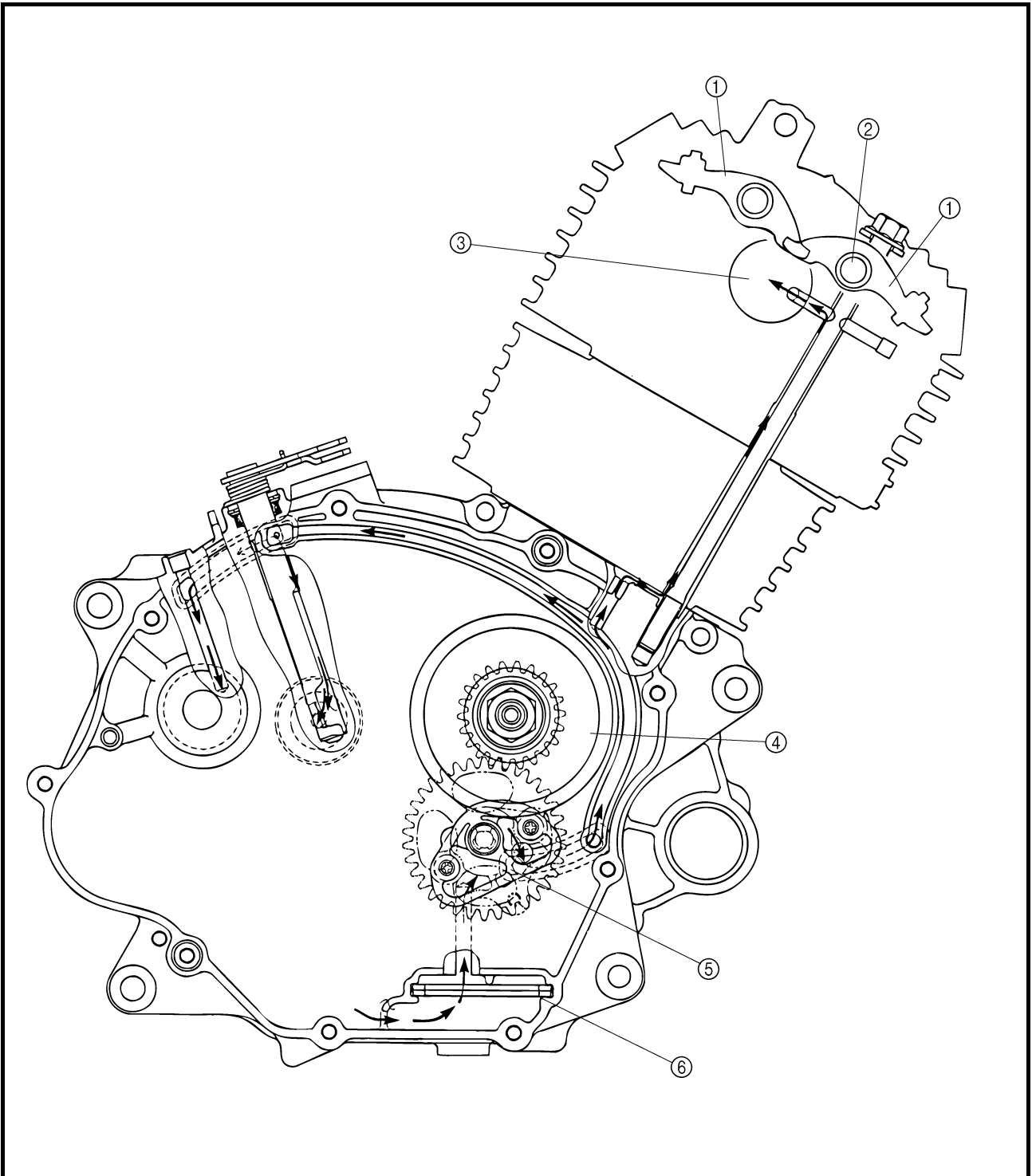
Lubrication point	Lubricant
Front wheel oil seal lip	
Speedometer gear unit inner surface	
Rear wheel oil seal lip and O-ring	YAMAHA GREASE F 150G
Rear wheel drive hub oil seal lip	YAMAHA GREASE F 150G
Rear brake camshaft	
Brake pedal inner surface	
Brake shoe pivot pin	
Brake caliper bolt	
Throttle grip tube guide inner surface and throttle cable end	
Clutch cable end at the clutch lever	
Brake lever pivot bolt outer surface	
Clutch lever pivot bolt outer surface	
Steering head bearing inner race	
Steering head bearing outer race	
Steering head upper bearing	
Steering head lower bearing	
Swingarm pivot shaft	
Swingarm bushing outer surface	
Dust cover oil seal lips	
Centerstand pivot shaft	
Passenger footrest pivoting point	



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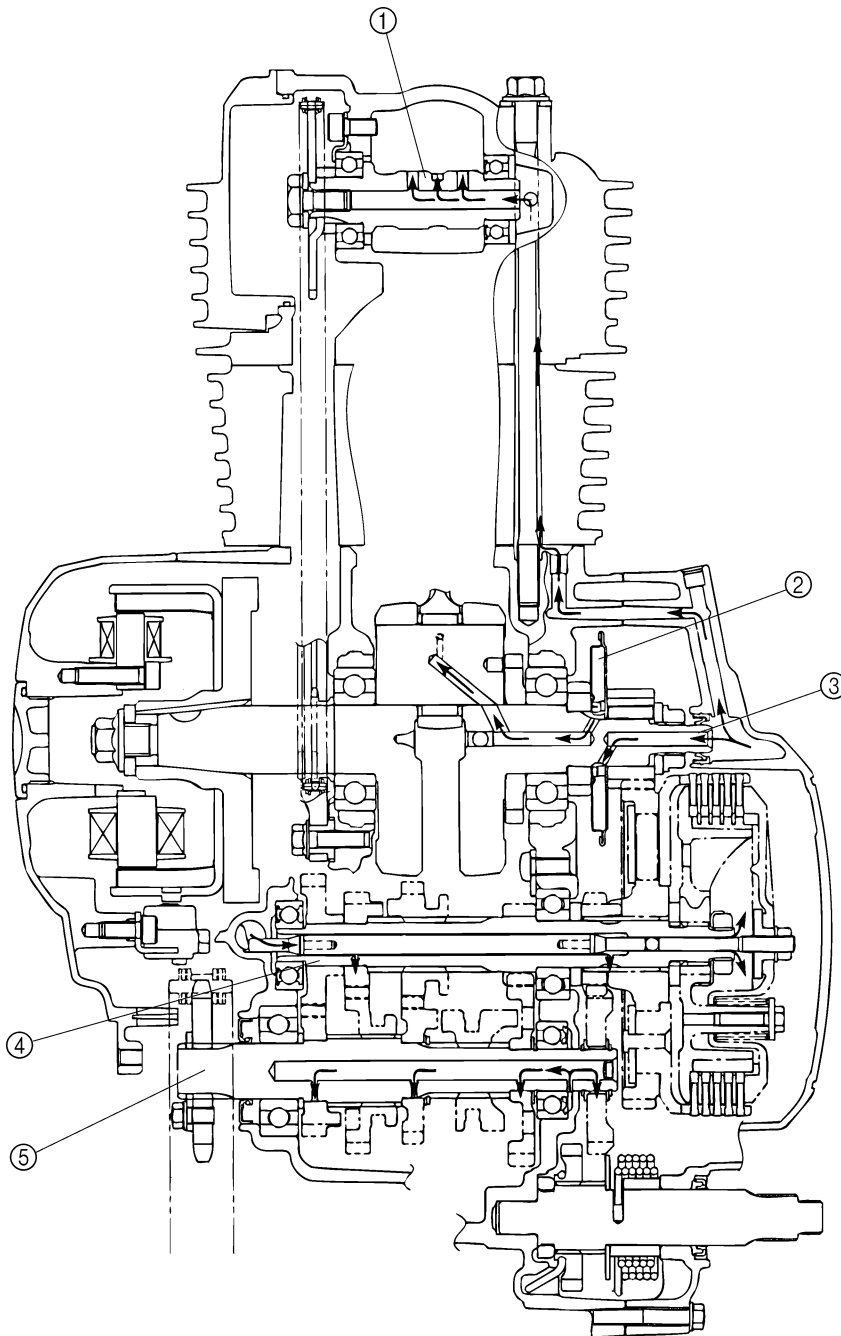
**LUBRICATION DIAGRAMS**

- ① Rocker arm
- ② Rocker arm shaft
- ③ Camshaft
- ④ Crankshaft
- ⑤ Oil pump
- ⑥ Oil strainer





- ① Camshaft
- ② Rotary filter
- ③ Crankshaft
- ④ Main axle
- ⑤ Drive axle

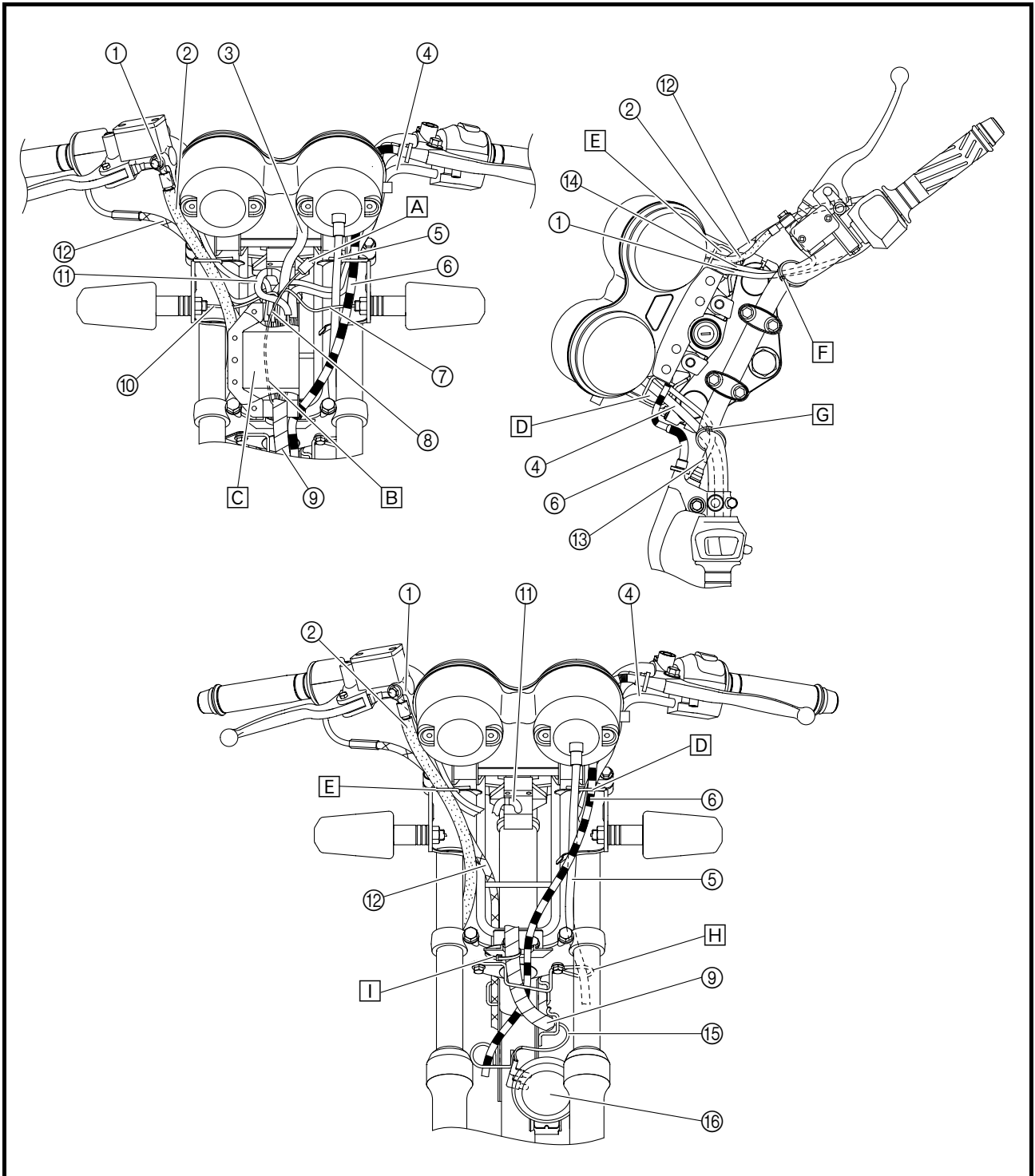




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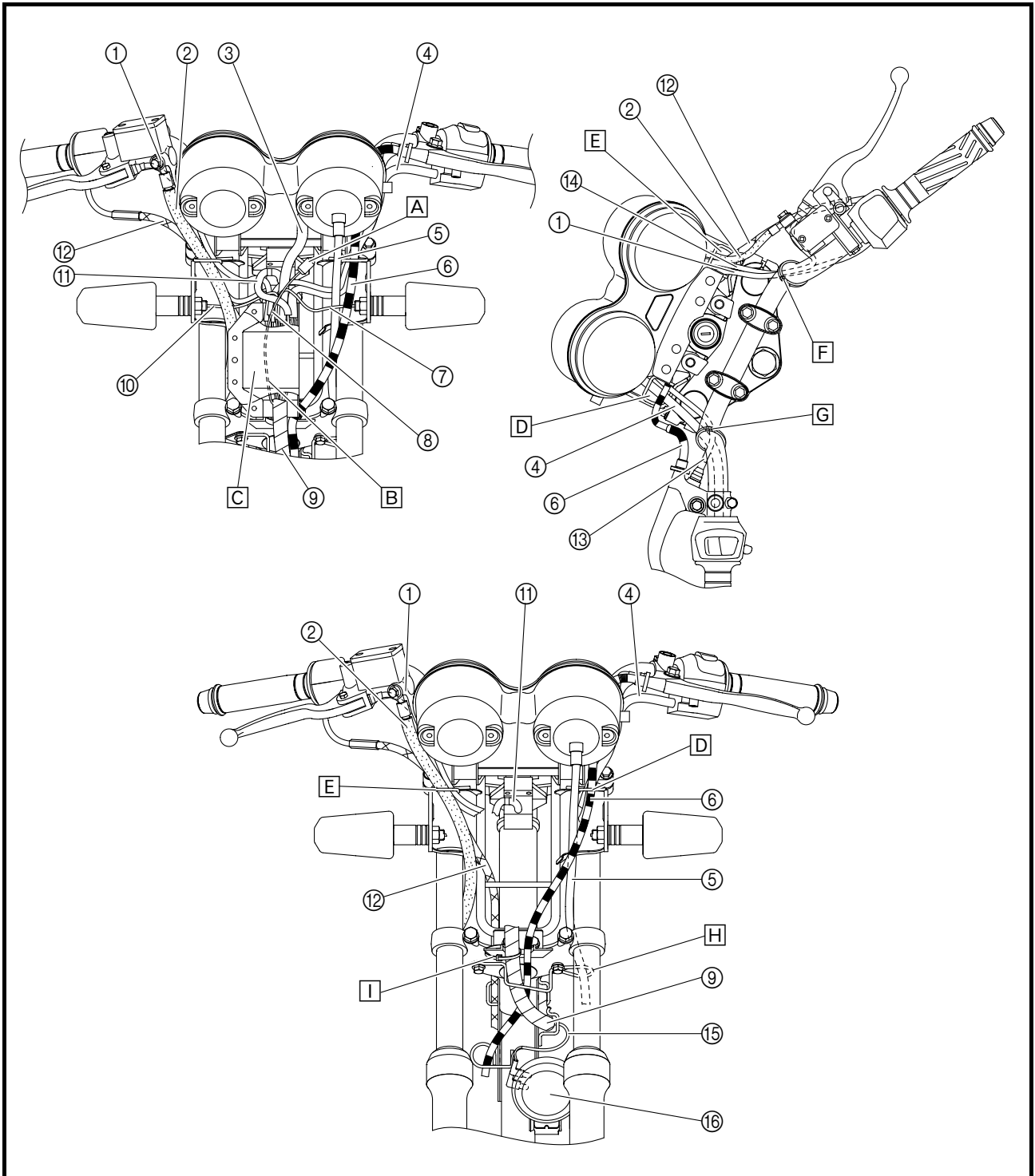
**CABLE ROUTING**

- ① Front brake light switch lead
  - ② Front brake hose
  - ③ Meter assembly lead
  - ④ Left handlebar switch lead
  - ⑤ Speedometer cable
  - ⑥ Clutch cable
  - ⑦ Front turn signal light lead (left)
  - ⑧ Headlight assembly lead
  - ⑨ Wire harness
  - ⑩ Front turn signal light lead (right)
  - ⑪ Main switch lead
  - ⑫ Throttle cable
  - ⑬ Clutch switch lead
  - ⑭ Right handlebar switch lead
  - ⑮ Horn lead
  - ⑯ Horn
- Ⓐ To headlight assembly





- ⓑ Make sure that the headlight assembly lead is routed through the protective covering.
- ⓒ Connect the main switch lead, right handlebar switch lead, left handlebar switch lead, meter assembly lead, clutch switch lead, front brake light switch lead, front turn signal light lead (right), and front turn signal light lead (left), and then cover the leads with the protective covering, and attach the protective covering.
- ⓓ Pass the clutch cable, left handlebar switch lead, and clutch switch lead through the guide.
- ⓔ Pass the throttle cable, front brake hose, front brake light switch lead, and right handlebar switch lead through the guide.
- ⓕ Fasten the right handlebar switch lead and front brake light switch lead with the plastic band.
- ⓖ Fasten the left handlebar switch lead and clutch switch lead with the plastic band.
- ⓗ Pass the speedometer cable through the guide.
- Ⓢ Fasten the wire harness with the plastic locking tie to the bracket. Cut off the excess end of the plastic locking tie.

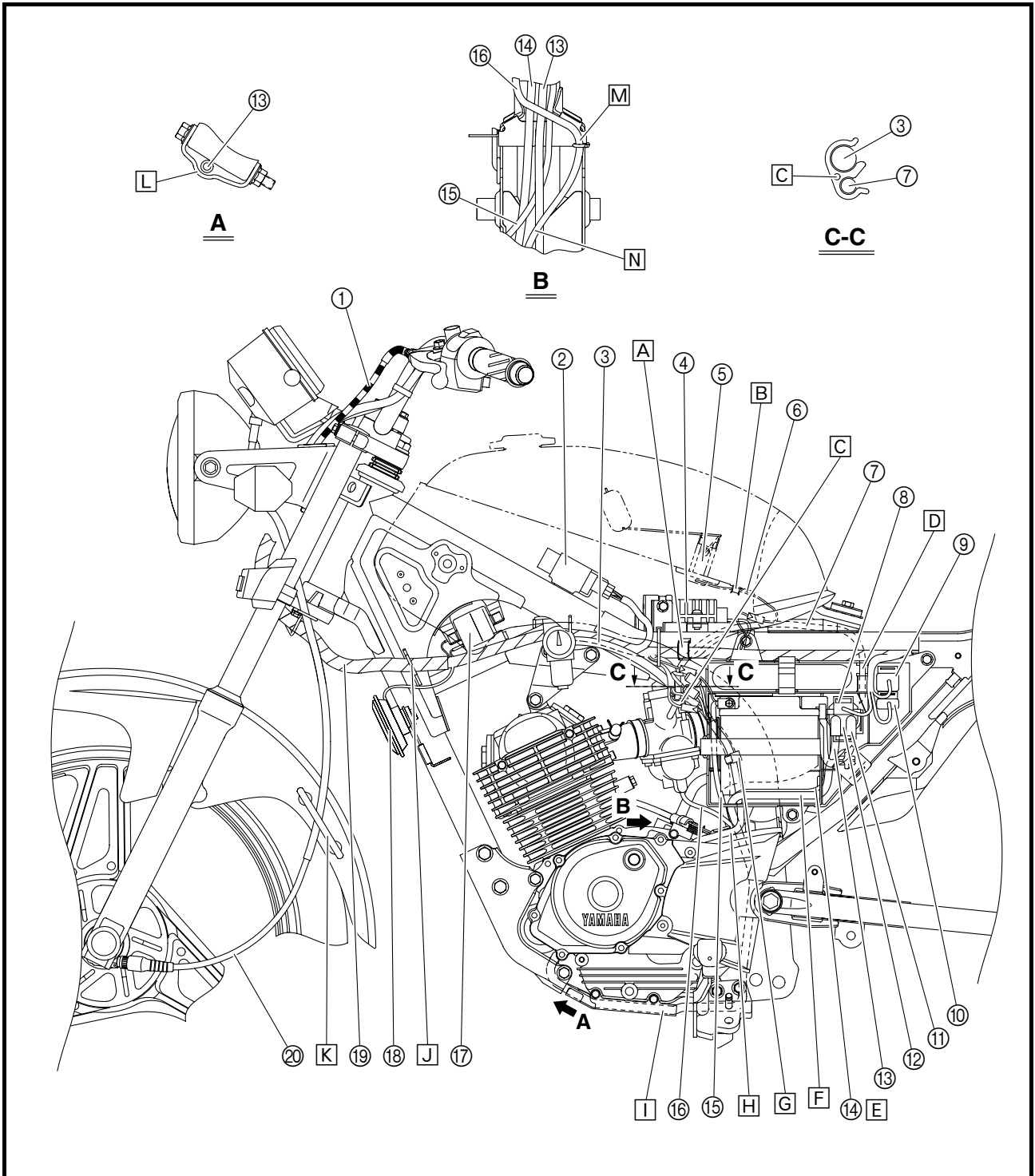


# CABLE ROUTING

**SPEC**



- |                         |                            |
|-------------------------|----------------------------|
| ① Clutch cable          | ⑫ Starter relay            |
| ② C.D.I. unit           | ⑬ Starter motor lead       |
| ③ Fuel hose             | ⑭ Battery breather hose    |
| ④ Rectifier/regulator   | ⑮ Negative battery lead    |
| ⑤ Fuel sender           | ⑯ Carburetor overflow hose |
| ⑥ Fuel sender lead      | ⑰ Ignition coil            |
| ⑦ Air vent hose         | ⑱ Horn                     |
| ⑧ Fuse                  | ⑲ Wire harness             |
| ⑨ Turn signal relay     | ⑳ Speedometer              |
| ⑩ Headlight relay       |                            |
| ⑪ Positive battery lead |                            |

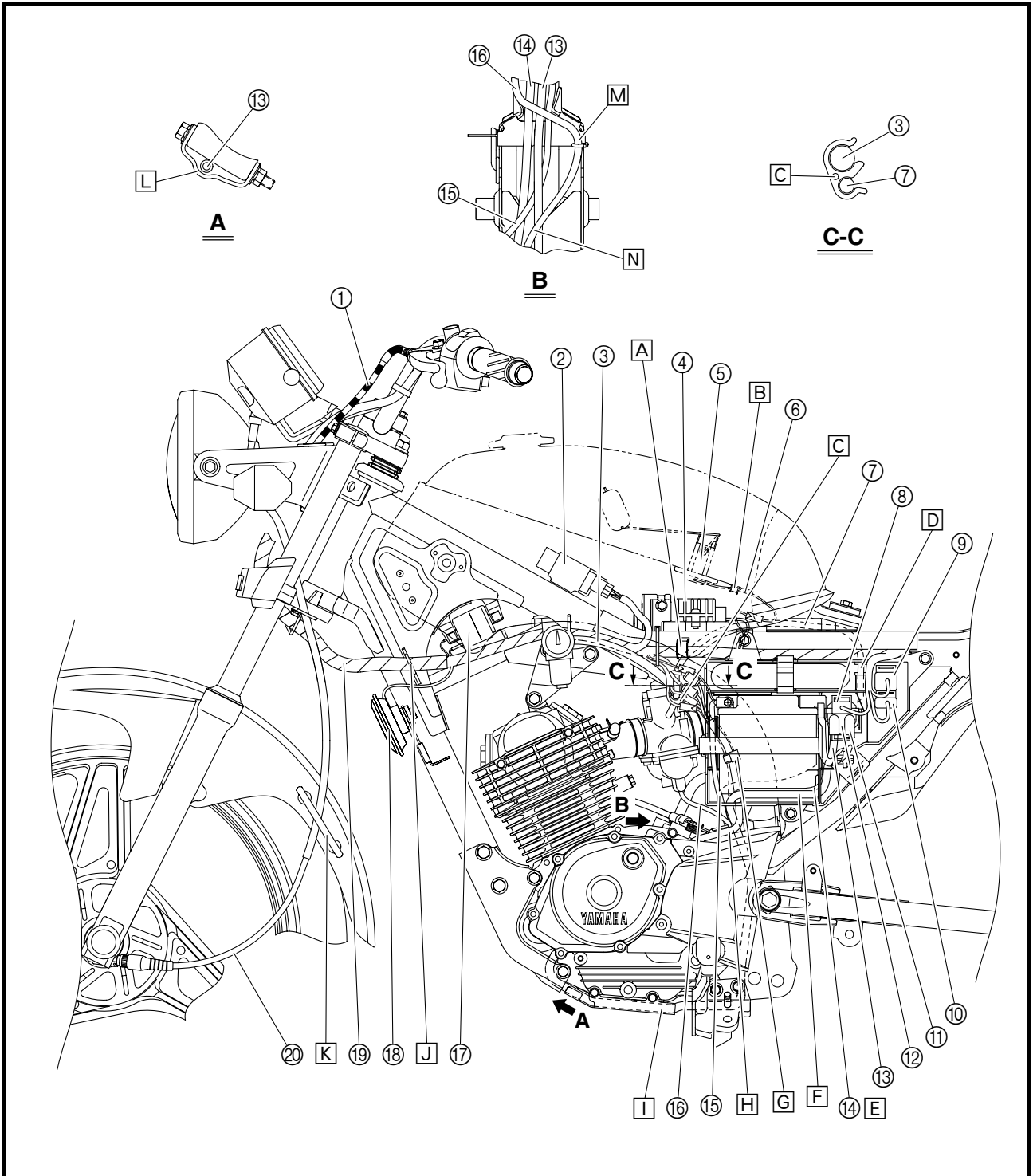


# CABLE ROUTING

**SPEC**



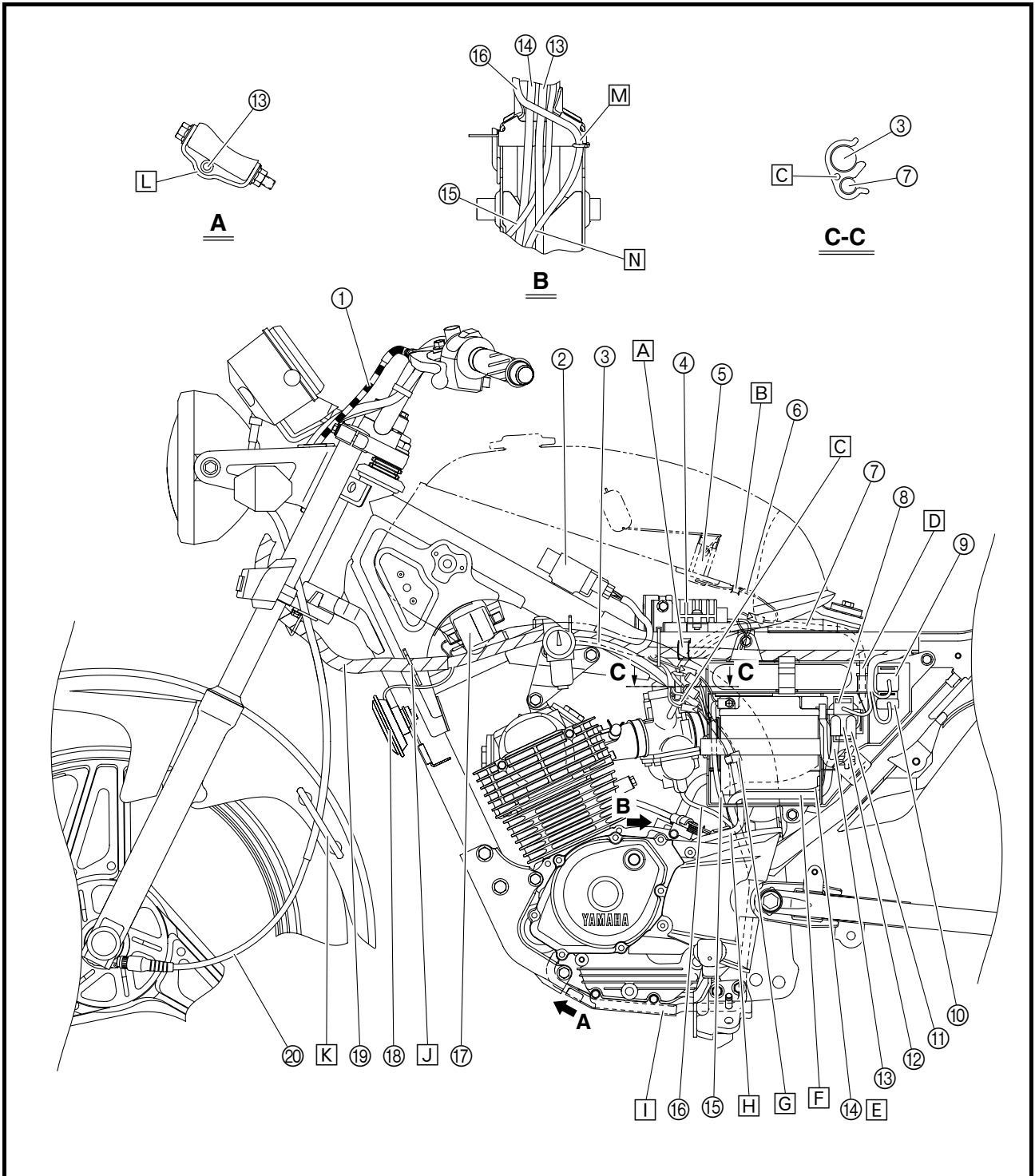
- A** Fasten the wire harness at the white tape with the holder.
- B** Fasten the fuel sender lead with the holder.
- C** Fasten the fuel hose and air vent hose with the holder.
- D** Insert the ends of the air vent hoses into the hole in the battery box.
- E** Route the battery breather hose to the inside of the battery.
- F** Route the starter motor lead to the inside of the battery.
- G** Fasten the A.C. magneto lead and rear brake light switch lead with the holder.
- H** Pass the A.C. magneto lead through the guide on the drive sprocket cover.
- I** Pass the starter motor lead through the guide.
- J** Pass the wire harness through the guide.







- K** Pass the speedometer cable through the guide.
- L** Route the starter motor lead in the groove in the lower engine bracket.
- M** Pass the carburetor overflow hose through the guide.
- N** Route the carburetor overflow hose in front of the battery breather hose, negative battery lead, and starter motor lead.

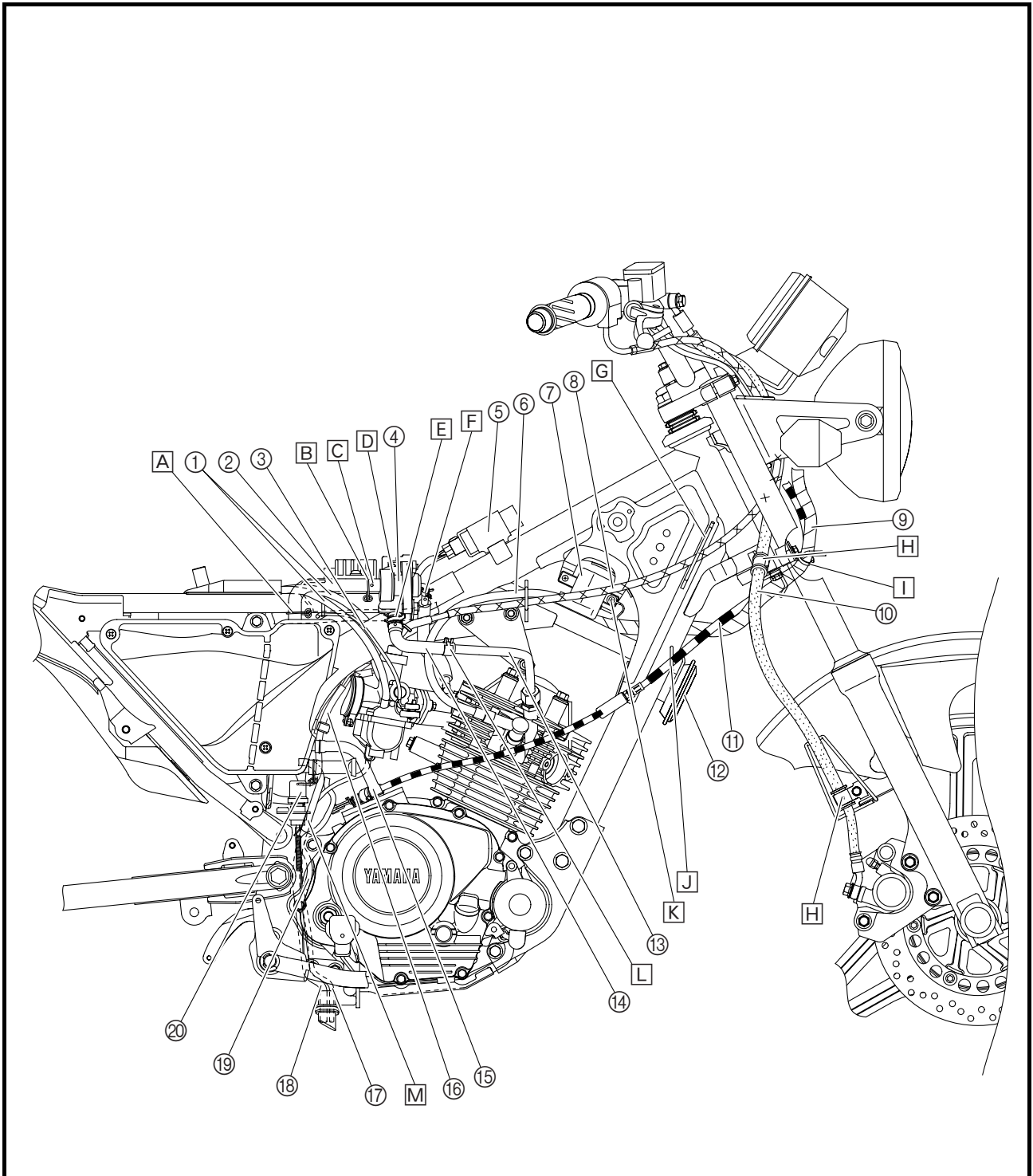


## CABLE ROUTING

SPEC



- |  |   |
|--|---|
| ① Air vent hose  | ⑪ Clutch cable  |
| ② Air induction system hose (air filter to air cut-off valve assembly) | ⑫ Horn  |
| ③ Carburetor heater lead   | ⑬ Air induction system pipe   |
| ④ Air cut-off valve assembly   | ⑭ Air induction system hose (air cut-off valve assembly to cylinder head) |
| ⑤ C.D.I. unit  | ⑮ Crankcase breather hose   |
| ⑥ Spark plug lead  | ⑯ Rear brake light switch lead  |
| ⑦ Ignition coil  | ⑰ Carburetor overflow hose  |
| ⑧ Throttle cable   | ⑱ Battery breather hose   |
| ⑨ Wire harness   | ⑲ Negative battery lead   |
| ⑩ Front brake hose   | ⑳ Rear brake light switch   |

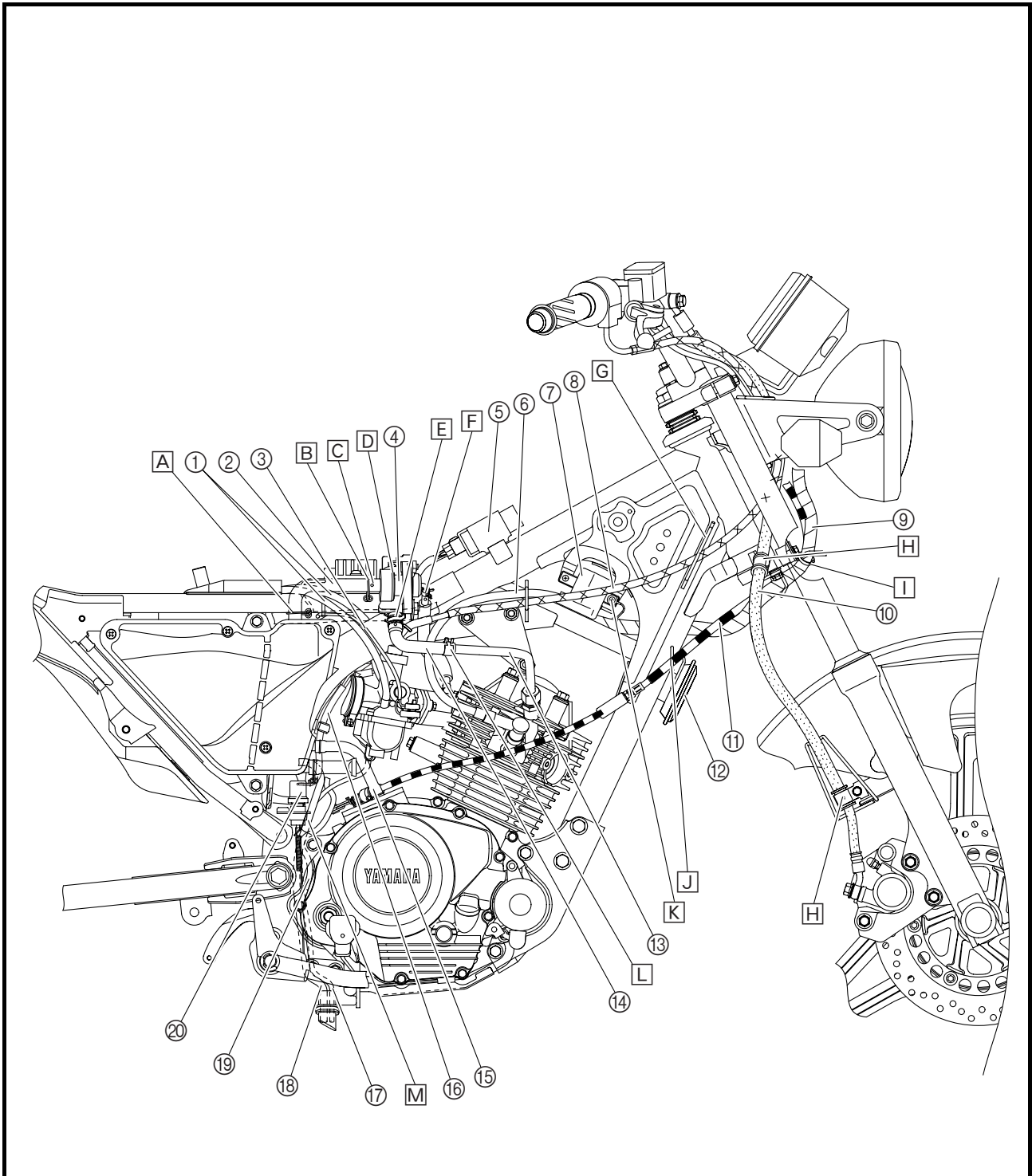


## CABLE ROUTING

SPEC



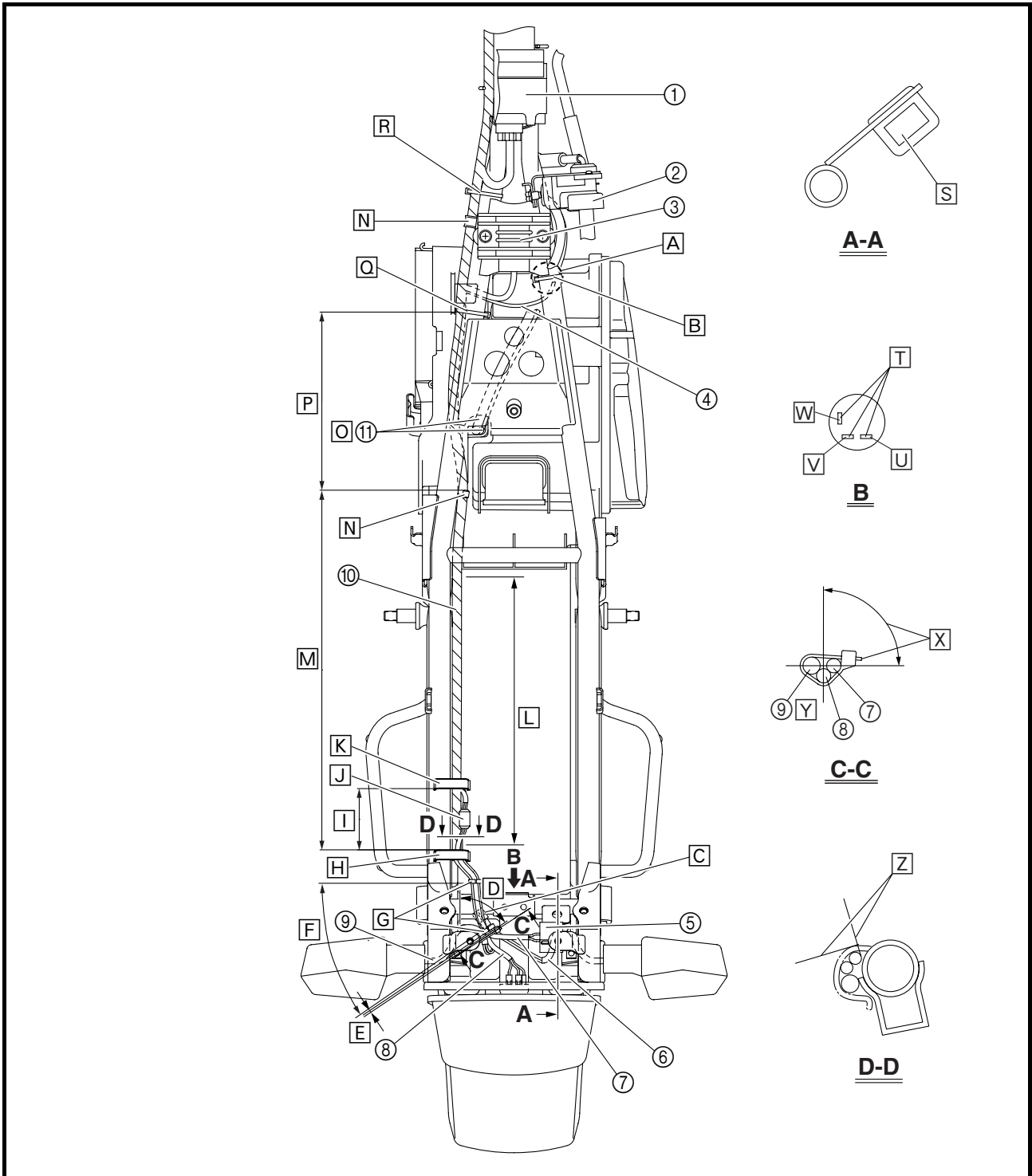
- A Face the ends of the hose clamp forward.
- B Face the ends of the hose clamp downward.
- C Install the air induction system hose (air filter to air cut-off valve assembly) with its white paint mark facing to the right.
- D Face the ends of the hose clamp to the right.
- E Install the air induction system hose (air cut-off valve assembly to cylinder head) with its white paint mark facing to the right.
- F Install the air induction system vacuum hose with its white paint mark facing to the right.
- G Pass the throttle cable through the guide.
- H Fasten the front brake hose with the holder.
- I Fasten the wire harness with the plastic locking tie to the guide. Cut off the excess end of the plastic locking tie.
- J Pass the clutch cable through the guide.
- K Install the ignition coil ground lead terminal and the ignition coil using the same screw.
- L Face the ends of the hose clamp forward.
- M Pass the carburetor overflow hose and battery breather hose between the engine and the frame.





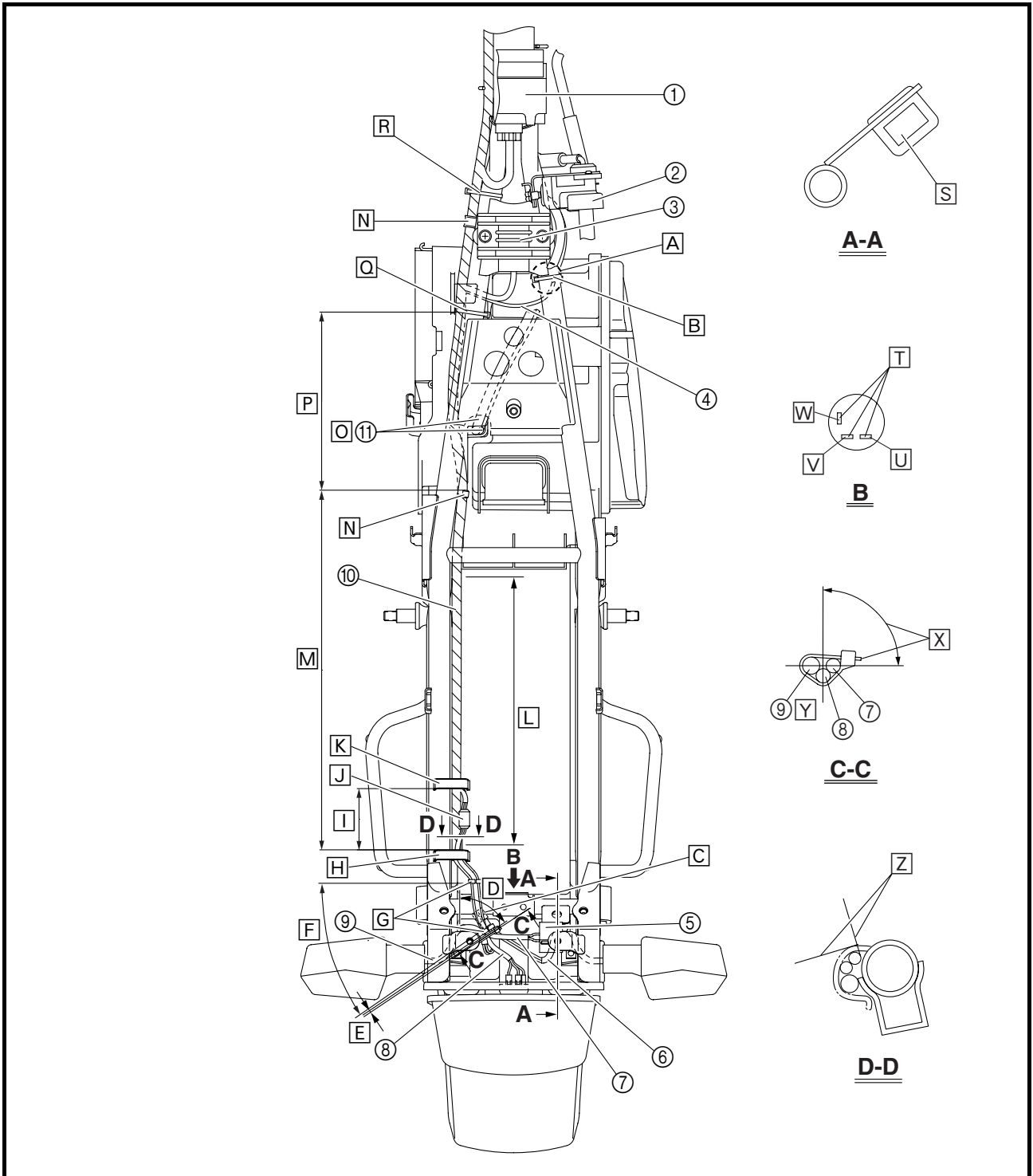
- ① C.D.I. unit
- ② Air cut-off valve assembly
- ③ Rectifier/regulator
- ④ Carburetor heater lead
- ⑤ Thermo switch
- ⑥ Rear turn signal light lead (right)
- ⑦ Thermo switch lead
- ⑧ Tail/brake light lead
- ⑨ Rear turn signal light lead (left)
- ⑩ Wire harness
- ⑪ Air vent hose

- A** Fasten the plastic locking tie next to the rectifier/regulator bracket.
- B** Fasten the carburetor heater lead with the plastic locking tie. Face the buckle of the plastic locking tie inward. Cut off the excess end of the plastic locking tie.
- C** Connect the rear turn signal light lead connectors under the thermo switch lead and tail/brake light lead.





- D Make sure that there is no slack in the rear turn signal light lead between the hole in the rear fender and the plastic locking tie.
- E Less than 10 mm (0.39 in)
- F Make sure that the rear turn signal light lead connectors are positioned in the area shown in the illustration.
- G Fasten the thermo switch lead, rear turn signal light lead (right), rear turn signal light lead (left), and tail/brake light lead with the holders.
- H Fasten the wire harness, thermo switch lead, and tail/brake light lead with the holder, making sure that the holder does not contact the rear fender.
- I Make sure that the thermo switch lead coupler is positioned in the area shown in the illustration.
- J Connect the thermo switch lead coupler, making sure that the coupler is on top of the wire harness and to the inside of the frame.
- K Fasten the wire harness with the holder, making sure that the holder does not contact the rear fender.

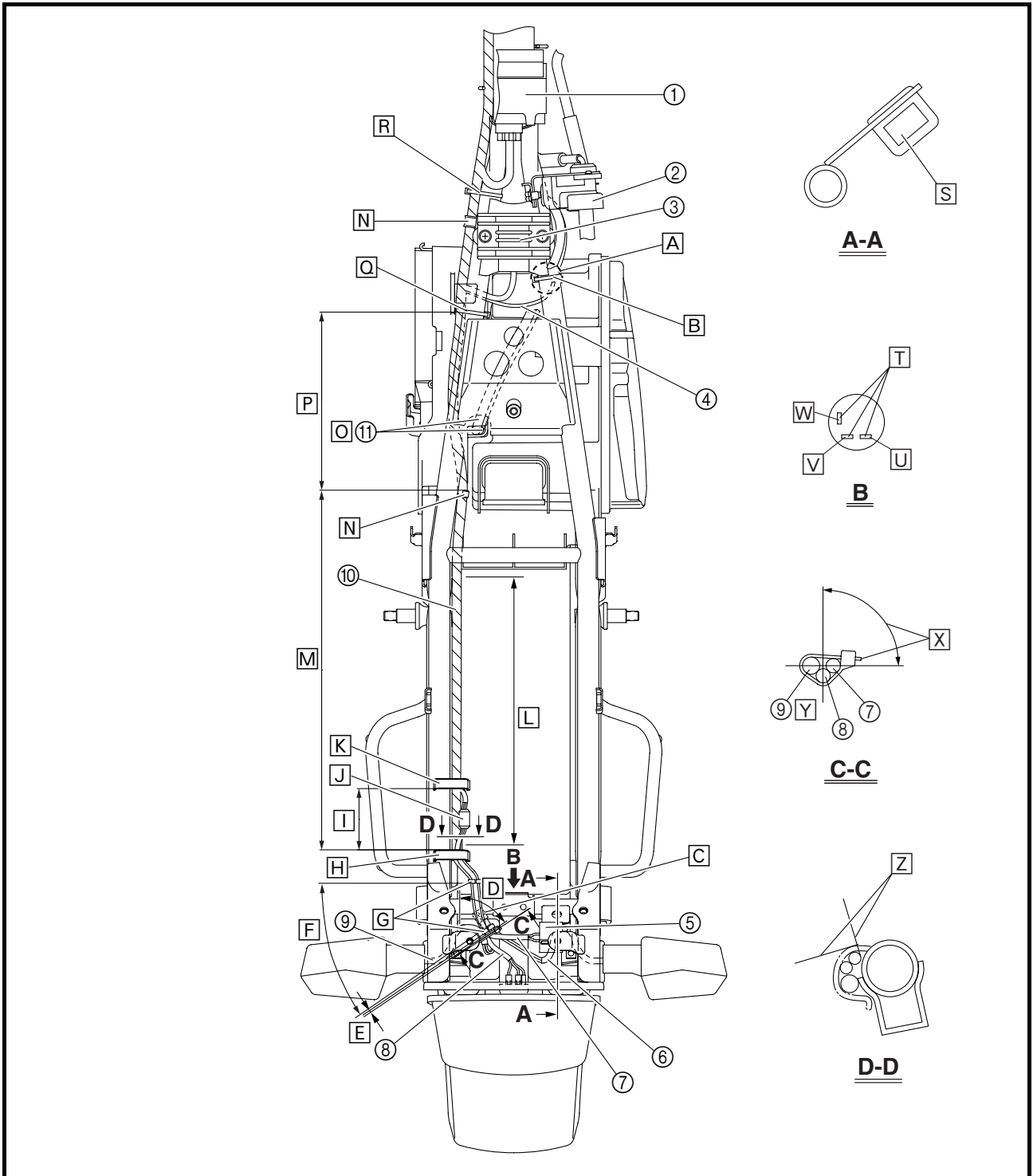


# CABLE ROUTING

**SPEC**

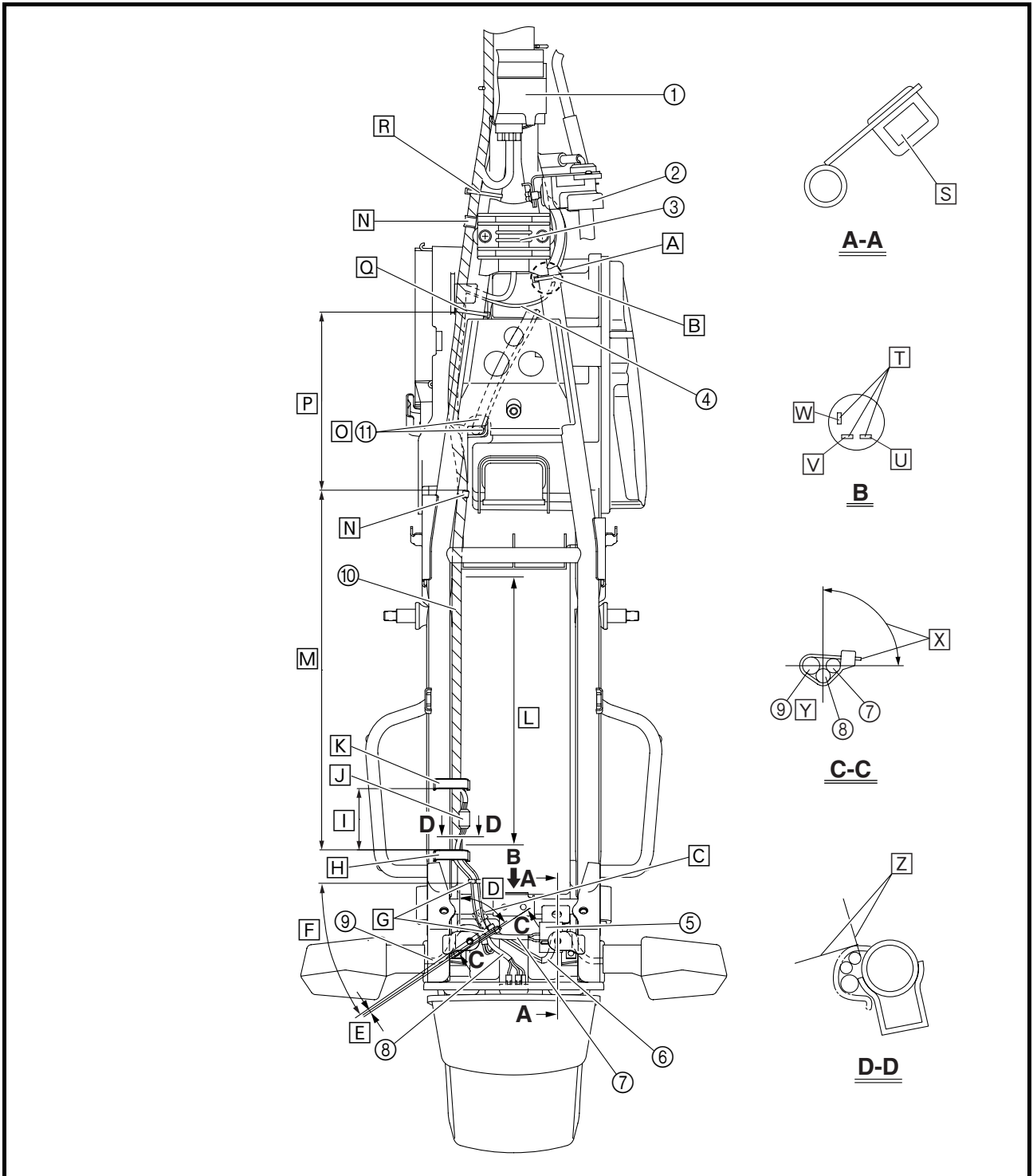


- L** Be sure to route the wire harness to the inside of the frame in the area shown in the illustration.
- M** Make sure that there is no slack in the wire harness in the area shown in the illustration.
- N** Fasten the wire harness with the holder.
- O** Pass the air vent hoses through the hole in the battery box, making sure not to pinch or crush the hoses.
- P** Any slack in the wire harness should be in the area shown in the illustration.
- Q** Fasten the wire harness with the plastic locking tie. Cut off the excess end of the plastic locking tie.
- R** Fasten the wire harness with the plastic band.
- S** Install the thermo switch on the bottom side of its bracket.
- T** Connect the tail/brake light leads to the tail/brake light terminals according to the lead colors shown next to the terminals in the illustration.
- U** Yellow
- V** Blue





- W Black
- X Cut off the excess end of the plastic locking tie to 2 mm or less, and then face the end of the tie inward and upward in the range shown in the illustration.
- Y Be sure to fasten the rear turn signal light lead (left) on its protective sleeve with the plastic locking tie.
- Z The wire harness should not protrude past the lines shown in the illustration.



---

## CHAPTER 3

### PERIODIC CHECKS AND ADJUSTMENTS

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## 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 AND LUBRICATION CHART

**NOTE:** \_\_\_\_\_

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

NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (× 1000 km)					ANNUAL CHECK
			1	6	12	18	24	
1	* Fuel line (See page 3-24.)	• Check fuel hoses for cracks or damage.		√	√	√	√	√
2	* Fuel cock filter (See page 3-24.)	• Check condition.			√		√	
3	Spark plug (See page 3-14.)	• Check condition.		√		√		
		• Clean and regap.						
		• Replace.			√		√	
4	* Valves (See page 3-7.)	• Check valve clearance. • Adjust.		√	√	√	√	
5	Air filter element (See page 3-21.)	• Clean.		√		√		
		• Replace.			√		√	
6	* Battery (See page 3-42.)	• Check electrolyte level and specific gravity. • Make sure that the breather hose is properly routed.		√	√	√	√	√
7	Clutch (See page 3-20.)	• Check operation. • Adjust.	√	√	√	√	√	
8	* Front brake (See pages 3-26, 3-27.)	• Check operation, fluid level and vehicle for fluid leakage.	√	√	√	√	√	√
		• Replace brake pads.	<b>Whenever worn to the limit</b>					
9	* Rear brake (See pages 3-26, 3-28.)	• Check operation and adjust brake pedal free play.	√	√	√	√	√	√
		• Replace brake shoes.	<b>Whenever worn to the limit</b>					
10	* Brake hose (See page 3-29.)	• Check for cracks or damage.		√	√	√	√	√
		• Replace.	<b>Every 4 years</b>					
11	* Wheels (See pages 4-3, 4-12.)	• Check runout and for damage.		√	√	√	√	
12	* Tires (See page 3-37.)	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√	√	√	√
13	* Wheel bearings (See page 4-3.)	• Check bearing for looseness or damage.		√	√	√	√	

# PERIODIC MAINTENANCE AND LUBRICATION CHART



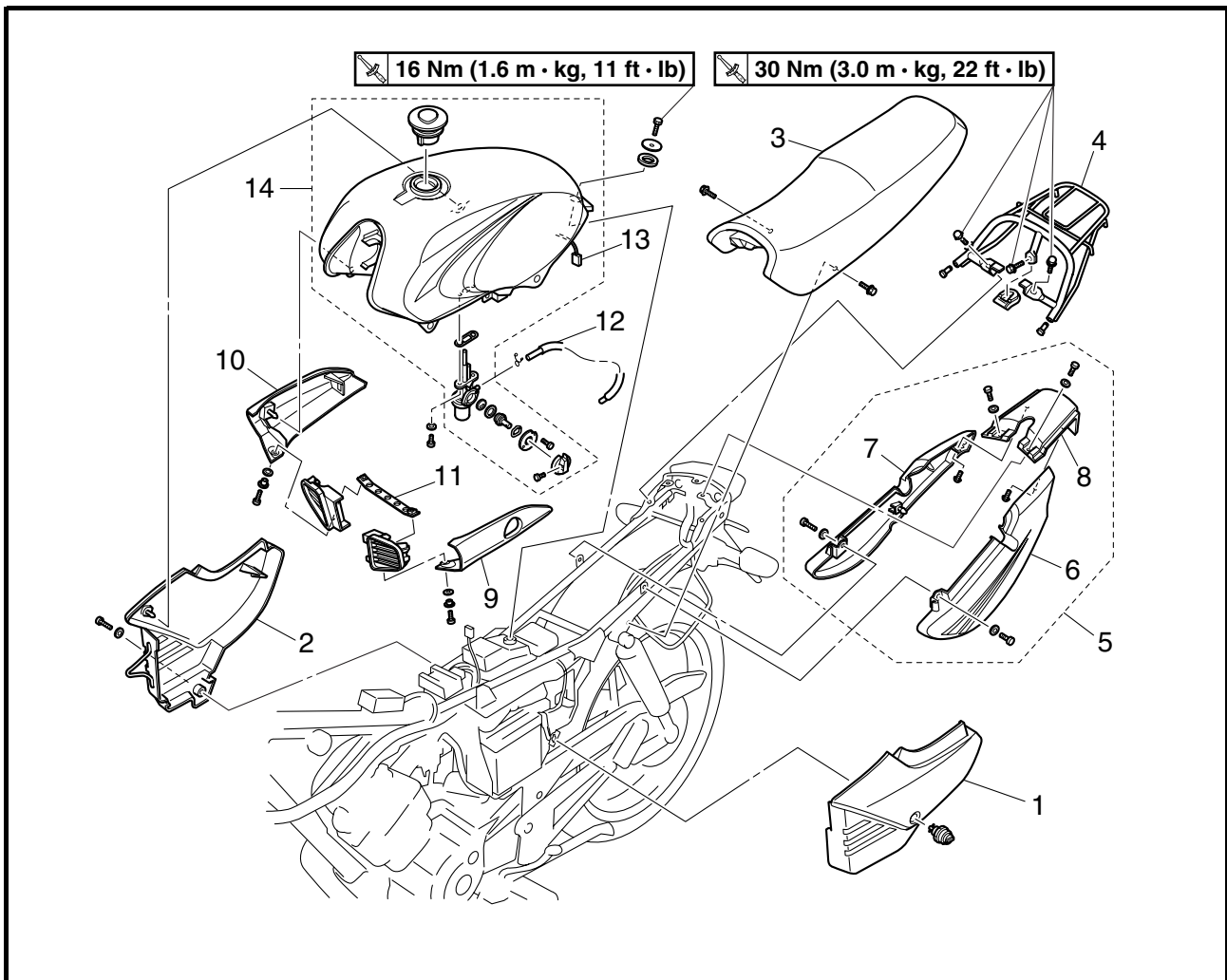
NO.	ITEM	CHECK OR MAINTENANCE JOB	ODOMETER READING (× 1000 km)					ANNUAL CHECK
			1	6	12	18	24	
14 *	Swingarm (See page 4-67.)	<ul style="list-style-type: none"> <li>• Check operation and for excessive play.</li> <li>• Lubricate with lithium-soap-based grease.</li> </ul>		√	√	√	√	
			Every 24000 km					
15	Drive chain (See pages 3-31, 4-61.)	<ul style="list-style-type: none"> <li>• Check chain slack, alignment and condition.</li> <li>• Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.</li> </ul>	Every 1000 km and after washing the vehicle or riding in the rain					
16 *	Steering bearings (See page 3-34.)	<ul style="list-style-type: none"> <li>• Check bearing play and steering for roughness.</li> <li>• Lubricate with lithium-soap-based grease.</li> </ul>	√	√	√	√	√	
			Every 24000 km					
17 *	Chassis fasteners (See page 2-19.)	<ul style="list-style-type: none"> <li>• Make sure that all nuts, bolts and screws are properly tightened.</li> </ul>		√	√	√	√	√
18	Centerstand (See page 3-41.)	<ul style="list-style-type: none"> <li>• Check operation.</li> <li>• Lubricate.</li> </ul>		√	√	√	√	√
19 *	Front fork (See page 3-35.)	<ul style="list-style-type: none"> <li>• Check operation and for oil leakage.</li> </ul>		√	√	√	√	
20 *	Shock absorber assemblies (See page 4-68.)	<ul style="list-style-type: none"> <li>• Check operation and shock absorbers for oil leakage.</li> </ul>		√	√	√	√	
21 *	Carburetor (See page 3-11.)	<ul style="list-style-type: none"> <li>• Check starter (choke) operation.</li> <li>• Adjust engine idling speed.</li> </ul>	√	√	√	√	√	√
22	Engine oil (See pages 3-17, 3-19.)	<ul style="list-style-type: none"> <li>• Change.</li> <li>• Check oil level and vehicle for oil leakage.</li> </ul>	√	√	√	√	√	√
23 *	Front and rear brake switches (See page 7-3.)	<ul style="list-style-type: none"> <li>• Check operation.</li> </ul>	√	√	√	√	√	√
24	Moving parts and cables (See pages 3-40, 3-41.)	<ul style="list-style-type: none"> <li>• Lubricate.</li> </ul>		√	√	√	√	√
25 *	Throttle grip housing and cable (See page 3-12.)	<ul style="list-style-type: none"> <li>• Check operation and free play.</li> <li>• Adjust the throttle cable free play if necessary.</li> <li>• Lubricate the throttle grip housing and cable.</li> </ul>		√	√	√	√	√
26 *	Air induction system (See page 6-12.)	<ul style="list-style-type: none"> <li>• Check the air cut-off valve, reed valve, and hose for damage.</li> <li>• Replace any damaged parts if necessary.</li> </ul>		√	√	√	√	√
27 *	Lights, signals and switches (See pages 3-48, 7-3.)	<ul style="list-style-type: none"> <li>• Check operation.</li> <li>• Adjust headlight beam.</li> </ul>	√	√	√	√	√	√

**NOTE:**

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

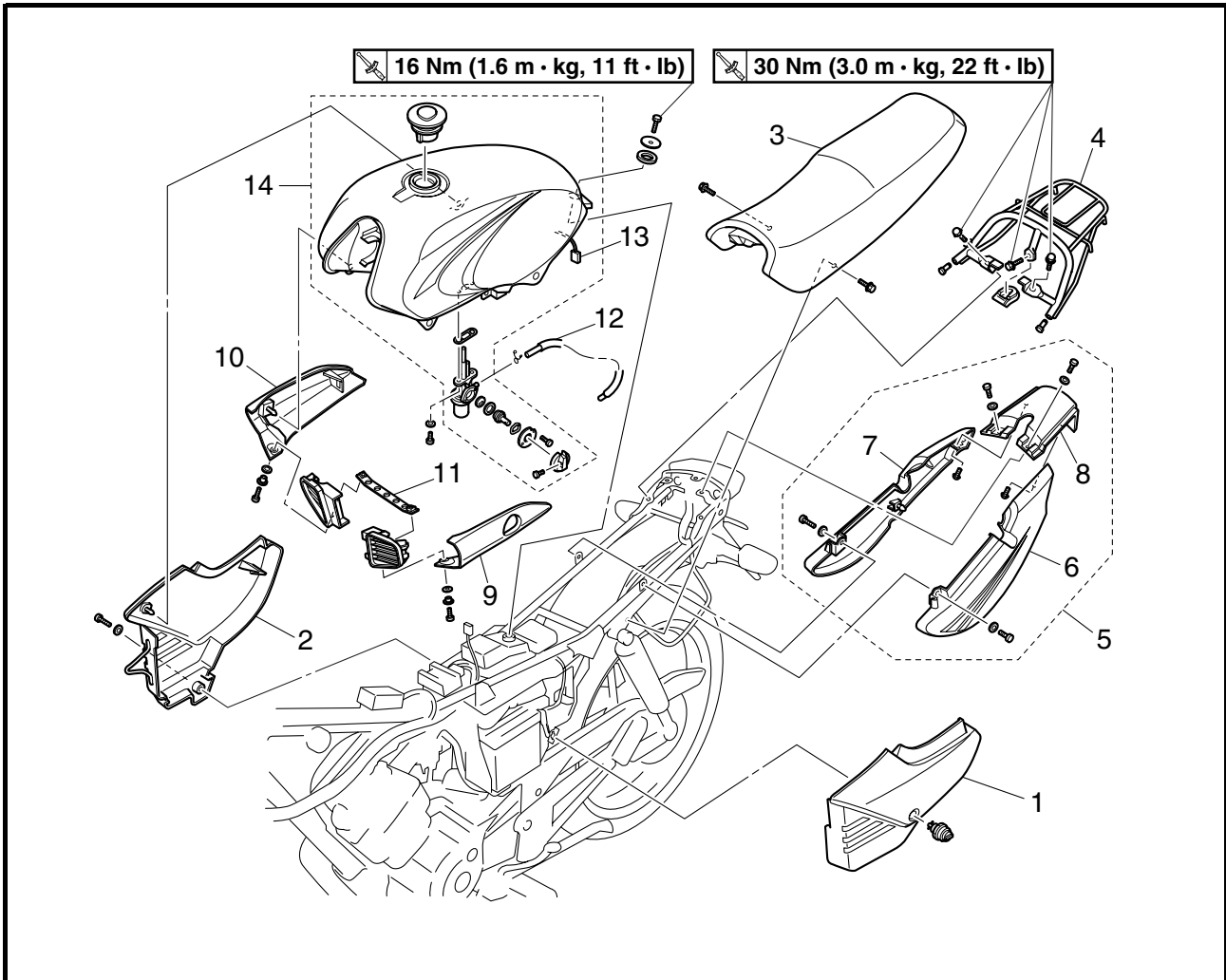
EAS00042

## SIDE COVERS, SEAT AND FUEL TANK



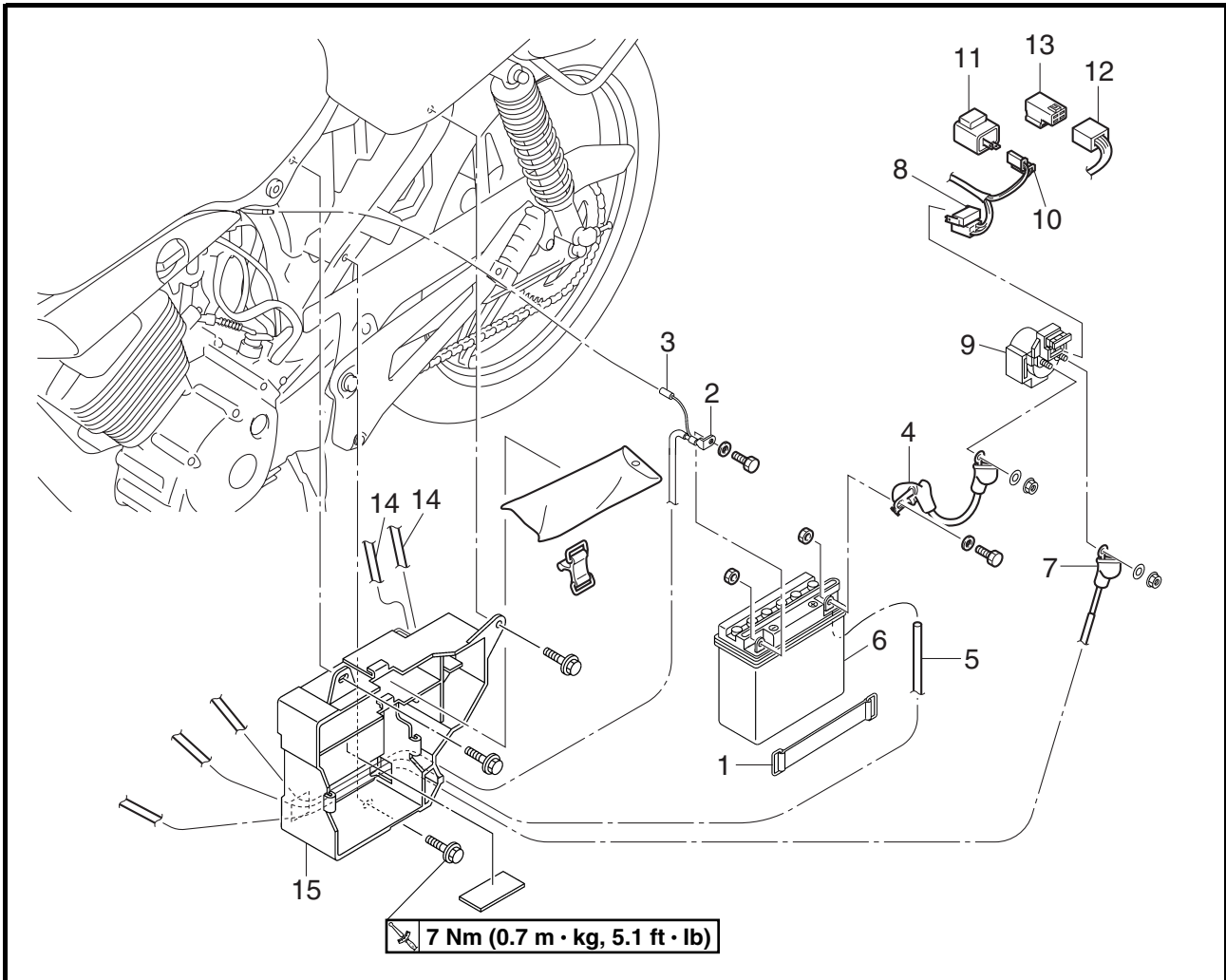
Order	Job/Part	Q'ty	Remarks
	<b>Removing the side covers, seat and fuel tank</b>		Remove the parts in the order listed.
1	Left side cover	1	
2	Right side cover	1	
3	Seat	1	
4	Carrier	1	
5	Rear cowling assembly	1	
6	Left rear side cover	1	
7	Right rear side cover	1	
8	Rear panel	1	
9	Left air duct	1	
10	Right air duct	1	
11	Air duct stay	1	

# SIDE COVERS, SEAT AND FUEL TANK



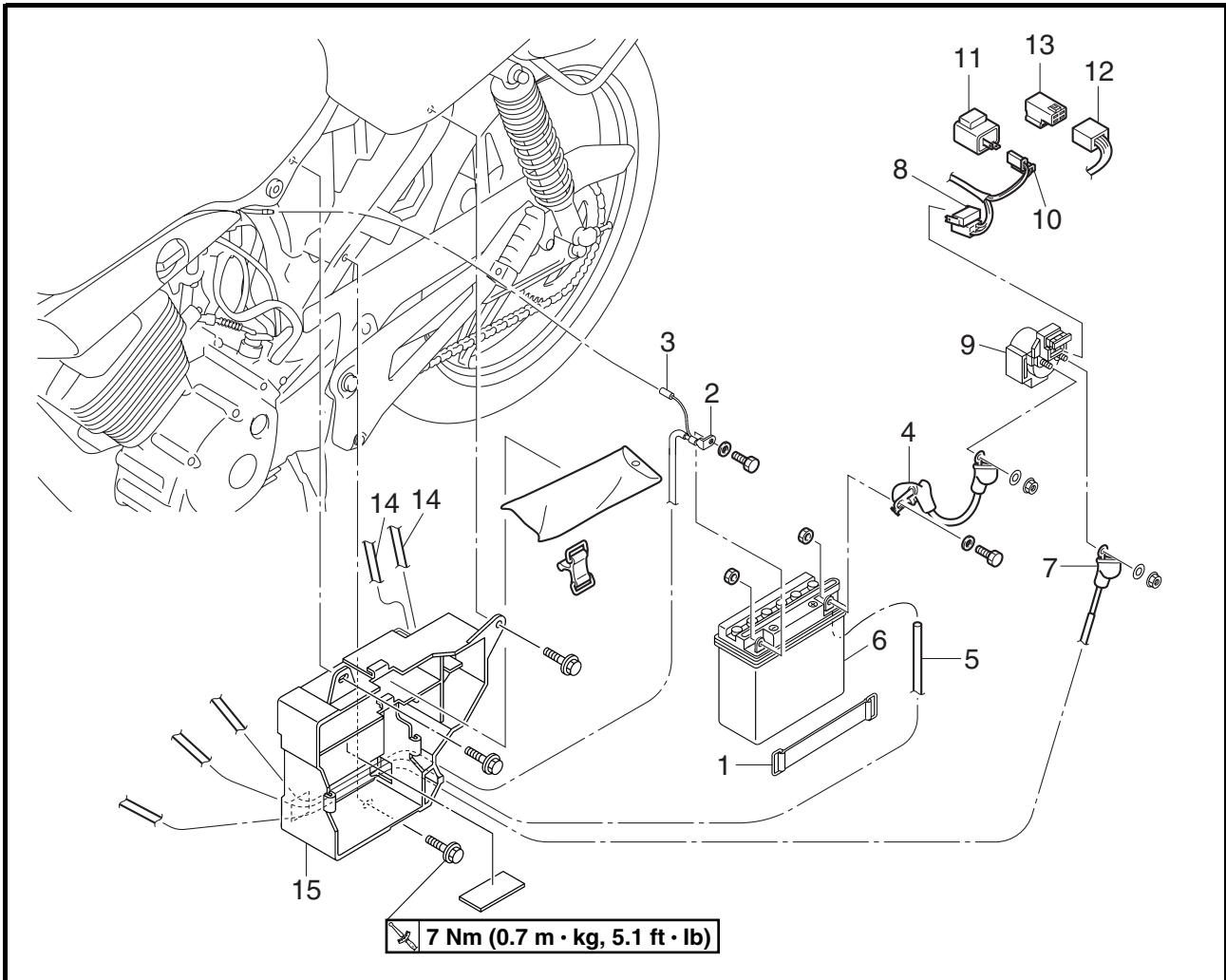
Order	Job/Part	Q'ty	Remarks
12	Fuel hose (fuel cock side)	1	<b>NOTE:</b> _____ Before disconnecting the fuel hose, turn the fuel cock to "OFF".
13	Fuel sender coupler	1	Disconnect.
14	Fuel tank	1	For installation, reverse the removal procedure.

BATTERY AND BATTERY BOX



Order	Job/Part	Q'ty	Remarks
	<b>Removing the battery and battery box</b>		Remove the parts in the order listed.
	Left side cover		Refer to "SIDE COVERS, SEAT AND FUEL TANK".
1	Battery band	1	
2	Negative battery lead	1	Disconnect.
3	Negative lead connector	1	Disconnect.
4	Positive battery lead	1	
5	Battery breather hose	1	Disconnect.
6	Battery	1	
7	Starter motor lead	1	Disconnect.
8	Starter relay coupler	1	Disconnect.
9	Starter relay	1	
10	Turn signal relay coupler	1	Disconnect.
11	Turn signal relay	1	

# BATTERY AND BATTERY BOX



Order	Job/Part	Q'ty	Remarks
12	Headlight relay coupler	1	Disconnect.
13	Headlight relay	1	
14	Air vent hose	2	
15	Battery box	1	For installation, reverse the removal procedure.

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## ENGINE

### ADJUSTING THE VALVE CLEARANCE

The following procedure applies to all of the valves.

#### NOTE:

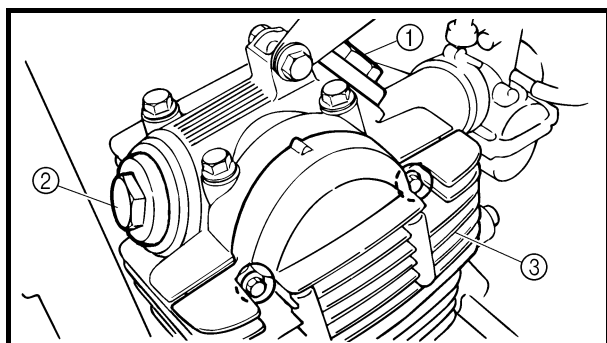
- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.

#### 1. Disconnect:

- spark plug cap

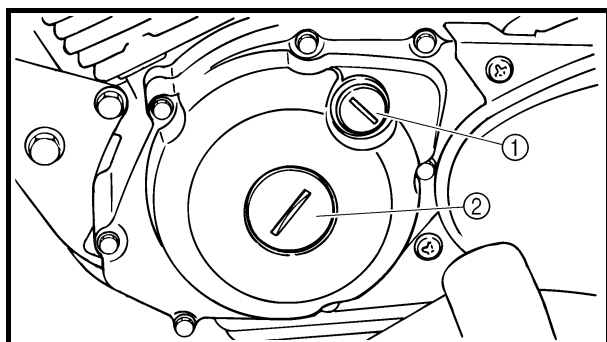
#### 2. Remove:

- spark plug



#### 3. Remove:

- intake tappet cover ①
- exhaust tappet cover ②
- camshaft sprocket cover ③



#### 4. Remove:

- timing mark accessing screw ①
- crankshaft end accessing screw ②

#### 5. Measure:

- valve clearance

Out of specification → Adjust.



#### Valve clearance (cold)

##### Intake valve

0.08 ~ 0.12 mm  
(0.0031 ~ 0.0047 in)

##### Exhaust valve

0.10 ~ 0.14 mm  
(0.0039 ~ 0.0055 in)





## ADJUSTING THE VALVE CLEARANCE/ CHECKING AND ADJUSTING THE EXHAUST GAS



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

	<b>Locknut</b> <b>8 Nm (0.8 m · kg, 5.8 ft · lb)</b>
--	---

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



7. Install:
  - timing mark accessing screw
  - crankshaft end accessing screw

8. Install:
  - O-rings **New**
  - camshaft sprocket cover

**10 Nm (1.0 m · kg, 7.2 ft · lb)**

- intake tappet cover

**18 Nm (1.8 m · kg, 13 ft · lb)**

- exhaust tappet cover

**18 Nm (1.8 m · kg, 13 ft · lb)**

9. Install:
  - spark plug

**13 Nm (1.3 m · kg, 9.4 ft · lb)**

10. Connect:
  - spark plug cap

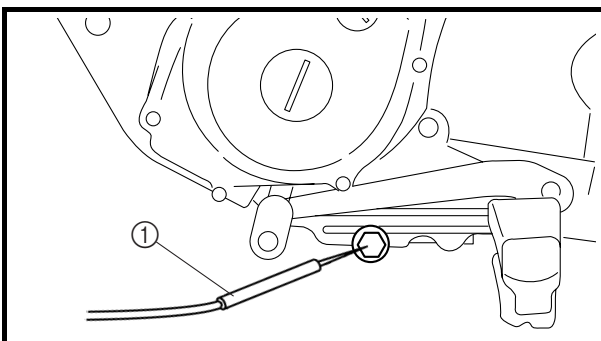
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### CHECKING AND ADJUSTING THE EXHAUST GAS

1. Stand the vehicle on a level surface.

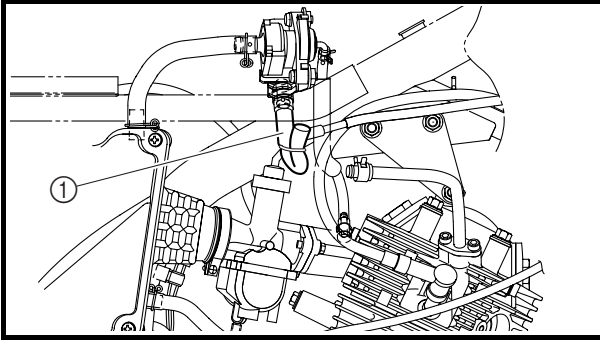
**NOTE:** \_\_\_\_\_

- Place the vehicle on a suitable stand.
- Make sure the vehicle is upright.
- Measure the exhaust gas at idle when the air induction system is not operating.



2. Install:
  - temperature probe tester ①  
(onto the engine oil drain bolt)

## CHECKING AND ADJUSTING THE EXHAUST GAS



3. Disconnect:
  - air induction system hose  
(air cut-off valve to cylinder head) ①
4. Stop air induction system operation.

**NOTE:**

Crimp the hose ① running from the reed valve to the air cut-off valve to prevent the air cut-off valve from operating.

Make sure not to damage the hose while crimping it.

5. Start the engine and warm it up until the specified oil temperature is reached.



**Oil temperature**

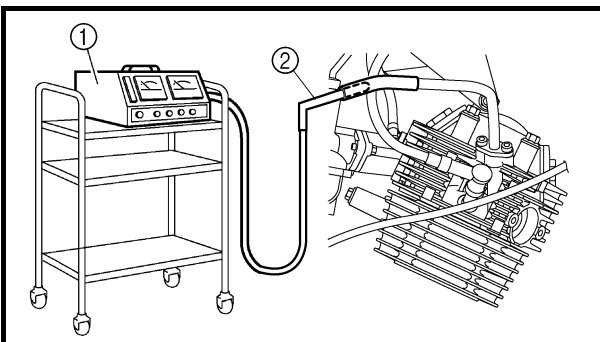
75 ~ 85 °C (167 ~ 185 °F)

6. Measure:
  - engine idling speed  
(air induction system OFF)  
Out of specification → Adjust.  
Refer to “ADJUSTING THE ENGINE IDLING SPEED”.



**Engine idling speed**

1,350 ~ 1,450 r/min



7. Install:
  - CO tester ①
  - sampling probe ②

**NOTE:**

- Be sure to set the heat-resistant rubber tube so that exhaust gas does not leak out.
- Before using the CO tester, be sure to read the user's manual.

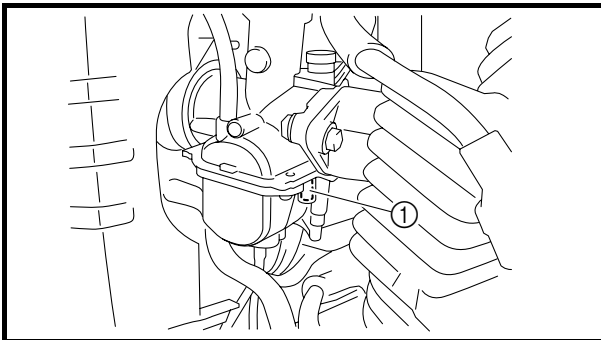
## CHECKING AND ADJUSTING THE EXHAUST GAS/ ADJUSTING THE ENGINE IDLING SPEED



8. Measure:
- CO density  
Out of specification → Adjust.  
Within specification → Check the air induction system.  
Refer to “AIR INDUCTION SYSTEM” in chapter 6.



**CO density (when the air induction system is not operating)**  
3.0 ~ 5.0%



9. Adjust:
- pilot screw ①



**Pilot screw**  
1-1/2 turns out

If the CO density cannot be adjusted with the pilot screw, overhaul the carburetor and check the air filter.

EAS00054

### ADJUSTING THE ENGINE IDLING SPEED

#### NOTE:

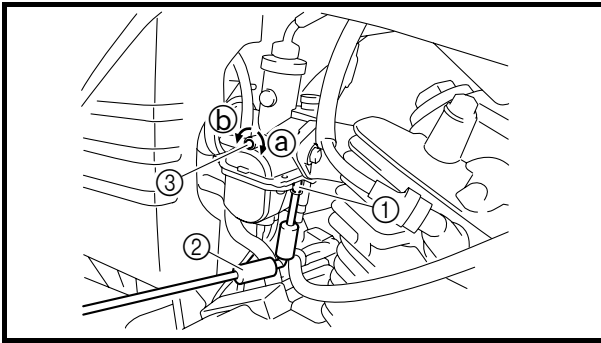
Prior to adjusting the engine idling speed, the air filter element should be clean, and the engine should have adequate compression.

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



**Engine idling speed**  
1,400 ~ 1,500 r/min

## ADJUSTING THE ENGINE IDLING SPEED/ ADJUSTING THE THROTTLE CABLE FREE PLAY



3. Adjust:
- engine idling speed



- a. Turn the pilot screw ① in or out until it is lightly seated with the carburetor angle driver ②.

	<b>Carburetor angle driver</b> <b>90890-03158</b>
--	--

- b. Turn the pilot screw out the specified number of turns.

	<b>Pilot screw setting</b> <b>1-1/2 turns out</b>
--	--

- c. Turn the throttle stop screw ③ in direction ① or ② until the specified engine idling speed is obtained.

<b>Direction ①</b>	<b>Engine idling speed is increased.</b>
<b>Direction ②</b>	<b>Engine idling speed is decreased.</b>



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

	<b>Throttle cable free play (at the flange of the throttle grip)</b> <b>3 ~ 7 mm (0.12 ~ 0.28 in)</b>
--	--

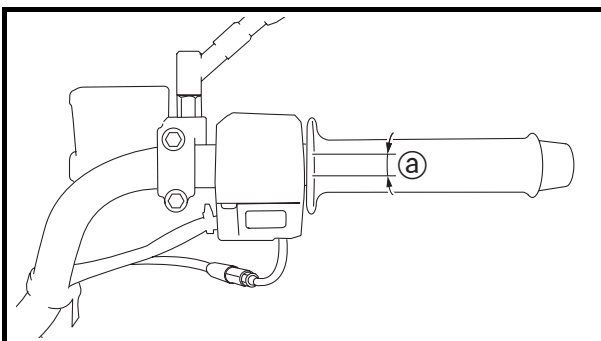
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### ADJUSTING THE THROTTLE CABLE FREE PLAY

**NOTE:** \_\_\_\_\_

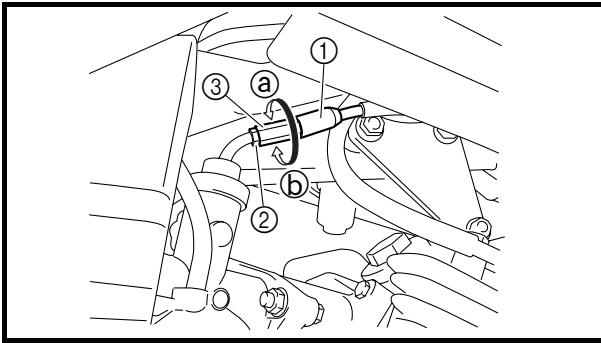
Prior to adjusting the throttle cable free play, the engine idling speed should be adjusted.

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



	<b>Throttle cable free play (at the flange of the throttle grip)</b> <b>3 ~ 7 mm (0.12 ~ 0.28 in)</b>
--	--

# ADJUSTING THE THROTTLE CABLE FREE PLAY



2. Adjust:
  - throttle cable free play



### Carburetor side

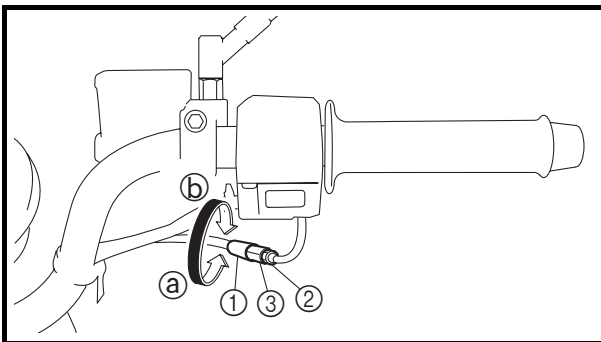
- a. Slide back the rubber cover ①.
- b. Loosen the locknut ②.
- c. Turn the adjusting nut ③ in direction ① or ② until the specified throttle cable free play is obtained.

<b>Direction ①</b>	<b>Throttle cable free play is increased.</b>
<b>Direction ②</b>	<b>Throttle cable free play is decreased.</b>

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

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

<b>Direction ①</b>	<b>Throttle cable free play is increased.</b>
<b>Direction ②</b>	<b>Throttle cable free play is decreased.</b>

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

### **⚠ WARNING**

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



EAS00060


## CHECKING THE SPARK PLUG

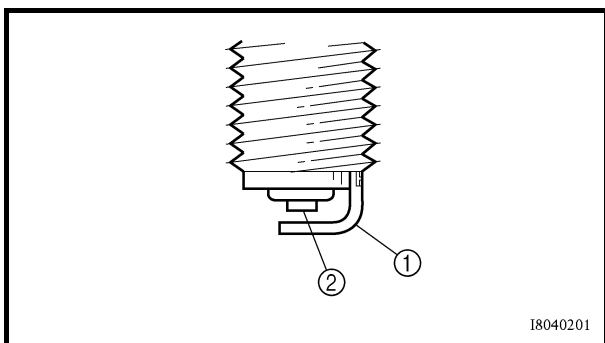
1. Disconnect:
  - spark plug cap
2. Remove:
  - spark plug

### CAUTION:

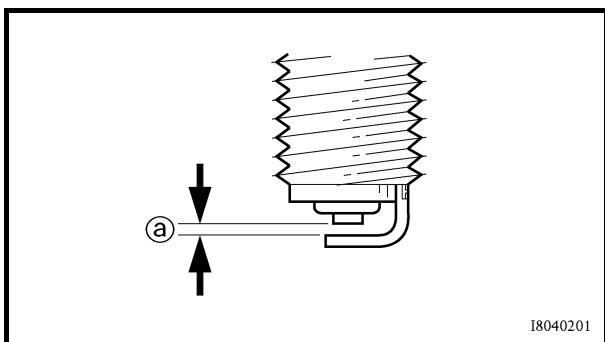
**Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.**

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


	<b>Spark plug type (manufacturer)</b> <b>CR6HSA (NGK)</b>
---	--



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 ③  
(with a wire thickness gauge)  
Out of specification → Regap.

	<b>Spark plug gap</b> <b>0.6 ~ 0.7 mm (0.024 ~ 0.028 in)</b>
---	---

7. Install:
  - spark plug  **13 Nm (1.3 m · kg, 9.4 ft · lb)**

### NOTE:

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

8. Connect:
  - spark plug cap





EAS00067

## MEASURING THE COMPRESSION PRESSURE

### 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. Disconnect:

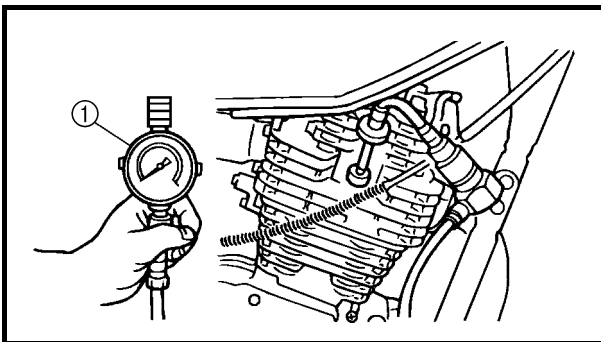
- spark plug cap

### 4. Remove:

- spark plug

### CAUTION:

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



### 5. Install:

- compression gauge ①



**Compression gauge**  
90890-03081, YU-33223

### 6. Measure:

- compression pressure

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



**Compression pressure (at sea level)**

**Minimum**

1,044 kPa  
(10.4 kg/cm<sup>2</sup>, 148.5 psi)

**Standard**

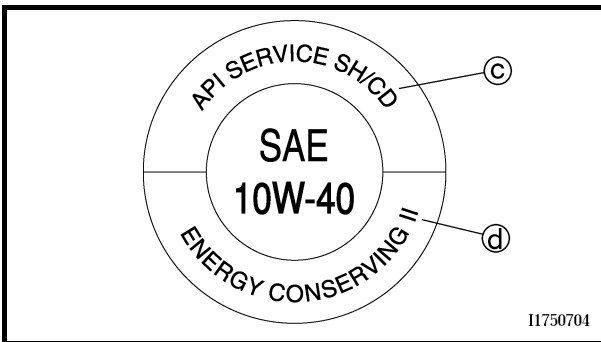
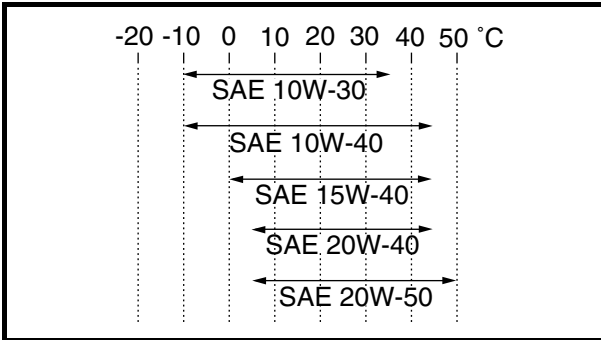
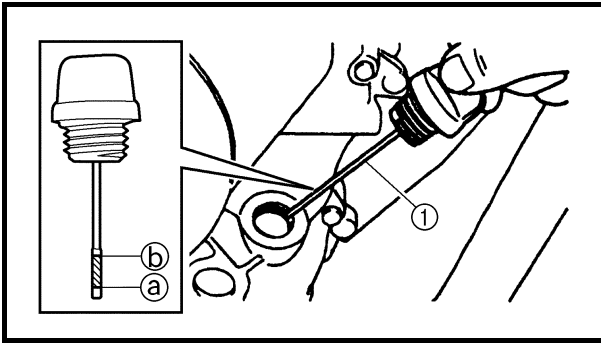
1,200 kPa  
(12.0 kg/cm<sup>2</sup>, 170.7 psi)

**Maximum**

1,344 kPa  
(13.4 kg/cm<sup>2</sup>, 191.2 psi)



## CHECKING THE ENGINE OIL LEVEL



### 3. Check:

- engine oil level

The engine oil level should be between the minimum level mark ① and maximum level mark ②.

Below the minimum level mark → Add the recommended engine oil to the proper level.

### NOTE:

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

**Recommended oil**  
Refer to the chart for the engine oil grade which is best suited for certain atmospheric temperatures.  
**API standard**  
**SE or higher grade**

### CAUTION:

- Engine oil also lubricates the clutch and the wrong oil types or additives could cause clutch slippage. Therefore, do not add any chemical additives or use engine oils with a grade of CD ③ or higher and do not use oils labeled “ENERGY CONSERVING II” ④ or higher.
- Do not allow foreign materials to enter the crankcase.

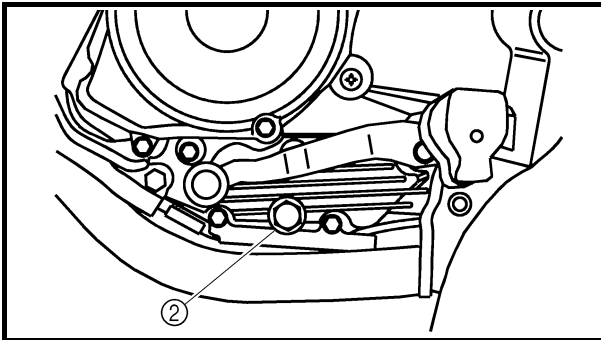
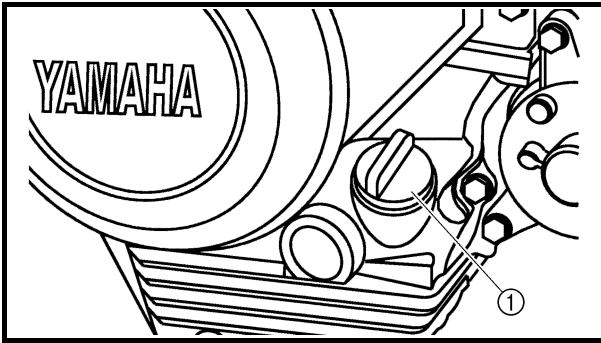
### NOTE:

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.




EAS00076

## 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. Check:
  - engine oil drain bolt gasket  
Damage → Replace.
6. Install:
  - engine oil drain bolt (along with the gasket)

 **20 Nm (2.0 m · kg, 14 ft · lb)**

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

	<b>Quantity</b>
	<b>Total amount</b> 1.20 L (1.06 Imp qt, 1.27 US qt)
	<b>Periodic oil change</b> 1.00 L (0.88 Imp qt, 1.06 US qt)

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



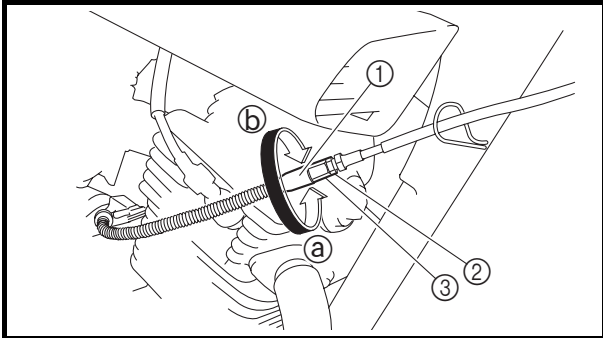
## ADJUSTING THE CLUTCH CABLE FREE PLAY/ CLEANING THE AIR FILTER ELEMENTS



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

**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.

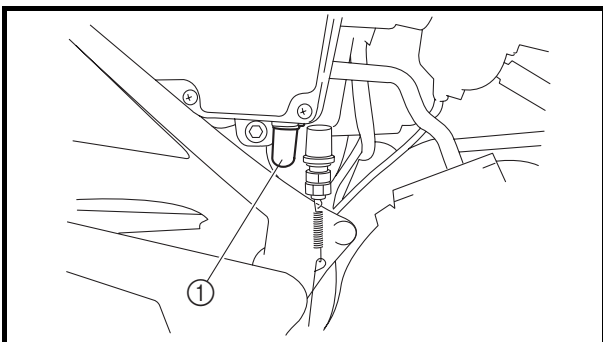


**Engine side**

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

Direction ①	Clutch cable free play is increased.
Direction ②	Clutch cable free play is decreased.

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



EAS00086

## CLEANING THE AIR FILTER ELEMENTS

**NOTE:** \_\_\_\_\_

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

1. Remove:
  - right side cover
 Refer to "SIDE COVERS, SEAT AND FUEL TANK".



6. Install:
  - air filter element 2
  - air filter element 1
  - air filter case cover

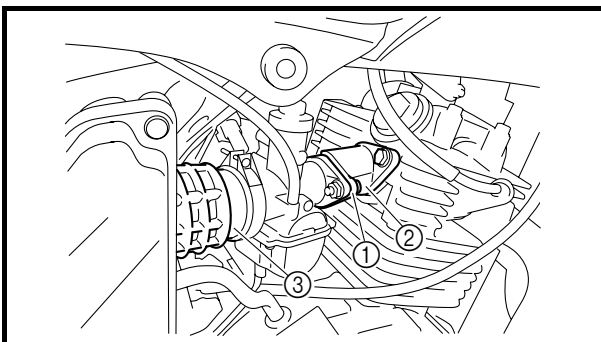
**CAUTION:**

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 carburetor 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.

7. Install:
  - right side coverRefer to "SIDE COVERS, SEAT AND FUEL TANK".



EAS00094

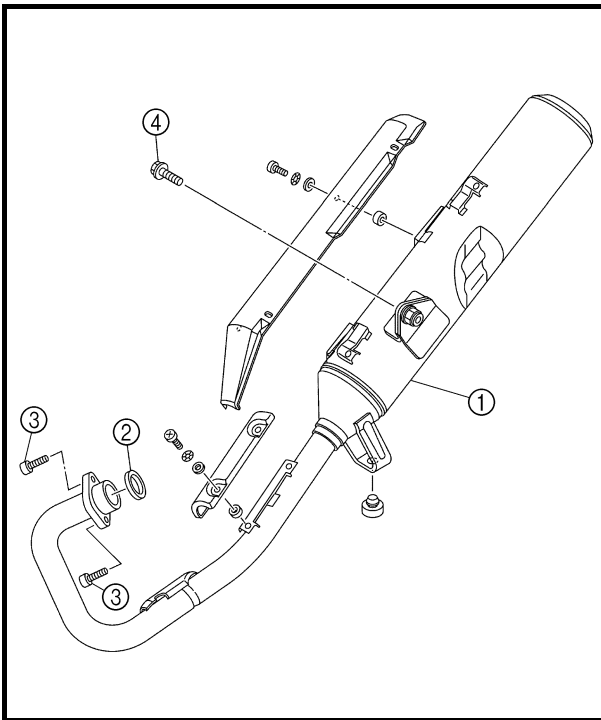
**CHECKING THE CARBURETOR JOINT AND INTAKE MANIFOLD**

1. Remove:
  - side cover (left and right)Refer to "SIDE COVERS, SEAT AND FUEL TANK".
2. Check:
  - carburetor joint (intake manifold side) ①
  - intake manifold ②
  - carburetor joint (air filter case side) ③Cracks/damage → Replace.  
Refer to "CARBURETOR" in chapter 6.
3. Install:
  - side cover (left and right)Refer to "SIDE COVERS, SEAT AND FUEL TANK".





## CHECKING THE EXHAUST SYSTEM



EAS00099

### CHECKING THE EXHAUST SYSTEM

#### 1. Check:

- muffler assembly ①  
Cracks/damage → Replace.
- exhaust pipe gasket ②  
Exhaust gas leaks → Replace.

#### 2. Check:

- tightening torques

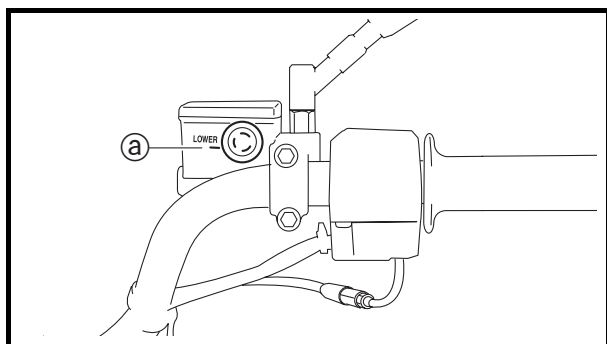


**Exhaust pipe bolts ③**  
**10 Nm (1.0 m · kg, 7.2 ft · lb)**

**Muffler bolt ④**  
**22 Nm (2.2 m · kg, 16 ft · lb)**



## CHECKING THE BRAKE FLUID LEVEL/ CHECKING THE FRONT BRAKE PADS



2. Check:

- brake fluid level

Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.



**Recommended brake fluid**  
DOT 3 or 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.

### **NOTE:**

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

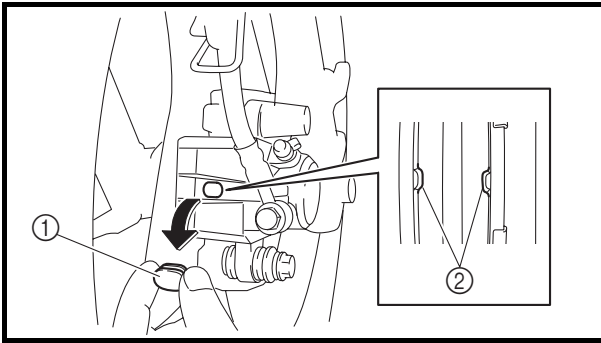
EAS00117

### **CHECKING THE FRONT BRAKE PADS**

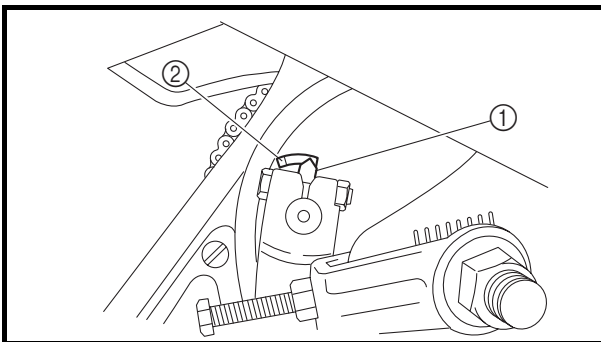
The following procedure applies to all of the brake pads.

1. Operate the brake.

**CHECKING THE FRONT BRAKE PADS/  
CHECKING THE REAR BRAKE SHOES/  
ADJUSTING THE REAR BRAKE LIGHT SWITCH**



2. Remove:
  - check plug ①
3. Check:
  - front brake padWear indicators ② almost touch the brake disc → Replace the brake pads as a set. Refer to “REPLACING THE FRONT BRAKE PADS” in chapter 4.
4. Install:
  - check plug



EAS00126

**CHECKING THE REAR BRAKE SHOES**

1. Operate the brake.
2. Check:
  - wear indicator ①Reaches the wear limit line ② → Replace the brake shoes as a set. Refer to “REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET” in chapter 4.

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. Remove:
  - right side coverRefer to “SIDE COVERS, SEAT AND FUEL TANK”.
2. Check:
  - rear brake light operation timingIncorrect → Adjust.





# BLEEDING THE HYDRAULIC BRAKE SYSTEM/ ADJUSTING THE DRIVE CHAIN SLACK



g. Loosen the bleed screw.


**NOTE:** \_\_\_\_\_

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

h. Tighten the bleed screw and then release the brake lever.

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.

	<b>Bleed screw</b> <b>6 Nm (0.6 m · kg, 4.3 ft · lb)</b>
---	---

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.**



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.**



# ADJUSTING THE DRIVE CHAIN SLACK



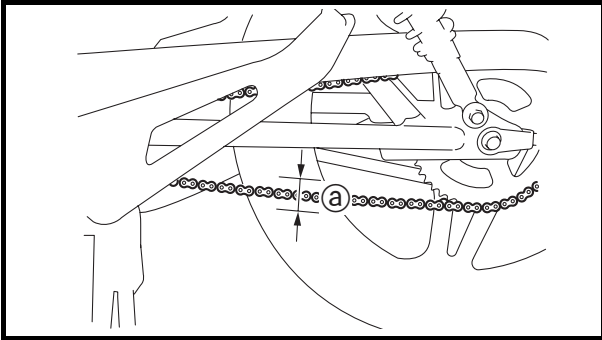
1. Stand the vehicle on a level surface.

**⚠ WARNING**

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

**NOTE:**

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



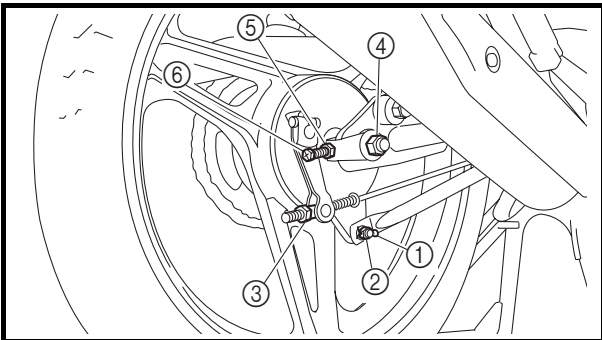
2. Spin the rear wheel several times and find the tightest position of drive chain.

3. Check:

- drive chain slack ①
- Out of specification → Adjust.



**Drive chain slack**  
20 ~ 30 mm (0.79 ~ 1.18 in)



4. Adjust:

- drive chain slack



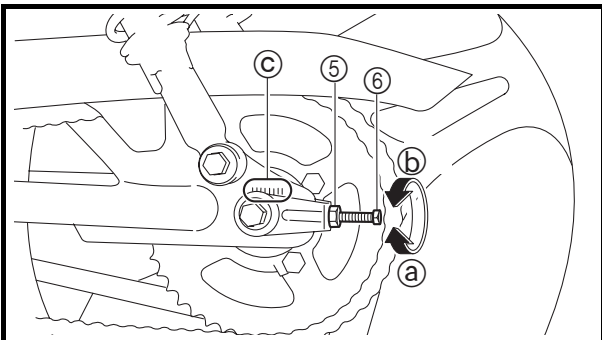
- Remove the cotter pin ①.
- Loosen the brake torque rod nut ②.
- Loosen the brake rod adjusting nut ③.
- Loosen the wheel axle nut ④.
- Loosen both chain puller locknuts ⑤.
- Turn both chain puller adjusting bolts ⑥ in direction ① or ② until the specified drive chain slack is obtained.

Direction ①	Drive chain is tightened.
Direction ②	Drive chain is loosened.

Direction ①	Drive chain is tightened.
Direction ②	Drive chain is loosened.

**NOTE:**

To maintain the proper wheel alignment, adjust both sides ③ evenly.



g. Tighten both chain puller locknuts to specification.

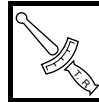


**Chain puller locknut**  
16 Nm (1.6 m · kg, 11 ft · lb)

## ADJUSTING THE DRIVE CHAIN SLACK/ LUBRICATING THE DRIVE CHAIN



h. Tighten the wheel axle nut to specification.



**Wheel axle nut**  
**91 Nm (9.1 m · kg, 66 ft · lb)**

i. Tighten the brake torque rod nut to specification.



**Brake torque rod nut**  
**19 Nm (1.9 m · kg, 13 ft · lb)**

j. Install the cotter pin.



**Always use a new cotter pin.**



5. Adjust:

- brake pedal free play  
Refer to “ADJUSTING THE REAR BRAKE”.

EAS00142

### LUBRICATING THE DRIVE CHAIN

The drive chain consists of many interacting parts. If the drive chain is not maintained properly, it will wear out quickly. Therefore, the drive chain should be serviced, especially when the vehicle is used in dusty areas.

This vehicle has a drive chain with small rubber O-rings between each side plate. Steam cleaning, high-pressure washing, certain solvents, and the use of a coarse brush can damage these O-rings. Therefore, use only kerosene to clean the drive chain. Wipe the drive chain dry and thoroughly lubricate it with engine oil or chain lubricant that is suitable for O-ring chains. Do not use any other lubricants on the drive chain since they may contain solvents that could damage the O-rings.

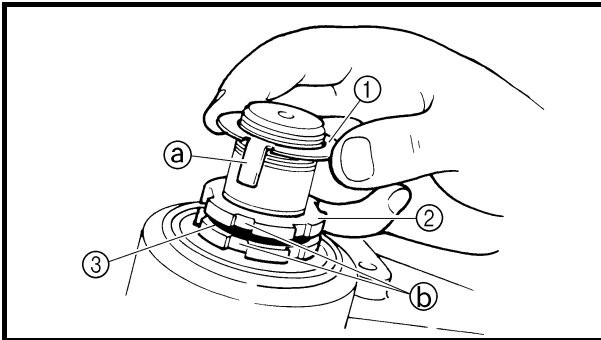


**Recommended lubricant**  
**Engine oil or chain lubricant**  
**suitable for O-ring chains**





**Lower ring nut (final tightening torque)**  
**22 Nm (2.2 m · kg, 16 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 ③.
- f. Install the upper ring nut ②.
- g. Finger tighten the upper ring nut ②, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
- h. Install the lock washer ①.

**NOTE:**

Make sure the lock washer tabs ① sit correctly in the ring nut slots ②.



5. Install:
  - upper bracket  
Refer to “STEERING HEAD” in chapter 4.

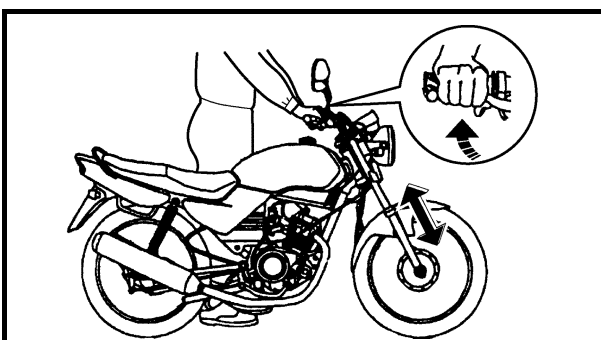
EAS00149

**CHECKING THE FRONT FORK**

1. Stand the vehicle on a level surface.

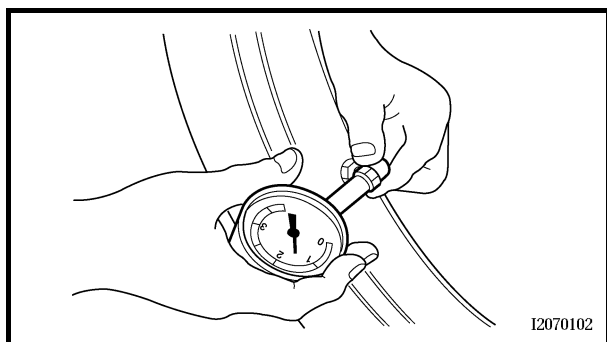
**⚠ WARNING**

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



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





EAS00166

## 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 vehicle could cause tire damage, an accident or an injury.

**NEVER OVERLOAD THE VEHICLE.**

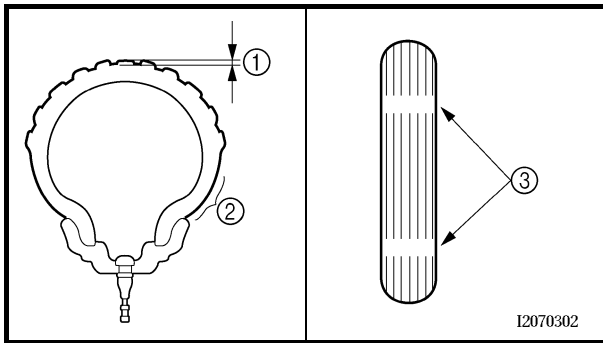
<b>Basic weight (with oil and a full fuel tank)</b>	120 kg (265 lb)	
<b>Maximum load*</b>	200 kg (441 lb)	
<b>Cold tire pressure</b>	<b>Front</b>	<b>Rear</b>
<b>Up to 90 kg load*</b>	175 kPa (1.75 kgf/cm <sup>2</sup> , 25 psi)	200 kPa (2.00 kgf/cm <sup>2</sup> , 29 psi)
<b>90 kg ~ maxi- mum load*</b>	175 kPa (1.75 kgf/cm <sup>2</sup> , 25 psi)	280 kPa (2.80 kgf/cm <sup>2</sup> , 41 psi)

\* Total weight of rider, passenger, cargo and accessories

### **⚠ WARNING**

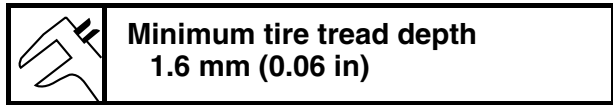
**It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.**

## CHECKING THE TIRES



### 2. Check:

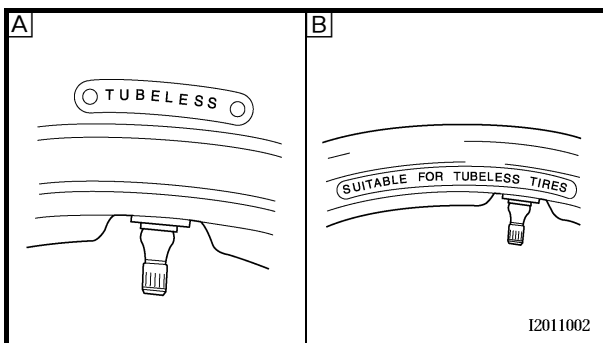
- tire surfaces  
Damage/wear → Replace the tire.



- 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 tube tires, 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

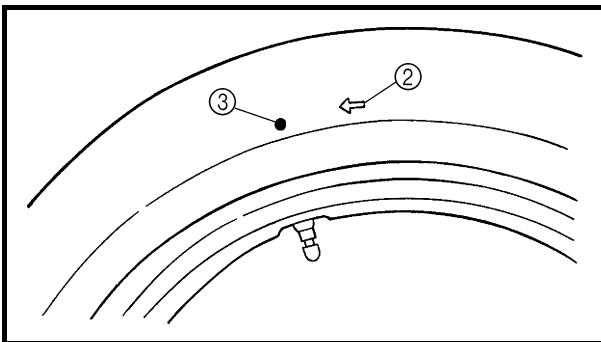
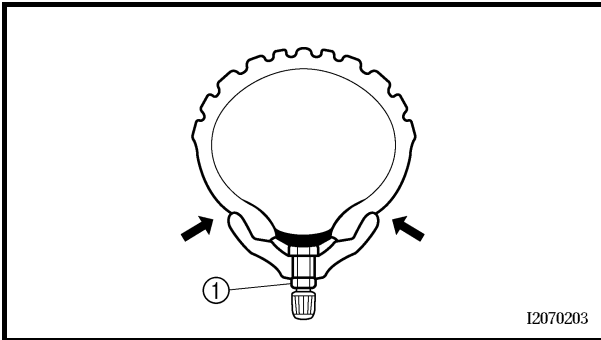
- After extensive tests, the tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved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

## Front tire

Manufacturer	Model	Size
CHENG SHIN	SAKURA S-901	2.75-18 42P
PIRELLI	CITY DEMON	2.75-18 42P

## Rear tire

Manufacturer	Model	Size
CHENG SHIN	SAKURA S-180	90/90-18 57P
PIRELLI	CITY DEMON	90/90-18 57P



### WARNING

- New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km should be traveled at normal speed before any high-speed riding is done.
- After a tire has been repaired or replaced, be sure to tighten the tire air valve stem locknut ① to specification.

### NOTE:

For tires with a direction of rotation mark ②:

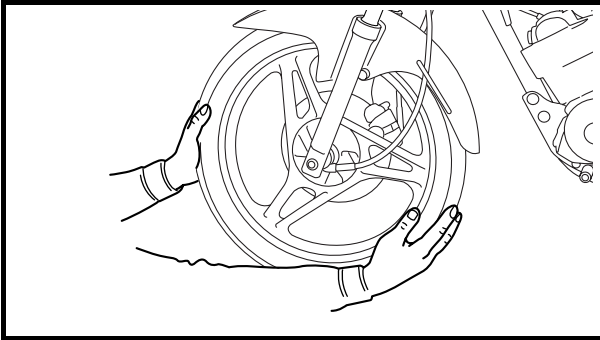
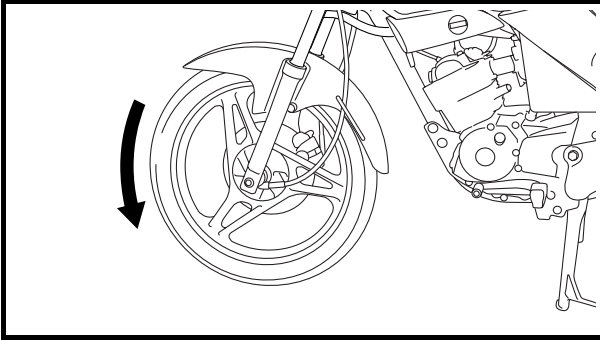
- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark ③ with the valve installation point.



**Tire air valve stem locknut**  
2 Nm (0.2 m · kg, 1.4 ft · lb)



## CHECKING THE WHEELS/ CHECKING AND LUBRICATING THE CABLES



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

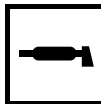
### CHECKING AND LUBRICATING THE CABLES

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.

## LUBRICATING THE LEVERS AND PEDALS/ LUBRICATING THE CENTERSTAND

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EAS00171

### LUBRICATING THE LEVERS AND PEDALS

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

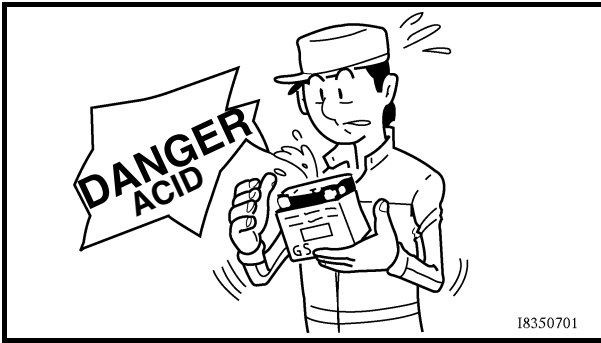


EAS00173

### LUBRICATING THE CENTERSTAND

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





EAS00176

## 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.

#### 1. Remove:

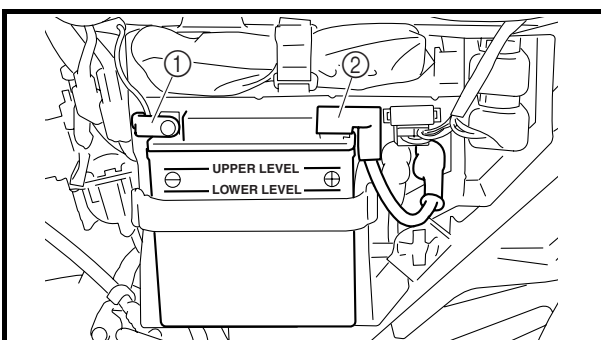
- left side cover  
Refer to "SIDE COVERS, SEAT AND FUEL TANK".

#### 2. Disconnect:

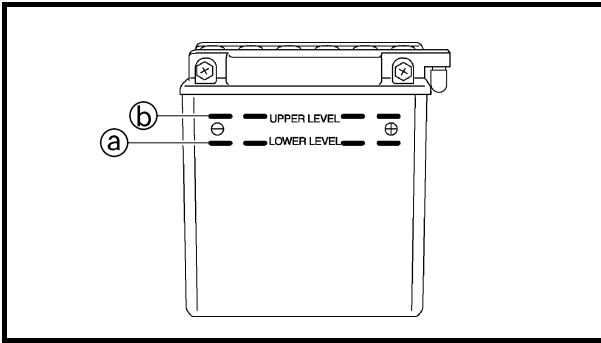
- battery leads  
(from the battery terminals)

#### **CAUTION:**

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



## CHECKING AND CHARGING THE BATTERY



3. Remove:
  - battery band
  - battery
4. Check:
  - electrolyte level

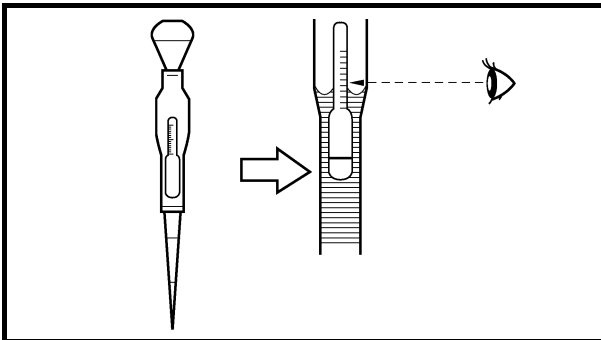
The electrolyte level should be between the minimum level mark (a) and the maximum level mark (b).

Below the minimum level mark → Add distilled water to the proper level.

**CAUTION:** \_\_\_\_\_

**Add only distilled water. Tap water contains minerals which are harmful to the battery.**

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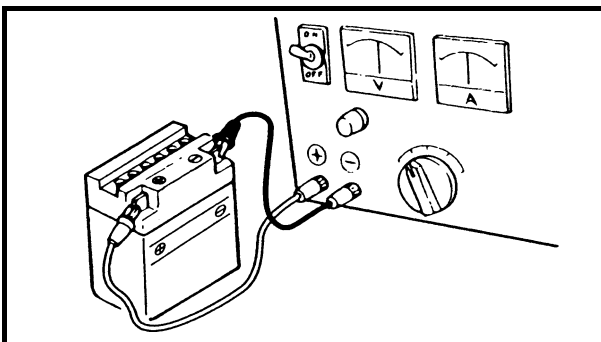


5. Check:
  - specific gravity

Less than 1.280 → Recharge the battery.



**Specific gravity**  
**1.280 at 20 °C (68 °F)**



6. Charge:
  - battery

**Battery charging amperage and time**  
**0.5 amps/10 hrs**

**⚠ WARNING** \_\_\_\_\_

**Do not quick charge a battery.**

---

**CAUTION:** \_\_\_\_\_

- Loosen the battery sealing caps.
- Make sure the battery breather hose and battery vent are free of obstructions.
- To ensure maximum performance, always charge a new battery before using it.



- Do not use a high-rate battery charger. They force a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
  - If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
  - When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative lead from the battery terminal.)
  - To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
  - Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
  - Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
  - If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!
- 

**NOTE:** \_\_\_\_\_

Replace the battery whenever:

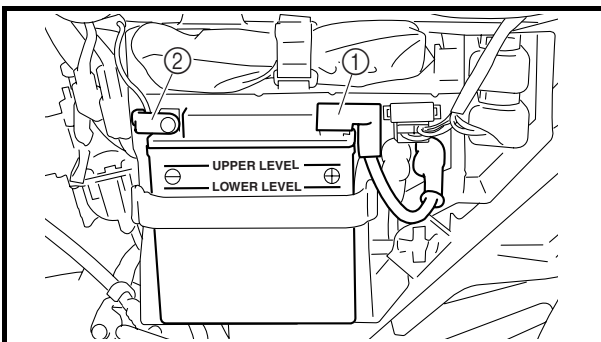
- battery voltage does not rise to specification or bubbles fail to rise during charging,
  - sulphation of one or more battery cells occurs (as indicated by the battery plates turning white or material accumulating in the bottom of the battery cell),
  - specific gravity readings after a long, slow charge indicate that one battery cell's charge is lower than the rest,
  - warpage or buckling of the battery plates or insulators is evident.
-

7. Check:
  - battery breather hose and battery vent  
Obstruction → Clean.  
Damage → Replace.
8. Connect:
  - battery breather hose
9. Install:
  - battery
  - battery band

**CAUTION:**

- **When checking the battery, make sure the battery breather hose is properly installed and routed correctly. If the battery breather hose is positioned so as to allow electrolyte or hydrogen gas from the battery to contact the frame, the vehicle and its finish may be damaged.**
- **Make sure the battery breather hose is properly routed away from the drive chain and from below the swingarm. Refer to “CABLE ROUTING”.**

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



11. Connect:
  - battery leads  
(to the battery terminals)

**CAUTION:**

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

12. Lubricate:
  - battery terminals



13. Install:
  - left side cover  
Refer to “SIDE COVERS, SEAT AND FUEL TANK”.









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## CHAPTER 4 CHASSIS

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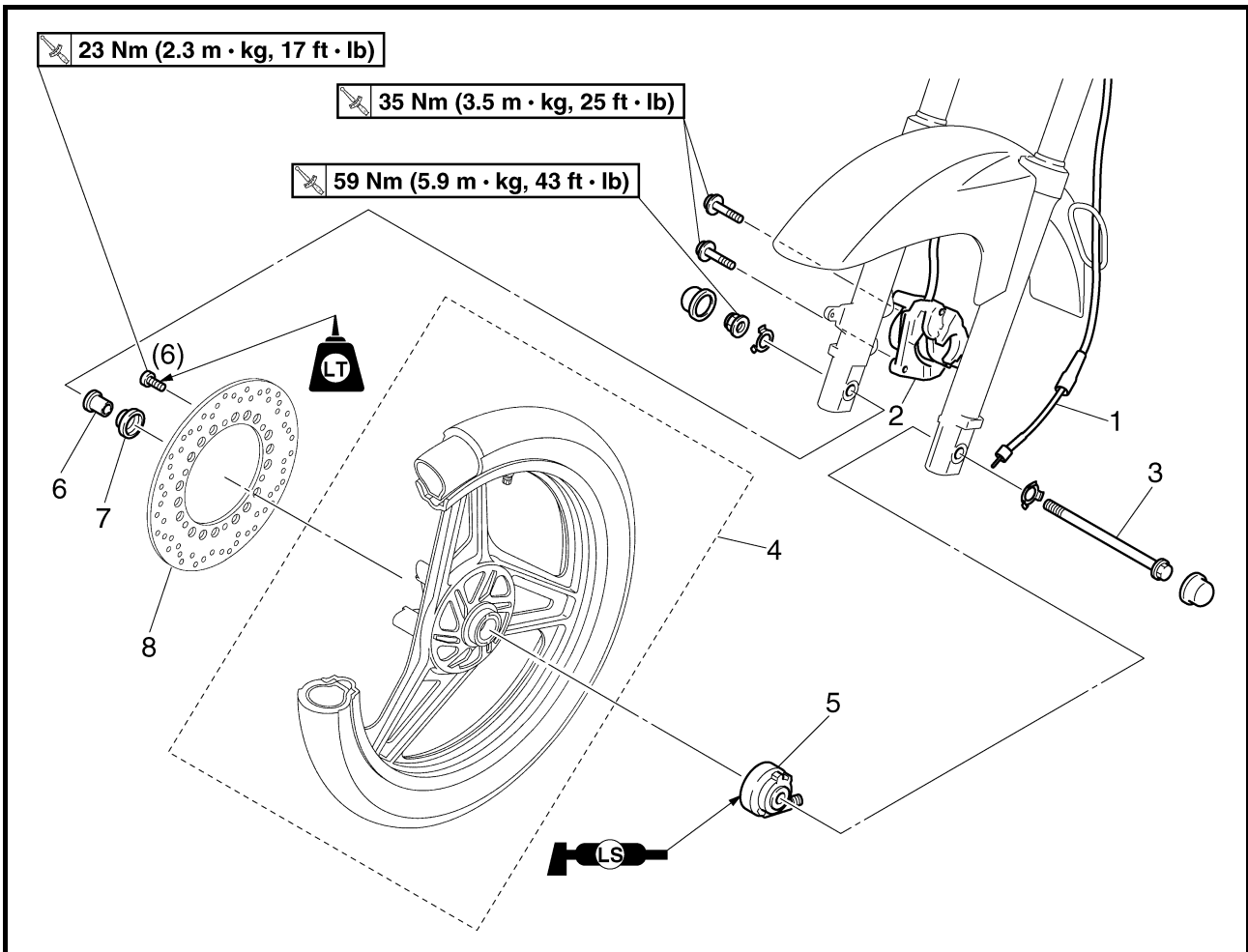
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EAS00512

CHASSIS

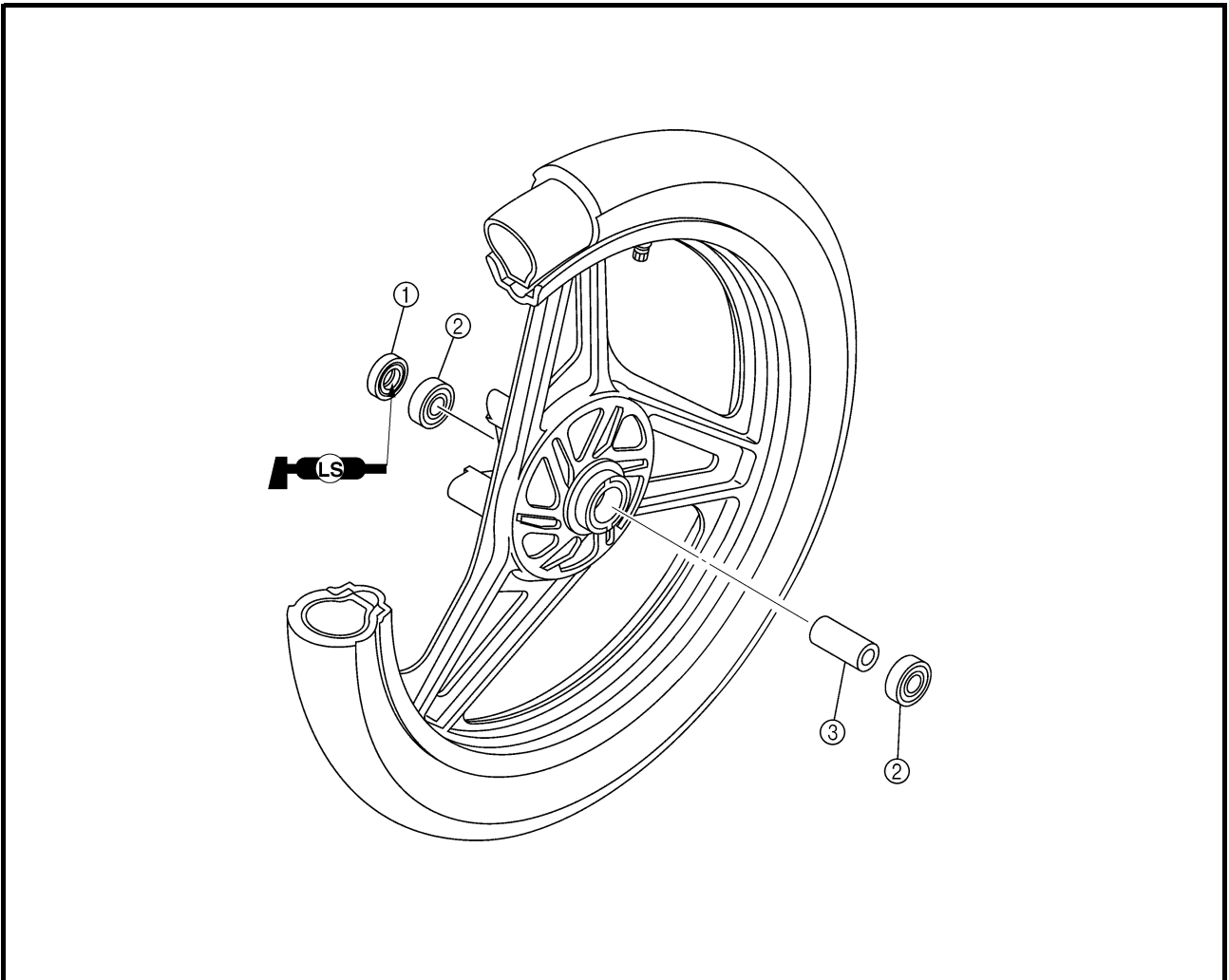
FRONT WHEEL AND BRAKE DISC



Order	Job/Part	Q'ty	Remarks
	<b>Removing the front wheel and brake disc</b>		Remove the parts in the order listed. <b>NOTE:</b> _____ Place the vehicle on a suitable stand so that the front wheel is elevated. _____
1	Speedometer cable	1	Refer to "REMOVING THE FRONT WHEEL" and "INSTALLING THE FRONT WHEEL".
2	Brake caliper	1	
3	Wheel axle	1	
4	Front wheel	1	
5	Speedometer gear unit	1	
6	Spacer	1	
7	Dust cover	1	
8	Brake disc	1	
			For installation, reverse the removal procedure.

EAS00518

FRONT WHEEL



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the front wheel</b>		Remove the parts in the order listed.
①	Oil seal	1	
②	Bearing	2	
③	Spacer	1	
			For assembly, reverse the disassembly procedure.

EAS00519

## REMOVING THE FRONT WHEEL

1. Stand the vehicle on a level surface.

**⚠ WARNING**

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

**NOTE:**

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

2. Remove:
  - brake caliper

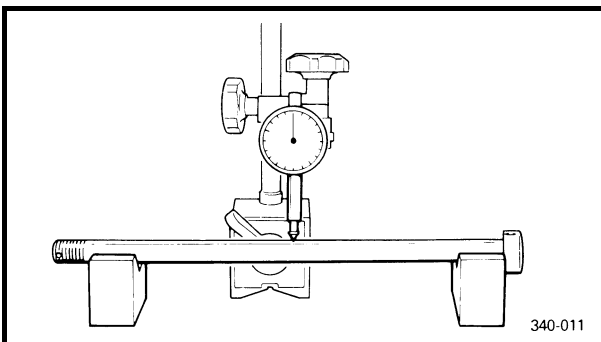
**NOTE:**

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

3. Elevate:
  - front wheel

**NOTE:**

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



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.**

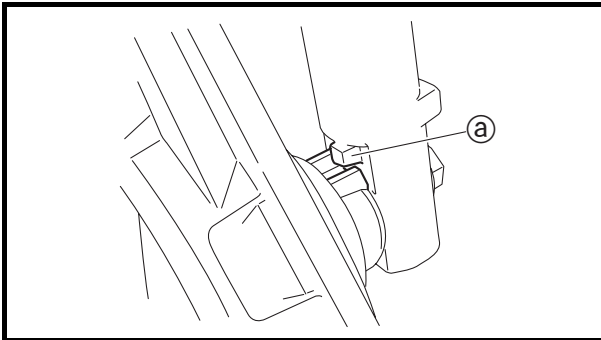
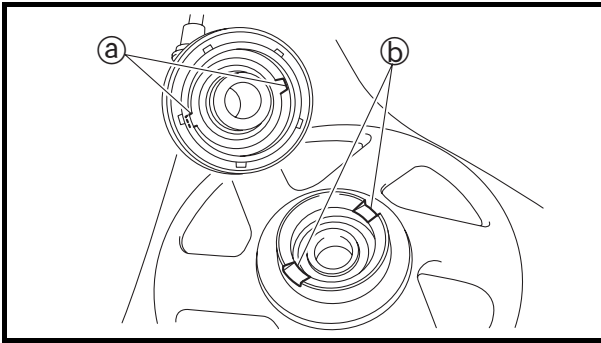
2. Check:
  - tire
  - front wheel  
Damage/wear → Replace.  
Refer to “CHECKING THE TIRES” and “CHECKING THE WHEELS” in chapter 3.











2. Install:
- speedometer gear unit

**NOTE:**


- Make sure that the speedometer gear unit and the wheel hub are installed with the projection ① of the speedometer gear unit inserted in a slot ② of the wheel hub.
- When installing the speedometer gear unit, make sure that the projection on the wheel hub does not damage the lip of the speedometer gear unit oil seal.

3. Install:
- front wheel


**NOTE:**

Make sure the slot in the speedometer gear unit fits over the stopper ① on the outer tube.

4. Tighten:
- wheel axle nut

 **59 Nm (5.9 m · kg, 43 ft · lb)**

- brake caliper bracket bolts

 **35 Nm (3.5 m · kg, 25 ft · lb)**

**⚠ WARNING**

Make sure the brake hose is routed properly.

**CAUTION:**

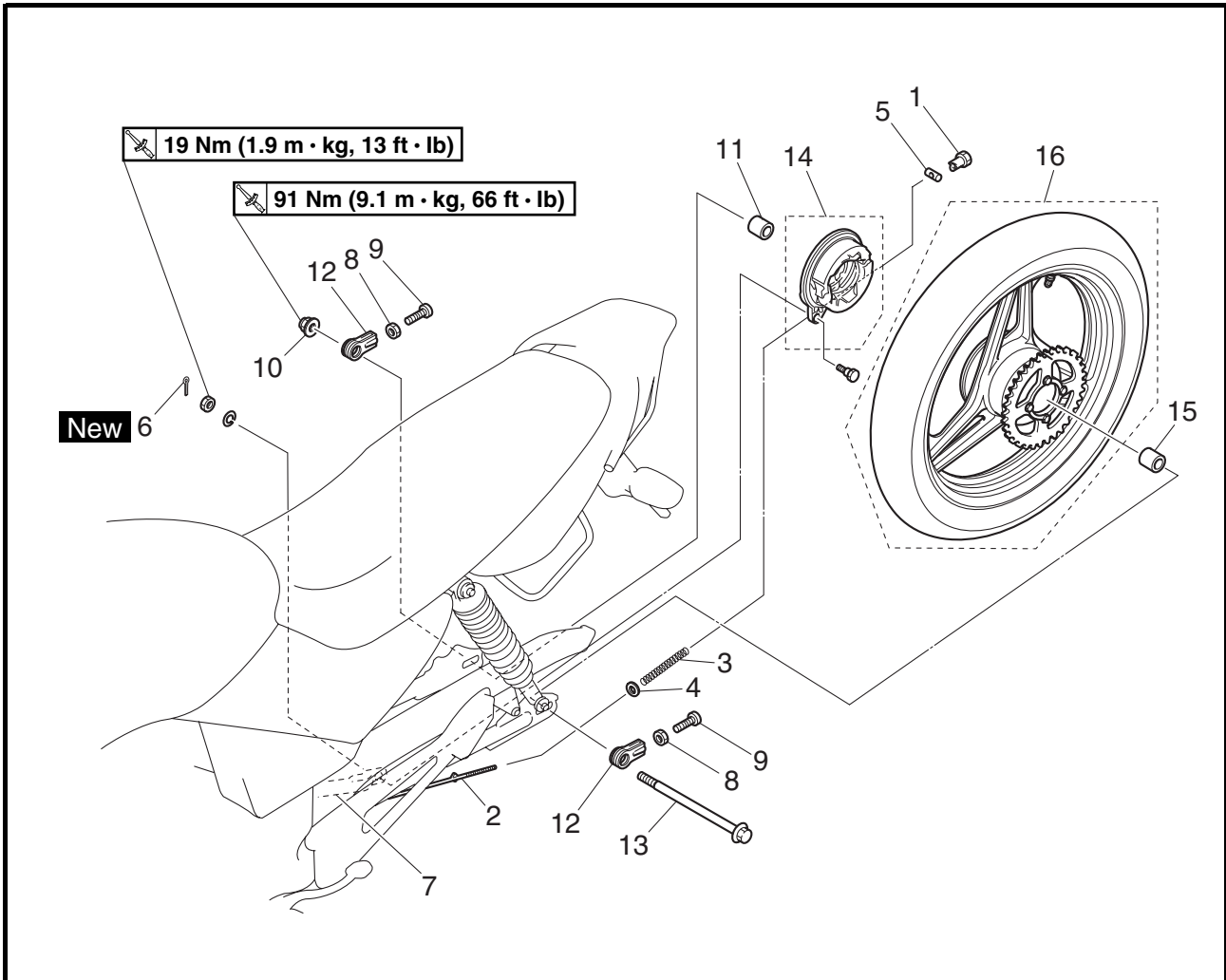
Before tightening the wheel axle nut, push down hard on the handlebar several times and check if the front fork rebounds smoothly.

# REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET



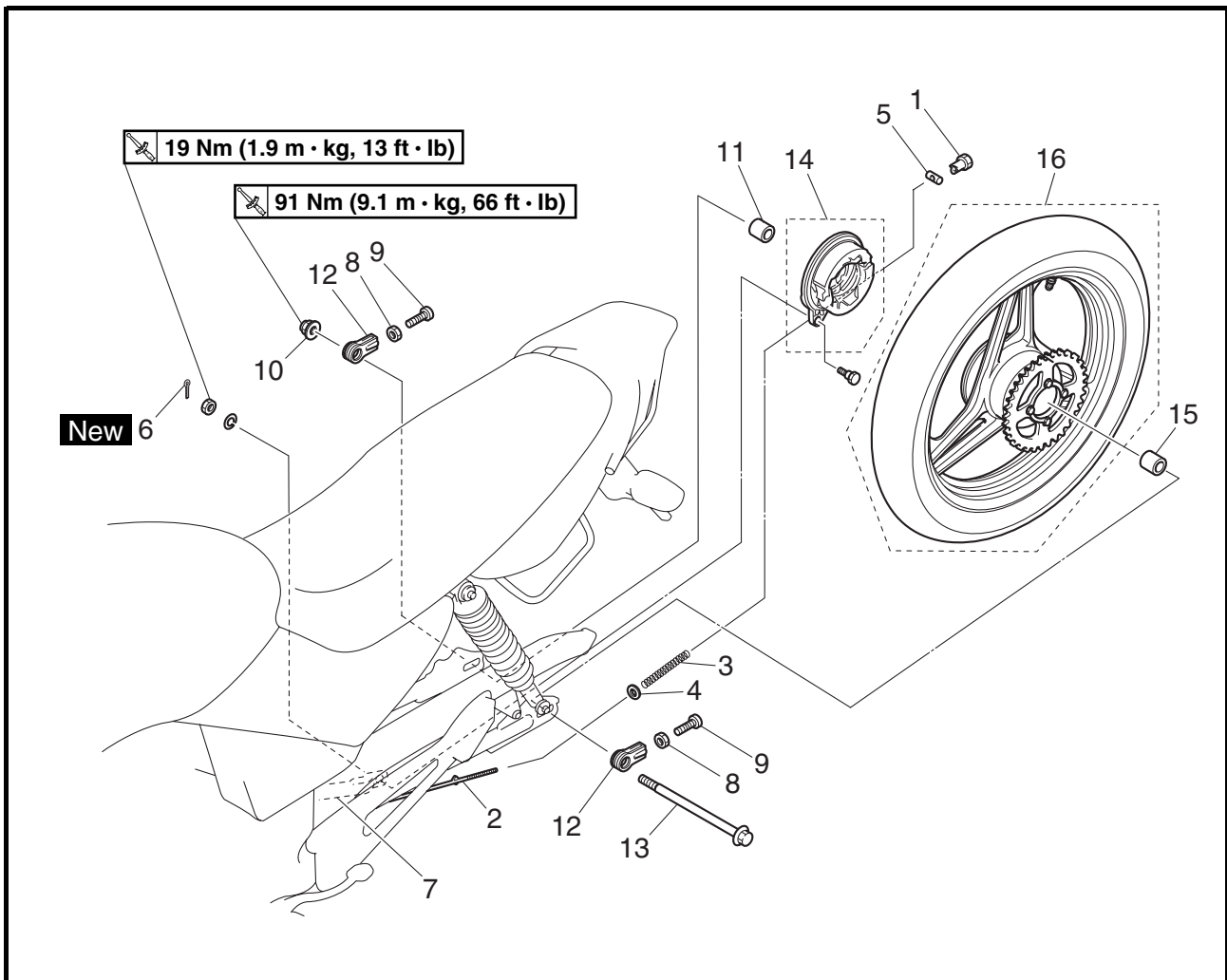
EAS00553

## REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET REAR WHEEL



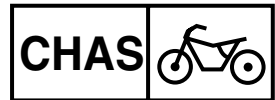
Order	Job/Part	Q'ty	Remarks
	<b>Removing the rear wheel</b>		Remove the parts in the order listed.
			<b>NOTE:</b> _____ Place the vehicle on a suitable stand so that the rear wheel is elevated.
1	Brake rod adjusting nut	1	Refer to "REMOVING THE REAR WHEEL".
2	Brake rod	1	
3	Compression spring	1	
4	Washer	1	
5	Pin	1	
6	Cotter pin	1	
7	Brake torque rod	1	
8	Chain puller locknut	2	
9	Chain puller adjusting bolt	2	
10	Wheel axle nut	1	

# REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET



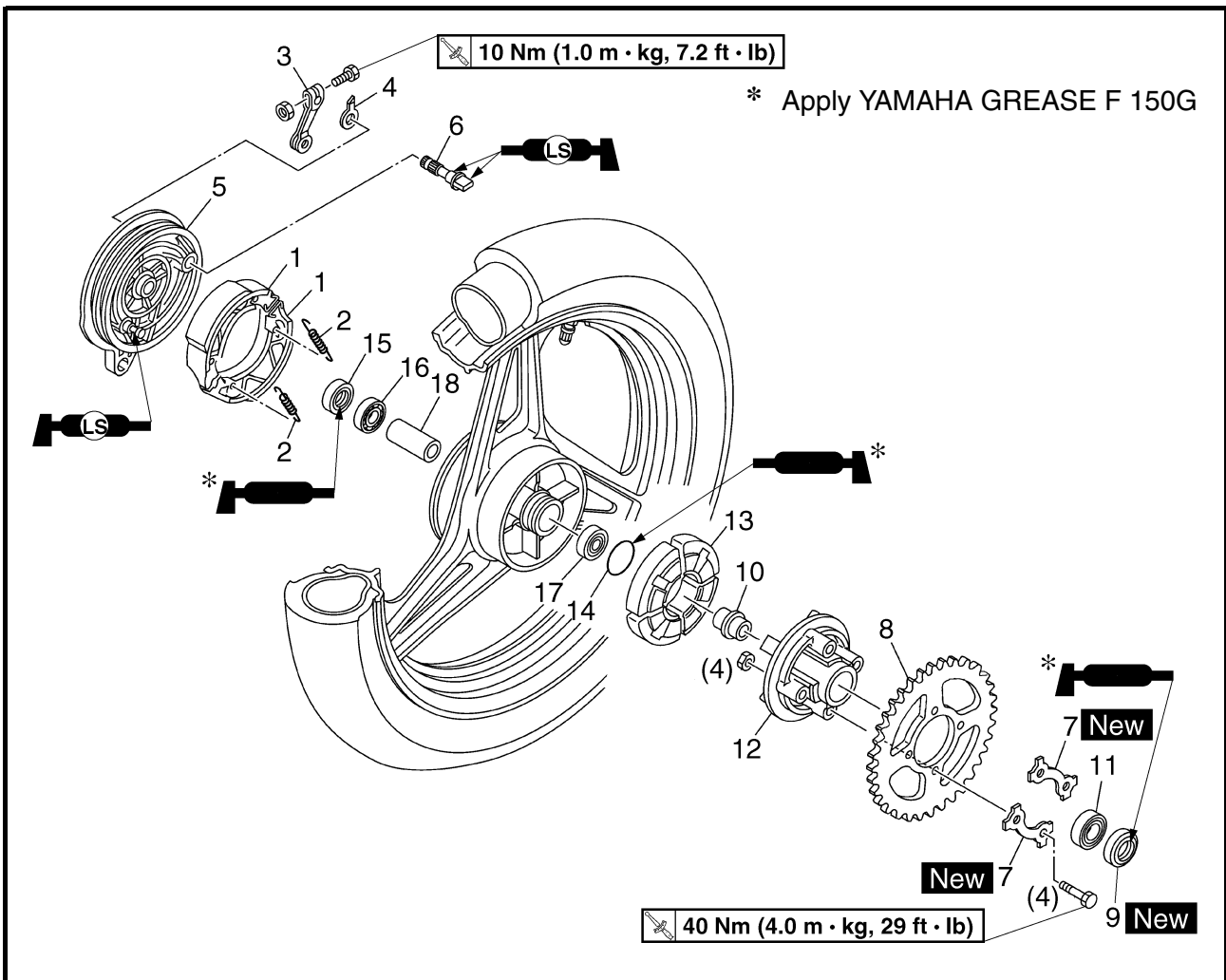
Order	Job/Part	Q'ty	Remarks
11	Spacer	1	
12	Chain puller	2	Refer to "INSTALLING THE REAR WHEEL AND REAR WHEEL SPROCKET".
13	Wheel axle	1	
14	Brake shoe plate assembly	1	
15	Spacer	1	
16	Rear wheel	1	Refer to "REMOVING THE REAR WHEEL". For installation, reverse the removal procedure.

# REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET



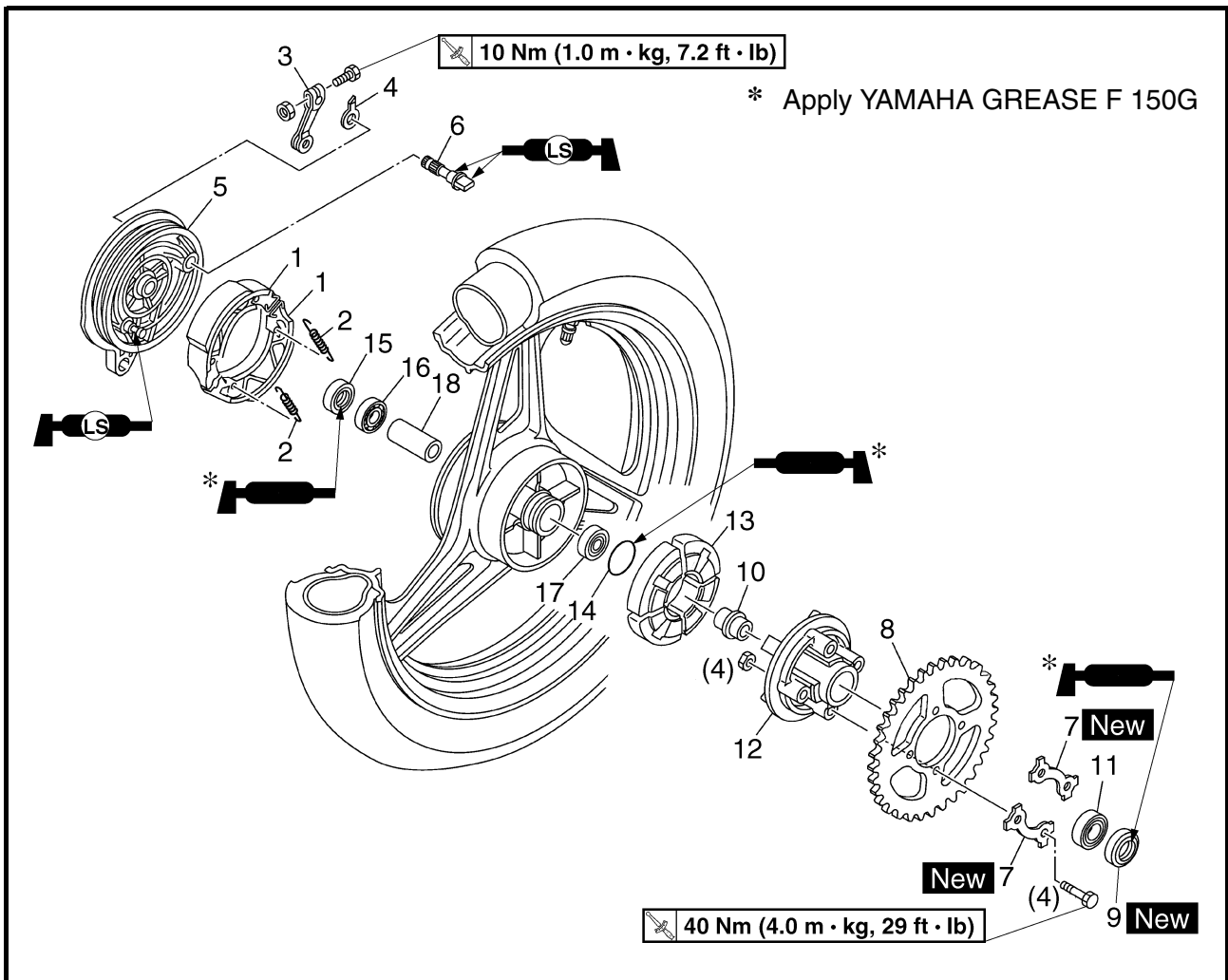
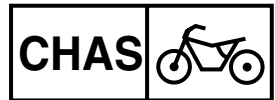
EAS00558

## BRAKE SHOE PLATE AND REAR WHEEL SPROCKET



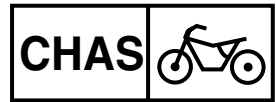
Order	Job/Part	Q'ty	Remarks
	<b>Removing the brake shoe plate and rear wheel sprocket</b>		Remove the parts in the order listed.
1	Brake shoe	2	Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" and "ASSEMBLING THE BRAKE SHOE PLATE".
2	Brake shoe spring	2	
3	Brake camshaft lever	1	
4	Brake shoe wear indicator	1	
5	Brake shoe plate	1	
6	Brake camshaft	1	
7	Lock washer	2	
8	Rear wheel sprocket	1	
9	Oil seal	1	Refer to "CHECKING AND REPLACING THE REAR WHEEL SPROCKET" and "INSTALLING THE REAR WHEEL AND REAR WHEEL SPROCKET".
10	Spacer	1	

# REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET



Order	Job/Part	Q'ty	Remarks
11	Bearing	1	For installation, reverse the removal procedure.
12	Rear wheel drive hub	1	
13	Rear wheel drive hub damper	4	
14	O-ring	1	
15	Oil seal	1	
16	Bearing	1	
17	Bearing	1	
18	Spacer	1	

# REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET



EAS00563

## REMOVING THE REAR WHEEL

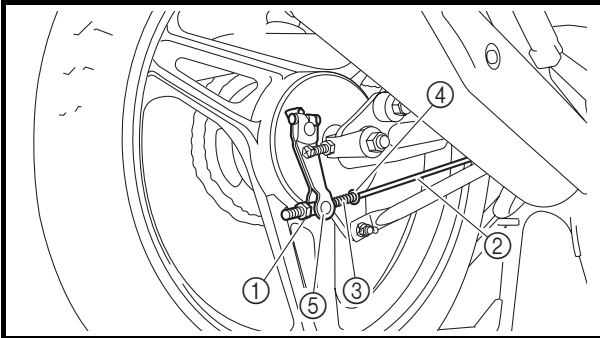
1. Stand the vehicle on a level surface.

### **⚠ WARNING**

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

### **NOTE:**

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



2. Remove:

- brake rod adjusting nut ①
- brake rod ②
- compression spring ③
- washer ④
- pin ⑤

### **NOTE:**

Press down on the brake pedal to remove the pin from the brake rod.

3. Remove:

- rear wheel

### **NOTE:**

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

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:

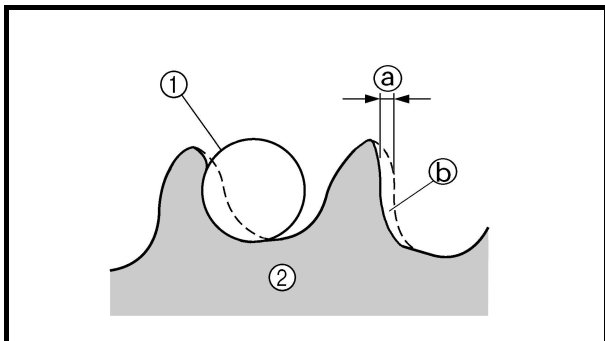
- radial wheel runout
- lateral wheel runout

Refer to “CHECKING THE FRONT WHEEL”.

EAS00567

## CHECKING THE REAR WHEEL DRIVE HUB

- Check:
  - rear wheel drive hub  
Cracks/damage → Replace.
  - rear wheel drive hub dampers  
Damage/wear → Replace.

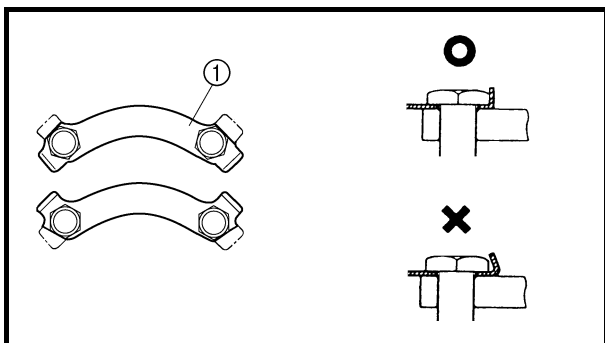
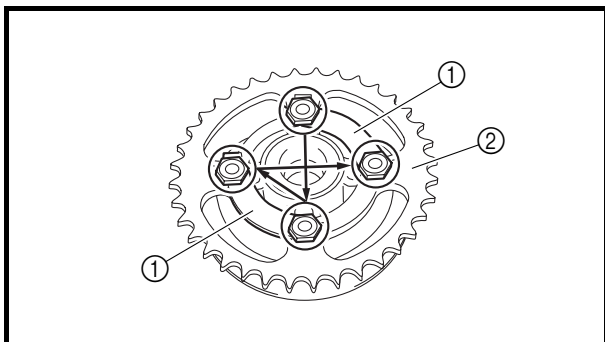


EAS00568

## CHECKING AND REPLACING THE REAR WHEEL SPROCKET

- Check:
    - rear wheel sprocket  
More than 1/4 tooth (a) wear → Replace the rear wheel sprocket.  
Bent teeth → Replace the rear wheel sprocket.
- (b) Correct  
 (1) Drive chain roller  
 (2) Rear wheel sprocket

- Replace:
  - rear wheel sprocket



- Straighten the lock washer tabs.
- Remove the bolts, lock washers (1) and the rear wheel sprocket (2).
- Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
- Install the new rear wheel sprocket and new lock washers.

	<p><b>Rear wheel sprocket bolt</b> 40 Nm (4.0 m · kg, 29 ft · lb)</p>
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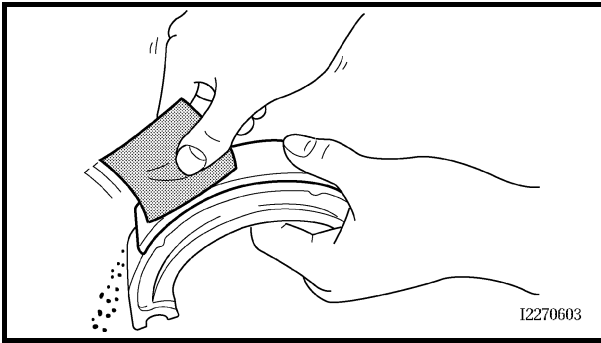
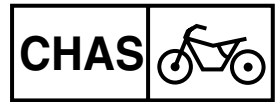
**NOTE:** \_\_\_\_\_  
Tighten the bolts in stages and in a crisscross pattern.  
\_\_\_\_\_

- Bend the lock washer tabs along a flat side of each bolt.





# REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET



EAS00569

## CHECKING THE BRAKE

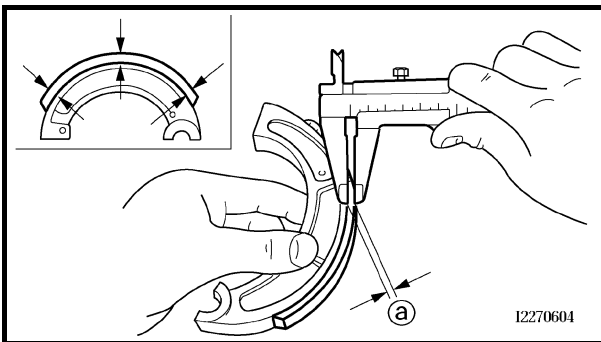
The following procedure applies to all of the brake shoes.

### 1. Check:

- brake shoe lining  
Glazed areas → Repair.  
Sand the glazed areas with course sandpaper.

### NOTE:

After sanding the glazed areas, clean the brake shoe with a cloth.



### 2. Measure:

- brake shoe lining thickness (a)  
Out of specification → Replace.



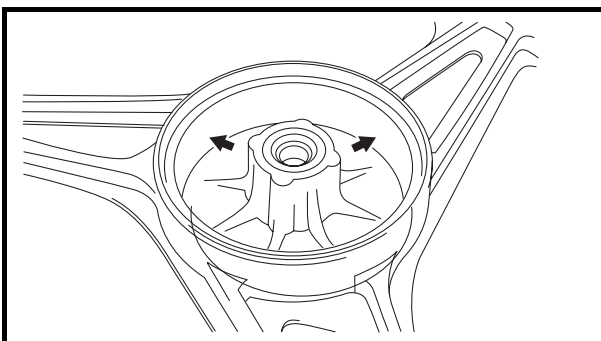
**Brake shoe lining thickness limit  
(minimum)  
2.0 mm (0.08 in)**

### ⚠ WARNING

Do not allow oil or grease to contact the brake shoes.

### NOTE:

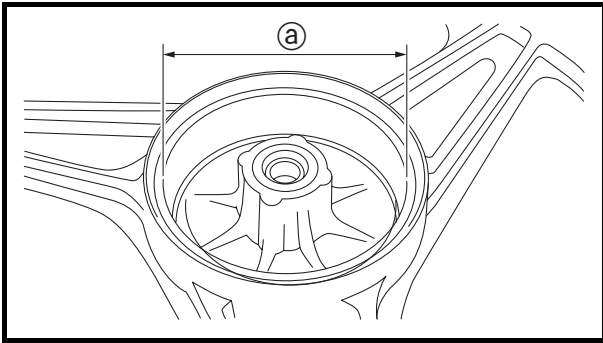
Replace the brake shoes as a set, if either is worn to the wear limit.



### 3. Check:

- brake drum inner surface  
Oil deposits → Clean.  
Remove the oil with a rag soaked in lacquer thinner or solvent.  
Scratches → Repair.  
Lightly and evenly polish the scratches with an emery cloth.

# REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET



4. Measure:
- brake drum inside diameter ①
- Out of specification → Replace the wheel.



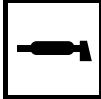
**Brake drum inside diameter limit (maximum)**  
**131.0 mm (5.16 in)**

5. Check:
- brake camshaft
- Damage/wear → Replace.

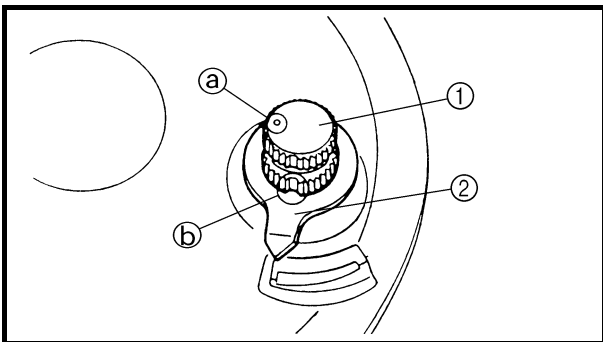
EAS00570

## ASSEMBLING THE BRAKE SHOE PLATE

1. Lubricate:
- brake camshaft
  - brake shoe plate

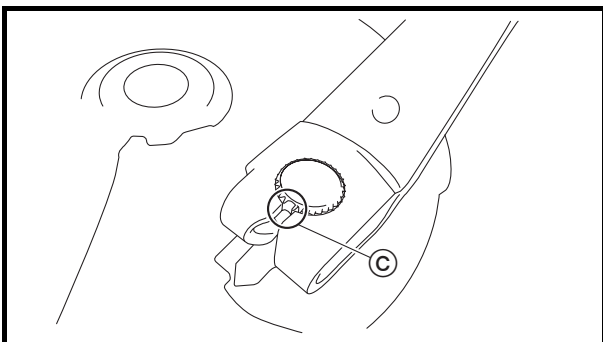


**Recommended lubricant**  
**Lithium-soap-based grease**



2. Install:
- brake camshaft ①
  - brake shoe wear indicator ②
  - brake camshaft lever

**10 Nm (1.0 m · kg, 7.2 ft · lb)**

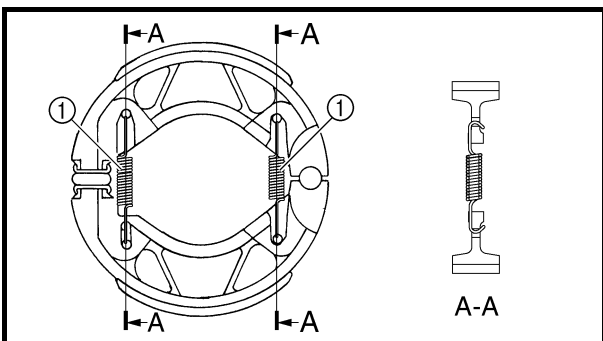


- a. Install the brake camshaft so its punch mark ① is positioned as shown.
- b. Align the projection ② on the brake shoe wear indicator with the notch in the brake camshaft.
- c. Align the slot ③ in the brake camshaft lever with the notch in the brake camshaft.
- d. Check that the brake shoes are properly positioned.



**WARNING**

**After installing the brake camshaft, remove any excess grease.**

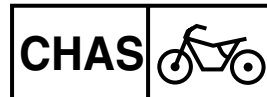


3. Install:
- brake shoe springs ①
  - brake shoes

**NOTE:**

- Do not to damage the springs during installation.
- Install the brake shoe springs as shown.

# REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET

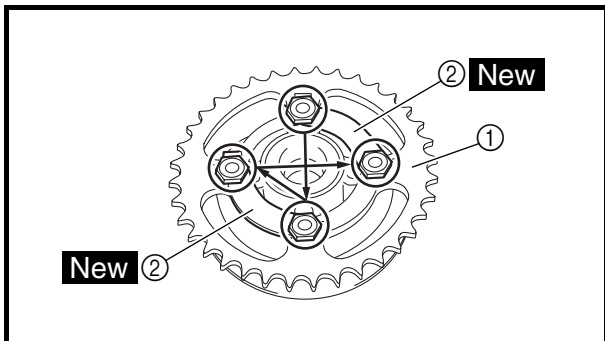


EAS00573

## INSTALLING THE REAR WHEEL AND REAR WHEEL SPROCKET

### 1. Lubricate:

- O-ring
- oil seals



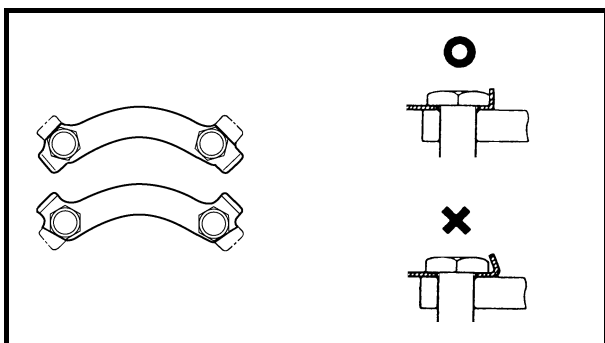
### 2. Install:

- rear wheel sprocket ①
- lock washers ② **New**
- rear wheel sprocket bolts

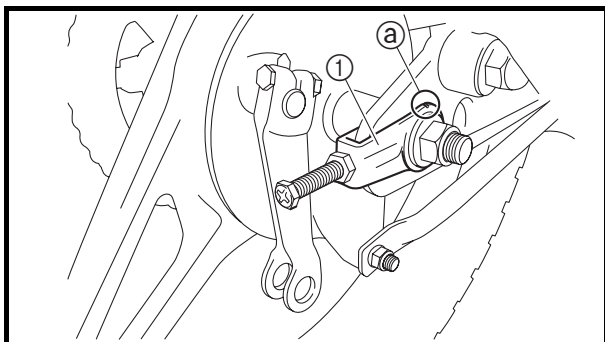
**40 Nm (4.0 m · kg, 29 ft · lb)**

### NOTE:

Tighten the bolts in stages and in a crisscross pattern.



- ### 3. Bend the lock washer tabs along a flat side of each bolt.



### 4. Install:

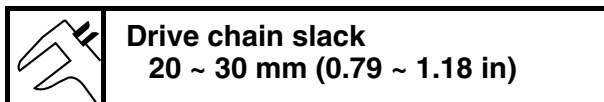
- chain pullers (left and right) ①

### NOTE:

Install each chain puller with its alignment mark ② facing outward.

### 5. Adjust:

- drive chain slack



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

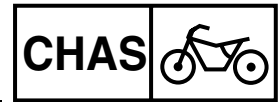
### 6. Tighten:

- wheel axle nut

**91 Nm (9.1 m · kg, 66 ft · lb)**


## REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET

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7. Install:

- brake torque rod

 19 Nm (1.9 m · kg, 13 ft · lb)

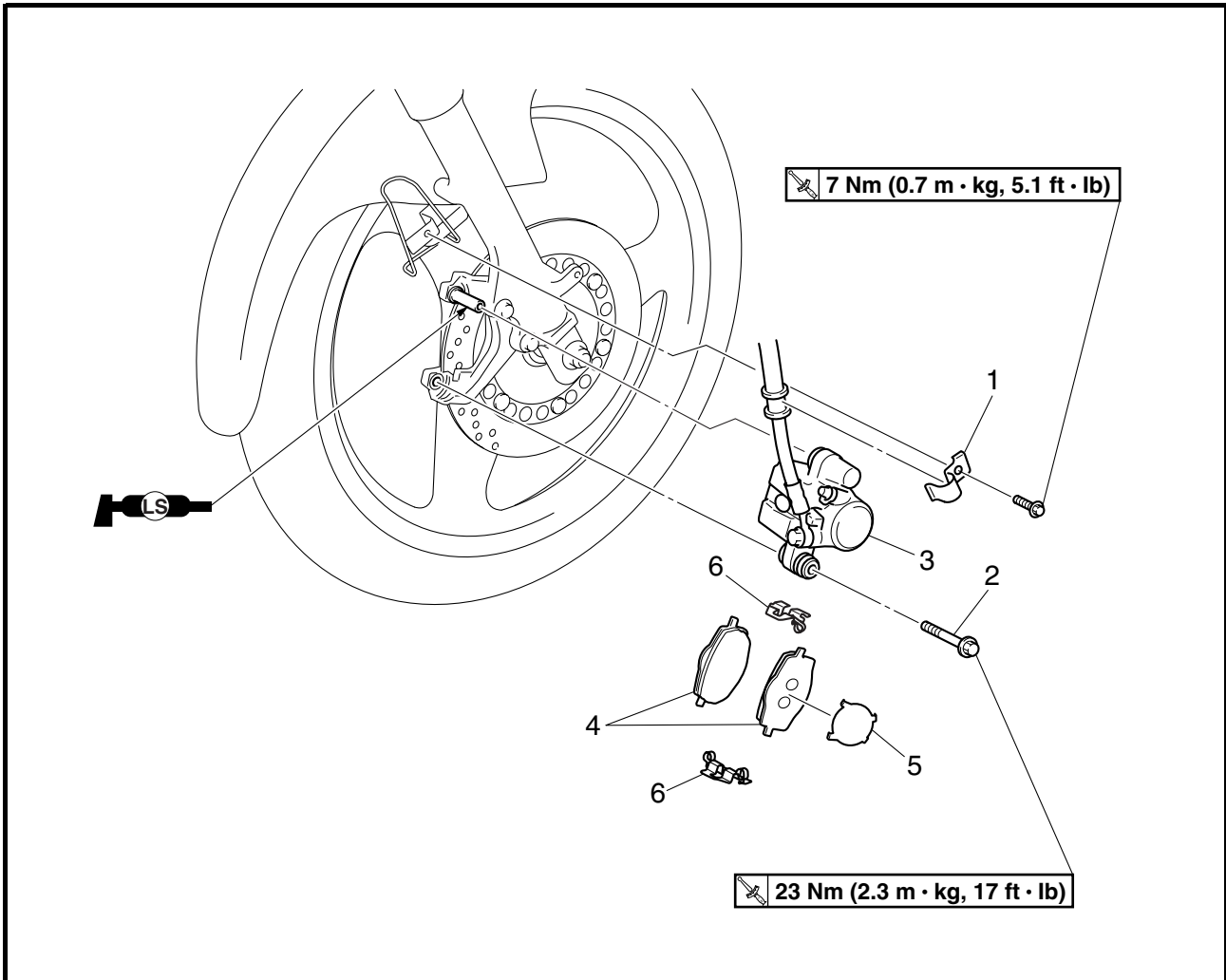
8. Adjust:

- brake pedal free play

Refer to “ADJUSTING THE REAR BRAKE”  
in chapter 3.

EAS00576

**FRONT BRAKE**  
**FRONT BRAKE PADS**



Order	Job/Part	Q'ty	Remarks
	<b>Removing the front brake pads</b>		Remove the parts in the order listed.
1	Brake hose holder	1	Refer to "REPLACING THE FRONT BRAKE PADS".
2	Brake caliper bolt	1	
3	Brake caliper	1	
4	Brake pad	2	
5	Brake pad shim	1	
6	Brake pad spring	2	
			For installation, reverse the removal procedure.

EAS00579

**CAUTION:**

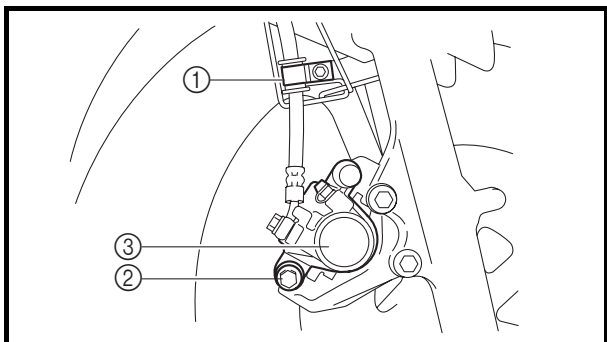
Disc brake components rarely require disassembly.

Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.

**FIRST AID FOR BRAKE FLUID ENTERING THE EYES:**

- Flush with water for 15 minutes and get immediate medical attention.



EAS00581

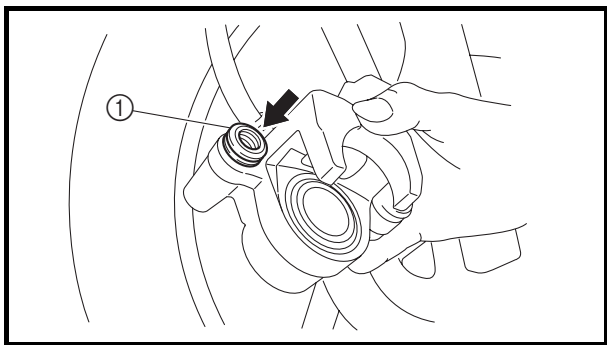
**REPLACING THE FRONT BRAKE PADS****NOTE:**

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

**1. Remove:**

- brake hose holder ①
- brake caliper bolt ②
- brake caliper ③





5. Lubricate:
- brake caliper dust boot ①




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

**CAUTION:**


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

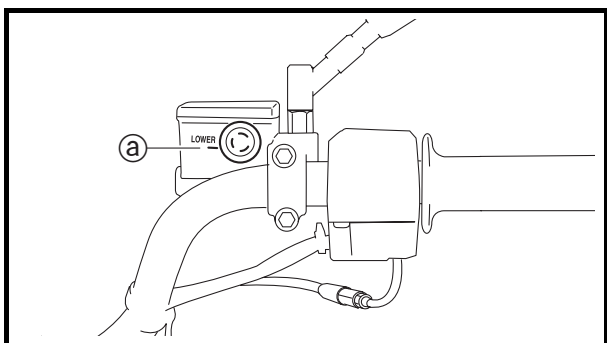
6. Install:

- brake caliper bolt

 23 Nm (2.3 m · kg, 17 ft · lb)

- brake hose holder bolt

 7 Nm (0.7 m · kg, 5.1 ft · lb)



7. Check:

- brake fluid level

Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.

Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

8. Check:

- brake lever operation

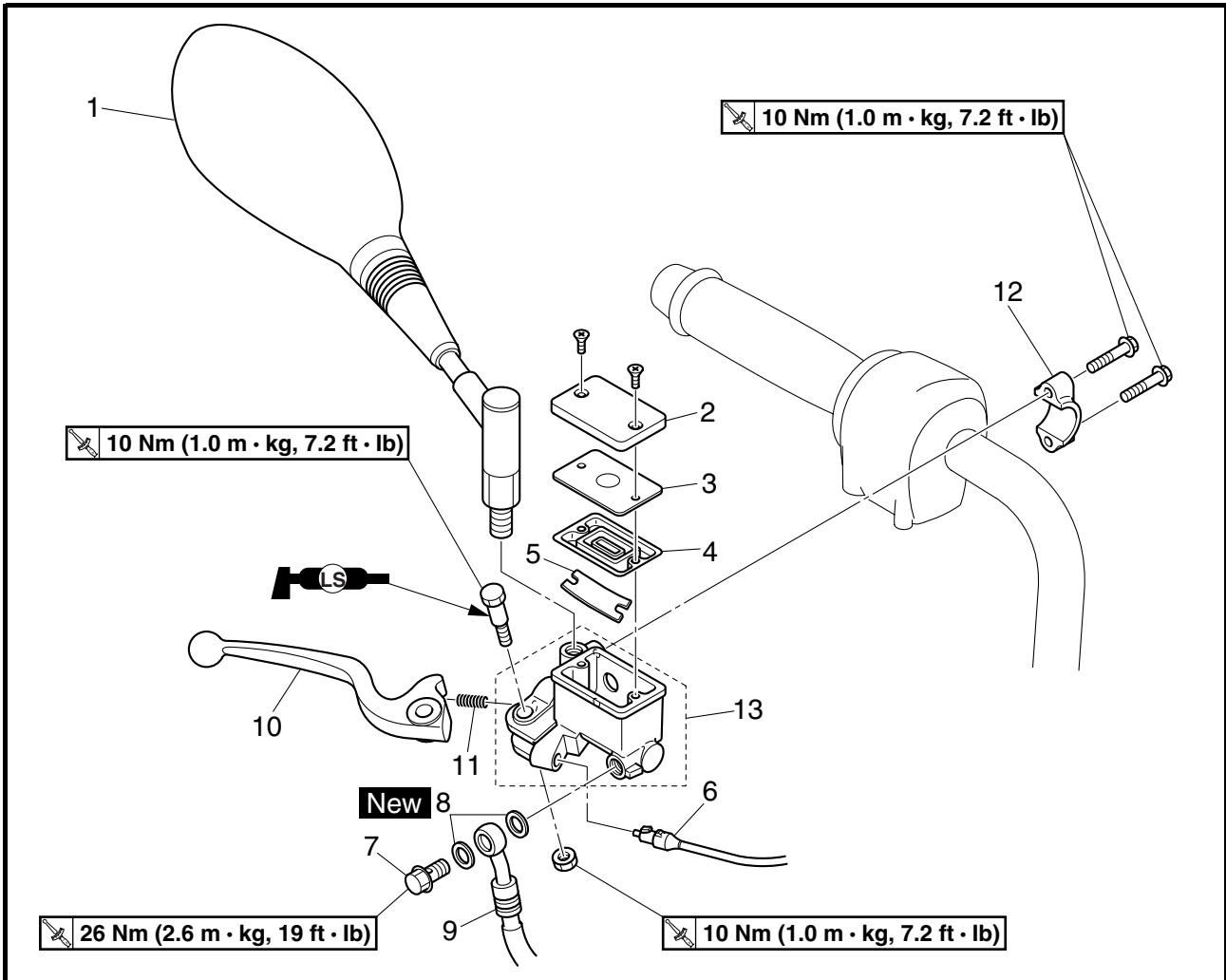
Soft or spongy feeling → Bleed the brake system.

Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.

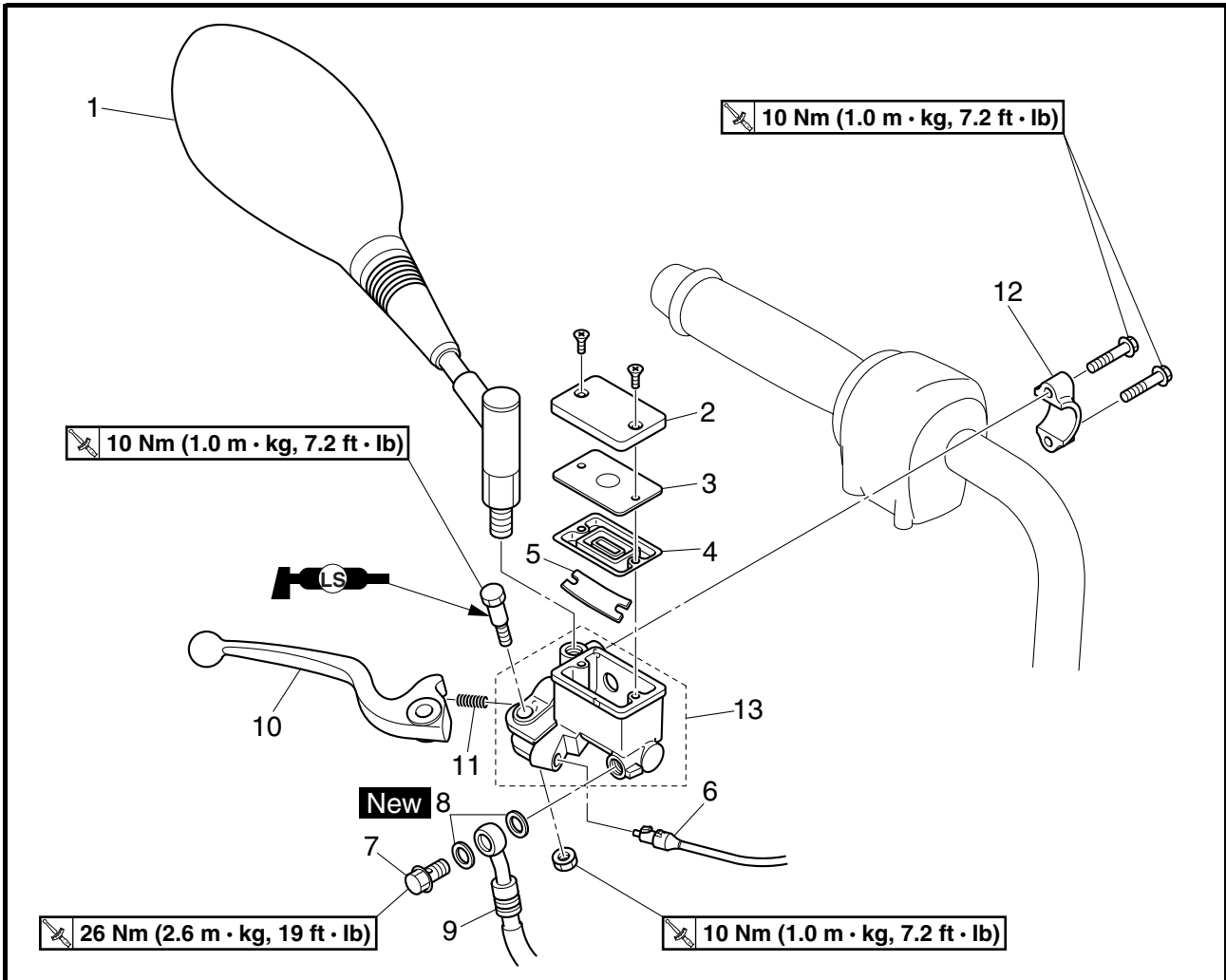


EAS00584

**FRONT BRAKE MASTER CYLINDER**

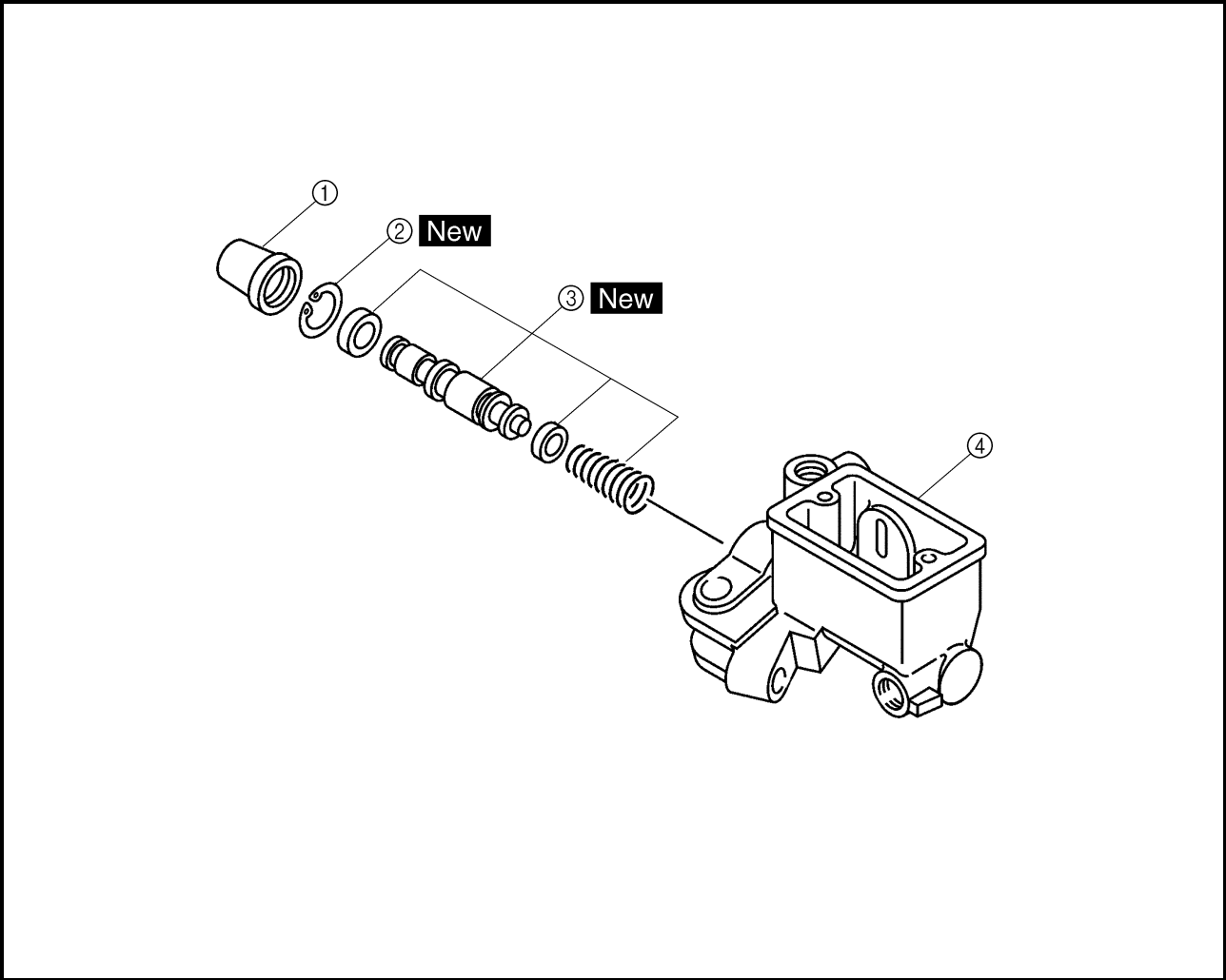


Order	Job/Part	Q'ty	Remarks
	<b>Removing the front brake master cylinder</b>		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Rearview mirror (right)	1	
2	Brake master cylinder reservoir cap	1	
3	Brake master cylinder reservoir diaphragm holder	1	
4	Brake master cylinder reservoir diaphragm	1	
5	Plate	1	



Order	Job/Part	Q'ty	Remarks
6	Front brake light switch	1	Disconnect. } Refer to "DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER" and "ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER".
7	Union bolt	1	
8	Copper washer	2	
9	Brake hose	1	
10	Brake lever	1	
11	Spring	1	
12	Brake master cylinder holder	1	
13	Brake master cylinder	1	
			For installation, reverse the removal procedure.

EAS00585

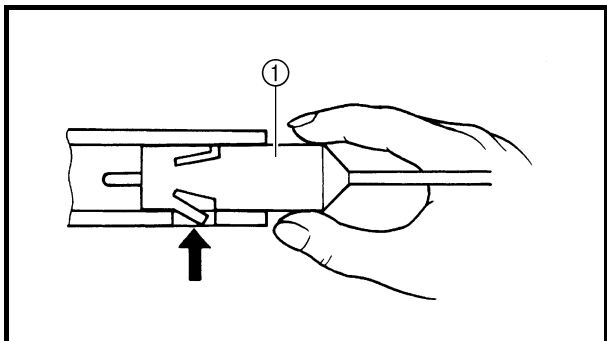


Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the front brake master cylinder</b>		Remove the parts in the order listed.
①	Dust boot	1	
②	Circlip	1	
③	Brake master cylinder kit	1	
④	Brake master cylinder	1	
			For assembly, reverse the disassembly procedure.

EAS00588

**DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER****NOTE:**

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

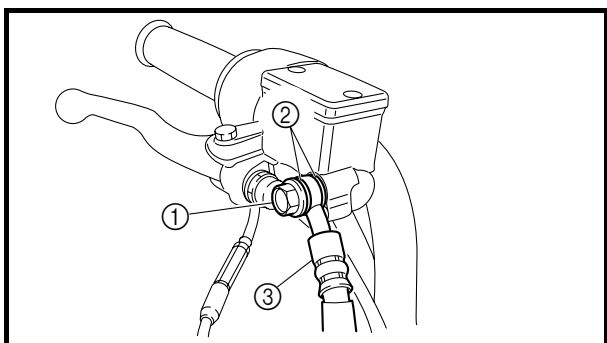


## 1. Disconnect:

- front brake light switch ①

**NOTE:**

Push the fastener to remove the front brake light switch from the brake master cylinder.



## 2. 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.

EAS00590

**CHECKING THE FRONT BRAKE MASTER CYLINDER**

## 1. Check:

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

## 2. Check:

- brake master cylinder kit  
Damage/scratches/wear → Replace.

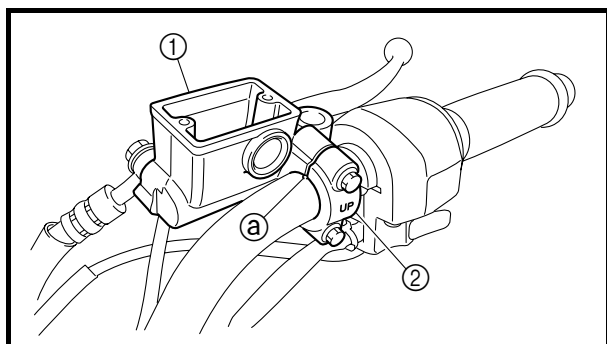
3. Check:
  - brake master cylinder reservoir cap  
Cracks/damage → Replace.
  - brake master cylinder reservoir diaphragm
  - brake master cylinder reservoir diaphragm holder  
Damage/wear → Replace.
4. Check:
  - brake hose  
Cracks/damage/wear → Replace.

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 3 or 4**

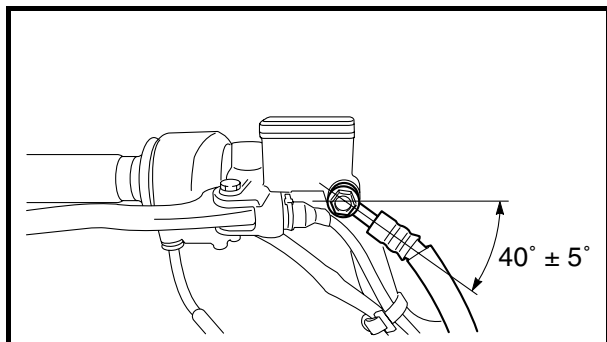
1. Install:
  - brake master cylinder ①
  - brake master cylinder holder ②

 **10 Nm (1.0 m · kg, 7.2 ft · lb)**

#### NOTE:

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

## FRONT BRAKE



### 2. Install:

- copper washers **New**
- brake hose
- union bolt  **26 Nm (2.6 m · kg, 19 ft · lb)**

### **WARNING**

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” in chapter 2.

### NOTE:

- Install the brake hose within the range 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)



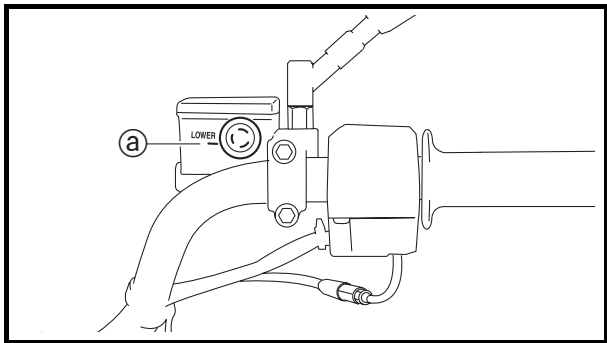
**Recommended brake fluid  
DOT 3 or 4**

### **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:**

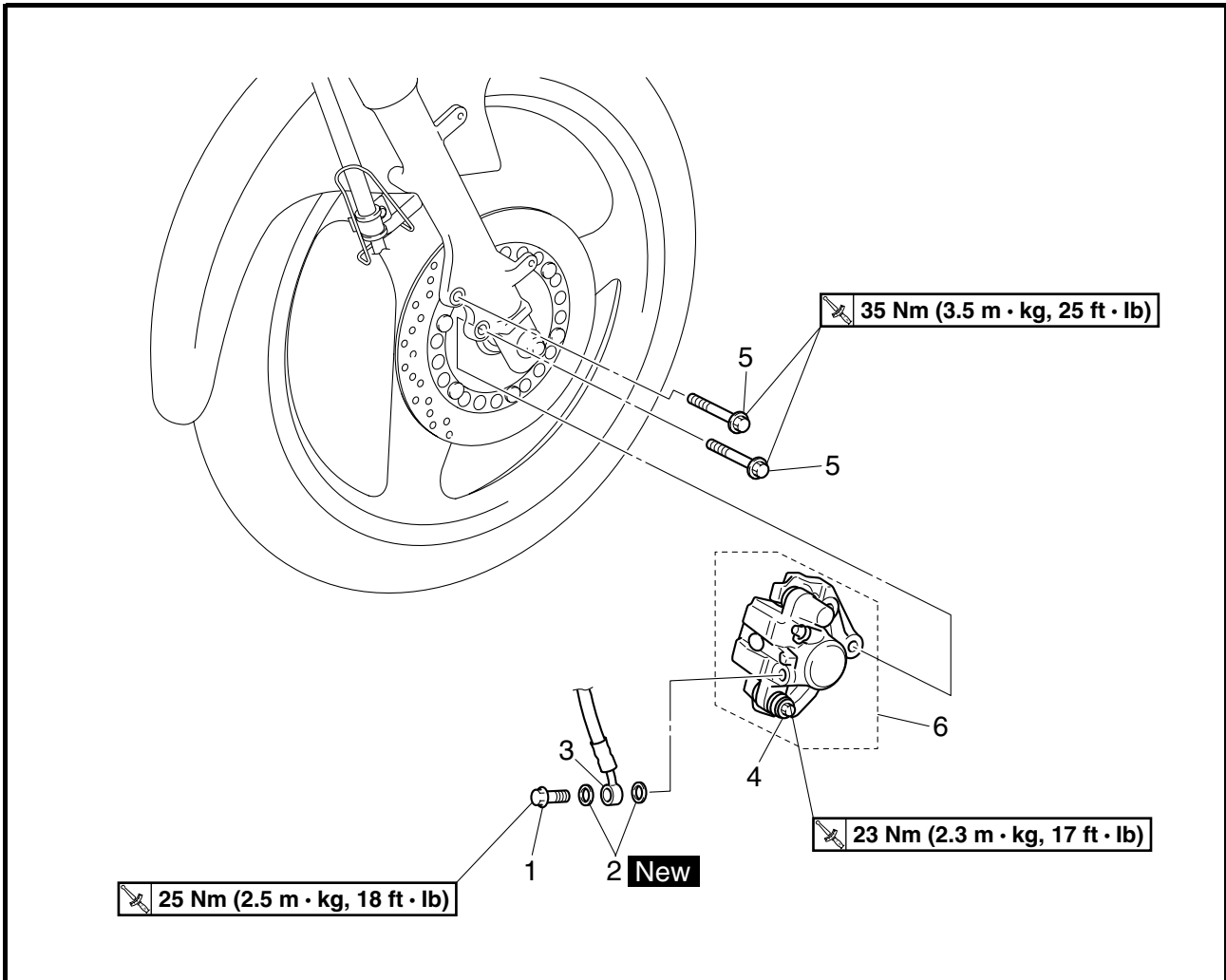
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.



4. Bleed:
  - brake system  
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.
5. Check:
  - brake fluid level  
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.  
Refer to “CHECKING THE BRAKE FLUID LEVEL” 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.

EAS00612

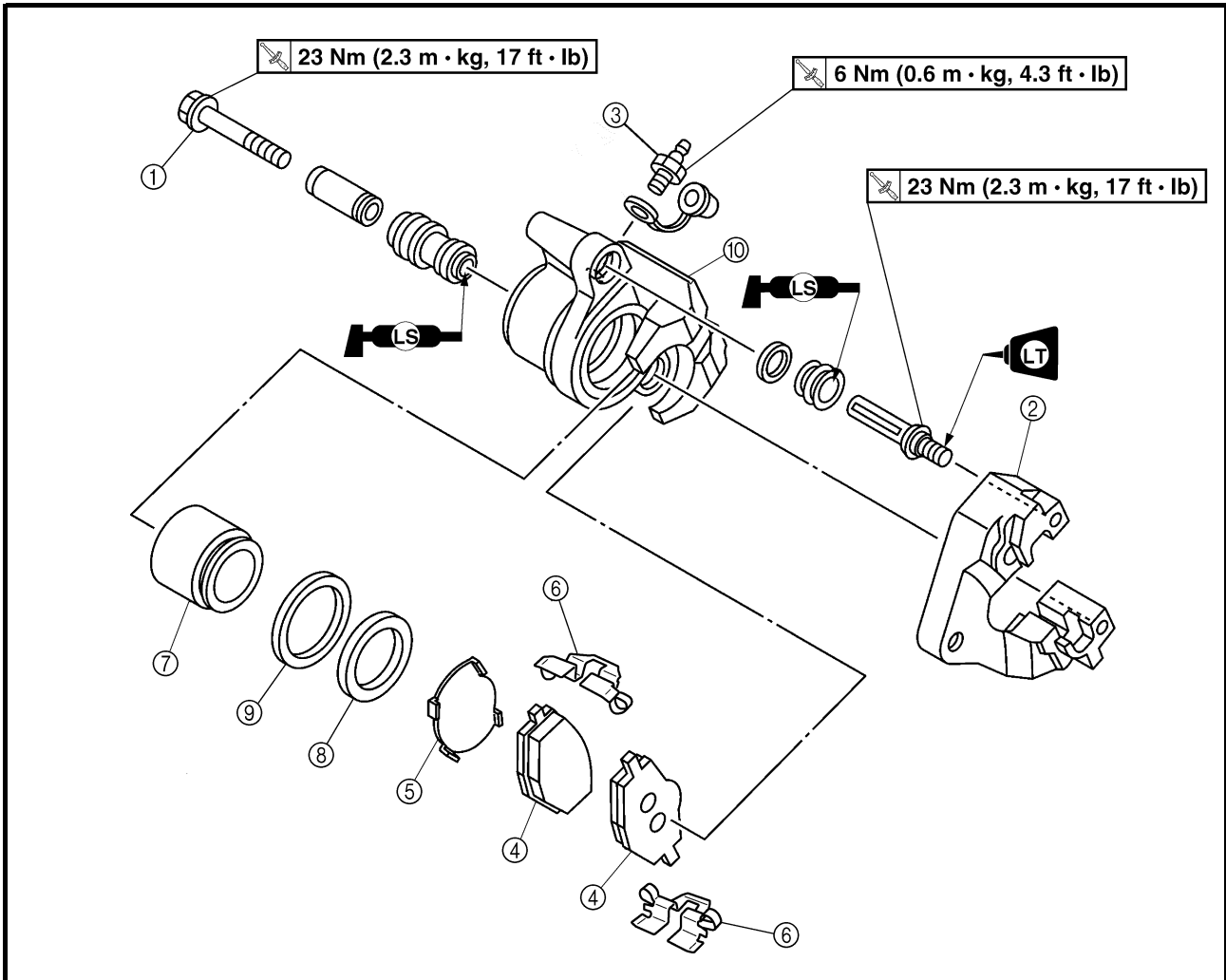
**FRONT BRAKE CALIPER**



Order	Job/Part	Q'ty	Remarks
	<b>Removing the front brake caliper</b>		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Union bolt	1	] Refer to "DISASSEMBLING THE FRONT BRAKE CALIPER" and "ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER".
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper bolt	1	
5	Brake caliper bracket bolt	2	] Refer to "ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPER".
6	Brake caliper	1	



EAS00614

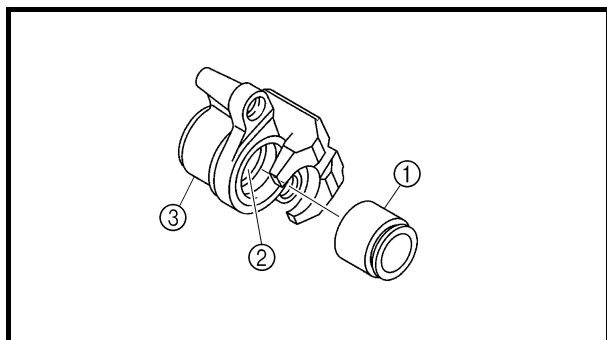


Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the front brake caliper</b>		Remove the parts in the order listed.
①	Brake caliper bolt	1	Refer to "DISASSEMBLING THE FRONT BRAKE CALIPER".  For assembly, reverse the disassembly procedure.
②	Brake caliper bracket	1	
③	Bleed screw	1	
④	Brake pad	2	
⑤	Brake pad shim	1	
⑥	Brake pad spring	2	
⑦	Brake caliper piston	1	
⑧	Dust boot	1	
⑨	Brake caliper piston seal	1	
⑩	Brake caliper body	1	



EAS00630

## CHECKING THE FRONT BRAKE CALIPER



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

## 1. Check:

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

**⚠ WARNING**

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

## 2. Check:

- brake caliper bracket  
Cracks/damage → Replace.

EAS00634

**ASSEMBLING AND INSTALLING THE FRONT 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 3 or 4**

1. Install:
  - brake caliper bracket

**⚡ 35 Nm (3.5 m · kg, 25 ft · lb)**

2. Install:
  - brake caliper (temporarily)
  - copper washers ① **New**
  - brake hose ②
  - union bolt ③ **⚡ 25 Nm (2.5 m · kg, 18 ft · lb)**

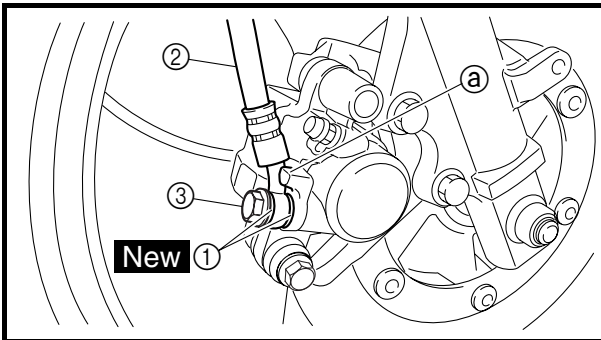
**⚠ WARNING**

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” in chapter 2.


**CAUTION:**

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

3. Remove:
  - brake caliper





4. Install:
  - brake pad springs
  - brake pad shim
  - brake pads
  - brake caliper  **23 Nm (2.3 m · kg, 17 ft · lb)**  
Refer to “REPLACING THE FRONT BRAKE PADS”.
5. Fill:
  - brake master cylinder reservoir  
(with the specified amount of the recommended brake fluid)



**Recommended brake fluid  
DOT 3 or 4**

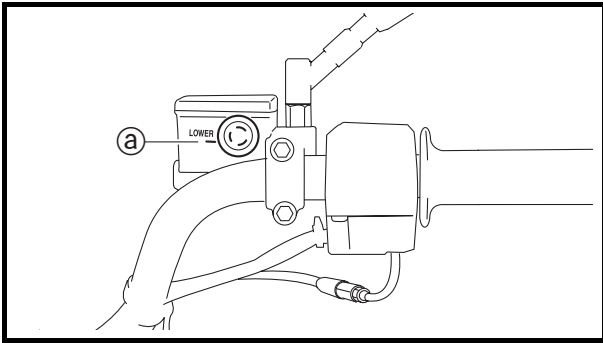
**⚠ WARNING**

- **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.**

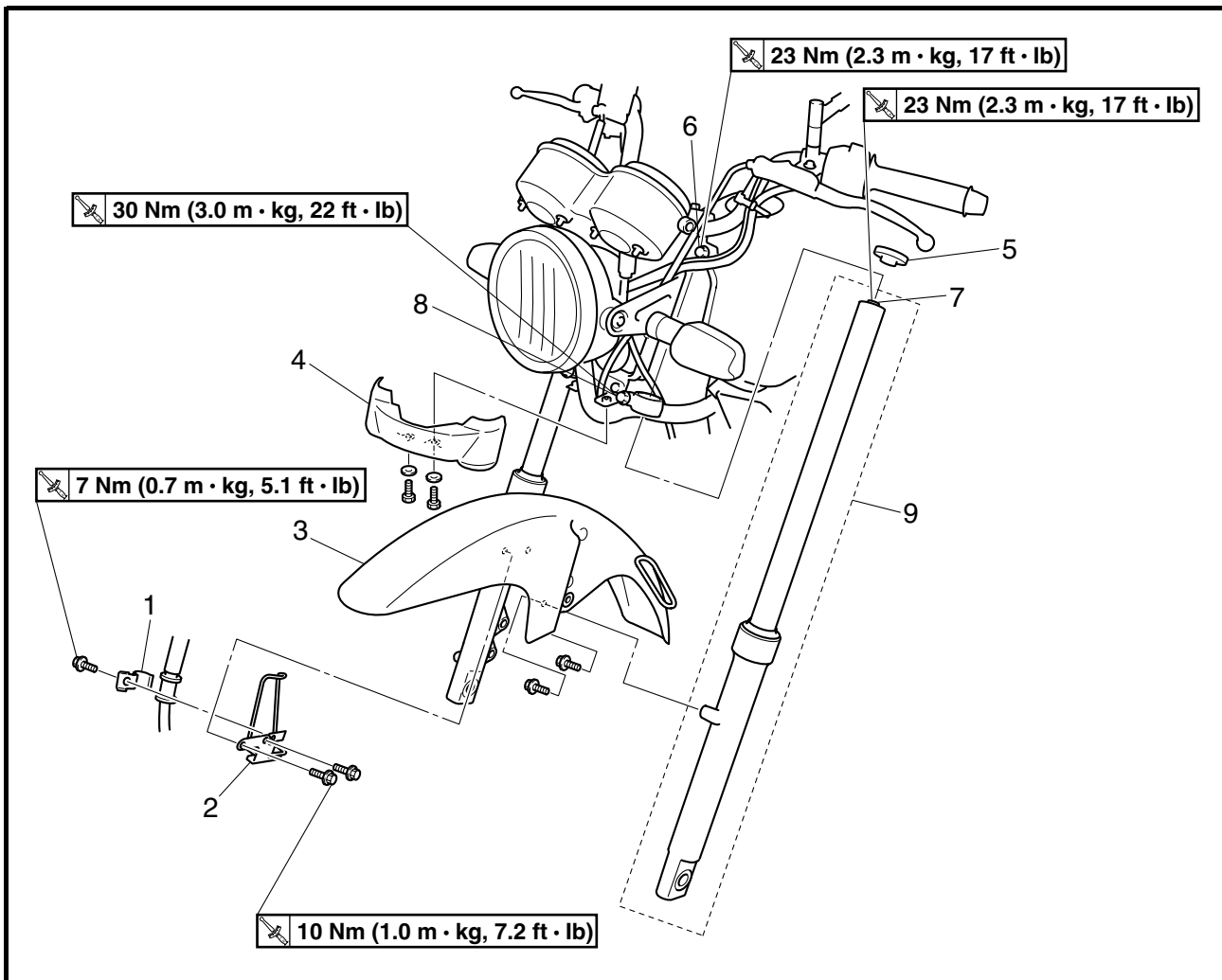
6. Bleed:
  - brake system  
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in chapter 3.



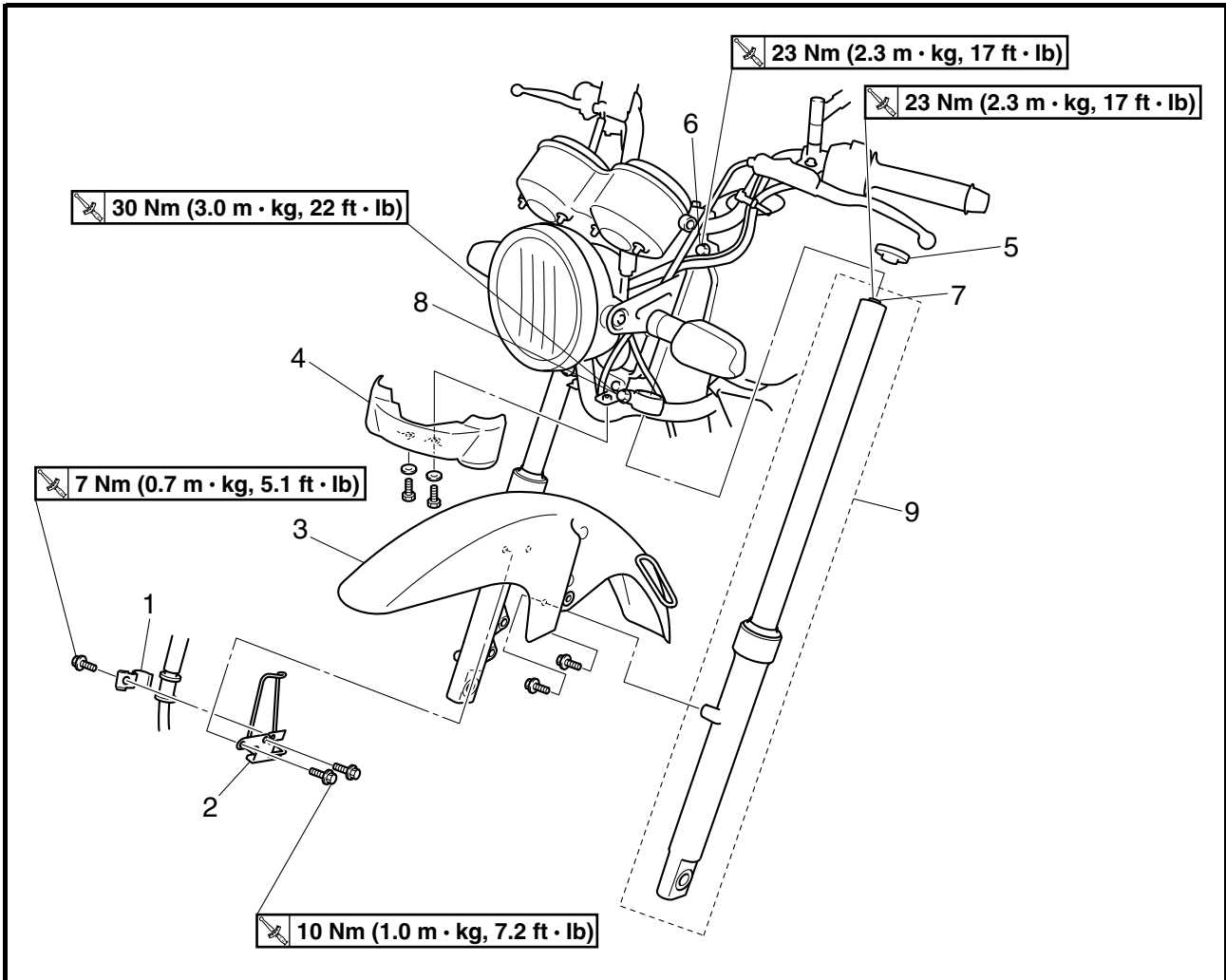
7. Check:
  - brake fluid level  
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.  
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
8. Check:
  - brake lever operation  
Soft or spongy feeling → Bleed the brake system.  
Refer to “BLEEDING THE HYDRAULIC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

EAS00646

**FRONT FORK**



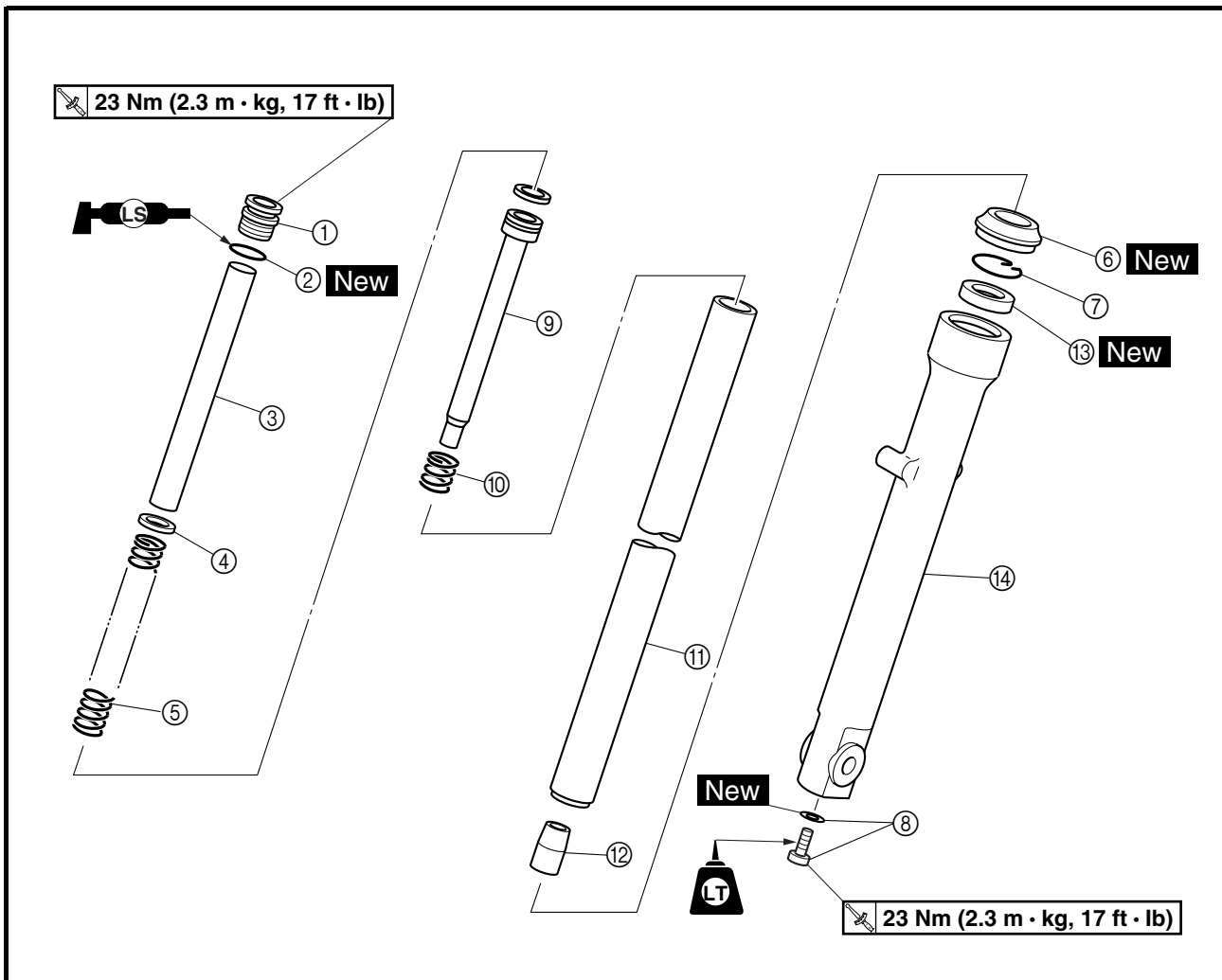
Order	Job/Part	Q'ty	Remarks
	<b>Removing the front fork legs</b>		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
	Brake caliper/front wheel		Refer to "FRONT WHEEL AND BRAKE DISC".
1	Brake hose holder	1	
2	Brake hose guide	1	
3	Front fender	1	
4	Lower bracket cover	1	
5	Rubber cap	1	



Order	Job/Part	Q'ty	Remarks
6	Upper bracket pinch bolt	1	Loosen. Refer to "REMOVING THE FRONT FORK LEGS" and "INSTALLING THE FRONT FORK LEGS". For installation, reverse the removal procedure.
7	Cap bolt	1	
8	Lower bracket pinch bolt	1	
9	Front fork leg	1	

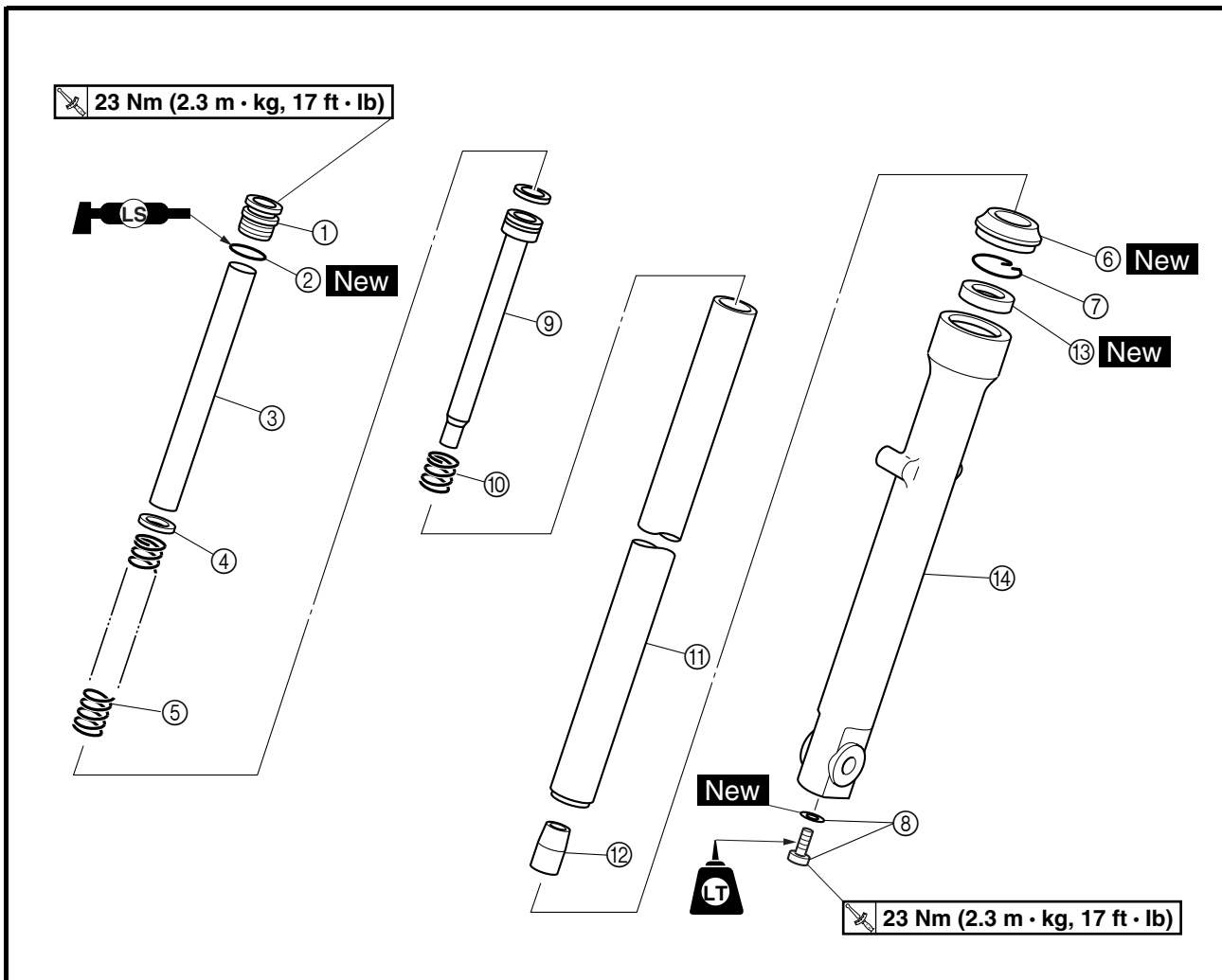


EAS00648



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the front fork legs</b>		Remove the parts in the order listed. The following procedure applies to both of the front fork legs.
①	Cap bolt	1	Refer to "DISASSEMBLING THE FRONT FORK LEGS" and "ASSEMBLING THE FRONT FORK LEGS".
②	O-ring	1	
③	Spacer	1	
④	Spring seat	1	
⑤	Fork spring	1	
⑥	Dust seal	1	
⑦	Oil seal clip	1	
⑧	Damper rod bolt/copper washer	1/1	

EAS00648



Order	Job/Part	Q'ty	Remarks
⑨	Damper rod	1	Refer to "DISASSEMBLING THE FRONT FORK LEGS" and "ASSEMBLING THE FRONT FORK LEGS".
⑩	Rebound spring	1	
⑪	Inner tube	1	
⑫	Oil flow stopper	1	
⑬	Oil seal	1	
⑭	Outer tube	1	
			For assembly, reverse the disassembly procedure.

EAS00651

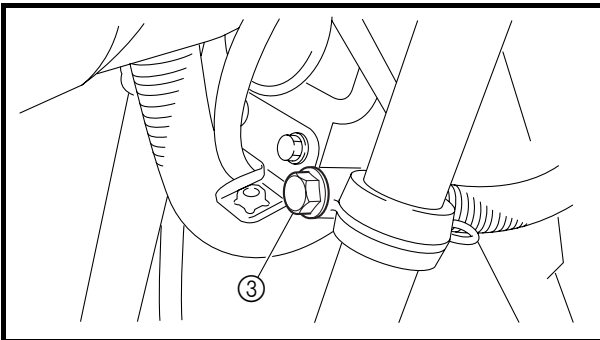
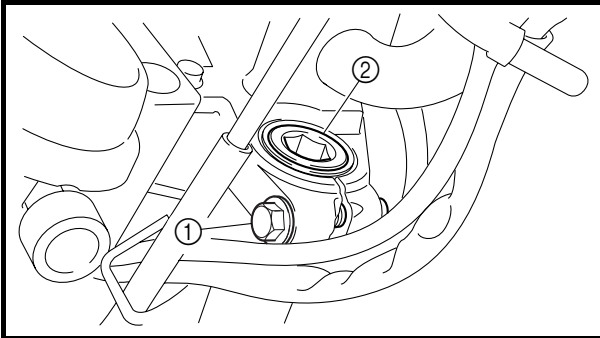
**REMOVING THE FRONT FORK LEGS**

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

1. Stand the vehicle on a level surface.

**⚠ WARNING**

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

**NOTE:**

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

2. Remove:
  - lower bracket cover
  - rubber cap
3. Loosen:
  - upper bracket pinch bolt ①
  - cap bolt ②
  - lower bracket pinch bolt ③

**⚠ WARNING**

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

4. Remove:
  - front fork leg

EAS00652

**DISASSEMBLING THE FRONT FORK LEGS**

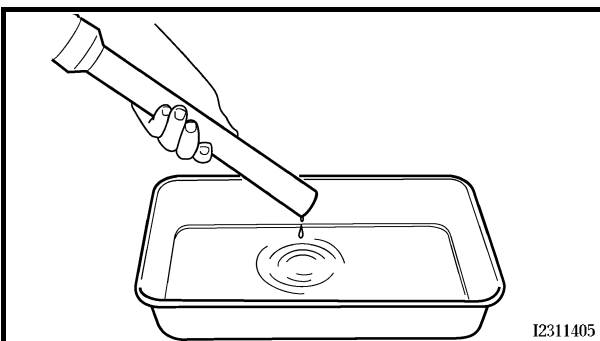
The following procedure applies to both of the front fork legs.

1. Remove:
  - cap bolt
  - spacer
  - spring seat
  - fork spring

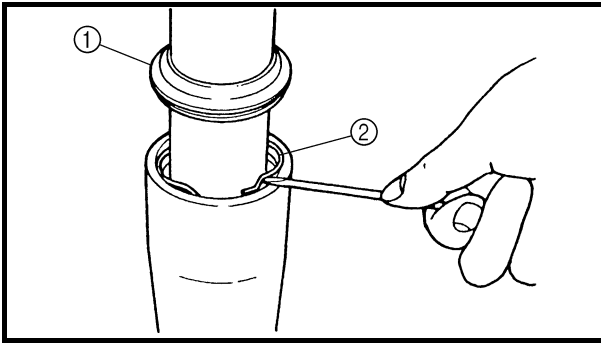
2. Drain:
  - fork oil

**NOTE:**

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



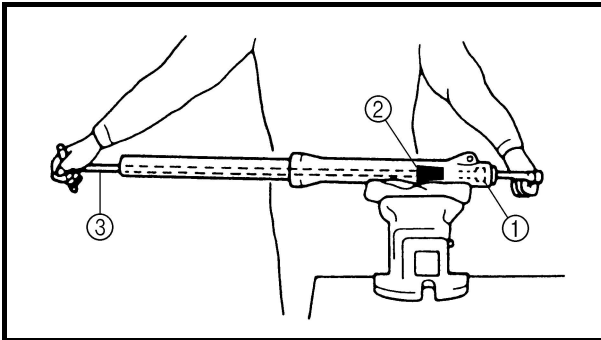
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3. Remove:
- dust seal ①
  - oil seal clip ②  
(with a flat-head screwdriver)

**CAUTION:** \_\_\_\_\_

**Do not scratch the inner tube.**



4. Remove:
- damper rod bolt ①
  - copper washer

**NOTE:** \_\_\_\_\_

While holding the damper rod with the 14-mm hexagon nut/socket wrench ② and T-handle ③, loosen the damper rod bolt.



**T-handle**  
90890-01326, YM-01326

EAS00656

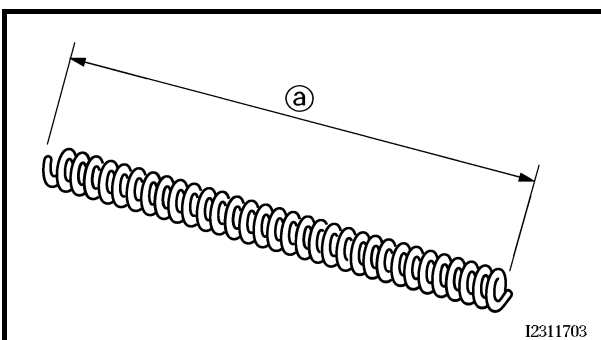
## CHECKING THE FRONT FORK LEGS

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

1. Check:
- inner tube
  - outer tube
- Bends/damage/scratches → Replace.

**⚠ WARNING** \_\_\_\_\_

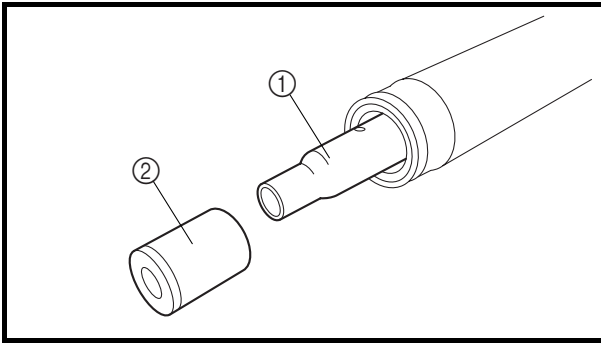
**Do not attempt to straighten a bent inner tube as this may dangerously weaken it.**



2. Measure:
- spring free length ①
- Out of specification → Replace.



**Spring free length**  
337.0 mm (13.27 in)  
<Limit>: 330.3 mm (13.00 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.

EAS00659

## ASSEMBLING THE FRONT FORK LEGS

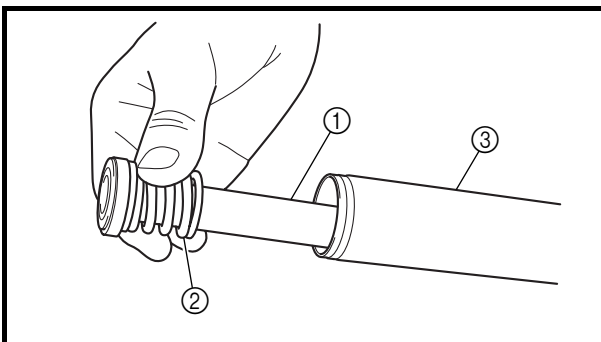
The following procedure applies to both of the front fork legs.

### **⚠ 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:
  - oil seal
  - dust seal
- Before assembling the front fork leg, make sure all of the components are clean.



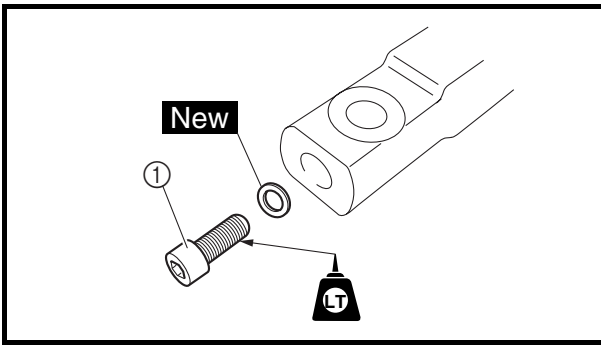
1. Install:
  - damper rod ①
  - rebound spring ②

### **CAUTION:**

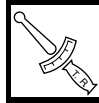
**Allow the damper rod to slide slowly down the inner tube ③ until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.**

2. Lubricate:
  - inner tube's outer surface

	<b>Recommended lubricant</b> Fork oil 10W or equivalent
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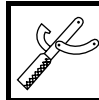
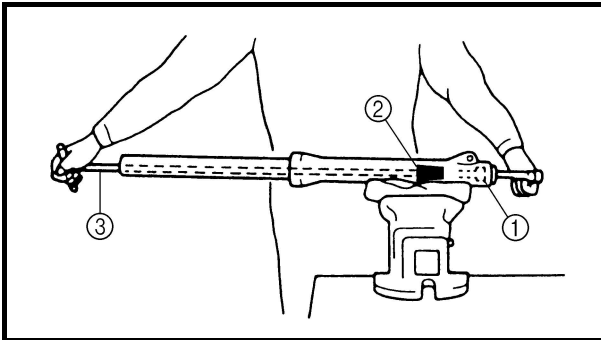
3. Tighten:
- damper rod bolt ①



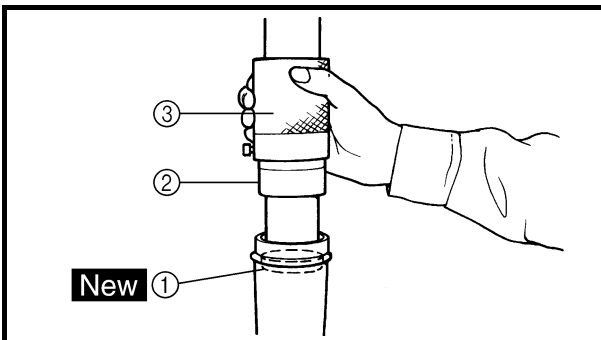
**23 Nm (2.3 m · kg, 17 ft · lb)**  
**LOCTITE®**

**NOTE:**

While holding the damper rod with the 14-mm hexagon nut/socket wrench ② and T-handle ③, tighten the damper rod bolt.



**T-handle**  
**90890-01326, YM-01326**



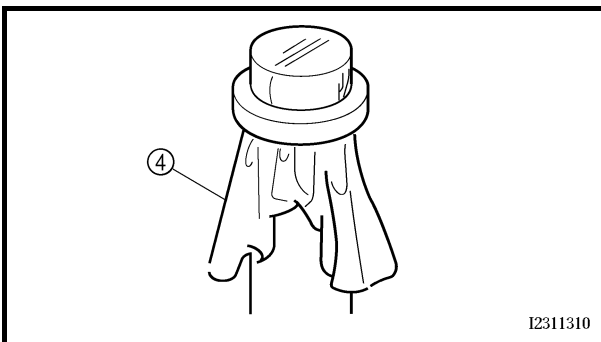
4. Install:
- oil seal ① **New**  
(with the fork seal driver attachment ② and fork seal driver weight ③)



**Fork seal driver weight**  
**90890-01367,**  
**YM-A9409-7, YM-A5142-4**  
**Fork seal driver attachment (ø30)**  
**90890-01400**

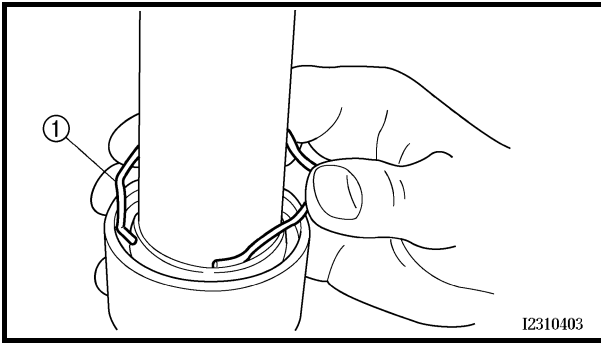
**CAUTION:**

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



**NOTE:**

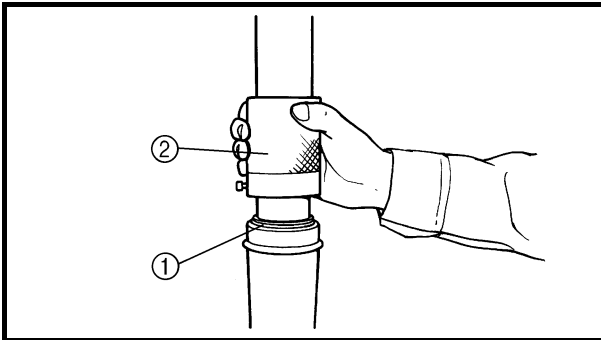
- Before installing the oil seal, lubricate its lips with lithium-soap-based grease.
- Lubricate the outer surface of the inner tube with fork oil.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag ④ to protect the oil seal during installation.



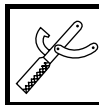
5. Install:
- oil seal clip ①

**NOTE:** \_\_\_\_\_  
Adjust the oil seal clip so that it fits into the outer tube's groove.

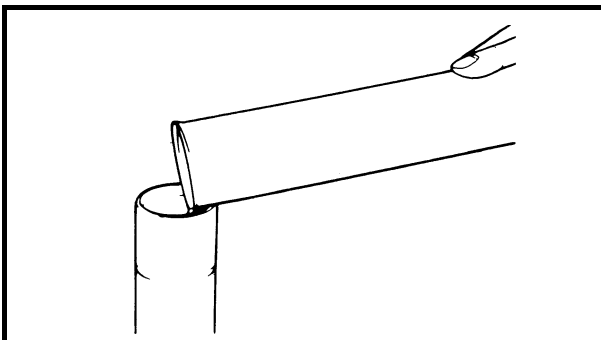
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6. Install:
- dust seal ①  
(with the fork seal driver weight ②)



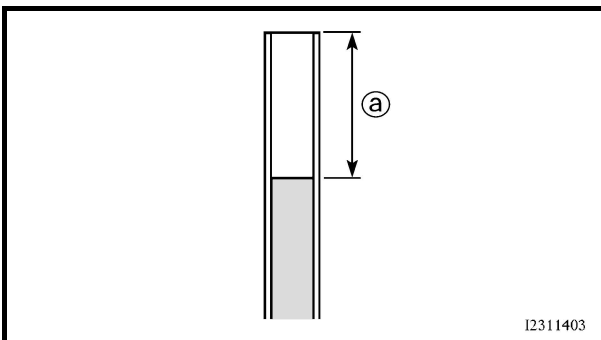
**Fork seal driver weight**  
90890-01367,  
YM-A9409-7, YM-A5142-4



7. Fill:
- front fork leg  
(with the specified amount of the recommended fork oil)



**Quantity (each front fork leg)**  
0.154 L  
(0.136 Imp qt, 0.163 US qt)  
**Recommended oil**  
Yamaha fork and shock oil 10W  
or equivalent

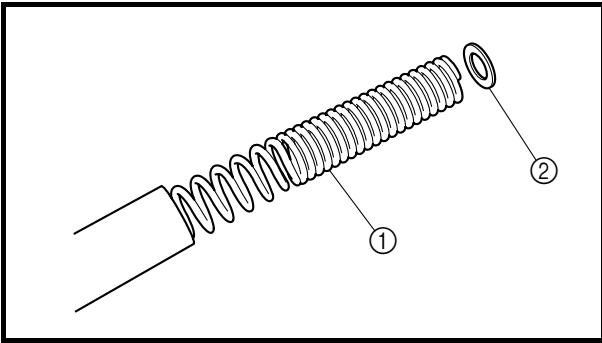


**Front fork leg oil level ① (from the top of the inner tube, with the inner tube fully compressed and without the fork spring)**  
166 mm (6.54 in)

**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.

---



8. Install:
- fork spring ①
  - spring seat ②
  - spacer
  - O-ring **New**
  - cap bolt

**NOTE:**

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

EAS00662

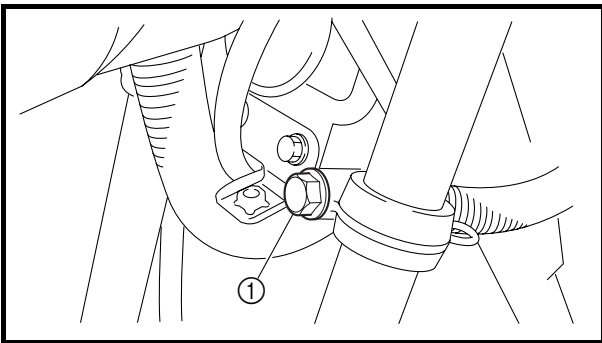
**INSTALLING THE FRONT FORK LEGS**

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


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


**NOTE:**


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



2. Tighten:
- lower bracket pinch bolt ① 

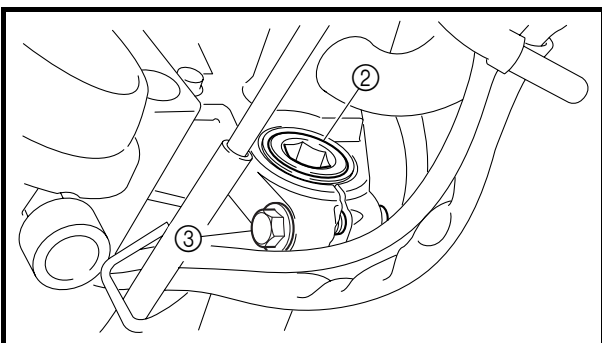
	<b>30 Nm (3.0 m · kg, 22 ft · lb)</b>
---	---------------------------------------
  - cap bolt ② 

	<b>23 Nm (2.3 m · kg, 17 ft · lb)</b>
---	---------------------------------------
  - upper bracket pinch bolt ③ 


	<b>23 Nm (2.3 m · kg, 17 ft · lb)</b>
---	---------------------------------------

**⚠ WARNING**

Make sure the brake hose is routed properly.



3. Install:
- brake hose holder 

	<b>7 Nm (0.7 m · kg, 5.1 ft · lb)</b>
---	---------------------------------------

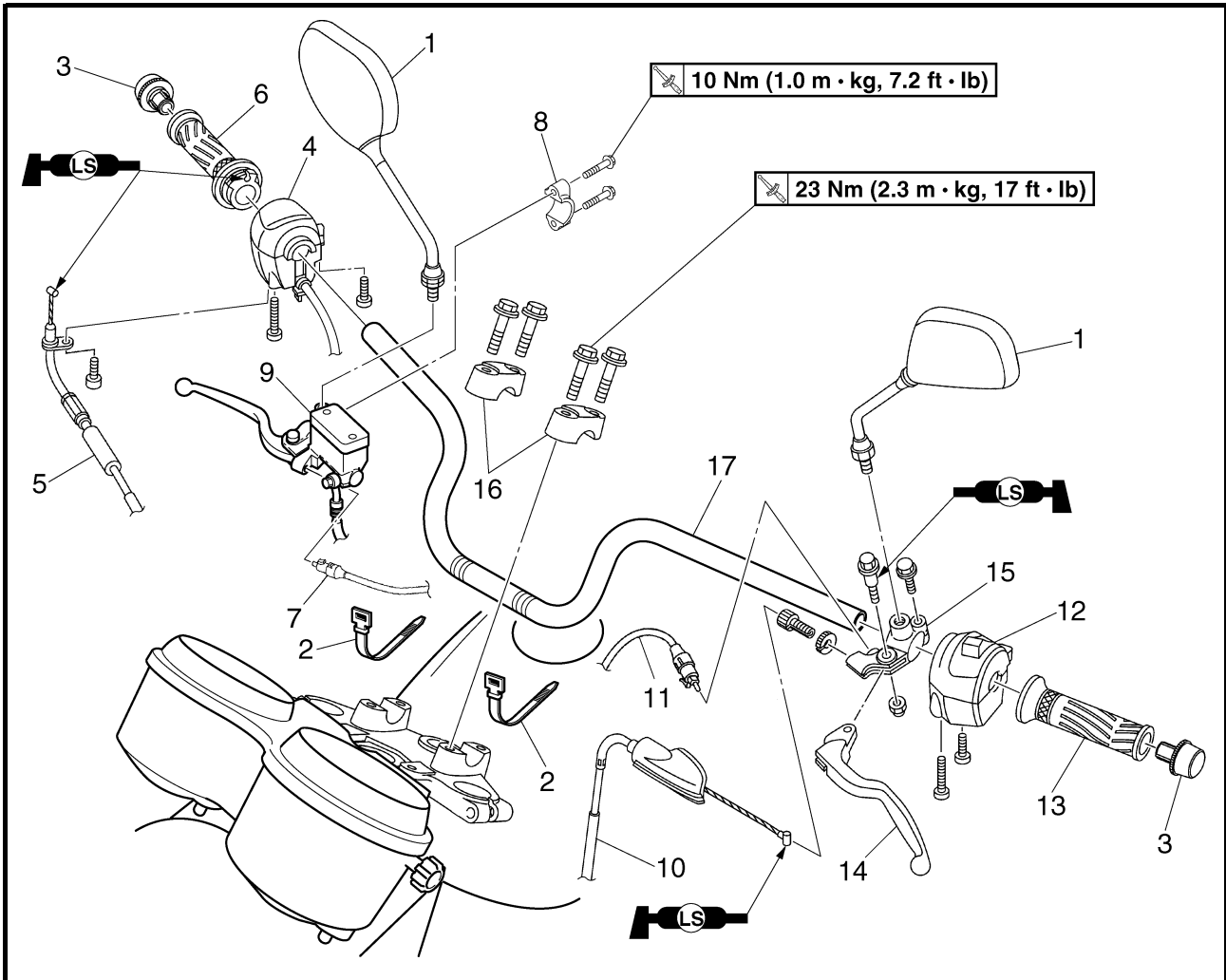
**⚠ WARNING**

Proper brake hose routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” in chapter 2.

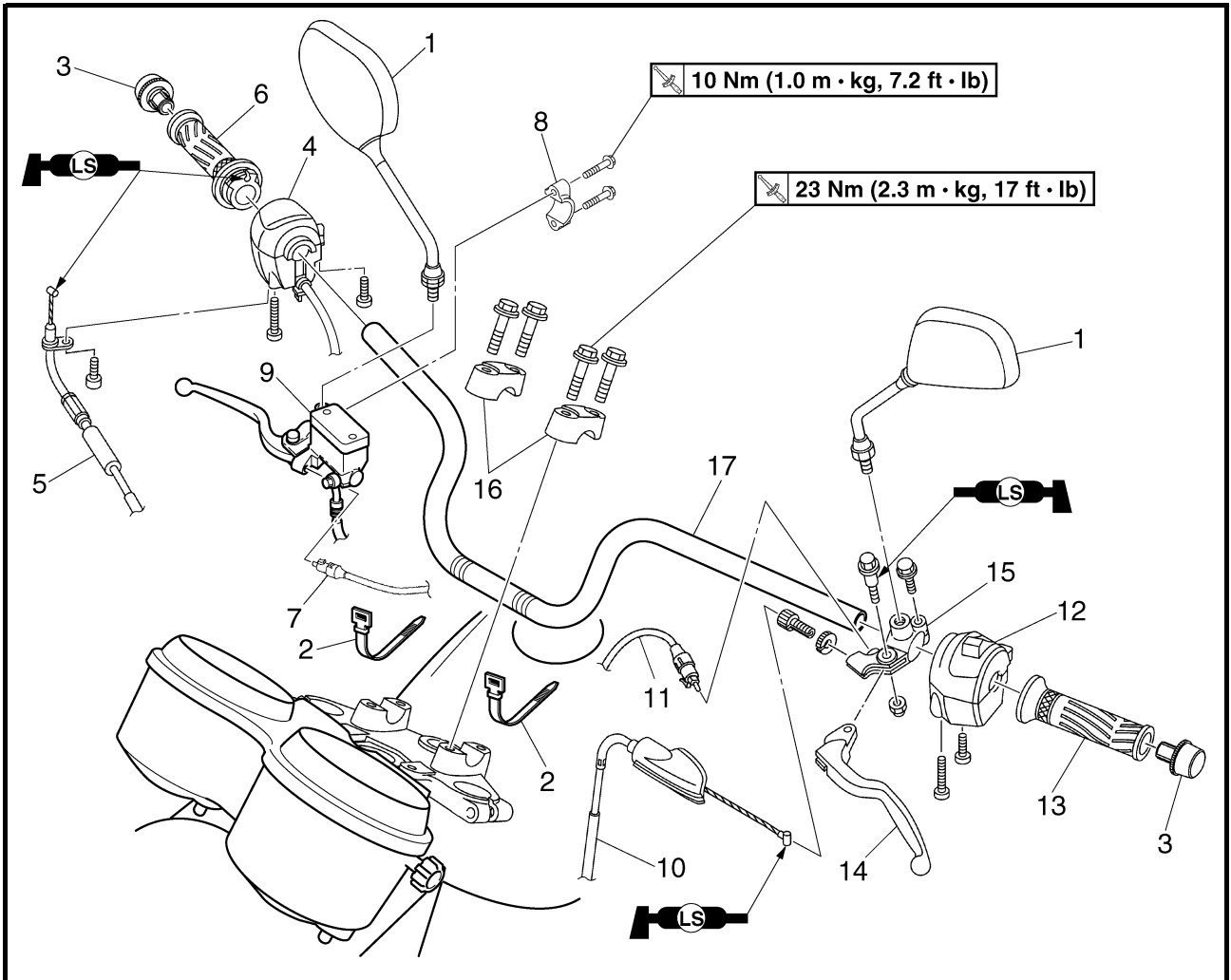


EAS00664

**HANDLEBAR**



Order	Job/Part	Q'ty	Remarks
	<b>Removing the handlebar</b>		Remove the parts in the order listed.
1	Rearview mirror (left and right)	2	
2	Plastic band	2	
3	Grip end	2	
4	Right handlebar switch	1	] Refer to "INSTALLING THE HANDLEBAR".
5	Throttle cable	1	
6	Throttle grip	1	
7	Front brake light switch	1	Refer to "REMOVING THE HANDLEBAR".
8	Brake master cylinder holder	1	] Refer to "INSTALLING THE HANDLEBAR".
9	Brake master cylinder	1	
10	Clutch cable	1	Disconnect.
11	Clutch switch	1	Refer to "REMOVING THE HANDLEBAR".



Order	Job/Part	Q'ty	Remarks
12	Left handlebar switch	1	Refer to "INSTALLING THE HANDLEBAR".
13	Handlebar grip	1	Refer to "REMOVING THE HANDLEBAR".
14	Clutch lever	1	Refer to "INSTALLING THE HANDLEBAR".
15	Clutch lever holder	1	
16	Handlebar holder	2	
17	Handlebar	1	
			For installation, reverse the removal procedure.

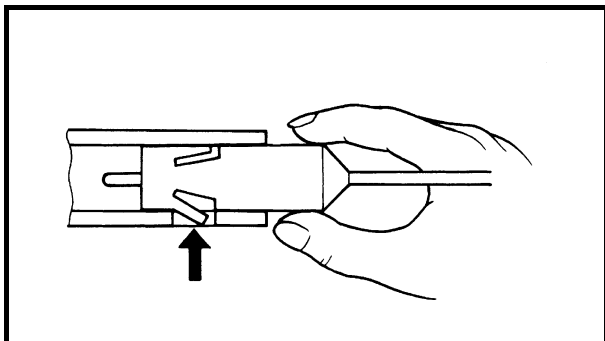
EAS00666

## REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

### **⚠ WARNING**

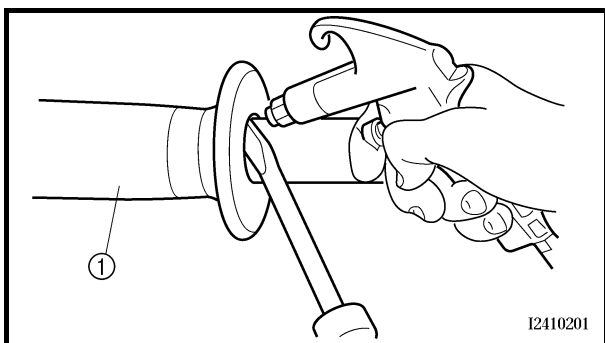
**Securely support the vehicle so that there is no danger of it falling over.**



2. Remove:
  - front brake light switch
  - clutch switch

### **NOTE:**

- Push the fastener to remove the front brake light switch from the brake master cylinder.
- Push the fastener to remove the clutch switch from the clutch lever holder.



3. Remove:
  - handlebar grip ①

### **NOTE:**

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

EAS00668

## CHECKING THE HANDLEBAR

1. Check:
  - handlebar

Bends/cracks/damage → Replace.

### **⚠ WARNING**

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

EAS00670

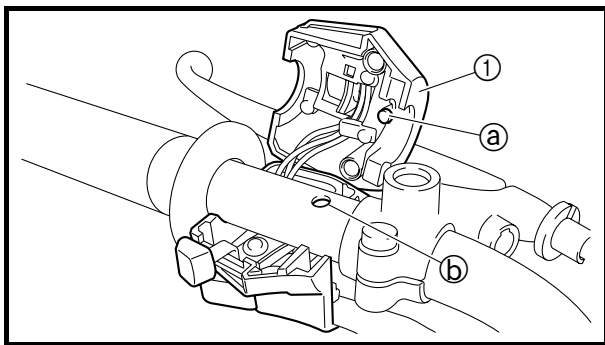
## INSTALLING THE HANDLEBAR

1. Stand the vehicle on a level surface.

### **⚠ WARNING**

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





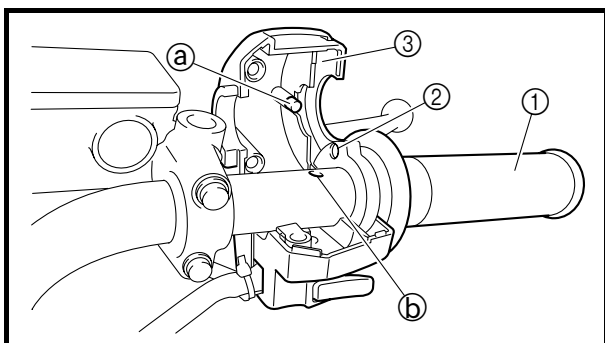
5. Install:
- left handlebar switch ①

**NOTE:** \_\_\_\_\_  
Align the projection ① on the left handlebar switch with the hole ② in the handlebar.

6. Install:
- clutch cable

**NOTE:** \_\_\_\_\_  
Lubricate the end of the clutch cable with a thin coat of lithium-soap-based grease.

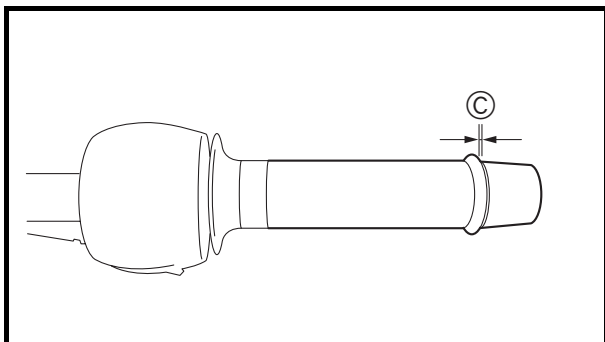
7. Install:
- brake master cylinder
  - brake master cylinder holder
- Refer to “FRONT BRAKE”.



8. Install:
- throttle grip ①
  - throttle cable ②
  - right handlebar switch ③
  - grip end

**NOTE:** \_\_\_\_\_

- Lubricate the end of the throttle cable and the inside of the throttle grip with a thin coat of the lithium-soap-based grease, and then install the throttle grip onto the handlebar.
- Route the throttle cable through the slot in the right handlebar switch, and then install the cable.
- Align the projection ① on the right handlebar switch with the hole ② in the handlebar.
- Apply a thin coat of rubber adhesive onto the grip end.
- There should be 1 ~ 2 mm (0.04 ~ 0.08 in) of clearance ③ between the throttle grip and the grip end.



9. Adjust:
- clutch cable free play
- Refer to “ADJUSTING 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)



10.Adjust:

- throttle cable free play

Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” in chapter 3.

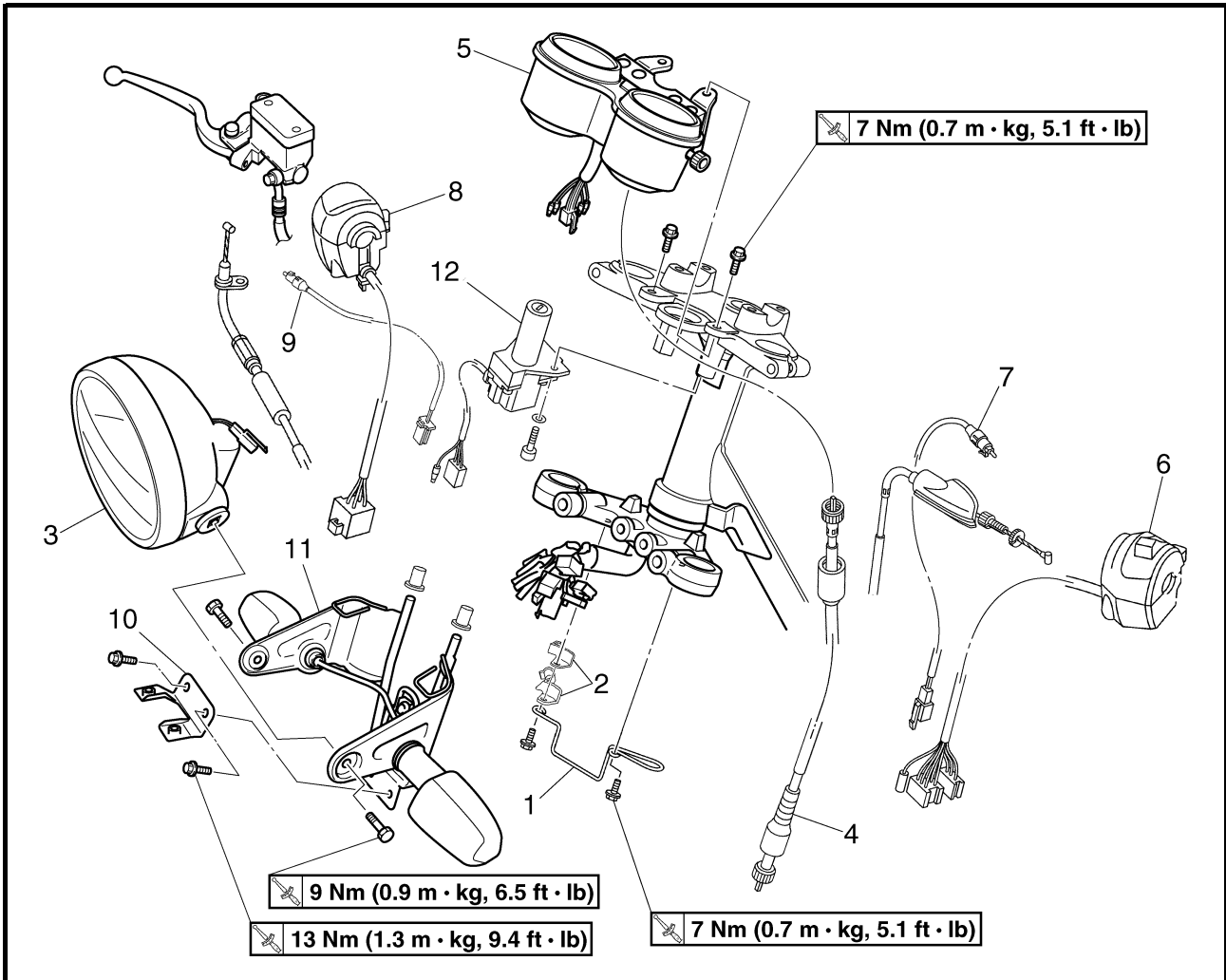


**Throttle cable free play (at the flange of the throttle grip)**  
**3 ~ 7 mm (0.12 ~ 0.28 in)**

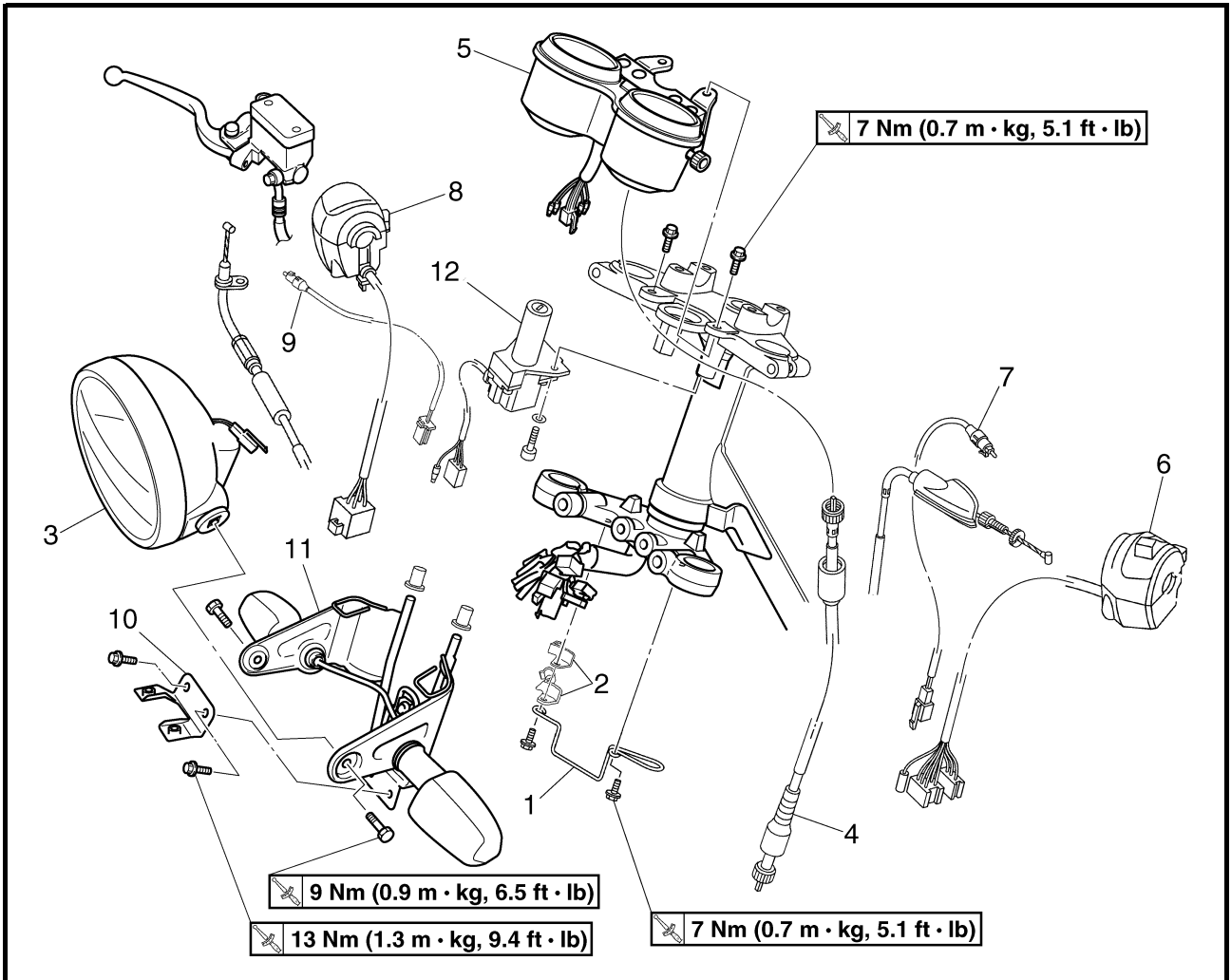
EAS00675

**STEERING HEAD**

**HEADLIGHT AND METER ASSEMBLY**



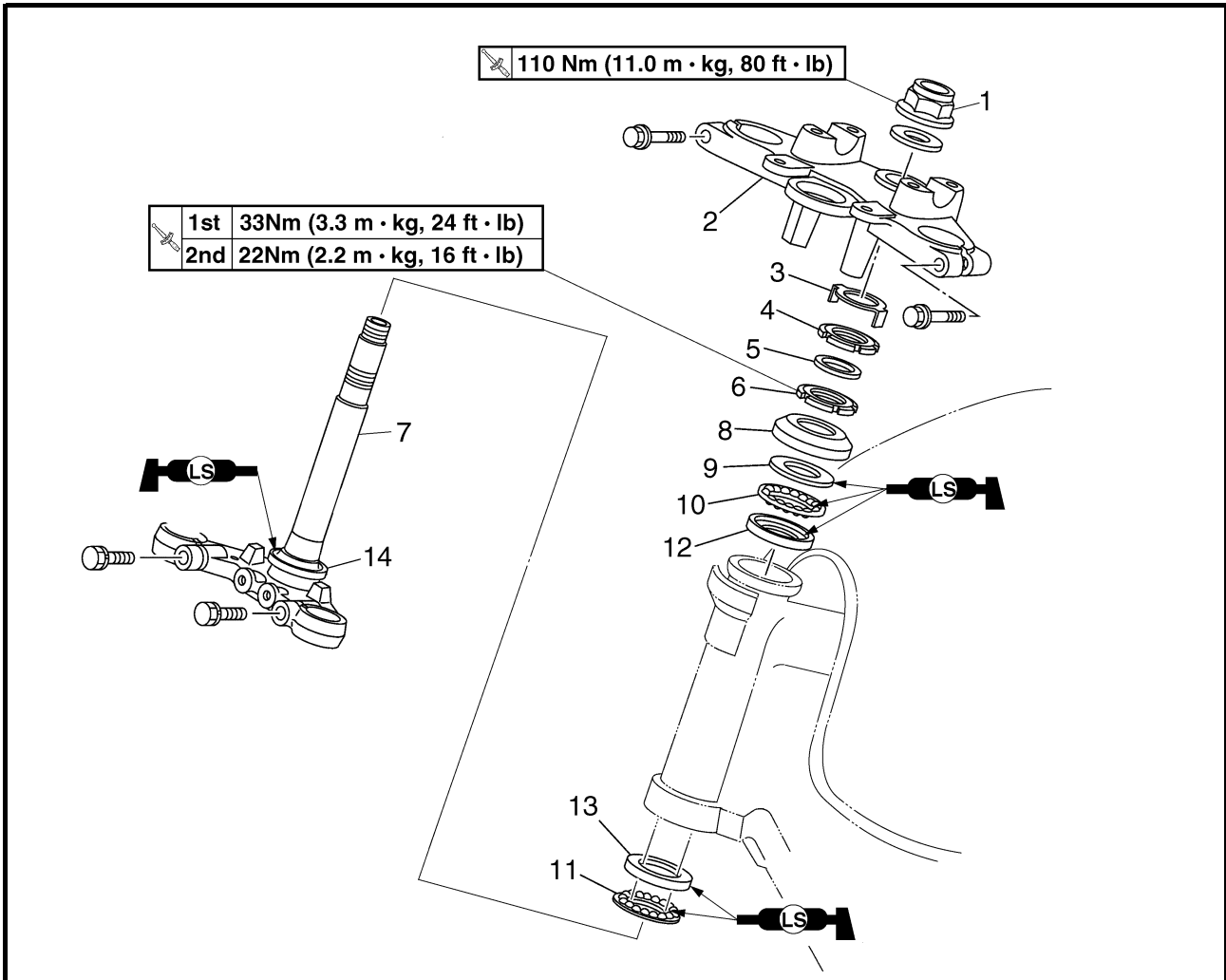
Order	Job/Part	Q'ty	Remarks
	<b>Removing the headlight and meter assembly</b>		Remove the parts in the order listed.
	Front wheel		Refer to "FRONT WHEEL AND BRAKE DISC".
	Front fork		Refer to "FRONT FORK".
	Handlebar		Refer to "HANDLEBAR".
1	Wire harness/speedometer cable guide	1	
2	Brake hose holder	2	
3	Headlight assembly	1	
4	Speedometer cable	1	
5	Meter assembly	1	
6	Left handlebar switch	1	
7	Clutch switch	1	
8	Right handlebar switch	1	
9	Front brake light switch	1	



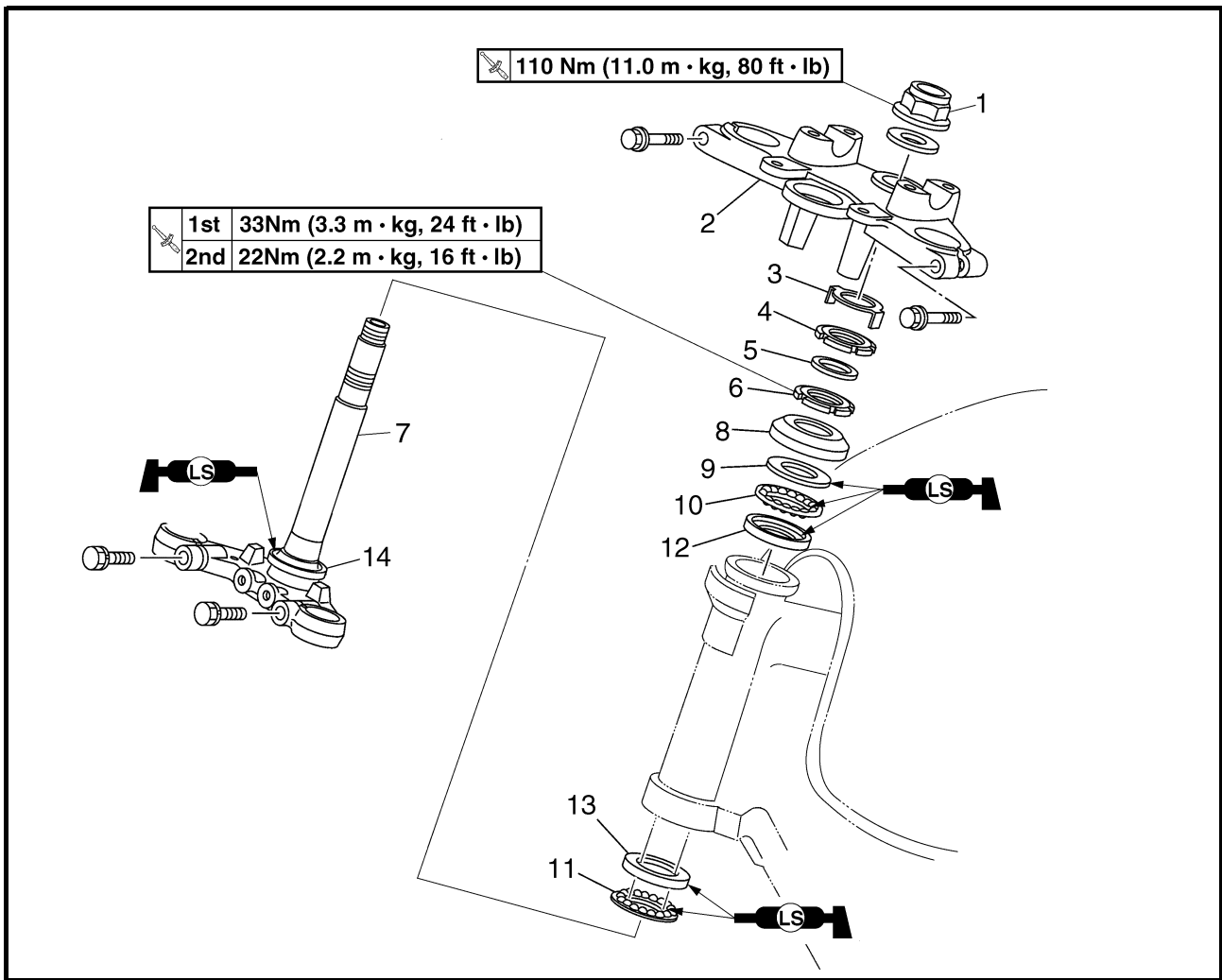
Order	Job/Part	Q'ty	Remarks
10	Bracket	1	For installation, reverse the removal procedure.
11	Front turn signal light assembly	1	
12	Main switch	1	



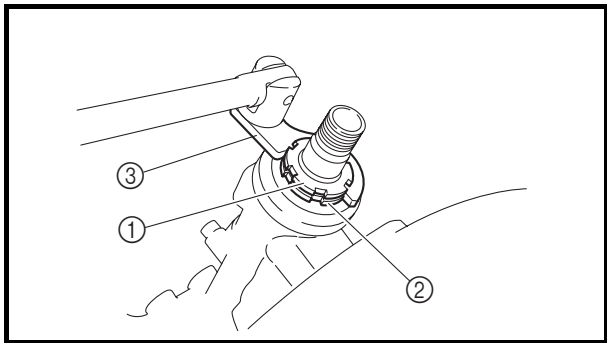
LOWER BRACKET



Order	Job/Part	Q'ty	Remarks
	<b>Removing the lower bracket</b>		
	Meter assembly/main switch		Remove the parts in the order listed. Refer to "HEADLIGHT AND METER ASSEMBLY".
1	Steering stem nut	1	Refer to "INSTALLING THE STEERING HEAD".
2	Upper bracket	1	
3	Lock washer	1	
4	Upper ring nut	1	Refer to "REMOVING THE LOWER BRACKET" and "INSTALLING THE STEERING HEAD".
5	Rubber washer	1	
6	Lower ring nut	1	
7	Lower bracket	1	
8	Bearing cover	1	
9	Upper bearing inner race	1	Refer to "INSTALLING THE STEERING HEAD".
10	Upper bearing	1	
11	Lower bearing	1	
12	Upper bearing outer race	1	



Order	Job/Part	Q'ty	Remarks
13	Lower bearing outer race	1	Refer to "INSTALLING THE STEERING HEAD". For installation, reverse the removal procedure.
14	Lower bearing inner race	1	



EAS00677

## REMOVING THE LOWER BRACKET

1. Stand the vehicle on a level surface.

**⚠ WARNING**

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

2. Remove:

- upper ring nut ①
- rubber washer
- lower ring nut ②  
(with the steering nut wrench ③)



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

**⚠ WARNING**

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

EAS00681

## CHECKING THE STEERING HEAD

1. Wash:

- bearings
- bearing races



**Recommended cleaning solvent**  
**Kerosene**

2. Check:

- bearings
- bearing races  
Damage/pitting → Replace.





3. Install:
  - upper bracket
  - steering stem nut

**NOTE:** \_\_\_\_\_

Temporarily tighten the steering stem nut.

---


4. Install:
  - front fork legsRefer to “INSTALLING THE FRONT FORK LEGS”.

**NOTE:** \_\_\_\_\_

Temporarily tighten the upper and lower bracket pinch bolts.

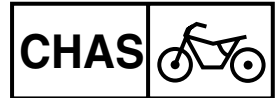
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5. Tighten:
  - steering stem nut

 **110 Nm (11.0 m · kg, 80 ft · lb)**

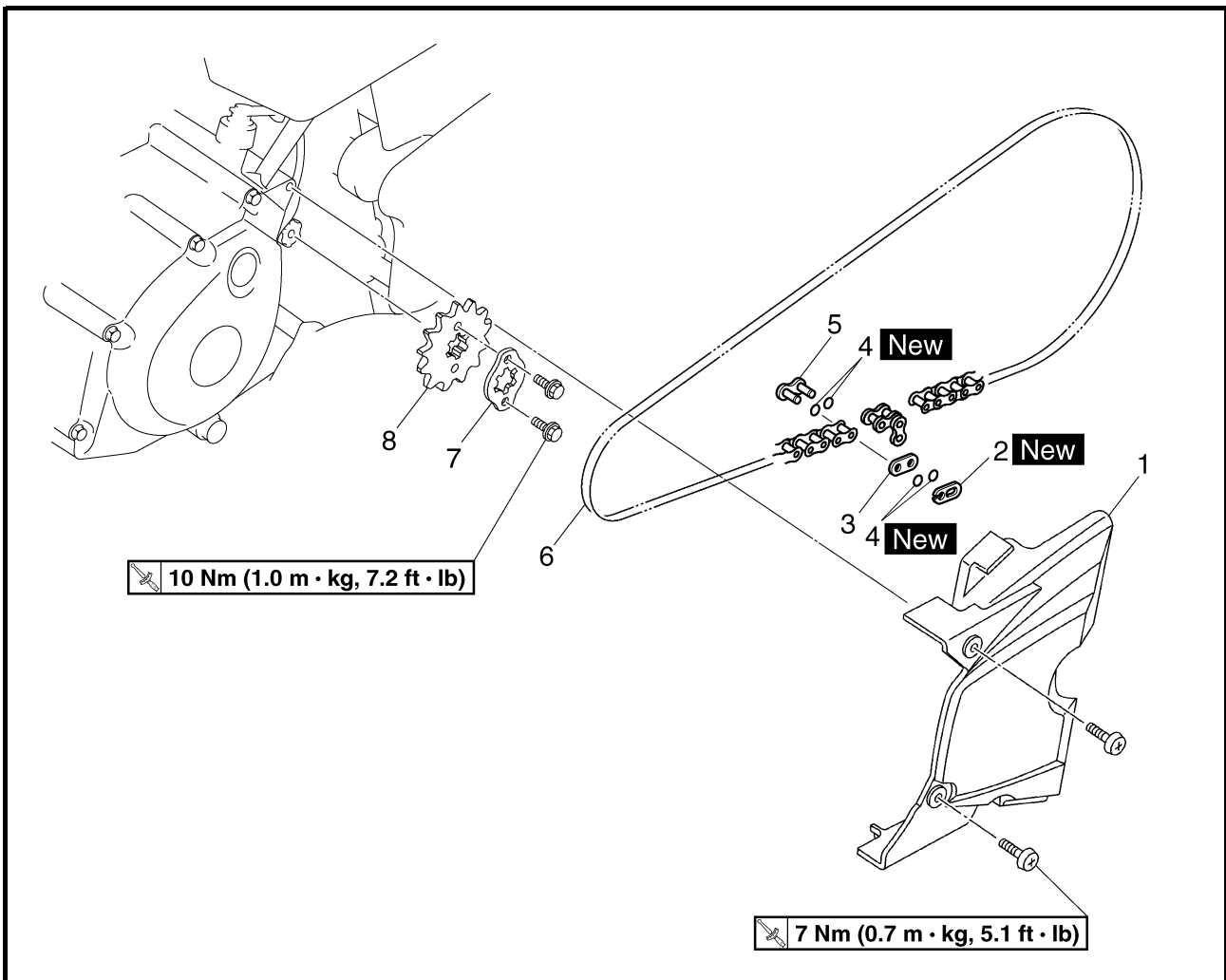
6. Adjust:
  - headlight beam (vertically)Refer to “ADJUSTING THE HEADLIGHT BEAM” in chapter 3.

# DRIVE CHAIN AND DRIVE SPROCKET



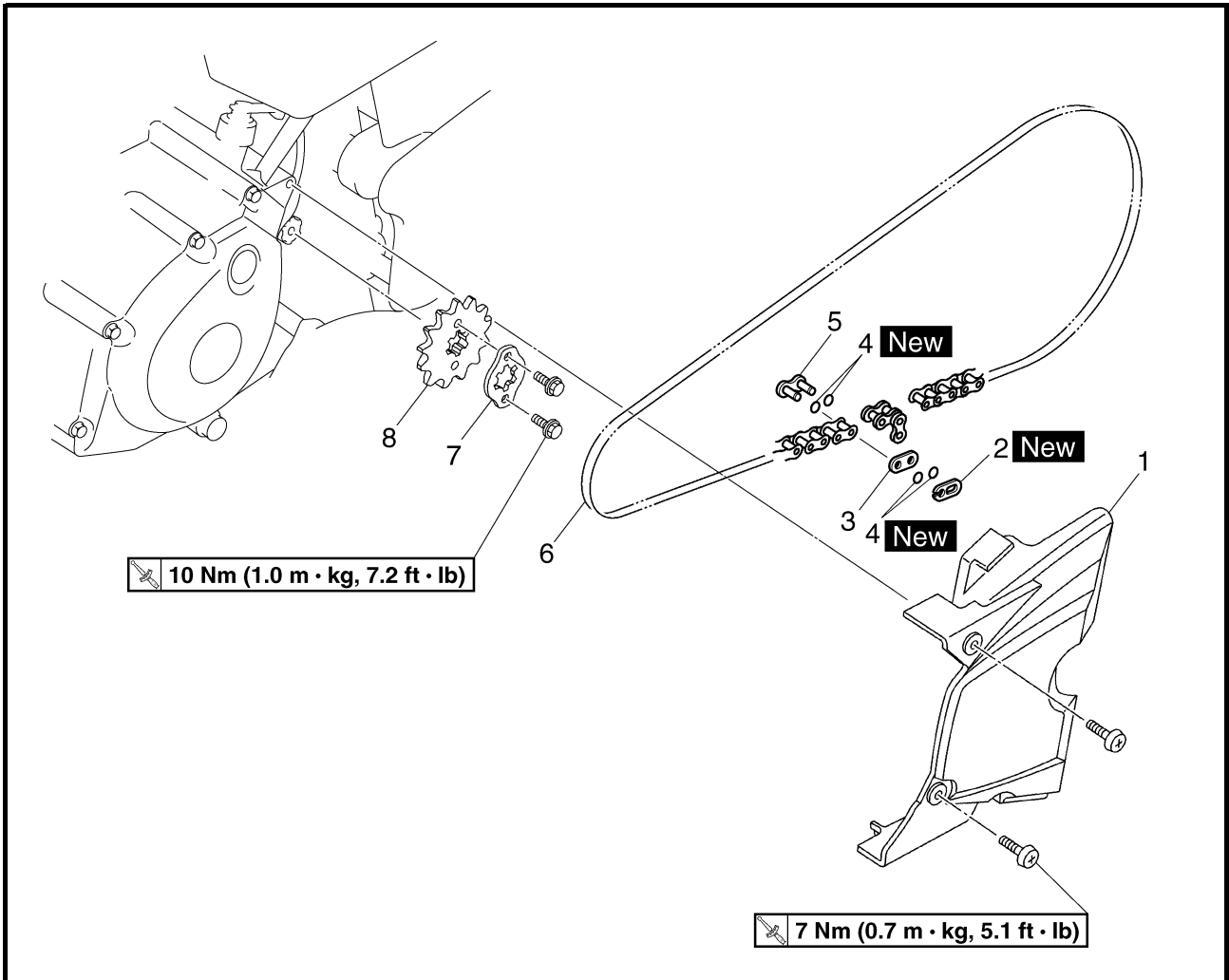
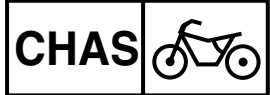
EAS00700

## DRIVE CHAIN AND DRIVE SPROCKET



Order	Job/Part	Q'ty	Remarks
	<b>Removing the drive chain and drive sprocket</b>		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET".
	Drive chain cover		Refer to "REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM".
1	Drive sprocket cover	1	Refer to "INSTALLING THE DRIVE CHAIN".
2	Master link clip	1	
3	Master link plate	1	
4	O-ring	4	
5	Master link body	1	
6	Drive chain	1	

# DRIVE CHAIN AND DRIVE SPROCKET



Order	Job/Part	Q'ty	Remarks
7	Drive sprocket holder	1	Refer to "REMOVING THE DRIVE CHAIN" and "INSTALLING THE DRIVE CHAIN". For installation, reverse the removal procedure.
8	Drive sprocket	1	

EAS00705

## REMOVING THE DRIVE CHAIN

1. Stand the vehicle on a level surface.

### **⚠ WARNING**

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

### **NOTE:**

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

2. Loosen:
  - drive sprocket bolts

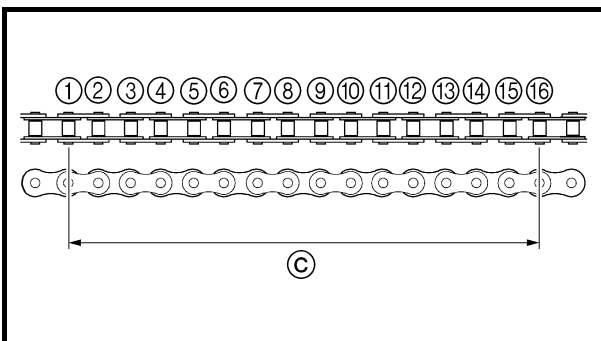
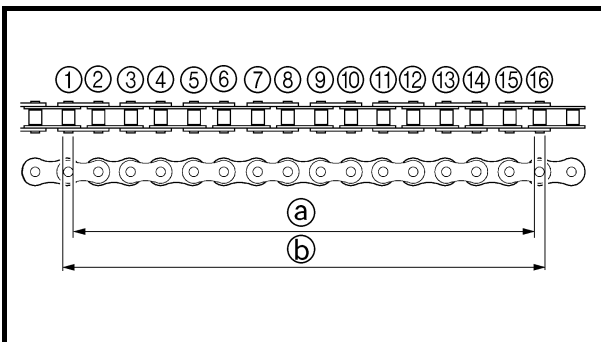
### **NOTE:**

Loosen the drive sprocket bolts while pressing the brake pedal.

3. Remove:
  - rear wheel

Refer to “REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET”.

4. Remove:
  - drive sprocket holder
  - drive sprocket



EAS00709

## CHECKING THE DRIVE CHAIN

1. Measure:
  - Measure the length of 15 links on the inner side **a** and outer side **b** of the pin and calculate the length between pin centers.
  - Length **c** between pin centers = (inner dimension **a** + outer dimension **b**)/2
  - 15-link section **c** of the drive chain

Out of specification → Replace the drive chain, drive sprocket and rear wheel sprocket as a set.



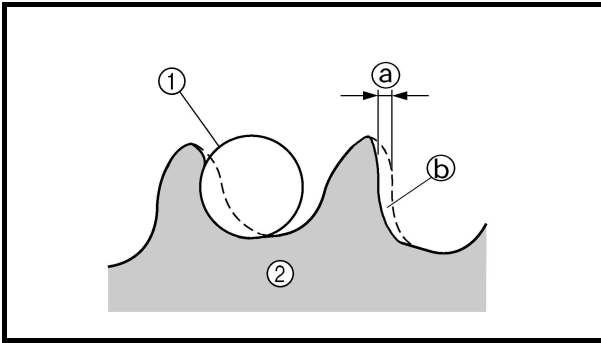
**15-link drive chain section limit (maximum)**  
191.5 mm (7.54 in)

### **NOTE:**

- While measuring the 15-link section, push down on the drive chain to increase its tension.
- Perform this measurement at two or three different places.







6. Check:
- drive sprocket
  - rear wheel sprocket
- More than 1/4 tooth (a) wear → Replace the drive chain, drive sprocket and rear wheel sprocket as a set.
- Bent teeth → Replace the drive chain, drive sprocket and rear wheel sprocket as a set.
- (b) Correct  
 (1) Drive chain roller  
 (2) Drive chain sprocket

EAS00713

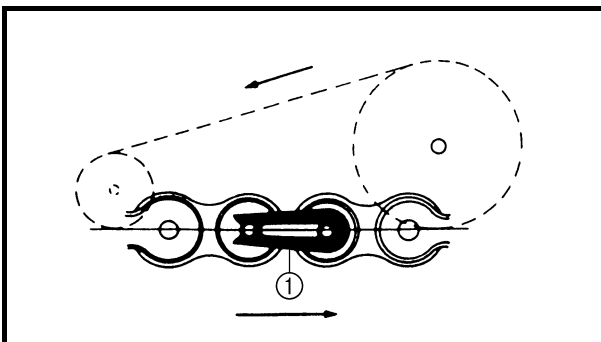
## INSTALLING THE DRIVE CHAIN

1. Lubricate:
- drive chain
  - master link **New**



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

2. Install:
- drive sprocket
  - drive sprocket holder
  - drive sprocket bolts (temporarily)



3. Install:
- master link body
  - O-rings
  - master link plate
  - master link clip (1) **New**

**CAUTION:** \_\_\_\_\_


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

4. Install:
- rear wheel
- Refer to "REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET".



5. Tighten:

- drive sprocket bolts


 10 Nm (1.0 m · kg, 7.2 ft · lb)

**NOTE:** \_\_\_\_\_

Tighten the drive sprocket bolts while pressing the brake pedal.

6. Install:

- drive sprocket cover

 7 Nm (0.7 m · kg, 5.1 ft · lb)


**NOTE:** \_\_\_\_\_

Proper neutral switch lead routing is essential to insure safe vehicle operation. Refer to “CABLE ROUTING” in chapter 2.

7. Adjust:

- drive chain slack

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

	<b>Drive chain slack</b> 20 ~ 30 mm (0.79 ~ 1.18 in)
--	---

**CAUTION:** \_\_\_\_\_

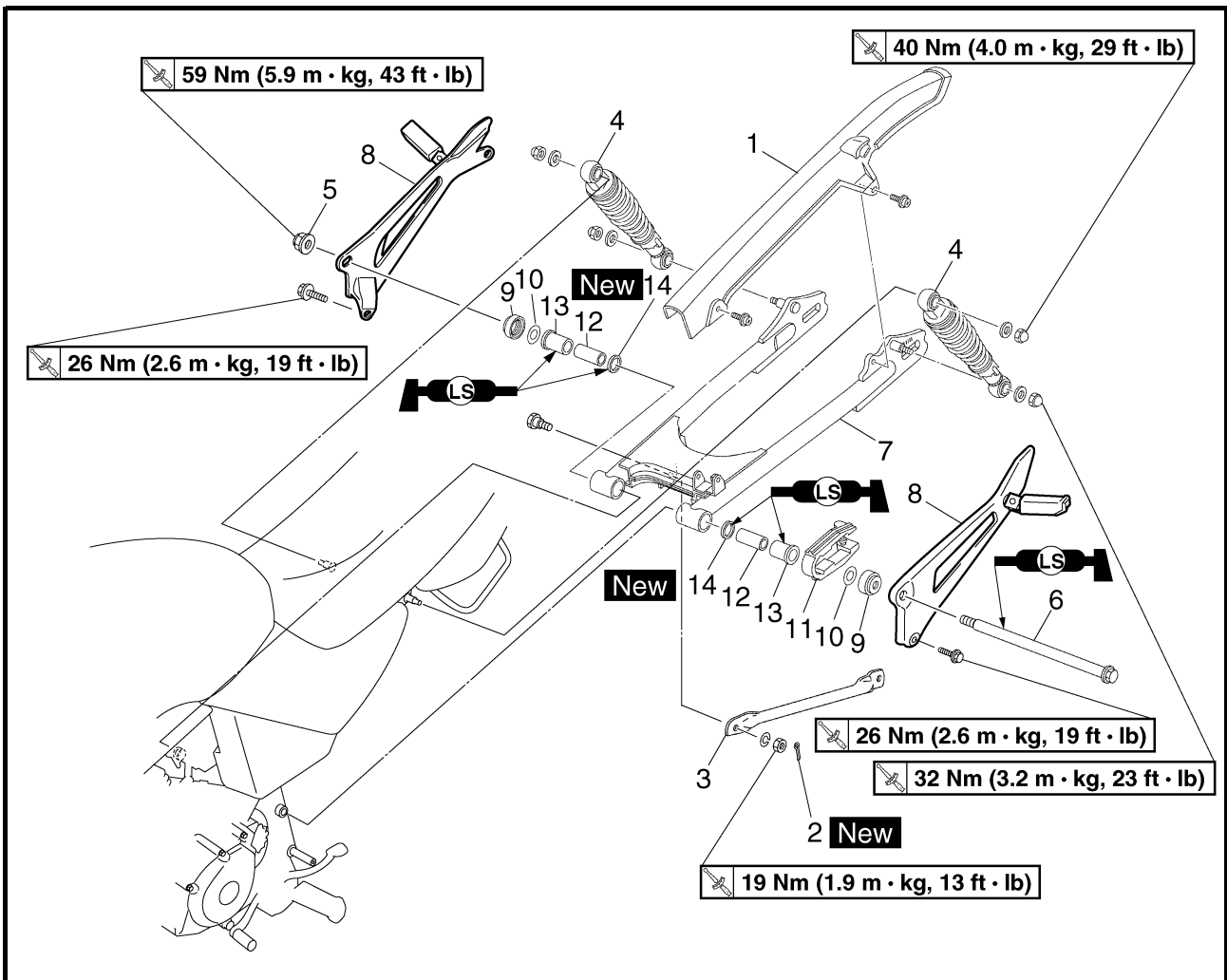
A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

# REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM



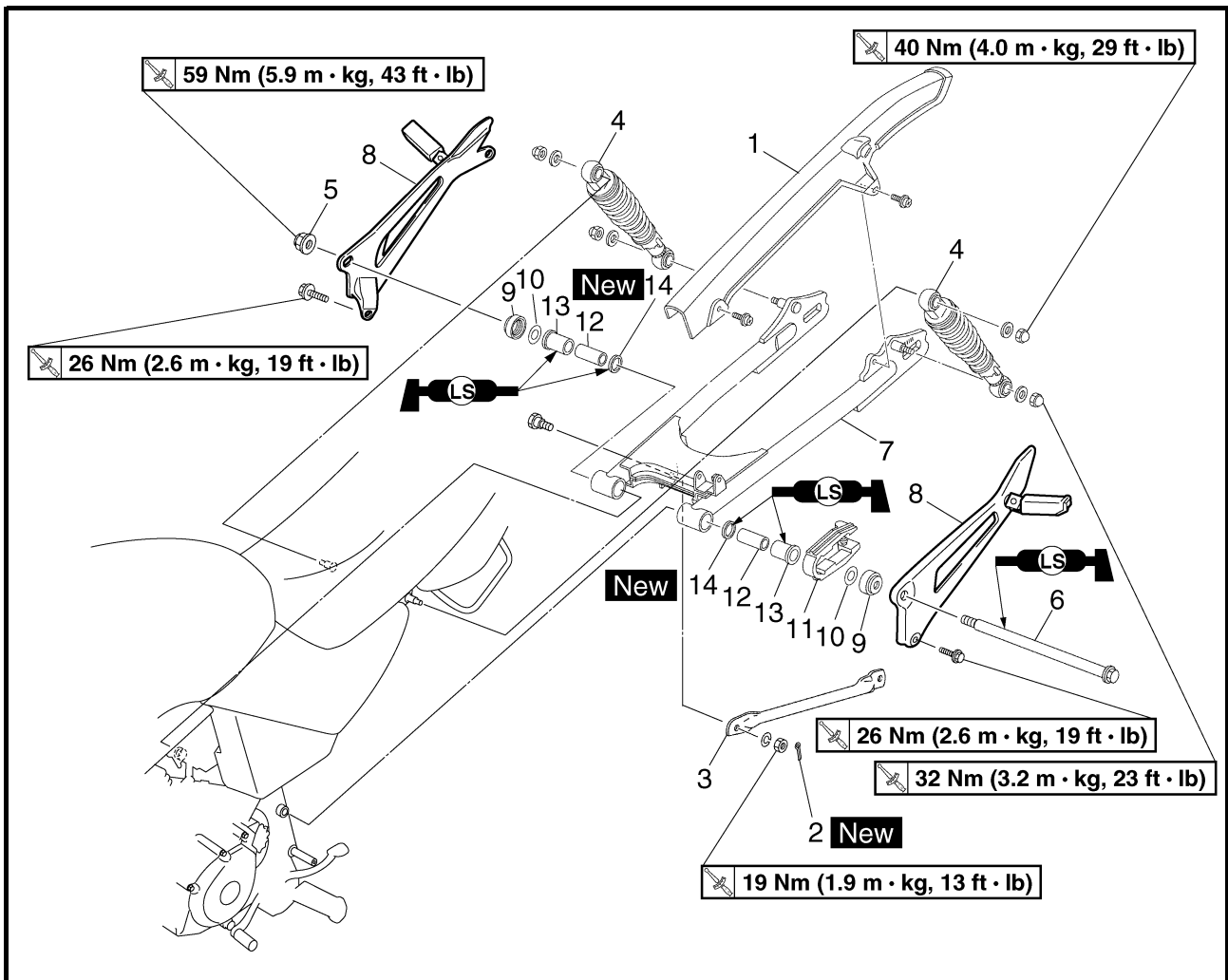
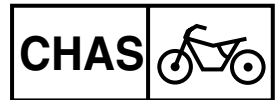
EAS00685

## REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM



Order	Job/Part	Q'ty	Remarks
	<b>Removing the rear shock absorber assemblies and swingarm</b>		Remove the parts in the order listed.
	Muffler assembly		Refer to "ENGINE" in chapter 5.
	Rear wheel		Refer to "REAR WHEEL, BRAKE SHOE PLATE, AND REAR WHEEL SPROCKET".
	Drive chain		Refer to "DRIVE CHAIN AND DRIVE SPROCKET".
1	Drive chain cover	1	
2	Cotter pin	1	
3	Torque rod	1	

# REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM



Order	Job/Part	Q'ty	Remarks
4	Rear shock absorber assembly	2	Refer to "REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM" and "INSTALLING THE REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM".  Refer to "INSTALLING THE REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM".  For installation, reverse the removal procedure.
5	Pivot shaft nut	1	
6	Pivot shaft	1	
7	Swingarm	1	
8	Passenger footrest bracket (left and right)	2	
9	Dust cover	2	
10	Shim	—	
11	Drive chain guide	1	
12	Spacer	2	
13	Bushing	2	
14	Oil seal	2	



5. Remove:
  - pivot shaft nut
  - pivot shaft
  - swingarm
  - footrest bracket (left and right)

EAS00695

## CHECKING THE REAR SHOCK ABSORBER ASSEMBLIES

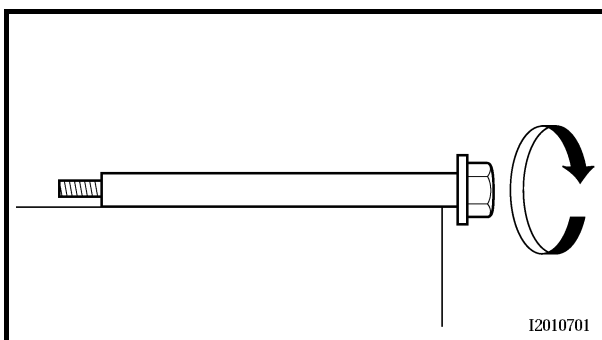
The following procedure applies to both rear shock absorber assemblies.

1. Check:
  - rear shock absorber rod  
Bends/damage → Replace the rear shock absorber assembly.
  - rear shock absorber  
Oil leaks → Replace the rear shock absorber assembly.
  - spring  
Damage/wear → Replace the rear shock absorber assembly.
  - bushings  
Damage/wear → Replace.

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.**





# REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM



**NOTE:**

If adding an even number of shims, add the same number to both the left and right sides of the swingarm. If adding an odd number of shims, the left side of the swingarm should have one more shim than the right side.

Shim size	
Part number	Thickness
5VL-F2127-00	0.3 mm (0.012 in)

d. Install all of the removed parts.



EAS00711/EAS00699

## INSTALLING THE REAR SHOCK ABSORBER ASSEMBLIES AND SWINGARM

- Lubricate:
  - pivot shaft
  - bushings
  - oil seals

	<b>Recommended lubricant</b> Lithium-soap-based grease
--	---

- Install:
  - footrest bracket lower bolts (temporarily)
  - swingarm
  - pivot shaft
  - pivot shaft nut (temporarily)

3. Tighten:

- pivot shaft nut

**59 Nm (5.9 m · kg, 43 ft · lb)**

- footrest bracket lower bolts

**26 Nm (2.6 m · kg, 19 ft · lb)**

4. Install:

- rear shock absorber assembly upper nuts

**40 Nm (4.0 m · kg, 29 ft · lb)**

- rear shock absorber assembly lower nuts

**32 Nm (3.2 m · kg, 23 ft · lb)**

5. Adjust:

- drive chain slack

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

	<b>Drive chain slack</b> 20 ~ 30 mm (0.79 ~ 1.18 in)
--	---

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## CHAPTER 5 ENGINE

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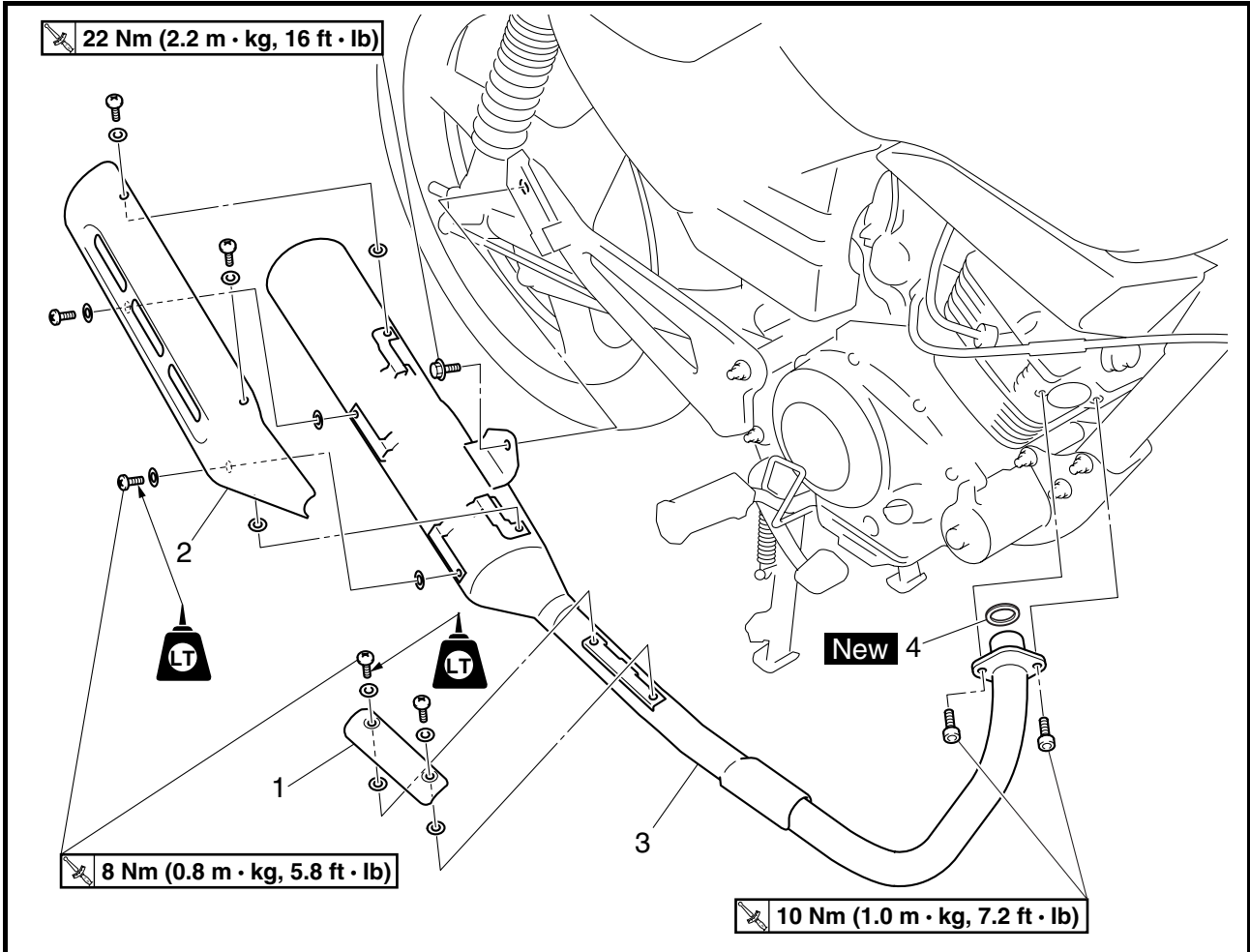
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EAS00189

ENGINE

ENGINE REMOVAL

MUFFLER ASSEMBLY

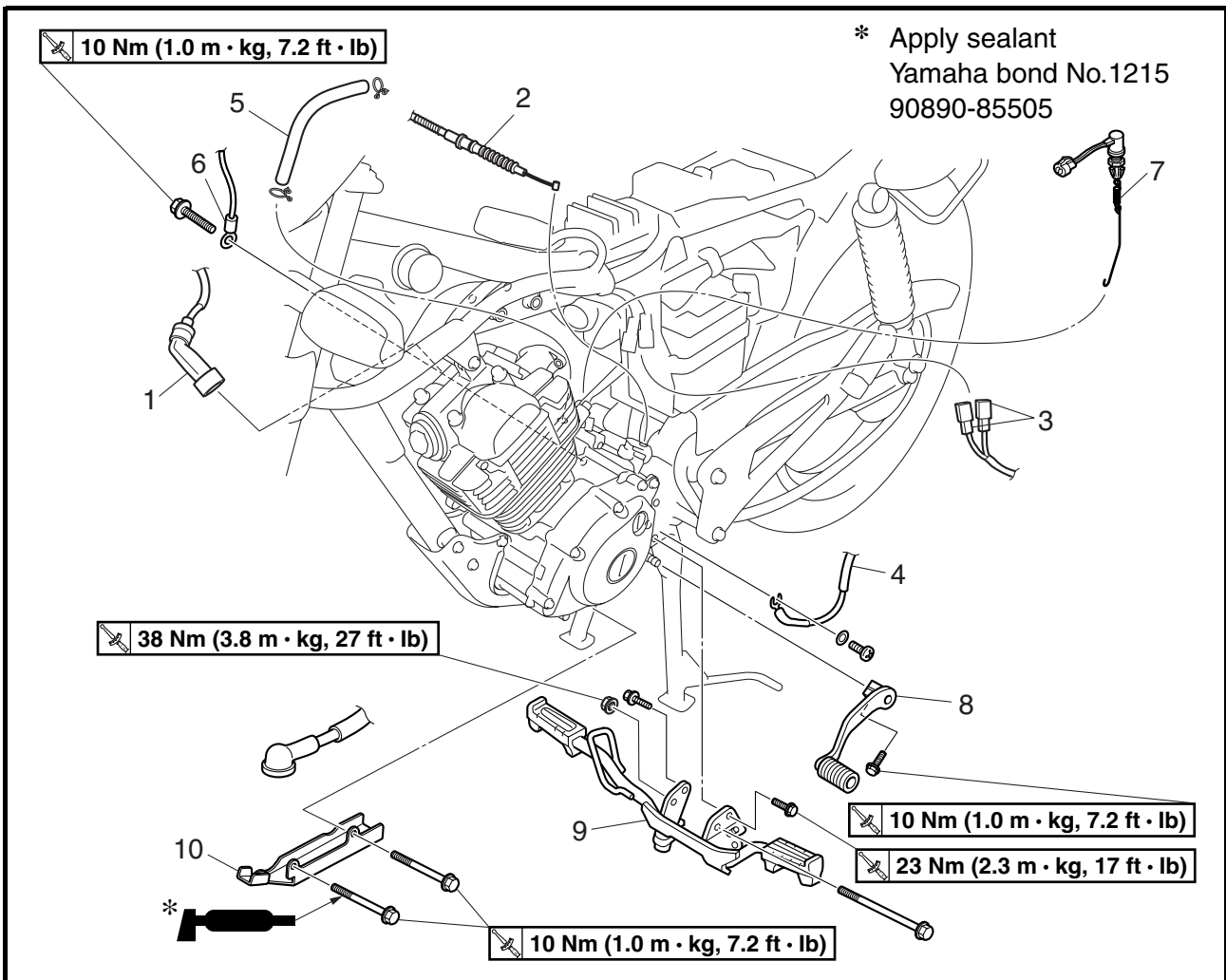


Order	Job/Part	Q'ty	Remarks
	<b>Removing the muffler assembly</b>		Remove the parts in the order listed.
1	Exhaust pipe protector	1	
2	Muffler protector	1	
3	Muffler assembly	1	
4	Exhaust pipe gasket	1	
			For installation, reverse the removal procedure.

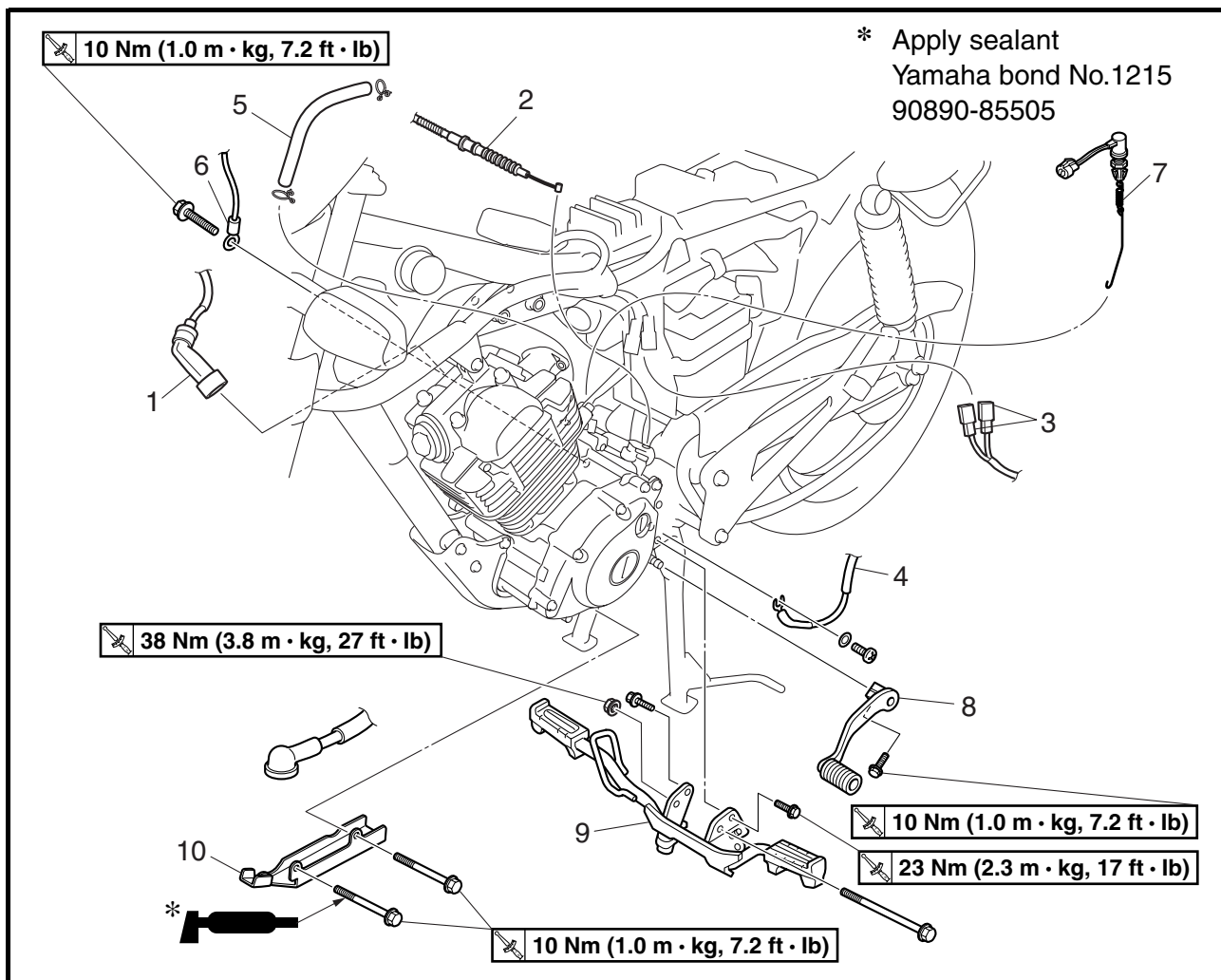


EAS00188

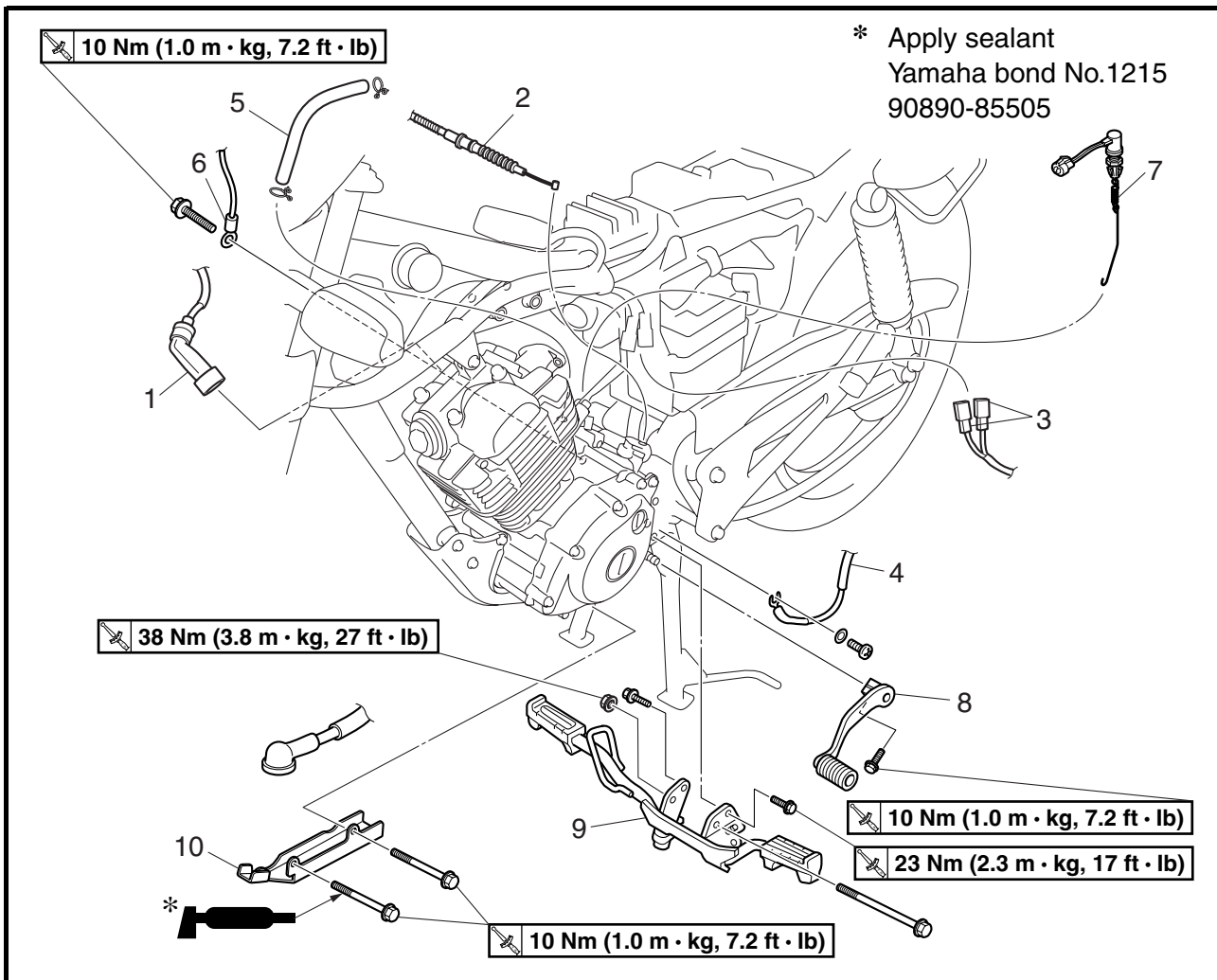
## CABLES, LEADS, HOSES AND FOOTREST



Order	Job/Part	Q'ty	Remarks
	<b>Removing the cables, leads, hoses and footrest</b>		Remove the parts in the order listed. <b>CAUTION:</b> _____ <b>First, disconnect the negative battery lead, and then the positive battery lead.</b>
	Negative battery lead		Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3. Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3. Refer to "SIDE COVERS, SEAT AND FUEL TANK" in chapter 3. Refer to "DRIVE CHAIN AND DRIVE SPROCKET" in chapter 4.
	Positive battery lead		
	Engine oil		
	Side cover/seat/fuel tank		
	Drive sprocket cover/drive sprocket		



Order	Job/Part	Q'ty	Remarks
	Carburetor assembly		Refer to "CARBURETOR" in chapter 6.
	Air induction system pipe/air induction system vacuum hose		Refer to "AIR INDUCTION SYSTEM" in chapter 6.
	Starter motor		Refer to "STARTER MOTOR" in chapter 7.
1	Spark plug cap	1	Disconnect.
2	Clutch cable	1	Disconnect.
3	A.C. magneto coupler/pickup coil coupler	1/1	Disconnect.
4	Neutral switch lead	1	
5	Crankcase breather hose	1	
6	Negative battery lead	1	
7	Brake light switch	1	
8	Shift pedal	1	



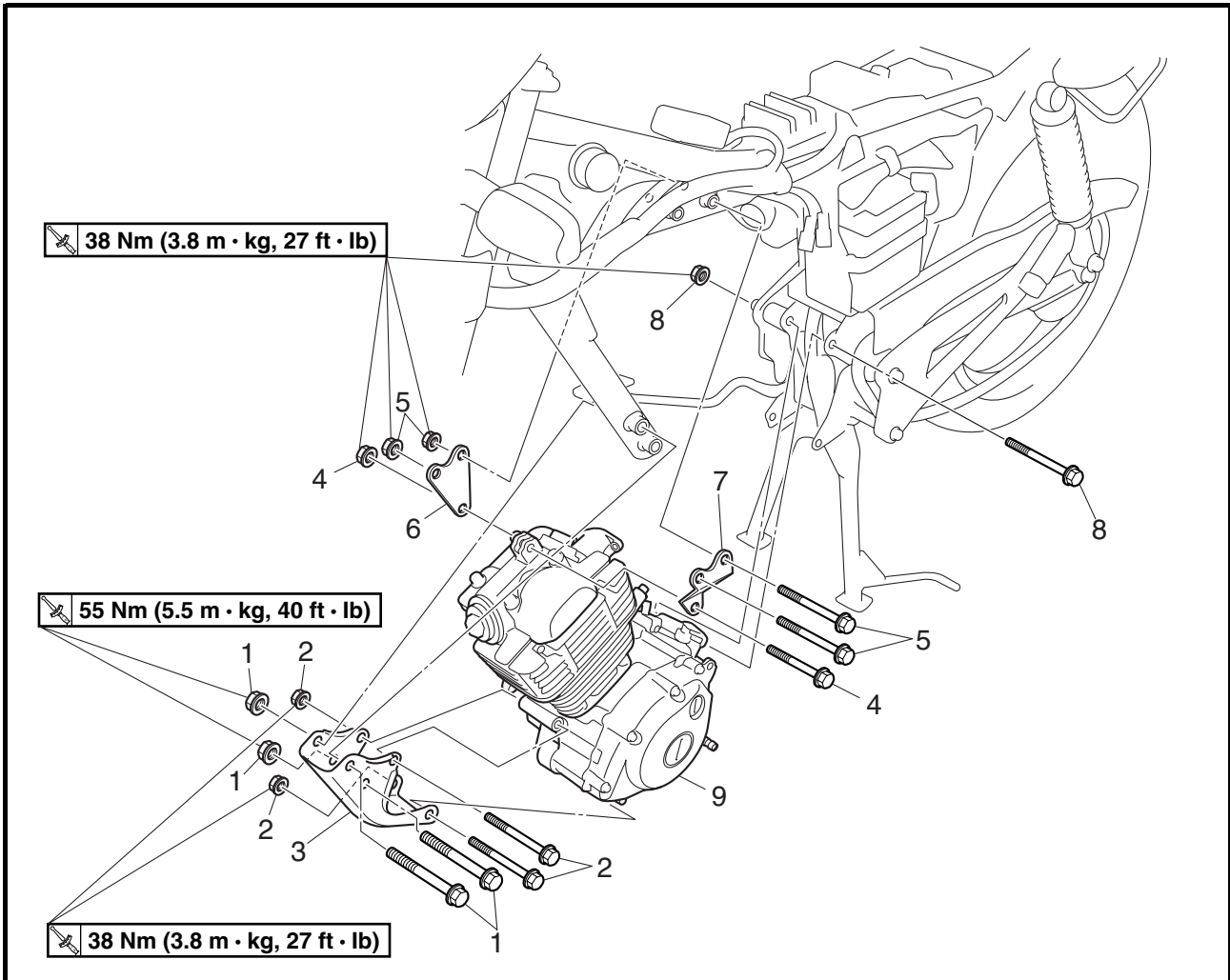
Order	Job/Part	Q'ty	Remarks
9	Rider footrest	1	For installation, reverse the removal procedure.
10	Starter motor lead guard	1	



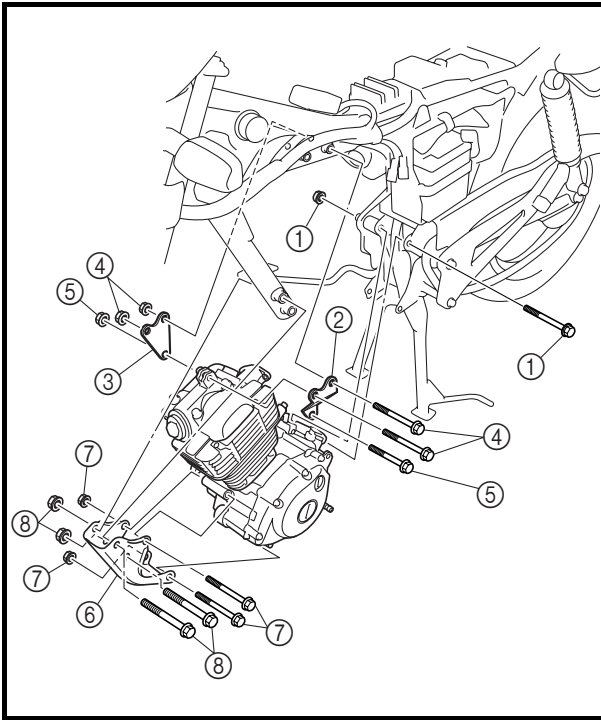


EAS00191

## ENGINE



Order	Job/Part	Q'ty	Remarks
	<b>Removing the engine</b>		Remove the parts in the order listed. <b>NOTE:</b> _____ Place a suitable stand under the engine.
1	Lower engine bracket bolt/nut	2/2	Refer to "INSTALLING THE ENGINE".
2	Front mounting bolt/nut	2/2	
3	Lower engine bracket	1	
4	Upper mounting bolt/nut	1/1	
5	Upper engine bracket bolt/nut	2/2	
6	Right upper engine bracket	1	
7	Left upper engine bracket	1	
8	Rear mounting bolt/nut	1/1	
9	Engine	1	
			For installation, reverse the removal procedure.



EAS00192






**INSTALLING THE ENGINE****1. Install:**

- rear mounting bolt/nut ①
- left upper engine bracket ②
- right upper engine bracket ③
- upper engine bracket bolts/nuts ④
- upper mounting bolt/nut ⑤
- lower engine bracket ⑥
- front mounting bolts/nuts ⑦
- lower engine bracket bolts/nuts ⑧

**NOTE:**

Do not fully tighten the bolts.

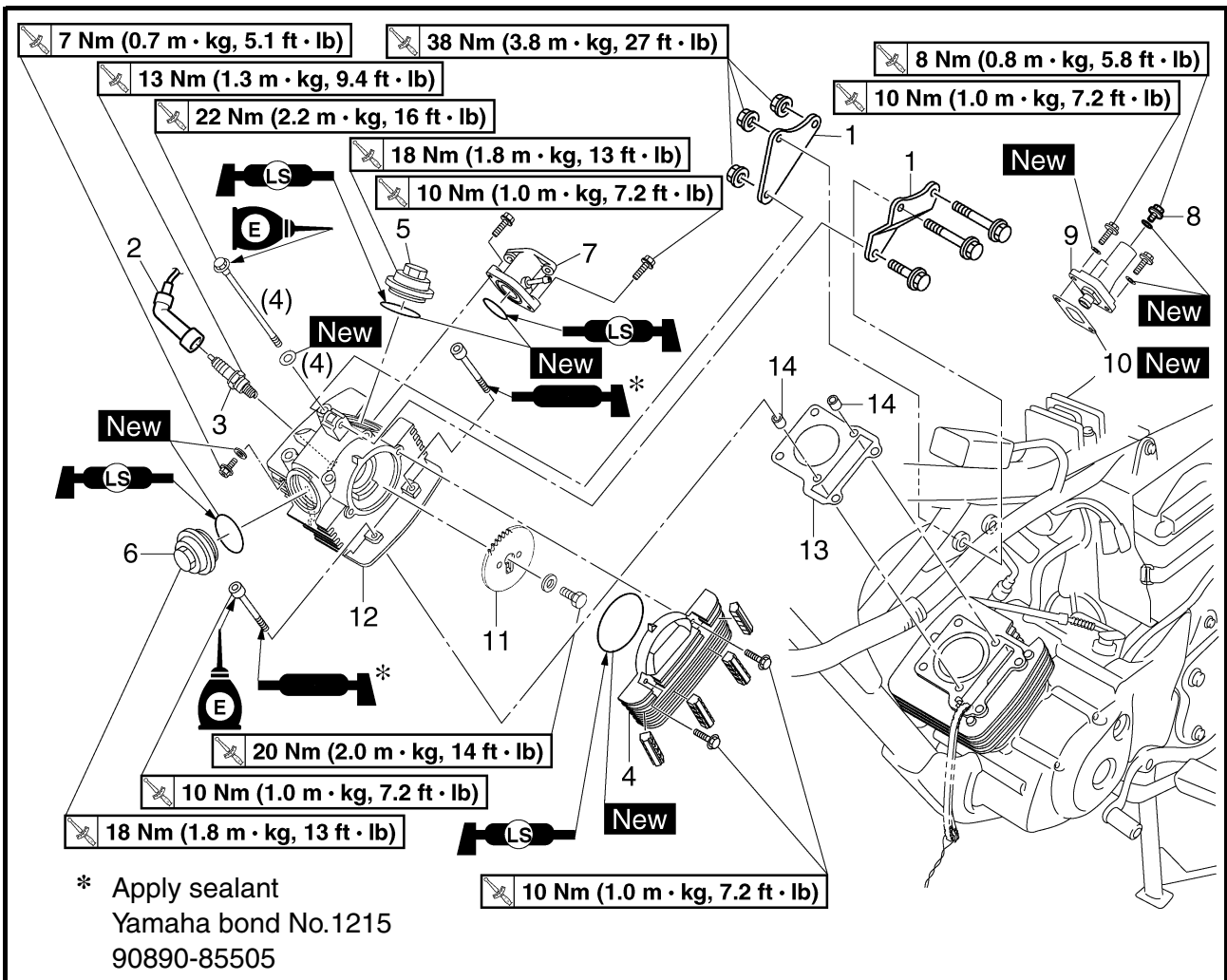
**2. Tighten:**

- rear mounting bolt/nut ①  
 **38 Nm (3.8 m · kg, 27 ft · lb)**
- upper engine bracket bolts/nuts ④  
 **38 Nm (3.8 m · kg, 27 ft · lb)**
- upper mounting bolt/nut ⑤  
 **38 Nm (3.8 m · kg, 27 ft · lb)**
- front mounting bolts/nuts ⑦  
 **38 Nm (3.8 m · kg, 27 ft · lb)**
- lower engine bracket bolts/nuts ⑧  
 **55 Nm (5.5 m · kg, 40 ft · lb)**



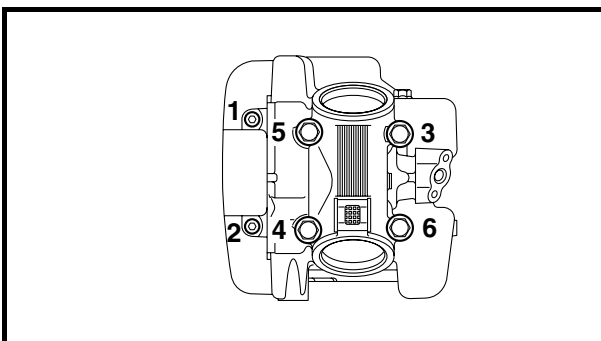
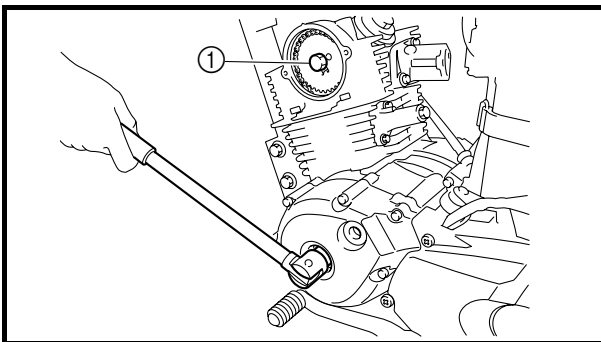
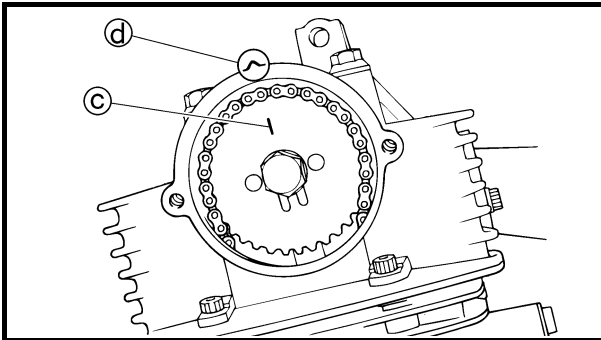
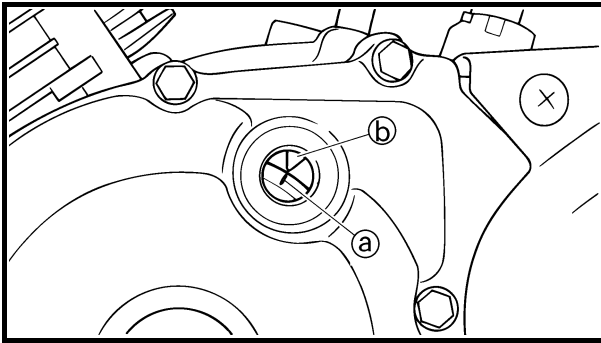
EAS00221

CYLINDER HEAD



Order	Job/Part	Q'ty	Remarks
	<b>Removing the cylinder head</b>		Remove the parts in the order listed.
	Side cover (left and right)/seat/fuel tank		Refer to "SIDE COVERS, SEAT AND FUEL TANK" in chapter 3.
	Muffler assembly		Refer to "ENGINE".
	Timing mark accessing screw/crankshaft end accessing screw		Refer to "STARTER CLUTCH AND A.C. MAGNETO ROTOR".
	Carburetor assembly		Refer to "CARBURETOR" in chapter 6.
	Air induction system pipe/air induction system vacuum hose		Refer to "AIR INDUCTION SYSTEM" in chapter 6.
1	Upper engine bracket (left and right)	2	
2	Spark plug cap	1	Disconnect.
3	Spark plug	1	
4	Camshaft sprocket cover	1	
5	Intake tappet cover	1	





EAS00225

**REMOVING THE CYLINDER HEAD**

1. Align:

- "I" mark Ⓒ on the A.C. magneto rotor (with the stationary pointer Ⓓ on the A.C. magneto rotor cover)



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



2. Loosen:

- camshaft sprocket bolt ①

**NOTE:**

While holding the A.C. magneto rotor nut with a wrench, remove the bolt.

3. Loosen:

- timing chain tensioner cap bolt

4. Remove:

- timing chain tensioner (along with the gasket)
- camshaft sprocket
- timing chain

**NOTE:**

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

5. Remove:

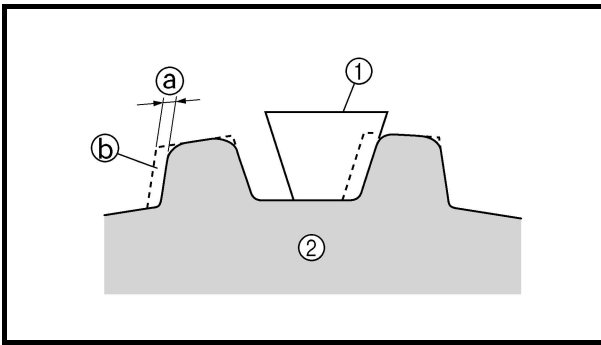
- cylinder head

**NOTE:**

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







## CHECKING THE CAMSHAFT SPROCKET

### 1. Check:

- camshaft sprocket  
Wear/damage → Replace the camshaft sprocket and timing chain as a set.

- Ⓐ 1/4 of a tooth
- Ⓑ Correct
- ① Roller
- ② Sprocket

EAS00231

## INSTALLING THE CYLINDER HEAD

### 1. Install:

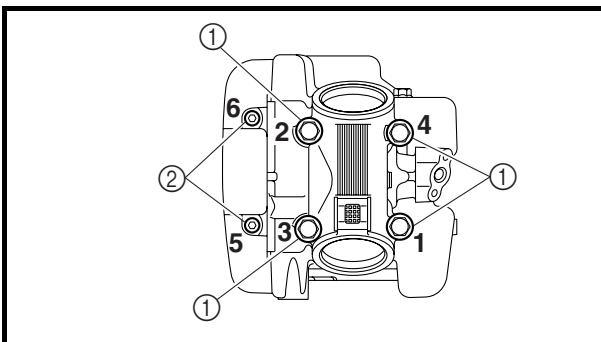
- cylinder head gasket **New**
- dowel pins

### 2. Install:

- cylinder head
- washers **New**
- cylinder head bolts

### NOTE:

- Apply sealant to the threads of the cylinder head bolts (M6).
- Lubricate the contact surfaces of the cylinder head bolts and on both contact surfaces of washers with engine oil.



### 3. Tighten:

- cylinder head bolts ①

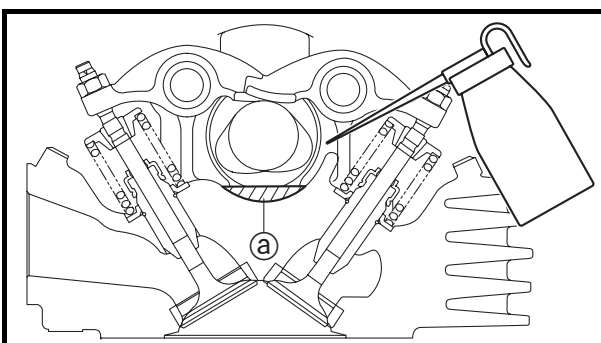
**22 Nm (2.2 m · kg, 16 ft · lb)**

- cylinder head bolts ②

**10 Nm (1.0 m · kg, 7.2 ft · lb)**

### NOTE:

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



### 4. Fill:

- cylinder head  
Engine oil (5 ml or more) into the space Ⓐ.

### NOTE:

Be sure to add engine oil every time the cylinder head is removed.










9. Tighten:

- camshaft sprocket bolt

 **20 Nm (2.0 m · kg, 14 ft · lb)**

**CAUTION:**

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

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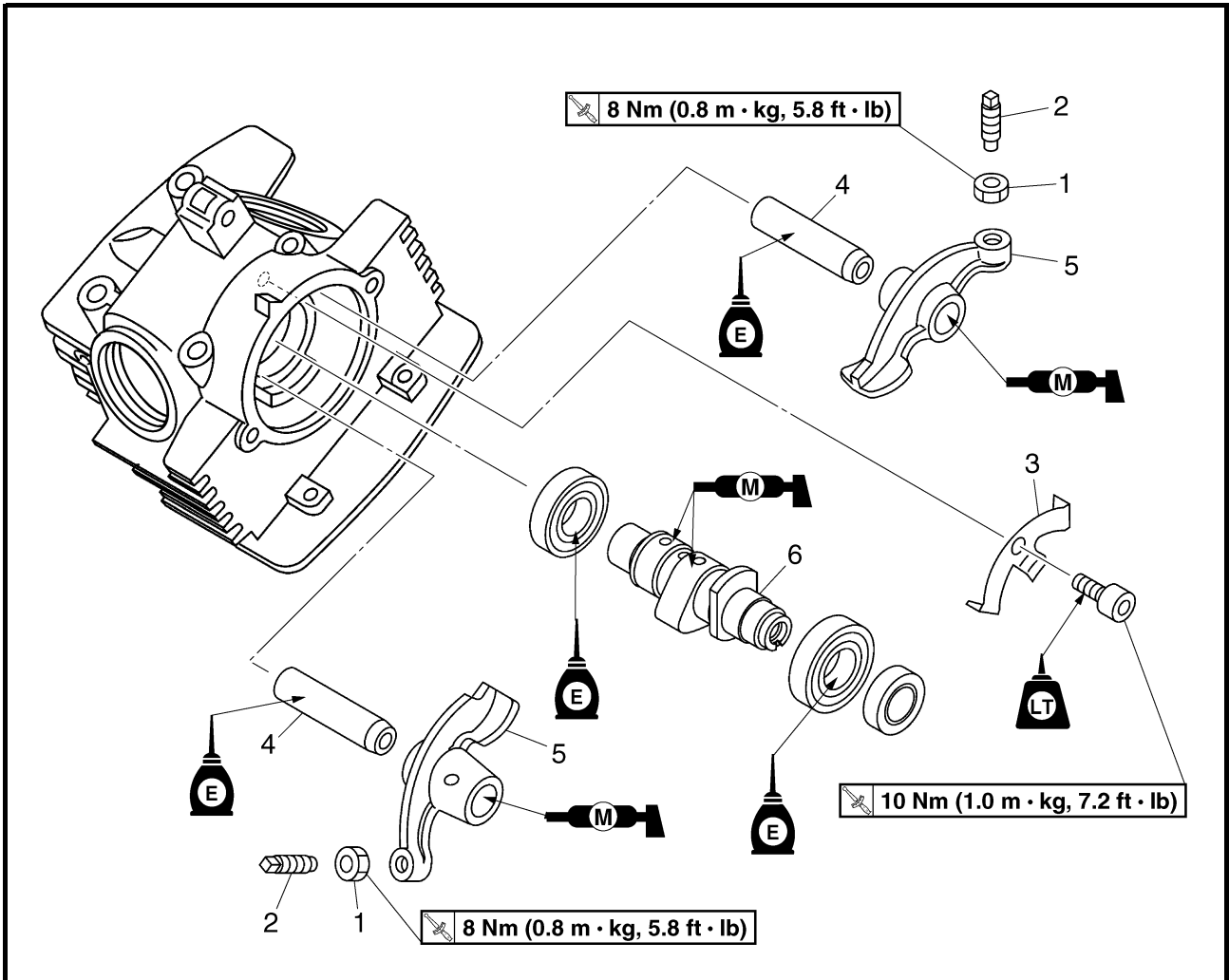
10. Measure:

- valve clearance

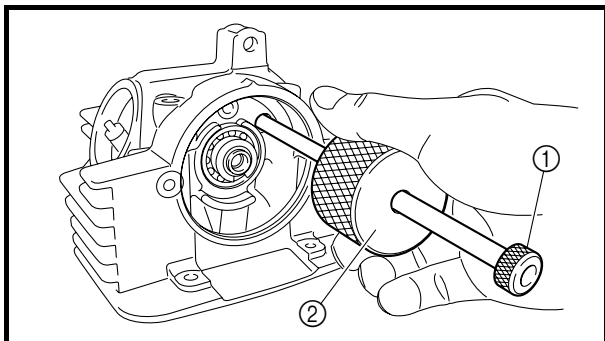
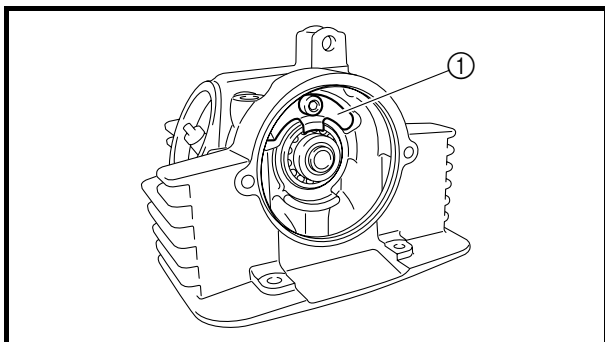
Out of specification → Adjust.

Refer to “ADJUSTING THE VALVE CLEARANCE” in chapter 3.

ROCKER ARMS AND CAMSHAFT



Order	Job/Part	Q'ty	Remarks
	<b>Removing the rocker arms and camshaft</b>		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Locknut	2	Loosen. Refer to "REMOVING THE ROCKER ARMS AND CAMSHAFT" and "INSTALLING THE ROCKER ARMS AND CAMSHAFT". For installation, reverse the removal procedure.
2	Adjusting screw	2	
3	Camshaft retainer	1	
4	Rocker arm shaft	2	
5	Rocker arm	2	
6	Camshaft	1	



EAS00202

## REMOVING THE ROCKER ARMS AND CAMSHAFT

1. Loosen:
  - locknuts
  - adjusting screws
2. Remove:
  - camshaft retainer ①
3. Remove:
  - intake rocker arm shaft
  - exhaust rocker arm shaft
  - intake rocker arm
  - exhaust rocker arm

### NOTE:

Remove the rocker arm shafts with the slide hammer bolt ① and weight ②.



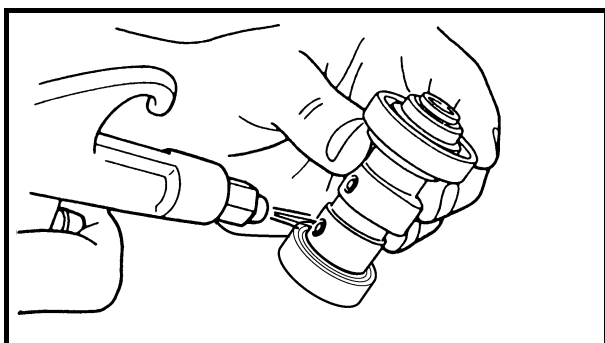
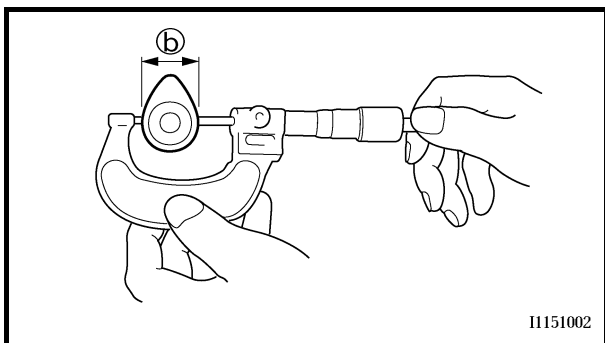
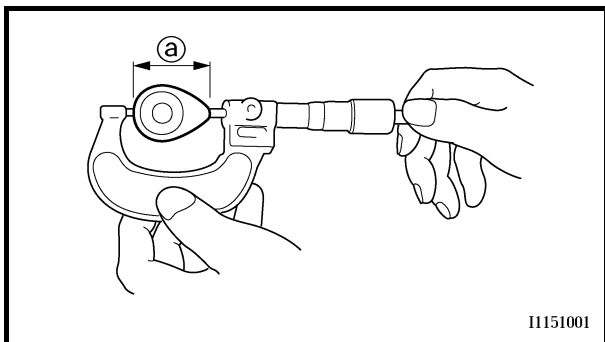
**Slide hammer bolt**  
 90890-01083, YU-01083-1  
**Weight**  
 90890-01084, YU-01083-3

4. Remove:
  - camshaft

EAS00205

## CHECKING THE CAMSHAFT

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



## 2. Measure:

- camshaft lobe dimensions (a) and (b)  
Out of specification → Replace the camshaft.

**Camshaft lobe dimensions****Intake**

- (a) 25.881 ~ 25.981 mm  
(1.0189 ~ 1.0229 in)  
<Limit>: 25.851 mm (1.0178 in)
- (b) 21.194 ~ 21.294 mm  
(0.8344 ~ 0.8383 in)  
<Limit>: 21.164 mm (0.8332 in)

**Exhaust**

- (a) 25.841 ~ 25.941 mm  
(1.0174 ~ 1.0213 in)  
<Limit>: 25.811 mm (1.0162 in)
- (b) 20.997 ~ 21.097 mm  
(0.8267 ~ 0.8306 in)  
<Limit>: 20.967 mm (0.8255 in)

## 3. Check:

- camshaft oil passage  
Obstruction → Blow out with compressed air.

EAS00206

**CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS**

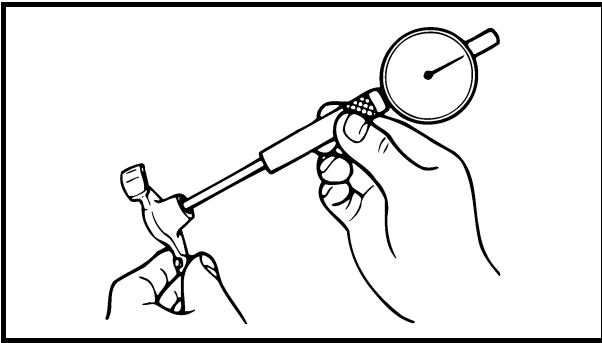
The following procedure applies to all of the rocker arms and rocker arm shafts.

## 1. Check:

- rocker arm  
Damage/wear → Replace.

## 2. Check:

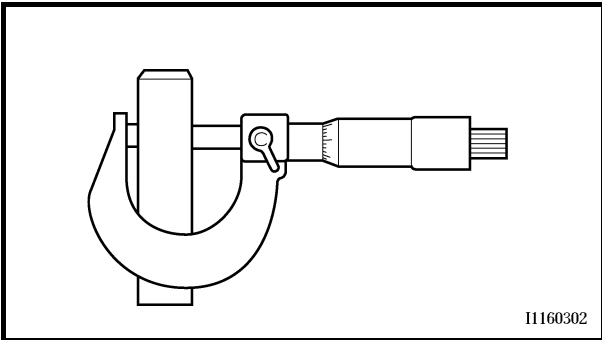
- rocker arm shaft  
Blue discoloration/excessive wear/pitting/scratches → Replace or check the lubrication system.



3. Measure:
- rocker arm inside diameter
- Out of specification → Replace.



**Rocker arm inside diameter**  
 10.000 ~ 10.015 mm  
 (0.3937 ~ 0.3943 in)  
 <Limit>: 10.030 mm (0.3949 in)



11160302

4. Measure:
- rocker arm shaft outside diameter
- Out of specification → Replace.



**Rocker arm shaft outside diameter**  
 9.981 ~ 9.991 mm  
 (0.3930 ~ 0.3933 in)  
 <Limit>: 9.950 mm (0.3917 in)

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

**NOTE:**

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

Above 0.080 mm (0.0031 in) → Replace the defective part(s).

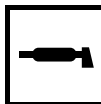


**Rocker-arm-to-rocker-arm-shaft clearance**  
 0.009 ~ 0.034 mm  
 (0.0003 ~ 0.0013 in)  
 <Limit>: 0.080 mm (0.0031 in)

EAS00220

## INSTALLING THE ROCKER ARMS AND CAMSHAFT


1. Lubricate:
- camshaft

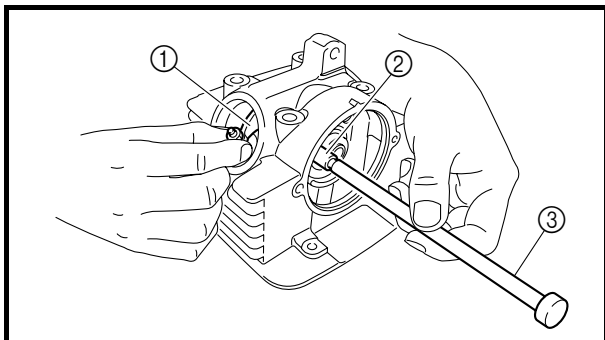


**Recommended lubricant**  
 Camshaft  
 Molybdenum - disulfide grease  
 Camshaft bearing  
 Engine oil



2. Install:
  - camshaft
3. Lubricate:
  - rocker arms
  - rocker arm shafts


	<b>Recommended lubricant</b> Rocker arm Molybdenum-disulfide grease Rocker arm shafts Engine oil
---	--




4. Install:
  - exhaust rocker arm ①
  - exhaust rocker arm shaft ②
  - intake rocker arm
  - intake rocker arm shaft

**NOTE:**

- Use a slide hammer bolt ③ to install the rocker arm shaft.
- Make sure the rocker arm shafts (intake and exhaust) are completely pushed into the cylinder head.

	<b>Slide hammer bolt</b> 90890-01083, YU-01083-1
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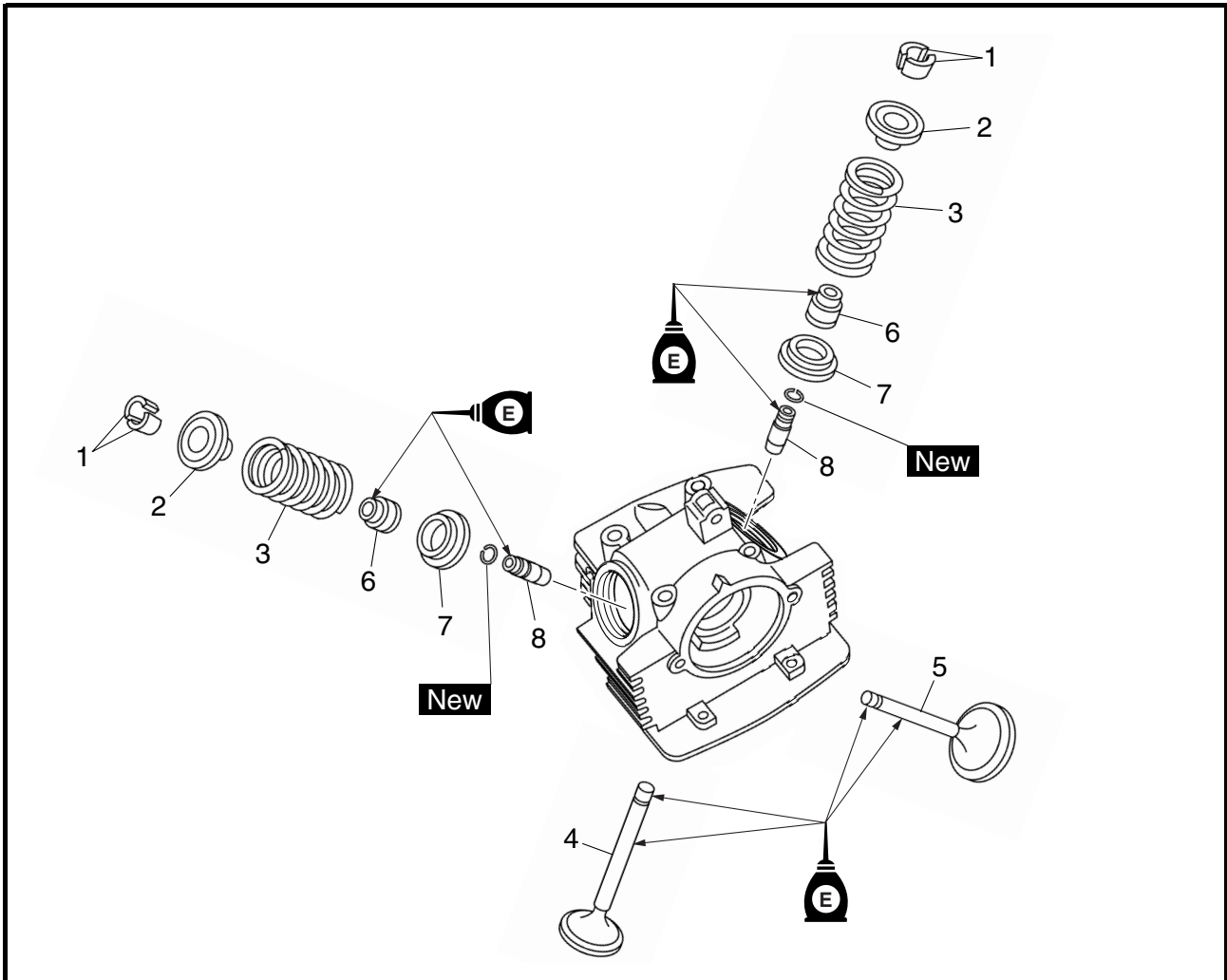
5. Install:
  - camshaft retainer
  - camshaft retainer bolt

 **10 Nm (1.0 m · kg, 7.2 ft · lb)**



EAS00236

VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the valves and valve springs</b>		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
	Rocker arms/rocker arm shafts/cam-shaft		Refer to "ROCKER ARMS AND CAM-SHAFT".
1	Valve cotter	4	Refer to "REMOVING THE VALVES" and "INSTALLING THE VALVES".
2	Valve spring retainer	2	
3	Valve spring	2	
4	Exhaust valve	1	
5	Intake valve	1	
6	Valve stem seal	2	
7	Valve spring seat	2	
8	Valve guide	2	
			For installation, reverse the removal procedure.



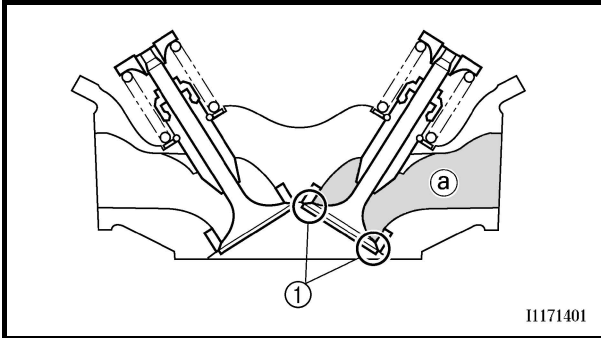
EAS00237

## 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. Check:

- valve sealing

Leakage at the valve seat → Check the valve face, valve seat, and valve seat width. Refer to “CHECKING THE VALVE SEATS”.

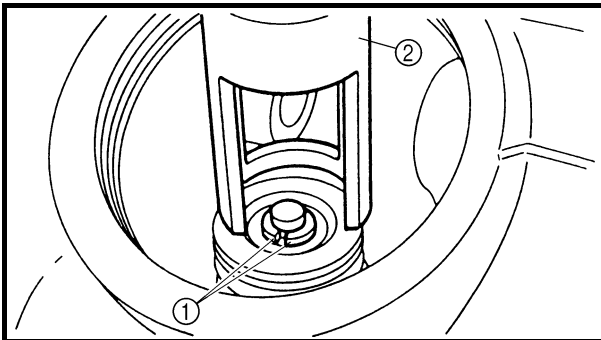


- a. Pour a clean solvent (a) into the intake and exhaust ports.

- b. Check that the valves properly seal.

**NOTE:** \_\_\_\_\_

There should be no leakage at the valve seat (1).



2. Remove:

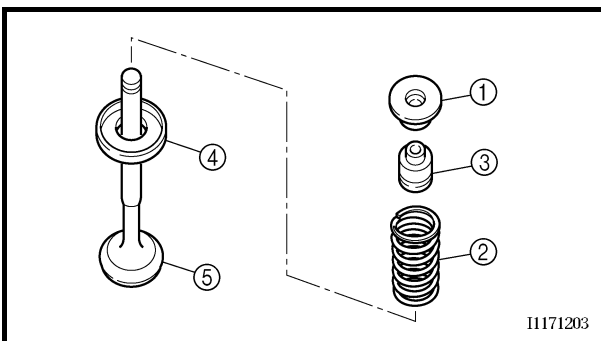
- valve cotters (1)

**NOTE:** \_\_\_\_\_

Remove the valve cotters by compressing the valve spring with the valve spring compressor (2).



**Valve spring compressor**  
90890-04019, YM-04019



3. Remove:

- valve spring retainer (1)
- valve spring (2)
- valve stem seal (3)
- valve spring seat (4)
- valve (5)

**NOTE:** \_\_\_\_\_

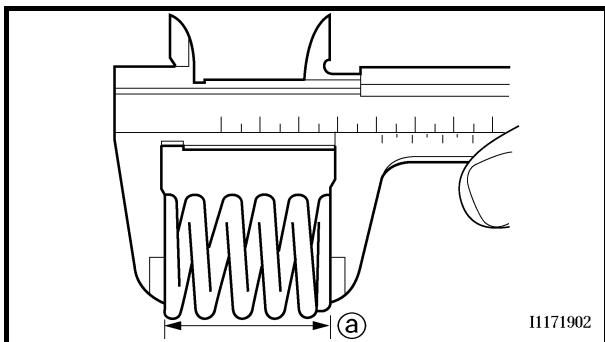
Identify the position of each part very carefully so that it can be reinstalled in its original place.











11171902

EAS00241

## CHECKING THE VALVE SPRINGS

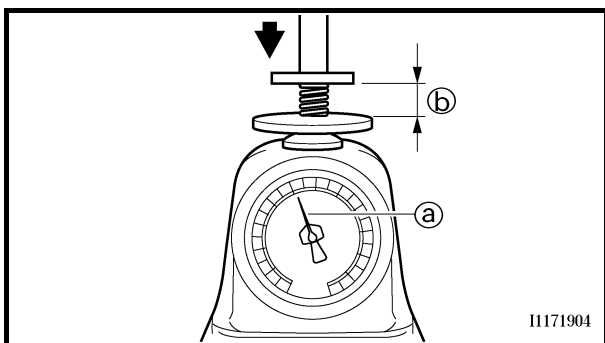
The following procedure applies to all of the valve springs.

1. Measure:

- valve spring free length <sup>a</sup>  
Out of specification → Replace the valve spring.



**Valve spring free length**  
47.06 mm (1.85 in)  
<Limit>: 44.71 mm (1.76 in)



11171904

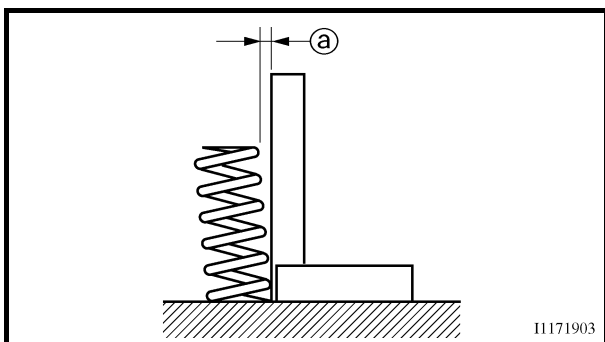
2. Measure:

- compressed valve spring force <sup>a</sup>  
Out of specification → Replace the valve spring.

<sup>b</sup> Installed length



**Compressed valve spring force (installed)**  
160.0 ~ 184.0 N at 25.6 mm  
(16.32 ~ 18.76 kg at 25.6 mm,  
35.97 ~ 41.36 lb at 1.01 in)



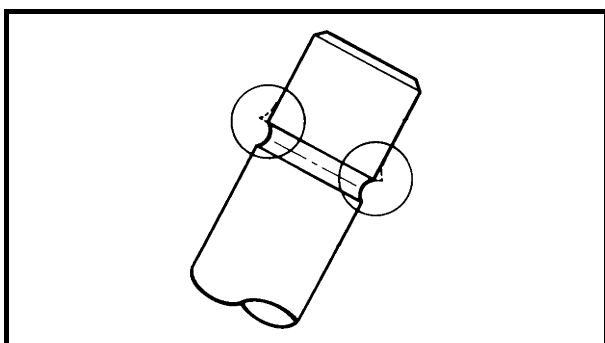
11171903

3. Measure:

- valve spring tilt <sup>a</sup>  
Out of specification → Replace the valve spring.



**Spring tilt limit**  
2.5°/2.1 mm (2.5°/0.08 in)



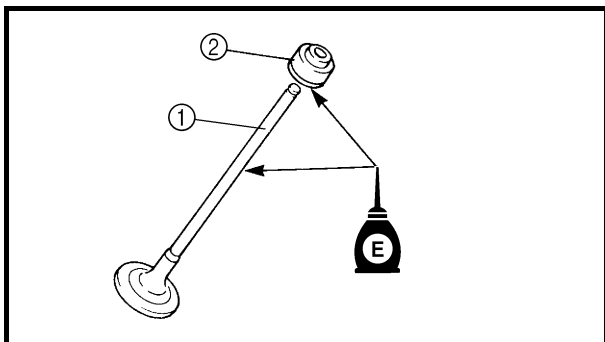
EAS00245

## INSTALLING THE VALVES

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

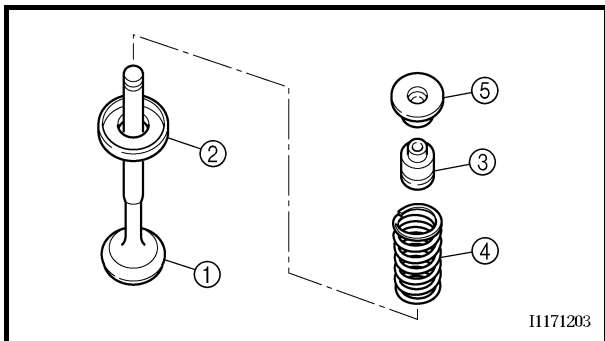
1. Deburr:

- valve stem end  
(with an oil stone)



2. Lubricate:

- valve stem ①
- valve stem seal ②  
(with the recommended lubricant)



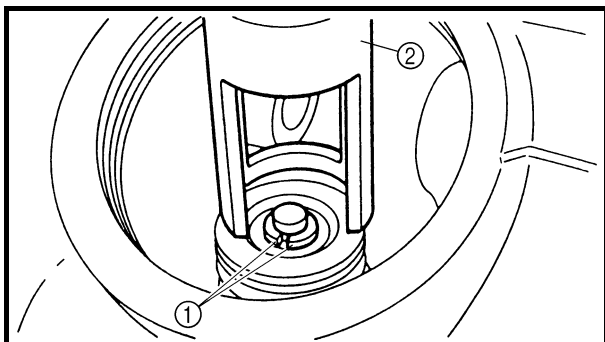
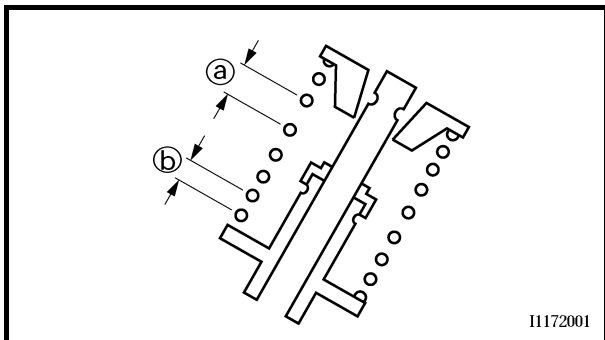
3. Install:

- valve ①
- valve spring seat ②  
(into the cylinder head)
- valve stem seal ③
- valve spring ④
- valve spring retainer ⑤

**NOTE:**

- Install the valve spring with the larger pitch **a** facing up.
- Install the valve spring with its painted end facing up.

⑥ Smaller pitch

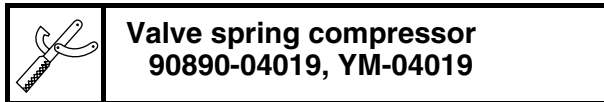


4. Install:

- valve cotter pins ①

**NOTE:**

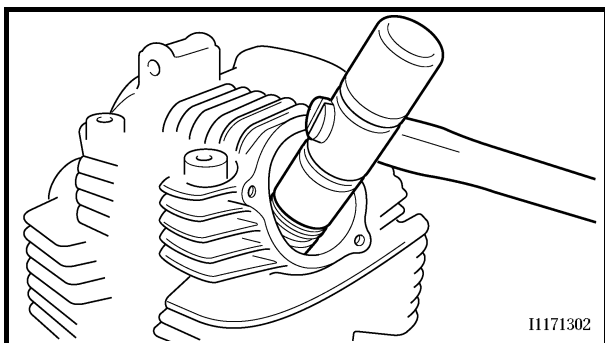
Install the valve cotter pins by compressing the valve spring with the valve spring compressor ②.



5. To secure the valve cotter pins 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.

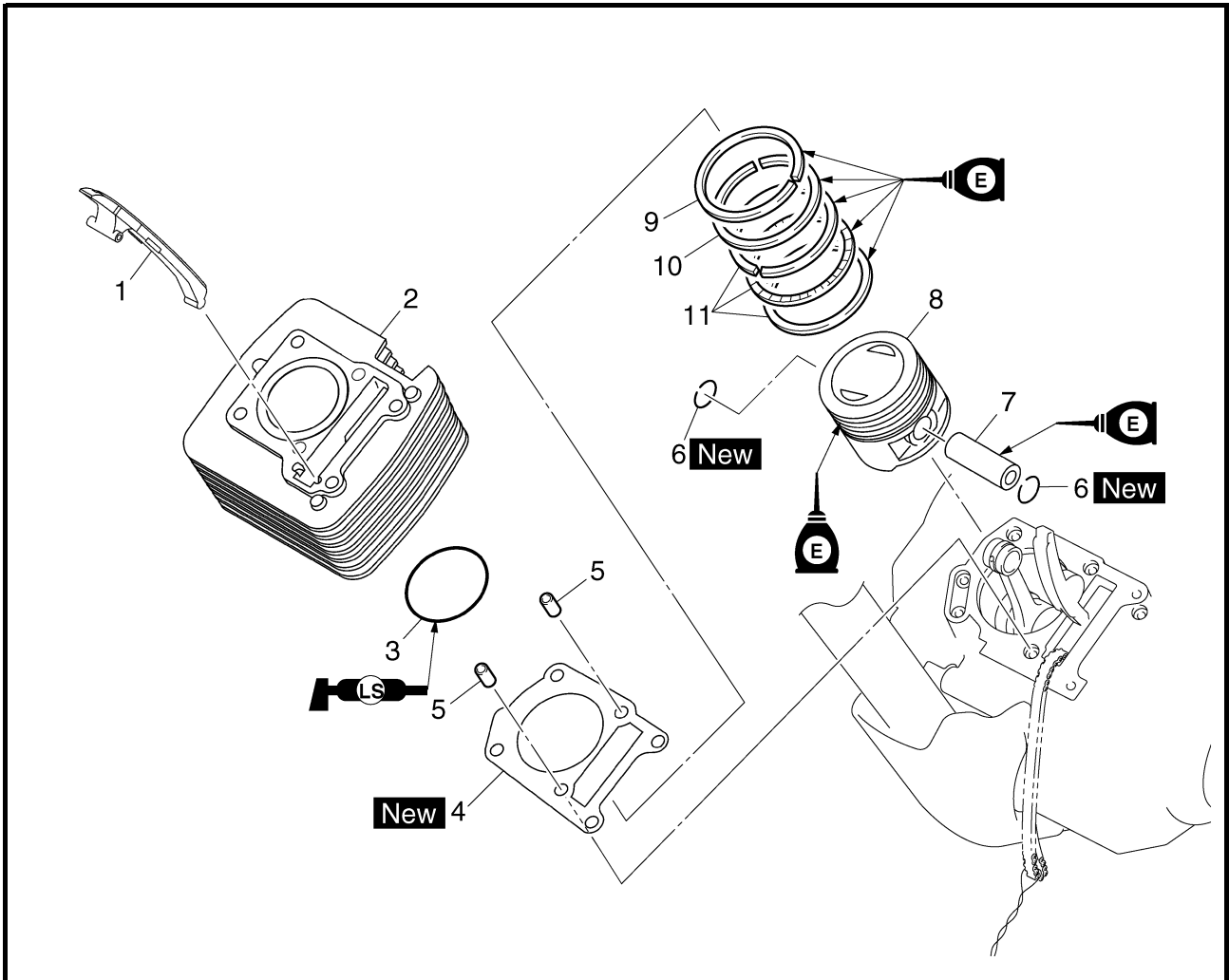




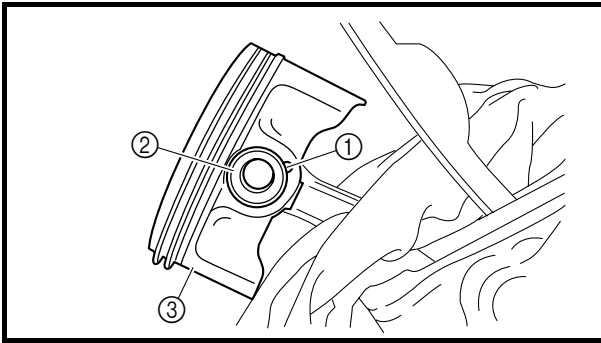


EAS00251

CYLINDER AND PISTON



Order	Job/Part	Q'ty	Remarks
	<b>Removing the cylinder and piston</b>		Remove the parts in the order listed. Refer to "CYLINDER HEAD".
1	Timing chain guide (exhaust)	1	
2	Cylinder	1	
3	O-ring	1	Refer to "INSTALLING THE PISTON AND CYLINDER".
4	Cylinder gasket	1	
5	Dowel pin	2	
6	Piston pin circlip	2	
7	Piston pin	1	Refer to "REMOVING THE CYLINDER AND PISTON" and "INSTALLING THE PISTON AND CYLINDER".
8	Piston	1	
9	Top ring	1	
10	2nd ring	1	
11	Oil ring	1	
			For installation, reverse the removal procedure.



EAS00253

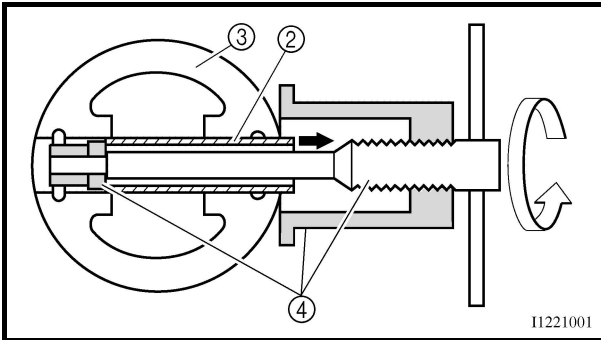
### REMOVING THE CYLINDER AND PISTON

1. Remove:

- piston pin clips ①
- piston pin ②
- piston ③

**CAUTION:** \_\_\_\_\_

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

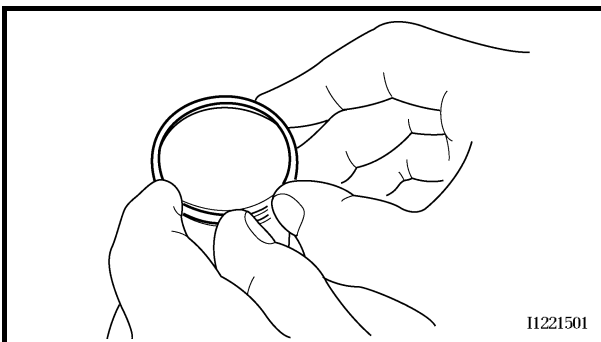


**NOTE:** \_\_\_\_\_

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



2. Remove:

- top ring
- 2nd ring
- oil ring

**NOTE:** \_\_\_\_\_

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

EAS00261

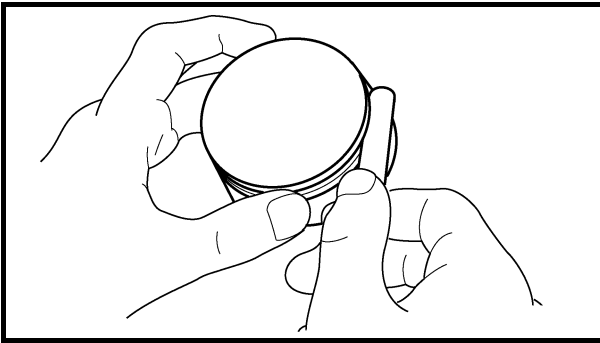
### CHECKING THE CYLINDER AND PISTON

1. Check:

- piston wall
- cylinder wall

Vertical scratches → Replace the cylinder, and the piston and piston rings as a set.





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.



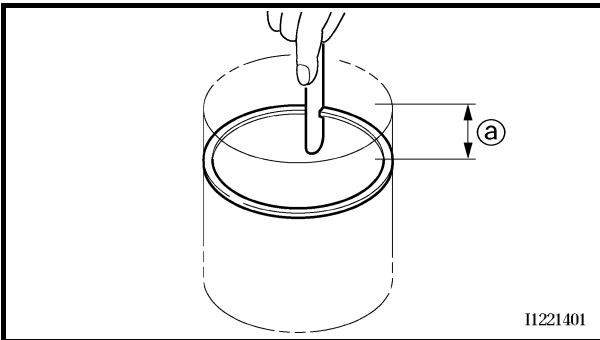
### Piston ring side clearance

#### Top ring

0.035 ~ 0.070 mm  
(0.0014 ~ 0.0028 in)  
<Limit>: 0.120 mm (0.0047 in)

#### 2nd ring

0.020 ~ 0.060 mm  
(0.0008 ~ 0.0024 in)  
<Limit>: 0.120 mm (0.0047 in)



### 2. Install:

- piston rings  
(into the cylinder)

### NOTE:

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

@ 15 ~ 20 mm (0.59 ~ 0.79 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

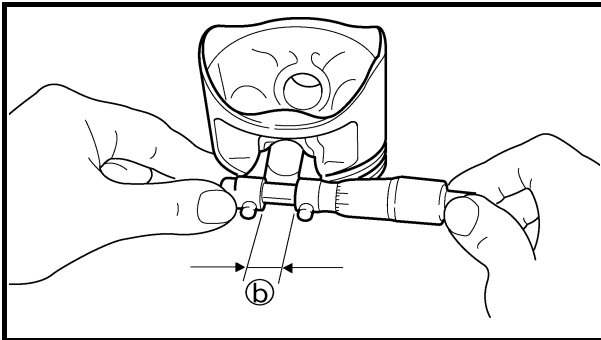
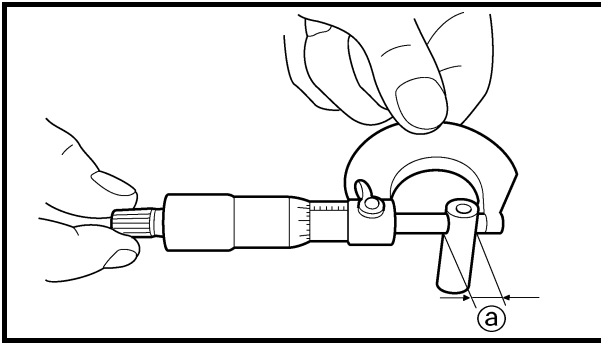
0.15 ~ 0.30 mm  
(0.006 ~ 0.012 in)  
<Limit>: 0.55 mm (0.022 in)

#### 2nd ring

0.30 ~ 0.45 mm  
(0.012 ~ 0.018 in)  
<Limit>: 0.80 mm (0.031 in)

#### Oil ring

0.20 ~ 0.70 mm  
(0.008 ~ 0.028 in)



EAS00265

**CHECKING THE PISTON PIN**

1. Check:
  - piston pin  
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.
2. Measure:
  - piston pin outside diameter (a)  
Out of specification → Replace the piston pin.



**Piston pin outside diameter**  
 14.991 ~ 15.000 mm  
 (0.5902 ~ 0.5906 in)  
 <Limit>: 14.971 mm (0.5894 in)

3. Measure:
  - piston pin bore inside diameter (b)  
Out of specification → Replace the piston.



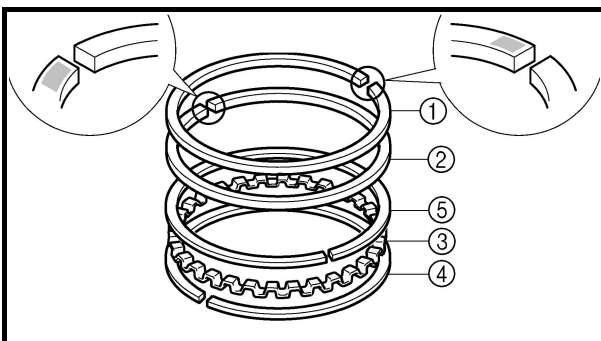
**Piston pin bore inside diameter**  
 15.002 ~ 15.013 mm  
 (0.5906 ~ 0.5911 in)  
 <Limit>: 15.043 mm (0.5922 in)

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

**Piston-pin-to-piston-pin-bore clearance =**  
**Piston pin bore diameter (b) –**  
**Piston pin outside diameter (a)**



**Piston-pin-to-piston clearance**  
 0.002 ~ 0.022 mm  
 (0.0001 ~ 0.0009 in)  
 <Limit>: 0.072 mm (0.0028 in)



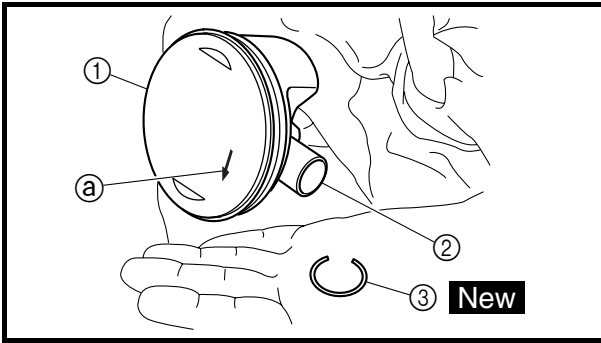
EAS00267

**INSTALLING THE PISTON AND CYLINDER**

1. Install:
  - top ring ①
  - 2nd ring ②
  - oil ring expander ③
  - lower oil ring rail ④
  - upper oil ring rail ⑤

**NOTE:**

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



### 2. Install:

- piston ①
- piston pin ②
- piston pin clips ③ **New**

### NOTE:

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

### 3. Install:

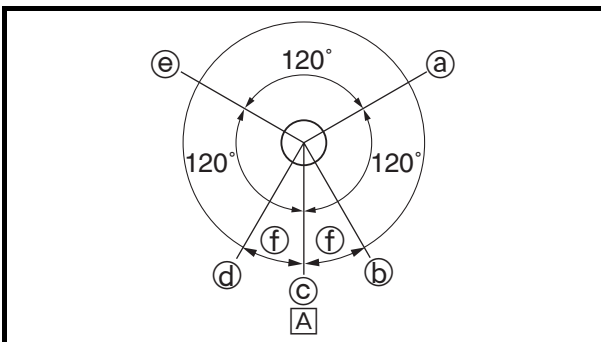
- cylinder gasket **New**
- dowel pins

### 4. Lubricate:

- piston
- piston rings
- cylinder  
(with the recommended lubricant)



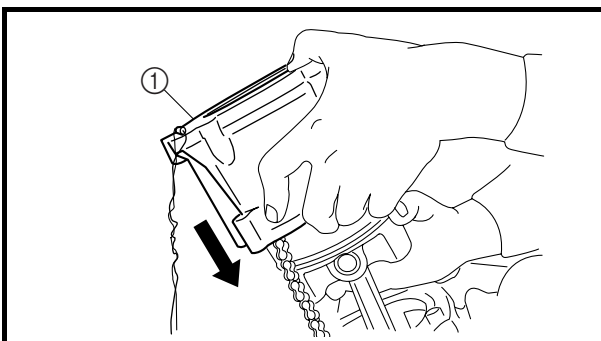
**Recommended lubricant**  
**Engine oil**



### 5. Offset:

- piston ring end gaps

- ① Top ring
- ② Upper oil ring rail
- ③ Oil ring expander
- ④ Lower oil ring rail
- ⑤ 2nd ring
- ⑥ 20 mm (0.79 in)
- Ⓐ Exhaust side



### 6. Install:

- O-ring **New**
- cylinder ①

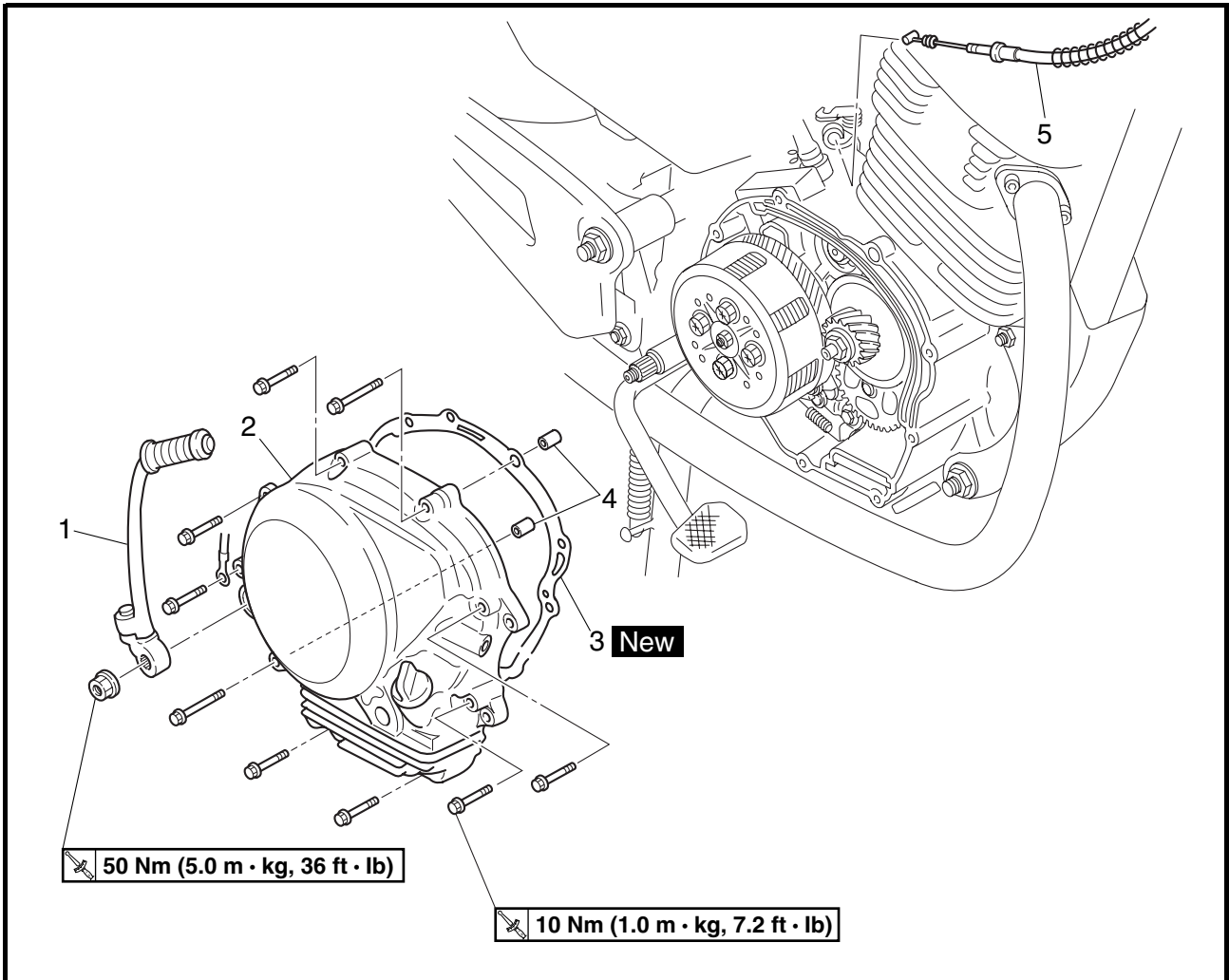
### NOTE:

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

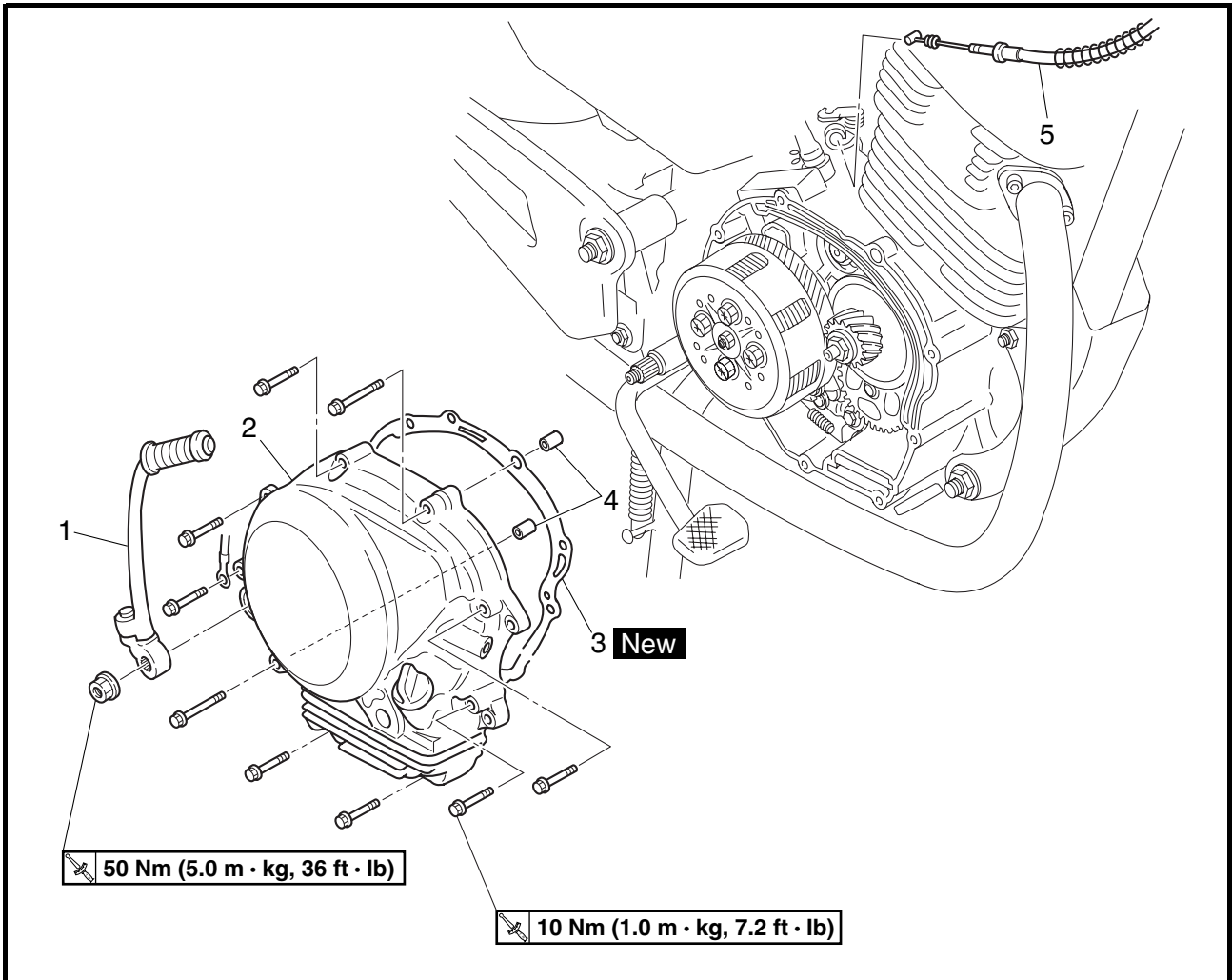


EAS00273

**CLUTCH**  
**CLUTCH COVER**



Order	Job/Part	Q'ty	Remarks
	<b>Removing the clutch cover</b>		Remove the parts in the order listed.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Left side cover		Refer to "SIDE COVERS, SEAT AND FUEL TANK" in chapter 3.
	Battery/relay case		Refer to "BATTERY AND BATTERY BOX" in chapter 3
	Muffler assembly		Refer to "ENGINE".
	Footrest		
	Starter motor		Refer to "STARTER MOTOR" in chapter 7.
	Clutch cable (handlebar side)		Refer to "HANDLEBAR" in chapter 4.
	Drive sprocket cover		Refer to "DRIVE CHAIN AND DRIVE SPROCKET" in chapter 4.



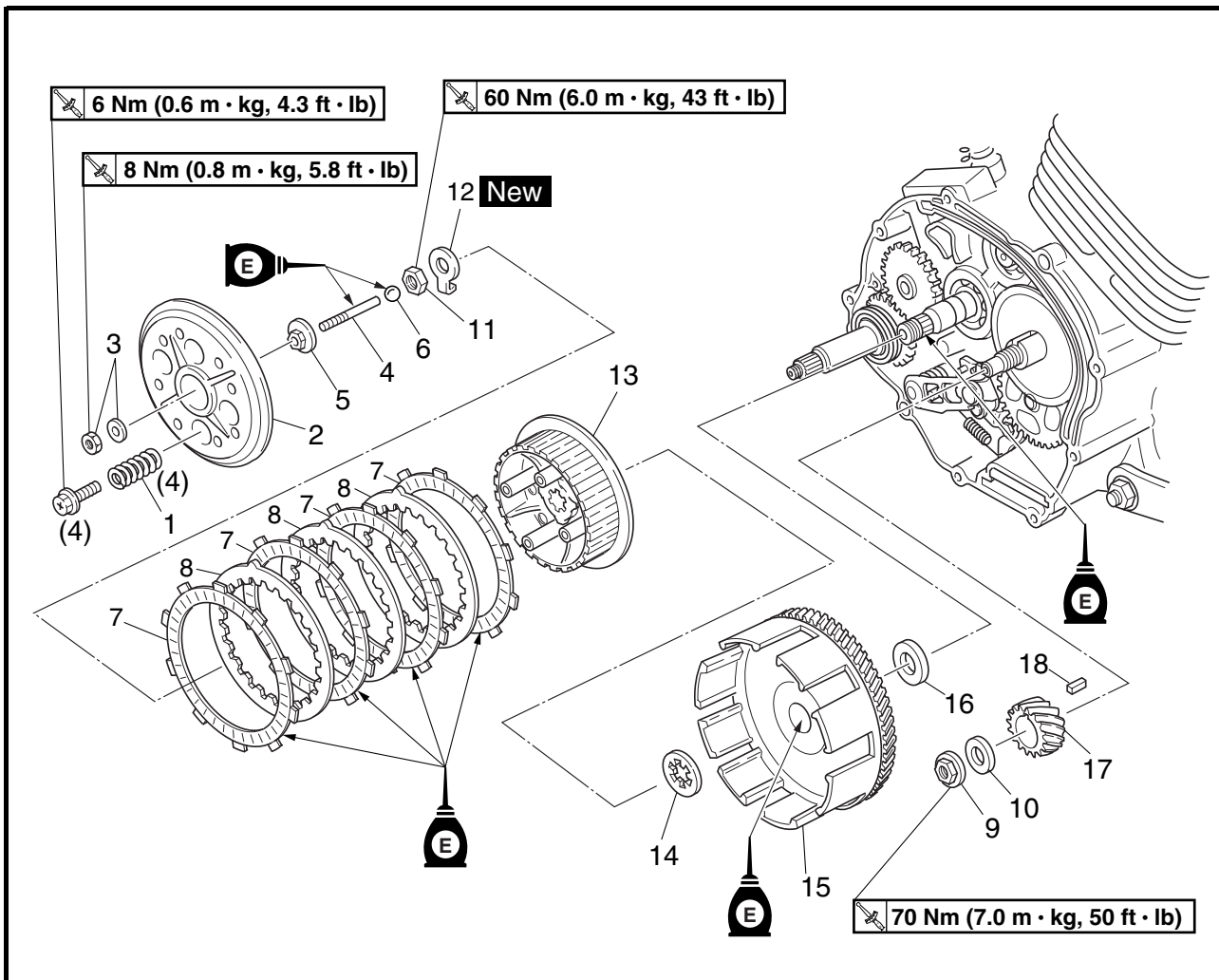
Order	Job/Part	Q'ty	Remarks
1	Kickstarter lever	1	
2	Clutch cover	1	Refer to "REMOVING THE CLUTCH" and "INSTALLING THE CLUTCH".
3	Clutch cover gasket	1	
4	Dowel pin	2	
5	Clutch cable	1	Disconnect. For installation, reverse the removal procedure.



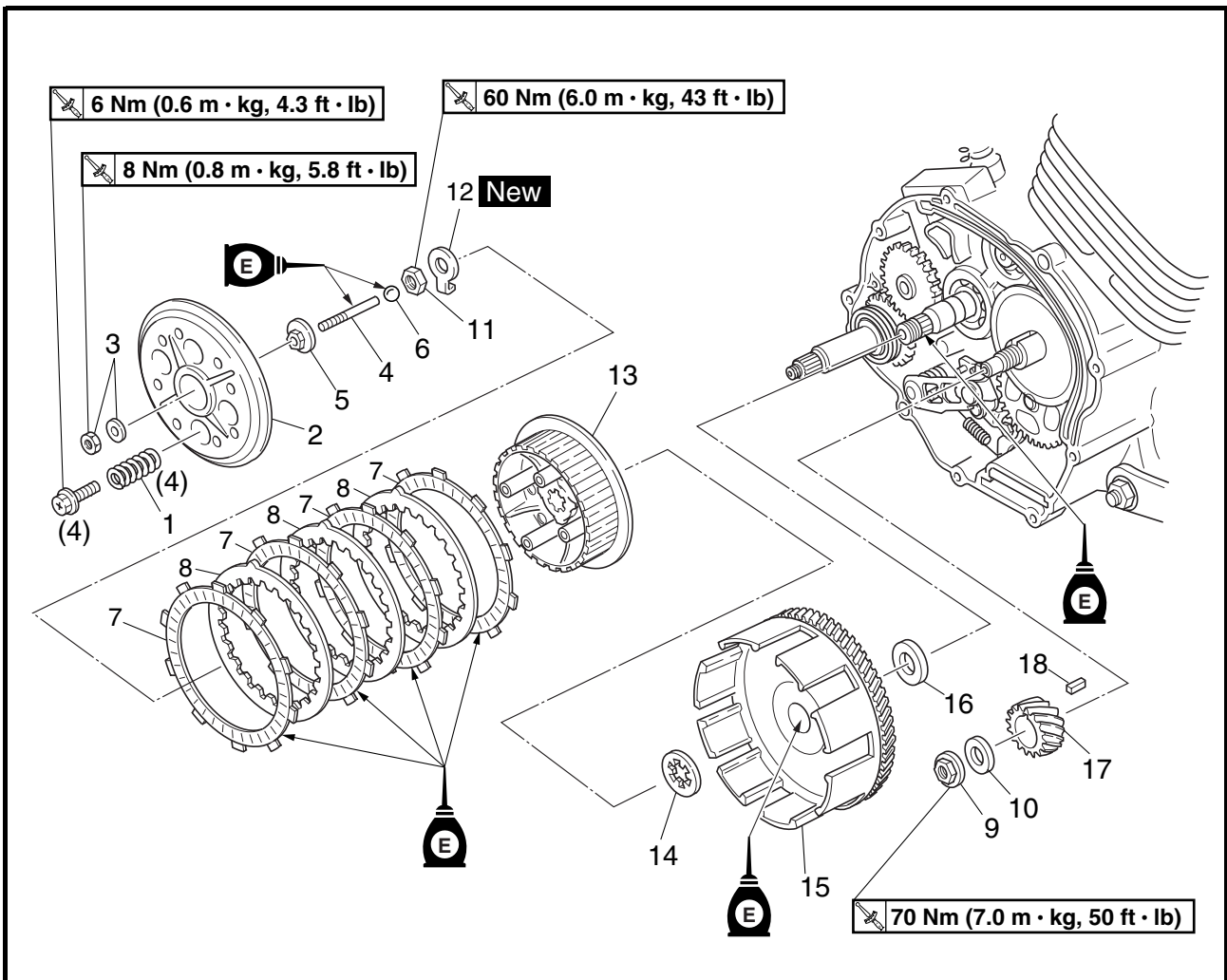


EAS00274

CLUTCH



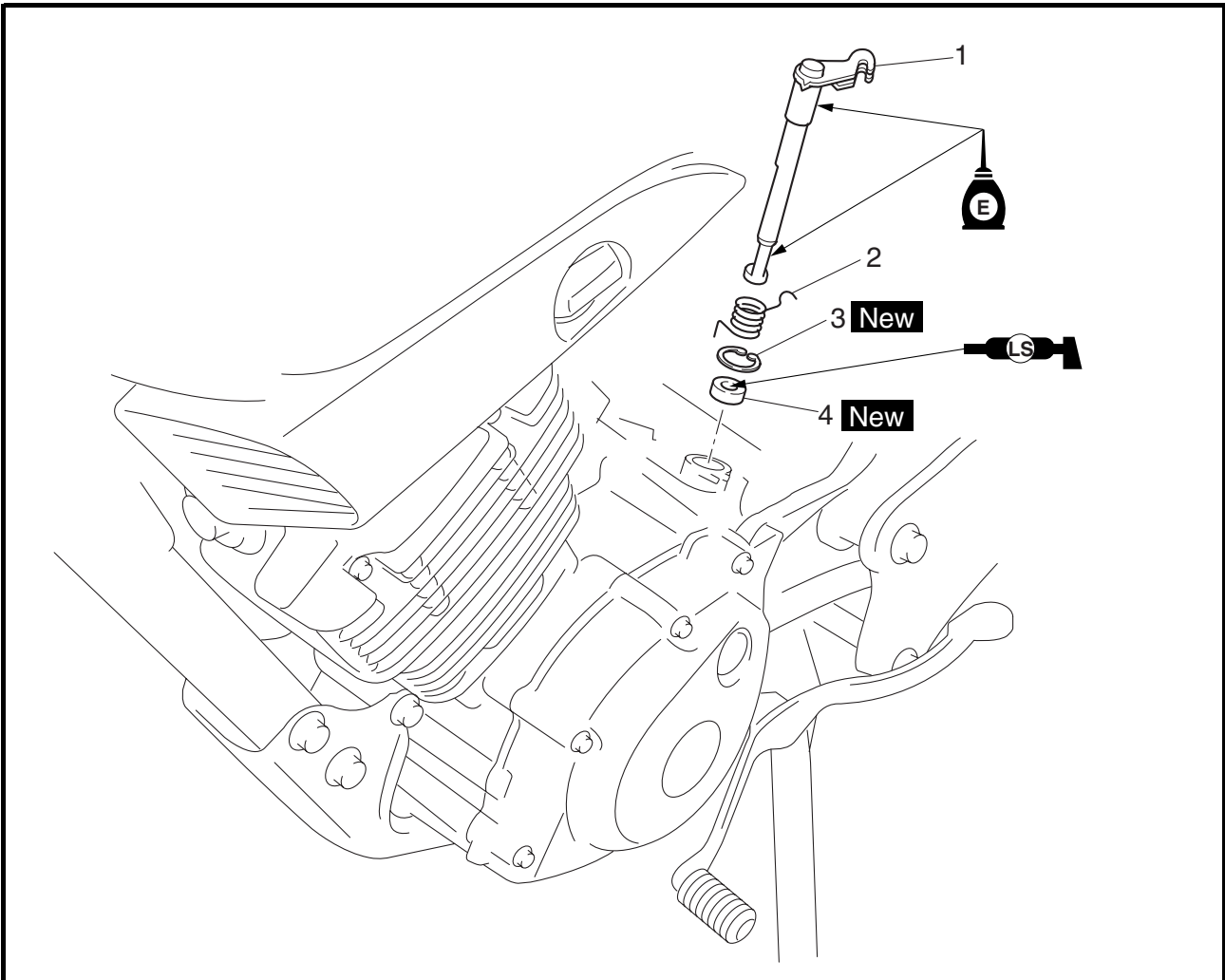
Order	Job/Part	Q'ty	Remarks
	<b>Removing the clutch</b>		Remove the parts in the order listed.
1	Clutch spring	4	Refer to "INSTALLING THE CLUTCH".
2	Pressure plate	1	
3	Locknut/washer	1/1	
4	Short clutch push rod	1	
5	Clutch push rod holder	1	
6	Ball	1	Refer to "INSTALLING THE CLUTCH".
7	Friction plate	4	
8	Clutch plate	3	



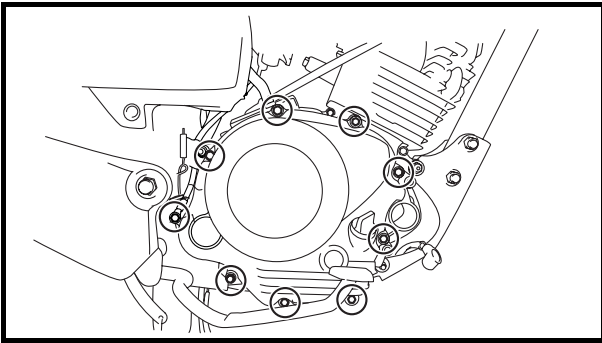
Order	Job/Part	Q'ty	Remarks
9	Primary drive gear nut	1	Refer to "REMOVING THE CLUTCH" and "INSTALLING THE CLUTCH".
10	Washer	1	
11	Clutch boss nut	1	
12	Lock washer	1	
13	Clutch boss	1	
14	Thrust washer	1	Refer to "INSTALLING THE CLUTCH".
15	Clutch housing	1	
16	Plate washer	1	
17	Primary drive gear	1	For installation, reverse the removal procedure.
18	Straight key	1	



**CLUTCH PUSH LEVER**



Order	Job/Part	Q'ty	Remarks
	<b>Removing the clutch push lever</b>		Remove the parts in the order listed.
1	Clutch push lever	1	] Refer to "INSTALLING THE CLUTCH".
2	Clutch push lever spring	1	
3	Circlip	1	
4	Oil seal	1	
			For installation, reverse the removal procedure.



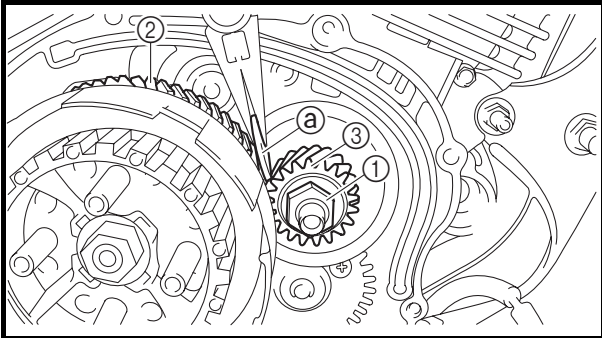
EAS00277

**REMOVING THE CLUTCH**

1. Remove:
  - clutch cover

**NOTE:**

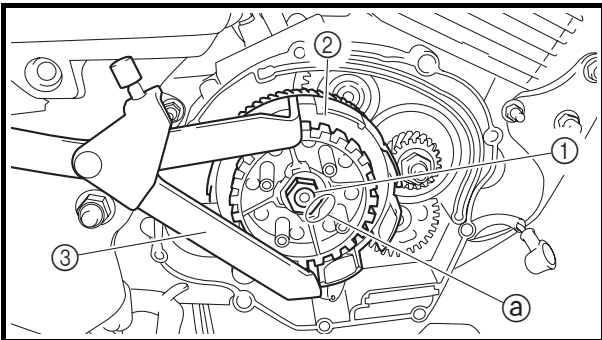
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them.



2. Loosen:
  - primary drive gear nut ①

**NOTE:**

Place an aluminum plate ① between the teeth of the primary driven gear ② and primary drive gear ③.



3. Straighten the lock washer tab ①.
4. Loosen:
  - clutch boss nut ①

**NOTE:**

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



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

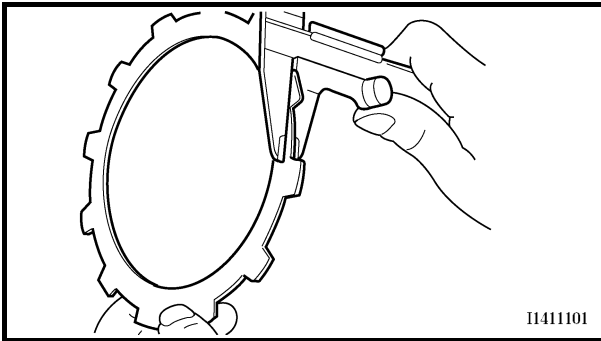
EAS00280

**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**  
**3.00 mm (0.118 in)**  
 <Limit>: 2.80 mm (0.110 in)

EAS00281

**CHECKING THE CLUTCH PLATES**

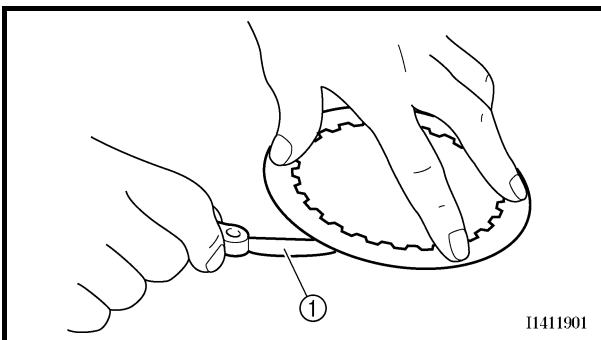
The following procedure applies to all of the clutch plates.

## 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**  
**0.20 mm (0.0079 in)**

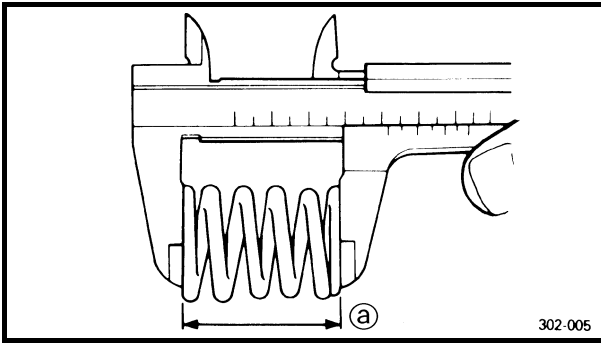
EAS00282

**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.

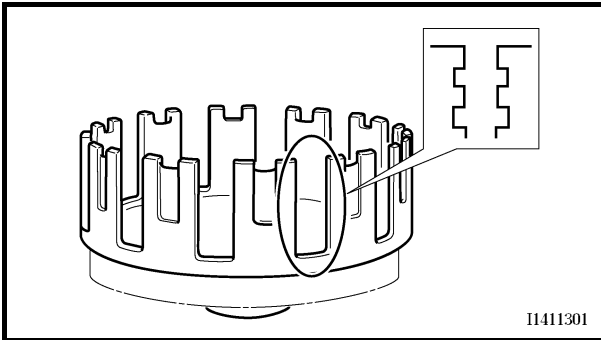


## 2. Measure:

- clutch spring free length <sup>a</sup>
- Out of specification → Replace the clutch springs as a set.



**Clutch spring free length**  
**29.30 mm (1.15 in)**  
 <Limit>: 27.84 mm (1.10 in)



EAS00284

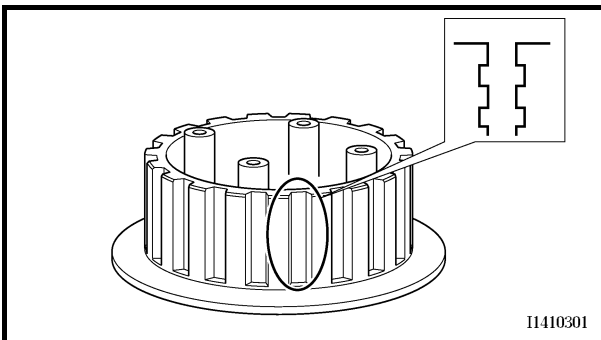
**CHECKING THE CLUTCH HOUSING**

## 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.



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:

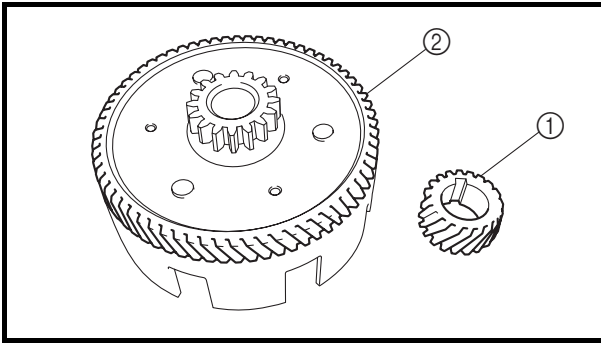
- pressure plate
- Cracks/damage → Replace.

EAS00287

**CHECKING THE CLUTCH PUSH LEVER AND SHORT CLUTCH PUSH ROD**

## 1. Check:

- clutch push lever
  - short clutch push rod
- Damage/wear → Replace.



EAS00292

### CHECKING THE PRIMARY DRIVE GEAR AND PRIMARY DRIVEN GEAR

#### 1. Check:

- primary drive gear ①
- primary driven gear ②  
(on the clutch housing)

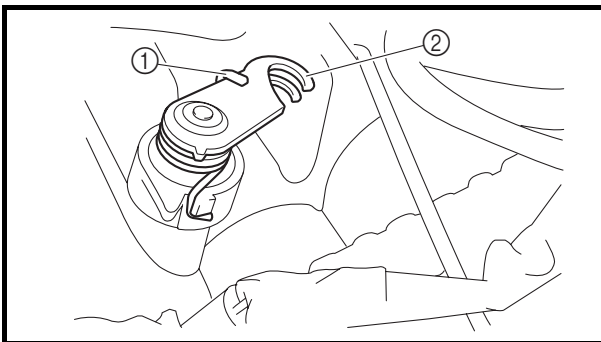
Damage/wear → Replace the primary drive gear and clutch housing as a set.

Excessive noise during operation → Replace the primary drive gear and clutch housing as a set.

#### 2. Check:

- primary-drive-gear-to-primary-driven-gear free play

Free play exists → Replace the primary drive gear and clutch housing as a set.



EAS00298

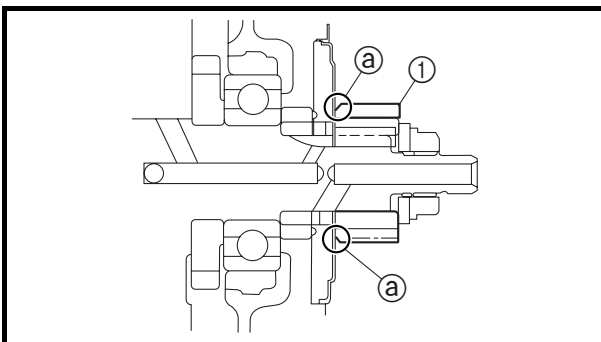
### INSTALLING THE CLUTCH

#### 1. Install:

- clutch push lever spring ①
- clutch push lever ②

#### NOTE:

Install the clutch push lever spring as shown.

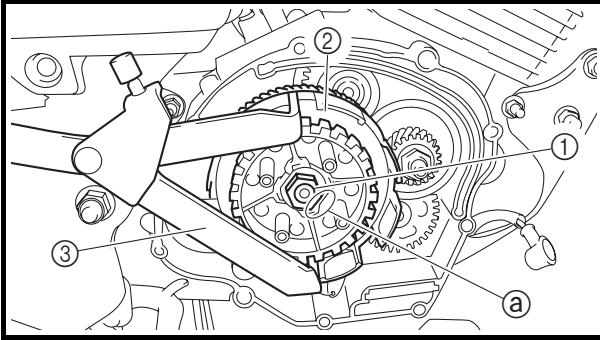


#### 2. Install:

- straight key
- primary drive gear ①
- washer
- primary drive gear nut

#### NOTE:

Install the primary drive gear with its chamfered side facing @ the rotary filter.




3. Install:
- clutch boss
  - lock washer **New**
  - clutch boss nut ①

**NOTE:**

Lubricate the crankshaft end threads with engine oil.

4. Tighten:
- clutch boss nut

 **60 Nm (6.0 m · kg, 43 ft · lb)**

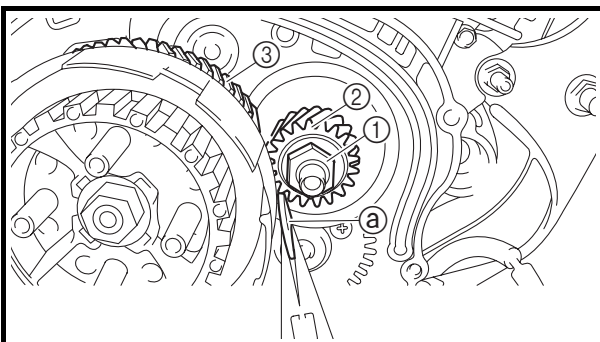
**NOTE:**

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




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

5. Bend the lock washer tab ④ along a flat side of the nut.



6. Tighten:
- primary drive gear nut ①

 **70 Nm (7.0 m · kg, 50 ft · lb)**

**NOTE:**

Place an aluminum plate ④ between the teeth of the primary drive gear ② and primary driven gear ③.

7. Lubricate:
- friction plates
  - clutch plates  
(with the recommended lubricant)



**Recommended lubricant**  
**Engine oil**

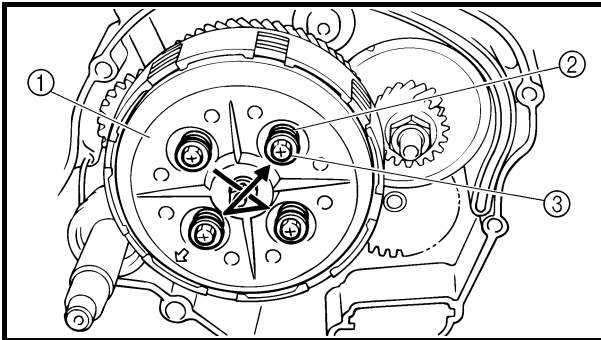




8. Install:
- friction plates
  - clutch plates

**NOTE:**

First, install a friction plate and then alternate between a clutch plate and a friction plate.

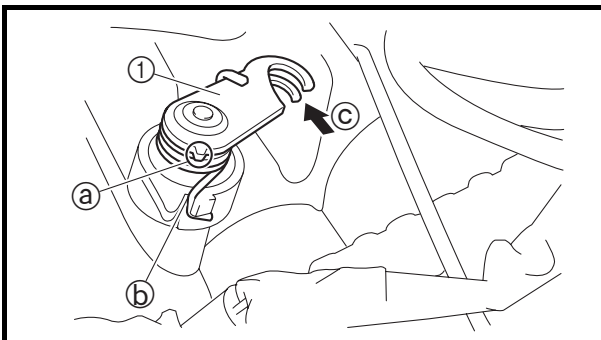


9. Install:
- pressure plate ①
  - clutch springs ②
  - clutch spring bolts ③

6 Nm (0.6 m · kg, 4.3 ft · lb)

**NOTE:**

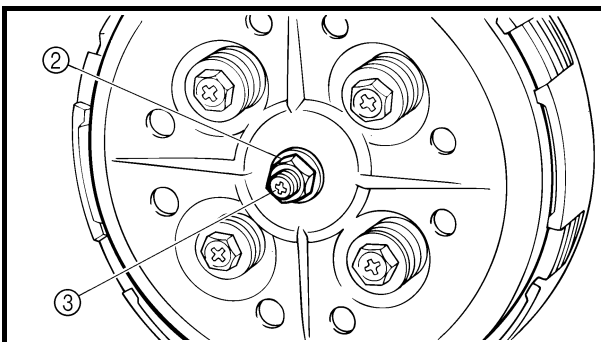
Tighten the clutch spring bolts in stages and in a crisscross pattern.



10. Adjust:
- clutch mechanism free play



- Check that projection (a) on the clutch push lever ① aligns with mark (b) on the crank-case by pushing the clutch push lever manually in direction (c) until it stops.
- If projection (a) is not aligned with mark (b), align them as follows:
  - Loosen the locknut ②.
  - With the clutch push lever fully pushed in direction (c), turn the short clutch push rod ③ in or out until projection (a) aligns with mark (b).
  - Hold the short clutch push rod to prevent it from moving and then tighten the locknut to specification.



**Locknut**  
8 Nm (0.8 m · kg, 5.8 ft · lb)

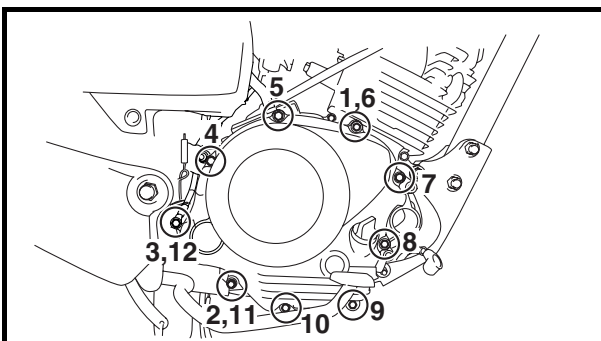


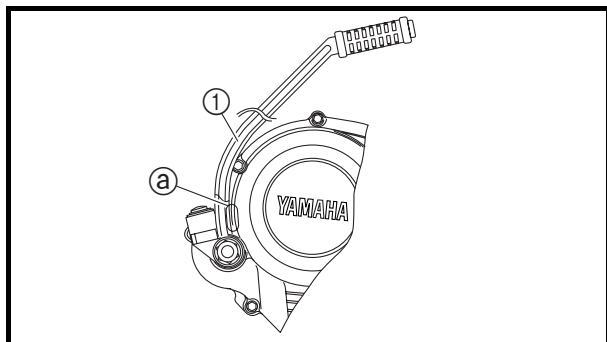
11. Install:
- clutch cover

10 Nm (1.0 m · kg, 7.2 ft · lb)

**NOTE:**


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





12.Install:

- kickstarter lever ①

 50 Nm (5.0 m · kg, 36 ft · lb)

**NOTE:**

Install the kickstarter lever as close as possible to the clutch cover, making sure that the lever does not contact the area ② of the clutch cover.

13.Adjust:

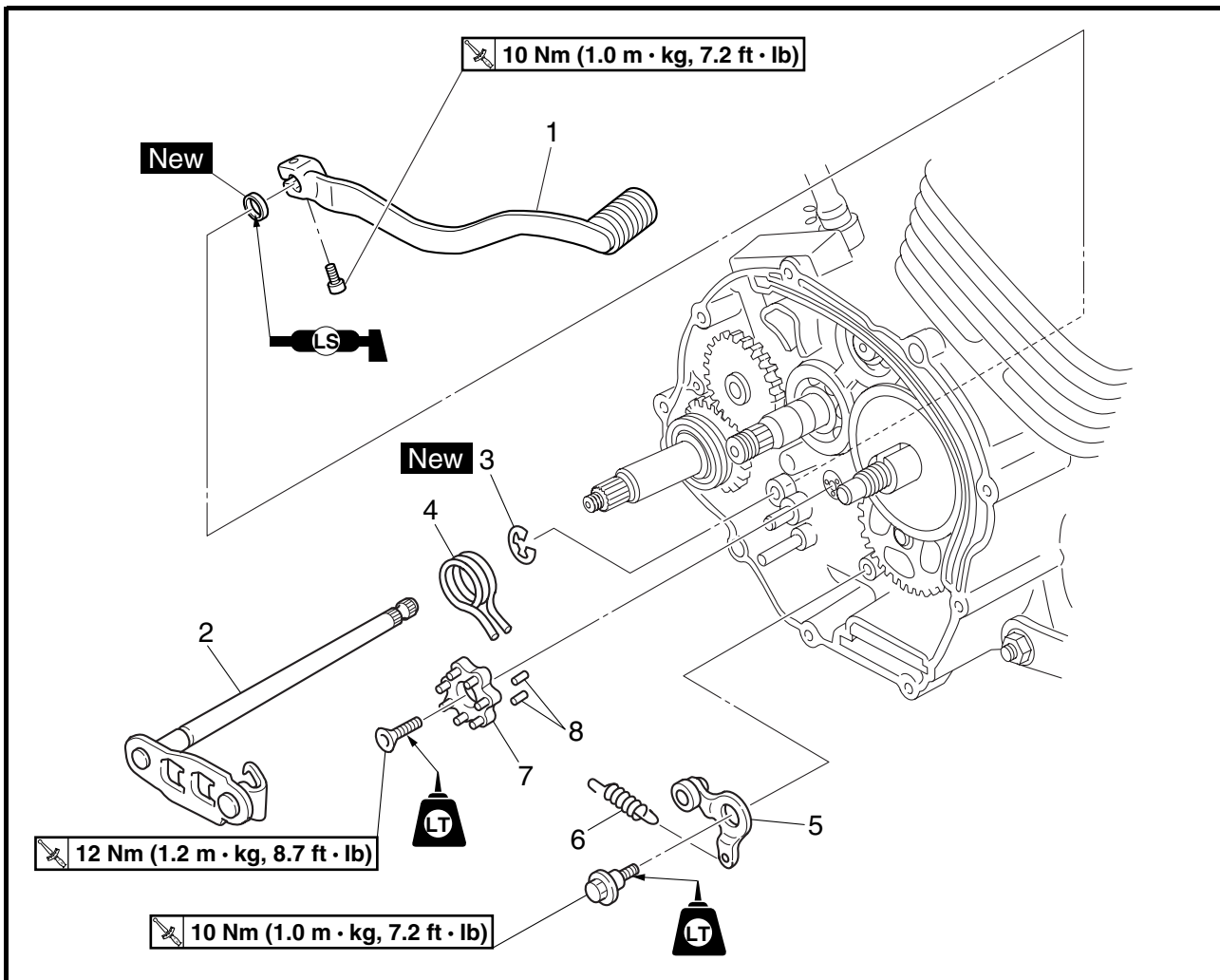
- clutch cable free play  
Refer to “ADJUSTING THE CLUTCH CABLE FREE PLAY” in chapter 3.

# SHIFT SHAFT AND STOPPER LEVER



EAS00327

## SHIFT SHAFT AND STOPPER LEVER



Order	Job/Part	Q'ty	Remarks
	<b>Removing the shift shaft and stopper lever</b>		Remove the parts in the order listed.
	Clutch housing		Refer to "CLUTCH".
1	Shift pedal	1	Refer to "INSTALLING THE SHIFT SHAFT AND SHIFT PEDAL".
2	Shift shaft	1	
3	Circlip	1	
4	Shift shaft spring	1	
5	Stopper lever	1	
6	Stopper lever spring	1	
7	Shift drum segment	1	
8	Dowel pin	2	
			For installation, reverse the removal procedure.



EAS00328

## CHECKING THE SHIFT SHAFT

1. Check:
  - shift shaft
  - shift lever
    - Bends/damage/wear → Replace.
  - shift lever spring
    - Damage/wear → Replace.

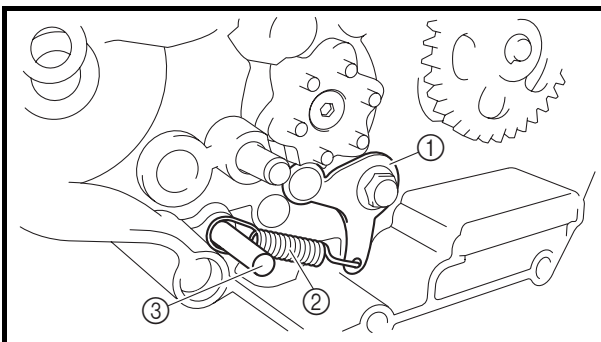
EAS00330

## CHECKING THE STOPPER LEVER

1. Check:
  - stopper lever
    - Bends/damage → Replace.
    - Roller turns roughly → Replace the stopper lever.
  - stopper lever spring
    - Damage/wear → Replace.

## CHECKING THE SHIFT DRUM SEGMENT


1. Check:
  - shift drum segment
    - Damage/wear → Replace the shift drum segment.



EAS00331

## INSTALLING THE SHIFT SHAFT AND SHIFT PEDAL

1. Install:
  - stopper lever ①
  - stopper lever spring ②
  - stopper lever bolt

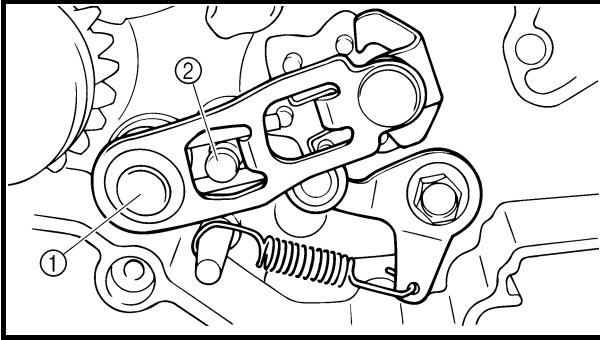
 **10 Nm (1.0 m · kg, 7.2 ft · lb)**

### NOTE:

- Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss ③.
- Install the stopper lever spring as shown in the illustration.
- Mesh the stopper lever with the shift drum segment.

## SHIFT SHAFT AND STOPPER LEVER

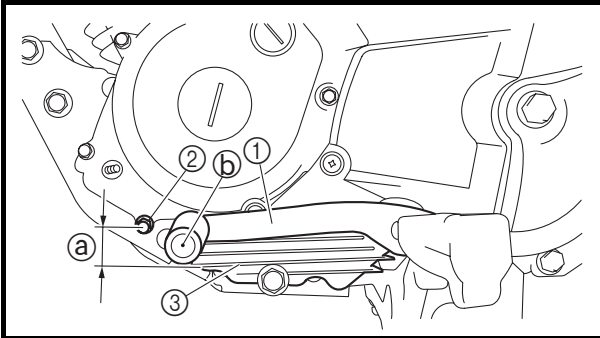
ENG




2. Install:
- shift shaft spring
  - circlip **New**
  - shift shaft ①

**NOTE:**

- Lubricate the oil seal lips with lithium-soap-based grease.
- Hook the end of the shift shaft spring onto the shift shaft spring stopper ②.



3. Install:

- shift pedal ①  **10 Nm (1.0 m · kg, 7.2 ft · lb)**

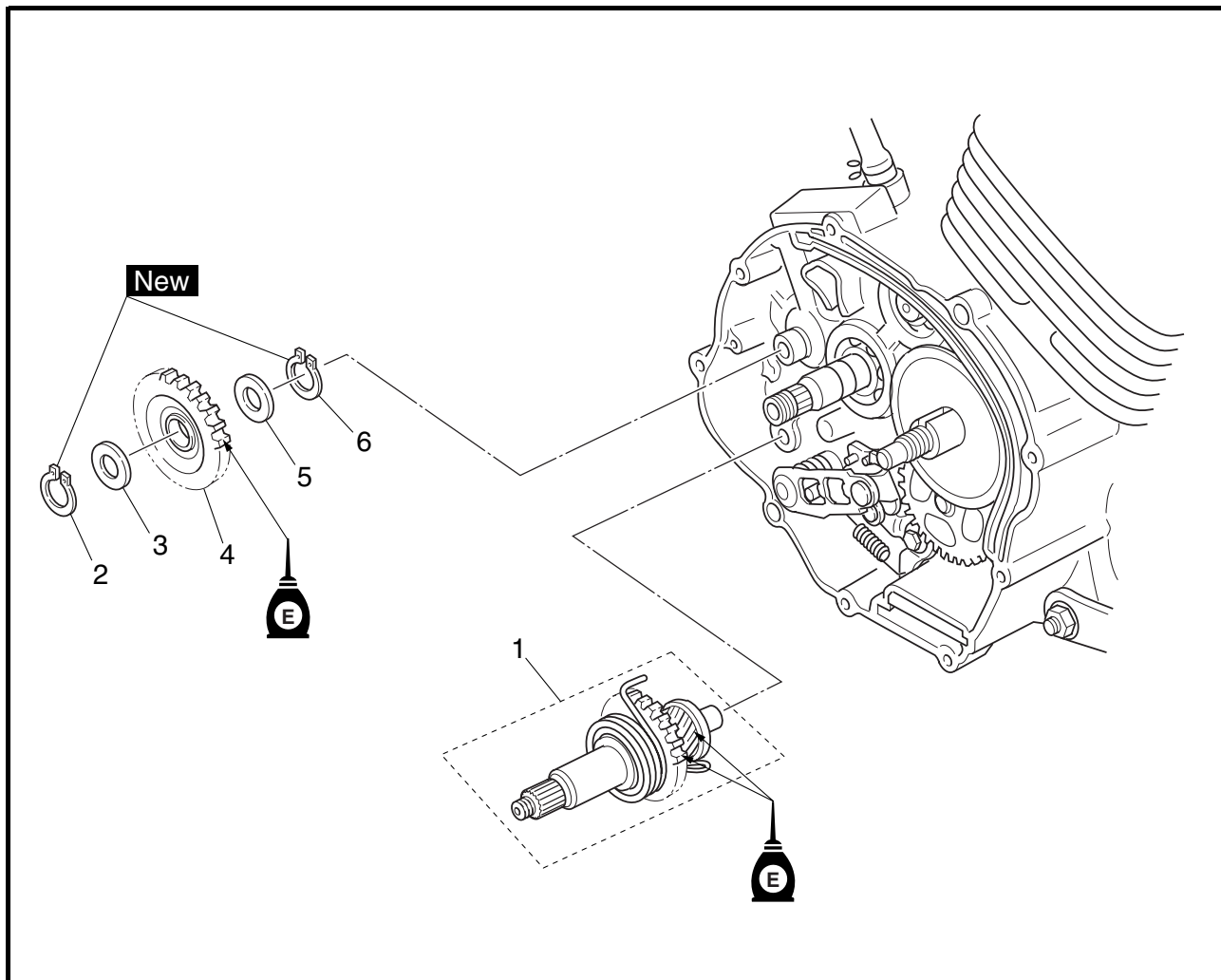
**NOTE:**

Install the shift pedal so that the center (b) of its end is positioned in the range (a) shown between the A.C. magneto rotor cover bolt (2) and the crankcase fin (3).

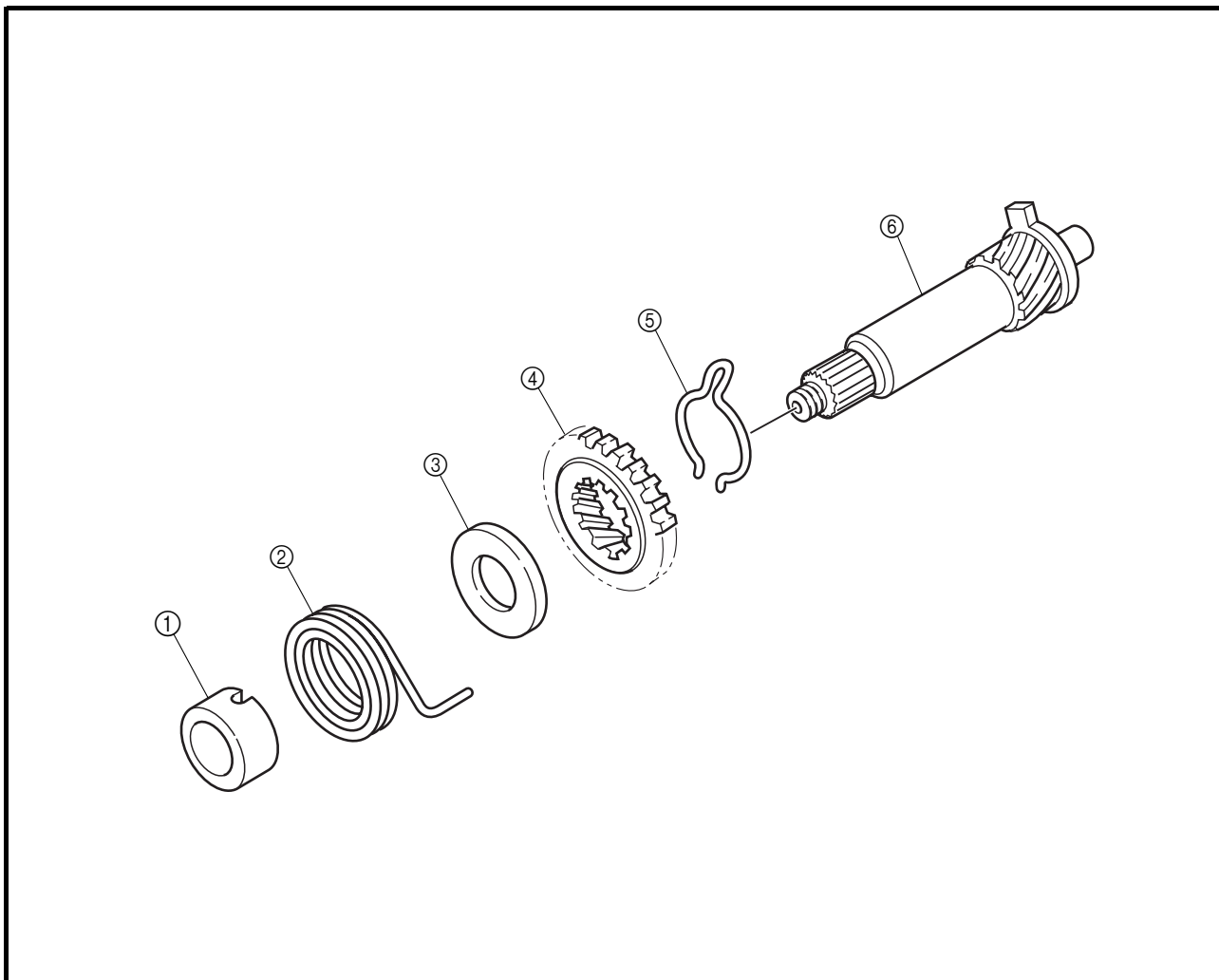


EAS00338

KICKSTARTER



Order	Job/Part	Q'ty	Remarks
	<b>Removing the kickstarter</b>		Remove the parts in the order listed. Refer to "CLUTCH".
1	Clutch housing		
1	Kickstarter assembly	1	Refer to "INSTALLING THE KICK-STARTER".
2	Circlip	1	
3	Washer	1	
4	Kickstarter idle gear	1	
5	Washer	1	
6	Circlip	1	
			For installation, reverse the removal procedure.



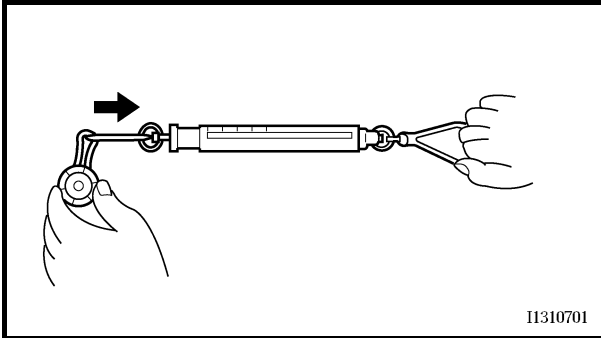
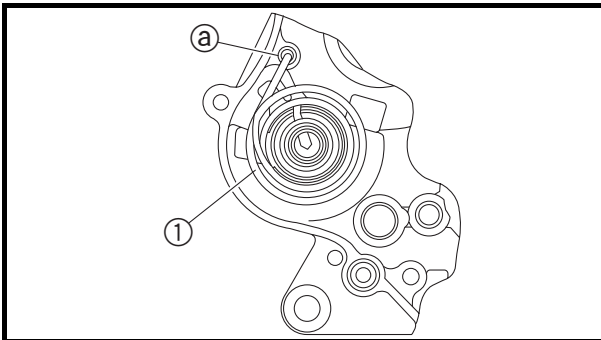
Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the kickstarter</b>		Remove the parts in the order listed.
①	Spacer	1	
②	Kickstarter spring	1	
③	Washer	1	
④	Kickstarter gear	1	
⑤	Kickstarter gear clip	1	
⑥	Kickstarter shaft	1	
			For assembly, reverse the disassembly procedure.



EAS00339

**CHECKING THE KICKSTARTER**

1. Check:
  - kickstarter idle gear
  - kickstarter gear
  - Damage/wear → Replace.
2. Check:
  - kickstarter spring
  - Damage/wear → Replace.
3. Measure:
  - kickstarter gear clip force (with the spring gauge)
  - Out of specification → Replace the kickstarter gear clip.

**Kickstarter gear clip force****8 ~ 12 N****(0.82 ~ 1.22 kg, 1.80 ~ 2.70 lb)**

EAS00340

**INSTALLING THE KICKSTARTER**

1. Install:
  - kickstarter shaft
  - kickstarter gear clip
  - kickstarter spring ①

**NOTE:**

Turn the kickstarter spring clockwise and install its end into the hole @ in the crankcase.



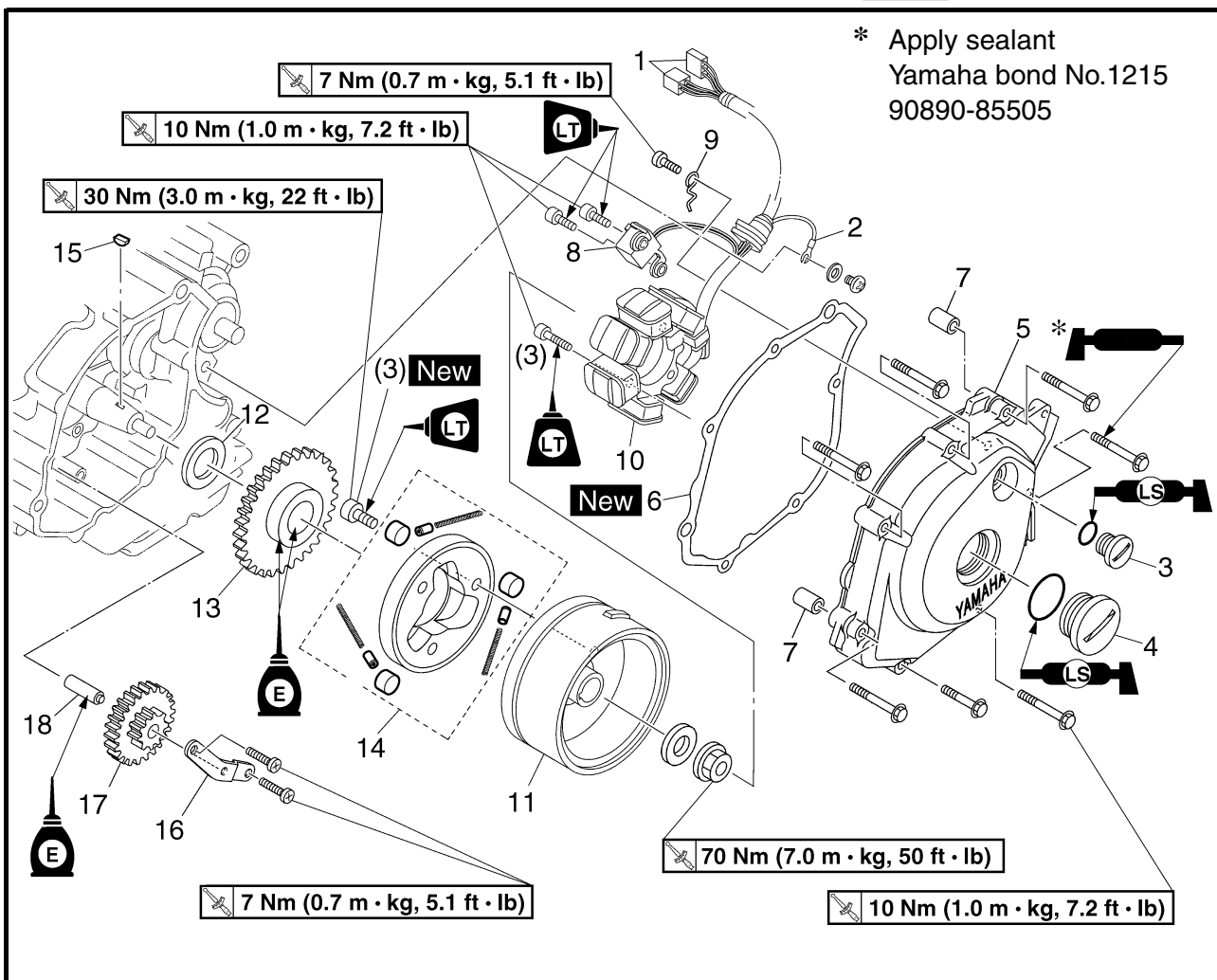
# STARTER CLUTCH AND A.C. MAGNETO ROTOR

ENG



EAS00343

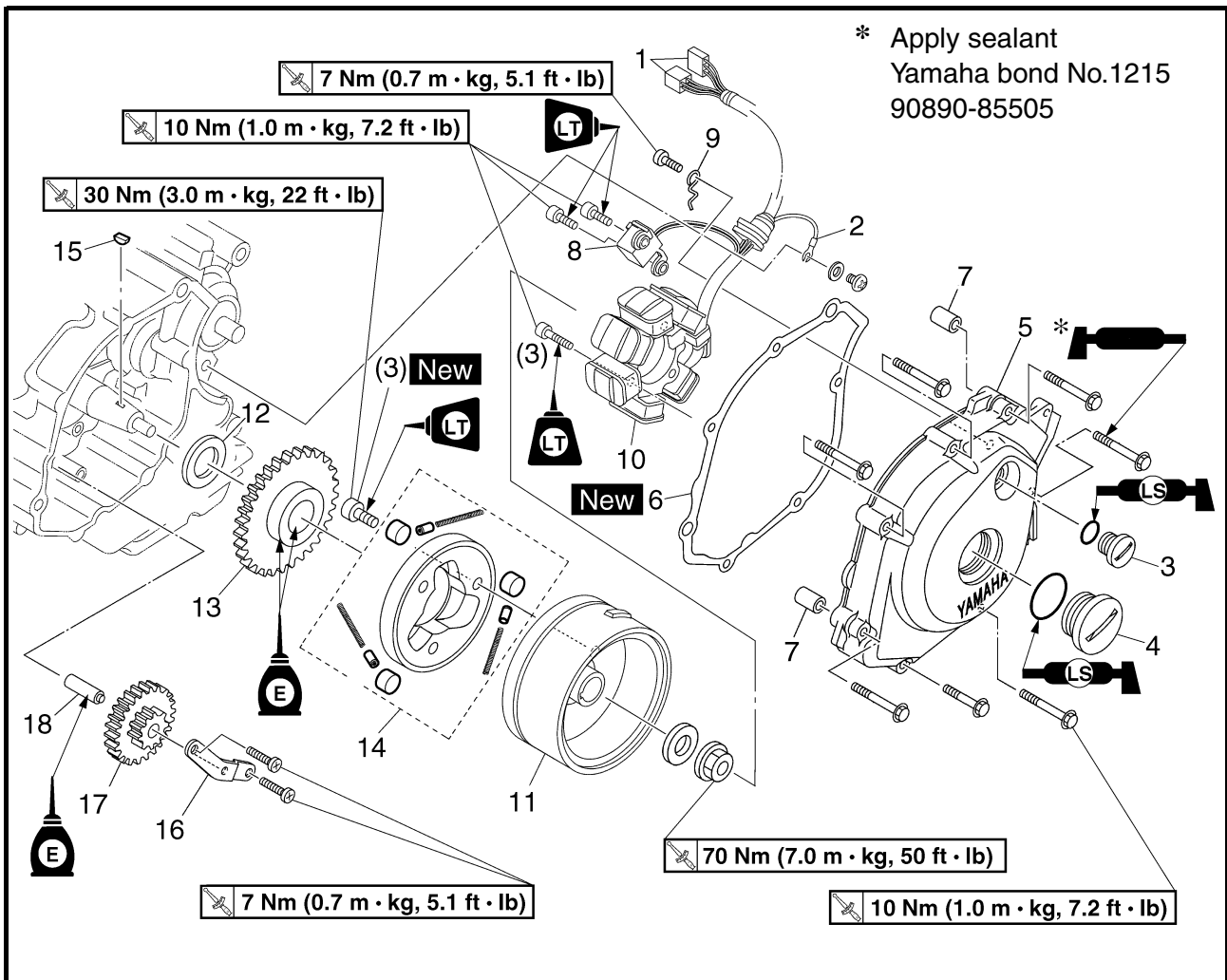
## STARTER CLUTCH AND A.C. MAGNETO ROTOR



Order	Job/Part	Q'ty	Remarks
	<b>Removing the starter clutch and A.C. magneto rotor</b>		Remove the parts in the order listed.
	Engine oil		Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Left side cover		Refer to "SIDE COVERS, SEAT AND FUEL TANK" in chapter 3.
	Drive sprocket cover		Refer to "DRIVE CHAIN AND DRIVE SPROCKET" in chapter 4.
1	A.C. magneto coupler/pickup coil coupler	1/1	Disconnect.
2	Neutral switch lead	1	Disconnect.
3	Timing mark accessing screw	1	
4	Crankshaft end accessing screw	1	
5	A.C. magneto rotor cover	1	Refer to "REMOVING THE A.C. MAGNETO ROTOR" and "INSTALLING THE A.C. MAGNETO ROTOR".

# STARTER CLUTCH AND A.C. MAGNETO ROTOR

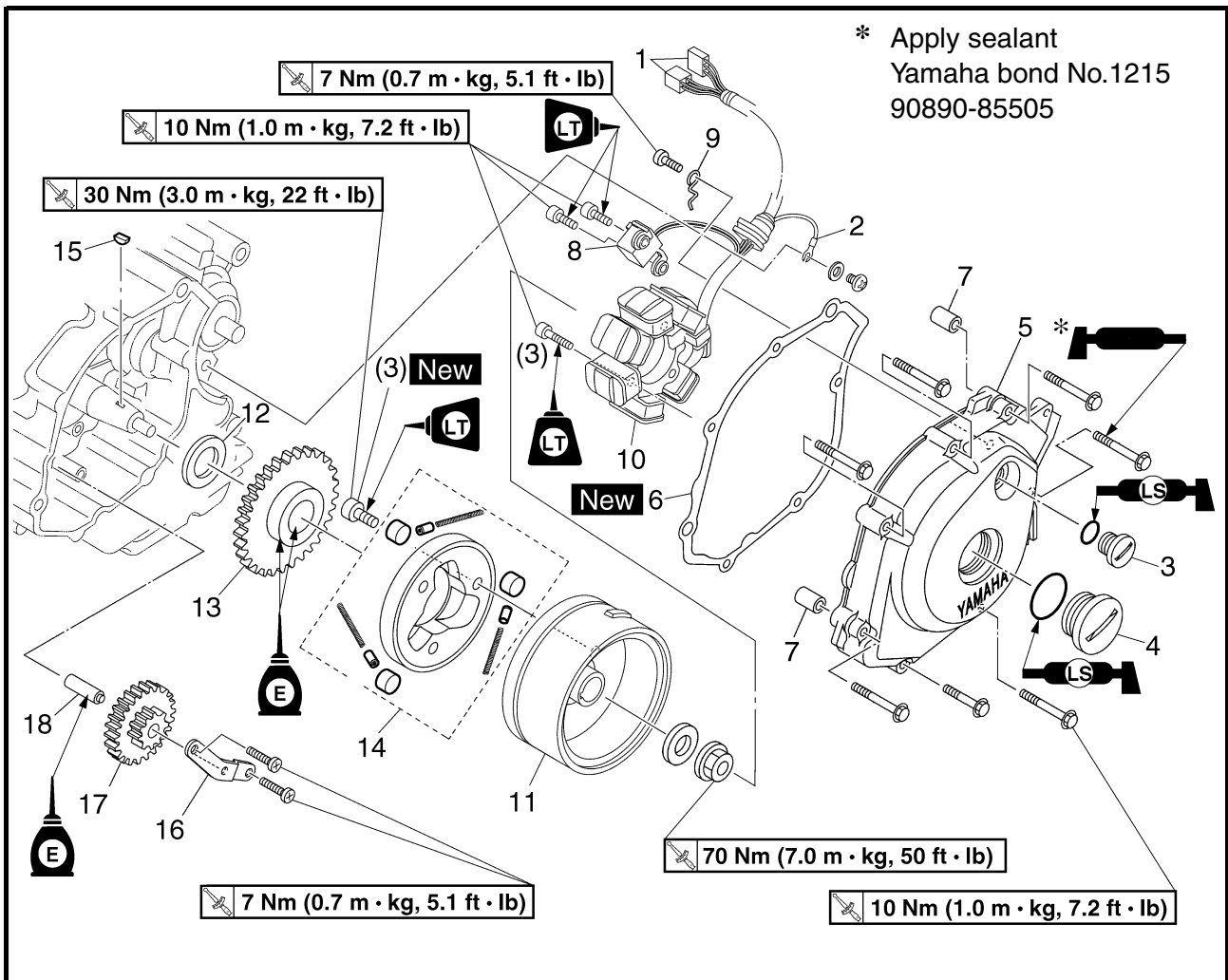
ENG



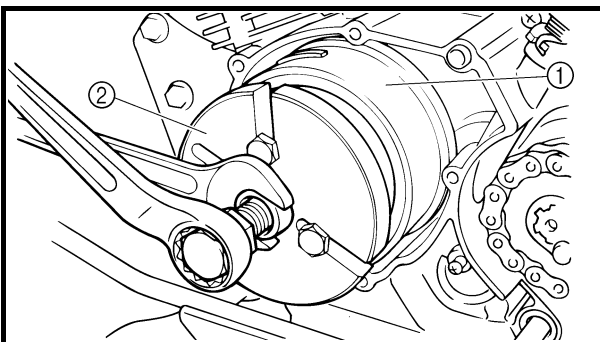
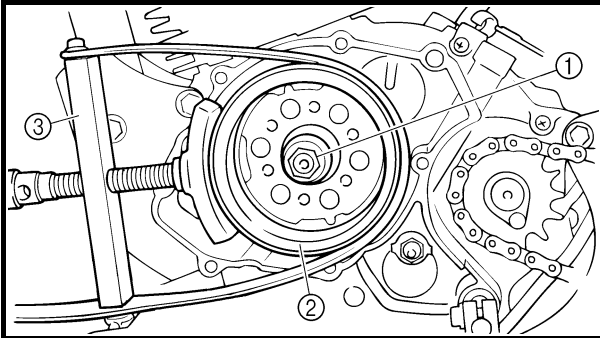
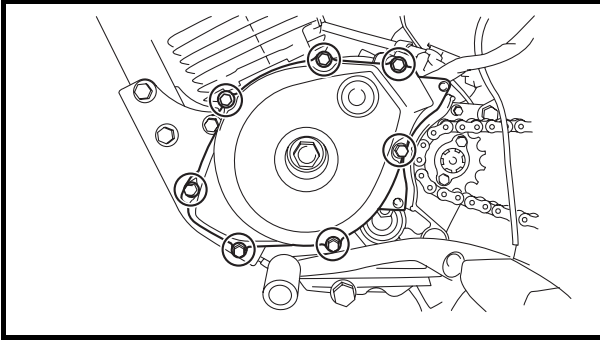
Order	Job/Part	Q'ty	Remarks
6	A.C. magneto rotor cover gasket	1	
7	Dowel pin	2	
8	Pickup coil	1	Refer to "INSTALLING THE A.C. MAGNETO ROTOR".
9	Stator coil lead holder	1	
10	Stator coil	1	
11	A.C. magneto rotor	1	Refer to "REMOVING THE A.C. MAGNETO ROTOR" and "INSTALLING THE A.C. MAGNETO ROTOR".
12	Washer	1	
13	Starter clutch gear	1	
14	Starter clutch assembly	1	Refer to "REMOVING THE STARTER CLUTCH" and "INSTALLING THE STARTER CLUTCH".
15	Woodruff key	1	

# STARTER CLUTCH AND A.C. MAGNETO ROTOR

ENG



Order	Job/Part	Q'ty	Remarks
16	Starter clutch idle gear holder	1	For installation, reverse the removal procedure.
17	Starter clutch idle gear	1	
18	Starter clutch idle gear shaft	1	



EAS00347

## REMOVING THE A.C. MAGNETO ROTOR

1. Remove:

- A.C. magneto 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.

2. Remove:

- A.C. magneto rotor nut ①
- washer

**NOTE:** \_\_\_\_\_

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



**Sheave holder**  
90890-01701, YS-01880-A

3. Remove:

- A.C. magneto rotor ①  
(with the flywheel puller ②)

**CAUTION:** \_\_\_\_\_

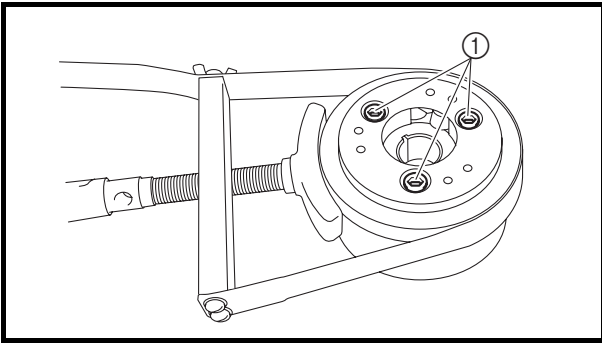
To protect the end of the crankshaft, place an appropriate sized socket between the flywheel puller set's center bolt and the crankshaft.

**NOTE:** \_\_\_\_\_

Make sure the flywheel puller is centered over the A.C. magneto rotor.



**Flywheel puller**  
90890-01362, YU-33270-B



## REMOVING THE STARTER CLUTCH

1. Remove:
  - starter clutch

### NOTE:

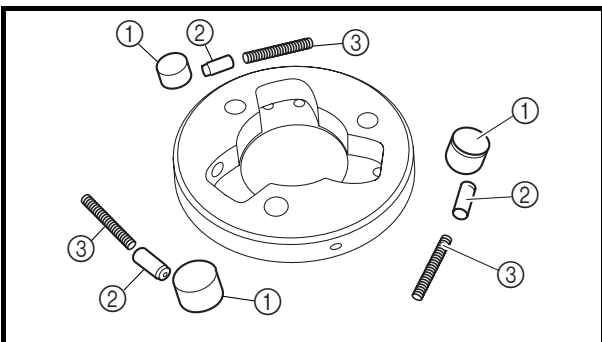
- While holding the A.C. magneto rotor with the sheave holder, remove the starter clutch bolts ①.
- Do not allow the sheave holder to touch the projection on the A.C. magneto rotor.



**Sheave holder**  
90890-01701, YS-01880-A

## CHECKING THE PICKUP COIL/STATOR ASSEMBLY

1. Check:
  - stator coil
  - pickup coil
 Damage → Replace the pickup coil/stator assembly.



EAS00351

## CHECKING THE STARTER CLUTCH

1. Check:
  - starter clutch rollers ①
  - starter clutch spring caps ②
  - starter clutch springs ③
 Damage/wear → Replace.
2. Check:
  - starter clutch idle gear
  - starter clutch gear
 Burrs/chips/roughness/wear → Replace the defective part(s).
3. Check:
  - starter clutch gear's contacting surfaces
 Damage/pitting/wear → Replace the starter clutch gear.





EAS00354

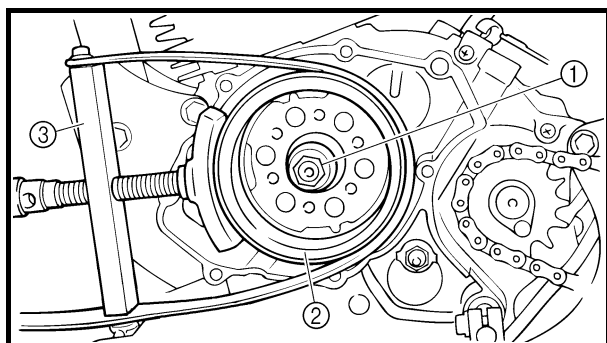
## INSTALLING THE A.C. MAGNETO ROTOR

### 1. Install:

- woodruff key
- A.C. magneto rotor
- washer
- A.C. magneto rotor nut

### NOTE:

- Clean the tapered portion of the crankshaft and the A.C. magneto rotor hub.
- When installing the A.C. magneto rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft.



### 2. Tighten:

- A.C. magneto rotor nut ①

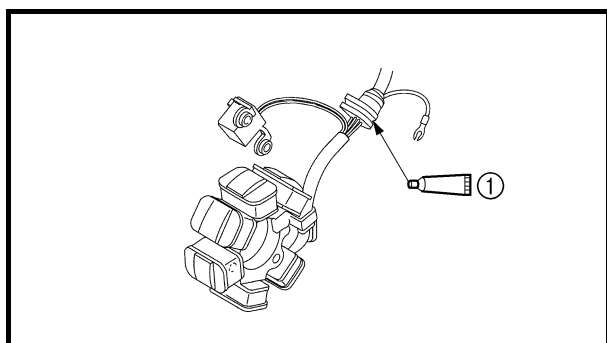
70 Nm (7.0 m · kg, 50 ft · lb)

### NOTE:

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



**Sheave holder**  
90890-01701, YS-01880-A



### 3. Apply:

- sealant ①  
(into the slits)

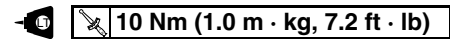


**Yamaha bond No. 1215**  
90890-85505

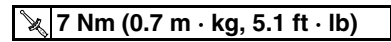


#### 4. Install:

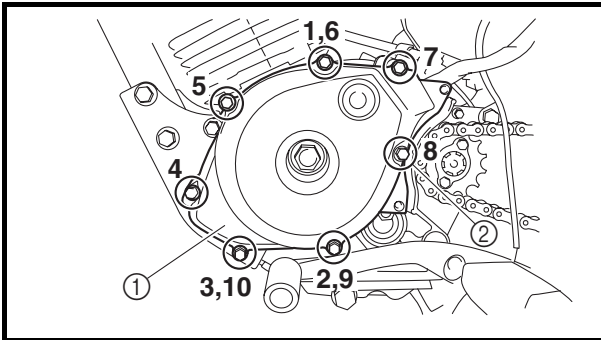
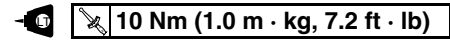
- stator coil



- stator coil lead holder

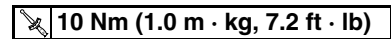


- pickup coil



#### 5. Install:

- A.C. magneto rotor cover ①



#### NOTE:

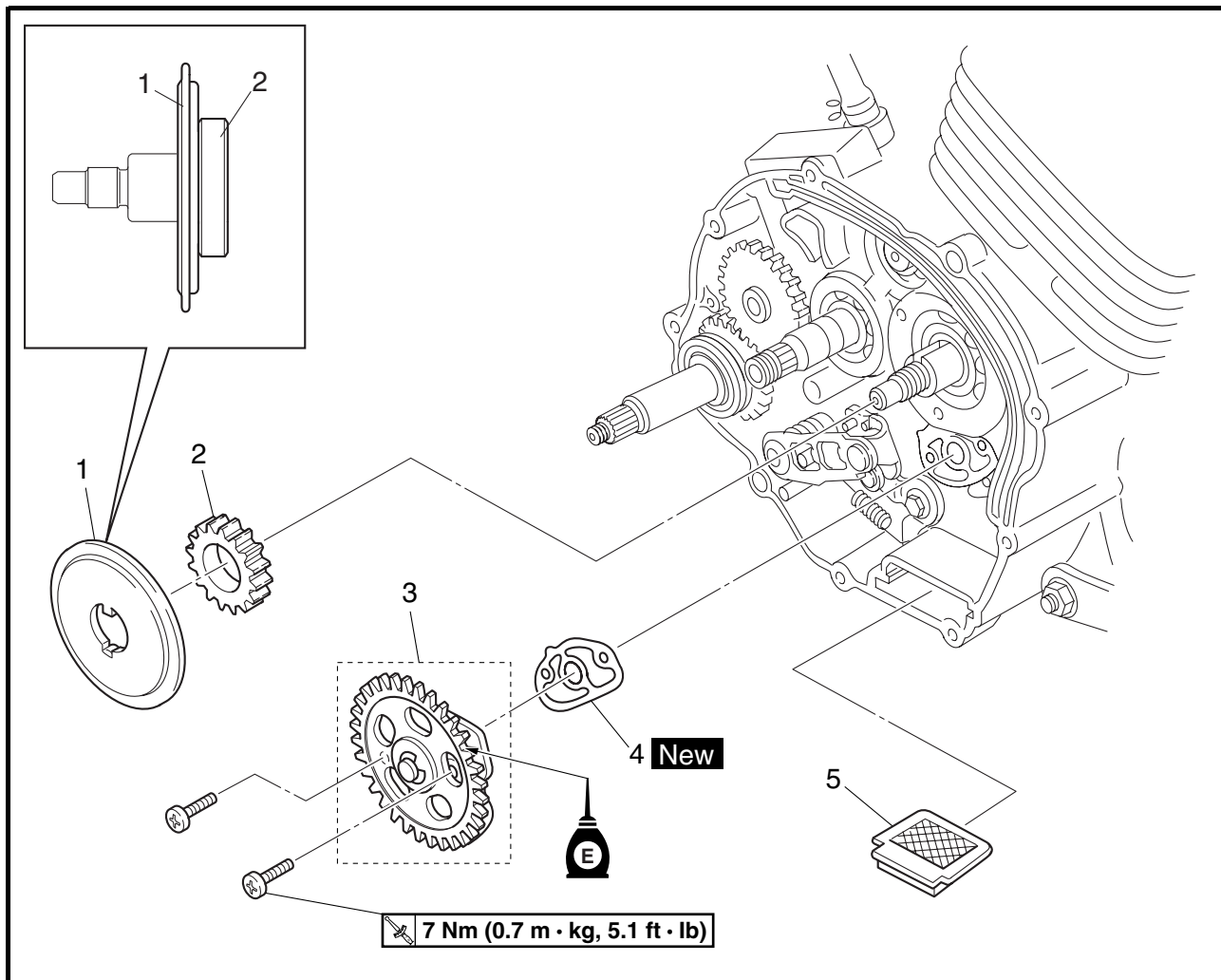
- Apply sealant to the threads of the A.C. magneto rotor cover bolt ②.
- Tighten the A.C. magneto rotor cover bolts in the proper tightening sequence as shown.



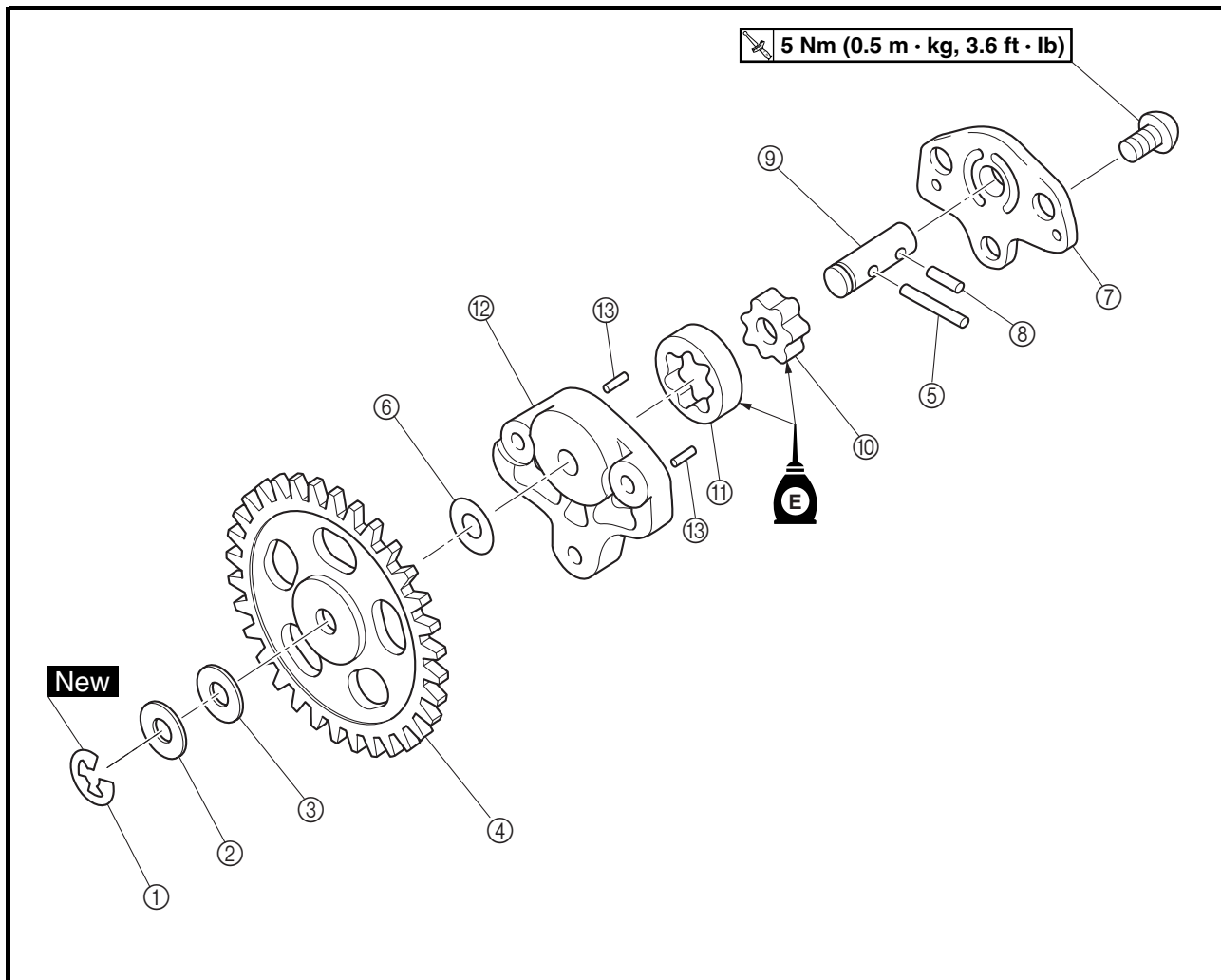


EAS00360

OIL PUMP



Order	Job/Part	Q'ty	Remarks
	<b>Removing the oil pump</b>		
	Clutch housing/primary drive gear		Remove the parts in the order listed. Refer to "CLUTCH".
1	Rotary filter	1	Refer to "INSTALLING THE ROTARY FILTER".
2	Oil pump drive gear	1	
3	Oil pump assembly	1	
4	Oil pump gasket	1	Refer to "INSTALLING THE OIL PUMP".
5	Oil strainer	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the oil pump</b>		Remove the parts in the order listed.
①	Circlip	1	Refer to "ASSEMBLING THE OIL PUMP".
②	Washer	1	
③	Spring washer	1	
④	Oil pump driven gear	1	
⑤	Dowel pin	1	
⑥	Washer	1	
⑦	Oil pump housing cover	1	
⑧	Dowel pin	1	
⑨	Oil pump shaft	1	
⑩	Inner rotor	1	
⑪	Outer rotor	1	
⑫	Oil pump housing	1	
⑬	Dowel pin	2	
			For assembly, reverse the disassembly procedure.

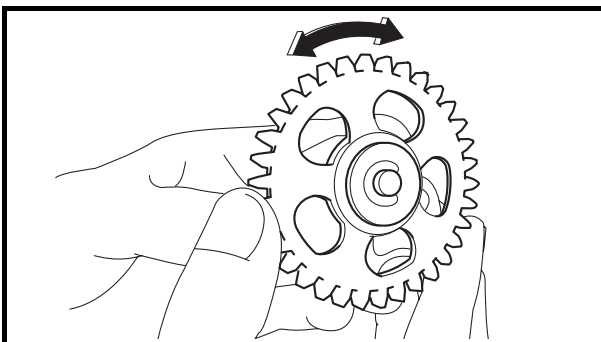
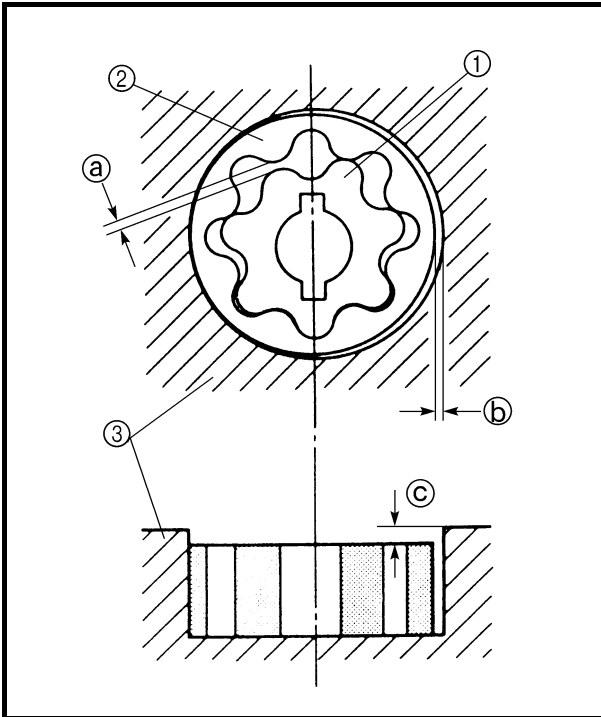


EAS00364

**CHECKING THE OIL PUMP**

## 1. Check:

- oil pump drive gear
  - oil pump driven gear
  - oil pump housing
  - oil pump housing cover
- Cracks/damage/wear → Replace the defective part(s).



## 2. Measure:

- inner-rotor-to-outer-rotor-tip clearance (a)
  - outer-rotor-to-oil-pump-housing clearance (b)
  - oil-pump-housing-to-inner-rotor-and-outer-rotor clearance (c)
- Out of specification → Replace the oil pump.

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

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

0.07 mm (0.0028 in)

&lt;Limit&gt;: 0.15 mm (0.0059 in)

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

0.13 ~ 0.19 mm

(0.0051 ~ 0.0075 in)

&lt;Limit&gt;: 0.26 mm (0.010 in)

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

0.06 ~ 0.10 mm

(0.0024 ~ 0.0039 in)

&lt;Limit&gt;: 0.17 mm (0.0067 in)

## 3. Check:

- oil pump operation
- Rough movement → Repeat steps (1) and (2) or replace the defective part(s).

EAS00368

**CHECKING THE OIL STRAINER**

## 1. Check:

- oil strainer
- Damage → Replace.  
Contaminants → Clean with solvent.



EAS00371

**CHECKING THE ROTARY FILTER**

## 1. Check:

- rotary filter
  - Cracks/damage/wear → Replace.
  - Contaminants → Clean with engine oil.

EAS00375

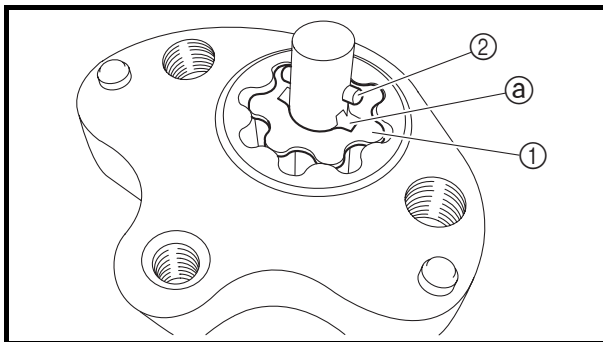
**ASSEMBLING THE OIL PUMP**

## 1. Lubricate:

- inner rotor
- outer rotor
- oil pump shaft  
(with the recommended lubricant)



**Recommended lubricant**  
**Engine oil**



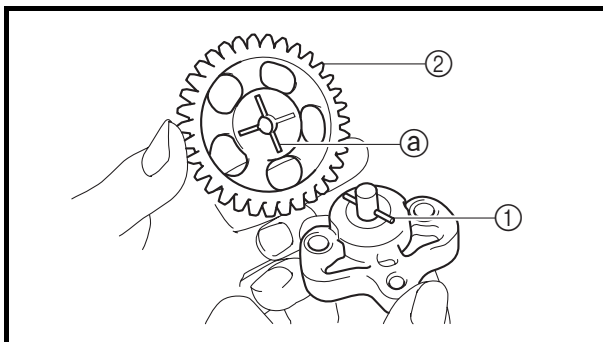
## 2. Install:

- inner rotor ①
- dowel pin ②
- oil pump housing cover

**5 Nm (0.5 m · kg, 3.6 ft · lb)**

**NOTE:**

When installing the inner rotor, align the pin in the oil pump shaft with the groove (a) in the inner rotor.

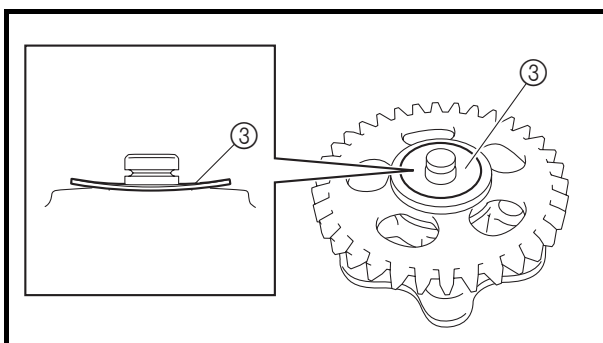


## 3. Install:

- dowel pin ①
- oil pump driven gear ②
- spring washer ③
- washer
- circlip **New**

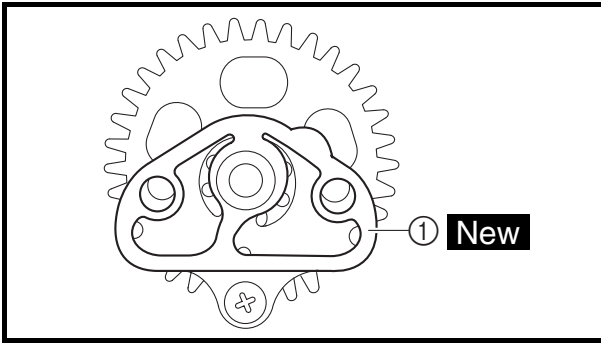
**NOTE:**

- When installing the oil pump driven gear, align the pin in the oil pump shaft with groove (a) in the oil pump driven gear.
- Install the spring washer as shown in the illustration.



## 4. Check:


- oil pump operation  
Refer to "CHECKING THE OIL PUMP".



EAS00376

**INSTALLING THE OIL PUMP**

1. Install:

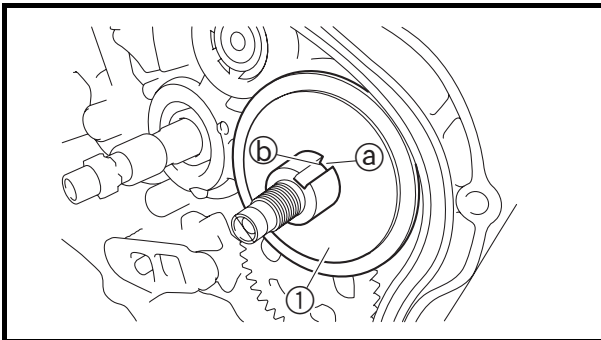
- oil pump gasket ① **New**
- oil pump  **7 Nm (0.7 m · kg, 5.1 ft · lb)**

**CAUTION:** \_\_\_\_\_

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

**NOTE:** \_\_\_\_\_

Install the oil pump gasket as shown in the illustration.



EAS00377

**INSTALLING THE ROTARY FILTER**

1. Install:

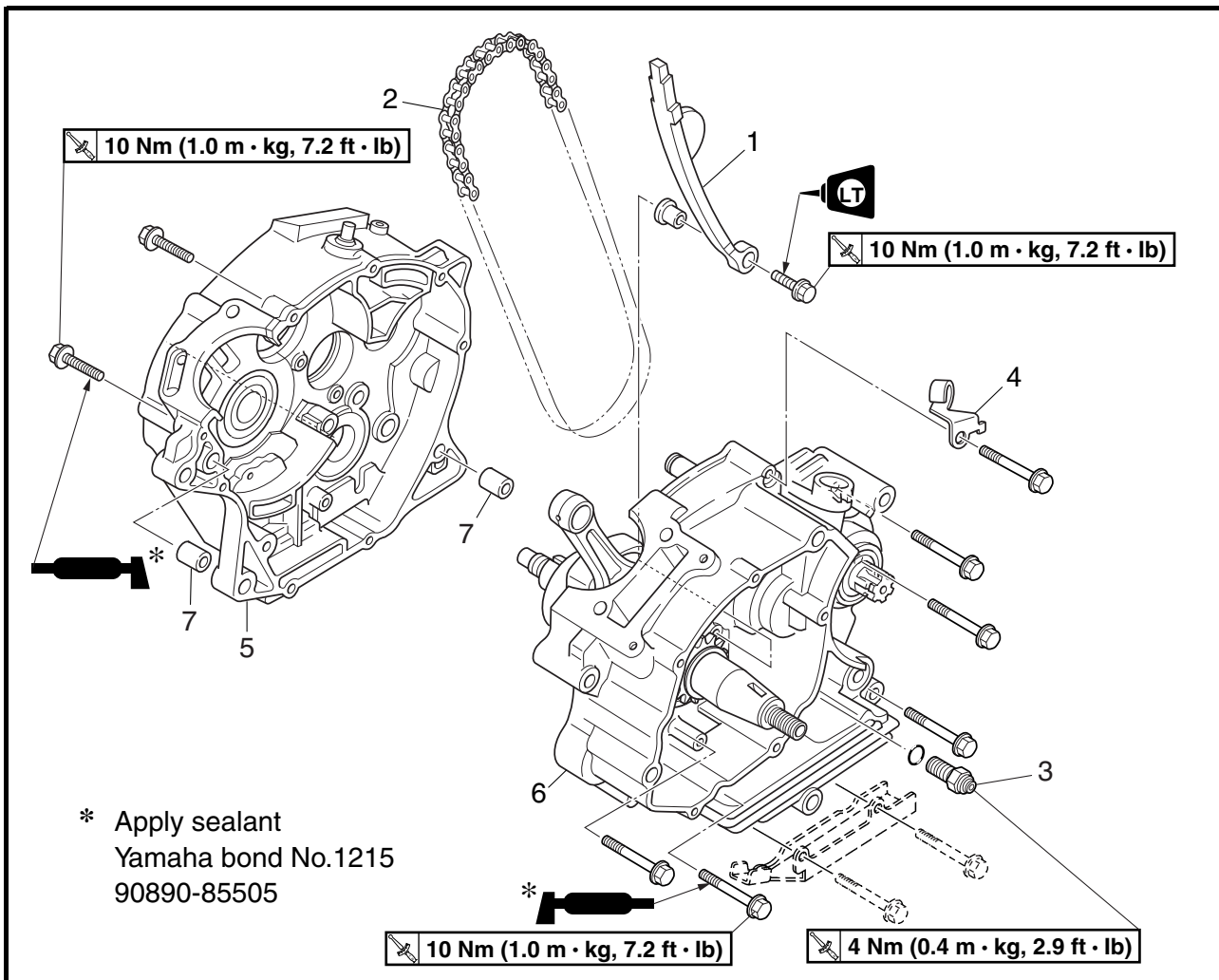
- rotary filter ①

**NOTE:** \_\_\_\_\_

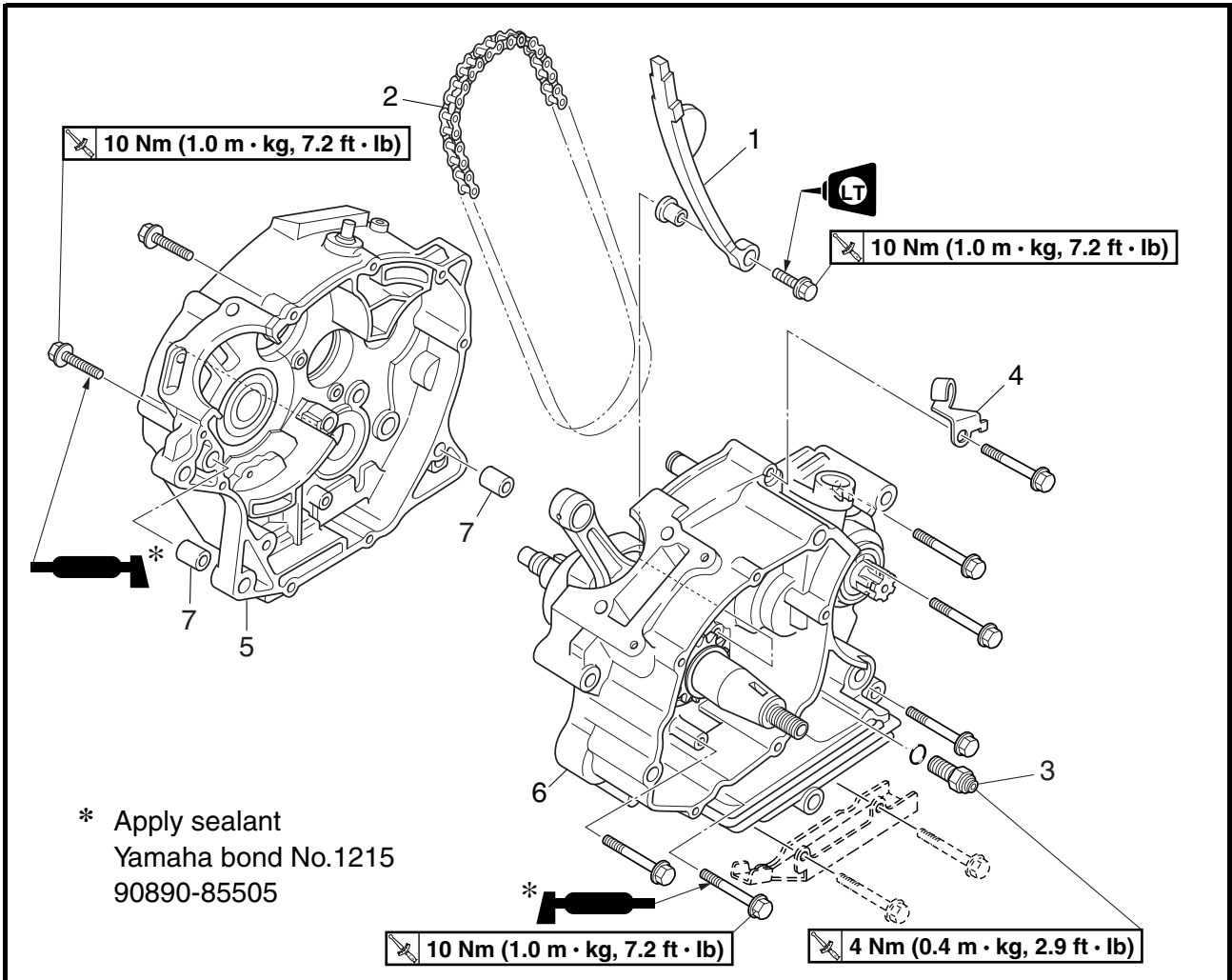
Align the projection (a) on the rotary filter with the oil hole (b) in the crankshaft.



CRANKCASE



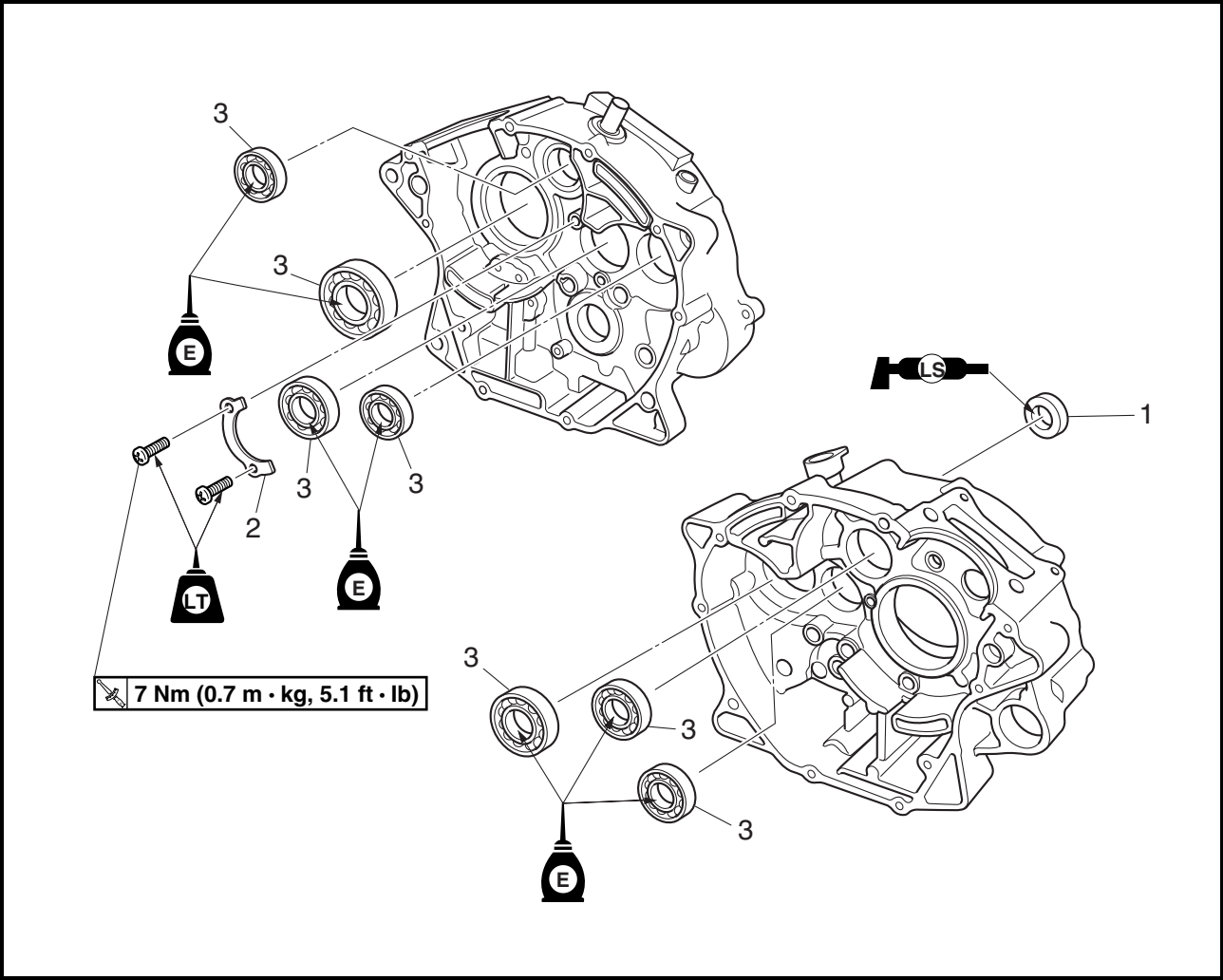
Order	Job/Part	Q'ty	Remarks
	<b>Separating the crankcase</b>		Remove the parts in the order listed.
	Engine		Refer to "ENGINE REMOVAL".
	Cylinder head		Refer to "CYLINDER HEAD".
	Cylinder/piston		Refer to "CYLINDER AND PISTON".
	A.C. magneto rotor/starter clutch idle gear		Refer to "STARTER CLUTCH AND A.C. MAGNETO ROTOR".
	Clutch/primary drive gear		Refer to "CLUTCH".
	Kickstarter assembly/kickstarter idle gear		Refer to "KICKSTARTER".
	Oil pump		Refer to "OIL PUMP".
	Shift shaft/shift drum segment		Refer to "SHIFT SHAFT AND STOPPER LEVER".
1	Timing chain guide (intake side)	1	
2	Timing chain	1	
3	Neutral switch	1	



Order	Job/Part	Q'ty	Remarks
4	Clutch cable holder	1	Refer to "SEPARATING THE CRANK-CASE".
5	Right crankcase	1	
6	Left crankcase	1	
7	Dowel pin	2	
			For installation, reverse the removal procedure.



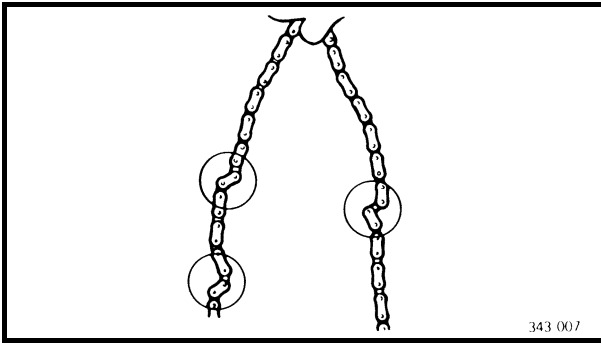
CRANKCASE BEARINGS



Order	Job/Part	Q'ty	Remarks
	<b>Removing the crankcase bearings</b>		
	Crankshaft/balancer shaft		Remove the parts in the order listed. Refer to "CRANKSHAFT".
	Transmission		Refer to "TRANSMISSION".
1	Oil seal	1	
2	Bearing retainer	1	
3	Bearing	7	
			For installation, reverse the removal procedure.



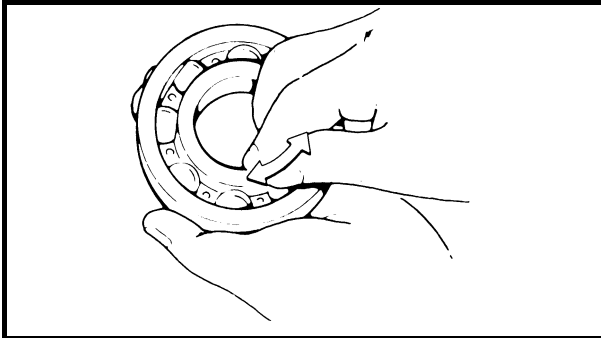




EAS00207

### CHECKING THE TIMING CHAIN AND TIMING CHAIN GUIDE

1. Check:
  - timing chain
    - Damage/stiffness → Replace the timing chain and camshaft sprocket as a set.
2. Check:
  - timing chain guide (intake side)
    - Damage/wear → Replace.



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 seal
    - Damage/wear → Replace.


EAS00418

### ASSEMBLING THE CRANKCASE

1. Lubricate:
  - bearings
  - oil seal

	<b>Recommended lubricant</b> <b>Bearing</b> <b>Engine oil</b> <b>Oil seal</b> <b>Lithium-soap-based grease</b>
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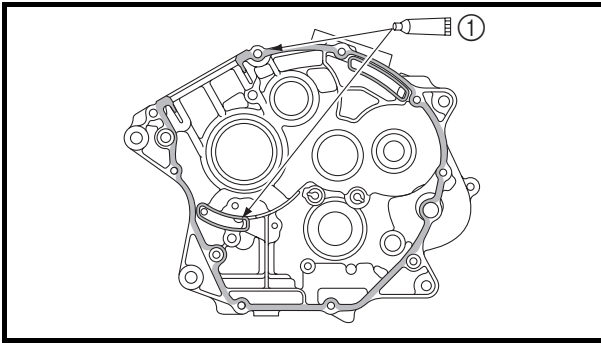
2. Install:
  - bearings **New**
  - bearing retainer  
(to the right crankcase)
  - bearing retainer bolts

 **7 Nm (0.7 m · kg, 5.1 ft · lb)**

#### NOTE:

Install the bearing retainer with its rounded side facing the bearing.

3. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces.



4. Apply:
- sealant ①  
(to the mating surfaces of both crankcase halves)



**Yamaha bond No. 1215**  
**90890-85505**

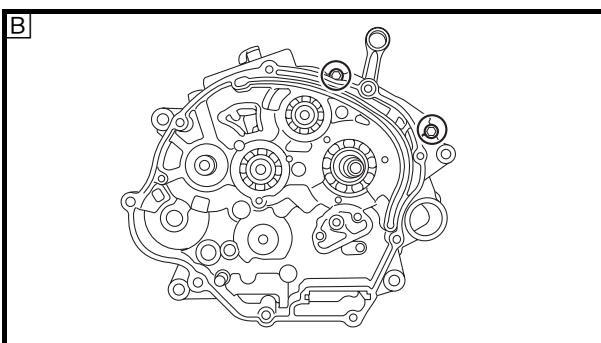
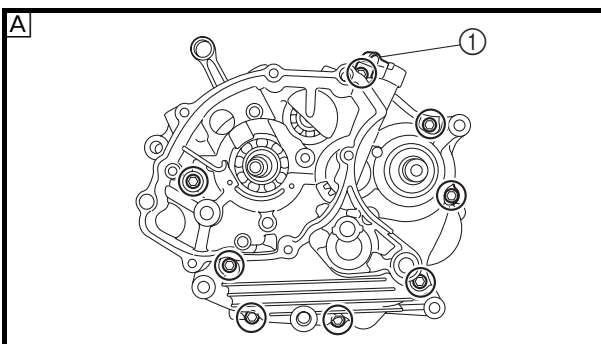
**NOTE:**

Do not allow any sealant to come into contact with the oil gallery.

5. Fit the right crankcase onto the left crankcase. Tap lightly on the case with a soft hammer.

**CAUTION:**

**Before installing and torquing the crankcase bolts, be sure to check whether the transmission is functioning properly by manually rotating the shift drum in both directions.**



6. Install:
- clutch cable holder ①
  - crankcase bolts

**NOTE:**

Apply sealant to the threads of the crankcase bolts.

- A Left crankcase
- B Right crankcase

7. Tighten:

- crankcase bolts  
(follow the proper tightening sequence)

**10 Nm (1.0 m · kg, 7.2 ft · lb)**

**NOTE:**

Tighten the bolts in stages, using a crisscross pattern.



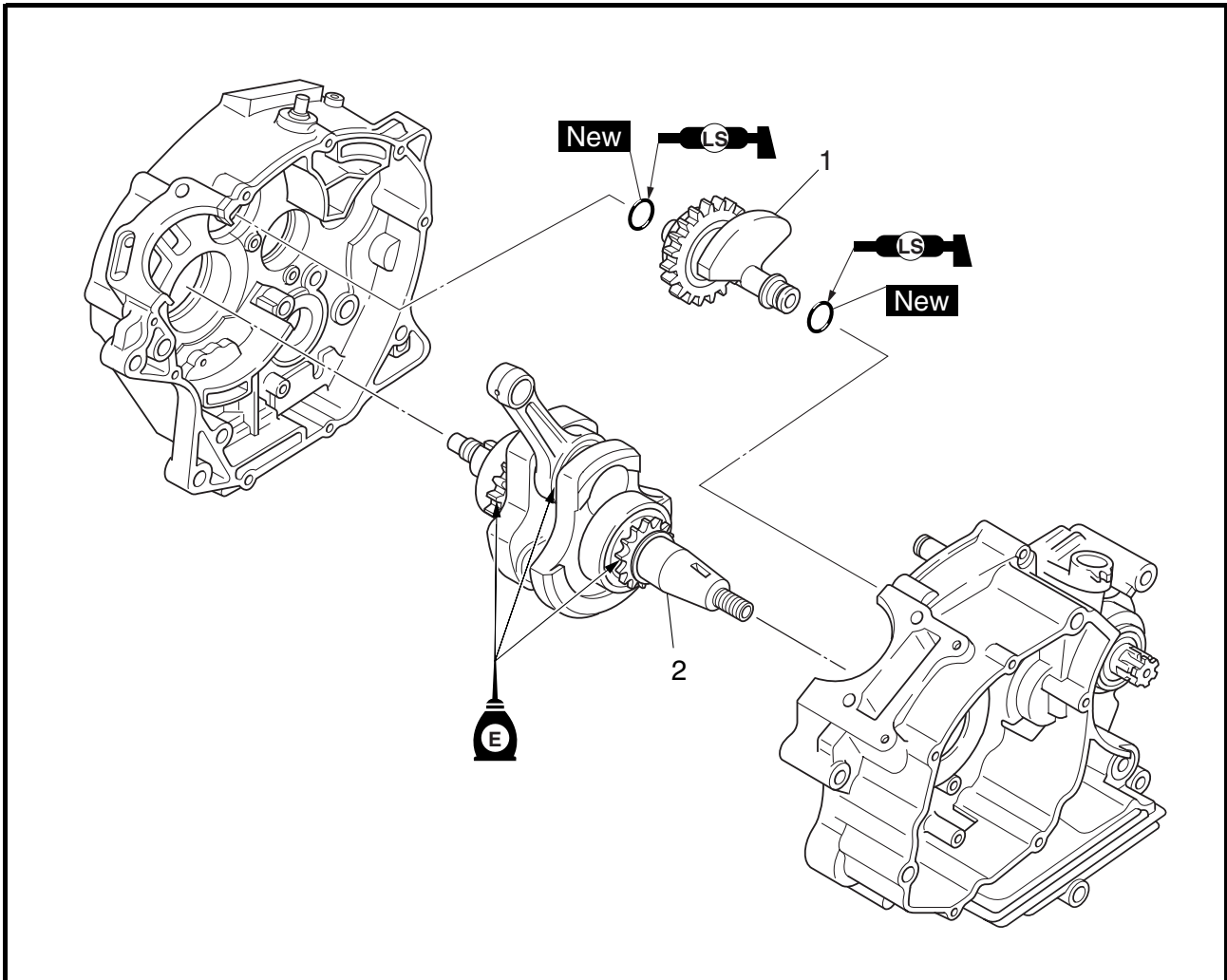
8. Apply:
  - 4-stroke engine oil  
(to the crankshaft pin, bearing, and oil delivery hole)
9. Check:
  - crankshaft and transmission operation  
Unsmooth operation → Repair.



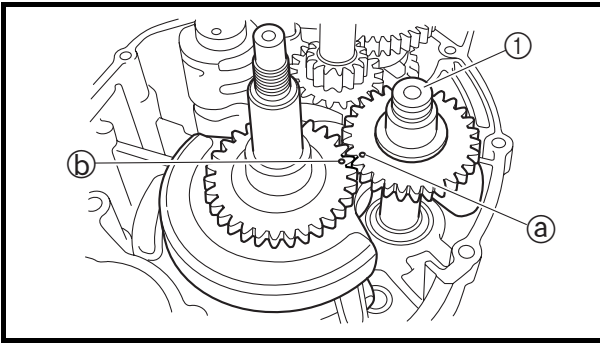
EAS00381

**CRANKSHAFT**

**CRANKSHAFT AND BALANCER**



Order	Job/Part	Q'ty	Remarks
	<b>Removing the crankshaft and balancer</b>		Remove the parts in the order listed.
	Crankcase		Separate. Refer to "CRANKCASE".
1	Balancer	1	Refer to "REMOVING THE CRANKSHAFT AND BALANCER" and "INSTALLING THE CRANKSHAFT AND BALANCER".
2	Crankshaft	1	
			For installation, reverse the removal procedure.



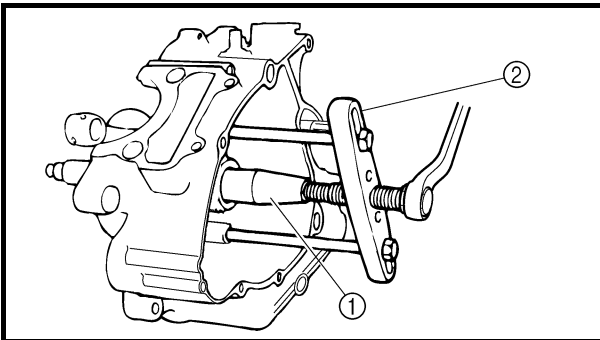
EAS00388

## REMOVING THE CRANKSHAFT AND BALANCER

1. Remove:
  - balancer ①

### NOTE:

Align the punch mark (a) on the balancer driven gear with the punch mark (b) on the balancer drive gear, and then remove the balancer shaft.



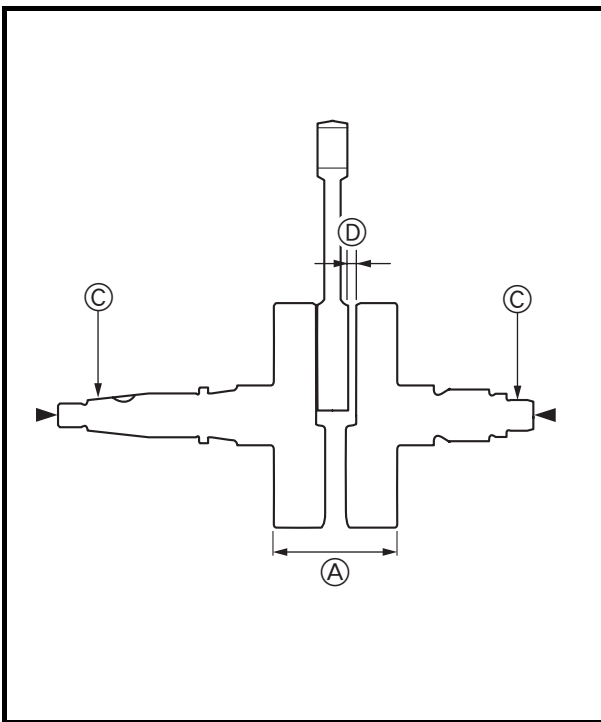
2. Remove:
  - crankshaft ①

### NOTE:

- Remove the crankshaft with the crankcase separating tool ②.
- Make sure the crankcase separating tool is centered over the crankshaft.



**Crankcase separating tool**  
90890-01135, YU-01135-B



EAS00394

## CHECKING THE CRANKSHAFT

### 1. Measure:

- crankshaft runout (B)  
Out of specification → Replace the crankshaft, bearing or both.

### NOTE:

Turn the crankshaft slowly.



**Maximum crankshaft runout**  
**0.030 mm (0.0012 in)**

### 2. Measure:

- big end side clearance (D)  
Out of specification → Replace the crankshaft.



**Big end side clearance**  
**0.150 ~ 0.450 mm**  
**(0.0059 ~ 0.0177 in)**

### 3. Measure:

- crankshaft width (A)  
Out of specification → Replace the crankshaft.



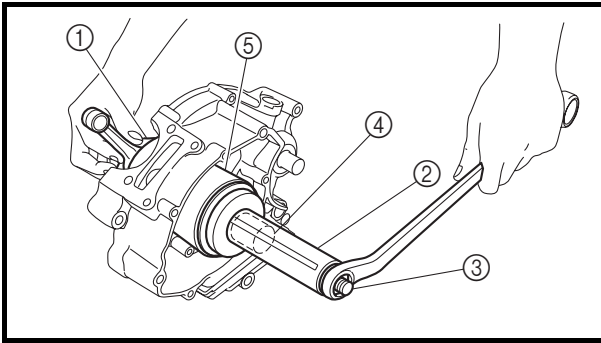
**Crankshaft width**  
**46.95 ~ 47.00 mm**  
**(1.848 ~ 1.850 in)**

### 4. Check:

- crankshaft sprocket  
Damage/wear → Replace the crankshaft.
- bearing  
Cracks/damage/wear → Replace the crankshaft.

### 5. Check:

- crankshaft journal  
Scratches/wear → Replace the crankshaft.
- crankshaft journal oil passage  
Obstruction → Blow out with compressed air.



EAS00408

## INSTALLING THE CRANKSHAFT AND BALANCER

1. Install:

- crankshaft ①

### NOTE:

Install the crankshaft with the crankshaft installer pot, crankshaft installer bolt, adapter (M12) and spacer.



**Crankshaft installer pot** ②

90890-01274,  
YU-90058, YU-90059

**Crankshaft installer bolt** ③

90890-01275, YU-90060

**Adapter (M12)** ④

90890-01278, YU-90063

**Spacer (crankshaft installer)** ⑤

90890-04081, YM-91044

### CAUTION:

To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

### NOTE:

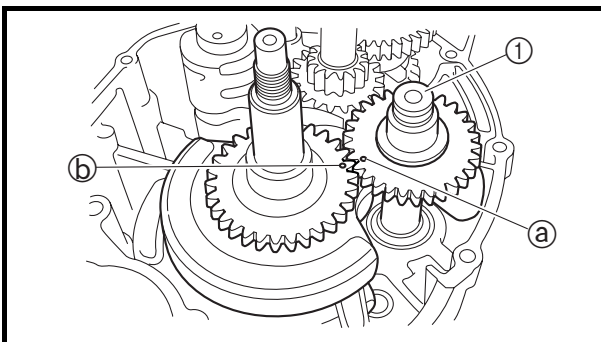
Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer bolt until the crankshaft assembly bottoms against the bearing.

2. Install:

- balancer ①

### NOTE:

Align the punch mark ① in the balancer driven gear with the punch mark ② in the balancer drive gear.

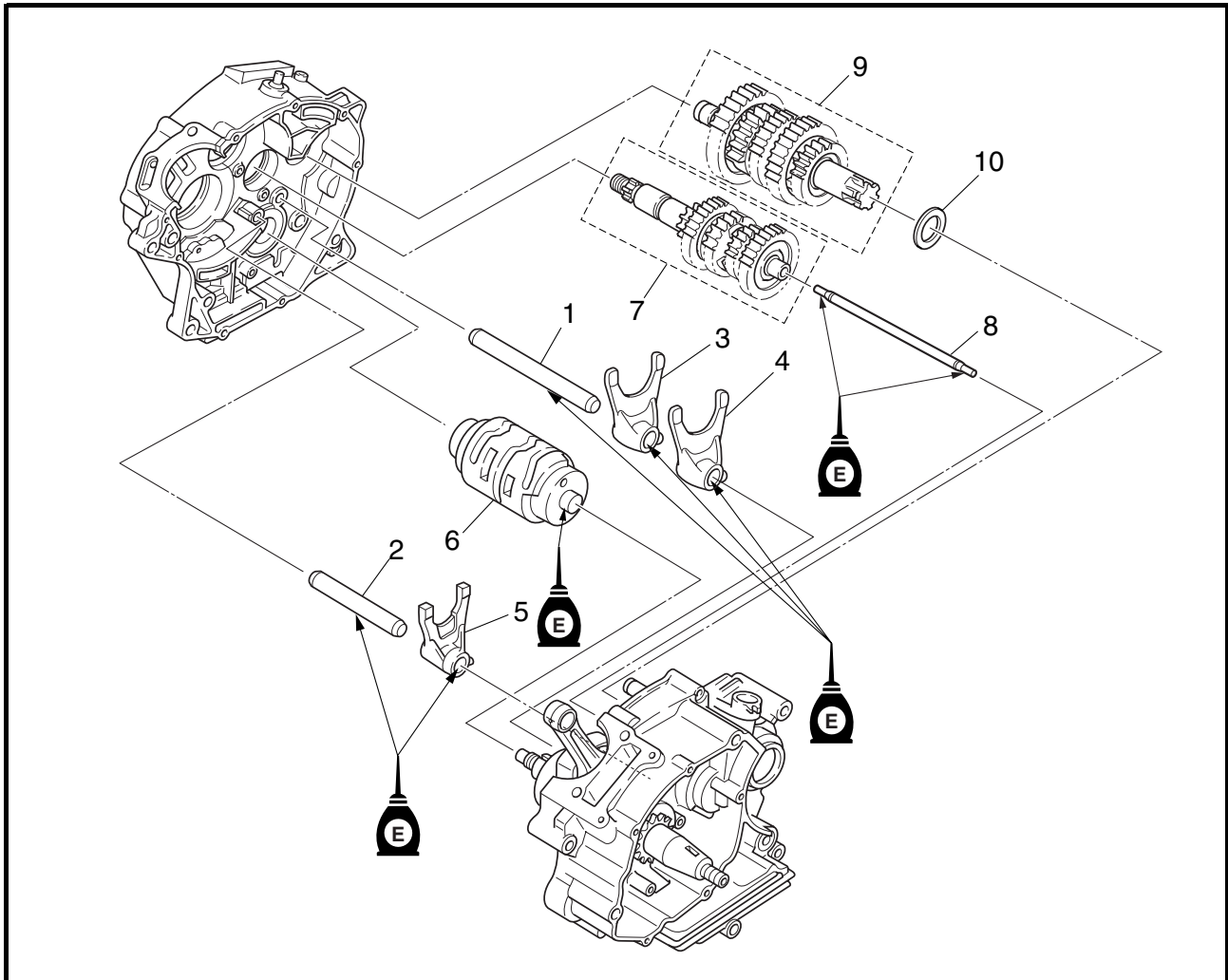




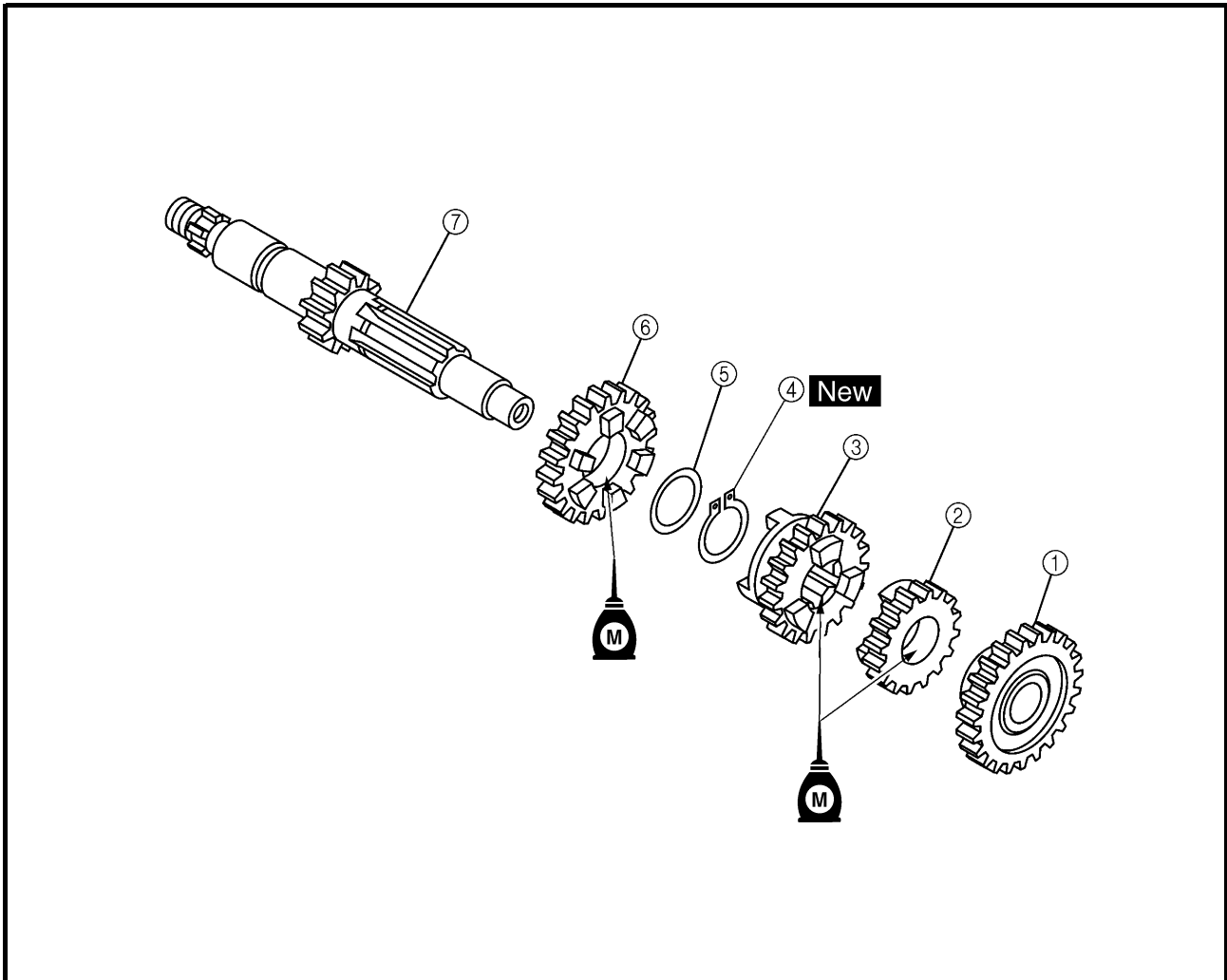


EAS00419

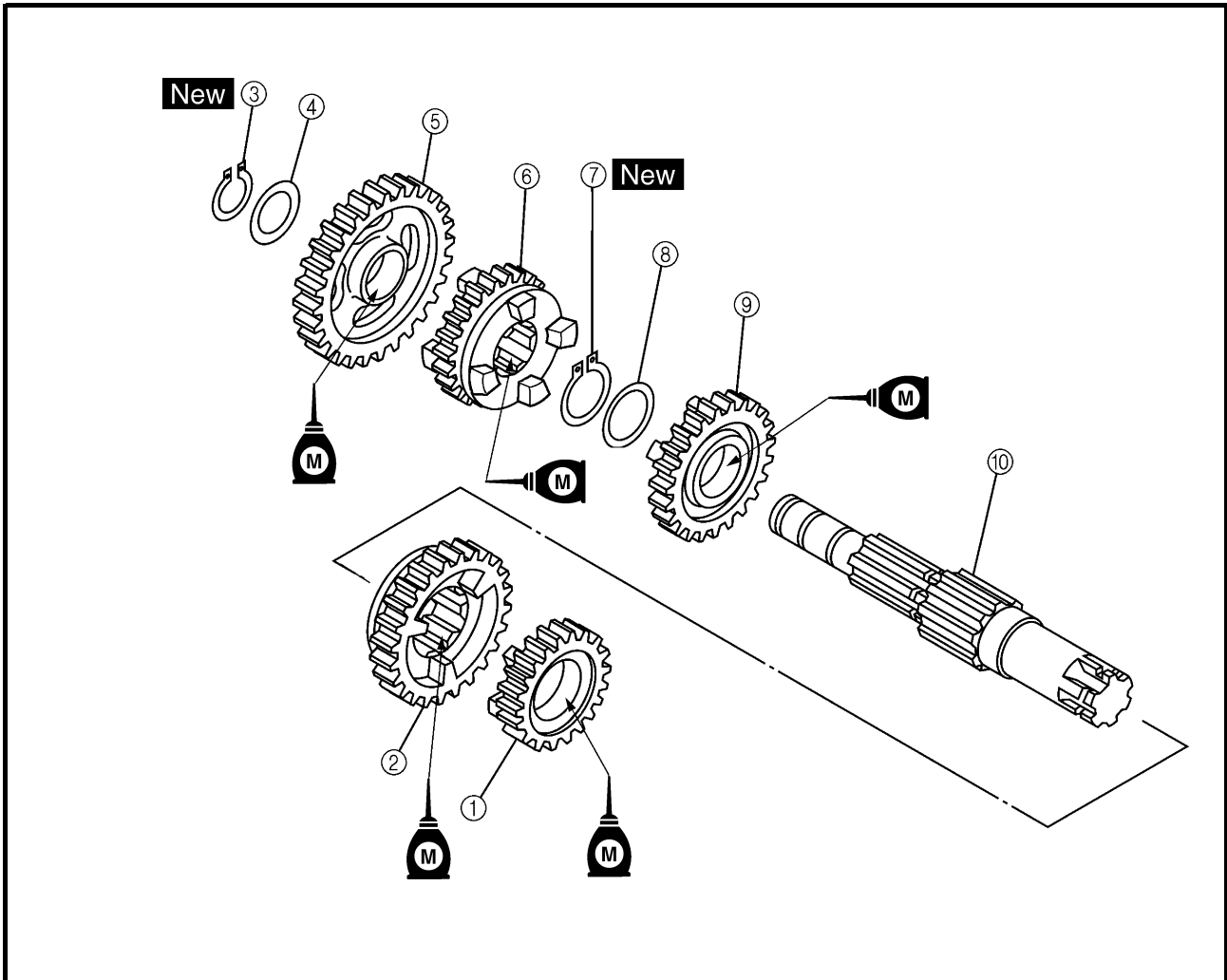
TRANSMISSION



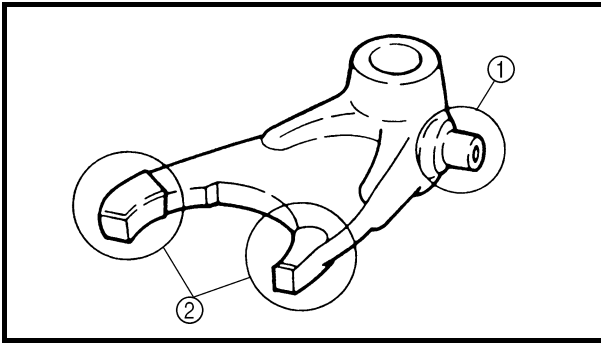
Order	Job/Part	Q'ty	Remarks
	<b>Removing the transmission, shift drum, and shift forks</b>		Remove the parts in the order listed.
	Crankcase		Separate. Refer to "CRANKCASE".
1	Long shift fork guide bar	1	Refer to "INSTALLING THE TRANSMISSION".
2	Short shift fork guide bar	1	
3	Shift fork "R"	1	
4	Shift fork "L"	1	
5	Shift fork "C"	1	
6	Shift drum	1	
7	Main axle assembly	1	
8	Long clutch push rod	1	
9	Drive axle assembly	1	
10	Washer	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the main axle</b>		Remove the parts in the order listed.
①	5th pinion gear	1	Refer to "ASSEMBLING THE MAIN AXLE AND DRIVE AXLE".
②	2nd pinion gear	1	
③	3rd pinion gear	1	
④	Circlip	1	Refer to "ASSEMBLING THE MAIN AXLE AND DRIVE AXLE".
⑤	Washer	1	
⑥	4th pinion gear	1	
⑦	Main axle	1	
			For assembly, reverse the disassembly procedure.



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the drive axle</b>		Remove the parts in the order listed.
①	5th wheel gear	1	Refer to "ASSEMBLING THE MAIN AXLE AND DRIVE AXLE".
②	2nd wheel gear	1	
③	Circlip	1	
④	Washer	1	
⑤	1st wheel gear	1	Refer to "ASSEMBLING THE MAIN AXLE AND DRIVE AXLE".
⑥	4th wheel gear	1	
⑦	Circlip	1	
⑧	Washer	1	
⑨	3rd wheel gear	1	For assembly, reverse the disassembly procedure.
⑩	Drive axle	1	



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:

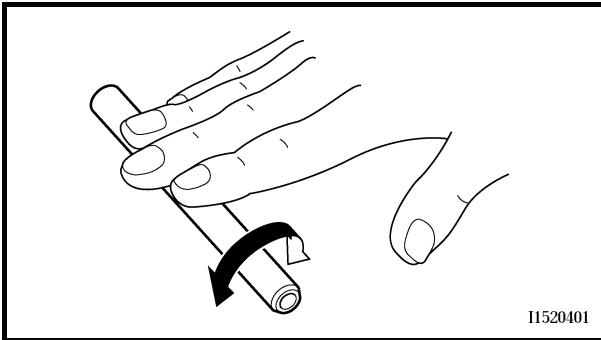
- shift fork guide bar

Roll the shift fork guide bar on a flat surface.

Bends → Replace.

### **⚠ WARNING**

**Do not attempt to straighten a bent shift fork guide bar.**

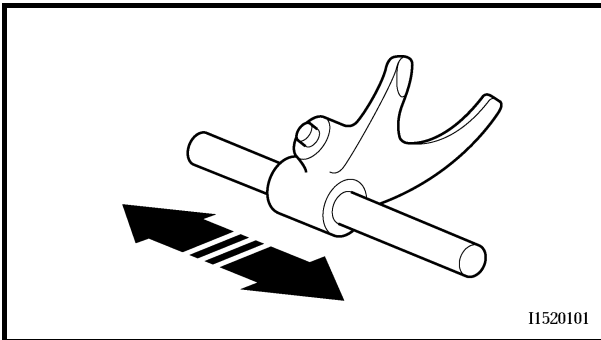


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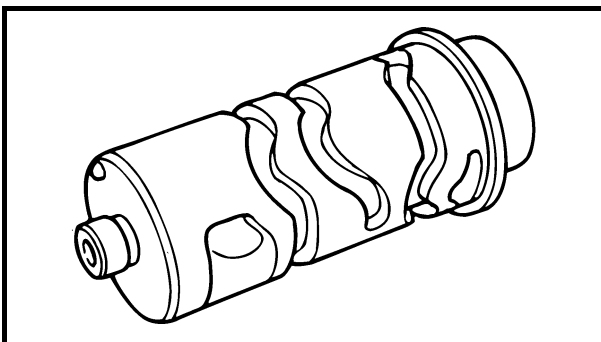
### 3. Check:

- shift fork movement  
(along the shift fork guide bar)

Rough movement → Replace the shift forks and shift fork guide bar as a set.



I1520101



EAS00422

## CHECKING THE SHIFT DRUM

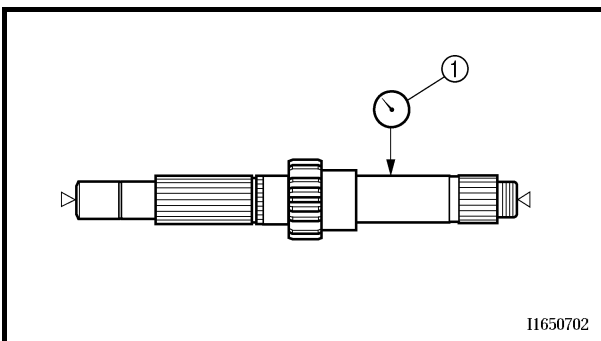
### 1. Check:

- shift drum grooves

Damage/scratches/wear → Replace the shift drum assembly.

- shift drum segment

Damage/wear → Replace the shift drum assembly.



I1650702

EAS00425

## CHECKING THE TRANSMISSION

### 1. Measure:

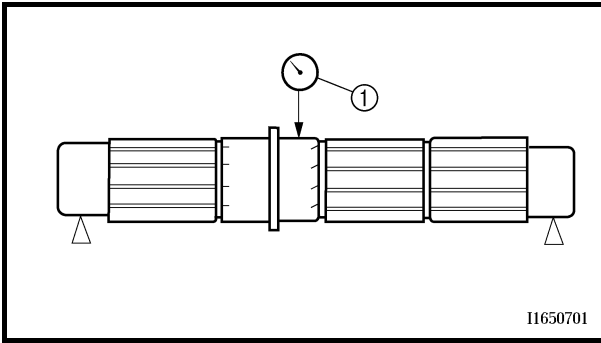
- main axle runout

(with a centering device and dial gauge ①)

Out of specification → Replace the main axle.



**Main axle runout limit  
0.03 mm (0.0012 in)**

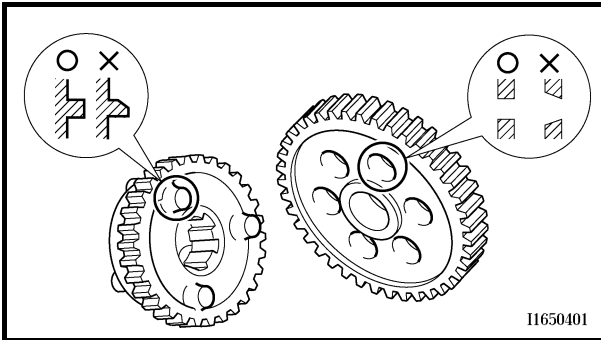


## 2. Measure:

- drive axle runout  
(with a centering device and dial gauge ①)  
Out of specification → Replace the drive axle.



**Drive axle runout limit**  
**0.03 mm (0.0012 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:

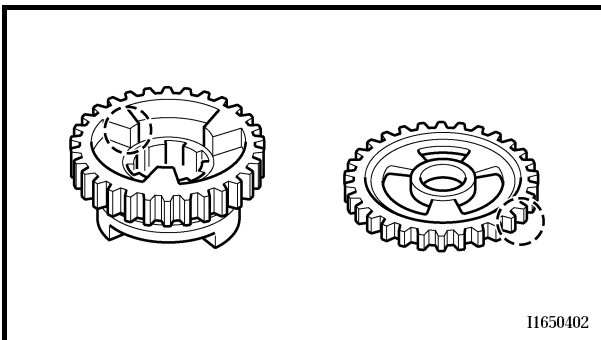
- transmission gear engagement  
(each pinion gear to its respective wheel gear)  
Incorrect → Reassemble the transmission axle assemblies.

## 5. Check:

- transmission gear movement  
Rough movement → Replace the defective part(s).

## 6. Check:

- circlips  
Bends/damage/looseness → Replace.



EAS00288

## CHECKING THE LONG CLUTCH PUSH ROD

### 1. Check:

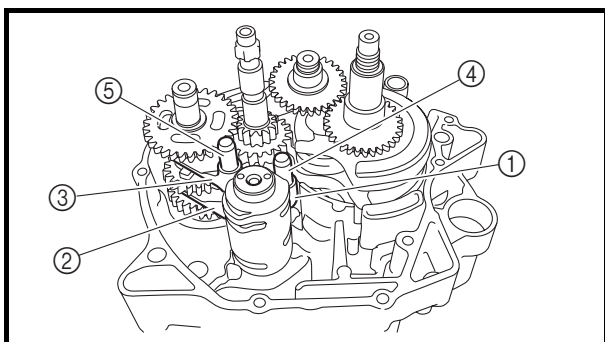
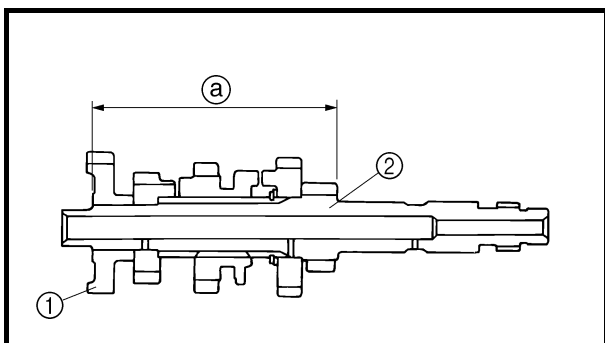
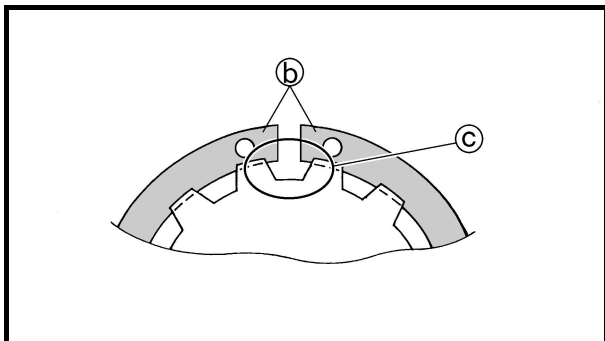
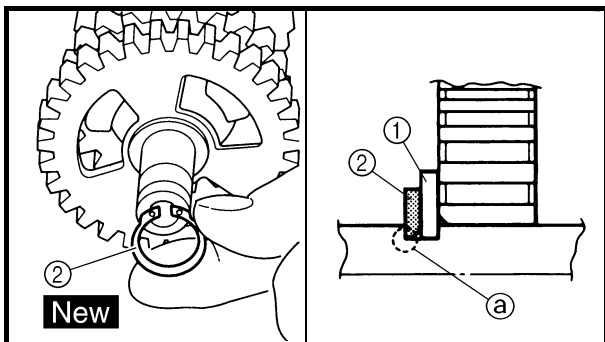
- long clutch push rod  
Cracks/damage/wear → Replace the long clutch push rod.

### 2. Measure:

- long clutch push rod bending limit  
Out of specification → Replace the long clutch push rod.



**Long clutch push rod bending limit**  
**0.500 mm (0.0197 in)**



EBS00355

**ASSEMBLING THE MAIN AXLE AND DRIVE AXLE**

1. Install:
  - washer ①
  - circlip ② **New**

**NOTE:**

- Be sure the circlip sharp-edged corner (a) is positioned opposite side to the toothed washer and gear.
- Be sure the circlip end (b) is positioned at axle spline groove (c).

2. Install:
  - 5th pinion gear ①

**NOTE:**

Press the 5th pinion gear into the main axle (2), as shown in the illustration.

① 83.25 ~ 83.45 mm (3.278 ~ 3.285 in)

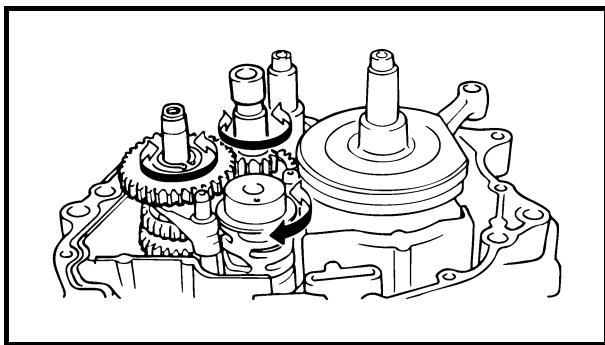
EAS00430

**INSTALLING THE TRANSMISSION**

1. Install:
  - washer
  - drive axle assembly
  - long clutch push rod
  - main axle assembly
  - shift fork "C" ①
  - shift fork "L" ②
  - shift fork "R" ③
  - short shift fork guide bar ④
  - long shift fork guide bar ⑤

**NOTE:**

- The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: "R", "C", and "L".
- Make sure that the shift fork cam follower is properly seated in the shift drum groove.



## 2. Check:

- transmission  
Rough movement → Repair.

**NOTE:**

- Apply engine oil to each gear, shaft, and bearing thoroughly.
- Before assembling the crankcase, make sure that the transmission is in neutral and that the gears turn freely.

---

## **CHAPTER 6 CARBURETOR**

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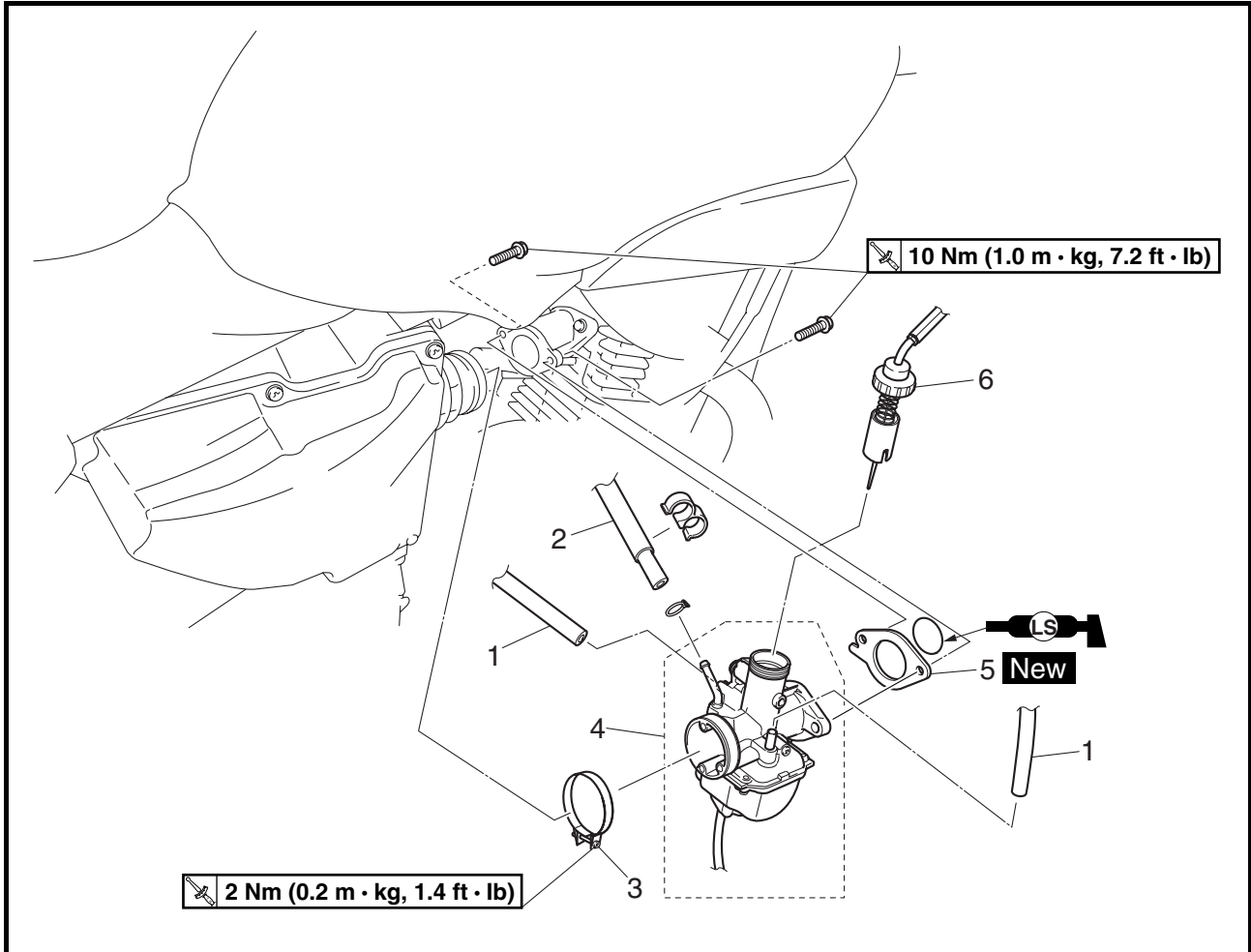




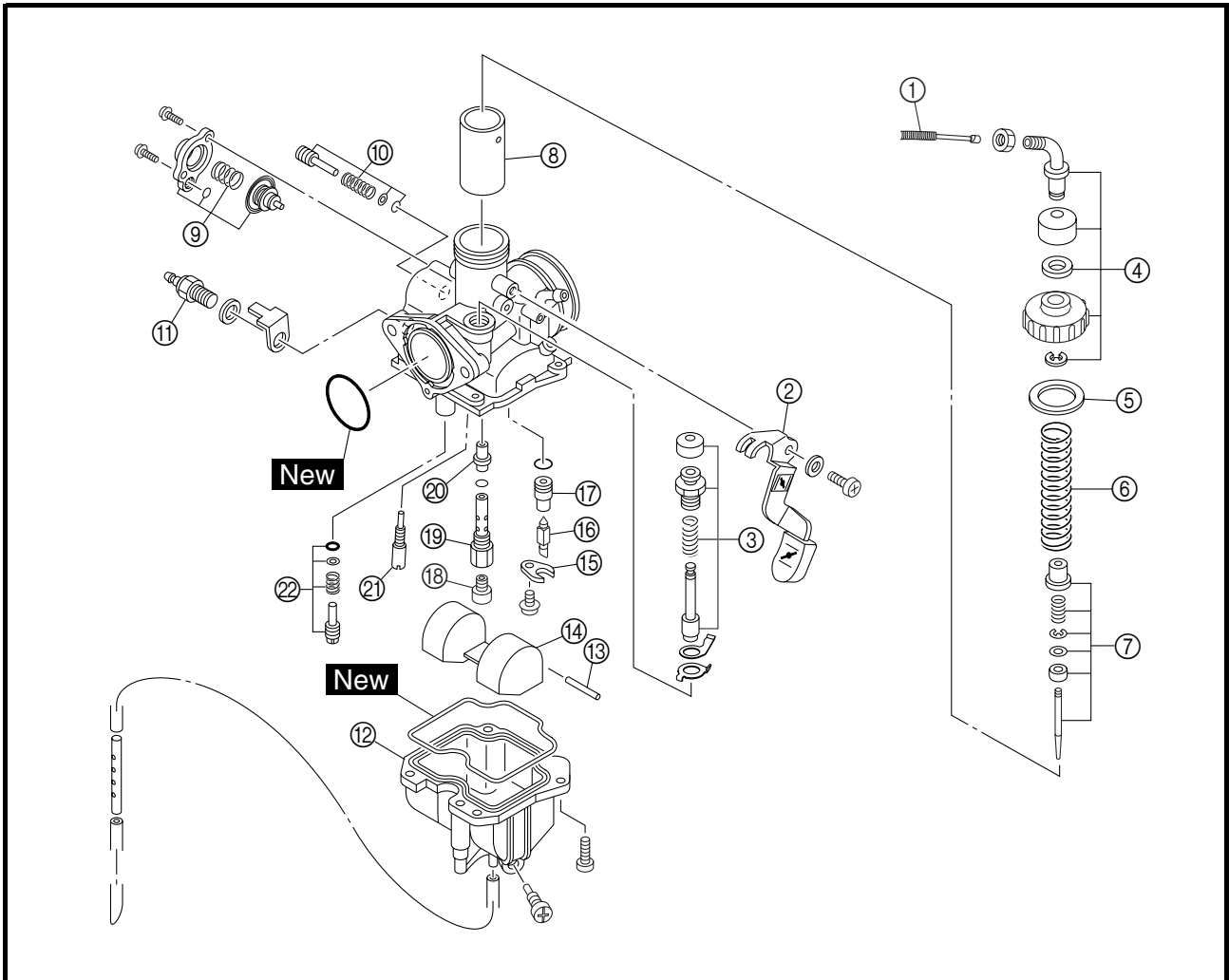
EAS00480

CARBURETOR

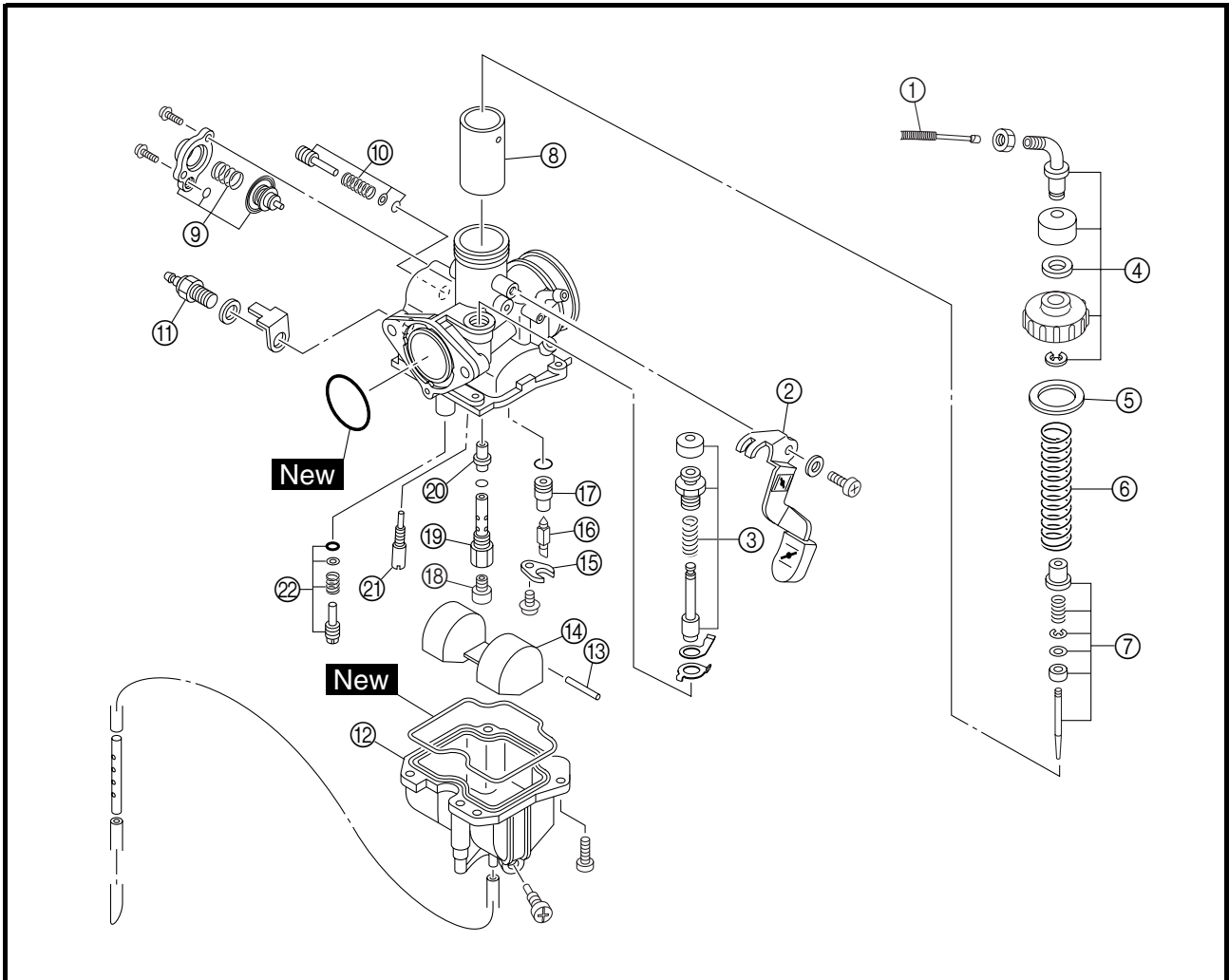
CARBURETOR



Order	Job/Part	Q'ty	Remarks
	<b>Removing the carburetor</b>		Remove the parts in the order listed. Refer to "SIDE COVERS, SEAT AND FUEL TANK" in chapter 3.
1	Air vent hose	2	Disconnect.
2	Fuel hose	1	
3	Carburetor joint clamp screw	1	Loosen.
4	Carburetor assembly	1	
5	Carburetor joint	1	
6	Carburetor cap assembly	1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the carburetor</b>		Remove the parts in the order listed.
①	Throttle cable	1	
②	Starter lever	1	
③	Starter plunger assembly	1	
④	Carburetor cap assembly	1	
⑤	Gasket	1	
⑥	Throttle valve spring	1	
⑦	Jet needle set	1	
⑧	Throttle valve	1	
⑨	Coasting enricher assembly	1	
⑩	Throttle stop screw set	1	
⑪	Carburetor heater	1	
⑫	Float chamber	1	
⑬	Float pin	1	



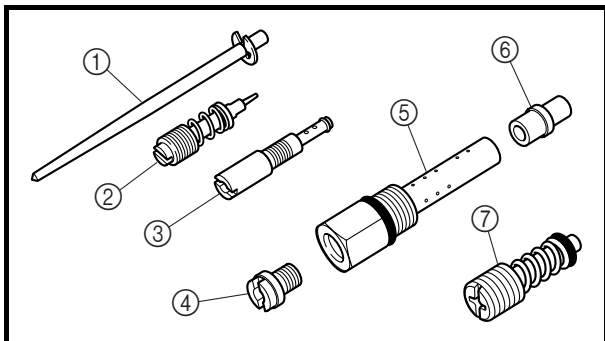
Order	Job/Part	Q'ty	Remarks
⑭	Float	1	Refer to "ASSEMBLING THE CARBURETOR".
⑮	Needle valve seat holder	1	
⑯	Needle valve	1	
⑰	Needle valve seat	1	
⑱	Main jet	1	
⑲	Needle jet holder	1	
⑳	Needle jet	1	
㉑	Pilot jet	1	
㉒	Pilot air screw set	1	Refer to "ASSEMBLING THE CARBURETOR". For assembly, reverse the disassembly procedure.





## 10. Check:

- coasting enricher diaphragm
  - spring
  - coasting enricher diaphragm cover
- Tears/damage → Replace.



## 11. Check:

- jet needle kit ①
  - pilot screw ②
  - pilot jet ③
  - main jet ④
  - needle jet holder ⑤
  - needle jet ⑥
  - throttle stop screw ⑦
- Bends/damage/wear → Replace.  
Obstruction → Clean.  
Blow out the jets with compressed air.

## 12. Check:

- throttle valve movement
- Insert the throttle valve into the carburetor body and move it up and down.  
Tightness → Replace the throttle valve.

## 13. Check:

- starter plunger
  - starter plunger spring
- Bends/cracks/damage → Replace.

## 14. Check:

- hose joints
- Cracks/damage → Replace.

## 15. Check:

- air vent hoses
  - fuel hose
- Cracks/damage/wear → Replace.  
Obstruction → Clean.  
Blow out the hoses with compressed air.

EAS00487

## ASSEMBLING THE CARBURETOR

### CAUTION:

- Before assembling the carburetor, wash all of the parts in a petroleum-based solvent.
- Always use a new gasket.









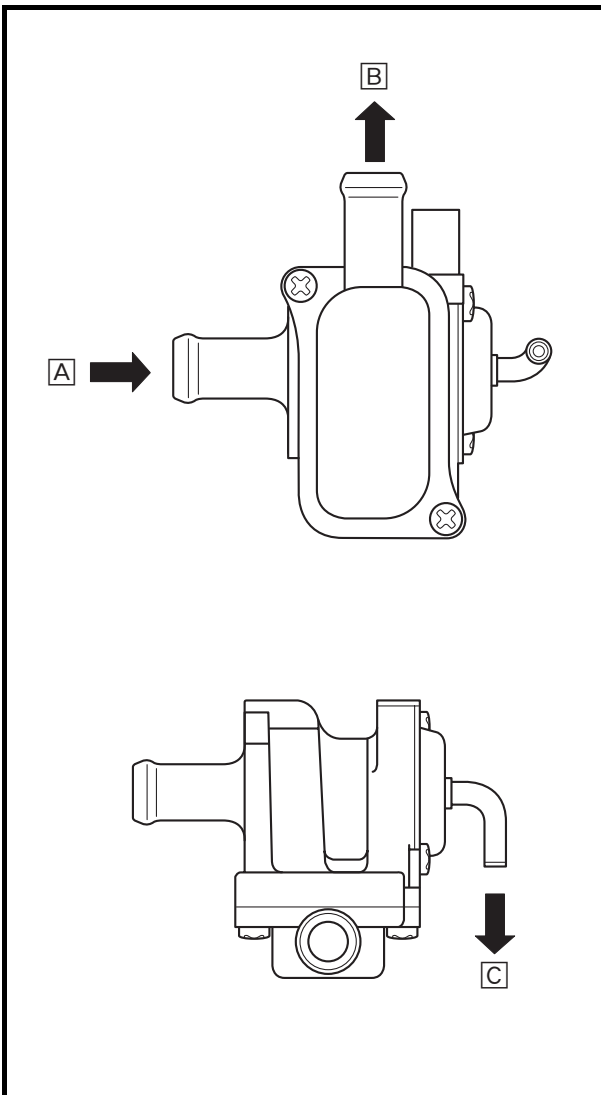
EAS00507

**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 (1,112 to 1,292 °F).



EAS00508

**AIR CUT-OFF VALVE**

The air cut-off valve is operated by the intake gas pressure through the piston valve diaphragm. Normally, the air cut-off valve is open to allow fresh air to flow into the exhaust port. During sudden deceleration (the throttle valve suddenly closes), negative pressure is generated and the air cut-off valve is closed in order to prevent after-burning.

Additionally, at high engine speeds and when the pressure decreases, the air cut-off valve automatically closes to guard against a loss of performance due to self-EGR.

**A** From the air filter case

**B** To the cylinder head

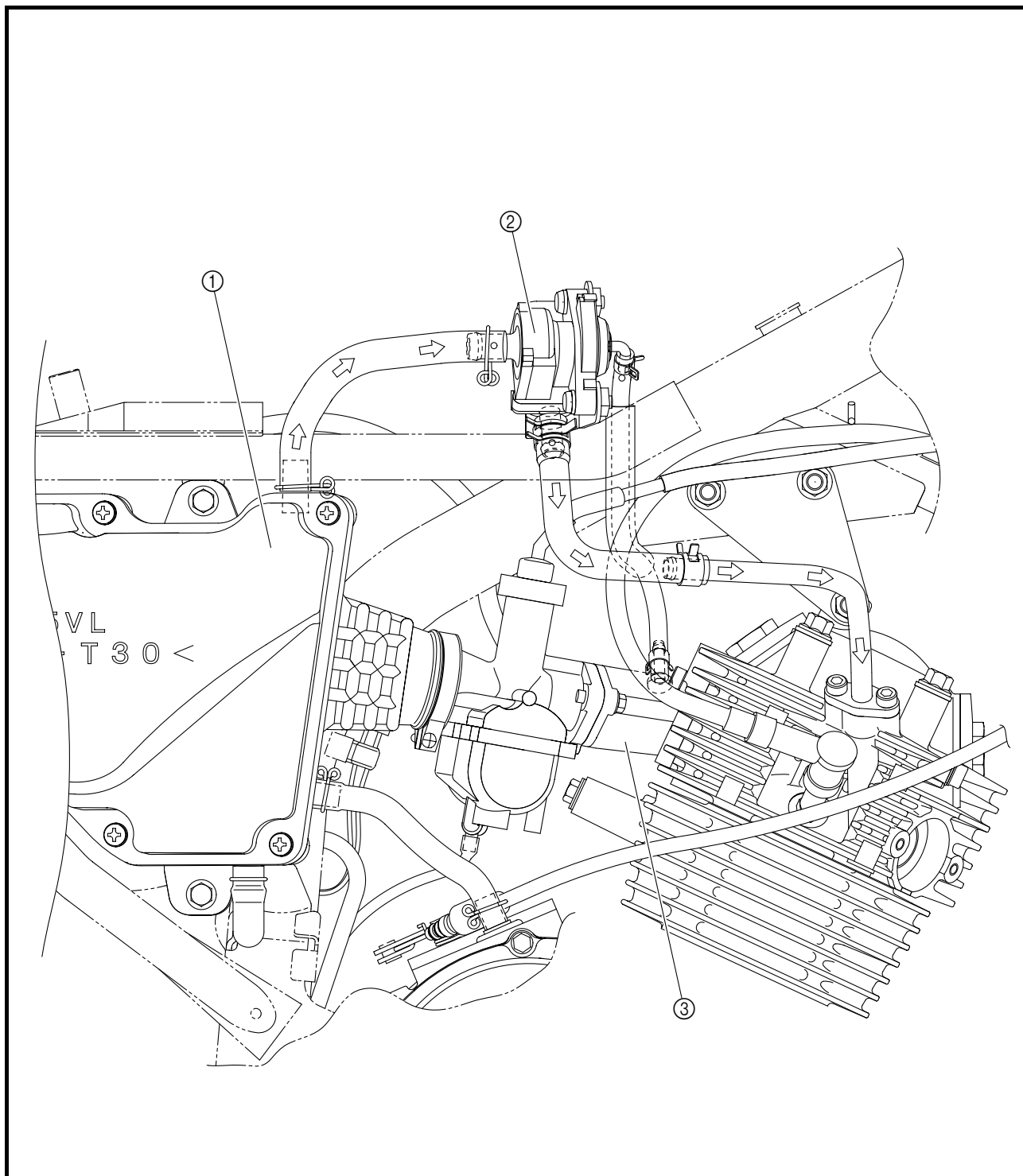
**C** To the intake manifold



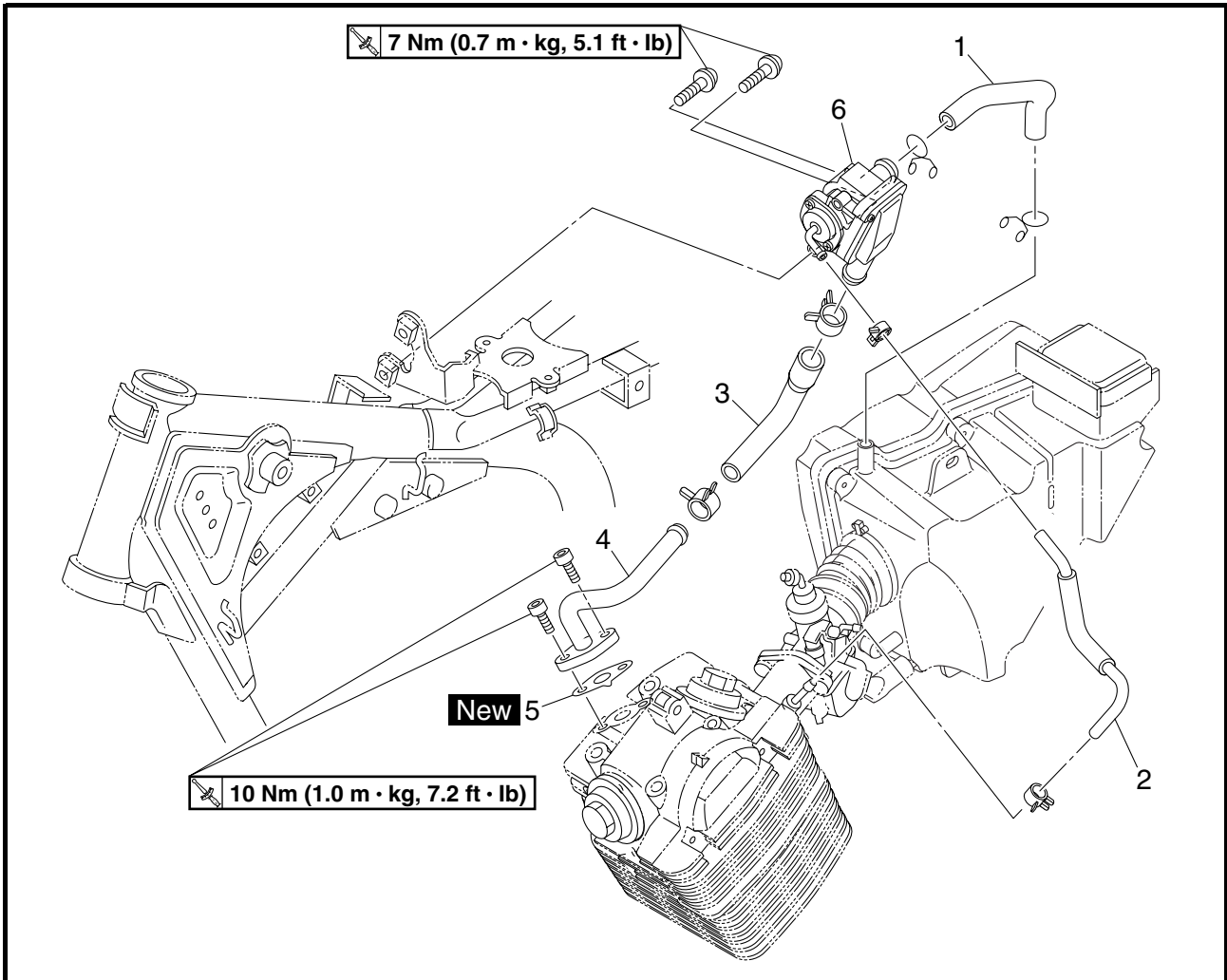
EAS00509

## AIR INDUCTION SYSTEM DIAGRAMS

- ① Air filter case
- ② Air cut-off valve assembly
- ③ Intake manifold



**AIR CUT-OFF VALVE ASSEMBLY**



Order	Job/Part	Q'ty	Remarks
	<b>Removing the air cut-off valve assembly</b>		Remove the parts in the order listed.
	Side cover/fuel tank		Refer to "SIDE COVERS, SEAT AND FUEL TANK" in chapter 3.
1	Air induction system hose (air filter to air cut-off valve assembly)	1	
2	Air induction system vacuum hose	1	
3	Air induction system hose (air cut-off valve to cylinder head)	1	
4	Air induction system pipe	1	
5	Air induction system pipe gasket	1	
6	Air cut-off valve assembly	1	
			For installation, reverse the removal procedure.



EAS00510

## **CHECKING THE AIR INDUCTION SYSTEM**

### 1. Check:

- hoses  
Loose connection → Connect properly.  
Cracks/damage → Replace.
- pipes  
Cracks/damage → Replace.

### 2. Check:

- air cut-off valve  
Cracks/damage → Replace.

---

## CHAPTER 7 ELECTRICAL SYSTEM

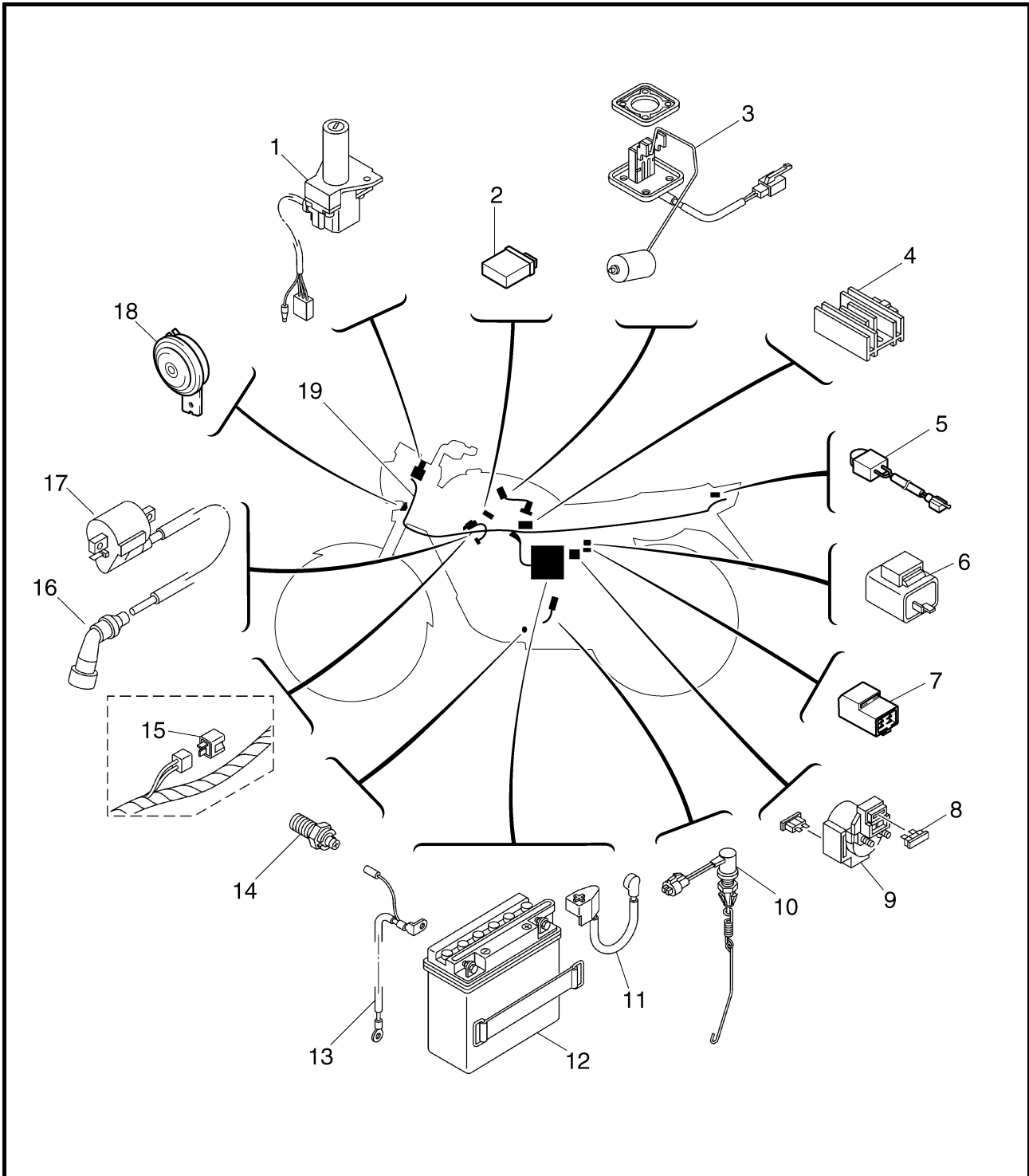
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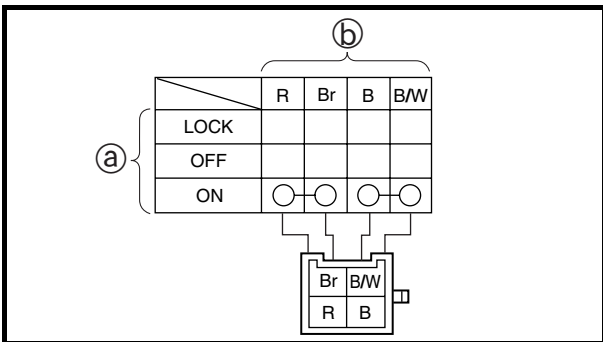
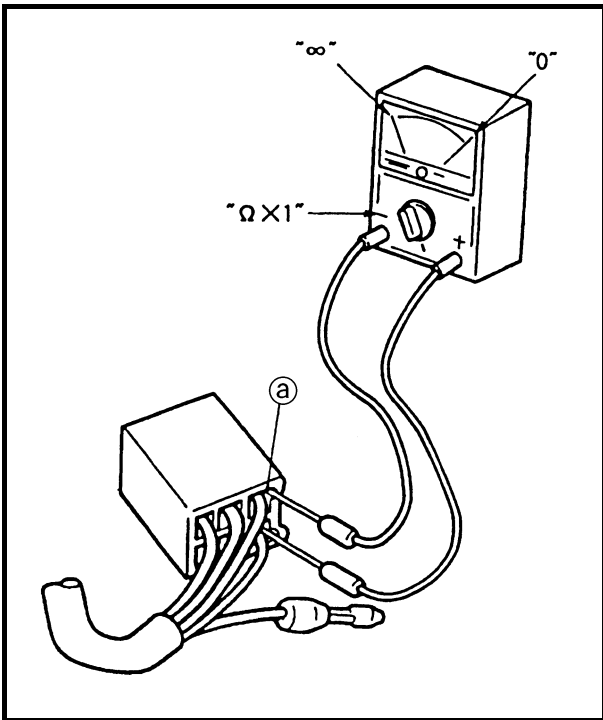
EAS00729

ELECTRICAL SYSTEM

ELECTRICAL COMPONENTS

- |                       |                           |                  |
|-----------------------|---------------------------|------------------|
| ① Main switch         | ⑧ Starter relay           | ⑮ Diode          |
| ② C.D.I. unit         | ⑨ Fuse                    | ⑯ Ignition coil  |
| ③ Fuel sender         | ⑩ Rear brake light switch | ⑰ Spark plug cap |
| ④ Rectifier/regulator | ⑪ Positive battery lead   | ⑱ Horn           |
| ⑤ Thermo switch       | ⑫ Battery                 | ⑲ Wire harness   |
| ⑥ Turn signal relay   | ⑬ Negative battery lead   |                  |
| ⑦ Headlight relay     | ⑭ Neutral switch          |                  |





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 (a). Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



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

**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) are shown in an illustration similar to the one on the left.

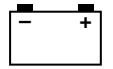
The switch positions (a) are shown in the far left column and the switch lead colors (b) are shown in the top row in the switch illustration.

**NOTE:**

“○—○” indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

**The example illustration on the left shows that:**

There is continuity between red and brown, black/white and black when the switch is set to “ON”.



EAS00731

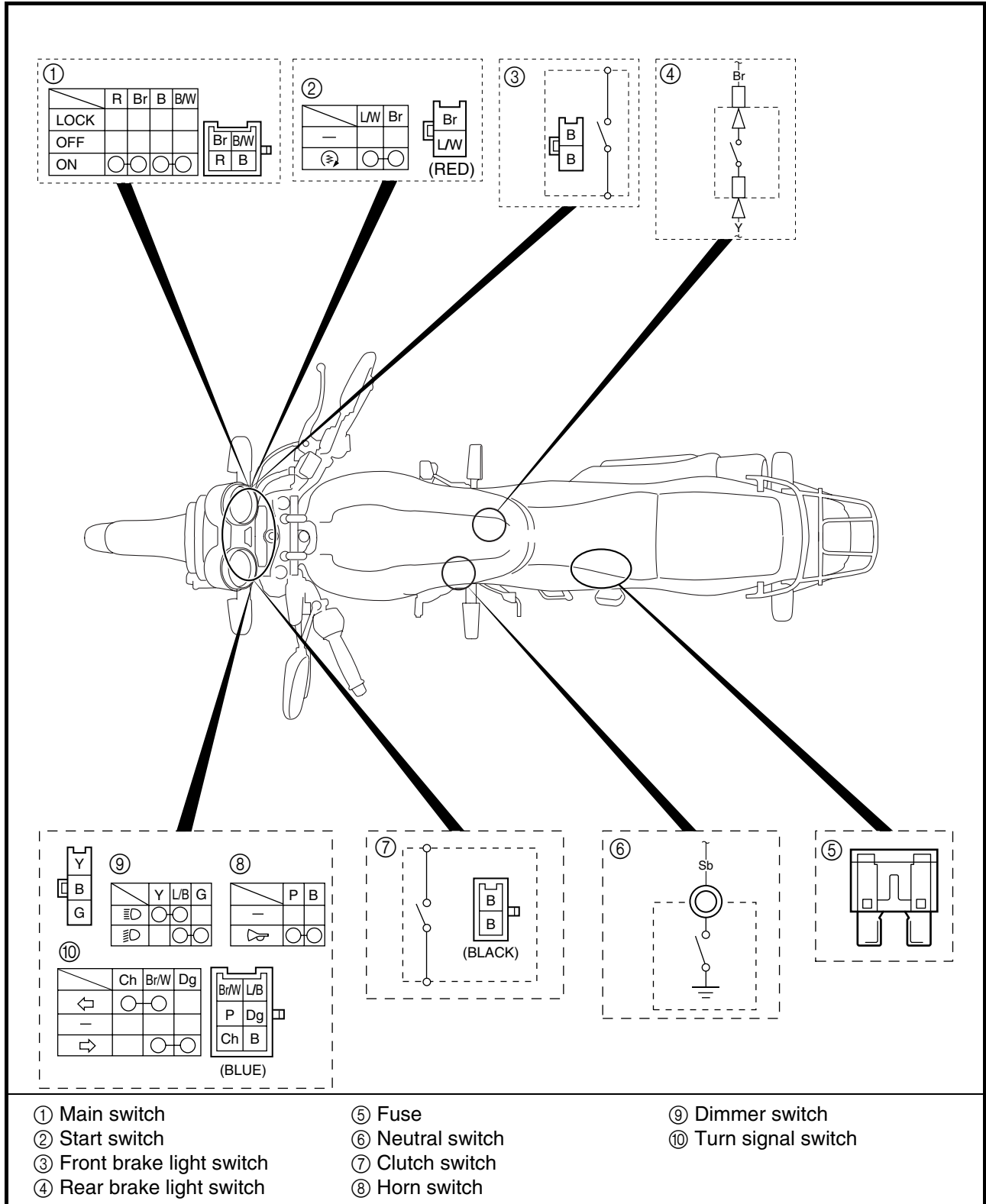
## CHECKING THE SWITCHES

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.





EAS00732

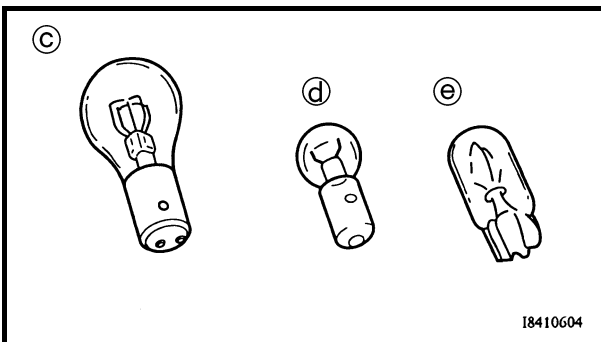
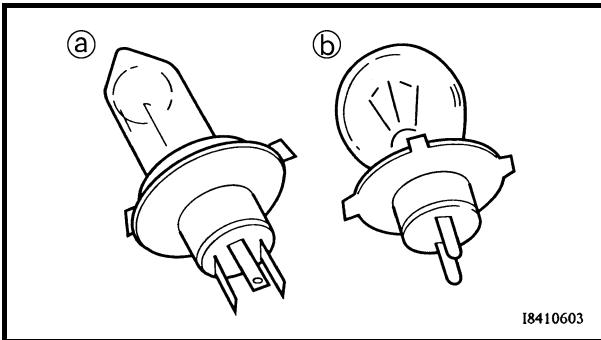
## CHECKING THE BULBS AND BULB SOCKETS

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.



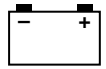
### TYPES OF BULBS

The bulbs used on this vehicle are shown in the illustration on the left.

- Bulbs (a) and (b) 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.
- Bulb (c) is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- Bulbs (d) and (e) are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.

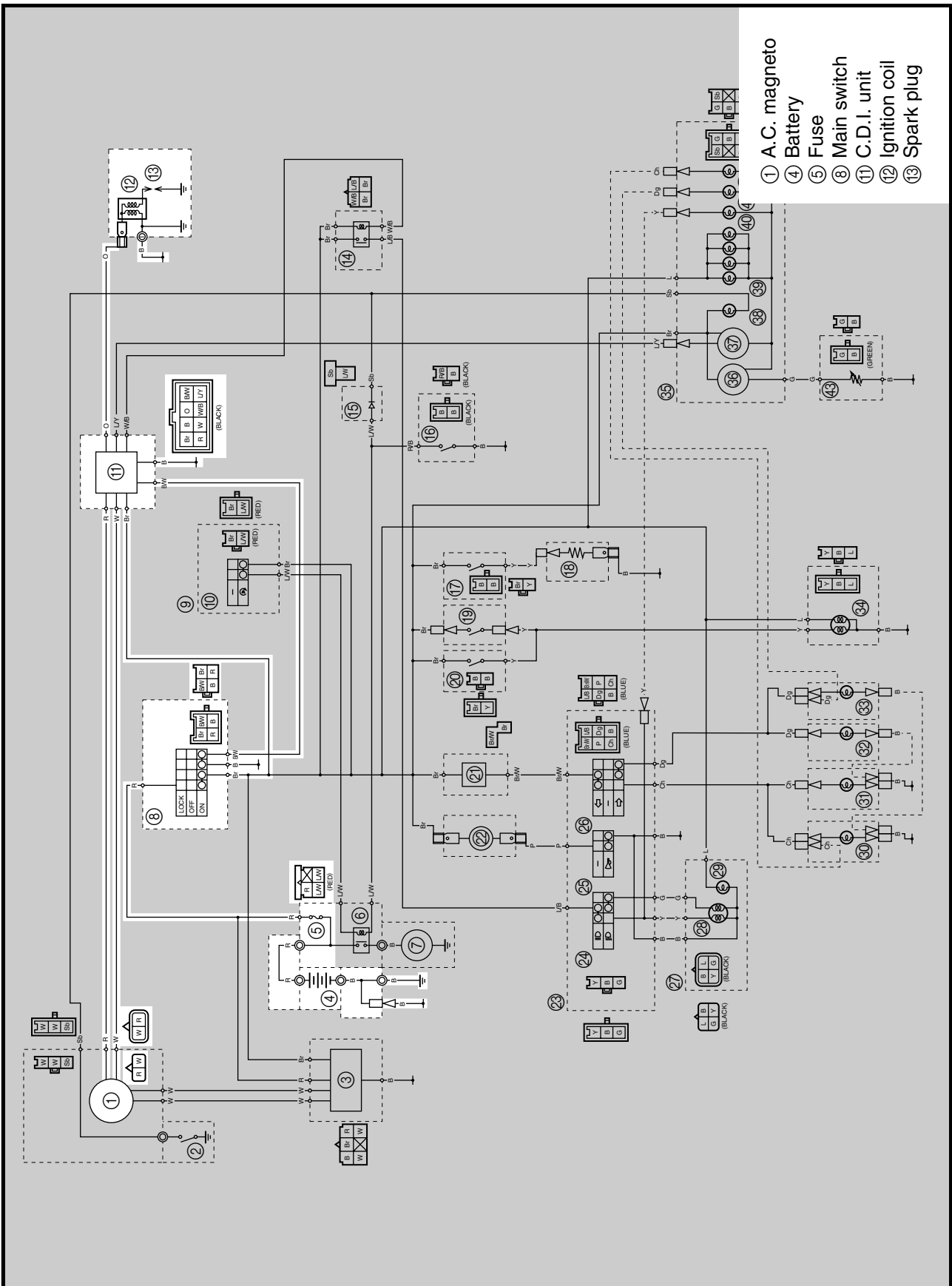


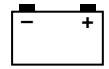




EAS00734

## IGNITION SYSTEM CIRCUIT DIAGRAM





EAS00736

### TROUBLESHOOTING

**The ignition system fails to operate (no spark or intermittent spark).**

Check:

1. fuse
2. battery
3. spark plug
4. ignition spark gap
5. spark plug cap resistance
6. ignition coil resistance
7. pickup coil resistance
8. main switch
9. wiring connections (of the entire ignition system)

**NOTE:**

- Before troubleshooting, remove the following part(s):
  1. left side cover
  2. headlight assembly
  3. air duct (left and right)
  4. fuel tank
- Troubleshoot with the following special tool(s).

	<b>Ignition checker</b> 90890-06754, YM-34487 <b>Pocket tester</b> 90890-03112, YU-03112-C
--	---

EAS00738

1. Fuse <ul style="list-style-type: none"> <li>• Check the fuse for continuity. Refer to “CHECKING THE FUSE” in chapter 3.</li> <li>• Is the fuse OK?</li> </ul>
---



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?



- Refill battery fluid.
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00740

### 3. Spark plug

- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap. Refer to “CHECKING THE SPARK PLUG” in chapter 3.

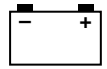


**Standard spark plug**  
**CR6HSA (NGK)**  
**Spark plug gap**  
**0.6 ~ 0.7 mm (0.024 ~ 0.028 in)**

- Is the spark plug in good condition, is it of the correct type, and is its gap within specification?



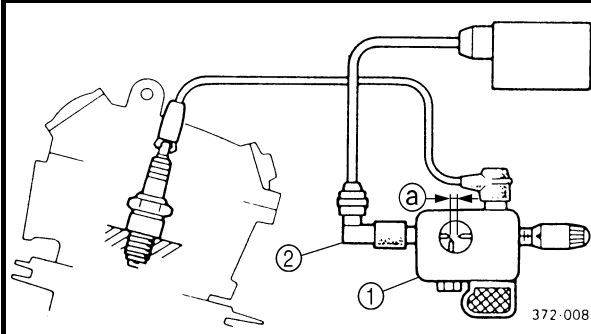
Re-gap or replace the spark plug.



EAS00742

### 4. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.
- ② Spark plug cap
  - Set the main switch to "ON".
  - Measure the ignition spark gap ③.
  - Crank the engine by pushing the start switch and gradually increase the spark gap until a misfire occurs.



**Minimum ignition spark gap**  
6.0 mm (0.24 in)

- Is there a spark and is the spark gap within specification?



YES



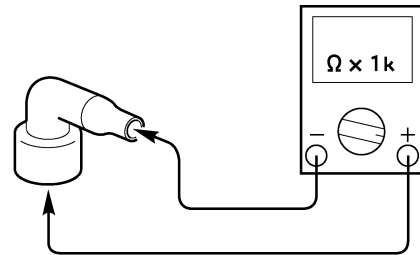
NO

The ignition system is OK.

EAS00744

### 5. Spark plug cap resistance

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ( $\Omega \times 1k$ ) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



**Spark plug cap resistance**  
4.0 ~ 6.0 k $\Omega$  at 20 °C (68 °F)

- Is the spark plug cap OK?

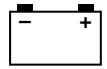


YES



NO

Replace the spark plug cap.

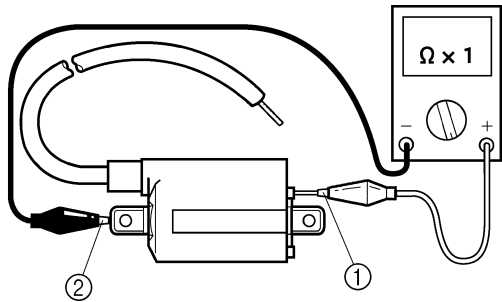


EAS00746

### 6. Ignition coil resistance

- Disconnect the ignition coil connector from the ignition coil terminal.
- Connect the pocket tester ( $\Omega \times 1$ ) to the ignition coil as shown.

**Positive tester probe** → orange ①  
**Negative tester probe** →  
**ignition coil base** ②



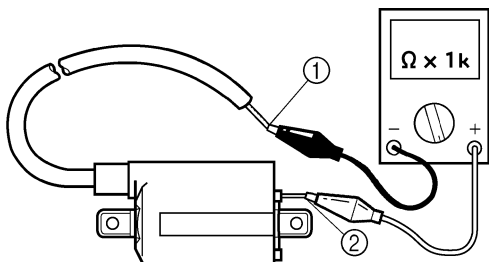
- Measure the primary coil resistance.



**Primary coil resistance**  
 0.32 ~ 0.48  $\Omega$  at 20 °C (68 °F)

- Connect the pocket tester ( $\Omega \times 1k$ ) to the ignition coil as shown.

**Negative tester probe** → spark plug lead ①  
**Positive tester probe** → orange ②



- Measure the secondary coil resistance.



**Secondary coil resistance**  
 5.68 ~ 8.52 k $\Omega$  at 20 °C (68 °F)

- Is the ignition coil OK?

↓ YES

↓ NO

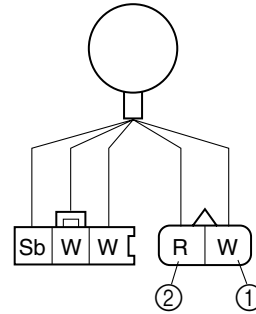
Replace the ignition coil.

EAS00748

### 7. Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 100$ ) to the pickup coil coupler as shown.

**Positive tester probe** → white ①  
**Negative tester probe** → red ②



- Measure the pickup coil resistance.



**Pickup coil resistance**  
 248 ~ 372  $\Omega$  at 20 °C (68 °F)  
 (between white and red)

- Is the pickup coil OK?

↓ YES

↓ NO

Replace the pickup coil/stator assembly.

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.

EAS00754

9. Wiring

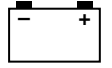
- Check the entire ignition system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the ignition system's wiring properly connected and without defects?



Replace the C.D.I. unit.

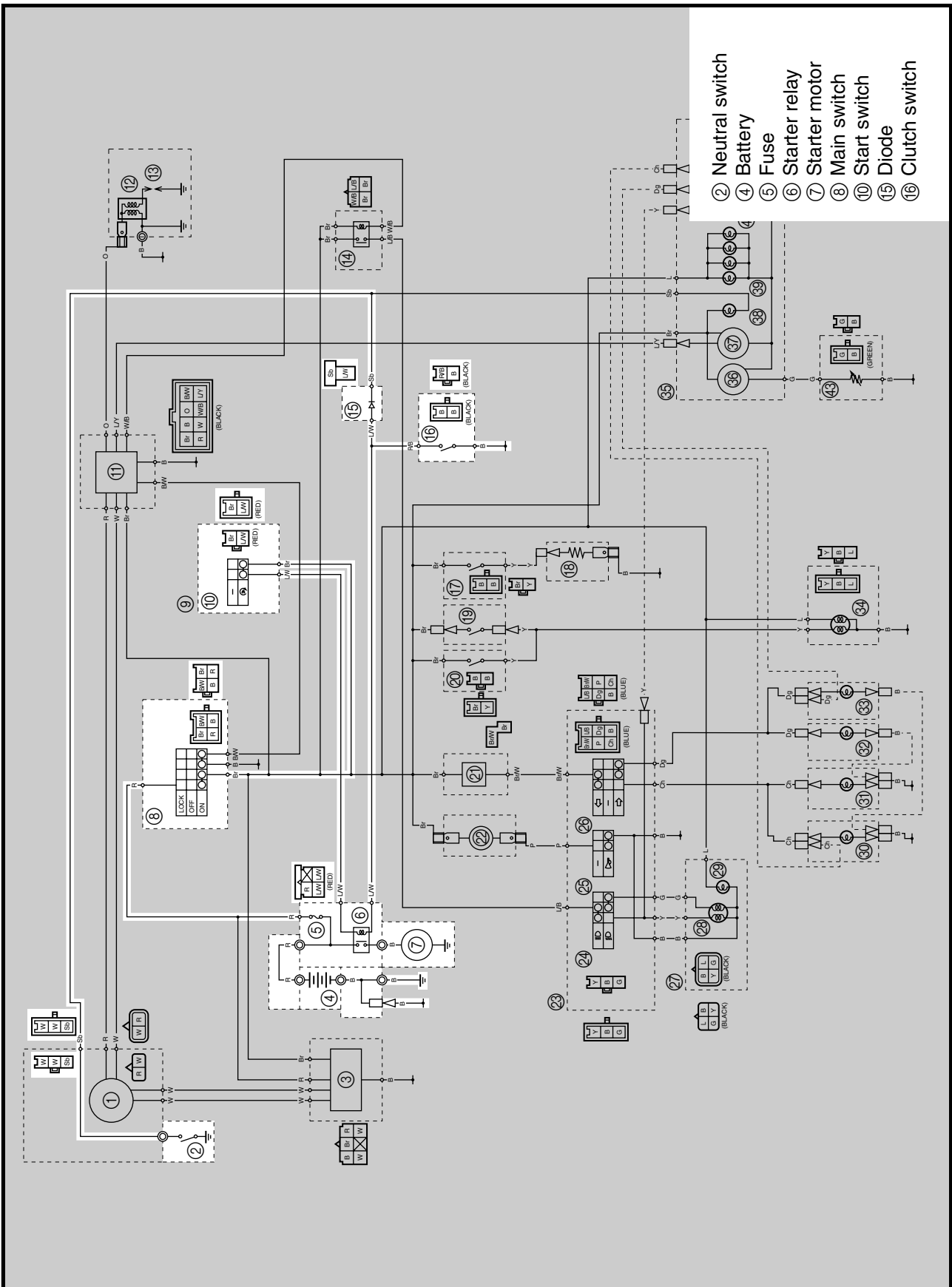
Properly connect or repair the ignition system's wiring.

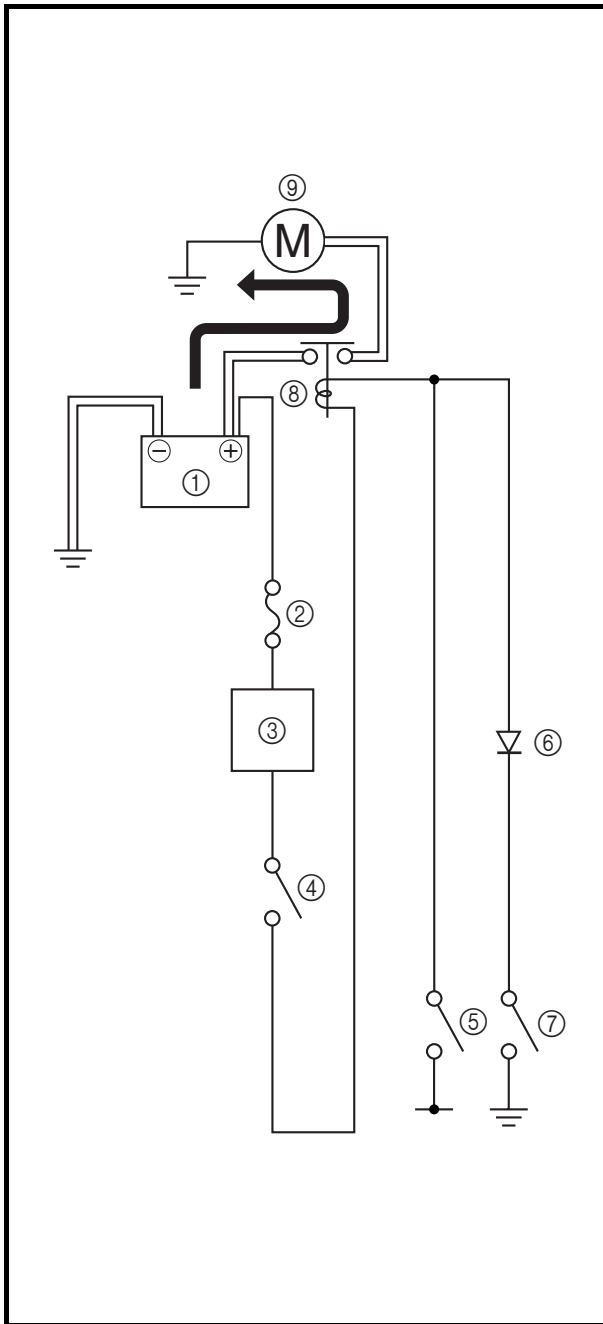




EAS00755

## ELECTRIC STARTING SYSTEM CIRCUIT DIAGRAM





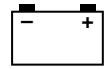
EAS00756

## STARTING CIRCUIT CUT-OFF SYSTEM OPERATION

If the main switch is set to “ON” (switch is 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).

- ① Battery
- ② Fuse
- ③ Main switch
- ④ Start switch
- ⑤ Clutch switch
- ⑥ Diode
- ⑦ Neutral switch
- ⑧ Starter relay
- ⑨ Starter motor



EAS00757

### TROUBLESHOOTING

**The starter motor fails to turn.**

Check:

1. fuse
2. battery
3. starter motor
4. starter relay
5. diode
6. main switch
7. neutral switch
8. clutch switch
9. start switch
10. wiring connections  
(of the entire starting system)

**NOTE:**

- Before troubleshooting, remove the following part(s):
  1. left side cover
  2. headlight assembly
  3. air duct (left and right)
  4. fuel tank
- Troubleshoot with the following special tool(s).



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

EAS00738

#### 1. Fuse

- Check the fuse for continuity.  
Refer to "CHECKING THE FUSE" in chapter 3.
- Is the fuse OK?



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?

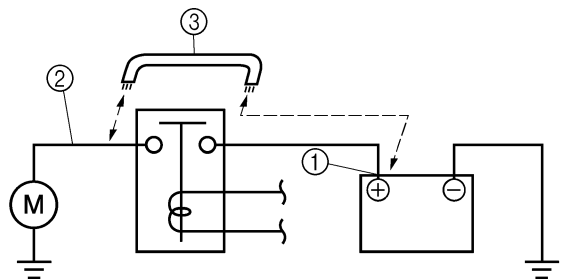


- Refill battery fluid.
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00758

#### 3. Starter motor

- Connect the positive battery terminal ① and starter motor lead ② with a jumper lead ③.



18210801

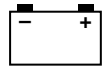
**! WARNING**

- 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?



Repair or replace the starter motor.



EAS00761

### 4. Starter relay

- Remove the starter relay.
- Connect the pocket tester ( $\Omega \times 1$ ) and battery (12 V) to the starter relay terminals as shown.

**Positive battery terminal** → blue/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.

EAS00760

### 5. Diode

- Remove the diode from the coupler.
- Connect the pocket tester ( $\Omega \times 1$ ) to the diode terminals as shown.
- Measure the diode for continuity as follows.

**NOTE:** \_\_\_\_\_  
 The pocket tester readings are shown in the following table.

<b>Positive tester probe</b> → sky blue ① <b>Negative tester probe</b> → blue/white ②	<b>Continuity</b>
<b>Positive tester probe</b> → blue/white ② <b>Negative tester probe</b> → sky blue ①	<b>No continuity</b>

- Are the testing readings correct?

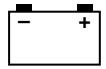
↓ YES

↓ NO

Replace the diode.

# ELECTRIC STARTING SYSTEM

**ELEC**



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.

EAS00764

**9. 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.

EAS00751

**7. Neutral switch**

- Check the neutral switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the neutral switch OK?

↓ YES

↓ NO

Replace the neutral switch.

EAS00766

**10. Wiring**

- Check the entire starting system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the starting system's wiring properly connected and without defects?

↓ YES

↓ NO

The starting system circuit is OK.

Properly connect or repair the starting system's wiring.

EAS00763

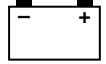
**8. Clutch switch**

- Check the clutch switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the clutch switch OK?

↓ YES

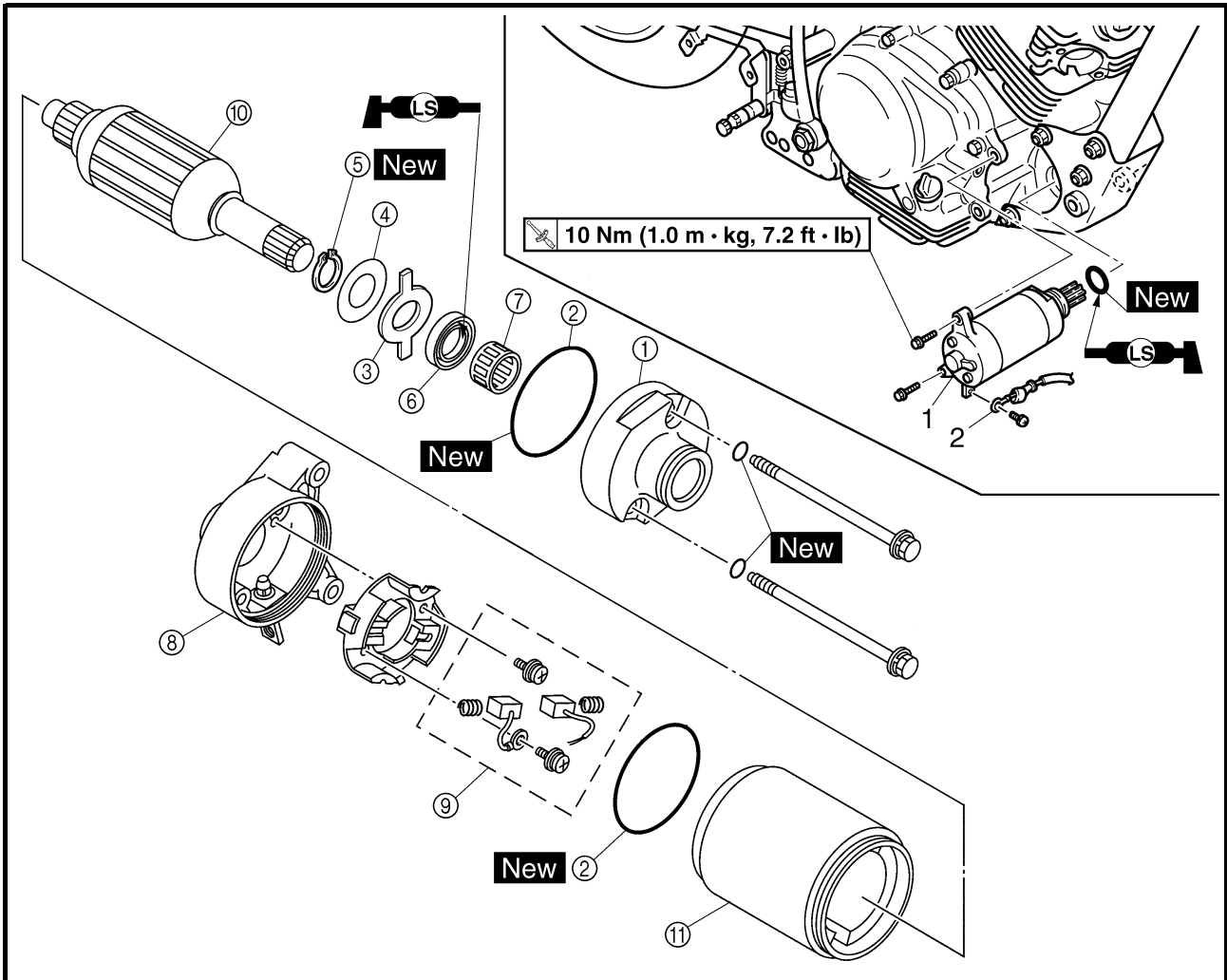
↓ NO

Replace the clutch switch.

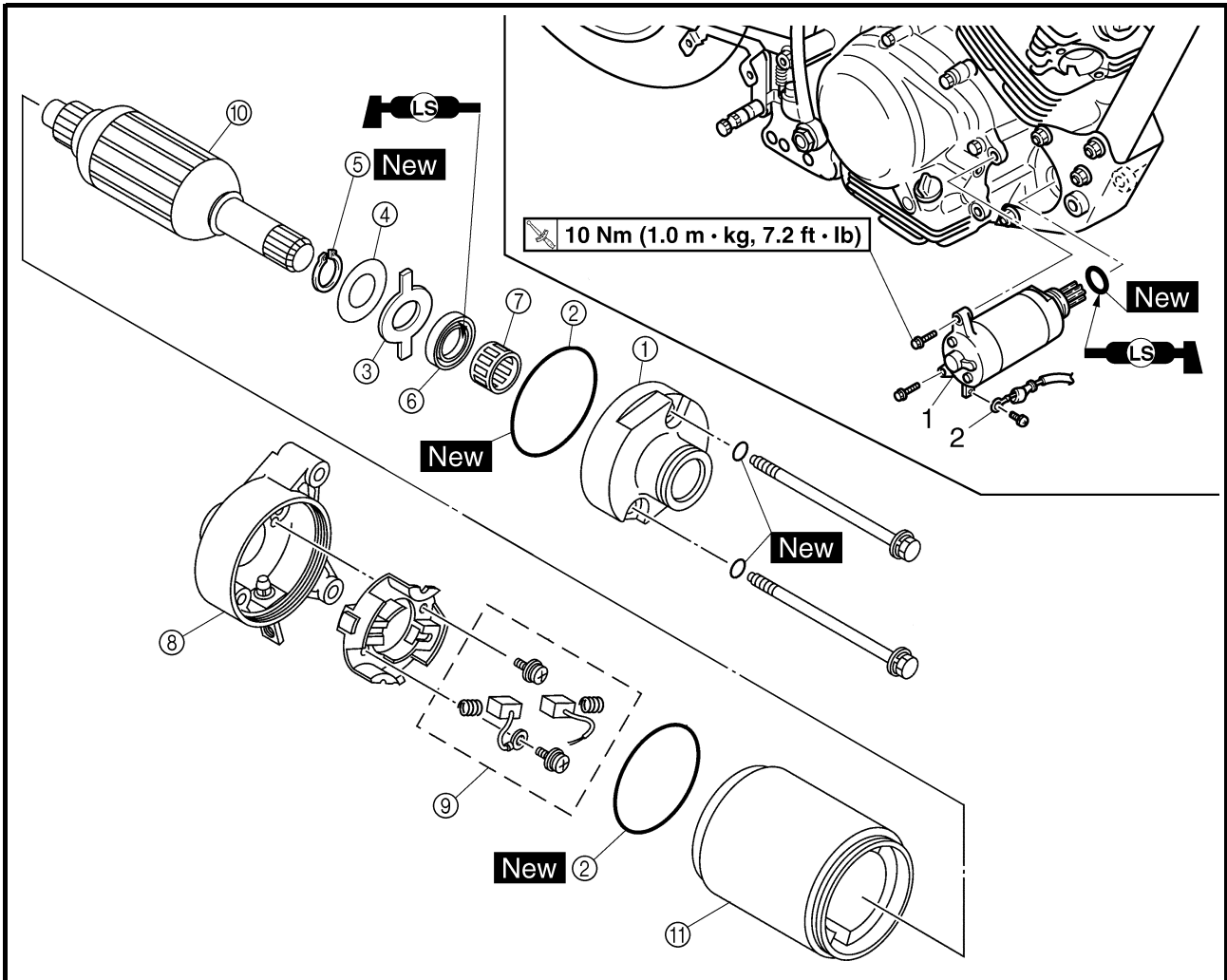
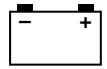


EAS00767

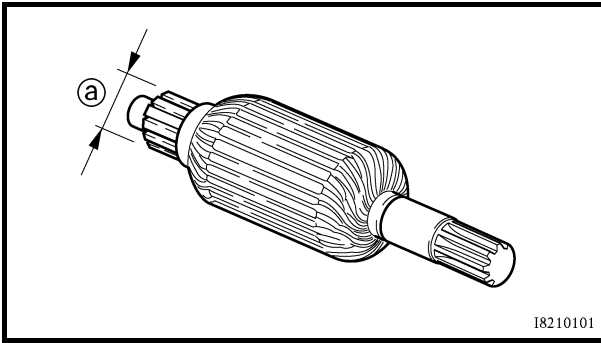
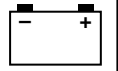
STARTER MOTOR



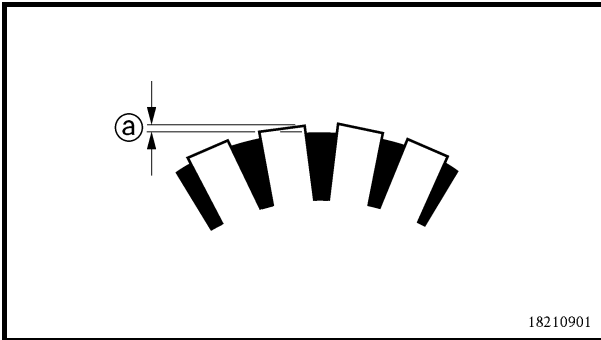
Order	Job/Part	Q'ty	Remarks
	<b>Removing the starter motor</b>		
1	Starter motor	1	Remove the parts in the order listed.
2	Starter motor lead	1	Disconnect. <b>NOTE:</b> _____ Pull out the starter motor before disconnecting the starter motor lead. _____ For installation, reverse the removal procedure.



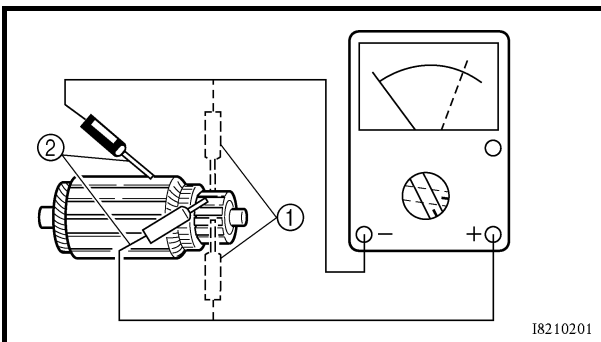
Order	Job/Part	Q'ty	Remarks
	<b>Disassembling the starter motor</b>		Remove the parts in the order listed.
①	Front bracket	1	Refer to "ASSEMBLING THE STARTER MOTOR".
②	O-ring	2	
③	Lock washer	1	
④	Shim		
⑤	Circlip	1	
⑥	Oil seal	1	
⑦	Bearing	1	
⑧	Rear bracket	1	
⑨	Brush set	1	
⑩	Armature assembly	1	
⑪	Starter motor yoke	1	
			For assembly, reverse the disassembly procedure.



18210101



18210901



18210201

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**  
**21.0 mm (0.83 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**  
**1.5 mm (0.06 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-03112-C**

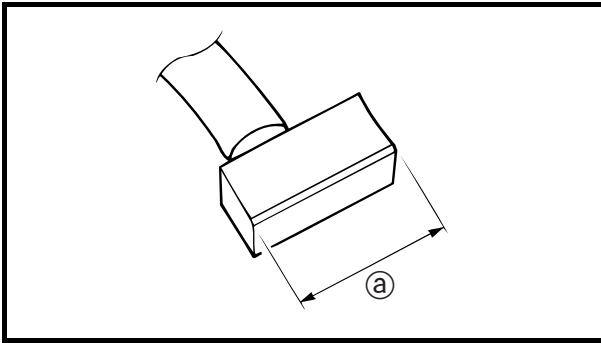
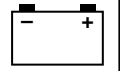


**Armature coil**  
**Commutator resistance ①**  
**0.017 ~ 0.021 Ω at 20 °C (68 °F)**  
**Insulation resistance ②**  
**Above 1 MΩ at 20 °C (68 °F)**

- b. If any resistance is out of specification, replace the starter motor.







5. Measure:

- brush length ①

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**  
5.52 ~ 8.28 N  
(563 ~ 844 gf, 19.87 ~ 29.80 oz)

7. Check:

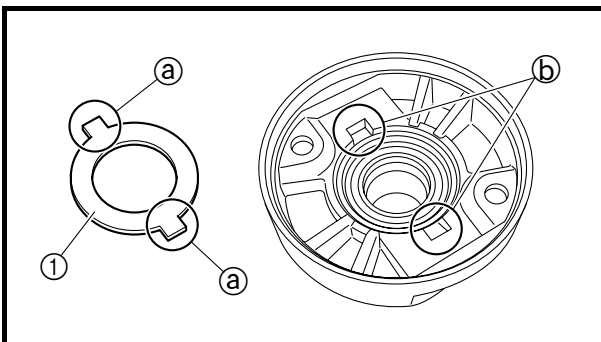
- gear teeth

Damage/wear → Replace the gear.

8. Check:

- bearing
- oil seal

Damage/wear → Replace the defective part(s).



EAS00772

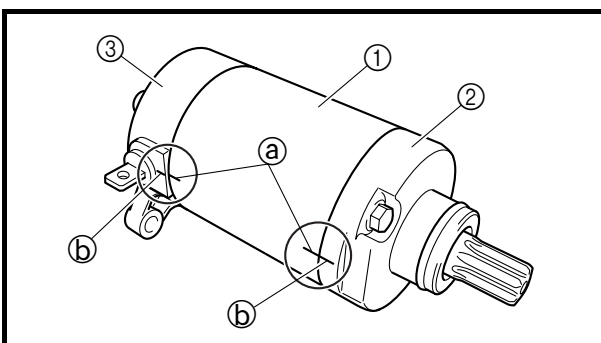
## ASSEMBLING THE STARTER MOTOR

1. Install:

- lock washer ①

**NOTE:** \_\_\_\_\_

Align the tabs ① on the lock washer with the slots ② in the starter motor front bracket.

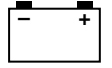


2. Install:

- starter motor yoke ①
- front bracket ②
- rear bracket ③

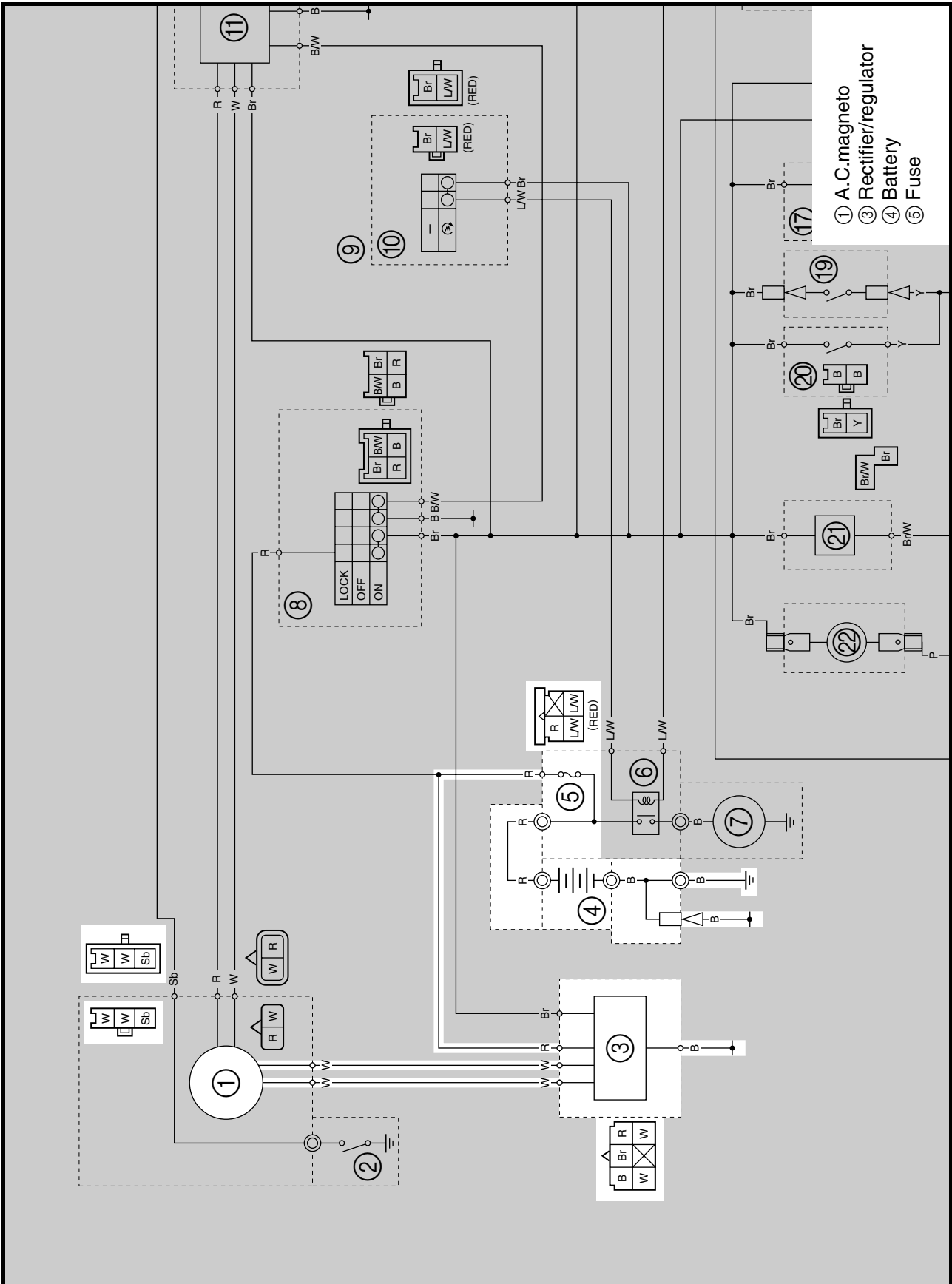
**NOTE:** \_\_\_\_\_

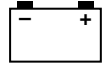
Align the match marks ① on the starter motor yoke with the match marks ② on the front and rear brackets.



EAS00773

## CHARGING SYSTEM CIRCUIT DIAGRAM





EAS00774

### TROUBLESHOOTING

**The battery is not being charged.**

Check:

1. fuse
2. battery
3. charging voltage
4. charging coil resistance
5. wiring connections  
(of the entire charging system)

#### NOTE:

- Before troubleshooting, remove the following part(s):
  1. left side cover
  2. air duct (left and right)
  3. fuel tank
- Troubleshoot with the following special tool(s).



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

EAS00738

#### 1. Fuse

- Check the fuse for continuity.  
Refer to "CHECKING THE FUSE" in chapter 3.
- Is the fuse OK?



Replace the fuse.

EAS00739

#### 2. Battery

- Check the condition of the battery.  
Refer to "CHECKING AND CHARGING THE BATTERY" in chapter 3.

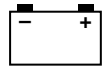


**Minimum open-circuit voltage**  
**12.8 V or more at 20 °C (68 °F)**

- Is the battery OK?



- Refill battery fluid.
- Clean the battery terminals.
- Recharge or replace the battery.



EAS00775

### 3. Charging voltage

- 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**  
**14.0 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.

EAS00776

### 4. Charging coil resistance

- Disconnect the A.C. magneto coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) to the A.C. magneto coupler as shown.

**Positive tester probe** → white ①  
**Negative tester probe** → white ②

- Measure the charging coil resistance.

**Charging coil resistance**  
**0.64 ~ 0.96  $\Omega$  at 20 °C (68 °F)**  
**(between white and white)**

- Is the charging coil OK?

YES

NO

Replace the pickup coil/stator assembly.

EAS00779

### 5. Wiring

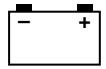
- Check the wiring connections of the entire charging system. Refer to "CIRCUIT DIAGRAM".
- Is the charging system's wiring properly connected and without defects?

YES

NO

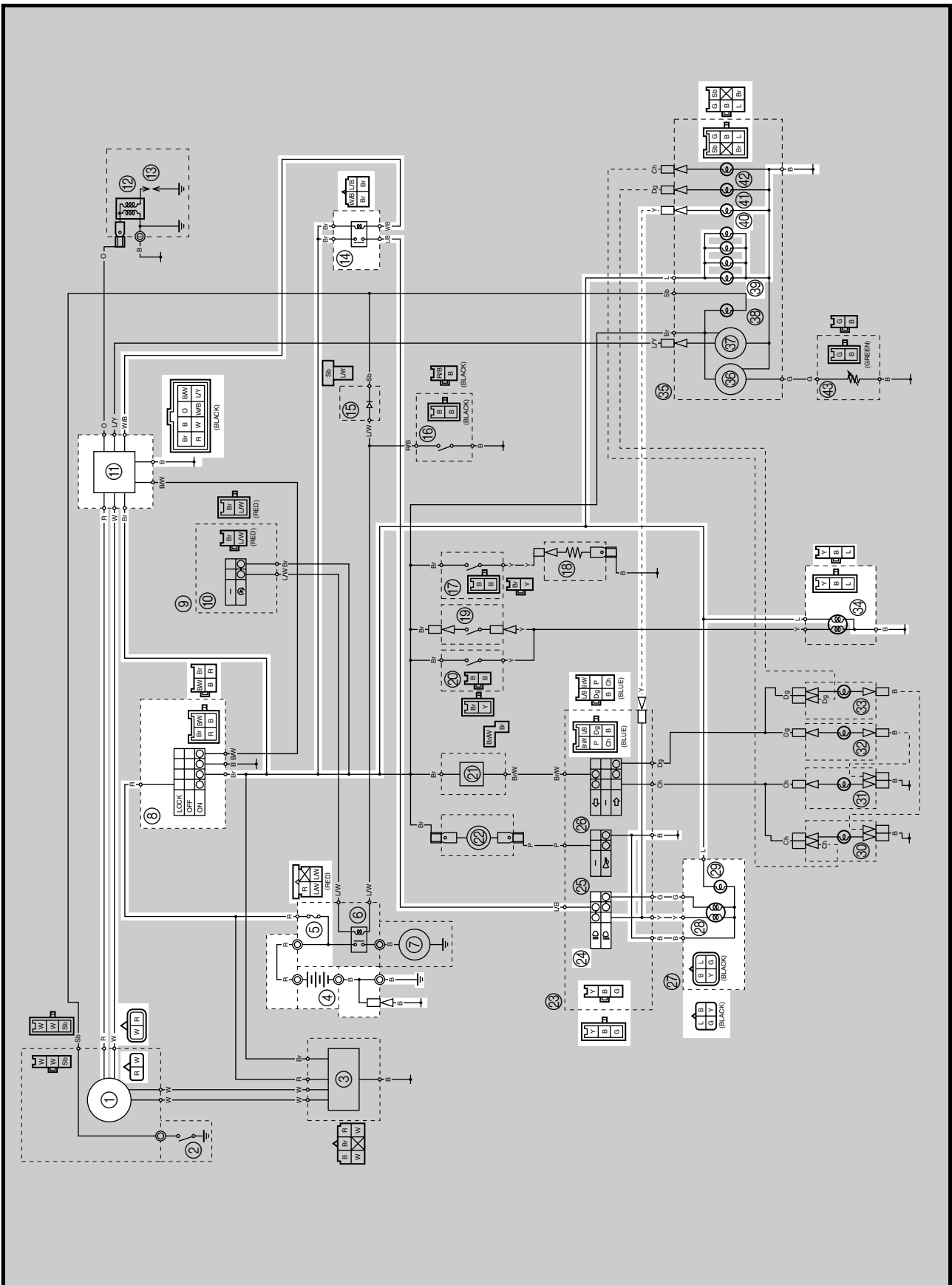
Replace the rectifier/regulator.

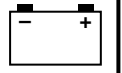
Properly connect or repair the charging system's wiring.



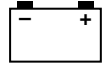
EAS00780

# LIGHTING SYSTEM CIRCUIT DIAGRAM





- ① A.C.magneto
- ④ Battery
- ⑤ Fuse
- ⑧ Main switch
- ⑪ C.D.I.unit
- ⑭ Headlight relay
- ⑲ Dimmer switch
- ⑳ Headlight
- ㉑ Auxiliary light
- ㉔ Tail/brake light
- ㉙ Meter light
- ㉚ High beam indicator light



EAS00781

### TROUBLESHOOTING

**Any of the following fail to light: headlight, high beam indicator light, taillight, auxiliary light or meter light.**

Check:

1. fuse
2. battery
3. main switch
4. dimmer switch
5. pickup coil resistance
6. headlight relay
7. wiring connections  
(of the entire lighting system)

**NOTE:**

- Before troubleshooting, remove the following part(s):
  1. side cover (left and right)
  2. headlight assembly
  3. seat
  4. air duct (left and right)
  5. fuel tank
- Troubleshoot with the following special tool(s).

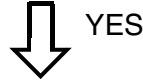


**Pocket tester**  
90890-03112, YU-03112-C

EAS00738

#### 1. Fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSE" in chapter 3.
- Is the fuse OK?



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?



- Refill battery fluid.
- 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?



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

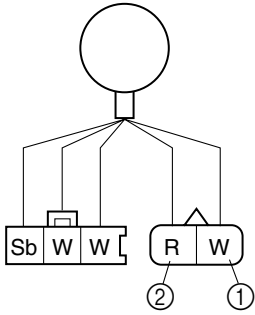
The dimmer switch is faulty. Replace the left handlebar switch.

EAS00748


**5. Pickup coil resistance**

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester ( $\Omega \times 100$ ) to the pickup coil coupler as shown.

**Positive tester probe → white ①**  
**Negative tester probe → red ②**



- Measure the pickup coil resistance.

 **Pickup coil resistance**  
**248 ~ 372  $\Omega$  at 20 °C (68 °F)**  
**(between white and red)**

- Is the pickup coil OK?

↓ YES                      ↓ NO

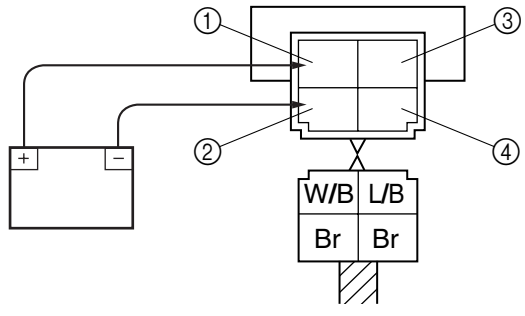
Replace the pickup coil/stator assembly.

**6. Headlight relay**

- Remove the headlight relay.
- Connect the pocket tester ( $\Omega \times 1$ ) and battery (12 V) to the headlight relay terminals as shown.
- Check the headlight relay for continuity.

**Positive battery terminal → brown ①**  
**Negative battery terminal → white/black ②**

**Positive tester probe → brown ③**  
**Negative tester probe → blue/black ④**

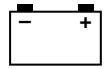


- Does the headlight relay have continuity between brown and blue/black?

↓ YES                      ↓ NO

Replace the headlight relay.





EAS00787

## 7. 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. High beam indicator light bulb and socket

- Check the high beam indicator light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Is the high beam indicator light bulb and socket OK?

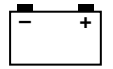


YES



NO

Replace the high beam indicator light bulb, socket or both.



**3. Voltage**

- Connect the pocket tester (DC 20 V) to the headlight coupler (wire harness side), meter assembly coupler (wire harness side), and high beam indicator light connector (left handlebar switch side) as shown.

**A** When the dimmer switch is set to “ $\equiv \bigcirc$ ”

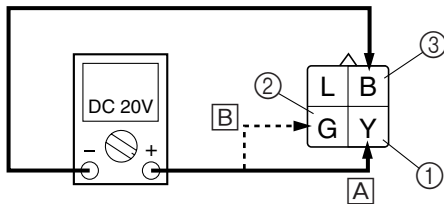
**B** When the dimmer switch is set to “ $\equiv \bigcirc$ ”

**Headlight**

**Positive tester probe** →

**yellow ① or green ②**

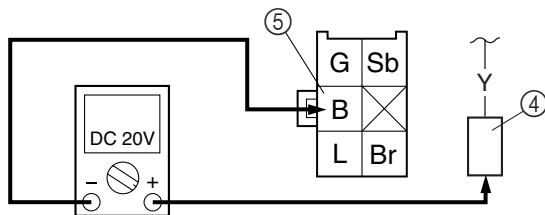
**Negative tester probe** → **black ③**



**High beam indicator light**

**Positive tester probe** → **yellow ④**

**Negative tester probe** → **black ⑤**



- Set the main switch to “ON”.
- Start the engine.
- Set the dimmer switch to “ $\equiv \bigcirc$ ” or “ $\equiv \bigcirc$ ”.
- Measure the voltage (DC 12 V) of yellow ① (green ②) on the headlight coupler (wire harness side) and yellow ④ on the high beam indicator light connector (left handlebar switch side).
- Is the voltage within specification?



This circuit is OK.

The wiring circuit is faulty and must be repaired.

EAS00789

2. The meter light fails to come on.

**1. Meter light bulb and socket**

- Check the meter light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the meter light bulb and socket OK?

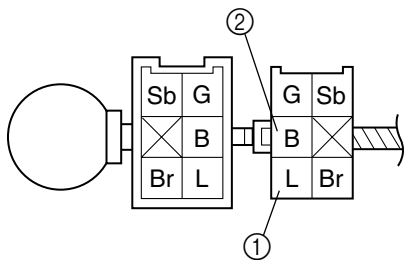


Replace the meter light bulb, socket or both.

**2. Voltage**

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

**Positive tester probe → blue ①**  
**Negative tester probe → black ②**



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of blue ① on the meter assembly coupler (wire harness side).
- Is the voltage within specification?



This circuit is OK.

The wiring circuit from the main switch to the meter assembly 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?

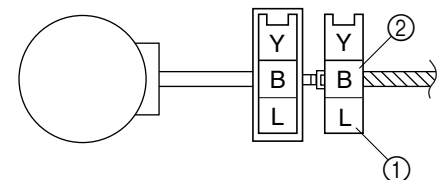


Replace the tail/brake light bulb, socket or both.

**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**



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of blue ① on the tail/brake light coupler (wire harness side).
- Is the voltage within specification?



This circuit is OK.

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

EAS00791

4. The auxiliary light fails to come on.

1. Auxiliary light bulb and socket

- Check the auxiliary light bulb and socket for continuity.  
Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the auxiliary light bulb and socket OK?

↓ YES

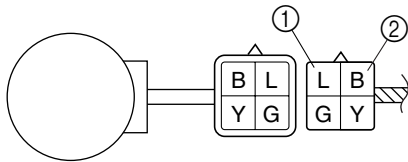
↓ NO

Replace the auxiliary light bulb, socket or both.

2. Voltage

- Connect the pocket tester (DC 20 V) to the headlight coupler (wire harness side) as shown.

**Positive tester probe** → blue ①  
**Negative tester probe** → black ②



- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of blue ① on the headlight coupler (wire harness side).
- Is the voltage within specification?

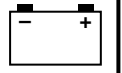
↓ YES

↓ NO

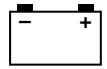
This circuit is OK.

The wiring circuit from the main switch to the headlight coupler is faulty and must be repaired.





- ① A.C.magneto
- ② Neutral switch
- ④ Battery
- ⑤ Fuse
- ⑧ Main switch
- ⑪ C.D.I. unit
- ⑱ Rear brake light switch
- ⑳ Front brake light switch
- ㉑ Turn signal relay
- ㉒ Horn
- ㉕ Horn switch
- ㉖ Turn signal switch
- ㉓ Front turn signal light (left)
- ㉔ Rear turn signal light (left)
- ㉗ Rear turn signal light (right)
- ㉘ Front turn signal light (right)
- ㉙ Tail/brake light
- ㉚ Fuel gauge
- ㉛ Tachometer
- ㉜ Neutral indicator light
- ㉝ Right turn signal indicator light
- ㉞ Left turn signal indicator light
- ㉟ Fuel sender



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. fuse
2. battery
3. main switch
4. wiring connections  
(of the entire signaling system)

#### NOTE:

- Before troubleshooting, remove the following part(s):
  1. headlight assembly
  2. side cover (left and right)
  3. seat
  4. air duct (left and right)
  5. fuel tank
- Troubleshoot with the following special tool(s).



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

EAS00738

#### 1. Fuse

- Check the fuse for continuity. Refer to "CHECKING THE FUSE" in chapter 3.
- Is the 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

- Refill battery fluid.
- 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

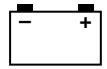
- Check the entire signal system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the signaling system's wiring properly connected and without defects?

↓ YES

↓ NO

Check the condition of each of the signaling system's circuits. Refer to "CHECKING THE SIGNALING SYSTEM".

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?

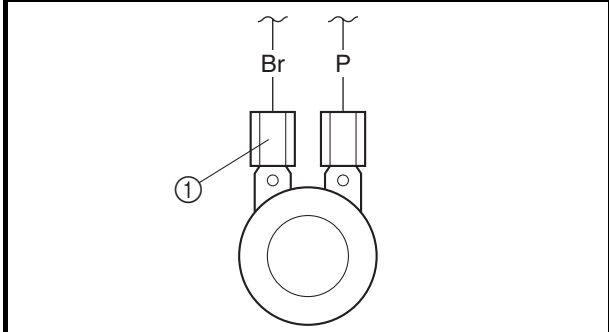


The horn switch is faulty. Replace the left handlebar switch.

2. Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.

**Positive tester probe** → brown ①  
**Negative tester probe** → ground



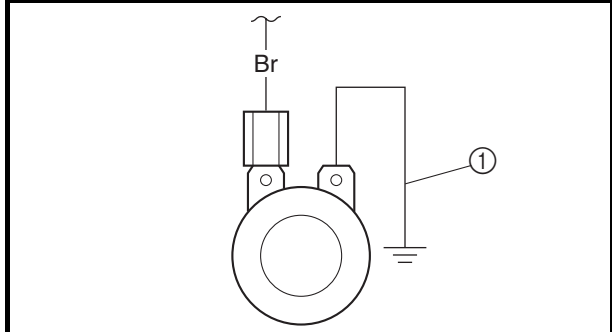
- Set the main switch to “ON”.
- Measure the voltage (DC 12 V) of brown at the horn terminal.
- Is the voltage within specification?



The wiring circuit from the main switch to the horn connector is faulty and must be repaired.

3. Horn

- Disconnect the black connector at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Set the main switch to “ON”.
- Does the horn sound?



The horn is OK.

Replace the horn.

EAS00797

2. The tail/brake light fails to come on.

1. Tail/brake light bulb and socket

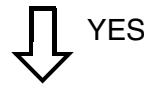
- Check the tail/brake light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the tail/brake light bulb and socket OK?



Replace the tail/brake light bulb, socket or both.

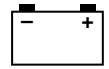
2. Brake light switches

- Check the brake light switches for continuity. Refer to “CHECKING THE SWITCHES”.
- Are the brake light switches OK?



Replace the brake light switch(es).



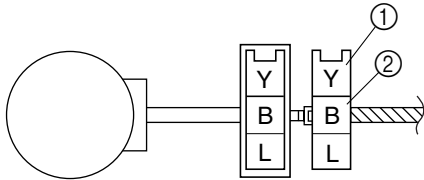


### 3. Voltage

- Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

**Positive tester probe** → yellow ①

**Negative tester probe** → black ②



- Set 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 ① on the tail/brake 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 tail/brake light coupler is faulty and must be repaired.

EAS00799

3. The turn signal light, turn signal indicator light or both fail to blink.

#### 1. Turn signal light bulb and socket

- Check the turn signal light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the turn signal light bulb and socket OK?

↓ YES

↓ NO

Replace the turn signal light bulb, socket or both.

#### 2. Turn signal indicator light bulb and socket

- Check the turn signal indicator light bulb and socket for continuity. Refer to "CHECKING THE BULBS AND BULB SOCKETS".
- Are the turn signal indicator light bulb and socket OK?

↓ YES

↓ NO

Replace the turn signal indicator light bulb, socket or both.

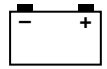
#### 3. Turn signal switch

- Check the turn signal switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the turn signal switch OK?

↓ YES

↓ NO

The turn signal switch is faulty. Replace the left handlebar switch.

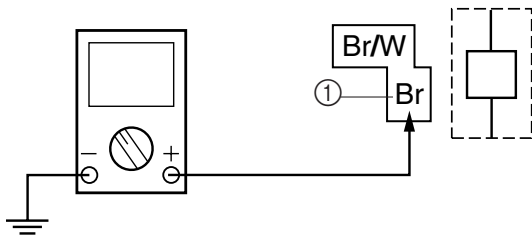


4. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler as shown.

**Positive tester probe** → brown ①

**Negative tester probe** → ground



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) on brown ① at the turn signal relay coupler.
- Is the voltage within specification?

↓ YES

↓ NO

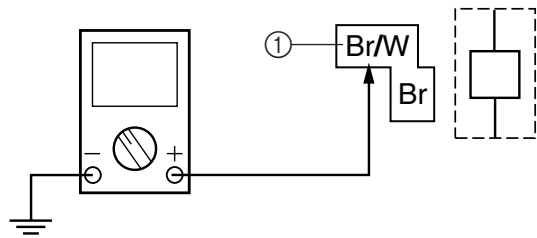
The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

5. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal relay coupler as shown.

**Positive tester probe** → brown/white ①

**Negative tester probe** → ground

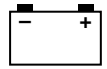


- Set the main switch to "ON".
- Measure the voltage (DC 12 V) on brown/white ① at the turn signal relay coupler.
- Is the voltage within specification?

↓ YES

↓ NO

The turn signal relay is faulty and must be replaced.



### 6. Voltage

- Connect the pocket tester (DC 20 V) to the turn signal light connector or turn signal indicator light connector (wire harness side) as shown.

- A Left turn signal light
- B Right turn signal light
- C Turn signal indicator light

#### Left turn signal light

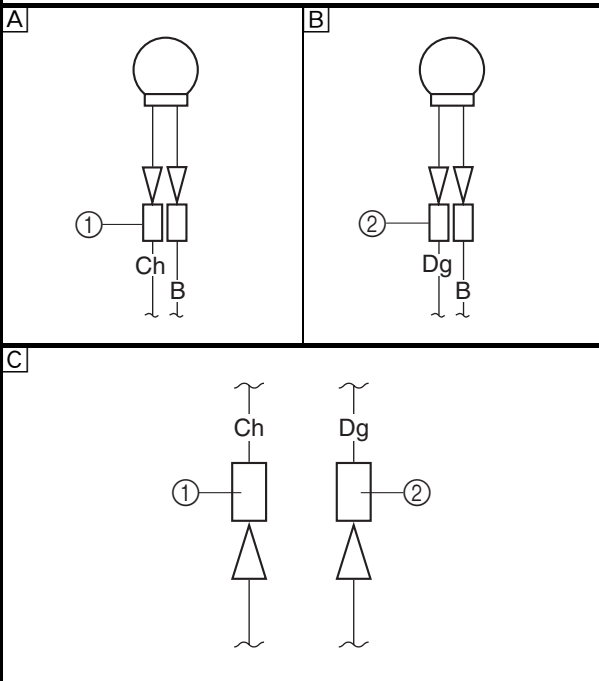
**Positive tester probe** → chocolate ①

**Negative tester probe** → ground

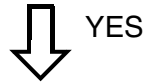
#### Right turn signal light

**Positive tester probe** → dark green ②

**Negative tester probe** → ground

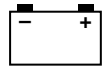


- Set the main switch to “ON”.
- Set the turn signal switch to “←” or “→”.
- Measure the voltage (DC 12 V) of the chocolate ① or dark green ② at the turn signal light connector or turn the signal indicator light connector (wire harness side).
- Is the voltage within specification?



This circuit is OK.

The wiring circuit from the turn signal switch to the turn signal light connector or turn the signal indicator light connector is faulty and must be repaired.



EAS00800

4. The neutral indicator light fails to come on.

**1. Neutral indicator light bulb and socket**

- Check the neutral indicator light bulb and socket for continuity. Refer to “CHECKING THE BULBS AND BULB SOCKETS”.
- Are the neutral indicator light bulb and socket OK?

↓ YES

↓ NO

Replace the neutral indicator light bulb, socket or both.

**2. Neutral switch**

- Check the neutral switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the neutral switch OK?

↓ YES

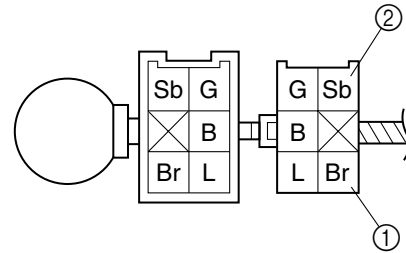
↓ NO

Replace the neutral switch.

**3. Voltage**

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

**Positive tester probe → brown ①**  
**Negative tester probe → sky blue ②**



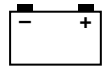
- Set the main switch to “ON”.
- Measure the voltage (DC 12 V).
- Is the voltage within specification?

↓ YES

↓ NO

This circuit is OK.

The wiring circuit from the main switch to the meter assembly coupler is faulty and must be repaired.



EAS00804

5. The fuel level gauge fails to operate.

**1. Fuel sender**

- Remove the fuel sender from the fuel tank.
- Connect the pocket tester to the fuel sender coupler (wire harness side) as shown.

**Positive tester probe → green ①**  
**Negative tester probe → black ②**

- Measure the fuel sender resistances.

**Fuel sender resistance (up position "full" [A])**  
 (Ω × 1)  
 4 ~ 10 Ω at 20 °C (68 °F)

**Fuel sender resistance (down position "empty" [B])**  
 (Ω × 10)  
 90 ~ 100 Ω at 20 °C (68 °F)

- Is the fuel sender OK?

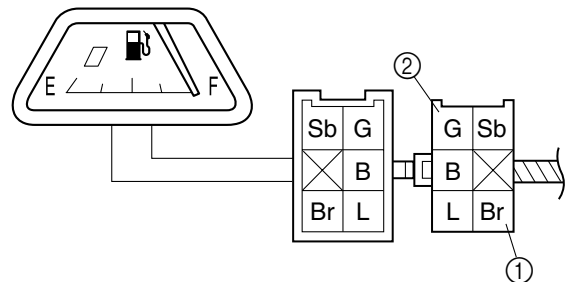


Replace the fuel sender.

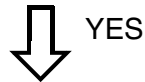
**2. Voltage**

- Connect the pocket tester (DC 20 V) to the meter assembly coupler (wire harness side) as shown.

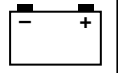
**Positive tester probe → brown ①**  
**Negative tester probe → green ②**



- Set the main switch to "ON".
- Measure the voltage (DC 12 V) of brown ① on the meter assembly coupler (wire harness side).
- Is the voltage within specification?

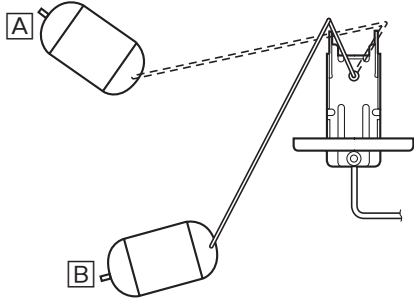


Check the wiring connections of the entire signaling system.



3. Fuel level gauge

- Set the main switch to “ON”.
- Move the float up **A** or down **B**.
- Check that the fuel level gauge needle moves to “F” or “E”.



**NOTE:** \_\_\_\_\_

Before reading the fuel level gauge, leave the float in one position (either up or down) for at least three minutes.

- Does the fuel level gauge needle move appropriately?

↓ YES

↓ NO

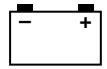
This circuit is OK.

Replace the meter assembly.



# CARBURETOR HEATING SYSTEM

**ELEC**



EAS00821

## TROUBLESHOOTING

**The carburetor heating system fails to operate.**

Check:

1. fuse
2. battery
3. main switch
4. thermo switch
5. carburetor heater
6. wiring connections  
(of the entire carburetor heating system)

**NOTE:**

- Before troubleshooting, remove the following part(s):
  1. headlight assembly
  2. side cover (left and right)
  3. seat
- Troubleshoot with the following special tool(s).



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

EAS00738

### 1. Fuse

- Check the fuse for continuity.  
Refer to "CHECKING THE FUSE" in chapter 3.
- Is the 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

- Refill battery fluid.
- 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

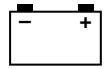
↓ NO

Replace the main switch.



# CARBURETOR HEATING SYSTEM

**ELEC**



EAS00823

## 4. Thermo switch

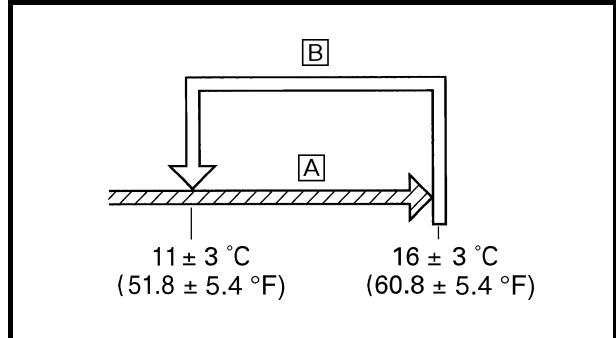
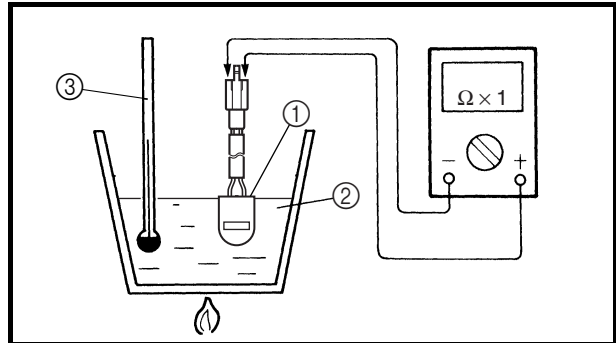
- Remove the thermo switch from the wire harness.
- Connect the pocket tester ( $\Omega \times 1$ ) to the thermo switch ① as shown.
- Immerse the thermo switch in a container filled with water ②.
- Place a thermometer ③ in the water.
- Slowly heat the water, then let it cool down to the specified temperature.
- Check the thermo switch for continuity at the temperatures indicated below.

**A** The thermo switch circuit closed.

**B** The thermo switch circuit open.

Test step	Water temperature	Continuity
1	Less than $16 \pm 3 \text{ }^\circ\text{C}$ ( $60.8 \pm 5.4 \text{ }^\circ\text{F}$ )	YES
2	More than $16 \pm 3 \text{ }^\circ\text{C}$ ( $60.8 \pm 5.4 \text{ }^\circ\text{F}$ )	NO
3	More than $11 \pm 3 \text{ }^\circ\text{C}$ ( $51.8 \pm 5.4 \text{ }^\circ\text{F}$ )	NO
4	Less than $11 \pm 3 \text{ }^\circ\text{C}$ ( $51.8 \pm 5.4 \text{ }^\circ\text{F}$ )	YES

Steps 1 & 2: Heating phase  
Steps 3 & 4: Cooling phase



### **! WARNING**

- Handle the thermo switch with special care.
- Never subject the thermo switch to strong shocks. If the thermo switch is dropped, replace it.

• Does the thermo switch operate properly?

↓ YES

↓ NO

Replace the thermo switch.

EAS00824

**5. Carburetor heater**

- Remove the carburetor heater from the carburetor.
- Connect the pocket tester to the carburetor heater as shown.

**Positive tester probe** →  
carburetor heater terminal ①

**Negative tester probe** →  
carburetor heater body ②

- Measure the carburetor heater resistance.

**Carburetor heater resistance**  
 4.44 ~ 9.21 Ω at 20 °C (68 °F)

- Is the carburetor heater OK?

↓ YES

↓ NO

Replace the carburetor heater.

EAS00826

**6. Wiring**

- Check the entire carburetor heating system's wiring. Refer to "CIRCUIT DIAGRAM".
- Is the carburetor heating system's wiring properly connected and without defects?

↓ YES

↓ NO

Properly connect or repair the carburetor heating system's wiring.

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## TROUBLESHOOTING

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**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.

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### STARTING FAILURES

#### ENGINE

##### Cylinder and cylinder head

- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Improperly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve

##### Piston and piston rings

- 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
- Deteriorated or contaminated fuel

##### Fuel cock

- Clogged or damaged fuel hose

##### Carburetor

- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Damaged float
- Worn needle valve
- Improperly installed needle valve seat
- Incorrect fuel level
- Improperly installed pilot jet
- Clogged starter jet
- Faulty starter plunger

**ELECTRICAL SYSTEMS**

**Battery**

- Discharged battery
- Faulty battery

**Fuse**

- Blown, damaged or incorrect fuse
- Improperly installed fuse

**Spark plug**

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

**Ignition coil**

- Cracked or broken ignition coil body
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

**Ignition system**

- Faulty C.D.I unit
- Faulty pickup coil
- Broken A.C. magneto rotor woodruff key

**Switches and wiring**

- Faulty main switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty clutch switch
- Improperly grounded circuit
- Loose connections

**Starting system**

- Faulty starter motor
- Faulty starter relay
- Faulty starter clutch

EAS00846

**INCORRECT ENGINE IDLING SPEED**

**ENGINE**

**Cylinder and cylinder head**

- Incorrect valve clearance
- Damaged valve train components

**Air filter**

- Clogged air filter element

**FUEL SYSTEM**

**Carburetor**

- Faulty starter plunger
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Damaged or loose carburetor joint
- Improperly adjusted engine idling speed (throttle stop screw)
- Improper throttle cable free play
- Flooded carburetor
- Faulty air induction system

**ELECTRICAL SYSTEMS**

**Battery**

- Discharged battery
- Faulty battery

**Spark plug**

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

**Ignition coil**

- Broken or shorted primary or secondary coils
- Faulty spark plug lead
- Cracked or broken ignition coil

**Ignition system**

- Faulty C.D.I unit
- Faulty pickup coil

EAS00849

## **POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE**

Refer to "STARTING FAILURES".

### **ENGINE**

#### **Air filter**

- Clogged air filter element

#### **Air intake system**

- Bent, clogged or disconnected carburetor air vent hose

### **FUEL SYSTEM**

#### **Carburetor**

- Faulty diaphragm
- Incorrect fuel level
- Loose or clogged main jet

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 thrust play
- Worn shift drum groove

#### **Transmission**

- Worn gear dog

EAS00851

## **FAULTY CLUTCH**

### **CLUTCH SLIPS**

#### **Clutch**

- Improperly assembled clutch
- Improperly adjusted clutch cable
- Loose or fatigued clutch spring
- Worn friction plate
- Worn clutch plate

#### **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
- Broken clutch boss
- Burnt primary driven gear bushing
- Match marks not aligned

#### **Engine oil**

- Incorrect oil level
- Incorrect oil viscosity (high)
- Deteriorated oil

# OVERHEATING/POOR BRAKING PERFORMANCE/ FAULTY FRONT FORK LEGS



EAS00854

## OVERHEATING

### ENGINE

#### Cylinder head and piston

- Heavy carbon buildup

#### Engine oil

- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

### FUEL SYSTEM

#### Carburetor

- Incorrect main jet setting
- Incorrect fuel level
- Damaged or loose carburetor joint

#### Air filter

- Clogged air filter element

### CHASSIS

#### Brake(s)

- Dragging brake

### ELECTRICAL SYSTEMS

#### Spark plug

- Incorrect spark plug gap
- Incorrect spark plug heat range

#### Ignition system

- Faulty C.D.I unit

EAS00859

## POOR BRAKING PERFORMANCE

### Disc brake

- 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

### Drum brake

- Worn brake shoe
- Worn or rusty brake drum
- Incorrect brake pedal position (above the top of the rider footrest)
- Incorrect brake pedal free play
- Incorrect brake camshaft lever position
- Incorrect brake shoe position
- Damaged or fatigued brake shoe spring
- Oil or grease on the brake shoe
- Oil or grease on the brake drum
- Broken brake torque rod

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 bolt
- Damaged damper rod bolt copper washer
- Cracked or damaged cap bolt O-ring

### MALFUNCTION

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level



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 bushing
- Bent or damaged swingarm

**Rear shock absorber assembly(ies)**

- Faulty rear shock absorber spring
- Leaking oil

**Tire(s)**

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

**Wheel(s)**

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

**Frame**

- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

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 SIGNALS FLASH SLOWLY

- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

### TURN SIGNALS REMAIN LIT

- Faulty turn signal relay
- Burnt-out turn signal bulb

### TURN SIGNALS FLASH 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

## YBR125ED 2005 WIRING DIAGRAM

- ① A.C. magneto
- ② Neutral switch
- ③ Rectifier/regulator
- ④ Battery
- ⑤ Fuse
- ⑥ Starter relay
- ⑦ Starter motor
- ⑧ Main switch
- ⑨ Right handlebar switch
- ⑩ Start switch
- ⑪ C.D.I. unit
- ⑫ Ignition coil
- ⑬ Spark plug
- ⑭ Headlight relay
- ⑮ Diode
- ⑯ Clutch switch
- ⑰ Thermo switch
- ⑱ Carburetor heater
- ⑲ Rear brake light switch
- ⑳ Front brake light switch
- ㉑ Turn signal relay
- ㉒ Horn
- ㉓ Left handlebar switch
- ㉔ Dimmer switch
- ㉕ Horn switch
- ㉖ Turn signal switch
- ㉗ Headlight assembly
- ㉘ Headlight
- ㉙ Auxiliary light
- ㉚ Front turn signal light (left)
- ㉛ Rear turn signal light (left)
- ㉜ Rear turn signal light (right)
- ㉝ Front turn signal light (right)
- ㉞ Tail/brake light
- ㉟ Meter assembly
- ㊱ Fuel gauge
- ㊲ Tachometer
- ㊳ Neutral indicator light
- ㊴ Meter light
- ㊵ High beam indicator light
- ㊶ Right turn signal indicator light
- ㊷ Left turn signal indicator light
- ㊸ Fuel sender

### COLOR CODE

B.....	Black
Br.....	Brown
Ch.....	Chocolate
Dg.....	Dark green
G .....	Green
L .....	Blue
Sb.....	Sky blue
O .....	Orange
P.....	Pink
R.....	Red
W.....	White
Y.....	Yellow
B/W .....	Black/White
Br/W .....	Brown/White
L/B.....	Blue/Black
L/W.....	Blue/White
L/Y.....	Blue/Yellow
R/B .....	Red/Black
W/B .....	White/Black





YBR125ED 2005  
WIRING DIAGRAM

YBR125ED 2005  
SCHÉMA DE CÂBLAGE

YBR125ED 2005  
SCHALTPLAN

SCHEMA ELETTRICO  
YBR125ED 2005

DIAGRAMA ELÉCTRICO DE LA  
YBR125ED 2005

