



FZS1000N **FZS1000NC**

SERVICE MANUAL

EAS00001

**FZS1000N (C)
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.

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

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

NOTE:

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

IMPORTANT INFORMATION

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



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



WARNING

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

CAUTION:

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

NOTE:

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

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” on the following page.

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.

(In Chapter 3, “Periodic Checks and Adjustments”, the sub-section title appears at the top of each page, instead of the section title.)

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 (see “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.


⑥

CLUTCH

ENG 


②

CLUTCH

ENG 

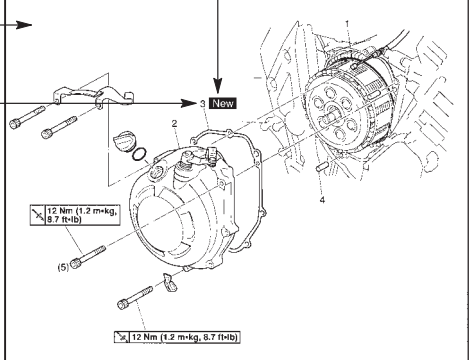
①

CLUTCH

ENG 

④

⑤



③


⑧

REMOVING THE CLUTCH

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

NOTE:

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



Universal clutch holder

YM-91042

3. Remove:

- clutch boss nut ①
- lock washer ②
- clutch boss ③

⑦

Order	Job/Part	Qty	Remarks
	Removing the clutch cover		
	Engine oil		Remove the parts in the order listed. Drain. Refer to “CHANGING THE ENGINE OIL” in chapter 3.
1	Clutch cable	1	
2	Clutch cover	1	
3	Clutch cover gasket	1	
4	Dowel pin	2	
			For installation, reverse the removal procedure.

⑧

CHECKING THE FRICTION PLATES

















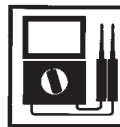







The following procedure applies to all of the friction plates.

1. Check:
 - friction plate

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

5-36

5-40

①	GEN INFO 	②	SPEC 		
③	CHK ADJ 	④	ENG 		
⑤	COOL 	⑥	CARB 		
⑦	CHAS 	⑧	ELEC 		
⑨	TRBL SHTG 	⑩			
⑪		⑫			
⑬		⑭			
⑮		⑯		⑰	
⑱		⑲		⑳	
㉑		㉒		㉓	
㉔		㉕	New		

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SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑨ indicate the subject of each chapter.

- ① General information
- ② Specifications
- ③ Periodic checks and adjustments
- ④ Engine
- ⑤ Cooling system
- ⑥ Carburetor(-s)
- ⑦ Chassis
- ⑧ Electrical system
- ⑨ Troubleshooting

Symbols ⑩ to ⑰ indicate the following.

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










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

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

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

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

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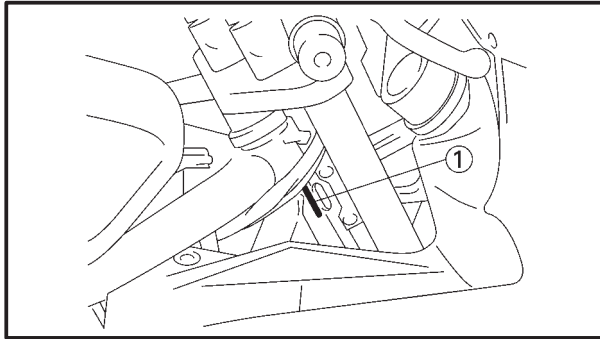


CHAPTER 1

GENERAL INFORMATION

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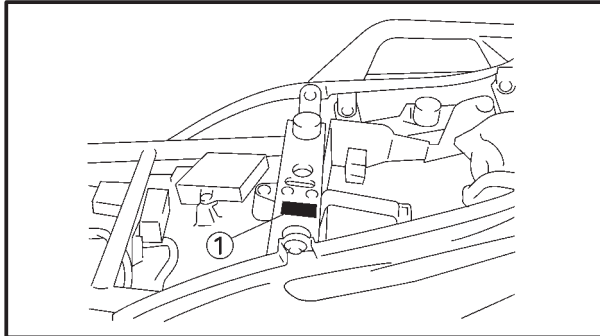
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GENERAL INFORMATION MOTORCYCLE IDENTIFICATION

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VEHICLE IDENTIFICATION NUMBER

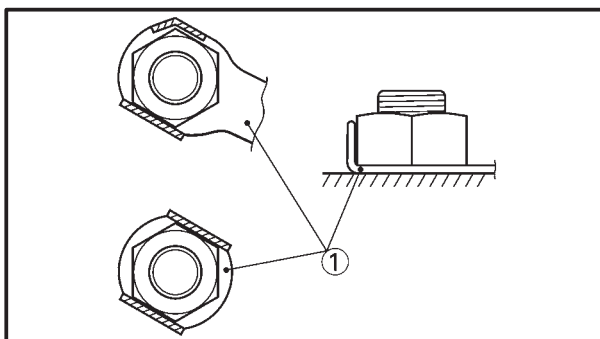
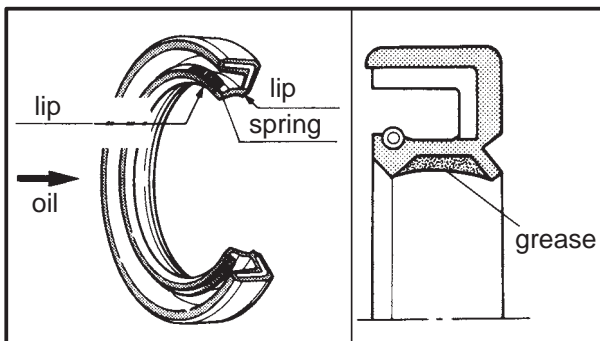
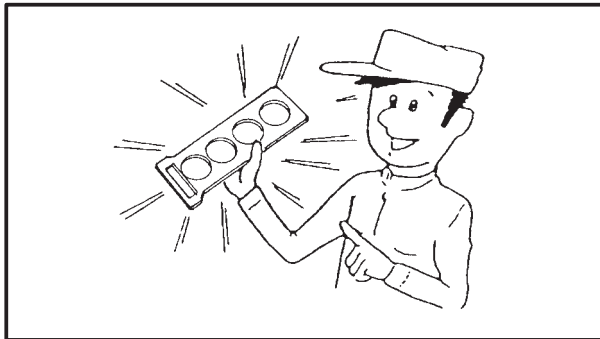
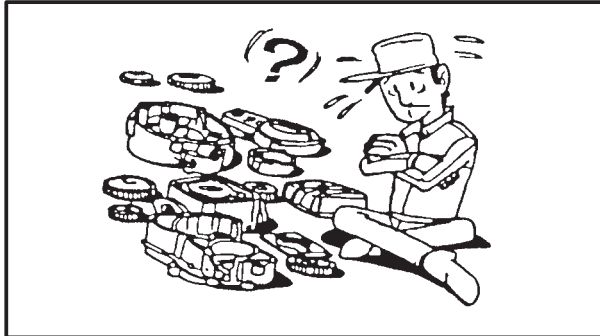
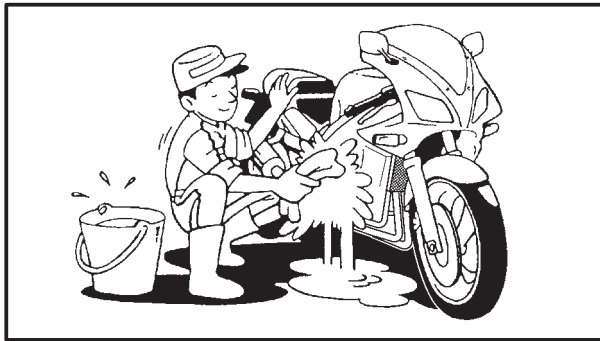
The vehicle identification number ① is stamped into the right side of the steering head.



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MODEL CODE

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



EAS00020

IMPORTANT INFORMATION PREPARATION FOR REMOVAL AND DIS- ASSEMBLY

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" section.
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

1. 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.

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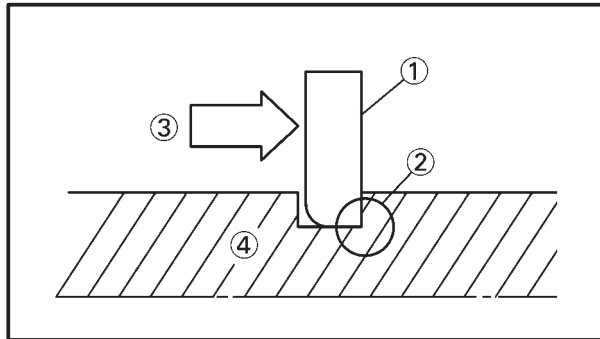
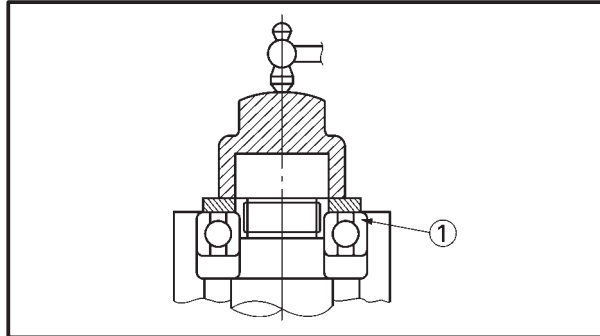
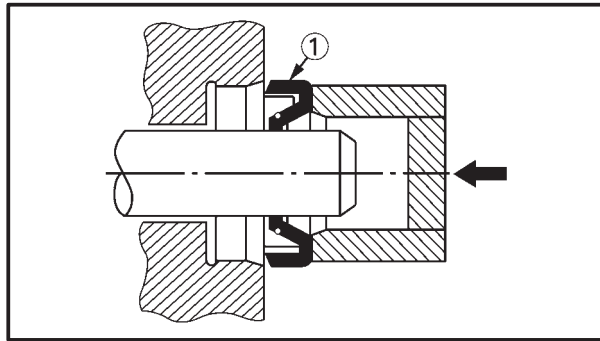
GASKETS, OIL SEALS AND O-RINGS

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 apply grease onto the oil seal lips with grease.

EAS00023

LOCK WASHERS/PLATES AND COTTER PINS

1. After removal, replace all lock washers/plates① 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

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

① Oil seal

CAUTION:

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

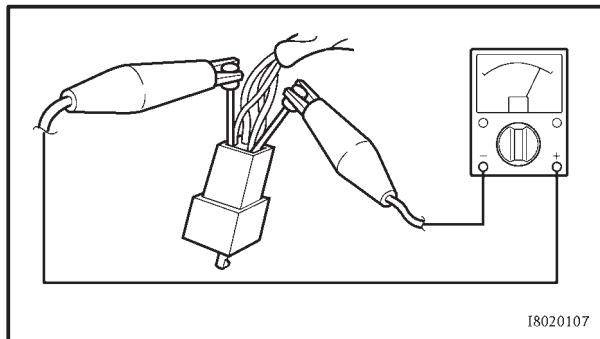
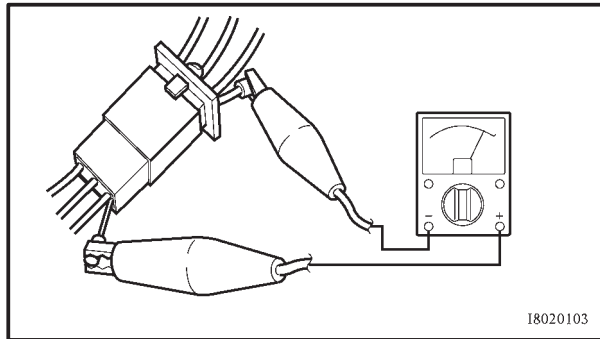
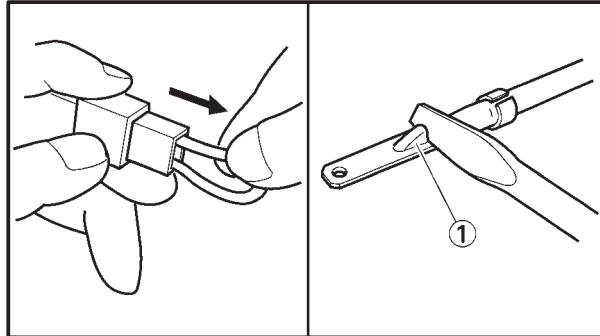
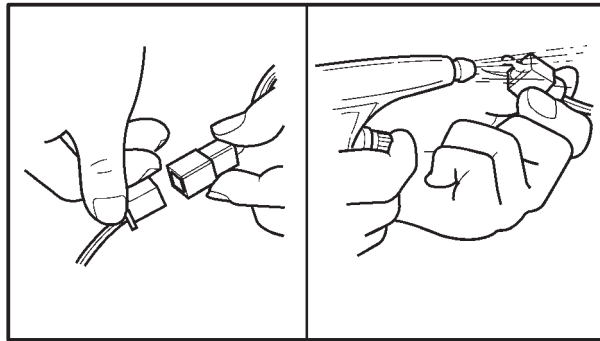
① Bearing

EAS00025

CIRCLIPS

1. 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 that 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 ①
- coupler ②
- connector ③

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 that all connections are tight.

5. Check:

- continuity
(with a pocket tester)



**Pocket tester measurement
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

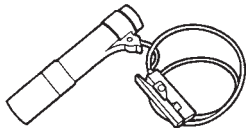
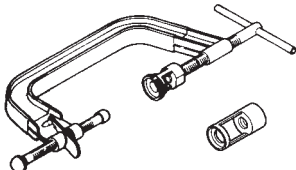
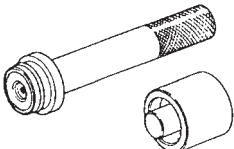
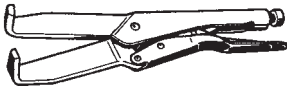
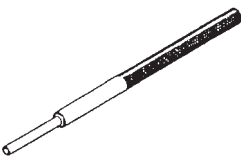
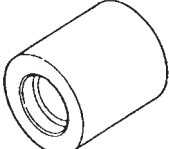
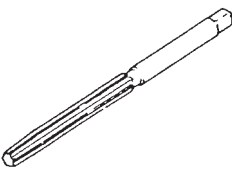
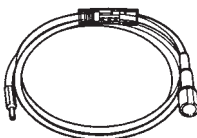

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.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

Tool No.	Tool name/Function	Illustration
YM-01080-A	Alternator Rotor Puller This tool is used to remove the generator rotor.	
YU-01235	Universal Magneto & Rotor Holder This tool is used to hold the generator rotor when removing or installing the generator rotor bolt or pickup coil rotor bolt.	
YU-01304	Piston Pin Puller This tool is used to remove the piston pins.	
YU-01312-A	Fuel Level Gauge This tool is used to measure the fuel level in the float chamber.	
Radiator Pressure Tester YU-24460-01 Radiator Pressure Tester Adapter YU-33984	Radiator Pressure Tester Radiator Pressure Tester Adapter These tools are used to check the cooling system.	
YU-33975	Spanner Wrench This tool is used to loosen or tighten the steering stem ring nuts.	
YU-1268	Steering Nut Wrench This tool is used to loosen the steering stem ring nuts.	
YM-01447	Damper Rod Holder This tool is used to hold the damper rod assembly when loosening or tightening the damper rod assembly bolt.	



Tool No.	Tool name/Function	Illustration
YU-38411	Oil Filter Wrench This tool is needed to loosen or tighten the oil filter cartridge.	
YM-01434	Rod Holder This tool is used to support the damper adjusting rod.	
Rod puller YM-01437	Rod Puller This tool is used to pull up the front fork damper rod.	
Driver YM-33963 43 mm Adapters YM-8020-A	Driver 43 mm Adapters This tool is used to install the front fork's oil seal and dust seal.	
YU-03008	Micrometers (50 ~ 75 mm) This tool is used to measure the piston skirt diameter.	
YU-8030	Carburetor Synchronizer This guide is used to synchronize the carburetors.	
Compression Gauge Set YU-33223	Compression Gauge Set Compression Gauge Adapter These tools are used to measure engine compression.	
YU-03112-C	Pocket Tester Measurement This tool is used to check the electrical system.	
YU-8036-B	Inductive Self-Powered Tachometer This tool is used to check engine speed.	



Tool No.	Tool name/Function	Illustration
YM-33277-A	Battery Powered Timing Light This tool is used to check the ignition timing.	
Valve Spring Compressor YM-04019 Adapter YM-4108 YM-4114	Valve Spring Compressor Set, Quick Release Adapter These tools are used to remove or install the valve assemblies.	
40 and 50 mm Bearing Driver YM-4058 Water Pump Seat Installer YM-33221	40 and 50 mm Bearing Driver Water Pump Seal Installer These tools are used to install the water pump seal.	
YM-91042	Universal Clutch Holder (Grabbit) This tool is used to hold the clutch boss when removing or installing the clutch boss nut.	
YM-04111 YM-4116	Valve Guide Remover (ø4) Valve Guide Remover (ø4.5) This tool is used to remove or install the valve guides.	
YM-04112 YM-4117	Valve Guide Installer (ø4) Valve Guide Installer (ø4.5) This tool is used to install the valve guides.	
YM-04113 YM-4118	Valve Guide Reamer (ø4) Valve Guide Reamer (ø4.5) This tool is used to rebores the new valve guides.	
YM-34487	Dynamic Spark Tester This tool is used to check the ignition system components.	
ACC-11001-05-01	Yamaha bond No. 1215 This bond is used to seal two mating surfaces (e.g., crankcase mating surfaces).	



CHAPTER 2. SPECIFICATIONS

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SPECIFICATIONS

GENERAL SPECIFICATIONS

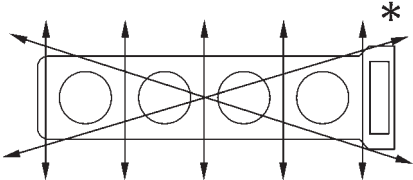
Item	Standard	Limit
Model code	5LV5 (USA except for California) 5LV6 (CDN) 5LV7 (California)	
Dimensions Overall length Overall width Overall height Seat height Wheelbase Minimum ground clearance Minimum turning radius	2,125 mm (83.7 in) 765 mm (30.1 in) 1,190 mm (46.9 in) 820 mm (32.3 in) 1,450 mm (57.1 in) 140 mm (5.5 in) 2,900 mm (114.2 in)	
Weight Wet (with oil and a full fuel tank) Dry (without oil and fuel) Maximum load (total of cargo, rider, passenger, and accessories)	231 kg (509 lb) 232 kg (512 lb) (for california) 208 kg (459 lb) 209 kg (461 lb) (for california) 189 kg (417 lb) 188 kg (415 lb) (for california)	



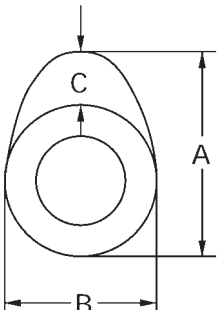
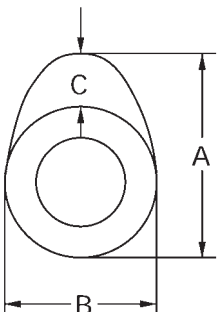
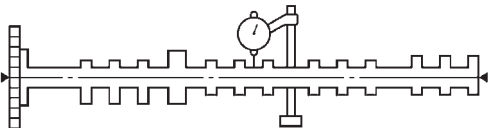
ENGINE SPECIFICATIONS

Item	Standard	Limit
Engine Engine type Displacement Cylinder arrangement Bore ~ stroke Compression ratio Engine idling speed Vacuum pressure at engine idling speed Standard compression pressure (at sea level)	Liquid-cooled, 4-stroke, DOHC 998 cm ³ Forward-inclined parallel 4-cylinder 74 ~ 58 mm (2.91 ~ 2.28 in) 11.4 : 1 1,050 ~ 1,150 r/min 30 kPa (225 mmHg, 8.86 in Hg) 1,450 kPa (14.5 kg/cm ² , 206 psi) at 400 r/min	
Fuel Recommended fuel Fuel tank capacity Total (including reserve) Reserve only	Unleaded fuel (for USA) Regular unleaded gasoline (for CDN) 21 L (18.5 Imp qt, 22.2 US qt) 4.0 L (3.52 Imp qt, 4.22 US qt)	
Engine oil Lubrication system Recommended oil <div style="text-align: center;"> <p>30 40 50 60°F 0 5 10 15°C</p> </div> Quantity Total amount Without oil filter cartridge replacement With oil filter cartridge replacement Oil pressure (hot) Relief valve opening pressure	Wet sump Yamalube 4 (20W40) or SAE 20W40 type SE motor oil 3.7 L (3.2 Imp qt, 3.8 US qt) 2.8 L (2.4 Imp qt, 2.9 US qt) 3.0 L (2.6 Imp qt, 3.1 US qt) 45 kPa (0.45 kg/cm ² , 6.40 psi) at 1,100 r/min 490 ~ 570 kPa (4.9 ~ 5.7 kg/cm ² , 69.7 ~ 81.1 psi)	

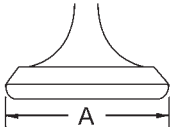
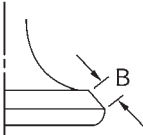
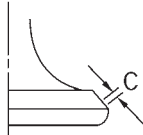
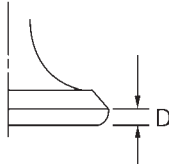


Item	Standard	Limit
Oil filter Oil filter type Bypass valve opening pressure	Cartridge (paper) 180 ~ 220 kPa (1.8 ~ 2.2 kg/cm ² , 25.6 ~ 31.3 psi)	
Oil pump Oil pump type Inner-rotor-to-outer-rotor-tip clearance Outer-rotor-to-oil-pump-housing clearance	Trochoidal 0.09 ~ 0.15 mm (0.004 ~ 0.006 in) 0.03 ~ 0.08 mm (0.001 ~ 0.003 in)	
Cooling system Radiator capacity Radiator cap opening pressure Radiator core Width Height Depth Coolant reservoir Capacity Water pump Water pump type Reduction ratio Max. impeller shaft tilt	2.4 L (2.11 Imp qt, 2.53 US qt) 95 ~ 125 kPa (0.95 ~ 1.25 kg/cm ² , 13.1 ~ 17.8 psi) 340 mm (13.4 in) 238 mm (9.4 in) 24 mm (0.94 in) 0.3 L (0.26 Imp qt, 0.32 US qt) Single-suction centrifugal pump 68/43 ~ 28/28 (1.581)	0.15 mm (0.006 in)
Starting system type	Electric starter	
Spark plugs Model (manufacturer) ~ quantity Spark plug gap	CR9E/U27ESR-N (NGK/DENSO) ~ 4 0.7 ~ 0.8 mm (0.028 ~ 0.031 in)	
Cylinder head Max. warpage 		0.1 mm (0.004 in)

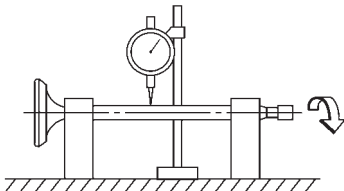
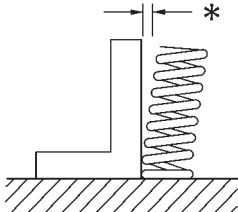



Item	Standard	Limit
Camshafts		
Drive system	Chain drive (right)	
Camshaft cap inside diameter	24.500 ~ 24.521 mm (0.9646 ~ 0.9654 in)	
Camshaft journal diameter	24.459 ~ 24.472 mm (0.9630 ~ 0.9635 in)	
Camshaft-journal-to-camshaft-cap clearance	0.028 ~ 0.062 mm (0.0011 ~ 0.0024 in)	
Intake camshaft lobe dimensions		
		
Measurement A	32.5 ~ 32.6 mm (1.2795 ~ 1.2835 in)	32.4 mm (1.2756 in)
Measurement B	24.95 ~ 25.05 mm (0.9823 ~ 0.9862 in)	24.85 mm (0.9783 in)
Measurement C	7.45 ~ 7.65 mm (0.2933 ~ 0.3012 in)	
Exhaust camshaft lobe dimensions		
		
Measurement A	32.95 ~ 33.05 mm (1.2972 ~ 1.3012 in)	32.85 mm (1.2933 in)
Measurement B	24.95 ~ 25.05 mm (0.9823 ~ 0.9862 in)	24.85 mm (0.9783 in)
Measurement C	7.75 ~ 7.95 mm (0.3051 ~ 0.3126 in)	
Max. camshaft runout		0.03 mm (0.0012 in)
		

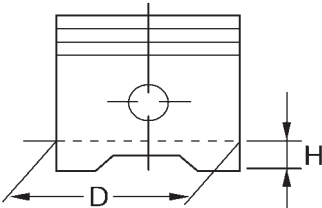



Item	Standard	Limit
Timing chain Model/number of links Tensioning system	RH2015/130 Automatic	
Valves, valve seats, valve guides Valve clearance (cold) Intake Exhaust Valve dimensions	0.11 ~ 0.20 mm (0.0043 ~ 0.0079 in) 0.21 ~ 0.25 mm (0.0083 ~ 0.0098 in)	
   		
Head Diameter	Face Width	Seat Width
Valve head diameter A		Margin Thickness
Intake	22.9 ~ 23.1 mm (0.9016 ~ 0.9094 in)	
Exhaust	24.4 ~ 24.6 mm (0.9606 ~ 0.9685 in)	
Valve face width B		
Intake	1.76 ~ 2.90 mm (0.0693 ~ 0.1142 in)	
Exhaust	1.76 ~ 2.90 mm (0.0693 ~ 0.1142 in)	
Valve seat width C		
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	
Valve margin thickness D		
Intake	0.5 ~ 0.9 mm (0.020 ~ 0.035 in)	
Exhaust	0.5 ~ 0.9 mm (0.020 ~ 0.035 in)	
Valve stem diameter		
Intake	3.975 ~ 3.900 mm (0.1565 ~ 0.1535 in)	3.945 mm (0.1553 in)
Exhaust	4.465 ~ 4.480 mm (0.1758 ~ 0.1764 in)	4.43 mm (0.1744 in)
Valve guide inside diameter		
Intake	4.000 ~ 4.012 mm (0.1575 ~ 0.1580 in)	4.05 mm (0.1594 in)
Exhaust	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in)	4.55 mm (0.1791 in)
Valve-stem-to-valve-guide clearance		
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.020 ~ 0.047 mm (0.0008 ~ 0.0019 in)	0.10 mm (0.0039 in)

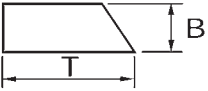
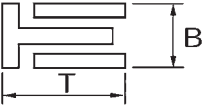
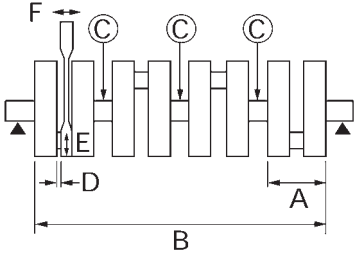


Item	Standard	Limit
Valve stem runout 	...	0.01 mm (0.0004 in)
Valve seat width		
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	...
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)	...
Valve springs		
Free length		
Intake	38.90 mm (1.53 in)	...
Exhaust	40.67 mm (1.60 in)	...
Installed length (valve closed)		
Intake	34.50 mm (1.36 in)	...
Exhaust	35.00 mm (1.38 in)	...
Compressed spring force (installed)		
Intake	82 ~ 96 N (8.2 ~ 9.6 kg, 18.4 ~ 25.4 lb)	...
Exhaust	110 ~ 126 N (11.0 ~ 12.6 kg, 24.7 ~ 28.3 lb)	...
Spring tilt		
		
Intake	...	2.5°/1.7 mm (2.5°/0.067 in)
Exhaust	...	2.5°/1.8 mm (2.5°/0.071 in)
Winding direction (top view)		...
Intake	Clockwise	...
Exhaust	Clockwise	
		



Item	Standard	Limit
Cylinders Cylinder arrangement Bore ~ stroke Compression ratio Bore Max. taper Max. out-of-round	Forward-inclined, parallel 4-cylinder 74 ~ 58 mm (2.91 ~ 2.28 in) 11.4 : 1 74.00 ~ 74.01 mm (2.9134 ~ 2.9138 in)	 0.05 mm (0.0016 in) 0.05 mm (0.0016 in)
Pistons Piston-to-cylinder clearance Diameter D  Height H Piston pin bore (in the piston) Diameter Offset Offset direction Piston pins Outside diameter Piston-pin-to-piston-pin-bore clearance Piston rings Top ring  Ring type Dimensions (B ~ T) End gap (installed) Ring side clearance	0.030 ~ 0.055 mm (0.001 ~ 0.002 in) 73.955 ~ 73.970 mm (2.9118 ~ 2.9122 in) 5 mm (0.20 in) 17.002 ~ 17.013 mm (0.6694 ~ 0.6698 in) 0.5 mm (0.0197 in) Intake side 16.991 ~ 17.000 mm (0.6689 ~ 0.6693 in) 0.002 ~ 0.022 mm (0.00008 ~ 0.00087 in)	 0.12 mm (0.005 in) 17.043 mm (0.6710 in) 16.971 mm (0.6681 in) 0.072 mm (0.0028 in)



Item	Standard	Limit
<p>2nd ring</p>  <p>Ring type Dimensions (B ~ T) End gap (installed) Ring side clearance</p> <p>Oil ring</p>  <p>Dimensions (B ~ T) End gap (installed)</p>	<p>Taper 0.8 ~ 2.8 mm (0.031 ~ 0.110 in) 0.43 ~ 0.58 mm (0.017 ~ 0.023 in) 0.020 ~ 0.055 mm (0.0008 ~ 0.0022 in)</p> <p>1.5 ~ 2.6 mm (0.059 ~ 0.101 in) 0.10 ~ 0.35 mm (0.004 ~ 0.014 in)</p>	
<p>Connecting rods Crankshaft-pin-to-big-end-bearing clearance Bearing color code</p>	<p>0.031 ~ 0.055 mm (0.0012 ~ 0.0022 in)</p> <p>-1 = Violet 0 = White 1 = Blue 2 = Black</p>	
<p>Crankshaft</p>  <p>Width A Width B Max. runout C</p> <p>Big end side clearance D Crankshaft-journal-to-crankshaft-journal-bearing clearance Bearing color code</p>	<p>52.40 ~ 57.25 mm (2.063 ~ 2.254 in) 300.75 ~ 302.65 mm (11.84 ~ 11.92 in)</p> <p>0.160 ~ 0.262 mm (0.006 ~ 0.010 in) 0.029 ~ 0.053 mm (0.0011 ~ 0.0021 in)</p> <p>-1 = Pink/violet 0 = Pink/white 1 = Pink/blue 2 = Pink/black 3 = Pink/brown</p>	<p>0.03 mm (0.0012 in)</p>
<p>Clutch Clutch type Clutch release method Clutch release method operation Operation Clutch cable free play (at the end of the clutch lever)</p>	<p>Wet, multiple disc Cam (pull rod type) Cable operation Left-hand operation 10 ~ 15 mm (0.39 ~ 0.59 in)</p>	



Item	Standard	Limit
Friction plates Thickness	2.92 ~ 3.08 mm (0.115 ~ 0.121 in)	2.82 mm (0.111 in)
Plate quantity	8	
Thickness	3.42 ~ 3.58 mm (0.135 ~ 0.141 in)	3.32 mm (0.131 in)
Plate quantity	1	
Clutch plates		
Thickness	1.9 ~ 2.1 mm (0.075 ~ 0.083 in)	
Plate quantity	8	
Max. warpage		0.1 mm (0.004 in)
Clutch springs		
Free length	50 mm (1.97 in)	
Spring quantity	6	
Transmission		
Transmission type	Constant mesh, 6-speed	
Primary reduction system	Spur gear	
Primary reduction ratio	68/43 (1.581)	
Secondary reduction system	Chain drive	
Secondary reduction ratio	44/16 (2.750)	
Operation	Left-foot operation	
Gear ratios		
1st gear	35/14 (2.500)	
2nd gear	35/19 (1.842)	
3rd gear	30/20 (1.500)	
4th gear	28/21 (1.333)	
5th gear	30/25 (1.200)	
6th gear	29/26 (1.115)	
Max. main axle runout		0.08 mm (0.003 in)
Max. drive axle runout		0.08 mm (0.003 in)
Shifting mechanism		
Shift mechanism type	Guide bar	
Max. shift fork guide bar bending		0.1 mm (0.004 in)
Installed shift rod length	260 mm (10.2 in)	
Air filter type	Dry element	
Fuel pump		
Pump type	Electrical	
Model (manufacturer)	4SV (MITSUBISHI)	
Output pressure	20 kPa (0.2 kg/cm ² , 2.8 psi)	



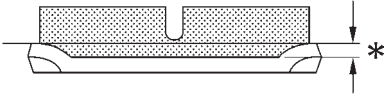
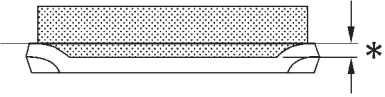
Item	Standard	Limit
Carburetors		
Model (manufacturer) ~ quantity	BSR37 (MIKUNI) ~ 4	
Throttle cable free play (at the flange of the throttle grip)	3 ~ 5 mm (0.12 ~ 0.20 in)	
ID mark	5LV5 40	
Main jet	Carburetors 1 and 4: #132.5 Carburetors 2 and 3: #130	
Main air jet	#80	
Jet needle	Carburetor 1 and 4: 5D129-3/5 Carburetor 2 and 3: 5D130-3/5	
Needle jet	P-OM	
Pilot air jet	#85	
Pilot outlet	1.0	
Pilot jet	#15	
Bypass 1	0.9	
Bypass 2	0.9	
Bypass 3	0.9	
Pilot screw turns out	2.0	
Valve seat size	1.5	
Starter jet 1	#42.5	
Starter jet 2	0.8	
Throttle valve size	#115	
Fuel level (above the line on the float chamber)	3.0 ~ 4.0 mm (0.118 ~ 0.157 in)	
Max. EXUP cable free play (at the EXUP valve pulley)	1.5 mm (0.059 in)	



CHASSIS SPECIFICATIONS

Item	Standard	Limit
Frame		
Frame type	Double cradle	...
Caster angle	26°	...
Trail	104 mm (4.09 in)	...
Front wheel		
Wheel type	Cast wheel	...
Rim		
Size	17 ~ MT3.50	...
Material	Aluminum	...
Wheel travel	140 mm (5.51 in)	...
Wheel runout		
Max. radial wheel runout	...	1 mm (0.04 in)
Max. lateral wheel runout	...	0.5 mm (0.02 in)
Rear wheel		
Wheel type	Cast wheel	...
Rim		
Size	17 ~ MT5.50	...
Material	Aluminum	...
Wheel travel	135 mm (5.31 in)	...
Wheel runout		
Max. radial wheel runout	...	1 mm (0.04 in)
Max. lateral wheel runout	...	0.5 mm (0.02 in)
Front tire		
Tire type	Tubeless	...
Size	120/70 ZR17 (58W)	...
Model (manufacturer)	MEZ4Y FRONT (METZELER) BT020F U (BRIDGESTONE)	...
Tire pressure (cold)		
0 ~ 90 kg	250 kPa (2.5 kgf/cm ² , 36 psi)	...
90 ~ 201 kg	250 kPa (2.5 kgf/cm ² , 36 psi)	...
High-speed riding	250 kPa (2.5 kgf/cm ² , 36 psi)	...
Min. tire tread depth	...	1.0 mm (0.04 in)



Item	Standard	Limit
Rear tire Tire type Size Model (manufacturer) Tire pressure (cold) 0 ~ 90 kg 90 ~ 201 kg High-speed riding Min. tire tread depth	Tubeless 180/55 ZR17 (73W) MEZ4Y (METZELER) BT020R U (BRIDGESTONE) 270 kPa (2.7 kgf/cm ² , 39 bar) 290 kPa (2.9 kgf/cm ² , 42 bar) 290 kPa (2.9 kgf/cm ² , 42 bar)	1.0 mm (0.04 in)
Front brakes Brake type Operation Recommended fluid Brake discs Diameter ~ thickness Min. thickness Max. deflection Brake pad lining thickness  Master cylinder inside diameter Caliper cylinder inside diameter	Dual-disc brake Right-hand-operation DOT 4 298 ~ 5 mm (11.7 ~ 0.20 in) 5.5 mm (0.22 in) 14 mm (0.05 in) 30.2 mm (1.19 in) and 27 mm (1.06 in)	4.5 mm (0.18 in) 0.1 mm (0.004 in) 0.5 mm (0.02 in)
Rear brake Brake type Operation Brake pedal position (from the top of the brake pedal to the top of the rider footrest) Recommended fluid Brake discs Diameter ~ thickness Min. thickness Max. deflection Brake pad lining thickness  Master cylinder inside diameter Caliper cylinder inside diameter	Single-disc brake Right-foot operation 35 ~ 40 mm (1.38 ~ 1.57 in) DOT 4 267 ~ 5 mm (10.51 ~ 0.20 in) 5.5 mm (0.22 in) 12.7 mm (0.5 in) 42.9 mm (1.69 in)	4.5 mm (0.18 in) 0.1 mm (0.004 in) 0.5 mm (0.02 in)



Item	Standard	Limit
Front suspension		
Suspension type	Telescopic fork	...
Front fork type	Coil sprin	...
Front fork travel	140 mm (5.51 in)	...
Spring		
Free length	344.0 mm (13.5 in)	...
Spacer length	66.0 mm (2.60 in)	...
Installed length	320.0 mm (12.6 in)	...
Spring rate (K1)	7.8 N/mm (0.78 kg/mm, 43.7 lb/in)	...
Spring rate (K2)	11.8 N/mm (1.2 kg/mm, 67.2 lb/in)	...
Spring stroke (K1)	0 ~ 64 mm (0 ~ 2.52 in)	...
Spring stroke (K2)	64 ~ 140 mm (2.52 ~ 5.51 in)	...
Optional spring available	No	...
Fork oil		
Recommended oil	Suspension oil "01" or equivalent	...
Quantity (each front fork leg)	435 cm ³ (15.3 Imp oz, 14.7 US oz)	...
Level (from the top of the inner tube, with the inner tube fully compressed, and without the fork spring)	140 mm (5.51 in)	...
Spring preload adjusting positions		
Minimum	5 (fully turned out position)	...
Standard	2	...
Maximum	1	...
Rebound damping adjusting positions		
Minimum*	17	...
Standard*	7	...
Maximum*	1	...
Compression damping adjusting positions		
Minimum*	21	...
Standard*	6	...
Maximum*	1	...
*from the fully turned-in position		

CHASSIS SPECIFICATIONS

SPEC



Item	Standard	Limit
Steering		
Steering bearing type	Angular ball bearings	
Rear suspension		
Suspension type	Swingarm (link suspension)	
Rear shock absorber assembly type	Coil spring/gas-oil damper	
Rear shock absorber assembly travel	65 mm (2.56 in)	
Spring		
Free length	182.5 mm (7.19 in)	
Installed length	163 mm (6.42 in)	
Spring rate (K1)	73.6 N/mm (7.5 kg/mm, 420 lb/in)	
Spring stroke (K1)	0 ~ 65 mm (0 ~ 2.56 in)	
Optional spring available	No	
Standard spring preload gas/air pressure	1,200 kPa (12 kg/cm ² , 170.7 psi)	
Spring preload adjusting positions		
Minimum	1	
Standard	6	
Maximum	11	
Rebound damping adjusting positions		
Minimum*	20	
Standard*	10	
Maximum*	3	
Compression damping adjusting positions		
Minimum*	1	
Standard*	7	
Maximum*	12	
*from the fully turned-in position		
Swingarm		
Free play (at the end of the swingarm)		
Radial		1 mm (0.04 in)
Axial		1 mm (0.04 in)
Drive chain		
Model (manufacturer)	50ZVM (DAIDO)	
Link quantity	116	
Drive chain slack	40 ~ 50 mm (1.57 ~ 1.97 in)	
Maximum ten-link section	150.1 mm (5.91 in)	152.5 mm (6.00 in)



ELECTRICAL SPECIFICATIONS

Item	Standard	Limit
System voltage	12 V	...
Ignition system		
Ignition system type	Transistorized coil ignition	...
Ignition timing	5° BTDC at 1,100 r/min	...
Advanced timing	55° BTDC at 5,000 r/min	...
Advancer type	Throttle position sensor and electrical	...
Pickup coil resistance/color	248 ~ 372 Ω/Gy-B	...
Transistorized coil ignition unit model (manufacturer)	TNDF69 (DENSO)	...
Ignition coils		
Model (manufacturer)	J0313 (DENSO)	...
Minimum ignition spark gap	6 mm (0.24 in)	...
Primary coil resistance	1.87 ~ 2.53 Ω	...
Secondary coil resistance	12 ~ 18 kΩ	...
Spark plug caps		
Material	Rubber	...
Resistance	10 kΩ	...
Throttle position sensor standard resistance	4 ~ 6 kΩ	...
Charging system		
System type	AC magneto	...
Model (manufacturer)	F4T361 (MITSUBISHI)	...
Normal output	14 V/365 W at 5,000 r/min	...
Stator coil resistance/color	0.27 ~ 0.33 Ω at 20°C (68°F)/W-W	...
Rectifier/regulator		
Regulator type	Semiconductor short circuit	...
Model (manufacture)	SH650C-11 (SHINDENGEN)	...
No-load regulated voltage	14.1 ~ 14.9 V	...
Rectifier capacity	18 A	...
Withstand voltage	200 V	...
Battery		
Battery type	GT14B-4	...
Battery voltage/capacity	12 V/12AH	...
Headlight type	Halogen bulb	
Bulbs (voltage/wattage ~ quantity)		
Headlight	12 V 60 W/55 W ~ 2	...
Auxiliary light	12 V 5 W ~ 2	...
Tail/brake light	12 V 5 W/21 W ~ 2	...
Front turn signal light	12 V 8 W/27 W ~ 2	...
Rear turn signal light	12 V 27 W ~ 2	...
Meter light	12 V 2 W ~ 3	...



Item	Standard	Limit
Indicator light (voltage/wattage ~ quantity)		
Neutral indicator light	14 V 1.4 W ~ 1	...
High beam indicator light	14 V 1.4 W ~ 1	...
Oil level indicator light	14 V 1.4 W ~ 1	...
Turn signal indicator light	14 V 1.4 W ~ 2	...
Fuel indicator light	12 V 2 W ~ 1	...
Water temperature indicator light	LED	...
Electric starting system		
System type	Constant mesh	...
Starter motor		
Model (manufacturer)	SM-13 (MITSUBA)	...
Power output	0.8 kW	...
Brushes		
Overall length	12.5 mm (0.49 in)	4 mm (0.16 in)
Spring force	7.65 ~ 10.01 N (780 ~ 1,021 gf, 27.5 ~ 36.0 oz)	...
Commutator resistance	0.025 ~ 0.035 Ω	...
Commutator diameter	28 mm (1.10 in)	27 mm (1.06 in)
Mica undercut	0.7 mm (0.03 in)	...
Starter relay		
Model (manufacturer)	MS5F-631 (JIDECO)	...
Amperage	180 A	...
Coil resistance	4.18 ~ 4.62 Ω	...
Horn		
Horn type	Plain	...
Model (manufacturer) ~ quantity	YF-12 (NIKKO) ~ 1	...
Max. amperage	3 A	...
Turn signal relay		
Relay type	Full-transistor	...
Model (manufacturer)	FE246BH (DENSO)	...
Self-cancelling device built-in	No	...
Turn signal blinking frequency	75 ~ 95 cycles/min.	...
Wattage	27 W ~ 2 + 3.4 W	...
Oil level switch		
Model (manufacturer)	5LV (DENSO)	...
Fuel sender		
Model (manufacturer)	5LV (NIPPON SEIKI)	...
Resistance	4 ~ 100 Ω at 25°C (77°F)	...
Sidestand/fuel pump relay		
Model (manufacturer)	5EB-20 (OMRON)	...
Coil resistance	180 Ω	...
Fuel pump maximum amperage	1.2 A	...
Radiator fan		
Model (manufacturer)	4XV (TOYO RADIATOR)	...
Thermo switch		
Model (manufacturer)	5JJ (NIPPON THERMOSTAT)	...

ELECTRICAL SPECIFICATIONS

SPEC



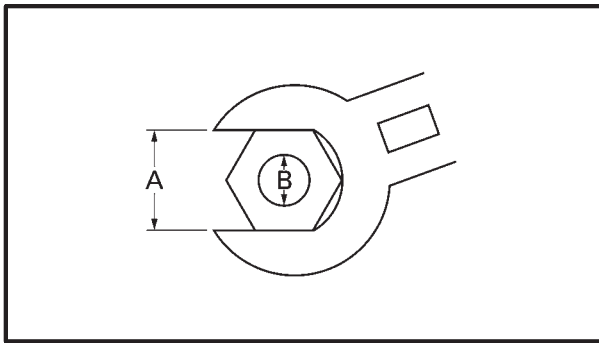
Item	Standard	Limit
Fuses (amperage × quantity)		
Main fuse	30 A × 1	
Headlight fuse	20 A × 1	
Signaling system fuse	20 A × 1	
Ignition fuse	20 A × 1	
Radiator fan fuse	10 A × 1	
Turn signal relay fuse	10 A × 1	
Backup fuse (odometer)	10 A × 1	
Reserve fuse	30 A × 1	
	20 A × 1	
	10 A × 1	



EAS00030

GENERAL TIGHTENING TORQUE SPECIFICATIONS

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a criss-cross 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



ENGINE TIGHTENING TORQUES

Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
Spark plugs	–	M10	4	13	1.3	9.4	
Cylinder head	Nut	M10	8	50	5.0	36	
Cylinder head	Cap nut	M10	2	50	5.0	36	
Cylinder head	Bolt	M6	2	12	1.2	8.7	
Camshaft caps	Bolt	M6	28	10	1.0	7.2	
Cylinder head cover	Bolt	M6	6	12	1.2	8.7	
Cylinder head (exhaust pipe)	Stud bolt	M8	8	15	1.5	11	
Connecting rod caps	Nut	M8	8	36	3.6	25	
Generator rotor	Bolt	M10	1	65 + 60°	6.5 + 60°	47 + 60°	
Crankshaft sprocket	Bolt	M10	1	60	6.0	43	
Cap bolt (timing chain tensioner)	Bolt	M6	1	6.4	0.64	4.6	
Camshaft sprocket	Bolt	M7	4	24	2.4	17	
Water pump inlet pipe	Bolt	M6	1	10	1.0	7.2	
Water pump outlet pipe	Bolt	M6	1	10	1.0	7.2	
Oil/water pump assembly driven sprocket	Bolt	M6	1	15	1.5	11	
Oil pump	Bolt	M6	1	12	1.2	8.7	
Oil cooler	Bolt	M20	1	35	3.5	25	
Engine oil drain bolt	–	M14	1	43	4.3	31	
Oil strainer housing	Bolt	M6	2	10	1.0	7.2	
Oil/water pump assembly driven sprocket cover	Bolt	M6	1	12	1.2	8.7	
Oil delivery pipe	Bolt	M6	1	10	1.0	7.2	
Oil filter bolt	Bolt	M20	1	70	7.0	51	
Oil filter cartridge	–	M20	1	17	1.7	12	
Oil pipe	Bolt	M6	2	10	1.0	7.2	
Oil strainer cover	Bolt	M6	2	10	1.0	7.2	
Air cleaner cap and air cleaner	Screw	M6	4	6	0.6	4.3	
Frame and air cleaner	Bolt	M6	3	7	0.7	5.1	
Air cleaner cover and air cleaner	Screw	M6	6	2	0.2	1.4	
Ring nut and cylinder head	Nut	M8	8	20	2.0	14	
Exhaust pipe and muffler	Bolt	M8	3	20	2.0	14	
Emission check bolt	Bolt	M8	4	10	1.0	7.2	
EXUP pulley cover	Bolt	M6	3	10	1.0	7.2	
EXUP cable bracket	Bolt	M6	3	10	1.0	7.2	
EXUP pulley and shaft arm	Bolt	M5	1	10	1.0	7.2	
Exhaust joint	Bolt	M4	2	3	0.3	2.2	
Exhaust pipe assembly	Bolt	M8	1	20	2.0	14	
Air induction system pipe	Band	–	4	3.5	0.35	2.5	
Crankcase (cylinder head)	Stud bolt	M10	10	10	1.0	7.2	
Crankcase	Bolt	M9	10	See note			
Crankcase	Bolt	M6	2	14	1.4	10	
Crankcase	Bolt	M6	14	12	1.2	8.7	
Crankcase	Bolt	M8	2	24	2.4	17	

TIGHTENING TORQUES

SPEC



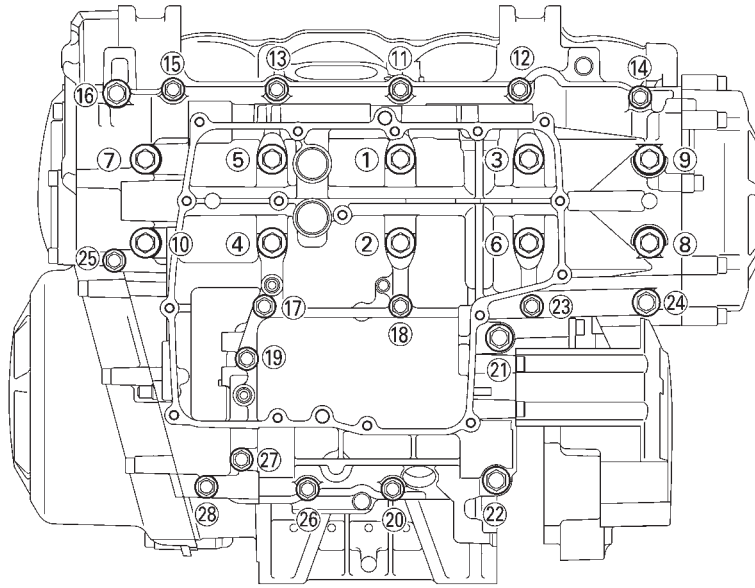
Item	Fastener	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m•kg	ft•lb	
AC magneto cover	Bolt	M6	9	12	1.2	8.7	
Drive sprocket cover	Bolt	M6	4	10	1.0	7.2	
Plate	Bolt	M6	2	10	1.0	7.2	
Clutch cover	Bolt	M6	8	12	1.2	8.7	
Timing chain cap bolt	Bolt	M6	8	12	1.2	8.7	
Shift shaft cover	Bolt	M6	5	12	1.2	8.7	
Breather plate	Bolt	M6	5	10	1.0	7.2	
Timing mark accessing screw	Bolt	M8	1	15	1.5	11	
Starter clutch idle gear shaft	Bolt	M6	1	10	1.0	7.2	
Starter one-way clutch	Bolt	M6	3	12	1.2	8.7	
Clutch boss	Nut	M20	1	90	9.0	65	Use a lock washer.
Clutch spring	Bolt	M6	6	8	0.8	5.8	Use a lock washer.
Drive sprocket	Nut	M22	1	85	8.5	61	
Main axle bearing housing	Screw	M6	3	12	1.2	8.7	Left thread
Shift lever stopper	Bolt	M6	2	10	1.0	7.2	
Stopper screw	Screw	M8	1	22	2.2	16	
Shift rod	Nut	M6	1	6.5	0.65	4.7	
Shift rod	Nut	M6	2	6.5	0.65	4.7	
Shift rod joint	Bolt	M6	1	10	1.0	7.2	
Shift arm	Bolt	M6	1	10	1.0	7.2	
AC magneto stator coil	Screw	M6	3	14	1.4	10	
Ignitor unit	Screw	M5	2	7	0.7	5.1	
Neutral switch	—	M10	1	20	2.0	14	
Pick up coil	Bolt	M6	2	10	1.0	7.2	
Thermo unit	—	—	1	15	1.5	11	

NOTE:

1. First, tighten the bolt to approximately 14.7 Nm (1.5 m•kg, 11 ft•lb) with a torque wrench.
2. Retighten the bolt to 14.7 Nm (1.5 m•kg, 11 ft•lb), and tighten another 45 ~ 50°.



Crankcase tightening sequence:





CHASSIS TIGHTENING TORQUES

Item	Thread size	Tightening			Remarks
		Nm	m kg	ft lb	
Upper bracket pinch bolt	M8	30	3.0	22	See note
Upper bracket cap nut	M22	110	11	80	
Upper bracket and handlebar holder	M10	32	3.2	23	
Handlebar holder	M8	23	2.3	17	
Lower bracket pinch bolt	—	23	2.3	17	
Lower bracket ring nut	M25	18	1.8	13	
Front brake master cylinder	M6	10	1.0	7.2	
Front brake hose union bolt	M10	30	3.0	22	
Engine mounting					
Engine mounting bolt/nut	M10	55	5.5	40	
Engine mounting bolt/nut	M8	33	3.3	24	
Frame and down tube	M10	89	8.9	64	
Clutch cable lock nut	M8	7	0.7	5.1	
Ignition coil and stay	M6	7	0.7	5.1	
Pivot shaft	M18	125	12.5	90	
Rear shock absorber (upper)	M10	40	4.0	29	
Rear shock absorber and relay arm	M10	40	4.0	29	
Relay arm and frame	M10	40	4.0	29	
Relay arm and connecting arm	M12	48	4.8	35	
Connecting arm and swing arm	M12	48	4.8	35	
Drive chain guard	M6	7	0.7	5.1	
Drive chain case	M6	7	0.7	5.1	
Fuel cock	M6	7	0.7	5.1	
Fuel sender	M5	4	0.4	2.9	
Side cover	M6	4	0.4	2.9	
Coolant reservoir tank	M6	4	0.4	2.9	
Front wheel axle	M16	72	7.2	52	
Front wheel axle pinch bolt	M8	23	2.3	17	
Front brake caliper	M10	40	4.0	29	
Front brake disk	M6	18	1.8	13	
Front brake bleed screw	M8	6	0.6	4.3	
Rear brake torque rod	M8	23	2.3	17	
Rear wheel sprocket	M10	69	6.9	50	
Drive chain adjusting nut	M8	16	1.6	12	
Rear brake caliper	M10	40	4.0	29	
Rear wheel axle	M24	150	15	108	
Rear brake hose union bolt	M10	30	3.0	22	
Rear brake bleed screw	M8	6	0.6	4.3	
Rear brake disk	M8	23	2.3	17	
Rider footrest bracket and frame	M8	30	3.0	22	
Rear brake reservoir tank	M6	4	0.4	2.9	
Rear brake master cylinder	M8	23	2.3	17	
Rider footrest and bracket	M10	55	5.5	40	
Passenger footrest bracket and frame	M8	28	2.8	20	
Passenger footrest bracket and muffler	M10	48	4.8	35	

NOTE:

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



EAS00031

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

Lubrication point	Lubricant
Oil seal lips	
O-rings	
Bearings	
Crankshaft pins	
Piston surfaces	
Piston pins	
Connecting rod bolts and nuts	
Crankshaft journals	
Camshaft lobes	
Camshaft journals	
Valve stems (intake and exhaust)	
Valve stem ends (intake and exhaust)	
Water pump impeller shaft	
Oil pump rotors (inner and outer)	
Oil strainer	
Starter clutch idle gear inner surface	
Starter clutch assembly	
Primary driven gear	
Transmission gears (wheel and pinion)	
Main axle and drive axle	
Shift drum	
Shift forks and shift fork guide bars	
Shift shaft	
Shift shaft boss	
Cylinder head cover mating surface	Yamaha bond No.1215
Crankcase mating surface	Yamaha bond No.1215
Clutch cover (crankcase mating surface)	Yamaha bond No.1215
Generator rotor cover (crankcase mating surface)	Yamaha bond No.1215



EAS00032

CHASSIS

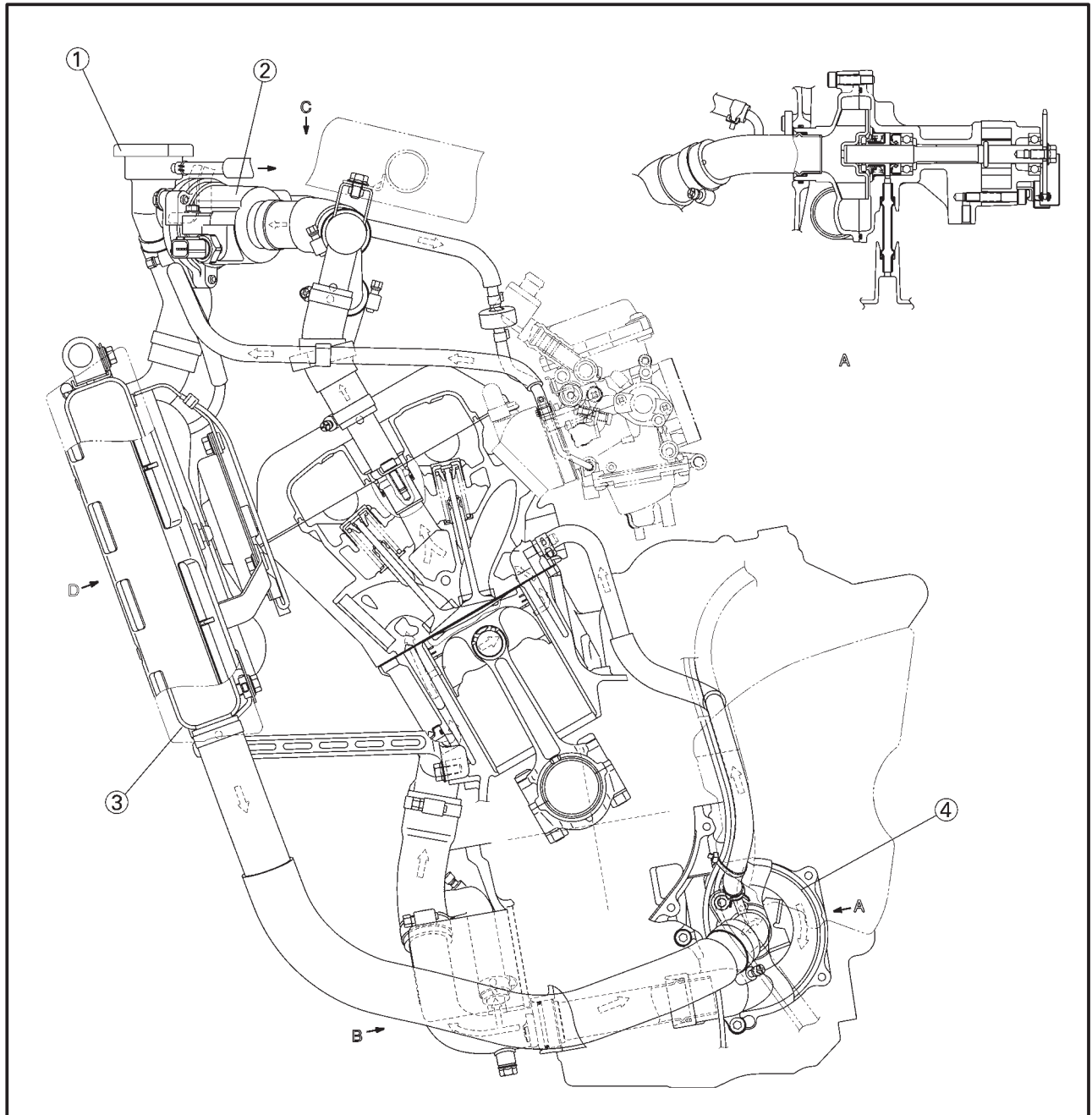
Lubrication point	Lubricant
Steering bearings, steering seal lips and ball race cover lips	
Pivot shaft	
Swing arm pivoting points and connecting arm bearings	
Connecting arm oil seal lips	
Swing arm oil seal lips	
Relay arm bearings	
Relay arm oil seal lips	
Rear shock absorber upper bolt	
Front wheel oil seal lips	
Rear wheel oil seal lips	
Clutch hub oil seal lips	
Throttle cable end	
Starter cable end and starter lever	
Rear brake pedal moving point	
Shift pedal moving point	
Side stand moving point	
Passenger footrest ball joint and moving point	
Engine mounting bracket collar and oil seal lips	
Mainstand moving point	



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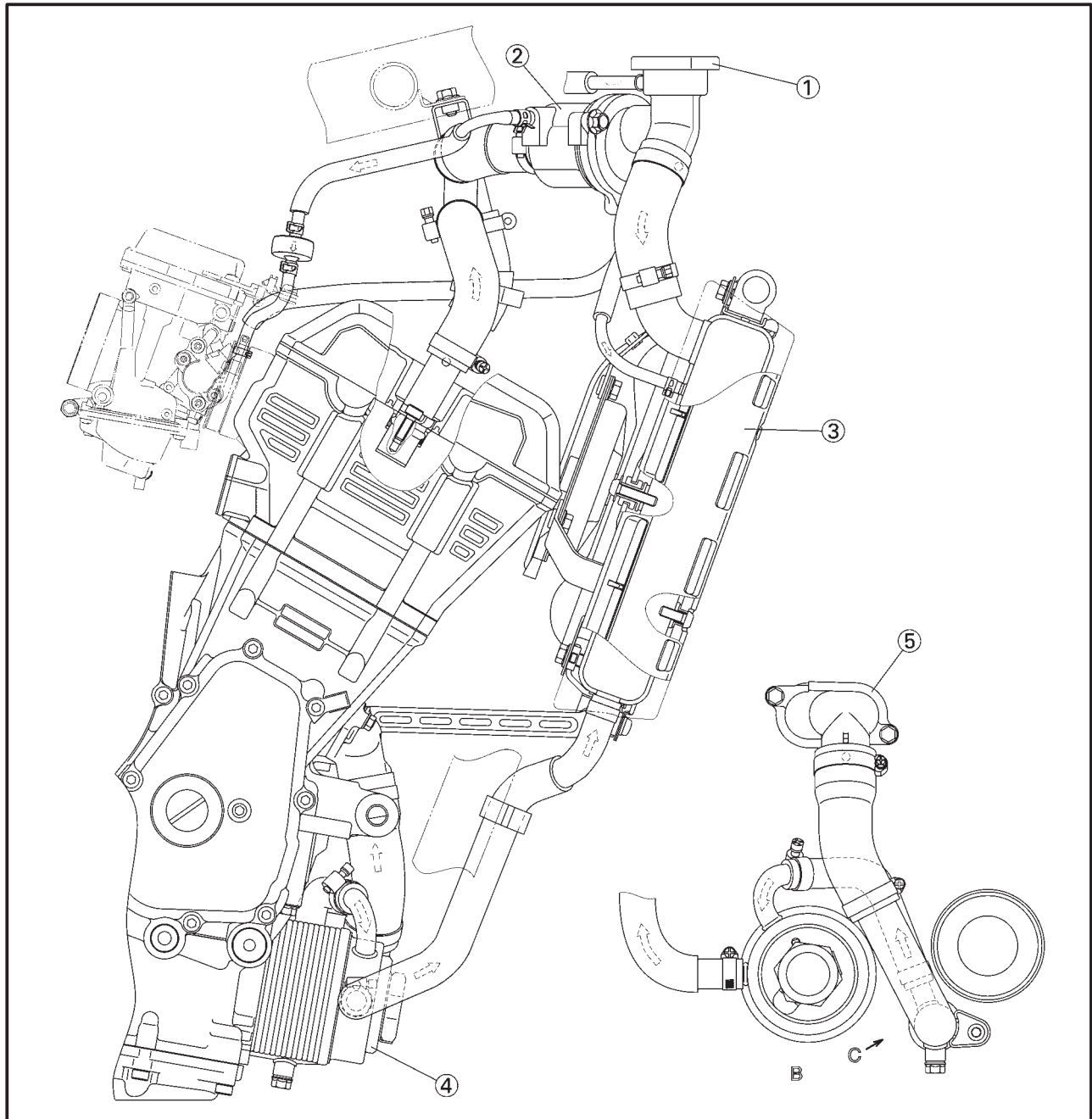
COOLING SYSTEM DIAGRAMS

- ① Radiator cap
- ② Thermostat housing
- ③ Radiator
- ④ Water pump



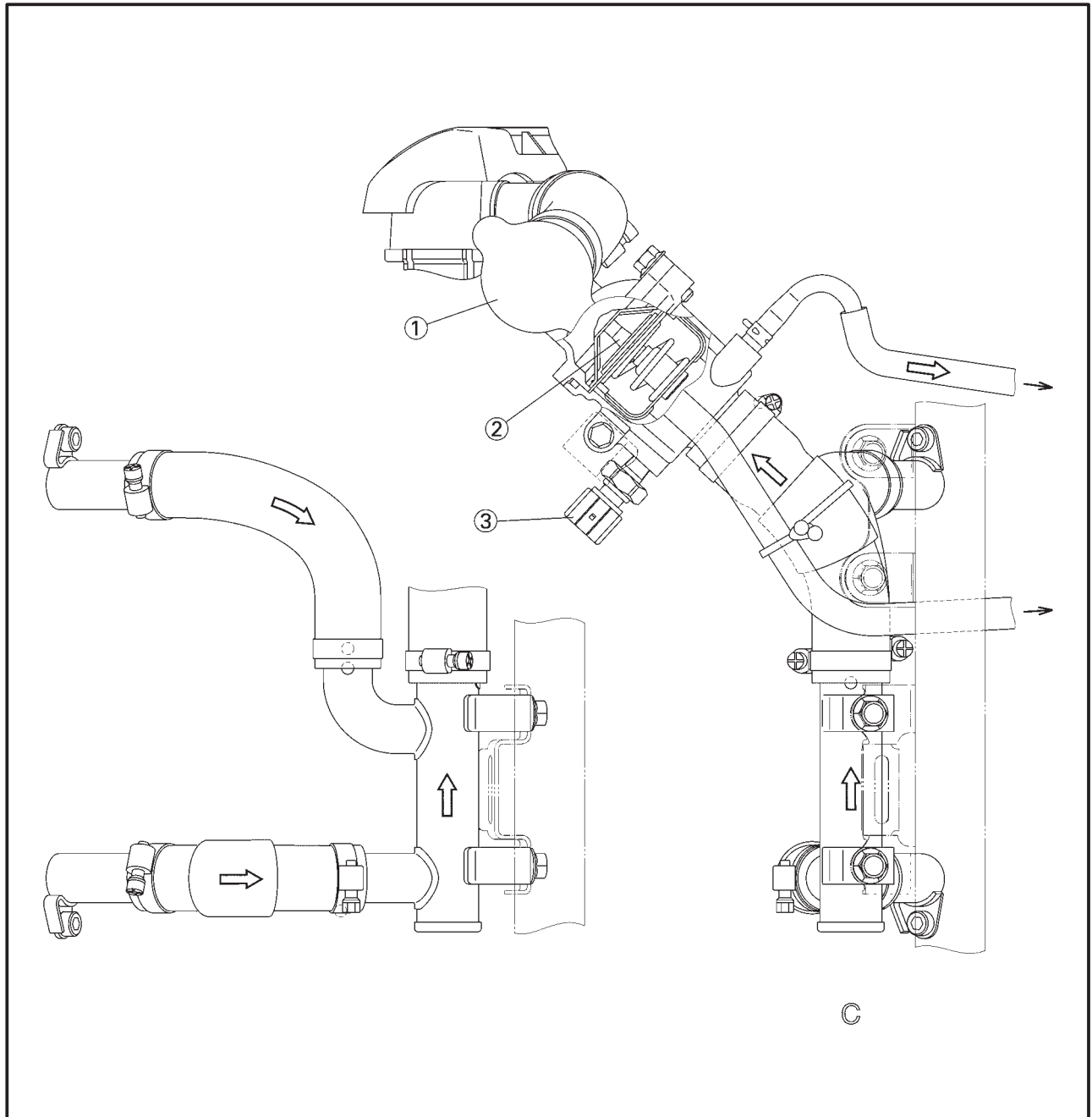


- ① Radiator cap
- ② Thermostat housing
- ③ Radiator
- ④ Oil cooler
- ⑤ Water jacket joint



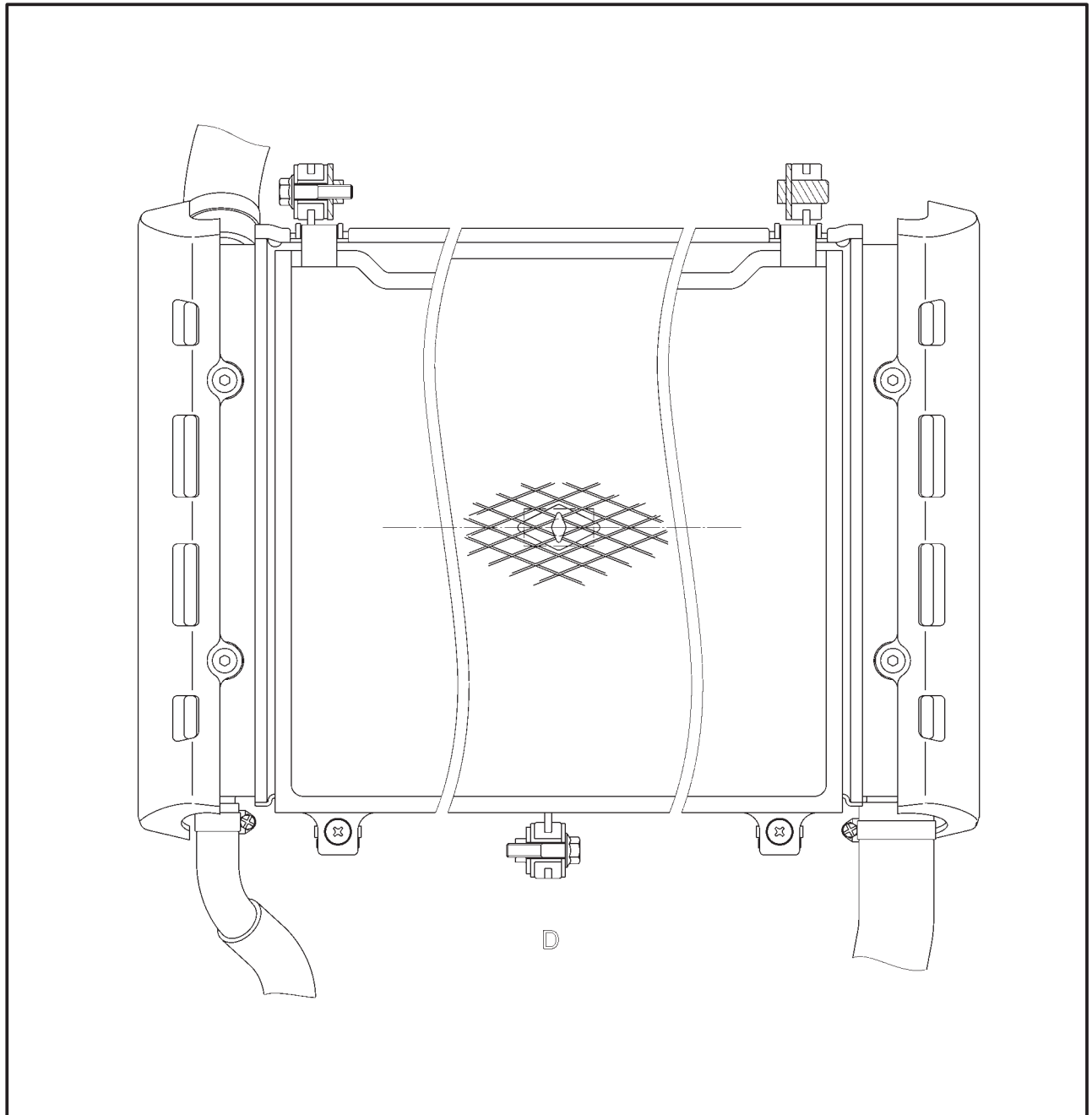


- ① Radiator cap
- ② Thermostat
- ③ Thermo unit



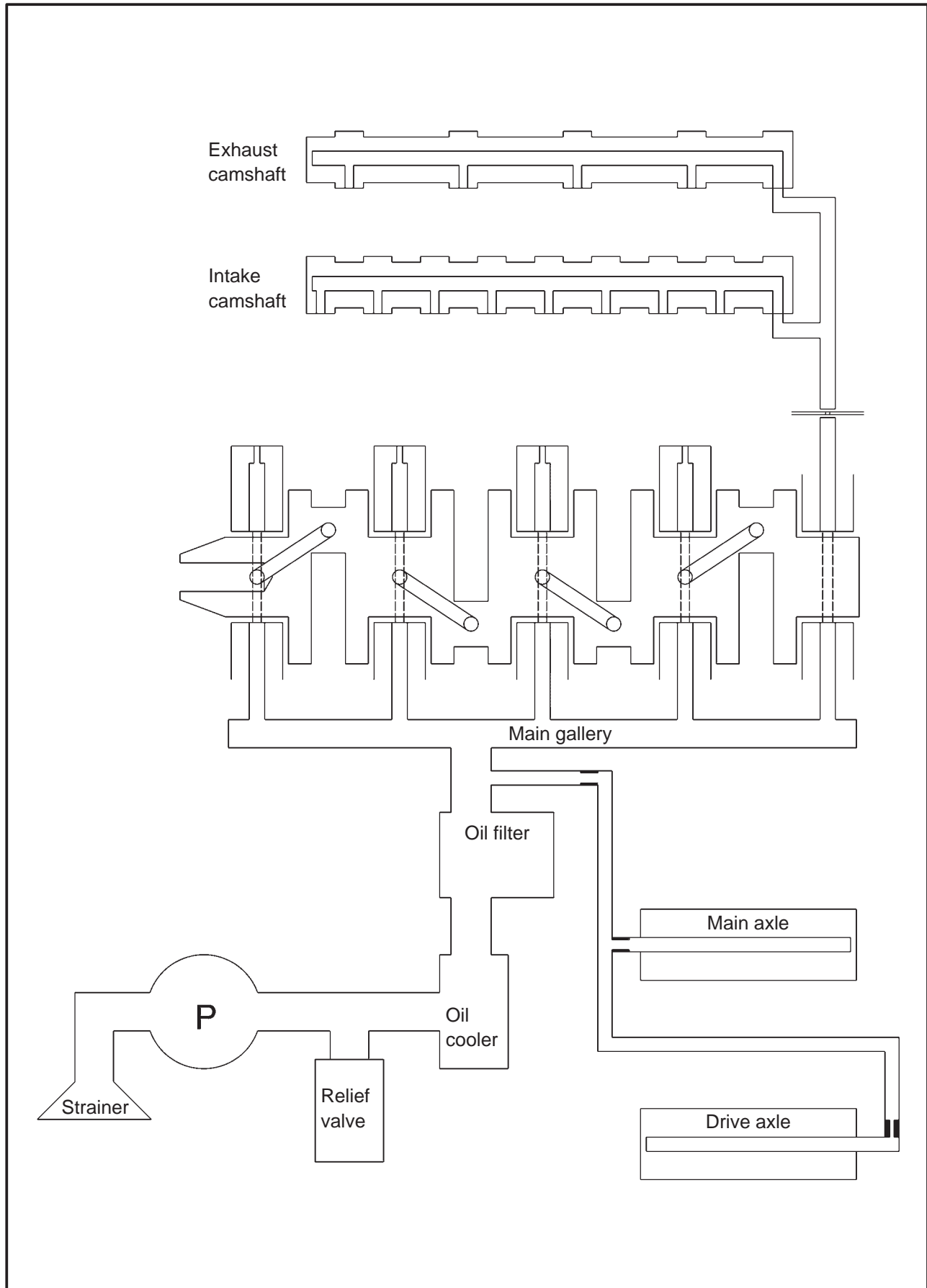


① Radiator





ENGINE OIL LUBRICATION CHART

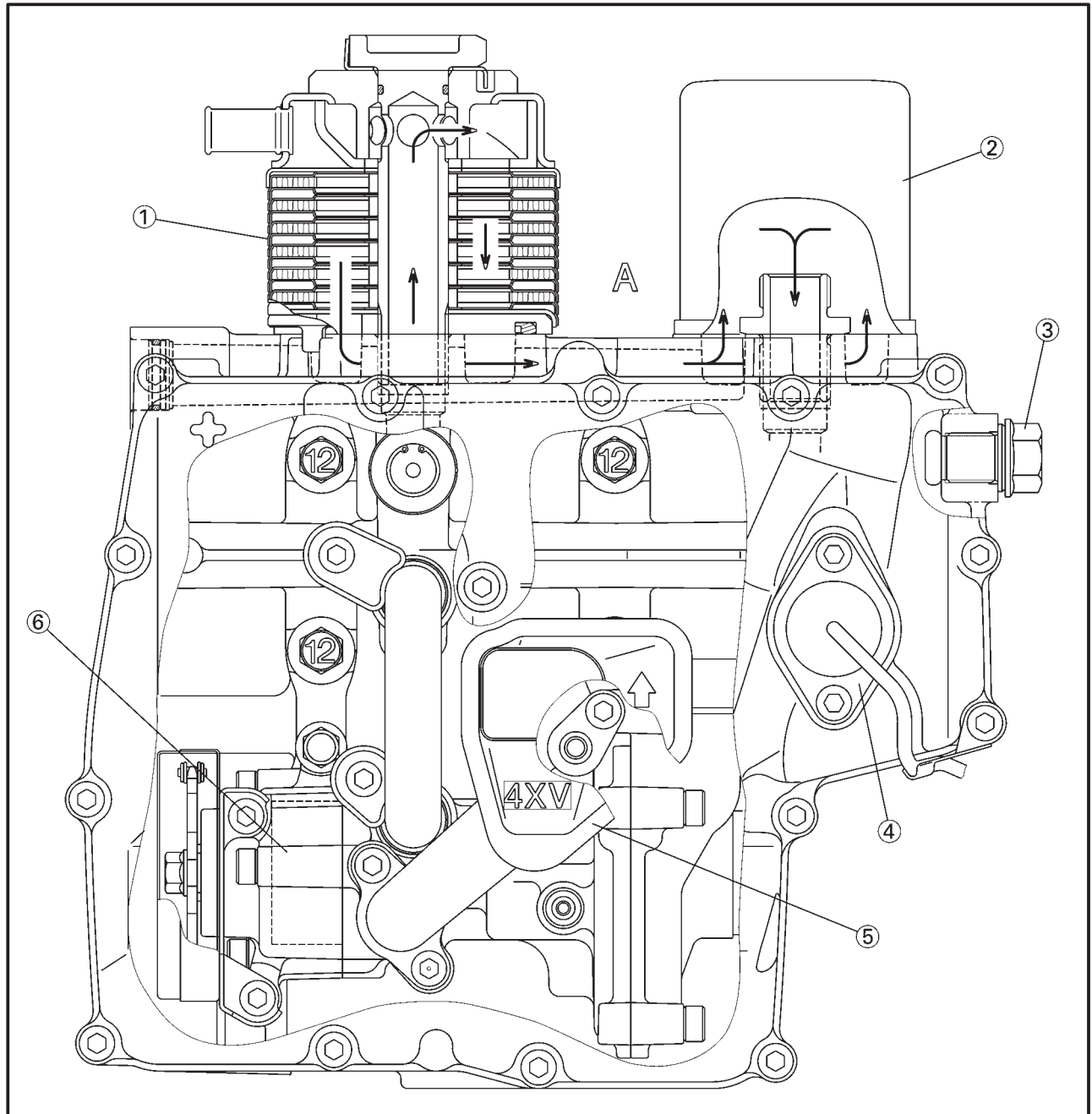




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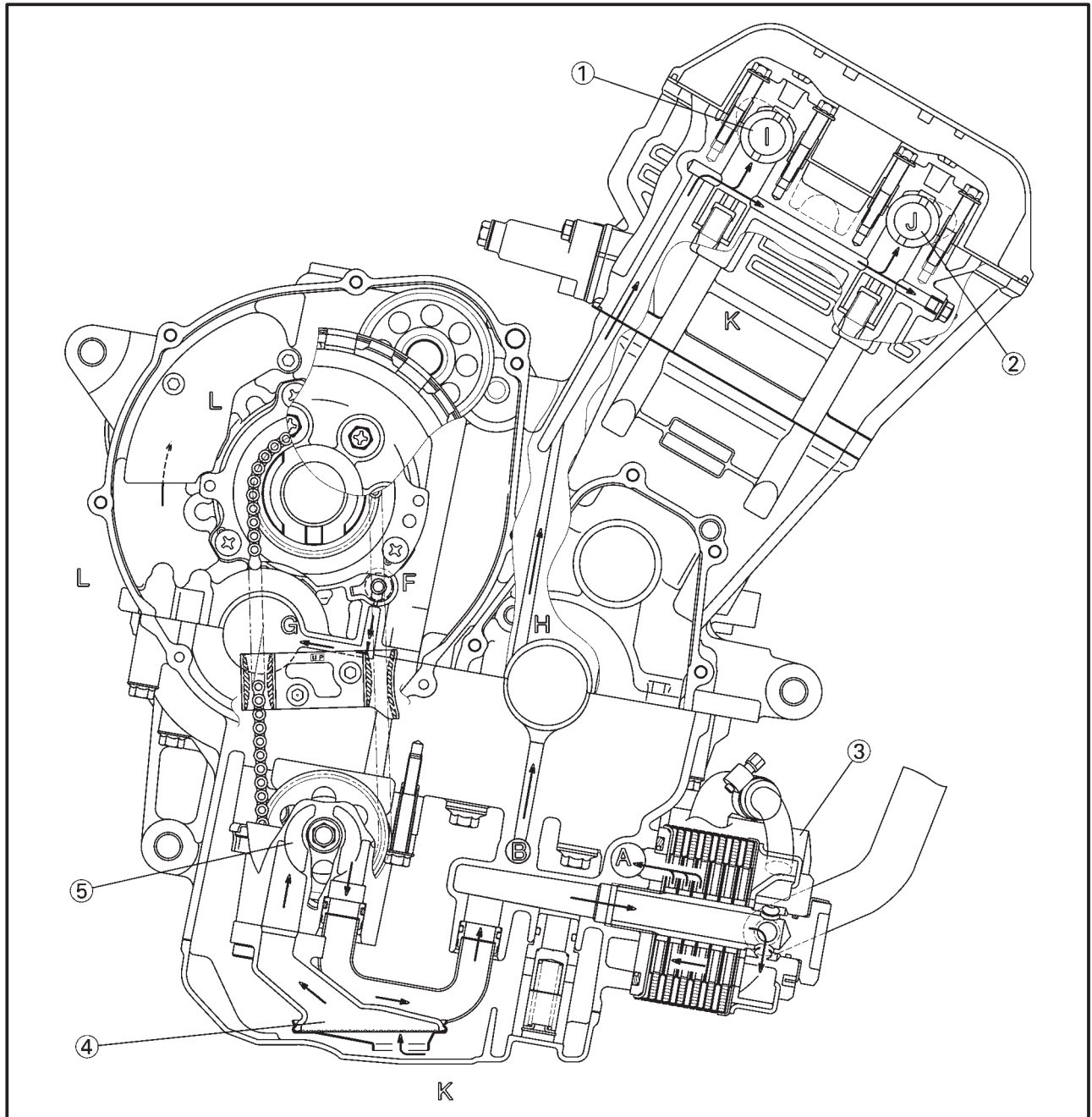
LUBRICATION DIAGRAMS

- ① Oil cooler
- ② Oil filter cartridge
- ③ Drain bolt
- ④ Oil level switch
- ⑤ Oil strainer
- ⑥ Oil pump



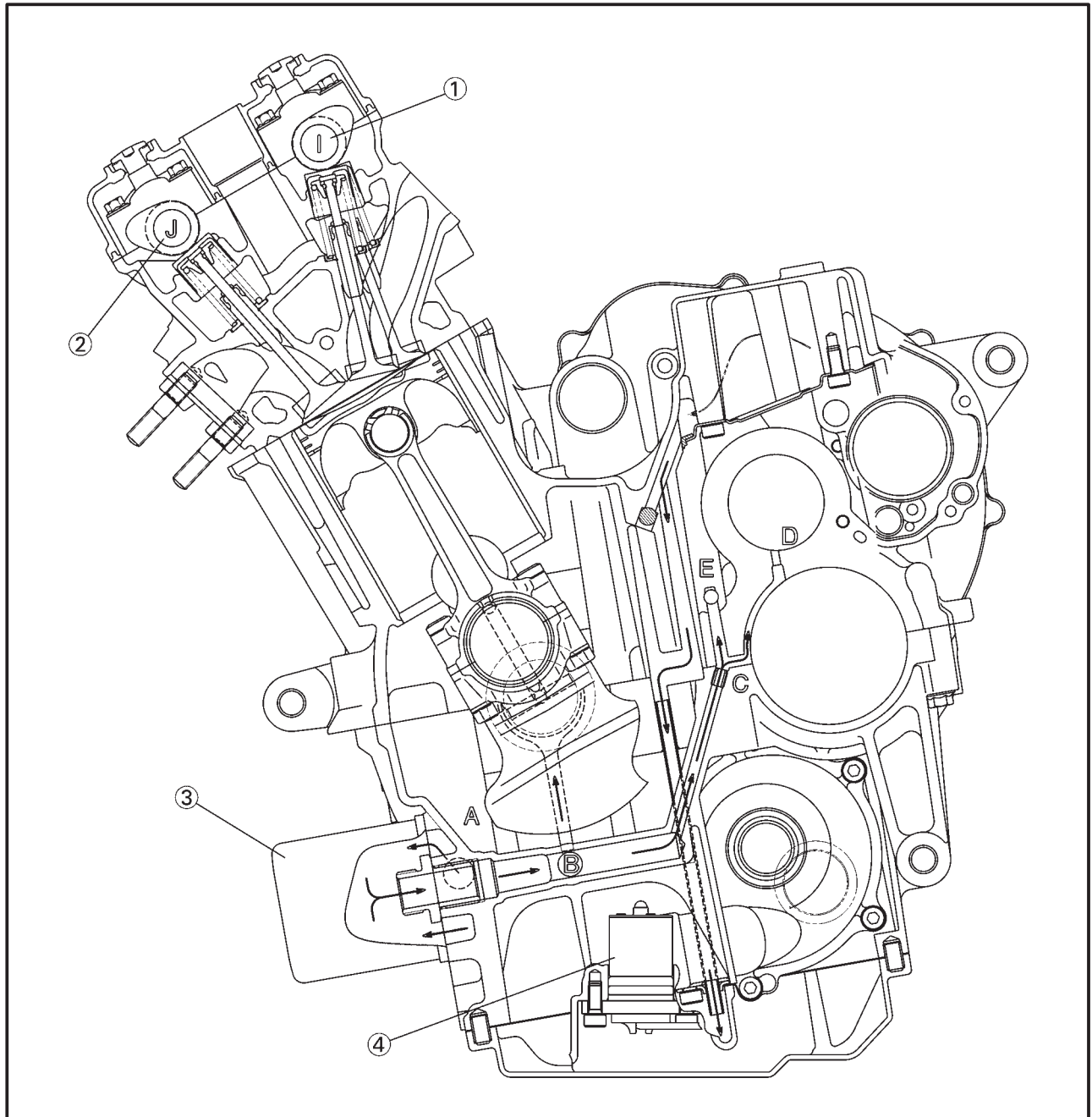


- ① Intake camshaft
- ② Exhaust camshaft
- ③ Oil cooler
- ④ Oil strainer
- ⑤ Oil pump



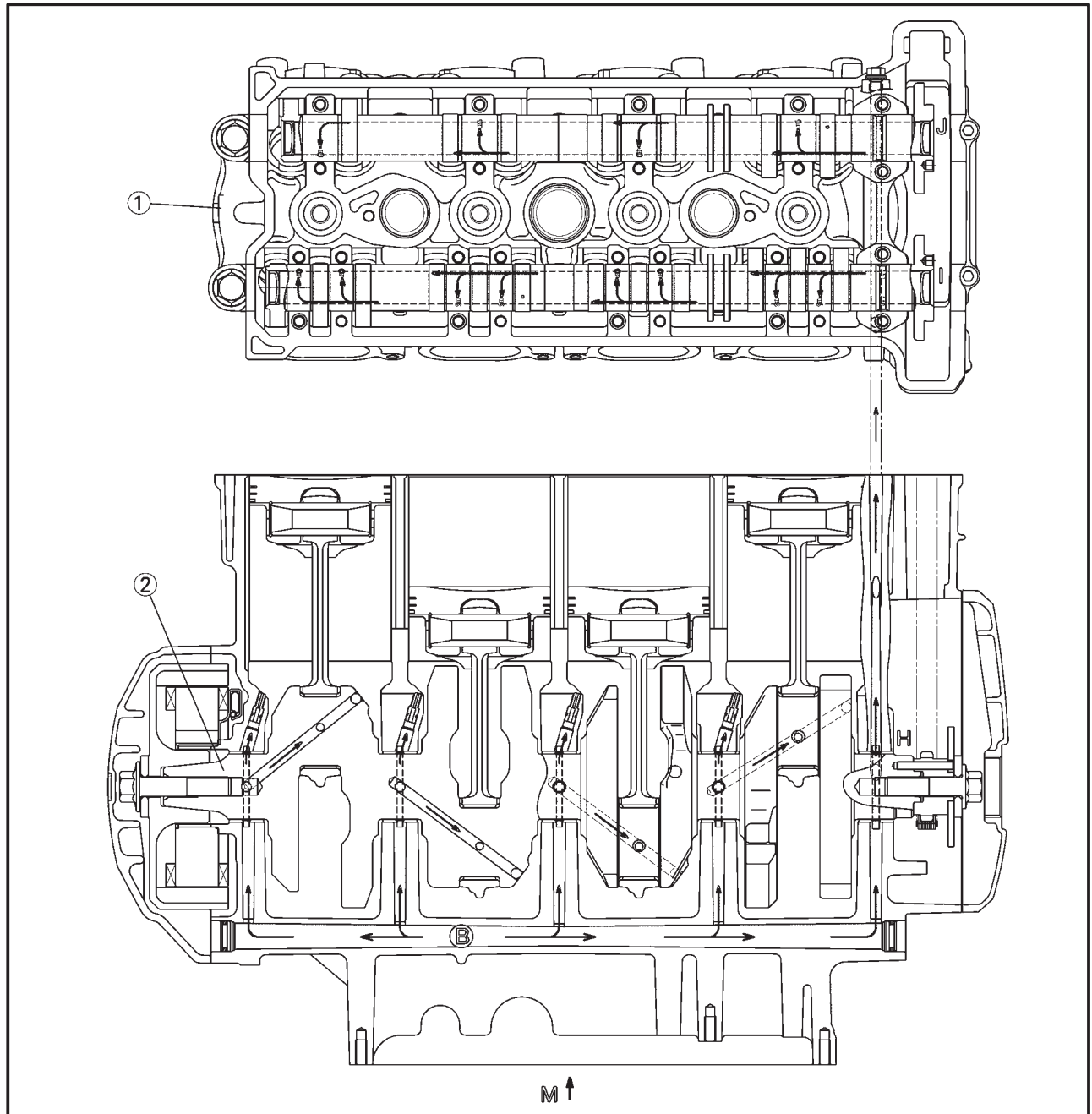


- ① Intake camshaft
- ② Exhaust camshaft
- ③ Oil filter cartridge
- ④ Oil level switch



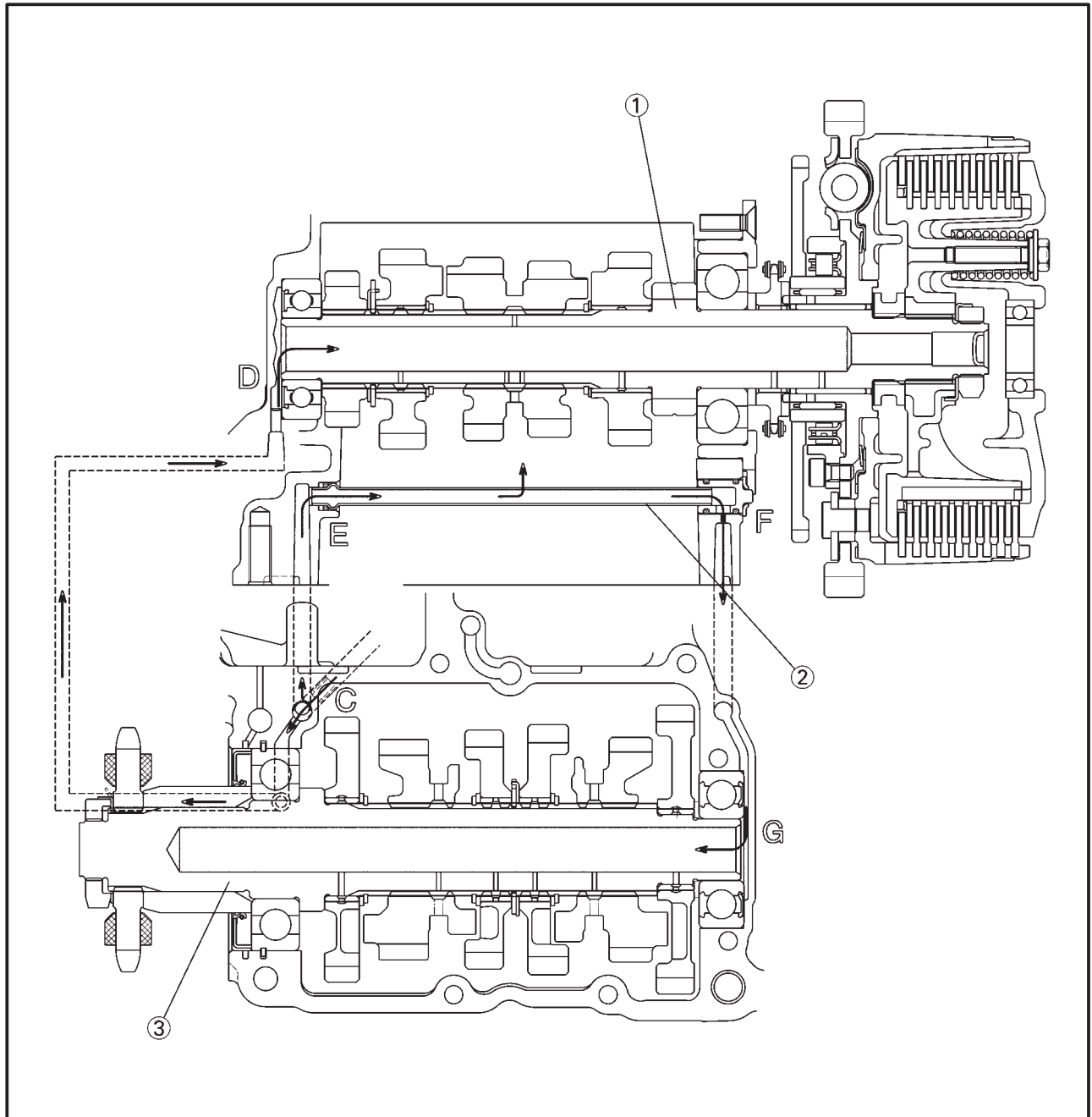


- ① Cylinder head
- ② Crankshaft





- ① Main axle
- ② Oil delivery pipe
- ③ Drive axle

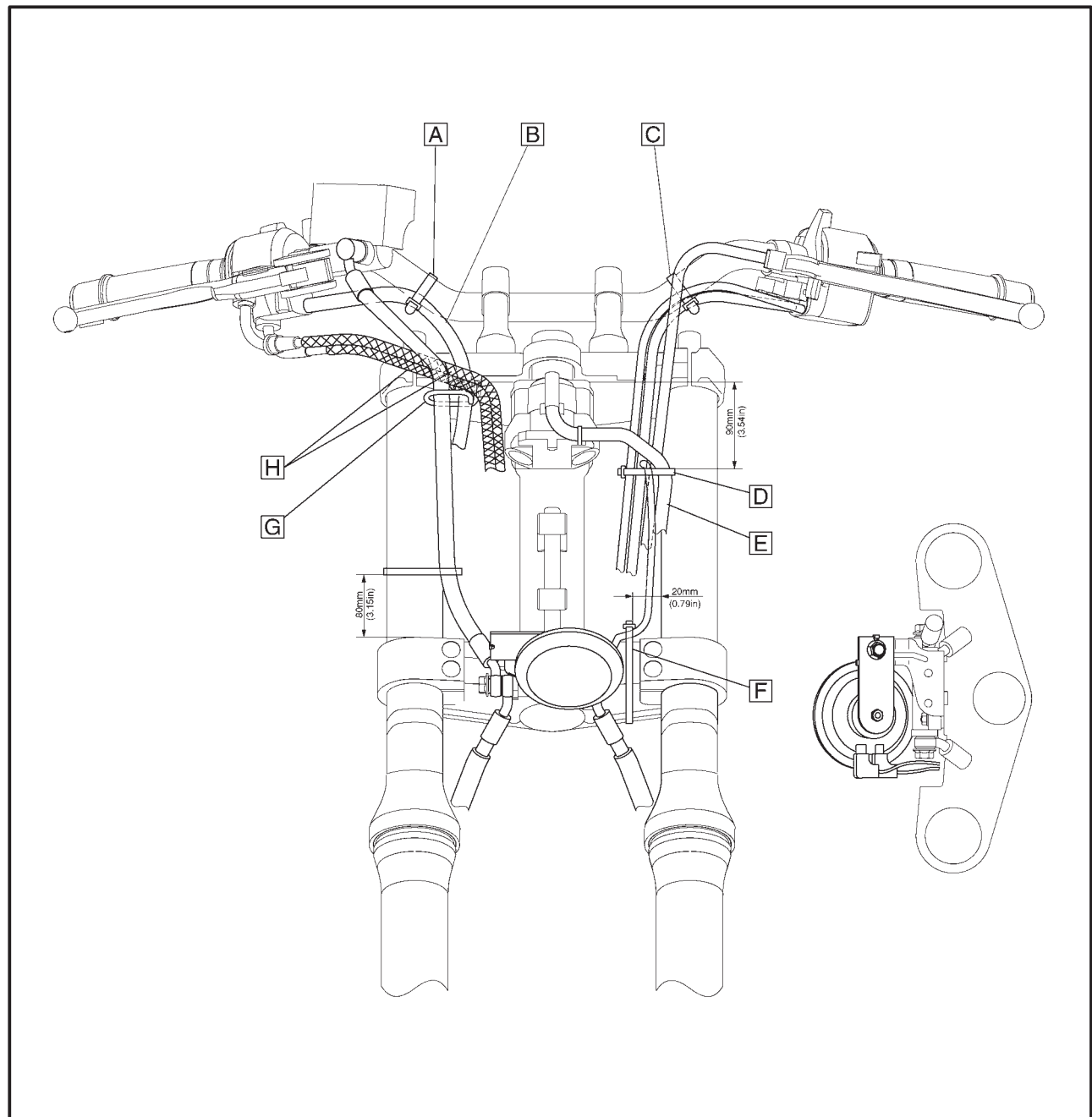




EAS00035

CABLE ROUTING

- A** Fasten the handlebar switch lead (right) and handlebar with a plastic band.
- B** Route the handlebar switch lead (right) backward the throttle cable and right side the brake hose guide.
- C** Fasten the handlebar switch lead (left) and handlebar with a plastic band.
- D** Fasten the handlebar switch lead (left), main switch lead, clutch cable and starter cable with a plastic band. Clamp beneath the horn lead branching position. Do not fasten the horn lead.
- E** Route the main switch lead front and left side the another leads.
- F** Route the horn lead outside the motorcycle body, and fasten with the under bracket. Do not loose between the horn and under bracket.
- G** Route the brake hose through the brake hose guide.
- H** Route the throttle cable 1 and 2 backward the brake hose, and left side the brake hose guide.





- ① Fuel pump lead
- ② Fuel pump
- ③ EXUP cable
- ④ Handlebar switch lead (right)
- ⑤ Throttle cable 1
- ⑥ Throttle cable 2
- ⑦ Water-carburetor hose
- ⑧ Fan motor lead
- ⑨ Coolant reservoir tank over flow hose
- ⑩ Fuel tank drain hose
- ⑪ Fuel tank breather hose
- ⑫ White paint mark
- ⑬ Rear brake light switch lead
- ⑭ Neutral switch lead
- ⑮ Speedo sensor lead
- ⑯ Pickup coil lead

- ⑰ Handle crown
- ⑱ Handlebar switch lead
- ⑲ Brake hose guide

A Fasten the fuel pump lead, pickup coil lead, neutral switch lead, speed sensor lead, rear brake light switch lead and fuel pump with a plastic clamp.

B Fasten the fuel hose, pickup coil lead, neutral switch lead and speed sensor lead with a plastic clamp under the fuel hose.

C Put the EXUP cable into the air box cover.

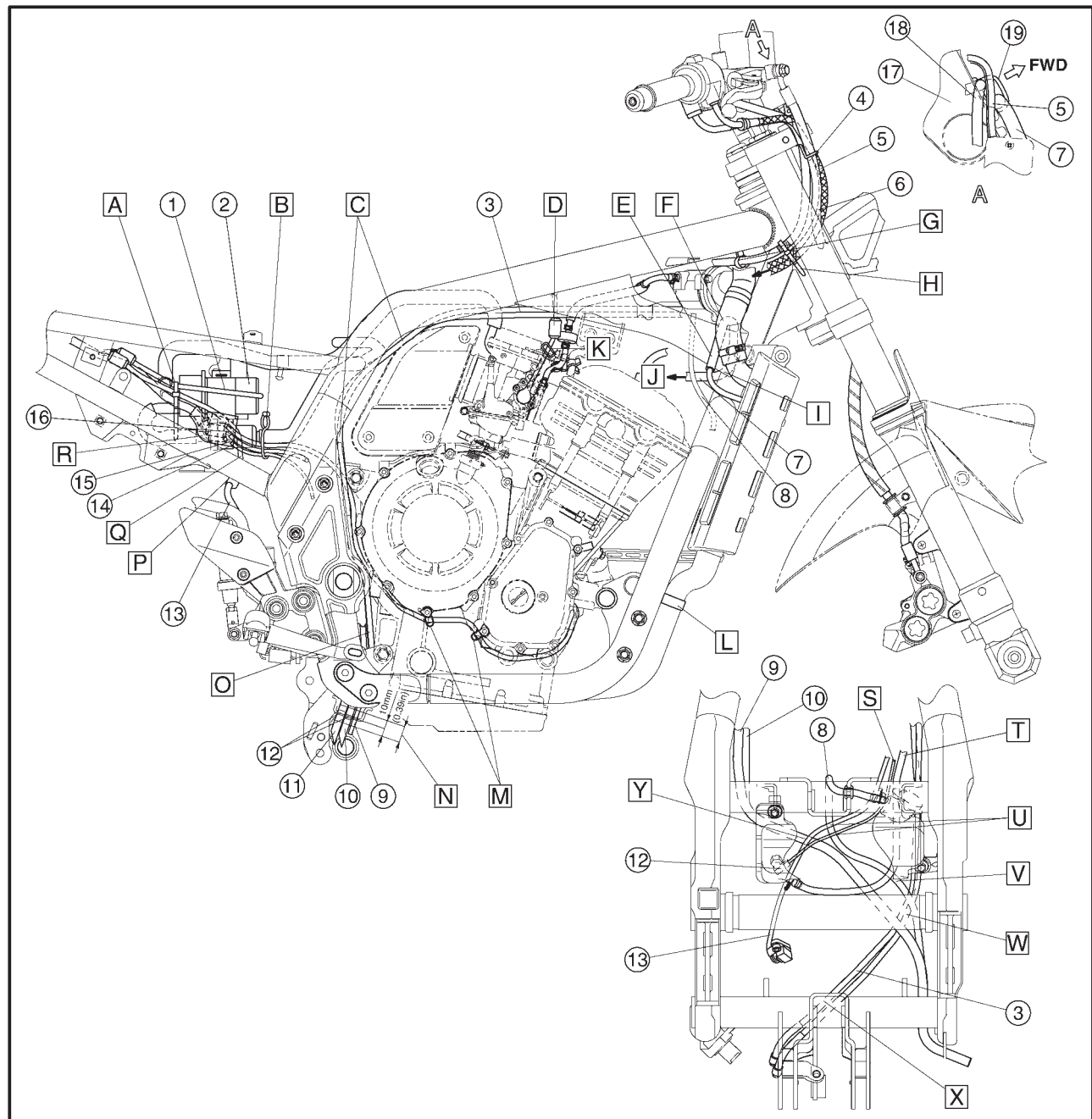
D Route the T.P.S. lead inward the EXUP cable.

E Fasten the water-carburetor hose with a plastic band.

F Route the coolant hose over the frame.

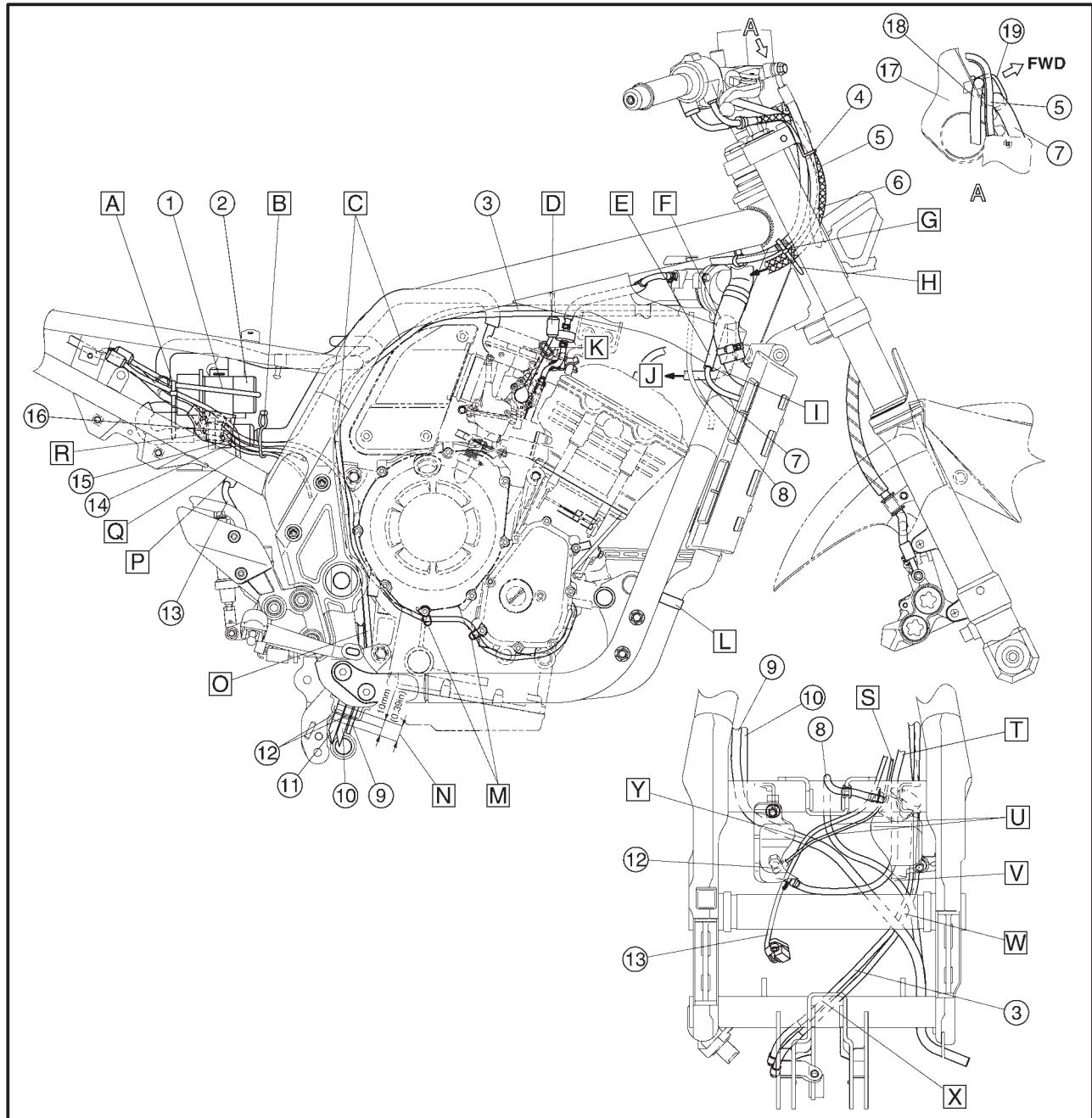
G Fasten the handlebar switch lead and frame with a plastic guide.

H Align the white tape mark of the handlebar switch lead (right) with the tank rail welding bead and clamp down throttle cables 1 and 2.





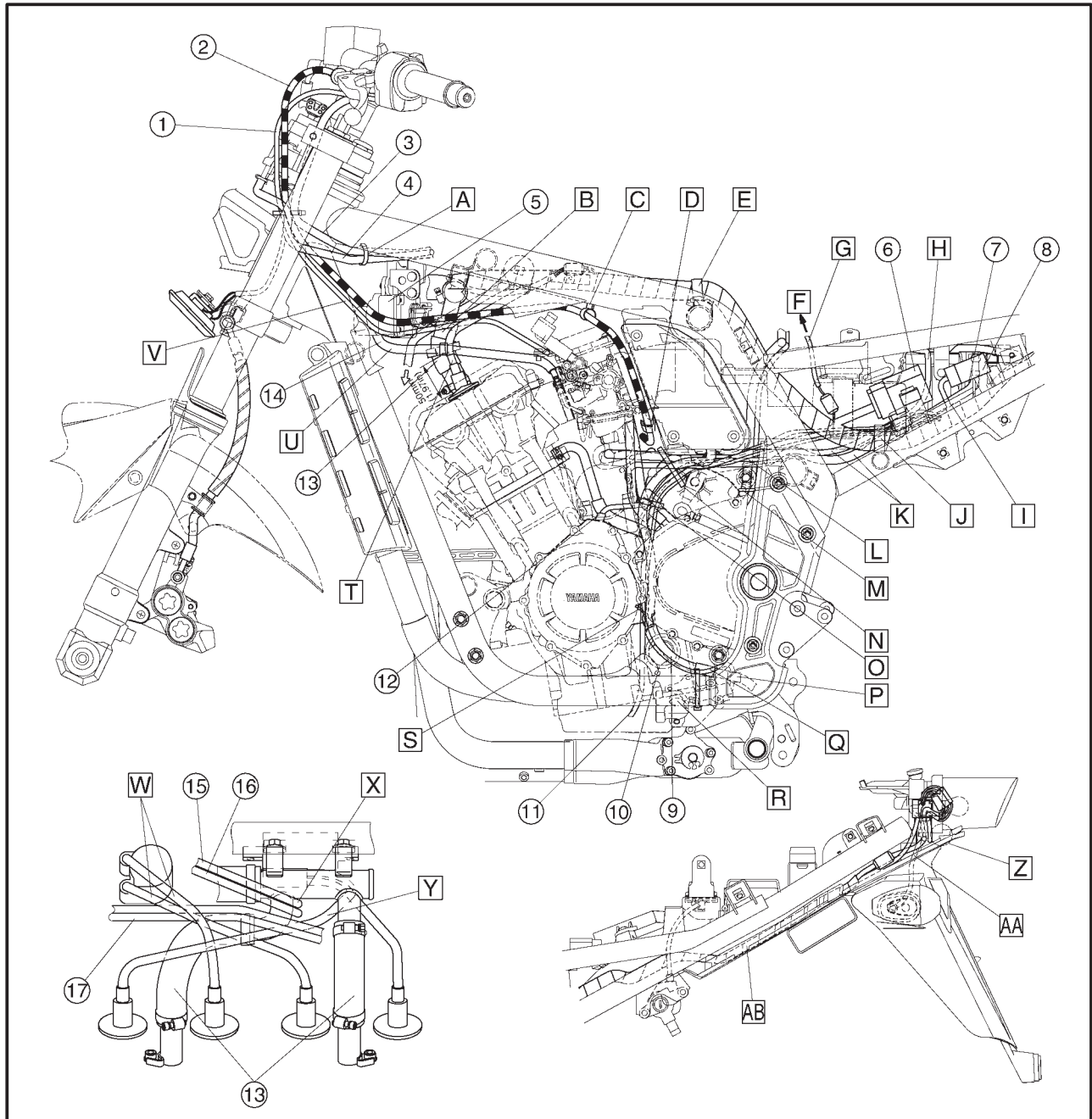
- I** Route the water-carburetor hose between the frame cross pipe and fan motor lead.
- J** To the carburetor
- K** Fasten the T.P.S. lead with a steel clamp.
- L** Fasten the coolant hose with a plastic band.
- M** Fasten the pickup coil lead with a steel clamp.
- N** Pass the coolant reservoir tank overflow hose, fuel tank drain hose and fuel tank breather hose through the frame hose holder from the inside of the vehicle to the outside. At this time, pull the fuel tank drain hose and fuel tank breather hose so that the white paint marks are within a 20 mm (0.79 in) range.
- O** Route the EXUP cable forward the another hoses, and upward the engine mounting bracket.
- P** Fasten the rear brake light switch lead with a plastic guide.
- Q** Insert the all couplers into the rubber cover.
- R** Route the rear brake light switch lead inside the another leads.
- S** Route the neutral switch lead and speed sensor lead left side the coolant reservoir hose.
- T** Route the coolant reservoir hose left side the engine mounting bracket.
- U** Route the coolant reservoir hose forward the neutral switch lead and speed sensor lead.
- V** Route the coolant reservoir hose backward the another hoses.
- W** Route the EXUP cable forward the another hoses.
- X** Route the EXUP cable forward the frame cross pipe.
- Y** Route the fuel tank drain hose and fuel tank breather hose forward the neutral switch lead and speed sensor lead.





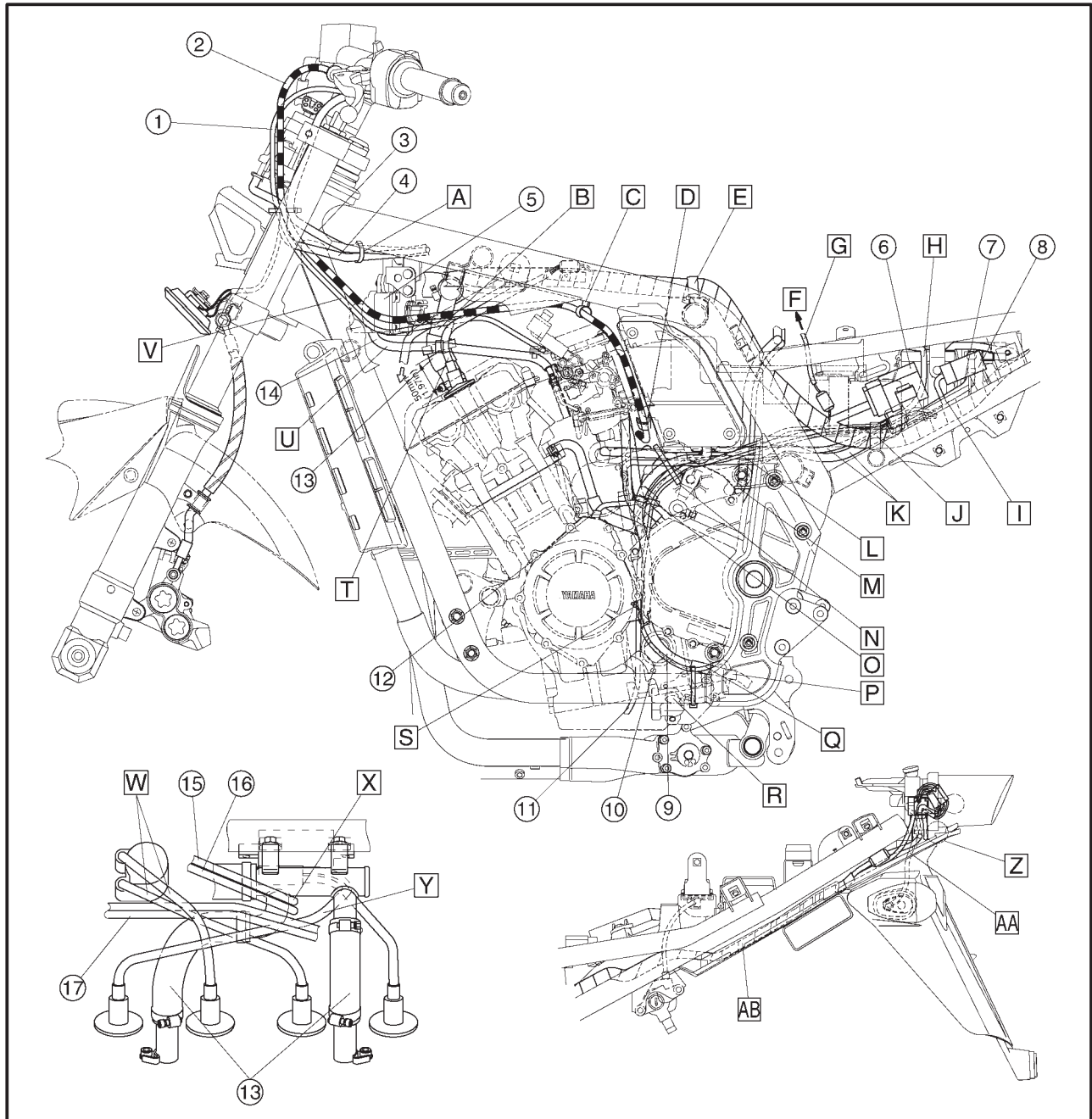
- ① Starter cable
- ② Clutch cable
- ③ Handlebar switch lead (left)
- ④ Main switch lead
- ⑤ EXUP servo motor
- ⑥ Starting circuit cutoff relay
- ⑦ Starter motor lead
- ⑧ Fan motor relay
- ⑨ Air cleaner case drain hose
- ⑩ Sidestand switch lead
- ⑪ oil level switch lead
- ⑫ ACgenerator lead
- ⑬ Water-head pipe
- ⑭ Water-carburetor hose
- ⑮ Throttle cable 2
- ⑯ Throttle cable 1
- ⑰ EXUP cable

- A Fasten the main switch lead and handlebar switch lead with a plastic guide.
- B Fasten the water-head hose and water-carburetor hose with a plastic band.
- C Fasten the clutch cable with a plastic band.
- D Fasten the clutch cable with a steel clamp.
- E Fasten the wire harness with a plastic band.
- F To the fuel sender.
- G Route the fuel sender lead inside the seat rail.
- H Route the battery negative lead forward the frame stay.
- I Route the main harness inside the rear fender groove.
- J Fasten the wire harness, sidestand switch lead, oil level switch and flame with a plastic band. Do not fasten the Acgenerator lead (white).
- K Route the starter motor lead and battery negative lead inside the plastic band.
- L Route the all hoses outside the fuel hose.
- M Route the fuel hose through the steel guide.



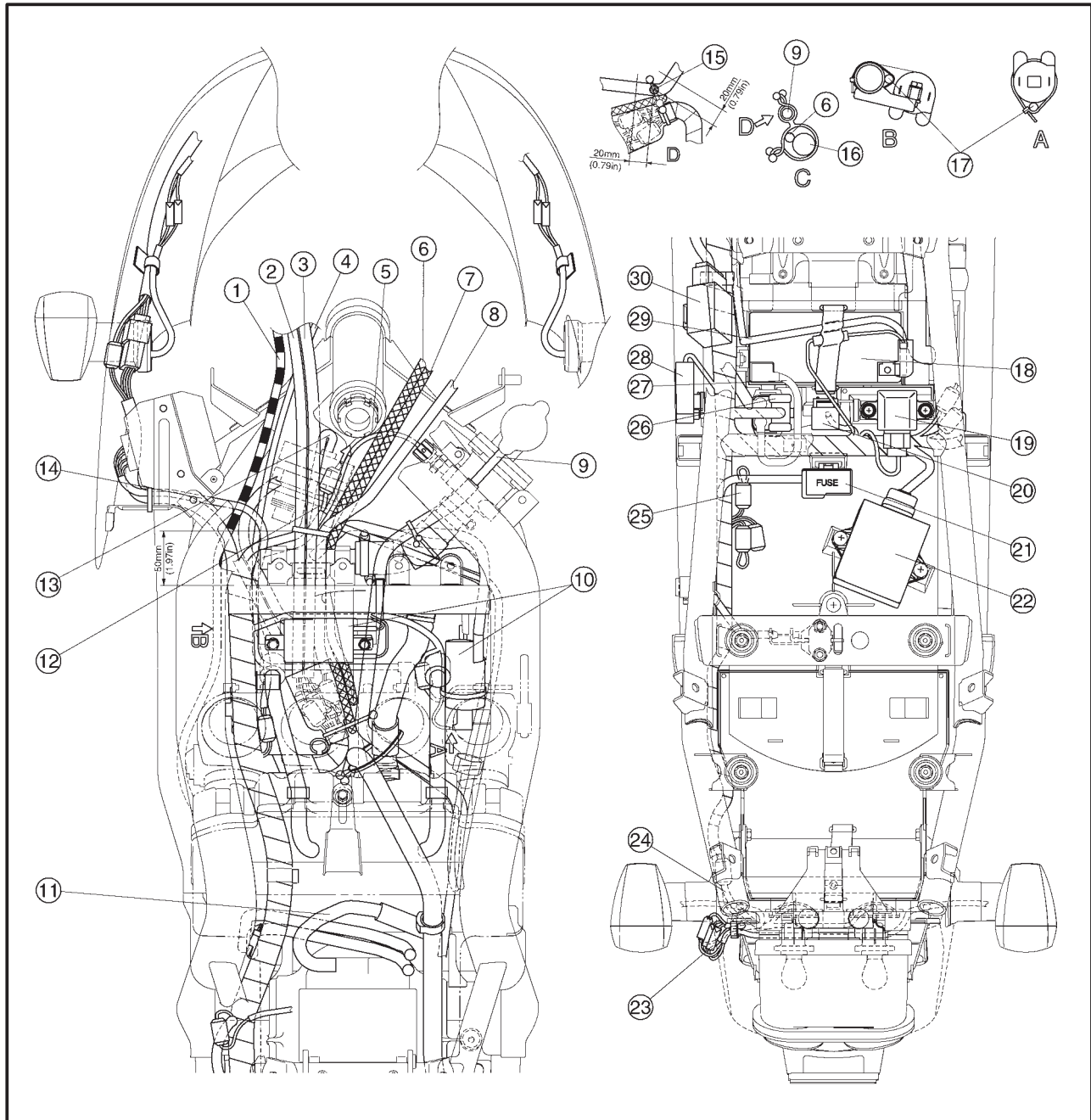


- N** Fasten the sidestand switch lead, oil level switch lead, ACgenerator lead, starter motor lead, battery negative lead and air cleaner case drain hose with a plastic clamp.
- O** Fasten the sidestand switch lead, oil level switch lead, ACgenerator lead and air filter case drain hose with a plastic clamp.
- P** Fasten the sidestand switch lead and frame with a plastic clamp.
- Q** Route the air cleaner box drain hose inside the sidestand switch lead, and put the end of the hose backward.
- R** Fasten the sidestand switch lead and frame with a plastic clamp.
- S** Fasten the sidestand switch lead, oil level switch lead and air filter case drain hose with a plastic clamp. Do not crush the air filter case drain hose.
- T** Route the high tension cable (#1) outside the starter cable and water-carburetor hose, and under the clutch cable and rectifier regulator lead.
- U** Route the water carburetor hose outside the coolant hose.
- V** Route the starter cable outside the coolant hose, and upper the water-carburetor hose.
- W** Route the high tension cable (#2, 3) forward the EXUP cable and high tension cable (#4).
- X** Route the throttle cable between the water-head hose, and upper the EXUP cable.
- Y** Route the high tension cable (#4) between the water-head hose.
- Z** Taillight lead and flasher light lead (right) should not be stick out from the gap between the rear fender and tail-light.
- AA** Route the flasher light lead through the hole on the rear fender.
- AB** Route the wire harness in the groove.



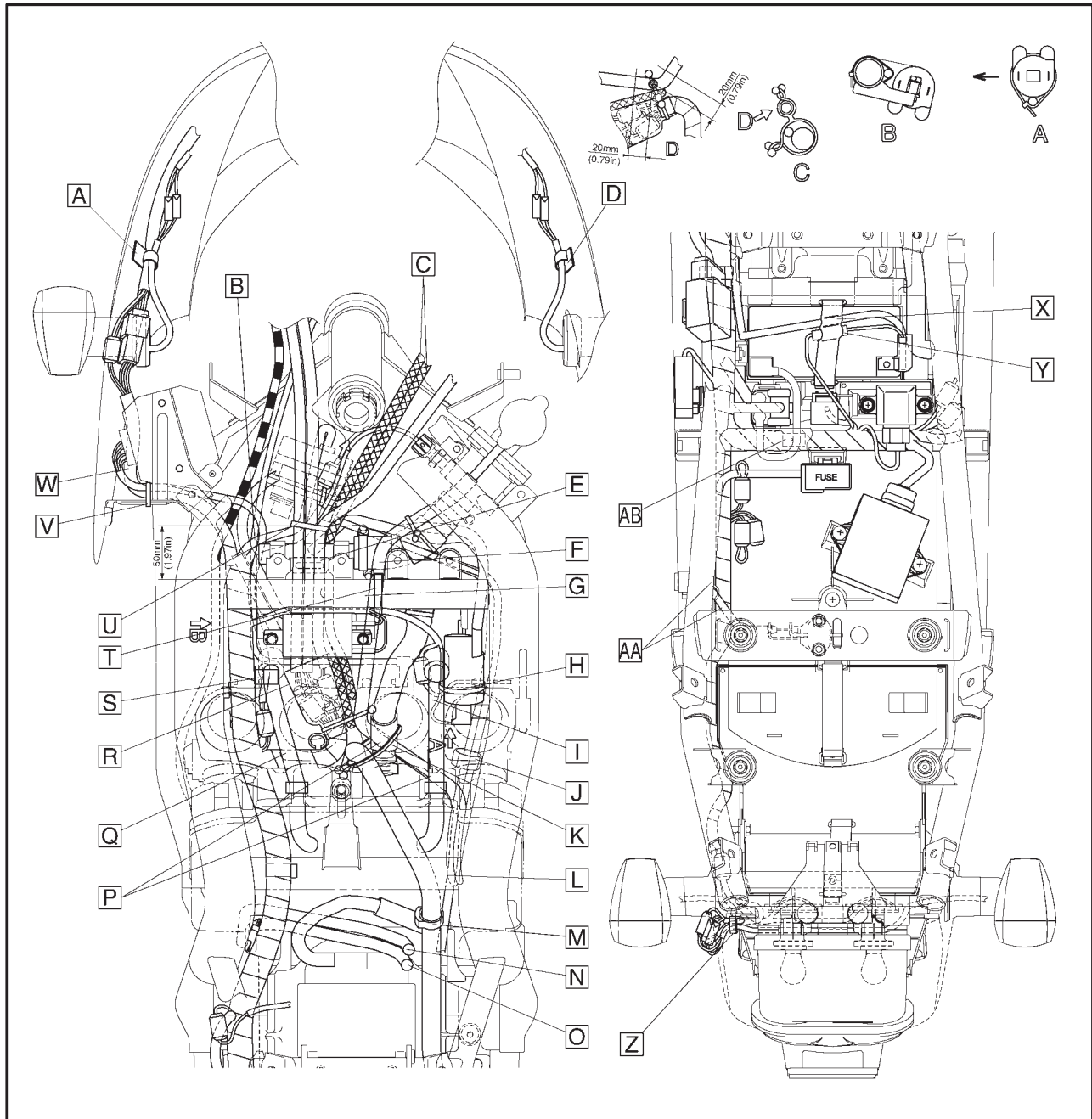


- | | |
|---------------------------------|----------------------------------|
| ① Clutch cable | ①⑦ Ignition coil lead |
| ② Handlebar switch lead | ①⑧ Battery |
| ③ Main switch lead | ①⑨ Emergency engine stop switch |
| ④ Starter cable | ①⑩ Flasher relay |
| ⑤ Thermo unit lead | ①⑪ Fuse box |
| ⑥ Throttle cable 1 | ①⑫ Igniter unit |
| ⑦ Throttle cable 2 | ①⑬ Flasher light lead |
| ⑧ Handlebar switch lead (right) | ①⑭ Taillight lead |
| ⑨ Coolant reservoir hose | ①⑮ Alarm coupler (free) |
| ⑩ Ignition coil | ①⑯ Starter relay |
| ⑪ Fuel hose | ①⑰ Battery positive lead |
| ⑫ Fan motor lead | ①⑱ Fan motor lead |
| ⑬ EXUP servo motor lead | ①⑲ Battery negative lead |
| ⑭ Rectifier/regulator lead | ①⑳ Starting circuit cutoff relay |
| ⑮ White paint mark | |
| ⑯ Main harness | |



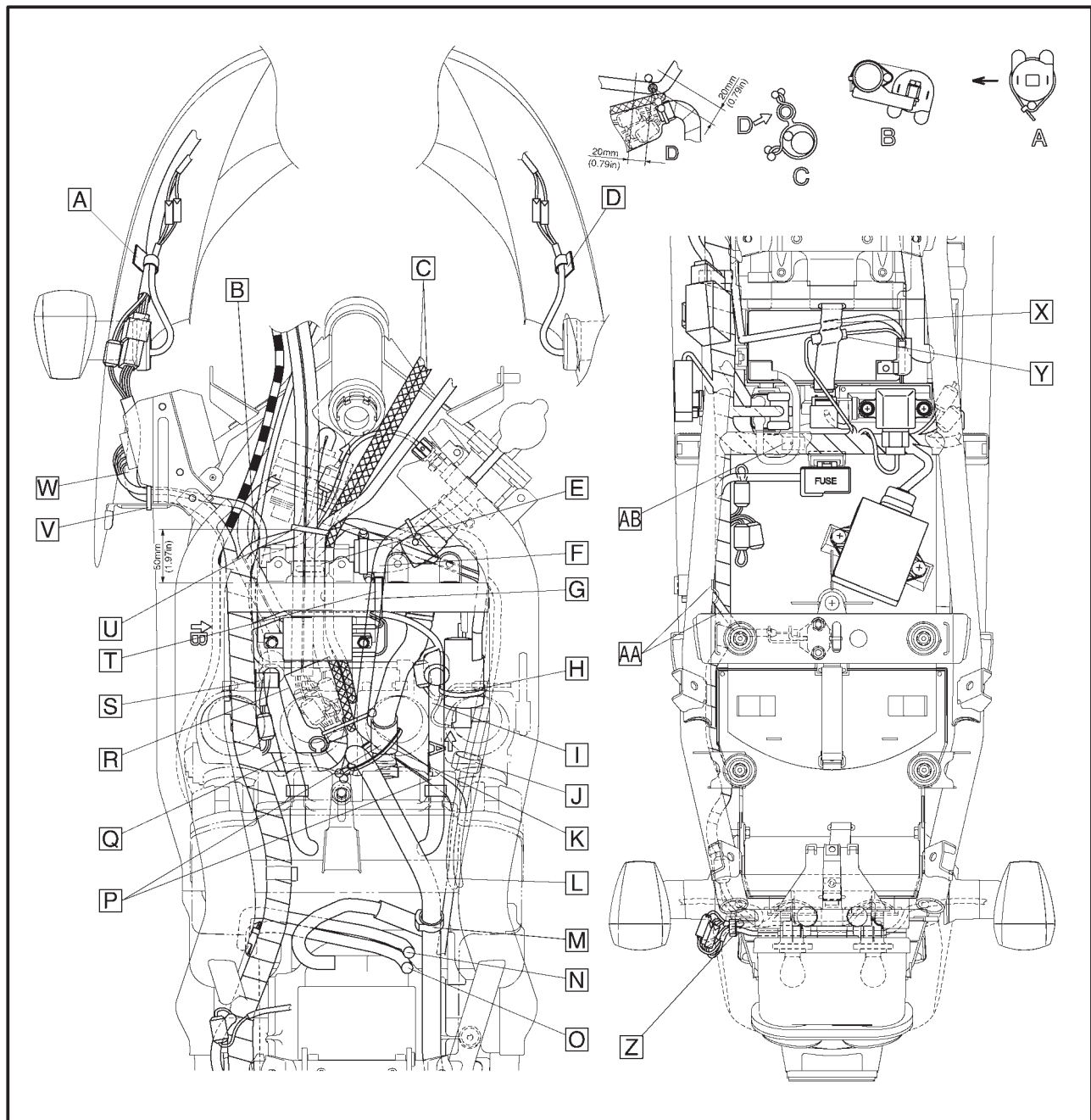


- [A] Fasten the flasher light lead and headlight lead with a plastic clamp.
- [B] Route the rectifier/regulator lead upper the fan motor lead and EXUP servomotor lead.
- [C] Route the throttle cable right side the fan motor lead, EXUP servo motor lead and thermo unit lead.
- [D] Fasten the flasher light lead with a plastic clamp.
- [E] Route the all leads between the frame cross pipe and bracket.
- [F] Do not excessively bend the throttle cable.
- [G] Route the coolant reservoir hose under the frame cross pipe.
- [H] Fasten the ignition coil and ignition coil lead with a plastic clamp.
- [I] Route the T.P.S. lead under the air vent hose.
- [J] Fasten the EXUP cable with a plastic band.
- [K] Fasten the fuel hose and air induction system hose with a plastic clamp.
- [L] Route the coolant reservoir hose under the frame cross pipe.
- [M] Fasten the fuel hose and frame with a plastic band.
- [N] Put the fuel tank drain hose into the frontward nipple on the fuel tank.
- [O] Put the fuel tank breather hose into the backward nipple on the fuel tank.
- [P] Route the coolant reservoir hose under the air vent hose and air induction system hose.
- [Q] Route the air vent hose upper the main harness.
- [R] All coupler into the rubber cover.
- [S] Fasten the Rectifier/regulator lead with a plastic band in the main harness.





- T** Fasten the ignition coil lead and frame cross pipe with a plastic clamp. Do not fasten the red/black lead and orange lead.
- U** Fasten the handlebar switch lead (left/right), main switch lead, EXUP servo motor lead, fan motor lead and thermo unit lead with a plastic clamp. Locate the end of clamp to downward. Ensure that the throttle cable and high tension cable do not come into contact with each other.
- V** Fasten the rectifier/regulator stay and rectifier/regulator lead with a plastic clamp.
- W** Route the wire harness under the rectifier/regulator.
- X** Fasten the battery negative lead with a battery band.
- Y** Insert the ground lead coupler in the battery band.
- Z** Fasten the taillight lead and flasher light lead, and put in the groove on the taillight bracket.
- AA** Put the seat lock cable into the groove on the rear fender.
- AB** Fasten the battery positive lead with a plastic band.



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 CHART FOR THE EMISSION CONTROL SYSTEM

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
				600 mi (1,000 km) or 1 month	4,000 mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months	
1	*	Valve clearance (See page 3-5)	<ul style="list-style-type: none">Check and adjust valve clearance when engine is cold.	Every 26,600 mi (42,000 km)						
2		Spark plugs (See page 3-15)	<ul style="list-style-type: none">Check condition.Adjust gap and clean.Replace every 8,000 mi (13,000 km) or 12 months.		✓	Replace.	✓	Replace.	✓	
3	*	Crankcase ventilation system (See page 3-25)	<ul style="list-style-type: none">Check ventilation hose for cracks or damage.Replace if necessary.		✓	✓	✓	✓	✓	
4	*	Fuel line (See page 3-24)	<ul style="list-style-type: none">Check fuel hoses and vacuum hose for cracks or damage.Replace if necessary.		✓	✓	✓	✓	✓	
5	*	Fuel filter (See page 3-24)	<ul style="list-style-type: none">Replace every 20,000 mi (31,000 km) or 30 months.						Replace.	
6	*	Exhaust system (See page 3-25)	<ul style="list-style-type: none">Check for leakage.Retighten if necessary.Replace gasket(s) if necessary.		✓	✓	✓	✓	✓	
7	*	Carburetor synchronization (See page 3-10)	<ul style="list-style-type: none">Adjust synchronization of carburetors.	✓	✓	✓	✓	✓	✓	
8	*	Idle speed (See page 3-12)	<ul style="list-style-type: none">Check and adjust engine idle speed.Adjust cable free play.		✓	✓	✓	✓	✓	
9	*	Evaporative emission control system (For California only) (See page 3-26)	<ul style="list-style-type: none">Check control system for damage.Replace if necessary.				✓		✓	
10	*	Air induction system (See page 7-14)	<ul style="list-style-type: none">Check the air cut valve and read valve for damage.Replace the entire air induction system if necessary.		✓	✓	✓	✓	✓	

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

GENERAL MAINTENANCE AND LUBRICATION CHART

No.		ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
				600 mi (1,000 km) or 1 month	4,000 mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months	
1		Engine oil (See page 3-20)	• Replace (warm engine before draining). (See NOTE)	✓	✓	✓	✓	✓	✓	
2		Engine oil filter cartridge (See page 3-20)	• Replace at initial 600 mi (1,000 km) or 1 month, and thereafter every 8,000 mi (13,000 km) or 12 months.	✓		✓		✓		
3	*	Air filter element (See page 3-23)	• Clean with compressed air. • Replace if necessary.		✓	✓	✓	✓	✓	
4	*	Cooling system (See page 3-29) (See page 3-30)	• Check hose for cracks or damage. • Replace if necessary.		✓	✓	✓	✓	✓	
			• Replace coolant every 24 months. #3					Replace.		
5	*	Brake system (See page 3-35) (See page 3-36)	• Check operation, pad wear, and fluid leakage. (See NOTE) • Correct if necessary.	✓	✓	✓	✓	✓	✓	

PERIODIC MAINTENANCE/LUBRICATION INTERVALS

**CHK
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No.	ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
			600 mi (1,000 km) or 1 month	4,000 mi (7,000 km) or 6 months	8,000 mi (13,000 km) or 12 months	12,000 mi (19,000 km) or 18 months	16,000 mi (25,000 km) or 24 months	20,000 mi (31,000 km) or 30 months	
6	*	Clutch (See page 3-22)	<ul style="list-style-type: none">Check operation.Adjust or replace cable.	✓	✓	✓	✓	✓	✓
7	*	Control cable (See page 3-50)	<ul style="list-style-type: none">Apply chain lube thoroughly. #1	✓	✓	✓	✓	✓	✓
8	*	Swingarm pivot bearing (See page 4-68) (See page 4-69)	<ul style="list-style-type: none">Check bearing assembly for looseness.Moderately repack every 16,000 mi (25,000 km) or 24 months. #2			✓		✓ Repack.	
9	*	Rear suspension link pivots (See page 4-69)	<ul style="list-style-type: none">Check operation.Moderately repack every 16,000 mi (25,000 km) or 24 months. #2			✓		✓ Repack.	
10	*	Shock absorber assembly (See page 4-64)	<ul style="list-style-type: none">Check operation and for oil leakage.Replace if necessary.		✓	✓	✓	✓	✓
11	*	Front fork (See page 3-43)	<ul style="list-style-type: none">Check operation and for oil leakage.Repair if necessary.		✓	✓	✓	✓	✓
12	*	Steering bearings (See page 3-41) (See page 4-59)	<ul style="list-style-type: none">Check bearing assembly for looseness.Moderately repack every 16,000 mi (25,000 km) or 24 months. #2		✓	✓	✓	✓ Repack.	✓
13		Brake and clutch lever pivot shafts (See page 3-50)	<ul style="list-style-type: none">Lubricate. #2		✓	✓	✓	✓	✓
14		Brake and shift pedal pivot shafts (See page 3-50)	<ul style="list-style-type: none">Lubricate. #2		✓	✓	✓	✓	✓
15	*	Drive chain (See page 3-39) (See page 3-69)	<ul style="list-style-type: none">Check chain slack/alignment condition.Adjust and lubricate chain thoroughly. #1	Every 600 mi (1,000 km) or after washing the motorcycle or riding in the rain. ✓					
16	*	Wheel bearings (See page 4-4)	<ul style="list-style-type: none">Check bearings for smooth operation.		✓	✓	✓	✓	✓
17	*	Sidestand and centerstand pivots (See page 3-50)	<ul style="list-style-type: none">Check operation.Lubricate. #2		✓	✓	✓	✓	✓
18	*	Sidestand switch (See page 8-21)	<ul style="list-style-type: none">Check and clean or replace if necessary.	✓	✓	✓	✓	✓	✓
19	*	Chassis fasteners (See page 2-22)	<ul style="list-style-type: none">Check all chassis fitting and fasteners.Correct if necessary.		✓	✓	✓	✓	✓

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

#1: Yamaha chain lube

#2: Lithium-soap-based grease (all-purpose grease)

#3: Ethylene glycol anti-freeze coolant

NOTE:

From 24,000 mi (37,000 km) or 36 months, repeat the maintenance intervals starting from 4,000 mi (7,000 km) or 6 months.

NOTE:

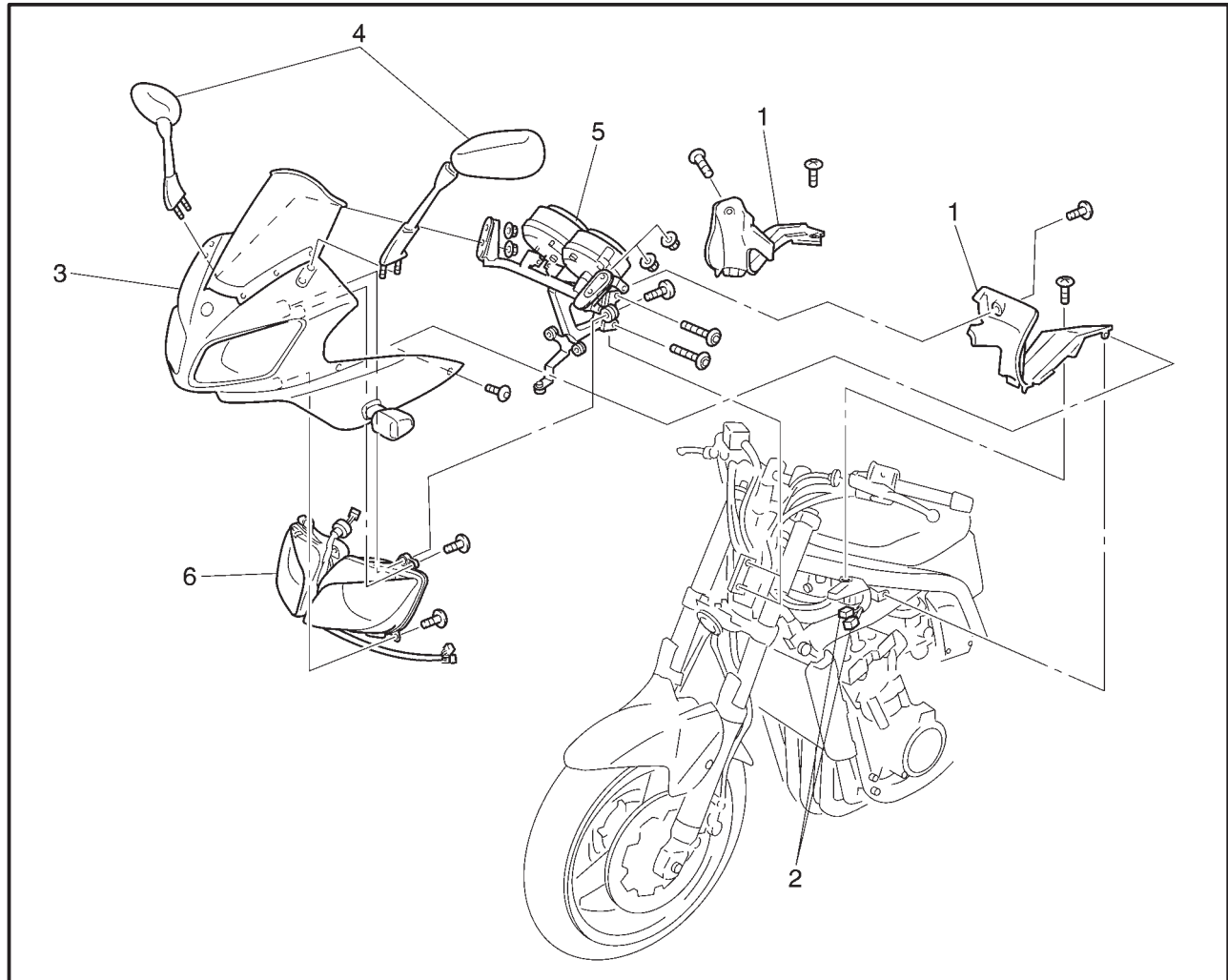
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake service
 - Regularly check and, if necessary, correct the brake fluid level.
 - Every two years replace the internal components of the brake master cylinder and caliper, and change the brake fluid.
 - Replace the brake hoses every four years and if cracked or damaged.
- Engine oil type
 - Yamalube 4 (20W-40) or engine oil SAE 20W-40 (API SE) for temperatures of 5 °C (40 °F) or above.
 - Yamalube 4 (10W-30) or engine oil SAE 10W-30 (API SE) for temperatures of 15 °C (60 °F) or below.



EAS00038

FRONT COWLING/SEAT/SIDE COVER/FUEL TANK

FRONT COWLING

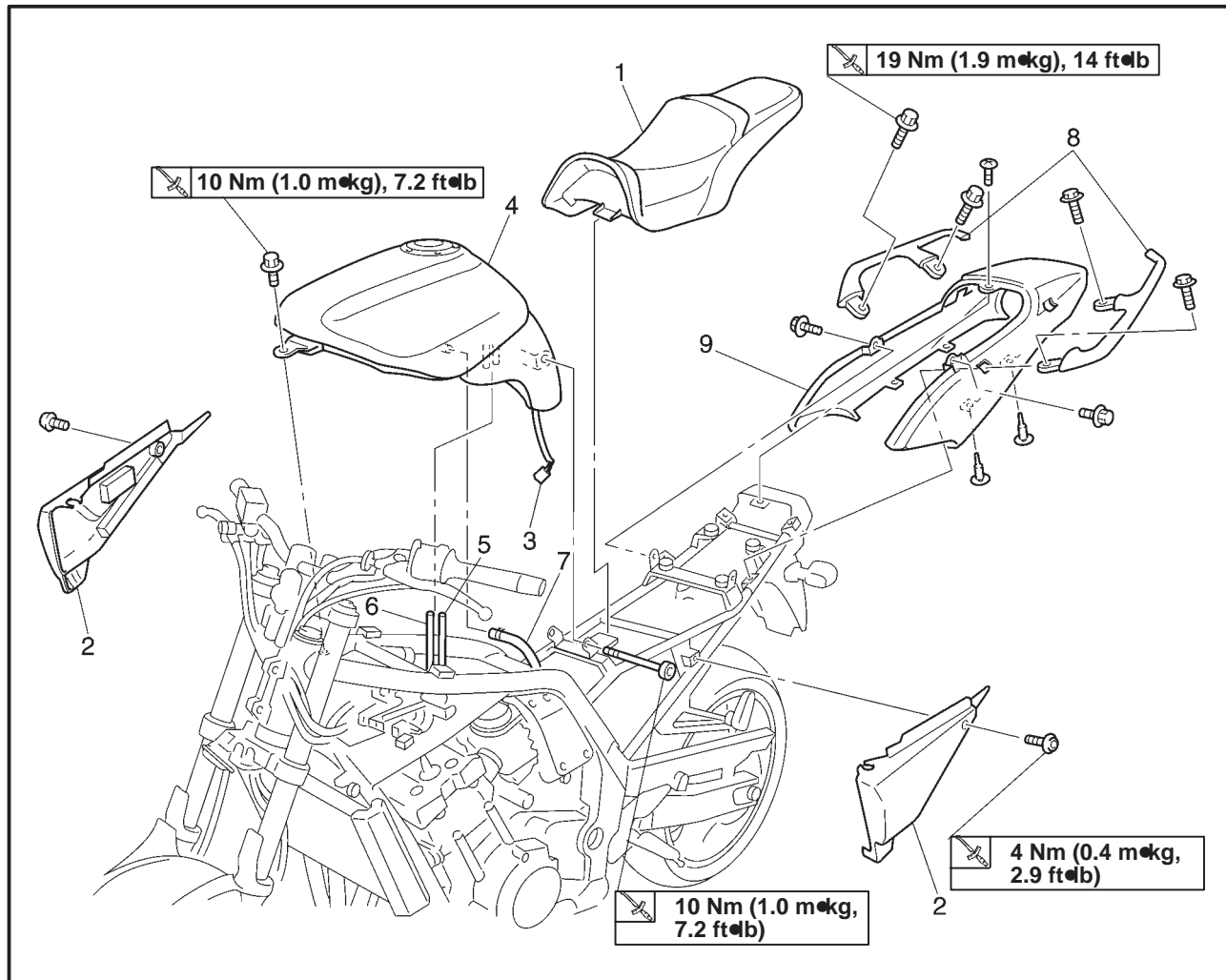


Order	Job/Part	Q'ty	Remarks
	Removing the front cowling		
1	Inner panel	2	Remove the parts in the order listed.
2	Headlight/meter coupler	1/1	Disconnect.
3	Front cowling assembly	1	
4	Back view mirror	2	
5	Meter unit	1	
6	Headlight unit	1	
			For installation, reverse the removal procedure.



EAS00040

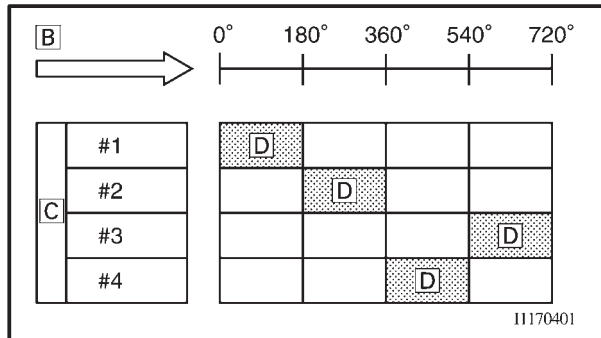
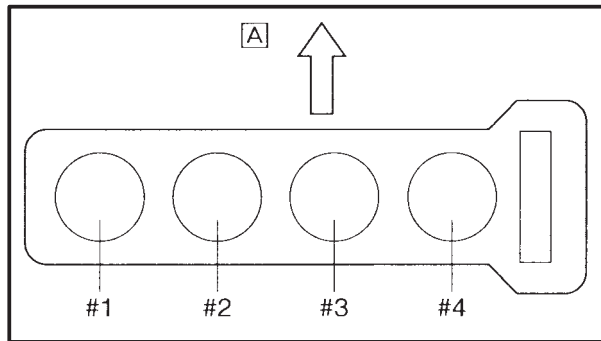
SEAT, SIDE COVER AND FUEL TANK



Order	Job/Part	Q'ty	Remarks
	Removing the seat, side cover and fuel tank		Remove the parts in the order listed.
1	Seat	1	
2	Side cover (left and right)	2	
3	Fuel sender coupler	1	Disconnect.
4	Fuel tank	1	
5	Fuel tank breather hose	1	
6	Fuel tank drain hose	1	NOTE: _____
7	Fuel hose	1	Before disconnecting the fuel hose, turn the fuel cock off.
8	Grab bar	1	
9	Rear cowl	1	For installation, reverse the removal procedure.

ADJUSTING THE VALVE CLEARANCE

CHK
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A Front

d. For each cylinder, starting with cylinder #1 at TDC, turn the crankshaft clockwise as specified in the following table.

B Degrees that the crankshaft is turned clockwise

C Cylinder

D Combustion cycle

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

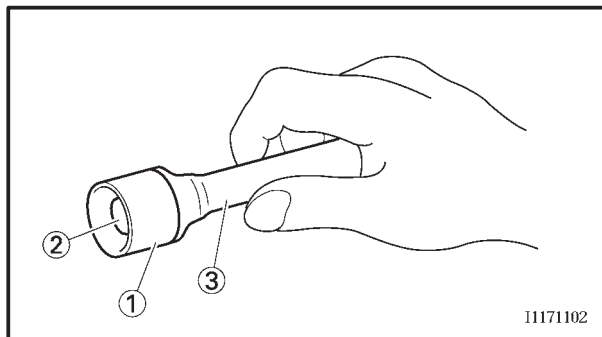


3. Remove:

- intake camshaft
- exhaust camshaft

NOTE:

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

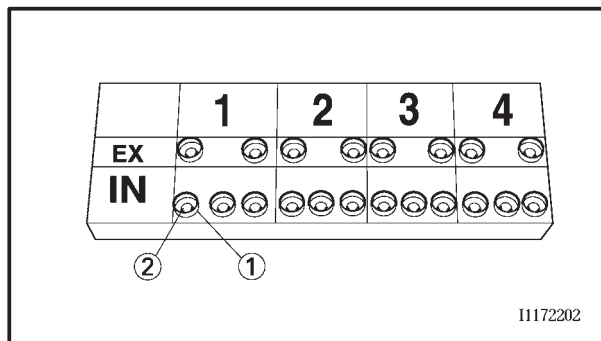


4. Adjust:

- valve clearance



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



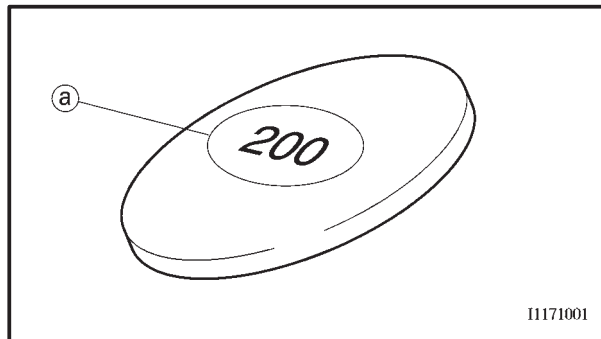
NOTE:

Cover the timing chain opening with a rag to prevent the valve pad from falling into the crankcase.

Make a note of the position of each valve lifter ① and valve pad ② so that they can be installed in the correct place.

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

Valve pad thickness range		Available valve pads
Nos. 120 ~ 240	1.20 ~ 2.40 mm (0.047 ~ 0.094 in)	25 thicknesses in 0.05 mm (0.0020 in) increments



NOTE:

The thickness ① of each valve pad is marked in hundredths of millimeters on the side that touches the valve lifter.

Since valve pads of various sizes are originally installed, the valve pad number must be rounded in order to reach the closest equivalent to the original.

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

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

EXAMPLE:

Original valve pad number = 148 (thickness = 1.48 mm (0.058 in))

Rounded value = 150

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

NOTE:

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

ADJUSTING THE VALVE CLEARANCE

CHK
ADJ



VALVE PAD SELECTION TABLE INTAKE

Measured clearance ↓	INSTALLED PAD NUMBER																											
	120	125	130	135	140	145		155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.00 ~ 0.02				120	125	130		140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225			
0.03 ~ 0.07			120	125	130	135		145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230			
0.08 ~ 0.10		120	125	130	135	140		150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235			
0.11 ~ 0.20	Specification																											
0.21 ~ 0.22	125	130	135	140	145	150		160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
								165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.28 ~ 0.32	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.33 ~ 0.37	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.38 ~ 0.42	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.43 ~ 0.47	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.48 ~ 0.52	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.53 ~ 0.57	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.58 ~ 0.62	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.63 ~ 0.67	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240													
0.68 ~ 0.72	175	180	185	190	195	200	205	210	215	220	225	230	235	240														
0.73 ~ 0.77	180	185	190	195	200	205	210	215	220	225	230	235	240															
0.78 ~ 0.82	185	190	195	200	205	210	215	220	225	230	235	240																
0.83 ~ 0.87	190	195	200	205	210	215	220	225	230	235	240																	
0.88 ~ 0.92	195	200	205	210	215	220	225	230	235	240																		
0.93 ~ 0.97	200	205	210	215	220	225	230	235	240																			
0.98 ~ 1.02	205	210	215	220	225	230	235	240																				
1.03 ~ 1.07	210	215	220	225	230	235	240																					
1.08 ~ 1.12	215	220	225	230	235	240																						
1.13 ~ 1.17	220	225	230	235	240																							
1.18 ~ 1.22	225	230	235	240																								
1.23 ~ 1.27	230	235	240																									
1.28 ~ 1.32	235	240																										
1.33 ~ 1.37	240																											

EXAMPLE:

VALVE CLEARANCE: 0.11 ~ 0.20 mm
(0.0043 ~ 0.0079 in)

Installed is 150

Measured clearance is 0.25 mm (0.0098 in)

Replace 150 pad with 160 pad

EXHAUST

Measured clearance ↓	INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170		180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02						120	125	130	135	140	145		155	160	165	170	175	180	185	190	195	200	205	210	215
0.03 ~ 0.07					120	125	130	135	140	145	150		160	165	170	175	180	185	190	195	200	205	210	215	220
0.08 ~ 0.10				120	125	130	135	140	145	150	155		165	170	175	180	185	190	195	200	205	210	215	220	225
0.13 ~ 0.17			120	125	130	135	140	145	150	155	160		170	175	180	185	190	195	200	205	210	215	220	225	230
0.18 ~ 0.20		120	125	130	135	140	145	150	155	160	165		175	180	185	190	195	200	205	210	215	220	225	230	235
0.21 ~ 0.30	Specification																								
0.31 ~ 0.32	125	130	135	140	145	150	155	160	165	170	175		185	190	195	200	205	210	215	220	225	230	235	240	
0.33 ~ 0.37													190	195	200	205	210	215	220	225	230	235	240		
0.38 ~ 0.42	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240			
0.43 ~ 0.47	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240				
0.48 ~ 0.52	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240					
0.53 ~ 0.57	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240						
0.58 ~ 0.62	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240							
0.63 ~ 0.67	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240								
0.68 ~ 0.72	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240									
0.73 ~ 0.77	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240										
0.78 ~ 0.82	175	180	185	190	195	200	205	210	215	220	225	230	235	240											
0.83 ~ 0.87	180	185	190	195	200	205	210	215	220	225	230	235	240												
0.88 ~ 0.92	185	190	195	200	205	210	215	220	225	230	235	240													
0.93 ~ 0.97	190	195	200	205	210	215	220	225	230	235	240														
0.98 ~ 1.02	195	200	205	210	215	220	225	230	235	240															
1.30 ~ 1.07	200	205	210	215	220	225	230	235	240																
1.08 ~ 1.12	205	210	215	220	225	230	235	240																	
1.13 ~ 1.17	210	215	220	225	230	235	240																		
1.18 ~ 1.22	215	220	225	230	235	240																			
1.23 ~ 1.27	220	225	230	235	240																				
1.28 ~ 1.32	225	230	235	240																					
1.33 ~ 1.37	230	235	240																						
1.38 ~ 1.42	235	240																							
1.43 ~ 1.47	240																								

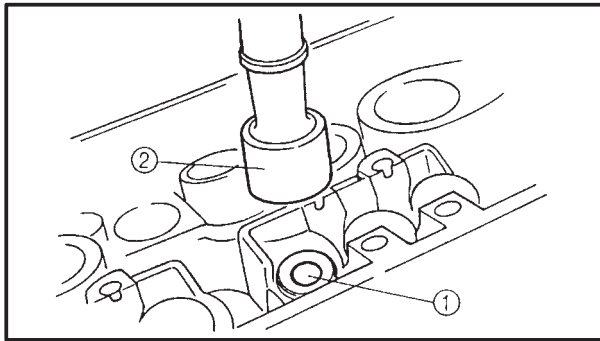
EXAMPLE:

VALVE CLEARANCE: 0.21 ~ 0.30 mm
(0.0083 ~ 0.0118 in)

Installed is 175

Measured clearance is 0.35 mm (0.0138 in)

Replace 175 pad with 185 pad



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

NOTE:

Apply molybdenum disulfide oil to the valve pad and the valve lifter.

The valve lifter must turn smoothly when rotated by hand.

Install the valve lifter and the valve pad in the correct place.

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



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

NOTE:

Refer to "INSTALLING THE CAMSHAFTS" in chapter 4.

Lubricate the camshaft caps, camshaft lobes and camshaft journals.

First, install the exhaust camshaft.

Align the camshaft marks with the camshaft cap marks.

Rotate the crankshaft clockwise several turns to seat the parts.

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

5. Install:
cylinder head cover
Refer to "CYLINDER HEAD COVER" in chapter 5.

6. Install:
all removed parts

NOTE:

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



EAS00050

SYNCHRONIZING THE CARBURETORS

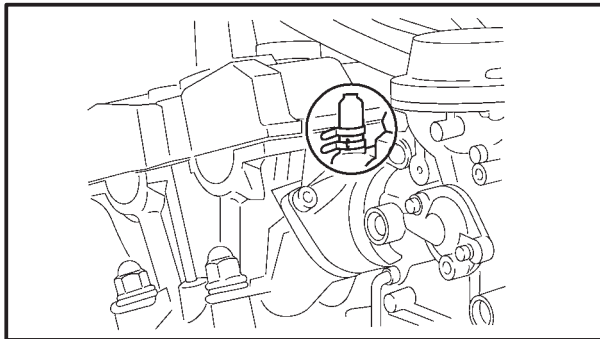
NOTE:

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

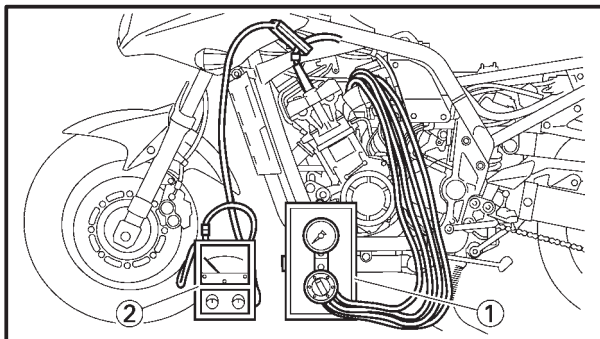
1. Stand the motorcycle on a level surface.

NOTE:

Place the motorcycle on a suitable stand.



2. Remove:
vacuum cap



3. Install:
carburetor synchronizer ①
inductive self-powered tachometer ②
(to the spark plug lead of cyl. #1)

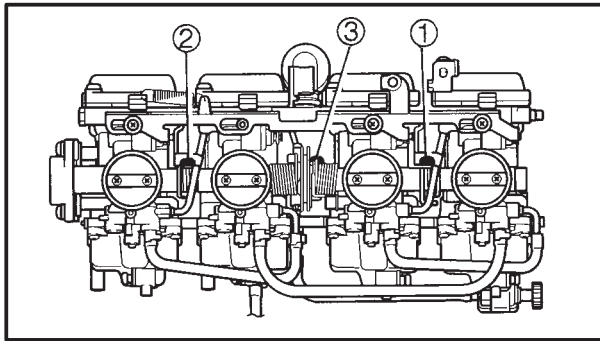


Carburetor synchronizer
YU-8030
Inductive self-powered tachometer
YU-8036-B

4. Start the engine and let it warm up for several minutes.
5. Check:
engine idling speed
Out of specification Adjust.
Refer to "ADJUSTING THE ENGINE IDLING SPEED".



Engine idling speed
1,050 ~ 1,150 r/min



6. Adjust:
carburetor synchronization



- a. Synchronize carburetor #1 to carburetor #2 by turning the synchronizing screw ① in either direction until both gauges read the same.

NOTE:

After each step, rev the engine two or three times, each time for less than a second, and check the synchronization again.

- b. Synchronize carburetor #4 to carburetor #3 by turning the synchronizing screw ② in either direction until both gauges read the same.
- c. Synchronize carburetor #2 to carburetor #3 by turning the synchronizing screw ③ in either direction until both gauges read the same.



Vacuum pressure at engine idling speed

30 kPa (225 mm Hg, 8.86 in Hg)

NOTE:

The difference in vacuum pressure between two carburetors should not exceed 1.33 kPa (10 mm Hg, 0.39 in Hg).



7. Measure:
engine idling speed
Out of specification Adjust.
8. Stop the engine and remove the measuring equipment.
9. Adjust:
throttle cable free play
Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY".



Throttle cable free play (at the flange of the throttle grip)

3 ~ 5 mm (0.12 ~ 0.20 in)

10. Install:
vacuum cap



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



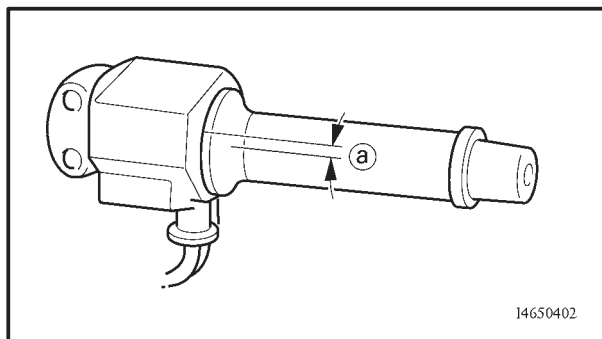
**Throttle cable free play (at the
flange of the throttle grip)**
3 ~ 5 mm (0.12 ~ 0.20 in)

EAS00055

**ADJUSTING THE THROTTLE CABLE FREE
PLAY**

NOTE: _____

Prior to adjusting the throttle cable free play, the
engine idling speed and carburetor synchro-
nization should be adjusted properly.



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



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

2. Remove:
seat
fuel tank



4. Install:
fuel tank
seat

EAS00059

CHECKING THE SPARK PLUGS

The following procedure applies to all of the spark plugs.

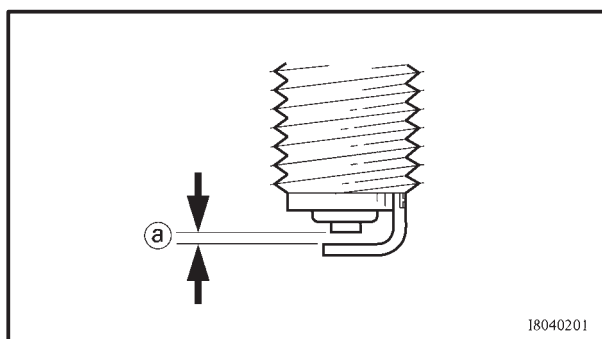
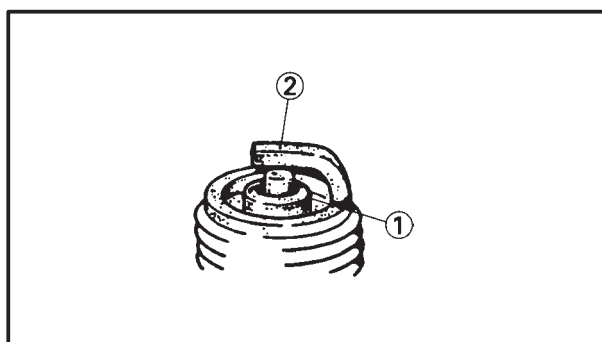
1. Disconnect:
spark plug cap
2. Remove:
spark plug

CAUTION:

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

3. Check:
spark plug type
Incorrect Change.

Spark plug type (manufacturer)
CR9E (NGK)
U27ESR-N (DENSO)

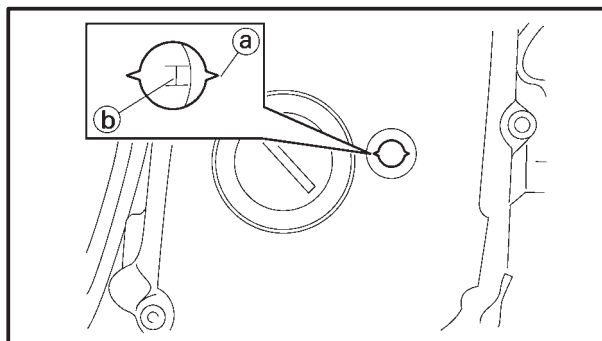


18040201

4. Check:
electrode ①
Damage/wear Replace the spark plug.
insulator ②
Abnormal color Replace the spark plug.
Normal color is a medium-to-light tan color.
5. Clean:
spark plug
(with a spark plug cleaner or wire brush)
6. Measure:
spark plug gap ③
(with a wire gauge)
Out of specification Regap.



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



- b. Check that the mark (a) is within the required firing range (b) on the pickup coil rotor.
Incorrect firing range Check the ignition system.

NOTE: _____

The ignition timing is not adjustable.



4. Remove:
timing light
engine tachometer
5. Install:
timing plug

EAS00065

MEASURING THE COMPRESSION PRESSURE

The following procedure applies to all of the cylinders.

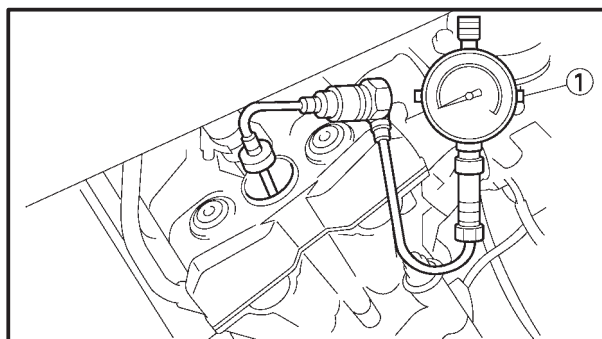
NOTE: _____

Insufficient compression pressure will result in a loss of performance.

1. Measure:
valve clearance
Out of specification Adjust.
Refer to "ADJUSTING THE VALVE CLEARANCE".
2. Start the engine, warm it up for several minutes, and then turn it off.
3. Disconnect:
spark plug cap
4. Remove:
spark plug

CAUTION: _____

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



5. Install:
compression gauge (1)




Compression gauge set

YU-33223

Compression gauge adapter

YU-33223-3

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

 **Compression pressure (at sea level):**
Standard:
 1,450 kPa (14.5 kg/cm², 206 psi)
Minimum:
 1,260 kPa (12.6 kg/cm², 179 psi)
Maximum:
 1,620 kPa (16.2 kg/cm², 230 psi)

- ⚠ WARNING**

NOTE: _____

▲▲▲

- 3-18



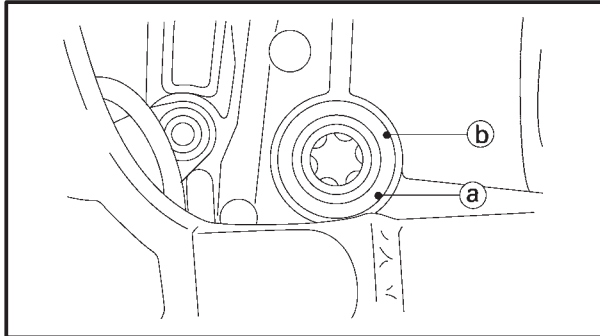
EAS00071

CHECKING THE ENGINE OIL LEVEL

1. Stand the motorcycle on a level surface.

NOTE:

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



2. Check:

engine oil level

The engine oil level should be between the minimum level marks (a) and maximum level marks (b).

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



Recommended engine oil
Yamalube 4 (20W40) or SAE
20W40 type SE motor oil

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.

Do not allow foreign materials to enter the crankcase.

NOTE:

API Service "SE", "SF" and "SG" type or equivalent (e.g., "SF-SE", "SF-SE-CC", "SF-SE-SD").

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

NOTE:

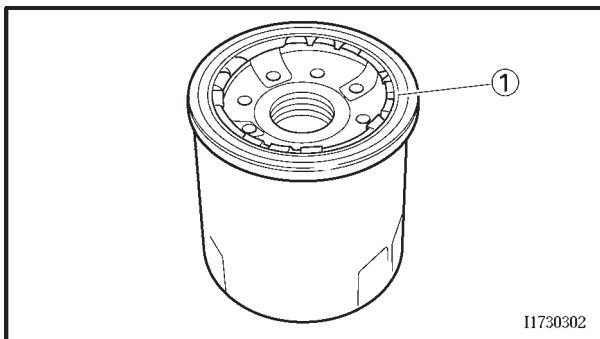
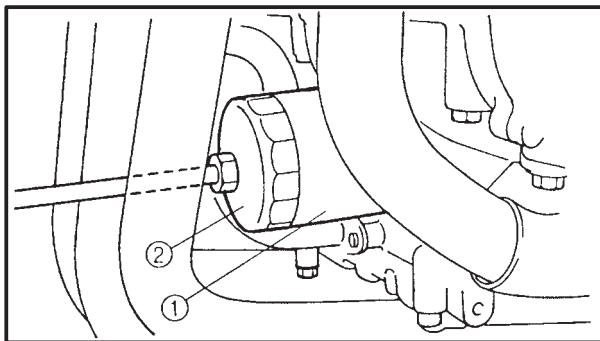
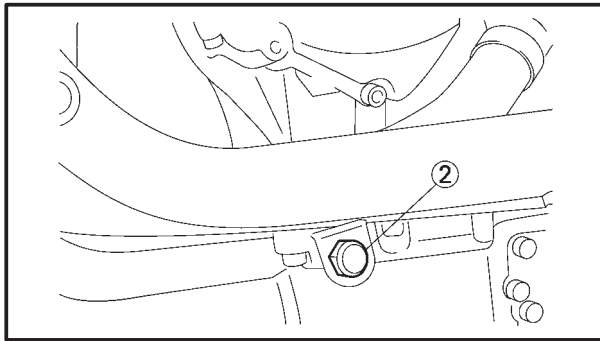
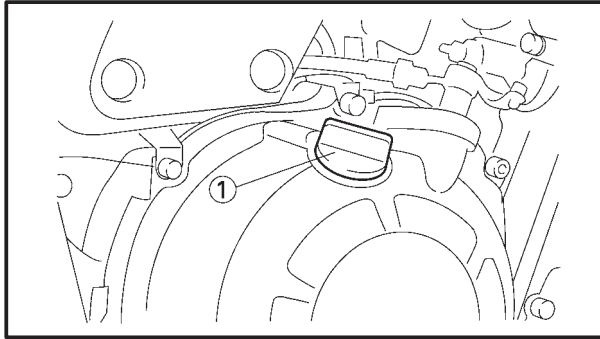
Before checking the engine oil level, wait a few minutes until the oil has settled.



EAS00073

CHANGING THE ENGINE OIL

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



3. Remove:
 - engine oil filler cap ①
 - engine oil drain bolt ②
(along with the gasket)
4. Drain:
 - engine oil
(completely from the crankcase)
5. If the oil filter cartridge is also to be replaced,
perform the following procedure.

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



Oil filter wrench
YU-38411

- b. Apply a thin coat of engine oil onto the O-ring ① of the new oil filter cartridge.

CAUTION:

Make sure that the O-ring ① is positioned correctly in the groove of the oil filter cartridge.




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



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

▲ ▲

6. Check:
engine oil drain bolt gasket
Damage Replace.
7. Install:
engine oil drain bolt

	43 Nm (4.3 m kg, 31 ft lb)
---	-----------------------------------
8. Fill:
crankcase
(with the specified amount of the recommended engine oil)



Quantity

Total amount
3.7 L (3.2 Imp qt, 3.8 US qt)

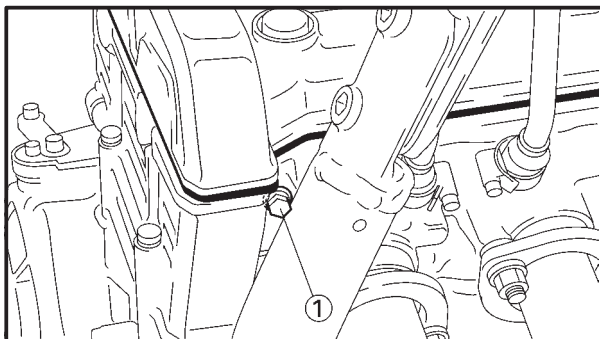
Without oil filter cartridge replacement
2.8 L (2.4 Imp qt, 2.9 US qt)

With oil filter cartridge replacement
3.0 L (2.6 Imp qt, 3.1 US qt)

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

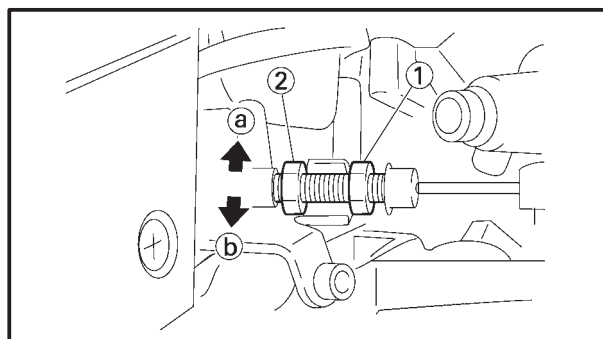
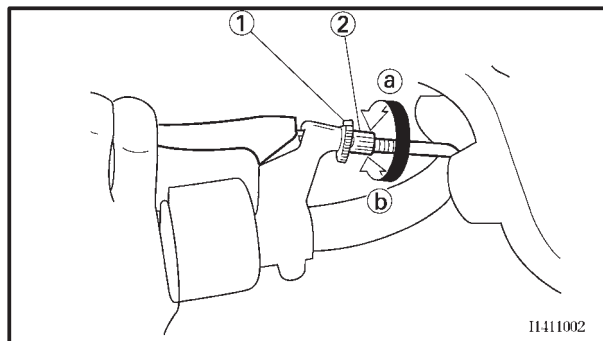
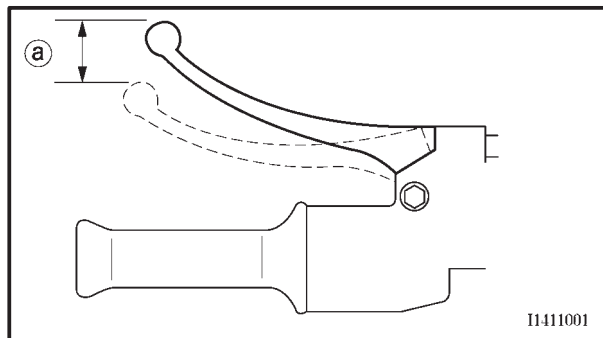
▼ ▼

- Slightly loosen the oil gallery bolt ①.
- Start the engine and keep it idling until engine oil starts to seep from the oil gallery bolt. If no engine oil comes out after one minute, turn the engine off so that it will not seize.
- Check the engine oil passages, the oil filter cartridge and the oil pump for damage or leakage. Refer to "OIL PAN AND OIL PUMP" in chapter 5.
- Start the engine after solving the problem(-s) and check the engine oil pressure again.
- Tighten the oil gallery bolt to specification.





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



EAS00078

ADJUSTING THE CLUTCH CABLE FREE PLAY

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



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

- 2. Adjust:
 - clutch cable free play



Handlebar side

- a. Loosen the locknut ①.
- b. Turn the adjusting bolt ② in direction ③ or ④ 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

- c. Tighten the locknut.

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. Loosen the locknut ①.
- b. Turn the adjusting bolt ② in direction ③ or ④ 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

- c. Tighten the locknut.

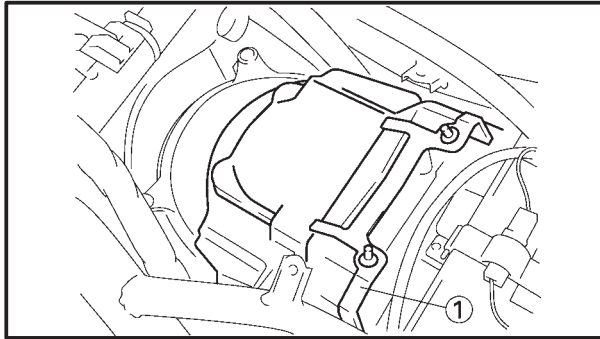




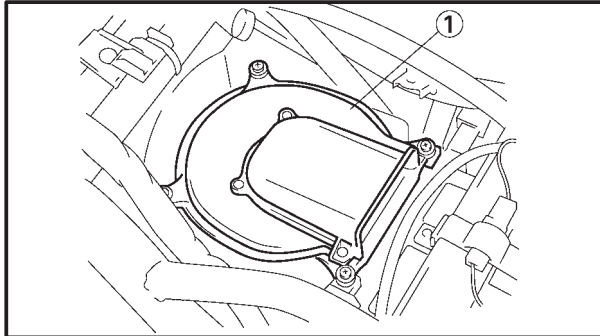
EAS00086

CLEANING THE AIR FILTER ELEMENT

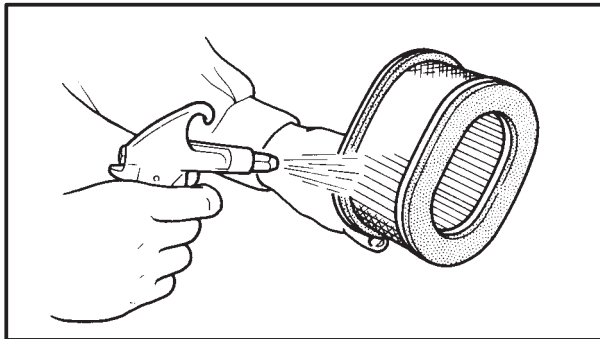
1. Remove:
seat
fuel tank
side cover
cover ①



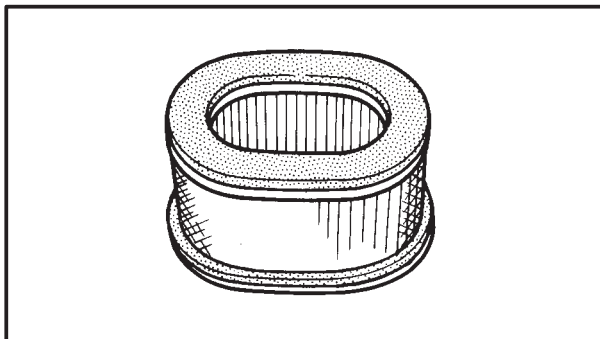
2. Remove:
air filter case cover ①
air filter element



3. Clean:
air filter element
Apply compressed air to the outer surface of the air filter element.



4. Check:
air filter element
Damage Replace.
5. Install:
air filter element
air filter case cover



CAUTION:

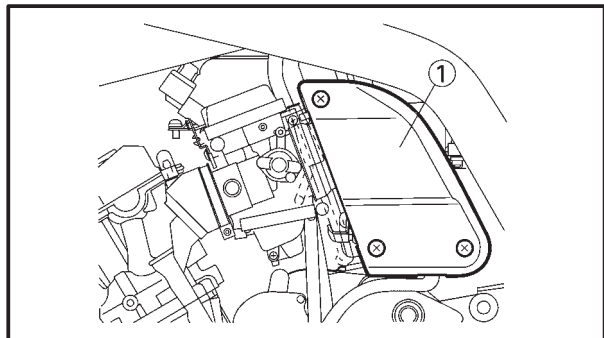
Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect the carburetor tuning, leading to poor engine performance and possible overheating.



NOTE:

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

6. Install:
 - cover
 - side cover
 - fuel tank
 - seat

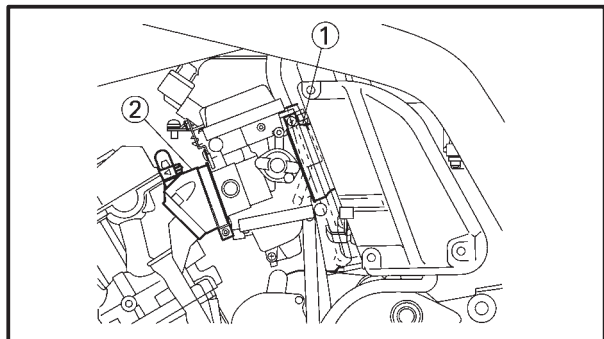


EAS00095

CHECKING THE CARBURETOR JOINTS AND INTAKE MANIFOLDS

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

1. Remove:
 - seat
 - fuel tank
 - air filter case panel ①



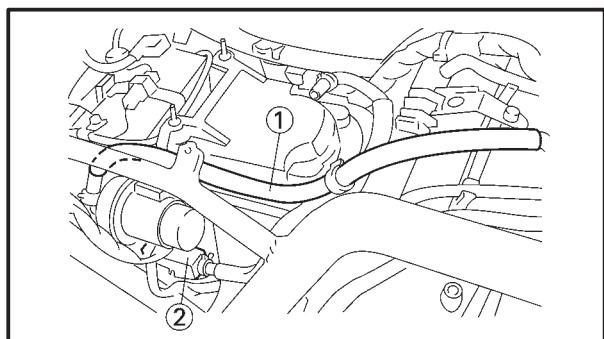
2. Check:
 - carburetor joint ①
 - intake manifold ②
 - Cracks/damage Replace.
 - Refer to "CARBURETORS" in chapter 6.
3. Install:
 - air chamber cover
 - fuel tank
 - seat

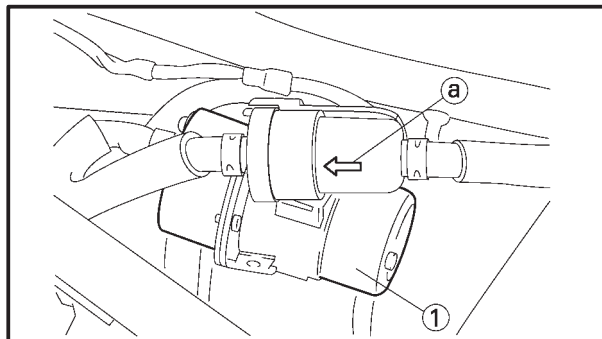
EAS00097

CHECKING THE FUEL HOSES AND FUEL FILTER

The following procedure applies to all of the fuel hoses.

1. Remove:
 - seat
 - fuel tank
 - side cover
2. Check:
 - fuel hose ①
 - Cracks/damage Replace.
 - fuel filter ②
 - Damage/dirt Replace.





NOTE:

Drain and flush the fuel tank if abrasive damage to any components of the fuel line is evident.

The arrow mark (a) on the fuel filter should face to the side of the fuel pump (1).

3. Install:
side cover
fuel tank
seat

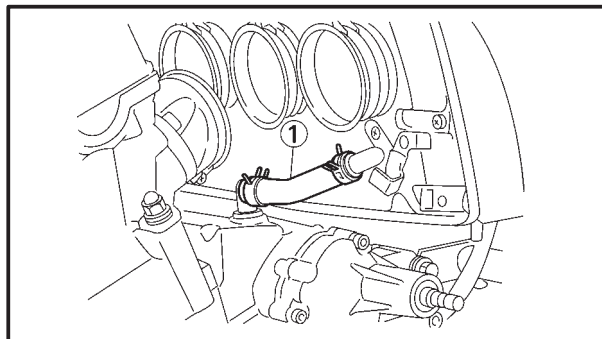
EAS00098

CHECKING THE CRANKCASE BREATHER HOSE

1. Remove:
seat
fuel tank
2. Check:
crankcase breather hose (1)
Cracks/damage Replace.
Loose connection Connect properly.

CAUTION:

Make sure that the crankcase breather hose is routed correctly.



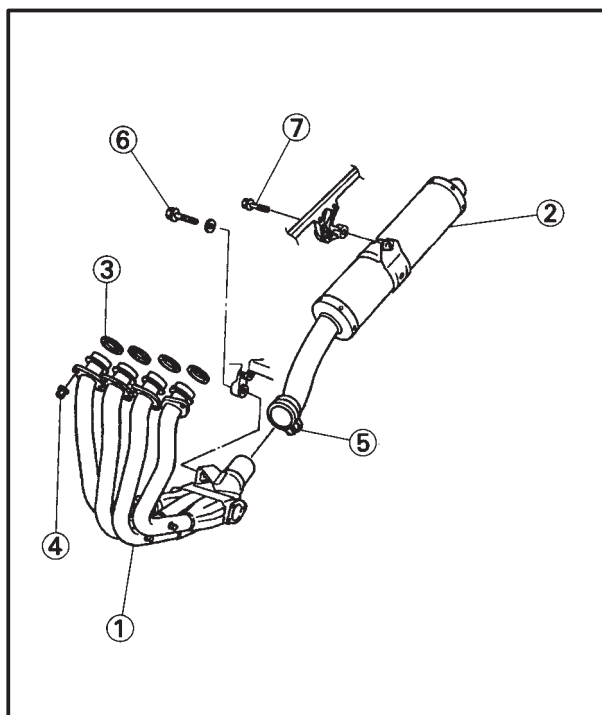
3. Install:
fuel tank
seat

EAS00099

CHECKING THE EXHAUST SYSTEM

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

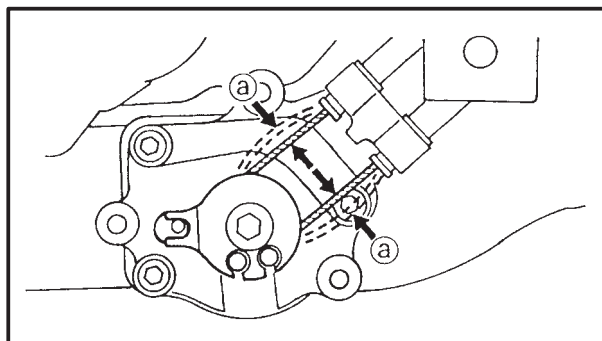
1. Check:
exhaust pipe (1)
muffler (2)
Cracks/damage Replace.
gasket (3)
Exhaust gas leaks Replace.
2. Check:
tightening torque



- Exhaust pipe nut (4)
20 Nm (2.0 m kg, 14 ft lb)
Exhaust pipe and muffler bolt (5)
20 Nm (2.0 m kg, 14 ft lb)
Exhaust pipe and bracket bolt (6)
20 Nm (2.0 m kg, 14 ft lb)
Muffler and muffler bracket bolt (7)
48 Nm (4.8 m kg, 35 ft lb)

ADJUSTING THE EXUP CABLES/ CHECKING THE COOLANT LEVEL

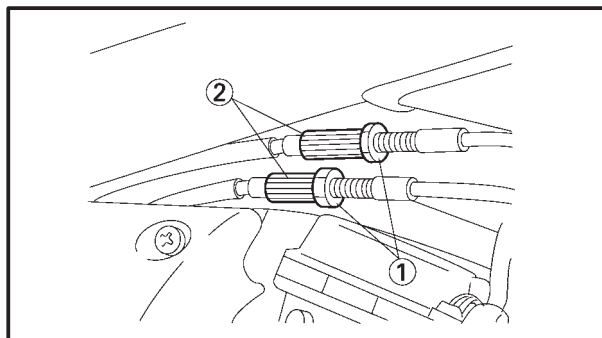
CHK
ADJ



4. Check:
EXUP cable free play **a**



EXUP cable free play
1.5 mm (0.06 in) max.



5. Adjust:
EXUP cable free play



- Loosen both locknuts **1**.
- Insert a 4 mm long pin through the notch in the EXUP valve pulley and into the hole in the EXUP valve cover.
- Turn both adjusting bolts **2** counterclockwise until there is no EXUP cable free play.
- Turn both adjusting bolts 1/2 of a turn clockwise.
- Tighten both locknuts and then remove the pin.



6. Install:
EXUP valve pulley cover

10 Nm (1.0 m kg, 7.2 ft lb)

7. Install:
fuel tank
seat

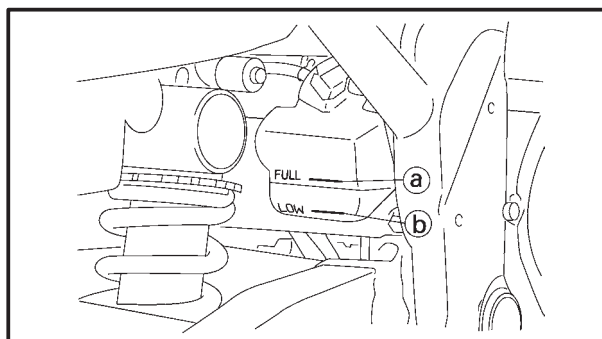
EAS00102

CHECKING THE COOLANT LEVEL

1. Stand the motorcycle on a level surface.

NOTE:

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



2. Check:
coolant level
The coolant level should be between the maximum level mark **a** and minimum level marks **b**.
Below the minimum level mark Add the recommended coolant to the proper level.

**CAUTION:** _____

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

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

NOTE: _____

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



EAS00104

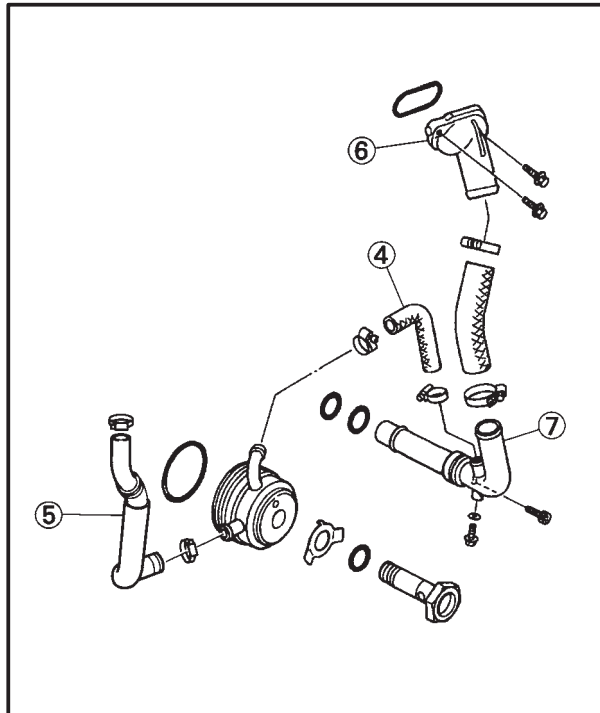
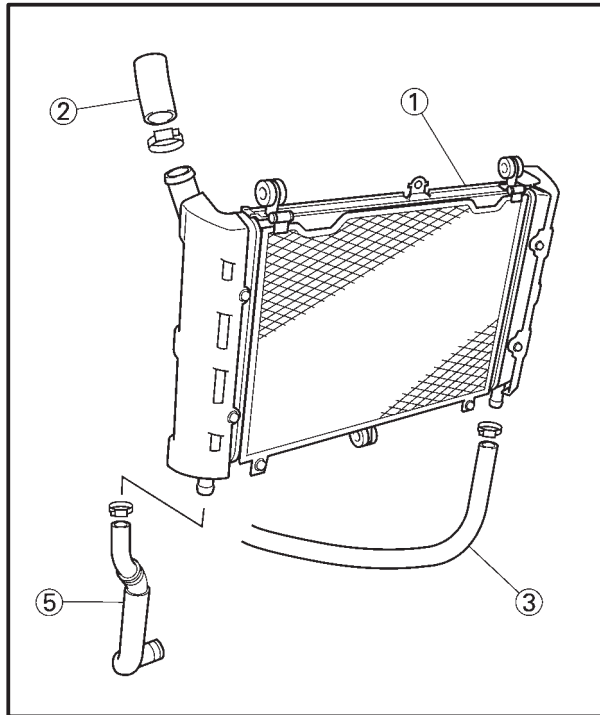
CHECKING THE COOLING SYSTEM

1. Check:

- radiator ①
- radiator inlet hose ②
- radiator outlet hose ③
- oil cooler inlet hose ④
- oil cooler outlet hose ⑤
- water jacket inlet joint ⑥
- water pump outlet joint ⑦

Cracks/damage Replace.

Refer to "COOLING SYSTEM" in chapter 6.

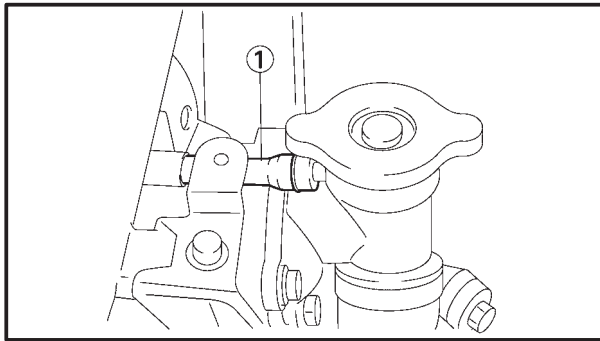




EAS00105

CHANGING THE COOLANT

1. Remove
seat
fuel tank
front cowling
rear suspension
Refer to "REAR SHOCK ABSORBER ASSEMBLY" in chapter 4.
2. Disconnect:
coolant reservoir hose ①
3. Drain:
coolant
(from the coolant reservoir)



4. Remove:
radiator cap ①

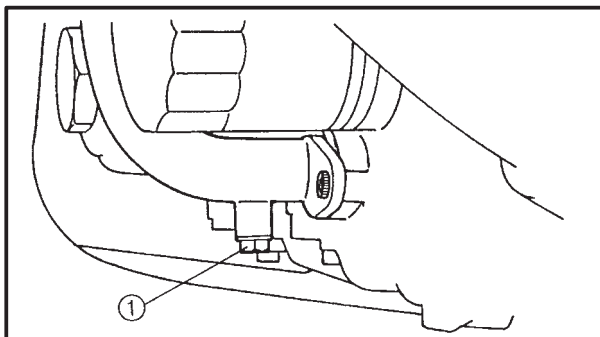
⚠ WARNING

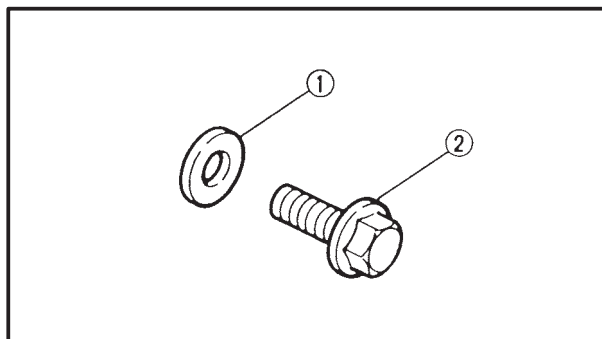
A hot radiator is under pressure. Therefore, do not remove the radiator cap when the engine is hot. Scalding hot fluid and steam may be blown out, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:

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

The following procedure applies to all of the coolant drain bolts and copper washers.

5. Remove:
coolant drain bolt ①
(along with the copper washer)
6. Drain:
coolant
(from the engine and radiator)





7. Check:
copper washer ①
coolant drain bolt ②
Damage Replace.

8. Install:
coolant drain bolt

7 Nm (0.7 m kg, 5.1 ft lb)

9. Connect:
coolant reservoir hose

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

Recommended antifreeze

High-quality ethylene glycol anti freeze containing corrosion inhibitors for aluminum engines

Mix ratio

50% antifreeze/50% water



Quantity

Total amount

2.4 L (2.11 Imp qt, 2.53 US qt)

Coolant reservoir capacity

0.3 L (0.26 Imp qt, 0.32 US qt)

From minimum to maximum level mark

0.2 L (0.18 Imp qt, 0.21 US qt)

Handling notes for coolant

Coolant is potentially harmful and should be handled with special care.

WARNING

If coolant splashes in your eyes, thoroughly wash them with water and consult a doctor.

If coolant splashes on your clothes, quickly wash it away with water and then with soap and water.

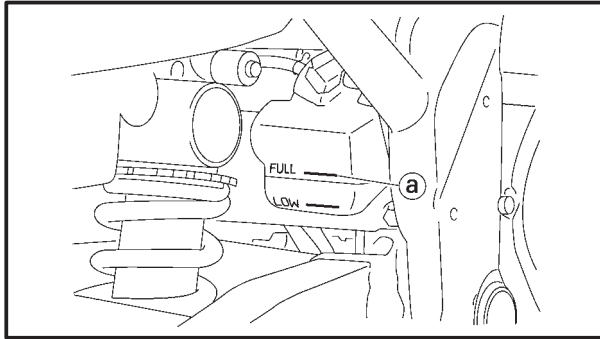
If coolant is swallowed, induce vomiting and get immediate medical attention.



CAUTION:

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

11. Install:
 - radiator cap



12. Fill:
 - coolant reservoir (with the recommended coolant to the maximum level mark (a))
13. Install:
 - coolant reservoir cap
14. Start the engine, warm it up for several minutes, and then turn it off.
15. Check:
 - coolant level
Refer to "CHECKING THE COOLANT LEVEL".

NOTE:

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

16. Install:
 - rear suspension
Refer to "REAR SHOCK ABSORBER ASSEMBLY" in chapter 4.
 - fuel tank
 - seat



3. Adjust:
rear brake light switch
Refer to "ADJUSTING THE REAR BRAKE LIGHT SWITCH".

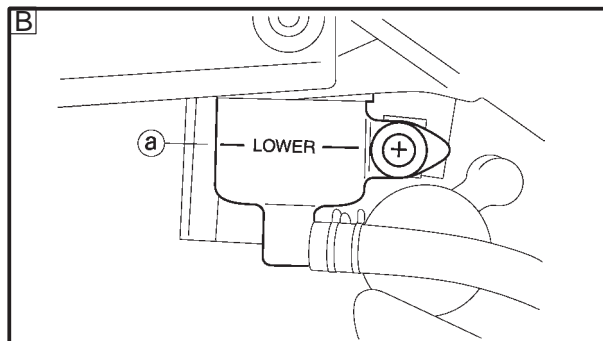
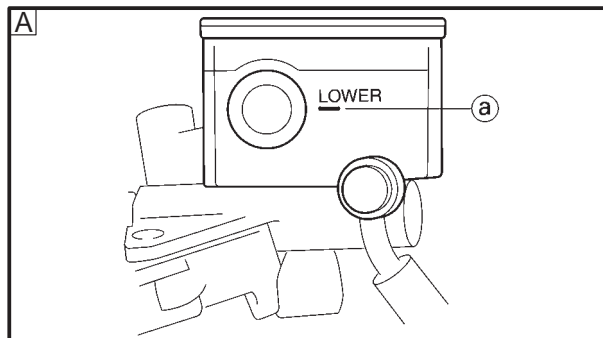
EAS00115

CHECKING THE BRAKE FLUID LEVEL

1. Stand the motorcycle on a level surface.

NOTE:

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



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



Recommended brake fluid
DOT 4

- A Front brake
B Rear brake

⚠ WARNING

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

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

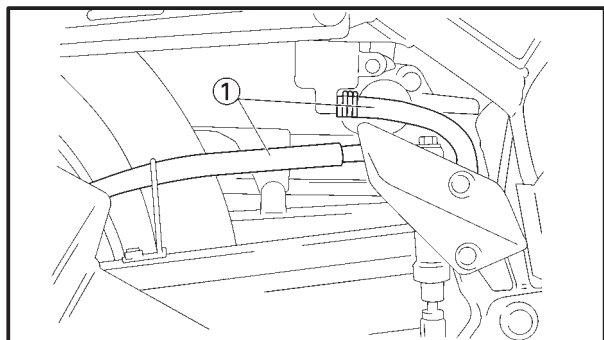
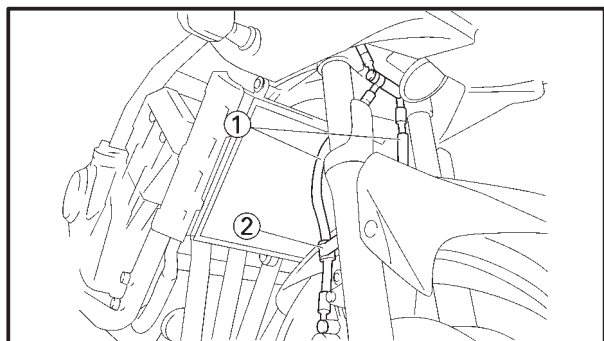
When refilling, be careful that water does not enter the reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

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 that the top of the reservoir is horizontal.



EAS00131

CHECKING THE BRAKE HOSES

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

1. Check:
brake hose ①
Cracks/damage/wear → Replace.
2. Check:
brake hose clamp ②
Loose connection → Tighten.
3. Hold the motorcycle upright and apply the brake.
4. Check:
brake hose ①
Activate the brake several times.
Brake fluid leakage → Replace the damaged hose.
Refer to "FRONT AND REAR BRAKES" in chapter 4.

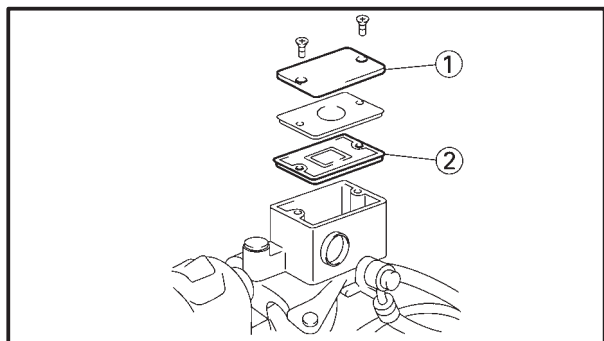
EAS00134

BLEEDING THE HYDRAULIC BRAKE SYSTEM

⚠ WARNING

Bleed the hydraulic brake system whenever:

**the system was disassembled,
a brake hose was loosened or removed,
the brake fluid level is very low,
brake operation is faulty.**



1. Remove:
reservoir cap ①
diaphragm ②

NOTE:

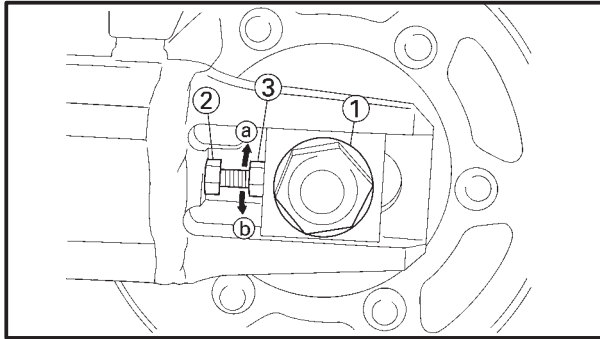
Be careful not to spill any brake fluid or allow the brake master cylinder reservoir or brake fluid reservoir to overflow.

When bleeding the hydraulic brake system, make sure that there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.

If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours. Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.

ADJUSTING THE DRIVE CHAIN SLACK

CHK
ADJ



4. Adjust:
drive chain slack



- Loosen the brake caliper bracket bolt.
- Loosen the wheel axle nut (1).
- Loosen both locknuts (2).
- Turn both adjusting nuts (3) in direction (a) or (b) until the specified drive chain slack is obtained.

Direction (a)	Drive chain is tightened.
Direction (b)	Drive chain is loosened.

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

- Tighten both locknuts to specification.



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

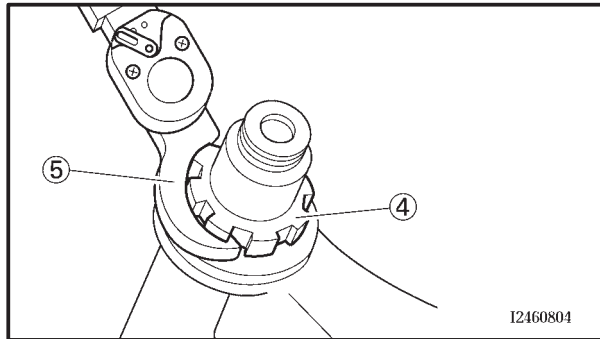
- Tighten the wheel axle nut to specification.



Wheel axle nut
150 Nm (15 m kg, 108 ft lb)

CHECKING AND ADJUSTING THE STEERING HEAD

CHK
ADJ



- b. Loosen the lower ring nut (4) and then tighten it to specification with a spanner wrench (5).

NOTE:

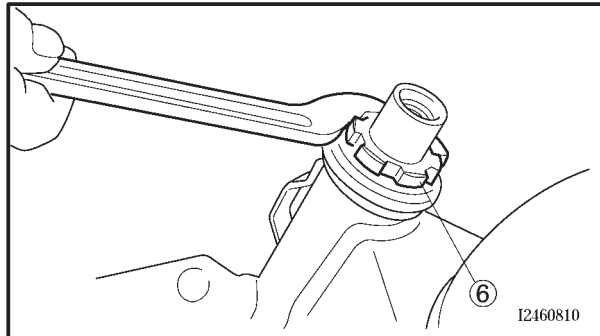
Set the torque wrench at a right angle to the spanner wrench.



Spanner wrench
YU-33975



Lower ring nut (initial tightening torque)
52 Nm (5.2 m kg, 38 ft lb)



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

⚠ WARNING

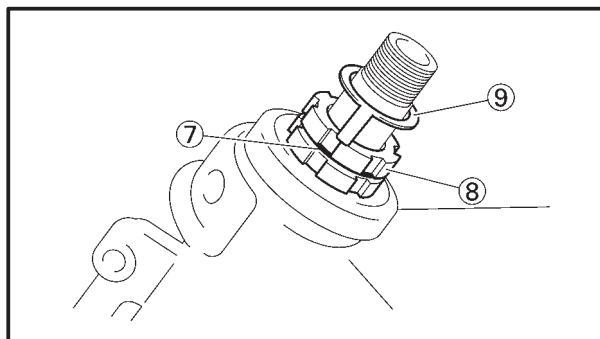
Do not overtighten the lower ring nut.



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

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

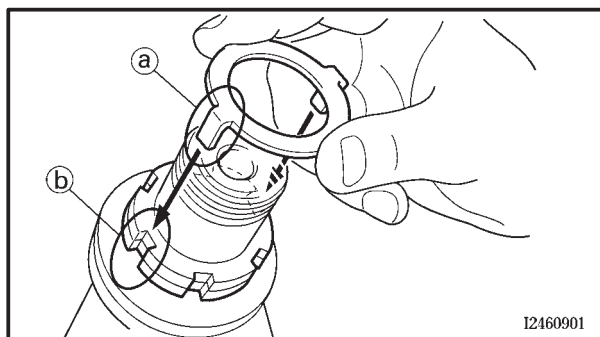
Refer to "STEERING HEAD AND HANDLEBAR" in chapter 4.



- e. Install the rubber washer (7).
f. Install the upper ring nut (8).
g. Finger tighten the upper ring nut (8), then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
h. Install the lock washer (9).

NOTE:

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



5. Install:
upper bracket
front cowling assembly



Steering stem nut
110 Nm (11 m kg, 80 ft lb)
Upper bracket pinch bolt
30 Nm (3.0 m kg, 22 ft lb)
Handlebar holder bolt
23 Nm (2.3 m kg, 17 ft lb)

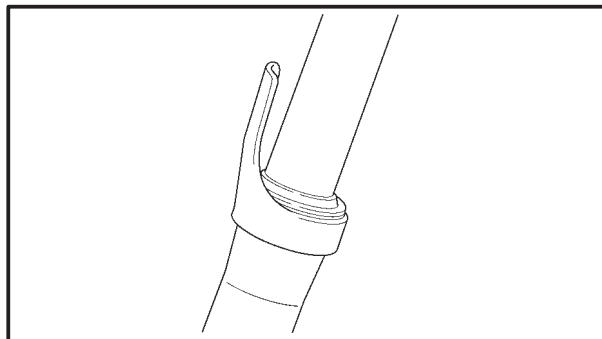
EAS00149

CHECKING THE FRONT FORK

1. Stand the motorcycle on a level surface.

WARNING

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



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

EAS00155

ADJUSTING THE FRONT FORK LEGS

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

WARNING

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

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

Spring preload

CAUTION:

Grooves are provided to indicate the adjustment position.

Never go beyond the maximum or minimum adjustment positions.

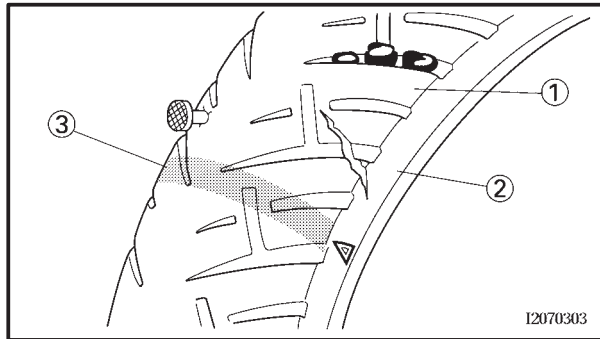


Basic weight (with oil and a full fuel tank)	231 kg (509 lb) 232 kg (512 lb) (california)	
Maximum load*	189 kg (417 lb) 188 kg (415 lb) (california)	
Cold tire pressure	Front tire	Rear tire
Up to 90 kg load*	250 kPa (2.5 kgf/cm ² , 36 psi)	270 kPa (2.7 kgf/cm ² , 39 psi)
90 kg ~ maximum load*	250 kPa (2.5 kgf/cm ² , 36 psi)	290 kPa (2.9 kgf/cm ² , 42 psi)
High speed riding	250 kPa (2.5 kgf/cm ² , 36 psi)	290 kPa (2.9 kgf/cm ² , 42 psi)

*: total of cargo, rider, passenger and accessories

⚠ WARNING

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



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



Minimum tire tread depth
1.0 mm (0.04 in)

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

⚠ WARNING

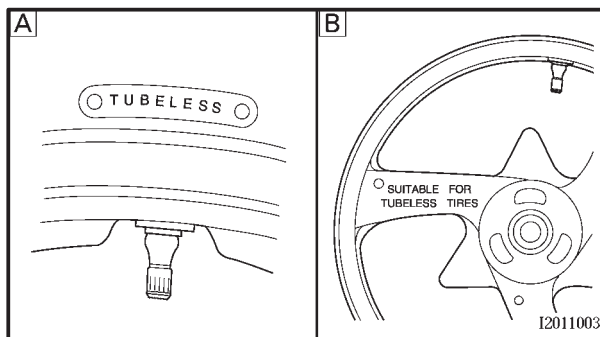
Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.

When using a tube tire, be sure to install the correct tube.

Always replace a new tube tire and a new tube as a set.

To avoid pinching the tube, make sure that 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 motorcycle.

Front tire

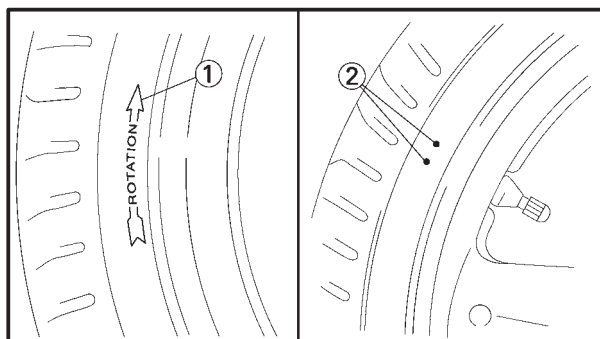
Manufacturer	Type	Size
METZELER	Tubeless	120/70 ZR17 (58 W)
BRIDGESTONE	Tubeless	120/70 ZR17 (58 W)

Rear tire

Manufacturer	Type	Size
METZELER	Tubeless	180/55 ZR17 (73 W)
BRIDGESTONE	Tubeless	180/55 ZR17 (73 W)

⚠ WARNING

New tires have a relatively low grip on the road surface until they have been slightly worn. Therefore, approximately 100 km (62 mi) should be traveled at normal speed before any highspeed riding is done.



NOTE:

For tires with a direction of rotation mark ①:
Install the tire with the mark pointing in the direction of wheel rotation.
Align the mark ② with the valve installation point.



EAS00170

CHECKING AND LUBRICATING THE CABLES

The following procedure applies to all of the cable sheaths and cables.

WARNING

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

1. Check:
cable sheath
Damage → Replace.
2. Check:
cable operation
Unsmooth operation → 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 lubing device.

EAS00171

LUBRICATING THE LEVERS AND PEDALS

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



Recommended lubricant
lithium soap base grease

EAS00172

LUBRICATING THE SIDESTAND

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



Recommended lubricant
lithium soap base grease

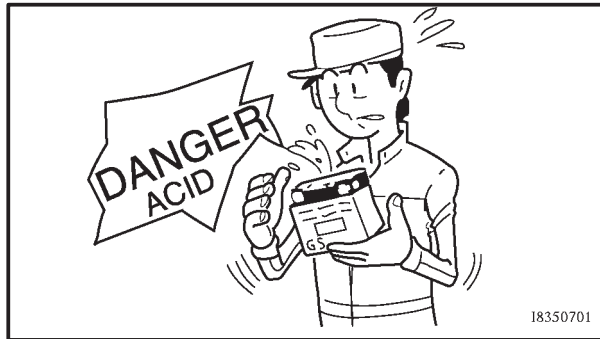
EAS00174

LUBRICATING THE REAR SUSPENSION

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



Recommended lubricant
lithium soap base grease



EAS00178

ELECTRICAL SYSTEM**CHECKING AND CHARGING THE BATTERY****⚠ WARNING**

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

Wear protective eye gear when handling or working near batteries.

Charge batteries in a well-ventilated area. Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).

DO NOT SMOKE when charging or handling batteries.

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

First aid in case of bodily contact:

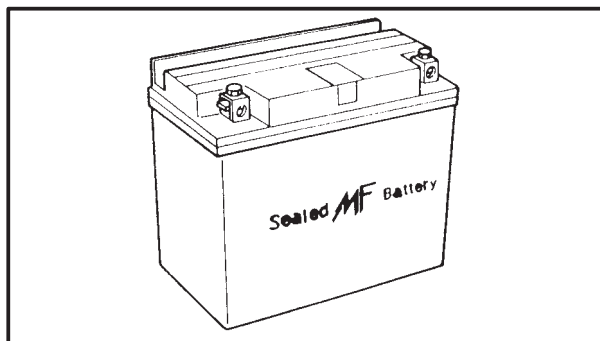
External

SKIN – Wash with water.

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

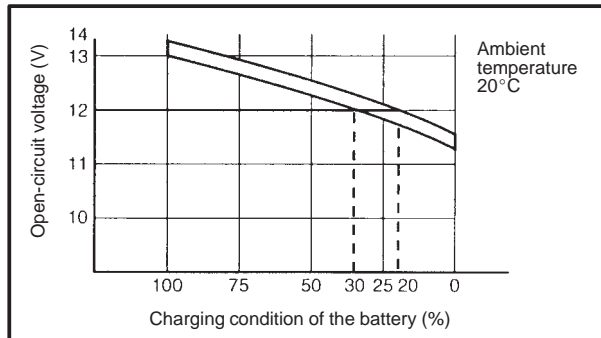
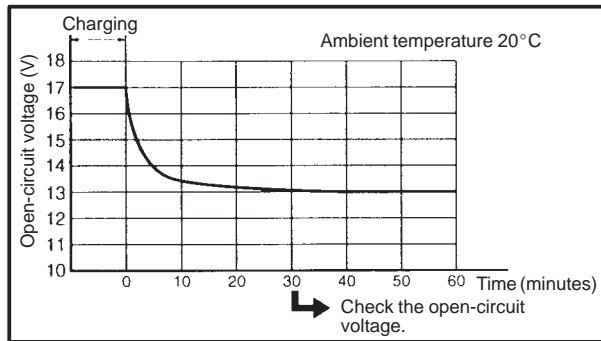
Internal

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

**CAUTION:**

This is a sealed battery. Never remove the sealing caps because the balance between cells will not be maintained and battery performance will deteriorate.

Charging time, charging amperage and charging voltage for a MF battery are different from those of conventional batteries. The MF battery should be charged as explained in the charging method illustrations. If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.



5. Charge:

- battery
(refer to the appropriate charging method illustration)

⚠ WARNING

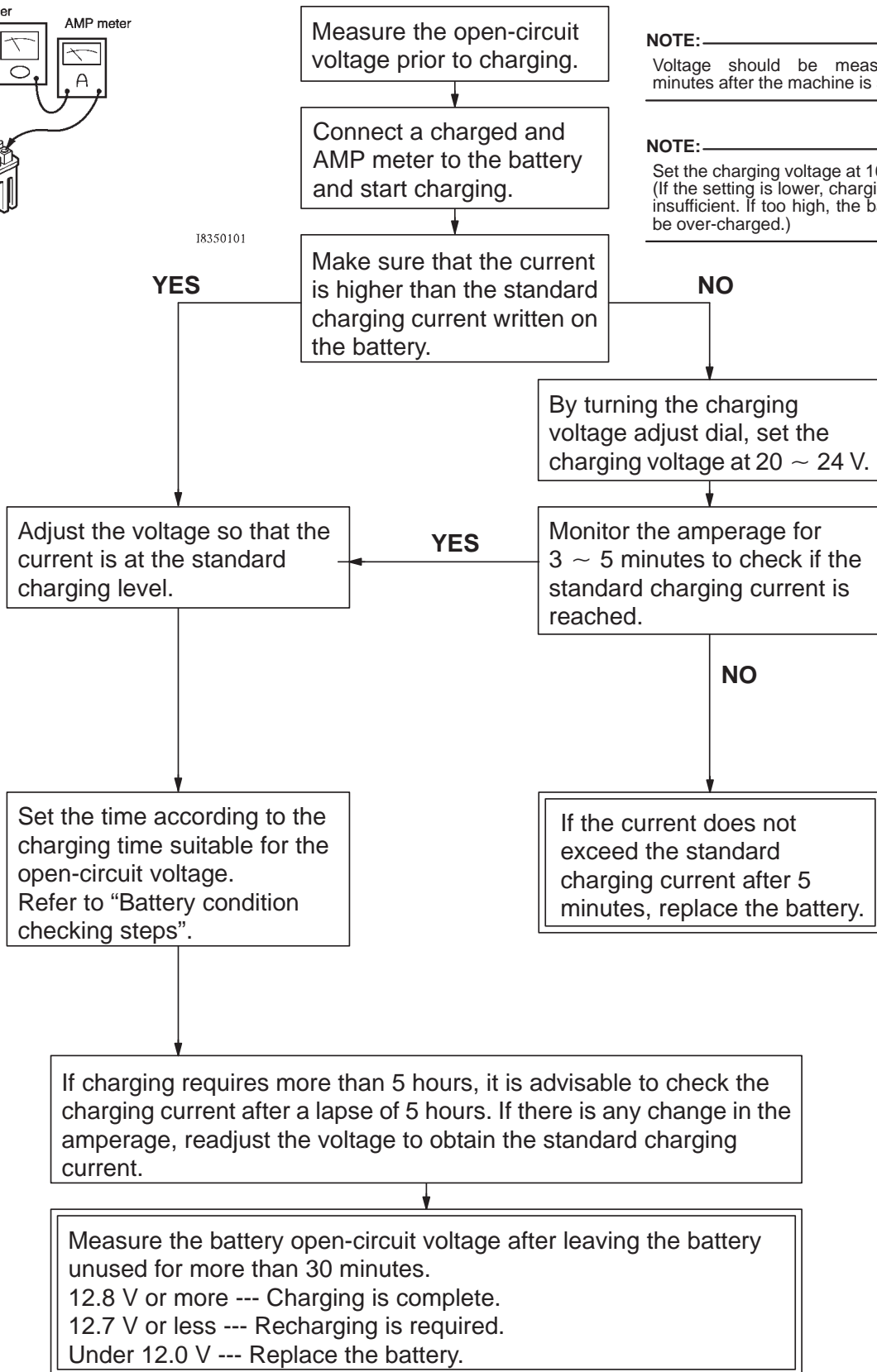
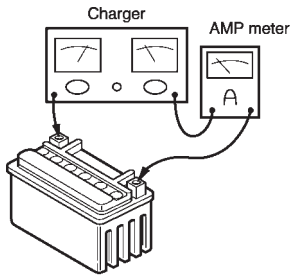
Do not quick charge a battery.

CAUTION:

- Make sure that the battery vent is free of obstructions.
- Never remove the MF battery sealing caps.
- 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 motorcycle. (If charging has to be done with the battery mounted on the motorcycle, 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 that the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
- If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!
- As shown in the following illustration, the open-circuit voltage of a MF battery stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.

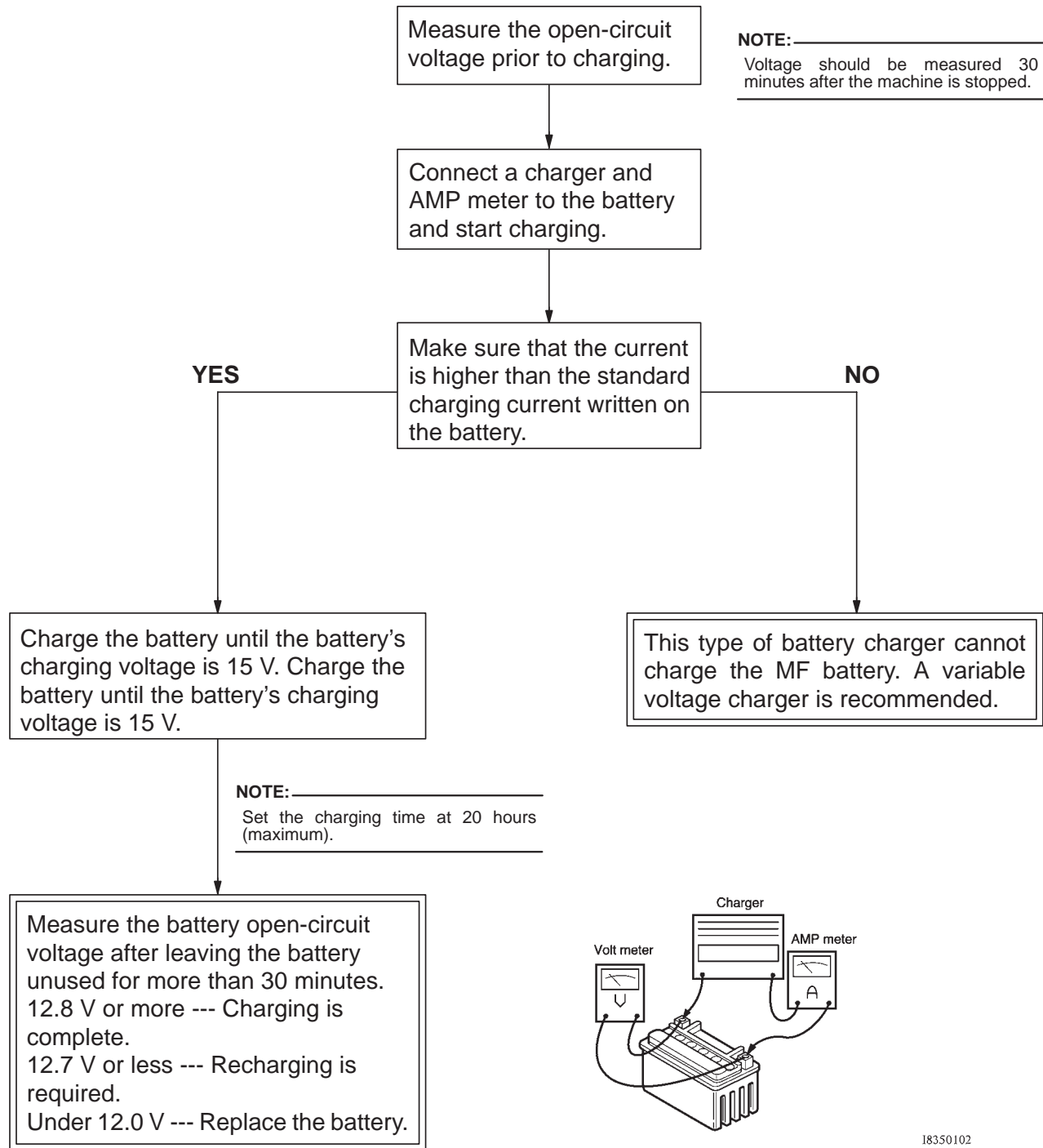


Charging method using a variable voltage charger





Charging method using a constant voltage charger



18350102



Pocket tester measurement YU-03112-C

- b. If the pocket tester indicates “∞”, replace the fuse.

[illegible]

3. Replace:
blown fuse

[illegible]

- Turn off the ignition.
- Install a new fuse of the correct amperage rating.
- Turn on the switches to verify if the electrical circuit is operational.
- If the fuse immediately blows again, check the electrical circuit.

[illegible]

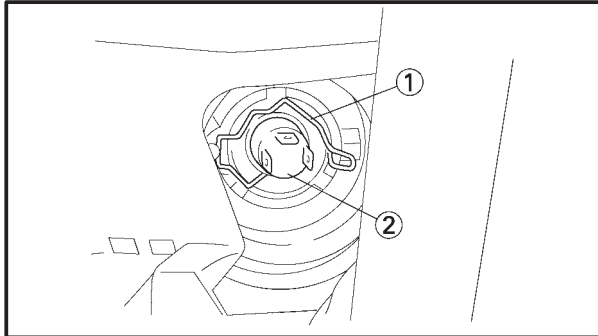
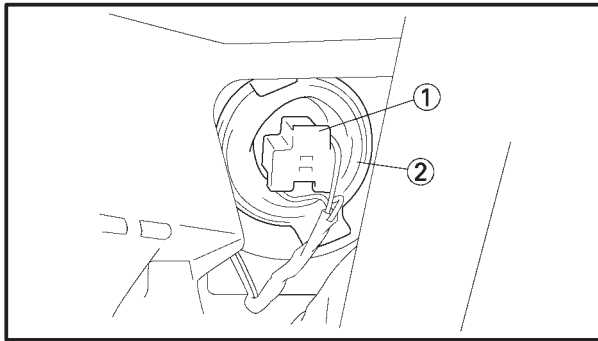
Fuses	Amperage rating	Quantity
Main fuse	30A	1
Headlight fuse	20A	1
Signaling system fuse	20A	1
Ignition fuse	20A	1
Turn signal relay fuse	10 A	1
Digital clock fuse	10A	1
Radiator fan fuse	10A	1
Reserve fuse	30A	1
Reserve fuse	20 A	1
Reserve fuse	10 A	1



⚠ WARNING

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

- #### 4. Install: seat



EAS00183

REPLACING THE HEADLIGHT BULBS

The following procedure applies to both of the headlight bulbs.

1. Disconnect:
headlight coupler ①
bulb cover ②

2. Remove:
headlight bulb holder ①

3. Remove:
headlight bulb ②

⚠ WARNING

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

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

CAUTION:

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

5. Install:
headlight bulb holder
6. Install:
bulb cover
7. Connect:
headlight coupler



CHAPTER 4

CHASSIS

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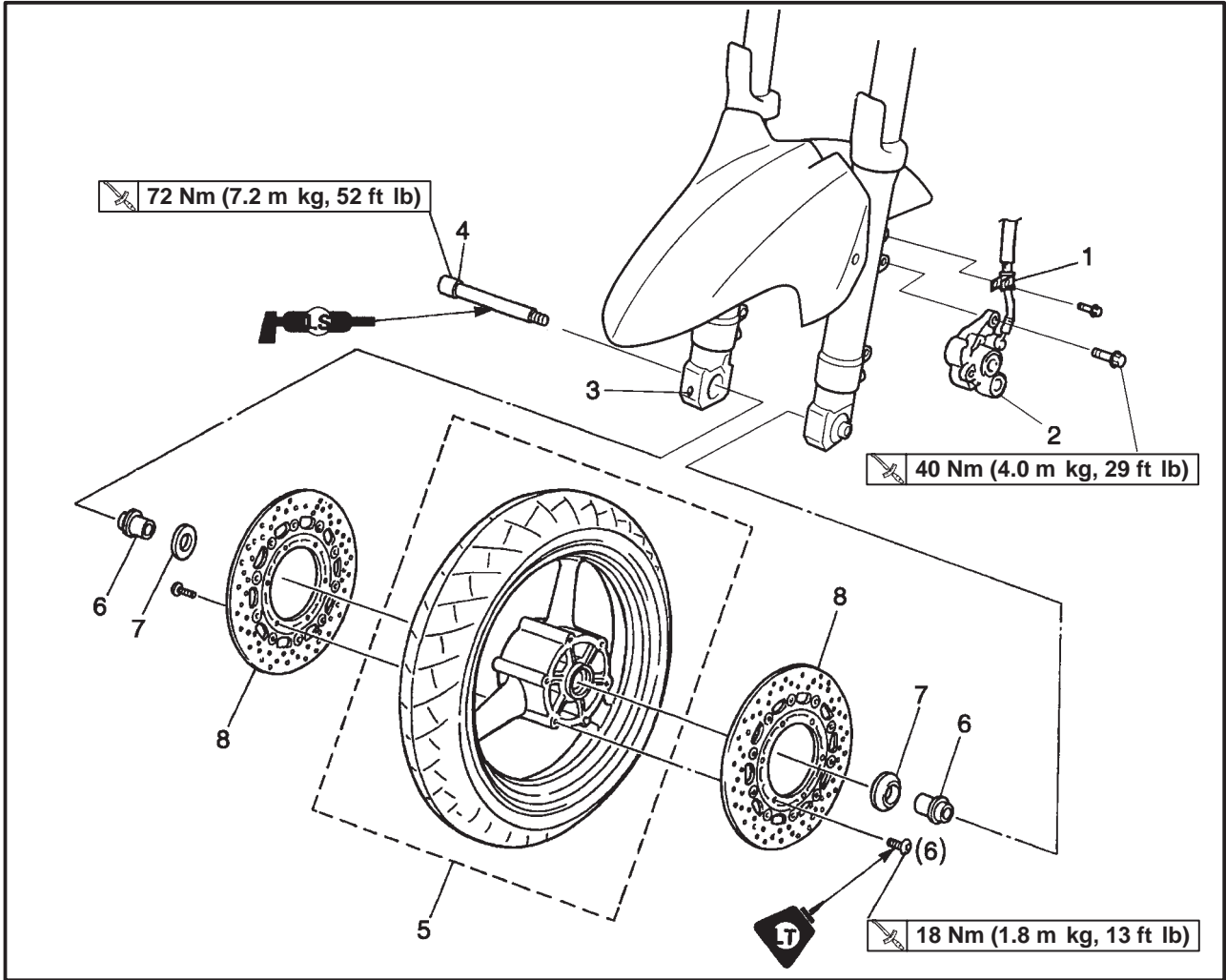


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EAS00514

CHASSIS

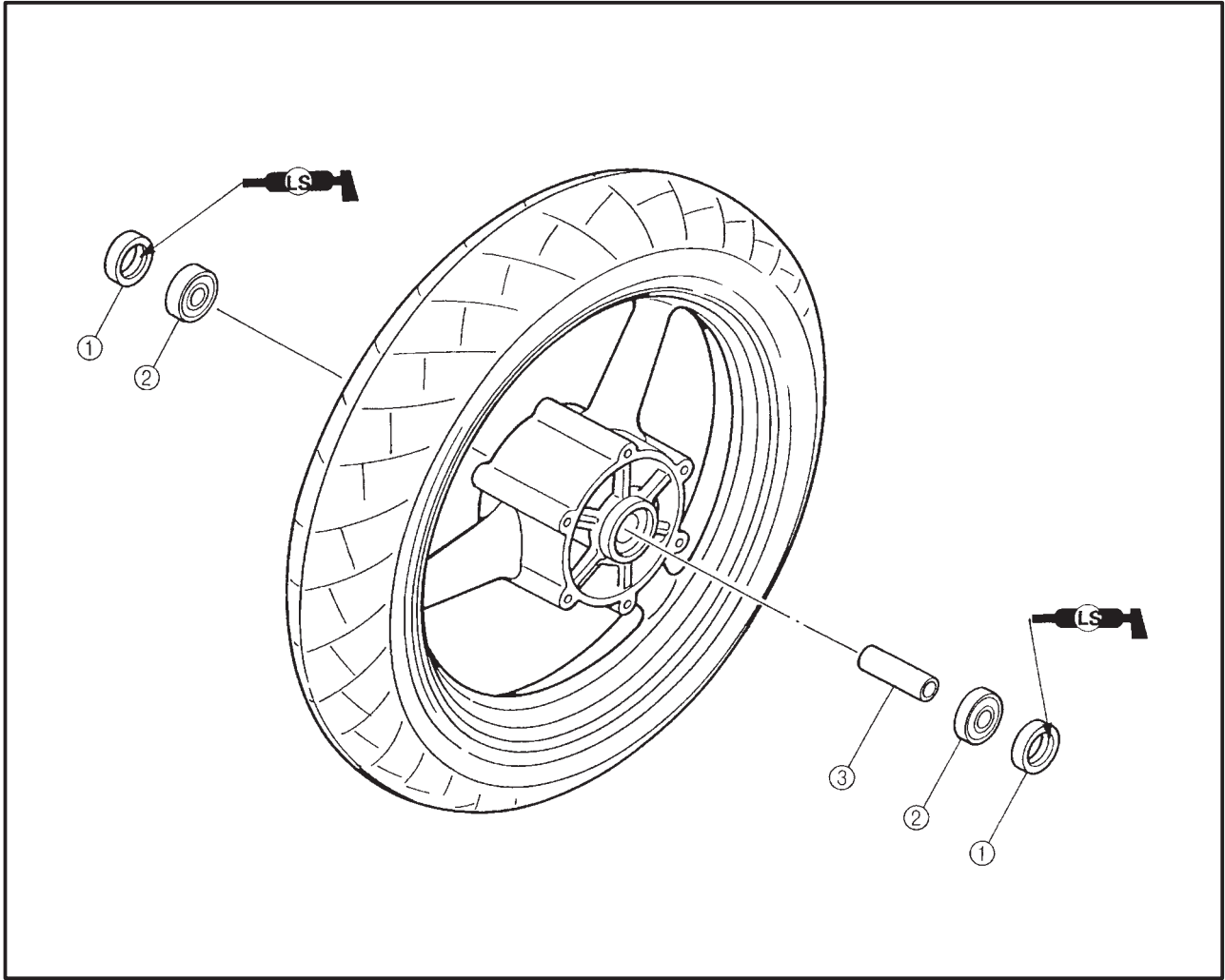
FRONT WHEEL AND BRAKE DISCS



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

EAS00518

FRONT WHEEL



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



EAS00521

REMOVING THE FRONT WHEEL

1. Stand the motorcycle on a level surface.

WARNING

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

NOTE:

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

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

NOTE:

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

3. Loosen:
 - wheel axle pinch bolt
 - front wheel axle

4. Elevate:
 - front wheel

NOTE:

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

5. Remove:
 - front wheel axle
6. Remove:
 - front wheel



EAS00539

ASSEMBLING THE FRONT WHEEL

1. Install:
 - wheel bearings **New**
 - oil seals **New**

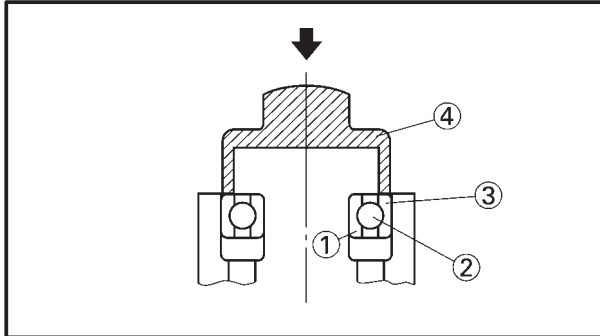
- a. Install the new wheel bearings and oil seals in the reverse order of disassembly.

CAUTION:

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

NOTE:

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



EAS00544

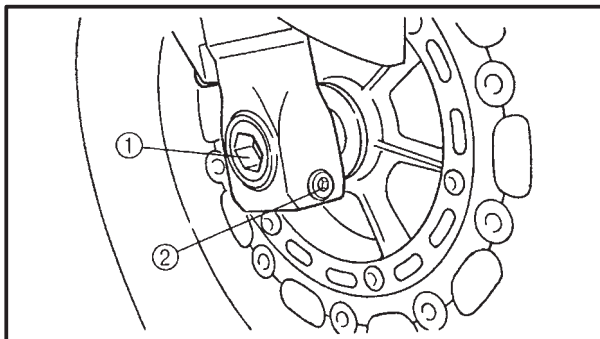
INSTALLING THE FRONT WHEEL

The following procedure applies to both brake discs.

1. Lubricate:
 - wheel axle
 - oil seal lips



Recommended lubricant
Lithium soap base grease



2. Tighten:
 - wheel axle ① **72 Nm (7.2 m kg, 52 ft lb)**
 - wheel axle pinch bolt ② **23 Nm (2.3 m kg, 17 ft lb)**

CAUTION:

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

3. Install:
 - brake caliper **40 Nm (4.0 m kg, 29 ft lb)**

WARNING

Make sure that the brake hose is routed properly.



EAS00549

ADJUSTING THE FRONT WHEEL STATIC BALANCE

NOTE:

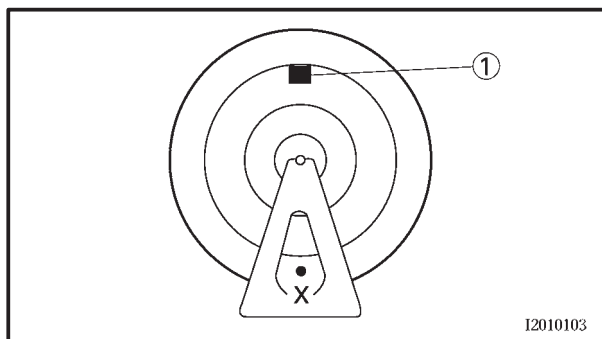
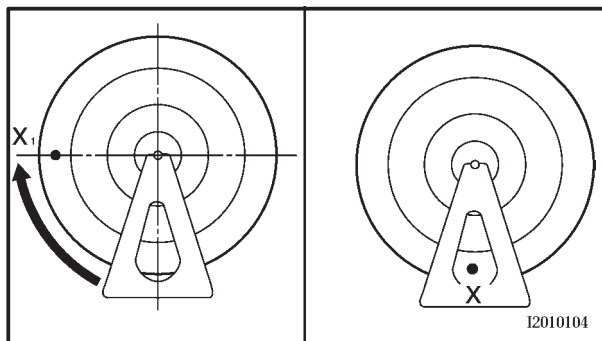
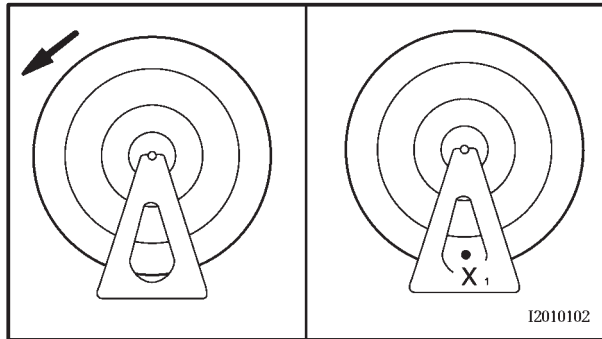
- After replacing the tire, wheel or both, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake discs installed.

1. Remove:

- balancing weight(-s)

NOTE:

Place the front wheel on a suitable balancing stand.



2. Find:

- front wheel's heavy spot



- Spin the front wheel.
- When the front wheel stops, put an "X₁" mark at the bottom of the wheel.
- Turn the front wheel 90° so that the "X₁" mark is positioned as shown.
- Release the front wheel.
- When the wheel stops, put an "X₂" mark at the bottom of the wheel.
- Repeat steps (b) through (d) several times until all the marks come to rest at the same spot.
- The spot where all the marks come to rest is the front wheel's heavy spot "X".



3. Adjust:

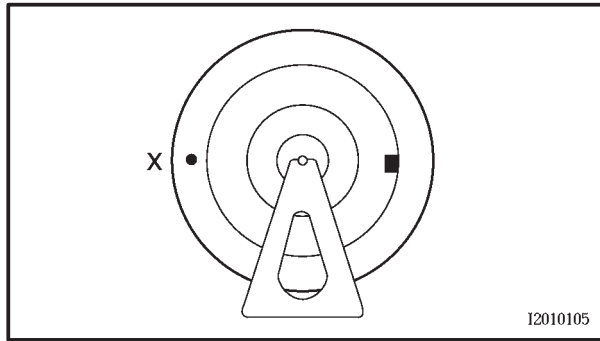
- front wheel static balance



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

NOTE:

Start with the lightest weight.

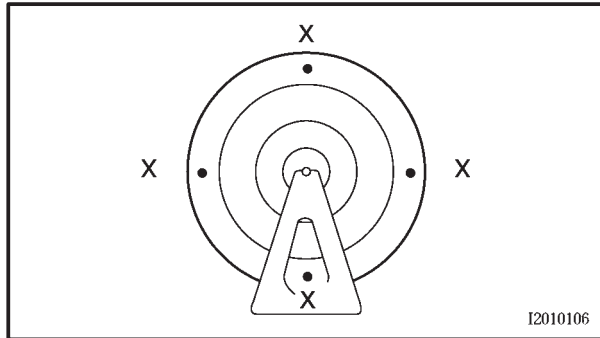


- b. Turn the front wheel 90° so that the heavy spot is positioned as shown.
- c. If the heavy spot does not stay in that position, install a heavier weight.
- d. Repeat steps (b) and (c) until the front wheel is balanced.

4. Check:
 - front wheel static balance



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

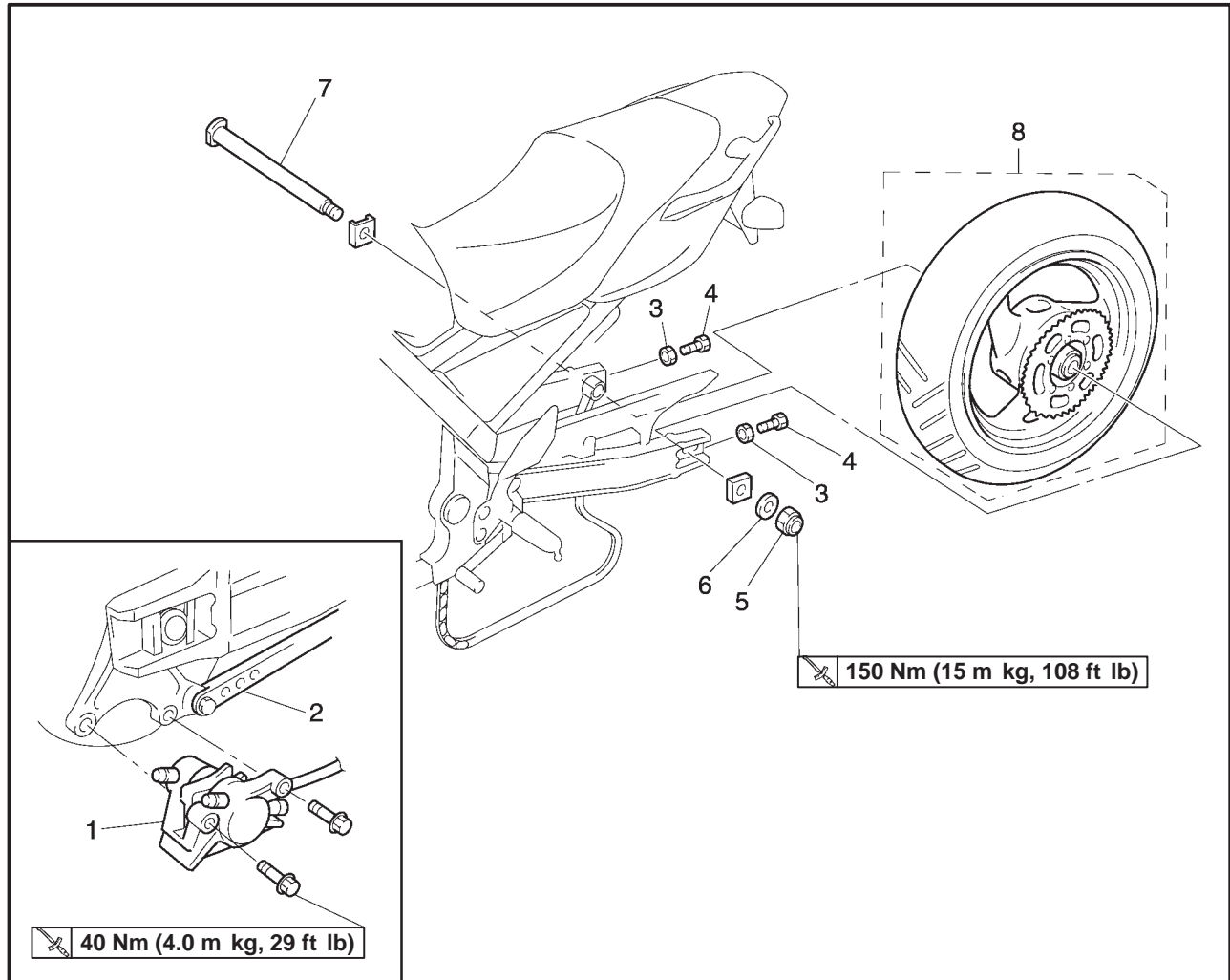




EAS00551

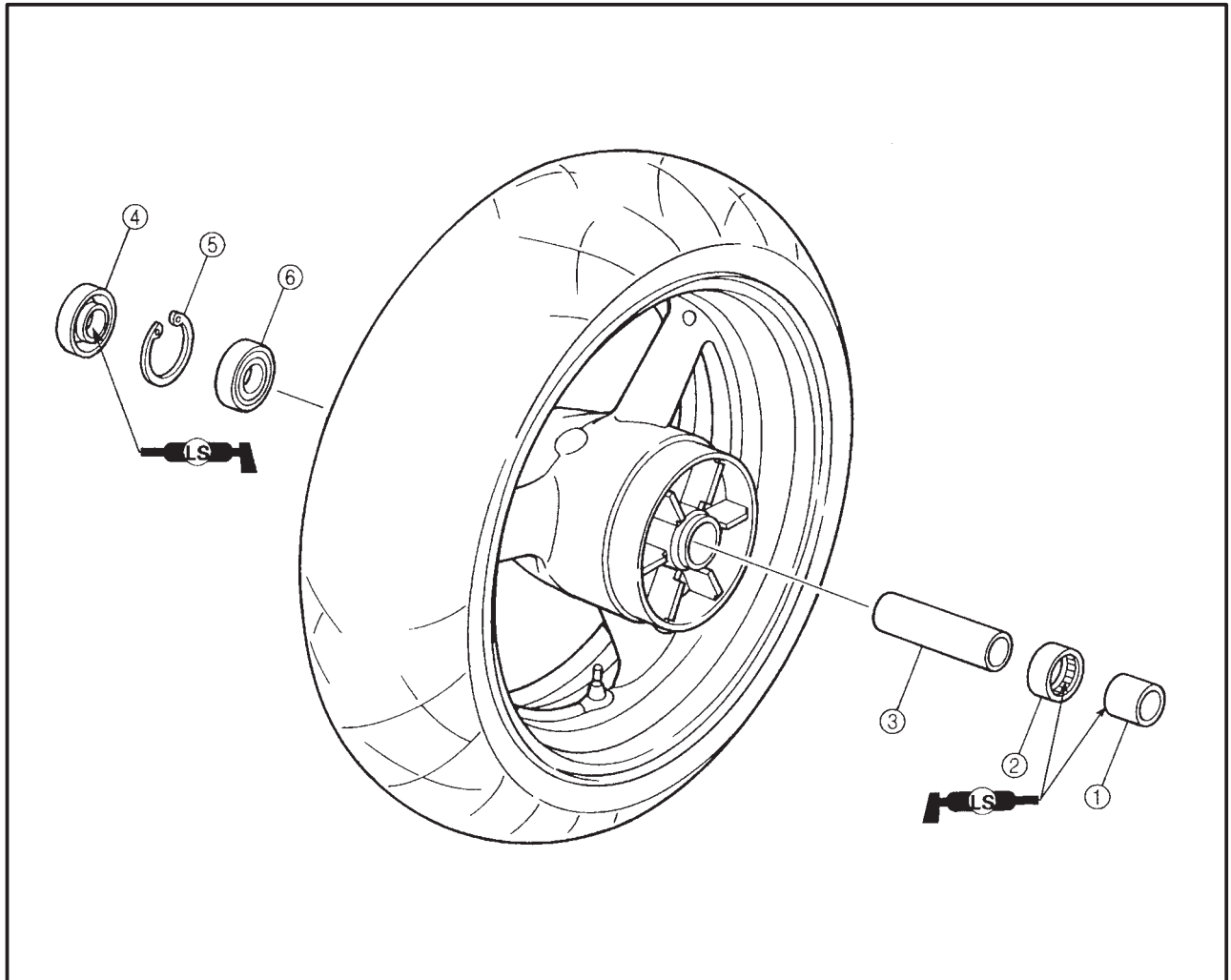
REAR WHEEL AND BRAKE DISC

REAR WHEEL

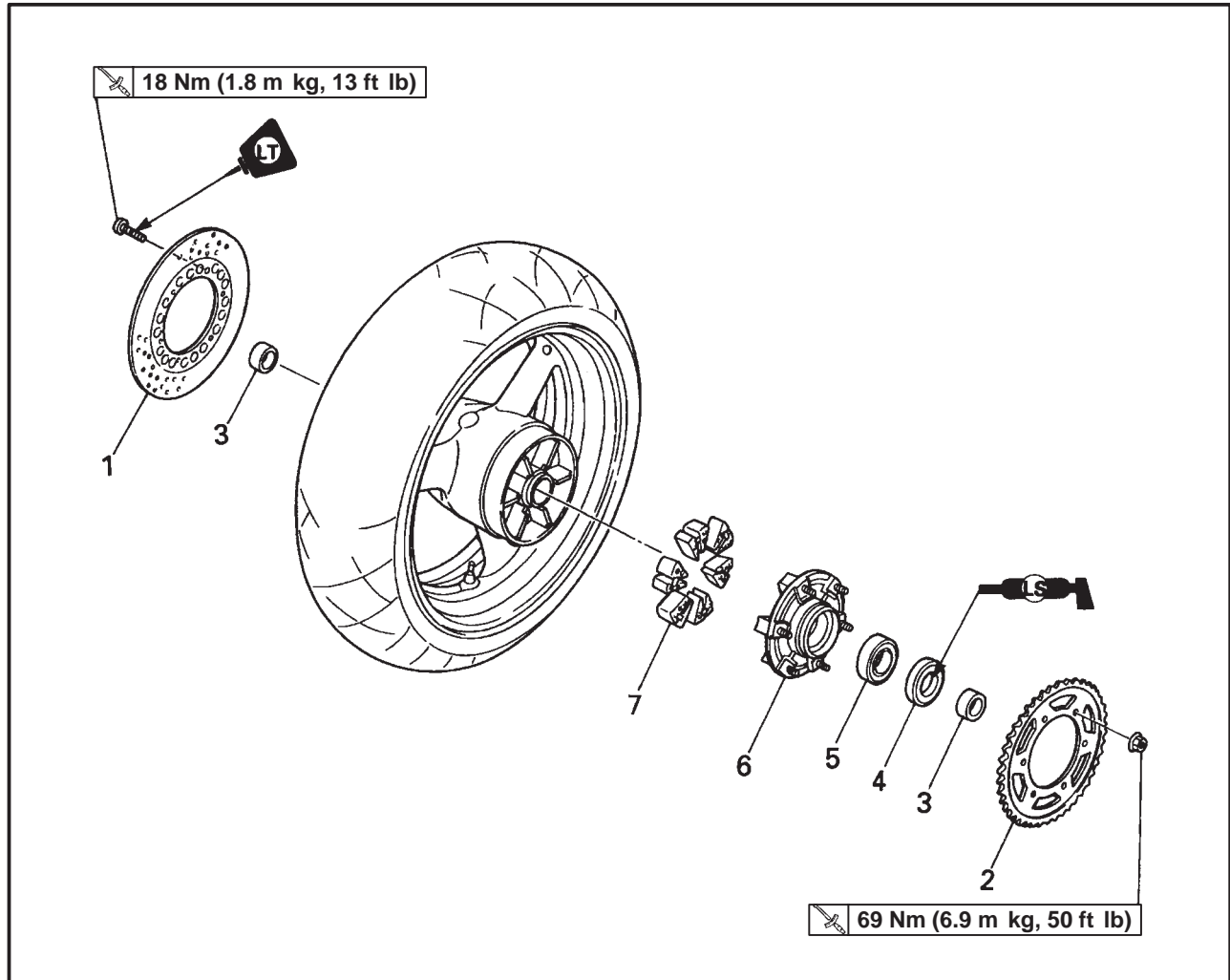


Order	Job/Part	Q'ty	Remarks
	Removing the rear wheel		Remove the parts in the order listed. NOTE: _____ Place the motorcycle on a suitable stand so that the rear wheel is elevated.
1	Brake caliper	1	
2	Brake torque rod	1	Loosen.
3	Lock nut	2	
4	Adjusting nut	2	Loosen.
5	Wheel axle nut	1	
6	Washer	1	
7	Wheel axle	1	
8	Rear wheel assembly	1	For installation, reverse the removal procedure.

EAS00560



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



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



EAS00561

REMOVING THE REAR WHEEL

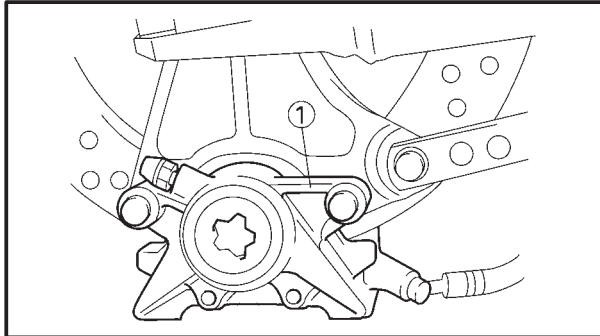
1. Stand the motorcycle on a level surface.

WARNING

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

NOTE:

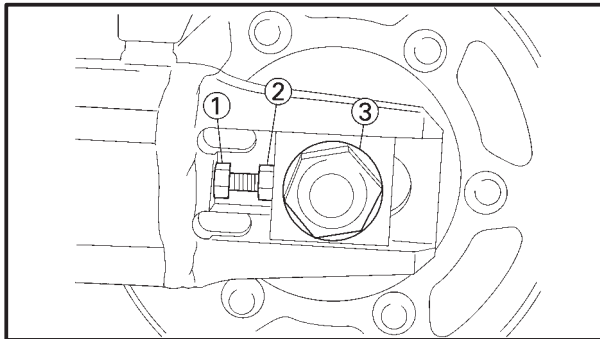
Place the motorcycle on a suitable stand so that the rear wheel is elevated.



2. Remove:
brake caliper ①

NOTE:

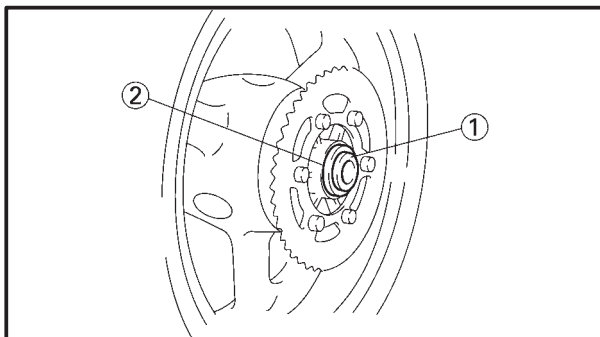
Do not depress the brake pedal when removing the brake caliper.



3. Loosen:
brake torque rod
4. Loosen:
locknut ①
adjusting nut ②
5. Remove:
wheel axle nut ③
wheel axle
rear wheel

NOTE:

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



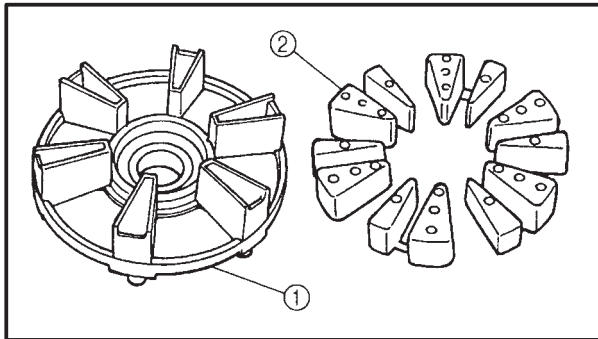
6. Remove:
left collar ①
rear wheel drive hub ②
rear wheel drive hub damper
right collar



EAS00565

CHECKING THE REAR WHEEL

1. Check:
 - wheel axle
 - rear wheel
 - wheel bearings
 - oil seals
 Refer to "FRONT WHEEL".
2. Check:
 - tire
 - rear wheel
 Damage/wear → Replace.
 Refer to "CHECKING THE TIRES" in chapter 3.
3. Measure:
 - rear wheel radial runout
 - rear wheel lateral runout
 Refer to "FRONT WHEEL".



EAS00567

CHECKING THE REAR WHEEL DRIVE HUB

1. Check:
 - rear wheel drive hub ①
 Cracks/damage → Replace.
 - rear wheel drive hub dampers ②
 Damage/wear → Replace.

EAS00568

CHECKING AND REPLACING THE REAR WHEEL SPROCKET

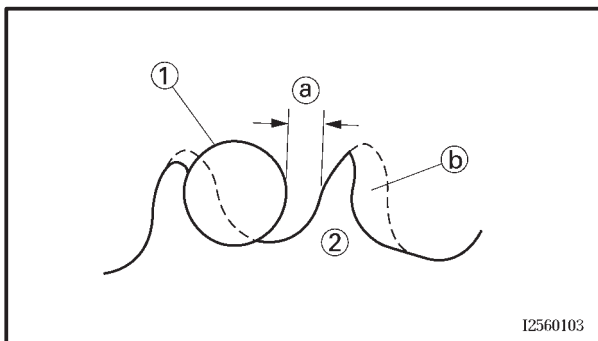
1. Check:
 - rear wheel sprocket
 More than 1/4 tooth ① wear → Replace the rear wheel sprocket, the drive sprocket and the drive chain as a set.
 Bent teeth → Replace the rear wheel sprocket, the drive sprocket and the drive chain as a set.

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

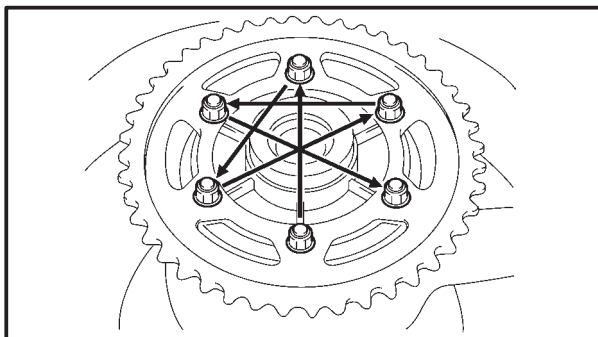
2. Replace:
 - rear wheel sprocket



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



I2560103



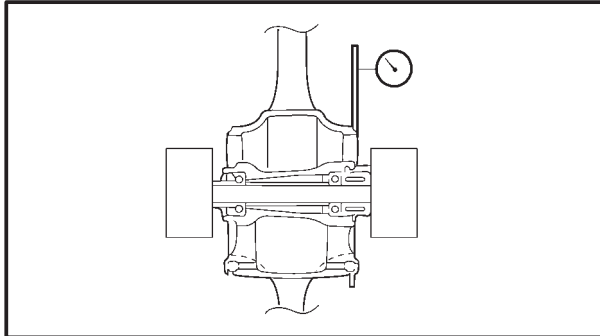


Rear wheel sprocket self-locking nut

69 Nm (6.9 m kg, 50 ft lb)

NOTE:

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



EAS00531

CHECKING THE BRAKE DISC

1. Check:
brake disc
Damage/galling → Replace.
2. Measure:
brake disc deflection
Out of specification → Correct the brake disc deflection or replace the brake disc.



Brake disc deflection limit (maximum)

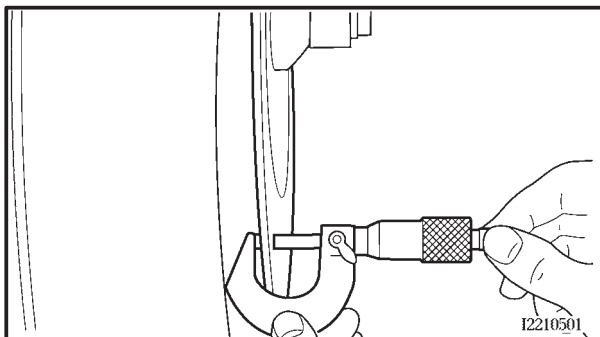
0.1 mm (0.004 in)

NOTE:

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



- a. Before measuring the front brake disc deflection, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- b. Remove the brake caliper.
- c. Hold the dial gauge at a right angle against the brake disc surface.
- d. Measure the deflection 2 ~ 3 mm below the edge of the brake disc.



3. Measure:

brake disc thickness

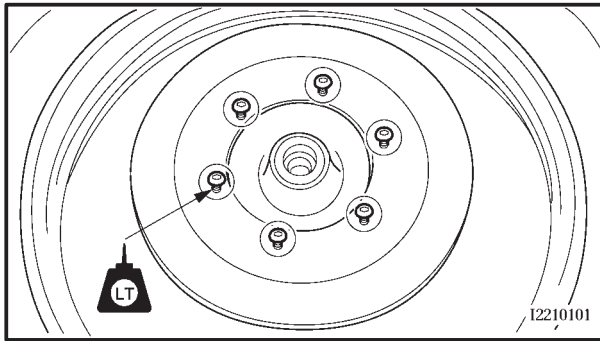
Measure the brake disc thickness at a few different locations.

Out of specification → Replace.



Brake disc thickness limit (minimum)

4.5 mm (0.18 in)



4. Adjust:
 - brake disc deflection



- a. Remove the brake disc.
- b. Rotate the brake disc by one bolt hole.
- c. Install the brake disc.

NOTE: _____

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



Brake disc bolt
18 Nm (1.8 m•kg, 13 ft•lb)
LOCTITE®

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





EAS00572

INSTALLING THE REAR WHEEL

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



Recommended lubricant
Lithium soap base grease

2. Tighten:
 - wheel axle nut  **150 Nm (15 m•kg, 108 ft•lb)**
 - brake caliper bolts  **40 Nm (4.0 m•kg, 29 ft•lb)**

EAS00575

ADJUSTING THE REAR WHEEL STATIC BALANCE

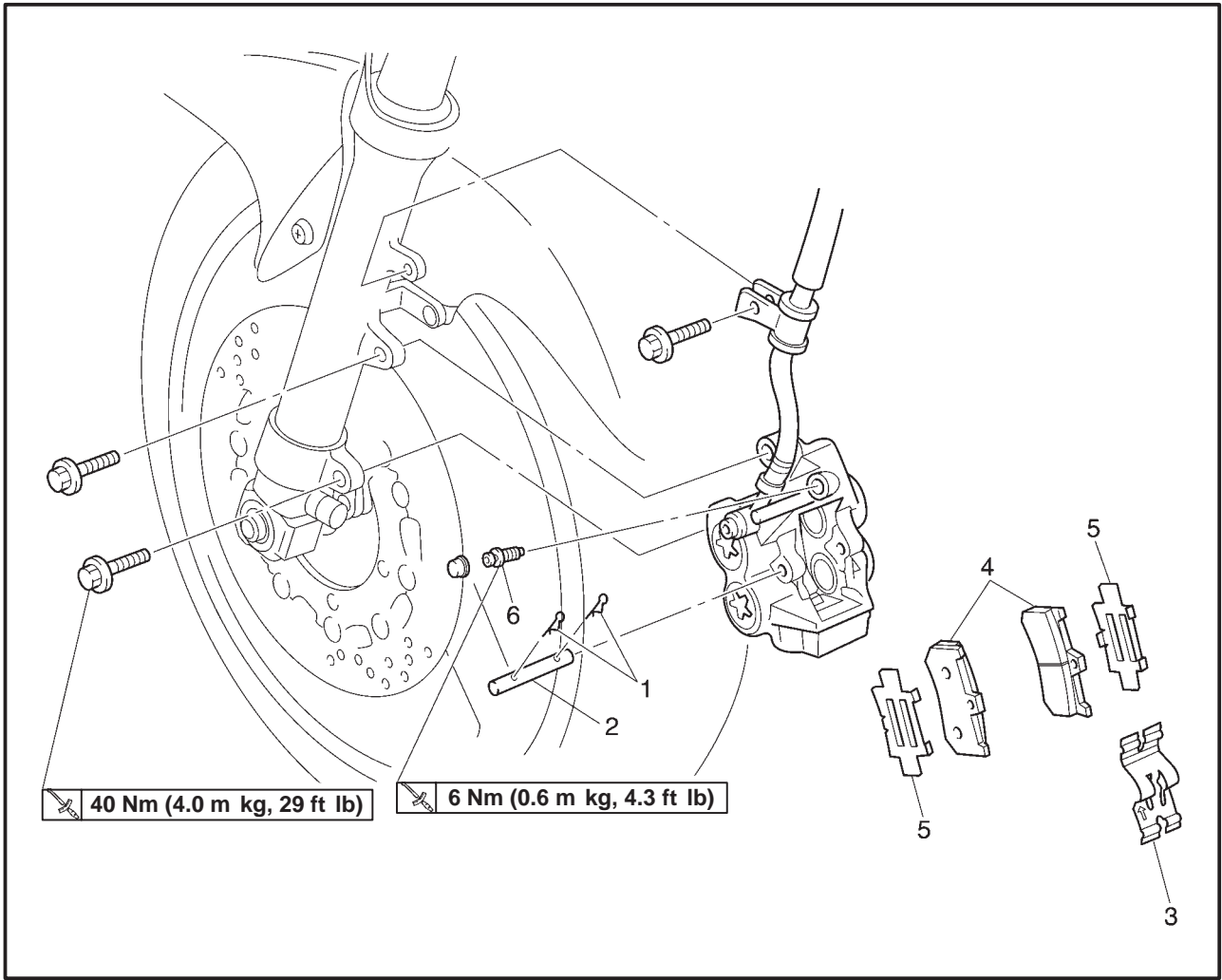
NOTE: _____

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

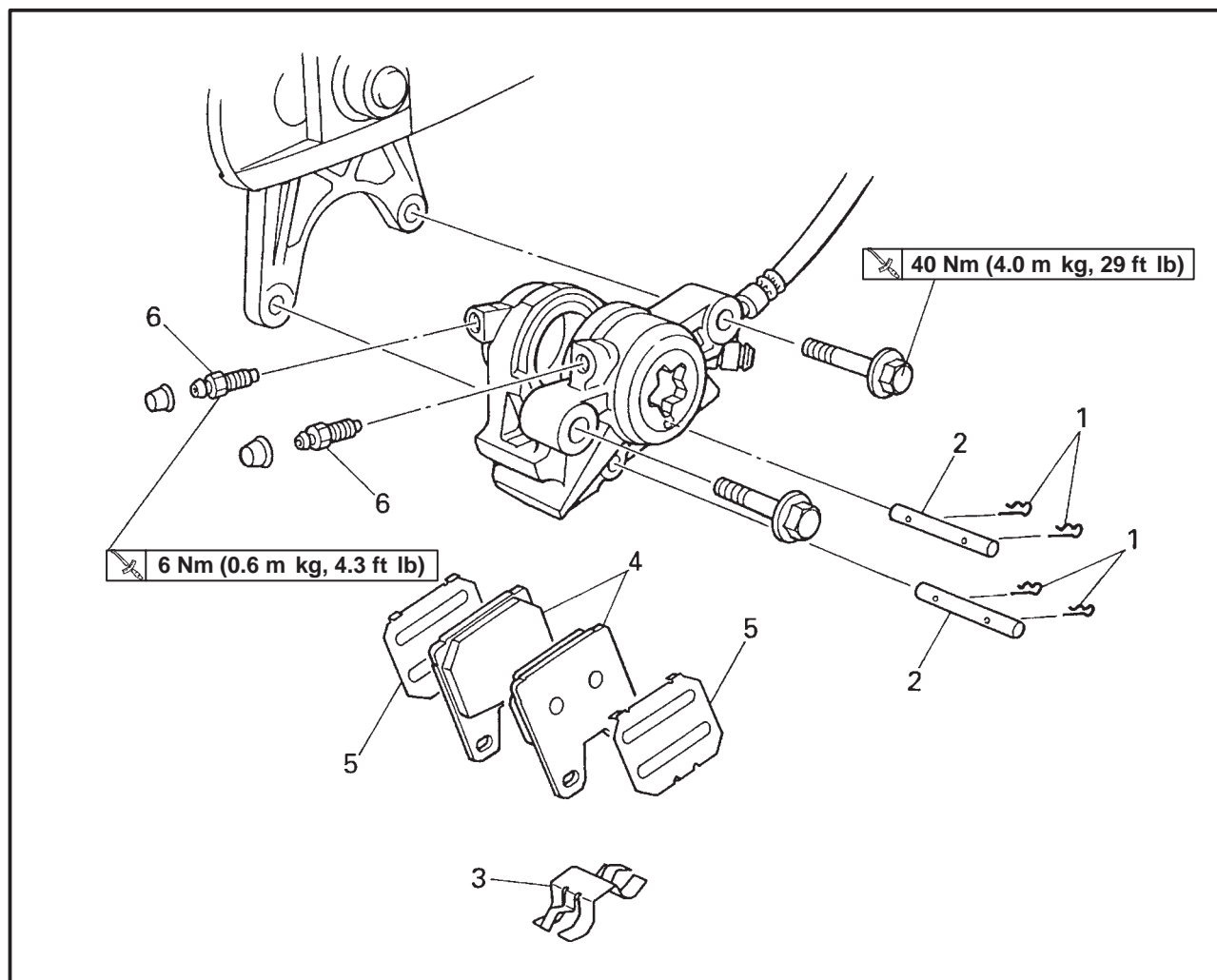
1. Adjust:
 - rear wheel static balance
 Refer to “FRONT WHEEL”.

EAS00577

FRONT AND REAR BRAKES
FRONT BRAKE PADS



Order	Job/Part	Q'ty	Remarks
	Removing the front brake pads		
1	Brake pad clip	2	Remove the parts in the order listed.
2	Brake pad pin	1	
3	Brake pad spring	1	
4	brake pad	2	
5	Brake pad shim	2	
6	Bleed scrw	1	For installation, reverse the removal procedure.



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake pads		
1	Brake pad clip	4	Remove the parts in the order listed.
2	Brake pad pin	2	
3	Brake pad spring	1	
4	Brake pad	2	
5	Brake pad shim	2	
6	Bleed screw	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 fluid immediately.

Avoid brake fluid coming into contact with the eyes as it can cause serious injury.

First aid for brake fluid entering the eyes:

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

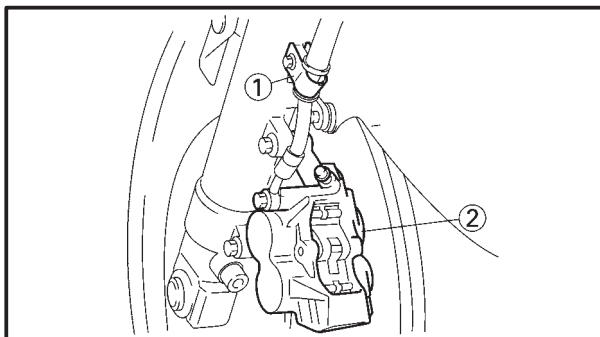
EAS00582

REPLACING THE FRONT BRAKE PADS

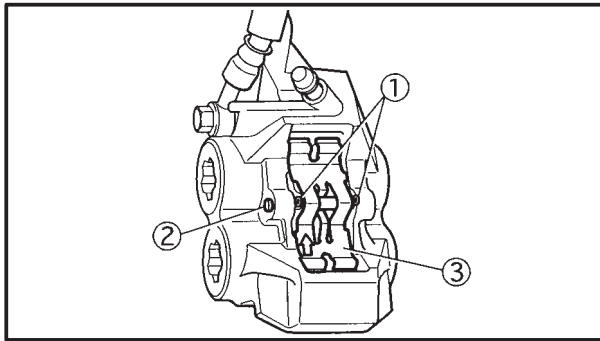
The following procedure applies to both brake calipers.

NOTE:

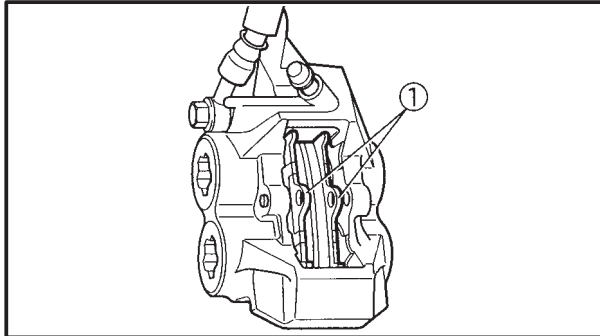
When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.



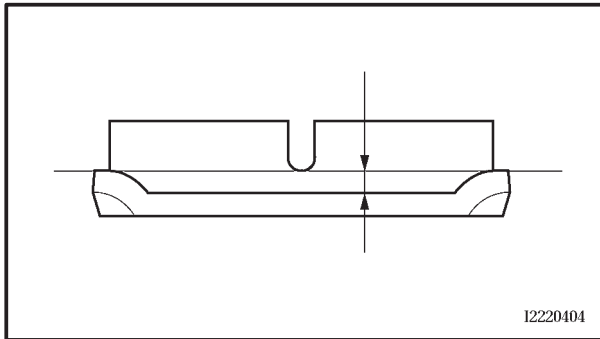
1. Remove:
 - brake hose holder ①
 - brake caliper ②



2. Remove:
 - brake pad clips ①
 - brake pad pins ②
 - brake pad spring ③



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



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

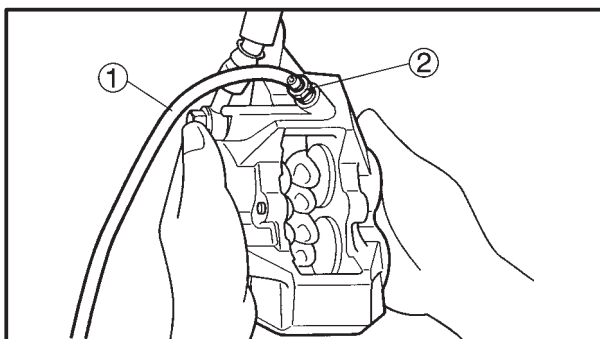


Brake pad wear limit
0.5 mm (0.02 in)

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

NOTE:

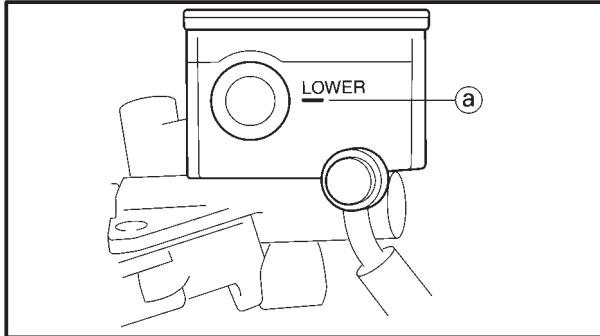
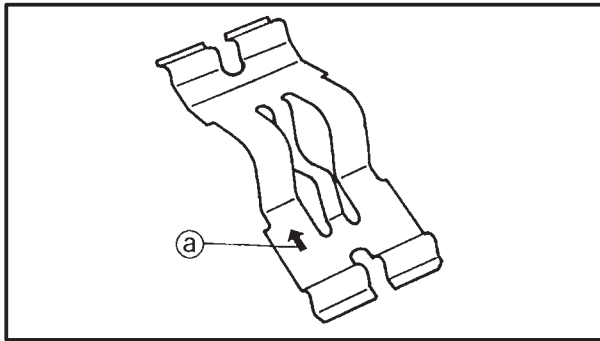
Always install new brake pads, brake pad shims, and a brake pad spring as a set.



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



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




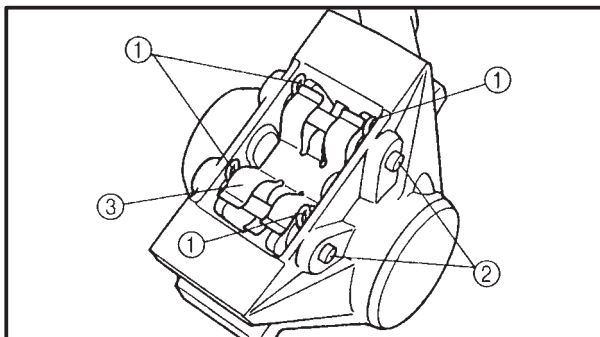
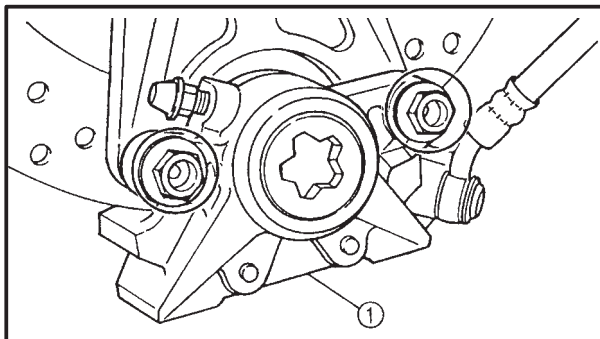
- d. Install new brake pad shims onto the new brake pads.
- e. Install new brake pads and a new brake pad spring.

NOTE:

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



6. Install:
 - brake pad pins
 - brake pad clips
 - brake caliper  **40 Nm (4.0 m kg, 29 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.



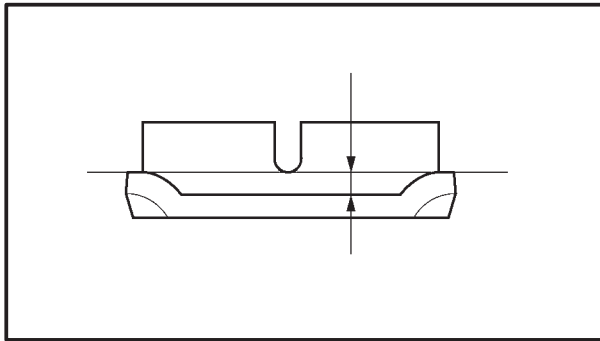
EAS00583

REPLACING THE REAR BRAKE PADS

NOTE:

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

1. Remove:
 - brake caliper ①
2. Remove:
 - brake pad clips ①
 - brake pad pins ②
 - brake pad spring ③
 - brake pads
 - (along with the brake pad shims)



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

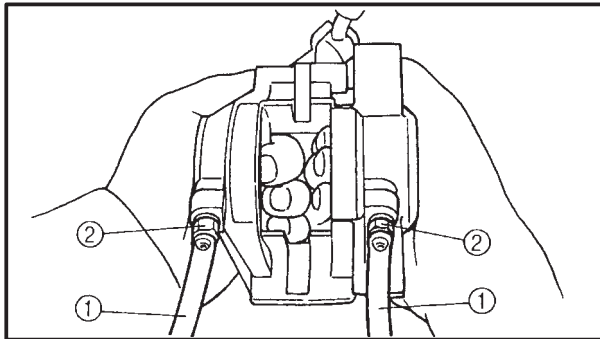


Brake pad wear limit
0.5 mm (0.02 in)

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

NOTE:

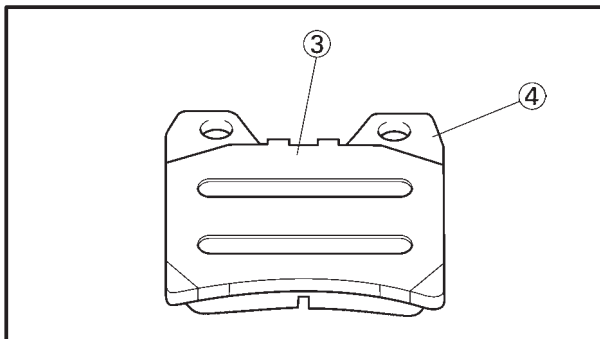
Always install new brake pads, brake pad shims, brake pad pins, brake pad clips, and a brake pad spring as a set.



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



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

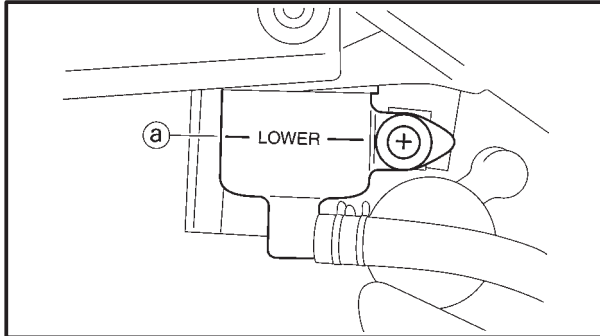


- d. Install a new brake pad shim ③ onto each new brake pad ④.
- e. Install new brake pads and a new brake pad spring.



5. Install:
 - brake pad pins
 - brake pad clips
 - brake caliper

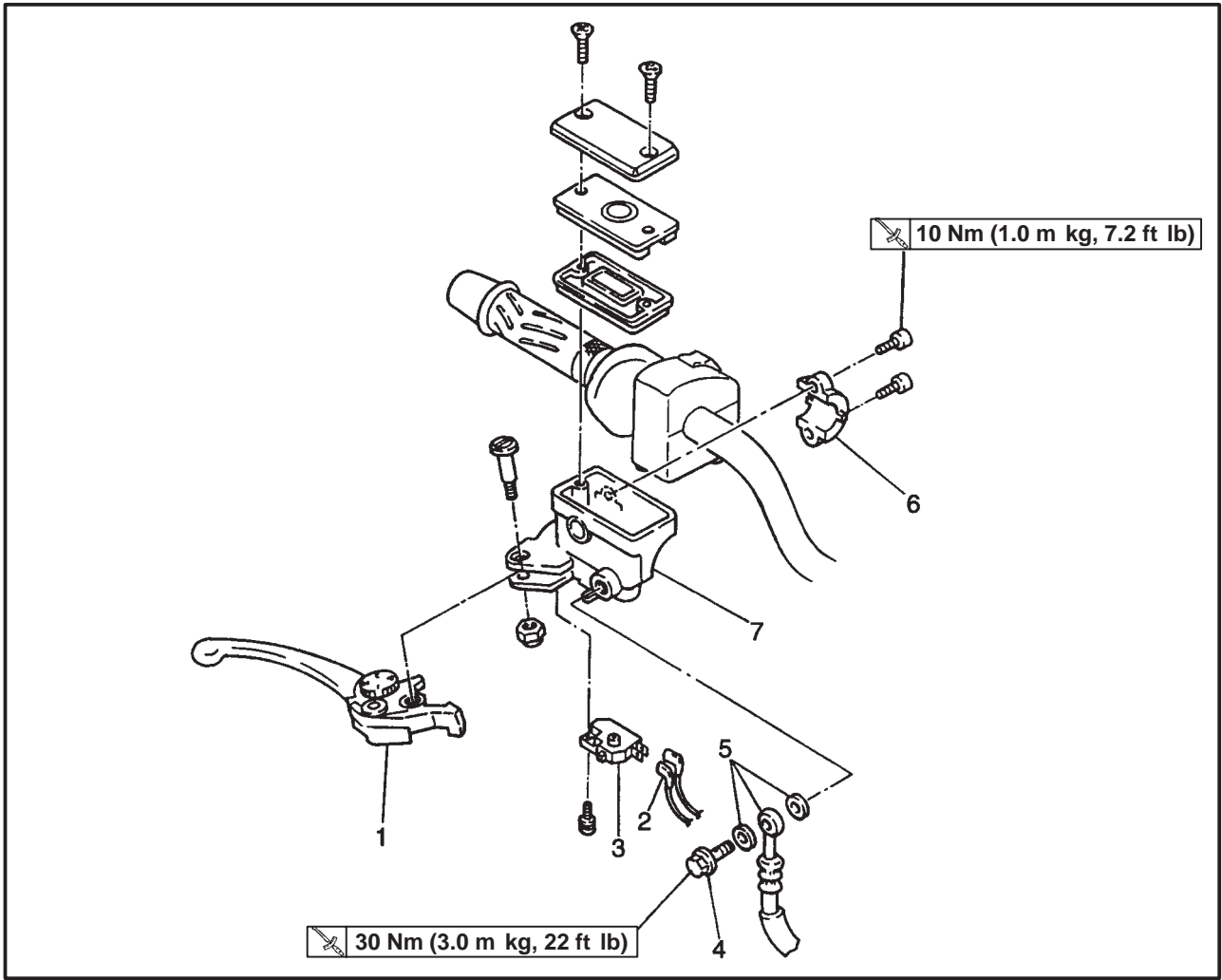
40 Nm (4.0 m kg, 29 ft lb)



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

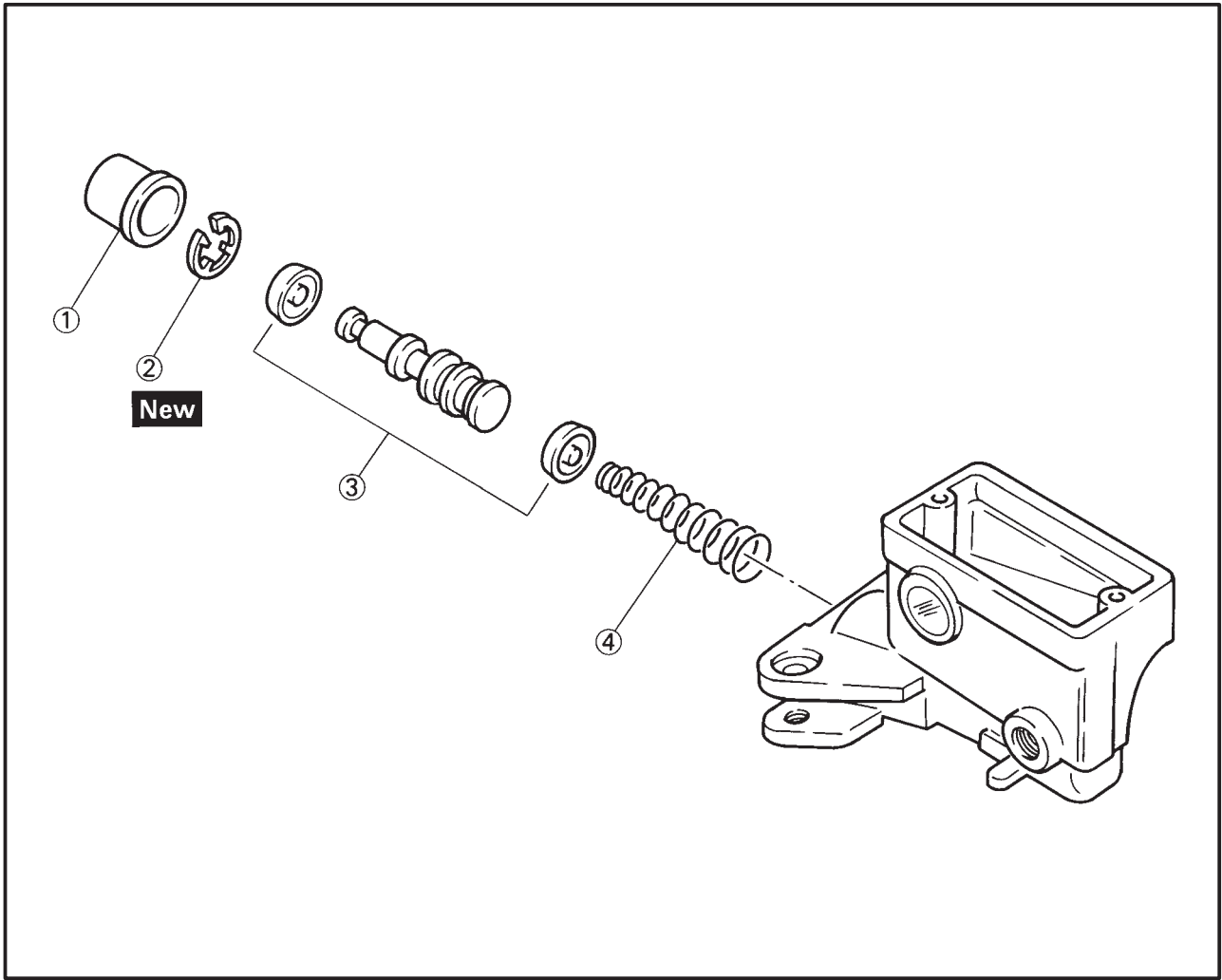
EAS00584

FRONT BRAKE MASTER CYLINDER



Order	Job/Part	Q'ty	Remarks
	Removing the front brake master cylinder		Remove the parts in the order listed.
	Brake fluid		Drain.
1	Brake lever	1	
2	Brake switch lead	2	
3	Brake switch	1	
4	Union bolt	1	
5	Brake hose/copper washer	1/2	Refer to "REMOVING/ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER" section.
6	Master cylinder bracket	1	
7	Master cylinder	1	
			For installation, reverse the removal procedure.

EAS00585

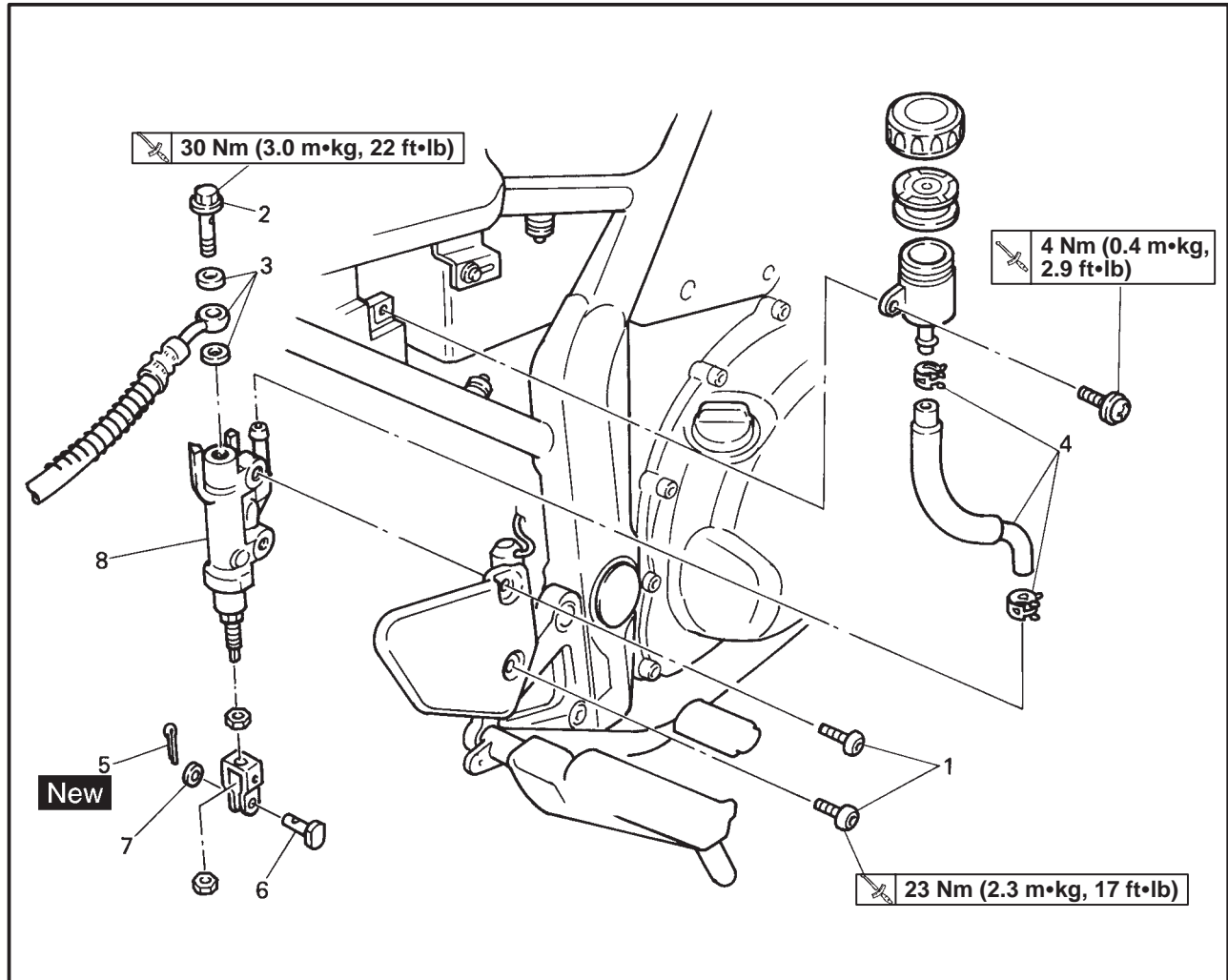


Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake master cylinder		
①	Master cylinder boot	1	Disassemble the parts in the order listed. For assembly, reverse the disassembly procedure.
②	Circlip	1	
③	Master cylinder kit	1	
④	Spring	1	



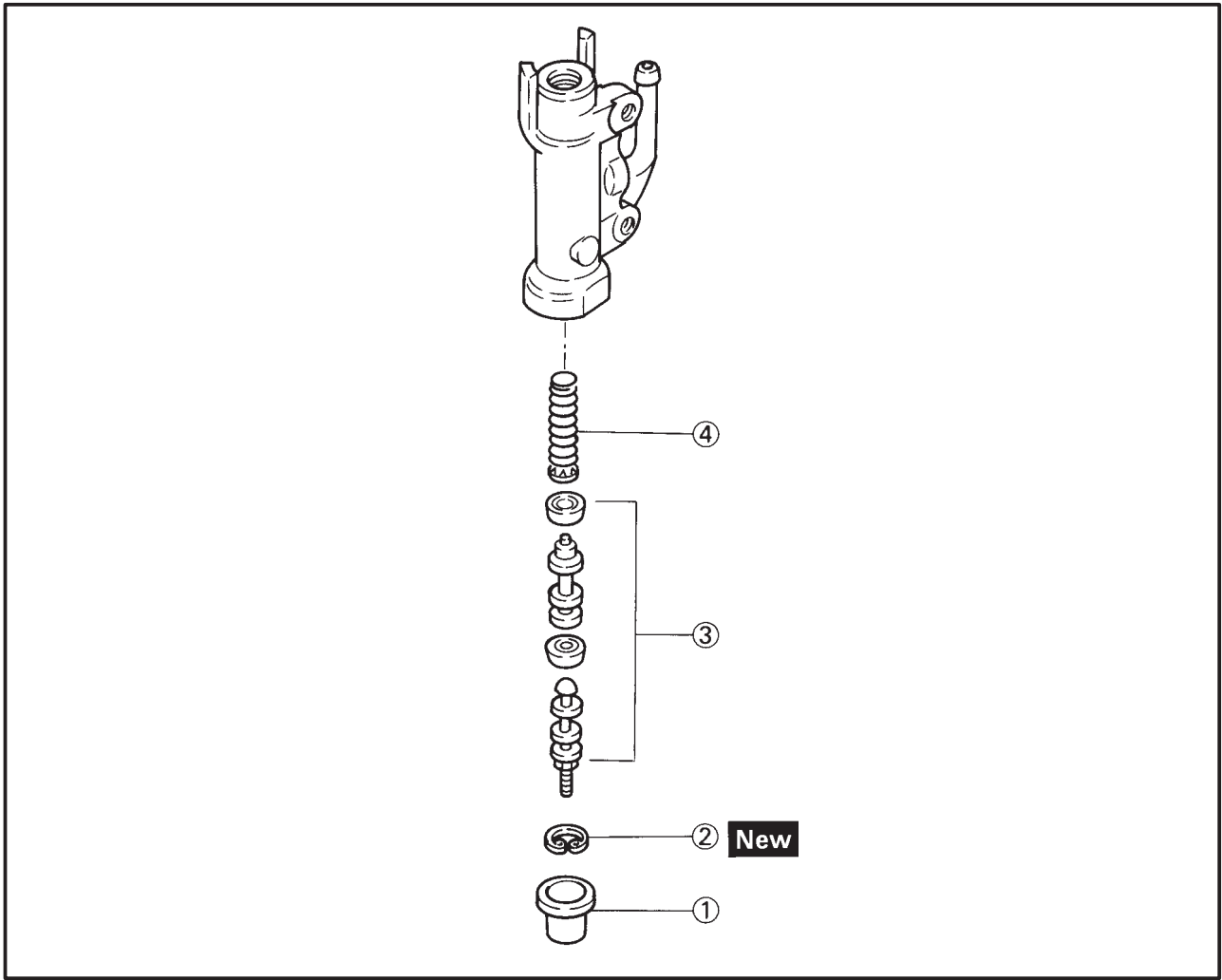
EAS00586

REAR BRAKE MASTER CYLINDER



Order	Job/Part	Q'ty	Remarks
	Removing the rear brake master cylinder		Remove the parts in the order listed.
	Side cover (right)		
	Brake fluid		Drain.
1	Master cylinder bolt	2	
2	Union bolt	1	
3	Brake hose/copper washer	1/2	Refer to "REMOVING/ASSEMBLING AND INSTALLING THE REAR BRAKE MASTER CYLINDER" section.
4	Clip/hose	2/1	
5	Cotter pin	1	
6	Pin	1	
7	Washer	1	
8	Master cylinder	1	
			For installation, reverse the removal procedure.

EAS00587



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

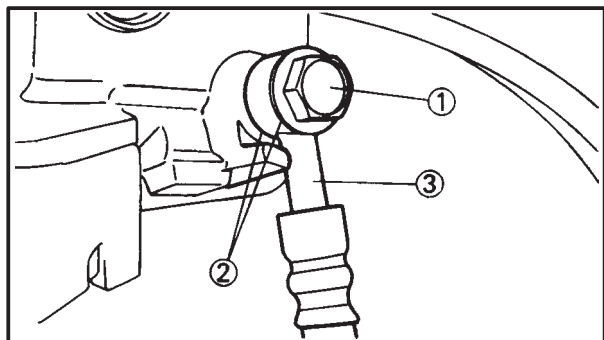


EAS00588

REMOVING AND DISASSEMBLING THE FRONT BRAKE MASTER CYLINDER

NOTE:

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



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

NOTE:

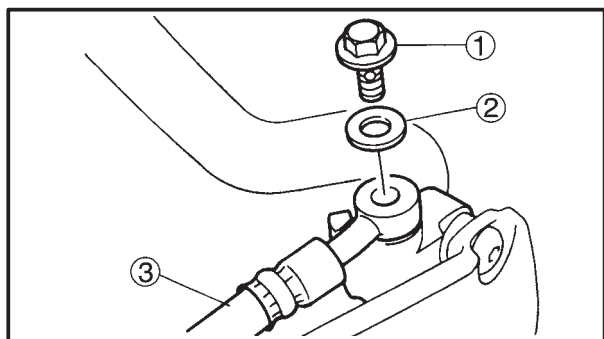
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.

3. Remove:
master cylinder bracket
master cylinder
4. Remove:
master cylinder boot
circlip
5. Remove:
master cylinder kit
spring

EAS00589

REMOVING AND DISASSEMBLING THE REAR BRAKE MASTER CYLINDER

1. Remove:
side cover (right)



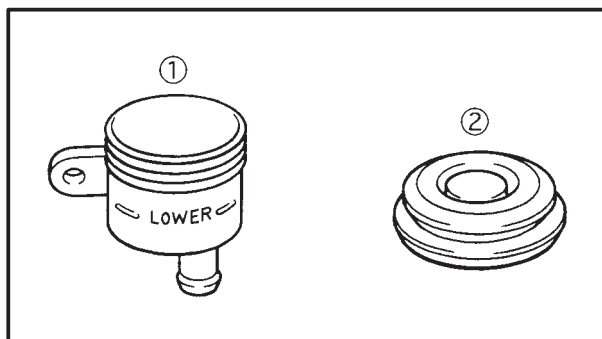
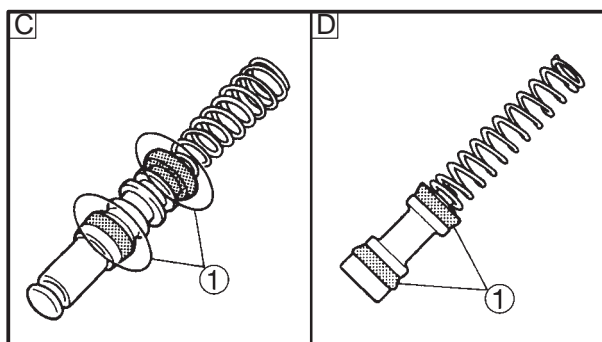
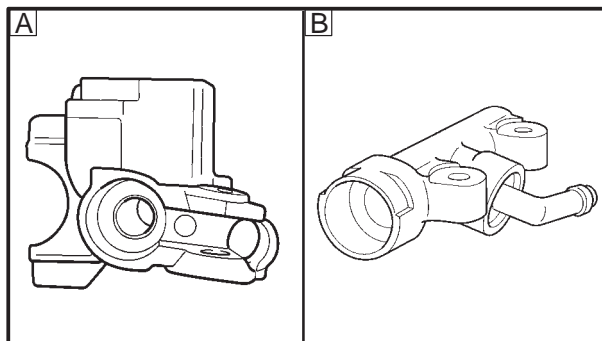
2. Remove:
union bolt ①
copper washers ②
brake hose ③

NOTE:

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



3. Remove:
 - clip
 - hose
 - cotter pin
 - pin
 - washer
4. Remove:
 - master cylinder
5. Remove:
 - master cylinder boot
 - circlip
6. Remove:
 - master cylinder kit
 - spring



EAS00592

CHECKING THE FRONT AND REAR BRAKE MASTER CYLINDERS

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

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

A Front

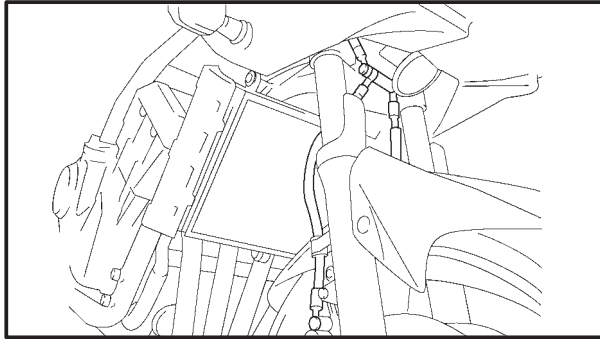
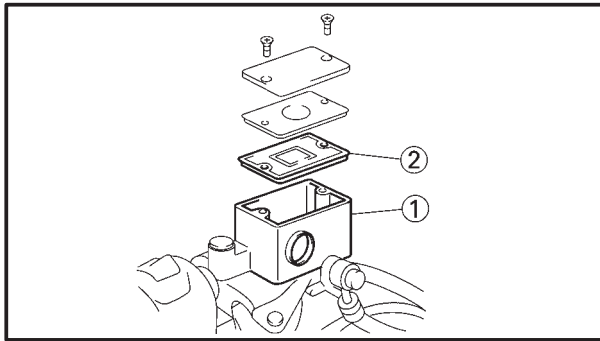
B Rear

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

C Front

D Rear

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



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

5. Check:
brake hoses
Cracks/damage/wear → Replace.

EAS00598

ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER

⚠ WARNING

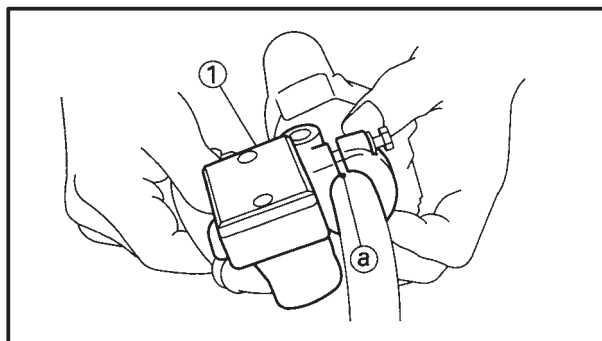
Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.

Never use solvents on internal brake components.



**Recommended brake fluid
DOT 4**

1. Install:
spring
master cylinder kit
2. Install:
circlip
master cylinder boot



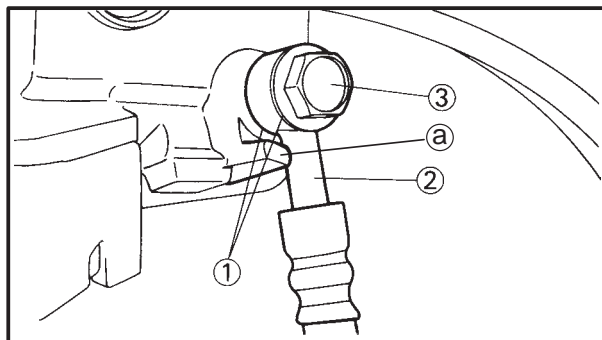
3. Install:

- brake master cylinder (1)

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.



4. Install:

- copper washers (1) **New**

- brake hose (2)

- union bolt (3)

30 Nm (3.0 m•kg, 22 ft•lb)

CAUTION:

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

⚠ WARNING

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

NOTE:

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

5. Fill:

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



**Recommended brake fluid
DOT 4**

**⚠ WARNING**

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

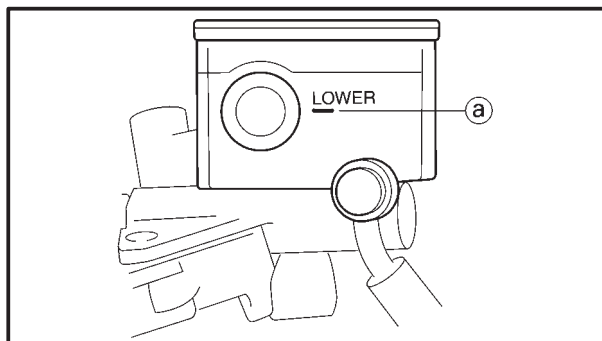
Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.

When refilling, be careful that water does not enter the 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.



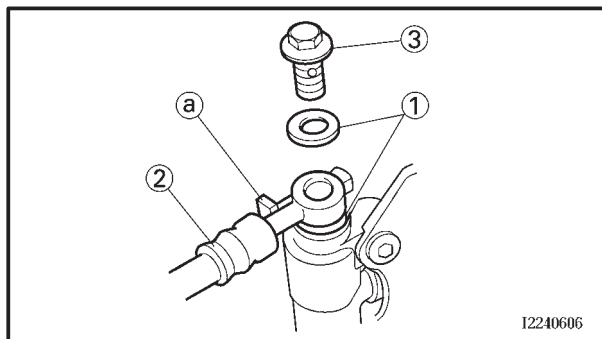
7. Check:
brake fluid level
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.
Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.
8. Check:
brake lever operation
Soft or spongy feeling → Bleed the brake system.
Refer to “BLEEDING THE HYDRAULIC BRAKE SYSTEM” in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



EAS00608

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

1. Install:
spring
master cylinder kit
2. Install:
circlip
master cylinder boot
3. Install:
master cylinder
4. Install:
washer
pin
cotter pin
hose
clip



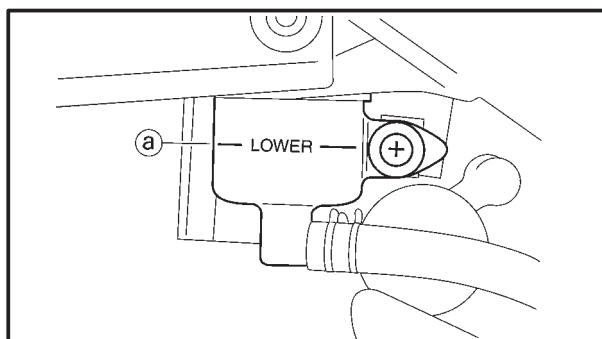
5. Install:
copper washers ① **New**
brake hose ②
union bolt ③ **30 Nm (3.0 m kg, 22 ft lb)**

CAUTION:

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

⚠ WARNING

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



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



**Recommended brake fluid
DOT 4**

**⚠ WARNING**

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

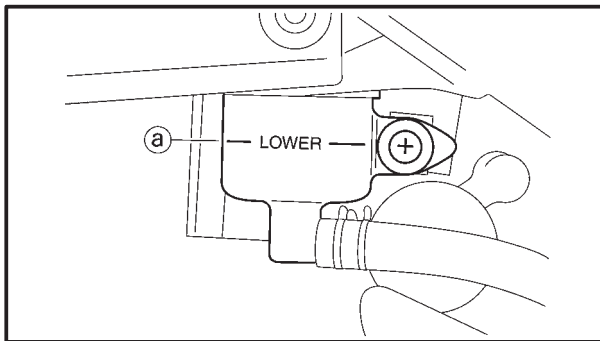
Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.

When refilling, be careful that water does not enter the reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

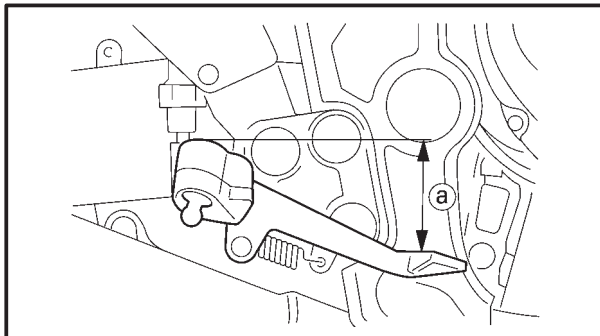
CAUTION:

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

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



8. 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.



9. Adjust:
brake pedal position (a)
Refer to “ADJUSTING THE REAR BRAKE” in chapter 3.

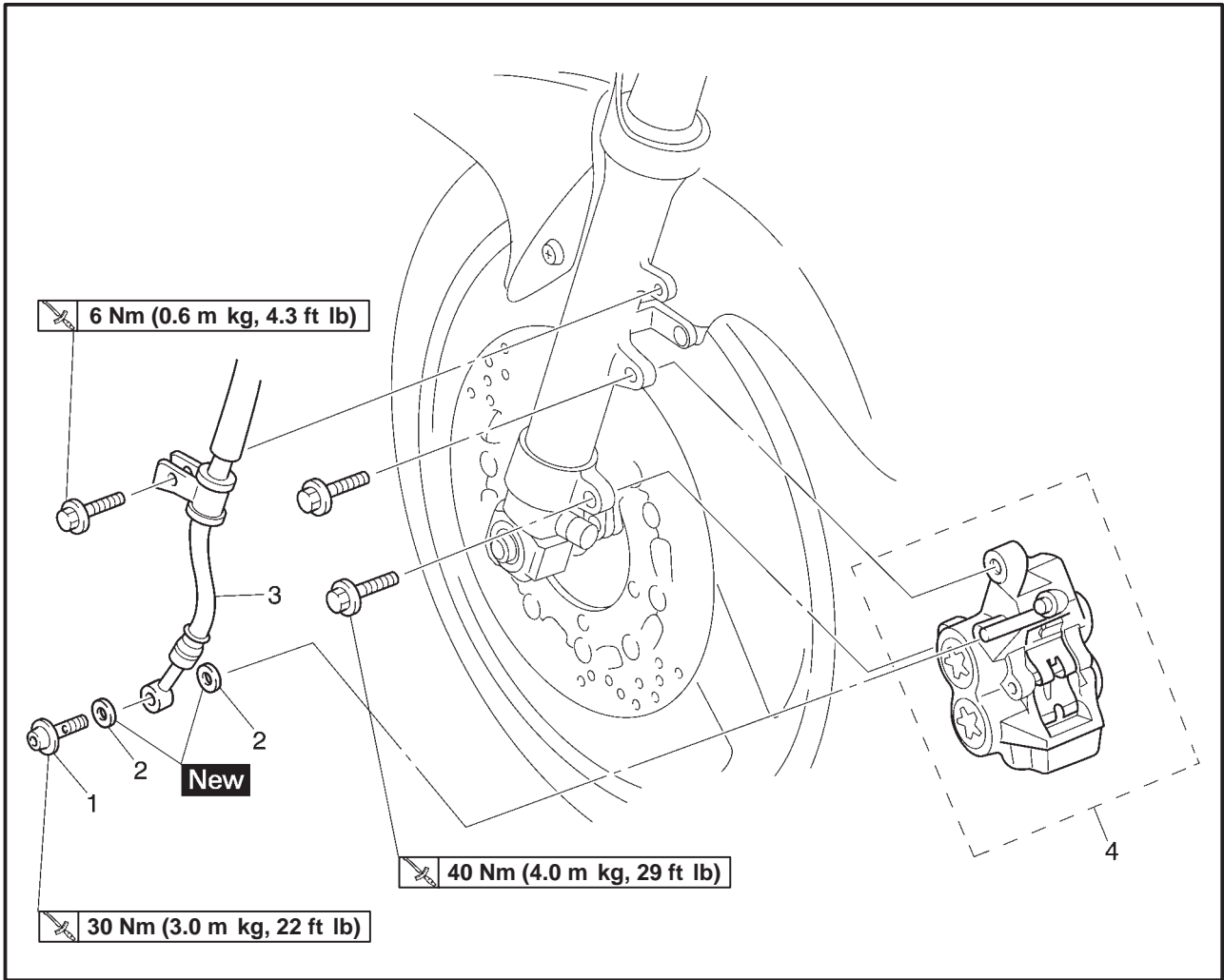


**Brake pedal position (below the top of the rider footrest)
40 mm (1.57 in)**

10. Adjust:
rear brake light operation timing
Refer to “ADJUSTING THE REAR BRAKE LIGHT SWITCH” in chapter 3.

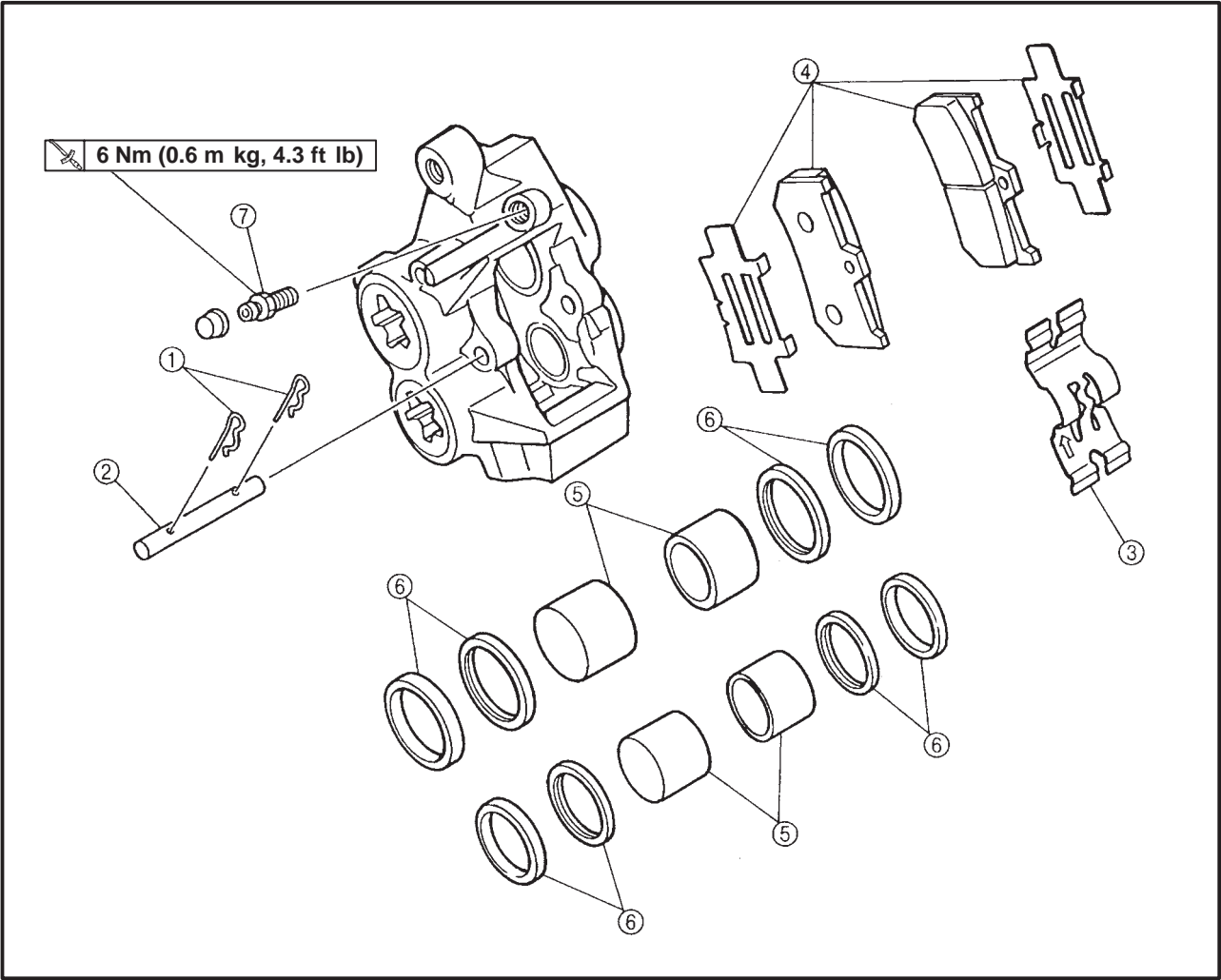
EAS00613

FRONT BRAKE CALIPERS



Order	Job/Part	Q'ty	Remarks
	Removing the front brake calipers		
	Brake fluid		Remove the parts in the order listed.
1	Union bolt	1	Drain.
2	Copper washer	2	
3	Brake hose	1	
4	Brake caliper	1	For installation, reverse the removal procedure.

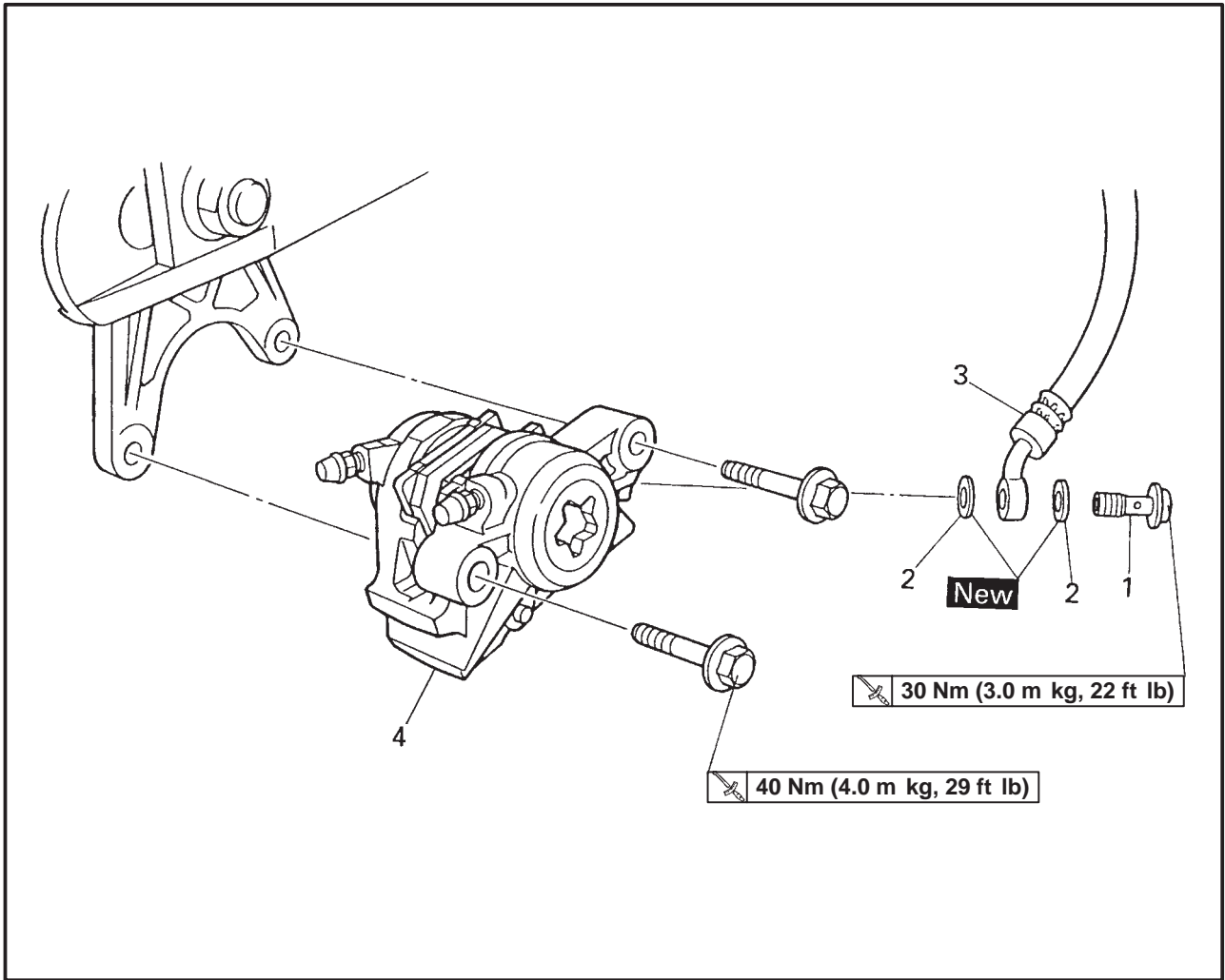
EAS00615



Order	Job/Part	Q'ty	Remarks
	Disassembling the front brake calipers		Disassemble the parts in the order listed. The following procedure applies to both of the front brake calipers.
①	Brake pad clip	2	
②	Brake pad pin	1	
③	Brake pad spring	1	
④	Brake pad	2	
⑤	Brake caliper piston	4	
⑥	Brake caliper piston seal	8	
⑦	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

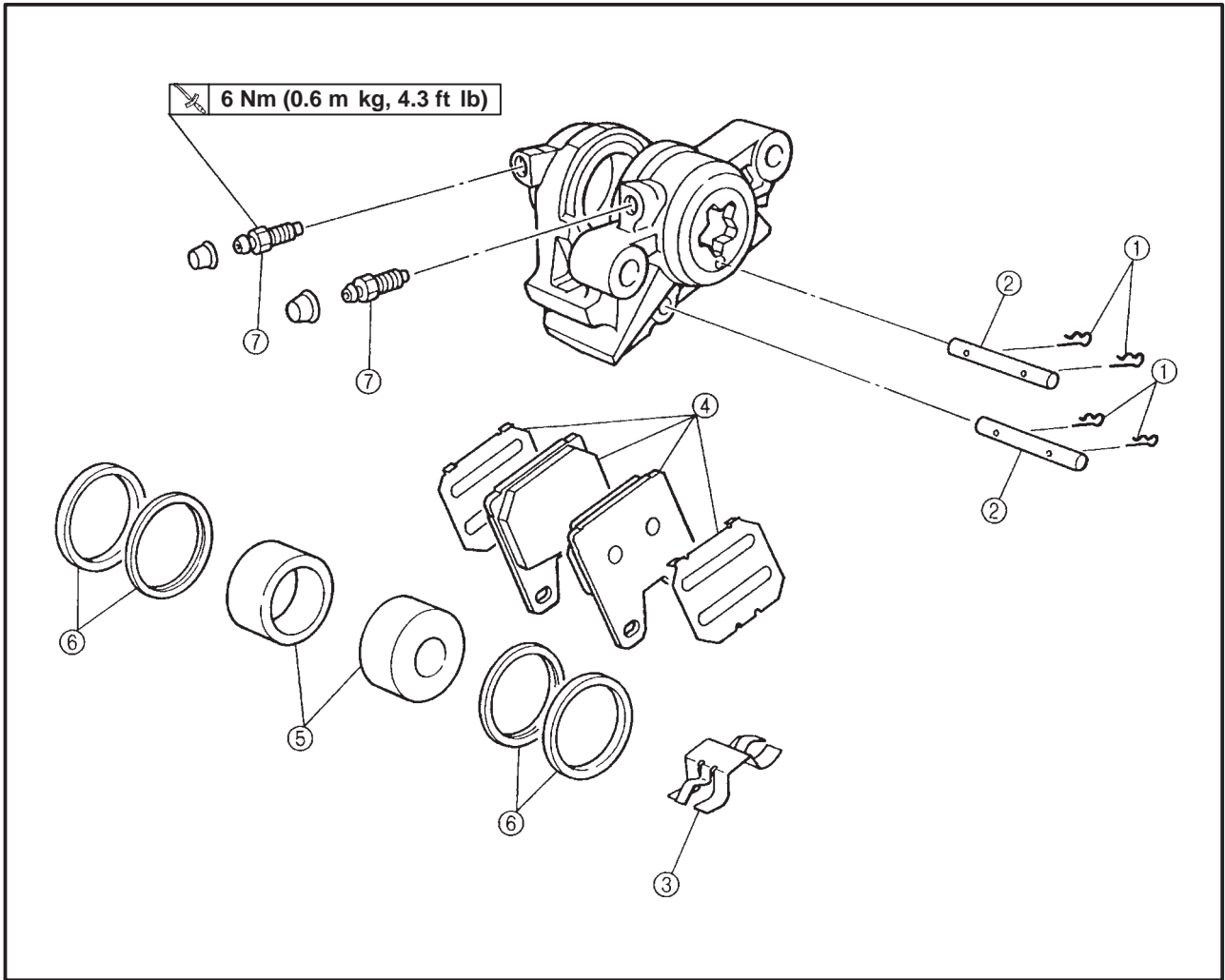
EAS00616

REAR BRAKE CALIPER



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

EAS00617



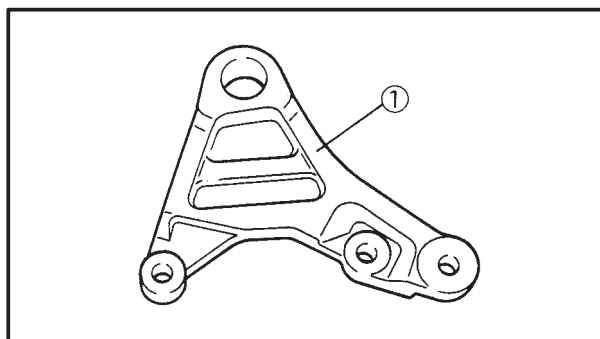
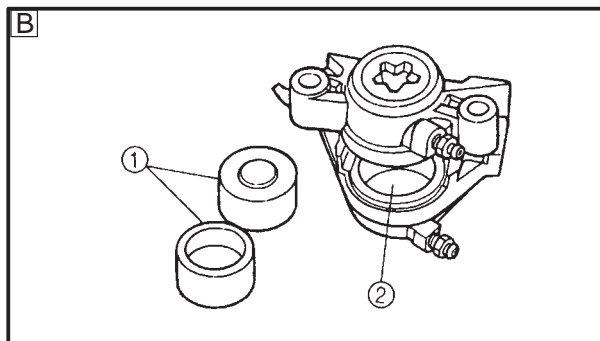
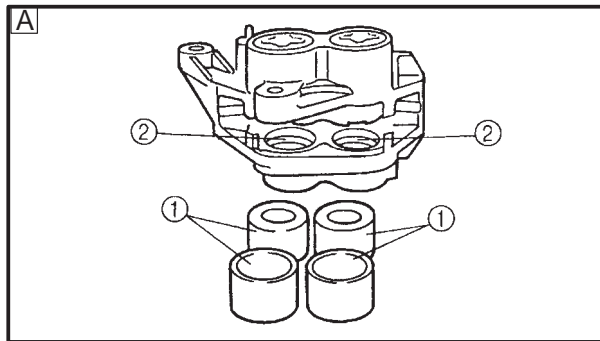
Order	Job/Part	Q'ty	Remarks
	Disassembling the rear brake caliper		Disassemble the parts in the order listed.
①	Brake pad clip	4	
②	Brake pad pin	2	
③	Brake pad spring	1	
④	Brake pad	2	
⑤	Brake caliper piston	2	
⑥	Brake caliper piston seal	4	
⑦	Bleed screw	2	
			For assembly, reverse the disassembly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



EAS00633

CHECKING THE FRONT AND REAR BRAKE CALIPERS

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



1. Check:

- brake caliper pistons ①
Rust/scratches/wear → Replace the brake caliper.
- brake caliper cylinders ②
Scratches/wear → Replace the brake caliper.
- brake calipers
Cracks/damage → Replace.
- brake fluid delivery passages (brake caliper body)
Obstruction → Blow out with compressed Air.

⚠ WARNING

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

A Front

B Rear

2. Check:

- brake caliper brackets ①
Cracks/damage → Replace.



EAS00638

ASSEMBLING AND INSTALLING THE FRONT BRAKE CALIPERS

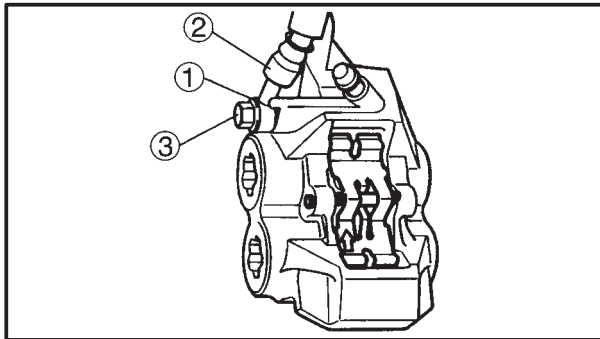
The following procedure applies to both of the brake calipers.

⚠ WARNING

- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components as they will cause the piston seals to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston seals.



**Recommended brake fluid
DOT 4**



1. Install:

- brake caliper (temporarily)
- copper washers ① **New**
- brake hose ②
- union bolt ③

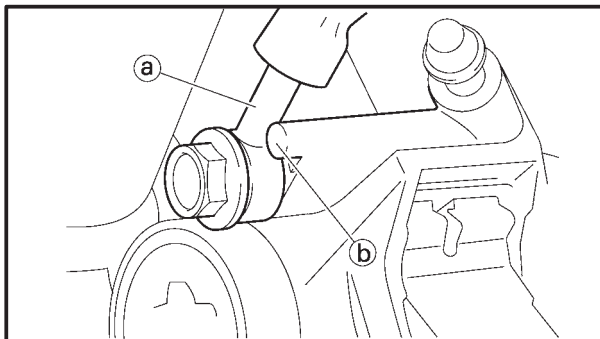
30 Nm (3.0 m•kg, 22 ft•lb)

⚠ WARNING

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

CAUTION:

When installing the brake hose onto the brake caliper, make sure that the brake pipe ① touches the projection ② on the brake caliper.



2. Remove:

- brake caliper

3. Install:

- brake pads
- brake pad pins
- brake pad clips
- brake hose holder

6 Nm (0.6 m•kg, 4.3 ft•lb)

- brake caliper

40 Nm (4.0 m•kg, 29 ft•lb)

Refer to “REPLACING THE BRAKE PADS”.



4. Fill:

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



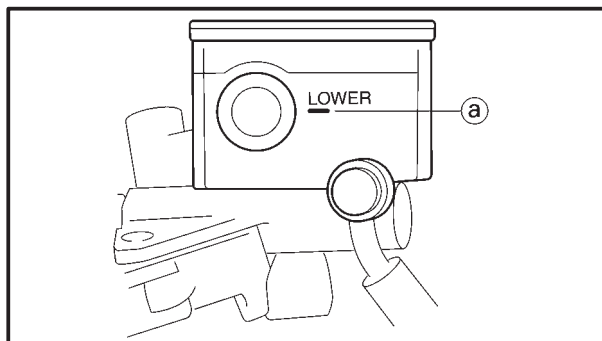
**Recommended brake fluid
DOT 4**

⚠ WARNING

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



5. Bleed:

- brake system
Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" in chapter 3.

6. Check:

- brake fluid level
Below the minimum level mark (a) → Add the recommended brake fluid to the proper level.
Refer to "CHECKING THE BRAKE FLUID LEVEL" in chapter 3.

7. Check:

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



EAS00644

ASSEMBLING AND INSTALLING THE REAR BRAKE CALIPER

⚠ WARNING

- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components as they will cause the piston seals to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston seals.

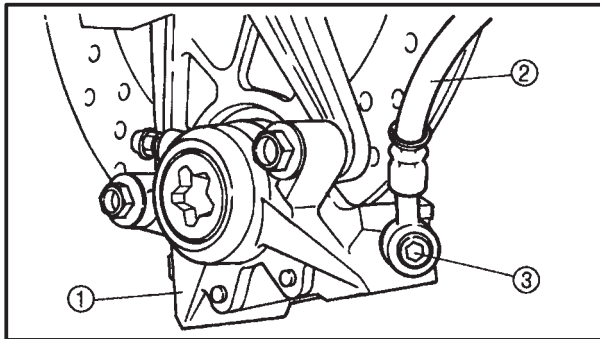


**Recommended brake fluid
DOT 4**

1. Install:

- brake caliper ①
- (temporarily)
- copper washers **New**
- brake hose ②
- union bolt ③

30 Nm (3.0 m•kg, 22 ft•lb)

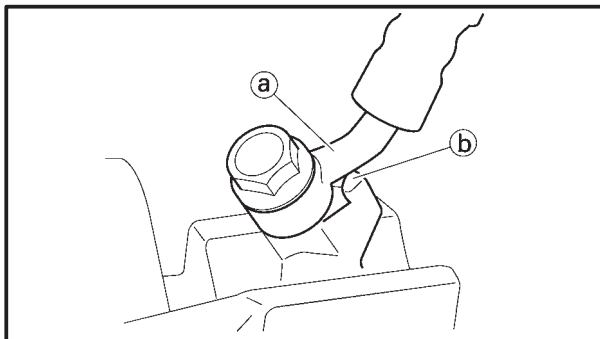


⚠ WARNING

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

CAUTION:

When installing the brake hose onto the brake caliper, make sure that the brake pipe ① touches the projection ② on the brake caliper.



2. Remove:

- brake caliper

3. Install:

- brake pads
- brake pad pin
- brake pad clips
- brake caliper

40 Nm (4.0 m•kg, 29 ft•lb)

Refer to “REPLACING THE BRAKE PADS”.

4. Fill:

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



**Recommended brake fluid
DOT 4**

**⚠ WARNING**

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

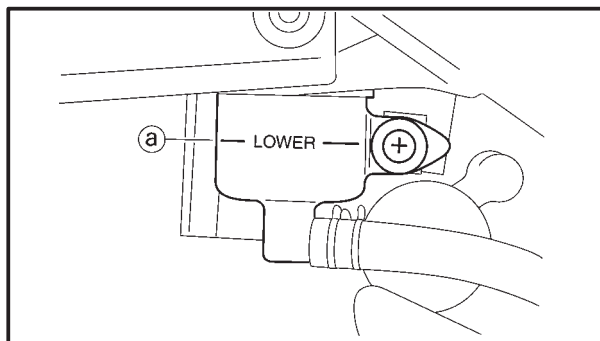
CAUTION:

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

5. Bleed:

- brake system

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



6. Check:

- brake fluid level

Below the minimum level mark (a) → Add the recommended brake fluid to the proper level. Refer to “CHECKING THE BRAKE FLUID LEVEL” in chapter 3.

7. Check:

- brake pedal operation

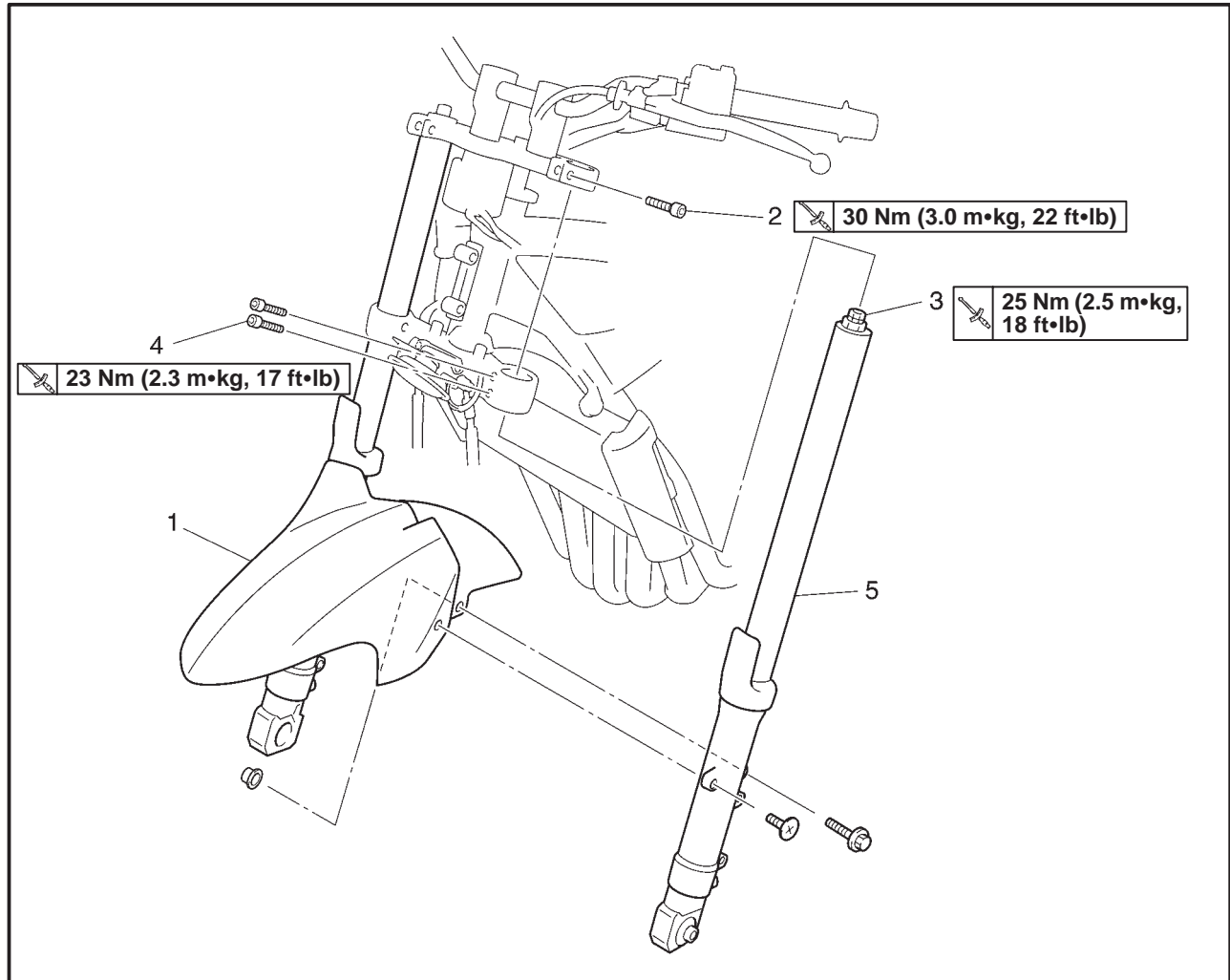
Soft or spongy feeling → Bleed the brake system.

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



EAS00647

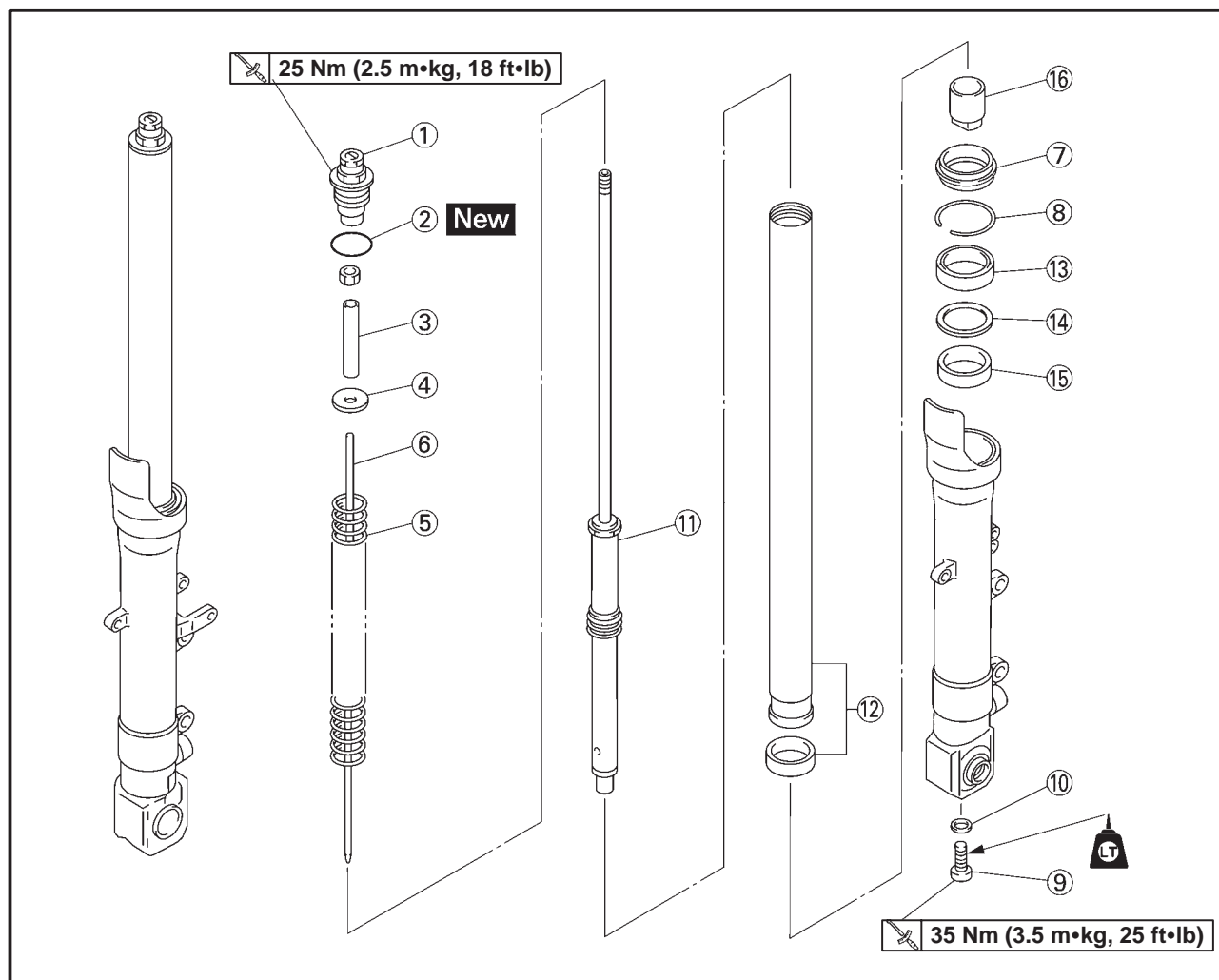
FRONT FORK



Order	Job/Part	Q'ty	Remarks
	Removing the front fork		
	Front wheel		Remove the parts in the order listed. Refer to "FRONT WHEEL AND BRAKE DISCS".
1	Front fender	1	
2	Upper bracket pinch bolt	2	Loosen. Refer to "REMOVING/
3	Cap bolt	2	Loosen. INSTALLING THE FRONT
4	Lower bracket pinch bolt	4	Loosen. FORK LEGS" section.
5	Front fork assembly (left/right)	1/1	For installation, reverse the removal procedure.



EAS00648



Order	Job/Part	Q'ty	Remarks
	Disassembly the front fork		Disassemble the parts in the order listed.
①	Cap bolt	1	
②	O-ring	1	
③	Spacer	1	
④	Spring seat	1	
⑤	Fork spring	1	
⑥	Damper adjusting rod	1	
⑦	Dust seal	1	
⑧	Oil seal clip	1	
⑨	Damper rod bolt	1	
⑩	Copper washer	1	
⑪	Damper rod	1	
⑫	Inner tube	1	
⑬	Oil seal	1	
⑭	Washer	1	
⑮	Slide metal	1	
⑯	Oil flow stopper	1	
			For assembly, reverse the disassembly procedure.



EAS00649

REMOVING THE FRONT FORK LEGS

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

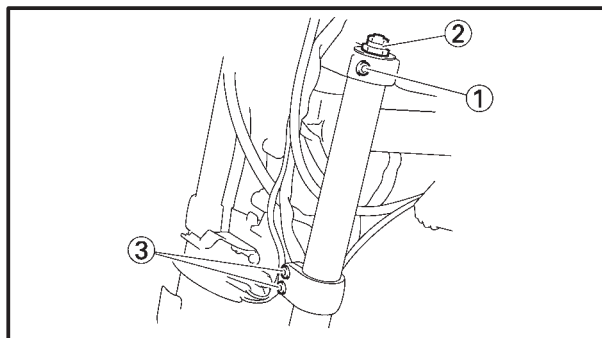
1. Stand the motorcycle on a level surface.

⚠ WARNING

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

NOTE:

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

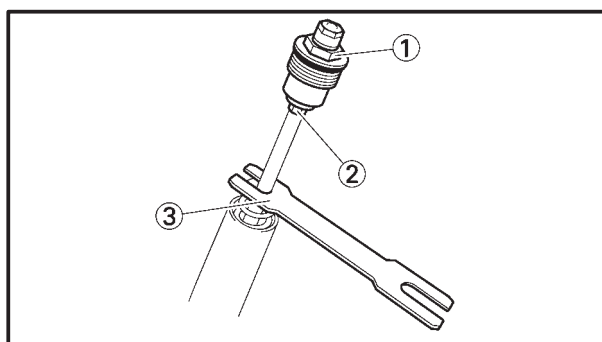


2. Loosen:
 - upper bracket pinch bolt ①
 - cap bolt ②
 - lower bracket pinch bolt ③

⚠ WARNING

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

3. Remove:
 - front fork leg



EAS00653

DISASSEMBLING THE FRONT FORK LEGS

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

1. Remove:
 - cap bolt ①
(from the damper adjusting rod)
 - nut ②

NOTE:

Remove the cap bolt with the piston rod holder ③.

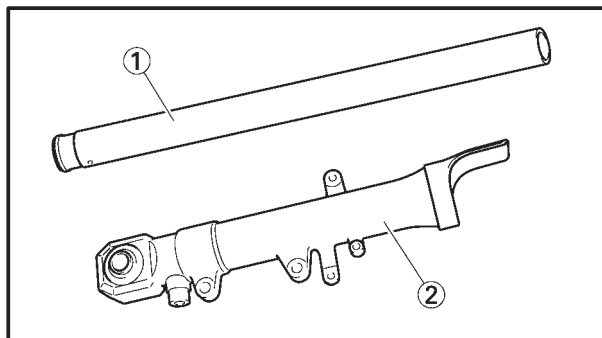


**Rod holder
YM-01434**



CAUTION:

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



EAS00657

CHECKING THE FRONT FORK LEGS

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

1. Check:

- inner tube ①
- outer tube ②

Bends/damage/scratches → Replace.

⚠ WARNING

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

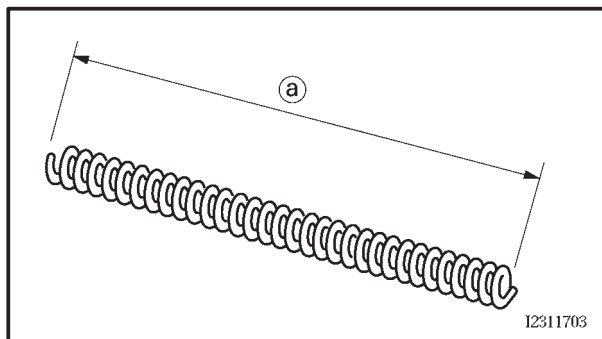
2. Measure:

- spring free length (a)

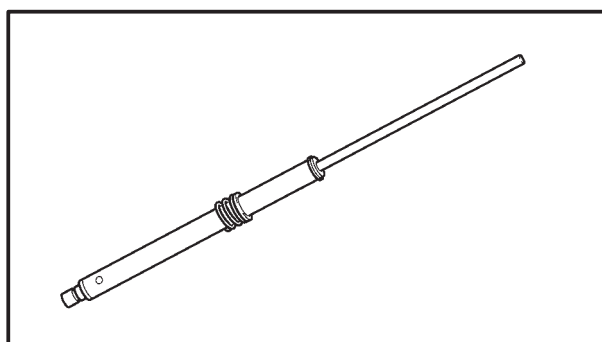
Over the specified limit → Replace.



Spring free length limit
344.0 mm (13.5 in)



I2311703



3. Check:

- damper rod

Damage/wear → Replace.

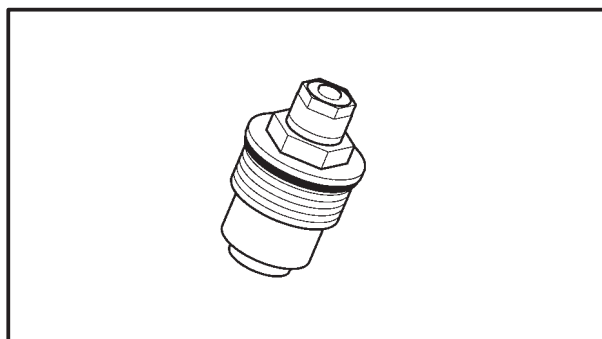
Obstruction → Blow out all of the oil passages with compressed air.

- oil flow stopper

Damage → Replace.

CAUTION:

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



4. Check:

- cap bolt O-ring

Damage/wear → Replace.



EAS00660

ASSEMBLING THE FRONT FORK LEGS

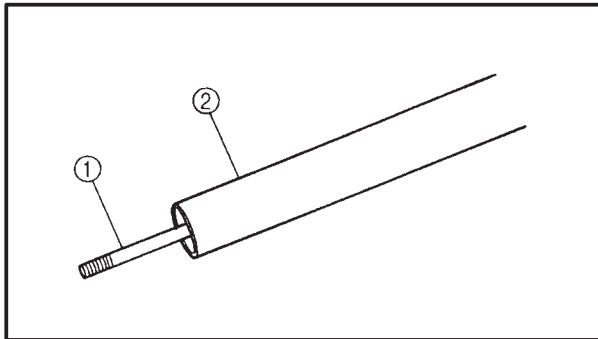
The following procedure applies to both of the front fork legs.

⚠ WARNING

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

NOTE:

- When assembling the front fork leg, be sure to replace the following parts:
 - inner tube bushing
 - outer tube bushing
 - oil seal
 - dust seal
- Before assembling the front fork leg, make sure that all of the components are clean.



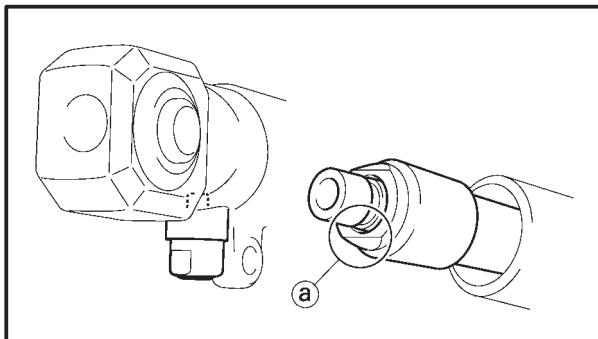
1. Install:
 - damper rod ①

CAUTION:

Allow the damper rod to slide slowly down the inner tube ② until it protrudes from the bottom of the inner tube. Be careful not to damage the inner tube.

NOTE:

Install the oil flow stopper with a flat surface part ① downward.



2. Lubricate:
 - inner tube's outer surface



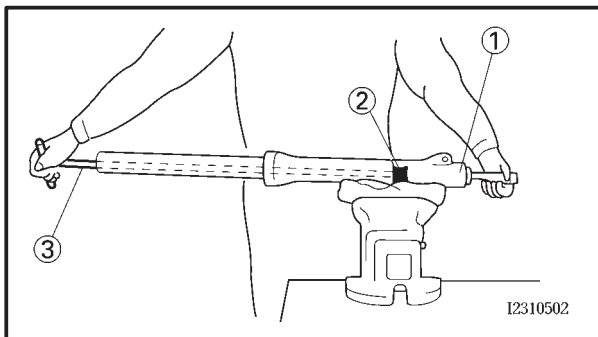
Recommended lubricant
Suspension oil "01" or
equivalent

3. Tighten:
 - damper rod bolt ①

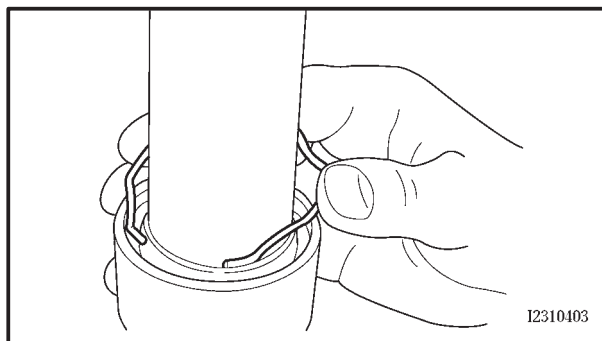
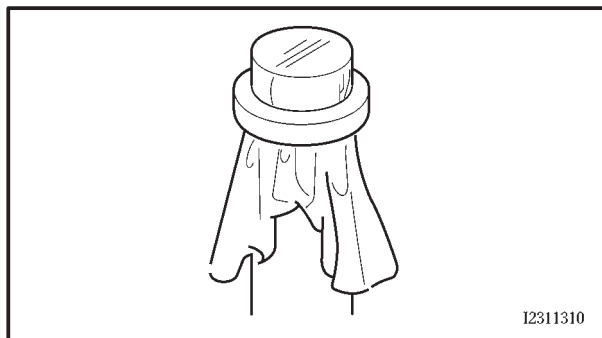
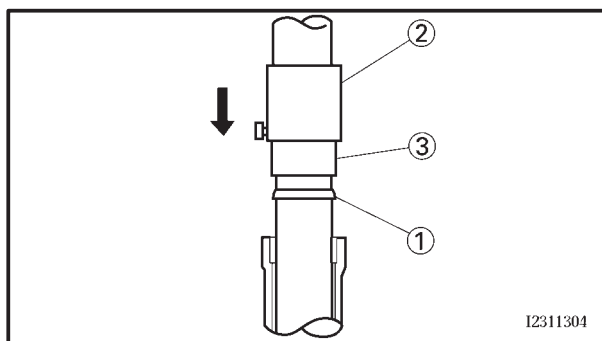
35 Nm (3.5 m•kg, 25 ft•lb)
LOCTITE®

NOTE:

While holding the damper rod with the damper rod holder ②, tighten the damper rod bolt.



Damper rod holder
YM-01447



4. Install:

- oil seal ①
(with the driver ② and 43 mm adapter ③)



Driver
YM-33963
43 mm Adapters
YM-8020-A

CAUTION:

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

NOTE:

- Before installing the oil seal, apply lithium soap base grease onto its lips.
- Apply fork oil onto the outer surface of the inner tube.
- Before installing the oil seal, cover the top of the front fork leg with a plastic bag to protect the oil seal during installation.

5. Install:

- oil seal clip

NOTE:

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

6. Fill:

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



Quantity (each front fork leg)
0.44 L (435 cm³)
(15.3 Imp oz, 14.7 US oz)

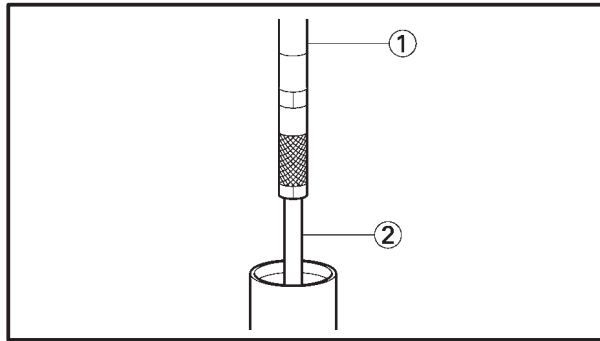
Recommended oil
Yamaha suspension oil "01" or equivalent

CAUTION:

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

NOTE:

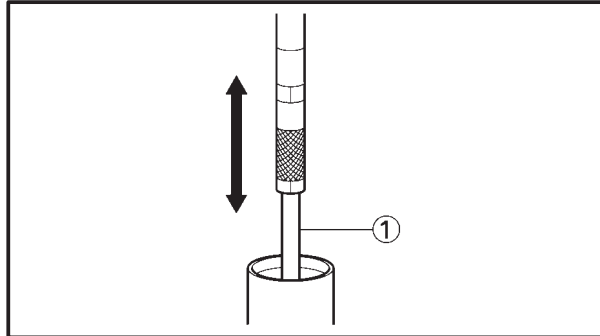
Be sure to bleed the front fork.



7. Install:
- rod puller ①
(onto the damper rod ②)



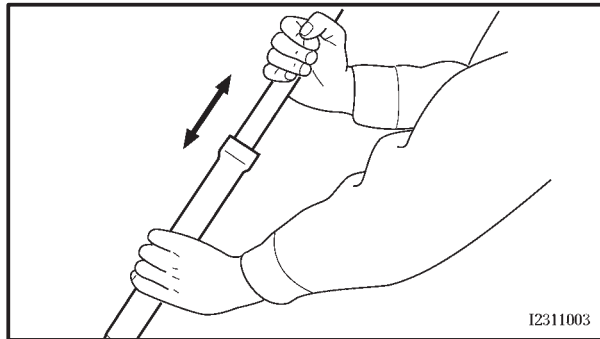
Rod puller
YM-01437



8. After filling the front fork leg, slowly stroke the damper rod ① up and down (at least ten times) to distribute the fork oil.

NOTE: _____

Be sure to stroke the damper rod slowly because the fork oil may spurt out.



9. Slowly stroke the inner tube ② up and down to distribute the fork oil once more (1 stroke = about 150 mm (5.9 in)).

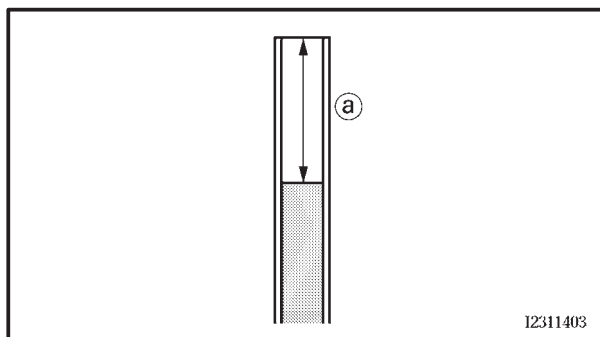
NOTE: _____

Be careful not to stroke the inner tube over 150 mm (5.9 in) as this will cause air to enter. If the inner tube is stroke more than 150 mm (5.9 in), repeat steps (10) and (11).

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

NOTE: _____

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



11. Measure:
- front fork leg oil level (a)
Out of specification → Correct.



Front fork leg oil level (from the top of the inner tube and damper rod, with the inner tube fully compressed, and without the spring)
140 mm (5.51 in)



EAS00662

INSTALLING THE FRONT FORK LEGS

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

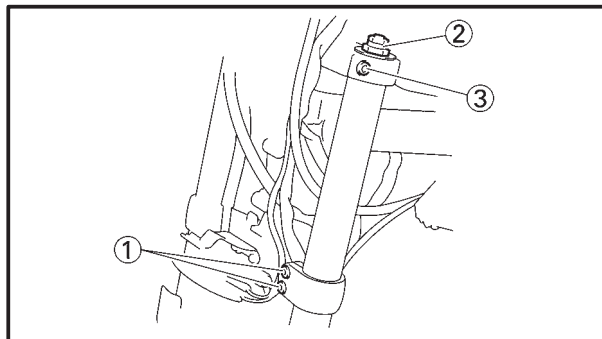
1. Install:

- front fork leg

Temporarily tighten the upper and lower bracket pinch bolts.

NOTE:

Make sure that the inner fork tube is flush with the top of the handlebar holder.

**2. Tighten:**

- lower bracket pinch bolt ①

23 Nm (2.3 m•kg, 17 ft•lb)

- cap bolt ②

25 Nm (2.5 m•kg, 18 ft•lb)

- upper bracket pinch bolt ③

30 Nm (3.0 m•kg, 22 ft•lb)

⚠ WARNING

Make sure that the brake hoses are routed properly.

3. Adjust:

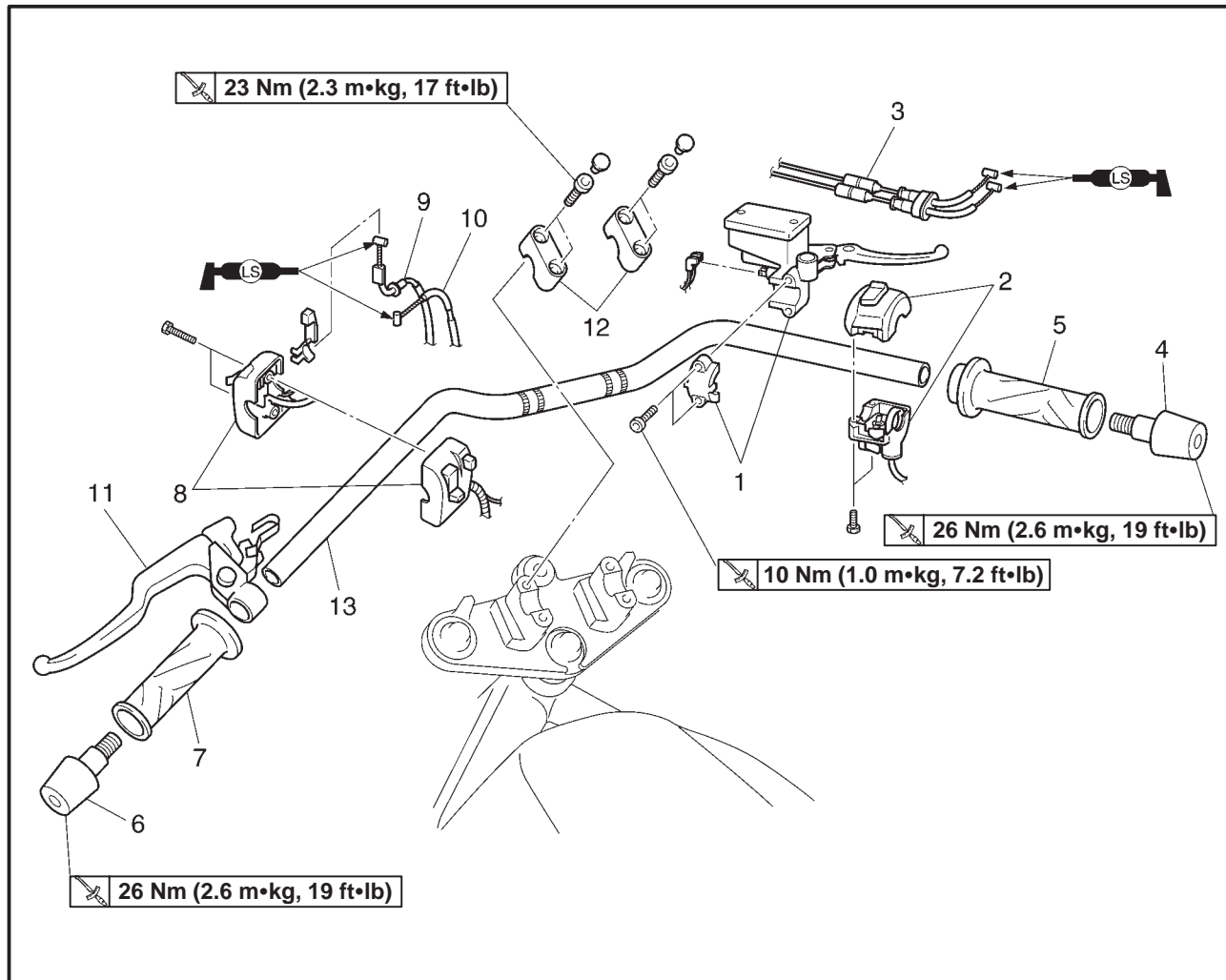
- spring preload
- rebound damping
- compression damping

Refer to “ADJUSTING THE FRONT FORK” in chapter 3.



EAS00664

HANDLEBAR



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



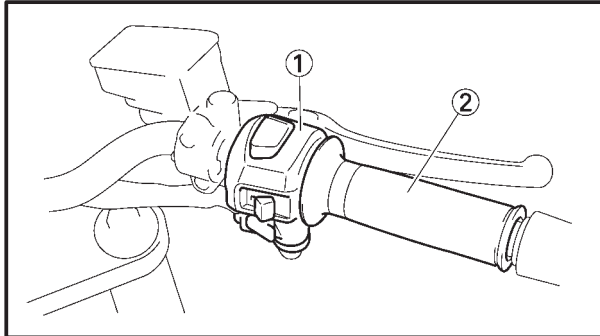
EAS00666

REMOVING THE HANDLEBAR

1. Stand the motorcycle on a level surface.

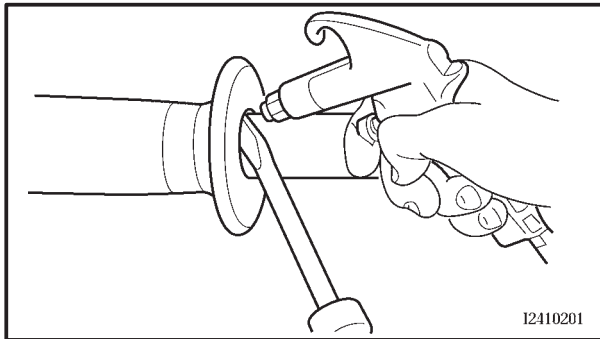
⚠ WARNING

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



2. Remove:

- throttle cable housing ①
- throttle grip ②



3. Remove:

- handlebar grip ①

NOTE:

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

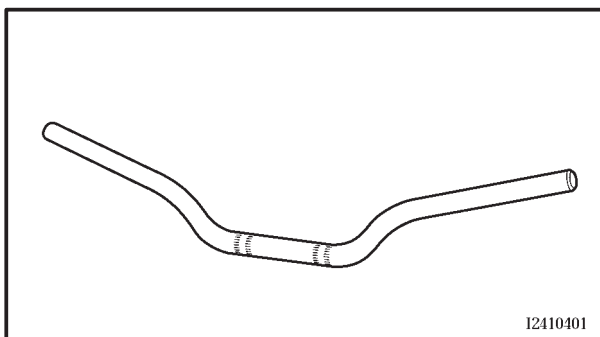
EAS00668

CHECKING THE HANDLEBAR

1. Stand the motorcycle on a level surface.

⚠ WARNING

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

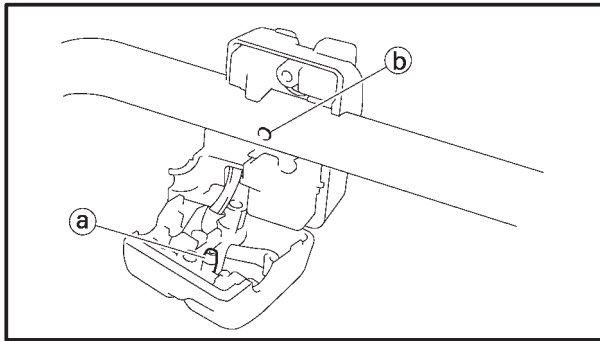


2. Check:

- handlebar
Bends/cracks/damage → Replace.

⚠ WARNING

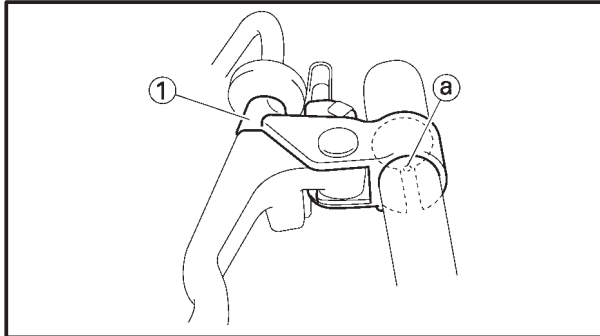
Do not attempt to straighten a bent handlebar as this may dangerously weaken it.



5. Install:
- left handlebar switch

NOTE:

Align the pins (a) on the right handlebar switch with the holes (b) in the handlebar.



6. Install:
- clutch lever holder

NOTE:

Align the slit in the clutch lever holder with the punch mark (a) in the left handlebar.

7. Install:
- brake master cylinder
- Refer to "ASSEMBLING AND INSTALLING THE FRONT BRAKE MASTER CYLINDER".
8. Adjust:
- throttle cable free play
- Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.



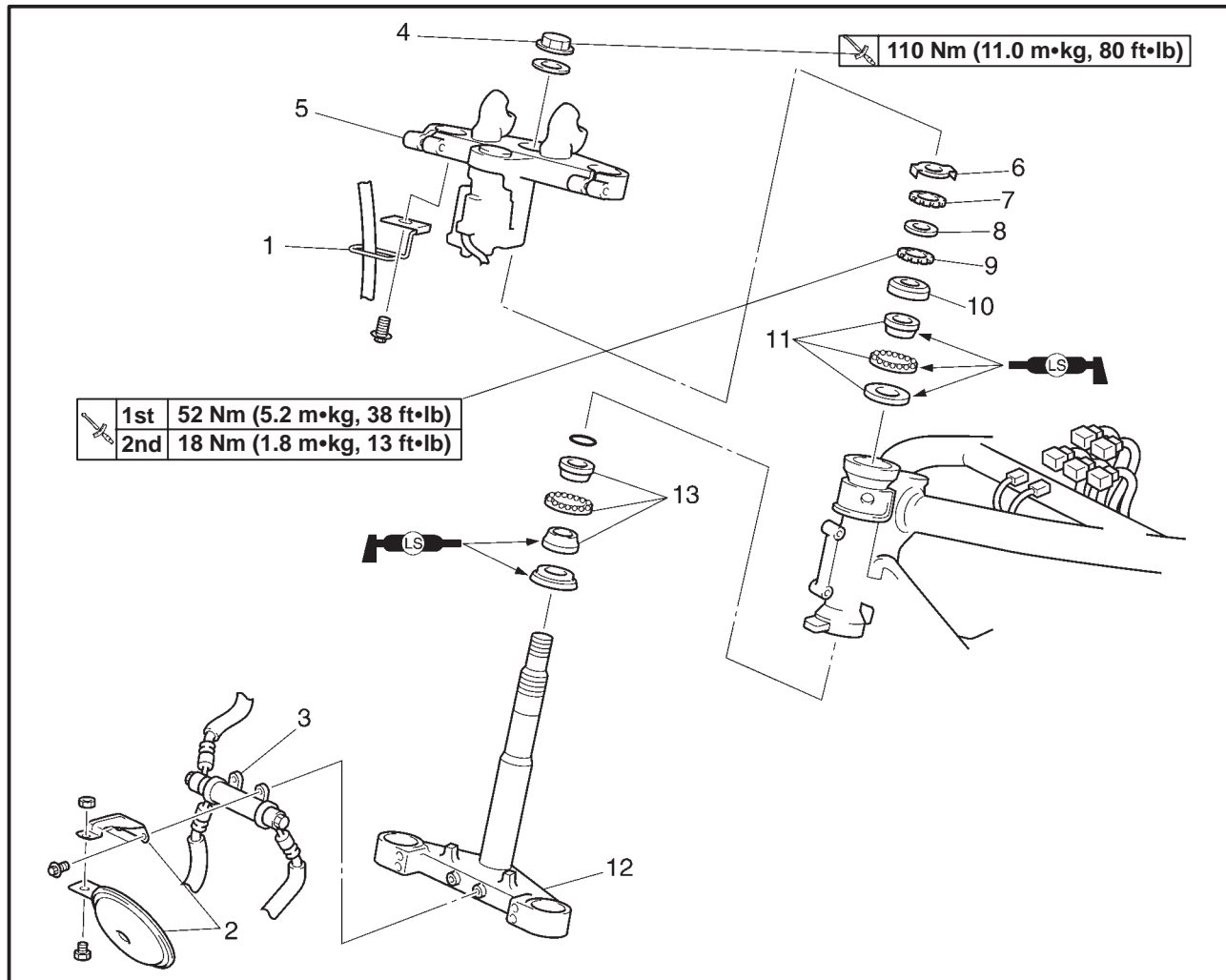
Throttle cable free play (at the flange of the throttle grip)

3 ~ 5 mm (0.12 ~ 0.20 in)

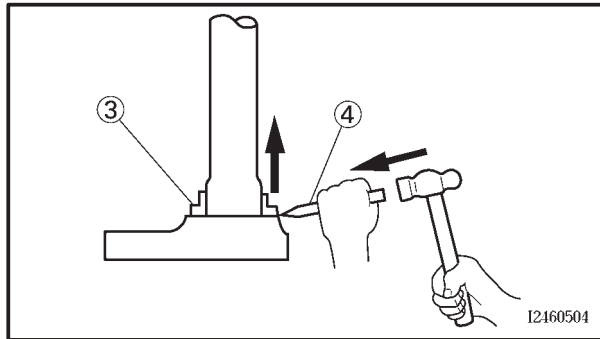


EAS00676

STEERING HEAD



Order	Job/Part	Q'ty	Remarks
	Removing the steering head		
	Front wheel		Remove the parts in the order listed.
	Front fork		Refer to "FRONT WHEEL"
	Handlebar		Refer to "FRONT FORK"
			Refer to "HANDLEBAR"
1	Front brake hose bracket	1	
2	Horn/bracket	1/1	
3	Brake hose joint	1	
4	Upper bracket cap nut	1	
5	Upper bracket	1	
6	Lock washer	1	
7	Upper ring nut	1	
8	Rubber washer	1	
9	Lower ring nut	1	
10	Dust cover	1	
11	Steering bearing (upper)	1	
12	Lower bracket	1	
13	Steering bearing (lower)	1	
			For installation, reverse the removal procedure.



- b. Remove the bearing race ③ from the lower bracket with a floor chisel ④ and hammer.
- c. Install a new rubber seal and new bearing races.

**CAUTION:**

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

NOTE:

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

4. Check:

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

EAS00683

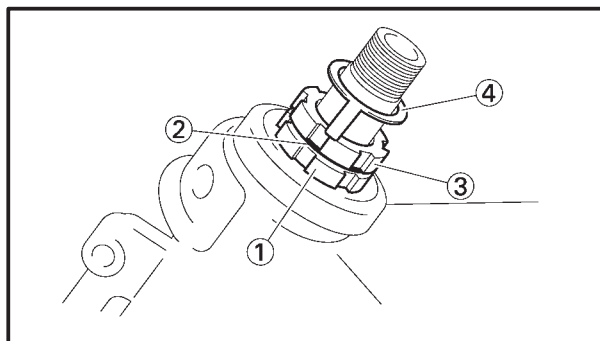
INSTALLING THE STEERING HEAD

1. Lubricate:

- upper bearing
- lower bearing
- bearing races



Recommended lubricant
Lithium soap base grease



2. Install:

- lower ring nut ①
- rubber washer ②
- upper ring nut ③
- lock washer ④

Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" in chapter 3.

3. Install:

- upper bracket
- steering stem nut

NOTE:

Temporarily tighten the steering stem nut.

4. Install:

- front fork legs
Refer to "FRONT FORK".

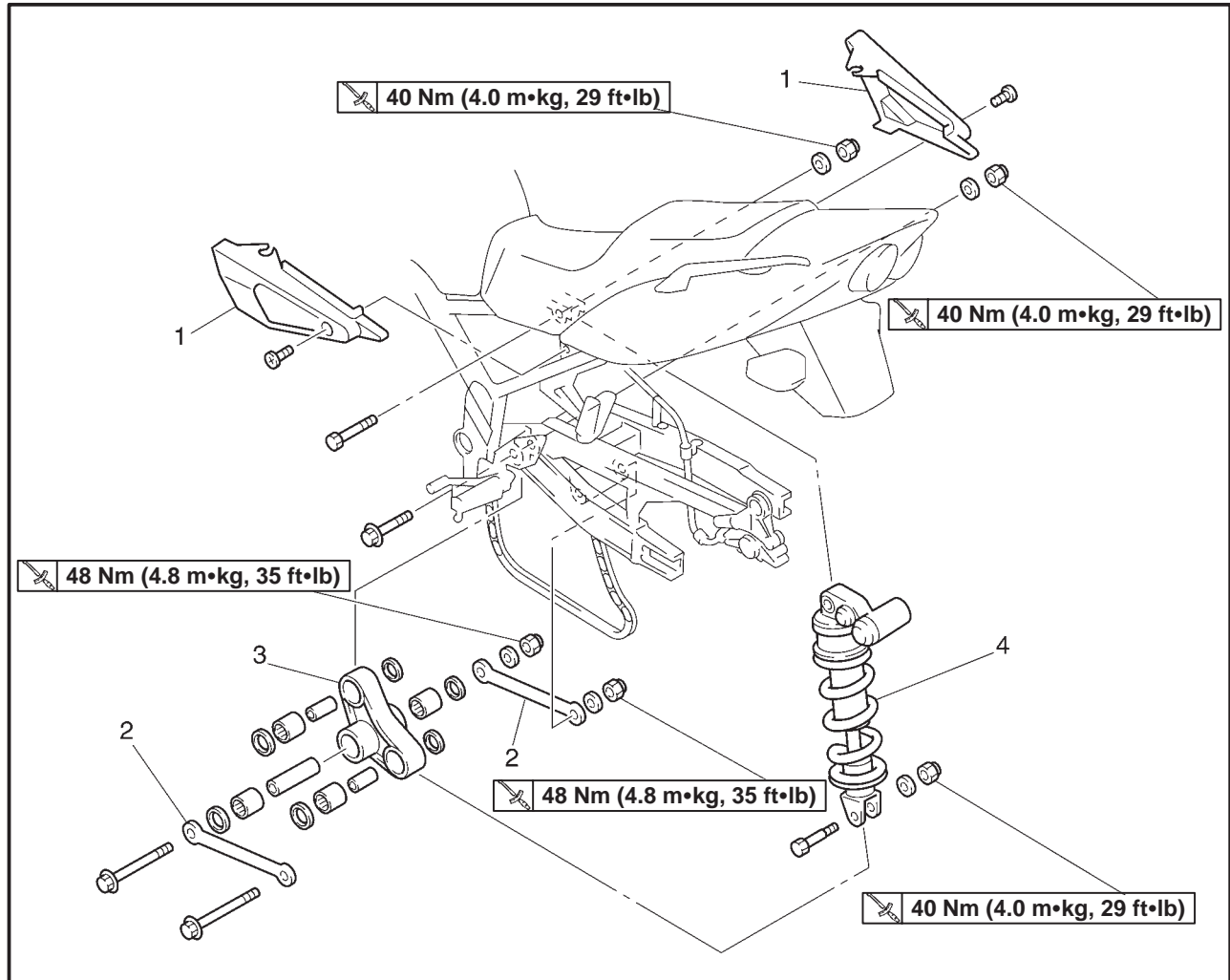
NOTE:

Temporarily tighten the upper and lower bracket pinch bolts.



EAS00685

REAR SHOCK ABSORBER ASSEMBLY



Order	Job/Part	Q'ty	Remarks
	Removing the rear shock absorber assembly		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL"
1	Side cover (left/right)	1/1	
2	Connecting arm	1	
3	Relay arm	1	
4	Rear shock absorber	1	
			For installation, reverse the removal procedure.



EAS00694

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

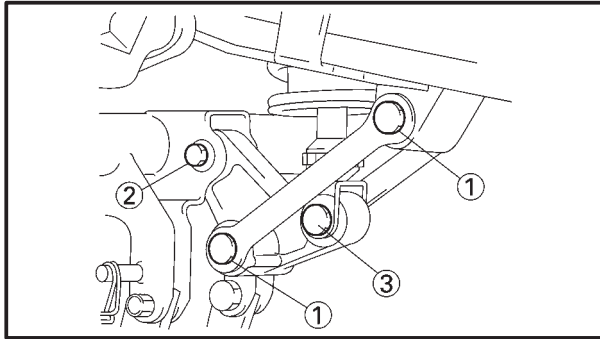
1. Stand the motorcycle on a level surface.

⚠ WARNING

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

NOTE:

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

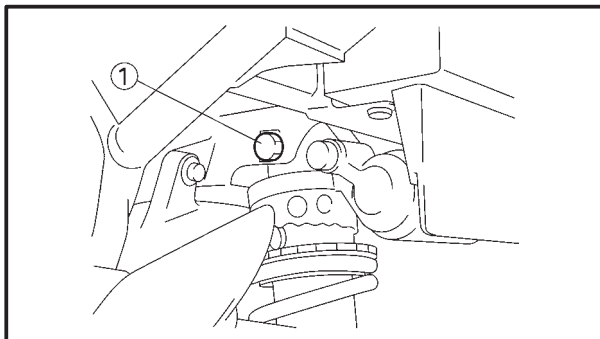


2. Remove:

- connecting arm bolt ①
- relay arm bolt ②
- rear shock absorber assembly lower bolt ③

NOTE:

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

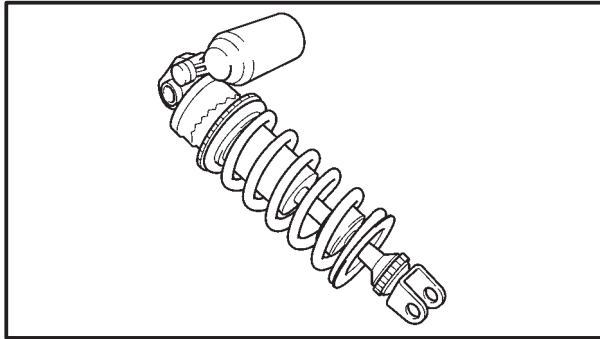


3. Remove:

- rear shock absorber assembly upper bolt ①
- rear shock absorber assembly

NOTE:

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



EAS00696

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:

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

EAS00698

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

1. Lubricate:

- spacers
- bearings



Recommended lubricant
Molybdenum disulfide grease

2. Install:

- rear shock absorber assembly



Rear shock absorber assembly upper nut

40 Nm (4.0 m•kg, 29 ft•lb)

Rear shock absorber assembly lower nut

40 Nm (4.0 m•kg, 29 ft•lb)

Relay-arm-to-frame-nut

40 Nm (4.0 m•kg, 29 ft•lb)

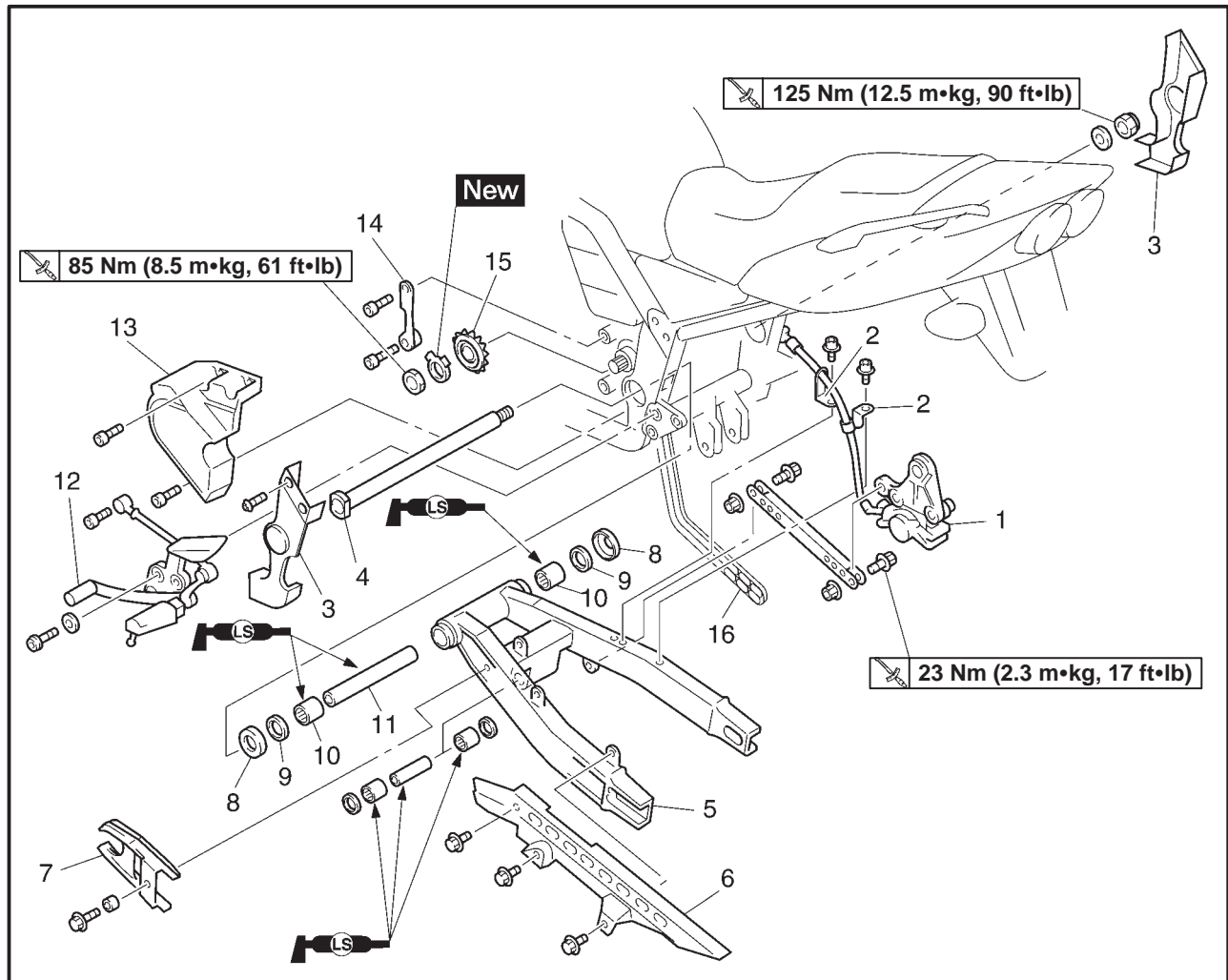
NOTE:

- When installing the rear shock absorber assembly, lift up the swingarm.
- Install the connecting arm front bolt from the right.

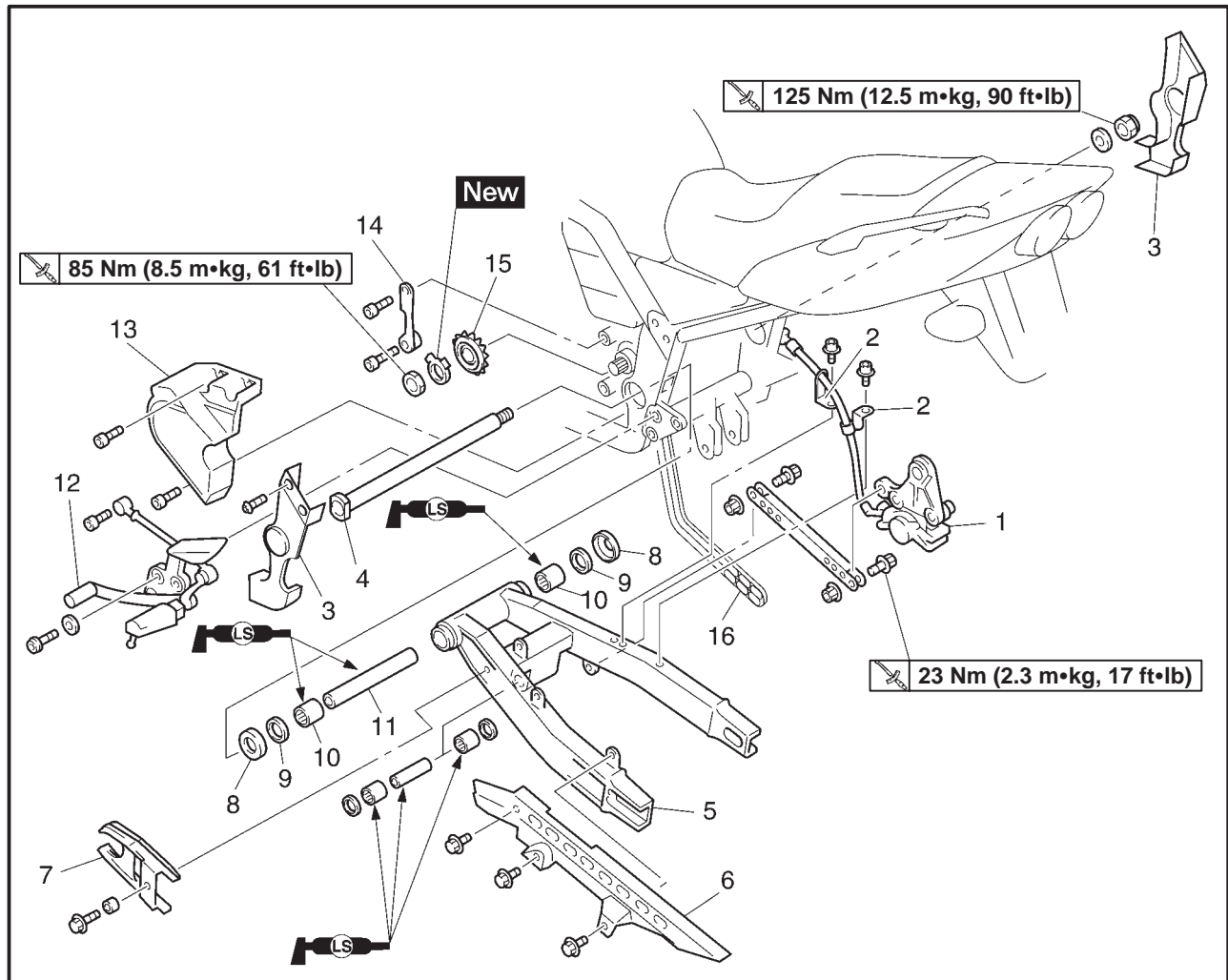


EAS00700

SWINGARM AND DRIVE CHAIN



Order	Job/Part	Q'ty	Remarks
	Removing the swing arm and drive chain		Remove the parts in the order listed.
	Rear wheel		Refer to "REAR WHEEL"
	Rear shock absorber assembly		Refer to "REAR SHOCK ABSORBER ASSEMBLY"
1	Rear brake caliper	1	NOTE: _____ Remove the side protector assembly. Do not remove the center cap.
2	Brake hose holder	2	
3	Side protector (left/right)	1/1	
4	Pivot shaft	1	
5	Swing arm	1	
6	Drive chain case	1	
7	Drive chain guard	1	
8	Dust cover	2	
9	Oil seal	2	



Order	Job/Part	Q'ty	Remarks
10	Bearing	2	For installation, reverse the removal procedure.
11	Spacer	1	
12	Shoft pedal assembly	1	
13	Drive sprocket cover	1	
14	Drive chain guide	1	
15	Drive sprocket	1	
16	Drive chain	1	



EAS00704

REMOVING THE DRIVE CHAIN

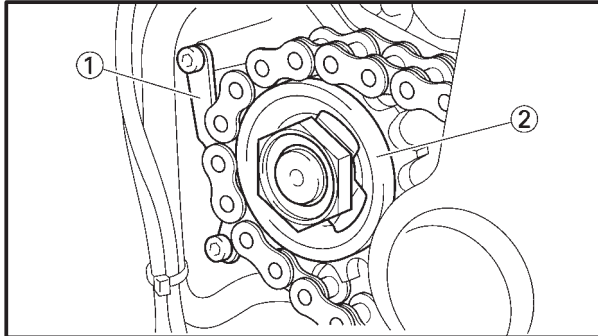
1. Stand the motorcycle on a level surface.

⚠ WARNING

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

NOTE:

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



2. Remove:

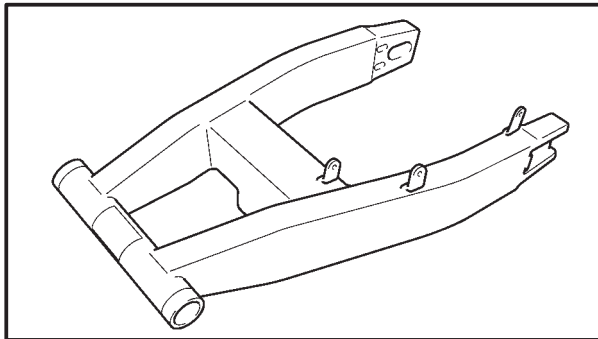
- foot rest (left)
- drive sprocket cover
- drive chain guide ①
- drive sprocket ②

EAS00707

CHECKING THE SWINGARM

1. Check:

- swingarm
- Bends/cracks/damage → Replace.

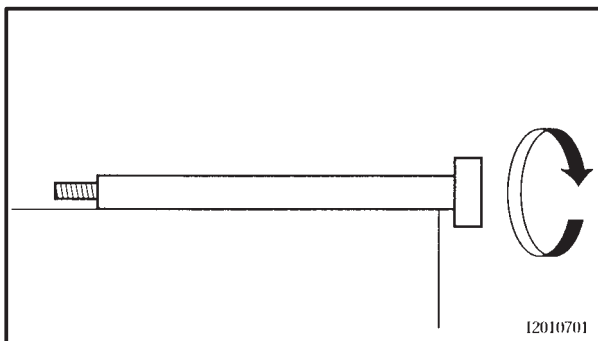


2. Check:

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

⚠ WARNING

Do not attempt to straighten a bent pivot shaft.

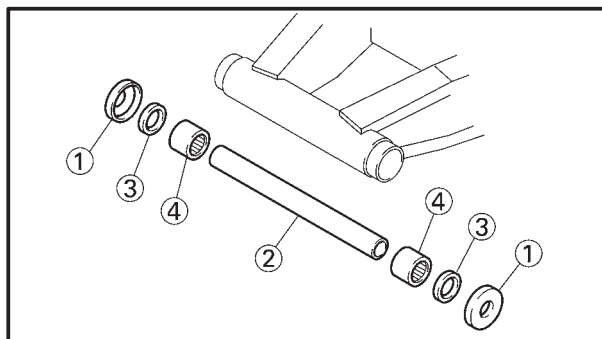


3. Wash:

- pivot shaft
- dust covers
- spacer
- washers
- bearings

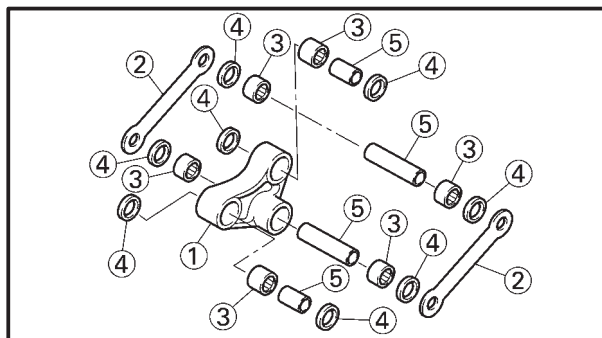


Recommended cleaning solvent
Kerosine



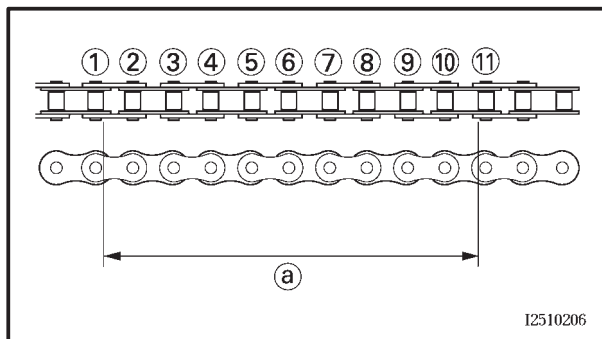
4. Check:

- dust covers ①
- spacer ②
- oil seals ③
- Damage/wear → Replace.
- bearings ④
- Damage/pitting → Replace.



5. Check:

- connecting arms ①
- relay arm ②
- Damage/wear → Replace.
- bearings ③
- oil seals ④
- Damage/pitting → Replace.
- spacers ⑤
- Damage/scratches → Replace.



EAS00709

CHECKING THE DRIVE CHAIN

1. Measure:

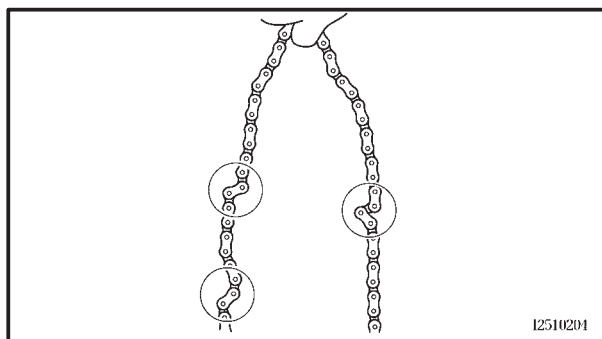
- ten-link section ① of the drive chain
- Out of specification → Replace the drive chain, the drive sprocket and the rear wheel sprocket as a set.



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

NOTE:

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



2. Check:

- drive chain
- Stiffness → Clean and lubricate or replace.



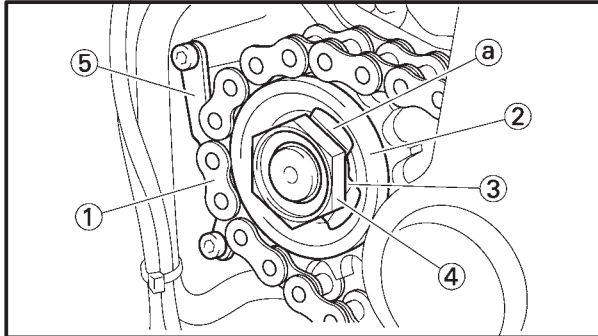
EAS00713

INSTALLING THE DRIVE CHAIN

1. Lubricate:
 - drive chain



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



2. Install:
 - drive chain ①
 - drive sprocket ②
 - lock washer ③ **New**
 - drive sprocket nut ④

85 Nm (8.5 m•kg, 61 ft•lb)

- drive chain guide ⑤

NOTE:

While applying the rear brake, tighten the drive sprocket nut.

3. Bend the lock washer tab (a) along a flat side of the nut.

EAS00711

INSTALLING THE SWINGARM

1. Lubricate:
 - bearings
 - spacers
 - dust covers
 - pivot shaft

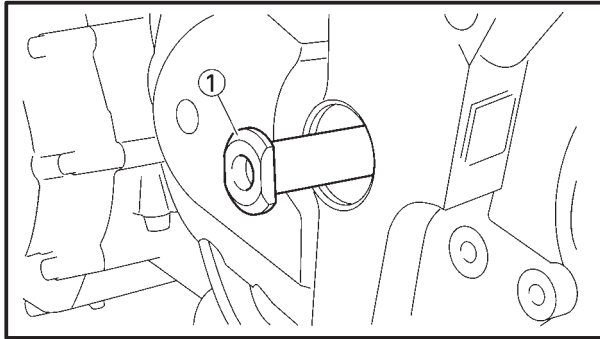


Recommended lubricant
Molybdenum disulfide grease

2. Install:
 - relay arm
 - left connecting arm
 - right connecting arm

48 Nm (4.8 m•kg, 35 ft•lb)

48 Nm (4.8 m•kg, 35 ft•lb)



NOTE:

Install the connecting arm front bolt ① from the right.

3. Install:

- rear shock absorber assembly
- rear wheel

Refer to "INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY" and "REAR WHEEL".

4. Adjust:

- drive chain slack

Refer to "ADJUSTING THE DRIVE CHAIN SLACK" in chapter 3.



Drive chain slack

40 ~ 50 mm (1.57 ~ 1.97 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.



CHAPTER 5

OVERHAULING THE ENGINE

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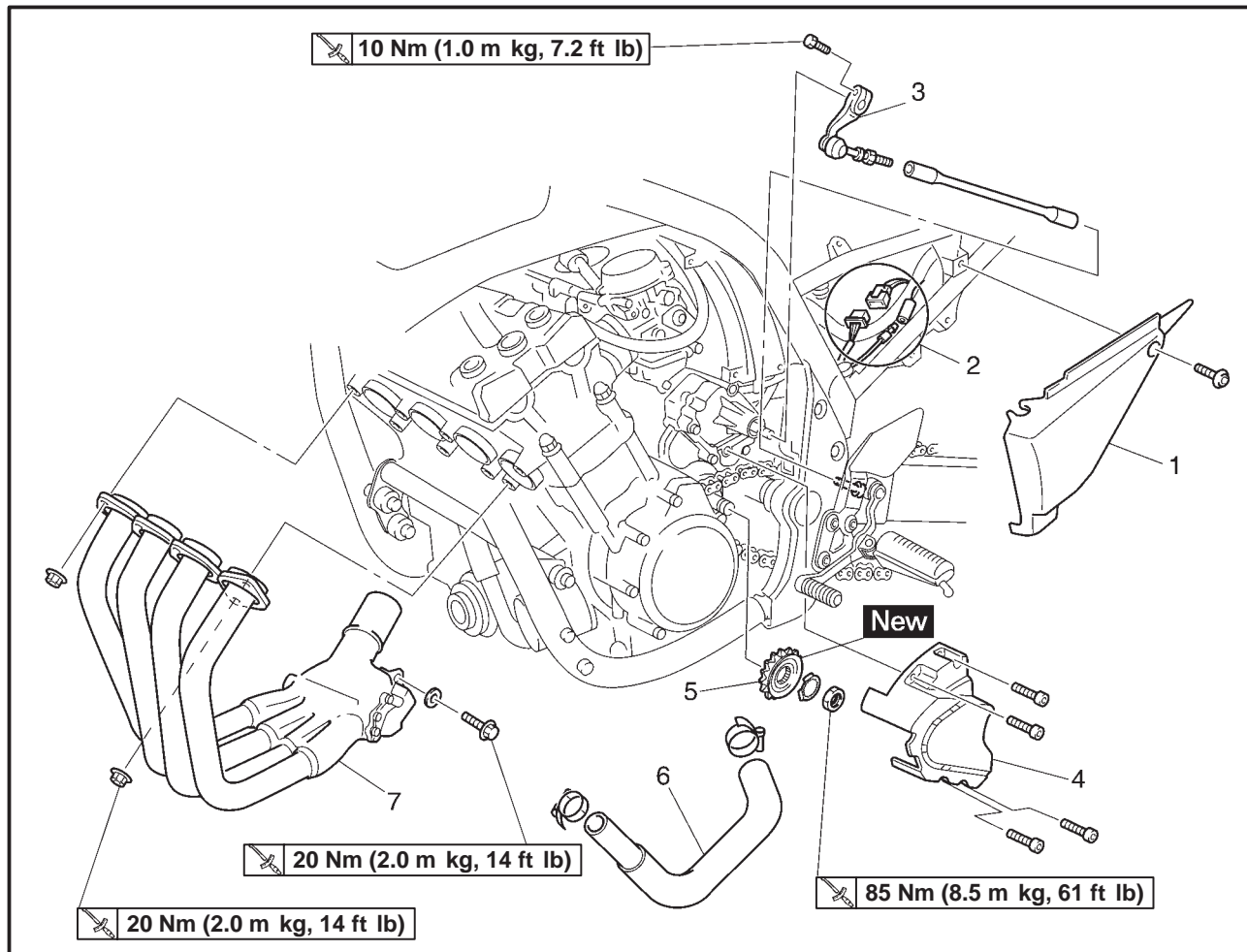


EAS00188

OVERHAULING THE ENGINE

ENGINE

DRIVE SPROCKET AND EXHAUST PIPE

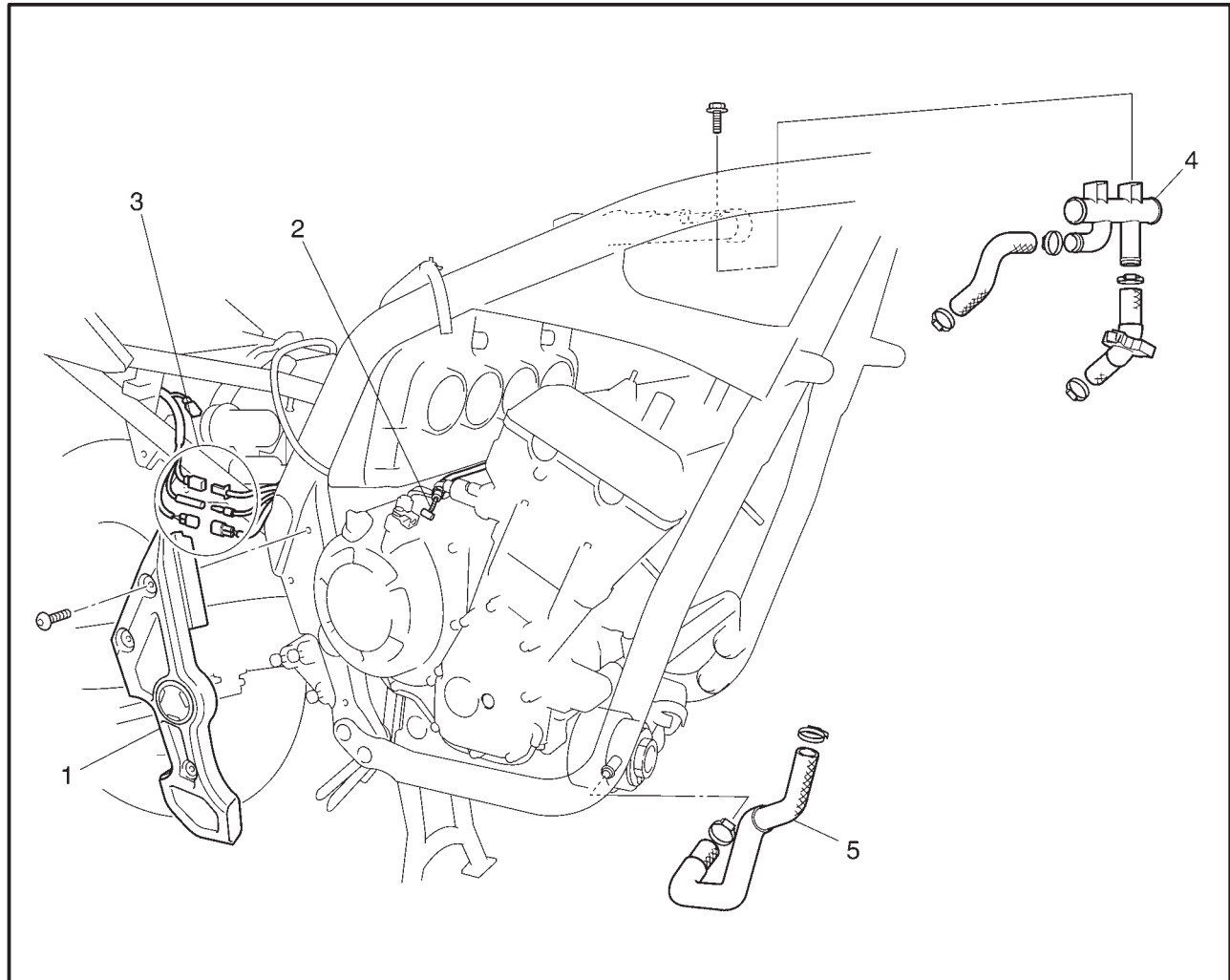


Order	Job/Part	Q'ty	Remarks
	Removing the drive sprocket and exhaust pipe		Remove the parts in the order listed.
	Carburetor		Refer to "CARBURETORS" in chapter 7.
	Plug code		
	Ignition coil		
	Radiator		Refer to "RADIATOR" in chapter 6.
	Water hose		
	Air iduction system		Refer to "AIR INDUCTION SYSTEM" in chapter 7.
1	Side cover (left)	1	
2	Stator coil coupler/oil level switch	1/1	
3	Shit rod	1	
4	Drive sprocket cover	1	
5	Drive sprocket	1	
6	Water outlet hose	1	
7	Exhaust pipe	1	
			For installation, reverse the removal procedure.



EAS00189

LEADS AND HOSES

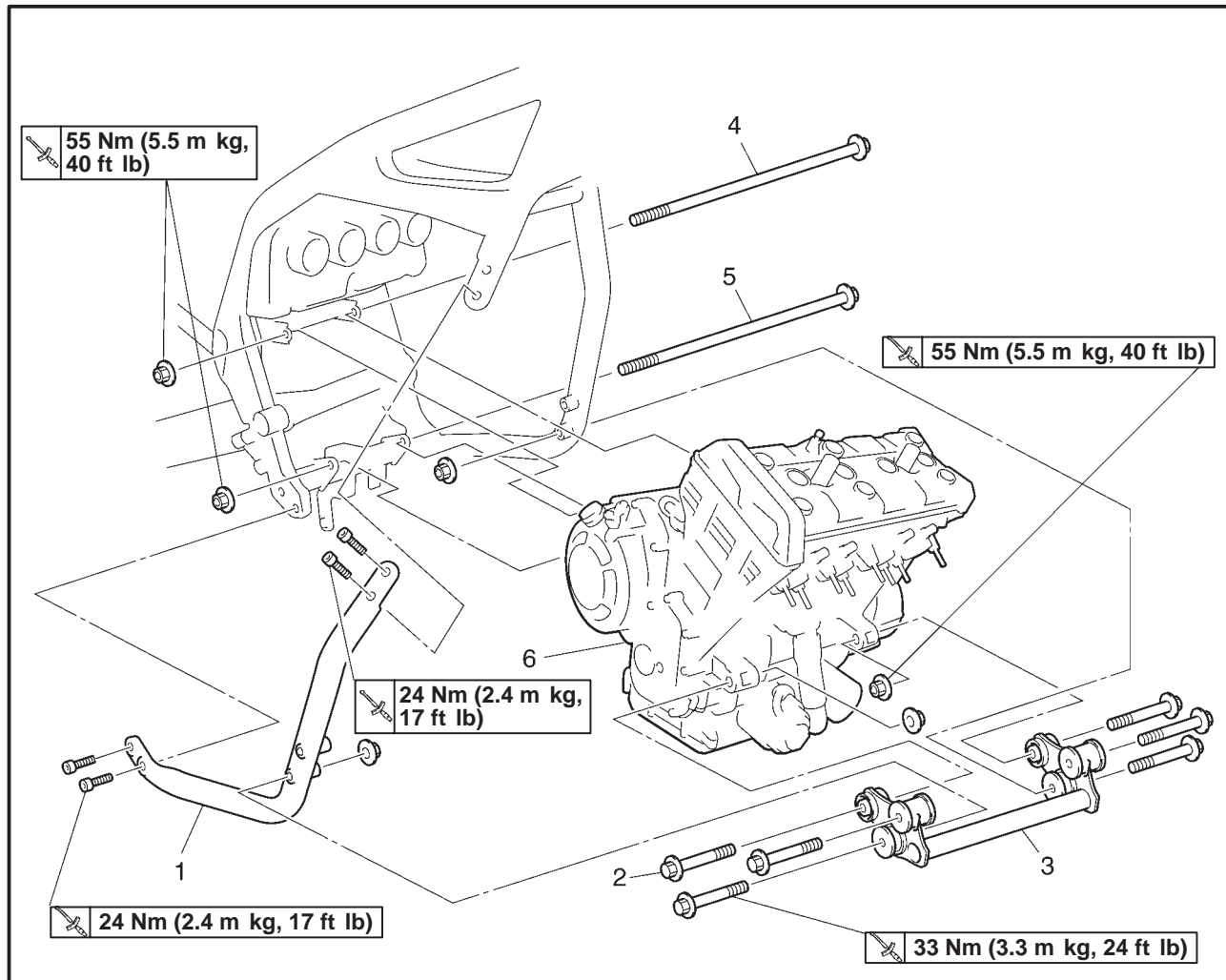


Order	Job/Part	Q'ty	Remarks
	Removing the leads and hoses		Remove the parts in the order listed.
1	Cover	1	
2	Clutch cable	1	
3	Neutral switch/speed sensor/pickup coil lead	1/1/1	Disconnect.
4	Water head pipe	1	
5	Coolant outlet hose	1	
			For installation, reverse the removal procedure.



EAS00191

ENGINE



Order	Job/Part	Q'ty	Remarks
	Removing the engine		
1	Down tube	1	Remove the parts in the order listed.
2	Engine mounting bolt (front)	2	
3	Engine bracket	1	
4	Engine mounting bolt (rear upper)	1	
5	Engine mounting bolt (rear lower)	1	
6	Engine	1	For installation, reverse the removal procedure.



EAS00192

INSTALLING THE ENGINE

1. Install:
- engine mount bolt ①
 - engine mount bolt ②
 - engine mount bolts ③
 - engine bracket ④
 - engine mount bolt ⑤
 - down tube ⑥

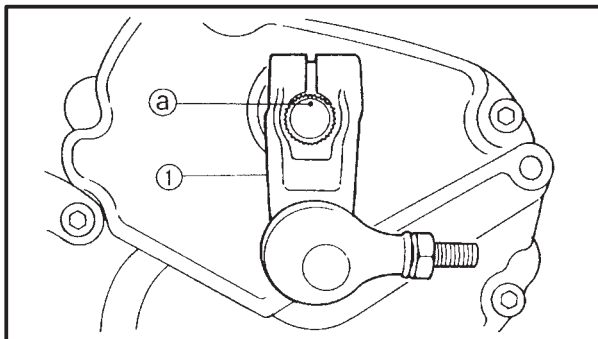
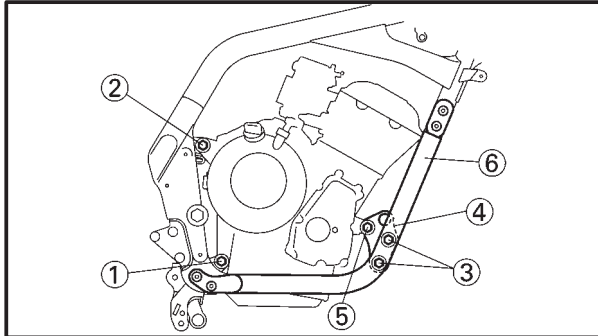
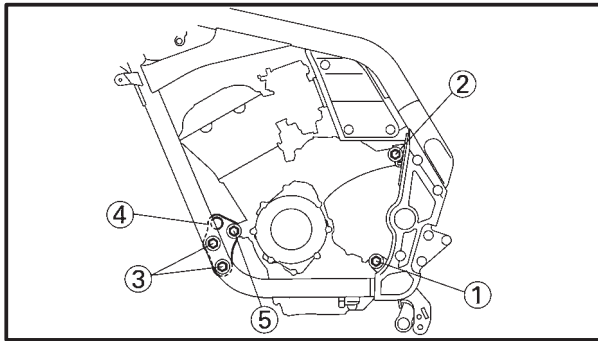
NOTE:

Do not fully tighten the bolts.

2. Tighten the bolts in the following order.



- Engine mount bolt ①**
55 Nm (5.5 m kg, 40 ft lb)
- Engine mount bolt ②**
55 Nm (5.5 m kg, 40 ft lb)
- Engine mount bolt ③**
33 Nm (3.3 m kg, 24 ft lb)
- Engine mount bolt ⑤**
55 Nm (5.5 m kg, 40 ft lb)
- Down tube ⑥**
24 Nm (2.4 m kg, 17 ft lb)



3. Install:
- shift arm ①

10 Nm (10 m kg, 7.2 ft lb)

NOTE:

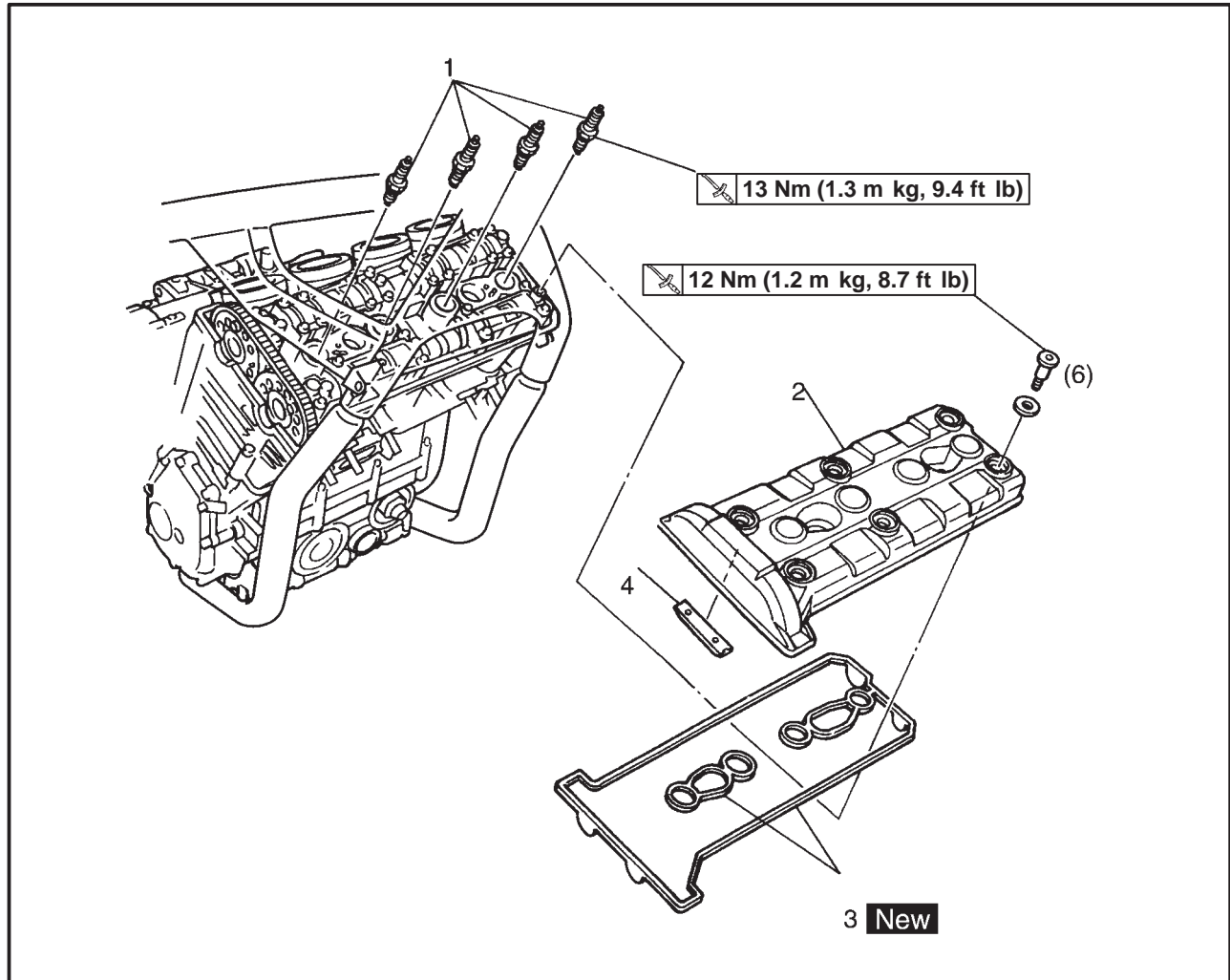
Align the punch mark ② in the shift shaft with the slot in the shift arm.

Align the bottom edge of the shift pedal with the mark on the frame-to-swingarm bracket.



EAS00194

CAMSHAFT CYLINDER HEAD COVER

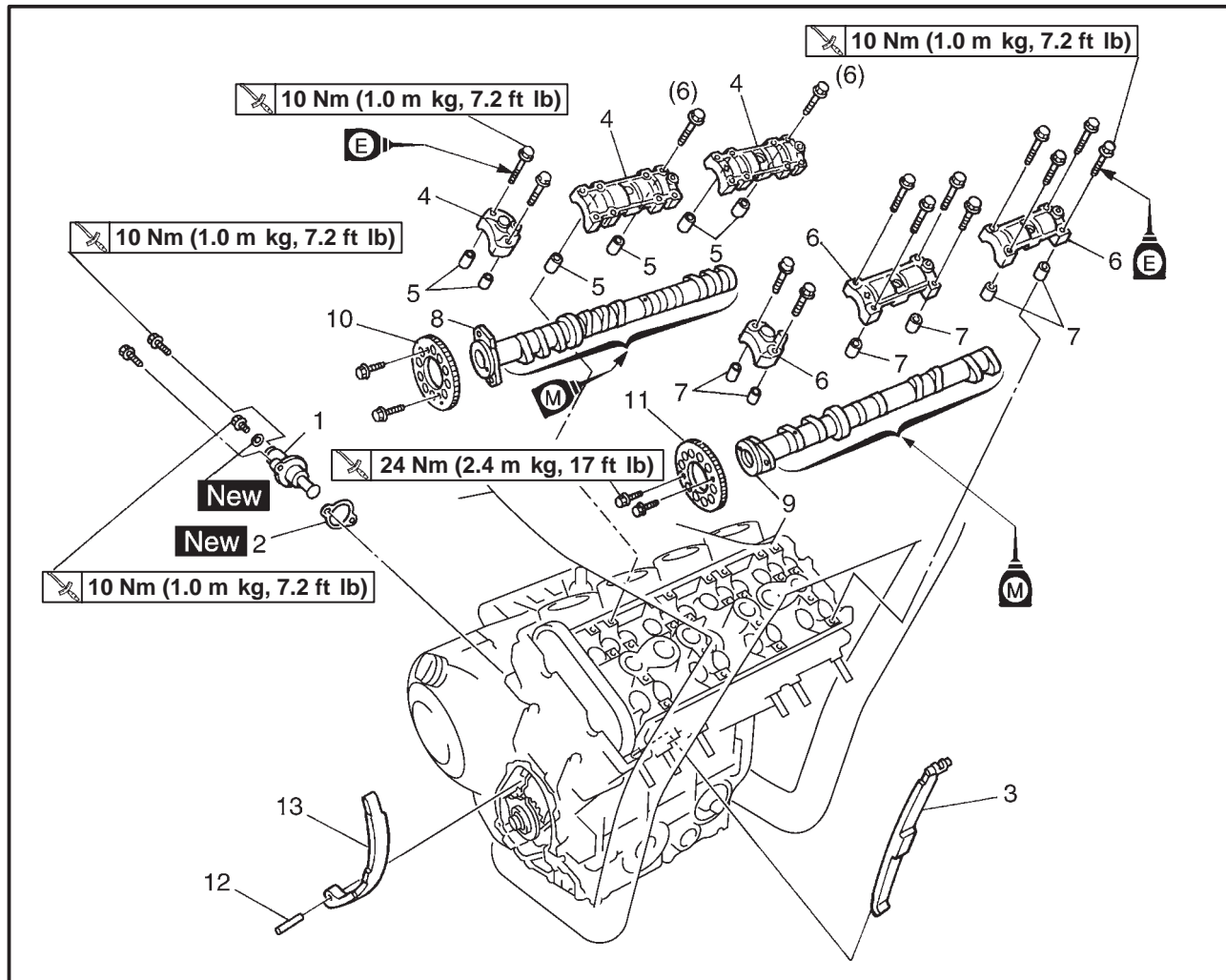


Order	Job/Part	Q'ty	Remarks
	Removing the cylinder head cover		
	Carburetor assembly		Remove the parts in the order listed.
	Radiator assembly and thermostat assembly		Refer to "CARBURETORS" in chapter 7.
1	Spark plug	4	Refer to "RADIATOR" and "THERMOSTAT ASSEMBLY" in chapter 6.
2	Cylinder head cover	1	
3	Cylinder head cover gasket	1	
4	Timing chain guide (top side)	1	
			For installation, reverse the removal procedure.

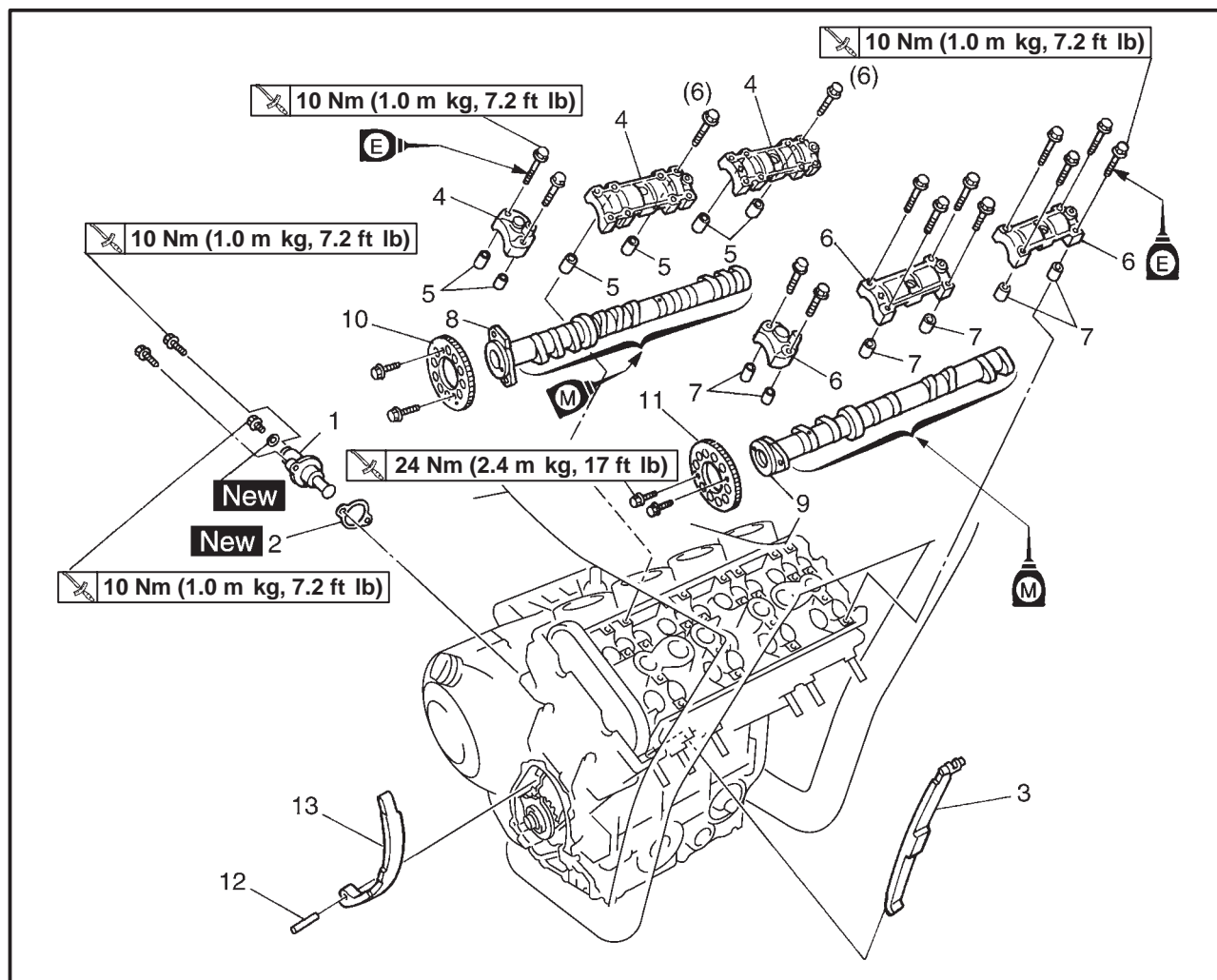


EAS00196

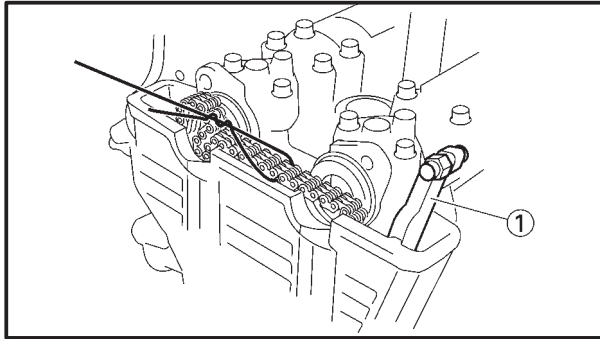
CAMSHAFTS



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



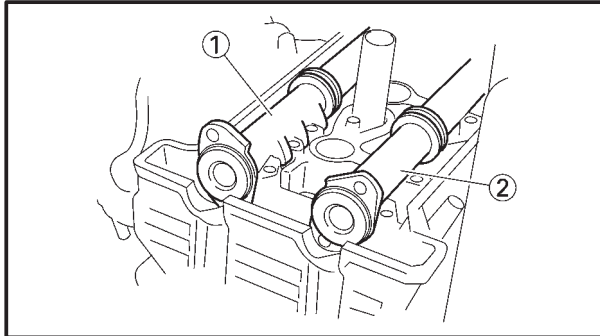
Order	Job/Part	Q'ty	Remarks
10	Intake camshaft sprocket	1	For installation, reverse the removal procedure.
11	Exhaust camshaft sprocket	1	
12	Pin	1	
13	Timing chain guide (intake side)	1	



7. Remove
timing chain guide (exhaust side) ①
camshaft caps
dowel pins

CAUTION:

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

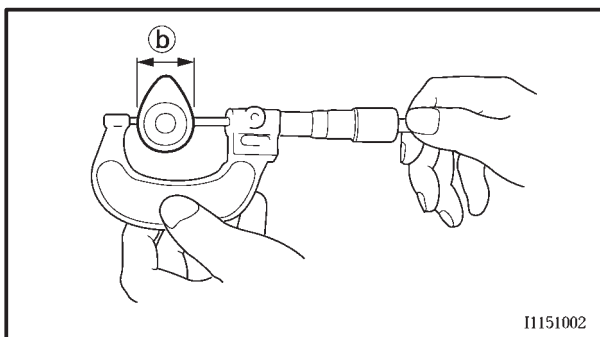
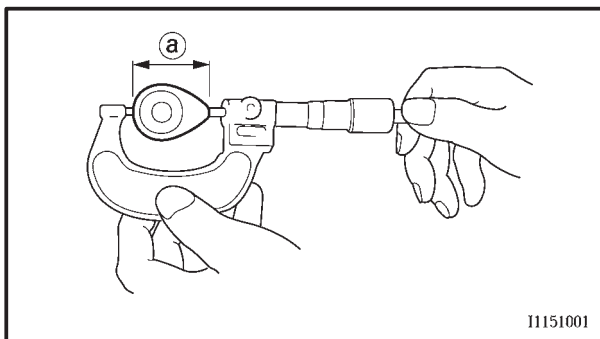


8. Remove:
intake camshaft ①
exhaust camshaft ②

EAS00204

CHECKING THE CAMSHAFTS

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



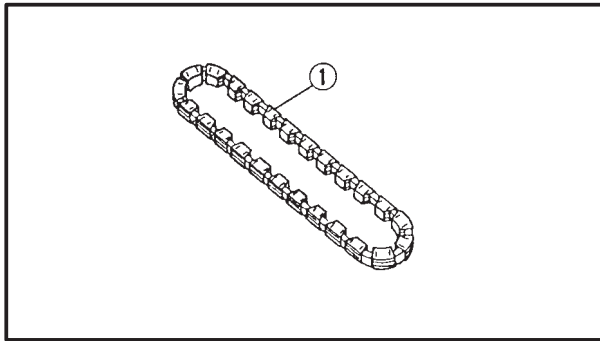
2. Measure:
camshaft lobe dimensions ① and ②
Out of specification → Replace the camshaft.

**Camshaft lobe dimension limit****Intake**

- ① 32.4 mm (1.2756 in)
- ② 24.85 mm (0.9783 in)

Exhaust

- ① 32.85 mm (1.2933 in)
- ② 24.85 mm (0.9783 in)



EAS00208

CHECKING THE TIMING CHAIN, CAMSHAFT SPROCKETS, AND TIMING CHAIN GUIDES

The following procedure applies to all of the camshaft sprockets and timing chain guides.

1. Check:

Ⓐ Timing chain (1)

Damage/stiffness → Replace the timing chain and camshaft sprockets as a set.

2. Check:

Ⓐ Camshaft sprocket

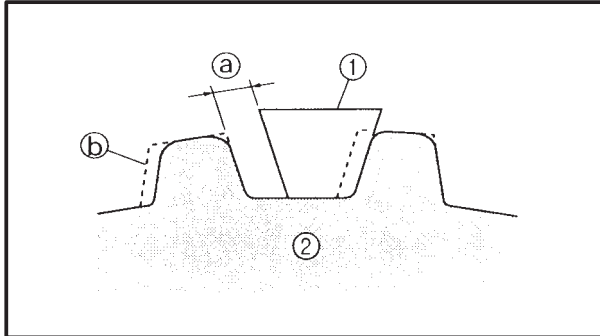
More than 1/4 tooth (a) wear → Replace the camshaft sprockets and the timing chain as a set.

(a) 1/4 tooth

(b) Correct

(1) Timing chain roller

(2) Camshaft sprocket



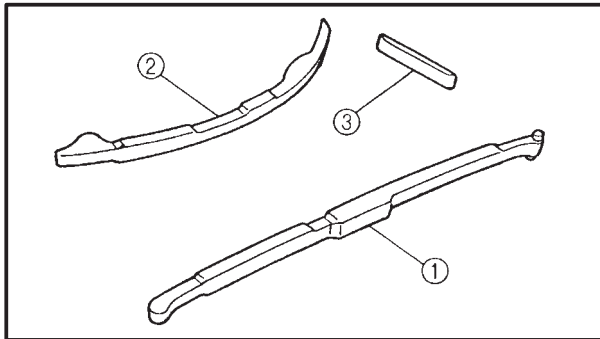
3. Check:

Ⓐ Timing chain guide (exhaust side) (1)

Ⓐ Timing chain guide (intake side) (2)

Ⓐ Timing chain guide (top side) (3)

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



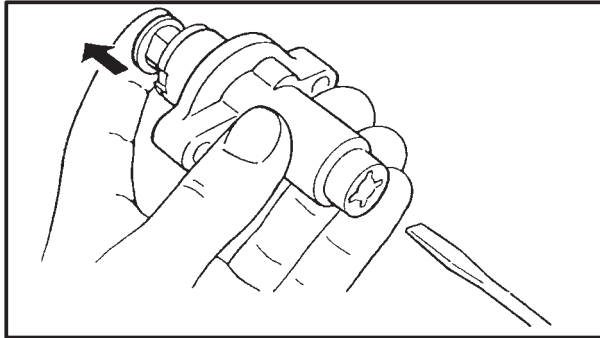
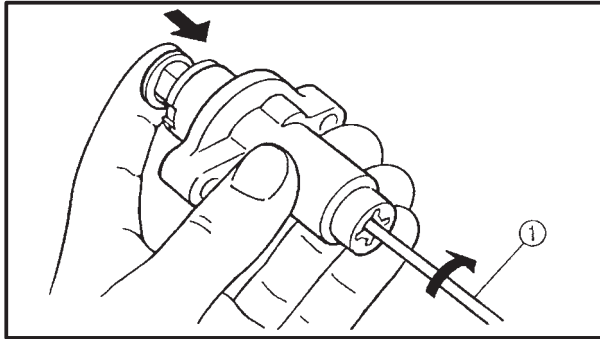
EAS00210

CHECKING THE TIMING CHAIN TENSIONER

1. Check:

Ⓐ Timing chain tensioner

Cracks/damage → Replace.



2. Check:

Ⓑ one-way cam operation

Rough movement → Replace the timing chain tensioner housing.



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

NOTE:

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

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



3. Check:

Ⓑ cap bolt

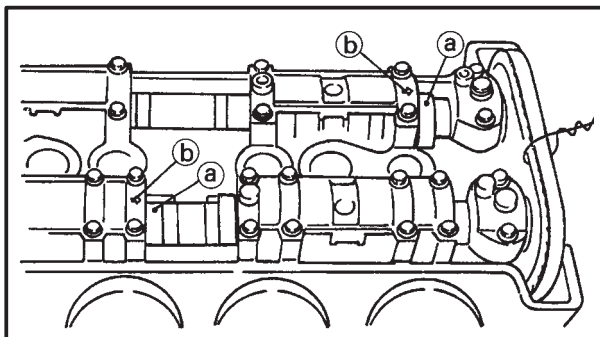
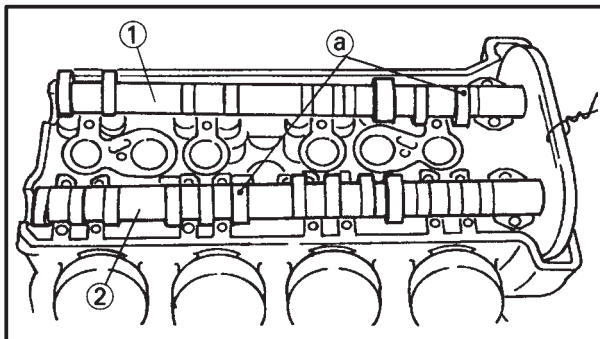
Ⓑ copper washer

Ⓑ spring

Ⓑ gasket

Ⓑ timing chain tensioner rod

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



EAS00217

INSTALLING THE CAMSHAFTS

1. Install:

Ⓑ exhaust camshaft ①

Ⓑ intake camshaft ②

NOTE:

Install the camshafts with the punch mark (a) facing up.

2. Install:

Ⓑ dowel pins

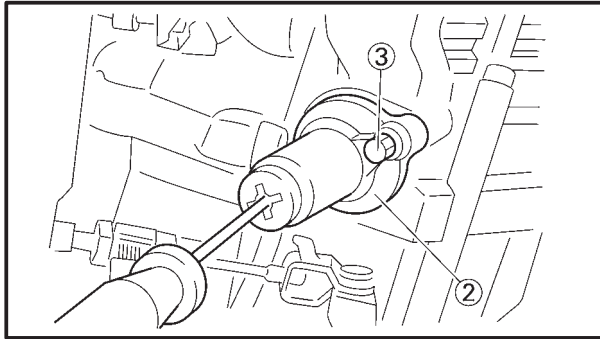
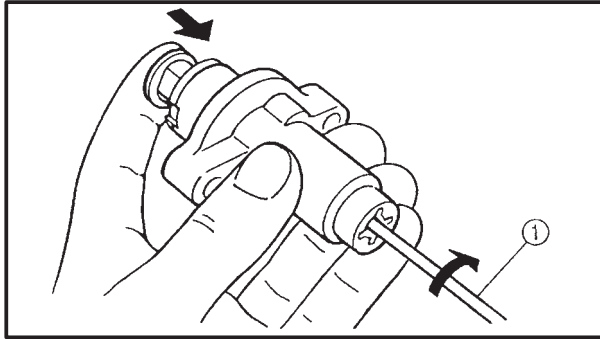
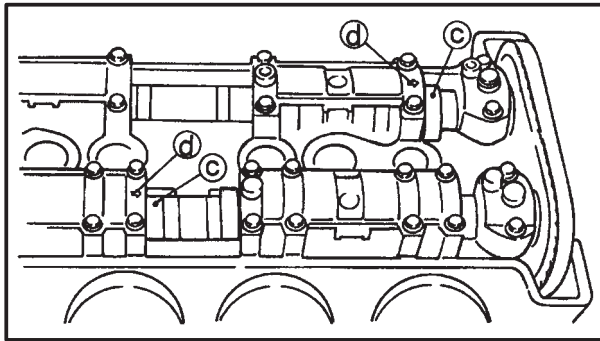
Ⓑ intake camshaft caps

Ⓑ exhaust camshaft caps

NOTE:

Make sure that the punch marks (a) on the camshafts are aligned with the arrow marks (b) on the camshaft caps.

Out of alignment → Reinstall.



- d. Turn both camshafts opposite each other so that the punch marks ③ in the camshaft are aligned with the arrow marks ④ in the camshaft caps as shown.
- e. While holding the camshafts, temporarily tighten the camshaft sprocket bolts.

5. Install:
Ⓜ timing chain tensioner

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

⚠ WARNING

Always use a new gasket.

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



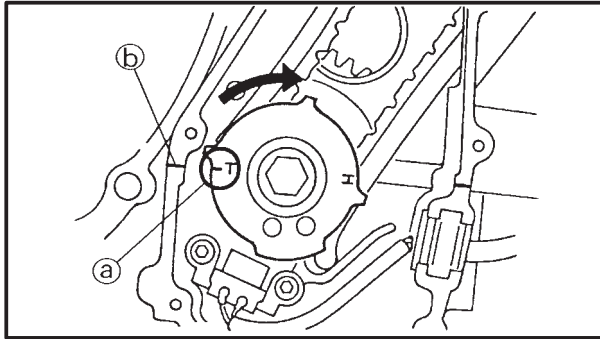
Timing chain tensioner bolt
10 Nm (1.0 mⒻkg, 7.2 ftⒻlb)

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



Timing chain cap bolt
12 Nm (1.2 mⒻkg, 8.7 ftⒻlb)

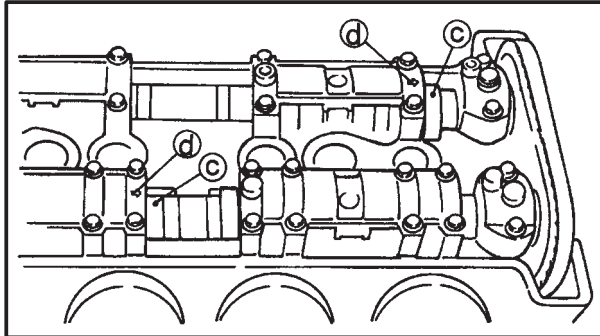
6. Turn:
Ⓜ crankshaft
(several turns clockwise)



7. Check:

ⓇT mark ⓐ

Make sure that the "T" mark ⓐ on the pickup coil rotor is aligned with the crankcase mating surface ⓑ.



Ⓡcamshaft punch marks ⓐ

Make sure that the marks ⓐ on the camshaft are aligned with the arrow marks ⓑ in the camshaft caps.

Out of alignment → Adjust.

Refer to the installation steps above.

8. Measure:

Ⓡvalve clearance

Out of specification → Adjust.

Refer to "ADJUSTING THE VALVE CLEARANCE" in chapter 3.

9. Install:

Ⓡtiming mark accessing screw

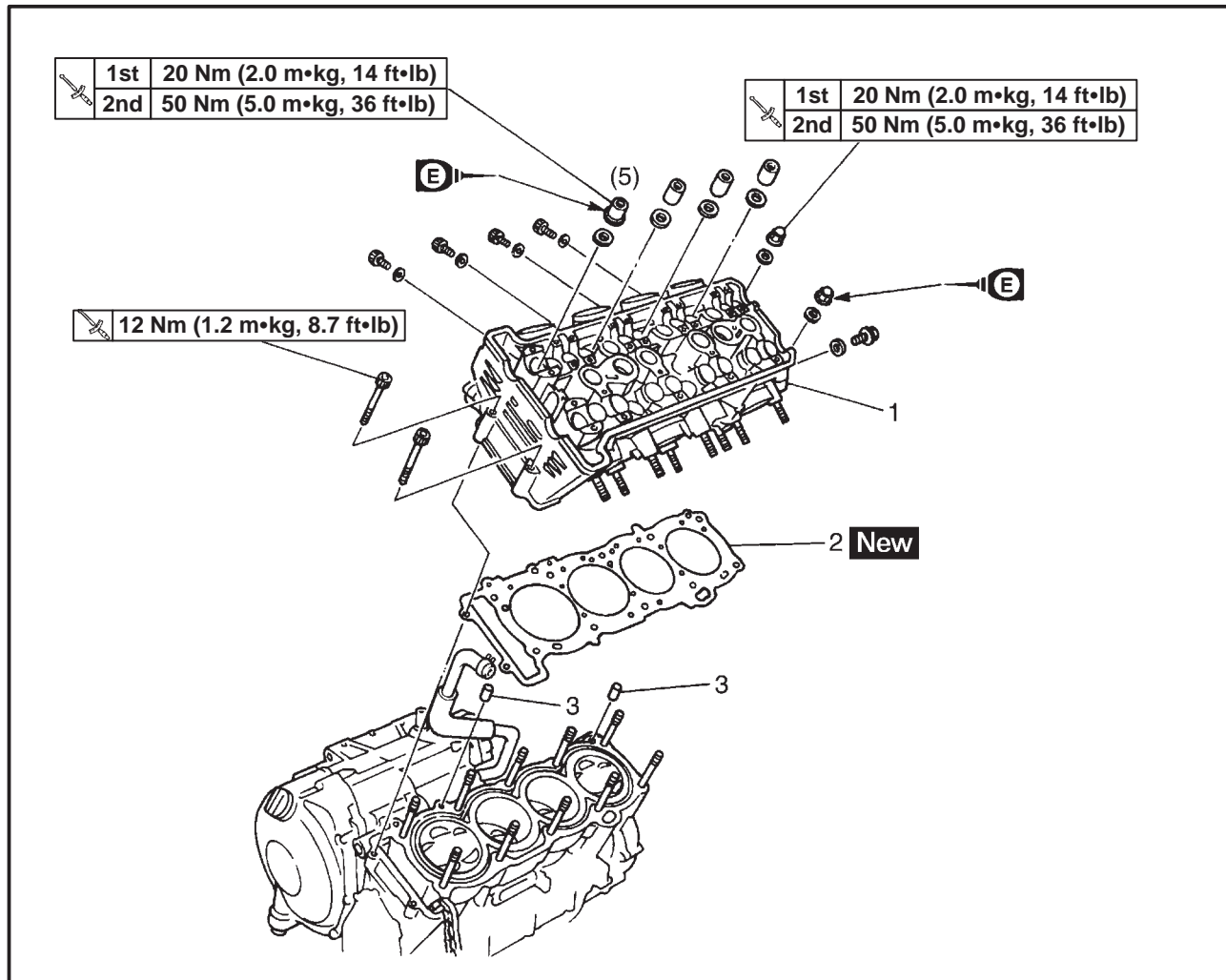
15 Nm (15 mⓇg, 11 ftⓇb)

Ⓡcrankshaft end cover

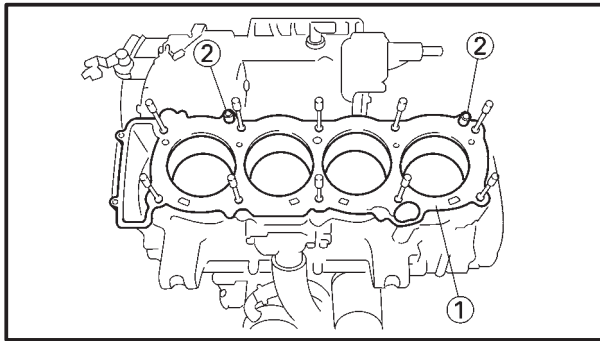


EAS00221

CYLINDER HEAD



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



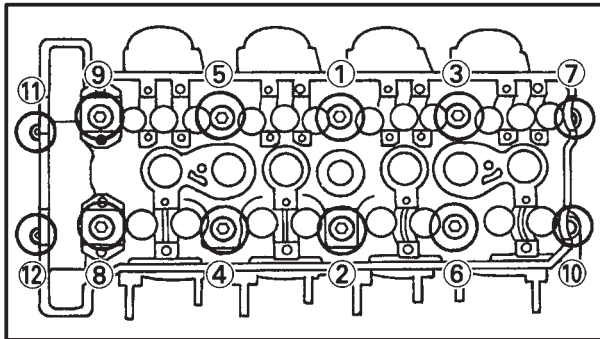
EAS00233

INSTALLING THE CYLINDER HEAD

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

NOTE: _____

Pass the timing chain through the timing chain cavity.



3. Tighten:

Ⓑ cylinder head nuts ① ~ ⑩

1st **20 Nm (2.0 mⒶkg, 14 ftⒶlb)**

2nd **50 Nm (5.0 mⒶkg, 36 ftⒶlb)**

Ⓑ cylinder head bolt ⑪ ⑫

12 Nm (1.2 mⒶkg, 8.7 ftⒶlb)

NOTE: _____

Ⓑ First, tighten the nuts ① ~ ⑩ to approximately 20 Nm (2.0 mⒶkg, 14 ftⒶlb) with a torque wrench.

Ⓑ Retighten the nuts to 50 Nm (5.0 mⒶkg, 36 ftⒶlb).

NOTE: _____

Ⓑ Apply engine oil onto the threads of the cylinder head nuts.

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

4. Install:

Ⓑ exhaust camshaft

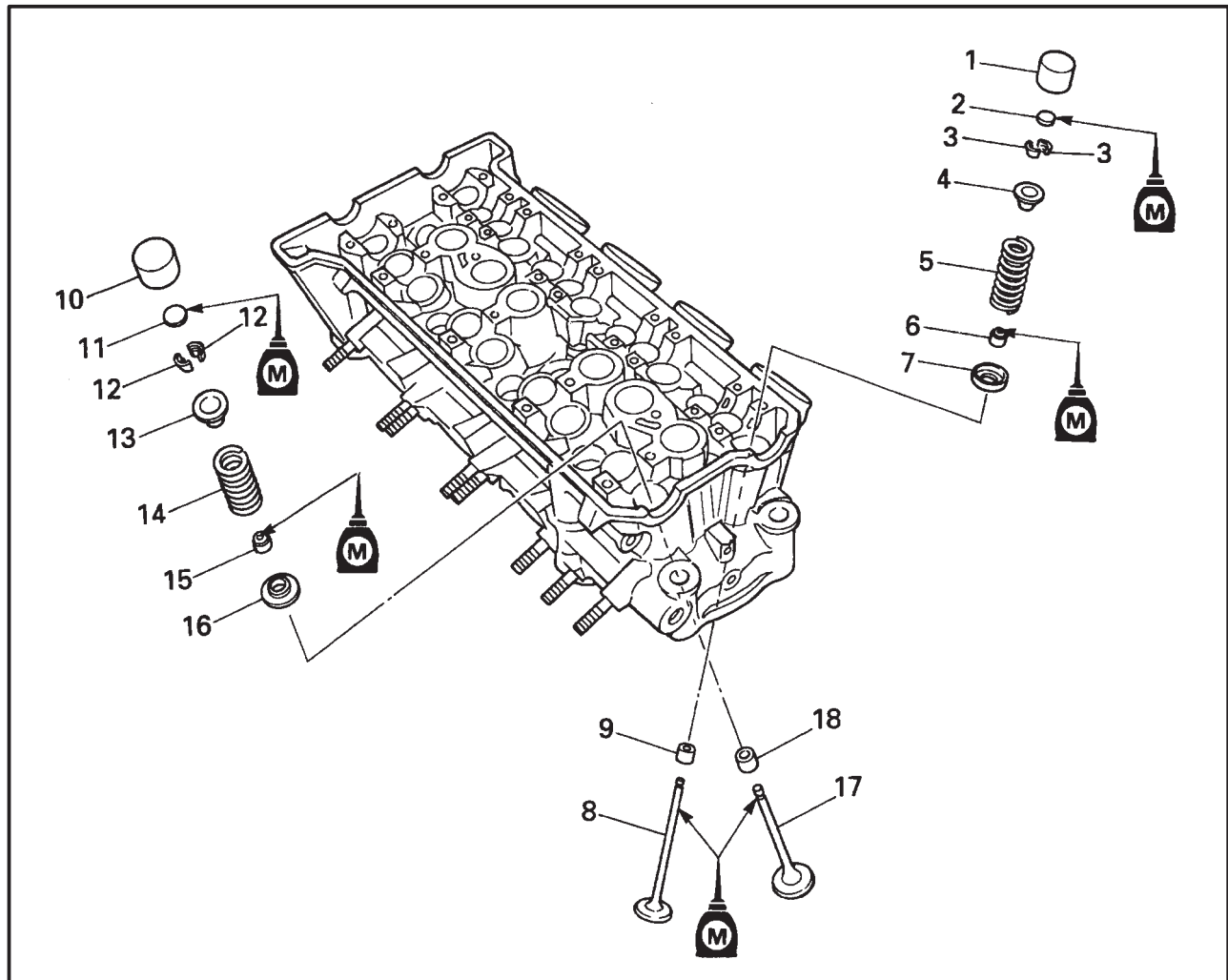
Ⓑ intake camshaft

Refer to "INSTALLING THE CAMSHAFTS".

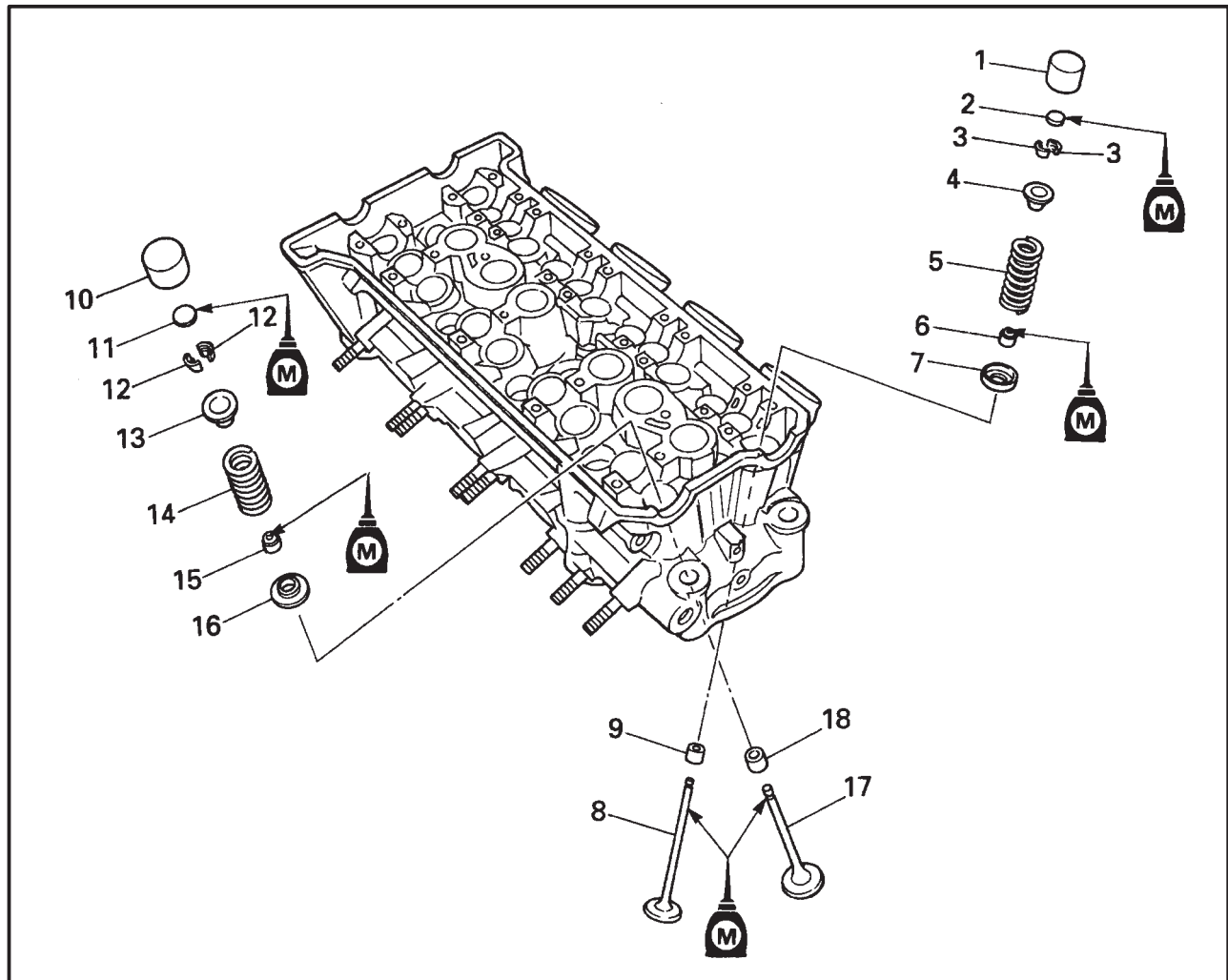


EAS00236

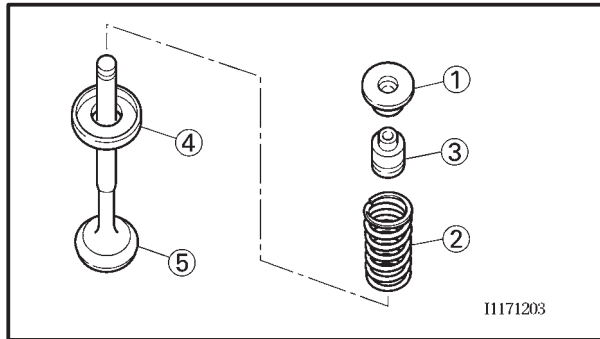
VALVES AND VALVE SPRINGS



Order	Job/Part	Q'ty	Remarks
	Removing the valves and valve springs		Remove the parts in the order listed.
	Cylinder head		Refer to "CYLINDER HEAD".
1	Intake valve lifter	12	
2	Intake valve pad	12	
3	Intake valve cotter	24	
4	Intake valve upper spring seat	12	
5	Intake valve spring	12	
6	Intake valve oil seal	12	
7	Intake valve lower spring seat	12	
8	Intake valve	12	
9	Intake valve guide	12	



Order	Job/Part	Q'ty	Remarks
10	Exhaust valve lifter	8	For installation, reverse the removal procedure.
11	Exhaust valve pad	8	
12	Exhaust valve cotter	16	
13	Exhaust valve upper spring seat	8	
14	Exhaust valve spring	8	
15	Exhaust valve oil seal	8	
16	Exhaust valve lower spring seat	8	
17	Exhaust valve	8	
18	Exhaust valve guide	8	

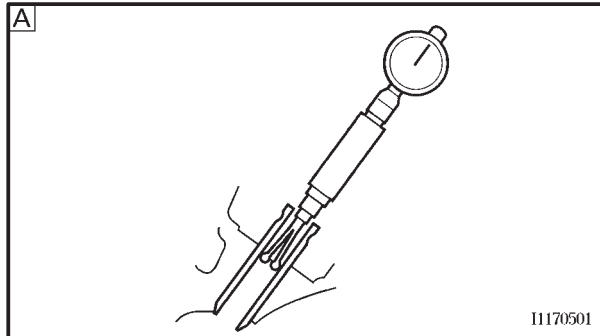


4. Remove:

- Ⓐ Rubber spring seat ①
- Ⓑ Valve spring ②
- Ⓒ Oil seal ③
- Ⓓ Lower spring seat ④
- Ⓔ Valve ⑤

NOTE:

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



EAS00239

CHECKING THE VALVES AND VALVE GUIDES

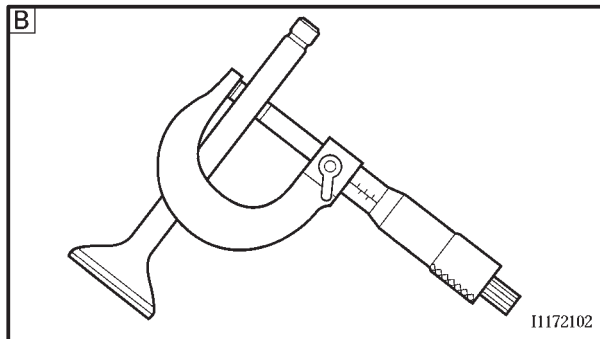
The following procedure applies to all of the valves and valve guides.

1. Measure:

- Ⓐ Valve-stem-to-valve-guide clearance

$$\text{Valve-stem-to-valve-guide clearance} = \text{Valve guide inside diameter } \text{A} - \text{Valve stem diameter } \text{B}$$

Out of specification → Replace the valve guide.



Valve-stem-to-valve-guide clearance

Intake

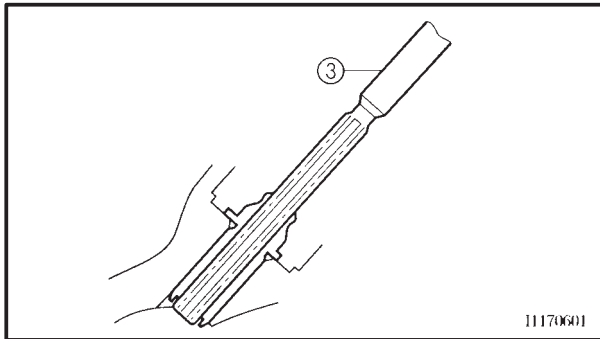
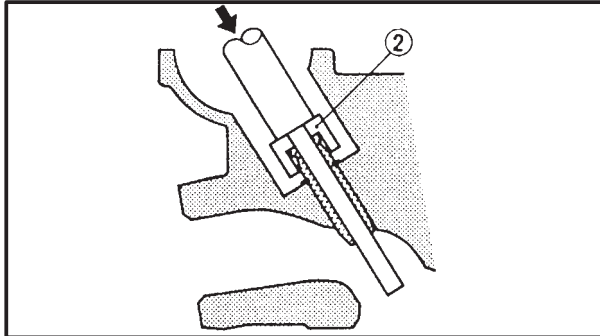
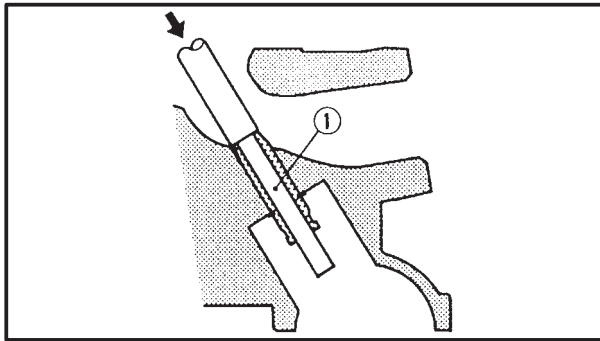
0.010 ~ 0.037 mm
(0.0004 ~ 0.0015 in)

<Limit>: 0.08 mm (0.0031 in)

Exhaust

0.020 ~ 0.047 mm
(0.0008 ~ 0.0019 in)

<Limit>: 0.1 mm (0.0039 in)



2. Replace:
- valve guide

NOTE:

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



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

NOTE:

After replacing the valve guide, reface the valve seat .



Valve guide remover
Intake (4.0 mm)

YM-04111

Exhaust (4.5 mm)

YM-4116

Valve guide installer

Intake (4.0 mm)

YM-04112

Exhaust (4.5 mm)

YM-4117

Valve guide reamer

Intake

YM-04113

Exhaust

YM4118



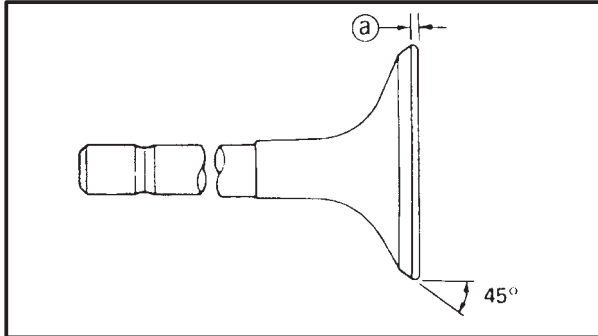


3. Eliminate:

- Ⓐ carbon deposits
(from the valve face and valve seat)

4. Check:

- Ⓐ valve face
Pitting/wear → Grind the valve face.
- Ⓐ valve stem end
Mushroom shape or diameter larger than the body of the valve stem → Replace the valve.



5. Measure:

- Ⓐ valve margin thickness Ⓐ
Out of specification → Replace the valve.



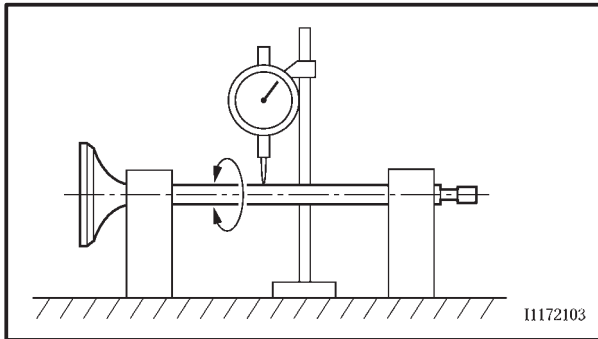
Valve margin thickness
0.5 ~ 0.9 mm (0.020 ~ 0.035 in)

6. Measure:

- Ⓐ valve stem runout
Out of specification → Replace the valve.

NOTE:

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



Valve stem runout
0.01 mm (0.0004 in)

EAS00240

CHECKING THE VALVE SEATS

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

1. Eliminate:

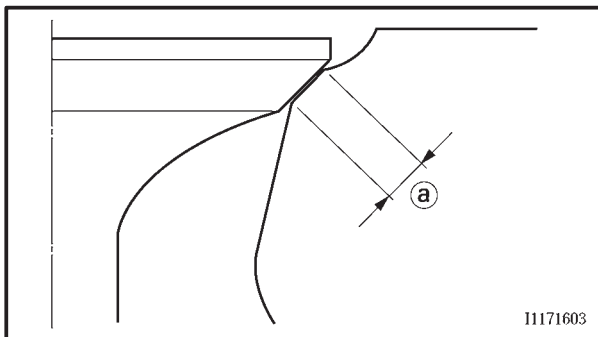
- Ⓐ carbon deposits
(from the valve face and valve seat)

2. Check:

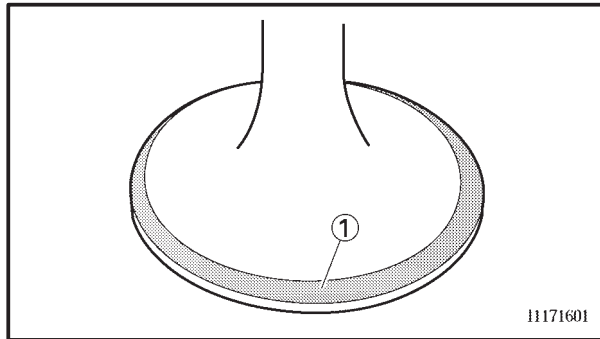
- Ⓐ valve seat
Pitting/wear → Replace the cylinder head.

3. Measure:

- Ⓐ valve seat width Ⓐ
Out of specification → Replace the cylinder head.



Valve seat width
Intake: 0.9 ~ 1.1 mm
(0.035 ~ 0.043 in)
Exhaust: 0.9 ~ 1.1 mm
(0.035 ~ 0.043 in)



- a. Apply Mechanic's blueing dye (Dykem) ① onto the valve face.
- b. Install the valve into the cylinder head.
- c. Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- d. Measure the valve seat width.

NOTE:

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

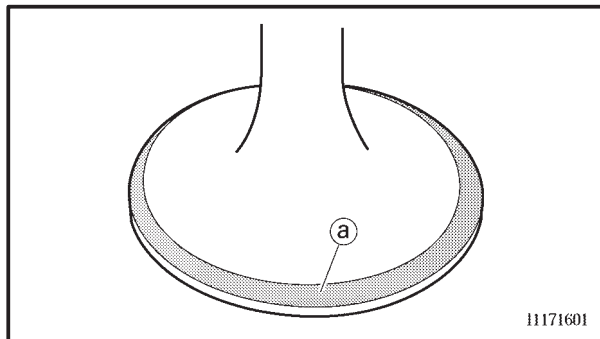
4. Lap:

Ⓜ valve face

Ⓜ valve seat

NOTE:

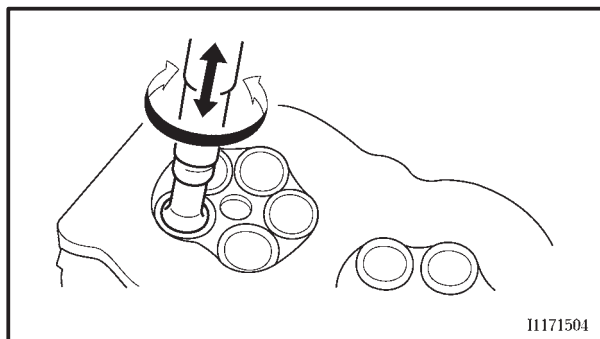
After replacing the cylinder head or replacing the valve and valve guide, the valve seat and valve face should be lapped.



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

CAUTION:

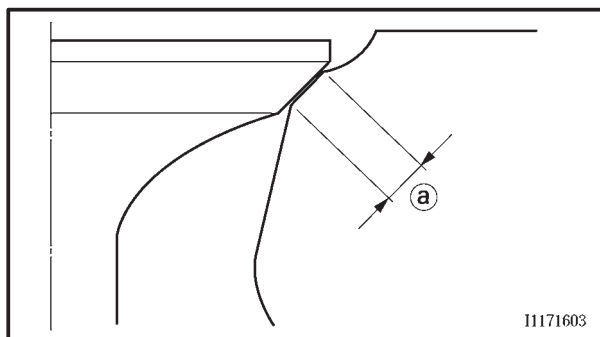
Do not let the lapping compound enter the gap between the valve stem and the valve guide.



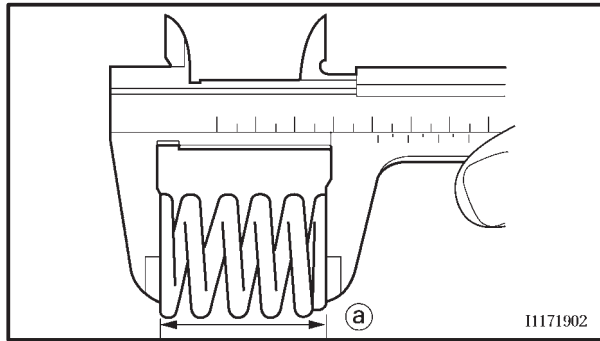
- b. Apply molybdenum disulfide oil onto the valve stem.
- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

NOTE:

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



- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.
- g. Apply Mechanic's blueing dye (Dykem) onto the valve face.
- h. Install the valve into the cylinder head.
- i. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- j. Measure the valve seat width Ⓜ again. If the valve seat width is out of specification, reface and lap the valve seat.



EAS00241

CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

1. Measure:

Ⓐ valve spring free length Ⓐ

Out of specification → Replace the valve spring.



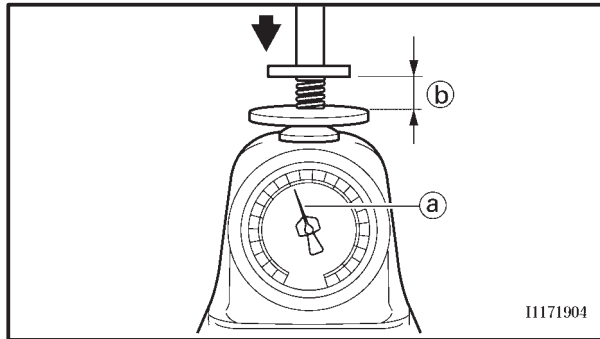
Valve spring free length

Intake spring

38.9 mm (1.53 in)

Exhaust spring

40.67 mm (1.60 in)



2. Measure:

Ⓐ compressed spring force Ⓐ

Out of specification → Replace the valve spring.

Ⓑ Installed length



Compressed spring force

Intake

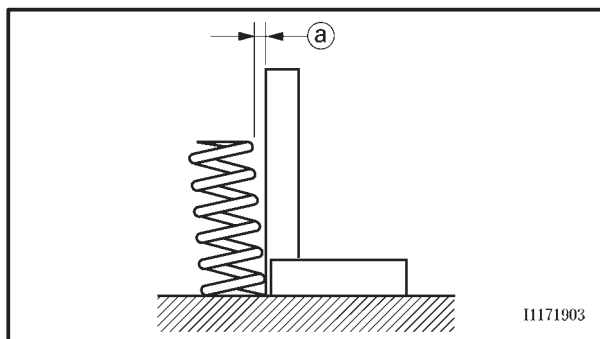
8.2 ~ 9.6 kg at 34.5 mm

(18.4 ~ 25.4 lb at 1.36 in)

Exhaust

11.0 ~ 12.6 kg at 35.0 mm

(24.7 ~ 28.3 lb at 1.38 in)



3. Measure:

Ⓐ valve spring tilt Ⓐ

Out of specification → Replace the valve spring.



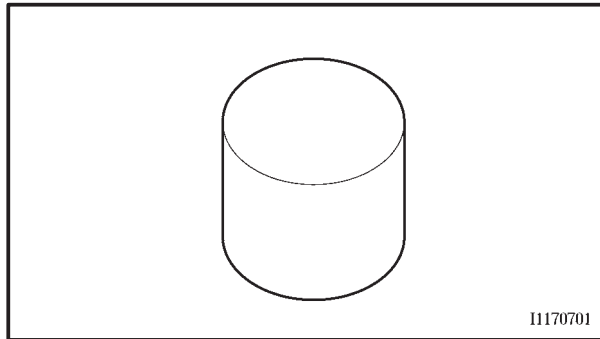
Spring tilt limit

Intake

1.7 mm (0.067 in)

Exhaust

1.8 mm (0.071 in)



EAS00242

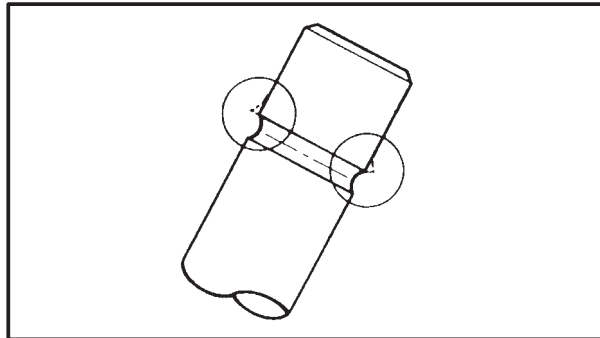
CHECKING THE VALVE LIFTERS

The following procedure applies to all of the valve lifters.

1. Check:

Ⓐ valve lifter

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



EAS00245

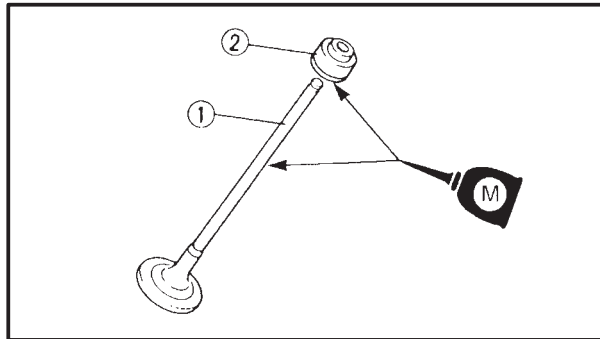
INSTALLING THE VALVES

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

1. Deburr:

Ⓐ valve stem end

(with an oil stone)



2. Lubricate:

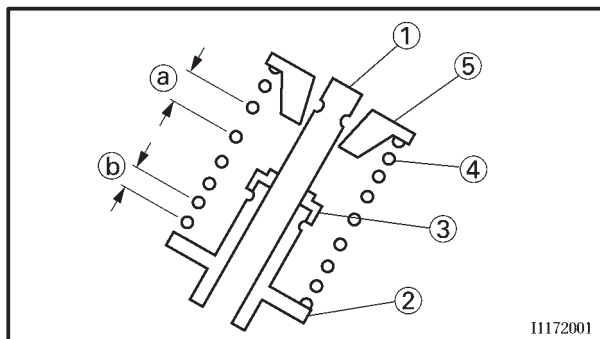
Ⓐ valve stem ①

Ⓑ oil seal ②

(with the recommended lubricant)



Recommended lubricant
Molybdenum disulfide oil



3. Install:

Ⓐ valve ①

Ⓑ lower spring seat ②

Ⓒ oil seal ③

Ⓓ valve spring ④

Ⓔ upper spring seat ⑤

(into the cylinder head)

NOTE:

Install the valve spring with the larger pitch Ⓐ facing up.

Ⓑ Smaller pitch

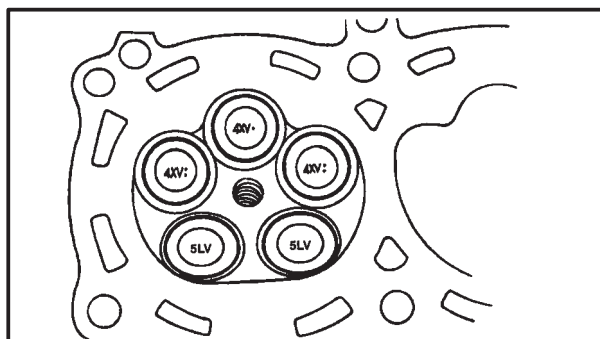
NOTE:

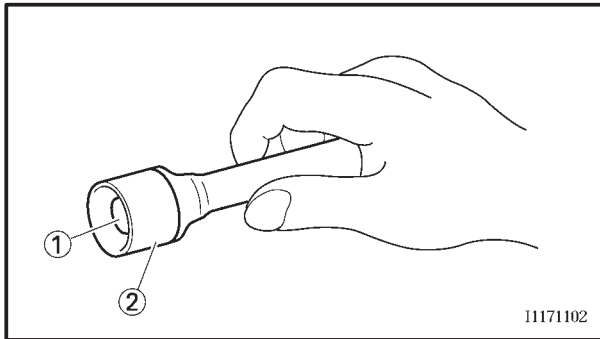
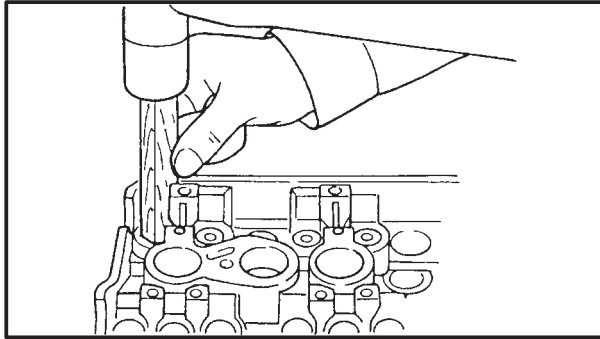
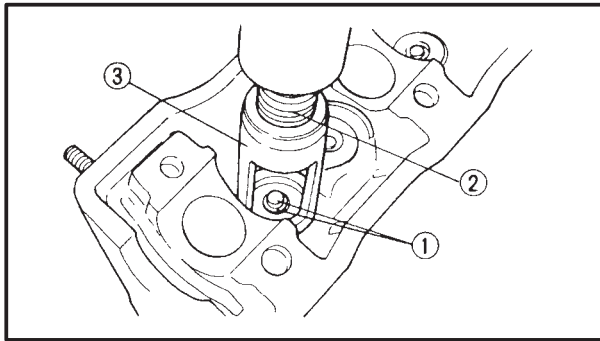
Make sure that each valve is installed in its original place. Refer to the following embossed marks.

Right and left intake valve(-s): "4XV:"

Middle intake valve(-s): "4XV."

Exhaust valve(-s): "5LV"





4. Install:

Ⓐ valve cotteners ①

NOTE:

Install the valve cotteners by compressing the valve spring with the valve spring compressor ② and adapter ③.



**Valve spring compressor set,
Quick release**

YM-04019

Adapter

Intake valve

YM-4114

Exhaust valve

YM-4108

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

CAUTION:

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

6. Install:

Ⓐ valve pad ①

Ⓐ valve lifter ②

NOTE:

Ⓐ Apply molybdenum disulfide oil onto the valve lifter and valve pad.

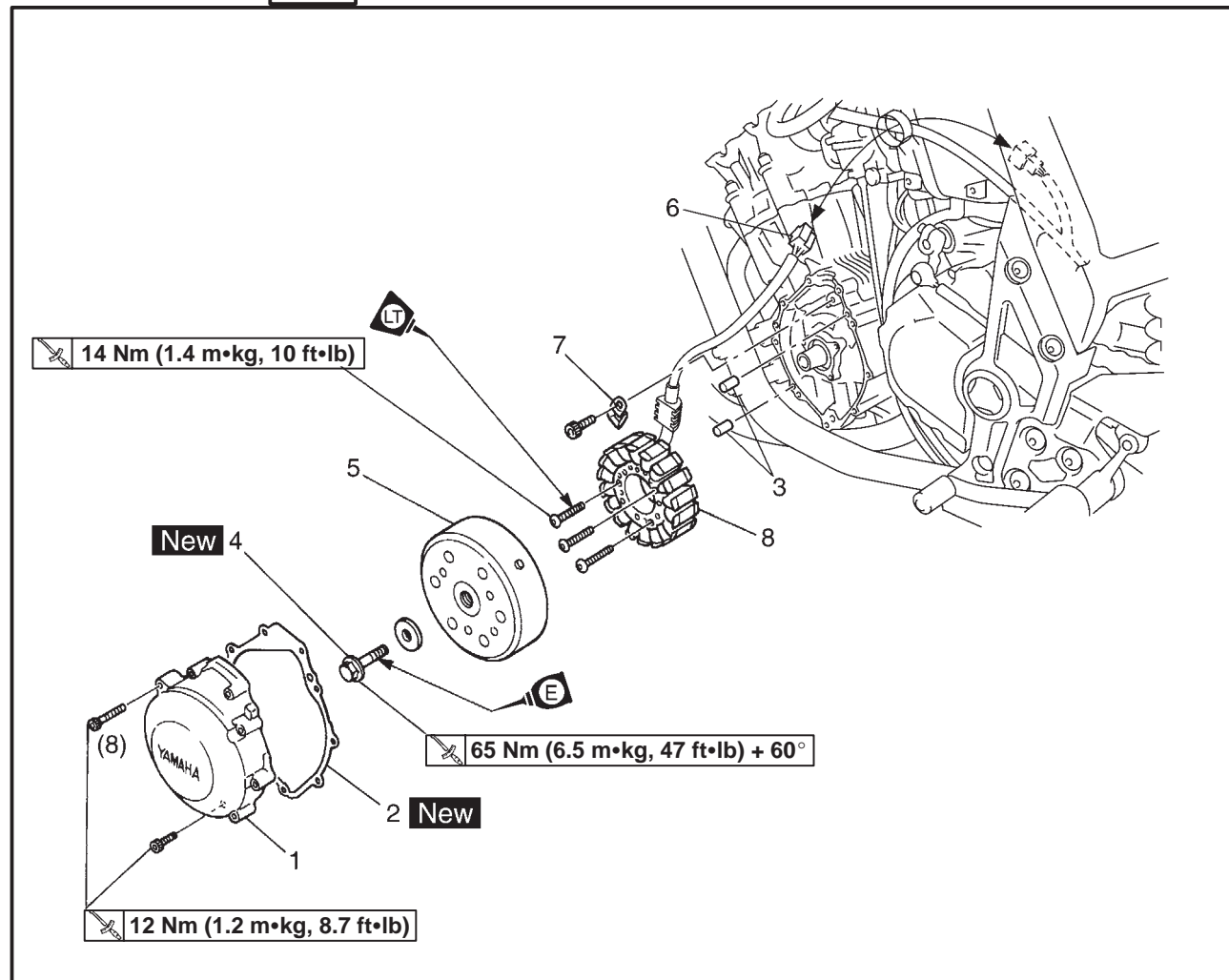
Ⓑ The valve lifter must move smoothly when rotated with a finger.

Ⓒ Each valve lifter and valve pad must be reinstalled in its original position.

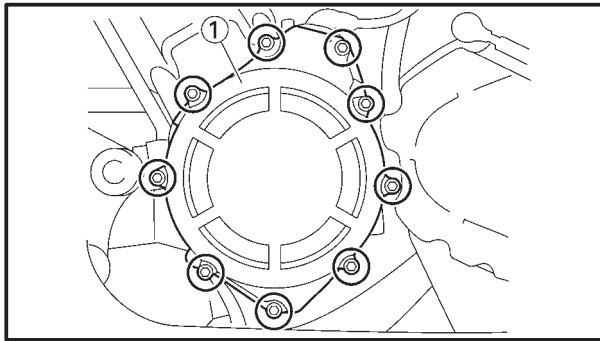


EB410000

GENERATOR



Order	Job/Part	Q'ty	Remarks
	Removing the stator coil assembly		
	Rider seat and fuel tank		Remove the parts in the order listed. Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Bottom cowling		Refer to "COWLINGS" in chapter 3.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Generator rotor cover	1	
2	Generator rotor cover gasket	1	
3	Dowel pin	2	
4	Generator rotor bolt	1	
5	Generator rotor	1	
6	Stator coil assembly coupler	1	Disconnect.
7	Stator coil assembly lead holder	1	
8	Stator coil assembly	1	For installation, reverse the removal procedure.



REMOVING THE GENERATOR

1. Remove:

Ⓡgenerator rotor cover ①

NOTE:

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.

After all of the bolts are fully loosened, remove them.

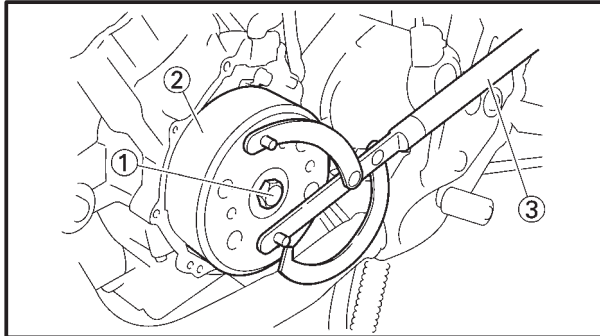
2. Remove:

Ⓡgenerator rotor bolt ①

Ⓡwasher

NOTE:

While holding the generator rotor ② with the universal magneto & rotor holder ③, loosen the generator rotor bolt.



**Universal magneto & rotor holder
YU-01235**

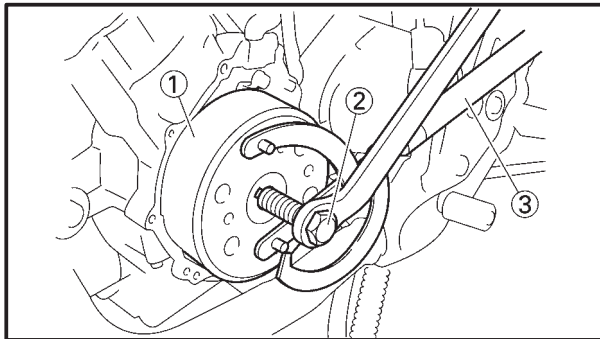
3. Remove:

Ⓡgenerator rotor ①

(with the alternator rotor puller ② and rotor holding tool ③)



**Alternator rotor puller
YM-01080-A**



INSTALLING THE GENERATOR

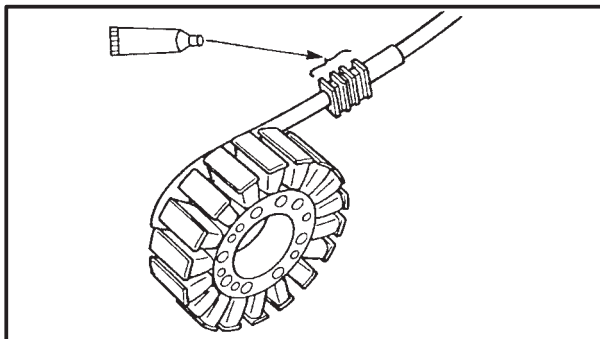
1. Apply:

Ⓡsealant

(onto the stator coil assembly lead grommet)



**Yamaha bond No. 1215
ACC-11001-05-01**



2. Install:

Ⓡgenerator rotor

Ⓡwasher

Ⓡgenerator rotor bolt



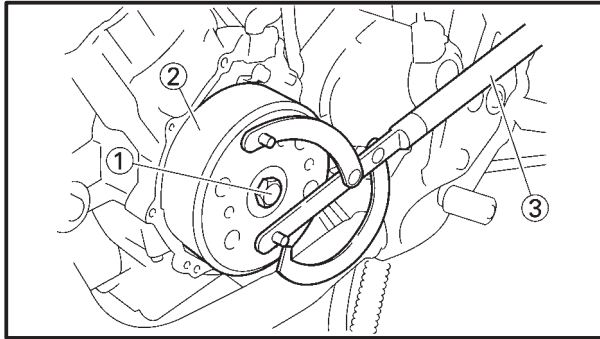
WARNING

Always use a new generator rotor bolt.

CAUTION:

ⓇClean the tapered portion of the crankshaft and the generator rotor hub with lacquer thinner.

ⓇLubricate the generator rotor bolt threads with engine oil.



3. Tighten:

- generator rotor bolt ① **New**

65 Nm (6.5 m•kg, 47 ft•lb) + 60°

NOTE:

- While holding the generator rotor ② with the universal magneto & rotor holder ③, tighten the generator rotor bolt.
- After tightening to 65 Nm (6.5 m•kg, 47 ft•lb), tighten another 60°.



Universal magneto & rotor holder
YU-01235

4. Install:

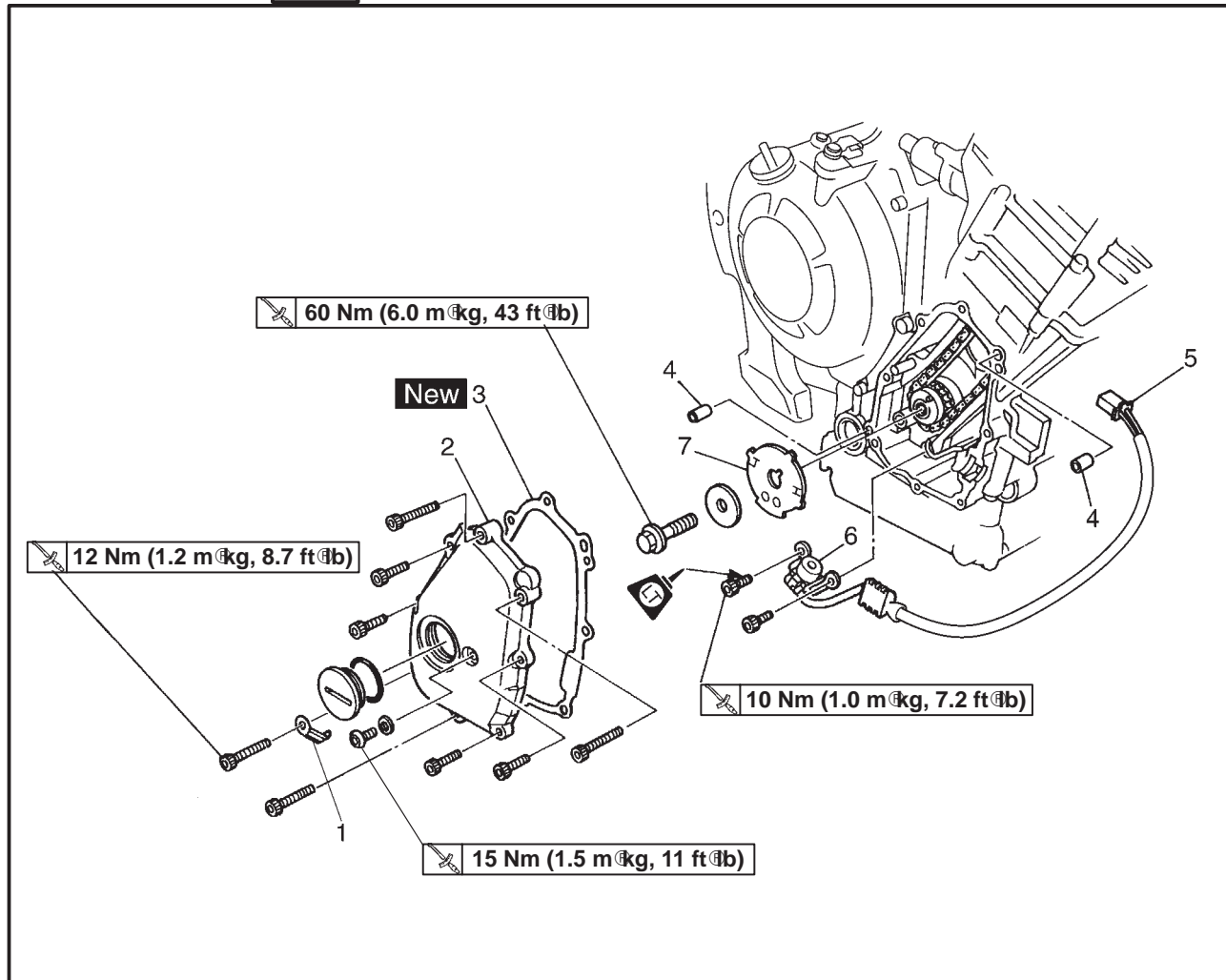
- generator rotor cover

NOTE:

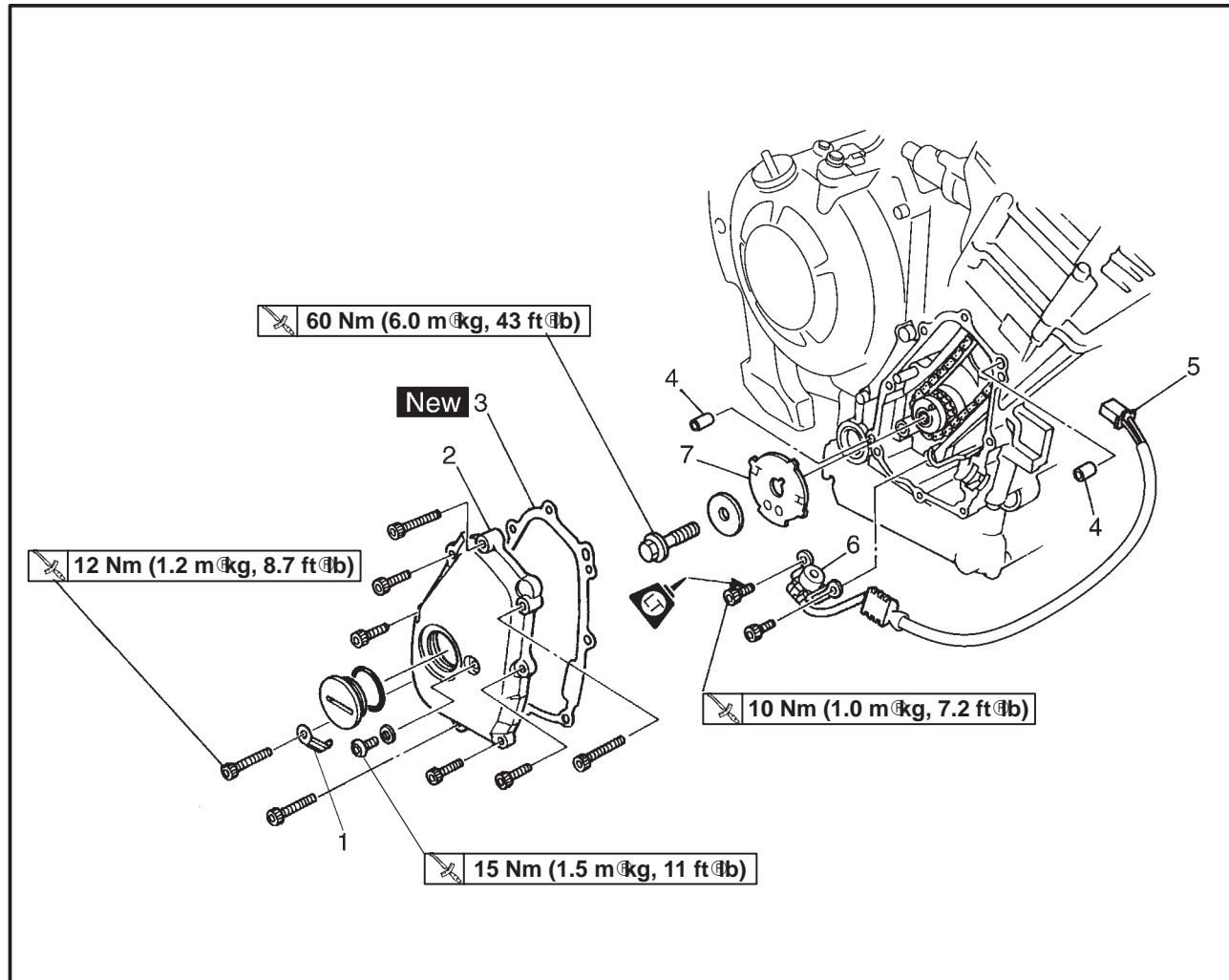
Tighten the generator rotor cover bolts in stages and in a crisscross pattern.



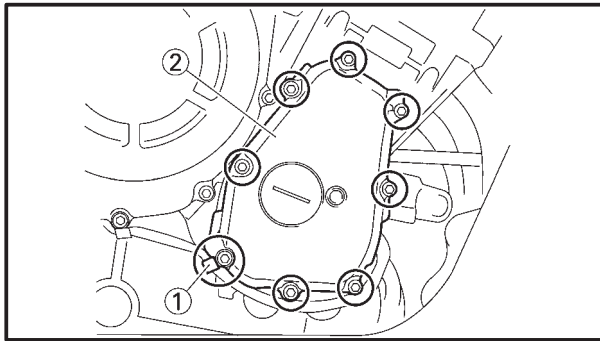
PICKUP COIL



Order	Job/Part	Q'ty	Remarks
	Removing the pickup coil and pickup coil rotor		Remove the parts in the order listed.
	Rider seat and fuel tank		Refer to "SEATS" and "FUEL TANK" in chapter 3.
	Bottom cowl and right side cowl		Refer to "COWLINGS" in chapter 3.
	Engine oil		Drain.
	Generator rotor cover		Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Pickup coil lead holder	1	Refer to "GENERATOR".
2	Pickup coil rotor cover	1	
3	Pickup coil rotor cover gasket	1	
4	Dowel pin	2	



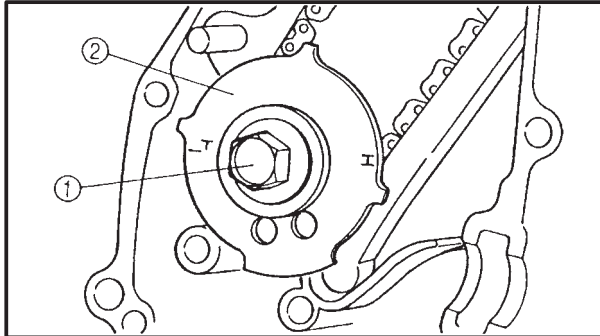
Order	Job/Part	Q'ty	Remarks
5	Pickup coil coupler	1	Disconnect.
6	Pickup coil	1	
7	Pickup coil rotor	1	
			For installation, reverse the removal procedure.

**REMOVING THE PICKUP COIL ROTOR****1. Remove:**

- Ⓡ pickup coil lead holder ①
- Ⓡ pickup coil rotor cover ②

NOTE:

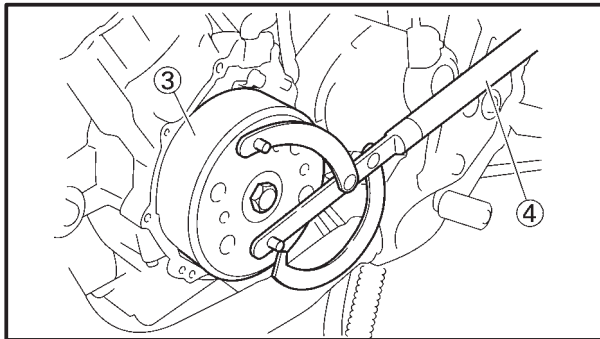
Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern.
After all of the bolts are fully loosened, remove them.

**2. Remove:**

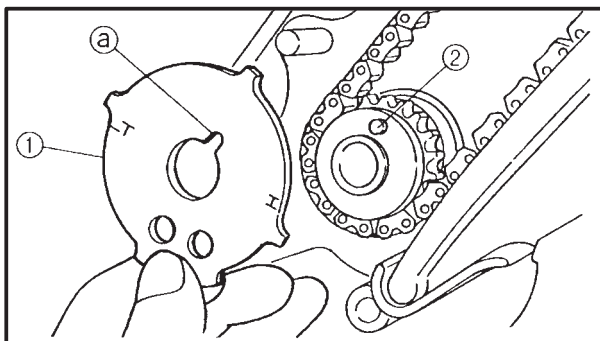
- Ⓡ pickup coil rotor bolt ①
- Ⓡ washer
- Ⓡ pickup coil rotor ②

NOTE:

While holding the generator rotor ③ with the universal magneto & rotor holder ④, loosen the pickup coil rotor bolt.



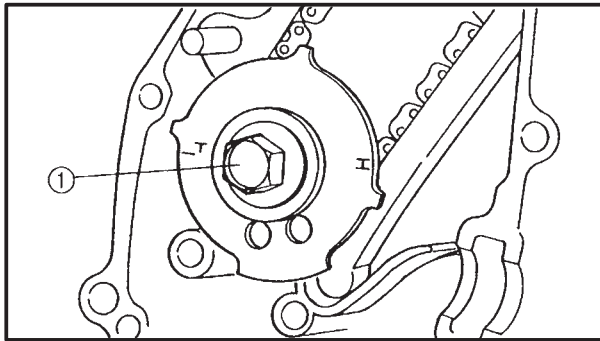
**Universal magneto & rotor holder
YU-01235**

**INSTALLING THE PICKUP COIL ROTOR****1. Install:**

- Ⓡ pickup coil rotor ①
- Ⓡ washer
- Ⓡ pickup coil rotor bolt

NOTE:

When installing the pickup coil rotor, align the pin ② in the crankshaft sprocket with the groove ② in the pickup coil rotor.



2. Tighten:

Ⓐ pickup coil rotor bolt ①

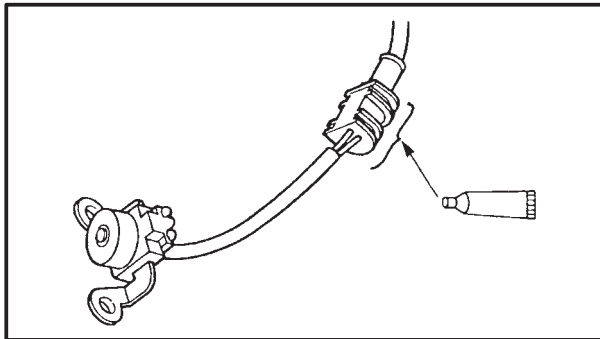
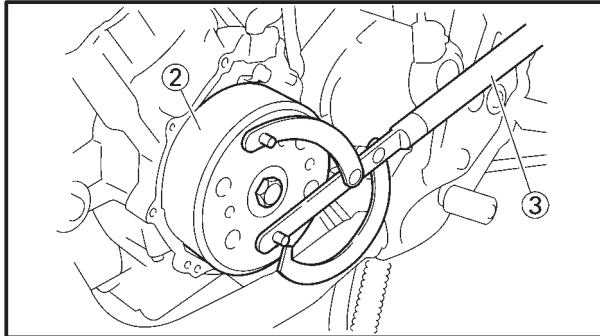
60 Nm (6.0 mⒶkg, 43 ftⒶlb)

NOTE:

While holding the generator rotor ② with the universal magneto & rotor holder ③, tighten the pickup coil rotor bolt.



**Universal magneto & rotor holder
YU-01235**



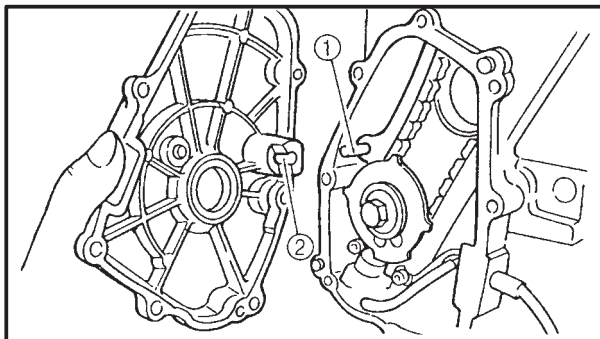
3. Apply:

Ⓐ sealant

(onto the pickup coil lead grommet)



**Yamaha bond No. 1215
ACC-11001-05-01**



4. Install:

Ⓐ pickup coil rotor cover

Ⓐ pickup coil lead holder

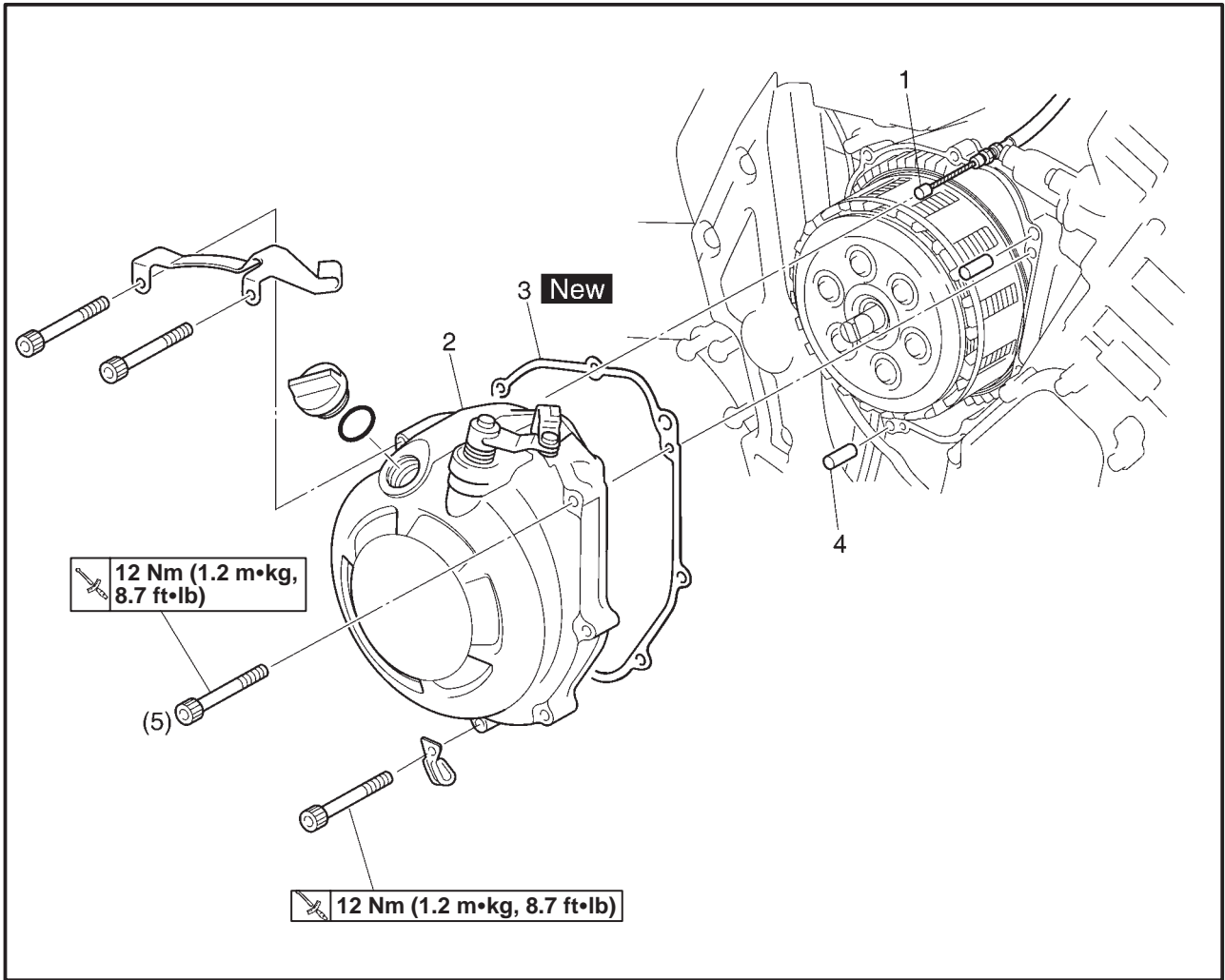
NOTE:

Ⓐ When installing the pickup coil rotor cover, align the timing chain guide (intake side) pin ① with the hole ② in the pickup coil rotor cover.
Ⓐ Tighten the pickup coil rotor cover bolts in stages and in a crisscross pattern.



EAS00273

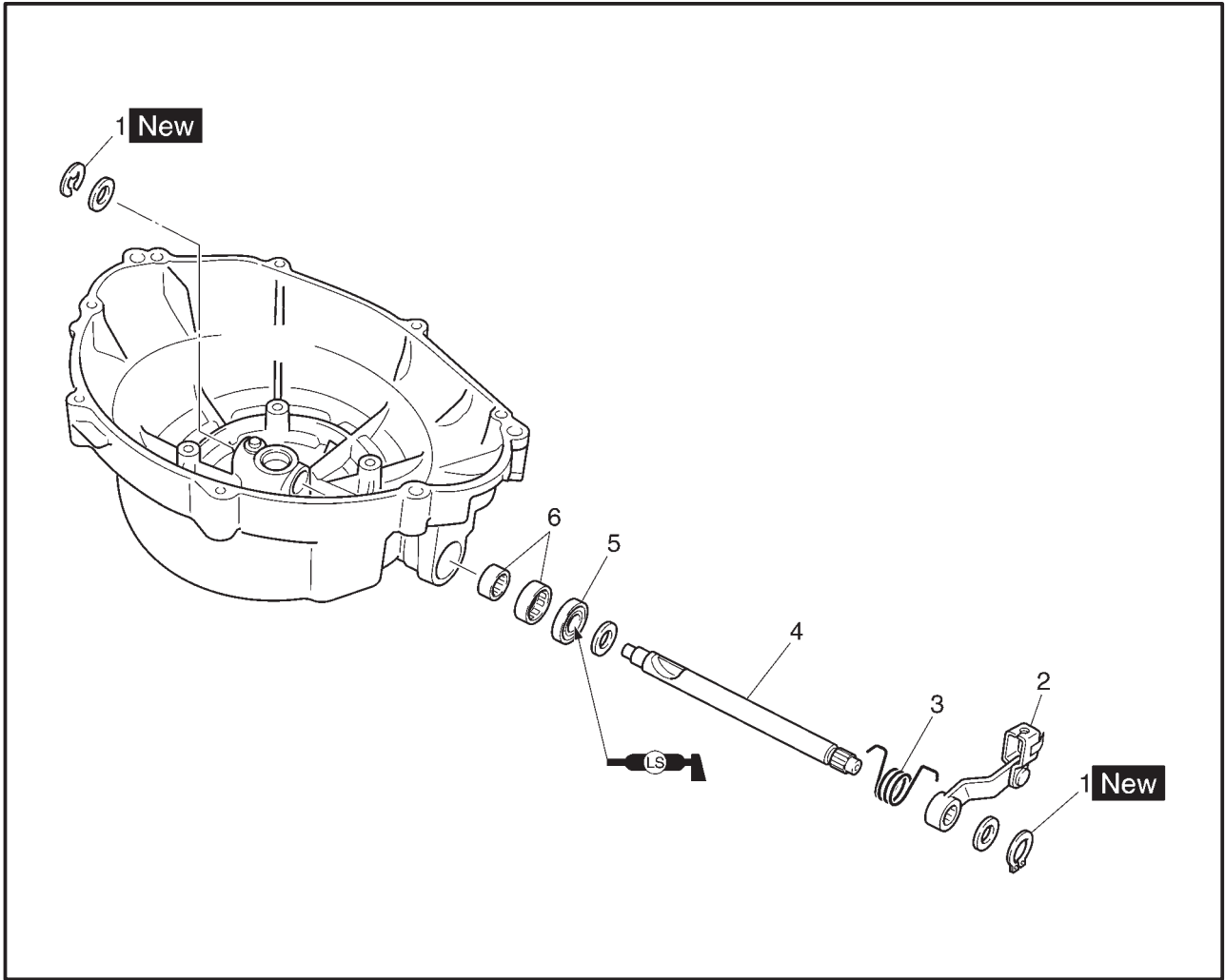
CLUTCH
CLUTCH COVER



Order	Job/Part	Q'ty	Remarks
	Removing the clutch cover Engine oil		Remove the parts in the order listed. Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
1	Clutch cable	1	
2	Clutch cover	1	
3	Clutch cover gasket	1	
4	Dowel pin	2	For installation, reverse the removal procedure.



EB405010

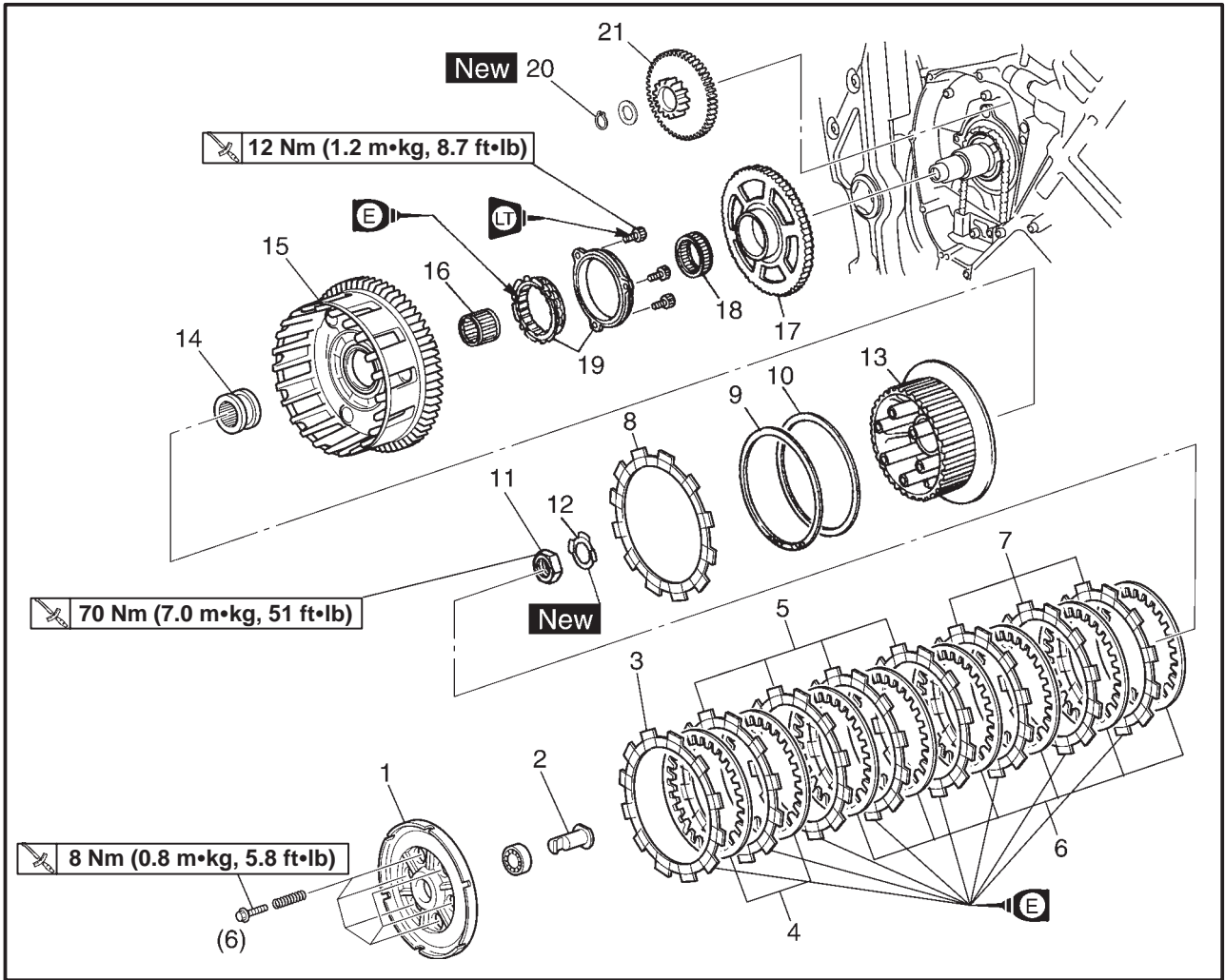


Order	Job/Part	Q'ty	Remarks
	Removing the pull lever shaft		
1	Circlip	2	Remove the parts in the order listed.
2	Pull lever	1	
3	Pull lever spring	1	
4	Pull lever shaft	1	
5	Oil seal	1	
6	Bearing	2	
			For installation, reverse the removal procedure.

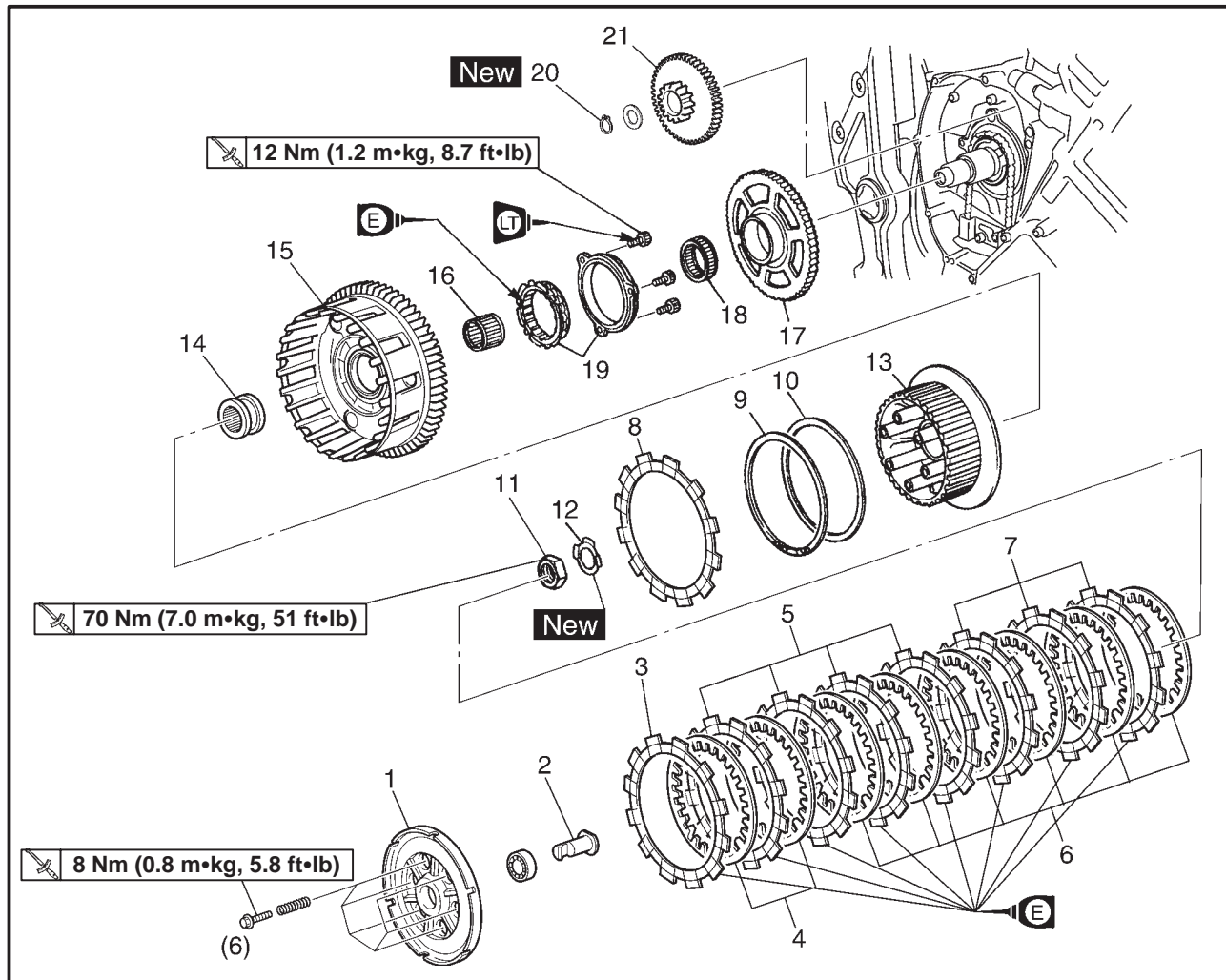


EAS00274

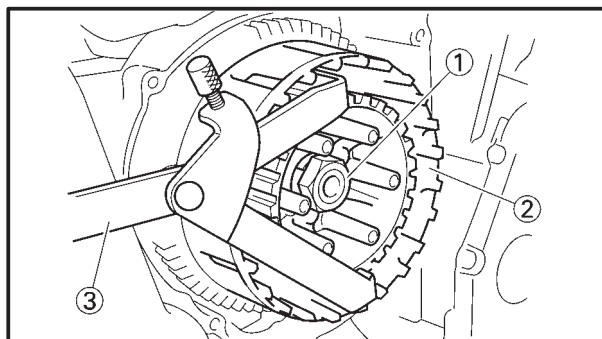
CLUTCH



Order	Job/Part	Q'ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
1	Clutch cover	1	
2	Pull rod	1	
3	Friction plate	1	
4	Clutch plate	2	Select.
5	Friction plate	4	Color code: Black
6	Clutch plate	6	
7	Friction plate	3	Color code: Blue
8	Friction plate	1	Refer to "INSTALLING THE CLUTCH".
9	Clutch damper spring	1	
10	Clutch damper spring seat	1	



Order	Job/Part	Q'ty	Remarks
11	Clutch boss nut	1	For installation, reverse the removal procedure.
12	Lock washer	1	
13	Clutch boss	1	
14	Thrust washer	1	
15	Clutch housing	1	
16	Bearing	1	
17	Starter clutch gear	1	
18	Bearing	1	
19	Starter clutch assembly	1	
20	Circlip	1	
21	Starter clutch idle gear	1	



EAS00277

REMOVING THE CLUTCH

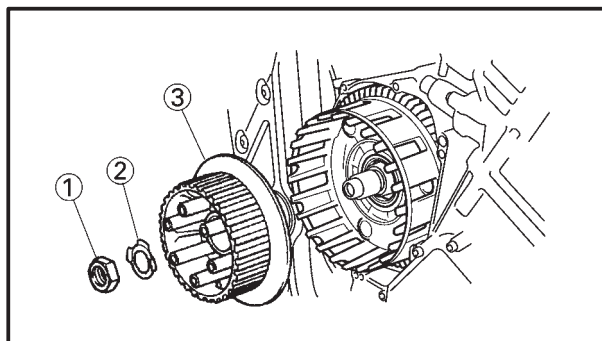
1. Straighten the lock washer tab.
2. Loosen:
 - Ⓑ clutch boss nut ①

NOTE:

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



Universal clutch holder
YM-91042



3. Remove:
 - Ⓑ clutch boss nut ①
 - Ⓑ lock washer ②
 - Ⓑ clutch boss ③

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.



EAS00281

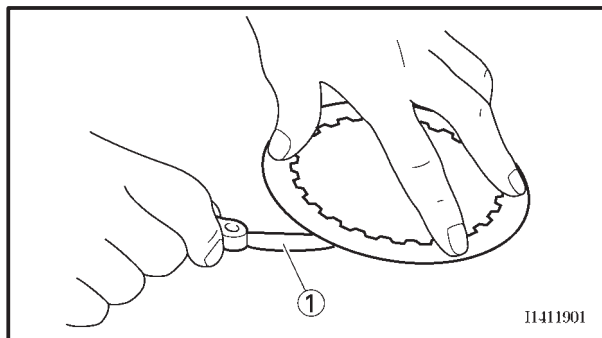
CHECKING THE CLUTCH PLATES

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
Less than 0.1 mm (0.004 in)

EAS00282

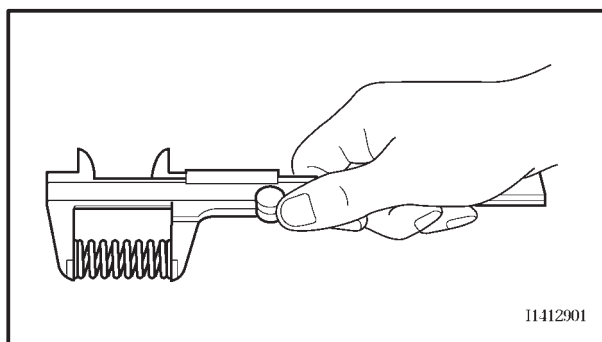
CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the clutch springs.

1. Check:

Ⓒ clutch spring

Damage → Replace the clutch springs as a set.



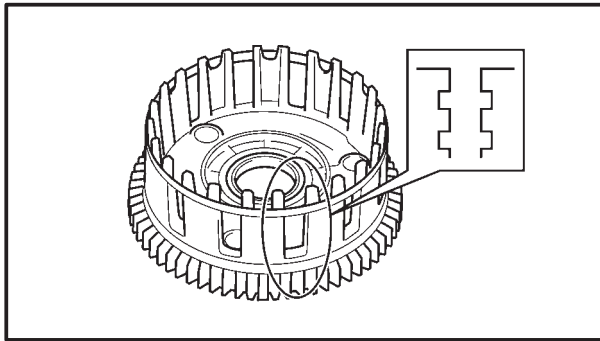
2. Measure:

Ⓒ clutch spring free length

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



Clutch spring free length
50 mm (1.97 in)
<Limit>: 47.5 mm (1.87 in)



EAS00284

CHECKING THE CLUTCH HOUSING

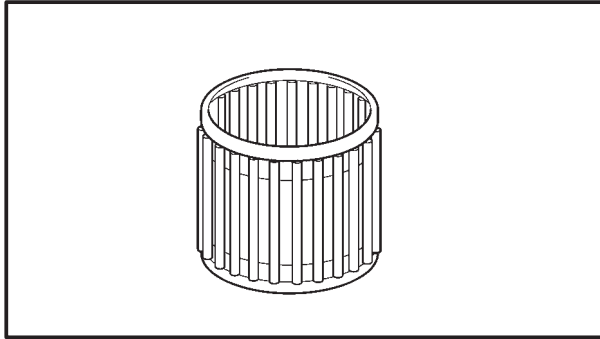
1. Check:

Ⓑ clutch housing dogs

Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

NOTE:

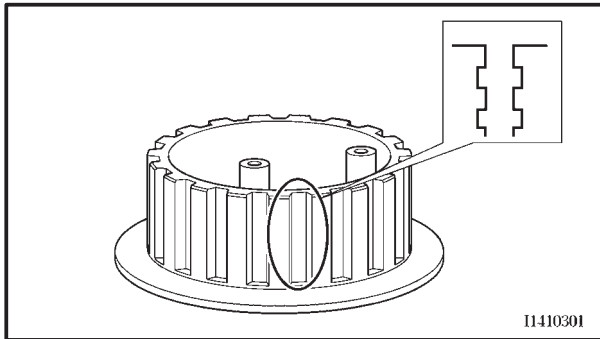
Pitting on the clutch housing dogs will cause erratic clutch operation.



2. Check:

Ⓑ bearing

Damage/wear → Replace the clutch housing.



EAS00285

CHECKING THE CLUTCH BOSS

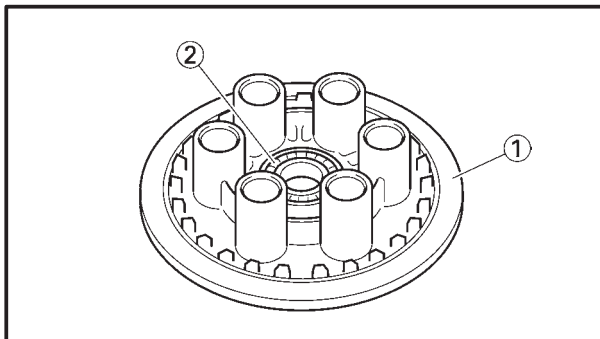
1. Check:

Ⓑ clutch boss splines

Damage/pitting/wear → Replace the clutch boss.

NOTE:

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



EAS00286

CHECKING THE PRESSURE PLATE

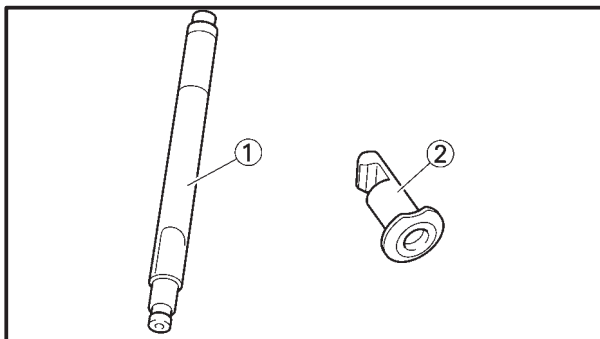
1. Check:

Ⓑ pressure plate ①

Cracks/damage → Replace.

Ⓑ bearing ②

Damage/wear → Replace.



EAS00287

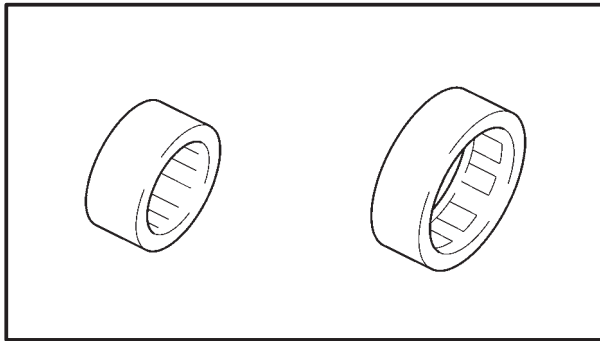
CHECKING THE PULL LEVER AND PULL ROD

1. Check:

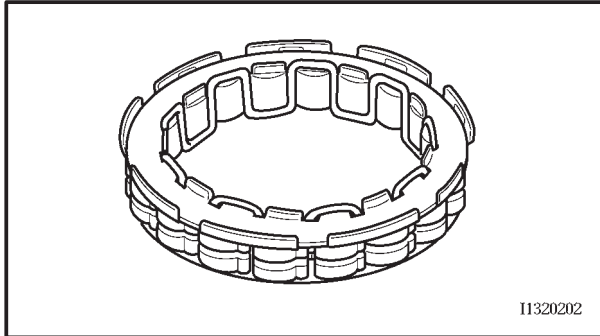
Ⓑ pull lever ①

Ⓑ pull rod ②

Damage/wear → Replace the pull rod and pull lever pinion gear as a set.



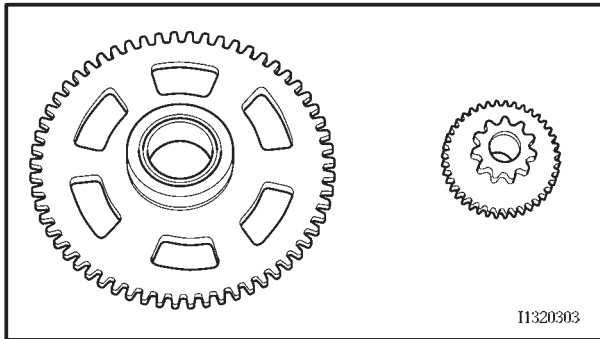
2. Check:
 Ⓐ pull rod bearing
 Damage/wear → Replace.



EAS00351

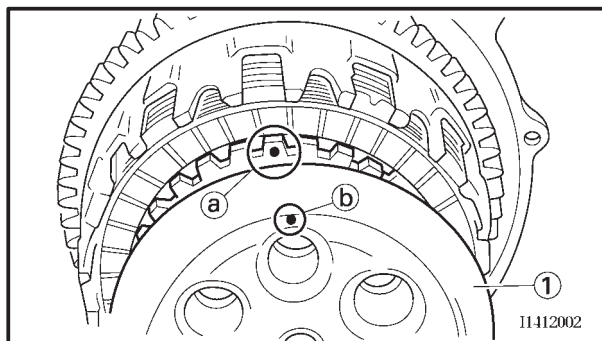
CHECKING THE STARTER CLUTCH

1. Check:
 Ⓐ starter clutch rollers
 Damage/wear → Replace.



2. Check:
 Ⓐ starter clutch idle gear
 Ⓐ starter clutch drive gear
 Ⓐ starter clutch gear
 Burrs/chips/roughness/wear → Replace the defective part(-s).

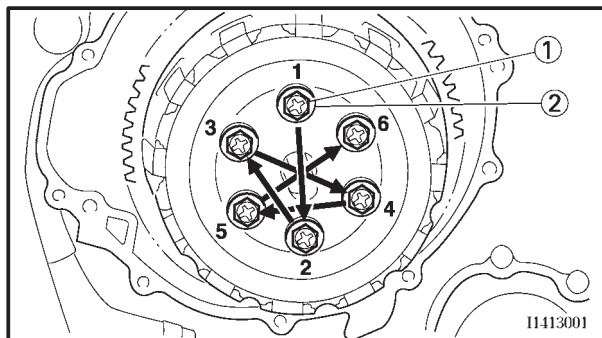
3. Check:
 Ⓐ starter clutch gear's contacting surfaces
 Damage/pitting/wear → Replace the starter clutch gear.



7. Install:
pressure plate ①

NOTE:

Align the punch mark (b) in the pressure plate with the punch mark (a) in the clutch boss.

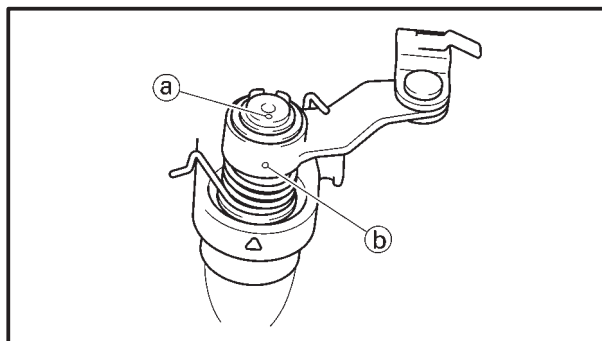


8. Install:
clutch springs
clutch spring bolts

8 Nm (0.8 m kg, 5.8 ft lb)

NOTE:

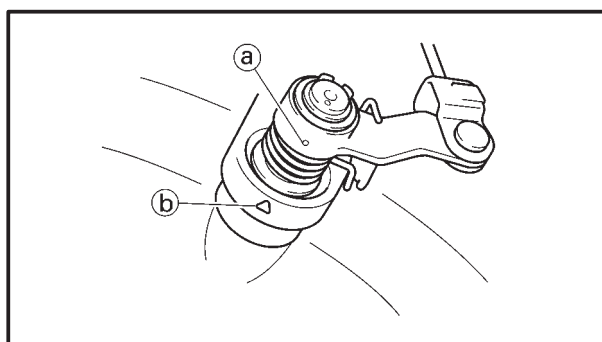
Tighten the clutch spring bolts in stages and in a crisscross pattern.



9. Install:
pull lever

NOTE:

Align the punch mark (a) in the pull lever shaft with the mark (b) on the clutch cover.

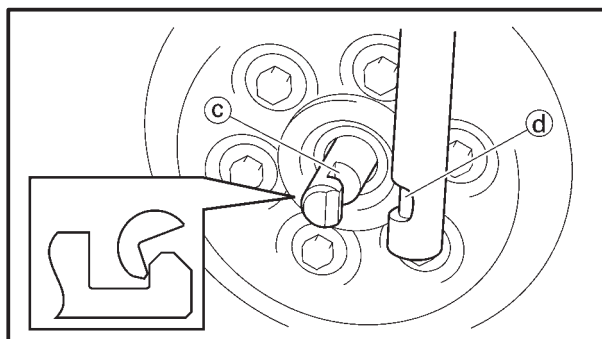


10. Install:
dowel pins
gasket **New**
clutch cover

12 Nm (1.2 m kg, 8.7 ft lb)

NOTE:

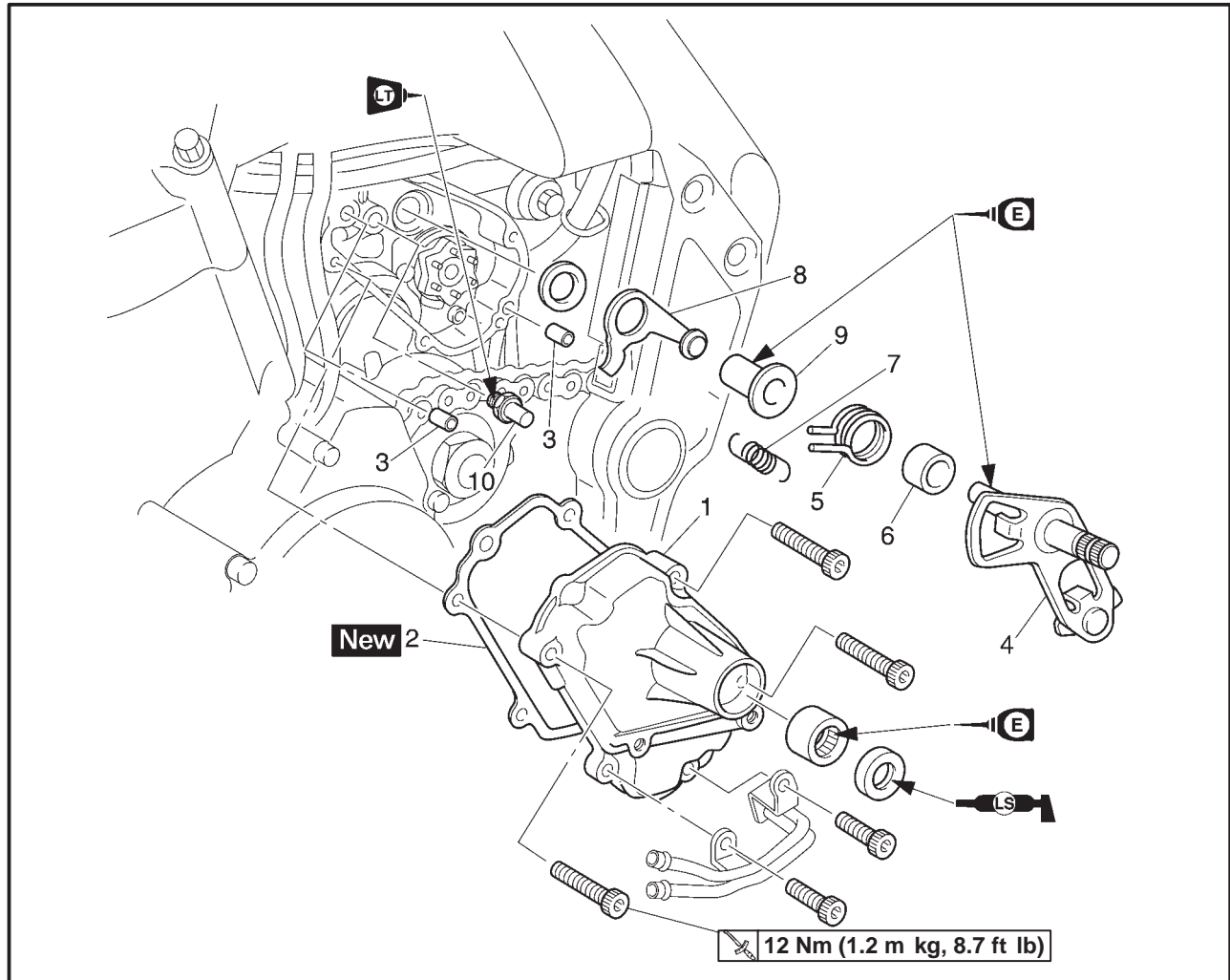
When installing the clutch cover, push the pull lever and check that the punch mark (a) on the pull lever aligns with the mark (b) on the clutch cover. Make sure that the pull rod groove (c) and pull lever shaft groove (d) are engaged. Tighten the clutch cover bolts in stages and in a crisscross pattern.



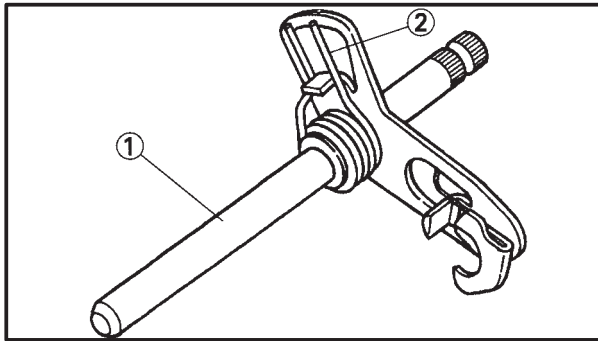


EAS00326

SHIFT SHAFT GENERATOR ROTOR COVER



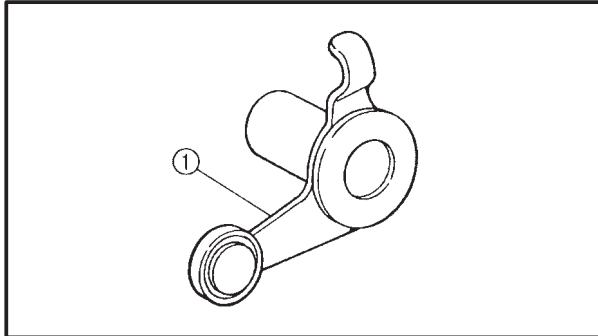
Order	Job/Part	Q'ty	Remarks
	Removing the shift shaft and stopper lever		Remove the parts in the order listed.
	Drive sprocket cover		Refer to "ENGINE".
1	Shift shaft cover	1	
2	Shift shaft cover gasket	1	
3	Dowel pin	2	
4	Shift shaft	1	
5	Shift shaft spring	1	
6	Spacer	1	
7	Stopper lever spring	1	
8	Stopper lever	1	
9	Collar	1	
10	Shift shaft spring stopper	1	
			For installation, reverse the removal procedure.



EAS00328

CHECKING THE SHIFT SHAFT

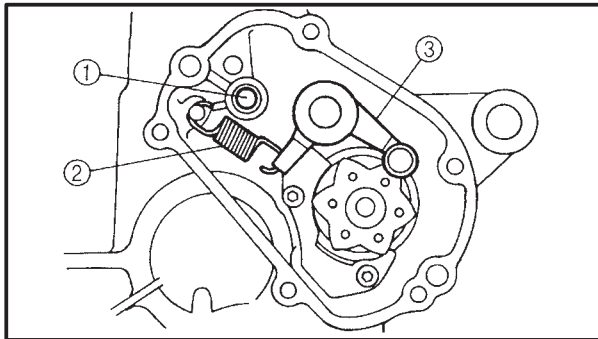
1. Check:
 - shift shaft ①
 - Bends/damage/wear → Replace.
 - shift shaft spring ③
 - Damage/wear → Replace.



EAS00330


CHECKING THE STOPPER LEVER

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



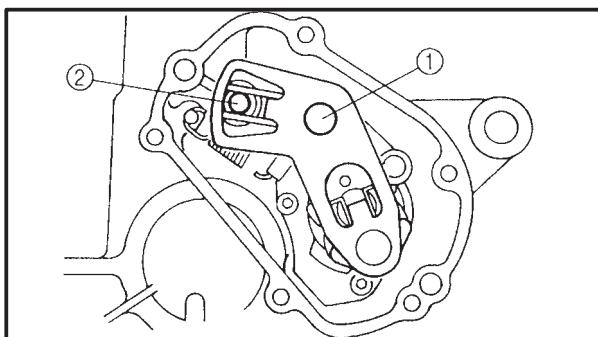
EAS00331

INSTALLING THE SHIFT SHAFT

1. Install:
 - shift shaft spring stopper ①
 -  **22 Nm (2.2 m kg, 16 ft lb)**
 - stopper lever spring ②
 - stopper lever ③

NOTE:

Apply LOCTITE® to the threads of the shift shaft spring stopper.
Hook the ends of the stopper lever spring onto the stopper lever and the crankcase boss.
Mesh the stopper lever with the shift drum segment assembly.



2. Install:
 - shift shaft ①
 - spacer

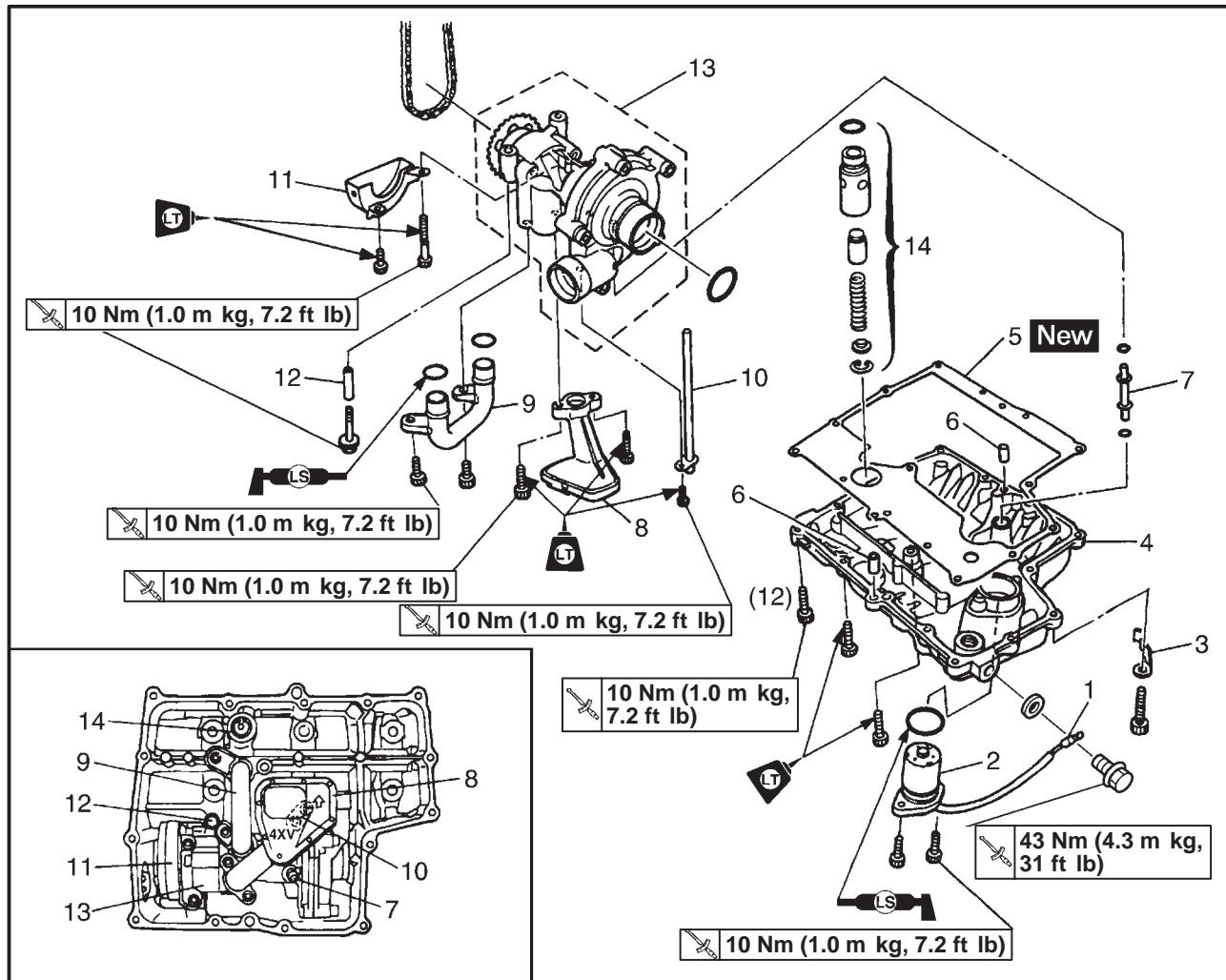
NOTE:

Lubricate the oil seal lips with lithium soap base grease.
Install the end of the shift shaft spring onto the shift shaft spring stopper ②.



EAS00356

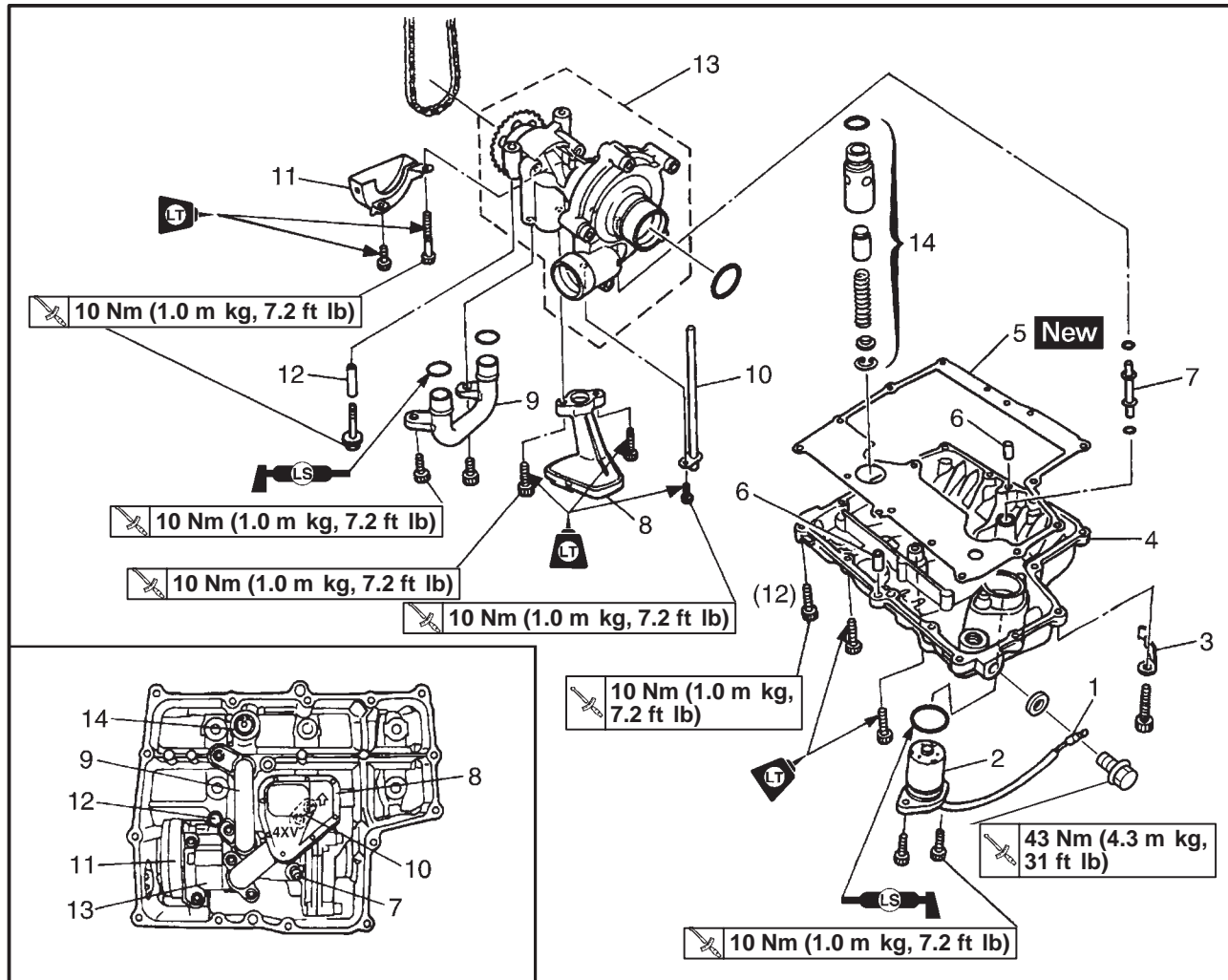
OIL PAN AND OIL PUMP



Order	Job/Part	Q'ty	Remarks
	Removing the oil pan and oil pump		
	Engine oil		Remove the parts in the order listed. Drain. Refer to "CHANGING THE ENGINE OIL" in chapter 3.
	Coolant		Drain. Refer to "CHANGING THE COOLANT" in chapter 3.
	Radiator assembly and water pump outlet pipe		Refer to "RADIATOR" in chapter 6.
	Exhaust pipe assembly		Refer to "ENGINE".
1	Oil level switch connector	1	Disconnect.
2	Oil level switch	1	
3	Oil level switch lead holder	1	
4	Oil pan	1	
5	Oil pan gasket	1	
6	Dowel pin	2	



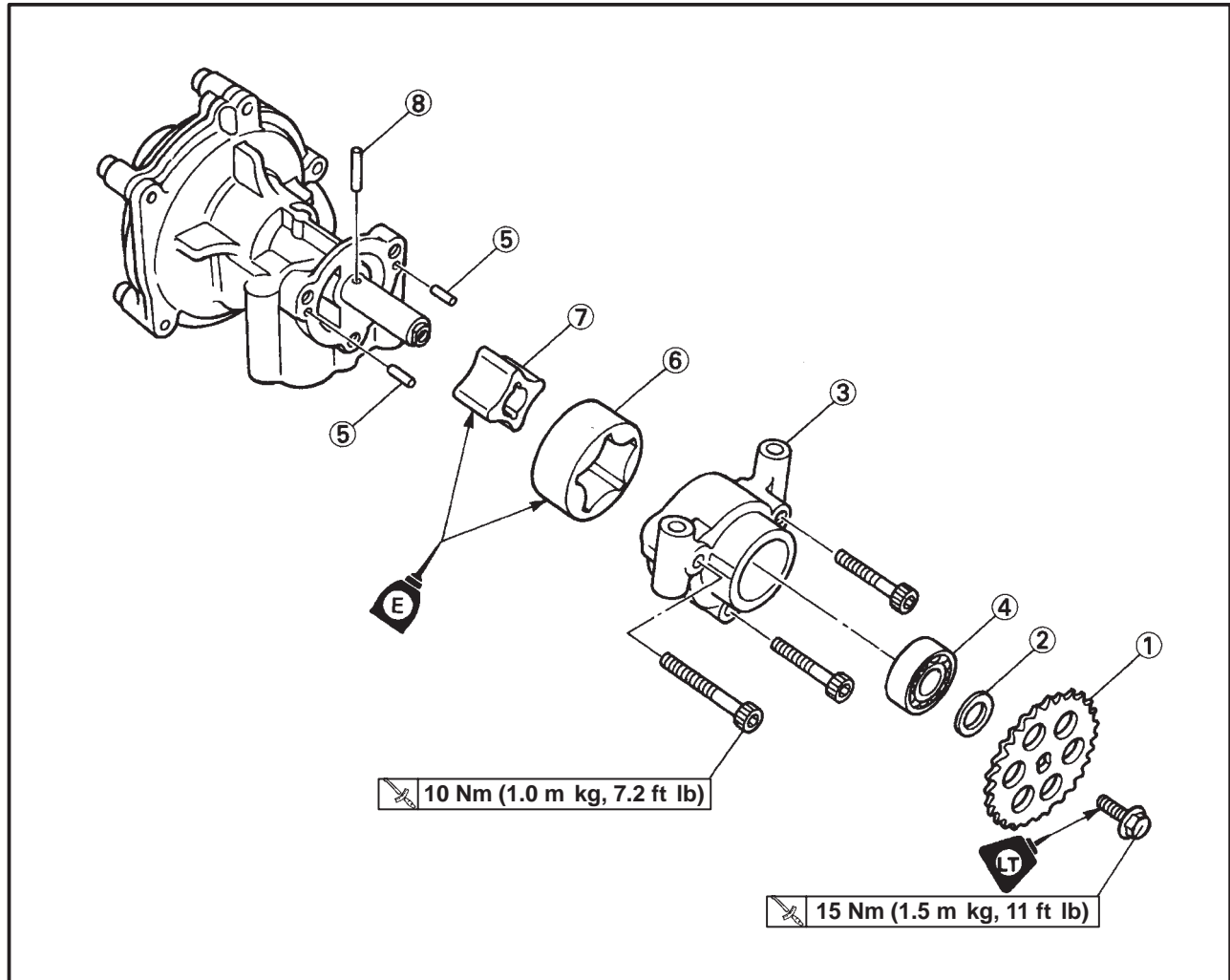
EB411001



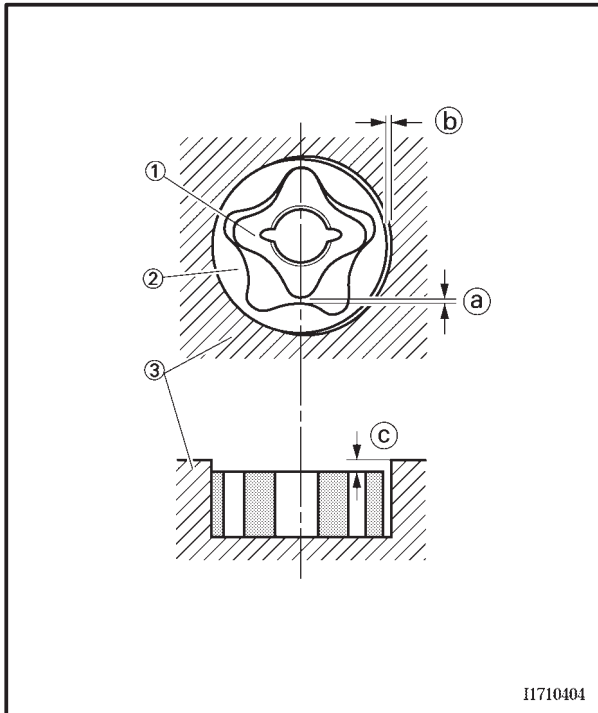
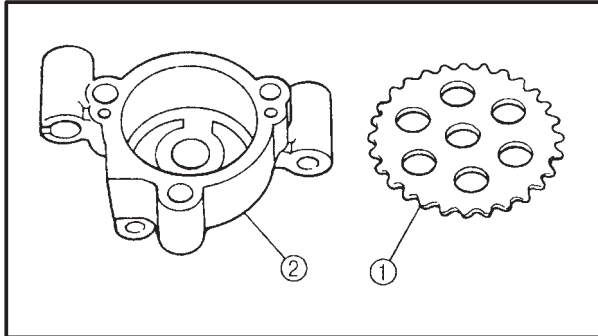
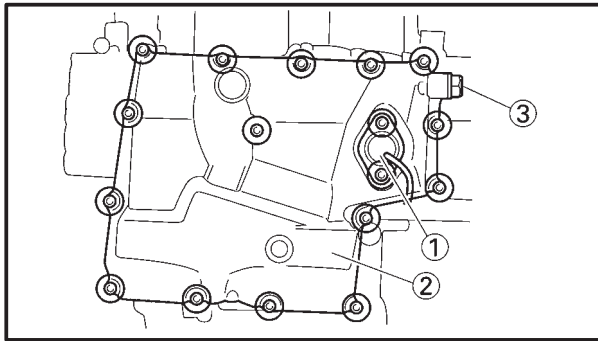
Order	Job/Part	Q'ty	Remarks
7	Drain pipe	1	For installation, reverse the removal procedure.
8	Oil strainer	1	
9	Oil pipe	1	
10	Oil delivery pipe	1	
11	Oil/water pump assembly drive sprocket cover	1	
12	Dowel pin	1	
13	Oil/water pump assembly	1	
14	Relief valve assembly	1	



EAS00360



Order	Job/Part	Q'ty	Remarks
	Disassembling the oil pump		
①	Oil/water pump assembly driven sprocket	1	Disassemble the parts in the order listed.
②	Washer	1	
③	Oil pump housing	1	
④	Bearing	1	
⑤	Pin	2	
⑥	Oil pump outer rotor	1	
⑦	Oil pump inner rotor	1	
⑧	Pin	1	For assembly, reverse the disassembly procedure.



I1710404

EAS00362

REMOVING THE OIL PAN

1. Remove:
 - oil level switch ①
 - oil pan ②
 - engine oil drain bolt ③
 - gasket
 - dowel pins

NOTE:

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

EAS00364

CHECKING THE OIL PUMP

1. Check:
 - oil pump drive gear ①
 - oil pump driven gear ②
 - oil pump housing
 - oil pump housing cover
 Cracks/damage/wear → Replace the defective part(-s).
2. Measure:
 - inner-rotor-to-outer-rotor-tip clearance ①
 - outer-rotor-to-oil-pump-housing clearance ②
 - oil-pump-housing-to-inner-rotor-and-outer-rotor clearance ③
 Out of specification → Replace the oil pump.

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

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

0.09 ~ 0.15 mm
(0.004 ~ 0.006 in)
<Limit>: 0.23 mm (0.009 in)

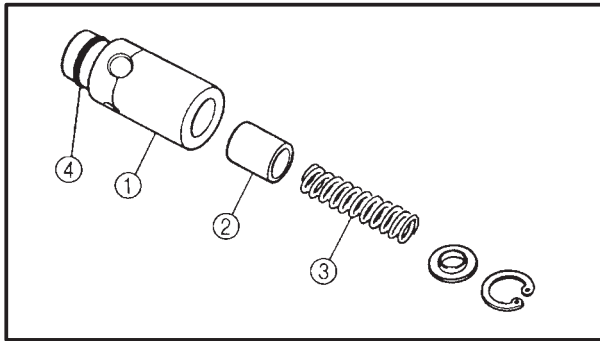
Outer-rotor-to-oil-pump-housing clearance

0.03 ~ 0.08 mm
(0.001 ~ 0.003 in)
<Limit>: 0.15 mm (0.006 in)

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

0.06 ~ 0.11 mm
(0.002 ~ 0.004 in)
<Limit>: 0.18 mm (0.007 in)

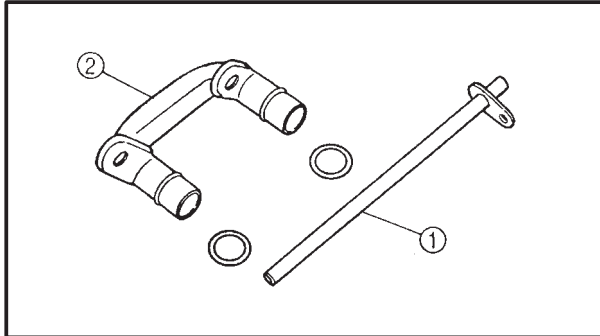
3. Check:
 - oil pump operation
 Unsmooth → Repeat steps (1) and (2) or replace the defective part(-s).



EAS00365

CHECKING THE RELIEF VALVE

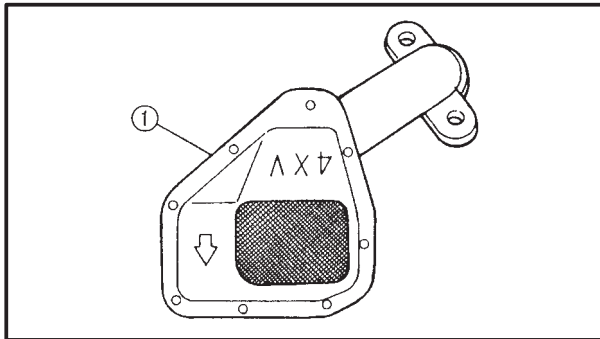
1. Check:
 - relief valve body ①
 - relief valve ②
 - spring ③
 - O-ring ④
 Damage/wear → Replace the defective part(-s).



EAS00366

CHECKING THE OIL DELIVERY PIPE

1. Check:
 - oil delivery pipe ①
 - oil pipe ②
 Damage → Replace.
 Obstruction → Wash and blow out with compressed air.



EAS00368

CHECKING THE OIL STRAINER

1. Check:
 - oil strainer ①
 Damage → Replace.
 Contaminants → Clean with engine oil.

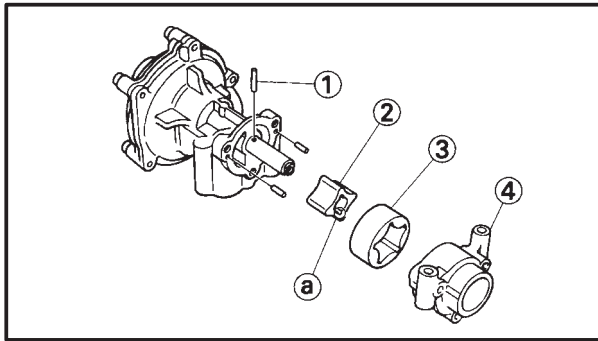
EAS00374

ASSEMBLING THE OIL PUMP

1. Lubricate:
 - inner rotor
 - outer rotor
 - oil pump shaft
 - (with the recommended lubricant)



Recommended lubricant
Engine oil



2. Install:
 - pin ①
 - inner rotor ②
 - outer rotor ③
 - oil pump housing ④

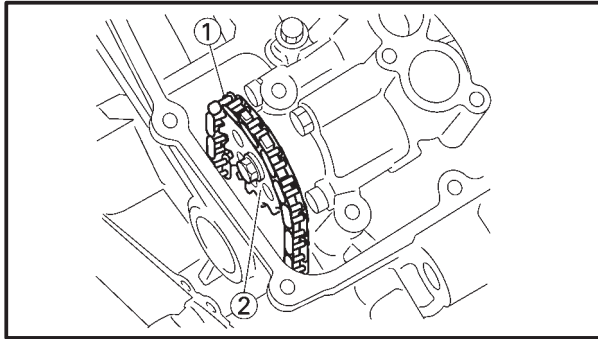


Oil pump housing screw
10 Nm (1.0 m kg, 7.2 ft lb)

NOTE:

When installing the inner rotor, align the pin ① in the oil pump shaft with the groove (a) on the inner rotor ②.

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



EAS00376

INSTALLING THE OIL PUMP

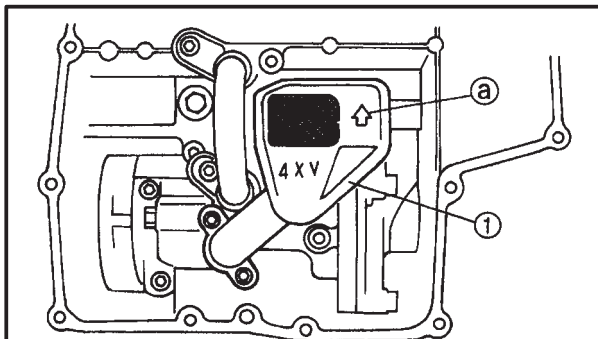
1. Install:
 - oil pump



12 Nm (1.2 m kg, 8.7 ft lb)

NOTE:

Install the oil/water pump drive chain ① onto the oil/water pump driven sprocket ②.



EAS00378

INSTALLING THE OIL STRAINER

1. Install:
 - oil strainer housing ①

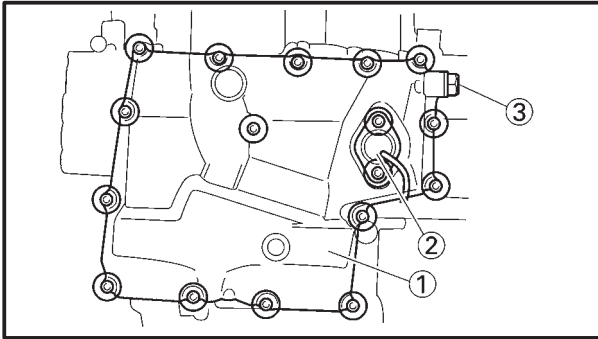


10 Nm (1.0 m kg, 7.2 ft lb)

LOCTITE®

NOTE:

The arrow (a) on the oil strainer housing must point towards the front of the engine.



EAS00380

INSTALLING THE OIL PAN**1. Install:**




dowel pins

gasket **New**

oil pan ①

oil level switch ②

engine oil drain bolt ③

 **10 Nm (10 m kg, 7.2 ft lb)** **10 Nm (10 m kg, 7.2 ft lb)** **43 Nm (4.3 m kg, 31 ft lb)****⚠ WARNING****Always use new copper washers.****NOTE:**

Tighten the oil pan bolts in stages and in a crisscross pattern.

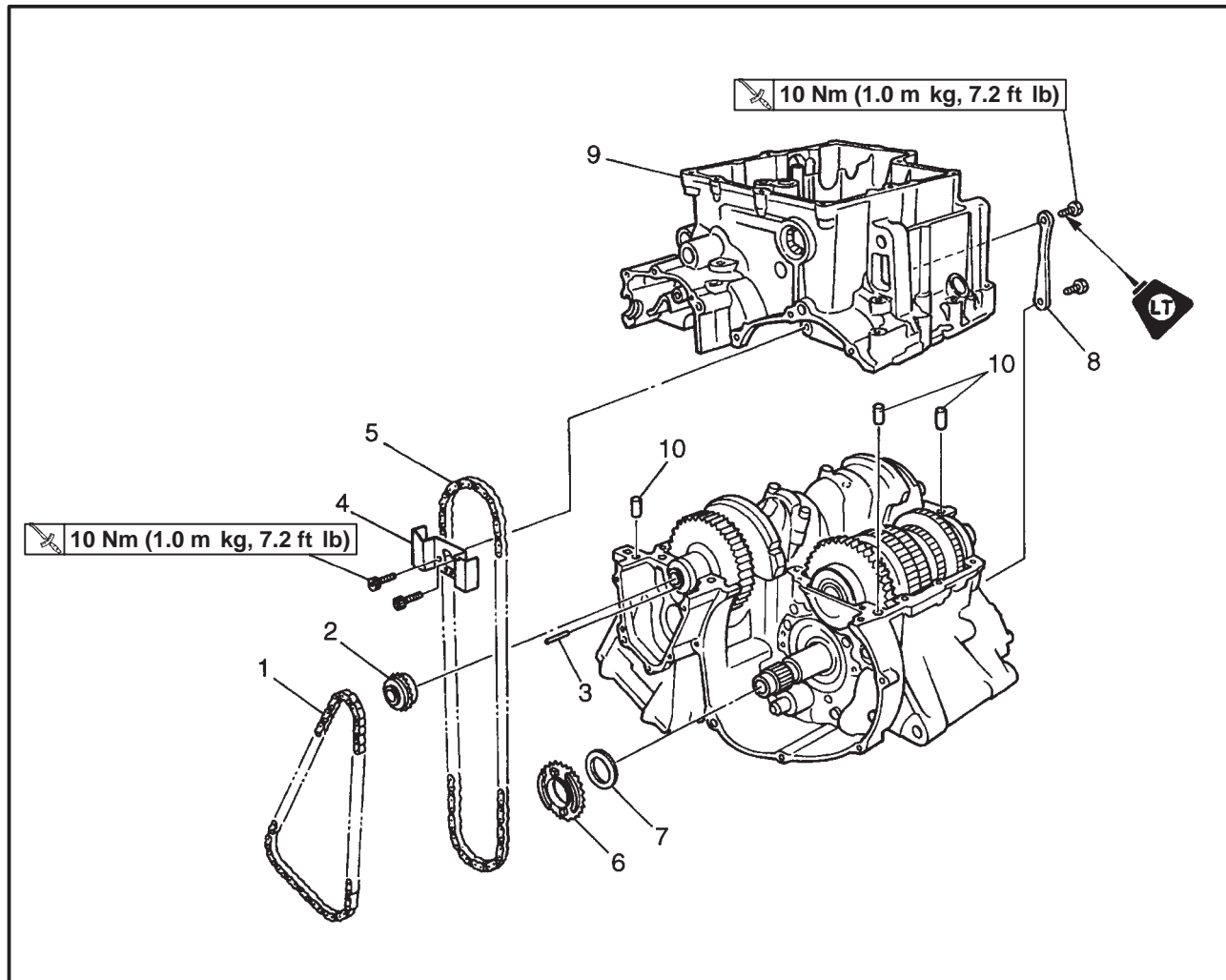
Lubricate the oil level switch's O-ring with engine oil.



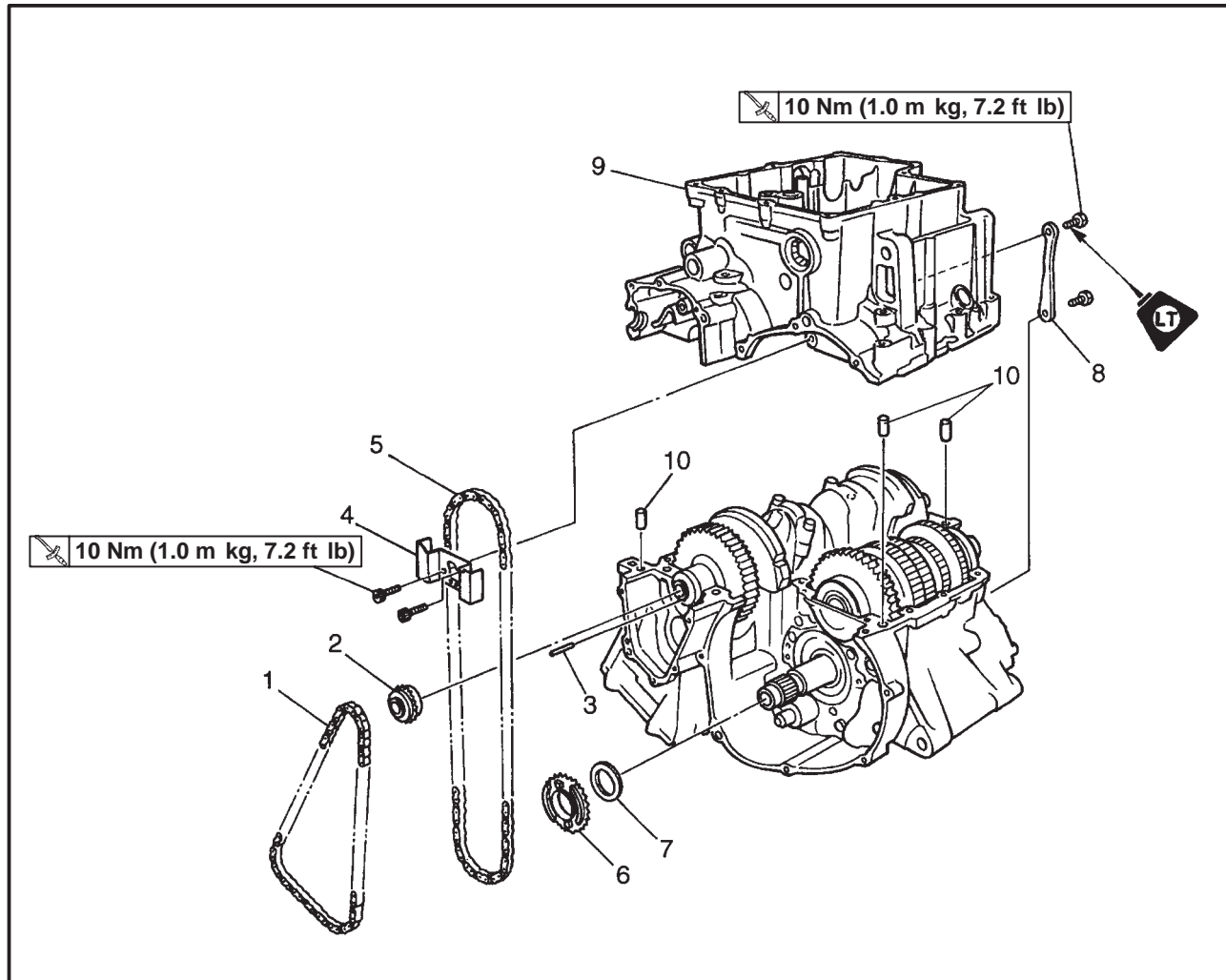
EAS00381

CRANKCASE

CRANKCASE



Order	Job/Part	Q'ty	Remarks
	Removing the crankcase		
	Engine		Remove the parts in the order listed.
	Cylinder head		Refer to "ENGINE".
	Pickup coil and pickup coil rotor		Refer to "CYLINDER HEAD".
	Stator coil assembly		Refer to "PICKUP COIL".
	Clutch housing and starter clutch idle gear		Refer to "GENERATOR".
	Oil/water pump assembly		Refer to "CLUTCH".
	Oil/water pump assembly		Refer to "OIL PAN AND OIL PUMP".
1	Timing chain	1	
2	Crankshaft sprocket	1	
3	Pin	1	
4	Oil/water pump assembly drive chain guide	1	
5	Oil/water pump assembly drive chain	1	

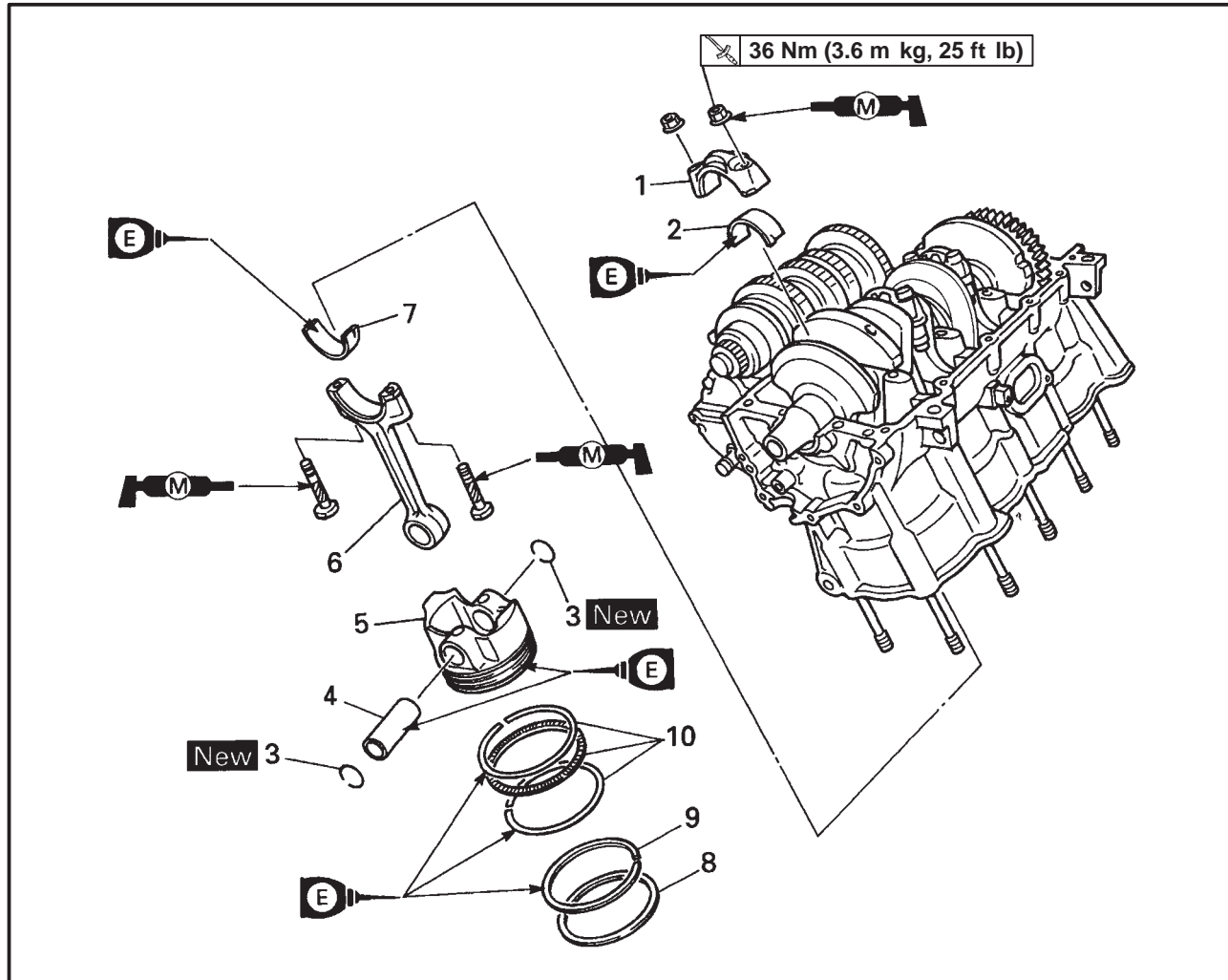


Order	Job/Part	Q'ty	Remarks
6	Oil/water pump assembly drive sprocket	1	For installation, reverse the removal procedure.
7	Washer	1	
8	Plate	1	
9	Lower crankcase	1	
10	Dowel pin	3	



EAS00382

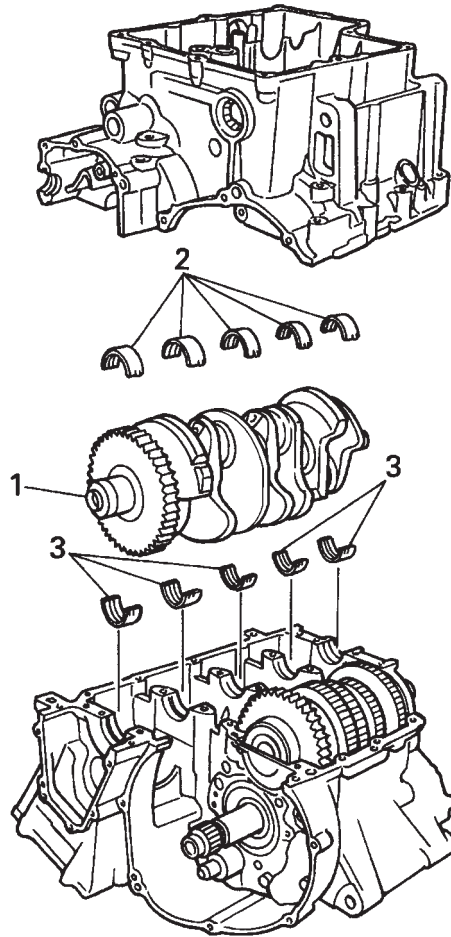
CONNECTING RODS AND PISTONS



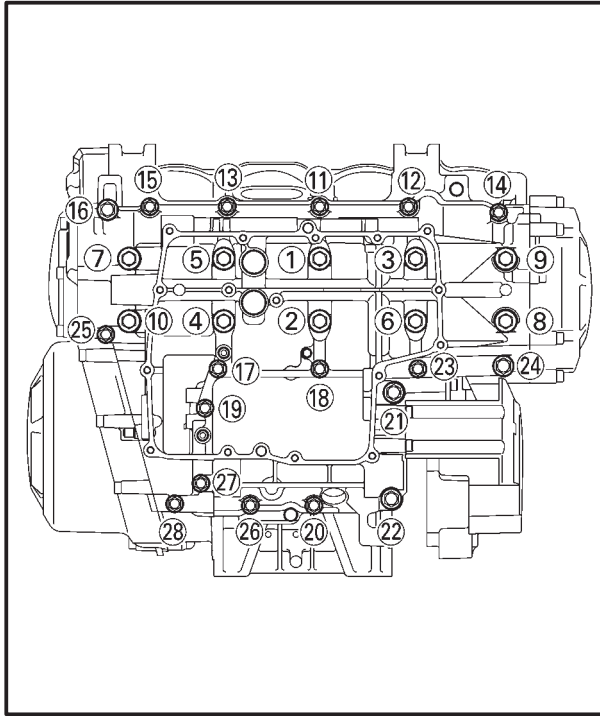
Order	Job/Part	Q'ty	Remarks
	Removing the connecting rods and pistons		Remove the parts in the order listed.
1	Connecting rod cap	4	
2	Big end lower bearing	4	
3	Piston pin clip	8	
4	Piston pin	4	
5	Piston	4	
6	Connecting rod	4	
7	Big end upper bearing	4	
8	Top ring	4	
9	2nd ring	4	
10	Oil ring	4	
			For installation, reverse the removal procedure.



CRANKSHAFT



Order	Job/Part	Q'ty	Remarks
	Removing the crankshaft assembly		
	Crankcase		Remove the parts in the order listed. Separate. Refer to "CRANKCASE".
	Connecting rod caps		Refer to "CONNECTING RODS AND PISTONS".
1	Crankshaft	1	
2	Crankshaft journal lower bearing	5	
3	Crankshaft journal upper bearing	5	
			For installation, reverse the removal procedure.



EAS00384

DISASSEMBLING THE CRANKCASE

1. Place the engine upside down.
2. Remove:
crankcase bolts

NOTE:

Loosen each bolt 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the bolts are fully loosened, remove them. Loosen the bolts in decreasing numerical order (refer to the numbers in the illustration). The numbers embossed on the crankcase indicate the crankcase tightening sequence.

3. Remove:
lower crankcase

CAUTION:

Tap on one side of the crankcase with a soft-face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure that the crankcase halves separate evenly.

M9 × 125 mm bolts: ① ~ ⑩

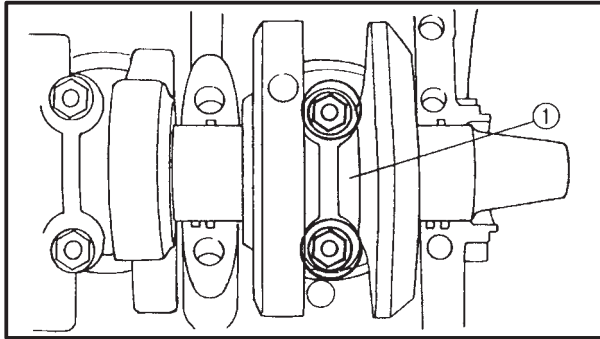
M8 × 125 mm bolts: ⑪ ~ ⑫

M6 × 100 mm bolts: ⑬ ~ ⑳, ㉑ ~ ㉒

4. Remove:
dowel pins
O-ring
5. Remove:
crankshaft journal lower bearing
(from the lower crankcase)

NOTE:

Identify the position of each crankshaft journal lower bearing so that it can be reinstalled in its original place.



EAS00393

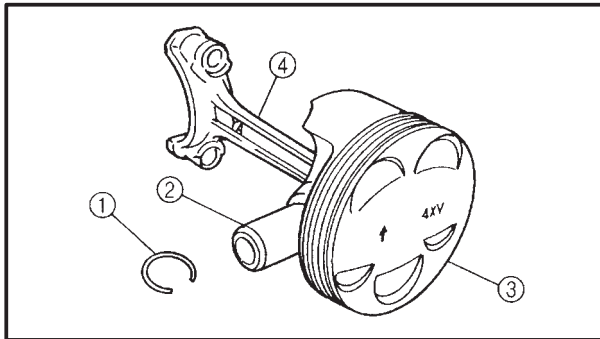
REMOVING THE CONNECTING RODS AND PISTONS

The following procedure applies to all of the connecting rods and pistons.

1. Remove:
connecting rod cap (1)
big end bearings

NOTE:

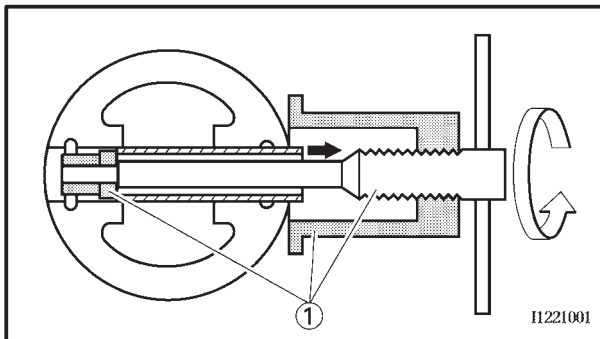
Identify the position of each big end bearing so that it can be reinstalled in its original place.



2. Remove:
piston pin clips (1)
piston pin (2)
piston (3)

CAUTION:

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



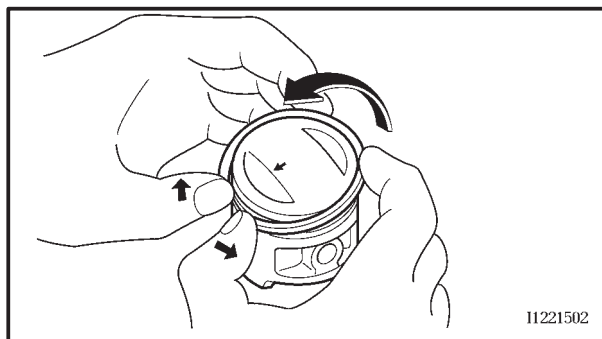
NOTE:

For reference during installation, put identification marks on the piston crown.

Before removing the piston pin, deburr the piston pin clip'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 (1).



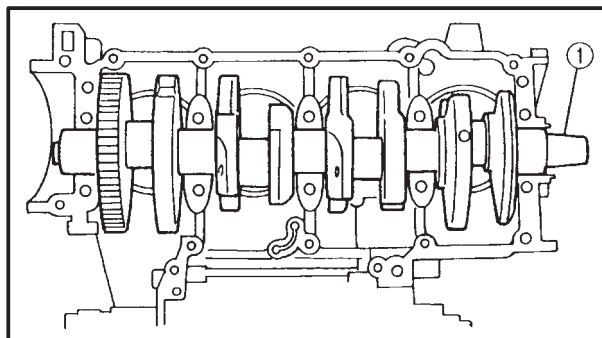
Piston pin puller
YU-01304



3. Remove:
top ring
2nd ring
oil ring

NOTE:

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



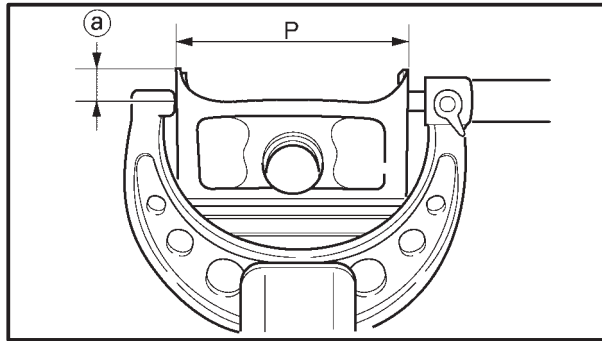
EAS00387

REMOVING THE CRANKSHAFT ASSEMBLY

1. Remove:
crankshaft assembly ①
crankshaft journal upper bearings
(from the upper crankcase)

NOTE:

Identify the position of each crankshaft journal upper bearing so that it can be reinstalled in its original place.



- c. Measure piston skirt diameter “P” with the micrometer.

- ① 5 mm (0.20 in) from the bottom edge of the piston.



Piston size “P”

73.955 ~ 73.970 mm
(2.9118 ~ 2.9122 in)

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

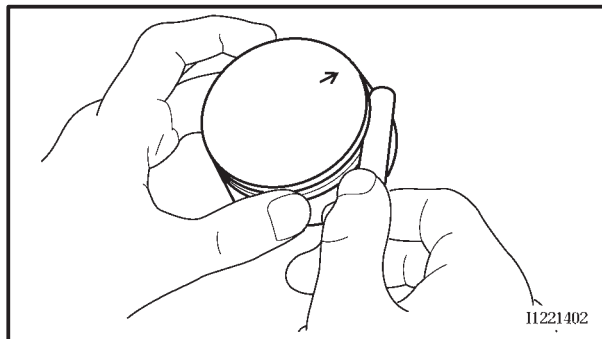
**Piston-to-cylinder clearance =
Cylinder bore “C” –
Piston skirt diameter “P”**



Piston-to-cylinder clearance

0.030 ~ 0.055 mm
(0.001 ~ 0.002 in)
<Limit>: 0.12 mm (0.005 in)

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



EAS00263

CHECKING THE PISTON RINGS

1. Measure:

piston ring side clearance

Out of specification → Replace the piston and piston rings as a set.

NOTE:

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



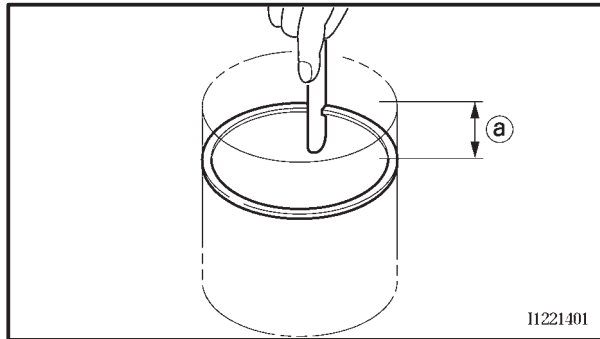
Piston ring side clearance

Top ring

0.030 ~ 0.065 mm
(0.0012 ~ 0.0026 in)

2nd ring

0.020 ~ 0.055 mm
(0.0008 ~ 0.0022 in)



2. Install:
piston ring
(into the cylinder)

NOTE: _____

Level the piston ring in the cylinder with the piston crown as shown.

① 5 mm (0.20 in)

3. Measure:
piston ring end gap
Out of specification → Replace the piston ring.

NOTE: _____

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



Piston ring end gap

Top ring

0.32 ~ 0.44 mm
(0.010 ~ 0.020 in)

2nd ring

0.43 ~ 0.58 mm
(0.017 ~ 0.023 in)

Oil ring

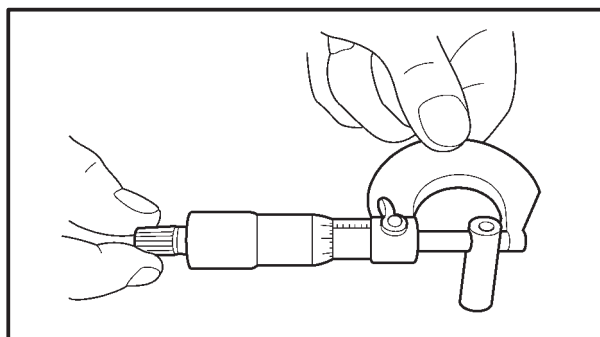
0.10 ~ 0.35 mm
(0.004 ~ 0.014 in)

EAS00266

CHECKING THE PISTON PINS

The following procedure applies to all of the piston pins.

1. Check:
piston pin
Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.

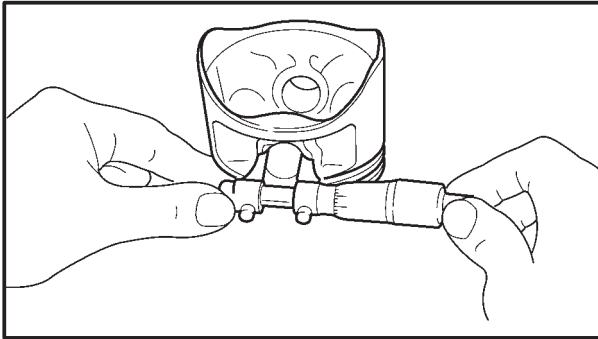


2. Measure:
piston pin outside diameter
Out of specification → Replace the piston pin.



Piston pin outside diameter

16.991 ~ 17.000 mm
(0.6689 ~ 0.6693 in)



3. Measure:
piston pin bore inside diameter
Out of specification → Replace the piston.

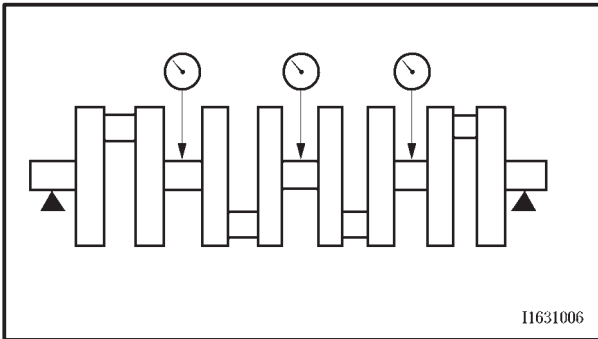


Piston pin bore inside diameter
17.002 ~ 17.013 mm
(0.6694 ~ 0.6698 in)

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



Piston-pin-to-piston clearance =
Piston pin bore size –
Piston pin outside diameter
Piston-pin-to-piston clearance
0.002 ~ 0.022 mm
(0.00008 ~ 0.00087 in)
<Limit>: 0.072 mm (0.0028 in)



EAS00395

CHECKING THE CRANKSHAFT AND CONNECTING RODS

1. Measure:
crankshaft runout
Out of specification → Replace the crankshaft.



Crankshaft runout
Less than 0.03 mm (0.0012 in)

2. Check:
crankshaft journal surfaces
crankshaft pin surfaces
bearing surfaces
Scratches/wear → Replace the crankshaft.
3. Measure:
crankshaft-journal-to-crankshaft-journal-bearing clearance
Out of specification → Replace the crankshaft journal bearings.

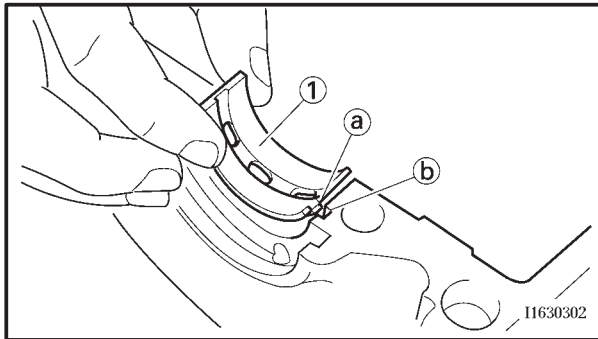


Crankshaft-journal-to-crankshaft-journal-bearing clearance
0.029 ~ 0.053 mm
(0.0011 ~ 0.0021 in)

**CAUTION:**

Do not interchange the crankshaft journal bearings. To obtain the correct crankshaft-journal-to-crankshaft-journal-bearing clearance and prevent engine damage, the crankshaft journal bearings must be installed in their original positions.

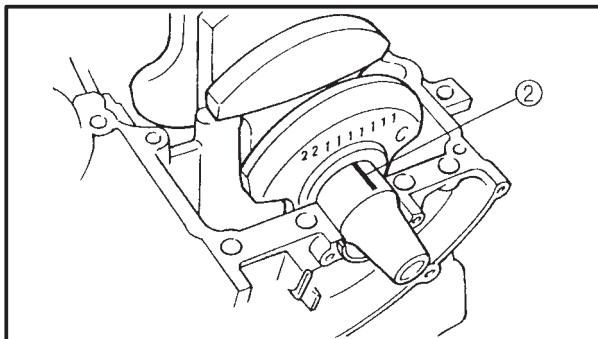
- a. Clean the crankshaft journal bearings, crankshaft journals, and bearing portions of the crankcase.
- b. Place the upper crankcase upside down on a bench.



- c. Install the crankshaft journal upper bearings ① and the crankshaft into the upper crankcase.

NOTE:

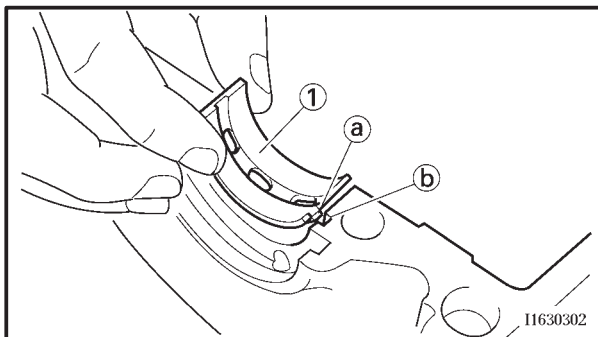
Align the projections (a) of the crankshaft journal upper bearings with the notches (b) in the crankcase.



- d. Put a piece of Plastigauge® ② on each crankshaft journal.

NOTE:

Do not put the Plastigauge® over the oil hole in the crankshaft journal.

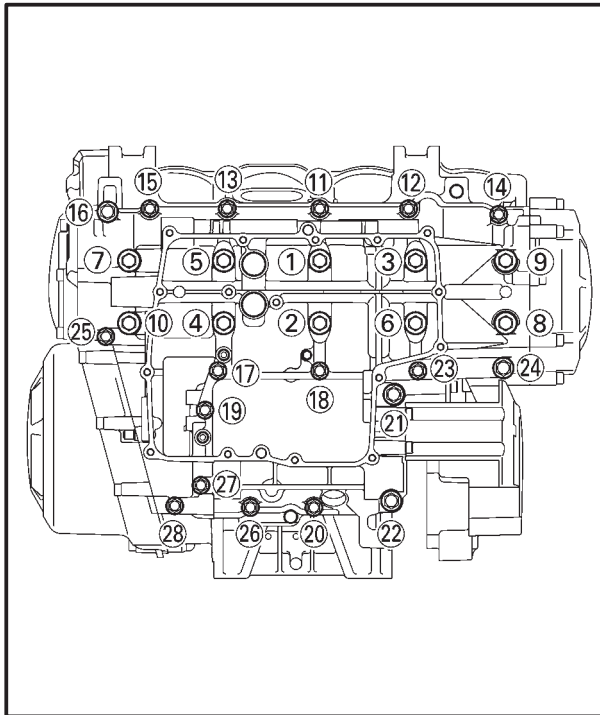


- e. Install the crankshaft journal lower bearings ① into the lower crankcase and assemble the crankcase halves.

NOTE:

Align the projections (a) of the crankshaft journal lower bearings with the notches (b) in the crankcase.

Do not move the crankshaft until the clearance measurement has been completed.



- f. Tighten the bolts to specification in the tightening sequence cast on the crankcase.



Crankcase bolt

Bolt ① ~ ⑩

1st: 15 Nm

(1.5 m•kg, 11 ft•lb)

2nd: 15 Nm

(1.5 m•kg, 11 ft•lb) +

45 ~ 50°

Bolt ⑪ ~ ⑮, ⑰ ~ ⑳, ㉓,

㉔ ~ ㉔

12 Nm (1.2 m•kg, 8.7 ft•lb)

Bolt ⑰, ㉔

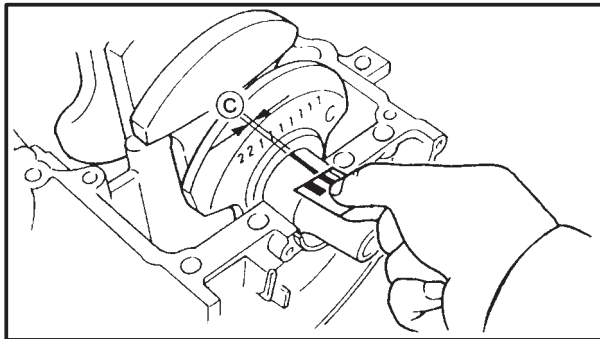
14 Nm (1.4 m•kg, 10 ft•lb)

Bolt ㉕ ~ ㉕

24 Nm (24 m•kg, 17 ft•lb)

NOTE:

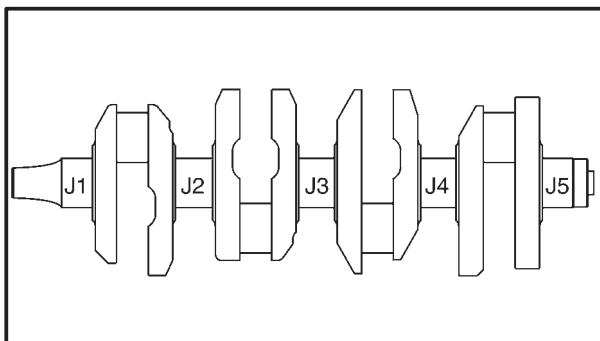
Lubricate the crankcase bolt threads with engine oil.



- g. Remove the lower crankcase and the crankshaft journal lower bearings.

- h. Measure the compressed Plastigauge® width ㉔ on each crankshaft journal.

If the clearance is out of specification, select replacement crankshaft journal bearings.



4. Select:

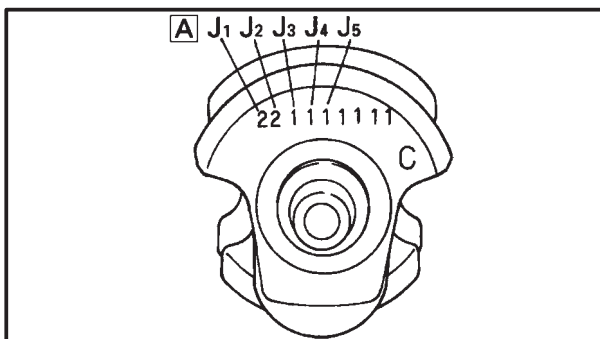
- crankshaft journal bearings (J1 ~ J5)

NOTE:

- The numbers ㉔ stamped into the crankshaft web and the numbers ① stamped into the lower crankcase are used to determine the replacement crankshaft journal bearing sizes.

- “J1 ~ J5” refer to the bearings shown in the crankshaft illustration.

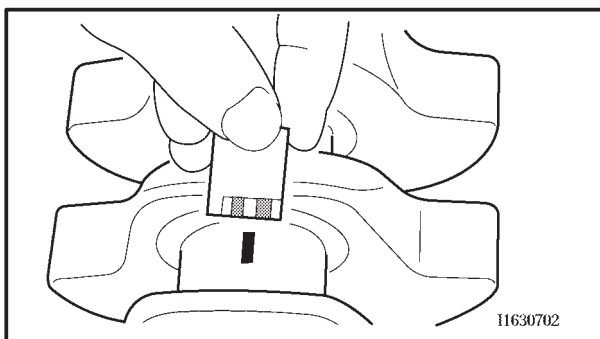
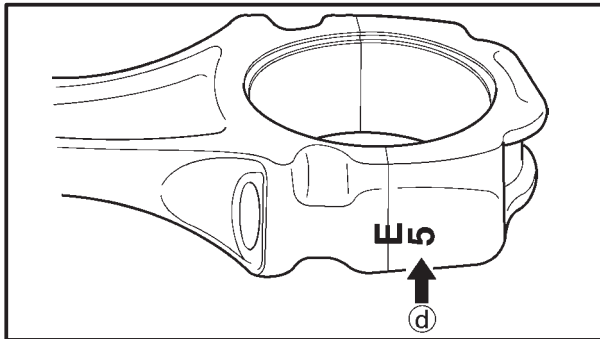
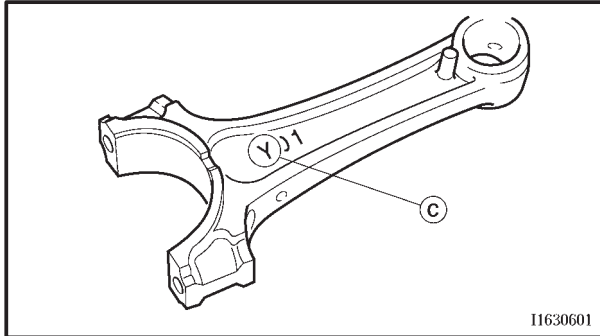
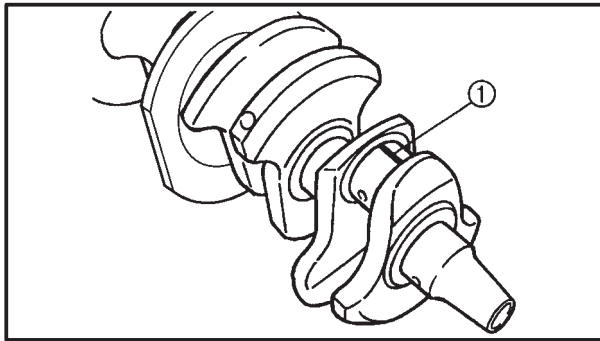
- If “J1 ~ J5” are the same, use the same size for all of the bearings.



For example, if the crankcase “J₁” and crankshaft web “J₁” numbers are “6” and “2” respectively, then the bearing size for “J₁” is:

Bearing size for J1:

J1 (crankcase) – J₁ (crankshaft web) – 2 =
6 – 2 – 2 = 2 (Pink/black)




- c. Put a piece of Plastigauge® ① on the crankshaft pin.
- d. Assemble the connecting rod halves.

NOTE:

Do not move the connecting rod or crankshaft until the clearance measurement has been completed.

Apply molybdenum disulfide grease onto the bolts, threads, and nut seats.

Make sure that the “Y” mark  on the connecting rod faces towards the left side of the crankshaft.

Make sure that the characters (d) on both the connecting rod and connecting rod cap are aligned.

- e. Tighten the connecting rod nuts.

CAUTION:

When tightening the connecting rod nuts, be sure to use an F-type torque wrench.

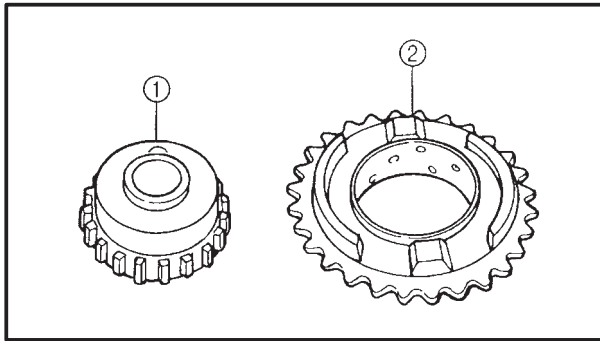
Without pausing, tighten the connecting rod nuts to the specified torque. Apply continuous torque between 2.0 and 3.6 m kg. Once you reach 2.0 m kg, DO NOT STOP TIGHTENING until the specified torque is reached. If the tightening is interrupted between 2.0 and 3.6 m kg, loosen the connecting rod nut to less than 2.0 m kg and start again.

Refer to “INSTALLING THE CONNECTING RODS”.



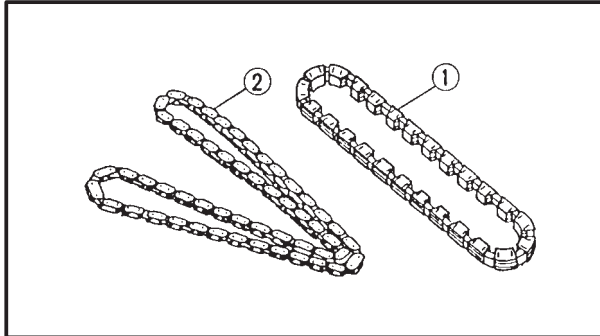
Connecting rod nut
36 Nm (3.6 m kg, 25 ft lb)

- f. Remove the connecting rod and big end bearings.
Refer to “REMOVING THE CONNECTING RODS”.
- g. Measure the compressed Plastigauge® width on the crankshaft pin.
If the clearance is out of specification, select replacement big end bearings.

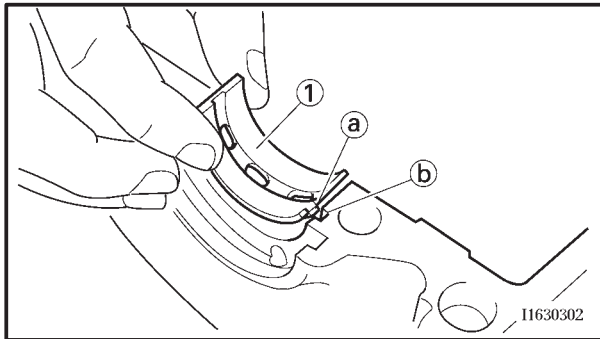


CHECKING THE SPROCKETS AND CHAINS

1. Check:
 - crankshaft sprocket ①
 - oil/water pump assembly drive sprocket ②
 - Cracks/damage/wear → Replace the defective part(-s).



2. Check:
 - timing chain ①
 - Damage/stiffness → Replace the timing chain and crankshaft sprocket as a set.
 - oil/water pump assembly drive chain ②
 - Damage/stiffness → Replace the oil/water pump assembly drive chain and oil/water pump assembly drive sprocket as a set.



EAS00407

INSTALLING THE CRANKSHAFT

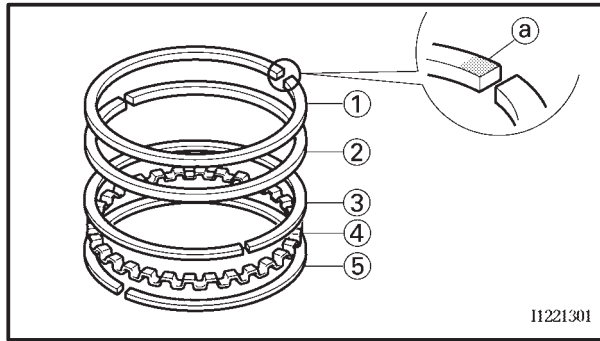
1. Install:
 - crankshaft journal upper bearings ①
 - (into the upper crankcase)

NOTE:

Align the projections (a) on the crankshaft journal upper bearings with the notches (b) in the crankcase.

Be sure to install each crankshaft journal upper bearing in its original place.

2. Install:
 - crankshaft



EAS00268

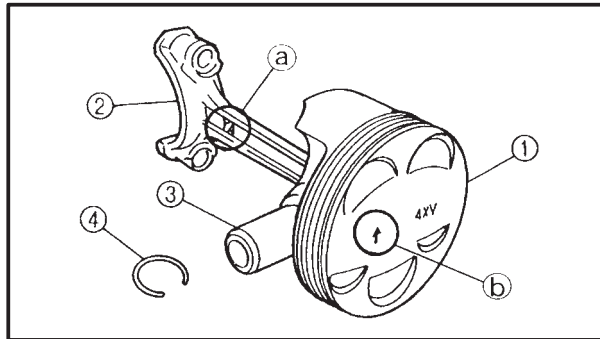
INSTALLING THE CONNECTING ROD AND PISTON

The following procedure applies to all of the connecting rods and pistons.

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

NOTE:

Be sure to install the piston rings so that the manufacturer's marks or numbers ① face up.



2. Install:
 - piston ①
 - (onto the respective connecting rod ②)
 - piston pin ③
 - piston pin clip **New** ④

NOTE:

Apply engine oil onto the piston pin.

Make sure that the "Y" mark ① on the connecting rod faces left when the arrow mark ② on the piston is pointing up. Refer to the illustration.

Reinstall each piston into its original cylinder (numbering order starting from the left: #1 to #4).

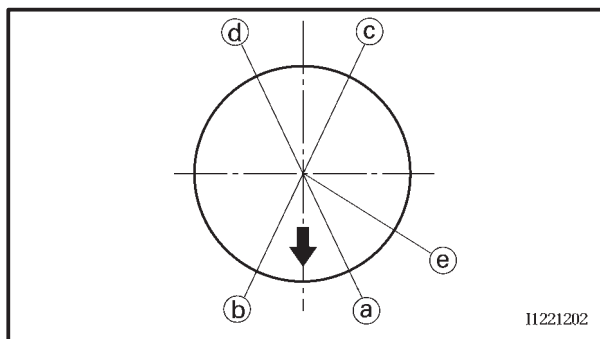
3. Lubricate:
 - piston
 - piston rings
 - cylinder
 - (with the recommended lubricant)



**Recommended lubricant
Engine oil**

4. Offset:
 - piston ring end gaps

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





5. Lubricate:
crankshaft pins
big end bearings
connecting rod big end inner surface
(with the recommended lubricant)

	Recommended lubricant Engine oil
--	---

6. Install:
big end bearings
connecting rod assembly
(into the cylinder and onto the crankshaft pin).
connecting rod cap
(onto the connecting rod)

NOTE:

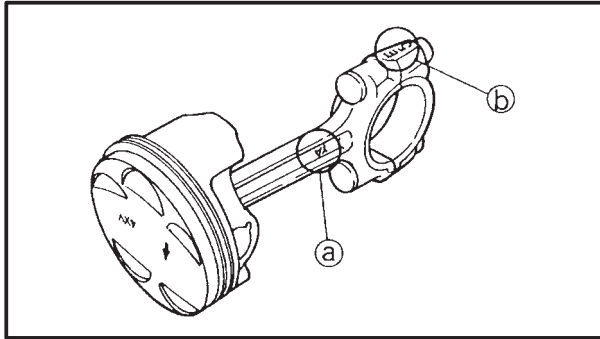
Align the projections on the big end bearings with the notches in the connecting rods and connecting rod caps.

Be sure to reinstall each big end bearing in its original place.

While compressing the piston rings with one hand, install the connecting rod assembly into the cylinder with the other hand.

Make sure that the “Y” marks (a) on the connecting rods face towards the left side of the crankshaft.

Make sure that the characters (b) on both the connecting rod and connecting rod cap are aligned.



7. Align:
bolt heads
(with the connecting rod caps)
8. Tighten:
connecting rod nuts

36 Nm (3.6 m kg, 25 ft lb)

CAUTION:

When tightening the connecting rod nuts, be sure to use an F-type torque wrench. Without pausing, tighten the connecting rod nuts to the specified torque. Apply continuous torque between 2.0 and 3.6 m kg. Once you reach 2.0 m kg DO NOT STOP TIGHTENING until the specified torque is reached. If the tightening is interrupted between 2.0 and 3.6 m kg, loosen the connecting rod nut to less than 2.0 m kg and start again.

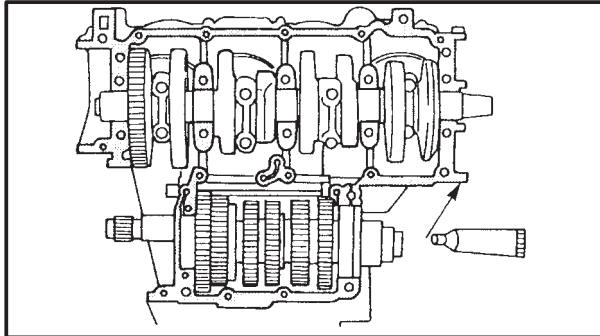


EAS00414

ASSEMBLING THE CRANKCASE

1. Lubricate:
crankshaft journal bearings
(with the recommended lubricant)

	Recommended lubricant Engine oil
--	---



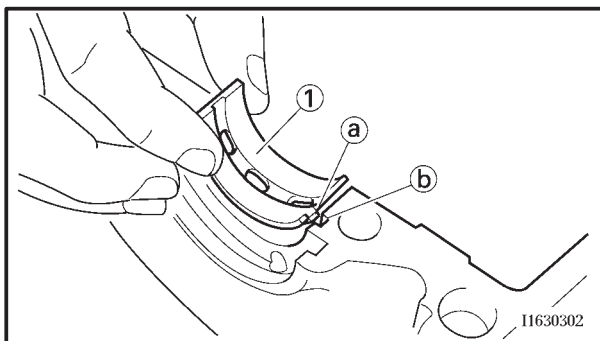
2. Apply:
sealant
(onto the crankcase mating surfaces)

	Yamaha bond No. 1215 ACC-11001-05-01
--	---

NOTE:

Do not allow any sealant to come into contact with the oil gallery or crankshaft journal bearings. Do not apply sealant to within 2 ~ 3 mm of the crankshaft journal bearings.

3. Install:
dowel pin

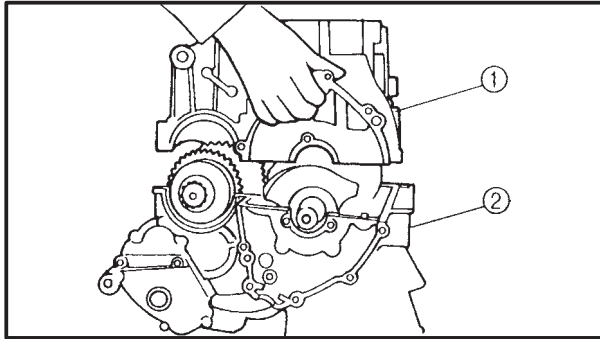


4. Install:
crankshaft journal lower bearings ①
(into the lower crankcase)

NOTE:

Align the projections (a) on the crankshaft journal lower bearings with the notches (b) in the crankcase.
Install each crankshaft journal lower bearing in its original place.

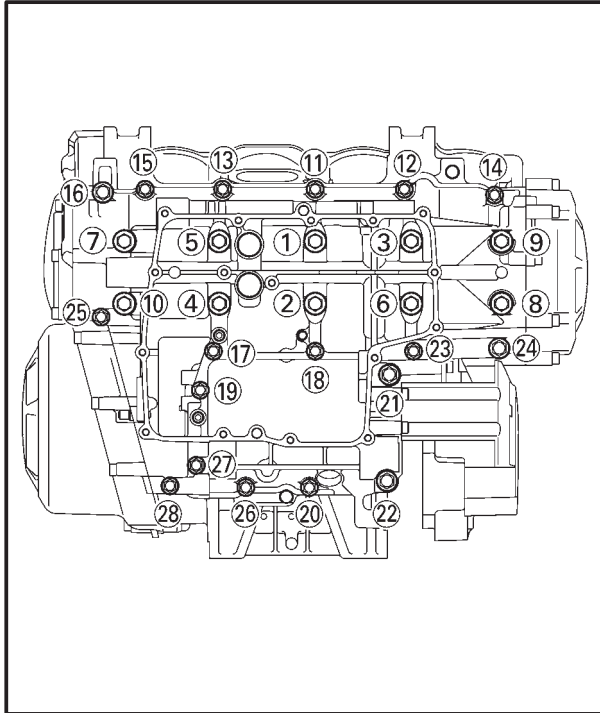
5. Set the shift drum assembly and transmission gears in the neutral position.



6. Install:
- upper crankcase ①
(onto the lower crankcase ②)

CAUTION:

Before tightening the crankcase bolts, make sure that the transmission gears shift correctly when the shift drum assembly is turned by hand.



7. Install:
- crankcase bolts

NOTE:

- Lubricate the bolt threads with engine oil.
- Tighten the bolts in increasing numerical order.
- Install washers on bolts ① ~ ⑩.

M9 × 125 mm bolts: ① ~ ⑩

M8 × 125 mm bolts: ⑪ ~ ⑫

M6 × 100 mm bolts: ⑬ ~ ⑭, ⑮ ~ ⑯



Crankcase bolt

Bolt ① ~ ⑩

1st: 15 Nm

(1.5 m•kg, 11 ft•lb)

2nd: 15 Nm

(1.5 m•kg, 11 ft•lb) +

45 ~ 50°

Bolt ⑪ ~ ⑮, ⑰ ~ ⑲, ⑳, ㉑, ㉒ ~ ㉓

12 Nm (1.2 m•kg, 8.7 ft•lb)

Bolt ⑯, ㉔

14 Nm (1.4 m•kg, 10 ft•lb)

Bolt ㉕ ~ ㉖

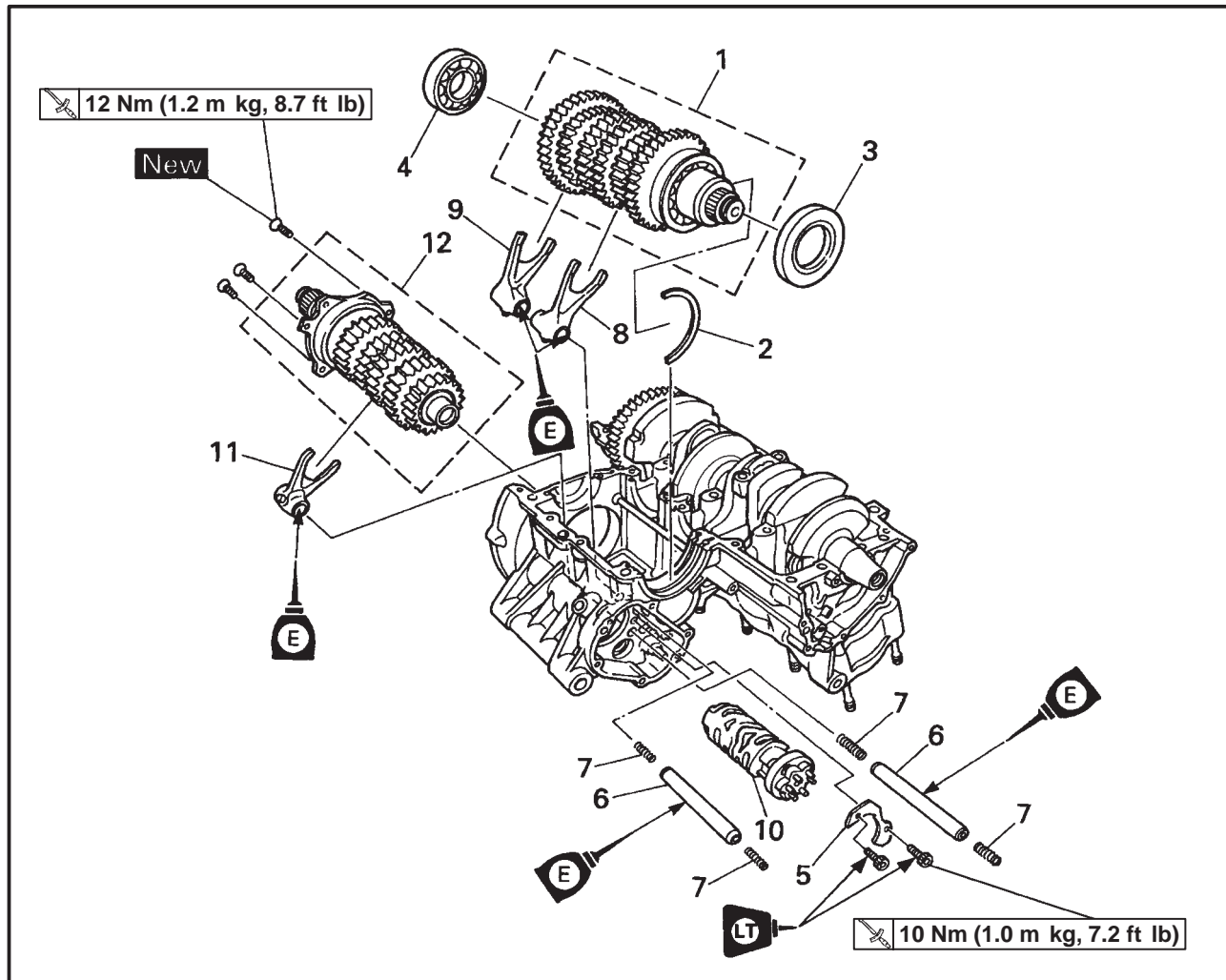
24 Nm (24 m•kg, 17 ft•lb)



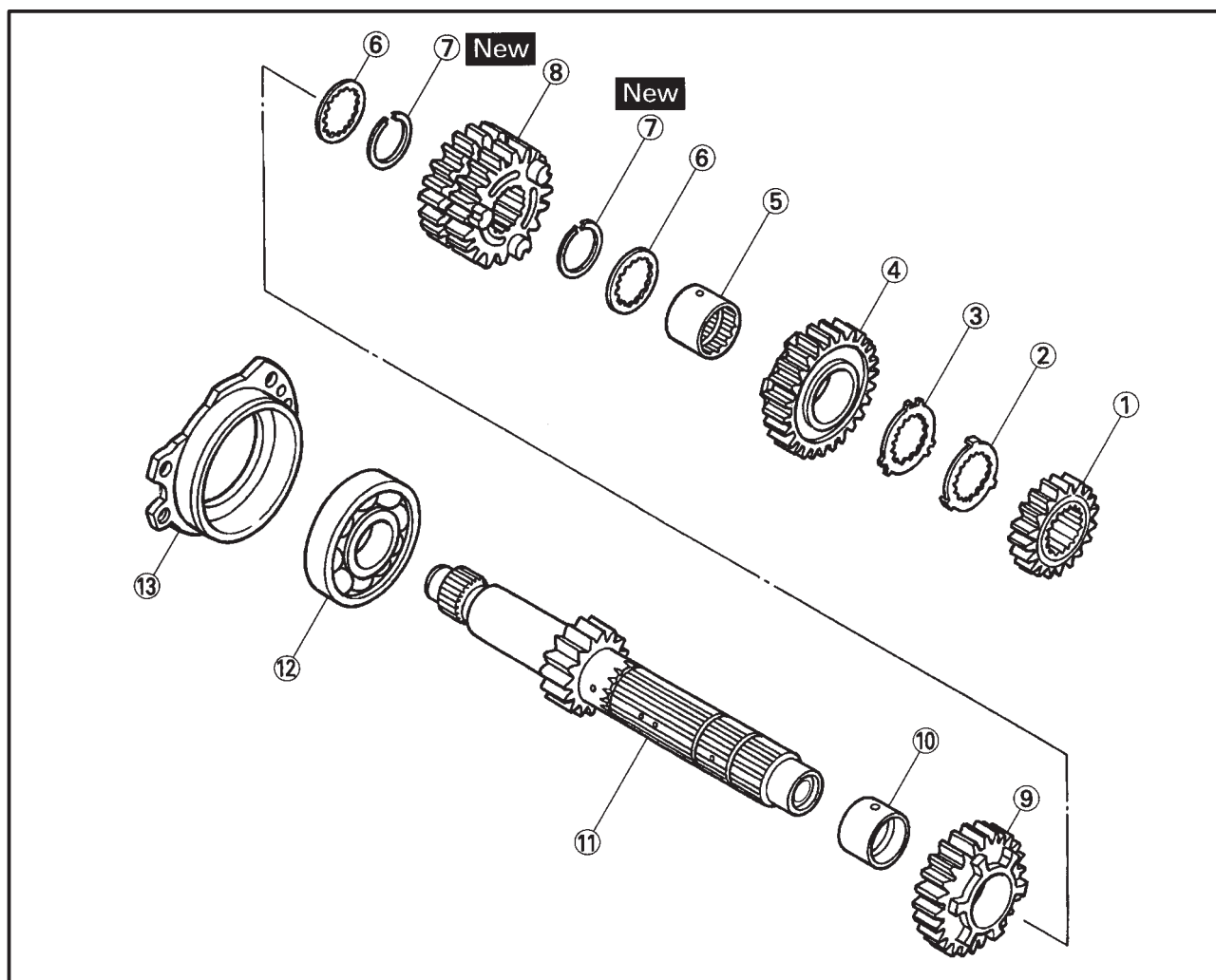
EAS00419

TRANSMISSION

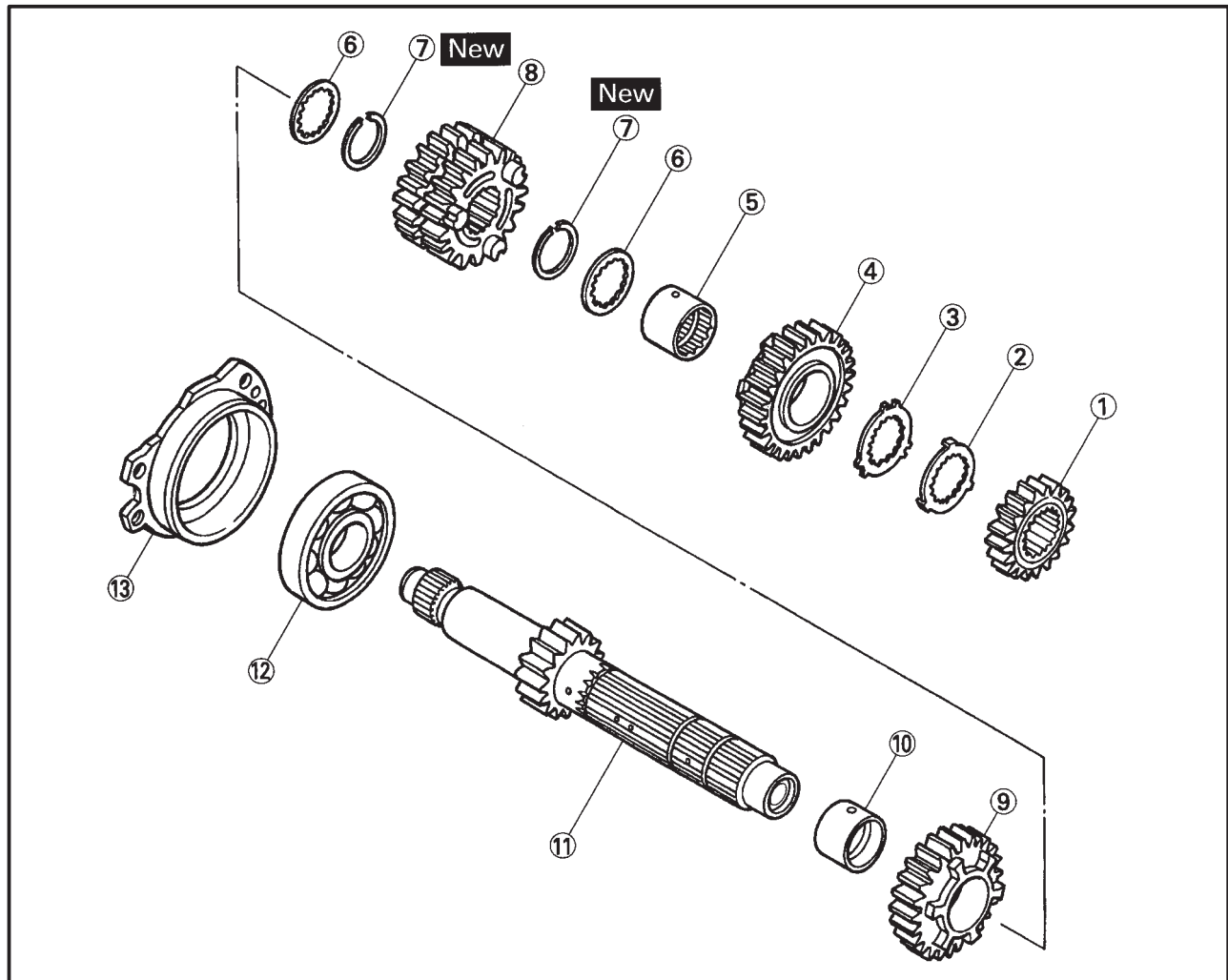
TRANSMISSION, SHIFT DRUM ASSEMBLY AND SHIFT FORKS



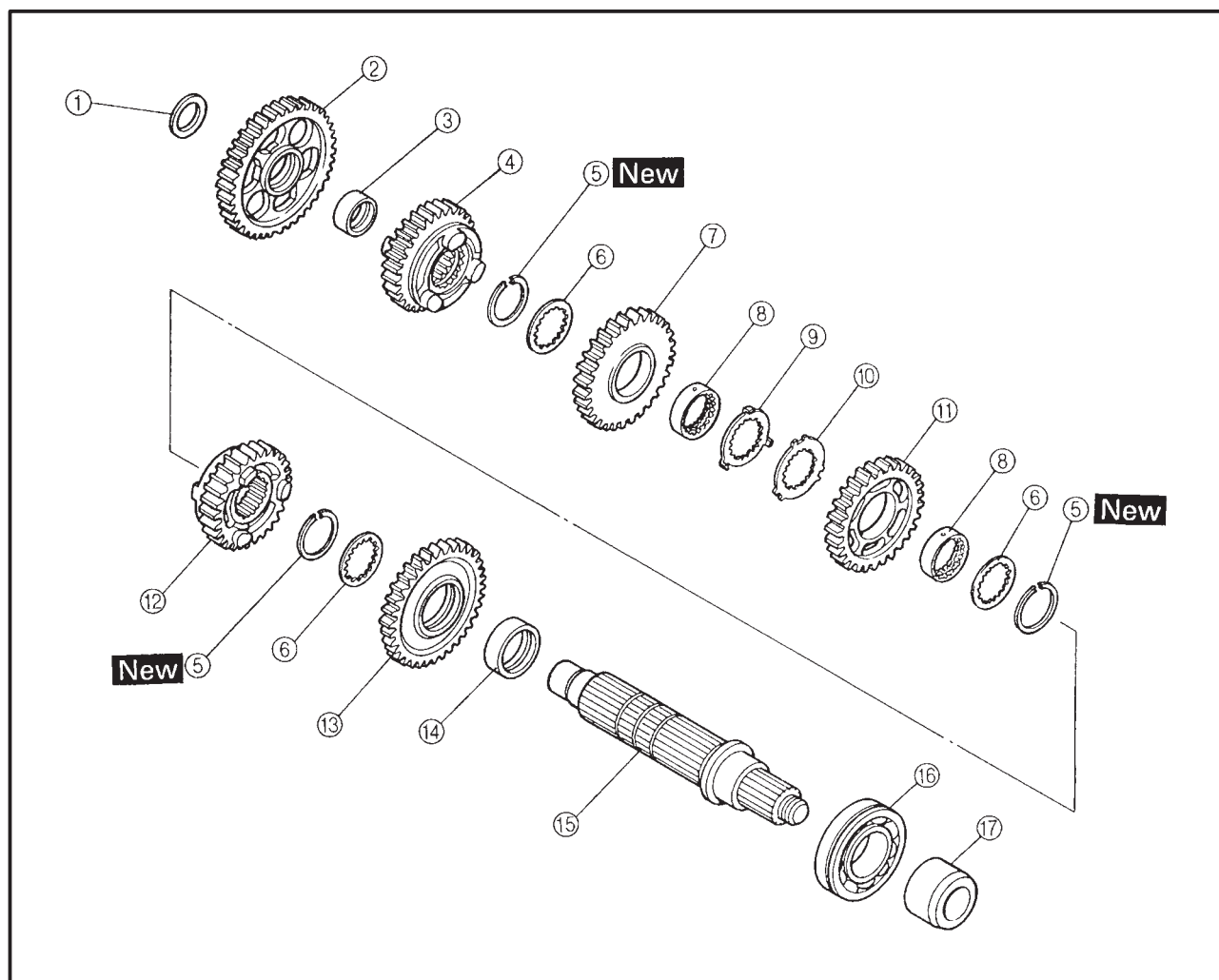
Order	Job/Part	Q'ty	Remarks
	Removing the transmission, shift drum assembly, and shift forks		
	Crankcase		Remove the parts in the order listed.
	Stopper lever		Separate.
1	Drive axle assembly	1	Refer to "CRANKCASE".
2	Circlip	1	Refer to "SHIFT SHAFT".
3	Oil seal	1	
4	Bearing	1	
5	Shift drum retainer	1	
6	Shift fork guide bar	2	
7	Spring	4	
8	Shift fork "L"	1	
9	Shift fork "R"	1	
			For installation, reverse the removal procedure.



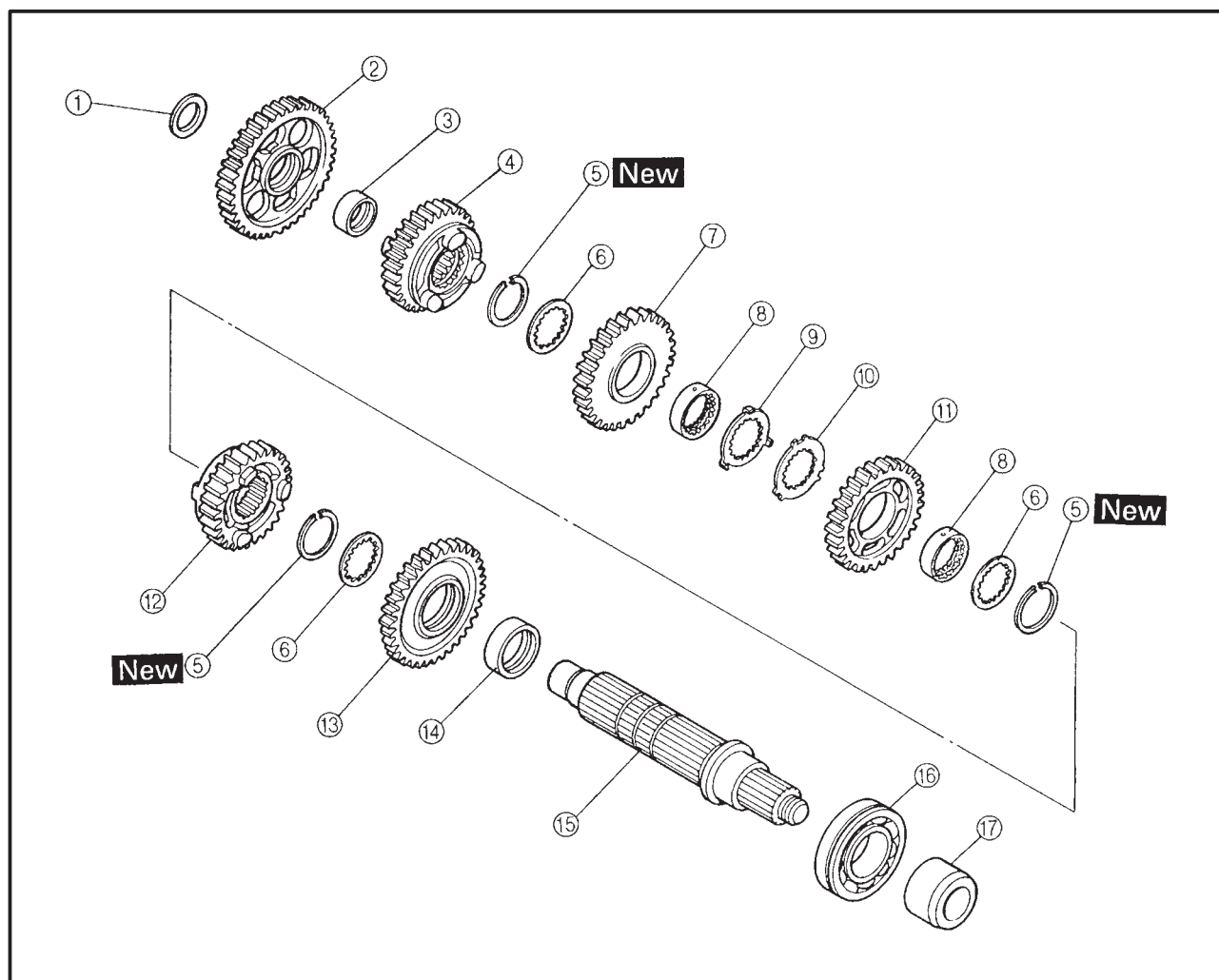
Order	Job/Part	Q'ty	Remarks
	Disassembling the main axle assembly		Disassembly the parts in the order listed.
①	2nd pinion gear	1	
②	Toothed lock washer	1	
③	Toothed lock washer retainer	1	
④	6th pinion gear	1	
⑤	Toothed spacer	1	
⑥	Toothed washer	2	
⑦	Circlip	2	
⑧	3rd/4th pinion gears	1	
⑨	5th pinion gear	1	
⑩	Collar	1	



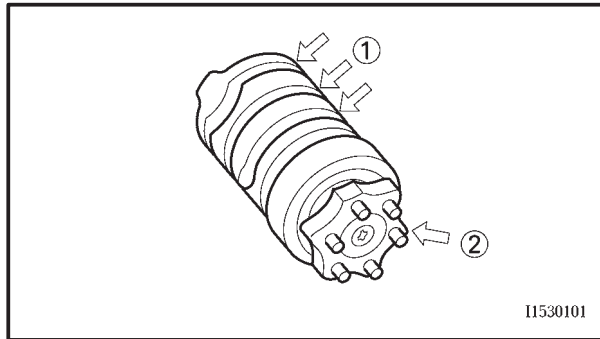
Order	Job/Part	Q'ty	Remarks
⑪	Main axle/1st pinion gear	1	For assembly, reverse the disassembly procedure.
⑫	Bearing	1	
⑬	Main axle bearing housing	1	



Order	Job/Part	Q'ty	Remarks
	Disassembling the drive axle assembly		Disassembly the parts in the order listed.
①	Washer	1	
②	1st wheel gear	1	
③	Spacer	1	
④	5th wheel gear	1	
⑤	Circlip	3	
⑥	Washer	3	
⑦	3rd wheel gear	1	
⑧	Toothed spacer	2	
⑨	Toothed lock washer	1	
⑩	Toothed lock washer retainer	1	



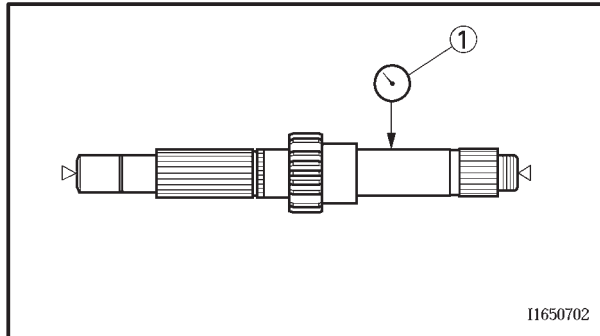
Order	Job/Part	Q'ty	Remarks
⑪	4th wheel gear	1	For assembly, reverse the disassembly procedure.
⑫	6th wheel gear	1	
⑬	2nd wheel gear	1	
⑭	Spacer	1	
⑮	Drive axle	1	
⑯	Bearing	1	
⑰	Spacer	1	



EAS00422

CHECKING THE SHIFT DRUM ASSEMBLY

1. Check:
 - shift drum grooves
Damage/scratches/wear → Replace the shift drum.
 - shift drum segment ①
Damage/wear → Replace.
 - shift drum bearing ②
Damage/pitting → Replace.



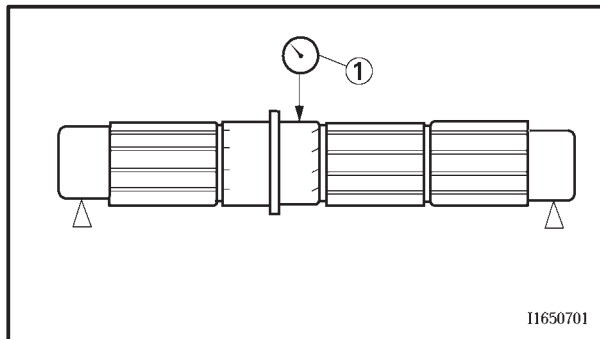
EAS00425

CHECKING THE TRANSMISSION

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



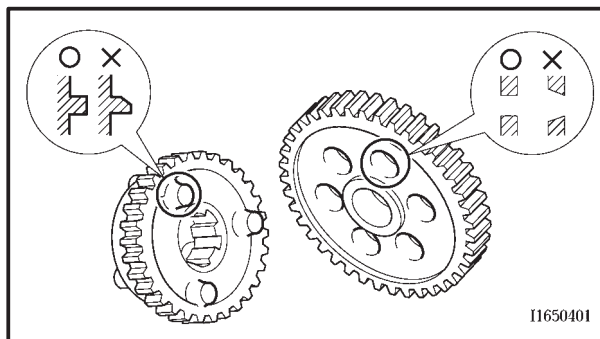
Main axle runout limit
0.08 mm (0.003 in)



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



Drive axle runout limit
0.08 mm (0.003 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
Damage/bends/looseness → Replace.



EAS00428

INSTALLING THE TRANSMISSION

main axle assembly
shift fork "C"
shift drum assembly
shift fork "R"
shift fork "L"
springs
shift fork guide bars
drive axle assembly

NOTE: _____

Carefully position the shift forks so that they are installed correctly into the transmission gears.

Install shift fork "C" into the groove in the 3rd and 4th pinion gear on the main axle.

Install shift fork "L" into the groove in the 6th wheel gear and shift fork "R" into the groove in the 5th wheel gear on the drive axle.

Make sure that the drive axle bearing circlip is inserted into the grooves in the upper crank-case.

2. Check:

transmission
Rough movement → Repair.

NOTE: _____

Oil each gear, shaft, and bearing thoroughly.



CHAPTER 6

COOLING SYSTEM

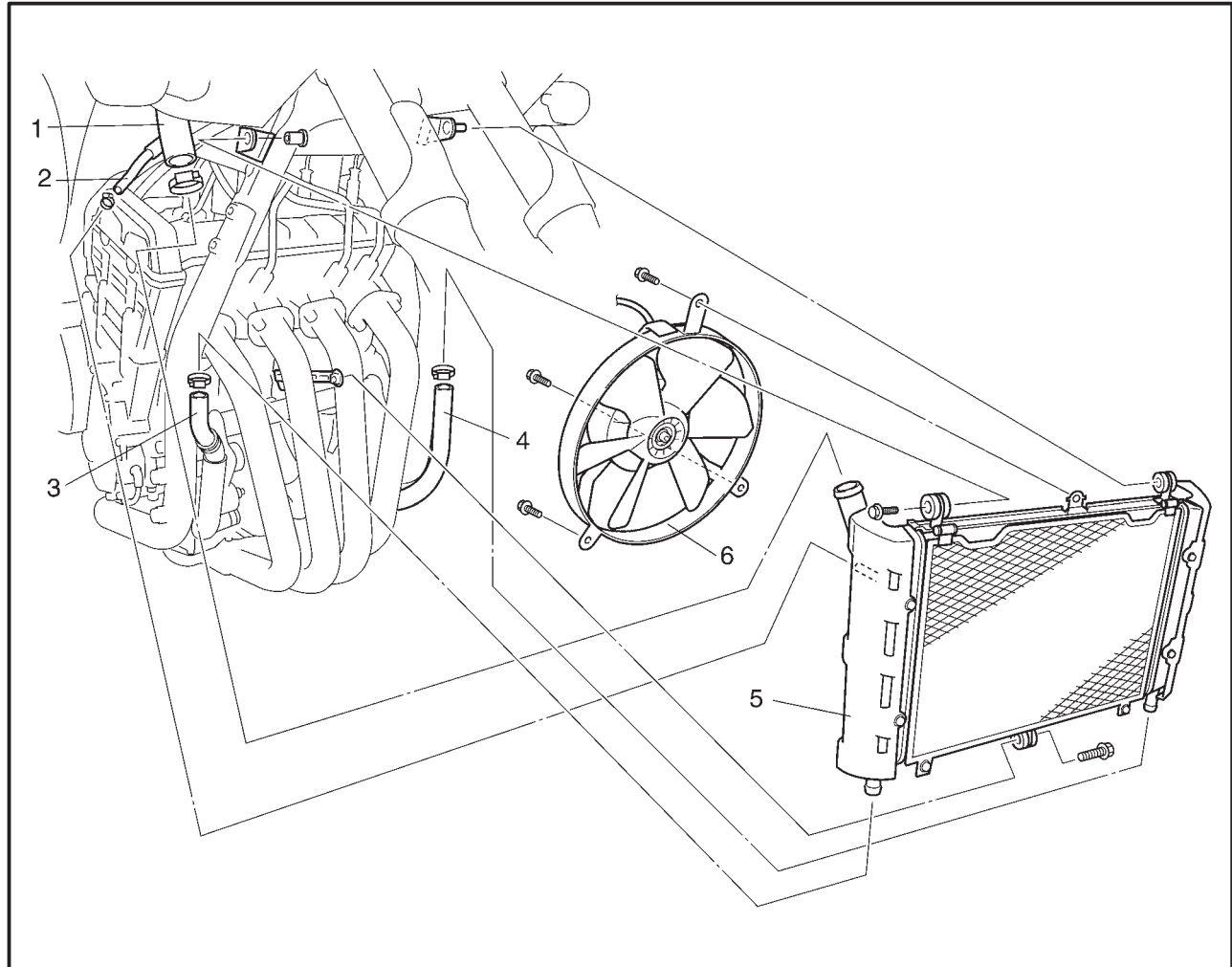
RADIATOR	6-1
CHECKING THE RADIATOR	6-2
INSTALLING THE RADIATOR	6-3
THERMOSTAT	6-4
CHECKING THE THERMOSTAT	6-6
ASSEMBLING THE THERMOSTAT	6-6
INSTALLING THE THERMOSTAT	6-7
WATER PUMP	6-8
DISASSEMBLING THE WATER PUMP	6-10
CHECKING THE WATER PUMP	6-10
ASSEMBLING THE WATER PUMP	6-11



EAS00454

COOLING SYSTEM

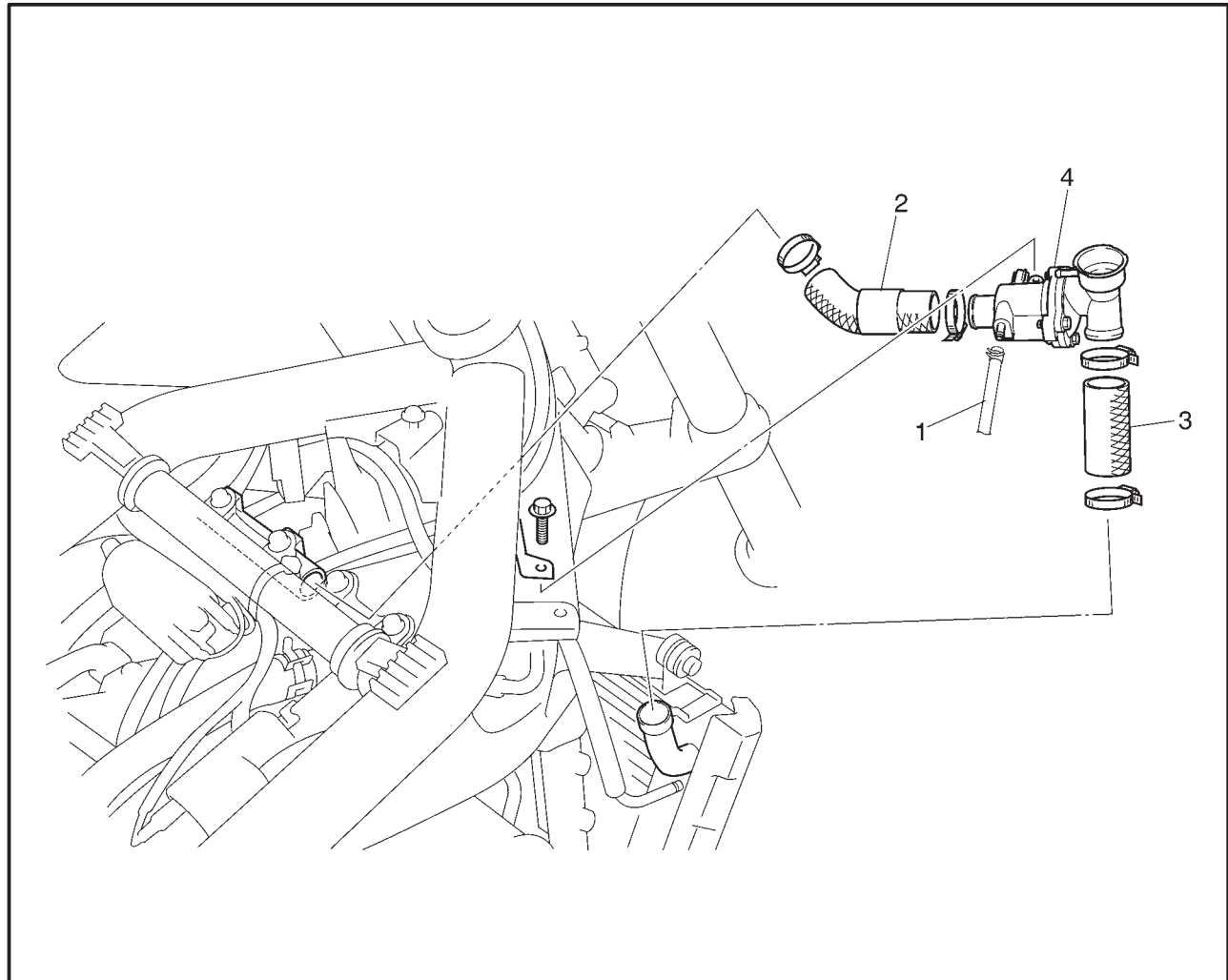
RADIATOR



Order	Job/Part	Q'ty	Remarks
	Removing the radiator		
	Coolant		Remove the parts in the order listed.
1	Water inlet hose	1	Drain.
2	Carburetor hose	1	
3	Oil cooler hose	1	
4	Water outlet hose	1	
5	Radiator	1	
6	Fan motor	1	
			For installation, reverse the removal procedure.



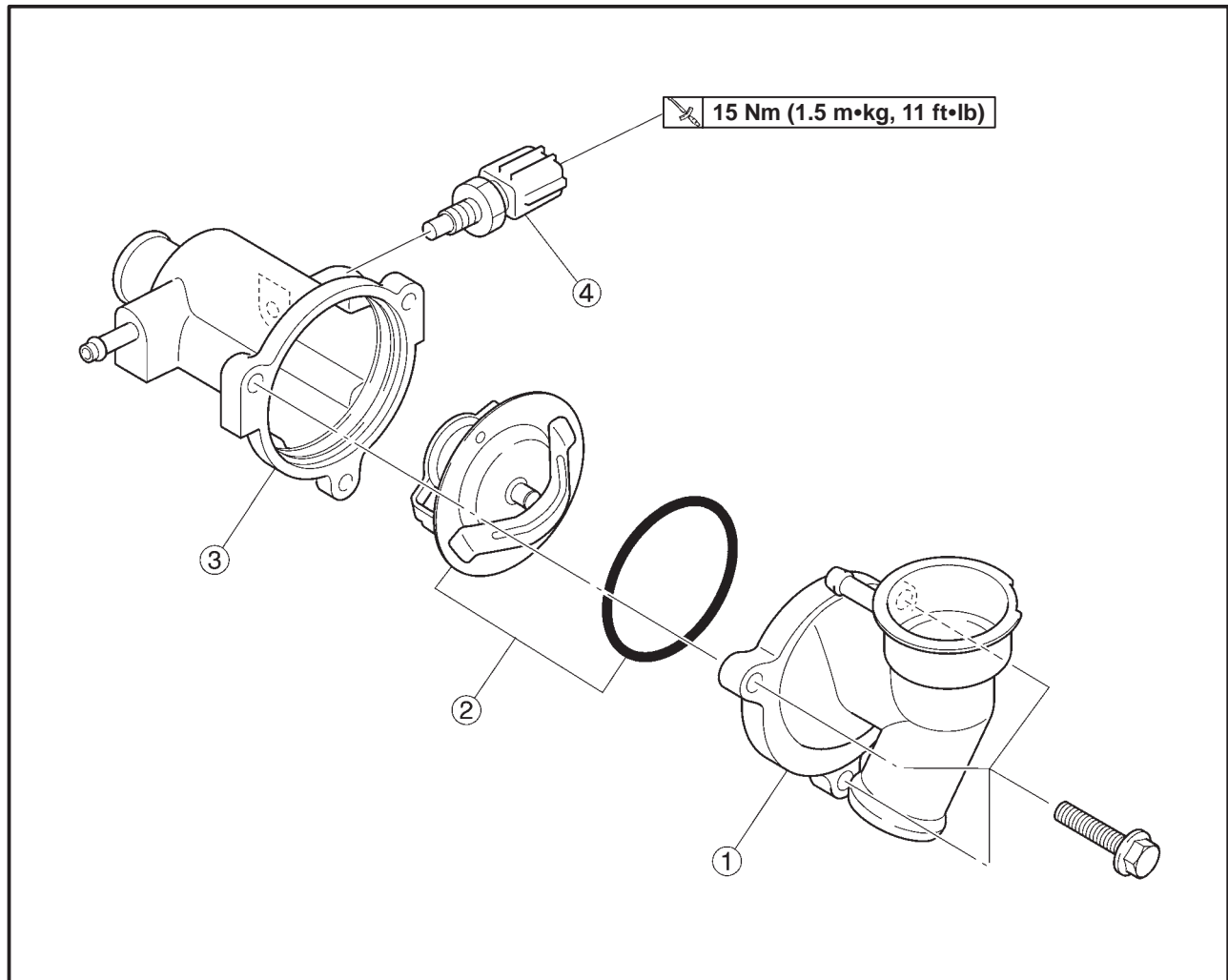
EAS00460

THERMOSTAT

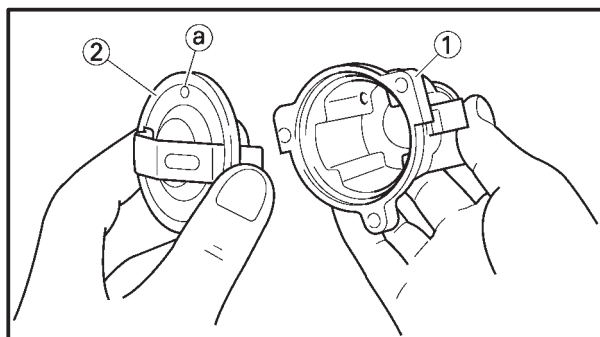
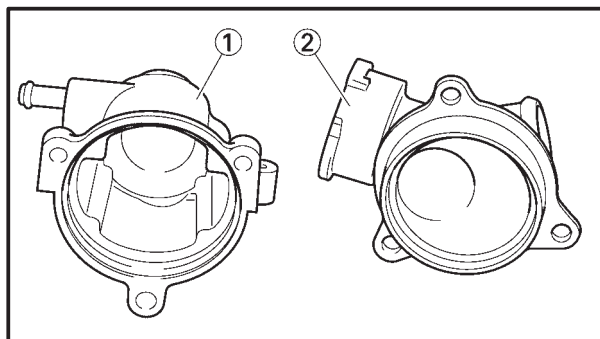
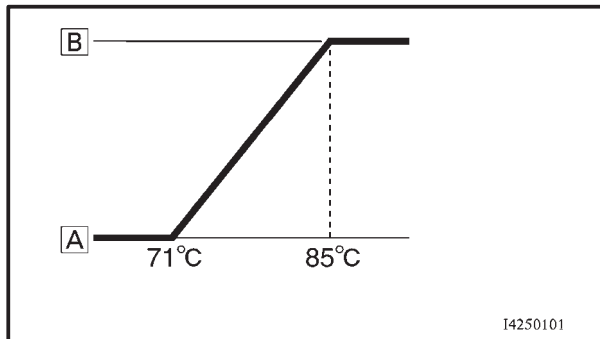
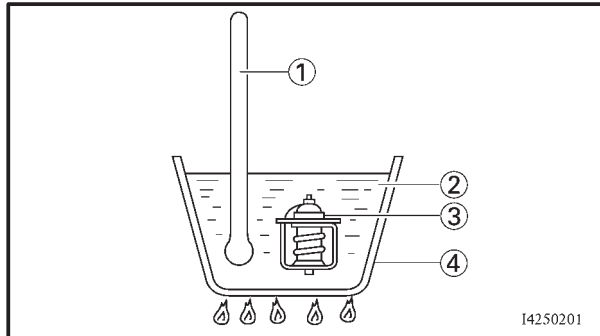
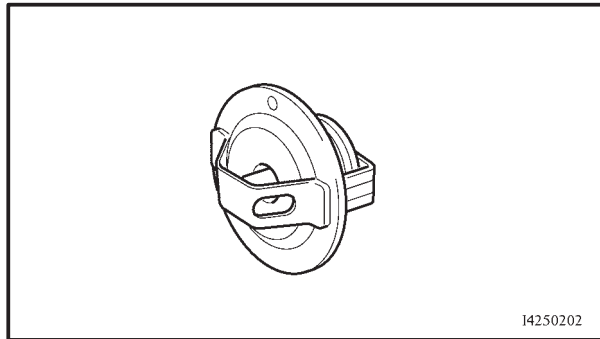
Order	Job/Part	Q'ty	Remarks
	Removing the thermostat		
1	Front cowling	1	Remove the parts in the order listed. Refer to "FRONT COWLING" in chapter 3.
2	Coolant reservoir hose	1	
3	Water inlet hose	1	
4	Water outlet hose	1	
	Thermostat housing	1	For installation, reverse the removal procedure.



EAS00461



Order	Job/Part	Q'ty	Remarks
	Disassembling the thermostat housing		Disassemble the parts in the order listed.
①	Thermostat housing cover	1	
②	Thermostat/O-ring	1/1	
③	Thermostat housing	1	
④	Thermo unit	1	
			For assembly, reverse the disassembly procedure.



EAS00462

CHECKING THE THERMOSTAT

1. Check:

- thermostat
Does not open at 71 ~ 85°C (160 ~ 185°F)
→ Replace.

- [illegible]

- ① Thermometer
 ② Water
 ③ Thermostat
 ④ Container
 A Closes
 B Opens

NOTE:

If the accuracy of the thermostat is in doubt, replace it. A faulty thermostat could cause serious overheating or overcooling.

2. Check:

- thermostat housing cover ①
 - thermostat housing ②
- Cracks/damage → Replace.

EAS00464

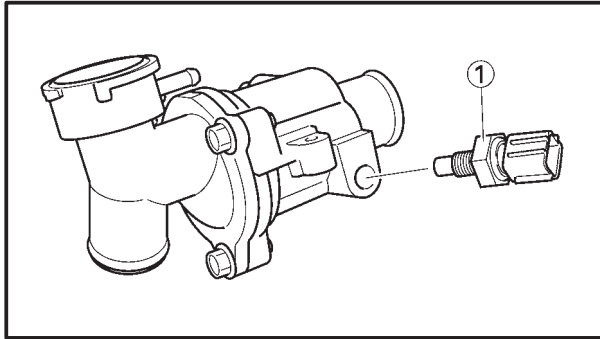
ASSEMBLING THE THERMOSTAT

1. Install:


- thermostat housing ①
- thermostat ②
- O-ring **New**
- thermostat housing cover

NOTE:

Install the thermostat with its breather hole (a) facing up.



2. Install:
thermo unit ①

 15 Nm (1.5 m kg, 11 ft lb)

CAUTION:

Use extreme care when handling the thermo unit. Replace any part that was dropped or subjected to a strong impact.

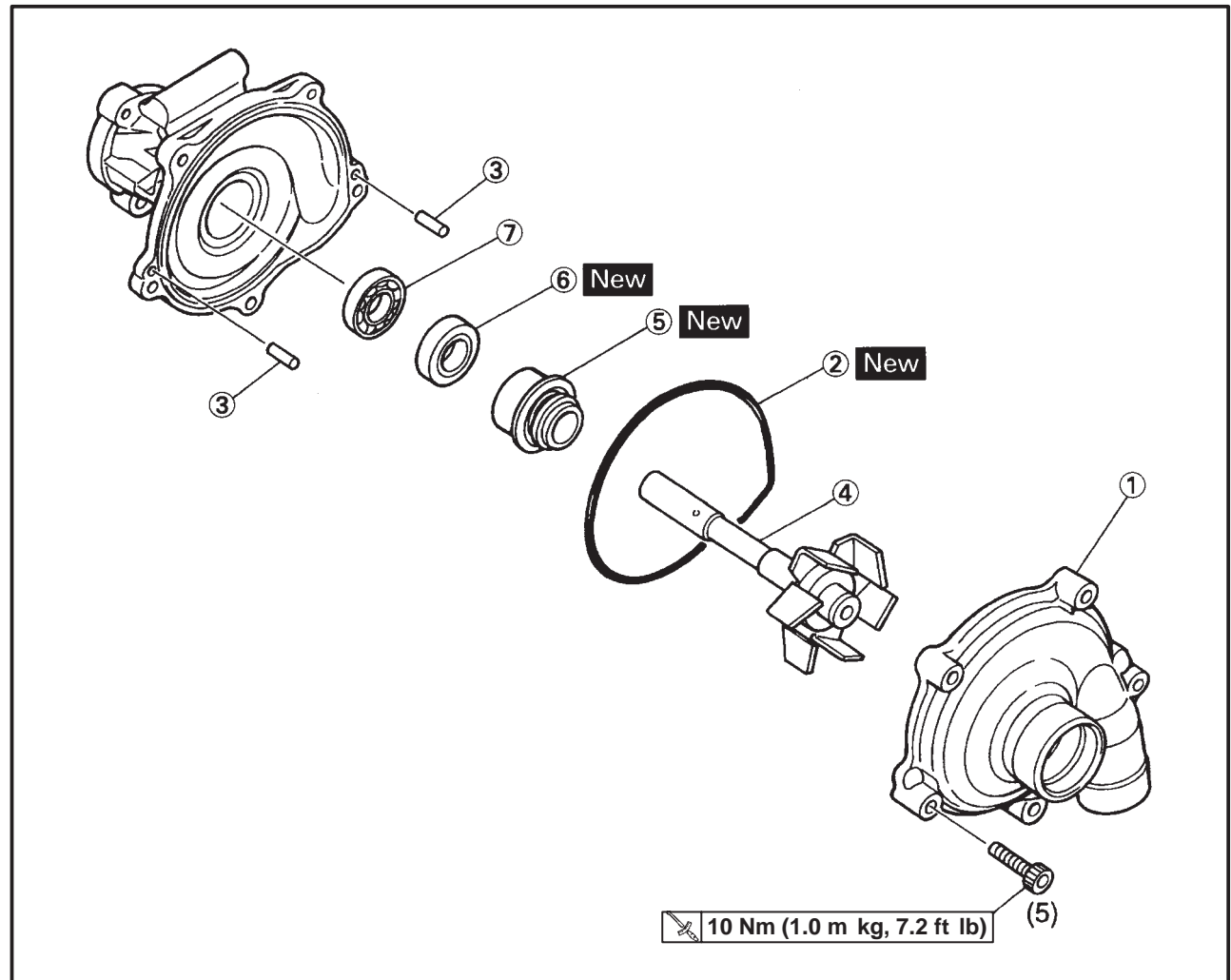
EAS00466

INSTALLING THE THERMOSTAT

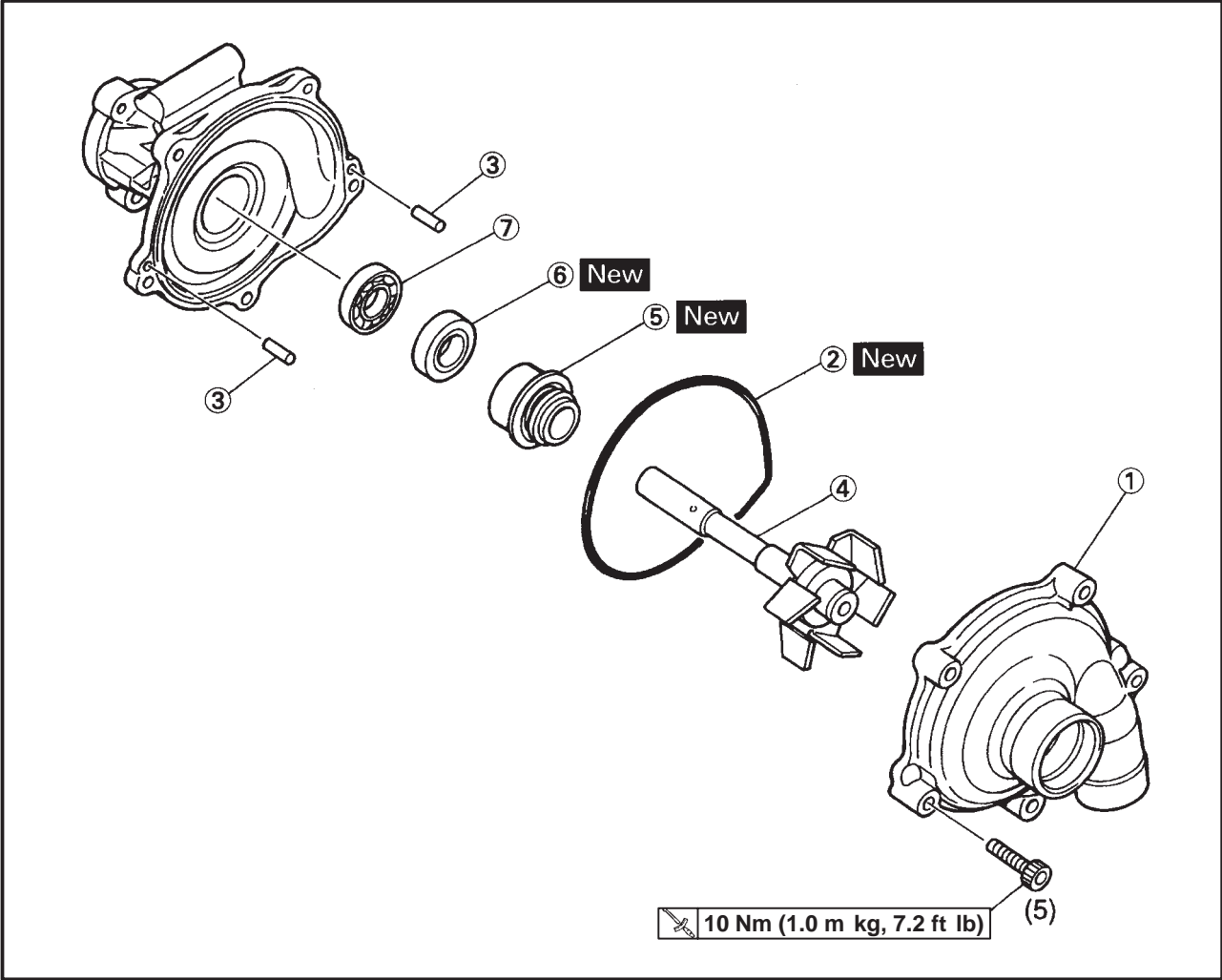
1. Fill:
cooling system
(with the specified amount of the recommended coolant)
Refer to "CHANGING THE COOLANT" in chapter 3.
2. Check:
cooling system
Leaks → Repair or replace any faulty part.

EAS00469

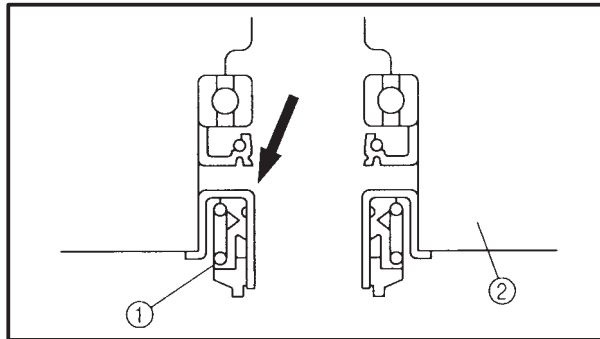
WATER PUMP



Order	Job/Part	Q'ty	Remarks
	Disassembling the water pump		Disassemble the parts in the order listed. NOTE: _____ The water pump and oil pump are combined into one unit (oil/water pump assembly). It is not necessary to remove the impeller shaft unless the coolant level is extremely low or coolant leaks from the oil pan.
①	Oil/water pump assembly and oil pump rotor	1	Refer to "OIL PAN AND OIL PUMP" in chapter 5.
②	Water pump cover	1	
③	O-ring	1	
③	Pin	2	
④	Impeller shaft (along with the impeller)	1	



Order	Job/Part	Q'ty	Remarks
⑤	Water pump seal	1	For assembly, reverse the disassembly procedure.
⑥	Oil seal	1	
⑦	Bearing	1	



EAS00470

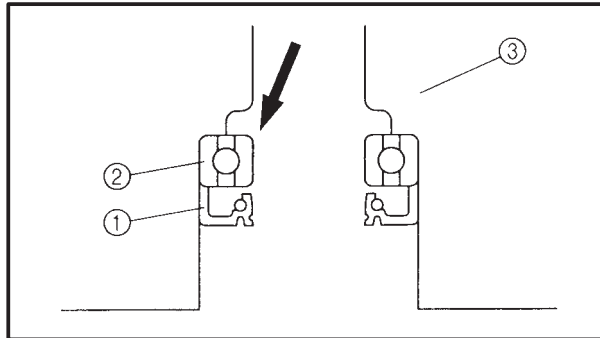
DISASSEMBLING THE WATER PUMP

1. Remove:
water pump seal ①

NOTE:

Tap out the water pump seal from the inside of the water pump housing.

- ② Water pump housing

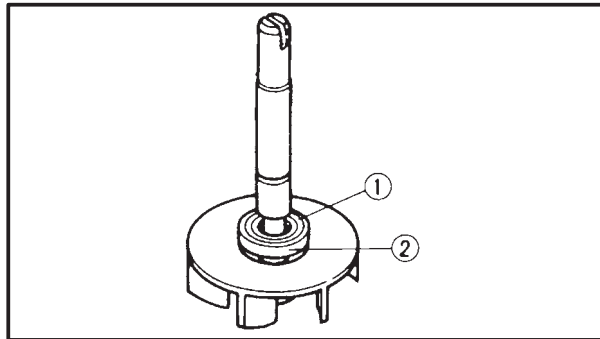


2. Remove:
oil seal ①
bearing ②

NOTE:

Tap out the bearing and oil seal from the outside of the water pump housing.

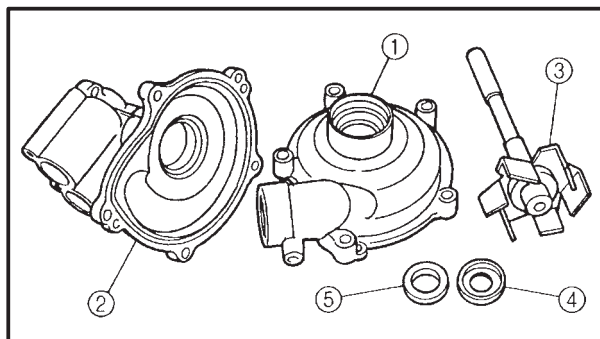
- ③ Water pump housing



3. Remove:
rubber damper holder ①
rubber damper ②
(from the impeller, with a thin, flat-head screwdriver)

NOTE:

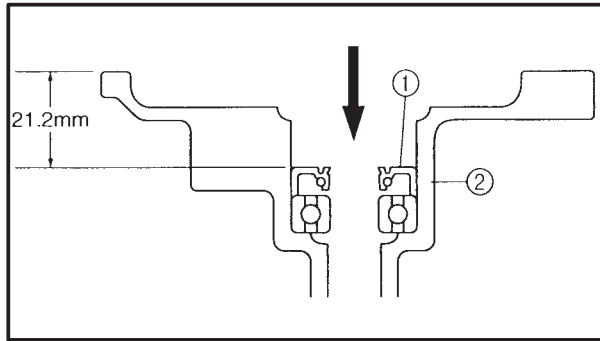
Do not scratch the impeller shaft.



EAS00473

CHECKING THE WATER PUMP

1. Check:
water pump housing cover ①
water pump housing ②
impeller ③
rubber damper ④
rubber damper holder ⑤
2. Check:
water pump seal
oil seal
water pump inlet pipe
Crack/damage/wear → Replace
bearing
Roughness → Replace.



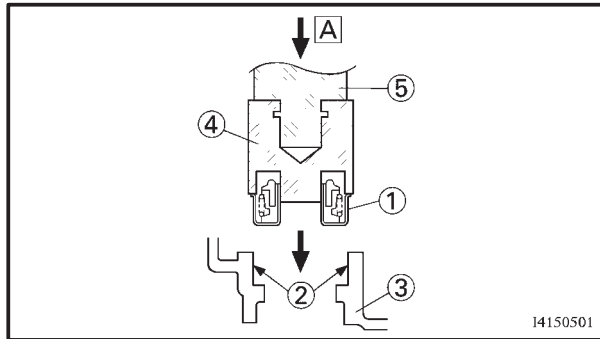
EAS00475

ASSEMBLING THE WATER PUMP

1. Install:
oil seal **New** ①
(to the water pump housing ②)

NOTE:

Install the oil seal with a socket that matches its outside diameter.
Before installing the oil seal, apply tap water or coolant onto its outer surface.



I4150501

2. Install:
water pump seal **New** ①

CAUTION:

Never apply oil or grease onto the water pump seal surface.

NOTE:

Install the water pump seal with the water pump seal installers.
Before installing the water pump seal, apply Yamaha bond No.1215 ② to the water pump housing ③.



Water pump seal installer ④

YM-33221

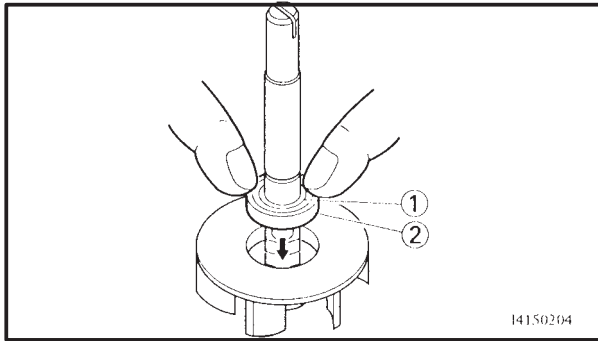
40 and 50 mm Bearing driver ⑤

YM-4058

Yamaha bond No.1215

ACC-11001-05-01

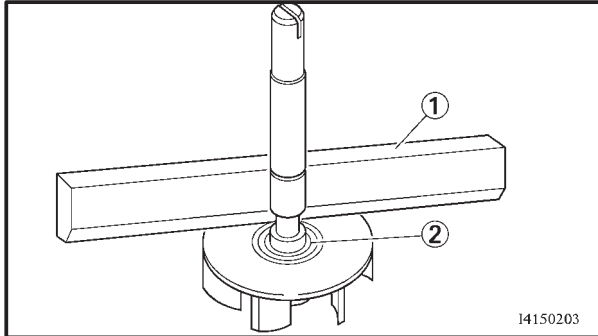
A Push down



3. Install:
 rubber damper **New** ①
 rubber damper holder **New** ②

NOTE:

Before installing the rubber damper, apply tap water or coolant onto its outer surface.



4. Measure:
 tilt
 Out of specification → Repeat steps (3) and (4).

CAUTION:

Make sure that the rubber damper and rubber damper holder are flush with the impeller.



Tilt limit
0.15 mm (0.006 in)

- ① Straightedge
 ② Impeller



CHAPTER 7

CARBURETORS

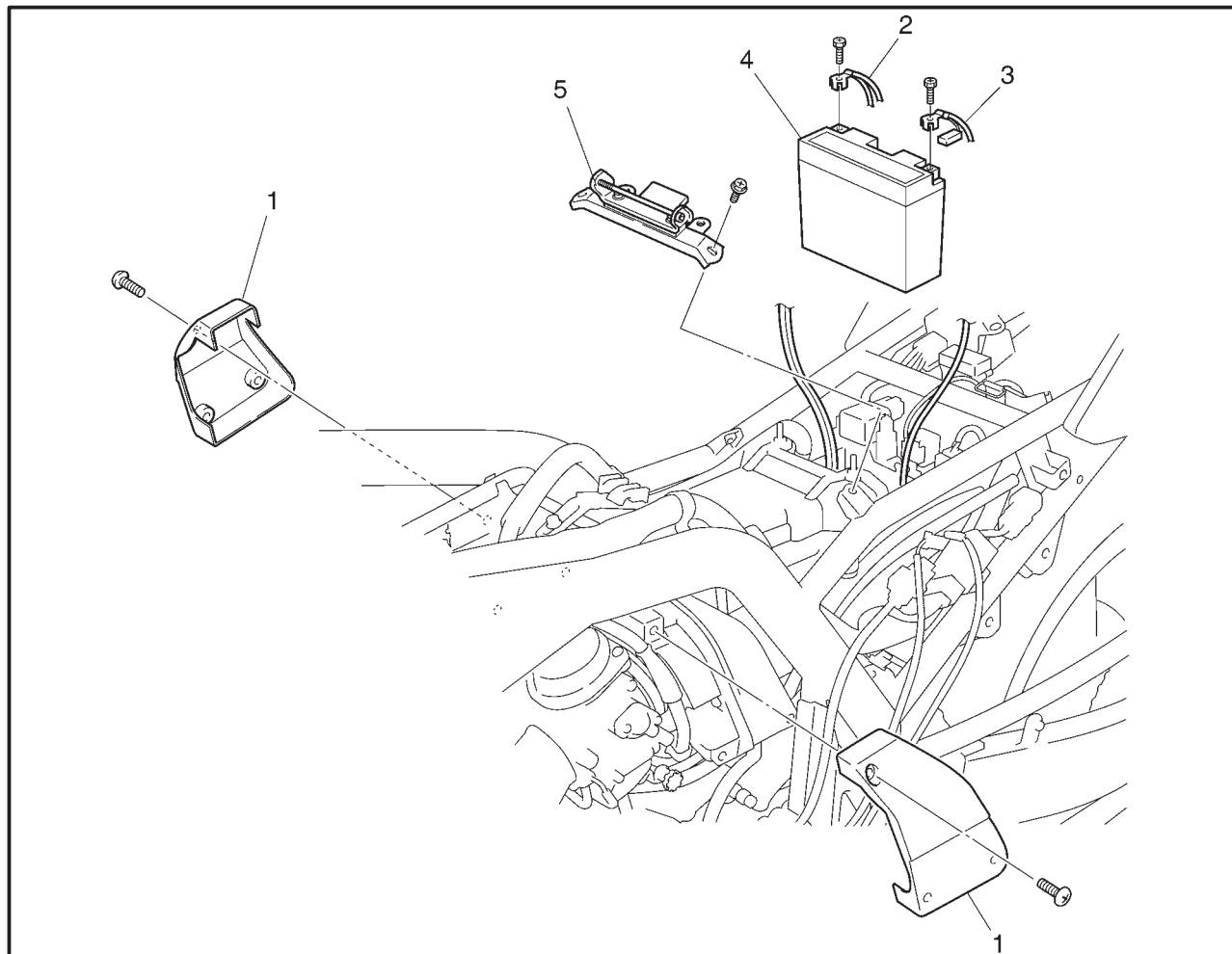
CARBURETORS	7-1
AIR FILTER CASE	7-1
CHECKING THE CARBURETORS	7-6
ASSEMBLING THE CARBURETORS	7-8
INSTALLING THE CARBURETORS	7-9
MEASURING AND ADJUSTING THE FUEL LEVEL	7-10
CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR	7-11
CHECKING THE FUEL PUMP	7-13
 AIR INDUCTION SYSTEM	7-14
AIR INJECTION	7-14
AIR CUTOFF VALVE	7-14
AIR INDUCTION SYSTEM DIAGRAMS	7-15
CHECKING THE AIR INDUCTION SYSTEM	7-16



CARBURETORS

CARBURETORS

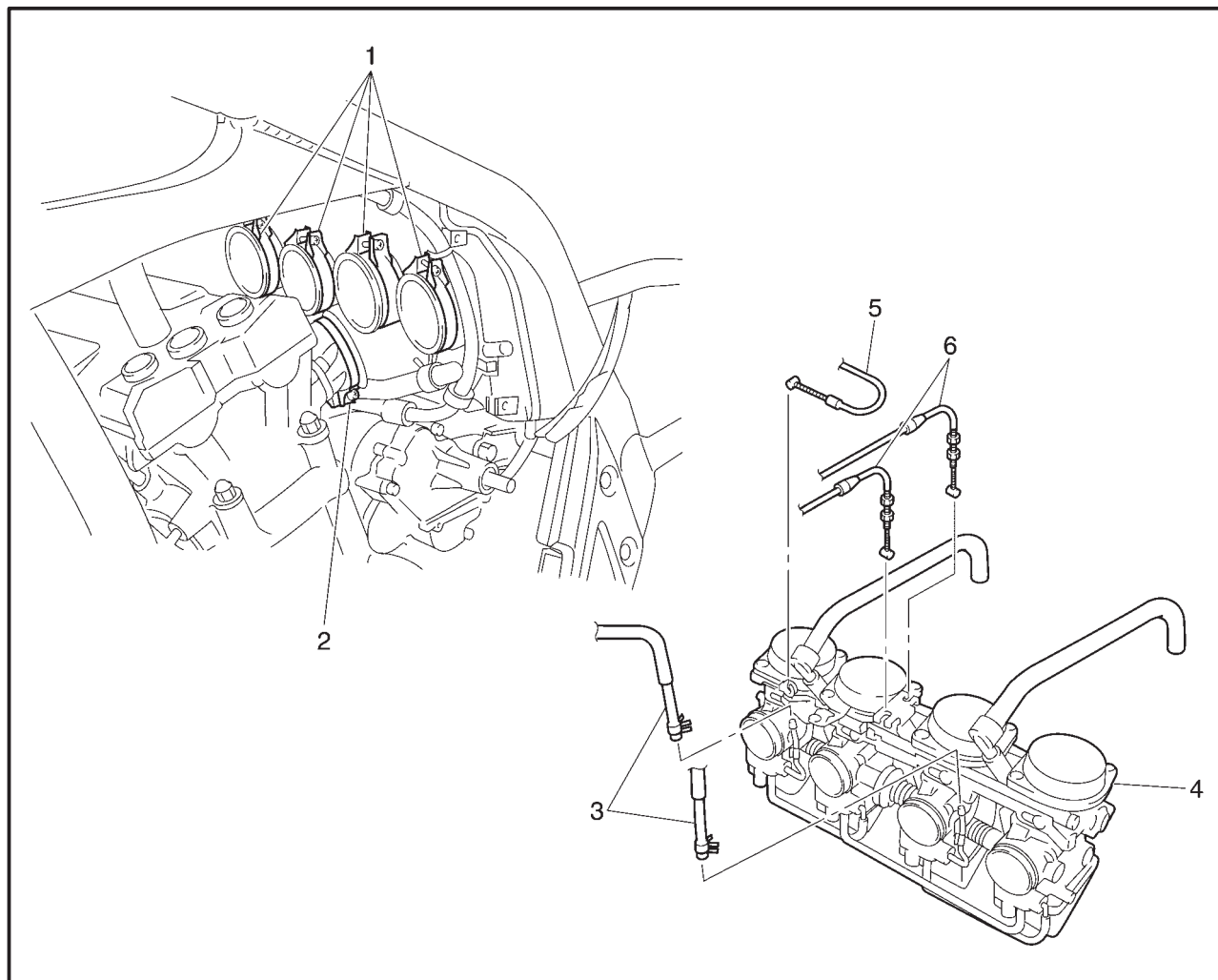
AIR FILTER CASE



Order	Job/Part	Q'ty	Remarks
	Removing the air filter case Seat, fuel tank and sidecovers		Remove the parts in the order listed. Refer to "FRONT COWLING/SEAT/ SIDE COVER/FUEL TANK" section in chapter 3.
	Drain the coolant		Refer to "CHANGING THE COOLANT" section.
1	Air filter case panel (left/right)	1/1	
2	Battery negative lead	1	
3	Battery positive lead	1	
4	Battery	1	
5	Stay	1	
			For installation, reverse the removal procedure.



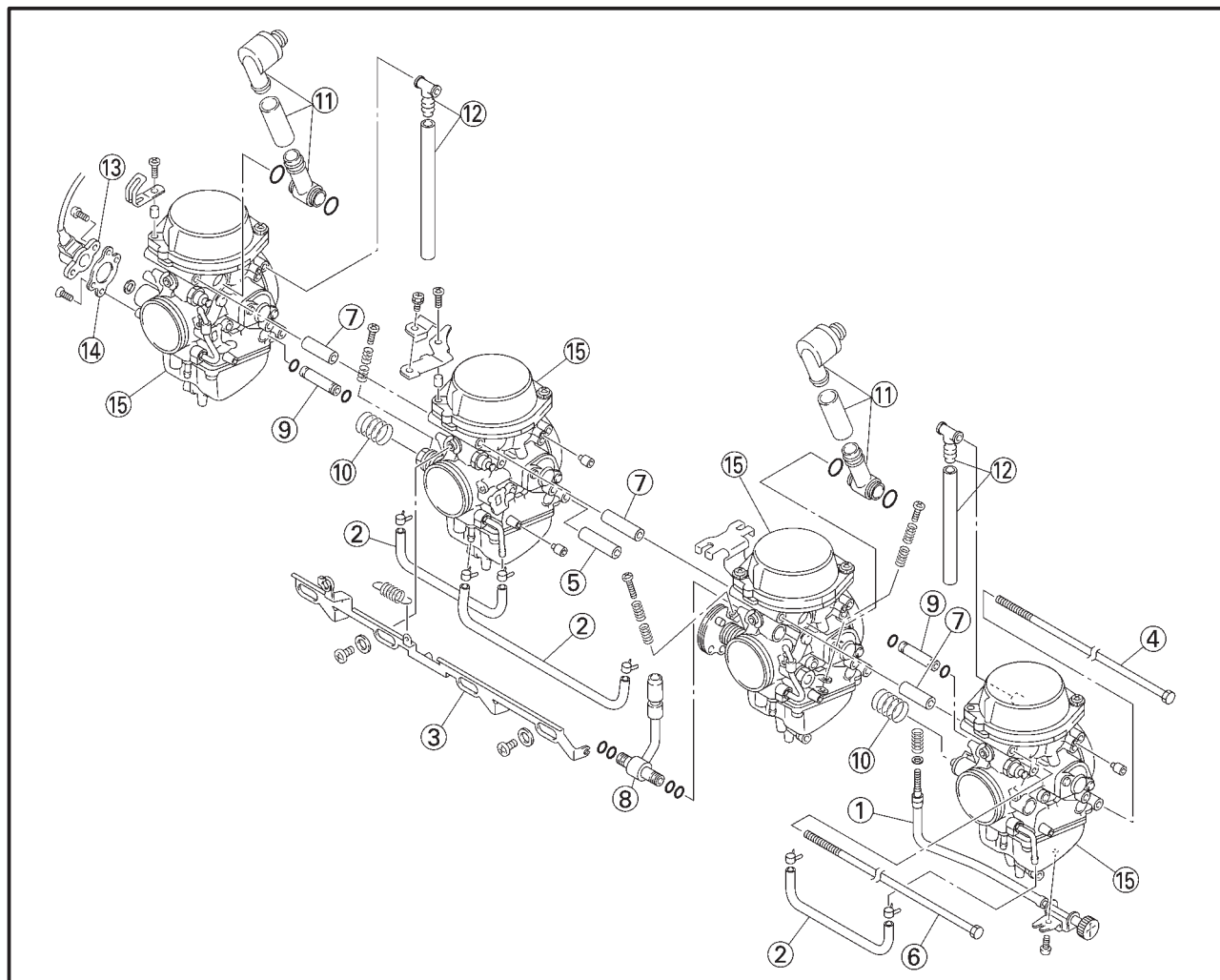
EAS00481



Order	Job/Part	Q'ty	Remarks
	Removing the carburetors		
	Throttle position sensor lead		Remove the parts in the order listed.
1	Air filter joint screw	4	Disconnect.
2	Carburetors joint screw	4	
3	Carburetor inlet/outlet hose	1/1	
4	Carburetors assembly	1	
5	Starter cable	1	
6	Throttle cable	2	
			For installation, reverse the removal procedure.



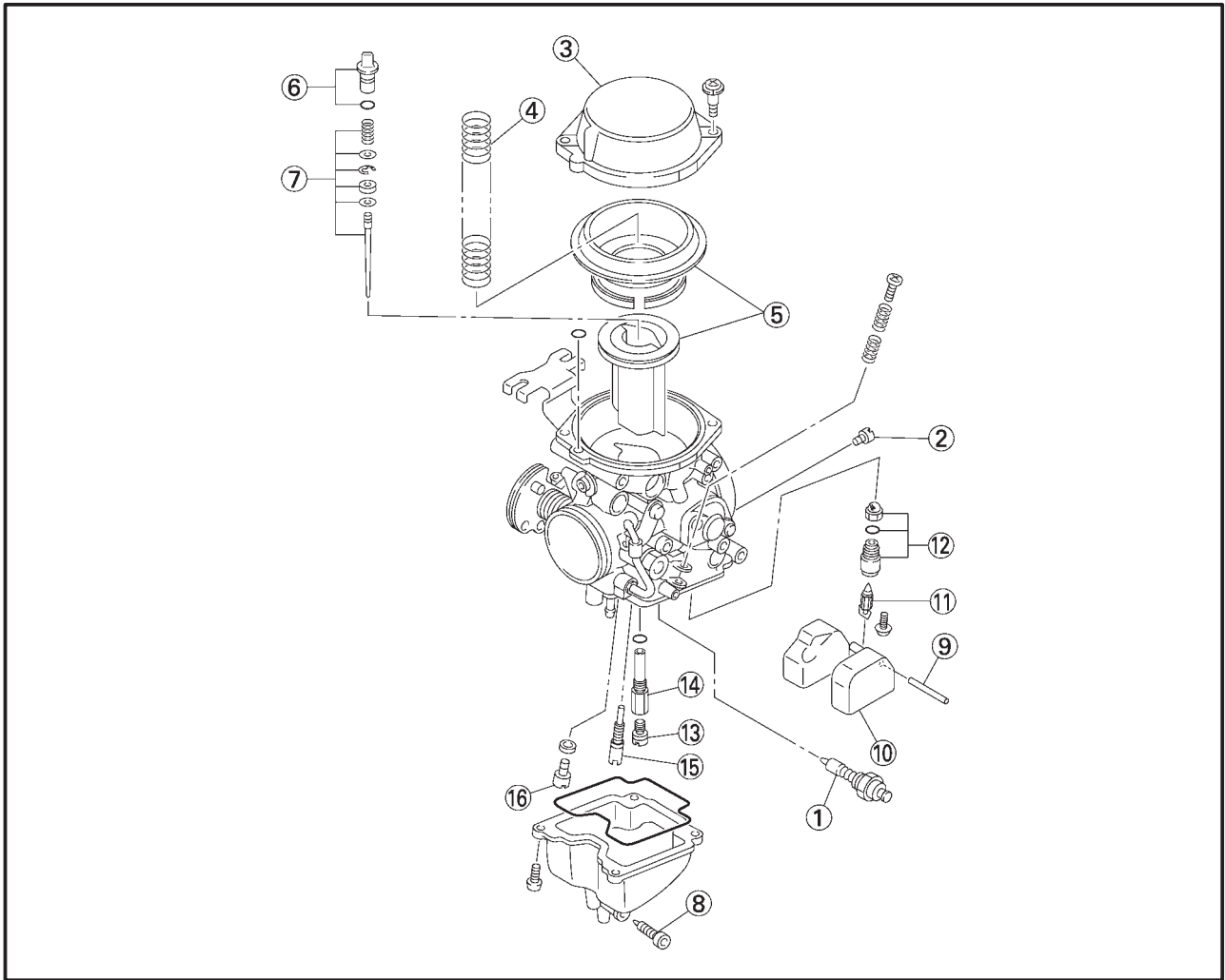
EAS00482



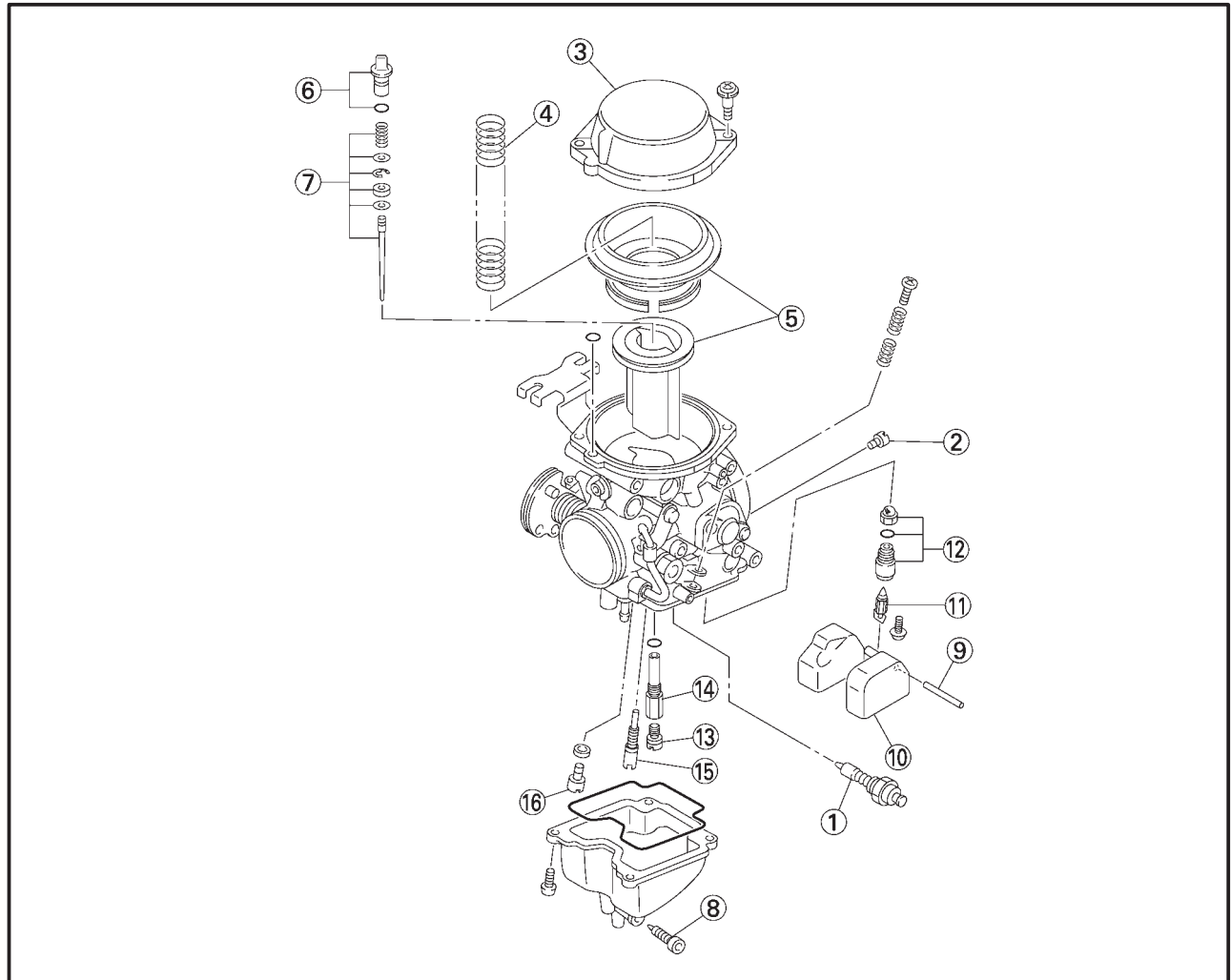
Order	Job/Part	Q'ty	Remarks
	Separating the carburetor		Remove the parts in the order listed.
1	Throttle stop screw	1	
2	Coolant hose	1	
3	Starter plunger link	1	
4	Connecting bolt	1	
5	Spacer	1	
6	Connecting bolt	1	
7	Spacer	3	
8	Fuel inlet pipe	1	
9	Fuel feed pipe	2	
10	Spring	2	
11	Vacuum chamber air vent hose	2	
12	Float chamber air vent hose	2	
13	Throttle position sensor	1	
14	Throttle position sensor bracket	1	
15	Carburetor	4	
			For installation, reverse the removal procedure.



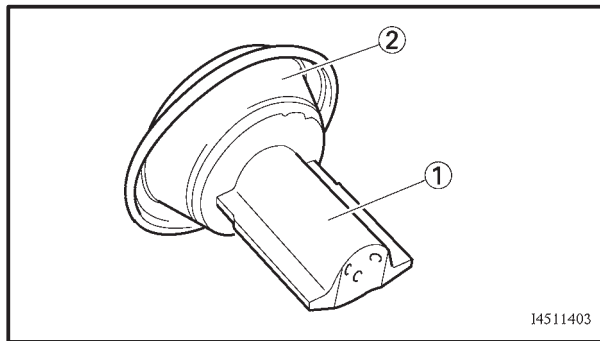
EAS00484



Order	Job/Part	Q'ty	Remarks
	Disassembling the carburetor		Disassemble the parts in the order listed. NOTE: _____ The following procedure applies to all of the carburetors. _____
①	Starter plunger	1	
②	Pilot air jet	1	
③	Vacuum chamber cover	1	
④	Piston valve spring	1	
⑤	Piston valve	1	
⑥	Jet needle holder	1	
⑦	Jet needle kit	1	
⑧	Fuel drain bolt	1	
⑨	Float pin	1	

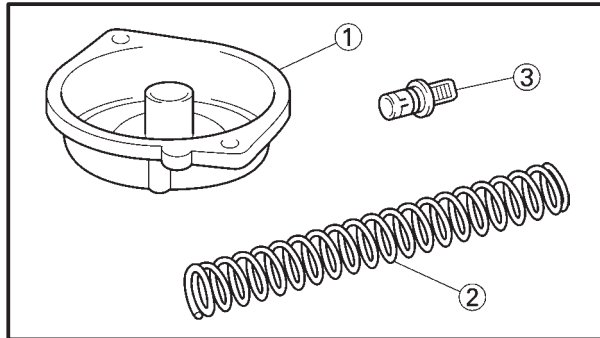


Order	Job/Part	Q'ty	Remarks
⑩	Float	1	For assembly, reverse the disassembly procedure.
⑪	Needle valve	1	
⑫	Needle valve seat	1	
⑬	Main jet	1	
⑭	Main jet holder	1	
⑮	Pilot jet	1	
⑯	Needle jet	1	



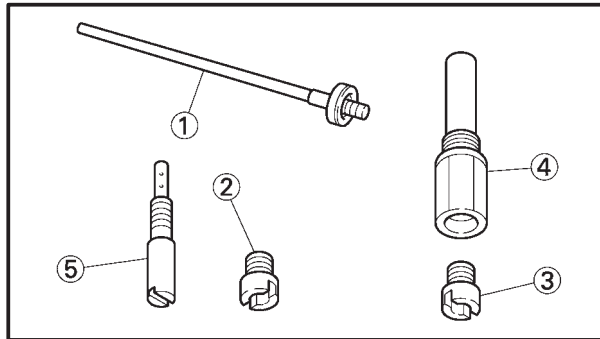
8. Check:

- piston valve ①
Damage/scratches/wear → Replace.
- rubber diaphragm ②
Cracks/tears → Replace.



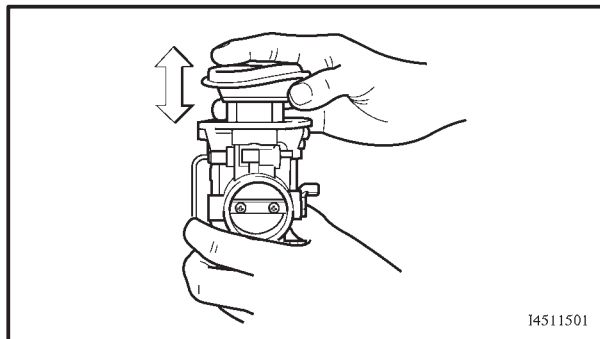
9. Check:

- vacuum chamber cover ①
- piston valve spring ②
- jet needle holder ③
Cracks/damage → Replace.



10. Check:

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



11. Check:

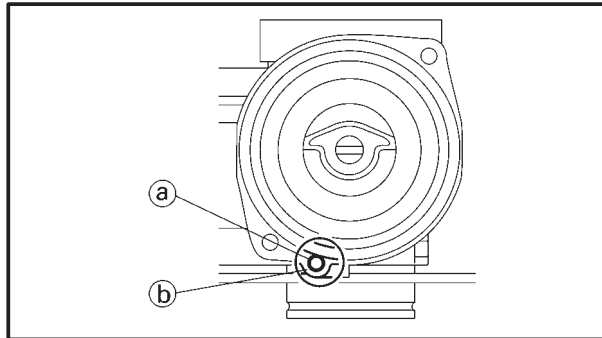
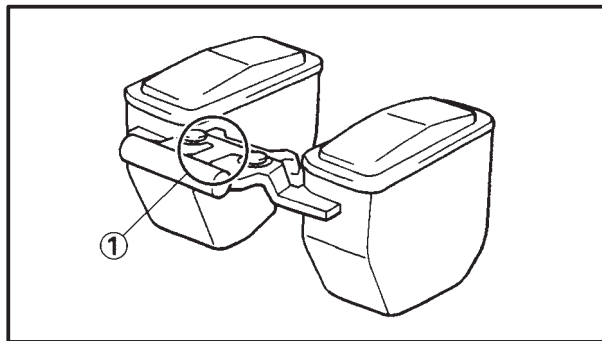
- piston valve movement
Insert the piston valve into the carburetor body and move it up and down.
Tightness → Replace the piston valve.

12. Check:

- fuel feed pipes
- hose joint
Cracks/damage → Replace.
Obstruction → Clean.
Blow out the pipes with compressed air.

13. Check:

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



- d. If either the needle valve seat or needle valve is worn, replace them both.
- e. If both the needle valve seat and needle valve are fine, adjust the float height by bending the float tang ①.
- f. Check the float height again.

[illegible]

4. Install:
 - piston valve
 - piston valve spring
 - vacuum chamber cover

NOTE:

Align the tab (a) on the piston valve diaphragm with the recess (b) in the carburetor body.

5. Install:
- connecting bracket

NOTE:

After installing the connecting bracket, check that the throttle cable lever and starter plunger link operate smoothly.

EAS00493

INSTALLING THE CARBURETORS

1. Adjust:
 - carburetor synchronizationRefer to “SYNCHRONIZING THE CARBURETORS” in chapter 3.
2. Adjust:
 - engine idling speed



Engine idling speed
1,050 ~ 1,150 r/min

Refer to “ADJUSTING THE ENGINE IDLING SPEED” in chapter 3.

- 3. Adjust:
 - throttle cable free play



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

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



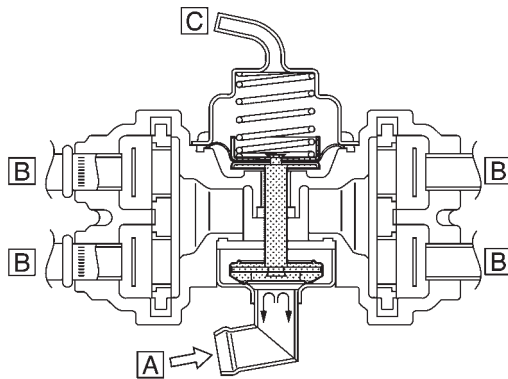
EAS00507

AIR INDUCTION SYSTEM

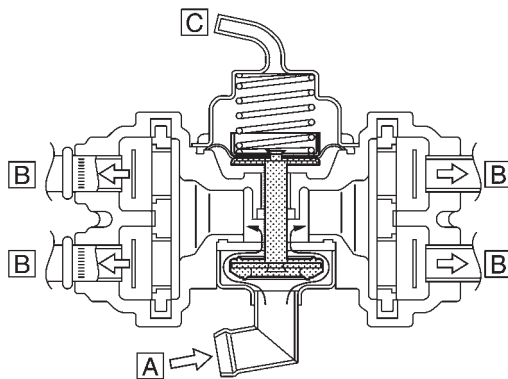
AIR INJECTION

The air induction system burns unburned exhaust gases by injecting fresh air (secondary air) into the exhaust port, reducing the emission of hydrocarbons.

When there is negative pressure at the exhaust port, the reed valve opens, allowing secondary air to flow into the exhaust port. The required temperature for burning the unburned exhaust gases is approximately 600 to 700°C (1112 to 1292°F).



VIEW 1. (NO FLOW)



VIEW 2. (FLOW)

EAS00508

AIR CUTOFF VALVE

The air cutoff valve is operated by the intake gas pressure through the piston valve diaphragm. Normally, the air cutoff 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 cutoff valve is closed in order to prevent after-burning.

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

VIEW 1. (NO FLOW)

When decelerating (the throttle closes), the valve will close.

VIEW 2. (FLOW)

During normal operation the valve is open.

A From the air cleaner

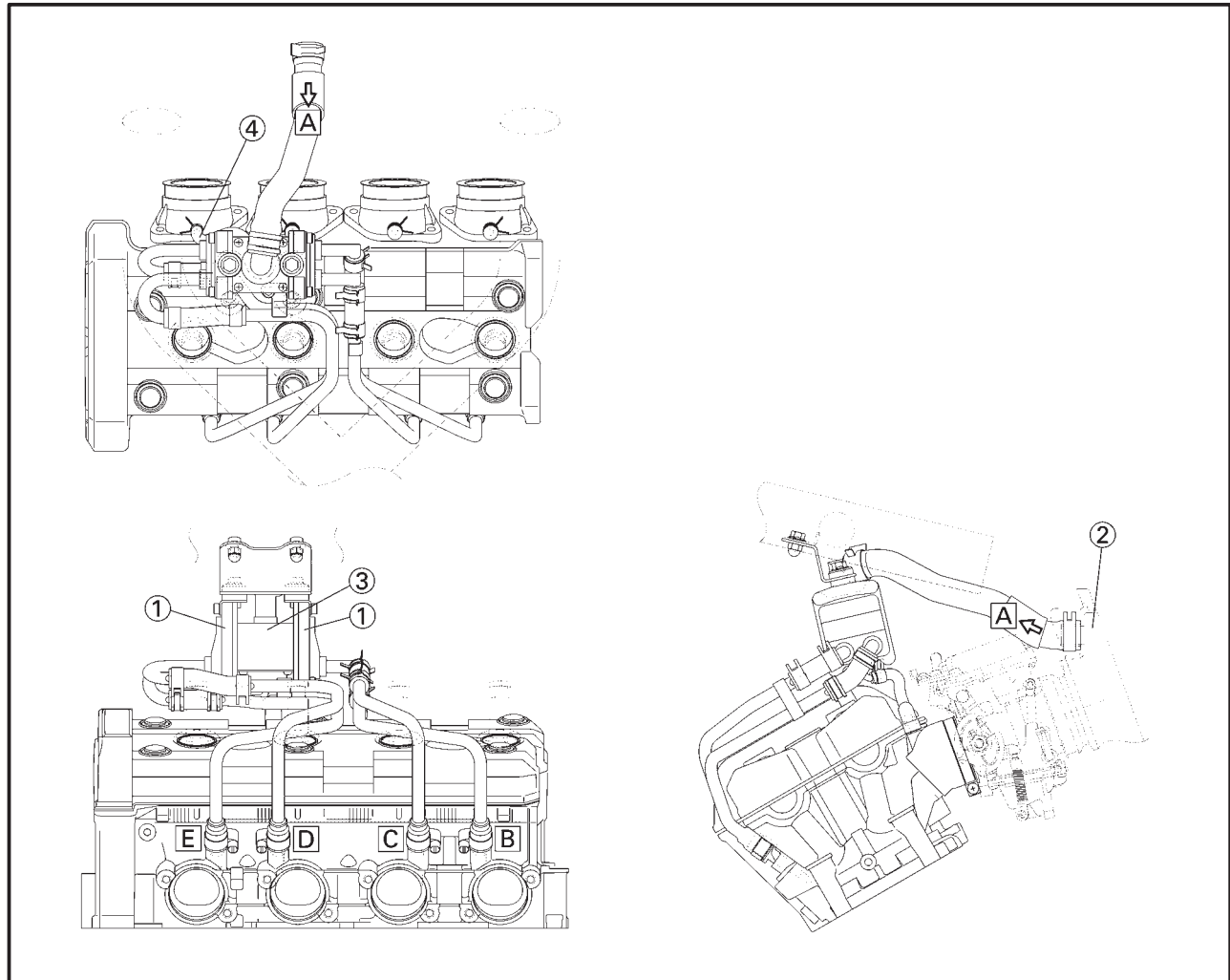
B To the reed valve

C To the carburetor joint



EAS00509

AIR INDUCTION SYSTEM DIAGRAMS



- ① Reed valve
- ② Air cleaner
- ③ Air cutoff valve
- ④ Carburetor joint (cylinder #4)
- A To the air cutoff valve
- B To cylinder #1
- C To cylinder #2
- D To cylinder #3
- E To cylinder #4

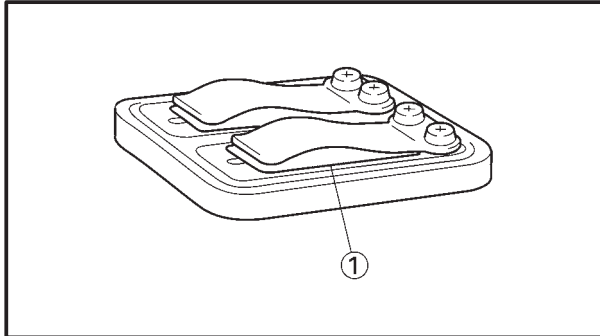


EAS00510

CHECKING THE AIR INDUCTION SYSTEM

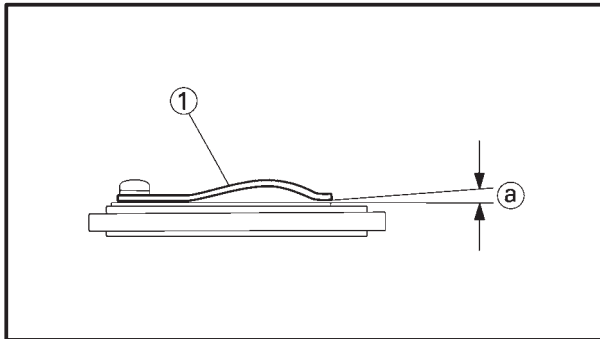
1. Check:

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



2. Check:

- ° fibre reed ①
- ° fibre reed stopper
- ° reed valve seat
Cracks/damage → Replace the reed valve.



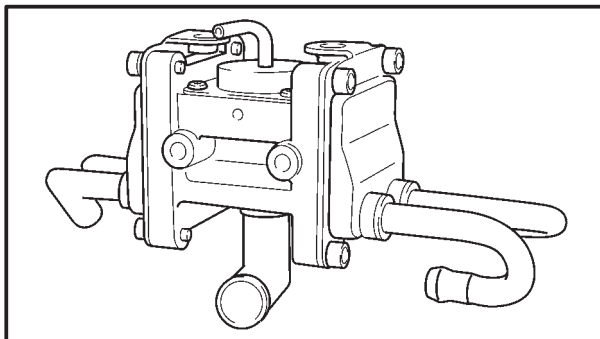
3. Measure:

- ° fibre reed bending limit ②
- Out of specification → Replace the reed valve.



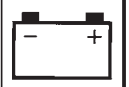
**Fibre reed bending limit
0.2 mm (0.008 in)**

- ① Surface plate



4. Check:

- ° air cutoff valve
Cracks/damage → Replace.



CHAPTER 8 ELECTRICAL

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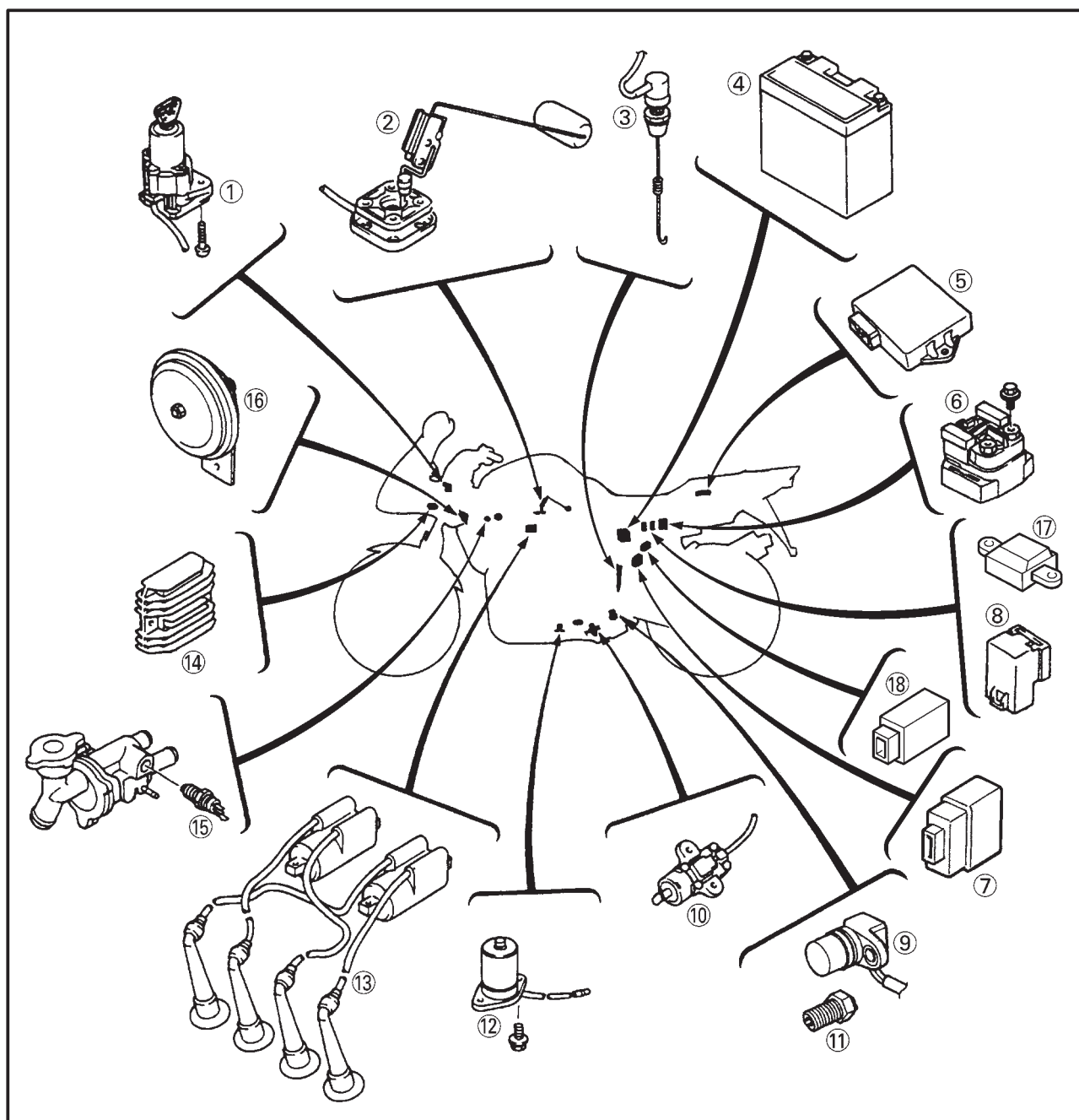


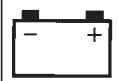
EAS00729

ELECTRICAL

ELECTRICAL COMPONENTS

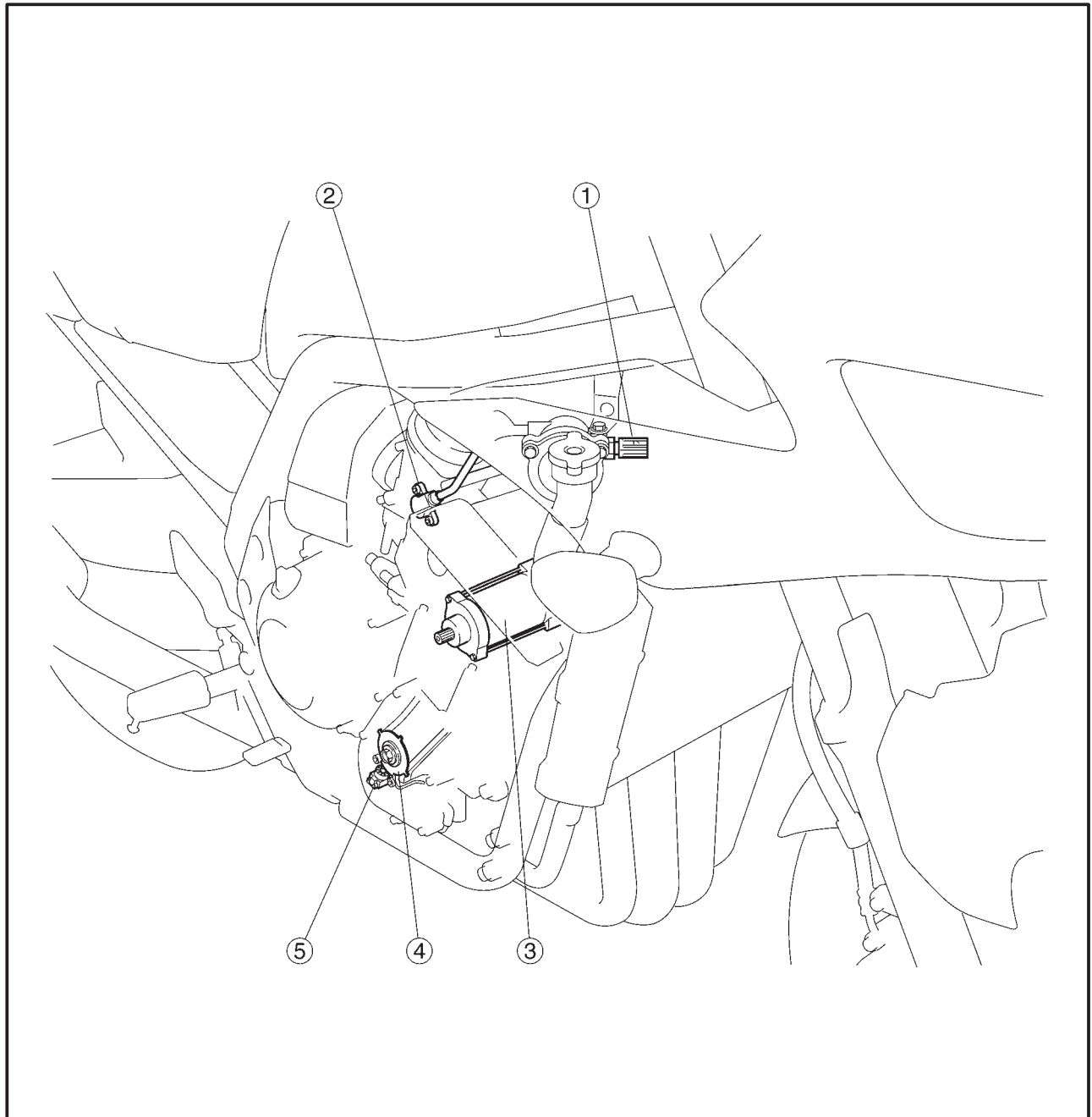
- | | | |
|---------------------|---------------------------------|-------------------------|
| ① Main switch | ⑦ Starting circuit cutoff relay | ⑫ Oil level gauge |
| ② Fuel sender | ⑧ Flasher relay | ⑬ Ignition coil |
| ③ Rear brake switch | ⑨ Speed sensor | ⑭ Rectifier/Regulator |
| ④ Battery | ⑩ Sidestand switch | ⑮ Thermo unit |
| ⑤ Ignitor unit | ⑪ Neutral switch | ⑯ Horn |
| ⑥ Starter relay | | ⑰ Emergency stop switch |
| | | ⑱ Fan motor relay |





ARRANGEMENT OF THE ELECTRICAL COMPONENTS AND COUPLERS

- ① Thermo unit
- ② T.P.S.
- ③ Starter motor
- ④ Pickup rotor
- ⑤ Pickup coil

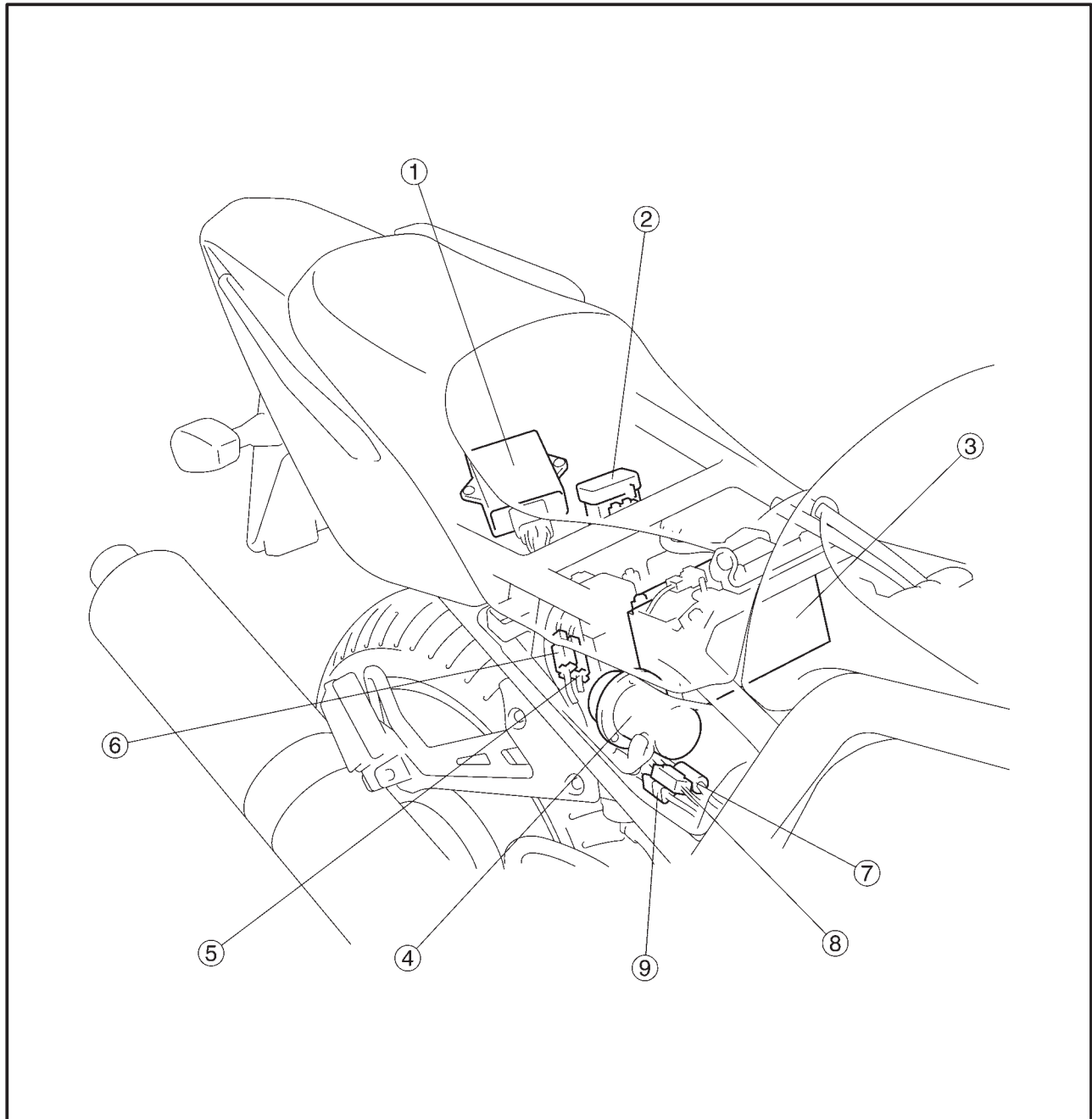


ARRANGEMENT OF THE ELECTRICAL COMPONENTS AND COUPLERS

ELEC

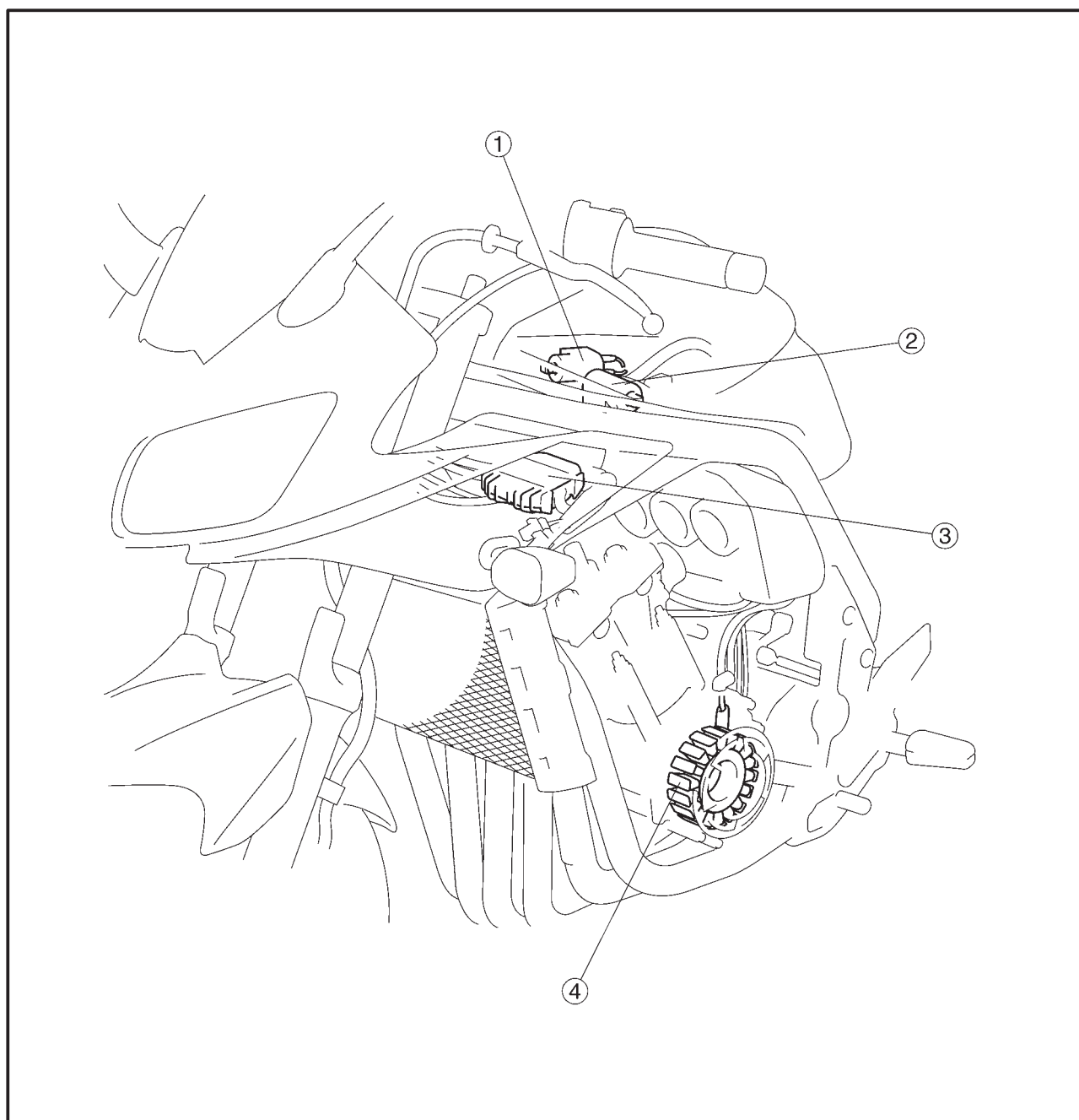


- ① Ignitor unit
- ② Fuse box
- ③ Battery
- ④ Fuel pump
- ⑤ Fuel pump coupler
- ⑥ Brake light switch coupler
- ⑦ Newtral switch coupler
- ⑧ Pickup coil coupler
- ⑨ Speed sensor coupler





- ① Ignition coil #2.3
- ② Ignition coil #1.4
- ③ Rectifier/regulator
- ④ Stator coil

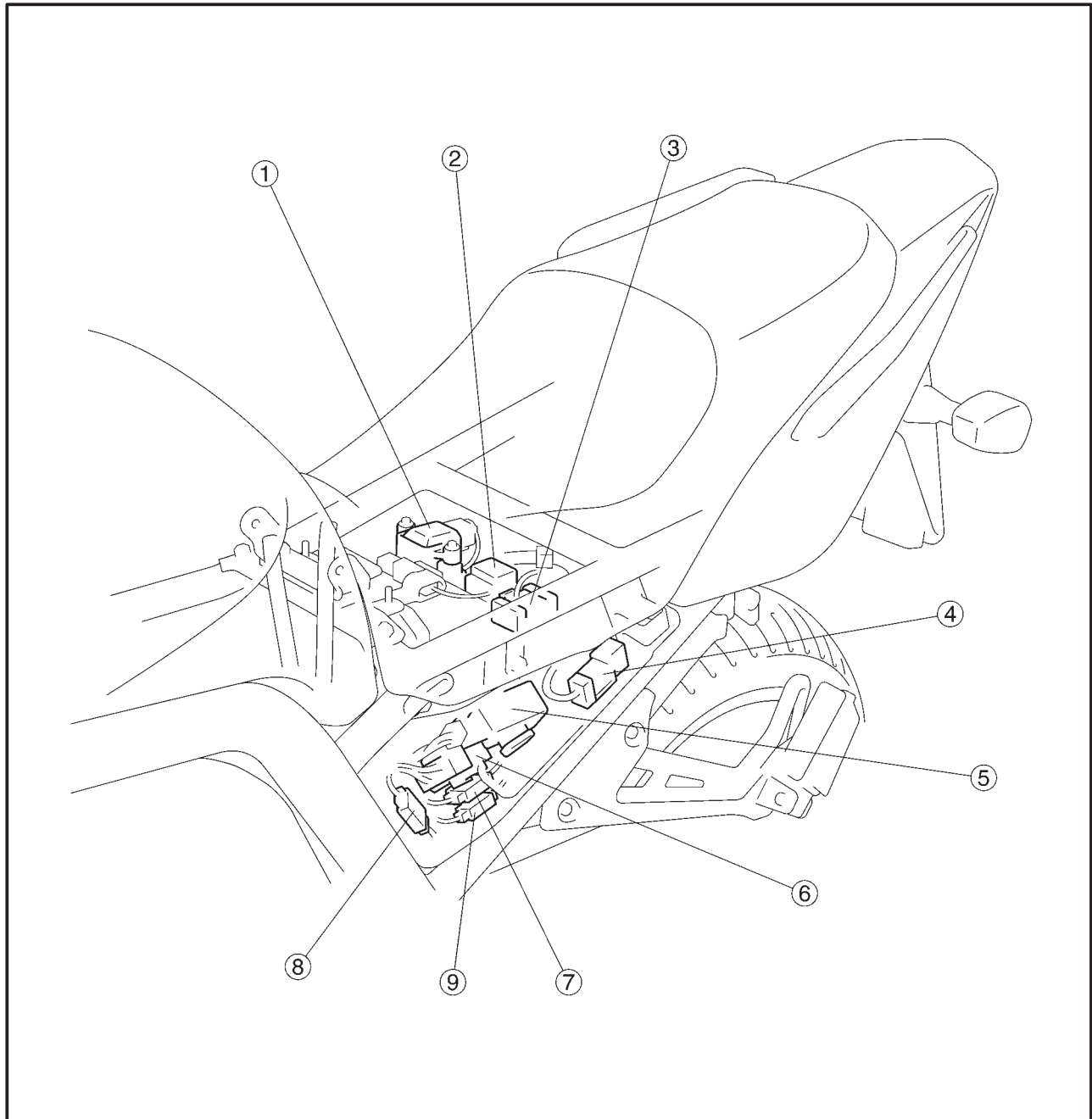


ARRANGEMENT OF THE ELECTRICAL COMPONENTS AND COUPLERS

ELEC



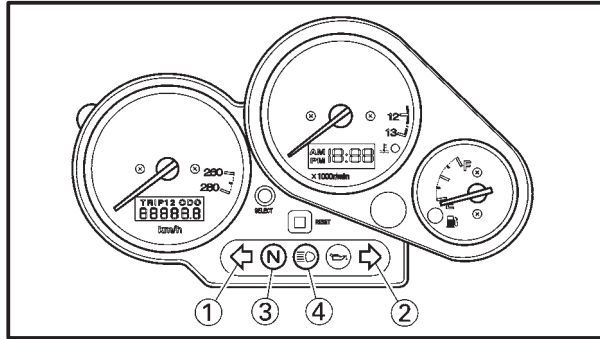
- ① Emergency stop switch
- ② Flasher relay
- ③ Starter relay
- ④ Fan motor relay
- ⑤ Starting circuit cutoff relay
- ⑥ Stator coil coupler
- ⑦ Sidestand switch coupler
- ⑧ Fuel sender coupler
- ⑨ Oil level switch coupler





INSTRUMENT FUNCTIONS

INDICATOR LIGHTS



- ① Turn indicator light (left) “↵”
- ② Turn indicator light (right) “↶”
- ③ Neutral indicator light “N”
- ④ High beam indicator light “≡”

Turn indicator light “↵” “↶”

This indicator flashes when the turn switch is moved to the left or right.

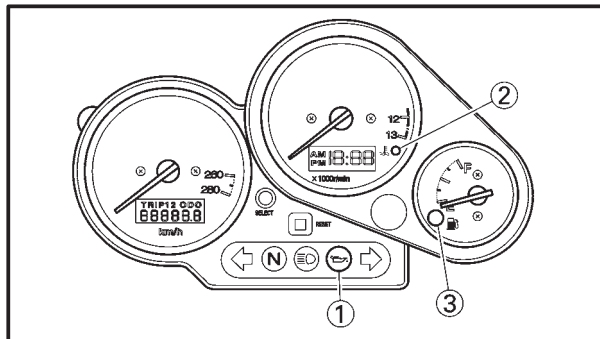
Neutral indicator light “N”

This indicator comes on when the transmission is in neutral.

High beam indicator light “≡”

This indicator comes on when the headlight high beam is used.

WARNING LIGHT



- ① Oil level warning light “⛽”
- ② Coolant temperature warning light “🌡️”
- ③ Fuel level warning light “⛽”

Oil level warning light “⛽”

This warning light comes on when the engine oil level is low. If this symbol flashes, stop the engine immediately and fill it with oil to the specified level.

Coolant temperature warning light “🌡️”

This warning light comes on when the coolant temperature is too high.

Fuel level warning light “⛽”

When the fuel level drops below approximately 5.5 L, this light will come on. When this light comes on, fill the fuel tank at the first opportunity.

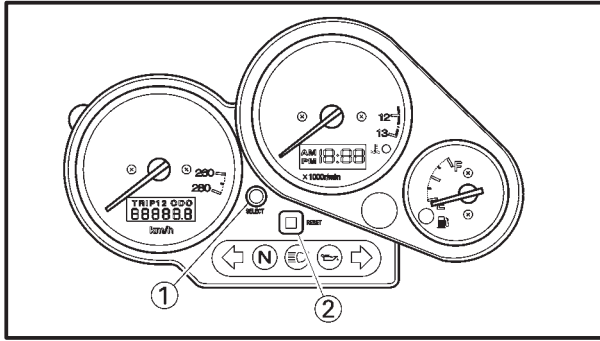
CAUTION:

Do not run the motorcycle until you know it has sufficient engine oil.

Do not run the motorcycle if the engine is overheated.

NOTE:

Even if the oil is filled to the specified level, the warning light may flicker when riding on a slope or during sudden acceleration or deceleration, but this is normal.

**DIGITAL CLOCK**

① “SELECT” button

② “RESET” button

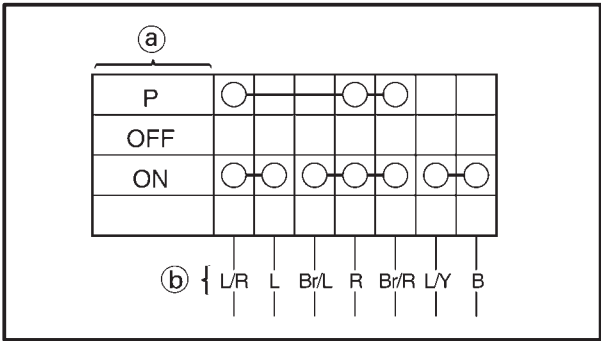
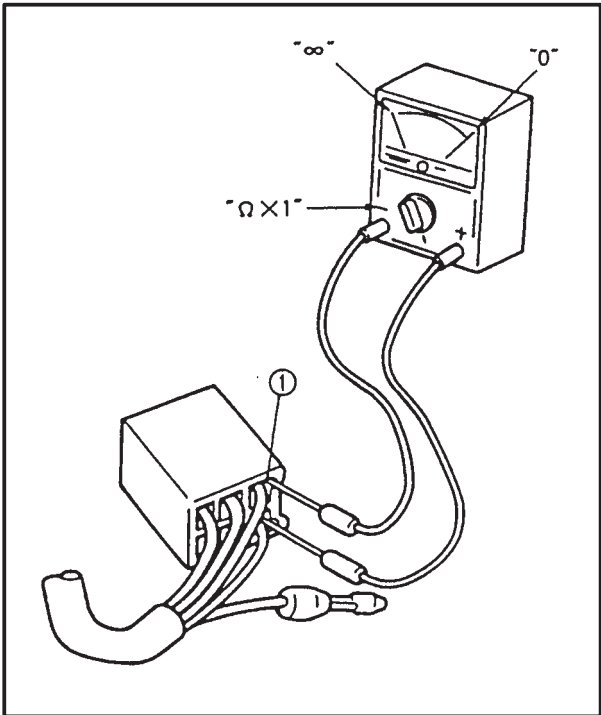
Clock

To set the clock:

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

NOTE:

After setting the clock, be sure to push the “SELECT” button ① before turning the main switch to “OFF”, otherwise the clock will not be set.



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 ①. Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.



Pocket tester measurement
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, engine stop switch) are shown in an illustration similar to the one on the left. The switch positions ① are shown in the far left column and the switch lead colors ② 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 blue/red and red when the switch is set to “P”.
There is continuity between blue/red and blue when the switch is set to “ON”.



EAS00731

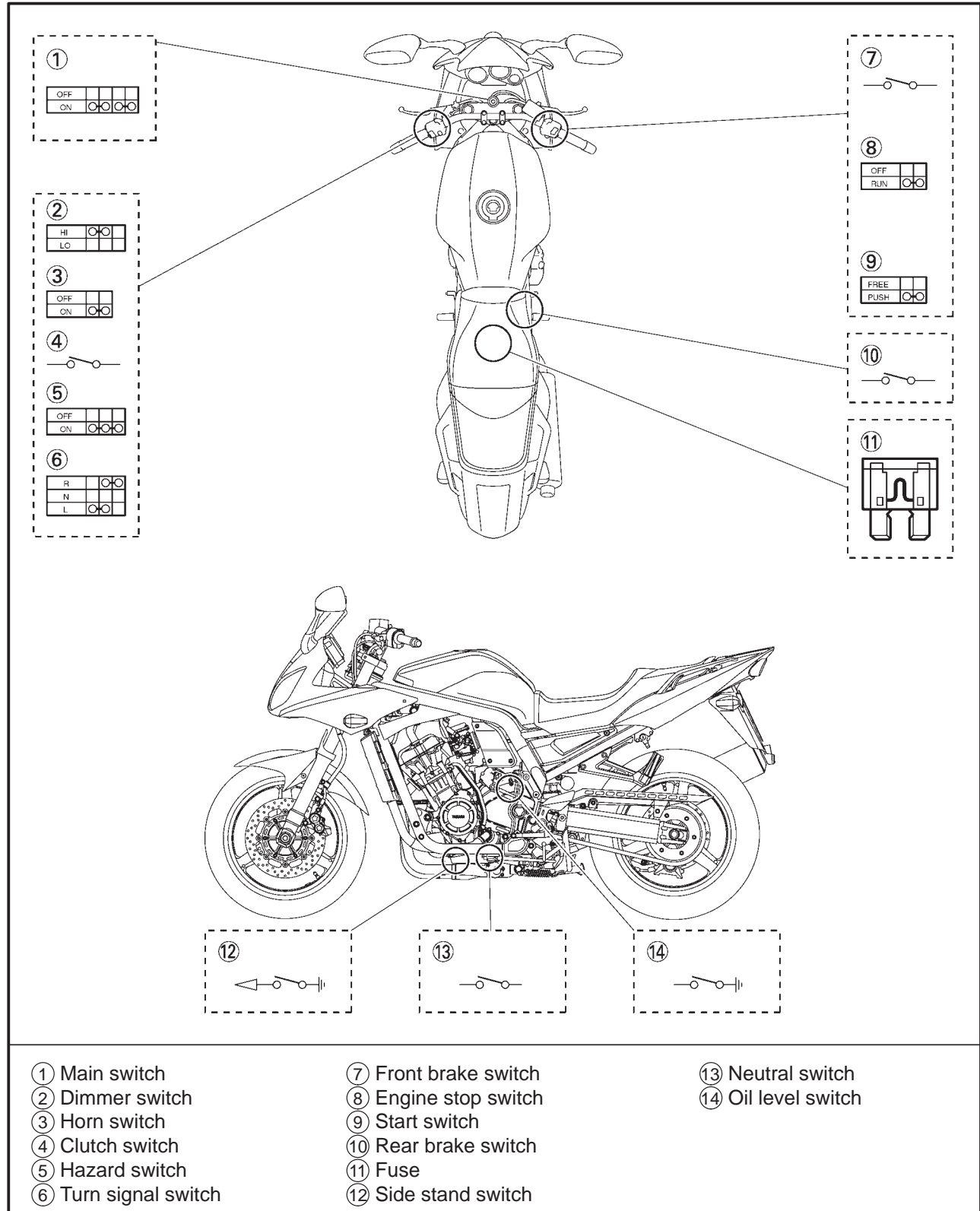
CHECKING THE SWITCHES

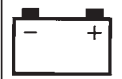
Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to "CHECKING SWITCH CONTINUITY".

Damage/wear → Repair or replace the switch.

Improperly connected → Properly connect.

Incorrect continuity reading → Replace the switch.





EAS00732

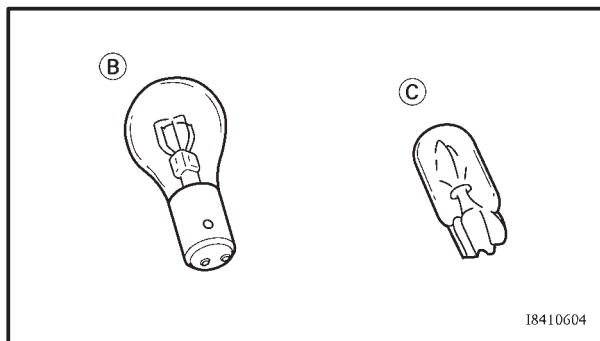
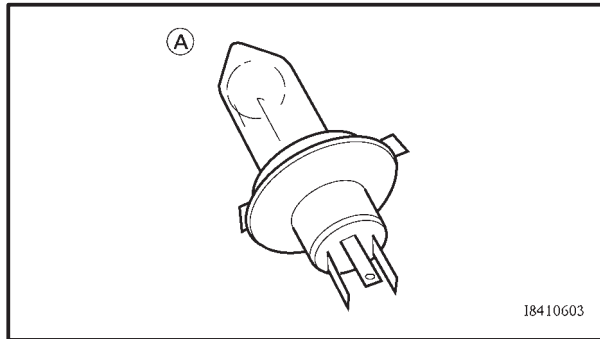
CHECKING THE BULBS AND BULB SOCKETS

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.

Incorrect continuity reading → Repair or replace the bulb, bulb socket or both.



TYPES OF BULBS

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

Bulbs ① are used for headlights and usually use a bulb holder which must be detached before removing the bulb. The majority of these bulbs can be removed from their respective socket by turning them counterclockwise.

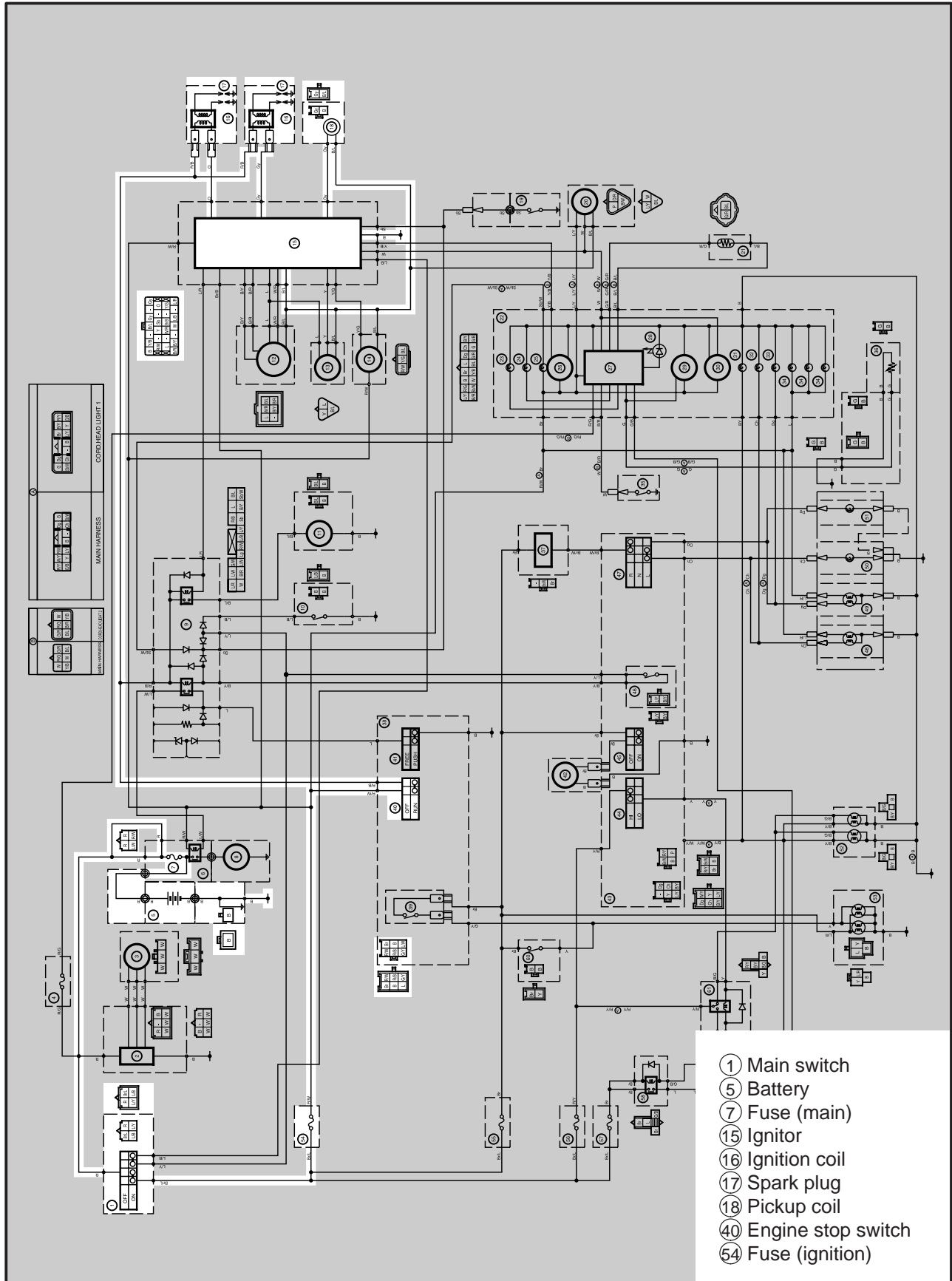
Bulb ② is used for turn signal and tail/brake lights and can be removed from the socket by pushing and turning the bulb counterclockwise.

Bulbs ③ are used for meter and indicator lights and can be removed from their respective socket by carefully pulling them out.



EAS00735

IGNITION SYSTEM CIRCUIT DIAGRAM





EAS00737

TROUBLESHOOTING

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

Check:

1. Main and ignition fuses
2. Battery
3. Spark plugs
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil resistance
7. Main switch
8. Engine stop switch
9. Pickup coil resistance
10. Wiring connections
(of the entire ignition system)

NOTE:

Before troubleshooting, remove the following part(-s):

- 1) Seat
 - 2) Fuel tank
 - 3) Side cover
- Troubleshoot with the following special tool(-s).



Dynamic spark tester
YM-34487
Pocket tester measurement
YU-03112-C

EAS00738

1. Main and ignition fuses

- Check the main and ignition fuses for continuity.
Refer to “CHECKING THE FUSES” in CHAPTER 3.

- Are the main and ignition fuses OK?



YES



NO

Replace the fuse(s).

EAS00739

2. Battery

- Check the condition of the battery.
Refer to “CHECKING THE BATTERY” in CHAPTER 3.



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

- Is the battery OK?



YES



NO

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

EAS00741

3. Spark plugs

The following procedure applies to all of the spark plugs.

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



Standard spark plug
CR9E (NGK)
U27ESR-N (DENSO)
Spark plug gap
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

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



YES



NO

Re-gap or replace the spark plug.

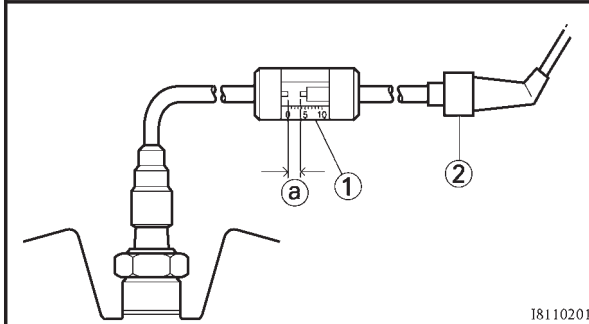


EAS00743

4. Ignition spark gap

The following procedure applies to all of the spark plugs.

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



18110201



Minimum ignition spark gap
6.0 mm (0.24 in)

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

NO

YES

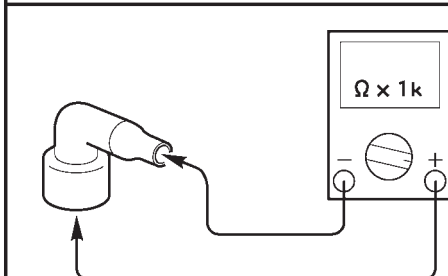
The ignition system is OK.

EAS00745

5. Spark plug cap resistance

The following procedure applies to all of the spark plug caps.

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ("Ω × 1k") to the spark plug cap as shown.
- Measure the spark plug cap resistance.



18040101



Spark plug cap resistance
10 kΩ at 20°C (68°F)

- Is the spark plug cap OK?



YES



NO

Replace the spark plug cap.

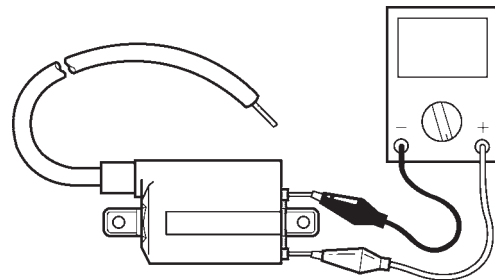
EAS00747

6. Ignition coil resistance

The following procedure applies to all of the ignition coils.

- Disconnect the ignition coil leads from the wire harness.
- Connect the pocket tester (Ω × 1) to the ignition coil as shown.

Positive tester probe → red/black
Negative tester probe → orange (gray)



18110104

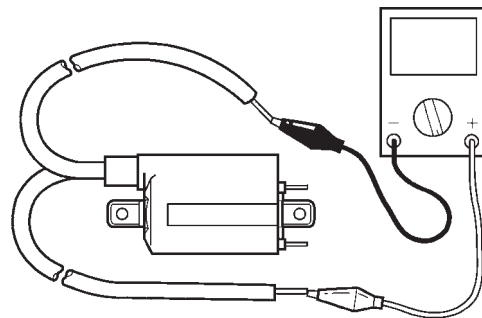
- Measure the primary coil resistance.



Primary coil resistance
1.87 ~ 2.53 Ω at 20°C (68°F)

- Connect the pocket tester (Ω × 1k) to the ignition coil as shown.

Positive tester probe → spark plug lead
Negative tester probe → spark plug lead



18110104

- Measure the secondary coil resistance.



Secondary coil resistance
12 ~ 18 kΩ at 20°C (68°F)

• Is the ignition coil OK?

↓ YES

↓ NO

Replace the ignition coil.

EAS00749

7. Main switch

• Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".

• Is the main switch OK?

↓ YES

↓ NO

Replace the main switch.

EAS00750

8. Engine stop switch

• Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".

• Is the engine stop switch OK?

↓ YES

↓ NO

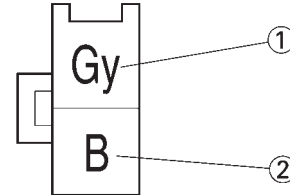
Replace the right handlebar switch.

EAS00748

9. Pickup coil resistance

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

Positive tester probe → gray ①
Negative tester probe → black ②



- Measure the pickup coil resistance.



Pickup coil resistance
248 ~ 372 Ω at 20°C (68°F)
(between gray and black)

- Is the pickup coil OK?

↓ YES

↓ NO

Replace the pickup coil.

EAS00754

10. Wiring

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

↓ NO

↓ YES

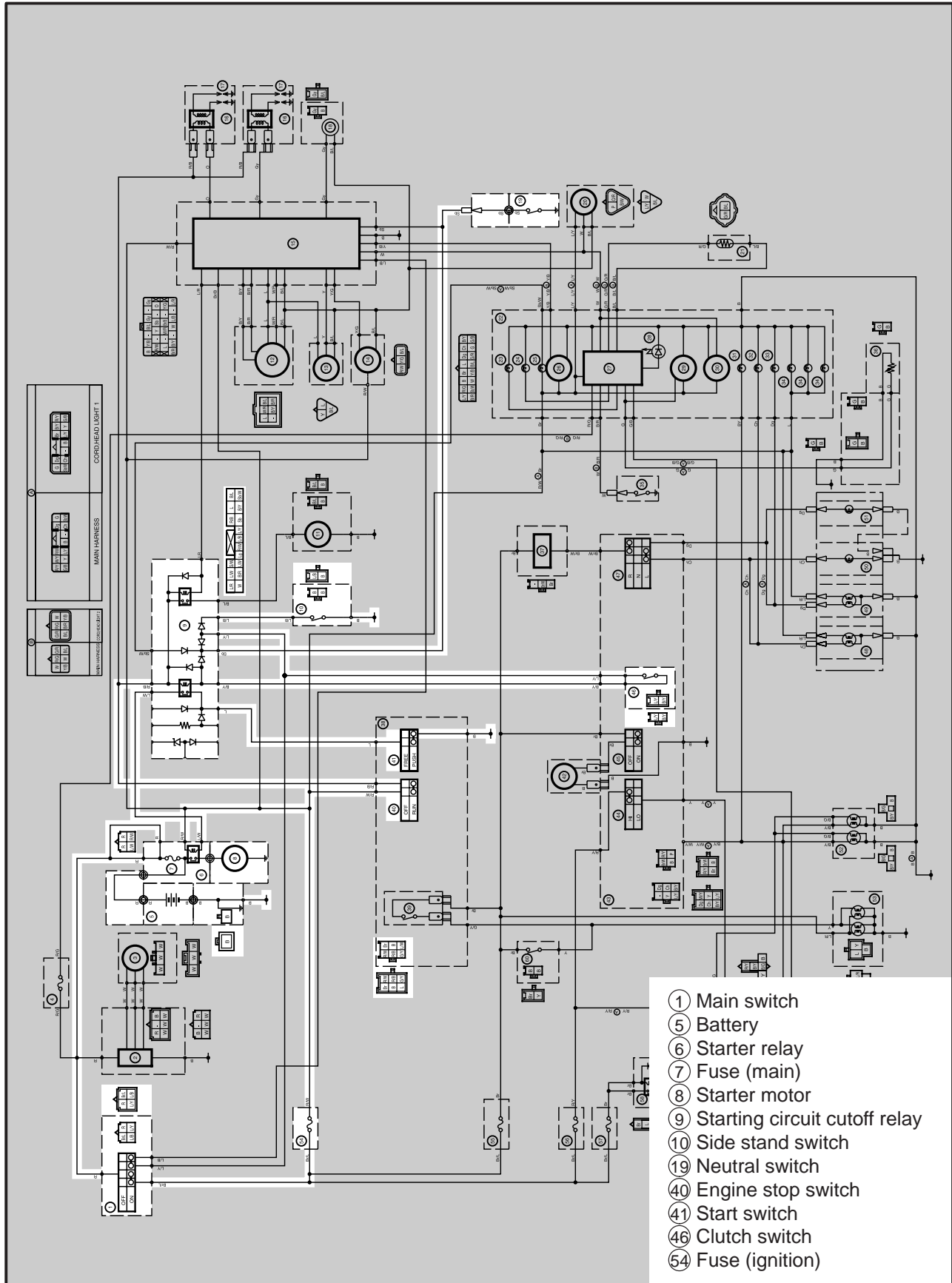
Properly connect or repair the ignition system's wiring.

Replace the ignitor unit.



EAS00755

ELECTRIC STARTING SYSTEM CIRCUIT DIAGRAM





EAS00756

STARTING CIRCUIT CUTOFF SYSTEM OPERATION

If the engine stop switch is set to "⌚" and the main switch is set to "ON" (both switches are closed), the starter motor can only operate if at least one of the following conditions is met:

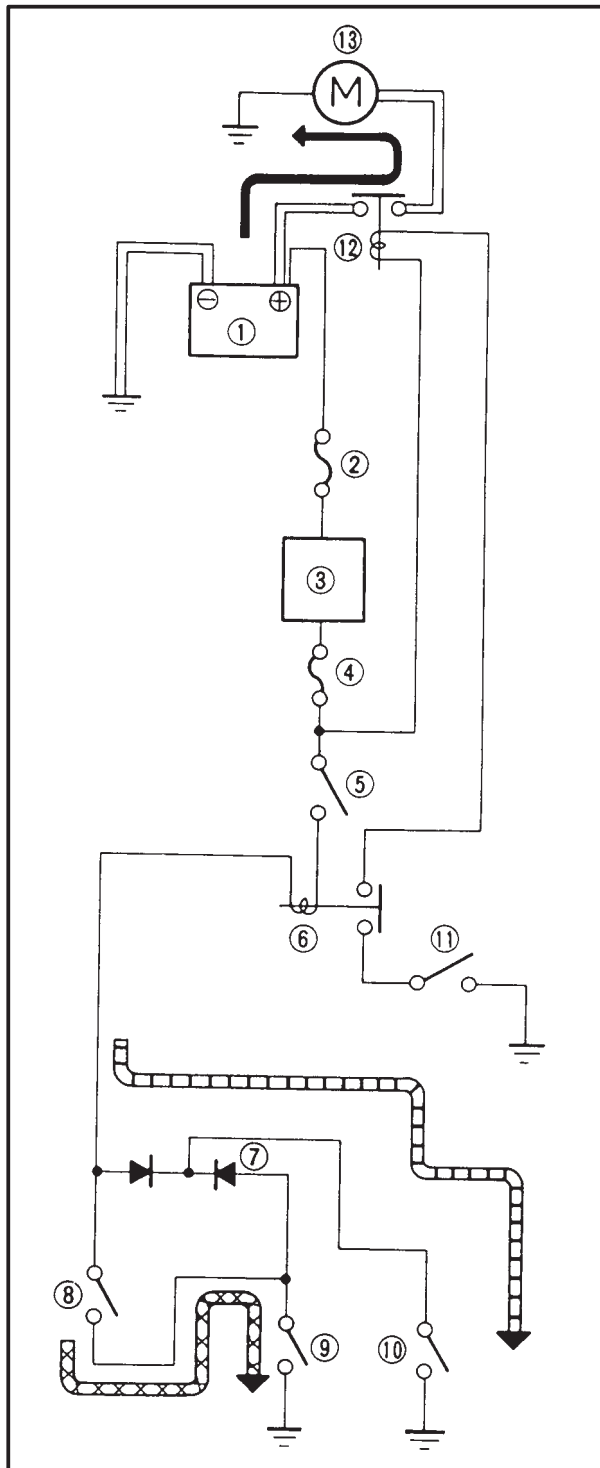
The transmission is in neutral (the neutral switch is closed).

The clutch lever is pulled to the handlebar (the clutch switch is closed) and the side-stand is up (the sidestand switch is closed).

The starting circuit cutoff relay prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cutoff relay is open so current cannot reach the starter motor. When at least one of the above conditions has been met the starting circuit cutoff relay is closed and the engine can be started by pressing the start switch.

← WHEN THE TRANSMISSION IS IN NEUTRAL

← WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED TO THE HANDLEBAR



- ① Battery
- ② Fuse (main)
- ③ Main switch
- ④ Fuse (ignition)
- ⑤ Engine stop switch
- ⑥ Starting circuit cutoff relay
- ⑦ Diode
- ⑧ Clutch switch
- ⑨ Sidestand switch
- ⑩ Neutral switch
- ⑪ Start switch
- ⑫ Starter relay
- ⑬ Starter motor



EAS00757

TROUBLESHOOTING**The starter motor fails to turn.**

Check:

1. Main and ignition fuses
2. Battery
3. Starter motor
4. Starting circuit cutoff relay
5. Starter relay
6. Main switch
7. Engine stop switch
8. Neutral switch
9. Sidestand switch
10. Clutch switch
11. Start switch
12. Wiring connections
(of the entire starting system)

NOTE:

- Before troubleshooting, remove the following part(-s):
 - 1) Seat
 - 2) Fuel tank
 - 3) Side cover
- Troubleshoot with the following special tool(-s).



Pocket tester measurement
YU-03112-C

EAS00738

1. Main and ignition fuses

- Check the main and ignition fuses for continuity. Refer to "CHECKING THE FUSES" in CHAPTER 3.

- Are the main and ignition fuses OK?

↓ YES

↓ NO

Replace the fuse (s).

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING THE BATTERY" in CHAPTER 3.



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

- Is the battery OK?

↓ YES

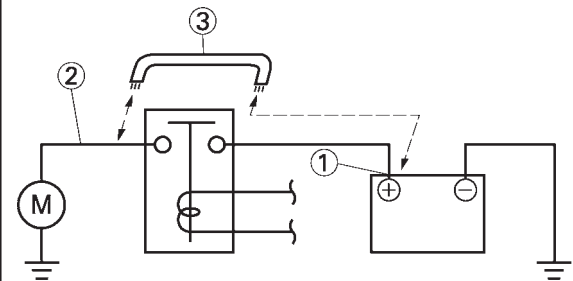
↓ NO

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

EAS00758

3. Starter motor

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



18210801

⚠ WARNING

- A wire that is used as a jumper lead must have at least the same capacity or more as that of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore make sure nothing flammable is in the vicinity.

- Does the starter motor turn?

↓ YES

↓ NO

Repair or replace the starter motor.



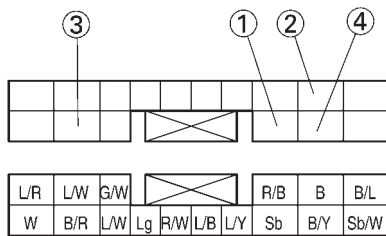
EAS00759

4. Starting circuit cutoff relay

Disconnect the starting circuit cutoff relay coupler from the wire harness.
Connect the pocket tester ($\Omega \sim 1$) and battery (12 V) to the starting circuit cutoff relay coupler as shown.

Positive battery lead → red/black ①
Negative battery lead → black/yellow ②

Positive tester probe → blue/white ③
Negative tester probe → black ④



Does the starting circuit cutoff relay have continuity between blue/white and black?



YES



NO

Replace the starting circuit cutoff relay.

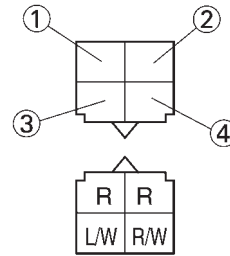
EAS00761

5. Starter relay

Disconnect the starter relay coupler from the wireharness.
Connect the pocket tester ($\Omega \sim 1$) and battery (12 V) to the starter relay coupler as shown.

Positive battery lead → blue/white ①
Negative battery lead → red/white ②

Positive tester probe → red ③
Negative tester probe → red ④



Does the starter relay have continuity between red and red?



YES



NO

Replace the starter relay.

EAS00749

6. Main switch

Check the main switch for continuity.
Refer to "CHECKING THE SWITCHES".

Is the main switch OK?



YES



NO

Replace the main switch.

EAS00750

7. Engine stop switch

Check the engine stop switch for continuity.
Refer to "CHECKING THE SWITCHES".

Is the engine stop switch OK?



YES



NO

Replace the right handlebar switch.



EAS00751

8. Neutral switch

Check the neutral switch for continuity.
Refer to "CHECKING THE SWITCHES".

Is the neutral switch OK?



YES



NO

Replace the neutral
switch.

EAS00752

9. Sidestand switch

Check the sidestand switch for continuity.
Refer to "CHECKING THE SWITCHES".

Is the sidestand switch OK?



YES



NO

Replace the side-
stand switch.

EAS00763

10. Clutch switch

Check the clutch switch for continuity.
Refer to "CHECKING THE SWITCHES".

Is the clutch switch OK?



YES



NO

Replace the clutch
switch.

EAS00764

11. Start switch

Check the start switch for continuity.
Refer to "CHECKING THE SWITCHES".

Is the start switch OK?



YES



NO

Replace the right
handlebar switch.

EAS00766

12. Wiring

Check the entire starting system's wiring.
Refer to "CIRCUIT DIAGRAM".

Is the starting system's wiring properly con-
nected and without defects?



YES



NO

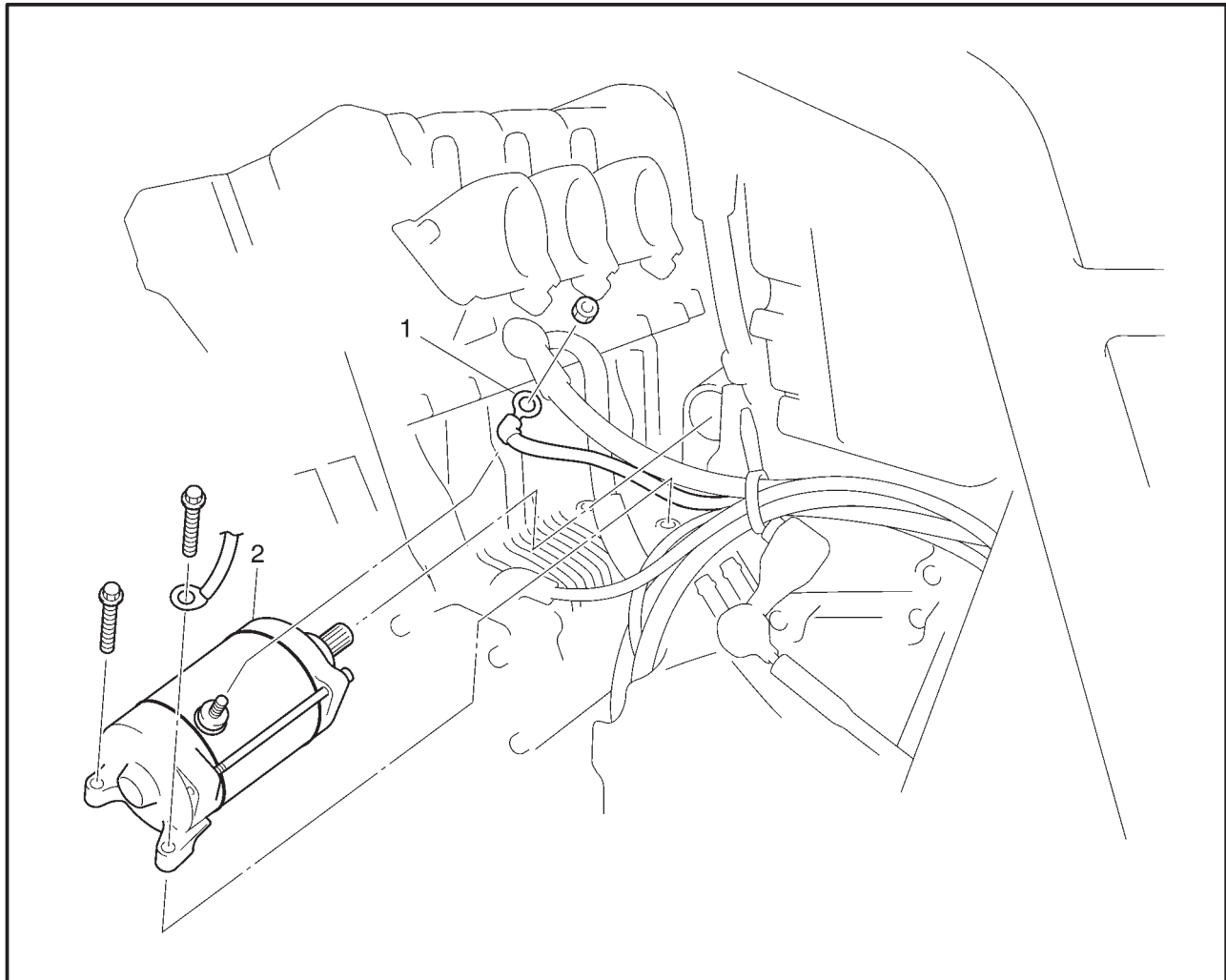
The starting system
circuit is OK?

Properly connect or
repair the starting
system's wiring.



EAS00767

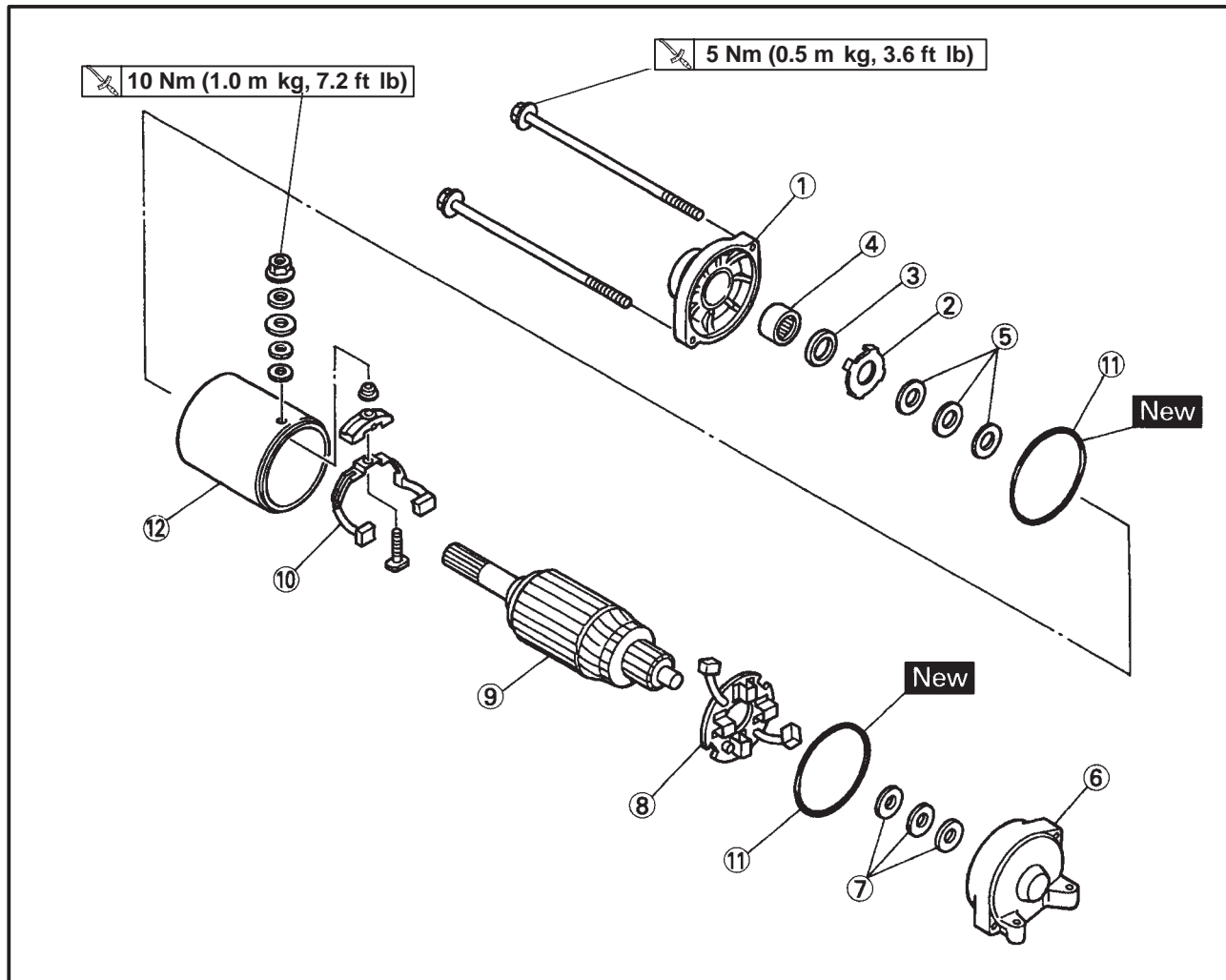
STARTER MOTOR



Order	Job/Part	Q'ty	Remarks
1	Removing the starter motor	1	Remove the parts in the order listed.
2	Carburetor	1/1	Refer to "CARBURETOR" in chapter 7.
	Starter motor lead		
	Starter motor/O-ring		For installation, reverse the removal procedure.



EAS00768



Order	Job/Part	Q'ty	Remarks
	Disassembling the starter motor		Disassemble the parts in the order listed.
①	Starter motor front cover	1	Refer to "ASSEMBLING THE STARTER MOTOR".
②	Lock washer	1	
③	Oil seal	1	
④	Bearing	1	
⑤	Washer set	1	
⑥	Starter motor rear cover	1	NOTE: _____ Be sure to remove the installation nut on brush #1 first.
⑦	Washer set	1	
⑧	Brush seat (along with the brushes)	1	
⑨	Armature assembly	1	
⑩	Brush holder (along with the brushes)	1	
⑪	O-ring	2	
⑫	Starter motor yoke	1	For assembly reverse the disassembly procedure.

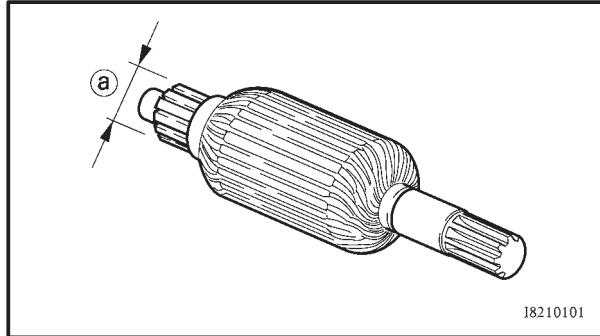


EAS00769

CHECKING THE STARTER MOTOR

1. Check:

- commutator
Dirt → Clean with 600-grit sandpaper.

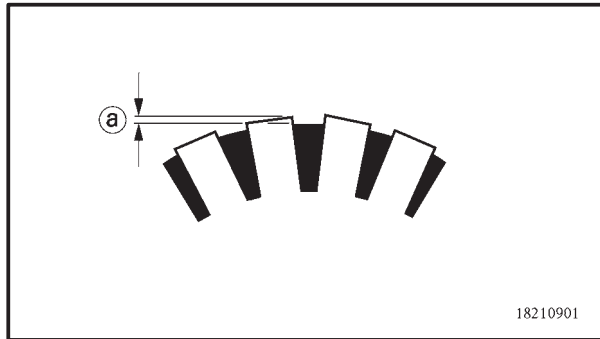


2. Measure:

- commutator diameter (a)
Out of specification → Replace the starter motor.



Commutator wear limit
27 mm (1.06 in)



3. Measure:

- mica undercut (a)
Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.



Mica undercut
0.7 mm (0.03 in)

NOTE:

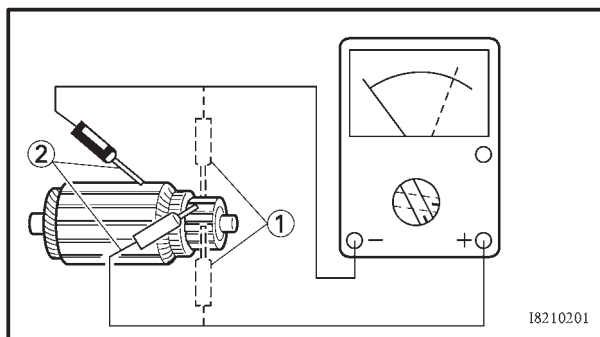
The mica must be undercut to ensure proper operation of the commutator.

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.



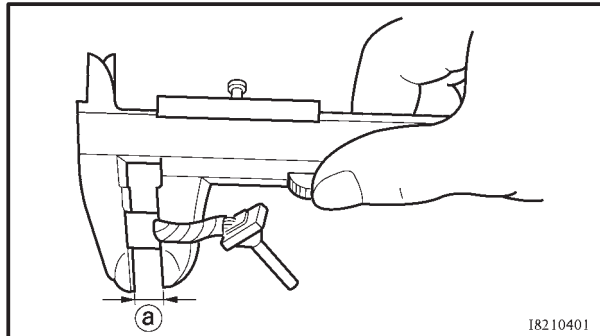
Pocket tester measurement
YU-03112-C



Armature coil
Commutator resistance ①
0.025 ~ 0.035 Ω at 20°C (68°F)
Insulation resistance ②
Above 1M Ω at 20°C (68°F)



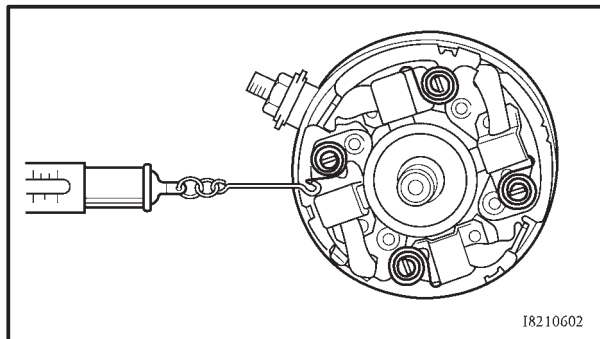
- b. If any resistance is out of specification, replace the starter motor.



5. Measure:
brush length (a)
Out of specification → Replace the brushes
as a set.



Brush length wear limit
4 mm (0.16 in)



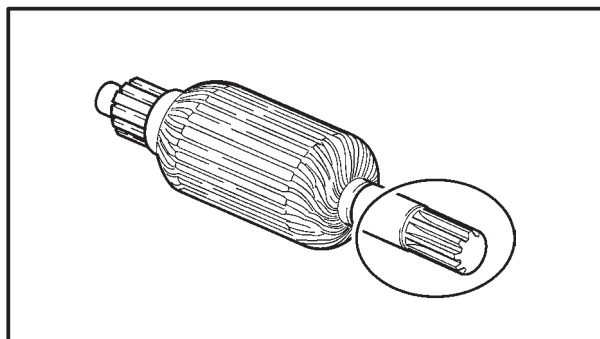
6. Measure:
brush spring force
Out of specification → Replace the brush
springs as a set.



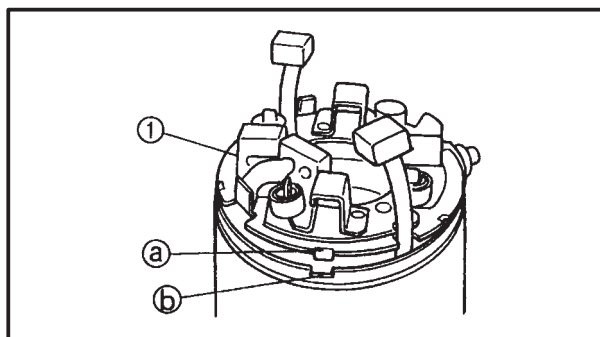
Brush spring force

7.65 ~ 10.01 N

(780 ~ 1,021 gf, 27.5 ~ 36.0 oz)



7. Check:
gear teeth
Damage/wear → Replace the gear.



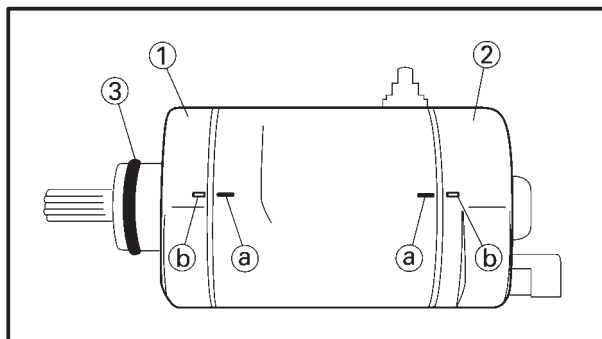
EAS00772

ASSEMBLING THE STARTER MOTOR

1. Install:
armature
brush seat ①

NOTE:

Align the tab (a) on the brush seat with the slot (b) in the starter motor rear cover.



2. Install:
- starter motor front cover ①
 - starter motor rear cover ②
 - O-ring ③ **New**

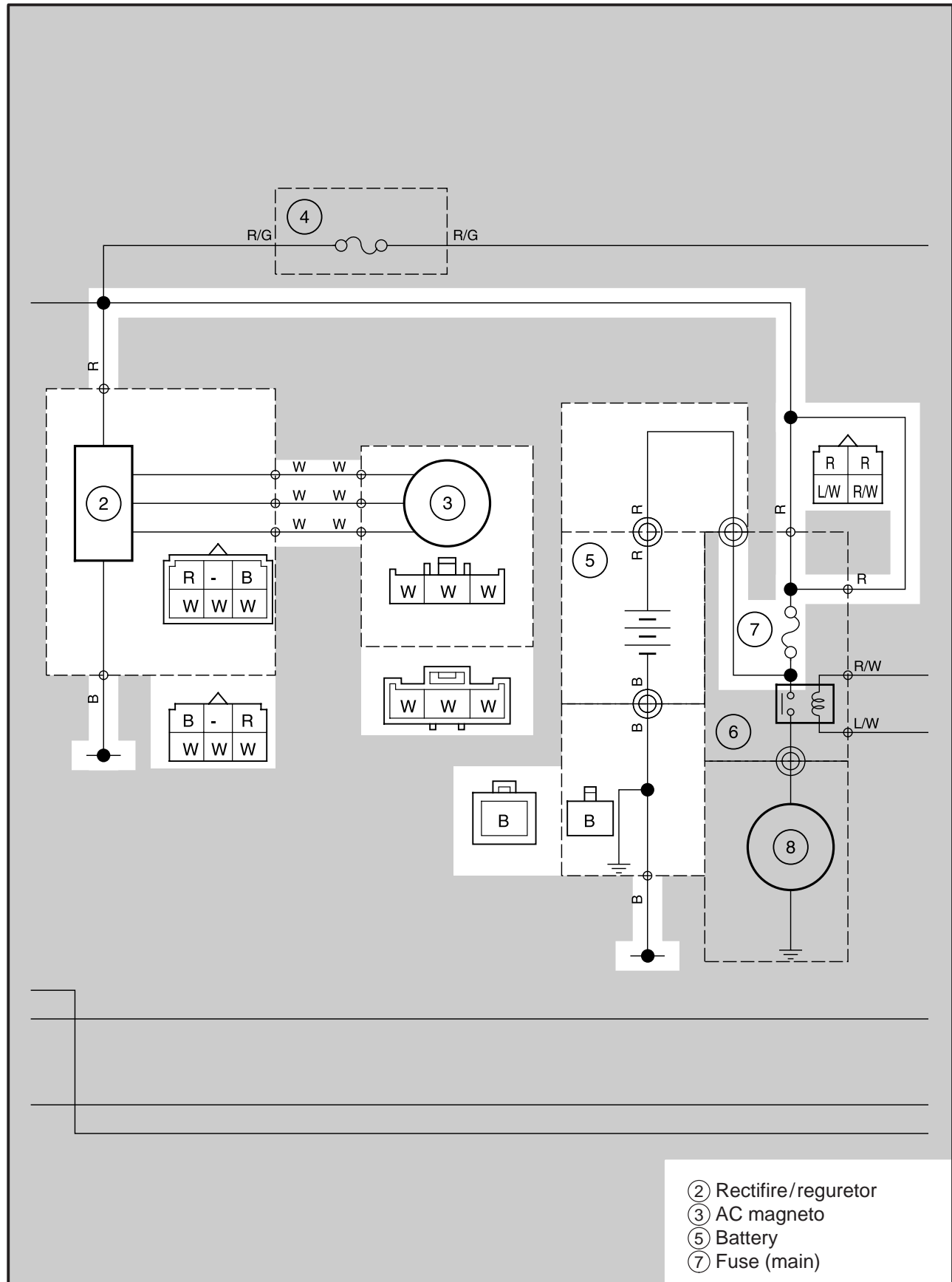
NOTE:

Align the match marks (a) on the starter motor yoke with the match marks (b) on the front and starter motor rear covers.



EAS00773

CHARGING SYSTEM CIRCUIT DIAGRAM



- ② Rectifier/regulator
- ③ AC magneto
- ⑤ Battery
- ⑦ Fuse (main)

CHARGING SYSTEM

ELEC



EAS00774

TROUBLESHOOTING

The battery is not being charged.

Check:

1. Main fuse
2. Battery
3. Charging voltage
4. Stator coil resistance
5. Wiring connections
(of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(-s):
 - 1) Seat
 - 2) Fuel tank
 - 3) Side cover
- Troubleshoot with the following special tool(-s).



**Inductive self-powered
tachometer**

YU-8036-B

Pocket tester measurement

YU-03112-C

EAS00738

1. Main fuses

- Check the fuses for continuity.
Refer to "CHECKING THE FUSES" in
CHAPTER 3.
- Are the fuses OK?

↓ YES

↓ NO

Replace the fuse (s).

EAS00739

2. Battery

- Check the condition of the battery.
Refer to "CHECKING THE BATTERY" in
CHAPTER 3.



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

- Is the battery OK?

↓ YES

↓ NO

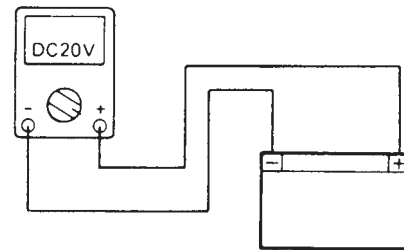
- Clean the battery terminals.
- Recharge or replace the battery.

EAS00775

3. Charging voltage

- Connect the inductive self-powered tachometer to the spark plug lead of cylinder #1.
- Connect the pocket tester (DC 20 V) to the battery as shown.

**Positive tester probe →
positive battery terminal**
**Negative tester probe →
negative battery terminal**



- Start the engine and let it run at approximately 5,000 r/min.
- Measure the charging voltage.



Charging voltage

14 V at 5,000 r/min

NOTE:

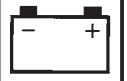
Make sure the battery is fully charged.

- Is the charging voltage within specification?

↓ NO

↓ YES

The charging circuit is OK.



EAS00776

4. Stator coil resistance

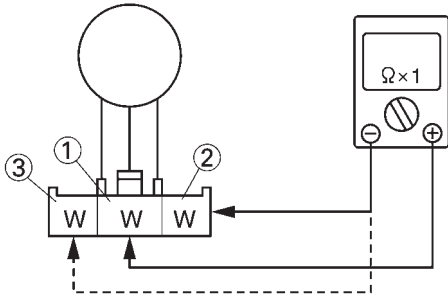
- Remove the generator cover.
- Connect the pocket tester ($\Omega \times 1$) to the stator coils as shown.

Positive tester probe → white ①

Negative tester probe → white ②

Positive tester probe → white ③

Negative tester probe → white ①



- Measure the stator coil resistances.



Stator coil resistance

0.27 ~ 0.33 Ω at 20°C (68°F)

- Is the stator coil OK?



YES



NO

Replace the stator coil 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.

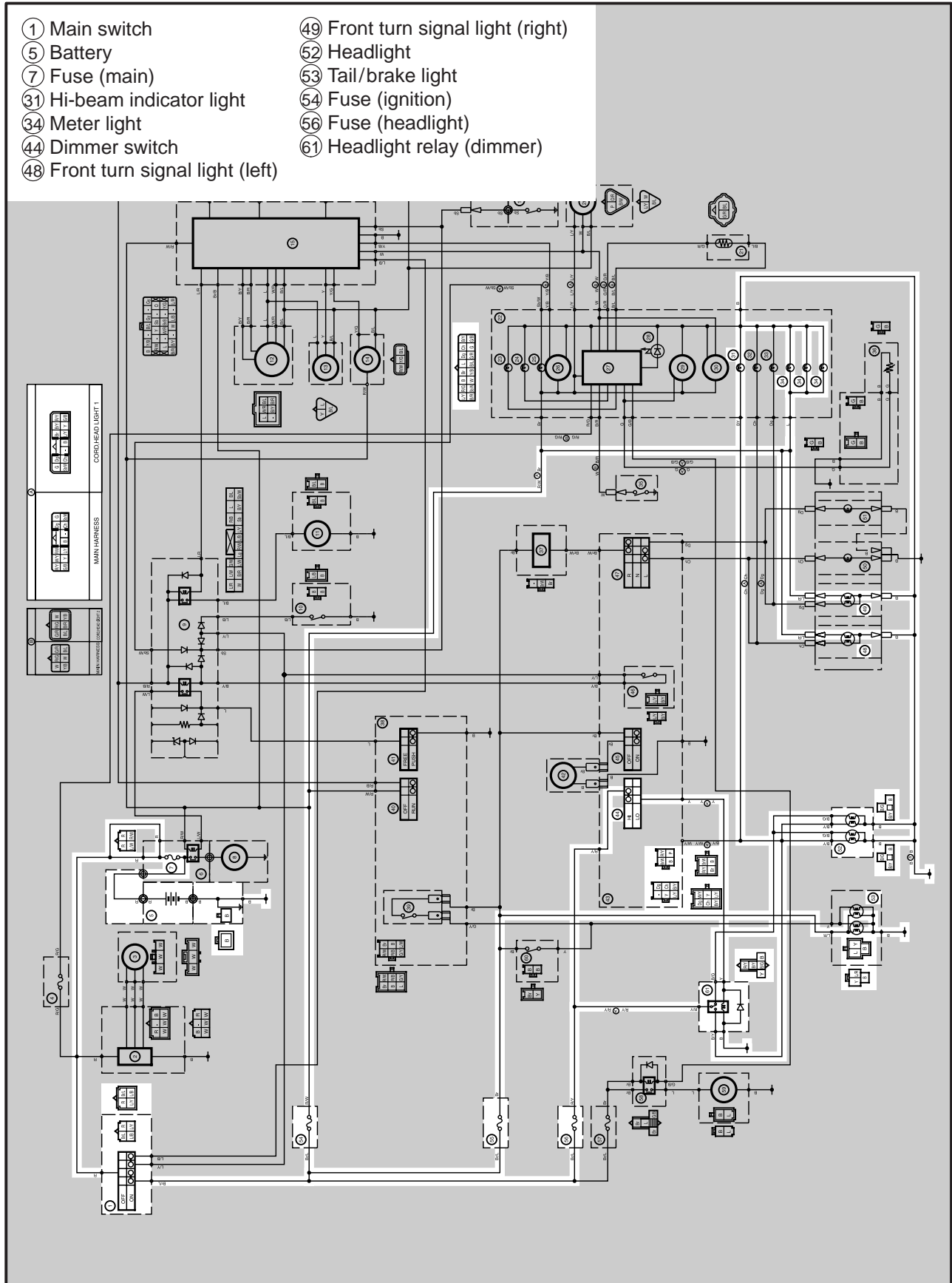
Properly connect or repair the charging system's wiring.



EAS00780

LIGHTING SYSTEM CIRCUIT DIAGRAM

- | | |
|-----------------------------------|------------------------------------|
| ① Main switch | ④⑨ Front turn signal light (right) |
| ⑤ Battery | ⑤② Headlight |
| ⑦ Fuse (main) | ⑤③ Tail/brake light |
| ③① Hi-beam indicator light | ⑤④ Fuse (ignition) |
| ③④ Meter light | ⑤⑥ Fuse (headlight) |
| ④④ Dimmer switch | ⑥① Headlight relay (dimmer) |
| ④⑧ Front turn signal light (left) | |



LIGHTING SYSTEM

ELEC



EAS00781

TROUBLESHOOTING

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

Check:

1. Main, ignition and headlight fuses
2. Battery
3. Main switch
4. Dimmer switch
5. Headlight relay (dimmer)
6. Wiring connections
(of the entire charging system)

NOTE:

- Before troubleshooting, remove the following part(-s):
 - 1) Seat
 - 2) Fuel tank
 - 3) Side cover
- Troubleshoot with the following special tool(-s).



**Pocket tester measurement
YU-03112-C**

EAS00738

1. Main, ignition and headlight fuses

- Check the main, ignition and headlight fuses for continuity. Refer to “CHECKING THE FUSES” in CHAPTER 3.
- Are the main, ignition and headlight fuses OK?



YES



NO

Replace the fuse (s).

EAS00739

2. Battery

- Check the condition of the battery. Refer to “CHECKING THE BATTERY” in CHAPTER 3.



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

- Is the battery OK?



YES



NO

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

EAS00749

3. Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?



YES



NO

Replace the main switch.

EAS00784

4. Dimmer switch

- Check the dimmer switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the dimmer switch OK?



YES



NO

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



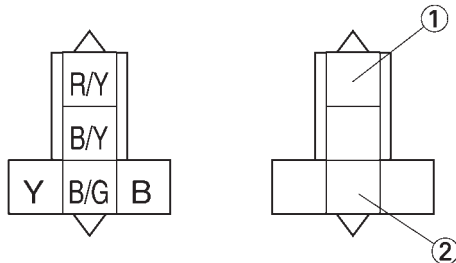
5. Headlight relay (dimmer)

Disconnect the headlight relay (dimmer) from the coupler.
Connect the pocket tester ($\Omega \sim 1$) and battery (12 V) to the headlight relay (dimmer) coupler as shown.

Low-beam

Positive tester probe → red/yellow ①

Negative tester probe → black/green ②



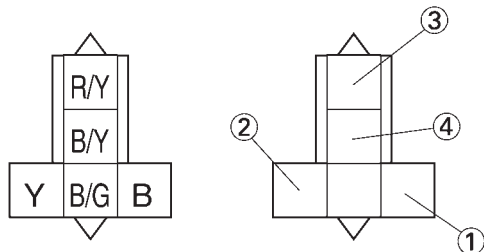
Hi-beam

Positive battery lead → yellow ①

Negative battery lead → black ②

Positive tester probe → red/yellow ③

Negative tester probe → black/yellow ④



Does the headlight rrelay (dimmer) have continuity?

YES

NO

Replace the headlight relay (dimmer).

EAS00787

6. Wiring

Check 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.

Are the headlight bulb and socket OK?



Replace the headlight bulb, socket or both

2. Voltage

Connect the pocket tester (DC 20 V) to the headlight and high beam indicator light couplers as shown.

- A When the dimmer switch is set to "ON".
- B When the dimmer switch is set to "OFF".

Headlight

Positive tester probe → black/yellow^① or black/green^②

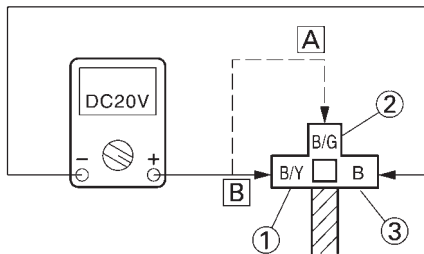
Negative tester probe → black^③

High beam indicator light

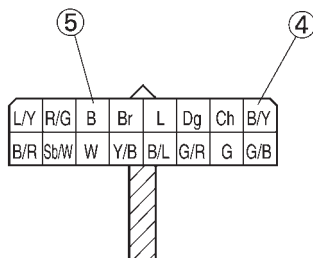
Positive tester probe → black/yellow^④

Negative tester probe → black^⑤

Headlight coupler (wire harness side)



Meter light coupler (wire harness side)



Set the main switch to "ON".
Set the dimmer switch to "ON" or "OFF".
Measure the voltage (12 V) (wire harness side).

Is the voltage within specification?



This circuit is OK.

The wiring circuit from the main switch to the headlight coupler 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.

Are the meter light bulb and socket OK?



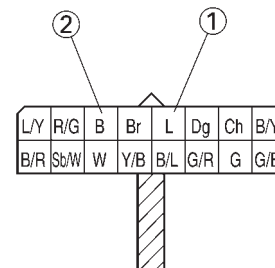
Replace the meter light bulb, socket of both.

2. Voltage

Connect the pocket tester (DC 20 V) to the meter 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 (12 V) of blue ① on the meter light coupler (wire harness side).

Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the meter light coupler is faulty and must be repaired.

Set the main switch to "ON".
Measure the voltage (12 V) of blue/red ① on the tail/brake light coupler (tail/brake light side).

Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the tail/brake light coupler is faulty and must be repaired.

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.

Are the tail/brake light bulb and socket OK?

YES

NO

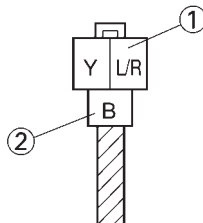
Replace the tail/brake light bulb, socket or both.

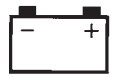
2. Voltage

Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

Positive tester probe → blue/red ①

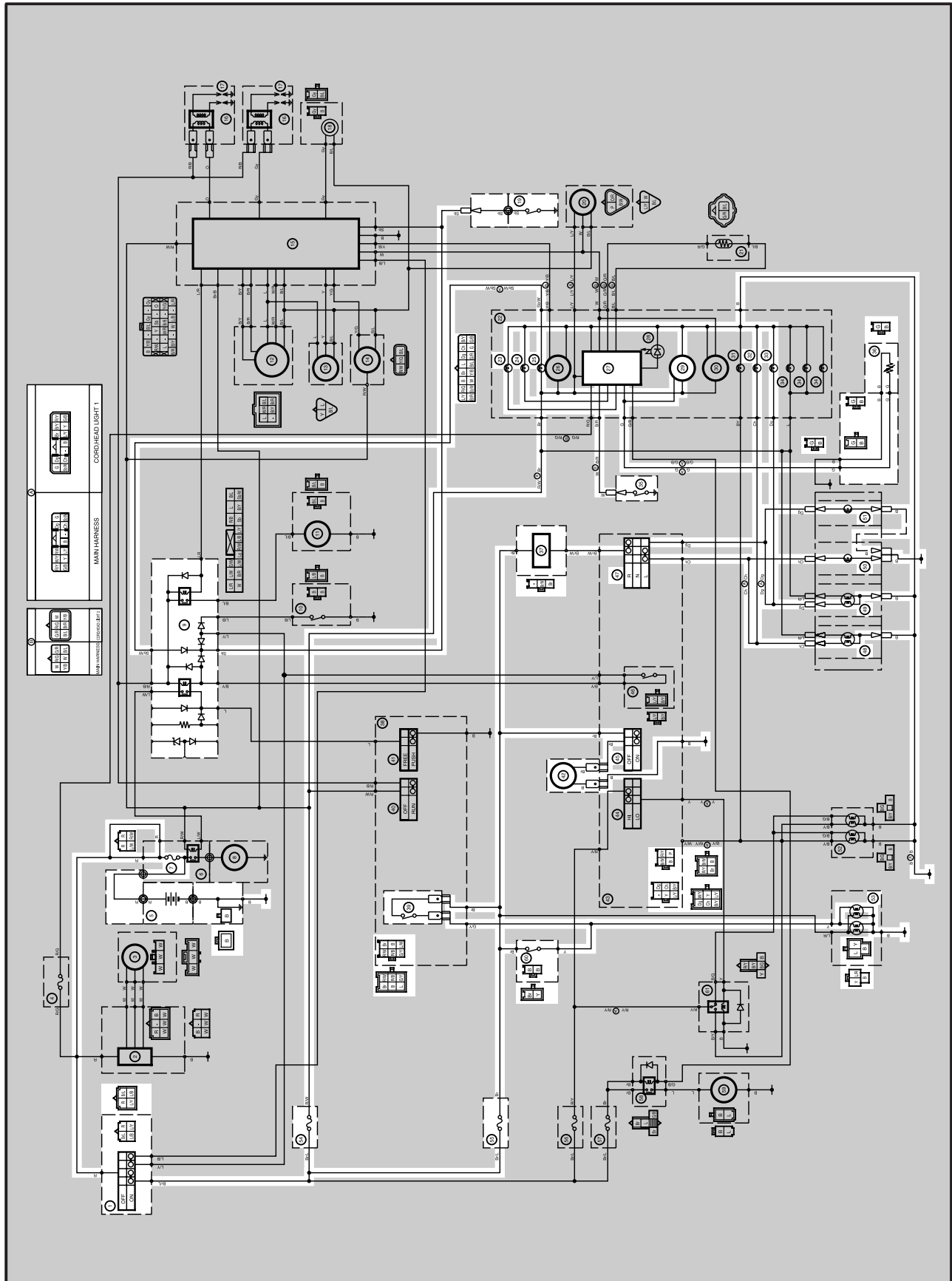
Negative tester probe → black ②

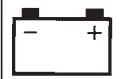




EAS00793

SIGNAL SYSTEM CIRCUIT DIAGRAM





- ① Main switch
- ⑤ Battery
- ⑦ Fuse (main)
- ⑨ Starting circuit cutoff relay
- ⑪ Neutral switch
- ⑬ Fuel level warning light
- ⑭ Oil level warning light
- ⑮ Neutral indicator light
- ⑰ Combination meter
- ⑲ Fuel gauge
- ⑳ Turn signal indicator light (left)
- ㉑ Turn signal indicator light (right)
- ㉒ Oil level gauge
- ㉓ Fuel sender
- ㉔ Turn signal relay
- ㉕ Front brake light switch
- ㉖ Horn
- ㉗ Horn switch
- ㉘ Turn signal switch
- ㉙ Front turn signal light (left)
- ㉚ Front turn signal light (right)
- ㉛ Rear turn signal light (left)
- ㉜ Rear turn signal light (right)
- ㉝ Tail/brake light
- ㉞ Fuse (ignition)
- ㉟ Fuse (turn signal)
- ㊱ Rear brake light switch



EAS00794

TROUBLESHOOTING

- Any of the following fail to come on: turn signal light, brake light or indicator light.
- The horn fails to sound.

Check:

1. Main, signal and ignition fuses
2. Battery
3. Main switch
4. Wiring connections
(of the entire signal system)

NOTE:

- Before troubleshooting, remove the following part(s):
 - 1) Seat
 - 2) Fuel tank
 - 3) Front cowling
 - 4) Side cover
- Troubleshoot with the following special tool(s).



**Pocket tester measurement
YU-03112-C**

EAS00738

1. Main, signal and ignition fuses

- Check the main, signal and ignition fuses for continuity. Refer to "CHECKING THE FUSES" in CHAPTER 3.
- Are the main, signal and ignition fuses OK?



YES



NO

Replace the fuse (s).

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING THE BATTERY" in CHAPTER 3.



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

- Is the battery OK?



YES



NO

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

EAS00749

3. Main switch

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



YES



NO

Replace the main switch.

EAS00795

4. Wiring

- Check the entire 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 SIGNAL SYSTEM

1. The horn fails to sound.

1. Horn switch

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



YES

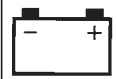


NO

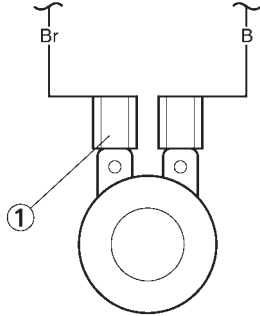
Replace the left handlebar switch.

2. Voltage

- Connect the pocket tester (DC 20 V) to the horn connector at the horn terminal as shown.



Positive tester probe → brown ①
Negative tester probe → black



Set the main switch to "ON".
 Push the horn switch.
 Measure the voltage (12 V) of pink at the horn terminal.

Is the voltage within specification?



YES



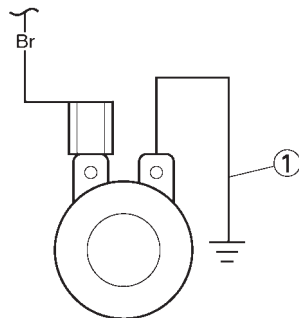
NO

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".
 Push the horn switch.

Does the horn sound?



NO



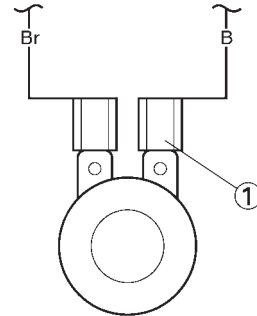
YES

The horn is OK.

4. Voltage

Connect the pocket tester (DC 20 V) to the horn connector at the black terminal as shown.

Positive tester probe → black ①
Negative tester probe → ground



Set the main switch to "ON".
 Measure the voltage (12 V) of black ① at the horn terminal.

Is the voltage within specification?



YES



NO

Repair or replace the horn.

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.

Are the tail/brake light bulb and socket OK?



YES



NO

Replace the tail/brake light bulb, socket or both.

2. Brake switches

Check the brake light switches for continuity. Refer to "CHECKING THE SWITCHES".

Is the brake light switch OK?



YES



NO

Replace the brake light switch.

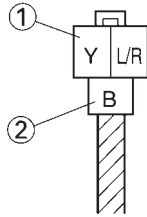


3. Voltage

Connect the pocket tester (DC 20 V) to the tail/brake light coupler (wire harness side) as shown.

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 (12 V) of yellow 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.

EAS00799

3. The turn signal light, turn signal indicator light or both fail to blink.

1. Turn signal indicator light bulb and socket

Check the turn signal light bulb and socket for continuity.

Are the turn signal light bulbs and socket OK?



Replace the turn signal light bulb, socket or both.

2. Turn signal switch

Check the turn signal switch for continuity. Refer to "CHECKING THE SWITCHES".

Is the turn signal switch OK?



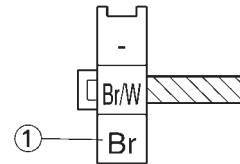
Replace the left handlebar switch.

3. Voltage

Connect the pocket tester (DC 20 V) to the turn signal relay coupler (wire harness side) as shown.

Positive tester probe → brown ①

Negative tester probe → ground



Set the main switch to "ON".
Measure the voltage (12 V) on brown ① at the turn signal relay coupler (wire harness side).

Is the voltage within specification?



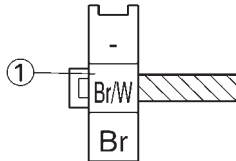
The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.



4. Voltage

Connect the pocket tester (DC 20 V) to the flasher relay coupler (wire harness side) as shown.

Positive tester probe → brown/white ①
Negative tester probe → ground



Set the main switch to "ON".
 Set the turn signal switch to "⇨" or "⇩".
 Measure the voltage (12 V) on brown/white ① at the turn signal relay coupler (wire harness side).

Is the voltage within specification?



The turn signal relay is faulty and must be replaced.

5. Voltage

Connect the pocket tester (DC 20 V) to the turn signal light connector (wire harness side) as shown.

- A** Rear turn signal light
- B** Turn signal indicator light

Left turn signal light

Positive tester probe → chocolate ①

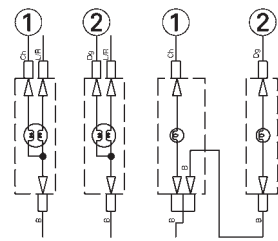
Negative tester probe → ground

Right turn signal light

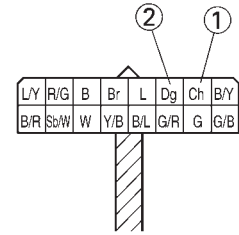
Positive tester probe → dark green ②

Negative tester probe → ground

A



B



Set the main switch to "ON".

Set the turn signal switch to "⇨" or "⇩".
 Measure the voltage (12 V) of the chocolate ① or dark green ② at the turn signal 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 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.

Are the neutral indicator light bulb and socket OK?



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?



Replace the neutral switch.

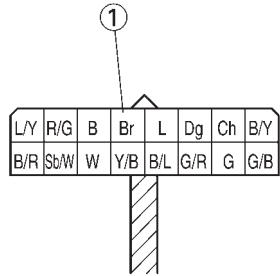


3. Voltage

Connect the pocket tester (DC 20 V) to the meter light bulb coupler (wire harness side) as shown.

Positive tester probe → **brown** ①

Negative tester probe → **ground**



Set the main switch to “ON”.
Measure the voltage (12 V).

Is the voltage within specification?

YES

This circuit is OK.

NO

The wiring circuit from the main switch to the meter light bulb coupler is faulty and must be repaired.

2. Engine oil level switch

Drain the engine oil and remove the engine oil level switch from the oil pan.
Check the engine oil level switch for continuity.
Refer to “CHECKING THE SWITCHES”.

Is the engine oil level switch OK?

YES

NO

Replace the engine oil level switch.

EAS00795

3. 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

Replace the meter unit.

Properly connect or repair the signaling system’s wiring.

EAS00802

5. The oil level warning light fails to come on.

1. Oil level warning light bulb and socket

Check the oil level warning light bulb and socket for continuity.

Are the oil level warning light bulb and socket OK?

YES

NO

Replace the oil level warning light bulb, socket or both.



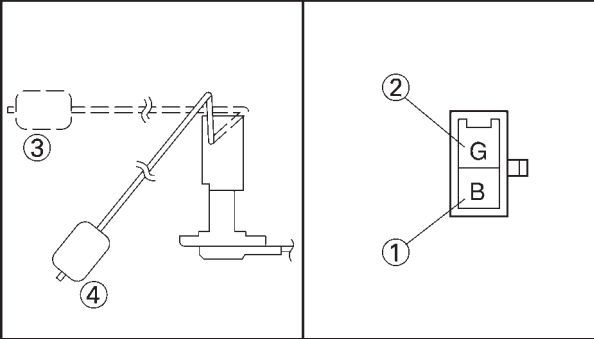
EAS00804

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 ③) (Ω × 1)

4 ~ 10 Ω at 20°C (68°F)

Fuel sender resistance (down position ④) (Ω × 10)

90 ~ 100 Ω at 20°C (68°F)

- Is the fuel sender OK?

YES

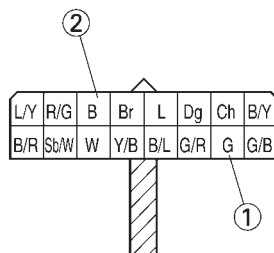
NO

Replace the fuel sender.

2. Voltage

- Connect the pocket tester (DC 20 V) to the meter light coupler (wire harness side) as shown.

Positive tester probe → brown ①
Negative tester probe → black ②



- Set the main switch to "ON".
- Measure the voltage (12 V) of brown ① on the meter light coupler (wire harness side).

- Is the voltage within specification?

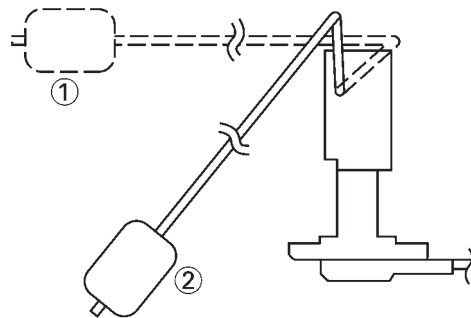
YES

NO

Check the wiring connections of the entire signaling system.

3. Fuel level gauge

- Set the main switch to "ON".
- Move the float up ① or down ②.
- 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

Replace the fuel level gauge.

4. Wiring

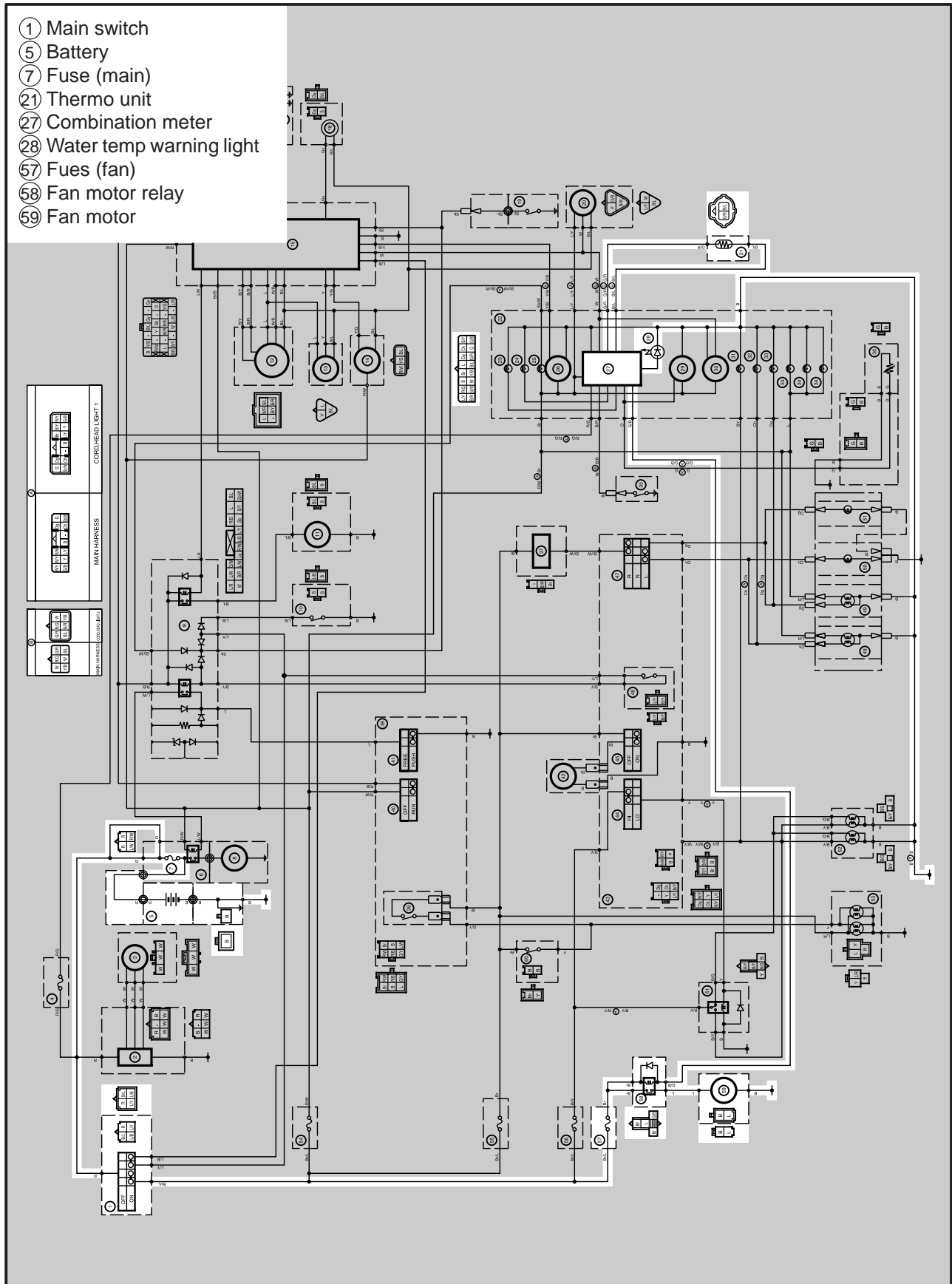
- Check the entire signaling system's wiring. Refer to "CIRCUIT DIAGRAM".



EAS00807

COOLING SYSTEM CIRCUIT DIAGRAM

- ① Main switch
- ⑤ Battery
- ⑦ Fuse (main)
- ②① Thermo unit
- ②⑦ Combination meter
- ②⑧ Water temp warning light
- ⑤⑦ Fuses (fan)
- ⑤⑧ Fan motor relay
- ⑤⑨ Fan motor





EAS00808

TROUBLESHOOTING

- The radiator fan motor fails to turn.
- The water temperature gauge needle fails to move when the engine is warm.

Check:

1. Main and radiator fan motor fuses
2. Battery
3. Main switch
4. Radiator fan motor
5. Thermo unit
6. Wiring connections
(the entire cooling system)

NOTE:

- Before troubleshooting, remove the following part(-s).
 - 1) Seat
 - 2) Fuel tank
- Troubleshoot with the following special tool(s).



Pocket tester measurement
YU-03112-C

EAS00738

1. Main and radiator fan motor fuses

- Check the main and radiator fan motor fuses for continuity. Refer to "CHECKING THE FUSES" in CHAPTER 3.
- Are the main and radiator fan motor fuses OK?

↓ YES

↓ NO

Replace the fuse (s).

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING THE BATTERY" in CHAPTER 3.



Minimum open-circuit voltage
12.8 V or more at 20°C

• Is the battery OK?

↓ YES

↓ NO

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

EAS00749

3. Main switch

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

↓ YES

↓ NO

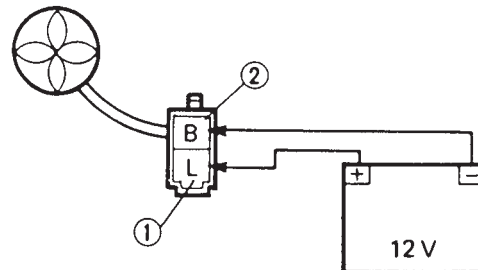
Replace the main switch.

EAS00809

4. Radiator fan motor

- Disconnect the radiator fan motor coupler from the wire harness.
- Connect the battery (12 V) as shown.

Positive battery lead → blue ①
Negative battery lead → black ②



• Does the radiator fan motor turn?

↓ YES

↓ NO

The radiator fan motor is faulty and must be replaced.



EAS00812

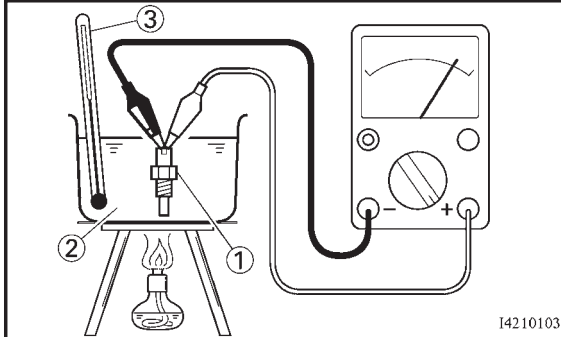
5. Thermo unit

- Remove the thermo unit from the thermostat housing.
- Connect the pocket tester ($\Omega \times 1$) to the thermo unit ① as shown.
- Immerse the thermo unit in a container filled with coolant ②.

NOTE:

Make sure the thermo unit terminals do not get wet.

- Place a thermometer ③ in the coolant.
- Slowly heat the coolant, and then let it cool to the specified temperature indicated in the table.
- Check the thermo unit for continuity at the temperatures indicated in the table.



I4210103

**Thermo unit resistance**

80°C (176°F): 3.41 ~ 4.00 Ω

105°C (221°F): 1.65 ~ 1.86 Ω

⚠ WARNING

- Handle the thermo unit with special care.
- Never subject the thermo unit to strong shocks. If the thermo unit is dropped, replace it.

**Thermo unit**

15 Nm (1.5 m•kg, 11 ft•lb)

Three bond sealock® 10

- Does the thermo unit operate properly?

↓ YES

↓ NO

Replace the thermo unit.

EAS00759

6. Fan motor relay

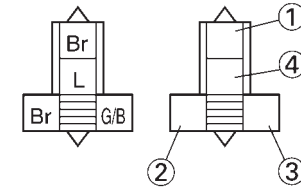
- Disconnect the fan motor relay coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the fan motor relay coupler as shown.

Positive battery terminal → brown ①

Negative battery terminal → green/black ②

Positive tester probe → brown ③

Negative tester probe → blue ④



- Does the fan motor relay have continuity between brown and blue?

↓ YES

↓ NO

Replace the fan motor relay.

EAS00813

7. Wiring

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

↓ YES

↓ NO

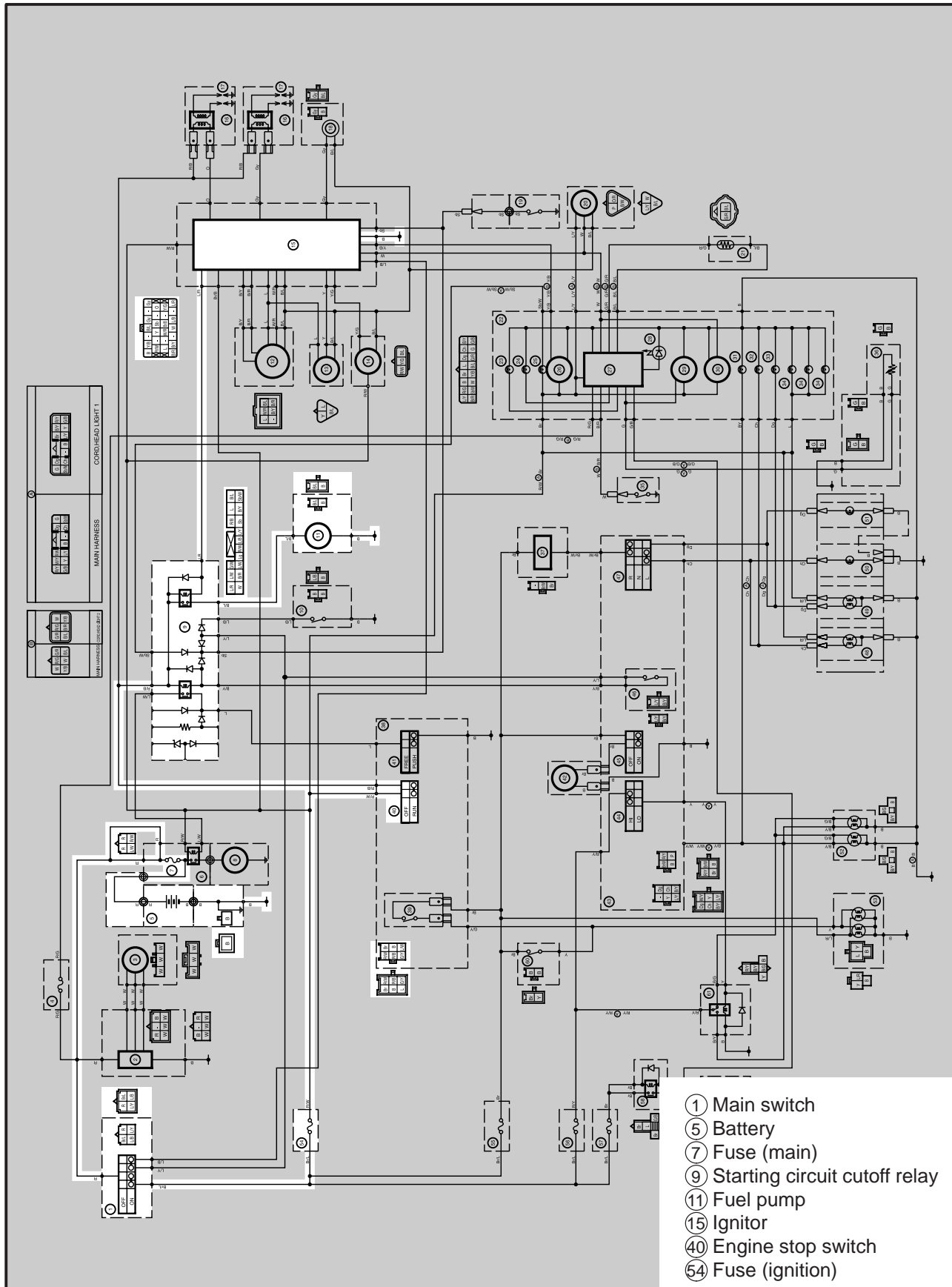
This circuit is OK.

Properly connect or repair the cooling system's wiring.



EAS00814

FUEL PUMP SYSTEM CIRCUIT DIAGRAM



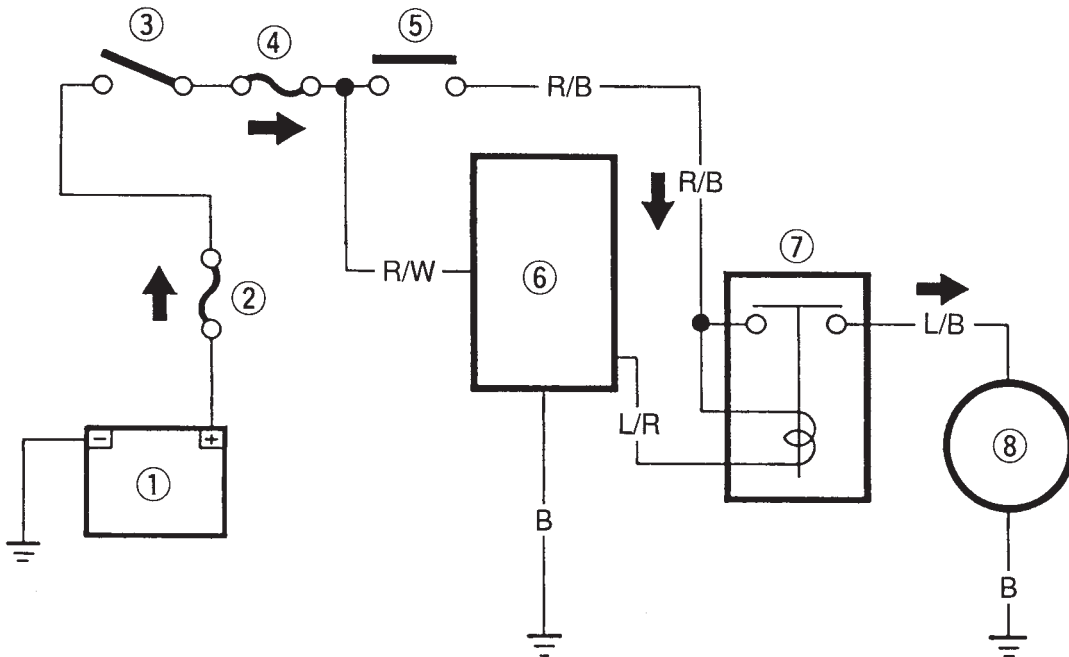


EAS00815

FUEL PUMP CIRCUIT OPERATION

The ignitor unit includes the control unit for the fuel pump.

- ① Battery
- ② Main fuse
- ③ Main switch
- ④ Ignition fuse
- ⑤ Engine stop switch
- ⑥ Ignitor unit
- ⑦ Fuel pump relay
- ⑧ Fuel pump





EAS00816

TROUBLESHOOTING

If the fuel pump fails to operate.

Check:

1. Main and ignition fuses
2. Battery
3. Main switch
4. Engine stop switch
5. Starting circuit cutoff relay (the fuel pump relay)
6. Fuel pump
7. Wiring connections (the entire fuel system)

NOTE:

• Before troubleshooting, remove the following part(-s):

- 1) Seat
- 2) Fuel tank
- 3) Side cover

Troubleshoot with the following special tool(s).



Pocket tester measurement
YU-03112-C

EAS00738

1. Main, and ignition fuses

- Check the main and ignition fuses for continuity. Refer to "CHECKING THE FUSES" in CHAPTER 3.

- Are the main and ignition fuses OK?



YES



NO

Replace the fuse (s).

EAS00739

2. Battery

- Check the condition of the battery. Refer to "CHECKING THE BATTERY" in CHAPTER 3.



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

- Is the battery OK?



YES



NO

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

EAS00749

3. Main switch

- Check the main switch for continuity. Refer to "CHECKING THE SWITCHES".

- Is the main switch OK?



YES



NO

Replace the main switch.

EAS00750

4. Engine stop switch

- Check the engine stop switch for continuity. Refer to "CHECKING THE SWITCHES".

- Is the engine stop switch OK?



YES



NO

Replace the right handlebar switch.

EAS00759

5. Starting circuit cutoff relay

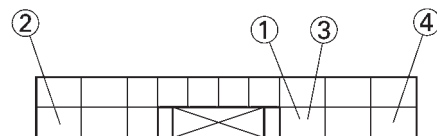
- Disconnect the starting circuit cutoff relay coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the starting circuit cutoff relay coupler as shown.

Positive battery lead \times **red/black** ①

Negative battery lead \times **blue/red** ②

Positive tester probe \times **red/black** ③

Negative tester probe \times **black/blue** ④



L/R	L/W	G/W		R/B	B	B/L
W	B/R	L/W	Lg	R/W	L/B	L/Y
				Sb	B/Y	Sb/W

- Does the starting circuit cutoff relay have continuity between red/black and black/blue?

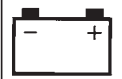


YES



NO

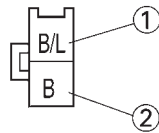
Replace the starting circuit cutoff relay.



EAS00817

6. Fuel pump resistance

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

Positive tester probe \times **black/blue** ①**Negative tester probe** \times **black** ②

- Measure the fuel pump resistance.

**Fuel pump resistance****4 ~ 30 Ω at 20°C (68°F)**

- Is the fuel pump OK?



YES



NO

Replace the fuel pump.

EAS00818

7. Wiring

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



YES



NO

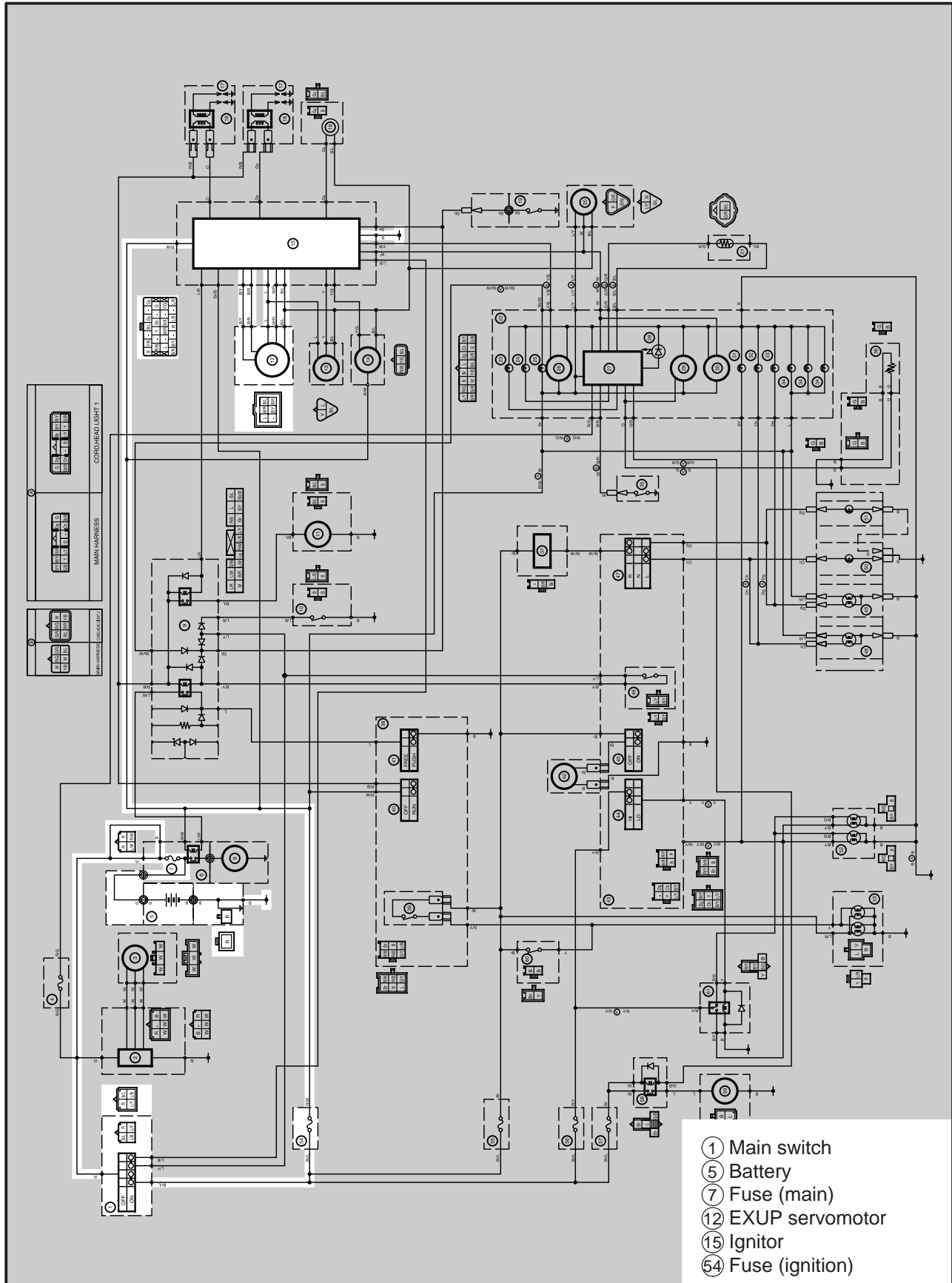
Replace the ignitor unit.

Properly connect or repair the fuel system's wiring.



EAS00827

EXUP SYSTEM CIRCUIT DIAGRAM





EAS00828

TROUBLESHOOTING

When the engine speed changes, the EXUP servomotor does not operate.

Procedure 1

Check:

1. EXUP servomotor operation
(with the EXUP servomotor coupler connected to the wire harness)
2. Voltage
3. EXUP servomotor operation
(with the EXUP servomotor coupler disconnected from the wire harness)
4. EXUP servomotor resistance
(potentiometer resistance)
5. Wiring connections
(the entire EXUP system)

Procedure 2

Check:

1. Main and turn signal fuses
2. Battery
3. Main switch
4. Neutral switch
5. Engine stop switch
6. Wiring connections
(the entire EXUP system)

NOTE:

Before troubleshooting, remove the following part(s):

- 1) Seat
- 2) Fuel tank

Troubleshoot with the following special tool(s).



Pocket tester measurement
YU-03112-C

EAS00829

Procedure 1

1. EXUP servomotor operation (with the EXUP servomotor coupler connected to the wire harness)

Disconnect the EXUP cables at the EXUP servomotor pulley side.
Start the engine and rev it to 5,000 r/min.

Does the EXUP servomotor pulley turn?



YES



NO

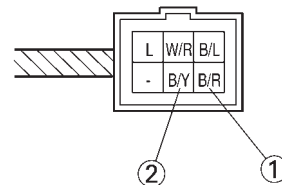
Check that the EXUP cables are properly installed.
If the connections are correct, check the EXUP valve and cables. Refer to "EXHAUST SYSTEM" in chapter 5.

EAS00830

2. Voltage

Connect the pocket tester (DC 20 V) to the EXUP servomotor coupler as shown.

Positive tester probe × black/red ①
Negative tester probe × black/yellow ②



Set the main switch to "ON".
Measure the voltage (12 V) between black/red ① and black/yellow ②.

Is the voltage within specification?

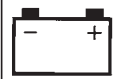


YES



NO

Go to Procedure 2.

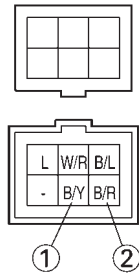


EAS00831

3. EXUP servomotor operation (with the servomotor coupler disconnected to the wire harness)

Disconnect the EXUP cables from the EXUP servomotor pulley.
Disconnect the EXUP servomotor coupler from the wire harness.
Connect the battery leads to the EXUP servomotor coupler as shown.

Positive battery lead × **black/yellow** ①
Negative battery lead × **black/red** ②



Check that the EXUP servomotor pulley rotates several times.

CAUTION:

To prevent damaging the EXUP servomotor, perform this test within a few seconds of connecting the battery.

Does the EXUP servomotor pulley turn?

↓ YES

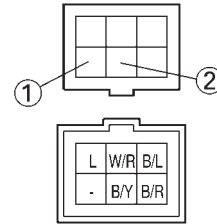
↓ NO

Replace the EXUP servomotor.

EAS00832

4. EXUP servomotor resistance (potentiometer resistance)

Disconnect the EXUP servomotor coupler from the wire harness.
Connect the pocket tester ($\Omega \times 1 \text{ k}$) to the EXUP servomotor coupler.



Positive tester probe × **blue** ①
Negative tester probe × **white/red** ②

While slowly turning the EXUP servomotor pulley, measure the EXUP servomotor resistance.



EXUP servomotor resistance
(when the pulley is turned once)
0 ~ approximately 7.5 k Ω
(blue – white/red)

Is the EXUP servomotor OK?

↓ YES

↓ NO

The EXUP servomotor is faulty and must be replaced.

EAS00833

5. Wiring

Check the entire EXUP system's wiring.
Refer to "CIRCUIT DIAGRAM".

Is the EXUP system's wiring properly connected and without defects?

↓ YES

↓ NO

Replace the ignitor unit.

Properly connect or repair the EXUP system's wiring.



Procedure 2

EAS00738

1. Main and ignition fuses

- Check the main and ignition fuses for continuity. Refer to “CHECKING THE FUSES” in chapter 3.
- Are the main and ignition fuses OK?

↓ YES

↓ NO

Replace the fuse(s).

EAS00739

2. Battery

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



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

- Is the battery OK?

↓ YES

↓ NO

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

EAS00749

3. Main switch

- Check the main switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the main switch OK?

↓ YES

↓ NO

Replace the main switch.

EAS00750

4. Engine stop switch

- Check the engine stop switch for continuity. Refer to “CHECKING THE SWITCHES”.
- Is the engine stop switch OK?

↓ YES

↓ NO

Replace the right handlebar switch.

EAS00833

5. Wiring

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

↓ YES

↓ NO

Replace the ignitor unit.

Properly connect or repair the EXUP system's wiring.



SELF-DIAGNOSIS

The FZS1000 features a self-diagnosing system for the following circuit(-s):

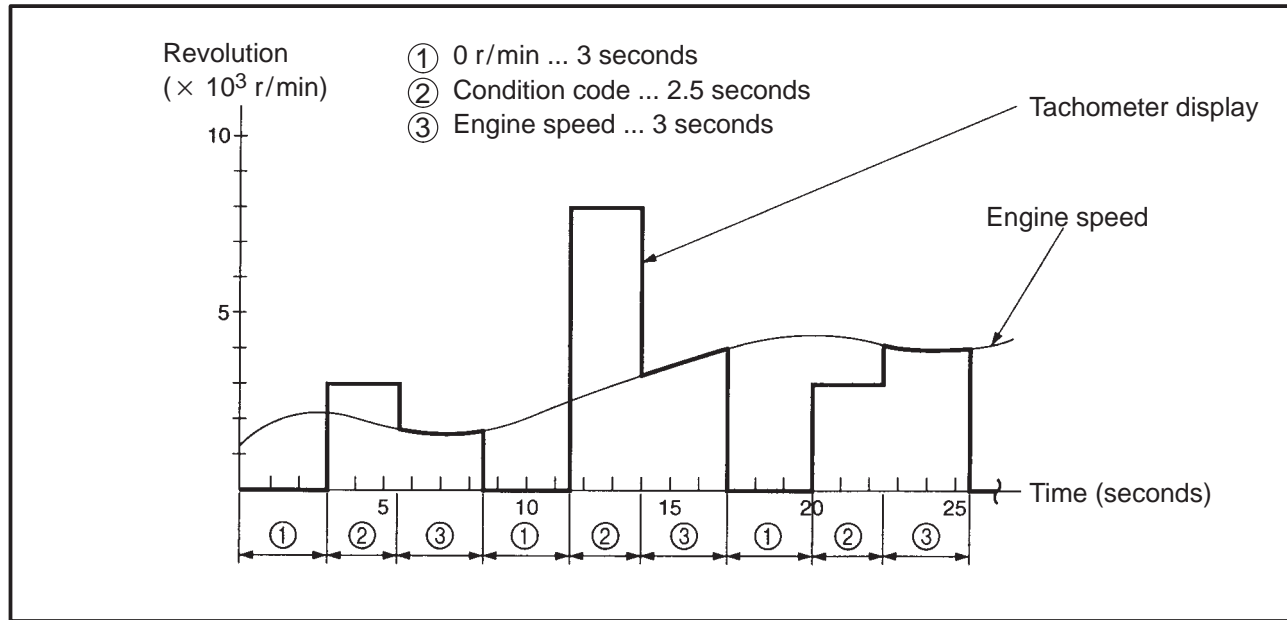
- Throttle position sensor
- EXUP
- Speed sensor
- Emergency stop switch

If any of these circuits are defective, their respective condition codes will be displayed on the tachometer when the main switch is set to "ON" (irrespective of whether the engine is running or not)

Circuit	Defect(-s)	System response	Condition code
Throttle position sensor	Disconnected Short-circuit Locked	The ignitor unit stays set to the wide-open throttle ignition timing. The motorcycle can be ridden. The tachometer displays the condition code.	3,000 r/min
EXUP	Improper connection Short-circuit	The EXUP valve stays in the open position for three seconds and then the servomotor shuts off. The motorcycle can be ridden. The tachometer displays the condition code.	7,000 r/min
	Servomotor is locked.	The servomotor's power supply is constantly interrupted so that it will not burn out. The motorcycle can be ridden. The tachometer displays the condition code.	
Speed sensor	Improper connection	The tachometer displays the condition code.	4,000 r/min
Emergency stop switch	Disconnected Short-circuit Fail angle	The tachometer displays the condition code. Ignition system cutoff.	9,000 r/min



Tachometer display sequence



When more than one item is being monitored, the tachometer needle displays the condition codes in ascending order, cycling through the sequence repeatedly.

If the engine is stopped, the engine speed ③ is 0 r/min.



TROUBLESHOOTING

The tachometer starts to display the self-diagnosis sequence.

Check:

1. Throttle position sensor
2. EXUP
3. Speed sensor
4. Emergency stop switch

NOTE:

Before troubleshooting, remove the following part(-s):

- 1) Rider seat
- 2) Fuel tank
- 3) Air filter case

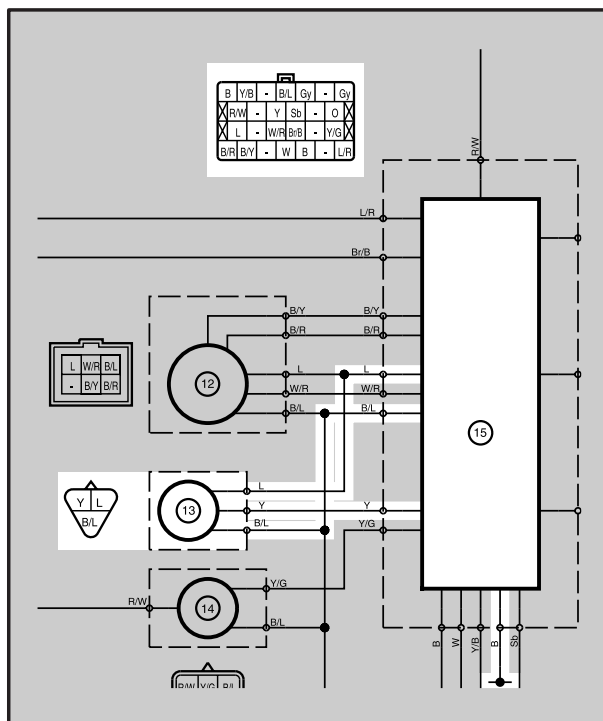
Troubleshoot with the following special tool(-s).



Pocket tester measurement
YU-03112-C

1. Throttle position sensor

CIRCUIT DIAGRAM



- ⑬ Throttle position sensor
⑮ Ignitor unit

1. Wire harness

Check the wire harness for continuity.
Refer to "CIRCUIT DIAGRAM".
Is the wire harness OK?



YES



NO

Repair or replace the wire harness.

2. Throttle position sensor

Check the throttle position sensor for continuity.
Refer to "CHECKING AND ADJUSTING THE THROTTLE POSITION SENSOR" in chapter 6.
Is the throttle position sensor OK?



YES



NO

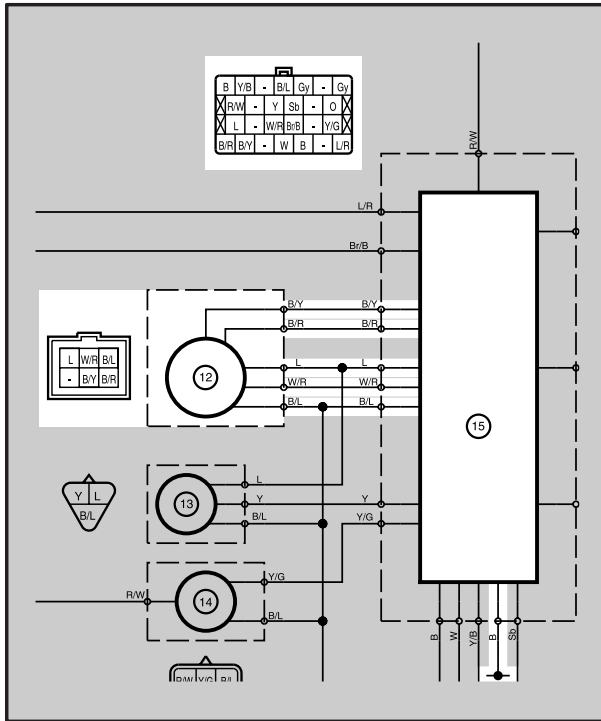
Replace the ignitor unit.

Replace the throttle position sensor.



2. EXUP

CIRCUIT DIAGRAM



⑫ EXUP servomotor

⑮ Ignitor unit

2. EXUP servomotor

Check the EXUP servomotor for continuity.
Refer to "EXUP SYSTEM".
Is the EXUP servomotor OK?



YES



NO

Replace the ignitor unit.

Replace the EXUP servomotor.

1. Wire harness

Check the wire harness for continuity.
Refer to "CIRCUIT DIAGRAM".
Is the wire harness OK?



YES

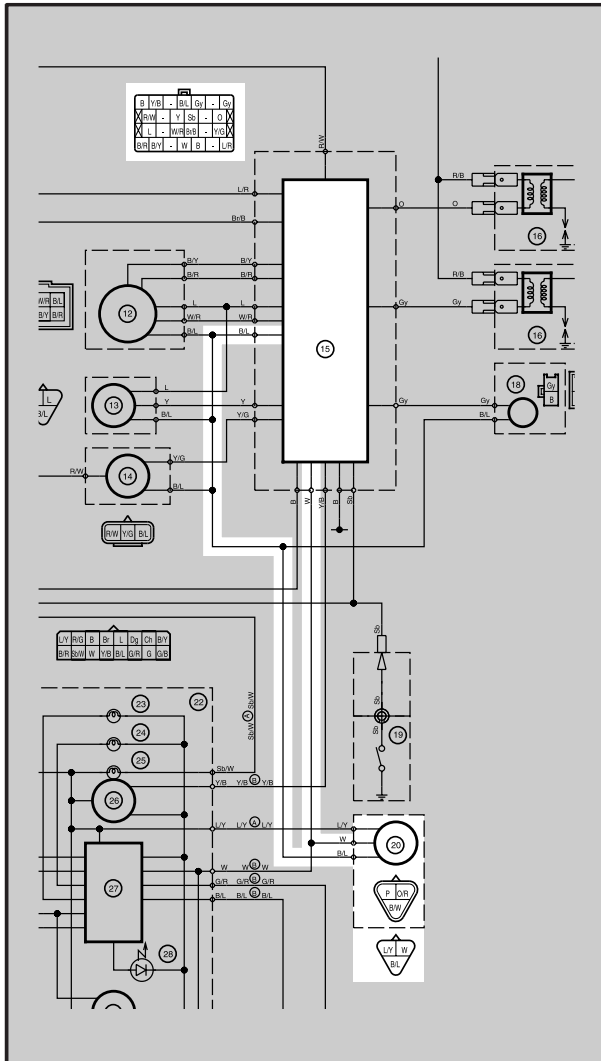


NO

Repair or replace the wire harness.



3. Speed sensor CIRCUIT DIAGRAM



- ⑮ Ignitor unit
- ⑳ Speed sensor

1. Wire harness

Check the wire harness for continuity.
Refer to "CIRCUIT DIAGRAM".

Is the wire harness OK?

YES

NO

Replace the speed sensor.

BAD

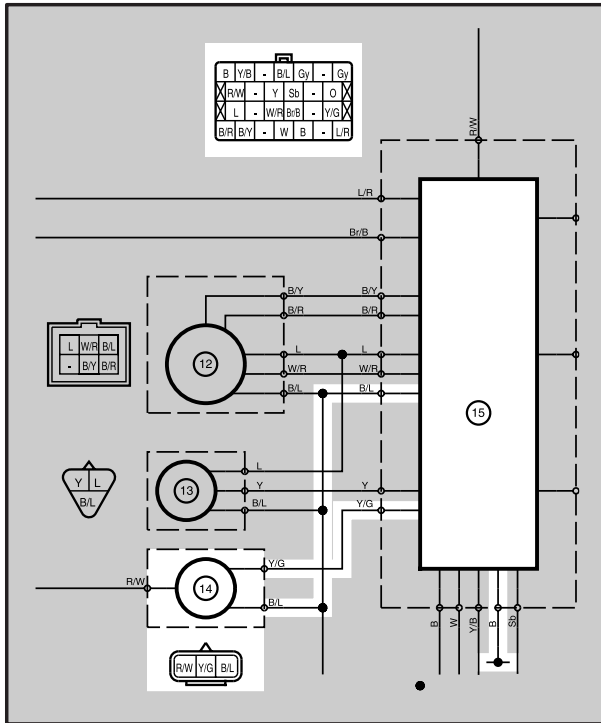
Replace the ignitor unit.

Repair or replace the wire harness.



4. Emergency stop switch

CIRCUIT DIAGRAM



⑭ Emergency stop switch

⑮ Ignitor unit

1. Wire harness

Check the wire harness for continuity.
Refer to "CIRCUIT DIAGRAM".

Is the wire harness OK?

YES

NO

Replace the emergency stop switch.

BAD

Replace the ignitor unit.

Repair or replace the wire harness.

CHAPTER 9 TROUBLESHOOTING

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TROUBLESHOOTING

NOTE:

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

STARTING PROBLEMS

ENGINE

Cylinder(s) and cylinder head(s)

- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder
- Incorrect valve clearance
- Improperly sealed valve
- Incorrect valve-to-valve-seat contact
- Incorrect valve timing
- Faulty valve spring
- Seized valve

Piston(s) and piston ring(s)

- Improperly installed piston ring
- Damaged, worn or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter

- Improperly installed air filter
- Clogged air filter element

Crankcase and crankshaft

- Improperly assembled crankcase
- Seized crankshaft

FUEL SYSTEM

Fuel tank

- Empty fuel tank
- Clogged fuel filter
- Clogged fuel strainer
- Clogged fuel tank drain hose
- Clogged rollover valve
- Clogged rollover valve hose
- Deteriorated or contaminated fuel

Fuel pump

- Faulty fuel pump
- Faulty fuel pump relay

Fuel cock

- Clogged or damaged fuel hose

Carburetor(s)

- 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
- Improperly adjusted starter cable

ELECTRICAL SYSTEMS**Battery**

- Discharged battery
- Faulty battery

Fuse(s)

- Blown, damaged or incorrect fuse
- Improperly installed fuse

Spark plug(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil(s)

- Cracked or broken ignition coil
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

Ignition system

- Faulty ignitor unit
- Faulty pickup coil
- Broken generator rotor woodruff key

Switches and wiring

- Faulty main switch
- Faulty engine stop switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty start switch
- Faulty sidestand switch
- Faulty clutch switch
- Improperly grounded circuit
- Loose connections

Starting system

- Faulty starter motor
- Faulty starter relay
- Faulty starting circuit cutoff relay
- Faulty starter clutch

EAS00846

**INCORRECT ENGINE IDLING SPEED
ENGINE****Cylinder(s) and cylinder head(s)**

- Incorrect valve clearance
- Damaged valve train components

Air filter

- Clogged air filter element

FUEL SYSTEM**Carburetor(s)**

- Faulty starter plunger
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Damaged or loose carburetor joint
- Improperly synchronized carburetors
- 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(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil(s)

- Broken or shorted primary or secondary coils
- Faulty spark plug lead
- Cracked or broken ignition coil

Ignition system

- Faulty ignitor unit
- Faulty pickup coil
- Broken generator rotor woodruff key

EAS00848

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING PROBLEMS".

ENGINE

Air filter

- Clogged air filter element

FUEL SYSTEM

Carburetor(s)

- Faulty diaphragm
- Incorrect fuel level
- Loose or clogged main jet

Fuel pump

- Faulty fuel pump

EAS00850

FAULTY GEAR SHIFTING**SHIFTING IS DIFFICULT**

Refer to "CLUTCH DRAGS".

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift rod
- Bent shift shaft.

Shift drum and shift forks

- Foreign object in a shift drum groove
- Seized shift fork
- Bent shift fork guide bar

Transmission

- Seized transmission gear
- Foreign object between transmission gears
- Improperly assembled transmission

JUMPS OUT OF GEAR

Shift shaft

- Incorrect shift pedal position
- Improperly returned stopper lever

Shift forks

- Worn shift fork

Shift drum

- Incorrect axial play
- Worn shift drum groove

Transmission

- Worn gear dog

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

EAS00855

OVERHEATING**ENGINE****Clogged coolant passages**

- Cylinder head(s) and piston(s)
- Heavy carbon buildup

Engine oil

- Incorrect oil level
- Incorrect oil viscosity
- Inferior oil quality

COOLING SYSTEM**Coolant**

- Low coolant level

Radiator

- Damaged or leaking radiator
- Faulty radiator cap
- Bent or damaged radiator fin

Water pump

- Damaged or faulty water pump
- Thermostat
- Thermostat stays closed
- Oil cooler
- Clogged or damaged oil cooler
- Hose(s) and pipe(s)
- Damaged hose
- Improperly connected hose
- Damaged pipe
- Improperly connected pipe

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

FUEL SYSTEM**Carburetor(s)**

- 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(s)**

- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system

- Faulty ignitor unit

EAS00856

**OVERCOOLING
COOLING SYSTEM****Thermostat**

- Thermostat stays open

EAS00857

POOR BRAKING PERFORMANCE

- Worn brake pad
- Worn brake disc
- Air in hydraulic brake system
- Leaking brake fluid
- Faulty brake caliper seal
- Loose union bolt
- Damaged brake hose
- Oil or grease on the brake disc
- Oil or grease on the brake pad
- Incorrect brake fluid level

EAS00861

**FAULTY FRONT FORK LEGS
LEAKING OIL**

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Improperly installed oil seal
- Damaged oil seal lip
- Incorrect oil level (high)
- Loose damper rod 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
- Worn or damaged outer tube bushing
- Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

EAS00862

UNSTABLE HANDLING**Handlebar**

- Bent or improperly installed handlebar

Steering head components

- Improperly installed upper bracket
- Improperly installed lower bracket (improperly tightened ring nut)
- Bent steering stem
- Damaged ball bearing or bearing race

Front fork leg(s)

- Uneven oil levels (both front fork legs)
- Unevenly tensioned fork spring (both front fork legs)
- Broken fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Swingarm

- Worn bearing or bushing
- Bent or damaged swingarm

Rear shock absorber assembly(-ies)

- Faulty rear shock absorber spring
- Leaking oil or gas

Tire(s)

- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)

- Incorrect wheel balance
- Deformed cast wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

EAS00866

FAULTY LIGHTING OR SIGNALING SYSTEM**HEADLIGHT DOES NOT LIGHT**

- Wrong headlight bulb
- Too many electrical accessories
- Hard charging
- Incorrect connection
- Improperly grounded circuit
- Poor contacts (main or light switch)
- Burnt-out headlight bulb

HEADLIGHT BULB BURNT OUT

- Wrong headlight bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded circuit
- Faulty main switch
- Headlight bulb life expired

TAIL/BRAKE LIGHT DOES NOT LIGHT

- 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 LIGHT

- Faulty turn signal switch
- Faulty turn signal relay
- Burnt-out turn signal bulb
- Incorrect connection
- Damaged or faulty wire harness
- Improperly grounded circuit
- Faulty battery
- Blown, damaged or incorrect fuse

TURN SIGNAL BLINKS SLOWLY

- Faulty turn signal relay
- Faulty main switch
- Faulty turn signal switch
- Incorrect turn signal bulb

TURN SIGNAL REMAINS LIT

- Faulty turn signal relay
- Burnt-out turn signal bulb

TURN SIGNAL BLINKS QUICKLY

- Incorrect turn signal bulb
- Faulty turn signal relay
- Burnt-out turn signal bulb

HORN DOES NOT SOUND

- Improperly adjusted horn
- Damaged or faulty horn
- Faulty main switch
- Faulty horn switch
- Faulty battery
- Blown, damaged or incorrect fuse
- Faulty wire harness



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