

YAMAHA

YZF600RJ

376+1

SERVICE MANUAL

EB000000

YZF600RJ

SERVICE MANUAL

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unauthorized use without the written
permission of Yamaha Motor Co., Ltd.
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NOTICE

This manual was produced by the Yamaha Motor Company 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, so it is assumed that anyone who uses this book to perform maintenance and repairs on Yamaha motorcycles has a basic understanding of the mechanical ideas and the procedures of motorcycle repair. Repairs attempted by anyone without this knowledge are likely to render the motorcycle 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 motorcycle 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 motorcycle 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 notations.



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



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



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

MANUAL ORGANIZATION

This manual is intended as a handy, easy-to-read reference book for the mechanic. It is divided into chapters, sections and sub-sections. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and inspection procedures are laid out with the individual steps in sequential order.

PAGE FEATURES

The circled numbers below refer to the features indicated in the sample page.

- ① : An abbreviation and symbol in the upper right corner of each page indicates the current chapter.
- ② : The current section title is shown at the top of each page. †
- ③ : Sub-section titles appear in smaller print than the section title. †
- ④ : Lines of asterisks (*) mark the beginning and end of a particularly important procedure. The steps of such procedures are marked with bullets (•).
- ⑤ : Important information such as fluids, special tools and torques are framed and marked with a corresponding symbol.
- ⑥ : A circled number refers to an illustrated part.
- ⑦ : A circled lower case letter refers to an illustrated dimension or alignment mark.
- ⑧ : An upper case letter in a box refers to other illustrated details.
- ⑨ : An arrow mark after a given defect suggests the recommended course of action.

† : In Chapter 3, "Periodic Inspection and Adjustment", it is usually the current sub-section title that appears at the top of each page, instead of the current section title.

EXPLODED DIAGRAMS

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

The sample page is divided into two columns. The left column contains two main sections: 'INSPECTION AND REPAIR' for the 'CRANKSHAFT' and 'CYLINDER HEAD'. The right column contains 'INSPECTION AND REPAIR' for the 'FRONT FORK'. Various features are highlighted with circled numbers 1 through 9 and arrows pointing to them.

Left Column Features:

- ①:** Chapter abbreviation 'ENG' and a motorcycle icon.
- ②:** Section title 'INSPECTION AND REPAIR'.
- ③:** Sub-section title 'CYLINDER HEAD'.
- ④:** A 'NOTE' block with asterisks marking important information.
- ⑤:** A boxed 'Warpage limit' specification.

Right Column Features:

- ⑥:** Part number 'CHAS' and a motorcycle icon.
- ⑦:** A dimension line on a fork spring illustration.
- ⑧:** A boxed 'Chain lube' recommendation.
- ⑨:** A 'WARNING' block with an asterisk.

ILLUSTRATED SYMBOLS

Illustrated symbols ① to ⑨ are printed on the top right of each page and indicate the subject of each chapter.

- ① General information
- ② Specifications
- ③ Periodic inspections and adjustments
- ④ Engine
- ⑤ Cooling system
- ⑥ Carburetion
- ⑦ Chassis
- ⑧ Electrical
- ⑨ Troubleshooting

Illustrated symbols ⑩ to ⑯ are used to identify the specifications appearing in the text.

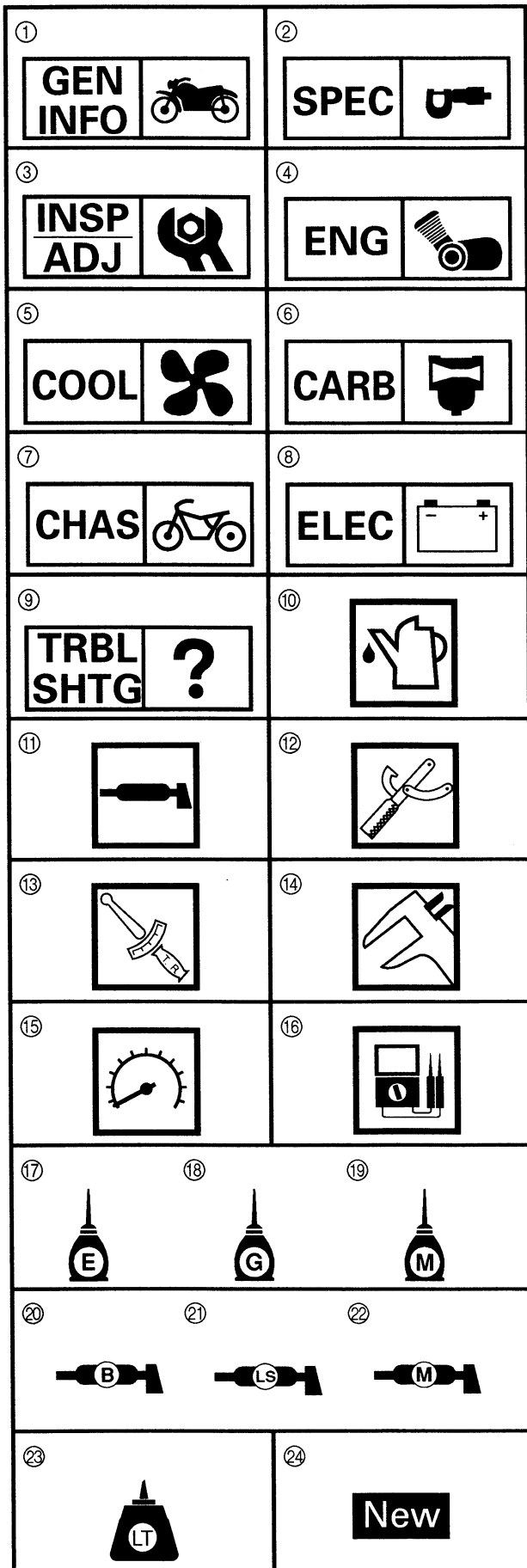
- ⑩ Filling fluid
- ⑪ Lubricant
- ⑫ Special tool
- ⑬ Torque
- ⑭ Wear limit, clearance
- ⑮ Engine speed
- ⑯ Ω , V, A

Illustrated symbols ⑰ to ⑳ in the exploded diagrams indicate the types of lubricants and lubrication points.










- ⑰ Apply engine oil
- ⑱ Apply gear oil
- ⑲ Apply molybdenum disulfide oil
- ⑳ Apply wheel bearing grease
- ㉑ Apply lightweight lithium-soap base grease
- ㉒ Apply molybdenum disulfide grease

Illustrated symbols ㉓ to ㉔ in the exploded diagrams indicate where to apply a locking agent ㉓ and when to install a new part ㉔.

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

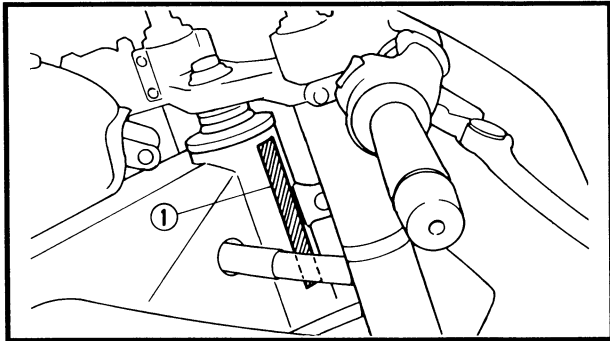


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CHAPTER 1. GENERAL INFORMATION

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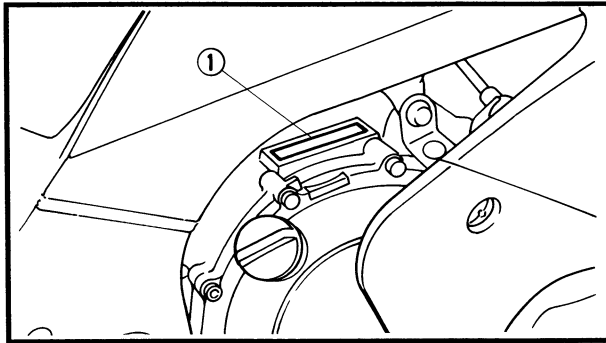
EB100000

GENERAL INFORMATION MOTORCYCLE IDENTIFICATION VEHICLE IDENTIFICATION NUMBER

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

NOTE: _____

The vehicle identification number is used to identify the motorcycle and may be used to register the motorcycle with a licensing authority.



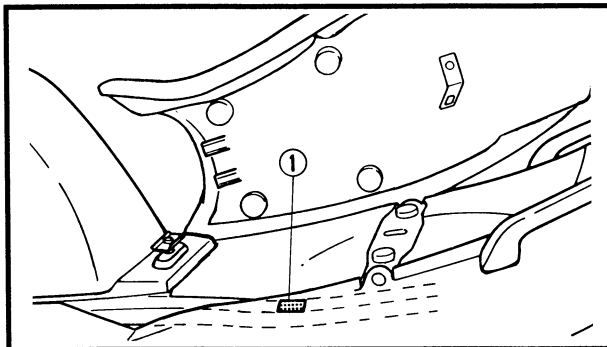
EB100030

ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the crankcase.

NOTE: _____

The first three digits of the engine serial number indicate the model type; the remaining digits are the unit production number.



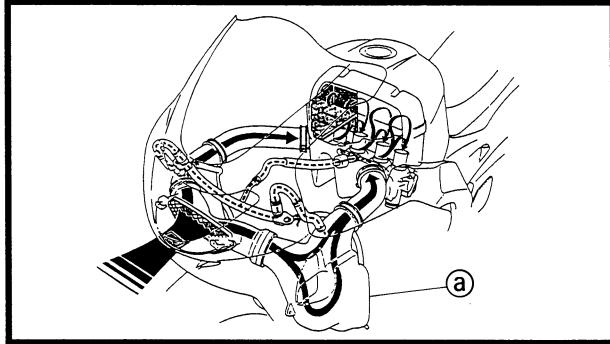
MODEL LABEL

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

FEATURES

AIR INTAKE SYSTEM

This system draws in air and increases the air density in order to increase the engine output. It is most effective during operation at middle and high speeds. During operation at high speeds the air intake system increases the maximum horsepower by a few percentage points.

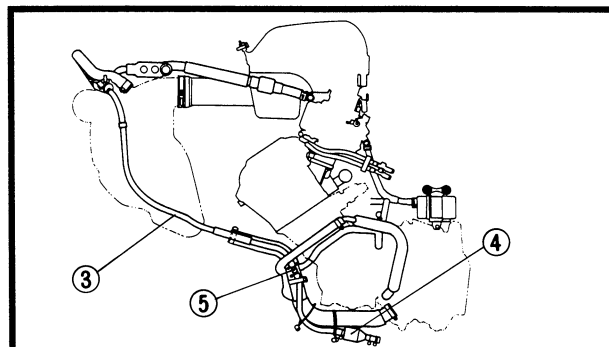
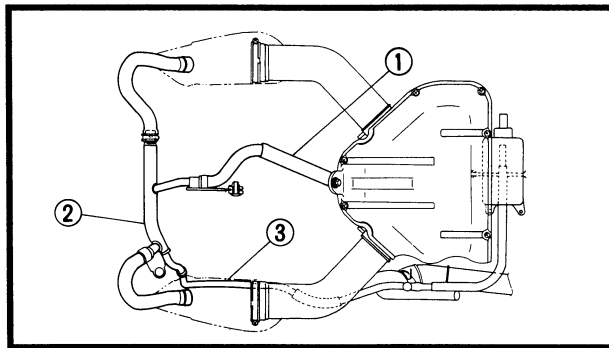


Operation

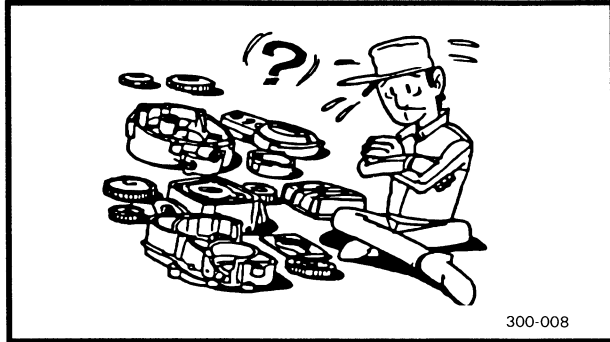
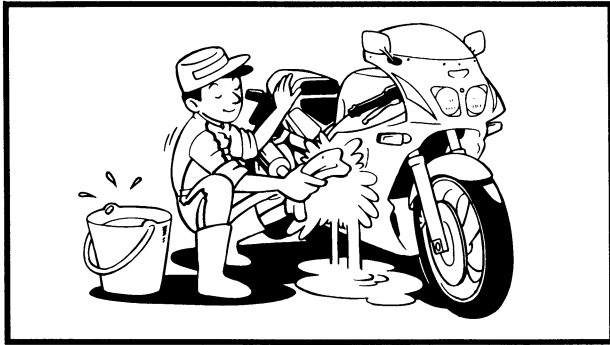
Air enters from the front cowling, is pressurized through the ducts and fed to the carburetor via the air filter. At the same time, some of the pressurized air passes from the ducts through the carburetor air vent hose and into the float chamber. This corrects the pressure in the float chamber and causes the fuel to flow more smoothly through the carburetor's main bore.

NOTE:

When inspecting the air filter element, clean the surge tanks ②. The surge tanks have been installed to filter out dust and water droplets in the air.



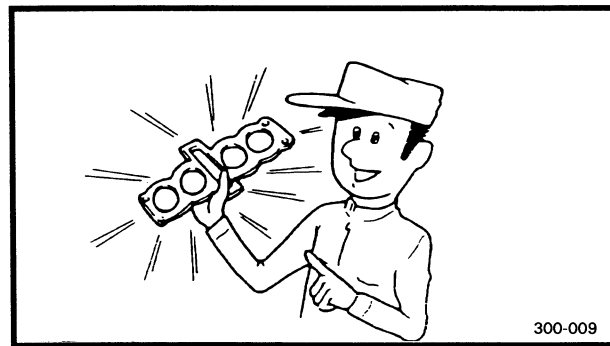
During operation at low speeds or very low speeds (as in a traffic jam), evaporated fuel passes through the carburetor air vent hose ① from the float chamber and is then cooled in the pipe joint ②. Condensation is separated from the fumes, then passed through the drain hose ③ on the left side and accumulated in the collector ④. The collector should be drained as necessary. Another pipe joint ⑤ is positioned halfway down the drain hose in order to maintain atmospheric pressure in the float chamber.



EB101000

**IMPORTANT INFORMATION
PREPARATION FOR REMOVAL
PROCEDURES**

1. Before removal and disassembly remove all dirt, mud, dust and foreign material.
2. Use proper tools and cleaning equipment. Refer to "SPECIAL TOOLS".
3. When disassembling the motorcycle, 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 motorcycle disassembly, clean all 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.



EB101010

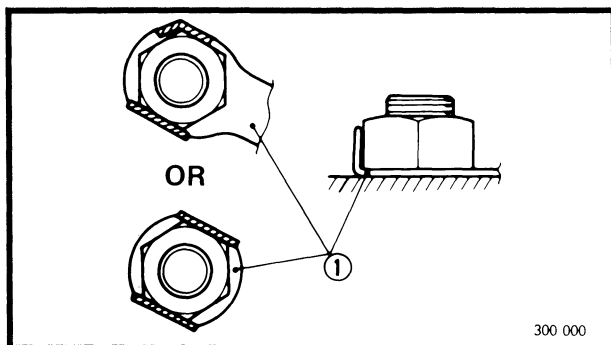
REPLACEMENT PARTS

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.

EB101020

GASKETS, OIL SEALS AND O-RINGS

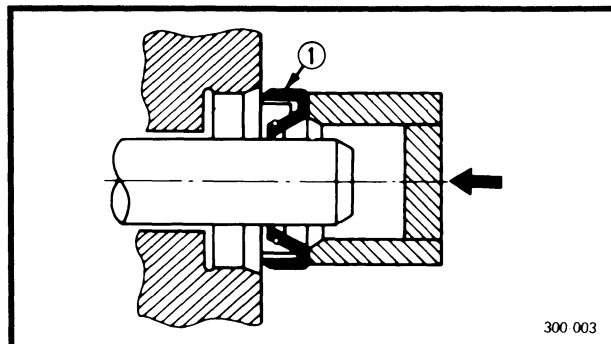
1. When overhauling the engine replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. During reassembly properly oil all mating parts and bearings. Apply grease to the oil seal lips.



EB101030

LOCK WASHERS/PLATES AND COTTER PINS

1. After removal replace all lock washers/ plates ① and cotter pins. After the bolt or nut has been tightened to specification bend the lock tab(s) along a flat side of the bolt or nut.



EB101040

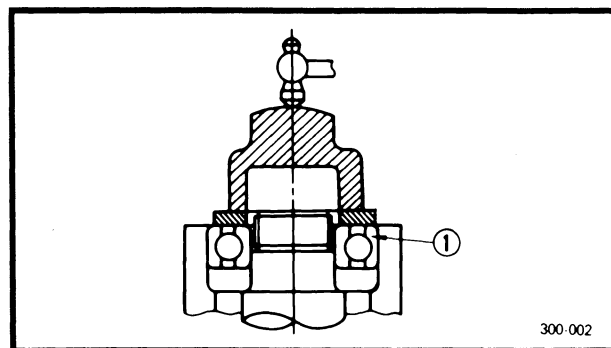
BEARINGS AND OIL SEALS

1. Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, apply a light coating of lightweight lithium base grease to the seal lips. When installing bearings oil them liberally, if appropriate.

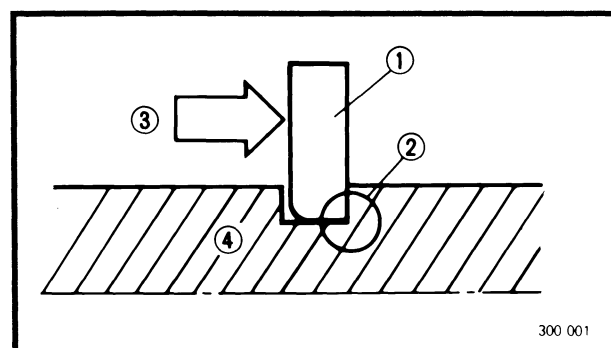
① Oil seal

CAUTION:

Do not use compressed air to spin the bearings dry. This will damage the bearing surfaces.



② Bearing



EB101050

CIRCLIPS

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

④ Shaft



EB102000

SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools; this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools may differ in shape and part number from country to country. In such a case, two types are provided.

EB102010

FOR TUNE-UP

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

P/N. YM- □□□□□, YU-□□□□□
 YS- □□□□□, YK-□□□□□
 ACC-□□□□□

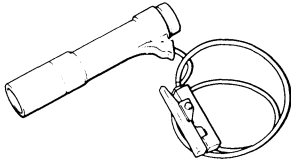
For
CDN

P/N.90890- □□□□□

Except for
CDN

2-A

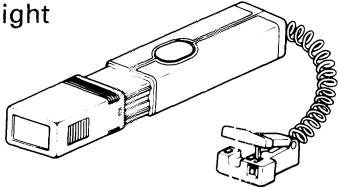
Inductive timing light
YM-33277-A



This tool is necessary for checking ignition timing.

2-B

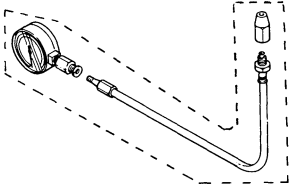
Inductive timing light
90890-03141



This tool is necessary for checking ignition timing.

3-A

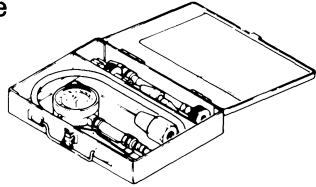
Compression gauge
YU-33223



This gauge is used to measure the engine compression.

3-B

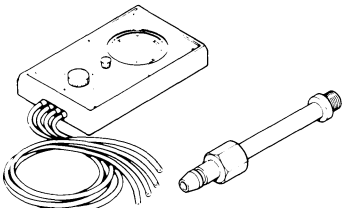
Compression gauge
YU-33223-3
90890-03081
Adapter
90890-04082



This gauge is used to measure the engine compression.

4

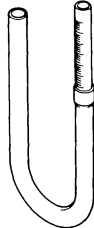
Vacuum gauge
YU-08030
90890-03094



This gauge is needed for carburetor synchronization.

5

Fuel level gauge
YM-01312-A
90890-01312

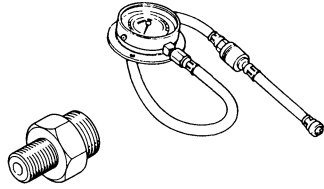


This gauge is used to measure the fuel level in the float chamber.



6

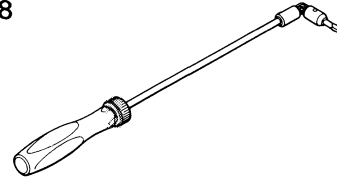
Oil pressure gauge
90890-03153
Adapter
90890-03139



This gauge is used to measure engine oil pressure.

7

Carburetor angle driver
90890-03158



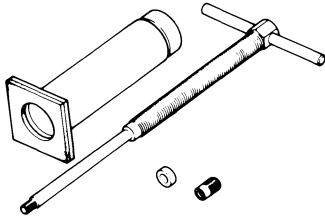
This tool is used to adjust the pilot screw.

EB102020

FOR ENGINE SERVICE

1

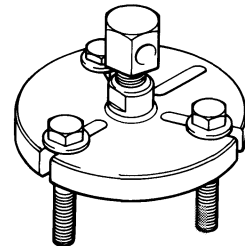
Piston pin puller
YU-01304
90890-01304



This tool is used to remove the piston pin.

2-A

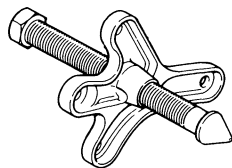
Flywheel puller set
90890-01362



This tool is used to remove the starter clutch.

2-B

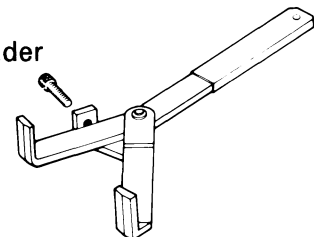
Heavy duty puller
YU-33270



This tool is used to remove the starter clutch.

3-A

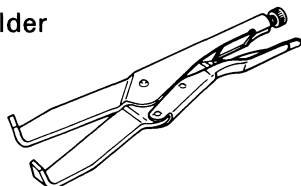
Universal clutch holder
90890-04086



This tool is used to hold the clutch when removing or installing the clutch boss locknut.

3-B

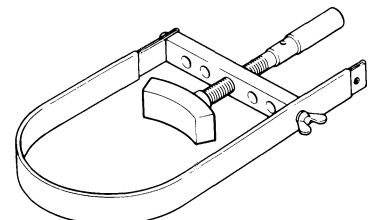
Universal clutch holder
YM-91042



This tool is used to hold the clutch when removing or installing the clutch boss locknut.

4

Sheave holder
YS-01880
90890-01701

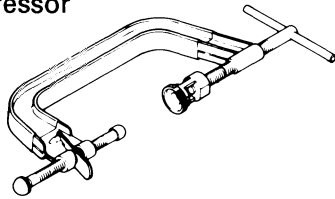


This tool is used to loosen and tighten the A.C. magneto.



5-A

Valve spring compressor
YM-04019
90890-04019



This tool is needed to remove and install the valve assemblies.

5-B

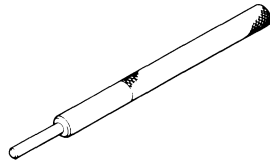
Attachment
YM-04108
90890-04108



This tool is needed to remove and install the valve assemblies.

6

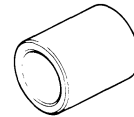
Valve guide remover (4.0 mm)
90890-04111



This tool is used to remove the valve guides.

7

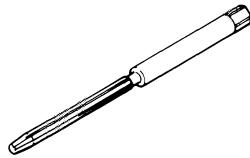
Valve guide installer
90890-04112



This tool is needed to install the valve guides properly.

8

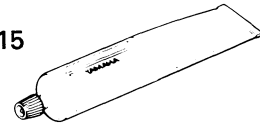
Valve guide reamer (4.0 mm)
90890-04113



This tool is used to rebore the new valve guide.

9

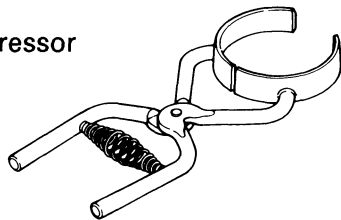
Sealant (Quick Gasket®)
ACC-11001-05-01
YAMAHA Bond No. 1215
90890-85505



This sealant (Bond) is used for crankcase mating surfaces, etc.

10

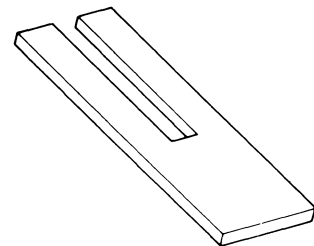
Piston ring compressor
YM-04044
90890-04044



This tool is used to compress piston rings when installing the cylinder.

11

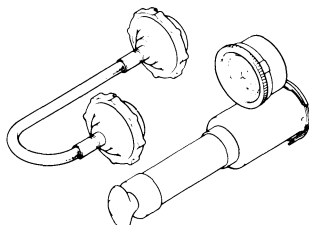
Piston base
YM-01067
90890-01067



Use four pieces of these to hold the pistons during cylinder installation.

12

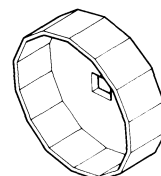
Radiator cap tester
YU-24460-01
90890-01325
Adaptor
YU-33984
90890-01352



This tester is needed for checking the cooling system.

13

Oil filter wrench
YU-38411
90890-01426



This tool is used to remove and install the oil filter.



EB102040

FOR CHASSIS SERVICE

1

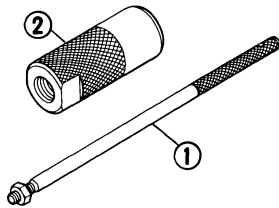
Ring nut wrench
YU-33975
90890-01403



This tool is used to loosen and tighten the steering ring nut.

2

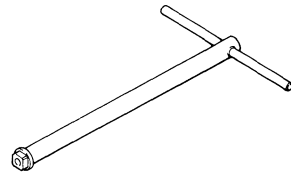
Rod puller ①
YM-01437
90890-01437
Adapter ②
90890-01436



These tools are used to pull up the fork damper rod.

3

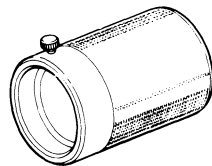
Damper rod holder
YM-01425
90890-01425



This tool is used to loosen and tighten the front fork damper rod holding bolt.

4-A

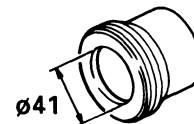
Fork seal driver weight
YM-33963
90890-01367



This tool is used when installing the fork seal.

4-B

Fork seal drive attachment (ø41)
YM-33968
90890-01381



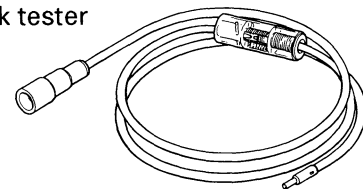
This tool is used when installing the fork seal.

EB102050

FOR ELECTRICAL COMPONENTS

1-A

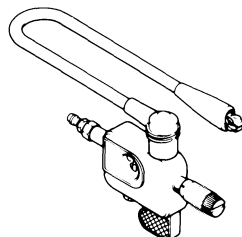
Dynamic spark tester
YM-34487



This instrument is necessary for checking the ignition system components.

1-B

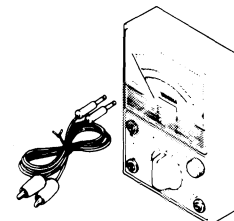
Ignition checker
90890-06754



This instrument is necessary for checking the ignition system components.

2

Pocket tester
YU-03112
90890-03112

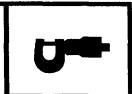


This instrument is invaluable for checking the electrical system.



CHAPTER 2. SPECIFICATIONS

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SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	YZF600R
Model code:	5AH1
Dimensions:	
Overall length	2,060 mm (81.1 in)
Overall width	725 mm (28.5 in)
Overall height	1,190 mm (46.9 in)
Seat height	805 mm (31.7 in)
Wheelbase	1,415 mm (55.7 in)
Minimum ground clearance	135 mm (5.31 in)
Minimum turning radius	3,200 mm (126.0 in)
Basic weight:	
With oil and full fuel tank	212 kg (467 lb)
Engine:	
Engine type	Liquid-cooled 4-stroke, DOHC
Cylinder arrangement	Forward-inclined parallel 4-cylinder
Displacement	599 cm ³
Bore × stroke	62.0 × 49.6 mm (2.44 × 1.95 in)
Compression ratio	12:1
Compression pressure (STD)	1,550 kPa (15.5 kg/cm ² , 220 psi) at 400 r/min
Starting system	Electric starter
Lubrication system:	Wet sump
Oil type or grade:	
Engine oil	
	Yamalube 4 (20W40) or SAE20W40 type SE motor oil (40°F/5°C or above) Yamalube 4 (10W30) or SAE10W30 type SE motor oil (60°F/15°C or below)
Oil capacity:	
Engine oil	
Periodic oil change	2.6 L (2.3 Imp qt, 2.7 US qt)
With oil filter replacement	2.9 L (2.6 Imp qt, 3.1 US qt)
Total amount	3.5 L (3.1 Imp qt, 3.7 US qt)
Oil cooler capacity (including all routes)	0.3 L (0.3 Imp qt, 0.3 US qt)
Radiator capacity (including all routes):	1.95 L (1.72 Imp qt, 2.06 US qt)
Air filter:	Wet type element

GENERAL SPECIFICATIONS



Model	YZF600R	
Fuel:		
Type	Unleaded fuel recommended	
Fuel tank capacity	19 L (4.18 Imp gal, 5.02 US gal)	
Fuel reserve amount	3.1 L (0.68 Imp gal, 0.82 US gal)	
Carburetor:		
Type / quantity	CVKD36 / 4	
Manufacturer	KEIHIN	
Spark plug:		
Type	CR9E / U27ESR-N	
Manufacturer	NGK / NIPPONDENSO	
Spark plug gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)	
Clutch type:	Wet, multiple-disc	
Transmission:		
Primary reduction system	Spur gear	
Primary reduction ratio	82/48 (1.708)	
Secondary reduction system	Chain drive	
Secondary reduction ratio	47/15 (3.133)	
Transmission type	Constant mesh 6-speed	
Operation	Left foot operation	
Gear ratio	1st	37/13 (2.846)
	2nd	37/19 (1.947)
	3rd	34/22 (1.545)
	4th	28/21 (1.333)
	5th	25/21 (1.190)
	6th	29/27 (1.074)
Chassis:		
Frame type	Delta box	
Caster angle	25°	
Trail	97 mm (3.82 in)	
Tire:		
Type	Tubeless	
Size	front	120/60ZR17
	rear	160/60ZR17
Manufacturer	front	BRIDGESTONE / DUNLOP / MICHELIN / MET-ZELER
	rear	BRIDGESTONE / DUNLOP / MICHELIN / MET-ZELER
Type	front	BT50F/D202F/A89X/MEZ1 FRONT
	rear	BT50R/D202/M89X/MEZ1

GENERAL SPECIFICATIONS

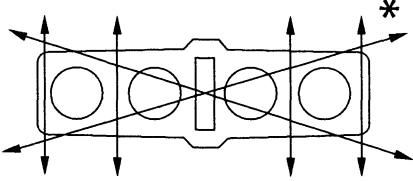
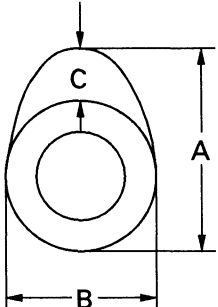
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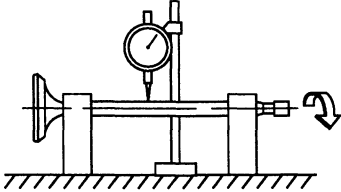
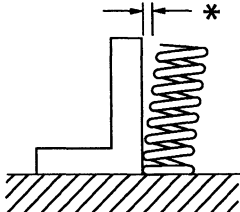



Model	YZF600R
Tire pressure (cold tire): Maximum load (except motorcycle) Loading condition A * front rear Loading condition B * front rear High-speed riding front rear	182 kg (401 lb) 0 ~ 90 kg (0 ~ 198 lb) 225 kPa (2.25 kg/cm ² , 32 psi) 250 kPa (2.50 kg/cm ² , 36 psi) 90 ~ 182 kg (198 ~ 401 lb) 250 kPa (2.50 kg/cm ² , 36 psi) 290 kPa (2.90 kg/cm ² , 41 psi) 250 kPa (2.50 kg/cm ² , 36 psi) 290 kPa (2.90 kg/cm ² , 41 psi)
Brake: Front brake type operation Rear brake type operation	Dual disc brake Right hand operation Single disc brake Right foot operation
Suspension: Front suspension Rear suspension	Telescopic fork Swingarm (link suspension)
Shock absorber: Front shock absorber Rear shock absorber	Coil spring / Oil damper Coil-gas spring / Oil damper
Wheel travel: Front wheel travel Rear wheel travel	130 mm (5.1 in) 120 mm (4.7 in)
Electrical: Ignition system Generator system Battery type Battery capacity	T.C.I. (Digital) A.C. magneto YTX12-BS 12 V 10 AH
Headlight type:	Quartz bulb (Halogen)
Bulb wattage × quantity: Headlight Tail / brake light Flasher light Meter light Neutral indicator light Turn indicator light Oil level indicator light High beam indicator light Fuel indicator light	12 V 60 W / 55 W 12 V 8 W / 27 W × 1 12 V 8 W / 27 W × 2 12 V 27 W × 2 12 V 1.7 W × 4 12 V 3.4 W × 1 12 V 3.4 W × 1 12 V 3.4 W × 1 12 V 3.4 W × 1 12 V 3.4 W × 1

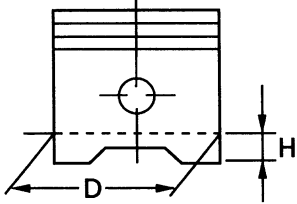

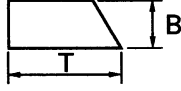
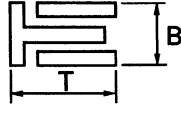
* Load is the total weight of the cargo, rider, passenger and accessories.

MAINTENANCE SPECIFICATIONS
ENGINE

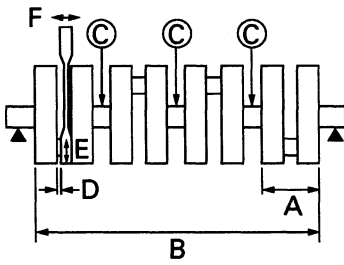
Model	YZF600R	
<p>Cylinder head: Warp limit</p> 	<p>0.05 mm (0.0020 in)</p>	
<p>Cylinder: Bore size</p>	<p>62.00 ~ 62.01 mm (2.4409 ~ 2.4413 in)</p>	
<p>Camshaft:</p> <p>Drive method</p> <p>Cam cap inside diameter</p> <p>Camshaft outside diameter</p> <p>Shaft-to-cap clearance</p> <p><Limit></p> <p>Cam dimensions</p> 	<p>Chain drive (Center)</p> <p>23.000 ~ 23.021 mm (0.9055 ~ 0.9063 in)</p> <p>22.967 ~ 22.980 mm (0.9042 ~ 0.9047 in)</p> <p>0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)</p> <p><0.08 mm (0.0031 in)></p>	<p>Intake</p> <p>"A" 32.75 ~ 32.85 mm (1.289 ~ 1.293 in)</p> <p><limit> <32.7mm (1.287 in)></p> <p>"B" 24.998 ~ 25.098 mm (0.984 ~ 0.988 in)</p> <p><limit> <24.95 mm (0.982 in)></p> <p>"C" 7.652 ~ 7.852 mm (0.301 ~ 0.309 in)</p> <p><limit> <7.5 mm (0.295 in)></p> <p>Exhaust</p> <p>"A" 32.55 ~ 32.65 mm (1.281 ~ 1.285 in)</p> <p><limit> <32.5 mm (1.280 in)></p> <p>"B" 24.998 ~ 25.098 mm (0.984 ~ 0.988 in)</p> <p><limit> <24.95 mm (0.982 in)></p> <p>"C" 7.452 ~ 7.652 mm (0.293 ~ 0.301 in)</p> <p><limit> <7.3 mm (0.287 in)></p>

Model	YZF600R	
<p>Stem runout limit</p>  <p>Valve seat width</p> <p><Limit></p>	<p>0.04 mm (0.0016 in)</p> <p>IN 0.9 ~ 1.1 mm (0.0354 ~ 0.0433in) EX 0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)</p> <p>IN <1.6 mm (0.06 in)> EX <1.6 mm (0.06 in)></p>	
<p>Valve spring:</p> <p>Free length</p> <p><Limit></p> <p>Set length (valve closed)</p> <p>Compressed pressure (installed)</p> <p>Tilt limit</p>  <p>Direction of winding (top view)</p>	<p>IN 40.09 mm (1.58 in) EX 40.09 mm (1.58 in)</p> <p>IN <37.5 mm (1.48 in)> EX <37.5 mm (1.48 in)></p> <p>IN 34.5 mm (1.4 in) EX 34.5 mm (1.4 in)</p> <p>IN 13,4 ~ 15,6 kg (30 ~ 34 lb) EX 13,4 ~ 15,6 kg (30 ~ 34 lb)</p> <p>IN 2.5°/1.8 mm (2.5°/0.071 in) EX 2.5°/1.8 mm (2.5°/0.071 in)</p> <p>IN Clockwise EX Clockwise</p> 	
<p>Piston:</p> <p>Piston to cylinder clearance</p> <p><Limit></p>	<p>0.025 ~ 0.050 mm (0.0010 ~ 0.0020 in)</p> <p><0.07 mm (0.0028 in)></p>	



Model	YZF600R
<p>Piston size "D"</p>  <p>Measuring point "H"</p> <p>Piston off-set</p> <p>Piston off-set direction</p> <p>Piston pin bore inside diameter <Limit></p> <p>Piston pin outside diameter <Limit></p>	<p>61.960 ~ 61.975 mm (2.439 ~ 2.440 in)</p> <p>5 mm (0.197 in)</p> <p>0.5 mm (0.02 in)</p> <p>IN side</p> <p>17.002 ~ 17.013 mm (0.6694 ~ 0.6698 in) <17.04 mm (0.670 in)></p> <p>16.991 ~ 17.000 mm (0.6689 ~ 0.6693 in) <16.975 mm (0.668 in)></p>
<p>Piston rings:</p> <p>Top ring:</p>  <p>Type</p> <p>Dimensions (B × T)</p> <p>End gap (installed) <Limit></p> <p>Side clearance (installed) <Limit></p> <p>2nd ring:</p>  <p>Type</p> <p>Dimensions (B × T)</p> <p>End gap (installed) <Limit></p> <p>Side clearance <Limit></p> <p>Oil ring:</p>  <p>Dimensions (B × T)</p> <p>End gap (installed)</p>	<p>Barrel</p> <p>0.8 × 2.2 mm (0.031 × 0.087 in)</p> <p>0.15 ~ 0.30 mm (0.006 ~ 0.012 in) <0.6 mm (0.024 in)></p> <p>0.020 ~ 0.075 mm (0.001 ~ 0.003 in) <0.1 mm (0.004 in)></p> <p>Taper</p> <p>0.8 × 2.3 mm (0.031 × 0.091 in)</p> <p>0.25 ~ 0.40 mm (0.010 ~ 0.016 in) <0.7 mm (0.028 in)></p> <p>0.020 ~ 0.055 mm (0.001 ~ 0.002 in) <0.1 mm (0.004 in)></p> <p>1.5 × 2.3 mm (0.059 × 0.091 in)</p> <p>0.10 ~ 0.35 mm (0.004 ~ 0.014 in)</p>

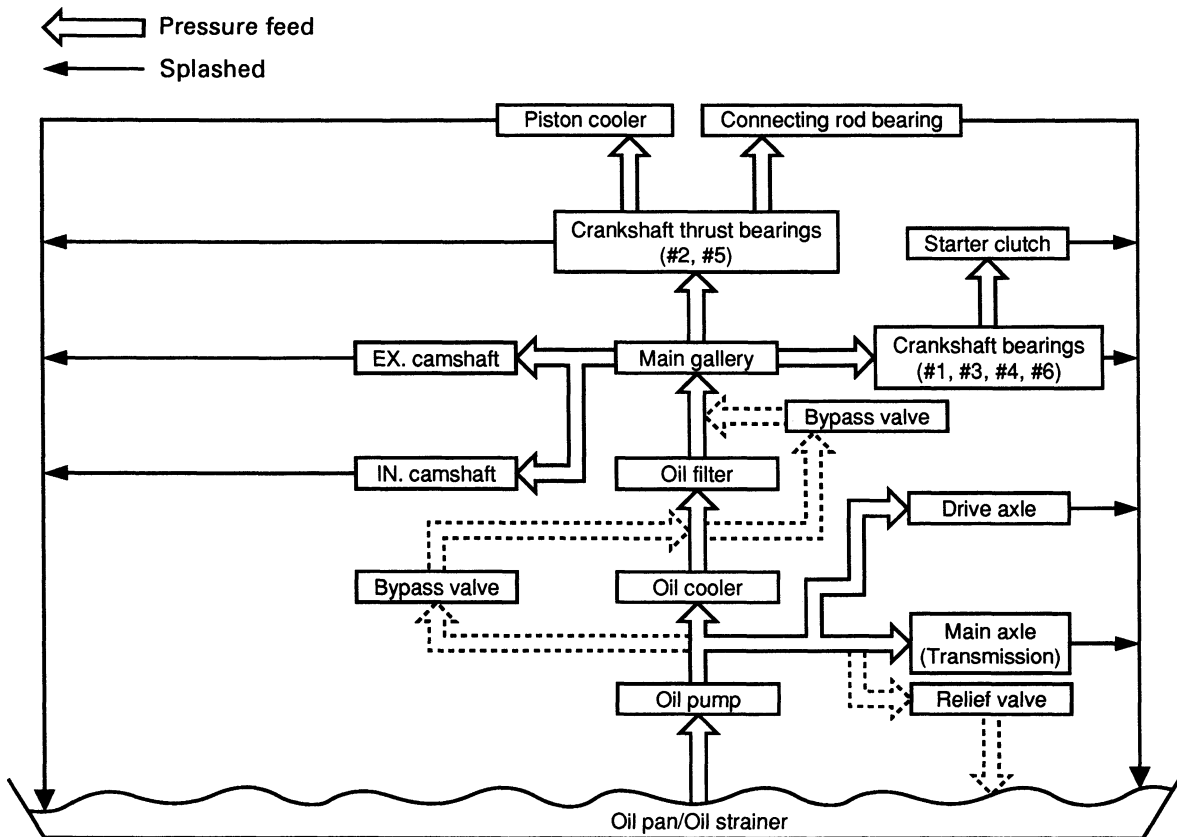


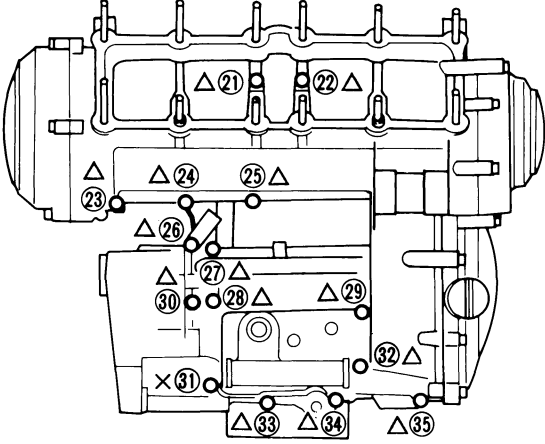
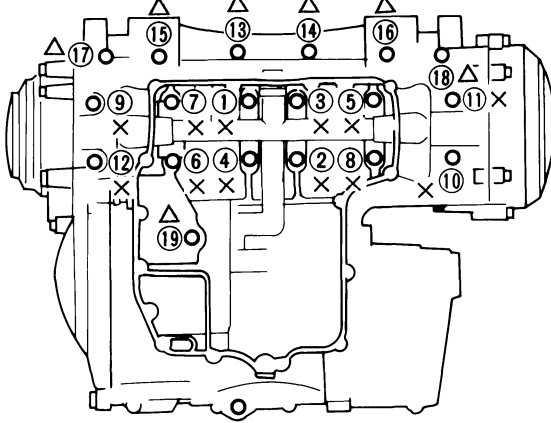
Model	YZF600R
Connecting rod: Oil clearance <Limit> Color code (corresponding size)	0.043 ~ 0.066 mm (0.002 ~ 0.003 in) <0.08 mm (0.003 in)> ① Blue ② Black ③ Brown ④ Green
Crankshaft:  Crank width "A" Assembly width "B" Runout limit "C" Big end side clearance "D" <Limit> Big end radial clearance "E" <Limit> Small end free play "F" <Limit> Journal oil clearance <Limit> Color code (corresponding size)	 48.4 mm (1.906 in) 296.8 ~ 298.0 mm (11.685 ~ 11.732 in) 0.03 mm (0.0012 in) 0.160 ~ 0.262 mm (0.006 ~ 0.010 in) <0.5 mm (0.020 in)> 0.043 ~ 0.066 mm (0.0017 ~ 0.0026 in) <0.08 mm (0.003 in)> 0.32 ~ 0.50 mm (0.0126 ~ 0.0197 in) <0.8 mm (0.0315 in)> 0.025 ~ 0.043 mm (0.0010 ~ 0.0017 in) <0.08 mm (0.0031 in)> ② Black ③ Brown ④ Green ⑤ Yellow ⑥ Pink
Clutch: Friction plate thickness Quantity Friction plate wear limit Clutch plate thickness Quantity Warp limit Clutch spring free length Quantity Minimum length Clutch spring free length Quantity Minimum length Clutch housing thrust clearance <Limit> Clutch housing radial clearance Clutch release method Push rod bending limit	2.92 ~ 3.08 mm (0.115 ~ 0.121 in) 9 2.8 mm (0.11 in) 1.9 ~ 2.1 mm (0.075 ~ 0.083 in) 8 0.1 mm (0.004 in) 40.4 mm (1.59 in) 3 39.9 mm (1.57 in) 38.3 mm (1.51 in) 3 37.5 mm (1.48 in) 0.05 ~ 0.13 mm (0.002 ~ 0.005 in) <0.2 mm (0.008 in)> 0.005 ~ 0.041 mm (0.0002 ~ 0.0016 in) Inner push, screw push 0.3 mm (0.012 in)
Transmission: Main axle deflection limit Drive axle deflection limit	0.02 mm (0.001 in) 0.02 mm (0.001 in)

Model	YZF600R
Shifter: Shifter type Guide bar bending limit	Cam drum 0.05 mm (0.002 in)
Carburetor: I. D. mark Main jet (M.J) Main air jet (M.A.J) Jet needle (J.N) Needle jet (N.J) Pilot air jet (P.A.J.1) Pilot outlet (P.O) Pilot jet (P.J) Bypass 1 (B.P.1) Bypass 2 (B.P.2) Bypass 3 (B.P.3) Pilot screw (P.S) Valve seat size (V.S) Starter jet (G.S.1) Starter jet (G.S.2) Throttle valve size (Th.V) Fuel level (F.L) Engine idle speed Intake vacuum	4TV 11 #155 #80 #1,4:N3FC #2,3:N1YF 2.6 #140 0.9 #38 0.8 0.8 0.8 1-3/8 1.2 #50 0.6 #110 11.5 ~ 12.5 mm (0.45 ~ 0.49 in) 1,200 ~ 1,300 r/min 30 kPa (225 mmHg, 8.86 inHg)
Fuel pump: Type Model / manufacturer Consumption amperage <max> Output pressure	Electrical type 4TV / MITSUBISHI 1 A 15 ~ 20 kPa (0.15 ~ 0.20 kg/cm ² , 2.13 ~ 2.84 psi)
Lubrication system: Oil filter type Oil pump type Tip clearance "A" or "B" <Limit> Side clearance <Limit> Bypass valve setting pressure Relief valve operating pressure Oil pressure (hot) Pressure check location	Paper type Trochoid type 0.03 ~ 0.09 mm (0.001 ~ 0.004 in) <0.15 mm (0.006 in)> 0.03 ~ 0.08 mm (0.001 ~ 0.003 in) <0.15 mm (0.006 in)> 80 ~ 120 kPa (0.8 ~ 1.2 kg/cm ² , 11.4 ~ 17.1 psi) 450 ~ 550 kPa (4.5 ~ 5.5 kg/cm ² , 64.0 ~ 78.2 psi) 350 ~ 450 kPa (3.5 ~ 4.5 kg/cm ² , 51 ~ 65 psi) at 10,000 r/min Main gallery













Model	YZF600R
Cooling system: Radiator core size Width Height Thickness Radiator cap opening pressure Reservoir tank capacity <From low to full level> Water pump Type Reduction ratio	320 mm (12.6 in) 218 mm (8.58 in) 24 mm (0.94 in) 110 ~ 140 kPa (1.1 ~ 1.4 kg/cm ² , 15.6 ~ 19.9 psi) 0.55 L (0.48 Imp qt, 0.58 US qt) <0.25 L (0.22 Imp qt, 0.26 US qt)> Single suction centrifugal pump 82/48 × 48/49 (1.673)

Lubrication chart:



Model	YZF600R
Crankcase tightening sequence:	
<p data-bbox="391 310 589 338">Crankcase (Upper)</p> 	<p data-bbox="1057 310 1255 338">Crankcase (Lower)</p> 
<p data-bbox="196 940 699 972">X: M8 : 24 Nm (2.4 m • kg, 17 ft • lb)</p> <p data-bbox="196 974 699 1005">△: M6 : 12 Nm (1.2 m • kg, 8.7 ft • lb)</p>	

Tightening torques

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Camshaft cap	Bolt	M6	24	10	1.0	7.2	
Cylinder head (exhaust pipe)	Stud bolt	M6	8	10	1.0	7.2	
Cylinder head	Nut	M8	12	35	3.5	25	
Spark plug	-	M10	4	12.5	1.25	9.0	
Cylinder head cover	Bolt	M6	8	10	1.0	7.2	
Connecting rod	Nut	M7	8	See NOTE			
Timing chain sprocket	Bolt	M7	4	24	2.4	17	
Timing chain tensioner	Bolt	M6	2	10	1.0	7.2	
Timing chain tensioner end	Cap bolt	M11	1	20	2.0	14	
Chain guide (intake side)	Bolt	M6	2	10	1.0	7.2	
Oil filter	-	M20	1	17	1.7	12	
Oil cooler	Union bolt	M20	1	63	6.3	45	
Oil pan	Bolt	M6	14	12	1.2	8.7	
Drain bolt	-	M14	1	43	4.3	31	
Oil delivery pipe	Bolt	M6	1	10	1.0	7.2	
	Union bolt	M10	2	20	2.0	14	
Oil pump cover	Screw	M6	1	7	0.7	5.1	
Oil pump assembly	Bolt	M6	3	10	1.0	7.2	
Oil strainer housing	Bolt	M6	2	10	1.0	7.2	
Water pipe 1	Bolt	M6	2	10	1.0	7.2	
Water pipe 2	Bolt	M6	2	10	1.0	7.2	
Thermostatic valve cover	Bolt	M6	2	10	1.0	7.2	
Conduction	Bolt	M6	2	7	0.7	5.1	
Radiator	Bolt	M6	3	7	0.7	5.1	
Joint	Bolt	M6	4	10	1.0	7.2	
Water pump	Bolt	M6	2	10	1.0	7.2	
Water pump cover	Bolt	M6	2	10	1.0	7.2	
Carburetor joint	Bolt	M6	8	10	1.0	7.2	
Air filter case cover	Screw	M5	8	5	0.5	3.6	
Air filter case	Bolt	M6	1	10	1.0	7.2	
Balance pipe 2	Bolt	M6	2	7	0.7	5.1	
Exhaust pipe	Nut	M6	8	10	1.0	7.2	
Muffler and stay	Bolt	M8	1	20	2.0	14	
Exhaust pipe blind plug (CO test)	Bolt	M6	4	10	1.0	7.2	
Exhaust pipe and stay	Bolt	M8	1	20	2.0	14	
Exhaust pipe and muffler	Bolt	M8	1	20	2.0	14	
Crankcase	Stud bolt	M8	12	12.5	1.25	9.0	
Crankcase	Bolt	M8	12	24	2.4	17	
Crankcase	Bolt	M6	21	12	1.2	8.7	
Crankcase	Bolt	M8	1	24	2.4	17	

MAINTENANCE SPECIFICATIONS

SPEC



Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Oil baffle plate	Screw	M6	2	7	0.7	5.1	
Oil baffle plate	Screw	M6	4	7	0.7	5.1	
Bearing retainer	Bolt	M6	2	10	1.0	7.2	
AC magneto cover	Bolt	M6	5	12	1.2	8.7	
Crankcase cover (left)	Bolt	M6	5	10	1.0	7.2	
	Screw	M5	4	4	0.4	2.9	
Starter clutch cover	Bolt	M6	7	12	1.2	8.7	
Crankcase plug	-	M16	2	8	0.8	5.8	
Clutch cover	Bolt	M6	10	12	1.2	8.7	
	Screw	M5	4	4	0.4	2.9	
Lead holder	Screw	M6	1	7	0.7	5.1	
Starter clutch	Bolt	M10	1	80	8.0	58	
Starter wheel gear	Bolt	M8	3	30	3.0	22	
Clutch spring	Screw	M6	6	8	0.8	5.8	
Clutch boss	Nut	M18	1	70	7.0	50	Use lock washer
Push lever assembly	Screw	M5	2	4.5	0.45	3.3	
Push rod adjuster	Nut	M8	1	16	1.6	12	
Drive sprocket	Nut	M18	1	70	7.0	50	Use lock washer
Stopper plate	Bolt	M6	1	10	1.0	7.2	
Spring stopper	Screw	M8	1	22	2.2	16	
Shift arm	Bolt	M6	1	10	1.0	7.2	
Shift cam stopper lever	Bolt	M6	1	10	1.0	7.2	
Shift pedal adjuster	Nut	M8	2	10	1.0	7.2	(1 of 2 has LH thread)
Guide bar stopper	Bolt	M6	1	10	1.0	7.2	
Side plate	Screw	M5	1	4	0.4	2.9	
AC magneto rotor	Bolt	M12	1	130	13.0	94	
Stator coil	Bolt	M6	3	10	1.0	7.2	
Pickup coil	Screw	M5	2	5	0.5	3.6	
Starter motor	Bolt	M6	2	10	1.0	7.2	
Neutral switch	Screw	M6	2	4	0.4	2.9	
Oil level switch	Bolt	M6	2	7	0.7	5.1	
Thermo switch	-	M16	1	23	2.3	17	
Thermo unit	-	-	1	15	1.5	11	


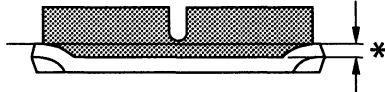
NOTE:

After tightening to 15 Nm (1.5 m · kg, 11 ft · lb), tighten another 90°.





CHASSIS

Model	YZF600R
Steering system: Steering bearing type	Taper roller bearing
Front suspension: Front fork travel Fork spring free length <Limit> Spring rate (K1) Stroke (K1) Optional spring Oil capacity Oil level Oil grade	130 mm (5.12 in) 424.5 mm (16.7 in) <419.5 mm (16.5 in)> 80.0 N/mm (0.8 kg/mm 44.8 lb/in) 0 ~ 130 mm (0.00 ~ 5.12 in) No 434 cm ³ (15.3 Imp oz, 14.7 US oz) 124 mm (4.88 in) Fork oil 5 WT or equivalent
Rear suspension: Shock absorber travel Spring free length Fitting length Spring rate (K1) Stroke (K1) Optional spring Enclosed gas / air pressure (STD)	64 mm (2.52 in) 228 mm (8.98 in) 217.5 mm (8.56 in) 870 N/mm (8.7 kg/mm 487 lb/in) 0 ~ 64 mm (0.00 ~ 2.52 in) No 1200 kPa (12 kg/cm ² , 171 psi)
Swingarm: Free play limit	end side 1 mm (0.04 in) 1 mm (0.04 in)
Front wheel: Type Rim size Rim material Rim runout limit	Cast wheel 17 X MT3.50 Aluminum radial 1 mm (0.04 in) lateral 0.5 mm (0.02 in)
Rear wheel: Type Rim size Rim material Rim runout limit	Cast wheel 17 X MT5.00 Aluminum radial 1 mm (0.04 in) lateral 0.5 mm (0.02 in)
Drive chain: Type / manufacturer No. of links Chain free play	50VA7/DAIDO 108 20 ~ 30 mm (0.8 ~ 1.2 in)
Front disc brake: Type Disc outside diameter × thickness Pad thickness	Dual disc 298 × 5 mm (11.7 × 0.20 in) inner 5 mm (0.20 in)

Model	YZF600R
<p><Limit> Pad thickness outer <Limit></p>  <p>Master cylinder inside diameter Caliper cylinder inside diameter Caliper cylinder inside diameter Brake fluid type</p>	<p><0.5 mm (0.02 in)> 5 mm (0.20 in) <0.5 mm (0.02 in)></p> <p>14 mm (0.55 in) 30.2 mm (1.19 in) 27 mm (1.06 in) DOT 4</p>
<p>Rear disc brake: Type Disc outside diameter × thickness Pad thickness inner <Limit> Pad thickness outer <Limit></p>  <p>Master cylinder inside diameter Caliper cylinder inside diameter Brake fluid type</p>	<p>Single disc 245 × 5 mm (9.6 × 0.20 in) 5.5 mm (0.22 in) <0.5 mm (0.02 in)> 5.5 mm (0.22 in) <0.5 mm (0.02 in)></p> <p>14 mm (0.55 in) 42.85 mm (1.69 in) DOT 4</p>
<p>Controls: Brake pedal position Clutch lever free play (at pivot)</p>	<p>42 mm (1.7 in) 2 ~ 3 mm (0.08 ~ 0.12 in)</p>

Tightening torques

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Upper bracket and inner tube	M8	30	3.0	22	See NOTE
Upper bracket and steering stem	M22	110	11.0	80	
Handle boss and inner tube	M6	13	1.3	9.4	
Handle boss and upper bracket	M6	13	1.3	9.4	
Ring nut (steering stem)	M25	3	0.3	2.2	
Inner tube and lower bracket	M10	38	3.8	27	
Union bolt (front brake hose)	M10	30	3.0	22	
Master cylinder (front brake)	M6	13	1.3	9.4	
Handle boss and handlebar	M8	28	2.8	20	
Engine mounting:					
Mounting bolt (front)	M10	54	5.4	39	
Mounting bolt (rear upper)	M10	48	4.8	35	
Mounting bolt (rear lower)	M10	48	4.8	35	
Pinch bolt (front left)	M10	64	6.4	46	
Exhaust pipe bracket	M10	40	4.0	29	
Frame and side panel stay	M8	30	3.0	22	
Swingarm pivot shaft	M16	90	9.0	65	
Relay arm and frame	M10	48	4.8	35	
Relay arm and connecting rod	M10	48	4.8	35	
Connecting rod and swingarm	M10	48	4.8	35	
Rear shock absorber and relay arm	M10	40	4.0	29	
Rear shock absorber and bracket	M10	40	4.0	29	
Fuel cock and fuel tank	M6	7	0.7	5.1	
Fuel sender and fuel tank	M6	7	0.7	5.1	
Footrest bracket and frame	M8	30	3.0	22	
Rear footrest and frame	M8	30	3.0	22	
Rear master cylinder and footrest bracket	M8	23	2.3	17	
Rear brake reservoir	M6	5	0.5	3.6	
Union bolt (rear brake hose)	M10	30	3.0	22	
Sidestand bolt and nut	M10	39	3.9	28	
Sidestand bolt and frame	M10	46	4.6	33	
Front wheel axle	M16	65	6.5	47	
Rear wheel axle nut	M18	117	11.7	85	
Front brake caliper and front fork	M10	40	4.0	29	
Rear brake caliper and bracket	M10	40	4.0	29	
Brake disc and front wheel	M8	23	2.3	17	 
Brake disc and rear wheel	M8	20	2.0	14	
Driven sprocket and rear wheel hub	M10	60	6.0	43	
Tension bar	M8	30	3.0	22	
Caliper bleed screw	M8	6	0.6	4.3	
Pinch bolt (front wheel axle)	M8	20	2.0	14	



NOTE:

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



ELECTRICAL

Model	YZF600R
Voltage:	12 V
Ignition system: Ignition timing (B.T.D.C.) Advancer type	5° at 1,250 r/min TPS and electrical type
T.C.I.: Pickup coil resistance / color T.C.I. unit model / manufacturer	189 ~ 231 Ω at 20°C (68°F) / Yellow – Blue J4T07871 / MITSUBISHI
Ignition coil: Model / manufacturer Minimum spark gap Primary winding resistance Secondary winding resistance	JO313 / NIPPONDENSO 6 mm (0.24 in) 1.87 ~ 2.53 Ω at 20°C (68°F) 12 ~ 18 kΩ at 20°C (68°F)
Spark plug cap: Type Resistance	Resin type 10 kΩ
Charging system: Type Model / manufacturer Nominal output Stator coil resistance / color	A.C. magneto F4T-358 / MITSUBISHI 12 V 8.8 A at 1,300 r/min 0.36 ~ 0.44 Ω at 20°C (68°F) / White – White
Voltage regulator: Type Model / manufacturer	Semi-conductor, short-circuit type SH650A / SHINDENGEN
Rectifier: Model / manufacturer Capacity Withstand voltage	SH650A / SHINDENGEN 25 A 240 V
Battery: Specific gravity	1.320
Electric starter system: Type Starter motor: Model / manufacturer Output Brush overall length <Limit> Commutator diameter <Wear limit> Mica undercut	Constant mesh type SM-13 / MITSUBA 0.7 kW 12.5 mm (0.49 in) <4 mm (0.16 in)> 28 mm (1.10 in) <27 mm (1.06 in)> 0.7 mm (0.03 in)

MAINTENANCE SPECIFICATIONS

SPEC



Model	YZF600R
Starter relay: Model / manufacturer Amperage rating Coil winding resistance	MS5F / JIDECO 100 A 3.96 ~ 4.84 Ω at 20°C (68°F)
Horn: Type Quantity Model / manufacturer Maximum amperage	Plane type 1 YF-12 / NIKKO 2.5 A
Flasher relay: Type Model / manufacturer Self cancelling device Flasher frequency Wattage	Full transistor type FE246BH / NIPPONDENSO No 60 ~ 120 cycle/min 27 W × 2 + 3.4 W
Starting circuit cut off relay: Model / manufacturer Coil winding resistance	4TV / OMRON 203 ~ 248 Ω at 20°C (68°F)
Fuel pump relay: Model / manufacturer Coil winding resistance	4TV / OMRON 203 ~ 248 Ω at 20°C (68°F)
Thermostatic switch: Model / manufacturer	3LN / NIHON THERMOSTAT
Thermo unit: Model / manufacturer	11H / NIPPON SEIKI
Circuit breaker: Type Amperage for individual circuits Main Headlight Signal Ignition Fan Reserve Reserve Reserve	Fuse 30 A × 1 20 A × 1 15 A × 1 7.5 A × 1 7.5 A × 1 30 A × 1 20 A × 1 7.5 A × 1

HOW TO USE THE CONVERSION TABLE/ GENERAL TORQUE SPECIFICATIONS



EB201000

HOW TO USE THE CONVERSION TABLE

All specification data in this manual are listed in SI and METRIC UNITS.

Use this table to convert METRIC unit data to IMPERIAL unit data.

Ex.

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

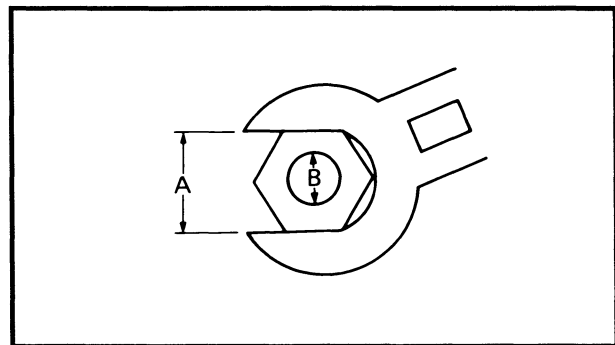
CONVERSION TABLE

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

EB202001

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. 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 fashion, in progressive stages, until the specified torque is reached. Unless otherwise specified, 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 torque specifications		
		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



EB203000

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

Lubrication Point	Symbol
Oil seal lips	
O-ring	
Bearing	
Piston surface	
Piston pin	
Connecting rod bearings	
Crankshaft journal	
Connecting rod bolt/nut	
Camshaft cam lobe	
Valve stem (IN, EX)	
Valve stem end (IN, EX)	
Cylinder head bolt/nut	
Valve lifter	
Camshaft cap bolt	
Water pump impeller shaft	
Oil pump rotor (inner/outer), housing	
Oil strainer assembly	
Idle gear inner surface	
Transmission gear (wheel/pinion)	
Axle (main/drive)	
Push rod (bearing/washer) and ball	
Shift cam	
Shift fork/guide bar	
Shift shaft assembly	
Shift pedal	
Shift lever assembly	
Starter idle gear shaft	

LUBRICATION POINTS AND LUBRICANT TYPES

SPEC



EB203010

CHASSIS

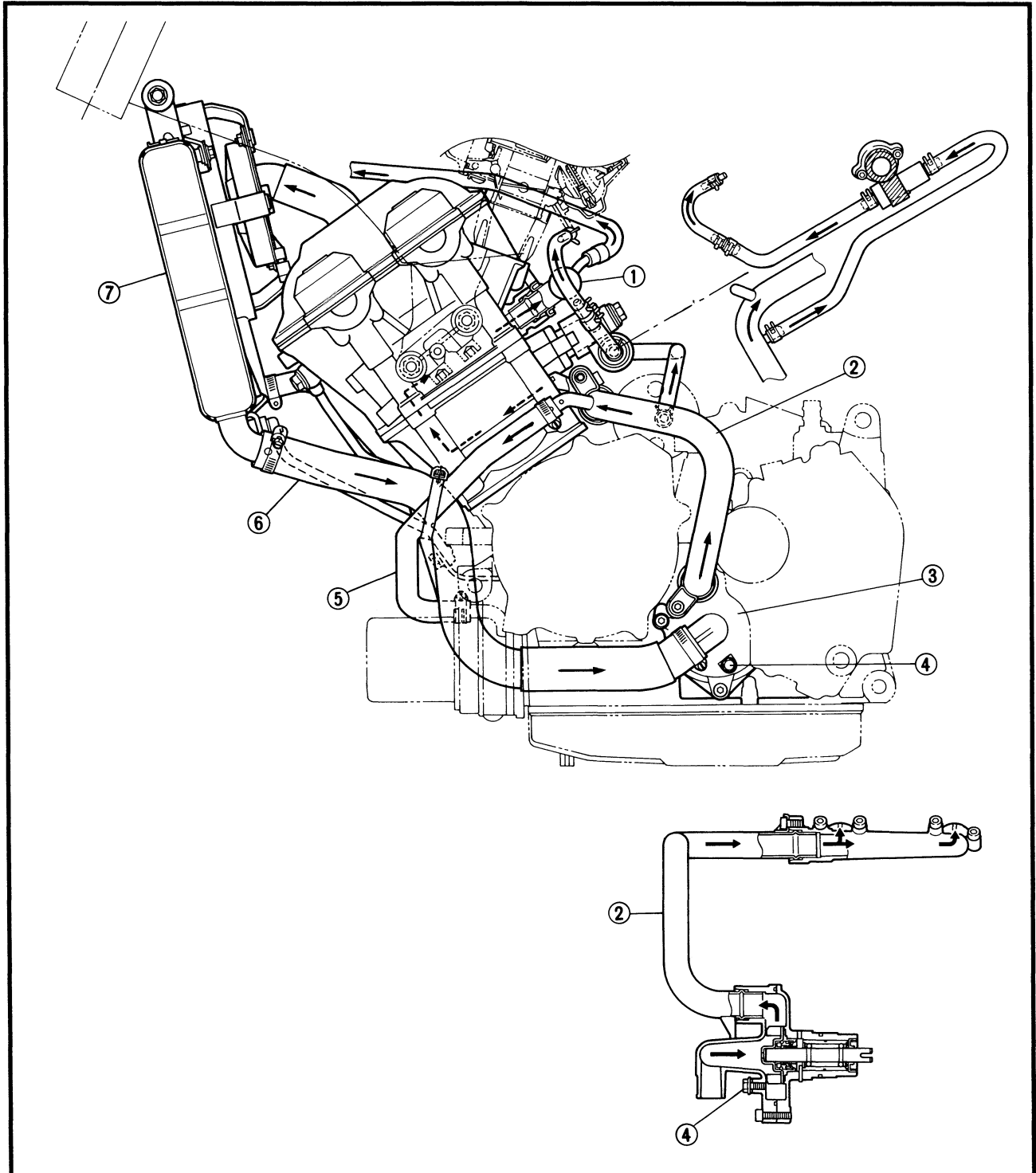
Lubrication Point	Symbol
Steering bearing and bearing race (upper/lower)	
Front wheel oil seal (right/left)	
Rear wheel oil seal	
Clutch hub oil seal	
Clutch hub fitting area	
Rear brake pedal shaft	
Shift pedal	
Sidestand sliding surface	
Tube guide (throttle grip) inner surface	
Brake lever pivot bolt, contact surface	
Clutch lever pivot bolt, contact surface	
Rear shock absorber (upper/lower)	
Pivot shaft	
Connecting rod bearing (on the swingarm)	
Thrust cover (inner)	
Relay arm bearing (inner)	
Relay arm oil seal	
Rear footrest pivot	



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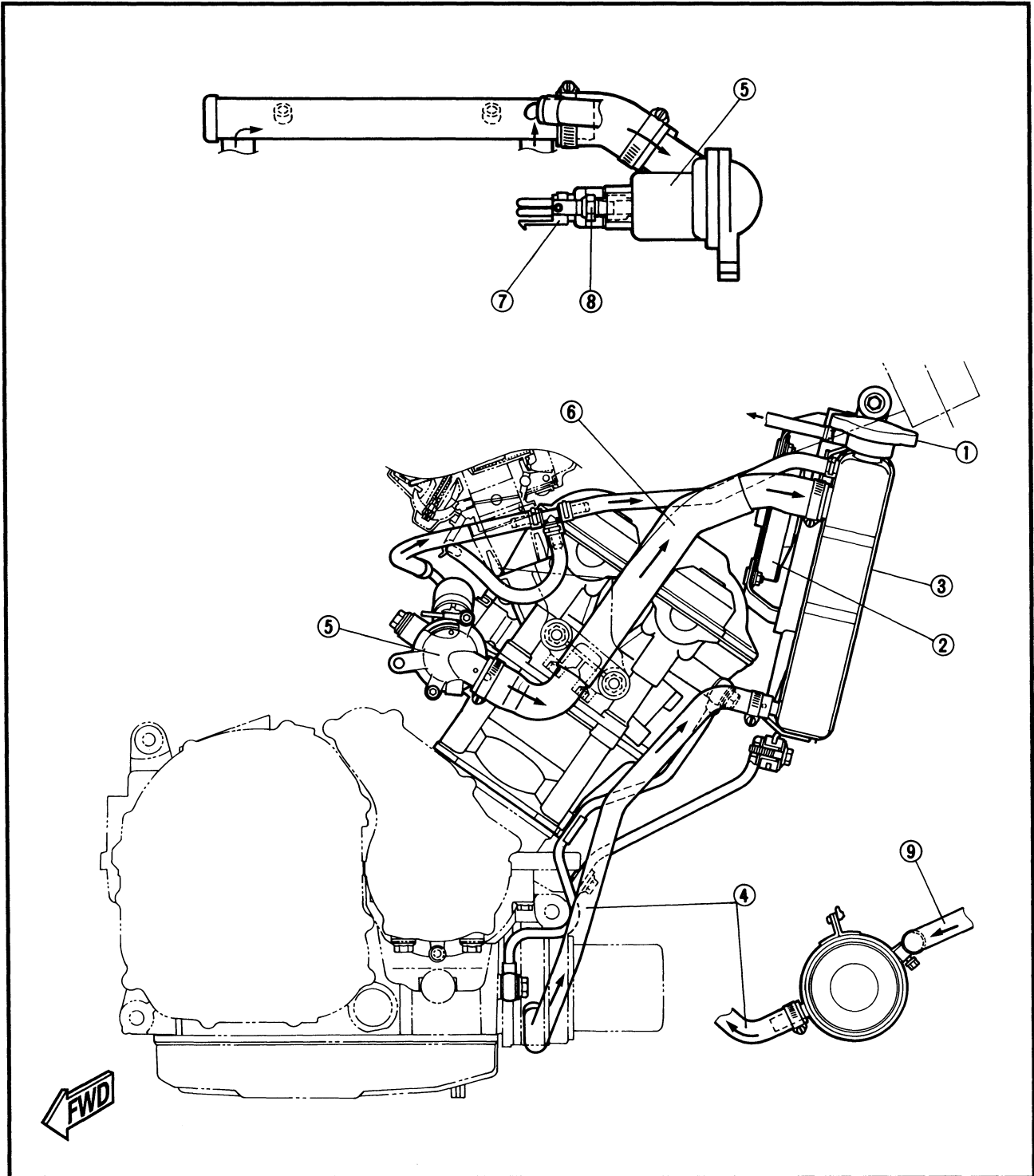
COOLING SYSTEM DIAGRAMS

- ① Water jacket joint (outlet)
- ② Outlet pipe (water pump)
- ③ Water pump
- ④ Drain bolt (water pump)
- ⑤ Inlet hose (oil cooler)
- ⑥ Inlet hose (water pump)
- ⑦ Radiator





- ① Radiator cap
- ② Fan motor
- ③ Radiator
- ④ Outlet hose (oil cooler)
- ⑤ Thermostatic valve housing
- ⑥ Inlet hose (radiator)
- ⑦ Thermo switch
- ⑧ Thermo unit
- ⑨ Inlet hose (oil cooler)

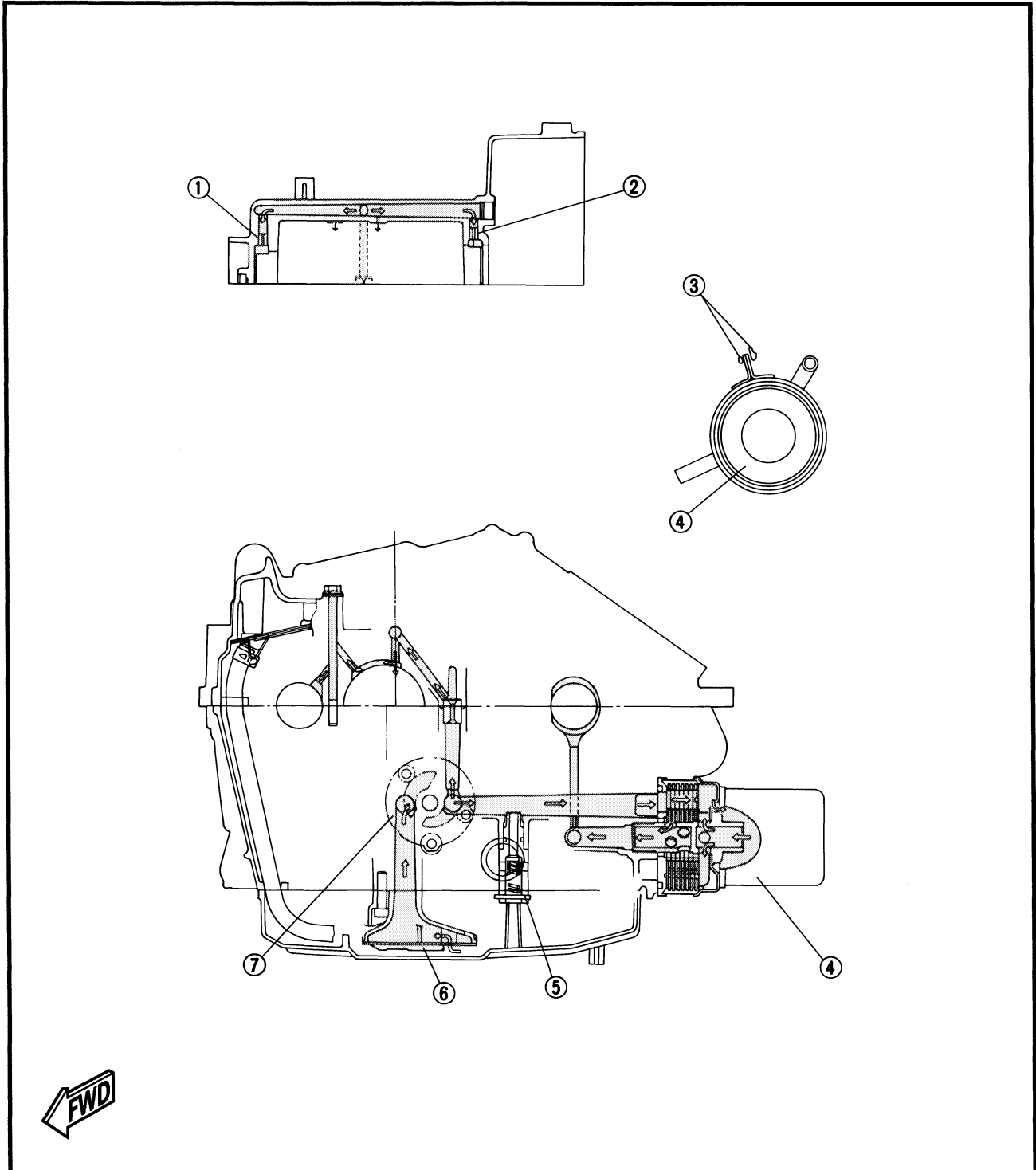




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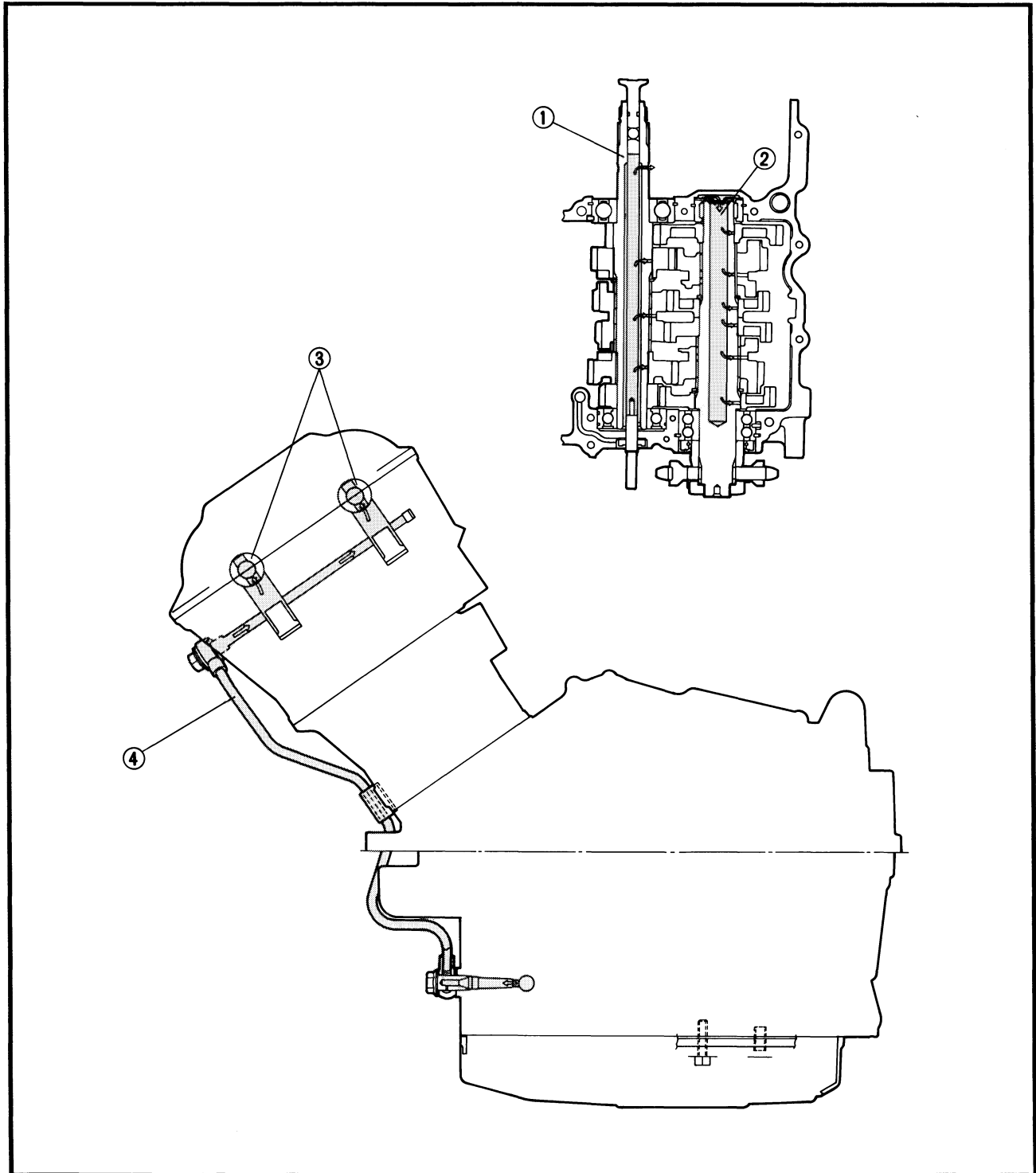
LUBRICATION DIAGRAMS

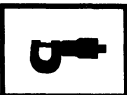
- ① Oil nozzle (main axle)
- ② Oil nozzle (drive axle)
- ③ Projection
- ④ Oil filter
- ⑤ Relief valve
- ⑥ Oil strainer
- ⑦ Oil pump



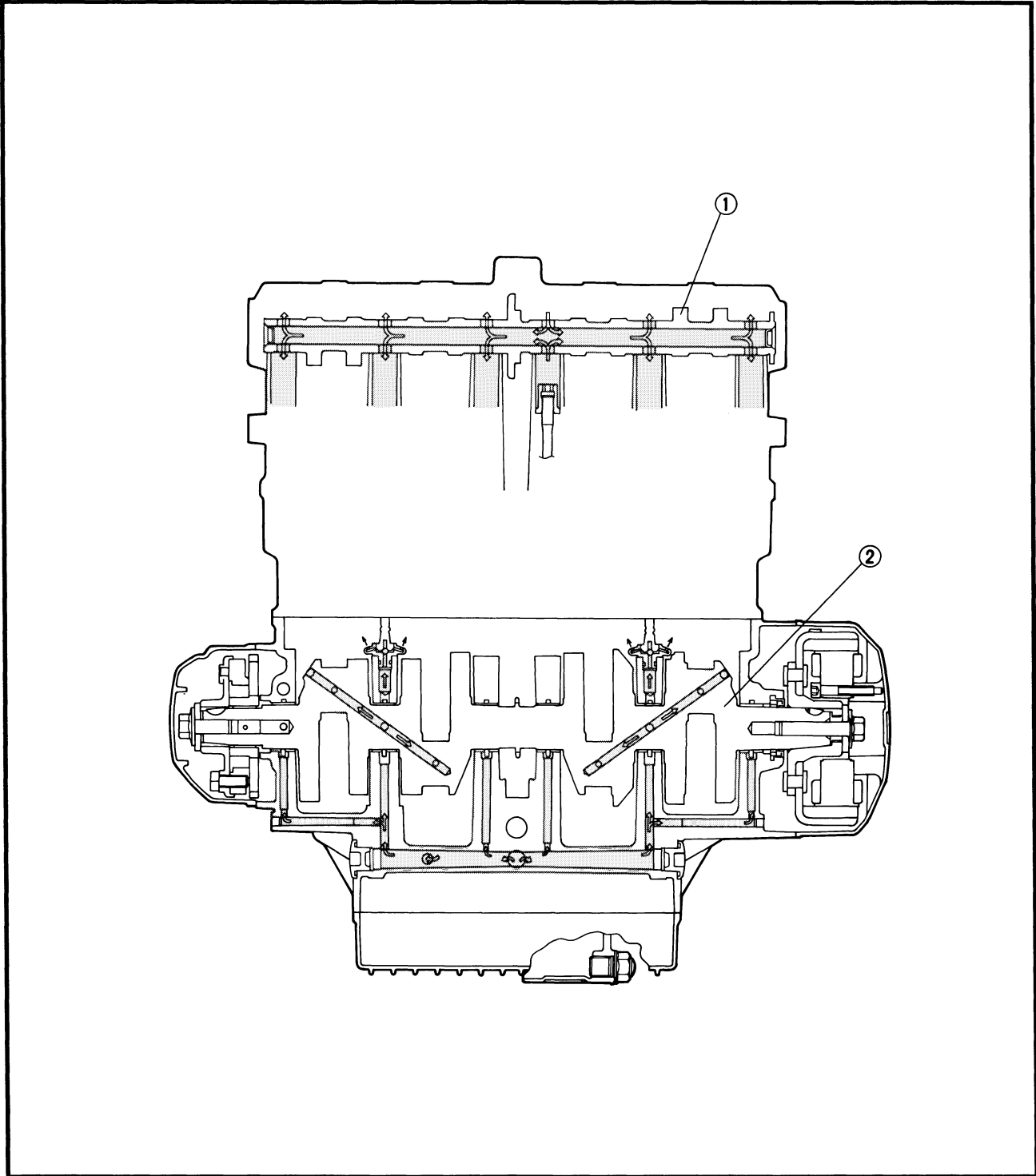


- ① Min axle
- ② Drive axle
- ③ Camshaft
- ④ Oil delivery pipe





- ① Camshaft
- ② Crankshaft



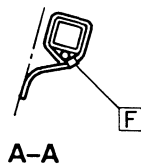
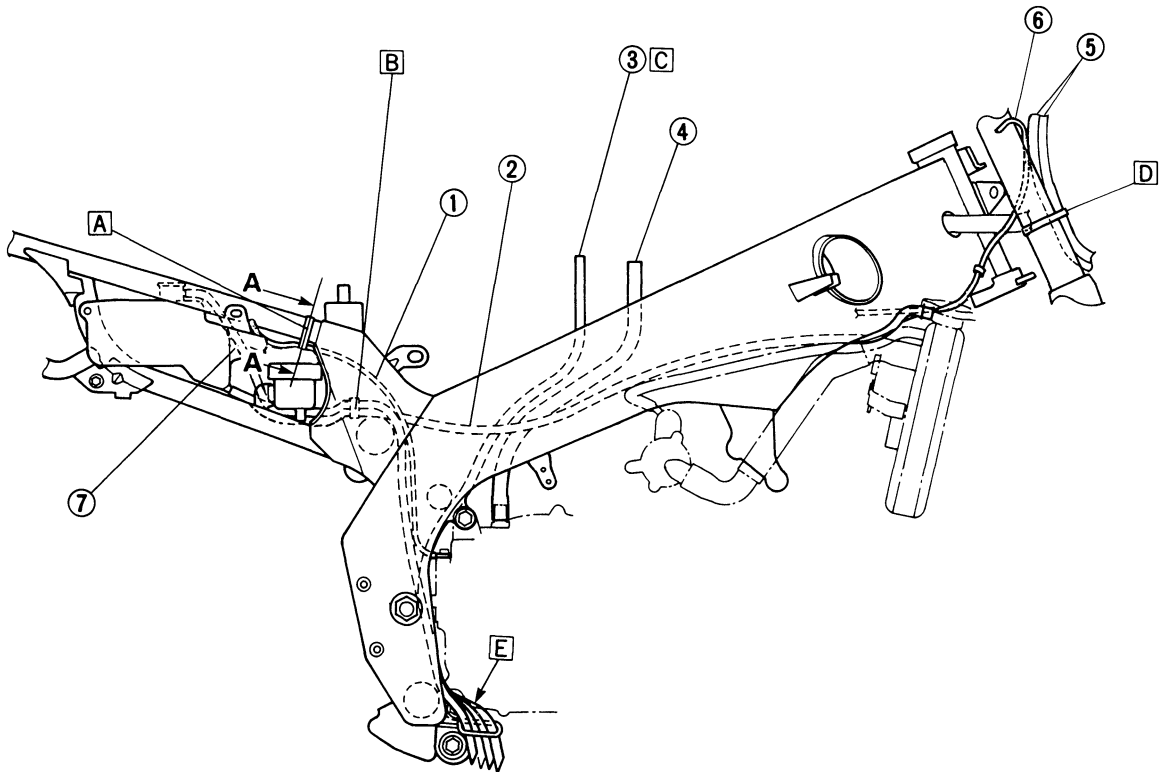


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CABLE ROUTING

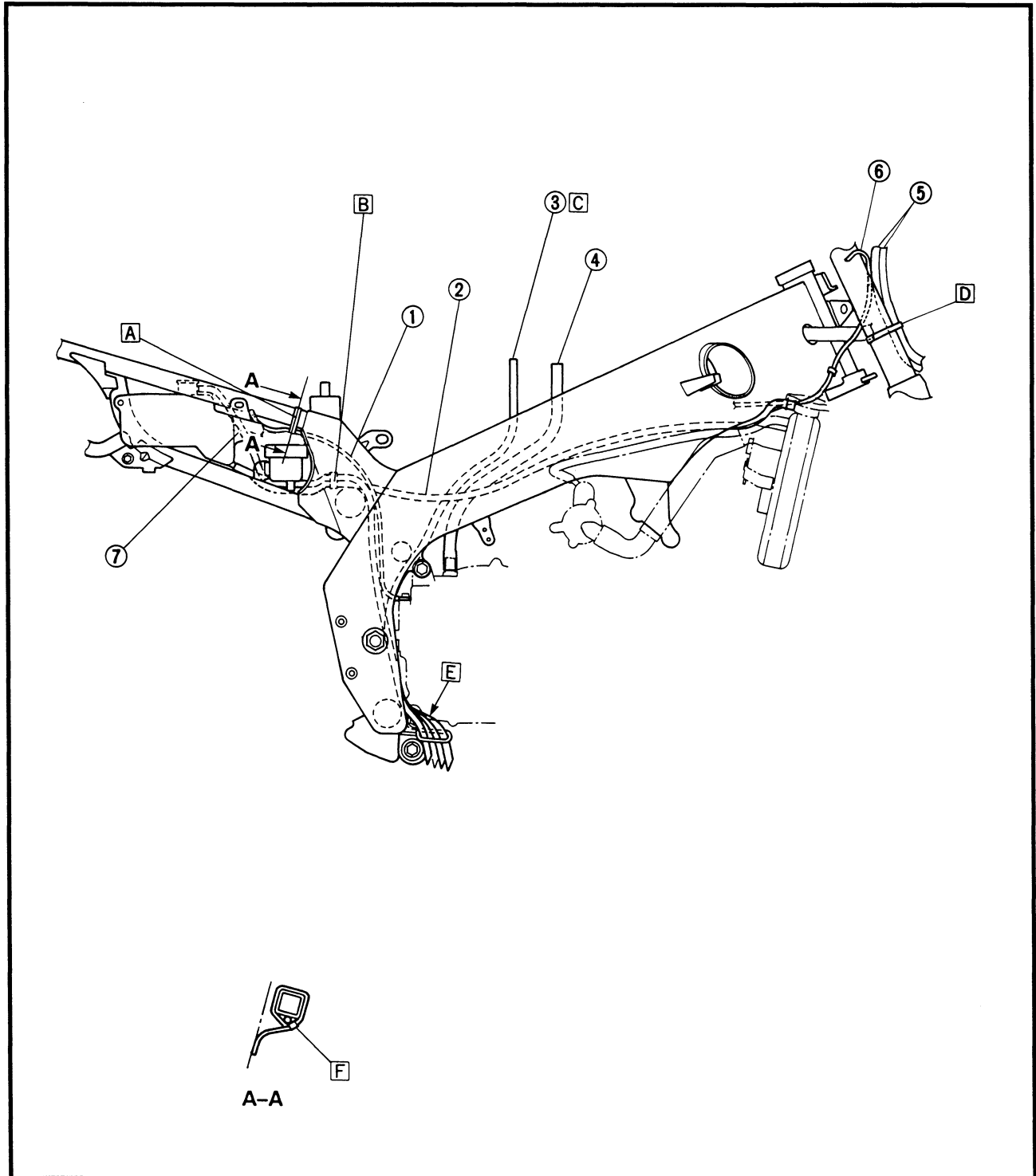
- ① Ground lead
- ② Coolant reservoir hose
- ③ Rollover hose (for D)
- ④ Crankcase breather hose
- ⑤ Front brake hose
- ⑥ Handlebar switch lead (right)
- ⑦ Coolant reservoir breather hose

- [A] Use a plastic band to fasten the ground lead to the frame.
- [B] Use a plastic clamp to fasten the coolant reservoir breather hose to the top of the frame and the coolant reservoir hose to the bottom of the frame.
- [C] Pass the air filter case breather hose along with the rollover hose (for D).



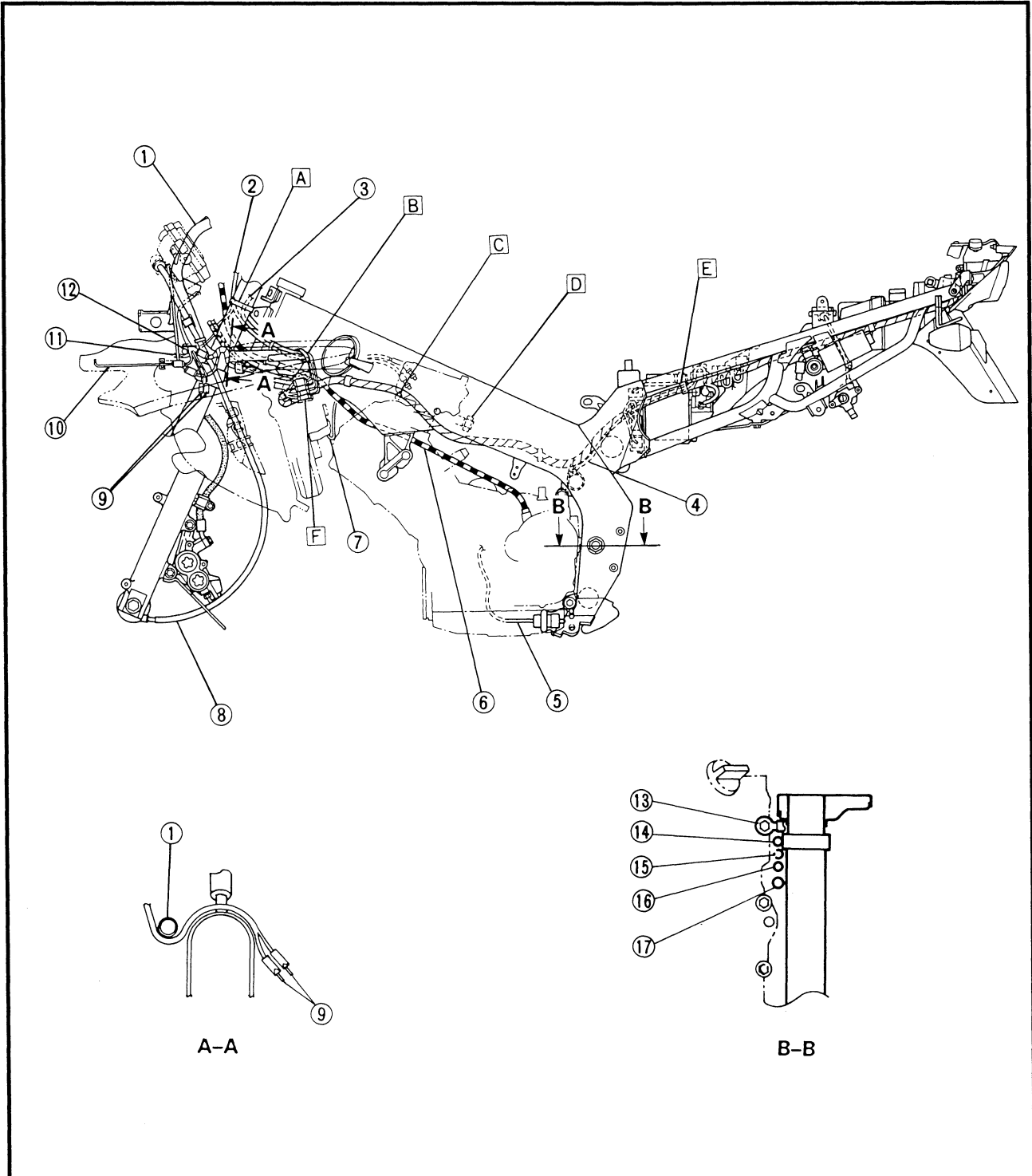


- D Use a plastic locking tie to fasten the front brake hoses to the right front fork inner tube. Cut off the excess end of the plastic locking tie.
- E Pass the hoses down along the frame and through the metal guide.
- F Use a plastic band to fasten the wires to the bottom of the frame. Make sure that the lock on the plastic band faces down.



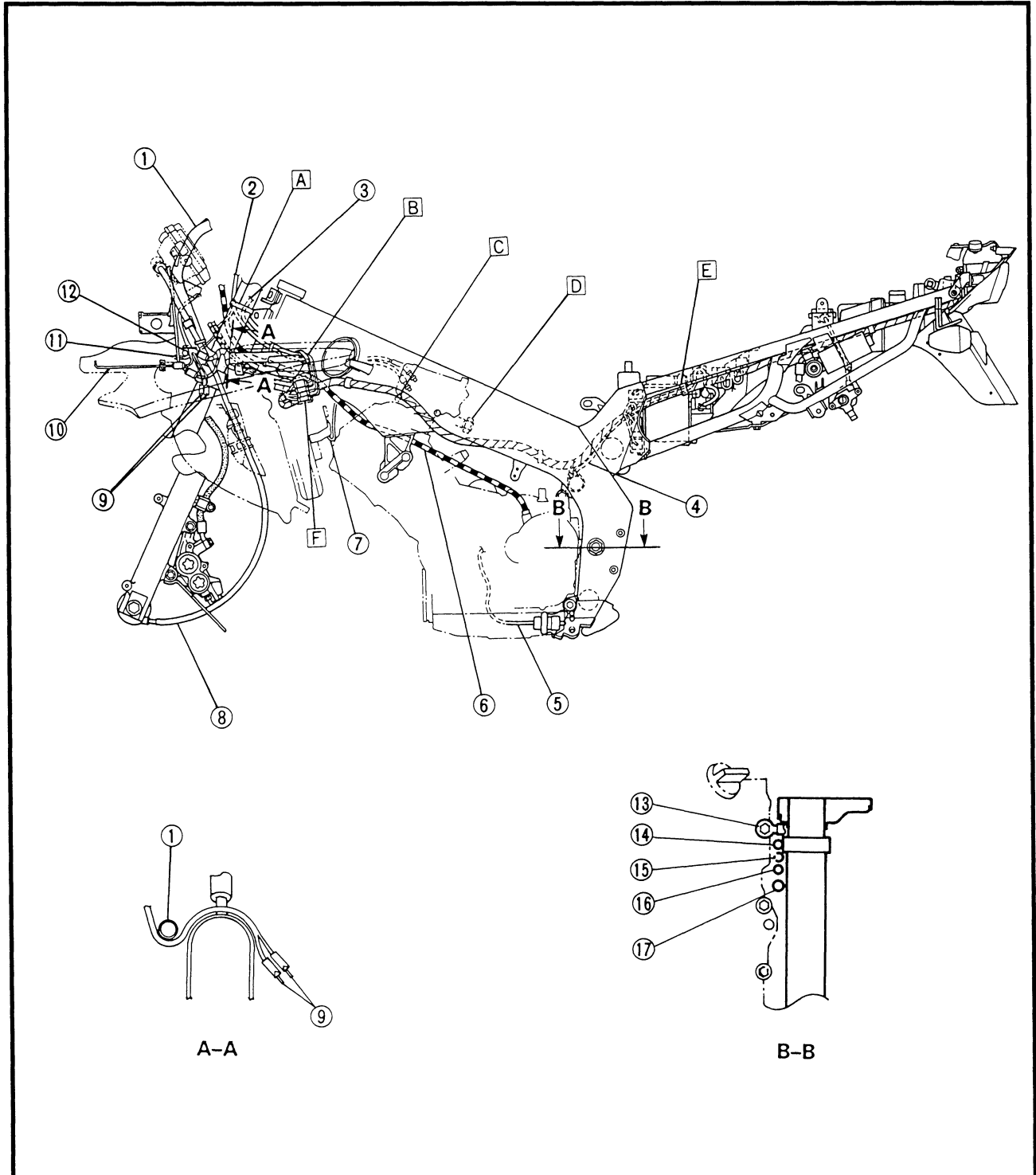


- | | |
|-----------------------------------|-----------------------------------|
| ① Front cowling stay | ⑫ Front brake hose (left) |
| ② Handlebar switch lead (left) | ⑬ Ground lead |
| ③ Main switch lead | ⑭ Coolant reservoir breather hose |
| ④ Starter motor lead | ⑮ Rollover hose (for D) |
| ⑤ Sidestand switch lead | ⑯ Fuel tank breather hose |
| ⑥ Clutch cable | ⑰ Air filter case breather hose |
| ⑦ Fan motor lead | |
| ⑧ Speedometer cable | |
| ⑨ Front flasher light lead (left) | |
| ⑩ Auxiliary light lead | |
| ⑪ Horn lead | |



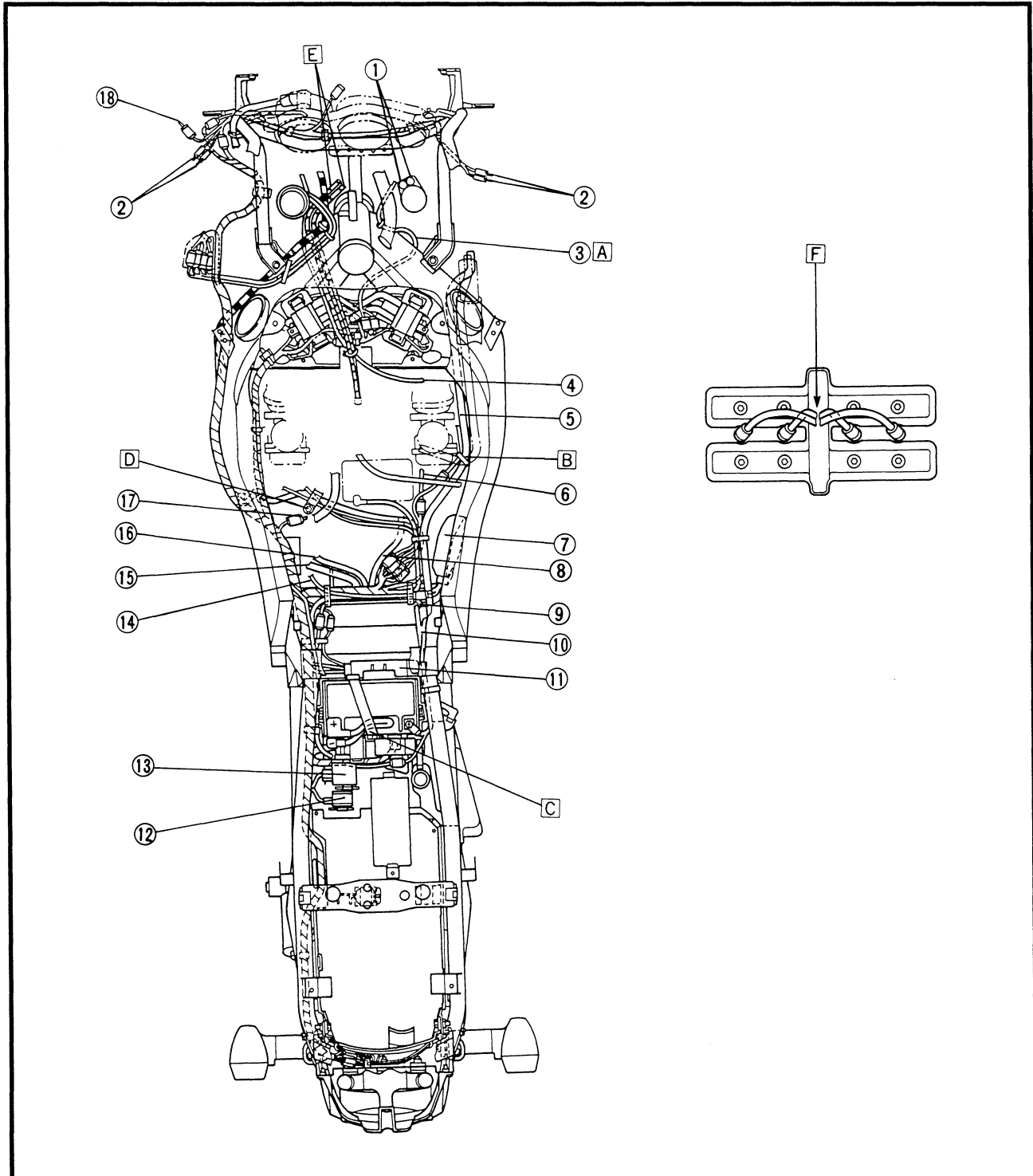


- A** Use a plastic locking tie to fasten the left handlebar switch lead to the left front fork inner tube. Cut off the excess end of the tie.
- B** Attach the front cowling stay to the radiator bracket, then use a plastic band to fasten the left handlebar switch lead and main switch lead to the left side of the radiator bracket.
- C** Attach the plastic T-clamp to the frame.
- D** Secure the vacuum hoses (#1 through #4) with the plastic guide on the frame.
- E** Pass the starter motor leads behind the wire harness, then use a plastic band to fasten them to the frame.
- F** Connect the leads and then pull the rubber boot over the couplers. The larger opening should face down.



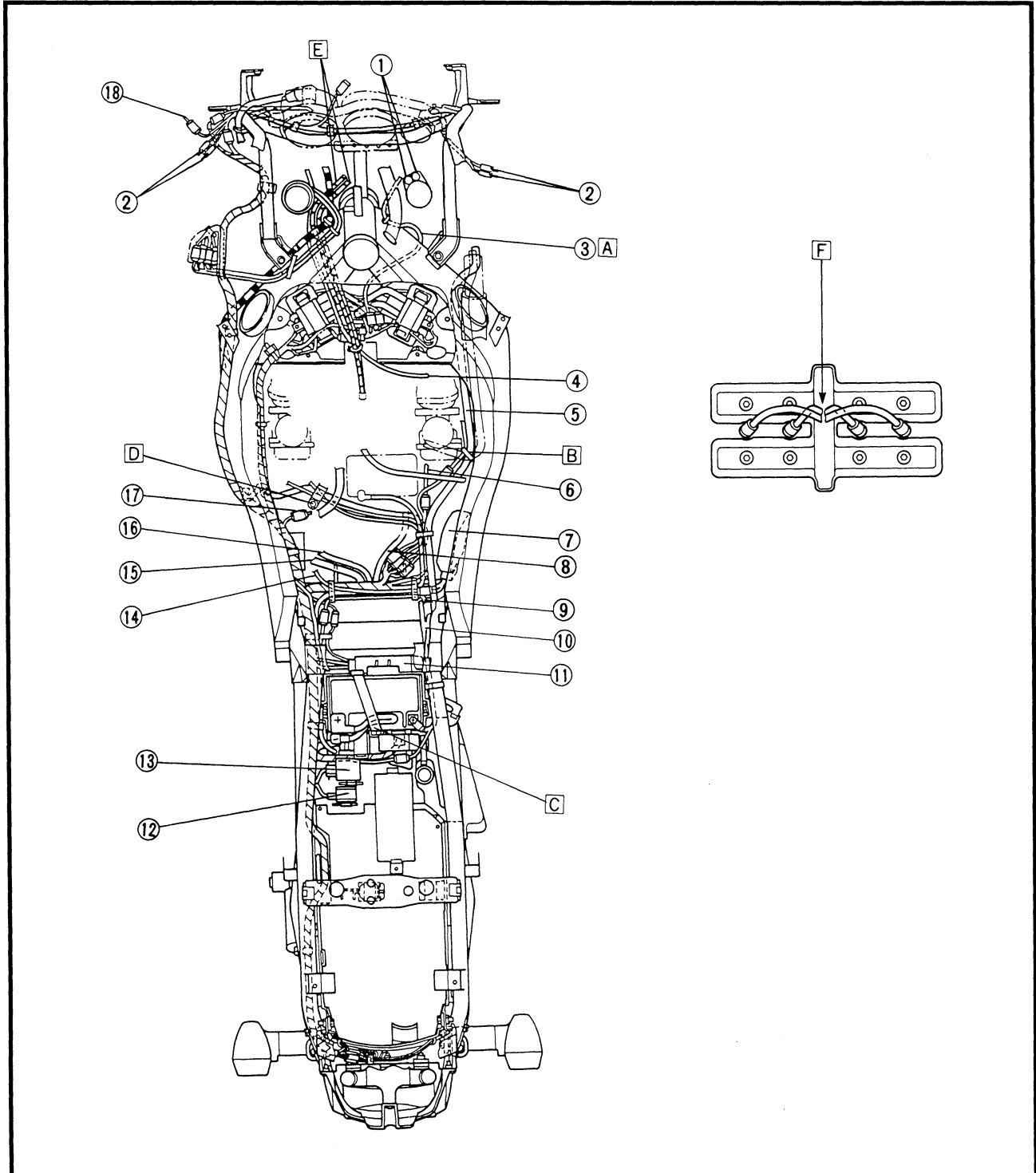


- ① Front brake hose
- ② Front flasher light lead
- ③ Handlebar switch lead (right)
- ④ Starter cable
- ⑤ Coolant reservoir hose
- ⑥ Thermo unit lead
- ⑦ Rectifier/regulator
- ⑧ Rollover hose (for D)
- ⑨ Rear brake switch lead
- ⑩ Ground lead
- ⑪ Ignitor unit
- ⑫ Flasher relay
- ⑬ Relay assembly
- ⑭ Fuel pump lead
- ⑮ Air filter case breather hose
- ⑯ Fuel tank breather hose
- ⑰ Fuel sender
- ⑱ Auxiliary light lead





- A Pass the right handlebar switch lead between the frame on one side and the radiator and ignition coil plate on the other.
- B Use a plastic band to fasten together the coolant reservoir hose, coolant reservoir breather hose and the gear position sensor lead.
- C Use the battery band to secure the positive lead.
- D Pass the sidestand switch lead, AC magneto lead and the gear position sensor lead through the metal guide.
- E Pass the throttle cables between the frame on one side and the radiator and ignition coil plate on the other.
- F The spark plug caps should face in. The high-tension cord should not obstruct the radiator.



CHAPTER 3. PERIODIC INSPECTIONS AND ADJUSTMENTS

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PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. 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.

EB301000

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

NO.	ITEM	ROUTINE	INITIAL	ODOMETER READINGS				
			1,000 km (600 mi) or 1 month	**1 7,000 km (4,400 mi) or 7 months	**2 13,000 km (8,200 mi) or 13 months	19,000 km (12,000 mi) or 19 months	**3 25,000 km (15,800 mi) or 25 months	**4 31,000 km (19,600 mi) or 31 months
1	* Valve clearance	• Check and adjust valve clearance when engine is cold.	Every 42,000 km (26,600 mi)					
2	Spark plugs	• Check condition. • Adjust gap and clean. • Replace at 13,000 km (or 13 months) and thereafter every 12,000 km (or 12 months).		○	Replace.	○	Replace.	○
3	* Crankcase ventilation system	• Check ventilation hose for cracks or damage. • Replace if necessary.		○	○	○	○	○
4	* Fuel line	• Check fuel hose for cracks or damage. • Replace if necessary.		○	○	○	○	○
5	* Fuel filter	• Replace initial 31,000 km (19,600 mi) and thereafter every 30,000 km (19,000 mi).						Replace.
6	* Exhaust system	• Check for leakage. • Retighten if necessary. • Replace gasket(s) if necessary.		○	○	○	○	○
7	* Carburetor synchronization	• Adjust synchronization of carburetors.	○	○	○	○	○	○
8	* Idle speed	• Check and adjust engine idle speed. • Adjust cable free play.		○	○	○	○	○
9	* Evaporative emission control system (for California only)	• Check control system for damage. • Replace if necessary.				○		○

Item marked with an asterisk (*) require special tools, data and technical skills for servicing.

NOTE:

For farther odometer reading, repeat the above maintenance at the period established; **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi), **3: Every 24,000 km (15,200 mi) and **4: Every 30,000 km (19,000 mi) intervals.

GENERAL MAINTENANCE/LUBRICATION

NO.	ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
			1,000 km (600 mi) or 1 month	**1 7,000 km (4,400 mi) or 7 months	**2 13,000 km (8,200 mi) or 13 months	19,000 km (12,000 mi) or 19 months	**3 25,000 km (15,800 mi) or 25 months	31,000 km (19,600 mi) or 31 months	
1	Engine oil	• Replace (warm engine before draining). <See NOTE.>	○	○	○	○	○	○	
2	* Engine oil filter	• Replace at 1,000 km (600 mi) or 1 month, and thereafter every 12,000 km (7,600 mi) or 12 months.	○		○			○	
3	* Air filter/surge tank	• Clean. • Replace if necessary.		○	○	○	○	○	
4	* Cooling system	• Check hose for cracks or damage. • Replace if necessary.		○	○	○	○	○	
		• Replace coolant every 24 months. • Ethylene glycol anti-freeze coolant.					Replace.		
5	* Brake system	• Check operation, pad wear, and fluid leakage. <See NOTE.> • Correct if necessary.	○	○	○	○	○	○	
6	* Clutch	• Check operation. • Correct if necessary.	○	○	○	○	○	○	
7	* Control and meter cable	• Apply chain lube thoroughly. • Yamaha chain and cable lube or SAE 10W30 motor oil.	○	○	○	○	○	○	
8	* Swingarm pivot bearing	• Check bearing assembly for looseness. • Moderately repack every 24,000 km (15,200 mi) or 24 months. • Molybdenum disulfide grease.			○		Repack.		
9	* Rear suspension link pivots	• Check operation. • Apply grease lightly every 24,000 km (15,200 mi) or 24 months. • Molybdenum disulfide grease.			○		○		
10	* Rear shock absorber	• Check operation and oil leakage. • Replace if necessary.		○	○	○	○	○	
11	* Front fork	• Check operation and oil leakage. • Replace if necessary.		○	○	○	○	○	
12	* Steering bearings	• Check bearing assembly for looseness. • Moderately repack every 24,000 km (15,200 mi). • Lithium soap base grease.		○	○	○	Repack.	○	
13	Brake/clutch lever pivot shaft	• Apply chain lube lightly. • Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○	
14	Brake pedal and shift pedal shaft	• Apply chain lube lightly. • Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○	

GENERAL MAINTENANCE/LUBRICATION



NO.	ITEM	ROUTINE	INITIAL	ODOMETER READINGS					
			1,000 km (600 mi) or 1 month	**1 7,000 km (4,400 mi) or 7 months	**2 13,000 km (8,200 mi) or 13 months	19,000 km (12,000 mi) or 19 months	**3 25,000 km (15,800 mi) or 25 months	31,000 km (19,600 mi) or 31 months	
15	* Drive chain	<ul style="list-style-type: none"> • Check chain slack/alignment condition. • Adjust and lubricate chain thoroughly. • Yamaha chain and cable lube or SAE 10W30 motor oil. 	Every 1,000 km (600 mi)						
16	* Wheel bearings	<ul style="list-style-type: none"> • Check bearings for smooth rotation. 		○	○	○	○	○	
17	* Sidestand pivot	<ul style="list-style-type: none"> • Check operation and lubricate. • Apply chain lube lightly. • Yamaha chain and cable lube or SAE 10W30 motor oil. 		○	○	○	○	○	
18	* Sidestand switch	<ul style="list-style-type: none"> • Check and clean or replace if necessary. 	○	○	○	○	○	○	
19	* Fittings/fasteners	<ul style="list-style-type: none"> • Check all chassis fittings and fasteners. • Correct if necessary. 		○	○	○	○	○	

Items marked with an asterisk (*) require special tools, data and technical skills for servicing.

NOTE:

For farther odometer reading, repeat the above maintenance at the period established; **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi) and **3: Every 24,000 km (15,200 mi) intervals.

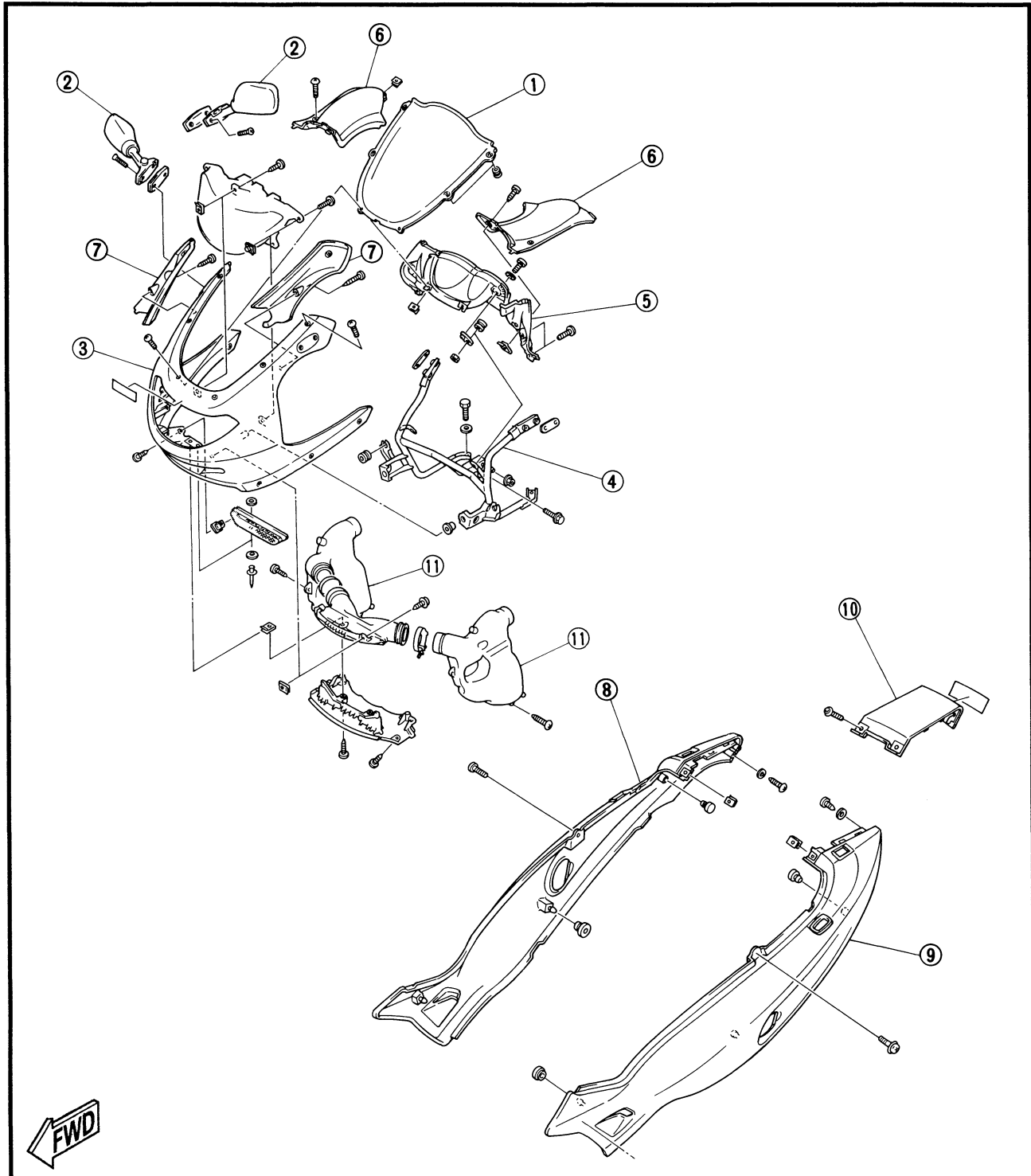
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Brake fluid replacement:
 1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
 2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
 3. Replace the brake hoses every four years, or if cracked or damaged.
- Engine oil type:
 - Yamalube 4 (20W40) or SAE 20W40 type "SE" motor oil for temperatures 5 °C (40 °F) or above.
 - Yamalube 4 (10W30) or SAE 10W30 type "SE" motor oil for temperatures 15 °C (60 °F) or below.



EB302003

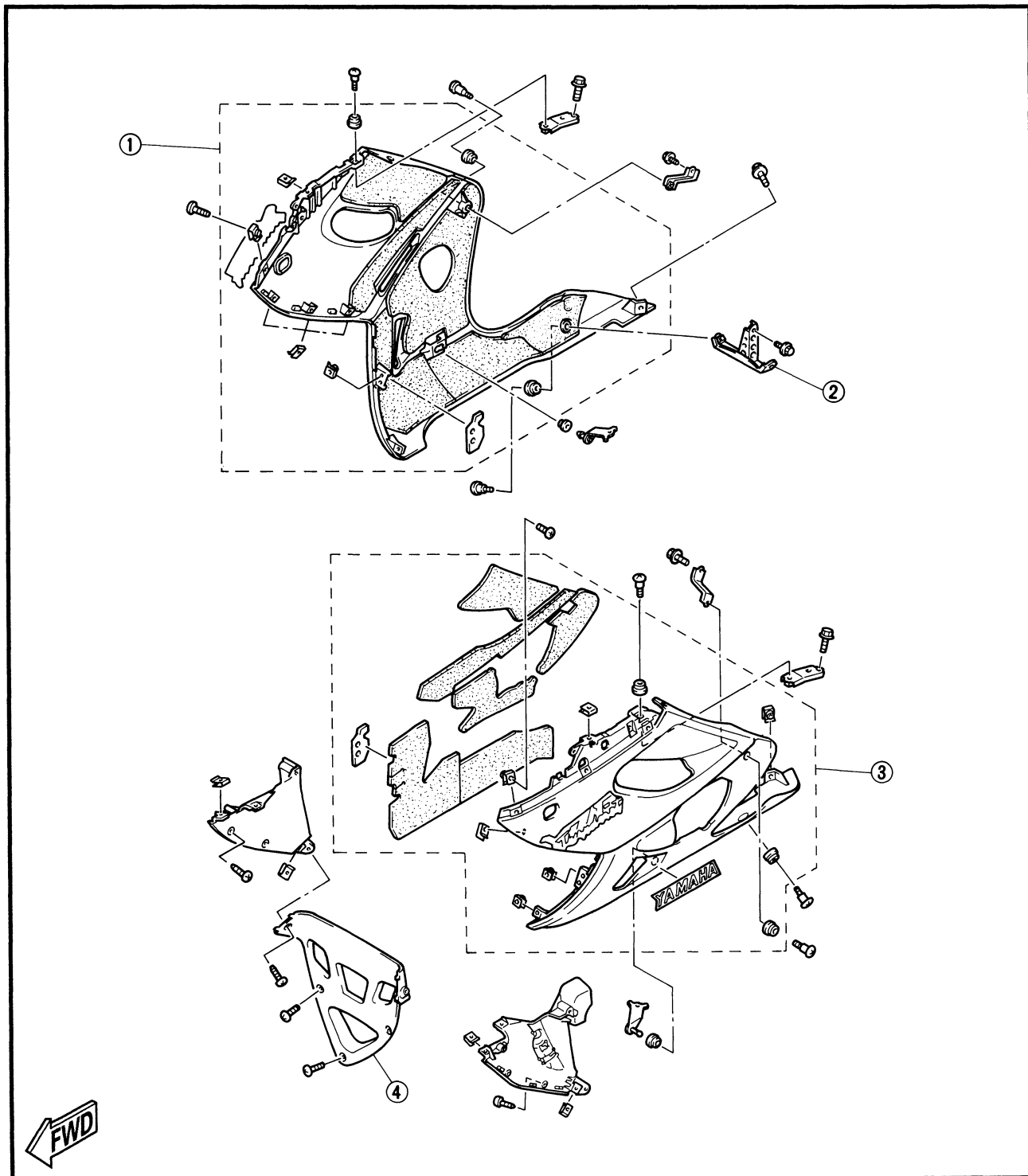
COWLINGS

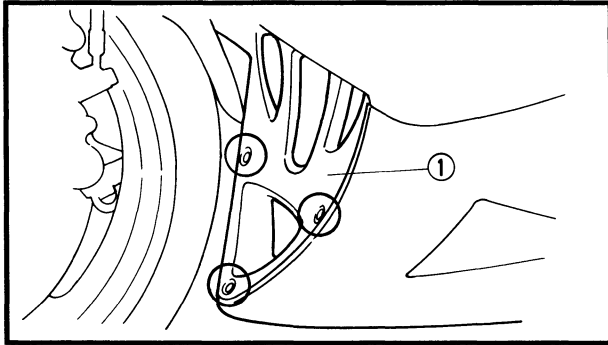
- ① Windshield
- ② Rear view mirror
- ③ Front cowling assembly
- ④ Cowling stay
- ⑤ Instrument panel cover
- ⑥ Air intake duct cover
- ⑦ Upper cover
- ⑧ Side panel (right)
- ⑨ Side panel (left)
- ⑩ Tail cover
- ⑪ Surge tank





- ① Bottom cowling (right)
- ② Bottom cowling stay
- ③ Bottom cowling (left)
- ④ Bottom cowling (front)

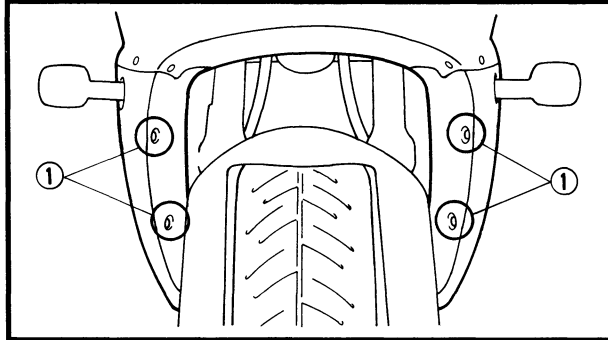




REMOVAL

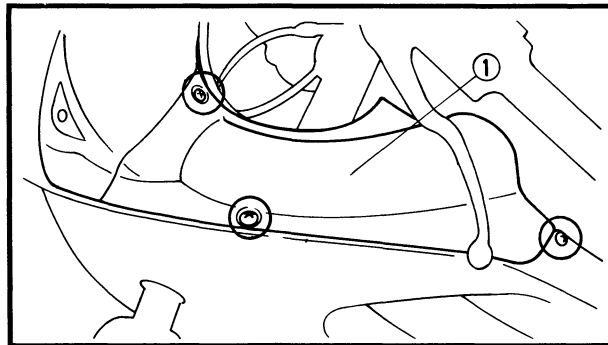
1.Remove:

- Bottom cowling ①



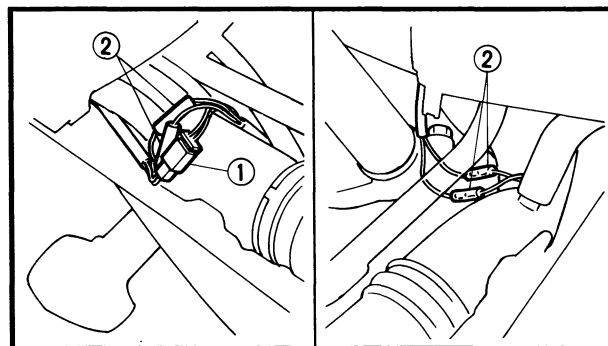
2.Remove:

- Screws (inside panels) ①



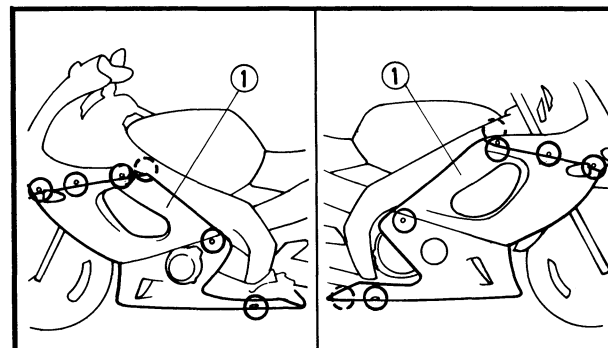
3.Remove:

- Air intake duct covers (left and right) ①



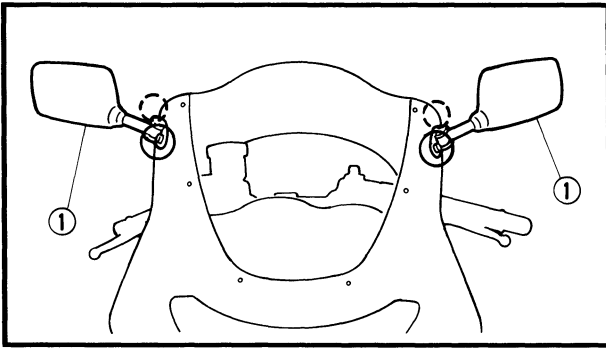
4.Disconnect:

- Auxiliary light coupler ①
- Front flasher light leads (left and right) ②



5.Remove:

- Side cowlings (left and right) ①

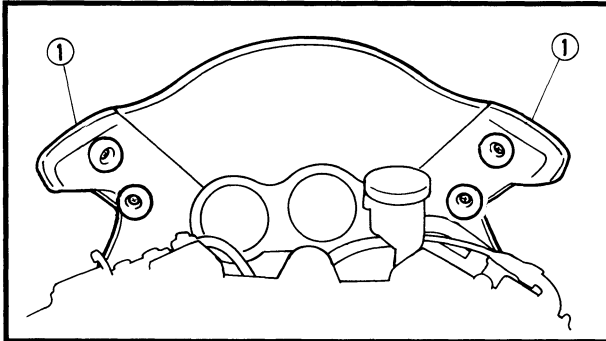


6.Remove:

- Rear view mirrors (left and right) ①
- Rubber dampers (left and right)

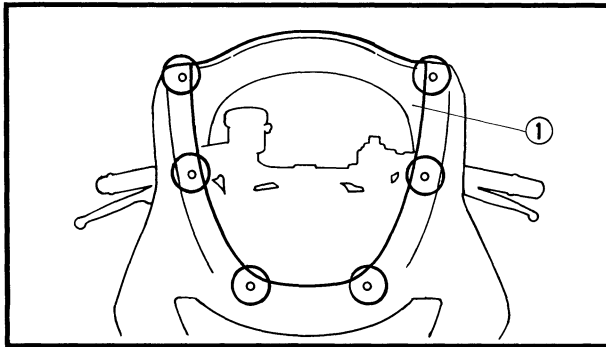
NOTE:

The arrow on the rubber dampers face towards the front of the motorcycle.



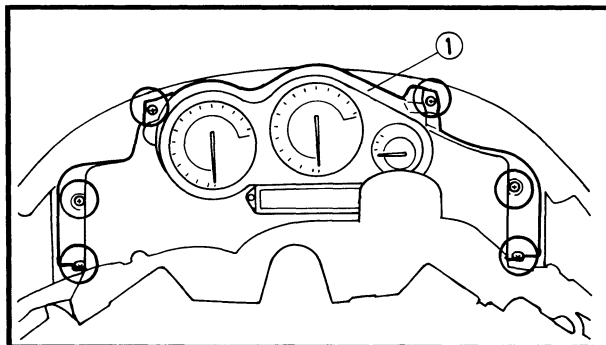
7.Remove:

- Upper covers (left and right) ①
(on the inside of the windscreen)



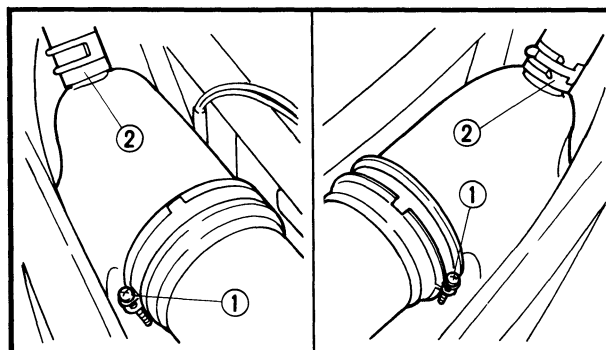
8.Remove:

- Windscreen ①



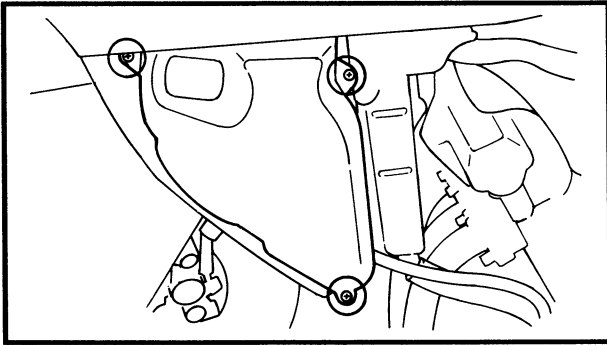
9.Remove:

- Instrument panel cover ①

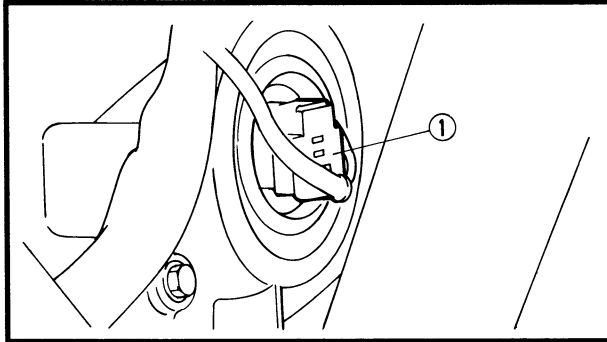


10.Loosen:

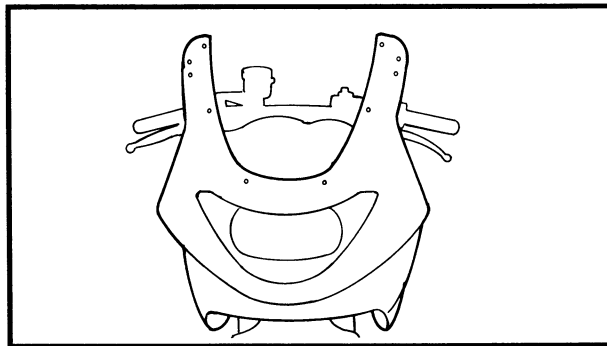
- Clamp screws (air intake ducts) ①
- Hoses (left and right) ②



- 11.Remove:
- Screws (left surge tank)



- 12.Disconnect:
- Headlight coupler ①

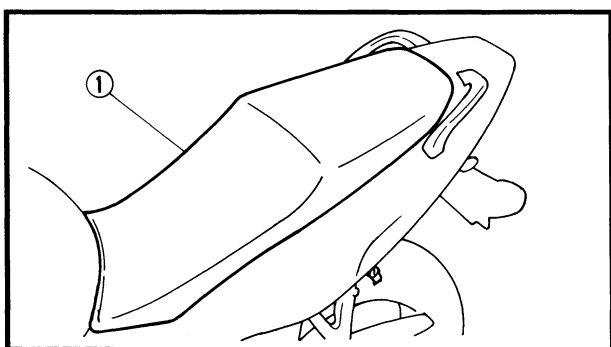


- 13.Remove:
- Front cowl assembly

NOTE: _____
Remove the speedometer cable and carburetor air vent drain hose from the left inner panel.

INSTALLATION

Reverse the "REMOVAL" procedure.



EB302001

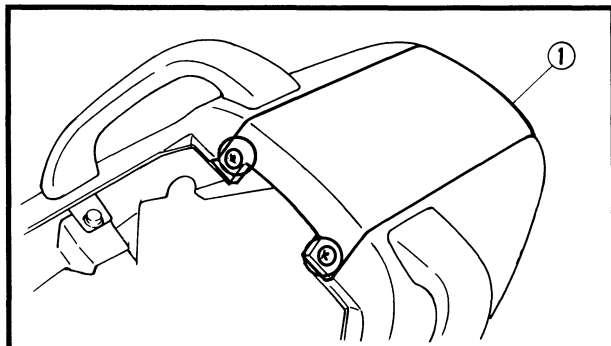
SEAT**REMOVAL**

1.Remove:

- Seat ①

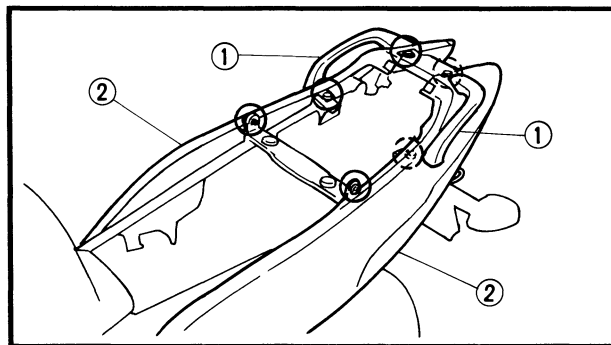
NOTE:

Insert the key into the helmet lock and turn the key to the right.



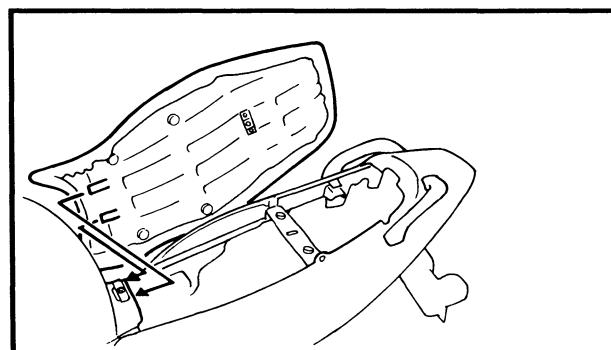
2.Remove:

- Tail cover ①



3.Remove:

- Grab bars (left and right) ①
- Side panels (left and right) ②

**INSTALLATION**

Reverse the "REMOVAL" procedure.
Note the following points.

1.Install:

- Seat

NOTE:

When installing the seat, insert the projections on the front of the seat into the receptacles on the frame, then push down the seat end.



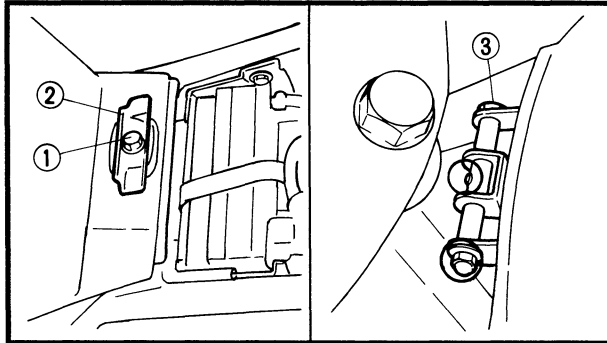
EB302002

FUEL TANK

REMOVAL

1.Remove:

- Seat
- Refer to "SEAT".



2.Remove:

- Bolt ①
- Plate ②
- Damper rubber
- Bolt ③

3.Turn the fuel cock to "OFF".

4.Disconnect:

- Fuel sender coupler ①
- Drain hose (fuel tank) ②
- Fuel hose ③

NOTE:

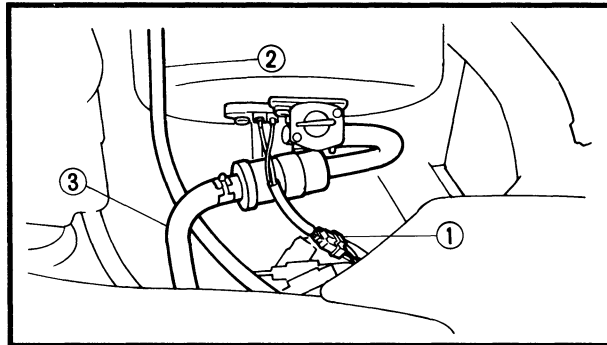
Place a rag under the fuel line to absorb any fuel that might spill.

⚠ WARNING

**Gasoline is highly flammable.
Avoid spilling fuel onto a hot engine.**

5.Remove:

- Fuel tank

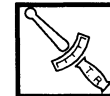


INSTALLATION

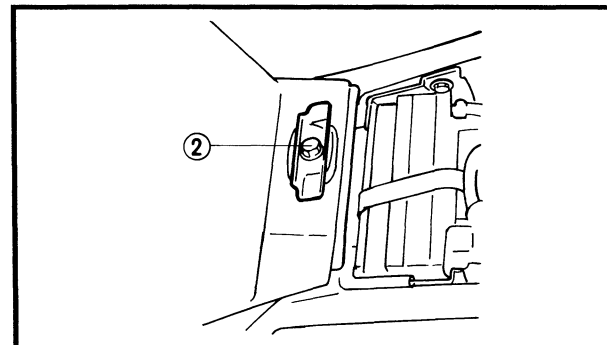
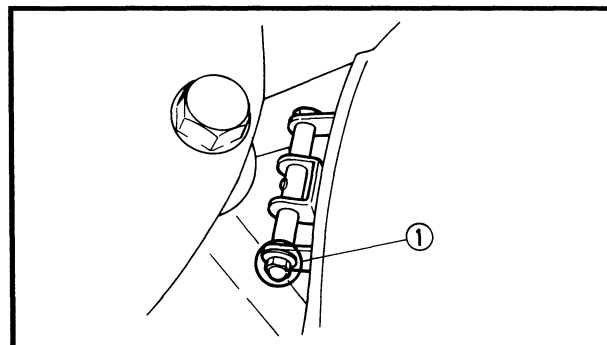
Reverse the "REMOVAL" procedure.
Note the following points.

1.Install:

- Fuel tank



Nut ①:
10 Nm (1.0 m · kg, 7.2 ft · lb)
Bolt ②:
16 Nm (1.6 m · kg, 11 ft · lb)



EB303001

ENGINE

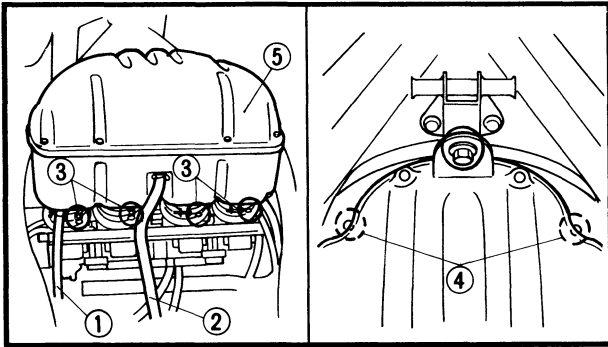
VALVE CLEARANCE ADJUSTMENT

NOTE:

- Valve clearance adjustment should be made with the engine cool, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at Top Dead Center (T.D.C.) on the compression stroke.

1.Remove:

- Seat
- Fuel tank
- Bottom cowling
- Side cowlings (left and right)
Refer to "SEAT", "FUEL TANK" and "COWLINGS".



2.Disconnect:

- Drain hose (air filter case) ①
- Breather hose (crankcase) ②

3.Loosen:

- Clamp screws (carburetor joints) ③
- Clamp screws (air intake ducts) ④

4.Remove:

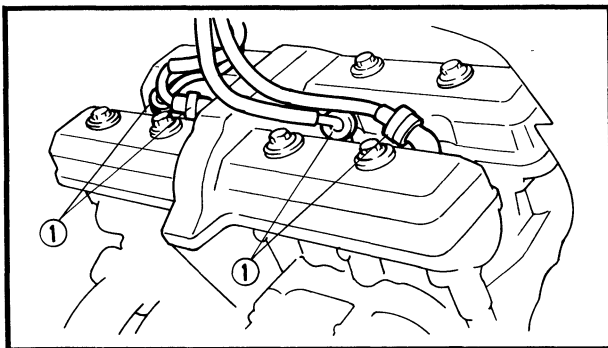
- Air filter case ⑤

5.Remove:

- Radiator assembly
Refer to "RADIATOR" in CHAPTER 5.

6.Remove:

- Carburetor assembly
Refer to "CARBURETORS" in CHAPTER 6.

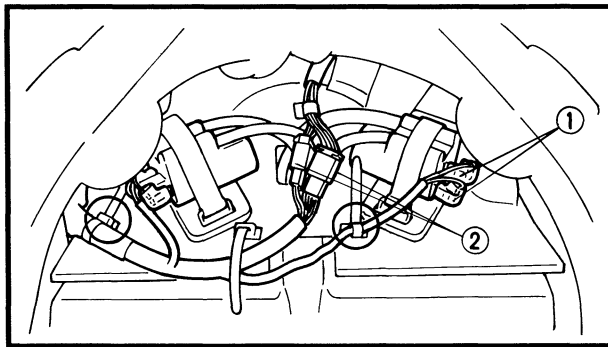


7.Disconnect:

- Spark plug caps ①

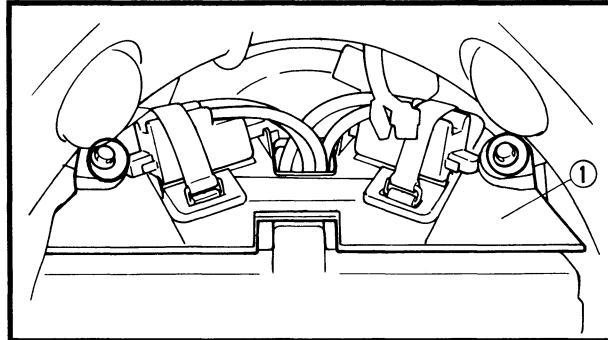
VALVE CLEARANCE ADJUSTMENT

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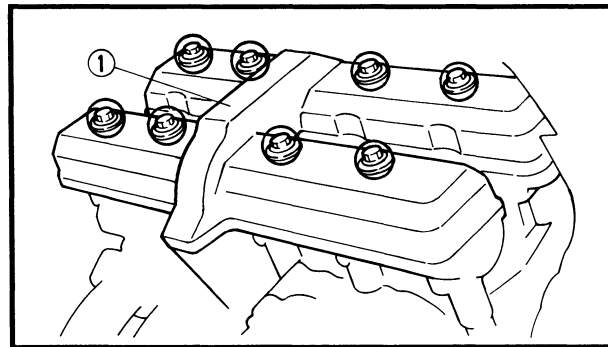
8.Disconnect:

- Leads (ignition coils) ①
- Couplers (right handlebar switch) ②



9.Remove:

- Ignition coil plate ①
(with the ignition coils)

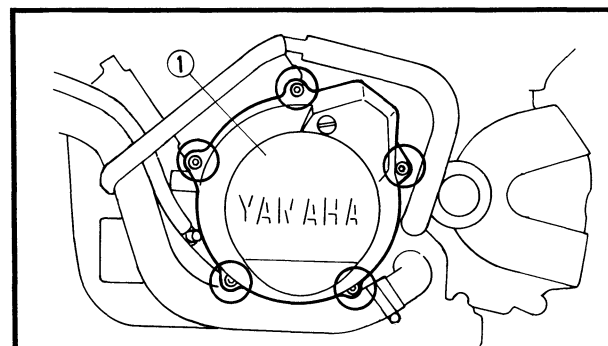


10.Loosen:

- Spark plugs

11.Remove:

- Cylinder head cover ①
- Gasket (cylinder head cover)



12.Remove:

- AC magneto cover ①

13.Measure:

- Valve clearance
- Out of specification → Adjust.



Valve clearance (cold):

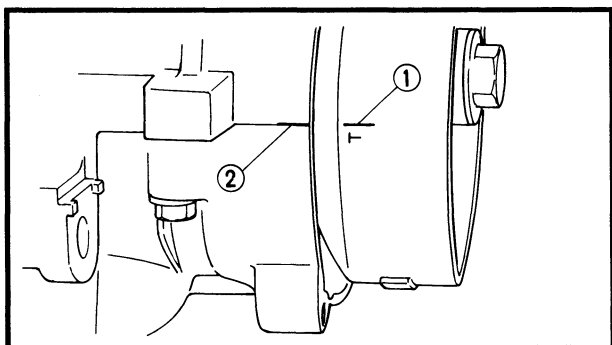
Intake valve:

0.11 ~ 0.20 mm (0.004~0.008 in)

Exhaust valve:

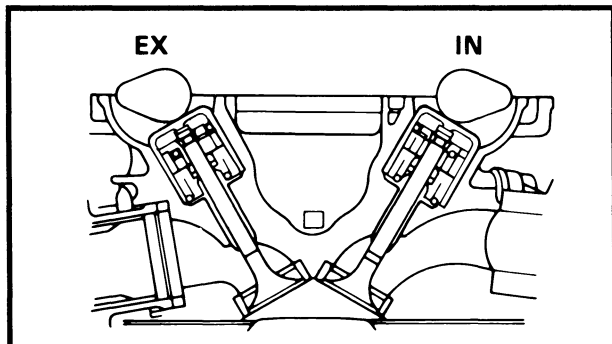
0.21 ~ 0.30 mm (0.008~0.012 in)

VALVE CLEARANCE ADJUSTMENT



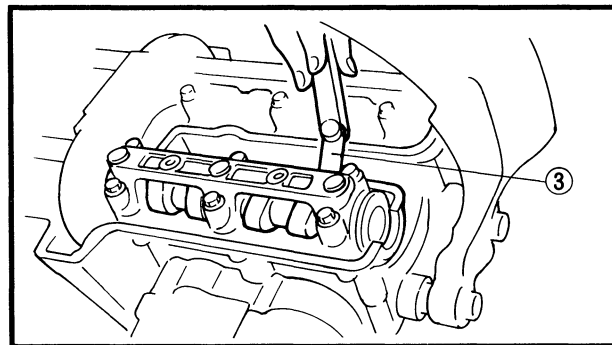
Measuring steps:

- Turn the crankshaft counterclockwise.
- When the #1 piston is at TDC on the compression stroke align the "T" mark ① on the AC magneto rotor with the crankcase end ②.



NOTE:

TDC on the compression stroke can be found when the cam lobes are facing opposite one another, as shown in the illustration.



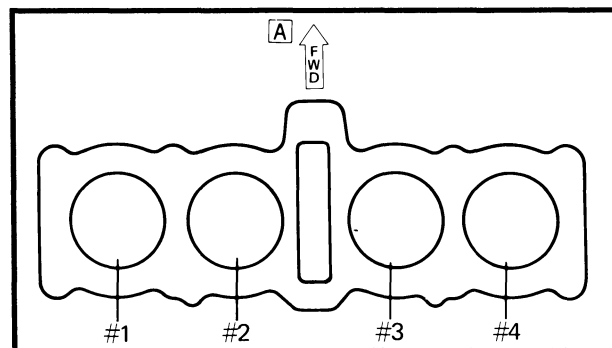
- Use a feeler gauge ③ to measure the valve clearance.

NOTE:

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

Measuring sequence:

#1 → #2 → #4 → #3



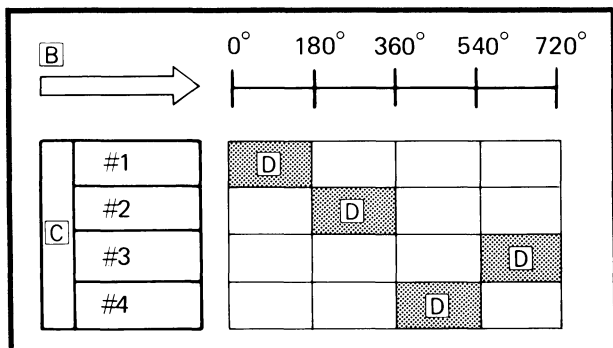
A Front

- Starting from the #1 cylinder when it is at TDC turn the crankshaft counterclockwise the specified amount of degrees for each cylinder. Refer to the chart below.

B The degrees that the crankshaft is turned counterclockwise

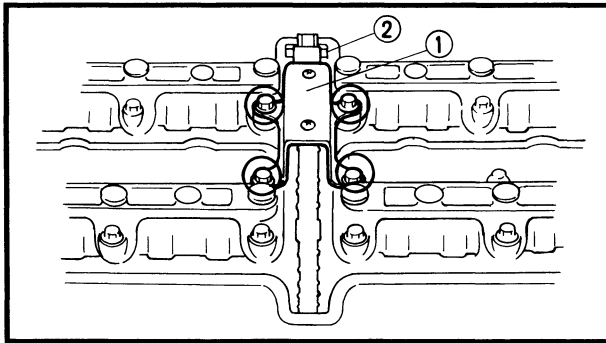
C Cylinder number

D Combustion



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

VALVE CLEARANCE ADJUSTMENT

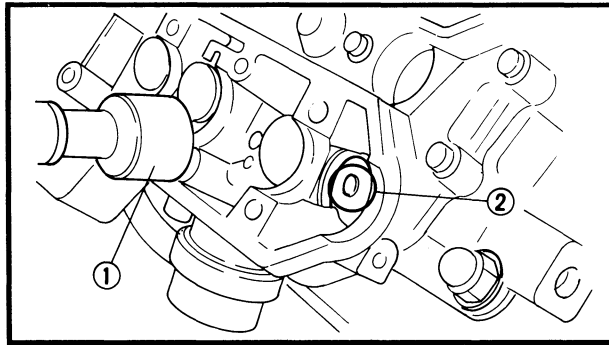


14.Remove:

- Timing chain tensioner
- Timing chain guide (upper) ①
- Timing chain guide (exhaust side) ②
- Camshaft caps (intake and exhaust)
- Timing chain
- Camshafts (intake and exhaust)

NOTE:

- Refer to "ENGINE DISASSEMBLY – CYLINDER HEAD COVER, CYLINDER HEAD AND CAMSHAFTS" in CHAPTER 4.
- When removing the timing chain or camshafts, fasten a wire to the timing chain to retrieve it if it falls into the crankcase.



15.Adjust:

- Valve clearance

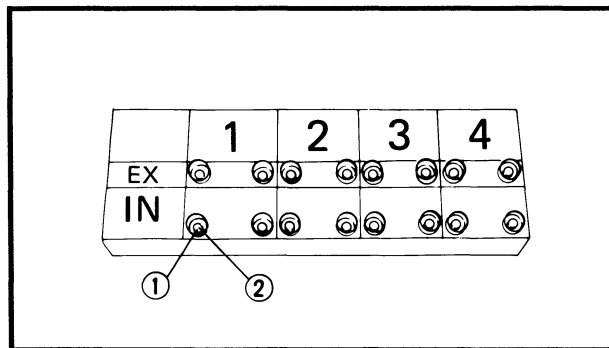
Adjustment steps:

- Remove the valve lifters ① and the pads ②.

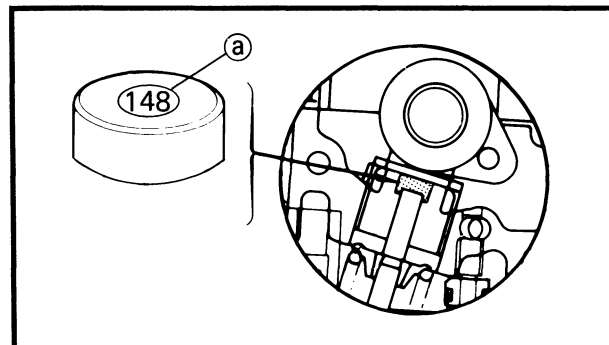
NOTE:

- To prevent the pads from falling into the crankcase, cover the timing chain opening with a rag.
- Make a note of the position of each valve lifter ① and pad ② so that they can be reinstalled in their original place.

- Select the proper pad from the following chart:



Pad range		Pad sizes: 25 thicknesses
No.120 ~ No.240	120 mm (0.047 in) ~ 2.40 mm (0.094 in)	Thickness increases in 0.05 mm (0.002 in) increments



NOTE:

The thickness ③ of each pad is indicated in hundredths of millimeters on the pad's upper surface.

- Round off the last digit of the installed pad number to the nearest increment

VALVE CLEARANCE ADJUSTMENT



Last digit of the pad number	Rounded value
0 or 2	0
5	DO NOT ROUND OFF
8	10

EXAMPLE:

Installed pad number = 148 (1.48 mm)

Rounded off value = 150

NOTE:

Pads can only be selected in 0.05 mm (0.002 in) increments.

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

NOTE:

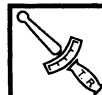
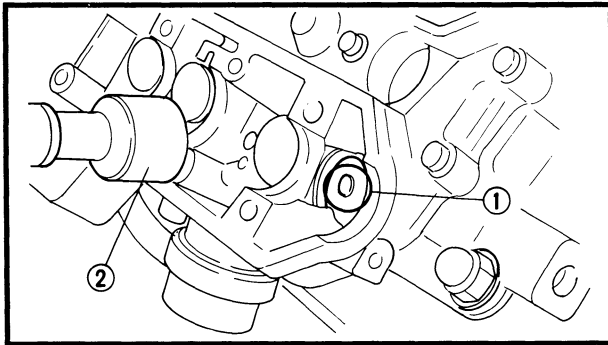
When verifying the valve clearance adjustment use the new pad number only as an approximation. It will be necessary to measure the valve clearance again and if necessary, repeat the above steps.

- Install the new pads ① and the valve lifters ②.

NOTE:

- Apply molybdenum disulfide grease to the pads.
- Lubricate the valve lifters with molybdenum disulfide oil.
- The valve lifters must turn smoothly when rotated by hand.
- Be careful to reinstall the valve lifters and the old pads in their original position.

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



Bolt (camshaft cap):
10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:

- Refer to "ENGINE ASSEMBLY AND ADJUSTMENT – CYLINDER HEAD AND CAMSHAFTS" in CHAPTER 4.
- Lubricate the camshaft bearings, cam lobes and camshaft journals.

VALVE CLEARANCE ADJUSTMENT

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ADJ



INTAKE

B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.03 ~ 0.07			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.08 ~ 0.10		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.11 ~ 0.20	C RECOMMENDED CLEARANCE																								
0.21 ~ 0.22	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.23 ~ 0.27	130	135	140	145	150	155	160	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 (cold):

0.11 ~ 0.20 mm (0.004 ~ 0.008 in)

Installed is 148 (Rounded off number is 150)

Measured clearance is 0.24 mm (0.009 in)

Replace 148 pad with 160 pad

EXHAUST

B MEASURED CLEARANCE	A INSTALLED PAD NUMBER																								
	120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240
0.00 ~ 0.02						120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215
0.03 ~ 0.07					120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220
0.08 ~ 0.12				120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225
0.13 ~ 0.17			120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230
0.18 ~ 0.20		120	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235
0.21 ~ 0.30	C RECOMMENDED CLEARANCE																								
0.31 ~ 0.32	125	130	135	140	145	150	155	160	165	170	175	180	185	190	195	200	205	210	215	220	225	230	235	240	
0.33 ~ 0.37	130	135	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	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															
1.03 ~ 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 (cold):

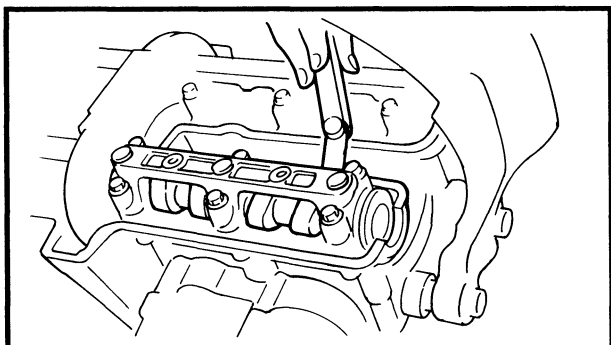
0.21 ~ 0.30 mm (0.008 ~ 0.012 in)

Installed is 175

Measured clearance is 0.35 mm (0.014 in)

Replace 175 pad with 185 pad

VALVE CLEARANCE ADJUSTMENT



- First, install the exhaust camshaft.
- Align the matching marks.
- Rotate the crankshaft counterclockwise several turns so that the installed parts settle into the correct position.

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

16.Install:

- All removed parts

NOTE:

Install all the parts in the reverse order of their removal. Note the following points.

17.Install:

- Timing chain guide (exhaust side)
- Timing chain guide (upper)
- Timing chain tensioner

Refer to "ENGINE ASSEMBLY AND ADJUSTMENT" in CHAPTER 4.

18.Install:

- AC magneto cover



Bolt (AC magneto cover):
12 Nm (1.2 m • kg, 8.7 ft • lb)

19.Install:

- Cylinder head cover
- Spark plugs



Bolt (cylinder head cover):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Spark plug:
12.5 Nm (1.25 m • kg, 9.0 ft • lb)

20.Install:

- Ignition coil plate
- Ignition coil

EB303010

CARBURETOR SYNCHRONIZATION

NOTE: _____

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

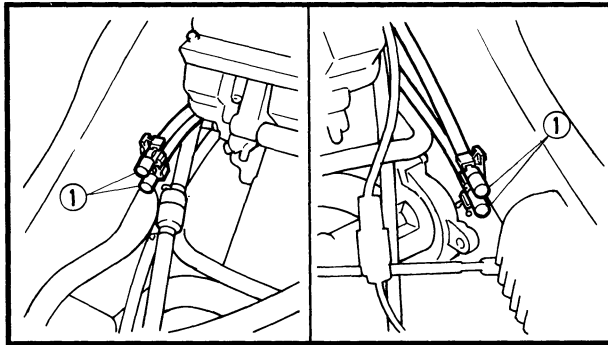
1. Stand the motorcycle on a level surface.

NOTE: _____

Place the motorcycle on a suitable stand.

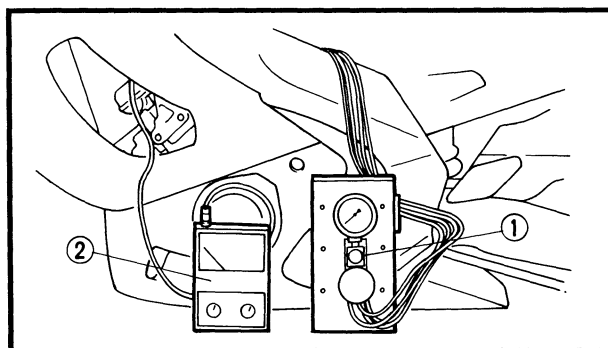
2. Remove:

- Seat
 - Fuel tank
- Refer to "SEAT" and "FUEL TANK".



3. Remove:

- Plugs (vacuum hoses) ①



4. Attach:

- Adapters
- Vacuum gauge ①
- Engine tachometer ②
(to the #1 spark plug lead)



Vacuum gauge:
YU-08030/90890 - 03094
Engine tachometer:
YU-8036-A/90890 - 03113

5. Start the engine and let it warm up for several minutes.

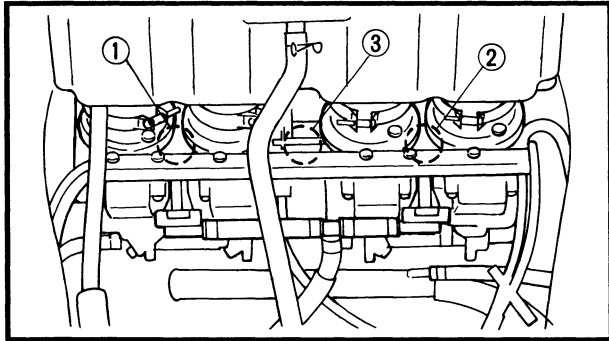
6. Check:

- Engine idling speed
Out of specification → Adjust.
Refer to "IDLING SPEED ADJUSTMENT".



Engine idling speed:
1,200 ~ 1,300 r/min

CARBURETOR SYNCHRONIZATION



7.Adjust:

- Carburetor synchronization

Adjustment steps:

- Synchronize carburetor #1 to carburetor #2 by turning the synchronizing screw ① until both gauges read the same.
- Rev the engine two or three times, each time for less than a second, and check the synchronization again.
- Repeat the above steps and synchronize carburetor #4 to carburetor #3 by turning the synchronizing screw ② until both gauges read the same.
- Repeat the same steps and synchronize carburetor #2 to carburetor #3 by turning the synchronizing screw ③ until both gauges read the same.

**Vacuum pressure at idle speed:
30 kPa (225 mm Hg, 8.86 in Hg)**

NOTE:

The difference between the two carburetors should not exceed 1.33 kPa (10 mm Hg, 0.4 in Hg).

8.Check:

- Engine idling speed
Out of specification → Adjust.

9.Stop the engine and detach the measuring equipment.

10.Adjust:

- Throttle cable free play
Refer to "THROTTLE CABLE ADJUSTMENT".



**Free play:
3 ~ 7 mm (0.12 ~ 0.28 in)
(at the throttle grip flange)**

11.Install:

- Fuel tank
- Seat
- Refer to "FUEL TANK" and "SEAT".

EB303020

IDLING SPEED ADJUSTMENT

NOTE:

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

1. Start the engine and let it warm up for several minutes.

2. Attach:

- Engine tachometer
(to the #1 spark plug lead)



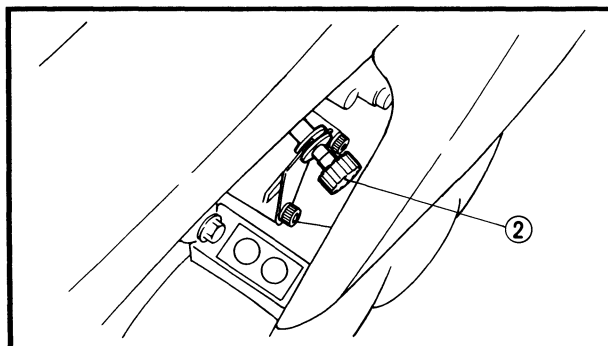
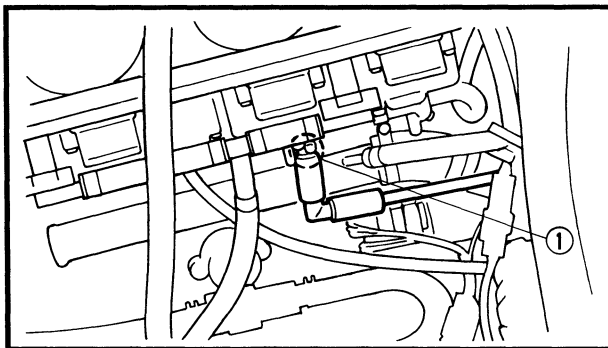
Engine tachometer:
YU-8036-A/90890 - 03113

3. Check:

- Engine idling speed
Out of specification → Adjust.



Engine idling speed:
1,200 ~ 1,300 r/min



4. Adjust:

- Engine idling speed

Adjustment steps:

- Turn the pilot screw ① until it is lightly seated.
- Turn the pilot screw out by the specified number of turns.



Carburetor angle driver:
90890-03158

Pilot screw: 1-3/8 turns out

- Turn the throttle stop screw ② in or out until the specified idling speed is obtained.

Turning in:	Idling speed is increased.
-------------	----------------------------

Turning out:	Idling speed is decreased.
--------------	----------------------------

5.Adjust:

- Throttle cable free play
Refer to "THROTTLE CABLE ADJUSTMENT".



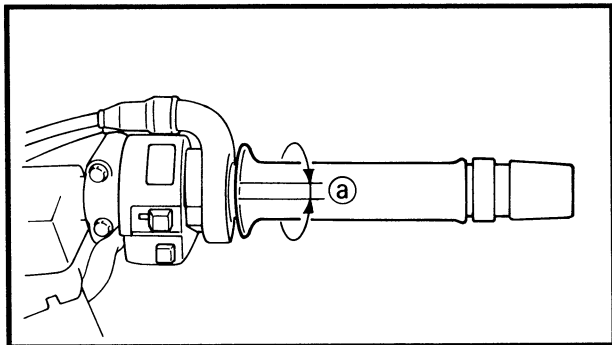
Free play:
3 ~ 7 mm (0.12 ~ 0.28 in)
(at the throttle grip flange)

EB303030

THROTTLE CABLE ADJUSTMENT

NOTE:

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



1.Check:

- Throttle cable free play @
Out of specification → Adjust.

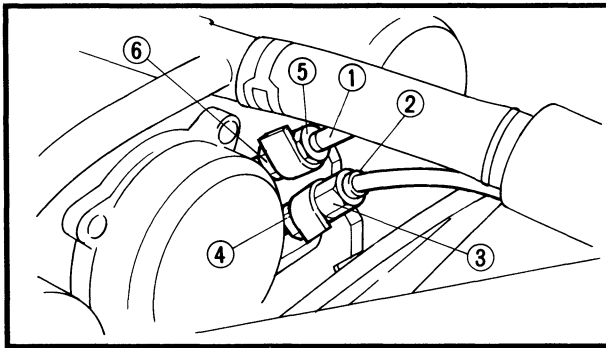


Free play (throttle cable):
3 ~ 7 mm (0.12 ~ 0.28 in)
(at the throttle grip flange)

2.Remove:

- Seat
- Fuel tank
- Air filter case
Refer to "SEAT", "FUEL TANK" and "VALVE CLEARANCE ADJUSTMENT".

THROTTLE CABLE ADJUSTMENT



3.Adjust:

- Throttle cable free play

Adjustment steps:

NOTE: _____
 When the motorcycle is accelerating, throttle cable #1 ① is pulled and throttle cable #2 ② is pushed.

1st step:

- Loosen the locknut ③ on throttle cable #2.
- Turn the adjuster ④ in or out to take up any slack on throttle cable #2.

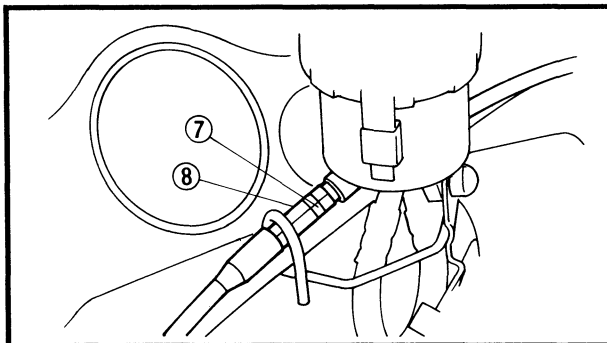
2nd step:

- Loosen the locknut ⑤ on throttle cable #1.
- Turn the adjuster ⑥ in or out until the specified free play is obtained.

Turning in:	Free play is increased.
Turning out:	Free play is decreased.

- Tighten the locknuts.

NOTE: _____
 If the specified free play cannot be obtained on the carburetor end of the cable, use the adjuster on the handlebar end.



Additional step:

- Loosen the locknut ⑦.
- Turn the adjuster ⑧ in or out until the specified free play is obtained.

Turning in:	Free play is increased.
Turning out:	Free play is decreased.

- Tighten the locknut.

⚠ WARNING _____

After adjusting, turn the handlebars to the right and to the left to ensure that this does not cause the engine idling speed to change.

4. Install:

- Air filter case
- Fuel tank
- Seat

Refer to "VALVE CLEARANCE ADJUSTMENT", "FUEL TANK" and "SEAT".

SPARK PLUG INSPECTION

1. Remove:

- Spark plug caps
- Spark plugs

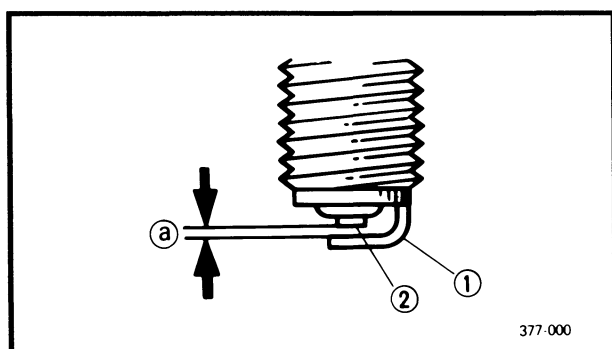
CAUTION

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

2. Check:

- Spark plug type
Incorrect → Replace.

Standard spark plug:
CR9E (NGK)
U27ESR-N (NIPPONDENSO)



3. Inspect:

- Electrode ①
Wear/damage → Replace.
- Insulator ②
Abnormal color → Replace.
Normal color is a medium-to-light tan color.

4. Clean:

- Spark plug
(with a spark plug cleaner or wire brush)

5. Measure:

- Spark plug gap ③
(with a wire gauge)
Out of specification → Adjust gap.




Spark plug gap:
0.7 ~ 0.8 mm (0.28 ~ 0.31 in)



6.Install:

- Spark plug

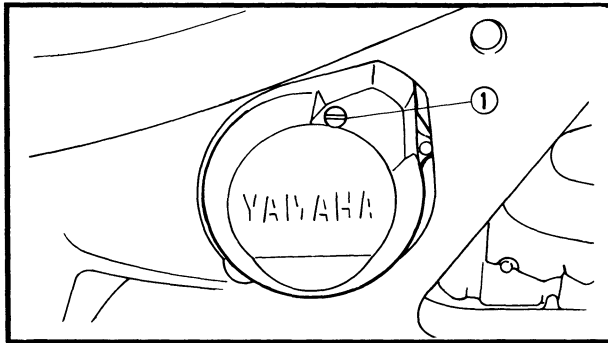
	<p>Spark plug: 12.5 Nm (1.25 m • kg, 9.0 ft • lb)</p>
---	--

NOTE: _____
Before installing a spark plug, clean the gasket surface and the plug surface.

EB303051

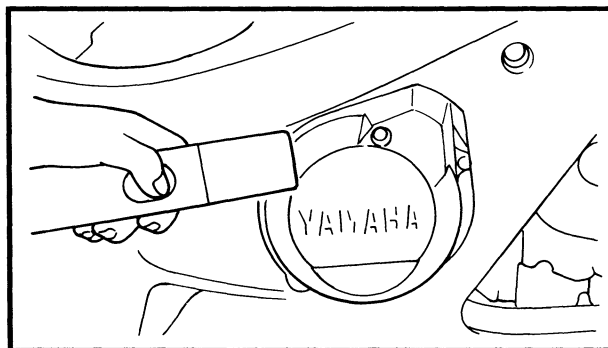
IGNITION TIMING CHECK

NOTE: _____
Prior to checking the ignition timing, check all electrical connections related to the ignition system. Make sure that all connections are tight and free of corrosion and that all ground connections are tight.




1.Remove:

- Timing plug ①



2.Attach:

- Timing light
- Engine tachometer
(to the #1 spark plug lead)


	<p>Timing light: YU-33277-A/90890 - 03141</p> <p>Engine tachometer: YU-8036-A/90890 - 03113</p>
---	---

3.Check:

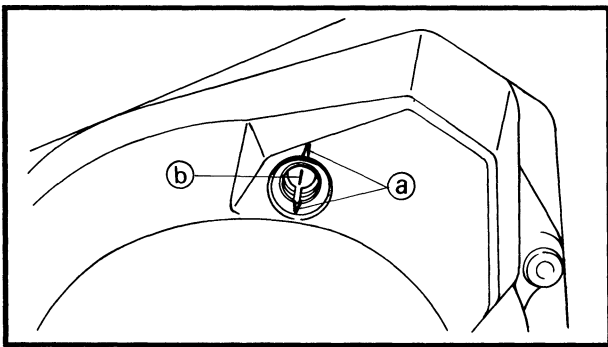
- Ignition timing

Checking steps:

- Start the engine and let it warm up for several minutes. Let the engine run at the specified speed.

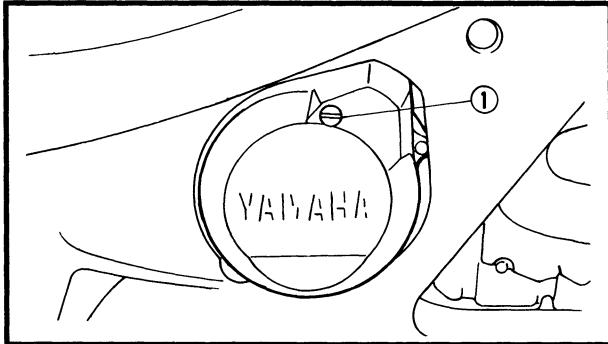
	<p>Engine idling speed: 1,200 ~ 1,300 r/min</p>
---	--

IGNITION TIMING CHECK/ COMPRESSION PRESSURE MEASUREMENT



- Check that the stationary pointer (a) is within the firing range (b) on the AC magneto rotor. Incorrect firing range → Check the ignition system.

NOTE: _____
Ignition timing is not adjustable.



4. Install:
- Timing plug (1)

EB303060

COMPRESSION PRESSURE MEASUREMENT

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

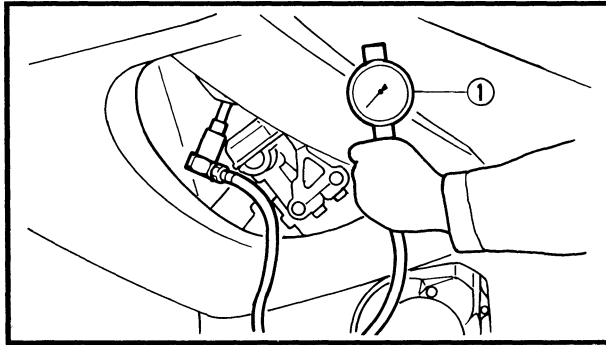
1. Check:
- Valve clearance
Out of specification → Adjust.
Refer to "VALVE CLEARANCE ADJUSTMENT".
2. Start the engine and let it warm up for several minutes.
3. Stop the engine.

4. Remove:
- Spark plug caps
 - Spark plugs

CAUTION

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

COMPRESSION PRESSURE MEASUREMENT



5. Attach:

- Compression gauge ①



Compression gauge:
YU-33223-3/90890 - 03081
Adapter:
90890 - 04082

6. Measure:

- Compression pressure

If it exceeds the maximum pressure allowed → Inspect the cylinder head, valve surfaces and piston crown for carbon deposits.

If it is below the minimum pressure → Squirt a few drops of oil into the affected cylinder and measure again.

- Refer to the table below.

Compression pressure (with oil applied in the cylinder)	
Reading	Diagnosis
Higher than without oil	Worn or damaged pistons → Repair.
Same as without oil	Possible defective ring(s), valves, cylinder head gasket or piston → Repair.

Compression pressure (at sea level)

Standard:

1,550 kPa (15.5 kgf/cm², 220 psi)

Minimum:

1,300 kPa (13.0 kgf/cm², 185 psi)

Maximum:

1,650 kPa (16.5 kgf/cm², 235 psi)

Measurement steps:

- With the throttle wide open crank the engine until the reading on the compression gauge stabilizes.

⚠ WARNING


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

- Repeat the previous steps for the other cylinders.

NOTE: _____
The difference in compression pressure between the highest and lowest cylinder compression readings should not exceed 100 kPa (1 kg/cm², 1 bar).

7. Install:

- Spark plugs
- Spark plug caps

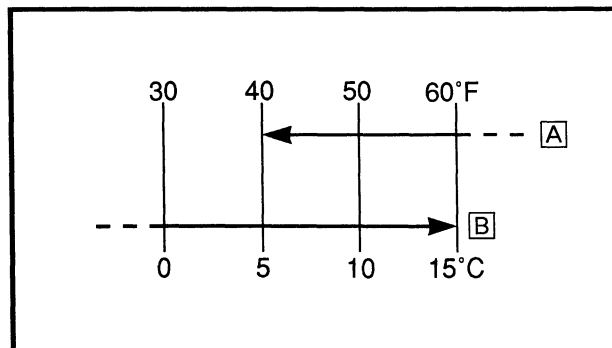
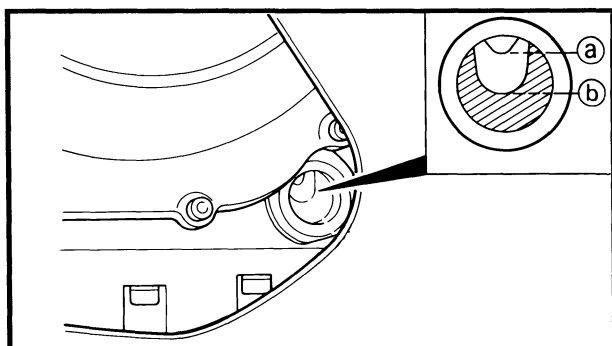
	<p>Spark plug: 12.5 Nm (1.25 m • kg, 9.0 ft • lb)</p>
---	--

EB303070

ENGINE OIL LEVEL INSPECTION


1. Stand the motorcycle on a level surface.

NOTE: _____
● When checking the oil level make sure that the motorcycle is upright.
● Place the motorcycle on a suitable stand.



2. Inspect:

- Oil level
Oil level should be between the maximum (a) and minimum (b) marks.
Oil level is below the minimum mark → Add oil up to the proper level.

	<p>Recommended oil: At 5°C (40°F) or higher [A]: Yamalube 4 (20W40) or SAE 20W40 type SE motor oil At 15°C (60°F) or lower [B]: Yamalube 4 (10W30) or SAE 10W30 type SE motor oil</p>
---	--

CAUTION:

- Do not add any chemical additives. Engine oil also lubricates the clutch and additives could cause clutch slippage.
- Do not allow foreign material to enter the crankcase.

NOTE:

Recommended engine oil classification; API Service "SE", "SF" type or equivalent (e.g. "SF-SE", "SF-SE-CC", "SF-SE-SD" etc.).

3. Start the engine and let it warm up for several minutes.
4. Turn off the engine and check the oil level again.

NOTE:

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

EB303081

ENGINE OIL REPLACEMENT

1. Remove:

- Bottom cowling
- Side cowlings (left and right)
Refer to "COWLINGS".

2. Start the engine and let it warm up for several minutes.

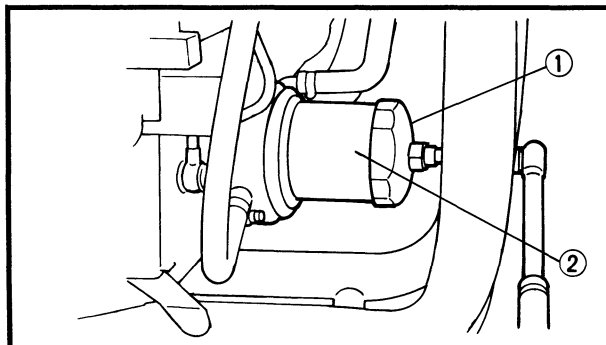
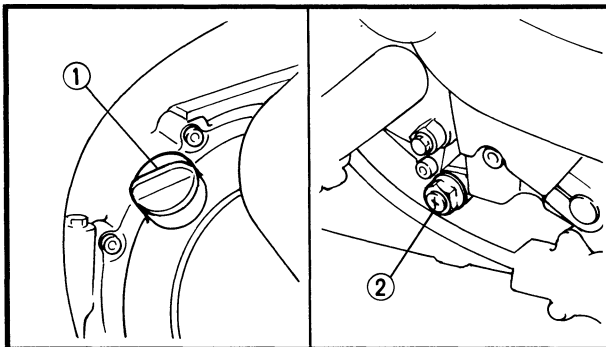
3. Turn off the engine and place a container under the drain bolt.

4. Remove:

- Oil filler cap ①
- Drain bolt ②
(with the gasket)

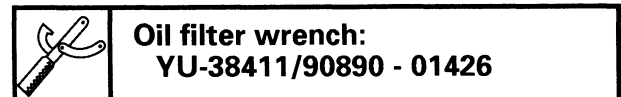
Drain the crankcase of its oil.

5. If the oil filter is to be replaced during this procedure, remove the following parts and reinstall them afterwards.

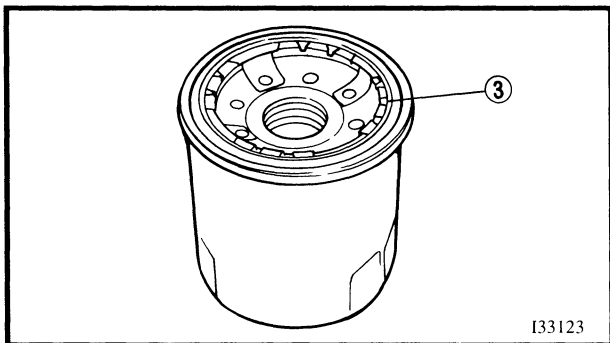


Replacement steps:

- Use an oil filter wrench ① to remove the oil filter ②.

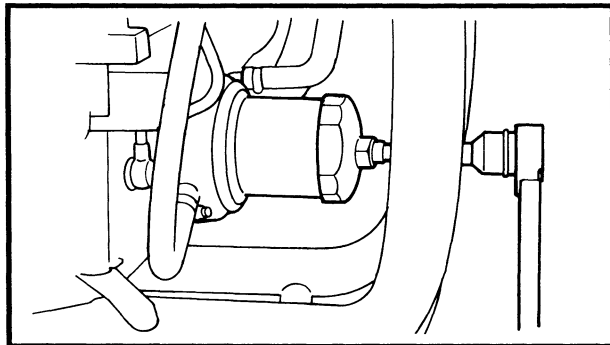


- Apply engine oil to the O-ring ③ of the new oil filter.



CAUTION:

Make sure that the O-ring ③ is positioned correctly.



- Use an oil filter wrench to tighten the new oil filter.

	Oil filter: 17 Nm (1.7 m · kg, 12 ft · lb)
--	---

6. Install:

- Drain bolt

	Drain bolt: 43 Nm (4.3 m · kg, 31 ft · lb)
--	---

NOTE:

Check the drain bolt gasket. If it is damaged, replace it.

7. Fill:

- Crankcase
Refer to "ENGINE OIL LEVEL INSPECTION".

	Oil quantity: Total amount: 3.5 L (3.1 Imp qt, 3.7 US qt) Periodic oil change: 2.6 L (2.3 Imp qt, 2.7 US qt) With oil filter replacement: 2.9 L (2.6 Imp qt, 3.1 US qt)
--	--

8. Install:

- Oil filler cap

9. Warm up the engine for a few minutes, then turn it off.

10. Check:

- Engine (for oil leaks)
- Oil level

11. Install:

- Side cowlings (left and right)
- Bottom cowling
Refer to "COWLINGS".

ENGINE OIL PRESSURE INSPECTION

1. Check:

- Oil level
Oil level low → Add oil to the proper level.

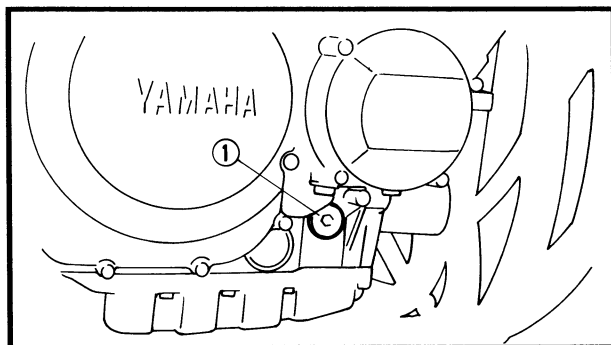
2. Remove:

- Bottom cowling
- Side cowling (right)
Refer to "COWLINGS".

3. Start the engine and let it warm up. Then, stop the engine.

CAUTION:

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

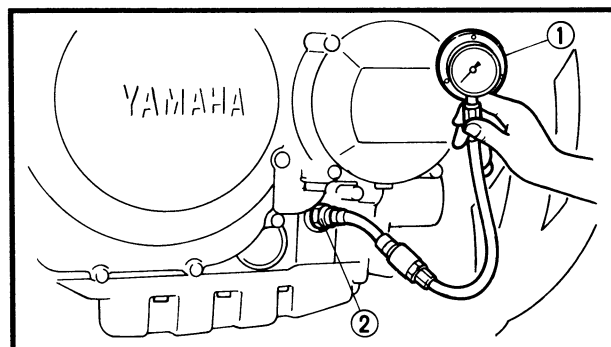


4. Remove:

- Main gallery bolt ①

⚠ WARNING

The engine, muffler or engine oil may be extremely hot.



5. Attach:

- Oil pressure gauge ①
- Adapter ②



Oil pressure gauge:

90890 - 03153

Adapter:

90890 - 03139

6. Measure:

- The oil pressure at the following conditions:



Engine oil pressure:

350 ~ 450 kPa (3.5 ~ 4.5 kg/cm²,
51 ~ 65 psi)

Engine speed:

Approx. 10,000 r/min

Oil temp:

100°C (212°F)

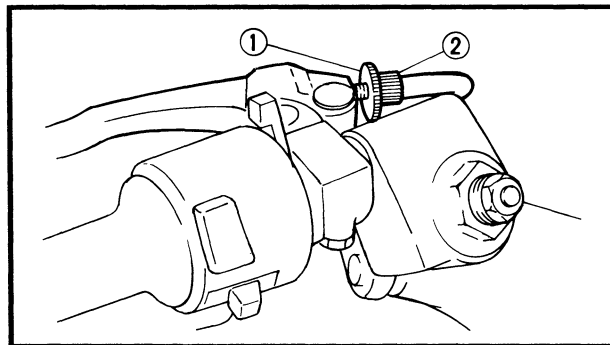
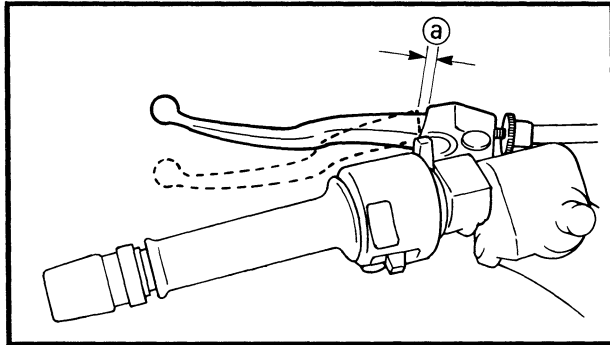
Out of specification → Check the following.

Oil pressure	Possible causes
When the oil pressure is less than the specification.	<ul style="list-style-type: none"> • Faulty oil pump • Clogged oil filter • Leaking oil passage • Broken or damaged oil seal
When the oil pressure is greater than the specification.	<ul style="list-style-type: none"> • Leaking oil passage • Faulty oil filter • Very viscous engine oil

7. Install:

- Main gallery bolt

	Bolt (main gallery): 8 Nm (0.8 m · kg, 5.8 ft · lb)
---	---




EB303091

CLUTCH ADJUSTMENT

Cable free play adjustment

1. Check:

- Clutch cable free play Ⓐ
- Out of specification → Adjust.

	Free play (clutch lever): 2 ~ 3 mm (0.08 ~ 0.12 in) (at the clutch lever pivot)
---	--

2. Adjust:

- Clutch cable free play

Adjustment steps:

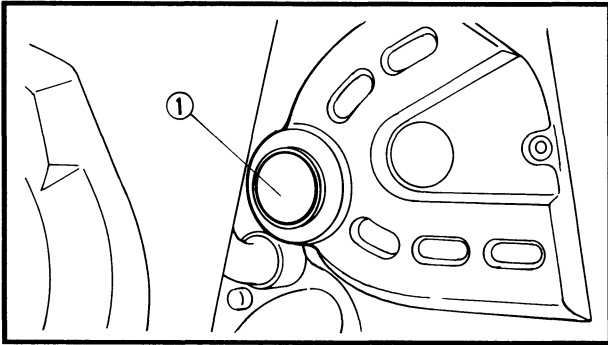
- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified free play is obtained.

Turning in:	Free play is increased.
Turning out:	Free play is decreased.

- Tighten the locknut.

NOTE:

_____ If the specified cable free play cannot be obtained using the above steps, follow the mechanism adjustment procedure described below to achieve the specified free play. _____



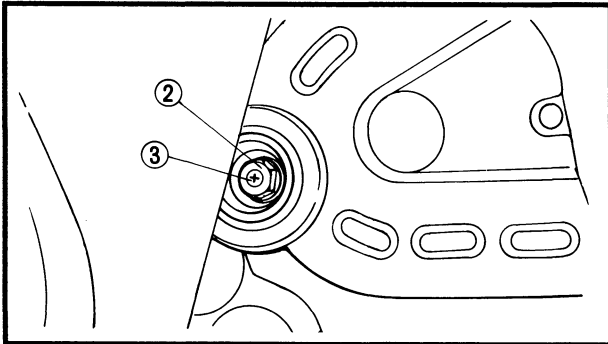
Mechanism adjustment

1.Adjust:

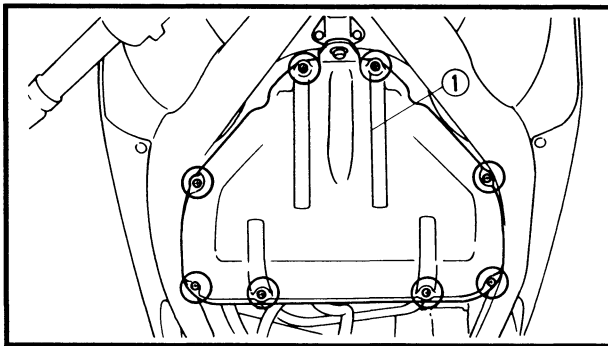
- Clutch cable free play

Adjustment steps:

- Remove the lower cowling and center cowling (left).
- Remove the cover ①.



- Loosen the locknut ②.
- Turn in the adjuster ③ until it is lightly seated.
- Turn the adjuster out 1/4 of a turn.
- Tighten the locknut.
- Check the clutch cable free play again and adjust the free play. Refer to "Cable free play adjustment".

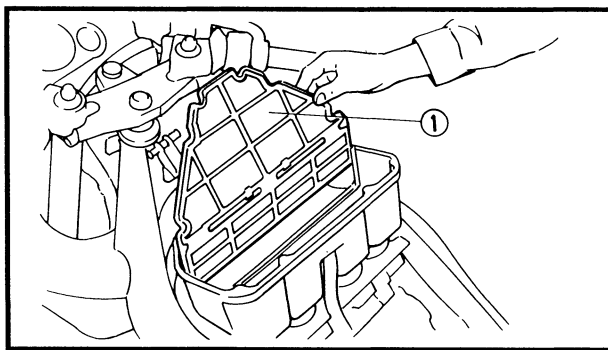


EB303121

AIR FILTER CLEANING

1.Remove:

- Seat
 - Fuel tank
- Refer to "SEAT" and "FUEL TANK".
- Air filter case cover ①

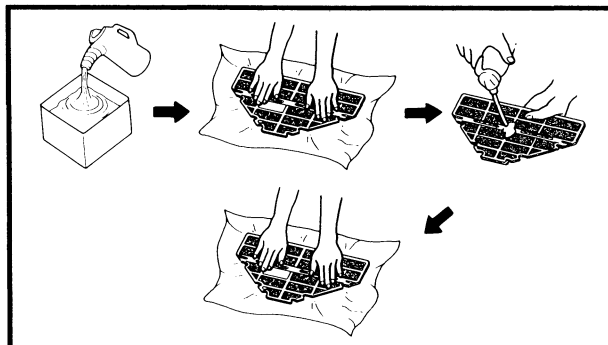


2.Remove:

- Air filter element ①

3.Inspect:

- Air filter element
- Damage → Replace.

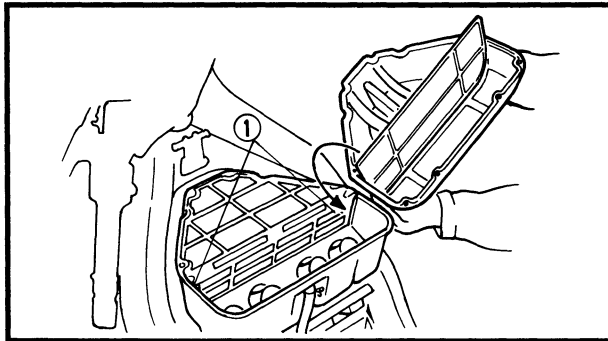


4.Clean:

- Air filter element

Use solvent to clean the air filter element. After cleaning the air filter element, remove the solvent from the air filter element.

- 5.Apply the engine oil to the entire surface of the filter and remove the excess oil. The air filter should be wet but not dripping.



6.Install:

- Air filter element
- Air filter case cover (with the gasket)

NOTE:

- Make sure that the element is properly installed in the filter case.
- The filter screen fits into the slots ① in the air filter case.

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 filter element will also affect the carburetor tuning, leading to poor engine performance and possible overheating.

7.Install:

- Fuel tank
- Seat

Refer to "FUEL TANK" and "SEAT".

SURGE TANK CLEANING

NOTE:

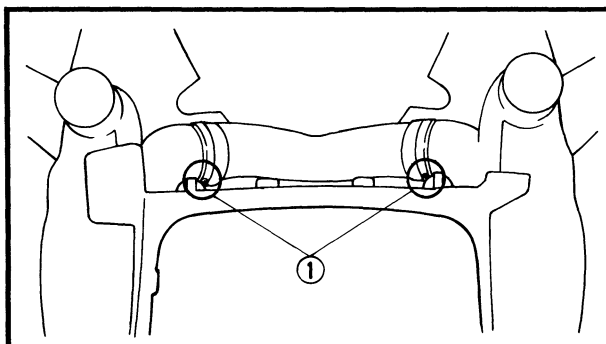
When cleaning the air filter element also clean the surge tanks at the same time.

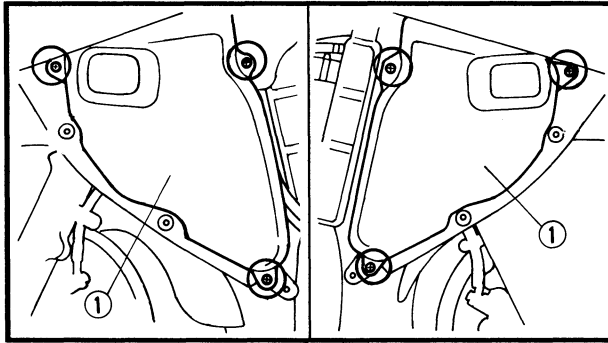
1.Remove:

- Bottom cowling
 - Side cowlings (left and right)
- Refer to "COWLINGS".

2.Loosen:

- Clamp screws ① (on inside of the front cowling assembly)





3.Remove:

- Surge tanks ① (left and right)

4.Clean:

- Surge tanks (left and right)

Cleaning steps:

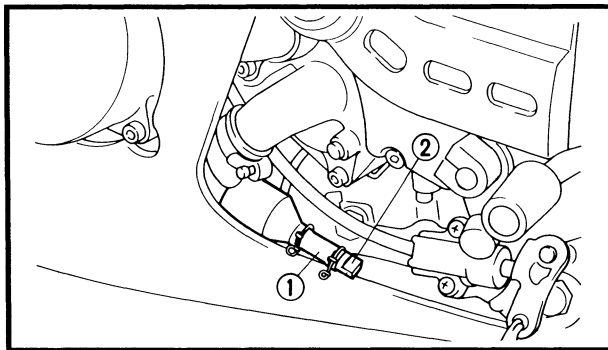
- Thoroughly flush out the left and right surge tanks with clean water.
- Hold the surge tanks upside down to allow the water to drain out.
- Repeat the flushing steps until the excess water is clear and free of debris.
- Place the surge tanks in an upright position to allow any remaining water to drain out of the lower drains.
- Leave the left and right surge tanks upright to allow them to dry sufficiently.

5.Install:

- Surge tanks (left and right)

6.Install:

- Side cowlings (left and right)
 - Bottom cowling
- Refer to "COWLINGS".



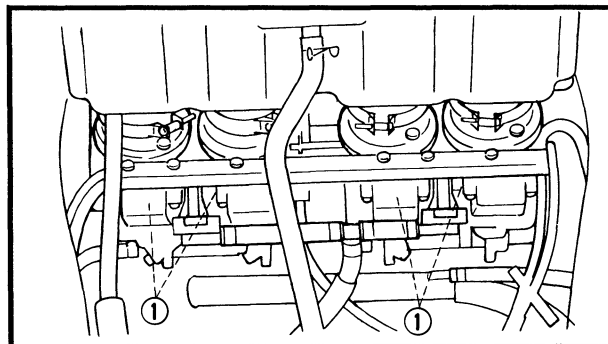
**CARBURETOR AIR VENT DRAIN HOSE
CLEANING**

1.Remove:

- Lower hose ①
 - Drain plug ②
- Drain any water or debris.

2.Install:

- Drain plug
- Lower hose



EB303130

CARBURETOR JOINT INSPECTION

1.Remove:

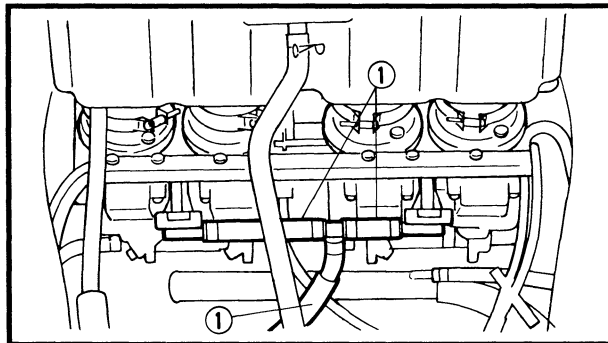
- Seat
 - Fuel tank
- Refer to "SEAT" and "FUEL TANK".

2.Inspect:

- Carburetor joints ①
- Cracks/damage → Replace.
Refer to "CARBURETORS" in CHAPTER 6.

3.Install:

- Fuel tank
 - Seat
- Refer to "FUEL TANK" and "SEAT".



EB303140

FUEL LINE INSPECTION

1.Remove:

- Seat
 - Fuel tank
- Refer to "SEAT" and "FUEL TANK".

2.Inspect:

- Fuel hoses ①
- Cracks/damage → Replace.

3.Install:

- Fuel tank
 - Seat
- Refer to "FUEL TANK" and "SEAT".

EB303150

**CRANKCASE BREATHER HOSE
INSPECTION**

1.Remove:

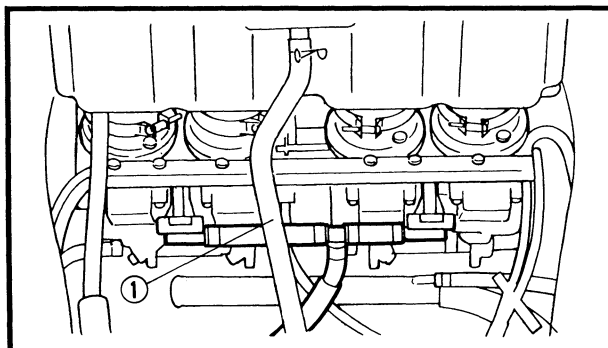
- Seat
 - Fuel tank
- Refer to "SEAT" and "FUEL TANK".

2.Inspection:

- Crankcase breather hose ①
- Cracks/damage → Replace.
Loose connection → Connect properly.

CAUTION:

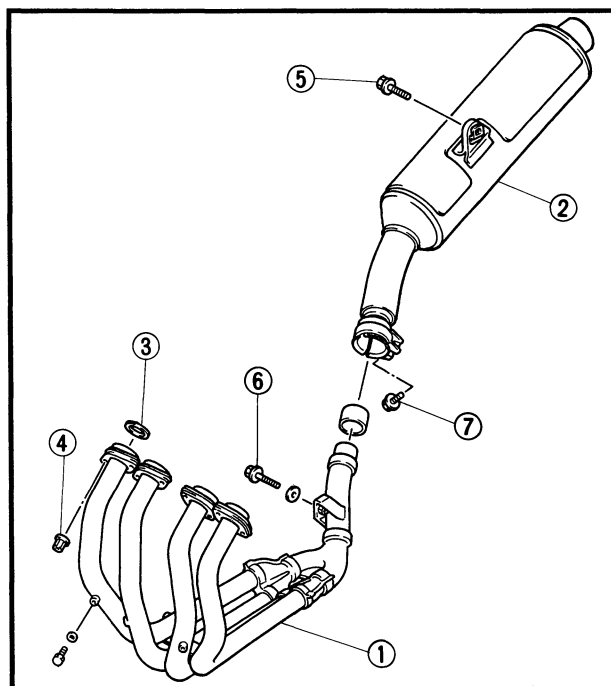
**Make sure that the crankcase breather
hose is routed correctly.**



3. Install:

- Fuel tank
- Seat

Refer to "FUEL TANK" and "SEAT".



EB303160

EXHAUST SYSTEM INSPECTION

1. Remove:

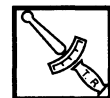
- Bottom cowlings
- Side cowlings (left and right)
Refer to "COWLINGS".

2. Inspect:

- Exhaust pipes ①
- Muffler ②
Cracks/damage → Replace.
- Gaskets ③
Exhaust gas leaks → Replace.

3. Check:

- Tightening torque



Nut (exhaust pipe) ④:
10 Nm (1.0 m • kg, 7.2 ft • lb)
Bolt (muffler and stay) ⑤:
20 Nm (2.0 m • kg, 14 ft • lb)
Bolt (exhaust pipe and stay) ⑥:
20 Nm (2.0 m • kg, 14 ft • lb)
Bolt (exhaust pipe and muffler) ⑦:
20 Nm (2.0 m • kg, 14 ft • lb)

4. Install:

- Side cowlings (left and right)
- Bottom cowlings
Refer to "COWLINGS".

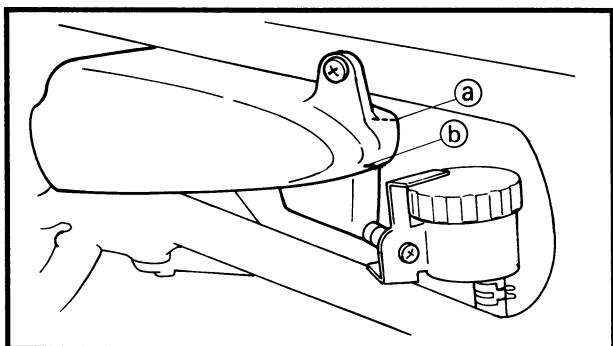
EB303170

COOLANT LEVEL INSPECTION

1. Stand the motorcycle on a level surface.

NOTE: _____

- When checking the coolant level make sure that the motorcycle is upright.
- Place the motorcycle on a suitable stand.



2.Remove:

- Side panel (right)
Refer to "SEAT".

3.Inspect:

- Coolant level
Coolant level should be between the maximum ① and minimum ② marks.
Coolant level is below the "LOWER" level line → Add soft water (tap water) up to the proper level.

CAUTION:

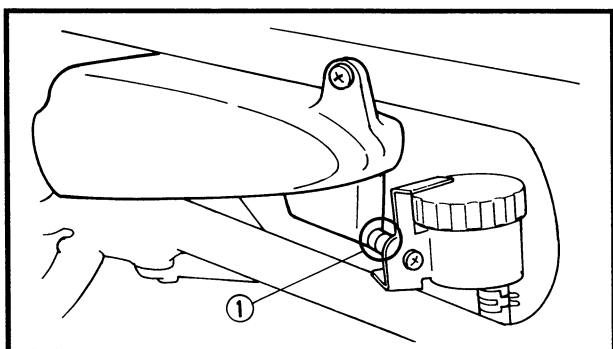
- Hard water or salt water is harmful to engine parts. If soft water is not available use only distilled water.
- If you use tap water, make sure that it is soft water.

4.Start the engine and let it warm up for several minutes.

5.Turn off the engine and check the coolant level again.

NOTE:

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



EB303180

COOLANT REPLACEMENT

1.Remove:

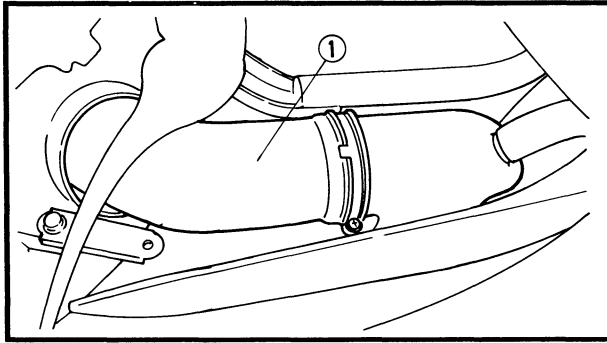
- Side panel (right)
Refer to "SEAT".

2.Disconnect:

- Hose (coolant reservoir) ①
Drain the coolant reservoir.

3.Remove:

- Seat
- Fuel tank
- Air filter case
- Bottom cowling
- Side cowlings (left and right)
Refer to "SEAT", "FUEL TANK" and "VALVE CLEARANCE ADJUSTMENT".

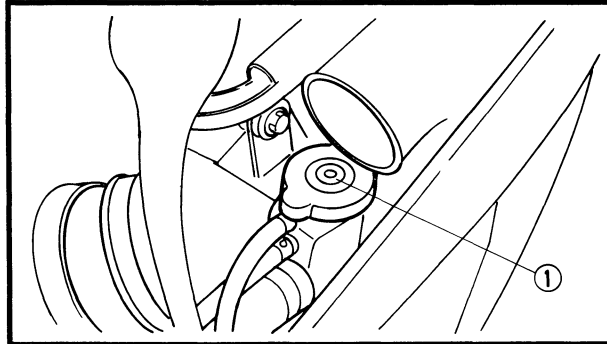


4. Loosen:

- Clamp screw (right air intake duct)

NOTE:

Slide the right air intake duct ① back towards the carburetor assembly.



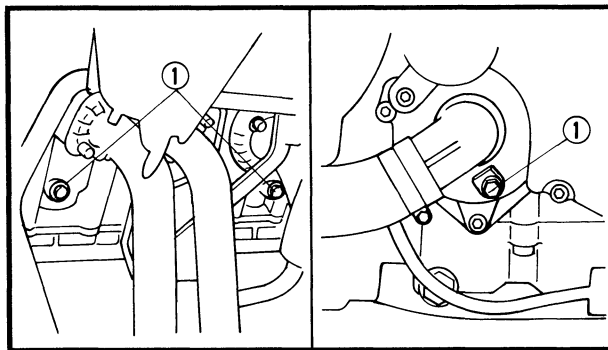
5. Remove:

- Radiator cap ①

⚠ WARNING

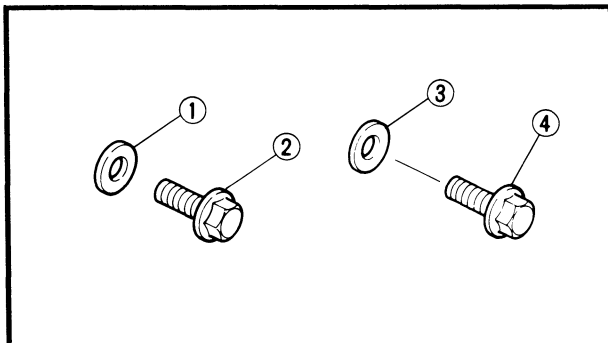
Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, open the radiator cap as follows:

Place a thick rag or a towel over the radiator cap. Slowly rotate the cap counterclockwise toward the detent. This allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.



6. Remove:

- Drain bolts (cylinder ① and water pump ②)
(with the copper washers)
Drain the engine and radiator of its coolant.



7. Inspect:

- Copper washer ① (cylinder drain bolt ②)
- Copper washer ③ (water pump drain bolt ④)
Damage → Replace.

COOLANT REPLACEMENT



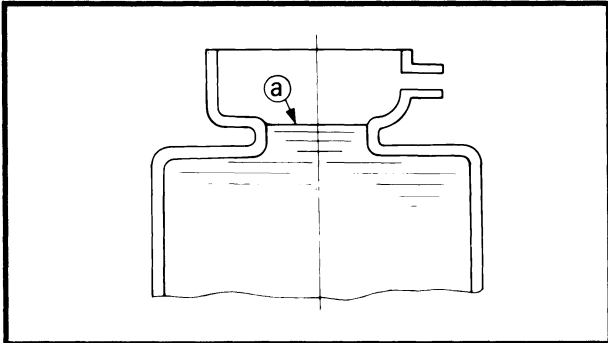
8.Install:

- Drain bolts

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


9.Connect:

- Coolant reservoir hose



10.Fill:

- Cooling system (radiator and engine)
(to the specified level @)

	Recommended coolant: High quality ethylene glycol anti-freeze containing corrosion inhibitors for aluminum engines
	Coolant and water mix ratio: 50% - 50%
	Cooling system total capacity: 1.95 L (1.72 Imp qt, 2.06 US qt)
	Coolant reservoir capacity: 0.55 L (0.48 Imp qt, 0.58 US qt)
	From lower to upper level: 0.25 L (0.22 Imp qt, 0.26 US qt)

Handling notes for coolant:

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

⚠ WARNING

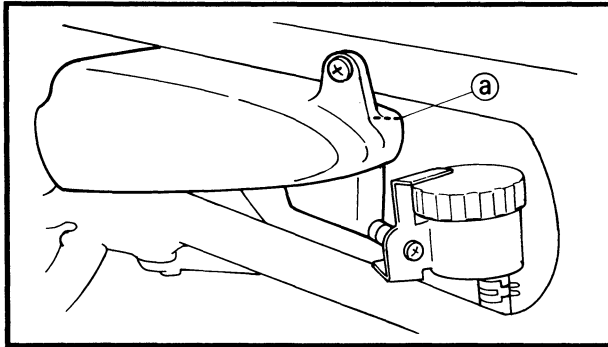
- If coolant splashes in your eyes: thoroughly wash your eyes with water and consult a doctor.
- If coolant splashes on your clothes: quickly wash it away with water and then with both soap and water.
- If coolant is swallowed: induce vomiting and get immediate medical attention.

CAUTION:

- Hard water or salt water is harmful to engine parts. If soft water is not available use only distilled water.
- If you use tap water, make sure that it is soft water.
- Do not use water containing impurities or oil.
- If coolant comes into contact with painted surfaces, immediately wash them with water.
- Do not mix different types of ethylene glycol antifreeze containing corrosion inhibitors for aluminium engines.

11. Install:

- Radiator cap



12. Fill:

- Coolant reservoir (to the upper level mark Ⓐ)

13. Install:

- Coolant reservoir cap

14. Start the engine and let it warm up for several minutes.

15. Turn off the engine and inspect the coolant level.

Refer to "COOLANT LEVEL INSPECTION".

NOTE:

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

16. Tighten:

- Screw (right air intake duct)

17. Install:

- Air filter case
- Fuel tank
- Seat

Refer to "VALVE CLEARANCE ADJUSTMENT", "FUEL TANK" and "SEAT".

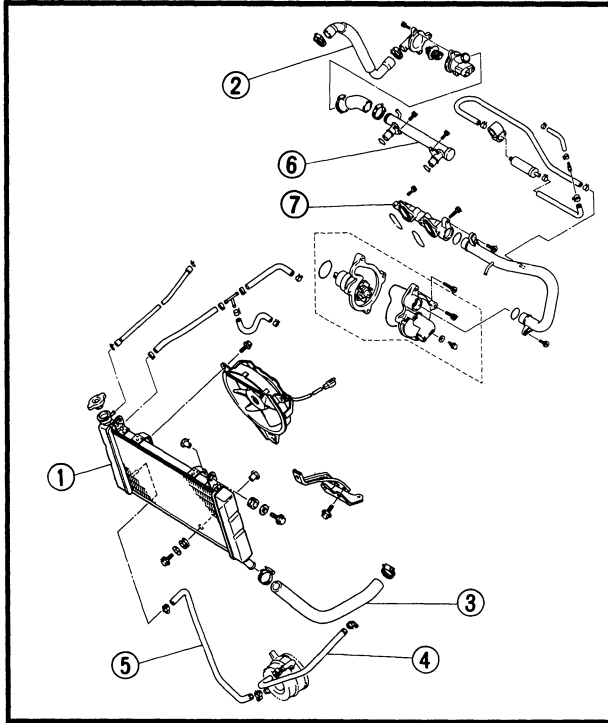
EB303190

COOLING SYSTEM INSPECTION

1.Remove:

- Seat
- Fuel tank
- Side cowlings (left and right)
- Front cowling assembly

Refer to "SEAT", "FUEL TANK" and "COWLINGS".



2.Inspect:

- Radiator ①
- Radiator hose (inlet) ②
- Radiator hose (outlet) ③
- Oil cooler hose (inlet) ④
- Oil cooler hose (outlet) ⑤
- Water jacket joint (outlet) ⑥
- Water jacket joint (inlet) ⑦

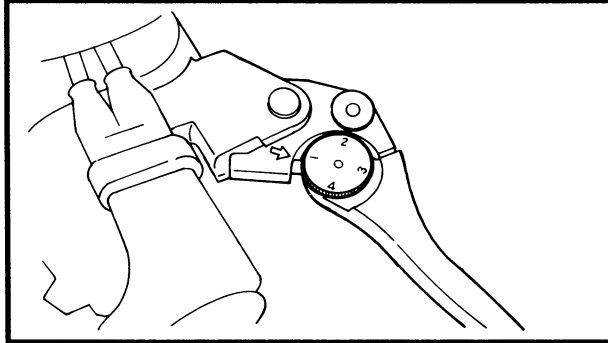
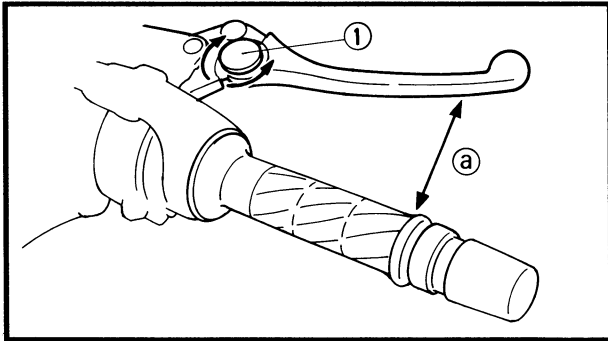
Cracks/damage → Replace.

Refer to "COOLING SYSTEM" in CHAPTER 5.

3.Install:

- Front cowling assembly
- Side cowlings (left and right)
- Fuel tank
- Seat

Refer to "COWLINGS", "FUEL TANK" and "SEAT".



EB304001

CHASSIS

FRONT BRAKE ADJUSTMENT

1.Adjust:

- Brake lever position
(distance ② from the handlebar grip to the front brake lever)

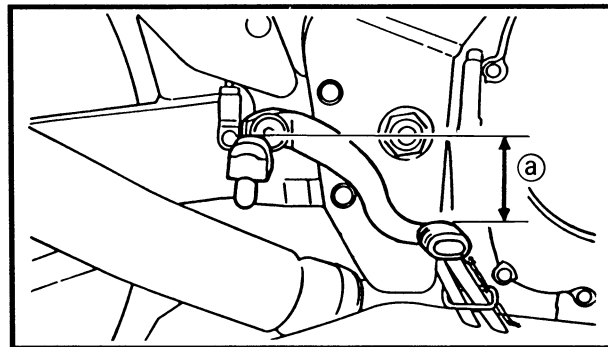
Adjustment steps:

- Turn the adjuster ① while pushing the front brake lever forward until the lever is in the desired position.

Adjuster position #1:	Brake lever distance ② is the largest.
Adjuster position #4:	Brake lever distance ② is the smallest.

⚠ WARNING

After adjusting the front brake lever position (distance), make sure that the pin on the brake lever holder is firmly inserted into the hole in the adjuster.




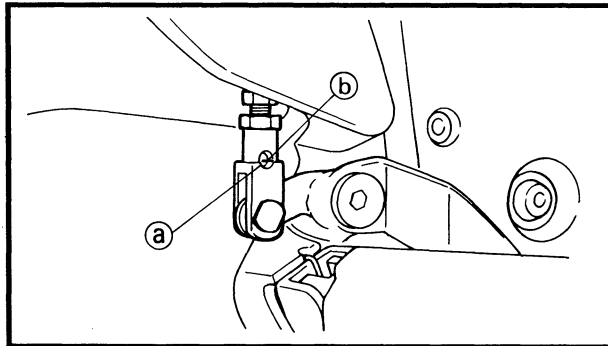
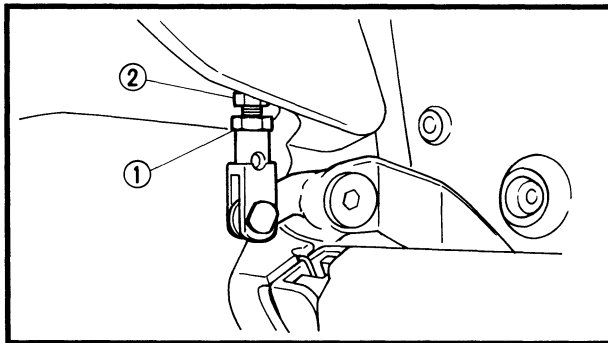
EB304010

REAR BRAKE ADJUSTMENT

1.Check:

- Brake pedal height ②
Out of specification → Adjust.

	Brake pedal height: 42 mm (1.7 in) (below the top of the footrest)
---	---



- 2.Adjust:
- Brake pedal height

Adjustment steps:


- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified pedal height is obtained.

Turning in:	Brake pedal height is decreased.
Turning out:	Brake pedal height is increased.

⚠ WARNING

After adjusting the brake pedal height, check that the adjuster end (b) is visible through the hole (a).

- Tighten the locknut ①.

	Locknut: 26 Nm (2.6 m · kg, 19 ft · lb)
---	---

CAUTION

After adjusting the brake pedal height make sure that there is no brake drag.

⚠ WARNING

A soft or spongy feeling in the brake pedal can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the motorcycle is operated. Air in the brake system will considerably reduce braking performance and can result in loss of control and possibly an accident. Inspect and if necessary bleed the brake system.

- 3.Adjust:
- Brake light switch

Refer to "BRAKE LIGHT SWITCH ADJUSTMENT".

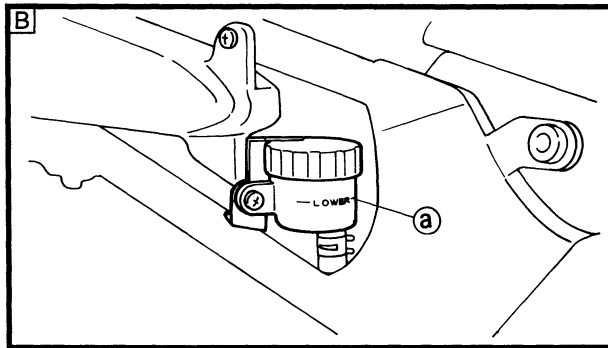
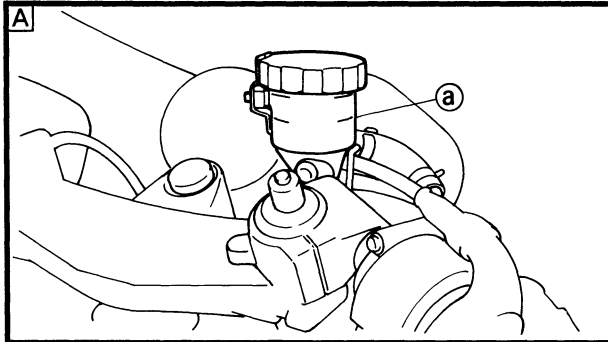
EB304020

BRAKE FLUID LEVEL INSPECTION

1. Stand the motorcycle on a level surface.

NOTE:

- When checking the brake fluid level make sure that the motorcycle is upright.
- Place the motorcycle on a suitable stand.



2. Remove:

- Side panel (right)
Refer to "SEAT".

3. Inspect:

- Brake fluid level
Brake fluid level is below the "LOWER" level line (a) → Fill to the proper level.



Recommended brake fluid:
DOT 4

- A** Front brake
- B** Rear brake

NOTE:

For a correct reading of the brake fluid level, make sure that the top of the handle-bar brake reservoir is horizontal.

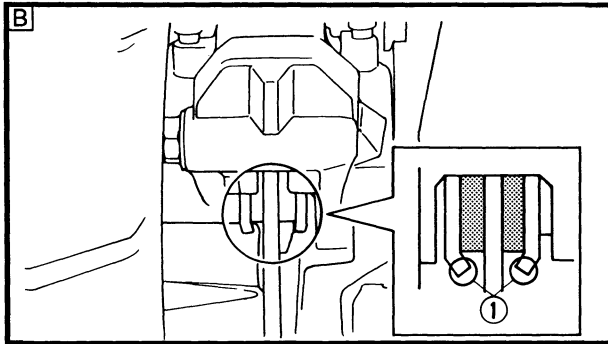
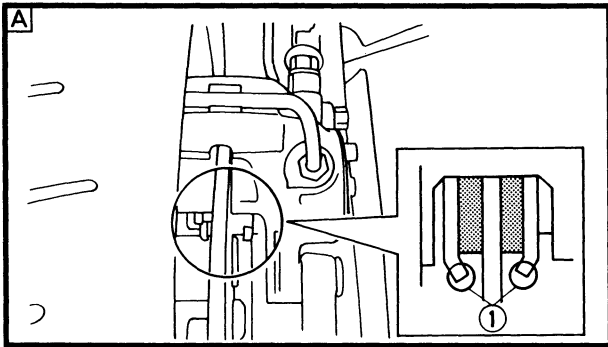
CAUTION:

Brake fluid may corrode painted surfaces or plastic parts. Always clean up any spilled fluid immediately.

⚠ WARNING

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

BRAKE PAD INSPECTION/ BRAKE LIGHT SWITCH ADJUSTMENT



EB304030

BRAKE PAD INSPECTION

1. Operate the brake lever or brake pedal.
2. Inspect:
 - Brake pad (front)
 - Brake pad (rear)
 Wear indicators ① almost touch the brake disc → Replace the brake pads as a set.
 Refer to "FRONT AND REAR BRAKES" in CHAPTER 7.

Ⓐ Front

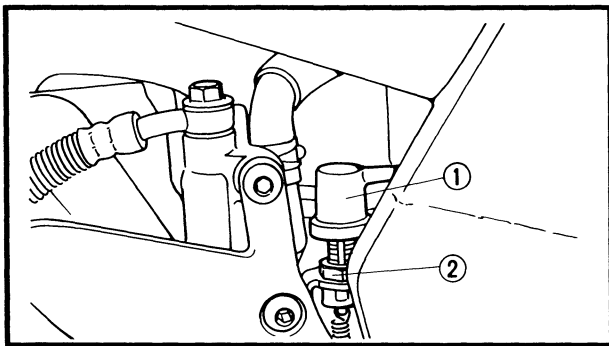
Ⓑ Rear

EB304050

BRAKE LIGHT SWITCH ADJUSTMENT

NOTE:

- The brake light switch is operated by movement of the brake pedal.
- Adjustment is correct when the brake light comes on just before the braking effect actually starts.



1. Check:

- Brake light operation timing
Incorrect → Adjust.

2. Adjust:

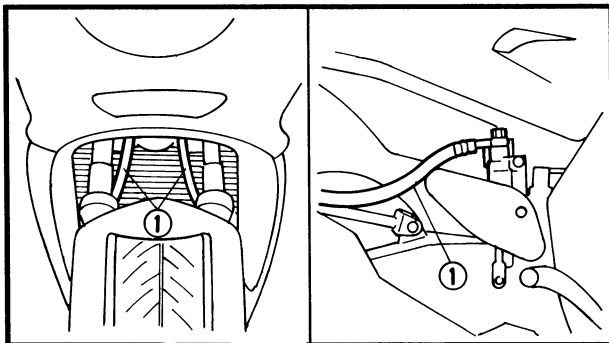
- Brake light operating timing

Adjustment steps:

- Hold the main body ① of the switch so that it does not rotate, and turn the adjuster ② in or out until the proper operation timing is obtained.

Turning in:	Brake light comes on sooner.
Turning out:	Brake light comes on later.

BRAKE HOSE INSPECTION/ AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)



EB304060

BRAKE HOSE INSPECTION

1. Inspect:
 - Brake hoses ①
Cracks/wear/damage → Replace.
2. Check:
 - Brake hose clamp
Loose → Tighten.
3. Hold the motorcycle upright and apply the front or rear brake.
4. Check:
 - Brake hoses
Activate the brake lever or pedal several times.
Brake fluid leakage → Replace the faulty hose.

EB304070

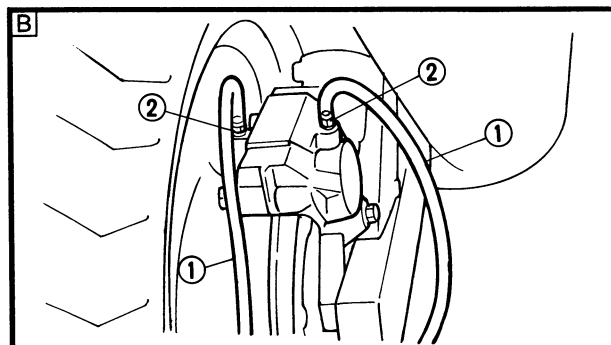
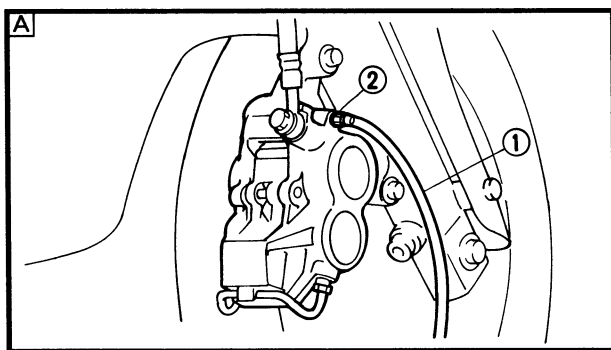
AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)

⚠ WARNING

Bleed the brake system whenever:

- The system is disassembled.
- A brake hose is loosened or removed.
- The brake fluid level is very low.
- Brake operation is faulty.

If the brake system is not properly bled, a loss of braking performance may occur.



1. Bleed:

- Brake system

Air bleeding steps:

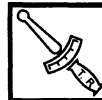
- a. Fill the brake reservoir with the proper brake fluid.
- b. Install the diaphragm. Be careful not to spill any fluid or allow the brake reservoir to overflow.
- c. Connect a clear plastic hose ① tightly to the caliper bleed screw ②.
- Ⓐ Front
Ⓑ Rear
- d. Place the other end of the hose into a container.
- e. Slowly apply the brake lever or pedal several times.

- f. Pull the lever in or push down on the pedal. Hold the lever or pedal in position.
- g. Loosen the bleed screw and allow the lever or pedal to travel towards its limit.
- h. Tighten the bleed screw when the lever or pedal limit has been reached, then release the lever or pedal.
- i. Repeat steps (e) to (h) until all the air bubbles have disappeared from the brake fluid.

NOTE: _____

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

- j. Tighten the bleed screw.



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

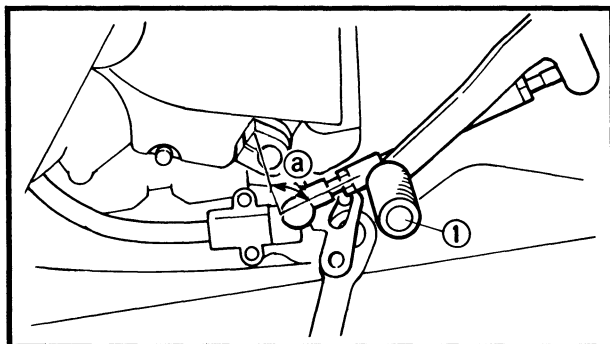
NOTE: _____

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 brake system have disappeared.

- k. Fill the brake reservoir to the proper level. Refer to "BRAKE FLUID LEVEL INSPECTION".

⚠ WARNING _____

After bleeding the brake system check the brake operation.



EB304080

SHIFT PEDAL ADJUSTMENT

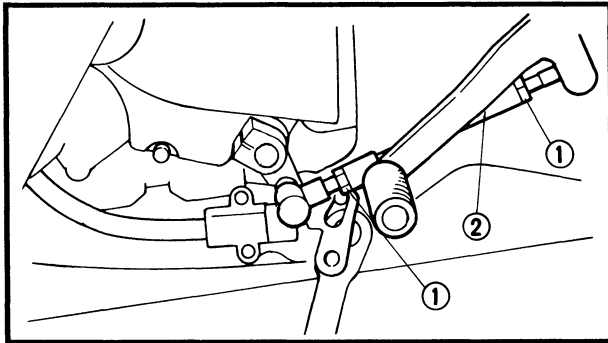
- 1. Check:

- Shift pedal position

Check that the end ① of the shift pedal is above the shift pedal link. (Angle ② should be approximately 90°.)

Incorrect position → Adjust.

SHIFT PEDAL ADJUSTMENT/ DRIVE CHAIN SLACK ADJUSTMENT



- 2.Adjust:
- Shift pedal position

Adjustment steps:

- Loosen both locknuts ①.
- Turn the shift pedal link ② in or out to obtain the correct pedal position.

Turning in:	Shift pedal is raised.
Turning out:	Shift pedal is lowered.

- Tighten both locknuts.

EB304090

DRIVE CHAIN SLACK ADJUSTMENT

NOTE:

Before checking and adjusting the drive chain slack rotate the rear wheel several revolutions. Check the slack at several points to find the tightest point. At the tightest position check the drive chain slack and if necessary, adjust it.

CAUTION:

Too little chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

⚠ WARNING

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

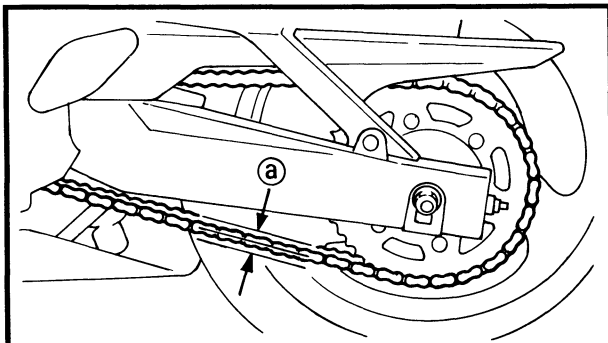
- 1.Place the motorcycle on a suitable stand.

NOTE:

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

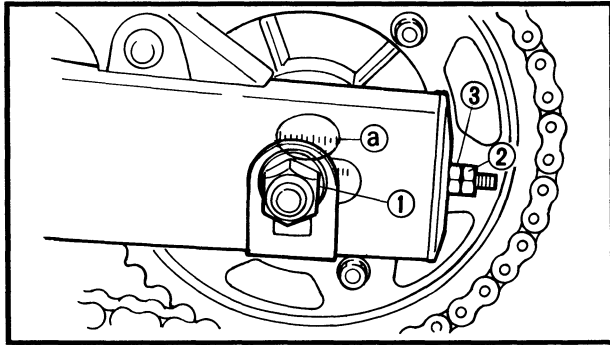
- 2.Check:

- Drive chain slack ②
Out of specification → Adjust.



	Drive chain slack: 20 ~ 30 mm (0.8 ~ 1.2 in)
--	--

DRIVE CHAIN SLACK ADJUSTMENT



3. Loosen:

- Axle nut ①

4. Adjust:

- Drive chain slack


Adjustment steps:

- Loosen both locknuts ②.
- Turn the adjuster ③ in or out until the specified drive chain slack is obtained.


Turning in:	Drive chain slack is decreased.
Turning out:	Drive chain slack is increased.

NOTE:

- To maintain the correct axle alignment turn each adjuster exactly the same amount. (There are marks ⓐ on each side of the swingarm. When adjusting the slack for the proper alignment use these marks as reference points.)
- Before tightening the axle nut to specification, make sure that there is no clearance at the adjuster or the swingarm end on both sides. Push the wheel forward to check for any clearances.

	Axle nut: 117 Nm (11.7 m • kg, 85 ft • lb)
---	--

- Tighten the locknuts.

	Locknut: 16 Nm (1.6 m • kg, 11 ft • lb)
---	---



EB304100

DRIVE CHAIN LUBRICATION

The drive chain consists of many interacting parts. If the chain is not maintained properly, it will wear out rapidly. Therefore, the drive chain should be serviced periodically. This service is necessary especially when the motorcycle is used in dusty areas. This motorcycle has a drive chain with small rubber O-rings between each chain plate. Steam cleaning, high-pressure washing, and certain solvents can damage these O-rings. Use only kerosene to clean the drive chain. Wipe it dry and thoroughly lubricate it with SAE 30 ~ 50W motor oil. Do not use any other lubricants on the drive chain. They may contain solvents that could damage the O-rings.



Recommended lubricant:

SAE 30 ~ 50W motor oil or chain lubricant suitable for O-ring chains.

EB304130

STEERING HEAD INSPECTION

⚠ WARNING

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

1. Stand the motorcycle on a level surface.
2. Remove:

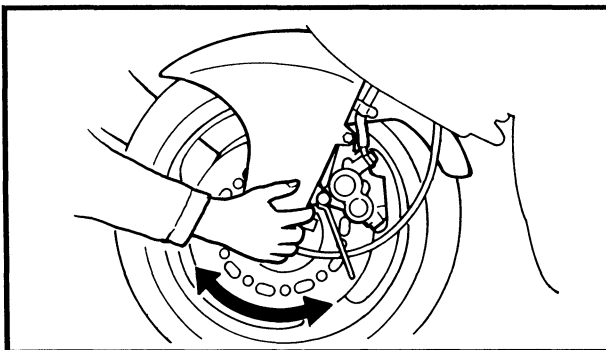
- Bottom cowling
- Side cowlings (left and right)
Refer to "COWLINGS".

NOTE:

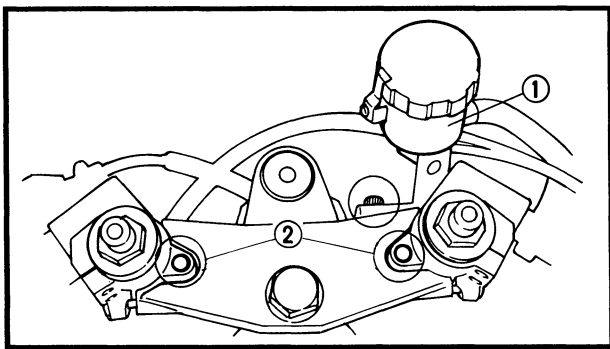
Place the motorcycle on a suitable stand so that the front wheel is elevated.

3. Check:

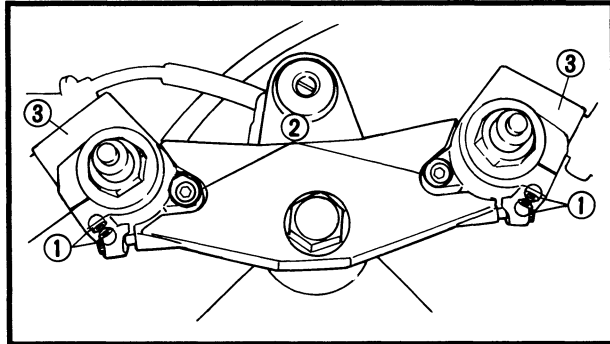
- Steering assembly bearings
Grasp the bottom of the lower front fork tubes and gently rock the fork assembly.
Looseness → Adjust the steering head.



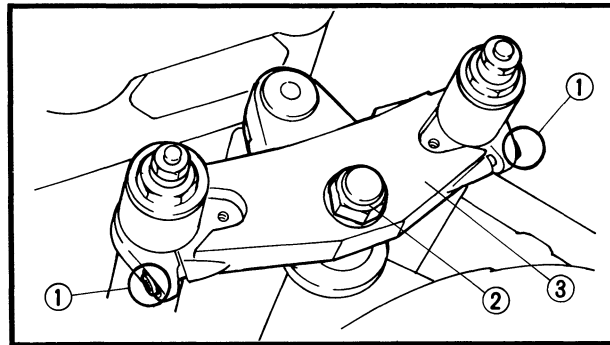
STEERING HEAD INSPECTION



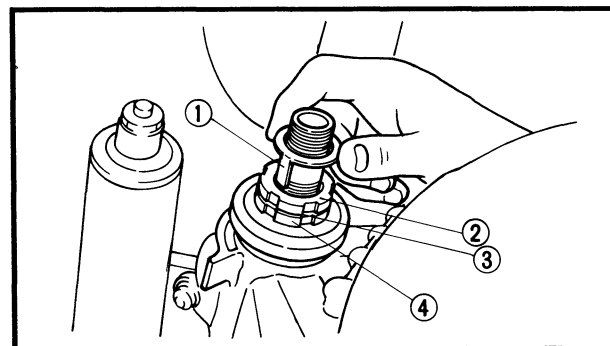
- 4.Remove:
- Brake reservoir ①
 - Blind plugs ②



- 5.Loosen:
- Pinch bolts (handlebar boss) ①
- 6.Remove:
- Bolts (handlebar) ②
 - Handlebars ③



- 7.Loosen:
- Pinch bolts (upper bracket) ①
- 8.Remove:
- Nut (upper bracket) ②
 - Washer
 - Upper bracket ③

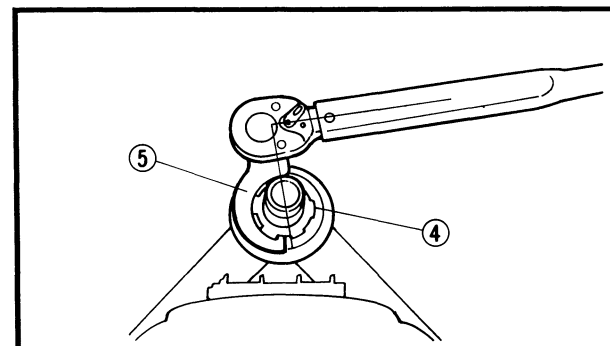


- 9.Adjust:
- Steering head
- *****

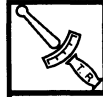
Adjustment steps:

- Remove the special washer ①, the upper ring nut ② and the rubber washer ③.
- Loosen the lower ring nut ④.
- Use a ring nut wrench ⑤ to tighten the lower ring nut.

NOTE: _____
 Set the torque wrench at a right angle to the ring nut wrench.



	<p>Ring nut wrench: YU-33975/90890 - 01403</p>
--	--



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

- Loosen the lower ring nut ④ completely, then tighten it to specification.

⚠ WARNING

Do not overtighten the ring nut.

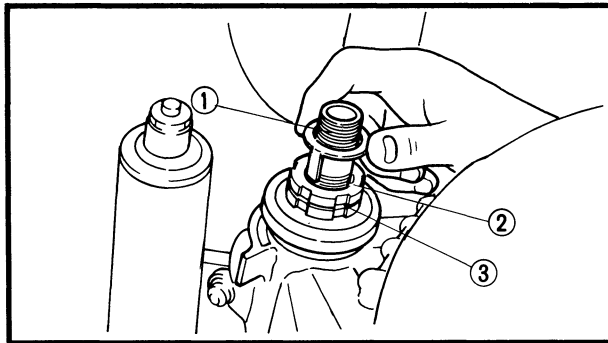


**Lower ring nut:
(final tightening):
3 Nm (0.3 m • kg, 2.2 ft • lb)**

- Check the steering head for looseness or binding by turning it all the way, in both directions. If it binds, remove the steering stem assembly and inspect the steering bearings.

Refer to "STEERING HEAD AND HANDLEBARS" in CHAPTER 7.

- Install the rubber washer ③.
- Install the upper ring nut ②.
- Finger tighten the upper ring nut ②, then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.
- Install the special washer ①.



NOTE:

Make sure that the special washer tabs sit correctly in the ring nut slots.

10. Install:

- Upper bracket
- Handlebars



**Nut: (upper bracket)
110 Nm (11.0 m • kg, 80 ft • lb)**
**Bolt (handlebar):
13 Nm (1.3 m • kg, 9.4 ft • lb)**
**Pinch bolt (upper bracket):
30 Nm (3.0 m • kg, 22 ft • lb)**
**Pinch bolt (handlebar boss):
13 Nm (1.3 m • kg, 9.4 ft • lb)**

11. Install:

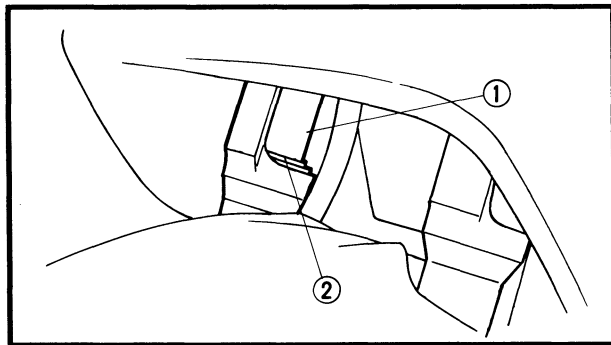
- Brake reservoir
 - Bottom cowling
 - Side cowlings (left and right)
- Refer to "COWLINGS".

FRONT FORK INSPECTION

⚠ WARNING

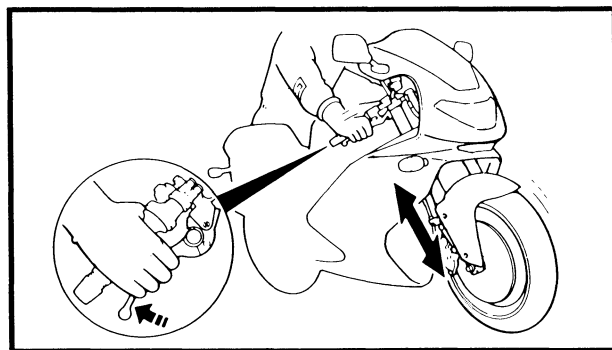
Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on a level surface.



2. Check:

- Inner tube ①
Bends/scratches/damage → Replace.
- Oil seal ②
Excessive oil leakage → Replace.



3. Hold the motorcycle in an upright position and apply the front brake.

4. Check:

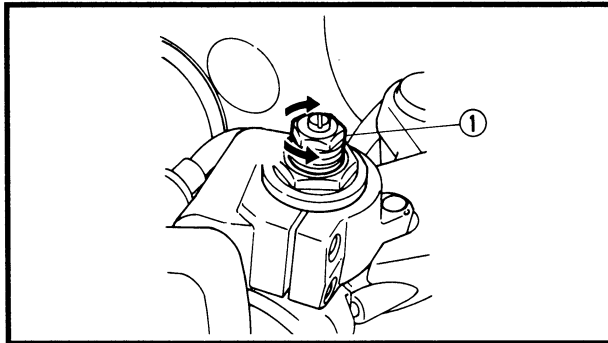
- Operation
Pump the front fork up and down several times.
Unsmooth → Repair.
Refer to "FRONT FORKS" in CHAPTER 7.

EB304150

FRONT FORK ADJUSTMENT

⚠ WARNING

- Always apply the same adjustment to each fork leg. Uneven adjustment can result in poor handling and a loss of stability.
- Securely support the motorcycle so that there is no danger of it falling over.



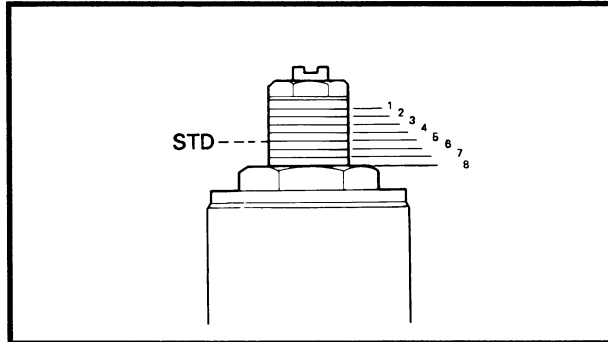
Spring preload

1.Adjust:

- Spring preload

Turn the spring preload adjuster ① in or out.

Turning in:	Spring preload is increased.
Turning out:	Spring preload is decreased.



Adjuster position:

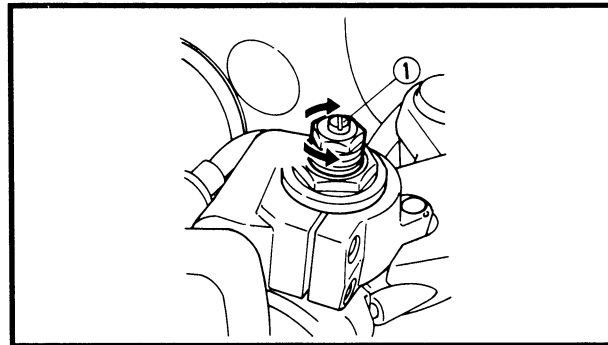
Standard: 5

Minimum: 8

Maximum: 1

CAUTION:

- Grooves are provided to indicate the adjustment position.
- Make sure that each fork leg is adjusted to the same position.
- Never turn the spring preload adjuster beyond the maximum or minimum adjustment positions.



Rebound damping

1.Adjust:

- Rebound damping

Turn the rebound damping force adjusting screw ① in or out.

Turning in:	Rebound damping is increased.
Turning out:	Rebound damping is decreased.

Adjuster position:

Standard: 7 clicks out *

Minimum: 12 clicks out *

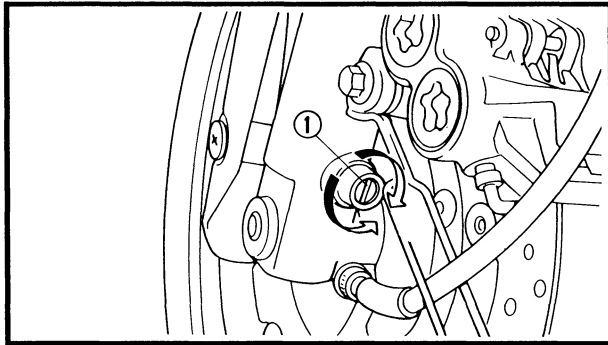
Maximum: 1 click out *

* : From the fully turned in position.

CAUTION:

- Make sure that each fork leg is adjusted to the same position.
- Never turn the rebound damping force adjusting screw beyond the maximum or minimum adjustment positions.

FRONT FORK ADJUSTMENT/ REAR SHOCK ABSORBER ADJUSTMENT



Compression damping

1.Adjust:

- Compression damping

Turn the compression damping force adjusting screw ① in or out.

Turning in:	Compression damping is increased.
Turning out:	Compression damping is decreased.

Adjuster position:

Standard: 7 clicks out *

Minimum: 12 clicks out *

Maximum: 1 click out *

* : From the fully turned in position.

CAUTION:

- Make sure that each fork leg is adjusted to the same position.
- Never turn the compression damping force adjusting screw beyond the maximum or minimum adjustment positions.

EB304161

REAR SHOCK ABSORBER ADJUSTMENT

⚠ WARNING

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

Spring preload

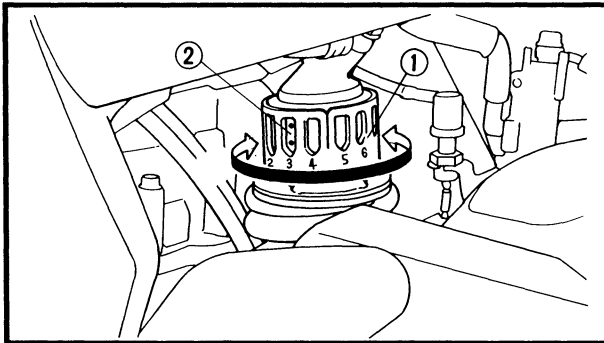
1.Adjust:

- Spring preload

NOTE:

To adjust the spring preload use the special wrench and extension bar included in the owner's tool kit.

REAR SHOCK ABSORBER ADJUSTMENT

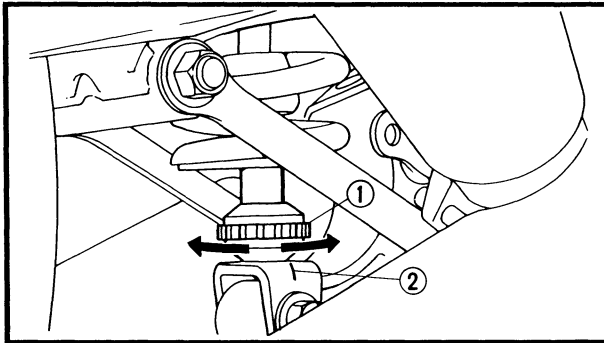


Turn the spring preload adjusting ring ① in or out.
Align the stopper ② with the spring preload adjusting ring.

Turning in:	Spring preload is decreased.
Turning out:	Spring preload is increased.

Adjuster position: Standard: 3 Minimum: 1 Maximum: 7

CAUTION:
Never turn the spring preload adjusting ring beyond the maximum or minimum adjustment positions.



Rebound damping

1. Adjust:

- Rebound damping

Turn the rebound damping force adjuster ① in or out.
Align the rebound damping force adjuster with the alignment mark ②.

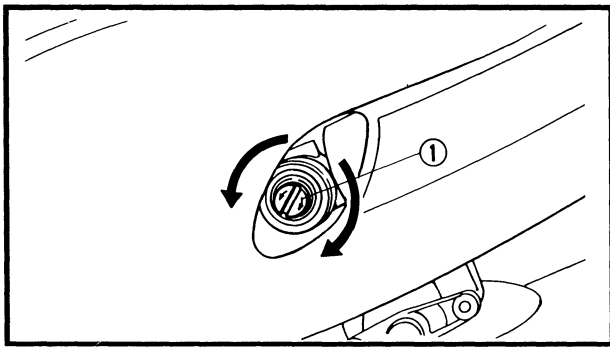
Turning in:	Rebound damping is increased.
Turning out:	Rebound damping is decreased.

Adjuster position: Standard: 10 clicks out Minimum: 20 clicks out Maximum: 0 clicks out
--

* : From the fully turned in position.

CAUTION:
Never turn the rebound damping force adjuster beyond the maximum or minimum adjustment positions.

REAR SHOCK ABSORBER ADJUSTMENT/ TIRE INSPECTION



Compression damping

1. Adjust:

- Compression damping
Turn the compression damping force adjusting screw ① in or out.

Turning in:	Compression damping is increased.
Turning out:	Compression damping is decreased.

Adjuster position:

Standard: 10 clicks in *

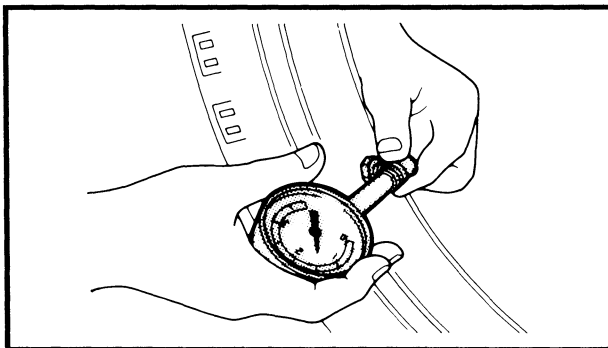
Minimum: 0 clicks in *

Maximum: 20 clicks in *

* : From the fully turned out position.

CAUTION:

Never turn the compression damping force adjusting screw beyond the maximum or minimum adjustment positions.



EB304170

TIRE INSPECTION

1. Measure:

- Tire inflation pressure
Out of specification → Adjust.

⚠ WARNING

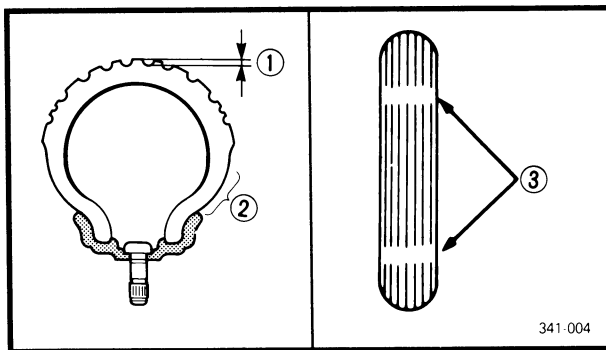
- Tire inflation pressure should only be checked and adjusted when the tire temperature equals the ambient air temperature. Tire inflation pressure and suspension must be adjusted according to the total weight of the cargo, rider, passenger and accessories (fairing, saddlebags, etc. if approved for this model), and according to whether the motorcycle will be operated at high speed or not.

NEVER OVERLOAD THE MOTORCYCLE.

- Operation of an overloaded motorcycle could cause tire damage, accident or injury.

Basic weight: With oil and full fuel tank	212 kg (467 lb)	
Maximum load*:	182 kg (401 lb)	
Cold tire pressure:	Front	Rear
Up to 90 kg load*	225 kPa (2.25 kg/ cm², 33 psi)	250 kPa (2.5 kg/cm², 36 psi)
90 kg ~ maxi- mum load*	250 kPa (2.5 kg/cm², 36 psi)	290 kPa (2.9 kg/cm², 42 psi)
High speed riding	250 kPa (2.5 kg/cm², 36 psi)	290 kPa (2.9 kg/cm², 42 psi)

* Load is the total weight of the cargo, rider, passenger and accessories.

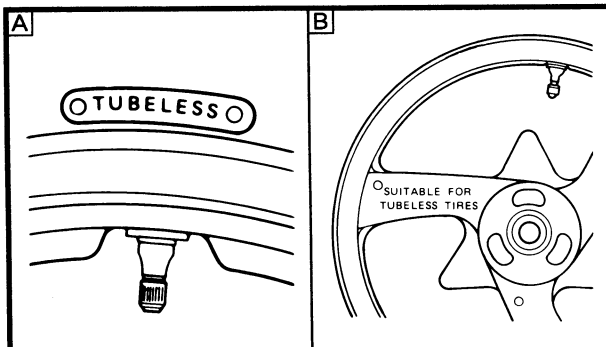


2. Inspect:

- Tire surfaces
Wear/damage → Replace.

**Minimum tire tread depth:
(front and rear):
1.0 mm (0.04 in)**

- ① Tread depth
- ② Side wall
- ③ Wear indicator



⚠ WARNING

- It is dangerous to ride with a worn-out tire. When the tire tread begins to show signs of wear, replace the tire immediately.
- Do not use tubeless tires on a wheel designed for tube type tires only. Tire failure and personal injury may result from sudden deflation.

[A] Tire

[B] Wheel



Tube type wheel:	Tube type tire only.
Tubeless type wheel:	Tube type or tubeless tire.

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

FRONT TIRE:

Manufacturer	Size	Type
BRIDGESTONE	120/60 ZR17	BT50F
DUNLOP	120/60 ZR17	D202F
MICHELIN	120/60 ZR17	A89X
METZELER	120/60 ZR17	MEZ1 FRONT

REAR TIRE:

Manufacturer	Size	Type
BRIDGESTONE	160/60 ZR17	BT50R
DUNLOP	160/60 ZR17	D202
MICHELIN	160/60 ZR17	M89X
METZELER	160/60 ZR17	MEZ1

⚠ WARNING

After mounting a tire, ride conservatively for a while to give the tire time to seat itself properly in the rim. Failure to do so could lead to an accident with possible injury to the rider or damage to the motorcycle.

EB304180

WHEEL INSPECTION

1. Inspect:

- Wheels
Bends/damage → Replace.

NOTE: _____
After a tire or wheel has been changed or replaced always balance the wheel.

⚠ WARNING _____

Never attempt to make any repairs to the wheels.

EB304200

CABLE INSPECTION AND LUBRICATION

⚠ WARNING _____

Damaged cable sheaths may cause corrosion and interfere with cable movements. Replace damaged cable sheaths and cables as soon as possible.

1. Inspect:

- Cable sheaths
Damage → Replace.

2. Check:

- Cable operation
Unsmooth operation → Lubricate.



NOTE: _____
Hold the cable end upright and pour a few drops of lubricant into the cable sheath.



EB304210

LEVER AND PEDAL LUBRICATION

Lubricate the pivoting points on the levers and pedals.



**Recommended lubricant:
Engine oil**

EB304220

SIDESTAND LUBRICATION

Lubricate the pivoting point and the contact surfaces on the sidestand.



**Recommended lubricant:
Lithium soap base grease**

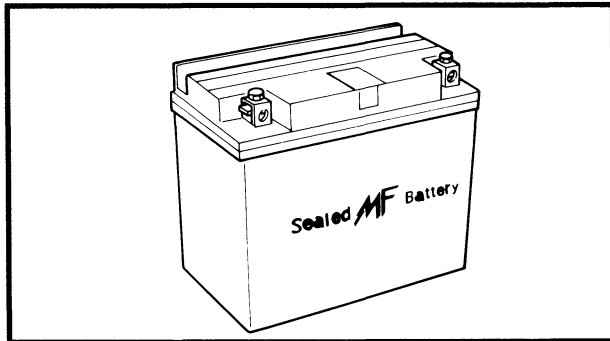
EB304240

REAR SUSPENSION LUBRICATION

Lubricate the pivoting points on the rear suspension.



**Recommended lubricant:
Molybdenum disulfide grease**



EB305000

ELECTRICAL**BATTERY INSPECTION****NOTE:**

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

CAUTION:

- This is a sealed type battery. Never remove the sealing caps. If the sealing caps have been removed, the balance will not be maintained and battery performance will deteriorate.
- Charging time, charging current and charging voltage for the MF battery are different from those of general type batteries. The MF battery should be charged as explained in "CHARGING METHOD". If the battery is overcharged, the electrolyte level will drop considerably. Therefore, take special care when charging the battery.

⚠ WARNING

Battery electrolyte is dangerous; it contains sulfuric acid which is poisonous and highly caustic.

Always follow these preventive measures:

- Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.
- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):

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

Antidote (INTERNAL):

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



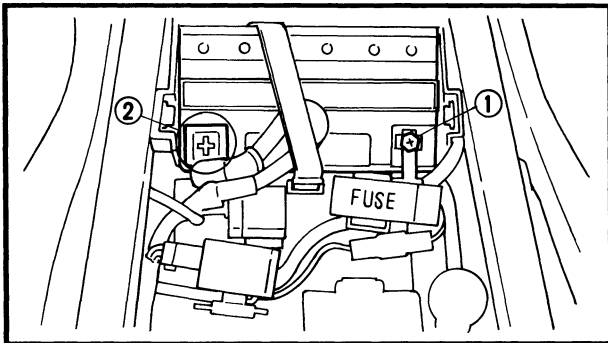
Batteries generate explosive hydrogen gas. Always follow the following preventive measures:

- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes, etc.)
- **DO NOT SMOKE** when charging or handling batteries.

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

1.Remove:

- Seat
Refer to "SEAT".



2.Disconnect:

- Battery leads

CAUTION:

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

3.Remove:

- Battery
- 4.Check:
• Battery condition

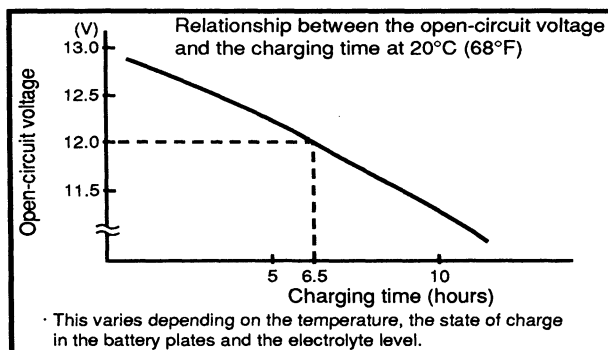
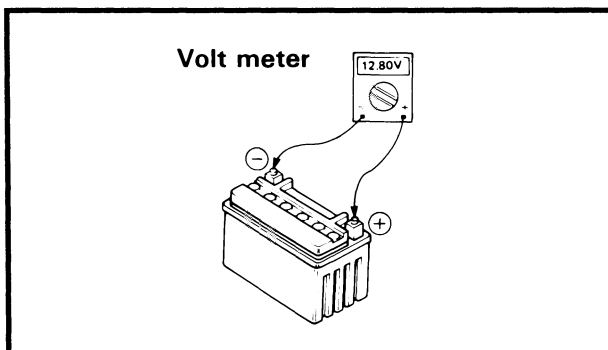
Battery condition checking steps:

- Connect a digital voltmeter to the battery terminals.

Tester (+) lead → battery (+) terminal
Tester (-) lead → battery (-) terminal

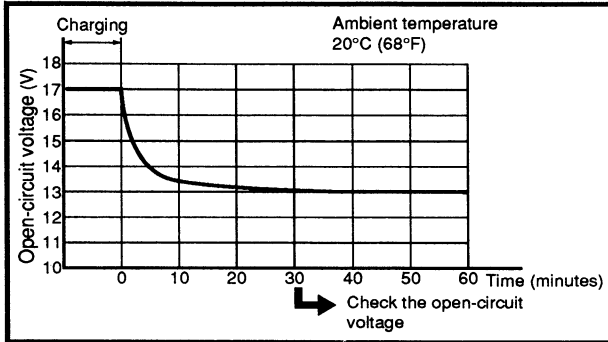
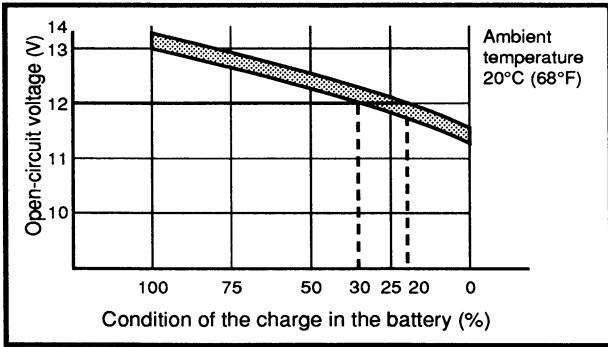
NOTE:

The charge state of an MF battery can be checked by measuring the open-circuit voltage (i.e. the voltage when the positive terminal is disconnected).



Open-circuit voltage	Charging time
12.8V or higher	No charging is necessary.

- Check the condition of the battery using the following charts.



Example:

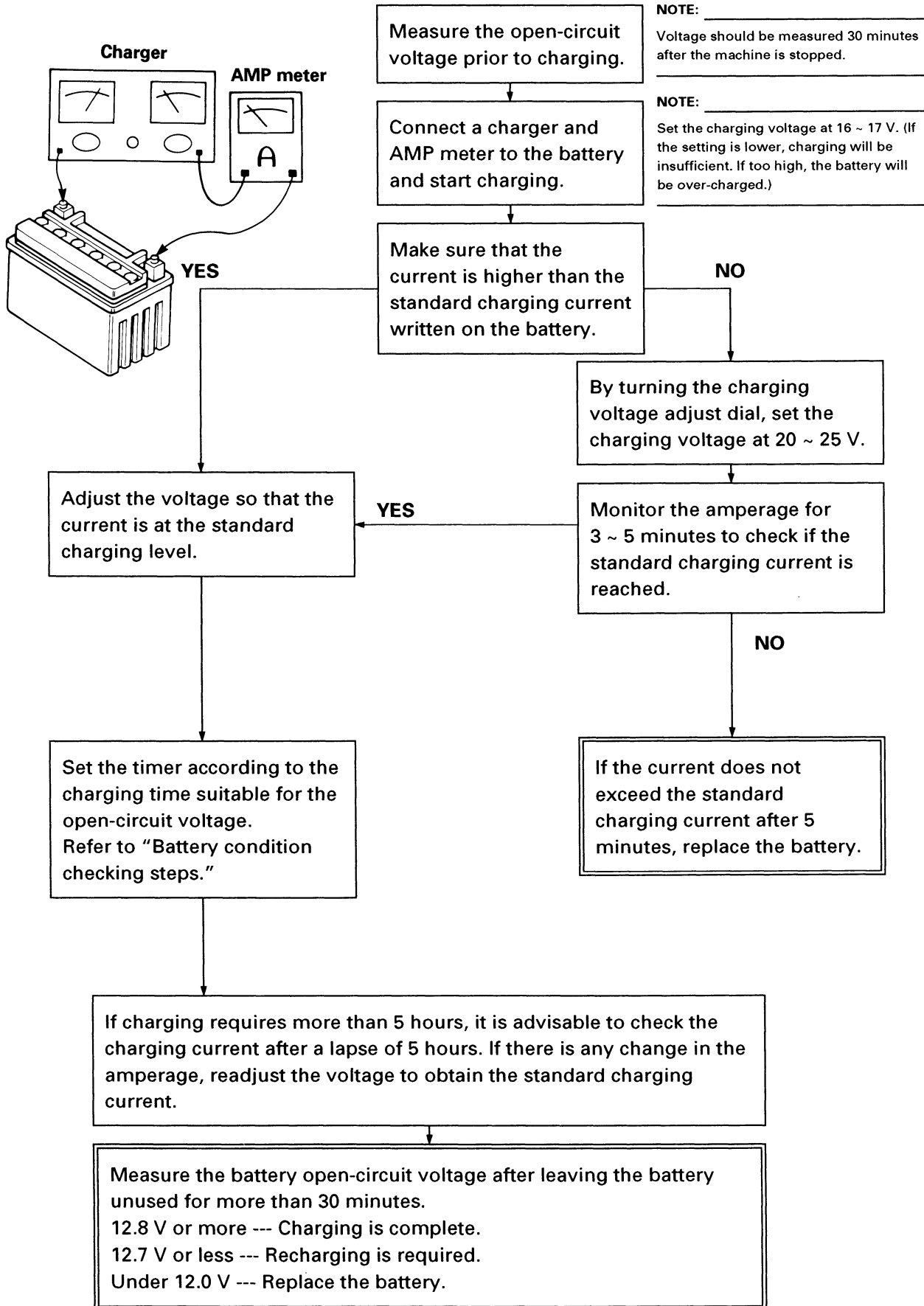
- Open-circuit voltage = 12.0V
- Charging time = 6.5 hours
- Charge condition of the battery = 20 ~ 30%
- Charging method for MF batteries

Charging method

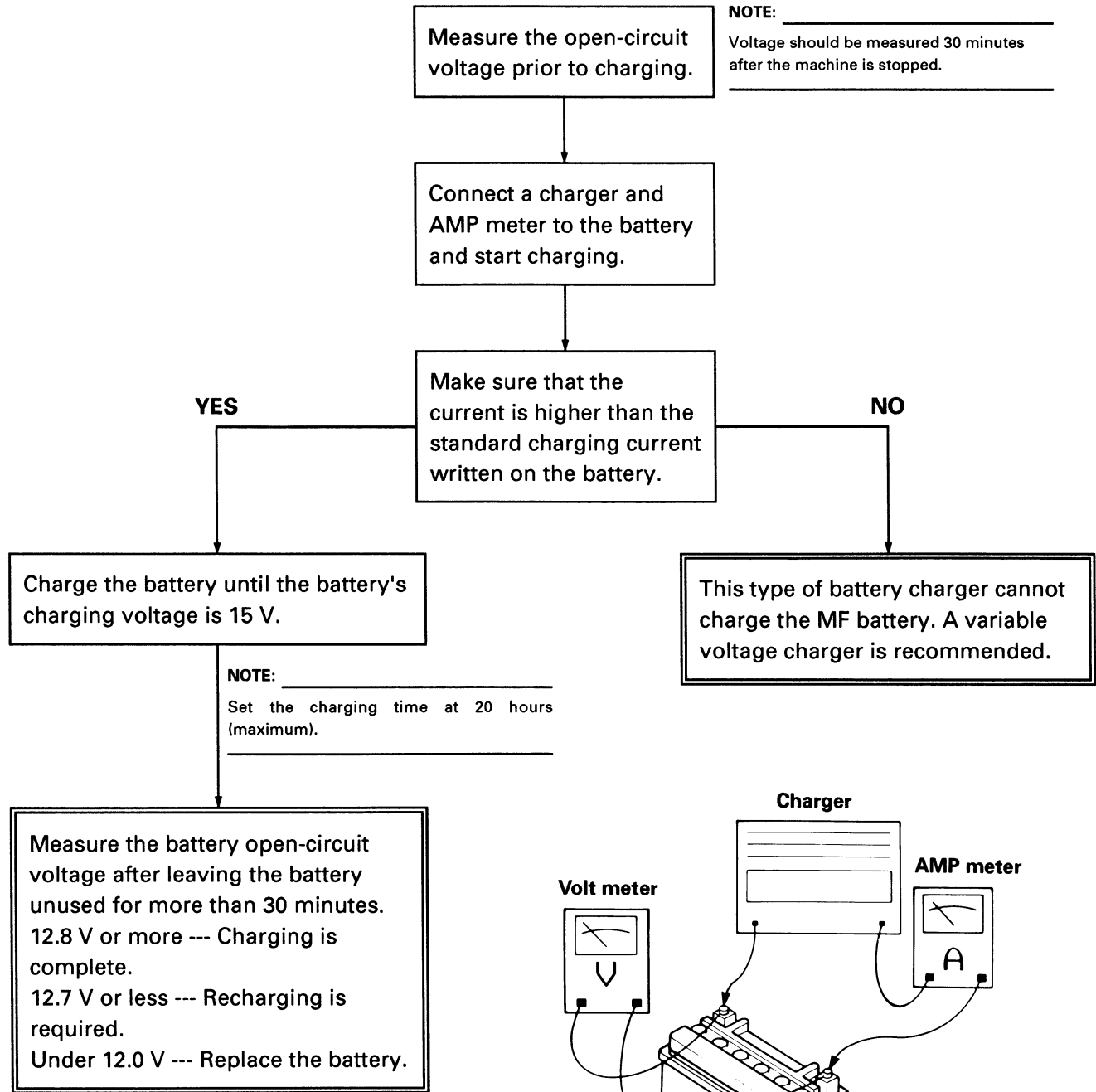
CAUTION:

- If it is impossible to set the standard charging current, be careful not to over-charge.
- When charging the battery, be sure to remove it from the motorcycle. (If charging has to be done with the battery mounted on the motorcycle, be sure to disconnect the wire at the negative terminal.)
- Never remove the sealing caps of an MF battery.
- Make sure that the charging clips are in full contact with the terminal and that they are not shorted together. (A corroded clip on the charger may cause the battery to generate heat in the contact area. A weak clip spring may cause sparks.)
- Before removing the clips from the battery terminals, be sure to turn off the charger's power switch.
- The open-circuit voltage variation for the MF battery after charging is shown below. As shown in the figure, the open-circuit voltage stabilizes about 30 minutes after charging has been completed. Therefore, wait 30 minutes after charging is completed before measuring the open-circuit voltage.

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



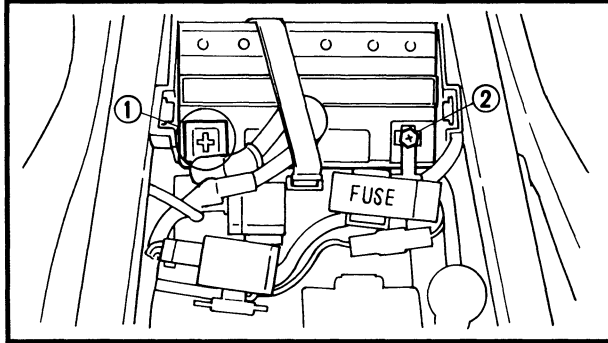
Charging method using a constant-voltage type charger



Charging method using a constant-current type charger
This type of battery charger cannot charge the MF battery.

5. Inspect:
- Battery terminals
Dirty → Clean with a wire brush.
Poor connection → Correct.

NOTE: _____
After cleaning the terminals, apply a light coat of grease.



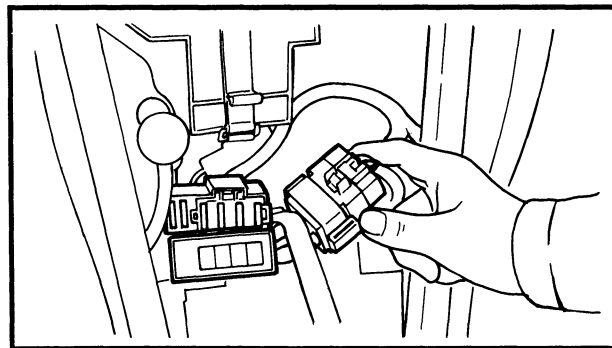
6. Install:
- Battery
7. Connect:
- Battery leads

CAUTION: _____
First, connect the positive lead ① then connect the negative lead ②.

8. Install:
- Seat
Refer to "SEAT".

EB305010
FUSE INSPECTION

CAUTION: _____
When checking or replacing the fuse always turn off the main switch. Otherwise, a short circuit may occur.




1. Remove:
- Seat
Refer to "SEAT".
 - Side panel (left)

2. Inspect:
- Fuses

Inspection steps:
• Connect the pocket tester to the fuse and check it for continuity.

NOTE: _____
Set the tester selector to " $\Omega \times 1$ ".

	Pocket tester: YU-03112/90890 - 03112
---	---

- If the tester indicates ∞ , replace the fuse.
- *****

3. Replace:

- Blown fuse

Replacement steps:

- Turn off the main switch.
- Install a new fuse with the proper current rating.
- Turn on switches to verify operation of related electrical devices.
- If the fuse blows again, immediately check the electrical circuit.

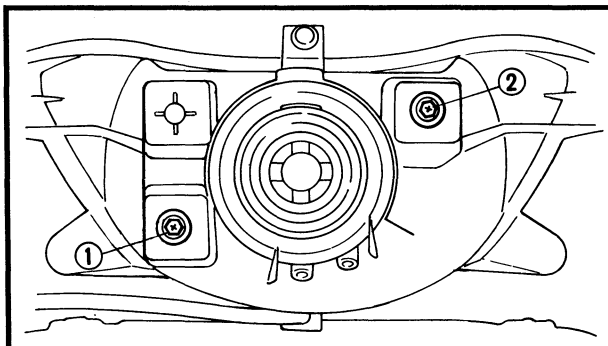
Description	Current rating	Quantity
Main fuse	30A	1
Headlight fuse	20A	1
Signal fuse	15A	1
Ignition fuse	7.5A	1
Fan fuse	7.5A	1
Reserve fuse	30A	1
Reserve fuse	20A	1
Reserve fuse	7.5A	1

⚠ WARNING

Never use a fuse with a rating other than that specified. Never use other materials in place of a fuse. An improper fuse may cause extensive damage to the electrical system, a malfunction of the lighting and ignition systems and could possibly cause a fire.

4. Install:

- Side panel (left)
- Seat
Refer to "SEAT".



EB305021

HEADLIGHT BEAM ADJUSTMENT

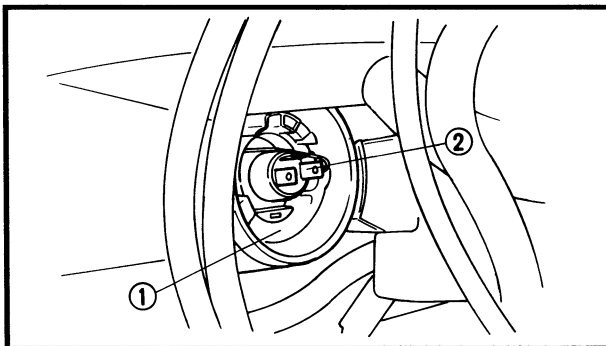
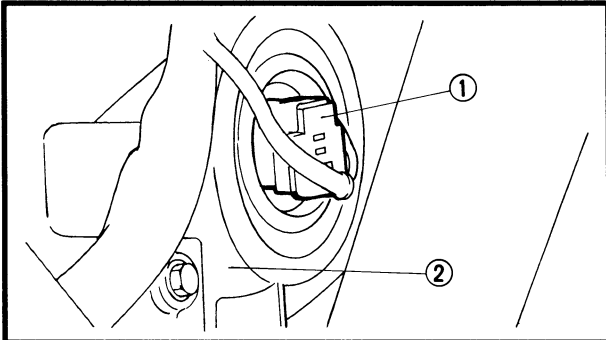
1. Adjust:

- Headlight beam (vertically)
Turn the adjuster ① in or out.

Turning in:	Headlight beam is lowered.
Turning out:	Headlight beam is raised.

- 2.Adjust:
- Headlight beam (horizontally)
Turn the adjuster ② in or out.

Turning in:	Headlight beam moves to the right.
Turning out:	Headlight beam moves to the left.



EB305030

HEADLIGHT BULB REPLACEMENT

- 1.Disconnect:
- Headlight lead ①
- 2.Remove:
- Cover ②

- 3.Unhook:
- Bulb holder ①
- 4.Remove:
- Bulb ②

⚠ WARNING

Since the bulb may be hot, keep flammable products and your hands away from it. Do not touch the bulb until it has cooled down.

- 5.Install:
- Bulb (new)
Secure the new bulb with the bulb holder.

CAUTION

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

- 6.Hook up:
- Bulb holder
- 7.Install:
- Cover
- 8.Connect:
- Headlight lead



CHAPTER 4. ENGINE OVERHAUL

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EB400000

ENGINE OVERHAUL

ENGINE REMOVAL

⚠ WARNING

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

NOTE:

It is not necessary to remove the engine in order to remove the following components:

- Cylinder head
- Cylinders
- Pistons
- Clutch
- Oil cooler
- Starter motor
- AC magneto rotor
- Oil pan

FUEL TANK AND COWLINGS

1.Remove:

- Seat
 - Fuel tank
 - Bottom cowling
 - Side cowlings (left and right)
- Refer to "SEAT", "FUEL TANK" and "COWLINGS" in CHAPTER 3.

ENGINE OIL AND COOLANT

1.Drain:

- Engine oil
 - Coolant
- Refer to "ENGINE OIL REPLACEMENT" and "COOLANT REPLACEMENT" in CHAPTER 3.



EB400010

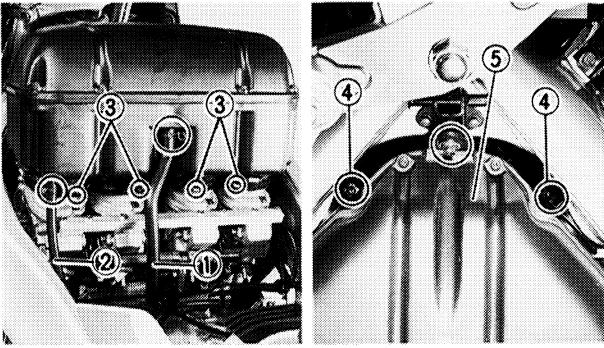
BATTERY LEADS

1.Disconnect:

- Battery leads

CAUTION:

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



AIR FILTER CASE

1. Disconnect:

- Breather hose (crankcase) ①
- Drain hose (air filter case) ②

2. Loosen:

- Clamp screws (carburetor joints) ③
- Clamp screws (air intake ducts) ④

3. Remove:

- Air filter case ⑤

EB400020

CARBURETORS

1. Remove:

- Carburetor assembly
Refer to "CARBURETORS – REMOVAL" in CHAPTER 6.

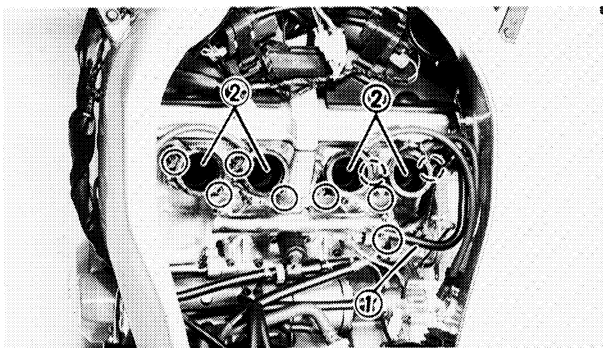
NOTE:

Cover the carburetor assembly with a clean rag to prevent dirt or foreign materials from entering.

RADIATOR

1. Remove:

- Radiator assembly
Refer to "RADIATOR – REMOVAL" in CHAPTER 5.



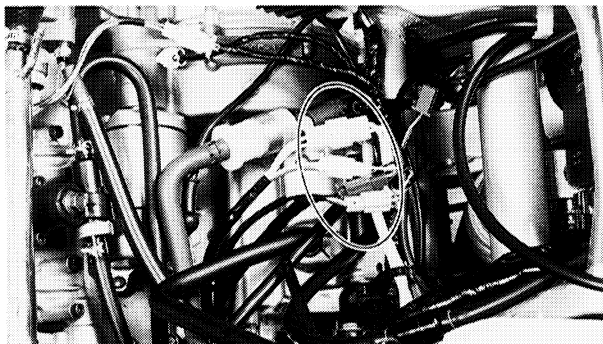
HOSES AND LEADS

1. Disconnect:

- Breather hose (thermostatic valve) ①

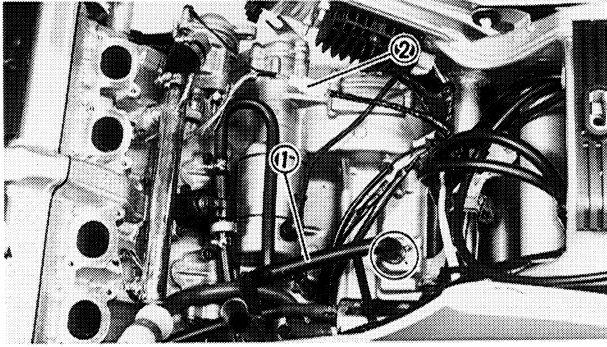
2. Remove:

- Carburetor joints ②



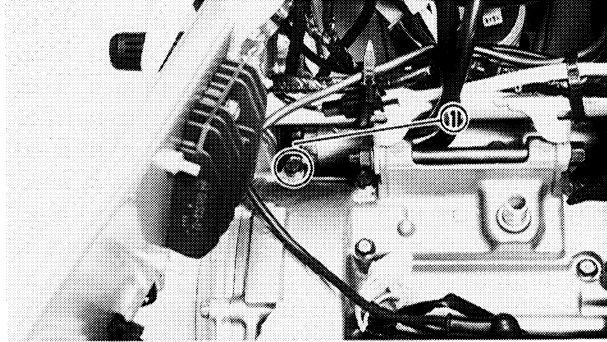
3. Disconnect:

- AC magneto coupler
- Pickup coil coupler
- Neutral switch/oil level switch coupler
- Sidestand switch coupler



4.Disconnect:

- Breather hose (crankcase) ①
- Thermo switch coupler ②

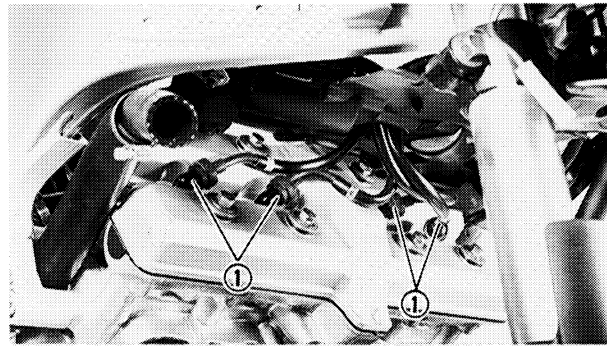


5.Disconnect:

- Ground lead ①

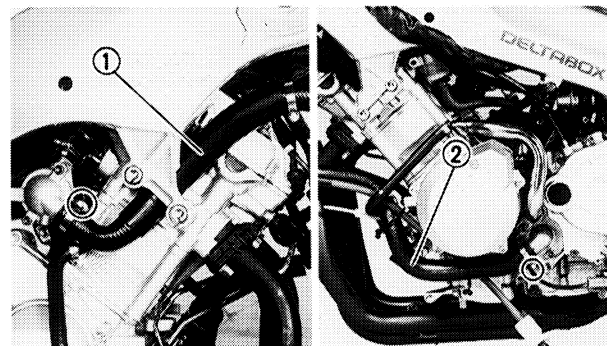
NOTE:

After disconnecting the ground lead, re-install the bolt.



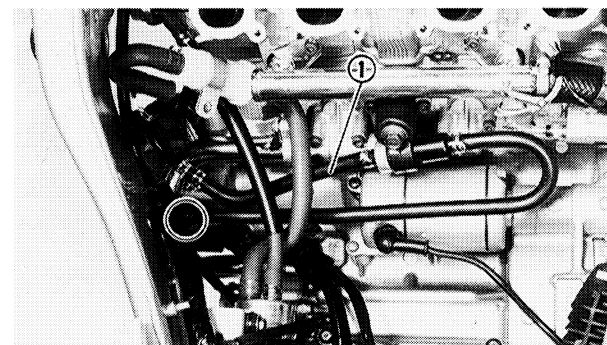
6.Disconnect:

- Spark plug caps ①



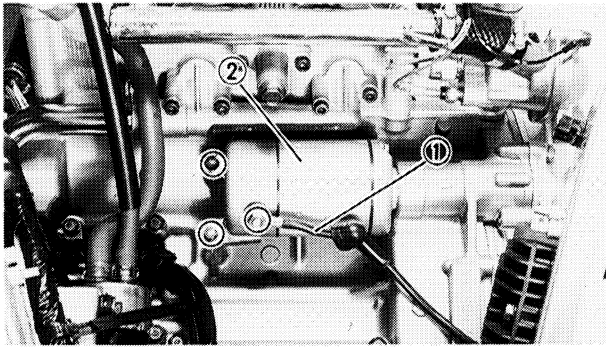
7.Remove:

- Radiator hose (inlet) ①
- Radiator hose (outlet) ②



8.Remove:

- Carburetor heater hose (inlet) ①



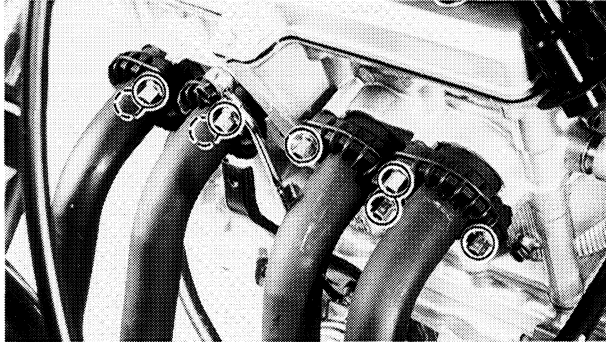
STARTER MOTOR

1.Disconnect:

- Starter motor lead ①

2.Remove:

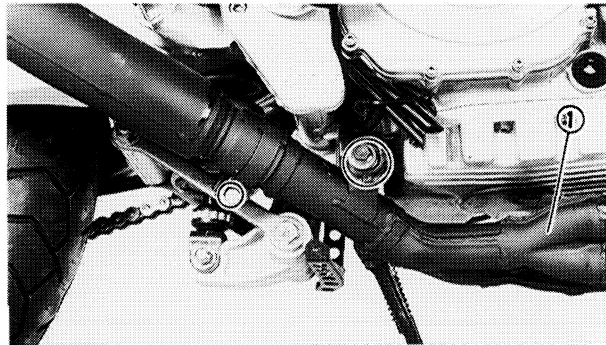
- Starter motor ②



MUFFLER ASSEMBLY

1.Remove:

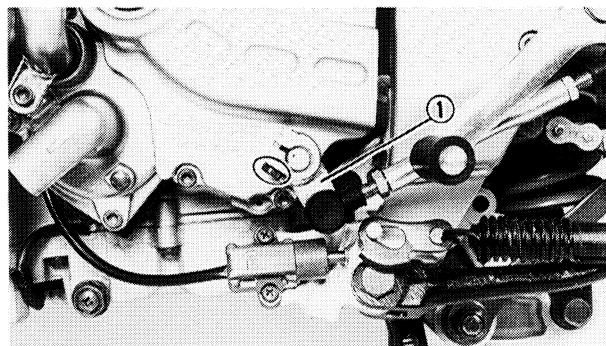
- Nuts (exhaust pipe)
- Exhaust pipe ①
- Gaskets (exhaust pipe)



DRIVE SPROCKET

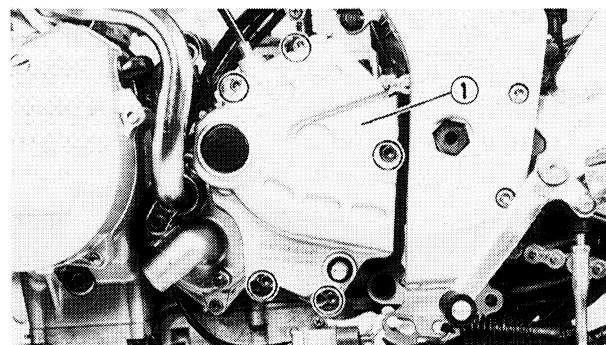
1.Remove:

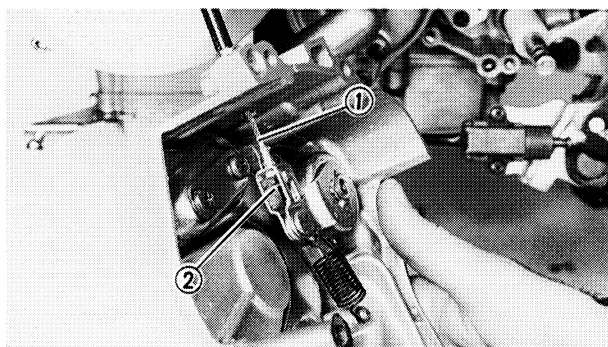
- Shift pedal link ①



2.Remove:

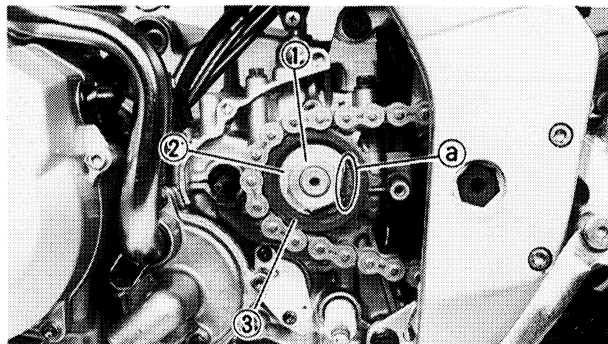
- Drive sprocket cover ①
- Dowel pins
- Gasket





3. Disconnect:
- Clutch cable (1)

NOTE: Straighten the tab (2) on the clutch cable holder and remove the clutch cable.



4. Loosen:
- Drive chain
Refer to "DRIVE CHAIN SLACK ADJUSTMENT" in CHAPTER 3.

5. Straighten:
- Lock washer tab (a)

6. Remove:
- Nut (drive sprocket) (1)
 - Lock washer (2)
 - Drive sprocket (3)

NOTE: While applying the rear brake loosen the drive sprocket nut.

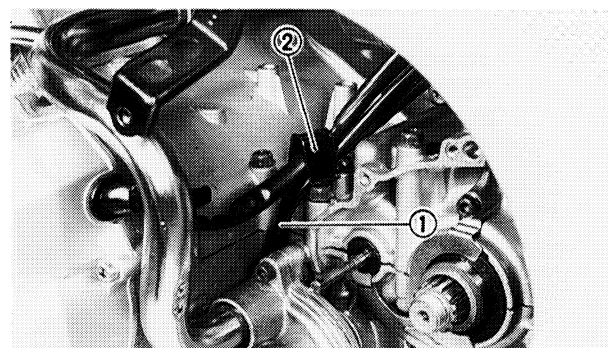
EB400060

ENGINE REMOVAL

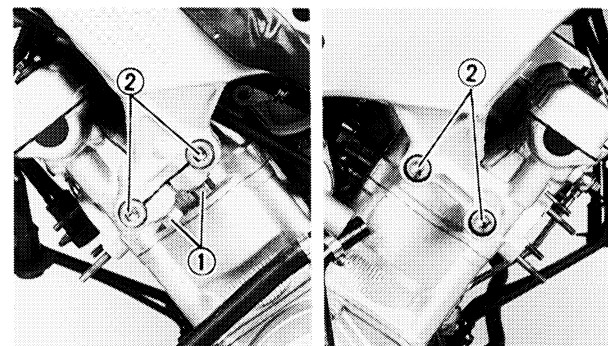
1. Place a suitable stand under the frame and the engine.

⚠ WARNING

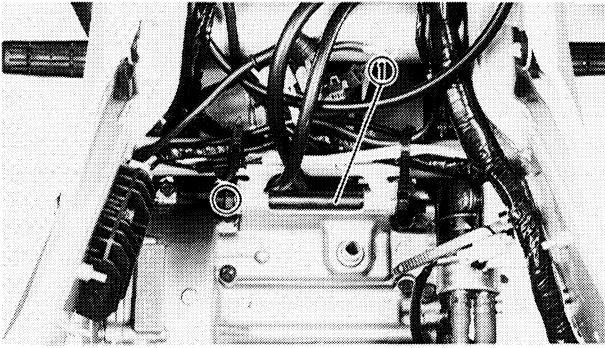
Securely support the motorcycle so that there is no danger of it falling over.



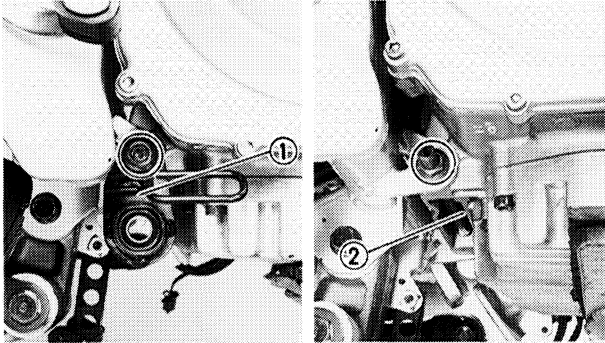
2. Unhook:
- Sidestand switch lead (1)
(from the metal clamp (2))



3. Loosen:
- Pinch bolts (1)
4. Remove:
- Mounting bolts (front) (2)

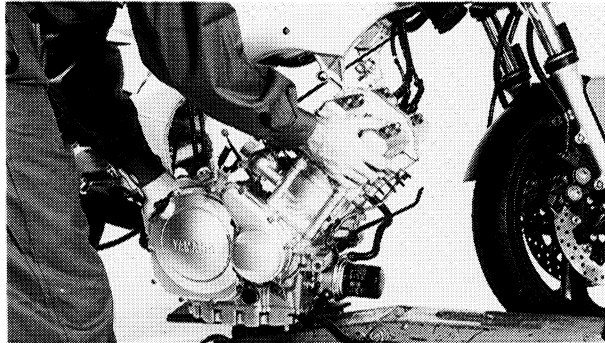


5. Mounting bolt (rear-upper) ①



6. Remove:

- Exhaust pipe stay ①
- Mounting bolt (rear-lower) ②



7. Remove:

- Engine assembly
(from the right side of the motorcycle)

CAUTION:

**To prevent scratching the front fender
place a rug over it.**



EB401000

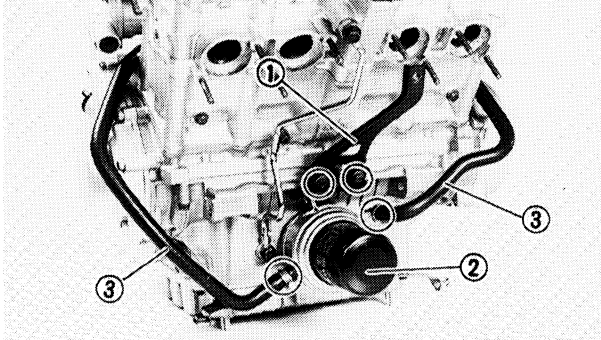
ENGINE DISASSEMBLY

OIL FILTER AND OIL COOLER

NOTE:

The oil filter and oil cooler can be removed while the engine is mounted by removing the following parts.

- Bottom cowling
- Side cowlings (left and right)



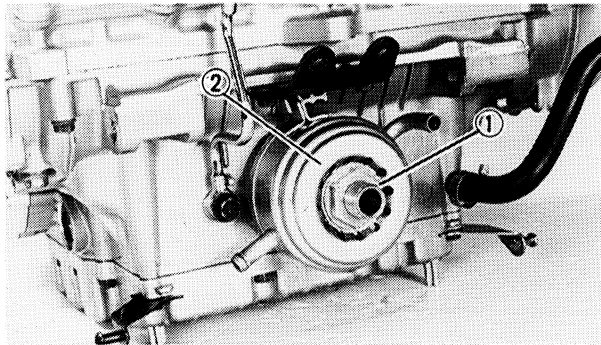
1.Remove:

- Radiator stay ①
- Oil filter ②

Refer to "ENGINE OIL REPLACEMENT" in CHAPTER 3.

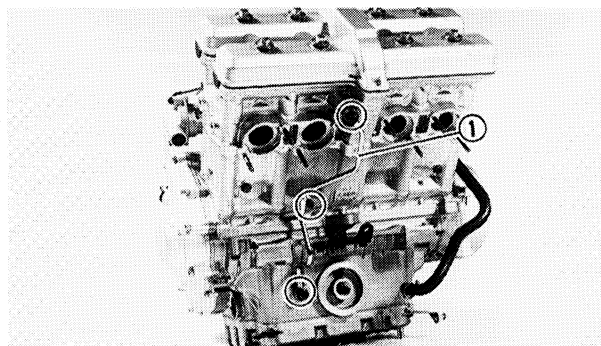
2.Disconnect:

- Oil cooler hoses ③



3.Remove:

- Bolt ①
- Oil cooler ②
- O-ring



4.Remove:

- Oil delivery pipe ①
- Copper washers

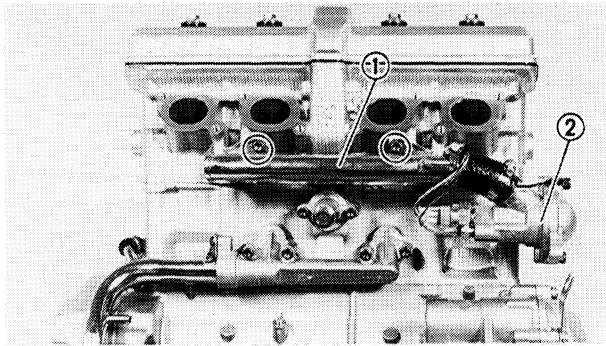
EB401010

WATER JACKET JOINT

NOTE:

The water jacket joint can be removed while the engine is mounted by removing the following parts.

- Seat
- Fuel tank
- Air filter case



1.Remove:

- Water jacket joint (outlet) ①
(with the thermostatic housing ②)
- O-rings

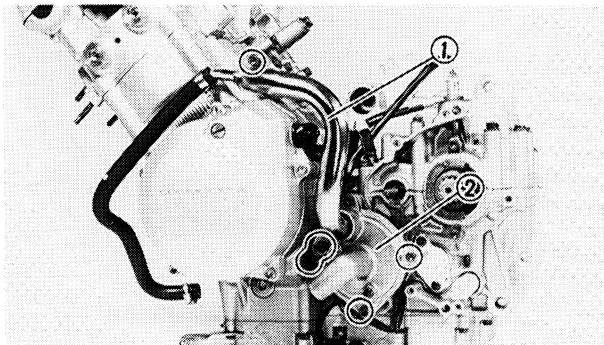
EB401020

WATER PUMP

NOTE:

The water pump can be removed while the engine is mounted by removing the following parts.

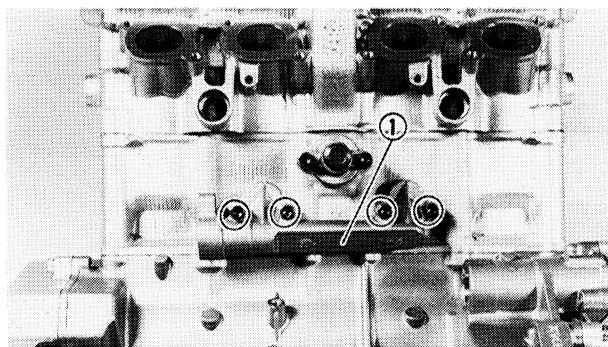
- Bottom cowling
- Side cowling (left)



1.Remove:

- Outlet pipe (water pump) ①
- Water pump cover ②
- Impeller

Refer to "WATER PUMP – REMOVAL" in CHAPTER 5.



2.Remove:

- Water jacket joint (inlet) ①



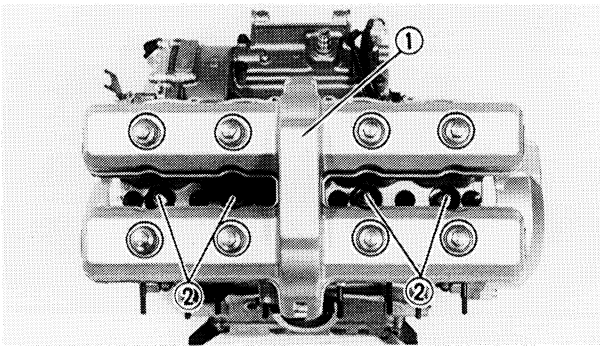
EB401031

CYLINDER HEAD COVER, CYLINDER HEAD AND CAMSHAFTS

NOTE:

The cylinder head cover, cylinder head and camshafts can be removed while the engine is mounted by removing the following parts:

- Bottom cowling
- Side cowlings (left and right)
- Seat
- Fuel tank
- Air filter case
- Radiator assembly

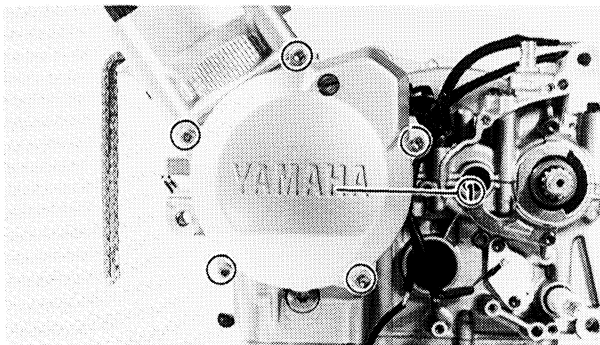


1.Remove:

- Cylinder head cover ①
- Gasket (cylinder head cover)
- Spark plugs ②

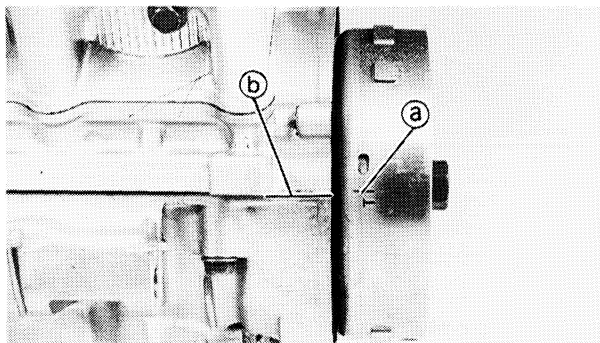
NOTE:

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



2.Remove:

- AC magneto cover ①

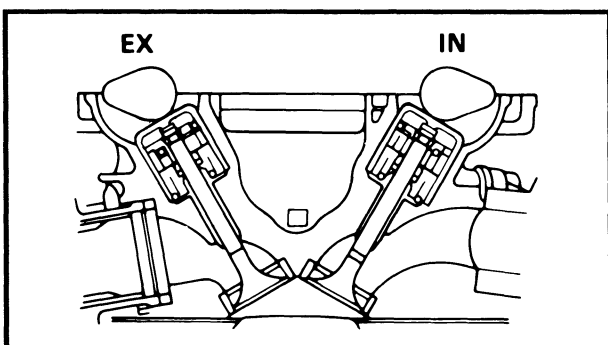


3.Align:

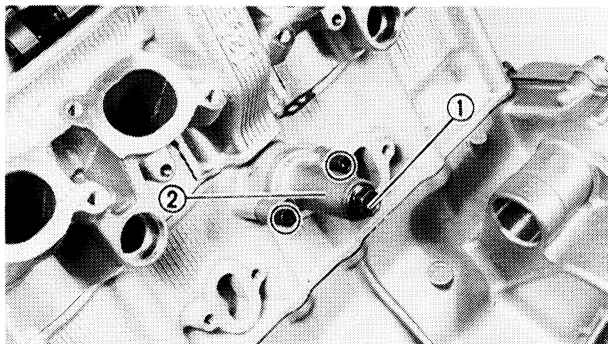
- "T" mark
(with the stationary pointer)

NOTE:

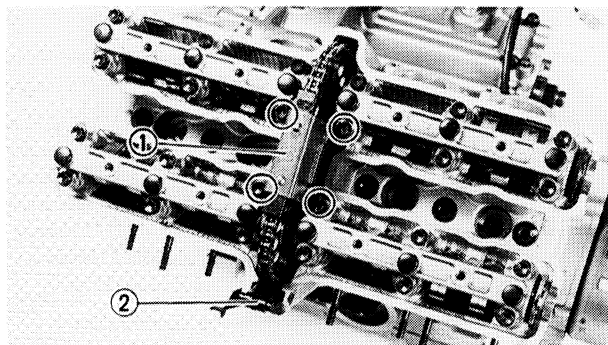
- Turn the crankshaft counterclockwise and align the "T" mark ① with the crankcase edge ② when the #1 piston is at TDC on the compression stroke.



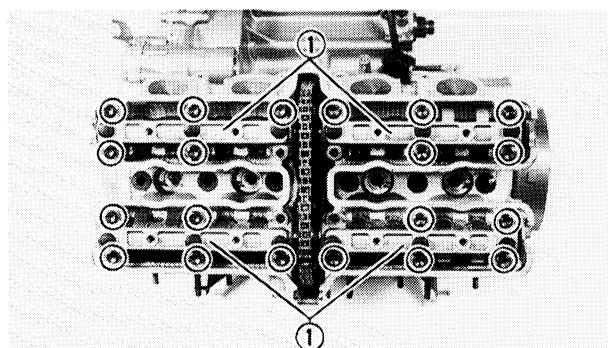
- The #1 piston is at TDC on the compression stroke when the cam lobes are opposite one other, as shown in the illustration.



4. Loosen:
 - Cap bolt (tensioner) ①
5. Remove:
 - Timing chain tensioner ②
 - Gasket



6. Remove:
 - Timing chain guide (upper) ①
 - Timing chain guide (exhaust side) ②

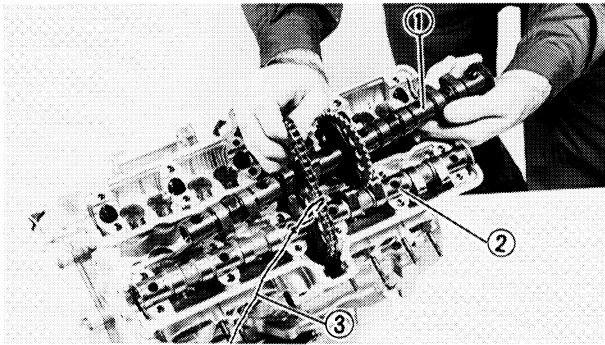


7. Remove:
 - Camshaft caps ①
 - Dowel pins

NOTE: _____
Remove the camshaft cap bolts in a criss-cross pattern from the outer caps working in.

CAUTION: _____

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

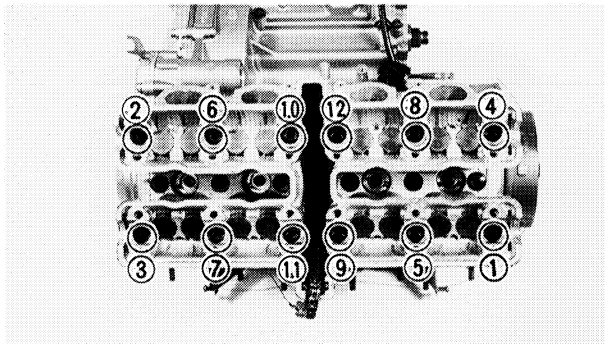


8.Remove:

- Camshafts (intake ① and exhaust ②)

NOTE: _____

To prevent the timing chain from falling into the crankcase fasten a wire ③ to it.



9.Remove:

- Nuts (cylinder head)

NOTE: _____

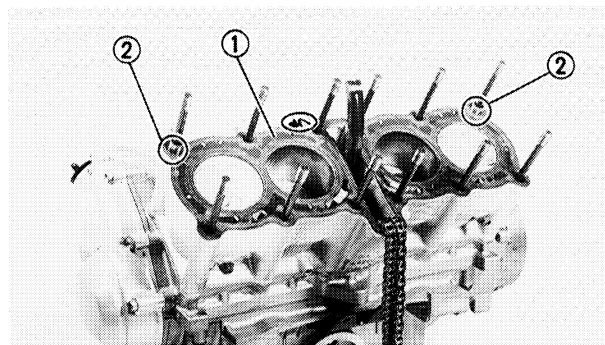
- Loosen the nuts in the proper sequence.
- Follow the numerical order shown in the illustration. Loosen each nut 1/2 of a turn at a time until all of the nuts are loosened.

10.Remove:

- Cylinder head

NOTE: _____

To prevent the valve lifters and adjusting pads from falling into the crankcase, remove as a unit the cylinder head.



11.Remove:

- Gasket (cylinder head) ①
- Dowel pins ②



EB401040

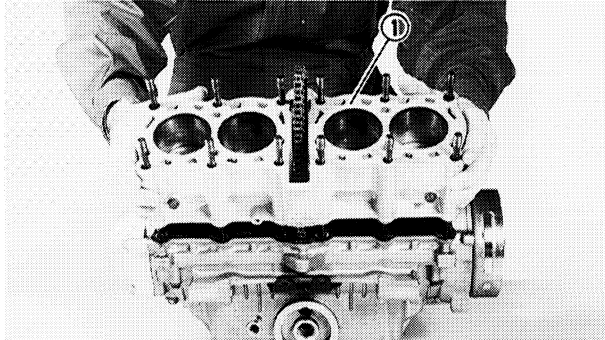
CYLINDERS AND PISTONS**NOTE:**

The cylinders and pistons can be removed while the engine is mounted by removing the following parts:

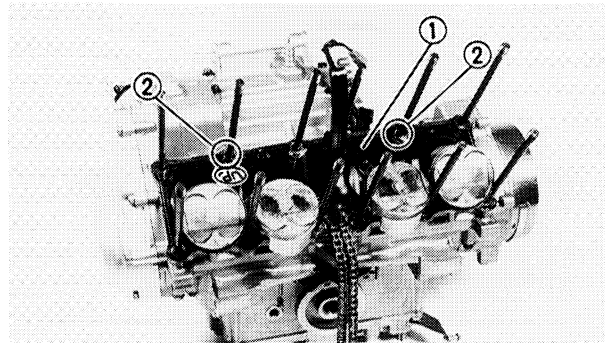
- Bottom cowling
- Side cowlings (left and right)
- Seat
- Fuel tank
- Air filter case
- Radiator assembly
- Cylinder head assembly

1.Remove:

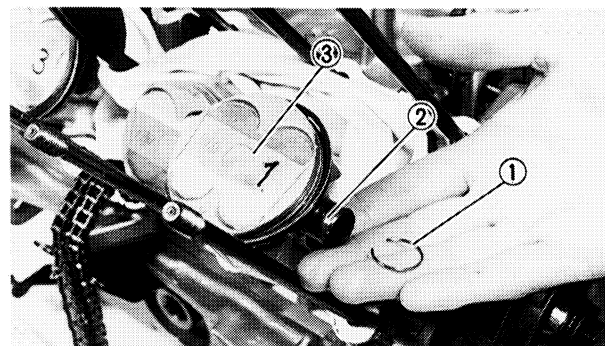
- Cylinders ①

**2.Remove:**

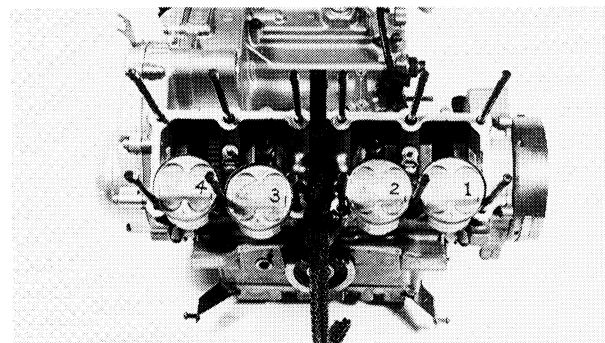
- Gasket (cylinders) ①
- Dowel pins ②

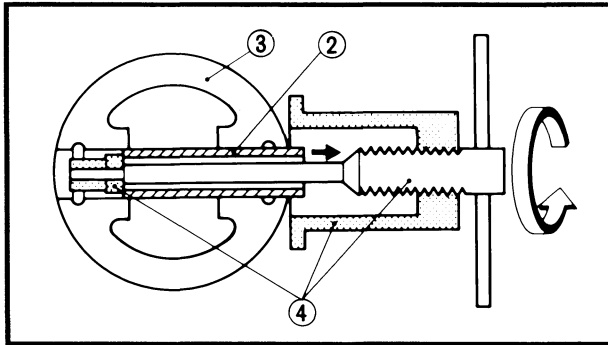
**3.Remove:**

- Piston pin circlips ①
- Piston pins ②
- Pistons ③

**NOTE:**

- Before removing each piston pin circlip, cover the crankcase opening with a clean rag to prevent the piston pin circlip from falling into the crankcase.
- For reference during reinstallation, put identification marks on each piston head.
- Before removing each piston pin, deburr the circlip groove and pin hole area. If the piston pin groove is deburred and the piston pin is still difficult to remove, use the piston pin puller ④.

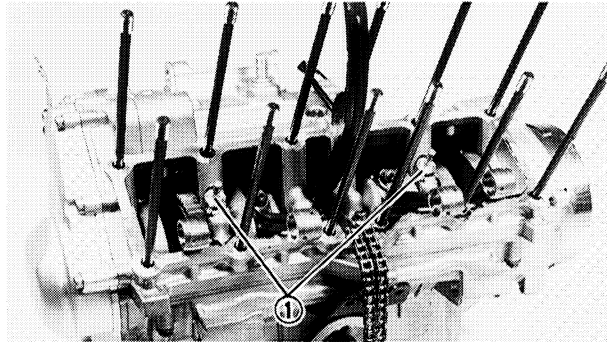




Piston pin puller:
YU-01304/90890 - 01304

CAUTION:

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



- 4.Remove:
- Oil-jet nozzles ①
(with the O-ring)

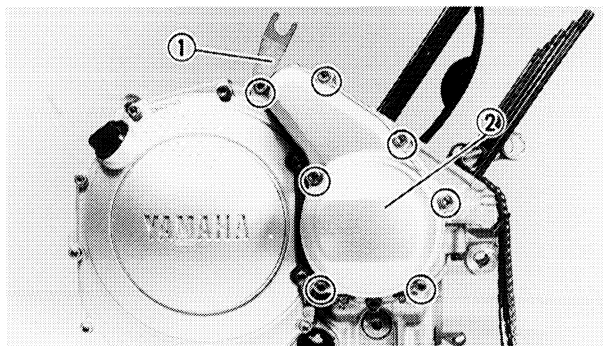
EB401050

STARTER CLUTCH

NOTE:

The starter clutch can be removed while the engine is mounted by removing the following parts:

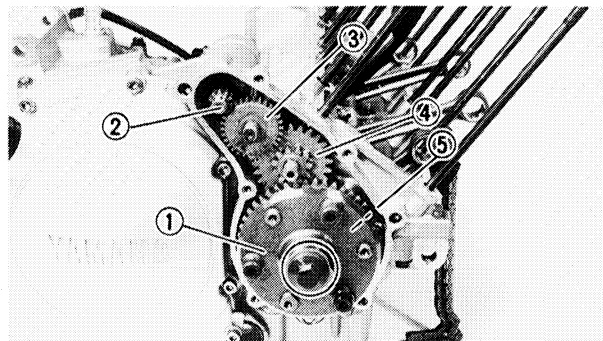
- Bottom cowling
- Side cowling (right)



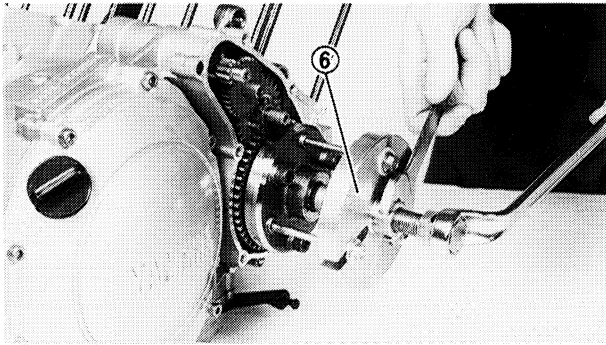
- 1.Remove:
- Stay (throttle stop screw) ①
 - Starter clutch cover ②
 - Dowel pins
 - Gasket

NOTE:

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



- 2.Remove:
- Starter clutch ①
 - Starter drive gear ②
 - Starter idle gear (primary) ③
 - Starter idle gear (secondary) ④
 - Woodruff key
 - Starter wheel gear ⑤



NOTE:

- While holding the AC magneto rotor with a sheave holder, remove the starter clutch bolt.
- Use the flywheel puller ⑥ to remove the starter clutch.



Sheave holder:

YS-01880/90890 - 01701

Flywheel puller:

YU-33270/90890 - 01362

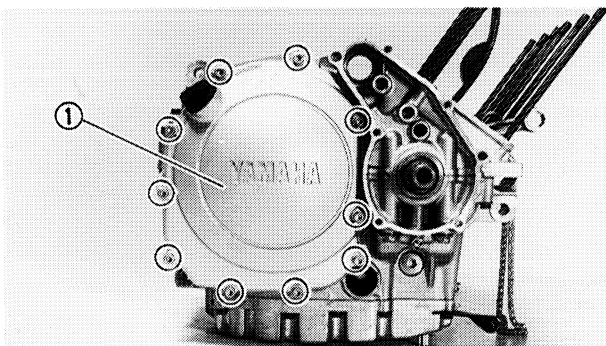
EB401061

CLUTCH

NOTE:

The clutch assembly can be removed while the engine is mounted by removing the following parts:

- Bottom cowling
- Side cowling (right)

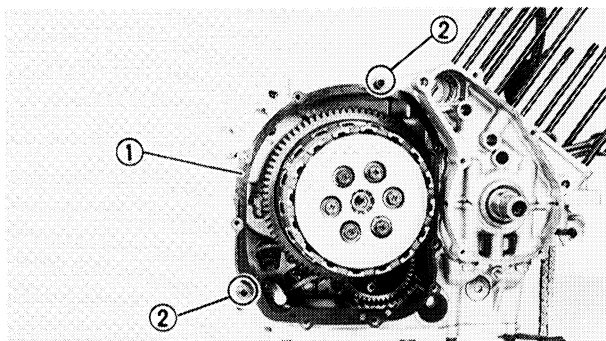


1.Remove:

- Clutch cover ①

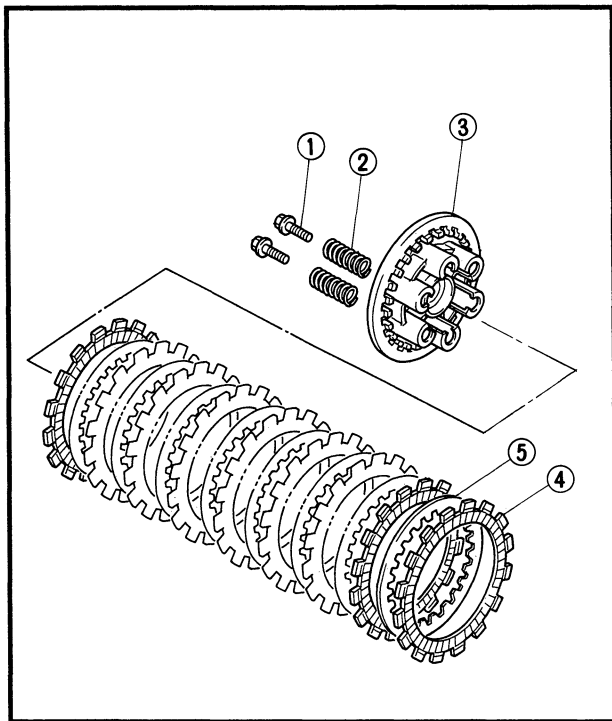
NOTE:

Loosen the bolts in a crisscross pattern.



2.Remove:

- Gasket ①
- Dowel pins ②

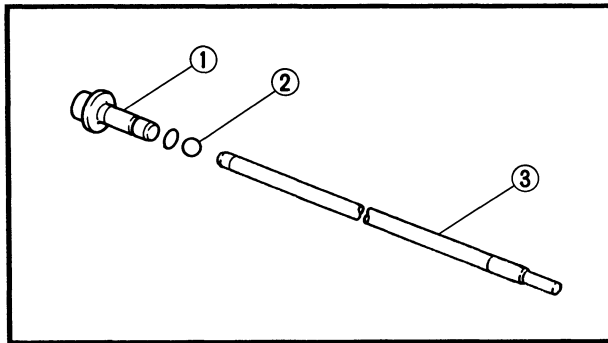


3.Remove:

- Bolts (pressure plate) ①
- Clutch springs ②
- Pressure plate ③
- Friction plates ④
- Clutch plates ⑤

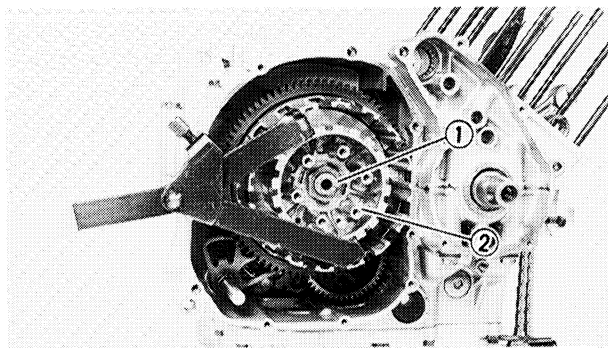
NOTE:

Loosen the pressure plate bolts in a criss-cross pattern.



4.Remove:

- Push rod #1 ①
(with the O-ring)
- Ball ②
- Push rod #2 ③



5.Straighten the lock washer tabs.

6.Loosen:

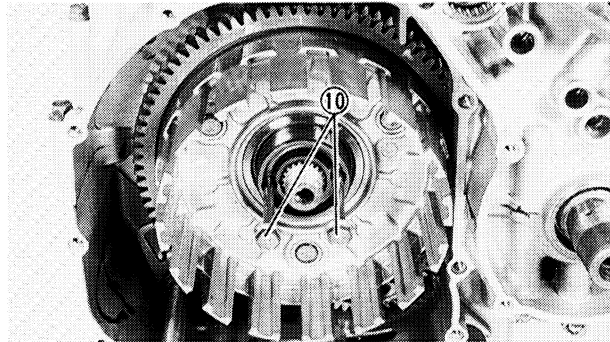
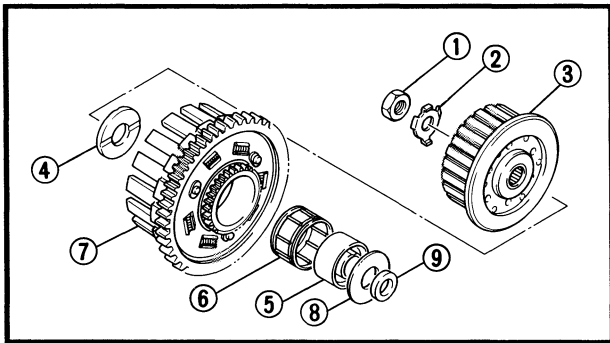
- Nut (clutch boss) ①

NOTE:

While holding the clutch boss ② with a universal clutch holder, loosen the clutch boss nut ①.



Universal clutch holder:
YM-91042/90890 - 04086



7.Remove:

- Nut (clutch boss) ①
- Lock washer ②
- Clutch boss ③
- Thrust washer ④
- Spacer ⑤
- Bearing ⑥
- Clutch housing ⑦
- Thrust washer ⑧
- Collar ⑨

NOTE:

Insert two 6 mm bolts ⑩ into the spacer. Then remove the spacer by pulling on the bolts.

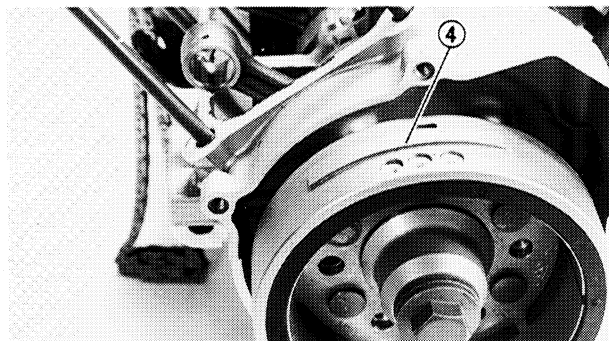
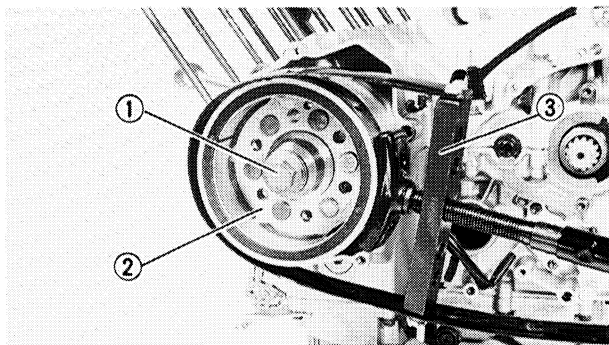
EB401080

AC MAGNETO

NOTE:

The AC magneto can be removed while the engine is mounted by removing the following parts:

- Bottom cowling
- Side cowling (left)
- AC magneto cover



1.Remove:

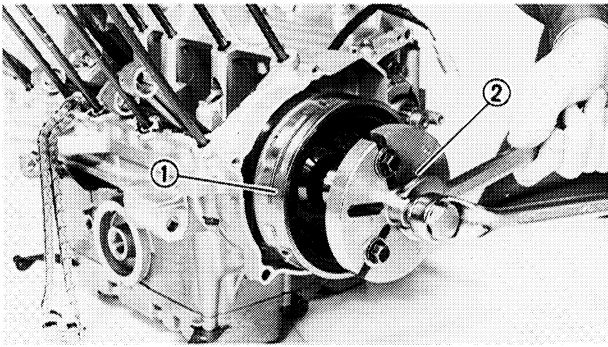
- Bolt (AC magneto rotor) ①
- Washer

NOTE:

- While holding the AC magneto rotor ② with a sheave holder ③, loosen the AC magneto rotor bolt ①.
- Do not allow the sheave holder ③ to touch the projection ④ on the AC magneto rotor.



Sheave holder:
YS-01880/90890 - 01701



2.Remove:

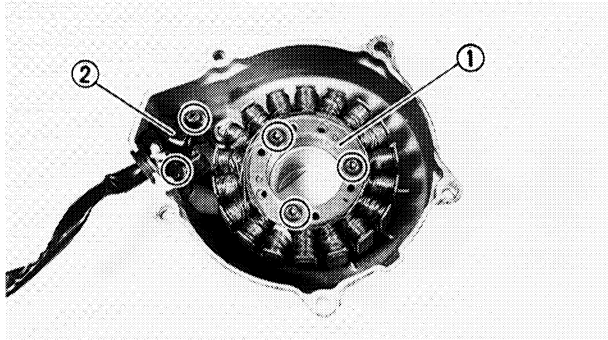
- AC magneto rotor ①
- Woodruff key

NOTE: _____

Use a flywheel puller ② to remove the AC magneto rotor ①.



Flywheel puller:
YU-33270/90890 - 01362



3.Remove:

- Stator coil assembly ①
- Pickup coil ②

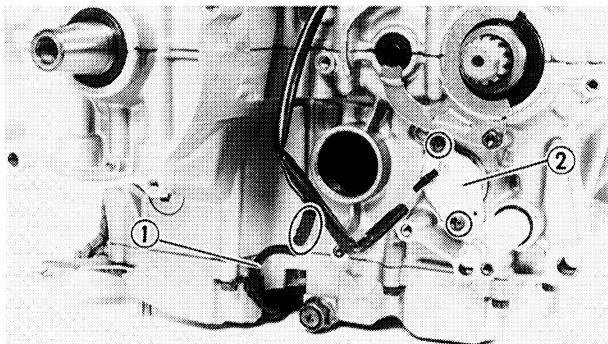
EB401100

OIL PAN AND OIL STRAINER

NOTE: _____

The oil pan and oil strainer can be removed while the engine is mounted by removing the following parts:

- Bottom cowling
- Side cowlings (left and right)
- Exhaust pipes

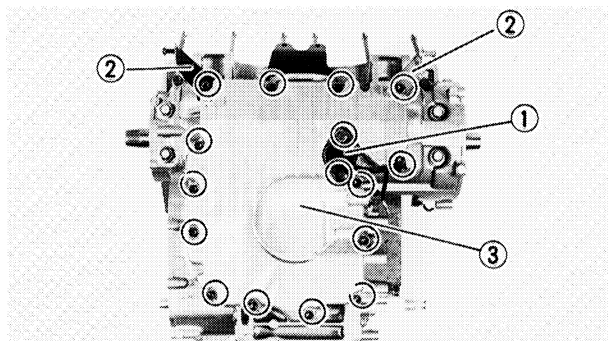


1.Disconnect:

- Oil level switch lead ①

2.Remove:

- Neutral switch ②



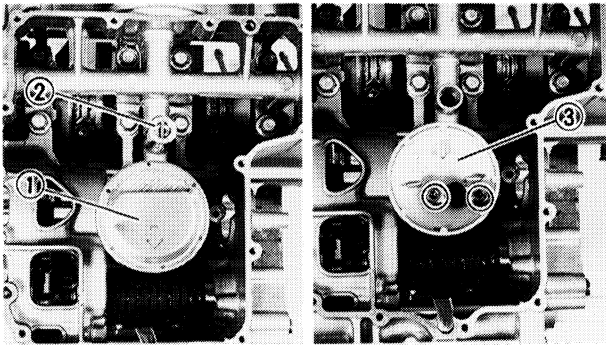
3.Remove:

- Oil level switch ①
- Stays (side cowlings) ②
- Oil pan ③

NOTE: _____

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

- Oil pan gasket
- Dowel pins



4.Remove:

- Oil strainer cover ①
- Relief valve ②
- Oil strainer housing ③

EB401110

OIL PUMP AND SHIFT SHAFT

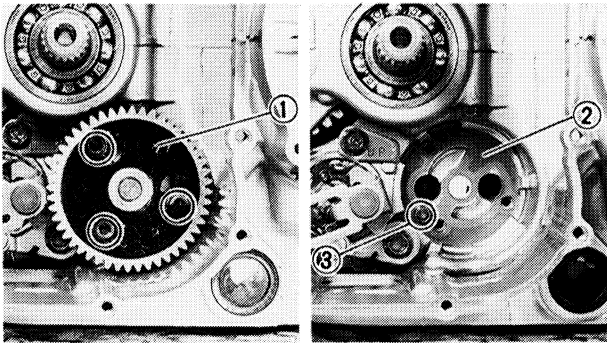
NOTE:

The oil pump and shift shaft can be removed while the engine is mounted by removing the following parts:

- Bottom cowlings
- Side cowlings (left and right)
- Crankcase covers (left and right)
- Clutch housing

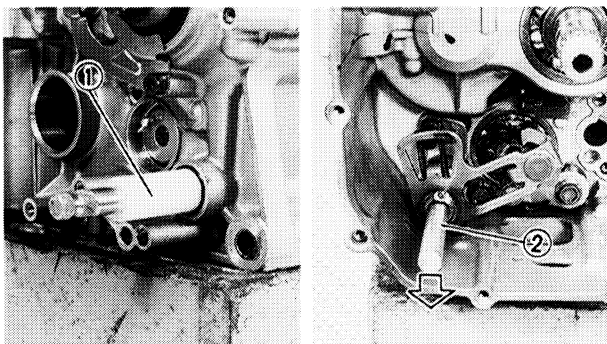
1.Remove:

- Oil pump assembly ①
- Gasket ②
- Dowel pin ③



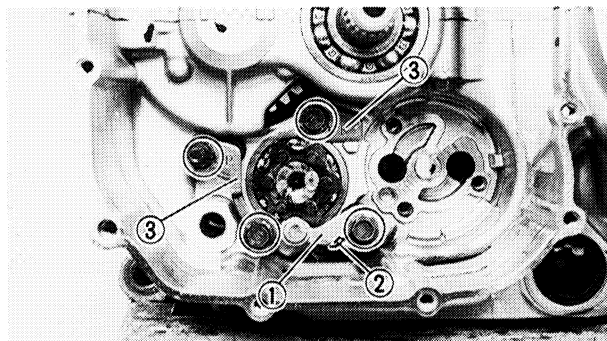
2.Remove:

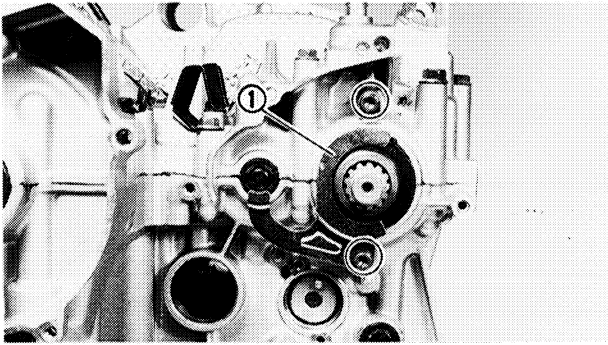
- Collar ①
- Shift shaft assembly ②



3.Remove:

- Stopper lever ①
- Return spring ②
- Stopper plate (shift fork guide bar and bearing) ③



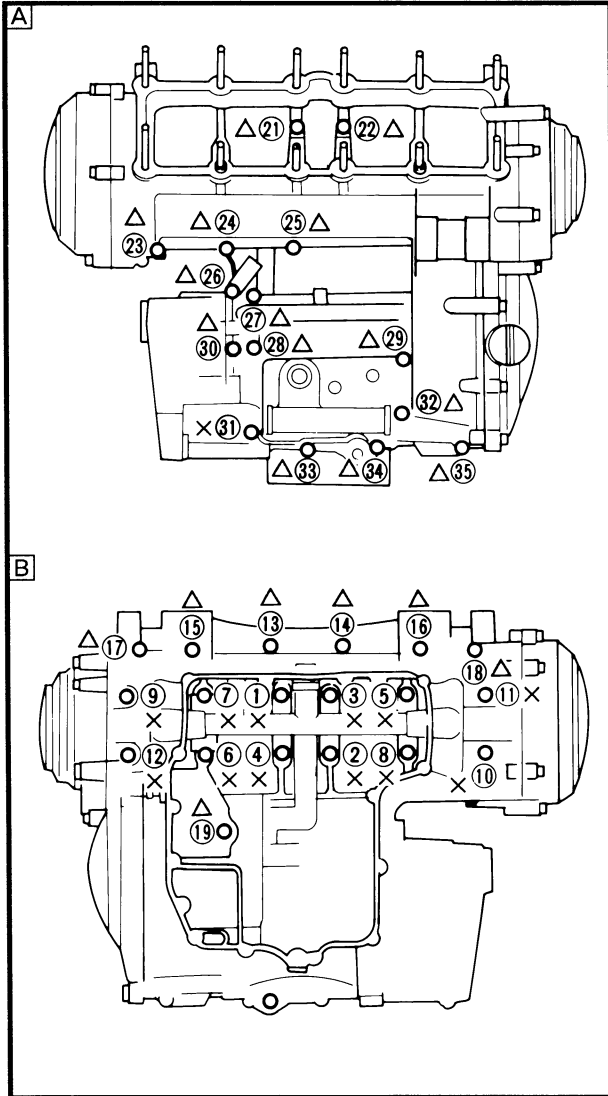


EB401130

CRANKCASE DISASSEMBLY

1.Remove:

- Oil seal stopper ①



2.Remove:

- Bolts (crankcase)

NOTE:

- Loosen each bolt 1/4 of a turn at a time and after they are all loosened, remove them.
- Loosen the bolts in decreasing numerical order (see numbers on the illustration).
- The numbers embossed on the crankcase indicate the crankcase tightening sequence.

3.Place the engine upside down.

4.Remove:

- Lower crankcase

CAUTION:

Use a soft hammer to tap on one side of the crankcase. Tap only on the reinforced portions of the crankcase. Do not tap on the crankcase mating surfaces. Work slowly and carefully. Make sure that the crankcase halves separate evenly.

- Dowel pin
- O-ring
- Oil jet

Ⓐ Upper crankcase

Ⓑ Lower crankcase

△ :M6 bolts

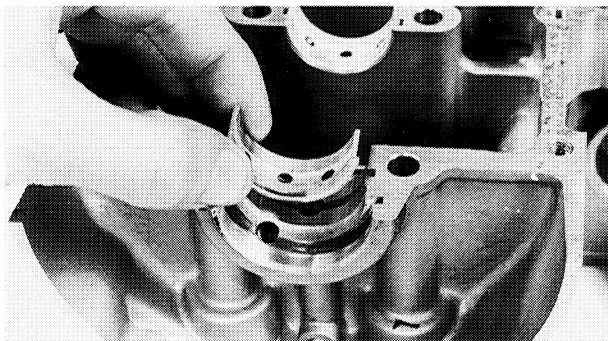
× :M8 bolts

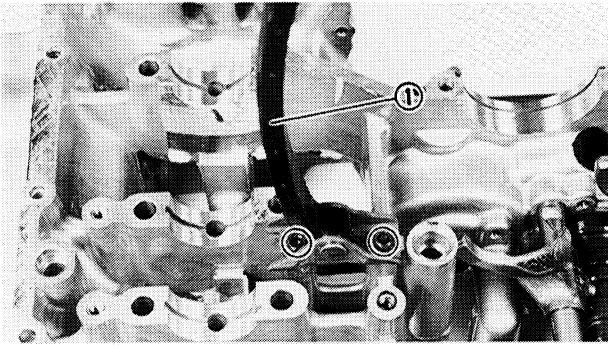
5.Remove:

- Main journal bearings
(from the lower crankcase)

NOTE:

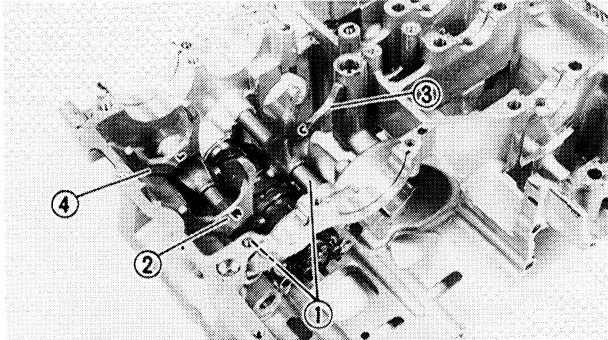
Identify the position of each main journal bearing very carefully so that it can be reinstalled in its original place.





6.Remove:

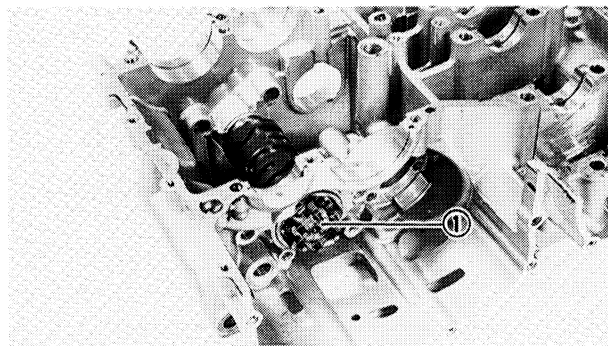
- Timing chain guide (intake side) ①



SHIFT FORKS AND SHIFT CAM

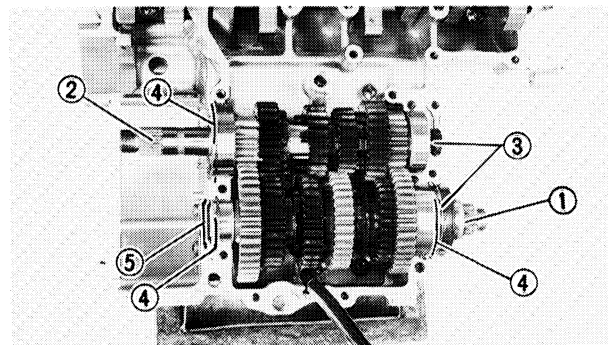
1.Remove:

- Guide bars (shift forks) ①
- Shift fork "R" ②
- Shift fork "C" ③
- Shift fork "L" ④



2.Remove:

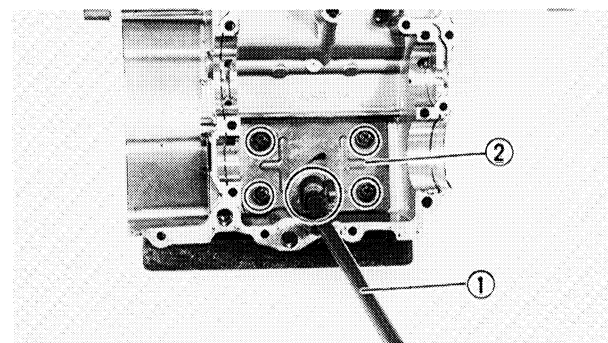
- Shift cam assembly ①



TRANSMISSION

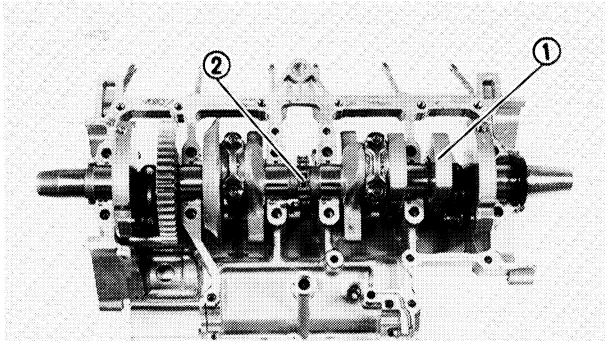
1.Remove:

- Drive axle assembly ①
- Main axle assembly ②
- Oil seals ③
- Circlips ④
- Special washer ⑤



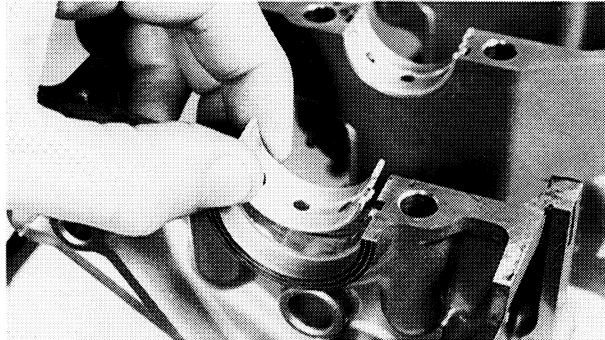
2.Remove:

- Breather hose ①
- Oil baffle plate ②



EB401140
CRANKSHAFT

- 1.Remove:
- Crankshaft assembly ①
 - Timing chain ②



- 2.Remove:
- Main journal bearings
(from the upper crankcase)

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

EB401150
VALVES

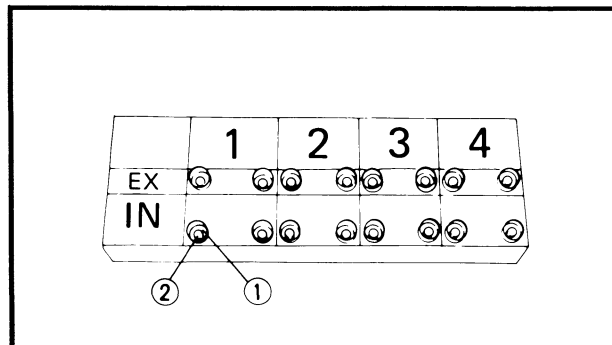
NOTE: _____
The valves can be removed while the engine is mounted by removing the following parts:

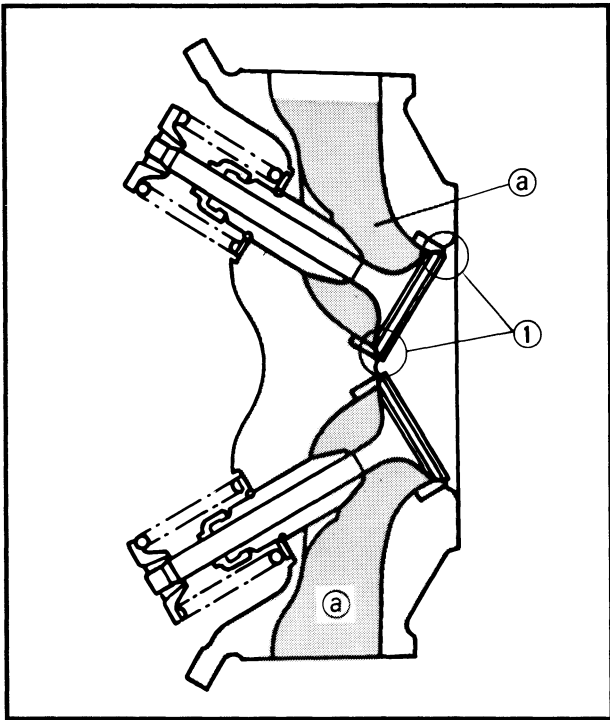
- Bottom cowling
- Side cowlings (left and right)
- Seat
- Fuel tank
- Air filter case
- Carburetor assembly
- Radiator assembly
- Cylinder head

NOTE: _____
Valve sealing should be checked before the internal parts (valves, valve springs, valve seats etc.) of the cylinder head are removed.

- 1.Remove:
- Valve lifters ①
 - Pads ②

NOTE: _____
Identify the position of each valve lifter ① and pad ② very carefully so that they can be reinstalled in their original place.





2.Check:

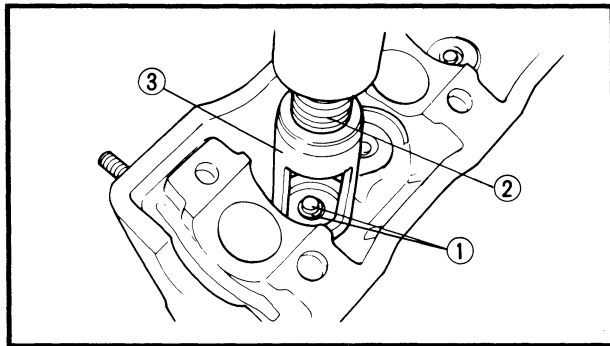
- Valve sealing

Leakage at the valve seat → Inspect the valve face, valve seat and valve seat width.

Refer to "INSPECTION AND REPAIR – VALVE SEATS".

Checking steps:

- Pour a clean solvent (a) into the intake and exhaust ports.
- Check that the valves seal properly. There should be no leakage at the valve seats (1).



3.Remove:

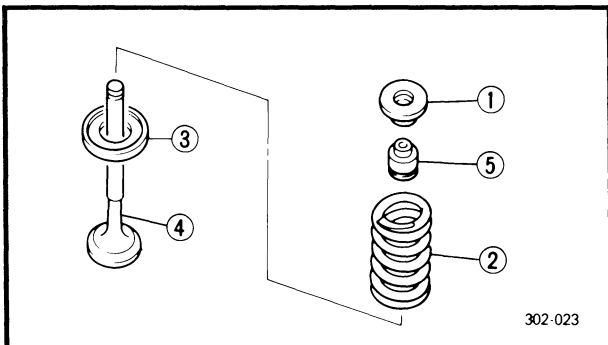
- Valve cotter pins (1)

NOTE:

Attach a valve spring compressor (2) and attachment (3) between the valve spring retainer and cylinder head to remove the valve cotter pins.



Valve spring compressor:
 YM-040109/90890 - 04019
Attachment:
 YM-040108/90890 - 04108



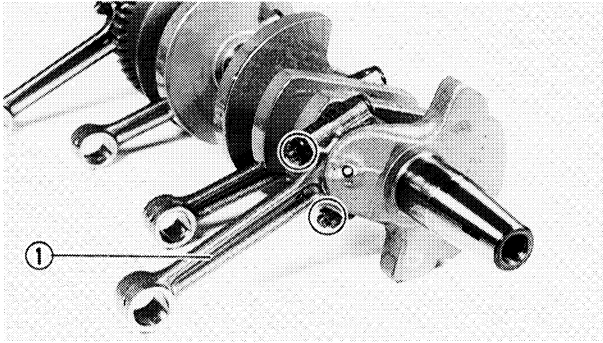
4.Remove:

- Valve spring retainer (1)
- Valve spring (2)
- Spring seat (3)
- Valve (4)
- Oil seal (5)

NOTE:

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

302-023



EB401160

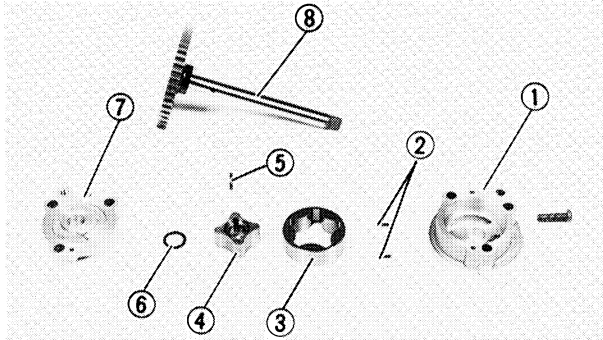
CONNECTING RODS

1.Remove:

- Connecting rods ①
- Bearings (connecting rods)

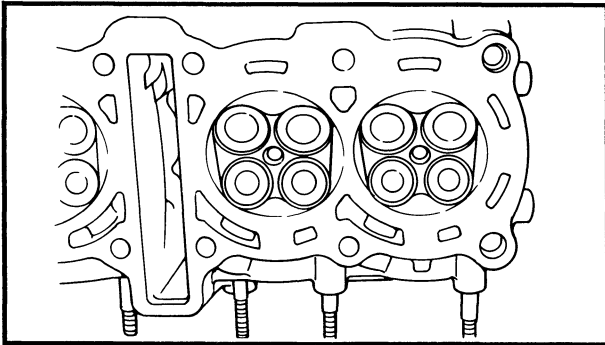
NOTE:

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

**OIL PUMP**

1.Remove:

- Screw
- Pump housing ①
- Dowel pins ②
- Outer rotor ③
- Inner rotor ④
- Pin ⑤
- Washer ⑥
- Pump cover ⑦
- Pump shaft ⑧



EB402001

INSPECTION AND REPAIR

CYLINDER HEAD

1. Eliminate:

- Carbon deposits
(from the combustion chambers)
Use a rounded scraper.

NOTE:

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

- Spark plug threads
- Valve seats

2. Inspect:

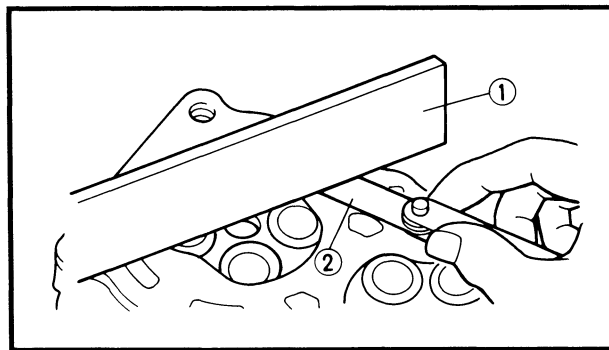
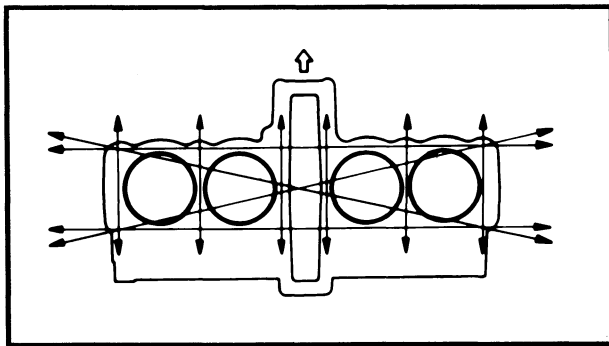
- Cylinder head
Scratches/damage → Replace.
- Water jacket
Mineral deposits/rust → Eliminate.

3. Measure:

- Cylinder head warpage
Out of specification → Resurface.



**Cylinder head warpage:
Less than 0.05 mm (0.0020 in)**

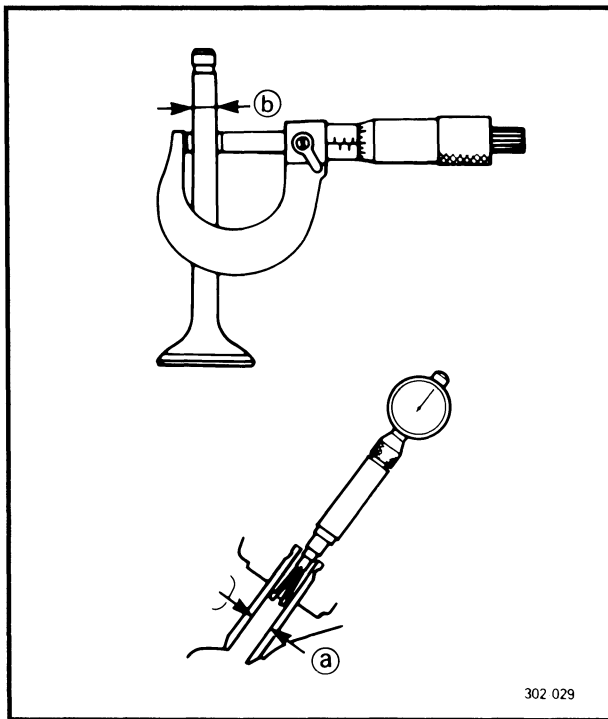


Warpage measurement and resurfacement steps:

- Place a straight edge ① and a feeler gauge ② across the cylinder head.
- Measure the warpage.
- If the warpage is out of specification, resurface the cylinder head.
- Place a 400 ~ 600 grit wet sandpaper on the surface plate, and resurface the head using a figure-eight sanding pattern.

NOTE:

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



EB402010

VALVES AND VALVE GUIDES

1.Measure:

- Stem-to-guide clearance

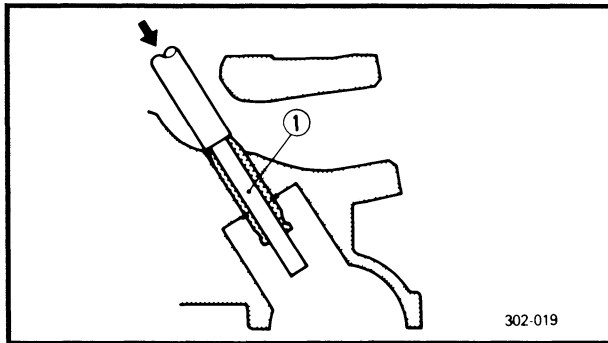
Stem-to-guide clearance = valve guide inside diameter (a) – valve stem diameter (b)

Out of specification → Replace the valve guide.

Clearance (stem to guide):

Intake:
 0.010 ~ 0.037 mm
 (0.0004 ~ 0.0015 in)
 <Limit>: 0.08 mm (0.003 in)

Exhaust:
 0.025 ~ 0.052 mm
 (0.0010 ~ 0.0020 in)
 <Limit>: 0.1 mm (0.004 in)



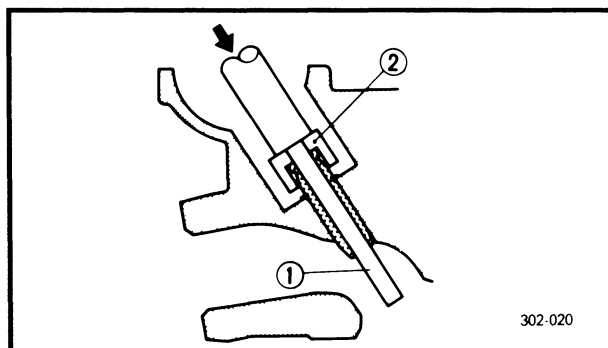
2.Replace:

- Valve guide

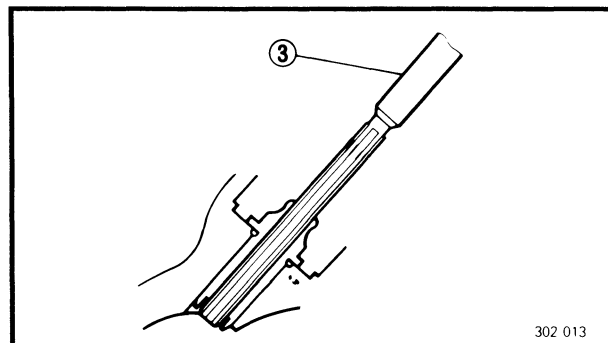
Replacement steps:

NOTE:

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



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



Valve guide remover (4.0 mm):
 90890 - 04111

Valve guide installer (4.0 mm):
 90890 - 04112

Valve guide reamer (4.0 mm):
 90890 - 04113

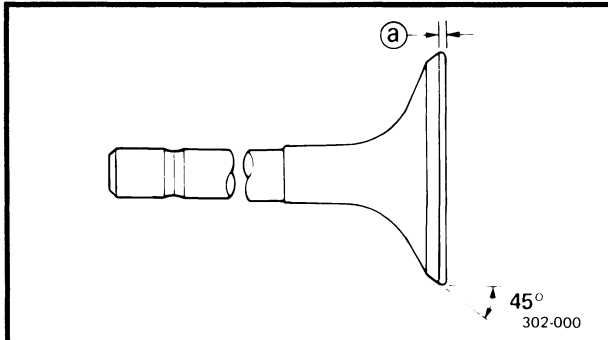


3. Eliminate:

- Carbon deposits
(from the valve face)

4. Inspect:

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



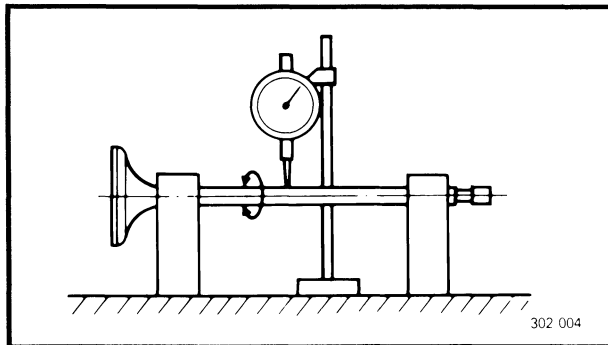
5. Measure:

- Margin thickness @
Out of specification → Replace.

**Margin thickness:**

0.6 ~ 0.8 mm (0.024 ~ 0.031 in)

<Limit>: 0.5 mm (0.02 in)



6. Measure:

- Runout (valve stem)
Out of specification → Replace.

**Runout limit:**

0.04 mm (0.0016 in)

NOTE:

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

EB402020

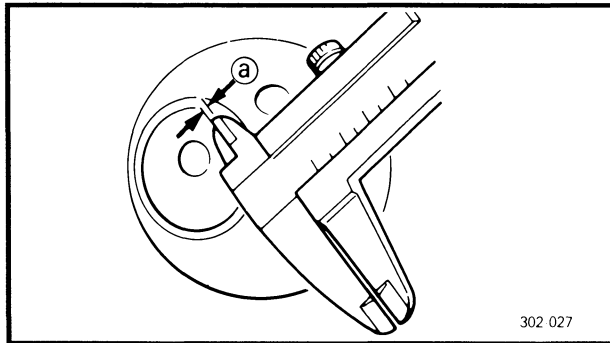
VALVE SEATS

1. Eliminate:

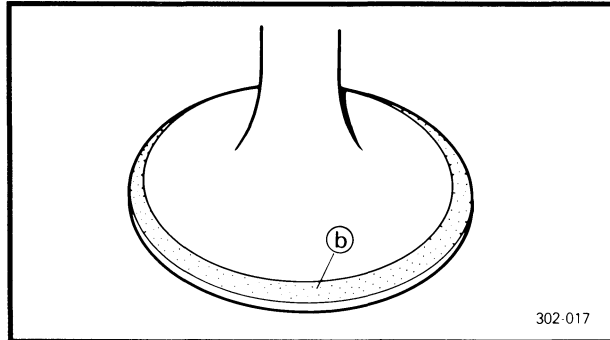
- Carbon deposits
(from the valve face and valve seat)

2. Inspect:

- Valve seat
Pitting/wear → Reface the valve seat.



302 027



302-017

3.Measure:

- Valve seat width ①
- Out of specification → Replace.



Valve seat width:

Intake:

0.9 ~ 1.1 mm (0.035 ~ 0.043 in)

<Limit>: 1.6 mm (0.06 in)

Exhaust:

0.9 ~ 1.1 mm (0.035 ~ 0.043 in)

<Limit>: 1.6 mm (0.06 in)

Measurement steps:

- Apply Mechanic's blueing dye (Dykem) ② to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width. Where the valve seat and valve face made contact, blueing will have been removed.

4.Lap:

- Valve face
- Valve seat

NOTE: _____

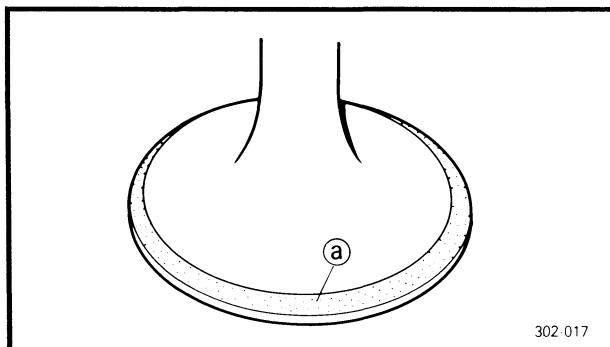
After replacing the valve and valve guide, the valve seat and valve face should be lapped.

Lapping steps:

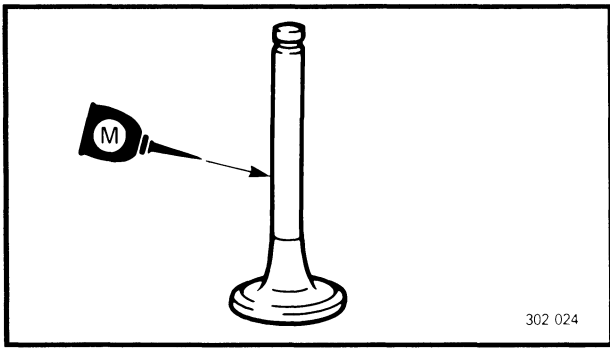
- Apply a coarse lapping compound ① to the valve face.

CAUTION: _____

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



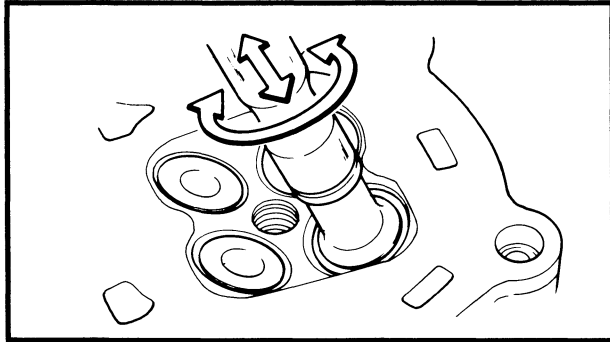
302 017



302 024

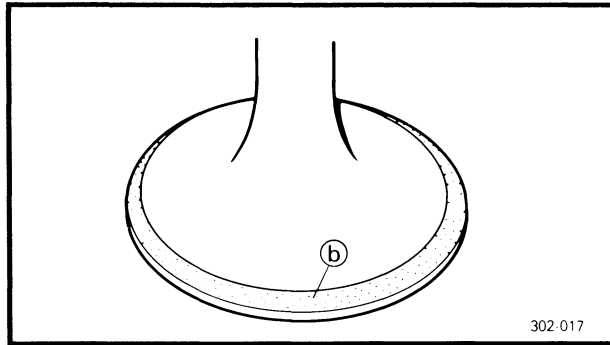
- Apply molybdenum disulfide oil to the valve stem.
- Install the valve into the cylinder head.
- Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the compound.

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



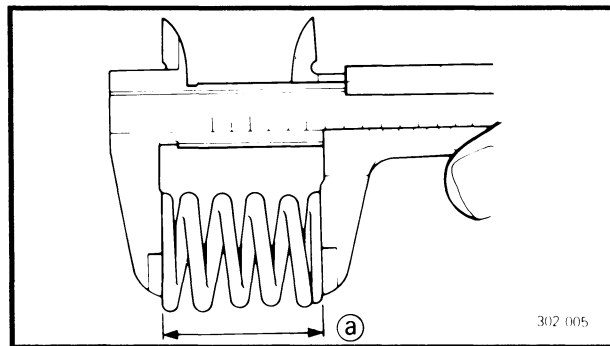
- Apply a fine lapping compound to the valve face and repeat the above steps.

NOTE: _____
 After every lapping operation be sure to clean off all of the compound from the valve face and valve seat.



302 017

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



302 005

EB402030

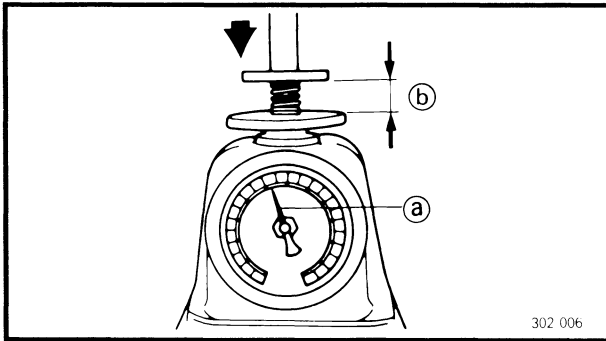
VALVE SPRINGS

1.Measure:

- Valve spring free length (a)
 Out of specification → Replace.



Free length (valve spring):
Intake/Exhaust:
40.09 mm (1.58 in)
<Limit>: 37.5 mm (1.48 in)



2. Measure:

- Compressed spring force (a)
Out of specification → Replace.
- (b) Installed length



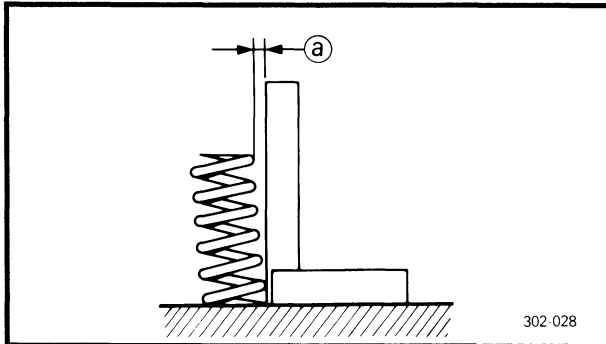
Compressed spring force:

Intake spring:

13.4 ~ 15.6 kg (30 ~ 34 lb) at
34.5 mm (1.4 in)

Exhaust spring:

13.4 ~ 15.6 kg (30 ~ 34 lb) at
34.5 mm (1.4 in)



3. Measure:

- Spring tilt (a)
Out of specification → Replace.



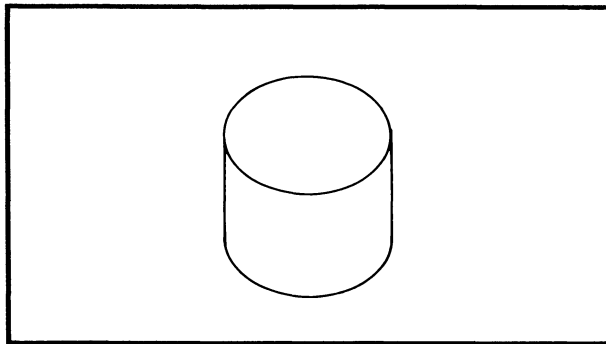
Spring tilt limit:

Intake spring:

1.8 mm (0.071 in)

Exhaust spring:

1.8 mm (0.071 in)

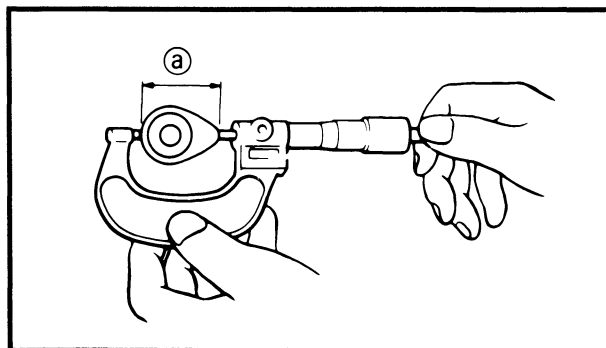


EB402040

VALVE LIFTERS

1. Inspect:

- Valve lifter
Scratches/damage → Replace both the lifters and the cylinder head.



EB402050

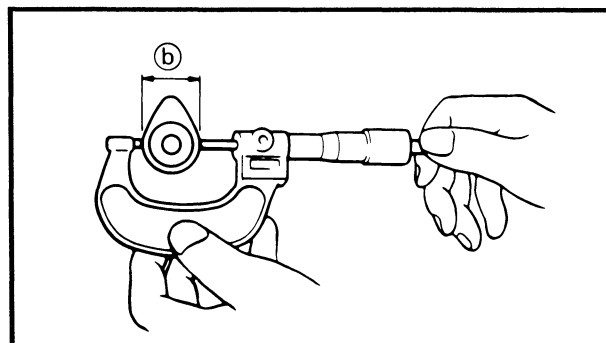
CAMSHAFTS

1. Inspect:

- Cam lobe
Blue discoloration/pitting/scratches → Replace.

2. Measure:

- Cam lobe length (a) and (b)
Out of specification → Replace.



Cam lobe length limit:

Intake:

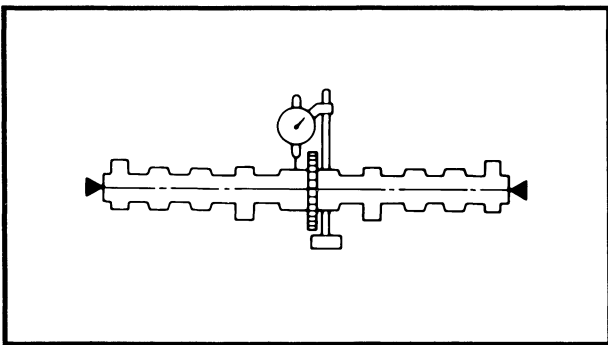
(a) 32.7 mm (1.287 in)

(b) 24.95 mm (0.982 in)

Exhaust:

(a) 32.5 mm (1.280 in)

(b) 24.95 mm (0.982 in)



3.Measure:

- Runout (camshaft)
Out of specification → Replace.



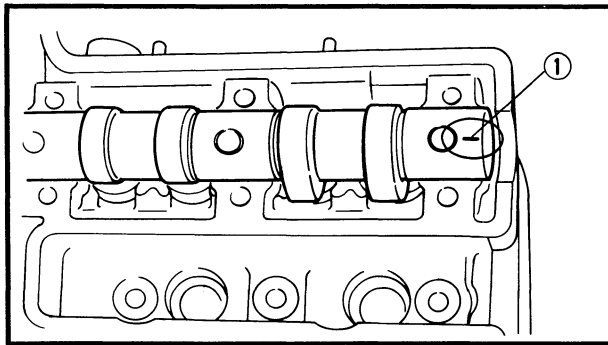
Runout (camshaft):
Less than 0.06 mm (0.0024 in)

4.Measure:

- Camshaft-to-cap clearance
Out of specification → Measure the diameter (camshaft bearing)



Clearance (camshaft to cap):
0.020 ~ 0.054 mm
(0.0008 ~ 0.0021 in)



Measurement steps:

- Install the camshaft onto the cylinder head.
- Position a strip of Plastigauge® ① onto the camshaft.

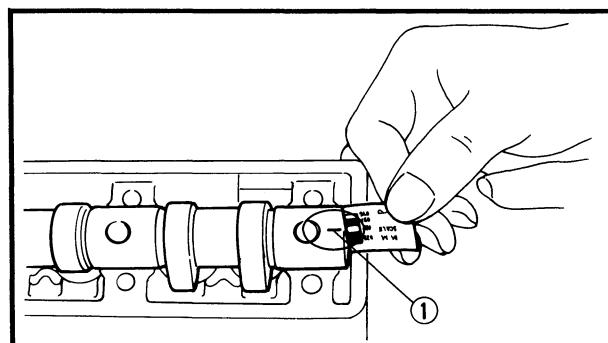
- Install the dowel pins and camshaft caps.

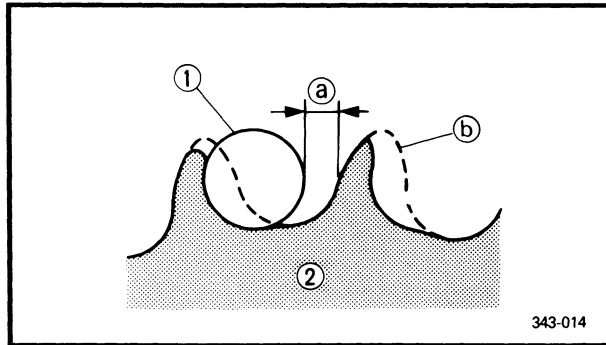
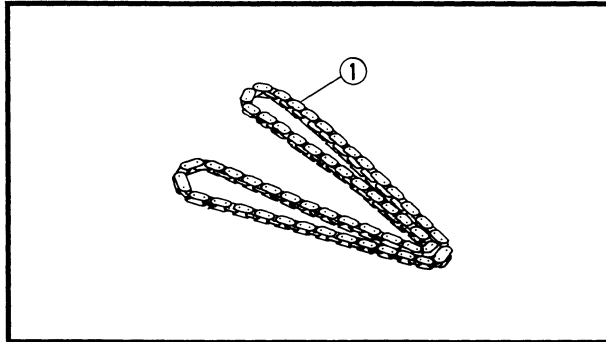
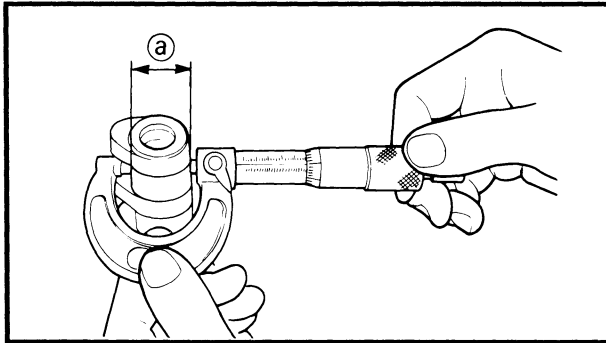


Bolt (camshaft cap):
10 Nm (1.0 m · kg, 7.2 ft · lb)

NOTE:

- Tighten the camshaft cap bolts in a criss-cross pattern from the inner caps working out.
 - When measuring clearance with the Plastigauge® do not turn the camshaft.
-
- Remove the camshaft caps and measure the width of the Plastigauge® ①.





343-014

5.Measure:

- Diameter (camshaft bearing) ①
Out of specification → Replace the camshaft.
Within specification → Replace the cylinder head and the camshaft caps as a set.



Diameter (camshaft bearing):
22.967 ~ 22.980 mm
(0.9042 ~ 0.9047 in)

EB402070

TIMING CHAIN, CAMSHAFT SPROCKETS AND TIMING CHAIN GUIDES

1.Inspect:

- Timing chain ①
Stiffness/damage → Replace the timing chain and the camshaft sprockets as a set.

2.Inspect:

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

① 1/4 of a tooth

② Correct

① Roller

② Sprocket

3.Inspect:

- Timing chain guide (exhaust)
- Timing chain guide (intake)
- Timing chain guide (upper)
Wear/damage → Replace.

EB402080

TIMING CHAIN TENSIONER

1.Check:

- One-way cam operation
Unsmooth operation → Replace.



EB402101

CYLINDERS AND PISTONS

1. Inspect:

- Cylinder and piston walls
Vertical scratches → Replace the cylinder and piston.

2. Measure:

- Piston-to-cylinder clearance

Measurement steps:

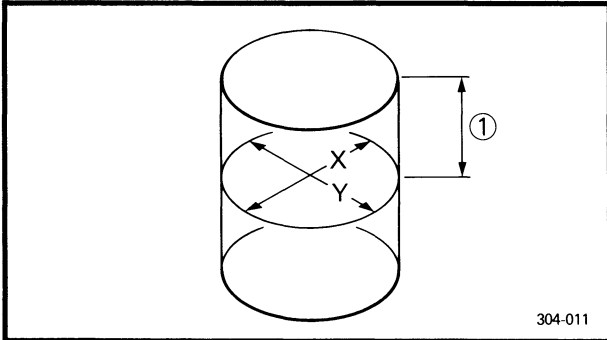
1st step:

- Measure cylinder bore "C" with a cylinder bore gauge.


① 20 mm (0.8 in) from the cylinder top

NOTE:

Measure the cylinder bore "C" in parallel to and at right angle to the crankshaft. Then, find the average of the measurements.



304-011

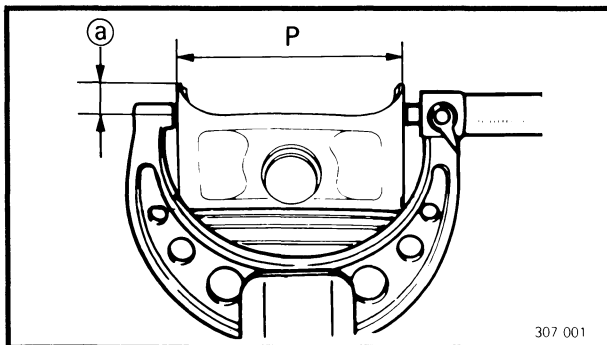
	Standard	Wear limit
Cylinder bore "C"	62.00 ~ 62.01 mm 2.4409 ~ 2.4413	62.1 mm (2.445 in)
$C = \frac{X+Y}{2}$		

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

2nd step:

- Measure piston skirt diameter "P" with a micrometer.

② 5 mm (0.197 in) from the bottom edge of the piston.



307 001


	Piston size P
Standard	61.960 ~ 61.975 mm (2.439 ~ 2.440 in)

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

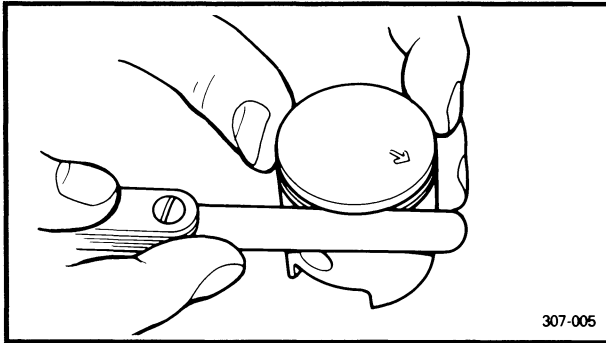
3rd step:

- Use the following formula to calculate the piston-to-cylinder clearance:

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

	Clearance (piston to cylinder): 0.025 ~ 0.050 mm (0.0010 ~ 0.0020 in) <Limit>: 0.07 mm (0.0028 in)
---	--

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



EB402110

PISTON RINGS

1. Measure:

- Side clearance

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

NOTE:

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

**Side clearance (piston ring):****Top ring:**

0.020 ~ 0.075 mm

(0.001 ~ 0.003 in)

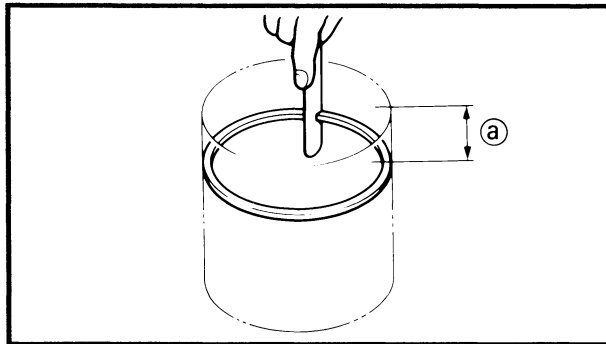
<Limit>: 0.1 mm (0.004 in)

2nd ring:

0.020 ~ 0.055 mm

(0.001 ~ 0.002 in)

<Limit>: 0.1 mm (0.004 in)



2. Position:

- Piston ring
(into the cylinder)

NOTE:

Using the piston crown, push the ring into the cylinder.

@ 20 mm (0.8 in)

3. Measure:

- End gap

Out of specification → Replace.

NOTE:

The end gap on the expander spacer of the oil ring cannot be measured. If the oil ring rails show excessive gap, replace all three rings.

**End gap:****Top ring:**

0.15 ~ 0.30 mm (0.006 ~ 0.012 in)

<Limit>: 0.6 mm (0.024 in)

2nd ring:

0.25 ~ 0.40 mm (0.010 ~ 0.016 in)

<Limit>: 0.7 mm (0.028 in)

Oil ring:

0.10 ~ 0.35 mm (0.004 ~ 0.014 in)



EB402120

PISTON PINS

1. Inspect:

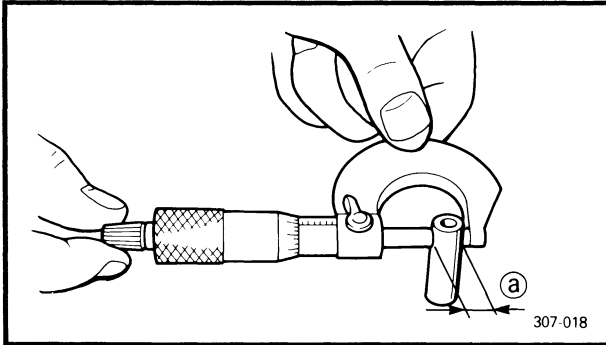
- Piston pin
Blue discoloration/grooves → Replace the piston pin, then inspect the lubrication system.

2. Measure:

- Piston pin-to-piston clearance

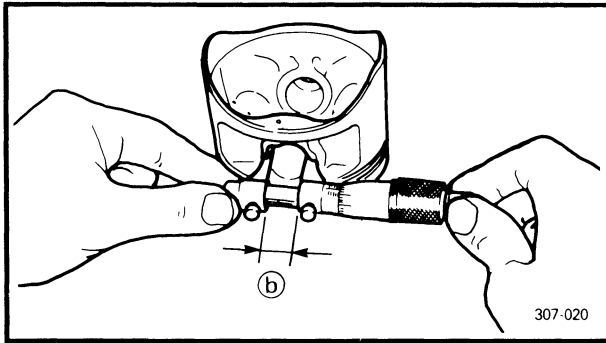
Measurement steps:

- Measure the piston pin outside diameter
Ⓐ.
If out of specification, replace the piston pin.



Outside diameter (piston pin):
16.991 ~ 17.000 mm
(0.6689 ~ 0.6693 in)

- Measure the inside diameter of the piston
Ⓑ.
- Use the following formula to calculate the piston pin-to-piston clearance:



Piston pin-to-piston clearance =
Bore size (piston pins) Ⓑ –
Outside diameter (piston pins) Ⓐ

- If out of specification, replace the piston.



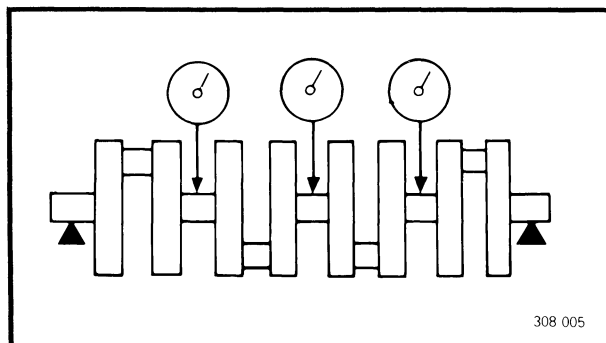
Clearance (piston pin to piston):
0.002 ~ 0.022 mm
(0.00008 ~ 0.00087 in)
<Limit>: 0.07 mm (0.003 in)

EB402131

CRANKSHAFT AND CONNECTING RODS

1. Measure:

- Runout (crankshaft)
Out of specification → Replace.



Runout (crankshaft):
Less than 0.03 mm (0.0012 in)



2. Inspect:

- Main journal surfaces
- Crank pin surfaces
- Bearing surfaces
Scratches/wear → Replace.

3. Measure:

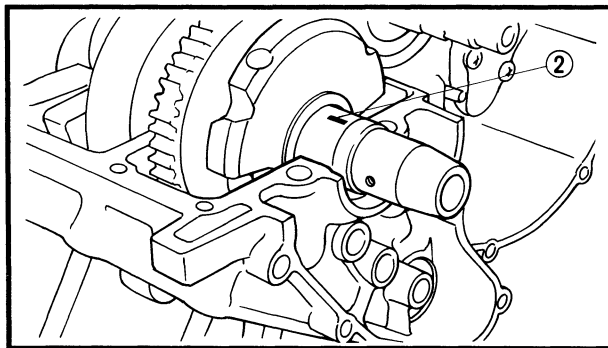
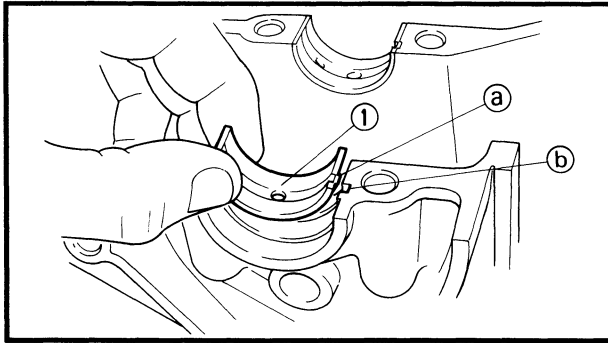
- Oil clearance (main journal)
Out of specification → Replace the main journal bearing.



Oil clearance (main journal):
0.08 mm (0.0031 in)

Measurement steps:**CAUTION:**

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



- Clean the main journal bearings, main journals and bearing portions of the crankcase.
- Place the upper crankcase upside down on a bench.
- Install the upper half of the main journal bearings ① and the crankshaft into the upper crankcase.

NOTE:

Align the projection ② of the main journal bearing with the notch ③ in the crankcase.

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

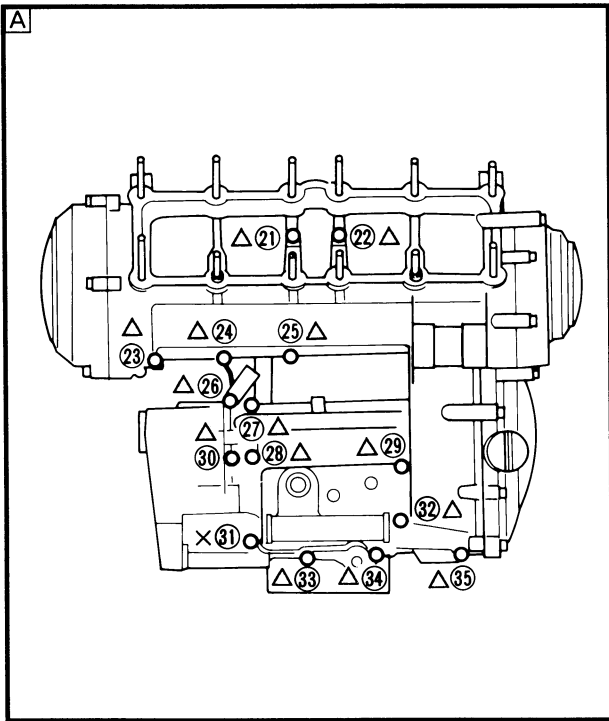
NOTE:

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

- Install the lower half of the main journal bearing into the lower crankcase and assemble the crankcase halves.

NOTE:

- Align the projection of the main journal bearing with the notch in the crankcase.
- Do not move the crankshaft until the oil clearance measurement has been completed.



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

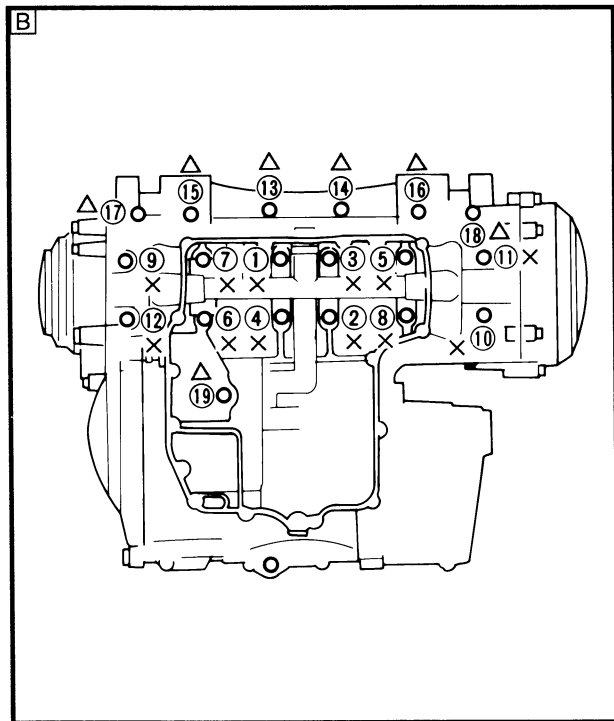


Bolt (crankcase):

M8 (1 ~ 12 and 31):
 24 Nm (2.4 m · kg, 17 ft · lb)

M6 (13 ~ 30 and 32 ~ 35):
 12 Nm (1.2 m · kg, 8.7 ft · lb)

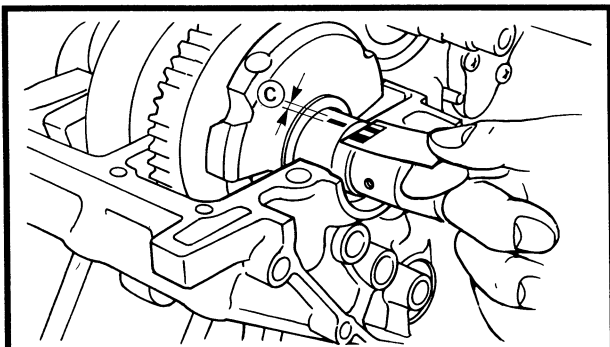
A Upper case



B Lower case

NOTE:

- Lubricate the bolt threads (M8) with molybdenum disulfide oil.
 - Lubricate the bolt threads (M6) with engine oil.
-
- Remove the lower crankcase and the lower half of the bearings.



- Measure the compressed Plastigauge® width © on each main journal. If the oil clearance is out of specification, select a replacement bearing.



4. Measure:

- Oil clearance (crank pin)
Out of specification → Replace the crank pin bearing.



Oil clearance (crank pin):
0.08 mm (0.0031 in)

Measurement steps:**CAUTION:**

Do not interchange the crank pin bearings and connecting rods. To obtain the correct oil clearance and to prevent engine damage they must be installed in their original positions.

- Clean the bearings, crank pins and bearing portions of the connecting rods.
- Install the upper half of the bearing into the connecting rod and the lower half of the bearing into the connecting rod cap.

NOTE:

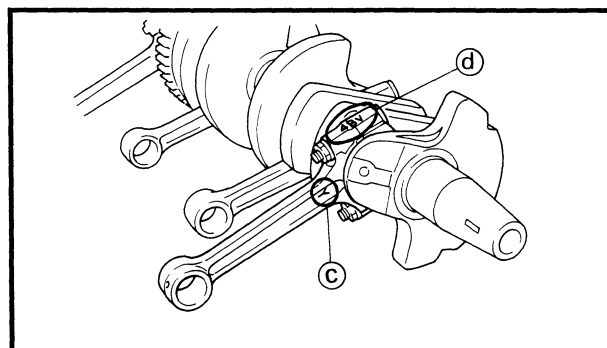
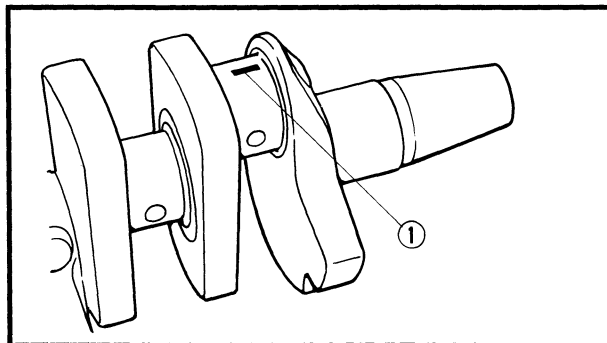
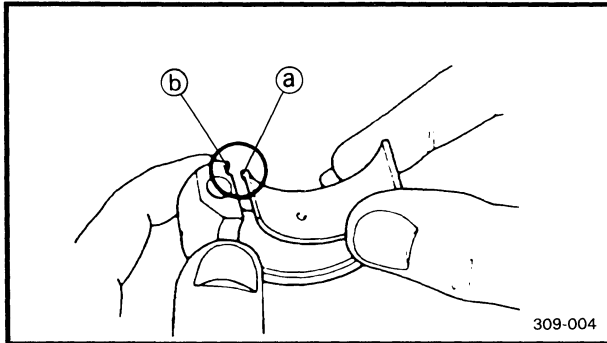
Align the projection ① of the bearing with the notch ② of the connecting rod and connecting rod cap.

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

NOTE:

- Do not move the connecting rod or crankshaft until the oil clearance measurement has been completed.
- Apply molybdenum disulfide grease to the bolts, threads and nut seats.

- Make sure that the "Y" marks ③ on the connecting rods face towards the left side of the crankshaft.
- When assembling, make sure that the letters ④ on both the connecting rod and the connecting rod cap align to form a perfect character.



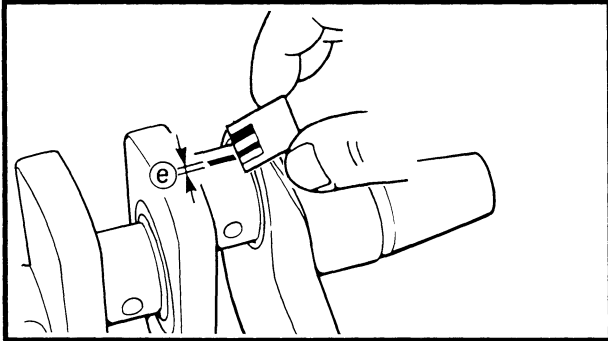


- Tighten the connecting rod nuts.

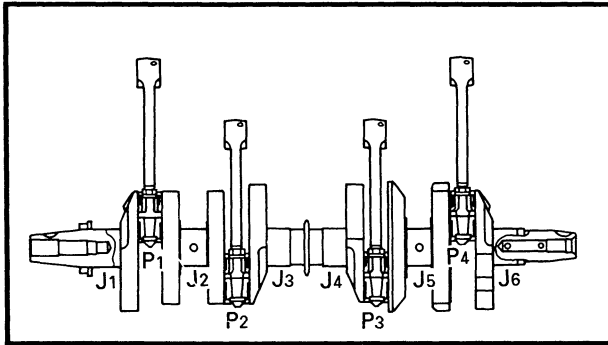


Nut (connecting rod):
15 Nm (1.5 m · kg, 11 ft · lb) +
(turn the nut another 90°)

Refer to “ENGINE ASSEMBLY AND ADJUSTMENT – CONNECTING RODS”.

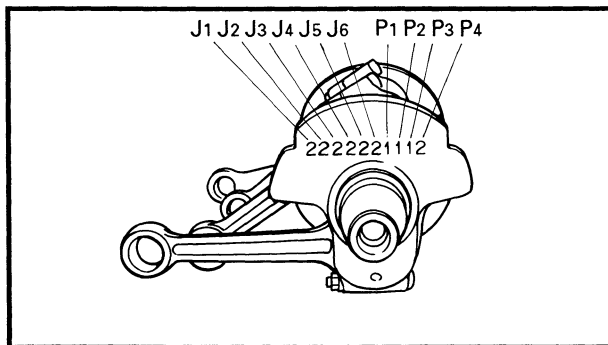


- Remove the connecting rods and bearings.
- Measure the compressed Plastigauge® width ⊕ on each crank pin.
 If the oil clearance is out of specification, select a replacement bearing.



5. Select:

- Main journal bearing (J₁ ~ J₆)
- Crank pin bearing (P₁ ~ P₄)

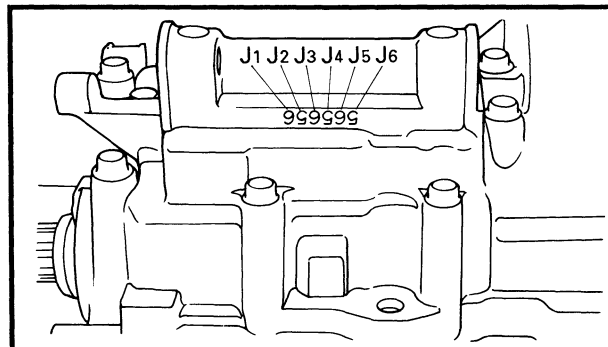


Selection of bearings:

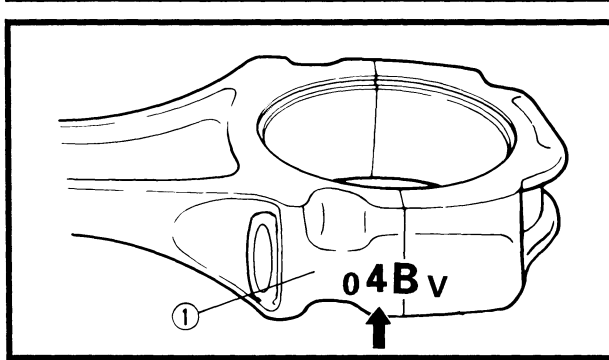
Example 1: Main journal bearing

- If “J₁” on the crankcase is “6” and “2” on the crankweb, then the bearing size for “J₁” is:

Bearing size of J₁:
Crankcase J₁ – Crankweb J₁ + 1 =
6 – 2 + 1 = 5 (yellow)



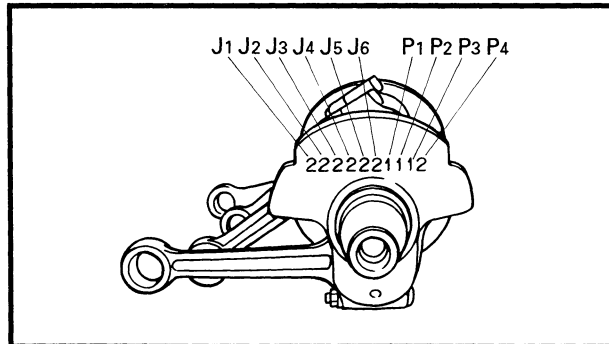
BEARING COLOR CODE	
2	black
3	brown
4	green
5	yellow
6	pink



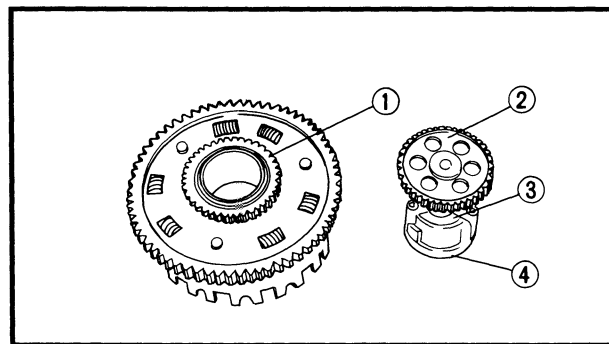
Example 2: Crank pin bearing

- If "P₁" on the connecting rod is "4" and "1" on the crankweb, then the bearing size for "P₁" is:

Bearing size of P₁:
Connecting rod P₁ – Crankweb P₁ =
4 – 1 = 3 (brown)



BEARING COLOR CODE	
1	blue
2	black
3	brown
4	green

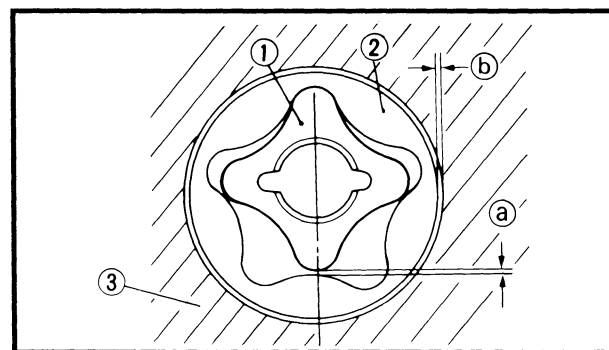


EB402140

OIL PUMP

1. Inspect:

- Drive gear (oil pump) ①
 - Driven gear (oil pump) ②
 - Pump housing ③
 - Pump housing cover ④
- Cracks/wear/damage → Replace.



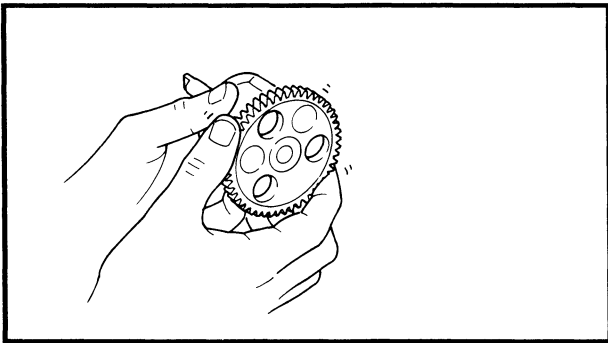
2. Measure:

- Tip clearance ①
(between the inner rotor ① and the outer rotor ②)
 - Side clearance ②
(between the outer rotor ② and the pump housing ③)
- Out of specification → Replace the oil pump assembly.



Tip clearance:
 0.03 ~ 0.09 mm
 (0.001 ~ 0.004 in)
 <Limit>: 0.15 mm (0.006 in)

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



3. Check:

- Oil pump operation
Unsmooth → Repeat steps 1 and 2 or replace the defective parts.

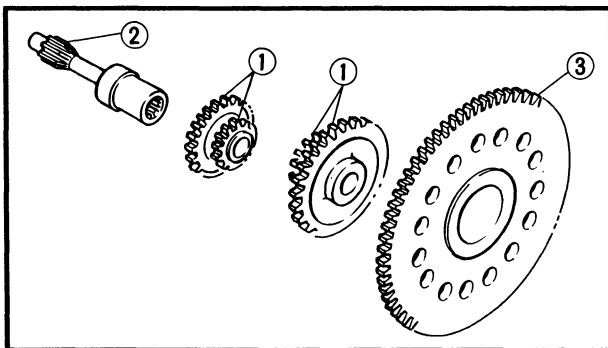
EB402150

PRIMARY DRIVE

1. Inspect:

- Gear teeth (primary drive)
- Gear teeth (primary driven)
Wear/damage → Replace both gears.
Excessive noise during operation → Replace both gears.

Primary reduction ratio:		
No. of teeth		Ratio
Drive	Driven	
48	82	1.708

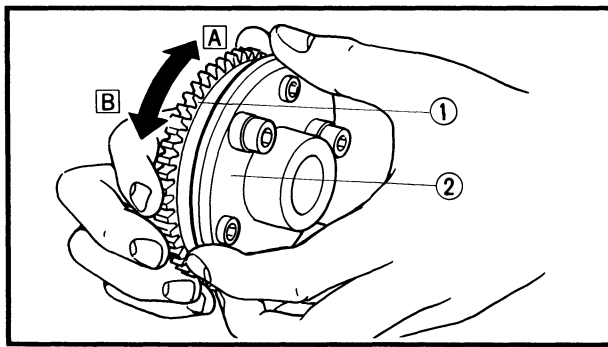


EB402160

STARTER DRIVES

1. Inspect:

- Gear teeth (starter idle) ①
- Gear teeth (starter drive) ②
- Gear teeth (starter wheel) ③
Burr/chips/roughness/wear → Replace.



2.Check:

- Starter clutch operation

Clutch operation checking steps:

- Install the starter wheel gear ① to the starter clutch ② and hold the starter clutch.
- When turning the starter wheel gear clockwise **A**, the starter clutch and the wheel gear should be engaged.
If not, the starter clutch is faulty. Replace it.
- When turning the starter wheel gear counterclockwise **B**, it should turn freely.
If not, the starter clutch is faulty. Replace it.

EB402181

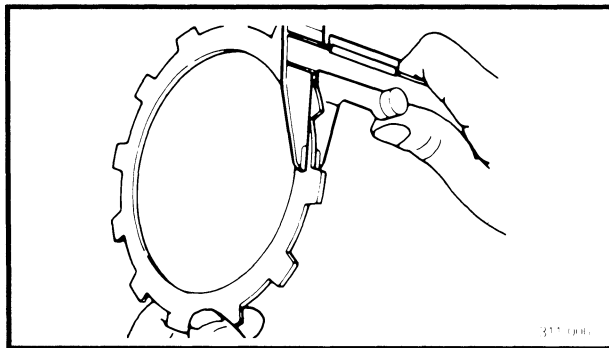
CLUTCH

1.Inspect:

- Friction plates
Wear/damage → Replace the friction plates as a set.

2.Measure:

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



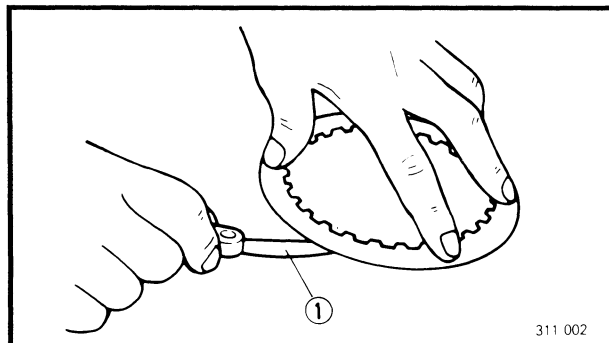
Thickness (friction plate):
2.92 ~ 3.08 mm (0.115 ~ 0.121 in)
<Limit>: 2.8 mm (0.11 in)

3.Inspect:

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

4.Measure:

- Clutch plate warpage
Out of specification → Replace the clutch plates as a set.
Use a surface plate and a feeler gauge ①.



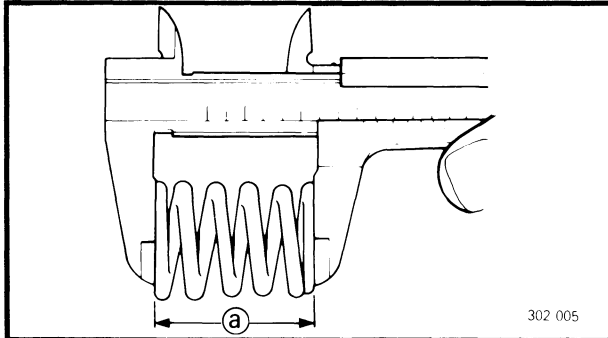
Warp limit (clutch plate):
Less than 0.1 mm (0.004 in)



5. Inspect:

- Clutch spring

Damage → Replace the clutch springs as a set.



6. Measure:

- Free length (clutch spring) ①

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



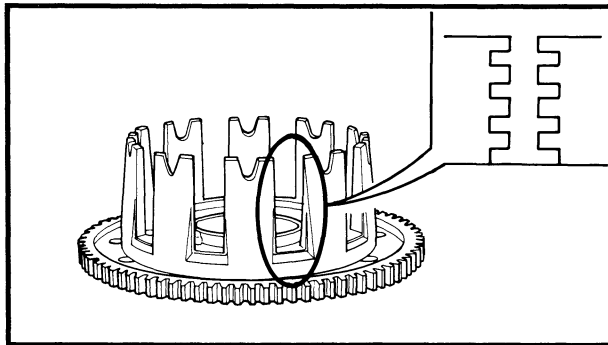
Free length (clutch spring):

40.4 mm (1.59 in)

<Limit>: 39.9 mm (1.57 in)

38.3 mm (1.51 in)

<Limit>: 37.5 mm (1.48 in)



7. Inspect:

- Dogs

(on the clutch housing)

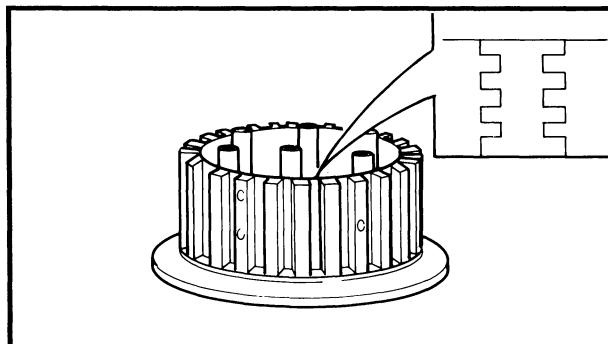
Pitting/wear/damage → Deburr or replace.

- Clutch housing bearing

Wear/damage → Replace the clutch housing.

NOTE:

Pitting on the clutch housing dogs will cause erratic operation.



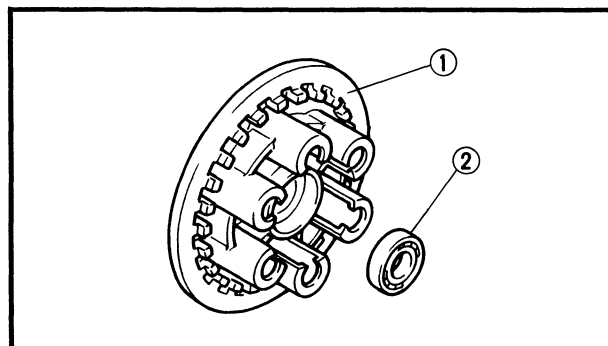
8. Inspect:

- Clutch boss splines

Pitting/wear/damage → Replace the clutch boss.

NOTE:

Pitting on the clutch boss splines will cause erratic operation.



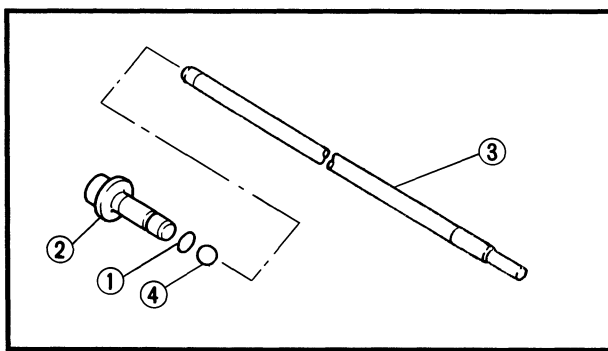
9. Inspect:

- Pressure plate ①

Cracks/damage → Replace.

- Bearing ②

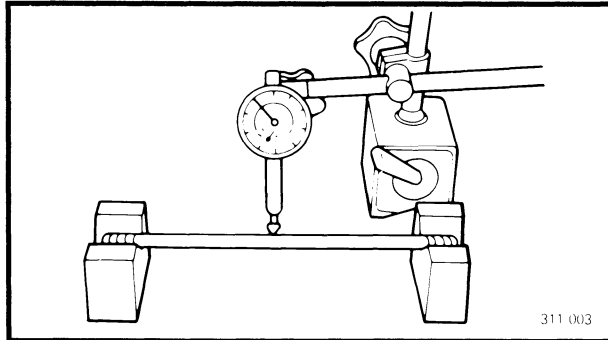
Wear/damage → Replace.



10. Inspect:

- O-ring ①
- Push rod #1 ②
- Push rod #2 ③
- Ball ④

Cracks/wear/damage → Replace.



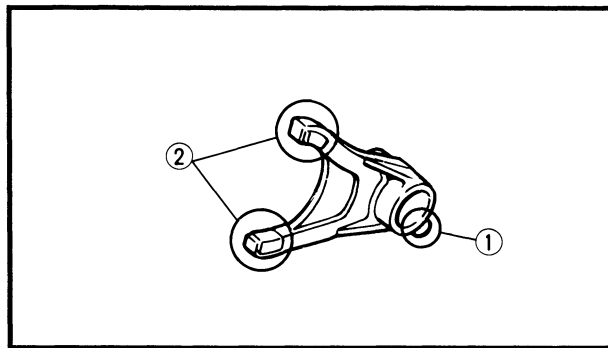
11. Measure:

- Push rod #2

Out of specification → Replace.



Bending limit (push rod #2):
0.3 mm (0.012 in)



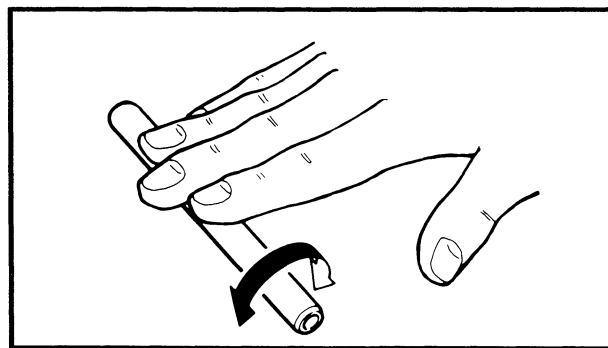
EB402191

TRANSMISSION AND SHIFTER

1. Inspect:

- Shift fork cam follower ①
- Shift fork pawl ②

Bends/scoring/wear/damage → Replace.

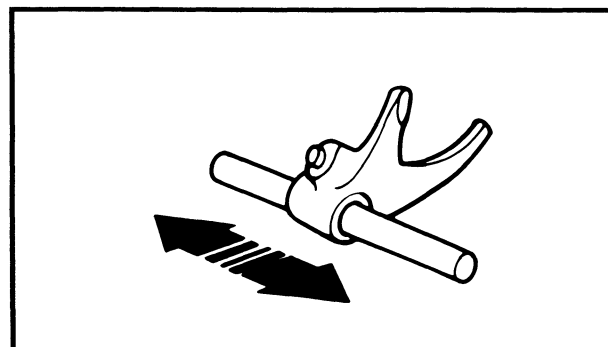


2. Inspect:

- Guide bar
- Roll the guide bar on a flat surface.
Bends → Replace.

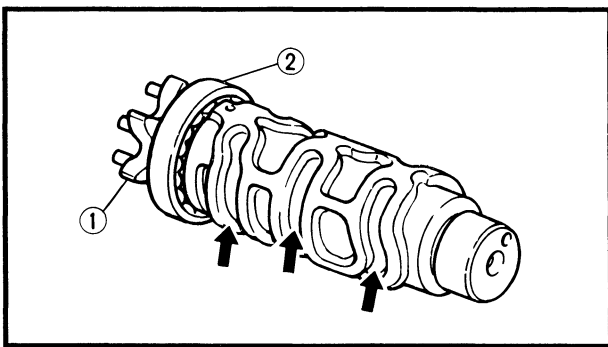
⚠ WARNING

Do not attempt to straighten a bent guide bar.



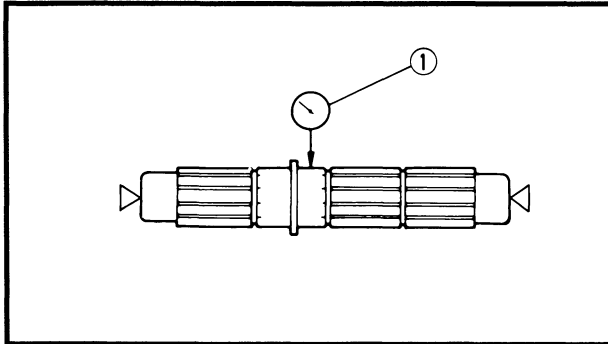
3. Check:

- Shift fork movement (on the guide bar)
- Unsmooth operation → Replace the shift fork and the guide bar.



4. Inspect:

- Shift cam grooves
Scratches/wear/damage → Replace.
- Shift cam segment ①
Wear/damage → Replace.
- Shift cam bearing ②
Pitting/damage → Replace.

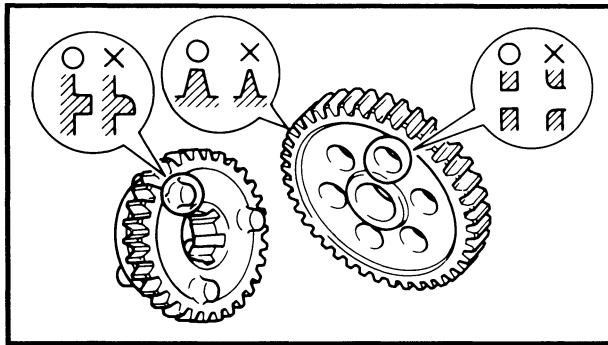


5. Measure:

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

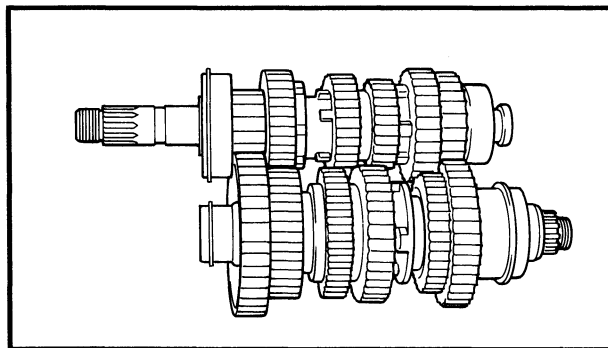


**Runout limit
(main and drive axle):
0.02 mm (0.001 in)**



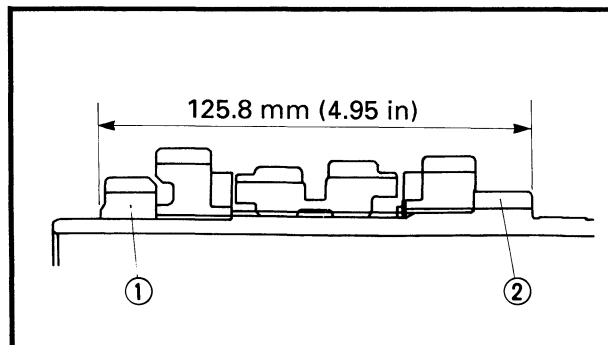
6. Inspect:

- Gear teeth
Blue discoloration/pitting/wear → Replace.
- Mated dogs
Cracks/missing portions/rounded edges
→ Replace.



7. Check:

- Proper pinion gear engagement (each gear to its counter part)
Incorrect → Reassemble.
- Gear movement
Roughness → Replace.

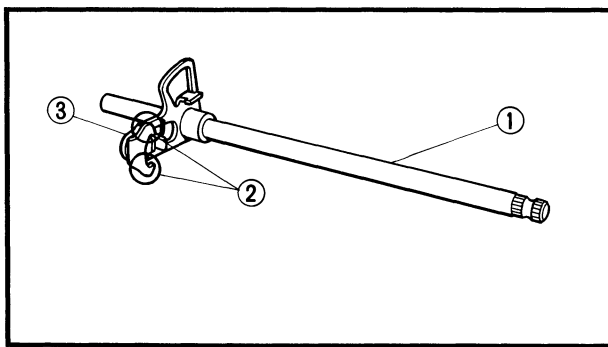


Transmission gear reassembling point:

Press the 2nd pinion gear ① into the main axle ②, as shown in the illustration.

8. Inspect:

- Circlip
Bends/looseness/damage → Replace.

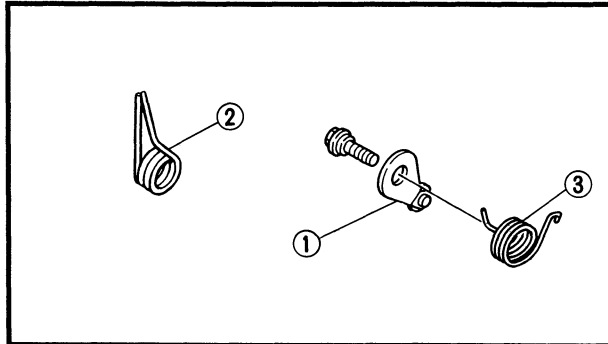


EB402201

SHIFT SHAFT AND STOPPER LEVER

1. Inspect:

- Shift shaft ①
- Shift pawl ②
- Return spring (shift pawl) ③
Bends/wear/damage → Replace.

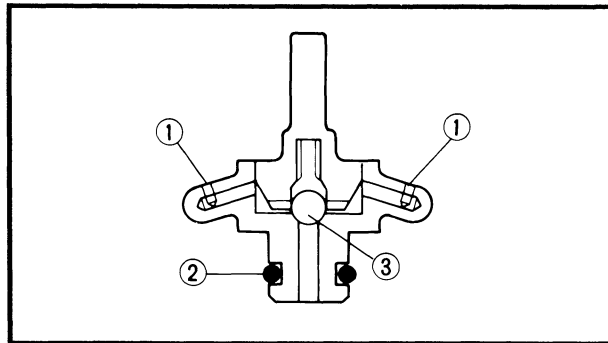


2. Inspect:

- Stopper lever ①
Roller turns roughly → Replace.
Bends/damage → Replace.

3. Inspect:

- Return spring (shift shaft) ②
- Return spring (stopper lever) ③
Wear/damage → Replace.

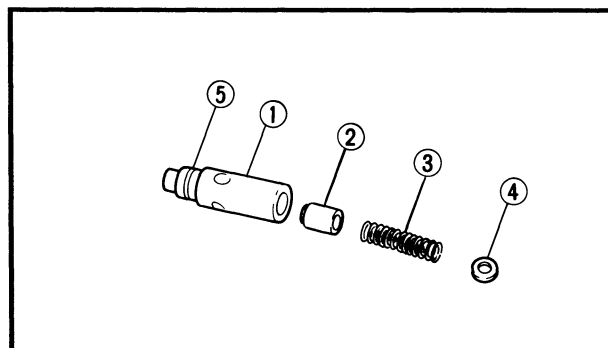


EB402210

OIL-JET NOZZLE

1. Check:

- Oil-jet nozzle ①
- O-ring ②
- Check ball ③
Wear/damage → Replace oil-jet nozzle assembly.
- Oil jet passage
Blockage → Blow out with compressed air.



EB402221

RELIEF VALVE, OIL PIPE AND STRAINER

1. Check:

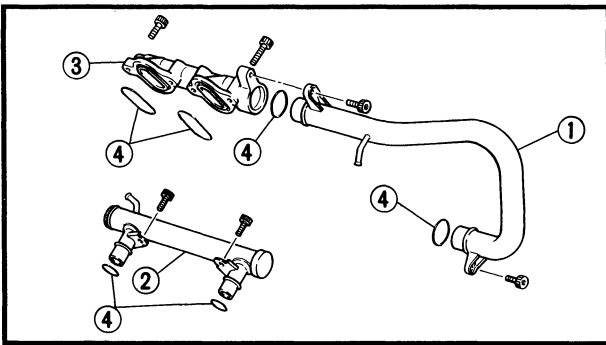
- Relief valve body ①
- Valve ②
- Spring ③
- Spring seat ④
- O-ring ⑤
Wear/damage → Replace.

2. Check:

- Oil delivery pipe
Damage → Replace.
Blockage → Wash the pipe and then blow it out with compressed air.

3. Inspect:

- Oil strainer
Damage → Replace.

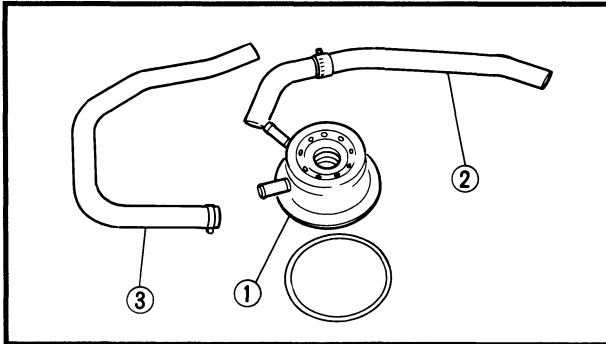


4. Check:

- Coolant pipe ①
- Water jacket joint (outlet ② and inlet ③)
- O-rings ④

Damage → Replace.

Refer to "COOLING SYSTEM" in CHAPTER 5.



EB402230

OIL COOLER

1. Check:

- Oil cooler ①
- Inlet hose (oil cooler) ②
- Outlet hose (oil cooler) ③

Cracks/wear/damage → Replace.

EB402240

CRANKCASE

1. Thoroughly wash the crankcase halves in a mild solvent.

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

3. Inspect:

- Crankcase
Cracks/damage → Replace.
- Oil delivery passages
Blockage → Blow out the passages with compressed air.

EB402250

BEARINGS AND OIL SEALS

1. Inspect:

- Bearing
Clean and then lubricate the bearings, then using a finger, rotate the inner race.
Roughness → Replace.

2. Inspect:

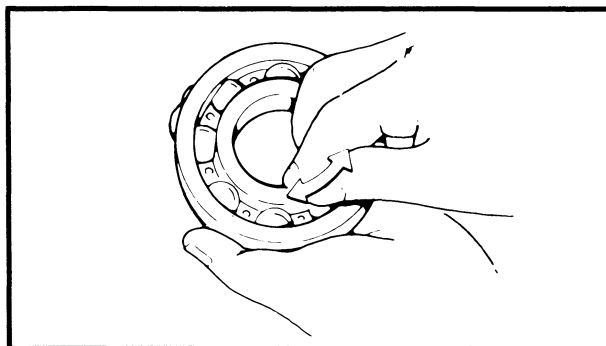
- Oil seal
Wear/damage → Replace.

EB402260

CIRCLIPS AND WASHERS

1. Inspect:

- Circlip
- Washer
Bends/looseness/damage → Replace.





EB404000

ENGINE ASSEMBLY AND ADJUSTMENT

⚠ WARNING

For engine assembly, replace the following parts with new ones:

- O-rings
- Gaskets
- Oil seals
- Copper washers
- Lock washers
- Circlips

EB404010

OIL PUMP

1. Lubricate:

- Inner rotor
- Outer rotor
- Pump shaft



Recommended lubricant:
Engine oil

2. Install:

- Pump shaft ①
- (to pump cover ②)
- Washer ③
- Pin ④
- Inner rotor ⑤
- Outer rotor ⑥
- Dowel pins ⑦
- Pump housing ⑧
- Screw ⑨



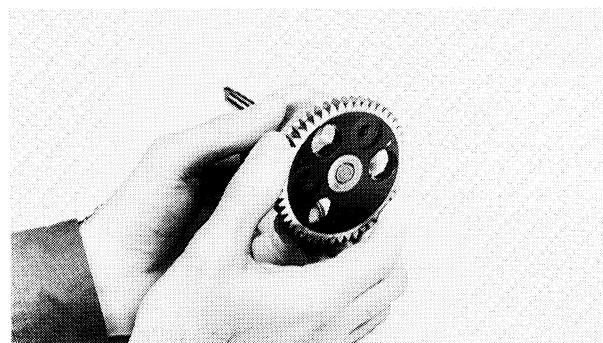
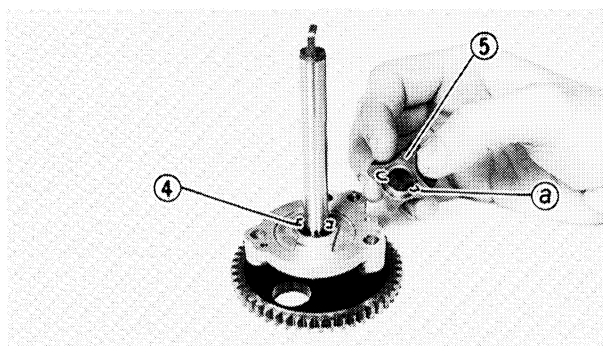
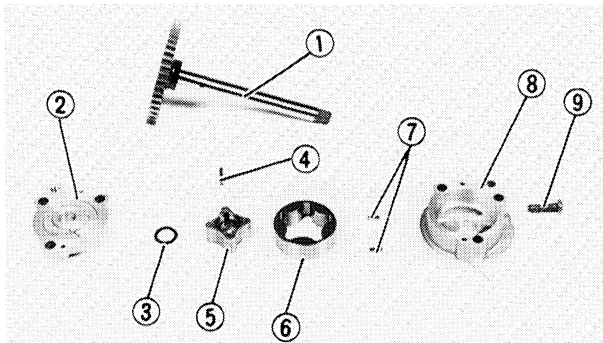
Screw (pump housing):
7 Nm (0.7 m · kg, 5.1 ft · lb)

NOTE:

When installing the inner rotor, align the pin ④ in the pump shaft with the groove ③ on the inner rotor ⑤.

3. Check:

- Oil pump operation
- Refer to "INSPECTION AND REPAIR".

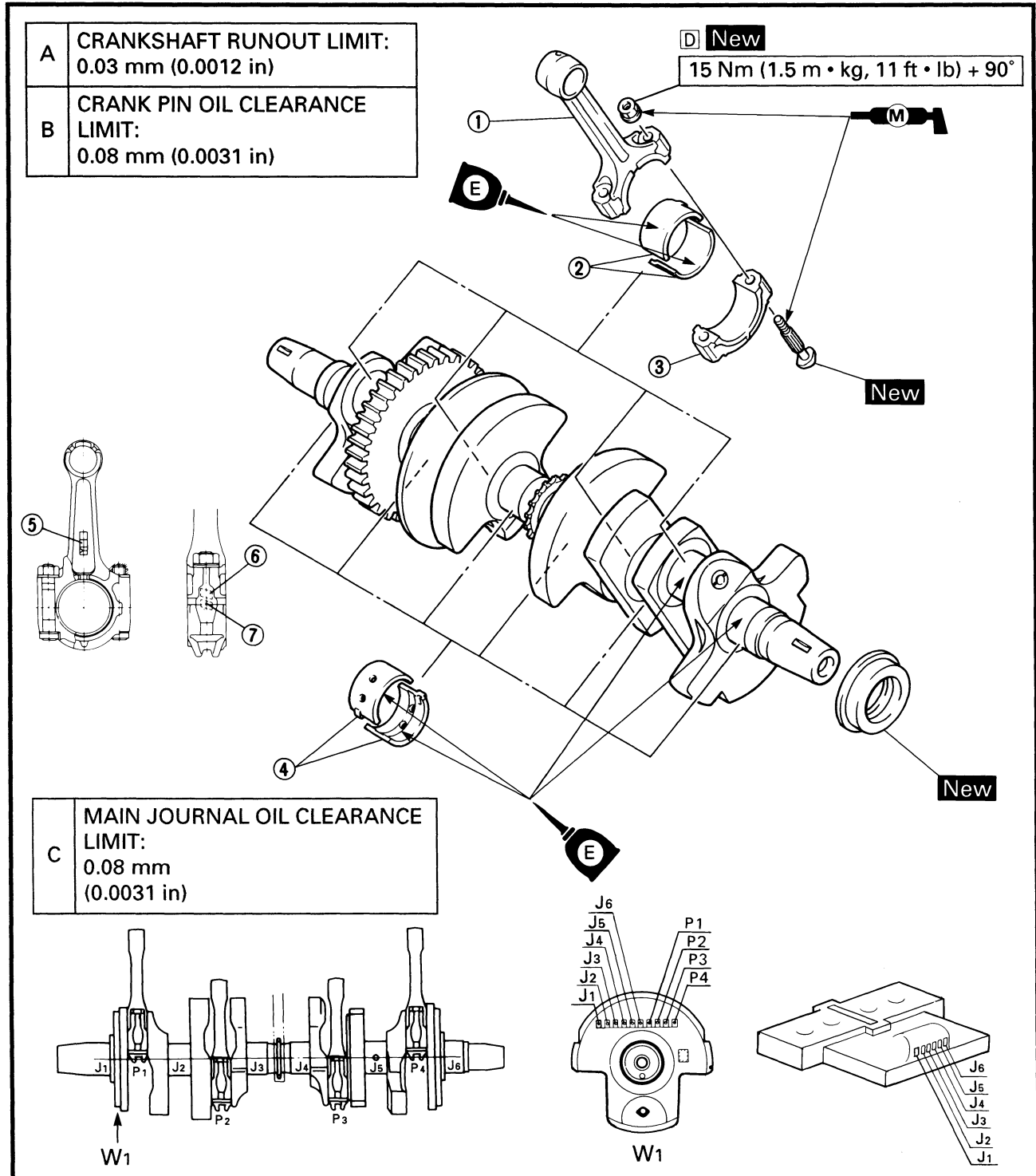




CONNECTING ROD AND CRANKSHAFT

- ① Connecting rod
- ② Plain bearing (connecting rod)
- ③ Connecting rod cap
- ④ Plain bearing (crankshaft-main journal)
- ⑤ Projection mark
- ⑥ Crank pin bearing size
- ⑦ Connecting rod weight number

ⓓ After tightening to the specified torque, tighten another 90° (1/4 turn).



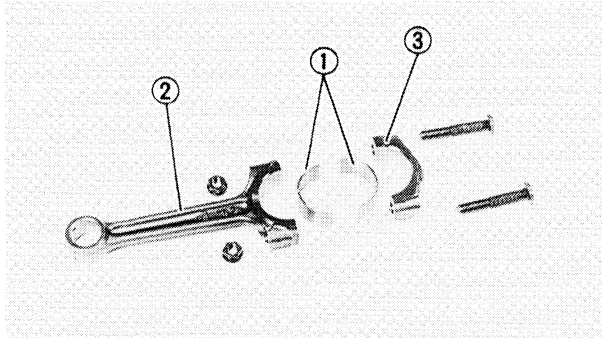


EB404021

CONNECTING RODS

1. Apply:

- Molybdenum disulfide grease (onto the threads of the bolts and nut seats)
- Engine oil (onto the crank pins, crank pin bearings and inner surfaces of each connecting rods)

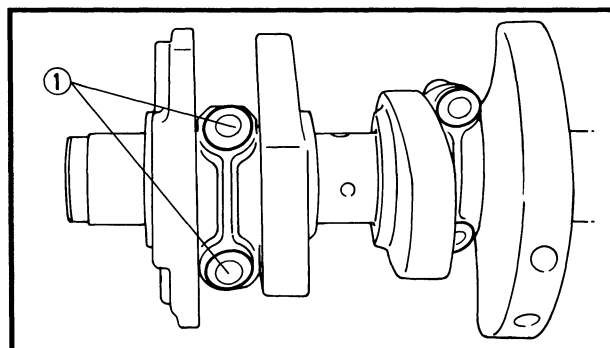
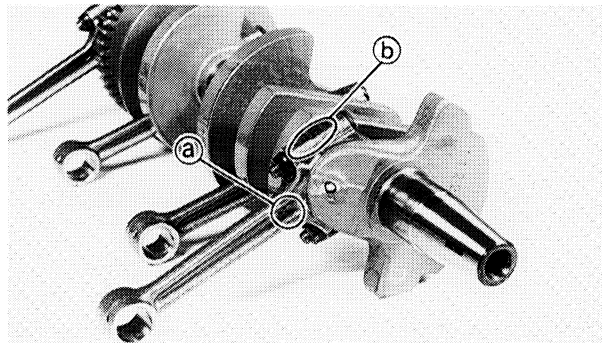


2. Install:

- Bearings (crank pin) ①
- Connecting rods ②
- Connecting rod caps ③ (onto the crank pins)

NOTE:

- Align the projection of the bearings with the groove of the connecting rods and their caps.
- Be sure to reinstall each connecting rod bearing in its original place.
- The stamped "Y" mark ③ on the connecting rod should face towards the left side of the crankshaft.
- When assembling, make sure that the letters ④ on both the connecting rod and connecting rod cap align to form a perfect character.

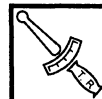


3. Align:

- Bolt heads ① (with the connecting rod cap)

4. Tighten:

- Nuts (connecting rod)



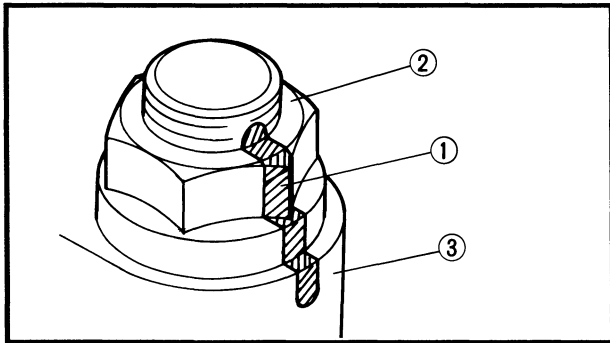
Nut (connecting rod):
15 Nm (1.5 m · kg, 11 ft · lb) +
(turn the nut another 90°)

Tightening steps:

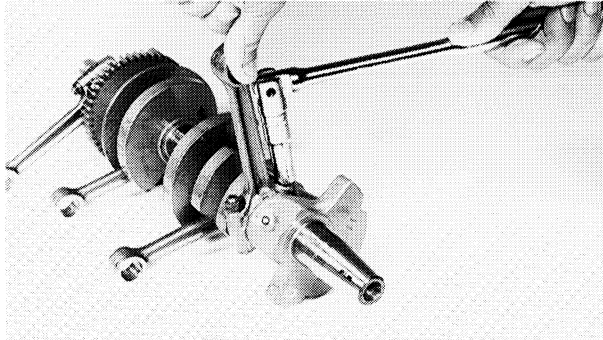
- Replace the connecting rod bolts and nuts with new ones.

CAUTION:

Tighten the connecting rod bolts using the plastic-region tightening angle method. Always install new bolts and nuts.



- Clean the connecting rod bolts and nuts.
- Tighten the connecting rod nuts.
- Put a mark ① on the corner of the connecting rod nut ② and the connecting rod ③.

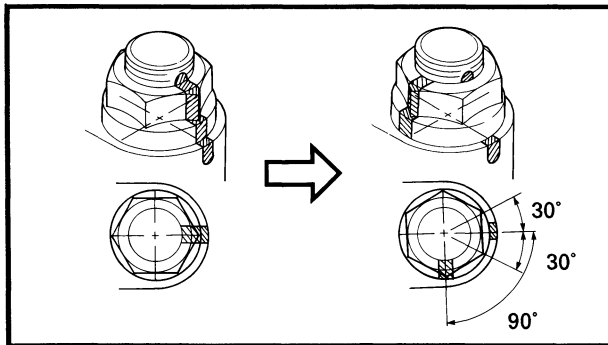


- Tighten the nut further to reach the specified angle (90°).

⚠ WARNING

When the nut is tightened more than the specified angle, do not loosen the nut and then retighten it.

Replace the bolt with a new one and perform the procedure again.



CAUTION

- Do not use a torque wrench to tighten the nut to the specified angle.
- Tighten the nut until it is at the specified angle.

NOTE:

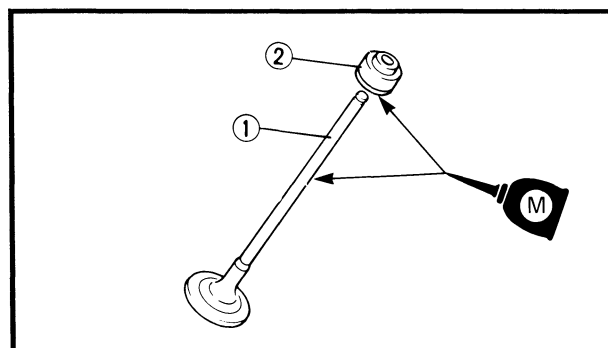
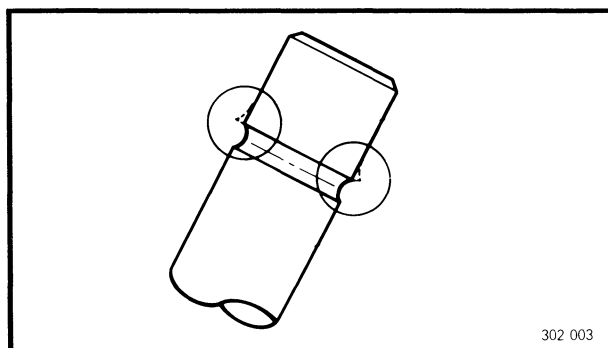
When using a hexagonal nut, note that the angle from one corner to another is 60°.

EB404031

VALVES

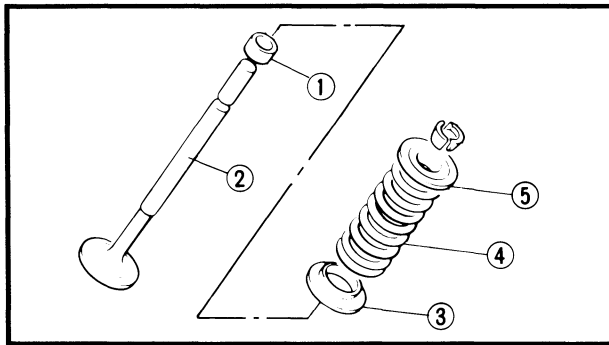
1. Deburr:

- Valve stem end
Use an oil stone to smooth the stem end.



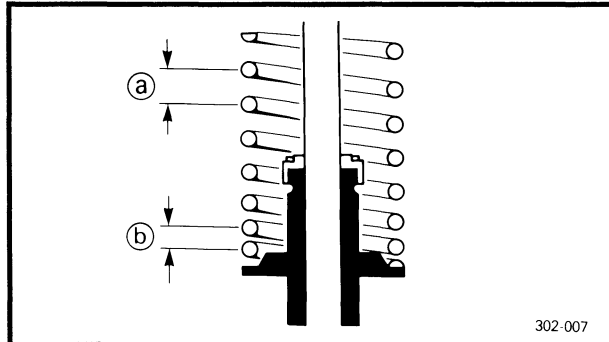
2. Apply:

- Molybdenum disulfide oil
(onto the valve stem ① and oil seal ②)



3.Install:

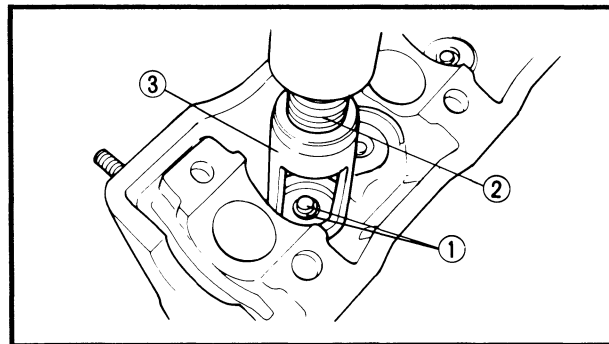
- Oil seal ①
- Valve ②
- Spring seat ③
- Valve spring ④
- Valve spring retainer ⑤
(into the cylinder head)



NOTE:

Install the valve spring with the larger pitch ① facing upwards.

- ① Smaller pitch



4.Install:

- Valve cotters ①

NOTE:

Install the valve cotters while compressing the valve spring with a valve spring compressor.

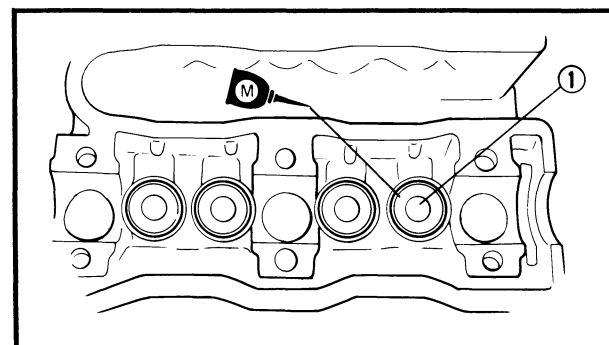


Valve spring compressor ②:
YM-04019/90890 - 04019
Attachment ③:
YM-04018/90890 - 04108

- 5. Secure the valve cotters ① onto the valve stem by tapping lightly with a piece of wood.

CAUTION:

Do not hit so much as to damage the valve.

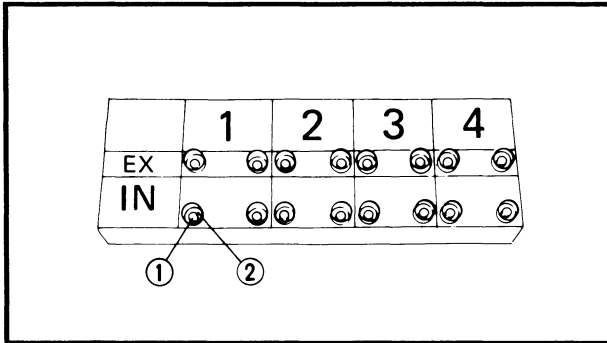


6.Install:

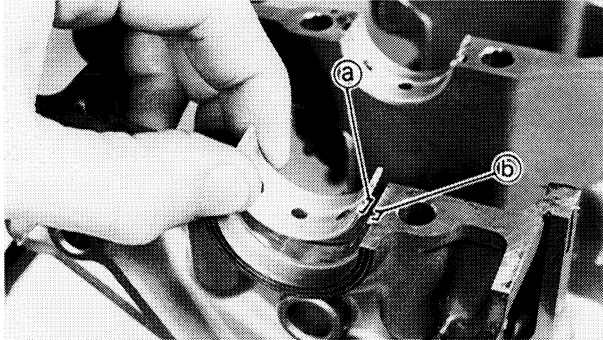
- Pads ①
- Valve lifters ②

NOTE:

- Apply molybdenum disulfide oil to the valve lifters and pads.
- The valve lifters must move smoothly when rotated with a finger.



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



EB404041

CRANKSHAFT

1. Install:

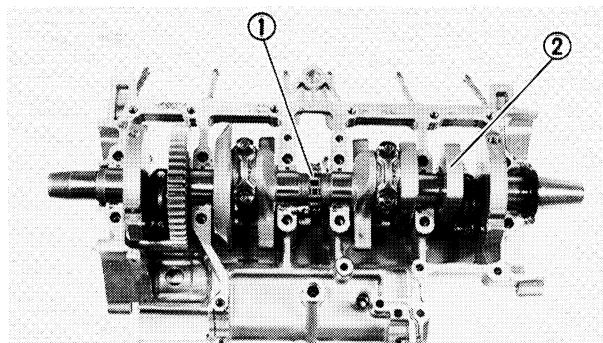
- Main journal bearings
(onto the upper crankcase)

NOTE:

- Align the projection **a** of the main journal bearing with the notch **b** in the crankcase.
- Be sure to install each main journal bearing in its original place.

2. Apply:

- Engine oil
(onto the bearing (main journal) surfaces)



3. Install:

- Timing chain **1**
(onto the crankshaft)
- Crankshaft assembly **2**

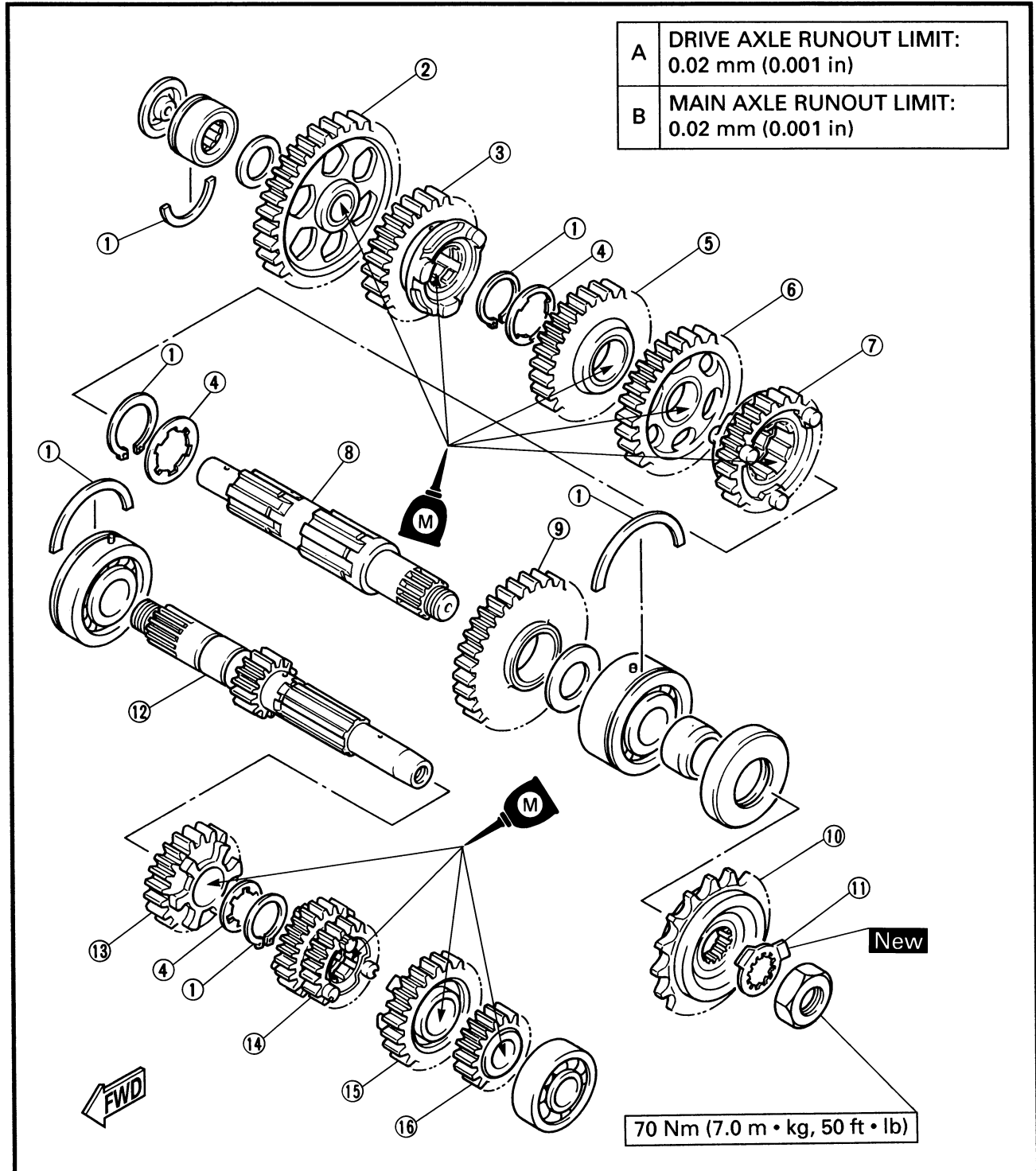
NOTE:

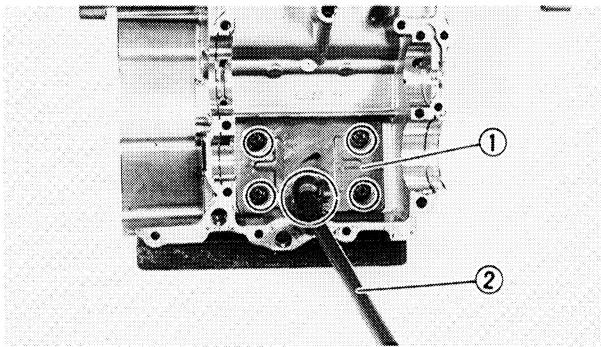
Pass the timing chain through the timing chain cavity. Fasten a wire to the timing chain to retrieve it in case it falls into the crankcase.



TRANSMISSION

- ① Circlip
- ② 1st wheel gear
- ③ 5th wheel gear
- ④ Thrust washer
- ⑤ 4th wheel gear
- ⑥ 3rd wheel gear
- ⑦ 6th wheel gear
- ⑧ Drive axle
- ⑨ 2nd wheel gear
- ⑩ Drive sprocket
- ⑪ Lock washer
- ⑫ Main axle
- ⑬ 5th pinion gear
- ⑭ 3rd/4th pinion gear
- ⑮ 6th pinion gear
- ⑯ 2nd pinion gear





EB404051

TRANSMISSION

1.Install:

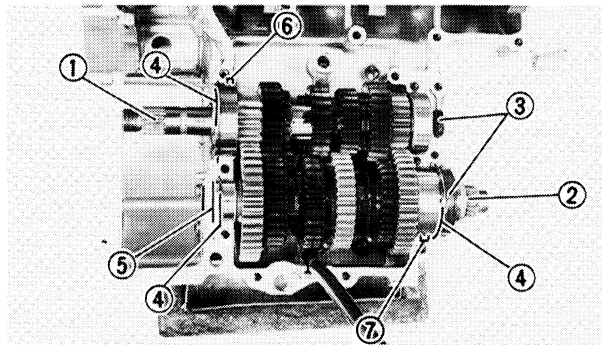
- Oil baffle plate ①
- Breather hose ②



Screw (oil baffle plate):
7 Nm (0.7 m · kg, 5.1 ft · lb)
LOCTITE®

NOTE:

Insert the metal clamp, on the breather hose, into the slots in the crankcase.



2.Install:

- Main axle assembly ①
- Drive axle assembly ②
- Oil seals ③
- Circlips ④
- Special washer ⑤

NOTE:

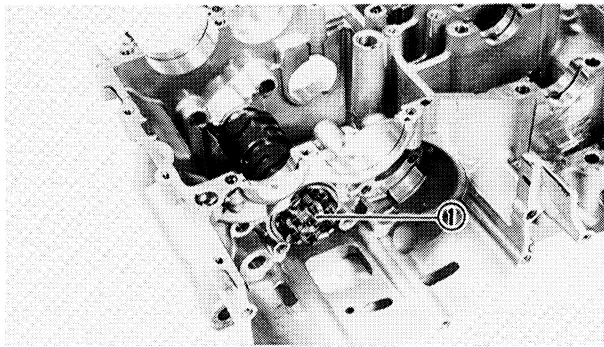
- Make sure that the drive axle bearing circlips ④ are inserted into the upper crankcase positioning grooves.
- The main axle bearing pin ⑥ must point to the front of the crankcase. The drive axle bearing pin ⑦ must point to the rear of the crankcase.

3.Check:

- Transmission
 Unsmooth rotation → Repair.

NOTE:

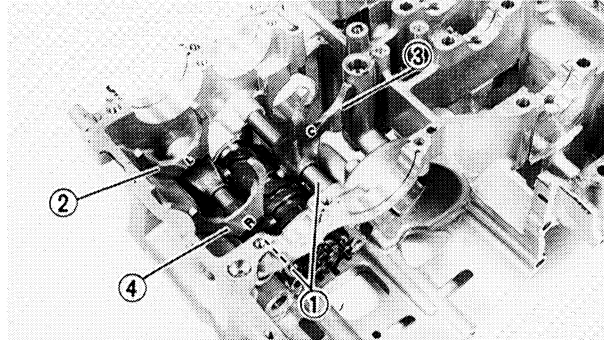
Oil each gear and bearing thoroughly.



SHIFT FORK AND SHIFT CAM

1. Install:

- Shift cam assembly ①



2. Install:

- Guide bars (shift fork) ①
- Shift fork "L" ②
- Shift fork "C" ③
- Shift fork "R" ④

NOTE:

The embossed mark on the shift forks should face towards the right side of the engine and be in sequence (R, C, L).

EB404072

CRANKCASE ASSEMBLY

1. Apply:

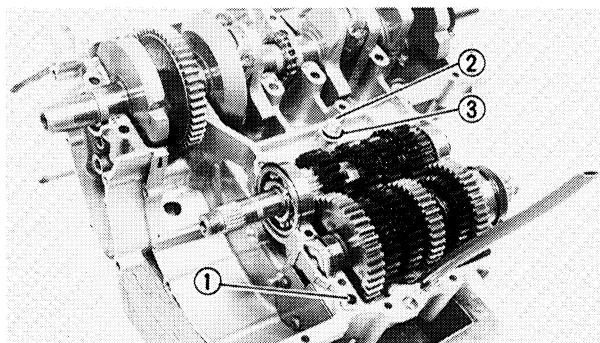
- Engine oil
(onto the main journal bearings)
- Sealant
(onto the crankcase mating surfaces)



Sealant (Quick Gasket®):
ACC-11001-05-01
Yamaha bond No. 1215:
90890 - 85505

NOTE:

DO NOT ALLOW any sealant to come into contact with the oil gallery or crankshaft bearings. Do not apply sealant to within 2 ~ 3 mm (0.08 ~ 0.12 in) of the bearings.



2. Install:

- Dowel pin ①
- Oil jet ②
- O-ring ③
(onto the upper crankcase)

⚠ WARNING

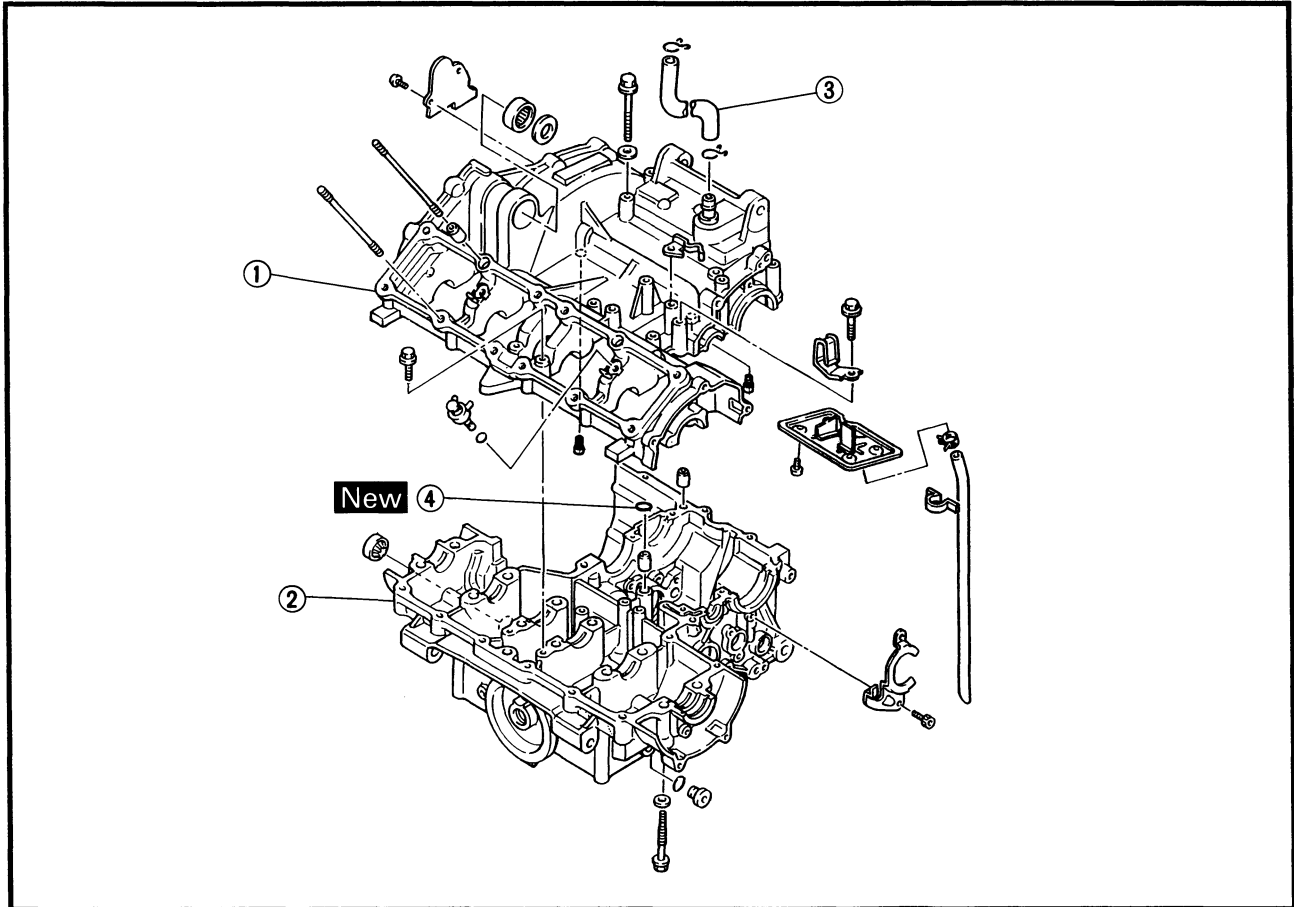
Always use a new O-ring.



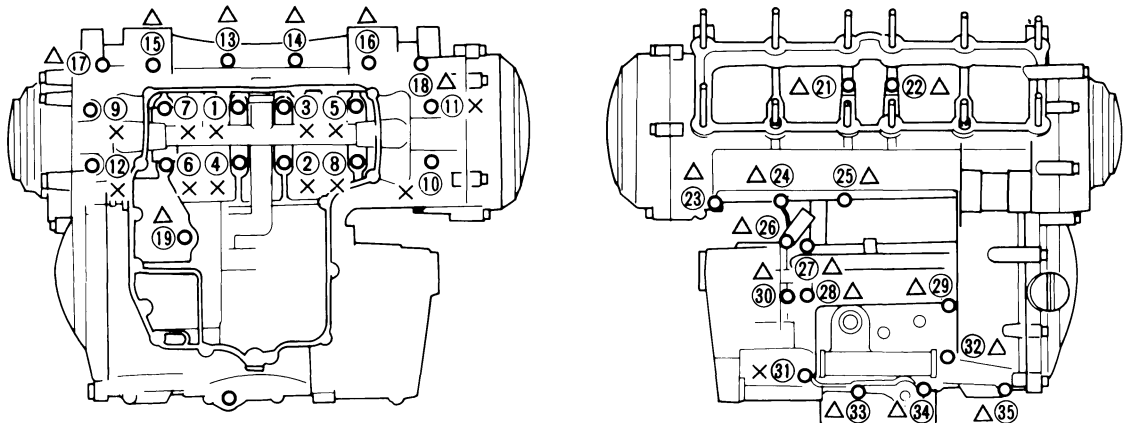
CRANKCASE

- ① Crankcase upper
- ② Crankcase lower
- ③ Crankcase breather hose
- ④ O-ring

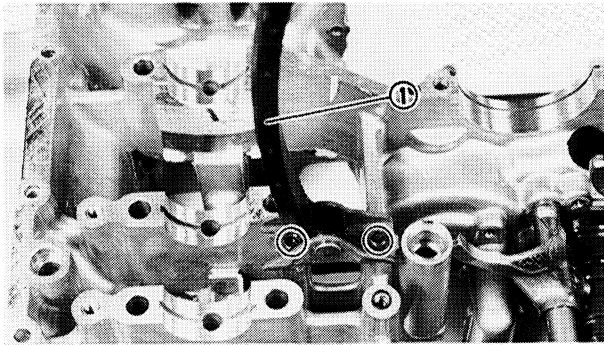
△ Crankcase sequence tightening



A

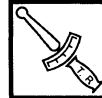


① ~ ⑫, ③①	24 Nm (2.4 m • kg, 17 ft • lb)
⑬ ~ ⑲, ⑳ ~ ⑳	12 Nm (1.2 m • kg, 8.7 ft • lb)

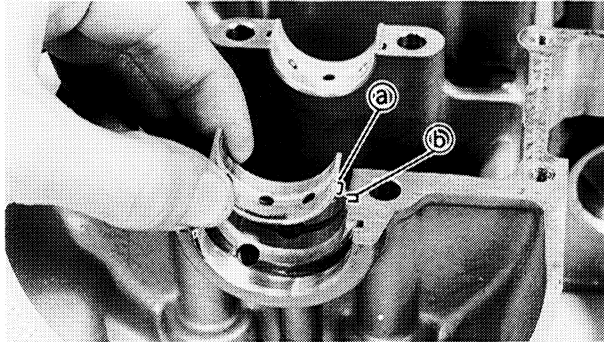


3. Install:

- Timing chain guide (intake side) ①



Bolt (chain guide):
10 Nm (1.0 m · kg, 7.2 ft · lb)

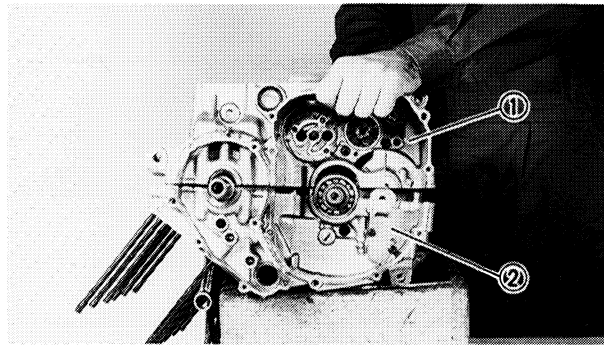


4. Install:

- Main journal bearings
(onto the lower crankcase)

NOTE:

- Align the projection ③ of the bearings with the notches ④ in the crankcase.
- Install each bearing in its original place.



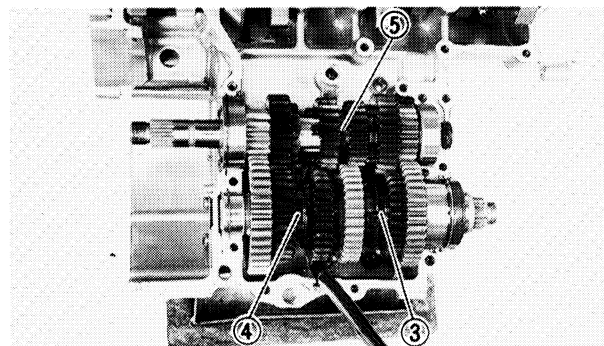
5. Set the shift cam and transmission gears in the neutral position.

6. Install:

- Lower crankcase ①
(onto the upper crankcase ②)

NOTE:

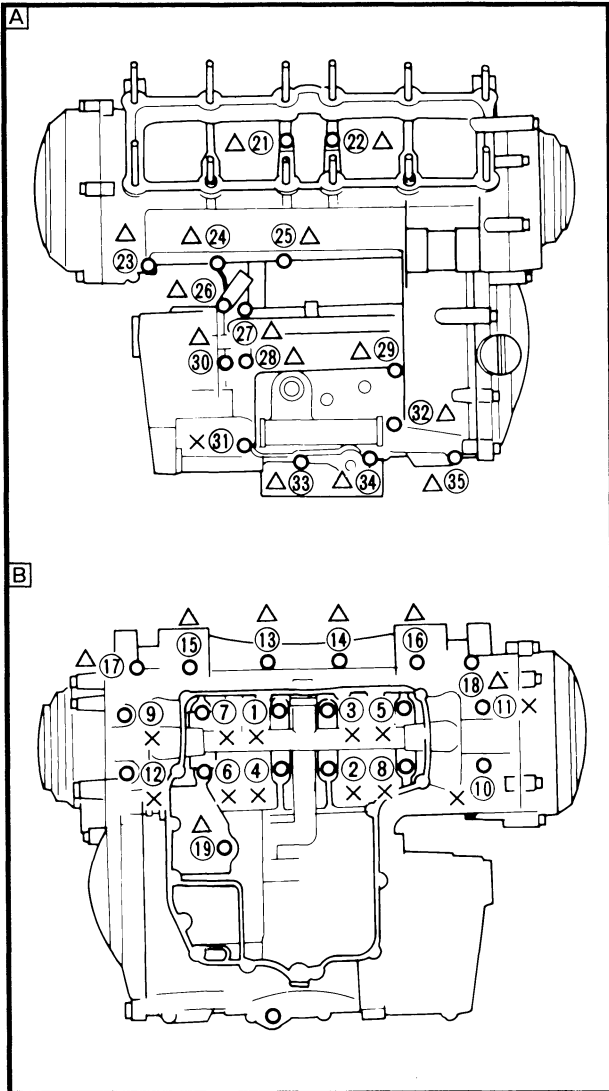
- Carefully guide the shift forks so that they mesh smoothly with the transmission gears.
- Mesh shift fork "L" with the 4th wheel gear ③ and shift fork "R" with the 5th wheel gear ④ on the drive axle.
- Mesh shift fork "C" with the 3rd pinion gear ⑤ on the main axle.



CAUTION:

Before tightening the crankcase bolts, check the following:

- Make sure that the gears shift correctly when the shift cam is turned by hand.



7. Tighten:

- Bolts (upper crankcase)
 - Bolts (lower crankcase)
- (follow the proper tightening sequence)

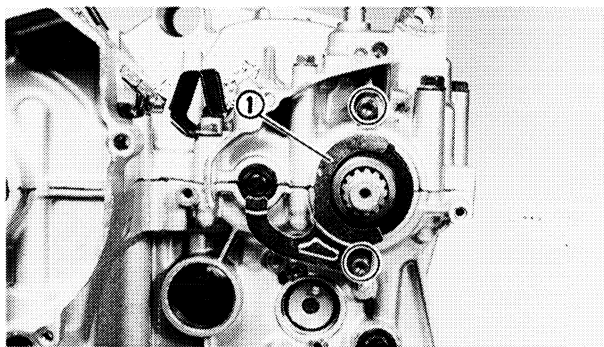


Δ : M6 bolt:
12 Nm (1.2 m · kg, 8.7 ft · lb)
 × : M8 bolt:
24 Nm (2.4 m · kg, 17 ft · lb)

- △ Upper crankcase
- × Lower crankcase

NOTE:

- Lubricate the bolt threads (No. ① ~ ⑫) with molybdenum disulfide oil.
- Lubricate the bolt threads (No. ⑬ ~ ⑳) with engine oil.
- Tighten the bolts in the tightening sequence cast on the crankcase.
- Install a copper washer on bolt No. ⑳.

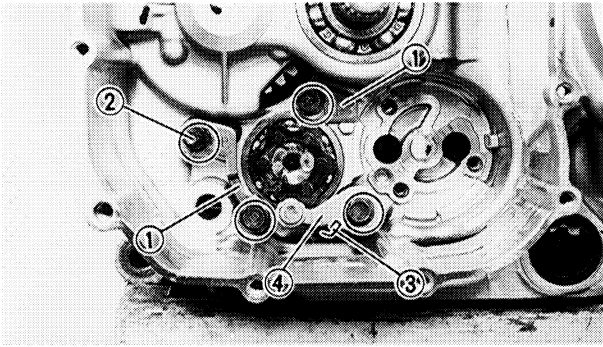


8. Install:

- Oil seal stopper ①



Bolt (oil seal stopper):
10 Nm (1.0 m · kg, 7.2 ft · lb)
LOCTITE®



EB404110

SHIFT SHAFT AND OIL PUMP

1. Install:

- Stopper plate (guide bar and bearing) ①
- Spring stopper ②
- Return spring ③
- Stopper lever ④



Bolt

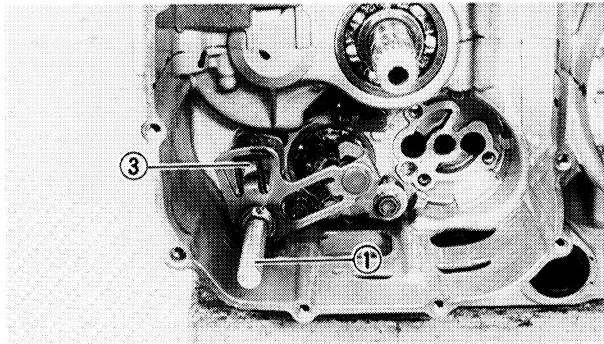
(stopper plate/stopper lever):
10 Nm (1.0 m · kg, 7.2 ft · lb)
LOCTITE®

Spring stopper:

22 Nm (2.2 m · kg, 16 ft · lb)
LOCTITE®

NOTE:

- Hook the spring ends onto the stopper lever ④ and crankcase boss.
- Mesh the stopper lever ④ with the shift cam stopper.



2. Install:

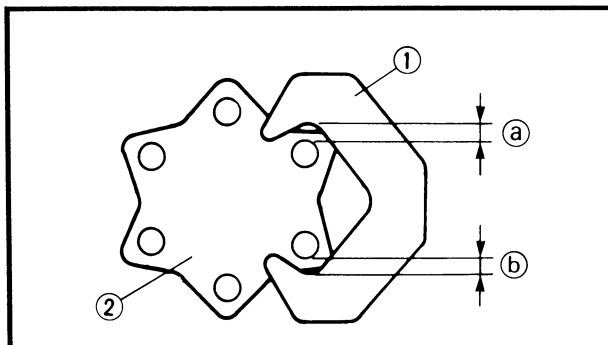
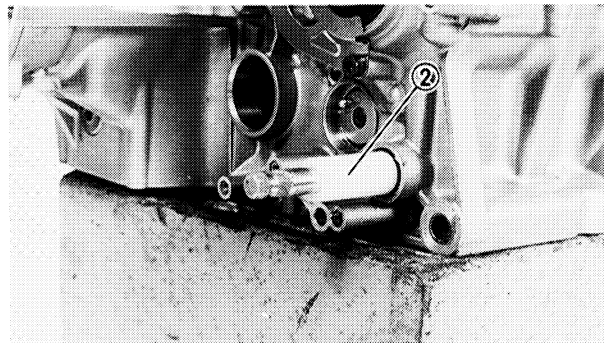
- Shift shaft ①
- Collar ②

NOTE:

- Apply grease onto the oil seal lips.
- Hook the spring ends onto the stopper ③.

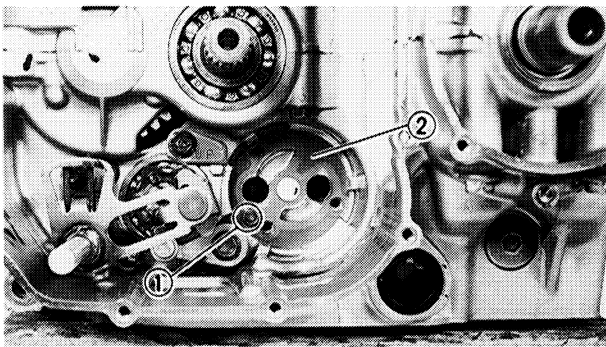
⚠ WARNING

Always use new circlips.



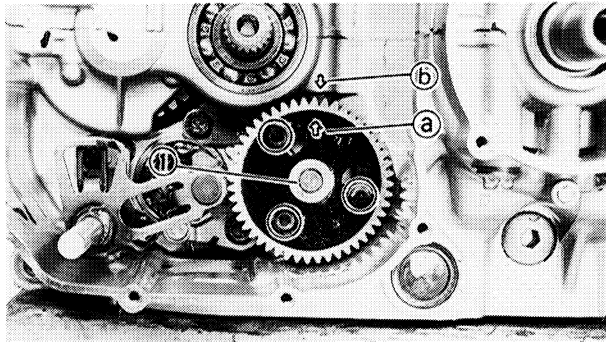
3. Check:

- Shift pawl position ①
Gaps ① and ② are not equal → Replace the defective parts.
- ② Shift cam



4. Install:

- Dowel pin ①
- Gasket ②



5. Install:

- Oil pump assembly ①



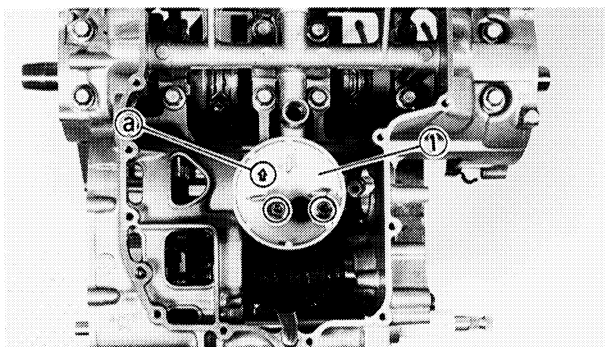
Bolt (oil pump assembly):
10 Nm (1.0 m · kg, 7.2 ft · lb)
LOCTITE®

NOTE:

Align the arrow mark ③ on the oil pump with the arrow mark ④ on the crankcase.

CAUTION:

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



EB404120

OIL PAN AND OIL STRAINER

1. Install:

- Oil strainer housing ①



Bolt (oil strainer housing):
10 Nm (1.0 m · kg, 7.2 ft · lb)
LOCTITE®

NOTE:

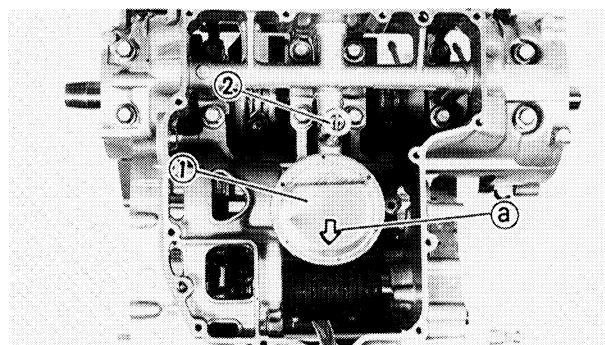
The arrow mark ③ on the strainer housing must point towards the front of the engine.

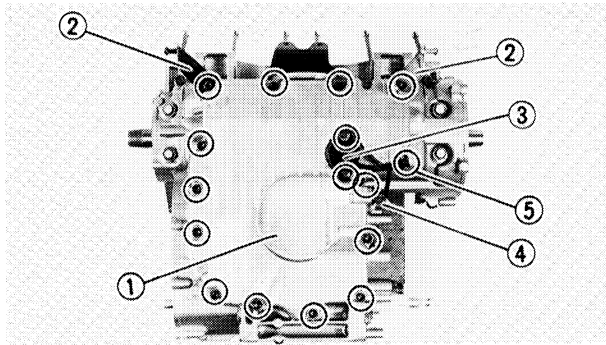
2. Install:

- Oil strainer cover ①
- Relief valve ②

NOTE:

The arrow mark ④ on the strainer cover must point towards the rear of the engine.





3. Install:

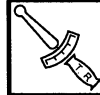
- Dowel pins
- Gasket (oil pan)
- Oil pan ①
- Stays (side cowlings) ②
- Oil level switch ③
(with the O-ring)
- Drain bolt ④
(with the copper washer)
- ⑤ Clamp (oil level switch lead)

⚠ WARNING

Always use new copper washers and gaskets.

NOTE:

- Tighten the oil pan bolts in a crisscross pattern.
- Apply engine oil onto the oil level switch O-ring.



Bolt (oil pan):

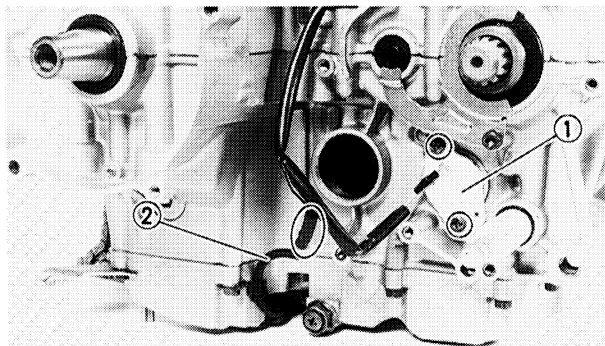
12 Nm (1.2 m • kg, 8.7 ft • lb)

Bolt (oil level switch):

7 Nm (0.7 m • kg, 5.1 ft • lb)

Drain bolt:

43 Nm (4.3 m • kg, 31 ft • lb)

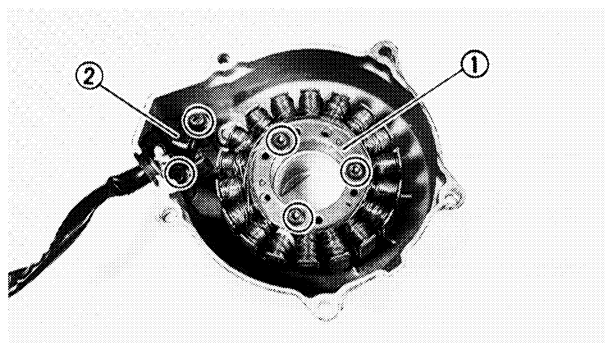


4. Install:

- Neutral switch ①

5. Connect:

- Oil level switch lead ②



AC MAGNETO

1. Install:

- Stator coil assembly ①
- Pickup coil ②



Bolt (stator coil assembly):

10 Nm (1.0 m • kg, 7.2 ft • lb)

LOCTITE®

Screw (pickup coil):

5 Nm (0.5 m • kg, 3.6 ft • lb)

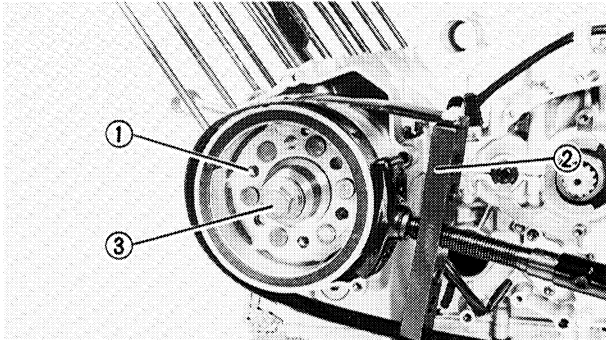


2. Install:

- Woodruff key
- AC magneto rotor
- Bolt (AC magneto rotor)

NOTE:

- Clean the tapered portion of the crankshaft and the AC magneto rotor.
- When installing the AC magneto rotor, make sure that the woodruff key is properly seated in the key way of the crankshaft.



3. Tighten:

- Bolt (magneto rotor)



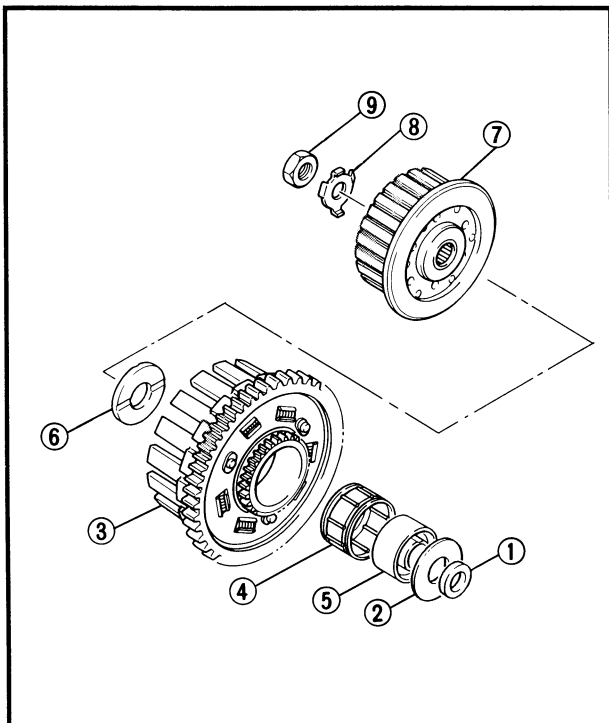
Bolt (AC magneto rotor):
130 Nm (13.0 m • kg, 94 ft • lb)

NOTE:

While holding the AC magneto rotor ① with a sheave holder ② tighten the AC magneto rotor bolt ③.



Sheave holder:
YS-01880/90890 - 01701



EB404160

CLUTCH

1. Install:

- Collar ①
- Thrust washer ②
- Clutch housing ③
- Bearing ④
- Spacer ⑤
- Thrust washer ⑥
- Clutch boss ⑦
- Lock washer ⑧
- Nut (clutch boss) ⑨

NOTE:

Install the spacer ⑤ with the two screw holes facing the clutch boss.

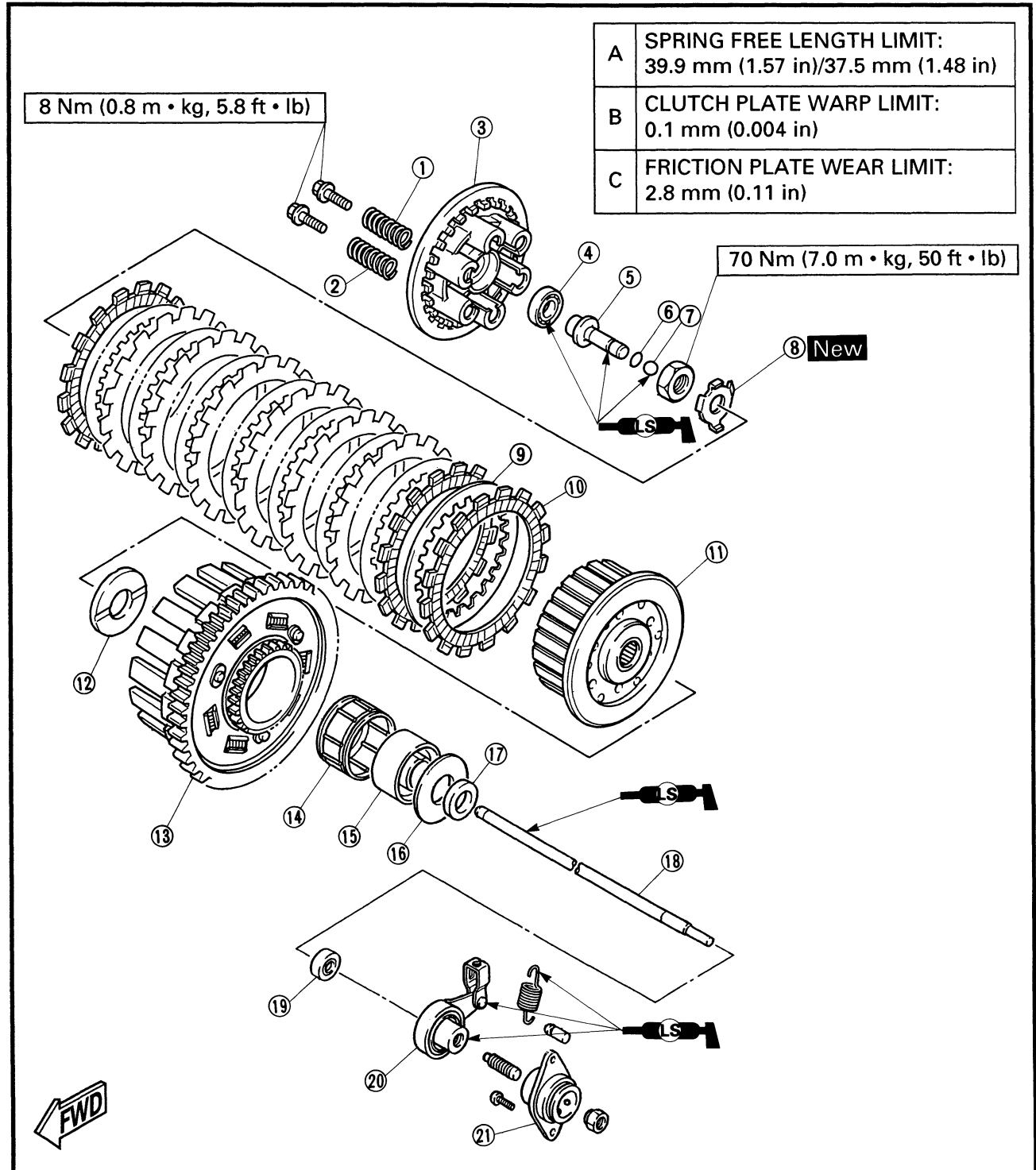
⚠ WARNING

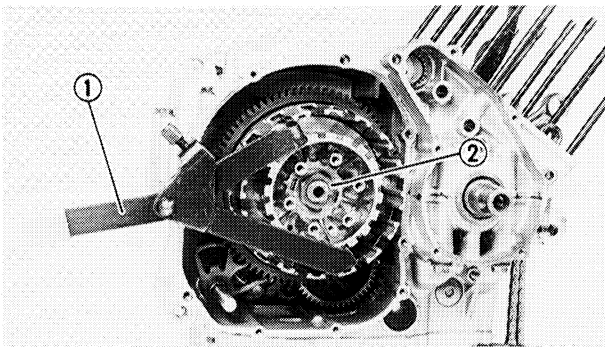
Always use a new lock washer.



CLUTCH

- ① Clutch spring (long-3pcs)
- ② Clutch spring (short-3pcs)
- ③ Pressure plate
- ④ Bearing
- ⑤ Push rod #1
- ⑥ O-ring
- ⑦ Ball
- ⑧ Lock washer
- ⑨ Clutch plate
- ⑩ Friction plate
- ⑪ Clutch boss
- ⑫ Thrust washer
- ⑬ Clutch housing
- ⑭ Bearing
- ⑮ Spacer
- ⑯ Thrust washer
- ⑰ Collar
- ⑱ Push rod #2
- ⑲ Oil seal
- ⑳ Push lever assembly
- ㉑ Ball screw housing





2. Tighten:
- Nut (clutch boss)



Nut (clutch boss):
70 Nm (7.0 m • kg, 50 ft • lb)

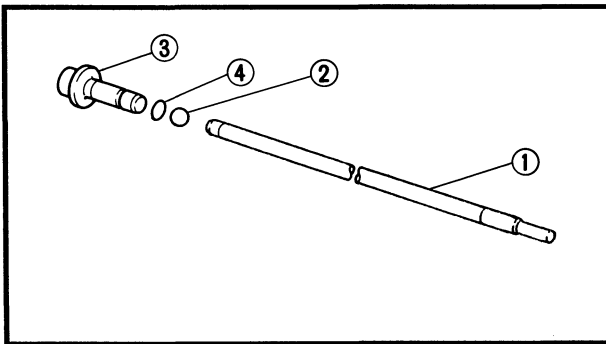
NOTE: While holding the clutch boss with a universal clutch holder ① tighten the clutch boss nut ②.



Universal clutch holder:
YM-91042/90890 - 04086

3. Bend:
- Lock washer tab

NOTE: Bend the lock washer tab along a flat side of the nut.

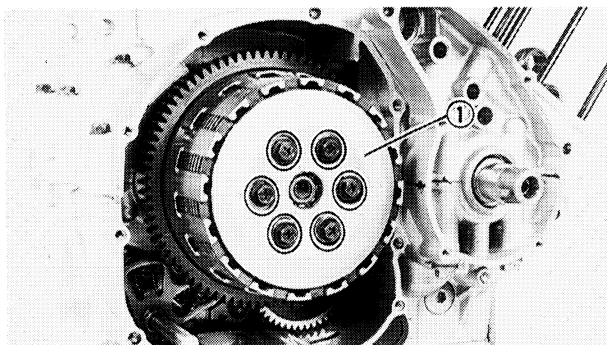


4. Install:
- Push rod #2 ①
 - Ball ②
 - Push rod #1 ③ (with the O-ring ④)

NOTE: Apply lithium soap base grease onto push rod #1, #2 and onto the ball.

5. Install:
- Friction plates
 - Clutch plates

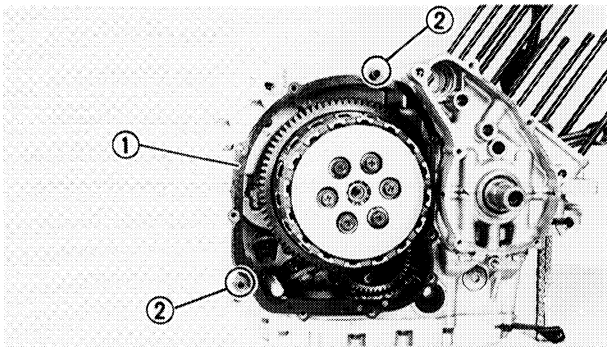
NOTE: Start with a friction plate and alternate between a clutch plate and a friction plate. The first and last friction plates should be black.



6. Install:
- Pressure plate ①
 - Clutch springs
 - Bolts (clutch springs)



Bolt (clutch spring):
8 Nm (0.8 m • kg, 5.8 ft • lb)



NOTE:

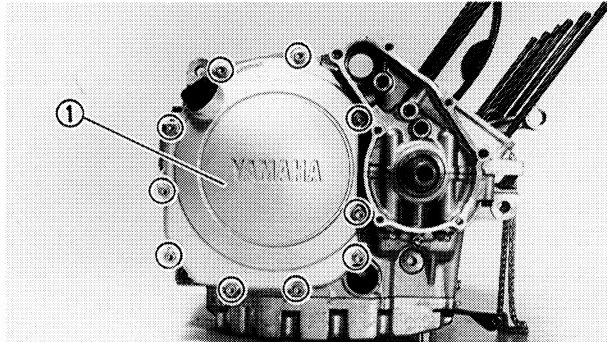
- During installation, alternate between long and short clutch springs.
- Tighten the clutch spring bolts in stages, using a crisscross pattern.

7. Install:

- Gasket ①
- Dowel pins ②

⚠ WARNING

Always use a new gasket.



8. Install:

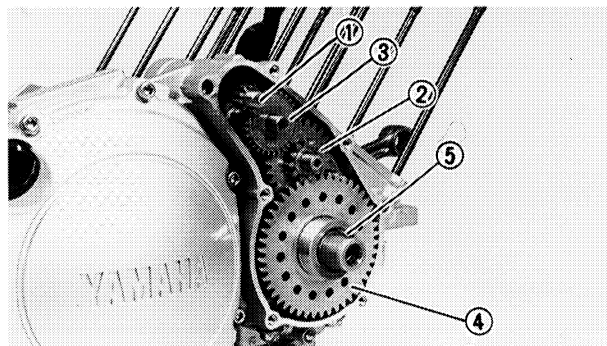
- Clutch cover ①



Bolt (clutch cover):
12 Nm (1.2 m • kg, 8.7 ft • lb)

NOTE:

Tighten the clutch cover bolts in stages, using a crisscross pattern.



STARTER CLUTCH

1. Install:

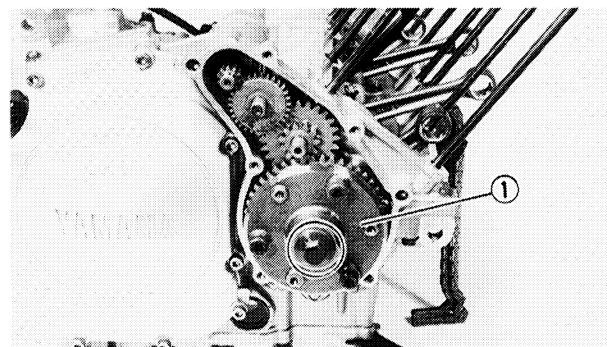
- Starter drive gear ①
- Starter idle gear (secondary) ②
- Starter idle gear (primary) ③
- Starter wheel gear ④
- Woodruff key ⑤

2. Install:

- Starter clutch ①



Bolt (starter clutch):
80 Nm (8.0 m • kg, 58 ft • lb)

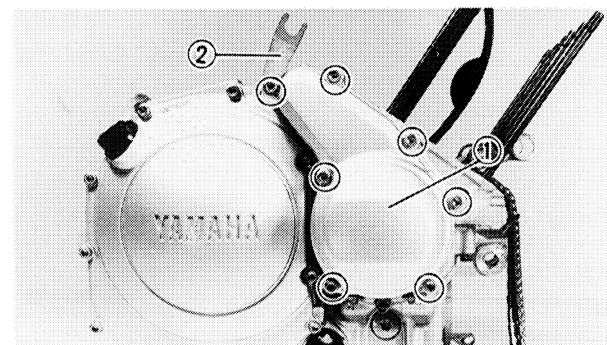


3. Install:

- Dowel pins
- Gasket (starter clutch cover)
- Starter clutch cover ①
- Stay (throttle stop screw) ②



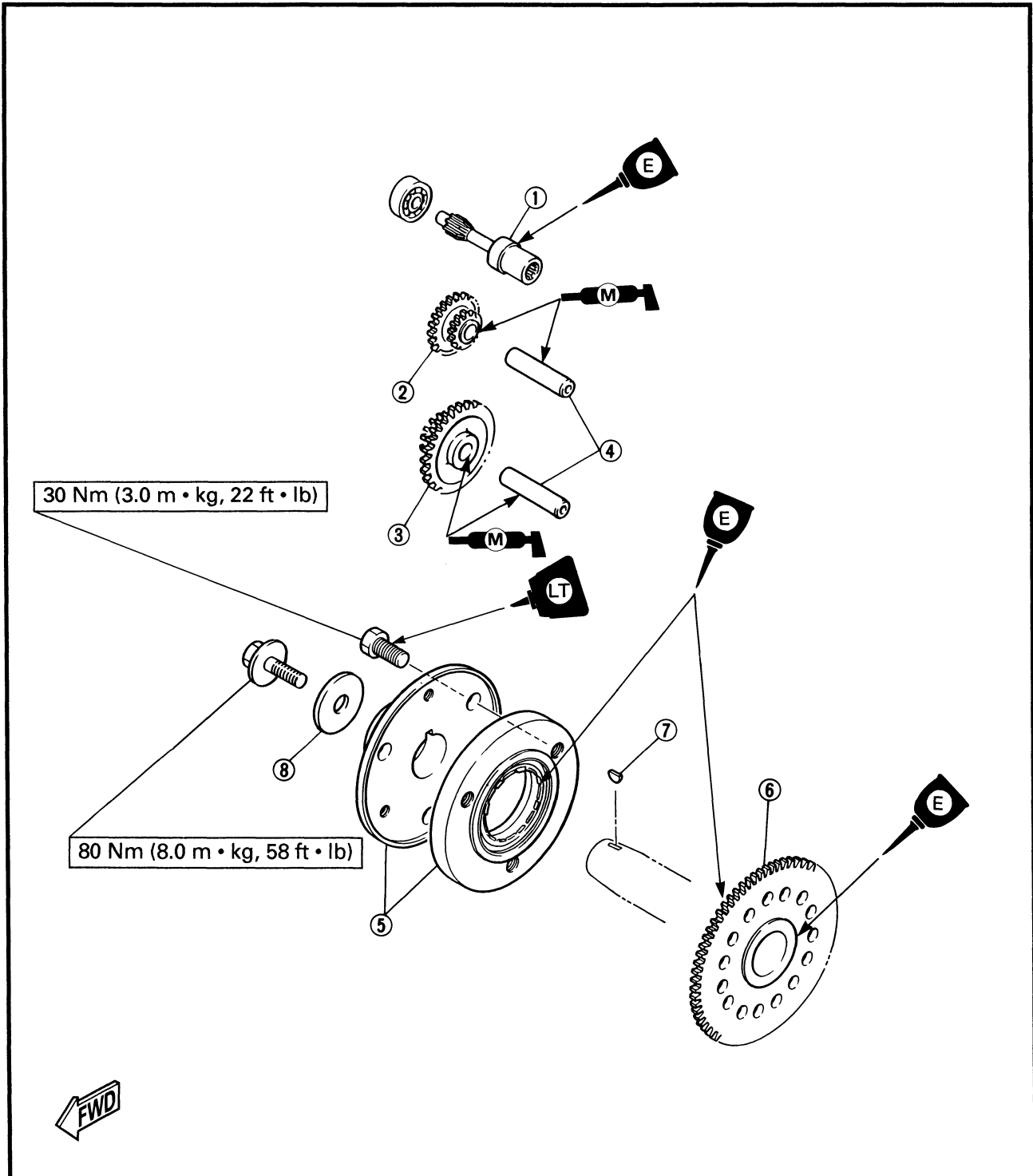
Bolt (starter clutch cover):
12 Nm (1.2 m • kg, 8.7 ft • lb)





STARTER CLUTCH

- ① Starter drive gear
- ② Idle gear (primary)
- ③ Idle gear (secondary)
- ④ Shaft
- ⑤ Starter clutch assembly
- ⑥ Starter wheel gear
- ⑦ Woodruff key
- ⑧ Washer

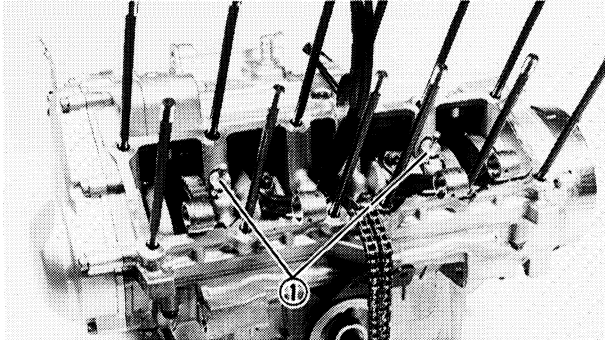




NOTE: _____
Tighten the starter clutch cover bolts in stages, using a crisscross pattern.

⚠ WARNING _____

Always use a new starter clutch cover gasket.

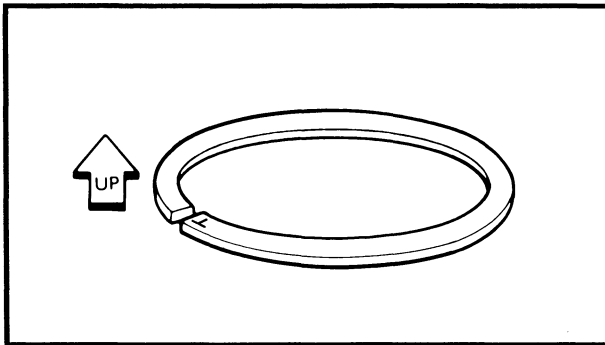


PISTONS AND CYLINDERS

1.Install:

- Oil-jet nozzles ①
(with the O-ring)

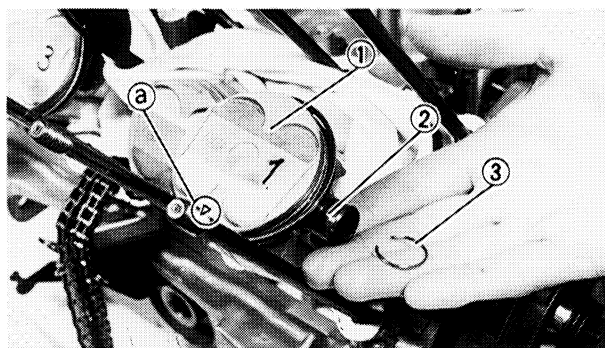
NOTE: _____
Apply engine oil onto the O-rings.



2.Install:

- Piston rings

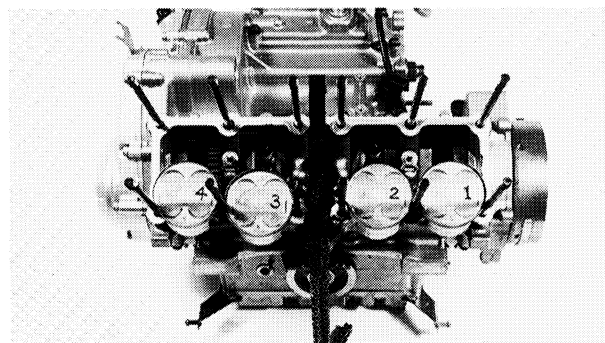
NOTE: _____
• Be sure to install the piston rings so that the manufacturer's marks or numbers are located on the upper side of the rings.
• Lubricate the pistons and piston rings liberally with engine oil.



3.Install:

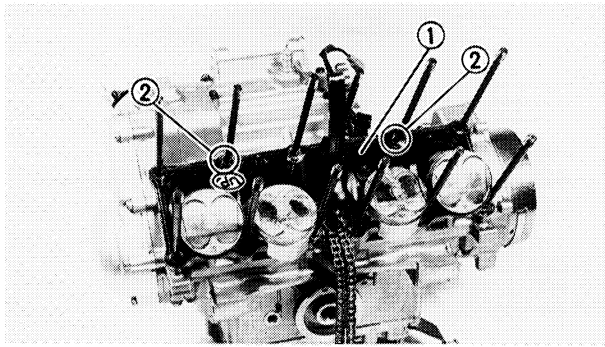
- Pistons ①
- Piston pins ②
- Piston pin circlips ③

NOTE: _____
• Apply engine oil onto the piston pin.
• Make sure that the arrow mark ② on the piston points towards the exhaust side of the engine.
• Before installing the piston pin circlip, cover the crankcase opening with a clean rag to prevent the piston pin circlip from falling into the crankcase.
• Reinstall each piston into its original cylinder (numbering order 1 to 4 from the left).



⚠ WARNING _____

Always use new piston pin circlips.



4. Install:

- Gasket (cylinders) ①
- Dowel pins ②

NOTE:

The gasket mark "UP" must be readable from above.

⚠ WARNING

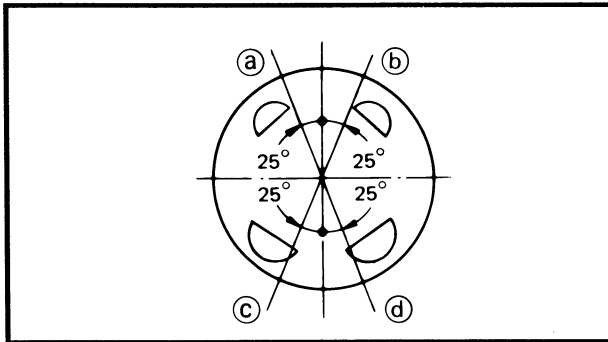
Always use a new cylinder gasket.

5. Lubricate:

- Pistons
- Piston rings
- Cylinders

NOTE:

Apply a liberal coating of engine oil.



6. Position:

- Top ring
- 2nd ring
- Oil ring

Offset the piston ring end gaps as shown.

- Ⓐ Top ring end
- Ⓑ Oil ring end (lower)
- Ⓒ Oil ring end (upper)
- Ⓓ 2nd ring end

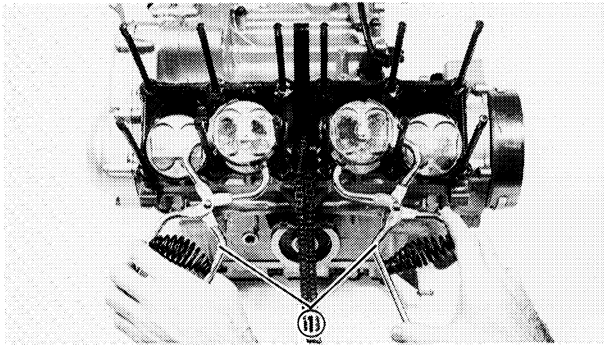
7. Install:

- Cylinders

NOTE:

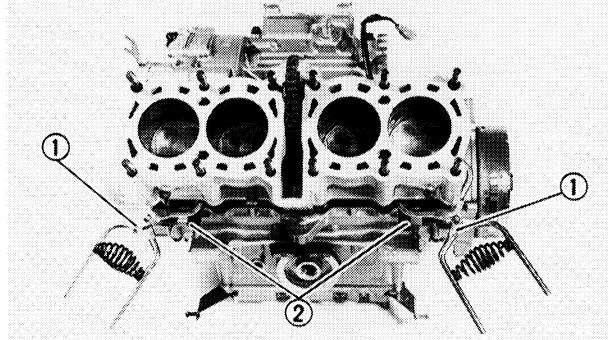
- First, install pistons # 2 and # 3.
- Pass the timing chain and timing chain guide (exhaust side) through the timing chain cavity.



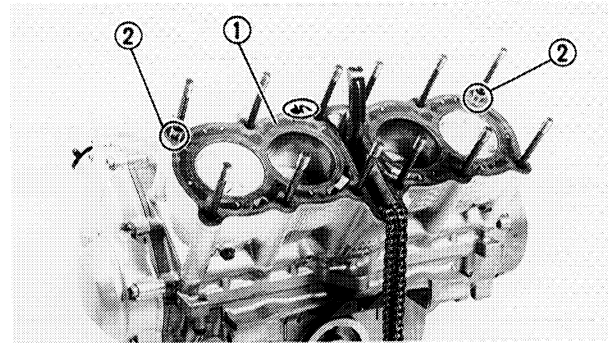


Installation steps:

- Install a piston ring compressor ① to pistons #2 and #3.
- Install pistons #2 and #3 onto the cylinder.
- Remove the piston ring compressor.
- Install the piston ring compressor ① and piston base ② to pistons #1 and #4.
- Install pistons #1 and #4 onto the cylinder.
- Remove the piston ring compressor and piston base.



Piston ring compressor:
YM-04044/90890 - 04044
Piston base:
YM-01067/90890 - 01067



EB404191

CYLINDER HEAD AND CAMSHAFTS

1.Install:

- Gasket (cylinder head) ①
- Dowel pins ②

NOTE:

The "UP" mark on the cylinder head gasket must be readable from above.

⚠ WARNING

Always use a new cylinder head gasket.

2.Install:

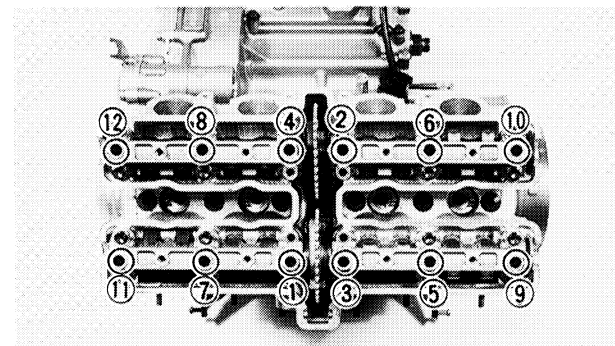
- Cylinder head assembly

3.Tighten:

- Nuts (cylinder head)

NOTE:

- Apply engine oil onto the nut threads.
- Tighten the nuts in their proper tightening sequence and torque them in two stages.

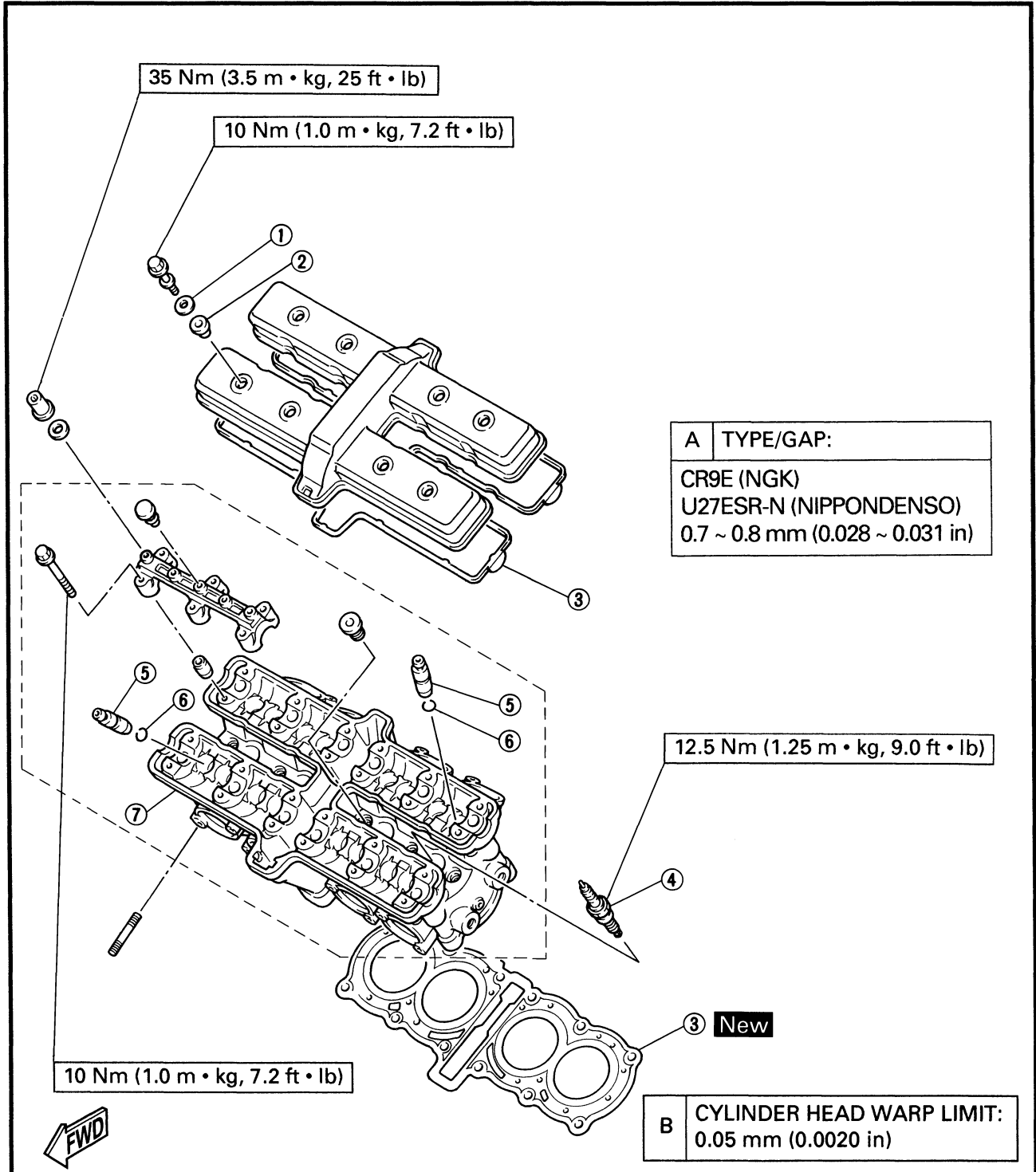


Nut (cylinder head):
35 Nm (3.5 m • kg, 25 ft • lb)



CYLINDER HEAD

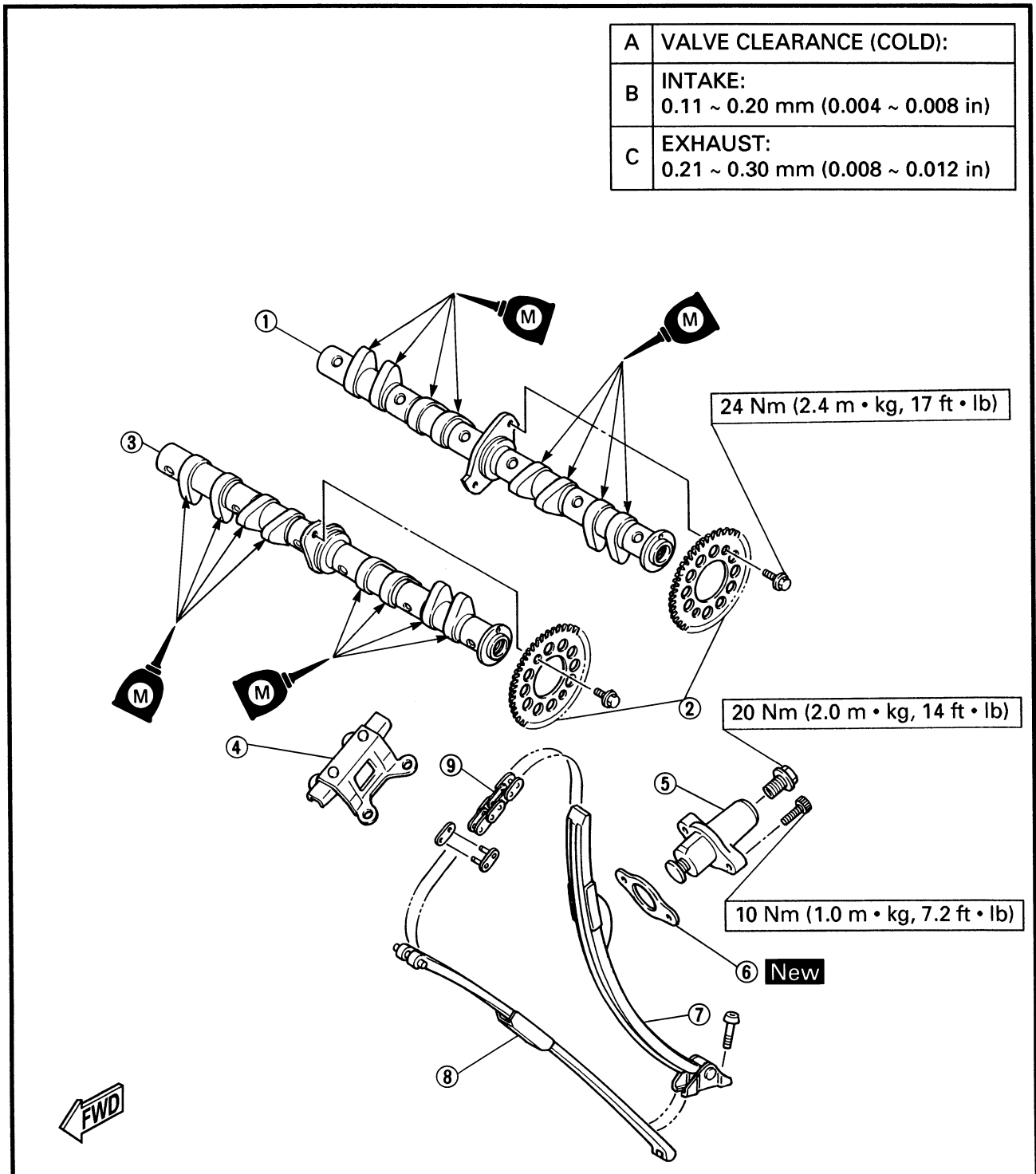
- ① Washer
- ② Rubber washer
- ③ Gasket
- ④ Spark plug
- ⑤ Valve guide
- ⑥ Circlip
- ⑦ Cylinder head

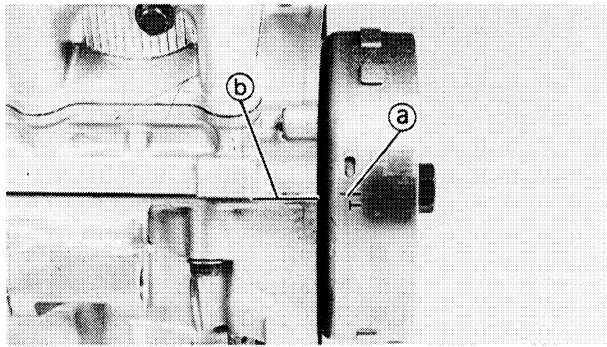




CAMSHAFTS

- ① Camshaft (intake)
- ② Timing chain sprocket
- ③ Camshaft (exhaust)
- ④ Chain guide (upper)
- ⑤ Timing chain tensioner
- ⑥ Gasket
- ⑦ Timing chain guide (intake side)
- ⑧ Timing chain guide (exhaust side)
- ⑨ Timing chain





4. Install:

- Camshafts (intake and exhaust)


Installation steps:

- Turn the crankshaft counterclockwise and align the "T" mark ⓐ on the AC magneto rotor with the crankcase end ⓑ when the #1 piston is at TDC.

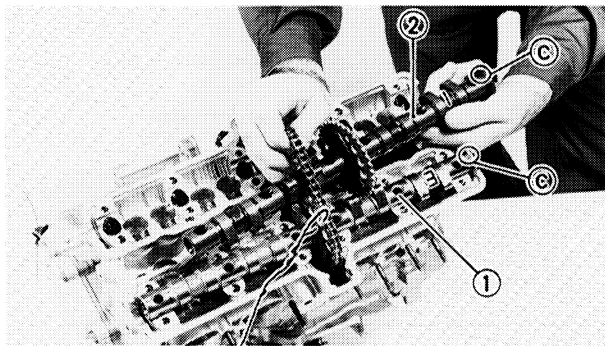
CAUTION:

While installing the camshafts do not turn the crankshaft. Damage or improper valve timing will result.

- Lubricate the camshaft bearing surfaces, cam lobes and cam journals.

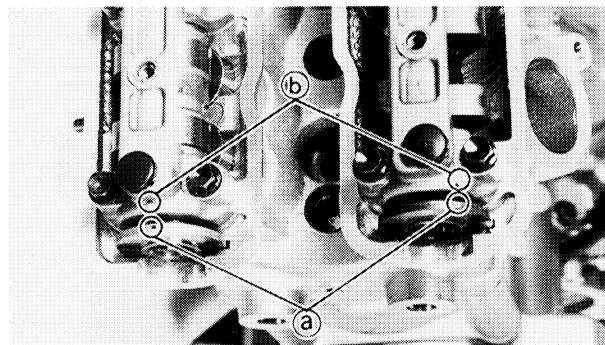
	Recommended lubricant: Molybdenum disulfide oil
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- First, install the exhaust camshaft ① then install the intake camshaft ②.



NOTE:

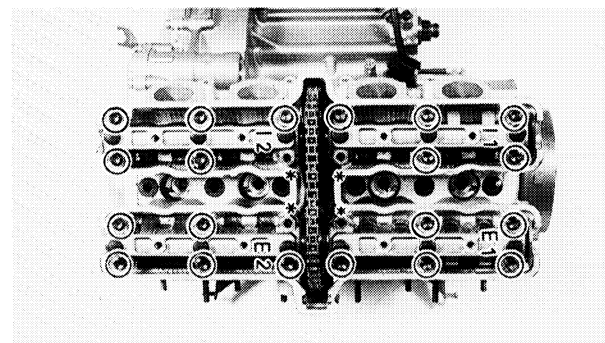
- Be sure to install the camshafts in the right place: "I" mark = intake camshaft "E" mark = exhaust camshaft
- Make sure that the timing marks Ⓒ on the camshaft face upward.
- Keep the timing chain as tight as possible on the exhaust side.
- Remove the wire on the timing chain.




CAUTION:

Do not rotate the camshaft, as damage could occur to the pistons and valves.

- Install the dowel pins.
- Install the camshaft caps.
- Align the camshaft timing marks Ⓒ with the camshaft cap marks Ⓓ.
- Tighten the camshaft cap bolts.

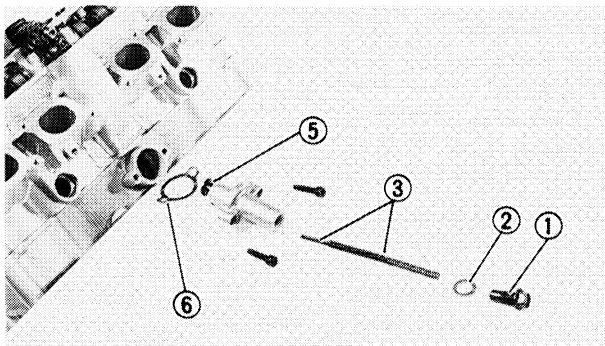


	Bolt (camshaft cap): 10 Nm (1.0 m · kg, 7.2 ft · lb)
---	---

- NOTE:**
- The camshaft caps are numbered from left to right.
 - Apply engine oil onto the camshaft cap bolt threads.
 - Do not install the bolts at places marked with a "*" at this stage.
 - Tighten the camshaft caps in a crisscross pattern starting from the center.

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

- Install the timing chain guide on the exhaust side.



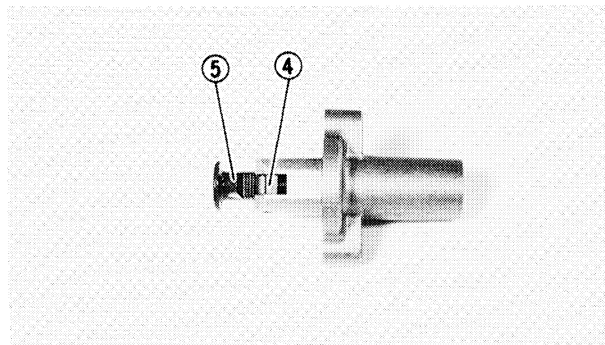
EB404202
TIMING CHAIN TENSIONER

1. Install:

- Timing chain tensioner

Installation steps:


- Remove the tensioner cap bolt ①, copper washer ② and springs ③.
- Release the timing chain tensioner one-way cam ④ and push the tensioner rod ⑤ all the way in.
- Install the tensioner with a new gasket ⑥ onto the cylinder.

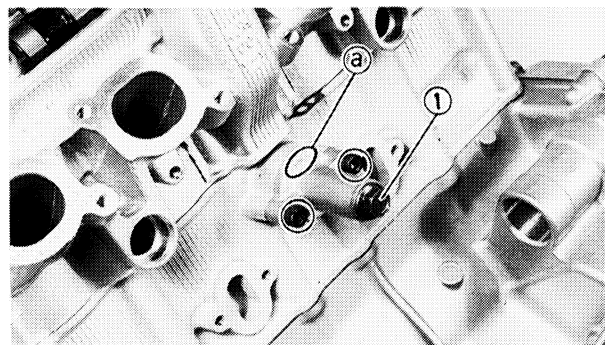


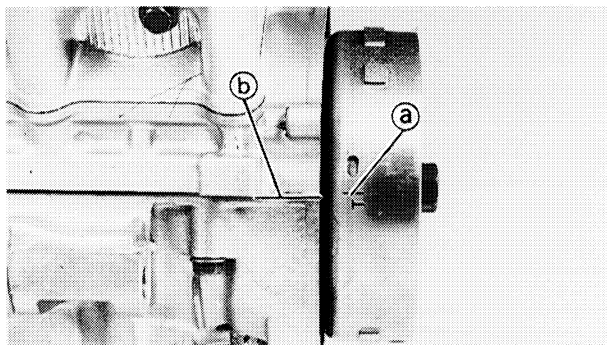
NOTE:
 The "UP" mark ⓐ on the tensioner should face up.

 **Bolt (timing chain tensioner):**
 10 Nm (1.0 m • kg, 7.2 ft • lb)

- Install the springs ③, copper washer ② and cap bolt ①.

 **Cap bolt (timing chain tensioner):**
 20 Nm (2.0 m • kg, 14 ft • lb)





2. Turn:

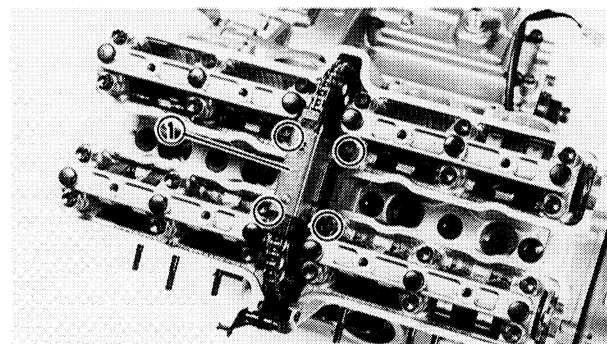
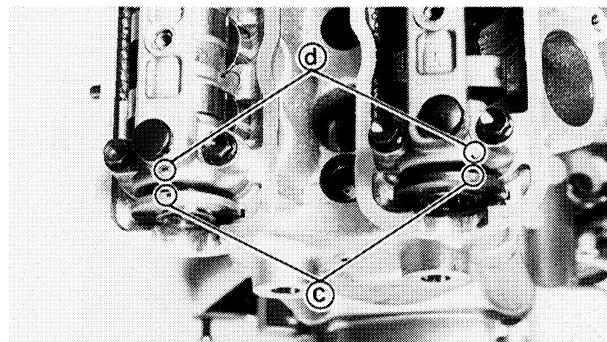
- Crankshaft
(several turns counterclockwise)

3. Check:

- Magneto rotor "T" mark (a)
Align the mark with the crankcase end (b).
- Camshaft timing marks (c)
Align the marks with the camshaft cap marks (d).

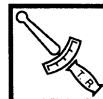
Out of alignment → Adjust.

Refer to "CYLINDER HEAD AND CAMSHAFTS – Installation steps:"

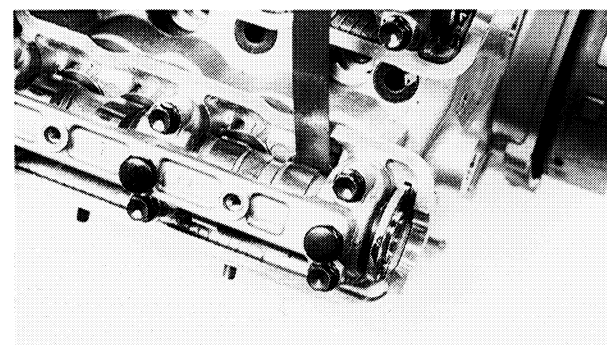


4. Install:

- Timing chain guide (upper) (1)



Bolt (chain guide – upper):
10 Nm (1.0 m • kg, 7.2 ft • lb)

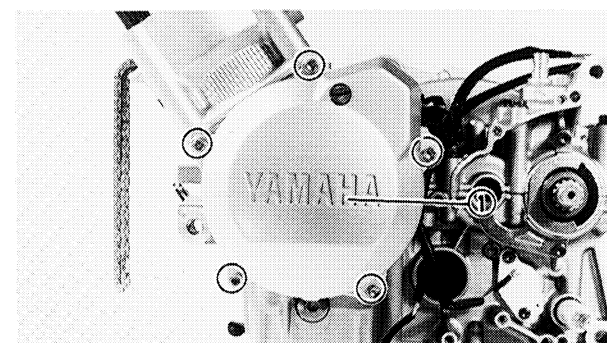


5. Measure:

- Valve clearance
Out of specification → Adjust.
Refer to "VALVE CLEARANCE ADJUSTMENT" in CHAPTER 3.



Intake valve (cold):
0.11 ~ 0.20 mm
(0.004 ~ 0.008 in)
Exhaust valve (cold):
0.21 ~ 0.30 mm
(0.008 ~ 0.012 in)

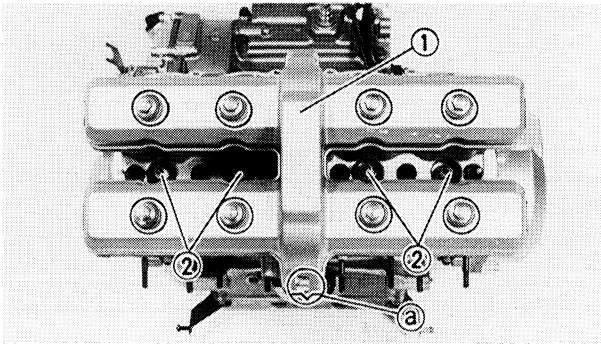


6. Install:

- AC magneto cover (1)



Bolt (AC magneto cover):
12 Nm (1.2 m • kg, 8.7 ft • lb)



7. Install:

- Gasket (cylinder head cover)
- Cylinder head cover ①
- Spark plugs ②

NOTE:

- Make sure that the cylinder head gasket mark @ points towards the front.
- Tighten the cylinder head cover bolts in a crisscross pattern.

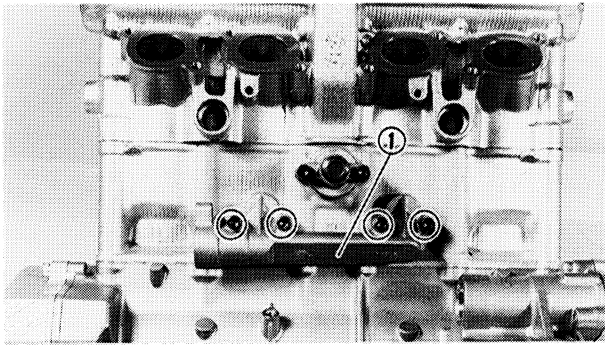


Spark plug:

12.5 Nm (1.25 m • kg, 9.0 ft • lb)

Bolt (cylinder head cover):

10 Nm (1.0 m • kg, 7.2 ft • lb)



WATER PUMP

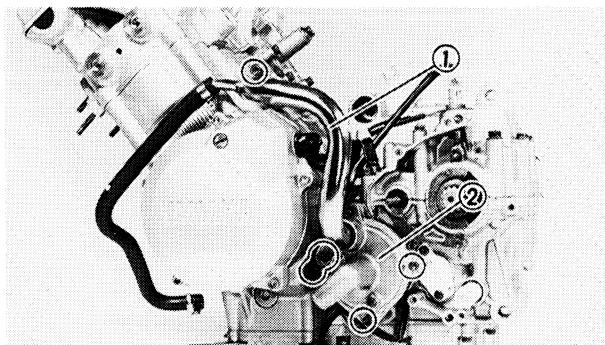
1. Install:

- Water jacket joint (inlet) ①



Bolt (water jacket joint):

10 Nm (1.0 m • kg, 7.2 ft • lb)



2. Install:

- Impeller
- Outlet pipe (water pump) ①
- Water pump cover ②



Bolt (water pump cover):

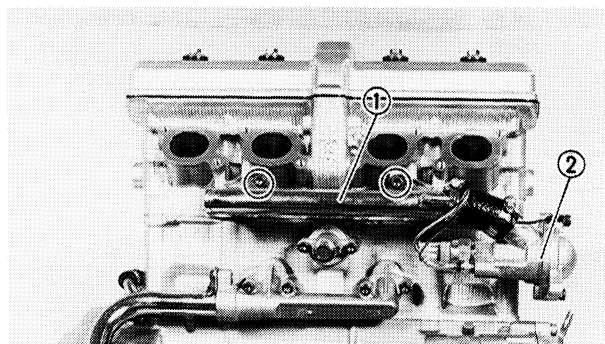
10 Nm (1.0 m • kg, 7.2 ft • lb)

Refer to "WATER PUMP - INSTALLATION" in CHAPTER 5.

WATER JACKET JOINT

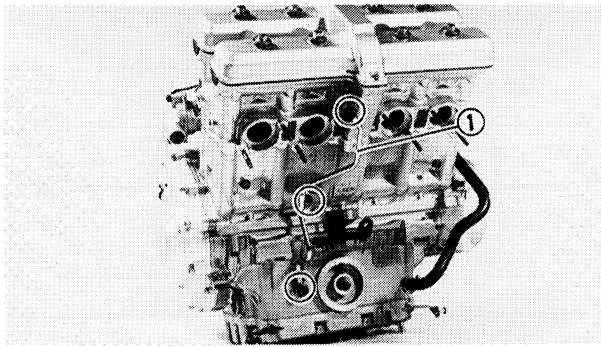
1. Install:

- O-rings
- Water jacket joint (outlet) ①
(with the thermostatic housing ②)



Bolt (water jacket joint):

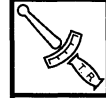
7 Nm (0.7 m • kg, 5.1 ft • lb)



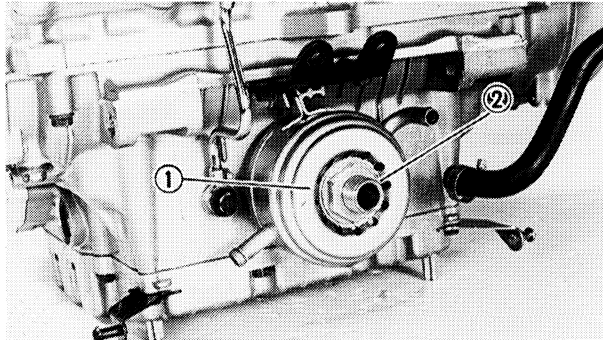
OIL COOLER AND OIL FILTER

1. Install:

- Copper washers
- Oil delivery pipe ①

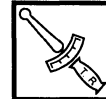


Union bolt (oil delivery pipe):
20 Nm (2.0 m · kg, 14 ft · lb)
Bolt (oil delivery pipe):
10 Nm (1.0 m · kg, 7.2 ft · lb)



2. Install:

- O-ring
- Oil cooler ①
- Bolt ②



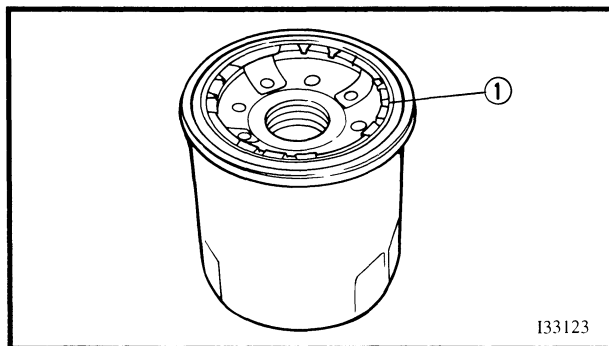
Bolt (oil cooler):
63 Nm (6.3 m · kg, 45 ft · lb)

NOTE:

- Apply engine oil to the O-ring of the oil cooler.
- Make sure that the O-ring is positioned properly.

⚠ WARNING

Always use a new O-ring.

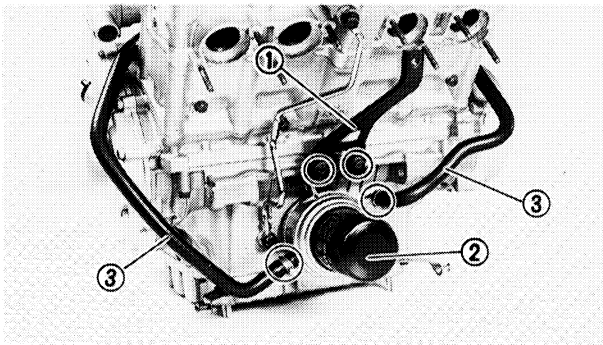


3. Apply:

- Engine oil (lightly)
(to the O-ring ① of the new oil filter)

NOTE:

Make sure that the O-ring is positioned properly.



4. Install:

- Radiator stay ①
- Oil filter ②



Oil filter:

17 Nm (1.7 m • kg, 12 ft • lb)

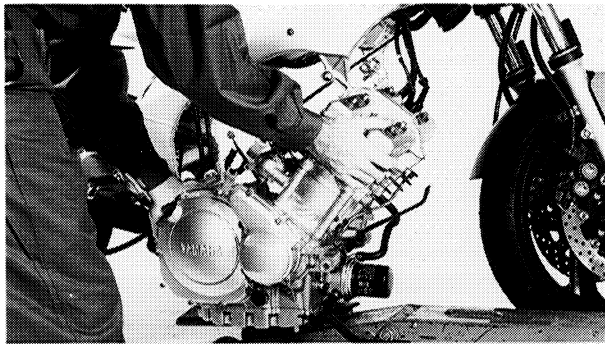
⚠ WARNING

Always use a new oil filter.

Refer to "ENGINE OIL REPLACEMENT" in CHAPTER 3.

5. Connect:

- Oil cooler hoses ③



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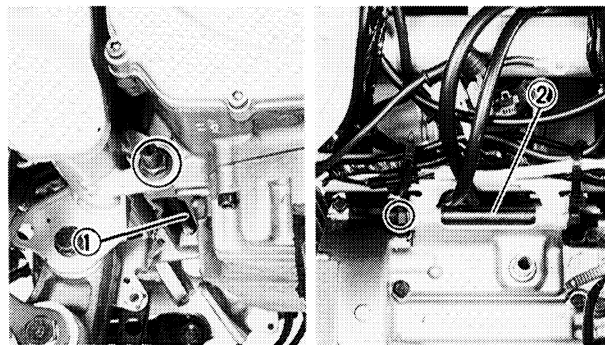
ENGINE REMOUNTING

When remounting the engine, reverse the removal procedure.

Note the following points:

1. Install:

- Engine assembly
(from the right side of the motorcycle)



2. Install:

- Mounting bolt (rear-lower) ①
- Mounting bolt (rear-upper) ②
- Mounting bolts (front) ③
- Pinch bolts ④

NOTE:

First, install all of the bolts and nuts and then tighten them to specification.



Mounting bolt (rear-lower):

48 Nm (4.8 m • kg, 35 ft • lb)

Mounting bolt (rear-upper):

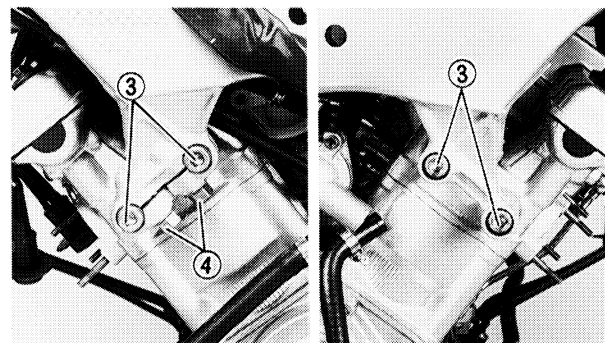
48 Nm (4.8 m • kg, 35 ft • lb)

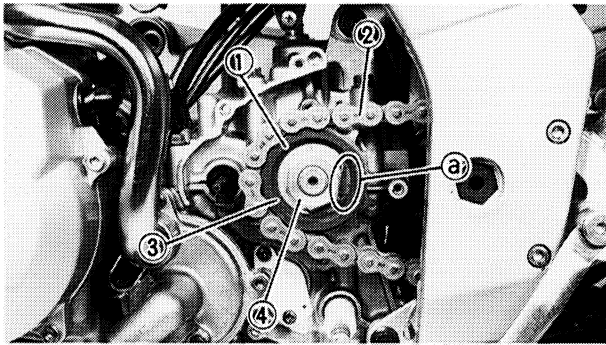
Mounting bolt (front):

54 Nm (5.4 m • kg, 39 ft • lb)

Pinch bolt (front):

64 Nm (6.4 m • kg, 46 ft • lb)





3. Install:

- Drive sprocket ①
(with the drive chain ②)
- Lock washer ③
- Nut (drive sprocket) ④



Nut (drive sprocket):
70 Nm (7.0 m • kg, 50 ft • lb)

⚠ WARNING

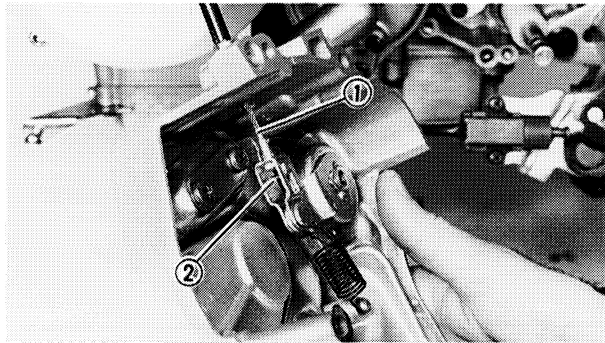
Always use a new lock washer.

NOTE:

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

4. Bend:

- Lock washer tab
(along a flat side of the nut)

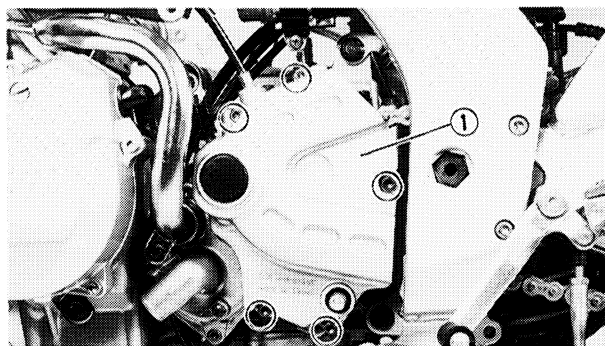


5. Install:

- Clutch cable ①

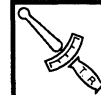
NOTE:

When installing the clutch cable, bend the tab ②.



6. Install:

- Gasket
- Dowel pins
- Drive sprocket cover ①



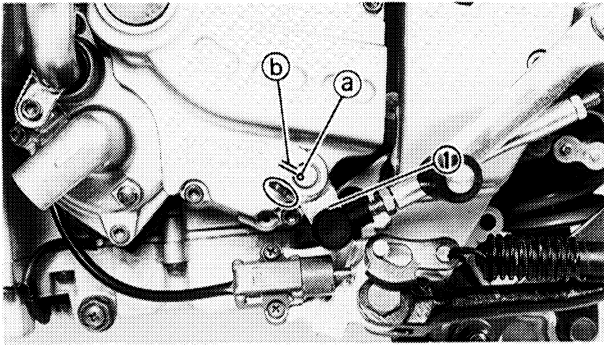
Bolt (drive sprocket cover):
10 Nm (1.0 m • kg, 7.2 ft • lb)
LOCTITE®

NOTE:

Tighten the drive sprocket cover bolts in stages, using a crisscross pattern.

⚠ WARNING

Always use a new gasket.



7.Install:

- Shift pedal link ①



Bolt (shift pedal link):
10 Nm (1.0 m • kg, 7.2 ft • lb)

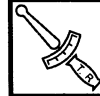
NOTE:

Align the punch mark ① on the shaft with the slot ② on the shift pedal link.

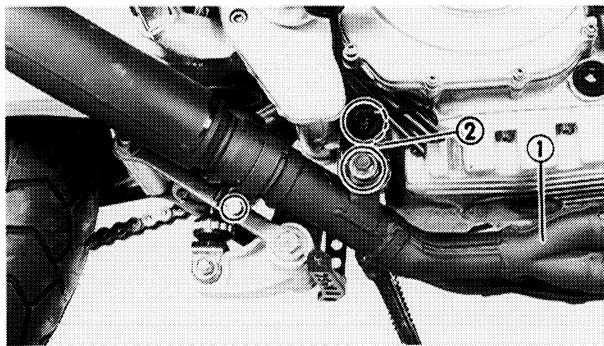


8.Install:

- Gaskets (exhaust pipes)
- Exhaust pipe ①
- Exhaust pipe stay ②
- Nuts (exhaust pipes)



Bolt (exhaust pipe stay):
20 Nm (2.0 m • kg, 14 ft • lb)
Nut (exhaust pipe):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Clamp bolt (exhaust pipe):
10 Nm (1.0 m • kg, 7.2 ft • lb)



9.Install:

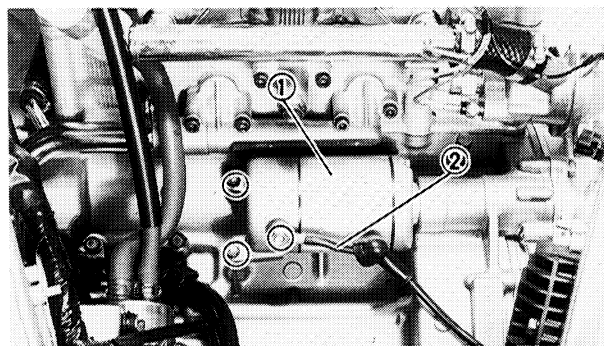
- Starter motor ①



Bolt (starter motor):
10 Nm (1.0 m • kg, 7.2 ft • lb)

10.Connect:

- Starter motor lead ②

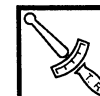


11.Install:

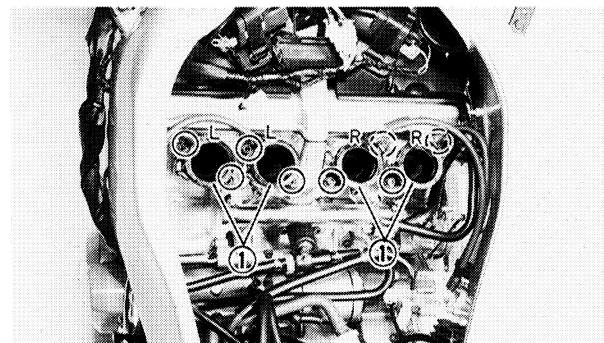
- Carburetor joints ①

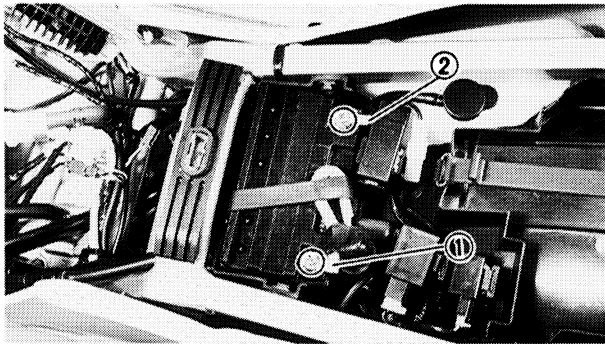
NOTE:

Install the carburetor joints with the "L" mark onto the #1 and #2 cylinders and the carburetor joints with the "R" mark onto the #3 and #4 cylinders.



Bolt (carburetor joint):
10 Nm (1.0 m • kg, 7.2 ft • lb)





12.Install:

- Radiator assembly
Refer to "RADIATOR – INSTALLATION" in CHAPTER 5.

13.Install:

- Carburetor assembly
Refer to "CARBURETORS – INSTALLATION" in CHAPTER 6.

14.Connect:

- Battery leads

CAUTION:

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

15.Fill:

- Crankcase
Refer to "ENGINE OIL REPLACEMENT" in CHAPTER 3.



Total amount:

3.5 L (3.1 Imp qt, 3.7 US qt)

16.Fill:

- Cooling system
Refer to "COOLANT LEVEL INSPECTION" in CHAPTER 3.

17.Adjust:

- Idle speed
Refer to "IDLING SPEED ADJUSTMENT" in CHAPTER 3.



Idle speed:

1,200 ~ 1,300 r/min



18.Adjust:

- Throttle cable free play

Refer to "THROTTLE CABLE ADJUSTMENT" in CHAPTER 3.



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

19.Adjust:

- Drive chain slack

Refer to "DRIVE CHAIN SLACK ADJUSTMENT" in CHAPTER 3.

CHAPTER 5. COOLING SYSTEM

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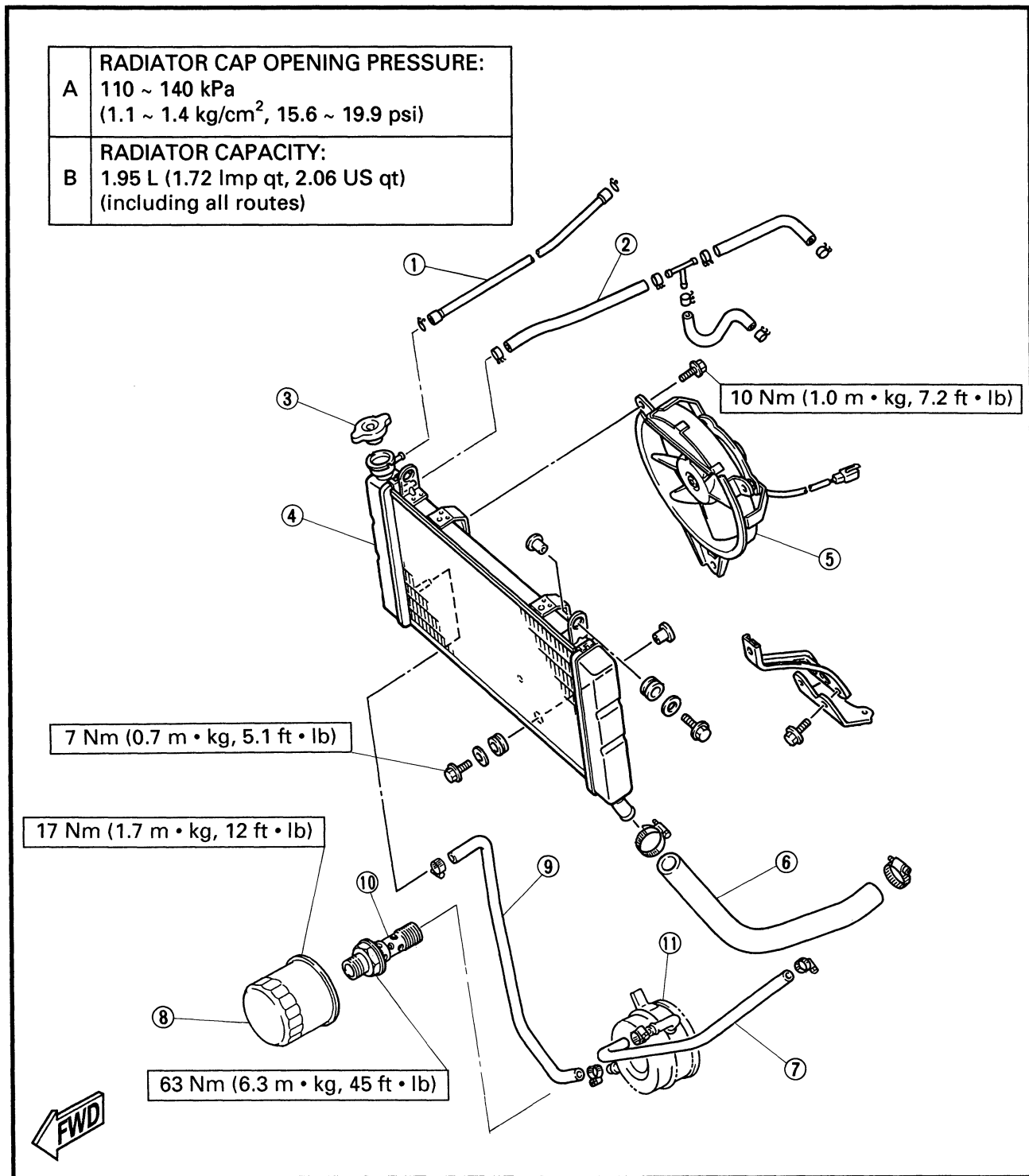
EB500000

COOLING SYSTEM

RADIATOR/OIL COOLER

- ① Coolant reservoir hose
- ② Water jacket joint hose (outlet)
- ③ Radiator cap
- ④ Radiator
- ⑤ Fan motor assembly
- ⑥ Radiator hose (outlet)
- ⑦ Oil cooler hose (inlet)
- ⑧ Oil filter
- ⑨ Oil cooler hose (outlet)
- ⑩ Bolt
- ⑪ Oil cooler

A	RADIATOR CAP OPENING PRESSURE: 110 ~ 140 kPa (1.1 ~ 1.4 kg/cm ² , 15.6 ~ 19.9 psi)
B	RADIATOR CAPACITY: 1.95 L (1.72 Imp qt, 2.06 US qt) (including all routes)





EB500010

RADIATOR

⚠ WARNING

Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury. When the engine has cooled, open the radiator cap by the following procedure:

Place a thick rag, like a towel, over the radiator cap, slowly rotate the cap counter-clockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counter-clockwise and remove it.

EB500020

REMOVAL

1.Remove:

- Seat
- Fuel tank
- Bottom cowling
- Side cowlings (left and right)
- Front cowling assembly

Refer to "SEAT", "FUEL TANK" and "COWLINGS" in CHAPTER 3.

2.Disconnect:

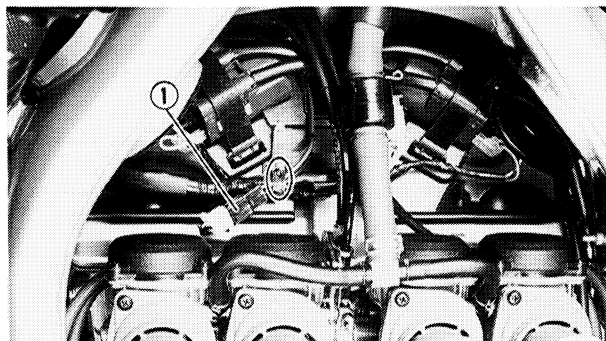
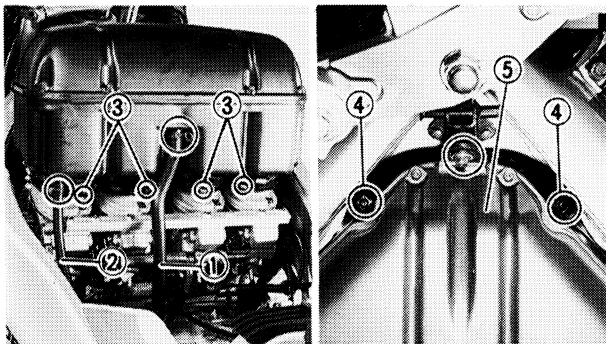
- Breather hose (crankcase) ①
- Drain hose (air filter case) ②

3.Loosen:

- Clamp screws (carburetor joints) ③
- Clamp screws (air intake ducts) ④

4.Remove:

- Air filter case ⑤



5.Disconnect:

- Coupler (cooling fan motor) ①

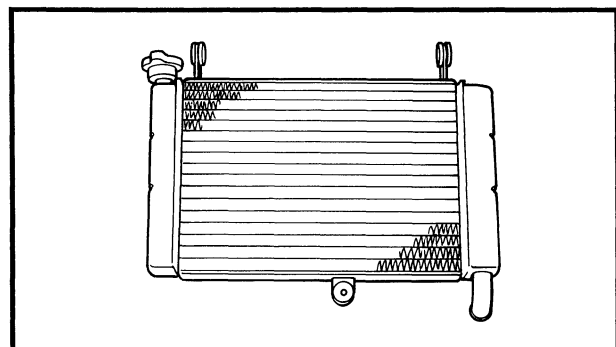
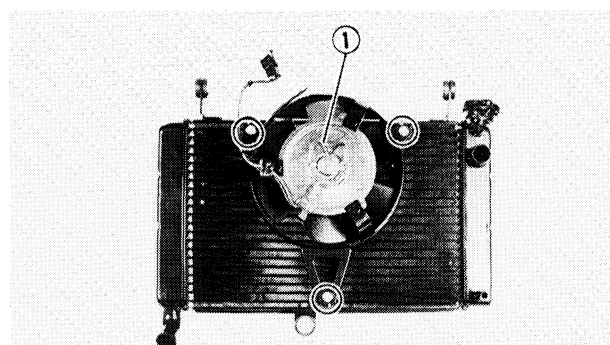
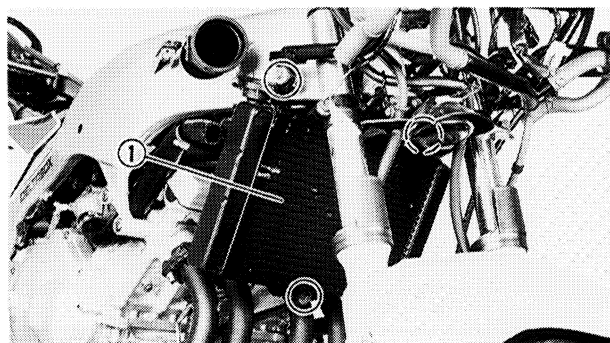
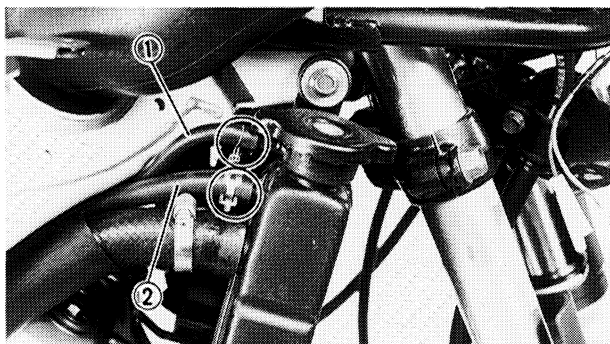
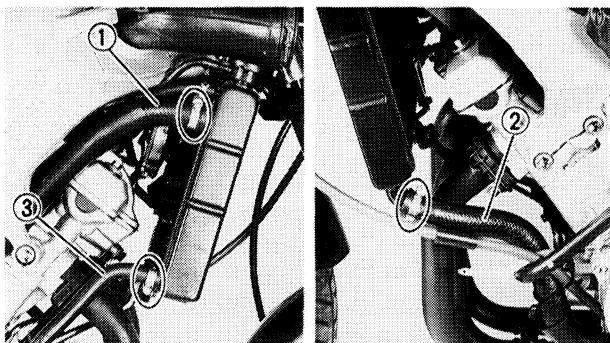
6.Drain:

- Coolant:

Refer to "COOLANT REPLACEMENT" in CHAPTER 3.

NOTE:

Thoroughly flush the cooling system with clean tap water.

**CAUTION:**

Take care that no coolant splashes onto the painted surfaces. If this happens, wash away the coolant with water.

7. Disconnect:

- Radiator hose (inlet) ①
- Radiator hose (outlet) ②
- Oil cooler hose (outlet) ③

8. Disconnect:

- Coolant reservoir hose ①
- Water jacket joint hose (outlet) ②

9. Remove:

- Radiator assembly ①

10. Remove:

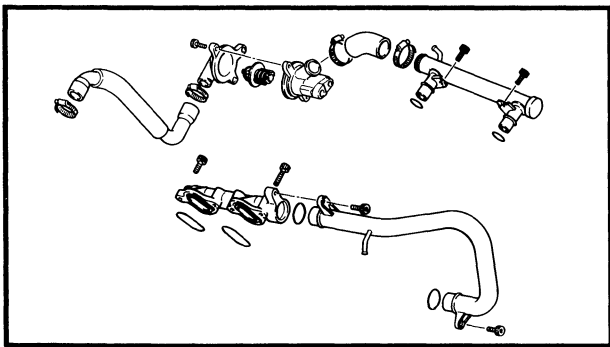
- Fan motor ①

EB500030

INSPECTION

1. Inspect:

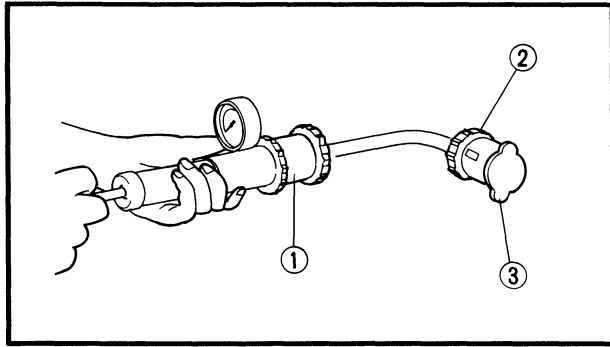
- Radiator core
 - Obstruction → Blow out with compressed air through the rear of the radiator.
 - Flattened fins → Repair or replace.




2. Inspect:
- Radiator hoses
 - Radiator pipes
- Cracks/damage → Replace.

3. Measure:
- Radiator cap opening pressure
- Radiator cap opens at a pressure below the specified pressure → Replace.

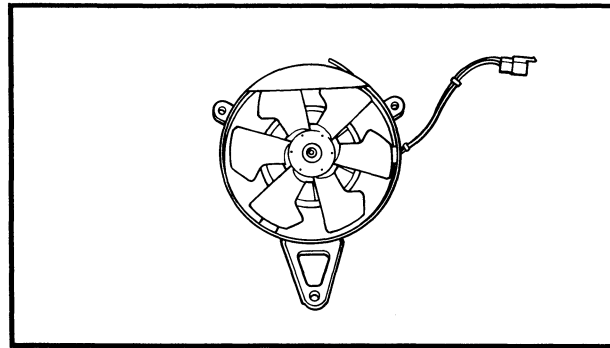
Radiator cap opening pressure:
110 ~ 140 kPa
(1.1 ~ 1.4 kg/cm², 15.6 ~ 19.9 psi)



- Measurement steps:**
- Attach the radiator cap tester ① and adapter ② to the radiator cap ③.

 **Radiator cap tester:**
YU-24460-01/90890 - 01325
Adapter:
YU-33984/90890 - 01352

- Apply the specified pressure for ten seconds and be sure that there is no pressure drop.



4. Inspect:
- Fan motor assembly
- Damage → Replace.
 Malfunction → Check and repair.
 Refer to "COOLING SYSTEM" in CHAPTER 8.



EB500040

INSTALLATION

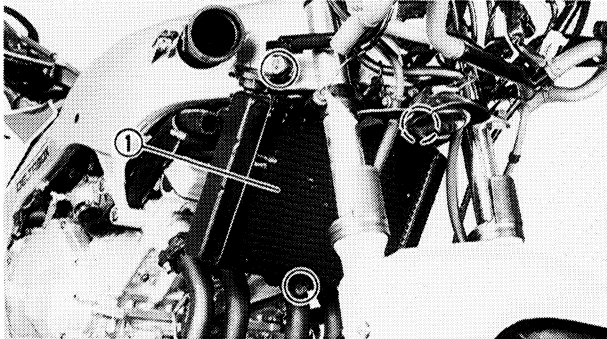
Reverse the "REMOVAL" procedure.
Note the following points.

1.Install:

- Fan motor



Bolt (fan motor):
10 Nm (1.0 m • kg, 7.2 ft • lb)



2.Install:

- Radiator assembly ①



Bolt (radiator assembly):
7 Nm (0.7 m • kg, 5.1 ft • lb)

3.Fill:

- Cooling system
Refer to "COOLANT REPLACEMENT" in CHAPTER 3.

4.Inspect:

- Cooling system
Decrease of pressure (leaks) → Repair as required.

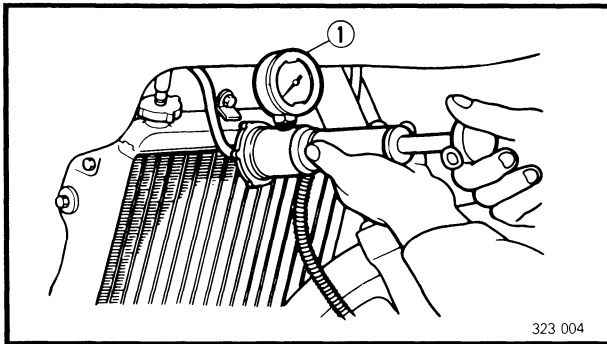
Inspection steps:

- Attach the radiator cap tester ① to the radiator.



Radiator cap tester:
YU-24460-01/90890 - 01325

- Apply 100 kPa (1.0 kg/cm², 14 psi) of pressure.
- Measure the indicated pressure with the gauge.



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EB501000

OIL COOLER**REMOVAL**

1.Remove:

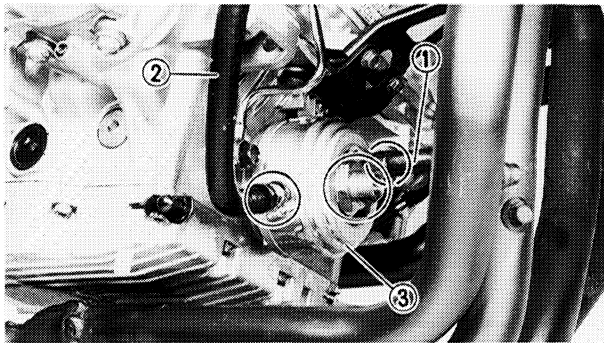
- Bottom cowling
- Side cowlings (left and right)
Refer to "COWLINGS" in CHAPTER 3.

2.Drain:

- Engine oil
- Coolant
Refer to "ENGINE OIL REPLACEMENT"
and "COOLANT REPLACEMENT" in
CHAPTER 3.

3.Remove:

- Oil filter
Refer to "ENGINE OIL REPLACEMENT" in
CHAPTER 3.

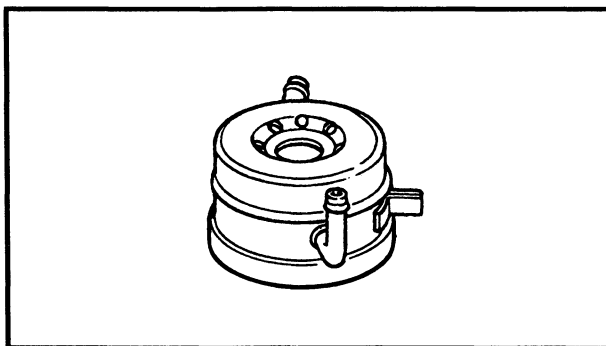


4.Disconnect:

- Inlet hose (oil cooler) ①
- Outlet hose (oil cooler) ②

5.Remove:

- Oil cooler ③

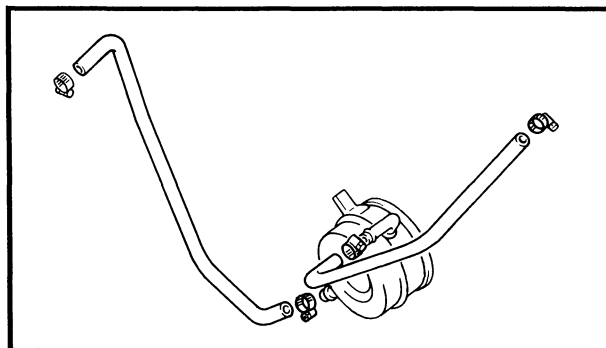


EB501010

INSPECTION

1.Inspect:

- Oil cooler
Cracks/damage → Replace.



2.Inspect:

- Inlet hose (oil cooler)
- Outlet hose (oil cooler)
Cracks/wear/damage → Replace.



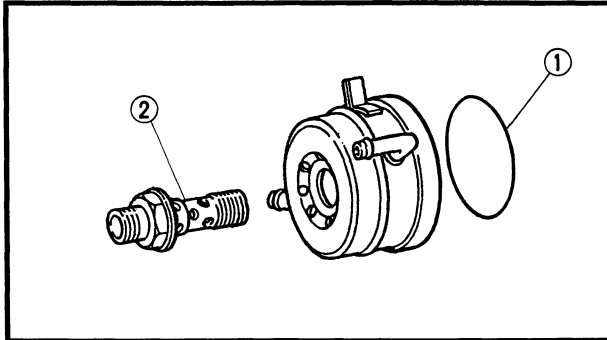
EB501020

INSTALLATION

Reverse the "REMOVAL" procedure.

Note the following points.

1. Clean the mating surfaces of the oil cooler and the crankcase with a cloth dampened with lacquer thinner.



2. Lubricate:

- O-ring ①
- Bolt ②



Recommended lubricant:
Engine oil

⚠ WARNING

Always use a new O-ring on the oil cooler.

3. Install:

- O-ring
- Oil cooler

NOTE:

Make sure that the O-ring is positioned properly.



Bolt (oil cooler):
63 Nm (6.3 m · kg, 45 ft · lb)

4. Install:

- Oil filter

Refer to "ENGINE OIL REPLACEMENT" in CHAPTER 3.



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

5. Fill:

- Cooling system
- Crankcase

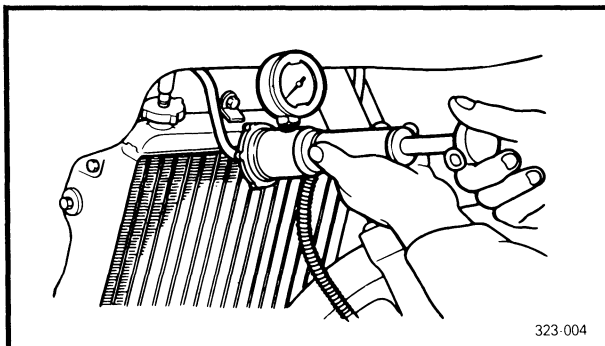
Refer to "COOLANT REPLACEMENT" and "ENGINE OIL REPLACEMENT" in CHAPTER 3.

6. Inspect:

- Cooling system (oil cooler)

Decrease in pressure (leaks) → Replace the oil cooler as required.

Refer to "RADIATOR - INSTALLATION".



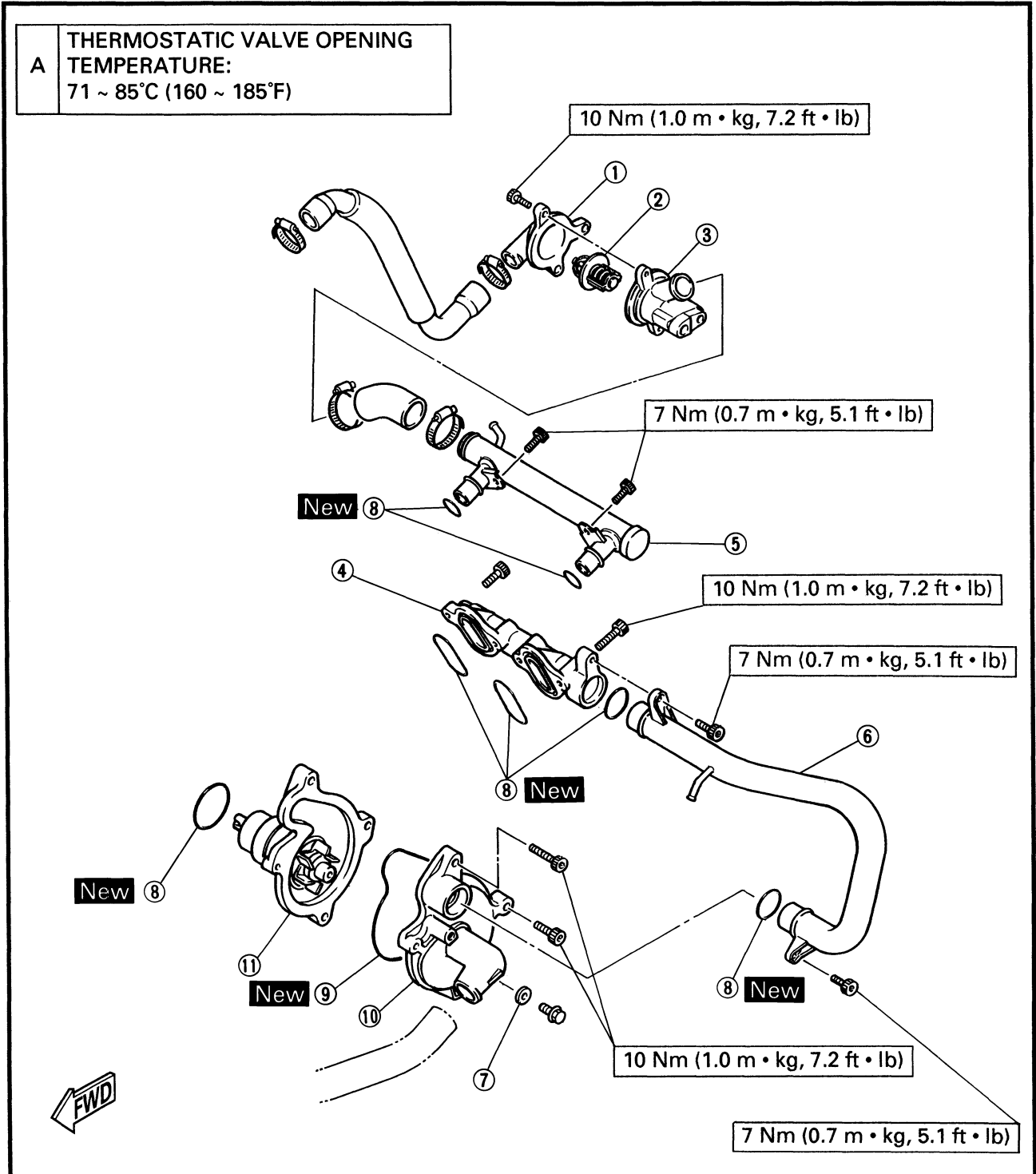
323-004



THERMOSTATIC VALVE/WATER PUMP

- ① Thermostatic valve cover
- ② Thermostatic valve
- ③ Thermostatic valve housing
- ④ Water jacket joint (inlet)
- ⑤ Water jacket joint (outlet)
- ⑥ Outlet pipe (water pump)
- ⑦ Copper washer
- ⑧ O-ring
- ⑨ Gasket
- ⑩ Water pump cover
- ⑪ Water pump housing

A THERMOSTATIC VALVE OPENING TEMPERATURE:
71 ~ 85°C (160 ~ 185°F)





EB502000

THERMOSTATIC VALVE

REMOVAL

1.Remove:

- Seat
 - Fuel tank
 - Bottom cowling
 - Side cowling (right)
- Refer to "SEAT", "FUEL TANK" and "COWLINGS" in CHAPTER 3.

2.Disconnect:

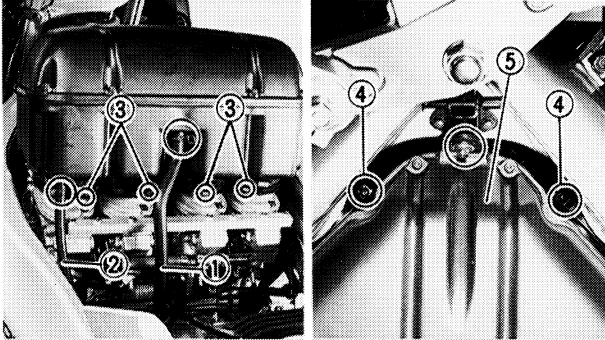
- Breather hose (crankcase) ①
- Drain hose (air filter case) ②

3.Loosen:

- Clamp screws (carburetor joints) ③
- Clamp screws (air intake ducts) ④

4.Remove:

- Air filter case ⑤



5.Drain:

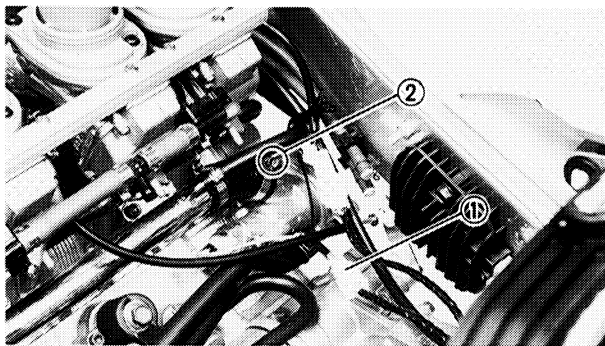
- Coolant
- Refer to "COOLANT REPLACEMENT" in CHAPTER 3.

6.Disconnect:

- Thermo switch/thermo unit coupler ①

7.Loosen:

- Hose clamp ②

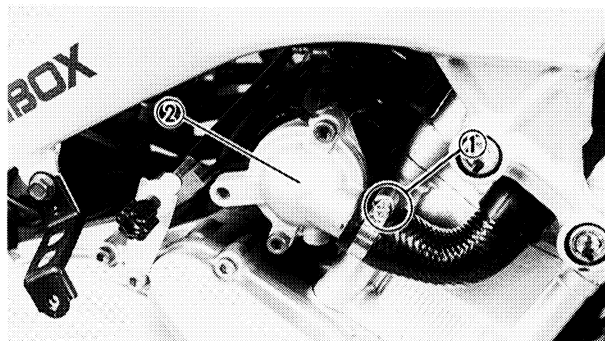


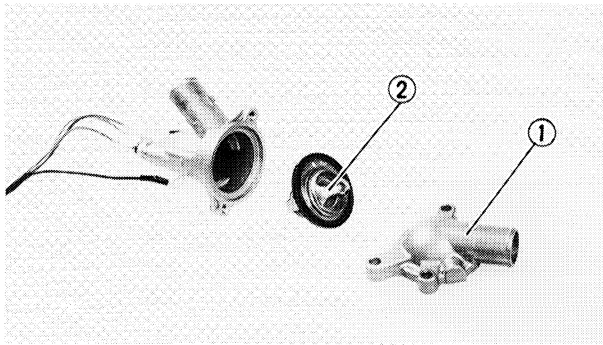
8.Loosen:

- Hose clamp ①

9.Remove:

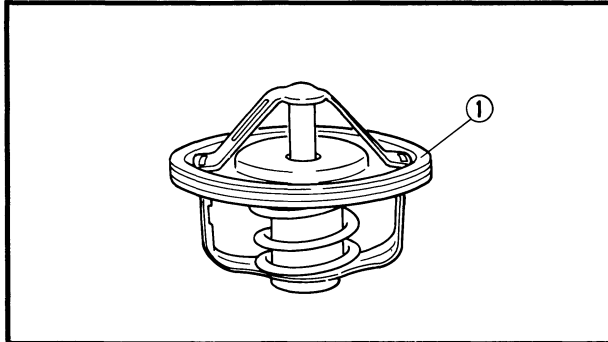
- Thermostatic valve housing ②





10.Remove:

- Thermostatic valve cover ①
- Thermostatic valve ②



EB502010

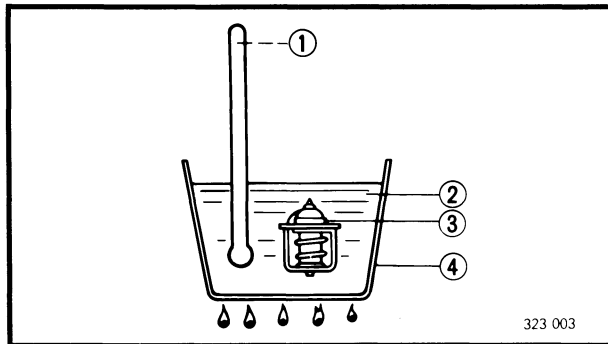
INSPECTION

1.Inspect:

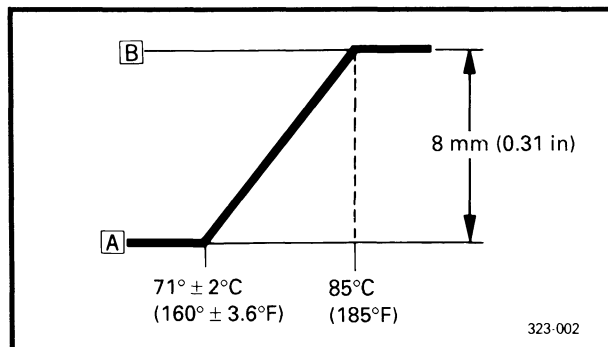
- Thermostatic valve ①
- Valve does not open at 71 ~ 85°C (160 ~ 185°F) → Replace.

Inspection steps:

- Suspend the thermostatic valve in a vessel.
- Place an accurate thermometer in the water.
- While stirring the water observe the thermometer's indicated temperature.

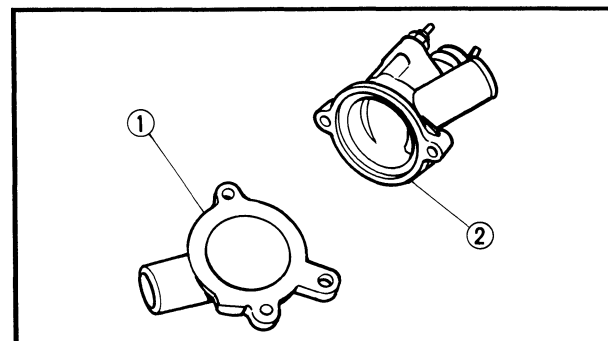


- ① Thermometer
- ② Water
- ③ Thermostatic valve
- ④ Vessel
- A CLOSE
- B OPEN



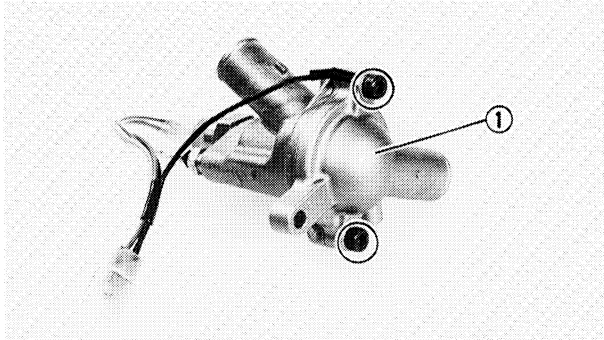
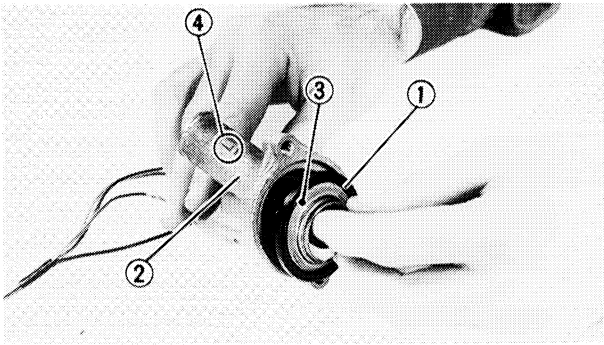
NOTE:

The thermostatic valve is sealed and its setting requires specialized work. If its accuracy is in doubt, replace it. A faulty unit could cause serious overheating or overcooling.



2.Inspect:

- Thermostatic housing cover ①
 - Thermostatic valve housing ②
- Cracks/damage → Replace.



EB502020

INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1.Install:

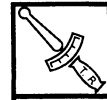
- Thermostatic valve ①
(into the thermostatic valve housing ②)

NOTE:

The thermostatic valve must be installed with the breather hole ③ aligned with the projection ④ on the housing.

2.Install:

- Thermostatic valve housing cover ①



Bolt (thermostatic valve housing cover):

10 Nm (1.0 m • kg, 7.2 ft • lb)

NOTE:

Before installing the thermostatic valve housing cover, apply a thin coating of lithium-soap base grease to the O-ring.

⚠ WARNING

Always use a new O-ring.

3.Fill:

- Cooling system
Refer to "COOLANT REPLACEMENT" in CHAPTER 3.



EB503000

WATER PUMP

REMOVAL

1.Remove:

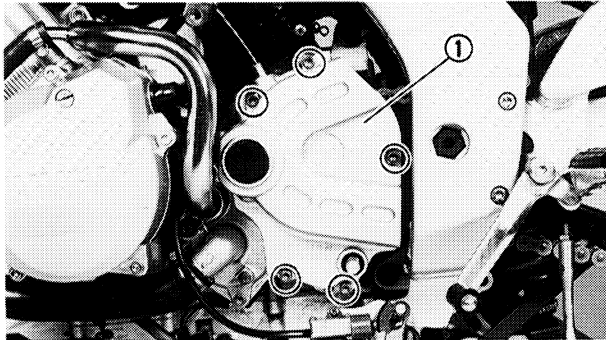
- Bottom cowling
 - Side cowling (left)
- Refer to "COWLINGS" in CHAPTER 3.

2.Drain:

- Coolant
- Refer to "COOLANT REPLACEMENT" in CHAPTER 3.

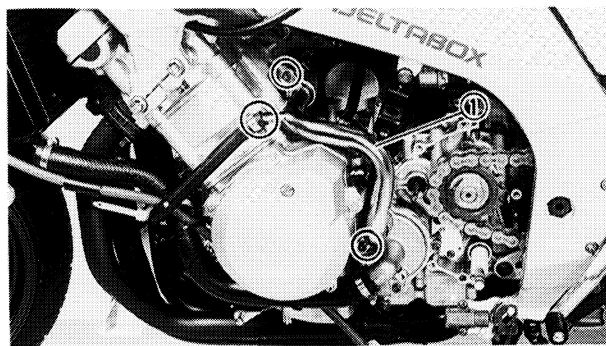
3.Remove:

- Shift pedal link
 - Drive sprocket cover ①
- Refer to "ENGINE REMOVAL" in CHAPTER 4.



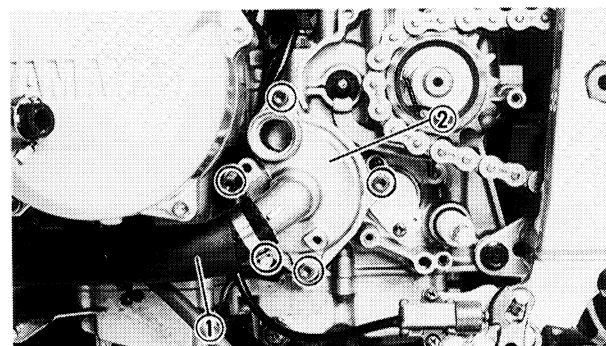
4.Remove:

- Outlet pipe (water pump) ①
- O-rings



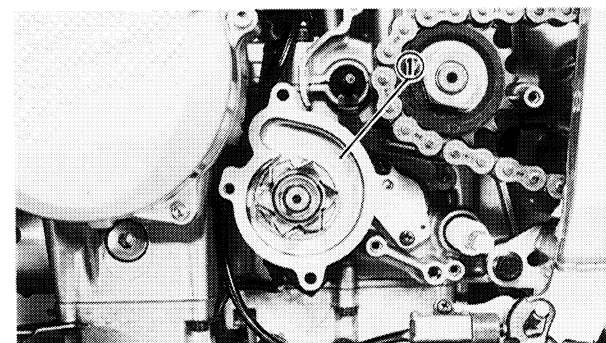
5.Remove:

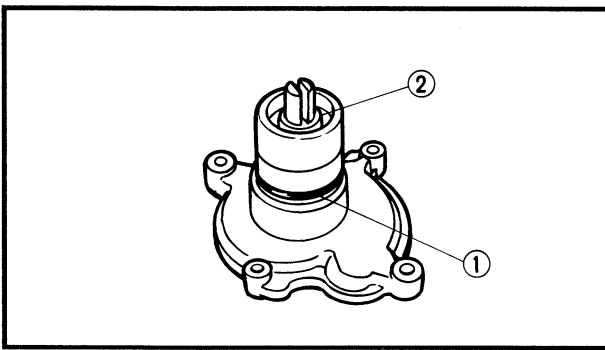
- Inlet hose ①
- Water pump cover ②
- O-ring



6.Remove:

- Water pump housing ①



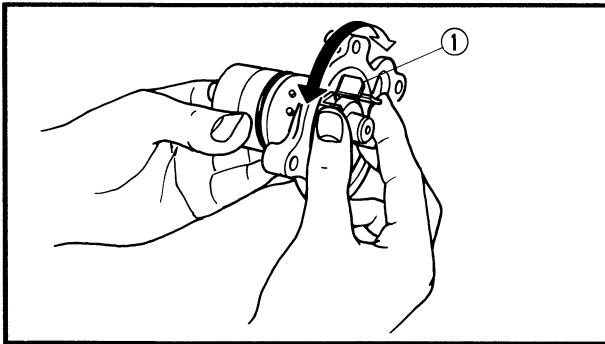


EB503010

INSPECTION

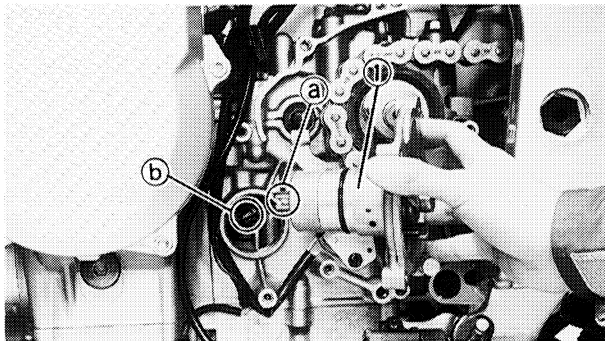
1. Inspect:

- O-ring ①
Wear/damage → Replace.
- Oil seal ②
Wear/damage → Replace the water pump housing assembly.



2. Inspect:

- Impeller ①
Cracks/wear/damage → Replace the water pump housing assembly.
- Bearing
Roughness → Replace the water pump housing assembly.



EB503020

INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Install:

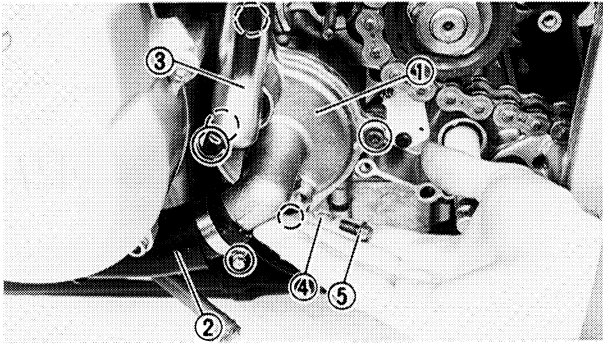
- Water pump housing ①

NOTE:

- Align the slot ① on the impeller shaft with the projection ② on the oil pump shaft.
- Apply a thin coat of grease onto the O-ring.

⚠ WARNING

Always use a new O-ring on the water pump housing.



2.Install:

- O-ring
- Water pump cover ①
- Inlet hose ②
- O-rings
- Outlet pipe ③

NOTE:

- Before installing the outlet pipe ③, apply grease onto the O-rings.
- Install a new copper washer ④ onto the coolant drain bolt ⑤.



Bolt (water pump cover):
10 Nm (1.0 m · kg, 7.2 ft · lb)

⚠ WARNING

Always use new O-rings on the outlet pipe.

3.Install:

- Drive sprocket cover
- Shift pedal link
Refer to "ENGINE ASSEMBLY AND ADJUSTMENT" in CHAPTER 4.

4.Fill:

- Cooling system
Refer to "COOLANT REPLACEMENT" in CHAPTER 3.

5.Inspect:

- Cooling system
Decrease in pressure (leaks) → Replace the oil cooler as required.
Refer to "RADIATOR – INSTALLATION".



CHAPTER 6. CARBURETION

CARBURETORS	6-1
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INSPECTION.....	6-6
ASSEMBLY.....	6-8
INSTALLATION	6-10
FUEL LEVEL ADJUSTMENT	6-11
THROTTLE POSITION SENSOR (TPS) ADJUSTMENT AND INSPECTION.....	6-12

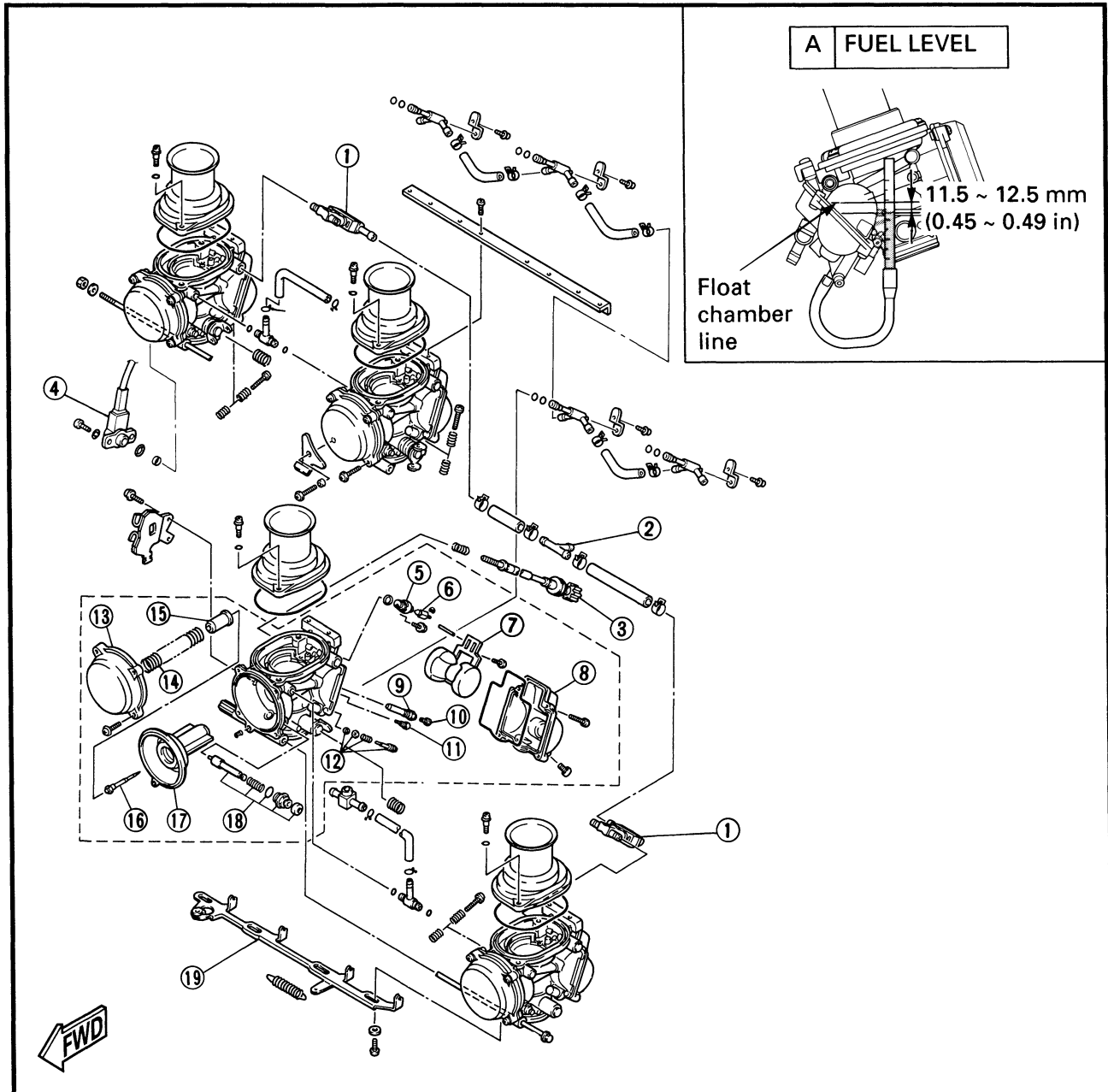
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CARBURETION

CARBURETORS

- ① Joint (fuel feed)
- ② Joint (fuel hose)
- ③ Throttle stop screw
- ④ Throttle position sensor (TPS)
- ⑤ Valve seat
- ⑥ Needle valve
- ⑦ Float
- ⑧ Float chamber
- ⑨ Main jet holder
- ⑩ Main jet
- ⑪ Pilot jet
- ⑫ Pilot screw set
- ⑬ Vacuum chamber cover
- ⑭ Spring
- ⑮ Jet needle holder
- ⑯ Jet needle set
- ⑰ Piston valve
- ⑱ Starter plunger set
- ⑲ Starter link

SPECIFICATIONS	
I.D. Mark	4TV 11
MAIN JET	#155
MAIN AIR JET	#80
PILOT JET	#38
PILOT AIR JET 1	#140
JET NEEDLE	#1.4 : N3FC #2.3 : N1YF
PILOT SCREW	1-3/8 turns out
THROTTLE VALVE	#110
ENGINE IDLE SPEED	1,200 ~ 1,300 r/min
FUEL LEVEL	11.5 ~ 12.5 mm (0.45 ~ 0.49 in)





EB600010

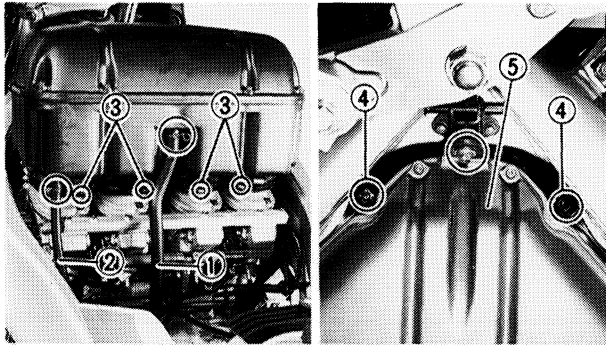
REMOVAL

1.Remove:

- Seat
 - Fuel tank
 - Bottom cowling
 - Side cowlings (left and right)
- Refer to "SEAT", "FUEL TANK" and "COWLINGS" in CHAPTER 3.

2.Drain:

- Coolant
- Refer to "COOLANT REPLACEMENT" in CHAPTER 3.



3.Disconnect:

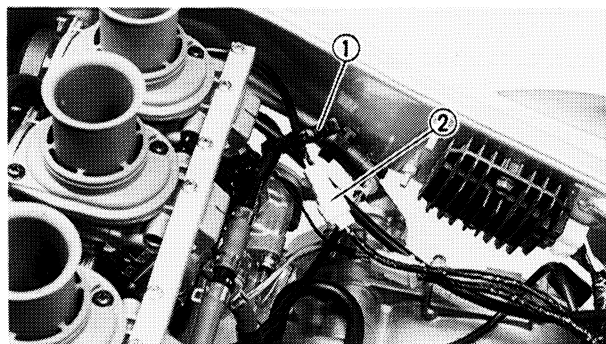
- Breather hose (crankcase) ①
- Drain hose (air filter case) ②

4.Loosen:

- Clamp screws (carburetor joints) ③
- Clamp screws (air intake ducts) ④

5.Remove:

- Air filter case ⑤

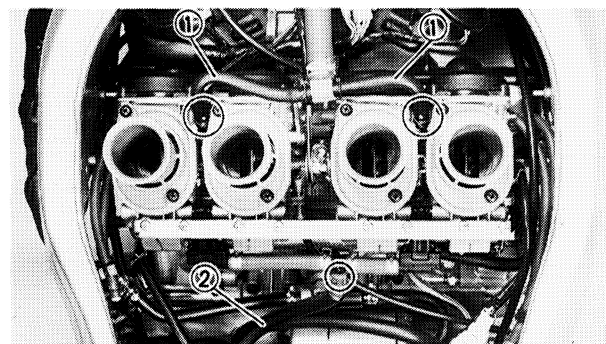


6.Remove:

- Plastic band ①

7.Disconnect:

- TPS coupler ②



8.Disconnect:

- Air vent hoses (carburetors) ①
- Fuel hose ②

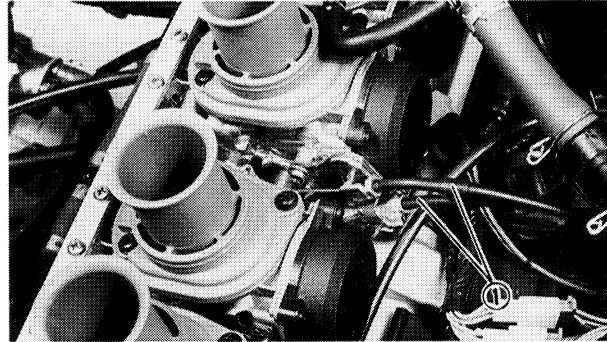
⚠ WARNING

**Gasoline is highly flammable.
Avoid spilling fuel onto a hot engine.**



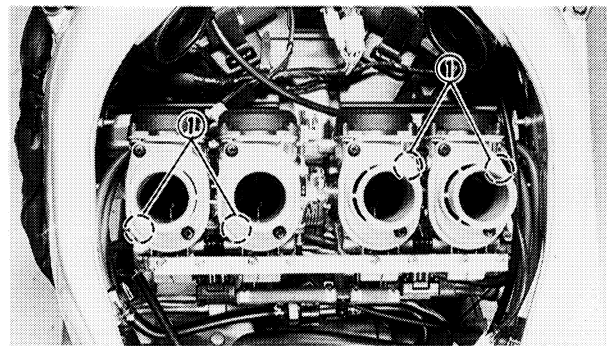
9.Remove:

- Throttle stop screw ①



10.Disconnect:

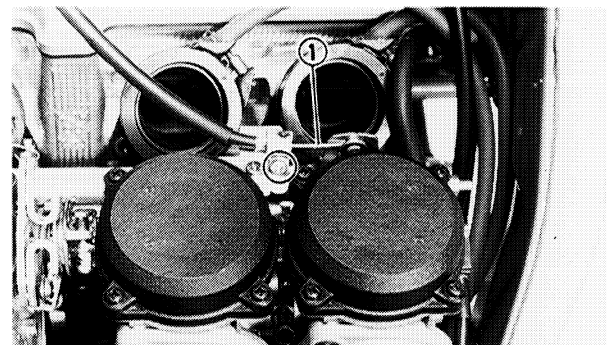
- Throttle cables ①



11.Loosen:

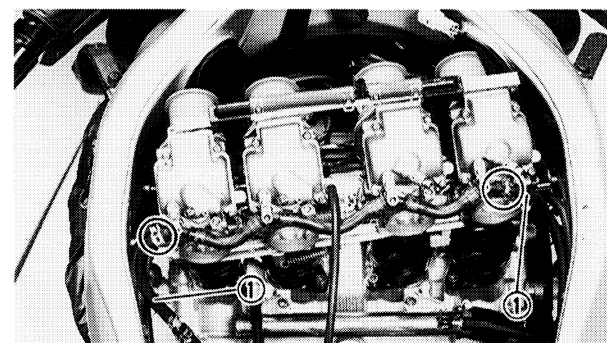
- Carburetor joint bolts ①

12.Pull out the carburetor assembly from the carburetor joints.



13.Disconnect:

- Starter cable ①



14.Disconnect:

- Carburetor heater hoses ①

15.Remove:

- Carburetor assembly



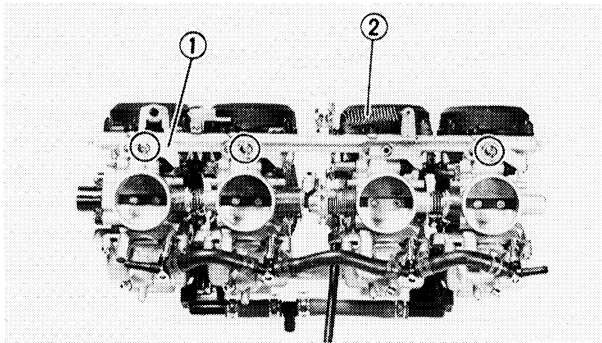
EB600020

DISASSEMBLY

NOTE:

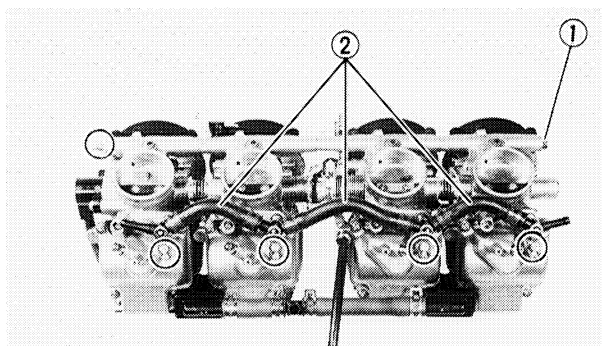
The following parts can be cleaned and inspected without disassembling the carburetors. (All inner parts except the starter plunger can be cleaned and inspected without separating the carburetors.)

- Throttle valve
- Piston valve
- All of the jets
- Float
- Needle valve
- Valve seat
- Main nozzle
- Jet needle



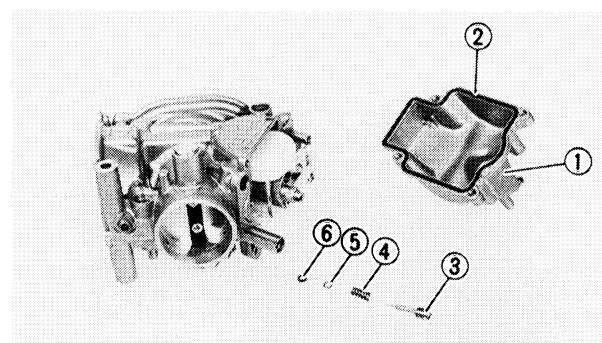
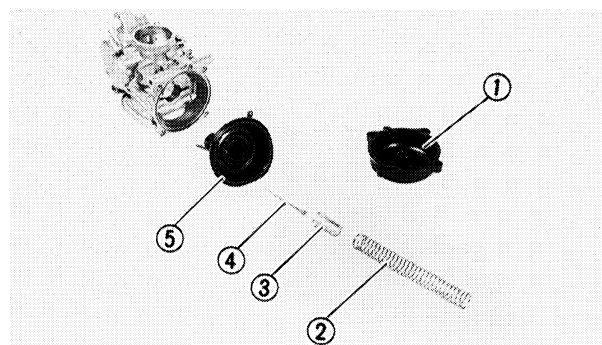
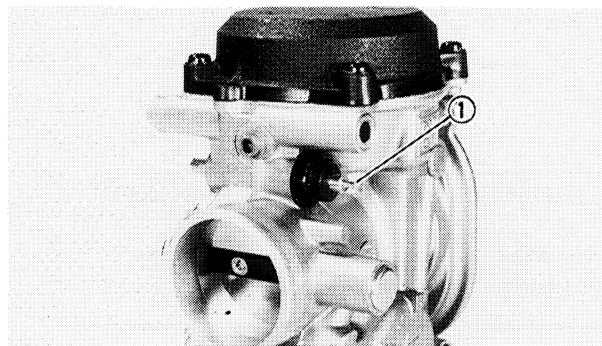
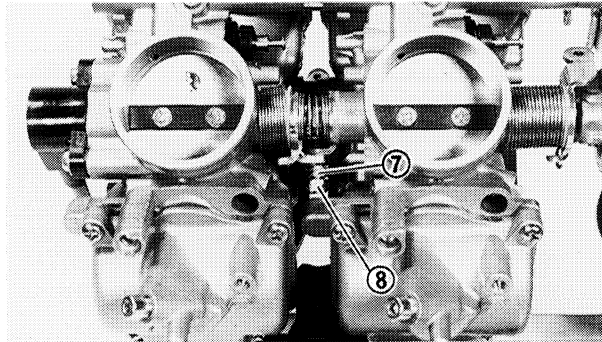
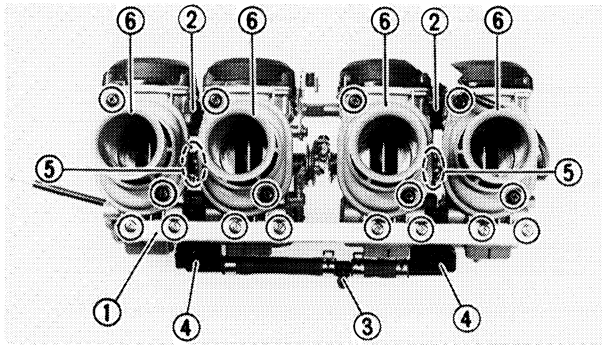
1.Remove:

- Starter joint ①
- Return spring ②



2.Remove:

- Connecting bolt (upper) ①
- Coolant hoses ②
(with the coolant hose joints)



3.Remove:

- Connecting plate (lower) ①
- Joints (air vent hose-vacuum chamber) ② (with the O-rings)
- Joint (fuel hose) ③
- Joints (fuel feed) ④ (with the O-rings)
- Springs ⑤ (from between carburetors #1 and #2 and #3 and #4)
- Air funnel ⑥ (with the O-rings)

CAUTION:

- **Never disassemble the fuel feed joint ④.**
- **Since the removed parts are defective, do not reuse them.**

NOTE:

When separating the carburetors be careful not to lose the return spring ⑦ located under the synchronizing screw ⑧.

4.Remove:

- Starter plunger ①

NOTE:

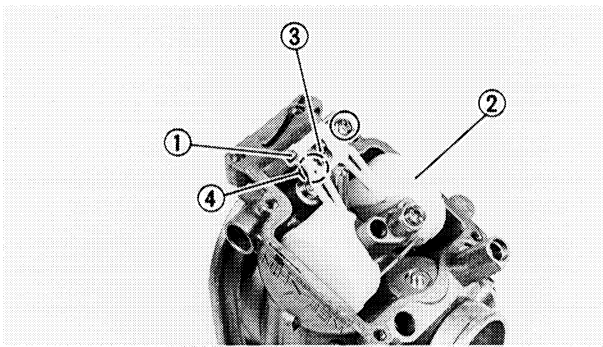
Unhook the hooks from the carburetor body and then pull out the starter plunger.

5.Remove:

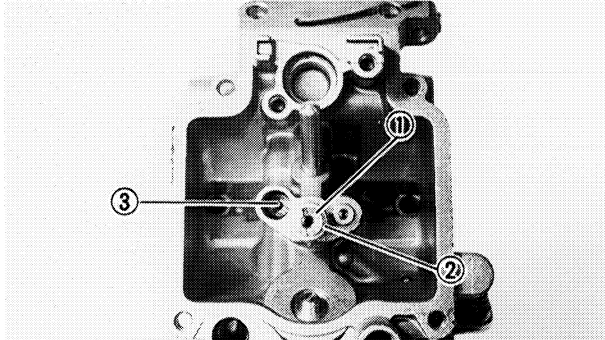
- Vacuum chamber cover ①
- Spring ②
- Jet needle holder ③
- Jet needle ④
- Piston valve ⑤

6.Remove:

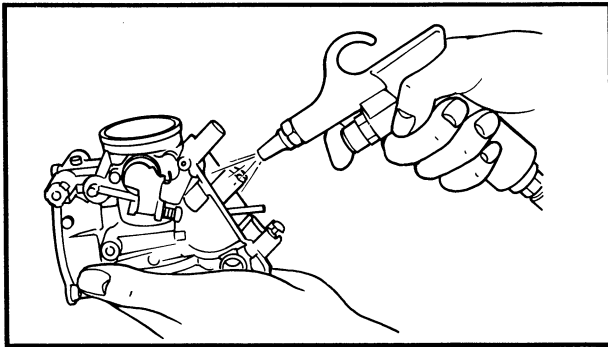
- Float chamber ①
- Gasket ②
- Pilot screw ③
- Spring ④
- Washer ⑤
- O-ring ⑥



- 7.Remove:
- Float pin ①
 - Float ②
 - Needle valve ③
 - Valve seat ④
 - O-ring



- 8.Remove:
- Main jet holder ①
 - Main jet ②
 - Pilot jet ③



EB600030

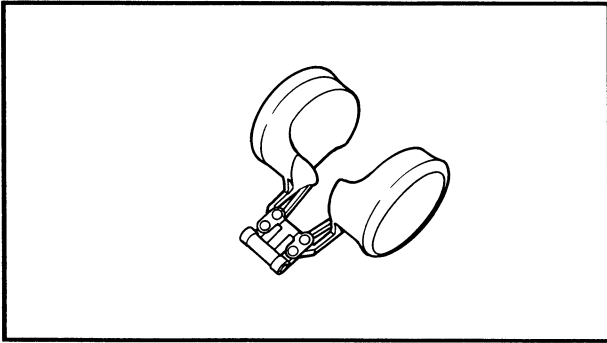
INSPECTION

- 1.Inspect:
- Carburetor body
 - Float chamber
 - Jet housing
 - Cracks/damage → Replace.
 - Fuel passage
 - Blockage → Clean as indicated.

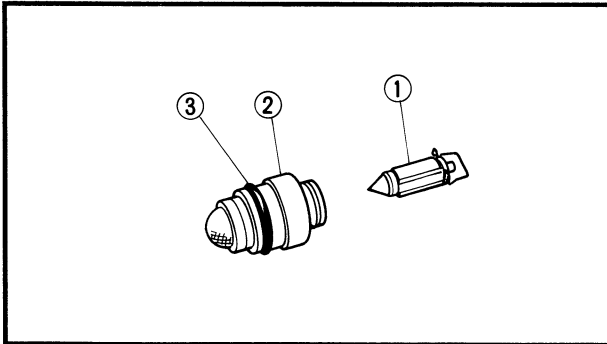
- Carburetor float chamber body
- Contamination → Clean.

Cleaning steps:

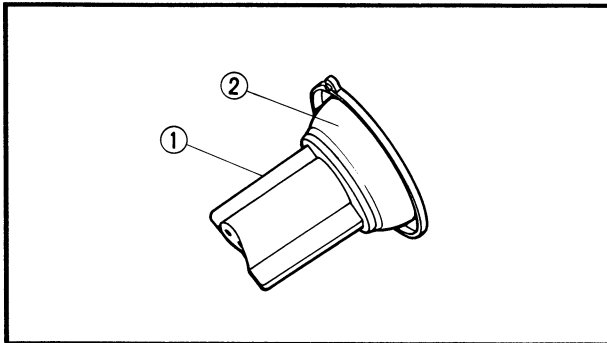
- Wash the carburetor in a petroleum based solvent. (Do not use any caustic carburetor cleaning solution.)
- Blow out all of the passages and jets with compressed air.



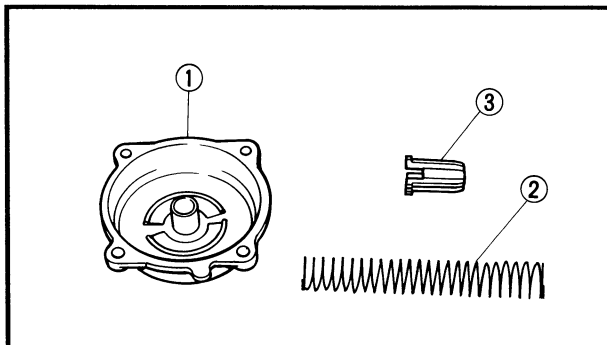
2. Inspect:
- Float
Damage → Replace.



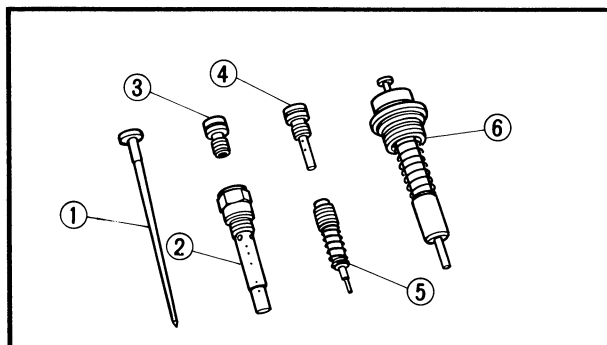
3. Inspect:
- Needle valve ①
 - Valve seat ②
 - O-ring ③
 - Contamination/wear/damage → Replace as a set.



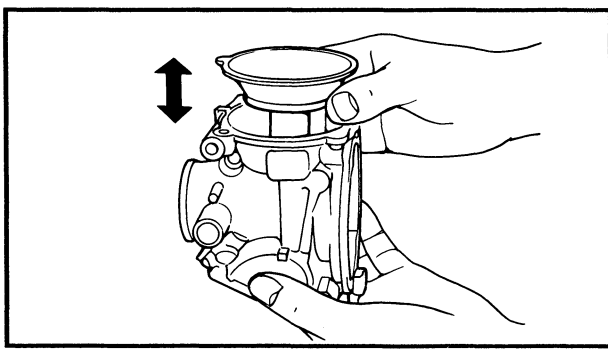
4. Inspect:
- Throttle valve ①
Scratches/wear/damage → Replace.
 - Rubber diaphragm ②
Tears → Replace.



5. Inspect:
- Vacuum chamber cover ①
 - Spring ②
 - Jet needle holder ③
 - Cracks/damage → Replace.

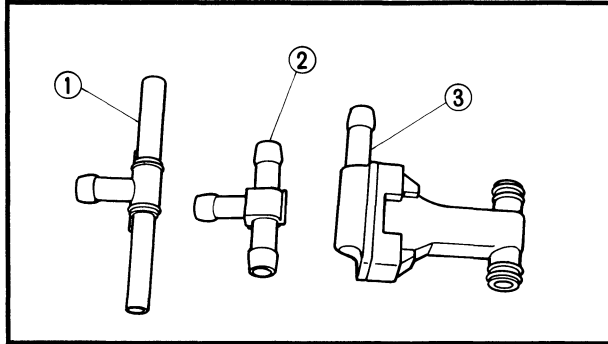


6. Inspect:
- Jet needle ①
 - Needle jet ②
 - Main jet ③
 - Pilot jet ④
 - Pilot screw ⑤
 - Starter plunger ⑥
 - Bends/wear/damage → Replace.
 - Blockage → Blow out the jets with compressed air.



7. Check:

- Free movement
Insert the throttle valve into the carburetor body and check for free movement.
Sticks/tight → Replace.



8. Inspect:

- Joint (ventilation hose) ①
 - Joint (fuel hose) ②
 - Joint (fuel feed) ③
- Cracks/damage → Replace.

EB600040

ASSEMBLY

Reverse the "DISASSEMBLY" procedure.
Note the following points.

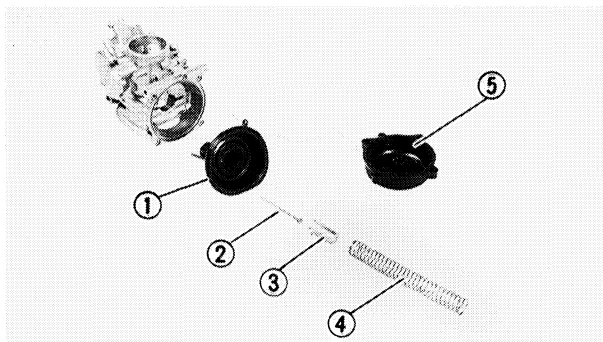
CAUTION:

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

1. Install:

- O-ring
- Washer
- Spring
- Pilot screw

Pilot screw (turns out):
1-3/8

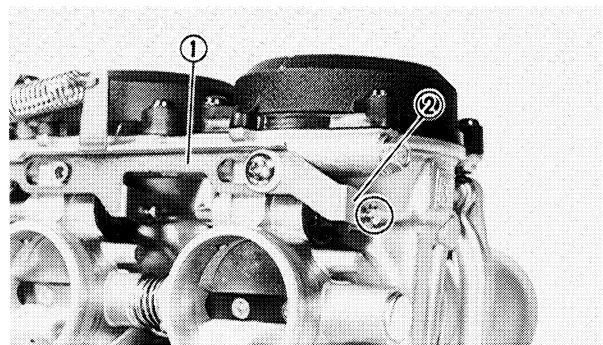
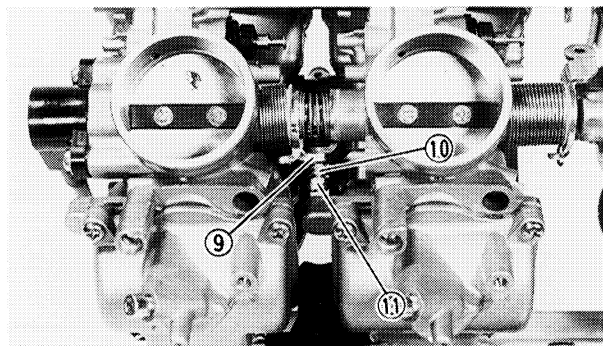
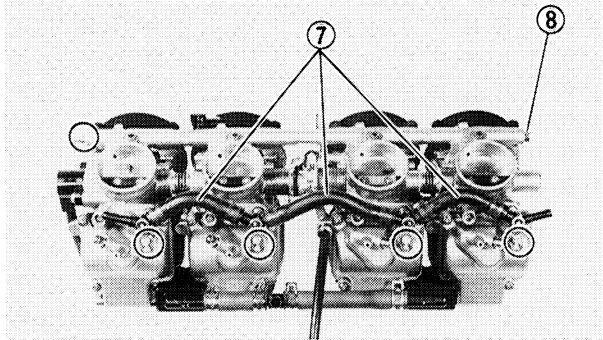
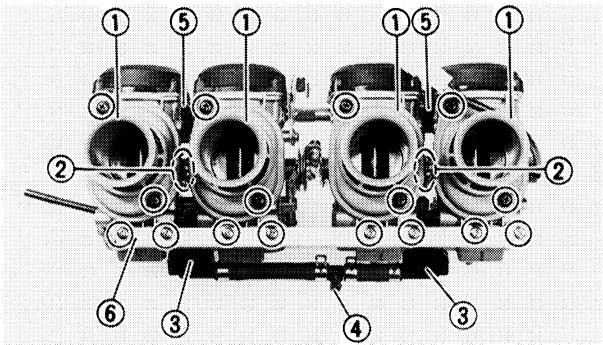


2. Install:

- Throttle valve ①
- Jet needle ②
- Jet needle holder ③
- Spring ④
- Vacuum chamber cover ⑤

NOTE:

- Insert the spring end onto the spring guide on the vacuum chamber cover.
- Match the tab on the diaphragm to the recess in the carburetor body.



3.Install:

- Air funnel ①
(with the O-ring)
- Springs ②
(between carburetors #1 and #2 and #3 and #4)
- Joints (fuel feed) ③
(with the O-rings)
- Joint (fuel hose) ④
- Joints (air vent hose-float chamber) ⑤
(with the O-ring)
- Connecting plate (lower) ⑥
- Coolant hoses ⑦
(with the coolant hose joints)
- Connecting bolt (upper) ⑧

NOTE:

- Do not tighten the connecting bolts, yet.
- Insert the throttle arm ⑨ (onto carburetors #1, #2 and #4) between the spring ⑩ and synchronizing screw ⑪.

4.Install:

- Starter joint ①

NOTE:

Hook the starter joint arm ② onto each starter plunger.

5.Tighten:

- Connecting bolts

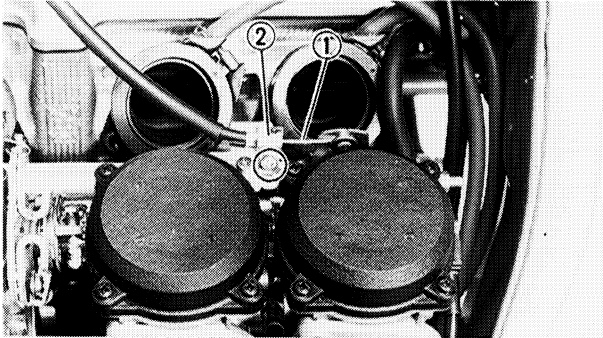


Connecting bolt (upper):
3.5 Nm (0.35 m • kg, 2.5 ft • lb)
Connecting plate (lower):
5 Nm (0.5 m • kg, 3.6 ft • lb)



NOTE: _____

- Place the carburetor assembly on a surface plate with the intake manifold side down and then tighten the connecting bolts while pushing down the respective carburetor with an even force.
- After tightening, check the throttle lever and starter joint for smooth action.



6. Install:

- Starter cable ①

NOTE: _____

Clamp the starter cable with the holder ②.

EB600050

INSTALLATION

Reverse the "REMOVAL" procedure.

Note the following points.

1. Adjust:

- Carburetor synchronization
Refer to "CARBURETOR SYNCHRONIZATION" in CHAPTER 3.

2. Adjust:

- Idling speed



Engine idling speed:
1,200 ~ 1,300 r/min

Refer to "IDLING SPEED ADJUSTMENT" in CHAPTER 3.

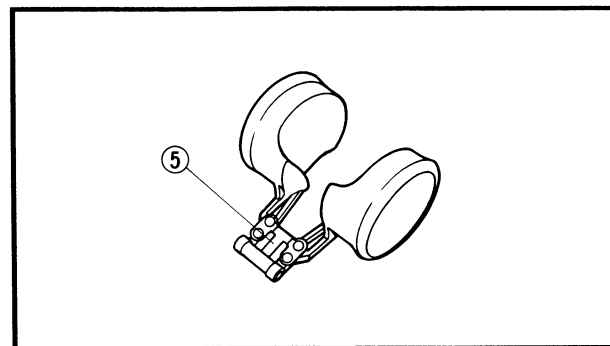
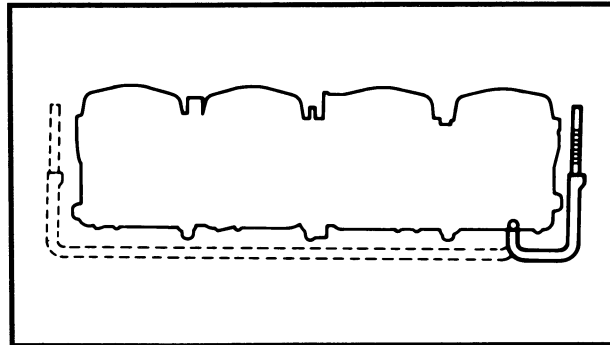
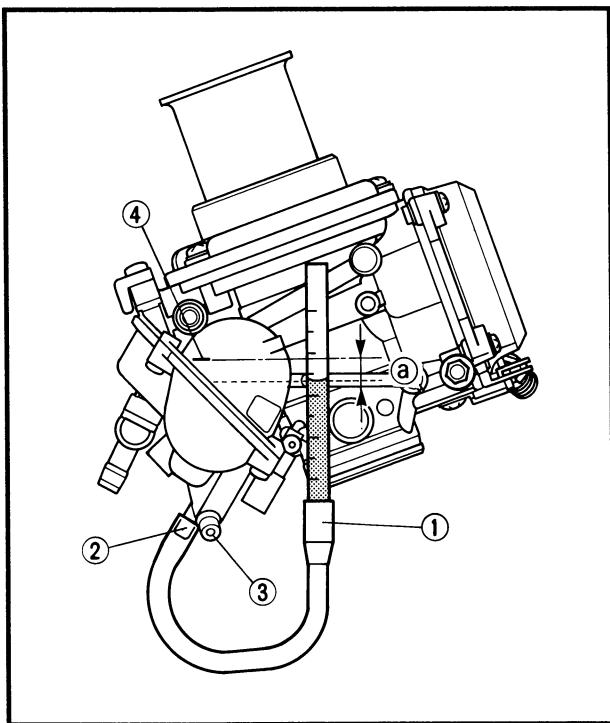
3. Adjust:

- Throttle cable free play



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

Refer to "THROTTLE CABLE ADJUSTMENT" in CHAPTER 3.



EB600061

FUEL LEVEL ADJUSTMENT

1. Measure:

- Fuel level ①
- Out of specification → Adjust.



Fuel level:
11.5 ~ 12.5 mm (0.45 ~ 0.49 in)
(below the float chamber line)

Measurement and adjustment steps:

- Place the motorcycle on a level surface.
- Put the motorcycle on a suitable stand to ensure that the carburetors are positioned vertically.
- Connect the fuel level gauge ① to the drain pipe ②.



Fuel level gauge:
YM-01312-A/90890 - 01312

- Loosen the drain screw ③.
- Hold the gauge vertically next to the float chamber line ④.
- Measure the fuel level ① with the gauge.

NOTE:

Fuel level readings should be equal on both sides of the carburetor assembly.

- If the fuel level is incorrect, adjust it.
- Remove the carburetor assembly.
- Inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float level by slightly bending the float tang ⑤.
- Install the carburetor assembly.
- Check the fuel level again.

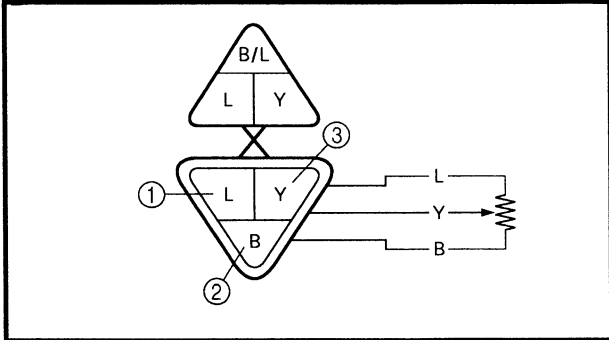


EB600070

**THROTTLE POSITION SENSOR (TPS)
ADJUSTMENT AND INSPECTION**

NOTE:

Before adjusting the TPS, idling speed should be adjusted properly.



1. Inspect:

- TPS

Inspection steps:

- Disconnect the TPS coupler.
- Remove the TPS from the carburetor.
- Connect the pocket tester ($\Omega \times 1k$) to the TPS coupler.

Tester (+) lead → Blue terminal ①
Tester (-) lead → Black terminal ②

- Check the TPS resistance.

TPS resistance "R₁":
4 ~ 6 k Ω at 20°C (68°F)
(Blue — Black)

Out of specification → Replace the TPS.

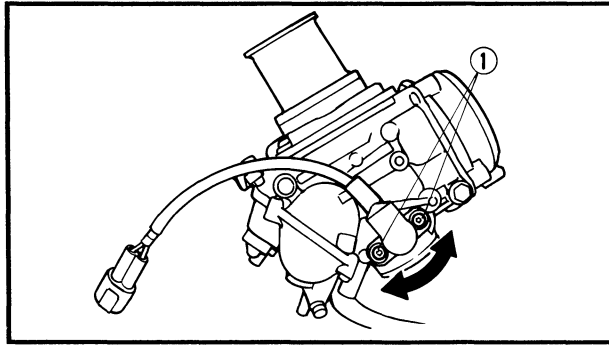
- Connect the pocket tester ($\Omega \times 1k$) to the TPS coupler.

Tester (+) lead → Yellow terminal ③
Tester (-) lead → Black terminal ②

- While slowly turning the throttle check the TPS resistance.

TPS resistance "R₂":
0 ~ 5 k Ω at 20°C (68°F)
(Yellow — Black)

Out of specification → Replace the TPS.



2.Adjust:

- TPS position

Adjustment steps:

- Loosen the screws ①.
- Adjust the throttle position sensor resistance by turning the sensor body to the right or left. Stop turning the sensor body when the required resistance is indicated on the tester.

<p>Resistance when the throttle is closed = Resistance "R₁" × (0.12 ~ 0.16)</p>

Example:

If the resistance "R₁" is 5 kΩ;

$$5 \times (0.116) = 0.58$$

The required resistance is 580 Ω.

- Tighten the screws.
- Detach the pocket tester leads and connect the throttle position sensor coupler.

CHAPTER 7. CHASSIS

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EB700000

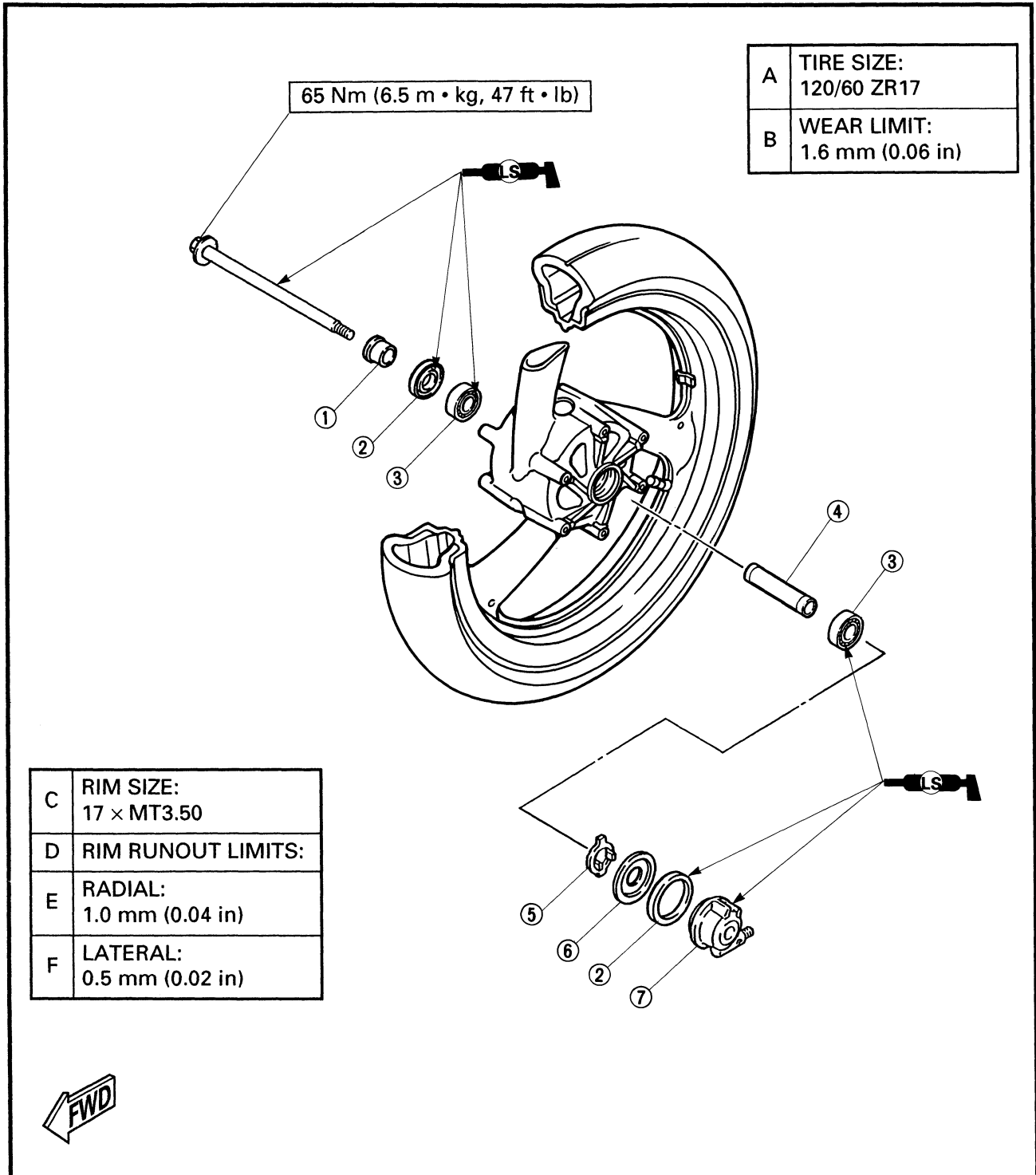
CHASSIS

FRONT WHEEL

- ① Collar
- ② Oil seal
- ③ Bearing
- ④ Spacer
- ⑤ Meter clutch
- ⑥ Clutch retainer
- ⑦ Speedometer gear unit

TIRE PRESSURE (COLD)		
Maximum load*	180 kg (397 lb)	
Cold tire pressure:	Front	Rear
Up to 90 kg (198 lb) load*	225 kPa (2.25 kg/cm ² , 32 psi)	250 kPa (2.5 kg/cm ² , 36 psi)
90 kg (198 lb) load ~ Maximum load*	250 kPa (2.5 kg/cm ² , 36 psi)	290 kPa (2.9 kg/cm ² , 41 psi)
High speed riding	250 kPa (2.5 kg/cm ² , 36 psi)	290 kPa (2.9 kg/cm ² , 41 psi)

* Load is the total weight of cargo, rider, passenger, and accessories.





EB700010

REMOVAL

⚠ WARNING

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

1. Stand the motorcycle on a level surface.

2. Remove:

- Bottom cowling
- Side cowlings (left and right)
Refer to "COWLINGS" in CHAPTER 3.

3. Disconnect:

- Speedometer cable ①

4. Remove:

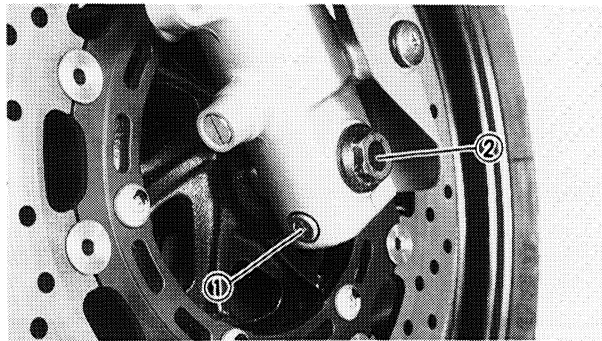
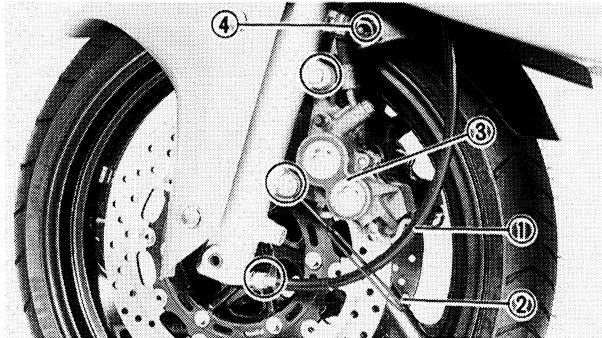
- Speedometer cable guide ②
- Front brake calipers (left and right) ③
- Bolts (brake hose holders) ④

NOTE:

Do not depress the brake lever when the wheel is off the motorcycle as the brake pads will be forced shut.

5. Loosen:

- Pinch bolt (front wheel axle) ①
- Front wheel axle ②



6. Elevate:

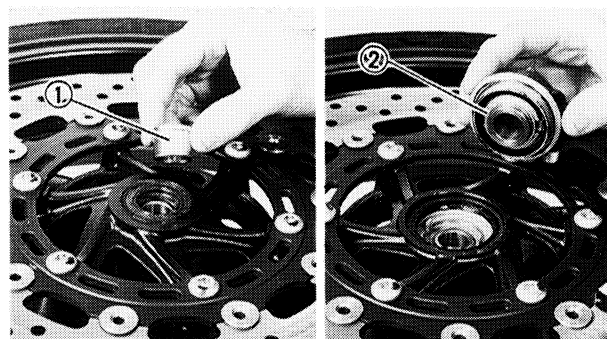
- Front wheel
Place a suitable stand under the engine.

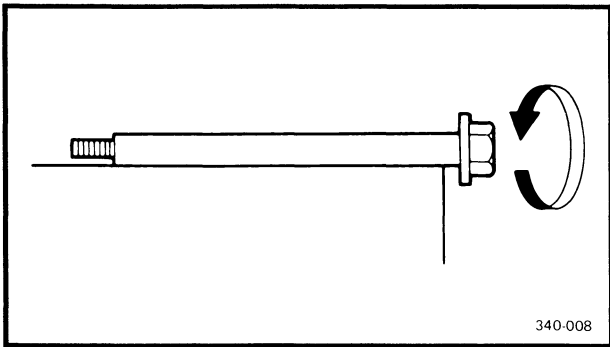
7. Remove:

- Front wheel axle
- Front wheel

8. Remove:

- Collar (right) ①
- Speedometer gear unit ②



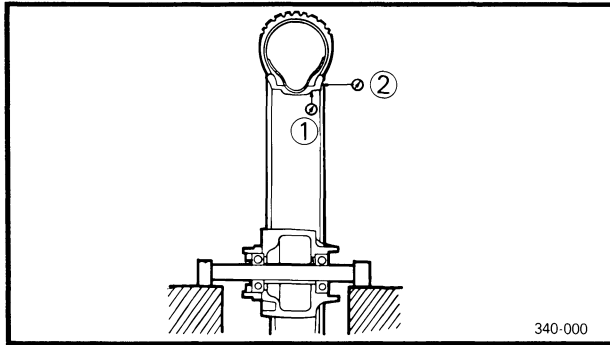


EB700020
INSPECTION


1. Inspect:
- Front wheel axle
(by rolling it on a flat surface)
Bends → Replace.

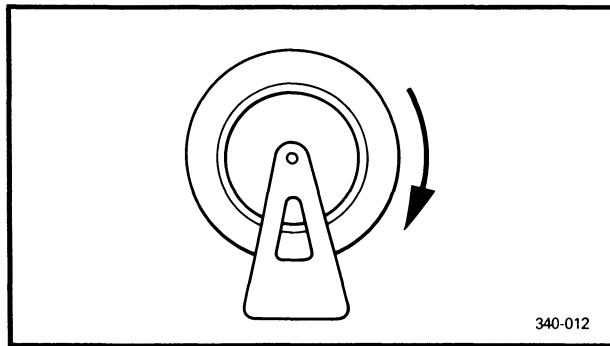
⚠ WARNING _____
Do not attempt to straighten a bent axle.

2. Inspect:
- Front tire
Wear/damage → Replace.
 - Front wheel
Refer to "TIRE INSPECTION" and "WHEEL INSPECTION" in CHAPTER 3.

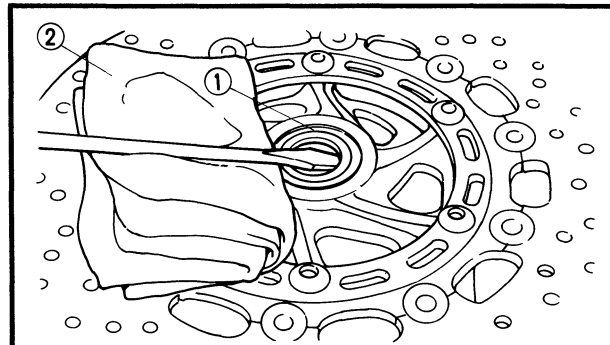


3. Measure:
- Front wheel runout
Over the specified limits → Replace.

 **Front wheel runout limits:**
Radial ①: 1.0 mm (0.04 in)
Lateral ②: 0.5 mm (0.02 in)



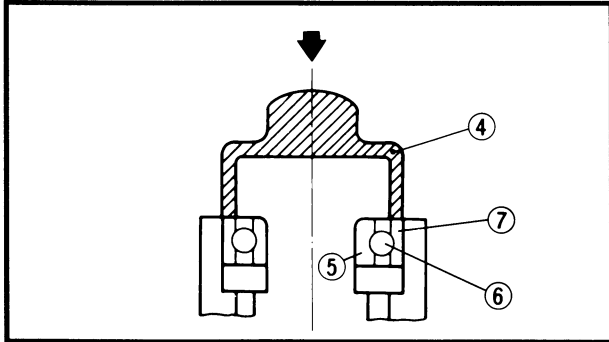
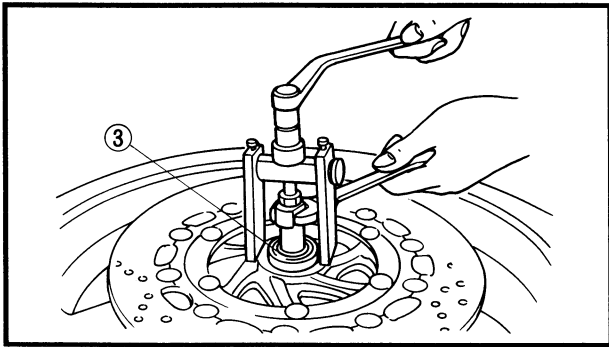
4. Inspect:
- Front wheel bearings
Bearings allow free play in the wheel hub or the wheel does not turn smoothly → Replace.
 - Oil seals
Wear/damage → Replace.



Front wheel bearing and oil seal replacement steps:

- Clean the outside of the front wheel hub.
- Use a flat-head screwdriver to remove the oil seals ①.

NOTE: _____
 To prevent damage place a rag ② between the screwdriver and the wheel surface.



- Use a standard bearing puller to remove the bearings ③.
- Install the new bearings and oil seals by reversing the previous steps.

NOTE: _____
Use a socket ④ that matches the diameter of the bearing outside race and the oil seal.


CAUTION: _____
Do not contact the bearing center race ⑤ or balls ⑥. Contact should be made only with the outer race ⑦.

EB700030

INSTALLATION

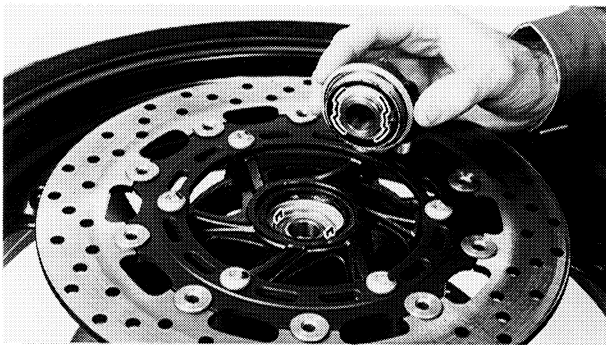
Reverse the "REMOVAL" procedure. Note the following points.

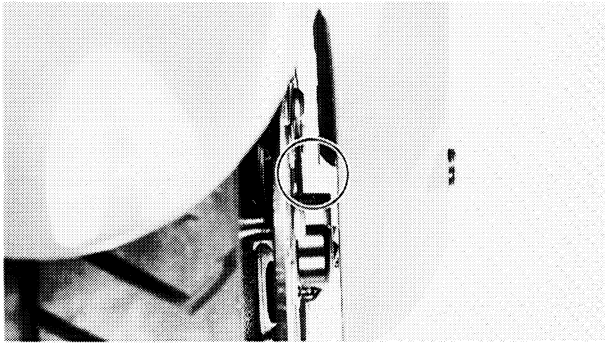
- 1.Lubricate:
- Front wheel axle
 - Bearings
 - Oil seal (lips)
 - Drive/driven gear (speedometer)

	Recommended lubricant: Lithium soap base grease
---	--

- 2.Install:
- Speedometer gear unit

NOTE: _____
Make sure that the wheel hub and the speedometer gear unit are installed with the two projections meshed into the two slots.





3. Install:

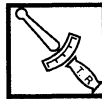
- Front wheel

NOTE:

Make sure that the slot in the speedometer gear unit fits over the stopper on the front fork outer tube.

4. Tighten:

- Front wheel axle
- Pinch bolt (front wheel axle)
- Bolts (brake calipers)

**Front wheel axle:**

65 Nm (6.5 m • kg, 47 ft • lb)

Pinch bolt (front wheel axle):

20 Nm (2.0 m • kg, 14 ft • lb)

Bolt (brake caliper):

40 Nm (4.0 m • kg, 29 ft • lb)

CAUTION:

Before tightening the pinch bolt, stroke the front fork several times to check for proper fork operation.

⚠ WARNING

Make sure that the brake hose is routed properly.

EB700040

**FRONT WHEEL STATIC BALANCE
ADJUSTMENT****NOTE:**

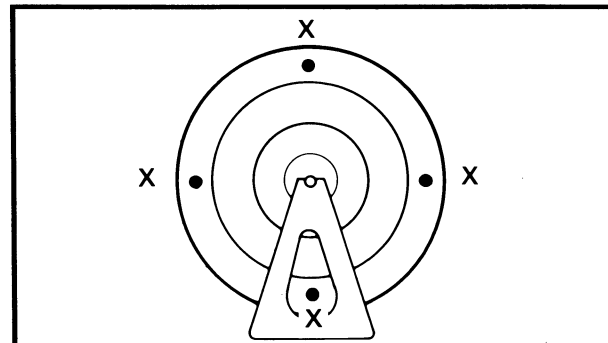
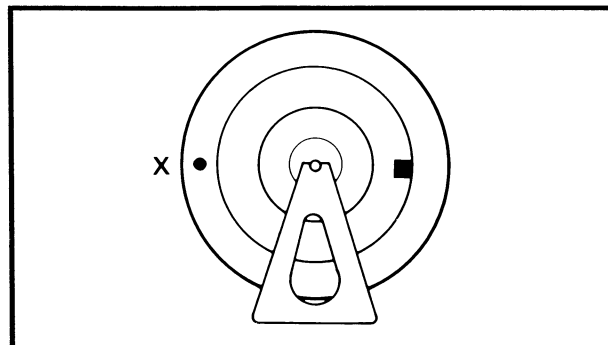
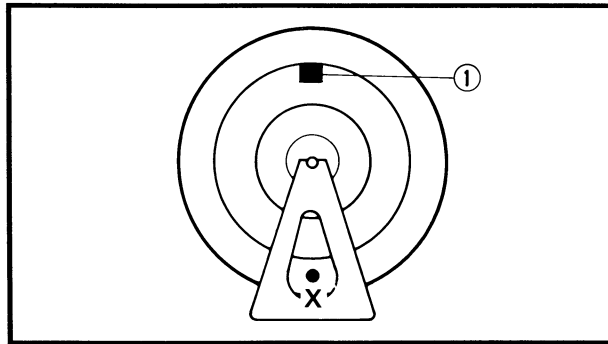
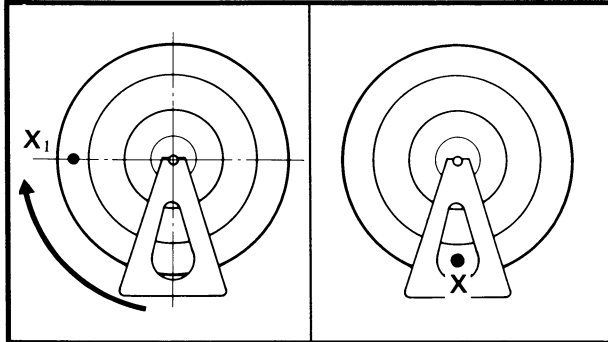
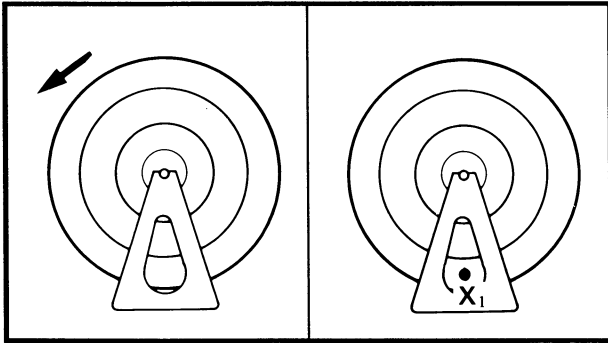
- After replacing the tire and/or rim, the front wheel static balance should be adjusted.
- Adjust the front wheel static balance with the brake disc installed.

1. Remove:

- Balancing weight

2. Set:

- Front wheel
(on a suitable stand)



3.Find:

- Heavy spot

Procedure:

- Spin the wheel and wait for it to rest.
- Put an "X₁" mark on the wheel's bottom spot.
- Turn the wheel so that the "X₁" mark is facing 90° up.
- Release the wheel and wait for it to rest. Put an "X₂" mark on the wheel's bottom spot.
- Repeat steps b, c, and d several times until all the marks come to rest at the same spot.
- This is the wheel's heavy spot "X".

4.Adjust:

- Front wheel static balance

Adjusting steps:

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

NOTE:

Start with the smallest weight.

- Turn the wheel so that the heavy spot is at rest there. 90° up.
- Check that the heavy spot is at rest there. If not, try another weight until the wheel is balanced.

5.Check:

- Front wheel static balance

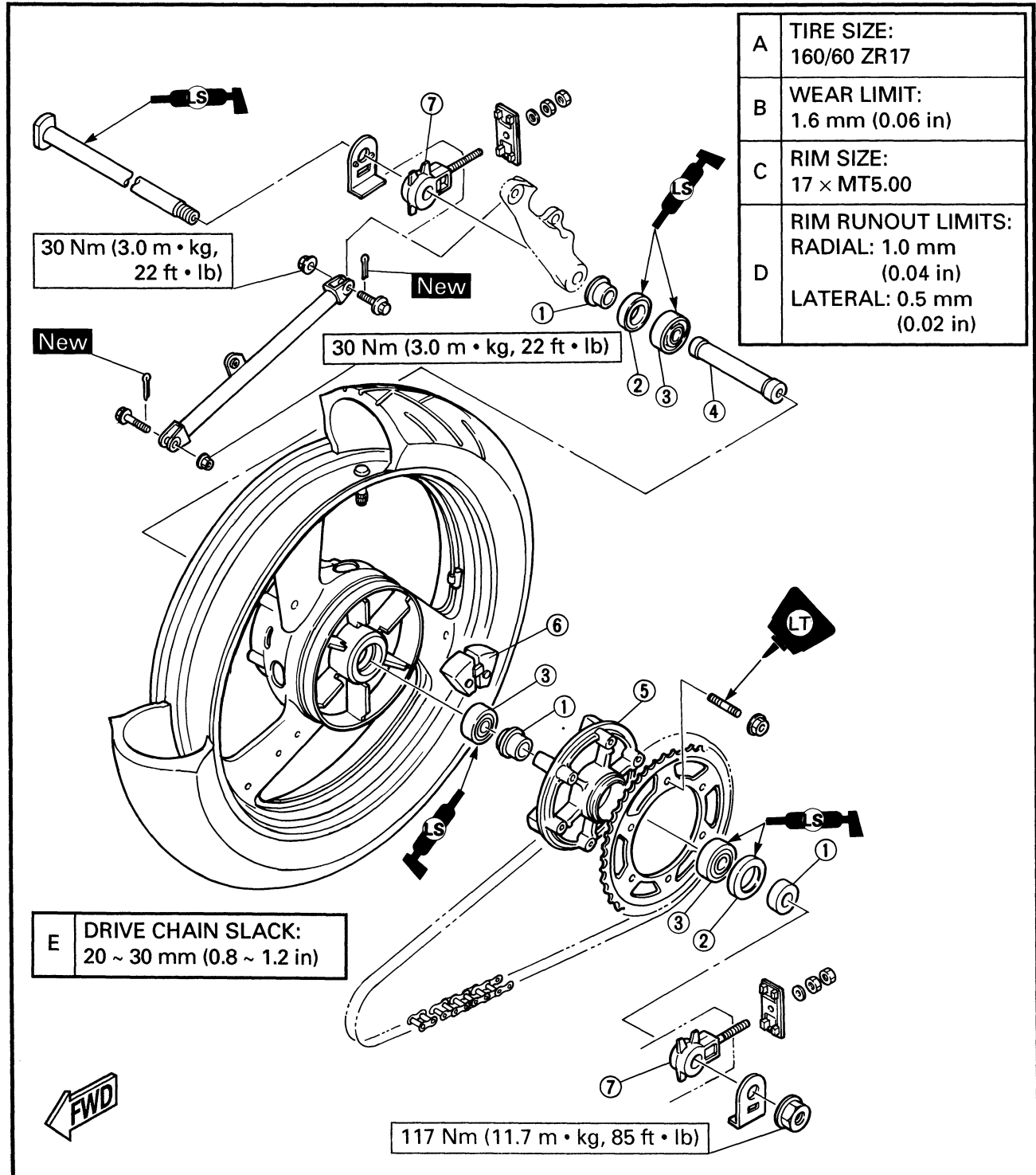
Checking steps:

- Turn the wheel so that it comes to each point, as shown in the illustration.
- Check that the wheel is at rest at each point. If not, readjust the front wheel static balance.

EB701000

REAR WHEEL

- ① Collars
- ② Oil seal
- ③ Bearings
- ④ Spacer
- ⑤ Sprocket hub
- ⑥ Damper rubber
- ⑦ Chain puller



EB701011
REMOVAL

⚠ WARNING

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

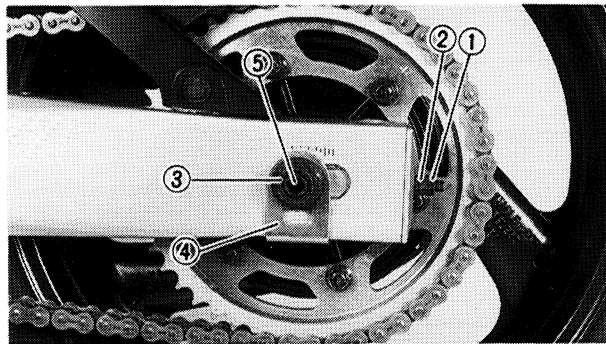
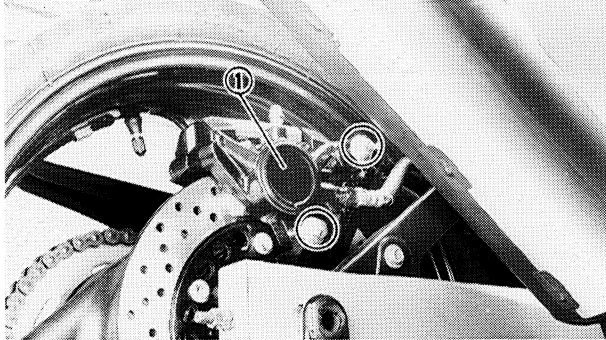
1. Stand the motorcycle on a level surface.
2. Place the motorcycle on a suitable stand.

3. Remove:

- Rear brake caliper ①

NOTE:

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

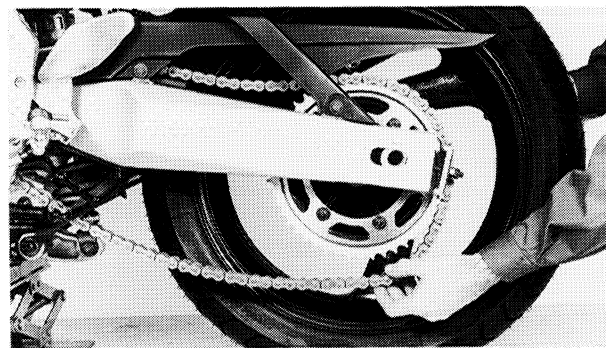


4. Loosen:

- Locknut ①
- Adjuster ②

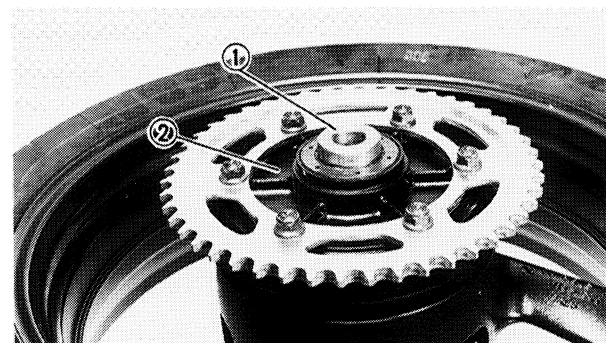
5. Remove:

- Nut (rear wheel axle) ③
- Adjuster plate (left) ④
- Rear wheel axle ⑤
- Adjuster plate (right)
- Drive chain tensioners
- Rear wheel



NOTE:

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



6. Remove:

- Collar (left) ①
- Sprocket hub ②
- Damper rubber
- Collar (right)



EB701020

INSPECTION

1. Inspect:

- Rear wheel axle
 - Rear wheel
 - Rear wheel bearings
 - Oil seals
- Refer to "FRONT WHEEL".

2. Measure:

- Rear wheel runout
- Refer to "FRONT WHEEL".

EB701030

INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.


1. Lubricate:

- Rear wheel axle
- Rear wheel bearings
- Oil seals

	Recommended lubricant: Lithium soap base grease
---	---


2. Adjust:

- Drive chain slack

	Drive chain slack: 20 ~ 30 mm (0.8 ~ 1.2 in)
---	--

3. Tighten:

- Rear wheel axle nut
- Bolts (rear brake caliper)

	Nut (rear wheel axle): 117 Nm (11.7 m • kg, 85 ft • lb)
	Bolt (rear brake caliper): 40 Nm (4.0 m • kg, 29 ft • lb)

EB701040

**REAR WHEEL STATIC BALANCE
ADJUSTMENT**

NOTE: _____

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

1. Adjust:

- Rear wheel static balance
- Refer to "FRONT WHEEL".

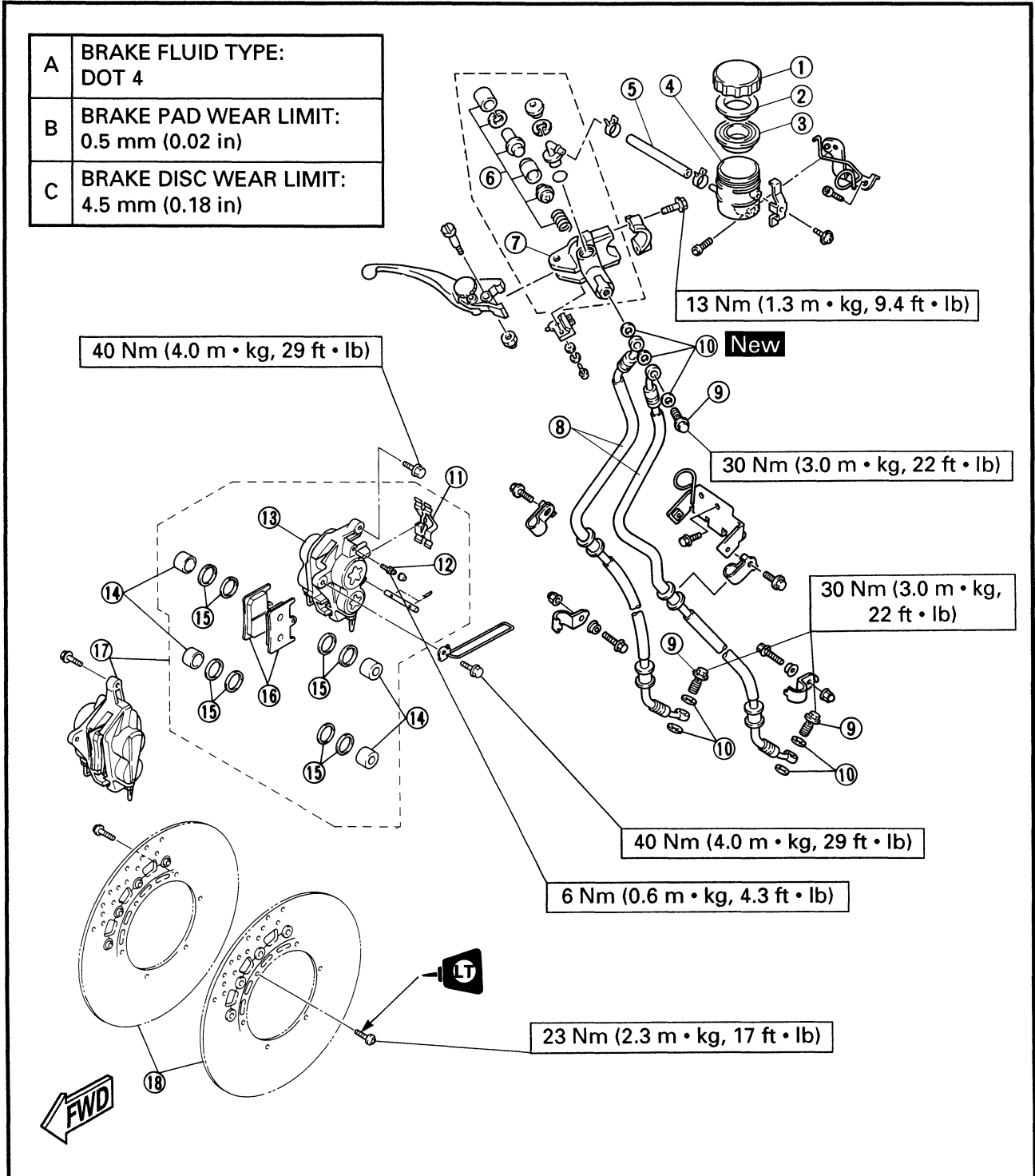
EB702000

FRONT AND REAR BRAKES

FRONT BRAKE

- ① Brake reservoir cap
- ② Holder (diaphragm)
- ③ Diaphragm
- ④ Brake reservoir
- ⑤ Brake reservoir hose
- ⑥ Master cylinder cup kit
- ⑦ Master cylinder
- ⑧ Brake hose
- ⑨ Union bolt
- ⑩ Copper washer
- ⑪ Brake pad spring
- ⑫ Bleed screw
- ⑬ Brake caliper
- ⑭ Brake caliper piston
- ⑮ Caliper piston seal
- ⑯ Brake pad
- ⑰ Brake caliper assembly
- ⑱ Brake disc

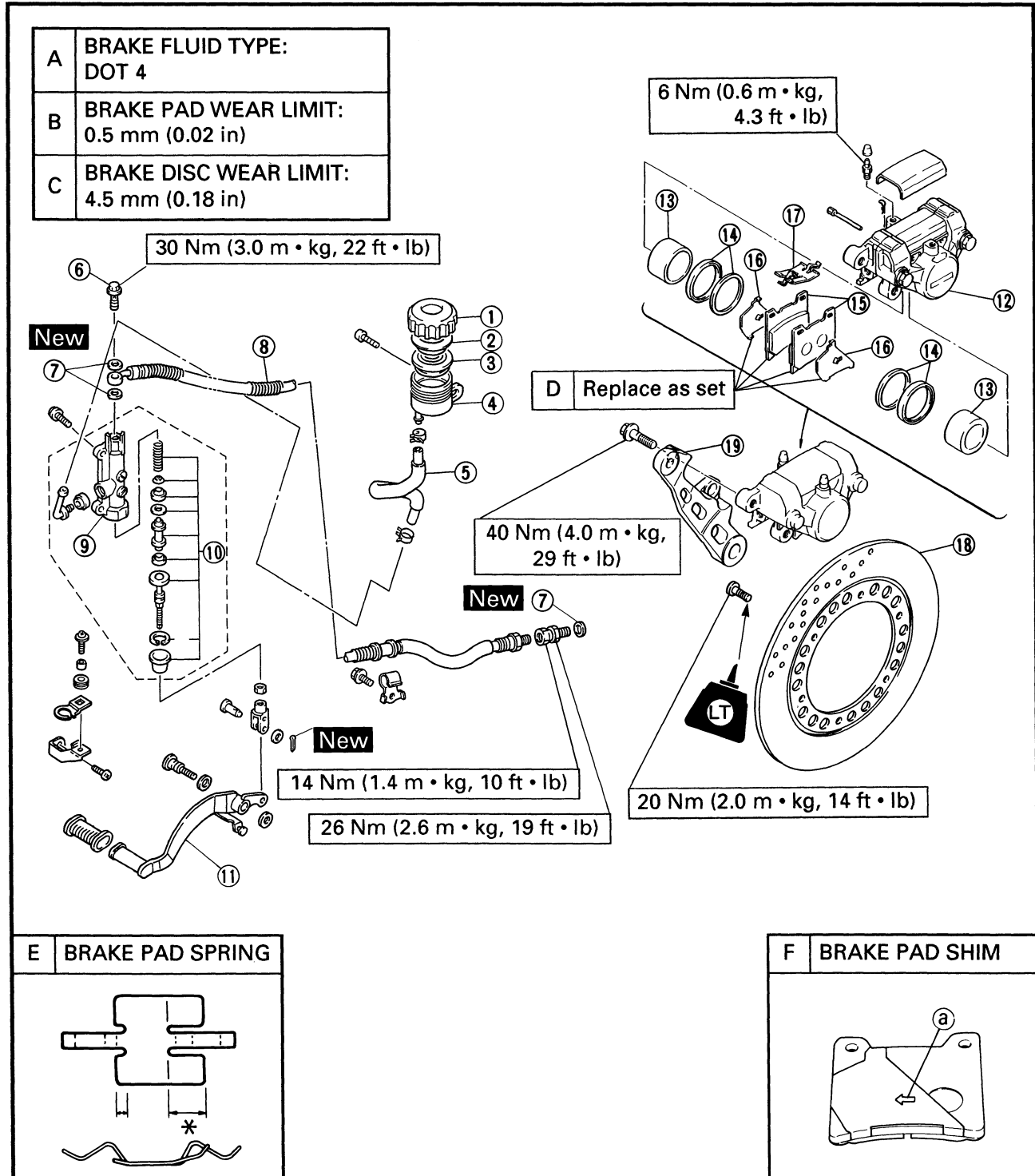
A	BRAKE FLUID TYPE: DOT 4
B	BRAKE PAD WEAR LIMIT: 0.5 mm (0.02 in)
C	BRAKE DISC WEAR LIMIT: 4.5 mm (0.18 in)



REAR BRAKE

- ① Brake reservoir cap
- ② Holder (diaphragm)
- ③ Diaphragm
- ④ Brake reservoir
- ⑤ Reservoir hose
- ⑥ Union bolt
- ⑦ Copper washer
- ⑧ Brake hose
- ⑨ Master cylinder
- ⑩ Master cylinder cup kit
- ⑪ Brake pedal
- ⑫ Brake caliper
- ⑬ Piston
- ⑭ Piston seal
- ⑮ Brake pad
- ⑯ Brake pad shim
- ⑰ Brake pad spring
- ⑱ Brake disc
- ⑲ Caliper bracket

- E The longer tangs (*) of the brake pad spring must point in the disc rotating direction.
- F The arrow mark (a) on the brake pad shim must point in the disc rotating direction.



EB702001

CAUTION:

Disc brake components rarely require disassembly. **DO NOT:**

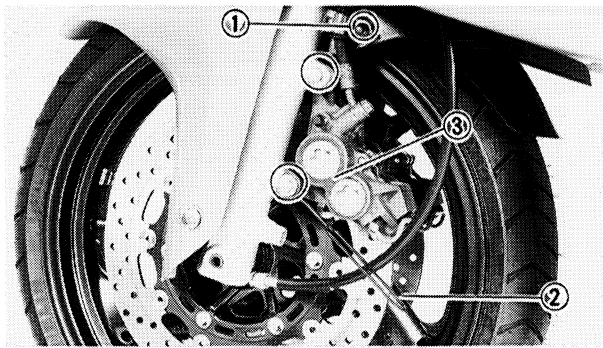
- Disassemble components unless absolutely necessary.
- Use solvents on internal brake components.
- Use spent brake fluid for cleaning (use only clean brake fluid).
- Allow brake fluid to come into contact with the eyes, as this may cause eye injury.
- Splash brake fluid onto painted surfaces or plastic parts, as this may cause damage.
- Disconnect any hydraulic connection, as this would require the entire brake system to be disassembled, drained, cleaned, properly filled and bled after reassembly.

EB702012

BRAKE PAD REPLACEMENT

NOTE:

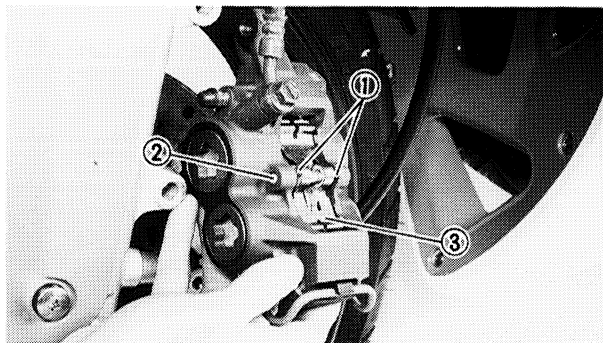
When replacing the brake pads it is not necessary to disassemble the brake caliper and brake hose.



Front brake

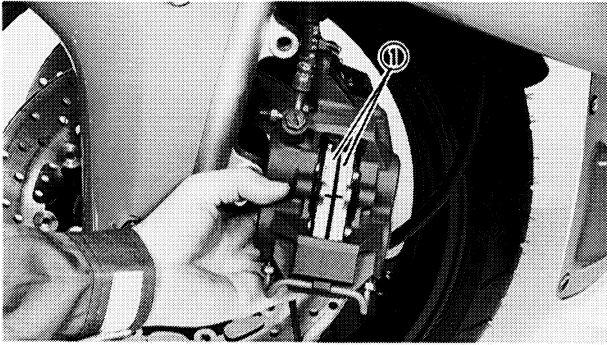
1.Remove:

- Brake hose holder ①
- Speedometer cable guide ②
- Brake caliper ③



2.Remove:

- Retaining clips ①
- Retaining pin ②
- Brake pad spring ③

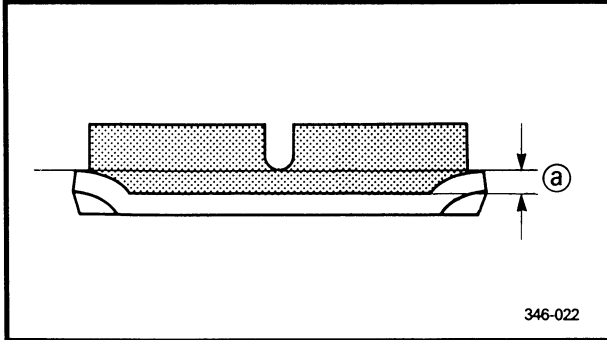



3.Remove:

- Brake pads ①
(with the brake pad shims)

NOTE:

- When replacing the brake pads install a new brake pad spring and new brake pad shims.
- Replace the brake pads as a set if either is found to be worn to the wear limit ③.



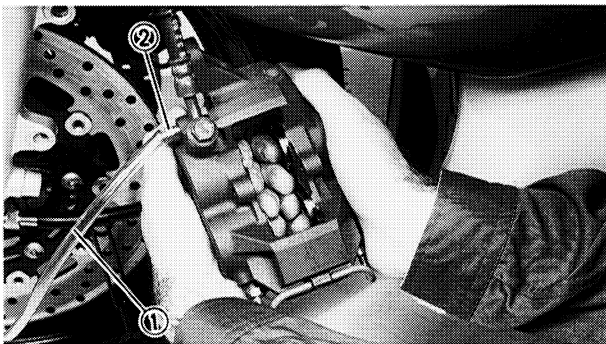
	Brake pad wear limit: 0.5 mm (0.02 in)
---	--

4.Install:

- Brake pad shims
(onto the brake pads)
- Brake pads
- Brake pad spring

Installation steps:

- Connect a suitable hose ① tightly to the brake caliper bleed screw ②. Put the other end of the hose into an open container.
- Loosen the brake caliper bleed screw and use a finger to push the caliper pistons into the brake caliper.
- Tighten the brake caliper bleed screw ②.

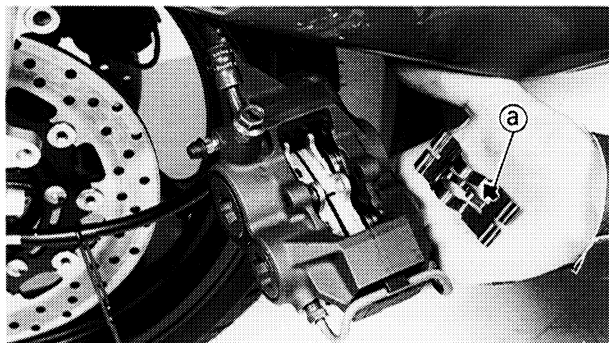


	Brake caliper bleed screw: 6 Nm (0.6 m · kg, 4.3 ft · lb)
---	---

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

NOTE:

The arrow mark ③ on the brake pad spring must point in the direction of disc rotation.



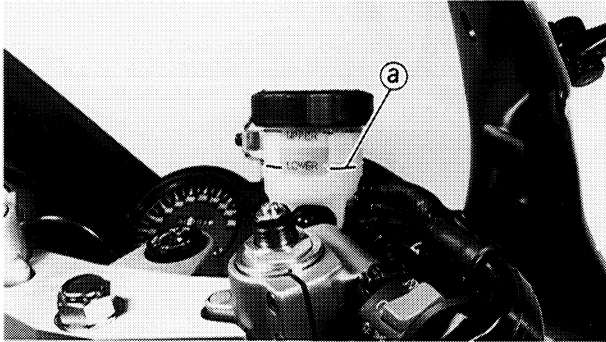


5.Install:

- Retaining pin
- Retaining clips
- Brake caliper



Bolt (brake caliper):
40 Nm (4.0 m · kg, 29 ft · lb)

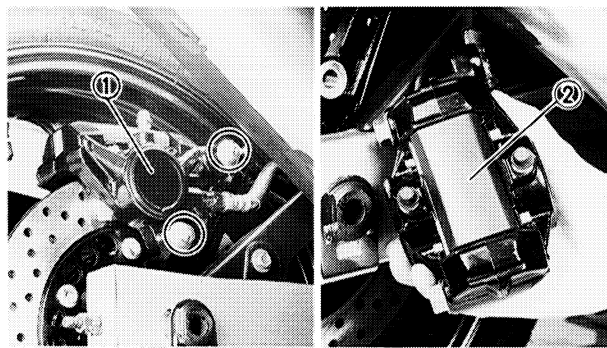


6.Inspect:

- Brake fluid level
 Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.
- Ⓐ "LOWER" level line

7.Check:

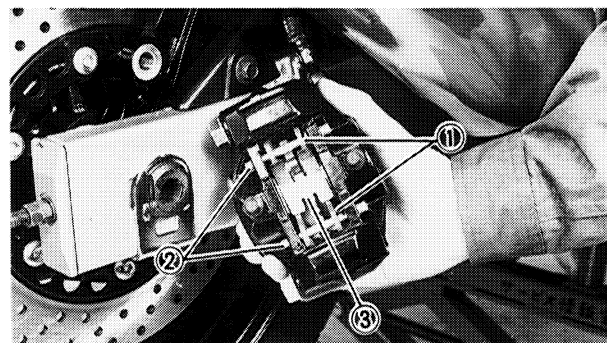
- Brake lever operation
 Soft or spongy feeling → Bleed the brake system.
 Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.



Rear brake

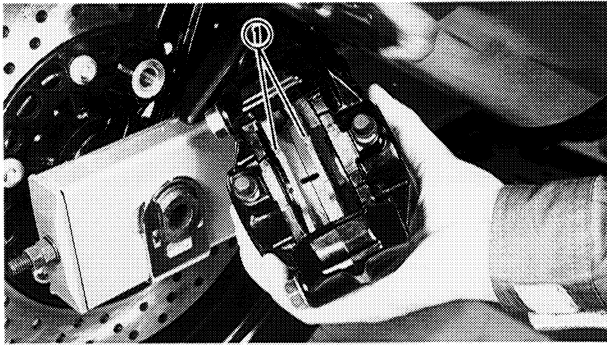
1.Remove:

- Brake caliper ①
- Brake pad cover ②



2.Remove:

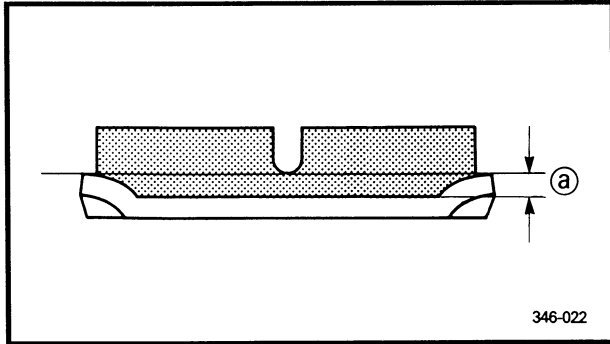
- Retaining clips ①
- Retaining pins ②
- Brake pad spring ③




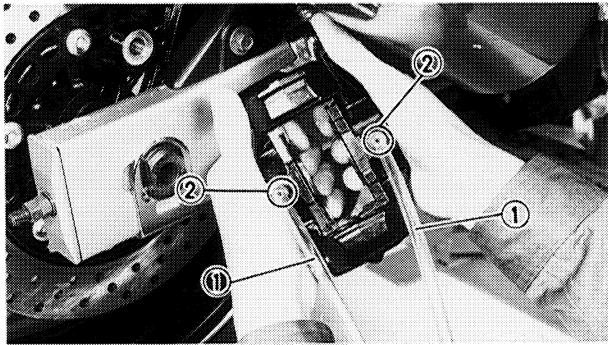
- 3.Remove:
- Brake pads ①
(with the brake pad shims)

NOTE:

- When replacing the brake pads install a new brake pad spring and new brake pad shims.
- Replace the brake pads as a set if either is found to be worn to the wear limit ②.



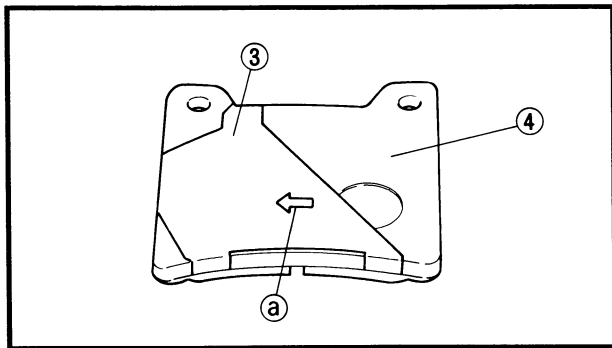
	Wear limit: 0.5 mm (0.02 in)
---	--



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

Installation steps:

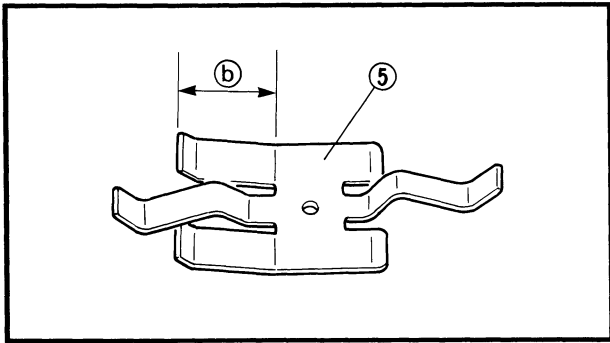
- Connect a suitable hose ① tightly to the brake caliper bleed screw ②. Put the other end of the hose into a container.
- Loosen the brake caliper bleed screws and use a finger to push the caliper pistons into the brake caliper.
- Tighten the brake caliper bleed screws ②.



	Brake caliper bleed screw: 6 Nm (0.6 m · kg, 4.3 ft · lb)
---	---

- Install a new brake pad shim ③ onto the new brake pad ④.

NOTE:
The arrow mark ② on the brake pad shim must point in the direction of brake disc rotation.

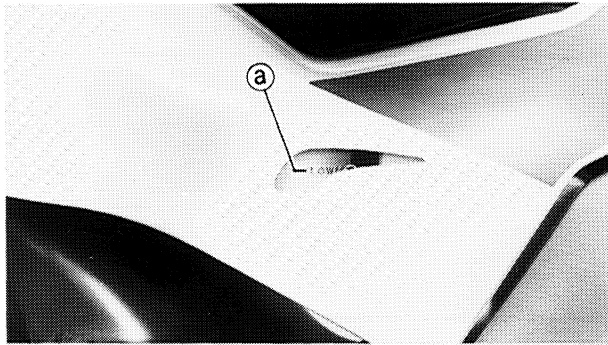


- Install new brake pads and a new brake pad spring ⑤.

NOTE: _____
 The longer tangs ⑤ of the brake pad spring must point in the direction of the brake disc rotation.

5. Install:
- Retaining pins
 - Retaining clips
 - Brake pad cover
 - Brake caliper

	Bolt (brake caliper): 40 Nm (4.0 m · kg, 29 ft · lb)
---	--



6. Inspect:
- Brake fluid level
 Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.
 - ① "LOWER" level line

7. Check:
- Brake pedal operation
 A soft or spongy feeling → Bleed the brake system.
 Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.

EB702021
BRAKE CALIPER DISASSEMBLY

NOTE: _____
 Before disassembling either brake caliper, drain the brake fluid from the entire brake system.

Front brake

1. Loosen:

- Union bolt

2. Remove:

- Brake caliper
- Retaining clips
- Retaining pins
- Brake pad spring
- Brake pads
(with the brake pad shims)

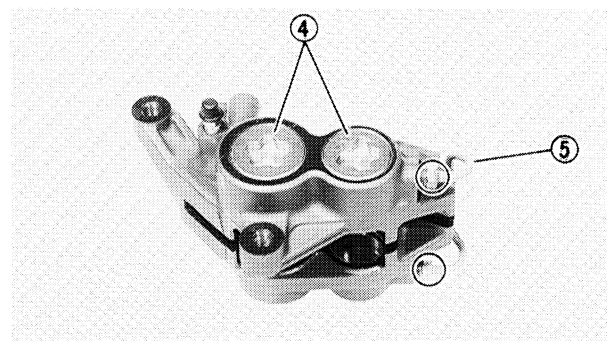
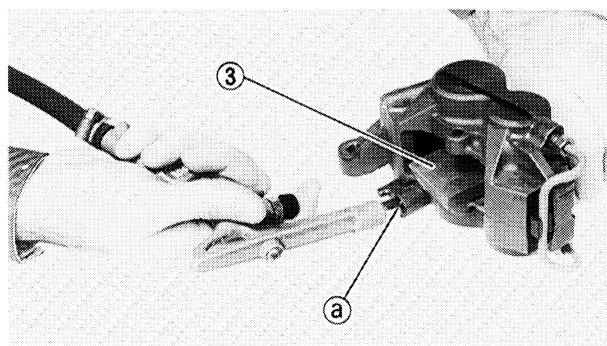
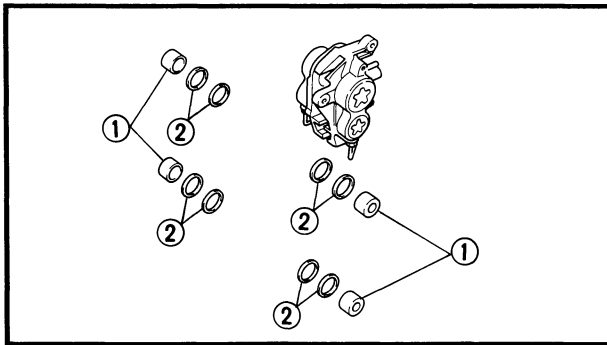
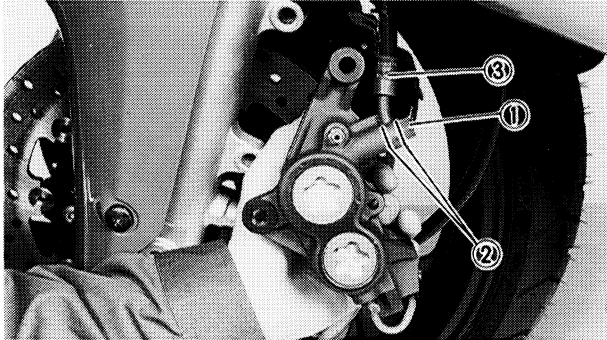
Refer to "BRAKE PAD REPLACEMENT".

3. Remove:

- Union bolt ①
- Copper washers ②
- Brake hose ③

NOTE:

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



4. Remove:

- Brake caliper pistons ①
- Caliper piston seals ②

Removal steps:

- Use a piece of wood ③ to secure the right side caliper pistons.
- To force out the left side caliper pistons from the brake caliper body blow compressed air into the hose joint opening ①.
- Remove the caliper piston seals and reinstall the left side caliper pistons.
- Repeat the previous steps to force out the right side caliper pistons from the brake caliper body.

⚠ WARNING

- Never try to pry out the caliper pistons.
- Do not remove the plugs ④ and the brake caliper pipe ⑤.

EB702022

Rear brake

1. Loosen:

- Union bolt

2. Remove:

- Brake caliper
- Brake pad cover
- Retaining clips
- Retaining pins
- Brake pad spring
- Brake pads

(with the brake pad shims)

Refer to "BRAKE PAD REPLACEMENT".

3. Remove:

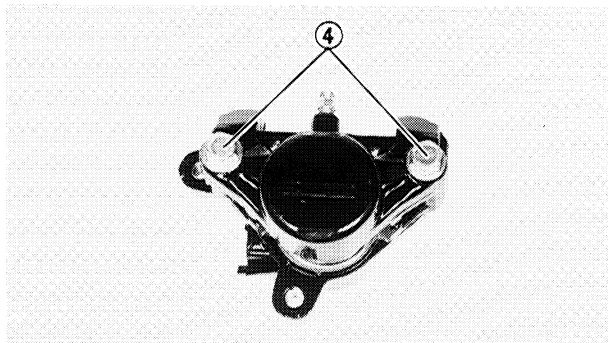
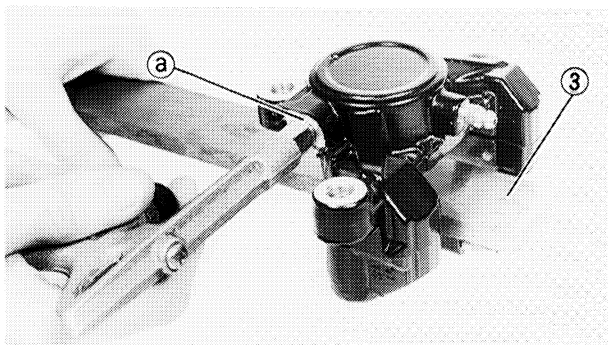
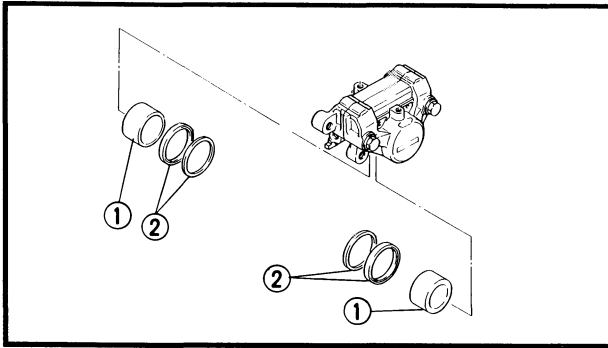
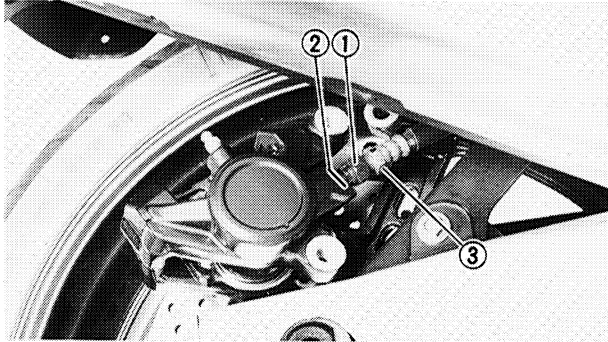
- Union bolt ①
- Copper washer ②
- Brake hose ③

NOTE:

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

4. Remove:

- Brake caliper pistons ①
- Caliper piston seals ②



Removal steps:

- Use a piece of wood ③ to secure the right side caliper piston.
- To force out the left side caliper piston from the brake caliper body blow compressed air into the hose joint opening ④.
- Remove the caliper piston seals and reinstall the left side caliper piston.
- Repeat the previous step to force out the right side caliper piston from the brake caliper body.

⚠ WARNING

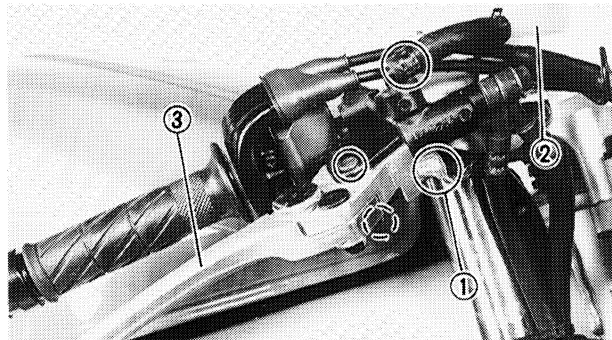
- Never try to pry out the caliper piston.
- Do not loosen the bolts ④.



EB702030

MASTER CYLINDER DISASSEMBLY**NOTE:**

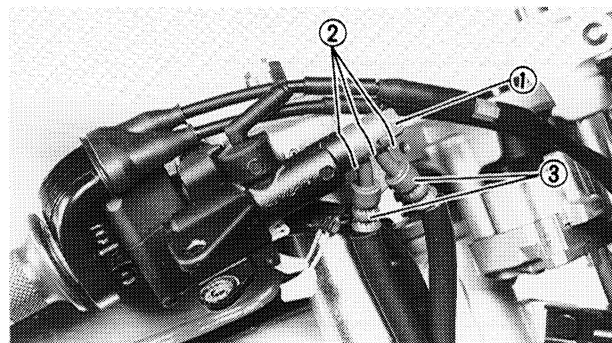
Before disassembling either master cylinder drain the brake fluid from the entire brake system.

**Front brake****1.Remove:**

- Brake switch leads ①

2.Remove:

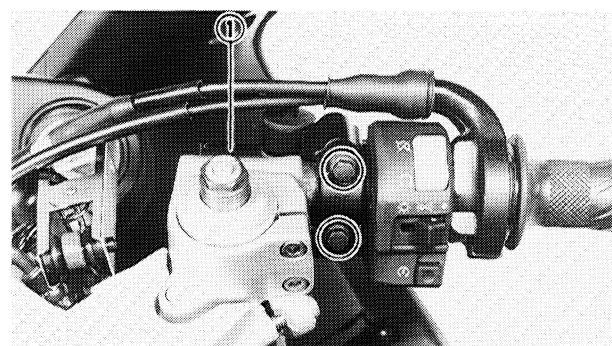
- Brake reservoir ②
- Brake lever ③

**3.Remove:**

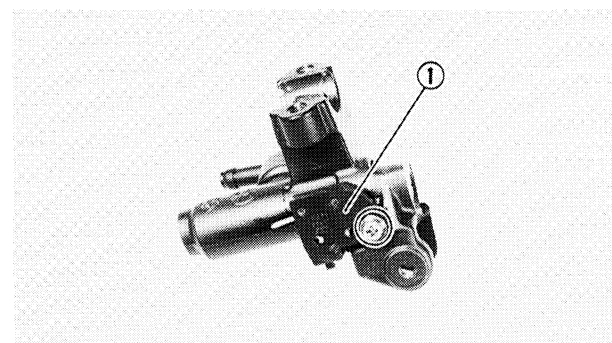
- Union bolt ①
- Copper washers ②
- Brake hoses ③

NOTE:

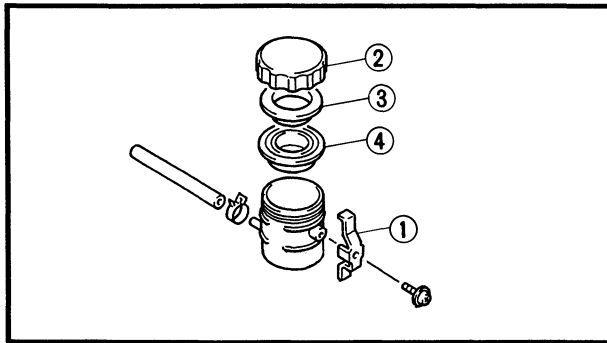
To collect any remaining brake fluid place a container under the master cylinder and the end of the hose.

**4.Remove:**

- Master cylinder ①

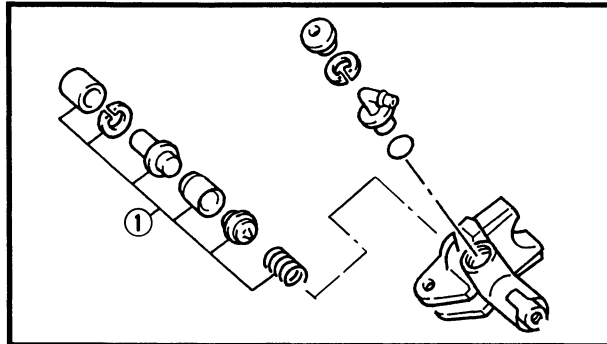
**5.Remove:**

- Brake switch ①



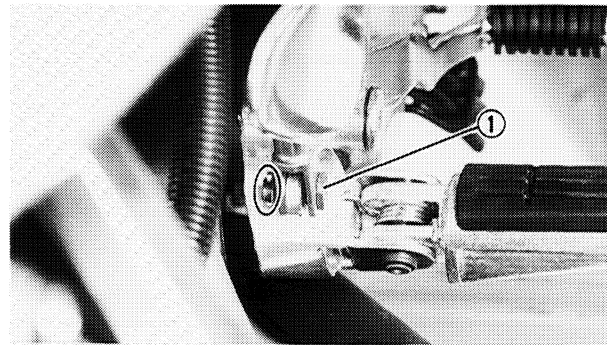
6.Remove:

- Stopper ①
- Cap (brake reservoir) ②
- Collar (diaphragm) ③
- Diaphragm ④



7.Remove:

- Master cylinder cup kit ①



EB702031

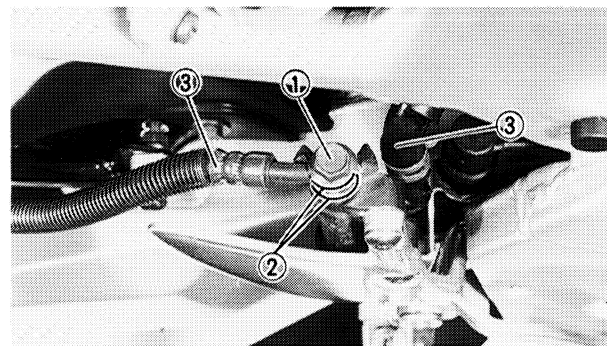
Rear brake

1.Remove:

- Seat
- Side panel (right)
Refer to "SEAT" and "COWLINGS" in CHAPTER 3.

2.Remove:

- Cotter pin
- Washer
- Clevis pin ①

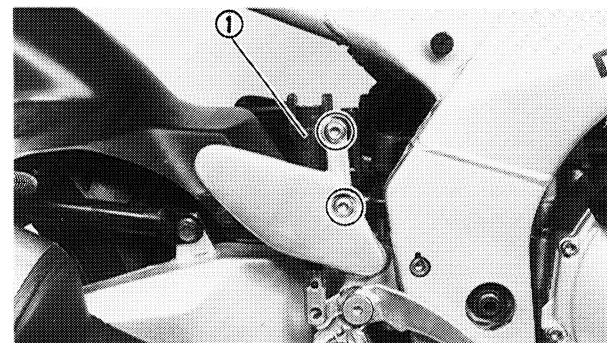


3.Remove:

- Union bolt ①
- Copper washers ②
- Brake hoses ③

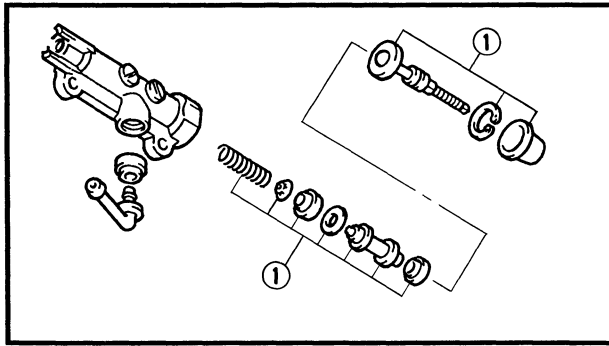
NOTE:

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



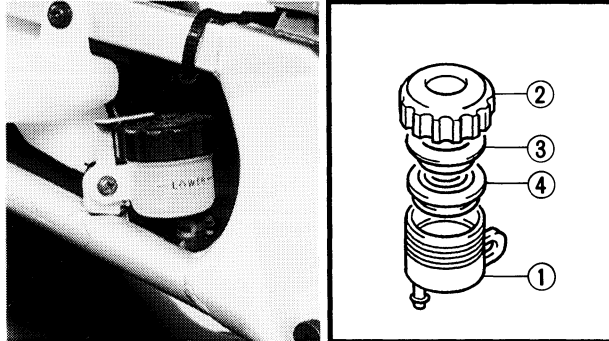
4.Remove:

- Master cylinder ①



5.Remove:

- Master cylinder cup kit ①



6.Remove:

- Brake reservoir ①
- Cap (brake reservoir) ②
- Holder (diaphragm) ③
- Diaphragm ④

EB702040

INSPECTION AND REPAIR

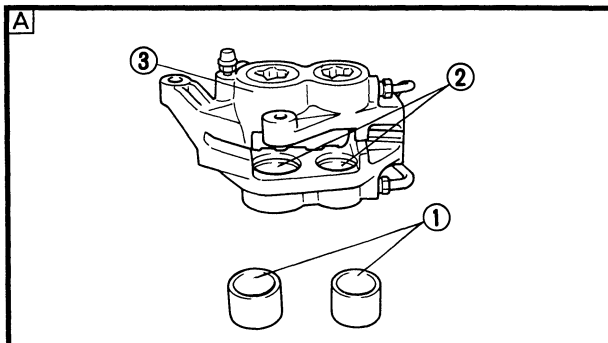
Recommended brake component replacement schedule:	
Brake pads	As required
Piston seals	Every two years
Brake hoses	Every four years
Brake fluid	Replace when brakes are disassembled.

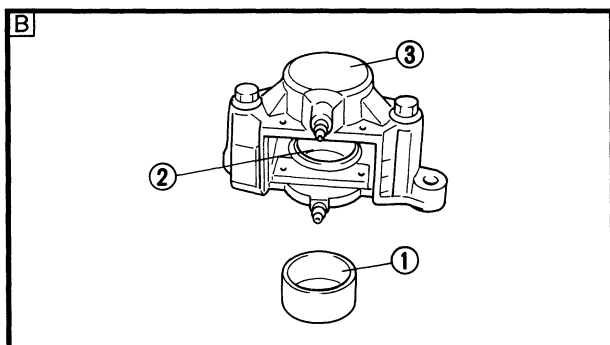
⚠ WARNING

All internal brake components should be cleaned in new brake fluid only. Do not use solvents as they will cause the seals to swell and distort.

1.Inspect:

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

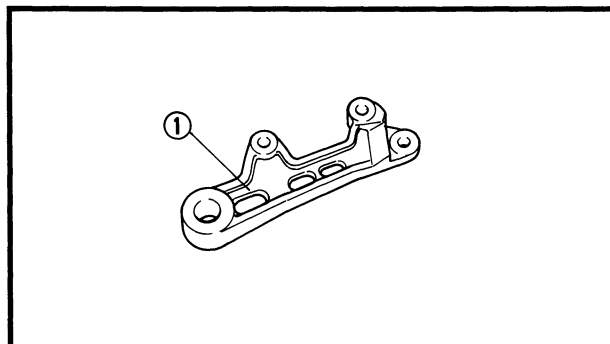




⚠ WARNING

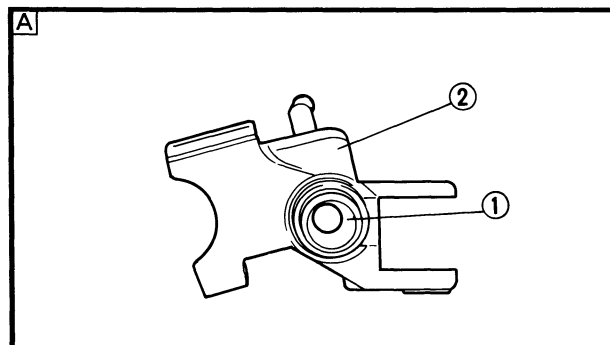
Whenever the brake caliper is disassembled replace the caliper piston seals.

- A** Front
- B** Rear



2. Inspect:

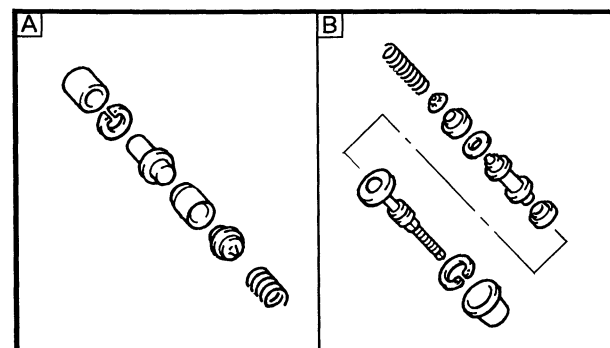
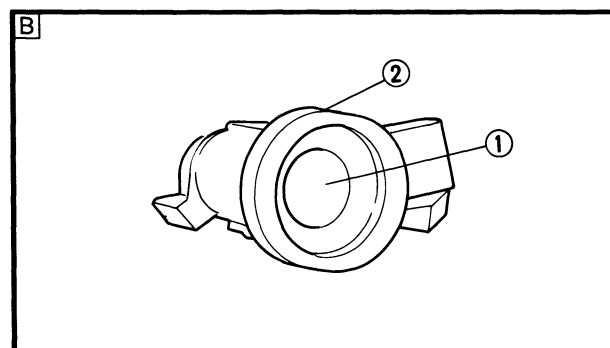
- Brake caliper bracket ①
Cracks/damage → Replace.



3. Inspect:

- Master cylinder ①
Scratches/wear → Replace the master cylinder assembly.
- Master cylinder body ②
Cracks/damage → Replace.
- Oil delivery passage (master cylinder body)
Blockage → Blow out with compressed air.

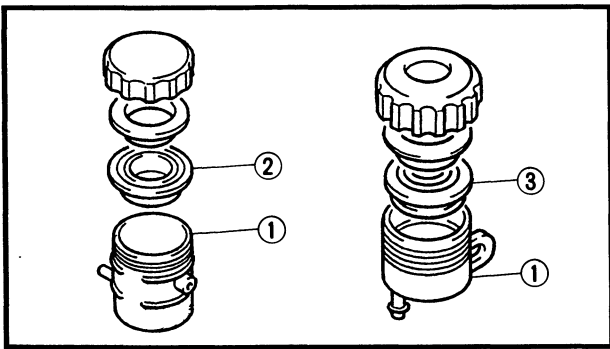
- A** Front
- B** Rear



4. Inspect:

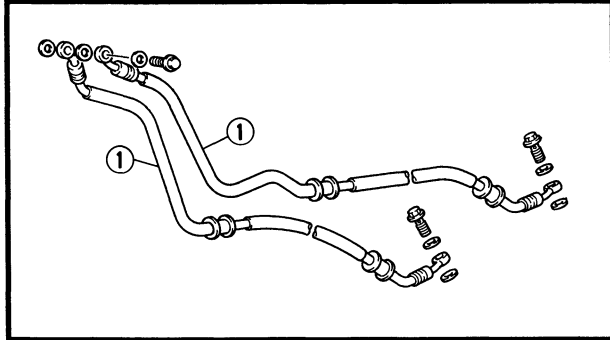
- Master cylinder assembly ①
Scratches/wear/damage → Replace as a set.

- A** Front
- B** Rear



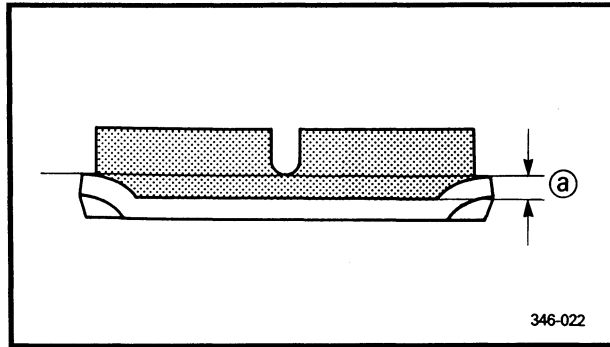
5. Inspect:

- Brake reservoir ①
Cracks/damage → Replace.
- Diaphragm (front) ②
- Diaphragm (rear) ③
Wear/damage → Replace.



6. Inspect:

- Brake hoses ①
Cracks/wear/damage → Replace.



7. Measure:

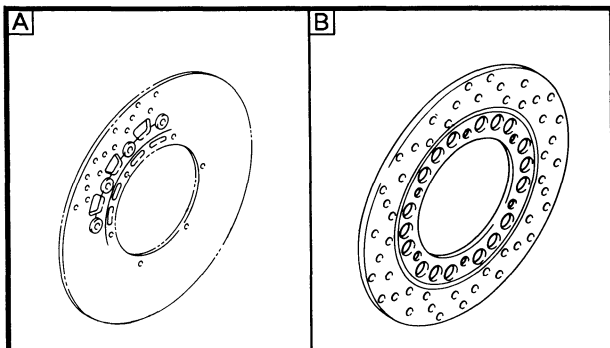
- Brake pads (thickness)
Out of specification → Replace.

NOTE:

- When replacing the brake pads install a new brake pad spring and new brake pad shims.
- Replace the brake pads as a set if either is found to be worn to the wear limit (a).



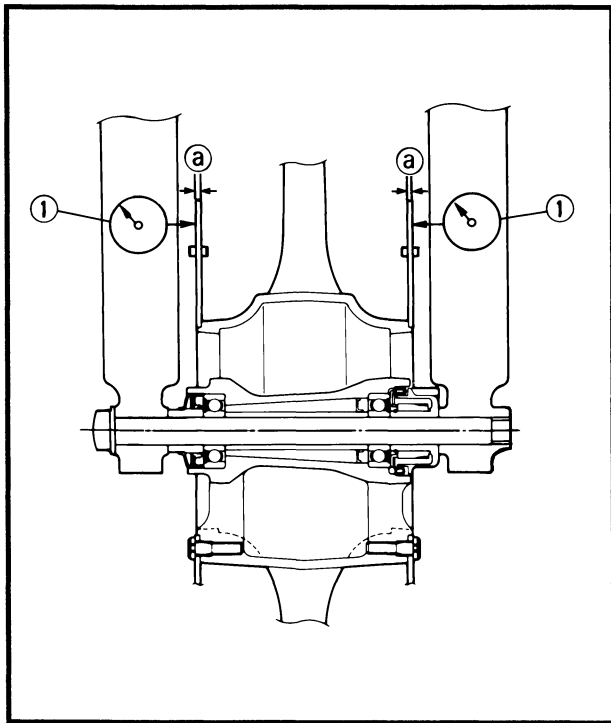
Brake pad wear limit:
Front: 0.5 mm (0.02 in)
Rear: 0.5 mm (0.02 in)



8. Inspect:


- Brake discs (front and rear)
Galling/damage → Replace.

- ▣ A Front
- ▣ B Rear



9. Measure:

- Brake disc deflection
Out of specification → Adjust or replace.




Brake disc maximum deflection:
Front: 0.2 mm (0.008 in)
Rear: 0.15 mm (0.006 in)

Measurement steps:

- Use a suitable stand to raise the wheel.
- When measuring the front brake disc turn the handlebars to the left or the right to ensure that the front wheel is stationary.
- Remove the caliper.
- Hold the dial gauge at a right angle against the disc surface. Measure the deflection at a point 2 ~ 3 mm below the edge of the brake disc.

- Brake disc thickness ②
Measure at a few different areas on the disc.
Out of specification → Replace.



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

① Dial gauge


10. Adjust:

- Brake disc deflection

Adjustment steps:

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

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



Bolt (brake disc):
Front: 23 Nm (2.3 m · kg, 17 ft · lb)
Rear: 20 Nm (2.0 m · kg, 14 ft · lb)
LOCTITE®

- Measure the brake disc deflection.
- If out of specification, repeat the adjustment steps until the brake disc deflection is within specification.

EB702051

BRAKE CALIPER ASSEMBLY

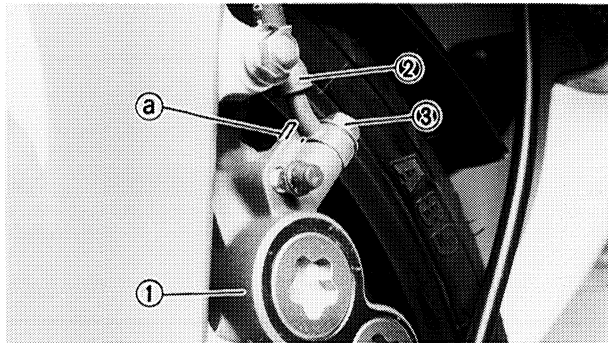
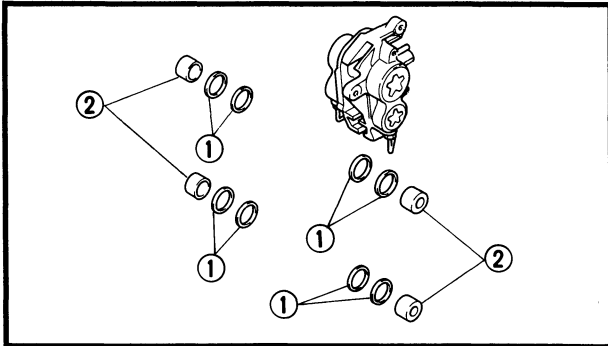
⚠ WARNING

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



**Recommended brake fluid:
DOT 4**

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



Front brake

1.Install:

- Caliper piston seals ①
- Brake caliper pistons ②

⚠ WARNING

Always use new caliper piston seals.

2.Install:

- Brake caliper (temporarily) ①
- Copper washers
- Brake hose ②
- Union bolt ③



**Union bolt:
30 Nm (3.0 m · kg, 22 ft · lb)**

CAUTION

When installing the brake hose onto the brake caliper ①, make sure that the brake pipe touches the projection ③ on the brake caliper.

⚠ WARNING

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

CAUTION

Always use new copper washers.

3.Remove:

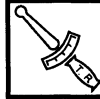
- Brake caliper



4. Install:

- Brake pads
(with the brake pad shims)
- Brake pad spring
- Retaining pin
- Retaining clips
- Brake caliper

Refer to "BRAKE PAD REPLACEMENT".



Bolt (brake caliper):
40 Nm (4.0 m • kg, 29 ft • lb)

5. Fill:

- Brake reservoir



Recommended brake fluid:
DOT 4

CAUTION:

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

⚠ WARNING

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- When refilling be careful that water does not enter the master cylinder. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

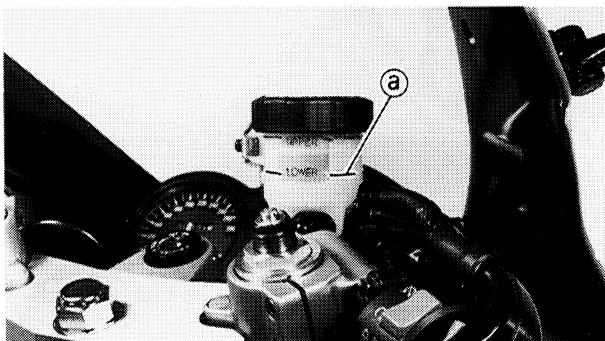
6. Air bleed

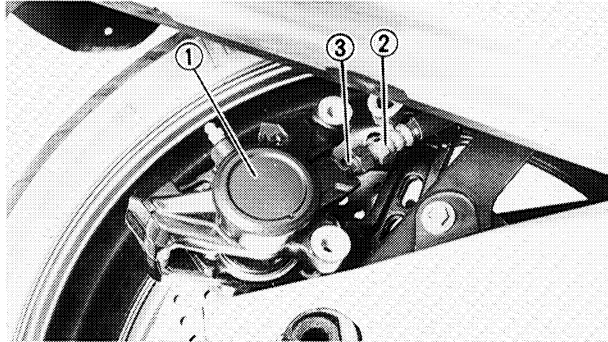
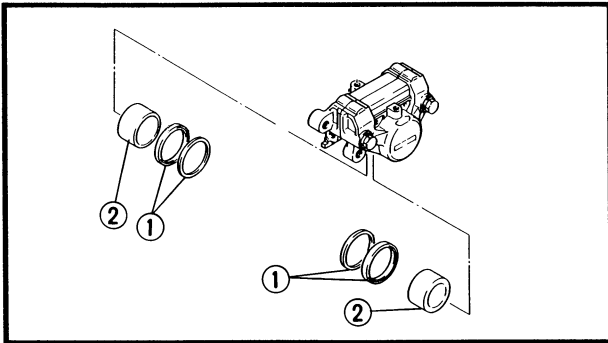
- Brake system
Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.

7. Inspect:

- Brake fluid level
Brake fluid level is under the "LOWER" level line → Fill up.
Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.

Ⓐ "LOWER" level line





EB702052

Rear brake

1.Install:

- Caliper piston seals ①
- Brake caliper pistons ②

⚠ WARNING

Always use new caliper piston seals.

2.Install:

- Brake caliper (temporarily) ①
- Copper washer
- Brake hose ②
- Union bolt ③

**Union bolt:****30 Nm (3.0 m • kg, 22 ft • lb)****⚠ WARNING**

- Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".
- Always use new copper washers.

3.Remove:

- Brake caliper

4.Install:

- Brake pads
(with the brake pad shims)
- Brake pad spring
- Retaining pins
- Retaining clips
- Brake pad cover
- Brake caliper

Refer to "BRAKE PAD REPLACEMENT".

**Bolt (brake caliper):****40 Nm (4.0 m • kg, 29 ft • lb)**

5.Fill:

- Brake reservoir



**Recommended brake fluid:
DOT 4**

CAUTION

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

⚠ WARNING

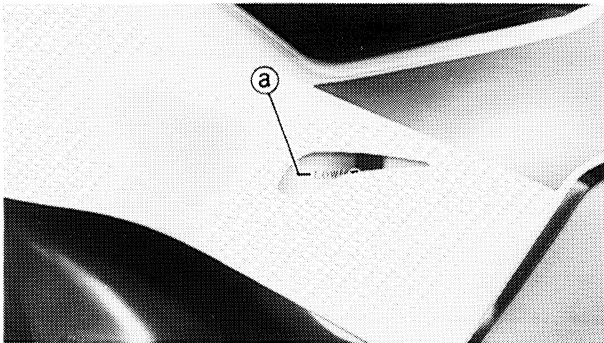
- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- When refilling be careful that water does not enter the master cylinder. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

6. Air bleed:

- Brake system
Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.

7. Inspect:

- Brake fluid level
Brake fluid level is under the "LOWER" level line → Fill up.
Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.
- Ⓐ "LOWER" level line



EB702060

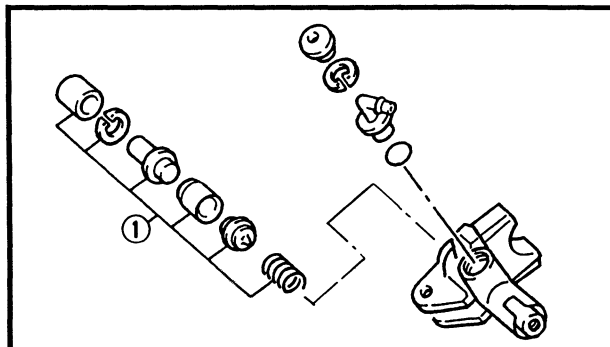
MASTER CYLINDER ASSEMBLY

⚠ WARNING

- Before installation all internal brake components should be cleaned and lubricated with new brake fluid only.

	Recommended brake fluid: DOT 4
---	---

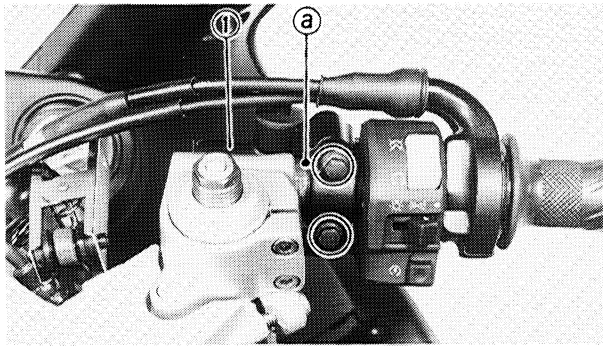
- Whenever a master cylinder is disassembled replace the caliper piston seals.



Front brake

1. Install:

- Master cylinder cup kit ①
- Brake switch



2. Install:

- Master cylinder ①

NOTE:

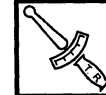
- Install the master cylinder holder with the "UP" mark facing up.
- Align the end of the master cylinder holder with the punch mark (a) on the handlebar.
- First, tighten the upper bolt, then tighten the lower bolt.



Bolt (master cylinder holder):
13 Nm (1.3 m • kg, 9.4 ft • lb)

3. Install:

- Copper washers
- Brake hose
- Union bolt



Union bolt:
30 Nm (3.0 m • kg, 22 ft • lb)

NOTE:

When turning the handlebar to the left and to the right make sure that the brake hose does not touch other parts (throttle cable, wire harness, leads, etc.). Correct if necessary.

⚠ WARNING

- Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".
- Always use new copper washers.

4. Install:

- Brake lever
- Brake reservoir

5. Connect:

- Brake switch leads

6. Fill:

- Brake reservoir



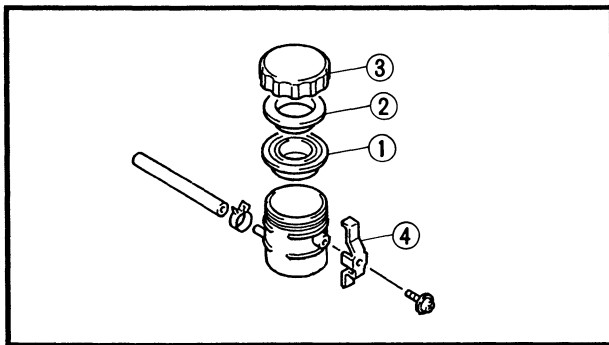
Recommended brake fluid:
DOT 4

CAUTION

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

⚠ WARNING

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- When refilling be careful that water does not enter the master cylinder. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

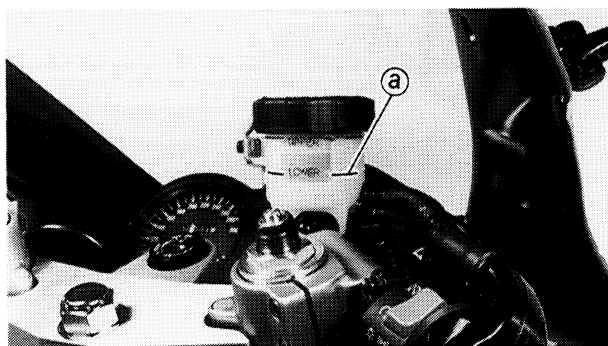


7. Install:

- Diaphragm ①
- Holder (diaphragm) ②
- Cap (brake reservoir) ③
- Stopper ④

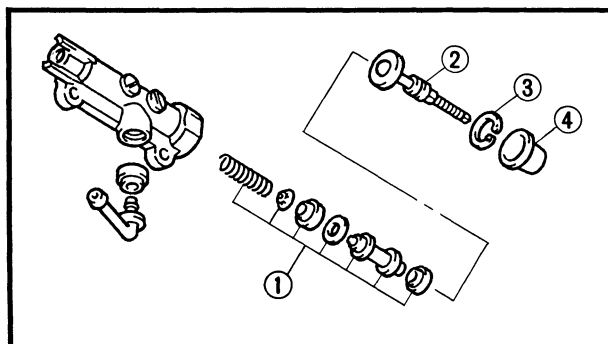
8. Air bleed:

- Brake system
Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.



9. Inspect:

- Brake fluid level
Brake fluid level is under the "LOWER" level line → Fill up.
Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.
- a "LOWER" level line

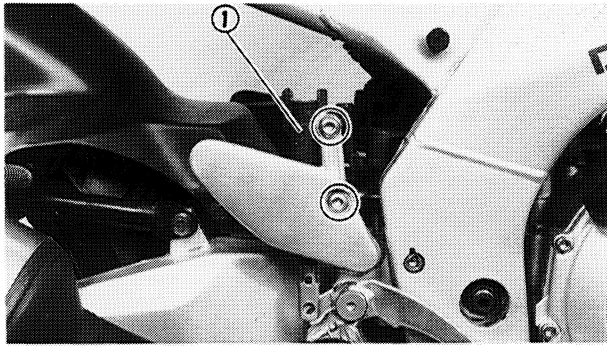


EB702061

Rear brake

1. Install:

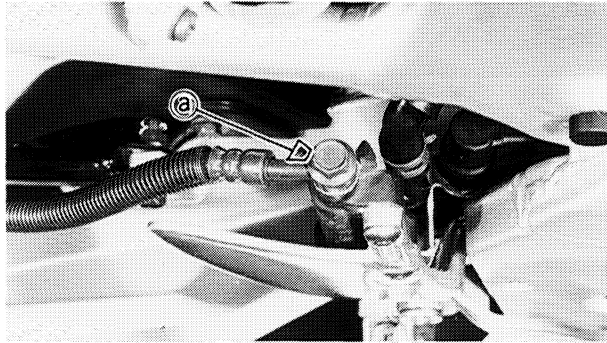
- Brake reservoir
(onto the frame)
- Master cylinder cup kit ①
- Brake pedal push rod ②
- Circlip ③
- Dust boot ④



2. Install:
- Master cylinder ①



Bolt (master cylinder):
23 Nm (2.3 m · kg, 17 ft · lb)



3. Install:
- Copper washers
 - Brake hoses
 - Union bolt



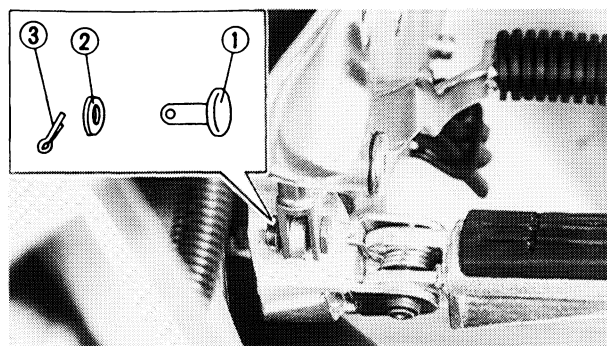
Union bolt:
30 Nm (3.0 m · kg, 22 ft · lb)

CAUTION:

When installing the brake hose onto the master cylinder, make sure that the brake pipe touches the projection ③, as shown in the illustration.

⚠ WARNING

- Proper brake hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING".
- Always use new copper washers.



4. Install:
- Clevis pin ①
 - Washer ②
 - Cotter pin ③

⚠ WARNING

Always use a new cotter pin.

5. Fill:
- Brake reservoir



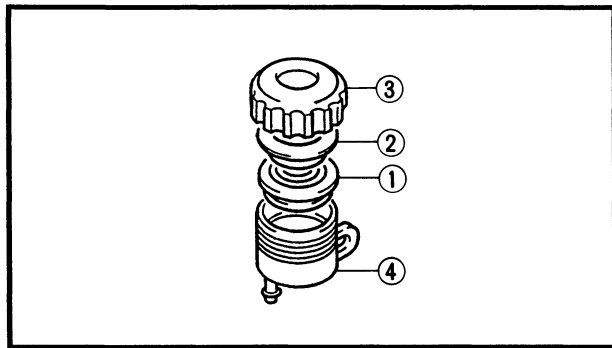
Recommended brake fluid:
DOT 4

CAUTION:

Brake fluid may damage painted surfaces or plastic parts. Always clean up spilled brake fluid immediately.

⚠ WARNING

- Use only the designated quality brake fluid: other brake fluids may deteriorate the rubber seals, causing leakage and poor brake performance.
- Refill with the same type of brake fluid: mixing brake fluids may result in a harmful chemical reaction and lead to poor brake performance.
- When refilling be careful that water does not enter the master cylinder. Water will significantly lower the boiling point of the brake fluid and may result in vapor lock.

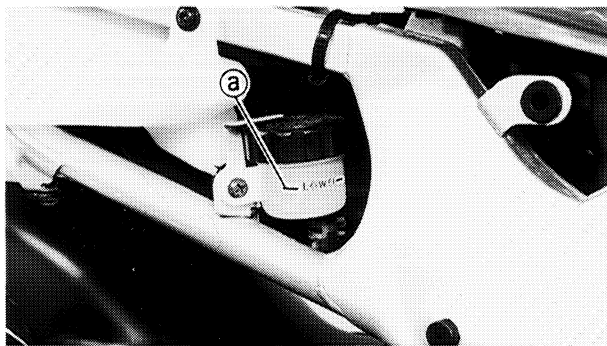


6.Install:

- Diaphragm ①
- Holder (diaphragm) ②
- Cap (brake reservoir) ③
- Brake reservoir ④

7.Air bleed:

- Brake system
Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.



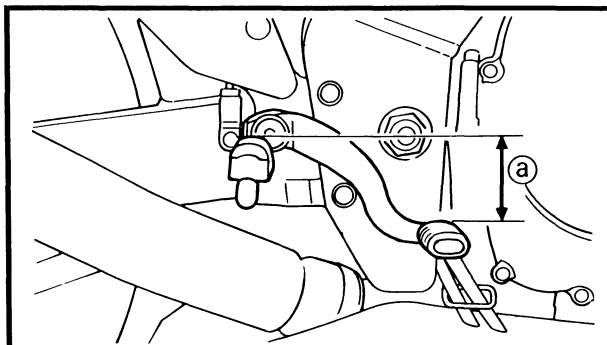
8.Inspect:


- Brake fluid level
Brake fluid level is under the "LOWER" level line → Fill up.
Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.

ⓐ "LOWER" level line

9.Adjust:

- Brake pedal height ⓐ
Refer to "REAR BRAKE ADJUSTMENT" in CHAPTER 3.



	<p>Brake pedal height: 42 mm (1.7 in) (below the top of the footrest)</p>
---	--

10.Adjust:

- Brake light switch
Refer to "BRAKE LIGHT SWITCH ADJUSTMENT" in CHAPTER 3.

EB703000

FRONT FORK

- ① Cap bolt
- ② O-ring
- ③ Locknut
- ④ Spring seat
- ⑤ Fork spring
- ⑥ Rod
- ⑦ Damper rod
- ⑧ Oil lock piece
- ⑨ Inner tube
- ⑩ Protector
- ⑪ Dust seal
- ⑫ Retaining clip
- ⑬ Oil seal
- ⑭ Seal spacer
- ⑮ Slide metal
- ⑯ Outer tube
- ⑰ Copper washer

A	FORK OIL (EACH SIDE):
B	CAPACITY: 434 cm ³ (15.3 Imp oz, 14.7 US oz)
C	OIL LEVEL: 124 mm (4.88 in) (from the top of the inner tube fully compressed without its spring)
D	GRADE: Fork oil "5W" or equivalent

38 Nm (3.8 m • kg, 27 ft • lb)

E	FORK SPRING FREE LENGTH LIMIT: 419.5 mm (16.5 in)
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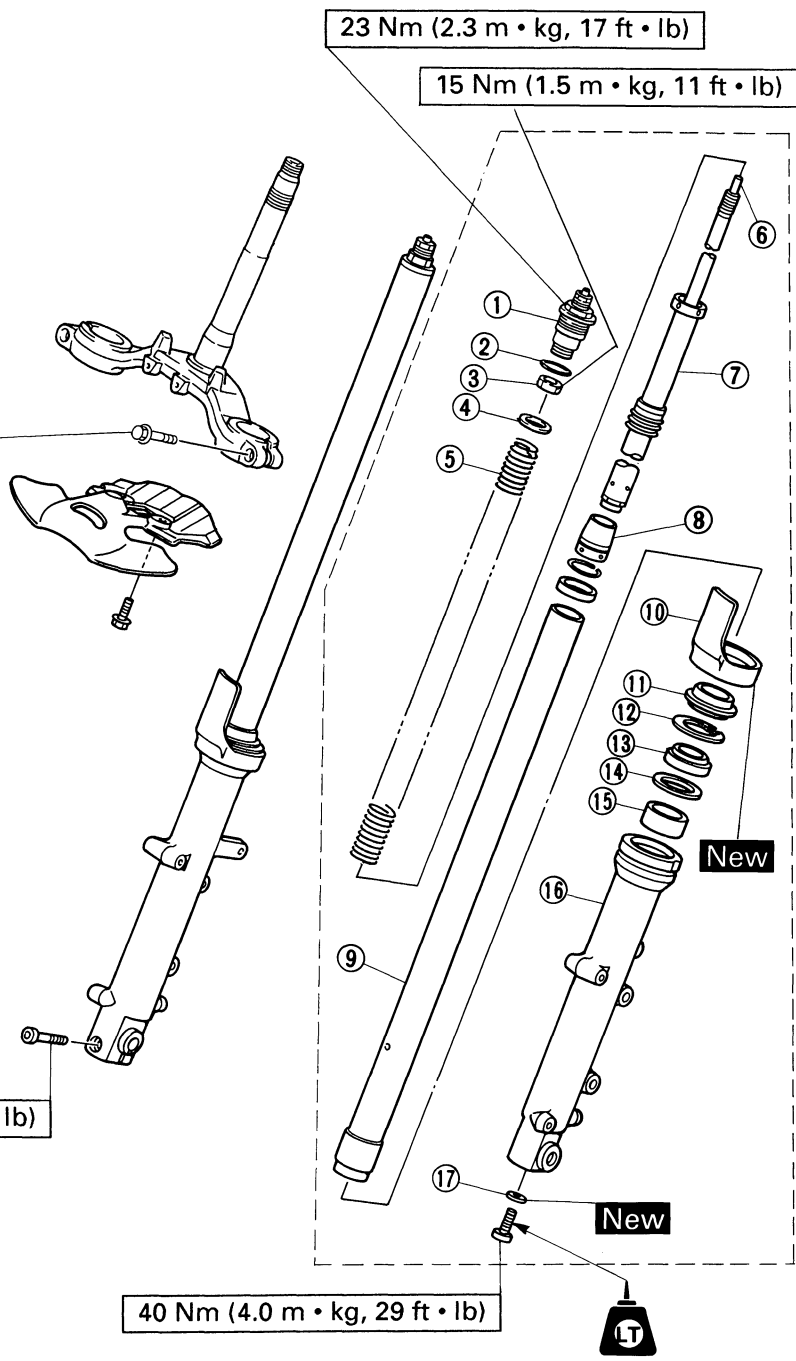
20 Nm (2.0 m • kg, 14 ft • lb)

23 Nm (2.3 m • kg, 17 ft • lb)

15 Nm (1.5 m • kg, 11 ft • lb)



40 Nm (4.0 m • kg, 29 ft • lb)





EB703010

REMOVAL

⚠ WARNING

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

NOTE:

Place a suitable stand under the engine to elevate the front wheel.

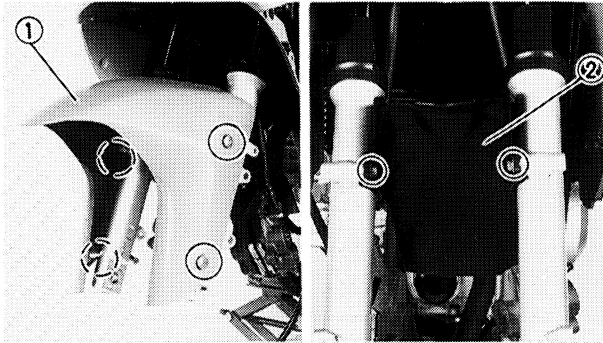
1. Stand the motorcycle on a level surface.

2. Remove:

- Bottom cowling
- Side cowlings (left and right)
Refer to "COWLINGS" in CHAPTER 3.
- Brake calipers (left and right)
- Front wheel
Refer to "FRONT WHEEL".

3. Remove:

- Front fender (front) ①
- Front fender (rear) ②

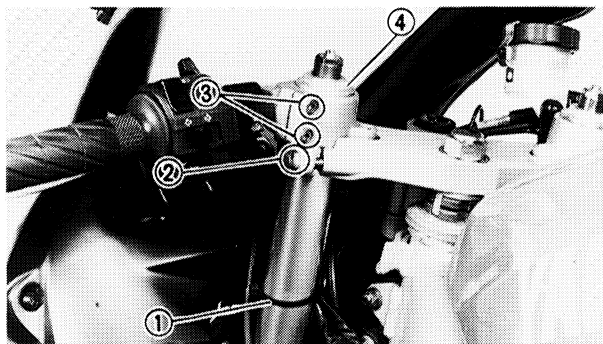


4. Remove:

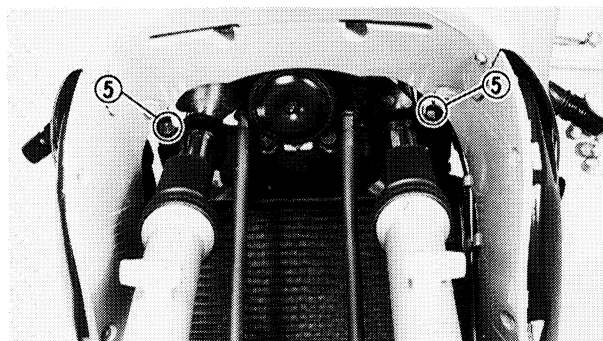
- Plastic band (handlebar switch leads) ①

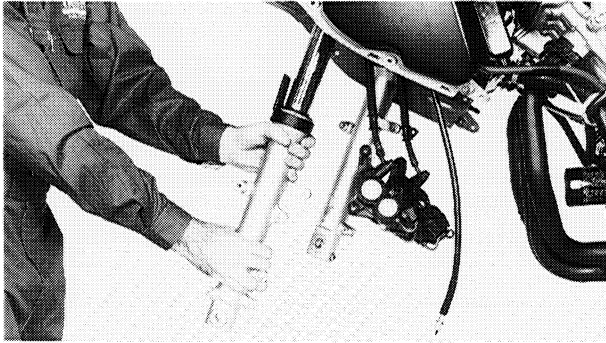
5. Loosen:

- Front fork pinch bolts (upper) ②
- Pinch bolts (handlebar boss) ③
- Cap bolts ④
- Front fork pinch bolts (lower) ⑤

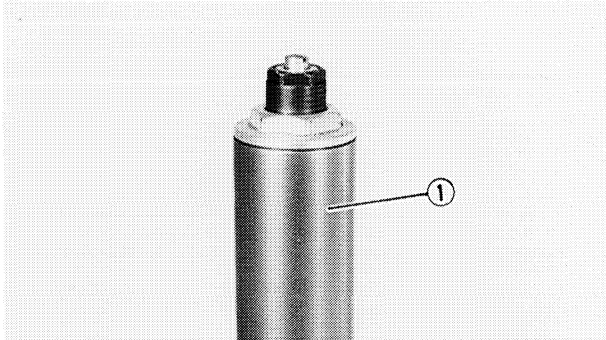

⚠ WARNING

Before loosening the pinch bolts support the front fork.



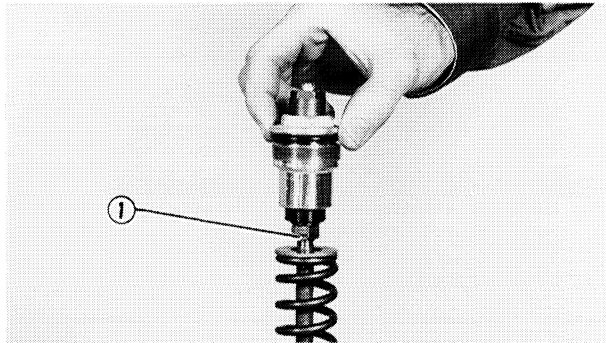


- 6.Remove:
 ● Front forks

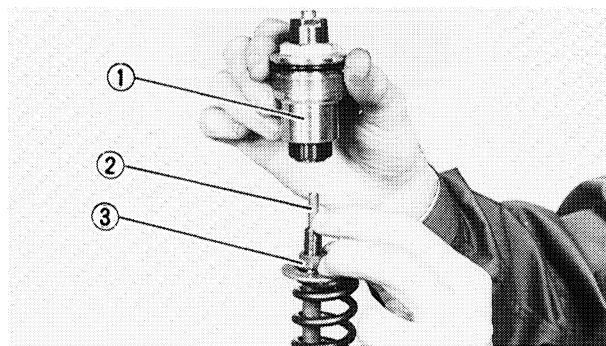


EB703020
DISASSEMBLY

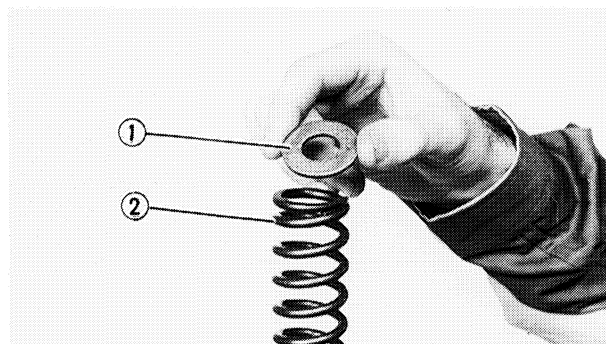
- 1.Unscrew:
 ● Inner tube ①



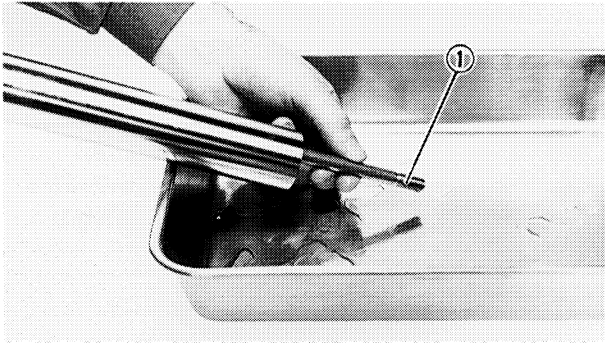
- 2.Loosen:
 ● Locknut ①



- 3.Remove:
 ● Cap bolt assembly ①
 ● Rod (rebound damping force adjuster) ②
 ● Locknut ③



- 4.Remove:
 ● Spring seat ①
 ● Fork spring ②

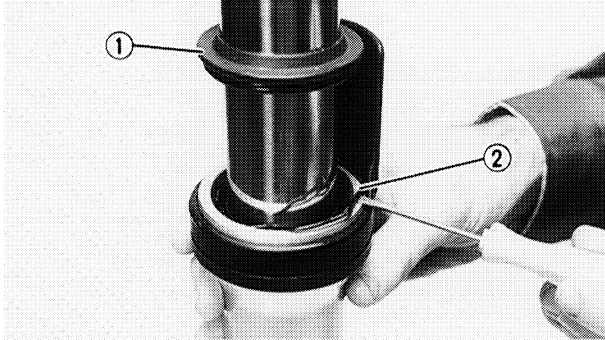


5.Drain:

- Fork oil

NOTE:

While stroking the piston rod ① several times, drain the fork oil.



6.Remove:

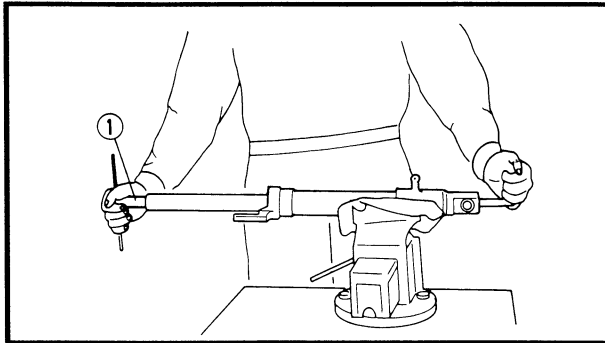
- Dust seal ①
- Retaining clip ②
Use a flat-head screwdriver.

CAUTION:

Take care not to scratch the inner tube.

NOTE:

- Do not remove the front fork protector from the outer tube.
- If the front fork protector must be removed, always install a new protector.

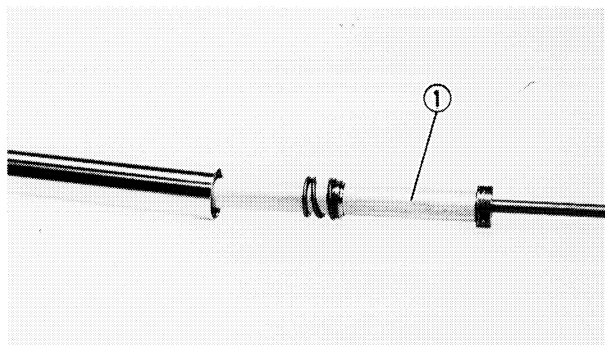


7.Remove:

- Bolt (damper rod)
- Copper washer

NOTE:

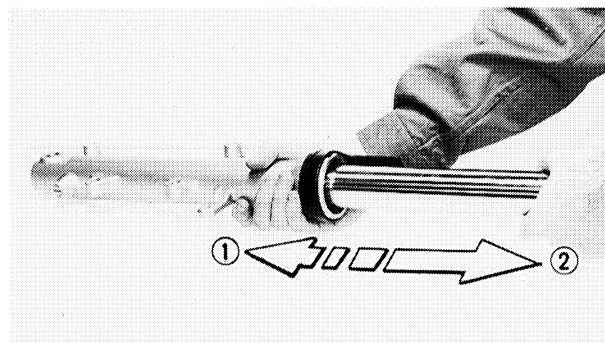
While holding the damper rod with the damper rod holder ① loosen the damper rod bolt.



	<p>Damper rod holder: YM-01425/90890 - 01425</p>
--	---

8.Remove:

- Damper rod assembly ①

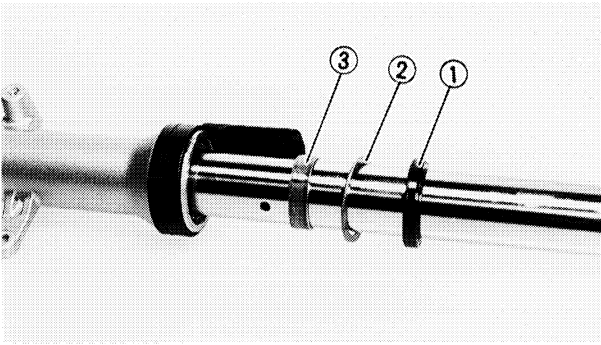


9.Remove:

- Inner tube

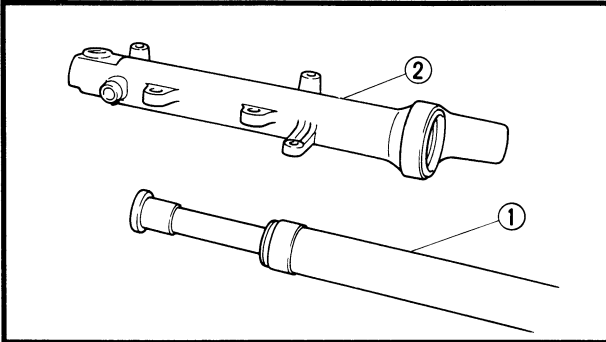
Removal steps:

- Slowly push ① the inner tube into the outer tube and just before it bottoms out pull the inner tube back quickly ②.
- Repeat this step until the inner tube can be pulled out from the outer tube.



10.Remove:

- Oil seal ①
- Seal spacer ②
- Slide metal ③
- Piston metal
- Oil lock piece



EB703030

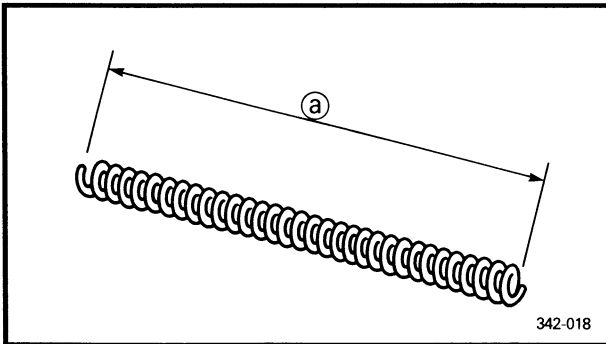
INSPECTION

1.Inspect:

- Inner tube ①
 - Outer tube ②
- Bends/scratches/damage → Replace.

⚠ WARNING

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



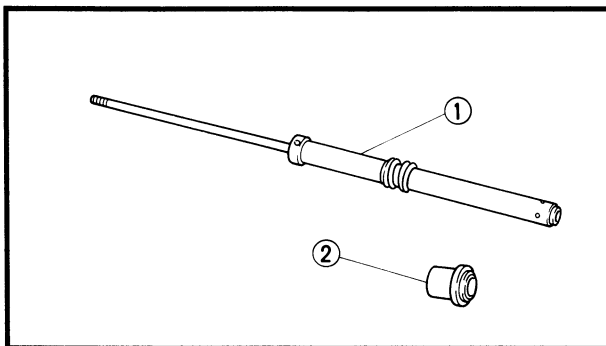
342-018

2.Measure:

- Fork spring ③
- Over the specified limit → Replace.



Fork spring free length (limit):
419.5 mm (16.5 in)

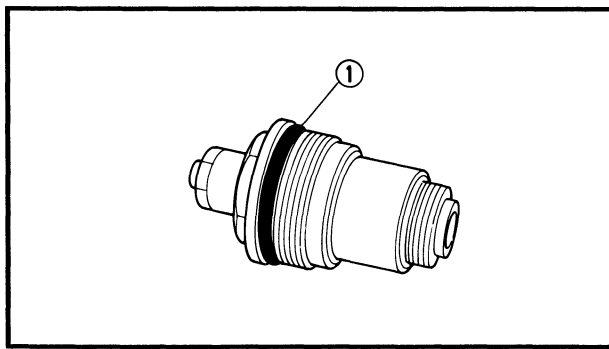


3.Inspect:

- Rod assembly ①
 - Oil lock piece ②
- Bends/damage → Replace.
- Damage → Replace.

CAUTION:

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



4. Inspect:

- O-ring (cap bolt) ①
Wear/damage → Replace.

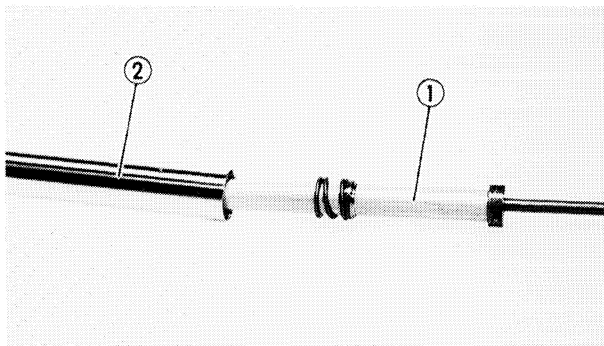
EB703040

ASSEMBLY

Reverse the "DISASSEMBLY" procedure.
Note the following points.

NOTE:

- When assembling the front fork be sure to replace the following parts.
 - *Piston metal
 - *Slide metal
 - *Oil seal
 - *Dust seal
- Before assembling the fork, 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, being careful not to damage the inner tube.

2. Lubricate:

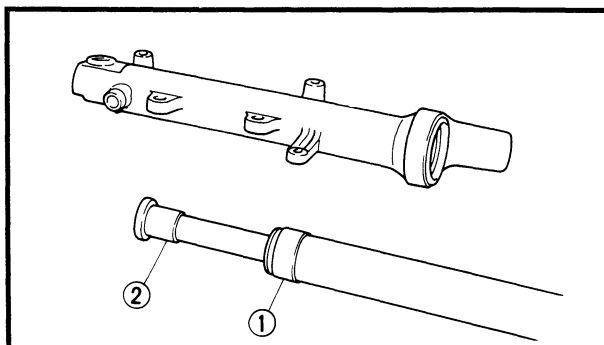
- Inner tube (outer surface)

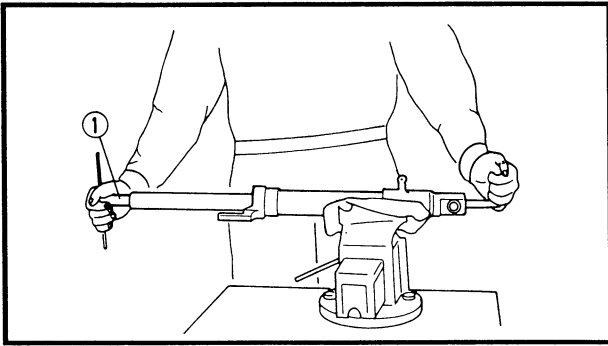


Recommended lubricant:
Fork oil 5W or equivalent

3. Install:

- Piston metal ①
- Oil lock piece ②





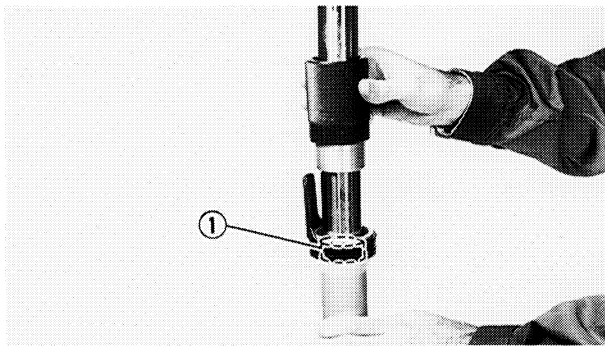
4. Tighten:
- Bolt (damper rod)

	<p>Bolt (damper rod): 40 Nm (4.0 m • kg, 29 ft • lb) LOCTITE®</p>
---	--


⚠ WARNING _____
 Always use new copper washers.

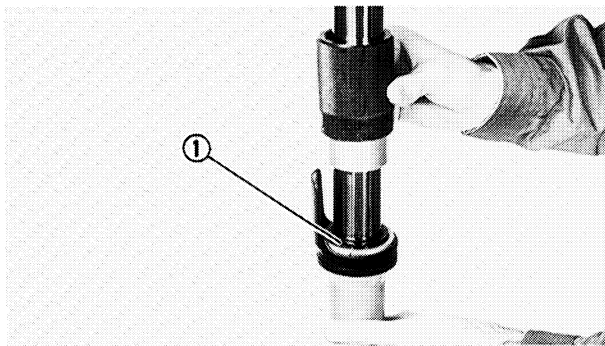
NOTE: _____
 While holding the damper rod with a damper rod holder tighten the damper rod bolt.

	<p>Damper rod holder: YM-01425/90890 - 01425</p>
---	--




5. Install:
- Slide metal ①
 Use a fork seal driver weight and the adapter.

	<p>Fork seal driver weight: YM-33963/90890-01367 Adapter: YM-33968/90890-01381</p>
---	---

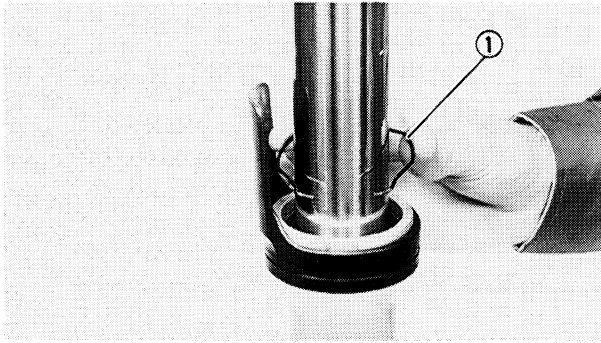


6. Install:
- Seal spacer
 - Oil seal ①
 Use the fork seal driver weight and the adapter.

	<p>Fork seal driver weight: YM-33963/90890 - 01367 Adapter: YM-33968/90890 - 01381</p>
---	---

NOTE: _____
 Before installing the oil seal, apply lithium soap base grease onto the oil seal lips.

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

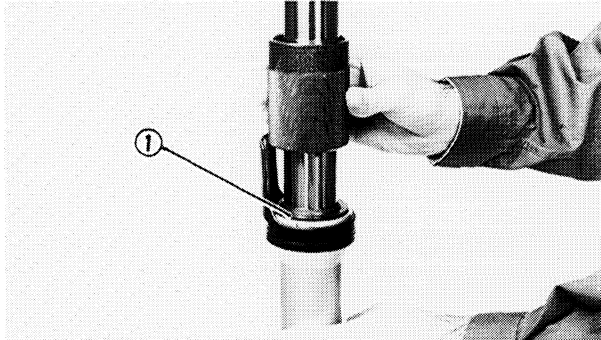


7. Install:

- Retaining clip ①

NOTE:

Adjust the retaining clip so that it fits into the outer tube groove.

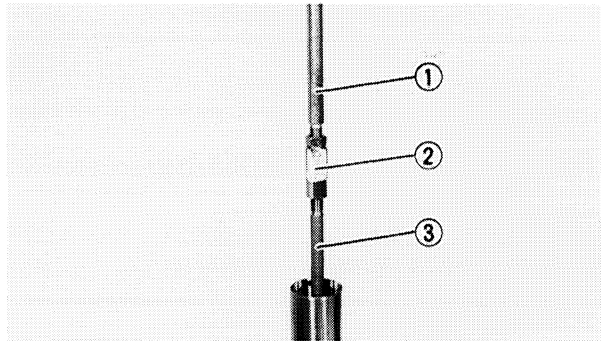


8. Install:

- Dust seal ①
- Use the fork seal driver weight.



Fork seal driver weight:
YM-33963/90890 - 01367



9. Attach:

- Rod puller ①
 - Adapter ②
- (to the damper rod ③)



Rod puller:
YM-01437/90890 - 01437
Adapter:
90890 - 01436

10. Fully compress the front fork.

11. Fill:

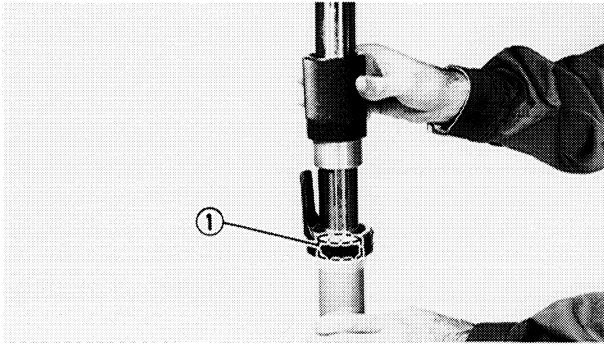
- Fork oil



Each fork:
434 cm³ (15.3 Imp oz, 14.7 US oz)
Fork oil 5W or equivalent.

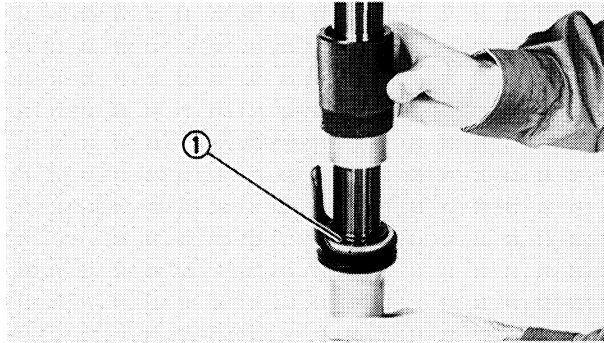
CAUTION:

- Be sure to use the recommended fork oil. If other oils are used they may have an adverse effect on front fork performance.
- NEVER allow foreign materials to enter the front fork.



12. After filling the front fork, slowly pump the damper rod ① up and down (for at least ten times) to distribute the front fork oil.

NOTE: _____
Be sure to pump the damper rod slowly because the fork oil may spurt out.

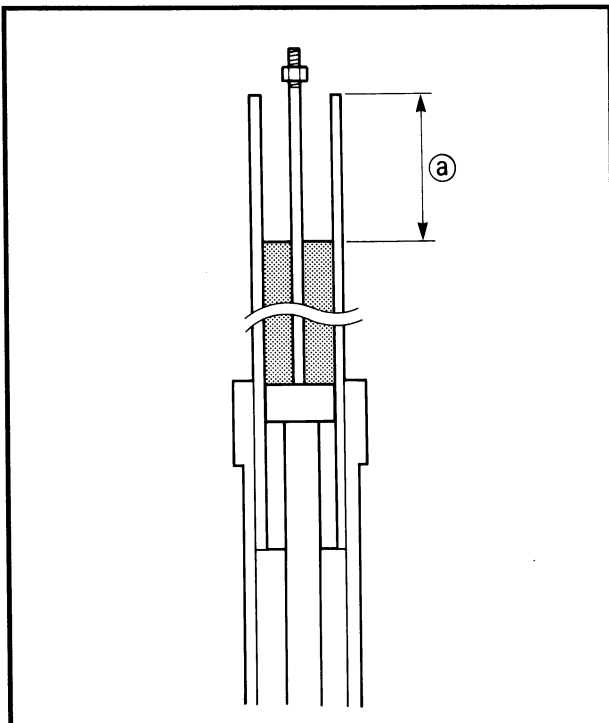


13. After filling the front fork, slowly stroke the inner tube ① up and down (stroke = about 130 mm (5.12 in)) to distribute the fork oil once more.

NOTE: _____
Be careful not to stroke the inner tube over 130 mm (5.12 in) as this will cause air to enter. If a stroke of 130 mm (5.12 in) is exceeded, repeat steps 12 and 13.


14. Before setting the recommended oil level wait ten minutes until the oil has settled and the air bubbles have dispersed.

NOTE: _____
Be sure to bleed the forks of any residual air.



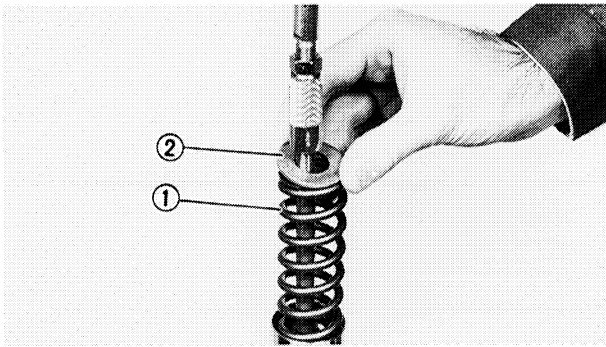
15. Measure:

- Oil level (left and right) ②
Out of specification → Adjust.

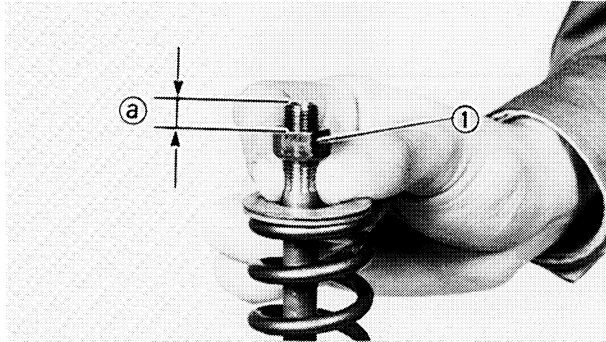
	Fork oil level: 124 mm (4.88 in)
---	---

(from the top of the fork tube with the fork tube fully compressed and without the spring)

⚠ WARNING _____
Always adjust each fork to the same oil level. Uneven adjustment can cause poor handling and a loss of stability.




- 16.Install:
- Fork spring ①
 - Spring seat ②




- 17.Install:
- Locknut
 - Rod (rebound damping force adjuster)
 - Cap bolt assembly

Installation steps:

- Remove the rod puller and adapter.
- Install the locknut ① and set the thread length ②.

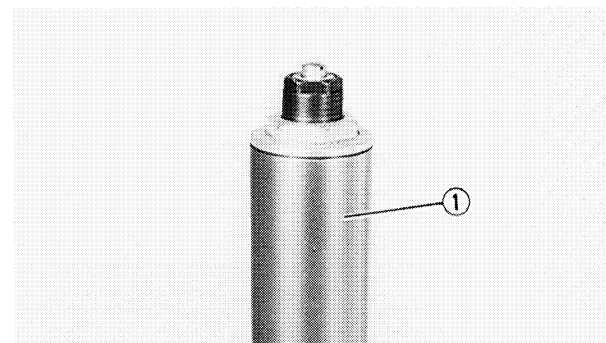
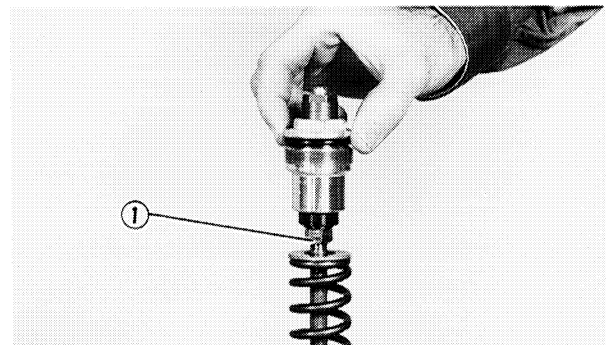
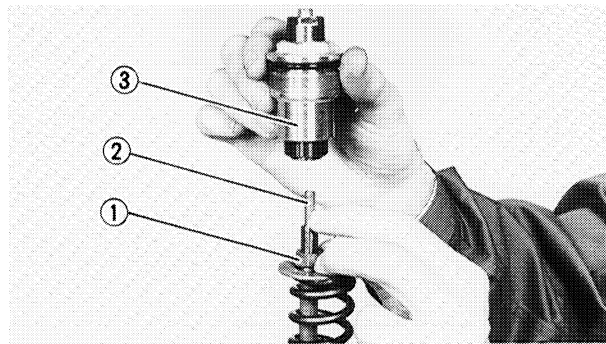
	Thread length: 12 mm (0.47 in)
---	--

- Install the rod (rebound damping force adjuster) ②.
- Install the cap bolt assembly ③ and finger tighten it.
- Tighten the locknut ①.

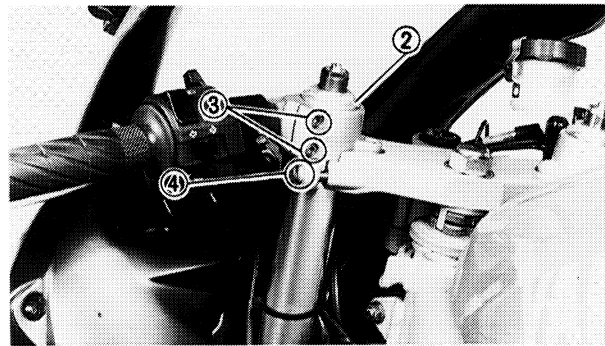
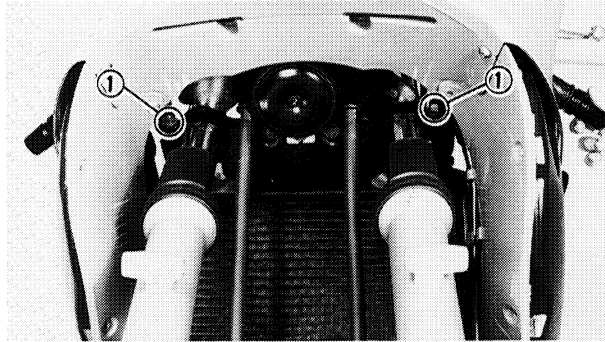
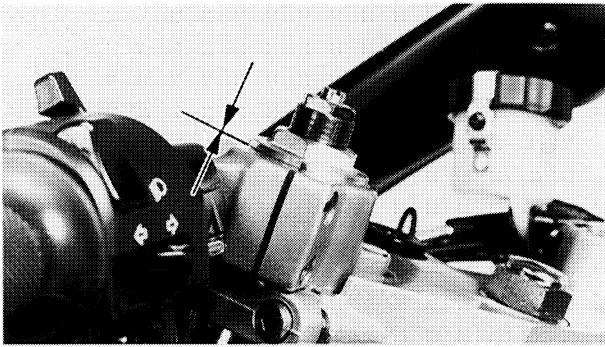
	Locknut: 15 Nm (1.5 m • kg, 11 ft • lb)
---	---

NOTE: _____
Hold the cap bolt and tighten the locknut to specification.

⚠ WARNING _____
Always use a new O-ring on the cap bolt assembly.



- 18.Install:
- Inner fork tube ①
(to cap bolt assembly)
Temporarily tighten the cap bolt assembly.



EB703050

INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Install:

- Front fork
Temporarily tighten the front fork pinch bolts.

NOTE:

Make sure that the inner tube end is flush with the top of the handlebar boss.

2. Tighten:

- Front fork pinch bolts (lower) ①
- Cap bolts ②
- Pinch bolts (handlebar boss) ③
- Front fork pinch bolts (upper) ④

**Pinch bolt (lower):**

38 Nm (3.8 m · kg, 27 ft · lb)

Cap bolt:

23 Nm (2.3 m · kg, 17 ft · lb)

Pinch bolt (handlebar boss):

13 Nm (1.3 m · kg, 9.4 ft · lb)

Pinch bolt (upper):

30 Nm (3.0 m · kg, 22 ft · lb)

3. Install:

- Front fenders (front and rear)

**Bolt (front fender):**

7 Nm (0.7 m · kg, 5.1 ft · lb)

4. Install:

- Front wheel
- Brake caliper
Refer to "FRONT WHEEL".

**Front axle:**

65 Nm (6.5 m · kg, 47 ft · lb)

Bolt (brake caliper):

40 Nm (4.0 m · kg, 29 ft · lb)

Pinch bolt (front wheel axle):

20 Nm (2.0 m · kg, 14 ft · lb)

⚠ WARNING

Make sure that the brake hoses are routed properly.

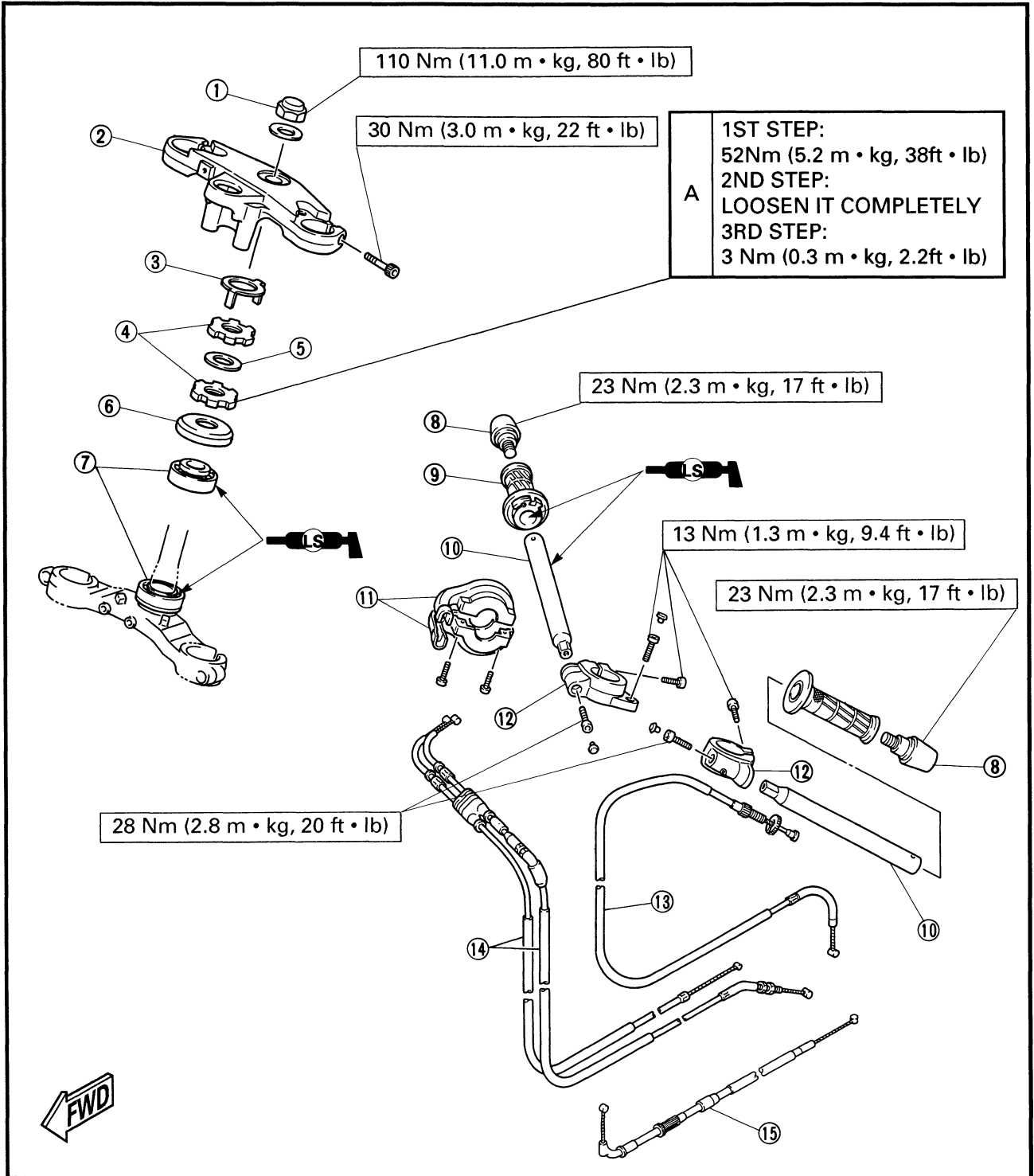
5. Adjust:

- Spring preload
- Rebound damping
- Compression damping
Refer to "FRONT FORK ADJUSTMENT" in CHAPTER 3.

EB704000

STEERING HEAD AND HANDLEBARS

- ① Steering stem nut
- ② Upper bracket
- ③ Lock washer
- ④ Ring nut
- ⑤ Rubber washer
- ⑥ Bearing cover
- ⑦ Bearing
- ⑧ Grip end
- ⑨ Handlebar grip (right)
- ⑩ Handlebar
- ⑪ Throttle cable housing
- ⑫ Handlebar boss
- ⑬ Clutch cable
- ⑭ Throttle cable
- ⑮ Starter cable



EB704010
REMOVAL

⚠ WARNING

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

1. Stand the motorcycle on a level surface.

2. Remove:

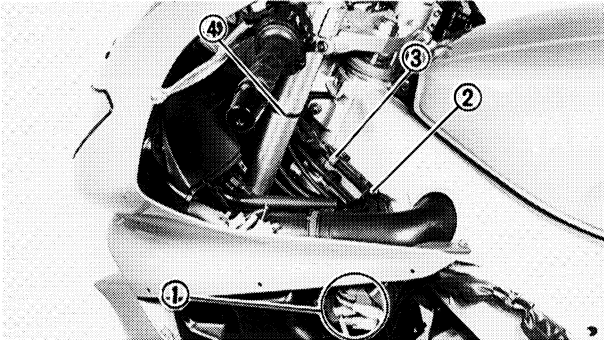
- Bottom cowling
- Side cowlings (left and right)
Refer to "COWLINGS" in CHAPTER 3.

3. Disconnect:

- Main switch couplers ①

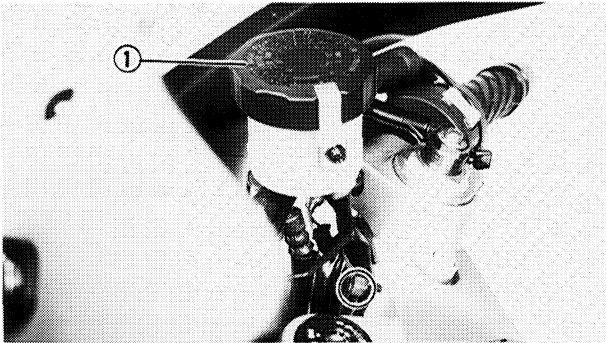
4. Remove:

- Plastic band ②
- Plastic clamp ③
- Plastic band ④



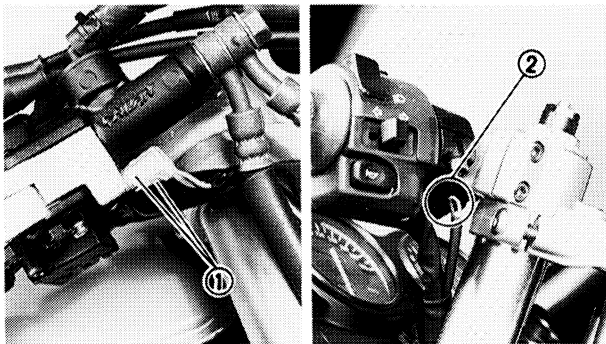
5. Remove:

- Brake reservoir ①



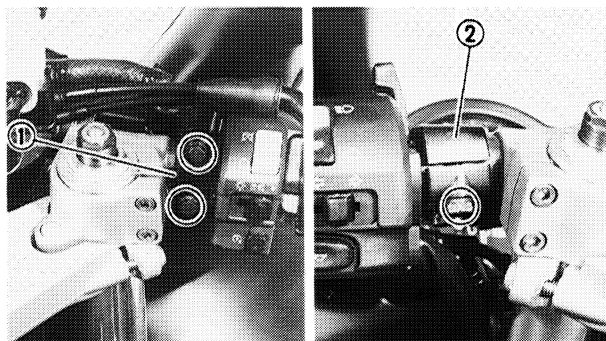
6. Remove:

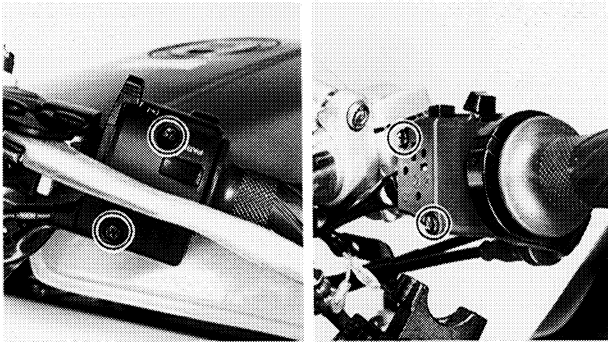
- Brake light switch leads ①
- Clutch switch coupler ②



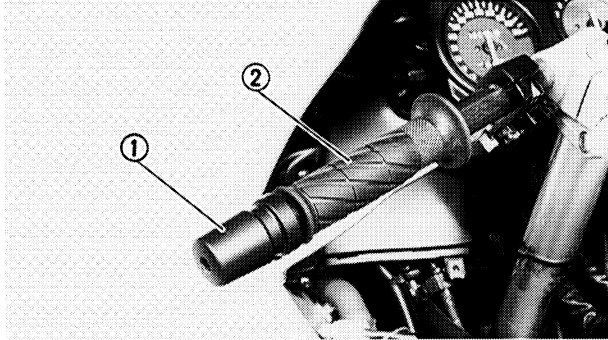
7. Remove:

- Master cylinder holder ①
- Bolt (clutch lever holder) ②

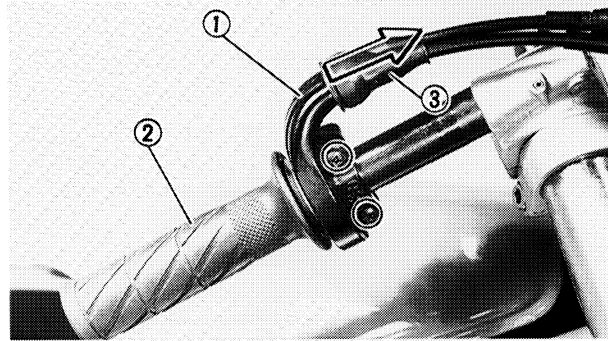




- 8.Remove:
- Handlebar switches (left and right)

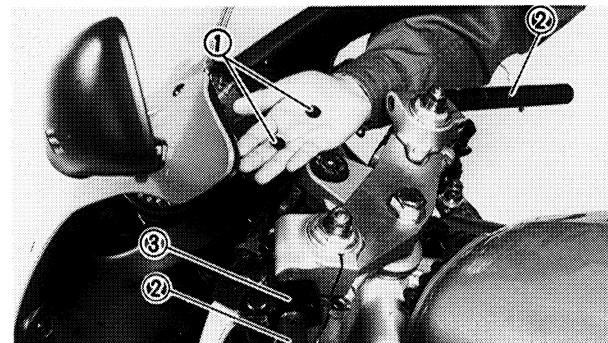


- 9.Remove:
- Grip ends (left and right) ①
 - Grip (left) ②

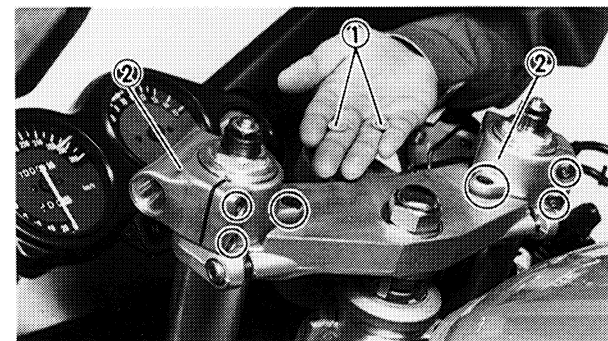


- 10.Remove:
- Throttle cable housing ①
 - Throttle grip ②

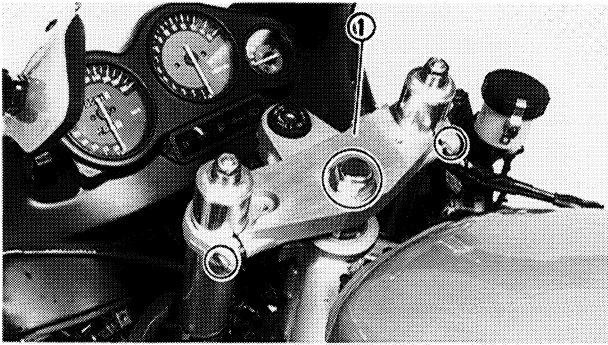
NOTE: _____
 When removing the throttle cable housing, pull back the rubber cover ③.



- 11.Remove:
- Blind plugs ①
 - Handlebars (left and right) ②
 - Clutch lever holder ③



- 12.Remove:
- Blind plugs ①
 - Handlebar bosses (left and right) ②



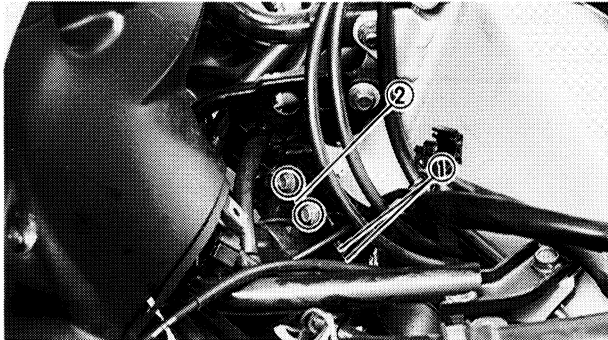
13.Remove:

- Upper bracket ①

14.Remove:

- Front wheel
- Front fork

Refer to "FRONT WHEEL" and "FRONT FORK".

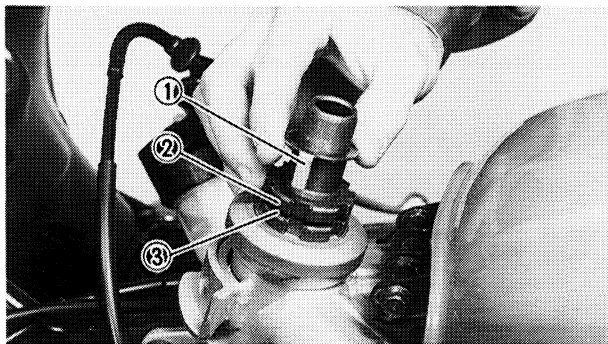


15.Disconnect:

- Horn leads ①

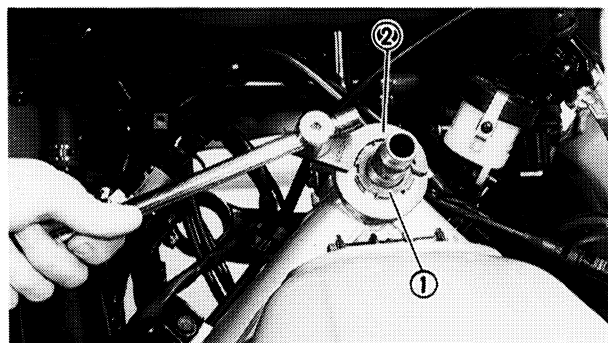
16.Remove:

- Brake hose holder ②



17.Remove:

- Special washer ①
- Ring nut (upper) ②
- Rubber washer ③



18.Remove:

- Ring nut (lower) ①
- Use a ring nut wrench ②.



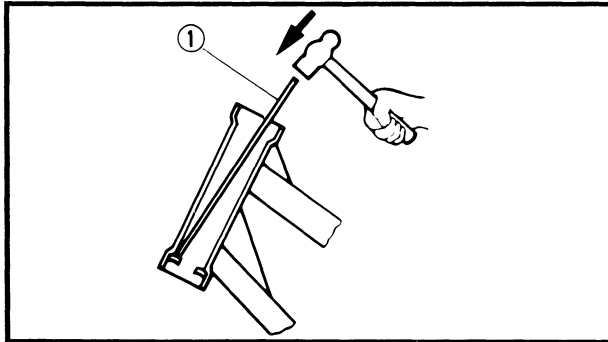
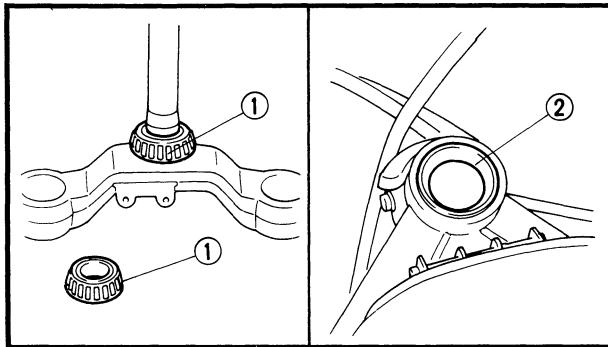
Ring nut wrench:
YU-33975/90890 - 01403

⚠ WARNING

Securely support the steering shaft so that there is no danger of it falling.

19.Remove:

- Bearing cover
- Bearing (upper and lower)
- Dust seal (lower)



EB704020

INSPECTION

1. Wash the bearings and the bearing races with a solvent.
2. Inspect:
 - Bearings ①
 - Bearing races ②
 Pitting/damage → Replace.

Bearing and bearing race replacement steps:

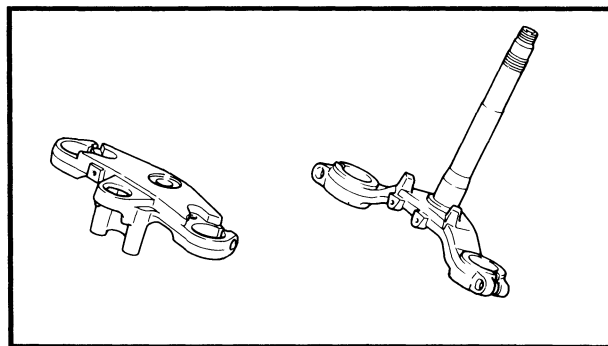
- Remove the bearing races from the steering head pipe using a long rod ① and a hammer, as shown in the illustration.
- Install a new dust seal and new races.

NOTE:

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

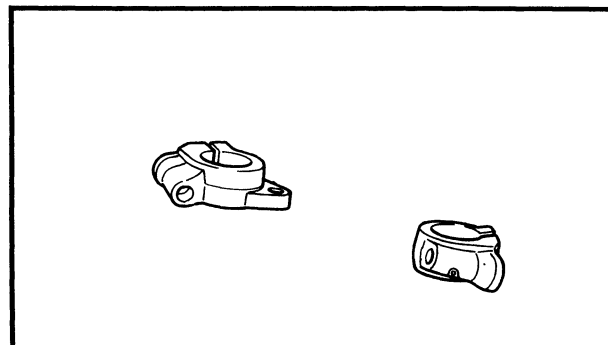
CAUTION:

If the bearing race is not fitted squarely, the steering head pipe could be damaged.



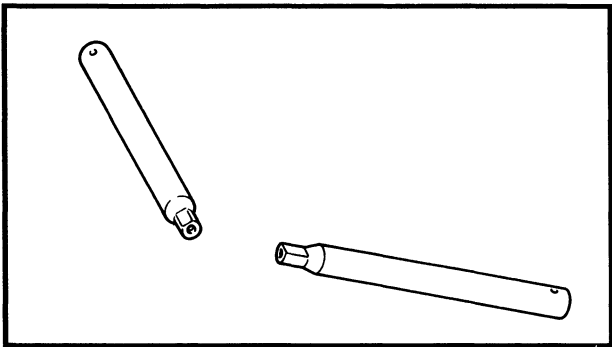
3. Inspect:

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



4. Inspect:

- Handlebar bosses
- Cracks/damage → Replace.



5. Inspect:
- Handlebar
Bends/cracks/damage → Replace.

⚠ WARNING

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

Left handlebar grip replacement steps:

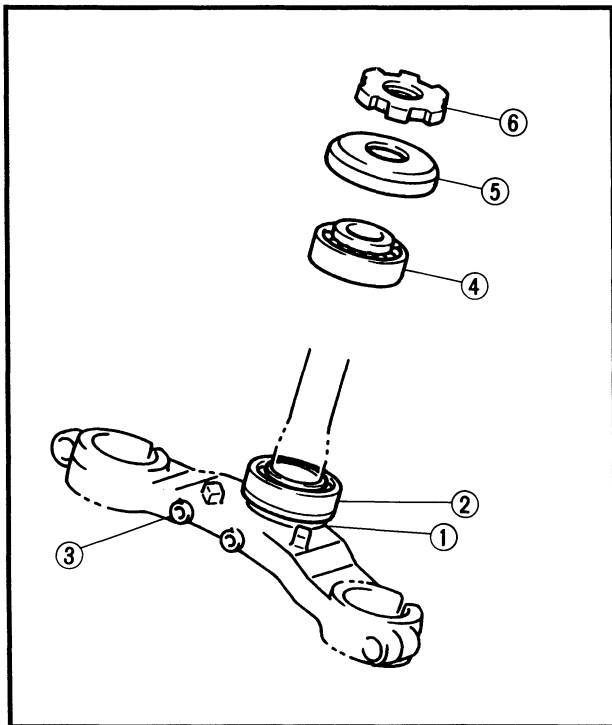
- Remove the handlebar grip.
- Apply a light coat of rubber adhesive onto the end of the handlebar.
- Install the handlebar grip.

NOTE:

Use a clean rag to wipe off any excess adhesive.

⚠ WARNING

Do not touch the grip until the adhesive has set.



EB704030

INSTALLATION

Reverse the "REMOVAL" procedure. Note the following points.

1. Lubricate:
- Bearings (upper and lower)
 - Bearing races

Recommended lubricant:
Lithium soap base grease

2. Install:

- Dust seal ①
- Bearing (lower) ②
- Lower bracket ③
- Bearing (upper) ④
- Bearing cover ⑤
- Ring nut (lower) ⑥

CAUTION:

Hold the steering stem until it is secured.

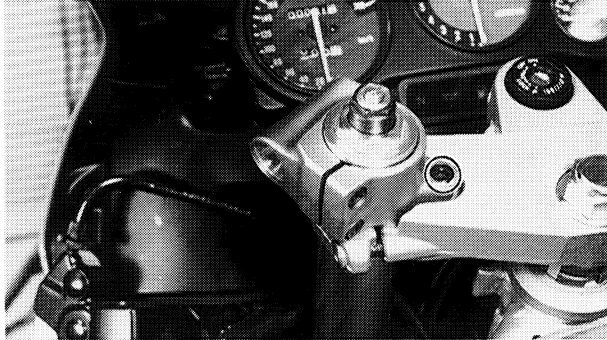
3.Tighten:

- Ring nuts (lower and upper)
Refer to "STEERING HEAD INSPECTION" in CHAPTER 3.

4.Install:

- Upper bracket
- Nut (steering stem)

NOTE: _____
Temporarily tighten the steering stem nut.



5.Install:

- Front forks
- Handlebar bosses
Refer to "FRONT FORK".

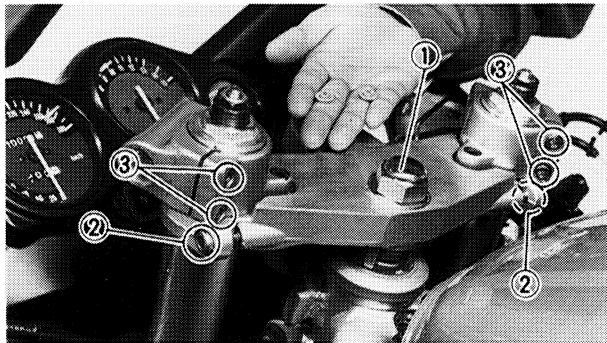
NOTE: _____
Temporarily tighten the front fork pinch bolt.

6.Install:

- Handlebar (left)
(with the clutch lever holder)
- Handlebar (right)

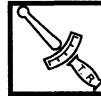


Handlebar:
28 Nm (2.8 m • kg, 20 ft • lb)

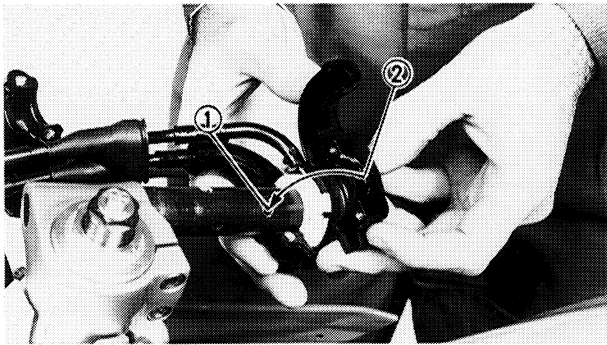


7.Tighten:

- Nut (steering stem) ①
- Front fork pinch bolts (upper) ②
- Pinch bolts (handlebar boss) ③
- Front fork pinch bolts (lower)



Nut (steering stem):
110 Nm (11.0 m • kg, 80 ft • lb)
Pinch bolt (upper):
30 Nm (3.0 m • kg, 22 ft • lb)
Pinch bolt (handlebar boss):
13 Nm (1.3 m • kg, 9.4 ft • lb)
Pinch bolt (lower):
38 Nm (3.8 m • kg, 27 ft • lb)



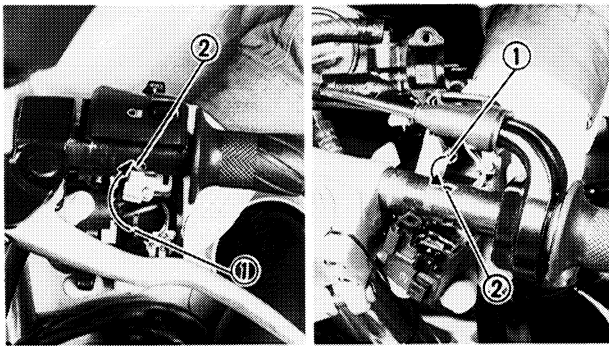
8. Install:
- Throttle grip
 - Throttle cable housing

NOTE: _____
Align the projection ① on the handlebar switch with the hole ② in the handlebar.

9. Install:
- Grip ends (left and right)

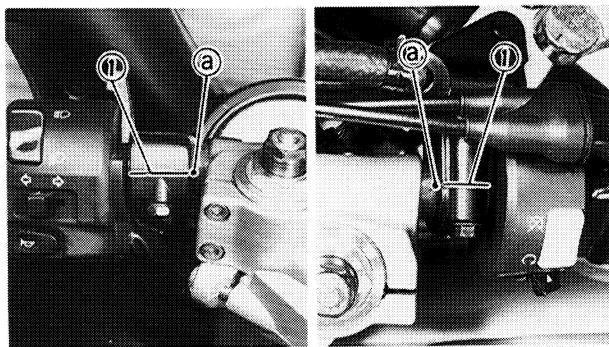


Grip end:
23 Nm (2.3 m • kg, 17 ft • lb)



10. Install:
- Handlebar switch (left and right)

NOTE: _____
Align the projection ① on the handlebar switch with the hole ② in the handlebar.



11. Install:
- Clutch lever holder
 - Brake lever holder

NOTE: _____
Align the slit in the lever holders ① with the punch mark @ on the handlebars.

CAUTION _____

- Install the lever holders with the "UP" mark facing up.
- First, tighten the upper bolt and then tighten the lower bolt.



Bolt (lever holder):
13 Nm (1.3 m • kg, 9.4 ft • lb)

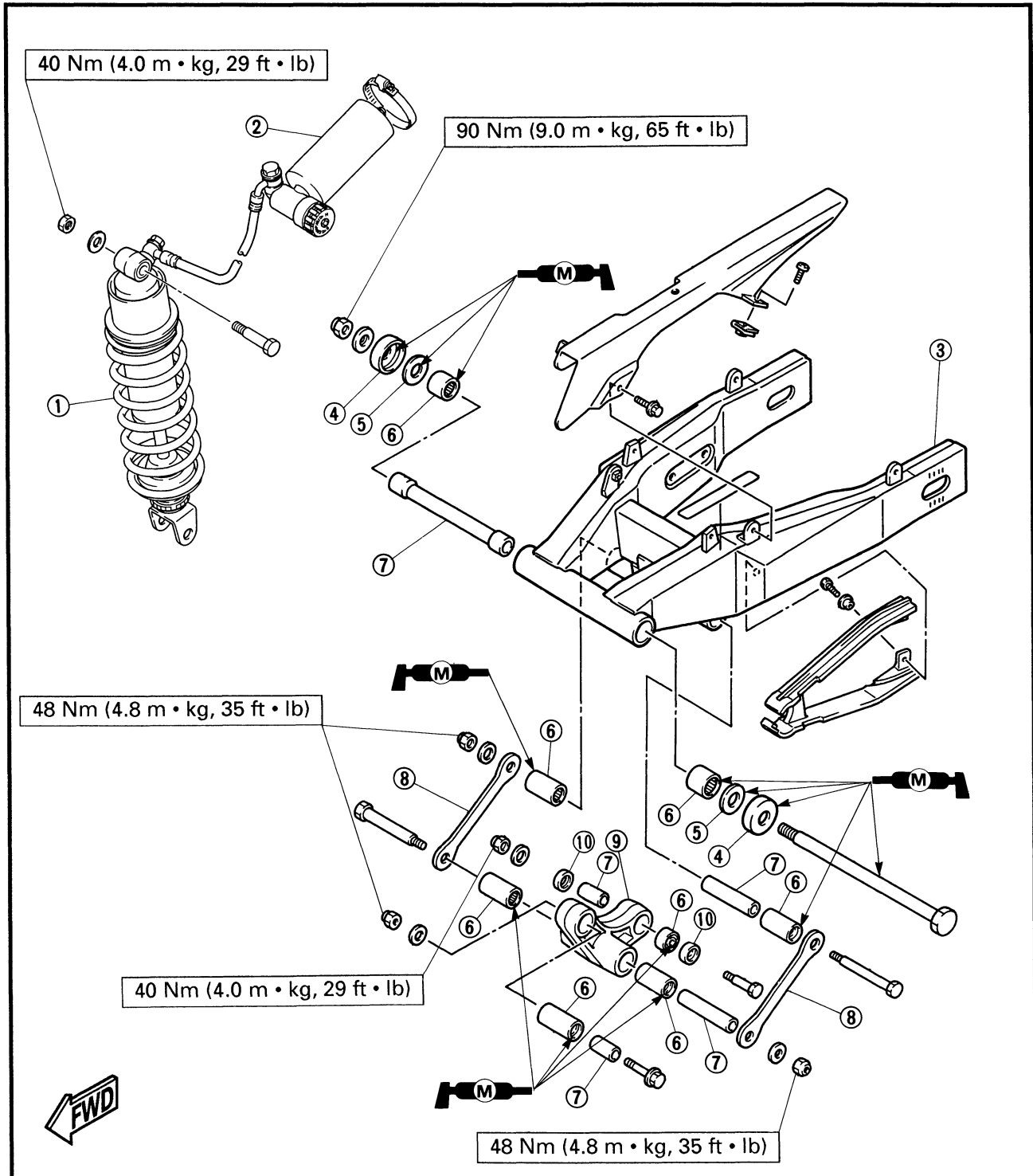
EB705000

REAR SHOCK ABSORBER AND SWINGARM

- ① Shock absorber
- ② Gas cylinder
- ③ Swingarm
- ④ Thrust cover
- ⑤ Thrust washer
- ⑥ Bearing
- ⑦ Collar
- ⑧ Connecting rod
- ⑨ Relay arm
- ⑩ Oil seal

NOTE:

Before installation, coat the bearings, oil seals, and collars with a liberal amount of molybdenum disulfide grease. After installing, thoroughly wipe off any excess grease.

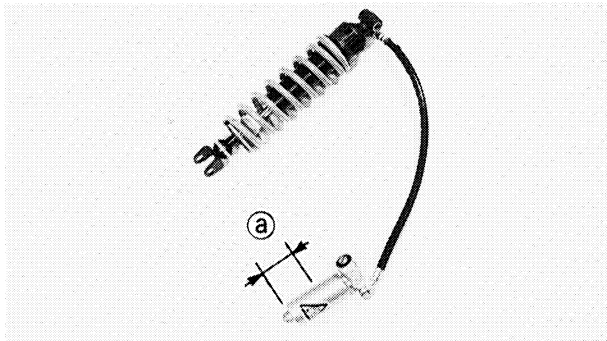


EB705010
HANDLING NOTES

⚠ WARNING

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

- Do not tamper or attempt to open the gas chamber.
- Do not subject the shock absorber to an open flame or any other source of high heat. This may cause the unit to explode due to excessive gas pressure.
- Do not deform or damage the gas chamber in any way. Gas chamber damage will result in poor damping performance.



EB705020
NOTES ON DISPOSAL

Shock absorber disposal procedure:

- Gas pressure must be released before disposing of the gas compartment. To do so, drill a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the gas chamber wall at a point Ⓐ 15 ~ 20 mm (0.6 ~ 0.8 in) from the end of the gas chamber.

⚠ WARNING

To prevent eye damage from released gas and/or metal chips wear eye protection.

EB705030
REMOVAL

Rear shock absorber

1. Stand the motorcycle on a level surface.

⚠ WARNING

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

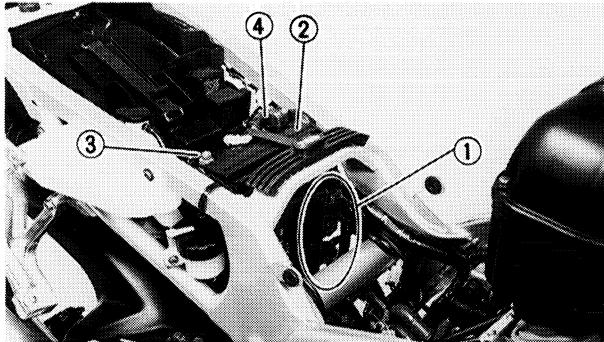
NOTE:

Place a suitable stand under the engine to elevate the rear wheel.

2.Remove:

- Bottom cowling
- Side cowlings (left and right)
- Seat
- Side panels (left and right)
- Fuel tank

Refer to "COWLINGS", "SEAT" and "FUEL TANK" in CHAPTER 3.



3.Disconnect:

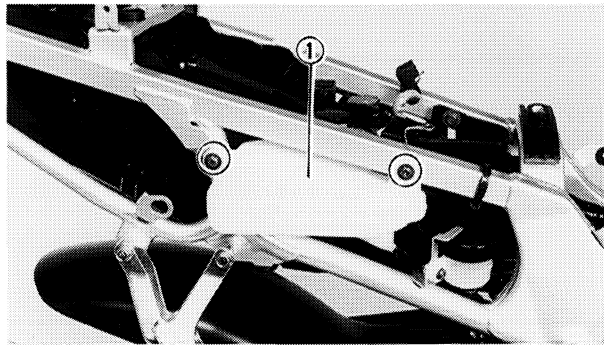
- Ignitor couplers ①

4.Remove:

- Battery ②

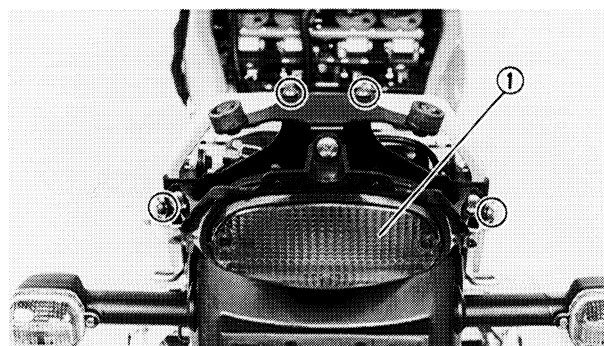
CAUTION:

First, disconnect the negative lead ③, then disconnect the positive lead ④.



5.Unhook:

- Coolant reservoir ①

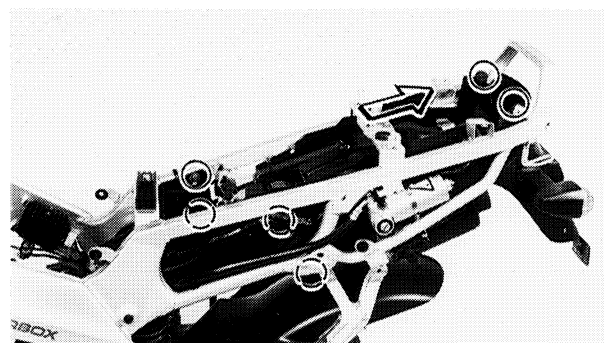


6.Disconnect:

- Tail/brake light coupler
- Flasher light leads (rear)

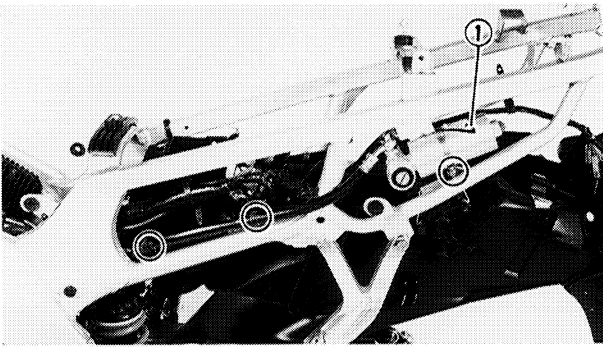
7.Remove:

- Taillight assembly ①



8.Remove:

- Bolts (upper rear fender)

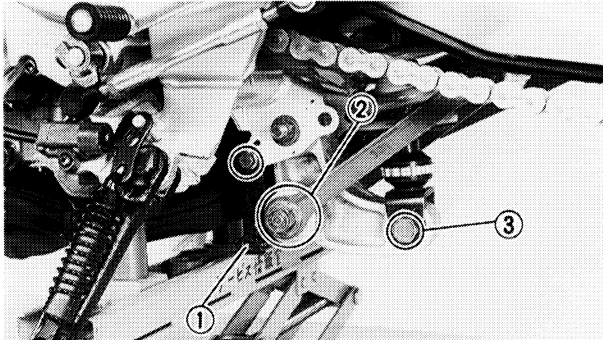


9.Remove:

- Gas chamber ①

NOTE: _____

When removing the gas chamber, pull back the upper rear fender.

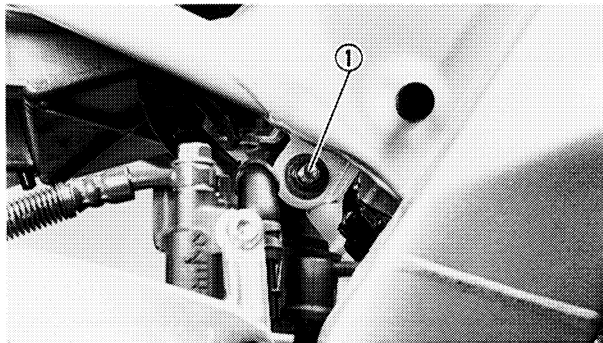


10.Remove:

- Stay (side cowlings) ①
- Bolt (connecting rod) ②
- Bolt (shock absorber - lower) ③

NOTE: _____

When removing the lower bolt, hold the swingarm so that it does not drop down.



11.Remove:

- Bolt (shock absorber - upper) ①
- Rear shock absorber

NOTE: _____

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

EB705031

Swingarm

1.Stand the motorcycle on a level surface.

⚠ WARNING _____

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

NOTE: _____

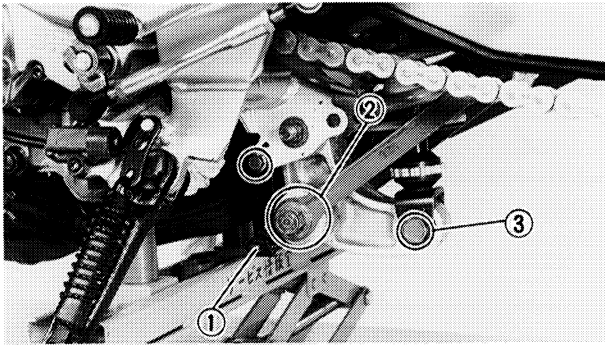
Place a suitable stand under the engine to elevate the rear wheel.

2.Remove:

- Bottom cowling
- Side cowlings (left and right)
Refer to "COWLINGS" in CHAPTER 3.

3.Remove:

- Rear wheel
- Drive chain tensioner
Refer to "REAR WHEEL".

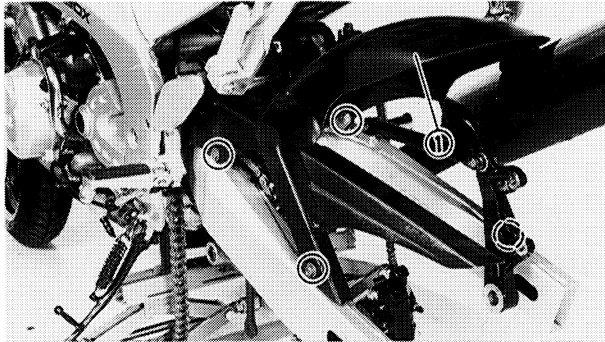


4.Remove:

- Stay (side cowlings) ①
- Bolt (connecting rod) ②
- Bolt (shock absorber - lower) ③

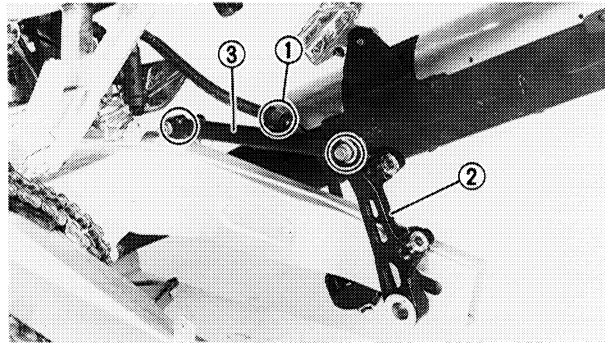
NOTE:

When removing the lower bolt, hold the swingarm so that it does not drop down.



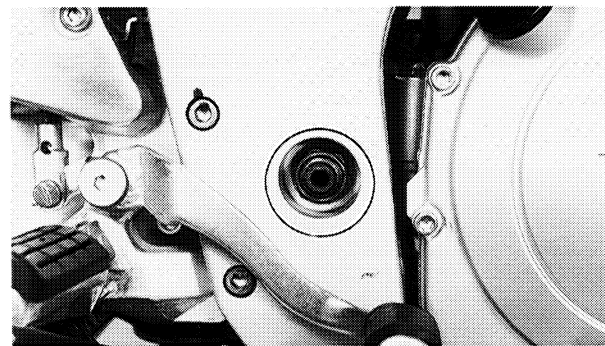
5.Remove:

- Rear fender (lower) ①
(with the chain guard)



6.Remove:

- Brake hose holder ①
- Brake caliper bracket ②
- Tension bar ③

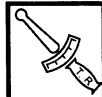


7.Check:

- Swingarm free play

Inspection steps:

- Check the tightening torque of the swingarm pivot shaft securing nuts.



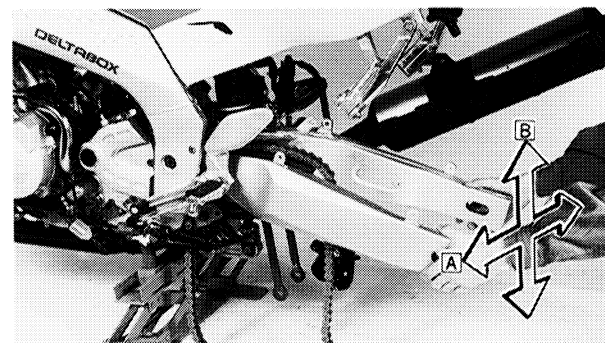
Nut (swingarm pivot shaft):
90 Nm (9.0 m · kg, 65 ft · lb)

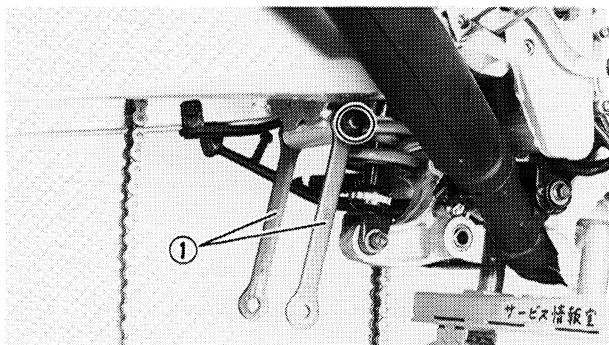
- Check the swingarm side play **A** by moving the swingarm from side to side. If side play is noticeable, check the inner collar, bearing, washer and thrust cover.



Side play (at swingarm end):
1.0 mm (0.04 in)

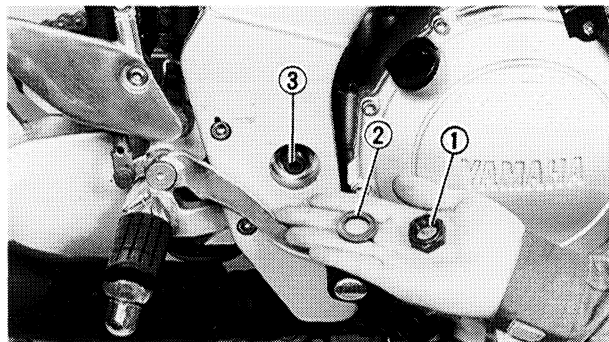
- Check the swingarm vertical movement **B** by moving the swingarm up and down. If vertical movement is not smooth or if there is binding, check the inner collar, bearing, washer and thrust cover.





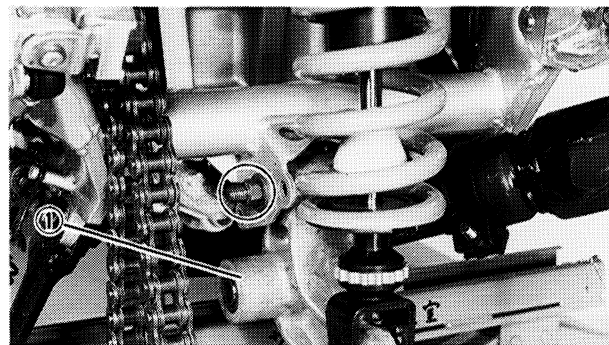
8.Remove:

- Connecting rods (left and right) ①



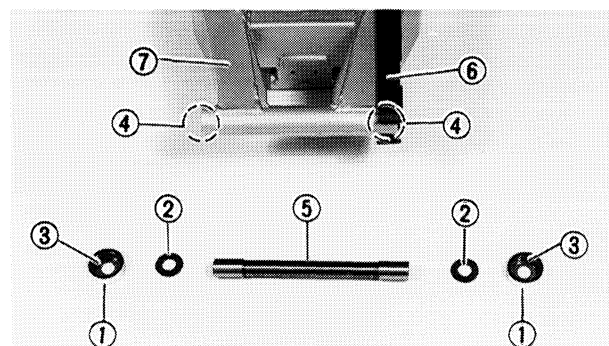
9.Remove:

- Nut (pivot shaft) ①
- Washer ②
- Pivot shaft ③
- Swingarm



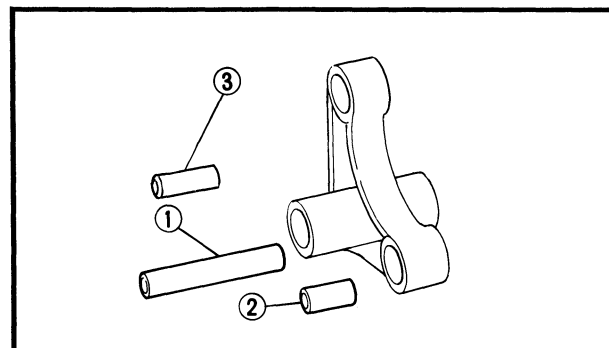
10.Remove:

- Relay arm ①



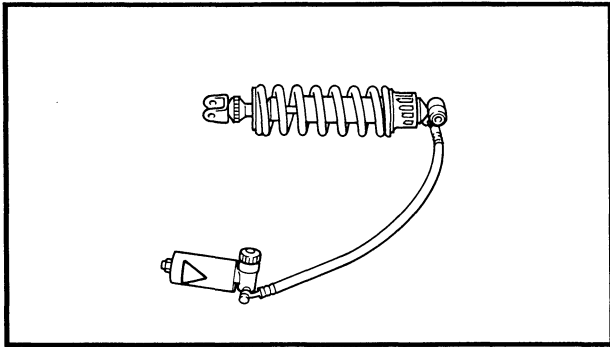
11.Remove:

- Thrust covers ①
- Thrust washers ②
- Oil seals ③
- Bearings ④
- Collar (swingarm) ⑤
- Chain guide ⑥
- Swingarm ⑦



12.Remove:

- Collar (compression arm) ①
- Collar (relay arm) ②
- Collar (shock absorber) ③



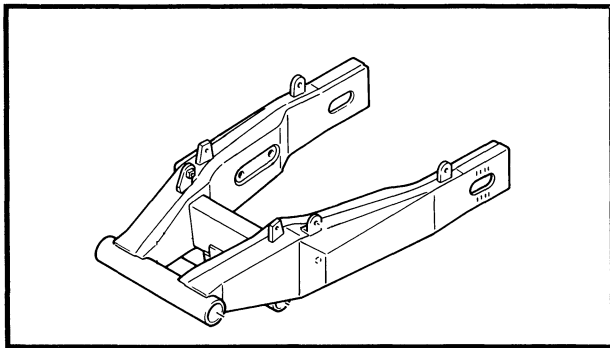
EB705040

INSPECTION

Rear shock absorber

1. Inspect:

- 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
Wear/damage → Replace the rear shock absorber assembly.
- Bushings
Dust seals
Wear/damage → Replace.
- Bolts
Bends/wear/damage → Replace.

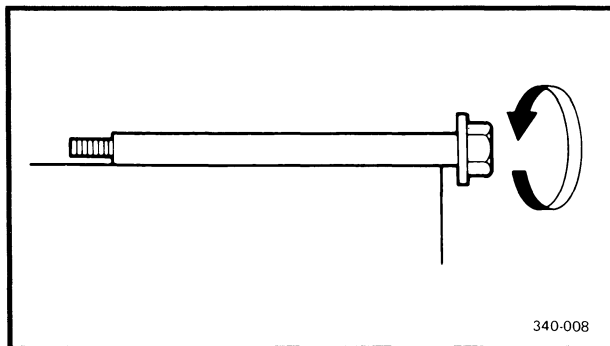


EB705042

Swingarm

1. Inspect:

- Swingarm
Bends/cracks/damage → Replace.



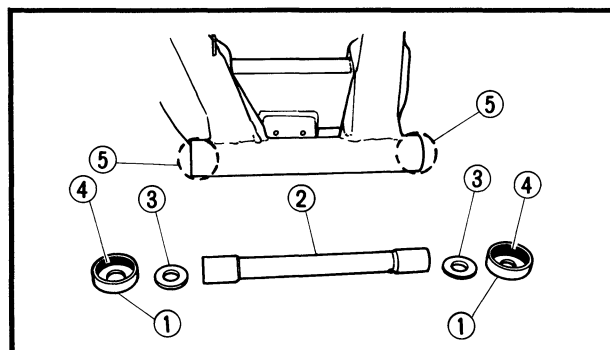
2. Inspect:

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

⚠ WARNING

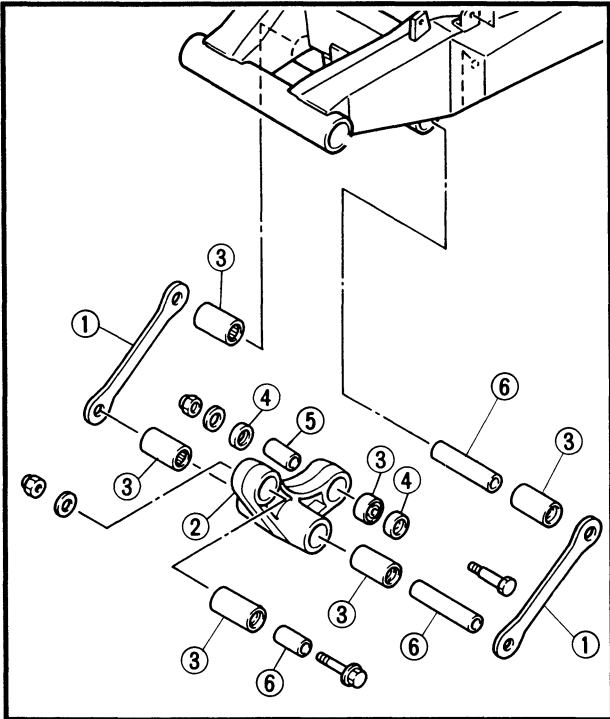
Do not attempt to straighten a bent axle.

- #### 3. Wash the swingarm pivoting parts in a solvent.



4. Inspect:

- Thrust cover ①
- Inner collar ②
- Washer ③
- Oil seal ④
Wear/damage → Replace.
- Bearings ⑤
Pitting/damage → Replace.



5. Inspect:

- Connecting rod ①
- Relay arm ②
Cracks/damage → Replace.
- Bearings ③
Pitting/damage → Replace.
- Oil seals ④
- Collars (shock absorber) ⑤
- Collars ⑥
Scratches/damage → Replace.

EB705050


INSTALLATION

Rear shock absorber

Reverse the "REMOVAL" procedure.
Note the following points.


1. Lubricate:

- Bearings
- Oil seals
- Collars
- Bushings

	Recommended lubricant: Molybdenum disulfide grease
---	---

2. Install:

- Collars
- Rear shock absorber

	Nut (rear shock absorber - upper): 40 Nm (4.0 m • kg, 29 ft • lb)
	Nut (rear shock absorber - lower): 40 Nm (4.0 m • kg, 29 ft • lb)
	Nut (relay arm - frame): 48 Nm (4.8 m • kg, 35 ft • lb)

NOTE:

- When installing the rear shock absorber lift up the swingarm.
- Insert the front connecting rod bolt from the right.

- 3.Connect:
- Battery leads
 - Ignitor coupler


CAUTION:

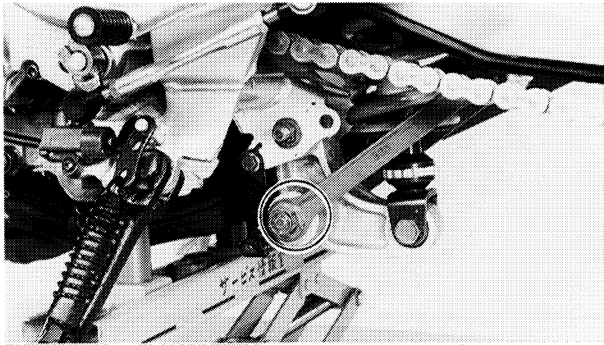
First, connect the positive lead, then connect the negative lead.

Swingarm


Reverse the "REMOVAL" procedure. Note the following points.

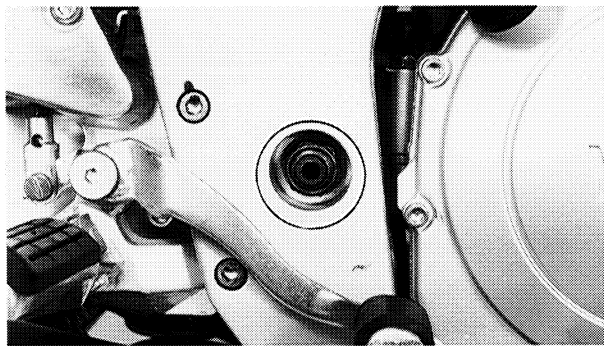
- 1.Lubricate:
- Bearings
 - Inner collars
 - Thrust covers
 - Pivot shaft

	Recommended lubricant: Molybdenum disulfide grease
---	--



- 2.Install:
- Relay arm
 - Connecting rods (left and right)


	Nut (relay arm): 48 Nm (4.8 m • kg, 35 ft • lb)
	Nut (connecting rod): 48 Nm (4.8 m • kg, 35 ft • lb)



CAUTION:

Insert the front connecting rod bolt ① from the right.

- 3.Install:
- Swingarm

	Nut (pivot shaft): 90 Nm (9.0 m • kg, 65 ft • lb)
---	---

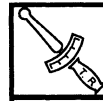
4. Install:

- Drive sprocket
- Drive sprocket cover

Refer to "ENGINE REMOUNTING" in CHAPTER 4.

5. Install:

- Rear fender
- Tension bar
- Brake caliper bracket



Bolt (rear fender):

7 Nm (0.7 m · kg, 5.1 ft · lb)

Nut (tension bar):

30 Nm (3.0 m · kg, 22 ft · lb)

6. Install:

- Rear shock absorber

Refer to "INSTALLATION – Rear shock absorber".

- Rear wheel

Refer to "REAR WHEEL".

7. Adjust:

- Drive chain slack

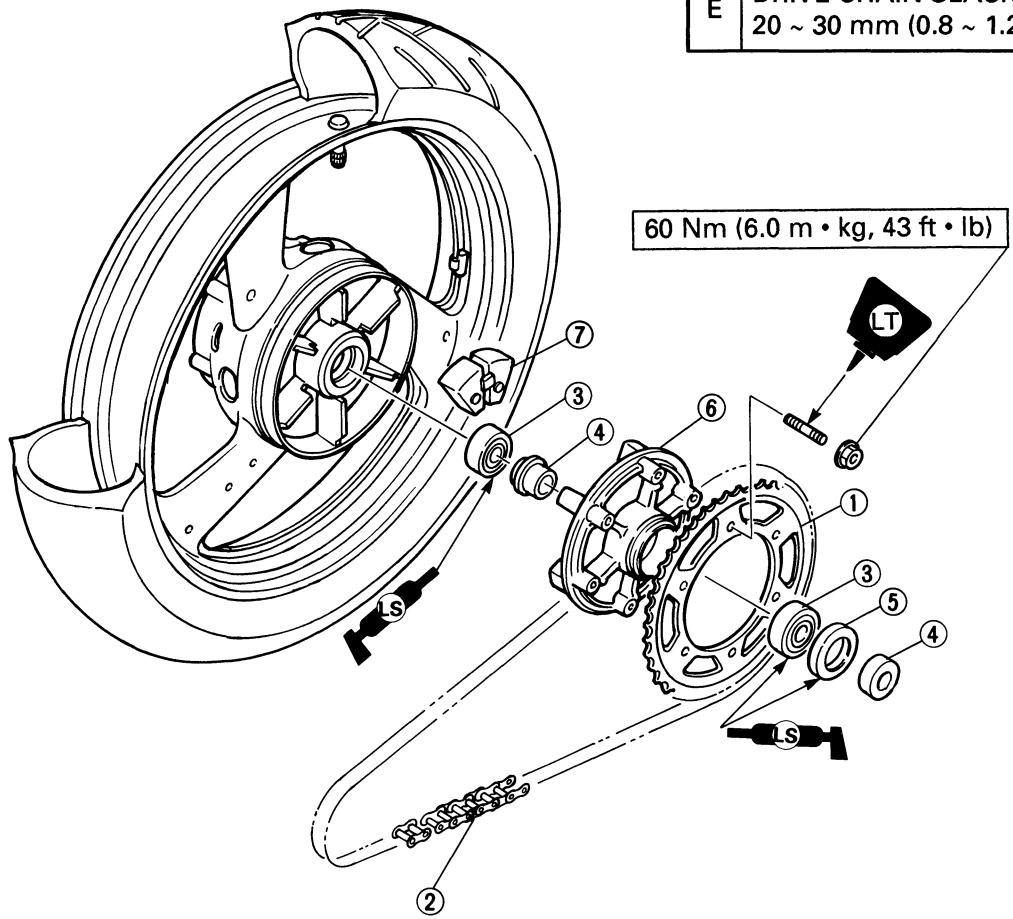
Refer to "DRIVE CHAIN SLACK ADJUSTMENT" in CHAPTER 3.

EB706000

DRIVE CHAIN AND SPROCKETS

- ① Driven sprocket
- ② Drive chain
- ③ Bearing
- ④ Collar
- ⑤ Oil seal
- ⑥ Sprocket hub
- ⑦ Damper rubber

A	DRIVE CHAIN:
B	TYPE: 50VA7
D	NO. OF LINKS: 108
E	DRIVE CHAIN SLACK: 20 ~ 30 mm (0.8 ~ 1.2 in)





EB706001

NOTE:

Before removing the drive chain and the sprockets, measure the drive chain slack and a ten link section of the drive chain.

EB706010

REMOVAL

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:

- Shift pedal link
- Crankcase cover (left)
- Drive sprocket

Refer to "ENGINE REMOVAL" in CHAPTER 4.

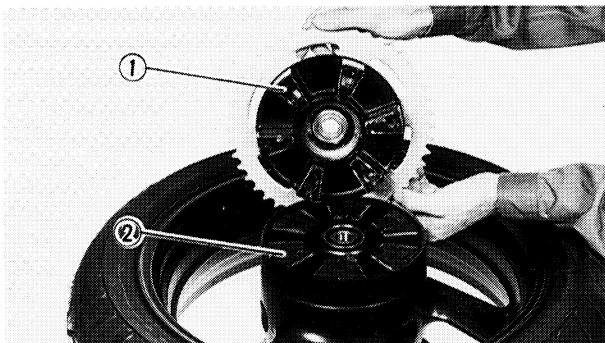
3. Remove:

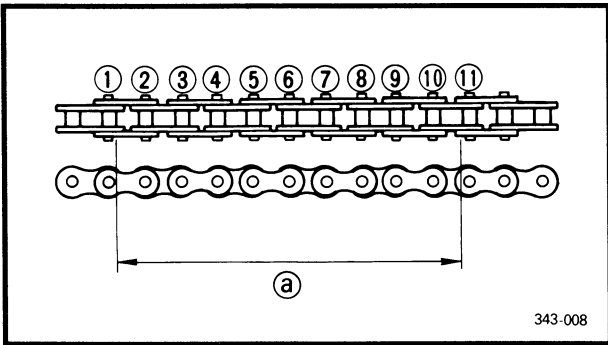
- Rear wheel
Refer to "REAR WHEEL".
- Rear shock absorber
- Swingarm
- Drive chain

Refer to "REAR SHOCK ABSORBER AND SWINGARM".

4. Remove:

- Collar
- Driven sprocket ①
(with the sprocket hub)
- Damper rubber ②





EB706020

INSPECTION

1. Measure:

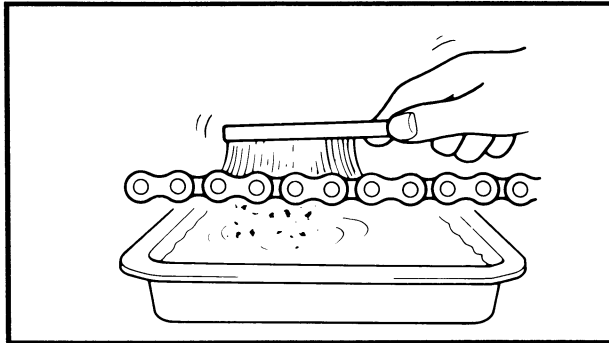
- Ten link length (drive chain) **a**
Out of specification → Replace the drive chain.



Ten link length limit:
151 mm (5.94 in)

NOTE:

- Use a finger to increase tension on the chain.
- A ten link section is the distance between the inside edge of roller ① and the inside edge of roller ⑪.
- Measurements should be taken at two or three different ten link sections.

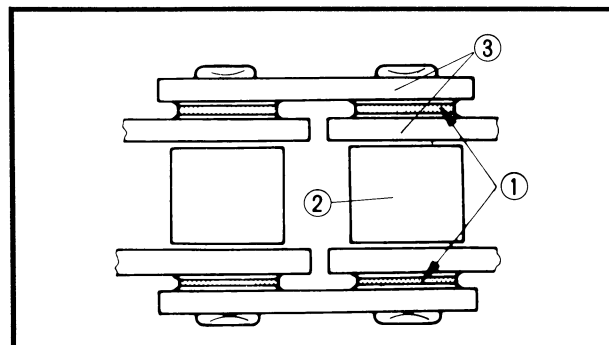
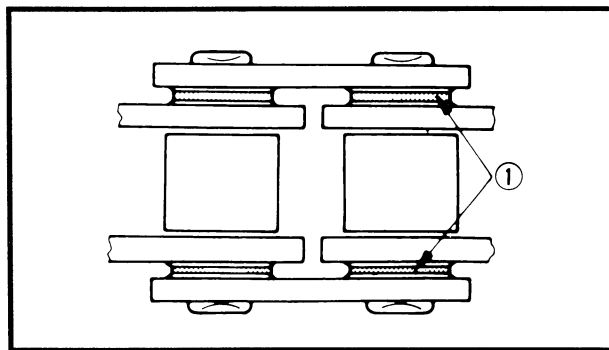


2. Clean:

- Drive chain
Put the drive chain in kerosene and brush off as much dirt as possible. Then, remove the drive chain from the kerosene and dry it off.

CAUTION:

This motorcycle has a drive chain with small rubber O-rings ① between the chain plates. Steam cleaning, high pressure washing, and certain solvents can damage these O-rings. Use only kerosene to clean the drive chain.




3. Inspect:

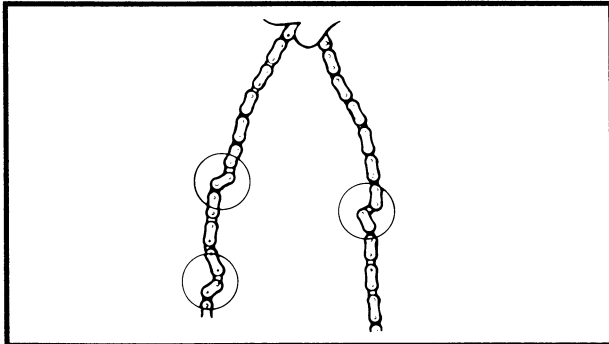
- O-rings (drive chain) ①
Damage → Replace the drive chain.
- Rollers ②
- Side plates ③
Wear/damage → Replace the drive chain.

4. Lubricate:

- Drive chain

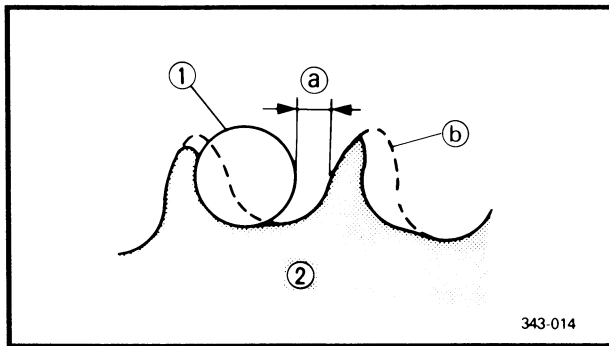


Drive chain lubricant:
SAE 30 ~ 50W motor oil or chain lubricant suitable for "O-ring" chains



5. Inspect:

- Drive chain
Stiffness → Clean and lubricate or replace.




6. Inspect:

- Drive sprocket
 - Driven sprocket
More than 1/4 tooth (a) wear → Replace the sprocket.
Bent teeth → Replace the sprocket.
- (b) Correct
(1) Roller
(2) Sprocket

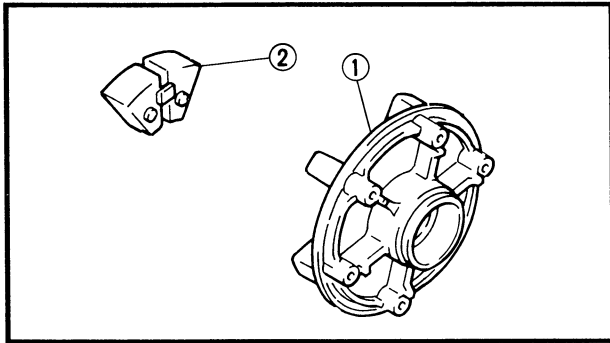
Driven sprocket replacement steps:

- Remove the self-locking nuts and the driven sprocket.
- Use a clean cloth to clean the hub, especially the surfaces in contact with the driven sprocket.
- Install the new driven sprocket.

NOTE: _____
Tighten the self-locking nuts in stages, using a crisscross pattern.



Self-locking nut (driven sprocket):
60 Nm (6.0 m • kg, 43 ft • lb)



7. Inspect:

- Sprocket hub ①
Cracks/damage → Replace.
- Damper rubber ②
Wear/damage → Replace.

EB706030

INSTALLATION

Reverse the "REMOVAL" procedure.
Note the following points.

1. Install:

- Drive chain
- Swingarm
- Rear shock absorber
Refer to "REAR SHOCK ABSORBER AND SWINGARM".
- Rear wheel
Refer to "REAR WHEEL".

2. Install:

- Drive sprocket
- Drive sprocket cover
- Shift pedal link
Refer to "ENGINE ASSEMBLY AND ADJUSTMENT" in CHAPTER 4.

3. Adjust:

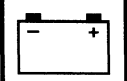
- Drive chain slack
Refer to "DRIVE CHAIN SLACK ADJUSTMENT" in CHAPTER 3.



Drive chain slack:
20 ~ 30 mm (0.8 ~ 1.2 in)

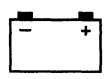
CAUTION

Too little chain slack will overload the engine and other vital parts; keep the slack within the specified limits.



CHAPTER 8. ELECTRICAL

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EB800000

ELECTRICAL

ELECTRICAL COMPONENTS

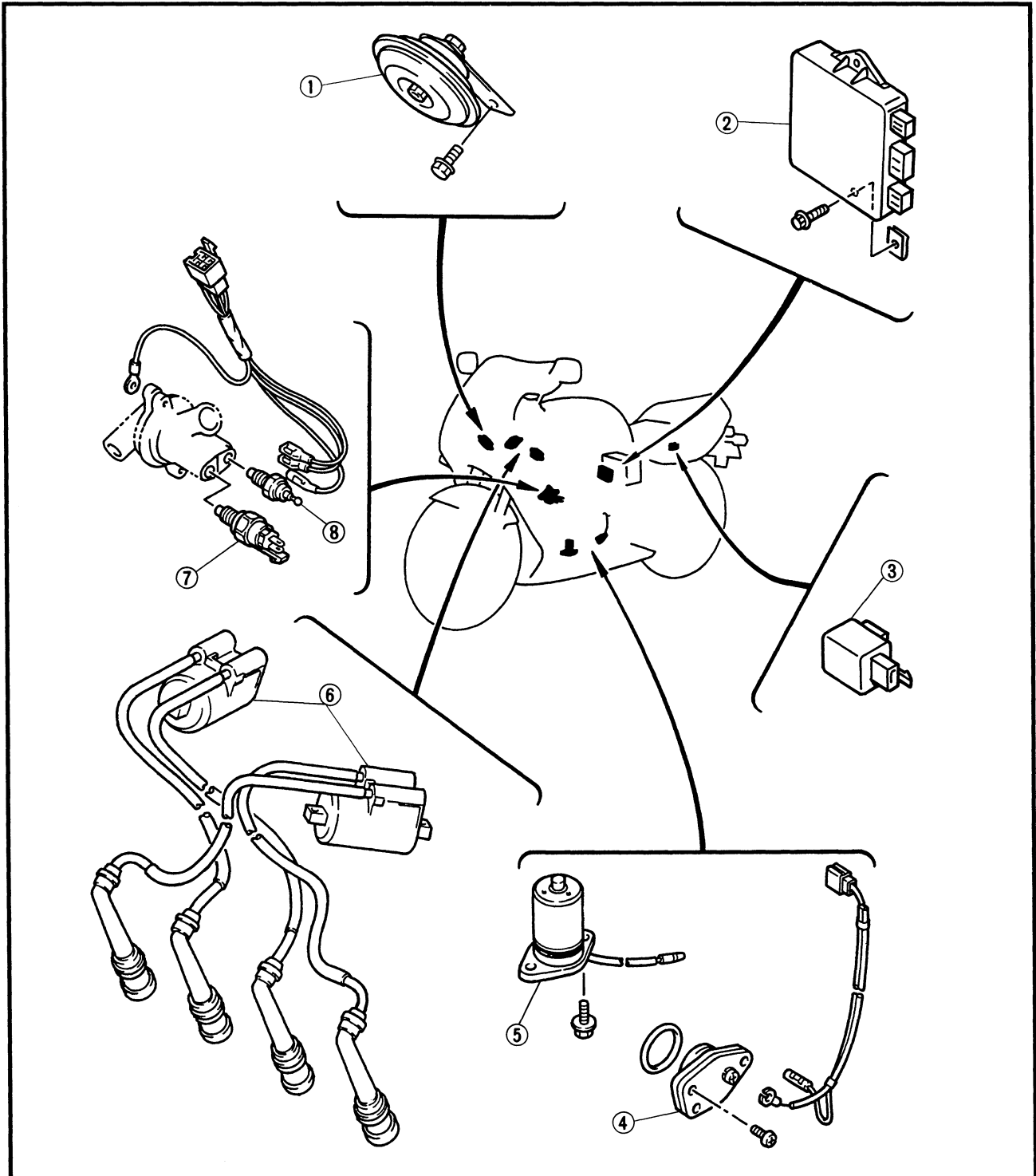
- ① Horn
- ② Ignitor unit
- ③ Flasher relay
- ④ Neutral switch
- ⑤ Oil level switch
- ⑥ Ignition coil
- ⑦ Thermo switch
- ⑧ Thermo unit

IGNITION COIL:

PRIMARY WINDING RESISTANCE:

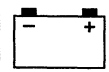
1.87 ~ 2.53 Ω at 20 °C (68°F)

SECONDARY WINDING RESISTANCE:

12 ~ 18 k Ω at 20 °C (68°F)

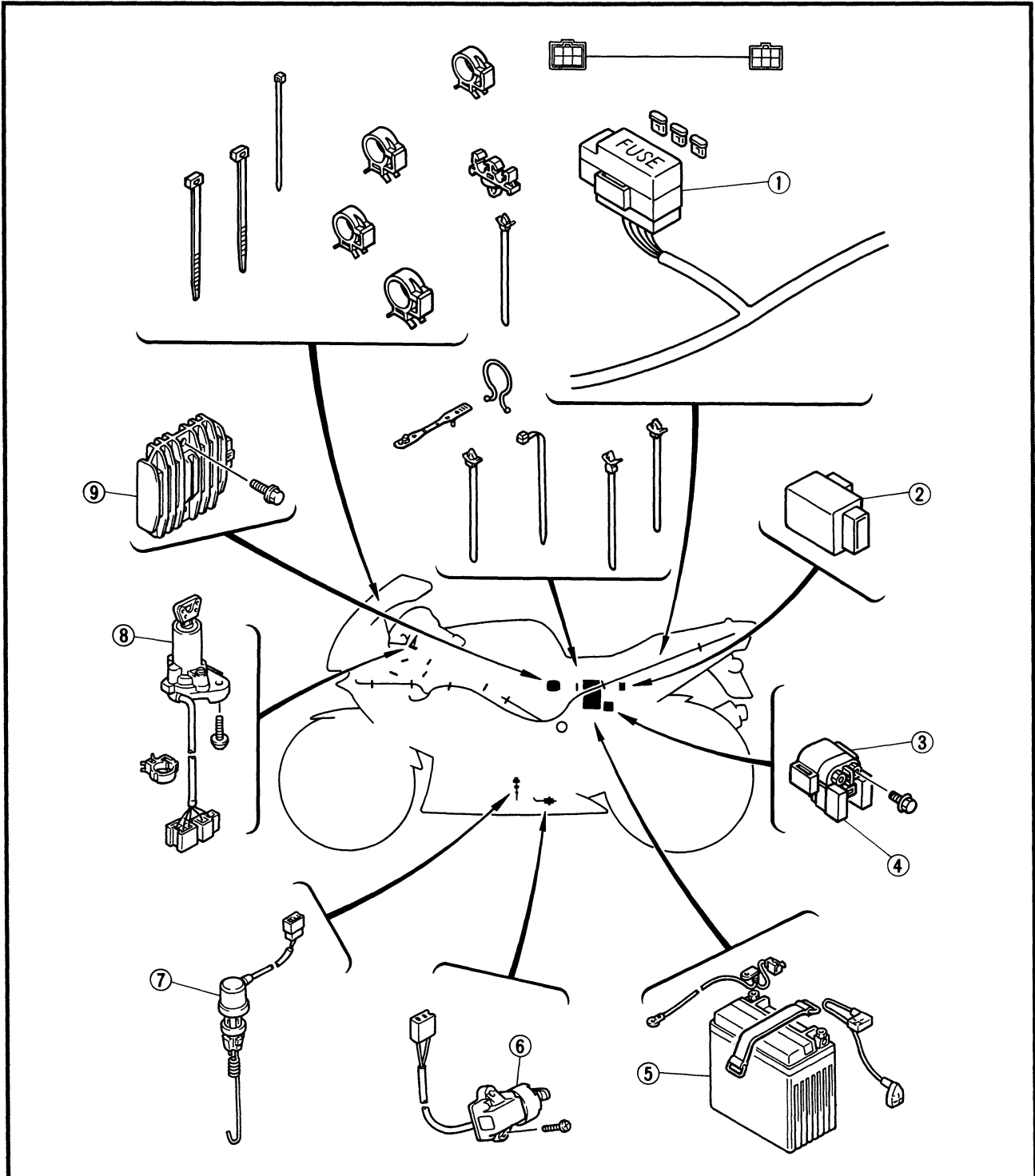
ELECTRICAL COMPONENTS

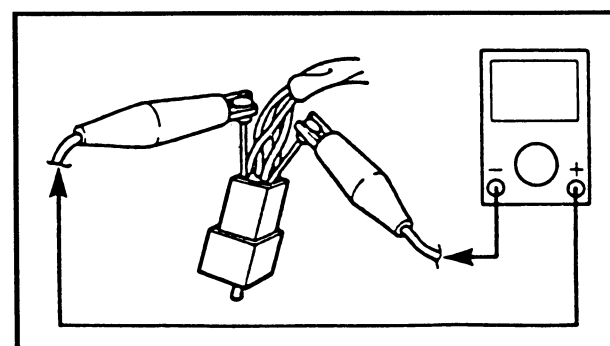
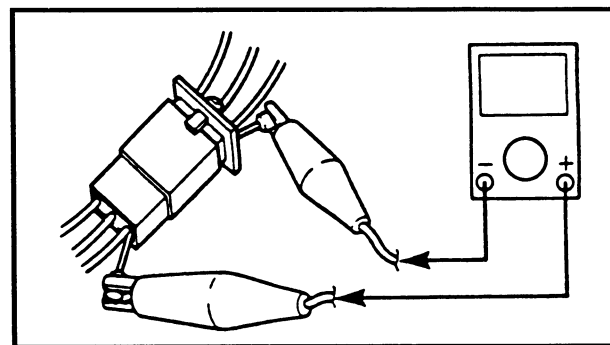
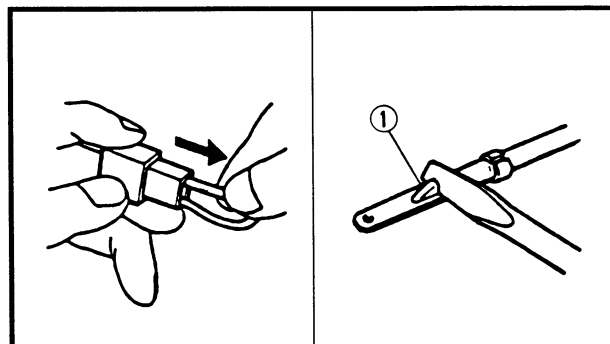
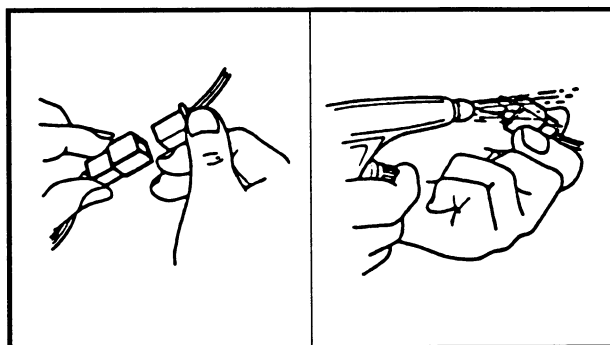
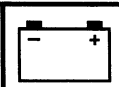
ELEC



- ① Fuse box
- ② Starting circuit cut-off relay
- ③ Starter relay
- ④ Main fuse
- ⑤ Battery
- ⑥ Sidestand switch
- ⑦ Rear brake switch
- ⑧ Main switch
- ⑨ Rectifier/regulator

BATTERY:
CAPACITY:
12V 10AH





EB801000

CHECKING OF CONNECTIONS

Check the connectors for stains, rust, moisture, etc.

1. Disconnect:

- Connector

2. Check:

- Connector

Moisture → Dry each terminal with an air blower.

Stains/rust → Connect and disconnect the terminals several times.

3. Check:

- Connector leads

Looseness → Bend up the pin ① and connect the terminals.

4. Connect:

- Connector terminals

NOTE:

The two terminals "click" together.

5. Check:

- Continuity (using a pocket tester)

NOTE:

- If there is no continuity, clean the terminals.

- When checking the wire harness be sure to perform steps 1 to 3.

- As a quick remedy, use a contact revitalizer available at most part stores.

- Check the connector with a pocket tester as shown.

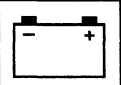
COLOR CODE

B..... Black
 Br Brown
 Ch..... Chocolate
 Dg Dark green
 G Green
 Gy Gray
 L Blue
 Lg Light green

O..... Orange
 R..... Red
 Sb..... Sky blue
 Y..... Yellow
 B/L Black/Blue
 B/R Black/Red
 B/W... Black/White
 B/Y.. Black/Yellow

Br/L Brown/Blue
 Br/W..... Brown/White
 G/R..... Green/Red
 G/Y..... Green/Yellow
 L/B..... Blue/Black
 L/R..... Blue/Red
 L/W Blue/White
 L/Y..... Blue/Yellow

R/B Red/Black
 R/L Red/Blue
 R/W Red/White
 R/Y Red/Yellow
 Y/R Yellow/Red
 W/G White/Green
 W/R..... White/Red
 Y/B Yellow/Black



EB802010

TROUBLESHOOTING

IF THE IGNITION SYSTEM FAILS TO OPERATE (NO SPARK OR INTERMITTENT SPARK):

Procedure

Check:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1.Fuses (main and ignition) 2.Battery 3.Spark plugs 4.Ignition spark gap 5.Spark plug cap resistance 6.Ignition coil resistance | <ol style="list-style-type: none"> 7.Main switch 8.Engine stop switch 9.Neutral switch 10.Sidestand switch 11.Diode (starting circuit cut-off relay) 12.Pickup coil resistance 13.Wiring connection (the entire ignition system) |
|--|---|

NOTE:

- Remove the following part(s) before troubleshooting:
 - 1)Seat
 - 2)Fuel tank
 - 3)Air filter case
 - 4)Bottom cowling
 - 5)Side cowlings (left and right)
- Use the following special tool(s) for troubleshooting.

Dynamic spark tester:
YM-34487

Ignition checker:
90890 - 06754

Pocket tester:
YU-03112/90890 - 03112

EB802011

1.Fuses (main and ignition)

- Remove the fuses.
- Connect the pocket tester ($\Omega \times 1$) to the fuses.
- Check the fuses for continuity.

NO CONTINUITY



Replace the fuses.



EB802012

2.Battery

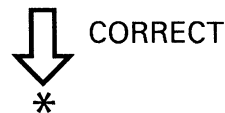
- Check the battery condition. Refer to "BATTERY INSPECTION" in CHAPTER 3.

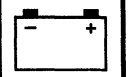
Open-circuit voltage:
12.8 V or more at 20 °C (68°F)

INCORRECT



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





EB802013

3. Spark plugs

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.
Refer to "SPARK PLUG INSPECTION" in CHAPTER 3.

**Standard spark plug:
CR9E/U27ESR-N
NGK/NIPPONDENSO**



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

INCORRECT



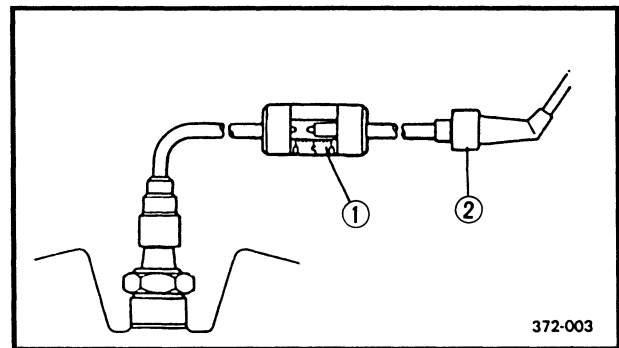
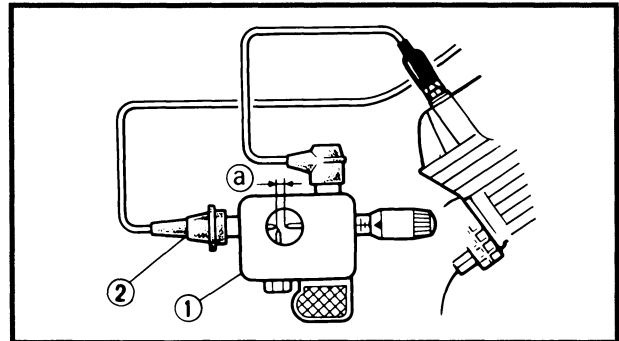
CORRECT

Repair or replace the spark plugs.

EB802014

4. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker/dynamic spark tester ① as shown.
- ② Spark plug cap
- Turn the main switch to "ON".



372-003

- Check the ignition spark gap ③.
- Crank the engine by pushing the starter switch, and increase the spark gap until a misfire occurs.

MEETS SPECIFICATION

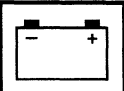


**Minimum spark gap:
6.0 mm (0.24 in)**

The ignition system is not faulty.



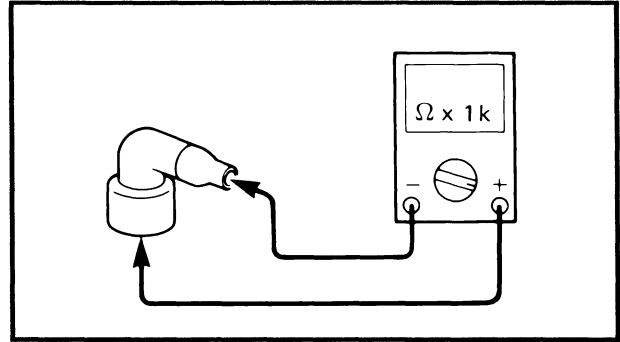
OUT OF SPECIFICATION OR NO SPARK



EB802015

5. Spark plug cap resistance

- Remove the spark plug cap.
- Connect the pocket tester ($\Omega \times 1k$) to the spark plug cap.



- Check if the spark plug cap has the specified resistance.

Spark plug cap resistance:
10 k Ω at 20 °C (68°F)

OUT OF SPECIFICATION

Replace the spark plug cap.

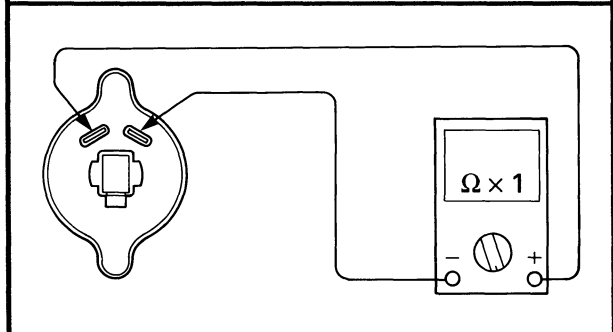


EB802016

6. Ignition coil resistance

- Disconnect the ignition coil connector from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the ignition coil.

Tester (+) lead → Red/Black terminal
Tester (-) lead → Orange (Gray) terminal

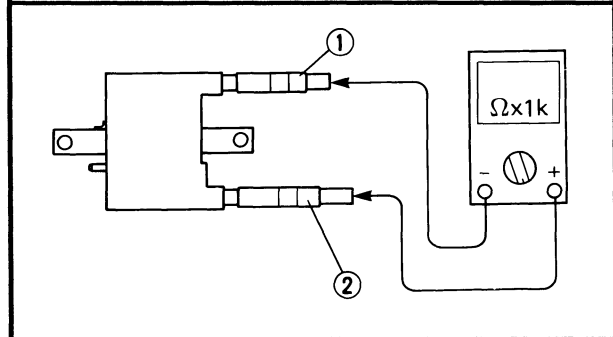


- Check if the primary coil has the specified resistance.

Primary coil resistance:
1.87 ~ 2.53 Ω at 20 °C (68°F)

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

Tester (+) lead → spark plug lead ①
Tester (-) lead → spark plug lead ②

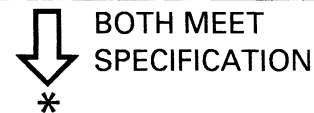


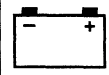
- Check if the secondary coil has the specified resistance.

Secondary coil resistance:
12 ~ 18 k Ω at 20 °C (68°F)

OUT OF SPECIFICATION

Replace the ignition coil.

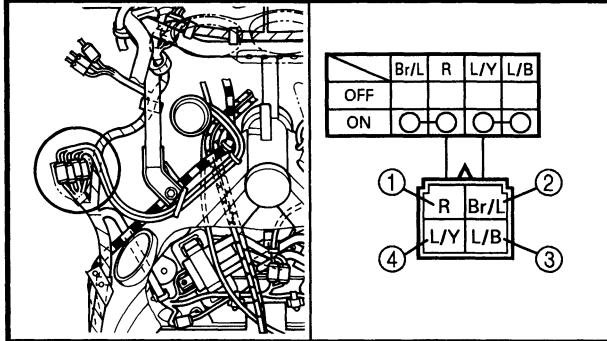




EB802017

7. Main switch

- Disconnect the main switch couplers from the wire harness.
- Check for continuity as follows:
Red ① – Brown/Blue ②
Blue/Black ③ – Blue/Yellow ④



NO CONTINUITY

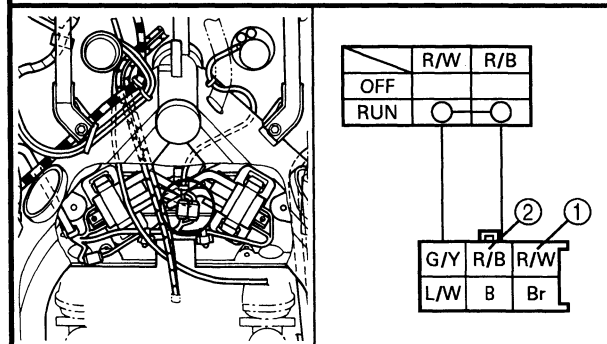
Replace the main switch.



EB802018

8. Engine stop switch

- Disconnect the right handlebar switch coupler from the wire harness.
- Check for continuity as follows:
Red/White ① – Red/Black ②



NO CONTINUITY

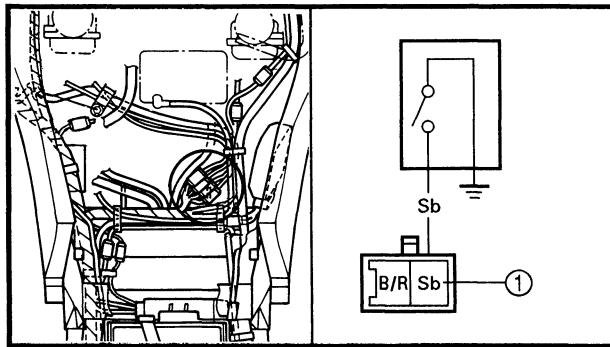
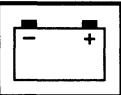
Replace the right handlebar switch.



EB802019

9. Neutral switch

- Disconnect the neutral switch/oil level switch coupler from the wire harness.
- Check for continuity as follows:
Sky blue ① – Ground



NO CONTINUITY

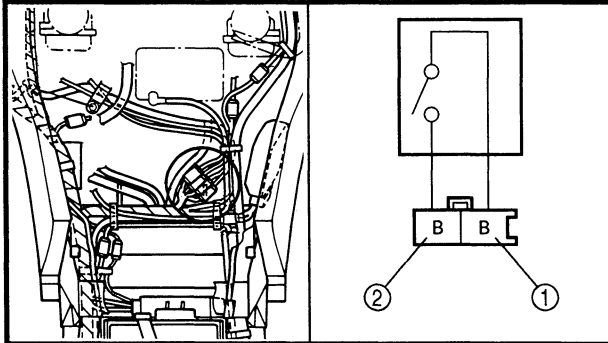
Replace the neutral switch.

CONTINUITY

EB80201A

10. Sidestand switch

- Disconnect the sidestand switch coupler from the wire harness.
- Check for continuity as follows:
Black ① – Black ②



NO CONTINUITY

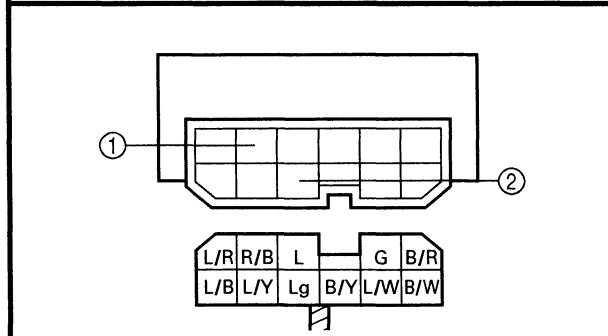
Replace the sidestand switch.

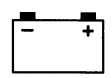
CONTINUITY

EB80201B

11. Diode (starting circuit cut-off relay unit)

- Remove the relay unit from the wire harness.
- Check for continuity as follows:
Blue/Yellow ① – Light green ②





Tester ⊕ lead → Blue/Yellow ①	Continuity
Tester ⊖ lead → Light green ②	
Tester ⊕ lead → Light green ②	No Conti- nuity
Tester ⊖ lead → Blue/Yellow ①	

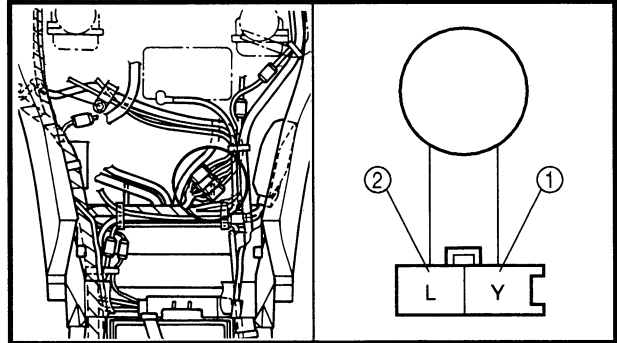
INCORRECT

Replace the relay unit.

↓ CORRECT


EB80201C

12.Pickup coil resistance
<ul style="list-style-type: none"> • Disconnect the pickup coil coupler from the wire harness. • Connect the pocket tester ($\Omega \times 100$) to the pickup coil terminal.
Tester (+) lead → Yellow terminal ① Tester (-) lead → Blue terminal ②



- Check if the pickup coil has the specified resistance.

OUT OF SPECIFICATION

 Pickup coil resistance: 189 ~ 231 Ω at 20 °C (68°F) (Yellow — Blue)
--

Replace the pickup coil.

↓ MEETS SPECIFICATION

EB80201D

13.Wiring connection
<ul style="list-style-type: none"> • Check the connections of the entire ignition system. Refer to "CIRCUIT DIAGRAM".

POOR CONNECTION

Properly connect the ignition system.

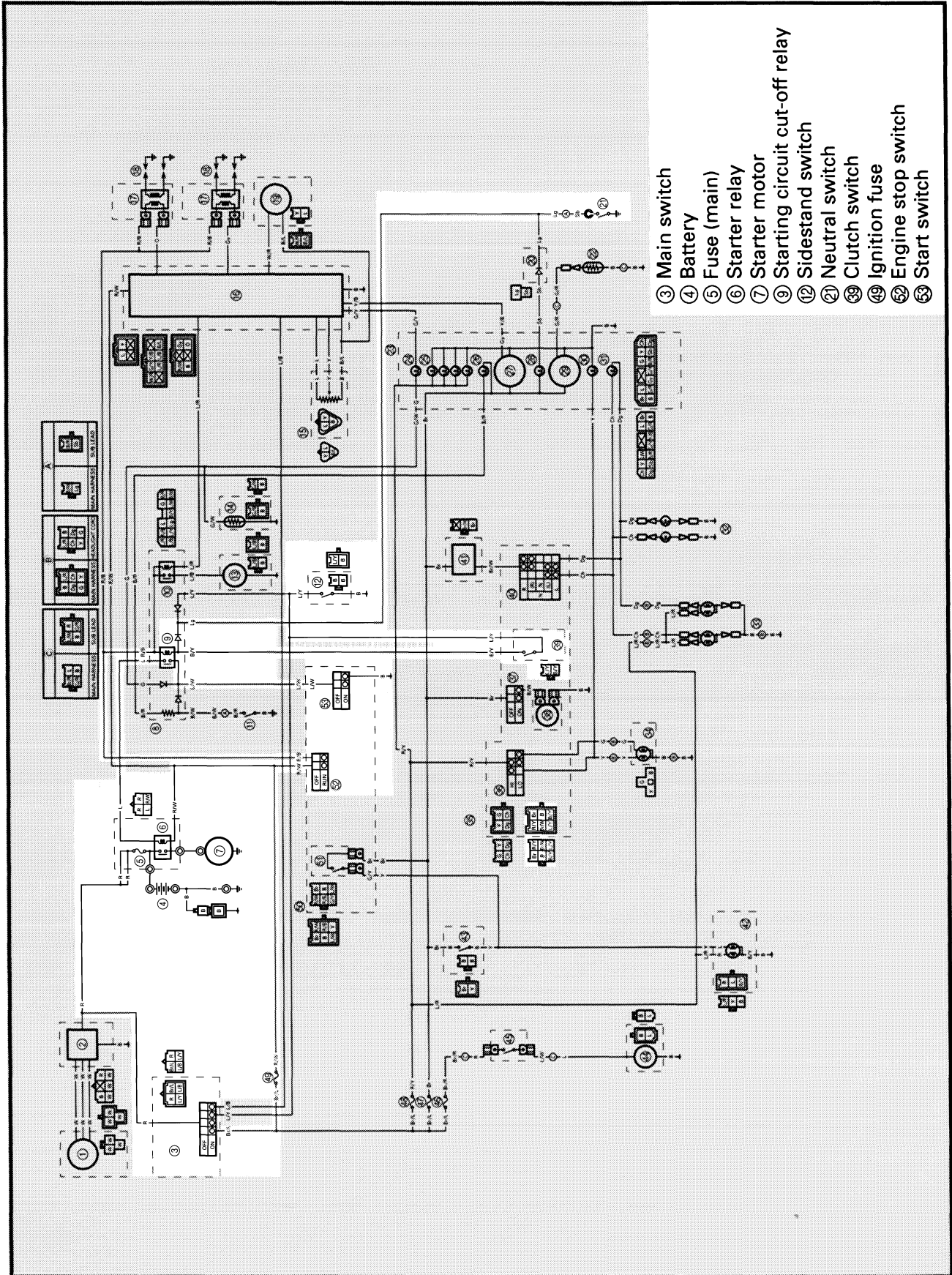
↓ CORRECT

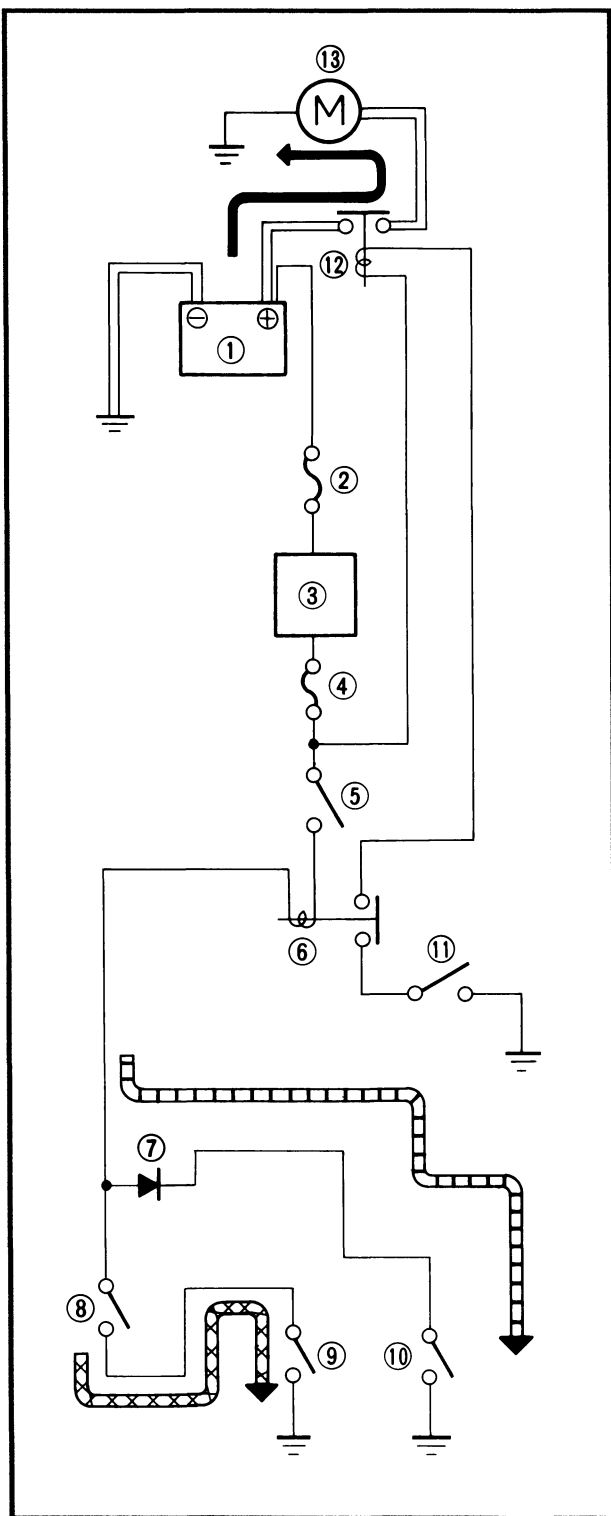
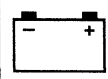
Replace the ignitor unit.

EB803000

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM





EB803010

STARTING CIRCUIT OPERATION

The starting circuit on this model consists of the starter motor, starter relay, and the starting circuit cut-off relay. If the engine stop switch is on "RUN" and the main switch is on "ON" (both switches are closed), the starter motor can operate only if:

The transmission is in neutral (the neutral switch is closed).

or if

The clutch lever is pulled to the handlebar (the clutch switch is closed) and the side-stand is up (the sidestand switch is closed).

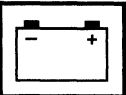
The starting circuit cut-off relay prevents the starter from operating when neither of these conditions have been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor.

When at least one of the above conditions have been met however, the starting circuit cut-off relay is closed, and the engine can be started by pressing the starter switch.

← WHEN THE TRANSMISSION IS IN NEUTRAL

← WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED IN

- ① Battery
- ② Fuse (main)
- ③ Main switch
- ④ Fuse (ignition)
- ⑤ Engine stop switch
- ⑥ Starting circuit cut-off relay
- ⑦ Diode
- ⑧ Clutch switch
- ⑨ Sidestand switch
- ⑩ Neutral switch
- ⑪ Start switch
- ⑫ Starter relay
- ⑬ Starter motor



EB803020

TROUBLESHOOTING

IF THE STARTER MOTOR FAILS TO OPERATE:

Procedure

Check:

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Fuses (main and ignition) 2. Battery 3. Starter motor 4. Starting circuit cut-off relay 5. Starter relay 6. Main switch 7. Engine stop switch | <ol style="list-style-type: none"> 8. Neutral switch 9. Sidestand switch 10. Clutch switch 11. Start switch 12. Diode (starting circuit cut-off relay) 13. Wiring connection (the entire starting system) |
|--|---|

NOTE:

- Remove the following part(s) before troubleshooting:
 - 1) Seat
 - 2) Fuel tank
 - 3) Air filter case
 - 4) Side cowling (left)
- Use the following special tool(s) for troubleshooting.



Pocket tester:
YU-03112/90890-03112

EB802011

1. Fuses (main and ignition)

- Remove the fuses.
- Connect the pocket tester ($\Omega \times 1$) to the fuses.
- Check the fuses for continuity.

NO CONTINUITY



Replace the fuse(s).



EB802012

2. Battery

- Check the battery condition. Refer to "BATTERY INSPECTION" in CHAPTER 3.

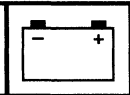
Open-circuit voltage:
12.8 V or more at 20 °C (68°F)

INCORRECT



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

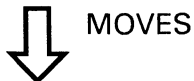
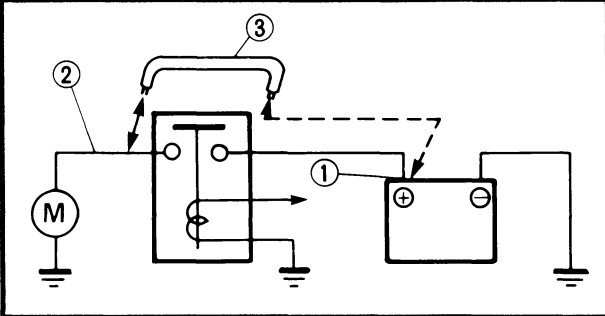




EB803021

3. Starter motor

- Connect the battery positive terminal ① and starter motor cable ② using a jumper lead ③ *.
- Check the operation of the starter motor.



*

⚠ WARNING

- A wire that is used as a jumper lead must have the equivalent capacity or more as that of the battery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.

DOES NOT MOVE



Repair or replace the starter motor.

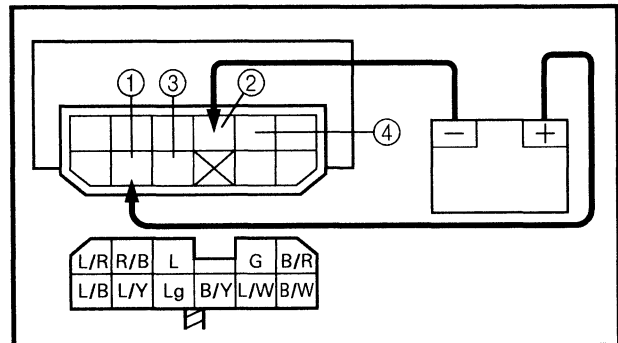
EB803023

4. Starting circuit cut-off relay (relay unit)

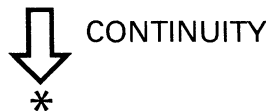
- Remove the relay unit from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay unit terminals.

Battery (+) terminal → Red/Black terminal ①
Battery (-) terminal → Black/Yellow terminal ②

Tester (+) lead → Blue terminal ③
Tester (-) lead → Blue/White terminal ④



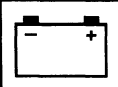
- Check the starting circuit cut-off relay for continuity.



NO CONTINUITY



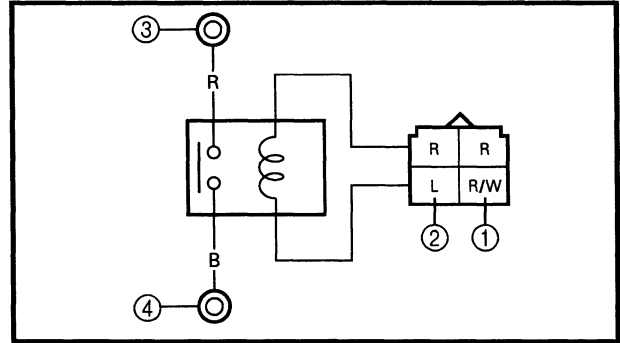
Replace the starting circuit cut-off relay.



EB803024

5. Starter relay

- Disconnect the relay unit coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay unit coupler terminals.



Battery (+) terminal → Red/White terminal ①
Battery (-) terminal → Blue terminal ②

Tester (+) lead → Red terminal ③
Tester (-) lead → Black terminal ④

- Check the starter relay for continuity.

NO CONTINUITY

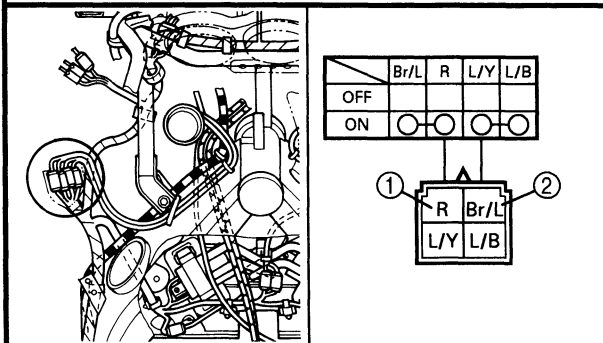
Replace the starter relay.



EB802017

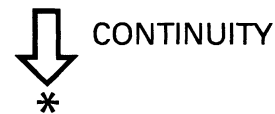
6. Main switch

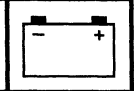
- Disconnect the main switch couplers from the wire harness.
- Check for continuity as follows:
 Red ① – Brown/Blue ②



NO CONTINUITY

Replace the main switch.

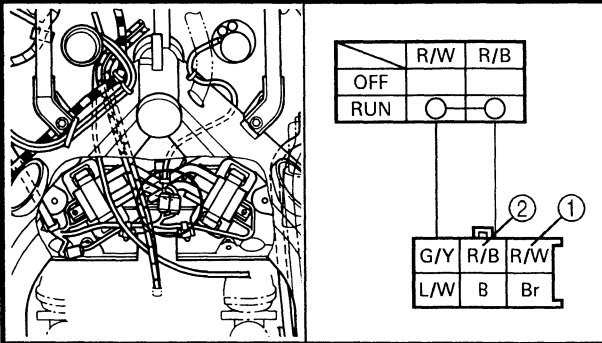




EB802018

7.Engine stop switch

- Disconnect the right handlebar switch coupler from the wire harness.
- Check for continuity as follows:
Red/White ① – Red/Black ②



NO CONTINUITY



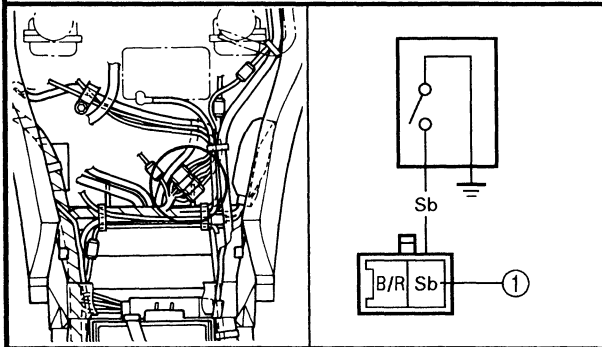
Replace the right handlebar switch.



EB802019

8.Neutral switch

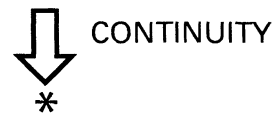
- Disconnect the neutral switch/oil level switch coupler from the wire harness.
- Check for continuity as follows:
Sky blue ① – Ground



NO CONTINUITY



Replace the neutral switch.

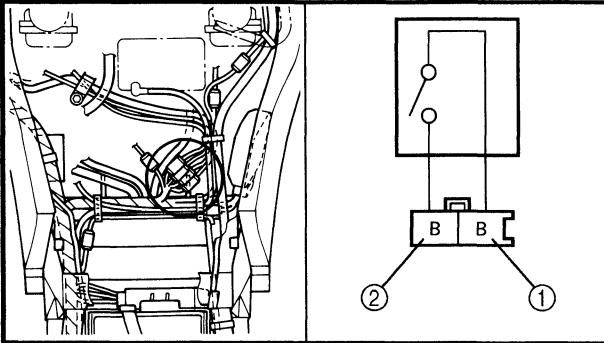




EB80201A

9. Sidestand switch

- Disconnect the sidestand switch coupler from the wire harness.
- Check for continuity as follows:
Black ① – Black ②



NO CONTINUITY



Replace the sidestand switch.

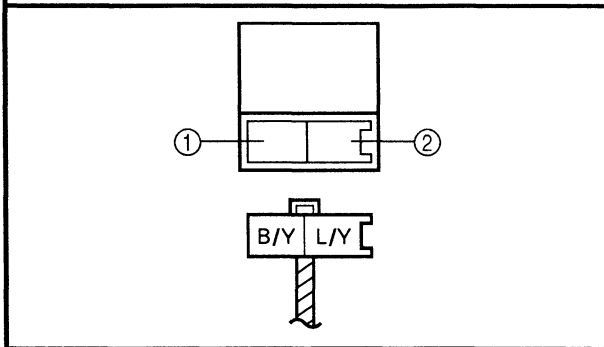


CONTINUITY

EB803025

10. Clutch switch

- Disconnect the clutch switch coupler from the wire harness.
- Check for continuity as follows:
Black/Yellow ① – Blue/Yellow ②



NO CONTINUITY

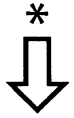


Replace the clutch switch.



CONTINUITY

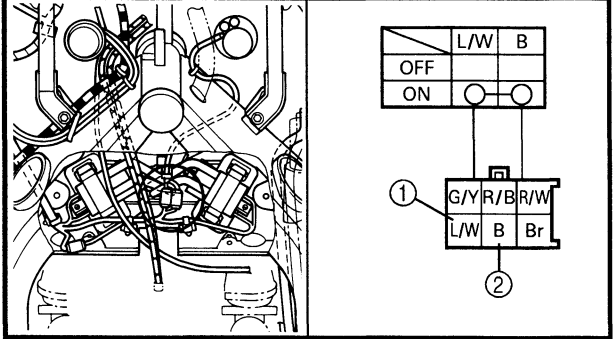
*



EB803027

11. Start switch

- Disconnect the right handlebar switch coupler from the wire harness.
- Check for continuity as follows:
Blue/White ① – Black ②



NO CONTINUITY



Replace the right handlebar switch.

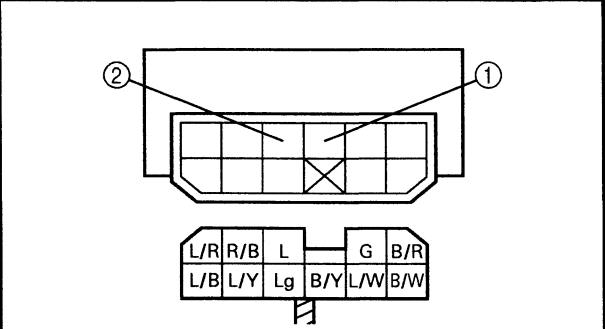


CONTINUITY

EB803026

12. Diode (starting circuit cut-off relay)

- Remove the relay unit from the wire harness.
- Check for continuity as follows:
Black/Yellow ① – Light green ②



INCORRECT



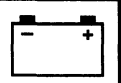
Replace the relay unit.

Tester (+) lead → Black/Yellow ①	Continuity
Tester (-) lead → Light green ②	
Tester (+) lead → Light green ②	No Continuity
Tester (-) lead → Black/Yellow ①	



CORRECT

*



EB803028

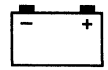
13. Wiring connection

- Check the connections of the entire starting system.
Refer to "CIRCUIT DIAGRAM".

POOR CONNECTION



Properly connect the starting system.

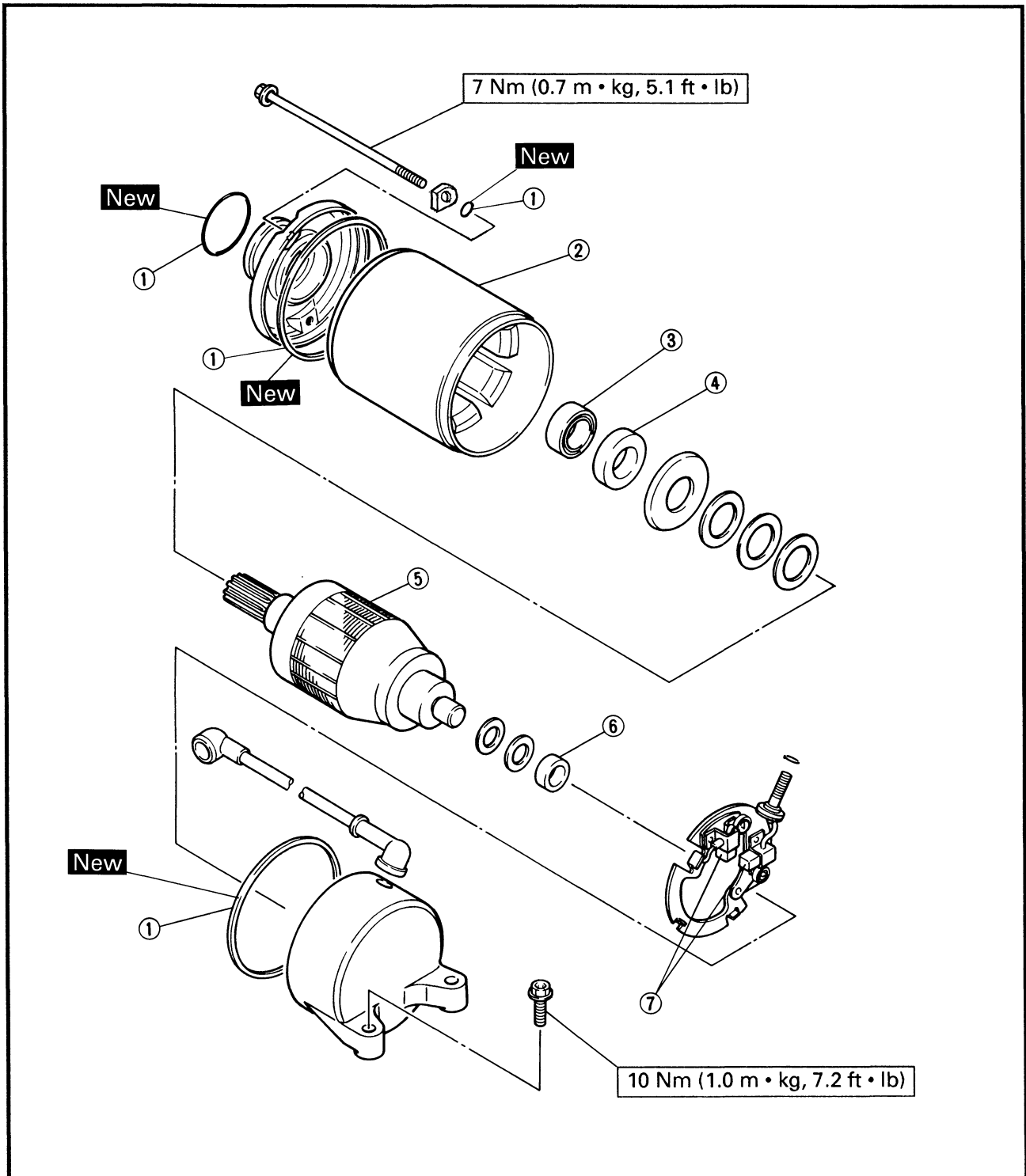


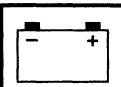
EB803030

STARTER MOTOR

- ① O-rings
- ② Brackets
- ③ Yoke
- ④ Armature
- ⑤ Commutator
- ⑥ Brushes

A	ARMATURE COIL RESISTANCE: 0.008 ~ 0.019 Ω at 20°C (68°F)
B	BRUSH WEAR LIMIT: 4 mm (0.16 in)
C	COMMUTATOR WEAR LIMIT: 27 mm (1.06 in)
D	MICA UNDERCUT: 0.7 mm (0.03 in)





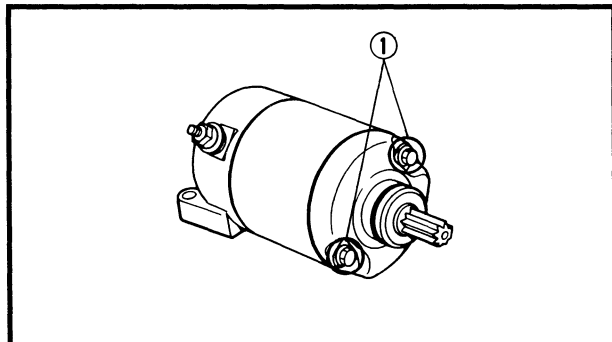
EB803031

Removal

1.Remove:

- Starter motor

Refer to "ENGINE REMOVAL" in CHAPTER 4.

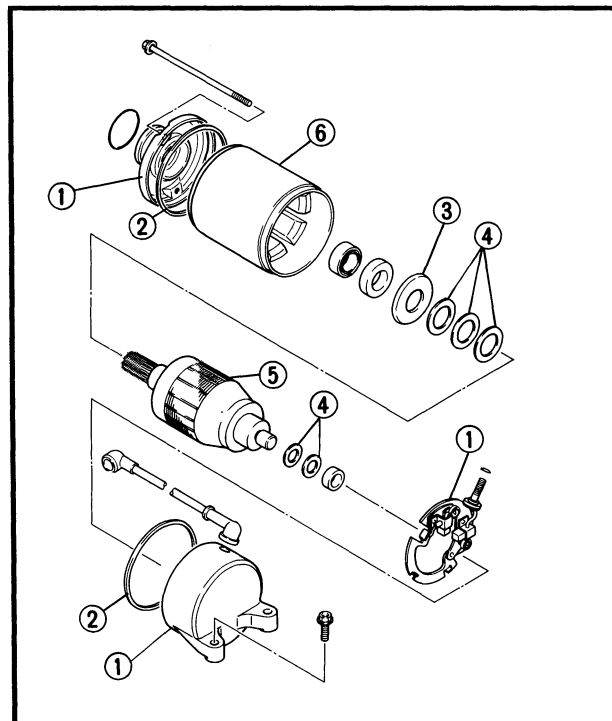


EB803032

Disassembly

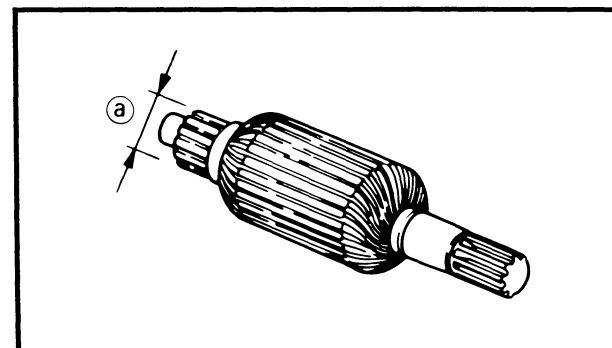
1.Remove:

- Bolts ①
(with washers and O-rings)



2.Remove:

- Brackets ①
- Gaskets ②
- Washer ③
- Shims ④
- Armature ⑤
- Yoke ⑥
- Brush holder ⑦



EB803034

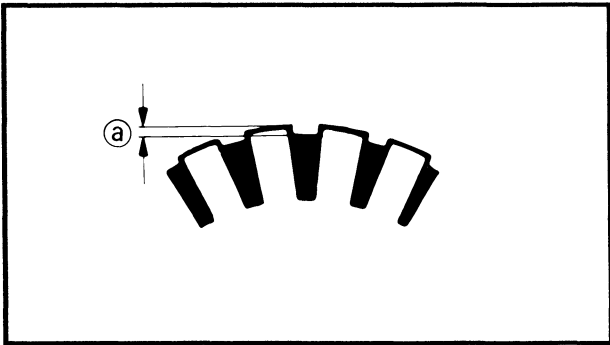
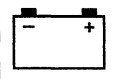
Inspection and repair

1.Inspect:

- Commutator
Dirty → Clean it with #600 grit sandpaper.

2.Measure:

- Commutator diameter ②
Out of specification → Replace the starter motor.



Commutator wear limit:
27 mm (1.06 in)

3. Measure:

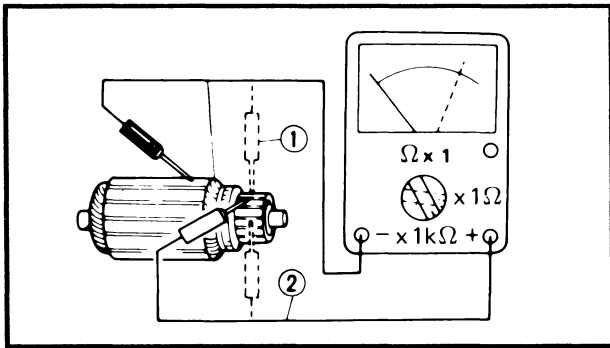
- Mica undercut ①
Out of specification → Scrape the mica to the proper measurement using a hacksaw blade which has been grounded to fit the commutator.



Mica undercut:
0.7 mm (0.03 in)

NOTE:

The mica insulation of the commutator must be undercut to ensure proper operation of the commutator.



4. Inspect:

- Armature coil resistances (insulation/continuity)
Defects → Replace the starter motor.

Inspection steps:

- Connect the pocket tester for the continuity ① and insulation ② checks.
- Measure the armature coil resistances.



Armature coil continuity resistance ①:
0.008 ~ 0.019 Ω at 20 °C (68°F)
Armature coil insulation resistance ②:
More than 1 MΩ at 20 °C (68°F)

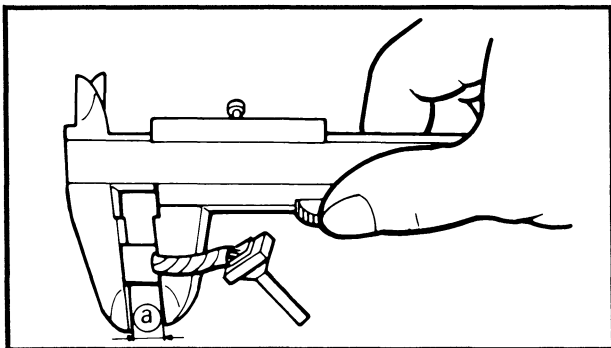
- If the resistance is incorrect, replace the starter motor.

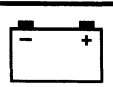
5. Measure:

- Brush length ①
Out of specification → Replace.



Brush length wear limit:
4 mm (0.16 in)



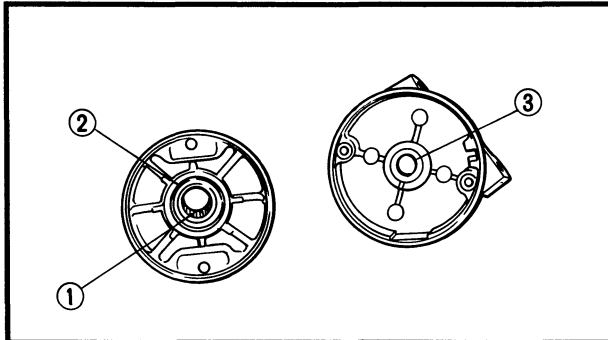


6.Measure:

- Brush spring force
Fatigue/out of specification → Replace as a set.

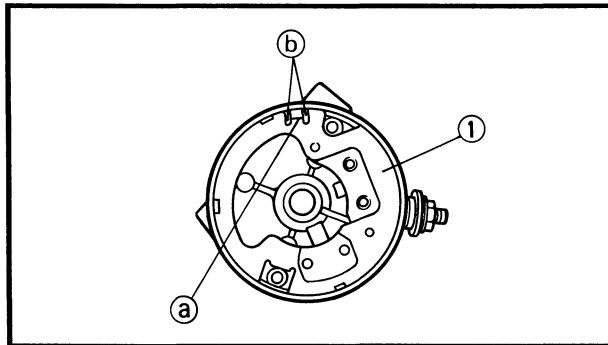


Brush spring force:
570 ~ 920 g (20.1 ~ 32.5 oz)



7.Inspect:

- Bearing ①
Roughness → Replace.
- Oil seal ②
- Bushing ③
Wear/damage → Replace.



EB803036

Assembly

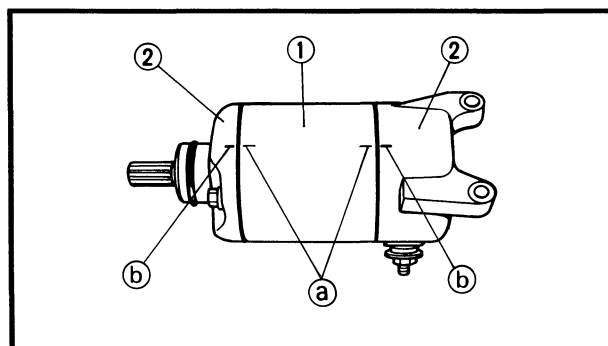
Reverse the "Removal" procedure.
Note the following points.

1.Install:

- Brush seat ①

NOTE:

Align the projection (a) on the brush seat with the slot (b) on the housing.

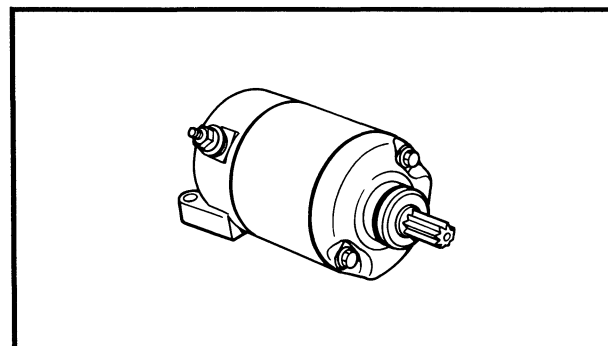


2.Install:

- Yoke ①
- Brackets ②

NOTE:

Align the match marks (a) on the yoke with the match marks (b) on the brackets.



3.Install:

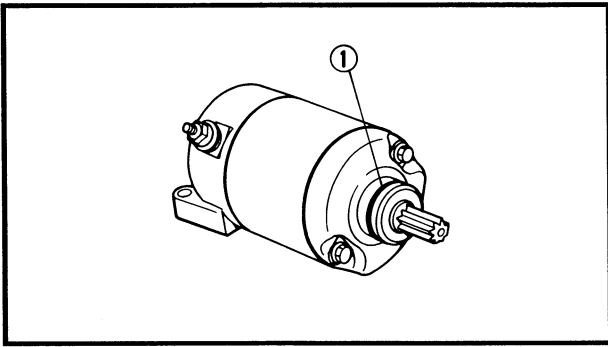
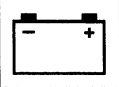
- O-rings
- Washers
- Bolts

⚠ WARNING

Always use new O-rings.



Bolt (yoke assembly):
7 Nm (0.7 m · kg, 5.1 ft · lb)



EB803037

Installation

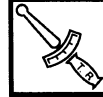
1. Install:

- Starter motor

NOTE:

Apply a thin coat of grease onto the O-ring

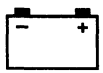
①.



Bolt (starter motor):

10 Nm (1.0 m • kg, 7.2 ft • lb)

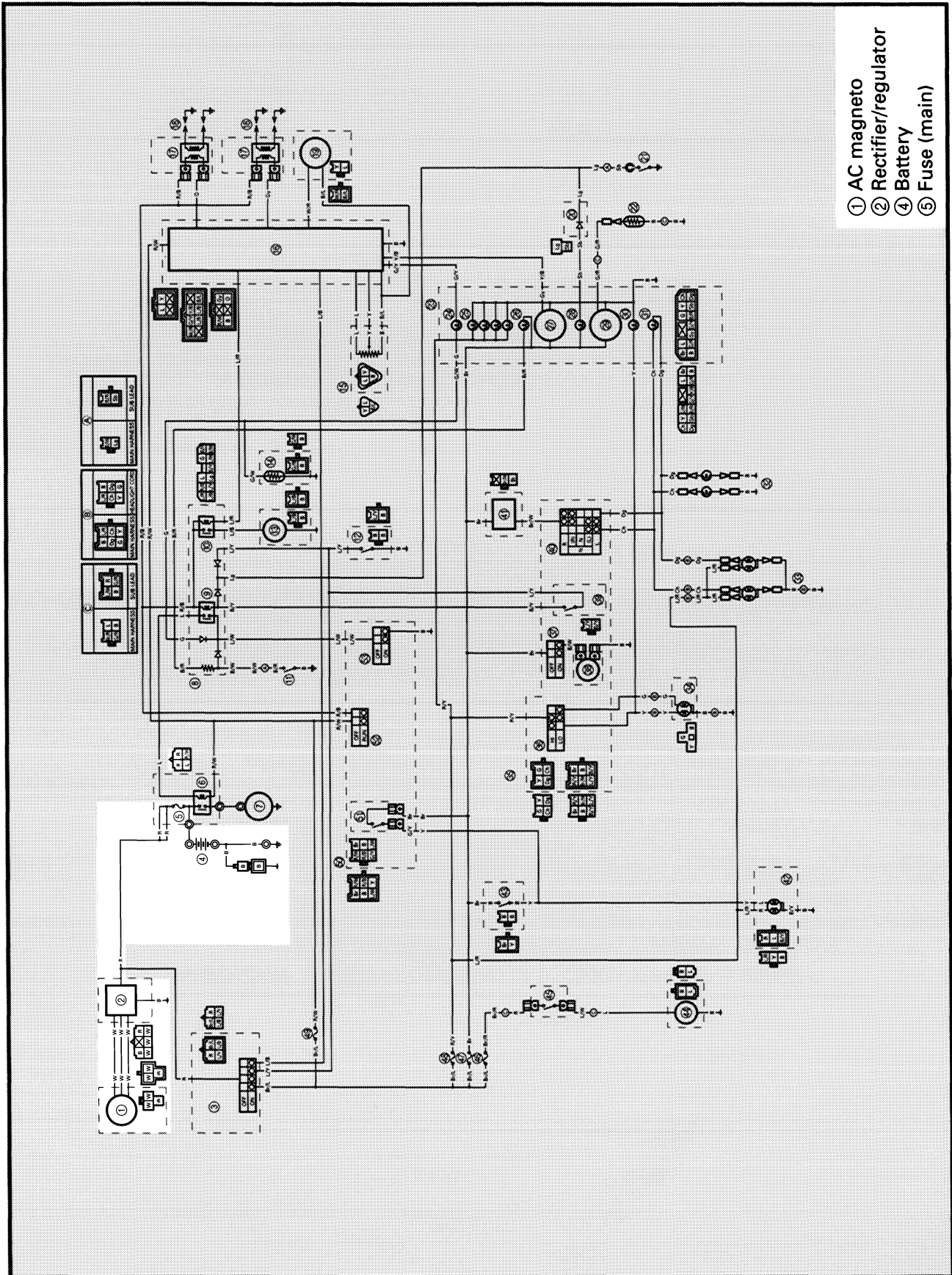
Refer to "ENGINE ASSEMBLY AND ADJUSTMENT" in CHAPTER 4.



EB804000

CHARGING SYSTEM

CIRCUIT DIAGRAM



EB804010
TROUBLESHOOTING

IF THE BATTERY IS NOT CHARGED:

Procedure

Check:

- | | |
|--|---|
| <ul style="list-style-type: none"> 1.Fuse (main) 2.Battery 3.Charging voltage | <ul style="list-style-type: none"> 4.Stator coil resistance 5.Wiring connections (the entire charging system) |
|--|---|

NOTE:

- Remove the following part(s) before troubleshooting:
 - 1)Seat
 - 2)Fuel tank
- Use the following special tool(s) for troubleshooting.

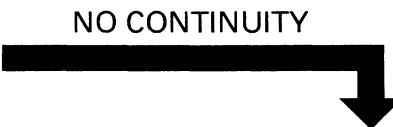


Engine tachometer:
YU-8036-A/90890-03113
Pocket tester:
YU-03112/90890-03112

EB802011

1.Fuses (main)

- Remove the fuses.
- Connect the pocket tester ($\Omega \times 1$) to the fuses.
- Check the fuses for continuity.



Replace the fuses.

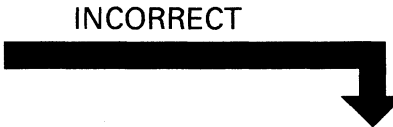


EB802012

2.Battery

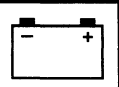
- Check the battery condition. Refer to "BATTERY INSPECTION" in CHAPTER 3.

Open-circuit voltage:
12.8 V or more at 20 °C (68°F)



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





EB804011

3. Charging voltage

- Connect the engine tachometer to the spark plug lead.
- Connect the pocket tester (DC 20 V) to the battery.

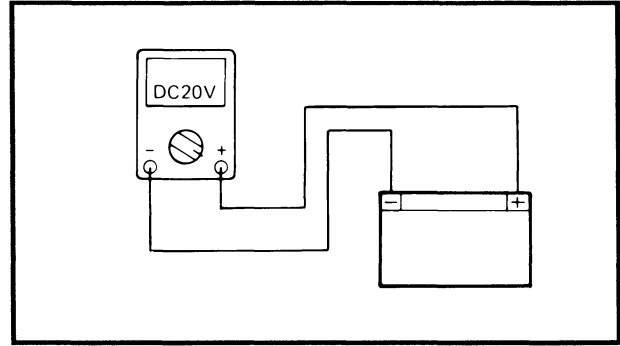
Tester (+) lead → Battery (+) terminal
Tester (-) lead → Battery (-) terminal

- Start the engine and accelerate to about 5,000 r/min.

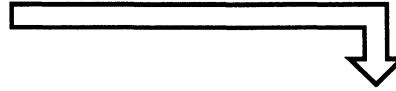


Charging voltage:
14.7 V at 5,000 r/min

NOTE: _____
 Use a fully charged battery.



MEETS SPECIFICATION



The charging circuit is not faulty.

OUT OF SPECIFICATION

EB804012

4. Stator coil resistance

- Remove the generator cover.
- Connect the pocket tester ($\Omega \times 1$) to the stator coils.

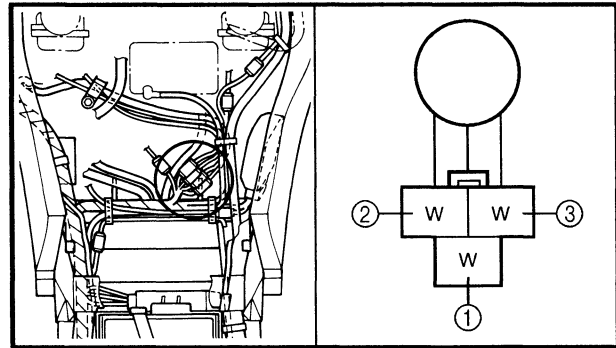
Tester (+) lead → White terminal ①
Tester (-) lead → White terminal ②

Tester (+) lead → White terminal ①
Tester (-) lead → White terminal ③

- Measure the stator coil resistance.



Stator coil resistance:
0.36 ~ 0.44 Ω at 20°C (68°F)

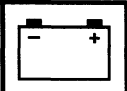


OUT OF SPECIFICATION

Replace the stator coil assembly.

BOTH MEET SPECIFICATION

*



EB804015

5.Wiring connections

- Check the connections of the entire charging system.
Refer to "CIRCUIT DIAGRAM".



CORRECT

Replace the rectifier/regulator.

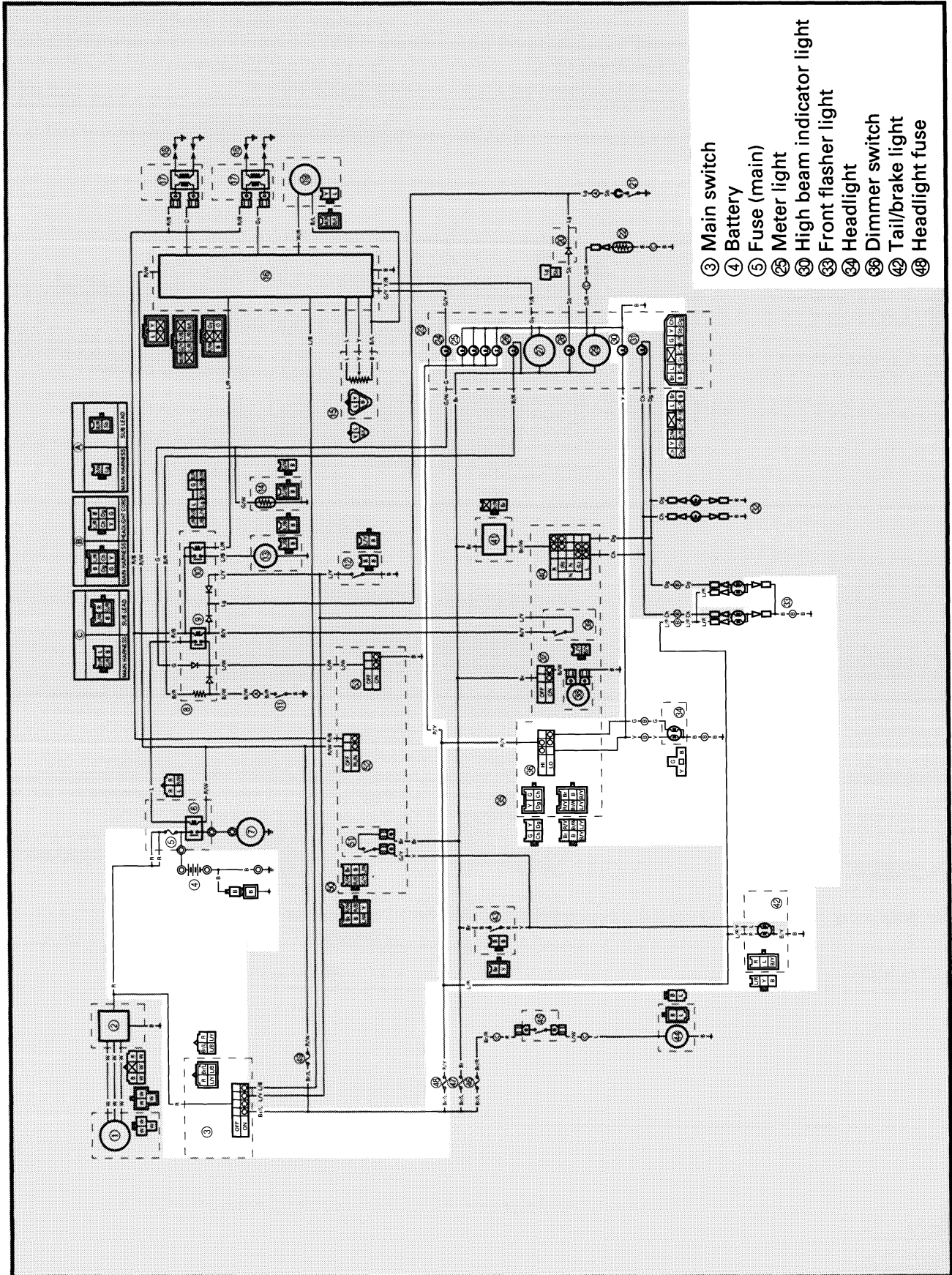
POOR CONNECTION



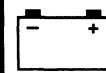
Properly connect the charging system.

EB805000

LIGHTING SYSTEM
CIRCUIT DIAGRAM



- ③ Main switch
- ④ Battery
- ⑤ Fuse (main)
- ②⑤ Meter light
- ②⑥ High beam indicator light
- ③③ Front flasher light
- ③④ Headlight
- ③⑤ Dimmer switch
- ④② Tail/brake light
- ④⑧ Headlight fuse



EB805010

TROUBLESHOOTING

IF THE HEADLIGHT, HIGH BEAM INDICATOR LIGHTS, TAILLIGHT, AUXILIARY LIGHT AND/OR METER LIGHT FAIL TO COME ON:

Procedure

Check:

- | | |
|---|--|
| <ol style="list-style-type: none"> 1.Fuses (main and head) 2.Battery 3.Main switch | <ol style="list-style-type: none"> 4.Dimmer switch 5.Wiring connections
(the entire lighting system) |
|---|--|

NOTE:

- Remove the following part(s) before troubleshooting:
 - 1)Seat
 - 2)Fuel tank
 - 3)Air filter case
 - 4)Front cowling assembly
- Use the following special tool(s) for troubleshooting.



Pocket tester:
YU-03112/90890-03112

EB802011

1.Fuses (main and head)

- Remove the fuses.
- Connect the pocket tester ($\Omega \times 1$) to the fuses.
- Check the fuses for continuity.

NO CONTINUITY



Replace the fuses.



EB802012

2.Battery

- Check the battery condition. Refer to "BATTERY INSPECTION" in CHAPTER 3.

Open-circuit voltage:
12.8 V or more at 20 °C (68°F)

INCORRECT



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

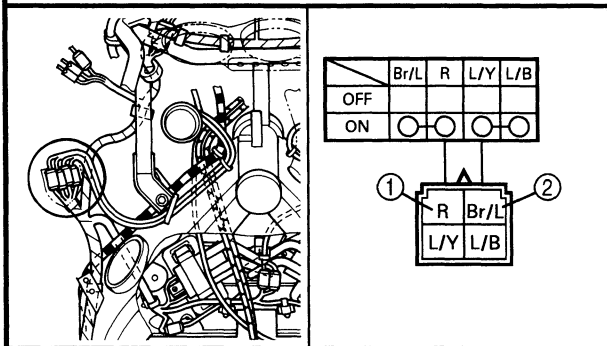




EB802017

3. Main switch

- Disconnect the main switch couplers from the wire harness.
- Check for continuity as follows:
Red ① – Brown/Blue ②



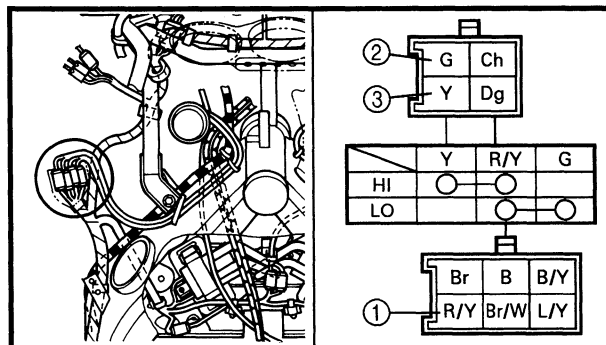
NO CONTINUITY

Replace the main switch.



4. Dimmer switch

- Disconnect the left handlebar switch couplers from the wire harness.
- Turn the dimmer switch to "LO".
- Check for continuity as follows:
Red/Yellow ① – Green ②
- Turn the dimmer switch to "HI".
- Check for continuity as follows:
Red/Yellow ① – Yellow ③



NO CONTINUITY

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



EB805013

5. Wiring connections

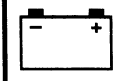
- Check the connections of the entire lighting system.
Refer to "CIRCUIT DIAGRAM".

POOR CONNECTION

Properly connect the lighting system.



Check the condition of each of the lighting system's circuits.
Refer to "LIGHTING SYSTEM CHECK".



EB805020

LIGHTING SYSTEM CHECK

1.If the headlight and the high beam indicator light fail to come on:

1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.

CONTINUITY

NO CONTINUITY

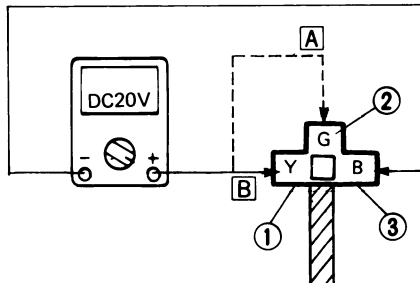
Replace the bulb and/or bulb socket.

2.Voltage

- Connect the pocket tester (DC 20 V) to the headlight and high beam indicator light couplers.

- [A] When the dimmer switch is on "LO".
- [B] When the dimmer switch is on "HI".

Headlight connector



Headlight:

Tester (+) lead → Yellow lead ① or Green lead ②

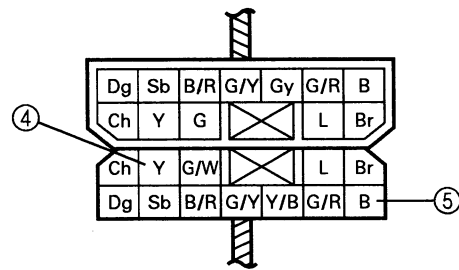
Tester (-) lead → Black lead ③

High beam indicator light:

Tester (+) lead → Yellow lead ④

Tester (-) lead → Black lead ⑤

Meter connector



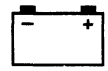
- Turn the main switch to "ON".
- Turn the dimmer switch to "LO" or "HI".
- Check the voltage (12 V) of the "Green" and "Yellow" leads on the bulb socket connector.

MEETS SPECIFICATION

OUT OF SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

This circuit is not faulty.

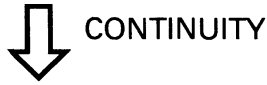


EB805021

2.If the meter light fails to come on:

1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.



2.Voltage

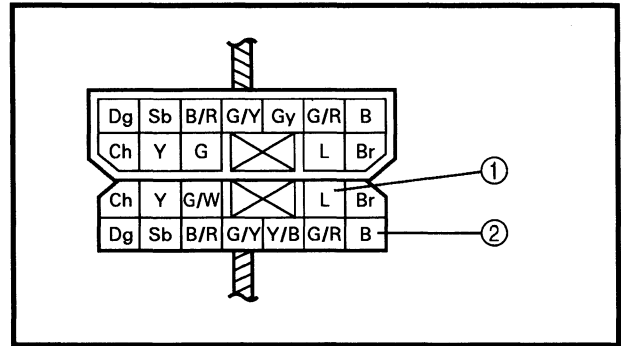
- Connect the pocket tester (20 V) to the bulb socket coupler.

Tester (+) lead → **Blue terminal** ①
Tester (-) lead → **Black terminal** ②

NO CONTINUITY



Replace the bulb and/or bulb socket.



- Turn the main switch to "ON".
- Check the voltage (12 V) of the "blue" lead on the bulb socket connector.



This circuit is not faulty.

OUT OF SPECIFICATION



The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

EB805022

3.If the taillight fails to come on:

1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.



2.Voltage

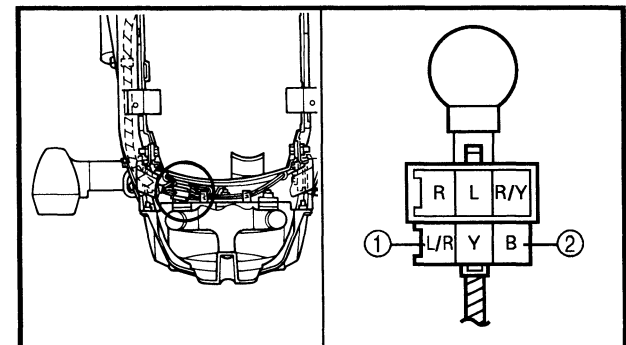
- Connect the pocket tester (DC 20 V) to the bulb socket connector.

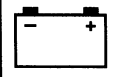
Tester (+) lead → **Blue/Red terminal** ①
Tester (-) lead → **Black terminal** ②

NO CONTINUITY



Replace the bulb and/or bulb socket.





- Turn the main switch to "ON".
- Check the voltage (12 V) of the "Blue/Red" lead on the bulb socket connector.

↓ MEETS SPECIFICATION

This circuit is not faulty.

OUT OF SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

EB805023

4.If the position light fails to come on:

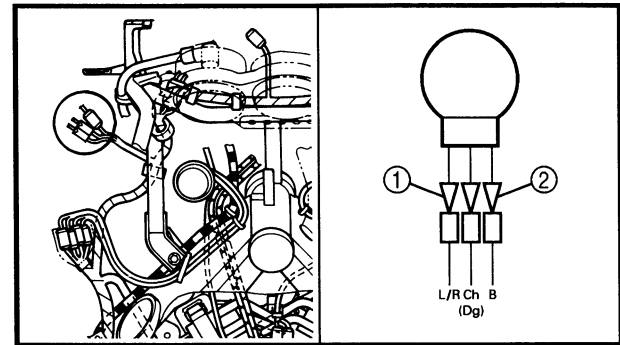
- 1.Bulb and bulb socket
- Check the bulb and bulb socket for continuity.

↓ CONTINUITY

- 2.Voltage
- Connect the pocket tester (DC 20 V) to the bulb socket connector.
- Tester (+) lead** → **Blue/Red terminal** ①
Tester (-) lead → **Black terminal** ②

NO CONTINUITY

Replace the bulb and/or bulb socket.



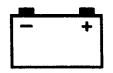
- Turn the main switch to "ON".
- Turn the lights switch to "ON" or "PO".
- Check the voltage (12 V) of the "Blue/Red" lead on the bulb socket connector.

↓ MEETS SPECIFICATION

This circuit is not faulty.

OUT OF SPECIFICATION

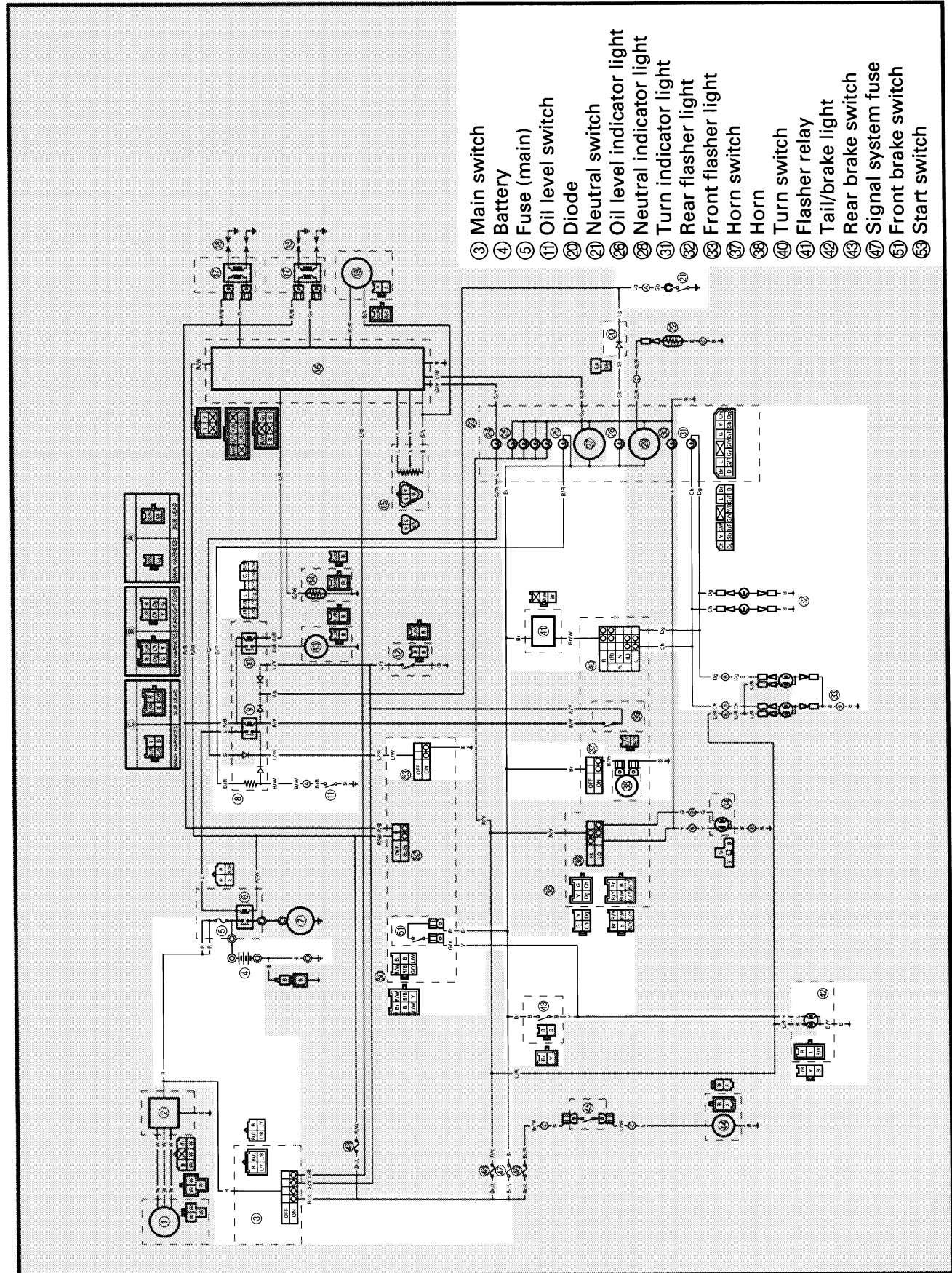
The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.



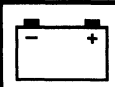
EB806000

SIGNAL SYSTEM

CIRCUIT DIAGRAM



- ③ Main switch
- ④ Battery
- ⑤ Fuse (main)
- ⑪ Oil level switch
- ⑫ Diode
- ⑰ Neutral switch
- ⑲ Oil level indicator light
- ⑳ Neutral indicator light
- ㉑ Turn indicator light
- ㉒ Rear flasher light
- ㉓ Front flasher light
- ㉔ Horn switch
- ㉕ Horn
- ㉖ Turn switch
- ㉗ Flasher relay
- ㉘ Tail/brake light
- ㉙ Rear brake switch
- ㉚ Signal system fuse
- ㉛ Front brake switch
- ㉜ Start switch



EB806010

TROUBLESHOOTING

**IF THE FLASHER LIGHT, BRAKE LIGHT AND/OR INDICATOR LIGHT FAIL TO COME ON:
IF THE HORN FAILS TO SOUND:**

Procedure

Check:

- 1.Fuses (main and signal)
- 2.Battery
- 3.Main switch
- 4.Wiring connections (the entire signal system)

NOTE:

- Remove the following part(s) before troubleshooting:
 - 1)Seat
 - 2)Fuel tank
 - 3)Air filter case
 - 4)Front cowling assembly
- Use the following special tool(s) for troubleshooting.



**Pocket tester:
YU-03112/90890-03112**

EB802011

1.Fuses (main and signal)

- Remove the fuses.
- Connect the pocket tester ($\Omega \times 1$) to the fuses.
- Check the fuses for continuity.

NO CONTINUITY



Replace the fuses.



CONTINUITY

EB802012

2.Battery

- Check the battery condition. Refer to "BATTERY INSPECTION" in CHAPTER 3.

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

INCORRECT

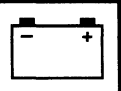


- Clean the battery terminals.
- Recharge or replace the battery.



CORRECT

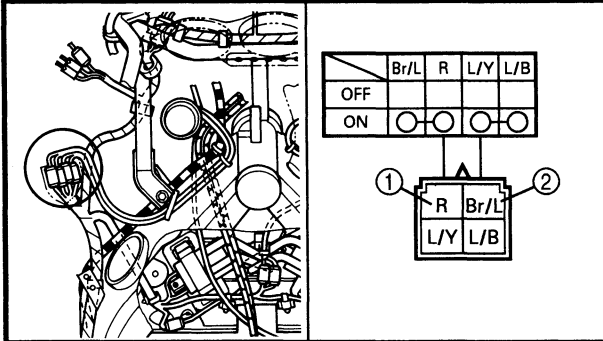
*



EB802017

3. Main switch

- Disconnect the main switch coupler from the wire harness.
- Check for continuity as follows:
Red ① – Brown/Blue ②



NO CONTINUITY

Replace the main switch.



CONTINUITY

EB806011

4. Wiring connections

- Check the connections of the entire signal system.
Refer to "CIRCUIT DIAGRAM".

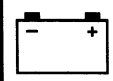
POOR CONNECTION

Properly connect the signal system.



CORRECT

Check the condition of each of the signal system's circuits.
Refer to "SIGNAL SYSTEM CHECK".

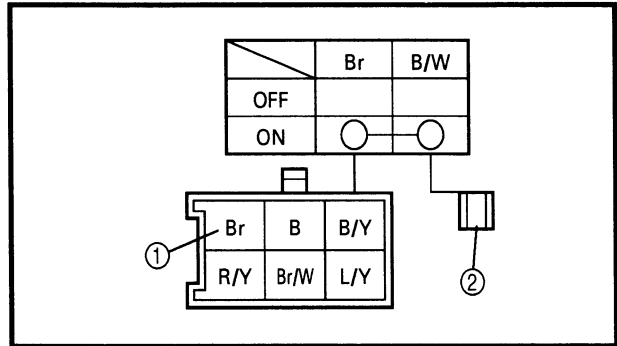


EB806020

SIGNAL SYSTEM CHECK

1.If the horn fails to sound:

1.Horn switch



- Disconnect the left handlebar switch coupler from the wire harness.
- Check for continuity as follows:
Brown ① – Black/White ②

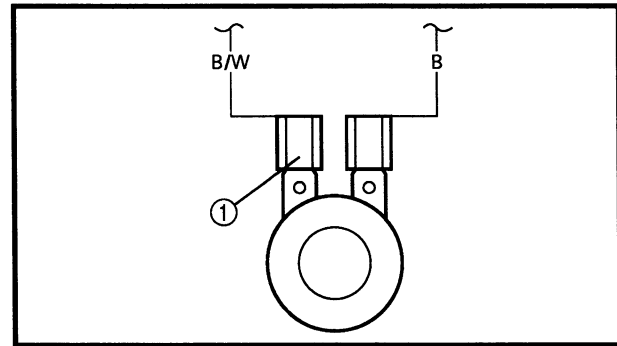
NO CONTINUITY

Replace the left handlebar switch.

CONTINUITY

2.Voltage

- Connect the pocket tester (DC 20 V) to the horn lead.
- Tester (+) lead → Black/White lead ①**
Tester (-) lead → Frame ground



- Turn the main switch to "ON".
- Push the horn switch.
- Check the voltage (12 V) of the "Black/White" lead at the horn terminal.

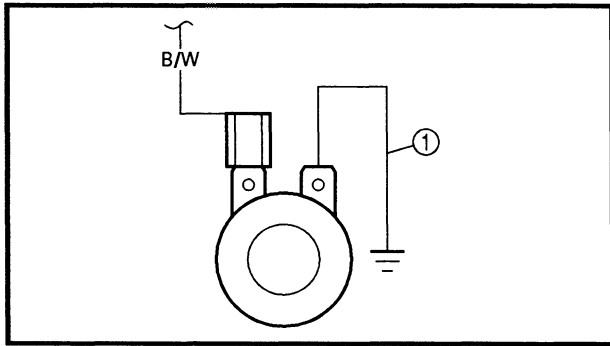
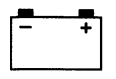
OUT OF SPECIFICATION

The wiring circuit from the main switch to the horn terminal is faulty, repair it.

MEETS SPECIFICATION

3.Horn

- Disconnect the "Black" lead at the horn terminal.
- Connect a jumper lead ① to the horn terminal and ground the jumper lead.
- Turn the main switch to "ON".
- Push the horn switch.



HORN SOUNDS

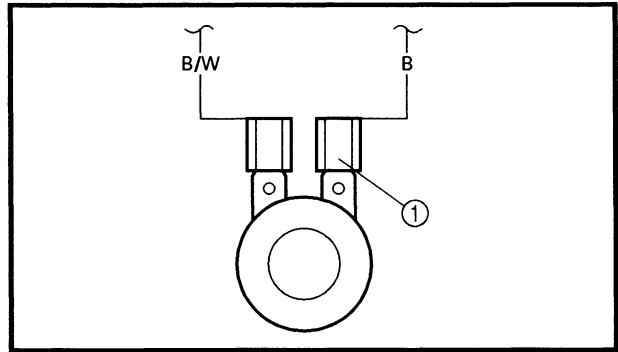
The horn is not faulty.

HORN DOES NOT SOUND

4. Voltage

- Connect the pocket tester (DC 20 V) to the horn at the "Black" terminal.

Tester (+) lead → Black lead ①
 Tester (-) lead → Frame ground



OUT OF SPECIFICATION

Replace the horn.

- Turn the main switch to "ON".
- Check the voltage (12 V) of the "Black" lead at the horn terminal.

MEETS SPECIFICATION

Adjust or replace the horn.

EB806022

2.If the brake light fails to come on:

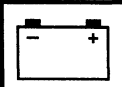
1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.

NO CONTINUITY

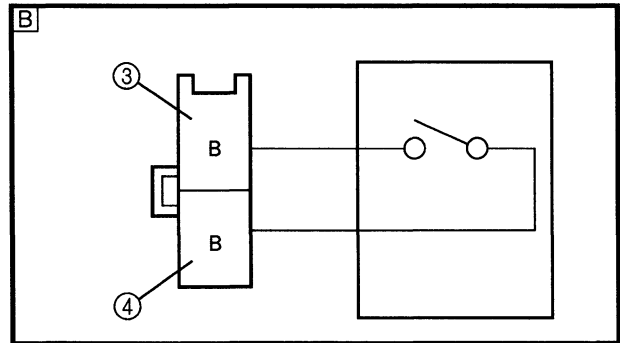
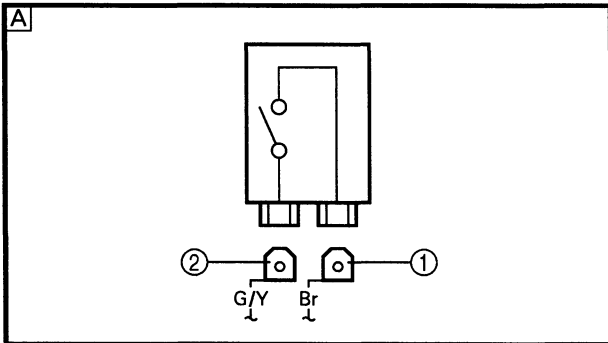
Replace the bulb and/or bulb socket.

CONTINUITY
*



2.Brake switch

- Disconnect the front brake switch leads.
- Disconnect the rear brake switch coupler from the wire harness.
- Check for continuity as follows:
Brown ① – Green/Yellow ②
Black ③ – Black ④



- A Front brake switch
- B Rear brake switch

NO CONTINUITY

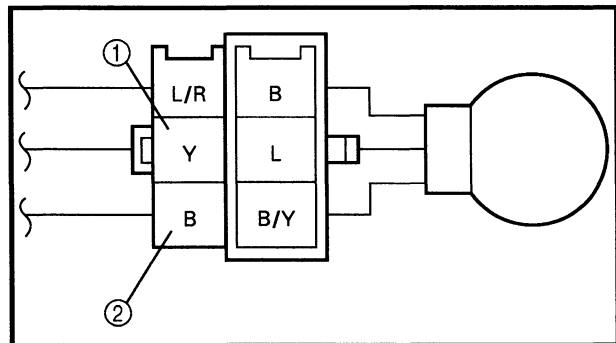
CONTINUITY

Replace the brake switch.

3.Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

Tester (+) lead → Yellow terminal ①
Tester (-) lead → Black terminal ②



OUT OF SPECIFICATION

- Turn the main switch to "ON".
- The brake lever is pulled in or the brake pedal is pressed down.
- Check the voltage (12 V) of the "Yellow" lead on the bulb socket connector.

MEETS SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

This circuit is not faulty.



EB806023

3.If the flasher light and/or turn indicator light fails to blink:

1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.

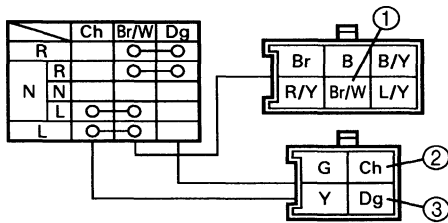
CONTINUITY

NO CONTINUITY

Replace the bulb and/or bulb socket.

2.Turn switch

- Disconnect the left handlebar switch couplers from the wire harness.
- Check for continuity as follows:
Brown/White ① – Chocolate ②
Brown/White ① – Dark green ③



CONTINUITY

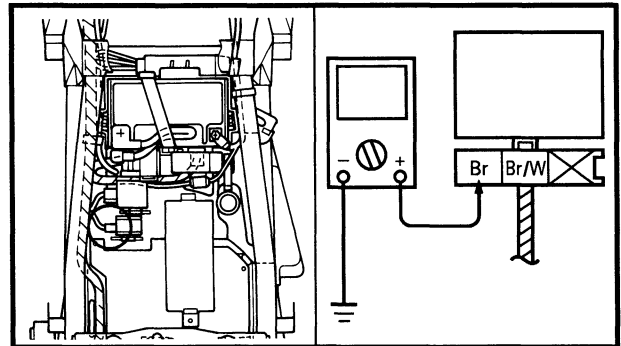
NO CONTINUITY

Replace the left handlebar switch.

3.Voltage

- Connect the pocket tester (DC 20 V) to the flasher relay coupler.

Tester (+) lead → Brown terminal ①
Tester (-) lead → Frame ground

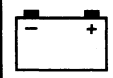


- Turn the main switch to "ON".
- Check the voltage (12 V) of the "Brown" ① lead at the flasher relay terminal.

MEETS SPECIFICATION

OUT OF SPECIFICATION

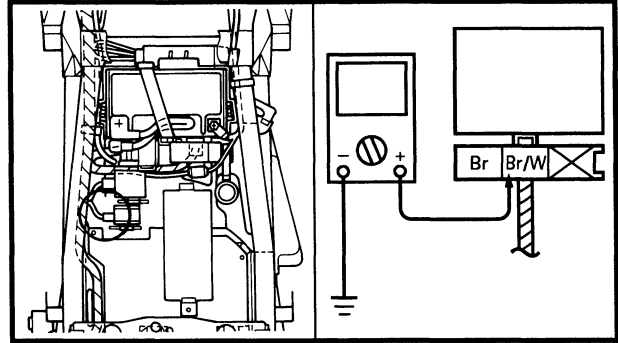
The wiring circuit from the main switch to the flasher relay connector is faulty, repair it.



4.Voltage

- Connect the pocket tester (DC 20 V) to the flasher relay coupler.

Tester (+) lead → **Brown/White terminal** ①
Tester (-) lead → **Frame ground**



OUT OF SPECIFICATION



The flasher relay is faulty, replace it.

- Turn the main switch to "ON".
- Turn the turn switch to "L" or "R".
- Check the voltage (12 V) on the "Brown/White" ① lead at the flasher relay terminal.

MEETS SPECIFICATION

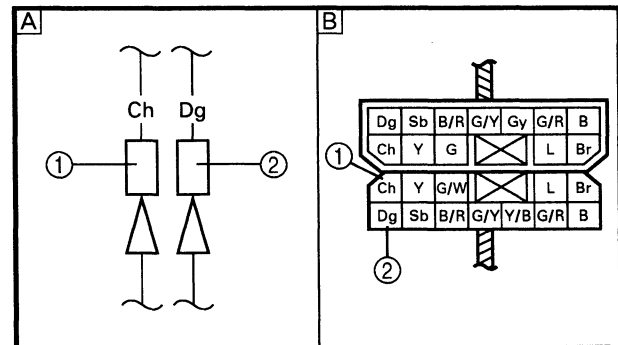
5.Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

Ⓐ Flasher light
 Ⓑ Turn indicator light

At the flasher light (left):
Tester (+) lead → **Chocolate lead** ①
Tester (-) lead → **Frame ground**

At the flasher light (right):
Tester (+) lead → **Dark green lead** ②
Tester (-) lead → **Frame ground**



OUT OF SPECIFICATION

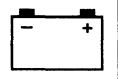


The wiring circuit from the turn switch to the bulb socket connector is faulty, repair it.

- Turn the main switch to "ON".
- Turn the turn switch to "L" or "R".
- Check the voltage (12 V) of the "Chocolate" lead or "Dark green" lead on the bulb socket connector.

MEETS SPECIFICATION

This circuit is not faulty.



EB806024

4.If the neutral indicator light fails to come on:

1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.

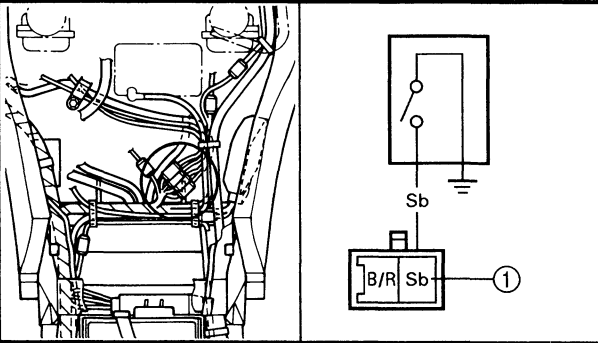
CONTINUITY

NO CONTINUITY

Replace the bulb and/or bulb socket.

2.Neutral switch

- Disconnect the neutral switch/oil level switch coupler from the wire harness.
- Check for continuity as follows:
Sky blue ① – Ground



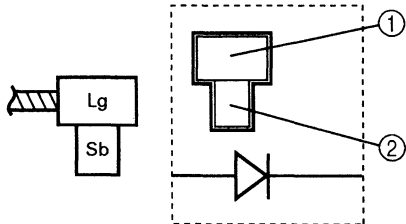
CONTINUITY

NO CONTINUITY

Replace the neutral switch.

3.Diode

- Remove the diode from the wire harness.
- Check for continuity as follows:
Sky blue ① – Light green ②



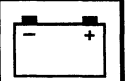
Tester (+) lead → Sky blue ①	Continuity
Tester (-) lead → Light green ②	
Tester (+) lead → Light green ②	No Continuity
Tester (-) lead → Sky blue ①	

CORRECT

INCORRECT

Replace the diode.

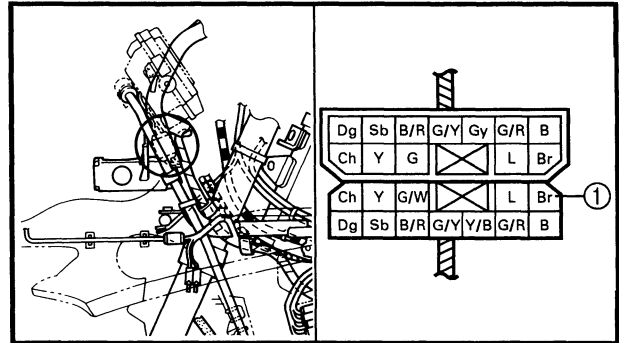
*



4.Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket coupler.

Tester (+) lead → Brown terminal ①
Tester (-) lead → Frame ground



- Turn the main switch to "ON".
- Check the voltage (12 V).

MEETS SPECIFICATION

This circuit is not faulty.

OUT OF SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

EB806025
 5.If the oil level indicator light fails to come on:

1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.

CONTINUITY

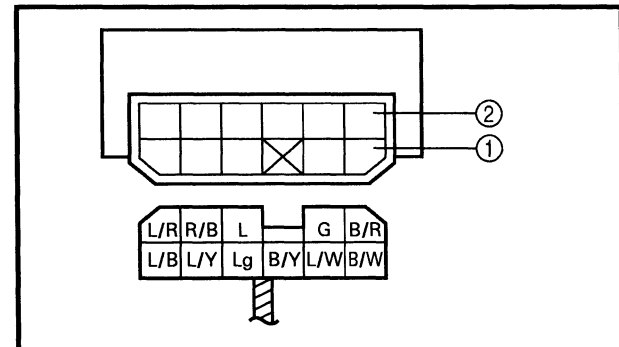
NO CONTINUITY


Replace the bulb and/or bulb socket.

2.Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 100$) to the starting circuit cut-off relay coupler terminals.
- Check the resistor for the specified resistance.

Tester (+) terminal → Black/Red terminal ①
Tester (-) terminal → Black/White ②

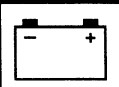


 **5 ~ 15 Ω at 20 °C (68°F)**

MEETS SPECIFICATION

OUT OF SPECIFICATION

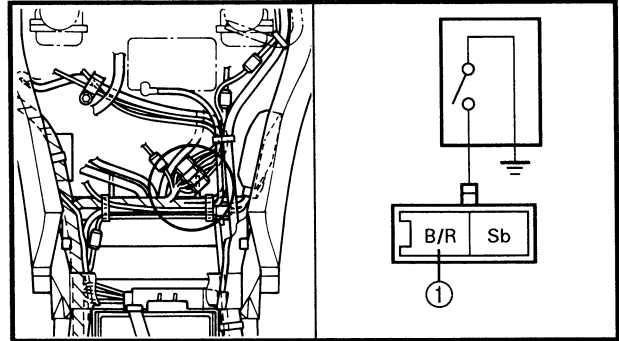
Replace the starting circuit cut-off relay.



3.Oil level switch

- Drain the engine oil and remove the oil level switch from the oil pan.
- Connect the pocket tester ($\Omega \times 1$) to the oil level switch.

Tester (+) lead → **Black/Red terminal** ①
Tester (-) lead → **Frame ground**



- Check the oil level switch for continuity.

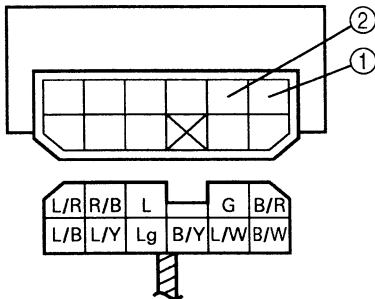
↓ CONTINUITY

NO CONTINUITY

Replace the oil level switch.

4.Diode (starting circuit cut-off relay)

- Remove the relay unit from the wire harness.
- Check for continuity as follows:
 Black/White ① – Blue/White ②



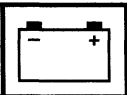
Tester (+) lead → **Black/White** ①
Tester (-) lead → **Blue/White** ② **Continuity**

Tester (+) lead → **Blue/White** ②
Tester (-) lead → **Black/White** ① **No Continuity**

↓ CORRECT
*

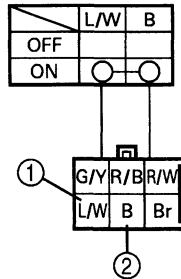
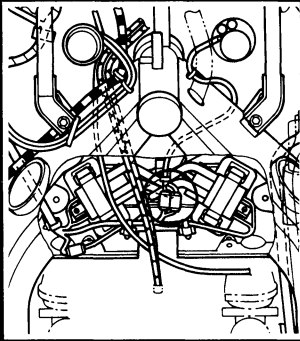
INCORRECT

Replace the relay unit.



5. Start switch

- Disconnect the right handlebar switch coupler from the wire harness.
- Check for continuity as follows:
Blue/White ① – Black ②



NO CONTINUITY

Replace the right handlebar switch.

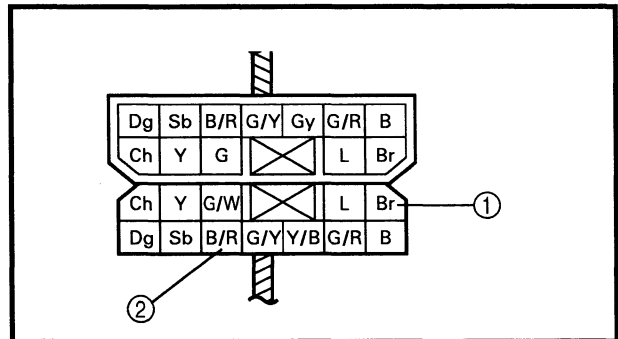


CONTINUITY

6. Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

Tester (+) lead → Brown lead ①
 Tester (-) lead → Black/Red lead ②



OUT OF SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

- Turn the main switch to "ON".
- Check the voltage (12 V).



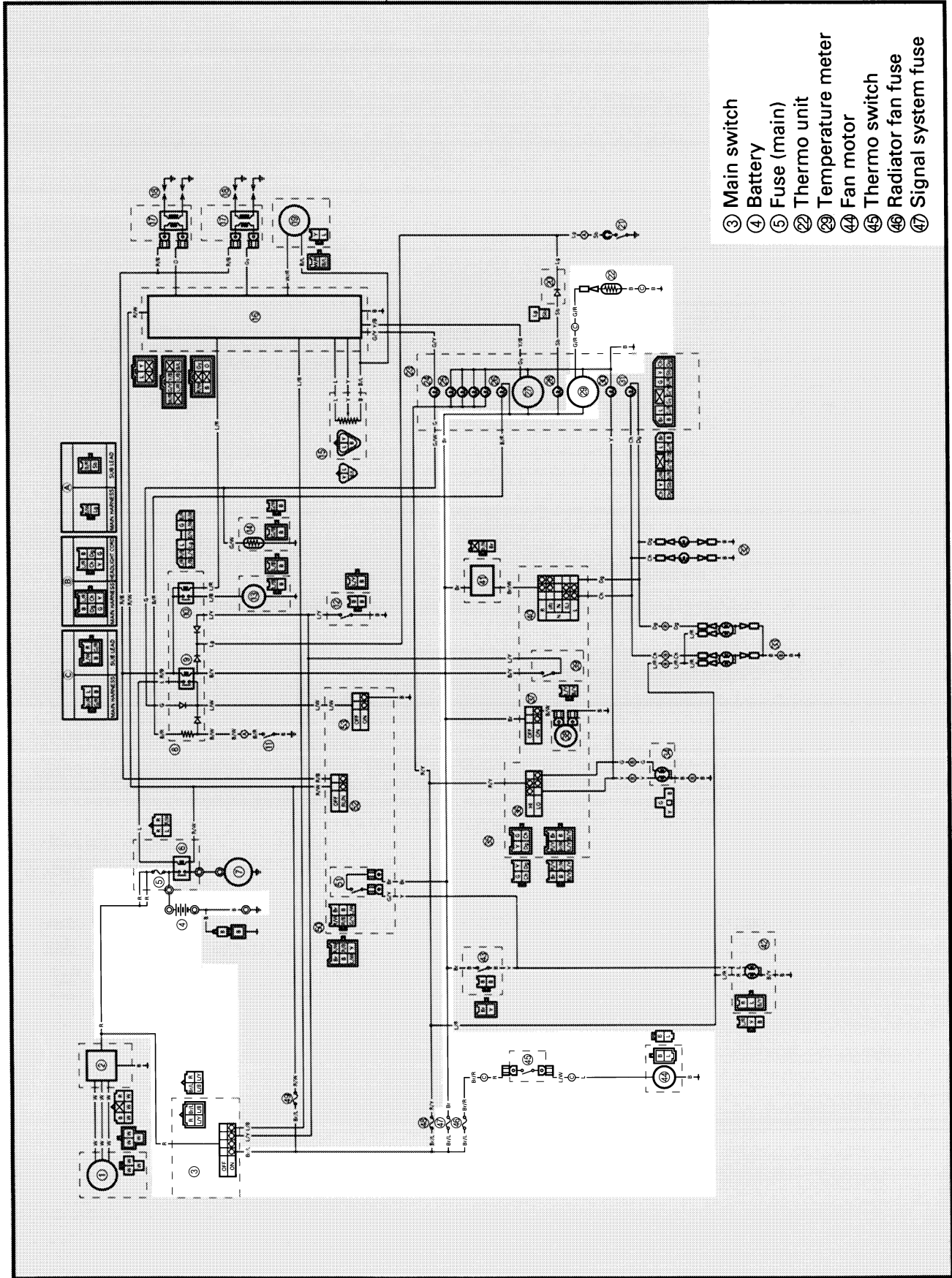
MEETS SPECIFICATION

This circuit is not faulty.

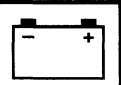


EB807000

**COOLING SYSTEM
CIRCUIT DIAGRAM**



- ③ Main switch
- ④ Battery
- ⑤ Fuse (main)
- ②② Thermo unit
- ②③ Temperature meter
- ④④ Fan motor
- ④⑤ Thermo switch
- ④⑥ Radiator fan fuse
- ④⑦ Signal system fuse



EB807010

TROUBLESHOOTING

**IF THE FAN MOTOR FAILS TO TURN:
IF THE WATER TEMPERATURE METER FAILS TO MOVE, WHEN THE ENGINE IS WARM:**

Procedure

Check:

- | | |
|---|---|
| <ul style="list-style-type: none"> 1.Fuses (main, signal and fan) 2.Battery 3.Main switch 4.Fan motor | <ul style="list-style-type: none"> 5.Thermo switch 6.Thermo unit 7.Water temperature meter 8.Wiring connections (the entire cooling system) |
|---|---|

NOTE:

- Remove the following part(s) before troubleshooting:
 - 1)Seat
 - 2)Fuel tank
 - 3)Air filter case
 - 4)Side cowling (right)
- Use the following special tool(s) for troubleshooting.



**Pocket tester:
YU-03112/90890-03112**

EB802011

1.Fuses (main, signal and fan)

- Remove the fuses.
- Connect the pocket tester ($\Omega \times 1$) to the fuses.
- Check the fuses for continuity.

NO CONTINUITY



Replace the fuse(s).

CONTINUITY



EB802012

2.Battery

- Check the battery condition. Refer to "BATTERY INSPECTION" in CHAPTER 3.

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

INCORRECT

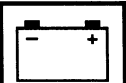


- Clean the battery terminals.
- Recharge or replace the battery.

CORRECT



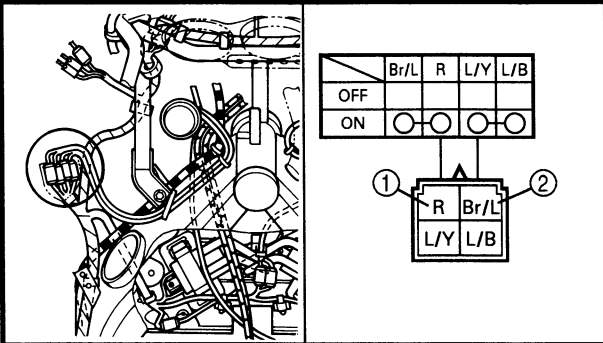
*



EB802017

3. Main switch

- Disconnect the main switch coupler from the wire harness.
- Check for continuity as follows:
Red ① – Brown/Blue ②



NO CONTINUITY



Replace the main switch.

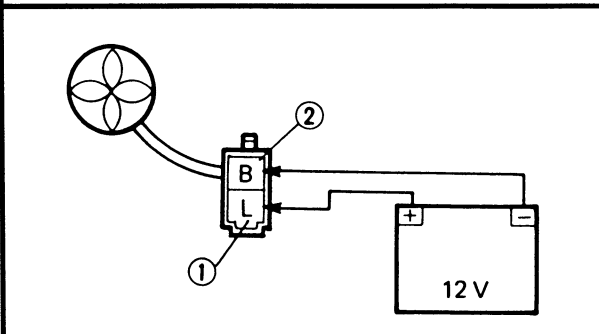


EB807011

4. Fan motor

- Disconnect the fan motor coupler.
- Connect the battery (12V) as shown.

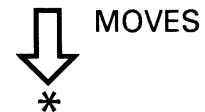
Battery (+) lead → Blue terminal ①
Battery (-) lead → Black terminal ②

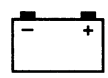


DOES NOT MOVE



The fan motor is faulty, replace it.





EB807012

5. Thermo switch

- Remove the thermo switch from the thermostatic valve housing.
- Connect the pocket tester ($\Omega \times 1$) to the thermo switch ①.
- Immerse the thermo switch in coolant ②.
- Check the thermo switch for continuity. While heating the coolant use a thermometer ③ to record the temperatures.

Test step	Water temperature	Good condition
	Thermo switch	
1	0 ~ 98°C (32 ~ 208.4°F)	×
2	More than 105 + 3°C (221.0 ± 5.4°F)	○
3*	105 to 98°C (221.0 to 208.4°F)	○
4*	Less than 98°C (208.4°F)	×

Tests 1 & 2; Heat-up tests
Tests 3* & 4*; Cool-down tests
 ○ : Continuity × : No continuity

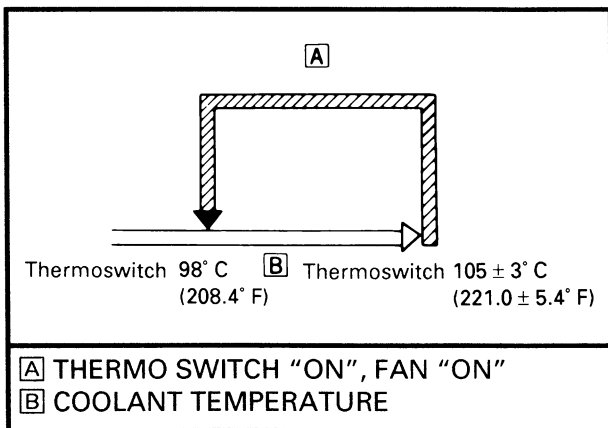
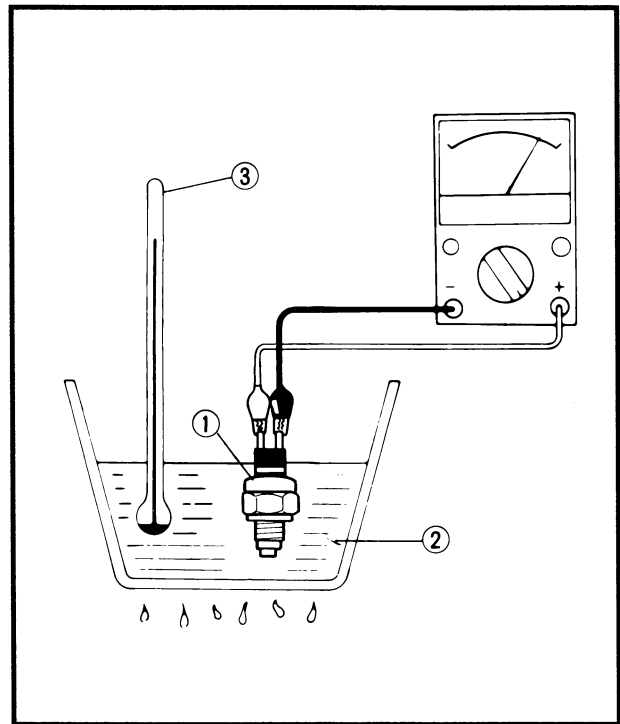
⚠ WARNING

Handle the thermo switch with special care.

Never subject it to strong shocks or allow it to be dropped. Should it be dropped, it must be replaced.



Thermo switch:
 23 Nm (2.3 m · kg, 17 ft · lb)
 Three bond sealock® #10

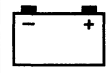


↓ GOOD CONDITION

*

BAD CONDITION

Replace the thermo switch.



EB807013

6. Thermo unit

- Remove the thermo unit from the thermostatic valve housing.
 - Connect the pocket tester ($\Omega \times 10$) to the thermo unit ①.
 - Immerse the thermo unit in coolant ②.
 - Measure the resistance.
- While heating the coolant use a thermometer ③ to record the temperatures.



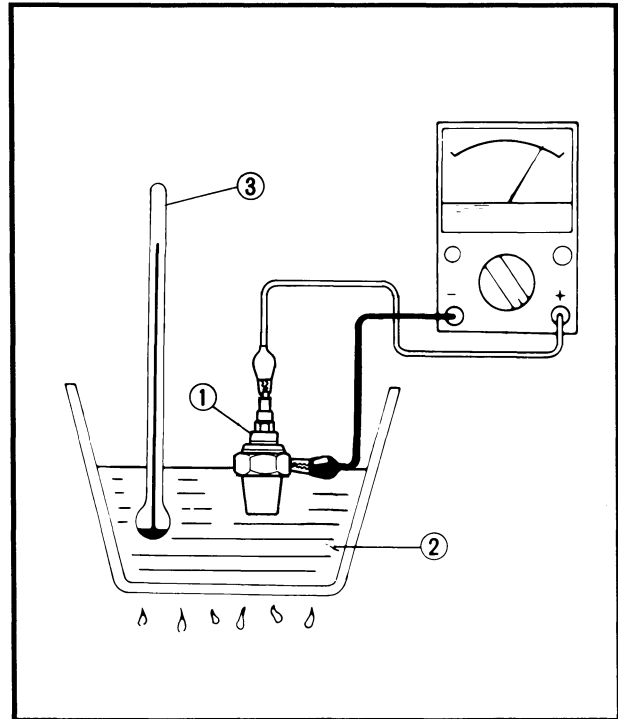
Thermo unit resistance:
 80°C (176°F): 47 ~ 53 Ω
 100°C (212°F): 26 ~ 30 Ω

⚠ WARNING

Handle the thermo unit with special care. Never subject it to strong shock or allow it to be dropped. Should it be dropped, it must be replaced.



Thermo unit:
 15 Nm (1.5 m · kg, 11 ft · lb)
 Three bond sealock® #10



BAD CONDITION

Replace the thermo unit.

GOOD CONDITION

7. Water temperature meter

- Turn the main switch to ON.
- Disconnect the thermo unit lead.
- Connect a jumper lead to the thermo unit lead and ground.
- Check that the water temperature meter needle more to H from C.

DOES NOT MOVE

Replace the water temperature meter.

MOVE

EB807014

8. Wiring connections

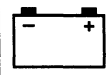
- Check the connections of the entire cooling system. Refer to "CIRCUIT DIAGRAM".

POOR CONNECTION

Properly connect the cooling system.

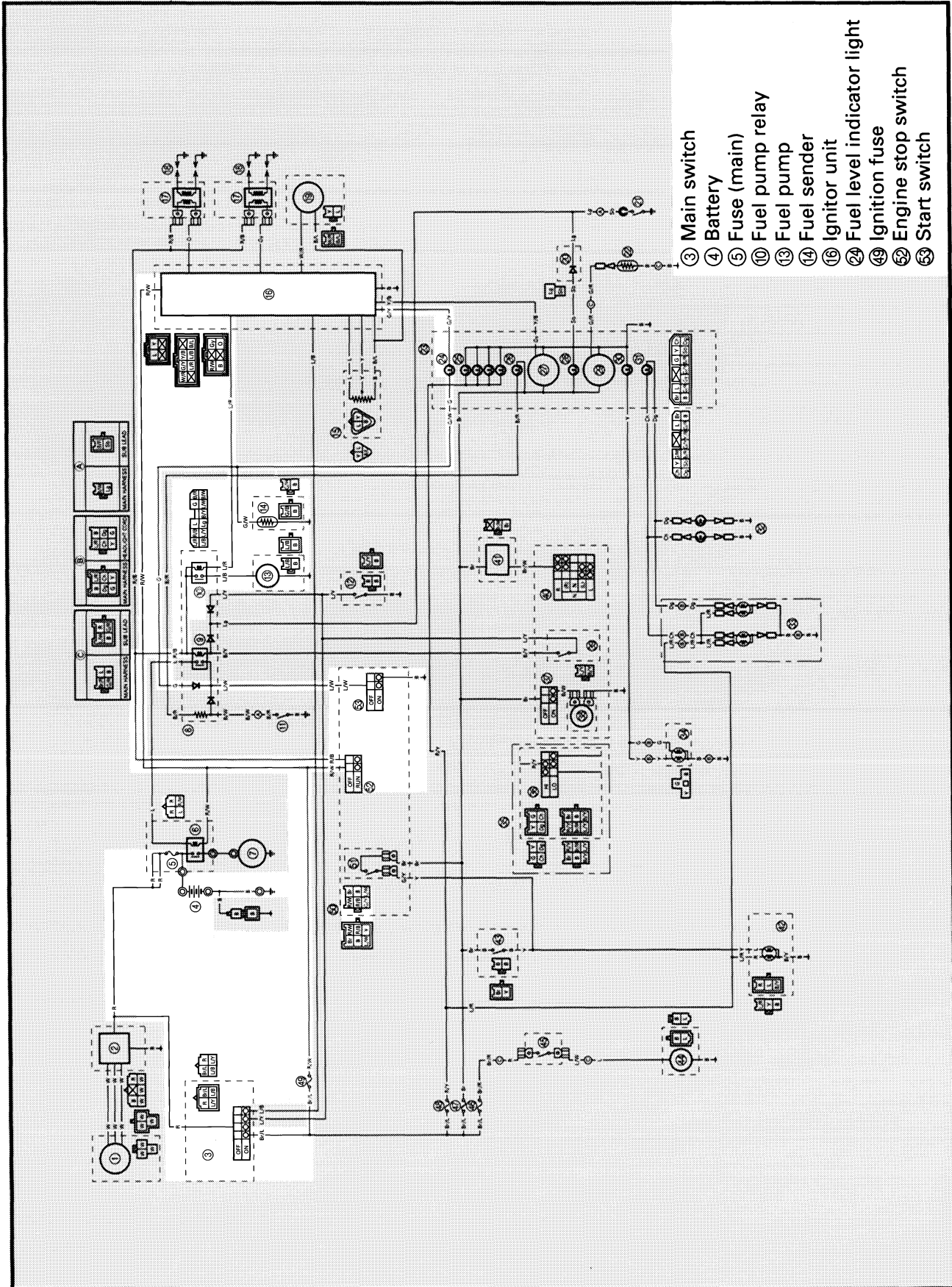
CORRECT

This circuit is not faulty.



EB808000

FUEL PUMP SYSTEM CIRCUIT DIAGRAM



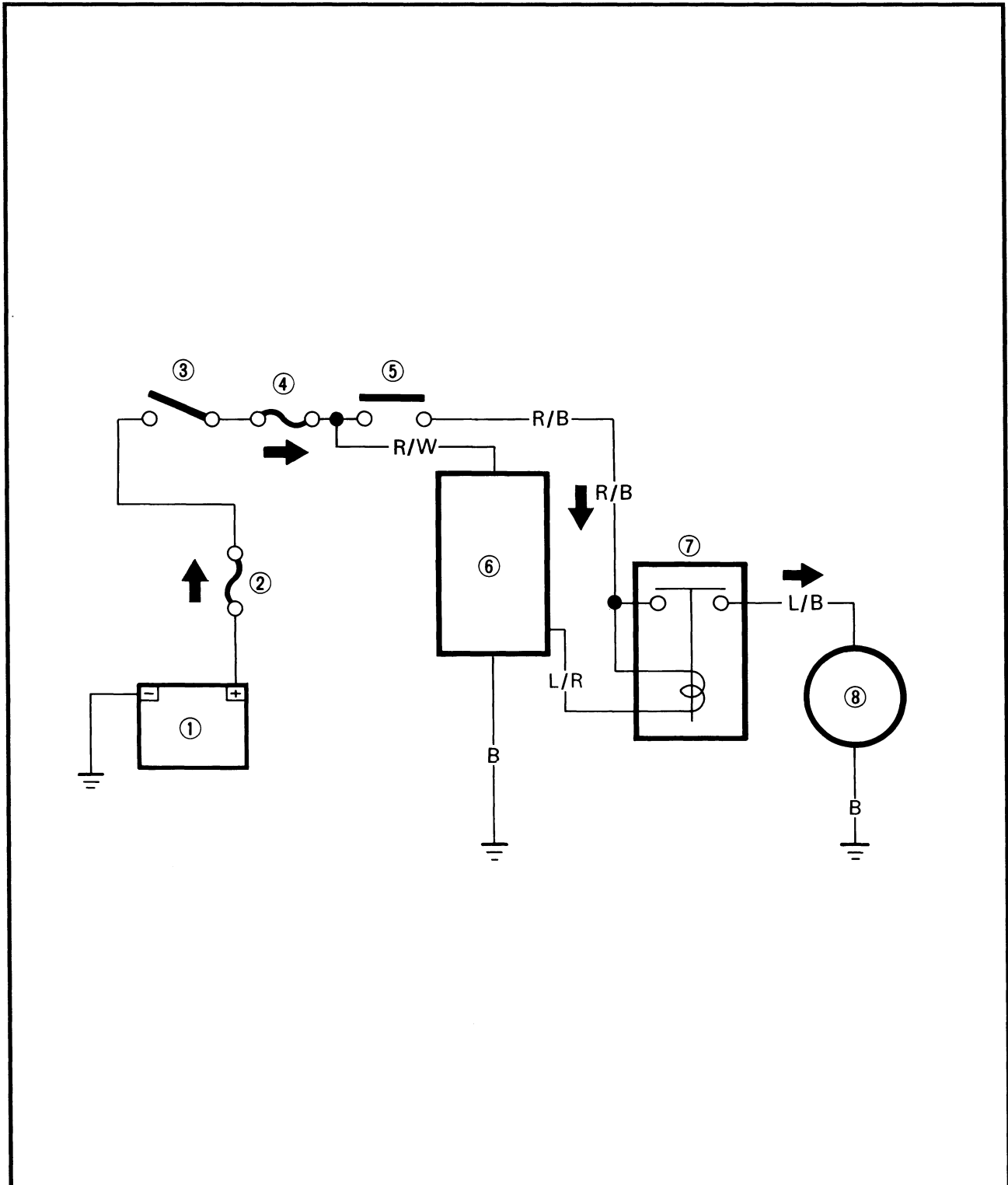
EB808010

FUEL PUMP CIRCUIT OPERATION

The fuel pump circuit consists of the fuel pump relay, fuel pump, engine stop switch and ignitor unit.

The ignitor unit includes the control unit for the fuel pump.

- ① Battery
- ② Fuse (main)
- ③ Main switch
- ④ Fuse (ignition)
- ⑤ Engine stop switch
- ⑥ Ignitor unit
- ⑦ Fuel pump relay
- ⑧ Fuel pump



EB808020
TROUBLESHOOTING

IF THE FUEL PUMP FAILS TO OPERATE:

Procedure

Check:

- | | |
|-----------------------------|---|
| 1.Fuses (main and ignition) | 5.Fuel pump relay (relay unit) |
| 2.Battery | 6.Fuel pump |
| 3.Main switch | 7.Wiring connections (the entire fuel system) |
| 4.Engine stop switch | |

NOTE:

- Remove the following part(s) before troubleshooting:
 - 1)Seat
 - 2)Fuel tank
- Use the following special tool(s) for troubleshooting.

	Pocket tester: YU-03112/90890-03112
---	---

EB802011

1.Fuses (main and ignition)
<ul style="list-style-type: none"> • Remove the fuses. • Connect the pocket tester ($\Omega \times 1$) to the fuses. • Check the fuses for continuity.

NO CONTINUITY



Replace the fuse(s).



EB802012

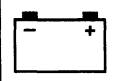
2.Battery
<ul style="list-style-type: none"> • Check the battery condition. Refer to "BATTERY INSPECTION" in CHAPTER 3.
Open-circuit voltage: 12.8 V or more at 20 °C (68°F)

INCORRECT



<ul style="list-style-type: none"> • Clean the battery terminals. • Recharge or replace the battery.
--

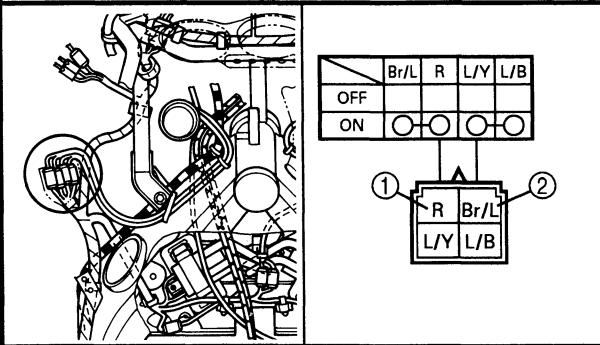




EB802017

3. Main switch

- Disconnect the main switch coupler from the wire harness.
- Check for continuity as follows:
Red ① – Brown/Blue ②



NO CONTINUITY

Replace the main switch.

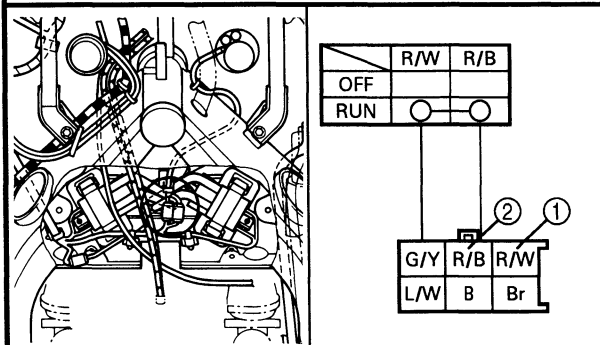


CONTINUITY

EB802018

4. Engine stop switch

- Disconnect the right handlebar switch coupler from the wire harness.
- Check for continuity as follows:
Red/White ① – Red/Black ②



NO CONTINUITY

Replace the right handlebar switch.

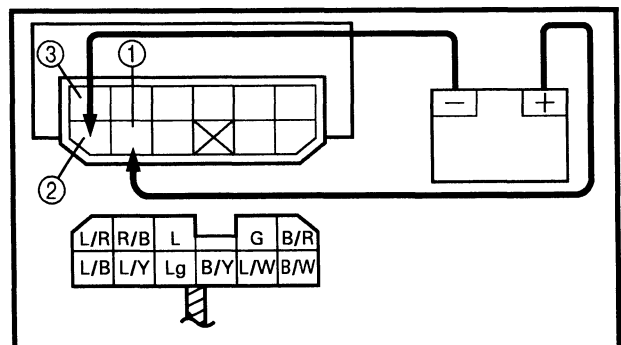


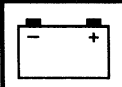
CONTINUITY

EB803023

5. Fuel pump relay (starting circuit cut-off relay)

- Remove the relay unit from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) and battery (12 V) to the relay unit terminals.





Battery (+) terminal → Red/Black terminal ①
Battery (-) terminal → Blue/Red terminal ②

Tester (+) lead → Red/Black terminal ①
Tester (-) lead → Blue/Black terminal ③

- Check the fuel pump relay for continuity.

NO CONTINUITY

Replace the starting circuit cut-off relay.

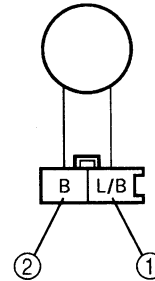
CONTINUITY

EB808021

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 terminals.

Tester (+) lead → Black/Blue terminal ①
Tester (-) lead → Black terminal ②



OUT OF SPECIFICATION

Replace the fuel pump.

- Check if the fuel pump has the specified resistance.



Fuel pump resistance:
 1.5 ~ 2.5 Ω at 20°C (68°F)

MEET SPECIFICATION

7. Bulb and bulb socket

- Check the bulb and bulb socket for continuity.

NO CONTINUITY

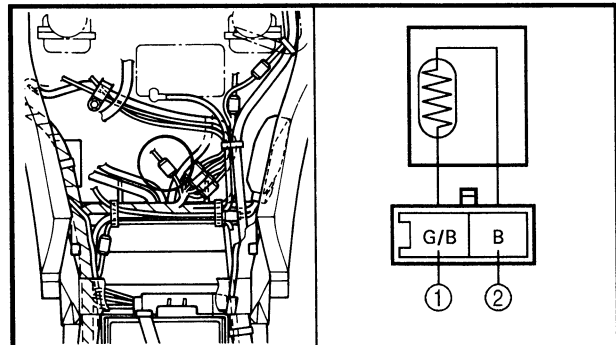
Replace the bulb and/or bulb socket.

CONTINUITY

8. Fuel sender

- Drain the fuel and remove the fuel sender from the fuel tank.
- Disconnect the fuel sender coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the fuel sender.

Tester (+) lead → Green/Black terminal ①
Tester (-) lead → Black terminal ②



• Check the fuel sender for continuity.

CONTINUITY

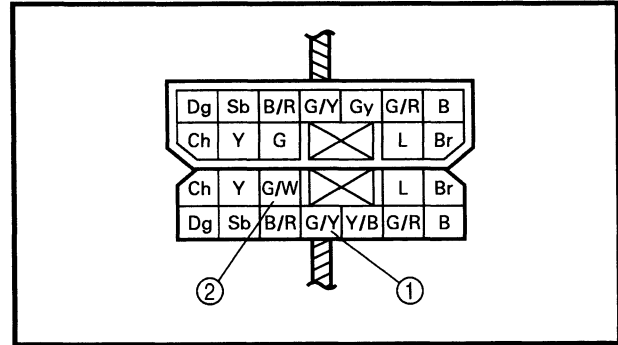
NO CONTINUITY

Replace the fuel sender.

9. Voltage

• Connect the pocket tester (DC 20 V) to the bulb socket connector.

Tester (+) lead → Green/Yellow terminal ①
Tester (-) lead → Green/White terminal ②



• Drain the fuel.
 • Turn the main switch to "ON".
 • Check the voltage (12 V).

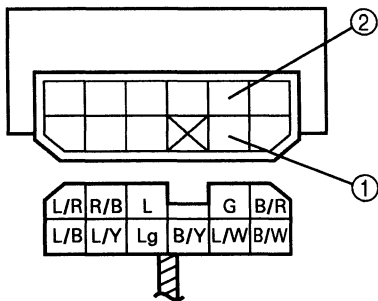
MEETS SPECIFICATION

OUT OF SPECIFICATION

The wiring circuit from the main switch to the bulb socket connector is faulty, repair it.

10. Diode (starting circuit cut-off relay)

• Remove the relay unit from the wire harness.
 • Check for continuity as follows:
 Green ① – Blue/White ②



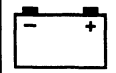
Tester (+) lead → Green ①	Continuity
Tester (-) lead → Blue/White ②	
Tester (+) lead → Blue/White ②	No Continuity
Tester (-) lead → Green ①	

INCORRECT

Replace the relay unit.

CORRECT

*



11. Start switch

- Disconnect the right handlebar switch coupler from the wire harness.
- Check for continuity as follows:
Blue/White ① – Black ②

	L/W	B
OFF		
ON	○	○

NO CONTINUITY

Replace the right handlebar switch.

CONTINUITY

EB808022

12. Wiring connections

- Check the connections of the entire fuel pump system.
Refer to "CIRCUIT DIAGRAM".

POOR CONNECTION

Properly connect the fuel pump system.

CORRECT

Replace the ignitor unit.

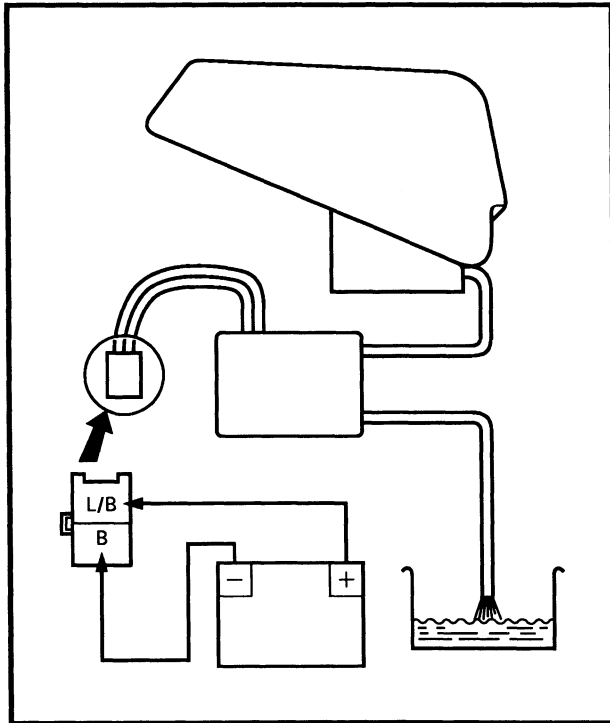
EB808030

FUEL PUMP TEST

⚠ WARNING

Gasoline is extremely flammable and under certain circumstances there can be a danger of an explosion or combustion. Be extremely careful and note the following points:

- Stop the engine before refuelling.
- Do not smoke and keep away from open flames, sparks, or any other source of fire.
- Take care not to spill gasoline. If you do accidentally spill some, wipe it up immediately with dry rags.
- If gasoline touches the engine when the engine is still hot, there is a danger of combustion. Make sure that the engine is completely cool before performing the following test.



1.Check:

- Fuel pump operation

Checking steps:

- Fill up the fuel tank.
- Put the end of the fuel hose into an open container.
- Connect the battery (12 V) to the fuel pump coupler terminals.

Battery (+) lead → Green/Black terminal ①
 Battery (-) lead → Black terminal ②

- If fuel flows out from the fuel hose, the fuel pump is good. If not, replace the fuel pump assembly.

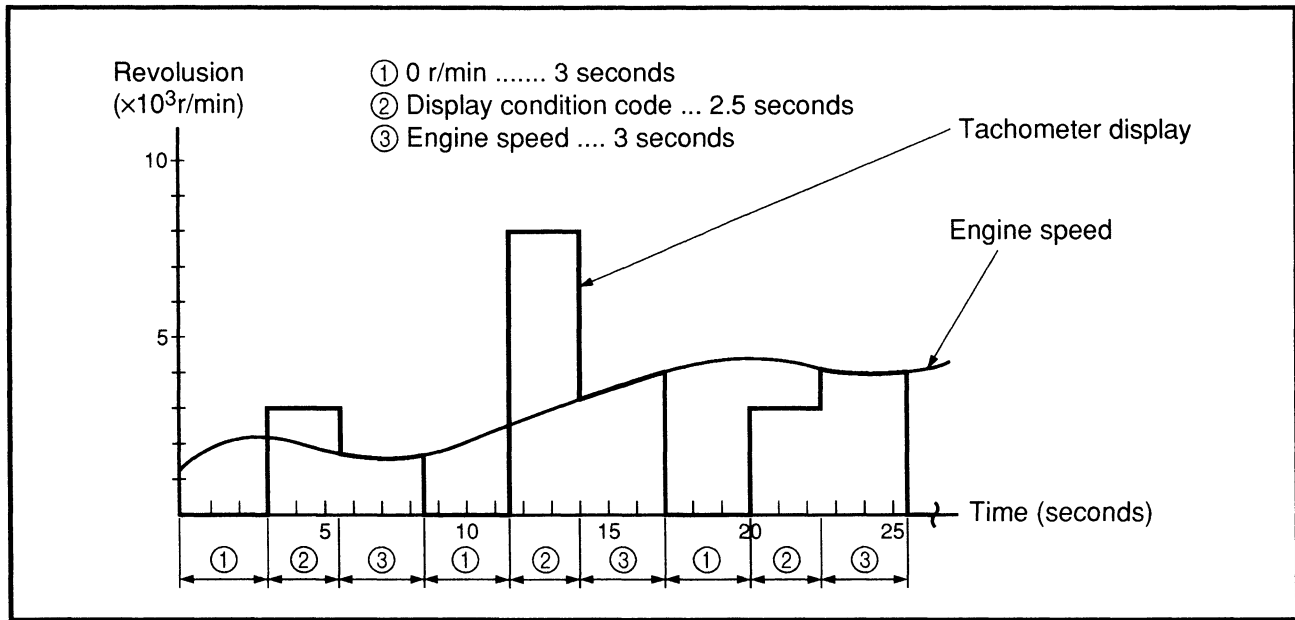
SELF-DIAGNOSIS

The YZF600R features self-diagnosis.

When the main switch is turned to "ON", the following items are monitored and the condition codes are displayed on the tachometer (irrespective of whether the engine is running or not).

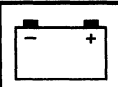
Item	Condition	Response	Display condition code
Throttle position sensor (TPS)	Disconnected Short-circuit Locked	<ul style="list-style-type: none"> Enables the motorcycle to run so that the ignition timing is fixed when the throttle is fully opened. Displays the condition code on the tachometer. 	3,000 r/min
Fuel light	Disconnected	<ul style="list-style-type: none"> Displays the condition code on the tachometer. 	8,000 r/min

Display order on the tachometer



When more than one item is being monitored, the tachometer needle shows the condition codes in ascending order, cycling through the sequence repeatedly.

While the engine is stopped, the engine speed ③ is shown as 0 r/min.



TROUBLESHOOTING

The tachometer starts to display the self-diagnosis sequence.

NOTE:

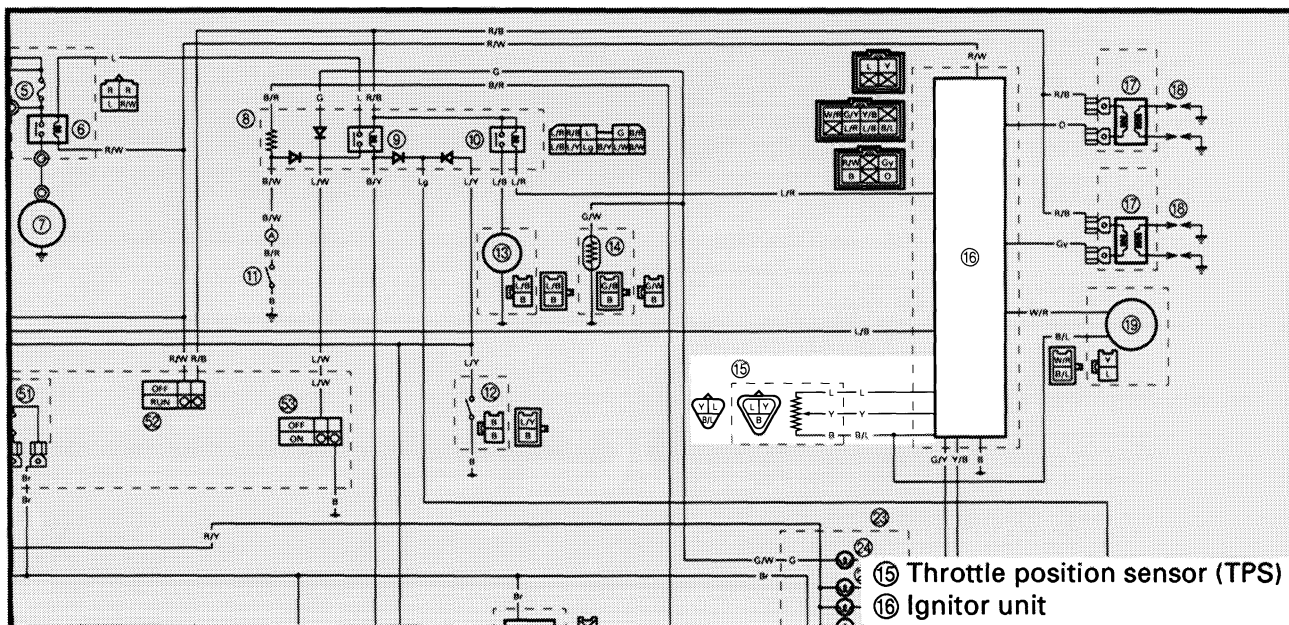
Use the following special tool in this troubleshooting.



Pocket tester:
YU-03112/90890-03112

1. Throttle position sensor (TPS)

CIRCUIT DIAGRAM



1. Wire harness

- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".

CONTINUITY

NO CONTINUITY

Repair or replace the wire harness.

2. TPS

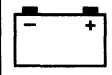
- Check the TPS for continuity.
- Refer to "THROTTLE POSITION SENSOR (TPS) ADJUSTMENT AND INSPECTION" in CHAPTER 6.

GOOD CONDITION

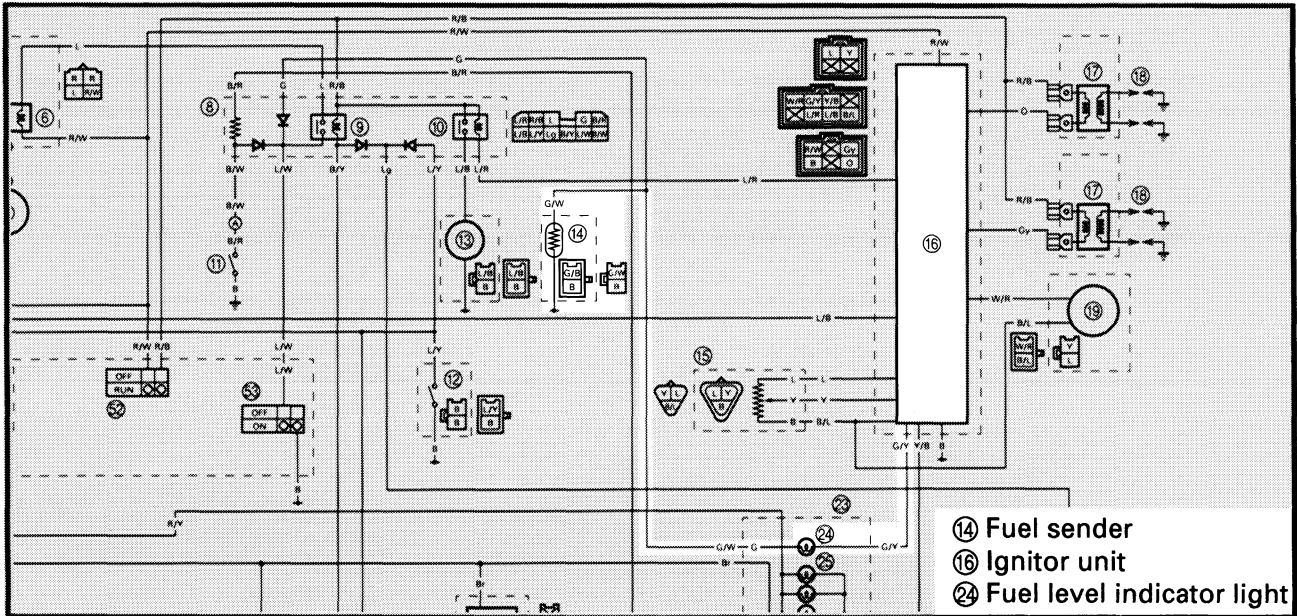
BAD CONDITION

Replace the TPS.

Replace the ignitor unit.



2. "Fuel level" indicator light
CIRCUIT DIAGRAM



- ⑭ Fuel sender
- ⑯ Ignitor unit
- ⑳ Fuel level indicator light

1. "Fuel level" indicator light

- Check the bulb and bulb socket for continuity.

CONTINUITY

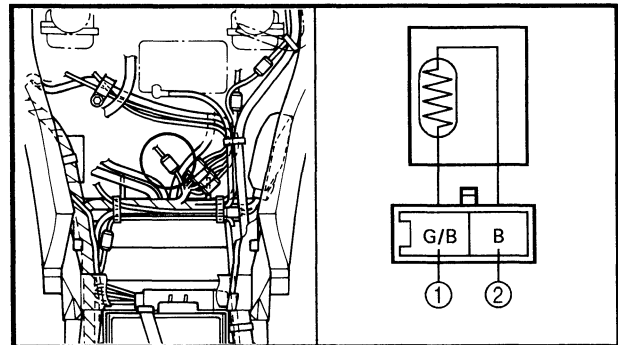
NO CONTINUITY

Replace the bulb and/or socket.

2. Fuel sender

- Disconnect the fuel sender coupler from the wire harness.
- Connect the pocket tester ($\Omega \times 1$) to the fuel sender coupler terminals.

Tester (+) terminal →
Green/Black terminal ①
Tester (-) terminal → Black terminal ②

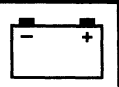


- Check the fuel pump for continuity.

CONTINUITY
*

NO CONTINUITY

Replace the fuel pump.



3. Wire harness

- Check the wire harness for continuity. Refer to "CIRCUIT DIAGRAM".



CONTINUITY

Replace the ignitor unit.

NO CONTINUITY



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 problems. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING

FUEL SYSTEM

Fuel tank

- Empty
- Clogged fuel filter
- Clogged fuel strainer
- Clogged fuel tank drain hose
- Clogged roll-over valve
- Clogged roll-over valve breather hose
- Deteriorated or contaminated fuel

Fuel cock

- Clogged fuel hose

ELECTRICAL SYSTEM

Spark plug

- Improper plug gap
- Worn electrodes
- Wire between terminals severed
- Improper heat range
- Faulty spark plug cap

Ignition coil

- Broken or shorted primary/secondary
- Faulty spark plug lead
- Broken body

Full-transistor system

- Faulty ignitor unit
- Faulty pickup coil

Carburetor

- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Deformed float
- Worn needle valve
- Improperly sealed valve seat
- Improperly adjusted fuel level
- Improperly set pilot jet
- Clogged starter jet
- Faulty starter plunger
- Improperly adjusted starter cable

Air filter

- Clogged air filter element

Fuel pump

- Faulty fuel pump
- Faulty fuel pump relay

Switch 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

Starter motor

- Faulty starter motor
- Faulty starter relay
- Faulty circuit cut-off relay
- Faulty starter clutch

COMPRESSION SYSTEM

Cylinder and cylinder head

- Loose spark plug
- Loose cylinder head or cylinder
- Faulty cylinder head gasket
- Worn, damaged or seized cylinder
- Improperly sealed valve
- Improper valve-to-valve seat contact
- Improper valve timing
- Faulty valve spring

Piston and piston ring

- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

Crankcase and crankshaft

- Improperly seated crankcase
- Seized crankshaft

EB901000

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor

- Improperly returned starter plunger
- Loose pilot jet
- Clogged pilot air jet
- Improperly synchronized carburetors
- Improperly adjusted idle speed (throttle stop screw)
- Improper throttle cable free play
- Flooded carburetor

Electrical system

- Faulty battery
- Faulty spark plug
- Faulty ignitor unit
- Faulty pickup coil
- Faulty ignition coil

Valve train

- Improperly adjusted valve clearance

Air filter

- Clogged air filter element

EB902000

POOR MEDIUM-AND HIGH-SPEED PERFORMANCE

POOR MEDIUM-AND HIGH-SPEED PERFORMANCE

Refer to "STARTING FAILURE/HARD STARTING". (Fuel system, electrical system, compression system and valve train)

Carburetor

- Faulty diaphragm
- Improperly adjusted fuel level
- Clogged or loose main jet

Air intake system

- Bent, clogged, or disconnected carburetor air vent hose(s)
- Clogged or leaking air duct(s)

Air filter

- Clogged air filter element

Fuel pump

- Faulty fuel pump

EB903000

FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to "CLUTCH DRAGGING".

SHIFT PEDAL DOES NOT MOVE

Shift shaft

- Improperly adjusted shift pedal link
- Bent shift shaft

Shift cam, shift fork

- Groove jammed with impurities
- Seized shift fork
- Bent shift fork guide bar

JUMPS-OUT-OF GEAR

Shift shaft

- Improperly adjusted shift lever position
- Improperly returned stopper lever

Shift fork

- Worn shift fork

Transmission

- Seized transmission gear
- Jammed impurities
- Incorrectly assembled transmission

Shift cam

- Improper thrust play
- Worn shift cam groove

Transmission

- Worn gear dog

EB904000

CLUTCH SLIPPING/Dragging

CLUTCH SLIPPING

Clutch

- Improperly adjusted clutch cable
- Loose clutch spring
- Fatigued clutch spring
- Worn friction plate/clutch plate
- Incorrectly assembled clutch

Engine oil

- Improper oil level
- Improper viscosity (low)
- Deterioration

CLUTCH DRAGGING

Clutch

- Warped pressure plate
- Unevenly tensioned clutch springs
- Bent push rod
- Broken clutch boss
- Burnt primary driven gear bushing
- Bent clutch plate
- Swollen friction plate
- Match marks not aligned

Engine oil

- Improper oil level
- Improper viscosity (high)
- Deterioration

EB905000

OVERHEATING

OVERHEATING

Ignition system

- Improper spark plug gap
- Improper spark plug heat range
- Faulty ignitor unit

Fuel system

- Improper carburetor main jet setting
- Improper fuel level
- Clogged air filter element

Compression system

- Heavy carbon build-up

Engine oil

- Improper oil level
- Improper oil viscosity
- Inferior oil quality

Brake

- Brake drag

EB906000

FAULTY BRAKE

POOR BRAKING EFFECT

Disc brake

- Worn brake pad
- Worn disc
- Air in brake fluid
- Leaking brake fluid
- Faulty cylinder cup kit
- Faulty caliper seal kit
- Loose union bolt
- Broken brake hose
- Oily or greasy disc/brake pad
- Improper brake fluid level

EB907000

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

MALFUNCTION

- Bent, deformed or damaged inner tube
- Bent or deformed outer tube
- Damaged fork spring
- Worn or damaged slide metal
- Bent or damaged damper rod
- Improper oil viscosity
- Improper oil level

OIL LEAKAGE

- Bent, damaged or rusty inner tube
- Damaged or cracked outer tube
- Damaged oil seal lip
- Improperly installed oil seal
- Improper oil level (too high)
- Loose damper rod holding bolt
- Broken cap bolt O-ring
- Loose drain bolt
- Damaged drain bolt gasket

EB908000

UNSTABLE HANDLING

UNSTABLE HANDLING

Handlebar

- Improperly installed or bent

Steering

- Improperly installed handlebar crown
- Bent steering stem
- Improperly installed steering shaft (improperly tightened ring nut)
- Damaged ball bearing or bearing race

Swingarm

- Worn bearing or bushing
- Bent or damaged

Rear shock absorber

- Faulty spring
- Oil and gas leakage

Tire

- Uneven tire pressures on both sides
- Incorrect tire pressure
- Uneven tire wear

Front fork

- Uneven oil levels on both sides
- Uneven spring tension (uneven damping force adjuster position)
- Broken spring
- Twisted front fork

Wheel

- Incorrect wheel balance
- Deformed cast wheel
- Damaged bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame

- Bent
- Damaged steering head tube
- Improperly installed bearing race

EB909000

FAULTY LIGHTING AND SIGNAL SYSTEMS

HEADLIGHT DOES NOT LIGHT

- Improper bulb
- Too many electric accessories
- Hard charging (broken stator coil wire, faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expired

FLASHER DOES NOT LIGHT

- Improperly grounded
- Discharged battery
- Faulty turn switch
- Faulty flasher relay
- Faulty wire harness
- Loosely connected coupler
- Burnt-out bulb
- Faulty fuse

FLASHER BLINKS SLOWLY

- Faulty flasher relay
- Faulty main and/or turn switch
- Improper bulb

BULB BURNT OUT

- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expired

FLASHER REMAINS LIT

- Faulty flasher relay
- Burnt-out bulb

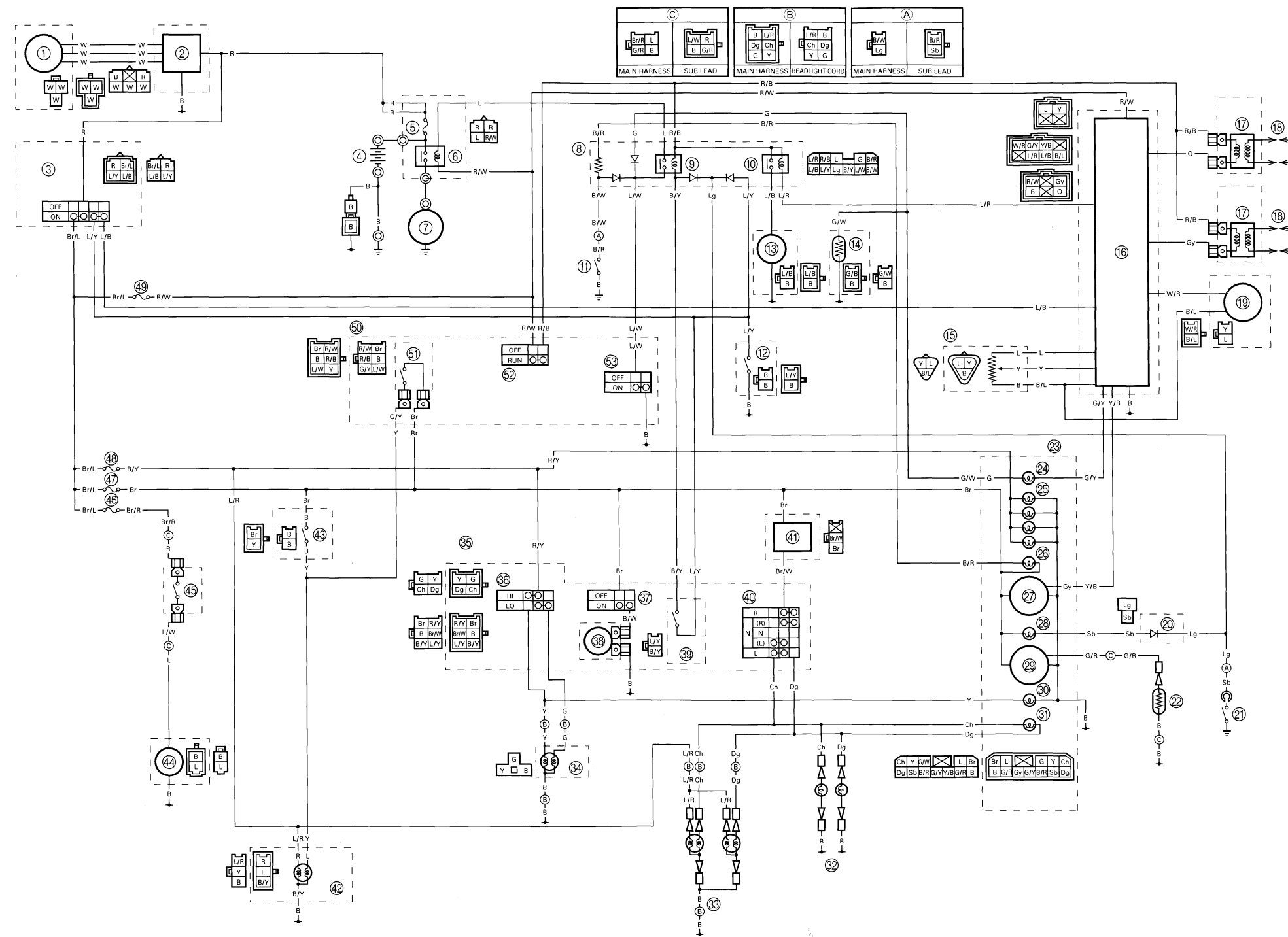
FLASHER BLINKS QUICKLY

- Improper bulb
- Faulty flasher relay
- Burnt-out bulb

HORN DOES NOT SOUND

- Faulty battery
- Faulty fuse
- Faulty main and/or horn switch
- Improperly adjusted horn
- Faulty horn
- Broken wire harness

YZF600RJ WIRING DIAGRAM



- ① AC magneto
- ② Rectifier/regulator
- ③ Main switch
- ④ Battery
- ⑤ Fuse (main)
- ⑥ Starter relay
- ⑦ Starter motor
- ⑧ Relay unit
- ⑨ Starting circuit cut-off relay
- ⑩ Fuel pump relay
- ⑪ Oil level switch
- ⑫ Sidestand switch
- ⑬ Fuel pump
- ⑭ Fuel sender
- ⑮ Throttle position sensor (TPS)
- ⑯ Ignitor unit
- ⑰ Ignition coil
- ⑱ Spark plug
- ⑲ Pickup coil
- ⑳ Diode
- ㉑ Neutral switch
- ㉒ Thermo unit
- ㉓ Meter assembly
- ㉔ Fuel level indicator light
- ㉕ Meter light
- ㉖ Oil level indicator light
- ㉗ Tachometer
- ㉘ Neutral indicator light
- ㉙ Temperature meter
- ㉚ High beam indicator light
- ㉛ Turn indicator light
- ㉜ Rear flasher light
- ㉝ Front flasher light
- ㉞ Headlight
- ㉟ Handlebar switch (left)
- ㊱ Dimmer switch
- ㊲ Horn switch
- ㊳ Horn
- ㊴ Clutch switch
- ㊵ Turn switch
- ㊶ Flasher relay
- ㊷ Tail/brake light
- ㊸ Rear brake switch
- ㊹ Fan motor
- ㊺ Thermo switch
- ㊻ Radiator fan fuse
- ㊼ Signal system fuse
- ㊽ Headlight fuse
- ㊾ Ignition fuse
- ㊿ Handlebar switch (right)
- 1 Front brake switch
- 2 Engine stop switch
- 3 Start switch

COLOR CODE

B..... Black	Lg..... Light green	B/R..... Black/Red	G/R..... Green/Red	R/B..... Red/Black
Br..... Brown	O..... Orange	B/W..... Black/White	G/W..... Green/White	R/W..... Red/White
Ch..... Chocolate	R..... Red	B/Y..... Black/Yellow	G/Y..... Green/Yellow	R/Y..... Red/Yellow
Dg..... Dark green	Sb..... Sky blue	Br/L..... Brown/Blue	L/B..... Blue/Black	W/R..... White/Red
G..... Green	W..... White	Br/R..... Brown/Red	L/R..... Blue/Red	Y/B..... Yellow/Black
Gy..... Gray	Y..... Yellow	Br/W..... Brown/White	L/W..... Blue/White	
L..... Blue	B/L..... Black/Blue	G/B..... Green/Black	L/Y..... Blue/Yellow	

YAMAHA

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