YAMAHA

XJ600S

SERVICE MANUAL

4EB-28197-20

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha motorcycle have a basic understanding of the mechanical concepts and procedures inherent in motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

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

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

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

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

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

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

HOW TO USE THIS MANUAL

CONSTRACTION OF THIS MANUAL

This manual consists of chapters for the main categories of subjects. (See "Illustrated symbols")

1st title ① : This is a chapter with its symbol on the upper right of each page.

2nd title ② : This title appears on the upper of each page on the left of the chapter symbol. (For the chapter "Periodic inspection and adjustment" the 3rd title appears.)

3rd title ③ : This is a final title.

MANUAL FORMAT

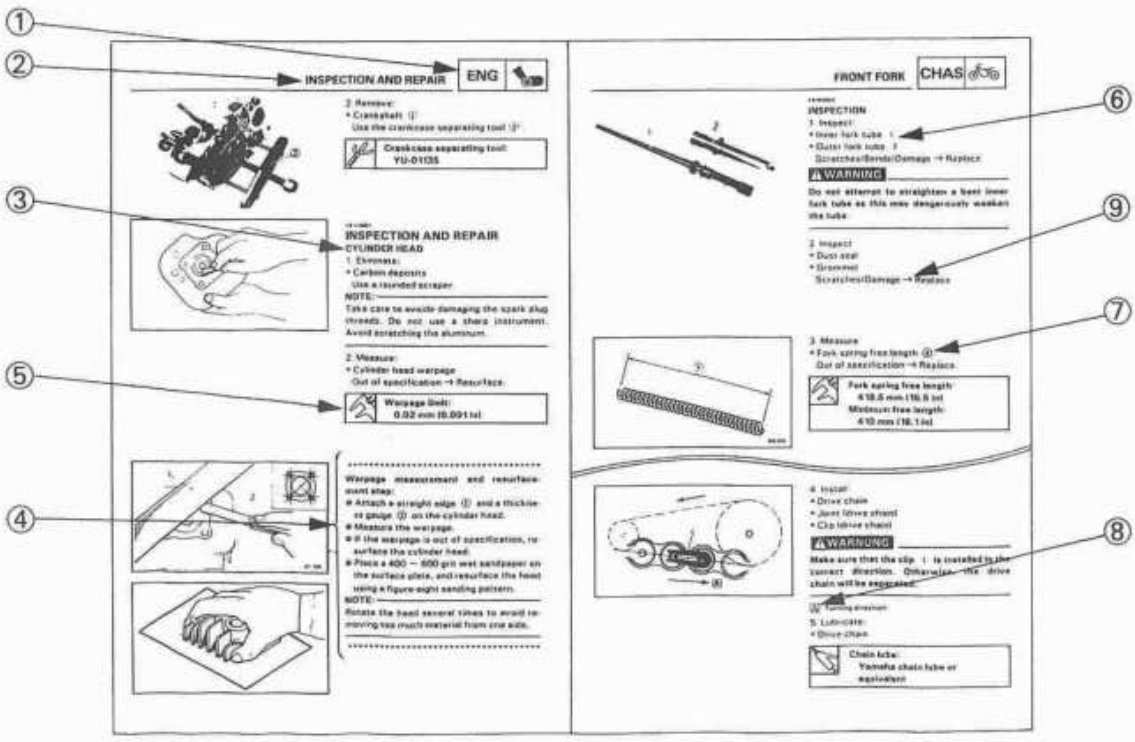
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections.
A set of particularly important procedure ④ is placed between a line of asterisks "＊" with each procedure preceded by " ● ".

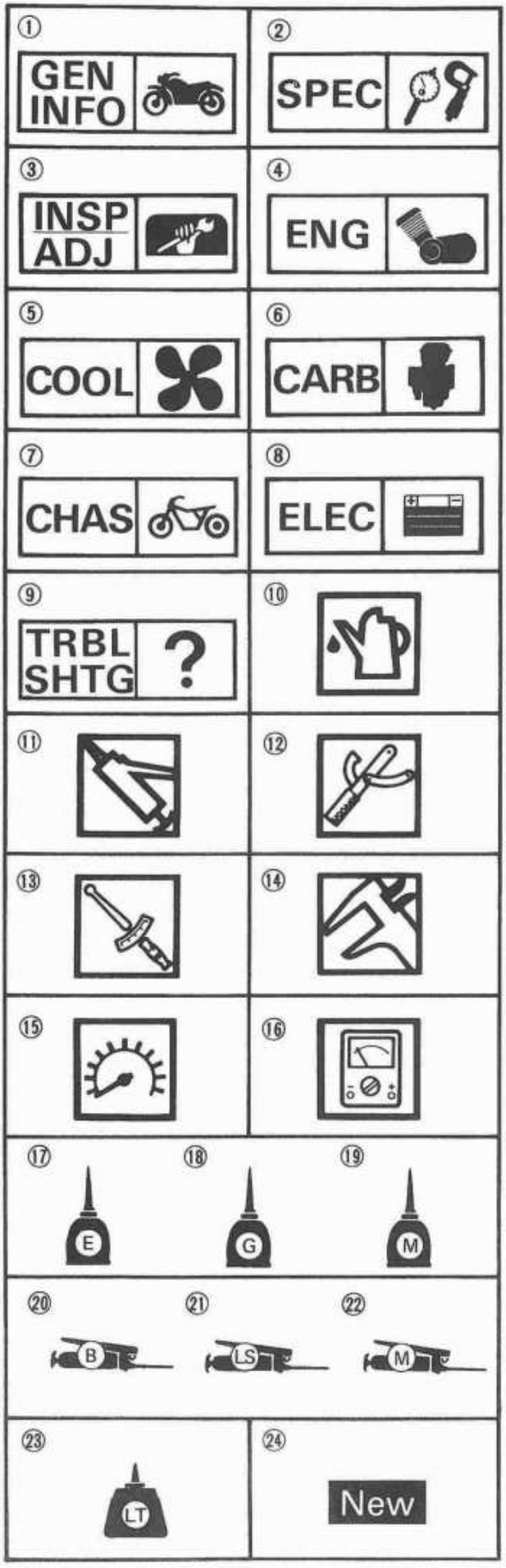
IMPORTANT FEATURES

- Data and a special tool are framed in a box preceded by a relevant symbol ⑤ .
- An encircled numeral ⑥ indicates a part name, and an encircled alphabetical letter data or an alignment mark ⑦ , the others being indicated by an alphabetical letter in a box ⑧ .
- A condition of a faulty component will precede an arrow symbol and the course of action required the symbol ⑨ .

EXPLODED DIAGRAM

Each chapter provides exploded diagrams before each disassembly section for ease in identifying correct disassembly and assembly procedures.





ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑨ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Specifications
③ Periodic inspection and adjustment
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 Tightening
⑭ Wear limit, clearance
⑮ Engine speed
⑯ Ω, V, A

Illustrated symbols ⑰ to ㉔ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑰ Apply engine oil
⑱ Apply gear oil
⑲ Apply molybdenum disufide oil
⑳ Apply wheel bearing grease
㉑ Apply lightweight lithium-soap base grease
㉒ Apply molybdenum disulfide grease
㉓ Apply locking agent (LOCTITE®)
㉔ Use new one

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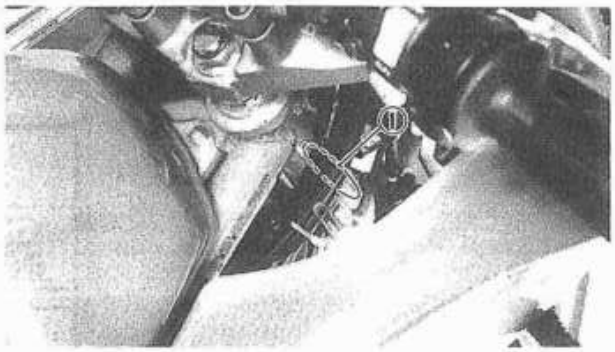
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XJ600S WIRING DIAGRAM



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GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

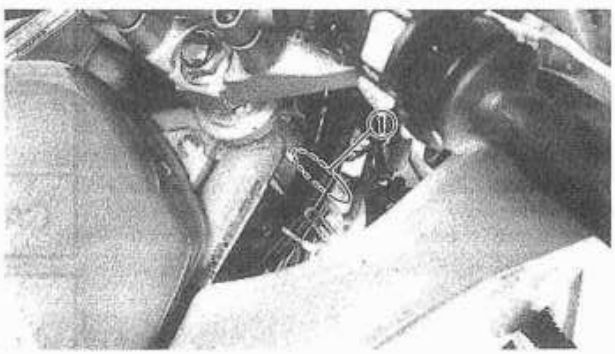
(For E)

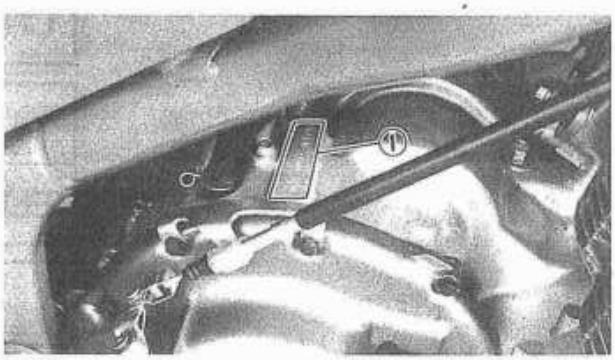
The vehicle identification number ① is stamped into the right side of steering head.

Starting serial number:
JYA4BRSO✳NA026101 (E)

NOTE:

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





FRAME SERIAL NUMBER

(Except for E)

The frame serial number ① is stamped into the right side of steering head.

Starting serial number:
4BR-000101
4BR-020101 (D) (S)
4BR-032101 (D)

NOTE:

The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.

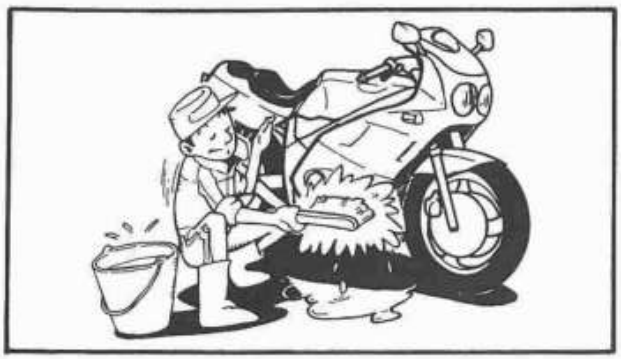
ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the right side the engine.

Starting serial number:
4BR-000101
4BR-026101 (E)
4BR-020101 (D) (S)
4BR-032101 (D)

NOTE:

- The first three digits of these numbers are for model identifications; the remaining digits are the unit production number.
- Designs and specifications are subject to change without notice.



IMPORTANT INFORMATION

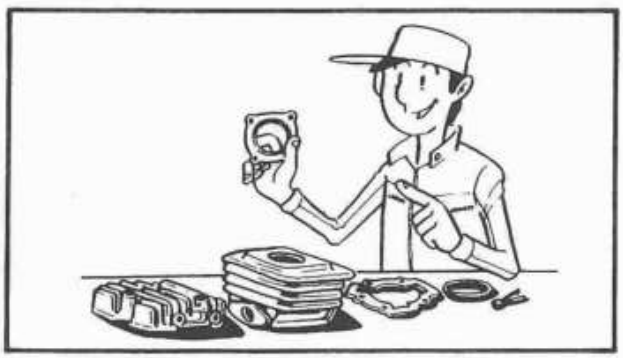
PREPARATION FOR REMOVAL

1. Remove all dirt, mud dust, and foreign material before removal and disassembly.

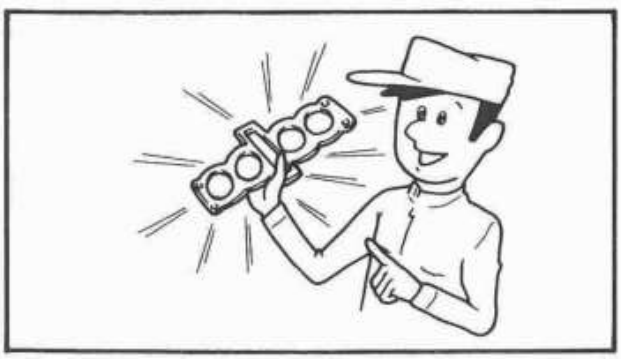


2. Use proper tools and cleaning quipment. Refer to "SPECIAL TOOL".

3. When disassembling the machine keep mated parts together. This includes gears, cylinders, pistons, and other mated parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.



4. During the machine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled.



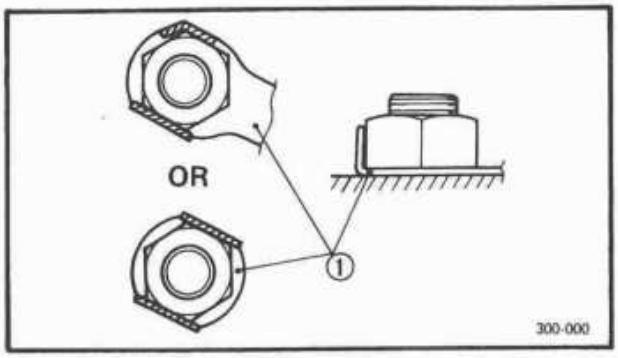
ALL REPLACEMENT PARTS

1. Use only genuine Yamaha parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment. Other brands may be similar in function and appearance, but inferior in quality.

GASKETS, OIL SEALS, AND O-RINGS

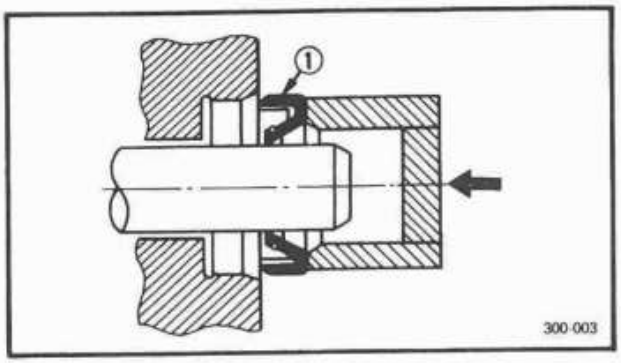
1. All gaskets, seals and O-rings should be replaced when an engine is overhauled. All gaskets surfaces, oil seal lips and O-rings must be cleaned.

2. Properly oil all mating parts and bearing during reassembly. Apply grease to the oil seal lips.



LOCK WASHERS/PLATES AND COTTER PINS

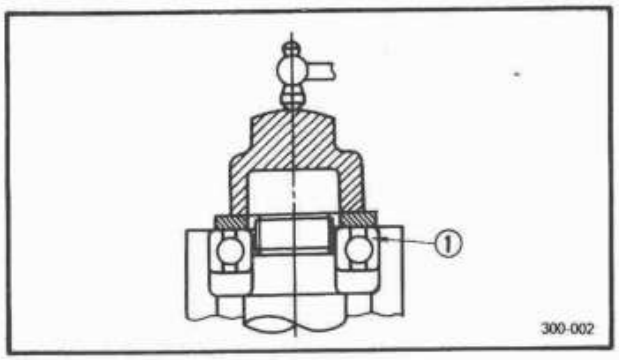
1. All lock washers/plates ① and cotter pins must be replaced when they are removed. Lock tab(s) should be bent along the bolt or nut flat(s) after the bolt or nut has been properly tightened.



BEARINGS AND OIL SEALS

1. Install the bearing(s) and oil seal(s) with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.

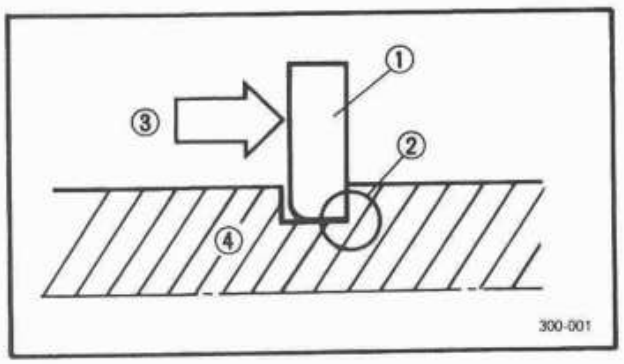
① Oil seal



CAUTION:

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

① Bearing



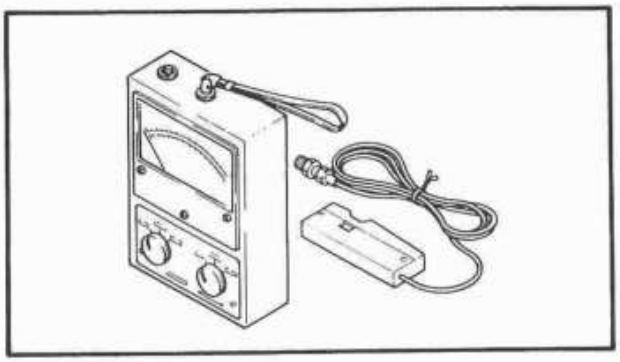
CIRCLIPS

1. All circlips should be inspected carefully before reassembly. Always replace piston pin clips after one use. Replace distorted circlips. When installing a circlips ①, make sure that the sharp edged corner ② is positioned opposite to the thrust ③ it receives. See the sectional view.

④ Shaft

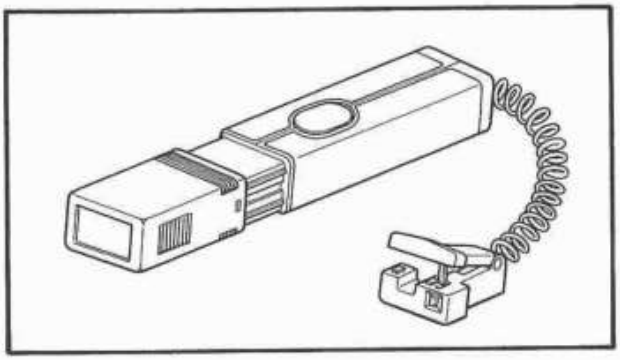
SPECIAL TOOLS

The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.

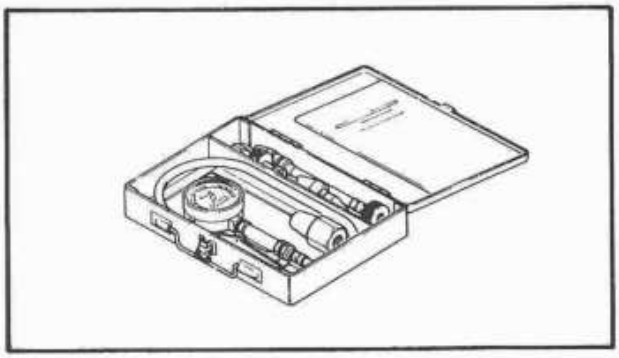


FOR TUNE UP

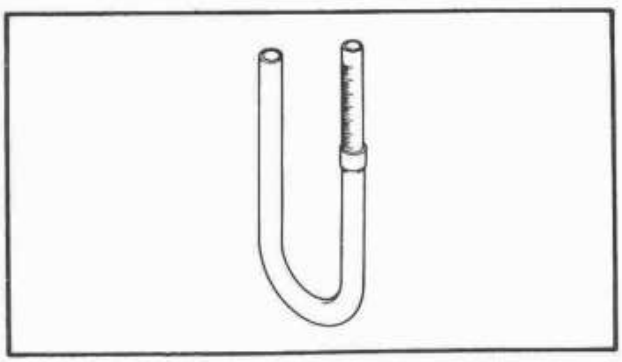
1. Inductive tachometer
   P/N 90890-03113
   This tool is needed for detecting engine rpm.



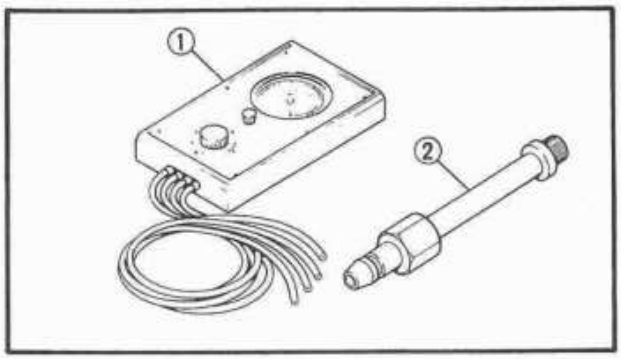
2. Inductive timing light
   P/N 90890-03141
   This tool is necessary for checking ignition timing.



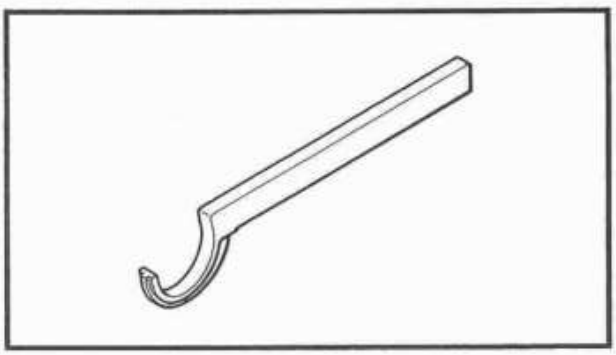
3. Compression gauge
   P/N 90890-03081
   This gauge is used to measure the engine compression.
   Adapter
   P/N 90890-04082



4. Fuel level gauge
   P/N 90890-01312
   This gauge is used to measure the fuel level in the float chamber.

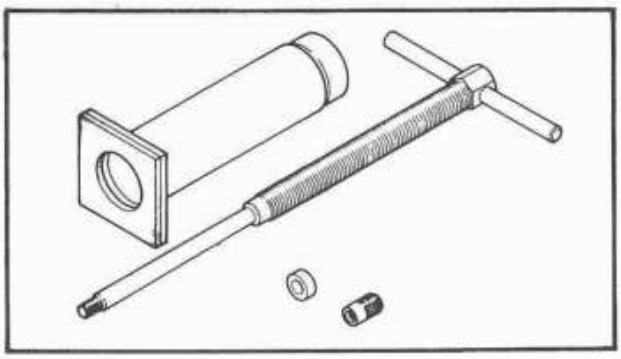


5. Vacuum gauge ①
P/N 90890-03094
Attachment ②
P/N 90890-03060
These tools are needed for carburetor synchronization.

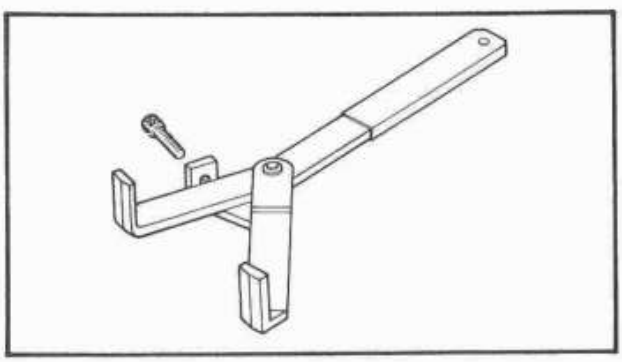


FOR ENGINE SERVICE

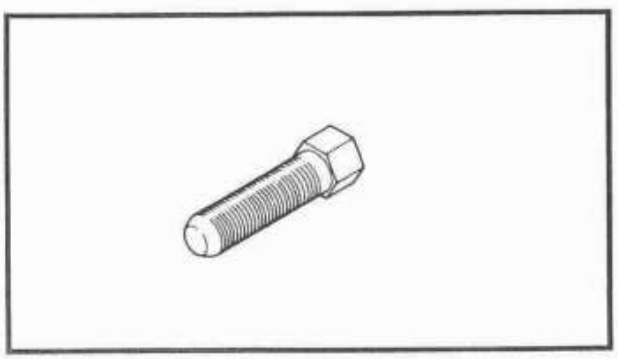
1. Tappet adjusting tool
P/N 90890-04125
This tool is necessary to replace valve adjusting pads.



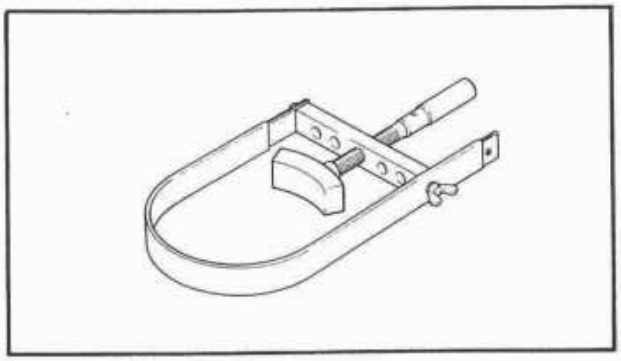
2. Piston pin puller
P/N 90890-01304
This tool is used to remove the piston pin.



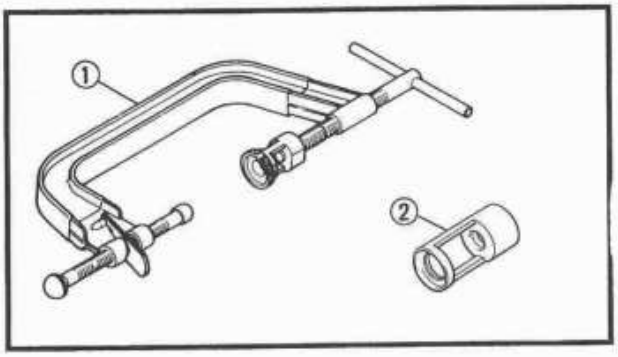
3. Universal clutch holder
P/N 90890-04086
This tool is used to loosen and tighten the clutch boss locknut.



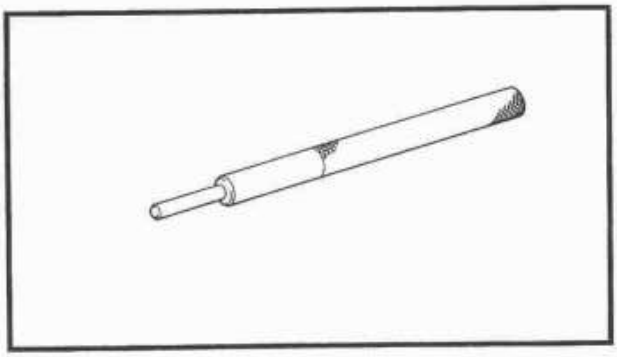
4. Rotor puller
P/N 90890-01080
This tool is used to remove the rotor.



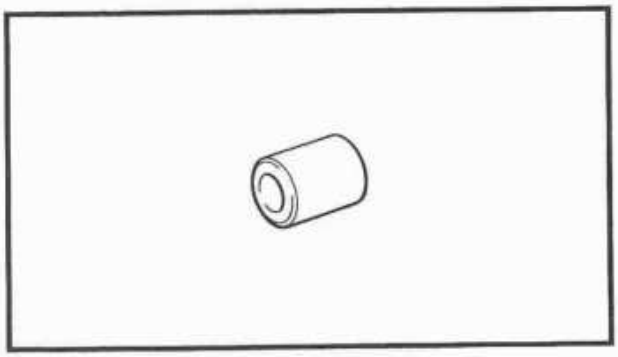
5. Primary sheave holder
   P/N 90890-01701
   This tool is used to loosen and tighten the A.C. magneto.



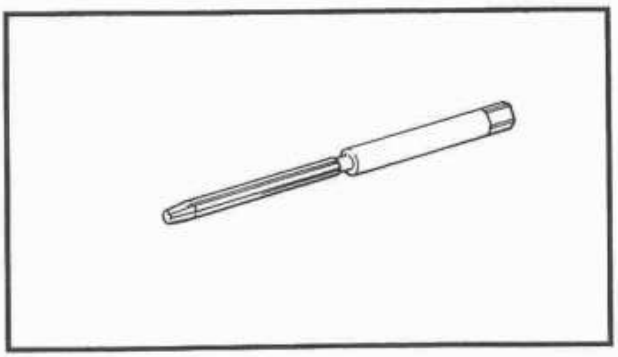
6. Valve spring compressor ①
   P/N 90890-04019
   Attachment ②
   P/N 90890-04108
   These tools are needed to remove and install the valve assemblies.



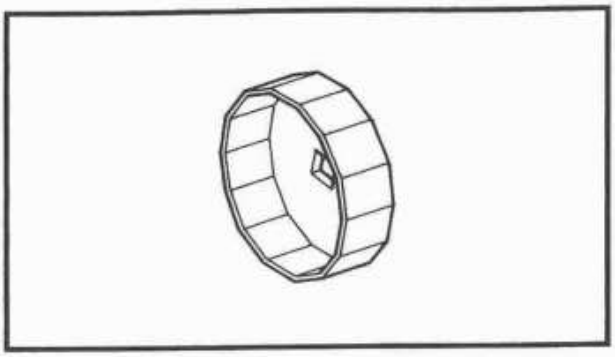
7. Valve guide remover (5.0 mm)
   P/N 90890-04097
   This tool is used to remove the valve guides.



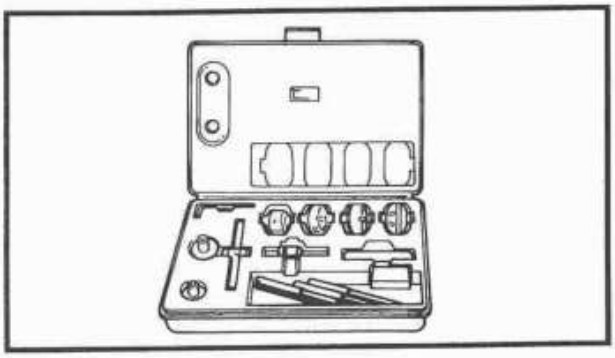
8. Valve guide installer (5.0 mm)
   P/N 90890-04098
   This tool is needed to install the valve guides properly.



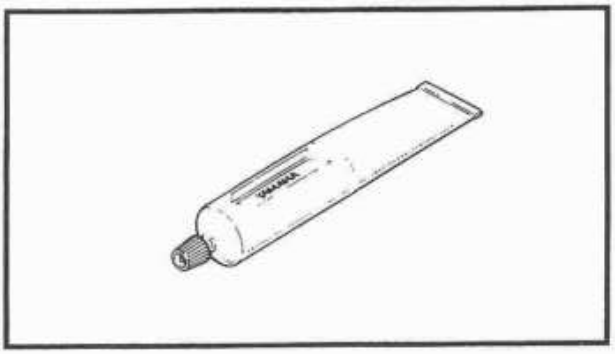
9. Valve guide reamer (5.0 mm)
   P/N 90890-04099
   This tool is used to rebore the new valve guide.



10. Oil filter wrench
    P/N 90890-01426
    This tool is used to remove and install the oil filter.

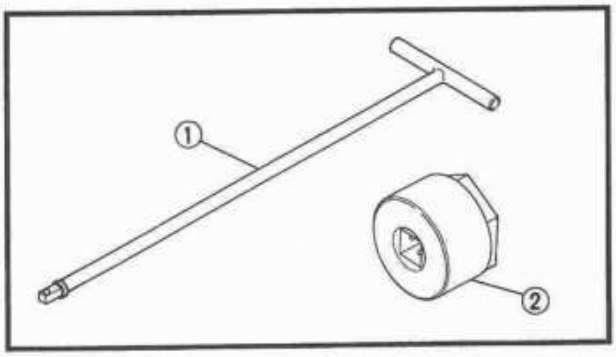


11. Valve seat cutter
    P/N YM-91043
    This tool is used to resurface the valve seat.

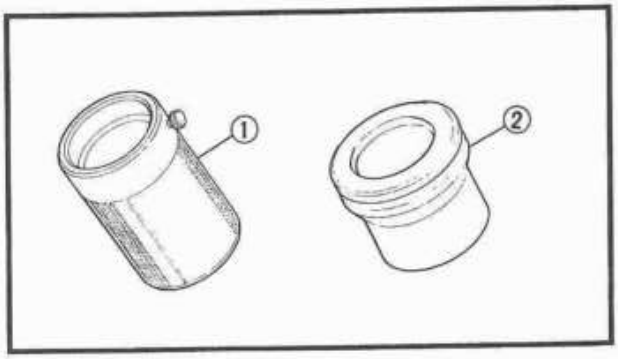


12. Yamaha bond No. 1215
    P/N 90890-85505
    This sealant (bond) is used for crankcase mating surface.

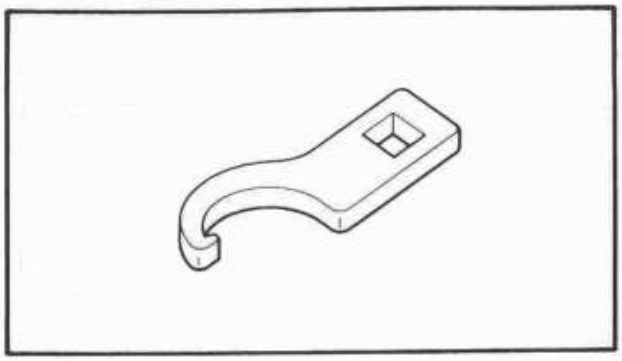
FOR CHASSIS SERVICE



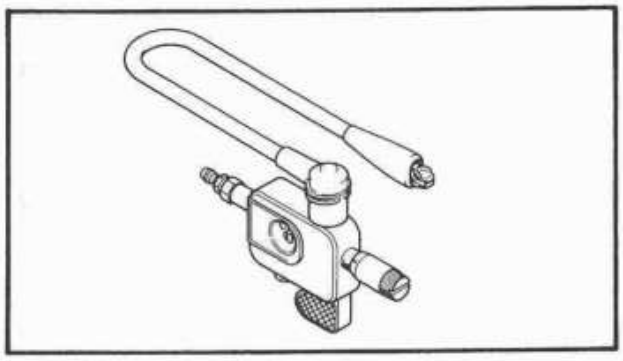
1. T-Handle ①
   P/N 90890-01326
   For damper rod holder ②
   P/N 90890-01328
   These tools are used to loosen and tighten the front fork damper rod holding bolt.



2. Front fork seal driver (weight) ①
   P/N 90890-01367
   Adapter (38 mm) ②
   P/N 90890-01372
   These tools are used when installing the fork seat.

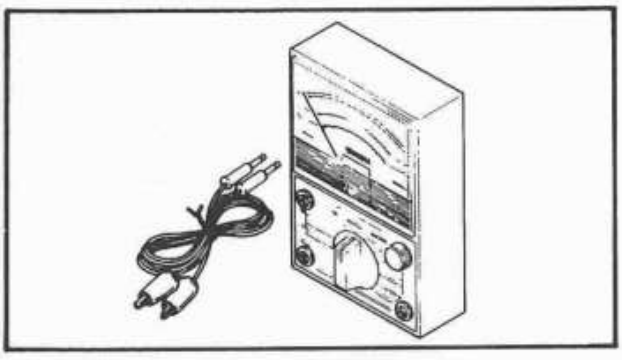


3. Ring nut wrench
   P/N 90890-01403
   This tool is used to loosen and tighten the steering ring nut.



FOR ELECTRICAL COMPONENTS

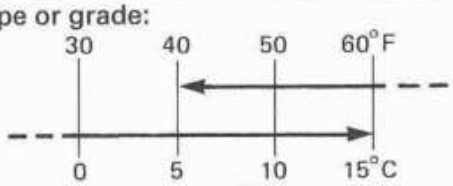
1. Ignition checker
   P/N 90890-06754
   This instrument is necessary for checking the ignition system components.



2. Pocket tester
   P/N 90890-03112
   This instsrument is invaluable for checking the electrical system.

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	XJ600S
Model code number:	4BR1 4BR2 (E) 4EB1 (D) (S) 4DS1 (D)
Vehicle identification number:	JYA4BRSO * NA026101 (E)
Frame starting number:	4BR-000101 4BR-020101 (D) (S) 4BR-032101 (D)
Engine starting number:	4BR-000101 4BR-026101 (E) 4BR-020101 (D) (S) 4BR-032101 (D)
Dimensions: Overall length Overall width Overall height Seat height Wheelbase Minimum ground clearance	 2,170 mm (85.4 in) 750 mm (29.5 in) 1,170 mm (46.1 in) 770 mm (30.3 in) 1,445 mm (56.9 in) 150 mm (5.91 in)
Basic weight: With oil and full fuel tank	 197 kg (434 lb)
Minimum turning radius:	2,600 mm (102 in)
Engine: Engine type Cylinder arrangement Displacement Bore × stroke Compression ratio Compression pressure Starting system	 Air cooled 4-stroke, gasoline, DOHC 4-cylinder parallel 598.8 cm^3 58.5 x 55.7 mm (2.30 x 2.19 in) 10.0 : 1 1,100 kPa (11.0 kg/cm^2, 156 psi) Electric starter
Lubrication system:	Wet sump
Engine oil type or grade:  	 SAE 20W40 type SE motor oil SAE 10W30 type SE motor oil
Engine oil capacity: Periodic oil change With oil filter replacement Total amount	 2.2 L (1.9 Imp qt, 2.3 US qt) 2.5 L (2.2 Imp qt, 2.6 US qt) 2.9 L (2.6 Imp qt, 3.1 US qt)
Air filter:	Dry type element

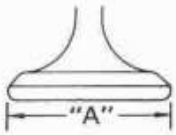
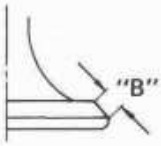
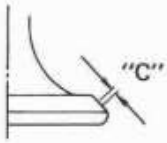
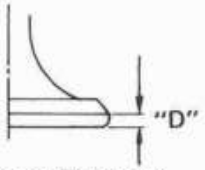
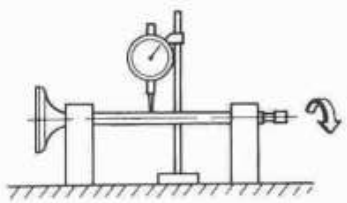
Model	XJ600S	
Fuel: Type Tank capacity Reserve amount	 Europe : Regular unleaded gasoline 17.0 L (3.74 Imp gal, 4.49 US gal) 3.5 L (0.77 Imp gal, 0.92 US gal)	
Carburetor: Type x quantity Manufacturer	 BDST 28 x 4 MIKUNI	
Spark plug: Type/Manufacture Gap	 CR7E (NGK), CR8E (NGK), CR9E (NGK), U22ESR-N (N.D.),U24ESR-N (N.D.), U27ESR-N (N.D.) 0.7 ~ 0.8 mm (0.028 ~ 0.031 in)	
Clutch type:	Wet, multiple-disc	
Transmission: Primary reduction system Primary reduction ratio Secondary reduction system Secondary reduction ratio Transmission type Operation Gear ratio 1st 2nd 3rd 4th 5th 6th	 Spur gear 23/24 x 65/28 (2.225) Chain drive 48/16 (3,000) Constant mesh 6-speed Left foot operation 41/15 (2.733) 32/18 (1.778) 28/21 (1.333) 29/27 (1.074) 21/23 (0.913) 23/28 (0.821)	
Chassis: Frame type Caster angle Trail	 Double cradle 25° 97 mm (3.82 in)	
Tire:	Front	Rear
Type Size Manufacture (Type)	Tubeless 110/80-17 57H YOKOHAMA (F209) DUNLOP (K275F)	Tubeless 130/70-18 63H YOKOHAMA (R209) DUNLOP (K275)
Tire pressure (Cold tire): Basic Weight: With oil and full fuel tank Maximum load*	 197 kg (434 lb) 200 kg (441 lb)	
Cold tire pressure:	Front	Rear
Up to 90 kg (198 lb) load*	200 kPa (2.0 kg/cm², 28 psi)	225 kPa (2.25 kg/cm², 32 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)
High speed riding	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)
	* Load is the total weight of cargo, rider, passenger, and accessories.	

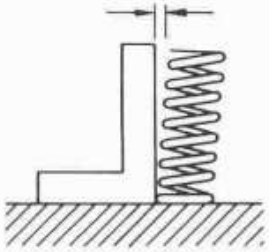
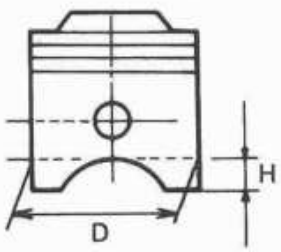
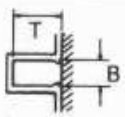
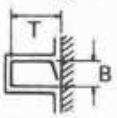
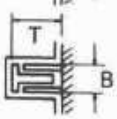
Model		XJ600S
Brake:		
Front		Single disc brake
Operation		Right hand operation
Rear		Single disc brake
Operation		Right foot operation
Suspension:		
Front suspension		Telescopic fork
Rear suspension		Swingarm (Monocross)
Shock absorber:		
Front shock absorber		Coil-spring/ Oil damper
Rear shock absorber		Coil-gas spring/Oil damper
Wheel travel:		
Front wheel travel		140 mm (5.51 in)
Rear wheel travel		110 mm (4.33 in)
Electrical:		
Ignition system		T.C.I. (Digital ignition)
Generator system		A.C. magneto generator
Battery type or model		YTX9-BS, GTX9-BS
Battery capacity		12V 8AH
Headlight type:		Quartz bulb (Halogen)
Bulb wattage x Quantity:		
Headlight		12V 60W/55W
Tail/brake light		12V 5W/21W
Flasher light		12V 21W x 4
Auxiliary light		12V 4W x 1 3.4W x 1 (GB)
Licence light		12V 5W x 2
Meter light		12V 1.7W x 3
Indicator light:		
Wattage x quantity	"NEUTRAL"	12V 3.4W x 1
	"HIGH BEAM"	12V 3.4W x 1
	"TURN"	12V 3.4W x 1
	"OIL LEVEL"	12V 3.4W x 1

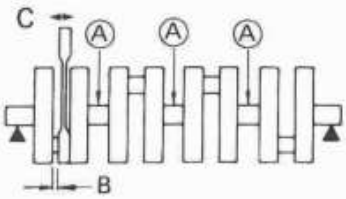
MAINTENANCE SPECIFICATIONS

ENGINE

Model	XJ600S
Cylinder head: Warp limit*	0.03 mm (0.0012 in) *Lines indicate straightedge measurement.
Cylinder: Bore size Taper Limit Out of Round Limit	58.505 ~ 58.545 mm (2.3033 ~ 2.3049 in) 0.05 mm (0.002 in) 0.01 mm (0.0004 in)
Camshaft: Drive method Cam cap inside dia. Camshaft Outside Dia. Shaft-to-cap clearance <Limit> Cam dimensions: Intake "A" <Limit> "B" <Limit> "C" <Limit> Exhaust "A" <Limit> "B" <Limit> "C" <Limit> Camshaft runout limit	Chain drive (Center) 25.000 ~ 25.021 mm (0.9843 ~ 0.9859 in) 24.967 ~ 24.980 mm (0.9830 ~ 0.9835 in) 0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in) <0.16 mm (0.0063 in)> 35.75 ~ 35.85 mm (1.404 ~ 1.411 in) <35.7 mm (1.4 in)> 27.95 ~ 28.05 mm (1.100 ~ 1.104 in) <27.9 mm (1.1 in)> 7.8 mm (0.31 in) <7.6 mm (0.30 in)> 35.45 ~ 35.55 mm (1.396 ~ 1.400 in) <35.4 mm (1.4 in)> 27.95 ~ 28.05 mm (1.100 ~ 1.104 in) <27.9 mm (1.1 in)> 7.5 mm (0.30 in) <7.3 mm (0.29 in)> 0.05 mm (0.002 in)
Cam chain: Cam chain type/No. of links Cam chain adjustment method	82-RH 2010/144 Auto

Model		XJ600S
Valve, valve seat, valve guide:		
Valve clearance (Cold):	IN.	0.11 ~ 0.15 mm (0.004 ~ 0.006 in)
	EX.	0.21 ~ 0.25 mm (0.008 ~ 0.010 in)
Valve dimensions:		
 Head Dia.	 Face Width	 Seat Width  Margin Thickness
"A" Head dia.	IN.	29.9 ~ 30.1 mm (1.177 ~ 1.185 in)
	EX.	25.9 ~ 26.1 mm (1.020 ~ 1.028 in)
"B" Face width	IN.	2.26 mm (0.089 in)
	EX.	2.26 mm (0.089 in)
"C" Seat limit width	IN.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
	EX.	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
<Limit>	IN.	<2.0 mm (0.08 in)>
	EX.	<2.0 mm (0.08 in)>
"D" Margin thickness limit	IN.	1.0 mm (0.039 in)
	EX.	1.0 mm (0.039 in)
Stem outside diameter	IN.	4.975 ~ 4.990 mm (0.1959 ~ 0.1965 in)
	EX.	4.960 ~ 4.975 mm (0.1953 ~ 0.1959 in)
<Limit>	IN.	<4.945 mm (0.195 in)>
	EX.	<4.920 mm (0.194 in)>
Guide inside diameter	IN.	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)
	EX.	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)
<Limit>	IN.	<5.045 mm (0.199 in)>
	EX.	<5.020 mm (0.198 in)>
Stem-to-guide clearance	IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
	EX.	0.025 ~ 0.052 mm (0.001 ~ 0.002 in)
<Limit>	IN.	<0.1 mm (0.004 in)
	EX.	<0.1 mm (0.004 in)>
Stem runout limit		0.03 mm (0.0012 in)
		
Valve seat width	IN.	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
	EX.	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
<Limit>	IN.	<2.0 mm (0.08 in)>
	EX.	<2.0 mm (0.08 in)>
Valve spring:		
Free length		
Inner spring	IN.	38.33 mm (1.51 in)
	EX.	38.33 mm (1.51 in)
Outer spring	IN.	38.52 mm (1.52 in)
	EX.	38.52 mm (1.52 in)
Installed length (valve closed):		
Inner spring	IN.	32.5 mm (1.28 in)
	EX.	32.5 mm (1.28 in)
Outer spring	IN.	33.4 mm (1.31 in)
	EX.	33.4 mm (1.31 in)

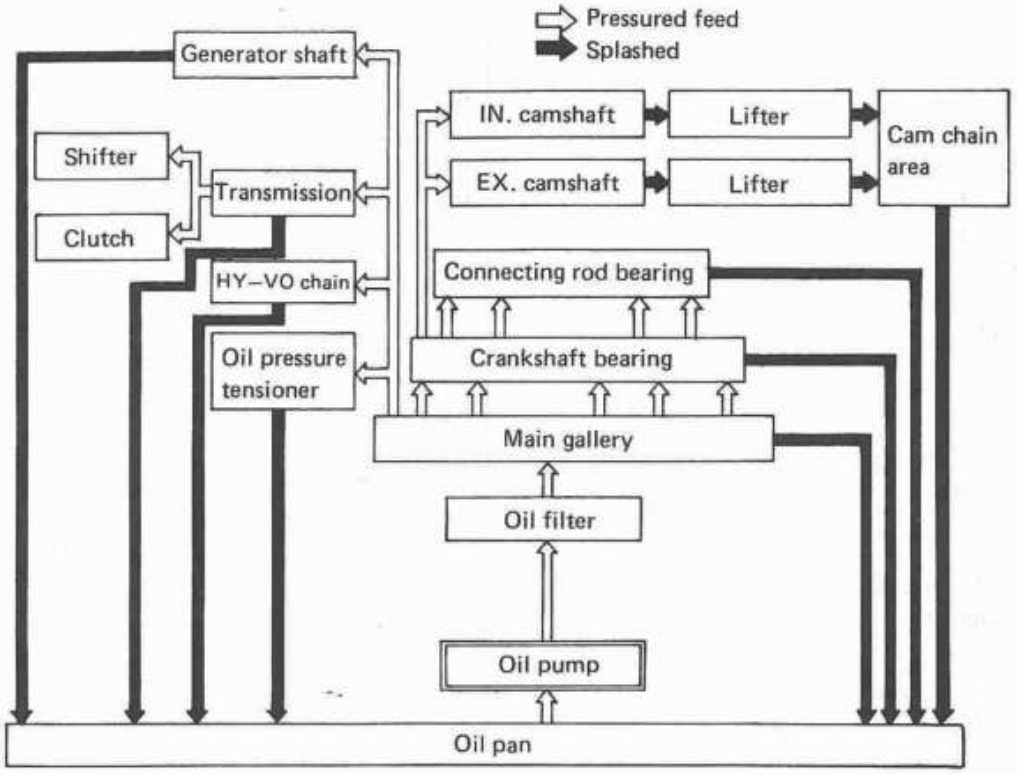
Model		XJ600S
Tilt limit:		
Inner spring	IN. and EX.	2.5°/1.7 mm (0.067 in)
Outer spring	IN. and EX.	2.5°/1.7 mm (0.067 in)
		
Direction of winding (Top view):		Inner spring: IN. and EX. — Counter Clockwise 
		Outer spring: IN. and EX. — Clockwise 
Piston:		
Piston size "D"		58.47 ~ 58.51 mm (2.302 ~ 2.304 in)
Measuring point "H"		4.0 mm (0.16 in)
Piston-to-cylinder clearance: <Limit>		0.025 ~ 0.045 mm (0.0010 ~ 0.0018 in) <0.15 mm (0.006 in)>
Piston ring:		
Sectional sketch	Top ring	Barrel B = 1.0 mm (0.04 in) T = 2.3 mm (0.09 in)
	2nd ring	Taper B = 1.2 mm (0.05 in) T = 2.5 mm (0.10 in)
	Oil ring	Expander B = 2.5 mm (0.10 in) T = 2.8 mm (0.11 in)
		
End gap (Installed):	Top ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
	<Limit>	<0.7 mm (0.028 in)>
	2nd ring	0.15 ~ 0.35 mm (0.006 ~ 0.014 in)
	<Limit>	<0.7 mm (0.028 in)>
	Oil ring	0.2 ~ 0.7 mm (0.008 ~ 0.028 in)
Side clearance	Top ring	0.035 ~ 0.07 mm (0.0014 ~ 0.0028 in)
	<Limit>	<0.15 mm (0.006 in)>
	2nd ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
	<Limit>	<0.15 mm (0.006 in)>
	Oil ring	—

Model	XJ600S
Connecting rod: Oil clearance <Limit>	 0.026 ~ 0.060 mm (0.0010 ~ 0.0024 in) <0.08 mm (0.003 in)>
Crankshaft:  Runout limit "A" Big end side clearance "B" <Limit> Big end radial clearance "C" <Limit> Main journal oil clearance Bearing size No. color code	 0.03 mm (0.0012 in) 0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in) <0.5 mm (0.02 in)> 0.026 ~ 0.060 mm (0.0010 ~ 0.0024 in) <0.08 mm (0.003 in)> 0.014 ~ 0.053 mm (0.0006 ~ 0.0021 in) 1. Blue 2. Black 3. Brown 4. Green 5. Yellow
Clutch: Friction plate: Thickness x Quantity <Wear limit> Clutch plate: Thickness x Quantity <Warp limit> Clutch spring: Free length x Quantity Minimum length Clutch housing: Thrust clearance Radial clearance Clutch release method	 2.9 ~ 3.1 mm (0.114 ~ 0.122 in) x 8 <2.7 mm (0.106 in)> 1.5 ~ 1.7 mm (0.060 ~ 0.067 in) x 7 <0.15 mm (0.006 in)> 42.8 mm (1.69 in) x 5 41.8 mm (1.65 in) 0.12 ~ 0.39 mm (0.005 ~ 0.0115 in) 0.015 ~ 0.043 mm (0.0006 ~ 0.0017 in) Outer pull, rack & Pinion pull
Transmission: Main axle deflection limit Drive axle deflection limit	 0.08 mm (0.0031 in) 0.08 mm (0.0031 in)
Shifter: Shifter type	 Guide bar

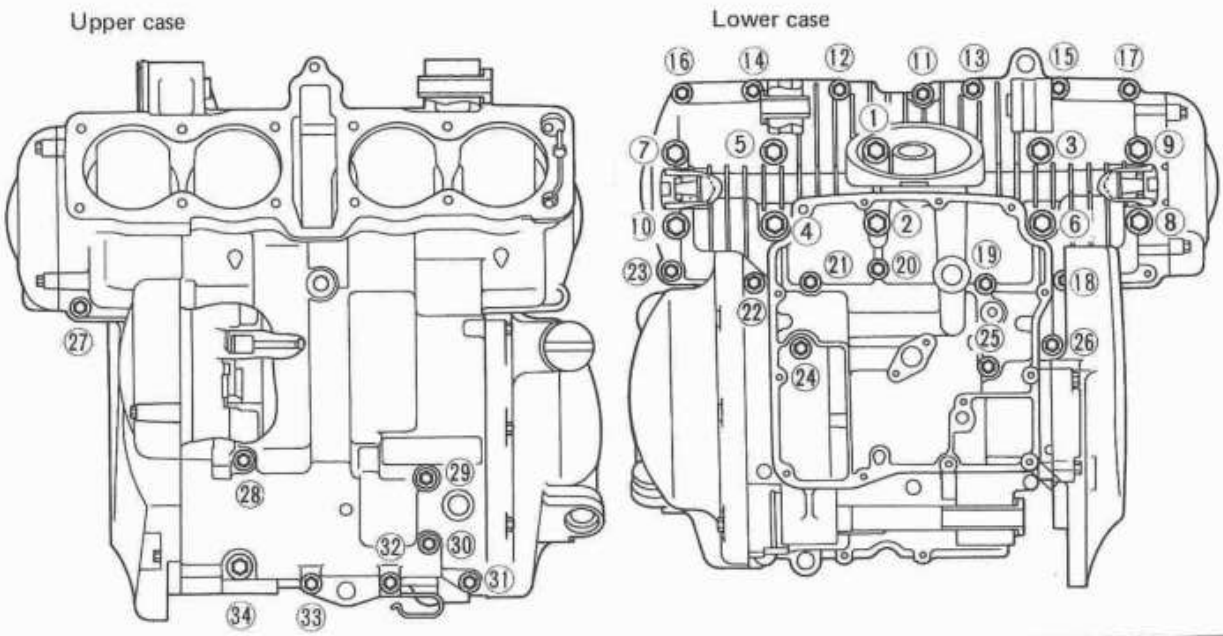
Model		XJ600S
Carburetor:		
Type/Manufacture x quantity		BDST28/MIKUNI x 4
I.D. mark		4BR00, 4DS00(D), 4EB00(D,S)
Main jet	(M.J.)	#1, #4 : #105 #2, #3 : #102.5
Main air jet	(M.A.J.)	#70
Jet needle-clip position	(J.N.)	5CT-3.5, 5CT-2.5(D,S)
Needle jet	(N.J.)	0-4
Pilot jet	(P.J.)	#15
Pilot outlet size	(P.O.)	0.8
Pilot air jet	(P.A.J.)	#145
Pilot screw (turns out)	(P.S.)	2
Valve seat size	(V.S.)	1.5
Starter jet	($G.S_1$)	47.5
	($G.S_2$)	0.6
Bypass 1	(B.P.1)	0.8
Bypass 2	(B.P.2)	0.8 (B.P. 3 : 0.8)
Throttle valve size	(Th. V.)	#130
Float height	(F.H.)	11 ~ 13 mm (0.43 ~ 0.51 in)
Fuel level	(F.L.)	3 ~ 5 mm (0.12 ~ 0.20 in)
		Above from the float chamber line
Engine idle speed		1,150 ~ 1,250 r/min
Intake vacuum		34,58 ~ 35,91kPa
		(260 ~ 270 mmHg, 10,24 ~ 10,64 inHg)
Lubrication system:		
Oil filter type		Paper
Oil pump type		Trochoid pump
Tip clearance		0.09 ~ 0.15 mm (0.0035 ~ 0.0060 in)
<Limit>		<0.2 mm (0.008 in)>
Side clearance		0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)
<Limit>		<0.15 mm (0.006 in)>
Bypass valve setting pressure		80 ~ 120 kPa
		(0.8 ~ 1.2 kg/cm², 11.4 ~ 17.1 psi)
Relief valve operating pressure		450 ~ 550 kPa
		(4.5 ~ 5.5 kg/cm², 64.0 ~ 78.2 psi)
Oil pressure (Hot)		80 kPa (0.8 kg/cm², 11.4 psi)/1,200 r/min
Pressure check location		Main gallery

Model	XJ600S

Lubrication Chart:



Crankcase Thghtening Sequence:

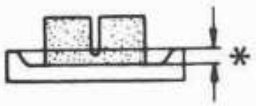
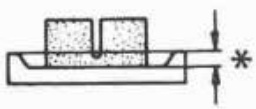


TIGHTENING TORQUE:

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque Nm	Tightening torque m·kg	Tightening torque ft·lb	Remarks
Camshaft	Bolt	M 6	24	10	1.0	7.2	Tighten in 3-stages
Cylinder head (cam chain)	Stud bolt	M 6	4	5	0.5	3.6	E
Cylinder head (exhaust pipe)	Stud bolt	M 6	8	15	1.5	11	E
Cylinder head	Cap nut	M 8	12	22	2.2	16	E
Spark plug	—	M 10	4	12.5	1.25	9.0	
Cylinder head cover	Bolt	M 6	8	10	1.0	7.2	
Cylinder and crankcase	Nut	M 8	1	20	2.0	14	
Cylinder head	Nut	M 6	4	10	1.0	7.2	
Connecting rod	Nut	M 7	8	25	2.5	18	M
Cam sprocket	Bolt	M 7	4	24	2.4	17	LT
Cam chain tensioner	Bolt	M 6	2	10	1.0	7.2	
	Cap bolt	—	1	20	2.0	14	
Cam chain guide	Bolt	M 6	1	7	0.7	5.1	
Oil pump rotor housing	Screw	M 6	1	7	0.7	5.1	
Oil pump	Screw	M 6	3	7	0.7	5.1	
Oil pump strainer	Bolt	M 6	2	10	1.0	7.2	
Oil pan	Bolt	M 6	12	10	1.0	7.2	
Oil filter	Union bolt	M 20	1	17	1.7	12	
Drain bolt	Plug	M 14	1	43	4.3	31	
Oil filter housing	Union bolt	M 20	1	50	5.0	36	
Intake manihold	Bolt	M 6	8	10	1.0	7.2	
Air filter cover	Screw	M 5	4	5	0.5	3.6	
Air filter	Bolt	M 6	1	10	1.0	7.2	
Exhaust pipe	Nut	M 8	8	20	2.0	14	
Muffler	Bolt	M 10	2	25	2.5	18	
	Bolt	M 8	2	20	2.0	14	
Exhaust pipe joint	Bolt	M 8	2	20	2.0	14	
Crankcase	Stud bolt	M 8	12	13	1.3	9.4	E
Crankcase (upper and lower)	Bolt	M 8	11	24	2.4	17	E
	Bolt	M 6	22	12	1.2	8.8	E
Timing plate cover	Bolt	M 6	4	8	0.8	5.8	
Magneto cover	Bolt	M 6	3	10	1.0	7.2	
Crankcase (main gallary blind plug)	Plug	M 20	2	12	1.2	8.8	E
Sleeve tensioner	Bolt	M 6	4	10	1.0	7.2	LT
HI-VO chain guide (upper)	Bolt	M 6	2	8	0.8	5.8	LT
Clutch pressure plate	Bolt	M 6	5	8	0.8	5.8	
Clutch boss	Nut	M 20	1	70	7.0	50	
Primary drive gear	Nut	M 16	1	50	5.0	36	
Drive sprocket	Nut	M 18	1	110	11.0	80	
Camshaft segment	Screw	M 6	1	12	1.2	8.8	LT
Shift shaft stopper lever	Screw	M 8	1	22	2.2	16	LT
Shift arm	Bolt	M 6	1	10	1.0	7.2	LT
Stopper plate	Screw	M 6	1	7	0.7	5.1	
Shift pedal adjuster	Nut	M 6	1	10	1.0	7.2	Left hand thread
	Nut	M 6	1	10	1.0	7.2	
Rotor	Bolt	M 10	1	80	8.0	58	
Pickup coil base	Screw	M 6	2	8	0.8	5.8	
Timing plate	Bolt	M 10	1	45	4.5	32	
Neutral switch	Screw	M 5	3	4	0.4	2.9	LT

CHASSIS

Model		XJ600S
Steering system:		
Steering bearing type		Ball bearing
No./Size of steel balls:	Upper	14 pcs/0.28 in
	Lower	14 pcs/0.31 in
Front suspension:		
Front fork travel		140 mm (5.51 in)
Front spring free length		476.5 mm (18.8 in)
<Limit>		<471.5 mm (18.6 in)>
Spring rate:	K1	45 N/mm (0.45 kg/mm, 25.2 lb/in)
	K2	80 N/mm (0.8 kg/mm, 44.8 lb/in)
Stroke:	K1	0 ~ 80 mm (0 ~ 3.15 in)
	K2	80 ~ 140 mm (3.15 ~ 5.51 in)
Optional spring		No.
Oil capacity		379 cm³ (13.3 Imp oz, 12.8 US oz)
Oil level (Fully compression)		111 mm (4.37 in)
		Below the top of inner fork tube without fork spring
Oil grade		Fork oil 10W or equivalent
Rear suspension:		
Shock absorber travel		37 mm (1.46 in)
Spring free length		170.5 mm (6.71 in)
<Limit>		<165 mm (6.51 in)>
Spring rate:	K1	1,800 N/mm (18 kg/mm, 1,008 lb/in)
Stroke:	K1	0 ~ 37 mm (0 ~ 1.46 in)
Optional spring		No.
Adjusting position		Hard: 7, 6, 5, 4 / STD: 3 / Soft: 2, 1
Swingarm:		
Free play limit:	End	1.0 mm (0.04 in)
	Side	1.0 mm (0.04 in)
Front wheel:		
Type		Cast wheel
Rim size		17 × MT2.50
Rim material		Aluminum
Rim runout limit:	Radial	2.0 mm (0.08 in)
	Lateral	2.0 mm (0.08 in)
Rear wheel:		
Type		Cast wheel
Rim size		18 × MT3.50
Rim material		Aluminum
Rim runout limit:	Radial	2.0 mm (0.08 in)
	Lateral	2.0 mm (0.08 in)
Drive chain:		
Type/Manufacturer		520VL2/DAIDO
No. of links		110
Chain free play		30 ~ 40 mm (1.2 ~ 1.6 in)

Model	XJ600S
Front disc brake:	
Type	Single
Disc outside diameter × thickness	320 × 6 mm (12.6 × 0.24 in)
Pad thickness Inner	6.2 mm (0.24 in)
<Limit>*	<0.8 mm (0.03 in)>
Pad thickness Outer	6.2 mm (0.24 in)
<Limit>*	<0.8 mm (0.03 in)>
	
Master cylinder inside diameter	14 mm (0.55 in)
Caliper cylinder inside diameter	30.2 + 33.3 mm (1.19 + 1.31 in)
Brake fluid type	DOT #3 or #4
Rear disc brake:	
Type	Single
Disc outside diameter × thickness	245 × 4 mm (9.6 × 0.16 in)
Pad thickness Inner	5.5 mm (0.22 in)
<Limit>*	<0.5 mm (0.02 in)>
Pad thickness Outer	5.5 mm (0.22 in)
<Limit>*	<0.5 mm (0.02 in)>
	
Master cylinder inside diameter	12.7 mm (0.5 in)
Caliper cylinder inside diameter	38.18 mm (1.5 in)
Brake fluid type	DOT #3 or #4
Clutch lever:	
Clutch lever free play	2 ~3 mm (0.08 ~ 0.12 in)
Brake lever and brake pedal:	
Brake pedal position	40 mm (1.6 in) Below the top of the footrest

TIGHTENING TORQUE:

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Handle crown and inner tube	M 8 x 1.25	23	2.3	17	
Handle crown and steering stem	M 22 x 1.0	110	11.0	80	
Steering stem and ring nut	M 25 x 1.0	18	1.8	13	See NOTE.
Inner tube and under bracket	M 8 x 1.25	38	3.8	2.7	
Under bracket and brake hose holder	M 6 x 1.0	10	1.0	7.2	
Brake hose and union bolt	M 10 x 1.25	30	3.0	22	
Upper cowl and stay	M 5 x 0.8	0.5	0.05	0.4	
Upper cowl and screen	M 5 x 0.8	0.5	0.05	0.4	
Cowl stay and frame	M 8 x 1.25	16	1.6	11	
Meter and stay	M 6 x 1.0	7	0.7	5.1	
Handlebar and grip end	M 16 x 1.5	26	2.6	19	
Front master cylinder and bracket	M 6 x 1.0	9	0.9	6.5	
Front master cylinder and cap	M 4 x 0.7	1.5	0.15	1.1	
Handle crown and holder upper	M 8 x 1.25	23	2.3	17	
Handle crown and main switch	M 6 x 1.0	7	0.7	5.1	
Front flasher light and stay	M 12 x 1.25	4	0.4	2.9	
Head light and stay	M 8 x 1.25	7	0.7	5.1	
Upper cowl and frame	M 5 x 0.8	0.5	0.05	0.4	
Upper cowl (left and right)	—	1.5	0.15	1.1	
Engine mount (upper)	M 10 x 1.25	60	6.0	43	
(lower)	M 10 x 1.25	60	6.0	43	
(rear)	M 12 x 1.25	88	8.8	64	
Engine stay and frame	M 10 x 1.25	46	4.6	33	
Pivot shaft and nut	M 14 x 1.5	91	9.1	66	
Rear shock absorber and rear arm	M 12 x 1.25	64	6.4	46	
Rear shock absorber and frame	M 12 x 1.25	64	6.4	46	
Chain case and rear arm	M 6 x 1.0	7	0.7	5.1	
Seal guard	M 6 x 1.0	7	0.7	5.1	
Fuel cock and fuel tank	M 6 x 1.0	7	0.7	5.1	
Fuel tank bracket and fuel tank	M 6 x 1.0	7	0.7	5.1	
Fuel tank bracket and frame	M 6 x 1.0	10	1.0	7.2	
Fuel tank and frame	M 8 x 1.25	15	1.5	11	
Rotor assembly and frame	M 6 x 1.0	7	0.7	5.1	
Rear fender and frame	M 6 x 1.0	7	0.7	5.1	
Tail light	M 6 x 1.0	7	0.7	5.1	
Rear fender cover and side cover	M 6 x 0.8	4	0.4	2.9	
Rectifier/Regulator	M 6 x 1.0	7	0.7	5.1	
Side cover	M 5 x 0.8	4	0.4	2.9	
Rear fender stay and frame	M 6 x 1.0	10	1.0	7.2	
Ignitor unit	—	1.5	0.15	1.1	
Fuse box	—	1.5	0.15	1.1	
Rear flasher light	M 12 x 1.25	5	0.5	3.6	
Front wheel axle	M 16 x 1.5	59	5.9	43	
Rear wheel axle and nut	M 16 x 1.5	105	10.5	75	
Front caliper and front fork	M 10 x 1.25	35	3.5	25	
Rear caliper and caliper bracket	M 10 x 1.25	35	3.5	25	
Caliper bracket and compression bar	M 8 x 1.25	30	3.0	22	
Rear arm and compression bar	M 8 x 1.25	30	3.0	22	
Brake disc and wheel (front and rear)	M 8 x 1.25	20	2.0	14	LT
Rear wheel sprocket and clutch hub	M 10 x 1.25	60	6.0	43	
Bleed screw and caliper	M 7 x 1.0	6	0.6	4.3	
Front wheel axle pinch bolt	M 8 x 1.25	20	2.0	14	
Front fender and front fork	M 6 x 1.0	9	0.9	6.5	

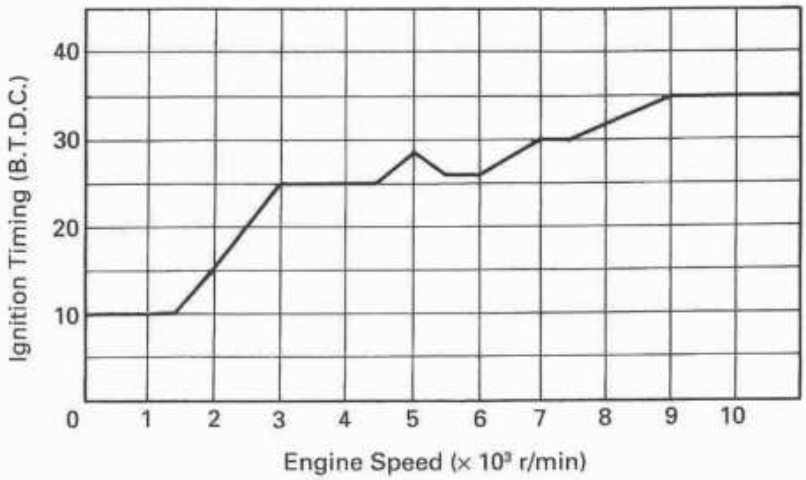
TIGHTENING TORQUE:

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m • kg	ft • lb	
Brake hose holder and front fork	M 6 x 1.0	7	0.7	5.1	
Sidestand	M 10 x 1.25	40	4.0	29	
Sidestand and lock nut	M 10 x 1.25	40	4.0	29	
Rear master cylinder	M 8 x 1.25	23	2.3	17	
Rear brake reservoir tank	M 6 x 1.0	4	0.4	2.9	
Footrest bracket and footrest	M 10 x 1.25	30	3.0	22	
Shift pedal	M 8 x 1.25	30	3.0	22	

NOTE:

1. First, tighten the ring nut approximately 52 Nm (5.2 m • kg, 37 ft • lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut to specification.

ELECTRICAL

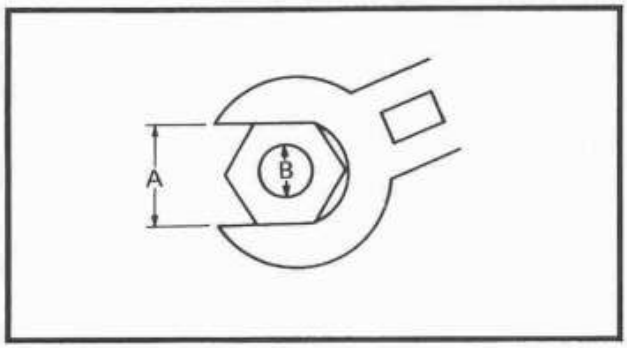
Model	XJ600S
Voltage:	12V
Ignition system:	
Ignition timing (B.T.D.C.)	10° at 1,200 r/min
Advanced timing (B.T.D.C.)	35° at 9,000 r/min
Advancer type	Electrical
	
T.C.I.:	
Pickup coil resistance	304 ~ 456Ω at 20°C (68°F)
(Color)	(White/Red – White/Black)
T.C.I. Unit/Manufacturer	4BR/YAMAHA
Ignition coil:	
Model/Manufacturer	4BR/YAMAHA
Minimum spark gap	6 mm (0.24 in)
Primary winding resistance	1.92 ~ 2.88Ω at 20°C (68°F)
Secondary winding resistance	9.52 ~ 14.28 kΩ at 20°C (68°F)
Spark plug cap:	
Type	Resin type
Resistance	10 kΩ
Charging system:	
Type	A.C. magneto generator
A.C. Generator:	
Model/Manufacturer	F4BR/YAMAHA
Nominal output	14V, 21A at 5,000 r/min
Stator coil resistance	0.32 ~ 0.48 Ω at 20°C (68°F) (White – White)
Voltage regulator:	
Type	Semi conductor – short circuit
Model/Manufacturer	SH629/SHINDENGEN
No load regulated voltage	14.3 ~ 15.3V
Rectifier:	
Model/Manufacturer	SH629/SHINDENGEN
Capacity	25A
Withstand voltage	200V
Battery:	
Capacity	12V, 8AH
Specific gravity	1.320

Model	XJ600S
Electrical starter system:	
Type	Constant mesh type
Starter motor:	
Model/Manufacturer	SM-13/MITSUBA
Output	0.8 kW
Armature coil resistance	0.011 ~ 0.013Ω at 20°C (68°F)
Brush — Overall length	12.5 mm (0.49 in)
<Limit>	<4 mm (0.16 in)>
— Spring force	340 ~ 460g (12.0 ~ 16.2 oz)
Commutator dia.	28. mm (1.10 in)
<Wear limit>	<27 mm (1.06 in)>
Mica undercut	0.8 mm (0.03 in)
Starter switch:	
Model/Manufacturer	4BP/HITACHI
Amperage rating	100A
Coil winding resistance	3.9 ~ 4.7Ω at 20°C (68°F)
Horn:	
Type/Quantity	Plane type/1 pc.
Model/Manufacturer	YF-12/NIKKO
Maximum amperage	2.5A
Flasher relay (Relay assembly):	
Type	Semi transistor type
Model/Manufacturer	FB249M/NIPPON DENSO
Self cancelling device	No
Flasher frequency	75 ~ 95 cycle/min
Wattage	21W x 2 pcs + 3.4W
Oil level switch:	
Model/Manufacturer	4BR/NIPPON DENSO
Starting circuit cut-off relay:	
Model/Manufacturer	G8R-30Y/OMRON
Coil winding resistance	180 ~ 270Ω at 20°C (68°F)
Diode	Yes
Circuit breaker:	
Type	Fuse
Amperage for individual circuit x quantity:	
MAIN	30A x 1
HEAD	15A x 1
SIGNAL	15A x 1
IGNITION	10A x 1
RESERVE	30A x 1, 15A x 1, 10A x 1

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 included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

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



A: Distance across flats
B: Outside thread diameter

DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1kg × m/sec ^{2}	Force
Nm m·kg	Newton meter Meter kilogram	N × m m × kg	Torque Torque
Pa N/mm	Pascal Newton per millimeter	N/m ^{2} N/mm	Pressure Spring rate
L cm^3	Liter Cubic centimeter	—	Volume or capacity
r/min	Revolution per minute	—	Engine speed

LUBRICATION POINT AND GRADE OF LUBRICANT

ENGINE

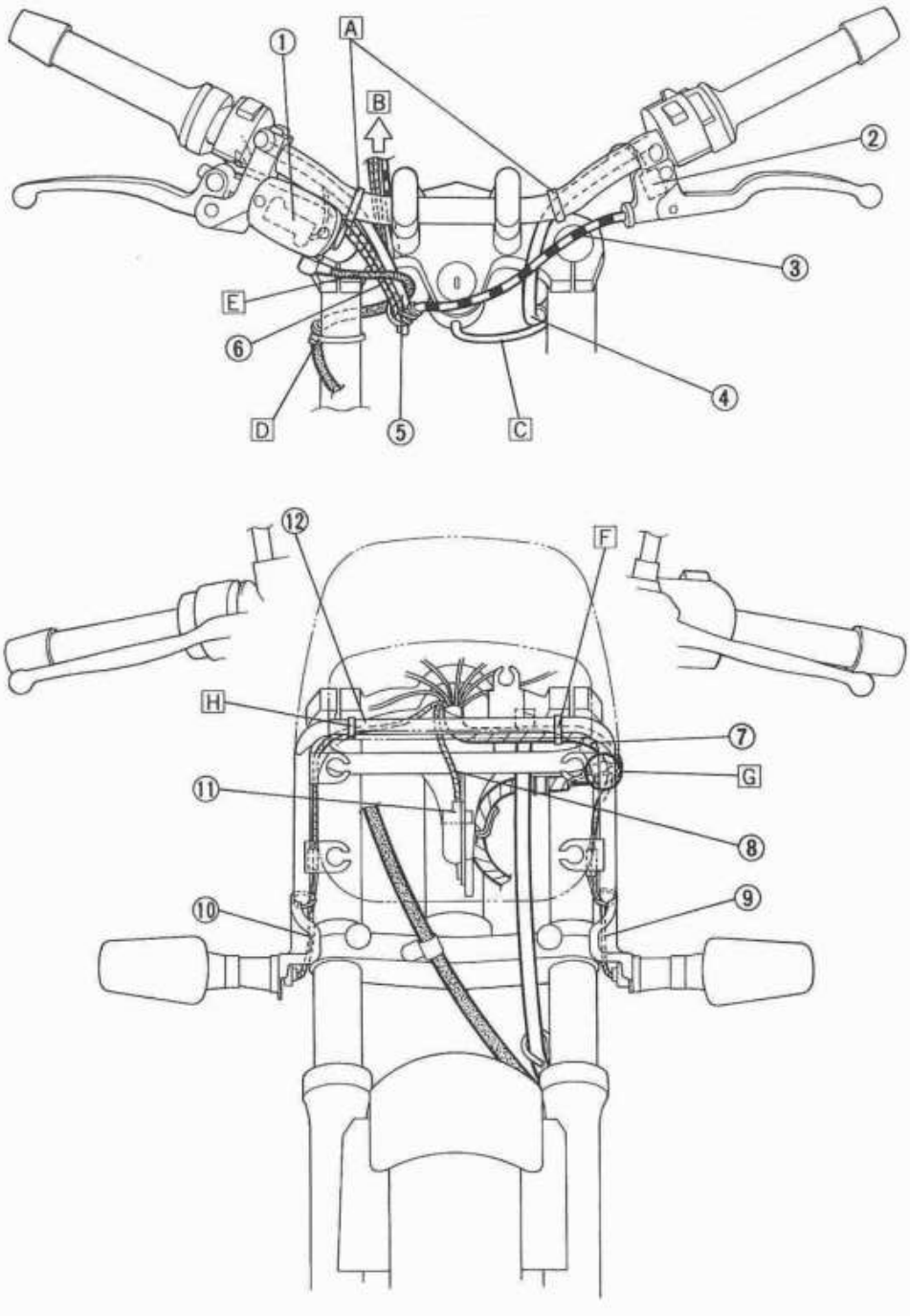
Lubrication Point	Symbol
Oil seal lips	LS
O-ring	LS
Bearing	E
Piston surface	E
Piston pin	E
Crankshaft pin	E
Crankshaft journal	E
Connecting rod bolt/nut	M
Camshaft cam lobe/journal	M
Valve stem (IN, EX)	M
Valve stem end (IN, EX)	E
Valve lifter	E
Oil pump rotor (Inner/outer), housing	E
Oil strainer assembly	E
Idle gear surface	E
Starter idle gear	E
Starter idle gear shaft	E
Starter clutch (outer/roller)	E
Crakcase cover (pull rod hole)	M
Primary driver gear/damper	E
Transmission gear (Wheel/pinion)	M
Axle (Main/drive)	M
Pull rod (bearing/washer)	LS
Shift cam	E
Shift fork/guide bar	E
Shift shaft assembly	E

CHASSIS

Lubrication Point	Symbol
Steering bearing (upper/lower)	LS
Front wheel oil seal (right/left)	LS
Rear wheel oil seal	LS
Clutch hub oil seal	LS
Clutch hub fitting area	LS
Rear brake pedal shaft	LS
Shift pedal	LS
Center stand sliding surface	LS
Side stand sliding surface	LS
Tube guide (throttle grip) inner surface	LS
Clutch cable end (lever side)	LS
Brake lever bolt, sliding surface	LS
Clutch lever bolt, sliding surface	LS
Rear shock absorber (lower-collar/oil seal)	M
Swingarm pivot bearing	M
Pivot shaft	M
Swing arm (thrust cover)	M

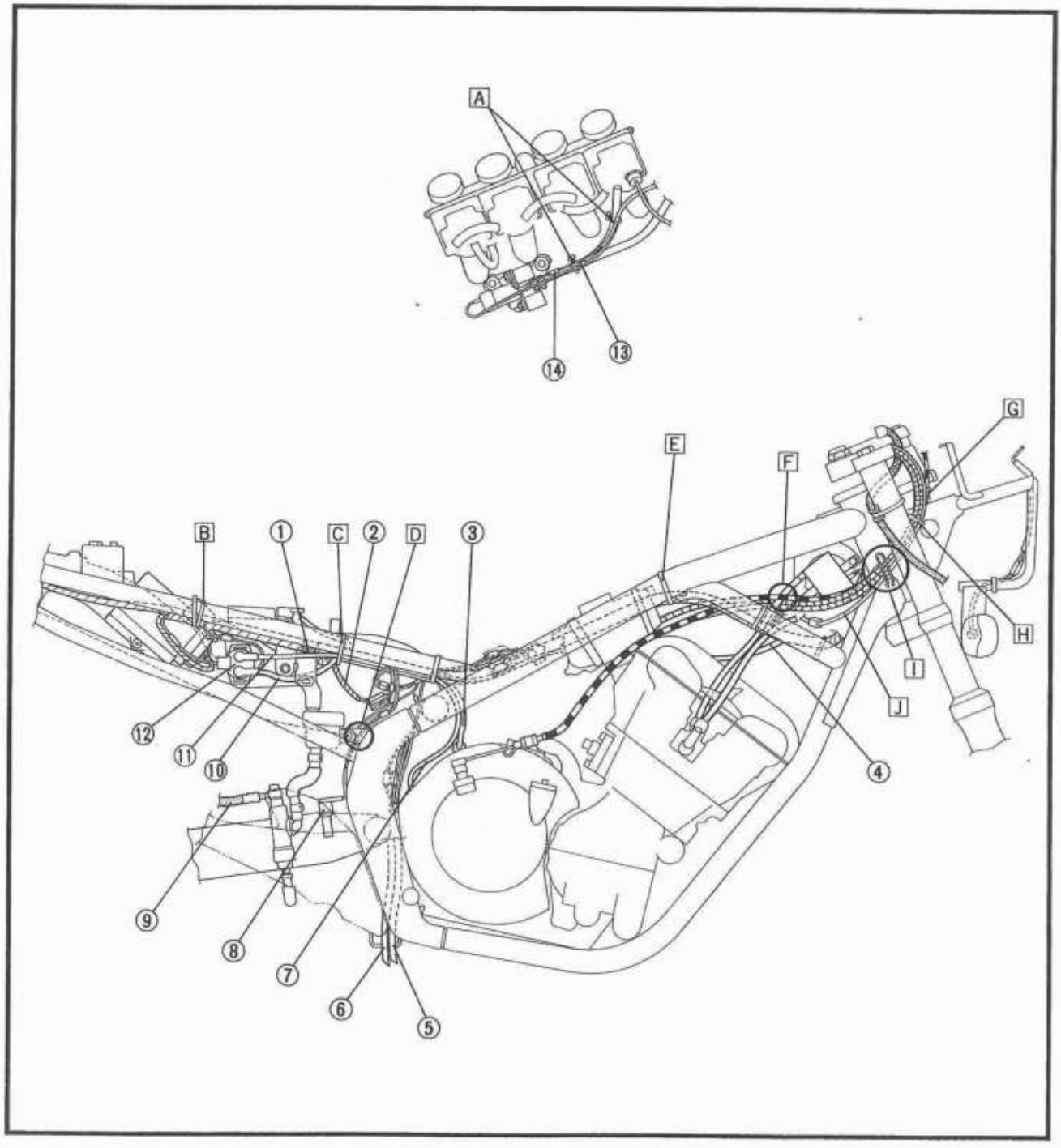
CABLE ROUTING

① Front brake switch
② Clutch switch
③ Clutch cable
④ Handlebar switch lead (left)
⑤ Handle bar switch lead (right)
⑥ Throttle cable
⑦ Meter light lead
⑧ Headlight lead
⑨ Flasher light lead (left)
⑩ Flasher light lead (right)
⑪ Headlight coupler
⑫ Cowling stay
[A] Clamp the handlebar switch lead (left and right)
[B] Under the fuel tank
[C] Clamp the main switch lead to the handlebar switch (left).
[D] Clamp the brake hose.
[E] Pass the brake hose between the cables and handle crown.
[F] Clamp the meter light lead to the cowling stay.
[G] Keep the couplers on the inside of the cowling stay.
[H] Clamp the flasher light lead (right) to the cowling stay.



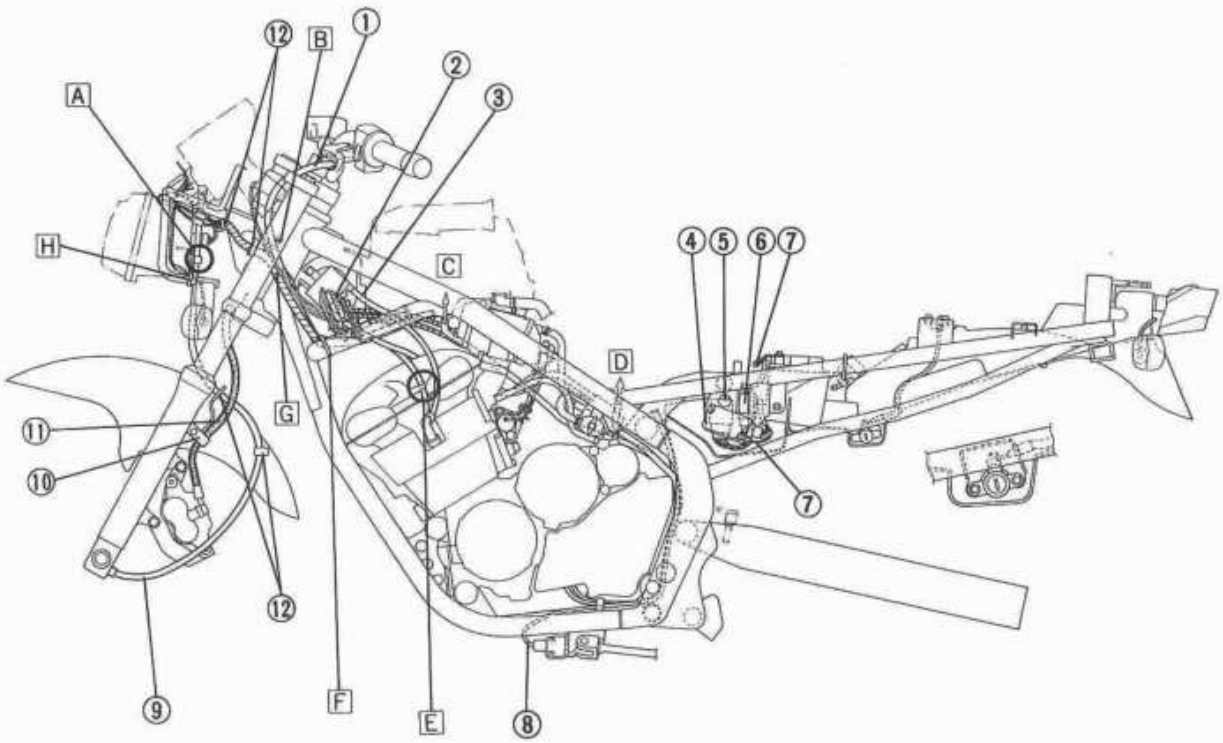
① White tape
② Relay lead
③ Starter motor lead
④ High tension cord
⑤ Fuel tank breather hose
⑥ Air filter drain hose
⑦ Ground lead
⑧ Rear brake switch
⑨ Brake hose
⑩ Positive lead
⑪ Negative lead
⑫ Starter relay
⑬ Solenoid coupler
⑭ Ground coupler

[A] Clamp the hose and solenoid ground lead.
[B] Clamp the wireharness.
[C] Clamp the wireharness and starter motor lead.
[D] Pass the rear brake switch lead on the inside of the reservoir tank bracket.
[E] Clamp the wireharness.
[F] Pass the high tension cord (#3) on the outside of the throttle cables.
[G] Clamp the clutch cable (grommet) and throttle cable 2 (no adjuster).
[H] Clamp the clutch cable, throttle cables and handlebar switch lead (right).
[I] Clamp the handlebar switch lead (right), clutch cable and throttle cables.
[J] Pass the handlebar switch lead (right) on the left side of frame.

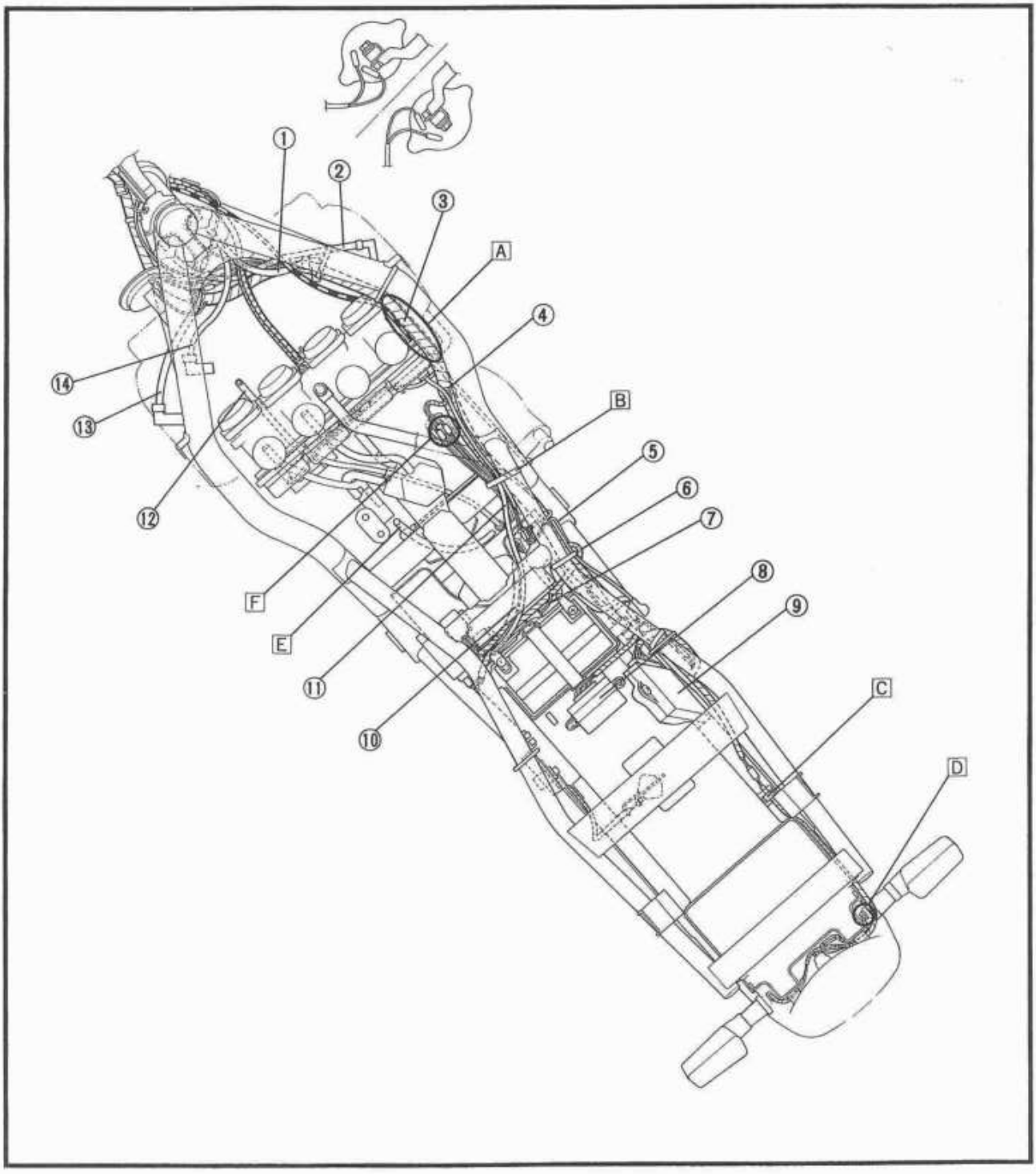


① Handlebar switch lead (left)
② Horn lead
③ High tension cord
④ Rectifier/regulator
⑤ Relay assembly
⑥ Flasher relay assembly
⑦ Ground lead
⑧ Sidestand switch lead
⑨ Speedometer cable
⑩ Brake hose holder
⑪ Brake hose
⑫ Clamp

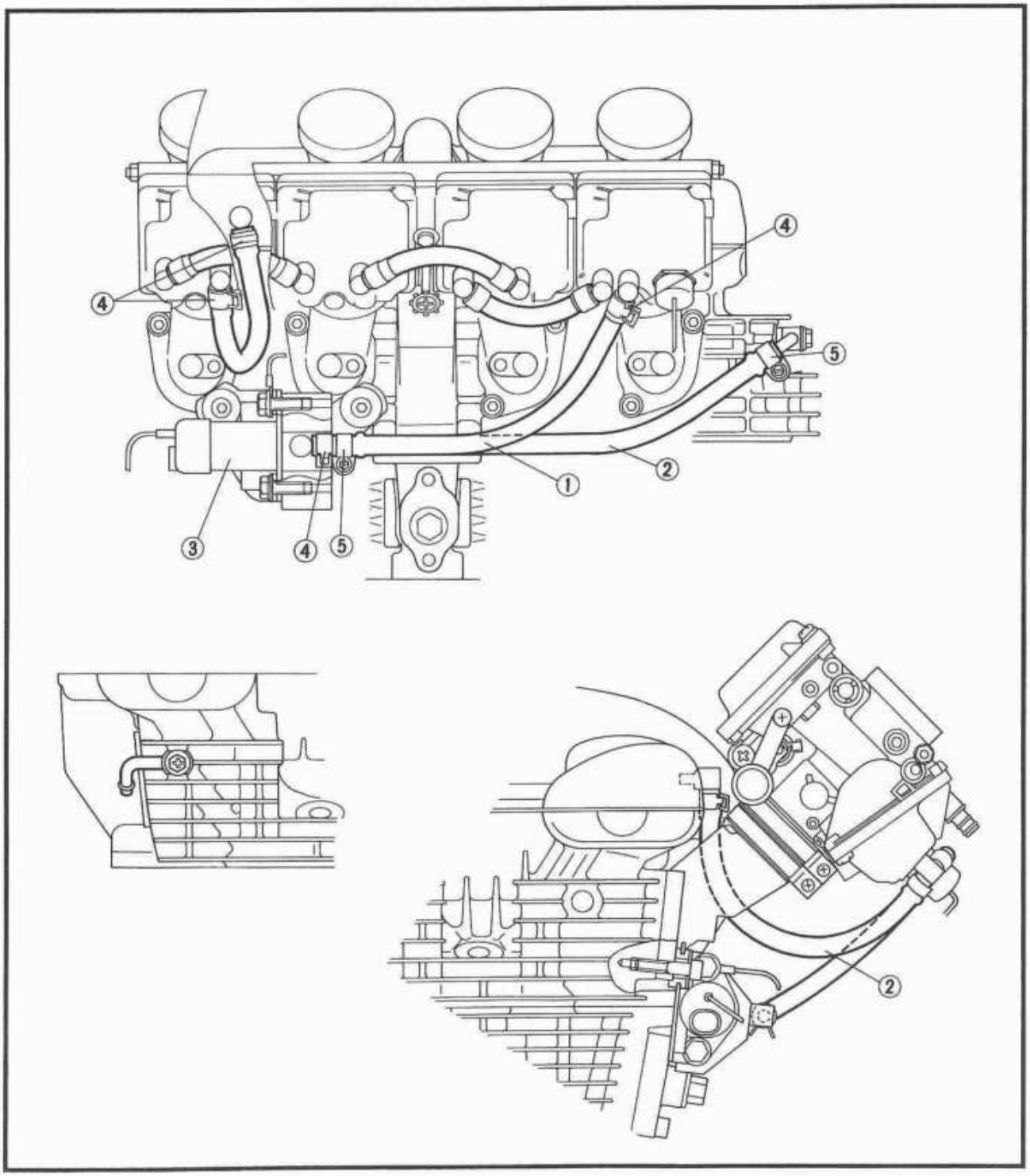
[A] Pass the speedometer cable on the inside of the headlight adjuster.
[B] Clamp the main switch lead and handlebar switch lead (left).
[C] To air cleaner
[D] To fuel tank
[E] Pass the high tension cord (#2, #3) through the hole in the rubber plate.
[F] Clamp the handlebar switch lead (left) and wireharness (white tape).
[G] Clamp the wireharness and handlebar switch lead (left).
[H] Clamp the flasher light leads (left and right) to the cowling stay.



① High tension cord (#3)
② High tension cord (#4)
③ Wireharness
④ Clamp
⑤ Rear brake switch lead
⑥ Regulator lead
⑦ Ground lead
⑧ Fuse box
⑨ Ignitor unit
⑩ Relay lead
⑪ Starter motor lead
⑫ Air filter drain hose
⑬ High tension cord (#1)
⑭ High tension cord (#2)
[A] Pass the wireharness above the carburetor.
[B] Clamp the wireharness, starter motor lead, ground lead, AC magneto leads, thermo switch lead, pick up lead, sidestand switch lead, and neutral/oil level switch lead.
[C] Clamp the tail light lead.
[D] Pass the flasher light lead (left and right) through the hole in the rear fender.
[E] Pass the fuel tank breather hose over the starter motor lead.
[F] Keep the AC magneto lead, pick up lead, sidestand switch lead and neutral/oil level switch lead connector in the guide.



① Hose (solenoid valve-carburetor)
② Hose (cylinder head-solenoid valve)
③ Solenoid valve
④ Clip
⑤ Clamp



PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable machine operation and a longer service life. In addition, the need for costly overhaul work will be greatly reduced. This information applies to motorcycles already in service as well as new motorcycles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

PERIODIC MAINTENANCE/LUBRICATION

Unit: km (miles)

Item	Remarks	Break-in 1,000 (600)	EVERY 6,000 (4,000) or 6 months	EVERY 12,000 (8,000) or 12 months
Valve(s)*	Check valve clearance. Adjust if necessary.	EVERY 24,000 (16,000) or 24 months		
Spark plug(s)	Check condition. Clean or replace if necessary.	O	O	O
Air filter	Clean. Replace if necessary.		O	O
Carburetor*	Check idle speed/synchronization/starter operation. Adjust if necessary.	O	O	O
Fuel line*	Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary.		O	O
Fuel filter*	Check condition. Replace if necessary.			O
Engine oil	Replace (Warm engine before draining).	O	O	O
Engine oil filter*	Replace.	O		O
Brake*	Check operation/fluid leakage/See NOTE. Correct if necessary.		O	O
Clutch	Check operation. Adjust if necessary.		O	O
Rear arm pivot*	Check rear arm assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.***			O
Wheel*	Check balance/damage/runout. Repair if necessary.		O	O
Wheel bearings*	Check bearings assembly for looseness/damage. Replace if damaged.		O	O
Steering bearings*	Check bearings assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.**	O		O
Front forks*	Check operation/oil leakage. Repair if necessary.		O	O
Rear shock absorber*	Check operation/oil leakage. Repair if necessary.		O	O
Drive chain	Check chain slack/alignment. Adjust if necessary. Clean and lube.	EVERY 500 (300)		
Fittings/Fasteners*	Check all chassis fittings and fasterners. Correct if necessary.	O	O	O
Center and sidestand*	Check operation. Repair if necessary.	O	O	O
Sidestand switch*	Check operation. Replace if necessary.	O	O	O

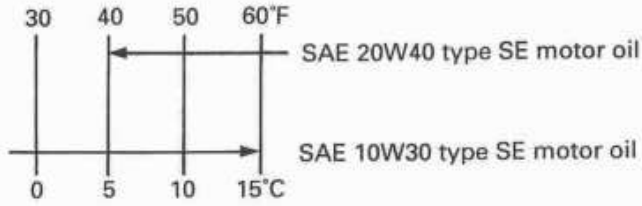
* : It is recommended that these items be serviced by a Yamaha dealer.
** : Medium weight wheel bearing grease.
*** : Molybdenum disulfide grease.

NOTE:

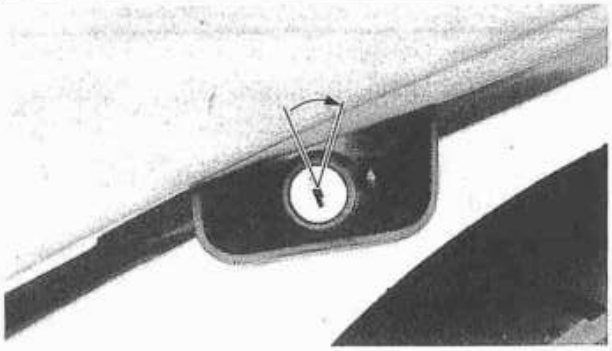
Brake fluid replacement:

1. When dissembling the master cylinder or caliper cylinder replace the brake fluid. Normally check the brake fluid level and add the fluid as rquired.
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:



3

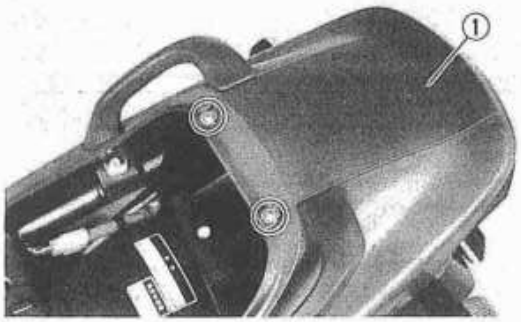


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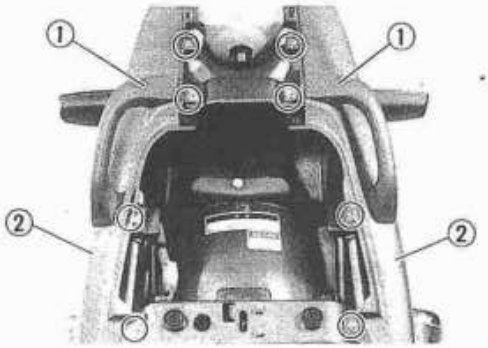
SIDE COVER, FUEL TANK AND COWLING

REMOVAL

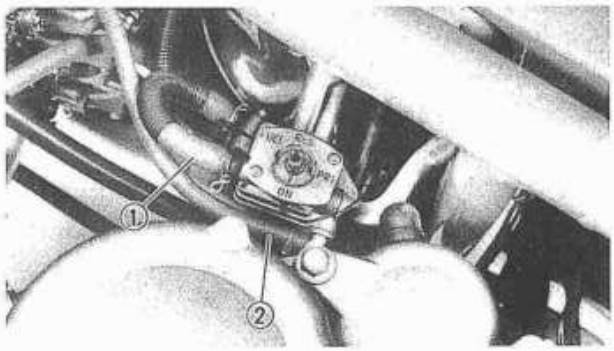
1. Remove:
• Seat



2. Remove:
• Tail cover ①



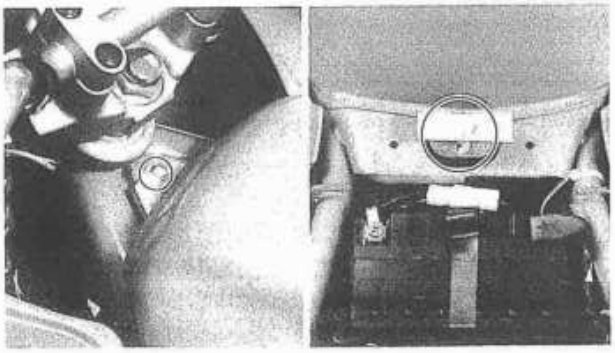
3. Remove:
• Grab bars ① (left and right)
• Side covers ① (left and right)



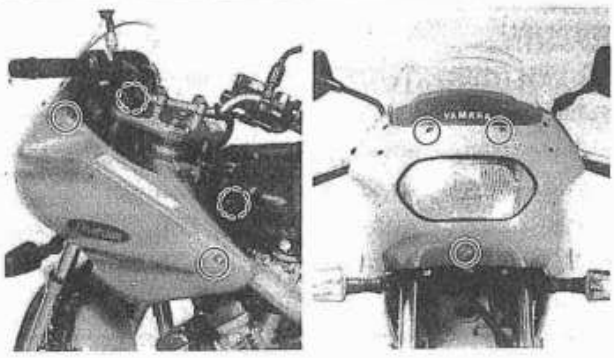
4. Turn the fuel cock to "RES" position.

5. Remove:
• Fuel cock knob

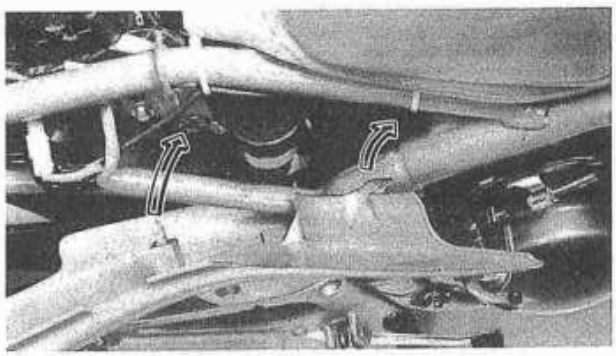
6. Disconnect:
• Fuel hose ①
• Vacuum hose ②



7. Remove:
• Fuel tank



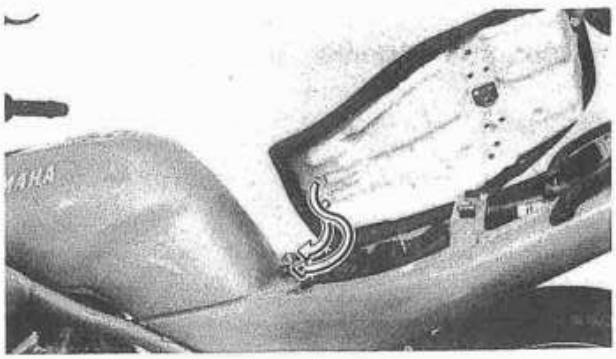




8. Remove:
• Cowling

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INSTALLATION
Reverse the "REMOVAL" procedure. Note the following points.
1. Install:
• Cowling
• Fuel tank
• Side covers (left and right)

	Bolt (cowling): **0.5 Nm (0.05 m · kg, 0.4 ft · lb)** **Screw (cowling):** **1.5 Nm (0.15 m · kg, 1.1 ft · lb)** **Bolt (fuel tank—front):** **10 Nm (1.0 m · kg, 7.2 ft · lb)** **Bolt (fuel tanl—rear):** **15 Nm (1.5 m · kg, 11 ft · lb)**



2. Install:
• Seat

NOTE:
When installing the seat, insert the lobes on the seat front into the respetacles on the frame, then push down the seat.

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ENGINE

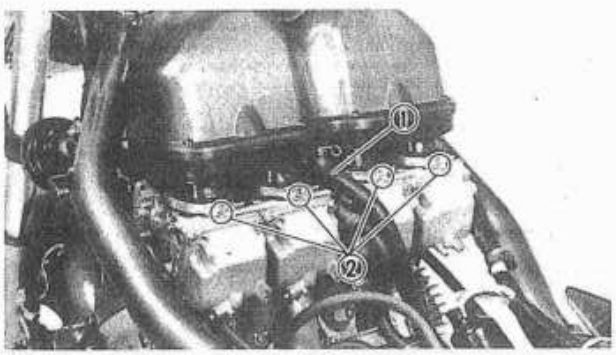
VALVE CLEARANCE ADJUSTMENT

NOTE:

- The valve clearance should be adjusted when the engine is cool to the touch.
- The piston must be at Top Dead Center (TDC) on compression stroke to check or adjust the valve clearance.

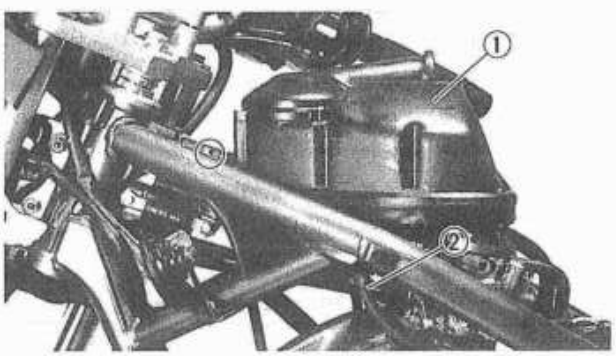
1. Remove:
- Seat
- Fuel tank
- Cowling

Refer to "SIDE COVER, FUEL TANK AND COWLING" section.



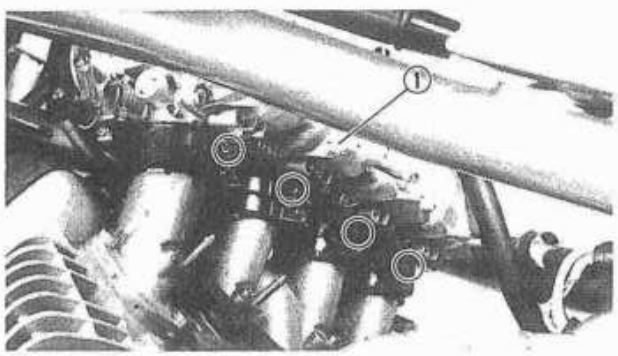
2. Disconnect:
- Breather hose ①

3. Loosen:
- Screws ②

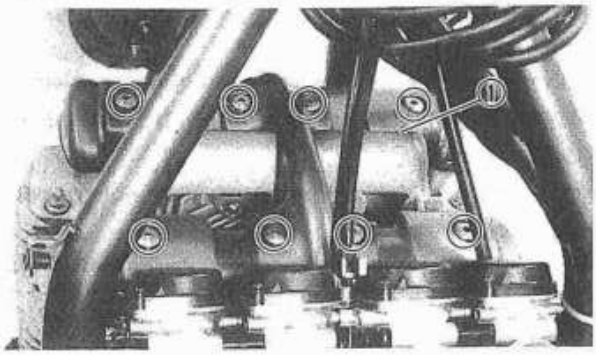


4. Remove:
- Air filter case ①

5. Disconnect:
- Drain hose ②

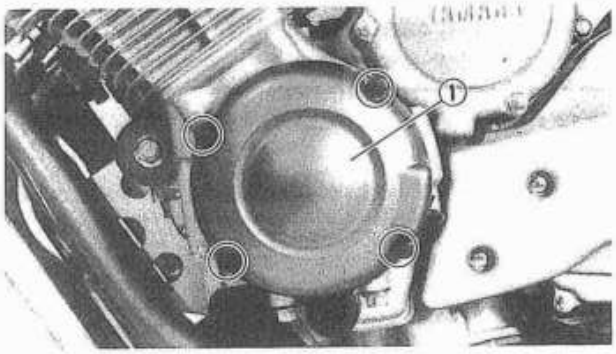


6. Remove:
- Carburetor assembly ①



7. Disconnect:
• Spark plug caps

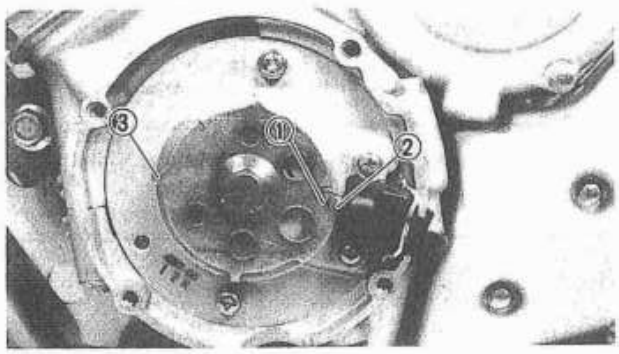
8. Remove:
• Cylinder head cover ①



9. Remove:
• Timing plate cover ①

10. Check:
• Valve clearance
Out of Specification → Adjust

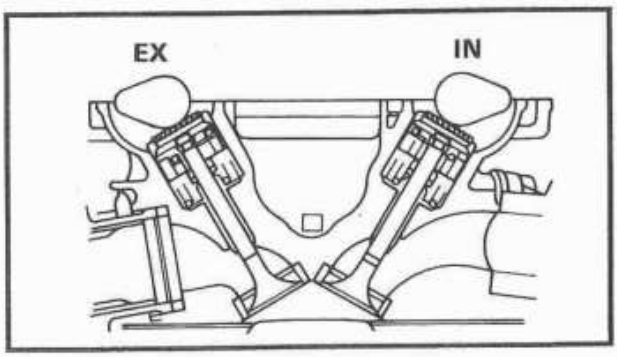
	Valve clearance (cold): **Intake valve** **0.11~0.15 mm (0.004~0.006 in)** **Exhaust valve** **0.21~0.25 mm (0.008~0.010 in)**

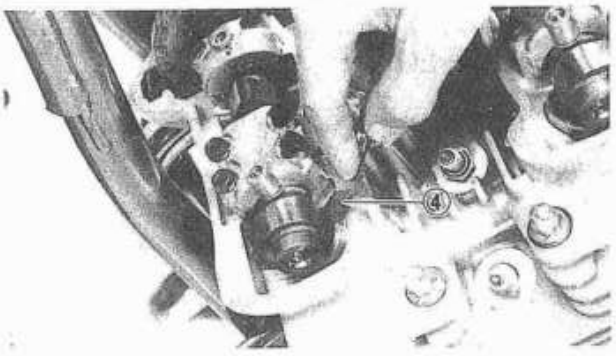


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Checking steps:
- Turn the crankshaft counterclockwise with a wrench.
  For #1 and #4 cylinders.
- Align the TDC mark ① with the pickup coil ②.
  For #2 and #3 cylinders.
- Align the TDC mark ③ with the pickup coil ②.

NOTE:
TDC on compression stroke can be found when the cam lobes are opposite each other as shown.





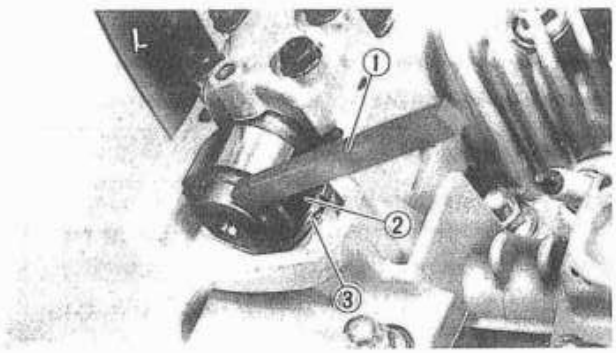
- Measure the valve clearance by using a feeler gauge ④ .

NOTE:

- Record the measured reading if the clearance is incorrect.
- Measure valve clearance in the following sequence.

Measuring sequence:
#1 → #2 → #4 → #3

****



11. Adjust:
- Valve clearance

****

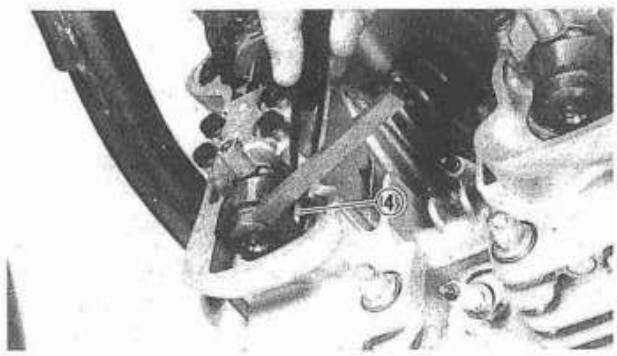
Adjustment steps:

- Position the valve lifter slots (intake and exhaust) opposite each other.
- Attach the Tappet adjusting tool ① .

Tappet adjusting tool:
P/N. 90890-04125

NOTE:

Make sure the tool only contacts the lifter ③ , not the pad ② .



- Slowly turn the tappet adjusting tool so that the pads can be removed.
- Remove the pads ④ from the lifters. Use a small screwdriver and a pair of tweezers for removal. Note pad numbers.
- Select the proper valve adjusting pad from the following chart.

INTAKE

MEASURED CLEARANCE	INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00~0.05			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.06~0.10		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.11~0.15	STANDARD CLEARANCE																								
0.16~0.20	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.21~0.25	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.26~0.30	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.31~0.35	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.36~0.40	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.41~0.45	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.46~0.50	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.51~0.55	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.56~0.60	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.61~0.65	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.66~0.70	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.71~0.75	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.76~0.80	265	270	275	280	285	290	295	300	305	310	315	320													
0.81~0.85	270	275	280	285	290	295	300	305	310	315	320														
0.86~0.90	275	280	285	290	295	300	305	310	315	320															
0.91~0.95	280	285	290	295	300	305	310	315	320																
0.96~1.00	285	290	295	300	305	310	315	320																	
1.01~1.05	290	295	300	305	310	315	320																		
1.06~1.10	295	300	305	310	315	320																			
1.11~1.15	300	305	310	315	320																				
1.16~1.20	305	310	315	320																					
1.21~1.25	310	315	320																						
1.26~1.30	315	320																							
1.31~1.35	320																								

VALVE CLEARANCE (cold):
0.11 ~ 0.15 mm (0.004 ~ 0.006 in)
Example: Installed is 250
Measured clearance is 0.23 mm (0.009 in)
Replace 250 pad with 260 pad
Pad number: (example)
Pad No. 250 = 2.50 mm (0.098 in)
Pad No. 255 = 2.55 mm (0.100 in)
Always install pad with number down.

EXHAUST

MEASURED CLEARANCE	INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00~0.05				200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305
0.06~0.10			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.10~0.15		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.16~0.20	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.21~0.25	STANDARD CLEARANCE																								
0.26~0.30	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.31~0.35	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.36~0.40	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.41~0.45	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.46~0.50	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.51~0.55	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.56~0.60	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.61~0.65	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.66~0.70	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.71~0.75	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.76~0.80	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.81~0.85	265	270	275	280	285	290	295	300	305	310	315	320													
0.86~0.90	270	275	280	285	290	295	300	305	310	315	320														
0.91~0.95	275	280	285	290	295	300	305	310	315	320															
0.96~1.00	280	285	290	295	300	305	310	315	320																
1.01~1.05	285	290	295	300	305	310	315	320																	
1.06~1.10	290	295	300	305	310	315	320																		
1.11~1.15	295	300	305	310	315	320																			
1.16~1.20	300	305	310	315	320																				
1.21~1.25	305	310	315	320																					
1.26~1.30	310	315	320																						
1.31~1.35	315	320																							
1.36~1.40	320																								

VALVE CLEARANCE (cold):
0.21 ~ 0.25 mm (0.008 ~ 0.010 in)
Example: Installed is 250
Measured clearance is 0.32 mm (0.013 in)
Replace 250 pad with 265 pad
Pad number: (example)
Pad No. 250 = 2.50 mm (0.098 in)
Pad No. 255 = 2.55 mm (0.100 in)
Always install pad with number down.

Pad range		Pad availability: 25 increments
No. 200 ~ No. 320	2.00 mm (0.079 in) ~ 3.20 mm (0.130 in)	Pads are stepped in 0.05 mm (0.002 in) increments

NOTE:
Thickness of each pad is marked on the pad face that contacts the valve lifter (not the cam).

- Round off the hundredths digit of the original pad number to the nearest 0.05 mm increment.

Hundredths digit → Rounded valve
0 or 2 → 0
5 → (NOT ROUNDED OFF)
8 → 10

EXAMPLE:
Original pad number = 248 (2.48 mm)
Rounded off digit = 250

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

- Locate the previously installed pad number on the chart. Locate the measured valve clearance on the chart. The point where these coordinates intersect is the new pad number.

NOTE:
Use the new pad number as a guide only if the number must be verified.

- Install the new pad with the numbered side down.
- Remove the adjusting tool.
- Recheck the valve clearance.

● If the clearance is incorrect, repeat all of the clearance adjustment steps until the specified clearance is obtained.

****

12. Install:
• Carburetor assembly
• Air filter case

	Bolt (air filter case): **10 Nm (1.0 m · kg, 7.2 ft · lb)**

• Cowling
• Fuel tank
• Seat

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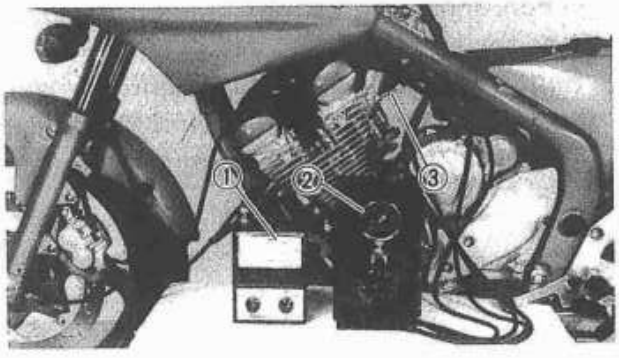
CARBURETOR SYNCHRONIZATION

NOTE:
Valve clearance should be adjusted properly before synchronizing the carburetors.

1. Place the motorcycle on a level surface.

NOTE:
Place the motorcycle on its centerstand if a centerstand is equipped. If not, place a suitable stand under the motorcycle.

2. Remove:
• Seat
• Fuel tank
Refer to the "SIDE COVER, FUEL TANK AND COWLING" section.



3. Attach:
• Inductive tachometer ① (to #1 spark plug lead)
• Vacuum gauge ②
• Adapter ③

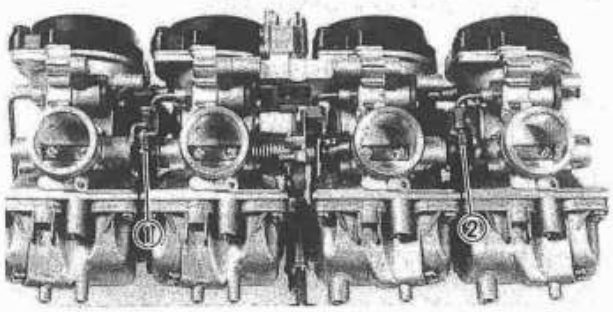
	Inductive tachometer: **P/N 90890-03113** **Vacuum gauge:** **P/N 90890-03094** **Adapter** **P/N 90890-03060**

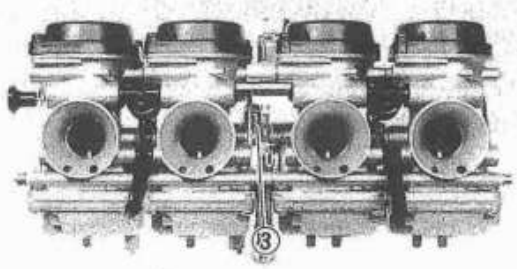
4. Start the engine and let it warm up for several minutes.

5. Check:
- Engine idling speed
  Out of specification → Adjust.
  Refer to "ENGINE IDLING SPEED ADJUSTMENT" section.

	Engine idling speed: **1,150~1,250 r/min**

6. Adjust:
- Carburetor synchronization.





****

Adjustment steps:
- Synchronize carburetor No.1 to carburetor No.2 by turning synchronizing screw ① until both gauges read the same.
- Race the engine for less than a second, two or three times and check the synchronization again.
- Repeat the above steps to synchronize carburetor No.4 to carburetor No.3 by turning synchronizing screw ② until both gauges read the same.
- Repeat the same steps to synchronize carburetor No.2 to carburetor No.3 by turning synchronizing screw ③ until both gauges read the same.

Vacuum pressure at idle speed:
34.58~35.91 kPa
(260~270 mm Hg, 10.24~10.64 in Hg)

NOTE:
The difference between both carburetors should be 1.33 kPa (10mm Hg, 0.4 in Hg) or less.

****

7. Check:
• Engine idling speed
Out of specification → Adjust.

8. Stop the engine and detach the measuring equipment.

9. Adjust:
• Throttle cable free play.
Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" section.

Free play:
3~7 mm (0.12~0.28 in)

10. Install:
• Fuel tank
• Seat
Refer to the "SIDE COVER, FUEL TANK AND COWLING" section.

YB703102
TIMING CHAIN ADJUSTMENT
Adjustment free.

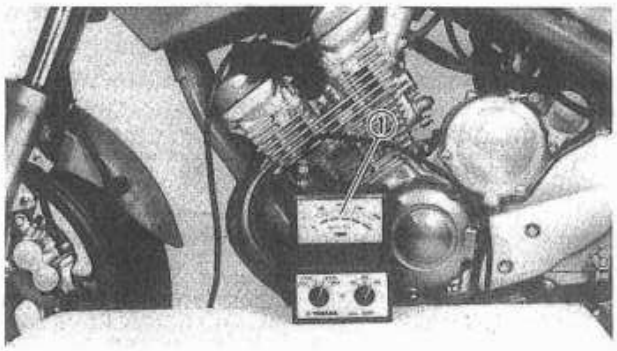
YB703113

IDLING SPEED ADJUSTMENT

NOTE:

The carburetor synchronization should be adjusted properly before adjusting the idling speed.

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

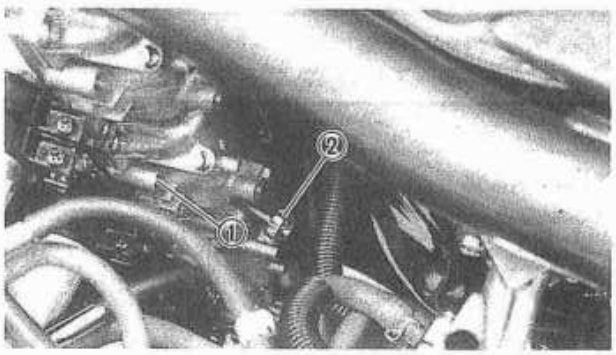


2. Attach:
   - Inductive tachometer ① (to the spark plug lead).

	Inductive tachometer: P/No. 90890-03113

3. Check:
   - Engine idling speed
     Out of specification → Adjust.

	Engine idling speed: 1,150~1,250 r/min



4. Adjust:
   - Engine idling speed

****

Adjustment steps:

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

Pilot air screw: 2 turns out

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

Turning in → Idling speed increased.
Turning out → Idling speed decreased.

****

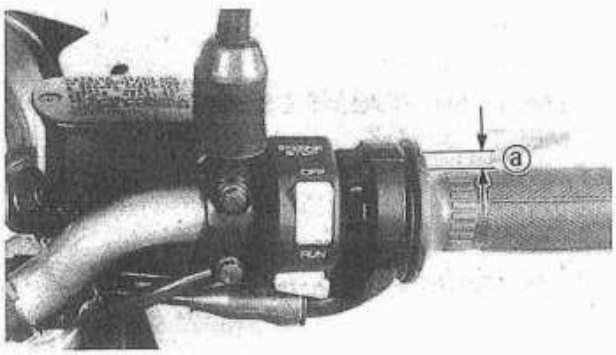
5. Adjust:
• Throttle cable free play
Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" section.

Free play:
3~7 mm (0.12~0.28 in)

YB703114

THROTTLE CABLE ADJUSTMENT

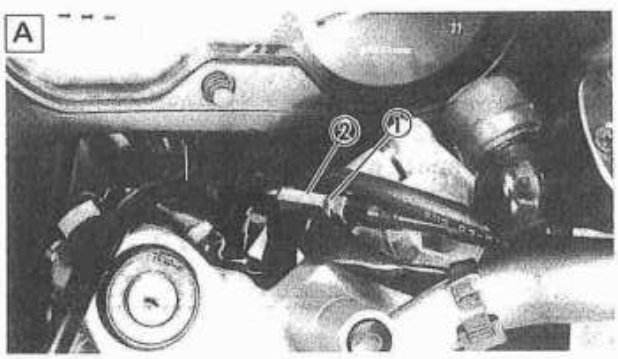
NOTE:
Engine idling speed and carburetor synchronization should be adjusted properly before adjusting the throttle cable free play.



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

Free play:
3~7 mm (0.12~0.28 in)
At throttle grip end

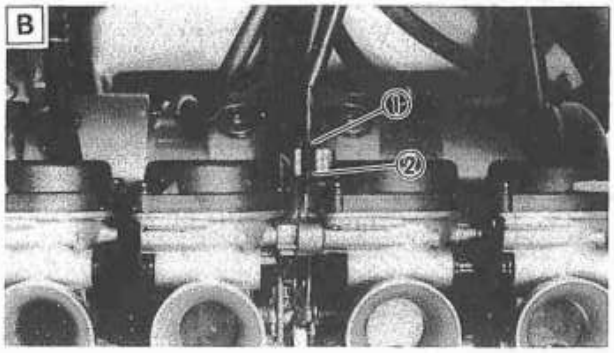
2. Remove
• Seat
• Fuel tank
Refer to the "SIDE COVER, FUEL TANK AND COWLING" section.
• Air filter case
Refer to the "VALVE CLEARANCE ADJUSTMENT" section.



3. Adjust:
• Throttle 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.

A Handlebar side
B Carburetor side

⚠WARNING

After adjusting, turn the handlebar to the right and left, making sure that the engine idling speed does not change.

****

4. Install:
- Air filter case
  Refer to the "VALVE CLEARANCE ADJUSTMENT" section.
- Fuel tank
- Seat
  Refer to the "SIDE COVER, FUEL TANK AND COWLING" section.

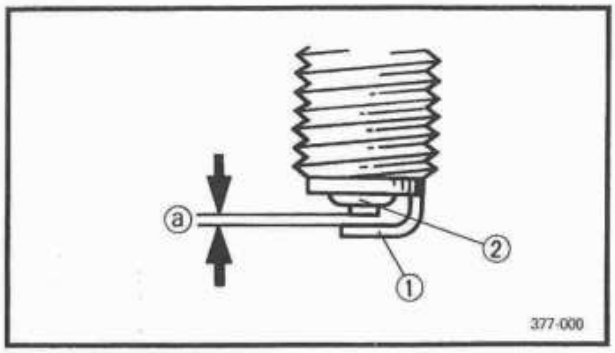
YB703103

SPARK PLUG INSPECTION

1. Remove:
- Spark plug
  Use the spark plug wrench in the owner's tool kit.

2. Inspect:
- Spark plug type
  Incorrect→Replace.

Standard spark plug: **CR7E(NGK), CR8E(NGK), CR9E(NGK)** **U22ESR-N(N.D.),U24ESR-N(N.D.)** **U27ESR-N(N.D.)**



3. Inspect:
- Electrode ①
  Wear/Damage→Replace.
- Insulator ②
  Abnormal color→Replace
  Normal color is a medium-to-light tan color.

4. Clean the spark plug with a spark plug cleaner or wire brush.

5. Measure:
- Plug gap ⓐ
  Use a Wire Gauge or Feeler Gauge.
  Out of specification→Re-gap.

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

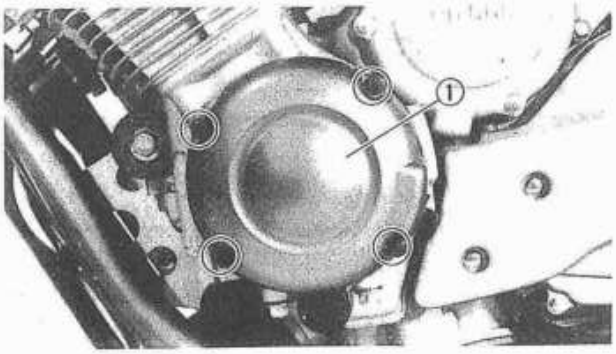
6. Tighten:
- Spark plug

Spark plug:
12.5 Nm (1.25 m.kg, 9.0 ft.lb)

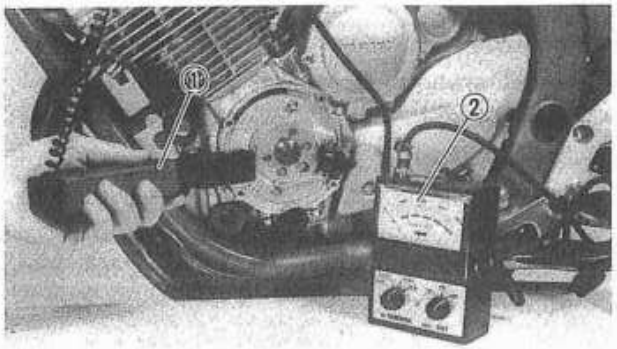
NOTE:
- Before installing a spark plug, clean the gasket surface and plug surface.

YB703104
IGNITION TIMING CHECK

NOTE:
Carburetor synchronization, engine idling speed and throttle cable free play should be adjusted properly before checking the ignition timing.



1. Remove:
- Timing plate cover ①



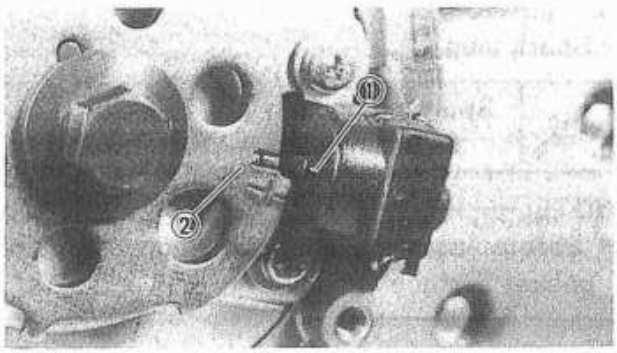
2. Attach:
• Timing light ① and inductive tachometer ②
(To the spark plug lead for #1 cylinder)

	Timing light: **P/N 90890-03141** **Inductive tachometer:** **P/N 90890-03113**

3. Check:
• Ignition timing

****

Checking steps:
● Warm up the engine and keep it at the specified speed.



	Engine speed: **1,150~1,250 r/min.**

● Visually check the pickup coil ① to verify it is within the required firing range ② indicated on the timing plate.
Incorrect firing range→Check flywheel and/or pickup assembly.

****

4. Install:
• Timing plate cover

YB703105

COMPRESSION PRESSURE MEASUREMENT

NOTE:

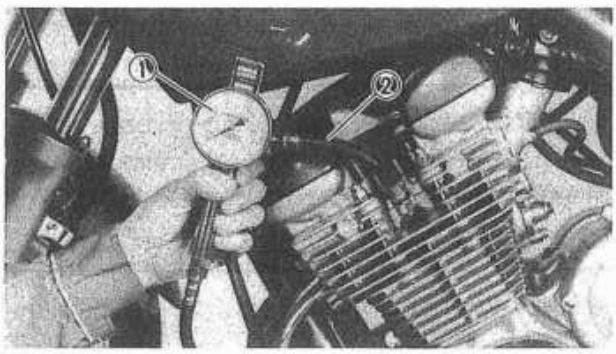
Insufficient compression pressure will result in performance loss.

1. Check:
• Valve clearance
Out of specification→Adjust.
Refer to the "VALVE CLEARANCE ADJUSTMENT" section.

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

3. Stop the engine.

4. Remove:
• Spark plug



5. Attach:
• Compression gauge ①
• Adapter ②

	Compression gauge: **P/N. 90890-03081** **Adapter:** **P/N 90890-04082**

6. Measure
• Compression pressure
Above the maximum pressure:
Inspect cylinder head, valve surfaces, and piston crown for carbon deposits.
Below the minimum pressure:
Squirt a few drops of oil into affected cylinder and measure again.

• Follow the table below.

Compression pressure (With oil applied into cylinder)	
Reading	**Diagnosis**
Higher than without oil	**Worn or damaged pistons**
Same as without oil	**Defective ring(s), valves, cylinder head gasket or piston is possible.**

Compression pressure (at sea level):
Standard:
1,100 kPa (11.0 kg/cm², 156 psi)
Minimum:
1,000 kPa (10.0 kg/cm², 142 psi)
Maximum:
1,150 kPa (11.5 kg/cm², 164 psi)

****

Measurement steps:

- Crank over the engine with the throttle wide-open until the compression reading on the gauge stabilizes.

⚠ WARNING

When cranking the engine, ground all spark plug leads to prevent sparking.

****

7. Repeat the previous steps for the other cylinders.

NOTE:

The difference of compression pressure between the highest and lowest cylinder compression readings should be 100 kpa (1 kg/cm², 14 psi) or less.

YB703110

ENGINE OIL LEVEL INSPECTION

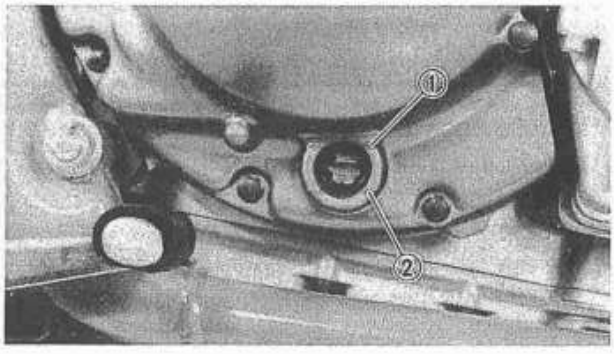
NOTE:

Position the motorcycle straight up when inspecting the oil level.

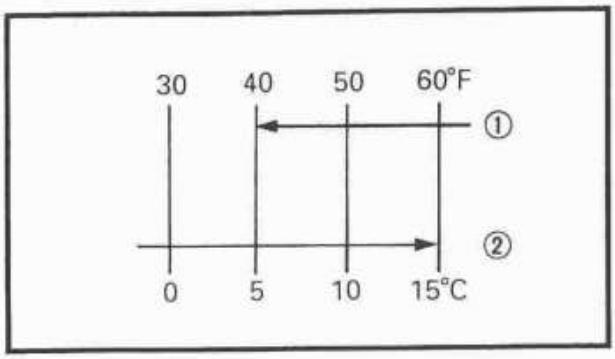
1. Place the motorcycle on a level surface.

NOTE:

Place the motorcycle on its centerstand if a centerstand is equipped. If not, place a suitable stand under the motorcycle.



2. Inspect
- Oil level
  Oil level should be between maximum ① and minimum ② marks.
  Oil level low → Add oil to proper level.



Recommended oil:
At 5°C (40°F) or higher ① :
SAE 20W40 type SE motor oil
At 15°C (60°F) or lower ② :
SAE 10W30 type SE motor oil

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.

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

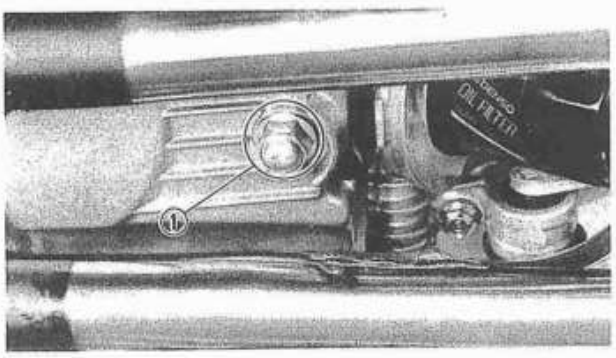
4. Stop the engine and inspect the oil level once again.

NOTE:
Wait a few minutes until the oil settles before inspecting the oil level.

YB703111
ENGINE OIL REPLACEMENT

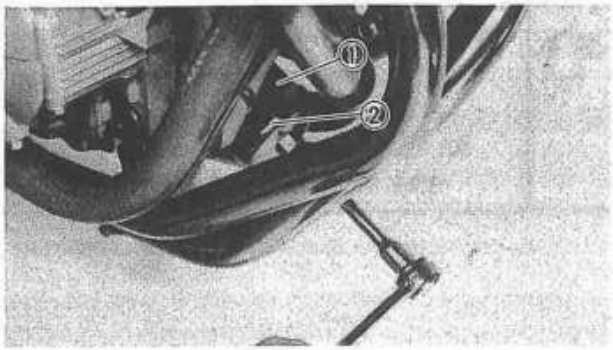
1. Start the engine and let it warm up for several minutes.

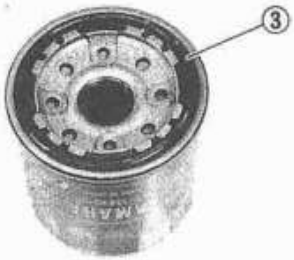
2. Stop the engine and place an oil pan under the engine.



3. Remove:
- Oil filler plug
- Drain plug ①

Drain the crankcase of its oil.





4. If the oil filter is replaced with oil change, remove the following parts and reinstall them.

****

Replacement steps:

- Remove the oil filter element ① using the oil filter wrench ②.

	Oil filter wrench: **P/N 90890-01426**

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

NOTE:

Make sure the O-ring is positioned properly.

- Install the new oil filterusing the oil filter wrench.

	Oil filter wrench: **P/N 90890-01426**

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

****

5. Install:

- Drain plug

	Drain plug: **43 Nm (4.3 m · kg, 31 ft · lb)**

NOTE:

Check the gasket (drain plug). If damaged, replace it with a new one.

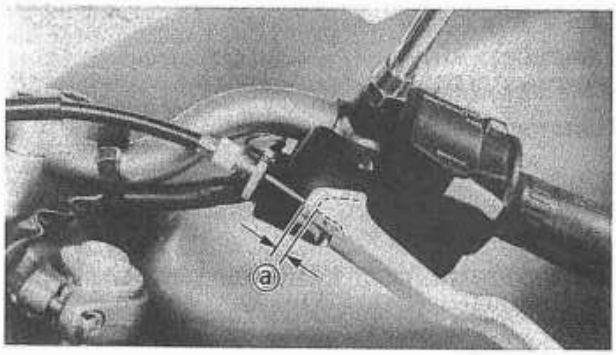
6. Fill:

- Engine oil

	Oil quantity: **without oil filter change** **2.2 L (1.9 Imp.qt, 2.3 US.qt)** **with oil filter change** **2.5 L (2.2 Imp.qt, 2.6 US.qt)**

Refer to the "ENGINE OIL LEVEL INSPEC-

TION" section.



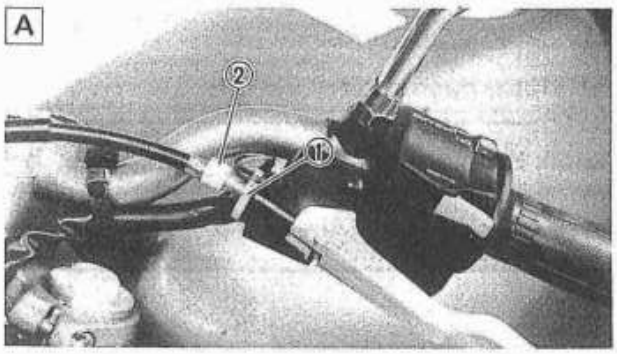
YB703116

CLUTCH ADJUSTMENT

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

	Free play: **2~3 mm (0.08~0.12 in)** **At clutch lever pivot**

A

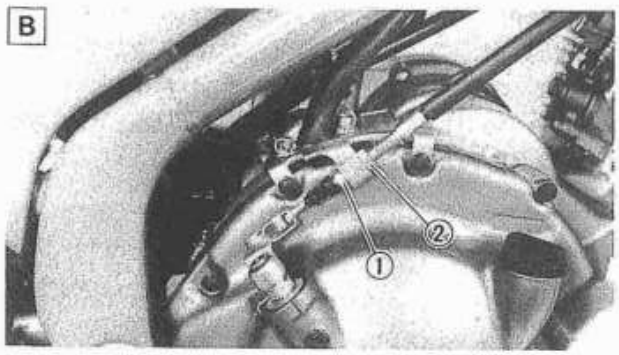


2. Adjust:
- Clutch cable free play

****

Adjustment steps:
- Loosen the locknut(s) ① .
- Turn the adjuster(s) ② in or out until the specified free play is obtained.

B

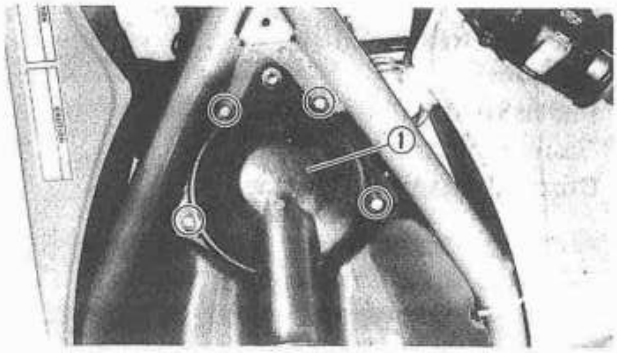


Turning in → Free play is increased.
Turning out → Free play is decreased.

- Tighten the locknut(s).

****

A Handlebar side
B Engine side



YB703106

AIR FILTER CLEANING

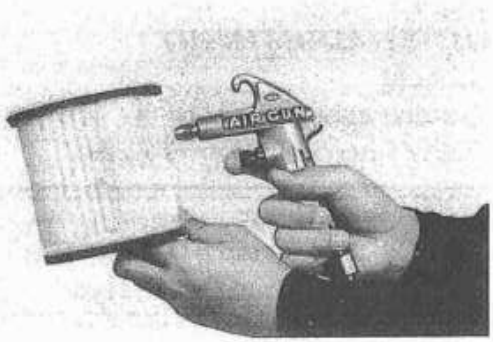
1. Remove:
- Seat
- Fuel tank
  Refer to the "SIDE COVER, FUEL TANK AND COWLING" section.

2.Remove:
- Air filter case cover ①

3. Remove:
• Air filter element

CAUTION:

Never operate the engine with the air filter element removed. Unfiltered air will cause rapid wear of engine parts and possible engine damage. Additionally, operation without the filter element will affect carburetor tuning with subsequent poor performance and possible engine overheating.



4. Inspect:
• Air filter element
Damaged → Replace.

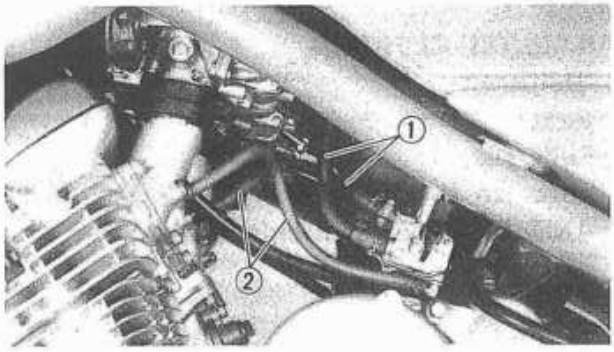
5. Clean:
• Air filter element
Blow out the dust in the element from the outer surface using compressed air.

6. Install:
• Air filter element
• Air filter case cover

NOTE:

When installing the element in its case, be sure its sealing surface matches the sealing surface of the case so there is no air leak.

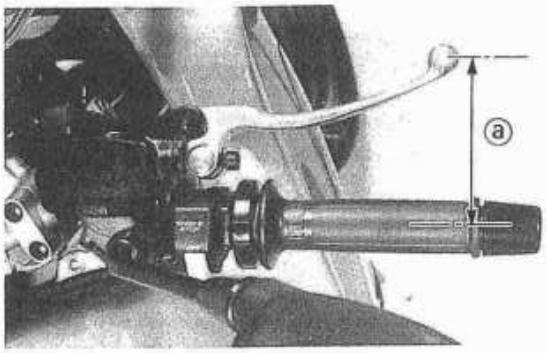
7. Install:
• Fuel tank
• Seat
Refer to the "SIDE COVER, FUEL TANK AND COWLING" section.

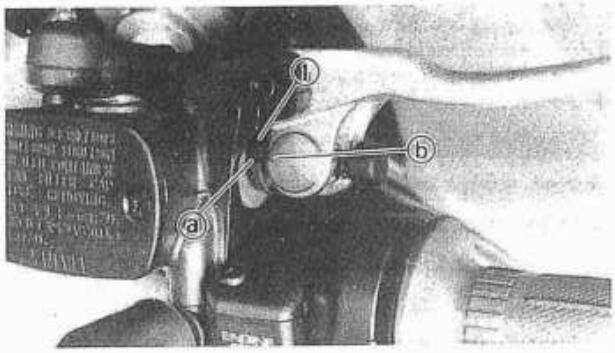


YB703115

FUEL LINE INSPECTION

1. Inspect:
• Fuel hose ①
• Vacuum hose ②
Crack/Damage → Replace.





YB703204

CHASSIS

FRONT BRAKE LEVER POSITION ADJUSTMENT

1. Adjust:
• Brake lever position
(distance ⓐ from handle grip to front brake lever)

****

Adjusting steps:
- Push the brake lever forward.
- Turn the adjuster ① in or put.

Turning in → Distance is smaller.
Turning out → Distance is larger.

- Align the mark ⓐ on the adjuster with the mark ⓑ on the lever.

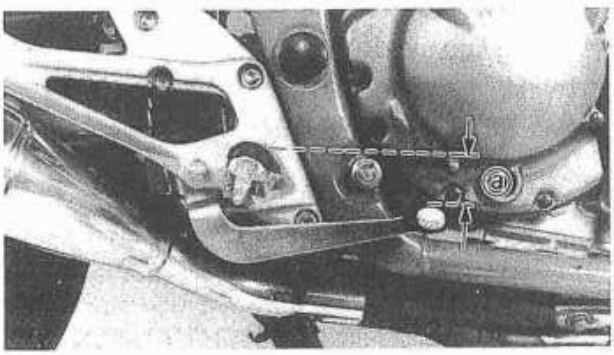
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CAUTION:

Make sure that the brake does not drag after adjusting it.

⚠ WARNING

A soft or spongy feeling in the brake lever 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 system will cause greatly diminished braking capability and can result in loss of control and an accident. Inspect and bleed the system if necessary.

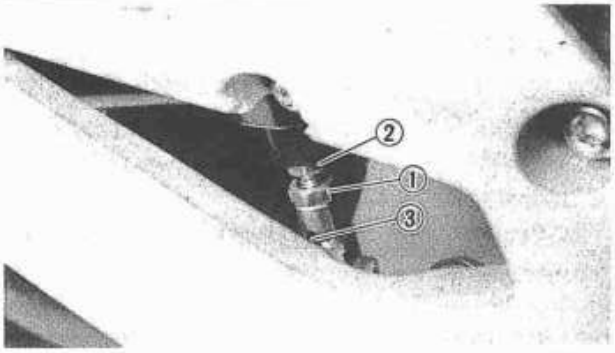


YB703205

REAR BRAKE ADJUSTMENT

1. Check:
• Brake pedal height ⓐ
Out of specification→Adjust.

Brake pedal height:
40 mm (1.6 in)
Below top of footrest



2. Adjust:
• Brake pedal height

****

Adjustment steps:
- Loosen the locknut(s) ①
- Turn the adjuster(s) ② in or out until the specified pedal height is obtained.

Turning in→Pedal height is down.
Turning out→Pedal height is up.

CAUTION:

After adjusting the brake pedal height, visually check the adjuster end through the hole ③ of the joint holder. The adjuster end must appear within this hole.

CAUTION:

Make sure that the brake does not drag after adjusting it.

⚠ 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 system will cause greatly diminished braking capability and can result in loss of control and an accident. Inspect and bleed the system if necessary.

****

3. Adjust:
• Brake light switch
Refer to the "BRAKE LIGHT SWITCH ADJUSTMENT" section.

YB703206

BRAKE FLUID LEVEL INSPECTION

NOTE:

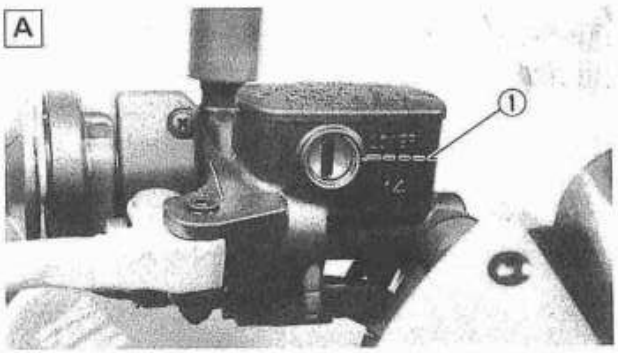
Position the motorcycle straight up when inspecting the fluid level.

1. Place the motorcycle on a level surface.

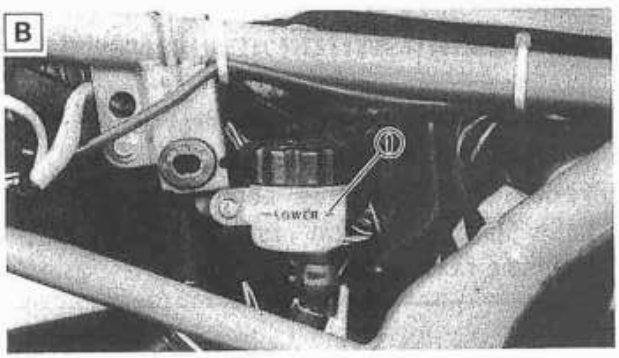
NOTE:

Place the motorcycle on its centerstand is equipped. If not, place a suitable stand under the motorcycle.

A



B



2. Inspect:

- Fluid level

  Fluid level is under "LOWER" level line ①

  → Fill to proper level.

	Recommended fluid: **DOT #3 or #4**

A Front

B Rear

NOTE:

When inspecting the fluid level of the reservoir at the handlebars, make sure the master cylinder top is horizontally level.

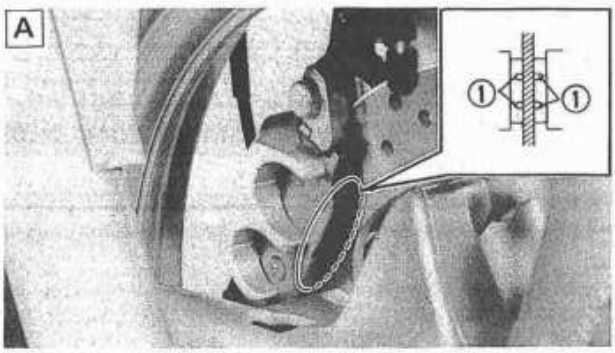
CAUTION:

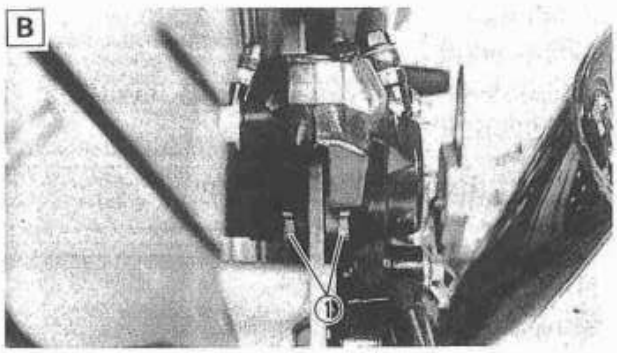
The fluid may corrode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

⚠ WARNING

- **Use only the designated quality fluid. Otherwise, the rubber seals may deteriorate 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.**
- **Be careful that water does not enter the master cylinder when refilling. Water will**

significantly lower the boiling point of the fluid and may result in vapor lock.





YB703207

BRAKE PAD INSPECTION

1. Activate the brake lever or brake pedal.

2. Inspect:
- Brake pad
  Wear indicator ① nearly contacting brake disc → Replace brake pads as a set.
  Refer to the "BRAKE PAD REPLACEMENT" section in the CHAPTER 6.

[A] Front
[B] Rear

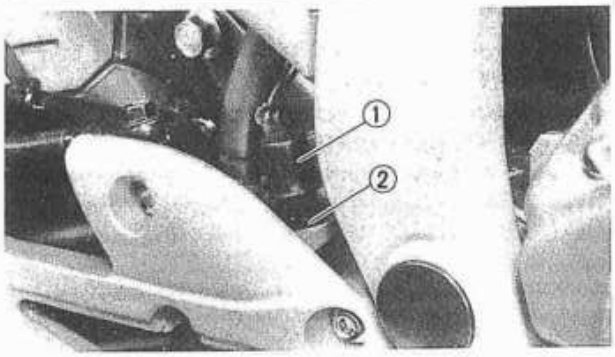
YB703208

BRAKE LIGHT SWITCH ADJUSTMENT

NOTE:

The brake light switch is operated by movement of the brake pedal.
Proper adjustment is achieved when the brake light comes on just before the brake begins to take effect.

1. Check:
- Brake light operating timing
  Incorrect→Adjust.



2. Adjust:
• Brake light operating timing

****

Adjustment steps:

● Hold the main body ① of the switch with your hand so that it does not rotate, and turn the adjuster in or out ② until the operating timing is correct.

****

YB703209

AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)

⚠WARNING

Bleed the brake system if:
- **The system has been disassembled.**
- **A brake hose has been loosened or removed.**
- **The brake fluid is very low.**
- **The brake operation is faulty.**

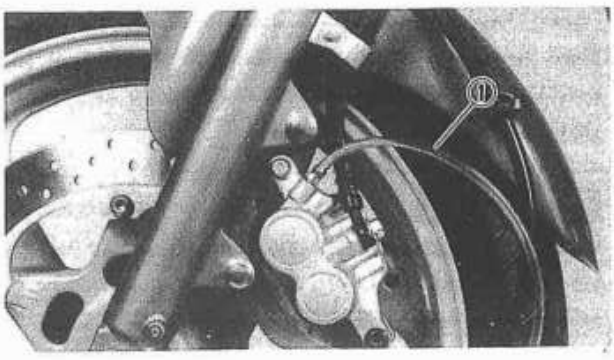
A loss of braking performance may occur if the brake system is not properly bled.

1. Bleed:
• Brake fluid

****

Air bleeding steps:

a. Add proper brake fluid to the reservoir.
b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.



c. Connect the clear plastic tube ① tightly to the caliper bleed screw.
d. Place the other end of the tube 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.

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

i. Repeat steps (e) to (h) until the air bubbles have been removed from the system.

NOTE:

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

j. Add brake fluid to proper level.

⚠WARNING

Check the operation of the brake after bleeding the brake system.

****

YB703214

DRIVE CHAIN SLACK ADJUSTMENT

NOTE:

Before checking and/or adjusting, rotate the rear wheel several revolutions and check slack at several points to find the tightest point. Check and/or adjust the chain slack with the rear wheel in this "tightest" position.

CAUTION:

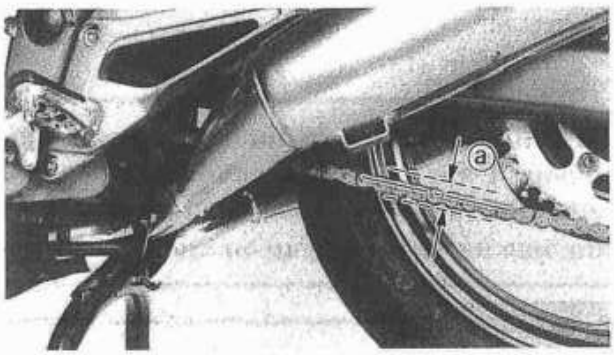
Too little of chain slack will overload the engine and other vital parts. Keep the slack within the specified limits.

⚠WARNING

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

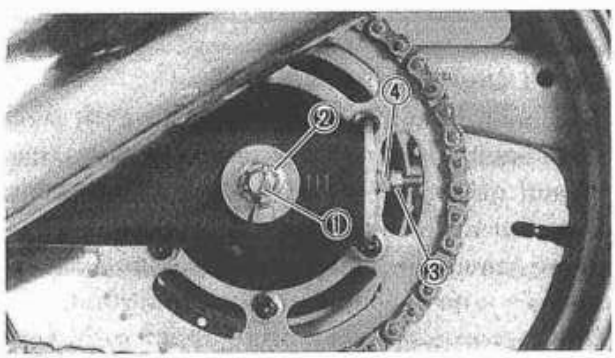
1. Place the motorcycle on a level place, and hold it in an upright position.

NOTE:
The both wheels on the ground without rider on it.



2. Check:
- Drive chain slack ⓐ
  Out of specification → Adjust.

	Drive chain slack: **30~40 mm (1.2~1.6 in)** **with elevated rear wheel.**



3. Remove:
- Cotter pin ①

4. Loosen:
- Axle nut ②

5. Adjust:
- Drive chain slack

****

Adjustment steps:
- Loosen the locknut(s) ③.
- Turn the adjuster(s) ④ in or out until the specified slack is obtained.

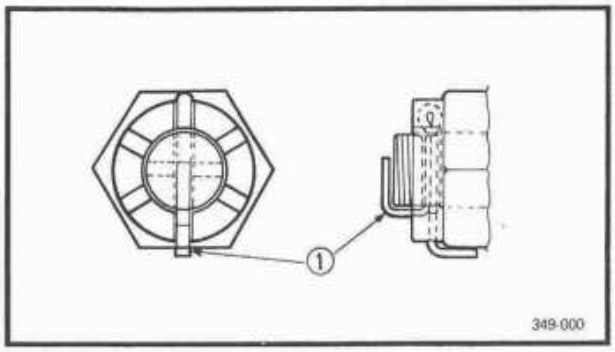
Turning in → Slack is decreased.
Turning out → Slack is increased.

NOTE:
Turn each adjuster exactly the same amount to maintain correct axle alignment. (There are marks on each side of swingarm and on each chain puller. Use them to check for proper alignment.)

- Tighten the axle nut to specification while pushing up or down on the chain to zero slack.

	Axle nut: **105 Nm (10.5 m · kg, 75 ft · lb)**

****



6. Install:
- Cotter pin ①

CAUTION:

Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the cotter pin hole, align groove with the hole by tightening up on the axle nut.

⚠WARNING

Always use a new cotter pin.

YB703215

DRIVE CHAIN LUBRICATION

The chain consists of many parts that work with each other. If the chain is not maintained properly, it will wear out rapidly. Therefore, form the habit of periodically servicing the chain. This service is especially necessary when riding in dusty conditions.

This motorcycle has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, 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 ~ 50 W Motor Oil or chain lubricants suitable for "O-ring" chains.**

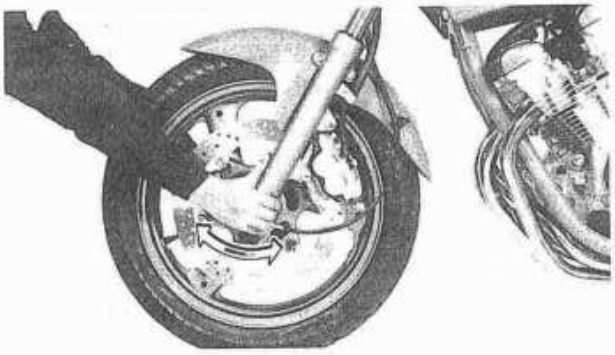
YB703201

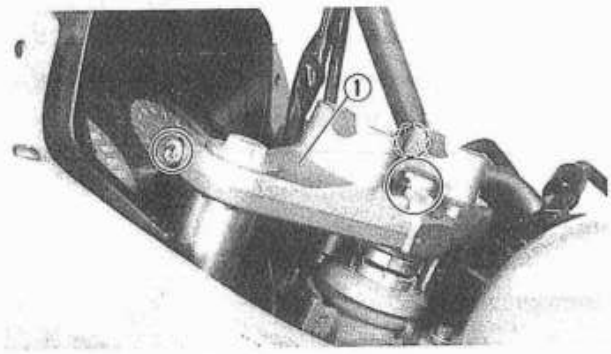
STEERING HEAD ADJUSTMENT

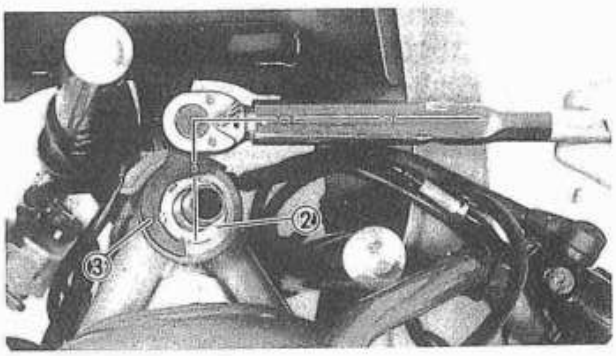
⚠ WARNING

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

1. Place the motorcycle on a level place.
2. Elevate the front wheel by placing a suitable stand under the exhaust pipe.
3. Check:
- Steering assembly bearings
  Grasp the bottom of the forks and gently rock the fork assembly back and forth.
  Looseness→Adjust steering head.
4. Remove:
- Front wheel
  Refer to the "FRONT WHEEL" section in CHAPTER 6.
5. Adjust:
- Steering head







****

Adjustment steps:
- Remove the handlebar.
- Remove the handle crown ① and special washer.
- Remove the ring nut (upper) and rubber washer.
- Tighten the ring nut (lower) ② using the ring nut wrench ③.

NOTE:

Set the torque wrench to the Ring nut wrench so that they form a right angle.

	Ring nut wrench: P/N 90890-01403

	Ring nut (initial tightening): 52 Nm (5.2 m · kg, 37 ft · lb)

- Loosen the ring nut one turn.
- Retighten the ring nut using the Ring nut wrench.

⚠ WARNING

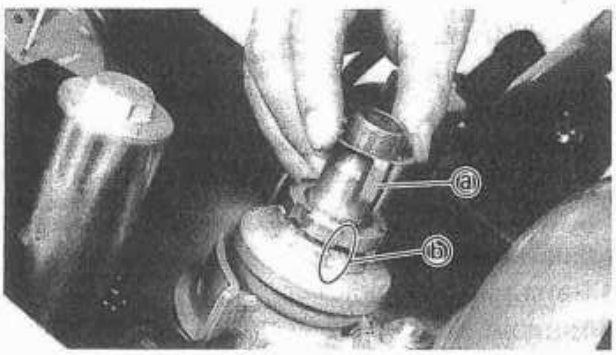
Avoid over-tightening.

	Ring nut (final tightening): **18 Nm (1.8 m · kg, 13 ft · lb)**

NOTE:

Recheck the steering head by turning the steering from left to right.
If steering is bound, remove the steering stem assembly and inspect the steering bearing. Refer to the "STEERING HEAD" section in the CHAPTER 6.

- Install the rubber washer and ring nut (upper).
- Finger tighten the ring nut (upper), then align the slot of both ring nuts. If not aligned, hold the ring nut (lower) and tighten the other until they are aligned.



NOTE:

Make sure the special washer tab ⓐ is placed in the slots ⓑ.

- Install the handle crown.

	Nut (steering shaft): **110 Nm (11.0 m · kg, 80 ft · lb)** **Pinch bolt (handle crown):** **23 Nm (2.3 m · kg, 17 ft · lb)**

****

6. Install:
- Front wheel
  Refer to the "FRONT WHEEL" section in CHAPTER 6.

YB703202

FRONT FORK INSPECTION

⚠ WARNING

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

1. Place the motorcycle on a level place.

2. Check:
- Inner tube
  Scratch/Damage→Replace.
- Oil seal
  Excessive oil leakage→Replace.

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



4. Check:
- Operation
  Pump the front fork up and down several times.
  Unsmooth operation→Repair
  Refer to the "FRONT FORK" section in CHAPTER 6.

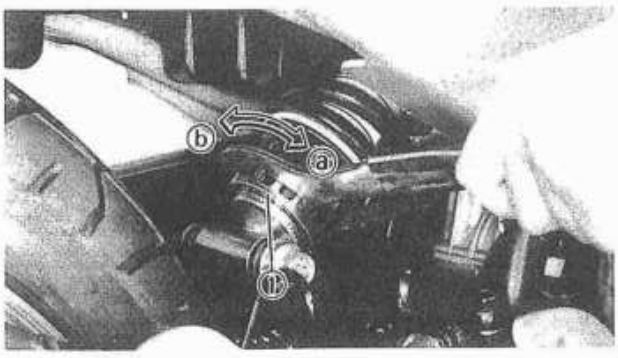
YB703203

REAR SHOCK ABSORBER ADJUSTMENT

⚠ WARNING

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

1. Place the motorcycle on a level place.

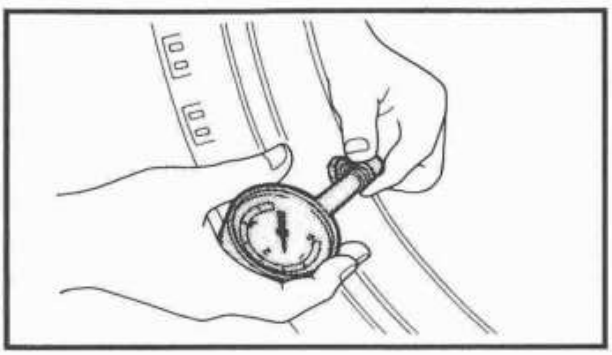


2. Adjust:
- Spring preload
  Turn the adjuster ① to direction ⓐ or ⓑ.

Turning toward ⓐ → **Spring preload is harder.**
Turning toward ⓑ → **Spring preload is softer.**

Adjuster position:
Standard 3
Minimum 1
Maximum 7

CAUTION:
Never turn the adjuster beyond the maximum or minimum setting.



YB703210

TIRE INSPECTION

1. Measure:
• Tire pressure
Out of specification→Adjust.

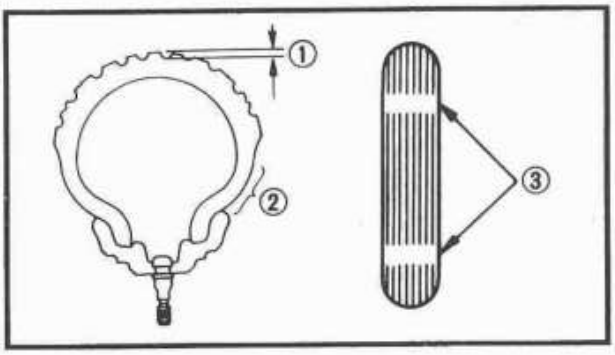
⚠ WARNING

- **Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature. Tire inflation pressure must be adjusted according to total weight of cargo, rider, and accessories (fairing, saddlebags, etc. if approved for this model), and vehicle speed.**
- **Proper loading of your motorcycle is important for the handling, braking, and other performance and safety characteristics of your motorcycle. Do not carry loosely packed items that can shift. Securely pack your heaviest items close to the center of the motorcycle, and distribute the weight evenly from side to side. Properly adjust the suspension for your load, and check the condition and pressure of your tires. NEVER OVERLOAD YOUR MOTORCYCLE. Make sure the total weight of the cargo, rider, and accessories (fairing, saddlebags, etc. if approved for this model) does not exceed the maximum load of the motorcycle. Operation of an overloaded motorcycle could cause tire damage, an accident, or even injury.**

Basic weight: With oil and full fuel tank	197 kg (434 lb)	
Maximum load*	200 kg(441 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb)*	200kPa (2.0kg/cm², 28 psi)	225kPa (2.25kg/cm², 32 psi)

Cold tire pressure	Front	Rear
90 kg (198 lb)*~Maximum load*	200kPa (2.0kg/cm², 28 psi)	250kPa (2.5kg/cm², 36 psi)
High speed riding	200kPa (2.0kg/cm², 28 psi)	250kPa (2.5kg/cm², 36 psi)

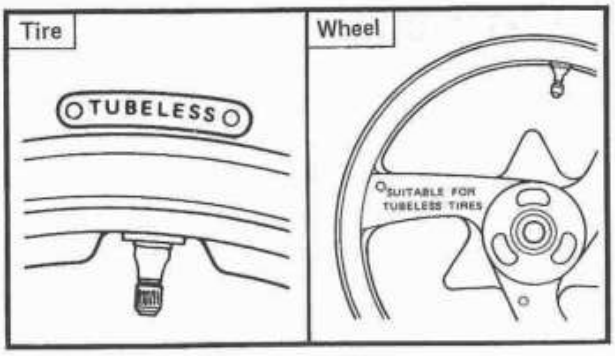
*Load is the total weight of cargo, rider, and accessories.



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 a tire tread begins to show lines, 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.**

Tube type wheel → Tube type tire only
Tubeless type wheel → Tube type or tubeless tire

- Be sure to install the correct tube when using tube type tires.

⚠ WARNING

After extensive tests, the tires mentioned below have been approved by Yamaha motor Co., Ltd. for this model. No guarantee for handling characteristics can be given if tire combinations other than what is approved are used on this motorcycle. The front and rear tires should be of the same manufacture and design.

FRONT:

Manufacture	Size	Type
YOKOHAMA	110/80-17 57H	F209
DUNLOP	110/80-17 57H	K275F

REAR:

Manufacture	Size	Type
YOKOHAMA	130/70-18 63H	R209
DUNLOP	130/70-18 63H	K275

⚠ WARNING

After mounting a tire, ride conservatively to allow proper tire to rim seating. Failure to do so may cause an accident resulting in motorcycle damage and possible operator injury.

YB703211

WHEEL INSPECTION

1. Inspect:
• Wheels
Damage/Bends→Replace.

NOTE:
Always balance the wheel when a tire or wheel has been changed or replaced.

⚠ WARNING
Never attempt to make any repairs to the wheel.

YB703216

SIDESTAND LUBRICATION

Lubricate the sidestand at pivoting points.

Recommended lubricant:
Lithium soap base grease

YB703217

CENTERSTAND LUBRICATION

(If equipped centerstand)
Lubricate the centerstand at pivoting points.

Recommended lubricant:
Lithium soap base grease

YB703301

ELECTRICAL

BATTERY INSPECTION

NOTE:

Since the MF battery is of a sealed-type construction, it is impossible to measure the specific gravity of the electrolyte in order to check the state of charge in the battery. Therefore, to check the state of charge in the battery, voltage must be measured at the battery terminals.

CAUTION:

CHARGING METHOD

- **This battery is sealed type. Never remove sealing caps even when charging. With the sealing cap removed, this balancing will not be maintained, and battery performance will lower gradually.**
- **Never add water. If distilled water is added, chemical reaction in the battery will not proceed in the normal way, thus making it impossible for the battery to operate regularly.**
- **The charging time, charging current and charging voltage for the MF battery is different than general type batteries.**
  The MF battery should be charged as instructed in the "Charging method". Should the battery be overcharged, the electrolyte level will over extremely. Therefore, use special care when charging the battery.
- **Avoid using any electrolyte other than specified. The specific gravity of the MF battery electrolyte is 1.32 at 20°C (68°F). (The specific gravity of the general type battery electrolyte is 1.28.) If the electrolyte whose specific gravity is less than 1.32, the sulfuric acid will decrease and thus low battery performance will result. Should any electrolyte, whose specific gravity is 1.32 or more, be used, the battery plates will corrode and battery life will shorten.**

⚠ WARNING

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

Always follow these preventive measures:

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

Antidote (EXTERNAL):

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

Antidote (INTERNAL):

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

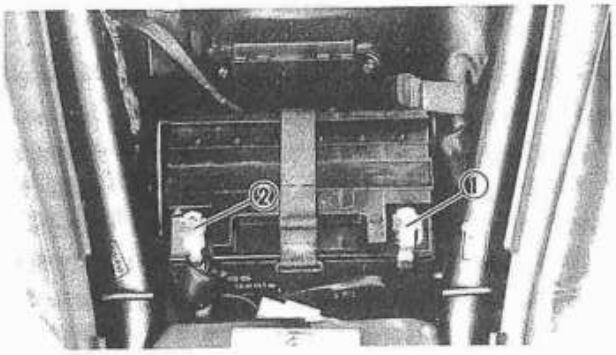
Batteries generate explosive hydrogen gas.

Always follow these 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

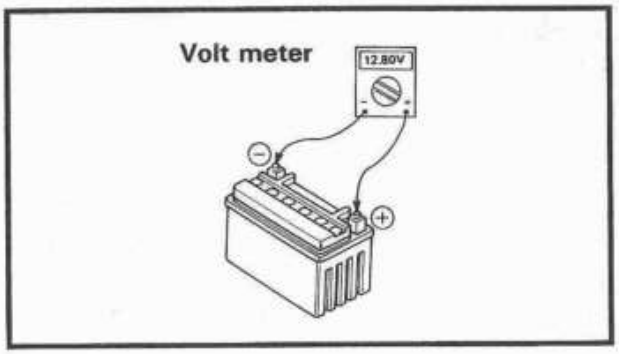


2. Disconnect:
   - Battery leads

CAUTION:

Disconnect the negative lead ① first and then disconnect the positive lead ② .

3. Remove:
   - Battery

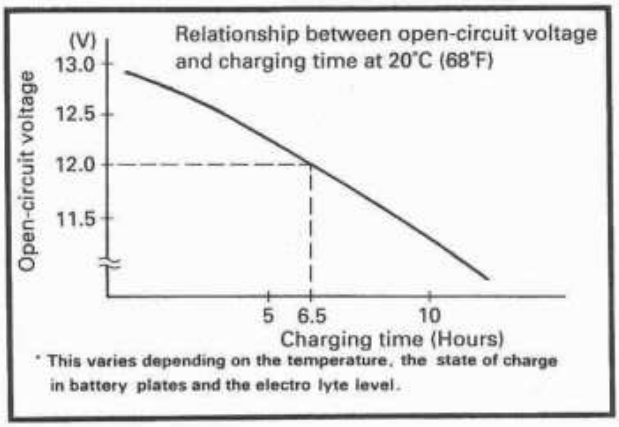


4. Check:
• Battery condition

****

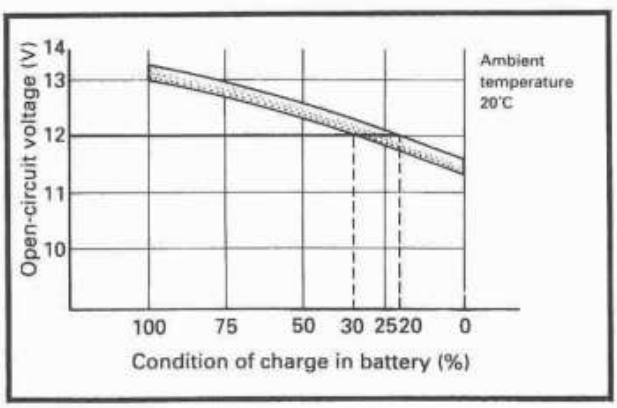
Battery condition checking steps:
● Connect a digital volt meter to the battery terminals.

Tester (+) lead → Battery (+) terminal.
Tester (−) lead → Battery (−) terminal.



NOTE:
The state of a discharged MF battery can be checked by measuring open circuit voltage (the voltage measured with the positive terminals being disconnected).

Open circuit voltage	Charging time
12.8 v or more	No charging is necessary.



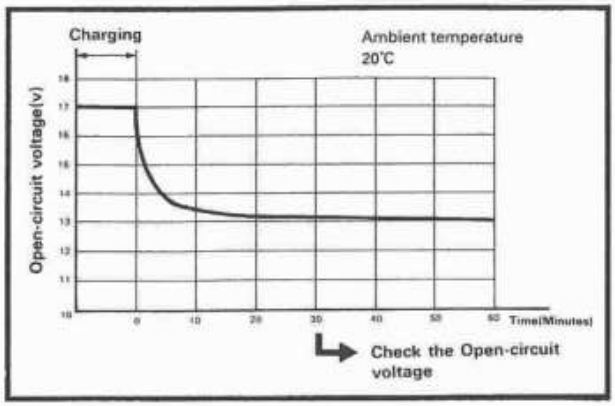
● Check the battery condition using figures.

EXAMPLE:
Open circuit voltage = 12.0 v
Charging time = 6.5 hours
Condition of charge in battery = 20~30 %

****

5. Charging method of MF battery

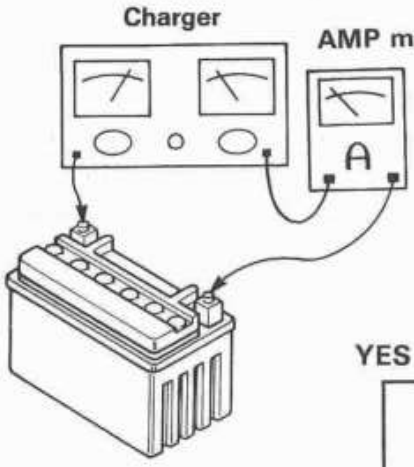
CAUTION:
• If it is impossible to set the standard charging current, be careful not to overcharge.
• When charging the battery, be sure to remove it from the motorcycle. (If charging has to be done with the battery mounted on the motorcycle for some reason, be sure to disconnect the wire at the negati-



ve terminal.)

- Never remove the sealing plug from the MF battery.
- Use special care so that charging clips are in a full contact with the terminal and that they are not shorted. (A corroded clip of the charger may cause the battery to generate heat at the contact area. A weak clip spring may cause sparks.)
- Before removing the clips from the battery terminals, be sure to turn off the power switch of the charger.
- Change in the open-circuit voltage of the MF battery after being charged is shown below. As shown in the figure, the open-circuit voltage is stabilized 30 minutes after charging has been completed.
  Therefore, to check the condition of the battery, measure the open-circuit voltage 30 minutes after has been completed.

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



Measure the open-circuit voltage prior to charging.

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

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

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

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

YES

NO

By turning the charging voltage adjust dial, set the charging voltage at 20 - 25 v.

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

YES

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

NO

Set the timer according to the charging time suitable for the open-circuit voltae.
Refer to "Battery condition checking steps".

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

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

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

Charging method using a constant-voltage type charger

Measure the open-circuit voltage prior to charging.

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

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

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

YES

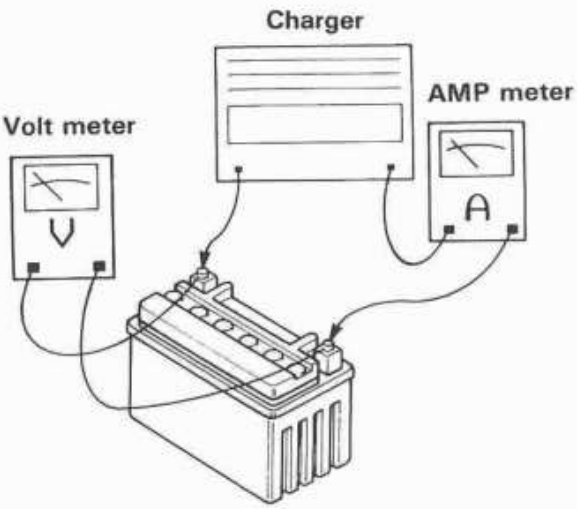
Charge the battery until the battery's charging voltage is 15 volts.

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

Check the open-circuit voltage after having left the battery for 30 minutes after charging.
12.8 v or more---Charging is complete.
12.7 v or less---Recharging is necessary.
Under 12 v---Replace the battery.

NO

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

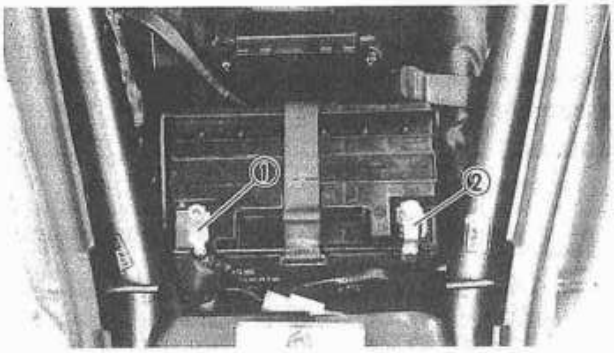


Charging method using a constant current type charger

This type of battery charger cannot charge the MF battery.

6. Inspect:
• Battery terminal
Dirty terminal → Clean with wire brush.
Poor connection → Correct.

NOTE:
After cleaning the terminals, apply grease lightly to the terminals.



7. Install
• Battery

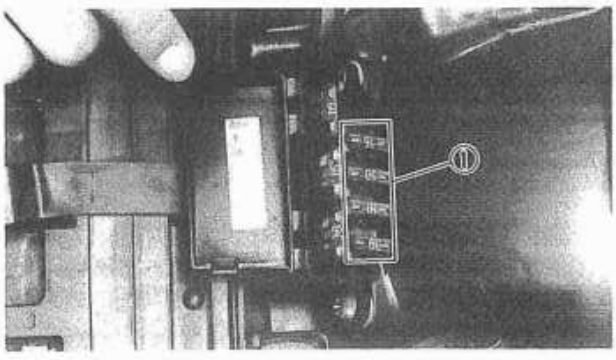
8. Connect:
• Battery leads

CAUTION:
Connect the positive lead ① first and then connect the negative lead ② .

9. Install:
• Seat

YB703302
FUSE INSPECTION

CAUTION:
Always turn off the main switch when checking or replacing a fuse. Otherwise, short-circuiting may occur.



1. Remove:
• Seat

2. Inspect:
• Fuse ①

****

Inspection steps:
● Connect the Pocket tester to the fuse and check it for continuity.

NOTE:
Set the tester selector to "Ω×1" position.

	Pocket tester: **P/N 90890-03112**

- If the tester is indicates at ∞. Replace the fuse.

****

3. Replace:
- Blown fuse

****

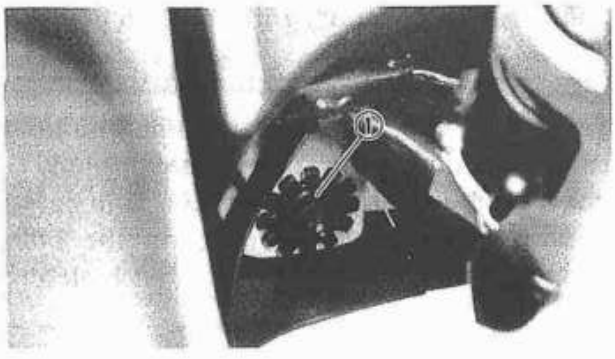
Replacement steps:
- Turn off the ignition.
- Install a new fuse of proper amperage.
- Turn on the switches to verify operation of the effected electrical device.
- If the fuse immediately blows again, check the electrical circuit.

⚠ WARNING

Never use a fuse with a rating other then specified. Never use other material in place of a fuse. An improper fuse may cause damage to the electrical system, to possibly cause a fire, the lighting and/or ignition.

****

4. Install:
- Seat

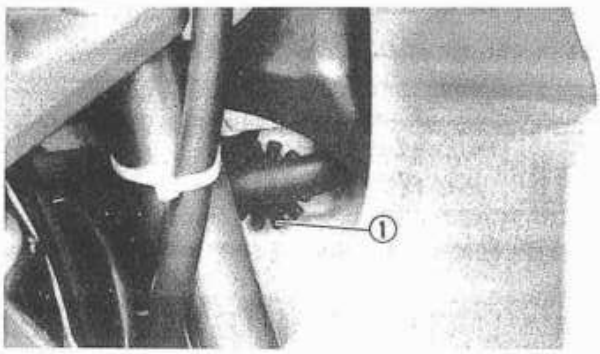


YB703303

HEADLIGHT BEAM ADJUSTMENT

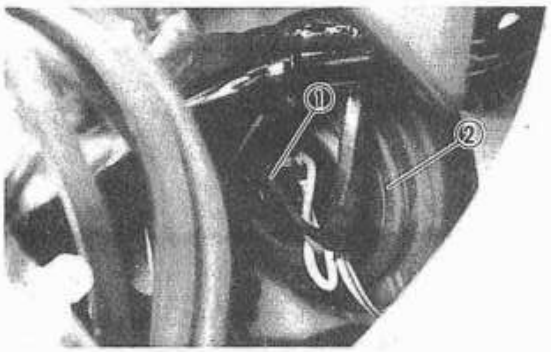
1. Adjust:
- Headlight beam (vertical)
  Turn the adjuster ① in or out.

Turning in → Headlight beam moves down.
Turning out → Headlight beam moves up.



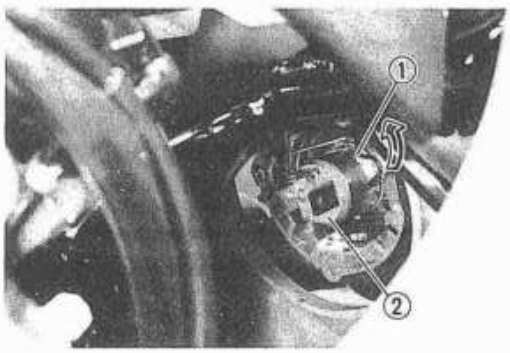
2. Adjust
• Headlight beam (horizontal)
Turn the adjuster ① in or out.

Turning in → Headlight beam moves right.
Turning out → Headlight beam moves left.



YB703304
HEADLIGHT BULB REPLACEMENT
1. Disconnect:
• Headlight lead ①

2. Remove:
• Cover ②



3. Unhook:
• Bulb holder ①

4. Remove:
• Bulb ②

⚠ WARNING

Keep flammable products and your hands away from the bulb while it is on, it will be hot. Do not touch the bulb until it cools down.

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

CAUTION:

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

6. Hook:
• Bulb holder

7. Install:
• Cover

8. Connect:
• Headlight lead

YB704101
ENGINE OVERHAUL
ENGINE REMOVAL

NOTE:

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

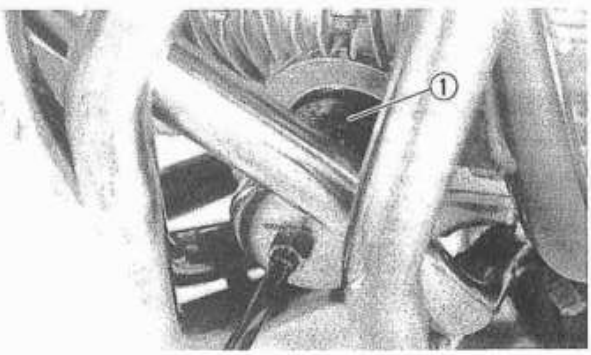
- Cylinder head
- Cylinder
- Piston
- Clutch
- AC magneto

4

YB704107
FUEL TANK AND COWLIING

1. Remove:
- Seat
- Fuel tank
- Cowling

Refer to the "SIDE COVER, FUEL TANK AND COWLING" section in the CHAPTER 3.

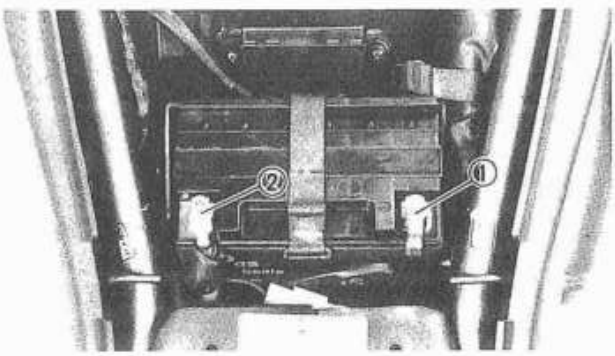


YB704108
ENGINE OIL

1. Drain:
- Engine oil

Refer to the "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.

2. Remove:
- Oil filter ①

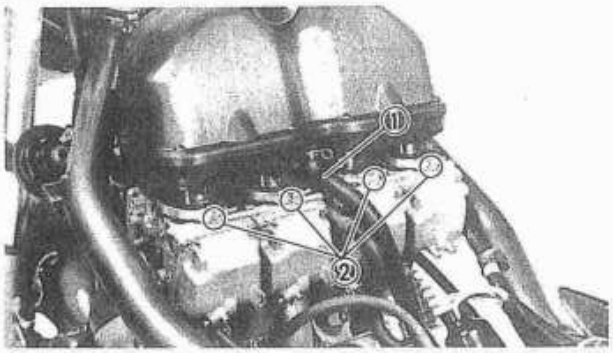


YB704102
BATTERY LEADS

1. Disconnect:
- Battery leads

CAUTION:

Disconnect the negative lead ① first and then disconnect the positive lead ② .

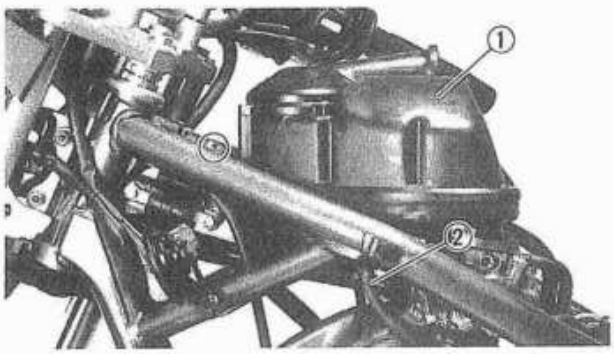


YB704109

AIR FILTER CASE

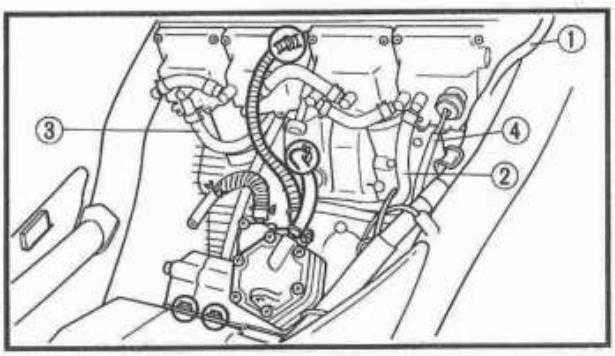
1. Disconnect:
• Breather hose ①

2. Loosen:
• Screws ②



3. Remove:
• Air filter case ①

4. Disconnect:
• Drain hose ②

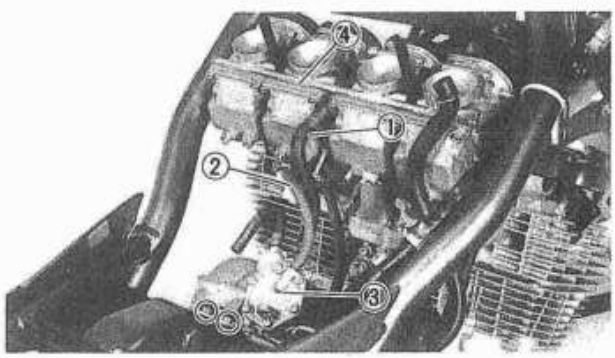


YB704103

CARBURETOR

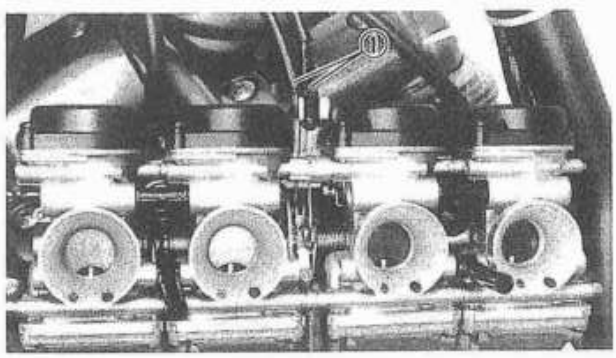
1. Remove:
• Hose ① (cylinder head-solenoid valve)
• Hose ② (solenoid valve-carburetor)
• Hose ③ (carbouretor-cylinder head)

2. Disconnect:
• Thermo switch lead ④



3. Disconnect:
• Fuel hose ①
• Vacuum hose ②

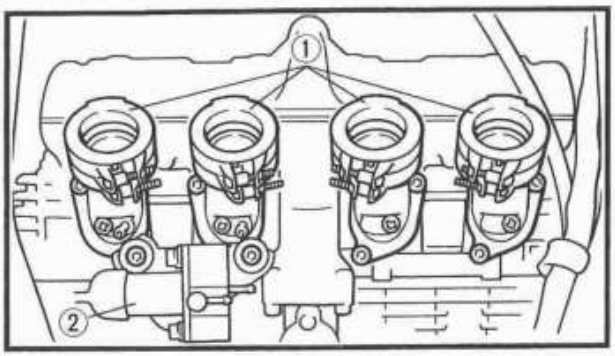
4. Remove:
• Fuel pump ③
• Carburetors ④



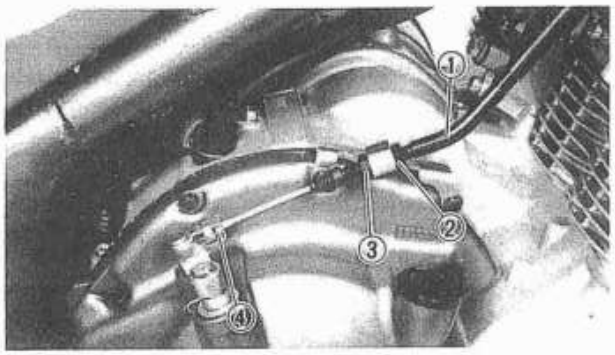
5. Disconnect:
• Throttle cables ①

NOTE:

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



6. Remove:
- Intake manifolds ①
- Solenoid valve ②

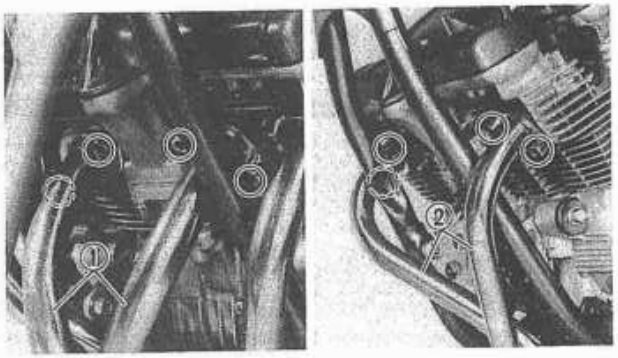


YB704104
CLUTCH CABLE
1. Remove:
- Clutch cable ①

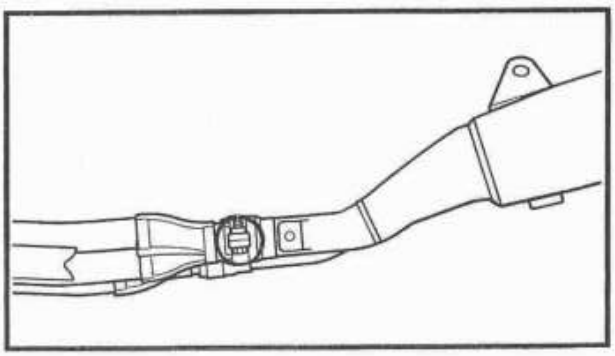
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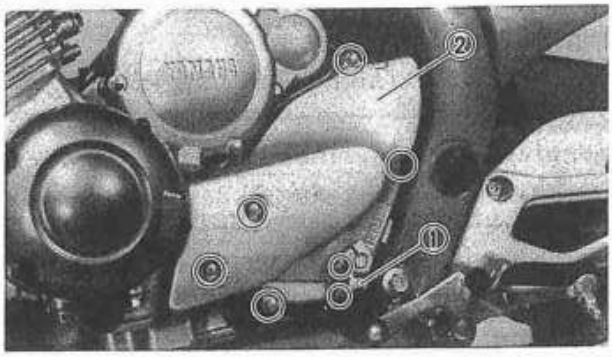
Removal steps:
- Loosen the locknuts ② .
- Turn the adjuster ③ enough to free the clutch cable.
- Unhook the cable end ④ .

****



YB704110
EXHAUST PIPE
1. Remove:
- Exhaust pipe (#2, #3) ①
- Exhaust pipe (#1, #4) ②

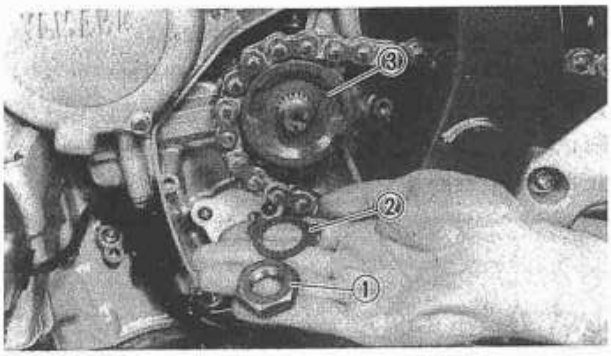




YB704105

DRIVE SPROCKET

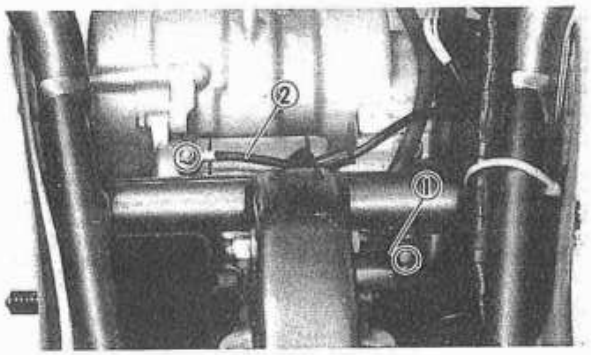
1. Remove:
- Shift arm ①
- Cover (drive sprocket) ②
- Collars



2. Straighten:
- Lock washer tab

3. Remove:
- Nut ①
- Lock washer ②
- Drive sprocket ③

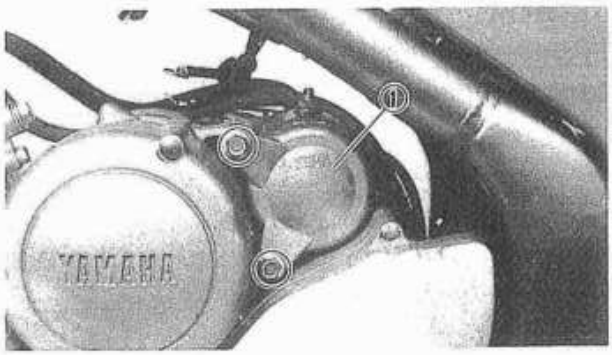
NOTE:
Loosen the nut while applying the rear brake.



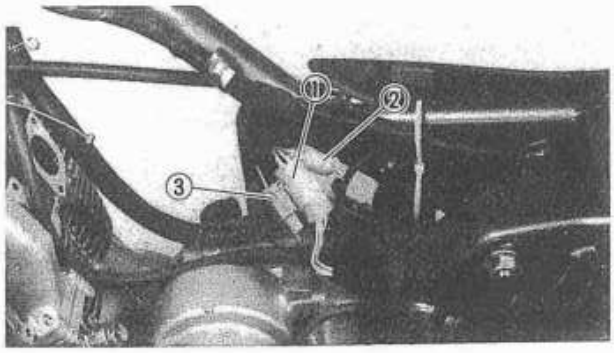
YB704111

CABLE AND LEADS

1. Disconnect:
- Spark plug leads
- Ground lead ①
- Starter motor lead ②



2. Remove:
- Starter motor ①



3. Disconnect:
- AC magneto leads ①
- Neutral switch/oil level switch lead ②

4. Remove:
- Sidestand switch lead ③
  from engine clamp

Y8704106

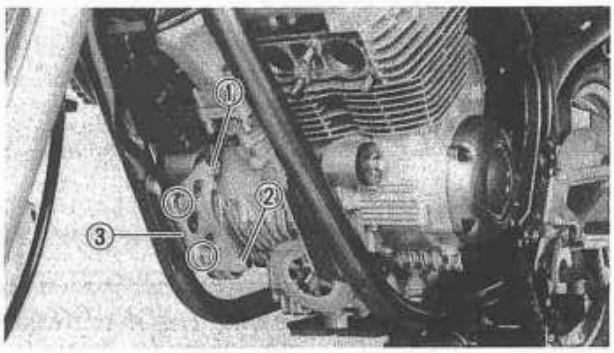
ENGINE REMOVAL

1. Place suitable stand under the engine.

⚠ WARNING

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

2. Cover the frame (right side)
3. Remove:

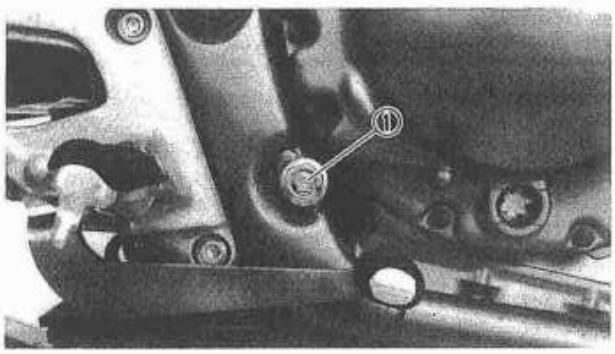


- Mounting bolt ① (front—upper)
- Mounting bolt ② (front—lower)
- Engine brackets ③ (left and right)

NOTE:

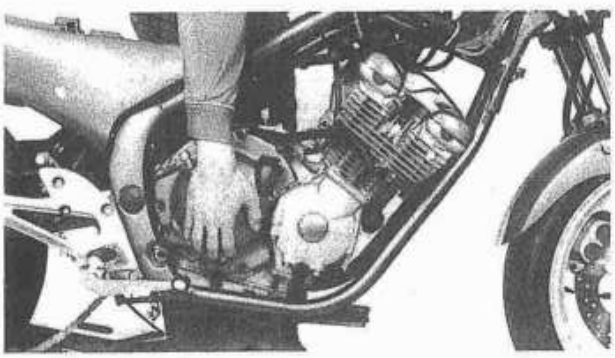
Put identification mark on the each engine bracket for reference during reinstallation.

4. Remove:



- Mounting bolt ① (rear)

5. Remove:



- Engine assembly from right side

YB704201

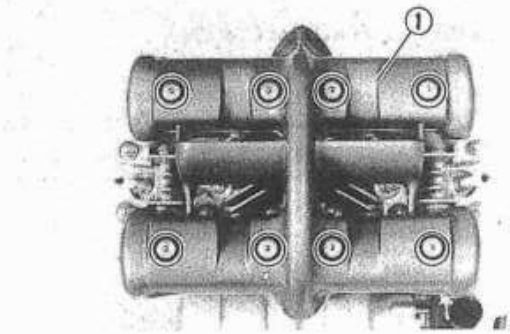
ENGINE DISASSEMBLY

CYLINDER HEAD COVER, CAMSHAFT AND CYLINDER HEAD

NOTE:

With the engine mounted, the cylinder head cover, camshaft and cylinder head can be maintained by removing the following parts.

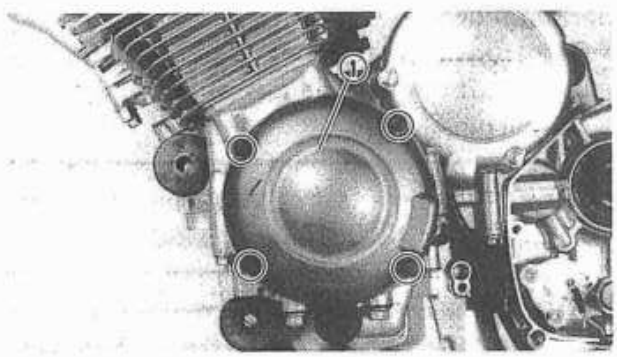
- Fuel tank
- Cowling
- Air filter case
- Carburetor



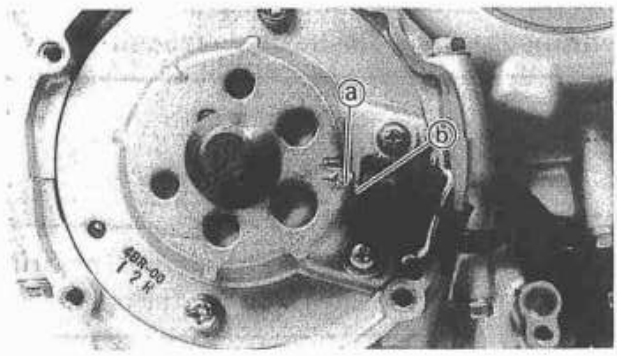
1. Remove:
- Cylinder head cover ①

NOTE:

Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.



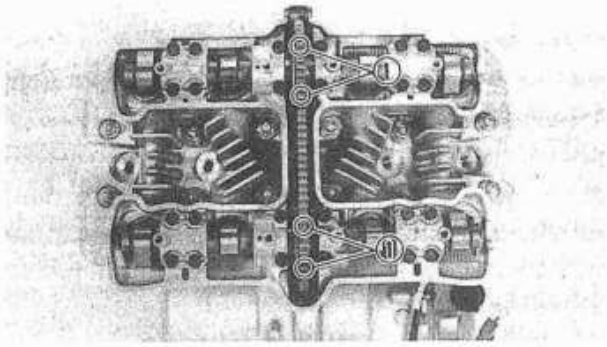
2. Remove:
- Timing plate cover ①



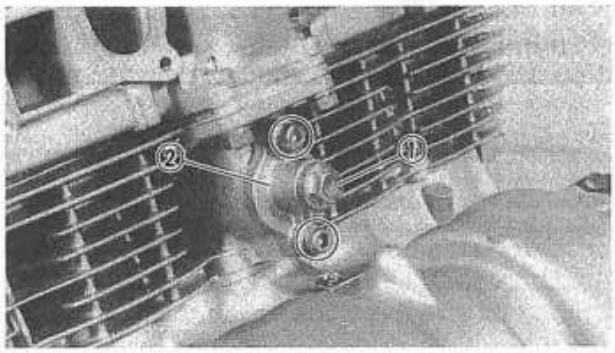
3. Align:
- "T" mark
  (with pickup coil)

NOTE:

Turn the crankshaft counterclockwise and align the "T" mark ⓐ on the timing plate with the pickup coil ⓑ when #1 piston is at TDC on compression stroke.

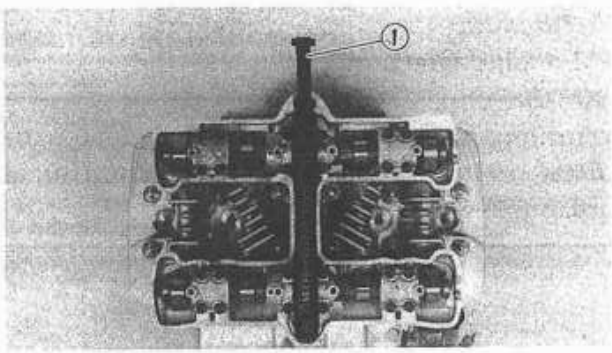


4. Loosen:
• Bolts (cam sprockets) ①

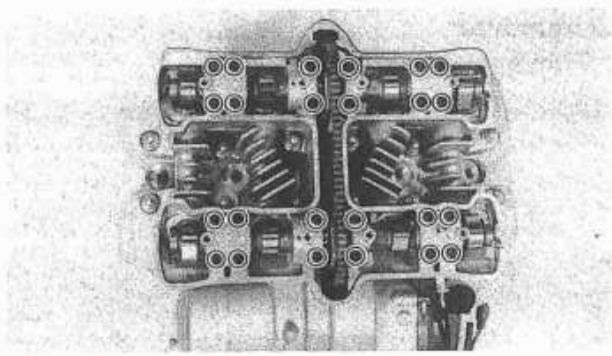


5. Loosen:
• Tensioner bolt ①

6. Remove:
• Timing chain tensioner ②



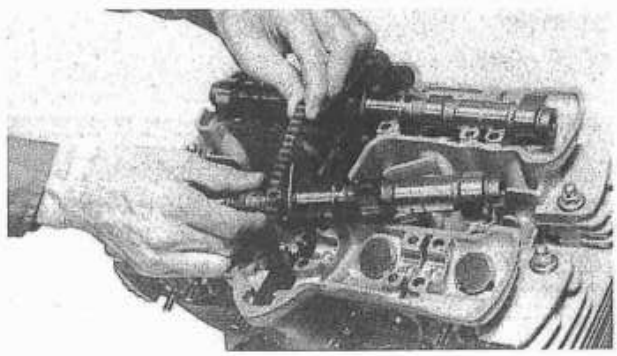
7. Remove:
• Chain guide ① (exhaust side)



8. Remove:
• Camshaft caps (intake)
• Camshaft caps (exhaust)
• Dowel pins

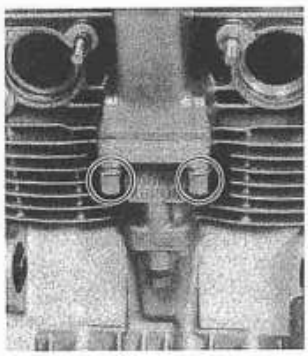
NOTE:
Remove the camshaft cap bolts in a crisscross pattern from out side to in side.

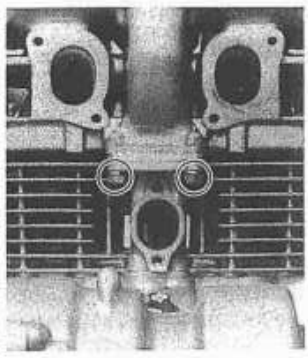
CAUTION:
The bolts (camshaft caps) must be removed evenly or damage to the cylinder head, camshaft caps and camshafts will result.



9. Remove:
• Camshafts

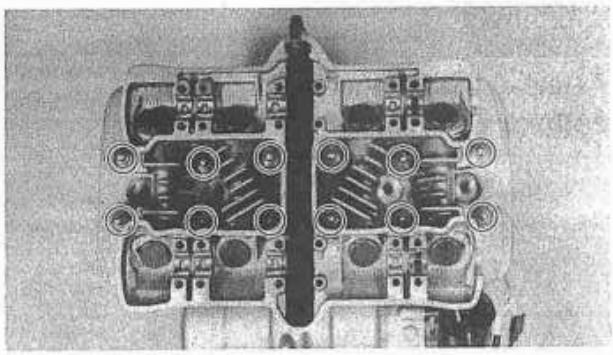
NOTE:
Fasten a safety wire to the timing chain to prevent it from falling into the crankcase.

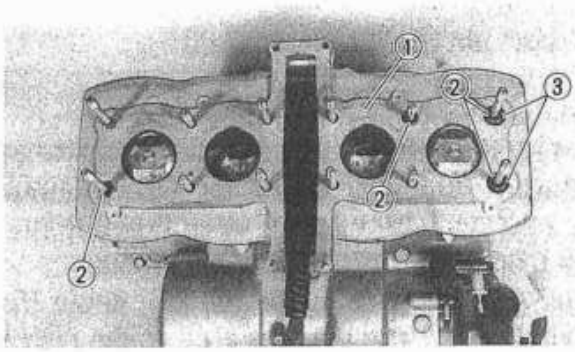




10. Remove:
- Nuts (cylinder head)

NOTE:
- Loosen the bolts in their proper loosening sequence.
- Follow numerical order shown in photo. Start by loosening each nut 1/2 turn until all are loose.





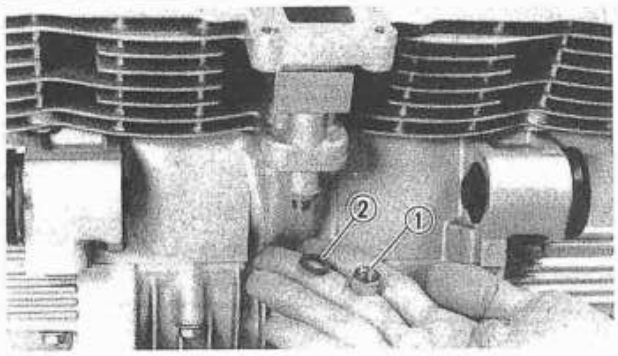
11. Remove:
- Cylinder head
- Gasket ① (cylinder head)
- Dowel pins ②
- O-rings ③

YB704202

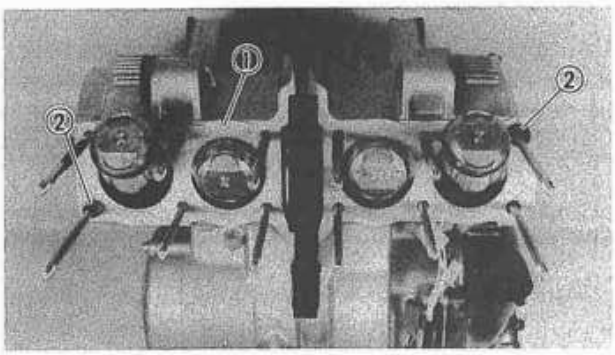
CYLINDER AND PISTON

NOTE:

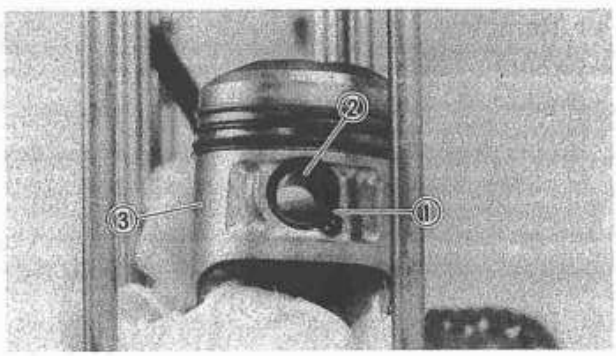
With the engine mounted, the cylinder and piston can be maintained by removing the following parts.
- Fuel tank
- Cowling
- Air filter case
- Carburetor
- Cylinder head



1. Remove:
- Nut ①
- Washer ②

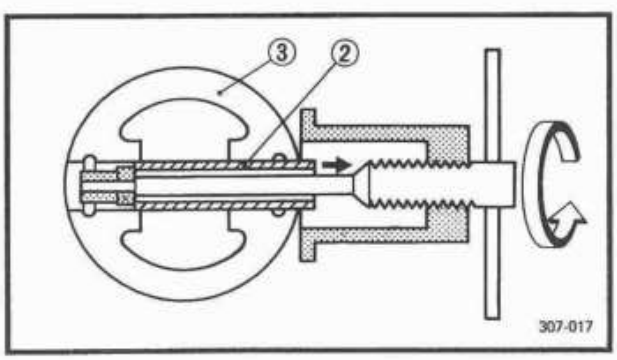


2. Remove:
- Cylinder
- Gasket ① (cylinder)
- Dowel pins ②



3. Remove:
- Piston pin circlips ①
- Piston pins ②
- Pistons ③

NOTE:
- Before removing piston pin circlip, cover crankcase with a clean rag to prevent circlip from falling into crankcase cavity.
- Before removing the piston pin, debur the clip grooved and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use piston pin puller.
- Put identification mark on the each piston head for reference during reinstallation.



	Piston pin puller: **P/N 90890-01304**

CAUTION:

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

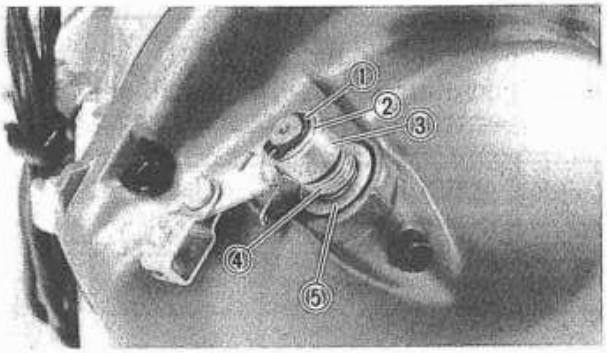
YB704203

CLUTCH

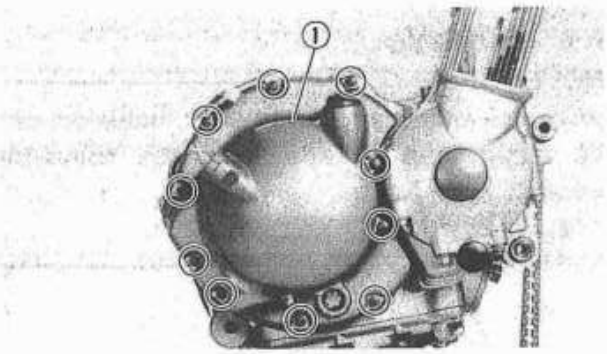
NOTE:

With the engine mounted, the clutch assembly can be maintained by removing the following parts.

- Clutch cover



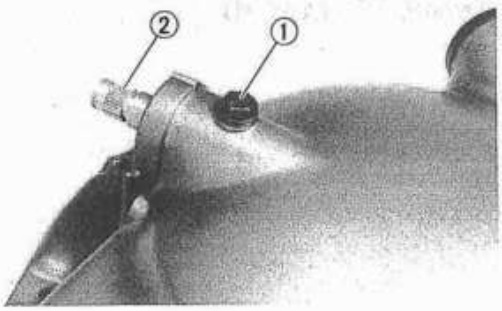
1. Remove:
- Circlip ①
- Washer ②
- Pull lever ③
- Return spring ④
- Plate washer ⑤



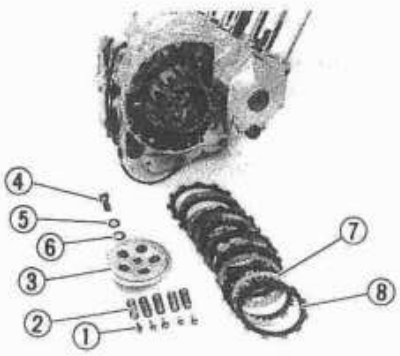
2. Remove:
- Clutch cable bracket
- Clutch cover ①
- Gasket
- Dowel pins

NOTE:

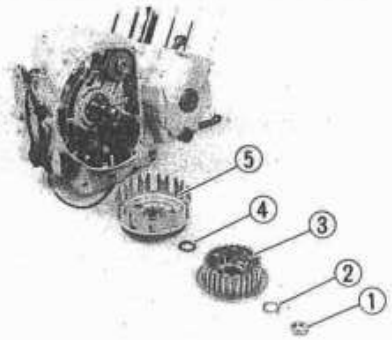
Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.



3. Remove:
- Bolt ①
- Clutch pull lever shaft ②

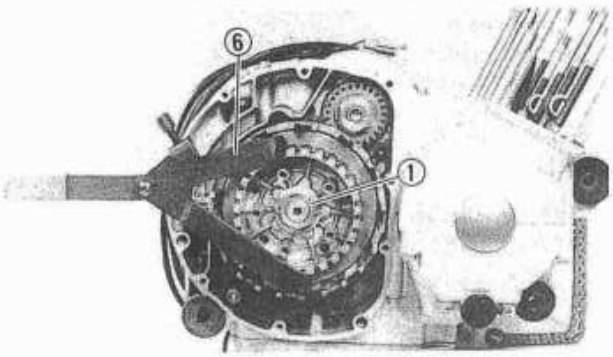


4. Remove:
- Clutch bolts ①
- Clutch springs ②
- Pressure plate ③
- Pull rod ④
- Bearing ⑤
- Washer ⑥
- Clutch plates ⑦
- Friction plates ⑧



5. Straighten:
• Lock washer tab

6. Remove:
• Nut ① (clutch boss)
• Lock washer ②
• Clutch boss ③
• Holding plate ④
• Clutch housing ⑤



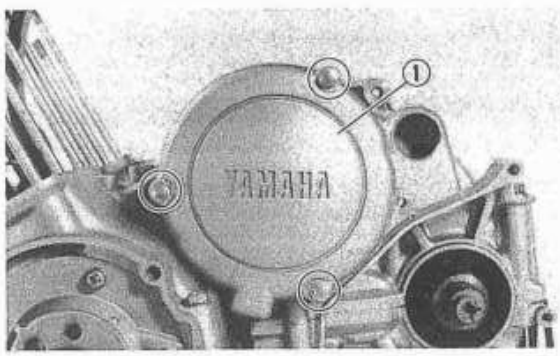
NOTE:
Loosen the nut (clutch boss) ① while holding the clutch boss by the clutch holder ⑥.

	Clutch holder: **P/N 90890-04086**

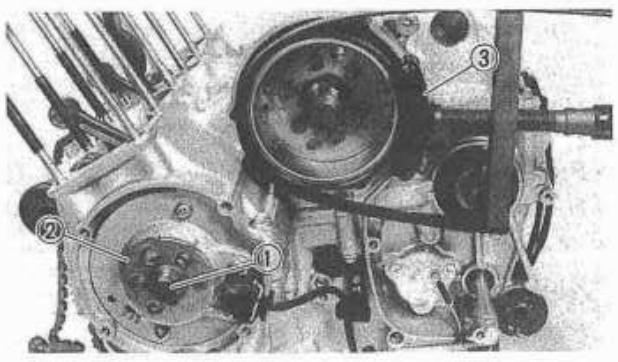
YB704208

A.C. MAGNETO

NOTE:
With the engine mounted, A.C. magneto can be maintained by removing the following parts.
• Magneto cover

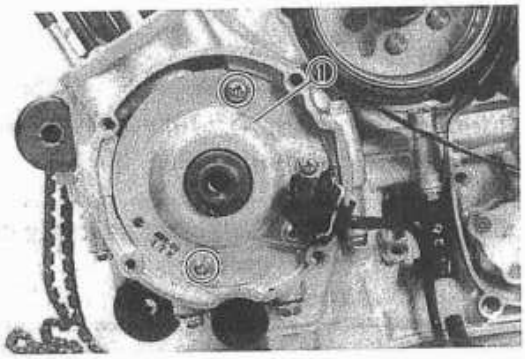


1. Remove:
• Magneto cover ①



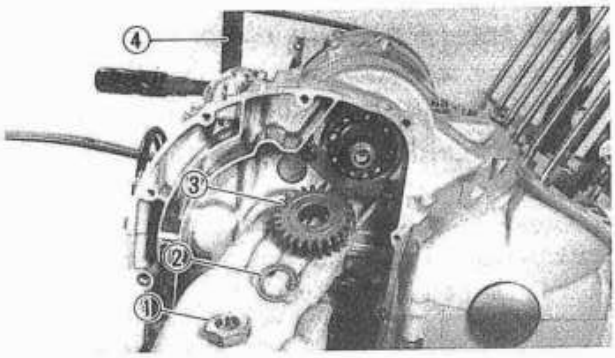
2. Remove:
• Bolt (timing plate) ①
• Timing plate ②
• Pin

NOTE:
Loosing the bolt (timing plate) ① while holding the rotor by the sheave holder ③.



Sheave holder:
P/N 90890-01701

3. Remove:
• Pickup coil base ①

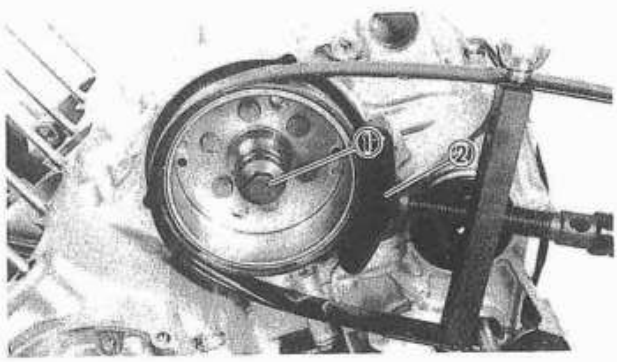


4. Straighten:
• Lock washer tab

5. Remove:
• Nut ① (primary drive gear)
• Lock washer ②
• Primary drive gear ③
• Collar

NOTE:
Loosen the nut (primary drive gear) ① while holding the rotor by the sheave holder ④.

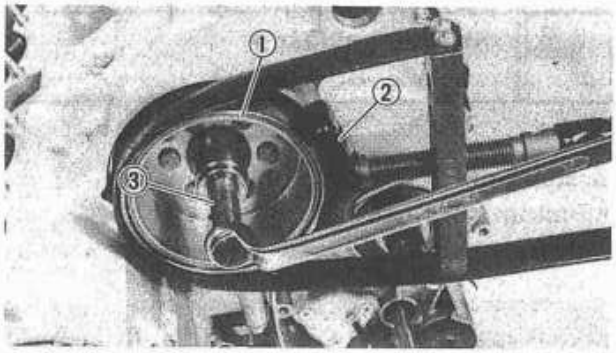
Sheave holder:
P/N 90890-01701



6. Remove:
• Bolt (rotor) ①
• Washer

NOTE:
Loosen the Bolt (rotor) ① while holding the rotor by the sheave holder ②.

Sheave holder:
P/N 90890-01701



7. Remove:
• Rotor ①

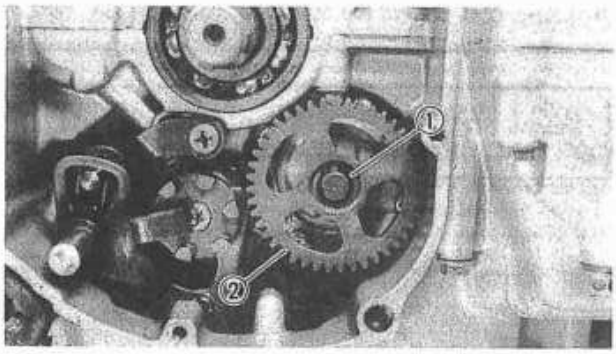
NOTE:
Remove the rotor ① while pushing back the rotor by the flywheel puller ② .

	Flywheel puller: **P/N 90890-01080**

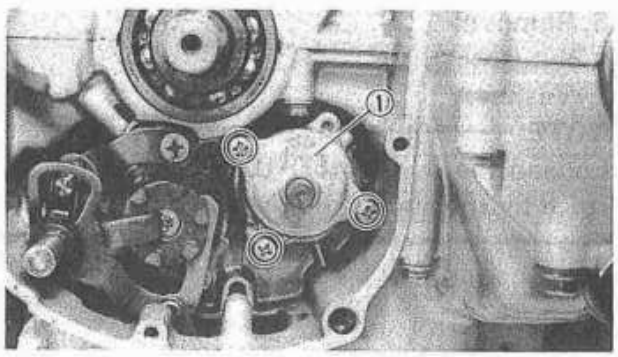
YB704206

SHIFT SHAFT AND OIL PUMP

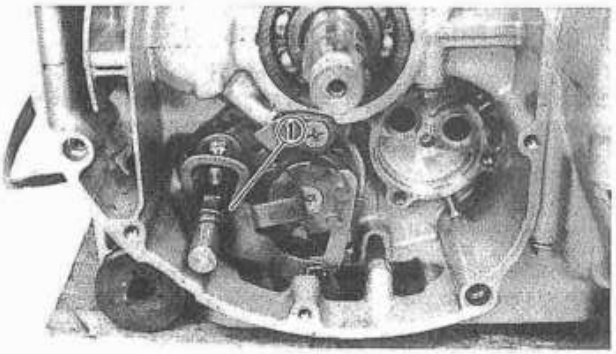
NOTE:
With the engine mounted, the shift shaft and oil pump can be maintained by the following parts.
• Clutch assembly



1. Remove:
• Circlip ①
• Driven gear ②



2. Remove:
• Oil pump assembly ①
• O-ring



3. Remove:
• Shift shaft ①

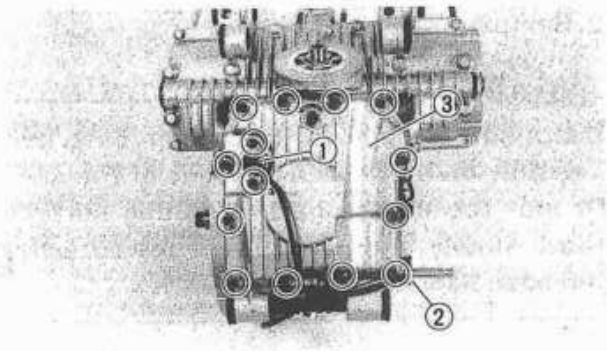
YB704205

OIL PAN AND OIL STRAINER

NOTE:

With the engine mounted, the oil pan, oil filter and oil strainer can be maintained by removing the following parts.

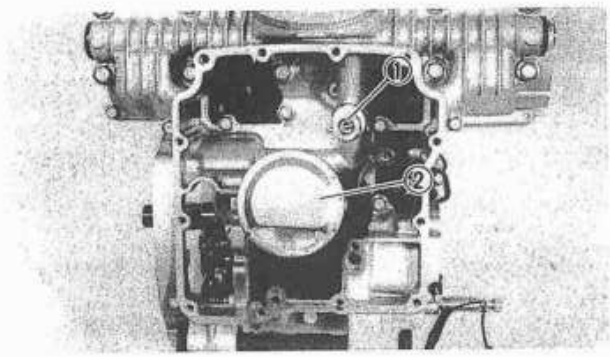
- Exhaust pipes



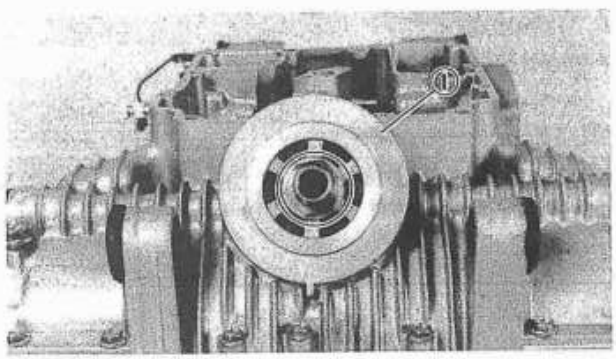
1. Remove:
- Oil level gauge ①
- Neutral switch lead ②
- Oil pan ③
- Gasket
- Dowel pins

NOTE:

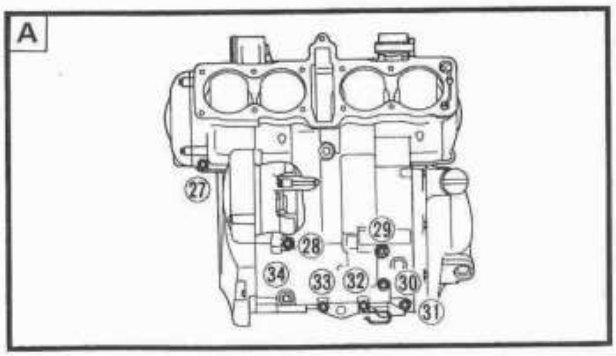
Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.



2. Remove:
- Relief valve ①
- Oil strainer ②
- Oil strainer housing



3. Remove:
- Oil filter housing ①
- O-ring



YB704209

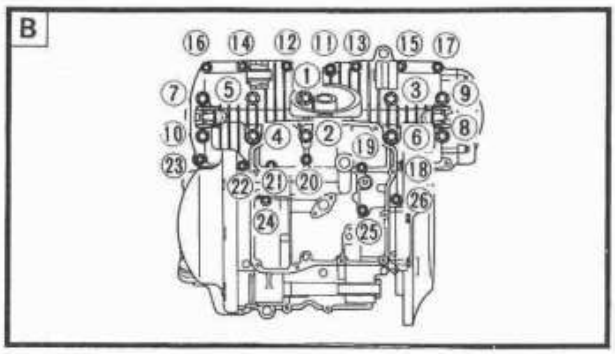
CRANKCASE

1. Remove:
- Bolts (crankcase)

A crankcase (upper)
B crankcase (lower)

NOTE:

- Loosen the bolts 1/4 turn each and remove

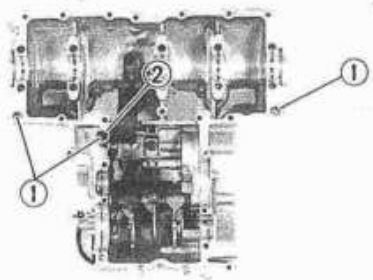


them after all are loosened.
- Loosen the bolts starting with the highest numbered one.
- The embossed numbers in the crankcase (lower) designate the tightening sequence.

2. Remove:
- Lower crankcase

CAUTION:

Use a soft hammer to tap on the case half. Tap only on reinforced portions of the case. Do not tap on the gasket mating surface. Work slowly and carefully. Make sure that the case halves separate evenly.

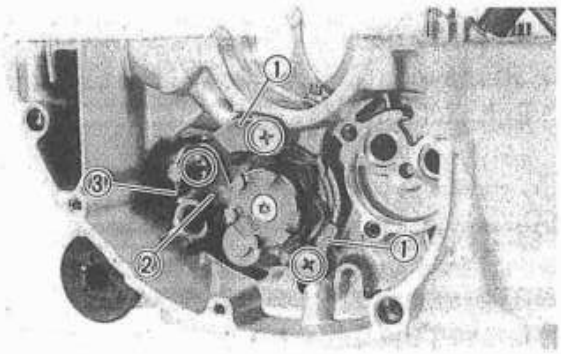


3. Remove:
- Dowel pins ①
- O-ring ②

4. Remove:
- Main journal bearing (from lower crankcase)

NOTE:

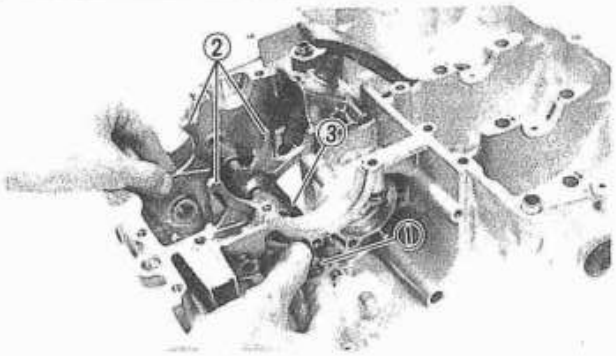
Identify each plane bearing position very carefully so that it can be reinstalled in its original place.



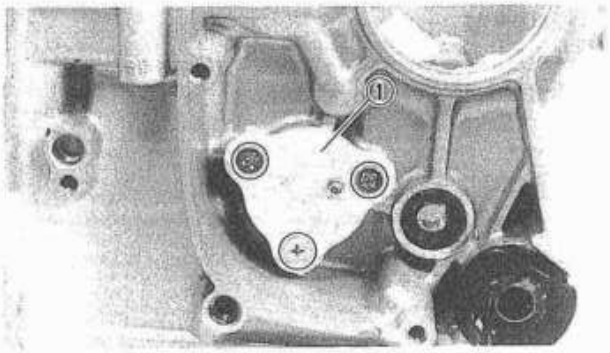
YB704204

SHIFT SHAFT AND SHIFT CAM

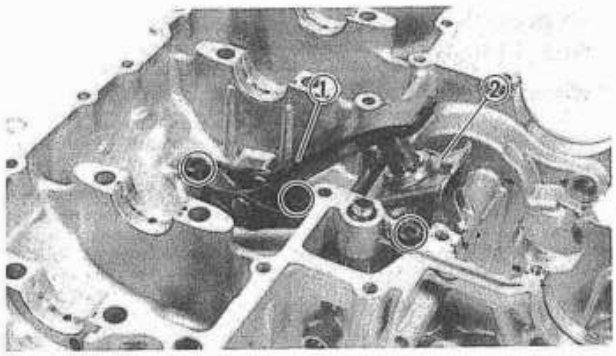
1. Remove:
- Stopper plats ①
- Stopper lever ②
- Return spring ③



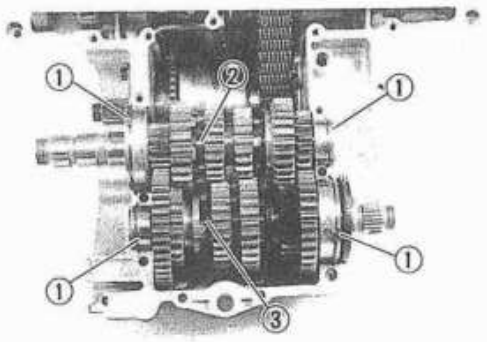
2. Remove:
- Guide bar ①
- Shift forks ②
- Shift cam ③



3. Remove:
- Neutral switch ①



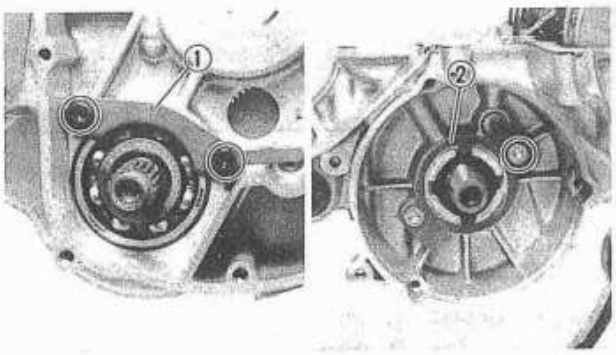
4. Remove:
- Chain guide ① (HY-VO chain—lower)
- Chain tensioner ② (HY-VO chain)



YB704214

TRANSMISSION

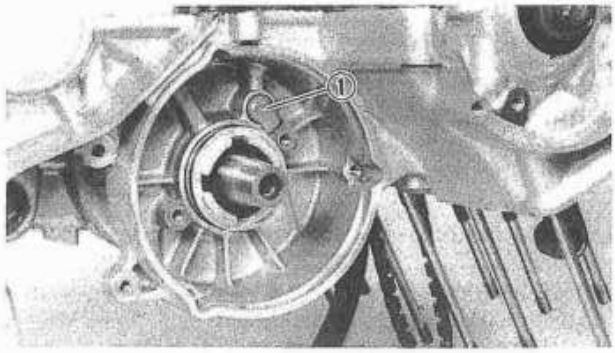
1. Remove:
- Circlips ①
- Main axle assembly ②
- Drive axle assembly ③



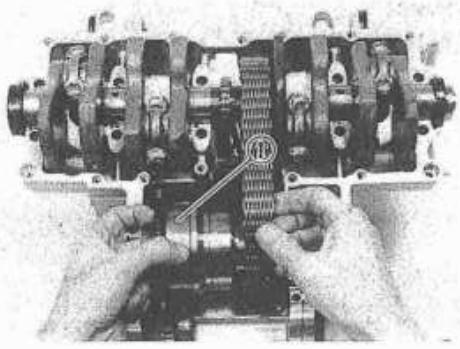
YB704212

STARTER CLUTCH

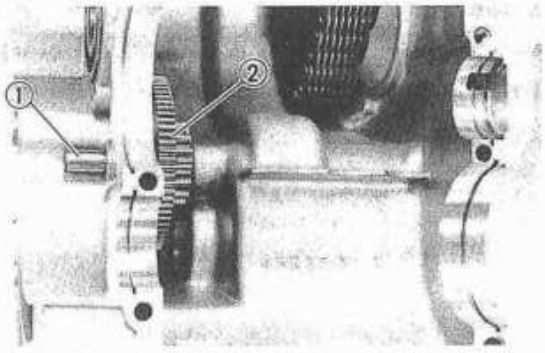
1. Remove:
- Bearing retainer ①
- Oil seal retainer ②



2. Remove:
• Oil nozzle ①

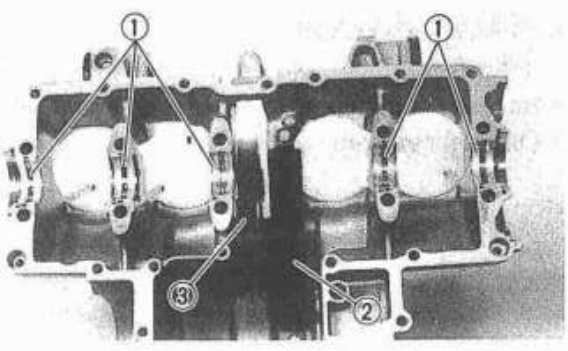


3. Remove:
• Starter clutch shaft
• Starter clutch assembly ①



4. Remove:
• Shaft (idle gear) ①
• Idle gear ②

YB704213
CRANKSHAFT
1. Remove:
• Crankshaft
(with timing chain and HY-VO chain)



2. Remove:
• Main journal bearing ①
(from upper crankcase)

NOTE:
Identify each plane bearing position very carefully so that it can be reinstalled in its original place.

• Chain guide ② (HY-VO chain—upper)
• Chain guide ③ (timing chain—intake)

YB704210

VALVE

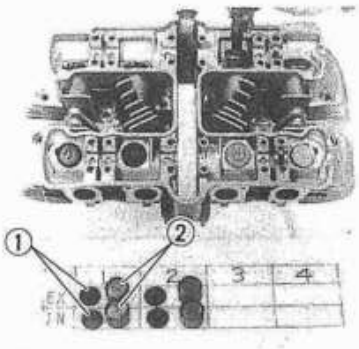
NOTE:

With the engine mounted, the valve and camshaft can be maintained by removing the following parts.

- Fuel tank
- Cowling
- Air filter case
- Carburetor
- Cylinder head

NOTE:

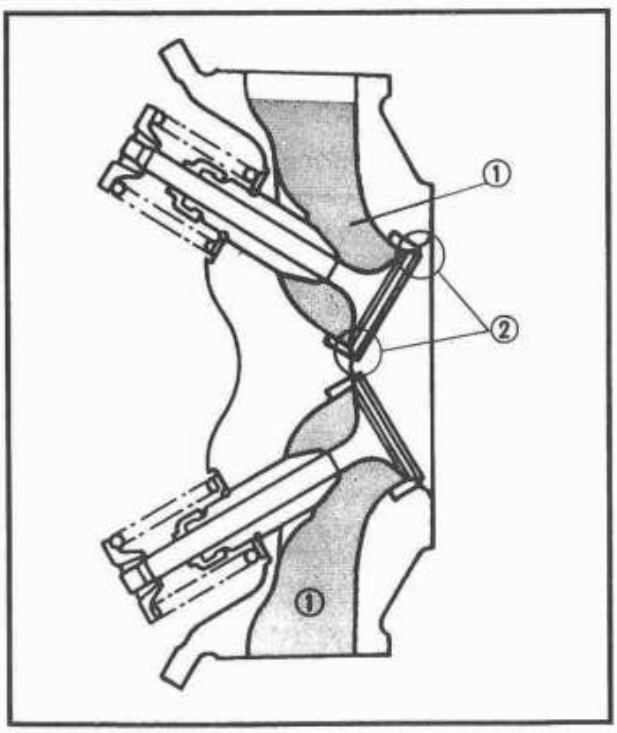
Before removing the internal parts (valve, valve spring, valve seat etc.) of the cylinder head.
The valve sealing should be checked.



1. Remove:
- Pads ①
- Lifters ②

NOTE:

Identify each lifter and pad position very carefully so that it can be reinstalled in its original place.



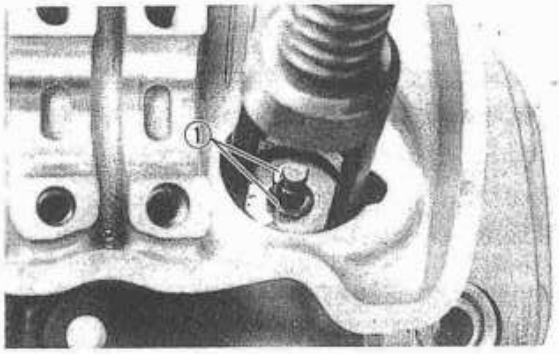
2. Check:
- Valve sealing
  Leakage at valve seat → Inspect the valve face, valve seat and valve seat width.
  Refer to the "INSPECTION AND REPAIR— VALVE SEAT".

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Checking steps:

- Pour a clean solvent ① into the intake and exhaust ports.
- Check the valve sealing.
  There should be no leakage at the valve seat ②.

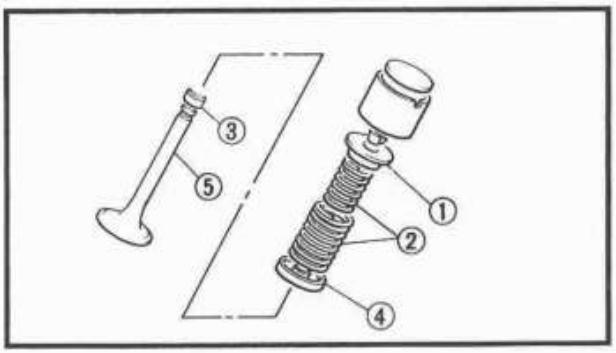
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3. Remove:
• Valve cotters ①

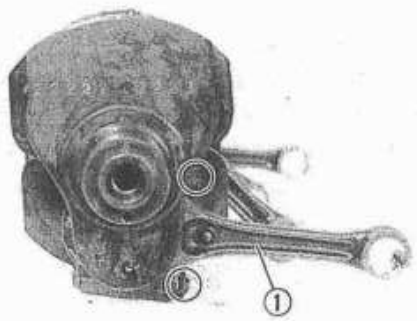
NOTE:
Remove the valve cotters while compressing the valve spring with the valve spring compressor.

	Valve spring compressor: **P/N 90890-04019** **Attachment:** **P/N 90890-04108**



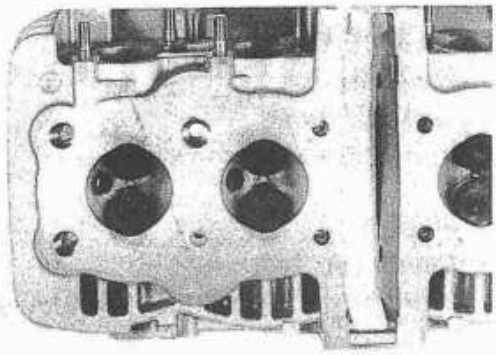
4. Remove:
• Valve retainers ①
• Valve spring ②
• Oil seal ③
• Spring seat ④
• Valve ⑤

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



YB704211
CONNECTING ROD
1. Remove:
• Connecting rod ①
• Connecting rod bearing

NOTE:
Identity each connecting rod bearing position very carefully so that it can be reinstalled in its original place.



YB704301

INSPECTION AND REPAIR

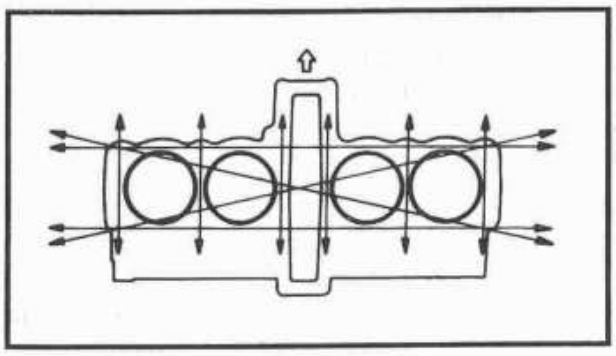
CYLINDER HEAD

1. Eliminate:
- Carbon deposits
  (from combustion chamber)
  Use a rounded scraper.

NOTE:

Do not use a sharp instrument and avoid damaging or scratching:
- Spark plug threads
- Valve seat

2. Inspect:
- Cylinder head
  Scratches/Damage → Replace.



3. Measure:
- Cylinder head warpage
  Out of specification → Resurface.

Warpage limit:
0.03 mm (0.0012 in)

****

Warpage measurement and resurfacement step:
- Attach a straight edge and a thickness gauge on 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:

Rotate the head several times to avoid removing too much material from one side.

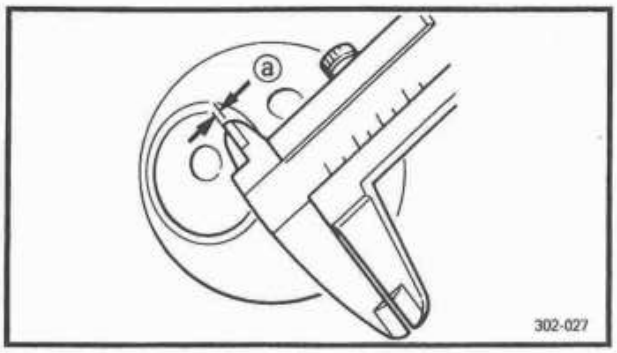
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YB704302

VALVE SEAT

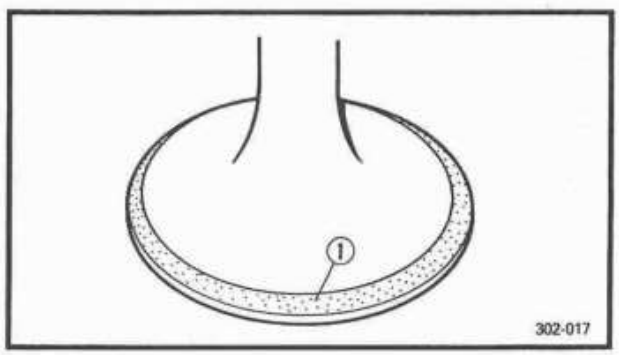
1. Eliminate:
• Carbon deposit
(from valve face and valve seat)

2. Inspect:
• Valve seat
Pitting/Wear → Refuse the valve seat.



3. Measure:
• Valve seat width ⓐ
Out of specification → Reface valve seat.

	Valve seat width: **Intake** **2.0 mm (0.08 in)** **Exhaust** **2.0 mm (0.08 in)**

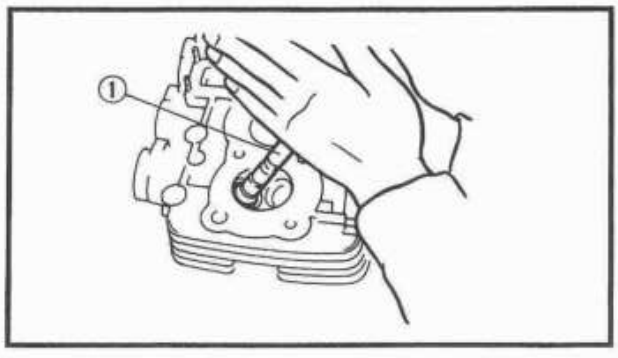


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Measurement steps:

- Apply the Mechanic's bluing dye (Dykem) ① 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. Wherever the valve seat and valve face made contact, bluing will have been removed.
- If the valve seat width is too wide, too narrow, or seat has not centered, the valve seat must be refaced.

****

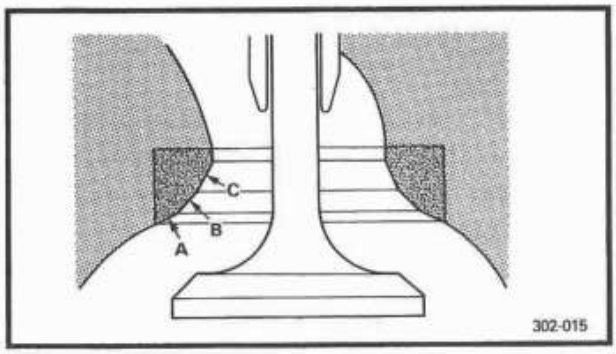


4. Reface:
• Valve seat
Use a 45°,60° and 75° valve seat cutter ① .

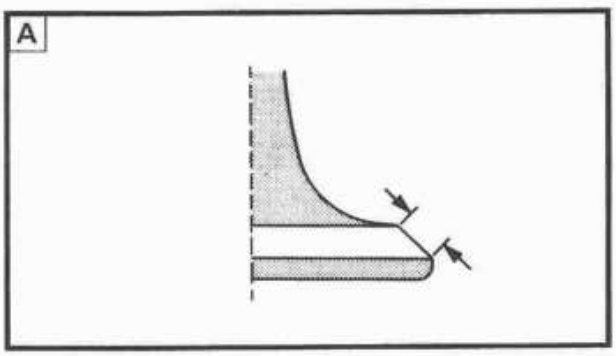
	Valve seat cutter: **YM-91043**

CAUTION:

When twisting cutter, keep an even downward pressure (4~5 kg) to prevent chatter marks.



Cut section as follows	
Section	Cutter
A	45°
B	60°
C	75°

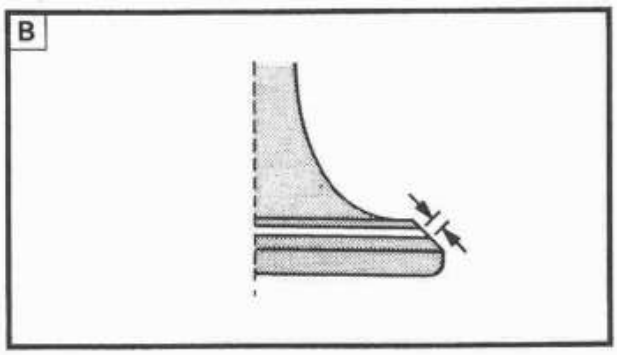


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Refacing steps:

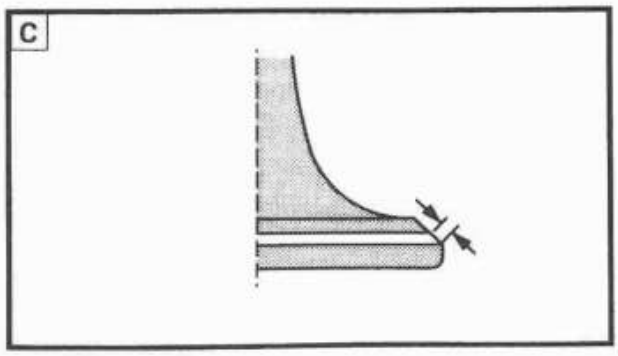
A Valve seat is centered on valve face but it is too wide.

Valve seat cutter set		Desire result
Use lightly	45° cutter 75° cutter	To reduce valve seat width to 1.0 mm (0.039 in).



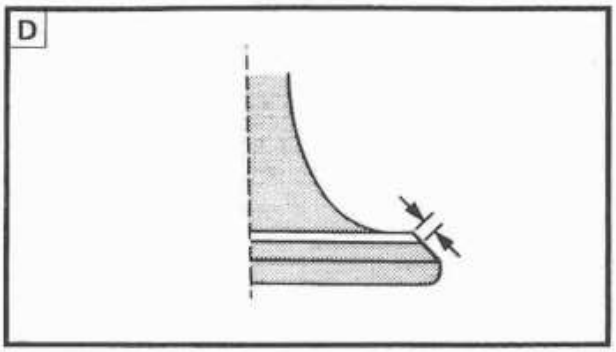
B Valve seat is in the middle of the face but it is too narrow.

Valve seat cutter set		Desired result
Use	60° cutter	To achieve a uniform valve seat width of 1.0 mm (0.039 in).



C Valve seat is too narrow and it is near valve margin.

Valve seat cutter set		Desired result
Use	First: 45°cutter Second: 60°cutter	To center the seat and to achieve its width of 1.0 mm (0.039 in).



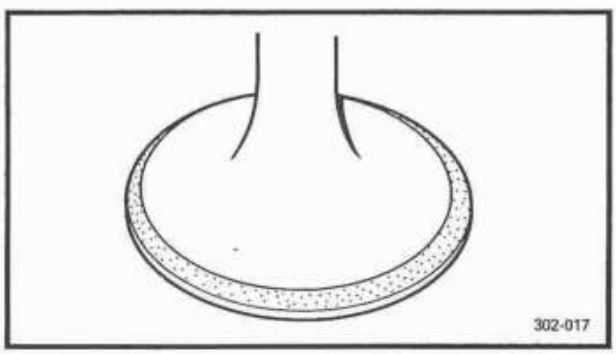
[D] Valve seat is too narrow and it is located near the bottom edge of the valve face.

Valve seat cutter set		Desired result
Use	First: 75° cutter Second: 60° cutter	To center the seat and increase its width.

****

5. Lap:
- Valve face
- Valve seat

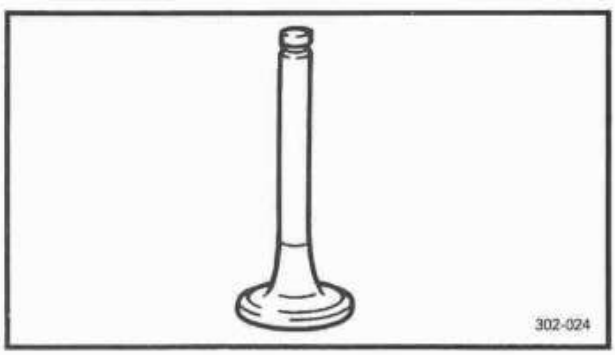
NOTE:
After refacing the valve seat or replacing the valve and valve guide, the valve seat and valve face should be lapped.



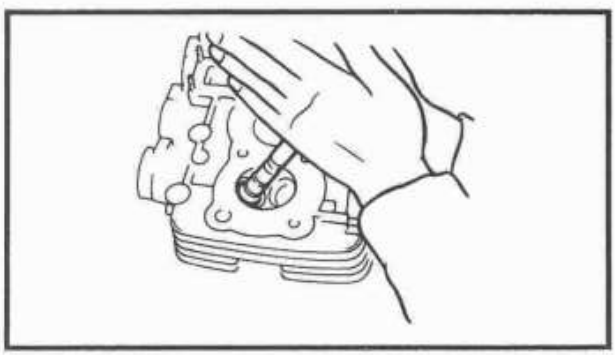
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Lapping steps:
- Apply a coarse lapping compound to the valve face.

CAUTION:
Be sure no compound enters the gap between the valve stem and guide.

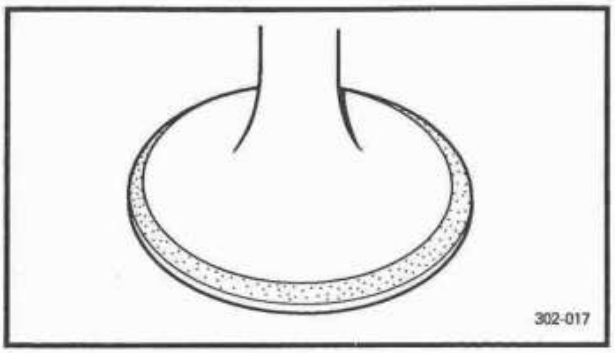


- Apply a molybdenum disulfide oil to the valve stem.
- Install the valve into the cylinder head.
- Turn the valve until the valve face and valve seat are evenly polished, then clean off all compound.



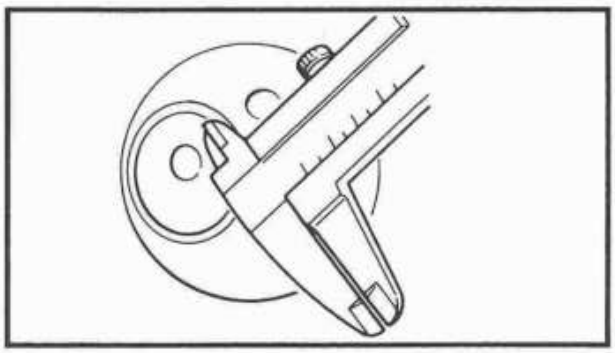
NOTE:
To obtain the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.

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



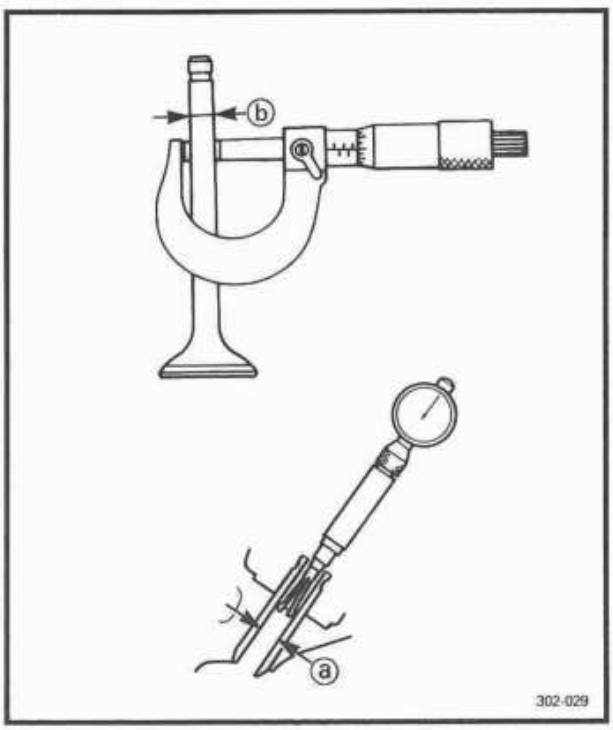
NOTE:
Be sure to clean off all compound from the valve face and valve seat after every lapping operation.

- Apply a Mechanic's bluing dye (Dykem) 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 again.
  If the valve seat width is out of specification, reface and lap the valve seat.

****



YB704303

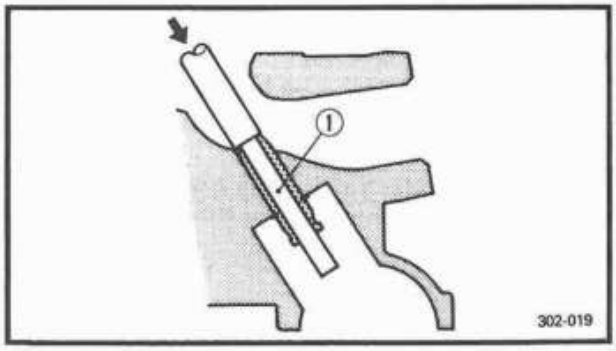
VALVE AND VALVE GUIDE

1. Measure:
• Stem-to-guide clearance

Stem-to-guide clearance =
Valve guide inside diameter ⓐ −
Valve stem diameter ⓑ

Out of specification → Replace valve guide.

Stem-to-guide clearance:
Intake:
0.010~0.037 mm
(0.0004~0.0015 in)
〈Limit〉: 0.1 mm (0.004 in)
Exhaust:
0.025~0.052 mm
(0.001~0.002 in)
〈Limit〉: 0.1 mm (0.004 in)

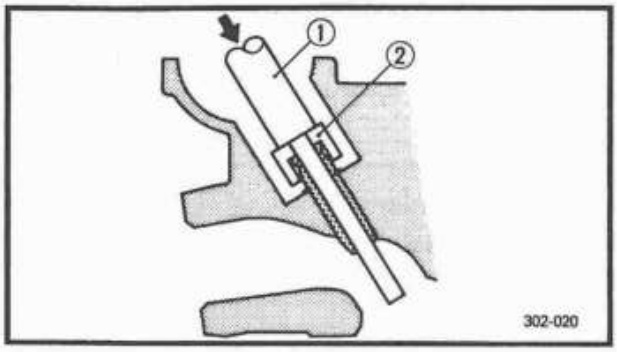


2. Replace:
• Valve guide

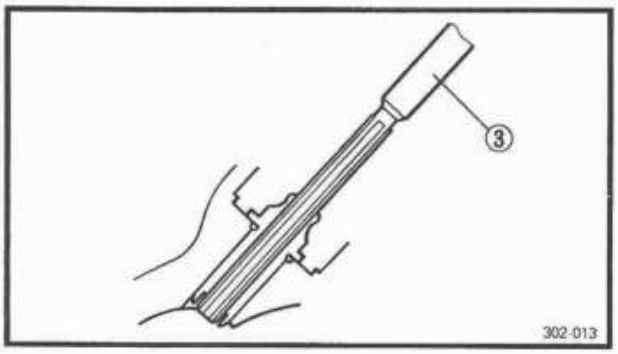
****

Replacement steps:

NOTE:
Heat the cylinder head in an oven to 100°C (212°F to ease guide removal and installation and to maintain correct interference fit.



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



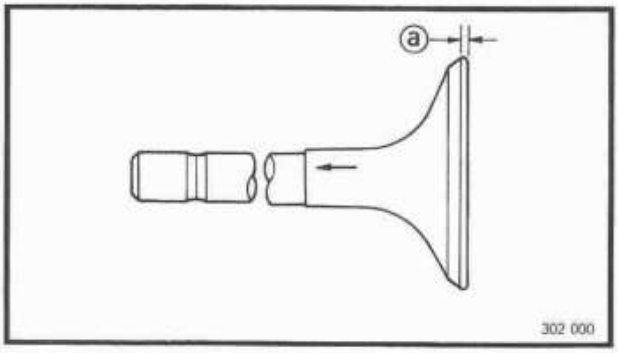
Valve guide remover (5 mm):
P/N 90890-04097
Valve guide installer (5 mm):
P/N 90890-04098
Valve guide reamer (5 mm):
P/N 90890-04099

****

NOTE:
Reface the valve seat after replacing the valve guide.

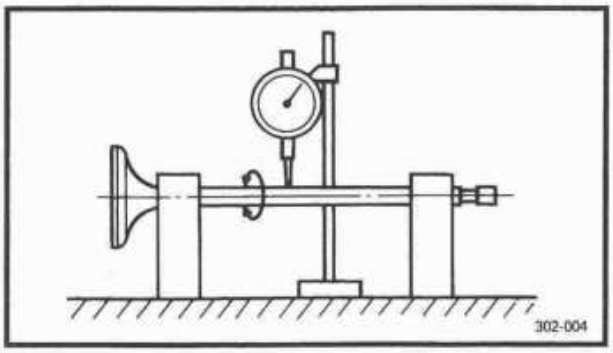
3. Eliminate:
- Carbon deposit
(from valve face)

4. Inspect:
- Valve face
Pitting/Wear → Grind the face.
- Valve stem end
Mushroom sharp or diameter larger than rest of stem → Replace.



5. Measure:
- Margin thickness ⓐ
Out of specification → Replace.

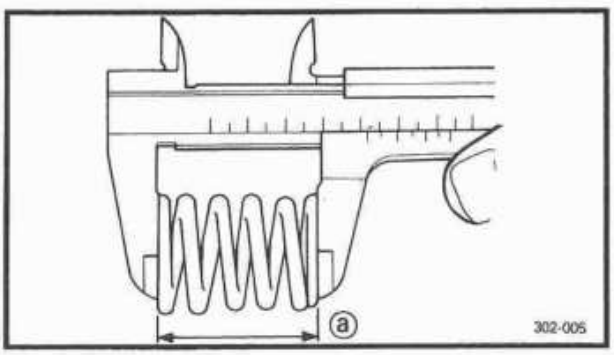
Margin thickness:
Limit: 1.0 mm (0.039 in)



6. Measure:
• Runout (valve stem)
Out of specification → Replace.

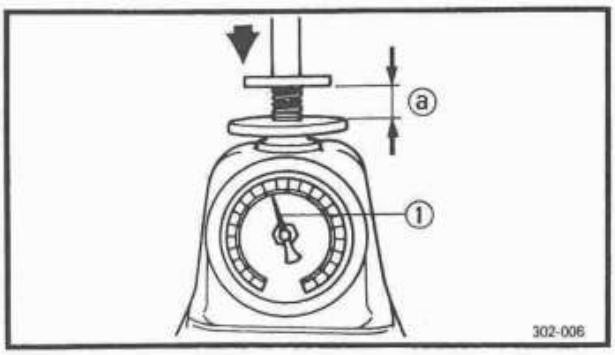
	Runout: **Less than 0.03 mm (0.0012 in)**

NOTE:
- Always replace the guide if the valve is replaced.
- Always replace the oil seal if the valve is removed.



YB704304
VALVE SPRING
1. Measure:
• Free length ⓐ (valve spring)
Out of specification → Replace.

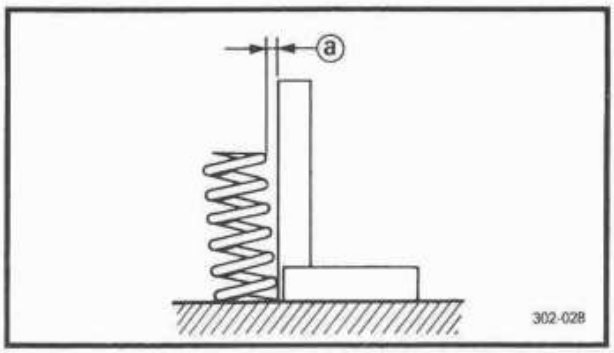
	Free length (valve spring): **Inner (intake/exhaust):** **38.33 mm (1.51 in)** **Outer (intake/exhaust):** **38.52 mm (1.52 in)**



2. Measure:
• Compressed force (valve spring) ①
Out of specification → Replace.

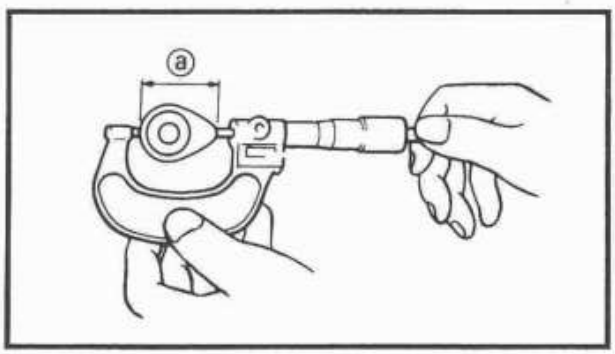
ⓐ Installed length

Compressed force:
Intake
6.25~7.25 kg (13.8~16.0 lb)
at 32.5 mm (1.28 in)
Exhaust
6.25~7.25 kg (13.8~16.0 lb)
at 32.5 mm (1.28 in)

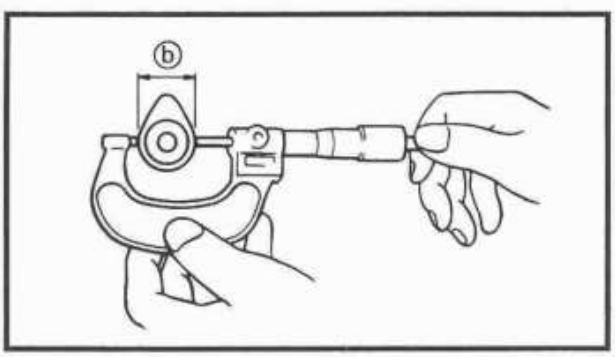


3. Measure:
• Spring tilt ⓐ
Out of specification → Replace.

Spring tilt:
Less than 1.7 mm (0.067 in)

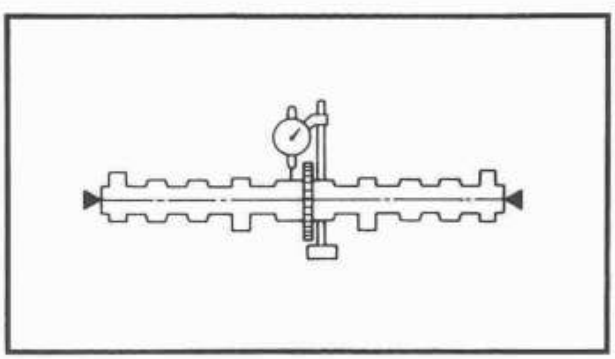


YB704305
CAMSHAFT
1. Inspect:
• Cam lobs
Pitting/Scratches/Blue discoloration → Replace.



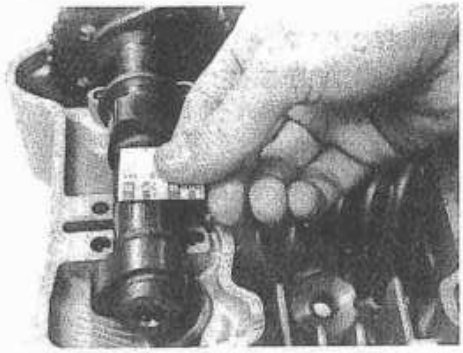
2. Measure:
• Cam lobes length ⓐ and ⓑ
Out of specification → Replace.

Cam lobes length:
Intake
ⓐ 35.7 mm (1.4 in)
ⓑ 27.9 mm (1.1 in)
Exhaust
ⓐ 35.4 mm (1.4 in)
ⓑ 27.9 mm (1.1 in)



3. Measure:
• Runout (camshaft)
Out of specification → Replace.

Runout (camshaft):
Less than 0.05 mm (0.002 in)



4. Measure:
• Camshaft-to-cap clearance
Out of specification → Measure bearing diameter (camshaft).

	Camshaft-to-cap clearance: 0.16 mm (0.0063 in)

****

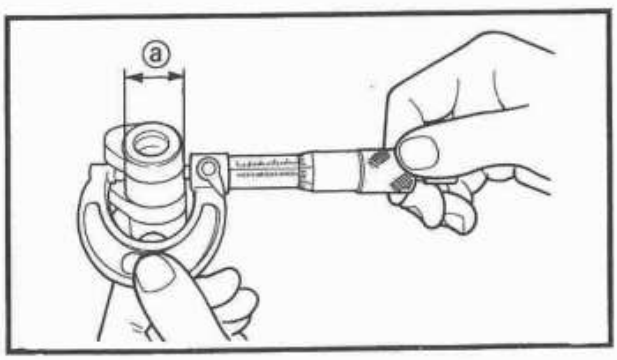
Measurement steps:
- Install the camshaft onto the cylinder head.
- Position a strip of Plastigauge® onto the camshaft.
- Install the dowel pins and camshaft caps.

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

NOTE:
- Tighten the camshaft caps in a crisscross pattern from innermost to outer.
- Do not turn the camshaft when measuring clearance with the Plastigauge®.

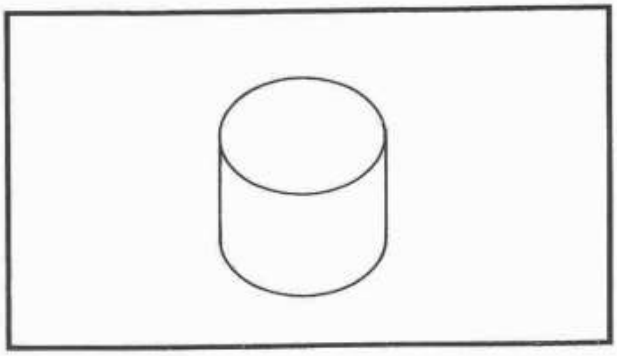
- Remove the camshaft caps and measure width of the Plastigauge®.

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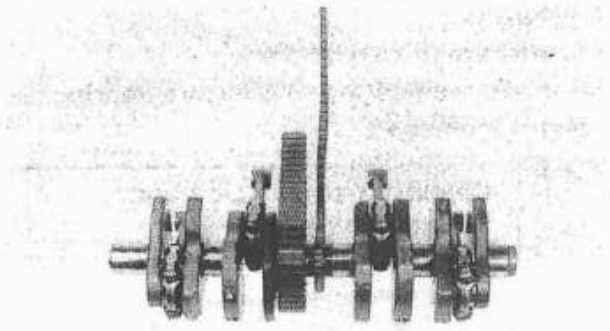


5. Measure:
• Bearing diameter ⓐ (camshaft)
Out of specification → Replace camshaft.
Within specification → Replace cylinder head.

	Bearing diameter (camshaft): 25.000~25.021 mm (0.9843~0.9859 in)



YB704306
VALVE LIFTER
1. Inspect:
• Valve lifters
Scratches/Damage → Replace both lifters and cylinder head.

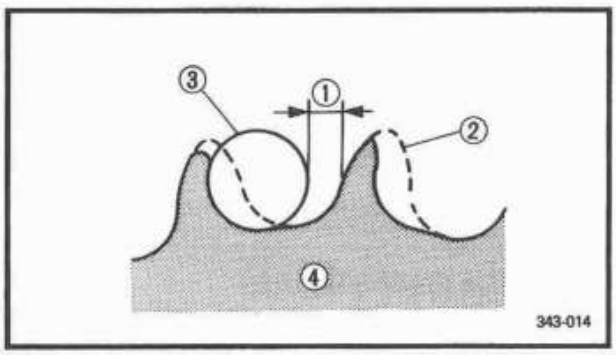


YB704307

TIMING CHAIN, HY-VO CHAIN, SPROCKET AND CHAIN GUIDE

1. Inspect:
- Timing chain
- HY-VO chain

Stiff/Cracks → Replace.



2. Inspect:
- Cam sprocket

Wear/Damage → Replace cam sprocket and timing chain as a set.

① 1/4 tooth
② Correct
③ Roller
④ Sprocket

3. Inspect:
- Chain guide (exhaust side)
- Chain guide (intake side)
- Chain guide (upper)
- Chain guide (HY-VO chain—lower)
- Chain guide (HY-VO chain—upper)

Wear/Damage → Replace.

YB704308

TIMING CHAIN TENSIONER

1. Check:
- One-way cam operation

Unsmooth operation → Replace.

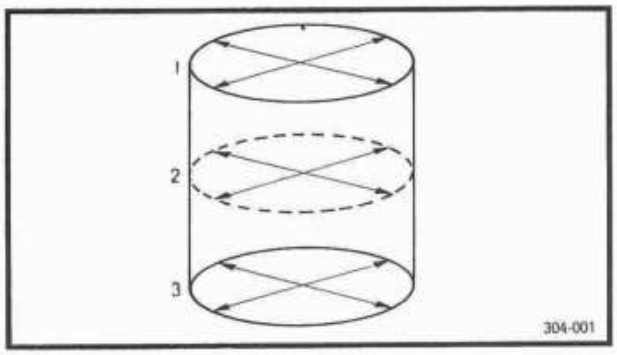
2. Inspect:
- All parts

Damage/Wear → Replace.

YB704309

CYLINDER AND PISTON

1. Inspect:
- Cylinder and piston walls
  Vertical scratches → Rebore or replace cylinder and piston.



2. Measure:
- Piston-to-cylinder clearance

****

Measurement steps:

First step:

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

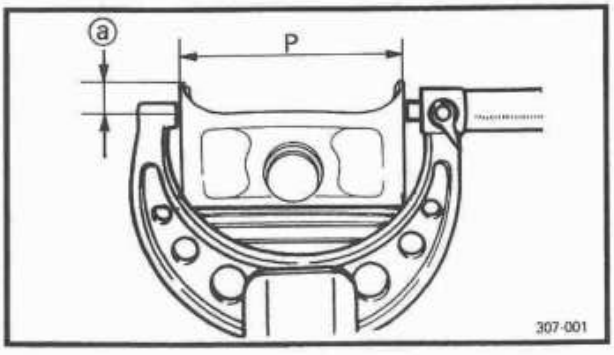
NOTE:

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

Cylinder bore "C"	**58.505~58.545 mm (2.3033~2.3049 in)**
Taper limit "T"	**0.05 mm(0.002 in)**
Out of round "R"	**0.01 mm (0.0004 in)**

"C"=Maximum D
"T"=(Maximum D_1, or D_2)−(Maximum D_5 or D_6)
"R"=(Maximum D_1, D_3 or D_5) −(Minimum D_2, D_4 or D_6)

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



Second step:

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

ⓐ 4.0 mm (0.16 in) from the piston bottom edge.

	Piston size P
Standard	58.47~58.51 mm (2.302~2.304 in)
Oversize 2	59.0 mm (2.32 in)
Oversize 4	59.5 mm (2.34 in)

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

Third step:

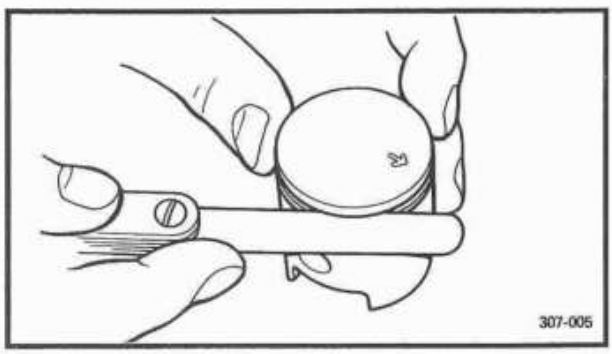
- Calculate the piston-to-cylinder clearance with following formula:

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

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

Piston-to-cylinder clearance:
0.025~0.045 mm
(0.0010~0.0018 in)
Limit: 0.15 mm (0.006 in)

****



YB704310

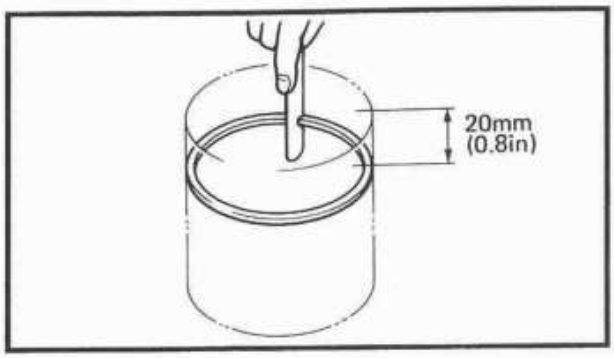
PISTON RING

1. Measure:
- Side clearance
  Out of specification → Replace piston and piston ring as a set.

NOTE:

Clean carbon from piston ring grooves and rings before measuring side clearance.

Side clearance:
Top ring
0.15 mm (0.006 in)
2nd ring
0.15 mm (0.006 in)



2. Position:
• Piston ring
(into the cylinder)

NOTE:
Push the ring with the piston crown so that the ring will be at a right angle to cylinder bore.

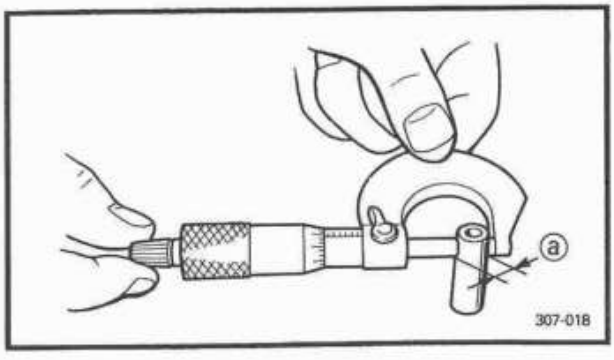
ⓐ 20 mm (0.8 in)

3. Measure:
• End gap
Out of specification → Replace.

NOTE:
You cannot measure end gap on expander spacer of oil control ring. If oil control ring rails show excessive gap, replace all three rings.

End gap:
Top ring
0.7 mm (0.028 in)
2nd ring
0.7 mm (0.028 in)
Oil ring
0.2~0.7 mm(0.008~0.028 in)

YB704311
PISTON PIN
1. Inspect:
• Piston pin
Blue discoloration/groove → Replace, then inspect lubrication system.

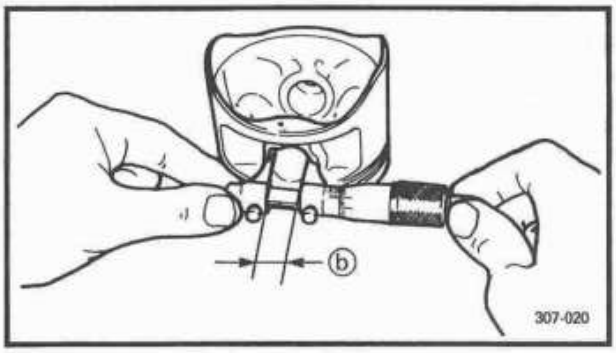


2. Measure:
• piston pin-to-piston clearance

****

Measurement steps:
● Measure the piston pin outside diameter ⓐ.
If out of specification, replace the piston pin.

Outside diameter (piston pin):
14.995~15.000 mm
(0.5904~0.5906 in)



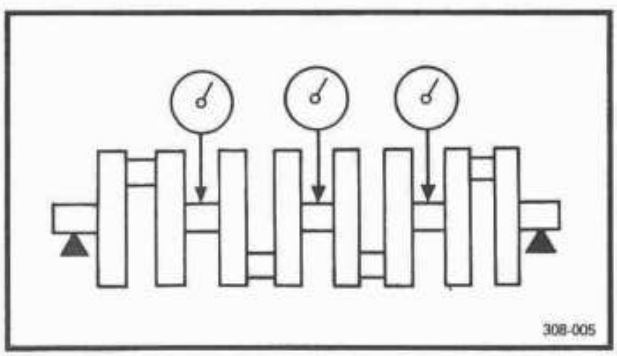
- Measure the piston inside diameter ⓑ.
- Calculate the piston pin-to-piston clearance with following formula:

Piston pin-to-piston clearance=
Bore size (piston pin) ⓑ −
Outside diameter (piston pin) ⓐ

- If out of specification, replace the piston.

Piston pin-to-piston clearance:
0.002~0.018 mm
(0.00008~0.00071 in)
Limit:0.07 mm (0.003 in)

****



YB704312

CRANKSHAFT AND CONNECTING ROD

1. Measure:
- Runout (crankshaft)
  Out of specification → Replace.

Runout:
Less than 0.03 mm (0.0012 in)

2. Inspect:
- Main journal surfaces
- Crank pin surfaces
- Bearing surfaces
  Wear/Scratches → Replace.



3. Measure:
• Oil clearance (main journal)
Out of specification → Replace bearing.

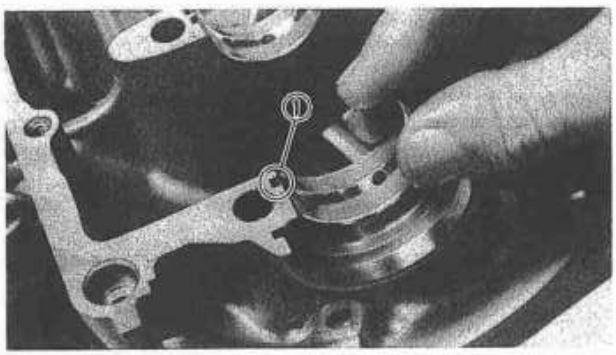
	Oil clearance: **0.014~0.053 mm** **(0.0006~0.0021 in)**

****

Measurement steps:

CAUTION:

Do not interchange the bearings. They must be installed in their original positions, or the correct oil clearance may not be obtained causing engine damage.



- Clean the bearings, main journals and bearing portions of the crankcase.
- Place the crankcase (upper) on a bench in an upside down position.
- Install the upper half of the bearings and crankshaft into the crankcase(upper).

NOTE:

Align the projection ① of the bearing with the notch in the crankcase.

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

NOTE:

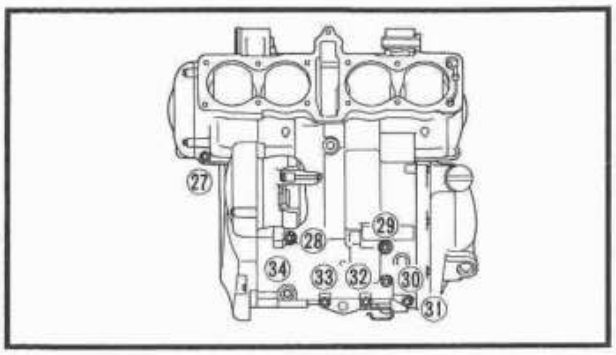
Do not put the Plastigauge® over the oil hole in the main journal of the crankshaft.

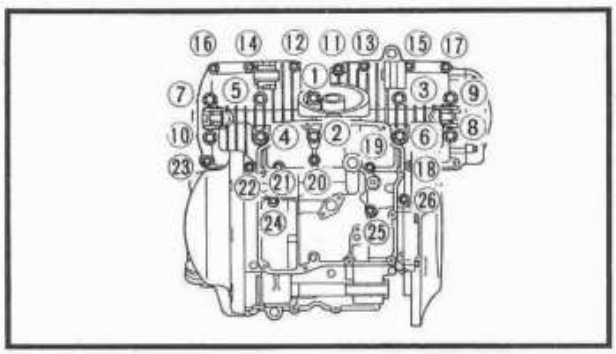
- Install lower half of the bearings into the crankcase (lower) and assembly the crankcase halves.

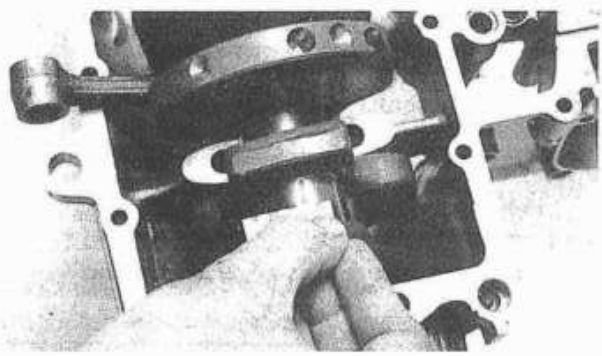
NOTE:

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

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







Bolts (crankcase):
M8 (① ~ ⑩ and ㉞):
24 Nm (2.4 m · kg, 17 ft · lb)
M6 (⑪ ~ ㉝):
12 Nm (1.2 m · kg, 8.7 ft · lb)

NOTE:

Lubricate the threads of bolts (M8 and M6) with engine oil.

- Remove the crankcase (lower) and lower half of the bearings.
- Measure the compressed Plastigauge® width on each main journal.
  If oil clearance is out of specification, select a replacement bearing.

****

4. Measure:
- Oil clearance (crank pin)
  Out of specification → Replace bearing.

Oil clearance:
0.026~0.060 mm (0.0010~0.0024 in)

****

Measurement steps:

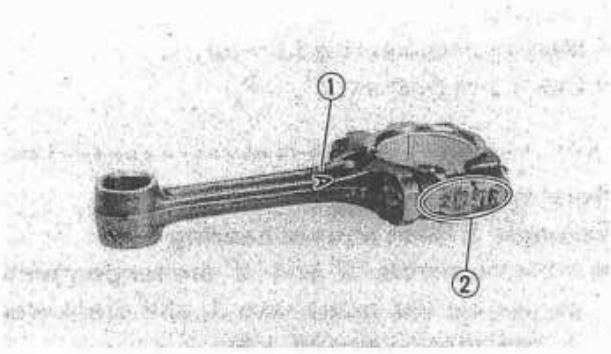
CAUTION:

Do not interchange the bearings and connecting rod. They must be installed in their original positions, or the correct oil clearance may not be obtained causing engine damage.

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

NOTE:

Align the projection of the bearing with the groove of the cap and connecting rod.



- Put a piece of Plastigauge® 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.
- Lubricate molybdenum disulfide grease to the bolt, threads and nut seats.
- Make sure the "A" marks ① on the connecting rods face toward right side crankshaft.
- Make sure that the letters ② on both components align to from a perfect character.

- Tighten the nuts in 2~3 steps.

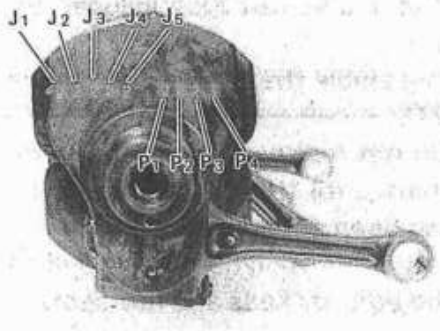
	Nut: **25 Nm (2.5 m · kg, 18 ft · lb)**

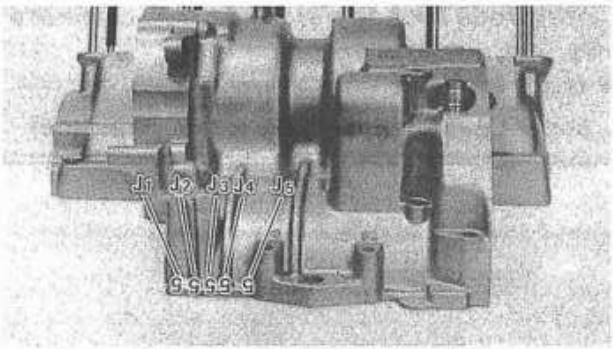
CAUTION:

Tighten to full torque specification without pausing. Apply continuous torque between 2.0 and 2.5 m · kg. Once you reach 2.0 m · kg DO NOT STOP TIGHTENING until final torque is reached. If the tightening is interrupted between 2.0 and 2.5 m · kg, loosen the nut to less than 2.0 m · kg and start again.

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

****





5. Select:
- Main journal bearing (J_1~J_5)
- Crank pin bearing (P_1 ~ P_4)

****

Selection of bearings:

Example 1: Main journal bearing

- If the numerals "5" and "2" are respectively shown on the crankcase J_1 and crankwed J_1, the bearing size of J_1 is:

Bearing size of J_1:
Crankcase J_1–Crankwed J_1=
5–2=3 (Brown)

BEARING COLOR CODE	
1	Blue
2	Black
3	Brown
4	Green
5	Yellow

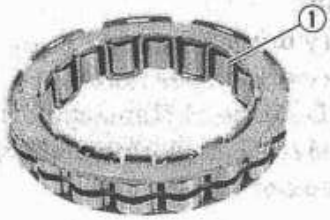
Example 2: Crank pin bearing

- If the numerals "5" and "2" are respectively shown on the connecting rod P_1 and crankwed P_1, the bearing size of P_1 is:

Bearing size of P_1:
Connecting rod P_1–Crankwed P_1=
5–2=3 (Brown)

BEARING COLOR CODE	
1	Blue
2	Black
3	Brown
4	Green

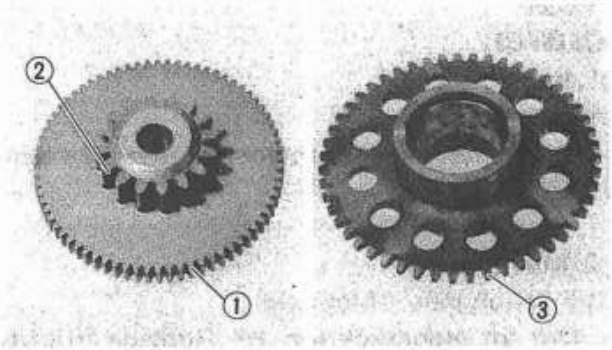
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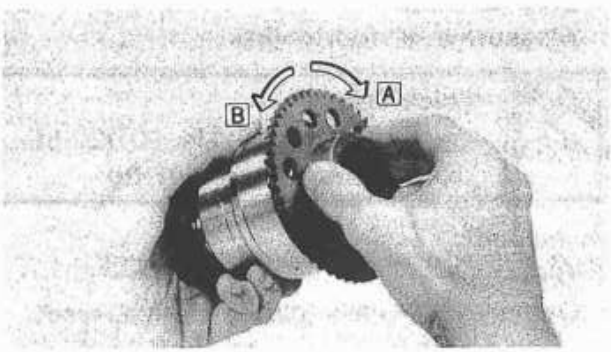
YB704313

ELECTRIC STARTER DRIVE

1. Inspect:
• Starter clutch roller ①
Wear/Damage → Replace.



2. Inspect:
• Starter idle gear teeth ①
• Starter drive gear teeth ②
• Starter wheel gear teeth ③
Burrs/Chips/Roughness/Wear → Replace.
3. Inspect:
• Starter wheel gear
(contacting surfaces)
Pitting/Wear/Damage → Replace.



4. Check:
• Starter clutch operation

****

Checking steps:

- Install the starter clutch gear to the starter clutch, and hold the starter clutch.
- When turning the starter clutch 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 clutch gear counterclockwise [B], the starter clutch gear should turn freely.
  If not, the starter clutch is faulty. Replace it.

****

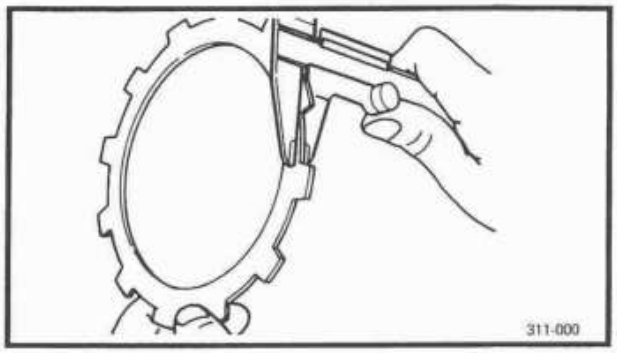
5. Inspect:
• Starter clutch shaft
Bend/Wear/Damage → Replace.

YB704314

PRIMARY DRIVE

1. Inspect:
- Primary drive gear teeth
- Primary driven gear teeth

Wear/Damage → Replace both gears.
Excessive noise during operation → Replace both gears.



YB704315

CLUTCH

1. Inspect:
- Friction plate

Damage/Wear → Replace friction plate as a set.

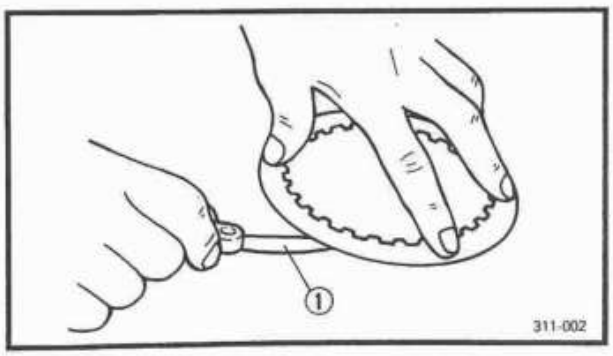
2. Measure:
- Friction plate thickness

Out of specification → Replace friction plate as a set.
Measure at all four points.

Thickness:
2.9~3.1 mm (0.114~0.122 in)
〈Limit: 2.7 mm (0.106 in)〉

3. Inspect:
- Clutch plate

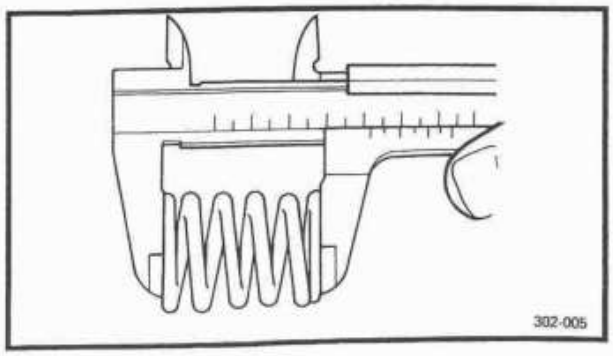
Damage → Replace clutch plate as a set.



4. Measure:
- Clutch plate warpage

Out of specification → Replace clutch plate as a set.
Use a surface plate and feeler gauge ①.

Warp limit:
Less than 0.15 mm (0.006 in)



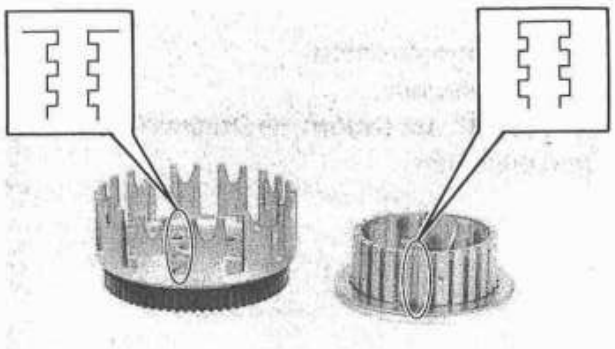
5. Inspect:
- Clutch spring

Damage → Replace as a set.

6. Measure:
- Clutch spring free length

Out of specification → Replace spring as a set.

Free length(clutch spring):
42.8 mm (1.69 in)
〈Limit: 41.8 mm (1.65 in)〉

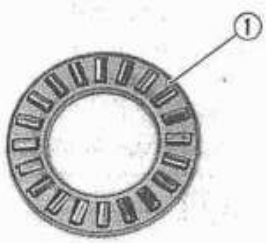


7. Inspect:
- Dogs on the clutch housing
  Pitting/Wear/Damage → Deburr or replace.
- Clutch housing bearing
  Wear/Damage → Replace clutch housing.

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

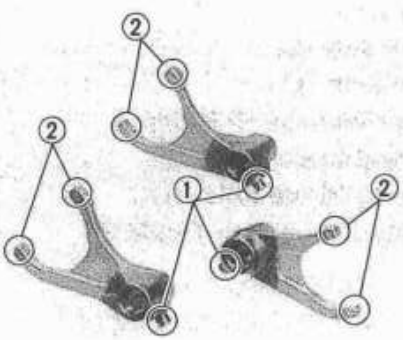
8. Inspect:
- Clutch boss splines
  Pitting/Wear/Damage → Replace clutch boss.

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



9. Inspect:
- Gear teeth (pull lever pinion gear)
- Gear teeth (pull rod)
  Wear/Damage → Replace as a set.

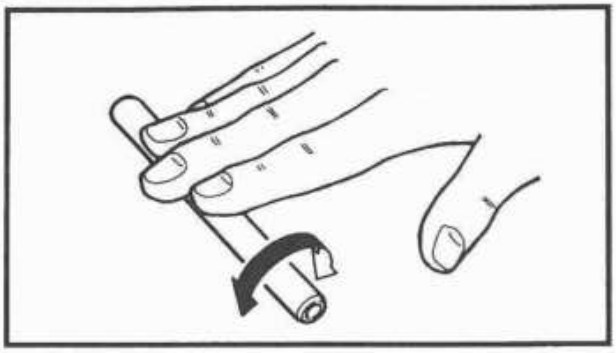
10. Inspect:
- Bearing ① (pull rod)
  Wear/Damage → Replace.



YB704316

TRANSMISSION

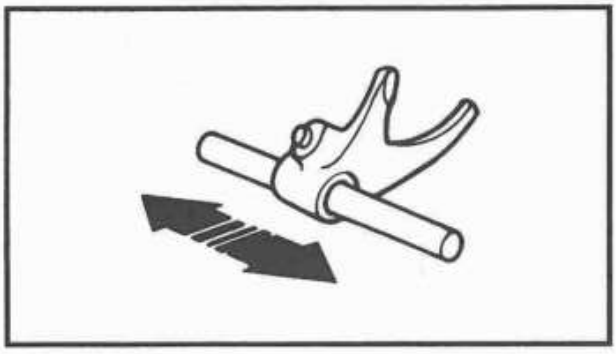
1. Inspect:
- Shift fork cam follower ①
- Shift fork pawl ②
  Wear/Coring/Bends/Damage → Replace.



2. Inspect:
- Guide bar
  Roll the guide bar on the flat surface.
  Bends → Replace.

⚠ WARNING

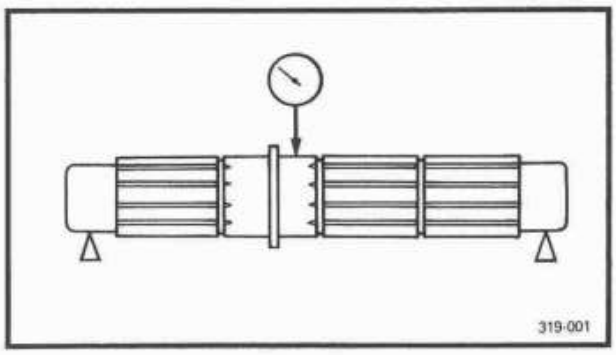
Do not attempt to straighten a bent guide bar.



3. Check:
- Shift fork movement
  on its guide bar
  Unsmooth operation → Replace the fork and guide bar.



4. Inspect:
- Shift cam grooves
  Wear/Damage/Scratches → Replace.
- Shift cam segment
  Damage/Wear → Replace.
- Shift cam bearing
  Pitting/Damage → Replace.

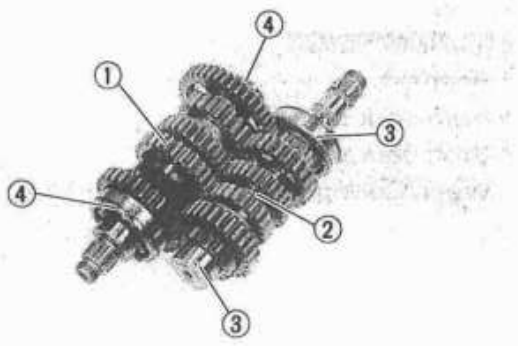


5. Measure:
- Runout (drive axle and main axle)
  Out of specification → Replace.

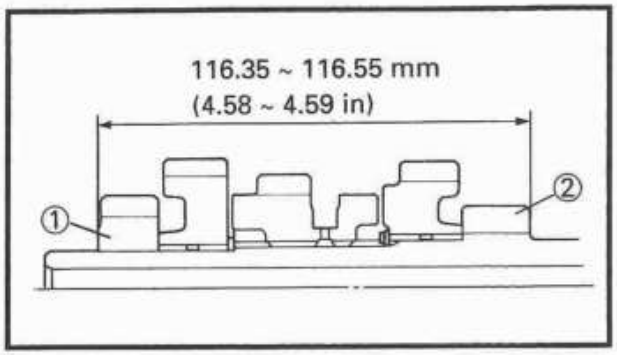
Runout:
Less than 0.08 mm (0.0031 in)

⚠ WARNING

Do not attempt to straighten a bent axle.



6. Inspect:
- Drive axle ①
- Main axle ②
  Wear/Damage → Replace.
- Bearing (main axle) ③
- Bearing (drive axle) ④
  Pitting/Damage → Replace.

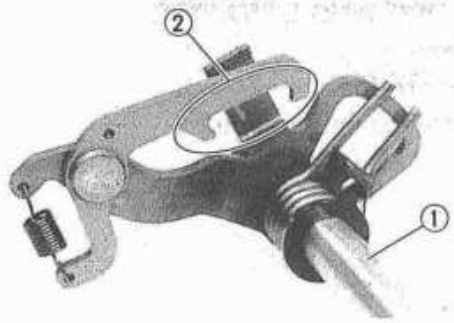


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Reassembling points:

- Press the 2nd pinion gear ① in the main axle ② as shown.

****

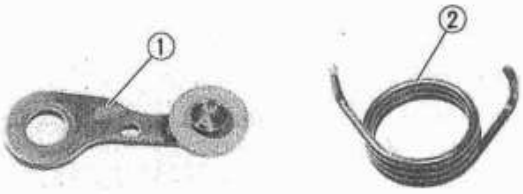


YB704317

SHIFT SHAFT AND STOPPER LEVER

1. Inspect:
- Shift shaft ①
- Shift pawls ②

  Bends/Wear/Damage → Replace.



2. Inspect:
- Stopper lever ①

  Roller turns roughly → Replace.

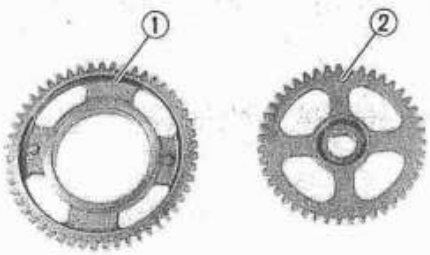
  Bends/Damage → Replace.

3. Inspect:
- Return spring (stopper lever) ②

  Wear/Damage → Replace.

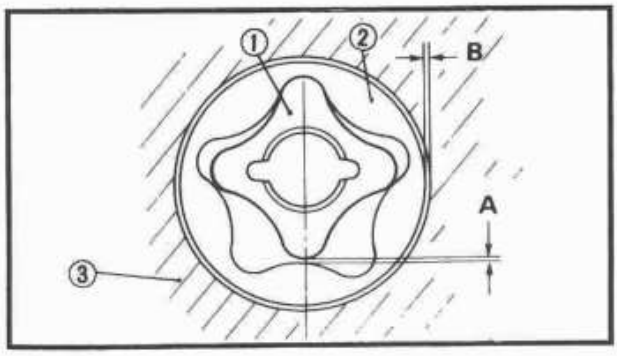
YB704318

OIL PUMP



1. Inspect:
- Oil pump drive gear ①
- Oil pump driven gear ②

  Wear/Crack/Damage → Replace.



2. Measure:
- Tip clearance ⓐ

  (between inner rotor ① and outer rotor ②)
- Side clearance ⓑ

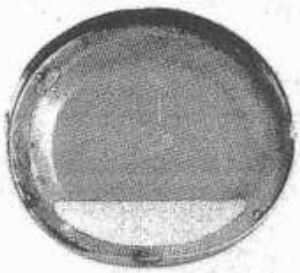
  (between outer rotor ② and pump housing ③)

  Out of specifications → Replace oil pump.

Tip clearance:
0.2 mm (0.008 in)
Side clearance:
0.15 mm (0.006 in)

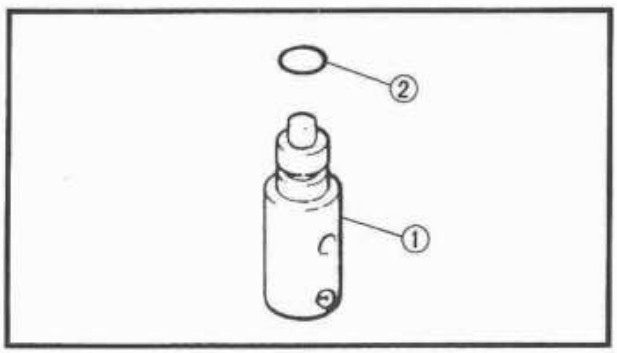
3. Check:
• Oil pump operation
Unsmooth operation → Replace.

YB704319
OIL PIPE AND STRAINER

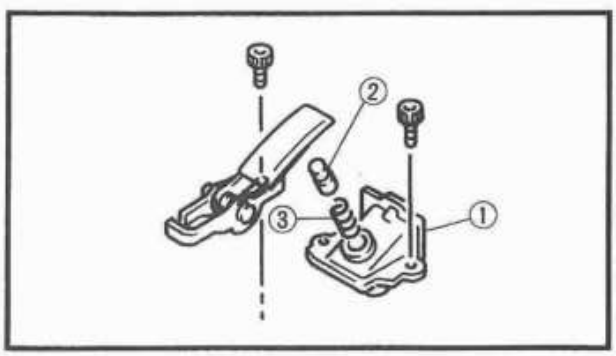


1. Inspect:
• Oil strainer
Damage → Replace.

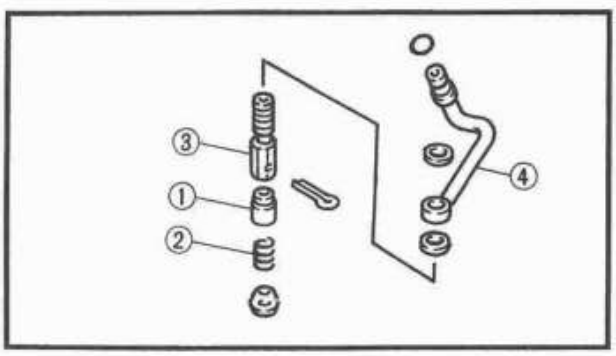
YB704323
RELIEF VALVE AND PIPE



1. Inspect:
• Relief valve assembly ①
• O-ring ②
Wear/Damage → Replace.



2. Inspect:
• Relief valve body ① (tensioner)
• Planger ②
• Spring ③
Wear/Damage → Replace.



3. Inspect:
• Tensioner plunger ①
• Spring ②
• Tensioner body ③
• Oil delivery pipe ④
• O-ring
Wear/Damage → Replace.

YB704320

CRANKCASE

1. Thoroughly wash the case halves in mild solvent.

2. Clean all the gasket mating surface and crankcase mating surface thoroughly.

3. Inspect:
- Crankcase
  Cracks/Damage → Replace.
- Oil delivery passages
  Clog → Blow out with compressed air.

YB704321

BEARING AND OIL SEAL

1. Inspect:
- Bearings
  Clean and lubricate, then rotate inner race with finger.
  Roughness → Replace.
2. Inspect:
- Oil seals
  Damage/Wear → Replace.

YB704322

CIRCLIP AND WASHER

1. Inspect:
- Circlips
- Washers
  Damage/Looseness/Bends → Replace.

YB704401
ENGINE ASSEMBLY AND ADJUSTMENT

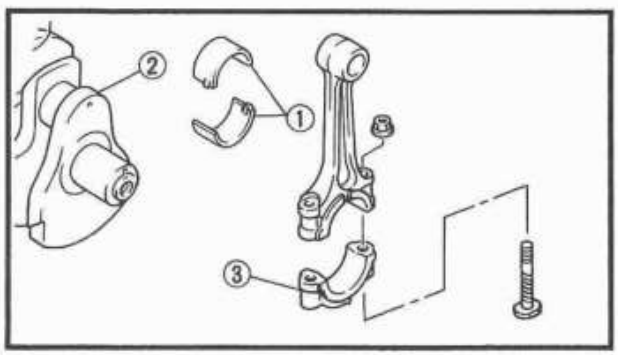
⚠ WARNING

For engine reassembly, replace the following parts with new ones.

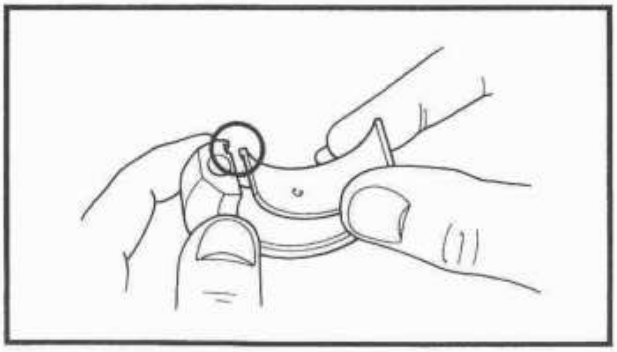
- **O-ring**
- **Gasket**
- **Oil seal**
- **Copper washer**
- **Lock washer**
- **Circlip**

YB704402
CONNECTING ROD

1. Apply:
- Molybdenum disulfide grease
  (onto threads of bolts and bottom surfaces of nuts)
- Engine oil
  (onto crank pins, crank pin bearings and inner surfaces of connecting rods)

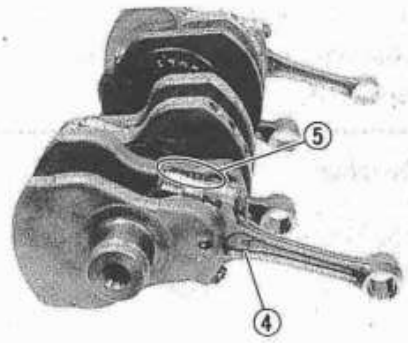


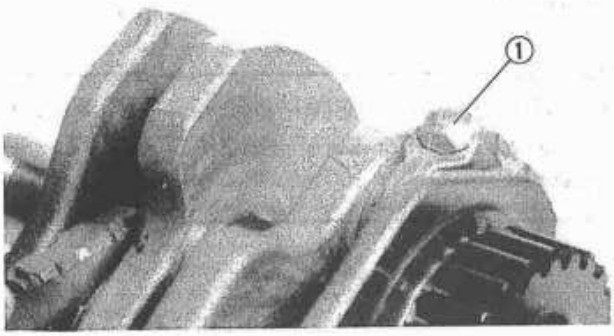
2. Install:
- Crank pin bearings ①
- Connecting rods ②
- Connecting rod caps ③
  (onto crank pins)



NOTE:
- Align the projection of bearing with the groove of the caps and connecting rod.
- Identify each bearing position very carefully so that it can be reinstalled in its original place.
- The stamped "A" mark on the connecting rods ④ should face towards the right side of the crankcase.
- Be sure that the letter ⑤ on both com-

ponents align to from a perfect character.





3. Align:
• Bolt head ①
(with connecting rod cap)

4. Tighten:
• Nuts (connecting rods)

CAUTION:

Tighten to full torque specification without pausing. Apply continuous torque between 2.0 and 2.5 m · kg. Once you reach 2.0 m · kg DO NOT STOP TIGHTENING until final torque is reached. If the tightening is interrupted between 2.0 and 2.5 m · kg, loosen the nut to less than 2.0 m · kg and start again.

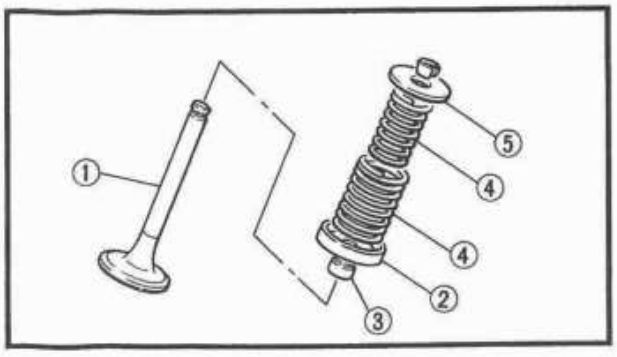
	Nut (connecting rod): 25 Nm (2.5 m · kg, 18 ft · lb)

YB704403

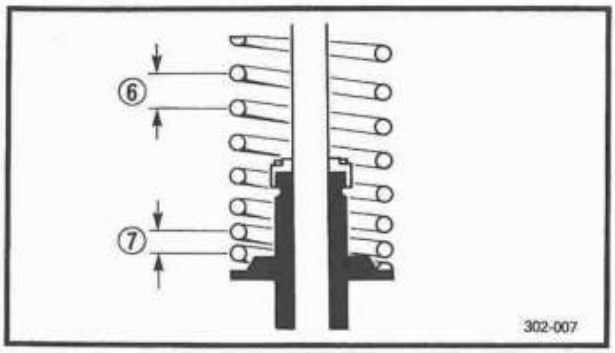
VALVES

1. Deburr:
• Valve stem end
Use an oil stone to smooth the stem end.

2. Apply:
• Molybdenum disulfide oil
(onto valve stem and oil seal)

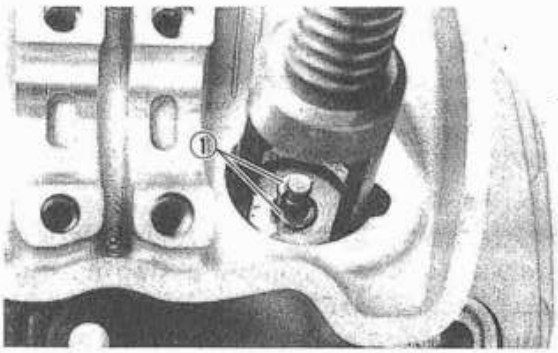


3. Install:
• Valve ①
• Spring seat ②
• Oil seal ③
• Valve spring ④
• Valve retainer ⑤
(into cylinder head)



NOTE:
Install the valve spring with larger pitch ⑥ facing upward.

⑦ Smaller pitch



4. Install:
• Valve cotters ①

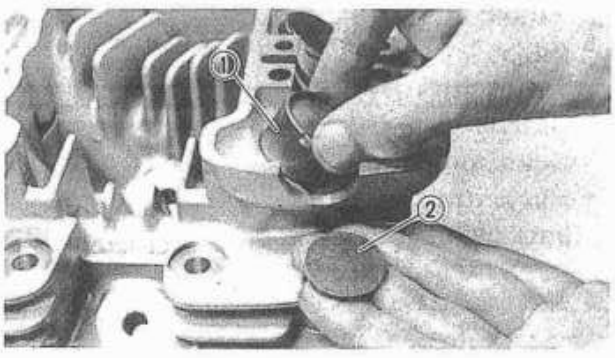
NOTE:
Install the valve cotters while compressing the valve spring with the valve spring compressor.

	Valve spring compressor: **P/N 90890-04019** **Attachment:** **P/N 90890-04108**

5. Secure the valve cotter on to the valve stem by tapping it lightly with a piece of wood.

NOTE:
Do not hit so much as to damage the valve.

6. Apply:
• Molybdenum disulfide oil
(onto outer surface of valve lifters and pads.)

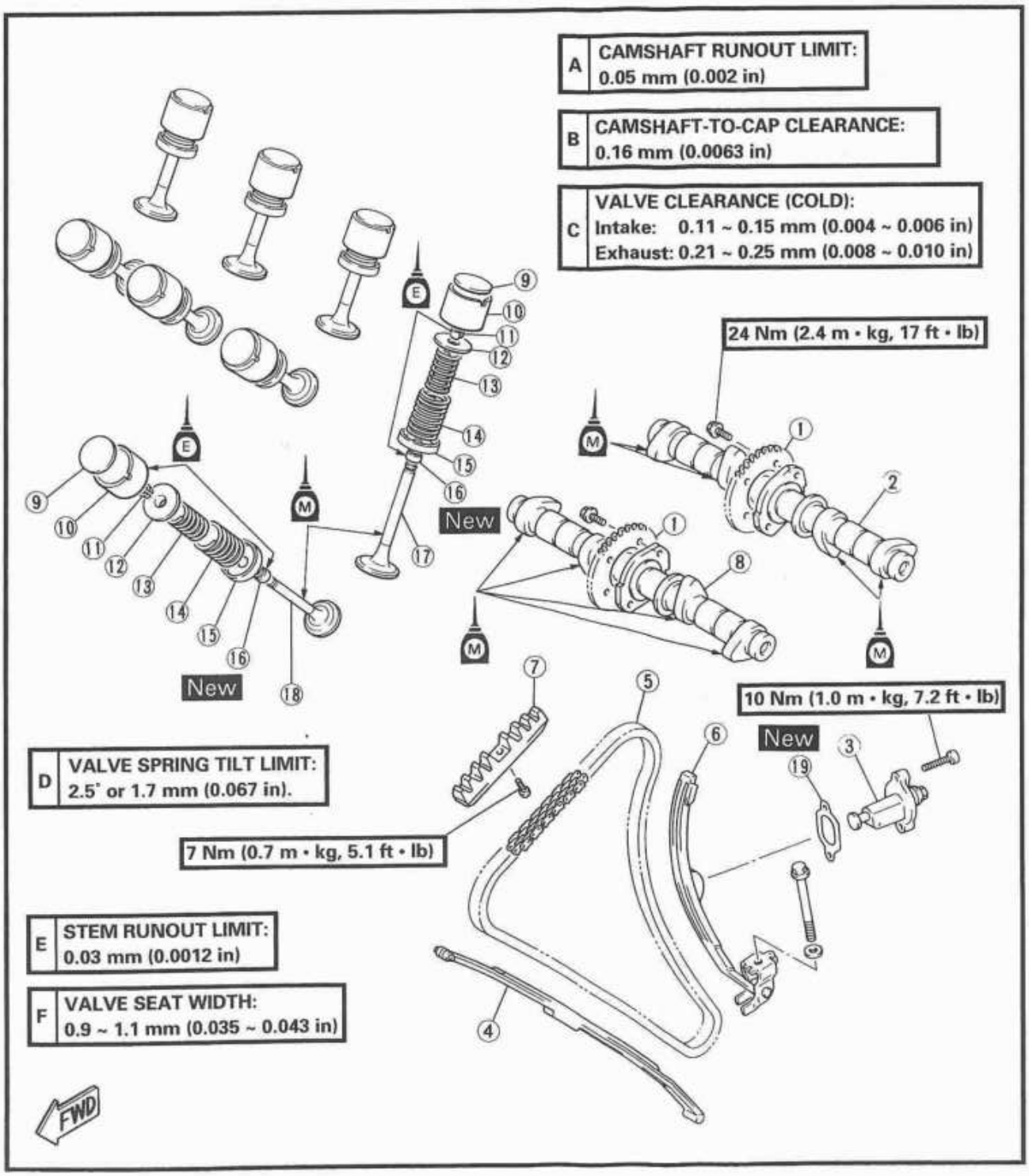


7. Install:
• Valve lifters ①
• Pads ②

NOTE:
• Valve lifter must be rotated smoothly by a finger.
• Each valve lifter and pad position very carefully so that its original place.

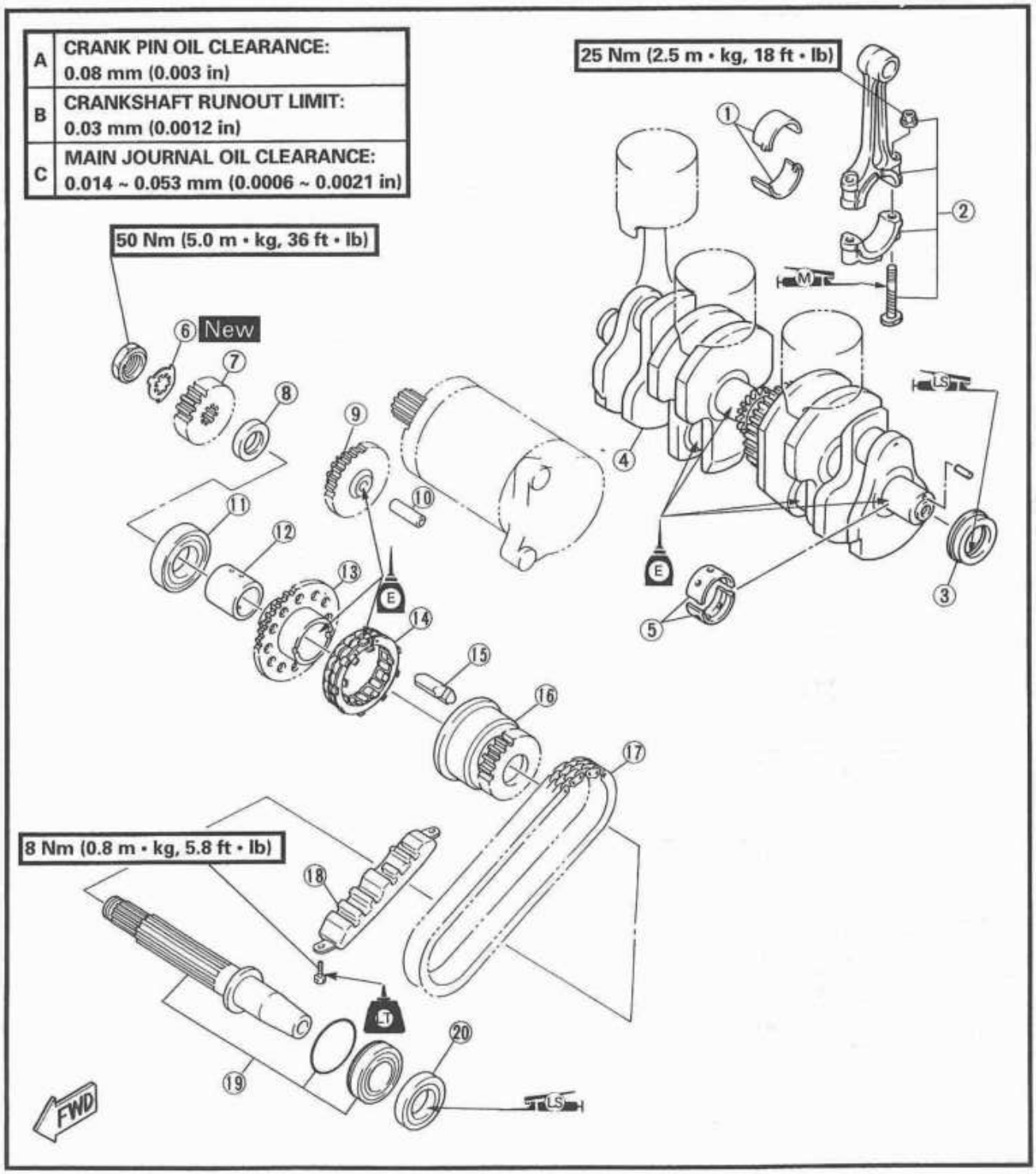
CAMSHAFT, VALVE AND TIMING CHAIN

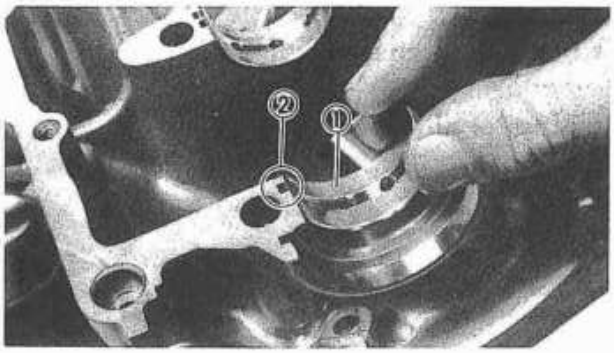
① Cam sprocket
② Camshaft (intake)
③ Chain tensioner
④ Chain guide (exhaust)
⑤ Timing chain
⑥ Chain guide (intake)
⑦ Chain guide (upper)
⑧ Camshaft (exhaust)
⑨ Valve pad
⑩ Valve lifter
⑪ Valve cotter
⑫ Valve retainer
⑬ Valve spring (inner)
⑭ Valve spring (outer)
⑮ Spring seat
⑯ Valve stem seul
⑰ Intake valve
⑱ Exhaust valve
⑲ Gasket

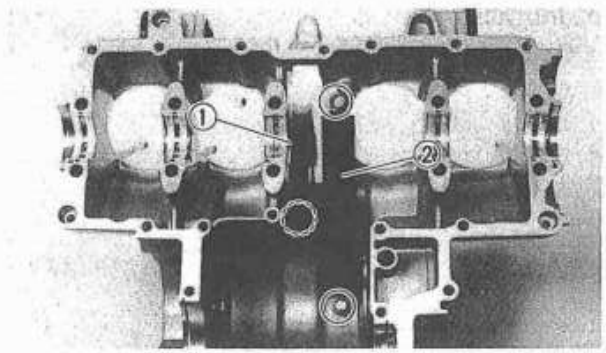


CRANKSHAFT AND STARTER CLUTCH

① Crank pin bearing
② Connecting rod
③ Oil seal
④ Crankshaft
⑤ Main journal bearing
⑥ Lock washer
⑦ Primary drive gear
⑧ Collar
⑨ Idle gear
⑩ Shaft
⑪ Bearing
⑫ Collar
⑬ Starter wheel gear
⑭ Starter clutch assembly
⑮ Absorber
⑯ Driven gear
⑰ HY-VO chain
⑱ Chain guide (HY/VO chain-upper)
⑲ Starter shaft
⑳ Oil seal







YB704406

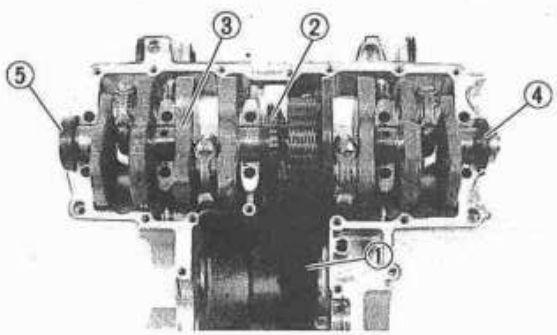
CRANKSHAFT

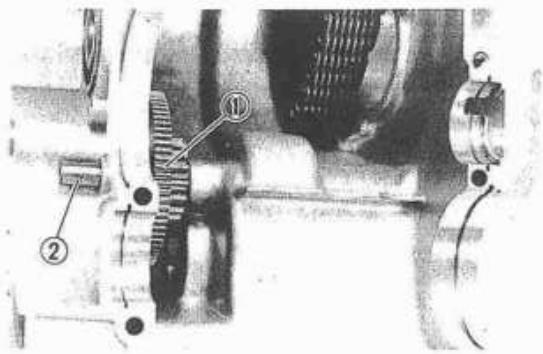
1. Install:
- Main journal bearings ①
  (onto upper crankcase)

NOTE:
- Align the projection ② of the bearing with the notch in the case.
- Identify each bearing position so that the bearing should be installed in position.

2. Install:
- Chain guide ① (timing chain—intake)
- Chain guide ② (HY-VO chain—upper)

	Bolt (timing chain guide): **7 Nm (0.7 m · kg, 5.1 ft · lb)** **Bolt (HY-VO chain):** **8 Nm (0.8 m · kg, 5.8 ft · lb)** **use Loctite®**





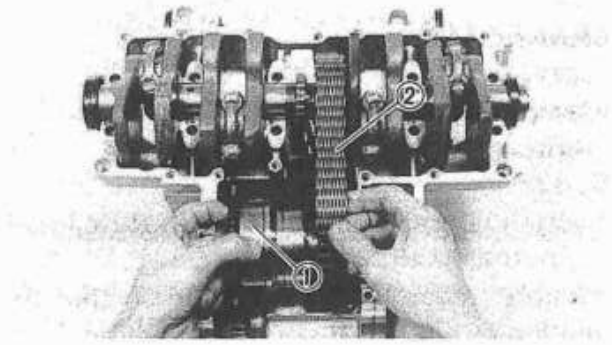
3. Install:
- HY-VO chain ①
- Timing chain ②
  (onto crankshaft)
- Crankshaft assembly ③
- Oil seal ④
- Plug ⑤

NOTE:
Pass the timing chain through the timing chain cavity. Be sure to attach a retaining wire to the timing chain.

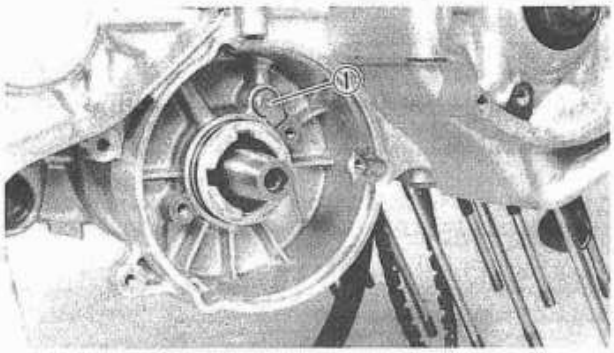
YB704414

STARTER CLUTCH

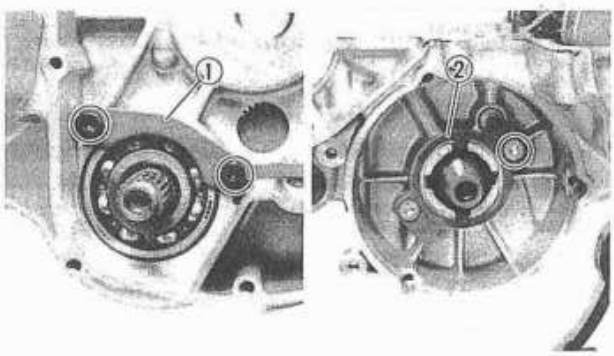
1. Install:
- Idle gear ①
- Shaft ② (idle gear)



2. Install:
- Starter clutch assembly ①
  (connect the HY-VO chain ②)
- Starter clutch shaft



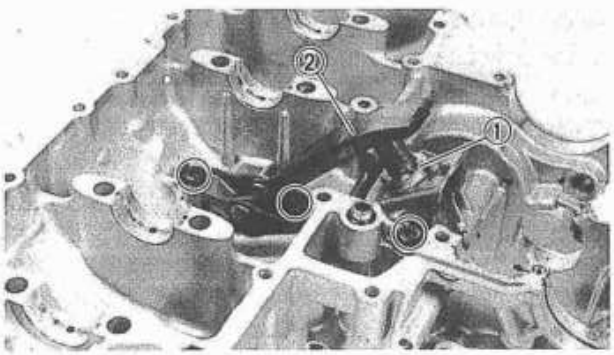
3. Install:
- Oil nozzle ①



4. Tighten:
- Bearing retainer ①
- Oil seal retainer ②

NOTE:
Align the oil seal retainer with crankcase as photo.

	Bolt (bearing retainer): **10 Nm (1.0 m · kg, 7.2 ft · lb)** **use Loctite®** **Screw (oil seal retainer):** **10 Nm (1.0 m · kg, 7.2 ft · lb)** **use Loctite®**

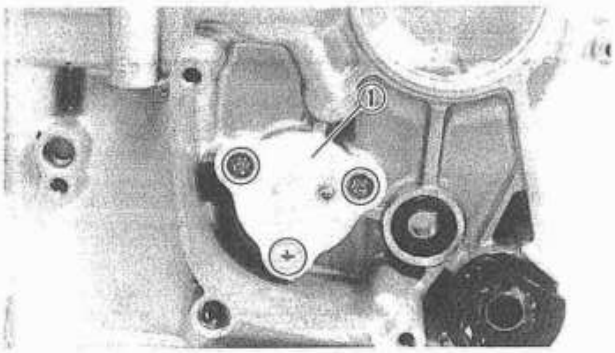


YB704404

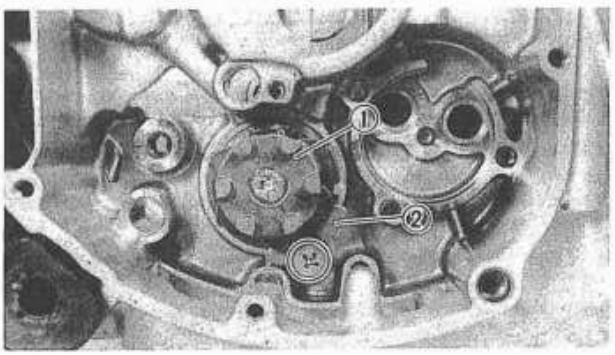
SHIFT FORK AND SHIFT CAM

1. Install:
- Tensiner ① (HY-VO chain)
- Chain guide ② (HY-VO chain—lower)

	Bolt (HY-VO chain tensioner): **10 Nm (1.0 m · kg, 7.2 ft · lb)** **use Loctite®** **Bolt (chain guide):** **10 Nm (1.0 m · kg, 7.2 ft · lb)** **use Loctite®**

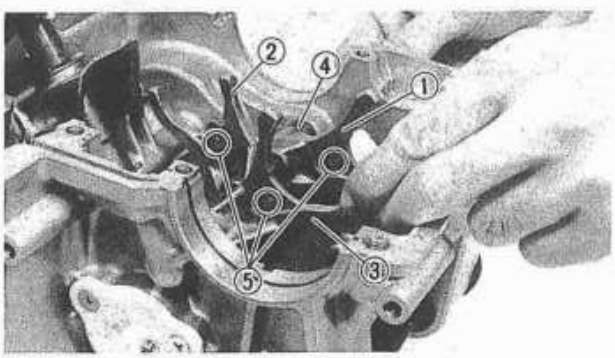


2. Install:
- Neutral switch ①



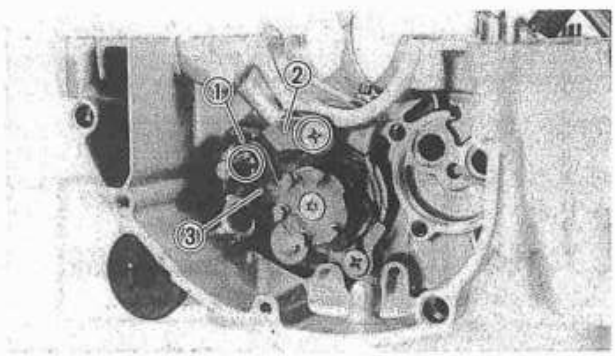
3. Install:
- Shift cam ①
- Stopper plate ②

	Screw (stopper plate): **7 Nm (0.7 m · kg, 5.1 ft · lb)** **use Loctite®**



4. Install:
- Shift fork "3" ①
- Shift fork "2" ②
- Shift fork "1" ③
- Guide bar ④

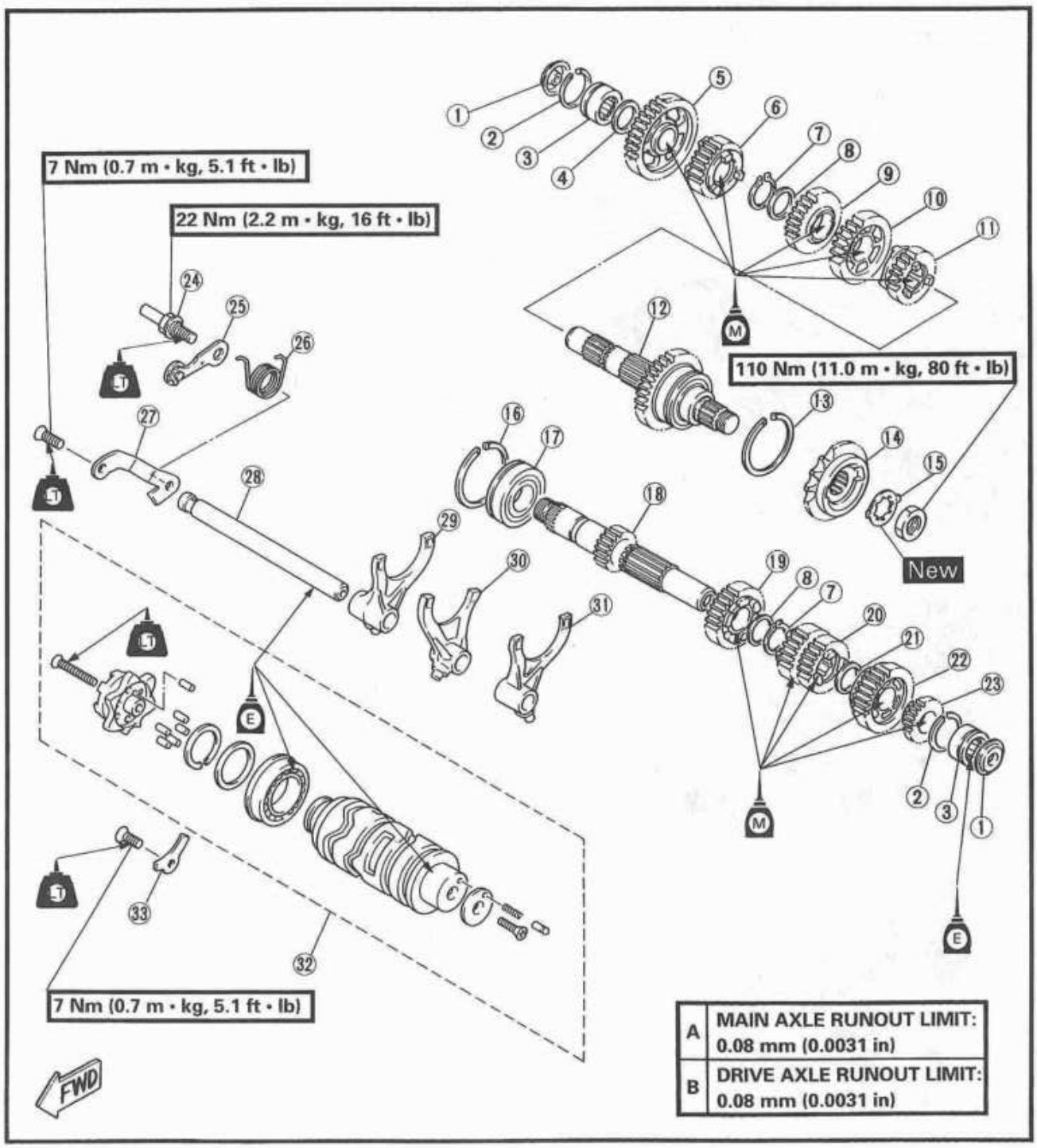
NOTE:
- Install the shift forks with the embossed mark ⑤ on each shift fork facing left side of the engine.
- Install the guide bar with the groove side facing the right side of the engine.



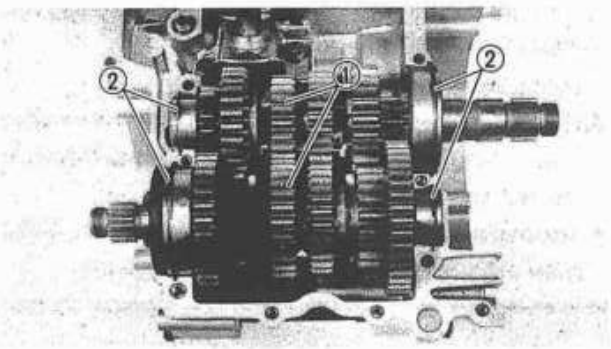
5. Install:
- Return spring ①
- Stopper plate ②
- Stopper lever ③

TRANSMISSION AND SHIFT CAM/SHIFT FORK

① Plug
② Circlip
③ Bearing
④ Plate washer
⑤ 1st wheel gear
⑥ 5th wheel gear
⑦ Circlip
⑧ Washer
⑨ 4th wheel gear
⑩ 3rd wheel gear
⑪ 6th wheel gear
⑫ Drive axle
⑬ Circlip
⑭ Drive sprocket
⑮ Lock washer
⑯ Circlip
⑰ Bearing
⑱ Main axle
⑲ 5th pinion gear
⑳ 3rd pinion gear
㉑ Plate washer
㉒ 6th pinion gear
㉓ 2nd pinion gear
㉔ Stopper screw
㉕ Stopper lever
㉖ Spring
㉗ Guide bar stopper
㉘ Guide bar
㉙ Shift fork 3
㉚ Shift fork 2
㉛ Shift fork 1
㉜ Shift cam
㉝ Bearing stopper plate



	Screw (stopper plate): **7 Nm (0.7 m · kg, 5.1ft · lb)** **use Loctite®** **Bolt (stopper lever):** **22 Nm (2.2 m · kg, 16 ft · lb)** **use Loctite®**



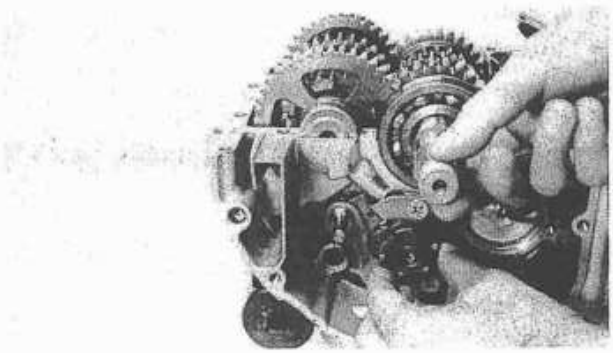
YB704407

TRANSMISSION

1. Install:
• Transmission assembly ①

NOTE:

Be sure that the main axle/drive axle bearing circlips ② are inserted into the upper crankcase positioning grooves.



2. Check:
• Transmission and shifter operation
Unsmooth operation → Repair.

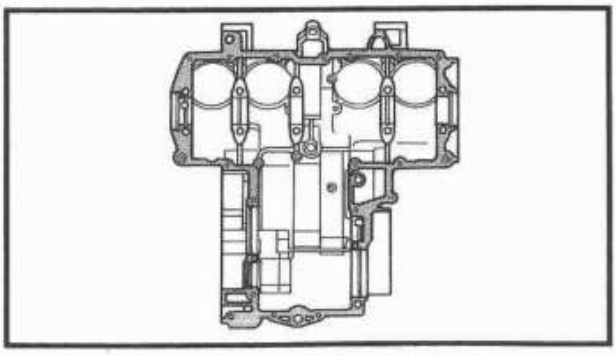
NOTE:

Oil each gear and bearing thoroughly.

YB704408

CRANKCASE

1. Apply:
• Engine oil
(onto main journal bearings)



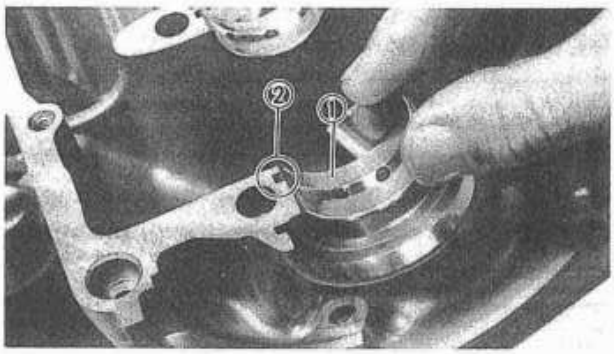
2. Apply:
• Sealant
(onto crankcase matching surfaces)

	Yamaha bond No. 1215: **P/N 90890-85505**

NOTE:

DO NOT ALLOW any sealant to came in contact with the oil gallery or crankshaft bearing.

Do not apply sealant to within 2~3 mm (0.08~0.12 in) of the bearings.

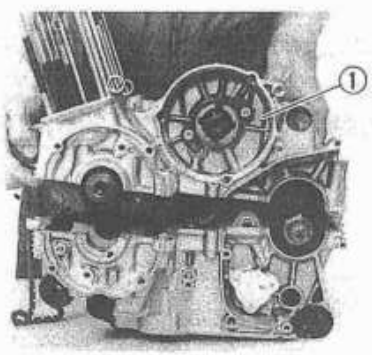


3. Install:
- Main journal bearings ①
  (onto lower crankcase)

NOTE:
- Align the projection ② of the bearing with the notch in the case.
- Identify each bearing position so that the bearing should be installed in position.

4. Install:
- Dowel pins
- O-ring

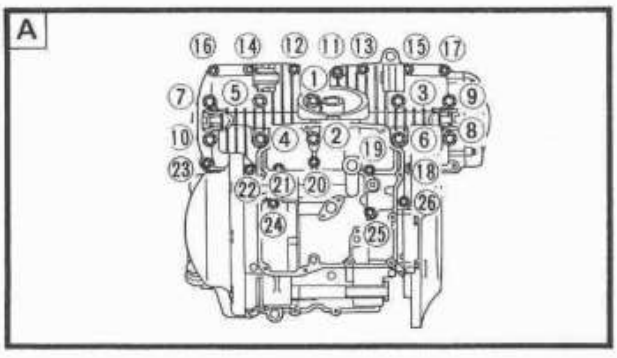
5. Set shift cam and transmission gears in NEUTRAL position.



6. Install:
- Upper crankcase ①

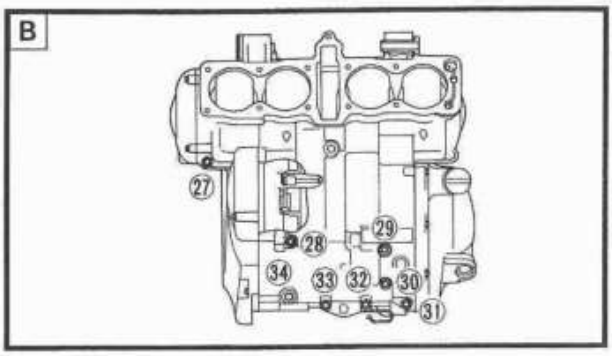
CAUTION:

Before tightening the crankcase bolts, check the following points:
- **Be sure the gear shifts correctly while hand turning the shift cam.**



7. Install:
- Bolts (crankcase)

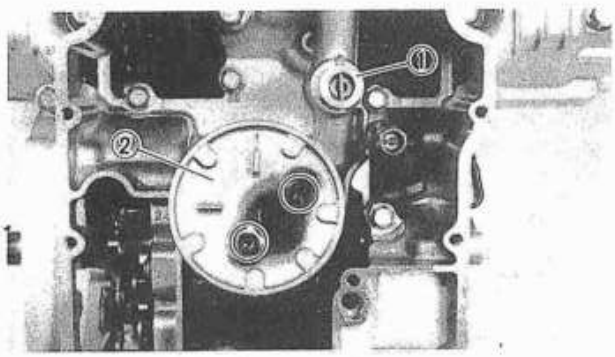
A Lower crankcase
B Upper crankcase

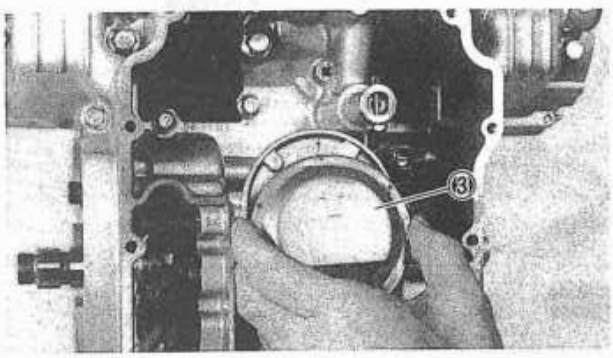


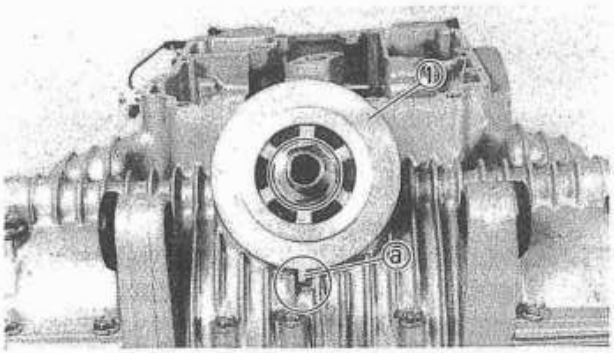
	M8 (① ~ ⑩ and ㉞): 24 Nm (2.4 m · kg, 17 ft · lb) M6 (⑪ ~ ㉝): 12 Nm (1.2 m · kg, 8.7 ft · lb)

NOTE:

- Lubricate the threads of bolts (M8 and M6) with engine oil.
- Tighten the bolts starting with the lowest numbered one.
- Install the washer on the bolts No.1~No. 10.
- Install the cable holder on the bolt No.32.







YB704413

OIL STRAINER AND OIL PAN

1. Install:
- Relief valve ①
- Oil strainer housing ②
- Oil strainer ③

NOTE:

The arrow mark on the oil strainer point to the front of the engine.

⚠WARNING

Always use a new O-ring.

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

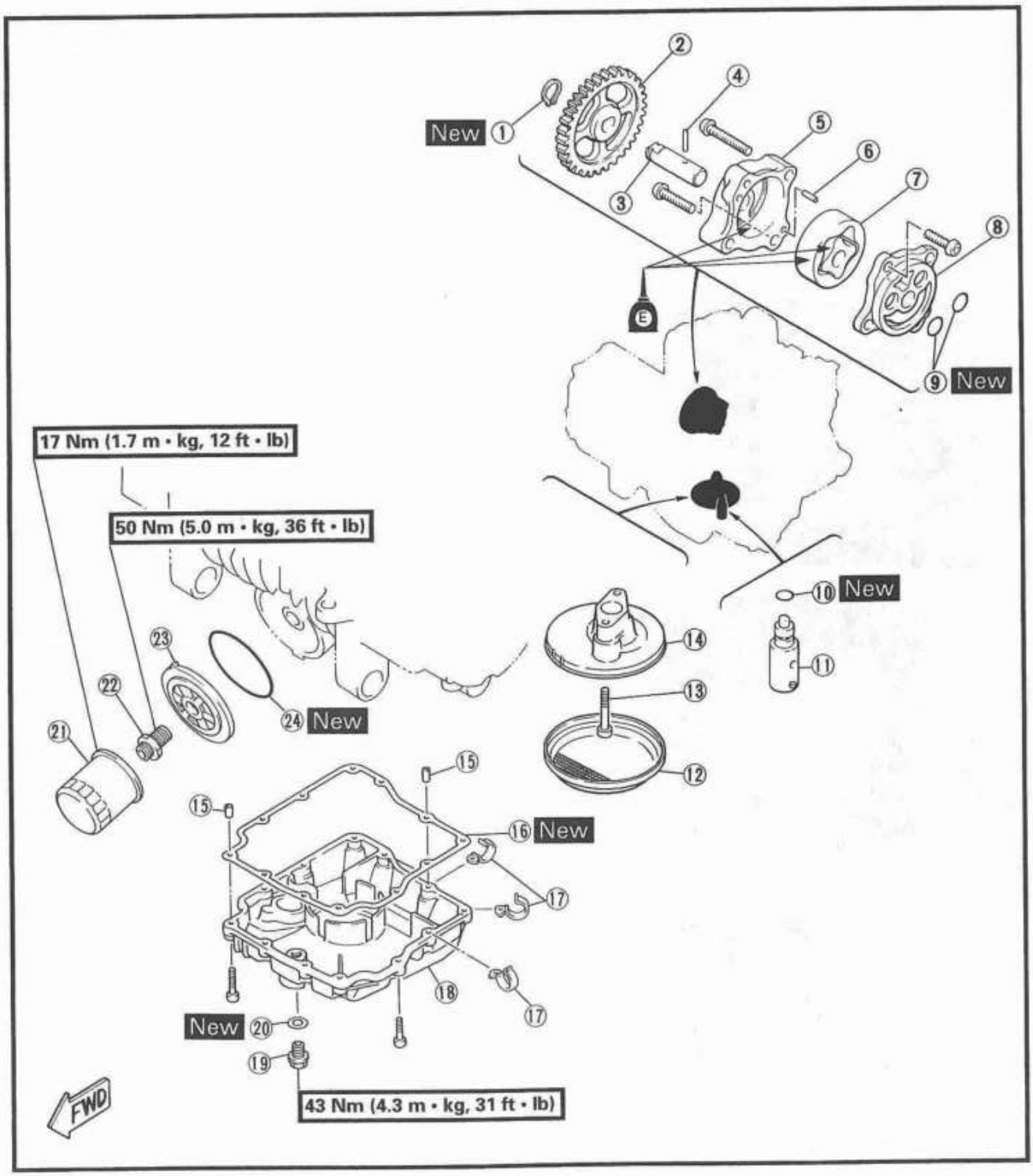
2. Install:
- Oil filter housing ①

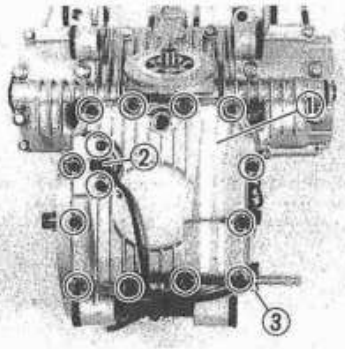
NOTE:

- Be sure that the O-ring is positioned properly.
- Mesh the oil filter housing projection ⓐ with the crankcase slot.

OIL PUMP AND OIL STRAINER

① Circlip
② Pump driven gear
③ Pump shaft
④ Dowel pin
⑤ Rotor housing
⑥ Dowel pin
⑦ Rotor assembly
⑧ Pump cover
⑨ O-ring
⑩ O-ring
⑪ Relief valve
⑫ Oil strainer
⑬ Bolt
⑭ Strainer housing
⑮ Dowel pin
⑯ Gasket
⑰ Clamp
⑱ Oil pan
⑲ Drain bolt
⑳ Gasket
㉑ Oil filter
㉒ Union bolt
㉓ Oil filter housing
㉔ O-ring





	Union bolt (oil filter housing): **50 Nm (5.0 m · kg, 36 ft · lb)**

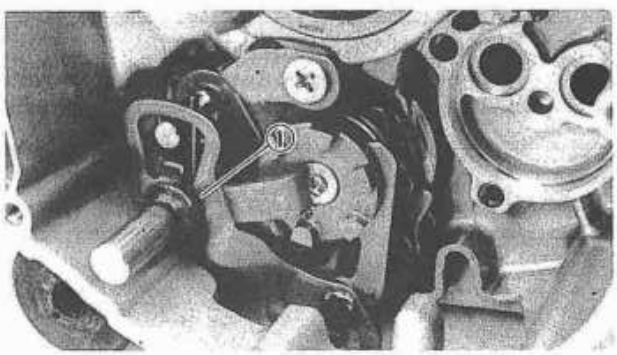
3. Install:
- Dowel pins
- Gasket
- Oil pan ①
- Oil level switch ②

NOTE:
Tighten the bolts (oil pan) in a crisscross pattern.

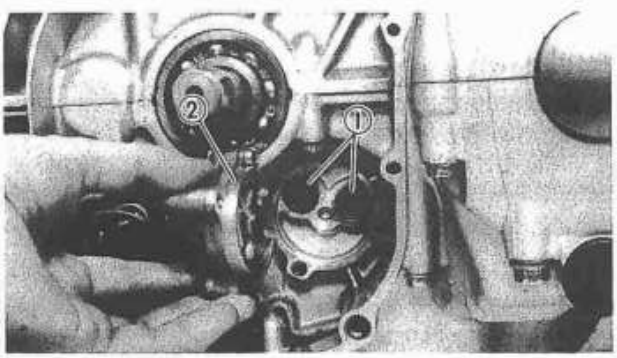
⚠WARNING
Always use new gasket.

	Bolt (oil pan): **10 Nm (1.0 m · kg, 7.2 ft · lb)** **Bolt (oil level switch):** **10 Nm (1.0 m · kg, 7.2 ft · lb)**

4. Connect:
- Neutral switch lead ③

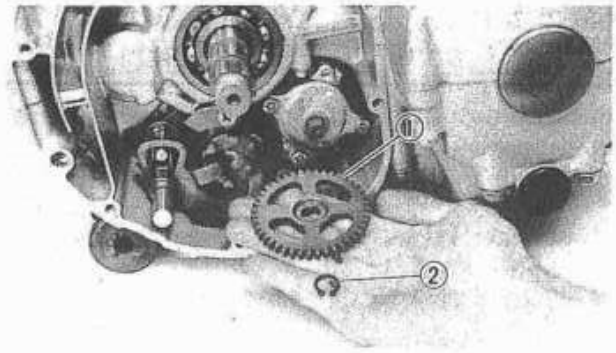


YB704412
OIL PUMP AND SHIFT SHAFT
1. Install:
- Shift shaft ①



2. Install:
- O-rings ①
- Oil pump assembly ②

	Bolt (oil pump): **7 Nm (0.7 m · kg, 5.1 ft · lb)**



3. Install:
- Oil pump driven gear ①
- Circlip ②

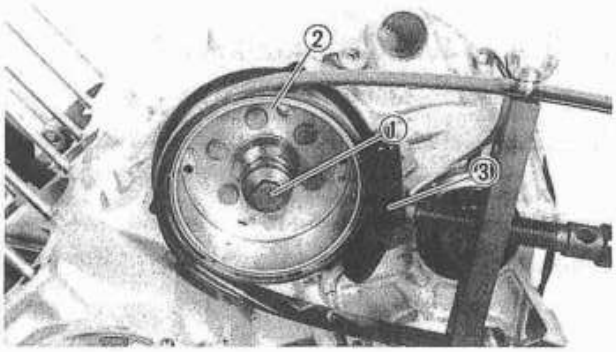
YB704409

AC MAGNETO

1. Install:
- Magneto rotor
- Washer
- Bolt (magneto rotor)

NOTE:

Clean the tapered portion of the crankshaft and magneto rotor.



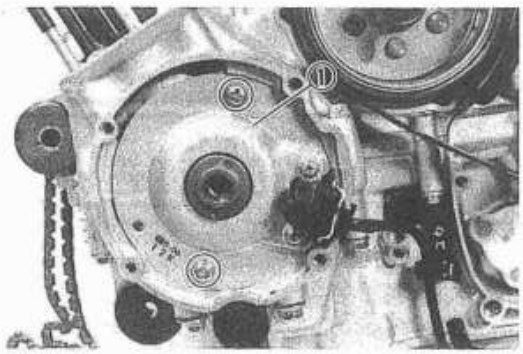
2. Tighten:
- Bolt (magneto rotor) ①

NOTE:

Tighten the bolt (magneto rotor) ① while holding the magneto rotor ② with the primary sheave holder ③.

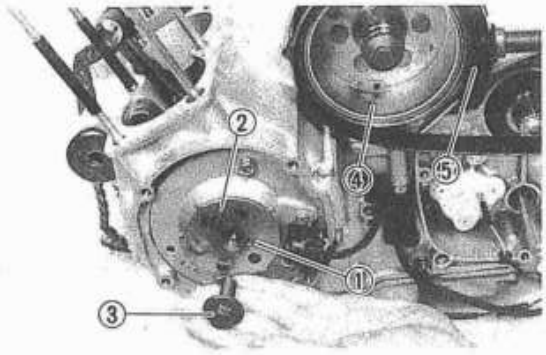
	Primary sheave holder: P/N 90890-01701

	Bolt (magneto rotor): 80 Nm (8.0 m · kg, 58 ft · lb)



3. Install:
- Pickup coil base ①

	Screw (pickup coil base): 8 Nm (0.8 m · kg, 5.8 ft · lb)

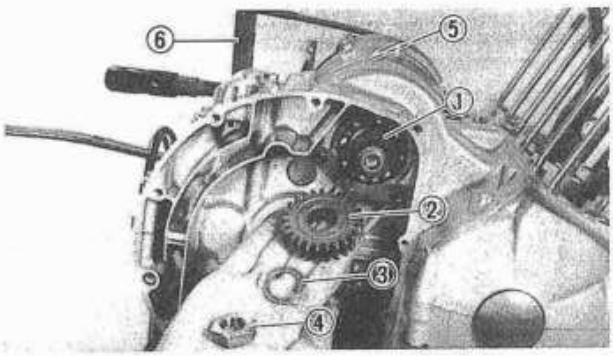


4. Install:
- Pin ① (timing plate)
- Timing plate ②

NOTE:
Tighten the bolt (timing plate) ③ while holding the magneto rotor ④ with the primary sheave holder ⑤.

	Primary sheave holder: 90890-01701

	Bolt (timing plate): 45 Nm (4.5 m · kg, 32 ft · lb)



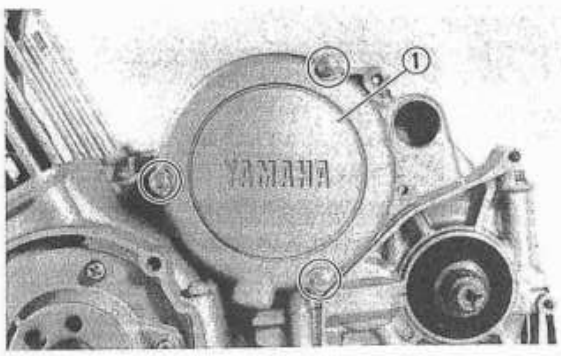
5. Install:
- Collar ①
- Primary drive gear ②
- Lock washer ③
- Nut ④

NOTE:
Tighten the nut (primary drive gear) ④ while holding the magneto rotor ⑤ with the primary sheave holder ⑥.

	Primary sheave holder: P/N 90890-01701

	Nut (primary drive gear): 50 Nm (5.0 m · kg, 36 ft · lb)

6. Bend the lock washer tab along the nut flat.

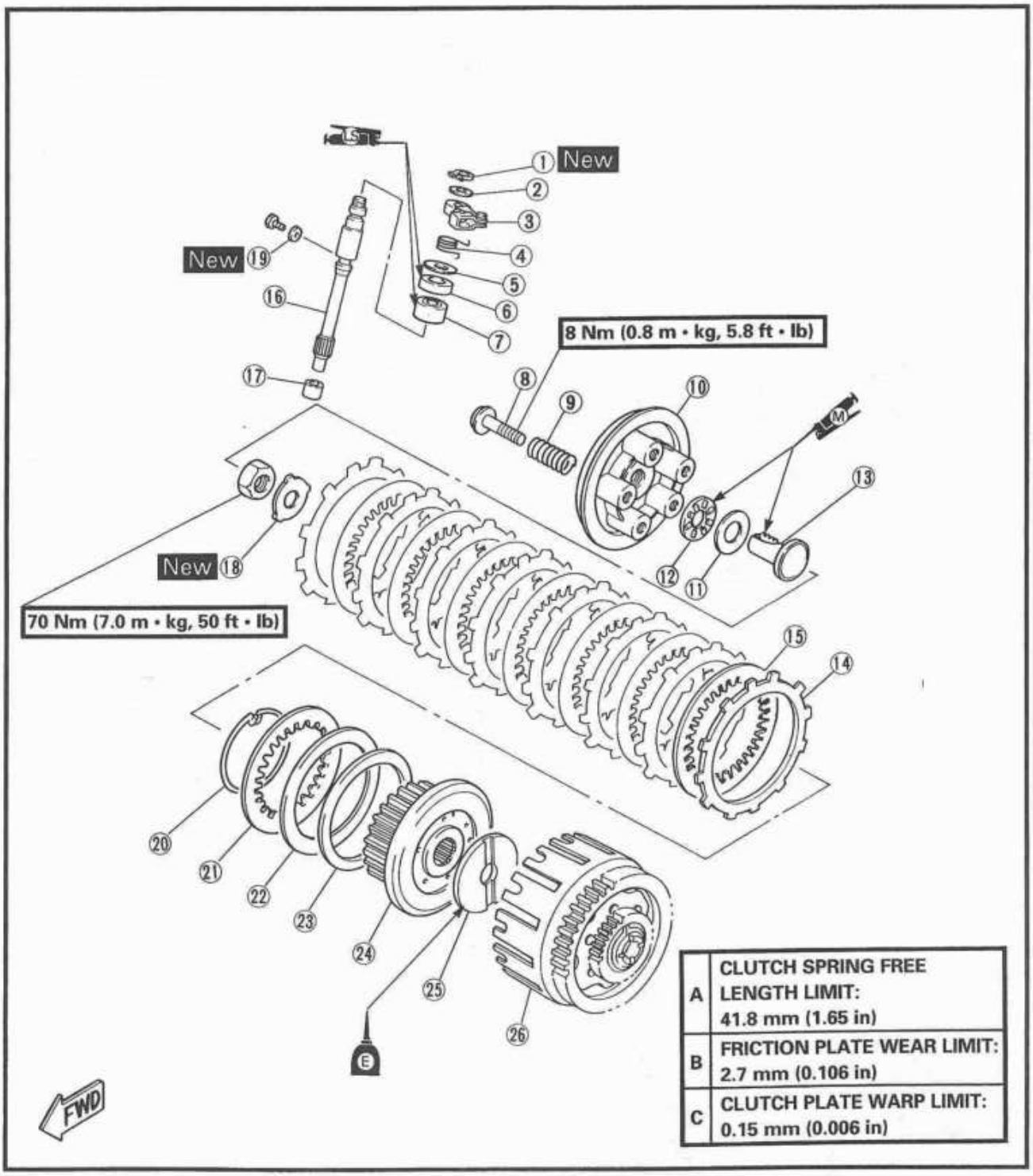


7. Install:
- Magneto cover ①

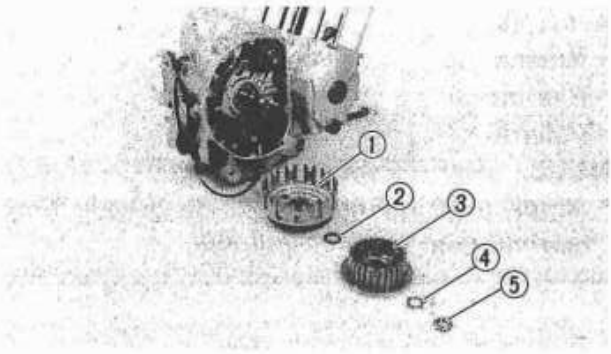
	Bolt (magneto cover): 10 Nm (1.0 m · kg, 7.2 ft · lb)

CLUTCH

① Circlip
② Plate washer
③ Pull lever
④ Spring
⑤ Plate wahser
⑥ Oil seal
⑦ Bearing
⑧ Bolt
⑨ Clutch spring
⑩ Pressure plate
⑪ Plate washer
⑫ Thrust bearing
⑬ Pull rod
⑭ Friction plate
⑮ Clutch plate
⑯ Pull lever axle
⑰ Bearing
⑱ Lock washer
⑲ Gasket
⑳ Wire circlip
㉑ Clutch plate 1
㉒ Clutch boss spring
㉓ Seat plate
㉔ Clutch boss
㉕ Thrust plate
㉖ Clutch housing



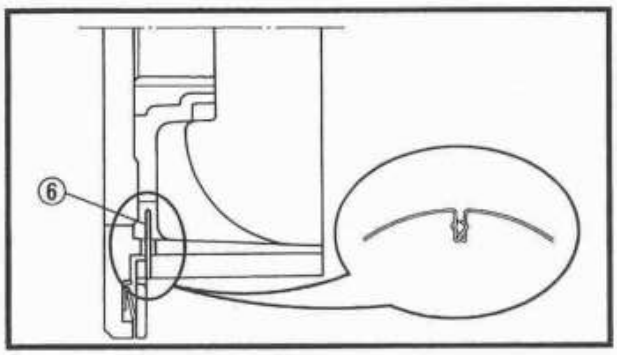
A	CLUTCH SPRING FREE LENGTH LIMIT: 41.8 mm (1.65 in)
B	FRICTION PLATE WEAR LIMIT: 2.7 mm (0.106 in)
C	CLUTCH PLATE WARP LIMIT: 0.15 mm (0.006 in)



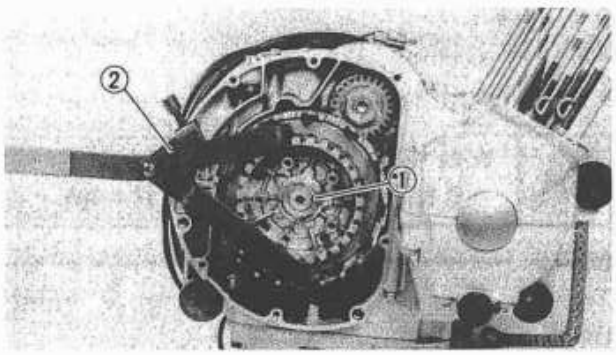
YB704416

CLUTCH

1. Install:
- Clutch housing ①
- Holding plate ②
- Clutch boss ③
- Lock washer ④ (new)
- Nut (clutch boss) ⑤



NOTE:
- If the wire circlip ⑥ is removed, take care reinstall them as shown.
- Make sure that the tab of the lock washer engages the slot in the clutch boss.



2. Tighten:
- Nut (clutch boss) ①

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

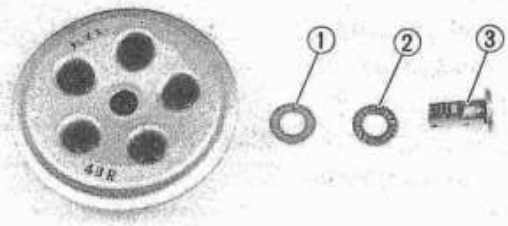
NOTE:
- Tighten the nut (clutch boss) ① while holding the clutch housing by the clutch holder ② .
- Bend the lock washer tab along the nut flat.

	Clutch holding tool: **P/N 90890-04086**



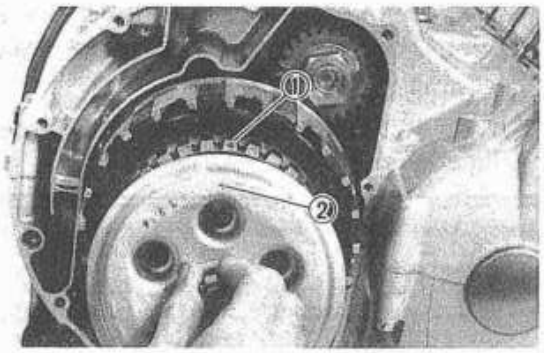
3. Install:
- Friction plates ①
- Clutch plates ②

NOTE:
Mount friction and clutch plate alternately.



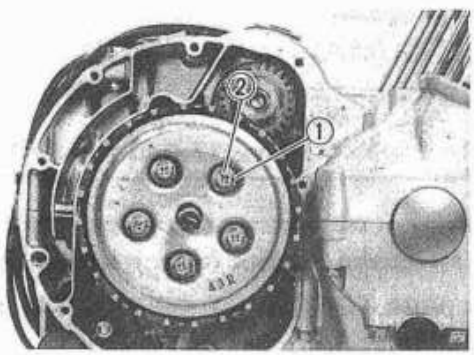
4. Install:
- Washer ①
- Bearing ②
- Pull rod ③

NOTE:
- Apply molybdenum disulfide grease onto bearing/gear teeth of pull rod.



5. Install:
- Pressure plate

NOTE:
Align the punched mark ① on the clutch boss with the punched mark ② on the pressure plate.



6. Install:
- Clutch springs ①
- Bolts (clutch spring) ②

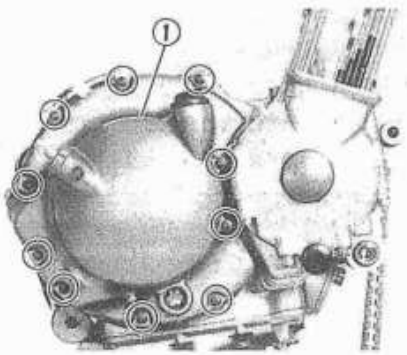
	Bolt (clutch spring): **8 Nm (0.8 m · kg, 5.8 ft · lb)**

NOTE:
Tighten the bolts (clutch spring) in stage, using a crisscross pattern.

7. Install:
- Clutch pull lever shaft

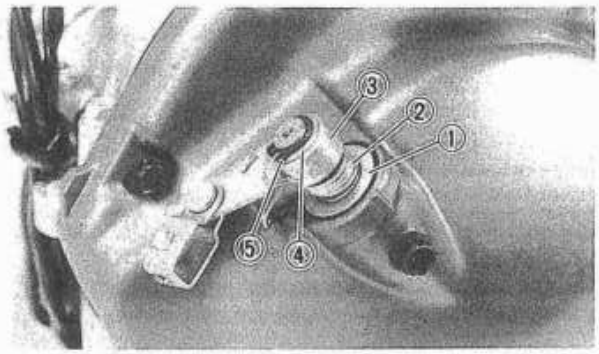
NOTE:
Aplly molybdenum disulfide grease on the gear (pull shaft).

	Bolt (clutch pull shaft): **10 Nm (1.0 m · kg, 7.2 ft · lb)**



8. Install:
- Dowel pins
- Gasket
- Clutch cover ①
- Clutch cable bracket

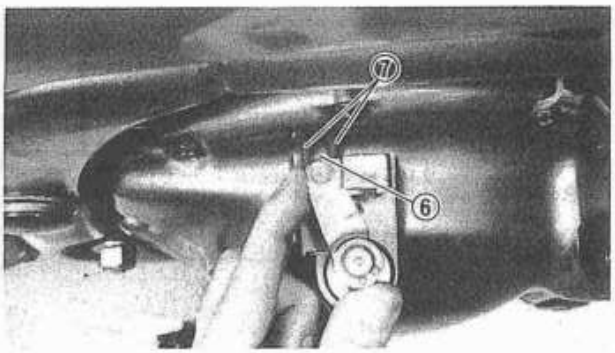
	Bolt (clutch cover): **10 Nm (1.0 m · kg, 7.2 ft · lb)**

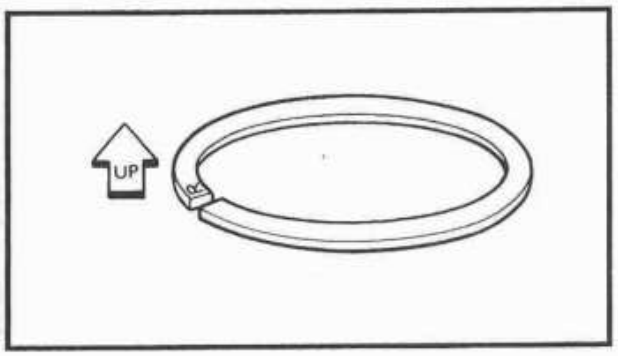


NOTE:
Tighten the bolts (clutch cover) in a crisscross pattern.

9. Install:
- Washer ①
- Return spring ②
- Pull lever ③
- Washer ④
- Circlip ⑤

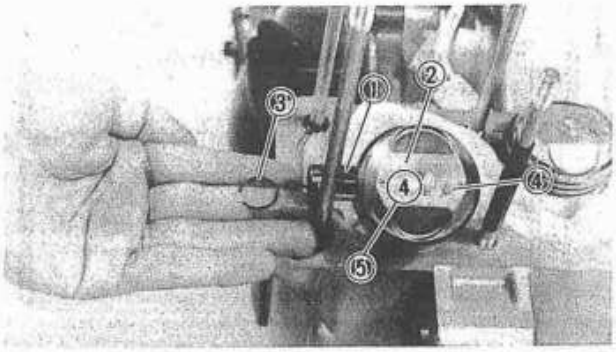
NOTE:
Make sure that the indicator ⑥ on the pull lever is aligned within between the embossed marks ⑦ on the crankcase while pushing the pull lever. If not, change the pull lever position.





YB704417
CYLINDER AND PISTON
1. Install:
- Piston rings

NOTE:
- Be sure to install rings to that manufacturer's marks or numbers are located on the top side of the rings. Oil the pistons and rings liberally.
- Piston ring with "R" mark should be installed into second ring position.

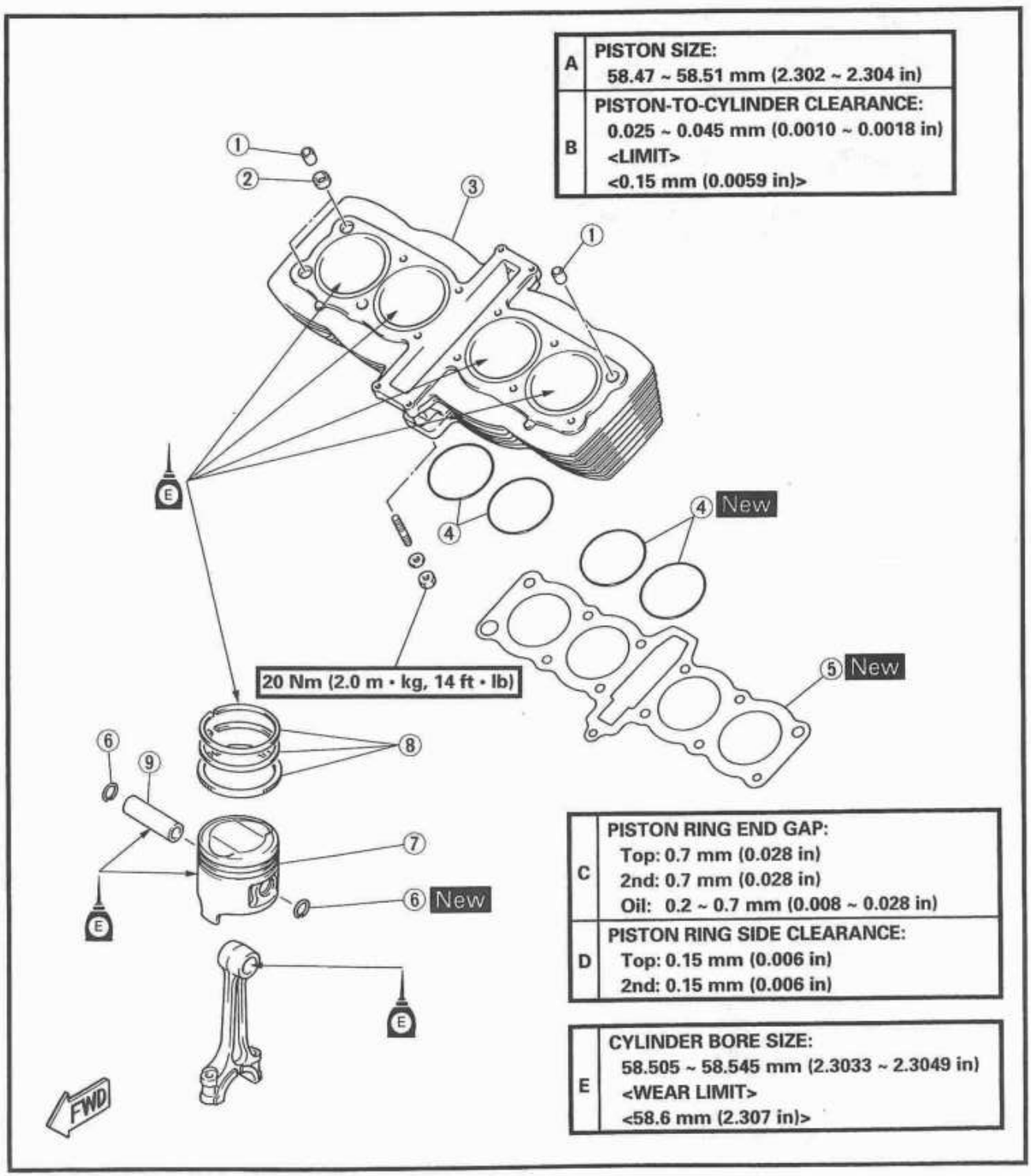


2. Install:
- Piston pins ①
- Pistons ②
- Circlips (piston pin) ③

NOTE:
- Apply the engine oil to the piston pins.
- Be sure that the piston allow mark ④ face to exhaust side of the engine.
- Before installing the piston pin circlips, cover the crankcase with a clean rag to pre-

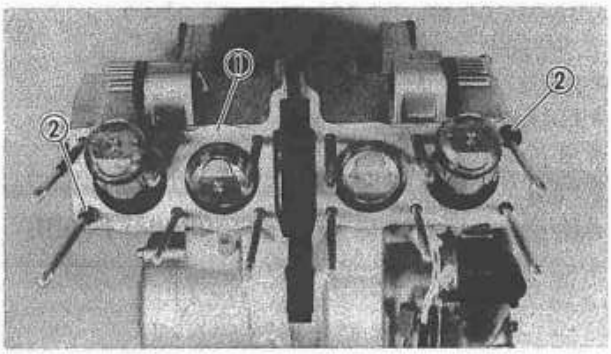
CYLINDER, PISTON AND PISTON RING

① Dowel pin
② Gasket
③ Cylinder
④ O-ring
⑤ Gasket
⑥ Piston pin circlip
⑦ Piston
⑧ Piston ring set
⑨ Piston pin



vent the circlip from falling into the crankcase cavity.
- Be sure that the marked piston numbers ⑤ should be in sequence (1,2,3,4) beginning from the left.

⚠WARNING
Always use new circlips (piston pin).



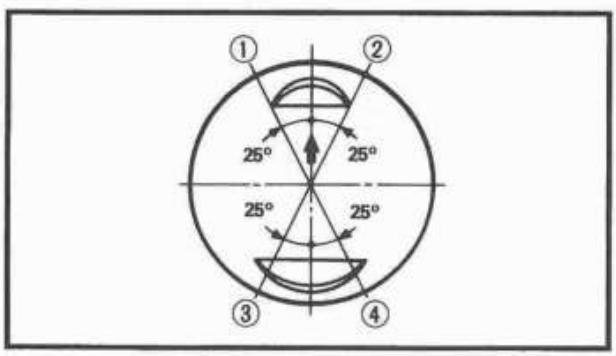
3. Install:
- Gasket (cylinder) ①
- Dowel pins ②

NOTE:
The gasket "UP" mark should face upward.

⚠WARNING
Always use a new gasket (cylinder).

4. Apply:
- Pistons
- Piston rings
- Cylinder

NOTE:
Apply a liberal coating of engine oil.

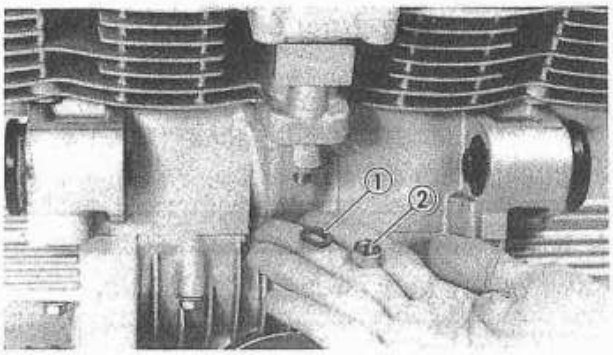


5. Piston:
- Top ring
- 2nd ring
- Oil ring

Offset the piston ring end gaps as shown.
① Top ring end
② Oil ring end (lower)
③ Oil ring end (upper)
④ 2nd ring end

6. Install:
- Cylinder

NOTE:
- Install the #2 and #3 pistons first.
- Pass the cam chain and cam chain guide (exhaust side) through the cam chain cavity.

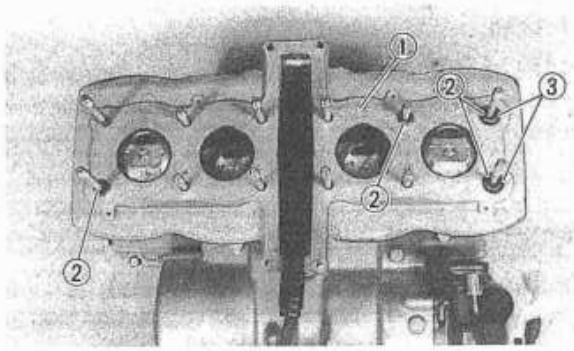


7. Install:
- Washer ①
- Nut ② (cylinder)

	Nut (cylinder): **20 Nm (2.0 m · kg, 14 ft · lb)**

YB704418

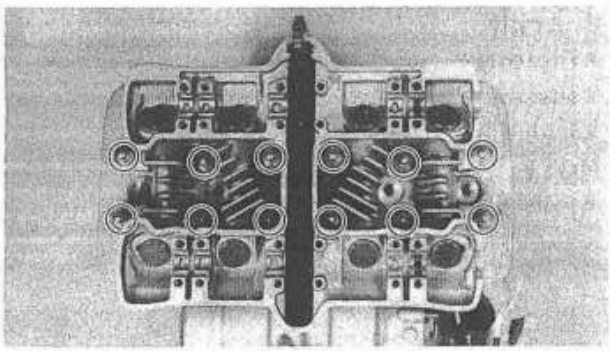
CYLINDER HEAD AND CAMSHAFT



1. Install:
- Gasket ① (cylinder head)
- Dowel pins ②
- O-rings ③

⚠ WARNING

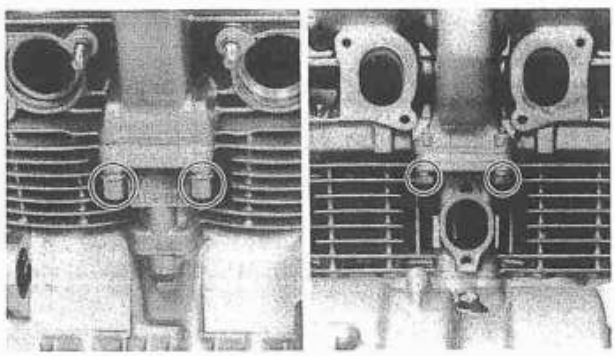
Always use a new gasket (cylinder head).



2. Install:
- Cylinder head
- Washers
- Copper washers
- Nuts

	Nut (cylinder head): **22 Nm (2.2 m · kg, 16 ft · lb)**

NOTE:
- Apply the engine oil onto the nut threads.
- Tighten the nuts in a crisscross pattern.

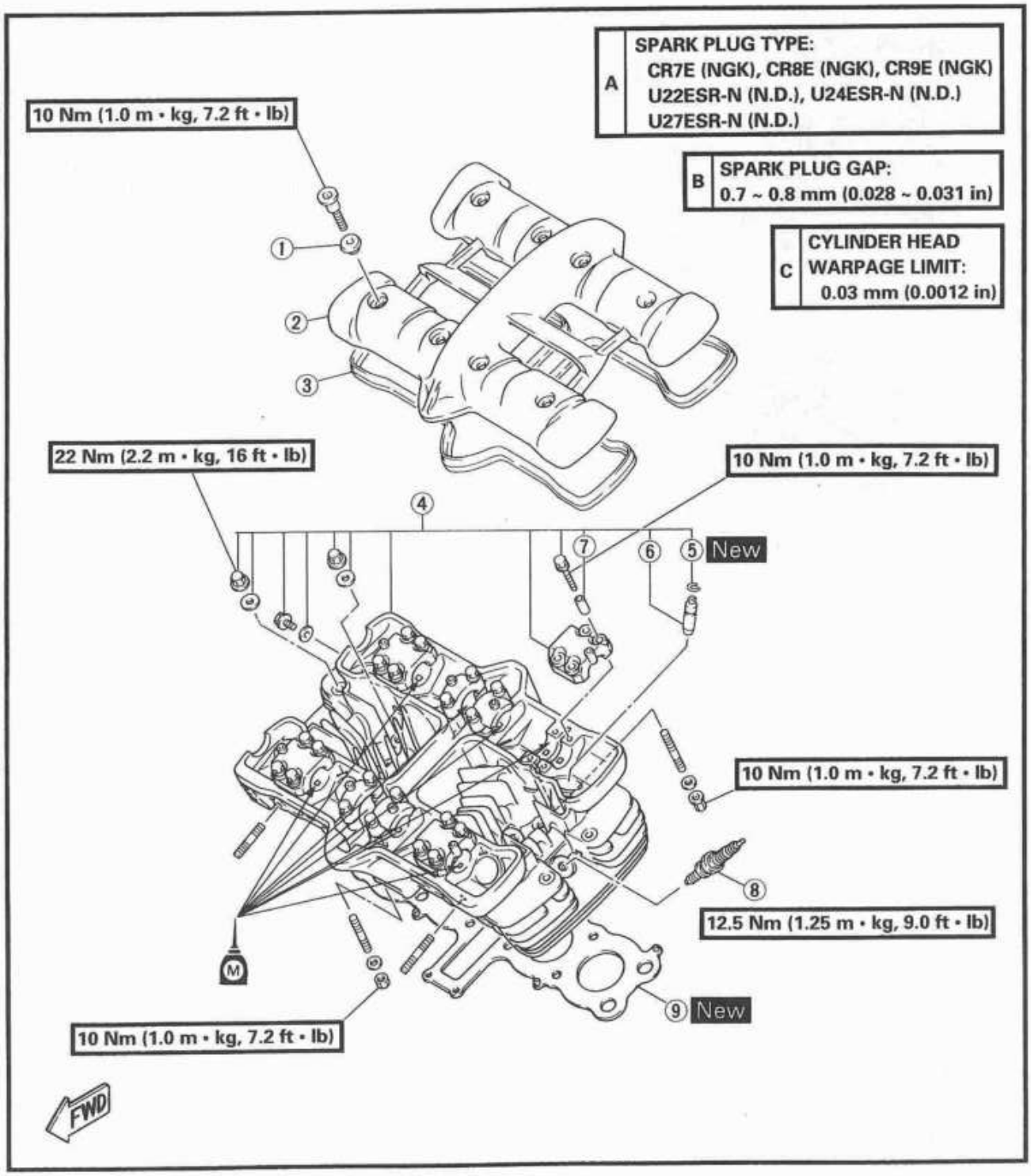


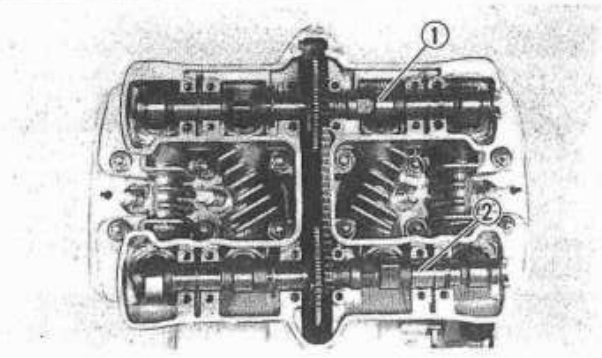
3. Install:
- Washers
- Nuts

	Nut (cylinder head—front/rear side): **10 Nm (1.0 m · kg, 7.2 ft · lb)**

CYLINDER HEAD AND CYLINDER HEAD COVER

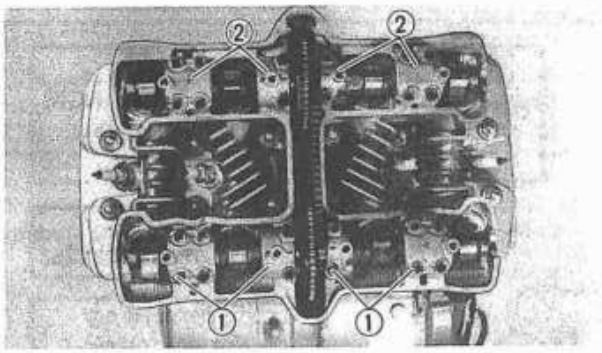
① Rubber
② Cylinder head cover
③ Cylinder head gasket
④ Cylinder head assembly
⑤ Circlip
⑥ Valve guide
⑦ Dowel pin
⑧ Spark plug
⑨ Gasket





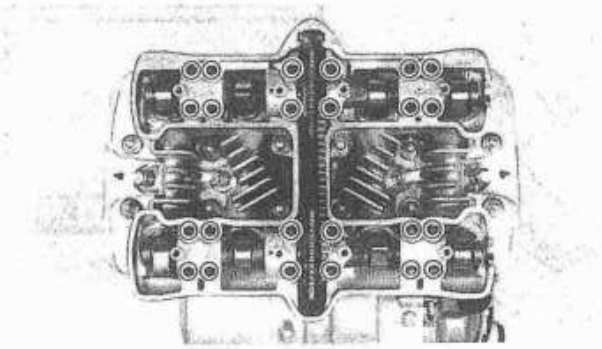
4. Install:
- Exhaust camshaft ①
- Intake camshaft ②
  (with cam sprocket at temporaly tighten)

NOTE:
Install the camshaft with the punch mark facing upward.



5. Install:
- Dowel pins
- Camshaft caps ① (intake camshaft)
- Camshaft caps ② (exhaust camshaft)

NOTE:
- Make sure that each camshaft cap is installed in its original place by reference to its embossed identification mark, as follows:
  Intake :I
  Exhaust :E
- Install the camshaft cap with the arrow mark embossed facing right side of the engine.

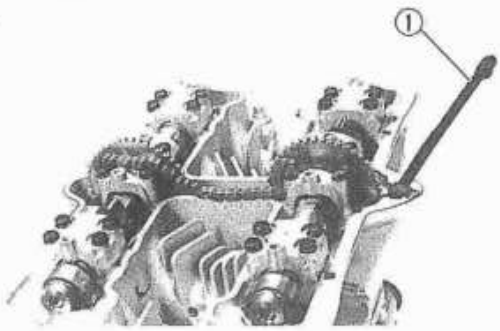


6. Install:
- Bolts (camshaft caps)

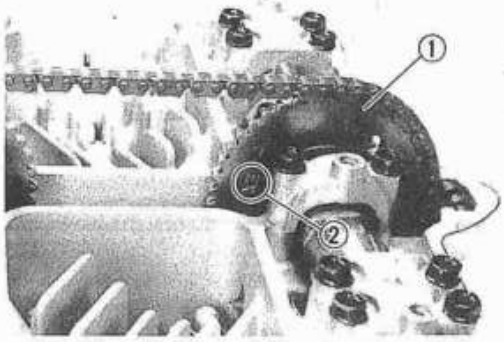
	Bolt (camshaft cap): **10 Nm (1.0 m · kg, 7.2 ft · lb)**

NOTE:
Tighten the bolts (camshaft cap) in a crisscross pattern from in side to out side.

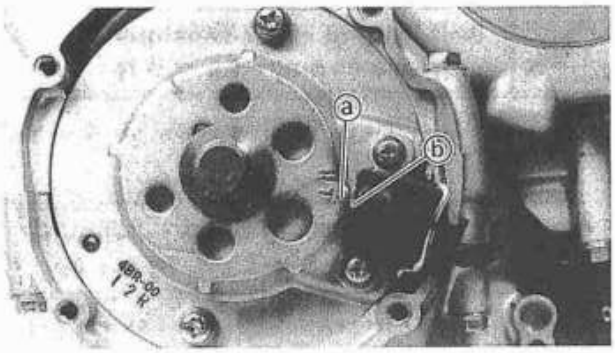
CAUTION:
The bolts (camshaft caps) must be tightened evenly or damage to the cylinder head, camshaft caps and camshaft will result.



7. Install:
- Chain guide ① (exhaust)



8. Install:
• Cam sprockets ①



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Installing steps:

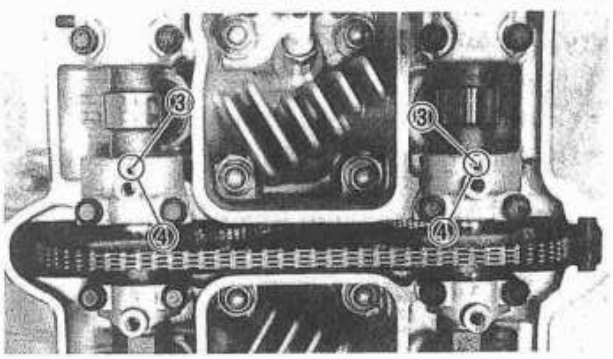
- Turn the crankshaft counterclockwise until the TDC mark ⓐ is aligned with the pickup coil ⓑ.
- Fit the timing chain onto both cam sprockets and install the cam sprockets on the camshafts.

NOTE:

When installing the cam sprockets, start with the exhaust camshaft to keep the timing chain as tense as possible on the exhaust side, and set the hole of "EX" mark side ② on the cam sprocket to the camshaft.
"IN":Intake side "EX":Exhaust side.

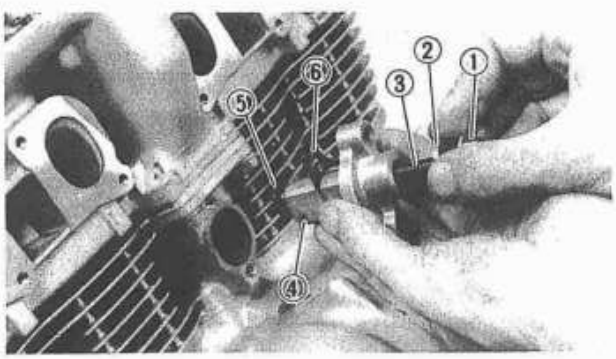
CAUTION:

Do not turn the crankshaft during the camshafts installation. Damage or improper valve timing will result.



- Turn both camshafts opposite to each other unit the punch mark ③ on the camshaft is aligned with the hole ④ on the camshaft cap.
- While holding the camshafts, temporary tighten the bolts.

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YB704419

TIMING CHAIN TENSIONER

1. Install:
• Timing chain tensioner

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Installation steps:

- Remove the tensioner cap bolt ①, washer ② and springs ③.
- Release the timing chain tensioner one-

way cam ④ and push the tension rod ⑤.
- Install the tensioner with a new gasket ⑥ into the cylinder.

NOTE:
The ratchet face on the tensioner should face downward.

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

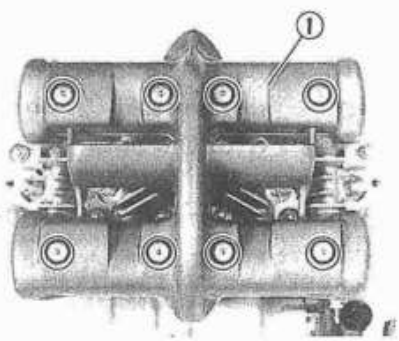
- Install the springs ③, washer ② and cap bolt ①.

	Cap bolt (timing chain tensioner): 20 Nm (2.0 m · kg, 14 ft · lb)

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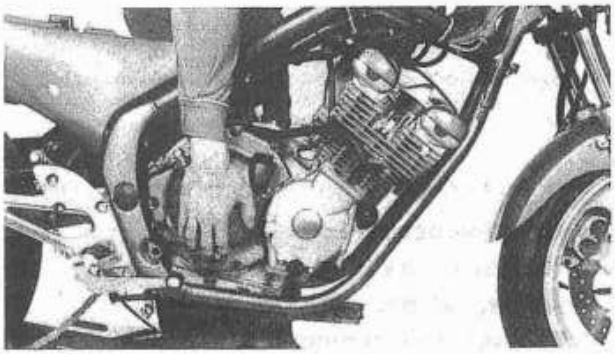
2. Tighten:
- Bolts (cam sprockets)

	Bolt (cam sprocket): 24 Nm (2.4 m · kg, 17 ft · lb) use Loctite®

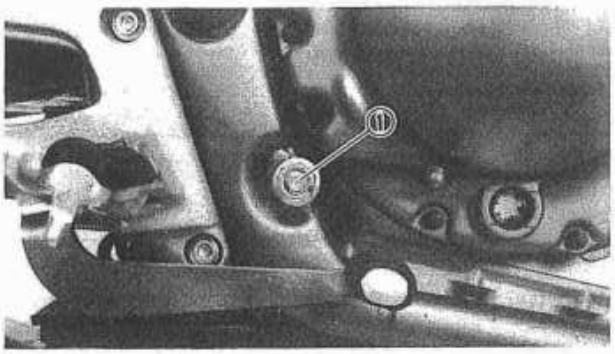


YB704420
CYLINDER HEAD COVER
1. Install:
- Gasket (cylinder head cover)
- Cylinder head cover ①

	Bolt (cylinder head): 10 Nm (1.0 m · kg, 7.2 ft · lb)

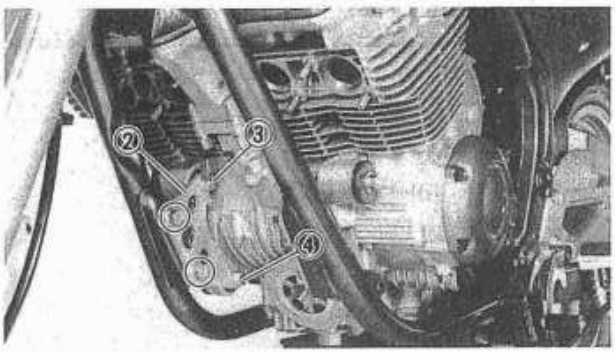


YB704421
REMOUNTING ENGINE
When remounting the engine, reverse the removal procedure. Note the following points.
1. Install:
- Engine assembly (from right side)

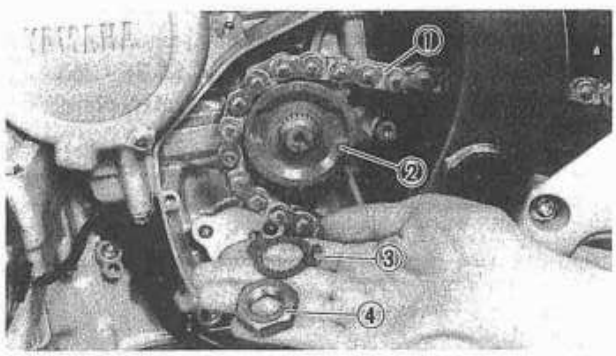


2. Install:
- Mounting bolt (rear) ①
- Engine brakets ② (left and right) (to the frame)
- Mounting bolts (front—upper) ③
- Mounting bolts (front—lower) ④

NOTE:
Install the all bolts and nuts first, and then tighten the bolts and nuts to specification.



	Engine mounting: **Nut (rear)** **88 Nm (8.8 m · kg, 64 ft · lb)** **Nut (engine bracket—frame)** **60 Nm (6.0 m · kg, 43 ft · lb)** **Bolt (engine bracket—engine)** **46 Nm (4.6 m · kg, 33 ft · lb)**

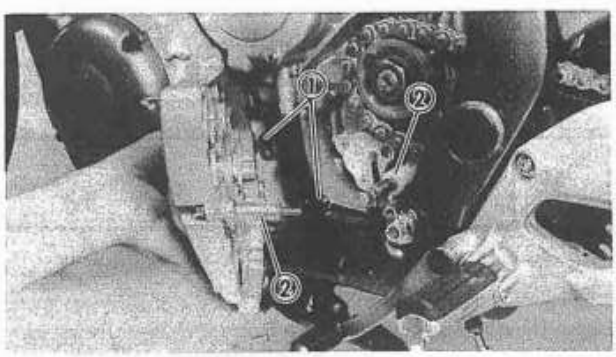


3. Install:
- Drive chain ①
- Drive sprocket ②
- Lock washer ③
- Nut (drive sprocket) ④

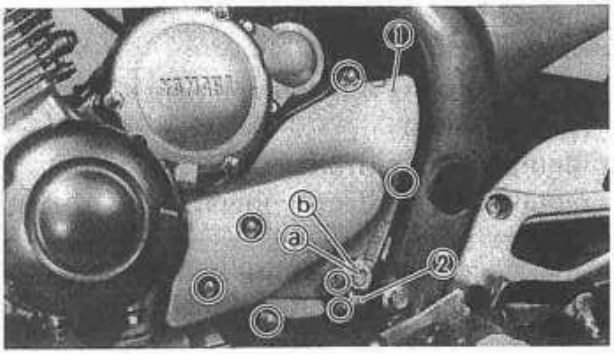
	Nut (drive sprocket): **110 Nm (11.0 m · kg, 80 ft · lb)**

NOTE:
- Tighten the nut (drive sprocket) while applying the rear brake.
- Bend the lock washer tab along the nut flat.

⚠WARNING
Always use a new lock washer.



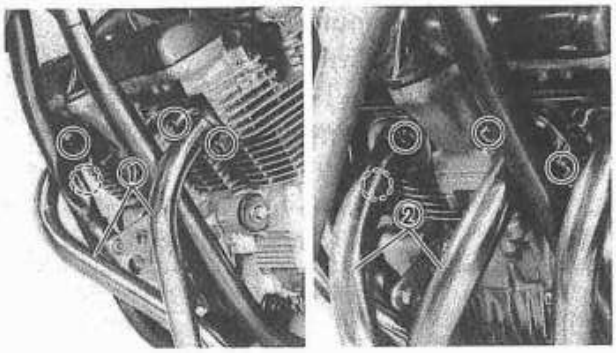
4. Install:
- Dowel pins ①
- Collers ②



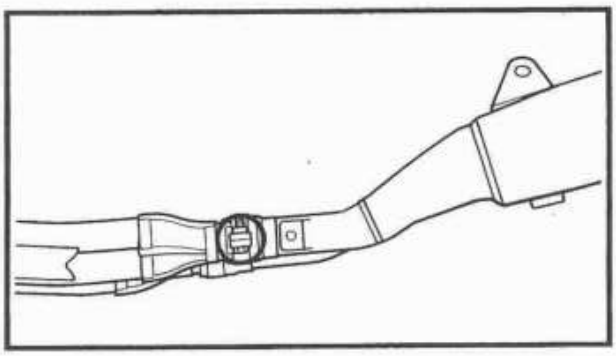
5. Install:
- Cover (drive sprocket)
- Shift arm ①

	Bolt (drive sprocket cover/shift arm): **10 Nm (1.0 m · kg, 7.2 ft · lb)**

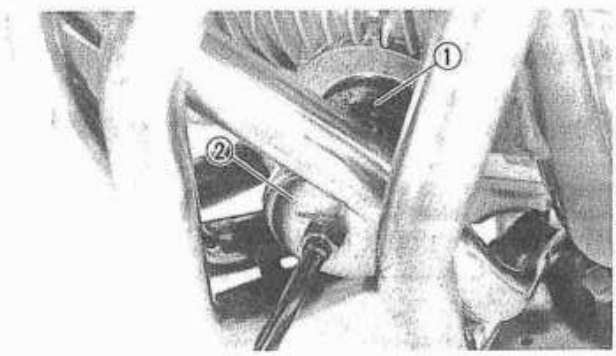
NOTE:
Align the punch mark ⓐ with the slot ⓑ on shift pedal joint.



6. Install:
- Exhaust pipe #1,#4 ①
- Exhaust pipe #2,#3 ②



	Nut (exhaust pipe): **20 Nm (2.0 m · kg, 14 ft · lb)** **Bolt (exhaust pipe—muffler):** **20 Nm (2.0 m · kg, 14ft · lb)**

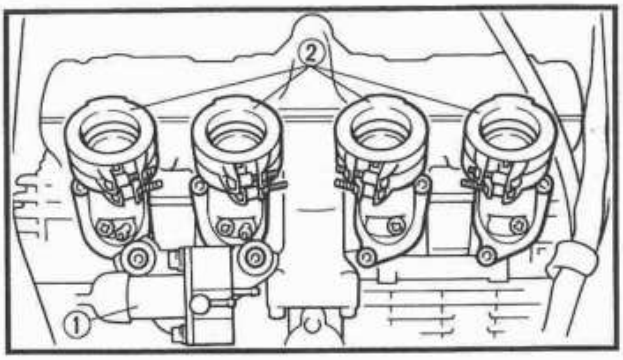


7. Install:
- Oil filter ①

NOTE:
- Be sure the O-ring is positioned properly.
- Install the oil filter ① using the oil filter wrench ②.

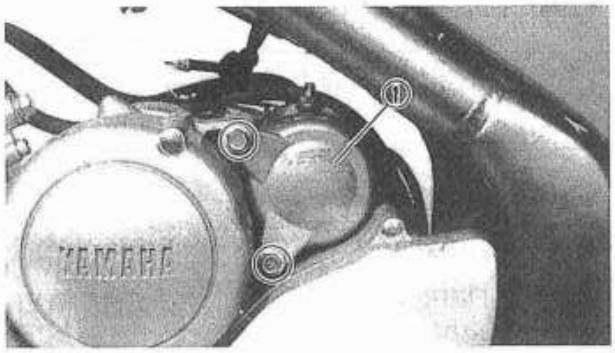
	Oil filter wrench: **P/N 90890-01426**

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



8. Install:
- Solenoid valve ①
- Intake manihold ②

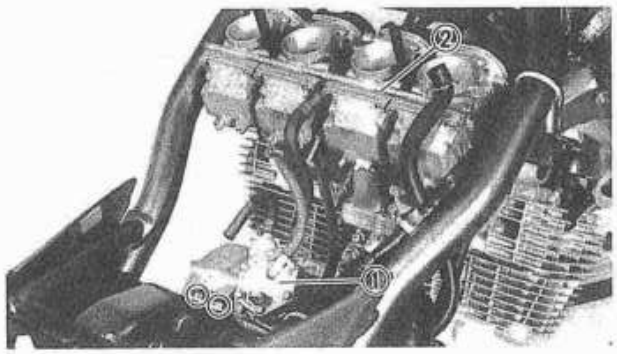
NOTE:
Make sure the O-ring is positioned properly.



9. Install:
- Starter motor ①

NOTE:
Apply the lithium soap base grease onto O-ring on starter motor.

	Bolt (starter motor): 10 Nm (1.0 m · kg, 7.2 ft · lb)

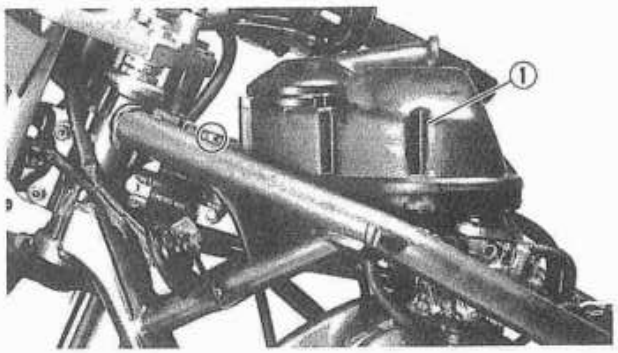


10. Install:
- Fuel pump ①

	Bolt (fuel pump bracket): 10 Nm (1.0 m · kg, 7.2 ft · lb)

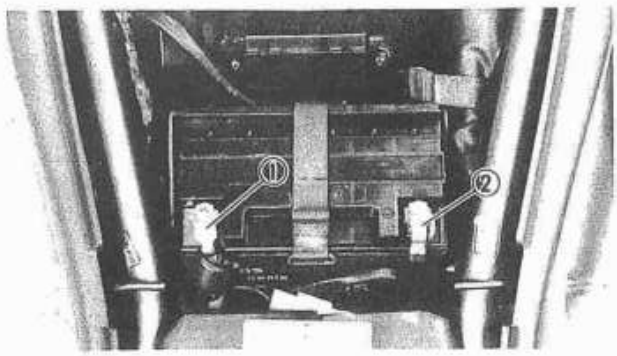
- Carburetor assembly ②

NOTE:
Make the the carburetors is properly in place.



11. Install:
- Air filter case ①

	Bolt (air filter case): 10 Nm (1.0 m · kg, 7.2 ft · lb)



12. Connect:
- Battery leads

CAUTION:
Connect the positive lead ① first and then connect the negative lead ② .

13. Adjust:
- Drive chain slack
  Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

Drive chain slack:
30 ~ 40 mm (1.2 ~ 1.6 in)

- Throttle cable free play
  Refer to the "THROTTLE CABLE ADJUSTMENT" section in the CHAPTER 3.

Throttle cable free play:
3 ~ 7 mm (0.08 ~ 0.28 in)

- Clutch cable free play
  Refer to the "CLUTCH CABLE FREE PLAY ADJUSTMENT" section in the CHAPTER 3.

Clutch free play:
2 ~ 3 mm (0.08 ~ 0.12 in)

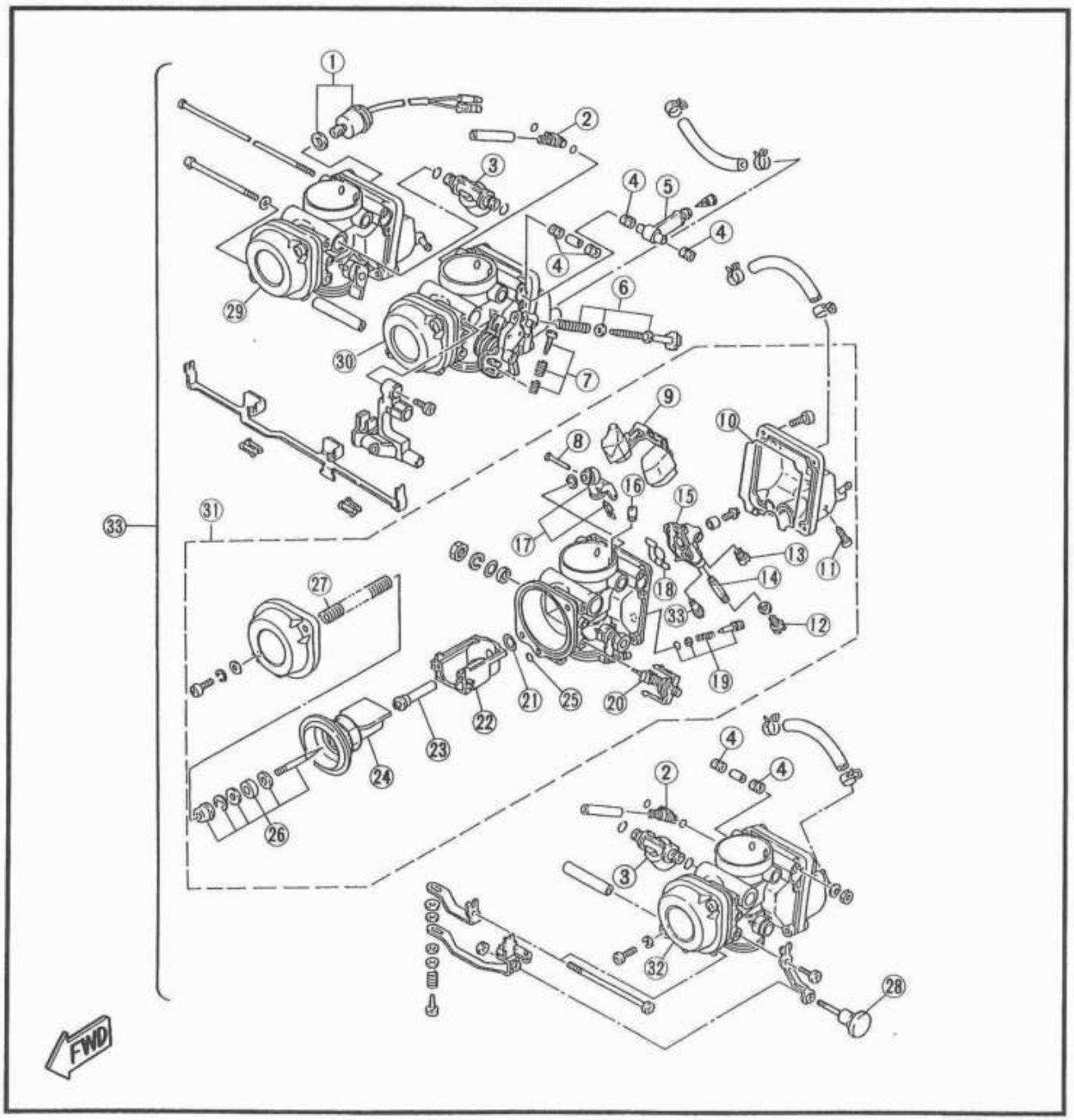
14. Fill:
- Engine oil
  Refer to the "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.

15. Install:
- Cowling
- Fuel tank
- Seat
  Refer to the "SIDE COVER, FUEL TANK AND COWLING" section in the CHAPTER 3.

CARBURETION

CARBURETOR

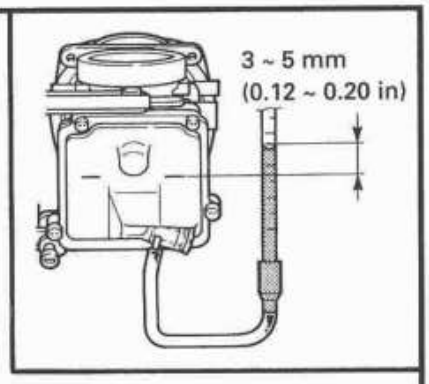
① Thermo switch assembly
② Joint (overflow)
③ Joint (ventilation)
④ Gasket
⑤ Joint (fuel hose)
⑥ Throttle stop screw
⑦ Stop screw
⑧ Float pin
⑨ Float
⑩ Gasket
⑪ Drain screw
⑫ Main jet
⑬ Starter jet
⑭ Holder
⑮ Jet housing
⑯ Pilot air jet
⑰ Needle valve set
⑱ O-ring
⑲ Pilot screw
⑳ Starter plunger
㉑ O-ring
㉒ Throttle valve support
㉓ Needle jet
㉔ Throttle valve assembly
㉕ O-ring
㉖ Jet needle set
㉗ Spring
㉘ Starter lever knob
㉙ Carburetor #4
㉚ Carburetor #3
㉛ Carburetor #2
㉜ Carburetor #1
㉝ Carburetor assembly



① Heat protector
② Union bolt
③ Copper washer
④ Pipe
⑤ Copper washer
⑥ Hose
⑦ Hose
⑧ Body
⑨ Solenoid valve
⑩ Damper
⑪ Holder
⑫ Lead
⑬ Hose
⑭ Plate washer
⑮ Collar
⑯ Grommet

Ⓐ to cylinder head
Ⓑ to cylinder head cover

SPECIFICATIONS		
ID MARK	4BR00/4DS00(D)	4EB00(D,S)
MAIN JET	#1, #4:#105/#2, #3:#102.5	←
MAIN AIR JET	#70	←
PILOT JET	#15	←
PILOT AIR JET 1	#145	←
JET NEEDLE	5CT-3.5	5CT-2.5
PILOT SCREW	2 turns out	←
THROTTLE VALVE	#130	←
ENGINE IDLE SPEED	1,150 ~ 1,250 r/min	←
FUEL LEVEL A	3 ~ 5 mm (0.12 ~ 0.20 in)	←

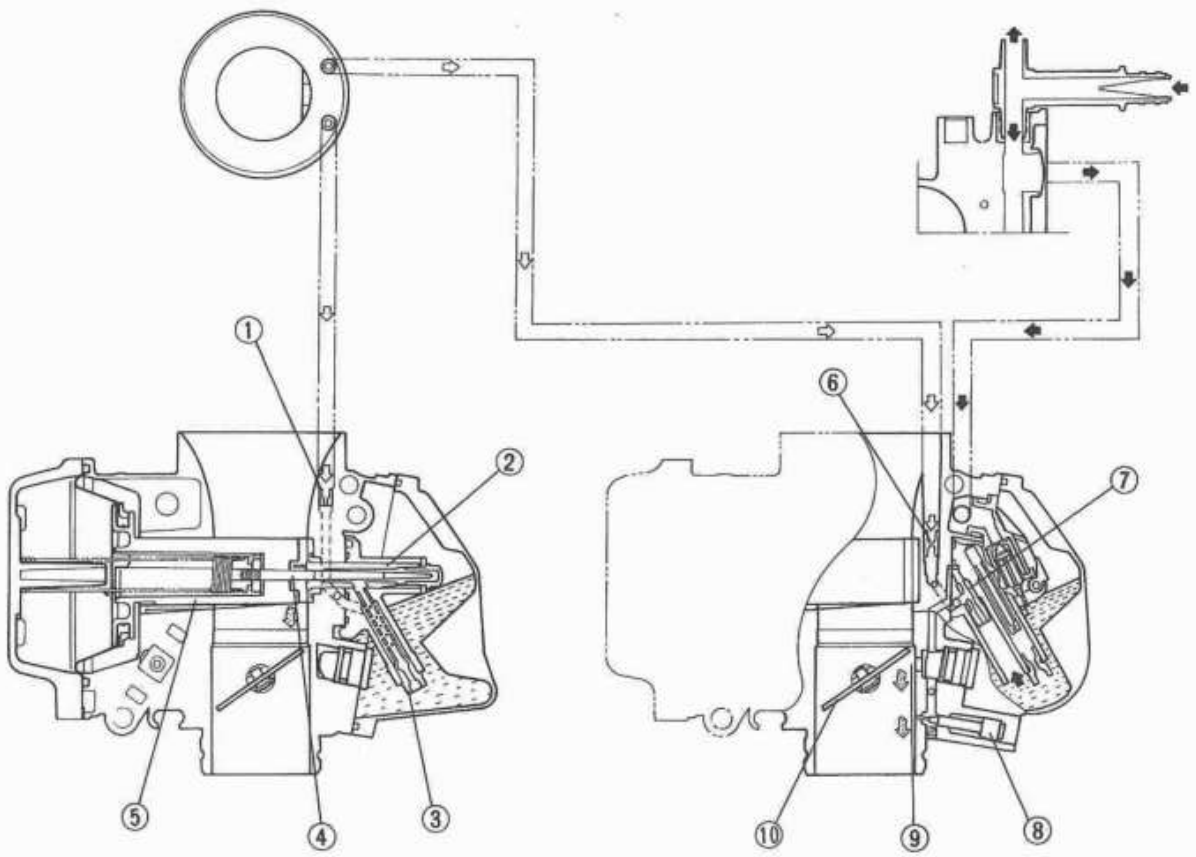


5

SECTION VIEW

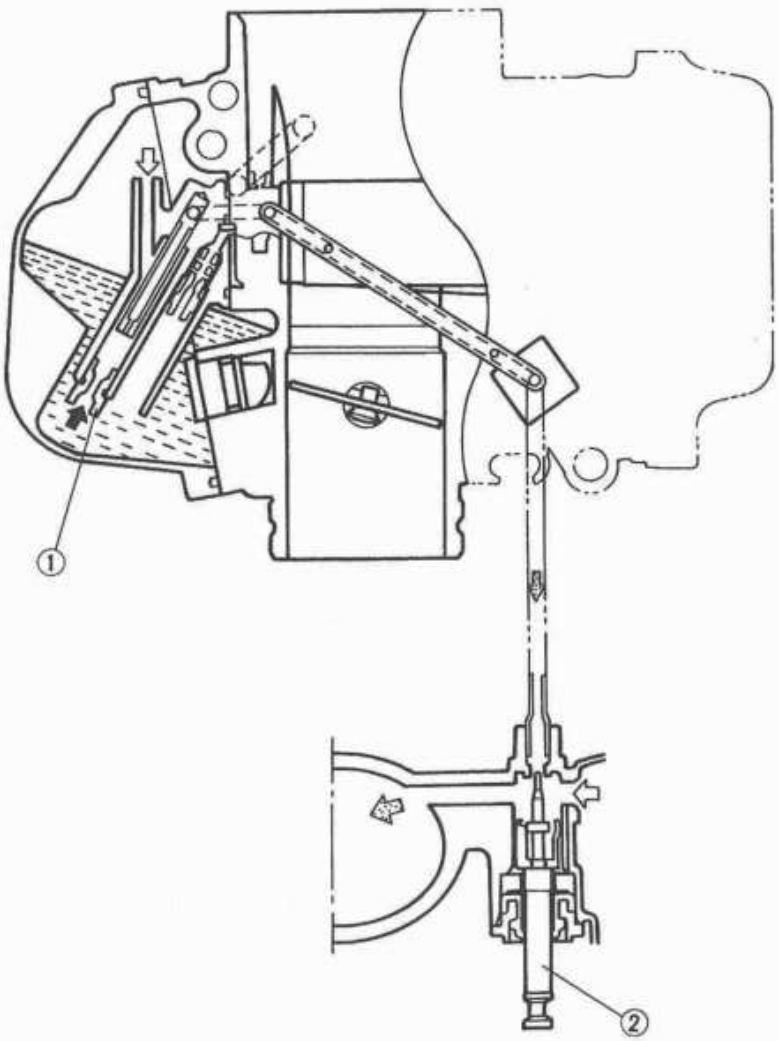
① Main air jet
② Needle jet
③ Main jet
④ Jet needle
⑤ Piston valve
⑥ Pilot air jet
⑦ Pilot jet
⑧ Pilot screw
⑨ By-pass hole
⑩ Throttle valve

A	⇦	AIR
B	⇦	MIXTURE
C	⬅	FUEL



① Starter jet
② Starter plunger

A	⇦	AIR
B	⇦	MIXTURE
C	⬅	FUEL

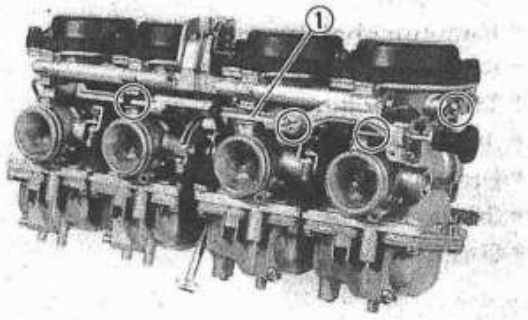


YB705101
REMOVAL
1. Remove:
- Seat
- Fuel tank
  Refer to the "SIDE COVER, FUEL TANK AND COWLING" section in the CHAPTER 3.
- Air filter case
  Refer to the "ENGINE REMOVAL-AIR FILTER CASE" section in the CHAPTER 4.
- Carburetor assembly
  Refer to the "ENGINE REMOVAL-CARBURETOR" section in the CHAPTER 4.

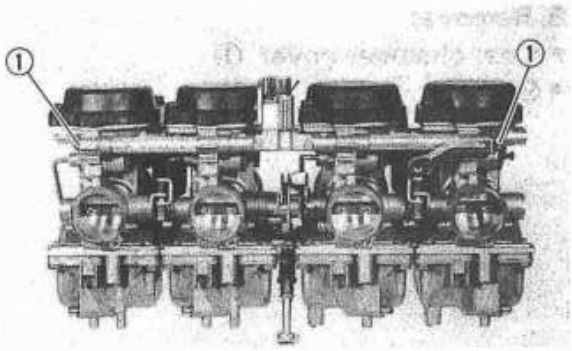
YB705102
DISASSEMBLY

NOTE:
The following parts can be cleaned and inspected without carburetor separation.
(All inner parts except starter plunger can be cleaned and inspected without carburetor separation.)
- Throttle valve
- All jets
- Float
- Needle valve
- Valve seat
- Needle jet
- Jet needle

1. Remove:
- Connecting hoses

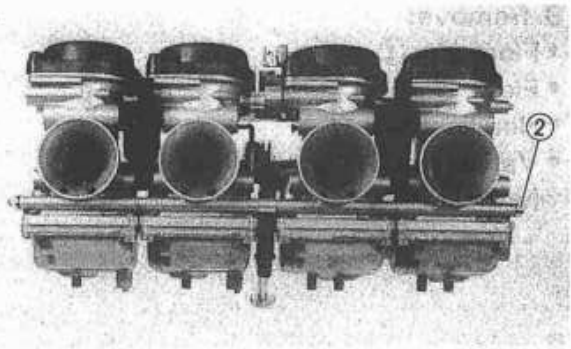


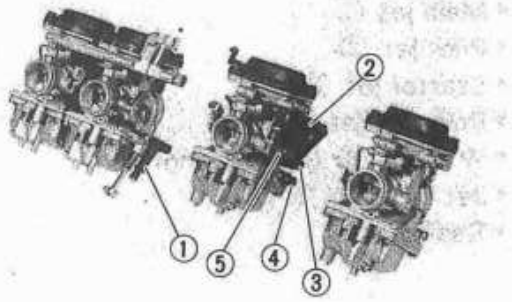
2. Remove:
• Starter lever ①



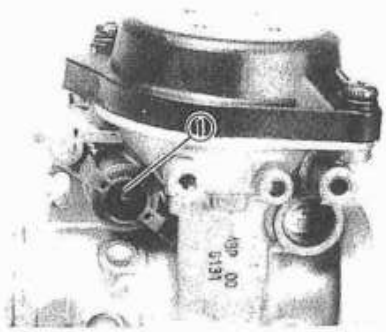
3. Remove:
• Connecting bolts ① (upper)
• Connecting bolt ② (lower)

4. Separate:
• Carburetors



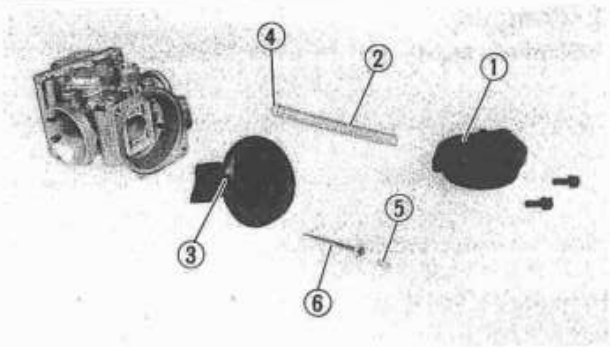


5. Remove:
• Joint ① (fuel hose)
• Joint ② (ventilation hose)
• Joint ③ (overflow hose)
• Joint ④ (fuel feed)
• Spring ⑤

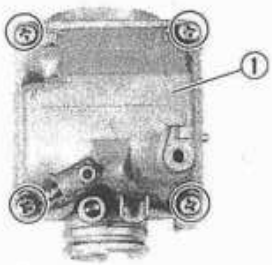


6. Remove:
• Starter plunger ①

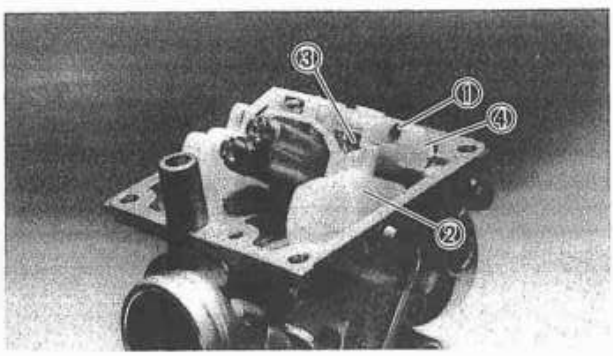
NOTE:
Unhook the hooks from the carburetor body and then pull out the starter plunger.



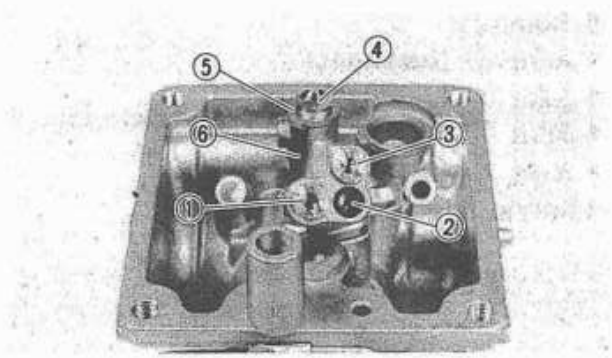
7. Remove:
- Vacuum chamber cover ①
- Spring (throttle valve) ②
- Throttle valve ③
- Jet needle holder ④
- Spring (jet needle holder) ⑤
- Jet needle ⑥
- O-ring



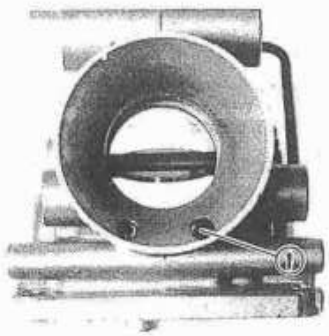
8. Remove:
- Float chamber cover ①
- Gasket



9. Remove:
- Float pin ①
- Float ②
- Needle valve ③
- Valve seat ④
  (with O-ring)



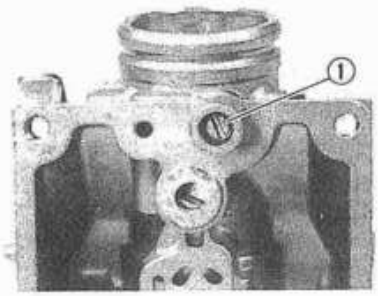
10. Remove:
- Main jet ①
- Pilot jet ②
- Starter jet ③
- Bolt ④ (jet housing)
- Washer ⑤ (jet housing)
- Jet housing ⑥
- Gasket



11. Remove:
- Needle jet
- Thorottle valve support
  (with O-ring)

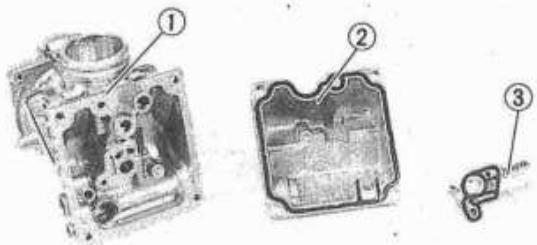
12. Remove:
- Pilot air jet ①

13. Remove:
• Pilot screw ①



YB705103
INSPECTION

1. Inspect:
• Carburetor body ①
• Float chamber ②
• Jet housing ③
Cracks/Damage → Replace.
• Fuel passage
Contamination → Clean as indicated.
• Carburetor float chamber body
Contamination → Clean.

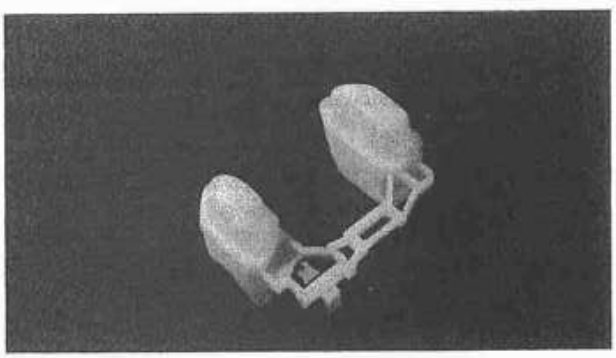


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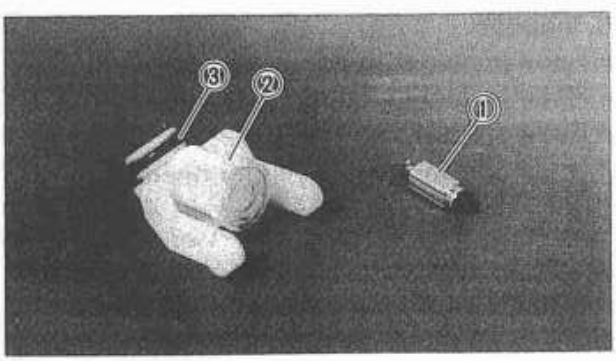
Cleaning steps:
● Wash carburetor in petroleum based solvent. (Do not use any caustic carburetor cleaning solution.)
● Blow out all passages and jets with compressed air.

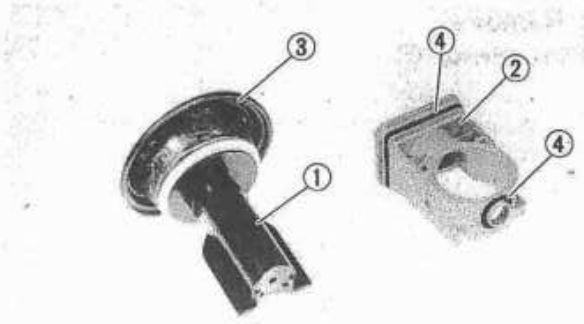
****

2. Inspect:
• Floats
Damage → Replace.



3. Inspect:
• Needle valve ①
• Valve seat ②
• O-ring ③
Damage/Wear/Contamination → Replace as a set.

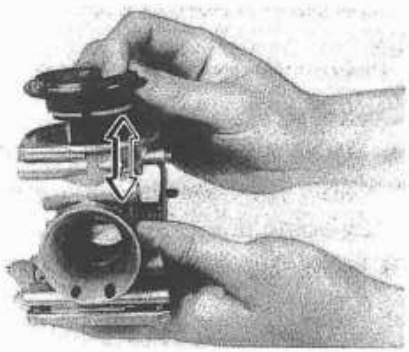




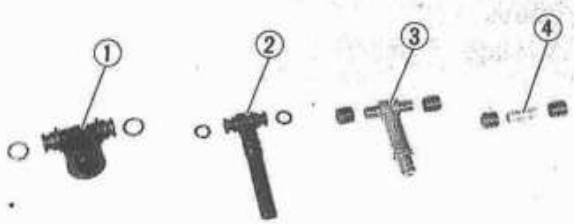
4. Inspect:
- Throttle valve ①
- Throttle valve support ②
  Scratches/Wear/Damage → Replace.
- Rubber diaphragm ③
  Tears → Replace.
- O-rings ④
  Wear/Damage → Replace.



5. Inspect:
- Jet needle ①
- Needle jet ②
- Main jet ③
- Pilot screw ④
- Starter jet ⑤
- Pilot jet ⑥
- Pilot air jet ⑦
- Starter plunger ⑧
  Bends/Wear/Damage → Replace.
  Contamination → Blow out jets with compressed air.

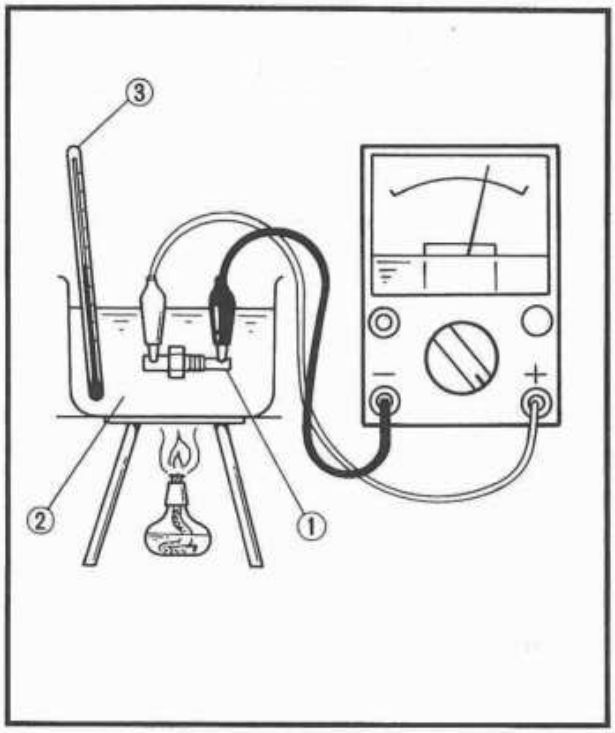


6. Check:
- Free movement
  Insert the throttle valve and throttle valve support into the carburetor body, and check for free movement.
  Stick → Replace.



7. Inspect:
- Joint (ventilation hose) ①
- Joint (overflow hose) ②
- Joint (fuel hose) ③
- Joint (fuel feed) ④
  Cracks/Damage → Replace.

8. Inspect:
- Hose (cylinder head—solenoid valve)
- Hose (solenoid valve—carburetor)
- Hose (carburetor—carburetor)
- Hose (carburetor—cylinder head)
  Damage/Cracks → Replace.



Test step	Water temperature	Good condition
1	Less than 30°C (86 ± 35 °F)	○
2	More than 35°C (95 + 23°F)	×
3*	35 to 23°C (95 to 73.4°F)	×
4*	Less than 23°C (73.4°F)	○

Test 1 & 2; Heat-up tests
Test 3* & 4*; Cool-down tests

○ : Continuity × : No Continuity

9. Inspect:
• Thermo switch
Bad condition → Replace.

****

Inspecting steps:

● Connect the pocket tester (Ω x 1) to the thermo switch ①.

Pocket tester:
P/N 90890-03112

● Immerse the thermo switch in the water ②.

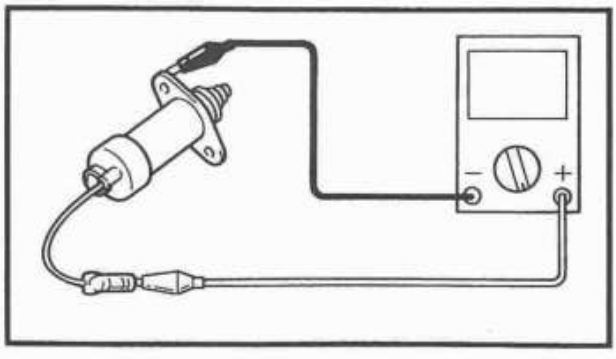
● Check the thermo switch for continuity.
Note temperatures while heating(or cooling) the water with the temperature gauge ③.

⚠WARNING

Handle the thermo switch with special care. Never subject it to strong shock or arrow it to be dropped. Should it be dropped, it must be replaced.

Thermo switch:
14 Nm (1.4 m · kg, 10 ft · lb)
water resistant sealant

****



10. Inspect:
• Solenoid valve
Out of specification → Replace.

****

Inspecting steps:

● Connect the pocket tester to the solenoid valve.

	Pocket tester: **P/N 90890-03112**
	Solenoid valve resistance: **11~15 Ω at 20°C**

****

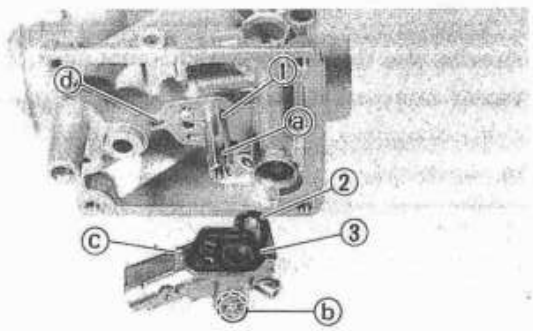
YB705104

ASSEMBLY

Reverse the "DISASSEMBLY" procedures.
Note the following points.

CAUTION:

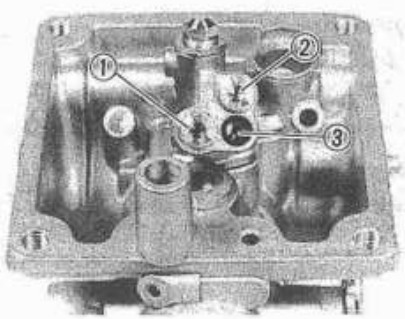
- **Before reassembling, wash all parts in clean petroleum based solvent.**
- **Always use a new gasket.**



1. Install:
- Needle jet ①
- Gasket ②
- Jet housing ③
- Holder (jet housing)
- Bolt (jet housing)

NOTE:

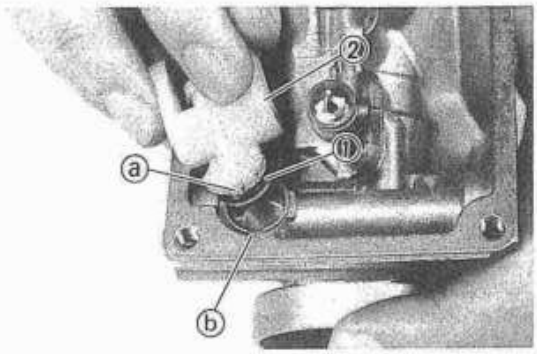
Align the groove ⓐ on the needle jet ① with the projection ⓑ on the jet housing ③ and then align the projection ⓒ on the jet housing ③ with the hole ⓓ on the carburetor body.



2. Install:
- Main jet ①
- Starter jet ②
- Pilot jet ③

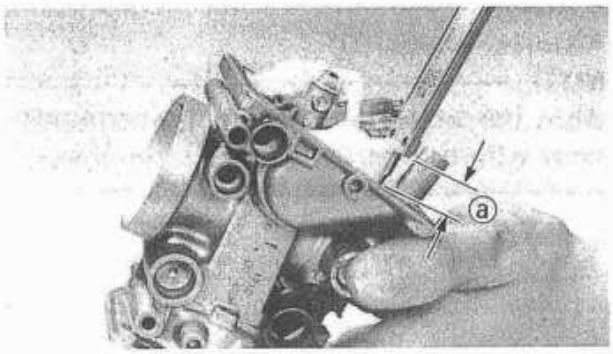
NOTE:

- The jet with a bigger eye is main jet ①.
- The jet with a smaller eye is starter jet ②.



3. Install:
- O-ring ①
- Valve seat ②
- Needle valve
- Float
- Float pin

NOTE:
Align the projection ⓐ on the valve seat with the slot ⓑ on the carburetor body.



4. Measure:
- Float height ⓐ

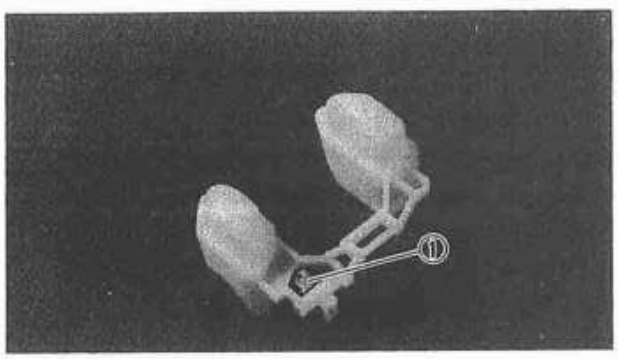
Out of specification → Adjust.

Float height (F.H.):
11~13 mm (0.43~0.51 in)

****

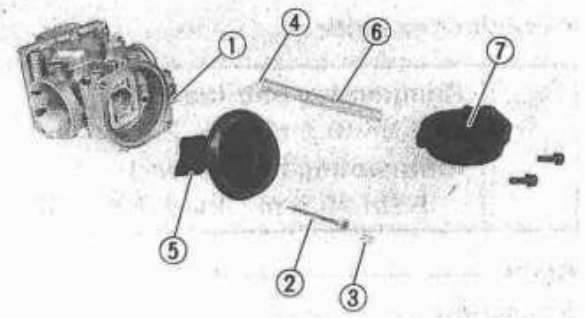
Measurement and adjustment steps:
- Hold the carburetor in an upside down position.
- Measure the distance from the mating surface of the float chamber (gasket removed) to the top of the float.

NOTE:
The float arm should be resting on the needle valve, but not compressing the needle valve.



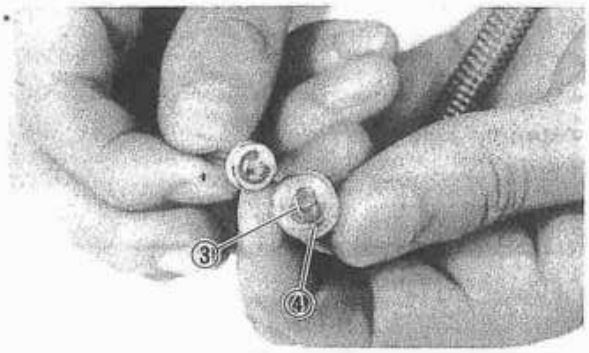
- If the float height is not within specification, inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang ① on the float.
- Recheck the float height.

****

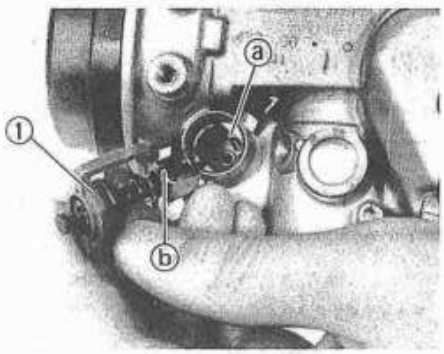


5. Install:
- O-ring ①
- Jet needle ②
- Spring (jet needle holder) ③
- Jet needle holder ④
- Throttle valve ⑤
- Spring ⑥
- Vacuum chamber cover ⑦

NOTE:
Insert the spring ③ onto the spring guide on

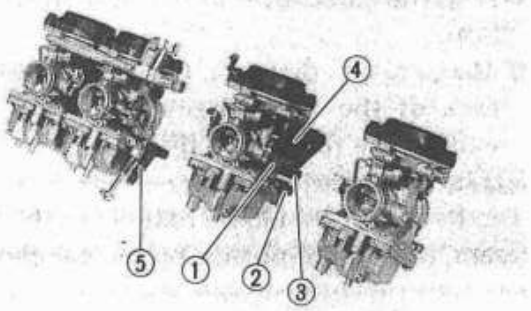


the jet needle holder ④.

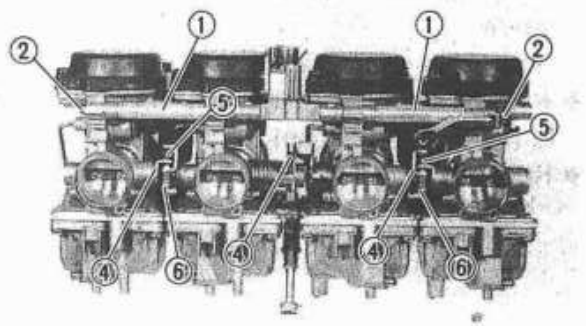


6. Install:
• Starter plunger ①

NOTE:
Align the projection ⓐ of the carburetor body with the slot ⓑ of the starter plunger.

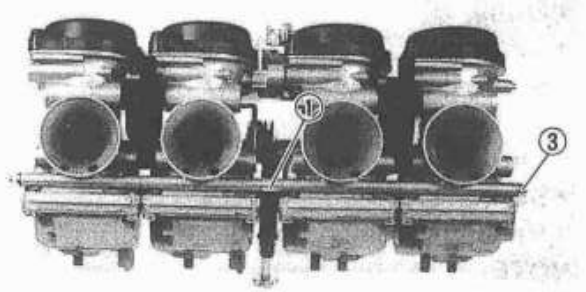


7. Install:
• Carburetors
① Spring
② Joint (fuel feed—with gasket rings)
③ Joint (overflow hose—with O-ring)
④ Joint (ventilation hose—with O-ring)
⑤ Joint (fuel hose—with gasket ring)



8. Install:
• Spacer collars ①
• Connecting bolts ② (upper)
• Connecting bolt ③ (lower)

NOTE:
• Do not tighten the connecting bolts yet.
• Insert the throttle arm ④ (on the #1, #2, #4 carburetors) between the spring ⑤ and synchronizing screw ⑥.



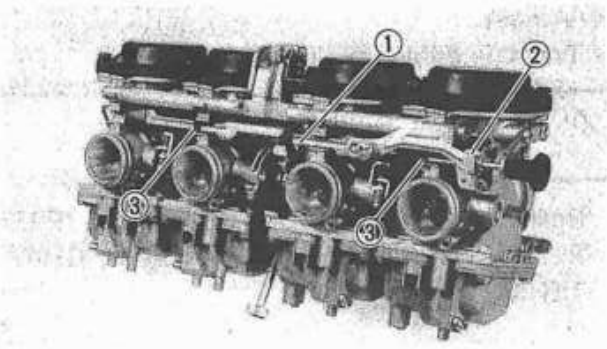
9. Tighten:
• Connecting bolts

	Connecting bolt (upper): **3 Nm(0.3 m · kg, 2.2 ft · lb)** **Connecting bolt (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.



10. Tighten:
- Starter joint ①

NOTE:
- Hook the starter joint arm ② onto each starter plunger.
- Insert the stoppers ③ into the slots on the carburetor body.

11. Install:
- Connecting hoses

YB705105

INSTALLATION

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

1. Install:
- Carburetor joint

NOTE:
- Install the carburetor joint with the "R" mark onto the #1 and #2 carburetors and the carburetor joint with the "L" mark onto the #3 and #4 carburetors.
- The carburetor joints with the "R" and "L" marks should face the carburetor side.

2. Adjust:
- Carburetor synchronization
  Refer to the "CARBURETOR SYNCHRONIZATION" section in the CHAPTER 3.

3. Adjust:
• Idle speed

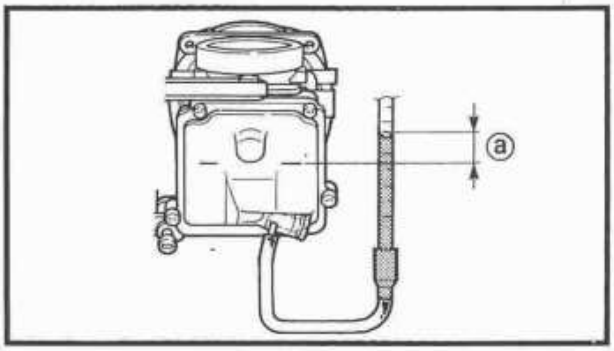
	Engine idle speed: **1,150~1,250 r/min**

Refer to the "IDLE SPEED ADJUSTMENT" section in the CHAPTER 3.

4. Adjust:
• Throttle cable free play

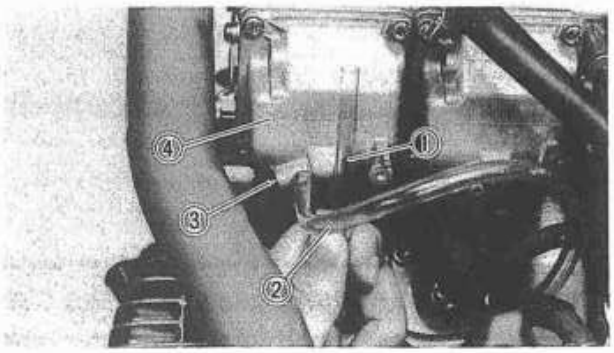
	Throttle cable free play: **3~7 mm (0.12 ~ 0.28 in)**

Refer to the "THROTTLE CABLE FREE PLAY ADJUSTMENT" section in the CHAPTER 3.



YB705106
FUEL LEVEL ADJUSTMENT
1. Measure:
• Fuel level ⓐ
Out of specification → Adjust.

	Fuel level ⓐ : **3 ~ 5 mm (0.12 ~ 0.20 in)** **above float chamber line**

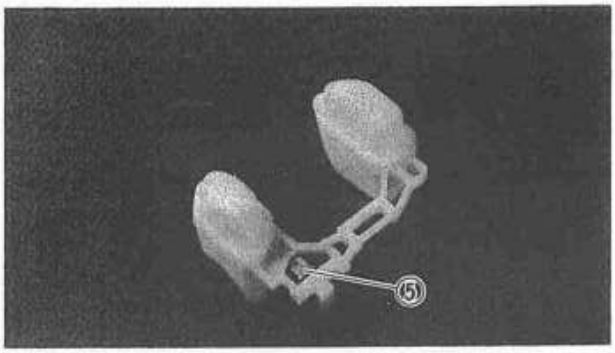


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Fuel level measurement and adjustment steps:
- Place the motorcycle on a level surface.
- Use a garage jack under the engine to ensure that the carburetor is positioned vertically.
- Connect the fuel level gauge ① to the drain pipe ②.

	Fuel level gauge: **P/N 90890-01312**

- Loosen the drain screw ③ and warm up the engine for several minutes.
- Hold the gauge vertically next to the float chamber line ④.
- Measure the fuel level ⓐ with the gauge.



NOTE:
Fuel level readings of both side of carburetor line should be equal.

- If the fuel level is incorrect, adjust the fuel level.
- Remove the carburetor.
- Inspect the valve seat and needle valve.
- If either is worn, replace them both.

- If both are fine, adjust float level by bending the float tang ⑤ slightly.
- Install the carburetor.
- Recheck the fuel level.

****

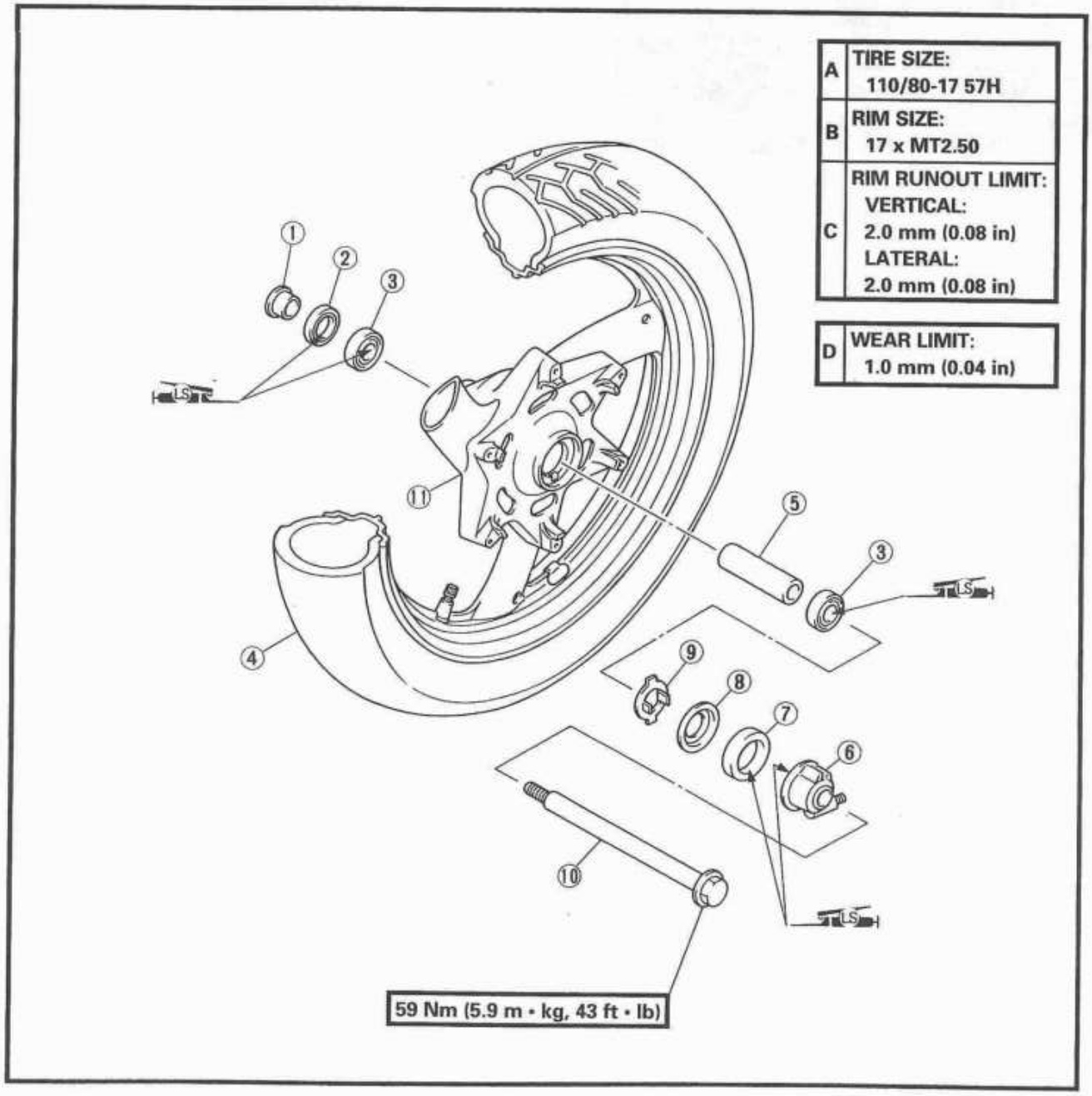
CHASSIS

FRONT WHEEL

① Collar
② Oil seal
③ Bearing
④ Tire
⑤ Spacer
⑥ Gear unit assembly
⑦ Oil seal
⑧ Clutch retainer
⑨ Speedometer clutch
⑩ Wheel axle
⑪ Front wheel

TIRE AIR PRESSURE (COLD):		
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	200 kPa (2.00 kg/cm², 28 psi)	225 kPa (2.25 kg/cm², 33 psi)
90 kg (198 lb) ~ 200 kg (441 lb)*	200 kPa (2.00 kg/cm², 28 psi)	250 kPa (2.50 kg/cm², 36 psi)
High speed riding	200 kPa (2.00 kg/cm², 28 psi)	250 kPa (2.50 kg/cm², 36 psi)

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



YB706101

REMOVAL

⚠ WARNING

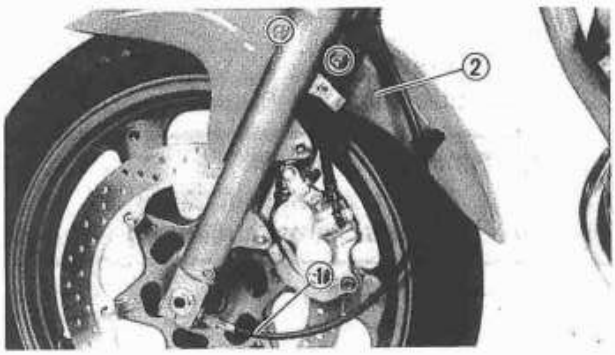
Securely support the motorcycle so there is no danger of it falling over.

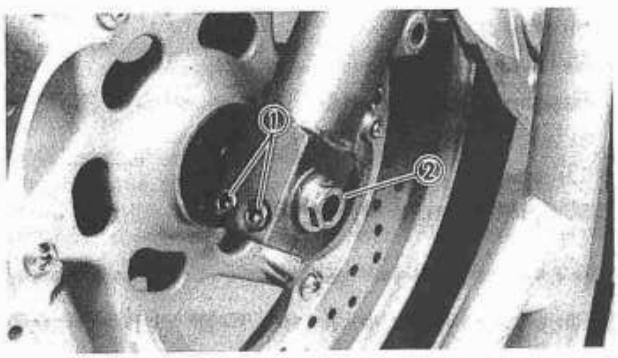
1. Place the motorcycle on a level place.

2. Disconnect:
   • Speedometer cable ①

3. Remove:
   • Front fender ②

4. Elevate the front wheel by placing a suitable stand under the exhaust pipe.



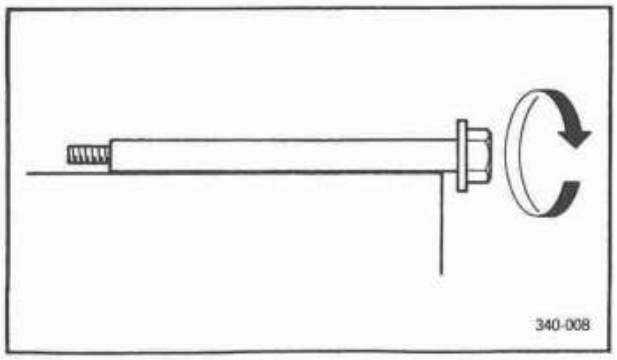


5. Loosen:
   • Pinch bolts (wheel axle) ①

6. Remove:
   • Wheel axle ②
   • Front wheel assembly

NOTE:

Do not depress the brake lever when the wheel is off the motorcycle otherwise the brake pads will be forced shut.



YB706102

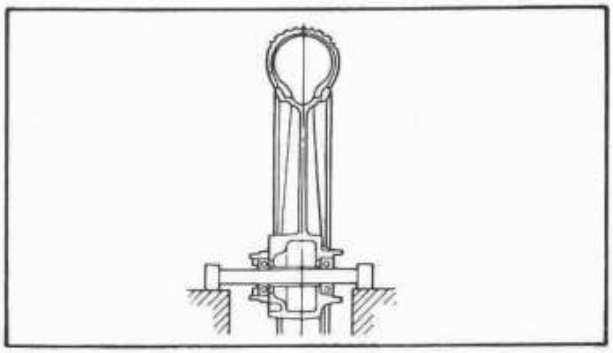
INSPECTION

1. Inspect:
   • Front axle
   Roll the axle on a flat surface.
   Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent axle.

2. Inspect:
- Tire
  Wear/Damage → Replace.
  Refer to the "TIRE INSPECTION" section in the CHAPTER 3.
- Wheel
  Refer to the "WHEEL INSPECTION" section in the CHAPTER 3.



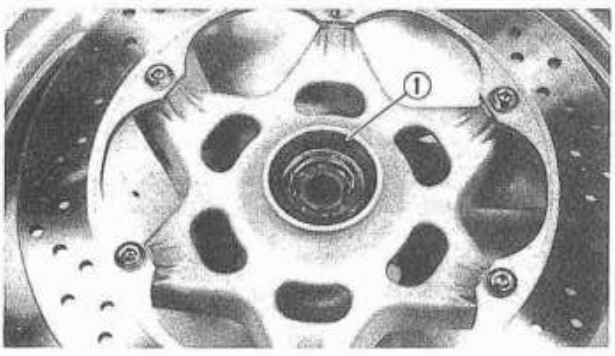
3. Measure:
- Wheel runout
  Over specified limit → Replace.

Rim runout limits:
Radial: 2.0 mm (0.08 in)
Lateral: 2.0 mm (0.08 in)

4. Inspect:
- Wheel bearings
  Bearings allow play in the wheel hub or wheel turns roughly → Replace.
- Oil seals
  Wear/Damage → Replace.

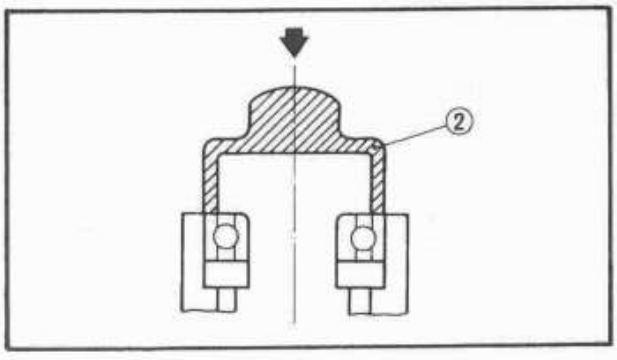
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Wheel bearing and oil seal replacement steps:



- Clean the outside of the wheel hub.
- Remove the oil seals ① use a flat-head screw driver.

NOTE:
Place a rag on the outer edge to prevent damage.



- Remove the bearing using a general bearing puller.
- Install the new bearing and oil seal by reversing the previous steps.

NOTE:
Use a socket ② that matches the outside diameter of the race of the bearing and oil seal.

CAUTION:
Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.

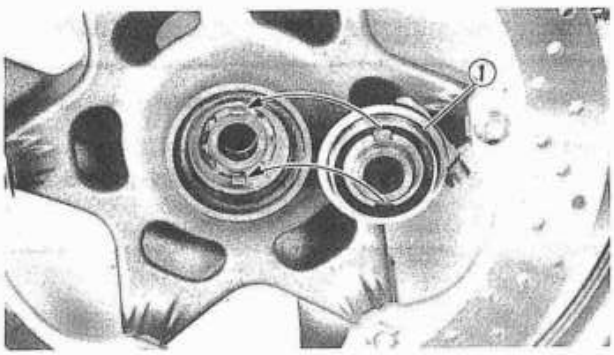
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YB706103
INSTALLATION

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

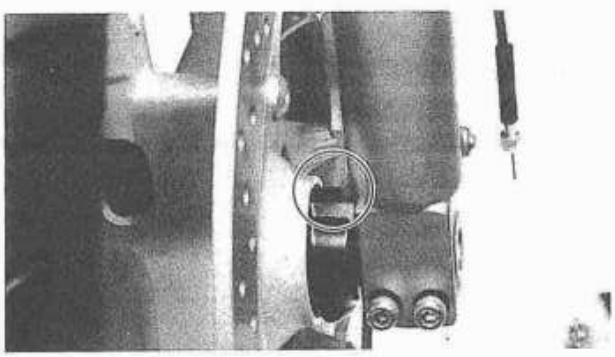
1. Lubricate:
- Front wheel axle
- Bearings
- Oil seal (lips)
- Drive/Driven gear (speedometer)

Recommended lubricant:
Lithium soap base grease



2. Install:
- Speedometer gear unit ①

NOTE:
Be sure the projections on the meter clutch are meshed with the flats in the wheel hub.



3. Install:
- Front wheel

NOTE:
Be sure the boss on the outer fork tube is pressed against the projection on the gear unit housing.

4. Tighten:
- Front wheel axle
- Pinch bolts (wheel axle)

Front wheel axle:
59 Nm (5.9 m · kg, 43 ft · lb)
Pinch bolt (wheel axle):
20 Nm (2.0 m · kg, 14 ft · lb)

CAUTION:

Before tightening the nuts (wheel axle), compress the front forks several times to allow proper fork setting.

5. Install:
- Front fender
- Speedometer cable

	Bolt (front fender): 9 Nm (0.9 m · kg, 6.5 ft · lb)

⚠ WARNING

Make sure that the brake hoses are routed properly.

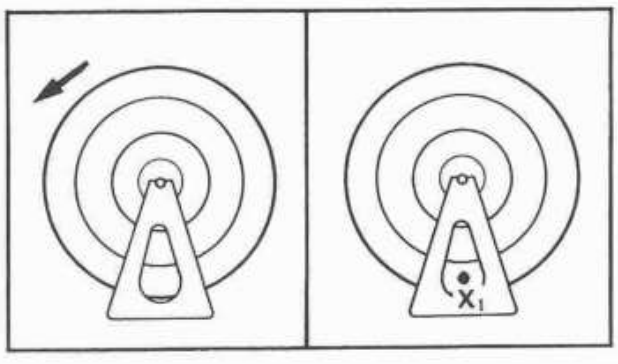
YB706104

STATIC WHEEL BALANCE ADJUSTMENT

NOTE:
- After replacing the tire and/or rim, wheel balancer should be adjusted.
- Adjust the wheel balance with brake disk installed.

1. Remove:
- Balancing weight

2. Set the wheel on a suitable stand.

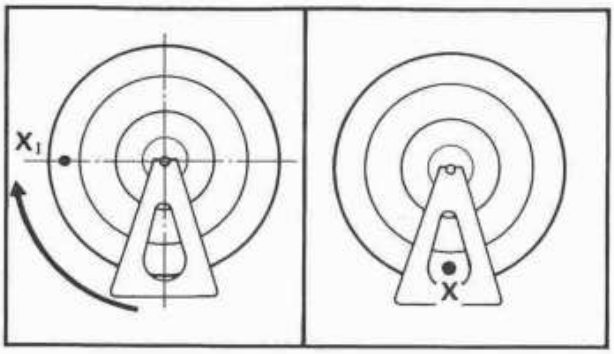


3. Find:
- Heavy spot

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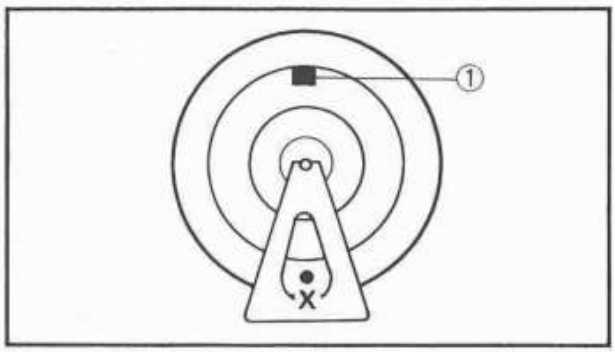
Procedure:

a. Spin the wheel and wait for it to rest.
b. Put an "X_1" mark on the wheel bottom spot.
c. Turn the wheel so that the "X_1" mark is 90 ° up.



d. Left the wheel fall and wait for it to rest. Put an "X_2" mark on the wheel bottom spot.
e. Repeat the above b., c., and d. several times until these marks come to the same spot.
f. This spot is the heavy spot "X".

****

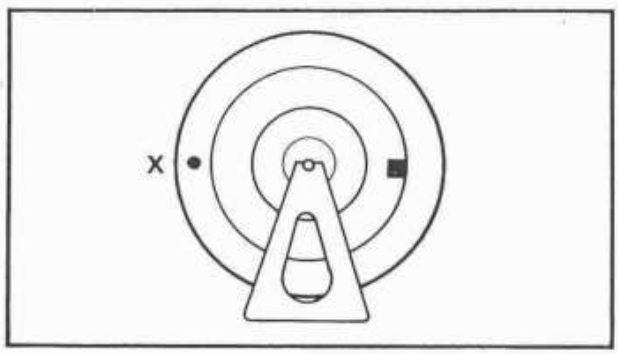


4. Adjust:
• Wheel balance

****

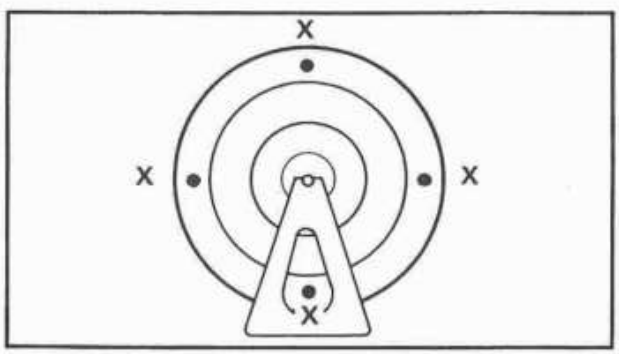
Adjusting steps:
● Install a balancing weight ① on the rim exactly opposite to the heavy spot "X".

NOTE:
Start with the smallest weight.



● Turn the wheel so that the heavy spot is 90° up.
● Check that the heavy spot is at rest there. If not, try another weight until the wheel is balanced.

****



5. Check:
• Wheel balance

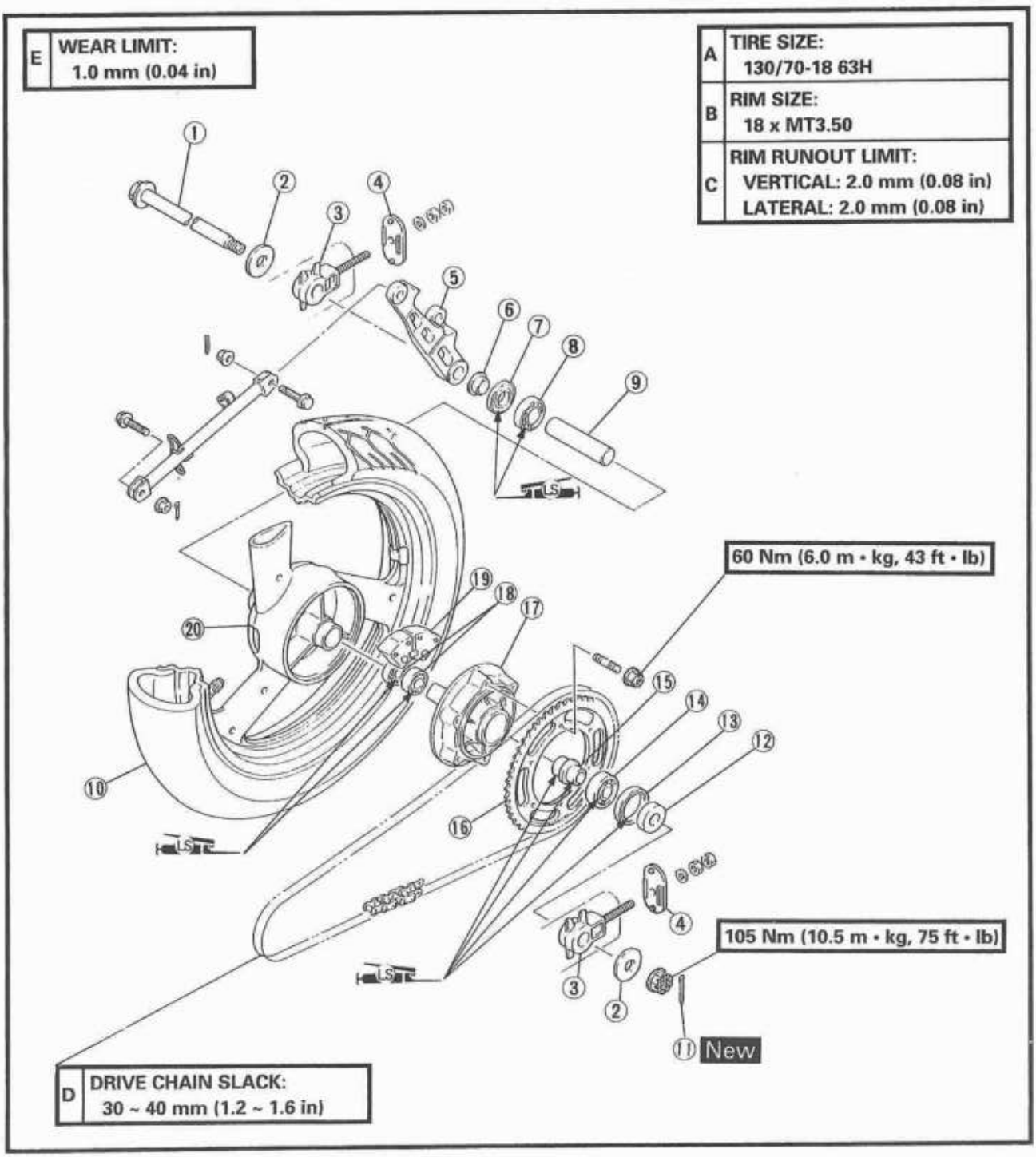
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Checking steps:
● Turn the wheel so that it comes to each point as shown.
● Check that the wheel is at rest at each point. If not, readjust the wheel balance.

****

REAR WHEEL

① Wheel axle
② Plate washer
③ Chain puller
④ End plate
⑤ Caliper bracket
⑥ Collar
⑦ Oil seal
⑧ Bearing
⑨ Spacer
⑩ Tire
⑪ Cotter pin
⑫ Collar
⑬ Oil seal
⑭ Bearing
⑮ Collar
⑯ Rear sprocket wheel
⑰ Clutch hub
⑱ Bearing
⑲ Clutch damper
⑳ Rear wheel



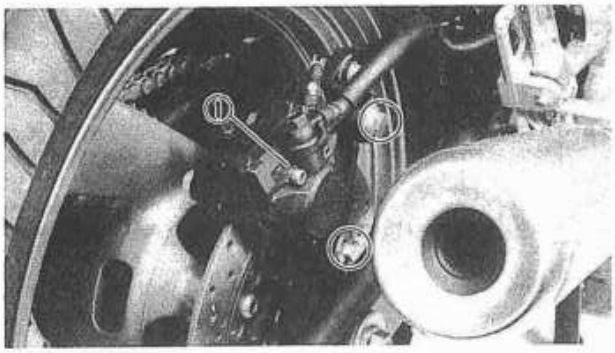
YB706201

REMOVAL

⚠ WARNING

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

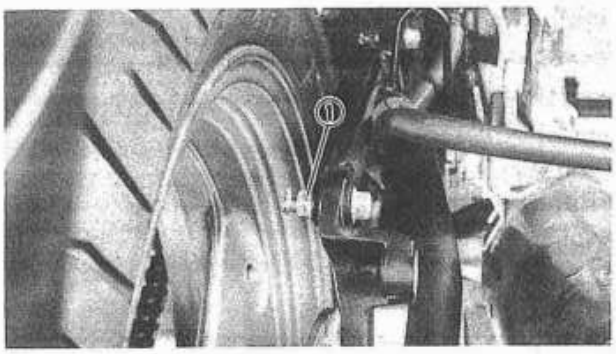
1. Place the motorcycle on a level place.



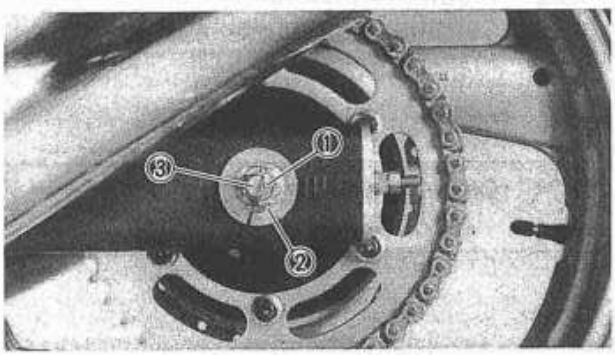
2. Remove:
- Brake caliper ①

NOTE:

Do not depress the brake pedal while the caliper is removed.



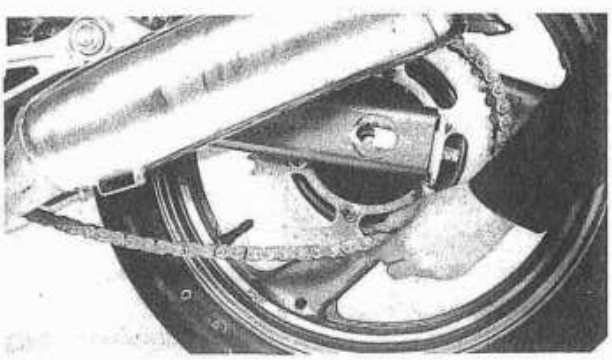
3. Loosen:
- Nut ① (compression bar)



4. Remove:
- Cotter pin ①
- Nut (wheel axle) ②
- Rear wheel axle ③
- Rear wheel assembly

NOTE:

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



YB706202
INSPECTION
1. Inspect:
- Rear wheel axle
- Wheel
- Wheel bearing
- Oil seals

Refer to the "FRONT WHEEL INSPECTION" section.

2. Measure:
- Wheel runout

Refer to the "FRONT WHEEL INSPECTION" section.

YB706203
INSTALLATION
Reverse the "Removal" procedure.
Note the following points.
1. Lubricate:
- Rear wheel axle
- Bearings
- Oil seals



Recommended lubricant:
Lithium soap base grease

2. Adjust:
- Drive chain slack



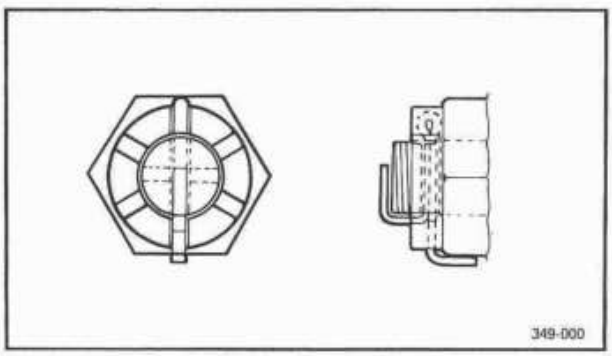
Drive chain slack:
30~40 mm (1.2~1.6 in)

Refer to the "DRIVE CHAIN ADJUSTMENT" section in the CHAPTER 3.

3. Tighten:
- Nut (rear wheel axle)
- Nut (compression bar)
- Bolts (brake caliper)

	Nut (rear wheel axle): **105 Nm (10.5 m · kg, 75 ft · lb)** **Nut (compression bar):** **30 Nm (3.0 m · kg, 22 ft · lb)** **Bolt (brake caliper):** **35 Nm (3.5 m · kg, 25 ft · lb)**

NOTE:
Do not loosen the axle nut after torque tightening.
If the axle nut groove is not aligned with the wheel shaft cotter pin hole, align groove to hole by tightening up on the axle nut.



4. Install:
• Cotter pin

⚠ WARNING
- **Always use a new cotter pin on the axle nut.**
- **Make sure that the brake hose is routed properly.**

YB706204
STATIC WHEEL BALANCE ADJUSTMENT

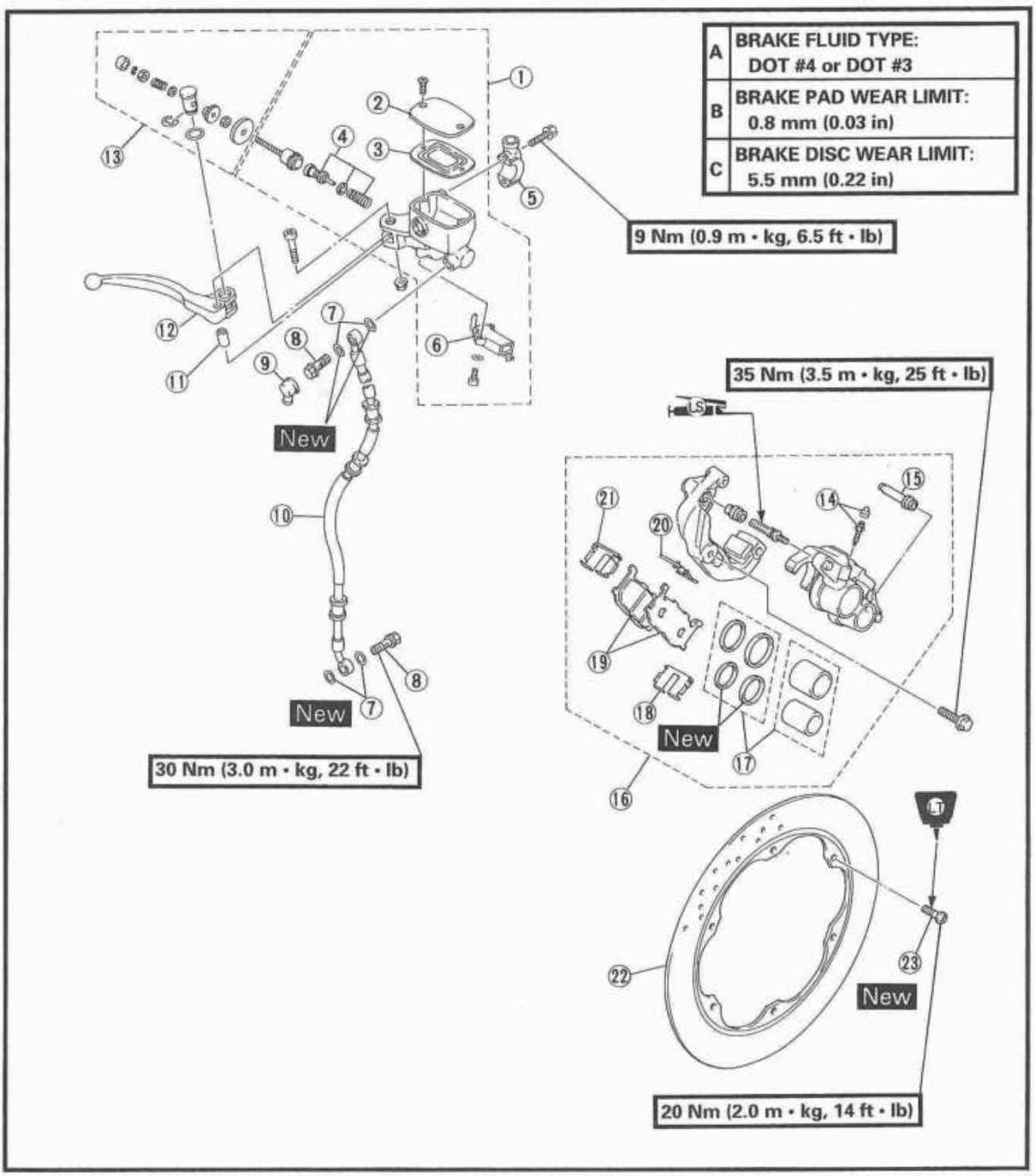
NOTE:
- After replacing the tire and/or rim, wheel balance should be adjusted.
- Adjust the wheel balance with brake disc and hub installed.

1. Adjust:
• Wheel balance
Refer to the "STATIC WHEEL BALANCE ADJUSTMENT—FRONT WHEEL" section.

FRONT AND REAR BRAKE

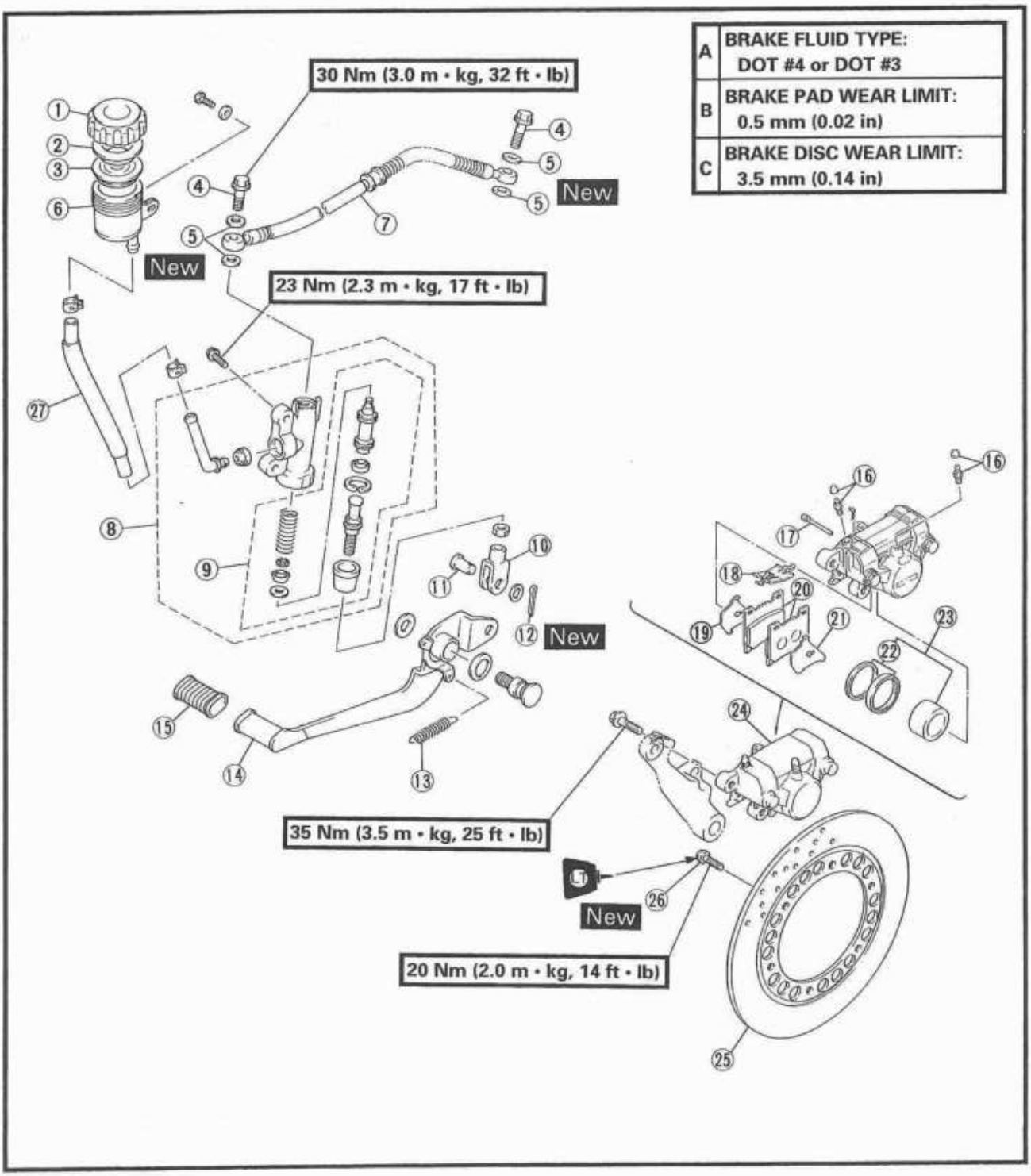
FRONT BRAKE

① Master cylinder assembly
② Master cylinder cap
③ Diaphragm
④ Master cylinder kit
⑤ Master cylinder bracket
⑥ Front brake switch
⑦ Copper washer
⑧ Union bolt
⑨ Dust cover
⑩ Brake hose
⑪ Collar
⑫ Brake lever
⑬ Master cylinder screw kit
⑭ Bleed screw
⑮ Rataining bolt
⑯ Caliper assembly
⑰ Caliper piston assembly
⑱ Pad spring
⑲ Brake pad
⑳ Pad spring
㉑ Pad spring
㉒ Brake disc
㉓ Bolt



REAR BRAKE

① Reservoir cap
② Bush
③ Diaphragm
④ Union bolt
⑤ Copper washer
⑥ Reservoir tank
⑦ Brake hose
⑧ Master cylinder assembly
⑨ Master cylinder kit
⑩ Joint
⑪ Crevis pin
⑫ Cotter pin
⑬ Spring
⑭ Brake pedal
⑮ Cover
⑯ Bleed screw
⑰ Retaining bolt
⑱ Pad spring
⑲ Shim
⑳ Brake pad
㉑ Shim
㉒ Piston seal
㉓ Caliper piston assembly
㉔ Caliper assembly
㉕ Brake disc
㉖ Bolt
㉗ Reservoir hose



A	BRAKE FLUID TYPE: DOT #4 or DOT #3
B	BRAKE PAD WEAR LIMIT: 0.5 mm (0.02 in)
C	BRAKE DISC WEAR LIMIT: 3.5 mm (0.14 in)

YB706301

CAUTION:

Disc brake components rarely require disassembly. DO NOT:

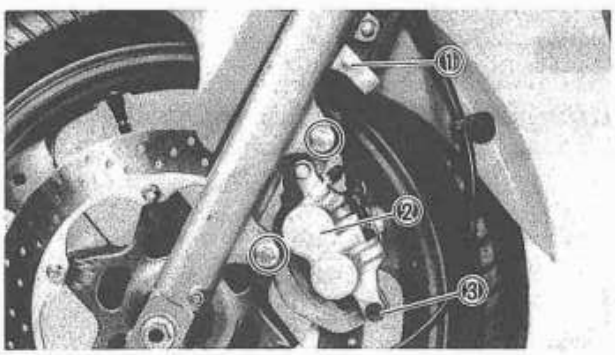
- **Disassembly components unless absolutely necessary.**
- **Use solvents on internal brake component.**
- **Use contaminated brake fluid for cleaning.**
- **Allow brake fluid to came in contact with the eyes otherwise eye injury may occur.**
- **Allow brake fluid to contact painted surfaces or plastic parts otherwise damage may occur.**
- **Disconnect any hydraulic connection otherwise the entire system must be disassembled, drained, cleaned, and then properly filled and bled after reassembly.**

YB706302

BRAKE PAD REPLACEMENT

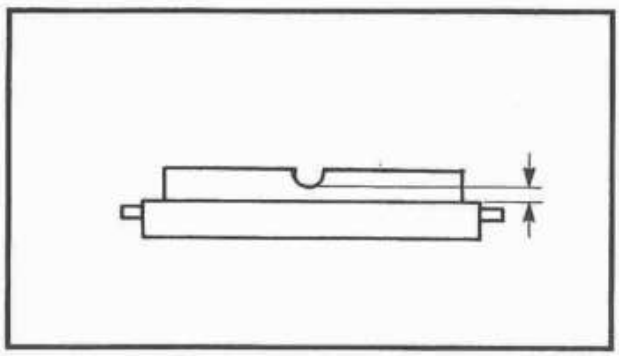
NOTE:

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.



Front brake

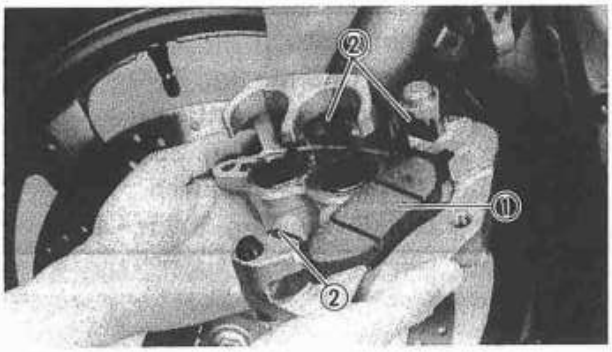
1. Remove:
- Bolt (brake hose holder) ①
- Caliper assembly ②
- Retaining bolt ③

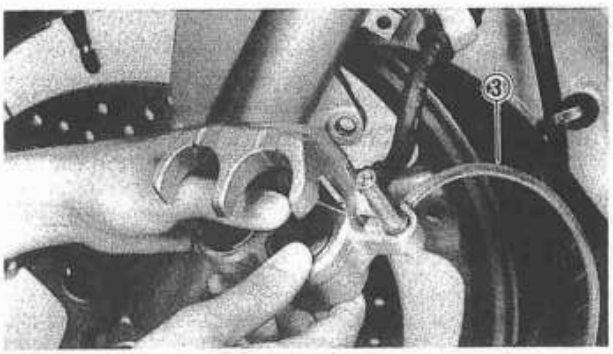


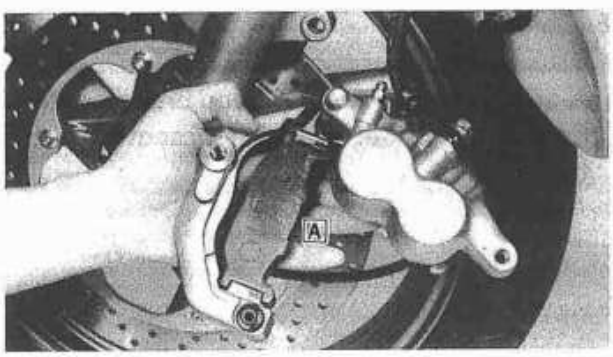
2. Remove:
- Brake pads

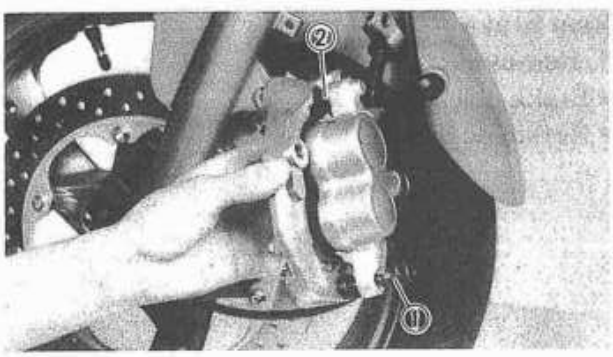
NOTE:

- Replace the pad spring if the pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit.









Wear limit:
0.8 mm (0.03 in)

4. Install:
- Brake pads ①
- Pad springs ②

****

Installation steps:

- Connect a suitable hose ③ tightly to the caliper bleed screw. Then, place the other end of this hose into an open container.
- Loosen the caliper bleed screw and push the piston into the caliper by your finger.
- Tighten the caliper bleed screw.

Caliper bleed screw:
6 Nm (0.6 m · kg, 4.3 ft · lb)

- Be careful to install the pad springs in proper position as shown.
- Install the brake pads.

NOTE:

Be sure to position the pad so that its round side [A] is backward.

****

5. Lubricate:
- Retaining bolt ① (caliper body)
- Caliper guide shaft ②

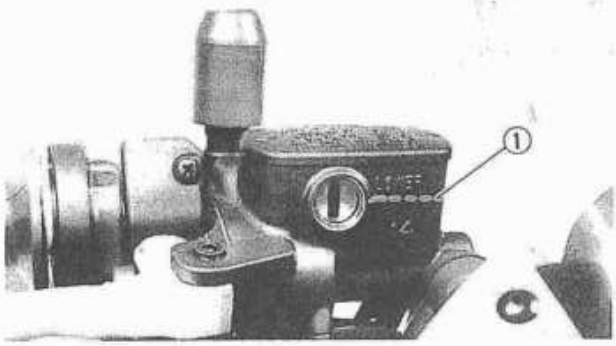
Recommended lubricant:
Lithium soap base grease

CAUTION:

- **Take care not to allow the brake pads to be smeared by grease.**
- **Wipe off any unnecessary grease that comes out of place.**

6. Install:
- Retaining bolt
- Caliper assembly
- Brake hose holder

	Retaining bolt: **23 Nm (2.3 m · kg, 17 ft · lb)** **Bolt (caliper bracket):** **35 Nm (3.5 m · kg, 25 ft · lb)** **Bolt (brake hose holder):** **7 Nm (0.7 m · kg, 5.1 ft · lb)**



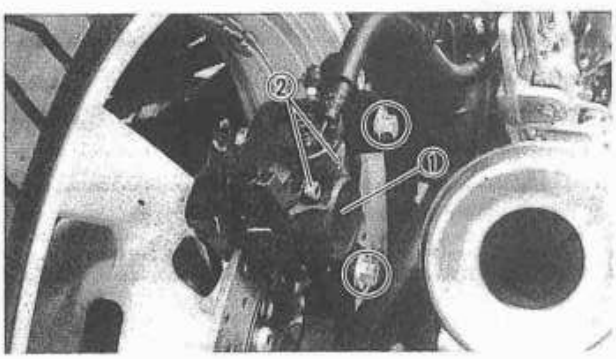
7. Inspect:
- Brake fluid level
  Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

① "LOWER" level line

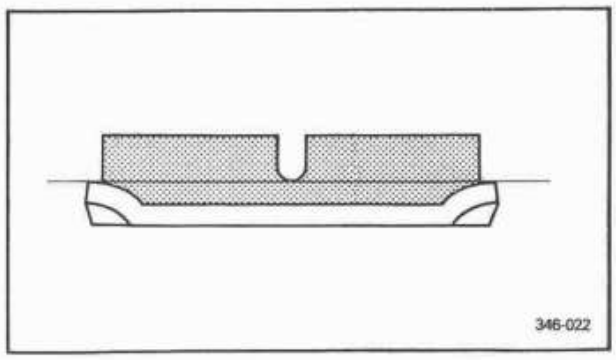
8. Check:
- Brake lever operation
  A soft spongy filling → Bleed brake system.
  Refer to the "AIR BLEEDING" section in the CHAPTER 3.

YB706303

Rear brake



1. Remove:
- Brake caliper ①
- Retaining bolt ②

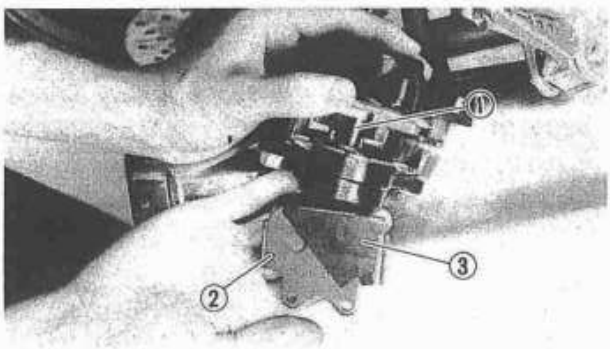


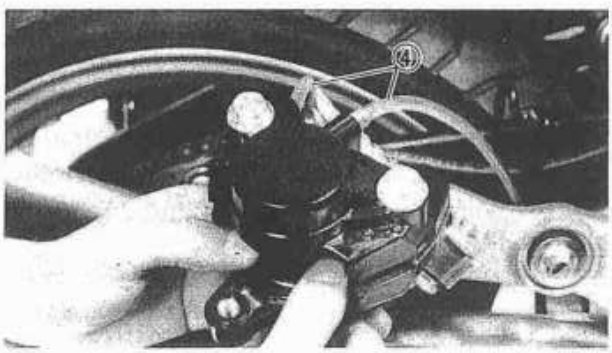
2. Remove:
- Brake pads
  (with shims)

NOTE:
- Replace the pad spring if the pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit.

	Wear limit: **0.5 mm (0.02 in)**

- Replace the pad shim if the pad replacement is required.





3. Install:
- Pad spring ①
- Brake pads ②
- Shims ③

****

Installation steps:
- Connect a suitable hose ④ tightly to the caliper bleed screw. Then, place the other end of this hose into an open container.
- Loosen the caliper bleed screw and push the piston into the caliper by your finger.
- Tighten the caliper bleed screw.

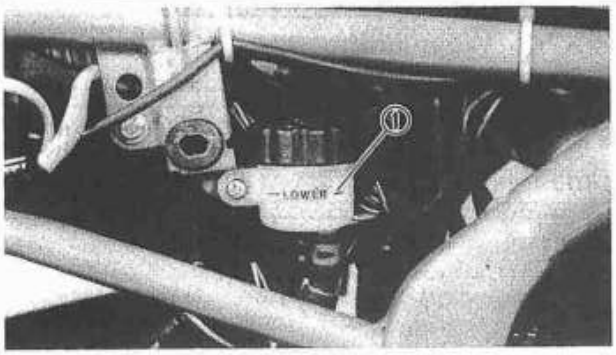
	Caliper bleed screw: **6 Nm (0.6 m · kg, 4.3 ft · lb)**

- Install the pad shim (new) to the brake pad (new).
- Install the pad spring (new) and brake pads (new).

****

4. Install:
- Retaining bolts
- Brake caliper

	Retaining bolt: **10 Nm (1.0 m · kg, 7.2 ft · lb)** **Bolt (brake caliper):** **35 Nm (3.5 m · kg, 25 ft · lb)**



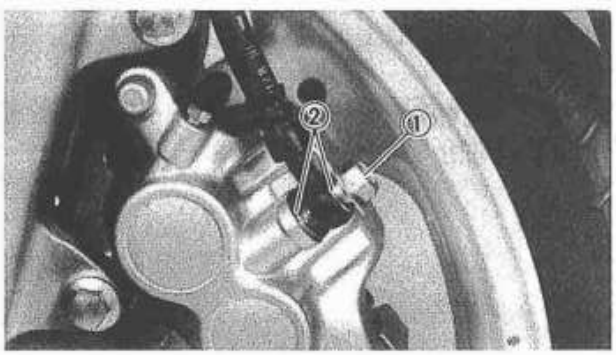
5. Inspect:
- Brake fluid level
  Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

① "LOWER" level line

6. Check:
- Brake pedal operation
  A softy or spongy filling → Bleed brake system.
  Refer to the "AIR BLEEDING" section in the CHAPTER 3.

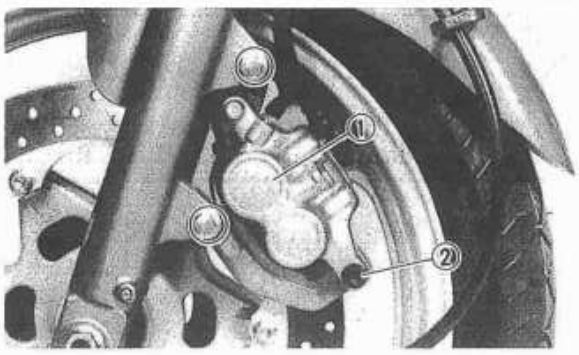
YB706304
CALIPER DISASSEMBLY

NOTE:
Before disassembling the front brake caliper or rear brake caliper, drain the brake hose, master cylinder, brake caliper and reservoir tank of their brake fluid.

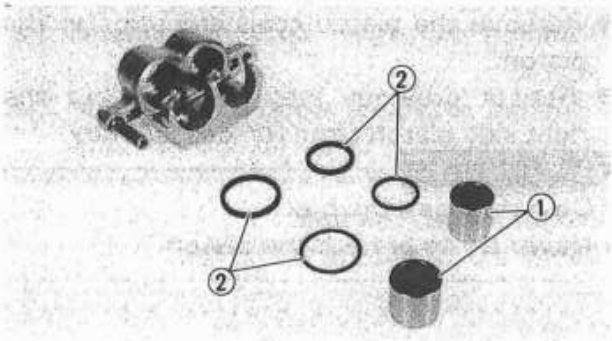


Front brake
1. Remove:
- Union bolt ①
- Copper washers ②

NOTE:
Place the open hose end into a container and pump the oil fluid out carefully.



2. Remove:
- Caliper assembly ①
- Retaining bolt ②
- Brake pads
- Pad springs



3. Remove:
- Pistons ①
- Piston seals ②

****

Removal steps:

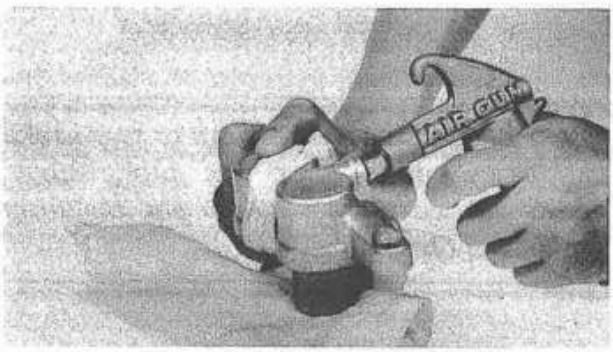
- Blow compressed air into the hose joint opening to force out the caliper piston from the caliper body.

⚠ WARNING

- **Never try to pry out the piston.**
- **Cover the piston with a rag. Use care so that piston does not cause injury as it is expelled from the cylinder.**

- Remove the piston seals.

****



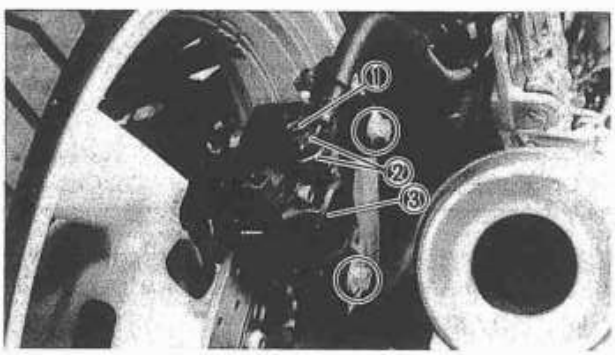
YB706305

Rear brake

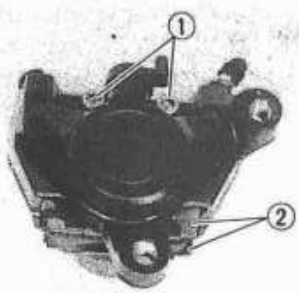
1. Remove:
- Union bolt ①
- Copper washers ②
- Brake caliper ③

NOTE:

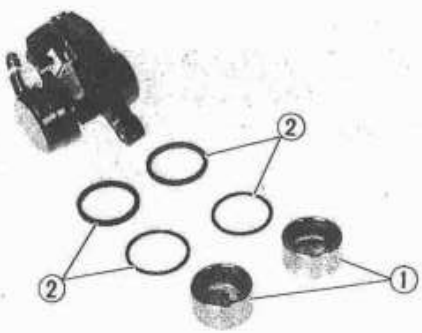
Place the open hose end into a container and pump the oil fluid out carefully.



2. Remove:
- Retaining bolts ①
- Brake pads ②



3. Remove:
- Pistons ①
- Piston seals ②



****

Caliper piston removal steps:

- Using a wood piece, lock the piston.
- Blow compressed air into the hose joint opening to force out the left side piston from the caliper body.



- Remove the piston seals and reinstall the piston.
- Repeat previous step to force out the right side piston from the caliper body.

⚠ WARNING

• Do not loosen the bolt.
• Never try to pry out the piston.

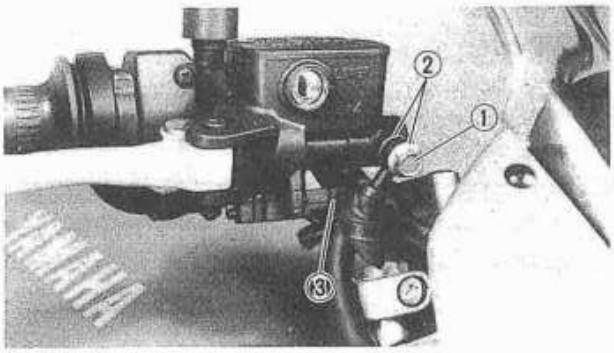
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YB706306

MASTER CYLINDER DISASSEMBLY

NOTE:

Before disassembling the front or rear brake master cylinders, drain the brake hose, master cylinder, brake caliper and reservoir tank of their brake fluid.

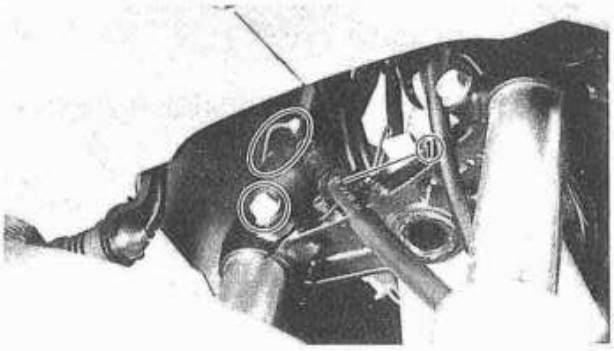


Front brake

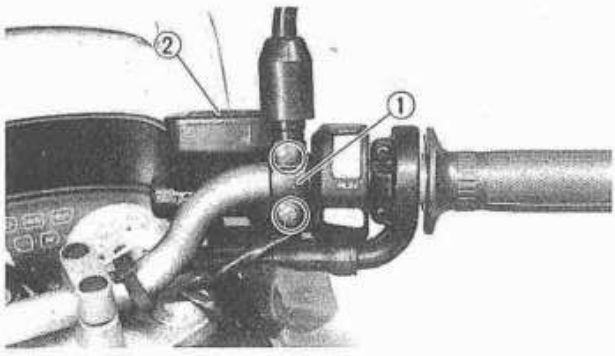
1. Remove:
- Union bolt ①
- Copper washers ②
- Brake switch lead ③

NOTE:

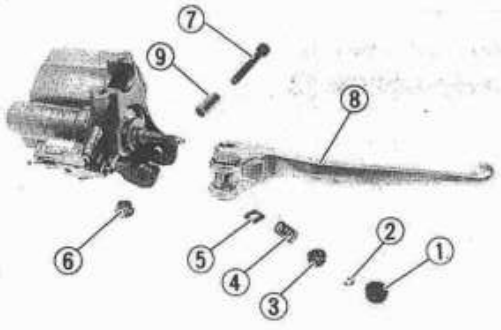
Disconnect the brake switch from the brake lever while the hook of the brake switch is pushed by suitable rod.

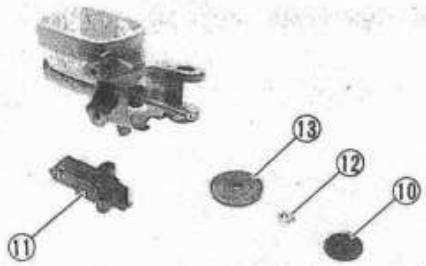


2. Remove:
- Brake hose ①



3. Remove:
- Master cylinder bracket ①
- Master cylinder cap ②
- Diaphragm
- Plate

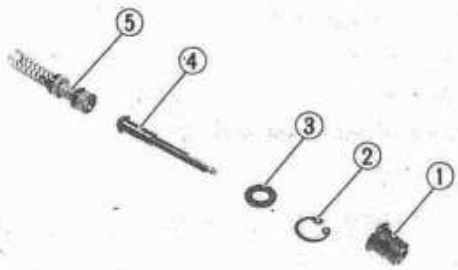




4. Remove:
- Cap ① (rubber)
- Circlip ②
- Nut ③
- Spring ④
- Washer ⑤
- Nut ⑥
- Bolt ⑦ (brake lever)
- Brake lever ⑧
- Collar ⑨
- Adjuster ⑩
- Brake switch ⑪
- Nut ⑫
- Plate ⑬

CAUTION:

Do not damage the rod threads.



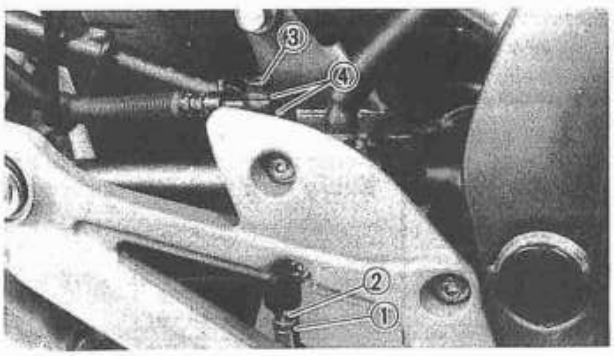
5. Remove:
- Dust cover ①
- Circlip ②
- Plate washer ③
- Rod ④
- Master cylinder kit ⑤

YB706307

Rear brake

1. Remove:
- Seat
- Side cover (right)

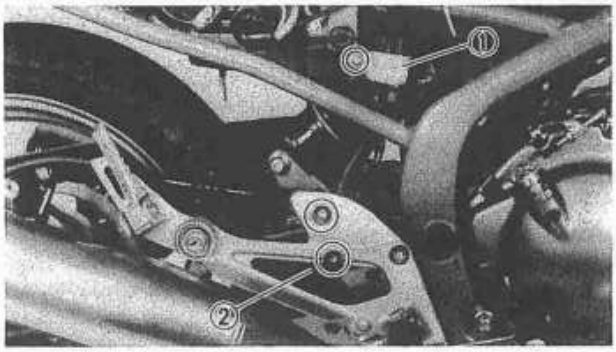
Refer to the "SIDE COVER, FUEL TANK AND COWLING" section in the CHAPTER 3.



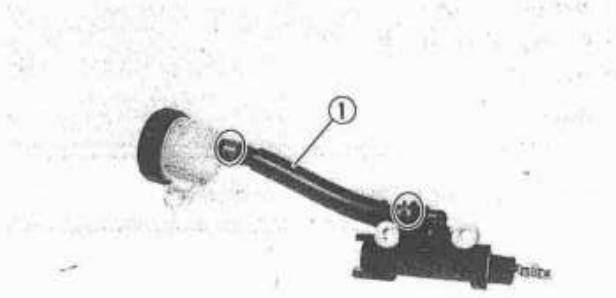
2. Loosen:
- Locknut ①

3. Disconnect:
- Brake adjuster ②

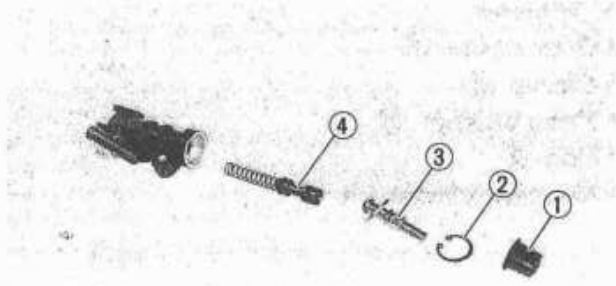
4. Remove:
- Union bolt ③
- Copper washers ④



5. Remove:
- Reservoir tank ①
- Master cylinder ②



6. Remove:
- Hose (reservoir tank) ①



7. Remove:
- Dust cover ①
- Circlip ②
- Rod ③
- Master cylinder kit ④

YB706308

INSPECTION AND REPAIR

Recommended brake component replacement schedule:

Brake pads	**As required**
Piston seal, Dust seal	**Every two years**
Brake hoses	**Every four years**
Brake fluid	**Replace only when brakes are disassembled.**

⚠ WARNING

All internal parts should be cleaned in new brake fluid only. Do not use solvents will cause seals to swell and distort.

A B



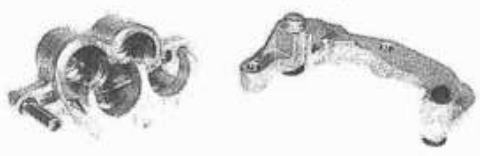
1. Inspect:
- Caliper piston
  Scratches/Rust/Wear → Replace caliper assembly.
- Caliper cylinder
  Wear/Scratches → Replace caliper assembly.

A Front
B Rear

⚠ WARNING

Replace the piston seals whenever a caliper is disassembled.

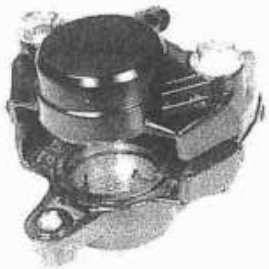
A

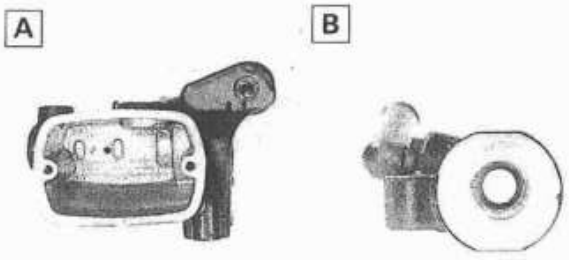


2. Inspect:
- Caliper body
- Caliper bracket
  Cracks/Damage → Replace.
- Oil delivery passage (caliper body)
  Blow out with compressed air.

A Front
B Rear

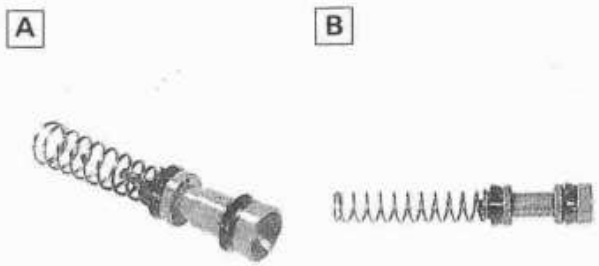
B





3. Inspect:
- Master cylinder
  Wear/Scratches → Replace the master cylinder assembly.
- Master cylinder body
  Cracks/Damage → Replace.
- Oil delivery passage (master cylinder body)
  Blow out with compressed air.

A Front
B Rear



4. Inspect:
- Master cylinder kit
  Scratches/Wear/Damage → Replace as a set.

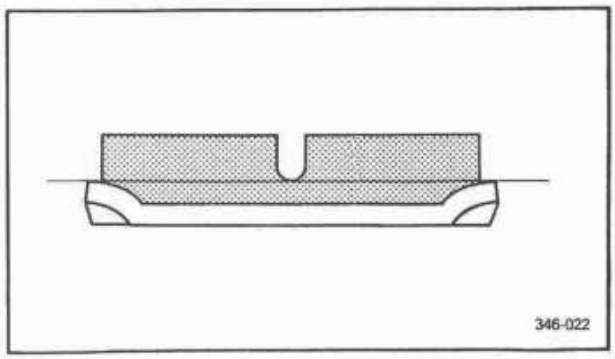
A Front
B Rear



5. Inspect:
- Reservoir tank
  Cracks/Damage → Replace.
- Diaphragm (front)
- Diaphragm (rear)
  Wear/Damage → Replace.



6. Inspect:
- Brake hose
  Cracks/Wear/Damage → Replace.

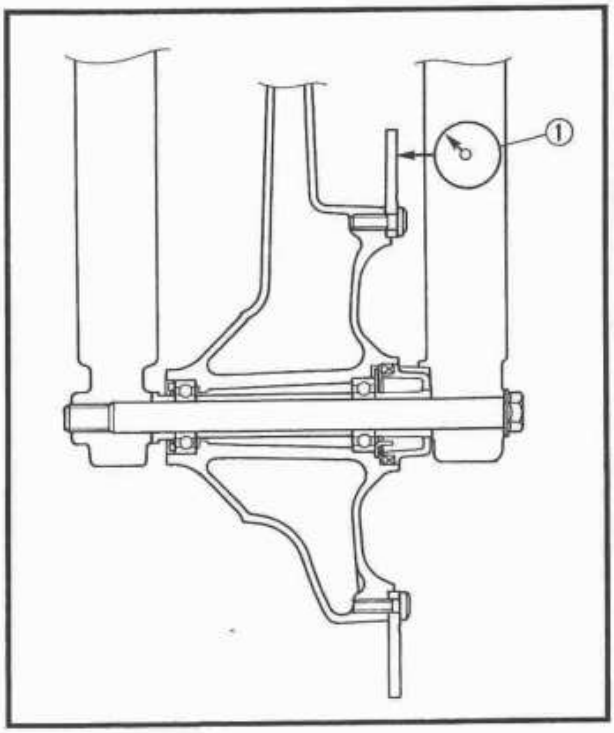


7. Measure:
- Brake pads (thickness)
  Out of specification → Replace.

	Wear limit: **Front 0.8 mm (0.03 in)** **Rear 0.5 mm (0.02 in)**

NOTE:
- Replace the pad spring as a set if pad replacement is required.
- Replace the pad as a set if either if found to be worn to the wear limit.

8. Inspect:
- Brake discs (front and rear)
  Galling/Damage → Replace.



9. Measure:
- Brake disc deflection
  Out of specification → Inspect wheel runout.
  If wheel runout is in good condition, replace the brake disc(s).

Maximum deflection:
0.15 mm (0.006 in)

- Brake disc thickness
  Out of specification → Replace.

Minimum thickness:
Front 5.5 mm (0.22 in)
Rear 3.5 mm (0.14 in)

① Dial gauge

NOTE:
Tighten the bolts (brake disc) in stage using a crisscross pattern.

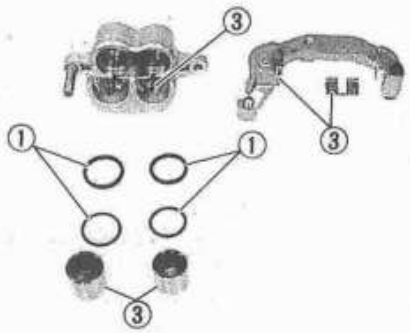
Bolt (brake disc):
20 Nm (2.0 m · kg, 14 ft · lb)
Loctite®

YB706309
CALIPER ASSEMBLY

⚠ WARNING
- **All internal parts should be cleaned in new brake fluid only.**
- **Internal parts should be lubricated with brake fluid when installed.**

	Recommended brake fluid: **DOT #3 or #4**

- **Replace the piston seals whenever a caliper is disassembled.**



Front brake

1. Install:
- Piston seals ①
- Caliper pistons ②
- Pad spring ③

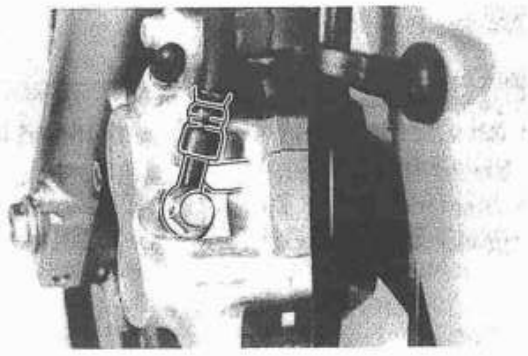
⚠ WARNING

Always use new piston seals.

2. Install:
- Brake pads
- Caliper body
- Caliper bracket

Refer to the "BRAKE PAD REPLACEMENT" section.

	Retaining bolt (caliper body): **23 Nm (2.3 m · kg, 17 ft · lb)** **Bolt (caliper bracket):** **35 Nm (3.5 m · kg, 25 ft · lb)**



3. Install:
- Brake hose
- Copper washers
- Union bolts

	Union bolt: **30 Nm (3.0 m · kg, 22 ft · lb)**

CAUTION:

When installing the brake hose to the caliper, lightly touch the brake pipe with the projection on the caliper.

⚠WARNING

- **Proper hose routing is essential to insure safe motorcycle operation. Refer to " CABLE ROUTING".**
- **Always use new copper washers.**

4. Fill:
- Brake fluid

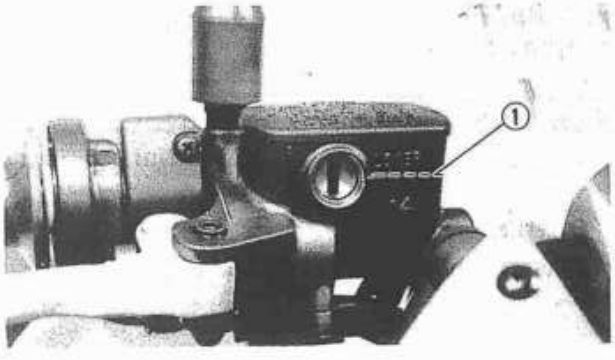
	Recommended brake fluid: DOT #3 or #4

CAUTION:

Brake fluid may erode painted surface or plastic parts. Always clean up spilled fluid immediately.

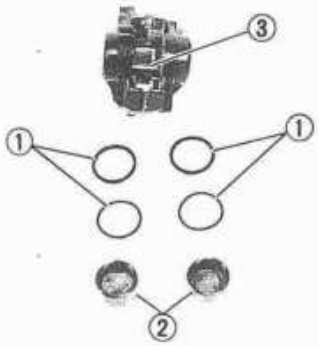
⚠WARNING

- **Use only designated quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid: mixing fluids may result in a harmful chemical reaction and lead to poor performance.**
- **Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid may result in vapor lock.**



5. Air bleed:
- Brake system
  Refer to "AIR BLEEDING" section.

6. Inspect:
- Brake fluid level
  Fluid level is under "LOWER" level line ①
  → Replenish.
  Refer to "BRAKE FLUID INSPECTION" section in the CHAPTER 3.



YB706310

Rear brake

1. Install:
- Piston seals ①
- Caliper piston ②
- Pad spring ③

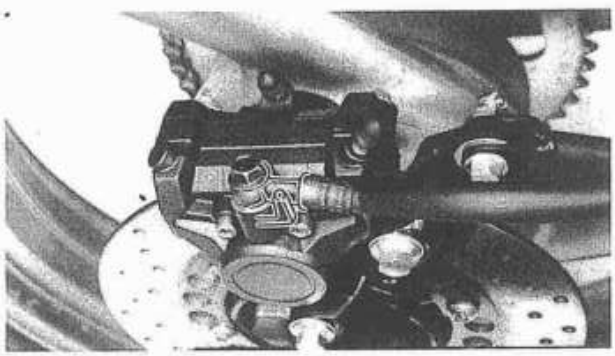
⚠ WARNING

Always use new piston seals.

2. Install:
- Brake pads
- Retaining bolts
- Brake caliper

Refer to the "BRAKE PAD REPLACEMENT" section.

	Retaining bolt: **10 Nm (1.0 m · kg, 7.2 ft · lb)** **Bolt (brake caliper):** **35 Nm (3.5 m · kg, 25 ft · lb)**



3. Install:
- Brake hose
- Copper washers
- Union bolts

	Union bolt: **30 Nm (3.0 m · kg, 22 ft · lb)**

CAUTION:

When installing the brake hose to the caliper, lightly touch the brake pipe with the projection on the caliper.

⚠ WARNING

- **Proper hose routing is essential to insure safe motorcycle operation. Refer to " CABLE ROUTING".**
- **Always use new copper washers.**

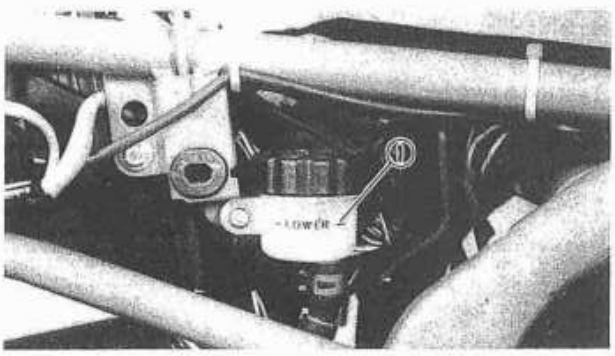
4. Fill:
• Brake fluid

	Recommended brake fluid: DOT #3 or #4

CAUTION:
Brake fluid may erode painted surface or plastic parts. Always clean up spilled fluid immediately.

⚠ WARNING
- **Use only designated quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid: mixing fluids may result in a harmful chemical reaction and lead to poor performance.**
- **Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid may result in vapor lock.**

5. Air bleed:
• Brake system
Refer to "AIR BLEEDING" section.



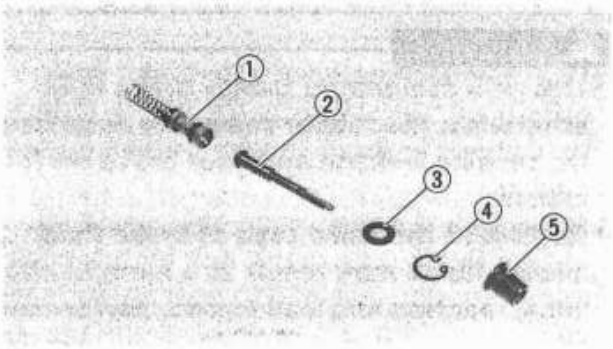
6. Inspect:
• Brake fluid level
Fluid level is under "LOWER" level line ①
→ Replenish.
Refer to "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

YB706311
MASTER CYLINDER ASSEMBLY

⚠ WARNING
- **All internal parts should be cleaned in new brake fluid only.**
- **Internal parts should be lubricated with brake fluid when installed.**

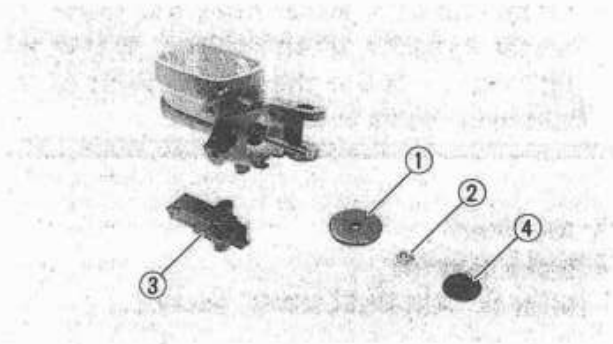
	Recommended brake fluid: DOT #3 or #4

- **Replace the piston seals whenever a caliper is disassembled.**



Front brake

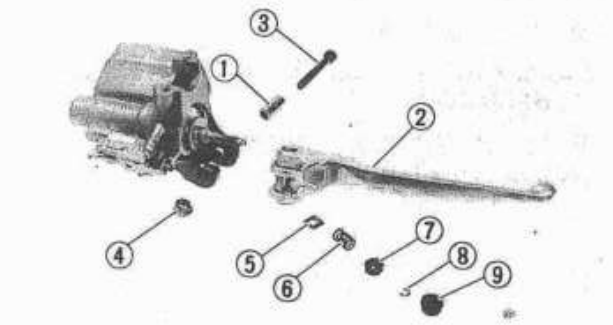
1. Install:
- Master cylinder kit ①
- Rod ②
- Plate washer ③
- Circlip ④
- Dust cover ⑤



2. Install:
- Plate ①
- Nut ②
- Brake switch ③
- Adjuster ④

CAUTION:

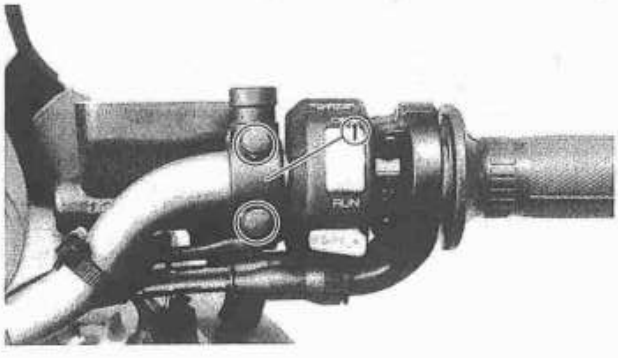
Do not damage the rod threads.



3. Install:
- Collar ①
- Brake lever ②
- Bolt ③
- Nut ④
- Washer ⑤
- Spring ⑥
- Nut ⑦
- Circlip ⑧
- Cap (rubber) ⑨

NOTE:

Apply the lithium soap base grease to the brake lever pivot.



4. Install:
- Master cylinder bracket ①

	Bolt (master cylinder bracket): 9 Nm (0.9 m · kg, 6.5 ft · lb)

5. Install:
- Brake hose
- Copper washers
- Union bolt

	**Union bolt:** **30 Nm (3.0 m · kg, 22 ft · lb)**

NOTE:
- Install each brake hose as shown.
- Tighten the union bolt while each brake hose is inclined backward.

⚠ WARNING
- **Proper hose routing is essential to insure safe motorcycle operation. Refer to the " CABLE ROUTING".**
- **Always use new copper washers.**

6. Make sure that brake hose does not touch with another parts (throttle cable, wireharness, leads ect.) by turning the handlebar to right and left. If touch, repair.

7. Fill:
- Brake fluid

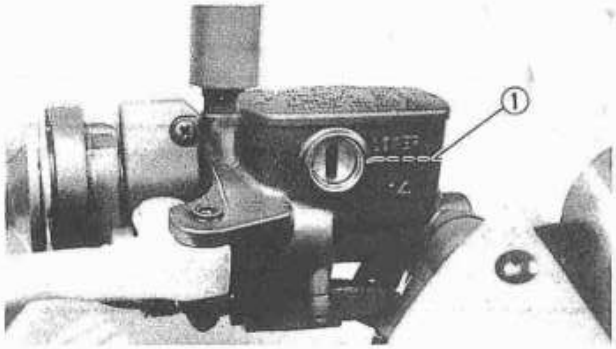
	**Recommended brake fluid:** **DOT #3 or #4**

CAUTION:
Brake fluid may erode painted surface or plastic parts. Always clean up spilled fluid immediately.

⚠ WARNING
- **Use only designated quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid: mixing fluids may result in a harmful chemical reaction and lead to poor performance.**

• Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid may result in vapor lock.

8. Air bleed:
• Brake system
Refer to "AIR BLEEDING" section.

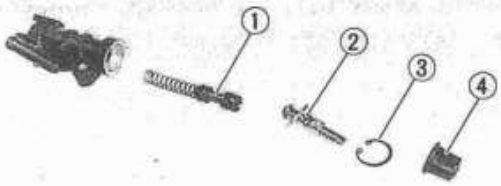


9. Inspect:
• Brake fluid level
Fluid level is under "LOWER" level line ①
→ Replenish.
Refer to "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

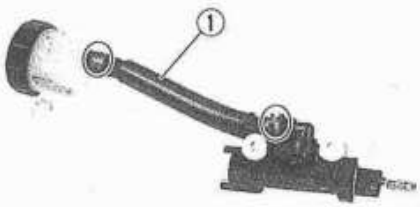
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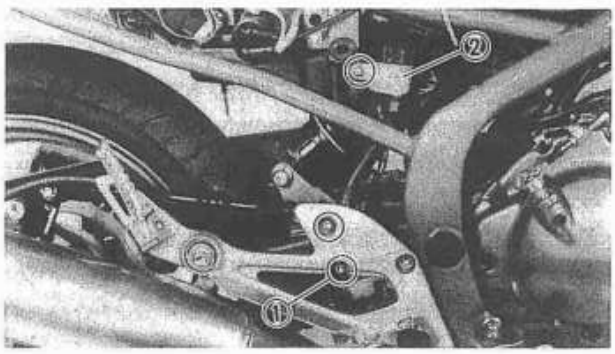
Rear brake

1. Install:
• Master cylinder kit ①
• Rod ②
• Circlip ③
• Dust cover ④



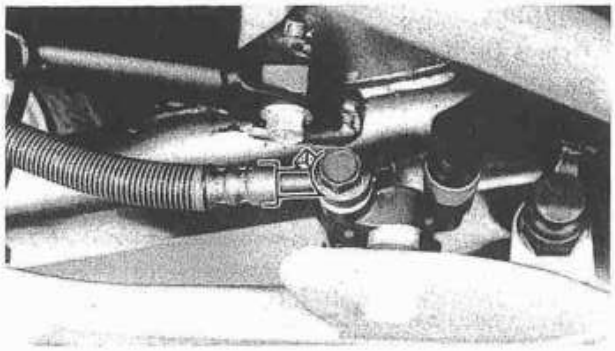
2. Install:
• Hose (reservoir tank) ①





3. Install:
• Master cylinder ①
• Reservoir tank ②

	Bolt (master cylinder): **23 Nm (2.3 m · kg, 17 ft · lb)** **Screw (reservoir tank):** **4 Nm (0.4 m · kg, 2.9 ft · lb)**



4. Install:
- Brake hose
- Copper washers
- Union bolts

	Union bolt: **30 Nm (3.0 m · kg, 22 ft · lb)**

CAUTION:

When installing the brake hose to the master cylinder, lightly touch the brake pipe with the projection on the master cylinder.

⚠ WARNING

- **Proper hose routing is essential to insure safe motorcycle operation. Refer to the " CABLE ROUTING".**
- **Always use new copper washers.**

5. Fill:
- Brake fluid

	Recommended brake fluid: **DOT #3 or #4**

CAUTION:

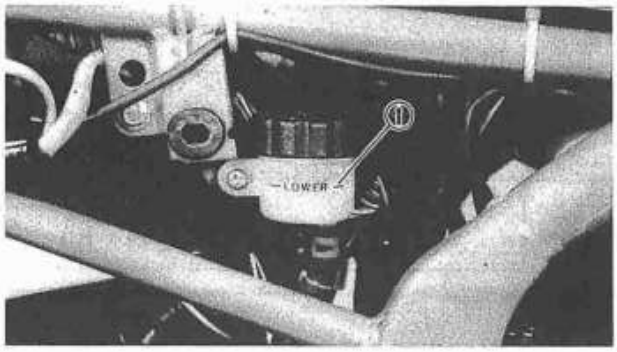
Brake fluid may erode painted surface or plastic parts. Always clean up spilled fluid immediately.

⚠ WARNING

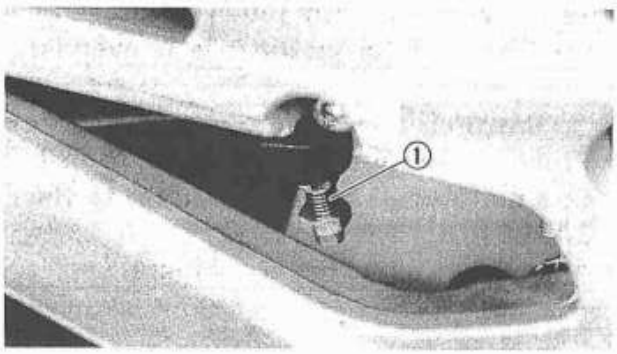
- **Use only designated quality brake fluid: otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid: mixing fluids may result in a harmful chemical reaction and lead to poor performance.**
- **Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid may result in vapor lock.**

6. Air bleed:
- Brake system

Refer to "AIR BLEEDING" section.



7. Inspect:
- Brake fluid level
  Fluid level is under "LOWER" level line ①
  → Replenish.
  Refer to "BRAKE FLUID INSPECTION" section in the CHAPTER 3.



8. Connect:
- Brake adjuster ①

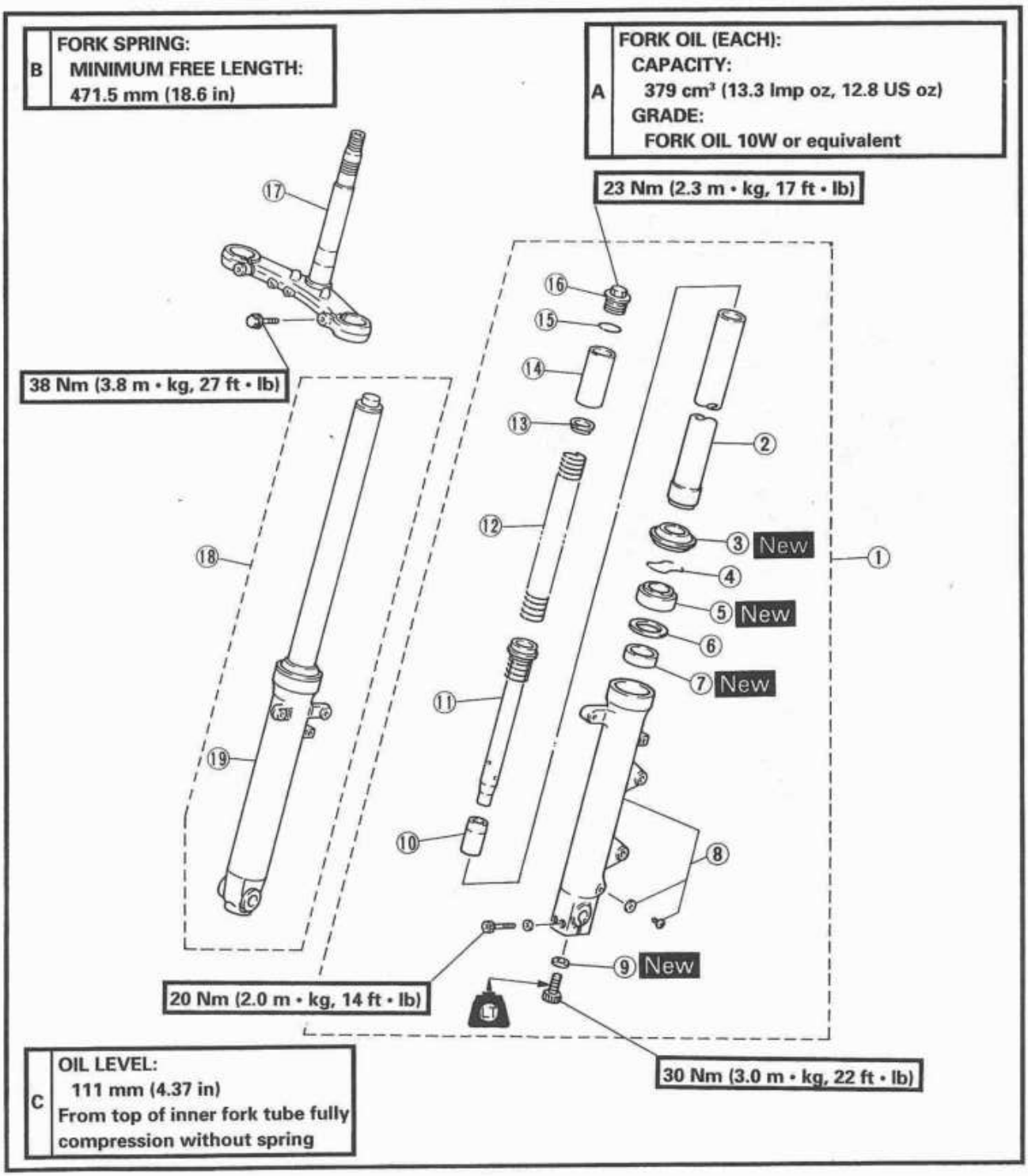
9. Adjust:
- Rear brake pedal height

Pedal height:
40 mm (1.6 in)
below top of footrest

Refer to "REAR BRAKE ADJUSTMENT" section in the CHAPTER 3.

FRONT FORK

① Front fork assembly (left)
② Inner tube
③ Dust seal
④ Retaining clip
⑤ Oil seal
⑥ Washer
⑦ Slide metal
⑧ Outer tube
⑨ Copper washer
⑩ Oil lock piece
⑪ Damper assembly
⑫ Fork spring
⑬ Spring seat
⑭ Spacer
⑮ O-ring
⑯ Cap bolt
⑰ Under bracket
⑱ Front fork assembly (right)
⑲ Outer tube



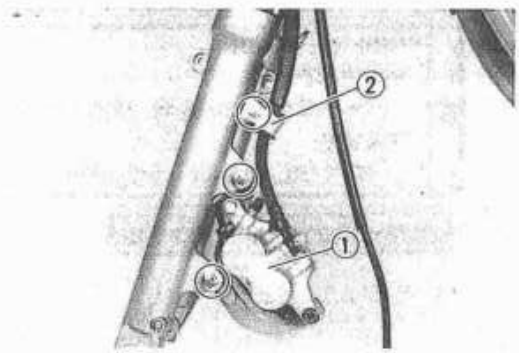
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REMOVAL

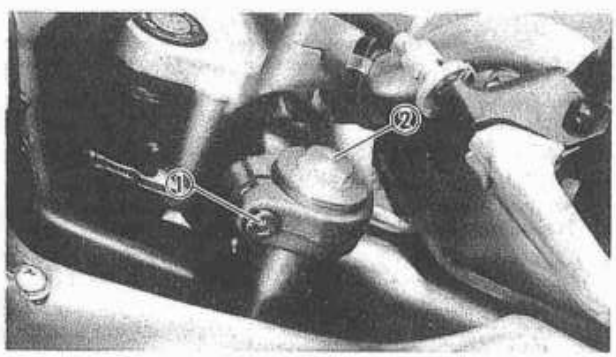
⚠ WARNING

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

1. Place the motorcycle on a level place.
2. Elevate the front wheel by placing suitable stand under the engine.



3. Remove:
- Front wheel
  Refer to the "FRONT WHEEL — REMOVAL " section.
- Caliper assembly ①
- Brake hose holder ②



4. Loosen:
- Pinch bolts (handle crown) ①
- Cap bolt ②
- Pinch bolts (under bracket)

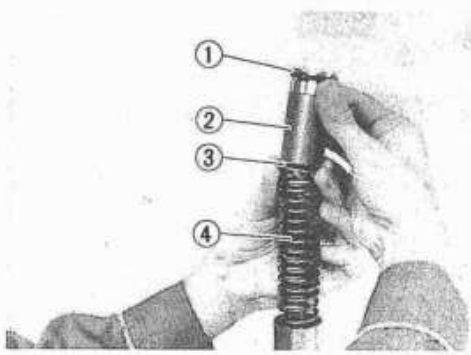
⚠ WARNING

Support the fork before loosening the pinch bolts.

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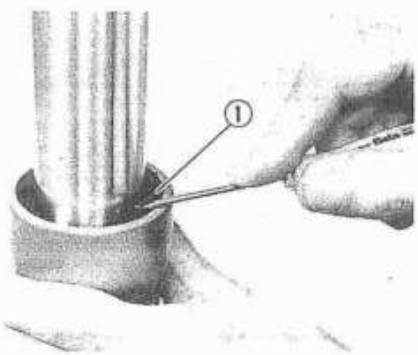
DISASSEMBLY

1. Remove:
- Cap bolt ①
- Spacer ②
- Spring seat ③
- Spring ④



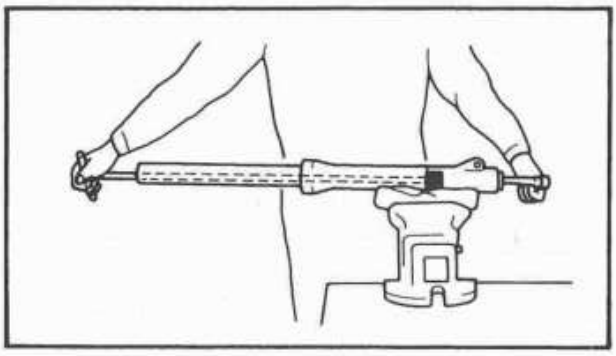
2. Drain:
- Fork oil

3. Remove:
- Dust seal
- Retaining clip ①
  Use a thin slotted head screw driver.



CAUTION:

Take care not to scratch the inner tube.



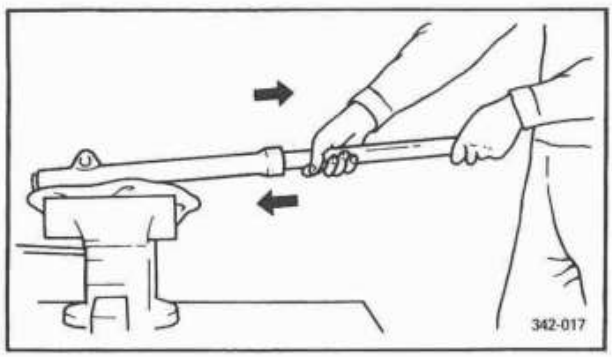
4. Remove:
- Bolt (damper rod)
- Copper washer

NOTE:
Loosen the bolt (damper rod) while holding the damper rod with the T-handle and holder.



T-handle:
90890-01326
Holder (24 mm):
90890-01328

5. Remove:
- Inner fork tube

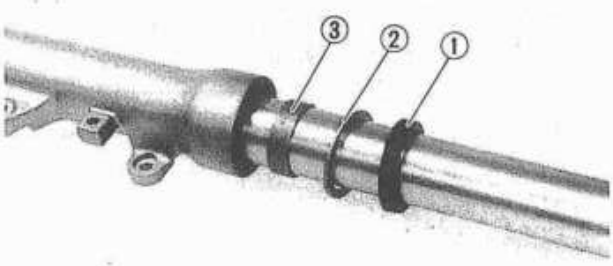


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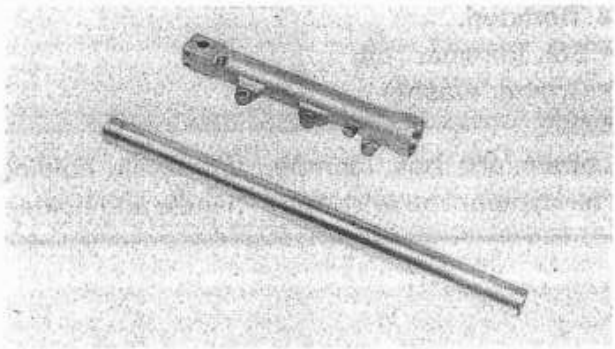
Removal steps:
- Hold the fork leg holizontally.
- Clamp the caliper mounting boss of the outer tube securely in a vise with soft jaws.
- Pull out the inner fork tube from the outer tube by forcefully, but carefully, with drawing the inner tube.

CAUTION:
- **Excessive force will damage the oil seal and/or the bushes. Damage oil seal and bushing must be replaced.**
- **Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock piece will be damaged.**

****



6. Remove:
- Oil seal ①
- Seal spacer ②
- Slide metal ③
- Piston metal
- Damper rod
- Oil lock piece



YB706403

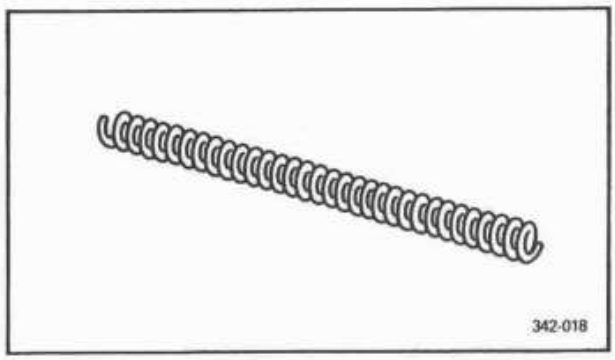
INSPECTION

1. Inspect:
- Inner fork tube
- Outer fork tube

Scratches/Bends/Damage → Replace.

⚠ WARNING

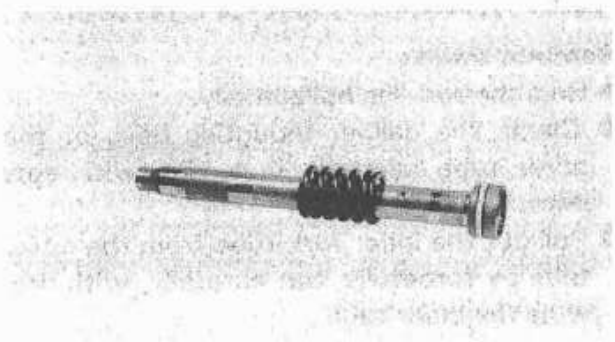
Do not attempt to straighten a bent inner fork tube as this may dangerously weaken the tube.



2. Measure:
- Fork spring

Over specified limit → Replace.

Fork spring free length (limit): 471.5 mm (18.6 in)



3. Inspect:
- Damper rod

Wear/Damage → Replace.
Contamination → Blow out all oil passages with compressed air.



4. Inspect:
- Oil lock piece
- O-ring (cap bolt)

Wear/Damage → Replace.

YB706404

ASSEMBLY

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

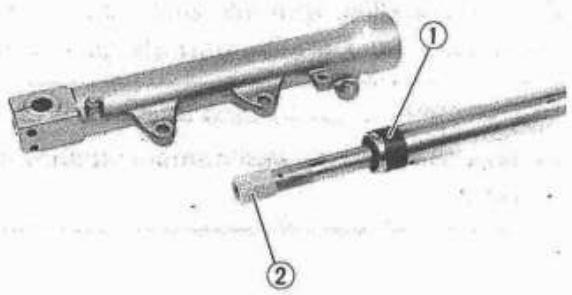
NOTE:

- In front fork reassembly, be sure to use following new parts.
  - *Piston metal
  - *Slide metal
  - *Oil seal
  - *Dust seal

• Make sure that all components are clean before reassembly.

1. Install:
• Damper rod

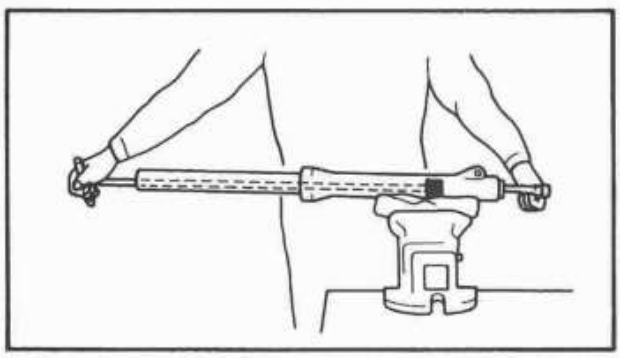
CAUTION:
Allow the damper rod to slide slowly down the inner fork tube until it protrudes from the bottom, being careful not to damage the inner fork tube.



2. Lubricate:
• Inner fork tube (outer surface)

	Recommended lubricant: **Fork oil 10w or equivalent**

3. Install:
• Piston metal ①
• Oil lock piece ②

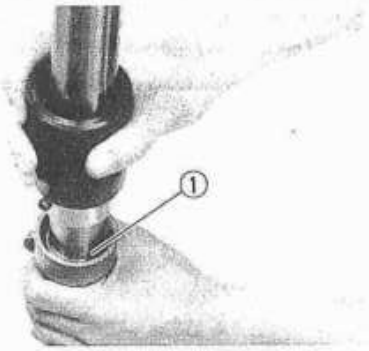


4. Tighten:
• Bolt (damper rod)

	Bolt (damper rod): **30 Nm (3.0 m · kg, 22 ft · lb)** **Loctite®**

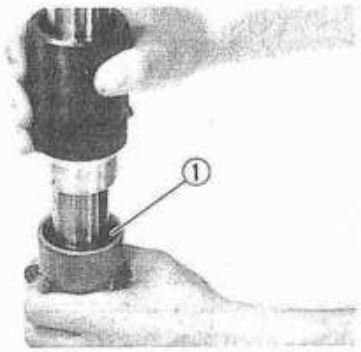
NOTE:
Tighten the bolt (damper rod) while holding the damper rod with the T-handle and holder.

	T-handle: **90890-01326** **Holder (24 mm):** **90890-01328**



5. Install:
• Slide metal ①
Use the fork seal driver weight and adapter.

	Fork seal driver weight: **90890-01367** **Adapter:** **90890-01372**

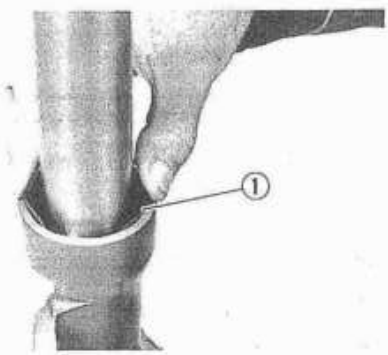


6. Install:
• Seal spacer
• Oil seal ①
Use the fork seal driver weight and adapter.

	Fork seal driver weight: **90890-01367** **Adapter:** **90890-01372**

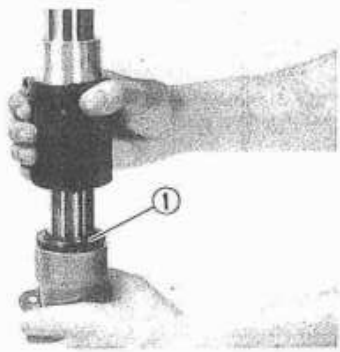
NOTE:
Before installing the oil seal, apply the lithium soap base grease onto the oil seal lips.

CAUTION:
Be sure that the oil seal numbered side face upward.



7. Install:
• Retaining clip ①

NOTE:
Fit the retaining clip correctly in the groove in the outer tube.



8. Install:
• Dust seal ①
Use the fork seal driver weight.

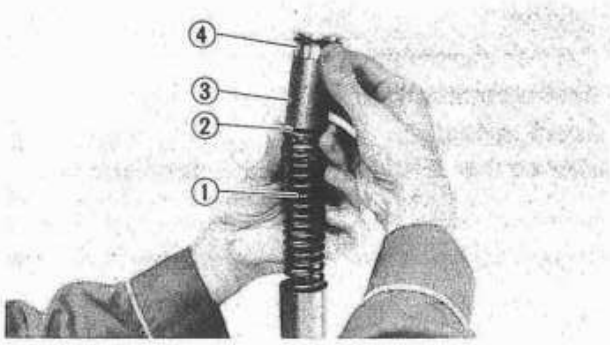
	Fork seal driver weight: **90890-01367**

9. Fill:
• Fork oil

	Each fork: **379 cm³** **(13.3 Imp oz, 12.8 US oz)** **Fork oil 10w or equivalent after filling, slowly pump the fork up and down to distribute oil.**

	Oil level: **111 mm (4.37 in)** **from the top of inner fork tube fully compressed without spring.**

NOTE:
Place the front fork on upright position.

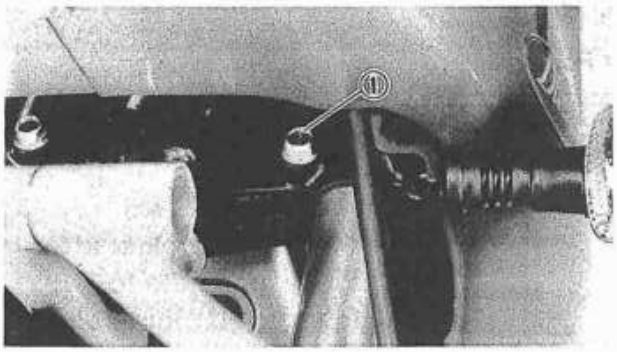


10. Install:
• Fork spring ①
• Spring seat ②
• Spacer collar ③
• Cap bolt ④

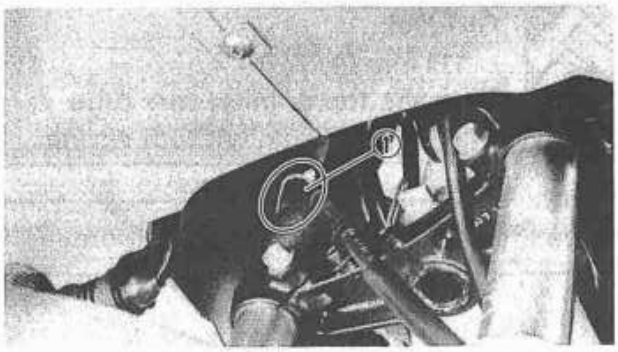
NOTE:
• Fork spring must be installed with the smaller pitch upward.
• Before installing the cap bolt, apply the grease to the O-ring.
• Temporarily tighten the cap bolt.

YB706405
INSTALLATION
Reverse the "REMOVAL" procedure.
Note the following points.
1. Install:
• Front fork(s)
Temporary tighten the pinch bolts.

NOTE:
Be sure the inner fork tube end is flush with the top of the handle crown.

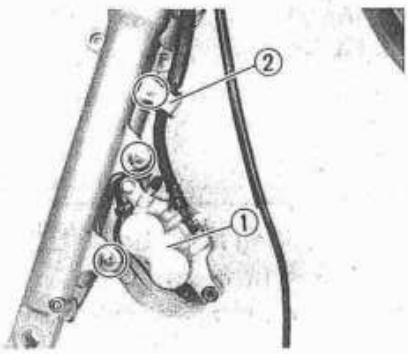


2. Tighten:
- Pinch bolt ① (under bracket)
- Cap bolt (front forl)
- Pinch bolt (handle crown)



	Pinch bolt (lower bracket): **38 Nm (3.8 m · kg, 27 ft · lb)** **Cap bolt (front fork):** **23 Nm (2.3 m · kg, 17 ft · lb)** **Pinch bolt (handle crown):** **23 Nm (2.3 m · kg, 17 ft · lb)**

3. Clamp:
- Brake hose (right side) ①



4. Install:
- Caliper assembly ①
- Brake hose holder ②
- Front wheel

Refer to the "FRONT WHEEL" section.

	Bolt (caliper bracket): **35 Nm (3.5 m · kg, 25 ft · lb)** **Wheel axle:** **59 Nm (5.9 m · kg, 43 ft · lb)** **Pinch bolt (wheel axle):** **20 Nm (2.0 m · kg, 14 ft · lb)**

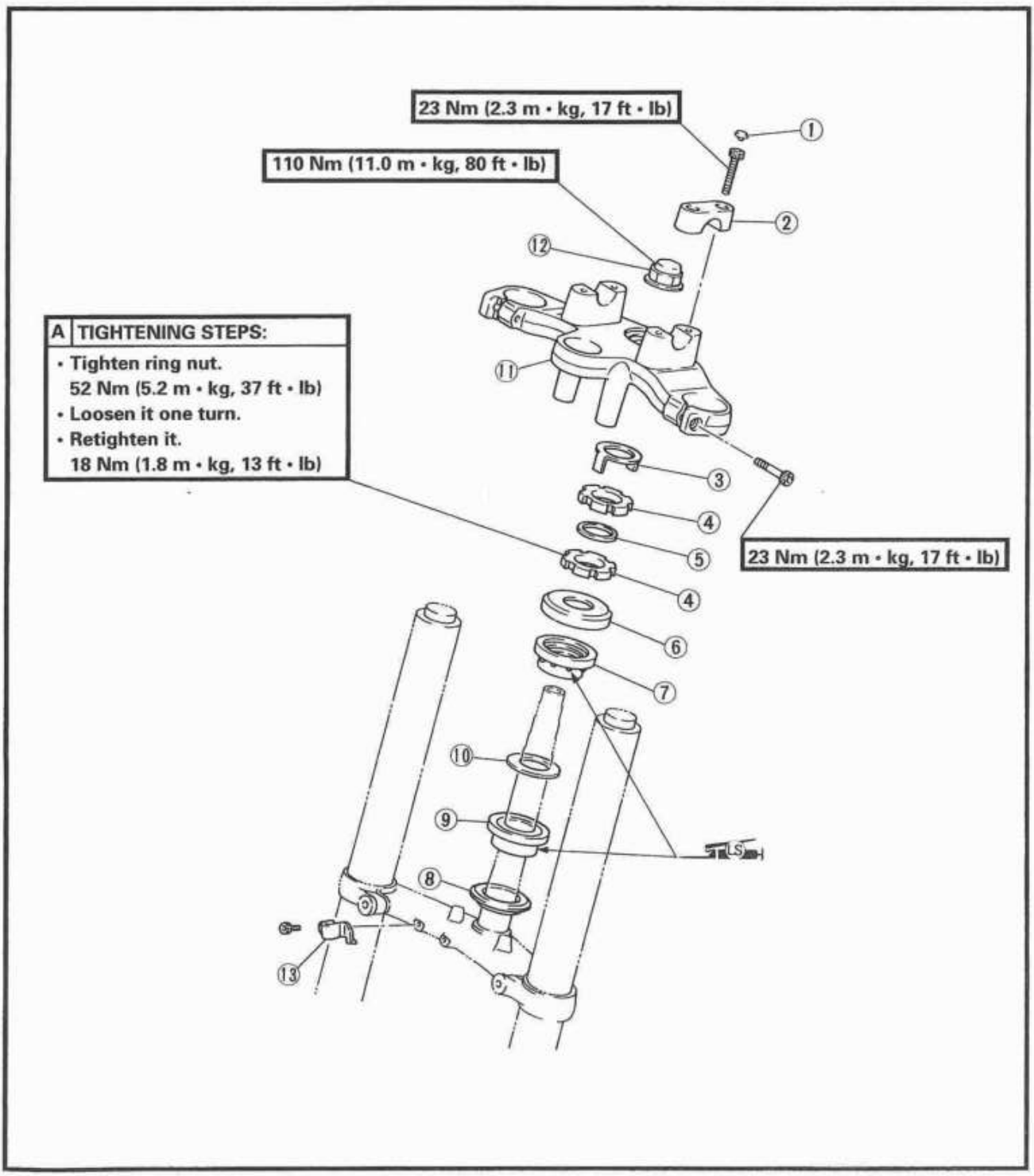
⚠ WARNING

Make sure that the brake hose are routed properly.

STEERING HEAD AND HANDLEBAR

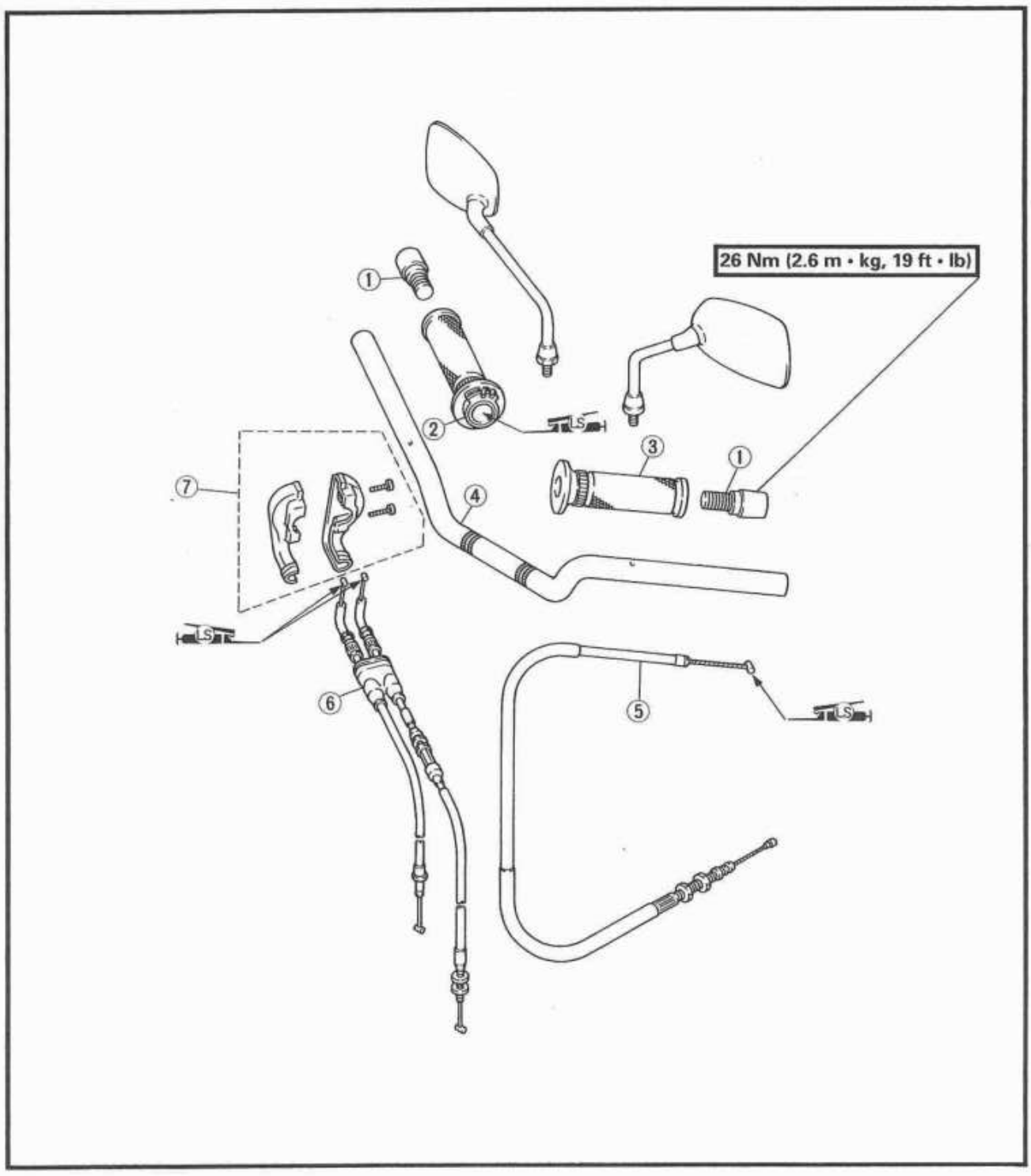
STEERING HEAD

① Cap
② Handlebar holder
③ Special washer
④ Ring nut
⑤ Rubber washer
⑥ Ball race cover
⑦ Bearing
⑧ Ball race
⑨ Bearing
⑩ Rubber seal
⑪ Handle crown
⑫ Nut
⑬ Brake hose holder



HANDLEBAR

① Grip end
② Handlebar grip (right)
③ Handlebar grip (left)
④ Handleber
⑤ Clutch cable
⑥ Throttle cable
⑦ Cable connector



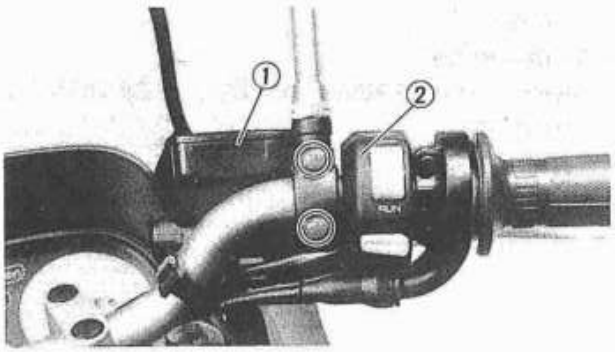
YB706501

REMOVAL

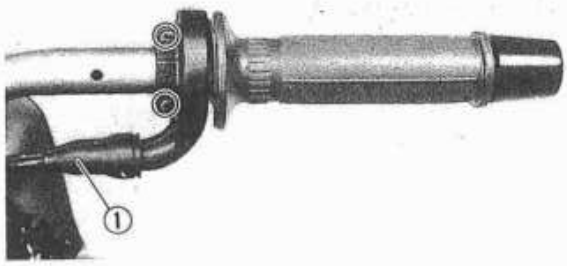
⚠ WARNING

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

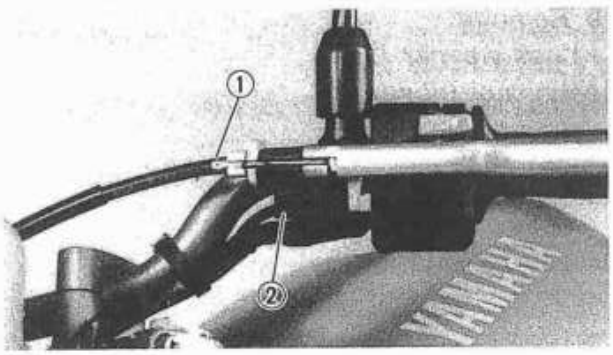
1. Place the motorcycle on a level place.



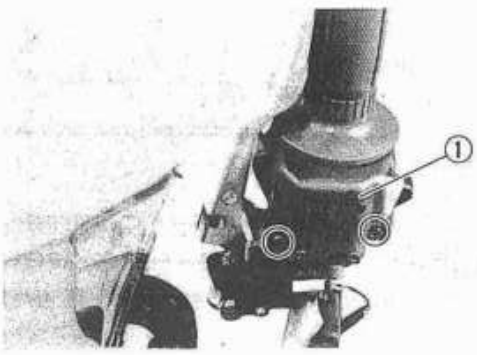
2. Remove:
- Master cylinder ①
- Handlebar switch (right) ②



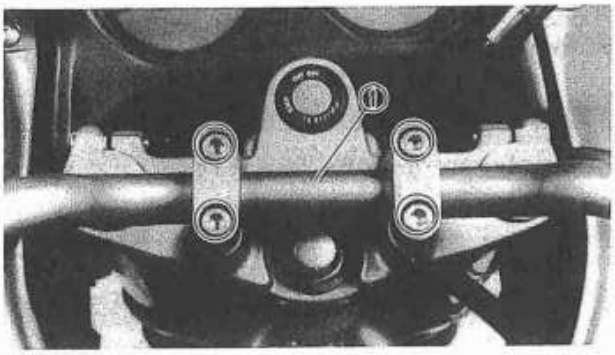
3. Disconnect:
- Throttle cables ①



4. Disconnect:
- Clutch cable ①
- Clutch switch lead ②

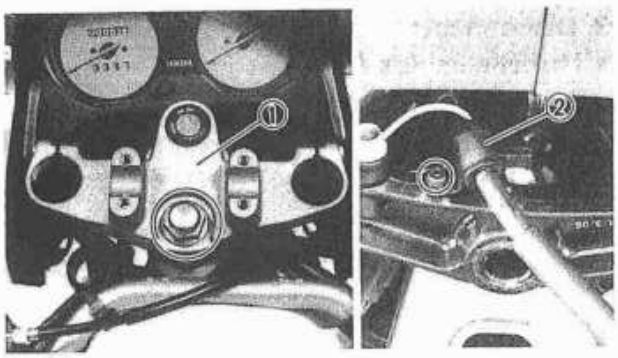


5. Remove:
- Handlebar switch (left) ①

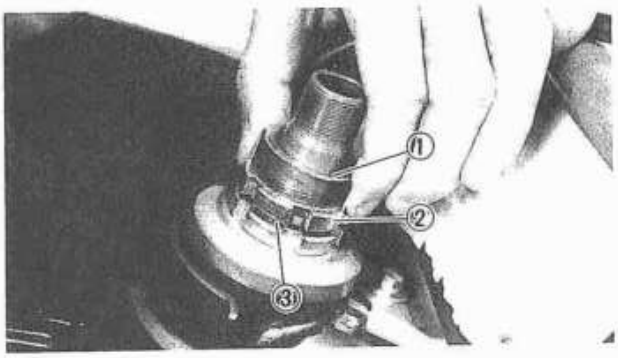


6. Remove:
• Handlebar ①

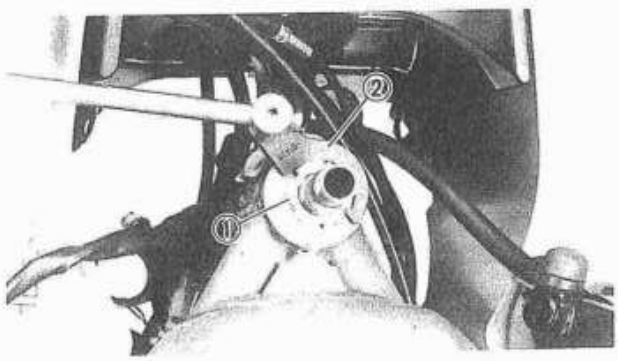
7. Remove:
• Front wheel
Refer to the "FRONT WHEEL — REMOVAL " section.
• Front forks
Refer to the "FRONT FORK — REMOVAL" section.



8. Remove:
• Handle crown ①
• Brake hose holder ②



9. Remove:
• Lock washer ①
• Ring nut (upper) ②
• Rubber washer ③



10. Remove:
• Ring nut ① (lower)
Use the ring nut wrench ② .

	Ring nut wrench: 90890-01403

⚠ WARNING

Support the steering shaft so that it may not fall down.



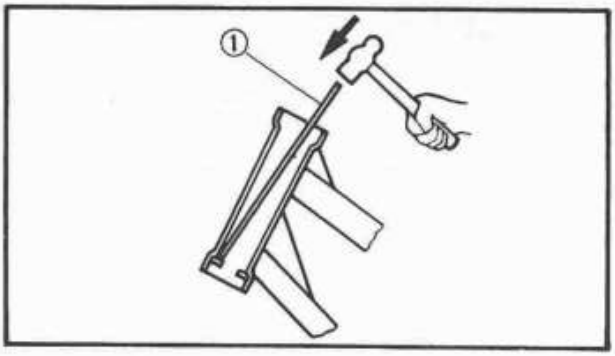
YB706502

INSPECTION

1. Wash the bearing and bearing races with a solvent.

2. Inspect:
- Bearings
- Bearing races

Pitting/Damage → Replace.



****

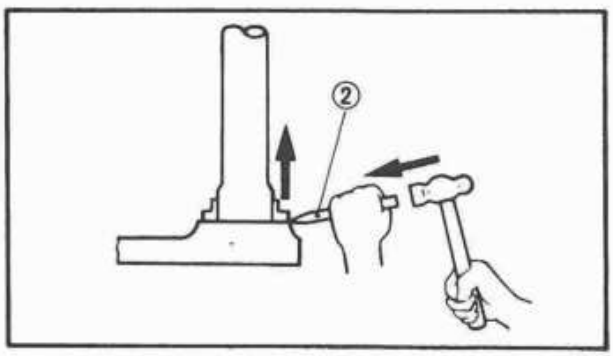
Bearing race replacement steps:

- Remove the bearing races on the head pipe using long rod ① and the hammer as shown.
- Remove the bearing race on the under bracket using the floor chisel ② and the hammer as shown.
- Install the new dust seal and races.

****

NOTE:

- Always replace bearings and races as a set.
- Replace the dust seal whenever a steering head disassembled.

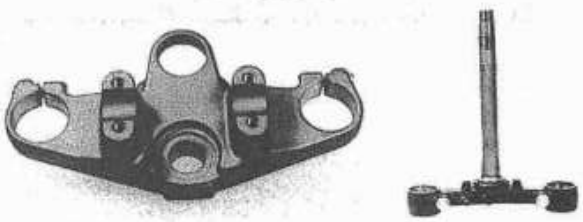


CAUTION:

If the bearing race is fitted not squarely, the head pipe could be damaged.

3. Inspect:
- Handle crown
- Under bracket (with steering stem)

Cracks/Bends/Damage → Replace.



4. Inspect:
- Handlebar

Bends/Cracks/Damage → Replace.

⚠ WARNING

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



****

Handlebar replacement steps:

- Remove the handlebar grip and lever holder.
- Install the lever holder to a new handlebar.
- Apply a light coat of an adhesive for rubber on the handlebar end.
- Install the handlebar grip.

NOTE:

Wipe off excess adhesive with a clean rag.

⚠WARNING

Leave the handlebar intact until the adhesive becomes dry enough to make the grip and handlebar stuck securely.

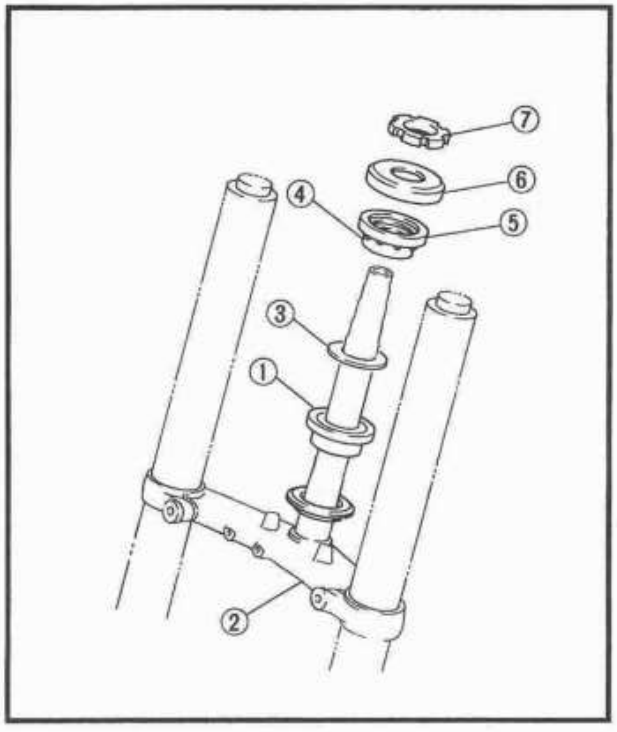
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YB706503

INSTALLATION

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

1. Lubricate:
- Bearings (upper and lower)
- Bearing races

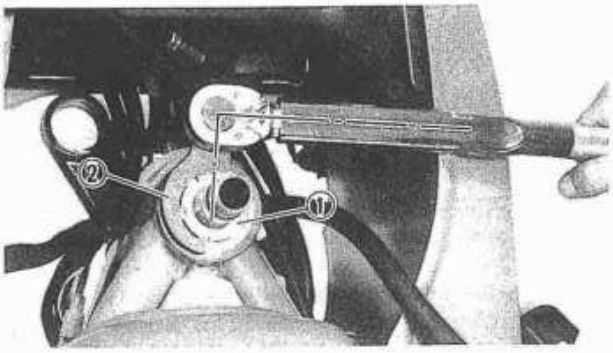


Recommended lubricant:
Wheel bearing grease

2. Install:
- Bearing ① (lower) onto steering stem
- Under bracket ②
- Rubber washer ③
- Bearing ④ (upper)
- Bearing race ⑤
- Bearing cover ⑥
- Ring nut ⑦ (lower)

CAUTION:

Hold the steering stem until it is secured.



3. Tighten:
• Ring nuts (lower and upper)

****

Tightening steps:

● Tighten the ring nut ① using the ring nut wrench ②.

NOTE:

• The tapperd side of ring nut must face down ward.
• Set the torque wrench to the ring nut wrench so that they form a right angle.

	Ring nut wrench: 90890-01403

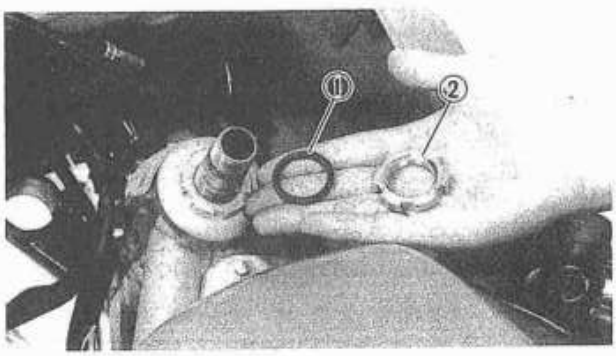
	Ring nut (initial tightening): 52 Nm (5.2 m · kg, 37 ft · lb)

● Loosen the ring nut one turn.
● Retighten the ring nut using the ring nut wrench.

⚠WARNING

Do not over tightening.

	Ring nut (final tightening): 18 Nm (1.8 m · kg, 13 ft · lb)



● Check the steering stem by turning lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings.
● Install the rubber washer ①.
● Install the ring nut (upper) ②.

NOTE:

The tapperd side of ring nut must be face upward.



● Finger tighten the ring nut, then align the slots of both ring nuts. If not aligned, hold the lower ring nut and tighten the other until they are aligned ①.
● Install the lock washer.

NOTE:

Make sure that the lock washer tab is placed in the slots.

****

4. Install:
- Handle crown
- Nut (steering stem)

NOTE:
Temporarily tighten the steering stem nut.

5. Install:
- Front fork

Refer to the "FRONT FORK INSTALLATION" section.

	**Pinch bolt (under bracket):** **38 Nm (3.8 m · kg, 27 ft · lb)**

NOTE:
In this stage, temporarily tighten the pinch bolts (handle crown).

6. Tighten:
- Nut (steering stem)
- Pinch bolt (handle crown)

	**Nut (steering stem):** **110 Nm (11.0 m · kg, 80 ft · lb)** **Pinch bolt (handle crown):** **23 Nm (2.3 m · kg, 17 ft · lb)**

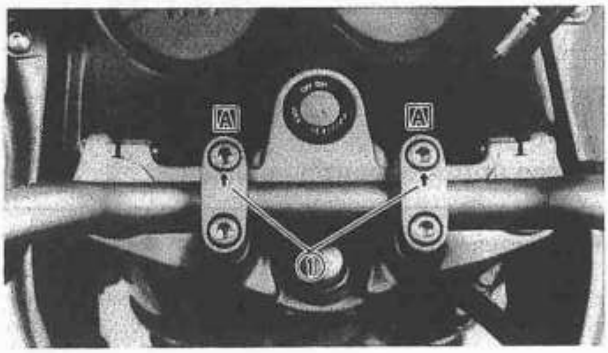
7. Install:
- Front wheel

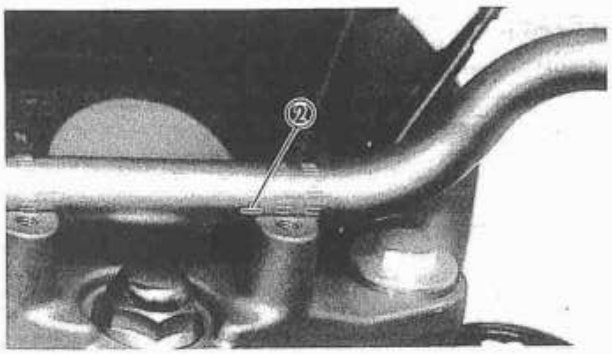
Refer to the "FRONT WHEEL INSTALLATION" section.

	**Wheel axle:** **59 Nm (5.9 m · kg, 43 ft · lb)** **Pinch bolt (wheel axle):** **20 Nm (2.0 m · kg, 14 ft · lb)**

8. Install:
- Handlebar
- Handlebar holders

	**Bolt (handlebar holder):** **23 Nm (2.3 m · kg, 17 ft · lb)**



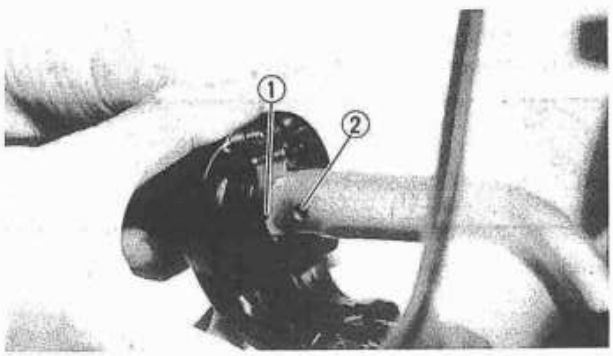


NOTE:

- Before installing the handlebar onto the handle crown, apply a light coat of lithium soap base grease onto the handlebar end and install the throttle housing to the handlebar.
- The upper handlebar holder should be installed with the arrow mark ① forward [A].
- Align the match mark ② on the handlebar with the top of handlebar holder (lower).

CAUTION:

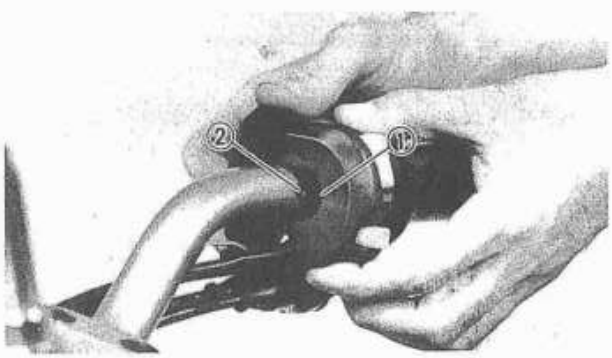
- **First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.**
- **Check the handlebar by turning lock to lock. If there is any contact to the fuel tank, adjust the handlebar position.**



9. Connect:
- Throttle cable

⚠ WARNING

Make sure that the projection ① on the throttle housing with the hole ② on the handlebar.



10. Install:
- Handlebar switches (left and right)

NOTE:

Align the projection ① on the handlebar switch with the hole ② on the handlebar.

11. Install:
- Master cylinder (front brake)

	Bolt (master cylinder bracket): 9 Nm (0.9 m · kg, 6.5 ft · lb)

12. Install:
• Clutch cable

NOTE:
Apply a light coat of lithium soap base grease onto the clutch cable end.

• Clutch switch lead

13. Adjust:
• Clutch cable free play

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

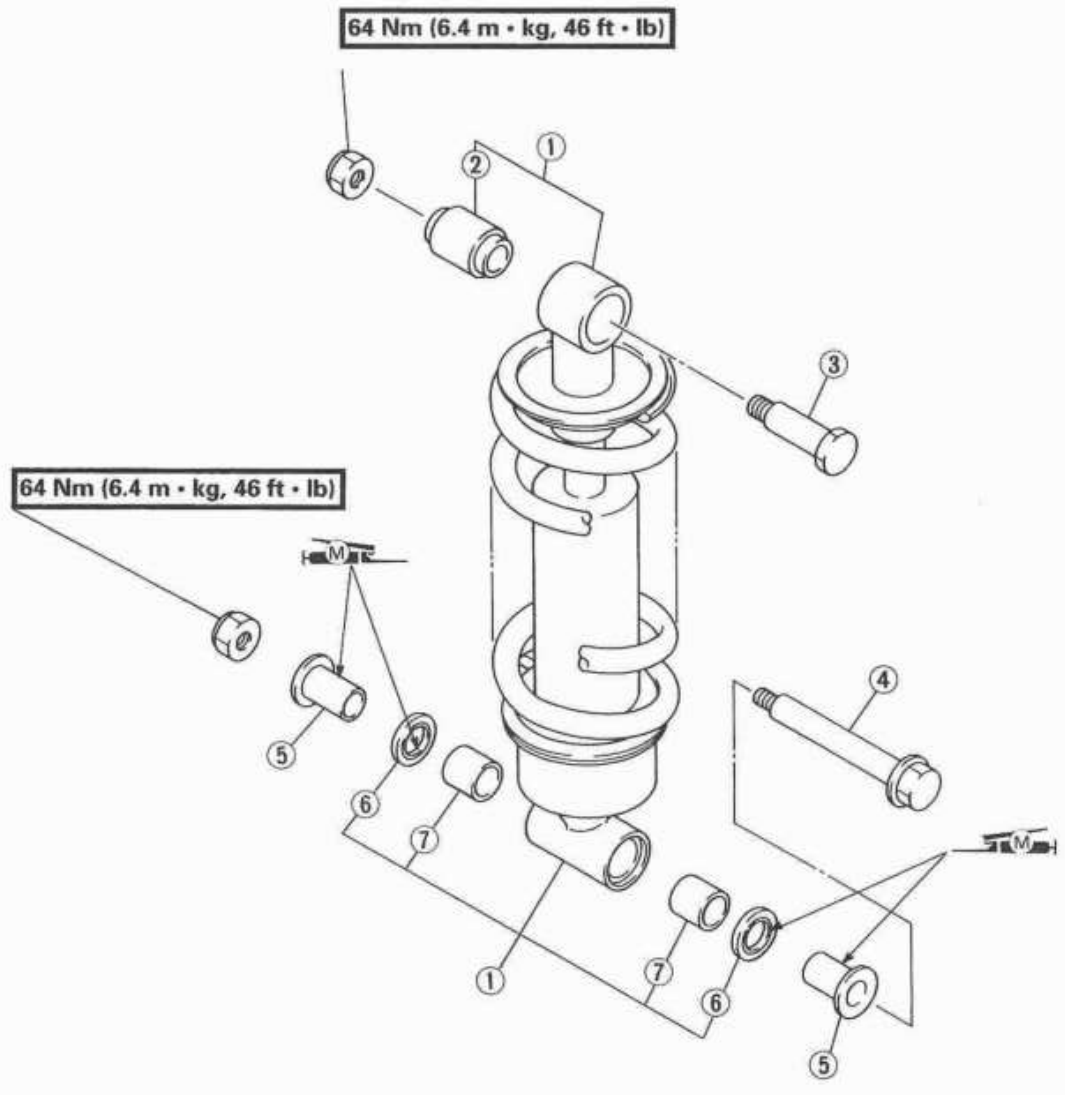
14. Adjust:
• Throttle cable free play

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

REAR SHOCK ABSORBER AND SWINGARM

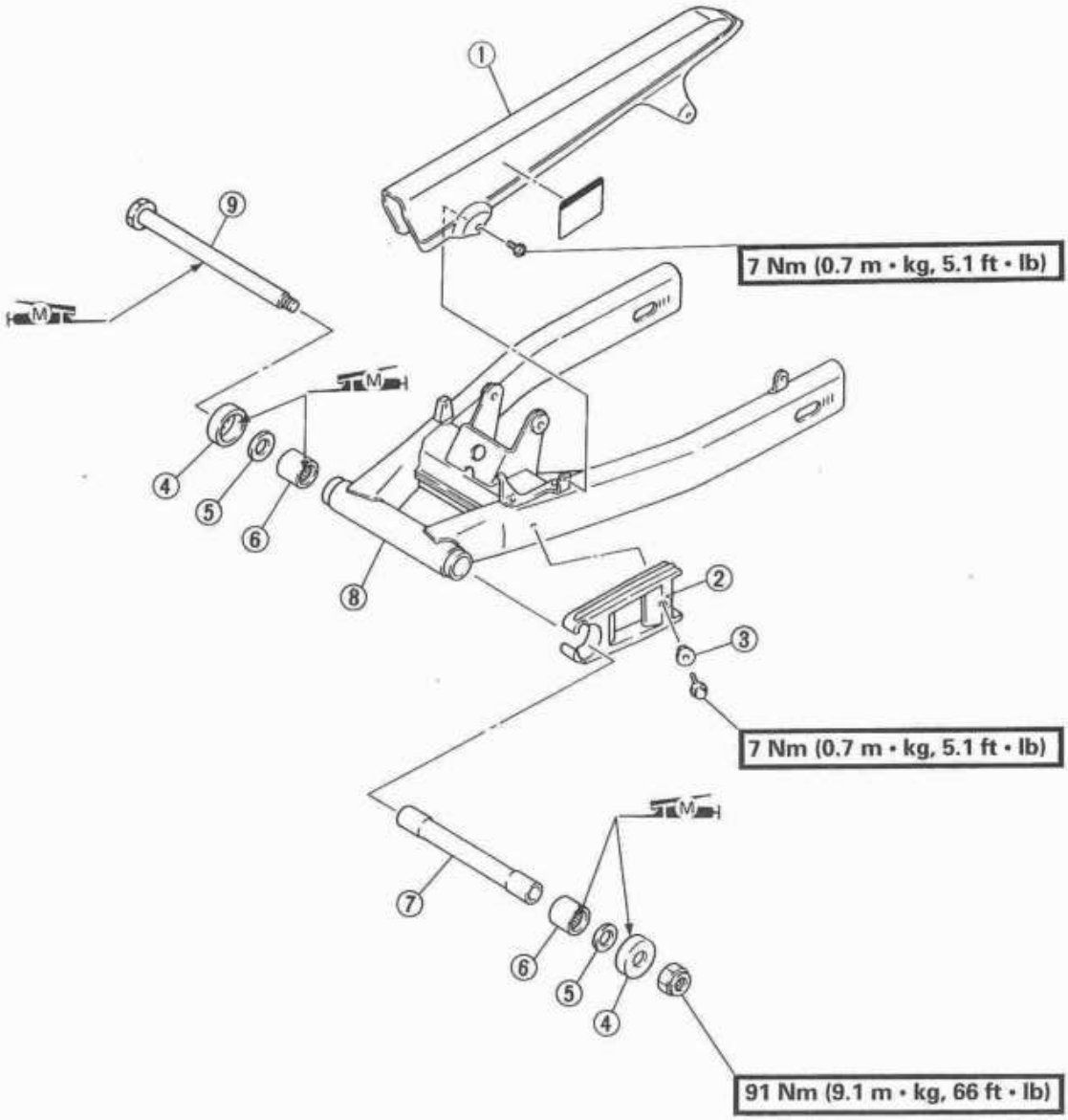
REAR SHOCK ABSORBER

① Rear shock absorber assembly
② Bush
③ Bolt
④ Bolt
⑤ Collar
⑥ Oil seal
⑦ Bush



SWINGARM

① Chain case
② Chain protecter
③ Collar
④ Cover
⑤ Plate washer
⑥ Bearing
⑦ Bush
⑧ Swingarm
⑨ Pivot shaft



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HANDLING NOTES

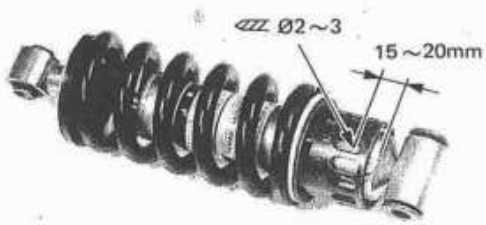
⚠ WARNING

This shock absorber contains highly compressed nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacture cannot be held responsible for property damage or personal injury that may result from improper handling.

1. **Do not tamper or attempt to open the cylinder assembly.**
2. **Do not subject shock absorber to an open flame or other high heat. This may cause the unit to explode due to excessive gas pressure.**
3. **Do not deform or damage are cylinder in any way. Cylinder damage will result in poor damping performance.**

YB706602

NOTES ON DISPOSAL



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Shock absorber disposal steps:

- Gas pressure must be released before disposing of shock absorber. To do so, drill a 2~3 mm (0.08~0.12 in) hole through the cylinder wall at a point 15~20 mm (0.6~0.8 in) from the end of gas chamber.

⚠ WARNING

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

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YB706603

REMOVAL

Rear shock absorber

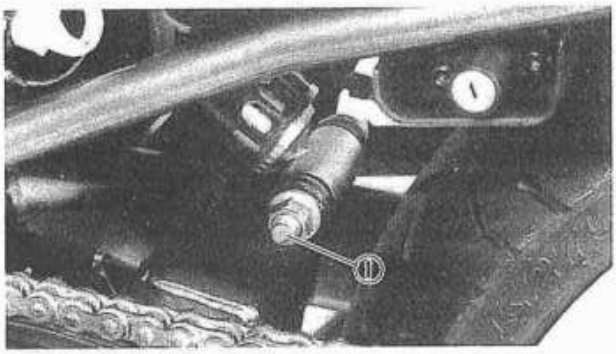
1. Place the motorcycle on a level place.

⚠ WARNING

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

2. Remove:
- Seat
- Feul tank

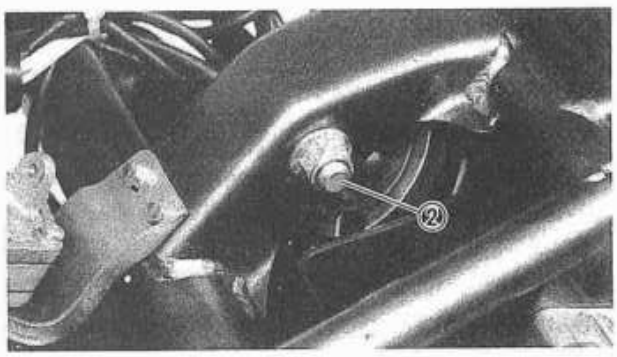
Refer to the "SIDE COVER, FUEL TANK AND COWLING" section in the CHAPTER 3.



3. Remove:
- Bolt ① (shock absorber-lower)

NOTE:

When removing the lower bolt, hold the swingarm so that it does not drip downwards when the lower bolt removed.



4. Remove:
- Bolt ② (shock absorber-upper)
- Rear shock absorber

YB706604

Swingarm

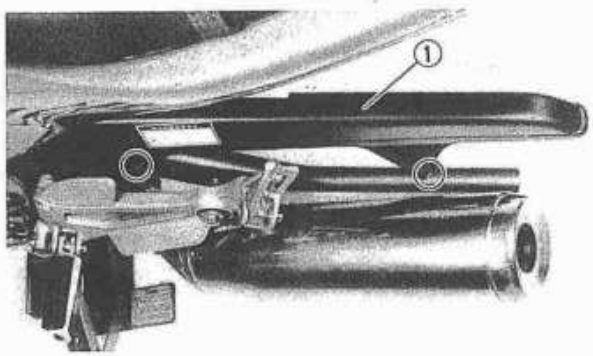
1. Place the motorcycle on a level place.

⚠ WARNING

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

2. Remove:
- Rear wheel assembly
  Refer to the "REAR WHEEL REMOVAL" section.
- Seat
- Fuel tank
  Refer to the "SIDE COVER, FUEL TANK AND COWLING" section in the CHAPTER 3.
- Rear shock absorber
  Refer to the "Rear shock absorber removal " section.

3. Remove:
- Compression bar

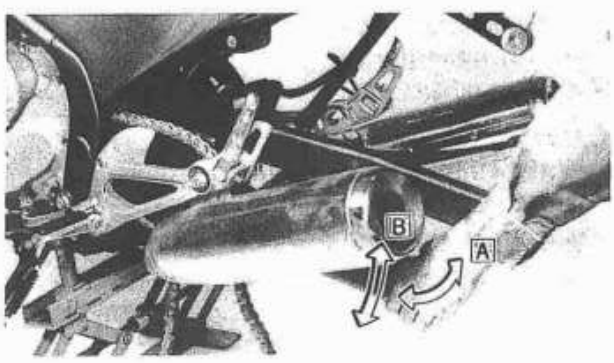


4. Remove:
- Chain case ①

5. Check:
- Swingarm free play

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Inspection steps:
- Check the tightening torque of the pivot shaft (swingarm) securing nut.



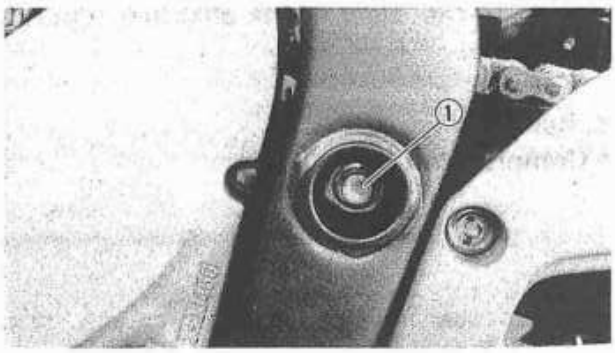
	Nut (swingarm pivot shaft): 91 Nm (9.1 m · kg, 66 ft · lb)

- Check the swingarm side play [A] by moving it from side to side.
  If side play noticeable, check the inner collar, bearing, washer and thrust cover.

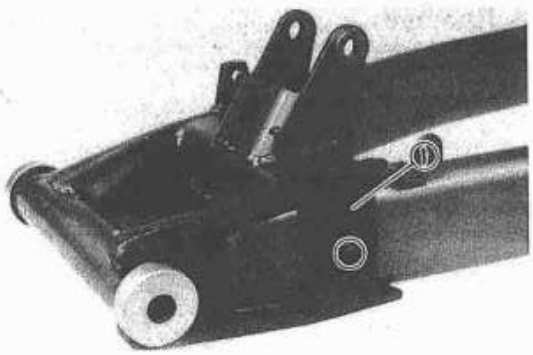
Side play (at end of swingarm):
1.0 mm (0.04 in)

- Check the swingarm vertical movement [B] by moving it up and down.
  If vertical movement is tight, binding or rough, check the inner collar, bearing, washer and thrust cover.

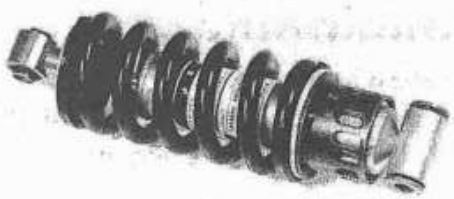
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6. Remove:
- Pivot shaft ①
- Swingarm



7. Remove:
- Chain guide ①



YB706605

INSPECTION

Rear shock absorber

1. Inspect:
- Rear shock absorber rod
  Bends/Damage → Replace the rear shock absorber assembly.
- Rear shock absorber
  Oil leaks/Gas leaks → Replace the rear shock absorber assembly.
- Spring
  Wear/Damage → Replace the rear shock absorber assembly.
- Bushings
- Dust seals
  Wear/Damage → Replace.
- Bolts
  Wear/Bends/Damage → Replace.



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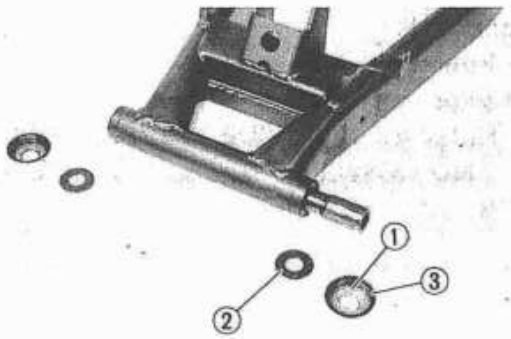
Swingarm

1. Inspect:
- Swingarm
  Crack/Bends/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
- Washer ②
- Oil seal ③
  Wear/Damage → Replace.



5. Inspect:
- Bearing
  Pitting/Damage → Replace.
- Bush
  Scratches/Damage → Replace.

YB706608

INSTALLATION

Rear shock absorber

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

1. Lubricate:
- Collars
- Bushes

Recommended lubricant:
Molybdenum disulfide grease

2. Install:
- Collars
- Rear shock absorber

Nut (rear shock absorber-upper):
64 Nm (6.4 m · kg, 46 ft · lb)
Nut (rear shock absorber-lower):
64 Nm (6.4 m · kg, 46 ft · lb)

NOTE:
Lift up the swingarm to install the rear shock absorber.

3. Install:
- Fuel tank
- Seat

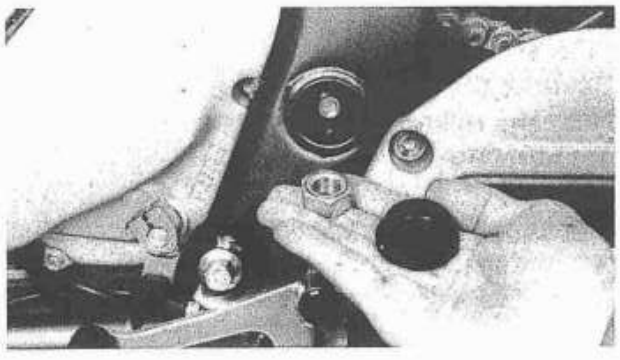
Refer to the "SIDE COVER, FUEL TANK AND COWLING" section in the CHAPTER 3.

YB706609

Swingarm

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

1. Lubricate:
- Bearing
- Bush
- Thrust washers
- Pivot shaft



Recommended lubricant:
Molybdenum disulfide grease

2. Install:
- Swingarm

Nut (pivot shaft):
91 Nm (9.1 m · kg, 66 ft · lb)

3. Install:
- Chain case
- Compression bar

	**Screw (chain case):** **7 Nm (0.7 m · kg, 5.1 ft · lb)** **Nut (compression bar):** **30 Nm (3.0 m · kg, 22 ft · lb)**

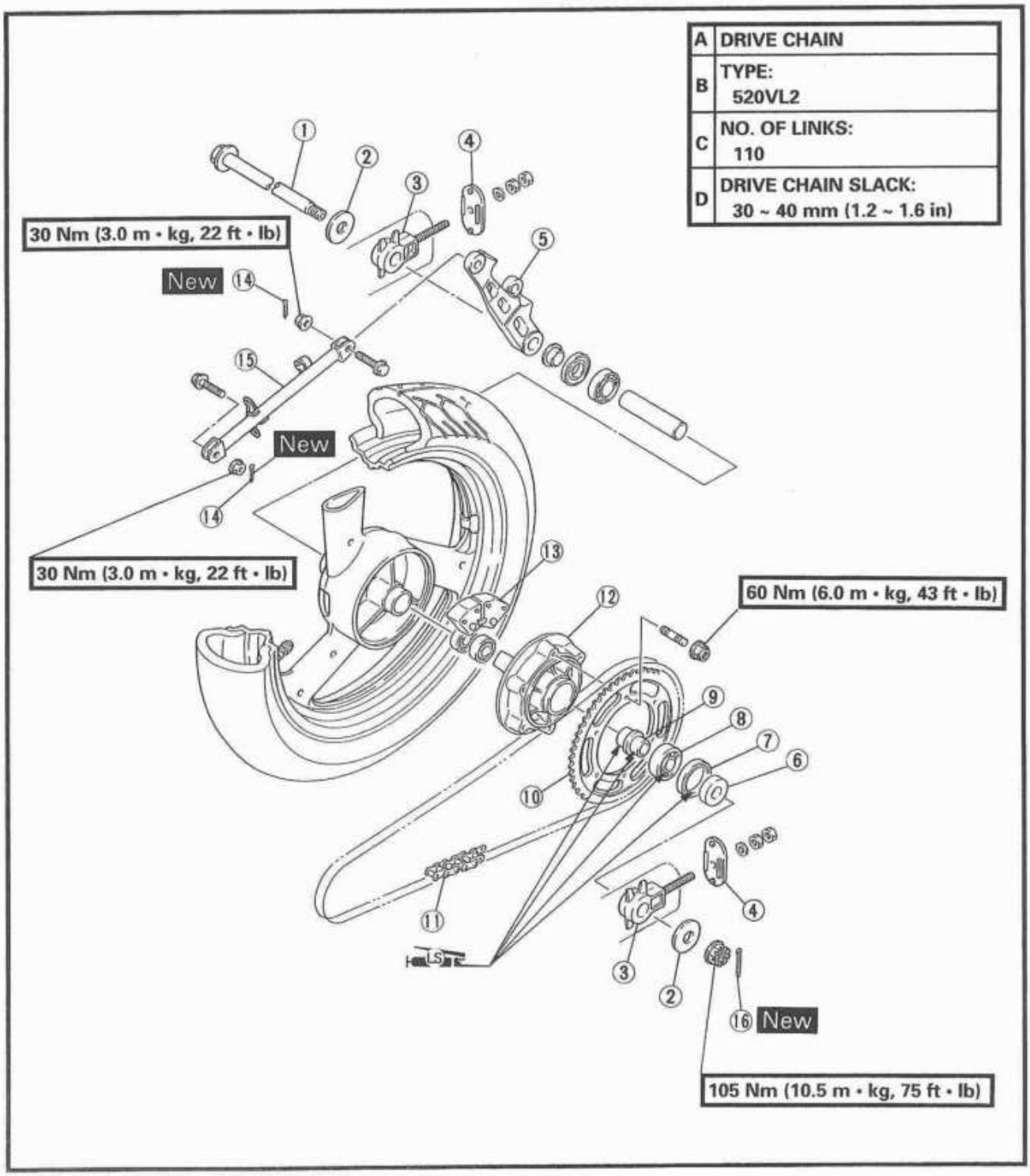
⚠ WARNING

Always use a new cotter pin.

4. Install:
- Rear shock absorber
  Refer to the "Rear shock absorbar installation" section.
- Fuel tank
- Seat
  Refer to the "SIDE COVER, FUEL TANK AND COWLING" section in the CHAPTER 3.
- Rear wheel
  Refer to the "REAR WHEEL INSTALLATION" section.

DRIVE CHAIN AND SPROCKETS

① Wheel axle
② Plate washer
③ Chain puller
④ End plate
⑤ Caliper bracket
⑥ Collar
⑦ Oil seal
⑧ Bearing
⑨ Collar
⑩ Rear sprocket wheel
⑪ Drive chain
⑫ Clutch hub
⑬ Clutch damper
⑭ Cotter pin
⑮ Compression bar
⑯ Cotter pin



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NOTE:

Before removing the drive chain and sprockets, drive chain slack and 10 link length of drive chain should be measured.

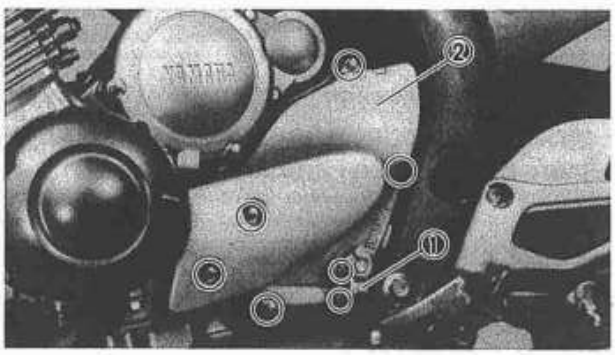
YB706702

REMOVAL

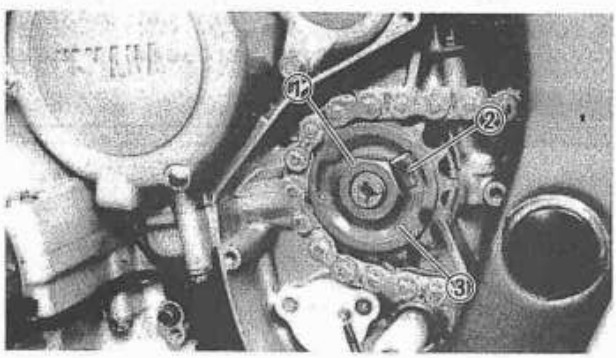
1. Place the motorcycle on a level place.

⚠ WARNING

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



2. Remove:
- Shift arm ①
- Drive sprocket cover ②



3. Straighten:
- Lock washer tab

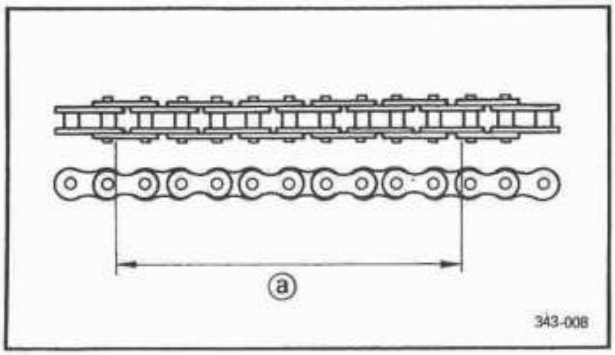
4. Remove:
- Nut (drive sprocket) ①
- Lock washer ②
- Drive sprocket ③

NOTE:

Loosen the nut (drive sprocket) while applying the rear brake.

5. Remove:
- Rear wheel
  Refer to the "REAR WHEEL REMOVAL" section.
- Swingarm
  Refer to the "Swingarm removal" section.

6. Remove:
- Drive chain



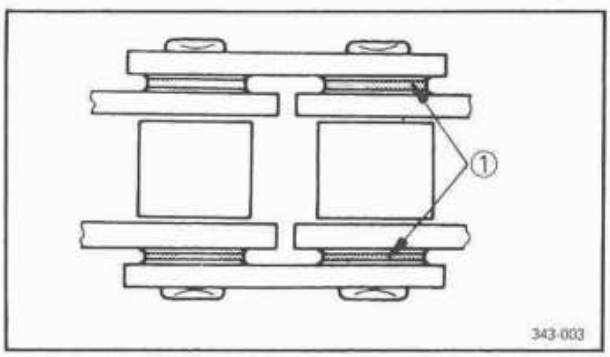
YB706703

INSPECTION

1. Measure:
- 10 link length ⓐ (drive chain)
  Out of specification → Replace drive chain.

	10 link length limit: 150 mm (5.91 in)

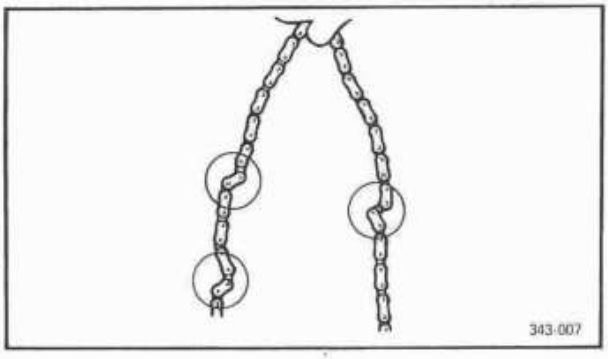
NOTE:
- For measurement make the chain tense by finger.
- 10 link length is a measurement between the insides of the ① and ⑪ rollers as shown.
- Two or three different 10 link length should be measured.

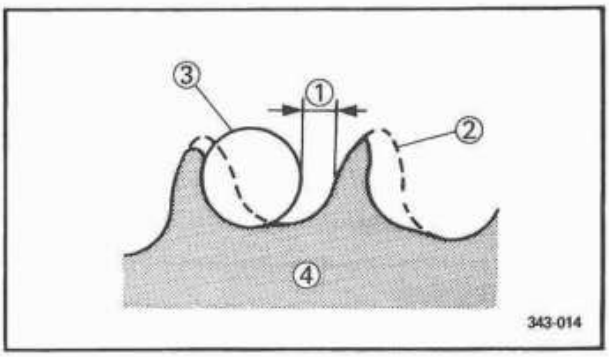


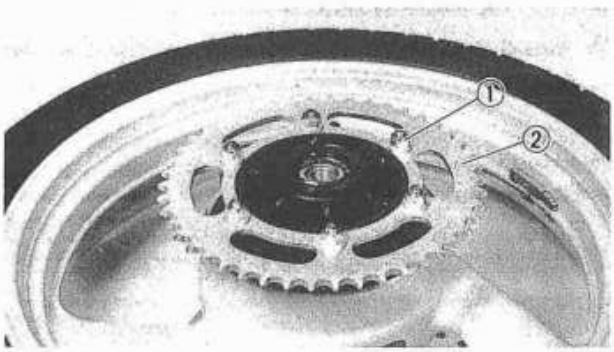
2. Clean:
- Drive chain
  Place it in kerosene, and brush off as much dirt as possible. Then remove the chain from the kerosene and dry the chain.

CAUTION:
This motorcycle has a drive chain with small rubber O-ring ① between the chain plate. Steam cleaning, high pressure washes, and certain solvent can damage these O-rings. Use only kerosene to clean the drive chain.

3. Inspect:
- O-ring (drive chain)
  Damage → Replace drive chain.
- Rollers
- Side plates
  Damage/Wear → Replace drive chain.







4. Lubricate:
• Drive chain

	Drive chain lubricant: SAE 30 ~ 50W motor oil

5. Inspect:
• Drive chain stiffness
Stiff → Clean and lubricate or replace.

6. Inspect:
• Drive sprocket
• Driven sprocket
More than 1/4 teeth ① wear → Replace sprocket.
Bent teeth → Replace sprocket.

② Correct
③ Roller
④ Sprocket

****

Driven sprocket replacement steps:
- Remove the self locknuts ① , and driven sprocket ② .
- Clean the hub, especially on the surfaces in contact with the sprocket, using clean cloth.
- Install the new driven sprocket.

NOTE:
Tighten the self lock nut in stage, using a criss-scross pattern.

	Self locknut (driven sprocket): 60 Nm (6.0 m · kg, 43 ft · lb)

****

YB706704
INSTALLATION
Reverse the "REMOVAL" procedure.
Note the following points.
1. Install:
• Drive chain
• Swingarm
Refer to the "Swingarm installation" section.
• Rear wheel
Refer to the "REAR WHEEL INSTALLATION" section.

2. Install:
- Drive chain
- Driven sprocket
- Lock washer
- Nut (drive sprocket)

	Nut (drive sprocket): 110 Nm (11.0 m · kg, 80 ft · lb)

NOTE:
Tighten the nut (drive sprocket) while applying the rear brake.

⚠ WARNING
Always use a new lock washer.

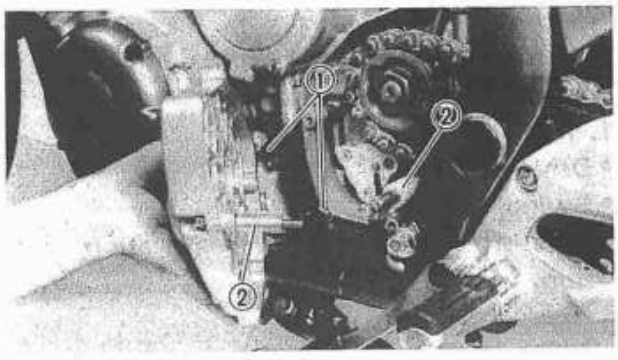
3. Bend the lock washer tab along the nut flats.

4. Adjust:
- Drive chain slack
  Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

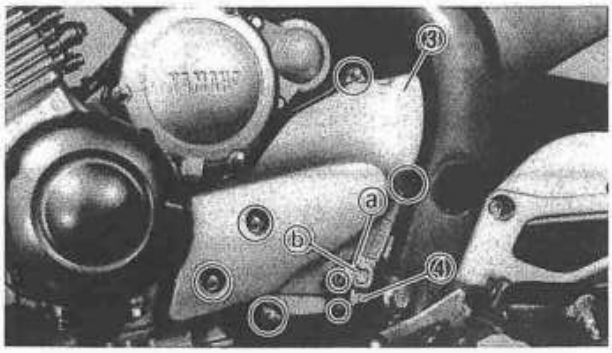
	Drive chain slack: 30~40 mm (1.2~1.6 in)

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

⚠ WARNING
Always use a new cotter pin on the axle nut.



5. Install:
- Dowelpins ①
- Cover (drive sprocket) ③
- Shift arm ④



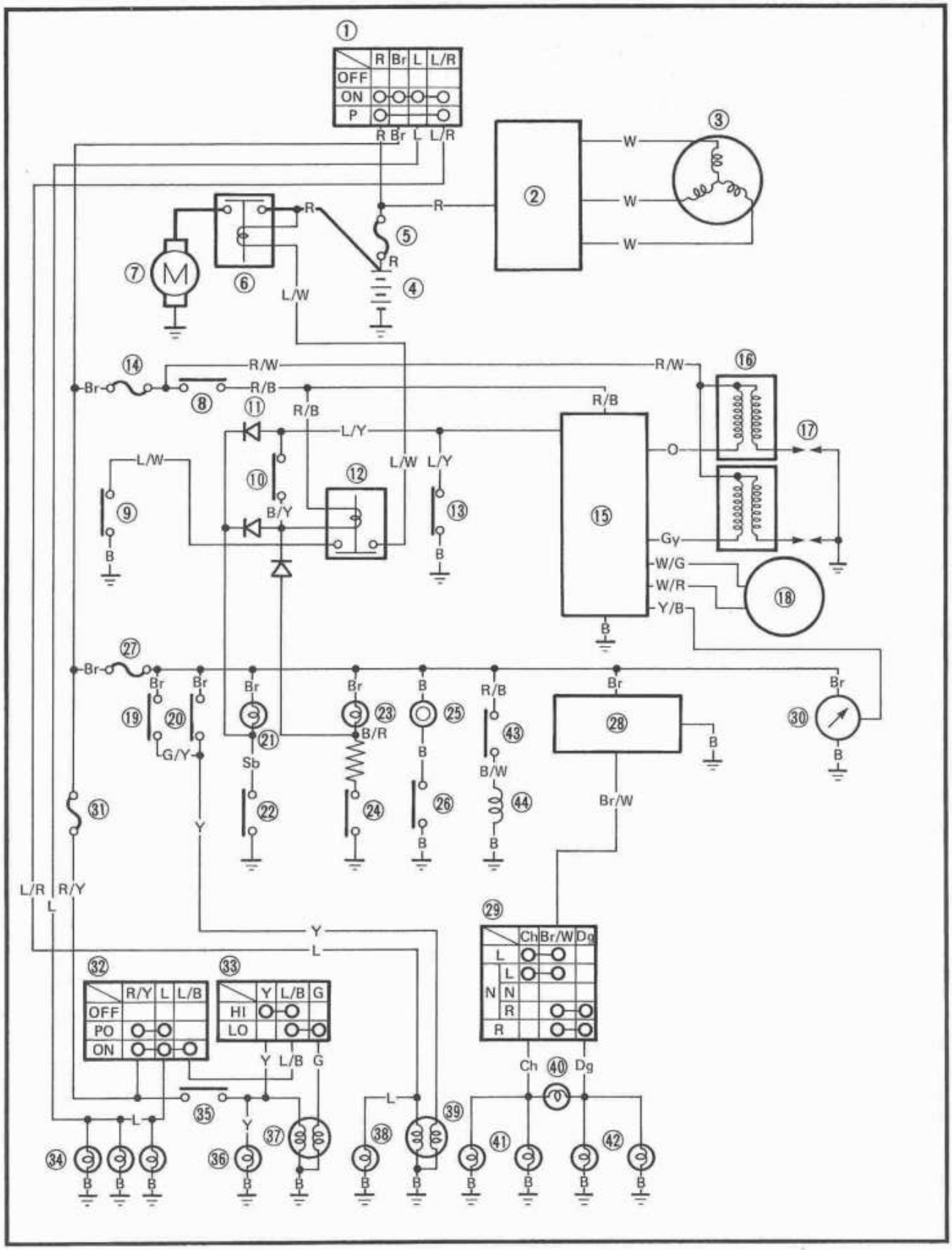
NOTE:

- Do not forget the collars ②.
- Align the opening ⓐ of the shift arm with the punch mark ⓑ on the shift shaft.

	Bolt (cover): **10 Nm (1.0 m · kg, 7.2 ft · lb)** **Bolt (shift arm):** **10 Nm (1.0 m · kg, 7.2 ft · lb)**

ELECTRICAL

XJ600S CIRCUIT DIAGRAM



① Main switch
② Rectifier/ regulator
③ A.C. magneto
④ Battery
⑤ Fuse (main)
⑥ Starter relay
⑦ Starter motor
⑧ "ENGINE STOP" switch
⑨ "START" switch
⑩ Clutch switch
⑪ Diode
⑫ Starting circuit cut-off relay
⑬ Sidestand switch
⑭ Fuse (ignition)
⑮ Ignitor unit
⑯ Ignition coil
⑰ Spark plug
⑱ Pick up coil
⑲ Front brake switch
⑳ Rear brake switch
㉑ "NEUTRAL" indicator light
㉒ Neutral switch
㉓ Oil level indicator light
㉔ Oil level switch
㉕ Horn
㉖ "HORN" switch
㉗ Fuse (signal)
㉘ Flasher relay
㉙ "TURN" switch
㉚ Tachometer
㉛ Fuse (head)
㉜ "LIGHTS" switch
㉝ "LIGHTS" (dimmer) switch
㉞ Meter light
㉟ "PASS" switch
㊱ "HIGH BEAM" indicator light
㊲ Headlight
㊳ Auxiliary light
㊴ Tail/brake light
㊵ "TURN" indicator light
㊶ Front flasher light
㊷ Rear flasher light
㊸ Thermo switch
㊹ Solenoid valve

NOTE:

- "START" switch is closed while the button (switch) is pushed.
- "HORN" switch is closed while the button (switch) is pushed.
- Clutch switch is closed while the clutch lever is pulled.
- Sidestand switch is closed while the sidestand is upped.
- Neutral switch is closed while the transmission is in neutral.
- Brake switch is closed while the brake is applied.

COLOR CODE

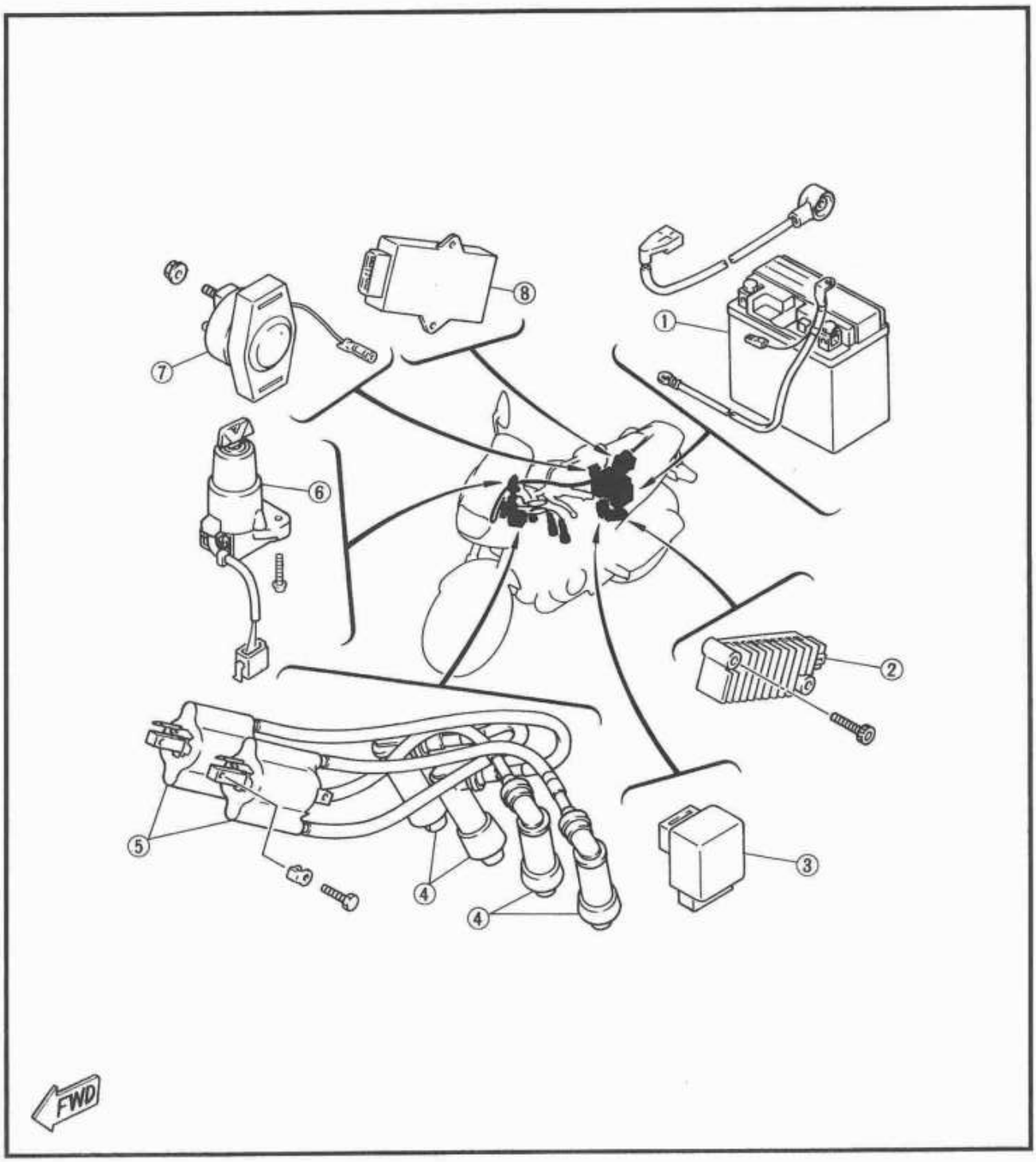
B	Black	Sb	Sky blue	R/Y	Red/Yellow
L	Blue	Dg	Dark green	L/Y	Blue/Yellow
G	Green	W	White	L/R	Blue/Red
Y	Yellow	B/Y	Black/Yellow	L/W	Blue/White
R	Red	B/W	Black/White	R/W	Red/White
P	Pink	B/R	Black/Red	Br/W	Brown/White
O	Orange	G/Y	Green/Yellow	W/G	White/Green
Br	Brown	L/B	Blue/Black	W/R	White/Red
Ch	Chocolate	Y/B	Yellow/Black		
Gy	Gray	R/B	Red/Black		

ELECTRICAL COMPONENTS

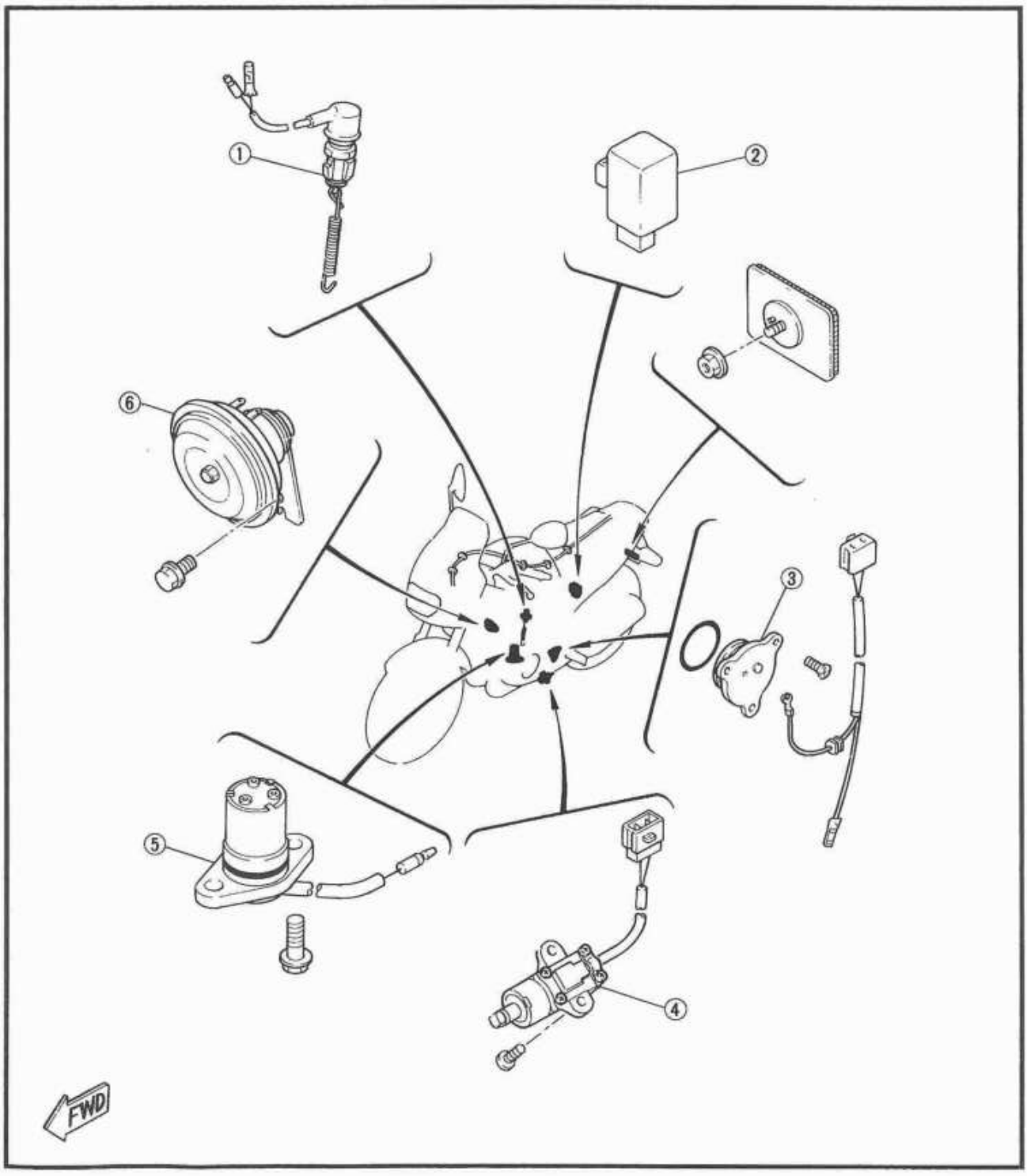
① Battery
② Rectifier/regulator
③ Relay assembly
④ Spark plug cap
⑤ Ignition coil
⑥ Main switch
⑦ Starter relay
⑧ Ignitor unit

BATTERY:
SPECIFIC GRAVITY: 1.32

IGNITION COIL:
PRIMARY COIL RESISTANCE:
1.92 ~ 2.88Ω at 20°C (68°F)
SECONDARY COIL RESISTANCE:
9.52 ~ 14.28kΩ at 20°C (68°F)



① Rear brake switch
② Flasher relay
③ Neutral switch
④ Sidestand switch
⑤ Oil level switch
⑥ Horn



YB707101

CHECKING OF SWITCHES

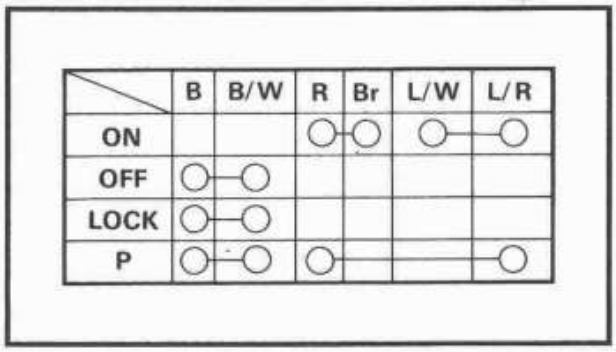
Check the switches for the continuity between the terminal to determine correct connection.

Read the following for switch inspection.

YB707102

SWITCH CONNECTION AS SHOWN IN MANUAL

The manual contains a connection chart as shown left showing the terminal connections of the switches (e.g., main switch, handlebar switch, bracket switch, lighting switch etc.)



The extreme left column indicates the switch positions and the top line indicates the colors of leads connected with the terminals in the switch component.

"○—○" indicates the terminals between which there is a continuity of electricity; i.e., a closed circuit at the respective switch positions.

In this chart:
"R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

"B and B/W" is continuous with the "OFF" switch position.

"B and B/W" is continuous with the "LOCK" switch position.

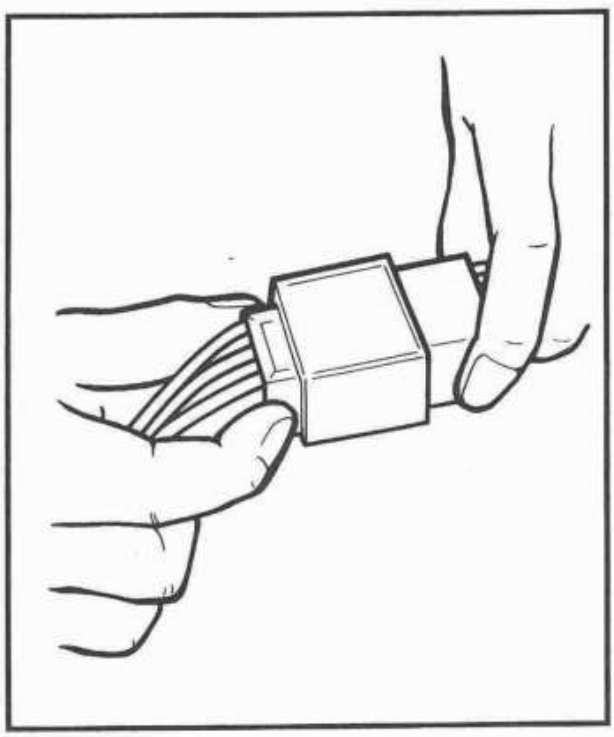
"B and B/W" and "R and L/R" are continuous with the "P" switch position.

YB707103

CHECKING SWITCH FOR TERMINAL CONNECTION

Before checking the switch, refer to the connection chart as shown above and check for the correct terminal connection (closed circuit) by the color combination.

To explain how to check the switch, the main switch taken for example in the following.



1. Disconnect the main switch coupler from the wireharness.

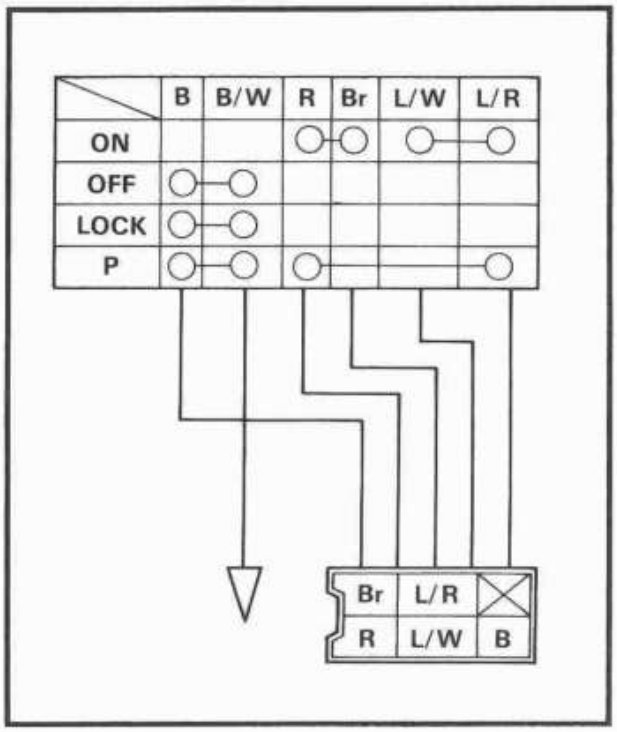
CAUTION:

Never disconnect the main switch coupler by pulling the leads. Otherwise, leads may be pulled off the terminals inside the coupler.

2. Inspect whether any lead is off the terminal inside the coupler. If it is, repair it.

NOTE:

If the coupler is clogged with mud or dust, blow it off by compressed air.



3. Use the connection chart to check the color combination for continuity (a closed circuit). In this example, the continuity is as follows.

   "R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

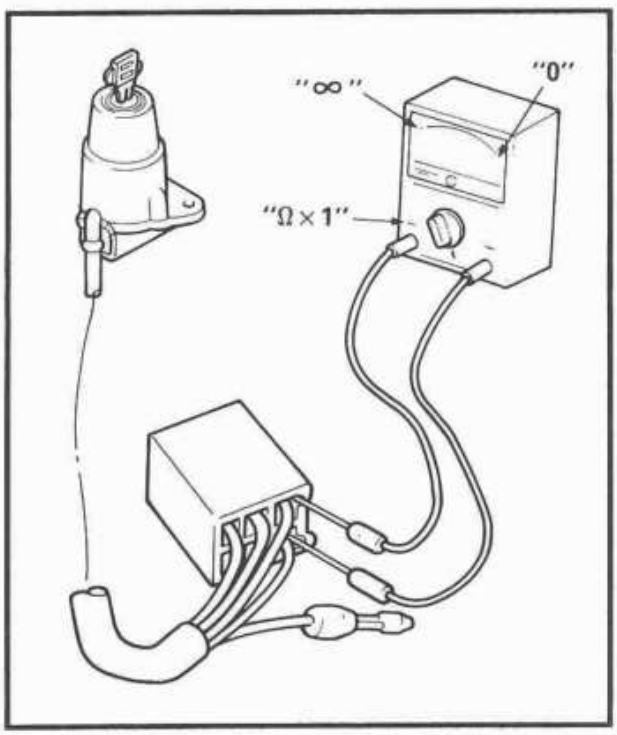
   "B and B/W" is continuous with the "OFF" switch position.

   "B and B/W" is continuous with the " LOCK" switch position.

   "B and B/W" and "R and L/R" are continuous with the "P" switch position.

   Please note that these is no continuity (an open circuit) at all for the color combinations other than the above.

4. Check the switch component for the continuity between "R and Br".



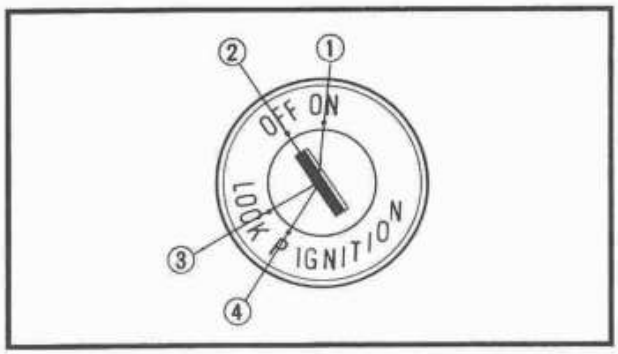
****

Checking steps:

- Turn the switch key to the "ON", "OFF", " LOCK" and "P" several times.
- Set the pocket tester selector to the "Ωx1".
- Connect the tester (+) lead to the "R" lead terminal in the coupler and the (−) lead to the "Br" lead terminal.

NOTE:

Use thin probes for checking the continuity. Otherwise, the probes may contact other terminals inside the coupler.



- Check the continuity between "R" and "Br " at the respective switch position of "ON" ① , "OFF" ② , "LOCK" ③ , and "P" ④ . There must be continuity (the tester indicating "0") at the "ON" switch position, and there must be no continuity (the tester indicating "∞") at "OFF", "LOCK", or "P". There is something wrong between "R" and "Br" if there is no continuity at the "ON " position or if there is some continuity either at the "OFF" or "LOCK" or "P".

NOTE:
Check the switch for continuity several times.

****

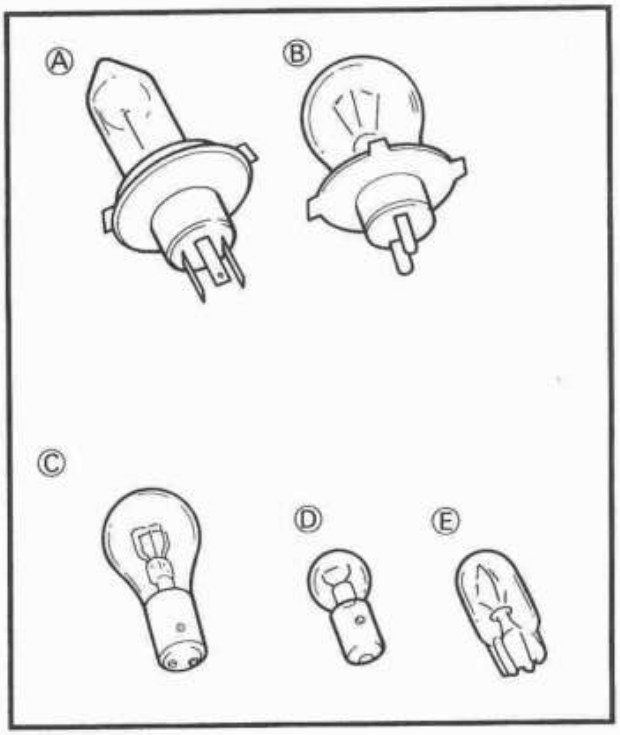
5. Next go on to checking of the continuity between "B" and "B/W", "L/W and L/R", and "R and L/R" at the respective switch positions, as in the same manner mentioned above.

6. If there is something wrong with any one of the combinations, replace the switch component.

YB707104

CHECKING OF BULBS (FOR HEADLIGHT, TAIL/BRAKE LIGHT, FLASHER LIGHT, METER LIGHT, ETC.)

Check the bulb terminal continuity for the condition of the bulb.



EB608110

KINDS OF BULBS

The bulbs used in the motorcycle are classified as shown left by the shape of the bulb socket.

Ⓐ and Ⓑ are many used for the headlight.

Ⓒ is mainly used for the flasher light and tail /brake light.

Ⓓ and Ⓔ are mainly used for the meter light and other indicator lights.

YB707106

CHECKING BULB CONDITION

1. Remove the bulb

NOTE:

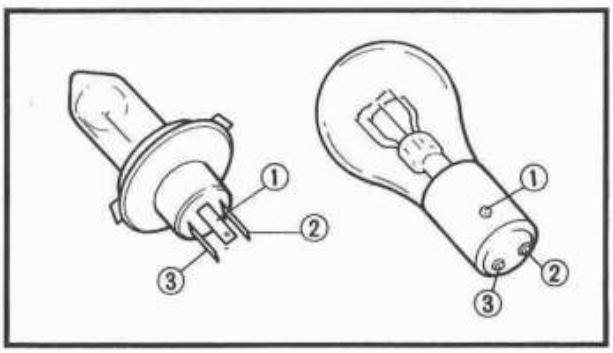
- Bulbs of the Ⓐ and Ⓑ type uses a bulb holder. Remove the bulb holder before removing the bulb itself. Most of the bulb holder for this type can be removed by turning them counterclockwise.
- Most of the bulbs of Ⓒ and Ⓓ type can be removed from the bulb sockets by pushing and turning them counterclockwise.
- Bulbs of the Ⓔ type can be removed from the bulb sockets by simply pulling them out.

CAUTION:

Be sure to hold the socket firmly when removing the bulb. Never pull the lead. Otherwise, the lead may be pulled off the terminal in the coupler.

⚠ WARNING

Keep flammable products or your hands away from the headlight bulb while it is on. It will be hot. Do not touch the bulb until it cools down.



2. Check the bulb terminals for continuity.

****

Checking steps:

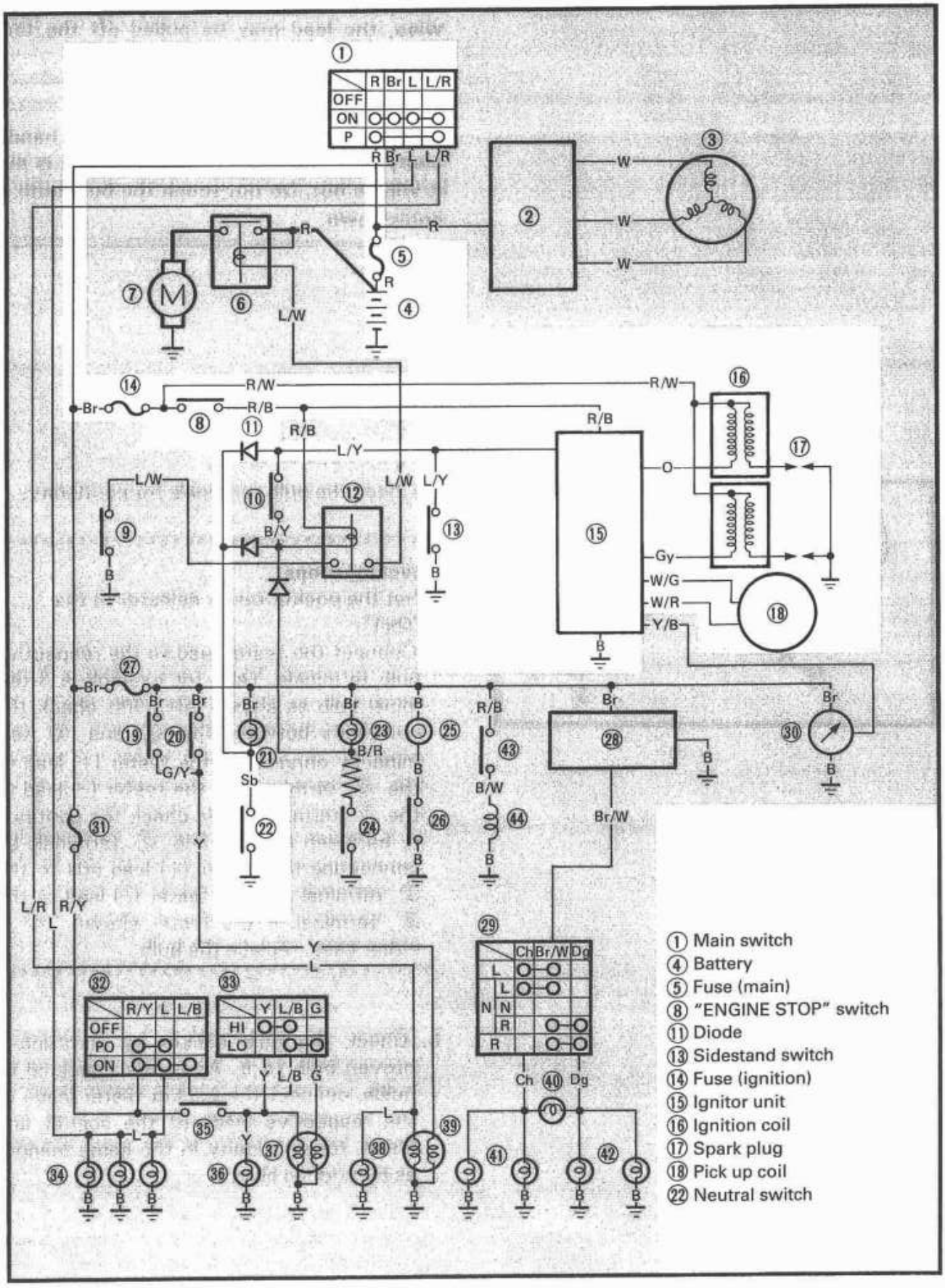
- Set the pocket tester selector to the "Ωx1".
- Connect the tester lead to the respective bulb terminals. Take for example a 3-terminal bulb as shown left. First check the continuity between the ① and ② terminal by connecting the tester (+) lead to the ① terminal and the tester (−) lead to the ② terminal. Then check the continuity between the ① and ③ terminals by connecting the tester (+) lead still to the ① terminal and the tester (−) lead to the ③ terminal. If the tester shown "∞" in either case, replace the bulb.

****

3. Check the bulb socket by installing a proven bulb to it. As in the checking of bulbs, connect the pocket tester leads to the respective leads of the socket and check for continuity in the same manner as mentioned above.

IGNITION SYSTEM

CIRCUIT DIAGRAM



YB707201

TROUBLESHOOTING

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK)

YB707202

Procedure

Check;

1. Fuse (main and ignition)
2. Battery
3. Spark plug
4. Ignition spark gap
5. Spark plug cap resistance
6. Ignition coil resistance
7. Main switch
8. "ENGINE STOP" switch
9. Neutral switch
10. Sidestand switch
11. Diode (relay unit)
12. Pickup coil resistance
13. Wiring connection (Entire ignition system)

YB707203

NOTE:

- Remove the following parts before troubleshooting.

1) Seat
2) Cowling
3) Side covers (left and right)
4) Fuel tank

Ignition checker:
P/N 90890-06754
Pocket tester:
P/N 90890-03112

YB707204

1. Fuse (main and ignition)
• Remove the fuses. • Connect the pocket tester (Ω x 1) to the fuses. • Check the fuses for continuity.

NO CONTINUITY → Replace fuse(s).

CONTINUITY ↓

YB707205

2. Battery
• Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.
Open circuit voltage: **12.8V or more at 20°C (68°F)**

INCORRECT → • Clean the battery terminals.
• Recharge or replace the battery.

↓

*

*

CORRECT

YB707206

3. Spark plug
• Check the spark plug condition. • Check the spark plug type. • Check the spark plug gap. Replace to the "SPARK PLUG INSPECTION" section in the CHAPTER 3.

Standard spark plug:
CR7E(NGK), U22ESR-N(N.D.)
CR8E(NGK), U24ESR-N(N.D.)
CR9E(NGK), U27ESR-N(N.D.)

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

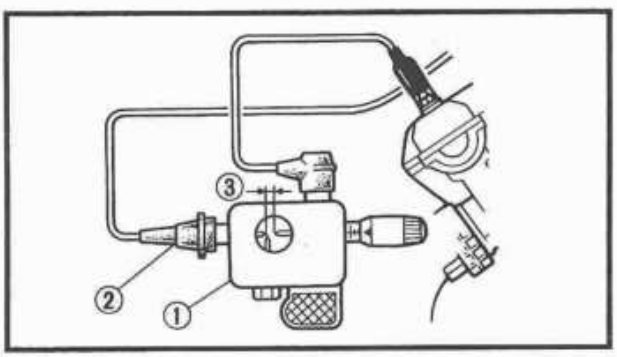
INCORRECT

Repair or replace spark plug.

CORRECT

YB707207

4. Ignition spark gap
• Disconnect the spark plug cap from spark plug. • Connect the ignition checker ① as shown. ② Spark plug cap • Turn the main switch to "ON".



• Check the ignition spark gap ③. • Start engine, and increase spark gap until misfire occurs.
Minimum spark gap: **6.0 mm (0.24 in)**

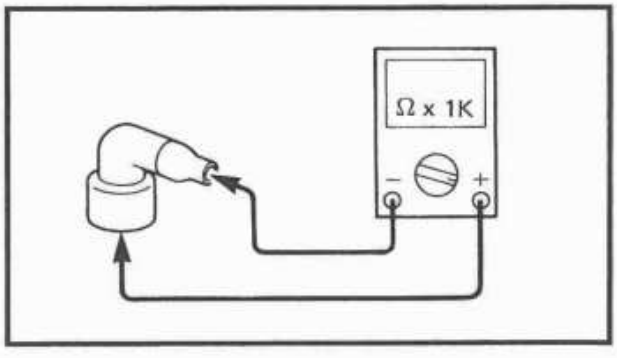
MEETS SPECIFICATION

Ignition system is good.

OUT OF SPECIFICATION OR NO SPARK

YB707208

5. Spark plug cap resistance
• Remove the spark plug cap. • Connect the pocket tester (Ω x 1k) to the spark plug cap.



- Check the spark plug cap for specificated resistance.

Spark plug cap resistance:
9~11 kΩ at 20°C (68°F)

OUT OF SPECIFICATION → Replace spark plug cap.

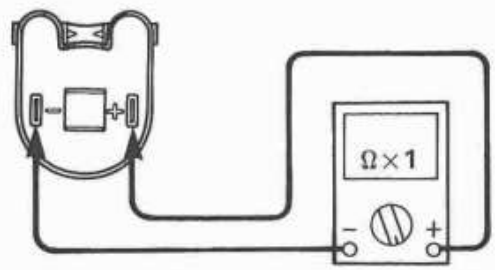
MEETS SPECIFICATION

YB707209

6. Ignition coil resistance

- Disconnect the ignition coil coupler from the wireharness.
- Connect the pocket tester (Ω x 1) to the ignition coil.

Tester (+) lead → Terminal
Tester (−) lead → Terminal

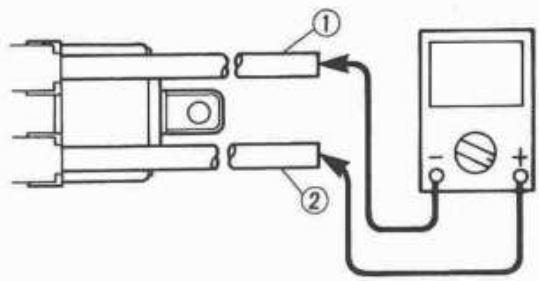


- Check the primary coil for specificated resistance.

Primary coil resistance:
1.92~2.88 Ω at 20°C (68°F)

- Connect the pocket tester (Ω x 1k) to the ignition coil.

Tester (+) lead → Spark plug lead ①
Tester (−) lead → Spark plug lead ②



- Check the secondary coil for specificated resistance.

Secondary coil resistance:
9.52~14.28 kΩ at 20°C (68°F)
(Spark plug lead-Spark plug lead)

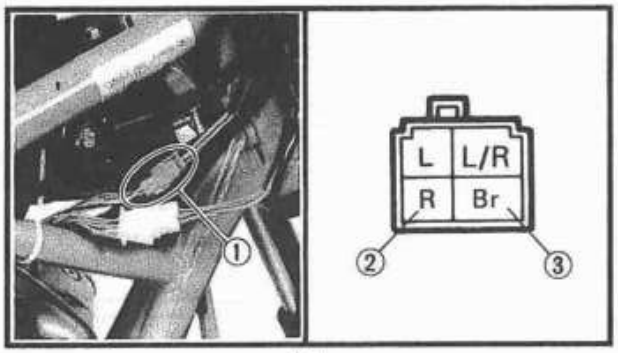
OUT OF SPECIFICATION → Replace ignition coil.

BOTH MEET SPECIFICATION

YB707210

7. Main switch

- Disconnect the main switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Red ② and Brown ③ ". Refer to the "CHECKING OF SWITCHES" section.



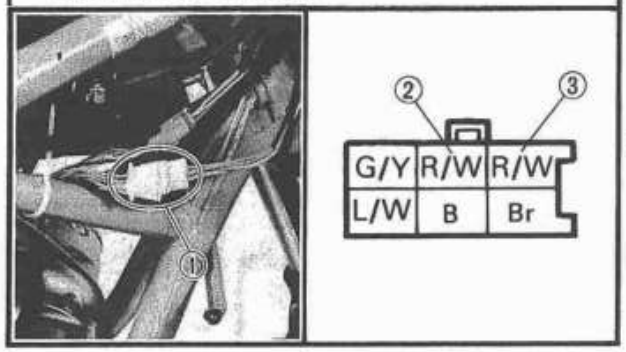
INCORRECT → Replace main switch.

CORRECT

YB707211

8. "ENGINE STOP" switch

- Disconnect the handlebar switch (right) coupler from ① the wireharness.
- Check the switch component for the continuity between "Red/White ② and Red/White ③ ". Refer to the "CHECKING OF SWITCHES" section.



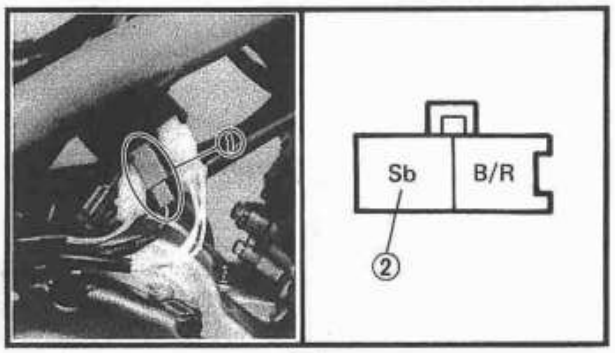
INCORRECT → Replace handlebar switch (right).

CORRECT

YB707212

9. Neutral switch

- Disconnect the neutral switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Sky blue ② and Ground". Refer to the "CHECKING OF SWITCHES" section.



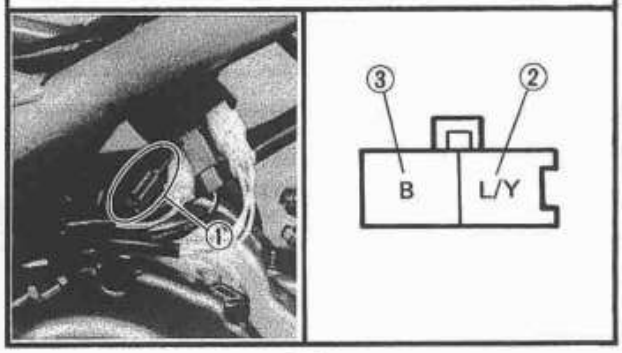
INCORRECT → Replace neutral switch.

CORRECT

YB707213

10. Sidestand switch

- Disconnect the sidestand switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Blue/Yellow ② and Black ③ ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Replace sidestand switch.

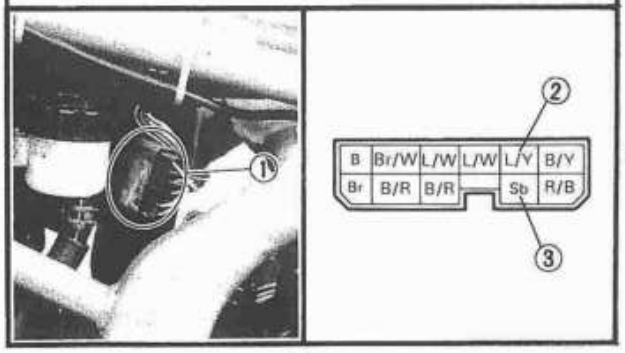
CORRECT

YB707214

11. Diode (relay unit)

- Disconnect the relay unit lead ① from the wireharness.
- Connect the pocket tester (Ω x 1) to the relay unit terminal.
- Check the relay unit for continuity.

Tester (+) lead → Blue/Yellow terminal ②
Tester (−) lead → Sky blue terminal ③



NO CONTINUITY → Replace relay unit.

*

*

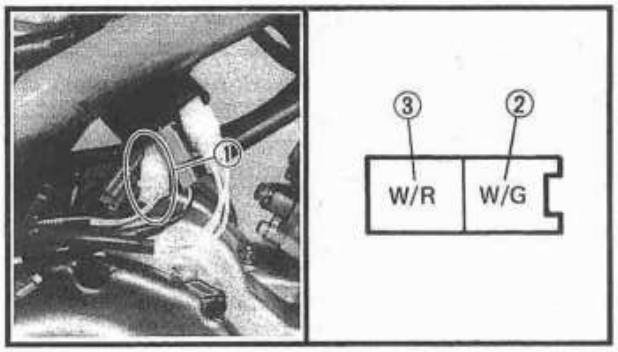
CONTINUITY

YB707215

12. Pickup coil resistance

- Disconnect the pickup coil coupler ① from the wireharness.
- Connect the pocket tester (Ω x 100) to the pickup coil terminal.

Tester (+) lead → White/Red ② terminal
Tester (−) lead → White/Green ③ terminal



- Check the pickup coil for specificated resistance.

Pickup coil resistance:
304~456 Ω at 20°C (68°F)
(White/Red-White/Green)

OUT OF SPECIFICATION

Replace pickup coil.

MEET SPECIFICATION

YB707216

13. Wiring connection

- Check the entire ignition system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

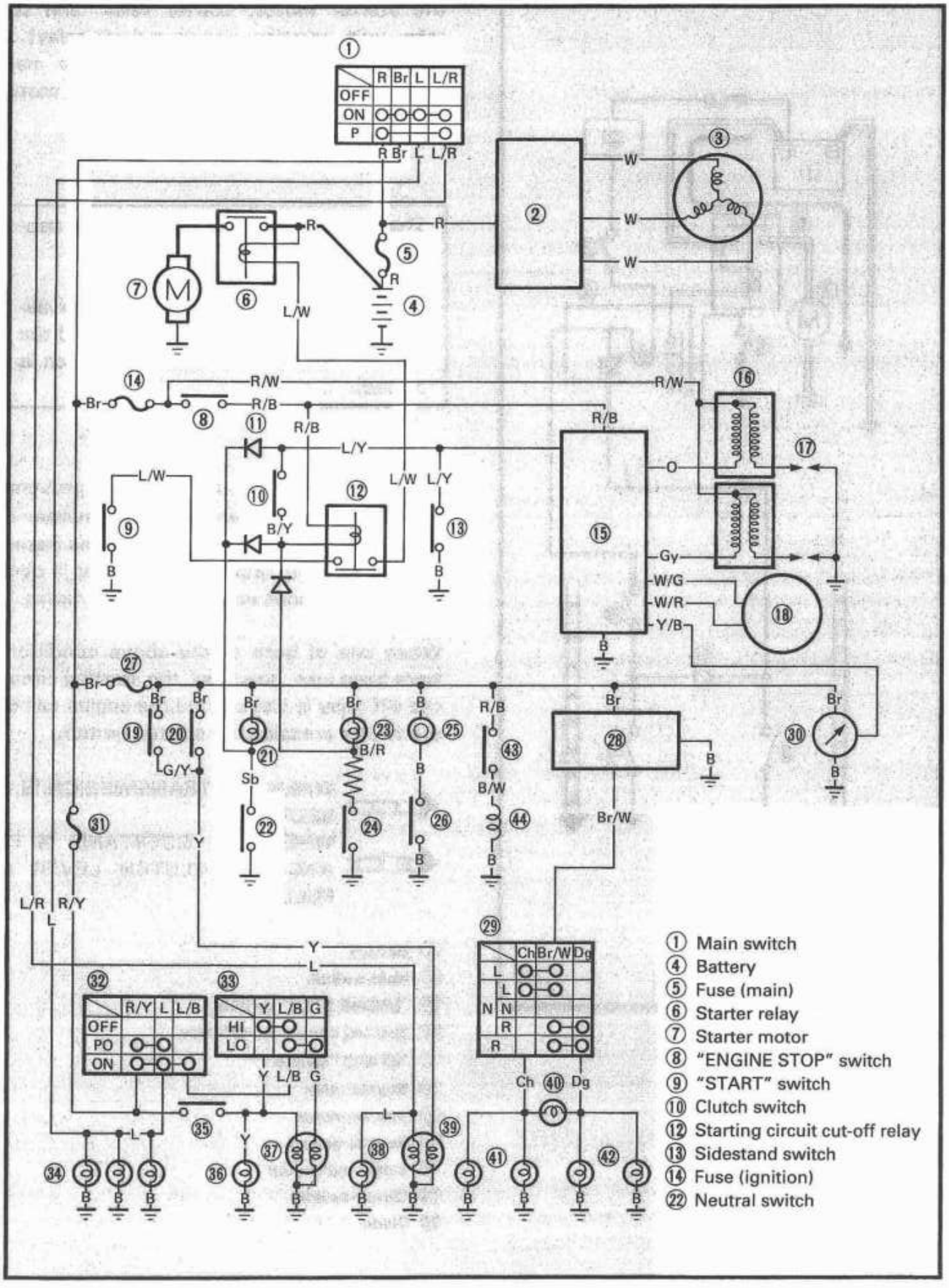
Correct.

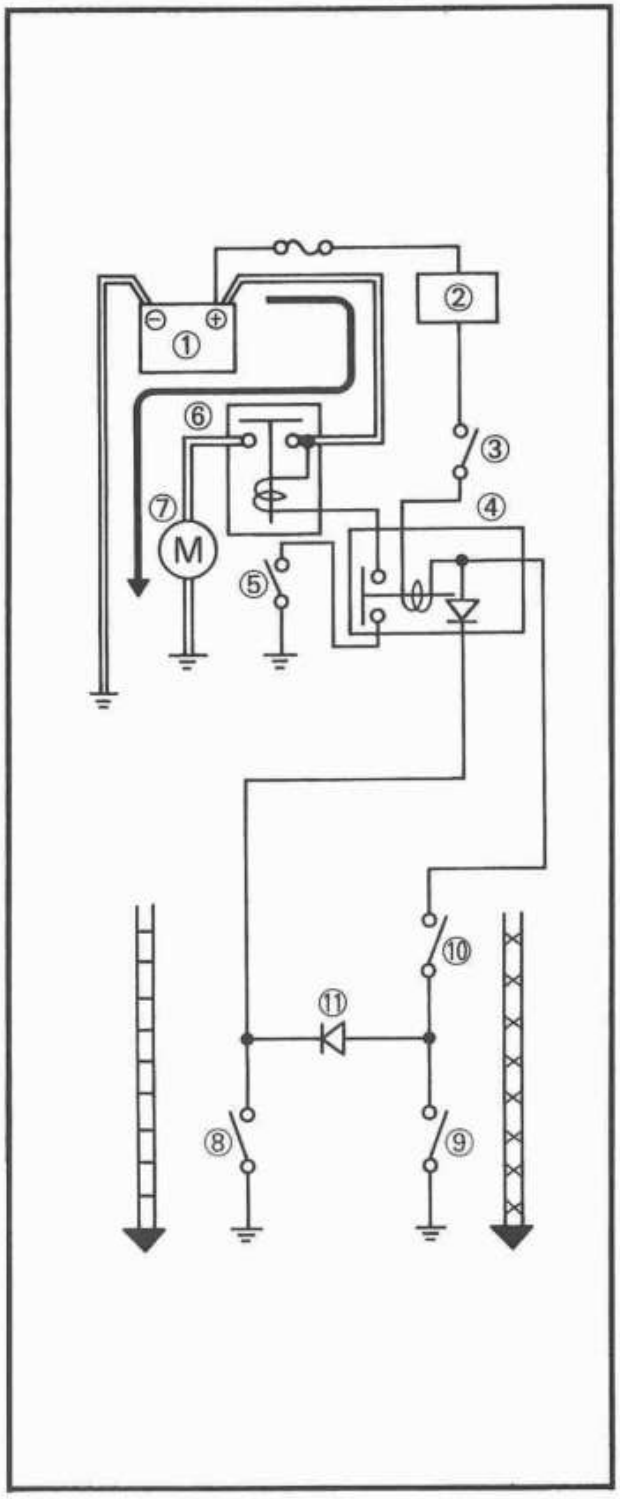
CORRECT

Replace digital ignitor unit.

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM





YB707301

STARTING CIRCUIT OPERATION

The starting circuit on this model consist of the starter motor, starter relay, and the relay unit (starting circuit cut-off relay). If the "ENGINE STOP" switch and the main switch are both closed, the starter motor can operate only if:

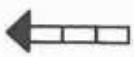
The transmission is in neutral (the neutral switch is closed).

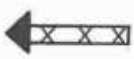
or if

The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed).

The starting circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor.

When one of both 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 Main switch
③ "ENGINE STOP" switch
④ Starting circuit cut-off relay
⑤ "START" switch
⑥ Starter relay
⑦ Starter motor
⑧ Neutral switch
⑨ Sidestand switch
⑩ Clutch switch
⑪ Diode

YB707302

TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE.

YB707303

Procedure

Check;

1. Fuse (main and ignition)
2. Battery
3. Starter motor
4. Starter relay
5. Starting circuit cut off relay
6. Main switch
7. "ENGINE STOP" switch
8. Neutral switch
9. Sidestand switch
10. Clutch switch
11. "START" switch
12. Wiring connection (entire electric starting system)

YB707304

NOTE:

Remove the following parts before troubleshooting.

1) Seat
2) Side covers (left and right)
3) Fuel tank
4) Cowling

Pocket tester:
90890-03112

YB707305

1. Fuse (main and ignition)

- Remove the fuses.
- Connect the pocket tester (Ω x 1) to the fuses.
- Check the fuses for continuity.

NO CONTINUITY → Replace fuse(s).

CONTINUITY ↓

YB707306

2. Battery

- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Open circuit voltage:
12.8V or more at 20°C (68°F)

INCORRECT →

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

↓

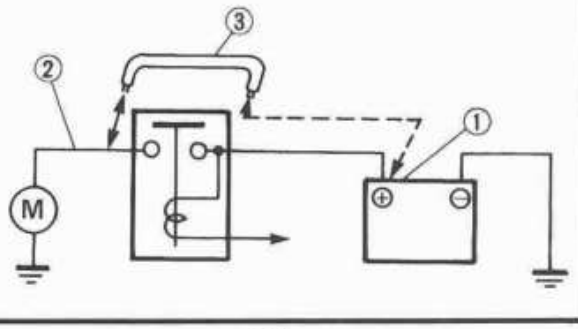
*

*

CORRECT

YB707307

3. Starter motor
• connect the battery positive terminal ① and starter motor cable ② using a jumper lead ③ *. • Check the starter motor for operation.



*

⚠WARNING

- **A wire for jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may cause the jumper lead to be burned.**
- **This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.**

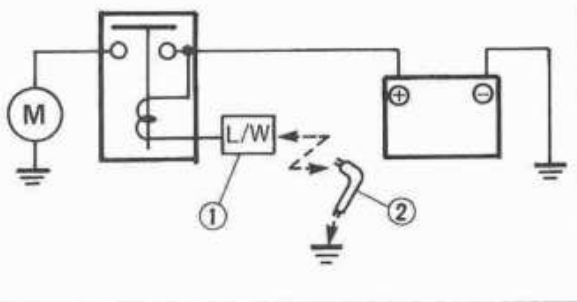
DOES NOT MOVE

Repair or replace starter motor.

MOVES

YB707308

4. Starter relay
• Disconnect the starter relay lead from the wireharness. • Ground the starter relay lead "Blue/White" ① to the frame using the jumper lead ② . • Check the starter motor for operation.



DOES NOT MOVE

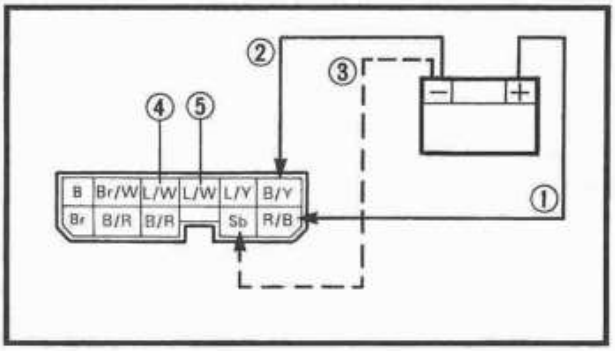
Replace starter relay.

MOVES

YB707309

5. Starting circuit cut-off relay (relay unit)
• Disconnect the relay unit lead from the wireharness. • Connect the pocket tester (Ω x 1) and battery (12 V) to the relay unit coupler terminals.

Step 1.
Battery (+) terminal → Red/Black ① terminal.
Battery (−) terminal → Black/Yellow ② terminal.
Step 2.
Battery (+) terminal → Red/Black ① terminal.
Battery (−) terminal → Sky blue ③ terminal.



Tester (+) lead → Blue/White ④ terminal
Tester (−) lead → Blue/White ⑤ terminal

- Check the starting circuit cut-off relay for continuity.

NO CONTINUITY → Replace relay unit assembly.

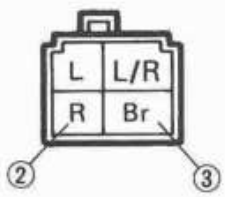
CONTINUITY

YB707310

6. Main switch

- Disconnect the main switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Red ② and Brown ③ ". Refer to the "CHECKING OF SWITCHES" section.





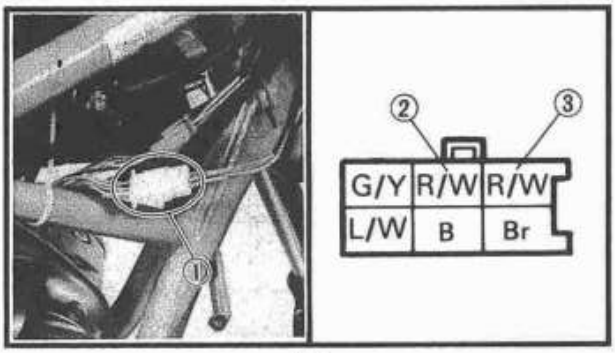
INCORRECT → Replace main switch.

CORRECT

YB707311

7. "ENGINE STOP" switch

- Disconnect the handlebar switch (right) coupler from ① the wireharness.
- Check the switch component for the continuity between "Red/White ② and Red/White ③ ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

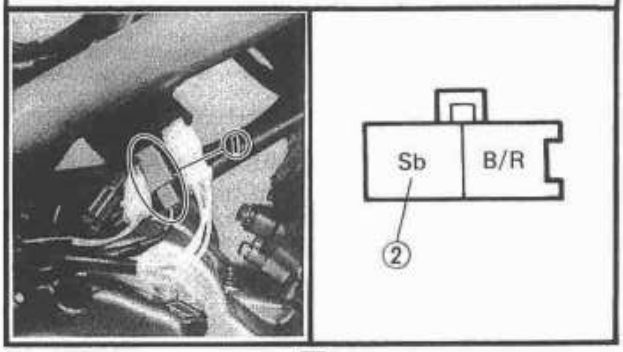
Replace handlebar switch (right).

CORRECT

YB707312

8. Neutral switch

- Disconnect the neutral switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Sky blue ② and Ground". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

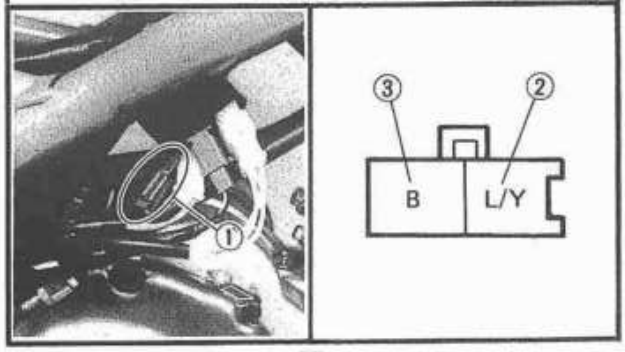
Replace neutral switch.

CORRECT

YB707313

9. Sidestand switch

- Disconnect the sidestand switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Blue/Yellow ② and Black ③ ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Replace sidestand switch.

CORRECT

*

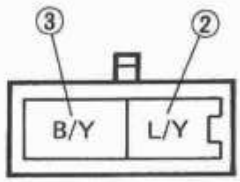
*

YB707314

10. Clutch switch

- Disconnect the handlebar switch (left) coupler ① from wireharness.
- Check the clutch switch component for the continuity between "Blue/Yellow ② and Black/Yellow ③ ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Replace the clutch switch.

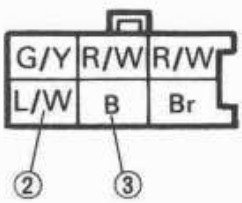
CORRECT

YB707315

11. "START" switch

- Disconnect handlebar switch (right) coupler ① from wireharness.
- Check the "START" switch component for the continuity between "Blue/White ② and Black ③ ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Replace handlebar switch (right).

CORRECT

YB707316

12. Wiring connection

- Check the entire starting system for connections.
  Refer to the "WIRING DIAGRAM" section.

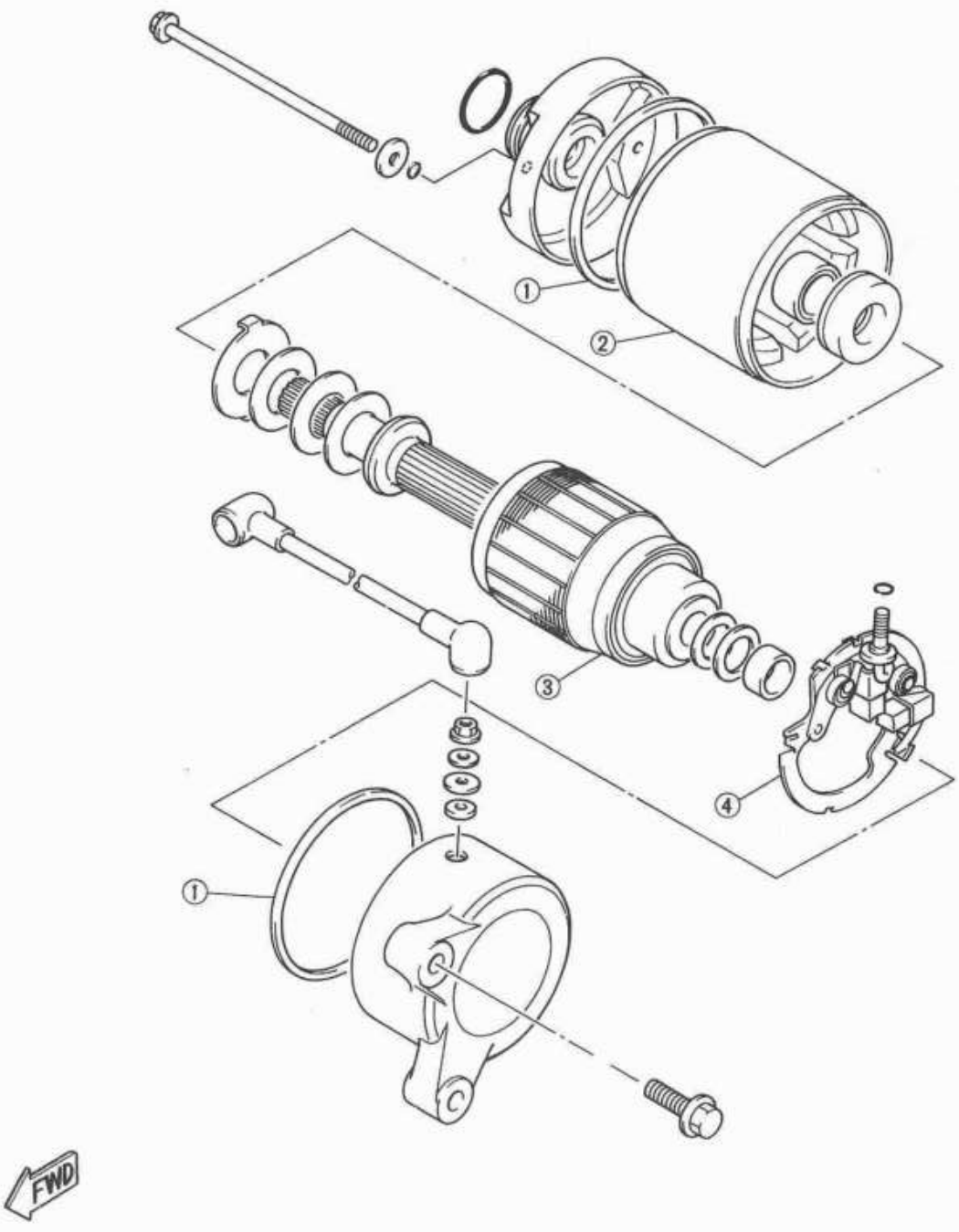
POOR CONNECTION

Correct.

STARTER MOTOR

① O-ring
② Yoke
③ Armature
④ Brush

A	ARMATURE COIL RESISTANCE: 3.9 ~ 4.7Ω 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: 0.8 mm (0.03 in)

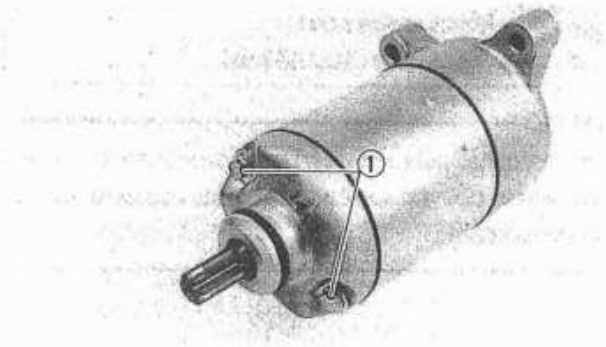


YB707317

Removal

1. Remove:
- Starter motor

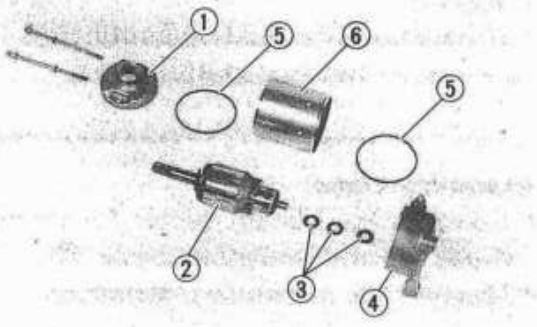
Refer to the "ENGINE OVERHAUL—ENGINE DISASSEMBLY" section in the CHAPTER 4.



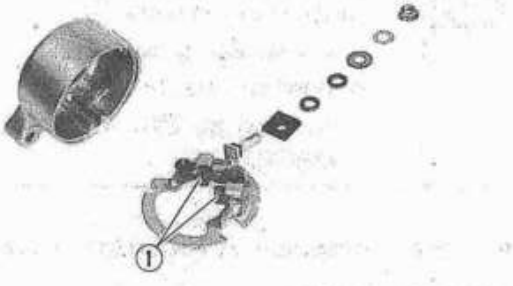
YB707318

Disassembly

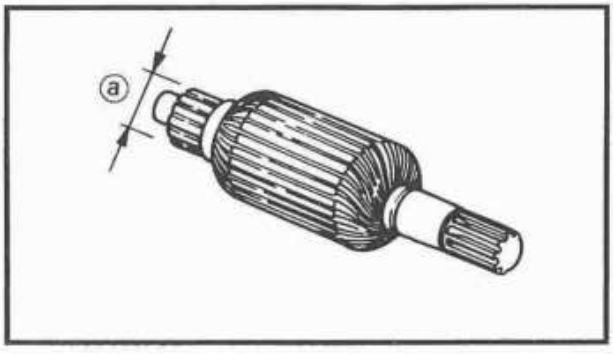
1. Remove:
- Bolts ①



2. Remove:
- Bracket ①
- Washers
- Armature ②
- Shims ③
- Bracket ④
- O-rings ⑤
- Yoke ⑥



3. Remove:
- Brushes ①



YB707319

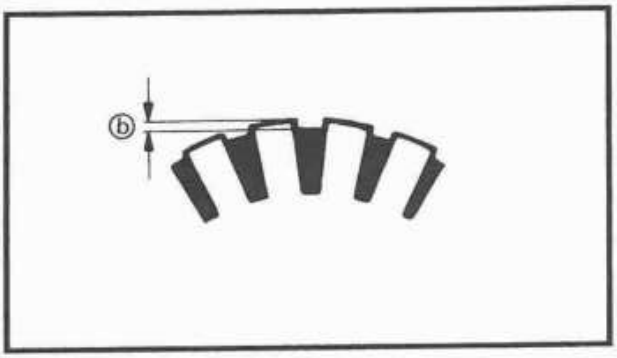
Inspection and repair

1. Inspect:
- Commutator

Dirty → Clean it with #600 grit sandpaper.

2. Measure:
- Commutator diameter ⓐ

Out of specification → Replace starter motor.

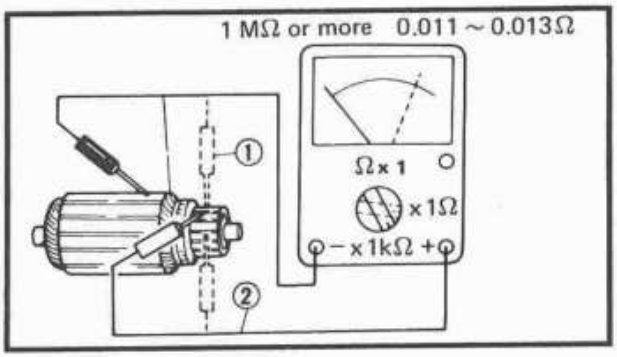


Commutator wear limit:
27 mm (1.06 in)

3. Measure:
• Mica undercut ⓐ
Out of specification → Scrape the mica to proper value use a hacksaw blade can be ground to fit.

Mica undercut:
0.8 mm (0.031 in)

NOTE:
The mica insulation of the commutator must be undercut to ensure proper operation of commutator.



4. Inspect:
• Armature coil (insulation/continuity)
Defects → Replace starter motor.

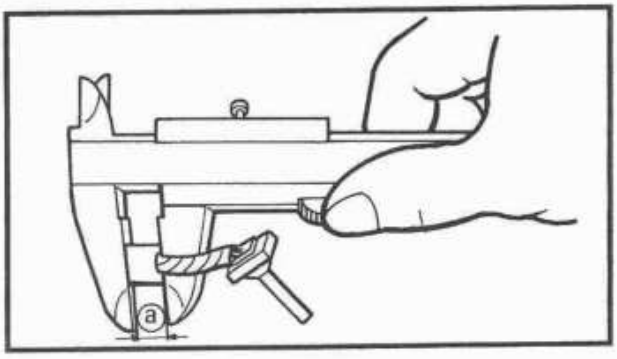
****

Inspecting steps:
● Connect the pocket tester for continuity check ① and insulation check ② .
● Measure the armature resistances.

Armature coil resistance:
Continuity check ① :
0 Ω at 20°C (68°F)
Insulation check ② :
More than 1MΩ at 20°C (68°F)

● If the resistance is incorrect, replace the starter motor.

****

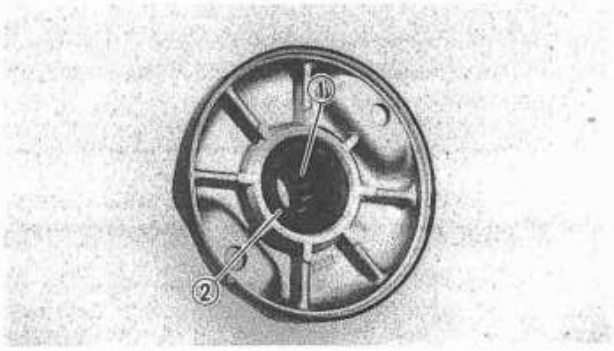


5. Measure:
• Brush length ⓐ
Out of specification → Replace.

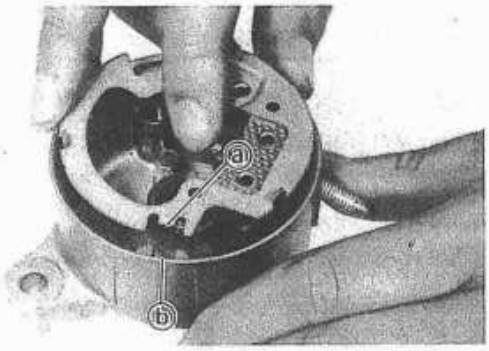
Brush length limit:
4 mm (0.16 in)

6. Measure:
• Brush spring force
Fatigue/Out of specification → Replace as a set.

	Brush spring force: **340~460 g (12.0~16.2 oz)**

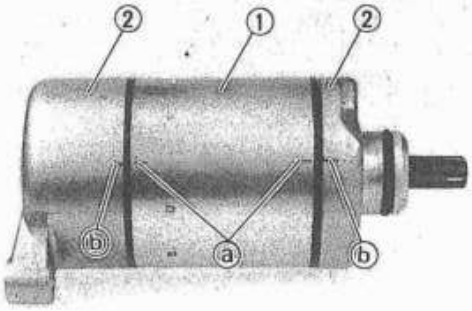


7. Inspect:
• Bearing ①
• Oil seal ②

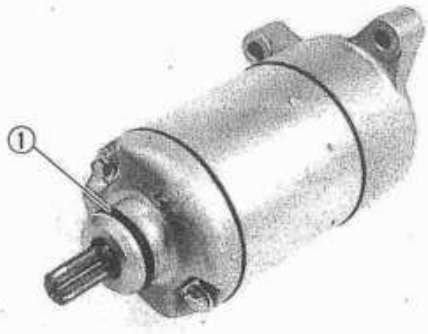


YB707320
Assembly
Reserve the "Removal" procedure.
Note the following points.

1. Install:
• Brush set
NOTE:
Align the projection ⓐ on the brush seat with the slot ⓑ on the housing.



2. Install:
• Yoke ①
• Brackets ②
NOTE:
Align the match marks ⓐ on the yoke with the match marks on the brackets ⓑ.



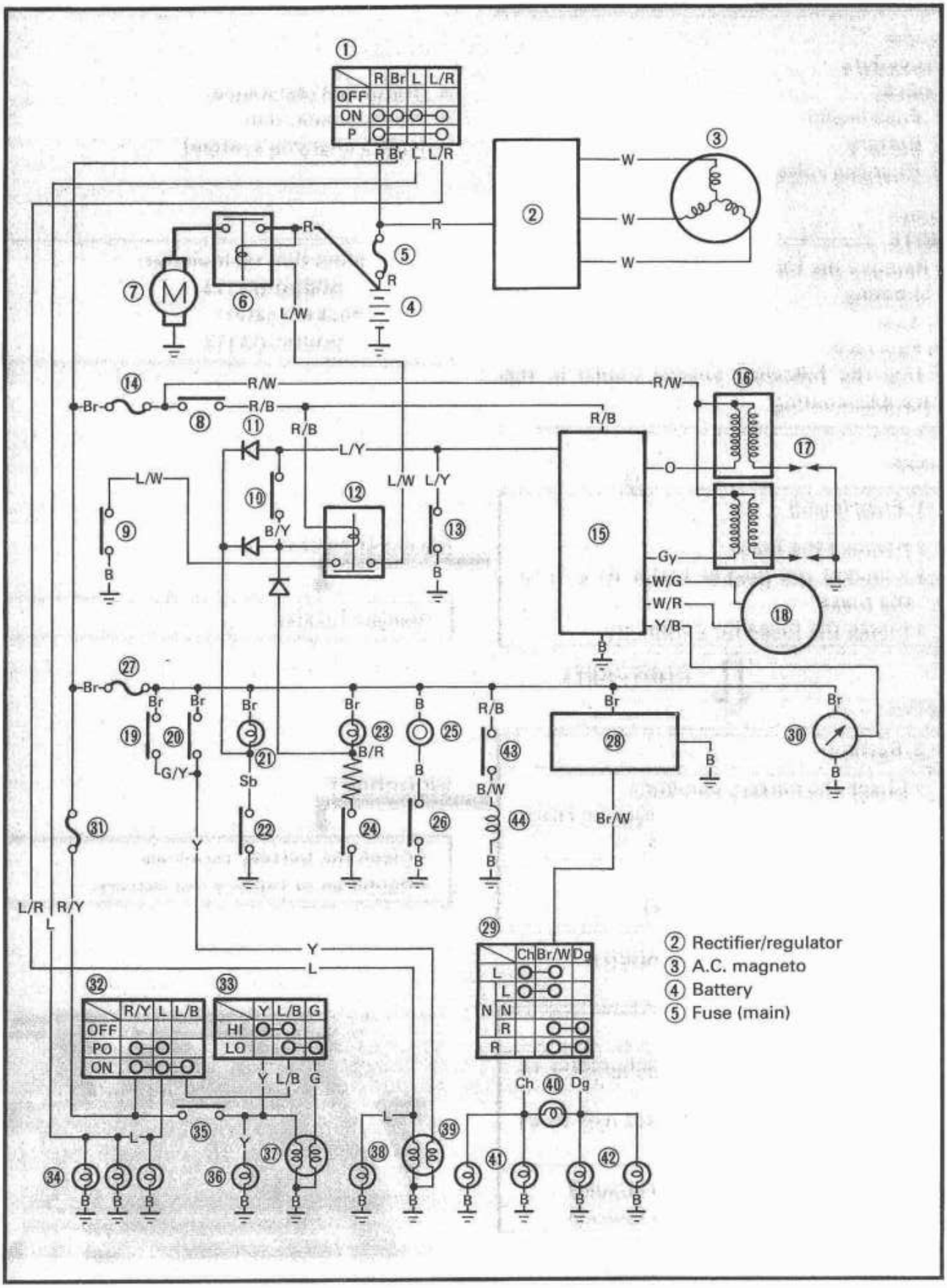
YB707321
Installation
1. Install:
• Starter motor
NOTE:
Apply a lightly grease to the O-ring ①.

	**Bolt (starter motor):** **10 Nm (1.0 m · kg, 7.2 ft · lb)**

Refer to the "ENGINE OVERHAUL—ENGINE ASSEMBLY" section in the CHAPTER 4.

CHARGING SYSTEM

CIRCUIT DIAGRAM



YB707401

TROUBLESHOOTING

THE BATTERY IS NOT CHARGED.

YB707402

Procedure

Check;
1. Fuse (main)
2. Battery
3. Charging voltage
4. Stator coil resistance
5. Wiring connection (entire charging system)

YB707403

NOTE:
- Remove the following parts before troubleshooting.
  1) Seat
  2) Feul tank
- Use the following special tool(s) in this troubleshooting.

Inductive tachometer:
90890-03113
Pocket tester:
90890-03112

YB707404

1. Fuse (main)
- Remove the fuses.
- Connect the pocket tester (Ω x 1) to the fuses.
- Check the fuses for continuity.

NO CONTINUITY → Replace fuse(s).

CONTINUITY ↓

YB707405

2. Battery
- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Open circuit voltage:
12.8V or more at 20°C (68°F)

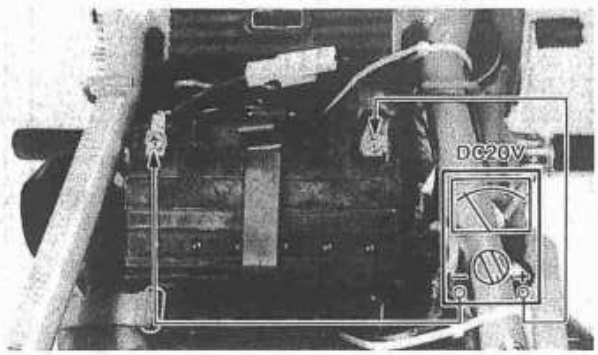
INCORRECT → • Clean the battery terminals. • Recharge or replace the battery.

CORRECT ↓

YB707406

3. Charging voltage
- Connect the inductive tachometer to 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.
- Check charging voltage.

Charging voltage:
14.3~15.3 V at 5,000 r/min

NOTE:
Use a full charged battery.

MEETS SPECIFICATION → Charging circuit is good.

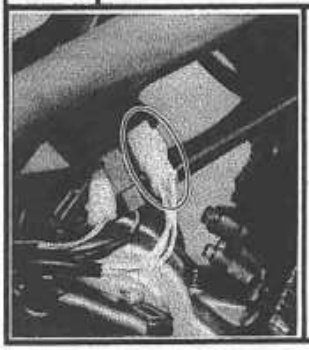
OUT OF SPECIFICATION

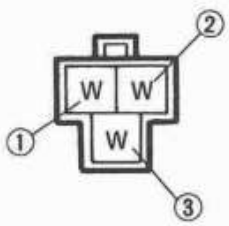
YB707407

4. Stator coil resistance

- Remove the generator cover.
- Connect the pocket tester "Ω x 1" to the stator coils.
- Measure the stator coil resistances.

Stator coil resistance:
0.32~0.48 Ω at 20°C (68°F)





Tester (+) lead → White lead ①	**Tester (+) lead → White lead ①**
Tester (−) lead → White lead ②	**Tester (−) lead → White lead ③**

OUT OF SPECIFICATION → Replace stator assembly.

BOTH MEET SPECIFICATIONS

YB707408

5. Wiring connection

- Check the entire ignition system for connections.
  Refer to the "WIRING DIAGRAM" section.

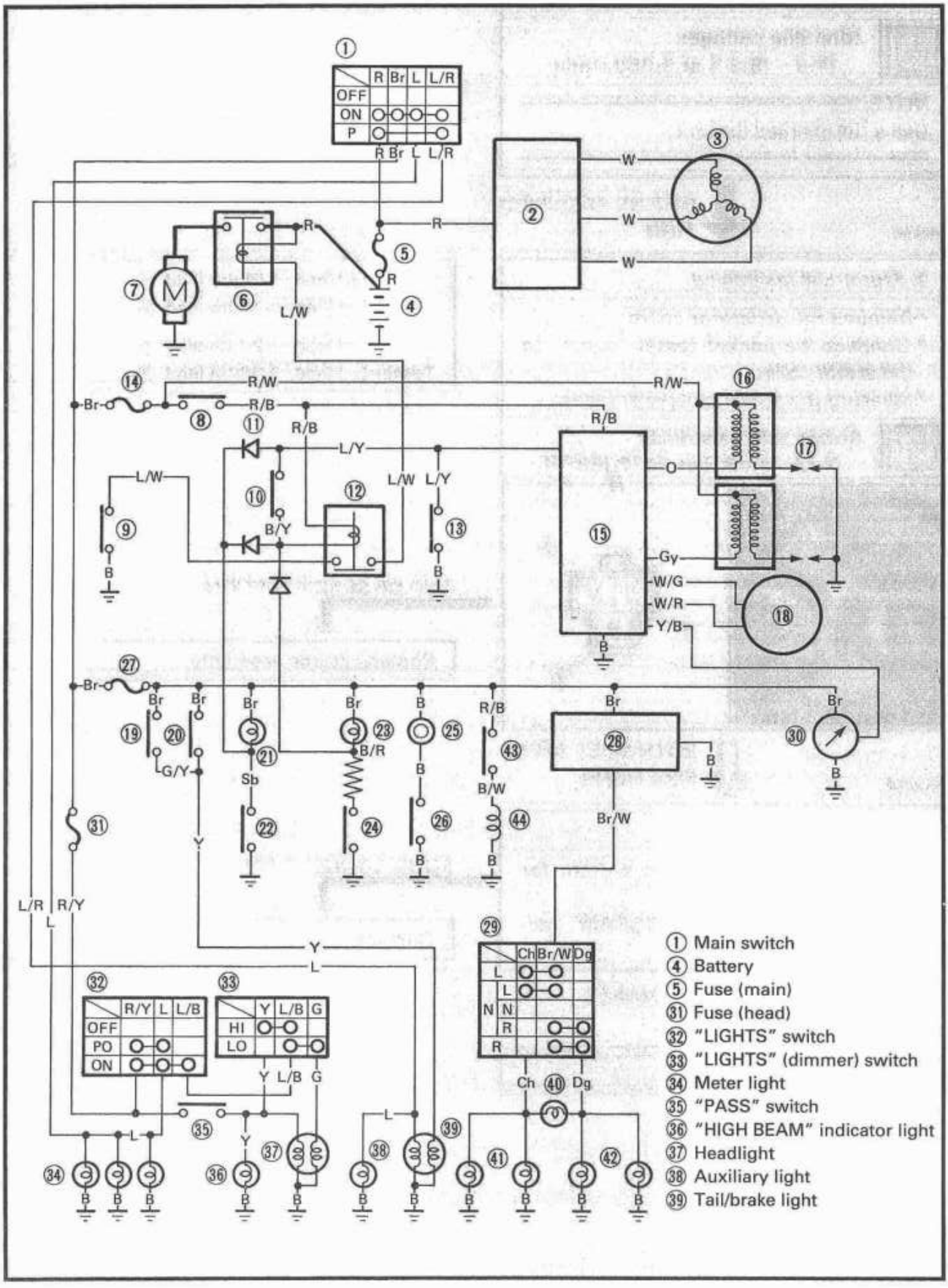
POOR CONNECTION → Correct.

CORRECT

Replace rectifier/regulator.

LIGHTING SYSTEM

CIRCUIT DIAGRAM



YB707501

TROUBLESHOOTING

HEADLIGHT "HIGH BEAM" INDICATOR LIGHT, TAILLIGHT, AND/OR METER LIGHT DO NOT COME ON.

YB707502

Procedure

Check;

1. Fuse (main and head)
2. Battery
3. Main switch
4. "LIGHTS" switch
5. "LIGHTS" (Dimmer) switch
6. "PASS" switch
7. Wiring connection (entire lighting system)

YB707503

NOTE:

- Remove the following parts before troubleshooting.

1) Seat
2) Cowling

- Use the following special tool(s) in this troubleshooting.



Pocket tester:
P/N 90890-03112

YB707504

1. Fuse (main and head)

- Remove the fuses.
- Connect the pocket tester (Ω x 1) to the fuses.
- Check the fuses for continuity.

NO CONTINUITY → Replace fuse(s).

CONTINUITY ↓

YB707505

2. Battery

- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Open circuit voltage:
12.8V or more at 20°C (68°F)

INCORRECT →

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

CORRECT ↓

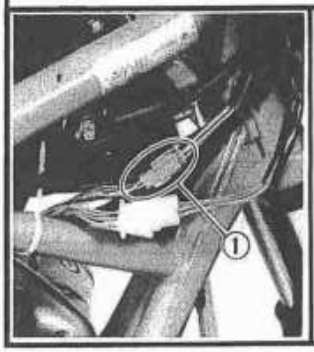
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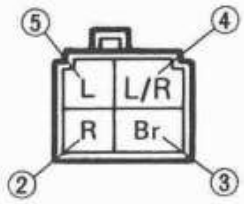
*

YB707506

3. Main switch

- Disconnect the main switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Red ② and Brown ③ ", "Blue/Red ④ and Blue ⑤ " and "Red ② and Blue/Red ④ ".





INCORRECT

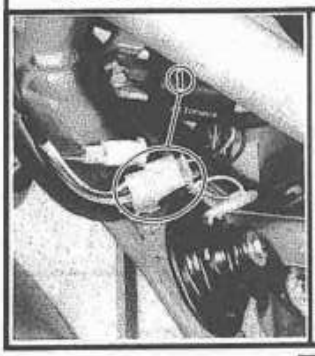
Replace main switch.

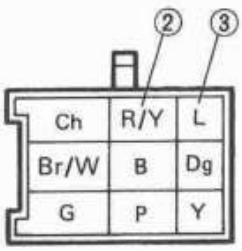
CORRECT

YB707507

4. "LIGHTS" switch

- Disconnect the handlebar switch (left) coupler ① from the wireharness.
- Check the switch component for the continuity between "Red/Yellow ② and Blue ③ ", "Red/Yellow ② and Blue/Black". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

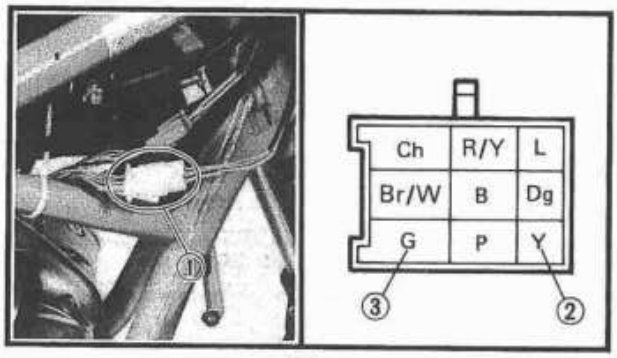
"LIGHTS" switch is faulty, replace handlebar switch (right).

CORRECT

YB707508

5. "LIGHTS" (Dimmer) switch

- Disconnect the handlebar switch (left) coupler ① from the wireharness.
- Check the switch component for the continuity between "Blue/Black and Yellow ② " and "Blue/Black and Green ③ ". Refer to the "CHECKING OF SWITCHES" section.



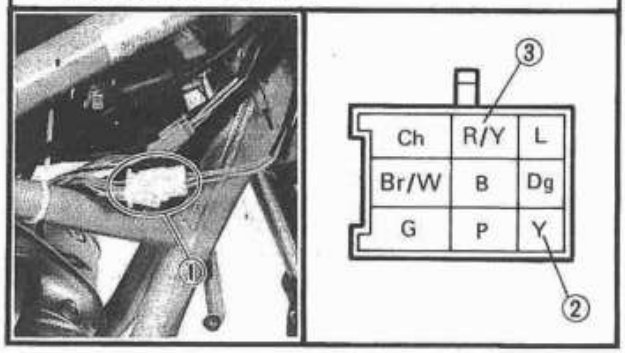
INCORRECT → Replace handlebar switch (left).

CORRECT

YB707509

6. "PASS" switch

- Disconnect the handlebar switch (left) coupler ① from the wireharness.
- Check the switch component for the continuity between "Yellow ② and Red/Yellow ③ ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → "PASS" switch is faulty, replace handlebar switch (left).

CORRECT

YB707511

7. Wiring connection

- Check the entire lighting system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

CORRECT

Check condition of each circuit for lighting system.
Refer to "LIGHTING SYSTEM CHECK" section.

YB707512

LIGHTING SYSTEM CHECK

1. Headlight and "HIGH BEAM" indicator light does not come on.

1. Bulb and bulb socket
• Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY

Replace bulb and/or bulb socket.

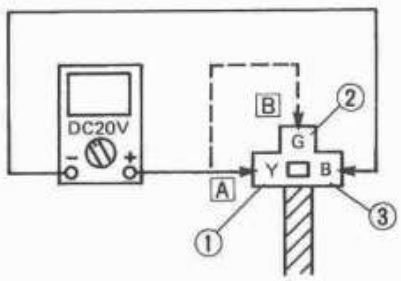
CONTINUITY

YB707513

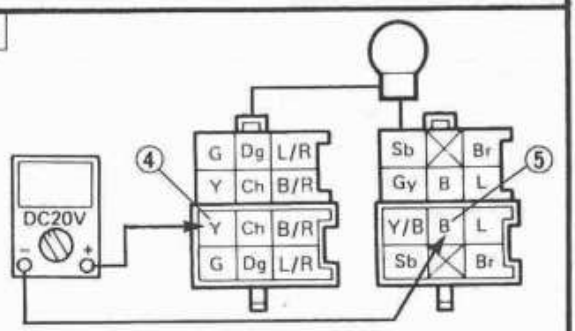
2. Voltage
• Connect the pocket tester (DC 20 V) to the headlight and "HIGH BEAM" indicator light couplers.
A When "LIGHTS" (dimmer) switch is "LO" position.
B When "LIGHTS" (dimmer) switch is "HI" position.

Head light:
Tester (+) lead → Yellow ① or Green ② lead.
Tester (−) lead → Black ③ lead.
"HIGH BEAM" indicator light:
Tester (+) lead → Yellow ④ lead
Tester (−) lead → Black ⑤ lead

A



B



- Turn the main switch to "ON".
- Turn the "LIGHTS" (dimmer) switch to "LO" or "HI" position.
- Check for voltage (12 V) on the "Green " and "Yellow" lead at bulb socket connectors.

OUT OF SPECIFICATION

Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION

This circuit is good.

YB707514

2. Meter light does not come on.

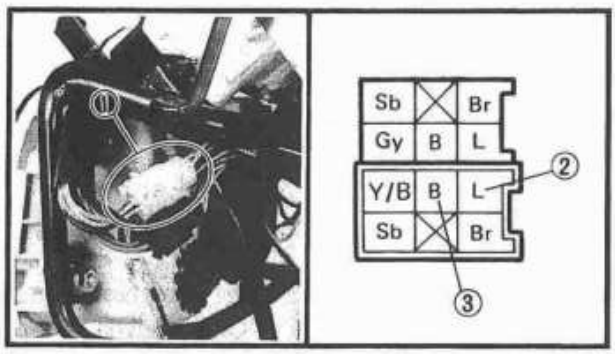
1. Bulb and bulb socket
• Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ⇩

YB707515

2. Voltage
• Connect the pocket tester (DC 20 V) to the bulb socket coupler ①.
Tester (+) lead → Blue ② terminal **Tester (−) lead → Black ③ terminal**



- Turn the main switch to "ON".
- Check for voltage (12 V) on the "Blue" lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION ⇩

This circuit is good.

YB707516

3. Taillight does not come on.

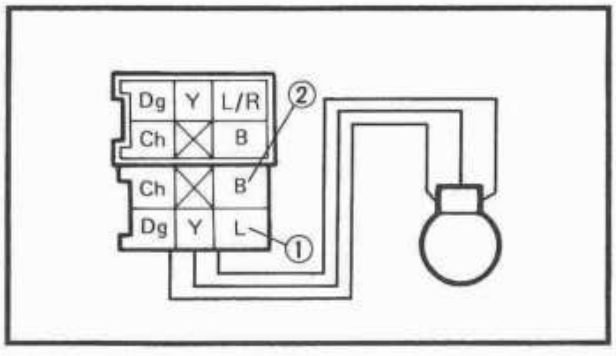
1. Bulb and bulb socket
• Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ⇩

YB707517

2. Voltage
• Connect the pocket tester (DC 20 V) to the bulb socket connector.
Tester (+) lead → Blue ① terminal **Tester (−) lead → Black ② terminal**



- Turn the main switch to "ON".
- Check for voltage (12 V) on the "Blue" lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connection is faulty, repair.

MEETS SPECIFICATION ↓

This circuit is good.

YB707518

4. Auxiliary light does not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY → Bulb and/or bulb socket are faulty, replace.

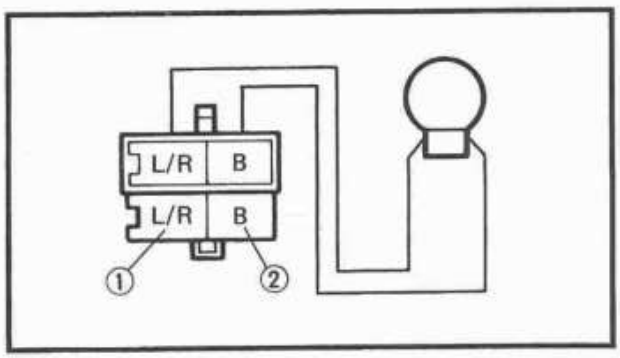
CONTINUITY ↓

YB707519

2. Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

Tester (+) lead → Blue/Red ① lead
Tester (−) lead → Black ② lead



- Turn the main switch to "ON".
- Turn the "LIGHTS" switch to "PO".
- Check for voltage (12 V) on the "Blue/Red" lead at the bulb socket connector.

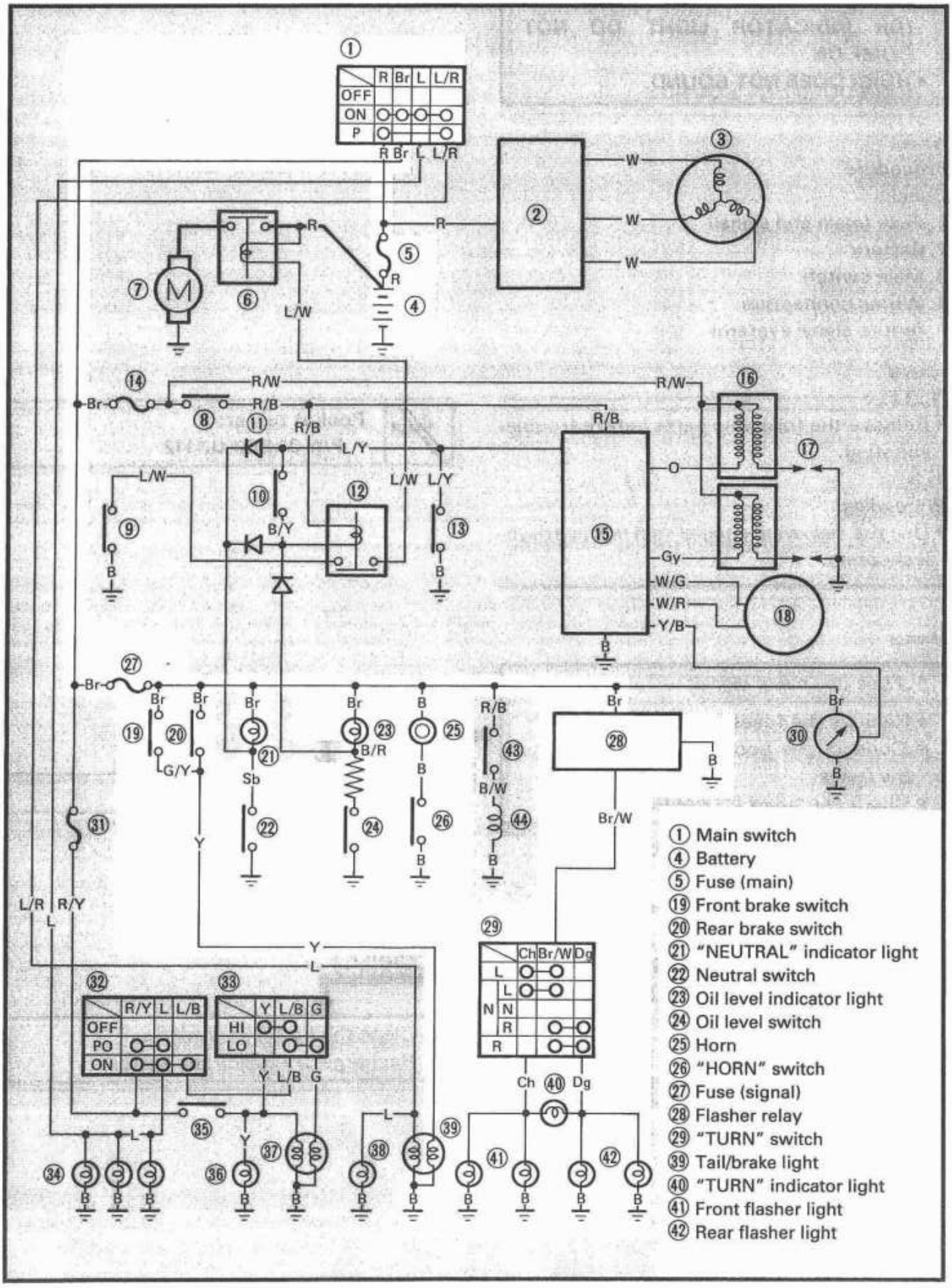
OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION ↓

This circuit is good.

SIGNAL SYSTEM

CIRCUIT DIAGRAM



YB707601

TROUBLESHOOTING

- **FLASHER LIGHT, BRAKE LIGHT AND /OR INDICATOR LIGHT DO NOT COME ON.**
- **HORN DOES NOT SOUND.**

YB707602

Procedure

Check;

1. Fuse (main and signal)
2. Battery
3. Main switch
4. Wiring connection (entire signal system)

YB707603

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Cowling
- Use the following special tool in this troubleshooting.

Pocket tester:
P/N 90890-03112

YB707604

1. Fuse (main and signal)
   - Remove the fuses.
   - Connect the pocket tester (Ω x 1) to the fuses.
   - Check the fuses for continuity.

NO CONTINUITY → Replace fuse(s).

CONTINUITY ↓

YB707605

2. Battery
   - Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

   Open circuit voltage:
   12.8V or more at 20°C (68°F)

INCORRECT →
- Clean the battery terminals.
- Recharge or replace the battery.

CORRECT ↓

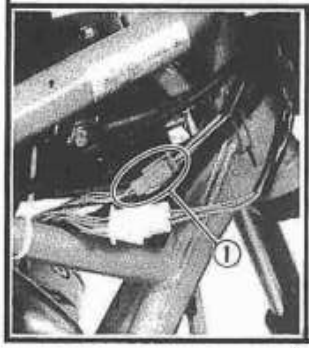
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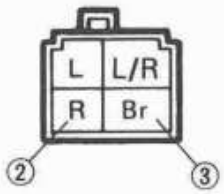
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YB707606

3. Main switch

- Disconnect the main switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Red ② and Brown ③ ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Replace main switch.

CORRECT

YB707607

4. Wiring connection

- Check the entire signal system for connections.
  Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

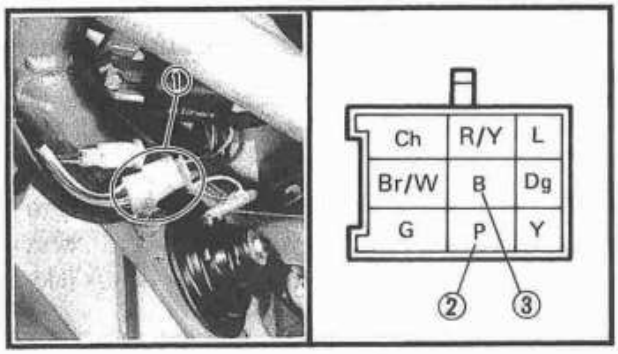
Check condition of each circuit for signal system. Refer to "SIGNAL SYSTEM CHECK" section.

YB707608

SIGNAL SYSTEM CHECK

1. Horn does not sound.

1. "HORN" switch.



- Disconnect the handlebar switch (left) coupler ① from wireharness.
- Check the switch component for the continuity between "Pink ② and Black ③ ". Refer to the "CHECKING OF SWITCHES" section.

INCORRECT → Replace handlebar switch (left).

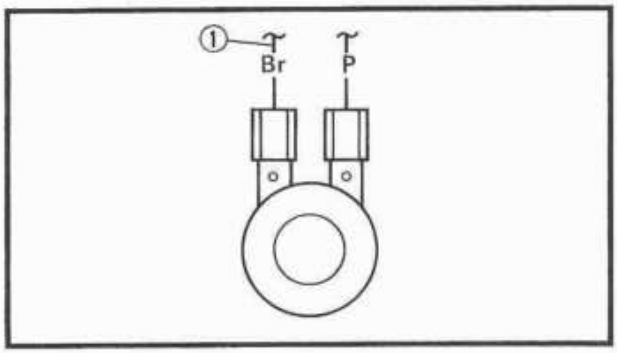
CORRECT

YB707609

2. Voltage

- Connect the pocket tester (DC 20 V) to the horn lead.

Tester (+) lead → Brown ① lead
Tester (—) lead → Frame ground



- Turn the main switch to "ON".
- Check for voltage (12 V) on the " Brown" lead at the horn terminal.

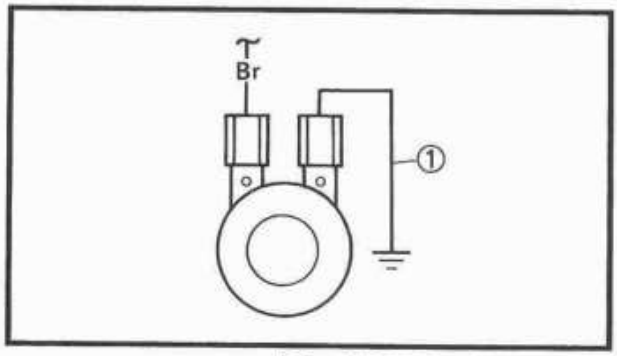
OUT OF SPECIFICATION → Wiring circuit from main switch to horn terminal is faulty, repair.

MEETS SPECIFICATION

YB707610

3. Horn

- Disconnect the "Pink" 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".



HORN IS SOUNDED

Horn is good.

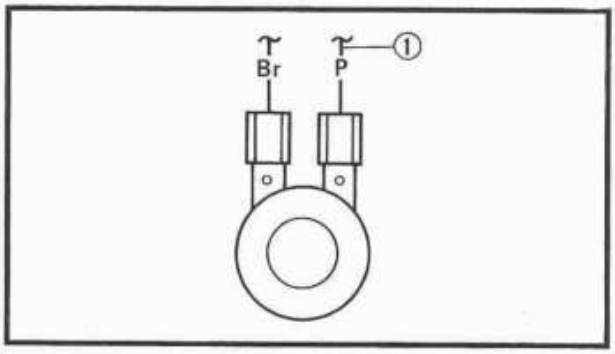
HORN IS NOT SOUNDED

YB707611

4. Voltage

- Connect the pocket tester (DC 20 V) to the horn at the "Pink" terminal.

Terminal (+) lead → Pink ① lead
Terminal (—) lead → Frame ground



- Turn the main switch to "ON".
- Check for voltage (12 V) on the "Pink" lead at the horn terminal.

OUT OF SPECIFICATION

Replace horn.

MEETS SPECIFICATION

Adjust or replace horn.

YB707612

2. Brake light does not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY

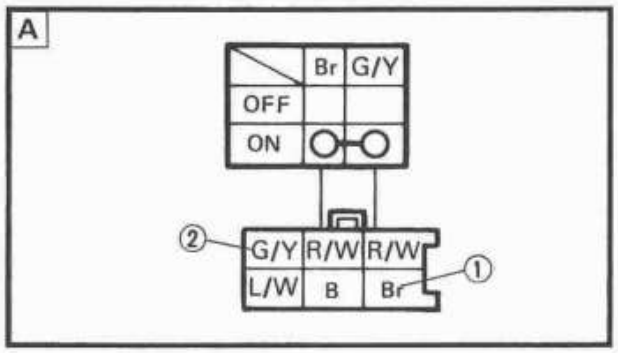
Replace bulb and/or bulb socket.

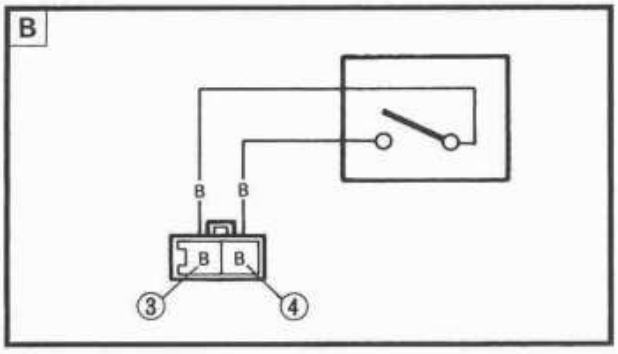
CONTINUITY

YB707613

2. Brake switch

- Disconnect the brake switch coupler from the wireharness.
- Check the switch component for the continuity between "Brown ① and Green/Yellow ②", or "Black ③ and Black ④". Refer to the "CHECKING OF SWITCHES" section.





A Front brake switch
B Rear brake switch

IN CORRECT

Replace brake switch.

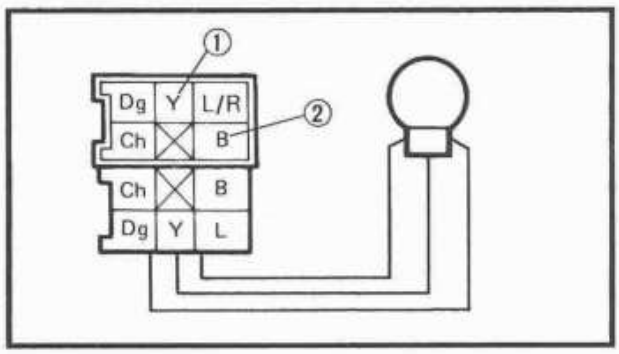
CORRECT

YB707614

3. Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

Tester (+) lead → Yellow ① lead
Tester (—) lead → Black ② lead



- Turn the switch to "ON".
- The brake level is pulled in or brake pedal is stepped down.
- Check for voltage (12 V) on the "Yellow" lead at the bulb socket connector.

OUT OF SPECIFICATION

Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION

This circuit is good.

YB707615

3. Flasher light and/or "TURN" indicator light does not blink.

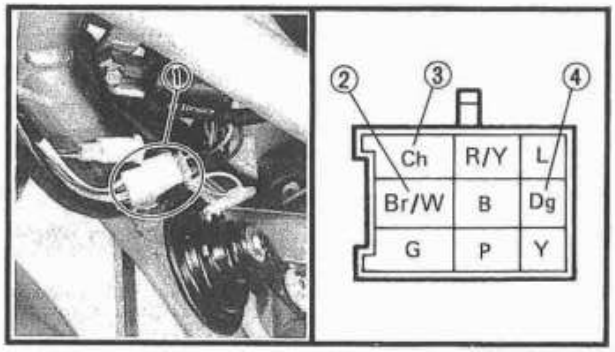
1. Bulb and bulb socket
• Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ⇩

YB707616

2. "TURN" switch



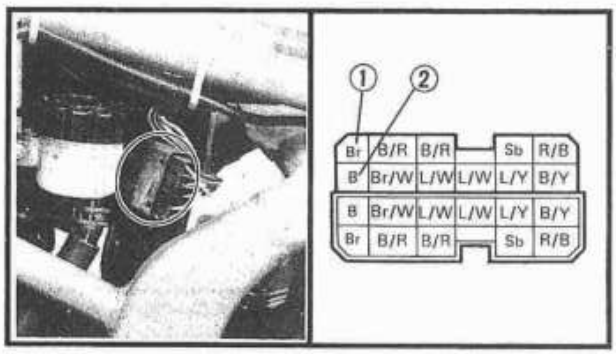
- Disconnect the handlebar switch (left) coupler ① from the wireharness.
- Check the switch component for the continuity between "Brown/White ② and Chocolate ③ " and "Brown/White ② and Dark green ④ ". Refer to the "CHECKING OF SWITCHES" section.

IN CORRECT → Replace handlebar switch (left).

CORRECT ⇩

YB707617

3. Voltage
• Connect the pocket tester (DC 20 V) to the flasher relay lead.
Tester (+) lead → Brown ① terminal **Tester (−) lead → Black ② terminal**



- Turn the main switch to "ON".
- Check for voltage (12 V) on the " Brown" lead at the flasher relay terminal.

OUT OF SPECIFICATION → Wiring circuit from main switch to flasher relay connector is faulty, repair.

MEETS SPECIFICATION ⇩

*

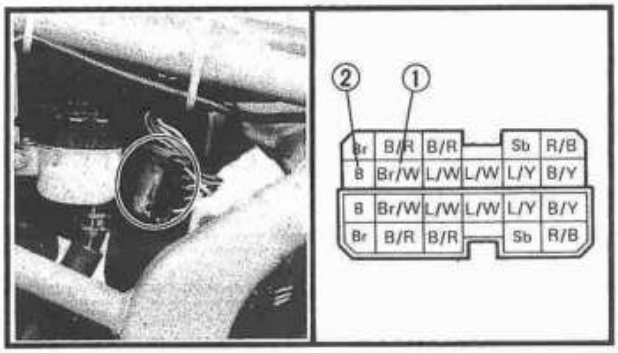
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YB707618

4. Voltage

- Connect the pocket tester (DC 20 V) to the flasher relay lead.

Tester (+) lead → Brown/White ① terminal
Tester (—) lead → Black ② terminal



- Turn the main switch to "ON".
- Check for voltage (12 V) on the "Brown/White" lead at the flasher relay terminal.

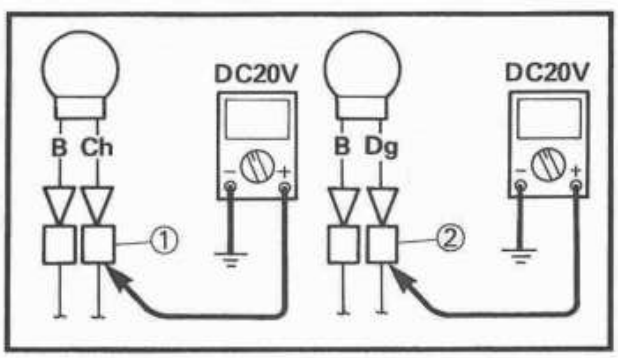
OUT OF SPECIFICATION → Replace flasher relay.

MEETS SPECIFICATION

YB707619

5. Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.



At flasher light (left):
Tester (+) lead → Chocolate ① lead
Tester (—) lead → Frame ground

At flasher light (right):
Tester (+) lead → Dark green ② lead
Tester (—) lead → Frame ground

- Turn the main switch to "ON".
- Turn the "TURN" switch to "L" or "R".
- Check for voltage (12 V) on the "Chocolate" lead or "Dark green" lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from "TURN" switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION

*

*

This circuit is good.

YB707620

4. "NEUTRAL" indicator light does not come on.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY → Replace bulb and/or bulb socket.

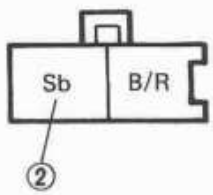
CONTINUITY

YB707621

2. Neutral switch

- Disconnect the neutral switch coupler ① from the wireharness.
- Check the switch component for the continuity between "Sky blue ② and Ground". Refer to the "CHECKING OF SWITCHES" section.





IN CORRECT → Replace neutral switch.

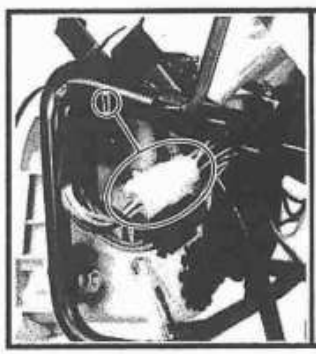
CORRECT

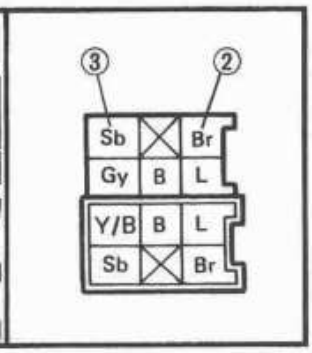
YB707622

3. Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket coupler ① .

Tester (+) lead → Brown ② terminal
Tester (−) lead → Sky blue ③ terminal





- Turn the main switch to "ON".
- Check for voltage (12 V) on the " Brown" lead at bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION ⇩

This circuit is good.

YB707623

5. "OIL LEVEL" indicator light does not come on, when engine oil level is low.

1. Bulb and bulb socket

- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

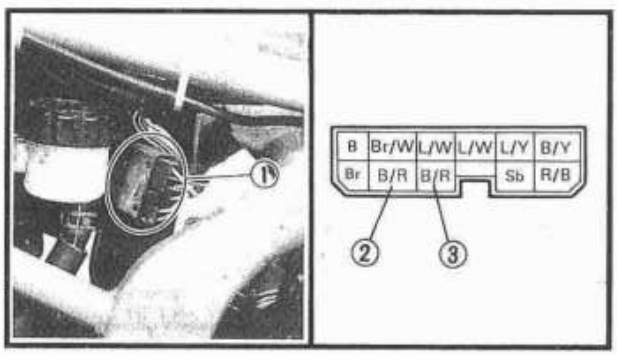
NO CONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ⇩

YB707624

2. Resistor

- Remove the relay unit lead ① from the wireharness.
- Connect the pocket tester (Ω x 1) to the relay unit terminal.



Tester (+) lead → Black/Red ② terminal
Tester (−) lead → Black/Red ③ terminal

- Check resistor for continuity.

NO CONTINUITY → Replace relay unit.

CONTINUITY ⇩

*

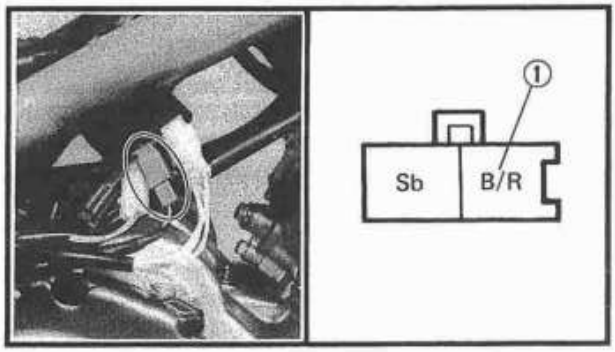
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YB707626

3. Oil level switch

- Drain the engine oil and remove the oil level switch from the oil pan.
- Connect the pocket tester (Ω x 1) to the oil level gauge.

Tester (+) lead → Black/Red ① terminal
Tester (−) lead → Frame ground



- Check the oil level switch for continuity.

BAD CONDITION → Replace oil level switch.

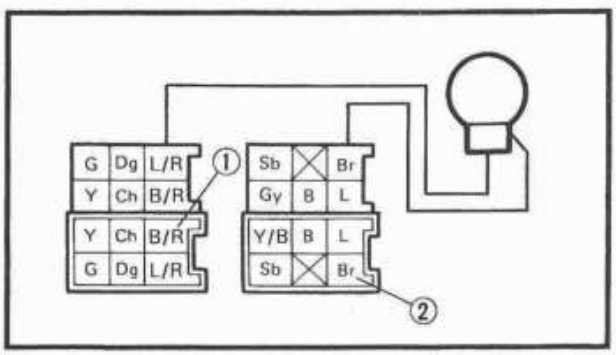
GOOD CONDITION

YB707627

4. Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

Tester (+) lead → Black/Red ① lead
Tester (−) lead → Brown ② lead



- Turn the main switch to "ON".
- Check for voltage (12 V) on the "Brown" lead at bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION

This circuit is good.

TROUBLESHOOTING

NOTE:

The following troubleshooting does not cover all the possible causes of trouble. 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	PROBABLE CAUSE
Fuel tank	• Empty • Clogged fuel filter • Clogged fuel breather hose • Deteriorated fuel or fuel containing water or foreign material
Fuel cock	• Clogged fuel hose • Clogged or damaged pulser hose
Carburetor	• Deteriorated fuel, fuel containing water or foreign material • Clogged pilot jet • Clogged pilot air passage • Sucked-in air • Deformed float • Groove-worn needle valve • Improperly sealed valve seat • Improperly adjusted fuel level • Improperly set pilot jet • Clogged starter jet • Starter plunger malfunction • Improperly adjusted starter cable
Air cleaner	• Clogged air filter
Fuel pump	• Faulty fuel pump • Clogged vacuum hose

STARTING FAILURE/HARD STARTING

TRBL SHTG ?

ELECTRICAL SYSTEM

	PROBABLE CAUSE
Spark plug	• Improper plug gap • Worn electrodes • Wire between terminals broken • 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
Switches and wiring	• Faulty main switch • Faulty engine stop switch • Broken or shorted wiring • Faulty neutral switch • Faulty start switch • Faulty starter motor switch • Faulty clutch switch
Starter motor	• Faulty starter motor • Faulty starter relay • Faulty circuit cut-off relay • Faulty starter clutch

COMPRESSION SYSTEM

	PROBABLE CAUSE
Cylinder and cylinder head	• Loose spark plug • Loose cylinder head or cylinder • Broken cylinder head gasket • Worn, damaged or seized cylinder • Improperly sealed valve • Improperly contacted valve and valve seat • Improper valve timing • Broken valve spring
Piston and piston rings	• 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

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POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

	PROBABLE CAUSE
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 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 cleaner	• Clogged air filter

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)

	PROBABLE CAUSE
Carburetor	• Improper jet needle clip position • Diaphragm malfunction • Improperly adjusted fuel level • Clogged or loose main jet
Air cleaner	• Clogged air filter
Fuel pump	• Faulty fuel pump

FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to "Clutch dragging."

SHIFT PEDAL DOES NOT MOVE

	PROBABLE CAUSE
Shift shaft	• Improperly adjusted shift rod • Bent shift shaft
Shift cam, shift fork	• Groove jammed with impurities • Seized shift fork • Bent shift fork guide bar
Transmission	• Seized transmission gear • Jammed impurities • Incorrectly assembled transmission

JUMP-OUT GEAR

	PROBABLE CAUSE
Shift shaft	• Improperly adjusted • Improperly returned stopper lever
Shift fork	• Worn shift fork
Shift cam	• Improper thrust play • Worn shift cam groove
Transmission	• Worn gear dog

CLUTCH SLIPPING/DRAGGING

CLUTCH SLIPPING

	PROBABLE CAUSE
Clutch	• Improperly adjusted clutch cable • Loose clutch spring • Fatigued clutch spring • Worn friction plate/clutch plate
Engine oil	• Low oil level • Improper quality/viscosity • Deterioration

CLUTCH DRAGGING

	PROBABLE CAUSE
Clutch	• Improperly adjusted clutch cable • Warped pressure plate • Unevenly tensioned clutch springs • Match marks not aligned • Broken clutch boss • Burnt primary driven gear bushing • Bent clutch plate
Engine oil	• Improper oil level • Improper quality/viscosity • Deterioration

OVERHEATING

OVERHEATING

	PROBABLE CAUSE
Ignition system	• Improper spark plug gap • Improper spark plug heat range • Faulty ignitor unit
Fuel system	• Improper carburetor main jet (setting) • Improperly adjusted H dimension • Clogged air filter
Compression system	• Heavy carbon build-up
Engine oil	• Incorrect oil level • Improper oil viscosity • Inferior oil quality
Brake	• Dragging brake

FAULTY BRAKE

POOR BRAKING EFFECT

	PROBABLE CAUSE
Disc brake	• Worn brake pads • Worn disc • Air in brake fluid • Leaking brake fluid • Faulty cylinder kit cup • Faulty caliper kit seal • Loose union bolt • Broken brake hose • Oily or greasy disc/brake pads • Improper brake fluid level

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

OIL LEAKAGE

PROBABLE CAUSE
• Bent, damaged or rusty inner tube • Damaged or cracked outer tube • Damaged oil seal lip • Improperly installed oil seal • Improper oil level (too much) • Loose damper rod holding bolt • Broken cap bolt O-ring

MALFUNCTION

PROBABLE CAUSE
• Bent, deformed or damaged inner tube • Bent or deformed outer tube • Damaged fork spring • Worn or damaged slide metal • Improper oil viscosity • Improper oil level

INSTABLE HANDLING

INSTABLE HANDLING

INSTABLE HANDLING	PROBABLE CAUSE
Handlebar	• Improperly installed or bent
Steering	• Improperly installed handlebar crown • Bent steering stem • Improperly installed steering shaft (Improperly tightened ringnut) • Damaged ball bearing or bearing race
Front forks	• Uneven oil levels on both sides • Broken spring • Twisted front forks
Tires	• Uneven tire pressures on both sides • Incorrect tire pressure • Unevenly worn tires
Wheels	• Incorrect wheel balance • Deformed cast wheel • Damaged bearing • Bent or loose wheel axle • Excessive wheel run-out
Frame	• Twisted • Damaged head pipe • Improperly installed bearing race
Swingarm	• Worn bearing or bush • Bent or damaged
Rear shock absorber	• Fatigued spring • Oil and gas leakage
Drive chain	• Improperly adjusted chain slack
Cowling	• Damaged or broken • Incorrectly installed

FAULTY SIGNAL AND LIGHTING SYSTEM

HEADLIGHT DARK

PROBABLE CAUSE

- 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 expires

BULB BURNT OUT

PROBABLE CAUSE

- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expires

FLASHER DOES NOT LIGHT

PROBABLE CAUSE

- Improperly grounded
- Discharged battery
- Faulty flasher switch
- Faulty flasher relay
- Broken wireharness
- Loosely connected coupler
- Bulb burnt out
- Faulty fuse

FLASHER KEEPS ON

PROBABLE CAUSE

- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Bulb burnt out

FAULTY SIGNAL AND LIGHTING SYSTEM

TRBL SHTG ?

FLASHER WINKS SLOWER

PROBABLE CAUSE

- Faulty flasher relay
- Insufficient battery capacity (nearly discharged)
- Improper bulb
- Faulty main and/or "TURN" switch

FLASHER WINKS QUICKER

PROBABLE CAUSE

- Improper bulb
- Faulty flasher relay

HORN IS INOPERATIVE

PROBABLE CAUSE

- Faulty battery
- Faulty fuse
- Faulty main and/or horn switch
- Improperly adjusted horn
- Faulty horn
- Broken wireharness