XT225D/XT225DC
SERVICE MANUAL
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unauthorized use without the written
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is expressly prohibited.

NOTICE

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

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

Yamaha Motor Company Ltd. is continually striving to improve all 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.

NOTE:

FOR USA:

This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the followng 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 cleaer.

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

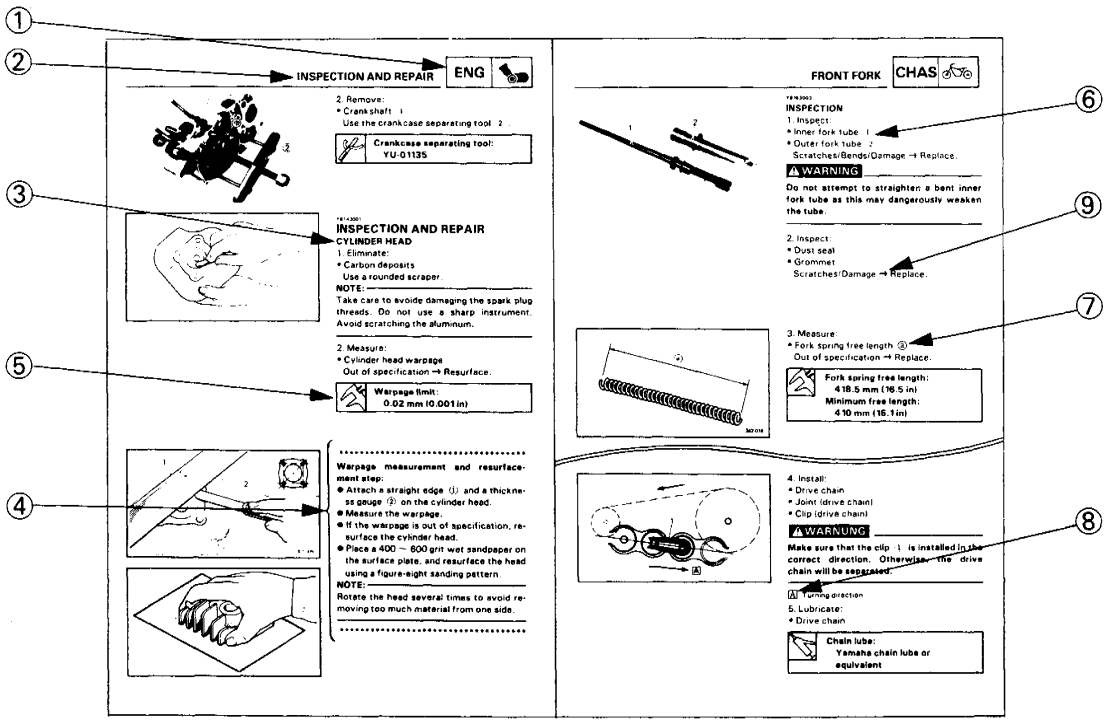
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections.
A set of particularly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

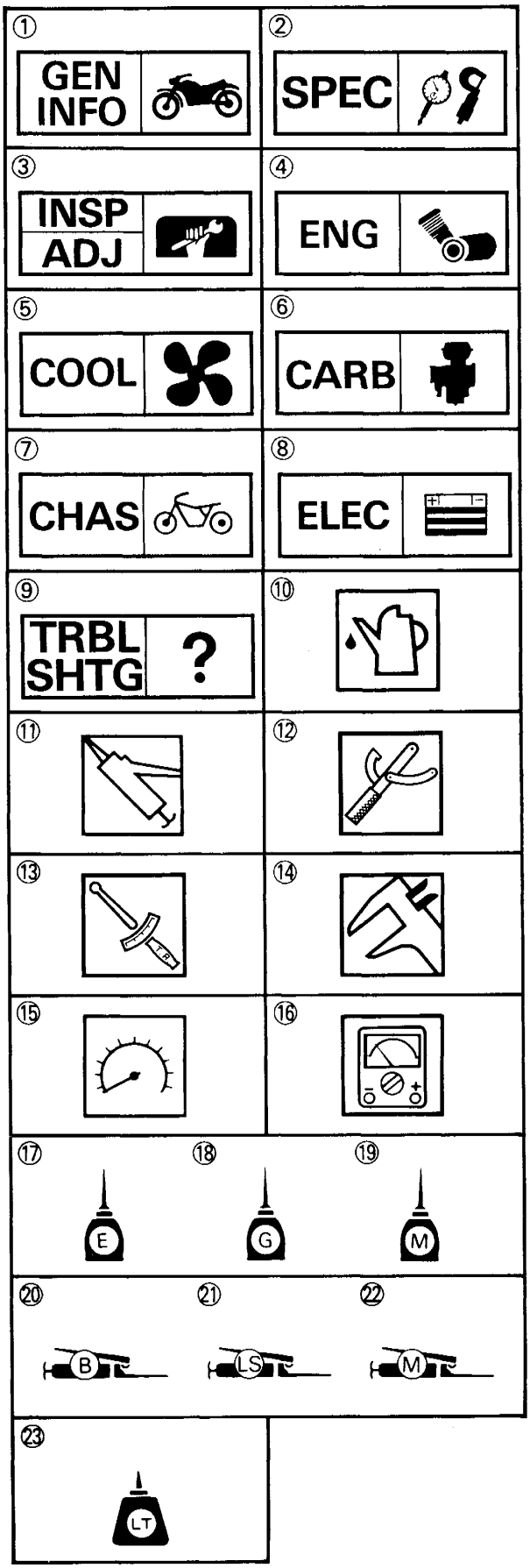
IMPORTANT FEATURES

- 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 ㉓ in the exploded diagram indicate grade of lubricant and location of lubrication point.

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

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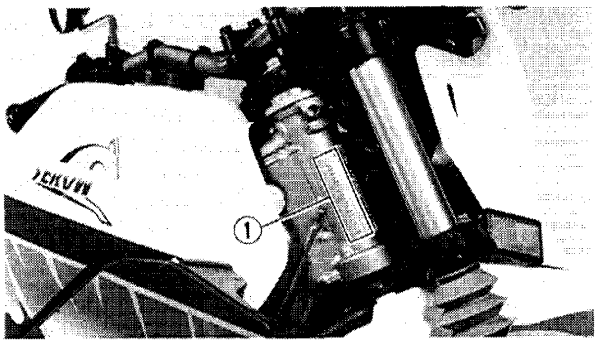
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GENERAL INFORMATION



MOTORCYCLE IDENTIFICATION

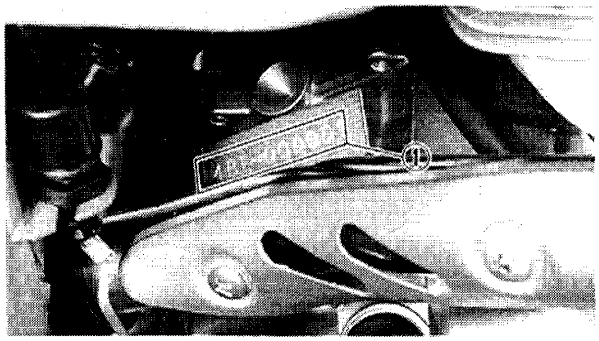
VEHICLE IDENTIFICATION NUMBER

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

Starting serial number:
JYA4BEE0✱NA000101
(USA-Except for California)
JYA4BEC0✱NA013101
(USA-For California)
JYA4BEN0✱NA010101 (CDN)

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.



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the elevated part of the right rear section of the engine.

Starting serial number:
XT225D....4BE-000101
(USA-Except for California)
XT225DC....4BE-013101
(USA-For California)
XT225D....4BE-010101 (CDN)

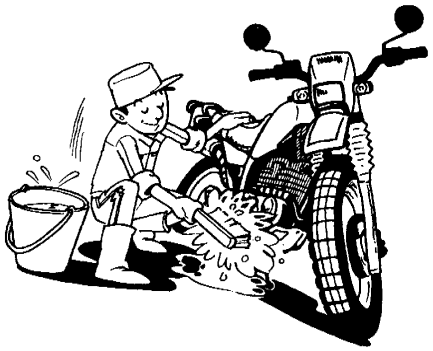
NOTE:

- 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.



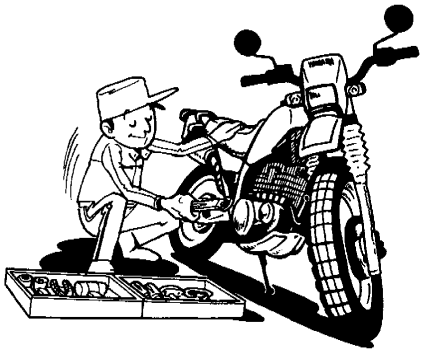


IMPORTANT INFORMATION



PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Remove all dirt, mud, dust, and foreign material before removing and disassembling.

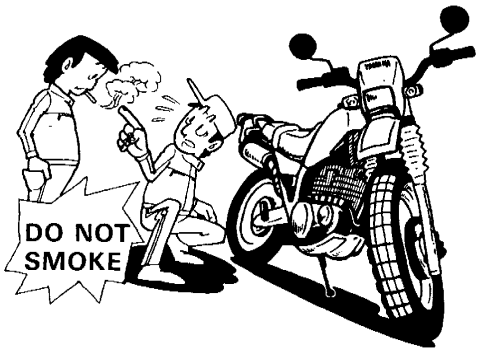


2. Use proper tools and cleaning equipment. Refor to "SPECIAL TOOL".

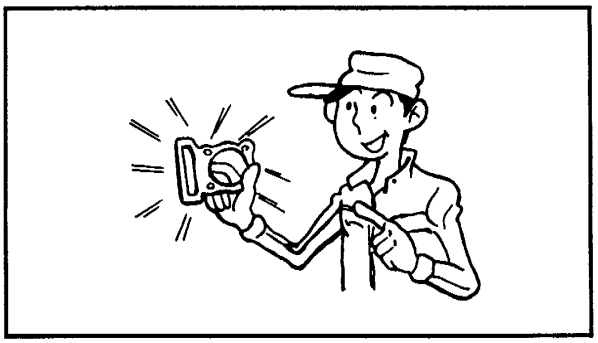


3. When disassembling the motorcycle, keep mated parts together. This includes gears, cylinder, piston and other mated parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.

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



5. Keep away from fire.



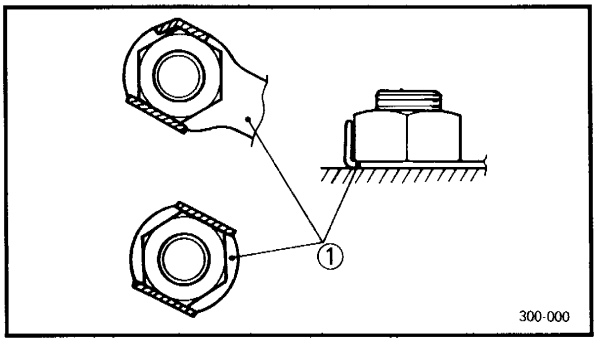
ALL REPLACEMENT PARTS

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

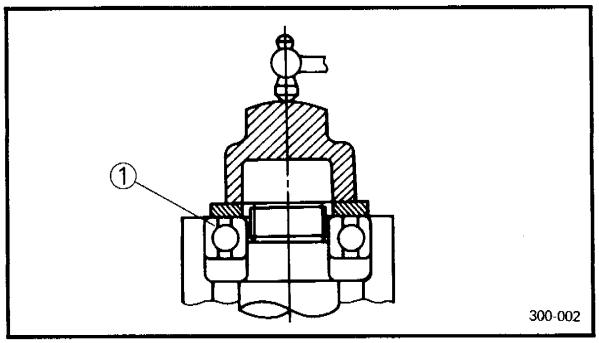
1. All gaskets, seals and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips and O-rings must be cleaned.

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



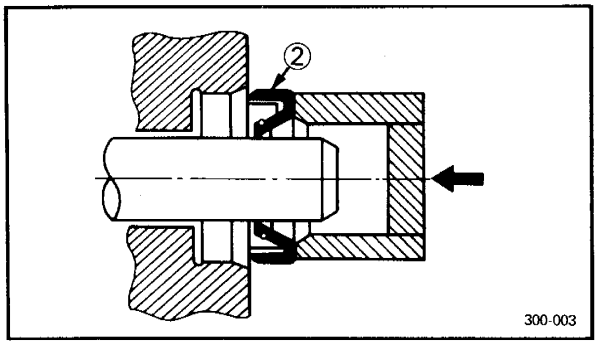
LOCK WASHERS/PLATES AND COTTER PINS

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.



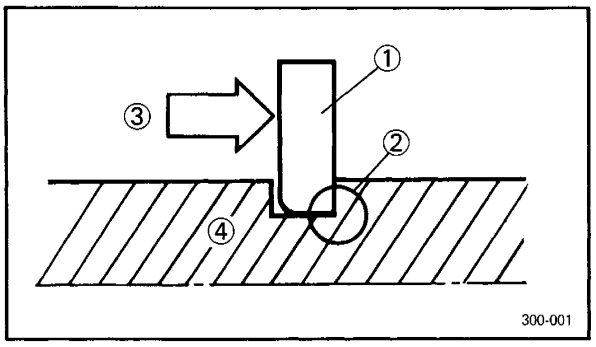
BEARINGS AND OIL SEALS

1. Install the bearing(s) ① and oil seal(s) ② 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), lubricate a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.



CAUTION:

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



CIRCLIPS

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

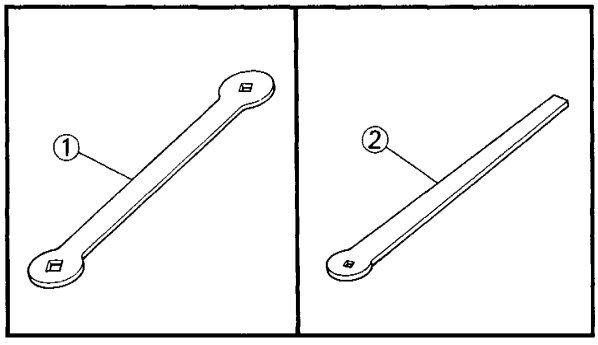
④ Shaft

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.
The shape and part number used for the special tool differ by country, so two types are provided. Refer to the list provided to avoid errors when placing an order.

P/N. YM- □□□□□, YU- □□□□□
YS- □□□□□, YK- □□□□□
ACC-□□□□□ — For US, CDN

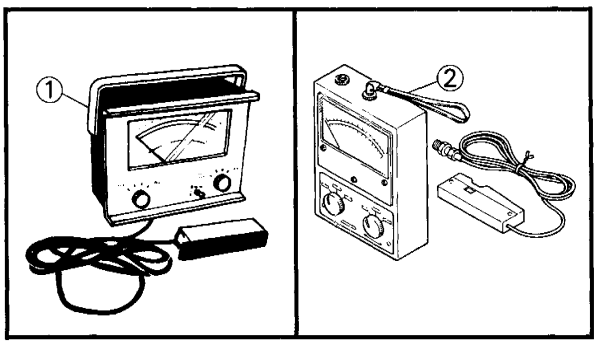
P/N. 90890-□□□□□ — Except for US, CDN



FOR TUNE UP

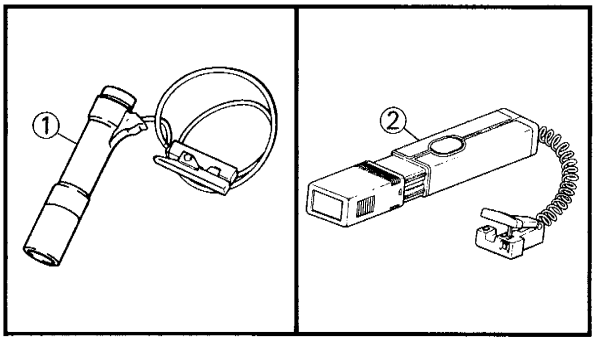
1. Valve adjusting tool
   P/N. YM-08035—①
   P/N. 90890-01311—②

This tool is necessary for adjusting the valve clearance.



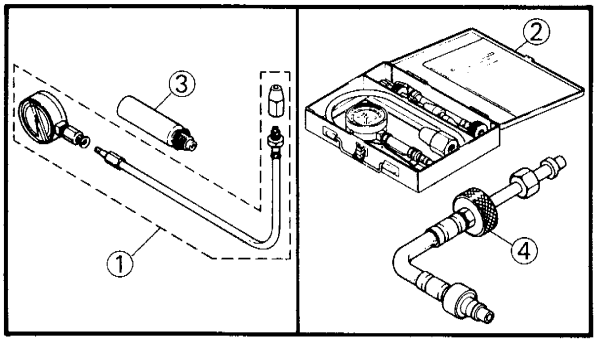
2. Inductive tachometer
   P/N. YU-08036-A—①
   P/N. 90890-03113—②

This tool is needed for detecting engine rpm.



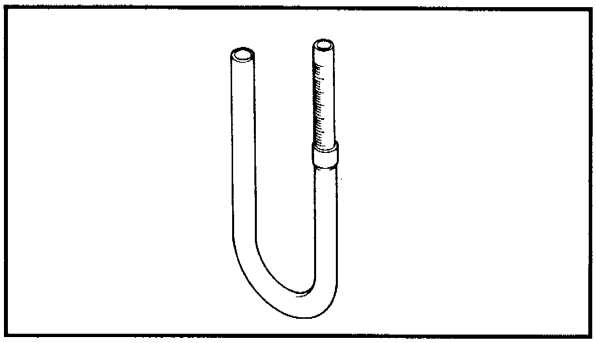
3. Inductive timing light
   P/N. YM-33277-A – ①
   P/N. 90890-03141 – ②

This tool is necessary for checking ignition timing.



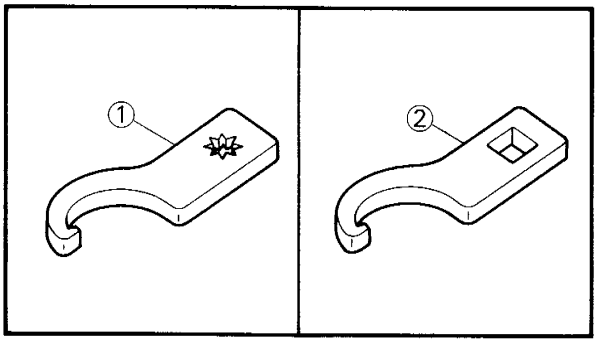
4. Compression gauge
   P/N. YU-33223 – ①
   P/N. 90890-03081 – ②
   Adapter (M12)
   P/N. YU-33223-3 – ③
   P/N. 90890-04082 – ④

These gauges are used to measure the engine compression.



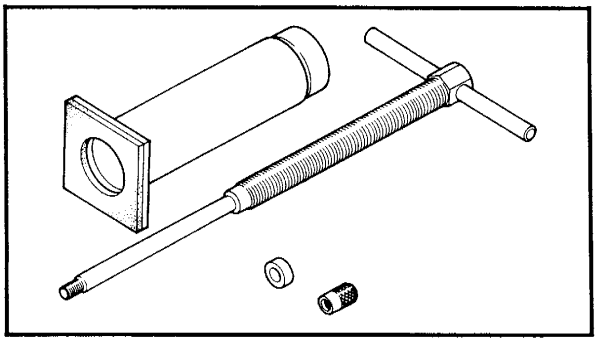
5. Fuel level gauge
   P/N. YM-01312-A
   P/N. 90890-01312

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



6. Steering nut wrench
   P/N. YM-38520 – ①
   P/N. 90890-01443 – ②

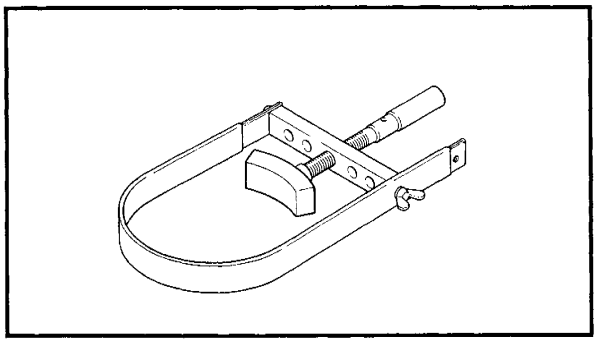
This tool is used to adjsut the spring preload of rear shock absorber.



FOR ENGINE SERVICE

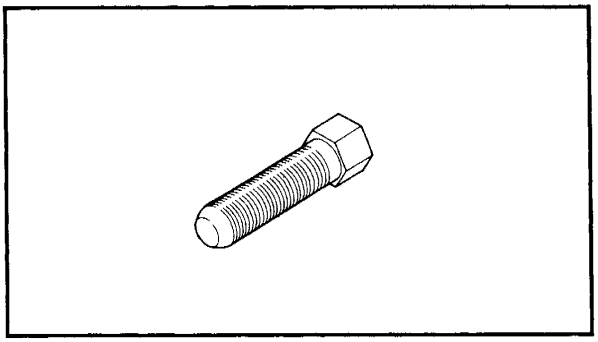
1. Piston pin puller
   P/N. YU-01304
   P/N. 90890-01304

This tool is used to remove the pisotn pin.



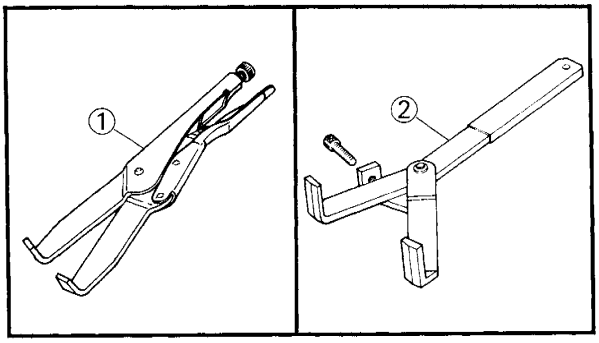
2. Rotor holder
   P/N. YS-01880
   P/N. 90890-01701

This tool is used to hold the rotor when removing or installing the rotor securing nut.



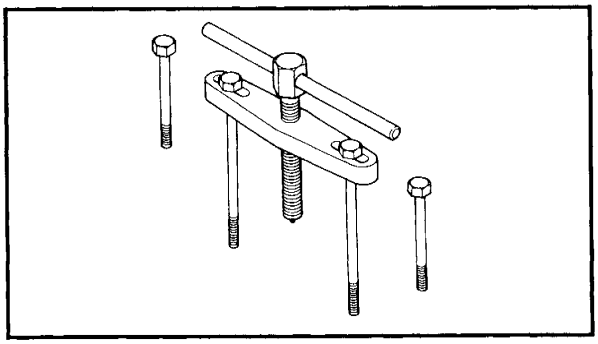
3. Rotor puller
   P/N. YM-01080-A
   P/N. 90890-01080

This tool is used to remove the rotor.



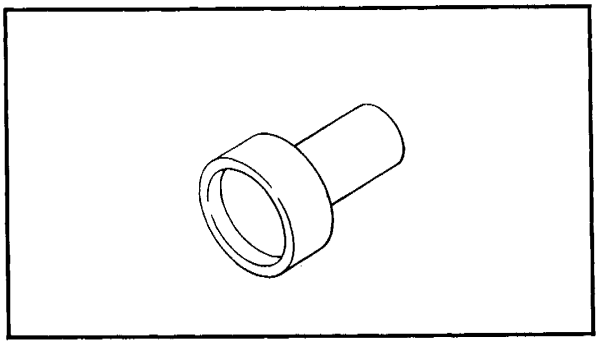
4. Universal clutch holder
   P/N. YM-91042—①
   P/N. 90890-04086—②

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



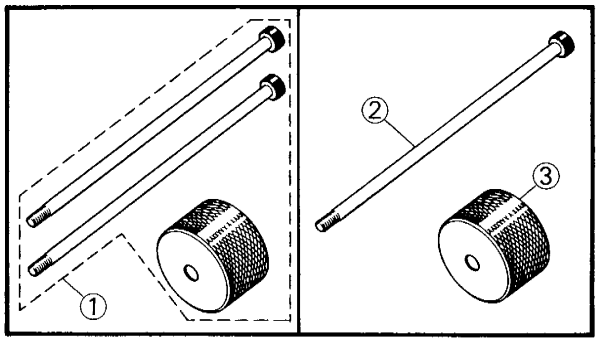
5. Crankcase separating tool
   P/N. YU-01135-A
   P/N. 90890-01135

This tool is necessary to separate the crankcase.



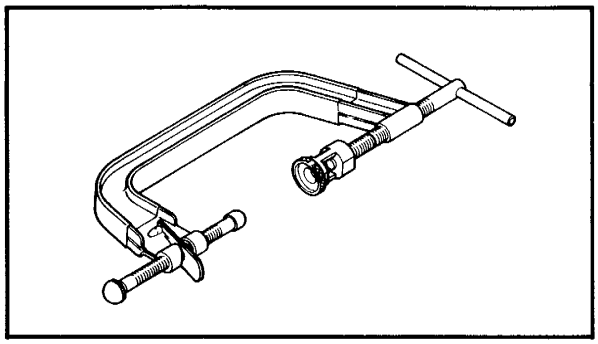
6. Crankshaft protector
   P/N. YM-01382
   P/N. 90890-01382

This tool is used to remove the crankshaft.



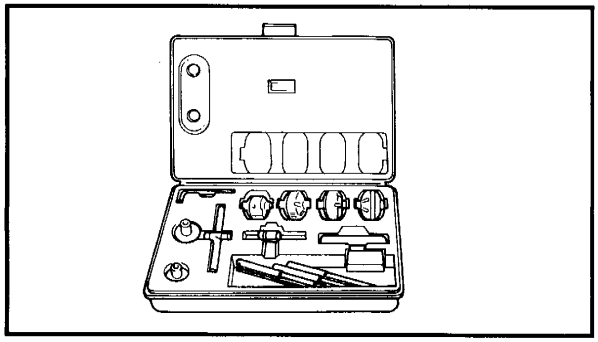
7. Slide hammer set
   P/N. YU-01083-A—①
   Slide hammer bolt
   P/N. 90890-01083—②
   Weight
   P/N. 90890-01084—③

These tools are used when removing the rocker arm shaft.



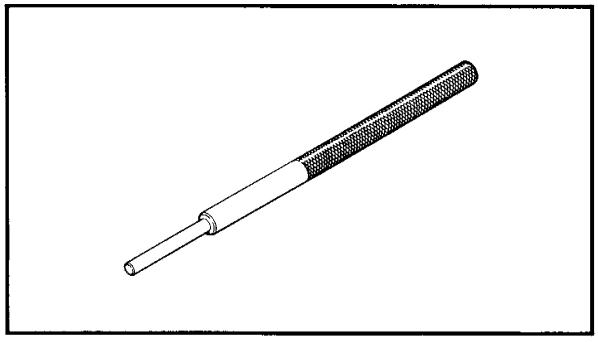
8. Valve spring compressor
   P/N. YM-04019
   P/N. 90890-04019

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



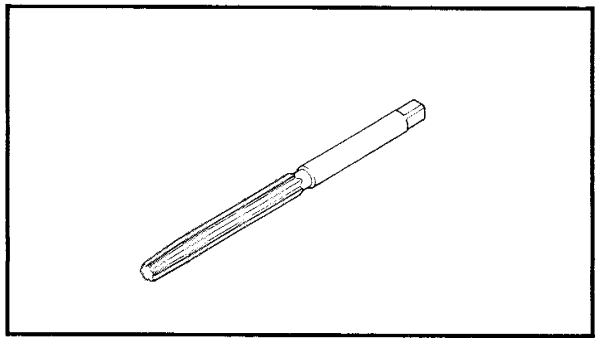
9. Valve seat cutter set
   P/N. YM-91043

This tool is needed to resurface the valve seat.



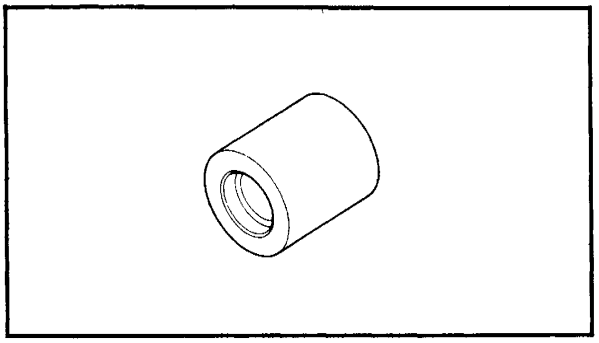
10. Valve guide remover 6 mm (0.24 in)
    P/N. YM-04064
    P/N. 90890-04064

This tool is used to remove the valve guides.



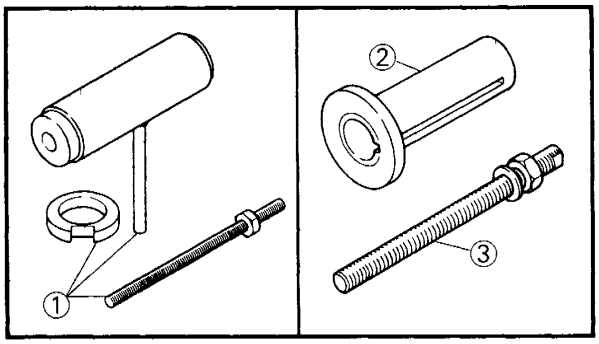
11. Valve guide reamer 6 mm (0.24 in)
    P/N. YM-04066
    P/N. 90890-04066

This tool is used to rebore the new valve guide.



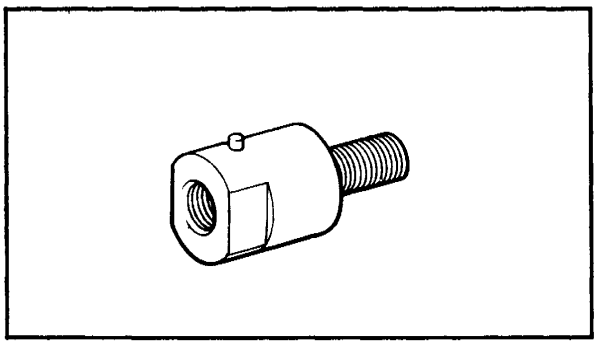
12. Valve guide installer 6 mm (0.24 in)
    P/N. YM-04065-A
    P/N. 90890-04065

This tool is needed to install the valve guides properly.



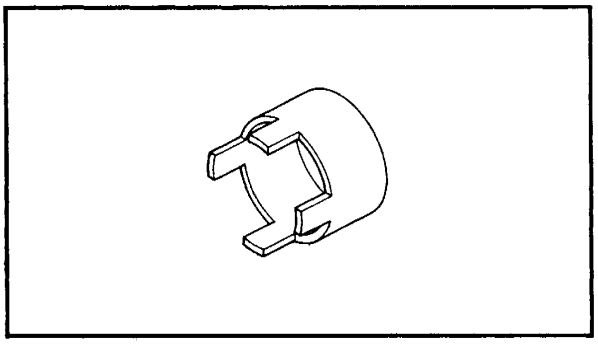
13. Crankshaft installer set
    P/N. YU-90050—①
    Crankshaft installer pot
    P/N. 90890-01274—②
    Crankshaft installer bolt
    P/N. 90890-01275—③

These tools are used to install the crankshaft.



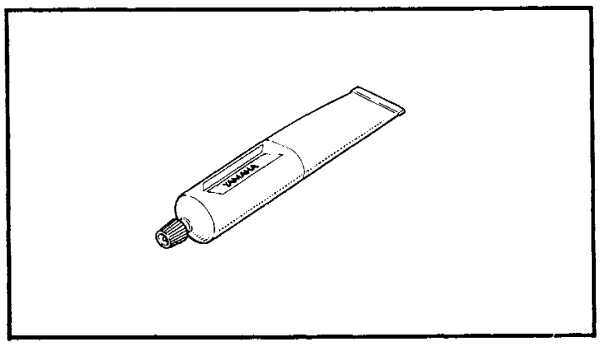
14. Adapter #12
    P/N. YM-01383
    P/N. 90890-01383

This tool is used to install the crankshaft.



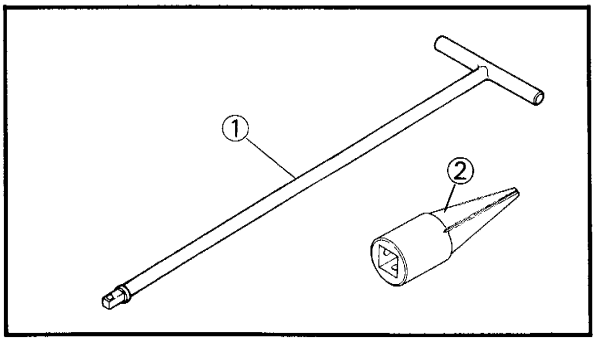
15. Crank pot spacer
    P/N. YM-91044
    P/N. 90890-04081—①

This tool is used to install the crankshaft.



16. Sealant (quick gasket)®
    P/N. ACC-11001-01
    Yamaha Bond No. 1215®
    P/N. 90890-85505

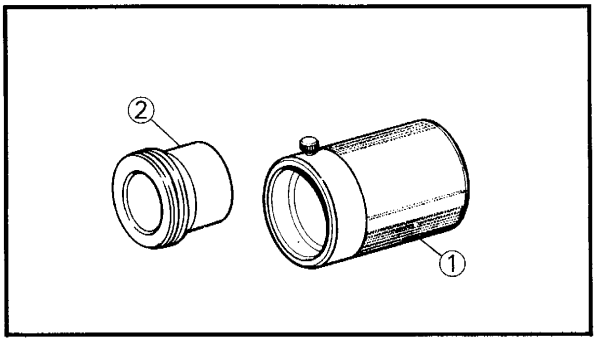
This sealant (bond) is used for crankcase mating surfaces, etc.



FOR CHASSIS SERVICE

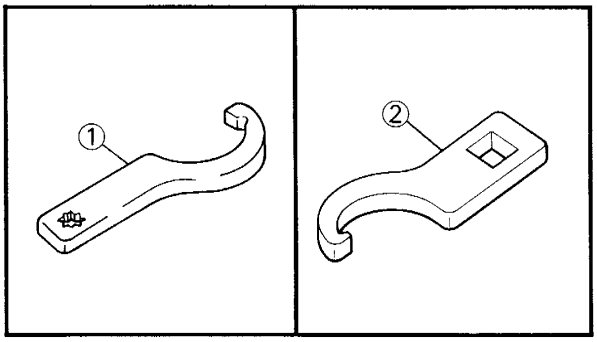
1. T-Handle
   P/N. YM-01326
   P/N. 90890-01326—①
   Holder (damper rod)
   P/N. YM-01300-1
   P/N. 90890-01294—②

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



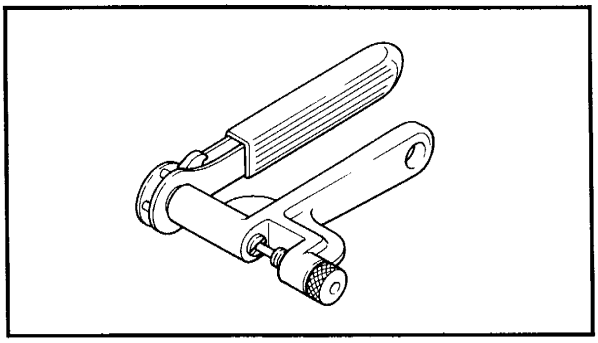
2. Front fork seal drive weight
   P/N. YM-33963
   P/N. 90890-01367—①
   Adapter 36 mm (1.42 in)
   P/N. YM-08010
   P/N. 90890-01370—②

These tools are used when installing the fork oil seal.



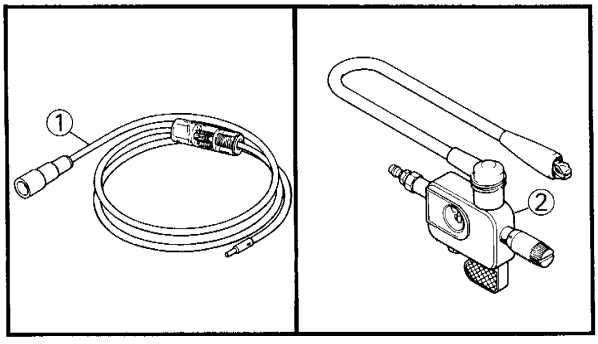
3. Ring nut wrench
   P/N. YU-33975—①
   P/N. 90890-01403—②

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



4. Drive chain cutter
   P/N. YM-33858

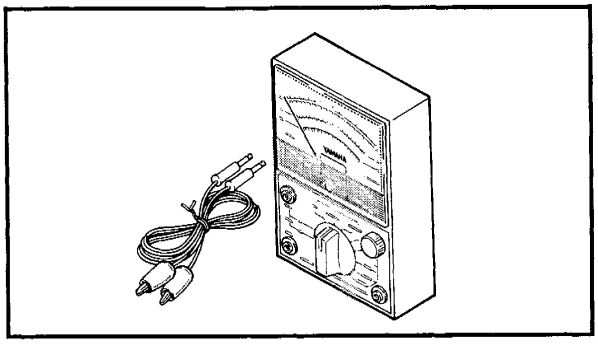
This tool is used to cut and joint the drive chain.



FOR ELECTRICAL COMPONENTS

1. Dynamic spark tester
   P/N. YM-34487—①
   Ignition checker
   P/N. 90890-06754—②

This instrument is necessary for checking the ignition system components.



2. Pocket tester
   P/N. YU-03112
   P/N. 90890-03112

This instrument is available for checking the electrical system.

SPECIFICATIONS

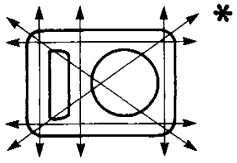
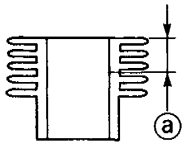
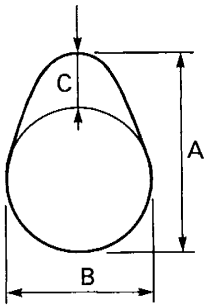
GENERAL SPECIFICATIONS

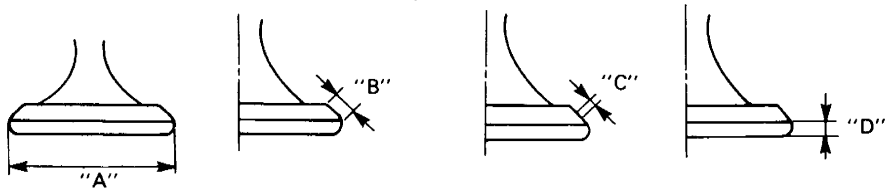
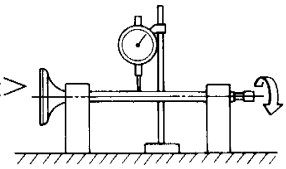
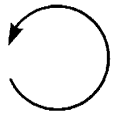
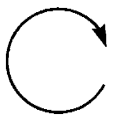
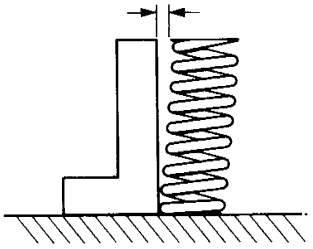
Model	XT225D/DC
Model code number:	4BE1: XT225D (USA-Except for California) 4BE2: XT225DC (USA-For California) 4BE3: XT225D (CDN)
Vehicle identification number:	JYA4BEE0*NA000101 (USA-Except for California) JYA4BEC0*NA013101 (USA-For California) JYA4BEN0*NA010101 (CDN)
Engine starting number:	4BE-000101 (USA-Except for California) 4BE-013101 (USA-For California) 4BE-010101 (CDN)
Dimensions:	
Overall length	2,070 mm (81.5 in)
Overall width	800 mm (31.5 in)
Overall height	1,160 mm (45.7 in)
Seat height	810 mm (31.9 in)
Wheelbase	1,350 mm (53.1 in)
Minimum ground clearance	285 mm (11.2 in)
Basic weight:	
With oil and full fuel tank	121 kg (267 lb)
Minimum turning radius:	1,900 mm (74.8 in)
Engine:	
Engine type	Air cooled 4-stroke, SOHC
Cylinder arrangement	Forward inclined single cylinder
Displacement	223.21 cm^3
Bore × Stroke	70 × 58 mm (2.76 × 2.28 in)
Compression ratio	9.5 : 1
Compression pressure standard	1,200 kPa (12 kg/cm^2, 171 psi)
Starting system	Electric
Lubrication system:	
Type	Wet sump
Engine oil type	Yamalube 4, SAE 20W40 type SE/SF motor oil or SAE 10W30 type SE/SF motor oil
Oil capacity:	
Periodic oil change	1.0 L (0.88 Imp qt, 1.06 US qt)
With oil filter replacement	1.1 L (0.97 Imp qt, 1.16 US qt)
Total amount	1.3 L (1.14 Imp qt, 1.37 US qt)
Air filter:	
Type	Wet type element

Model		XT225D/DC	
Fuel:			
Type		Unleaded fuel recomended (USA) Regular unleaded gasoline (CDN)	
Fuel tank capacity		8.8 L (1.94 Imp gal, 2.32 US gal)	
Fuel reserve amount		2.0 L (0.4 Imp gal, 0.5 US gal)	
Carburetor:			
Type/Quantity		BST34/1 pc.	
Manufacturer		MIKUNI	
Spark plug:			
Type/Plug gap/Manufacturer		DR8EA/0.6~0.7 mm (0.02~0.03 in) N.G.K. X24ESR-U/0.6~0.7 mm (0.02~0.03 in) NIPPONDENSO	
Clutch:			
Type		Wet, multiple disc	
Transmission:			
Type		Constant mesh 6-speed	
Operation		Left foot operation	
Primary reduction system		Spur gear	
Primary reduction ratio		73/22 (3.318)	
Secondary reduction system		Chain drive	
Secondary reduction ratio		45/15 (3.000)	
Gear ratio:	1st	34/11 (3.090)	
	2nd	30/15 (2.000)	
	3rd	30/21 (1.428)	
	4th	27/24 (1.125)	
	5th	25/27 (0.925)	
	6th	23/29 (0.793)	
Chassis:			
Frame type		Diamond	
Caster angle		26.5°	
Trail		102 mm (4.0 in)	
Tire:		Front	Rear
Type		With tube	With tube
Size		2.75-21-4PR	120/80-18-62P
Manufacture (type)		BRIDGESTONE (TW27) YOKOHAMA (E704)	BRIDGESTONE (TW30) YOKOHAMA (E704)
<Wear limit>		<0.8 mm (0.03 in)>	<0.8 mm (0.03 in)>

Model	XT225D/DC	
Tire pressure (cold tire):		
Maximum load *	183 kg (403 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load *	125 kPa (1.25 kg/cm², 18 psi)	150 kPa (1.5 kg/cm², 21 psi)
90 kg (198 lb)~Maximum load *	150 kPa (1.5 kg/cm², 21 psi)	175 kPa (1.75 kg/cm², 25 psi)
High speed riding	150 kPa (1.5 kg/cm², 21 psi)	175 kPa (1.75 kg/cm², 25 psi)
* Load is total weight of cargo, rider, passenger, and accessories.		
Brake:		
Front brake type	Single disc brake	
Front brake operation	Right hand operation	
Rear brake type	Drum brake	
Rear brake operation	Right foot operation	
Suspension:		
Front	Telescopic fork	
Rear	Swingarm (newmonocross)	
Shock absorber:		
Front	Coil — Air spring/Oil damper	
Rear	Coil — Gas spring/Oil damper	
Wheel travel:		
Front	225 mm (8.9 in)	
Rear	190 mm (7.5 in)	
Electrical:		
Ignition system	C.D.I.	
Generator system	A.C. magneto generator	
Battery type	YTX7L-BS	
Battery capacity	12V, 6AH	
Headlight type	Quartz bulb (halogen)	
Bulb wattage (quantity):		
Headlight	12V 35W/35W (1 pc.)	
Tail/Brake light	12V 8W/27W (1 pc.)	
Flasher light	12V 27W (4 pcs.)	
Front position light	12V 8W (2 pcs.)	
Indicator light:		
Meter light	12V 3.4W (1 pc.)	
"NEUTRAL" indicator light	12V 3.4W (1 pc.)	
"HIGH BEAM" indicator light	12V 3.4W (1 pc.)	
"TURN" indicator light	12V 3.4W (1 pc.)	

MAINTENANCE SPECIFICATIONS
ENGINE

Model	XT225D/DC
Cylinder head: <Warp limit> 	<0.03 mm (0.0012 in)> *Lines indicate straightedge measurement.
Cylinder: Bore size <Warp limit> Measuring point (a) 	 69.970~70.020 mm (2.7547~2.7567 in) <70.1 mm (2.76 in)> 40 mm (1.6 in)
Camshaft: Drive method Camshaft outside diameter Shaft-to-cap clearance Cam dimensions Intake "A" "B" "C" Exhaust "A" "B" "C" <Camshaft runout limit> 	 Chain drive (left) 24.960~24.980 mm (0.9827~0.9835 in) 0.020~0.061 mm (0.0008~0.0024 in) 36.51~36.61 mm (1.437~1.441 in) 30.10~30.20 mm (1.185~1.189 in) 6.50~6.62 mm (0.256~0.261 in) 36.51~36.61 mm (1.437~1.441 in) 30.15~30.25 mm (1.187~1.191 in) 6.50~6.62 mm (0.256~0.261 in) <0.03 mm (0.0012 in)>
Cam chain: Cam chain type Number of links Cam chain adjustment method	 DID25SH 104 Links Automatic
Rocker arm/Rocker arm shaft: Rocker arm inside diameter Shaft outside diameter Arm-to-shaft clearance	 12.000~12.018 mm (0.472~0.473 in) 11.981~11.991 mm (0.4717~0.4721 in) 0.009~0.037 mm (0.0004~0.0015 in)
Valve, valve seat, valve guide: Valve clearance (cold): Intake Exhaust Valve dimensions: Intake "A" head diameter "B" face width "C" seat width "D" margin thickness	 0.05~0.09 mm (0.002~0.004 in) 0.15~0.19 mm (0.006~0.007 in) 33.9~34.1 mm (1.33~1.34 in) 3.68 mm (0.145 in) 0.9~1.1 mm (0.03~0.04 in) 0.8~1.2 mm (0.03~0.05 in)

Model	XT225D/DC	
Exhaust		
"A" head diameter	28.4~28.6 mm (1.12~1.13 in)	
"B" face width	3.68 mm (0.145 in)	
"C" seat width	0.9~1.1 mm (0.03~0.04 in)	
"D" margin thickness	0.8~1.2 mm (0.031~0.050 in)	
		
Stem outside diameter		
Intake	5.975~5.990 mm (0.2352~0.2358 in)	
Exhaust	5.960~5.975 mm (0.2346~0.2352 in)	
Guide inside diameter		
Intake	6.000~6.012 mm (0.2362~0.2367 in)	
Exhaust	6.000~6.012 mm (0.2362~0.2367 in)	
Stem-to-guide clearance		
Intake	0.010~0.037 mm (0.0004~0.0015 in)	
Exhaust	0.025~0.052 mm (0.0010~0.0020 in)	
<Stem runout limit> 	<0.010 mm (0.0004 in)>	
Valve seat width		
Intake	0.9~1.1 mm (0.03~0.04 in)	
Exhaust	0.9~1.1 mm (0.03~0.04 in)	
Valve spring:	Inner spring	Outer spring
Free length:		
Intake	36.17 mm (1.424 in)	36.63 mm (1.442 in)
Exhaust	36.17 mm (1.424 in)	36.63 mm (1.442 in)
Set length (valve closed)		
Intake	30.5 mm (1.20 in)	32.0 mm (1.26 in)
Exhaust	30.5 mm (1.20 in)	32.0 mm (1.26 in)
Direction of winding		
(Top view)	Counterclockwise 	Clockwise 
<Tilt limit>: 		
Intake	<2.5°/1.6 mm (0.063 in)>	<2.5°/1.6 mm (0.063 in)>
Exhaust	<2.5°/1.6 mm (0.063 in)>	<2.5°/1.6 mm (0.063 in)>

Model	XT225D/DC
Piston:	
Piston size "D"	69.925~69.975 mm (2.7530~2.7549 in)
Measuring point "H"	4.0 mm (0.16 in)
Oversize 2nd	70.50 mm (2.776 in)
Oversize 4th	71.00 mm (2.795 in)
Piston off-set	0.5 mm (0.02 in)
Piston off-set direction	Intake side
Piston-to-cylinder clearance	0.035~0.055 mm (0.0014~0.0022 in)
<Limit>	<0.10 mm (0.004 in)>
Piston ring:	
Type:	
Top ring	Barrel
2nd ring	Taper
Dimensions (B×T):	
Top ring	B=1.2 mm (0.05 in) T=2.8 mm (0.11 in)
2nd ring	B=1.2 mm (0.05 in) T=2.8 mm (0.11 in)
Oil ring	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)
2nd ring	0.15~0.30 mm (0.006~0.012 in)
Oil ring	0.30~0.90 mm (0.012~0.035 in)
Side clearance (installed):	
Top ring	0.03~0.07 mm (0.001~0.003 in)
2nd ring	0.02~0.06 mm (0.001~0.002 in)
Crankshaft:	
Crank width "A"	55.95~56.00 mm (2.203~2.205 in)
<Runout limit "C">	<0.03 mm (0.0012 in)>
Big end side	
Clearance "D"	0.35~0.65 mm (0.013~0.026 in)
Small end	
<Free play limit "F">	<0.8 mm (0.031 in)>
Balancer:	
Drive method	Gear

Model		XT225D/DC		
Clutch:				
Friction plate:				
Thickness		2.90~3.10 mm (0.114~0.122 in)		
Quantity		6 pcs.		
<Wear limit>		<2.80 mm (0.110 in)>		
Clutch plate:				
Thickness		1.50~1.70 mm (0.059~0.067 in)		
Quantity		5 pcs.		
<Warp limit>		<0.20 mm (0.008 in)>		
Clutch spring:				
Free length		37.3 mm (1.47 in)		
Quantity		4 pcs.		
Minimum free length		35.3 mm (1.39 in)		
Clutch housing:				
Thrust clearance		0.010~0.044 mm (0.0004~0.0017 in)		
Clutch release method		Inner push, cam push		
<Push rod bending limit>		<0.5 mm (0.02 in)>		
Transmission:				
<Main axle runout limit>		<0.08 mm (0.003 in)>		
<Drive axle runout limit>		<0.08 mm (0.003 in)>		
Shifter:				
Type		Cam drum and guide bar		
		XT225D (4BE1)	XT225DC (4BE2)	XT225D (4BE3)
Carburetor:				
I.D. Mark		4BE 10	4BE 00	3RW 00
Main jet	(M.J.)	#130	←	#122.5
Main air jet size	(M.A.J.)	1.0	←	0.9
Jet needle	(J.N.)	5DL27-1	←	5GN50-3/5
Needle jet	(N.J.)	O-1	←	O-0
Pilot air jet size	(P.A.J. 1)	#60	←	#80
	(P.A.J. 2)	1.2	←	1.2
Pilot jet	(P.J.)	#40	←	#42.5
Pilot outlet	(P.O.)	0.85	←	←
Bypass 1	(B.P.1)	0.8	←	←
Pilot screw	(P.S.)	Preset	←	2 turns out
Valve seat size	(V.S.)	2.0	←	←
Starter jet	(G.S.1)	#60	←	←
	(G.S.2)	0.7	←	←
Fuel level (with special tool)	(F.L.)	11.0~12.0 mm (0.43~0.47 in) Below from the float chamber mating surface (front)		
Float height	(F.H.)	14.1~15.1 mm (0.56~0.59 in) Below from the float chamber mating surface (front)		
Engine idle speed		1,300~1,500 r/min		
Intake vacuum		220~240 mmHg		

Model	XT225D/DC
Lubrication system:	
Oil filter:	
Type	Wire mesh type
Oil pump:	
Type	Trochoid type
Tip clearance	0.15 mm (0.006 in)
Side clearace	0.04~0.09 mm (0.002~0.004 in)
Pressure checking location	Cylinder head

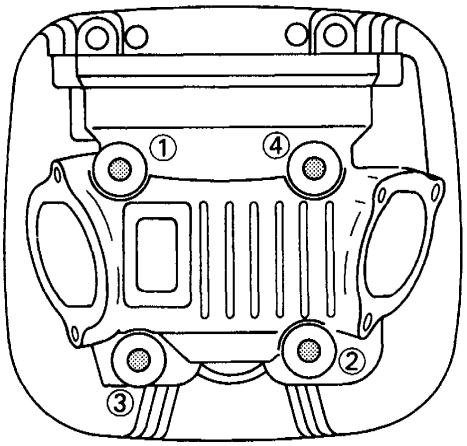
TIGHTENING TORQUE

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m • kg	ft • lb	
Cylinder head	Crossrecessed hexagon bolt	M6	1	7	0.7	5.1	Oil check
Cylinder head and cylinder	Flange bolt	M8	4	22	2.2	17	Apply oil to the washer
Cylinder head	Bolt	M8	2	20	2.0	14	
Cylinder head side cover 3	Panhead screw	M6	2	7	0.7	5.1	
Cylinder head side cover 12	Bolt	M6	5	10	1.0	7.2	
Plate	Bolt	M6	2	8	0.8	5.8	Use lock washer
Spark plug	—	M12	1	17.5	1.75	12.5	
Cylinder	Bolt	M6	2	10	1.0	7.2	
Balance weight gear	Nut	M14	1	50	5.0	36	Use lock washer
AC generator rotor	Bolt	M10	1	50	5.0	36	
Valve clearance	Nut	M6	2	13.5	1.35	10	
Cam sprocket	Bolt	M10	1	60	6.0	43	
Tensioner	Bolt	M6	2	10	1.0	7.2	
Stopper guide 2	Bolt	M6	2	8	0.8	5.8	
Oil pump assembly	Flat head screw	M6	3	7	0.7	5.1	
Drain plug 1	—	M35	1	43	4.3	31	
Element cover	Panhead screw	M6	1	7	0.7	5.1	
Element cover	Panhead screw	M6	1	7	0.7	5.1	
Element cover	Bolt	M6	1	10	1.0	7.2	
Carburetor joint 1	Button head bolt	M6	2	12	1.2	8.7	
Carburetor	Hose clamp	M5	1	2	0.2	1.4	
Air filter case fitting (front)	Screw with washer	M6	1	10	1.0	7.2	
Air filter case fitting (rear)	Hexagon bolt with washer	M6	2	10	1.0	7.2	
Muffler mounting	Flange bolt	M8	2	27	2.7	19	
Exhaust pipe fitting	Bolt	M6	2	10	1.0	7.2	
Exhaust pipe protector	Bind head screw	M6	3	7	0.7	5.1	Use lock washer LT
Muffler protector	Screw	M6	2	7	0.7	5.1	Use lock washer LT
Exhaust pipe and muffler link	Bolt	M8	1	20	2.0	14	
Case 1 & 2	Panhead screw	M6	7	7	0.7	5.1	
Case 1 & 2	Panhead screw	M6	2	7	0.7	5.1	
Case 1 & 2	Panhead screw	M6	2	7	0.7	5.1	Tighten starter motor together
Case 1 & 2	Panhead screw	M6	1	7	0.7	5.1	

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m • kg	ft • lb	
Crankcase cover 1	Panhead screw	M6	6	7	0.7	5.1	
Crankcase cover 1	Panhead screw	M6	2	7	0.7	5.1	
Clamp	Panhead screw	M6	1	7	0.7	5.1	
Crankcase cover 2	Panhead screw	M6	2	7	0.7	5.1	
Crankcase cover 3	Panhead screw	M6	5	7	0.7	5.1	
Crankcase cover 3	Panhead screw	M6	3	7	0.7	5.1	
Crankcase cover 3	Panhead screw	M6	2	7	0.7	5.1	
Primary drive gear	Nut	M14	1	50	5.0	36	Use lock washer
Clutch spring	Screw with washer	M5	4	6	0.6	4.3	
Clutch boss	Nut	M14	1	70	7.0	51	Use lock washer
Push lever assembly stopper	Screw	M8	1	12	1.2	8.7	
Push lever clearance adjusting	Nut	M6	1	8	0.8	5.8	
Drive sprocket	Bolt	M6	2	10	1.0	7.2	
Shift pedal	Bolt	M6	1	10	1.0	7.2	
Segment	Screw	M6	1	12	1.2	8.7	Torques bolt LT
Pulser coil	Panhead screw	M6	2	7	0.7	5.1	LT
Neutral switch assembly	—	M10	1	20	2.0	14	
Charge coil	Panhead screw with washer	M5	2	4	0.4	2.9	LT
Stator coil	Panhead screw with washer	M5	2	4	0.4	2.9	LT

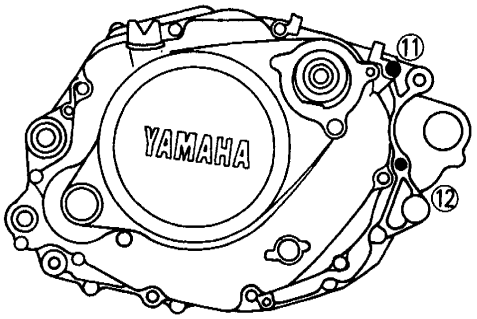
Tightening sequence:

Cylinder head

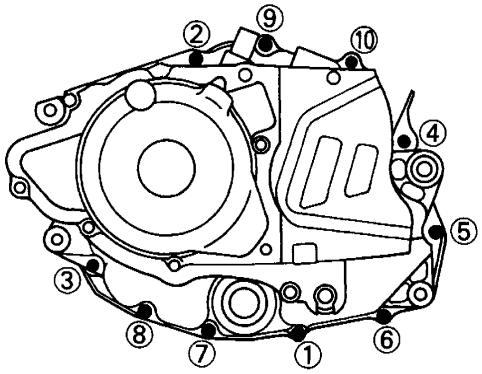


Crankcase

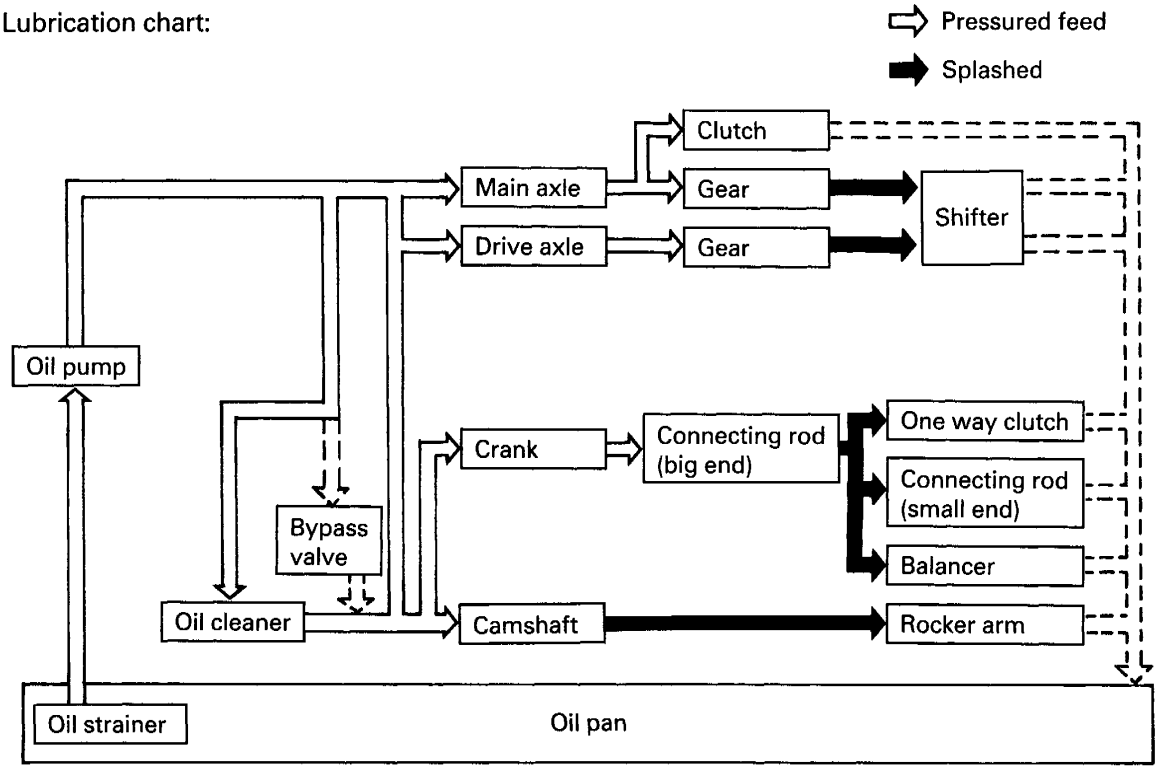
Right-hand



Left-hand



Lubrication chart:



CHASSIS

Model		XT225D/DC
Steering system:		
Bearing type		Ball and taper roller bearing
No./Size of steel balls (upper)		22 pcs. 0.1875 (3/16) in
Front suspension:		
Front fork travel		225 mm (8.9 in)
Fork spring free length		594.7 mm (23.41 in)
<Minimum free length>		588.8 mm (23.18 in)
Spring rate	(K1)	3.5 N/mm (0.35 kg/mm, 19.6 lb/in)
	(K2)	4.0 N/mm (0.40 kg/mm, 22.4 lb/in)
Stroke	(K1)	Zero~78.5 mm (Zero~3.09 in)
	(K2)	78.5~230.0 mm (3.09~9.06 in)
Optional spring		No
Oil capacity		355 cm^3 (12.5 Imp oz, 12.0 US oz)
Oil level		147 mm (5.8 in) From top of inner tube fully compressed without spring
Oil grade		Fork oil 10W or equivalent
Enclosed air pressure:		
Standard		Zero kPa (Zero kg/cm^2, Zero psi)
(Min.~Max.)		Zero~40 kPa (Zero~0.4 kg/cm^2, Zero~5.7 psi)
Rear suspension:		
Shock absorber travel		72 mm (2.8 in)
Spring free length		189 mm (7.4 in)
Fitting length		174 mm (6.9 in)
Spring-rate	(K1)	61.5 N/mm (6.15 kg/mm, 344 lb/in)
Stroke	(K1)	Zero~94 mm (Zero~3.7 in)
Optional spring		No
Enclosed gas pressure		1,500 kPa (15 kg/cm^2, 213 psi)
Swingarm:		
<Free play limit>		<1.0 mm (0.04 in)> at swingarm end Move swingarm end side to side.
Side clearance		0.4~0.7 mm (0.02~0.03 in) at swingarm pivot
<Free play limit>		<1.0 mm (0.04 in)> at swingarm pivot
Front wheel:		
Type		Sporke wheel
Rim size		1.6 × 21
Rim material		Aluminum
<Rim runout limit>		
Vertical		<2.0 mm (0.08 in)>
Lateral		<2.0 mm (0.08 in)>

Model	XT225D/DC
Rear wheel:	
Type	Sporke wheel
Rim size	2.15 × 18
Rim material	Aluminum
<Rim runout limit>	
Vertical	<2.0 mm (0.08 in)>
Lateral	<2.0 mm (0.08 in)>
Drive chain:	
Type/Manufacturer	428V1/DAIDO
Number of links	120
Chain slack	35~45 mm (1.38~1.77 in)
Front disc brake:	
Type	Single
Disc outside diameter	220 mm (8.7 in)
Disc thickness	3.5 mm (0.14 in)
Pad thickness	6.0 mm (0.24 in)
<Wear limit>	<0.8 mm (0.03 in)>
Master cylinder inside diameter	11 mm (0.4 in)
Caliper cylinder inside diameter	34.93 mm (1.375 in)
Brake fluid type	DOT No. 4 or DOT No. 3
Rear drum brake:	
Type	Leading, Trailing
Brake drum inside diameter	110 mm (4.33 in)
<Limit>	<111 mm (4.37 in)>
Lining thickness	4.0 mm (0.16 in)
<Limit>	<2 mm (0.08 in)>
Shoe spring free length	50.5 mm (1.99 in)
Brake lever and pedal:	
Brake lever free play	2.0~5.0 mm (0.08~0.20 in) at end of brake lever.
Brake pedal position	10 mm (0.4 in) below top of footrest.
Brake pedal free play	20~30 mm (0.8~1.2 in)
Clutch lever and throttle grip:	
Clutch lever free play	10~15 mm (0.4~0.6 in) at clutch lever end.
Throttle cable free play	3.0~5.0 mm (0.12~0.20 in) at grip flange.

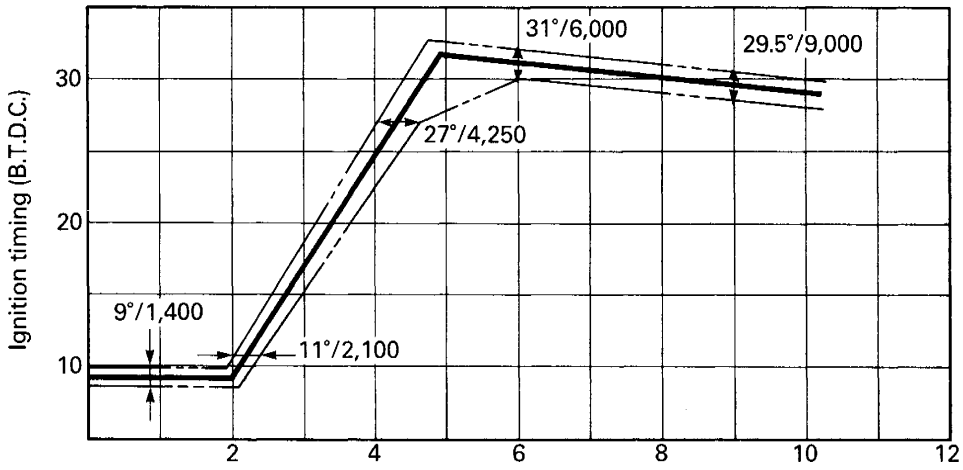
TIGHTENING TORQUE

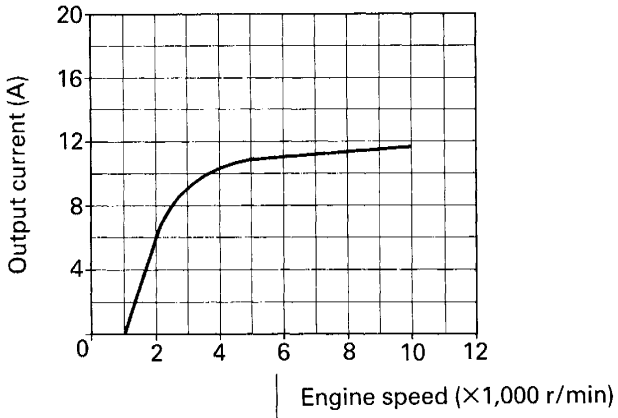
Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m • kg	ft • lb	
Front engine stay and frame	M 8×1.25	33	3.3	24	
Front engine stay and engine	M 8×1.25	33	3.3	24	
Engine stay 1 and frame	M 8×1.25	38	3.8	27	
Engine stay 1 and engine	M 8×1.25	33	3.3	24	
Engine and frame (rear, under)	M 8×1.25	33	3.3	24	
Pivot shaft and nut	M12×1.25	80	8.0	58	
Relay arm and swingarm	M12×1.25	55	5.5	40	
Connecting rod and relay arm	M10×1.25	32	3.2	23	
Connecting rod and frame	M10×1.25	32	3.2	23	
Rear shock absorber and relay arm	M10×1.25	32	3.2	23	
Rear shock absorber and frame	M10×1.25	32	3.2	23	
Steering shaft and ring nut	M25×1.0	5.5	0.55	4	Refer to NOTE
Steering shaft and handle crown	M14×1.25	70	7.0	50	
Handle crown and inner tube	M 8×1.25	23	2.3	17	
Handle crown and handlebar holder	M 8×1.25	15	1.5	11	
Under bracket and inner tube	M 8×1.25	20	2.0	14	
Handle crown and steering lock	M 6×1.0	7	0.7	5.1	
Front wheel axle and nut	M14×1.5	85	8.5	61	
Caliper and front fork	M10×1.25	35	3.5	25	
Caliper and brake hose	M10×1.25	27	2.7	19	
Rear wheel axle and nut	M14×1.5	85	8.5	61	
Master cylinder and brake hose	M10×1.25	27	2.7	19	
Master cylinder and cap	M 4×0.7	1.5	0.15	1.1	
Footrest (left) and frame	M10×1.25	32	3.2	23	
Footrest (right) and frame	M10×1.25	42	4.2	30	
Shift pedal and footrest bracket 1	M 8×1.25	20	2.0	14	
Brake shaft and frame	M14×1.5	30	3.0	22	
Sidestand fitting bolt and nut	M10×1.25	40	4.0	29	
Sidestand fitting bolt and sidestand	M10×1.25	40	4.0	29	
Rear footrest (left) bracket and frame	M 8×1.25	28	2.8	20	
Rear footrest (right) bracket and frame	M 8×1.25	28	2.8	20	
Taillight fitting bolt and nut	M 6×1.0	5.5	0.55	4	

NOTE:

1. First, tighten the ring nut approximately 38 Nm (3.8 m • kg, 27 ft • lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut to specification.

ELECTRICAL

Model	XT225D/DC
Voltage:	12V
Ignition system: Ignition timing (B.T.D.C.) Advanced timing (B.T.D.C.) Advancer type	 9° at 1,400 r/min 31°/6,000 r/min Electrical type
	
C.D.I.: Unit model/Manufacturer Pickup coil resistance (color) Charging coil resistance (color)	 4BE/YAMAHA 656~984Ω at 20°C (68°F) (Red—White) 584~876Ω at 20°C (68°F) (Brown—Green) 20~30Ω at 20°C (68°F) (Yellow—Black)
Ignition coil: Model/Manufacturer Primary coil resistance Secondary coil resistance Minimum spark gap	 2JN/YAMAHA 0.56~0.84Ω at 20°C (68°F) 5.68~8.52kΩ at 20°C (68°F) 6.0 mm (0.24 in)
Spark plug cap: Type Resistance	 Resin type 10kΩ at 20°C (68°F)
Charging system: Type	 A.C. magneto generator

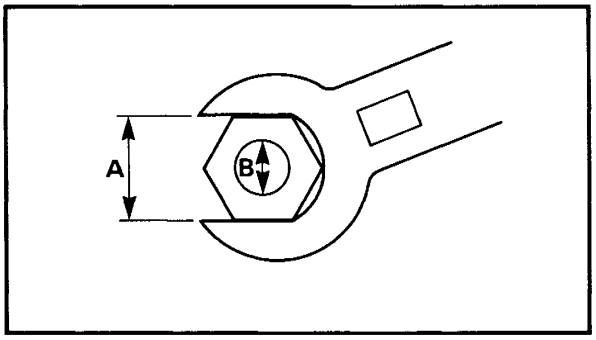
Model	XT225D/DC
A.C. generator:	
Model/Manufacturer	2YG/YAMAHA
Charging output	14V, 10A at 5,000 r/min
	
Stator coil resistance (color)	0.48~0.72Ω at 20°C (68°F) (White—White)
Voltage regulator/Rectifier:	
Model/Manufacturer	SH569A-12/SHINDENGEN
Voltage regulator:	
Type	Semi conductor - Short circuit type
No load regulated voltage	14.3~15.3V
Rectifier:	
Capacity	12A
Battery:	
Specific gravity	1.320
Electric starter system:	
Type	Constant mesh type
Starter motor:	
Model/Manufacturer	3RW1/YAMAHA
Output	0.4 kW
Brush overall length	10.0 mm (0.39 in)
<Limit>	<3.5 mm (0.14 in)>
Commutator diameter	22.0 mm (0.87 in)
<Limit>	<21.0 mm (0.83 in)>
Mica undercut (depth)	1.5 mm (0.06 in)

Model	XT225D/DC
Starter switch:	
Model/Manufacturer	MS5D - 191/HITACHI
Amperage rating	100A
Horn:	
Type	Plane type
Quantity	1 pc.
Model/Manufacturer	GF-12/NIKKO
Maximum amperage	1.5A
Flasher relay:	
Type	Semi transister type
Model/Manufacturer	G8A/OMRON
Self cancelling device	No
Flasher frequency	60~120 cycles/min
Wattage	27WX2+3.4W
Circuit breaker:	
Type	Fuse
Amperage for individual circuit×Quantity:	
Main	15A/1 pc.
Reserve	15A/1 pc.

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	1 kg × 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 POINTS AND LUBRICANT TYPE

ENGINE

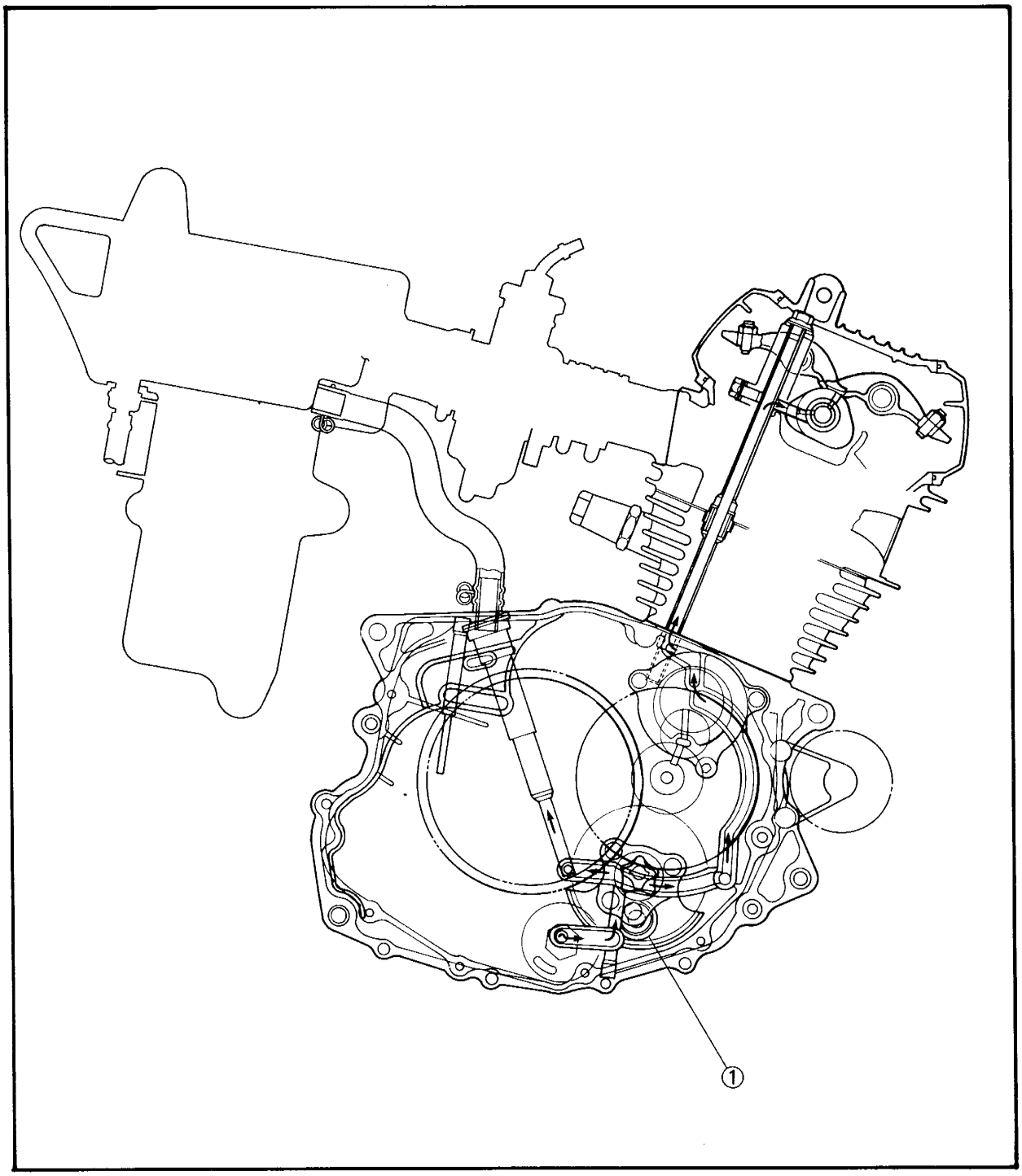
Lubrication points (part name)	Lubricant type
Oil seal lips (all)	LS
Bearing retainer (all)	E
Bolt (cylinder head)	E
Crank pin	E
Connecting rod (big end)	E
Piston and piston ring	E
Buffer boss	E
Piston pin	E
Valve stem and valve guide	M
Oil seal (valve stem end)	M
Rocker arm shaft and rocker arm	E
Cam and bearing (camshaft)	E
Rocker arm shaft and rocker arm	M
O-ring (drain plug)	LS
Push rod	E
Primary driven gear and main axle	E
Sliding gear (transmission)	M
Free movement gear (transmission)	M
Shift fork and guide bar	E
Shift cam and bearing (shift cam)	E
Shift shaft	E
Crankcase mating surfaces	Sealant (quick gasket)® Yamaha Bond No. 1215
Crankcase cover 1 and grommet	Sealant (quick gasket)® Yamaha Bond No. 1215

CHASSIS

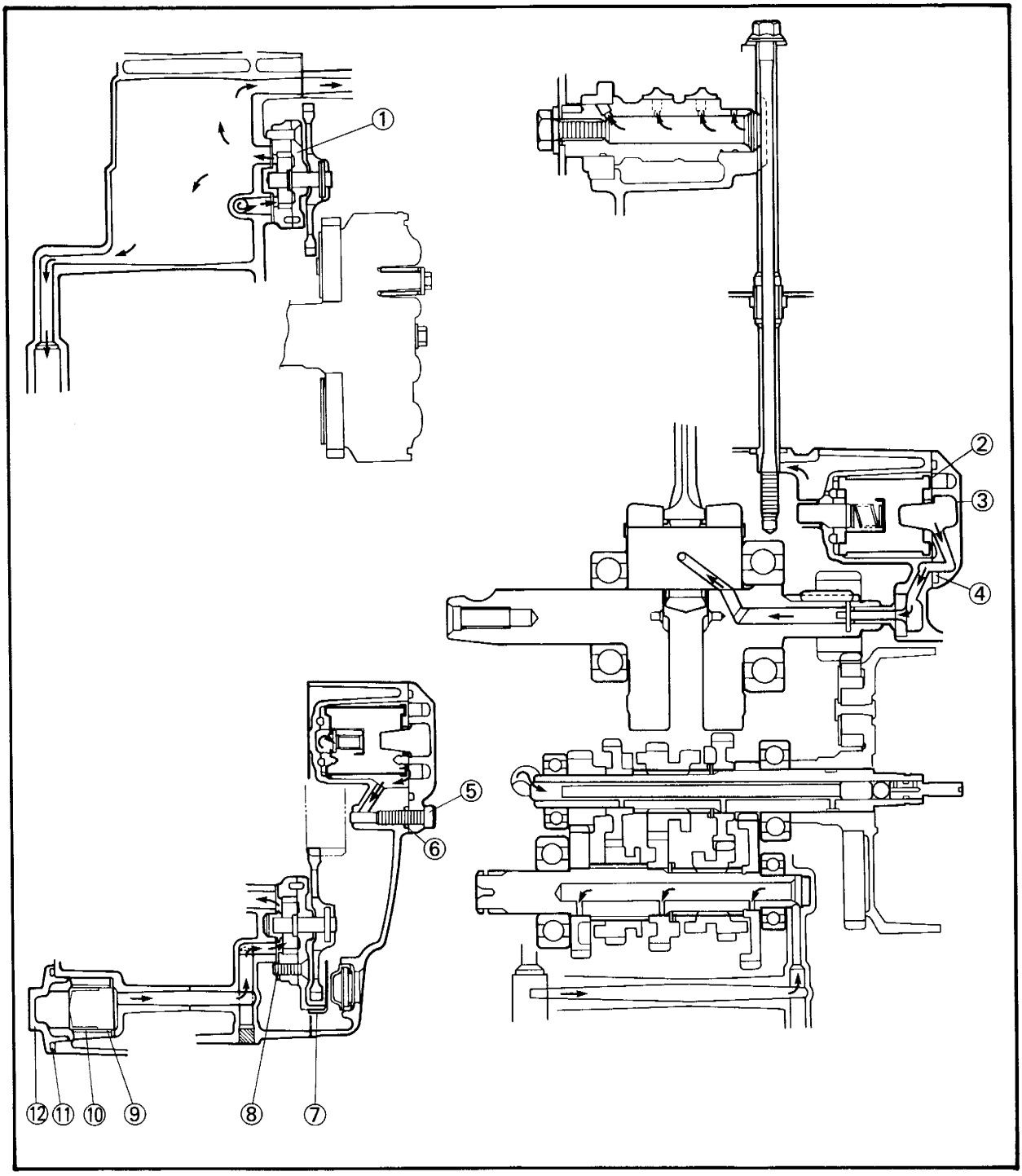
Lubrication points (part name)	Lubricant type
Gear unit (speedometer)	LS
Oil seal lips (all)	LS
Wheel axle (front wheel and rear wheel)	LS
Rear wheel hub	LS
Rear brake shoe plate, camshaft and pivoting pin	LS
Bush (swingarm) and thrust cover	LS
Collar (swingarm)	LS
Pivot shaft (swingarm)	LS
Bush (rear shock absorber)	LS
Thrust cover (rear shock absorber and relay arm)	LS
Bushes (relay arm and connecting arm)	LS
Collar (relay arm and connecting arm)	LS
Bushes (connecting arm and frame)	LS
Collar (connecting arm and frame)	LS
Bushes (relay arm and swingarm) and thrust cover	LS
Collars (relay arm and swingarm)	LS
Pivoting points (brake pedal shaft and frame)	LS
Bearings and balls (steering head)	LS
Tube guide (right grip)	LS
Pivoting points (brake lever and clutch lever)	LS
Pivoting point (sidestand)	LS
Bushes (chain tensioner)	LS

LUBRICATION DIAGRAM

① Oil pump



① Oil pump
② Oil cleaner assembly
③ Element cover
④ O-ring
⑤ Bolt
⑥ O-ring
⑦ Gear cover
⑧ Pump cover gasket
⑨ Oil strainer
⑩ Compression spring
⑪ O-ring
⑫ Drain plug

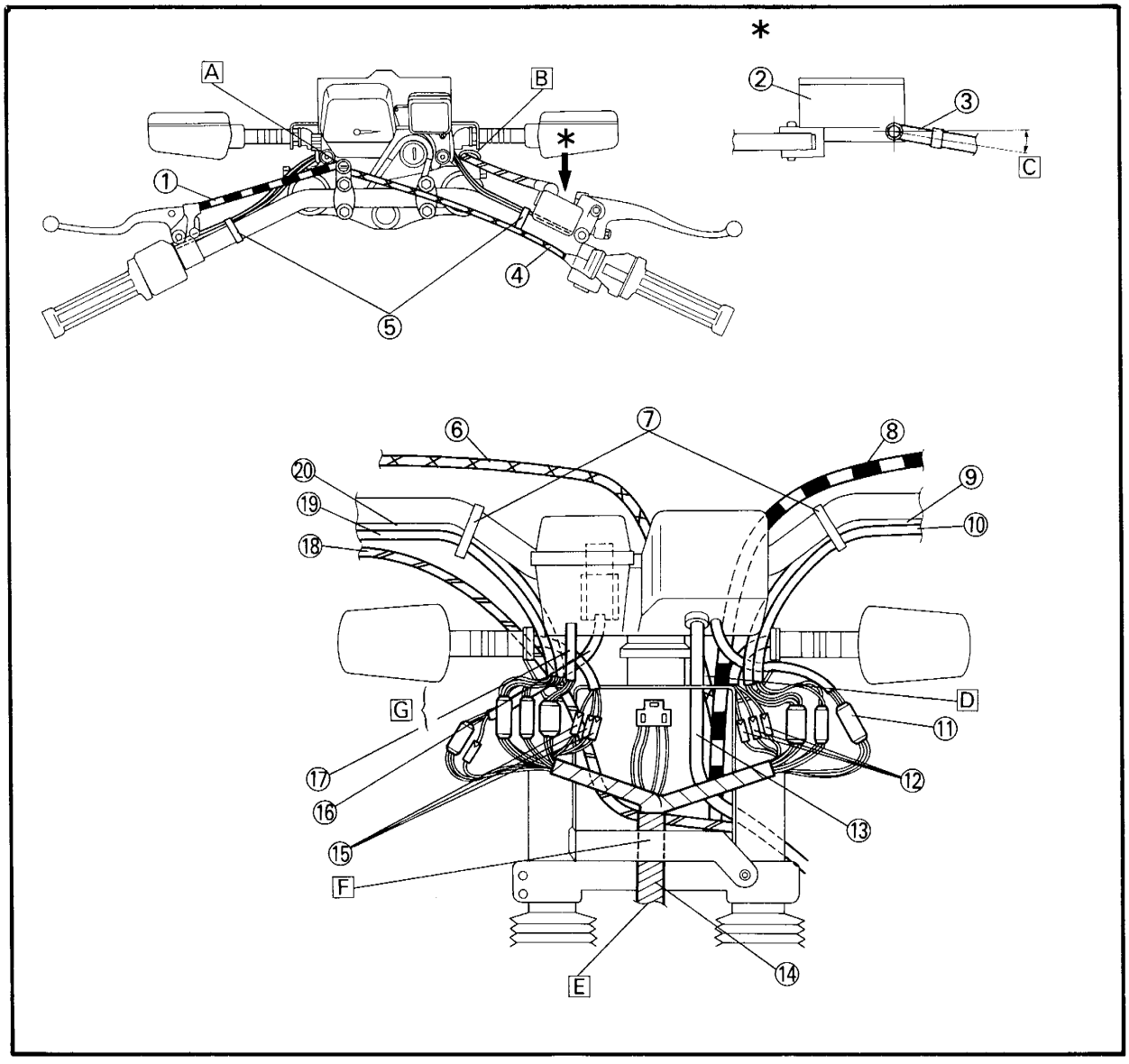


CABLE ROUTING

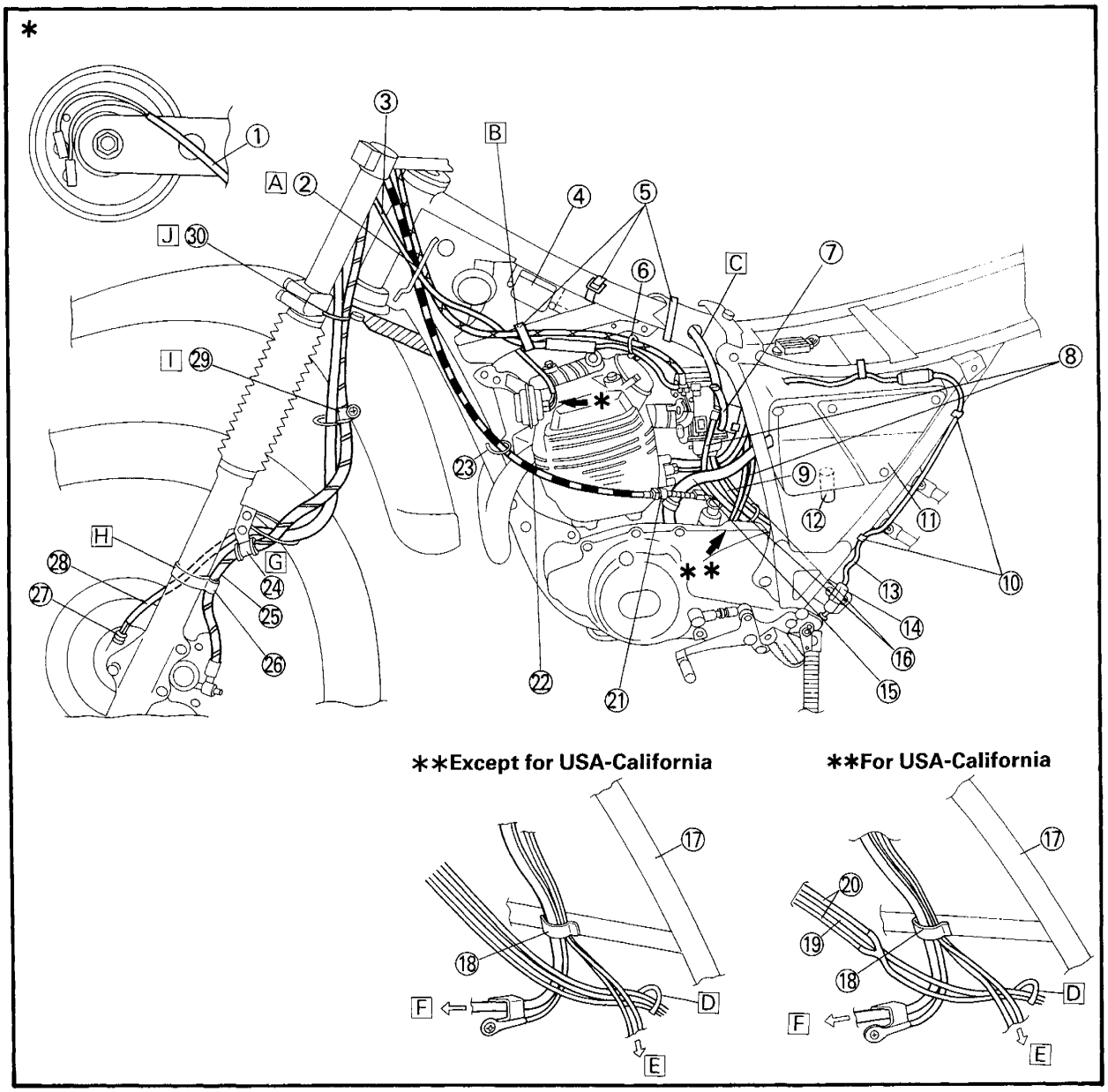
① Clutch cable
② Master cylinder
③ Front brake hose
④ Throttle cable
⑤ Band
⑥ Throttle cable
⑦ Band
⑧ Clutch cable
⑨ Handlebar switch lead (left)
⑩ Clutch switch lead
⑪ Speedometer lead
⑫ Flasher light lead (left)
⑬ Speedometer cable
⑭ Wireharness
⑮ Flasher light lead (right)
⑯ Main switch lead
⑰ Pilot box lead
⑱ Brake hose
⑲ Front brake switch lead
⑳ Handlebar switch lead (right)

[A] Pass the starter cable to the front of the clutch cable and the throttle cable.
[B] Pass the brake hose through the guide.
[C] 10°
[D] Pass the throttle cable inside of the clutch cable.
[E] Pass the wireharness between the under bracket and the front fender.
[F] Align the locating tape on the wireharness with the headlight stay.

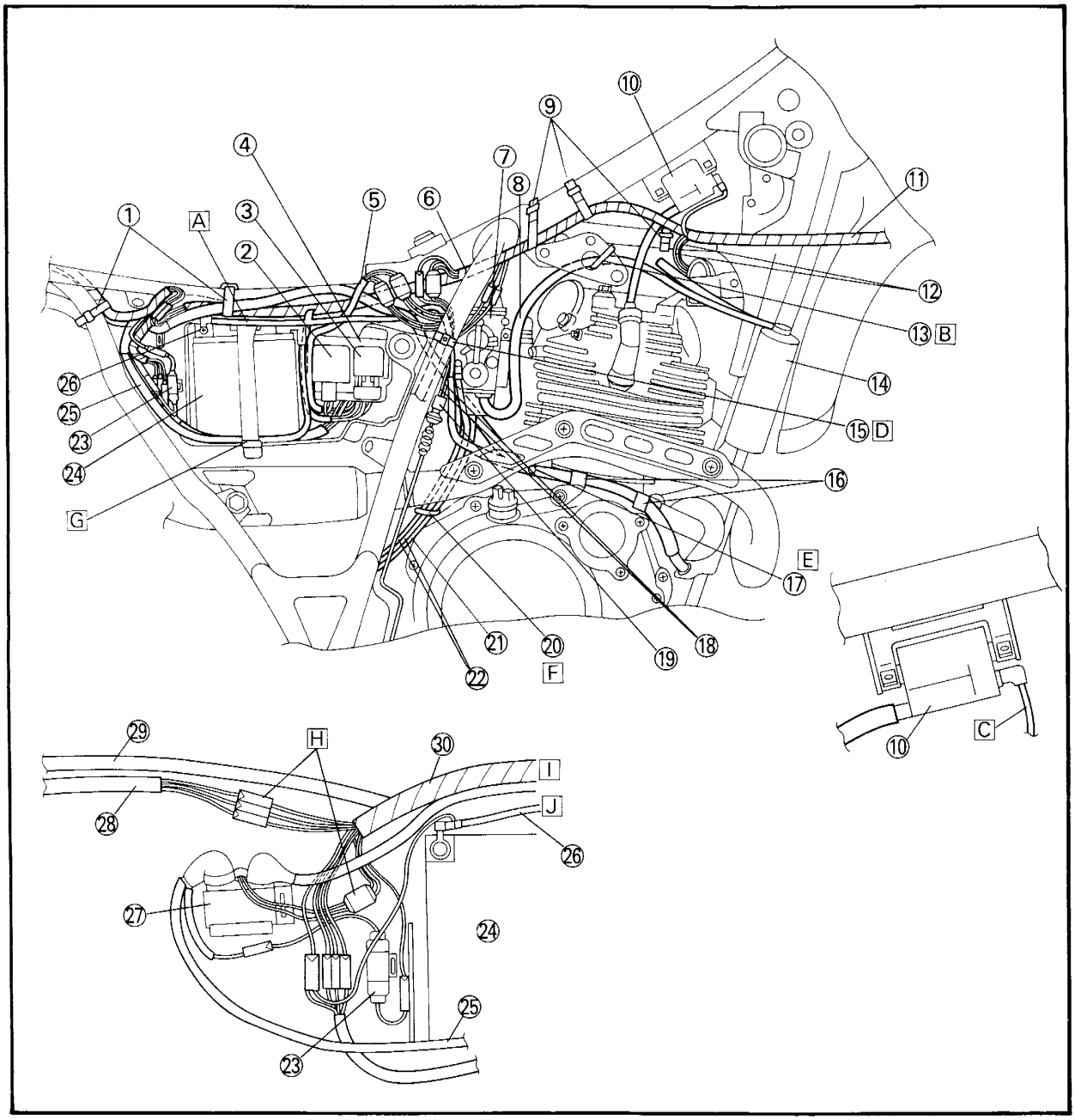
[G] Procedure
1. Connect the wires to the flasher light (right), pilot box, front brake switch, handlebar switch (right) and main switch.
2. Connect the wires to the clutch switch, handlebar switch (left), meters and flasher light (left), crossing the wires over the wires used in step 1.
3. After the wiring is completed, put the coupler underneath the meter and pilot box.
4. Clamp the wires at the point where taping will stop near the wireharness.
(Locate the protection taped portion above the headlight rim).



① Horn lead
② Cable guide
③ Starter cable
④ Ignition coil
⑤ Band
⑥ Clamp
⑦ Fuel pipe
⑧ Air vent pipe
⑨ Overflow pipe
⑩ Clamp
⑪ Air cleaner
⑫ Drain pipe
⑬ Sidestand switch lead
⑭ Sidestand switch
⑮ Crankcase breather hose
⑯ Flywheel magneto lead
⑰ Seat pillar (left)
⑱ Clamp
⑲ Overflow pipe
⑳ Carburetor air vent hose (right and left)
㉑ Holder
㉒ Clutch cable
㉓ Guide
㉔ Cable holder
㉕ Front brake hose
㉖ Cable band
㉗ Speedometer gear unit
㉘ Speedometer cable
㉙ Cable holder
㉚ Guide
[A] Pass the throttle cable, the clutch cable and the starter cable inside of the guide and pass the starter cable outside of the clutch cable.
[B] This band has slack within interference (Do not contact the engine).
[C] The air vent hose is not equipped on models for California.
[D] Guide (engine side)
[E] To engine
[F] To start motor
[G] Clamp the brake hose.
[H] Clamp the brake hose and the speedometer cable with the band and tighten the band passing along the hollow on the brake disc cover.
[I] Clamp the brake hose to the cable holder and pass the meter cable through the clamp.
[J] Pass the brake hose inside and the meter cable outside through the guide.

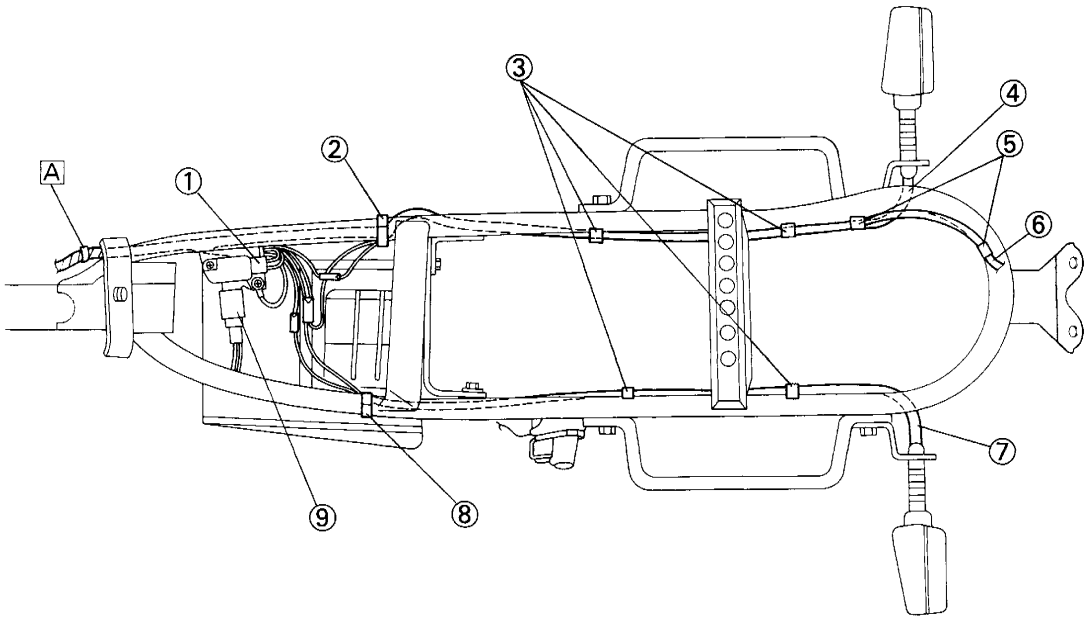


① Band
② Flasher relay
③ Starting circuit cut-off relay
④ CDI unit
⑤ CDI unit lead
⑥ White tape
⑦ Carburetor
⑧ Canister hose (for California only)
⑨ Band
⑩ Ignition coil
⑪ Wireharness
⑫ Horn lead
⑬ Band (for California only)
⑭ Canister (for California only)
⑮ Band
⑯ Clamp
⑰ Clamp
⑱ Rear brake switch lead
⑲ Rear brake switch
⑳ Guide
㉑ Carburetor overflow pipe
㉒ Air vent pipe
㉓ Fuse
㉔ Battery
㉕ Battery lead (+)
㉖ Battery lead (−)
㉗ Starter relay
㉘ Taillight lead
㉙ Flasher light lead
㉚ Wireharness
[A] Do not band.
[B] Tighten the engine stay and the canister hose (for California only).
[C] Install the terminal with the lead facing downward.
[D] Tighten the rear brake switch lead, battery lead (−) and flywheel magneto leads (two).
[E] Tighten the battery lead (−) together.
[F] Pass the overflow pipe, and air vent pipe through the guide and between the relay arm and swingarm.
[G] Band the battery lead together.
[H] After connecting the couplers, put them inside of the leads.
[I] To starter motor.
[J] To engine earth.



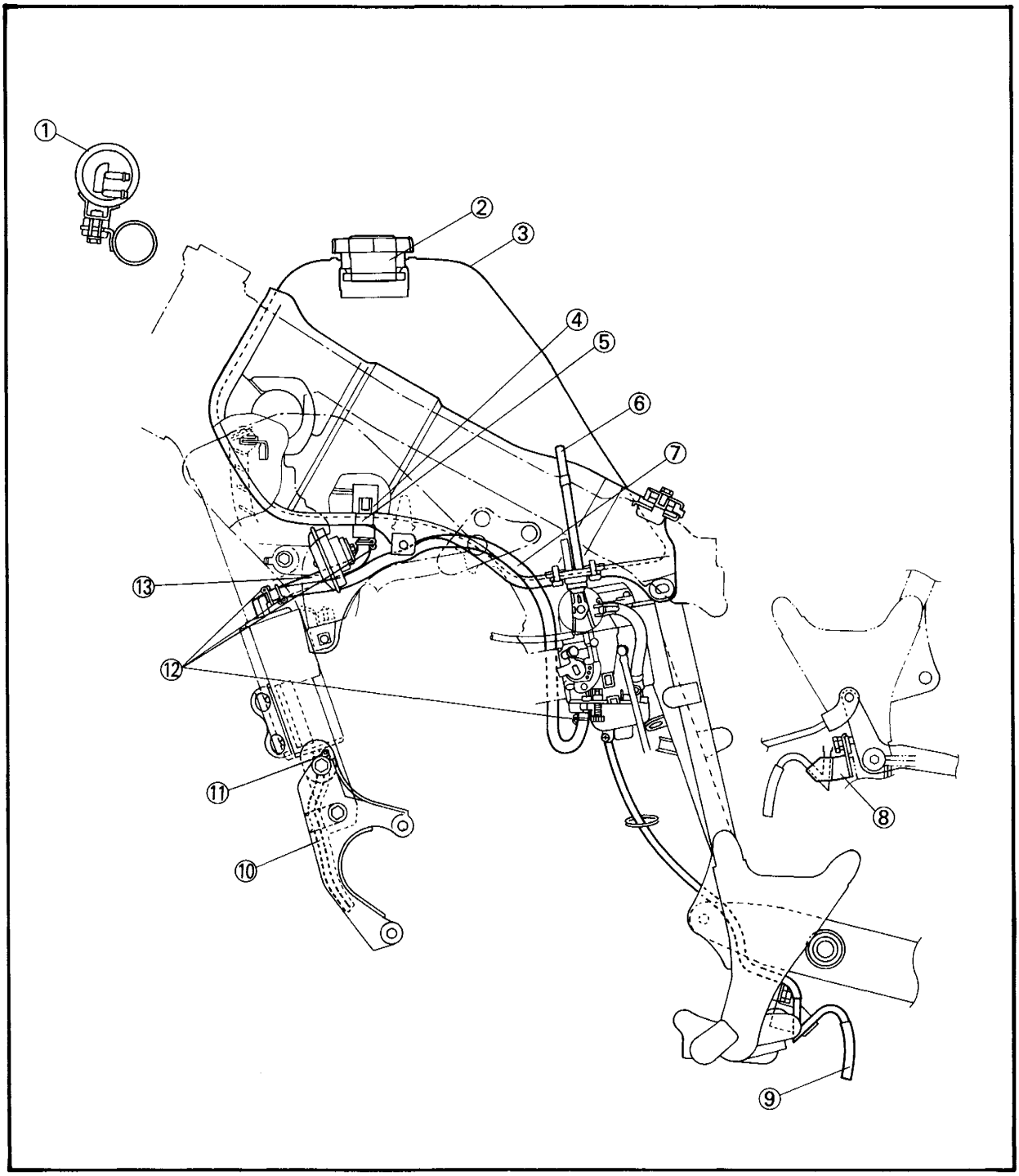
① Rectifier/regulator
② Band
③ Clamp
④ Rear flasher light lead (right)
⑤ Clamp
⑥ Taillight lead
⑦ Rear flasher light lead (left)
⑧ Band
⑨ Neutral relay

[A] Align the white tape on the wireharness with the seat pillar R.



EMISSION HOSE ROUTING (XT225DC CALIFORNIA ONLY)

① Canister ass'y
② Cap ass'y
③ Fuel tank comp.
④ O-ring
⑤ Roll over valve ass'y
⑥ Fuel cock ass'y
⑦ Hose (Canister-carburetor)
⑧ Over flow pipe
⑨ Hose
⑩ Hose
⑪ Clip
⑫ Clip
⑬ Hose (canister-roll over valve)





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 vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service as well as new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

MAINTENANCE INTERVALS CHARTS (For USA)

Proper periodic maintenance is important. Especially important are the maintenance services related to emissions control. These controls not only function to ensure cleaner air but are also vital to proper engine operation and maximum performance. In the following maintenance tables, the services related to emissions control are grouped separately.

PERIODIC MAINTENANCE/EMISSION CONTROL SYSTEM

NO.	ITEM	REMARKS	INITIAL	ODOMETER READING			
			1,000 km or 1 month (600 mi)	**1 6,000 km or 7 months (3,800 mi)	**2 11,000 km or 13 months (6,900 mi)	16,000 km or 19 months (10,000 mi)	21,000 km or 25 months (13,100 mi)
1.*	Valve clearance	Check and adjust valve clearance when engine is cold.	○	○	○	○	○
2.*	Spark plug	Check condition. Adjust gap and clean. Replace at 11,000 km (or 13 months) and thereafter every 10,000 km (or 23 months).		○	Replace	○	Replace
3.*	Crankcase breather system	Check breather hose for cracks or damage. Replace if necessary.		○		○	
4.*	Fuel line	Check fuel hose for cracks or damage. Replace if necessary.		○	○	○	○
5.*	Exhaust system	Check for leakage. Retighten if necessary. Replace gasket(s) if necessary.		○	○	○	○
6.*	Idle speed	Check and adjust engine idle speed. Adjust cable free play.		○	○	○	○
7.*	Evaporative emission control system**	Check control system for damage. Replace if necessary.			○		○

* It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.
** California type only.

NOTE:

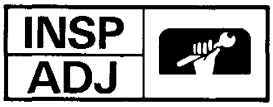
For farther odometer reading, repeat the above maintenance at the period established; **1: Every 5,000 km (3,100 mi) and **2: Every 10,000 km (6,200 mi) intervals.



GENERAL MAINTENANCE/LUBRICATION

NO.	ITEM	REMARKS	TYPE	INITIAL	ODOMETER READINGS			
				1,000 km or 1 month (600 mi)	**1 6,000 km or 7 months (3,800 mi)	**2 11,000 km or 13 months (6,900 mi)	16,000 km or 19 months (10,000 mi)	21,000 km or 25 months 13,100 mi)
1.	Engine oil	Warm-up engine before draining	*1) Yamalube 4 (20W40) or SAE 20W40 type "SE" motor oil *2) Yamalube 4 (10W30) or SAE 10W30 type "SE" motor oil	○	○	○	○	○
2.	Oil filter/Strainer	Clean oil filter and strainer. Replace oil filter and strainer if damage.	–	○		○		○
3.*	Air filter	Wet type filter must be washed and damaged with oil.	–		○	○	○	○
4.*	Brake system	Adjust free play. Replace pads if necessary. (Front) Replace shoes if necessary. (Rear)	–	○	○	○	○	○
5.*	Clutch	Adjust free play	–	○	○	○	○	○
6.	Drive chain	Check chain condition. Adjust and lubricate chain thoroughly.	SAE 30W ~ 50W motor oil		Every 500 km (300 mi)			
7.*	Control and meter calbe	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W30 motor oil	○	○	○	○	○
8.*	Rear arm pivot shaft and rear suspension link pivots	Apply untile new grease show.	Lithium soap base grease.		○	○	○	○
9.	Brake/Clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil		○	○	○	○
10.	Brake pedal and shift pedal shaft	Lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○
11.*	Sidestand pivot	Check operation and lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○
12.*	Front fork	Check operation and leakage.	–		○	○	○	○
13.*	Steering bearings	Check bearings assembly for looseness. Moderately repack every 24,000 km (15,200 mi)	Medium weight wheel bearing grease.		○	○	○	○
14.*	Wheel bearings	Check bearings for smooth rotation.	–		○	○	○	○
15.*	Sidestand switch	Check and clean or replace if necessary.	–	○	○	○	○	○

*1) If ambient temperature does not go below 5°C/40°F.
*2) If ambient temperature does not go above 15°C/60°F.
* It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.



NOTE:

For farther odometer reading, repeat the above maintenance at the period established; **1: Every 5,000 km (3,100 mi) and **2: Every 10,000 km (6,200 mi) intervals.

PERIODIC MAINTENACE/LUBRICATION INTERVALS (For CDN)

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.	○	○	○
Spark plug	Check condition. Clean or replace of necessary.	○	○	○
Air filter	Clean. Replace if ncessary.		○	○
Carburetor*	Check idle speed/starter operation. Adjust if necessary.	○	○	○
Fuel line*	Check fuel hose for cracks or damage. Replace if necessary.		○	○
Engine oil	Replace (Warm engine before draining).	○	○	○
Engine oil filter	Clean.	○	○	○
Engine oil strainer	Clean.	○	○	○
Front Brake*	Check operation/fluid leakage/See NOTE. Correct if necessary.		○	○
Rear Brake	Check operation. Adjust if necessary.		○	○
Clutch	Check operation. Adjust if necessary.		○	○
Rear arm pivot*	Check rear arm assembly for looseness. Tighten if necessary. Moderately repack.***	○	○	○
Rear suspension link pivot*	Check operation. Moderately repack.***	○	○	○
Wheels*	Check balance, damage, runout and spoke tightness. Repair if necessary.		○	○
Wheel bearings*	Check bearing assembly for looseness/damage. Replace if damaged.		○	○
Steering bearings*	Check bearing assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.**	○		○
Front fork*	Check operation/oil leakage. Repair if necessary.		○	○
Rear shock absorber*	Check operation/oil leakage. Repair if necessary.		○	○
Drive chain	Check chain slack/alignment. Adjust if necessary. Clean and lube.	EVERY 500 (300)		
Fittings/Fasteners*	Check all chassis fitting and fasterners. Correct if necessary.	○	○	○
Sidestand*	Check operation. Repair if necessary.	○	○	○
Sidestand switch*	Check operation. Clean or replace if necessary.	○	○	○

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



NOTE:

Brake fluid replacement:

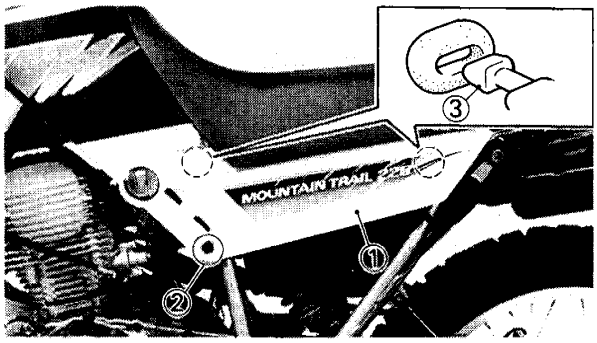
1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. Replace the brake hoses every four years, or if cracked or damaged.

SEAT, FUEL TANK AND COVER

REMOVAL

⚠ WARNING

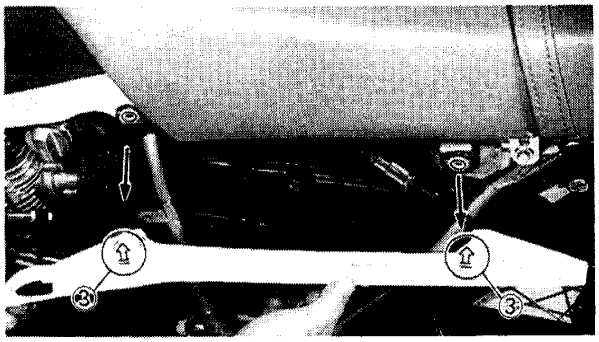
Securely support the motorcycle so there is no danger of it falling over.

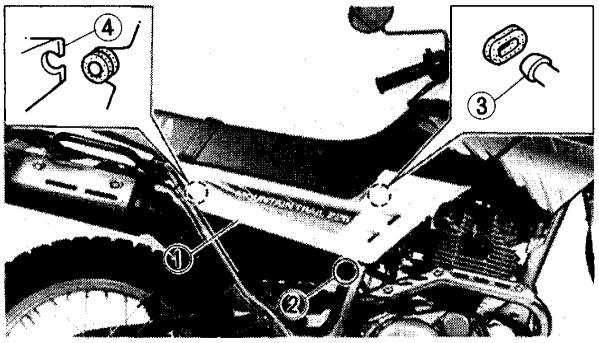


1. Remove:
   - Side cover (left) ①

NOTE:

When removing the side cover (left), remove the bolt (with claw washer) ②. Then pull the front and rear portion of the side cover outward to remove the projection ③ from the grommet.

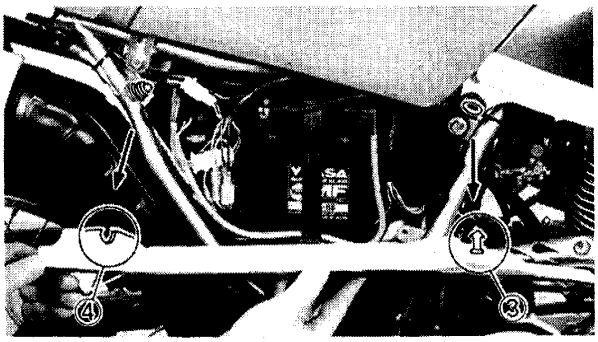


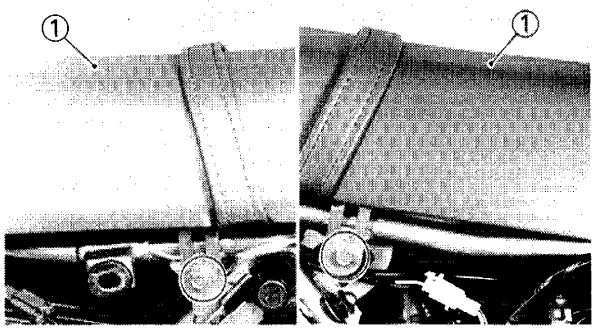


2. Remove:
   - Side cover (right) ①

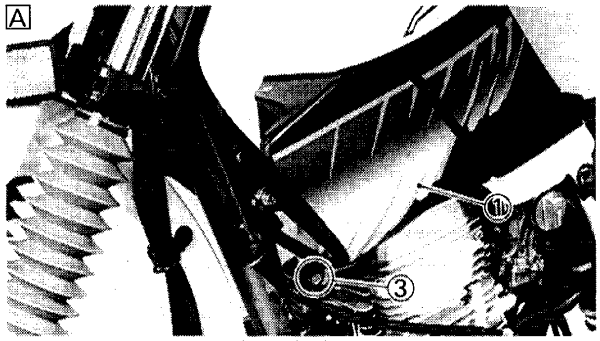
NOTE:

When removing the side cover (right), remove the bolt ②. Then pull the front portion of the side cover outward to remove the projection ③ from the grommet. Then pull the rear portion of the side cover outward to remove the receptacle ④ from the lobe.





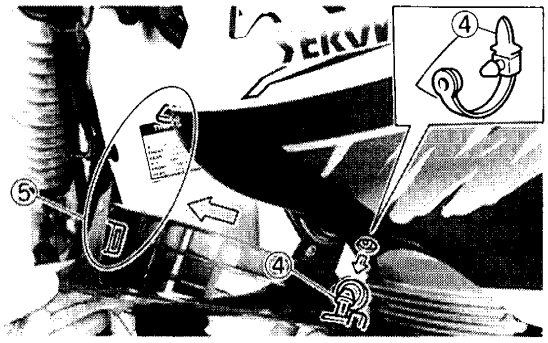
3. Remove:
   • Seat ①



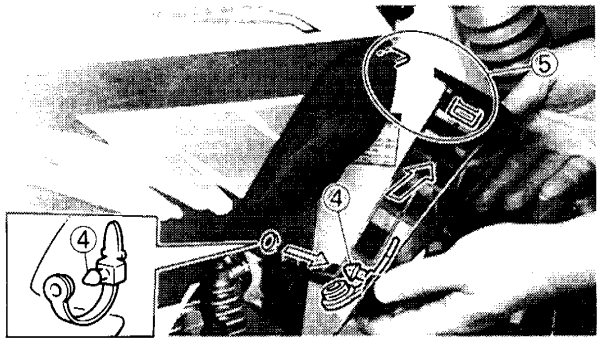
4. Remove:
   • Air scoop (left) ①
   • Air scoop (right) ②

NOTE:

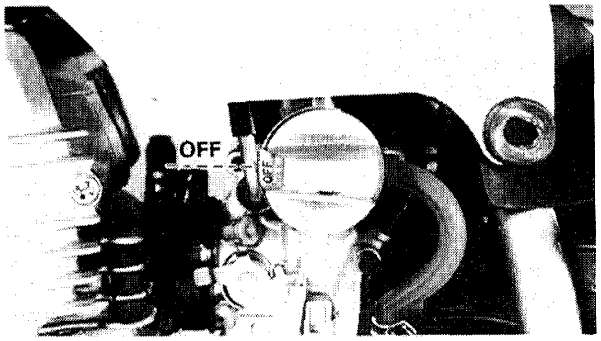
When removing the air scoop (left), remove the bolt ③. The bolt ③ is linked with the right air scoop stay, so take care not to drop the fixing part and nut of the right air scoop stay when loosening. Then pull the rear portion of the air-scoops outward to remove the projection ④ from the grommet. Then pull the rear portion ⑤ of the air scoop forward to remove the air scoop from the fuel tank.



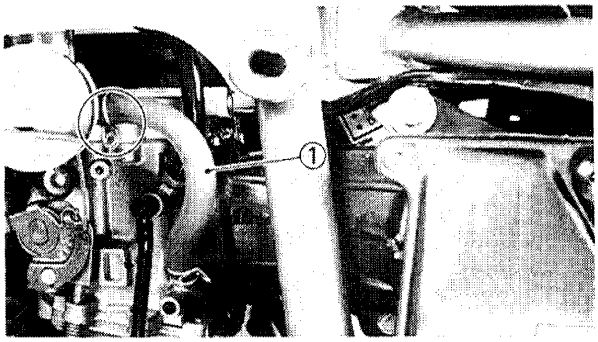




A Air scoop (left)
B Air scoop (right)



5. Turn the fuel cock to "OFF"



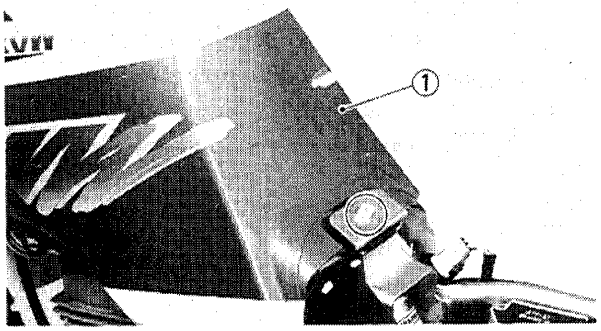
6. Disconnect:
   - Fuel hose ①

NOTE:

Place a rug on the engine to absorb a spilt fuel.

⚠ WARNING

Gasoline is highly flammable.
Avoid spilling fuel on the hot engine.



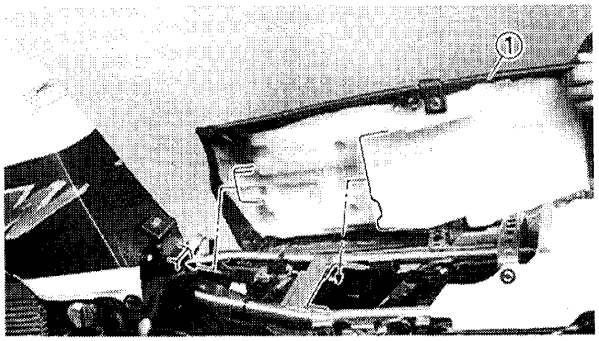
7. Remove:
   - Fuel tank ①
8. Disconnect:
   - Roll over valve hose (for California only)

INSTALLATION

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

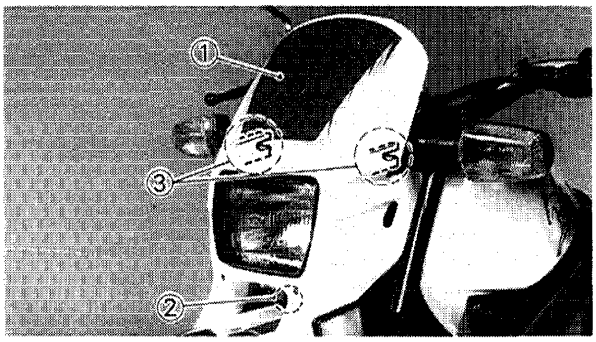
1. Install:
   - Fuel tank
   - Air scoops

Bolts (fuel tank):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Bolts (air scoop):
7 Nm (0.7 m•kg, 5.1 ft•lb)



2. Install:
   - Seat ①
   - Side covers

Bolt (seat):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Bolt (side cover):
7 Nm (0.7 m•kg, 5.1 ft•lb)



COWLING

REMOVAL

1. Remove:
   • Cowling ①

NOTE:

When removing the cowling ①, remove the bolt ②. Then pull the projections ③ from the grommets.

INSTALLATION

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

1. Install:
   • Cowling

	Bolts (cowling): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

INSP ADJ

ENGINE

VALVE CLEARANCE ADJUSTMENT

NOTE:

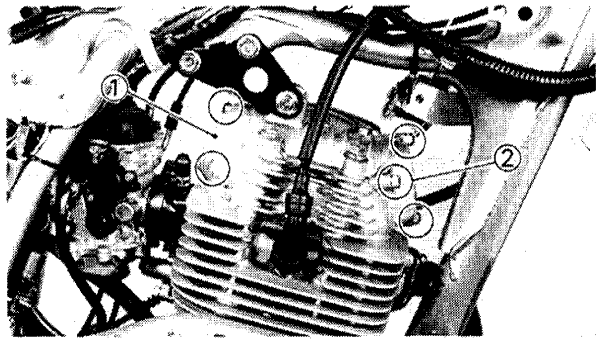
- The valve clearance must be adjusted when the engine is cool to the touch.
- Adjust the valve clearance when the piston is at the Top Dead Center (T.D.C.) on compression stroke.

⚠ WARNING

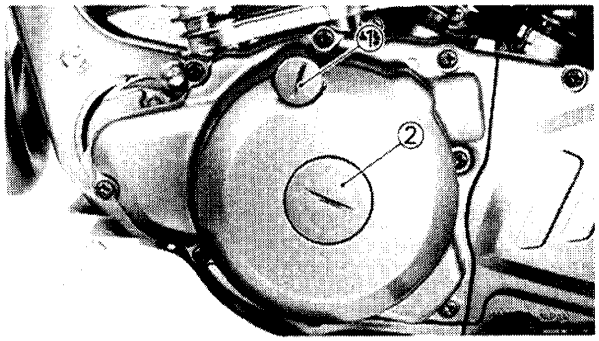
Securely support the motorcycle so there is no danger of it falling over.

1. Remove:
   - Side covers
   - Seat
   - Air scoops
   - Fuel tank

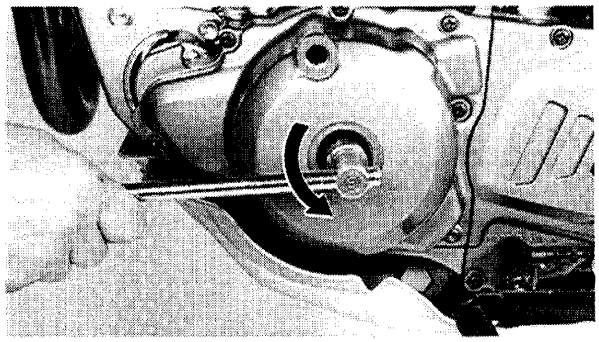
   Refer to the "SEAT, FUEL TANK AND COVER" section.



2. Remove:
   - Tappet cover ① (intake)
   - Tappet cover ② (exhaust)



3. Remove:
   - Plug ① (with O-ring)
   - Plug ② (with O-ring)



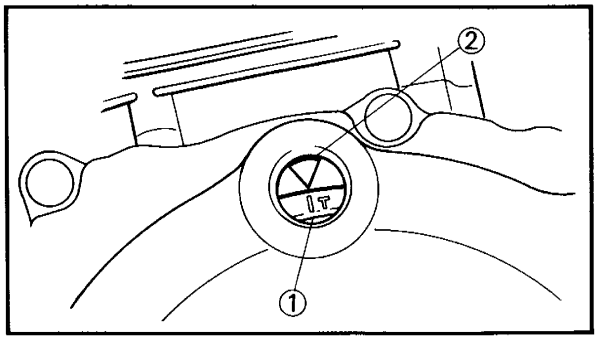
4. Align:
   - "T" mark on the rotor

   With the stationary pointer on the crankcase cover.

****

T.D.C. alignment steps:

- Turn the crankshaft counterclockwise with a wrench.



● Align the "T" mark ① on the rotor with stationary pointer ② on the crankcase cover. When the "T" mark is aligned with the stationary pointer, the piston is at Top Dead Center (T.D.C.).

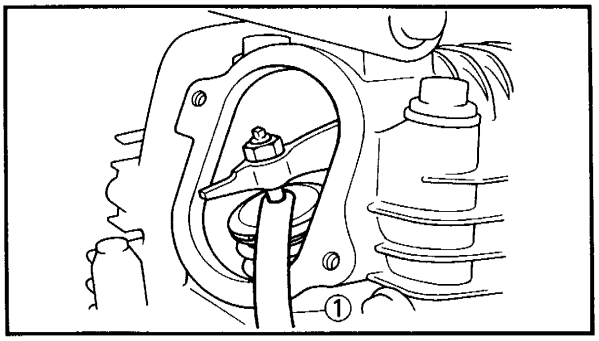
NOTE:

T.D.C. on compression stroke check:
- Both rocker arms must have a valve clearance when the rotor match mark ① is aligned with the stationary pointer match mark ②.
- If not, give the crankshaft one counterclockwise turn to meet above condition.

****

4. Check:
   - Valve clearance

   Measure the valve clearance by using a feeler gauge ①.
   Out of specification→Adjust.



Valve clearance (cold):
Intake:
0.05 ~ 0.09 mm (0.002 ~ 0.004 in)
Exhaust:
0.15 ~ 0.19 mm (0.006 ~ 0.007 in)

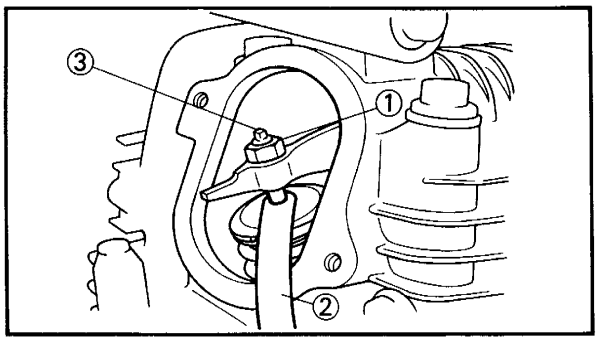
5. Adjust:
   - Valve clearance

****

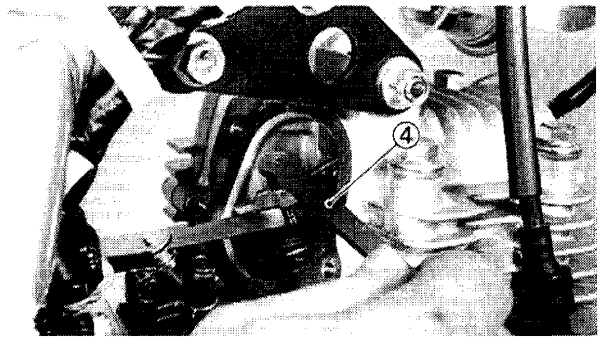
Adjustment steps:

● Loosen the locknut ①.

● Insert a Feeler Gauge ② between the adjuster end and the valve end.



● Turn the adjuster ③ clockwise or counterclockwise with the valve adjusting tool ④ until proper clearance is obtained.



Valve adjusting tool:
P/N. YM-08035
P/N. 90890-01311

● Hold the adjuster to prevent it from moving and thoroughly tighten the locknut.

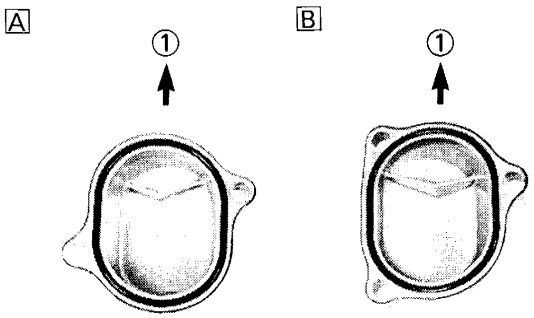
	Locknut: **13.5 Nm (1.35 m•kg, 10 ft•lb)**

- Measure the valve clearance.
- If the clearance is incorrect, repeat above steps until the proper clearance is obtained.

****

6. Install:
   Reverse the removal procedure.
   - Plugs
   - Tappet cover (intake)
   - Tappet cover (exhaust)

	Bolts (tappet cover): **10 Nm (1.0 m•kg, 7.2 ft•lb)**



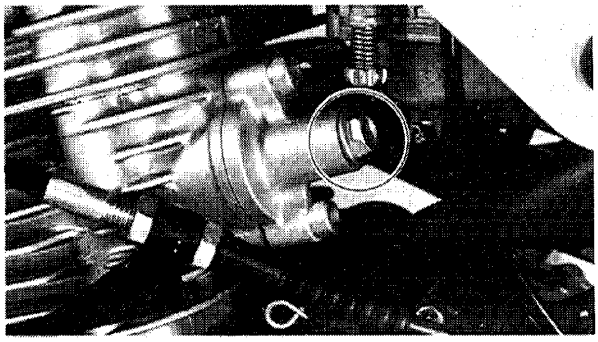
NOTE:
Install the tappet covers with its ridge facing up ward ①.

A Intake
B Exhaust

7. Install:
   - Fuel tank
   - Air scoops
   - Seat
   - Side covers

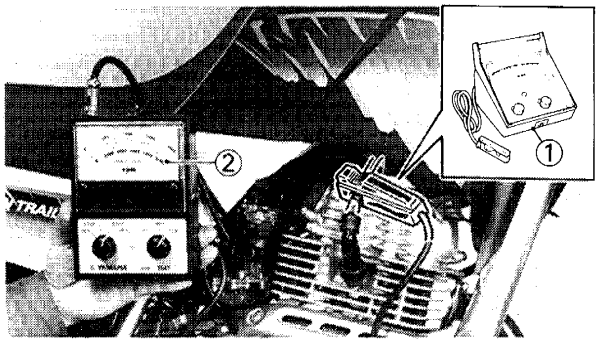
   Refer to the "SEAT, FUEL TANK AND COVER" section.

	Bolts (fuel tank, air scoop, seat and side cover): **7 Nm (0.7 m•kg, 5.1 ft•lb)**



TIMING CHAIN ADJUSTMENT

Adjustment free.



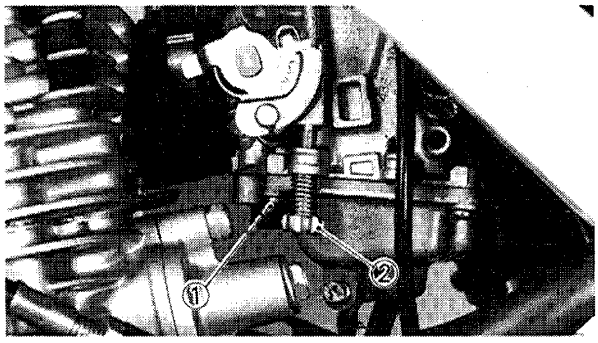
IDLING SPEED ADJUSTMENT

1. Start the engine and let it warm up for several minutes.
2. Attach:
   - Inductive tachometer
     to the spark plug lead.

	Inductive tachometer **P/N. YU-08036-A – ①** **P/N. 90890-03113 – ②**

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

	Engine idling speed: **1,300 ~ 1,500 r/min**



4. Adjust:
   - Engine idling speed

****

Adjustment steps:

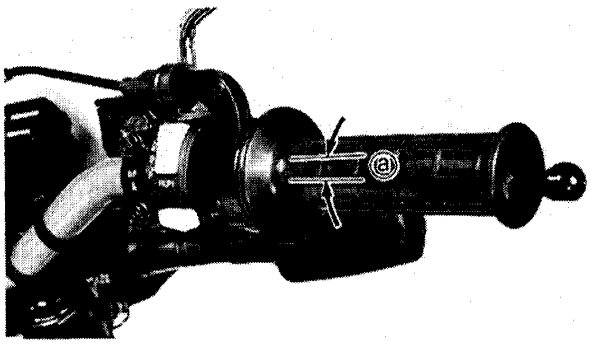
- Turn in the pilot screw ① until it is lightly seated.
- Turn out the pilot screw for the specified number of turns.

Pilot screw (For CDN): **2 turns out** **(For US, California)** **Unadjustable from regulations.**

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

Turn in → Idling speed becomes higher.
Turn out → Idling speed becomes lower.

****



5. Remove:
   • Inductive tachometer

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

Free play:
3 ~ 5 mm (0.12 ~ 0.20 in)

THROTTLE CABLE FREE PLAY ADJUSTMENT

NOTE:

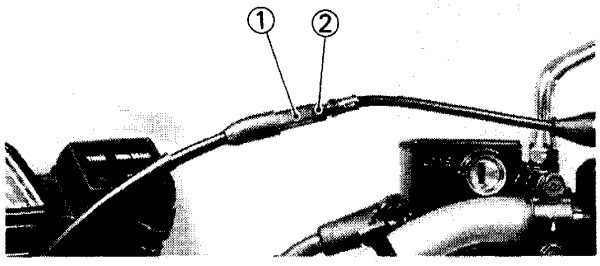
Before adjusting the throttle cable free play, the engine idle speed should be adjusted.

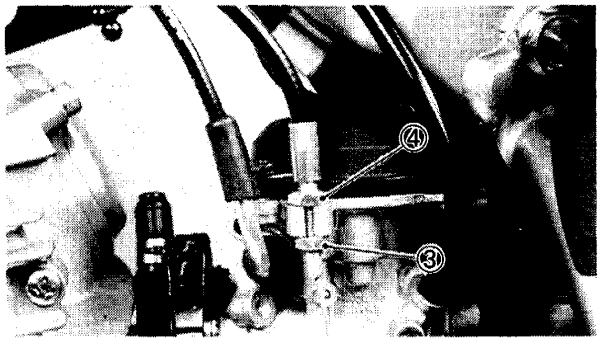
1. Check:
   • Throttle cable free play ⓐ
   Out of specification → Adjust.

Throttle cable free play:
3 ~ 5 mm (0.12 ~ 0.20 in)

2. Remove:
   • Side covers
   • Seat
   • Air scoops
   • Fuel tank
   Refer to the "SEAT, FUEL TANK AND COVER" section.

3. Adjust:
   • Throttle cable free play





****

Adjustment steps:

First step:

- Make sure that the adjuster ① and locknut ② are fully tightened.
- Loosen the locknut ③ on the carburetor side.
- Turn the adjuster nut ④ in or out until the correct free play is obtained.

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

- Tighten the locknut ③.

NOTE:

If the free play is incorrect, adjust the throuttle cable free play with the adjuster (above the handlebar).

Second step:

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

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

- Tighten the locknut ②.

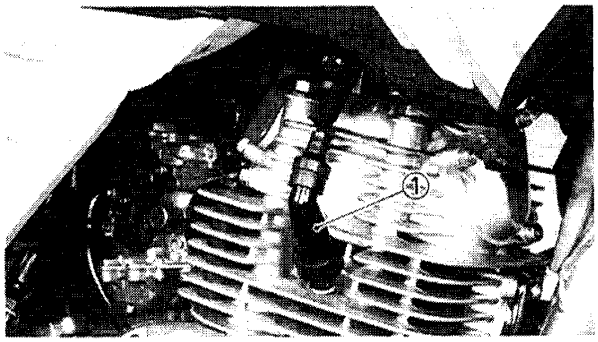
⚠ WARNING

After adjusting the free play, turn the handlebar to right and left, and make sure that the engine idling does not run faster.

- Install the fuel tank, seat and the side covers.

Bolts (fuel tank, air scoops, seat and side cover):
7 Nm (0.7 m•kg, 5.1 ft•lb)

****



SPARK PLUG INSPECTION

1. Disconnect:
   - Spark plug cap ①

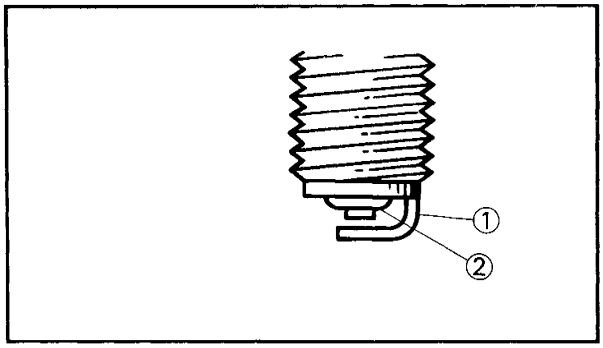
2. Remove:
   - Spark plug

CAUTION:

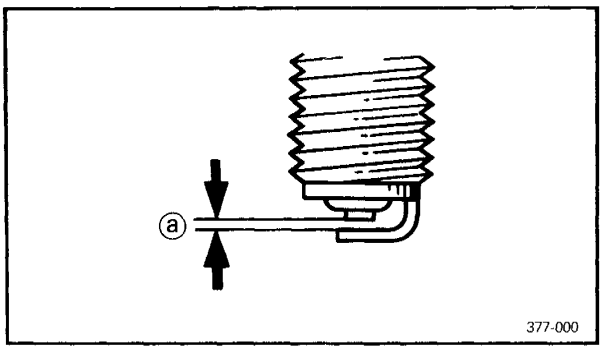
When removing the spark plug, use caution to prevent an object from falling into the engine.

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

Standard spark plug:
DR8EA (N.G.K.),
X24ESR-U (NIPPONDENSO)



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



5. Clean the spark plug with a spark plug cleaner or wire brush.
6. Measure:
   - Plug gap ⓐ
     Use a wire gauge or feeler gauge.
     Out of specification→Regap.

Spark plug gap:
0.6~0.7 mm (0.02~0.03 in)

7. Tighten:
   • Spark plug



Spark plug:
17.5 Nm (1.75 m•kg, 12.5 ft•lb)

NOTE:

- Before installing a spark plug, clean the gasket surface and plug surface.
- If a torque wrench is not available when you are installing a spark plug, a good estimate of the correct torque is 1/4 to 1/2 turns part finger tight. Have the spark plug torque to the correct value as soon as possible with a torque wrench.

8. Connect:
   • Spark plug cap

IGNITION TIMING CHECK

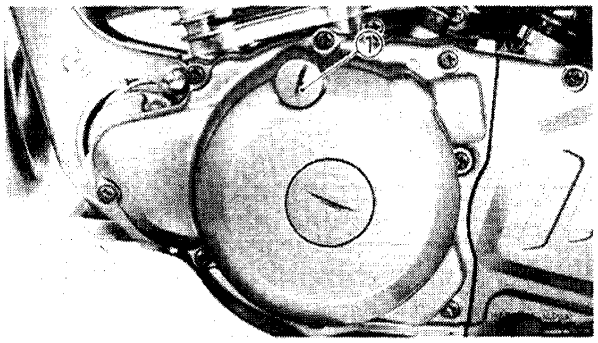
NOTE:

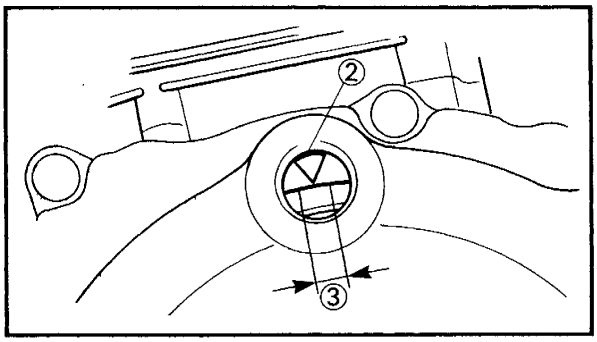
Engine idling speed and throttle cable free play should be adjusted properly before checking the ignition timing.

1. Start the engine and let it warm up for several minutes, then stop the engine.
2. Attach:
   • Inductive tachometer
   • Timing light
   to spark plug lead.



Inductive tachometer:
P/N. YU-08036-A
P/N. 90890-03113
Timing light:
P/N. YM-33277-A
P/N. 90890-03141





3. Check:
   • Ignition timing

****

Checking steps:

- Remove the plug ①.
- Start the engine and let it run at the specified speed.

	Engine speed: **1,400 r/min**

CAUTION:

Under extreme conditions, the oil may spurt out when running the engine. Therefore care should be used when running.

- Visually check the stationary pointer ② to verify it is within the required firing range ③ indicated on the flywheel.
  Incorrect firing range → Check pulser coil assembly.

NOTE:

Ignition timing is not adjustable.

****

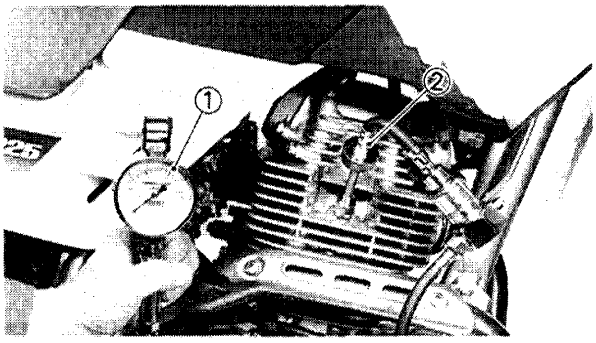
4. Install:
   • Plug
5. Detach:
   • Timing light
   • Inductive tachometer

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. Disconnect:
   • Spark plug cap

5. Remove:
   • Spark plug
   Refer to the "SPARK PLUG INSPECTION" section.

6. Attach:
   • Compression gauge ①
   • Adapter ②

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

7. Check:
   • Compression pressure

****

Checking steps:

- Crank over the engine with the electric starter (be sure the battery is fully charged) with the throttle wide-open until the compression reading on the gauge stabilizes.

⚠ WARNING

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

- Check reading with specified levels (see chart).

INSP ADJ

Compression pressure (at sea level):
Standard:
1,200 kPa (12 kg/cm^2, 171 psi)
Minimum:
960 kPa (9,6 kg/cm^2, 128 psi)
Maximum:
1,300 kPa (13 kg/cm^2, 185 psi)

- If pressure falls below the minimum level:
  1) Squirt a few drops of oil into the affected cylinder.
  2) Measure the compression again.

Compression pressure (with oil introduced 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.**
Above maximum level	**Inspect cylinder head, valve surfaces, or piston crown for carbon deposits.**

****

8. Install:
   - Spark plug



Spark plug:
17.5 Nm (1.75 m•kg, 12.5 ft•lb)

Refer to the "SPARK PLUG INSPECTION" section.

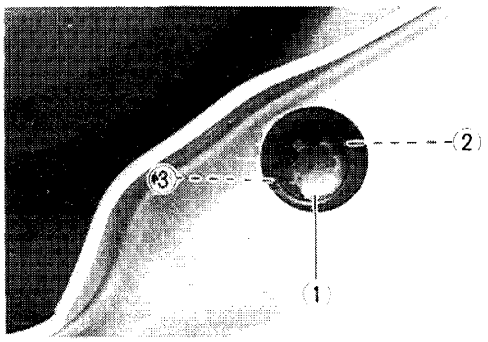
9. Connect:
   - Spark plug cap

ENGINE OIL LEVEL INSPECTION

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.**

1. Place the motorcycle on a level place.
2. Warm up the engine for several minutes.



3. Stop the engine and visually check the oil level throught the level window ①.

NOTE:

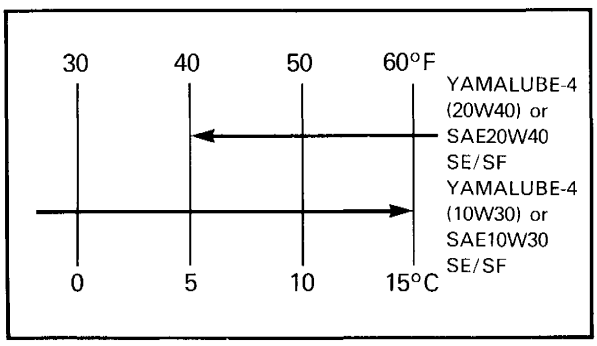
Position motorcycle straight up when checking oil level, a slight tilt to the side can produce false readings.

4. Inspect:
   - Oil level

   Oil level should be between maximum ② and minimum ③ marks.
   Low oil level→Add oil to proper level.

NOTE:

Wait a few minutes until level settles before inspecting.



Recommended engine oil:
At 5°C (40°F) or higher:
YAMALUBE-4 (20W40) or SAE 20W40 type SE/F motor oil
At 15°C (60°F) or lower:
YAMALUBE-4 (10W30) or SAE 10W30 type SE/F motor oil

5. Install:
   • Oil filler cap
6. Start the engine and warm up for several minutes.

CAUTION:

When the oil tank is empty, never start the engine.

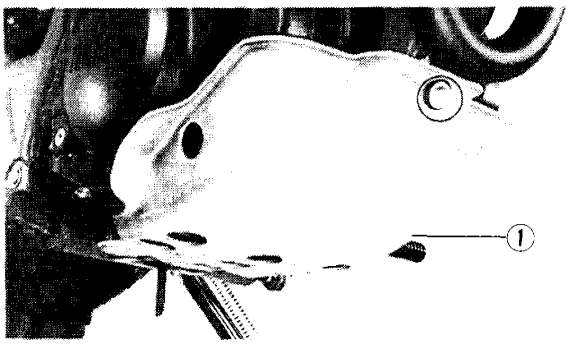
7. Stop the engine and inspect the oil level once again.

Oil quantity:
Periodic oil change
1.0 L (0.88 Imp qt, 1.06 US qt)
With oil filter replacement
1.1 L (0.97 Imp qt, 1.16 US qt)
Total amount
1.3 L (1.14 Imp qt, 1.37 US qt)

ENGINE OIL REPLACEMENT

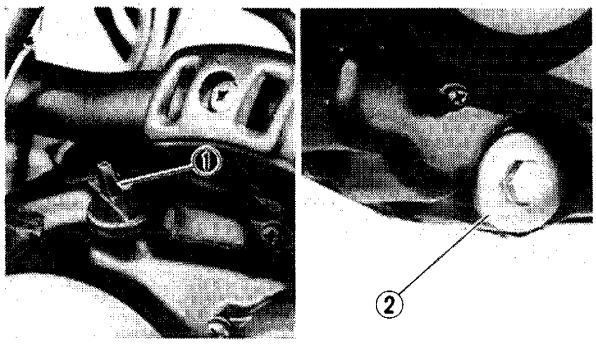
CAUTION:

- **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.**



Engine oil replacement (without oil filter)

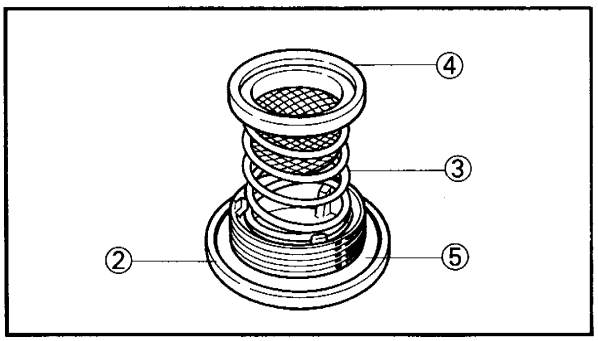
1. Place the motorcycle on a level place.
2. Remove:
   • Engine guard ①
3. Warm up the engine for several minutes, then stop the engine. Then place a receptacle under the drain plug.



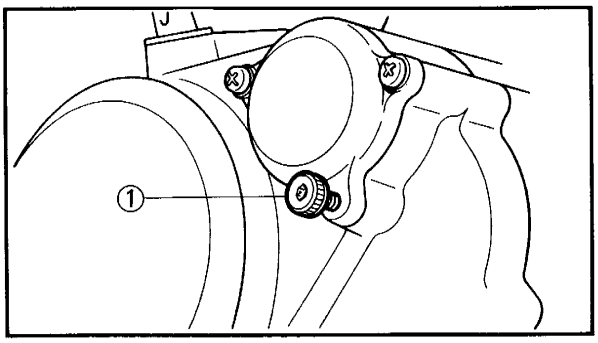
4. Remove:
   - Oil filler cap ①
   - Drain plug ②

NOTE:

When removing the drain plug ②, the compression spring ③, oil strainer ④ and O-ring ⑤ will fall off. Take care not to lose these party.



5. Drain:
   - Engine oil



6. Remove:
   - Bolt ① (oil filter cover-lower)

NOTE:

The oil filter cover is secured by three screws. The lower one should be removed so that the filter cavity will drain.

7. Inspect:
   - O-ring (drain plug)
     Damage→Replace.

8. Clean:
   - Oil strainer
     Clean it with solvent.
     Clog/Damage→Replace.

9. Install:
   - Bolt (oil filter cover-lower)
   - Drain plug

CAUTION:

Before reinstalling the drain plug, do not forget to fit the O-ring, compression spring and oil strainer.

Bolt (oil filter cover-lower):
10 Nm (1.0 m•kg, 7.2 ft•lb)
Drain plug (crankcase):
43 Nm (4.3 m•kg, 31 ft•lb)

10. Fill:
    - Crankcase

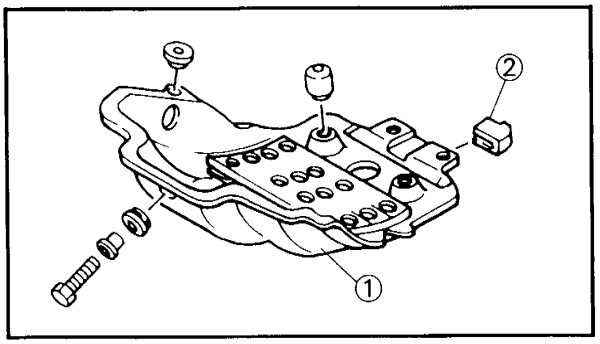
Periodic oil change:
1.0 L (0.88 Imp qt, 1.06 US qt)
Recommended engine oil:
At 5°C (40°F) or higher:
YAMALUBE-4 (20W40) or
SAE 20W40 type SE/F motor oil
At 15°C (60°F) or lower
YAMALUBE-4 (10W30) or
SAE 10W30 type SE/F motor oil

CAUTION:

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

11. Install:
    - Oil filler cap

12. Inspect:
    - Oil level
      Refer to the "ENGINE OIL LEVEL INSPECTION" section.
    - Oil pressure
      Refer to the "OIL PRESSURE INSPECTION" section.
    - Oil leaks



13. Install:
    - Engine guard ①

Bolt (engine guard):
7 Nm (0.7 m•kg, 5.1 ft•lb)

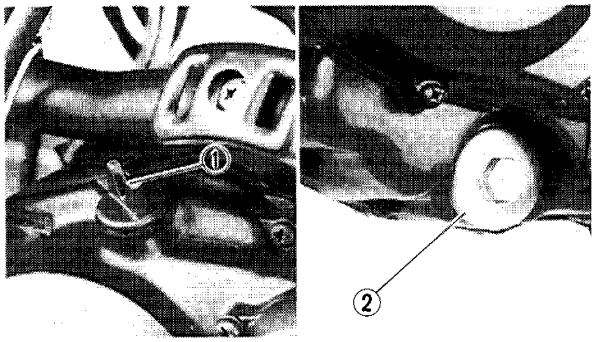
NOTE:

Before installing the engine guard, do not forget to install the rubber dampers ②.

Engine oil replacement (with oil filter)

1. Place the motorcycle on a level place.
2. Remove:
   - Engine guard

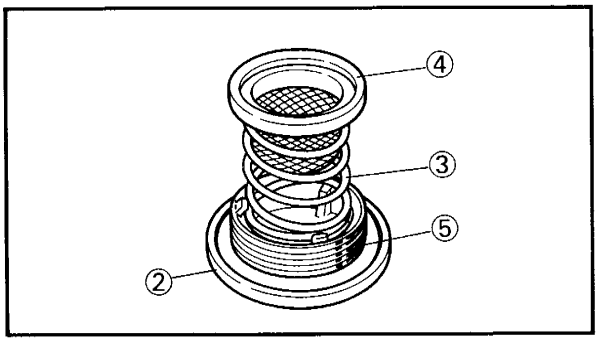
   Refer to the "ENGINE OIL REPLACEMENT (without oil filter)" section.
3. Warm up the engine for several minutes, then stop the engine. Then place a receptacle under the drain plug.



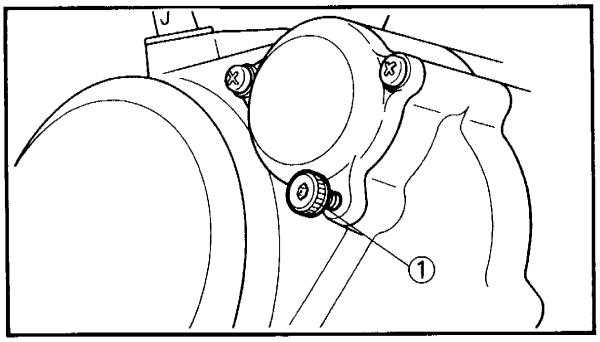
4. Remove:
   - Oil filler cap
   - Drain plug ① (oil tank)

NOTE:

When removing the drain plug ②, the compression spring ③, oil strainer ④ and O-ring ⑤ will fall off. Take care not to lose these parts.



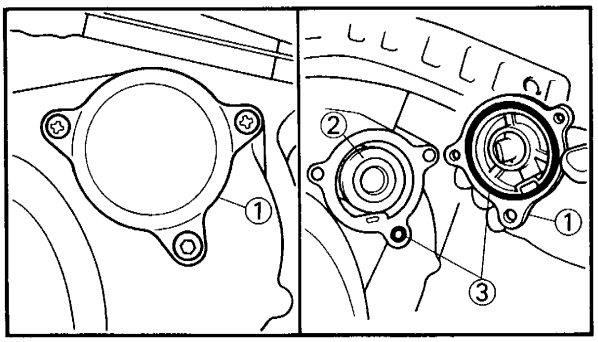
5. Drain:
   - Engine oil



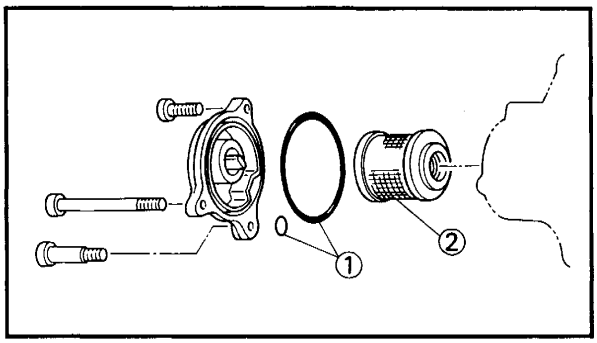
6. Remove:
   - Bolt ① (oil filter cover-lower)

NOTE:

The oil filter cover is secured by three screws. The lower one should be removed so that the filter cavity will drain.

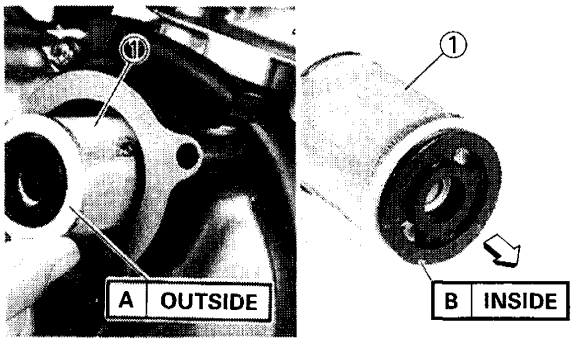


7. Remove:
   - Oil filter cover ①
   - Oil filter ②
   - O-ring ③



8. Inspect:
   • O-ring ①
   Damage → Replace.

9. Clean:
   • Oil filter ②
   Clean it with solvent
   Clog/Damage → Replace.



10. Install:
    • Oil filter ①

CAUTION:

Install the oil filter as shown.

    • Oil filter cover
    • Drain plug (crankcase)

CAUTION:

Before reinstalling the drain plug, do not forget to fit the O-ring, compression spring and oil strainer.

Bolt (oil filter cover-lower):
10 Nm (1.0 m•kg, 7.2 ft•lb)
Bolt (oil filter cover-both side):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Drain plug (crankcase):
43 Nm (4.3 m•kg, 31 ft•lb)

11. Fill:
    • Crankcase

With oil filter replacement:
1.1 L (0.97 Imp qt, 1.16 US qt)
Recommended engine oil:
At 5°C (40°F) or higher:
YAMALUBE-4 (20W40) or
SAE 20W40 type SE/F motor oil
At 15°C (60°F) or lower:
YAMALUBE-4 (10W30) or
SAE 10W30 type SE/F motor oil

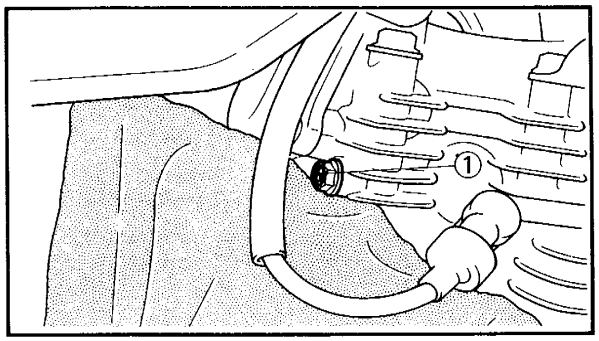
CAUTION:

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

12. Install:
    • Oil filler cap

13. Inspect:
    • Oil level
      Refer to the "ENGINE OIL LEVEL INSPECTION" section.
    • Oil pressure
      Refer to the "OIL PRESSURE INSPECTION" section.
    • Oil leaks
14. Install:
    • Engine guard

	Bolt (engine guard): 7 Nm (0.7 m•kg, 5.1 ft•lb)



OIL PRESSURE INSPECTION

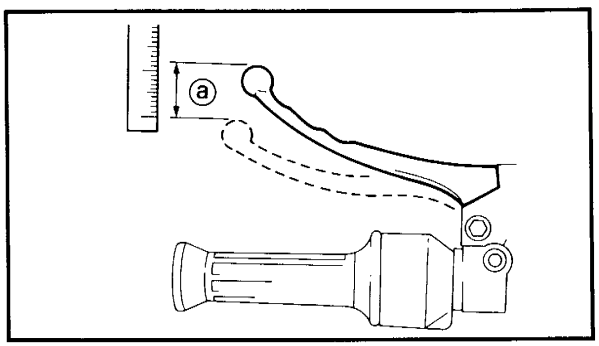
1. Remove:
   • Oil check bolt ①
2. Start the engine and keep it idling for several minutes.
3. Inspect:
   • Oil condition of the bleed hole
     Oil flows out→Oil pressure is good.
     No oil comes out→Oil pressure is bad.

CAUTION:

If no oil comes out after a lapse of one minute, turn off the engine immediately so it will not seize.

4. Tighten:
   • Oil check bolt

	Oil check bolt: 7 Nm (0.7 m•kg, 5.1 ft•lb)

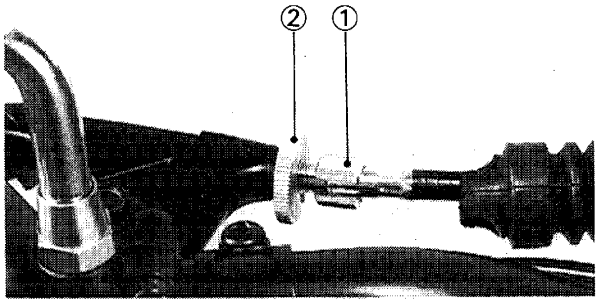


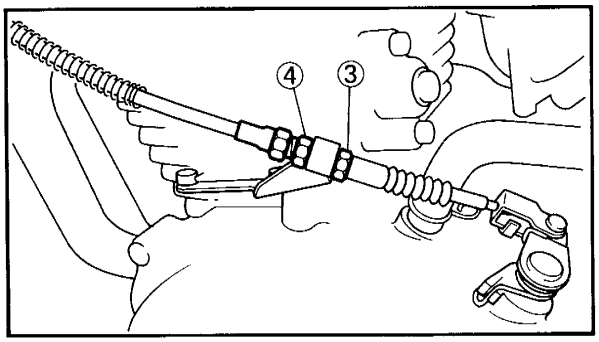
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CLUTCH ADJUSTMENT

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

	Free play: 10 ~ 15 mm (0.4 ~ 0.6 in) at clutch lever end





2. Adjust:
   • Clutch cable free play

****

Adjustment steps:

First step:

- Make sure that the adjuster ① and locknut ② are fully tighened.
- Loosen the locknut ③.
- Turn the adjust nut ④ 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 ③.

NOTE:

If the free play is incorrect, adjust the clutch cable free play with the adjuster (part of clutch lever holder).

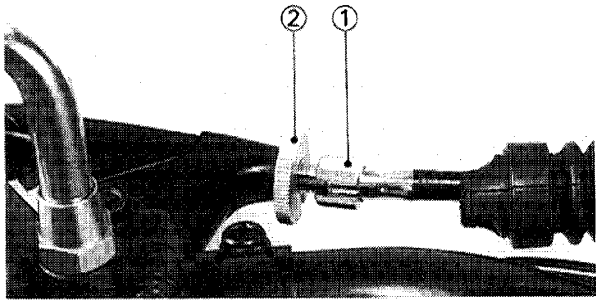
Second step:

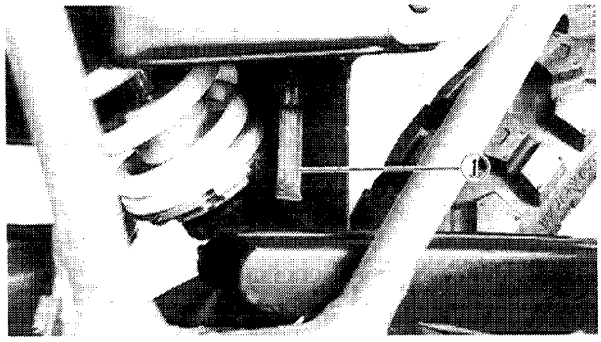
- Loosen the locknut ②.
- Turn the adjuster ① in or out until the correct free play is obtained.

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

- Tighten the locknut ②.

****

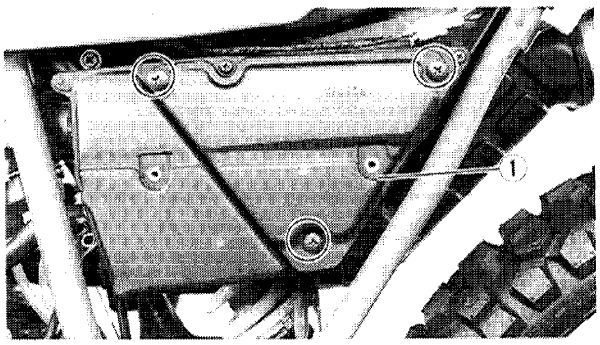




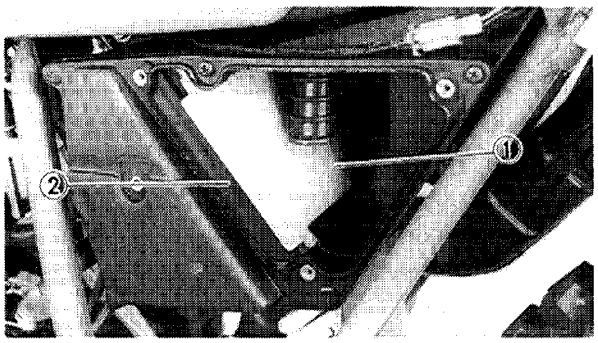
AIR FILTER CLEANING

NOTE:

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



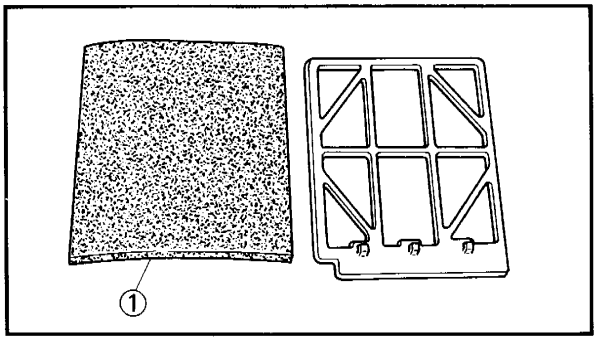
1. Remove:
   • Side cover (left)
   Refer to the "SEAT, FUEL TANK AND COVER" section.
   • Air filter case cover ①



2. Remove:
   - Air filter element ①
   - Element guide ②

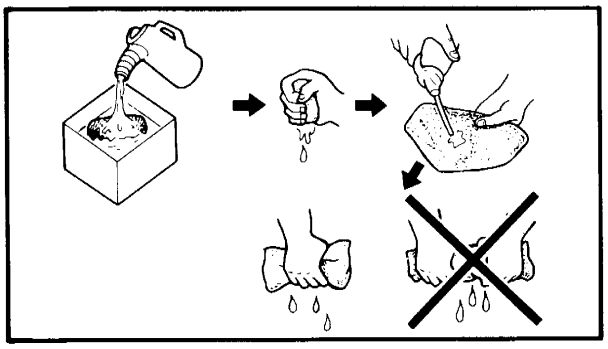
CAUTION:

Never operate the engine with the air filter element removed. This will allow unfiltered air to enter, causing rapid wear and possible engine damage. Additionally, operation without the filter element will affect carburetor tuning with subsequent poor performance and possible engine overheating.



3. Inspect:
   - Air filter element ①

   Damage→Replace.



4. Clean:
   - Air filter element

   Clean it with solvent.

NOTE:

After cleaning, remove the remaining solvent by squeezing the element.

CAUTION:

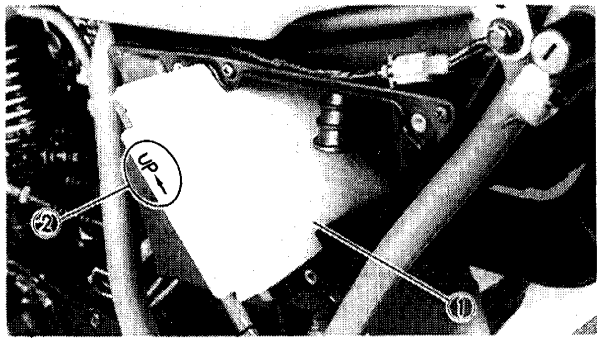
Do not twist the filter element when squeezing the filter element.

⚠ WARNING

Never use low flash point solvents such as gasoline to clean the air filter element. Such solvent may lead to a fire or explosion.

5. Apply recommened oil to the entire surface of the filter and squeeze out the excess oil. The element should be wet but not dripping.

Recommended oil:
Foam-air-filter oil or SAE 10W30 motor oil



6. Install:
   - Air filter element ①

NOTE:

- Install the air filter element with the "UP" mark ② facing upward.
- When installing the air filter element in its case, fit section into the slot of air filter case.

7. Install:
   - Air filter case cover
   - Side cover (left)

	Bolt (side cover): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

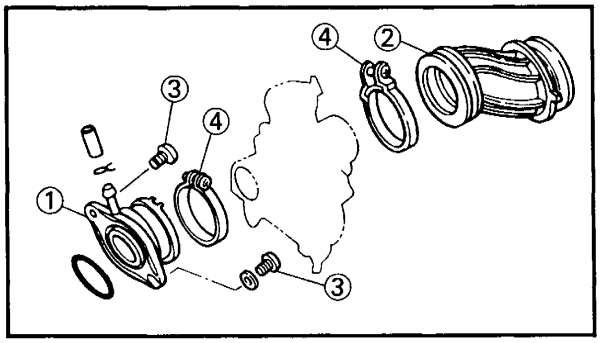
CARBURETOR JOINT INSPECTION

1. Remove:
   - Side covers
   - Seat

   Refer to the "SEAT, FUEL TANK AND COVER" section.

2. Inspect:
   - Carburetor joint ①, ②

   Crack/Damage→Replace.



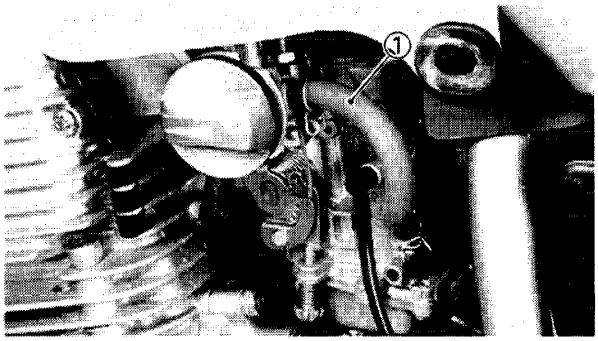
	Bolt ③ (carburetor joint): **12 Nm (1.2 m•kg, 8.7 ft•lb)** **Screw ④:** **2 Nm (0.2 m•kg, 1.4 ft•lb)**

3. Install:
   - Seat
   - Side cover

	Bolts (seat and side cover): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

FUEL LINE INSPECTION

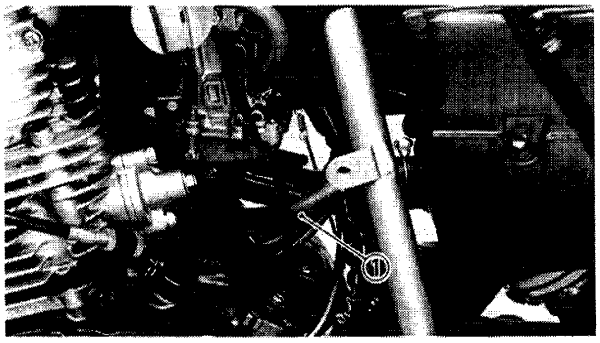
1. Remove:
   - Side cover (left)
     Refer to the "SEAT, FUEL TANK AND COVER" section.



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

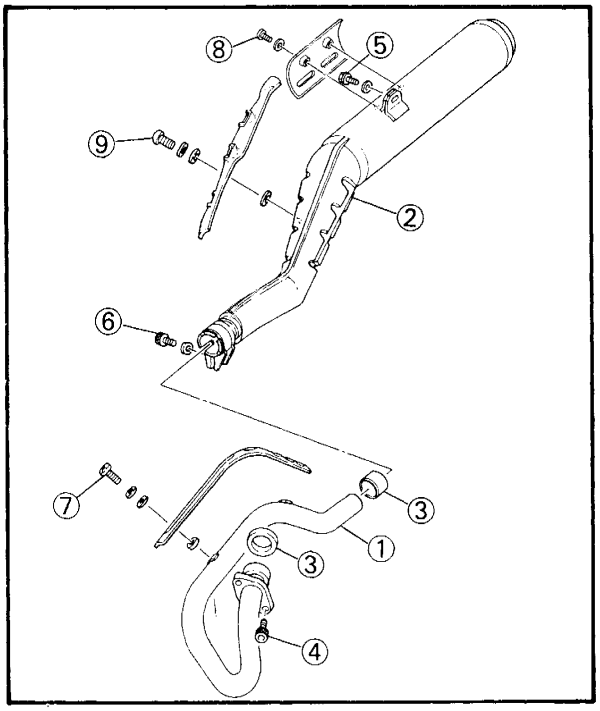
3. Install:
   - Side cover (left)

	Bolts (side cover): **7 Nm (0.7 m•kg, 5.1 ft•lb)**



CRANKCASE VENTILATION HOSE INSPECTION

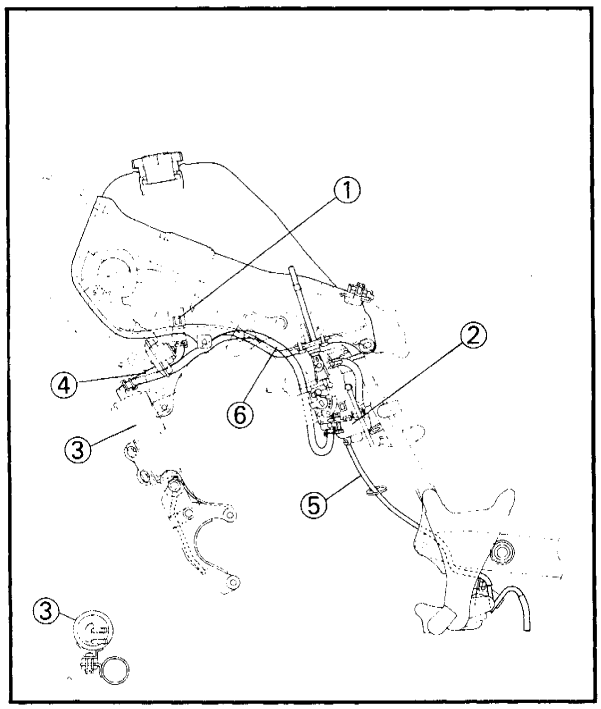
1. Inspect:
   - Crankcase ventilation hose ①
     Crack/Damage→Replace.



EXHAUST SYSTEM INSPECTION

1. Inspect:
   - Exhaust pipe ①
   - Muffler ②
     Crack/Damage→Replace.
   - Gasket ③
     Exhaust gas leaks→Replace.

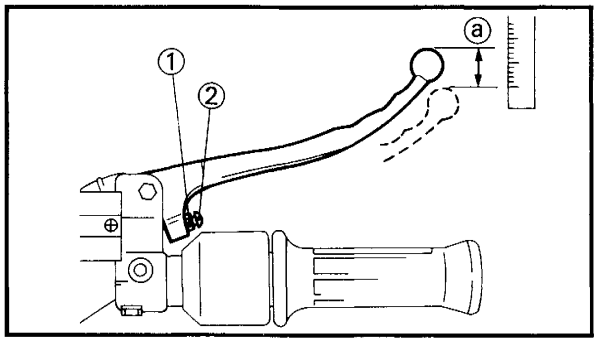
Bolt ④ (exhaust pipe and cylinder head):
10 Nm (1.0 m•kg, 7.2 ft•lb)
Bolt ⑤ (muffler and frame):
27 Nm (2.7 m•kg, 20 ft•lb)
Bolt ⑥ (exhaust pipe and muffler):
20 Nm (2.0 m•kg, 14 ft•lb)
Screw ⑦ (protector):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Use LOCTITE®
Screw ⑧ (protector):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Use LOCTITE® , 5.1 ft•lb)
Screw ⑨ (protector)
7 Nm (0.7 m•kg, 5.1 ft•lb)
Use LOCTITE®



CANISTER INSPECTION (CALIFORNIA ONLY)

1. Inspect:
   - Hose connection
     Poor condition→Correct.
   - Hoses
   - Canister
     Cracks/Damage→Replace.
     Clogs→Clean.

① Roll over valve
② Carburetor
③ Canister
④ Hose (to roll over valve)
⑤ Over flow hose
⑥ Hose (to carburetor)



CHASSIS

FRONT BRAKE ADJUSTMENT

1. Check:
   - Brake lever free play ⓐ
     Out of specification→Adjust.

	Free play: **2~5 mm (0.08~0.20 in)**

2. Adjust:
   - Brake lever free play

****

Adjustment steps:

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

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

- Tighten the locknut.

****

CAUTION:

Proper lever free play is essential to avoid excessive brake drag.

⚠ WARNING

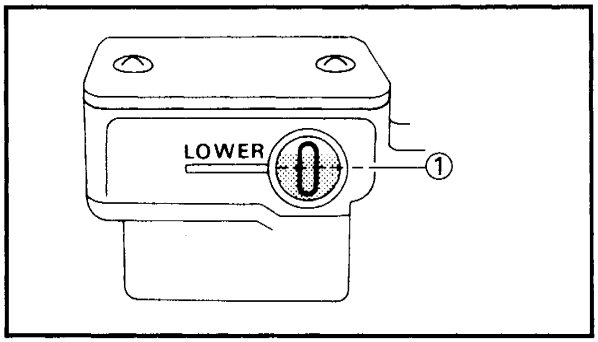
A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the motorcycle is operated. Air in the system will cause greatly diminished braking capability and can result in loss of control and an accident. Inspect and bleed the system if necessary.

FRONT BRAKE FLUID LEVEL INSPECTION

1. Place the motorcycle on a level place.

NOTE:

- Position the motorcycle straight up when inspecting the brake fluid level.
- When inspecting the front brake fluid level, make sure the master cylinder top is horizontal by turning the handlebars.



2. Inspect:
   - Brake fluid level
     Fluid level is under "LOWER" level line ①→Fill up.

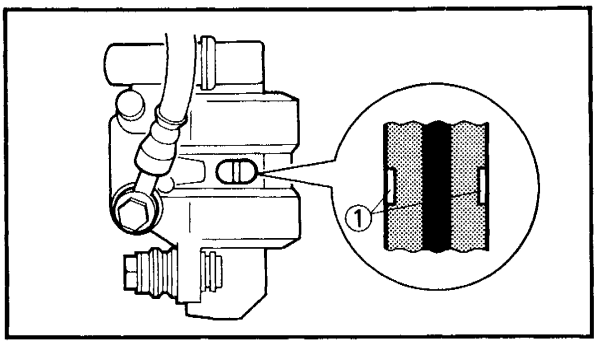
Recommended brake fluid:
Front: DOT No. 4 or DOT No. 3

CAUTION:

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

⚠ WARNING

- **Use only the 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 and may result in vapor lock.**



FRONT BRAKE PAD INSPECTION

1. Activate the brake lever or brake pedal.
2. Inspect:
   - Brake pad
     Wear indicator ① almost contacts brake disc→Replace brake pad as a set.

Wear limit:
Front: 0.8 mm (0.03 in)

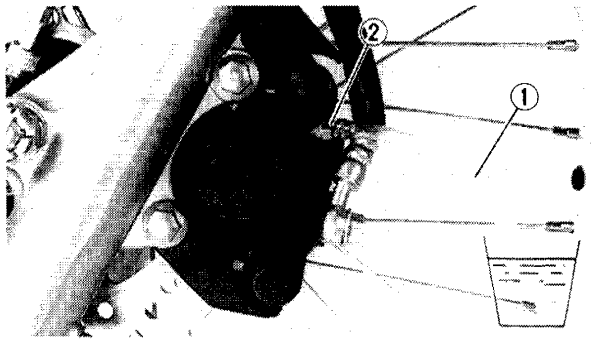
Refer to the "BRAKE PAD REPLACEMENT" section in the CHAPTER 6.

AIR BLEEDING (FRONT 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 dangerous loss of braking performance may occur if the brake system is not properly bled.



1. Bleed:
   - Brake system

****

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 ②.
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 all of the air bubbles have been removed from the system.

NOTE:

If the 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.

Recommended brake fluid:
Front: DOT No. 4 or DOT No. 3

⚠ WARNING

Check the operation of the brake after bleeding brake system.

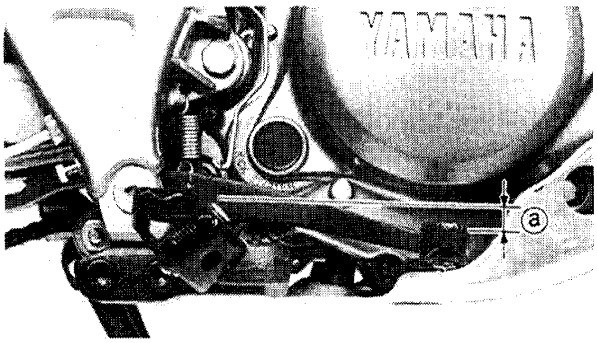
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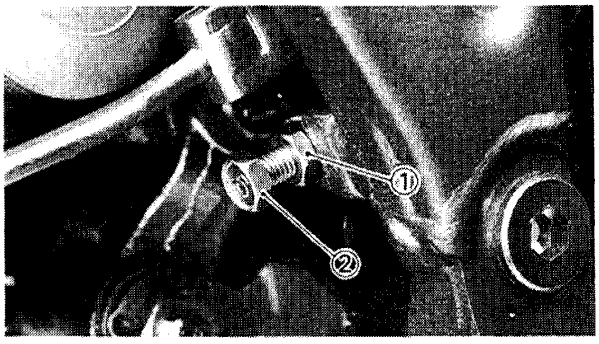
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REAR BRAKE ADJUSTMENT

⚠ WARNING

After adjusting the brake pedal height or free play, brake light switch should be adjusted.





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

Brake pedal height:
10 mm (0.4 in)
below top of footrest

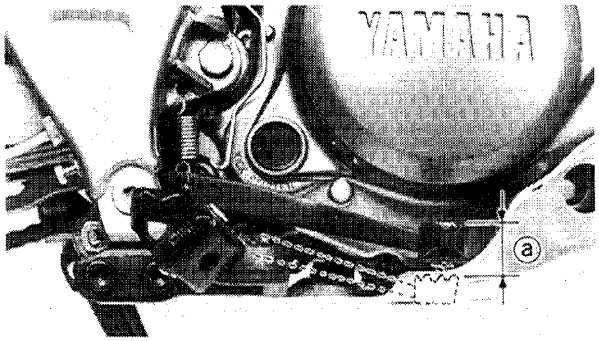
2. Adjust:
   • Brake pedal height

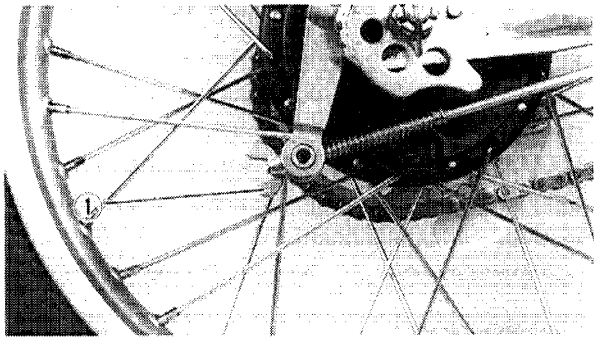
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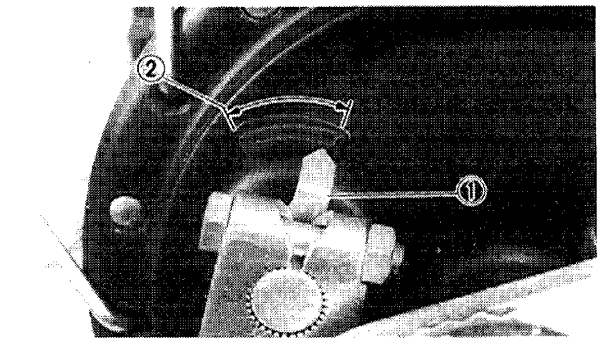
Adjustment steps:

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

Turning in→Pedal height is increased.
Turning out→Pedal height is decreased.







- Tighten the locknut.

	Locknut: 7 Nm (0.7 m•kg, 5.1 ft•lb)

⚠ WARNING

After adjusting the brake pedal height, adjust the brake pedal free play.

****

3. Check:
   - Brake pedal free play ⓐ
     Out of specification→Adjust.

	Brake pedal free play: 20 ~ 30 mm (0.8 ~ 1.2 in)

NOTE:

Before adjusting the brake pedal free play, the brake pedal height should be adjusted.

4. Adjust:
   - Brake pedal free play

****

Brake pedal free play adjustment steps:

- Turn the adjuster ① until free play is within the specified limits.

****

Refer to the "REAR BRAKE SHOE INSPECTION" section.

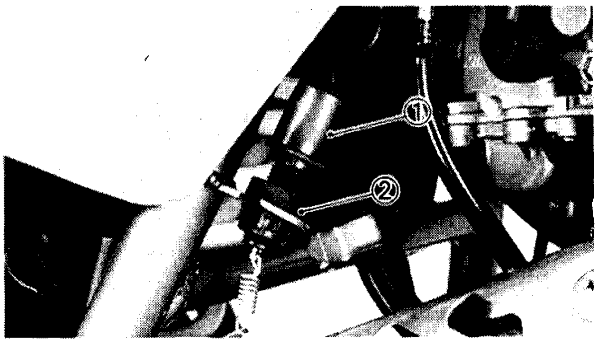
REAR BRAKE SHOE INSPECTION

1. Depress the rear brake pedal.
2. Inspect:
   - Pointer (wear indicator plate) ①
     Indicator at wear limit line ②→Replace rear brake shoes.
     Refer to the "REAR WHEEL" section in the CHAPTER 6.

REAR 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 switch body ① with your hand so that it does not rotate and turn the adjusting nut ②.

****

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.

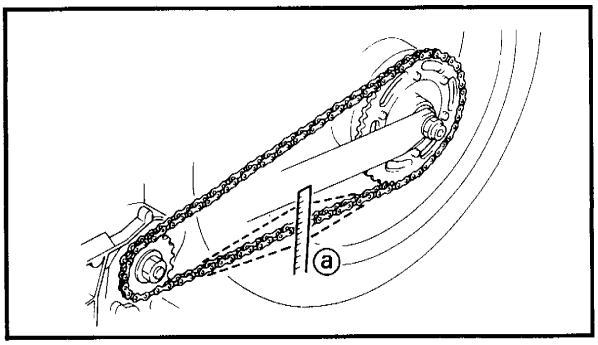
⚠ WARNING

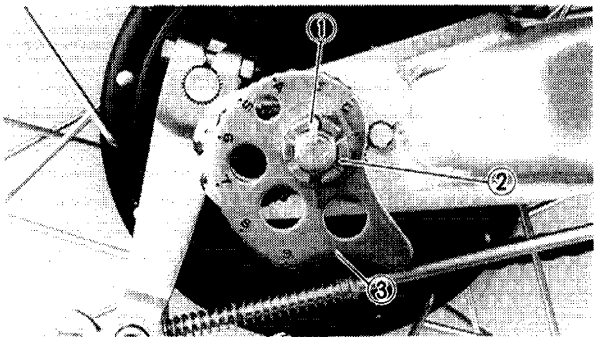
Securely support the motorcycle so there is no danger of it falling over.

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

NOTE:

Both wheels should be on the ground without the rider on it.





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

Drive chain slack:
35 ~ 45 mm (1.38 ~ 1.77 in)
at both wheels on ground
without rider

3. Adjust:
   • Drive chain slack

****

Adjustment steps:

- Remove the cotter pin ① and loosen the axle nut ②.
- Turn the chain pullers ③ clockwise or counterclockwise until the specified slack is obtained.

Turning clockwise → Slack is decreased.
Turning counterclockwise → Slack is increased.

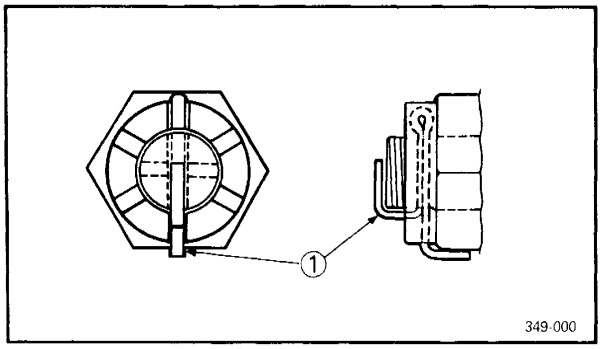
NOTE:

Turn each chain puller exactly the same amount to maintain correct axle alignment. (There are marks 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:
85 Nm (8.5 m•kg, 61 ft•lb)

****



4. 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

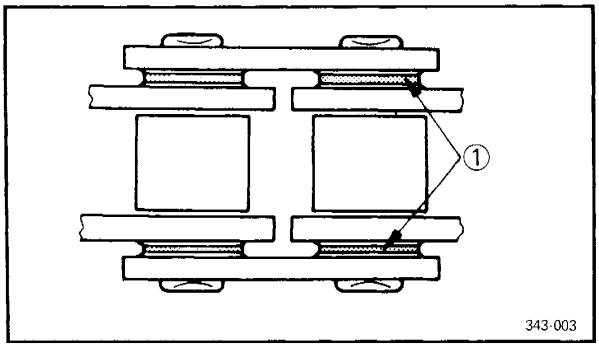
Always use a new cotter pin.

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DRIVE CHAIN LUBRICATION

The chain consists of many parts which work against 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 ①.

Recommended lubricant:
SAE 30 ~ 50W Motor Oil or chain lubricants suitable for "O-ring" chains.

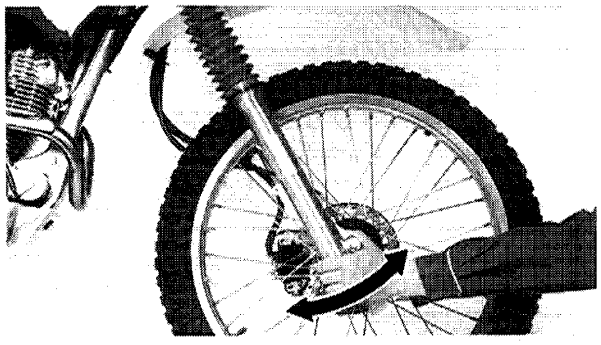
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STEERING HEAD ADJUSTMENT

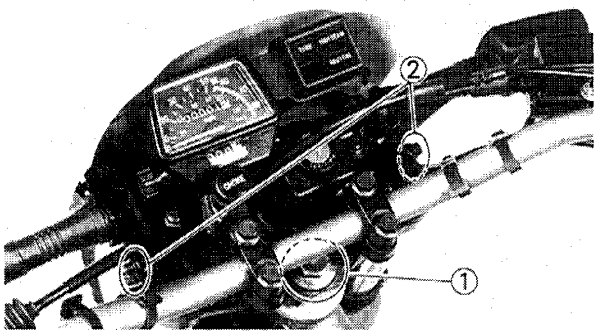
⚠ WARNING

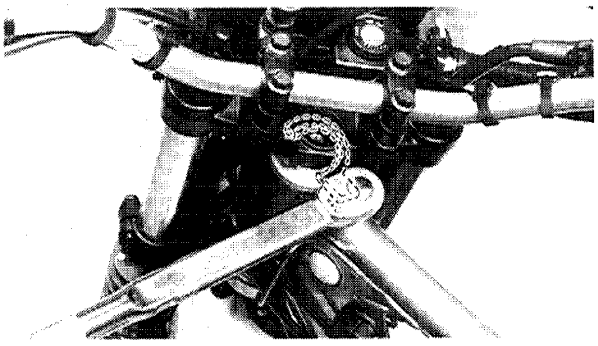
Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on a level place.
2. Elevate the front wheel by placing a suitable stand under the frame and engine.



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. Adjust:
   - Steering head





****

Adjustment steps:

- Remove the side cover, seat, air scoops and fuel tank.
- Remove the bolt ① (steering shaft) and loosen the bolt ② (handlebar crown).
- Tighten the ring nut using the ring nut wrench.

NOTE:

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

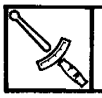
Ring nut wrench:
P/N. YU-33975
P/N. 90890-01403

Ring nut (initial tightening):
38 Nm (3.8 m•kg, 27 ft•lb)

- Loosen the ring nut one turn.
- Retighten the ring nut using the ring nut wrench ③.

⚠ WARNING

Avoid over-tightening.



Ring nut (final tightening):
5.5 Nm (0.55 m•kg, 4.0 ft•lb)

NOTE:

Check the steering head by turning the steering from lock to lock, after adjusting steering head. If steering is binded, loosen the ring nut but not to the extent of free play in bearing.
If steering is loosened, repeat the adjustment steps.

- Tighten the bolt (steering shaft) and bolt (handlebar crown).



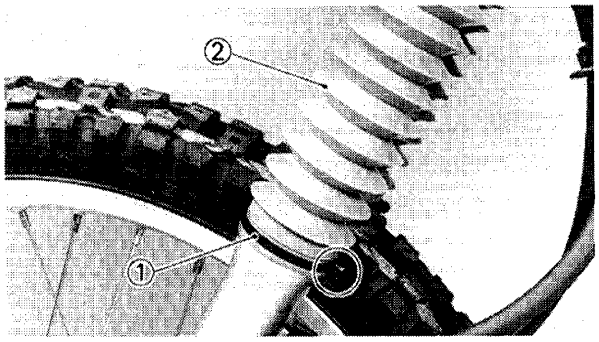
Nut (steering shaft):
70 Nm (7.0 m•kg, 51 ft•lb)
Bolt (handlebar crown):
23 Nm (2.3 m•kg, 17 ft•lb)

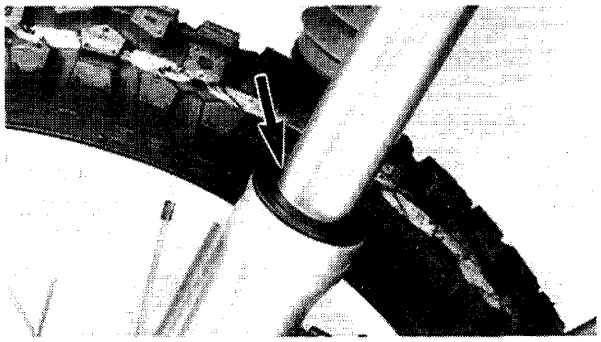
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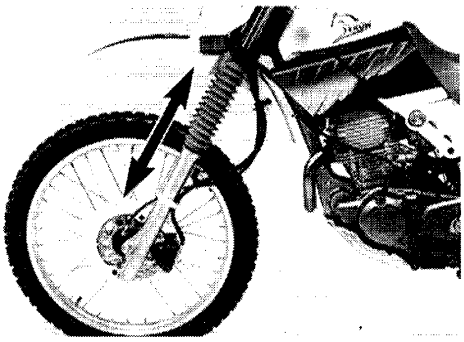
5. Install:
   - Fuel tank
6. Tighten:
   - Bolt (fuel tank)
   - Air scoops
   - Seat
   - Side cover



Bolt (fuel tank, air scoops, seat and sidecovers):
7 Nm (0.7 m•kg, 5.1 ft•lb)







YB2A1001

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. Remove:
   - Band ①
   - Fork boots ②

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

4. Hold the motorcycle on upright position and apply the front brake.

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

6. Install:
   - Fork boots
   - Band
     Refer to the "FRONT FORK-INSTALLATION" section in the CHAPTEA 6.

CAUTION:

Always use a new band.

EB1A1003

FRONT FORK ADJUSTMENT

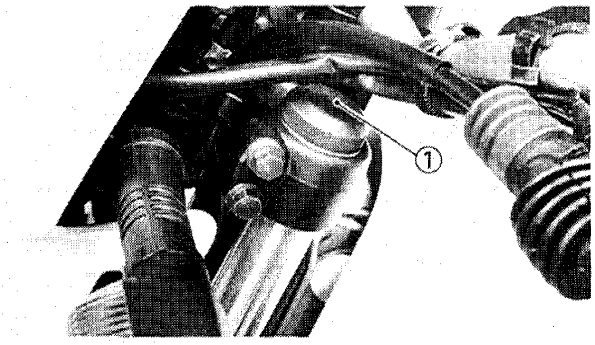
⚠ WARNING

- **Always adjust each fork to the same setting. Uneven adjustment can cause poor handling and loss of stability.**
- **Securely support the motorcycle so there is no danger of it falling over.**

1. Elevate the front wheel by placing a suitable stand under the frame and engine.

NOTE:

When checking and adjusting the air pressure, there should be no weight on the front end of the motorcycle.

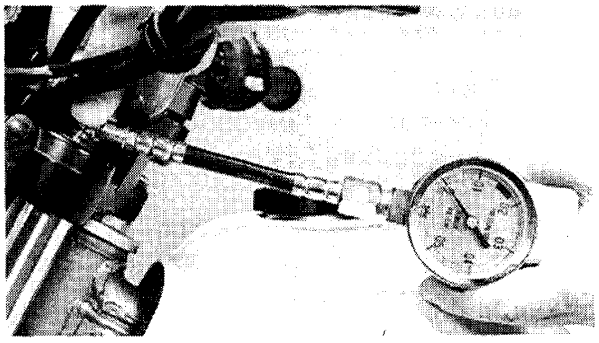


2. Remove:
- Air valve caps ①

3. Adjust:
- Air pressure

****

Adjustment steps:
- Check the air pressure with an air pressure gauge.



Stiffer→Increase the air pressure.
(Use an air pump or pressurized air supply.)
Softer→Decrease the air pressure.
(Release the air by pushing the valve.)

Standard air pressure:
Zero kPa (Zero kg/cm^2, Zero psi)
Maximum air pressure:
40 kPa (0.4 kg/cm^2, 5.7 psi)

CAUTION:

Never exceed the maximum pressure as oil seal damage may occur.

⚠ WARNING

The difference between the left and right tubes should be 10 kPa (0.1 kg/cm^3, 1.4 psi) or less.

****

4. Install:
- Air valve caps

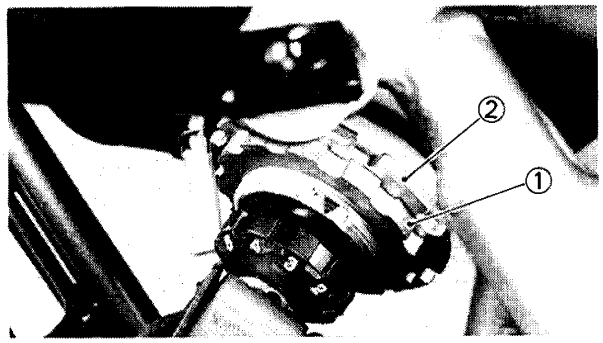
YB2A2002

REAR SHOCK ABSORBER ADJUSTMENT

⚠ WARNING

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

1. Adjust:
   - Spring preload
   - Damping



****

Adjustment steps:

Spring preload

- Loosen the locknut ① using the ring nut wrench.

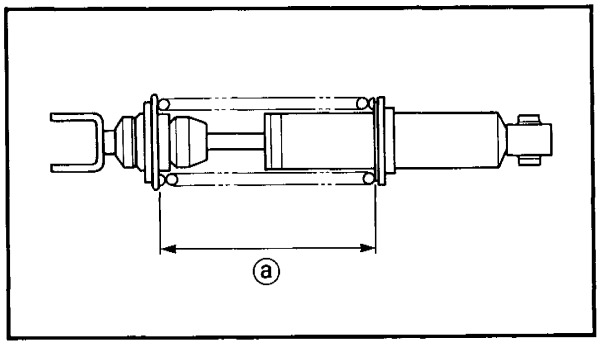
Ring nut wrench:
P/N. YM-38520
P/N. 90890-01443

- Turn the adjuster ② in or out.

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

NOTE:

The length of the spring (installed) changes 1.0 mm (0.04 in) per turn of the adjuster.



Measurement length ⓐ:
Standard:
174 mm (6.9 in)
Minimum:
167 mm (6.6 in)
Maximum:
181 mm (7.1 in)

CAUTION:

Never attempt to turn the adjuster beyond the maximum or minimum setting.

- Tighten the locknut.

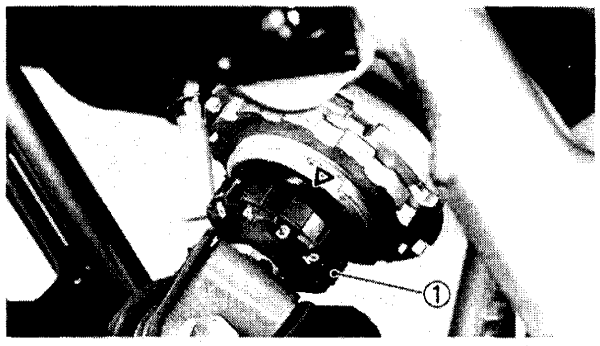
Locknut:
54 Nm (5.4 m•kg, 39 ft•lb)

CAUTION:

Always tighten the locknut against the spring adjuster and torque the locknut to specification.

****

RECOMMENDED COMBINATIONS OF THE FRONT FORK AND THE REAR SHOCK ABSORBER SETTINGS



****

Adjustment steps:

Damping

- Adjust the damping with the damping adjuster ①.

	Hard		S.T.D.	Soft	
Adjuster position	5	4	3	2	1

CAUTION:

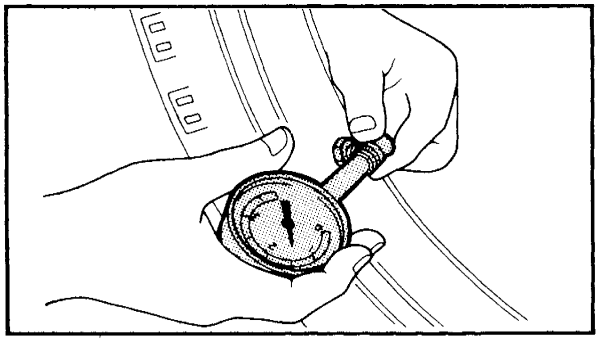
Never attempt to turn the adjuster beyond the maximum or minimum setting.

****

RECOMMENDED COMBINATIONS OF THE FRONT FORK AND THE REAR SHOCK ABSORBER SETTINGS.

Use this table as a guide for specific settings according to motorcycle load conditions.

	Front fork	Rear shock absorber		Loading condition			
	Air pressure	Spring length	Damping adjuster	Solo rider	With passenger	With accessories and equpment	With accessories, equipment and passenger
1.	0 kPa (0 kg/cm^2, 0 psi)	181 ~ 174 mm (7.13 ~ 6.85 in)	1 ~ 3	○			
2.	0 kPa (0 kg/cm^2, 0 psi)	174 ~ 167 mm (6.85 ~ 6.57 in)	3 ~ 5		○		
3.	0 kPa (0 kg/cm^2, 0 psi)	181 ~ 174 mm (7.13 ~ 6.85 in)	1 ~ 3			○	
4.	0 ~ 40 kPa (0 ~ 0.4 kg/cm^2, 0 ~ 5.7 psi)	174 ~ 167 mm (6.85 ~ 6.57 in)	3 ~ 5				○



YB2A3014

TIRE INSPECTION

1. Measure:
   - Tire pressure

   Out of specification → Adjust.

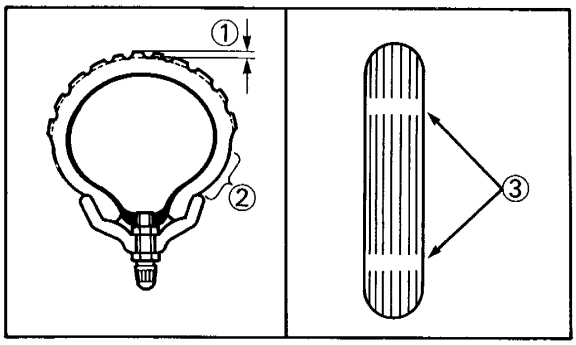
⚠ WARNING

- **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, passenger, 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, passenger, 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	121 kg (267 lb)
Maximum load*	183 kg (403 lb)

Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	125 kPa (1.25 kg/cm^2, 18 psi)	150 kPa (1.5 kg/cm^2, 21 psi)
90 kg (198 lb) ~ Maximum load*	150 kPa (1.5 kg/cm^2, 21 psi)	175 kPa (1.75 kg/cm^2, 25 psi)
High speed riding	150 kPa (1.5 kg/cm^2, 21 psi)	175 kPa (1.75 kg/cm^2, 25 psi)

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



2. Inspect:
   • Tire surfaces
   Wear/Damage → Replace.

Minimum tire tread depth (front and rear):
0.8 mm (0.03 in)

① Tread depth
② Side wall
③ Wear indicator

⚠ WARNING

- **It is dangerous to ride with a wornout tire. When a tire tread begins to show lines, replace the tire immediately.**
- **Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.**
- **Do not attempt to 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

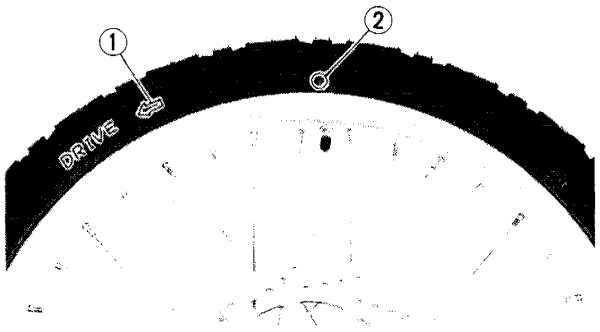
- **Be sure to install the correct tube when using tube type tires.**
- **After extensive tests, the tires mentioned below have been approved by Yamaha motor Co., Ltd. for this model. No guarantee for handling characteristics can be given if tire combinations other than what is approved are used on this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

Front:

Manufacture	Size	Type
BRIDGESTONE	2.75-21-4PR	TW27
YOKOHAMA	2.75-21-4PR	E704

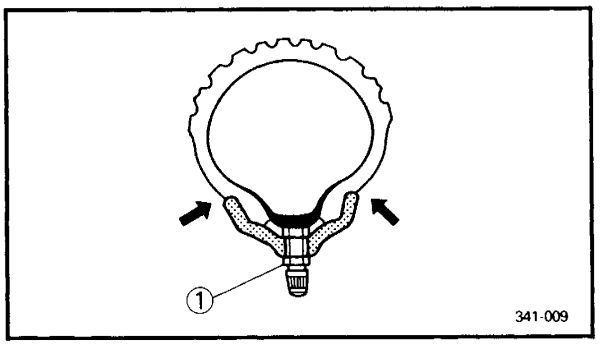
Rear:

Manufacture	Size	Type
BRIDGESTONE	120/80-18 62P	TW30
YOKOHAMA	120/80-18 62P	E704



NOTE:

For the tires with "DRIVE" mark ①:
- Install the wheel with the "DRIVE" mark to the rotating direction.
- Align the light point mark (yellow) ② with the valve installation point.



⚠ 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.**
- **After a tire repair or replacement, be sure to torque tighten the valve stem locknut ① to specification.**

Valve stem locknut: 1.5 Nm (0.15 m•kg, 1.1 ft•lb)

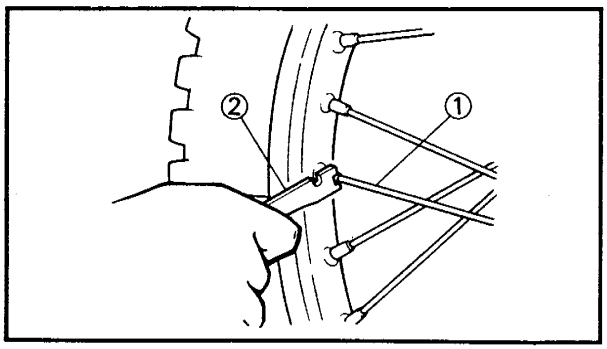
YB2A3016

WHEEL INSPECTION

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

⚠ WARNING

Never attempt even small repairs to the wheel.



YB2A3017

SPOKES INSPECTION AND TIGHTENING

1. Inspect:
   - Spokes ①
     Bend/Damage→Replace.
     Loose spoke→Retighten.

2. Tighten:
   - Spokes

② Spoke wrench

NOTE:

Be sure to retighten these spokes before and after Break-in.

Nipple:
2 Nm (0.2 m•kg, 1.4 ft•lb)

YB3A3018

CABLE INSPECTION AND LUBRICATION

⚠ WARNING

Damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result so replace such cable as soon as possible.

1. Inspect:
   - Cable sheath
     Damage→Replace.

2. Check:
   - Cable operation
     Unsmooth operation→Lubricate.

Recommended lubricant:
Yamaha Chain and Cable Lube or SAE 10W30 motor oil

NOTE:

Hold cable end high and apply several drops of lubricant to cable.

YB3A3019

LEVER AND PEDAL LUBRICATION

Lubricate the lever and pedal at their pivoting points.

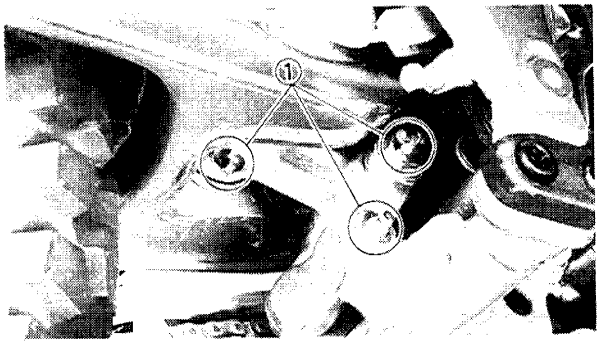
Recommended lubricant:
Yamaha Chain and Cable Lube or SAE 10W30 motor oil

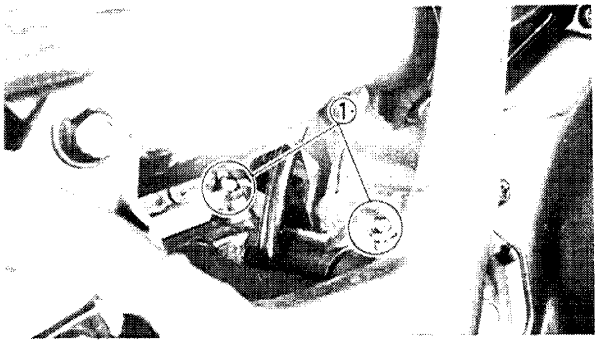
YB3A5000

SIDESTAND LUBRICATION

Lubricate the sidestand at pivoting points.

Recommended lubricant:
Yamaha Chain and Cable Lube or SAE 10W30 motor oil





YB2A2005

REAR SUSPENSION LUBRICATION

Lubricate the swingarm and relay arms at their pivoting points.

Recommended lubricant:
Lithium soap base grease

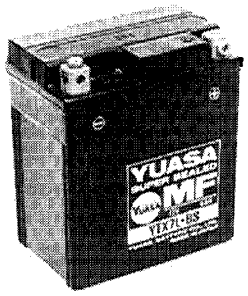
① Grease nipple

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 lower 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

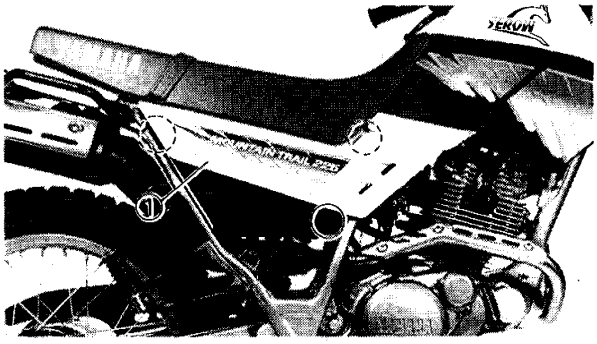
Battery electrolyte is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.
Always follow these preventive measures:
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**
- **Wear protective eye gear when handling or working near batteries.**

Antidote (EXTERNAL):
- **SKIN-Flush with water.**
- **EYES-Flush with water for 15 minutes and get immediate medical attention.**

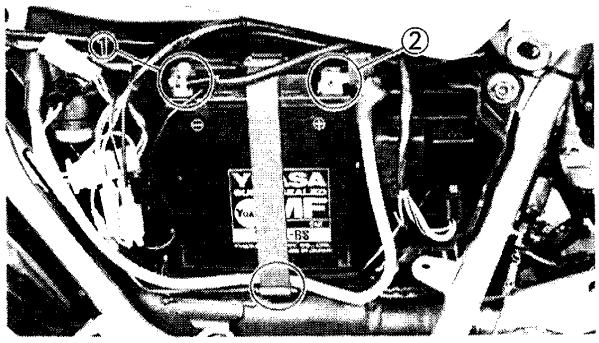
Antidote (INTERNAL):
- **Drink large quantities of water or milk follow with milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.**

Batteries also generate explosive hydrogen gas, therefore you should 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:
   - Side cover ① (right)
   Refer to the "SEAT, FUEL TANK AND COVER" section.

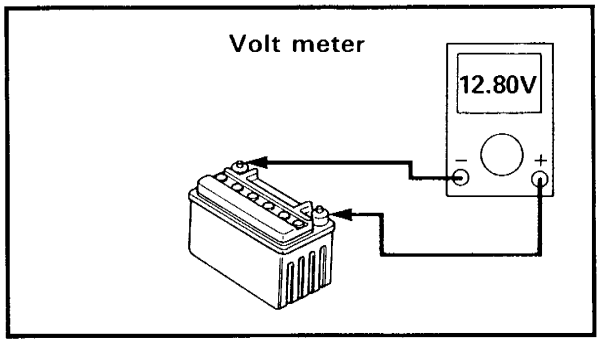


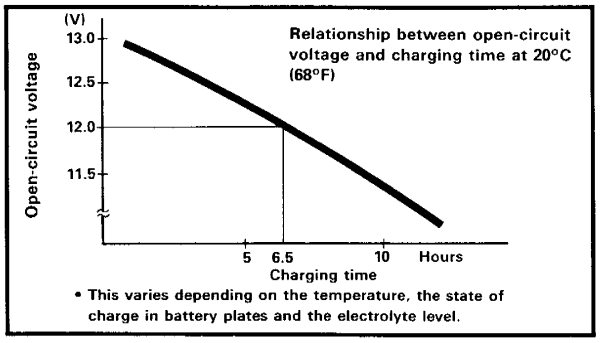
2. Disconnect:
   - Battery leads

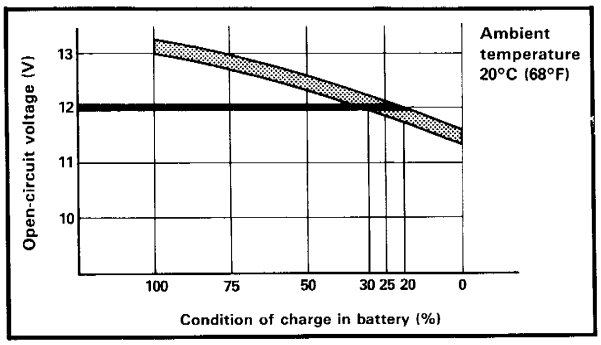
CAUTION:

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
12.8V or more	No charging is necessary.

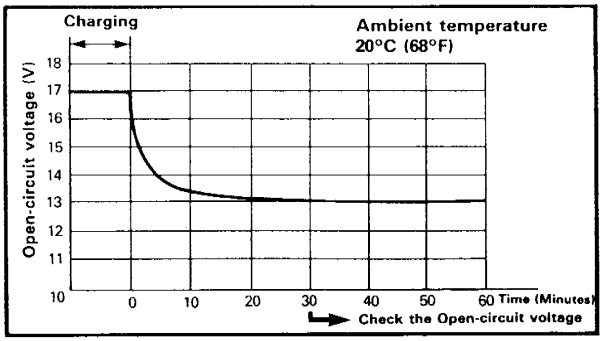
- Check the battery condition using figure.
  Example:
  Open circuit voltage = 12.0V
  Charging time = 6.5 hours
  Condition of charge in battery = 20 ~ 30%

****

5. Charging method of MF battery.

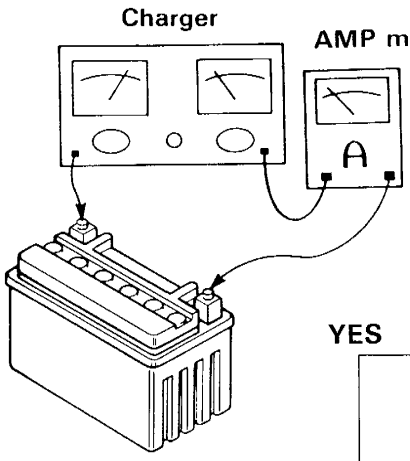
CAUTION:

- **If it is impossible to set the standard charging current, this type of battery charger cannot charge the MF battery.**
- **When charging the battery, be sure to remove it from the machine. (If charging has to be done with the battery mounted on the machine for some reason, be sure to disconnect the wire at the negative 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 charging 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 ~ 25V.

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

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

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

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.
12.8V or more—Charging is complete.
12.7V or less—Recharging is required.
Under 12.0V—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

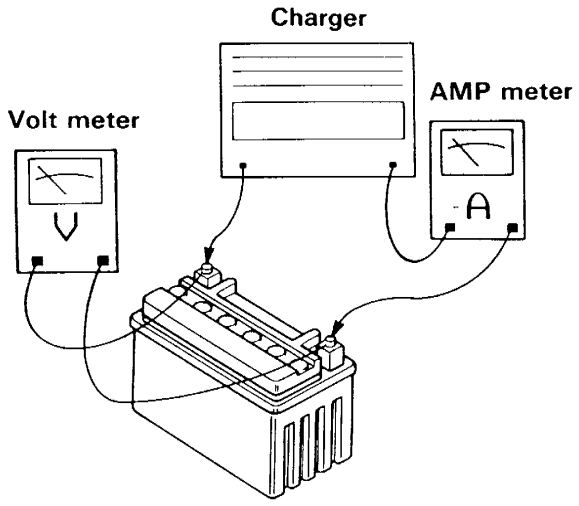
Charge the battery until the battery's charging voltage is 15 volts.

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

Check the open-circuit voltage after having left the battery for 30 minutes after charging.
12.8V or more—Charging is complete.
12.7V or less—Recharging is necessary.
Under 12V—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 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 first and then connect the negative lead.

9. Install:
   • Side cover (right)

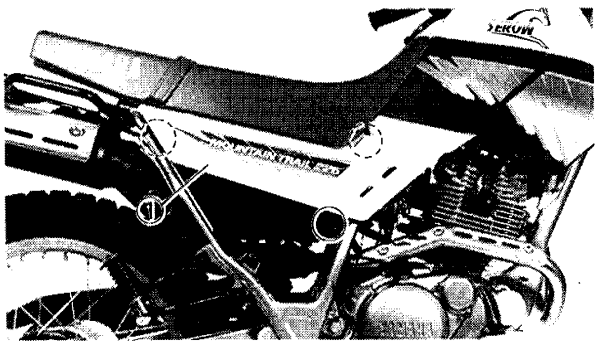
	Bolt (side cover): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

YB302001

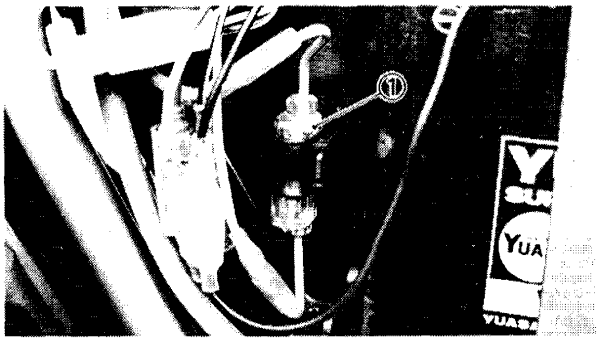
FUSE INSPECTION

CAUTION:

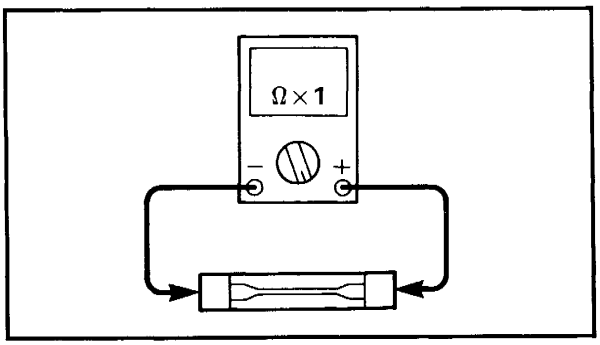
Don't forget to turn off the main switch when checking or replacing the fuse. Otherwise, it may cause accidental short-circuiting.



1. Remove:
   • Side cover ① (right)
   Refer to the "SEAT, FUEL TANK AND COVER" section.



2. Remove:
   • Fuse ①



3. Inspect:
   • Fuse

****

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. YU-03112
P/N. 90890-03112

- If the tester is indicated at ∞. The fuse is blown, replace it.

****

4. Replace:
   • Blown fuse

****

Blown fuse replacement steps:

- Turn off ignition and the circuit.
- Install a new fuse of proper amperage.

Fuse:
15 amps × 1 pc.

- Turn on switches to verify operation of electrical device.
- If fuse blows immediately again, check circuit in question.

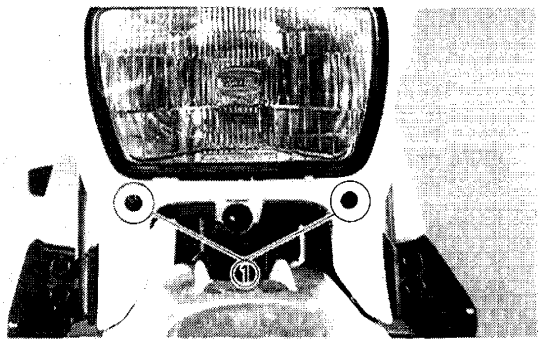
****

⚠ WARNING

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

5. Install:
   • Side cover (right)

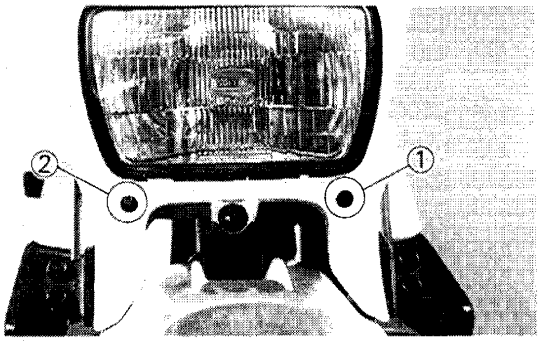
	Bolt (side cover): **7 Nm (0.7 m•kg, 5.1 ft•lb)**



HEADLIGHT BEAM ADJUSTMENT

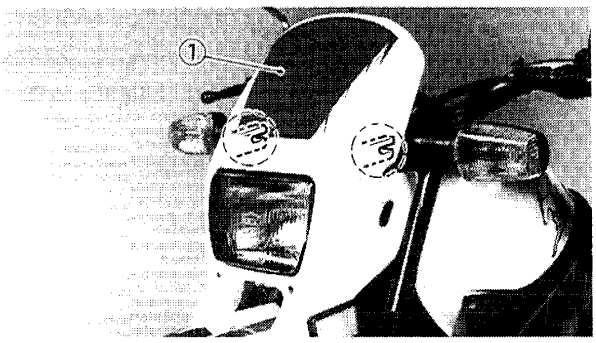
1. Adjust:
   • Headlight beam (vertical)

To raise the beam	**Turn both adjuster ① clockwise at the same time.**
To lower the beam	**Turn both adjuster ① counterclockwise at the same time.**



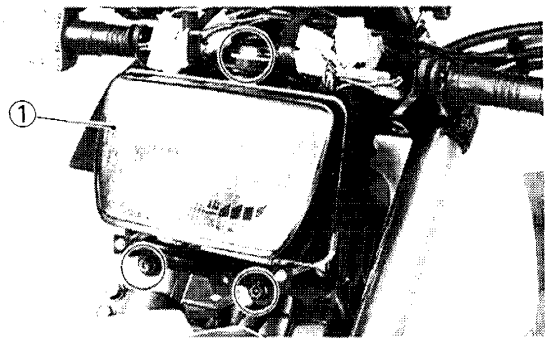
2. Adjust:
   • Headlight beam (horizontal)

To right the beam	**Turn the adjuster ① clockwise while turning adjuster ② counterclockwise at the same time.**
To left the beam	**Turn the adjuster ② clockwise while turning adjuster ① counterclockwise at the same time.**

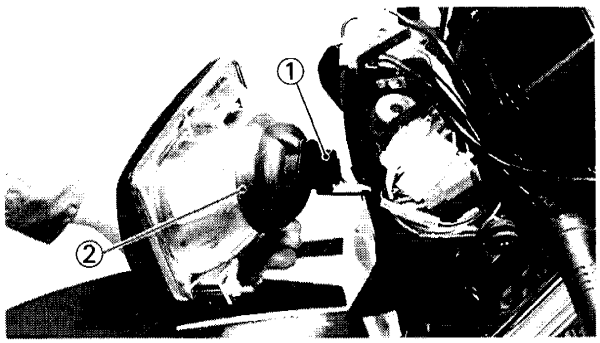


HEADLIGHT BULB REPLACEMENT

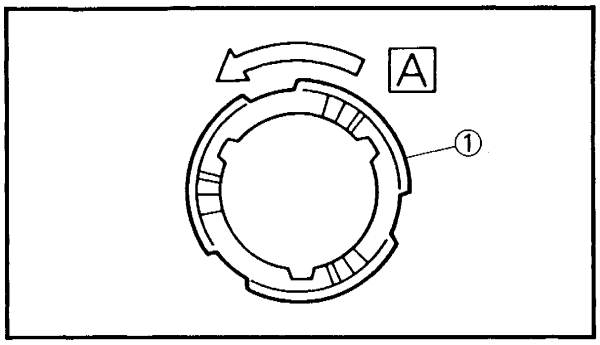
1. Remove:
   • Cowling (headlight) ①
   Refer to the "COWLING-REMOVAL" section.



2. Remove:
   • Headlight lens unit ①



3. Disconnect:
   - Headlight leads ①
   - Bulb cover ②

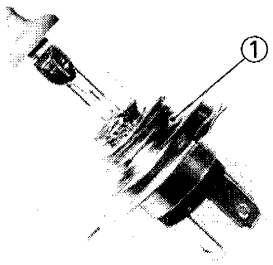


4. Remove:
   - Bulb holder ①
   - Bulb

   Unhook the bulb.

⚠ 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.



A Turn

5. Install:
   - Bulb (new) ①

   Secure the new bulb with the bulb holder.

CAUTION:

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

6. Install:
   - Bulb cover
   - Headlight leads

7. Install:
   - Headlight lens unit
   - Cowling (headlight)

Bolt (headlight-upper):
15 Nm (1.5 m•kg, 12 ft•lb)
Bolt (headlight-lower):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Bolt (cowling):
7 Nm (0.7 m•kg, 5.1 ft•lb)

YB241000

ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

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

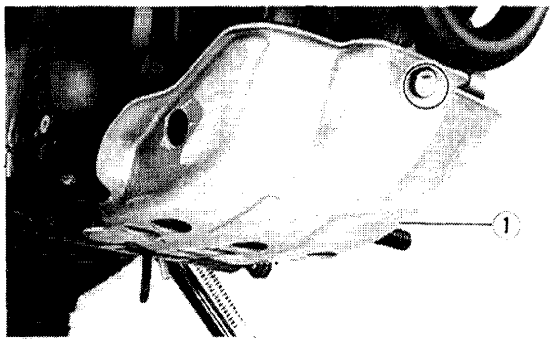
- Cylinder head
- Cylinder
- Piston
- Clutch
- Oil pump
- C.D.I. magneto

YB241001

SEAT, FUEL TANK AND COVER

1. Remove:
   - Side covers
   - Seat
   - Air scoops
   - Fuel tank

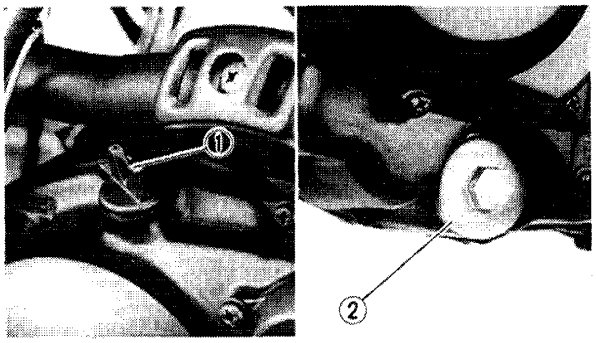
   Refer to the "SEAT, FUEL TANK AND COVER" section in the CHAPTER 3.



YB241004

ENGINE GUARD

1. Remove:
   - Engine guard ①

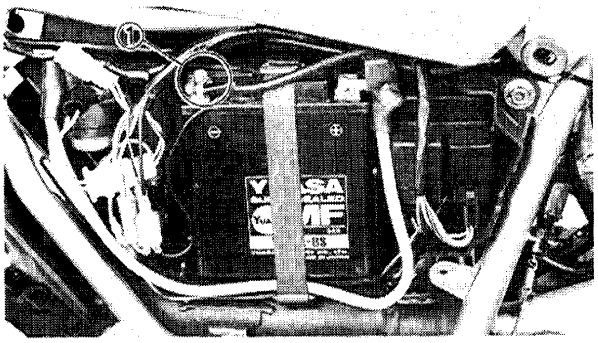


YB241002

ENGINE OIL

1. Drain:
   - Oil filler cap ①
   - Drain plug ②

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

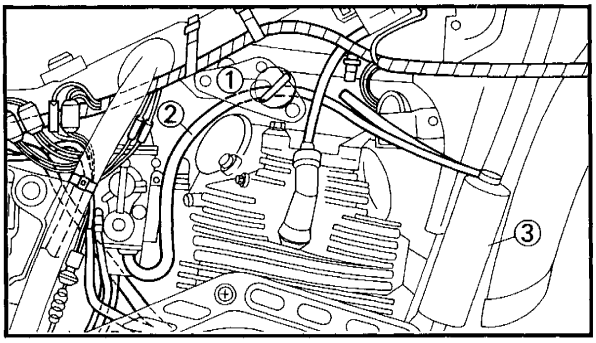


YB241003

BATTERY LEADS

1. Disconnect:
   - Battery negative lead ①

   Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.



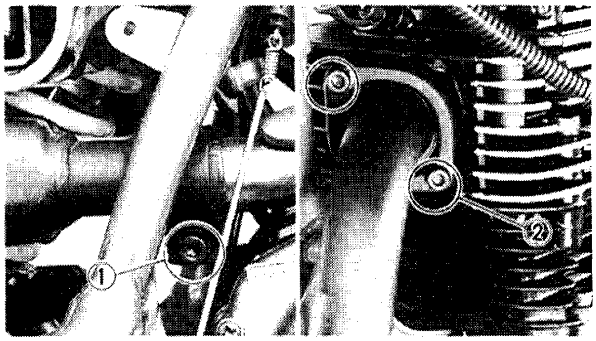
CANISTER (CALIFORNIA ONLY)

1. Disconnect:
   - Band ①
   - Hose (canister) ② (carburefor side)

⚠ WARNING

Gasoline is highly flammable. Avoid spilling fuel on the hot engine.

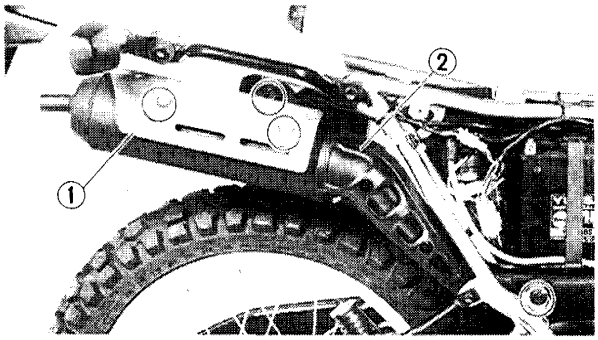
2. Remove:
   - Canister ③



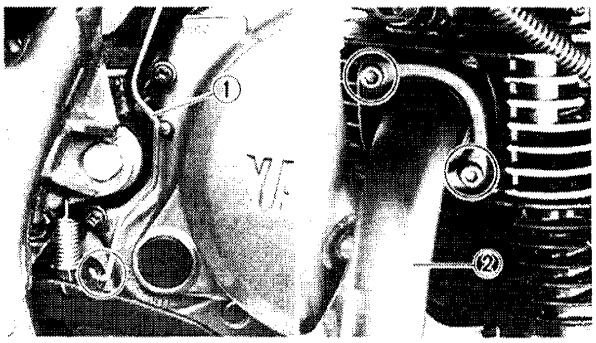
YB241005

EXHAUST PIPE AND MUFFLER

1. Loosen:
   - Bolt ① (clamp)
   - Bolt ② (exhaust pipe)

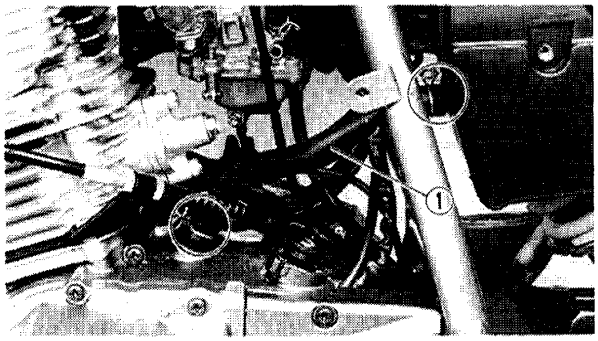


2. Remove:
   - Protector ①
   - Muffler ②



3. Disconnect:
   - Rear brake switch rod ①

4. Remove:
   - Exhaust pipe ②



YB241007

CRANKCASE VENTILATION HOSE AND CARBURETOR

1. Disconnect:
   - Crankcase ventilation hose ①

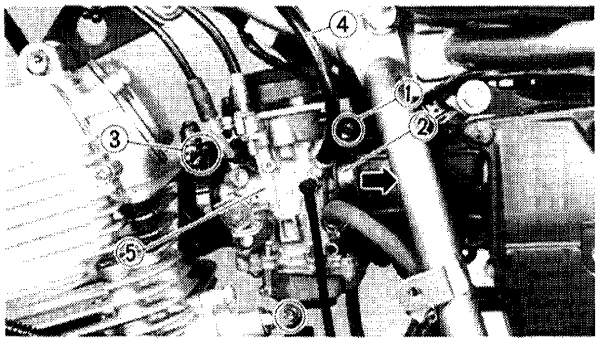
2. Drain:
   - Fuel (float chamber)

NOTE:

Place a rag under the over flow hose to absorb a spilt fuel.

⚠ WARNING

Gasoline is highly flammable. Avoid spilling fuel on the hot engine.



3. Loosen:
   - Screw ① (carburetor joint)

NOTE:

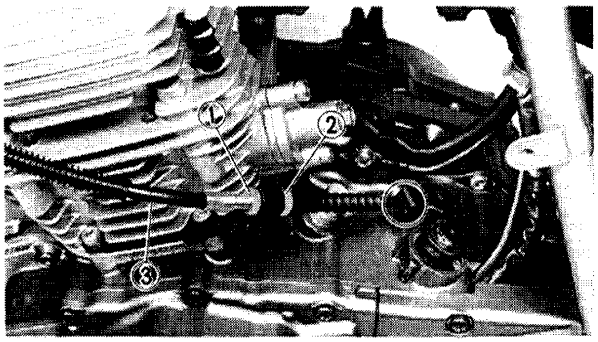
Move carburetor joint clamp ② to the rear.

4. Loosen:
   - Screw ③ (intake manifold)

5. Disconnect:
   - Air vent hose ④ (except for California)
   - Carburetor ⑤
     (from left side of motorcycle)

NOTE:

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

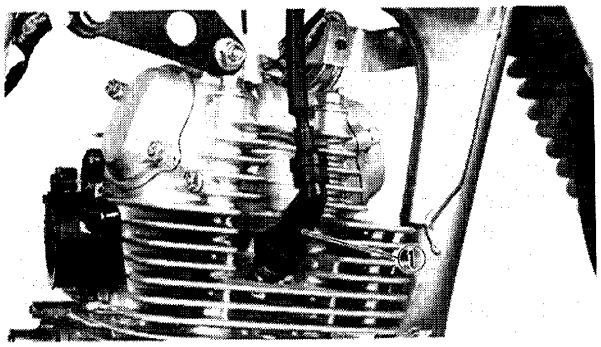


HORN, CABLES AND LEADS

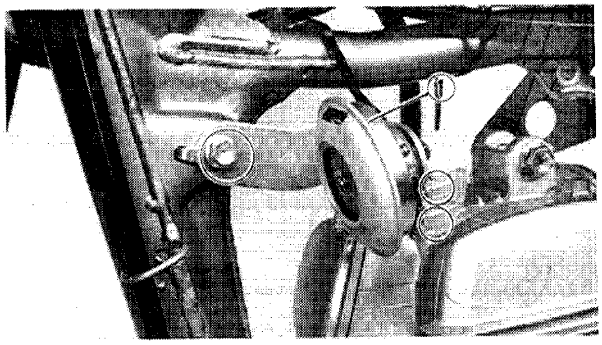
1. Loosen:
   - Nut ①

2. Remove:
   - Nut ②
     (from cable adjust bolt)

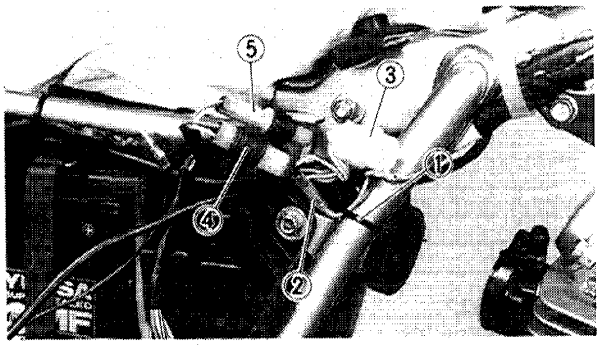
3. Disconnect:
   - Clutch cable ③
     (from pull lever and cable holder)



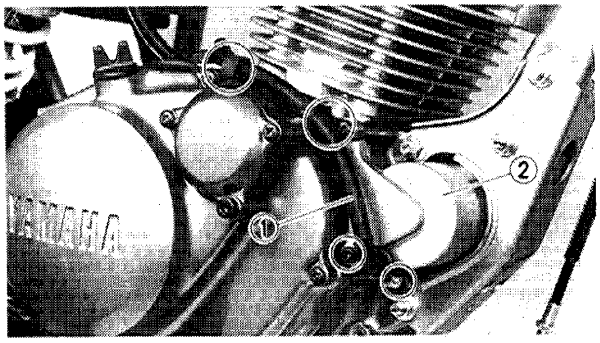
4. Disconnect:
   - Spark plug cap ①
     (from spark plug)



5. Remove:
   - Horn ①

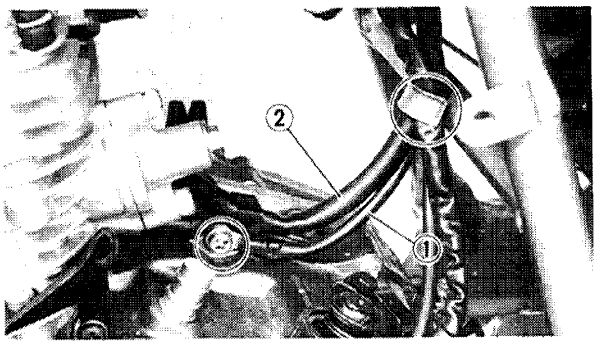


6. Disconnect:
   - Band ①
   - Neutral switch lead ②
   - Stator coil lead ③
   - Neutral switch lead ③
   - Charge coil lead ④
   - Pulser coil lead ⑤

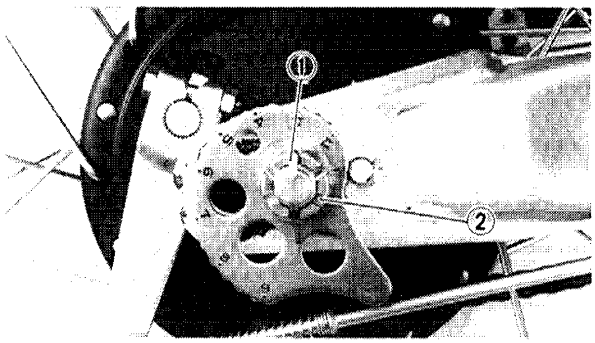


7. Disconnect:
   - Starter motor lead ①
     (from starter motor and clamps)

8. Remove:
   - Starter motor ②



9. Disconnect:
   - Wire earth lead ①
   - Starter motor lead ②
     (from the crankcase)

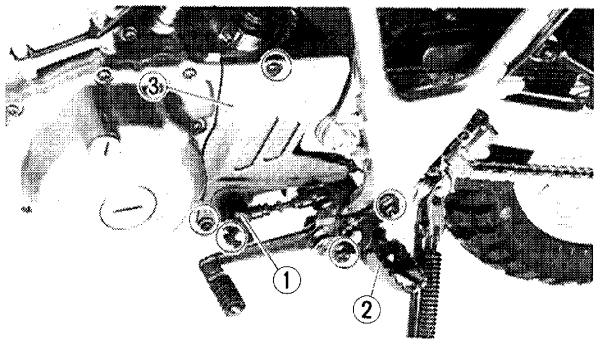


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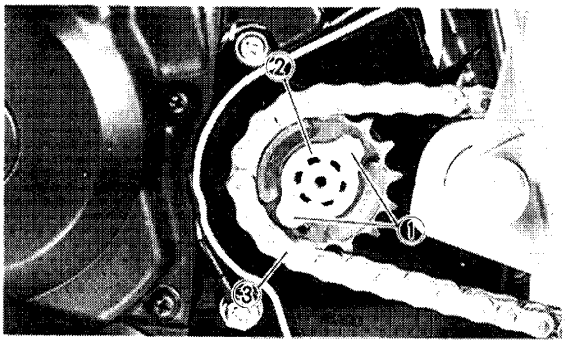
DRIVE CHAIN

1. Remove:
   - Cotter pin ①

2. Loosen:
   - Axle nut ②



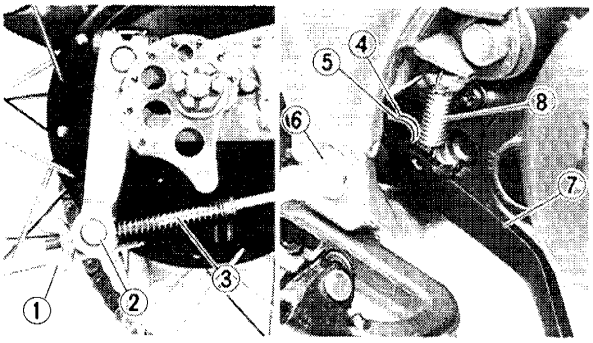
3. Remove:
   - Shift arm ①
   - Footrest ② (left)
   - Crankcase cover 2 ③



4. Remove:
   - Bolts ①
   - Sprocket holder ②
   - Drive chain ③ (with drive sprocket)

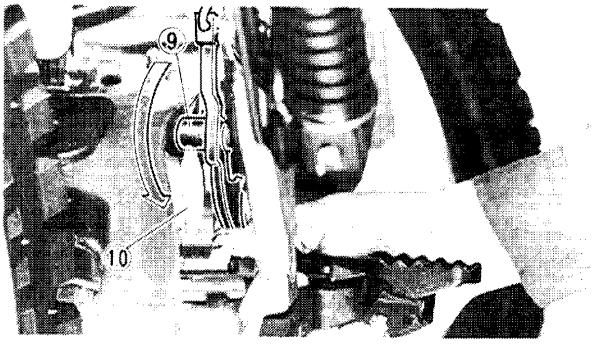
NOTE:

Loosen the bolt while applying the rear brake.



5. Remove:
   - Adjuster ①
   - Pin ②
   - Compression spring ③

6. Remove:
   - Circlip ④
   - Washer ⑤
   - Brake pedal shaft ⑥
   - Rear brake pedal ⑦



7. Disconnect:
   - Spring ⑧

NOTE:

When removing the brake pedal, pass the pedal boss ⑨ over the relay arm shaft cover ⑩ and remove backward.

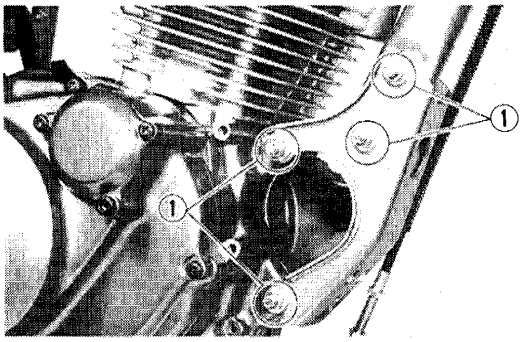
YB241011

ENGINE REMOVAL

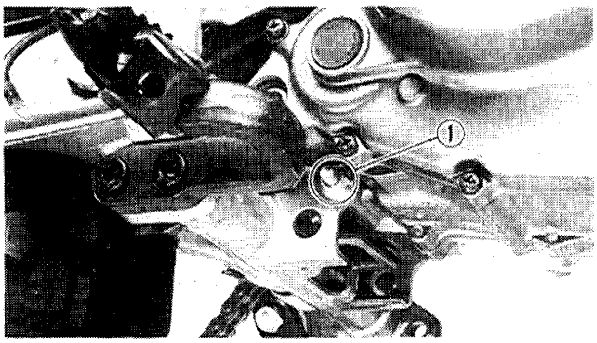
1. Place suitable stand under the frame and engine.

⚠ WARNING

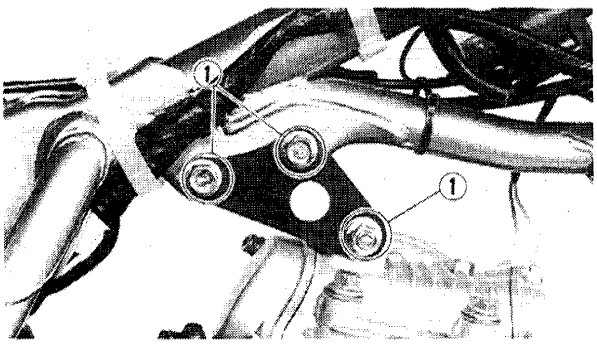
Securely support the motorcycle so there is no danger of it falling over.



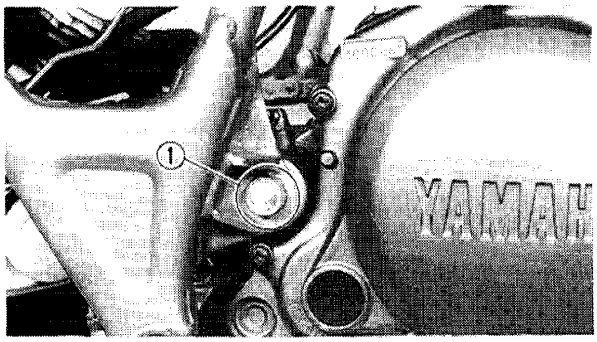
2. Remove:
   - Mounting bolts ① (front—lower)



3. Remove:
   - Mounting bolt ① (rear—lower)



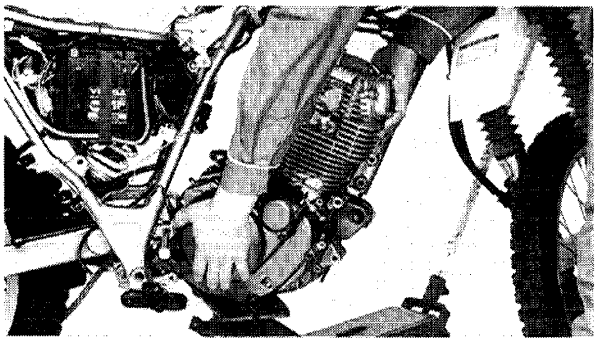
4. Remove:
   - Mounting bolts ① (front—upper)



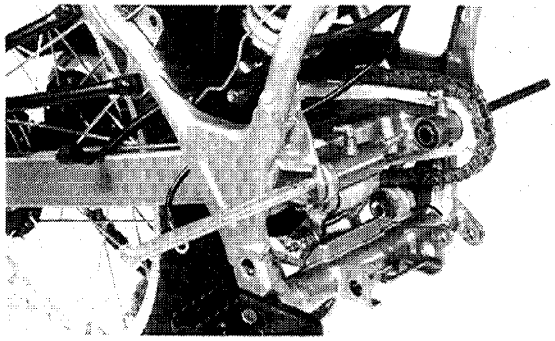
5. Remove:
   - Pivot shaft ①

NOTE:

The engine and swingarm are installed using the same pivot shaft. Therefore, take care so that the pivot shaft is pulled, not entirely out, but for enough to set the engine free.



6. Remove:
   - Engine assembly
     (from right side of motorcycle)



NOTE:

After removing the engine, hold the other side of the swingarm using an appropriate shaft.

YB342002

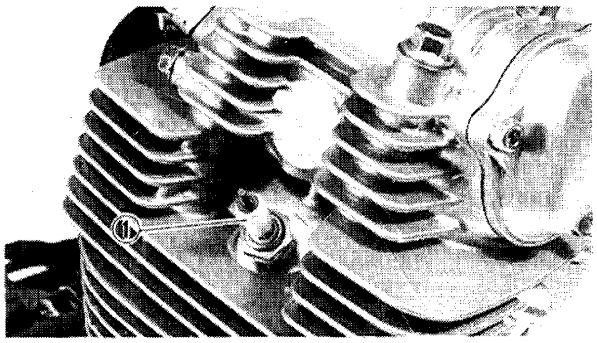
ENGINE DISASSEMBLY

CYLINDER HEAD, CYLINDER AND PISTON

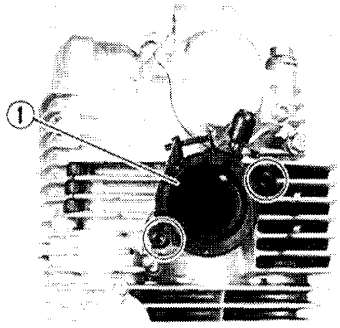
NOTE:

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

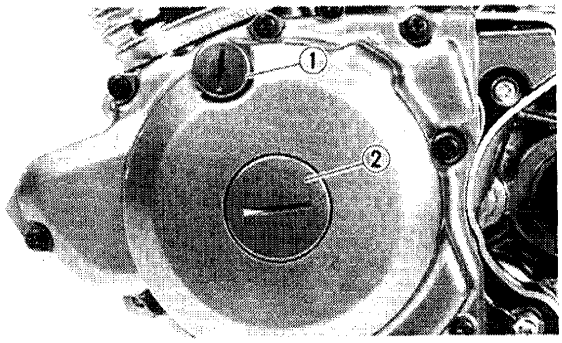
- Side covers
- Seat
- Air scoops
- Fuel tank
- Exhaust pipe
- Carburetor
- Clutch cable
- Spark plug lead
- Horn
- Engine mount stay (from upper)



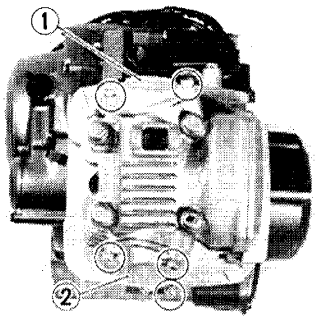
1. Remove:
   - Spark plug ①



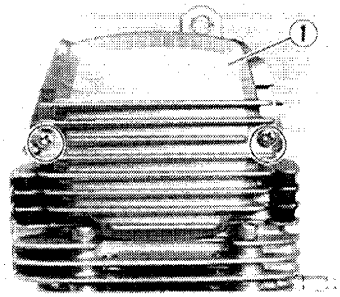
2. Remove:
   - Intake manifold ①



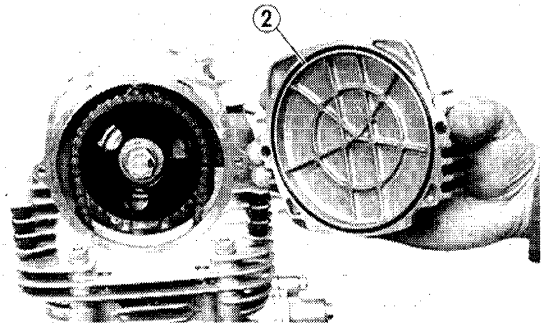
3. Remove:
   - Timing plug ①
   - Plug (center) ②

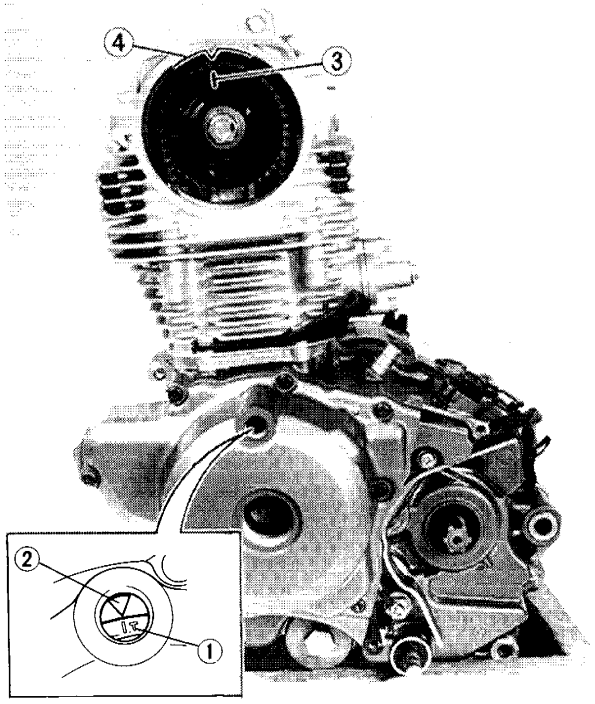


4. Remove:
   - Tappet cover (intake) ①
   - Tappet cover (exhaust) ②



5. Remove:
   - Cylinder head side cover ①
   - O-ring ②





6. Align:
   - "T" mark on the rotor
     With the stationary pointer on the crankcase cover.

****

TDC alignment steps:

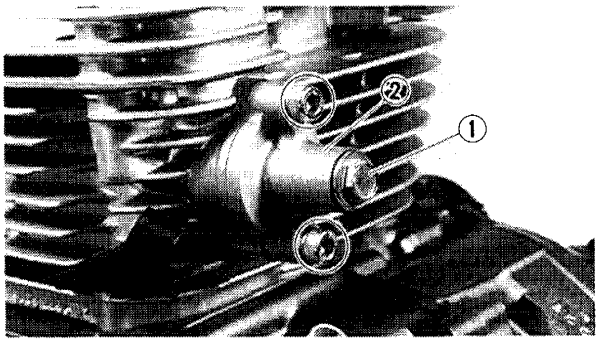
- Turn the crankshaft counterclockwise with wrench.
- Align the "T" mark ① on the rotor with the stationary pointer ② on the crankcase cover. When the "T" mark is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

NOTE:

TDC on compression stroke check:

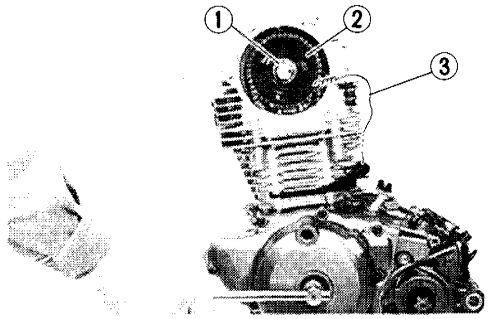
- Both rocker arms must have a valve clearance when the cam sprocket match mark ③ is aligned with the cylinder head match mark ④.
- If not, give the crankshaft one counterclockwise turn too meet above condition.

****



7. Loosen:
   • Cap bolt ① (chain tensioner)

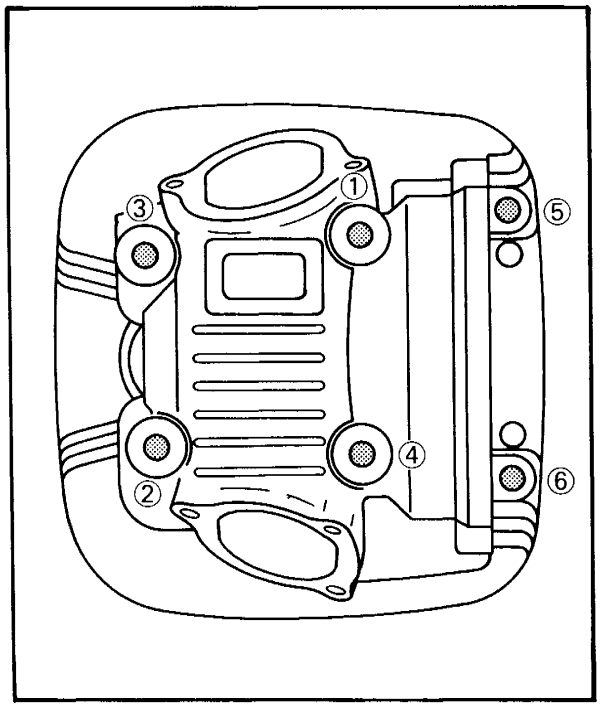
8. Remove:
   • Chain tensioner ②



9. Remove:
   • Bolt ①
   • Cam sprocket ②

NOTE:

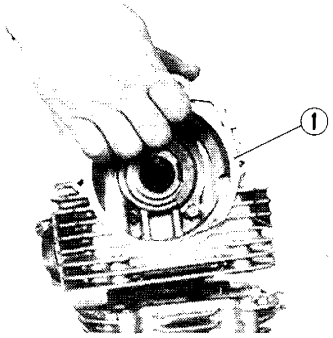
• Fasten a safety wire ③ to the timing chain to prevent if from falling into the crankcase.



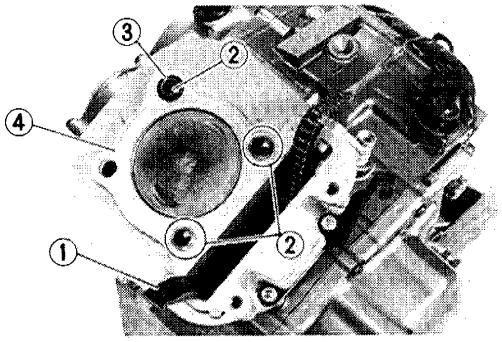
10. Remove:
    • Bolts

NOTE:

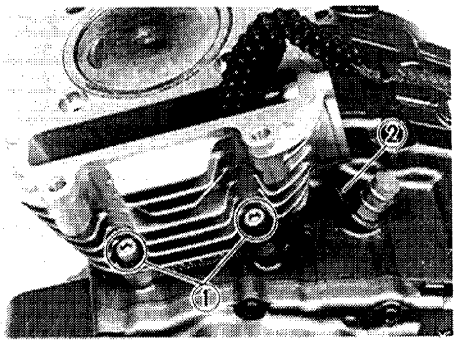
• Loosen the bolts 1/4 turn each and remove them after all are loosened.
• Loosen the bolts starting with the highest numbered one.
• The embossed numbers in the cylinder head designate the tightening sequence.



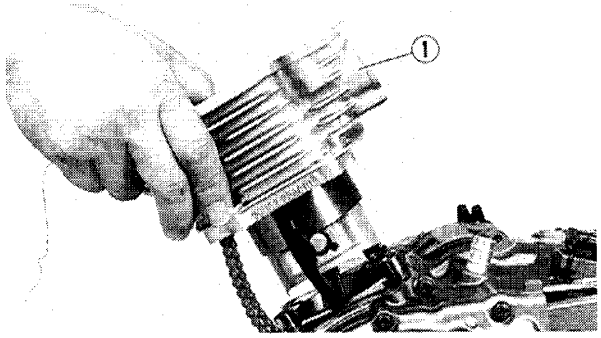
11. Remove:
    • Cylinder head ①



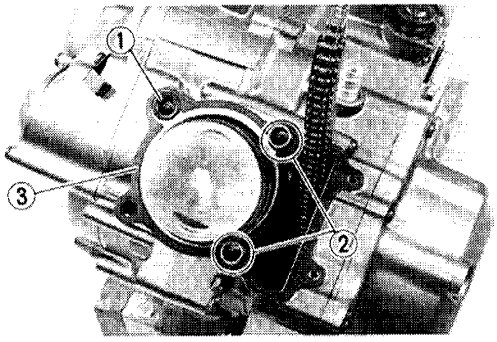
12. Remove:
    - Timing chain guide ① (exhaust)
    - Dowel pins ②
    - Grommet ③
    - Gasket ④ (cylinder head)



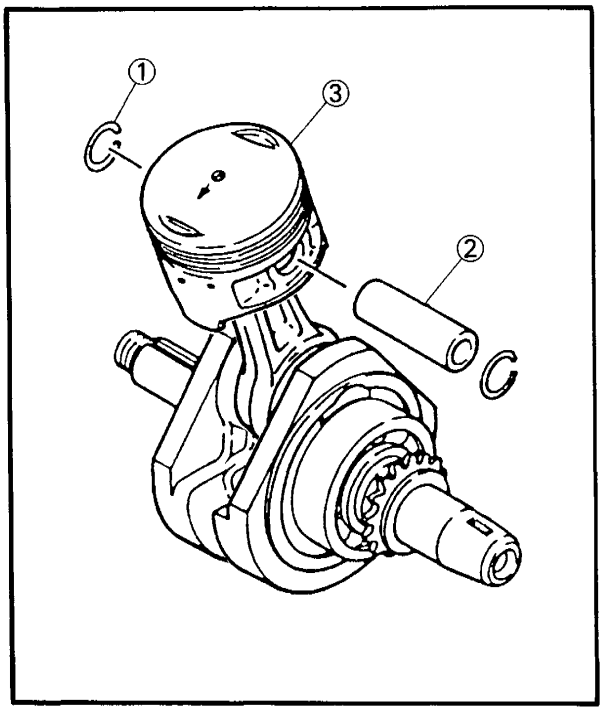
13. Remove:
    - Bolts ①
    - Clutch cable holder ②



14. Remove:
    - Cylinder ①



15. Remove:
    - O-ring ①
    - Dowel pins ②
    - Gasket ③ (cylinder)



16. Remove:
    - Piston pin circlip ①
    - Piston pin ②
    - Piston ③

NOTE:

- Before removing the piston pin circlip, cover the crankcase with a clean rag to prevent the circlip from falling into the crankcase cavity.
- Before removing the piston pin, deburr the clip grooved and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use the piston pin puller.

	Piston pin puller: P/N. YU-01304, 90890-01304

CAUTION:

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

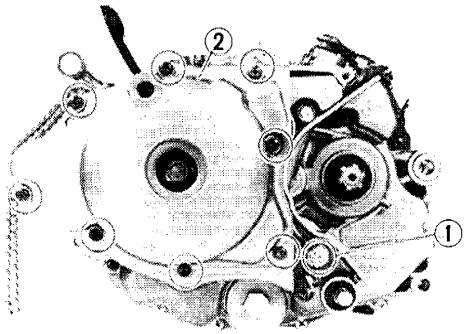
YB342003

ROTOR AND STARTER DRIVES

NOTE:

With the engine mounted, the C.D.I. magneto and starter drives can be maintained by removing the following part.

- Sidecover (right)
- Seat
- Engine guard

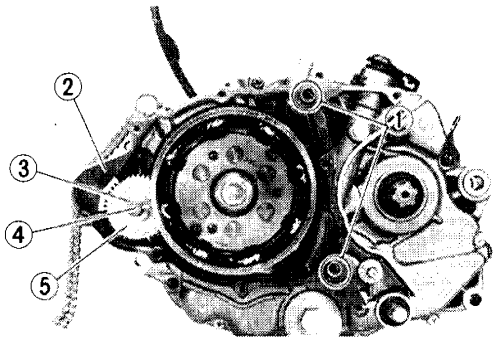


1. Disconnect:
    - Neutral switch lead ①

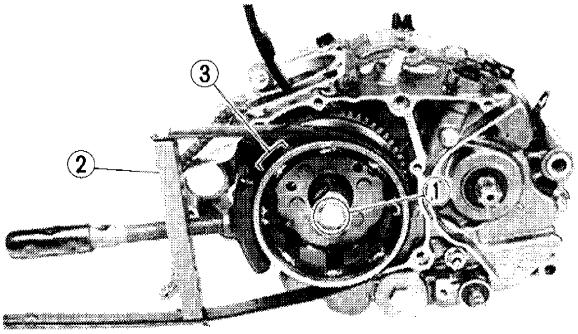
2. Remove:
    - Crankcase cover ② (left)

NOTE:

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



3. Remove:
   - Dowel pins ①
   - Gasket ② (crankcase cover)
   - Coller ③
   - Shaft ④
   - Starter idle gear 1 ⑤



4. Remove:
   - Bolt ① (rotor)

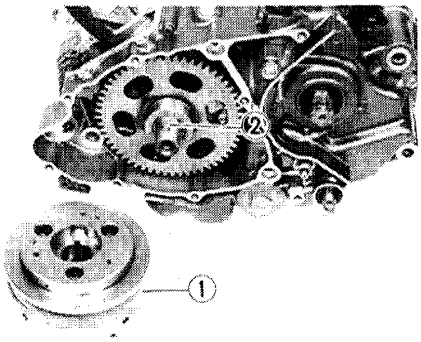
NOTE:

Loosen the bolt (rotor) while holding the rotor with the rotor holder ②.

	Rotor holder: **P/N. YS-01880, 90890-01701**

CAUTION:

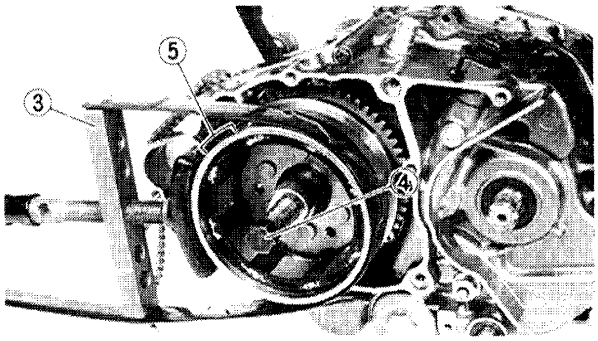
Do not allow the rotor holder to touch the projection ③ on the rotor.



5. Remove:
   - Rotor ①
   - Woodruff key ②

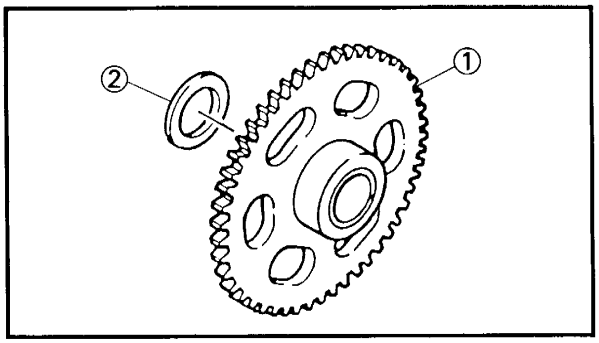
   Use the rotor holder ③ and rotor puller ④.

	Rotor puller: **P/N. YM-01080-A, 90890-01080**

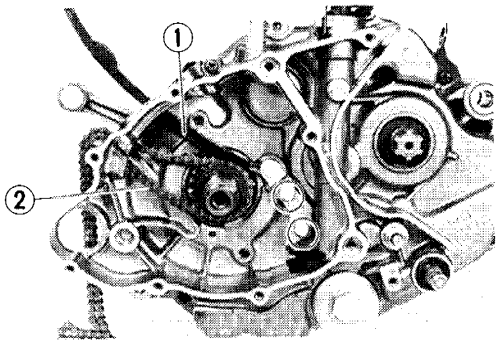


CAUTION:

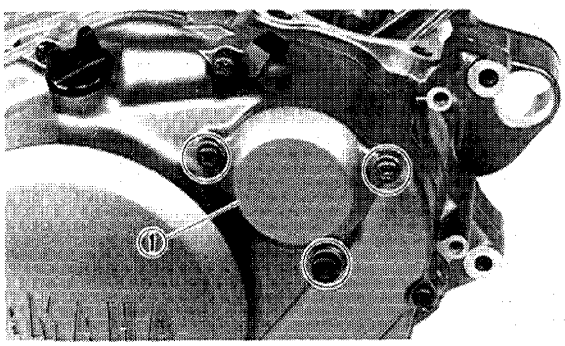
Do not allow the rotor holder to touch the projection ⑤.



6. Remove:
   - Wheel gear ①
   - Washer ②



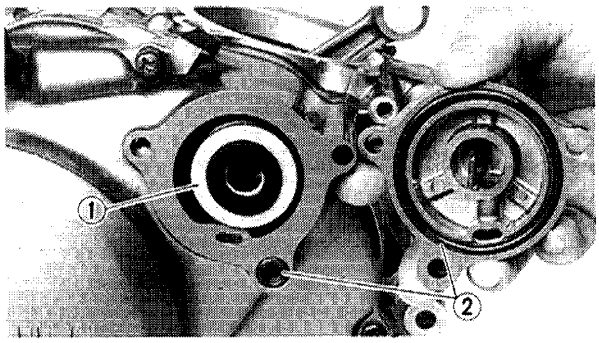
7. Remove:
   - Chain guide ① (intake)
   - Timing chain ②



YB342004

OIL FILTER

1. Remove:
   - Oil filter cover ①



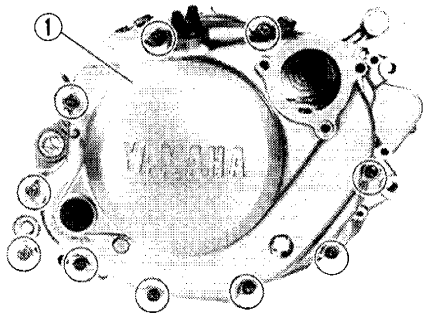
2. Remove:
   - Oil filter ①
   - O-rings ②

CLUTCH, OIL PUMP AND BALANCER GEAR

NOTE:

With the engine mounted, the clutch and oil pump can be maintained by removing the following parts.

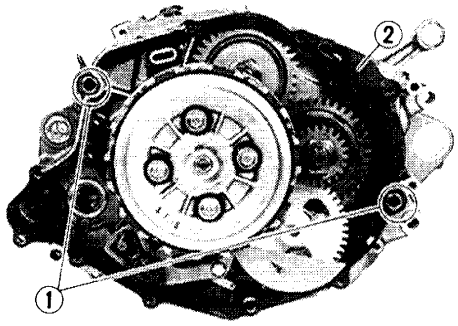
- Engine guard
- Brake pedal



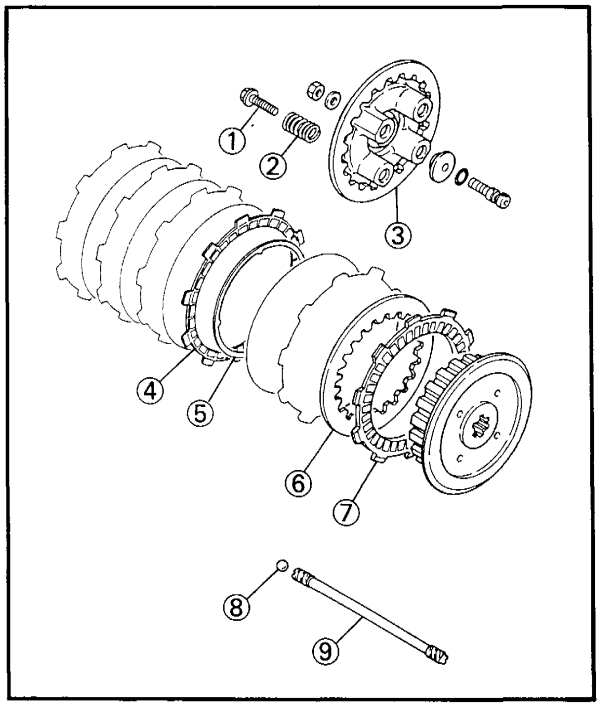
1. Remove:
   - Crankcase cover ① (right)

NOTE:

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



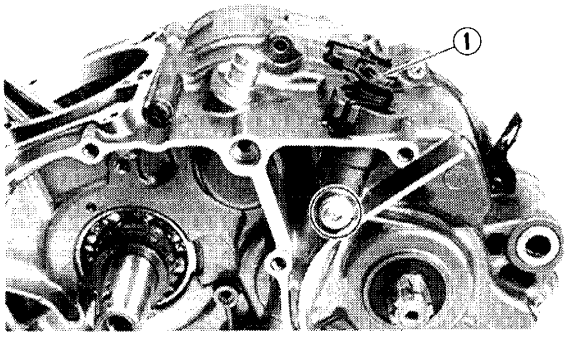
2. Remove:
   - Dowel pins ①
   - Gasket ② (crankcase cover)



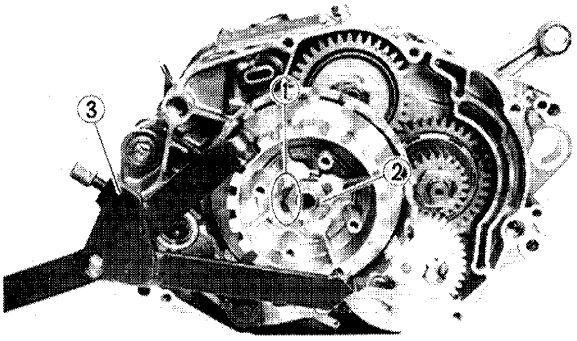
3. Remove:
   - Bolts ①
   - Clutch springs ②
   - Pressure plate ③
   - Friction plate ④ (type A)
   - Cushion spring ⑤
   - Clutch plate ⑥
   - Friction plate ⑦ (type B)
   - Ball ⑧
   - Push rod 2 ⑨

NOTE:

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



4. Remove:
   • Push lever assembly ①



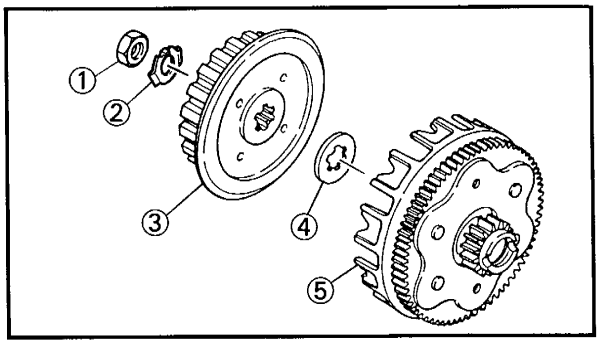
5. Straighten:
   • Lock washer tab ①

6. Loosen:
   • Nut ② (clutch boss)

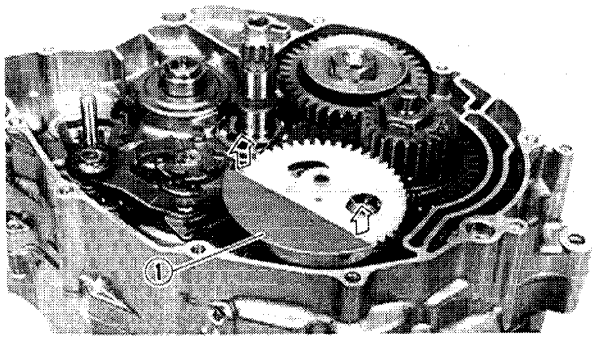
NOTE:

Loosen the nut (clutch boss) while holding the clutch boss with universal clutch holder ③.

	Universal clutch holder: P/N. YM-91042, 90890-04086



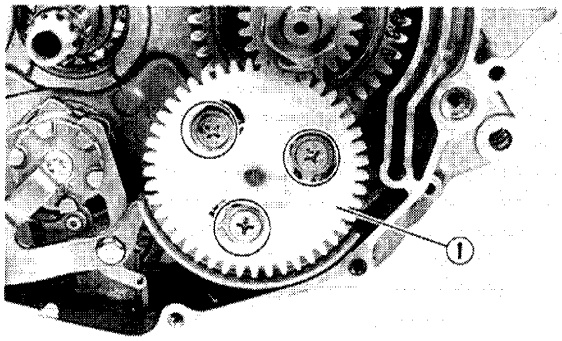
7. Remove:
   • Nut ① (clutch boss)
   • Lock washer ②
   • Clutch boss ③
   • Thrust plate ④
   • Primary driven gear ⑤



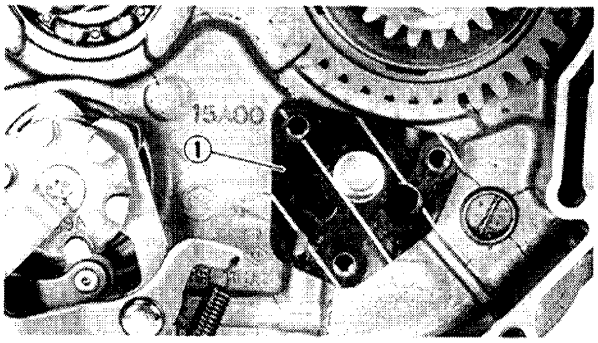
8. Remove:
   • Oil pump gear cover ①

NOTE:

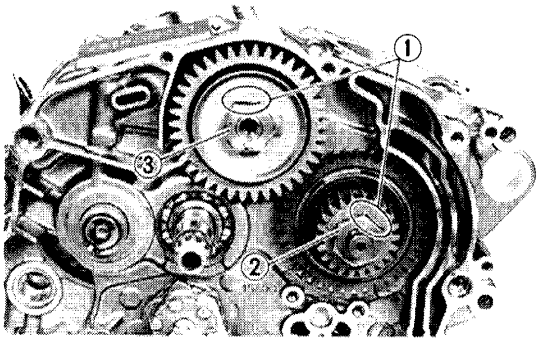
Remove the cover by lifting upward as shown.



9. Remove:
   - Oil pump assembly ①



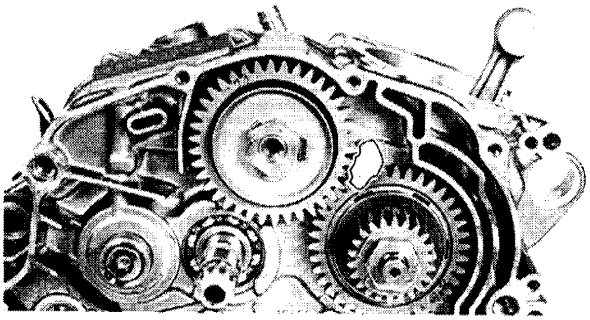
10. Remove:
    - Gasket ① (oil pump)

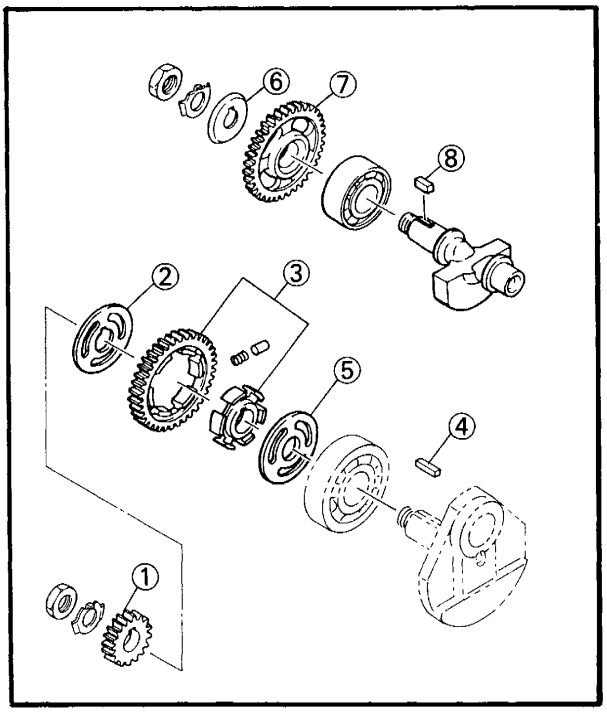


11. Straighten:
    - Lock washer tabs ①
12. Loosen:
    - Nut ② (crankshaft)
    - Nut ③ (balancer shaft)

NOTE:

- Place a folded rag or aluminum plate between the teeth of the balancer drive gear and balancer gear.
- Take care not to damage the gear teeth.



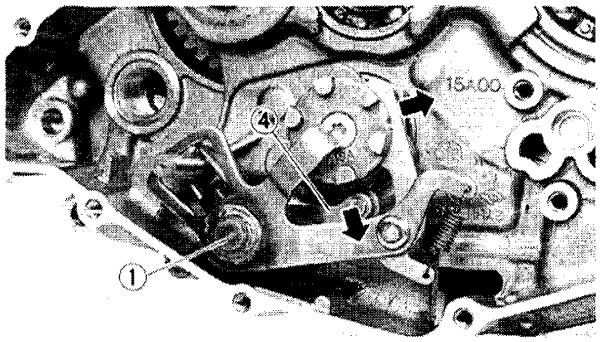


13. Remove:
    - Primary drive gear ①
    - Claw washer ②
    - Balancer drive gear and buffer boss ③
    - Key ④
    - Plate washer ⑤
    - Plate ⑥
    - Balancer gear ⑦
    - Key ⑧

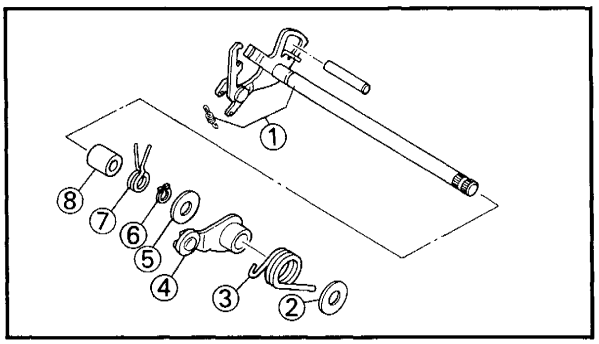
SHIFT SHAFT

NOTE:

With the engine mounted, the shift shaft can be maintained by removing the following parts.
- Engine guard
- Brake pedal
- Clutch
- Oil pump

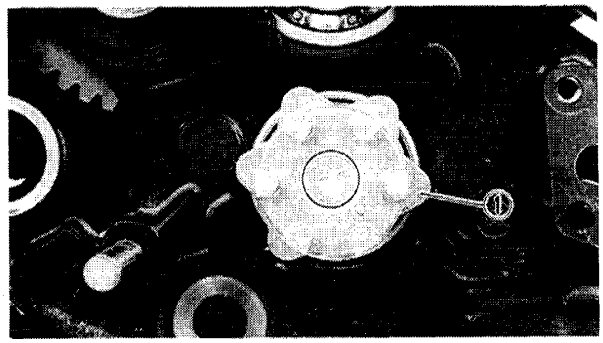


1. Remove:
    - Shift shaft ①
    - Washer ②
    - Return spring ③
    - Stopper lever ④
    - Washer ⑤
    - Circlip ⑥
    - Torsion spring ⑦
    - Collar ⑧



NOTE:

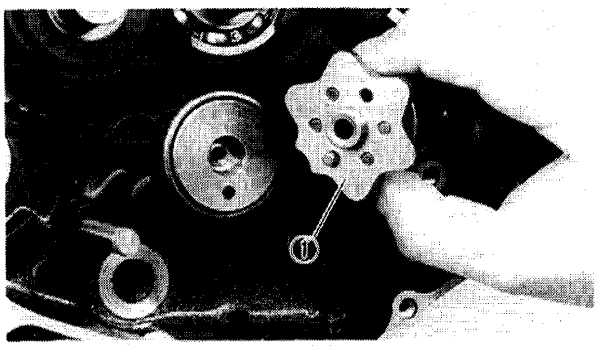
Push the shift shaft arm and the stopper lever to the arrow direction and remove them from the segment.

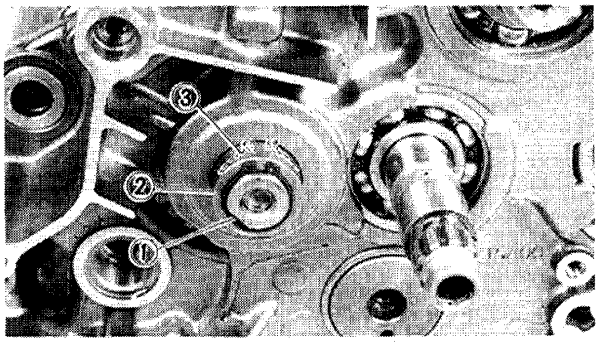


2. Remove:
   • Segment ①
   Use the torx wrench to remove.

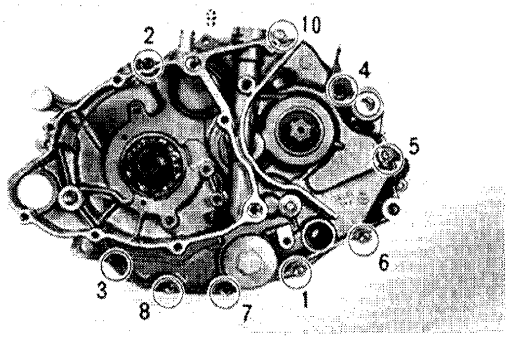
NOTE:

When removing the segment, the dowel pin will fall off. Take care not to lose the pin.





3. Remove:
   • Circlip ①
   • Collar ② (drive axle)
   • Circlip ③



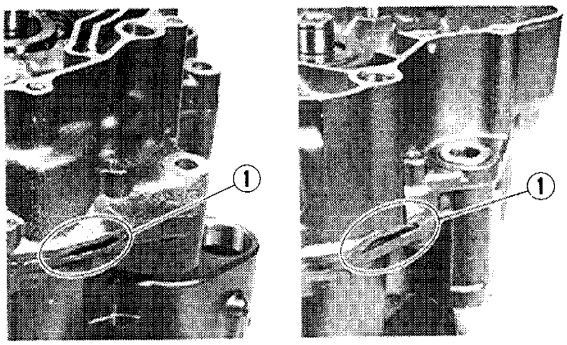
YB242009

CRANKCASE

1. Remove:
   • Bolts (crankcase)

NOTE:

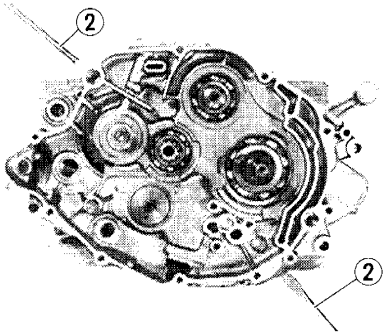
- Loosen the bolts 1/4 turn each and remove them after all are loosened.
- Loosen the bolts starting with the highest numbered one.
- The embossed numbers in the crankcase designate the tightening sequence.



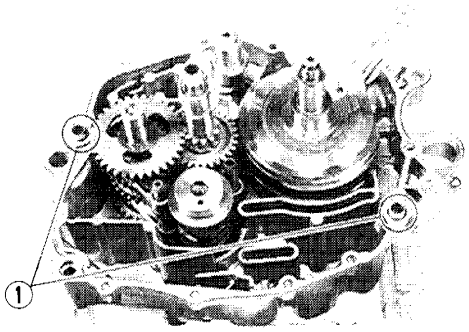
2. Remove:
   • Crankcase:
   The slot ① for separating the crankcase is provided. Using the screwdriver ②, separate the case with even force applied to both sides.

CAUTION:

- **The crankcase should be separated from right side.**
- **Separate the crankcase after checking that the shift cam segment and the drive axle circlip should be removed.**
- **Use the screwdriver only the position ① as shown.**
- **Do not damage the crankcase mating surfaces.**



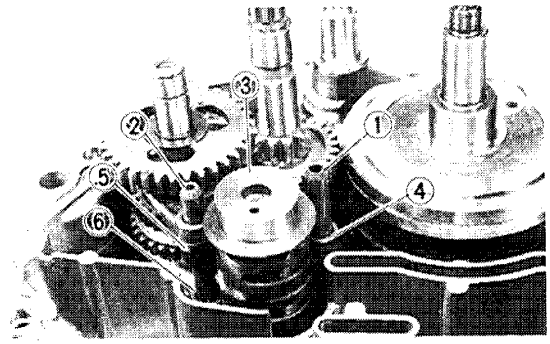
3. Remove:
   • Dowel pins ①



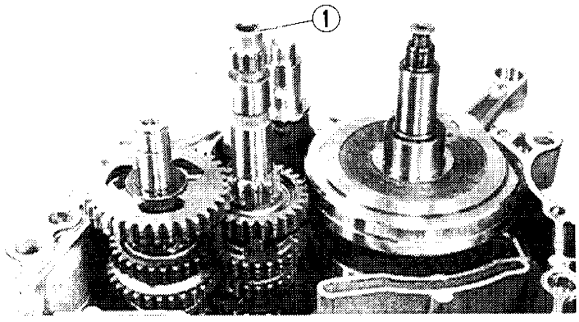
YB242010

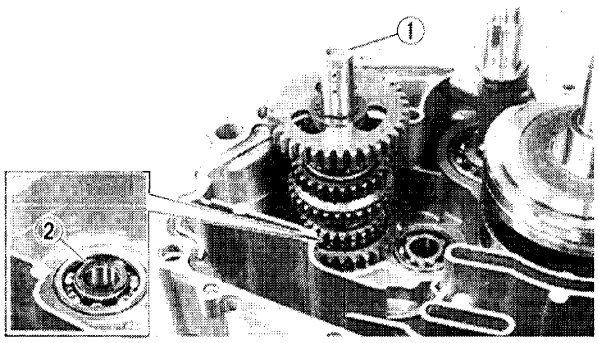
BALANCER, TRANSMISSION AND SHIFTER

1. Remove:
   • Shift fork guide bar ① (short)
   • Shift fork guide bar ② (long)
   • Shift cam ③
   • Shift fork 1 ④
   • Shift fork 2 ⑤
   • Shift fork 3 ⑥

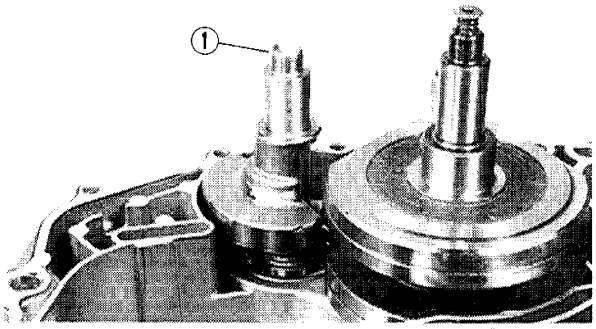


2. Remove:
   • Main axle assembly ①

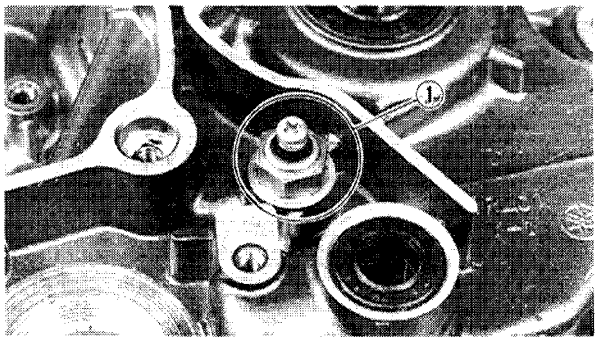




3. Remove:
   - Drive axle assembly ①
   - Washer ②



4. Remove:
   - Balancer shaft ①



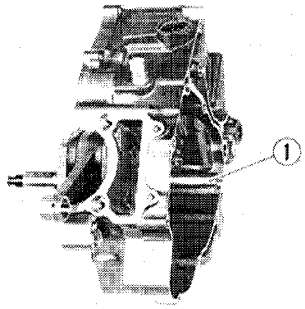
5. Remove:
   - Neutral switch ①

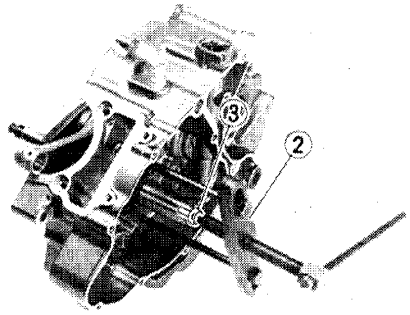
YB242011

CRANKSHAFT

1. Remove:
   - Crankshaft assembly ①

   Use the crankcase separating tool ② and adapter ③.

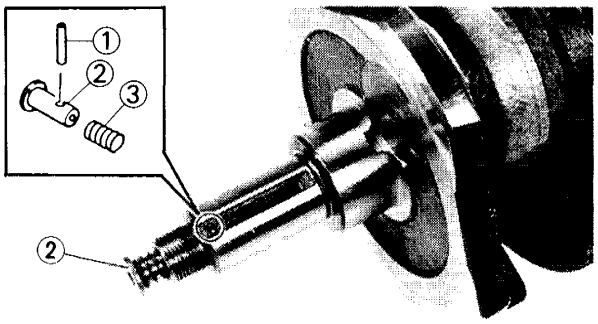




Crankcase separating tool:
P/N. YU-01135-A, 90890-01135
Adapter:
P/N. YM-1382, 90890-01382

NOTE:

Tighten the tool holding bolts, but make sure that the tool body is vertical with the crankshaft. If necessary, one screw may be backed out slightly to level tool body.

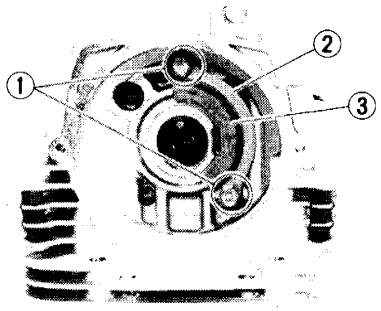


2. Remove:
   - Dowel pin ①
   - Pin with hole ②
   - Compression spring ③

ROCKER ARM AND CAMSHAFT

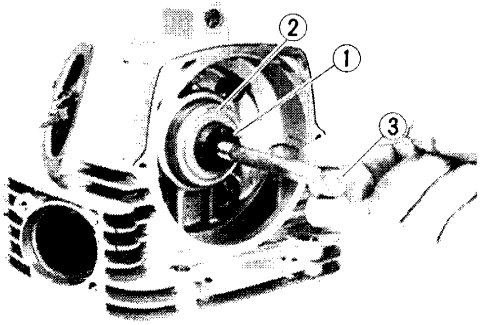
NOTE:

With the engine mounted, the camshaft and rocker arm can be maintained by removing the following parts.
- Side covers
- Seat
- Air scoops
- Fuel tank
- Tappet covers
- Cylinder head side cover



1. Straighten:
   - Lock washer tab ①

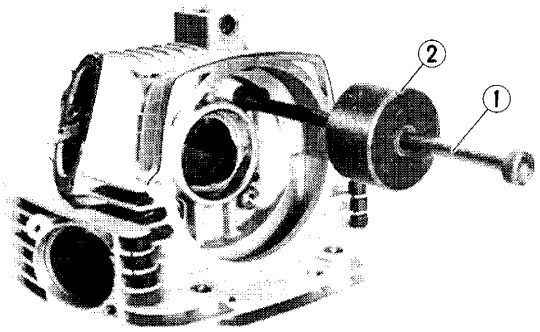
2. Remove:
   - Lock washer ②
   - Plate ③



3. Remove:
   - Camshaft ①
   - Collar ②

NOTE:

Remove the camshaft and collar by using 10 mm (0.4 in) bolt ③.



4. Remove:
   - Rocker arm shaft
   - Rocker arm

NOTE:

Remove the rocker arm shaft by the slide hammer bolt ① and weight ②.

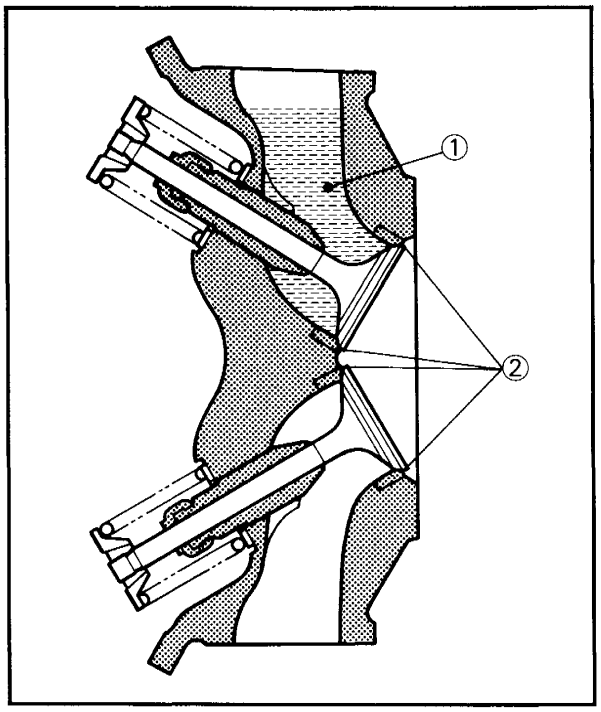
Slide hammer set:
P/N. YU-01083-A
Slide hammer bolt:
P/N. 90890-01083
Weight:
P/N. 90890-01084

YB342012

VALVES

NOTE:

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



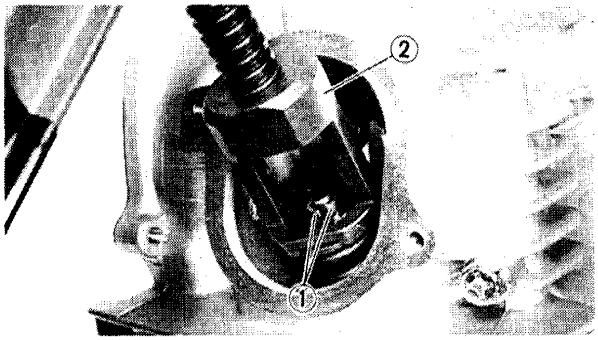
1. Check:
   - Valve sealing
     Leakage at valve seat→Inspect the valve face, valve seat and valve seat width.
     Refer to the "INSPECTION AND REPAIR—VALVE SEAT".

****

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.

****

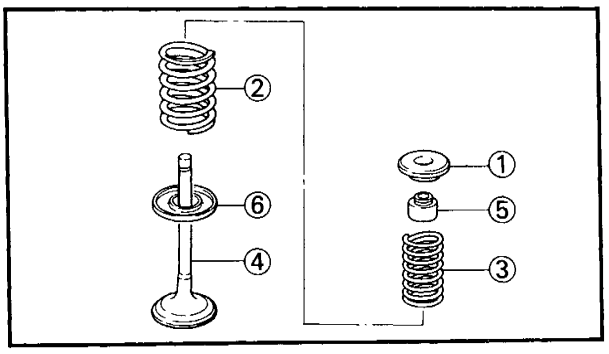


2. Remove:
   • Valve cotters ①

NOTE:

Remove the valve cotters while compressing the valve spring with the valve spring compressor ②.

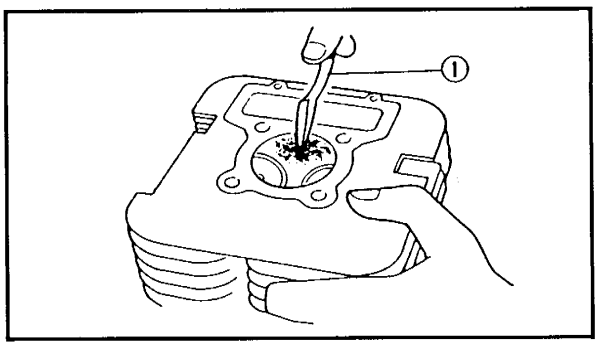
	Valve spring compressor: P/N. YM-04019, 90890-04019



3. Remove:
   • Valve retainer ①
   • Valve spring ② (outer)
   • Valve spring ③ (inner)
   • Valve ④
   • Oil seal ⑤
   • Spring seat ⑥

NOTE:

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



YB243001

INSPECTION AND REPAIR

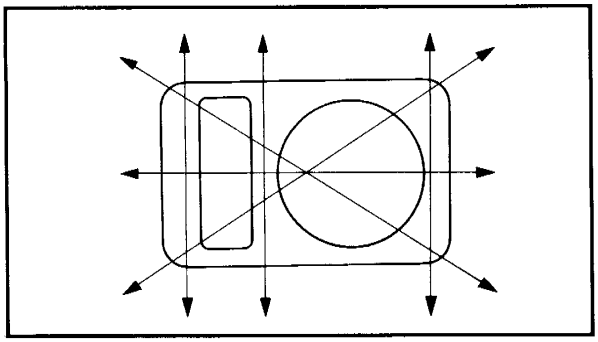
CYLINDER HEAD

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

NOTE:

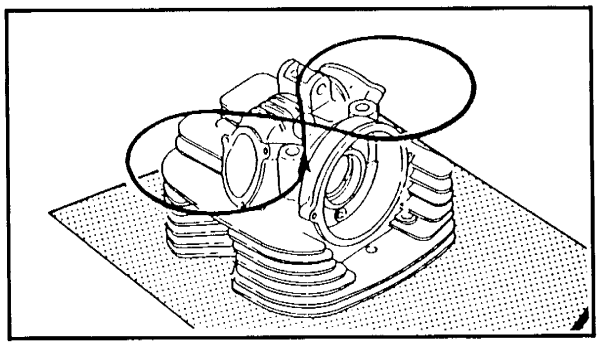
Do not use a sharp instrument and avoid damaging or scratching:
- Spark plug thread
- Valve seat

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



3. Measure:
   - Warpage
     Out of specification→Resurface.

Cylinder head warpage:
Less than 0.03 mm (0.0012 in)



4. Resurface:
   - Cylinder head

****

Resurfacement steps:

- 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.

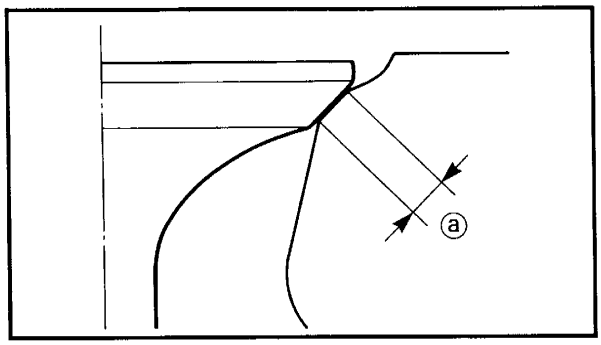
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YB243002

VALVE SEAT

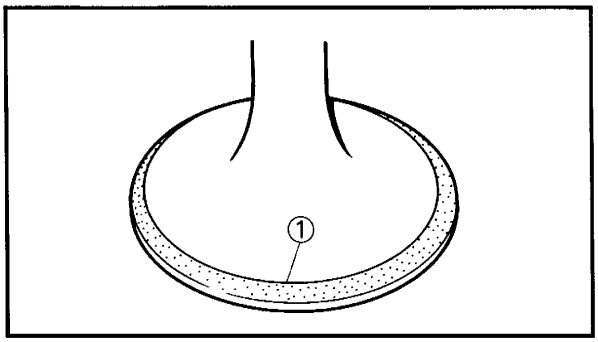
1. Eliminate:
   - Carbon deposit
     (from valve face and valve seat)

2. Inspect:
   - Valve seat
     Pitting/Wear → Refase the valve seat.



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

Valve seat width:
Intake:
0.9 ~ 1.1 mm (0.03 ~ 0.04 in)
Exhaust:
0.9 ~ 1.1 mm (0.03 ~ 0.04 in)

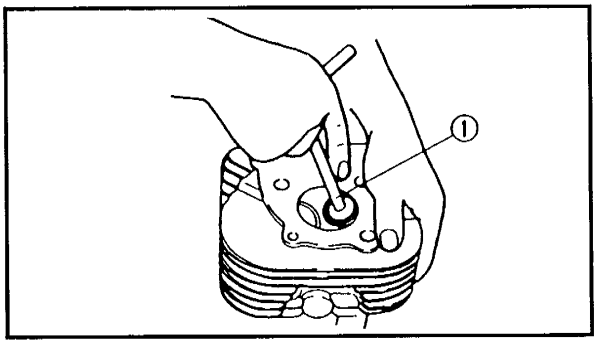


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Measurement steps:

- 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, bluding 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.

****

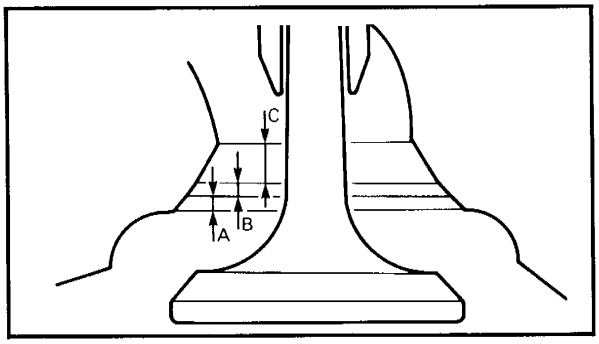


4. Reface:
   • Valve seat
   Use a 30°, 45° and 60° valve seat cutter ①.

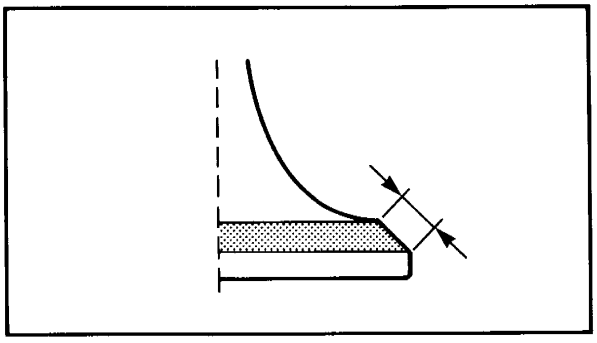
	Valve seat cutter: P/N. YM-91043

CAUTION:

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



Cut section as follows	
Section	**Cutter**
A	**30°**
B	**45°**
C	**60°**

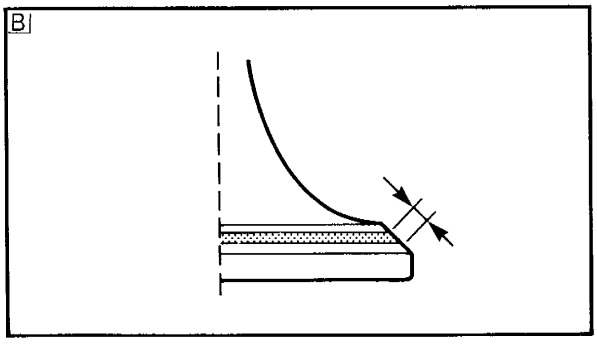


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Refacing steps:

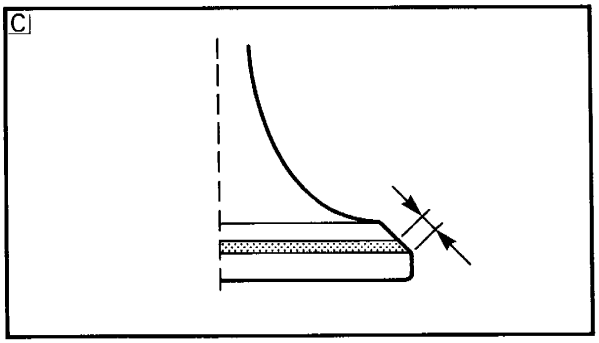
A Valve seat is centered on valve face but it is too wide.

Valve seat cutter set		Desire result
Use lightly	**30° cutter 60° cutter**	**To reduce valve seat width to 1.0 mm (0.039 in).**



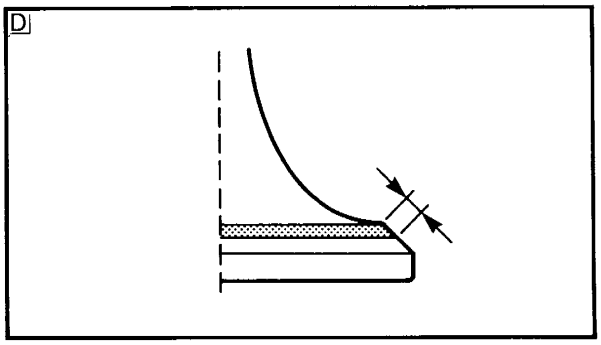
B Valve seat is in the middle of the face but it is too narrow.

Valve seat cutter set		Desired result
Use	**45° 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: 30° cutter Second: 45° 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.

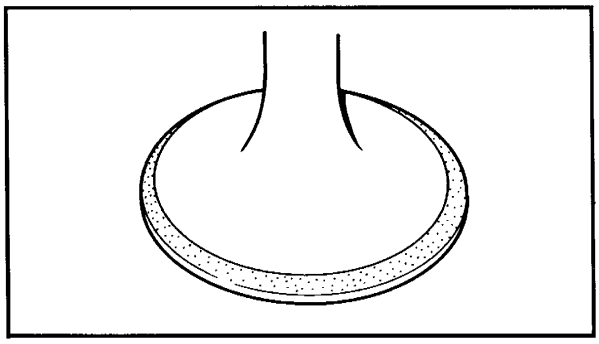
Valve seat cutter set		Desired result
Use	First: 60° cutter Second: 45° cutter	To center the seat and increase its width.

****

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.



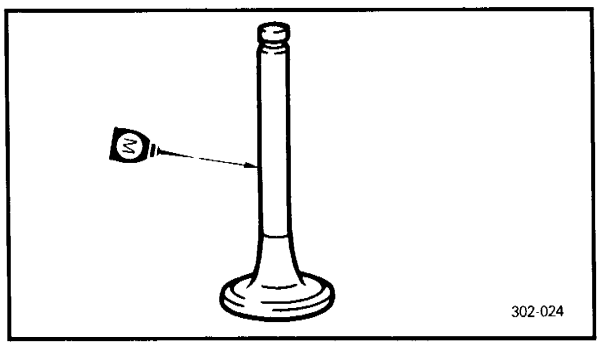
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Lapping steps:

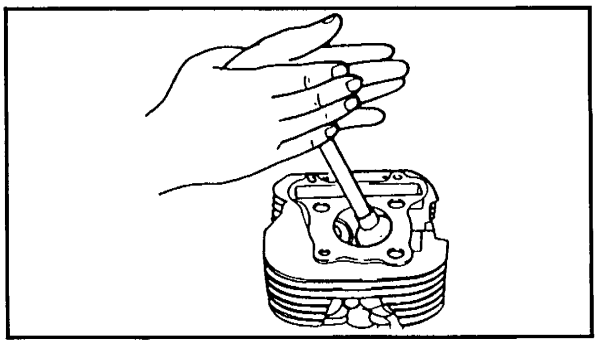
- Apply a coarse lapping compound to the valve face.

CAUTION:

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



- Apply a molybdenum disulfied 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.

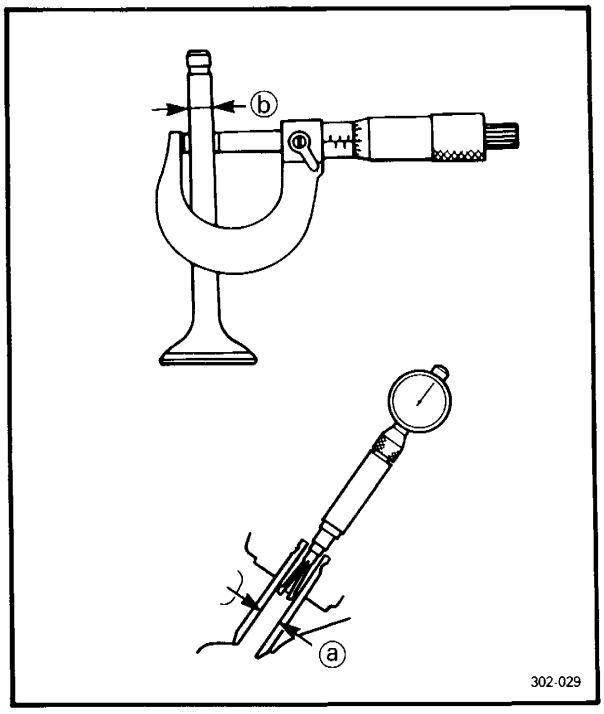
NOTE:

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 out of specification, reface and lap the valve seat.

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YB243003

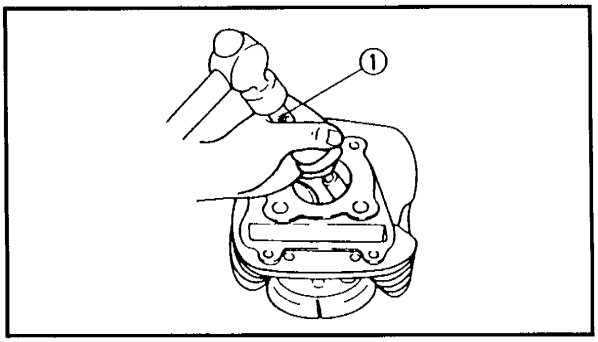
VALVE AND VALVE GUIDE

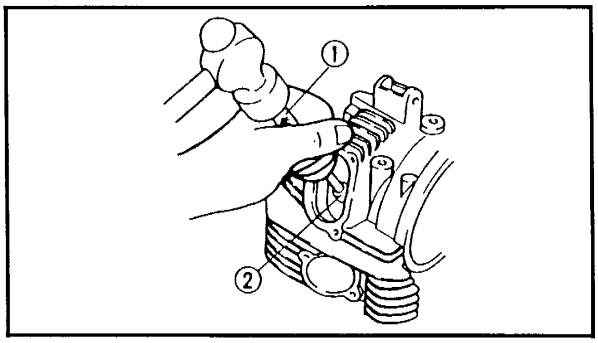
1. Measure:
   - Stem-to-guide clearance

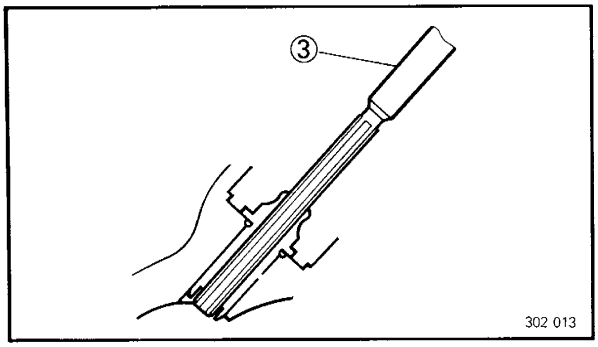
Stem-to-guide clearance =
Valve guide inside diameter ⓐ −
Valve stem diameter ⓑ

Out of specification → Replace valve guide.

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







2. Replace:
   • Valve guide

****

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 6 mm (0.24 in):
P/N. YM-04064-A, 90890-04064
Valve guide reamer 6 mm (0.24 in):
P/N. YM-04066, 90890-04066
Valve guide installer 6 mm (0.24 in):
P/N. YM-04065-A, 90890-04065

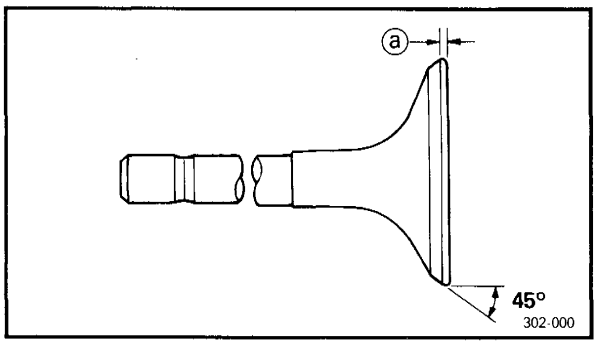
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NOTE:

Reface the valve seat after replacing the valve guide.

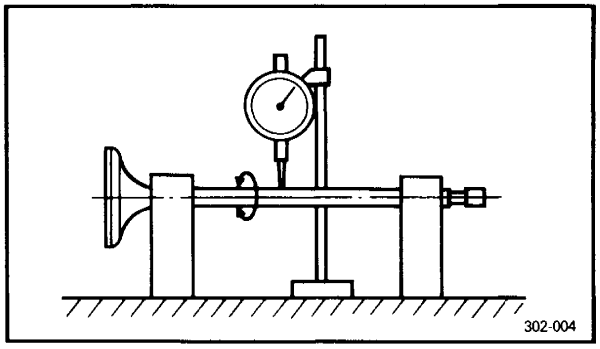
3. Eliminate:
   • Carbon deposit
   (from valve face)

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



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

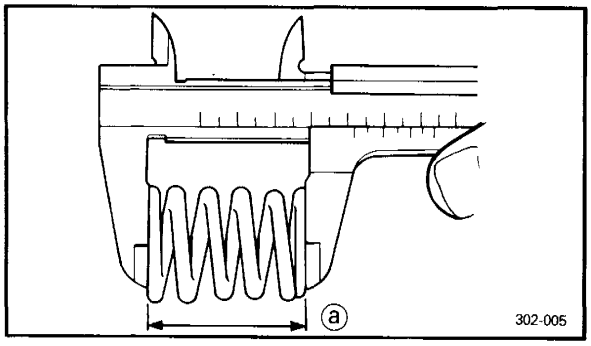
Margin thickness:
0.8 ~ 1.2 mm (0.03 ~ 0.05 in)



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

Runout:
Less than 0.010 mm (0.0004 in)

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

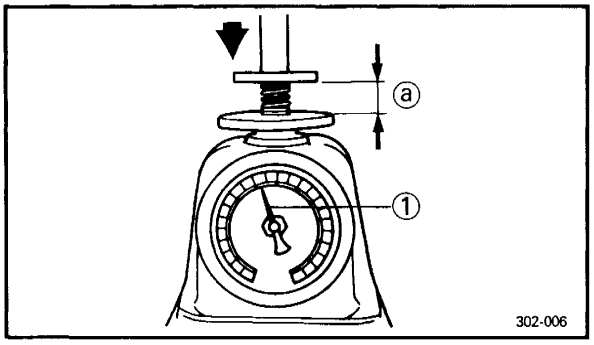


YB243004

VALVE SPRING

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

Free length (valve spring):		
	Inner spring	Outer spring
Intake	36.17 mm (1.424 in)	36.63 mm (1.442 in)
Exhaust	36.17 mm (1.424 in)	36.63 mm (1.442 in)

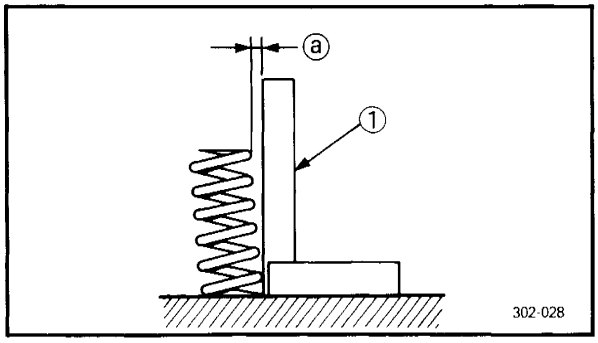


2. Measure:
   • Compressed force (valve spring) ①
   Out of specification → Replace.

ⓐ Installed length

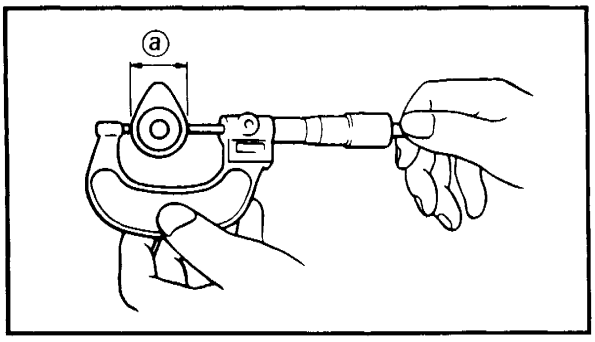
Compressed force:

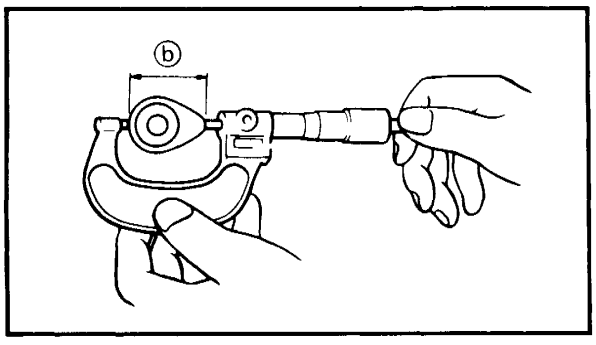
	Inner spring at 30.5 mm (1.20 in)	Outer spring at 36.6 mm (1.44 in)
Intake	7.7 ~ 9.4 kg (16.98 ~ 20.72 lb)	13.1 ~ 16.1 kg (28.88 ~ 35.49 lb)
Exhaust	7.7 ~ 9.4 kg (16.98 ~ 20.72 lb)	13.1 ~ 16.1 kg (28.88 ~ 35.49 lb)



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

Spring tilt:
Intake:
Less than 1.6 mm (0.063 in)
Exhaust:
Less than 1.6 mm (0.063 in)





YB243005

CAMSHAFT

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

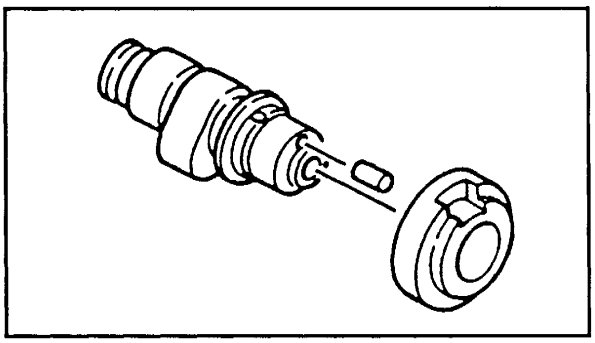
2. Measure:
   • Cam lobes length ⓐ and ⓑ
   Out of specification → Replace.

Cam lobes length:
Intake:
ⓐ 30.10 ~ 30.20 mm (1.185 ~ 1.189 in)
ⓑ 36.51 ~ 36.61 mm (1.437 ~ 1.441 in)

Cam lobes length:
Exhaust:
ⓐ 30.15 ~ 30.25 mm
(1.187 ~ 1.191 in)
ⓑ 36.51 ~ 36.61 mm
(1.437 ~ 1.441 in)

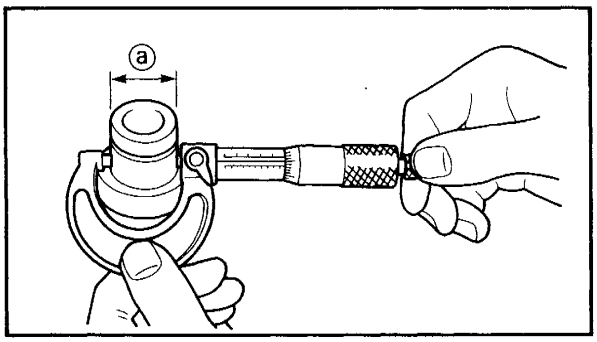
3. Measure:
   • Runout (camshaft)
   Out of specification → Replace.

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



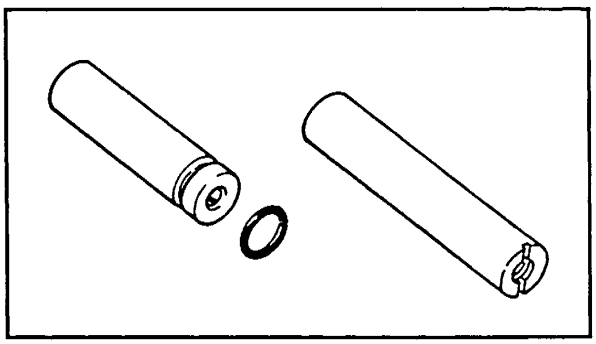
4. Measure:
   • Camshaft-to-cap clearance
   Out of specification → Measure bearing diameter (camshaft).

Camshaft-to-cap clearance:
0.020 ~ 0.061 mm
(0.0008 ~ 0.0024 in)



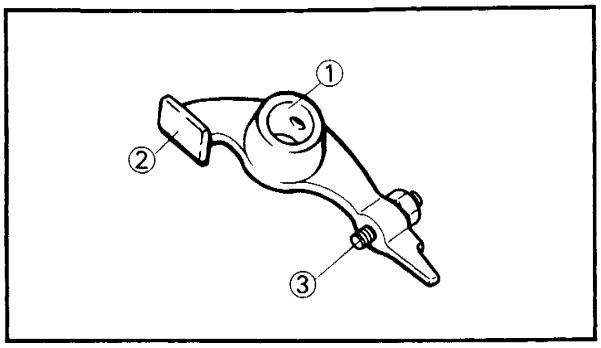
5. Measure:
   • Bearing diameter ⓐ (camshaft)
   Out of specification → Replace camshaft.
   Within specification → Replace cap (coller).

Bearing diameter (camshaft):
24.960 ~ 24.980 mm
(0.9827 ~ 0.9835 in)



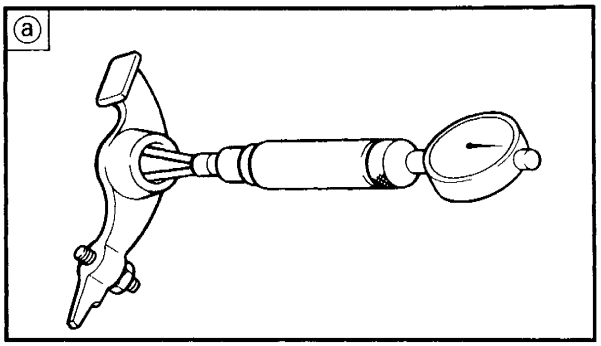
ROCKER ARM AND ROCKER ARM SHAFT

1. Inspect:
   • Rocker arm shaft
   Blue discoloration/Grooves → Replace, then inspect lubrication system.



2. Inspect:
   - Rocker arm shaft hole ①
   - Cam lobe contact surface ②
   - Adjuster surface ③

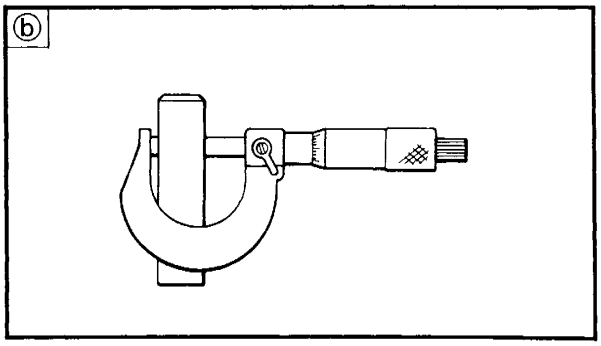
   Wear/Pitting/Scratches/Blue discoloration
   → Replace, then inspect lubrication system.



3. Measure:
   - Arm-to-shaft clearance.

Arm-to-shaft clearance =
Rocker arm inside diameter ⓐ − Rocker arm shaft outside diameter ⓑ

Out of specification → Replace as a set.



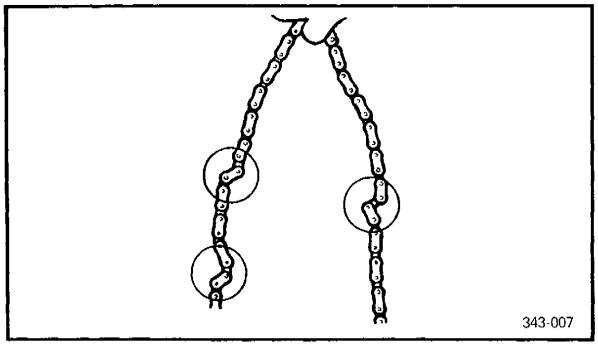
Arm-to-shaft clearance:
0.009 ~ 0.037 mm
(0.0004 ~ 0.0015 in)

YB243007

TIMING CHAIN, SPROCKET, CHAIN GUIDE AND TENSIONER

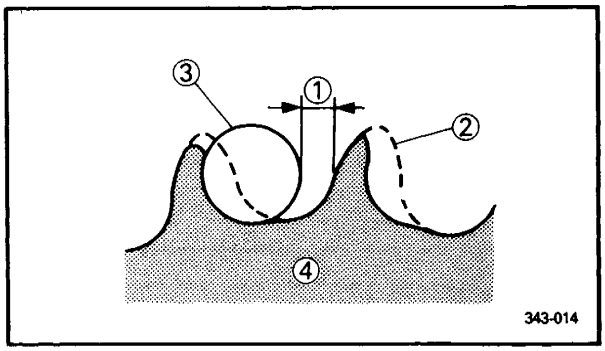
1. Inspect:
   - Timing chain

   Stiff/Cracks → Replace timing chain and sprocket as a set.

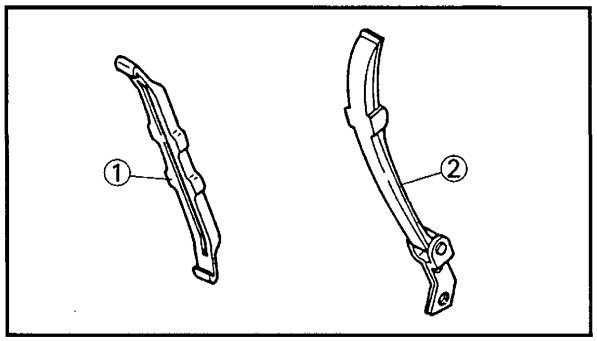


2. Inspect:
   - Cam sprocket

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

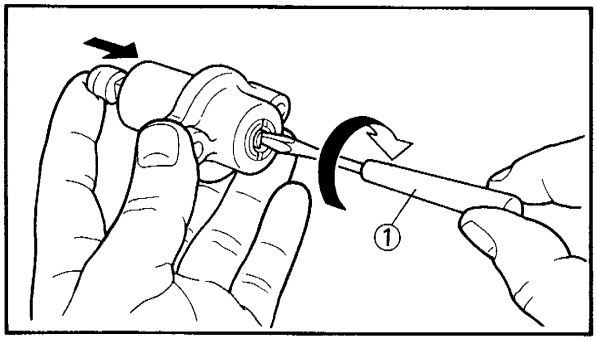


① 1/4 tooth
② Correct
③ Roller
④ Sprocket



3. Inspect:
   - Chain guide ① (exhaust side)
   - Chain guide ② (intake side)

   Wear/Damage→Replace.



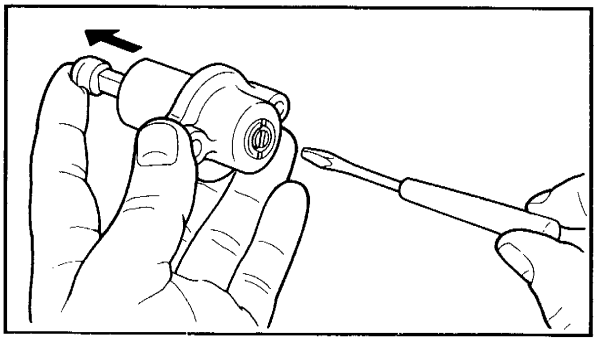
4. Check:
   - Timing chain tensioner play

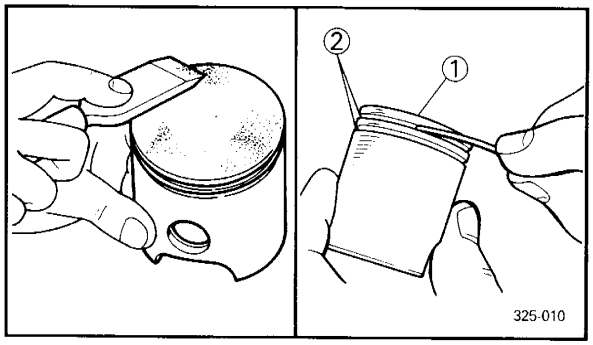
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Checking steps:

- While pressing the tensioner rod lightly with fingers, use a thin screwdriver ① and wind the tensioner rod up fully clockwise.
- When releasing the screwdriver by pressing lightly with fingers, make sure that the tensioner rod will come out smoothly.
- If not, replace the tensioner assembly.

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YB243008

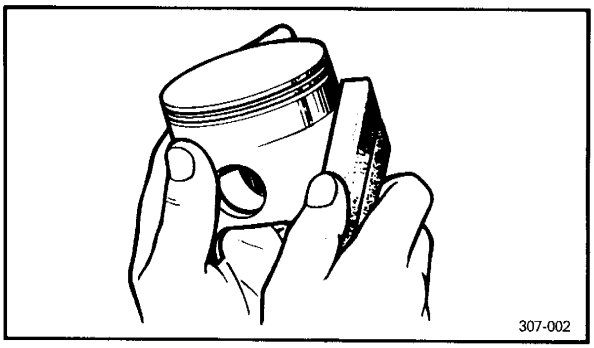
CYLINDER AND PISTON

1. Eliminate:
   - Carbon deposits

   (from the piston crown and ring grooves.)

2. Inspect:
   - Piston wall

   Wear/Scratches/Damage→Replace.



3. Eliminate:
   - Score marks and lacquer deposits

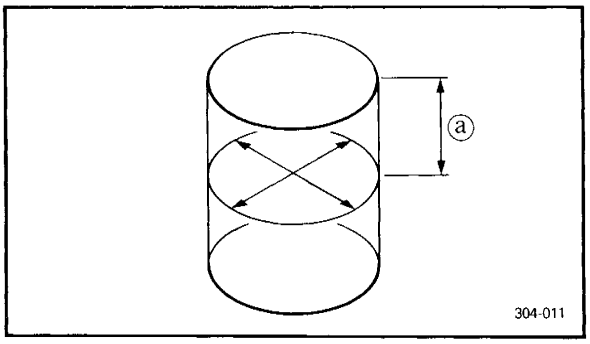
   (from the side of the piston.)

   Use a 600~800 grit wet sandpaper.

NOTE:

Sand in a crisscross pattern. Do not sand excessively.

4. Inspect:
   • Cylinder wall
   Wear/Scratches → Rebore or replace.



5. Measure:
   • Piston-to-cylinder clearance

****

Measurement steps:

First steps

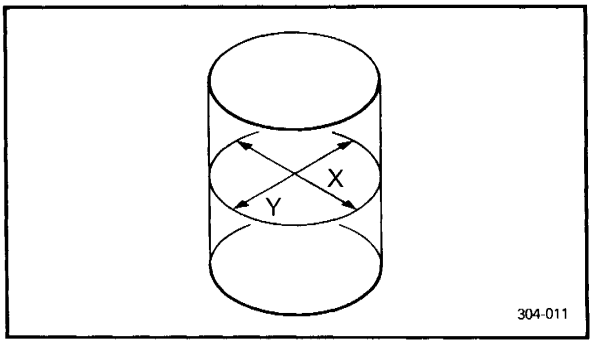
- Measure the cylinder bore "C" with a cylinder bore gauge.

ⓐ 40 mm (1.6 in) from the cylinder top

NOTE:

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

Cylinder bore "C":
69.970 ~ 70.020 mm
(2.7547 ~ 2.7567 in)
< Limit: 70.1 mm (2.76 in) >



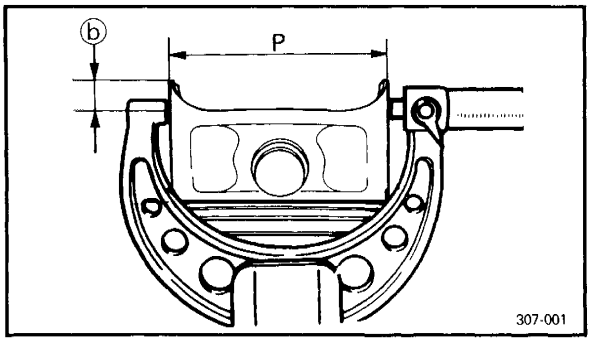
C = (X + Y)/2

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

2nd steps

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

ⓑ 4.0 mm (0.16 in) from the piston bottom edge



Piston skirt diameter "P":
69.925 ~ 69.975 mm
(2.7530 ~ 2.7549 in)

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

3rd steps

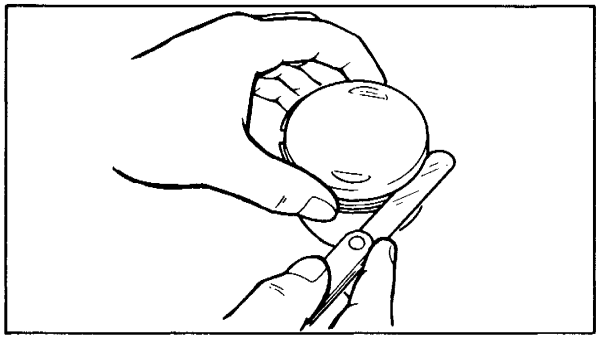
- Find the piston-to-cylinder clearance with following formula.

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

Piston-to-cylinder clearance:
0.035 ~ 0.055 mm
(0.0014 ~ 0.0022 in)
<Limit: 0.10 mm (0.004 in)>

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

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YB243009

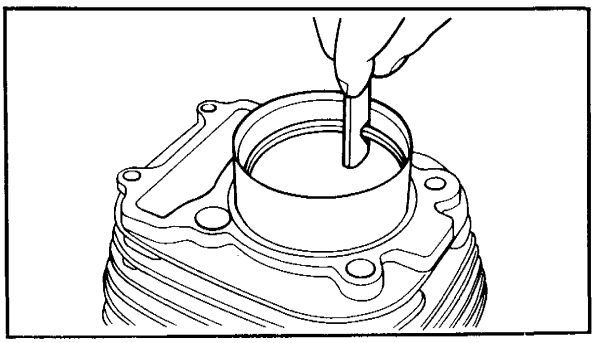
PISTON RING

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:
0.03 ~ 0.07 mm
(0.001 ~ 0.003 in)
2nd ring:
(0.02 ~ 0.06 mm)
(0.001 ~ 0.002 in)



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

NOTE:

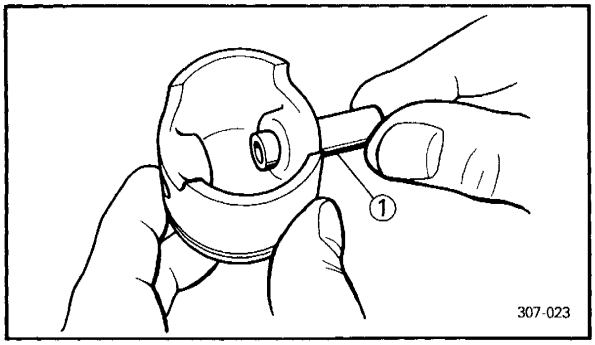
Push the ring with the piston crown so that the ring will be at a right angle to cylinder bore.

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.

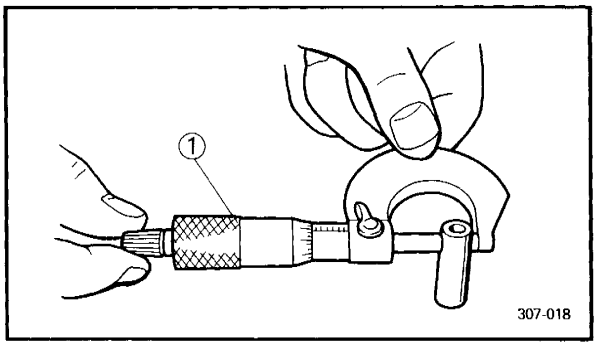
End gap:
Top ring:
0.15 ~ 0.30 mm
(0.006 ~ 0.012 in)
2nd ring:
0.15 ~ 0.30 mm
(0.006 ~ 0.012 in)
Oil ring:
0.30 ~ 0.90 mm (0.012 ~ 0.035 in)



YB243010

PISTON PIN

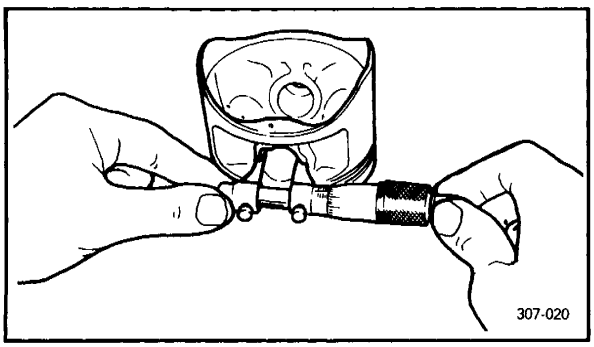
1. Inspect:
   • Piston pin ①
   Blue discoloration/groove → Replace, then inspect lubrication system.



2. Measure:
   • Piston-pin outside diameter
   Out of specification → Replace.

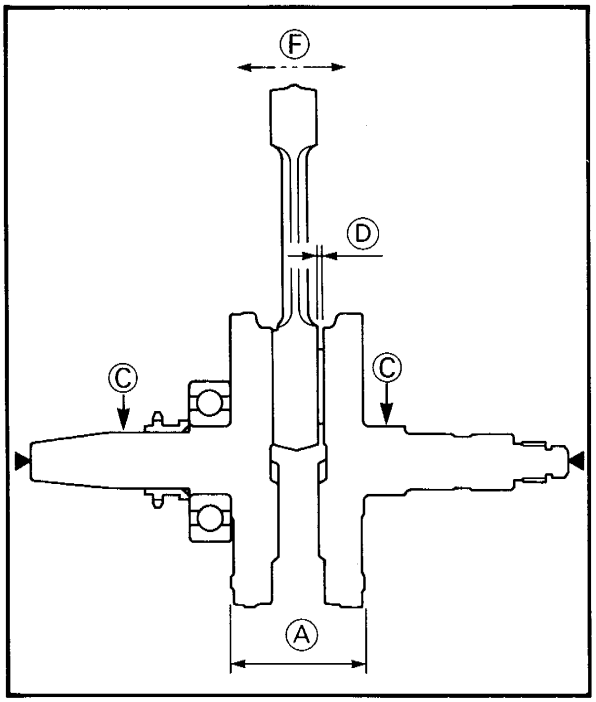
Outside diameter (piston pin):
15.991 ~ 16.000 mm
(0.6296 ~ 0.6299 in)

① Micrometers



3. Measure:
   • Piston-pin bore inside diameter
   Out of specification → Replace.

Piston pin bore inside diameter:
16.002 ~ 16.013 mm
(0.6300 ~ 0.6304 in)



CRANKSHAFT

1. Measure:
   - Crank width Ⓐ
     Out of specification→Replace crankshaft.

Crank width:
55.95 ~ 56.00 mm
(2.203 ~ 2.205 in)

   - Runout Ⓒ
     Out of specification→Replace crankshaft and/or bearing.

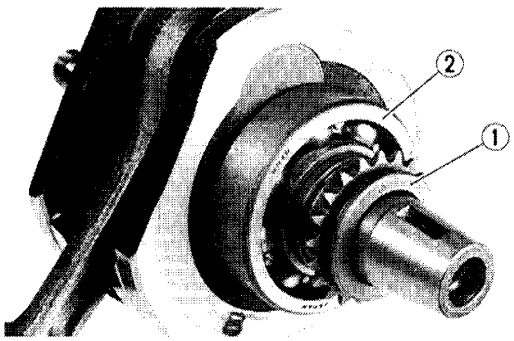
Runout limit:
0.03 mm (0.001 in)

   - Big end side clearance Ⓓ
     Out of specification→Replace big end bearing, crank pin and/or connecting rod.

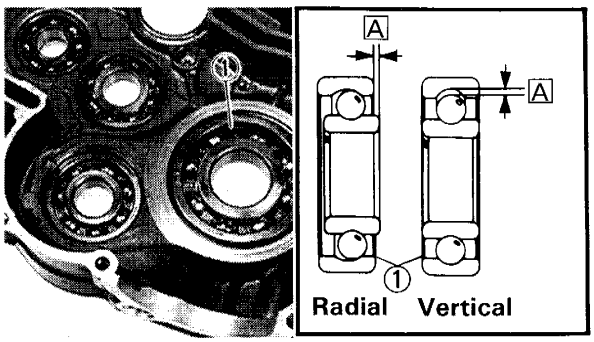
Big end side clearance:
0.35 ~ 0.65 mm (0.013 ~ 0.026 in)

   - Small end free play Ⓕ
     Out of specification→Replace connecting rod.

Big end side clearance:
0.8 mm (0.03 in)

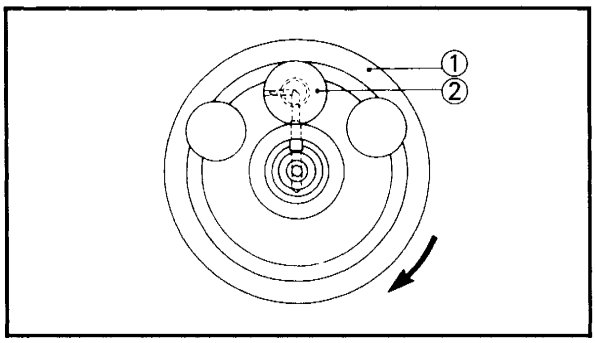


2. Inspect
   - Crankshaft sprocket ①
     Wear/Damage→Replace crankshaft.
   - Crank bearing ②
     Abnormal noise/Turn roughly/Free play→Replace crankshaft.



3. Inspect:
   - Crank bearing ①
     Abnormal noise/Turn roughly/Free play→Replace crankshaft.

A Free play

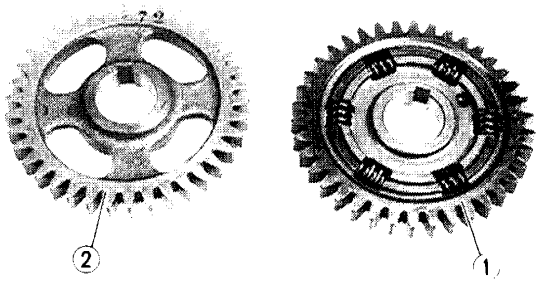


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Crankshaft reassembling point:

The crankshaft ① and the crank pin ② oil passages must be properly interconnected with a tolerance of less than 1 mm (0.04 in).

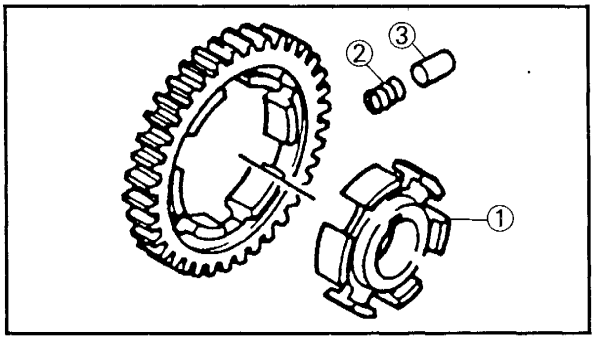
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BALANCER DRIVE GEAR AND BALANCER GEAR

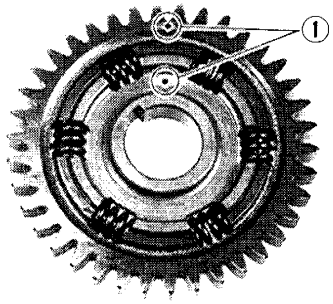
1. Inspect:
   - Balancer drive gear teeth ①
   - Balancer gear teeth ②

   Wear/Damage→Replace both gears.



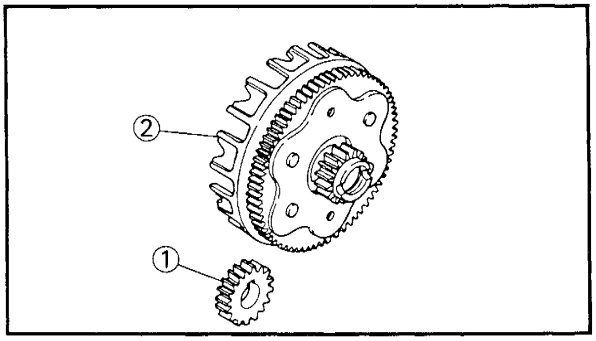
2. Inspect:
   - Buffer boss ①
   - Compression spring ②
   - Dowel pin ③

   Wear/Cracks/Damage→Replace.



3. Inspect:
   - Match marks ①

   If they are not aligned→Align match marks as shown.



YB243013

PRIMARY DRIVE

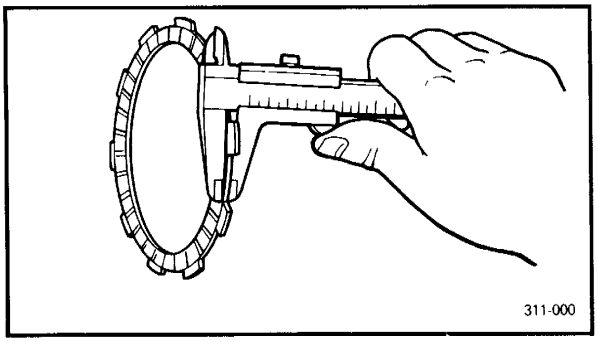
1. Inspect:
   - Primary drive gear teeth ①
   - Primary driven gear teeth ②

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

YB243014

CLUTCH

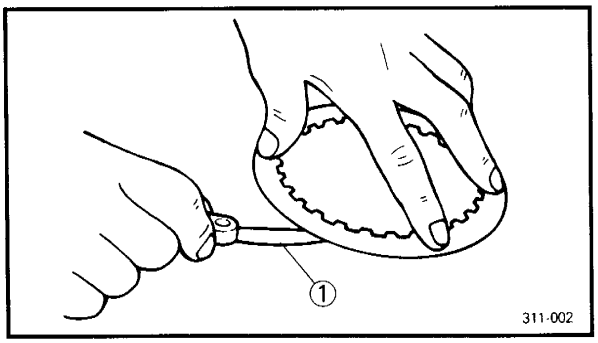
1. Inspect:
   - Friction plate
     Damage/Wear → Replace friction plate as a set.



2. Measure:
   - Friction plate thickness
     Out of specification → Replace friction plate as a set.
     Measure at all four points.

	Thickness	Wear limit
Type "A" (1 pcs.)	2.90 ~ 3.10 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)
Type "B" (5 pcs.)	2.90 ~ 3.10 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)

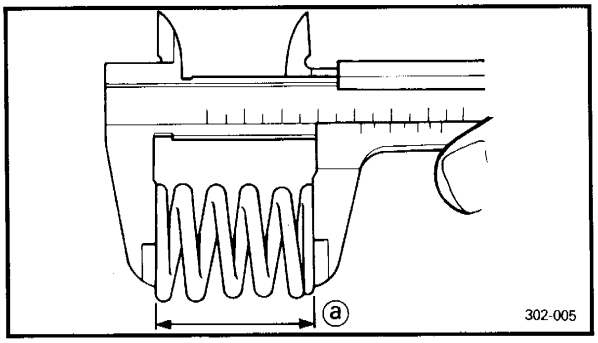
3. Inspect:
   - Clutch plate
     Damage → Replace clutch plate as a set.



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

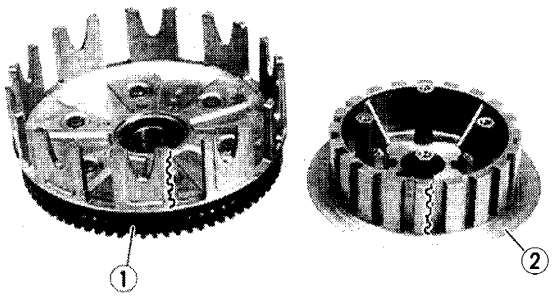
Warp limit:
Less than 0.2 mm (0.008 in)

5. Inspect:
   • Clutch spring
     Damage → Replace as a set.



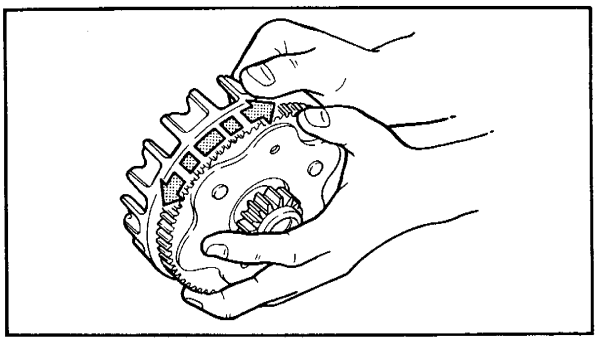
6. Measure:
   • Clutch spring free length ⓐ
     Out of specification → Replace spring as a set.

Free length (clutch spring):
37.3 mm (1.47 in)
<Limit: 35.3 mm (1.39 in)>

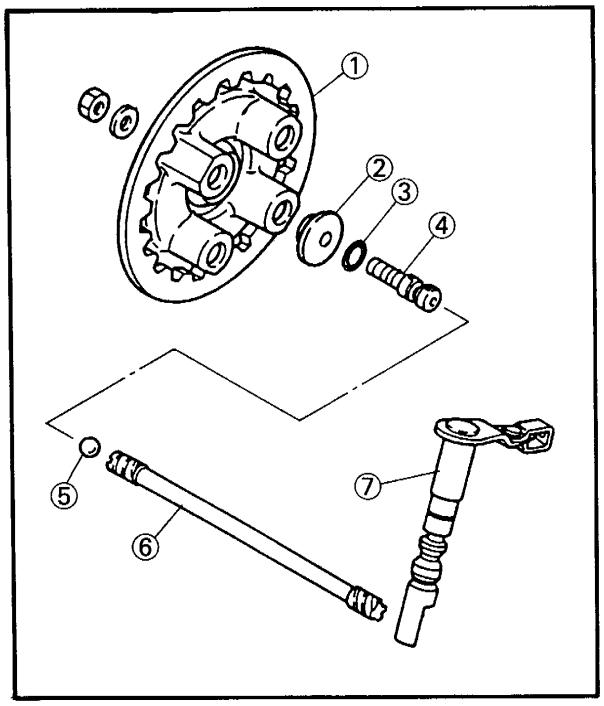


7. Inspect:
   • Dogs on the primary driven gear ①
     Scoring/Wear/Damage → Deburr or replace.
   • Clutch boss splines ②
     Scoring/Wear/Damage → Replace clutch boss.

NOTE:
Scoring on the clutch housing dogs and the clutch boss splines will cause erratic operation.



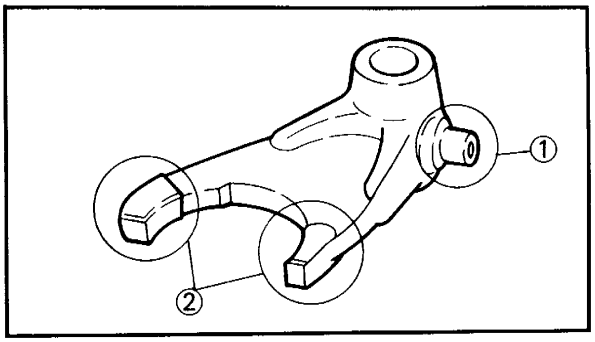
8. Check:
   • Circumferential play
     Free play exists → Replace.



9. Inspect:
   - Pressure plate ①
   - Push plate ②
   - O-ring ③
   - Push rod 1 ④
   - Ball ⑤

   Wear/Damage→Replace.
   - Push rod 2 ⑥
   - Push lever ⑦

   Wear/Bend/Damage→Replace.

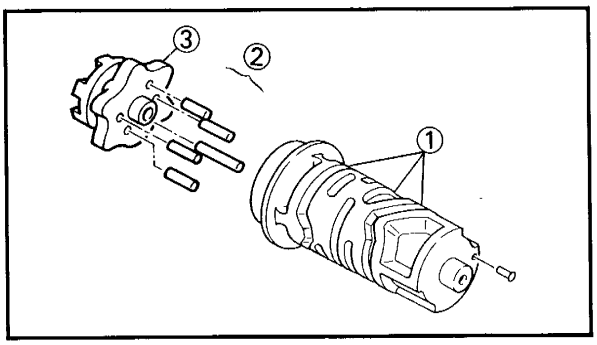


YB243015

TRANSMISSION AND SHIFTER

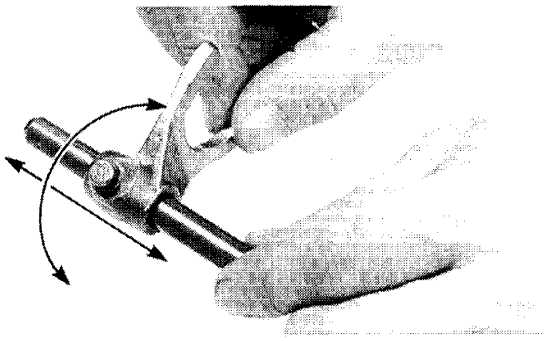
1. Inspect:
   - Shift fork cam follower ①
   - Shift fork pawl ②

   Scoring/Bends/Wear→Replace.



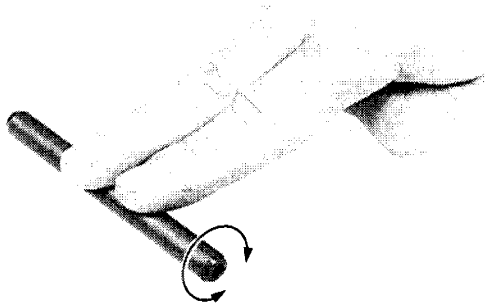
2. Inspect:
   - Shift cam groove ①
   - Dowel pin ②
   - Shift cam segment ③

   Wear/Damage→Replace.



3. Check:
   - Shift fork movement

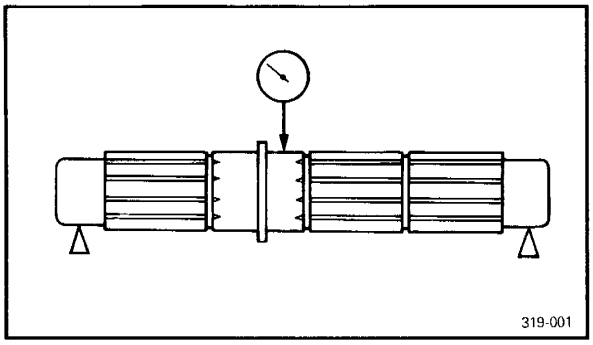
   Unsmooth operation→Replace shift fork and/or guide bar.



4. Check:
   • Guide bar
   Roll the guide bar on a flat surface.
   Bends → Replace.

⚠ WARNING

Do not attempt to straighten a bent guide bar.

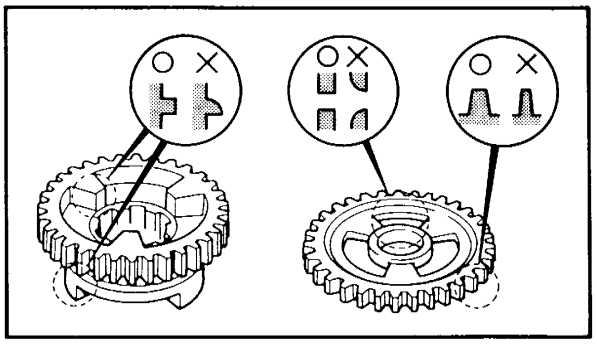


5. Measure:
   • Runout (drive axle and main axle)
   Out of specification → Replace.

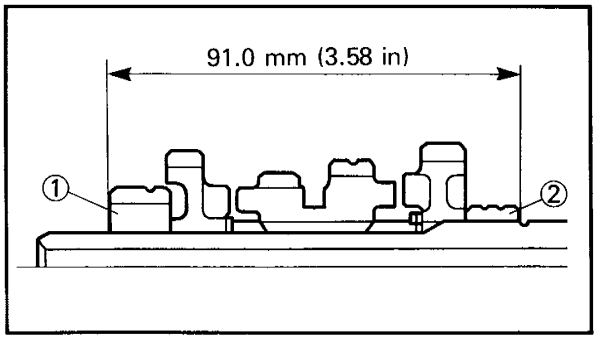
Runout:
Less than 0.08 mm (0.003 in)

⚠ WARNING

Do not attempt to straighten a bent axle.



6. Inspect:
   • Gear teeth
   Blue discoloration / Pitting / Wear → Replace.
   • Mated dogs
   Rounded edges / Cracks / Missing portions → Replace.

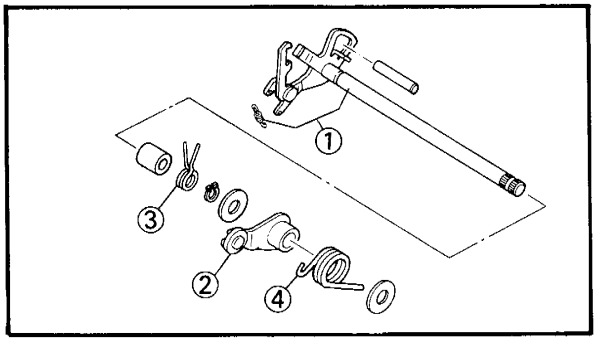


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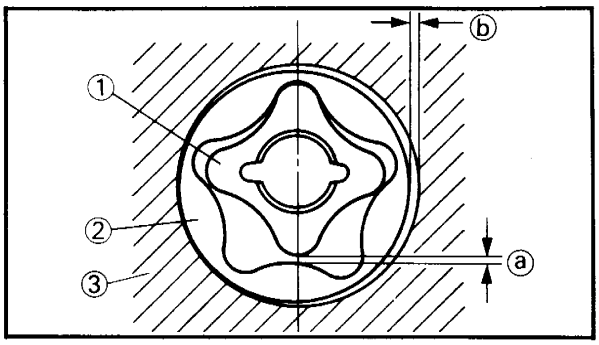
Reassembling point:

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

****



7. Inspect:
   - Shift shaft ①
   - Stopper lever ②
     Damage/Bends/Wear→Replace.
   - Torsion spring ③
   - Return spring ④
     Cracks/Damage→Replace.

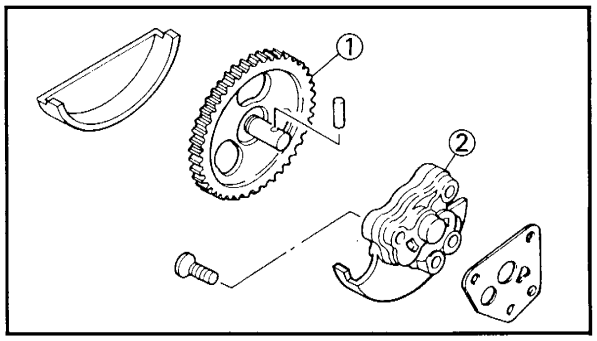


YB243016

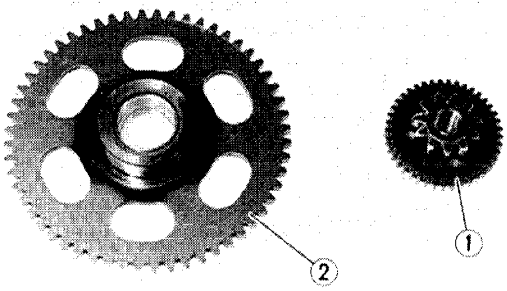
OIL PUMP AND STRAINER

1. 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:
0.15 mm (0.006 in)
Side clearance:
0.04~0.09 mm (0.002~0.004 in)



2. Inspect:
   - Oil pump dirven gear ①
   - Oil pump ②
     Wear/Cracks/Damage→Replace.

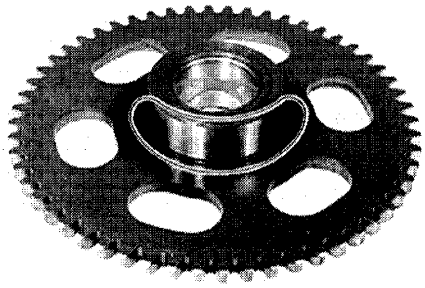


YB243012

ELECTRIC STARTER DRIVE

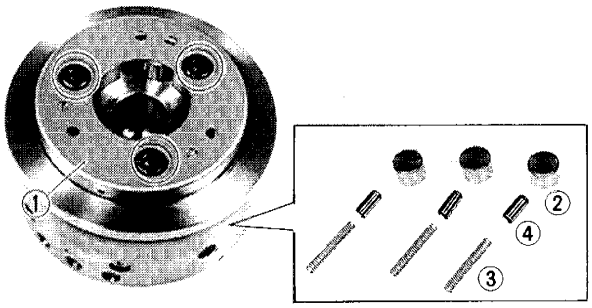
1. Inspect:
   - Starter idle gear 1 teeth ①
   - Starter wheel gear teeth ②

   Burrs/Chips/Roughness/Wear→Replace.



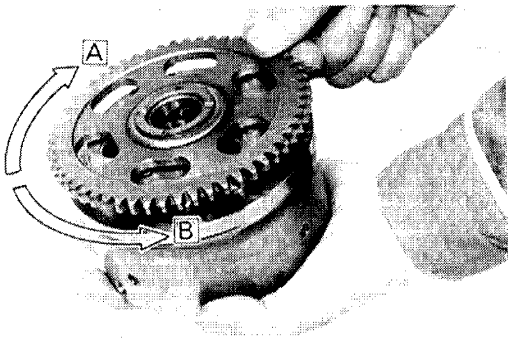
2. Inspect:
   - Starter wheel gear (contacting surfaces)

   Pitting/Wear/Damage→Replace.



3. Inspect:
   - Starter clutch assembly ①
   - Dowel pin ②
   - Compression spring ③
   - Spring cap ④

   Wear/Damage→Replace.



4. Check:
   - Starter clutch operation

****

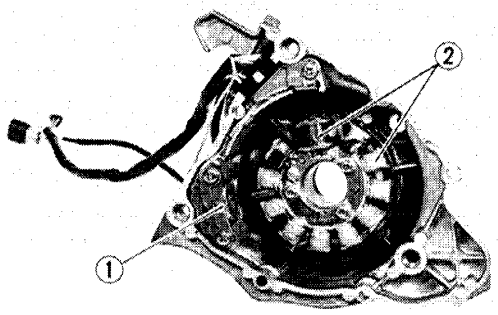
Checking steps:

- Install the starter wheel gear to the starter clutch, and hold the starter clutch.
- When turning the starter wheel gear clockwise [A], the starter clutch and the wheel gear should be engaged.

  If not, the starter clutch is faulty. Replace it.
- When turning the starter wheel gear counter-clockwise [B], the starter clutch gear should turn freely.

  If not, the starter clutch is faulty. Replace it.

****



5. Inspect:
   - Pulser coil ①
   - Charge/startor coil ②

   Damage→Replace.

YB243018

CRANKCASE

1. Thoroughly wash the case halves i 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.

YB243019

BEARING AND OIL SEAL

1. Inspect:
   - Bearings

     Clean and lubricate, then rotate inner race with finger.

     Roughness→Replace.

CAUTION:

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

2. Inspect:
   - Oil seals

     Damage/Wear→Replace.

YB243020

CIRCLIP AND WASHER

1. Inspect:
   - Circlips
   - Washers

   Damage/Looseness/Bends→Replace.

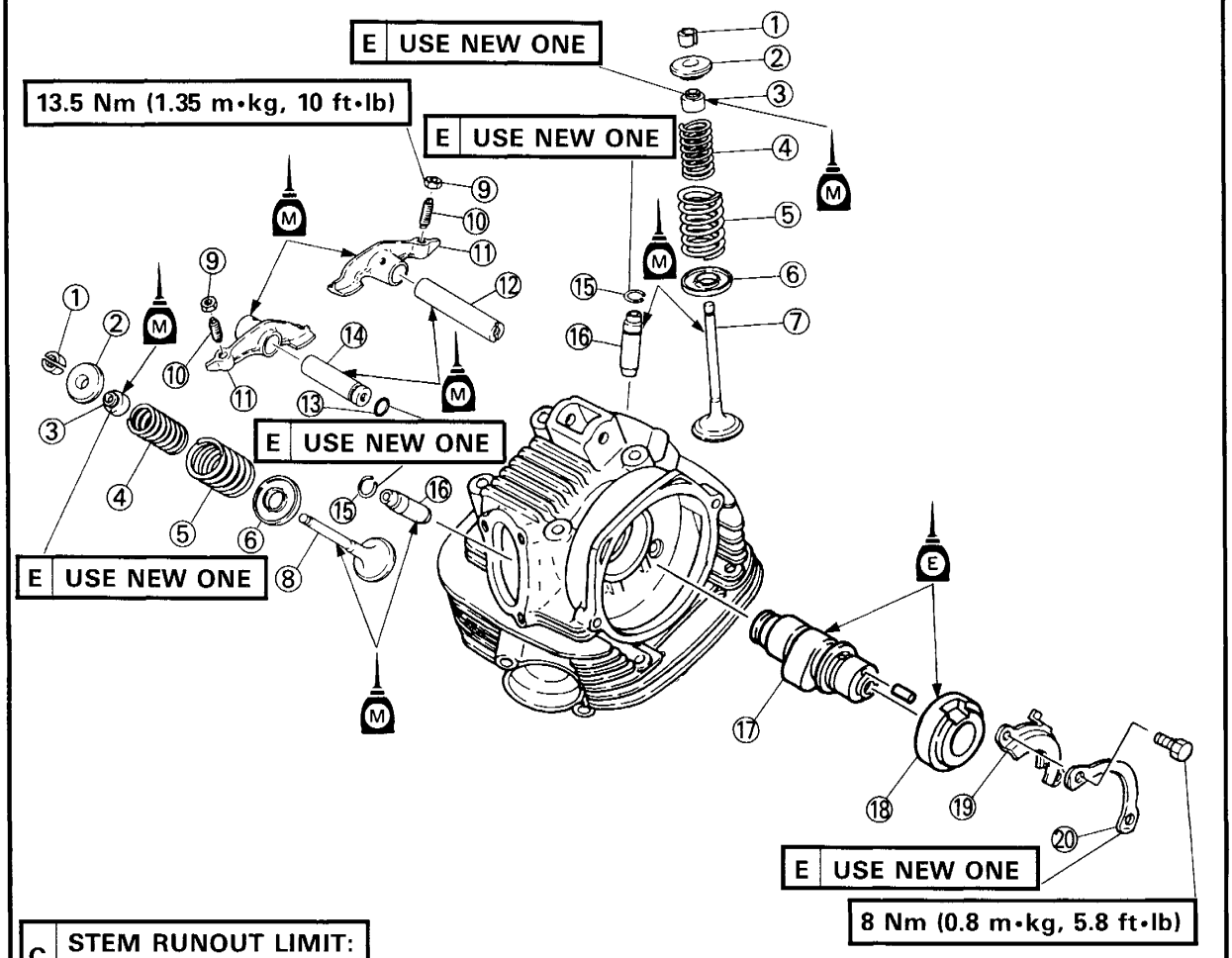
ENGINE ASSEMBLY AND ADJUSTMENT

VALVES, ROCKER ARM AND CAMSHAFT

① Valve cotter
② Valve spring retainer
③ Valve stem seat
④ Valve spring (inner)
⑤ Valve spring (outer)
⑥ Valve spring seat
⑦ Valve (intake)
⑧ Valve (exhaust)
⑨ Locknut
⑩ Adjuster
⑪ Rocker arm
⑫ Rocker arm shaft (intake)
⑬ O-ring
⑭ Rocker arm shaft (exhaust)
⑮ Circlip
⑯ Valve guide
⑰ Camshaft
⑱ Collar
⑲ Plate
⑳ Lock washer

B	VALVE SPRING TILT LIMIT: Inner spring: 2.5° or 1.6 mm (0.063 in) Outer spring: 2.5° or 1.6 mm (0.063 in)

A	VALVE CLEARANCE (COLD): Intake: 0.05 ~ 0.09 mm (0.002 ~ 0.004 in) Exhaust: 0.15 ~ 0.19 mm (0.006 ~ 0.007 in)



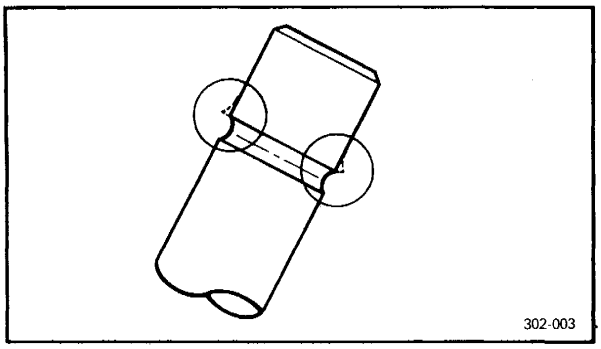
C	STEM RUNOUT LIMIT: 0.01 mm (0.0004 in)

D	VALVE SEAT WIDTH: 0.9 ~ 1.1 mm (0.03 ~ 0.04 in)

YB244000
ENGINE ASSEMBLY AND ADJUSTMENT

⚠ WARNING

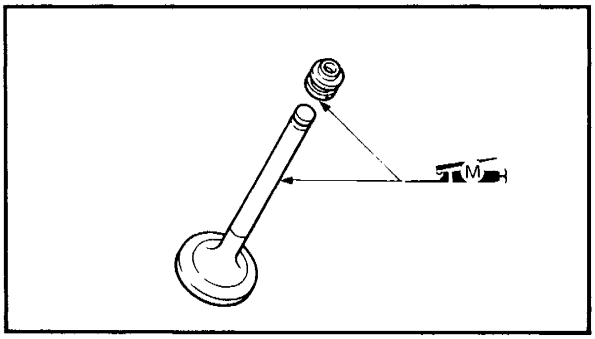
For engine reassembly, replace the following parts with new ones.
- **O-ring**
- **Gasket**
- **Oil seal**
- **Copper washer**
- **Lock washer**
- **Circlip**



YB344002
VALVES

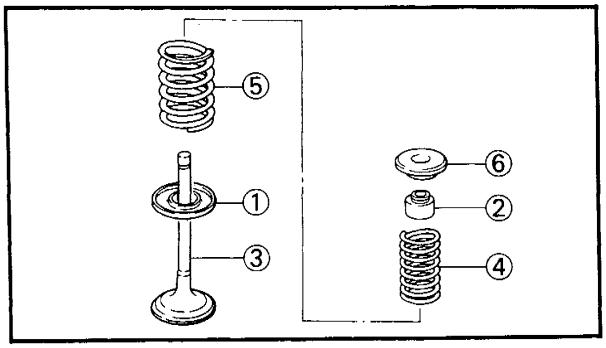
1. Deburr:
   - Valve stem end

   Use an oil stone to smooth the stem end.

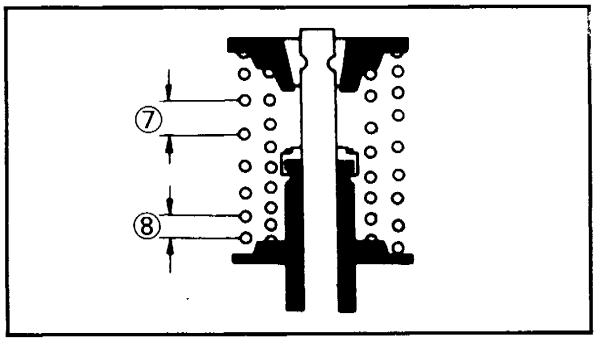


2. Apply:
   - Molybdenum disulfide oil

   (onto valve stem and oil seal)

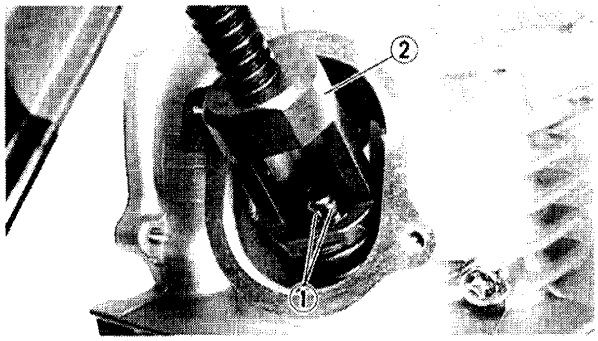


3. Install:
   - Valve spring seat ①
   - Valve stem seal ②
   - Valve ③
   - Valve spring (inner) ④
   - Valve spring (outer) ⑤
   - Valve retainer ⑥



NOTE:

Install the valve spring with larger pitch ⑦ facing upward.
⑧ Smaller pitch



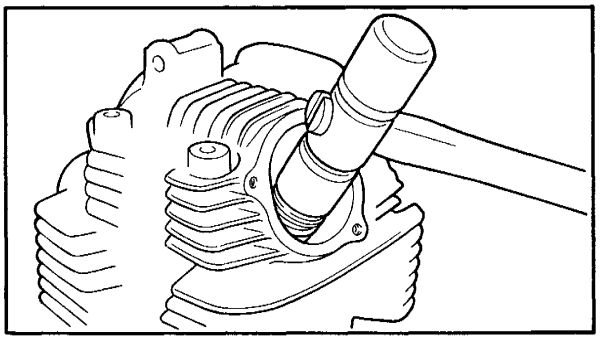
4. Install:
   - Valve cotters ①

NOTE:

Install the valve cotters while compressing the valve spring with the valve spring compressor ②.



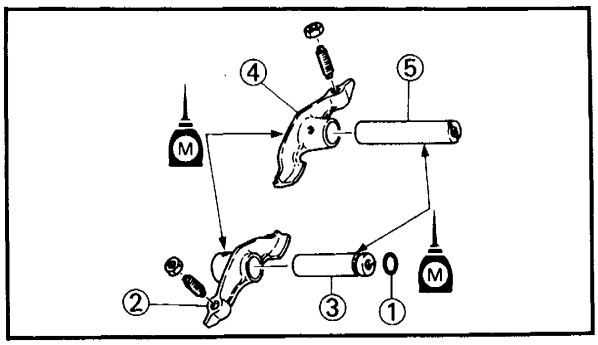
Valve spring compressor:
P/N. YM-04019, 90890-04019



5. Secure the valve cotter on to the valve stem by tapping it lightly with a soft hammer.

NOTE:

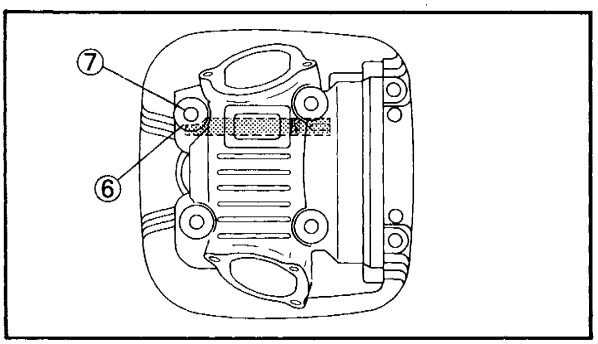
Do not hit so much as to damage the valve.



ROCKER ARM

1. Lubricate:
   - Molybdenum disulfide oil
     (to the rocker arm, rocker arm shaft and O-ring)

2. Install:
   - O-ring ①
   - Rocker arm ②
   - Rocker arm shaft ③ (exhaust)
   - Rocker arm ④
   - Rocker arm shaft ⑤ (intake)

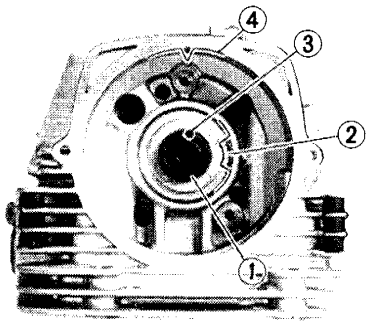


NOTE:

Align the slit ⑥ on the rocker arm shaft (intake) with the cylinder head bolt hole ⑦ and install the rocker arm shaft.

CAUTION:

Do not confuse the installation direction of rocker arm shaft. Be sure to install the threaded part facing outward.

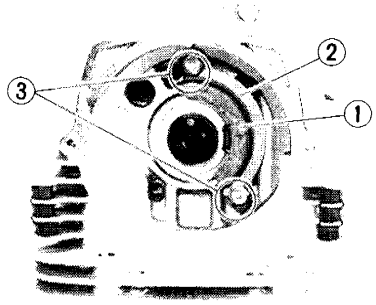


3. Lubricate:
   - 4-stroke engine oil (to the camshaft, collar and pin)

4. Install:
   - Camshaft ①
   - Collar ②
   - Pin ③

NOTE:

Align the camshaft pin ③ with the match mark ④ on the cylinder head and install the pin.



5. Install:
   - Plate ①
   - Lock washer ②

	Bolt ③ (camshaft): 8 Nm (0.8 m•kg, 5.8 ft•lb)

⚠ WARNING

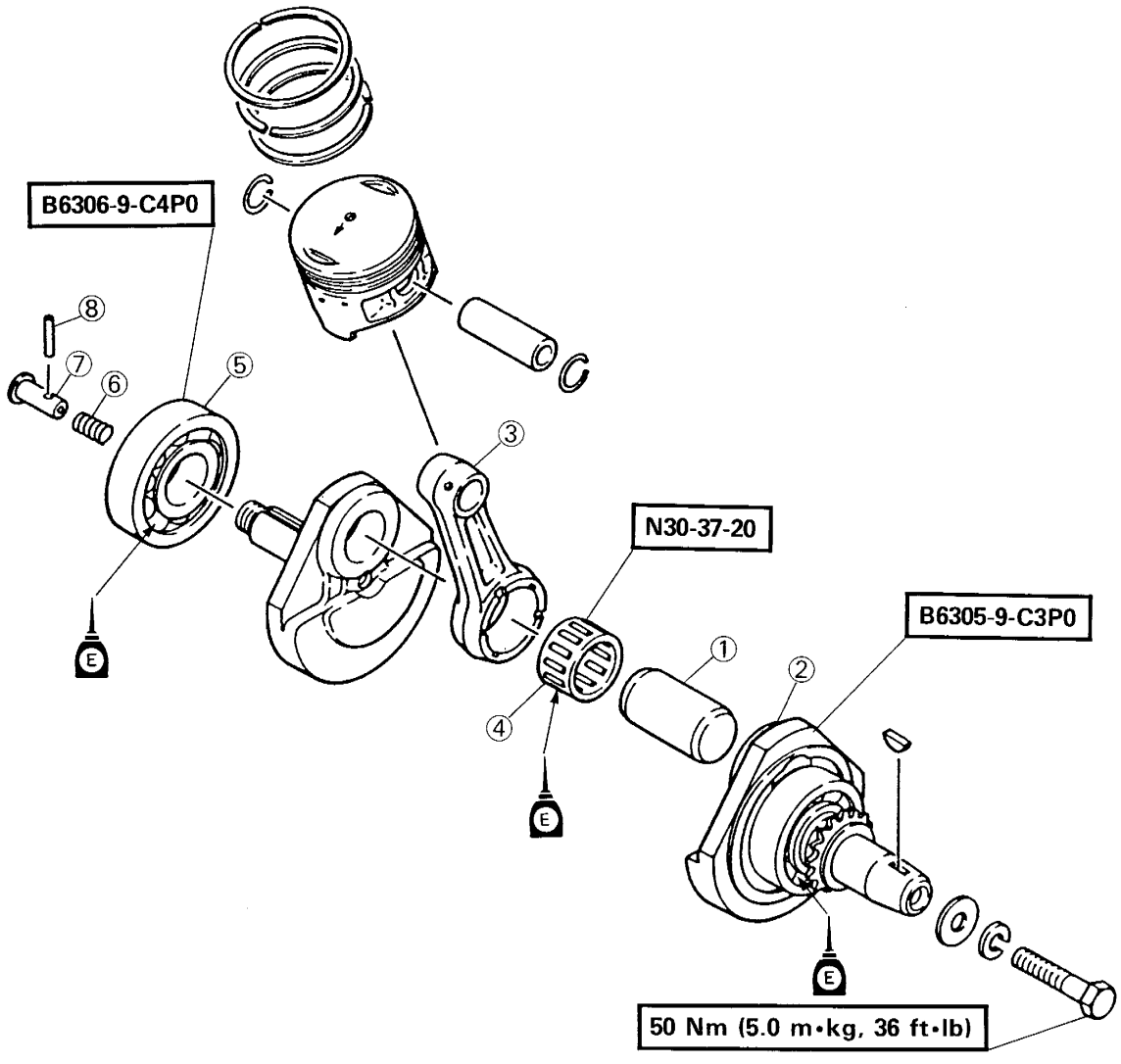
Always use a new lock washer.

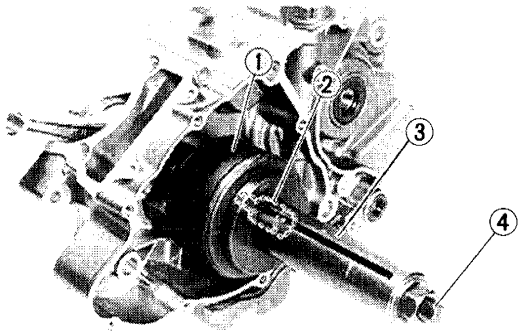
6. Bend the lock washer tab along the bolt flats.

CRANKSHAFT

① Crank pin
② Crank (left)
③ Connecting rod
④ Big end bearing
⑤ Crankshaft bearing
⑥ Compression spring
⑦ Pin with hole
⑧ Dowel pin

A	CRANK WIDTH: <55.95 ~ 56.00 mm (2.203 ~ 2.205 in)>
B	RUNOUT LIMIT: <0.03 mm (0.0012 in)>
C	SMALL END FREE PLAY LIMIT: <0.8 mm (0.031 in)>
D	BIG END SIDE CLEARANCE: <0.35 ~ 0.65 mm (0.013 ~ 0.026 in)>





CRANKSHAFT

1. Attach:
   - Crankshaft installing tool

Crankshaft installer set:
P/N. YU-90050
Crank pot spacer ①:
P/N. YM-91044
P/N. 90890-04081
Adapter #12 ②:
P/N. YM-01383
P/N. 90890-01383
Crankshaft installer pot ③:
P/N. 90890-01274
Crankshaft installer bolt ④:
P/N. 90890-01275

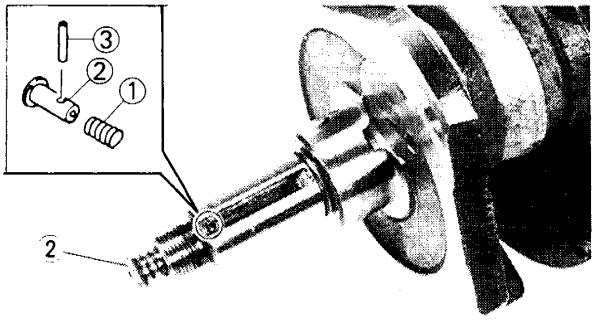
2. Install:
   - Crankshaft

NOTE:

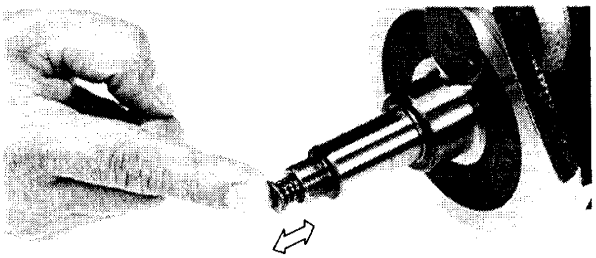
Hold the connecting rod at top dead center with one hand while turning the nut of the installing tool with the other. Operate the installing tool until the crankshaft bottoms against the bearing.

CAUTION:

To protect the crankshaft against scratches or to facilitate the operation of the installation.
Apply the grease to the oil seal lips, and apply the engine oil to each bearing.



3. Install:
   - Compression spring ①
   - Pin with hole ②
   - Dowel pin ③

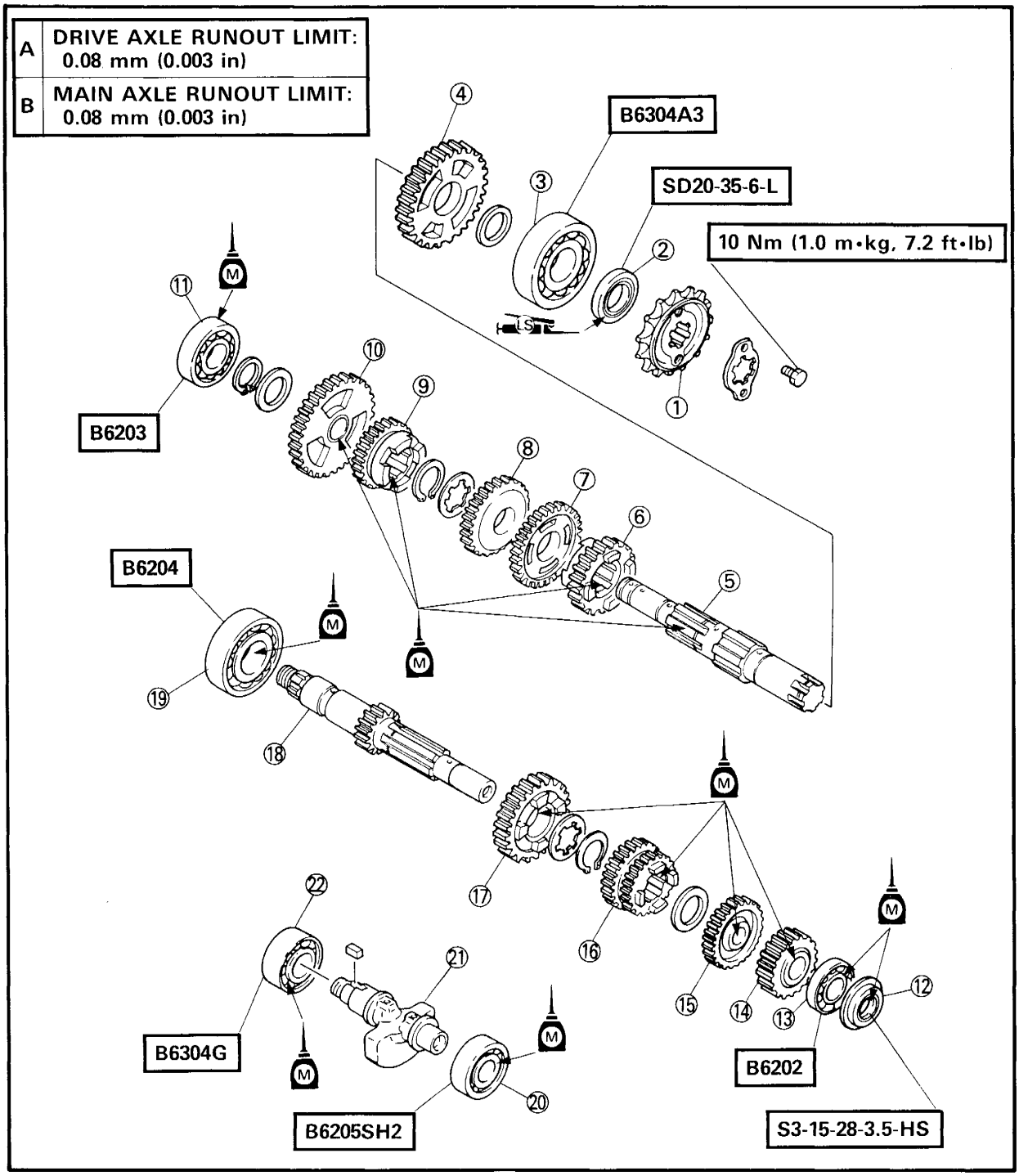


4. Check:
   - Pin with hole play

   After installing, make sure that the pin with hole operates smoothly in the arrow direction.

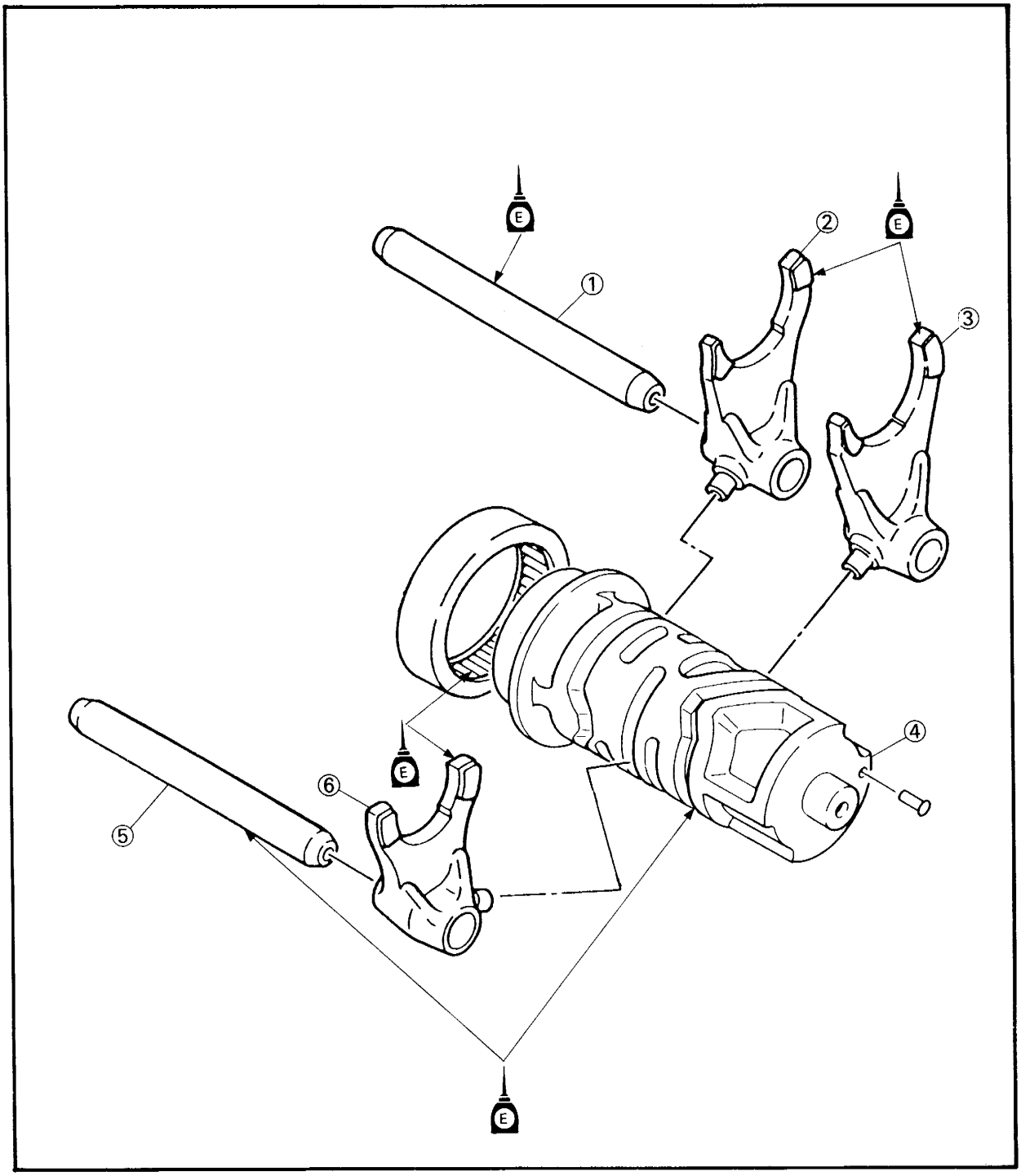
BALANCER AND TRANSMISSION

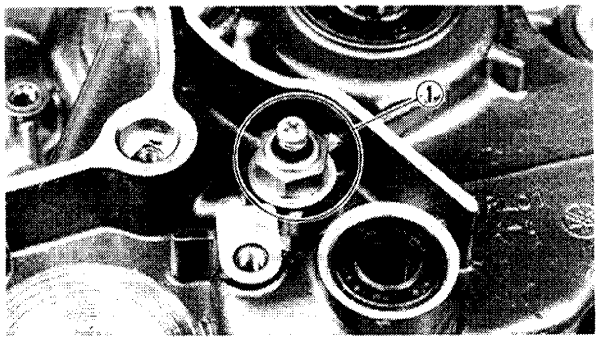
① Drive sprocket
② Oil seal
③ Bearing
④ 2nd wheel gear
⑤ Drive axle
⑥ 5th wheel gear
⑦ 3rd wheel gear
⑧ 4th wheel gear
⑨ 6th wheel gear
⑩ 1st wheel gear
⑪ Bearing
⑫ Oil seal
⑬ Bearing
⑭ 2nd pinion gear
⑮ 5th pinion gear
⑯ 3rd pinion gear
⑰ 4th pinion gear
⑱ Main axle
⑲ Bearing
⑳ Bearing
㉑ Balancer weight
㉒ Bearing



SHIFTER

① Shift fork guide bar (long)
② Shift fork #3
③ Shift fork #1
④ Shift cam
⑤ Shift fork guide bar (short)
⑥ Shift fork #2

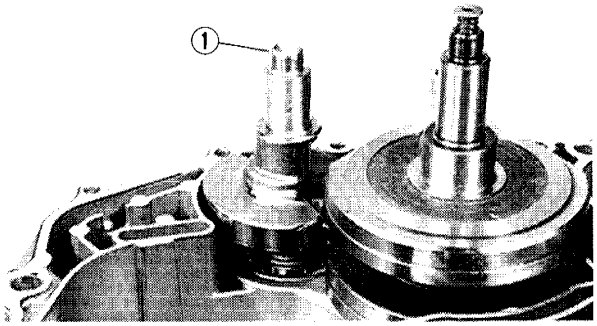




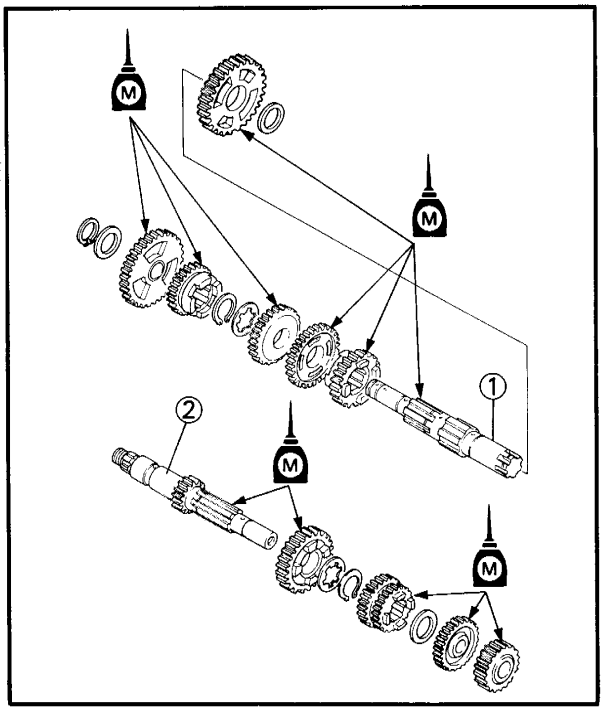
YB244004

BALANCER, TRANSMISSION AND SHIFTER

1. Install:
   - Neutral switch ①

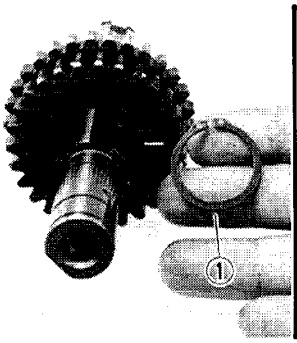


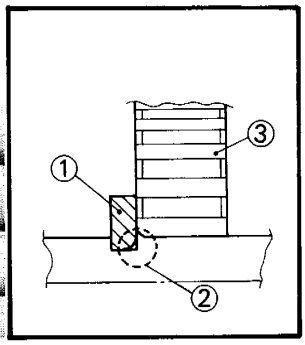
2. Install:
   - Balancer shaft ①



3. Apply:
   - Molybdenum disulfide oil (onto drive axle, main axle and gears)

4. Install:
   - Drive axle assembly ①
   - Main axle assembly ②

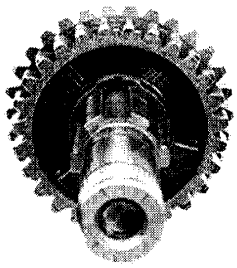


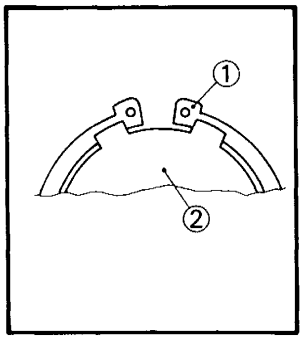


- Circlip ①
  Install the chamfered side ② facing the gear ③.

⚠ WARNING

Always use a new circlip.



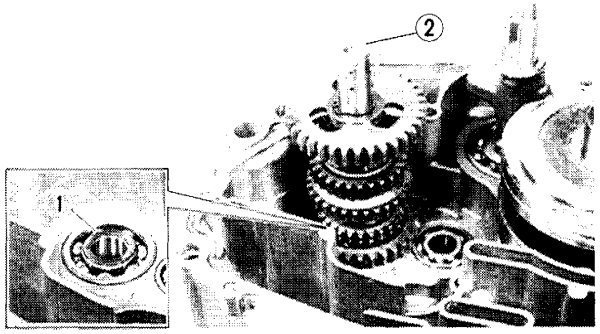


- Circlip ①
- Spline ②

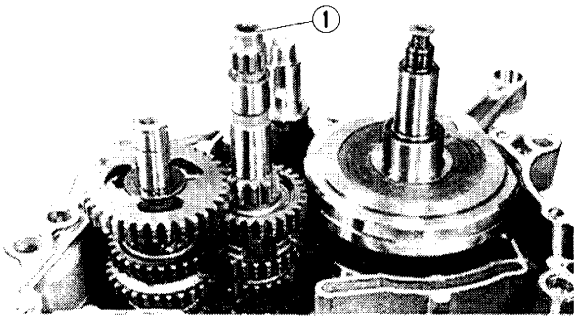
Install the circlip end to the center of the spline.

CAUTION:

Do not expand the circlip than needed.

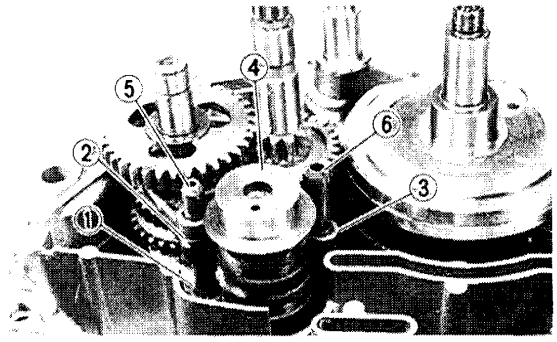


5. Install:
   - Washer ①
   - Drive axle assembly ②



6. Install:
   - Main axle assembly ①

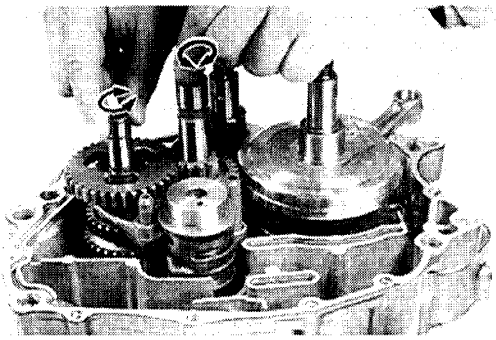
7. Apply:
   - 4-stroke engine oil (onto shift fork guide bars)



8. Install:
   - Shift fork 3 ①
   - Shift fork 2 ②
   - Shift fork 1 ③
   - Shift cam ④
   - Shift fork guide bar (long) ⑤
   - Shift fork guide bar (short) ⑥

NOTE:

Install the shift forks with the embossed mark on each shift fork facing left side of the engine.

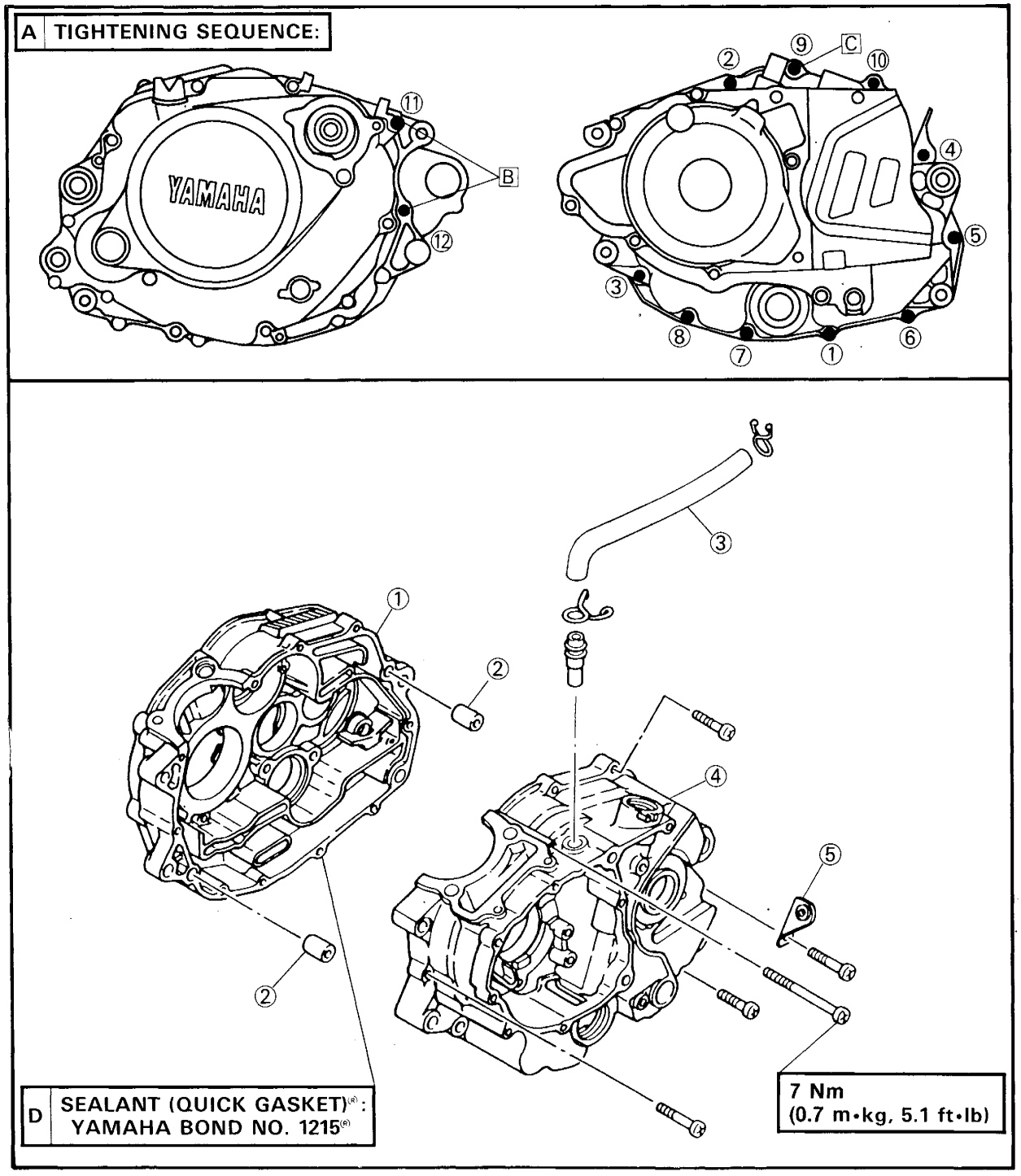


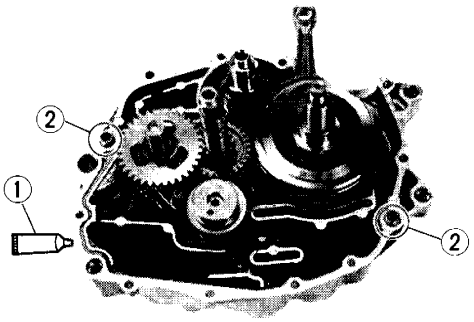
9. Check:
   • Transmission operation
   Unsmooth operation→Repair.

CRANKCASE

① Crankcase (right)
② Dowel pin
③ Crankcase ventilation hose
④ Crankcase (left)
⑤ Hose holder

B Tighten the bolt together with the starter motor.
C Tighten the bolt together with the earth lead.





CRANKCASE (RIGHT)

1. Apply:
   - Sealant ①
   (onto mating surfaces of both case halves)

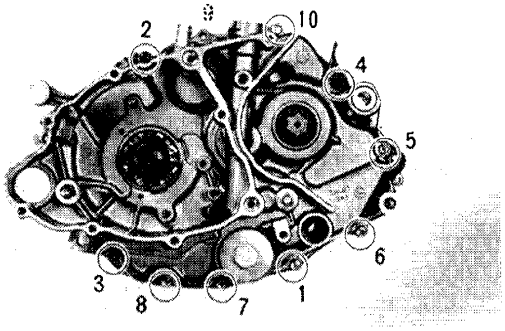
Sealant (quick gasket)®:
P/N. ACC-11001-01
Yamaha Bond No. 1215®:
P/N. 90890-85505

NOTE:

DO NOT ALLOW any sealant to come in contact with the oil gallery.

2. Install:
   - Dowel pins ②

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



4. Tighten:
   - Bolt (crankcase) ①~⑩

NOTE:

- Tighten the bolts starting with the lowest numbered one.
- Install the cable clamp on the bolt No. 9, and the hose holder on the bolt No. 4.

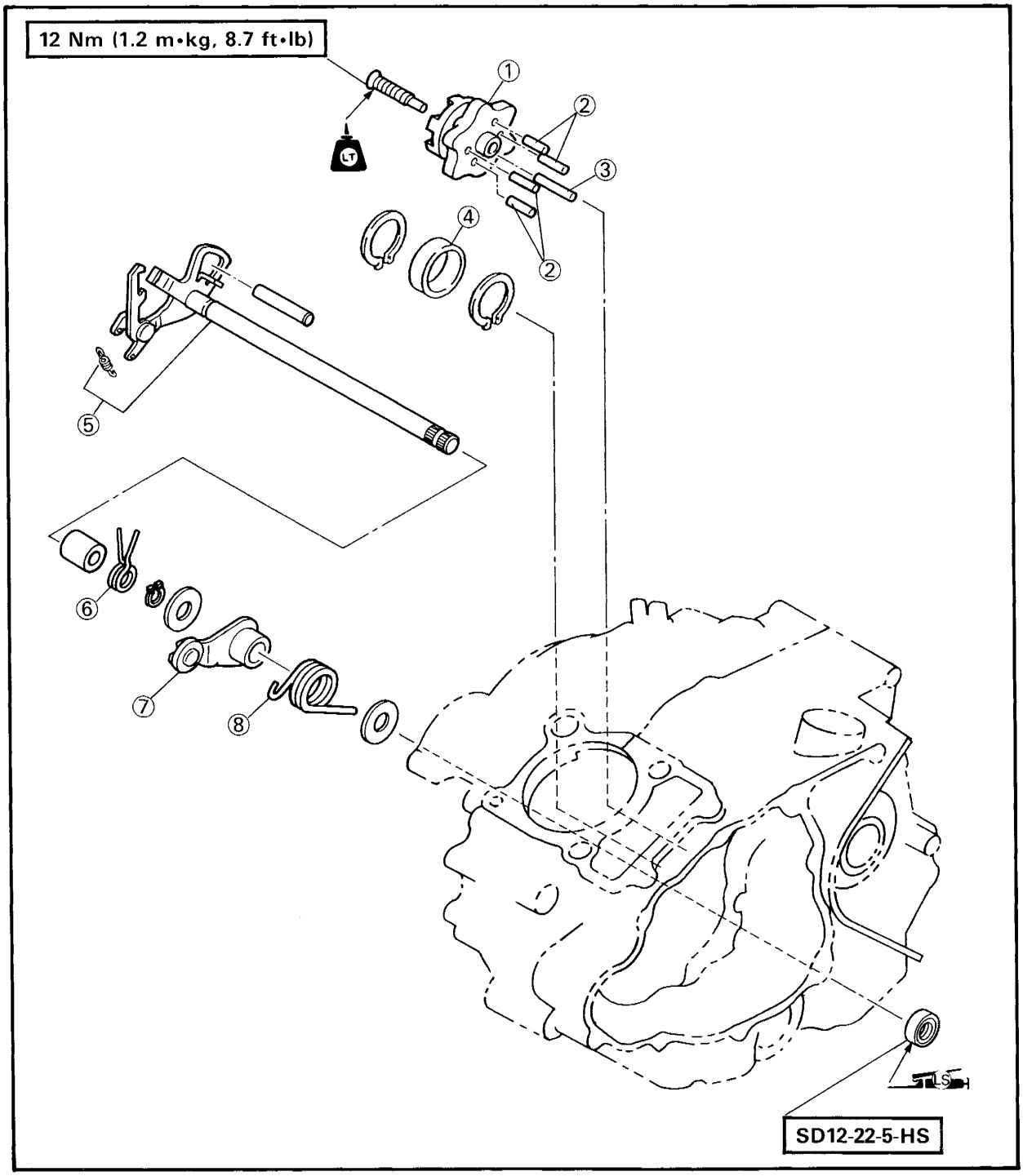
Bolts (crankcase):
7 Nm (0.7 m•kg, 5.1 ft•lb)

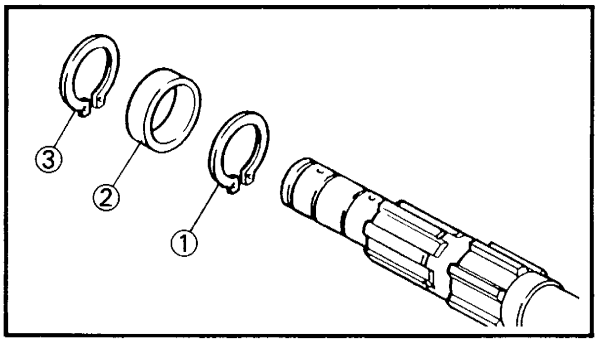
5. Apply:
   - 4-stroke engine oil
   (to the crank pin, bearing and oil delivery hole)

6. Check:
   - Crankshaft and transmission operation
   Unsmooth operation→Repair.

SHIFT SHAFT

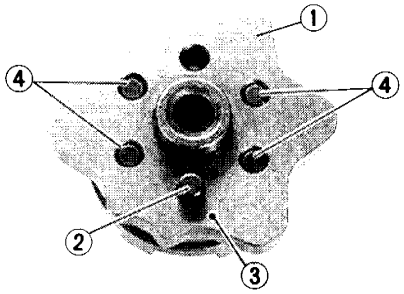
① Segment
② Dowel pin (short)
③ Dowel pin (long)
④ Collar
⑤ Shift shaft
⑥ Torsion spring
⑦ Stopper lever
⑧ Return spring





SHIFT SHAFT

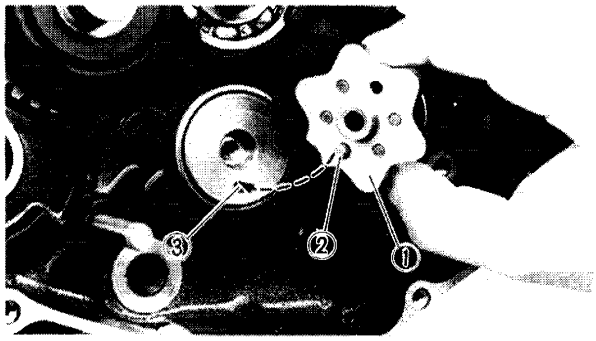
1. Install:
   - Circlip ① (to drive axle)
   - Collar ②
   - Circlip ③



2. Install:
   - Segment ①
   - Dowel pin ② (long)
   - Dowel pin ④ (short)

NOTE:

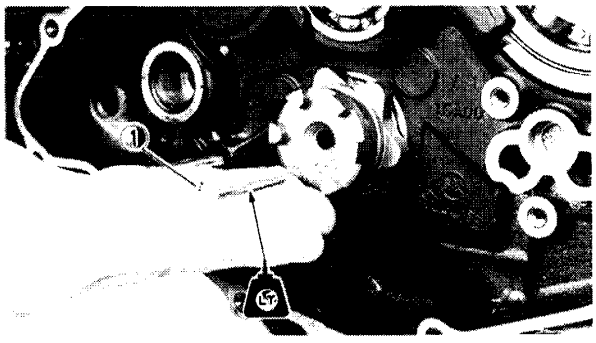
Install the dowel pin ② (long) to the match mark ③ position.



3. Install:
   - Segment ①

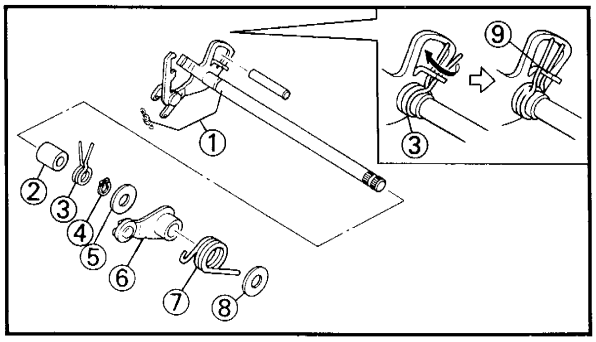
NOTE:

Fit the dowel pin ② (long) on the segment to the locating hole ③ and install the segment.



4. Tighten:
   - Screw ①

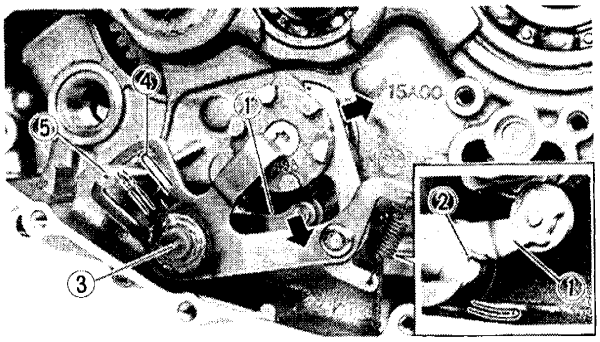
Screw:
12 Nm (12 m•kg, 8.7 ft•lb)
USE LOCTITE®



5. Install:
   - Shift shaft ①
   - Collar ②
   - Torsion spring ③
   - Circlip ④
   - Washer ⑤
   - Stopper lever ⑥
   - Return spring ⑦
   - Washer ⑧

NOTE:

Install the torsion spring ③ firmly to hold both sides of the guide plate ⑨.



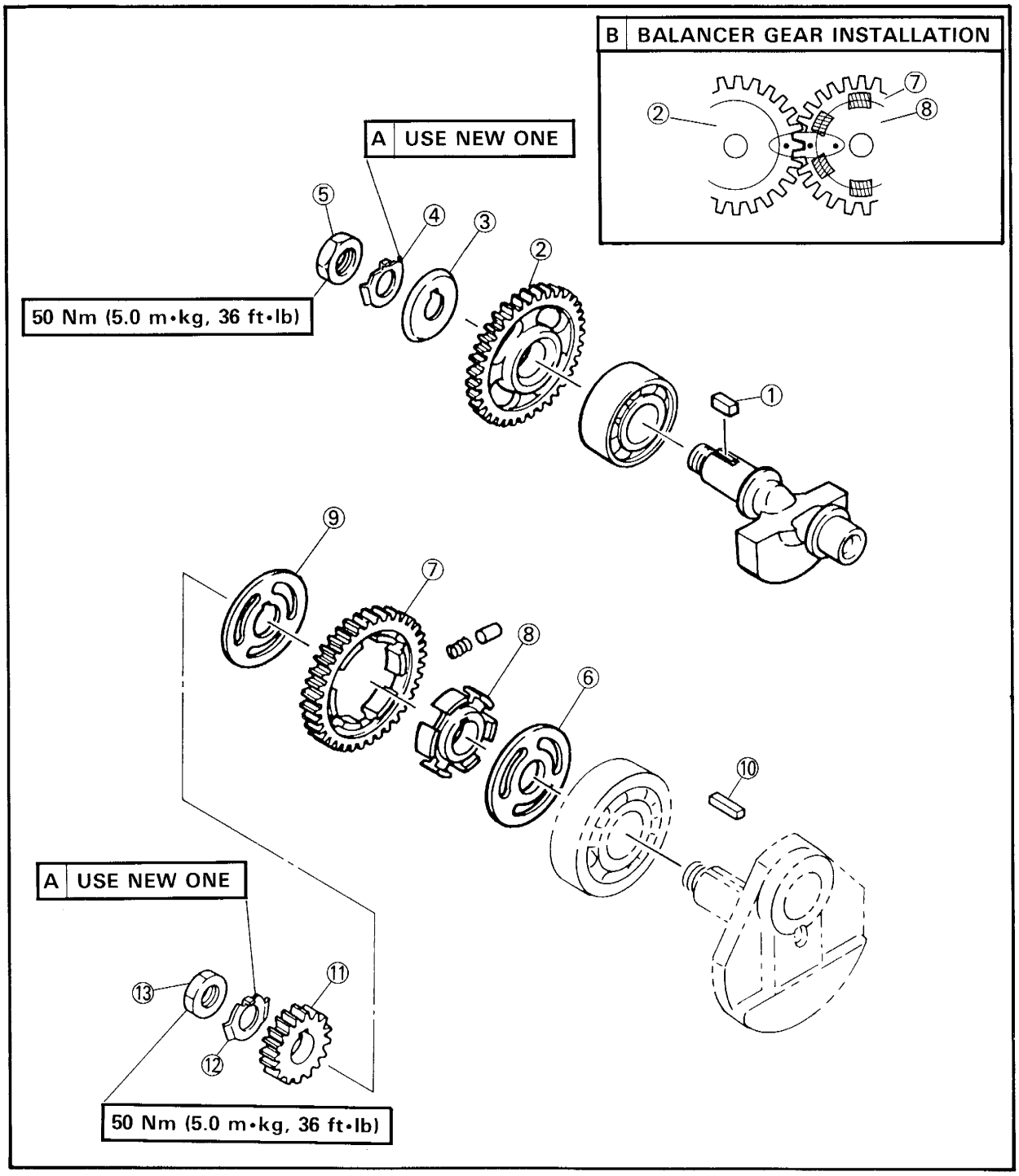
6. Install:
   - Stopper lever ①
   - Return spring ②
   - Shift shaft ③
   - Torsion spring ④

NOTE:

- Set the return spring ② and stopper lever ① at proper position.
- Push the shift shaft arm and the stopper lever to the arrow direction and install them to the segment.
- Install the torsion spring ④ fitting to the guide pin ⑤.

BALANCER GEAR

① Key
② Balancer gear
③ Plate
④ Lock washer
⑤ Nut
⑥ Plate washer
⑦ Balancer drive gear
⑧ Buffer boss
⑨ Claw washer
⑩ Key
⑪ Primary drive gear
⑫ Lock washer
⑬ Nut



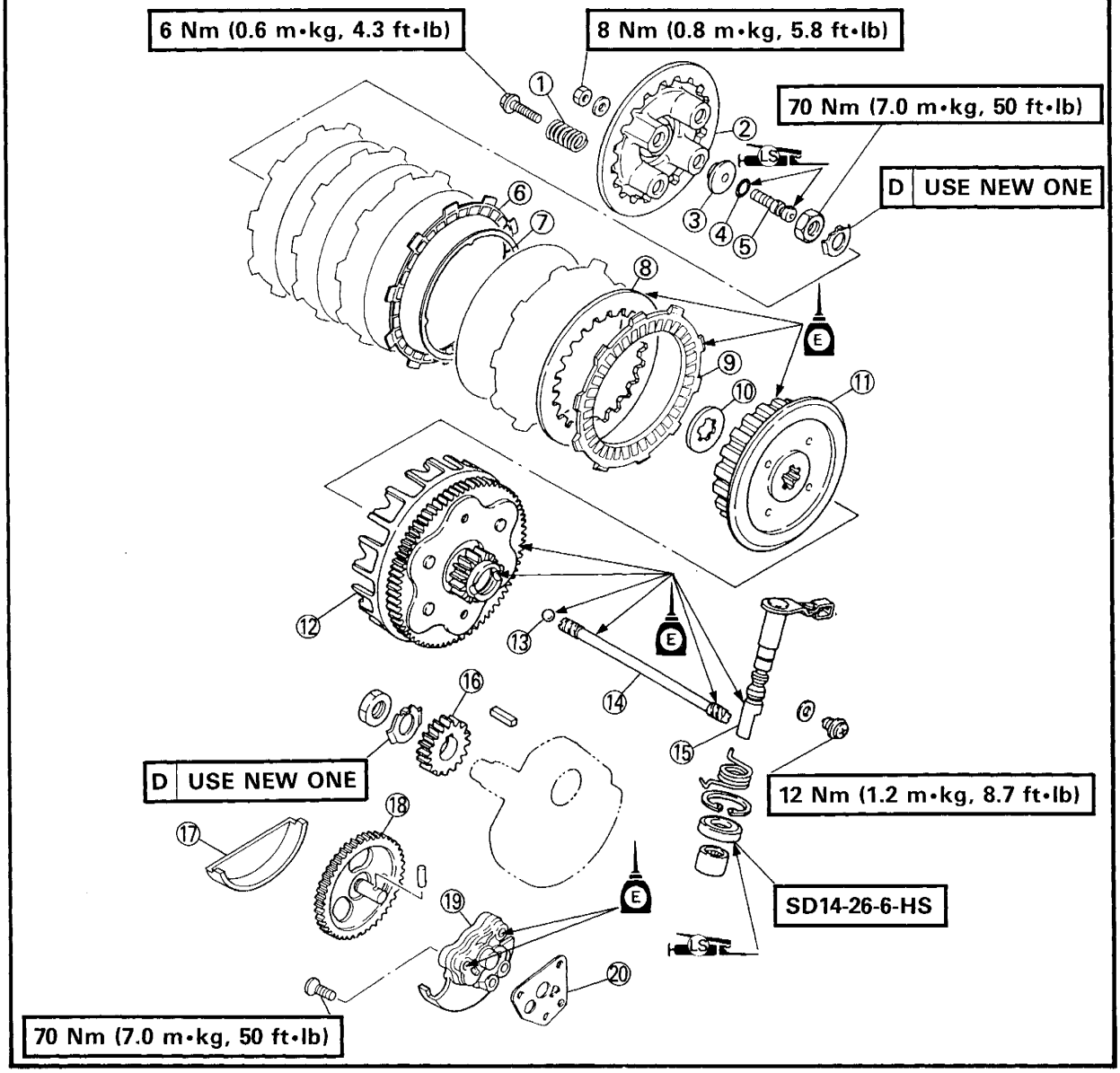
CLUTCH AND OIL PUMP

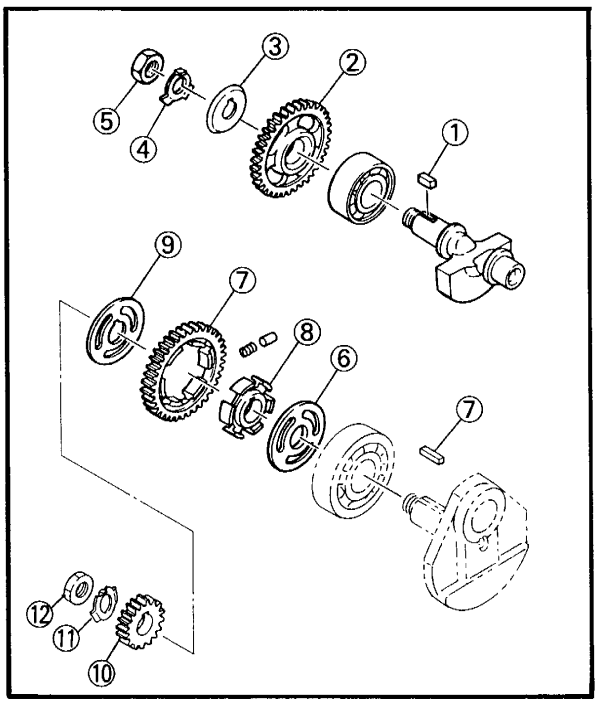
① Clutch spring
② Pressure plate
③ Push plate
④ O-ring
⑤ Push rod 1
⑥ Friction plate (type A)
⑦ Cushion spring
⑧ Clutch plate
⑨ Friction plate (type B)
⑩ Thrust washer
⑪ Clutch boss
⑫ Primary driven gear
⑬ Ball
⑭ Push rod 2
⑮ Push lever
⑯ Primary drive gear
⑰ Oil pump gear cover
⑱ Oil pump driven gear
⑲ Oil pump
⑳ Gasket

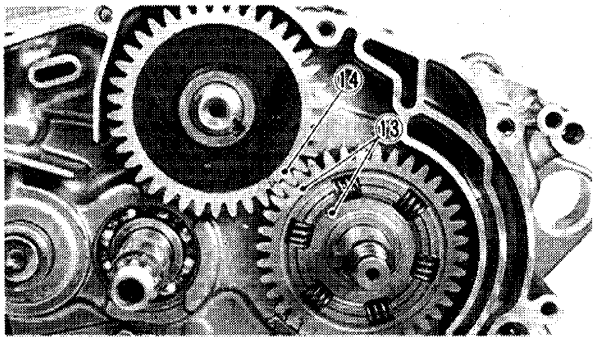
A	FRICTION PLATE:		
Type	Thickness	Wear Limit
A 1 pc.	2.90 ~ 3.10 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)
B 5 pcs.	2.90 ~ 3.10 mm (0.114 ~ 0.122 in)	2.8 mm (0.110 in)

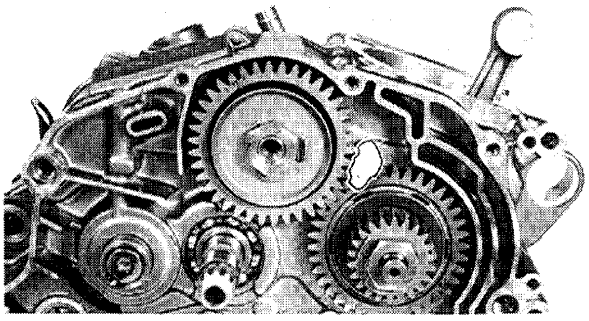
B | CLUTCH SPRING MINIMUM FREE LENGTH: 35.3 mm (1.39 in)

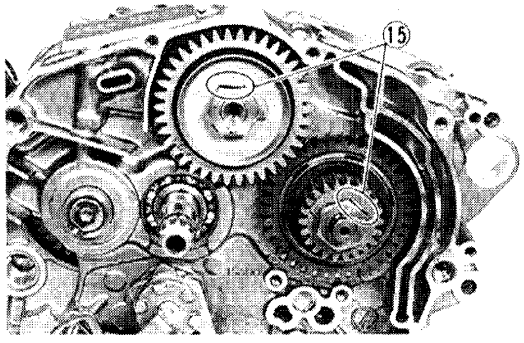
C | CLUTCH PLATE WARPAGE LIMIT: 0.2 mm (0.008 in)











CLUTCH, OIL PUMP AND BALANCER GEAR

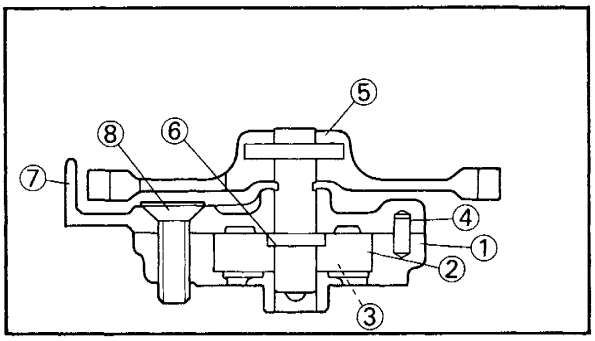
1. Install:
   - Key ①
   - Balancer gear ②
   - Plate ③
   - Lock washer ④
   - Nut ⑤ (balancer gear)
   - Plate washer ⑥
   - Key ⑦
   - Balancer drive gear and buffer boss ⑧
   - Claw washer ⑨
   - Primary drive gear ⑩
   - Lock washer ⑪
   - Nut ⑫ (primary drive gear)

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

NOTE:

- When installing the drive gear, align the punched mark ⑬ on the drive gear and the buffer boss with the punched mark ⑭ on the balancer gear.
- Place a folded rag or aluminum plate between the teeth of the balancer drive gear and balancer gear.
- Take care not to damage the gear teeth.

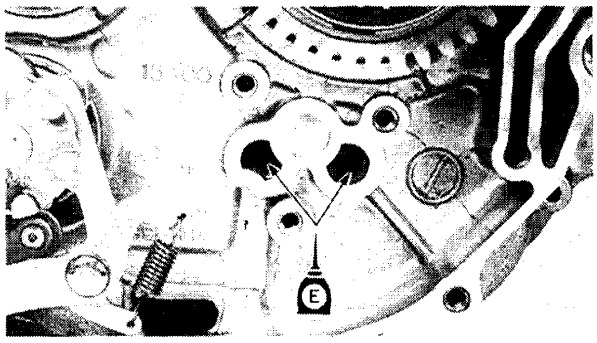
2. Bend the lock washer tab along the nut flats ⑮.



3. Apply:
   •4-stroke engine oil
   (to the oil pump inner parts)

4. Install:
   •Rotor housing ①
   •Outer rotor ②
   •Inner rotor ③
   •Dowel pins ④
   •Oil pump driven gear ⑤
   •Dowel pin ⑥
   •Oil pump cover ⑦
   •Screw ⑧

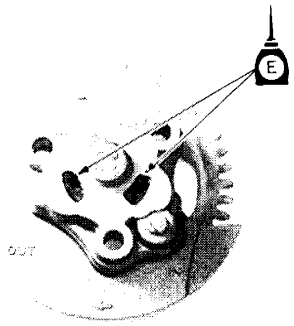
	Screw: **7 Nm (0.7 m•kg, 5.1 ft•lb)**



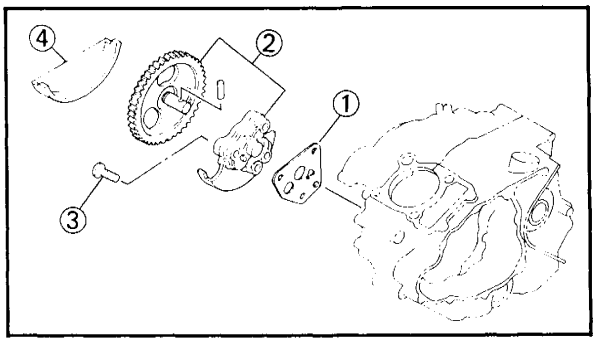
5. Apply:
   •4-stroke engine oil
   (to the oil passages in the crankcase)

CAUTION:

Apply a liberal amount of 4-stroke engine oil to the oil pump passages in the crankcase, or the engine may be damaged.

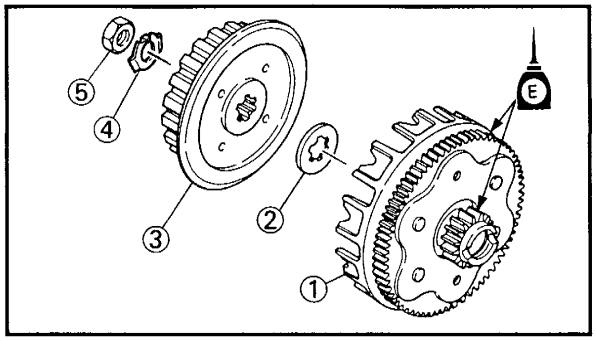


6. Apply:
   •4-stroke engine oil
   (to the oil passages in the oil pump)



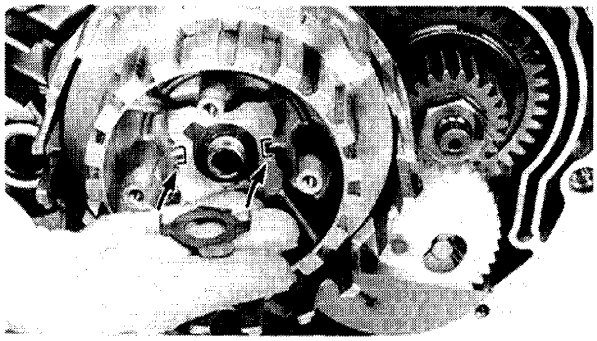
7. Install:
   •Gasket ①
   •Oil pump assembly ②
   •Bolts ③
   •Oil pump driven gear cover ④

	Bolts (oil pump): **7 Nm (0.7 m•kg, 5.1 ft•lb)**



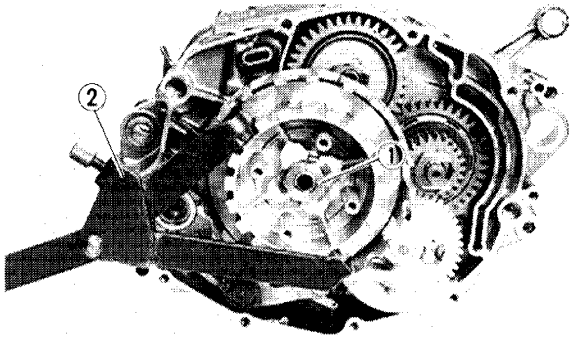
8. Apply:
   - 4-stroke engine oil (onto journal and gear teeth)

9. Install:
   - Primary driven gear ①
   - Thrust plate ②
   - Clutch boss assembly ③
   - Lock washer ④
   - Nut ⑤ (clutch boss)



NOTE:

Fit the tabs of the lock washer to the groove of the clutch boss.



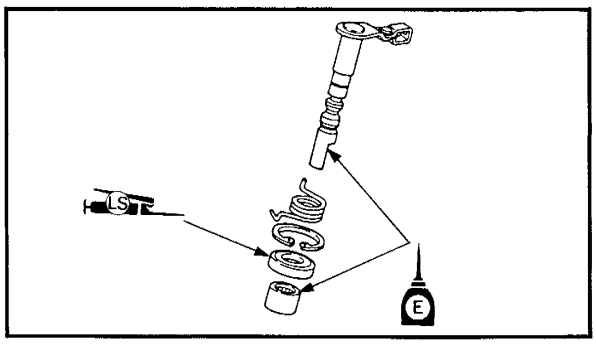
10. Tighten:
    - Nut ① (clutch boss)

NOTE:

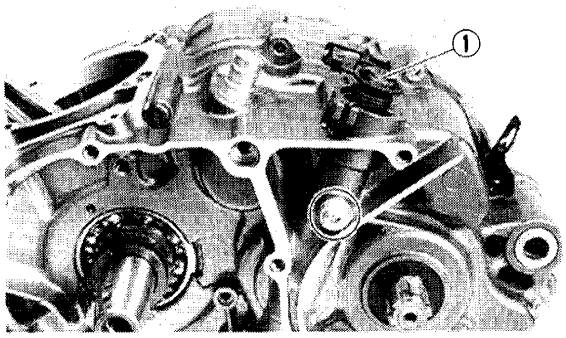
Tighten the nut (clutch boss) while holding the clutch boss with the universal clutch holder ②.

	**Universal clutch holder: P/N. YM-91042, 90890-04086**
	**Nut (clutch boss): 70 Nm (7.0 m•kg, 50 ft•lb)**

11. Bend:
    - Lock washer tab (along nut flat)

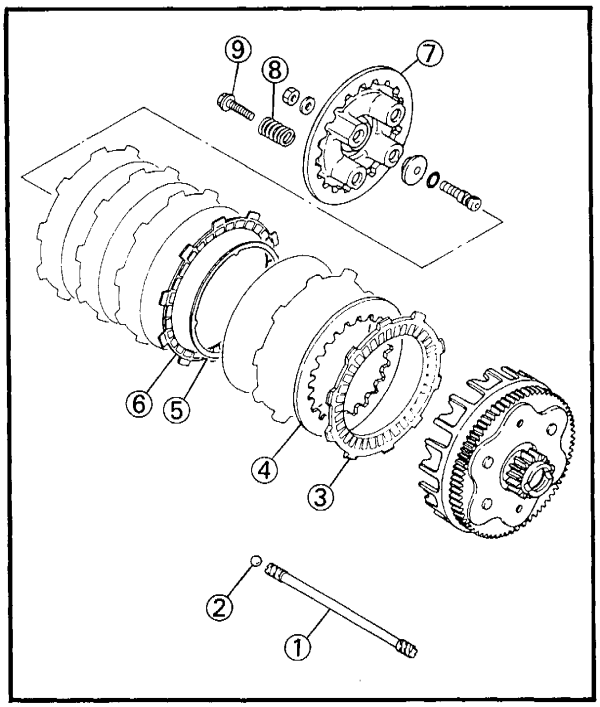


12. Apply:
    - 4-stroke engine oil (onto push lever bearing and push lever)
    - Litium soap base grease (onto push lever oil seal)



13. Install:
    - Push lever assembly ①

	Bolt (push lever): **12 Nm (1.2 m•kg, 8.7 ft•lb)**



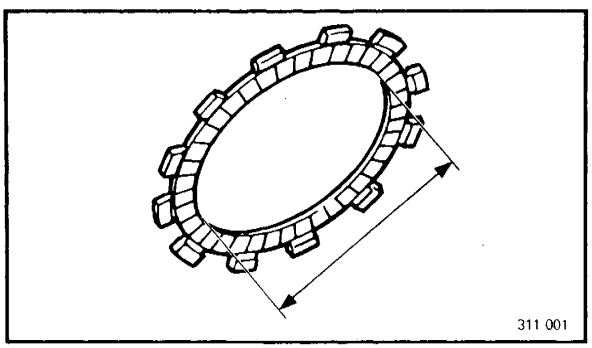
14. Install:
    - Push rod 2 ①
    - Ball ②
    - Friction plate ③ (type B)
    - Clutch plates ④
    - Cushion spring ⑤
    - Friction plate ⑥ (type A)
    - Pressure plate ⑦
    - Clutch spring ⑧
    - Bolts ⑨

NOTE:

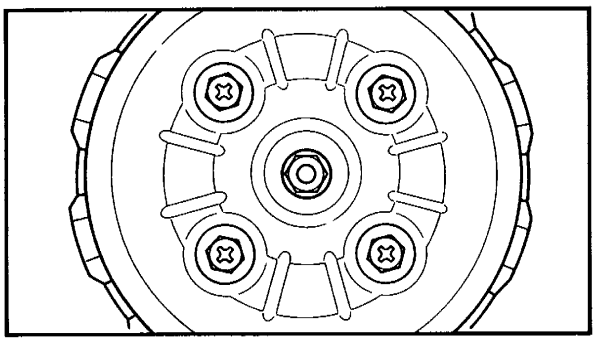
- Apply 4-stroke engine oil to the plates and install
- Install the clutch plates and friction plates alternately on the clutch boss, starting with a friction plate and ending with a friction plate.

CAUTION:

- **The friction plate (type A) ⑥ with the larger of the inside diameter must be installed in the third places.**
- **The cushion spring ⑤ must be placed on the inside of the third friction plate.**



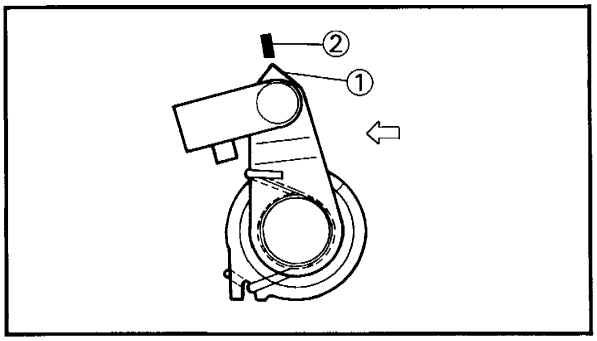
	Friction Plate	
	Type "A"	Type "B"
Quantity	1 pcs.	5 pcs.
Inside Diameter "D"	107 mm (4.21 in)	99 mm (3.90 in)



NOTE:

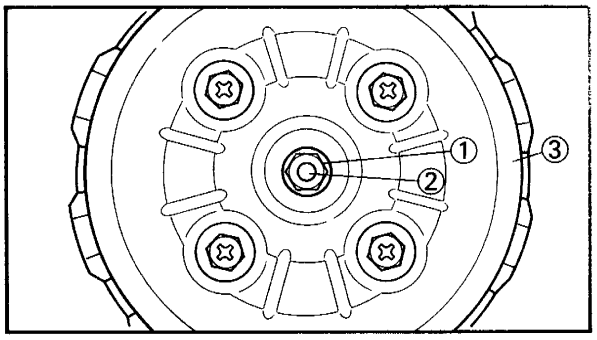
Tighten the bolts in a crisscross pattern.

	Bolt (pressure plate): 6 Nm (0.6 m•kg, 4.3 ft•lb)



15. Check:
    - Push lever position
    - Push the push lever ass'y to the arrow direction and make sure that match marks should be aligned.
      Not aligned→Adjust.

① Match mark on the push lever ass'y
② Match mark on the crankcase



16. Adjust:
    - Push lever position

****

Adjustment steps:

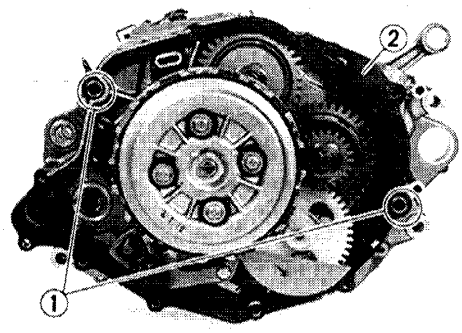
- Loosen the locknut ①.
- Turn the adjuster ② clockwise or counter clockwise to the position marks align.
- Hold the adjuster to prevent it from moving and thoroughly tighten the locknut.

CAUTION:

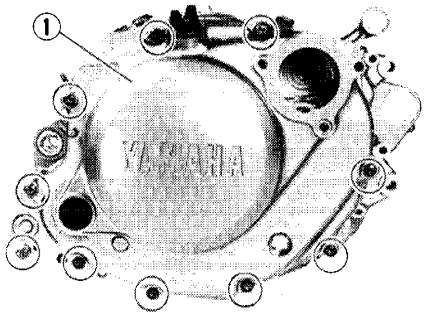
Do not overtighten the adjuster ② and remove the free play between push rods.

	Locknut (push rod 1): 8 Nm (0.8 m•kg, 5.8 ft•lb)

****



17. Install:
    - Dowel pins ①
    - Gasket ② (crankcase cover)



18. Install:
    - Crankcase cover ① (right)

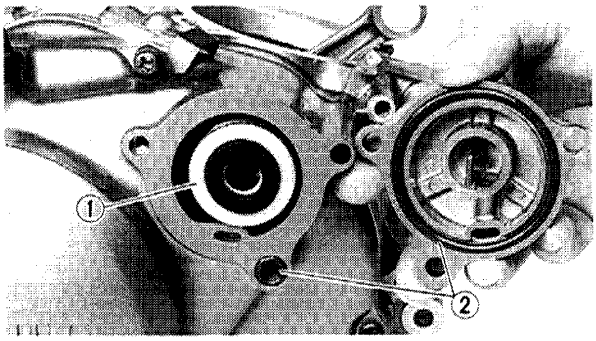
	Bolt (crankcase cover): 7 Nm (0.7 m•kg, 5.1 ft•lb)

NOTE:

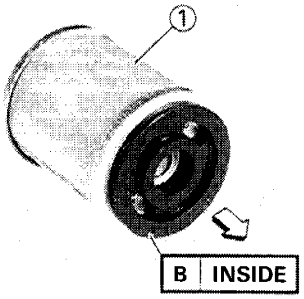
Tighten the bolts (crankcase cover) in a crisscross pattern.

OIL FILTER

1. Apply:
    - 4-stroke engine oil (to the oil filter and into the oil passage)

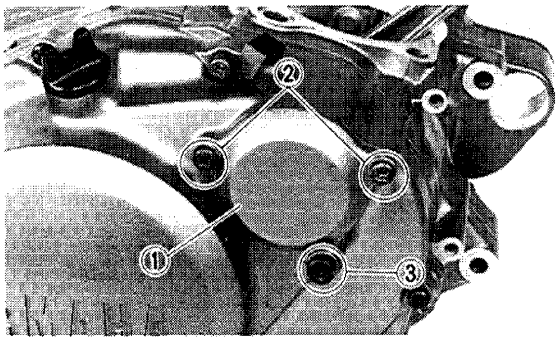


2. Install:
    - Oil filter ①
    - O-rings ②



CAUTION:

Install the oil filter as shown.

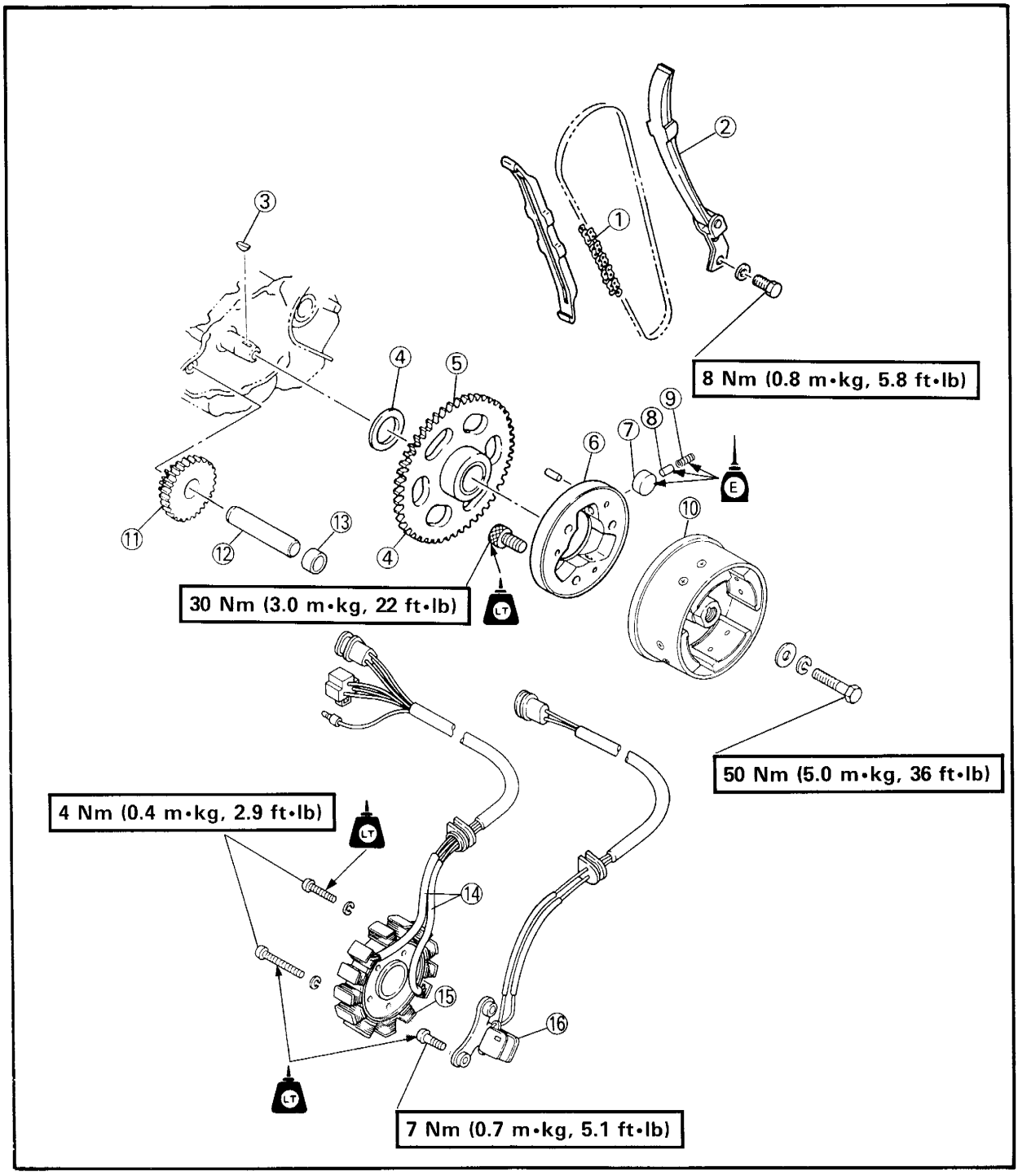


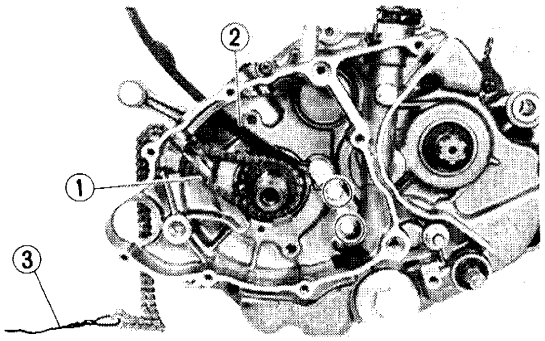
3. Install:
    - Oil filter cover ①

	Bolt ② (oil filter coverboth side): 7 Nm (0.7 m•kg, 5.1 ft•lb) **Bolt ③ (oil filter cover-lower): 10 Nm (1.0 m•kg, 7.2 ft•lb)**

ROTOR AND STARTER DRIVES

① Timing chain
② Timing chain guide (intake)
③ Woodruff key
④ Washer
⑤ Starter wheel gear
⑥ Starter clutch
⑦ Dowel pin
⑧ Starter clutch spring cap
⑨ Compression spring
⑩ Rotor
⑪ Starter idle gear 1
⑫ Shaft
⑬ Collar
⑭ Charge coil
⑮ Stator coil
⑯ Pulser coil





YB344011

ROTOR AND STARTER DRIVES

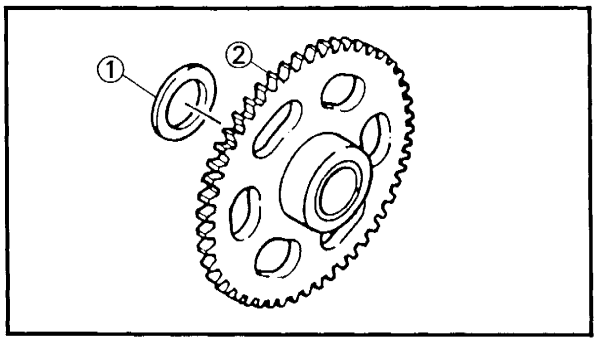
1. Install:
   - Timing chain ①
   - Chain guide ②

	Bolt (chain guide): 8 Nm (0.8 m•kg, 5.8 ft•lb)

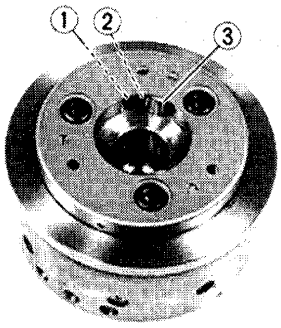
NOTE:

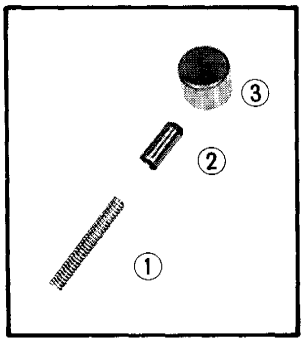
Fasten a safety wire ③ to the timing chain to prevent it from falling into the crankcase.

2. Apply:
   - 4-stroke engine oil (onto journal and starter drives)

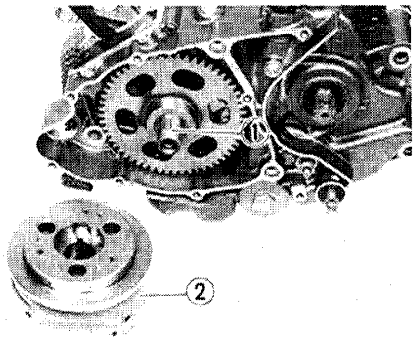


3. Install:
   - Washer ①
   - Wheel gear ②

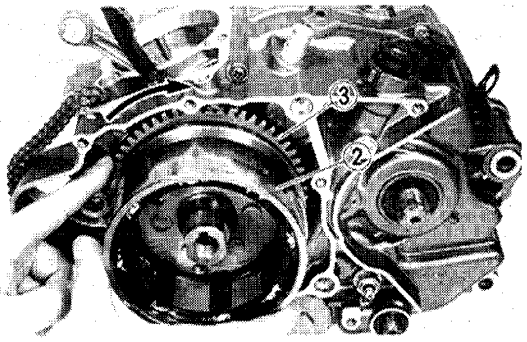




4. Install:
   - Compression spring ①
   - Starter clutch spring cap ②
   - Dowel pin ③

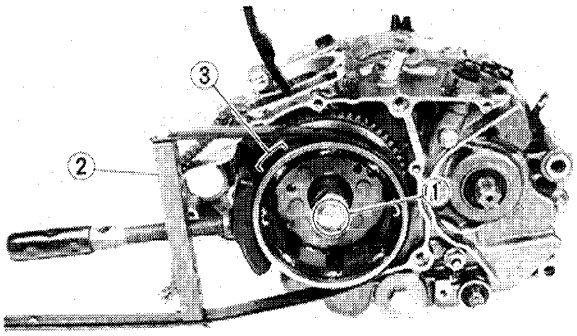


5. Install:
   - Woodruff key ①
   - Rotor ②



NOTE:

Temporarily install the rotor aligning the key way of the rotor with the woodruff key. Turn the starter wheel gear ③ clockwise and install the rotor to the starter wheel gear.



6. Install:
   - Bolt ① (rotor)

	Bolt (rotor): **50 Nm (5.0 m•kg, 36 ft•lb)**

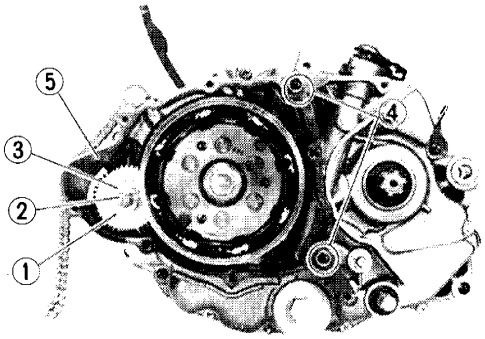
NOTE:

Tighten the bolt (rotor) while holding the rotor with the rotor holder ②.

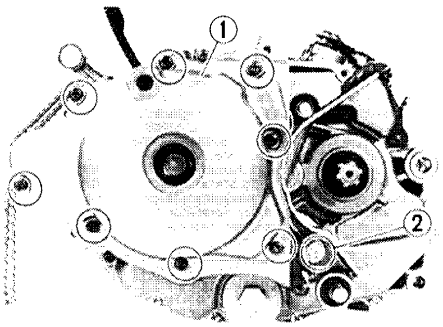
	Rotor holder: **P/N. YS-01880, 90890-01701**

CAUTION:

Do not allow the rotor holder to touch the projections ③ on the rotor.



7. Install:
   - Starter idle gear 1 ①
   - Shaft ②
   - Collar ③
   - Dowel pins ④
   - Gasket ⑤ (crankcase cover)



8. Install:
   - Crankcase cover ① (left)

	Bolt (crankcase cover): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

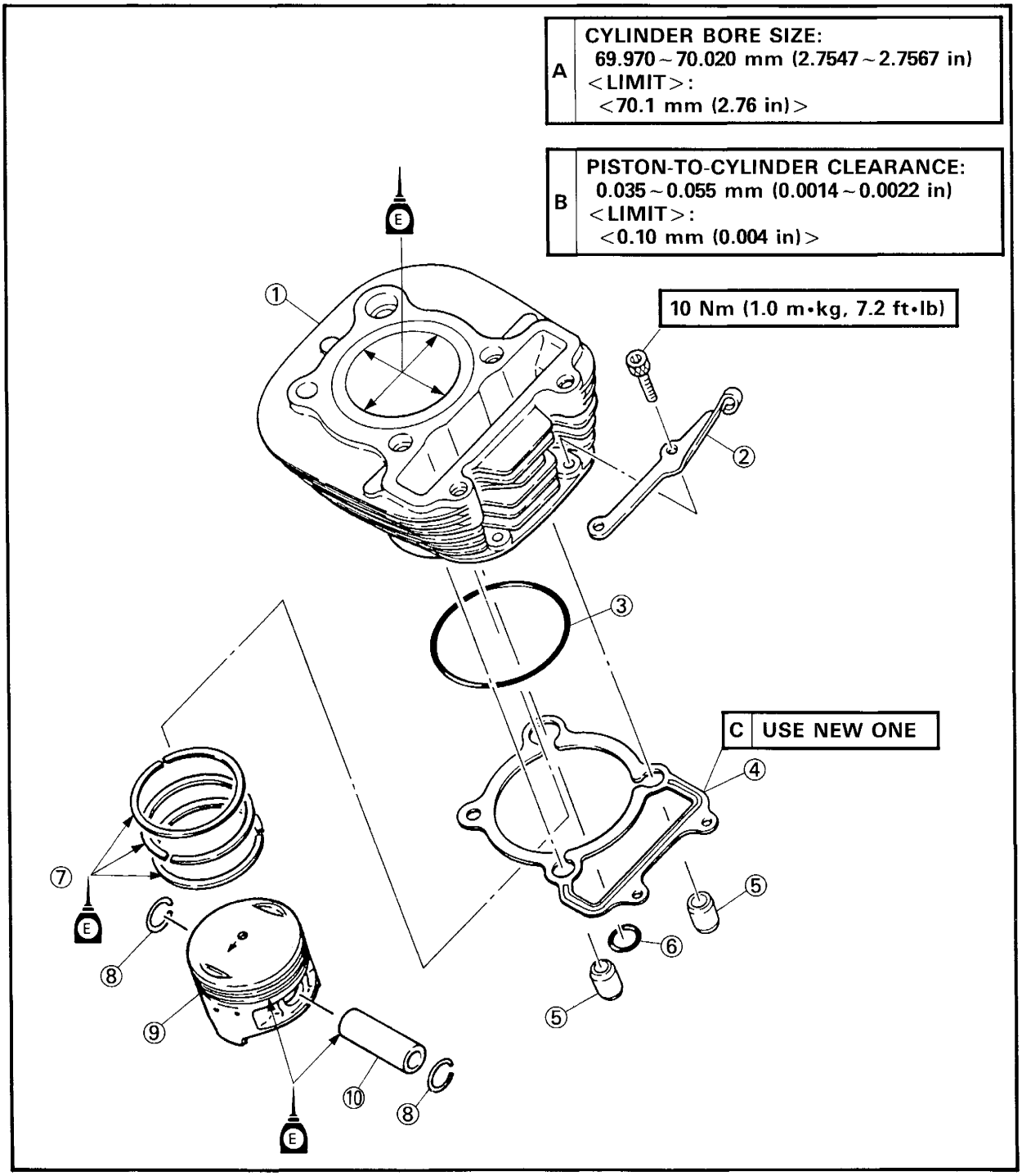
NOTE:

Tighten the bolts (crankcase cover) in a crisscross pattern.

9. Connect:
   • Neutral switch lead ②

CYLINDER AND PISTON

① Cylinder
② Clutch cable holder
③ O-ring
④ Cylinder gasket
⑤ Dowel pin
⑥ O-ring
⑦ Piston ring
⑧ Piston pin clip
⑨ Piston
⑩ Piston pin

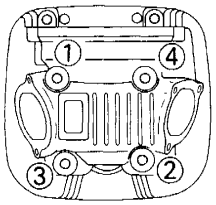


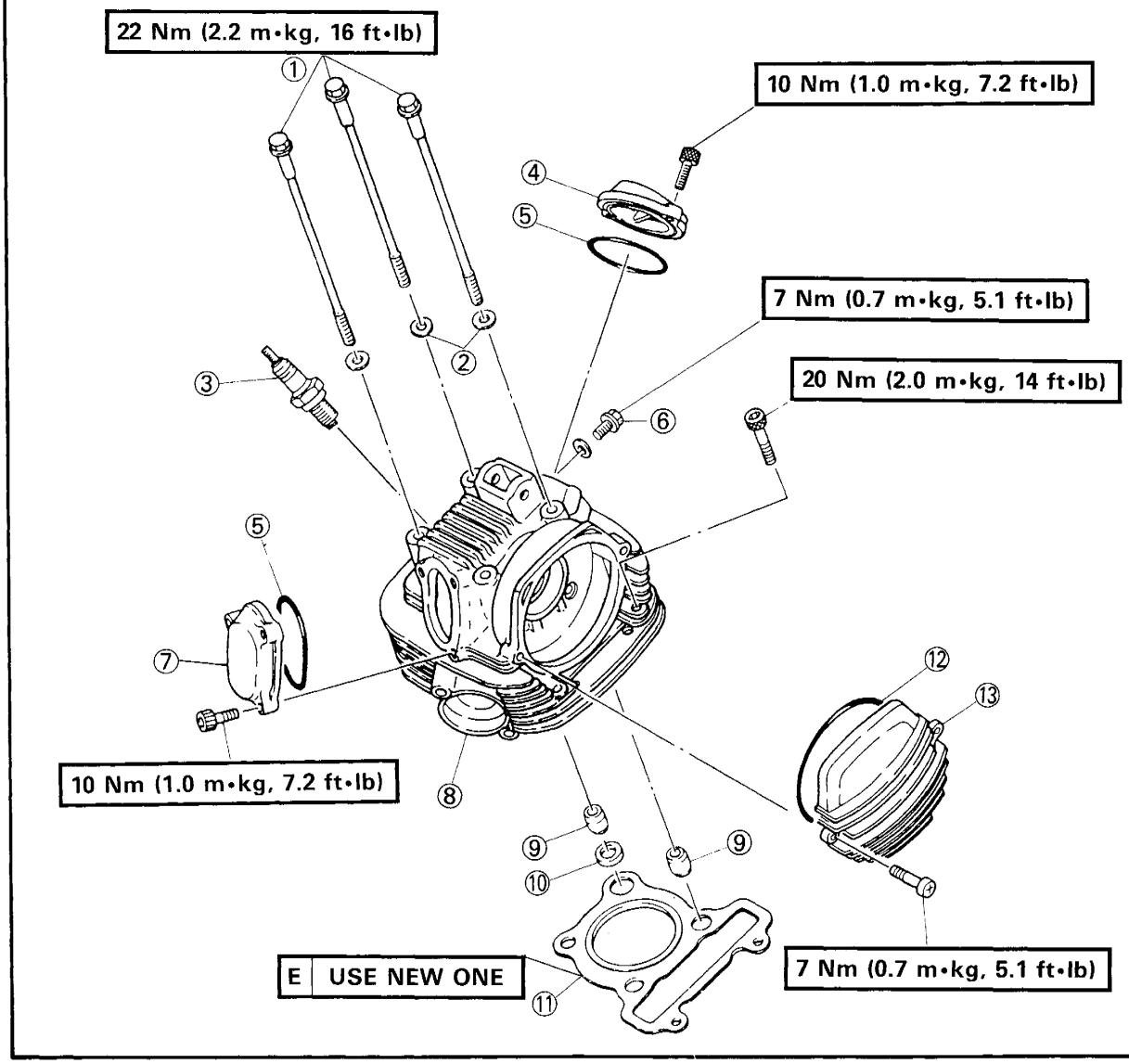
CYLINDER HEAD

① Bolt
② Washer
③ Spark plug
④ Tappet cover (intake)
⑤ O-ring
⑥ Bolt (oil check)
⑦ Tappet cover (exhaust)
⑧ Cylinder head
⑨ Dowel pin
⑩ Gromet
⑪ Cylinder head gasket
⑫ O-ring
⑬ Cylinder head side cover

A	SPARK PLUG TYPE: DR8EA (N.G.K.), X24ESR-U (NIPPONDENSO)
B	SPARK PLUG GAP: 0.6 ~ 0.7 mm (0.02 ~ 0.03 in)
C	CYLINDER HEAD WARPAGE LIMIT: 0.03 mm (0.0012 in)

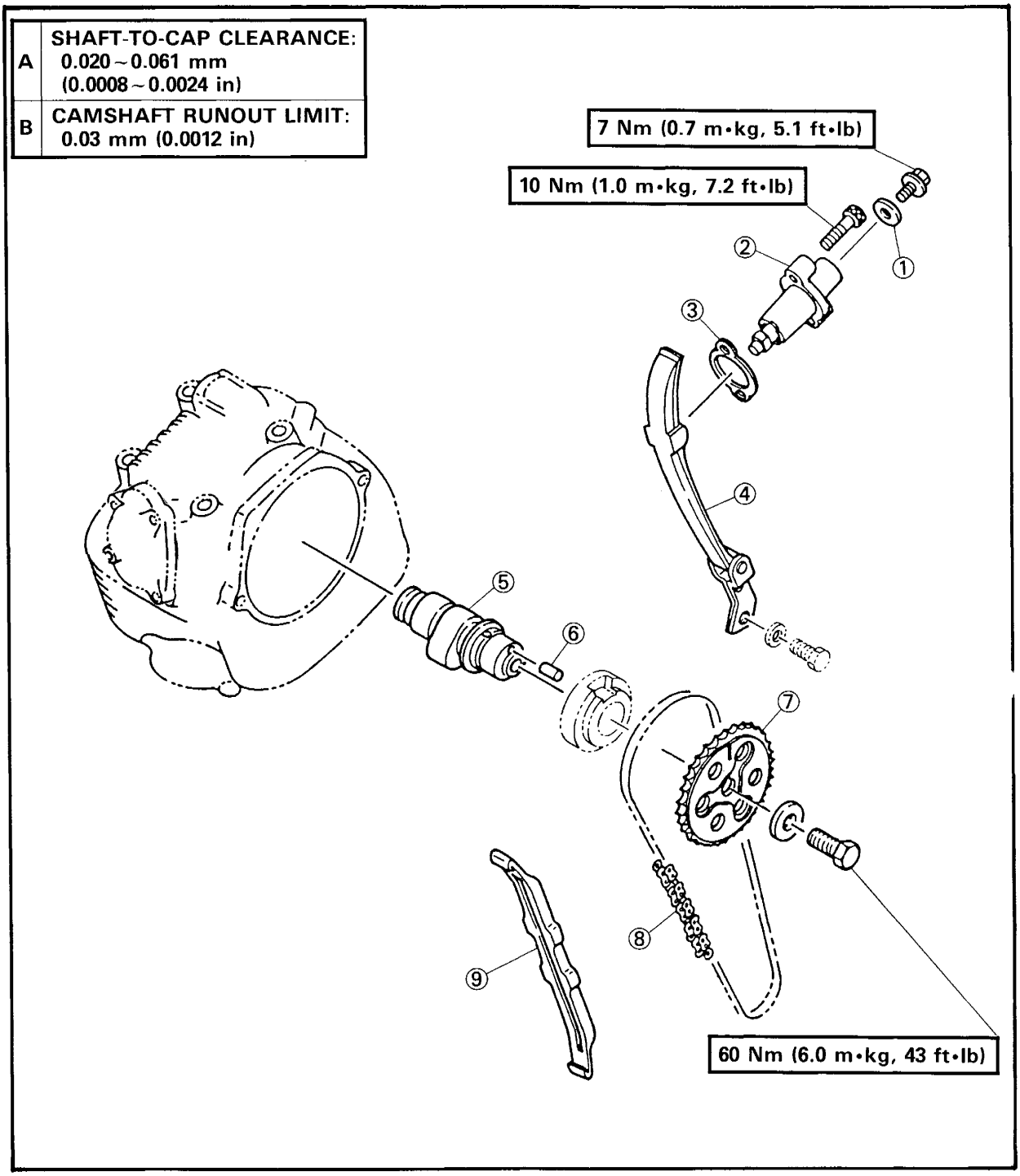
D TIGHTENING SEQUENCE:





CAMSHAFT AND TIMING CHAIN

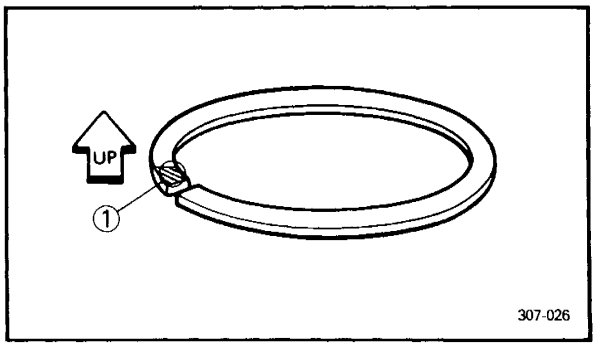
① Gasket
② Timing chain tensioner
③ Gasket
④ Timing chain guide (intake)
⑤ Camshaft
⑥ Pin
⑦ Cam sprocket
⑧ Timing chain
⑨ Timing chain guide (exhaust)



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CYLINDER HEAD, CYLINDER AND PISTON

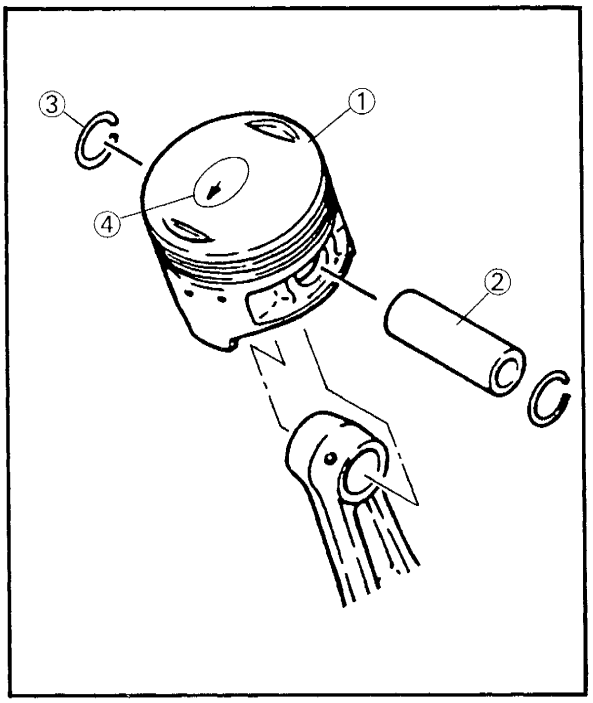
1. Apply:
   - 4-stroke engine oil
     (onto piston ring and piston pins)



2. Install:
   - Piston rings

NOTE:

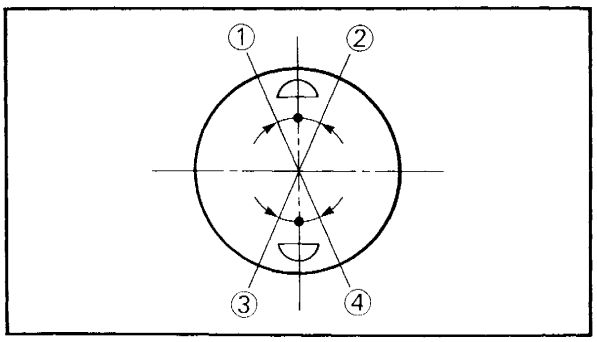
Be sure to install ring so that manufactures marks or numbers are located on the top side of the rings.



3. Install:
   - Pistons ①
   - Piston pin ②
   - Piston pin clips ③

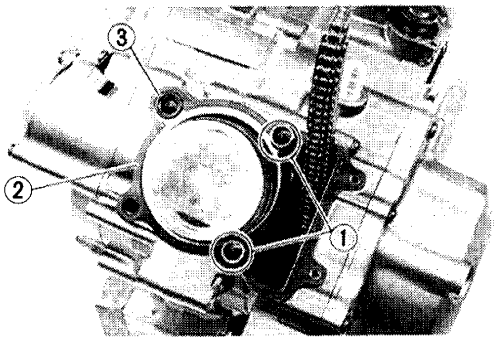
NOTE:

- The arrow ④ on the piston must point to the front of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the piston pin clip and material into the crankcase.

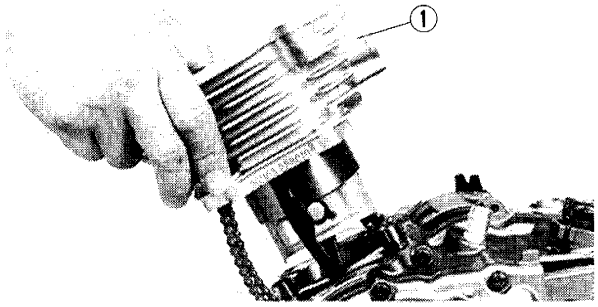


4. Position:
   - Top ring
   - 2nd ring
     Offset the piston ring end gaps as shown.

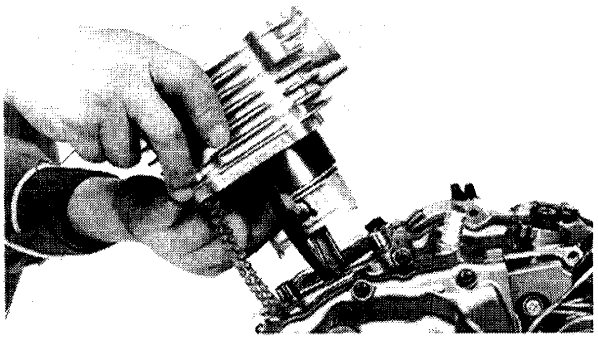
① Top ring end
② Oil ring end (lower)
③ Oil ring end (upper)
④ 2nd ring end



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

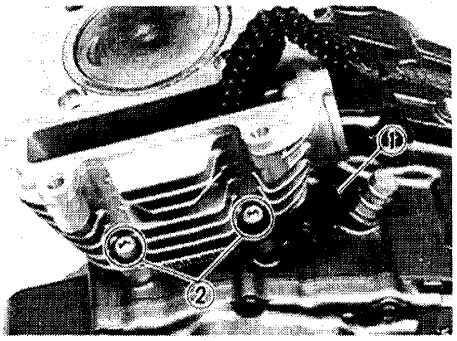


6. Install:
   - Cylinder ①



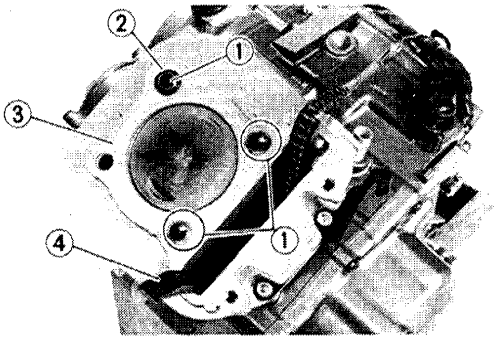
NOTE:

Install the cylinder while compressing the piston ring by the hand.

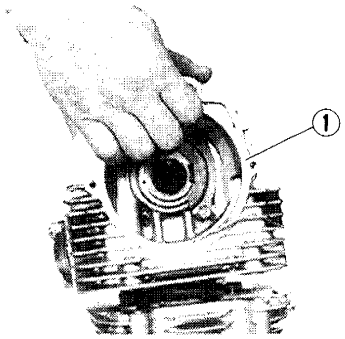


7. Install:
   - Clutch cable holder ①
   - Bolts ②

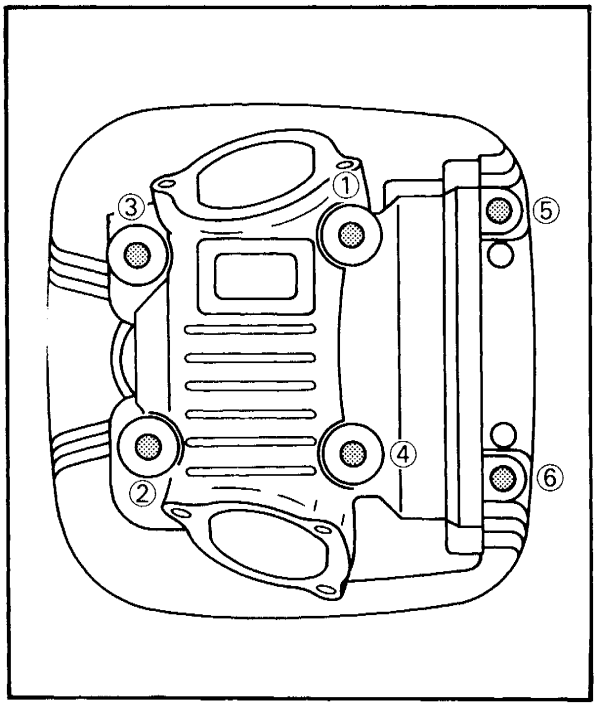
	**Bolts ②:** **10 Nm (1.0 m•kg, 7.2 ft•lb)**



8. Install:
   - Dowel pins ①
   - Gromment ②
   - Gasket ③ (cylinder head)
   - Timing chain guide ④ (exhaust)



9. Install:
   • Cylinder head ①

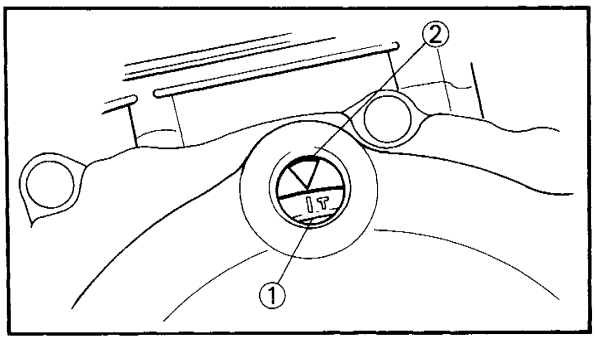


10. Install:
    • Bolts

	Bolts ①~④: **22 Nm (2.2 m•kg, 16 ft•lb)** **Bolt ⑤, ⑥:** **20 Nm (2.0 m•kg, 14 ft•lb)**

NOTE:

- Apply the 4-stroke engine oil onto the washers.
- Tighten the bolts starting with the lowest numbered one.
- The embossed numbers in the cylinder head designate the tightening sequence.

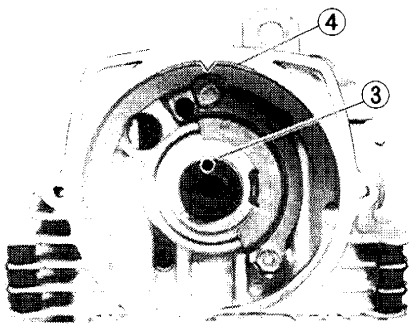


11. Install:
    • Cam sprocket

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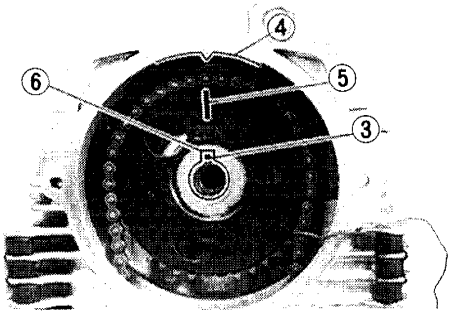
Installing steps:

- Turn the crankshaft counterclockwise until the TDC mark ① is aligned with the stationary pointer ②.
- Align the pin ③ on the camshaft with the stationary pointer ④ on the cylinder head.
- Fit the timing chain onto cam sprocket and install the cam sprocket on the camshaft.



NOTE:

- When installing the cam sprocket, keep the timing chain as tense as possible on the exhaust side.
- Align the mutch mark ⑤ on the cam sprocket with the stationary pointer ④ on the cylinder head.
- Align the pin ③ on the camshaft with the slot ⑥ in the cam sprocket.

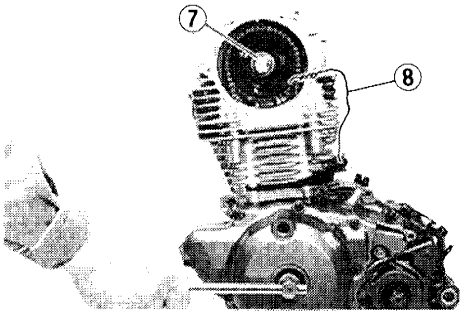


CAUTION:

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

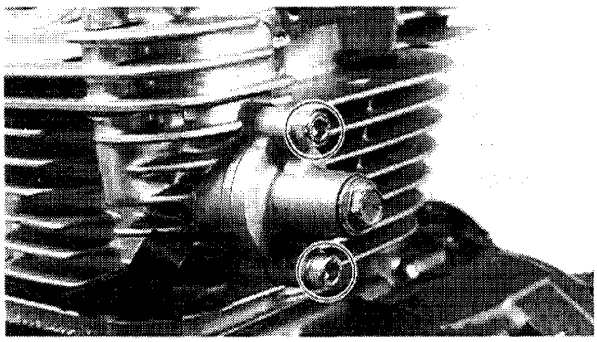
- Tighten the Bolt ⑦.

	Bolt (cam sprocket): 60 Nm (6.0 m•kg, 43 ft•lb)



- Remove a safety wire ⑧ from the timing chain.

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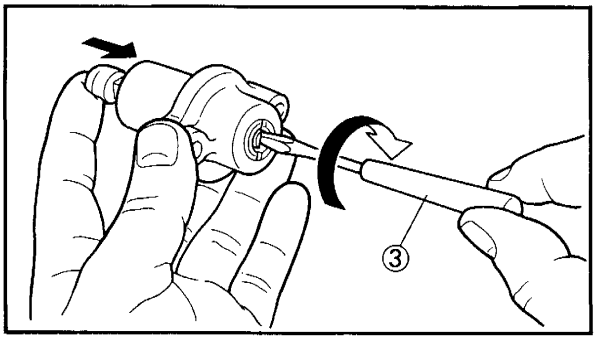


12. Install:
    - Timing chain tensioner

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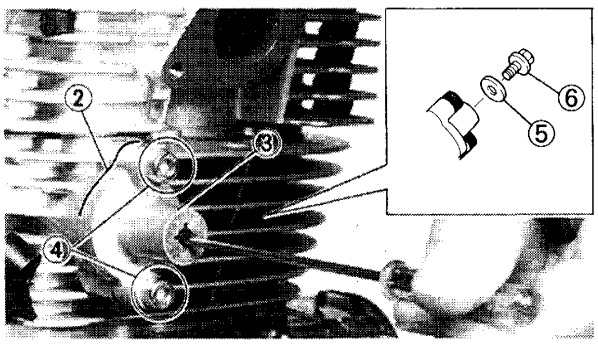
Installing steps:

- While pressing the tensioner rod lightly with fingers, use a thin screwdriver ① and wind the tensioner rod up fully clockwise.
- With the rod fully wound, install the gasket ② and the chain tensioner ③, and tighten the bolt ④ to the specified torque.



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

- Release the screwdriver, check the tensioner rod to come out and tighten the gasket ⑤ and the cap bolt ⑥ to the specified torque.



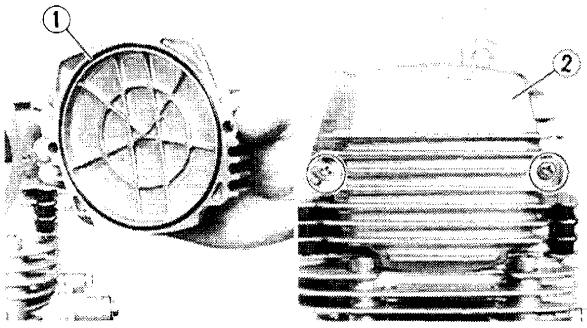
	Cap bolt (timing chain tensioner): 7 Nm (0.7 m•kg, 5 ft•lb)

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13. Check:
    • Valve timing
      Out of alignment → Adjust.
      Refer to above steps 11 ~ 12.

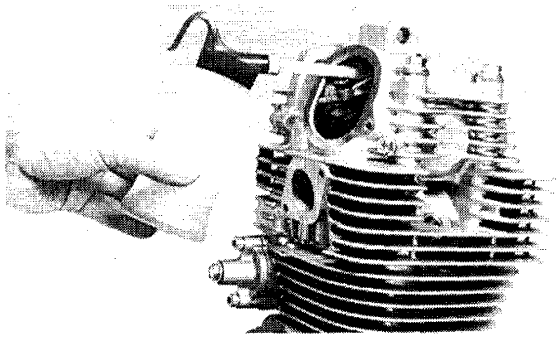
14. Check:
    • Valve clearance
      Out of specification → Adjust.
      Refer to "VALVE CLEARANCE ADJUSTMENT" section in the CHAPTER 3.

Install valve (cold):
0.05 ~ 0.09 mm (0.002 ~ 0.004 in)
Exhaust valve (cold):
0.15 ~ 0.19 mm (0.006 ~ 0.007 in)



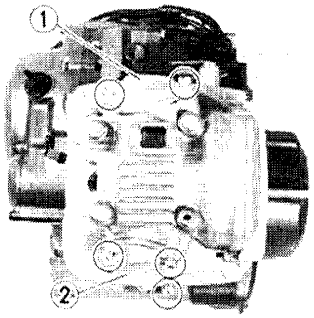
15. Install:
    • O-ring ①
    • Cylinder head side cover ②

Bolt (cylinder head side cover):
7 Nm (0.7 m•kg, 5.1 ft•lb)



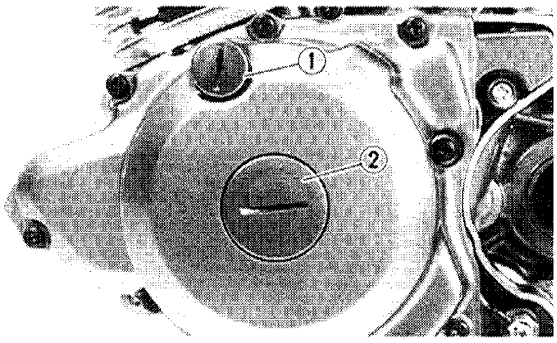
16. Apply:
    • 4-stroke engine oil
      (to the camshaft upper side)

Oil quantity:
0.5 L (0.44 Imp•qt, 0.53 US•qt)

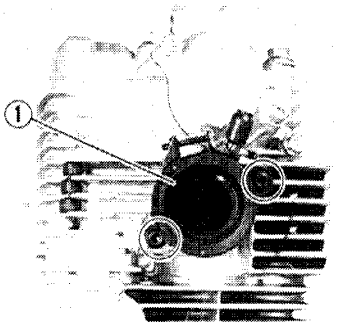


17. Install:
    • Tappet cover (intake) ①
    • Tappet cover (exhaust) ②

Bolt (tappet cover):
10 Nm (1.0 m•kg, 7.2 ft•lb)

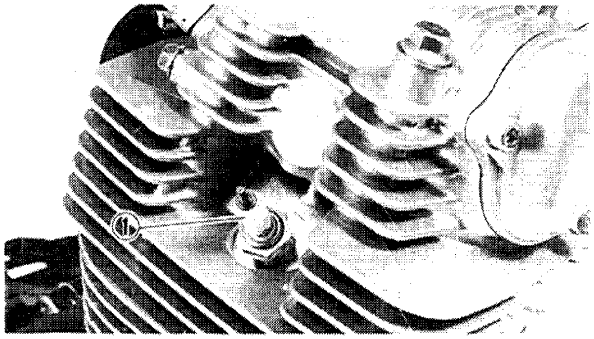


18. Install:
    - Timing plug ①
    - Plug (center) ②



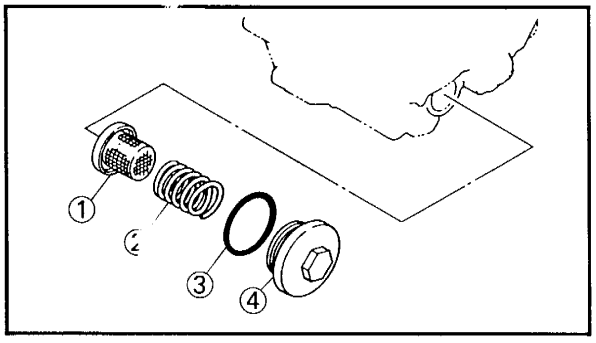
19. Install:
    - Intake manifold ①

	Bolt (intake manifold): 12 Nm (1.2 m•kg, 8.7 ft•lb)



20. Install:
    - Spark plug ①

	Spark plug: 17.5 Nm (1.75 m•kg, 12.5 ft•lb)



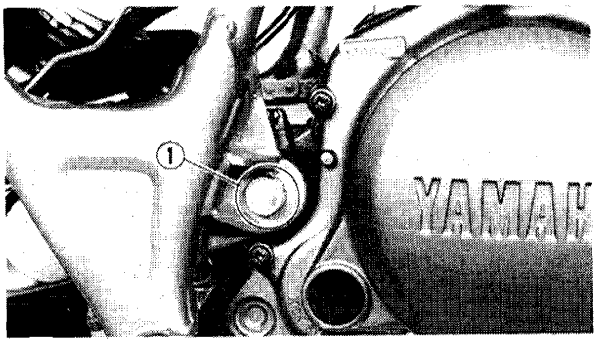
21. Install:
    - Oil strainer ①
    - Compression spring ②
    - O-ring ③
    - Drain plug ④

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

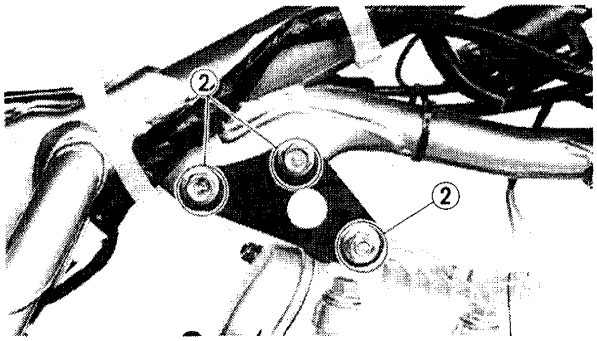
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REMOUNTING ENGINE

When remounting the engine, reverse the removal procedure. Note the following points.

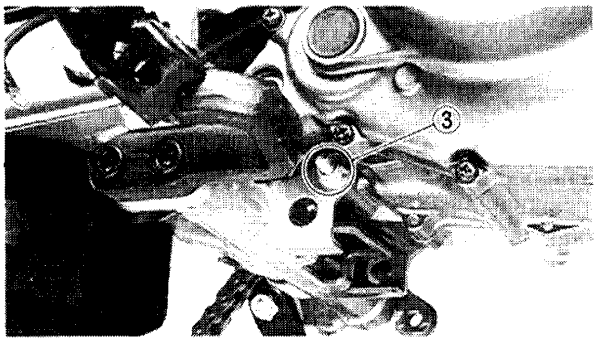


1. Install:
   - Pivot shaft ①
   - Mounting bolt ② (front—upper)
   - Mounting bolt ③ (rear—lower)
   - Mounting bolts ④ (front—lower)

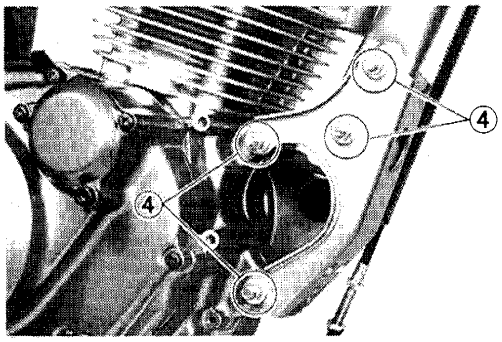


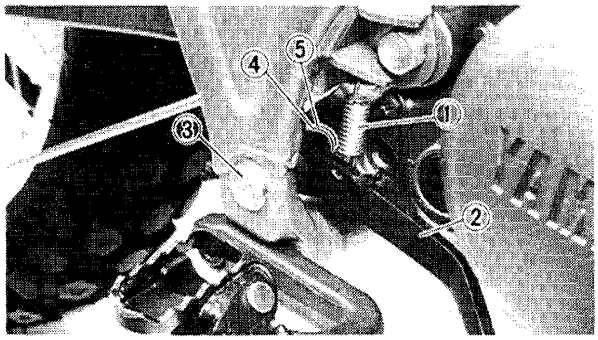
NOTE:

Install the all bolts and nuts first, and then tighten the bolts and nuts to specifications.



	Nut (pivot shaft):
	80 Nm (8.0 m•kg, 58 ft•lb)
	Bolt (engine stay upper—frame):
	37.5 Nm (3.75 m•kg, 27 ft•lb)
	Nut (mounting bolt):
	Front—upper
	32.5 Nm (3.25 m•kg, 23.5 ft•lb)
	Front, Rear—lower
	32.5 Nm (3.25 m•kg, 23.5 ft•lb)

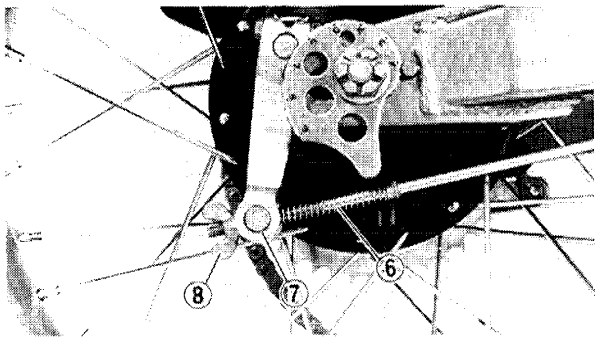




2. Connect:
   - Spring ①

3. Install:
   - Rear brake pedal ②
   - Brake pedal shaft ③
   - Washer ④
   - Circlip ⑤

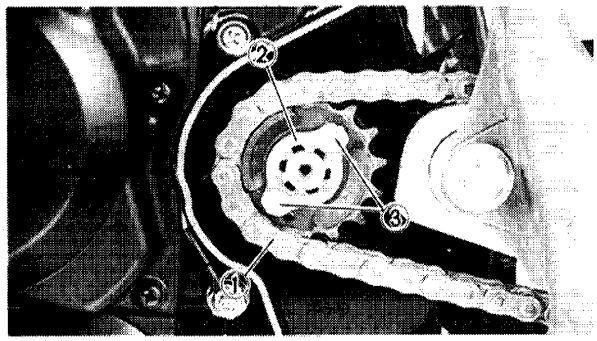
	Brake pedal shaft:
	30 Nm (3.0 m•kg, 22 ft•lb)



4. Install:
   - Compression spring ⑥
   - Pin ⑦
   - Adjuster ⑧

5. Adjust:
   - Brake pedal free play
     Refer to the "REAR BRAKE ADJUSTMENT" section in the CHAPTER 3.

Brake pedal free play:
20 ~ 30 mm (0.8 ~ 1.2 in)

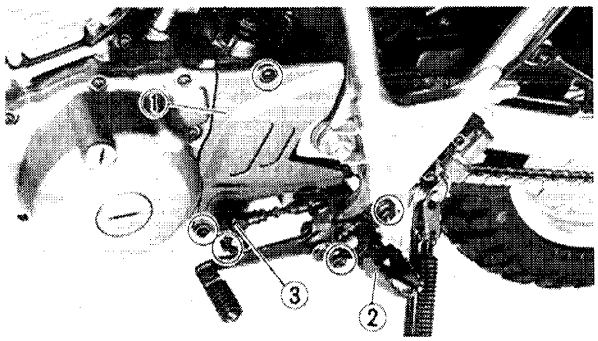


6. Install:
   - Drive chain ① (with drive sprocket)
   - Sprocket holder ②
   - Bolts ③

Bolts:
10 Nm (1.0 m•kg, 7.2 ft•lb)

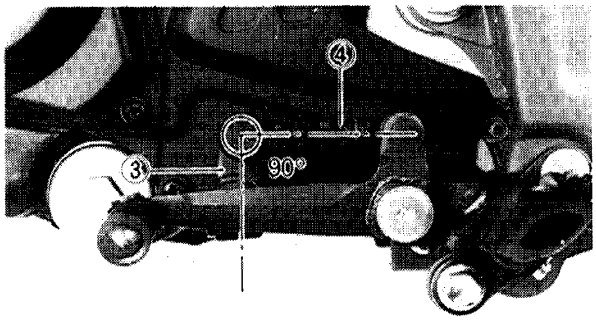
7. Adjust:
   - Drive chain slack
     Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

Drive chain slack:
35 ~ 45 mm (1.38 ~ 1.77 in)



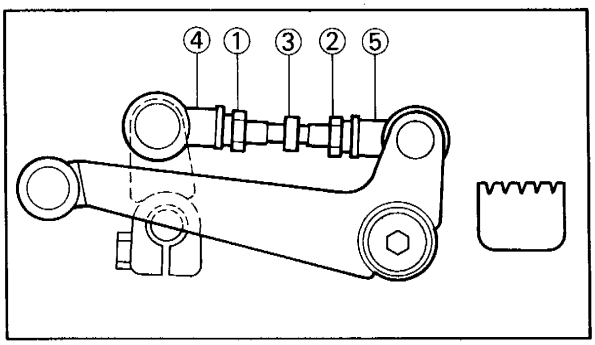
8. Install:
   - Crankcase cover 2 ①
   - Footrest ② (left)
   - Shift arm ③

Bolt (footrest):
32 Nm (3.2 m•kg, 23 ft•lb)
Bolt (shift arm):
10 Nm (1.0 m•kg, 7.2 ft•lb)



NOTE:

Install the shift arm ③ and the shift rod ④ so that they form a right angle.



9. Check:
   - Shift pedal position
     Check that the shift pedal is set to same as the footrest top.
     Not set→Adjust.

10. Adjust:
    - Shift pedal position

****

Adjustment steps

- Loosen the locknut ①, ② and turn the shift rod ③.

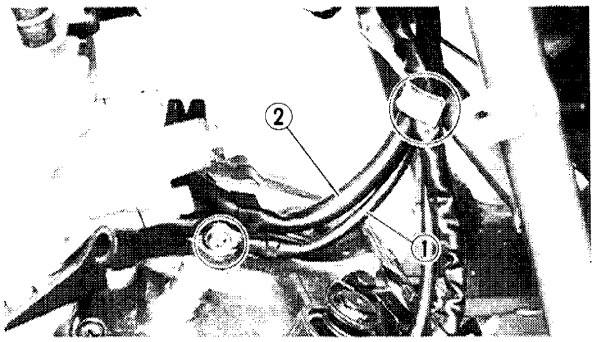
CAUTION:

- **The locknut ② is left-hand thread.**
- **Screw the shift rod threads into the holder ④, ⑤ more then 4.**

- Tighten the locknut ①, ② to the specified torque.

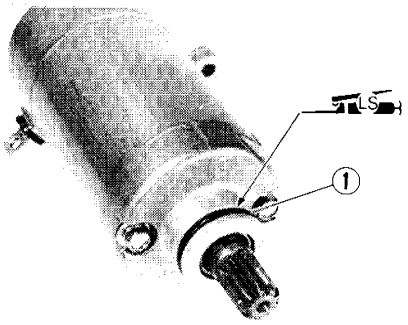
	Locknut: **10 Nm (1.0 m•kg, 7.2 ft•lb)**

****

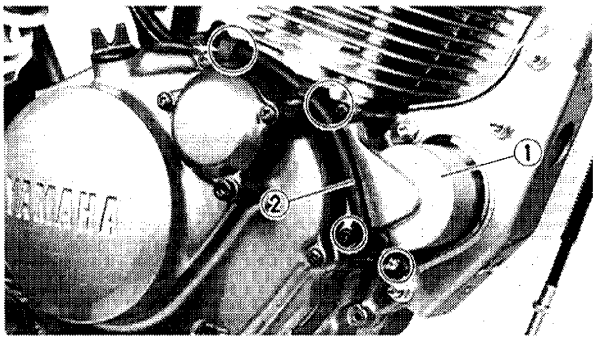


11. Connect:
    - Wire earth lead ①
    - Starter motor lead ②
      (to the crankcase)
      Refer to the "CABLE ROUTING" section in the CHAPTER 2.

	Bolt: **7 Nm (0.7 m•kg, 5.1 ft•lb)**



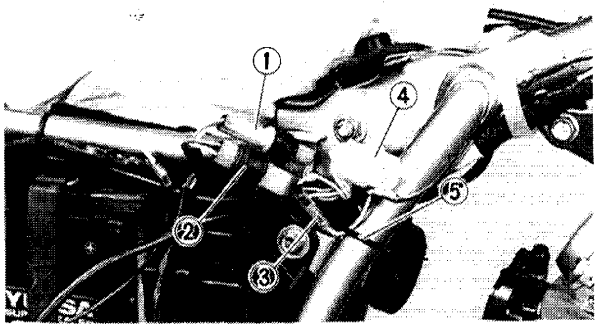
12. Apply:
    - Litium soap base grease
      (on to the O-ring on starter motor)



13. Install:
    - Starter motor ①

	Bolts (starter motor): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

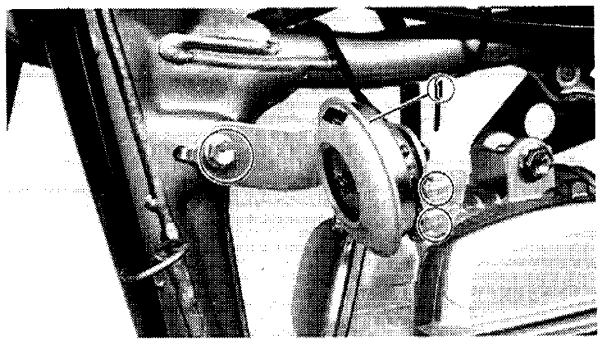
14. Connect:
    - Starter motor lead ②
      (to starter motor and clamps)



15. Connect:
    - Pulser coil lead ①
    - Charge coil lead ②
    - Neutral switch lead ③
    - Stator coil lead ④
    - Band ⑤
    - Spark plug cap

CAUTION:

Always use a new band.



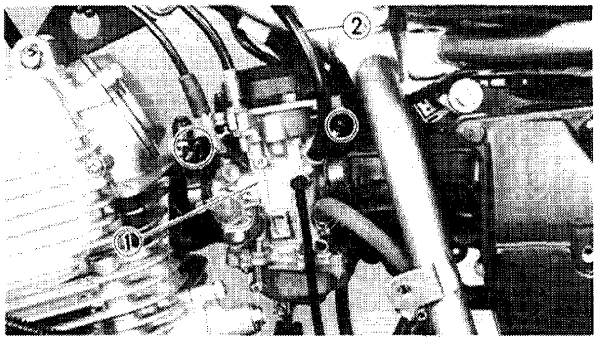
16. Install:
    - Horn ①

	Bolt (horn stay): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

17. Connect:
    - Clutch cable

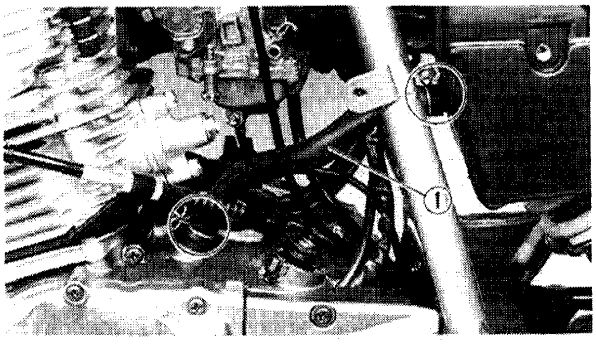
18. Adjust:
    - Clutch cable free play
      Refer to the "CLUTCH ADJUSTMENT" section in the CHAPTER 3.

Free play:
10 ~ 15 mm (0.39 ~ 0.59 in)
at clutch lever end

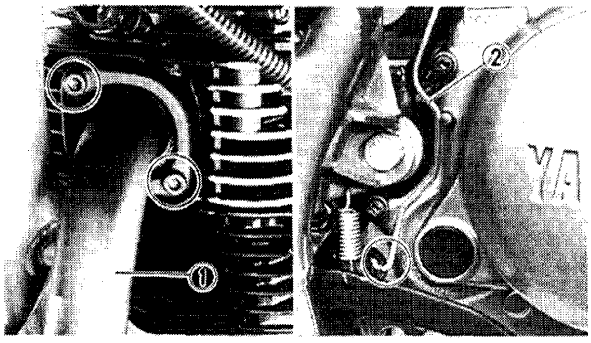


19. Connect:
- Carburetor ①
- Air vent hose ② (Except for California)

Screw (carburetor joint clamp):
2 Nm (0.2 m•kg, 1.4 ft•lb)



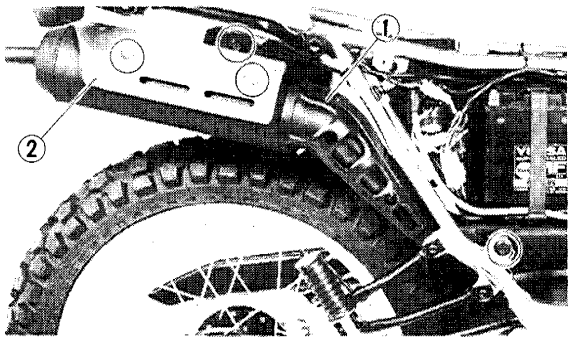
20. Connect:
- Crankcase ventilation hose ①



21. Install:
- Exhaust pipe ①

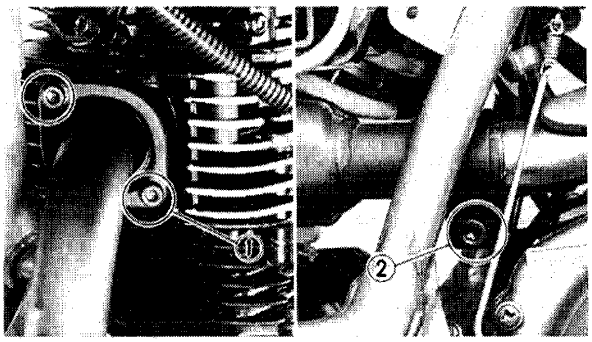
22. Connect:
- Rear brake switch rod ②

Refer to the "CABLE ROUTING" section in the CHAPTER 2.



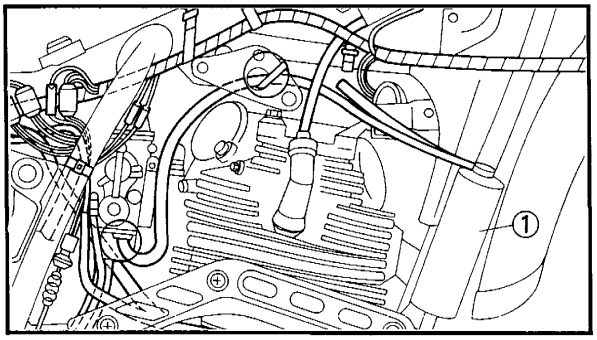
23. Install:
- Muffler ①
- Protector ②

Bolt (muffler):
27 Nm (2.7 m•kg, 19 ft•lb)
Bolt (protector):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Use LOCTITE®.



24. Tighten:
- Bolt ① (exhaust pipe)
- Bolt ② (clamp)

Bolt (exhaust pipe):
10 Nm (1.0 m•kg, 7.2 ft•lb)
Bolt (clamp):
20 Nm (2.0 m•kg, 14 ft•lb)

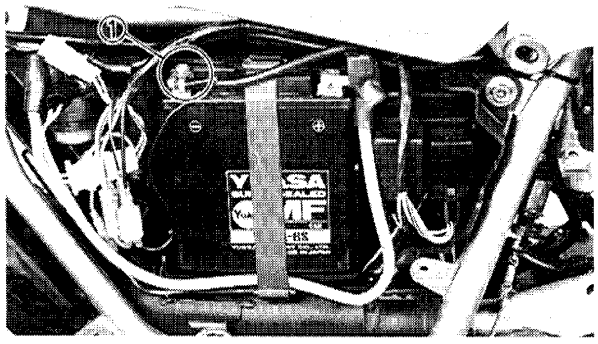


25. Install:
- Canister ① (for California only)

Bolt (canister):
10 Nm (1.0 m•kg, 7.2 ft•lb)

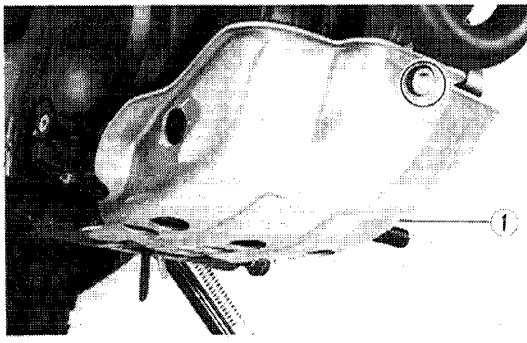
Refer to the "CABLE ROUTING" section in the CHAPTER 2.

CAUTION:
Always use a new band.



26. Connect:
- Battery negative lead ①

Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.



27. Install:
- Engine guard ①

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

Bolt (engine guard):
7 Nm (0.7 m•kg, 5.1 ft•lb)

28. Fill:
    - 4-stroke engine oil
      (to the crankcase)
      Refer to the "ENGINE OIL REPLACEMENT and OIL PRESSURE INSPECTION" section in the CHAPTER 3.

	Oil quantity: **Total amount** **1.3 L (1.14 Imp•qt, 1.37 US•qt)**

	Oil check bolt: **7 Nm (0.7 m•kg, 5.1 ft•lb)**

CAUTION:

Never start the engine when the oil is drained.

29. Install:
    - Fuel tank
    - Air scoops
    - Seat
    - Side covers
      Refer to the "SEAT, FUEL TANK AND COVER" section in the CHAPTER 3.

	Bolts (fuel tank, air scoops, seat and, side cover): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

30. Check:
    - Engine idle speed
      Refer to the "IDLING SPEED ADJUSTMENT" section in the CHAPTER 3.

	Engine idle speed **1,300 ~ 1,500 r/min**

31. Check:
    - Brake light operating timing and each light operation.
      Incorrect → Adjust or repair.

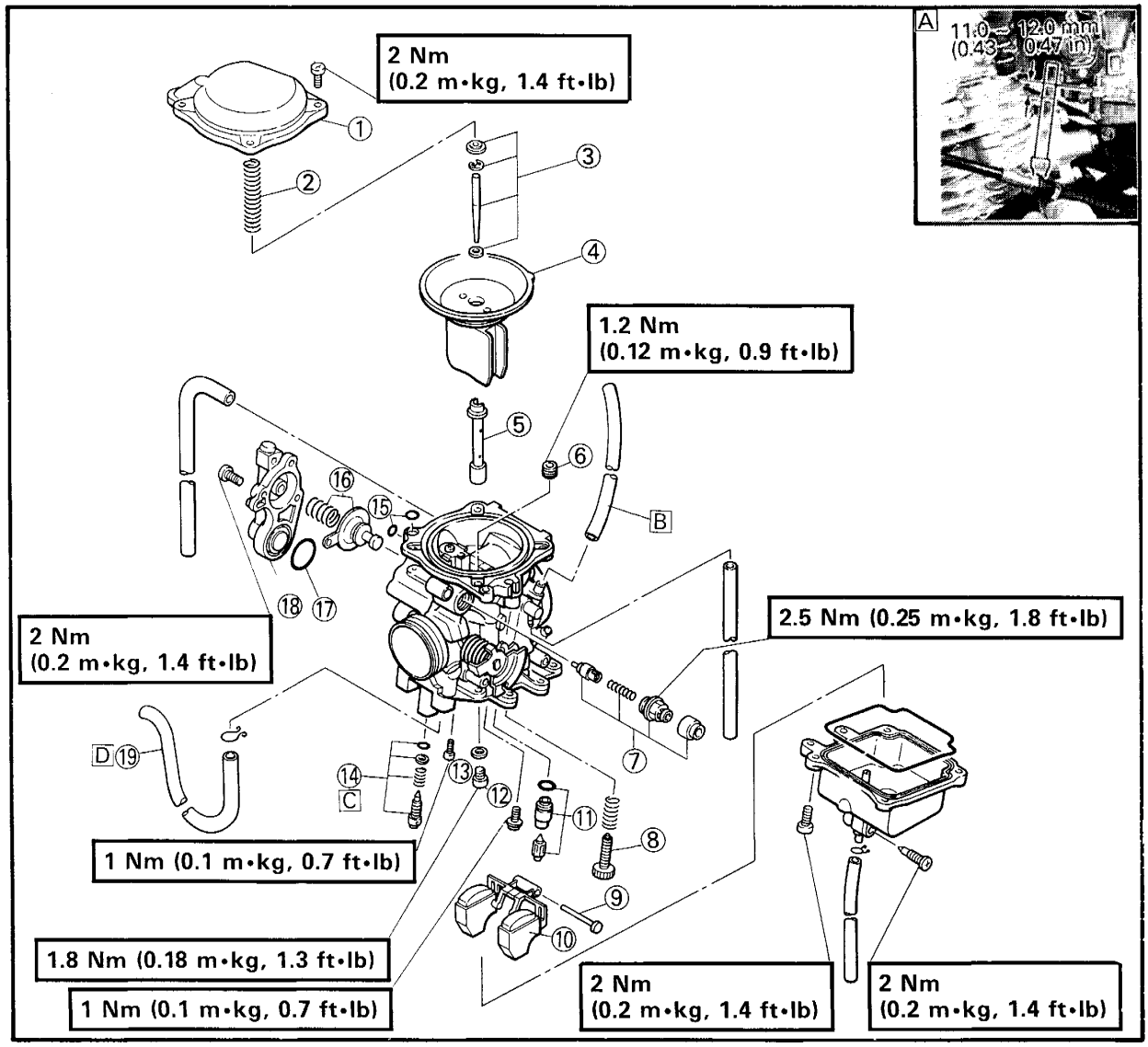
CARBURETION

CARBURETOR

① Diaphragm cover
② Diaphragm spring
③ Jet needle set
④ Diaphragm assembly
⑤ Needle jet
⑥ Pilot air jet
⑦ Starter plunger assembly
⑧ Throttle stop screw
⑨ Float pin
⑩ Float
⑪ Needle valve set
⑫ Main jet
⑬ Pilot jet
⑭ Pilot screw
⑮ O-ring
⑯ Diaphragm assembly (coasting enricher)
⑰ O-ring
⑱ Cover assembly
⑲ Canister hose (For USA-California)

SPECIFICATIONS		
ID MARK	4BE10 (USA-Except for California) 4BE00 (USA-For California)	3RW00 (CDN)
MAIN JET (M.J.)	#130	#122.5
PILOT JET (P.J.)	#40	#42.5
JET NEEDLE (J.N.)	5DL27-1	5GN50-3/5
NEEDLE JET (N.J.)	O-1	Q-0
PILOT SCREW (P.S.)	Preset	2 turns out
FLOAT HEIGHT (F.H.)	14.1 ~ 15.1 mm (0.56 ~ 0.59 in)	
FUEL LEVEL [A] (F.L.)	11.0 ~ 12.0 mm (0.43 ~ 0.47 in) Below from the float chamber mating surface (front)	
ENGINE IDLING SPEED	1,300 ~ 1,500 r/min	

[B] Except for USA-California
[C] For USA, it is unadjustable from regulations.
[D] For USA-California



SECTIONAL VIEW

- SU TYPE CARBURETOR

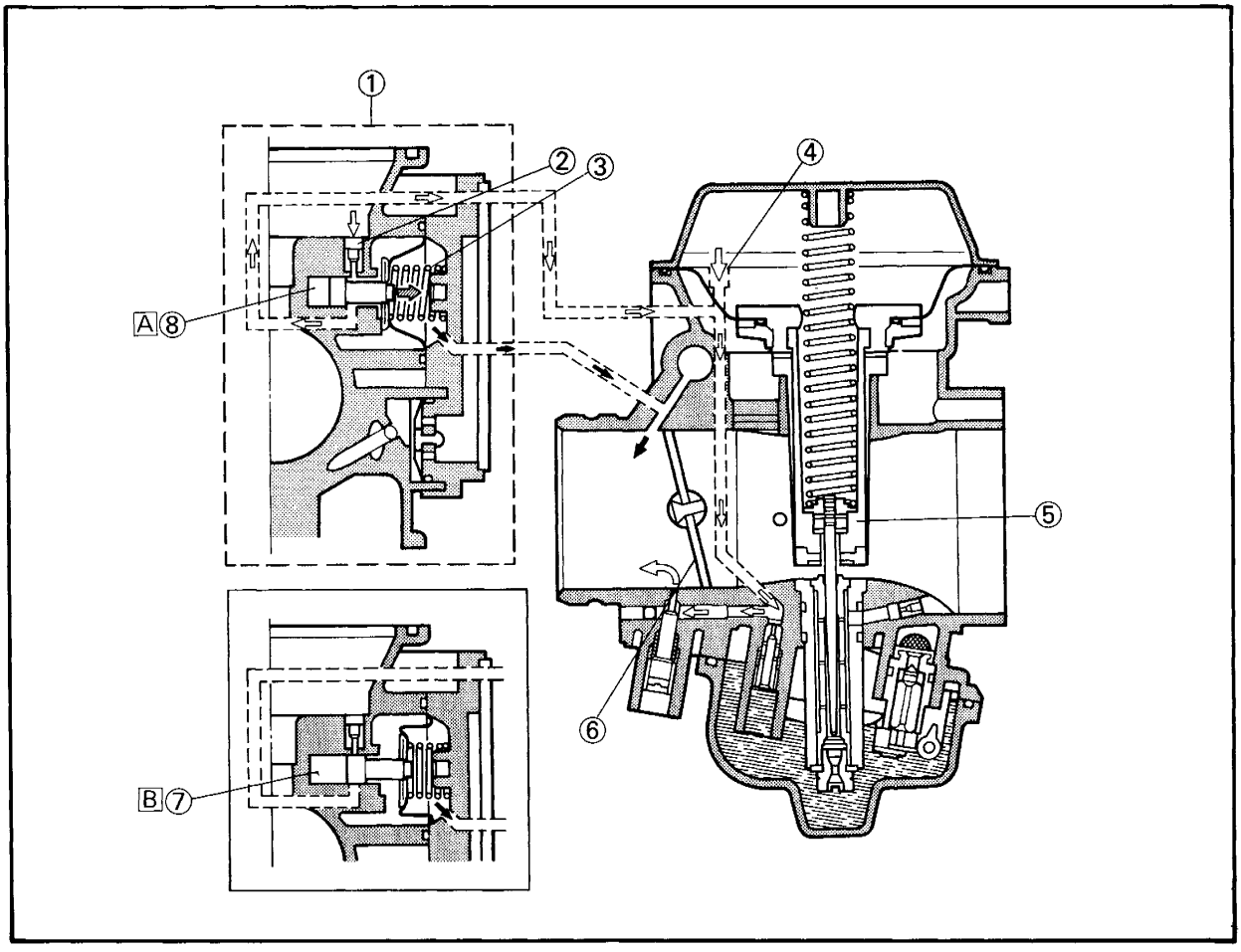
  The SU carburetor features a butterfly type throttle valve that is operated by moving the throttle grip which in turn controls the piston valve by means of negative intake pressure.
  The throttle valve controls the air/fuel mixture where at the same time the piston valve regulates the venturi area by use of negative pressure. This keeps the velocity of the air/fuel mixture stream more constant in supplying the engine with the necessary mixture at all times.

- COASTING ENRICHER (purpose)

  When the throttle valve is suddenly closed, the main fuel path is cut causing a lean mixture and sometimes unstable idling. The coast enricher compensates for this lean mixture.

  (Operation)
  When the throttle valve is open, air is supplied by both pilot air jets (1 & 2). Negative pressure is always present in the carburetor, however, when the throttle valve is open, negative pressure is weaker than the force of the enricher valve spring, which keeps the enricher valve open and allows air to be supplied by pilot air jet 2.
  When the throttle valve is closed, negative pressure is increased which pulls the enricher valve close and cuts off air supply from pilot air jet 2. Air intake supplied by only pilot air jet 1 provides an adequate mixture for stable idling and low speed performance.

① Coasting enricher
② Pilot air jet 2
③ Valve spring
④ Pilot air jet 1
⑤ Piston valve
⑥ Throttle valve
⑦ Enricher valve
⑧ Enricher valve
A OPEN
B CLOSED
Air ⇨
Negative pressure ➡



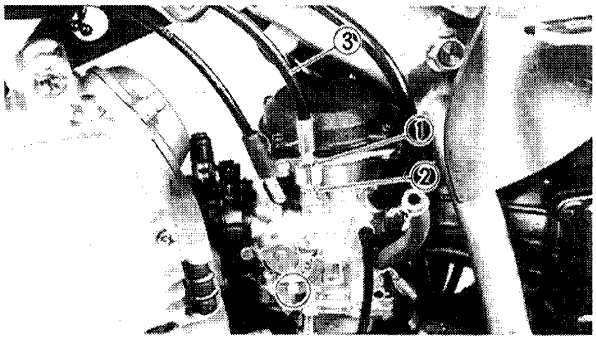
REMOVAL

1. Remove:
   - Side covers
   - Seat
   - Air scoops
   - Fuel tank

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

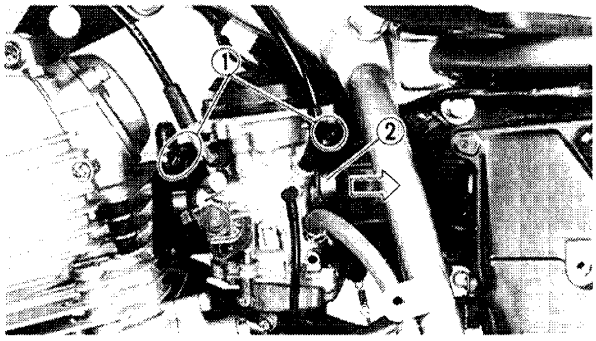
2. Drain:
   - Fuel (float chamber)

   Refer to the "ENGINE OVERHAUL—ENGINE REMOVAL" section in the CHAPTER 4.



3. Loosen:
   - Locknut ① (throttle cable)

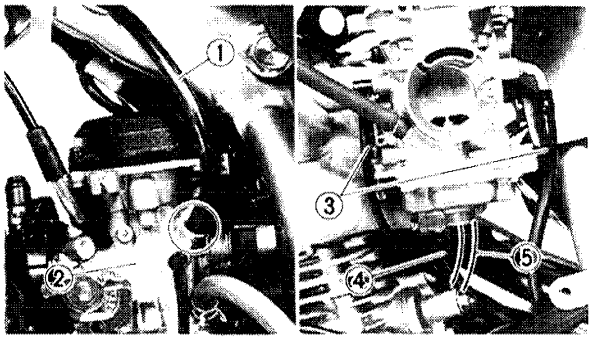
4. Remove:
   - Locknut ② (from cable adjust bolt)
   - Throttle cable ③ (from throttle lever and cable holder)



5. Loosen:
   - Screws ① (carburetor joint clamp)

NOTE:

Move carburetor joint clamp ② to the rear.



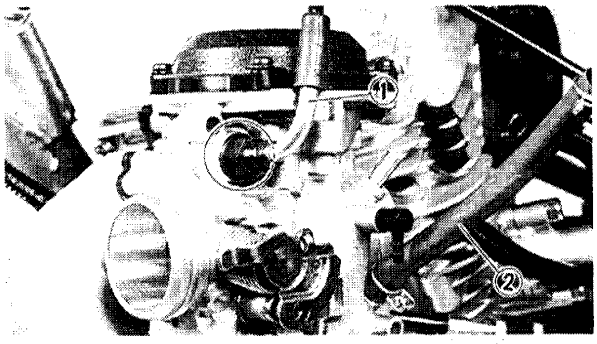
6. Disconnect:
   - Air vent hose ①

   (Except for USA-California)

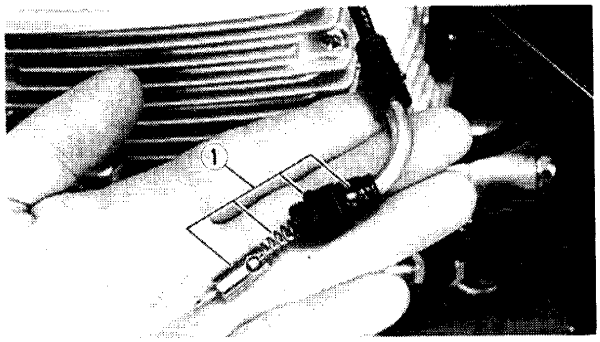
7. Remove:
   - Carburetor assembly ②

8. Disconnect:
   - Air vent hoses ③
   - Over flow hose ④
   - Canister hose ⑤

   (For USA-California)



9. Remove:
   - Starter cable ①
   - Fuel hose ②

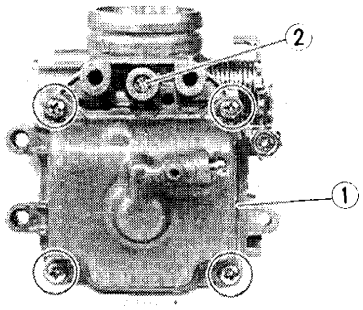


10. Disconnect:
    - Starter plunger assembly ①
      (from starter cable)

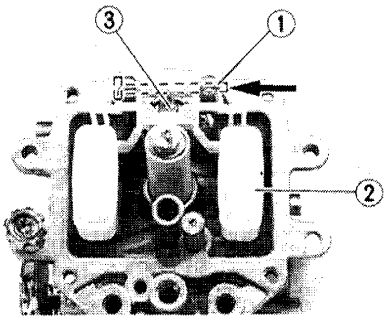
DISASSEMBLY

NOTE:

The following parts can be cleaned and inspected without disassembly.
- Diaphragm (coasting enricher)
- Starter plunger
- Throttle stop screw



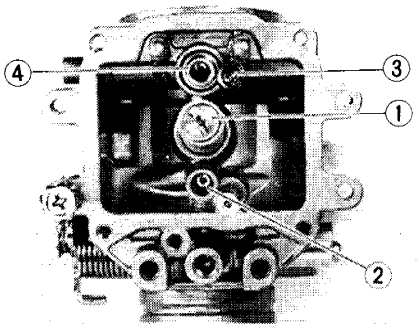
1. Remove:
   - Float chamber ①
   - Pilot screw – ② (Except for USA)



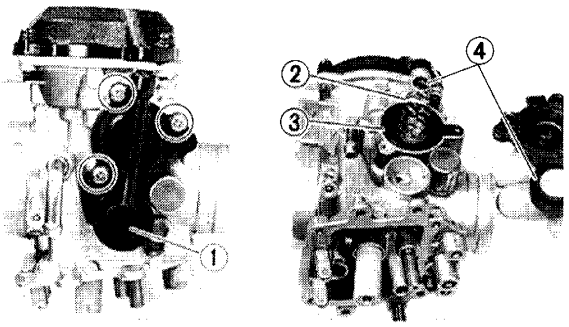
2. Remove:
   - Float pin ①
   - Float ②
   - Needle valve ③

NOTE:

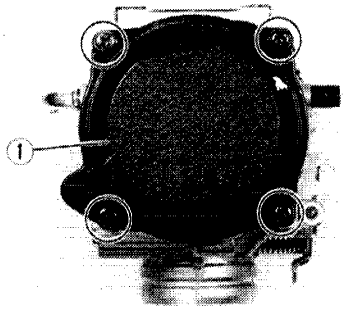
Remove the float pin in the arrow direction.



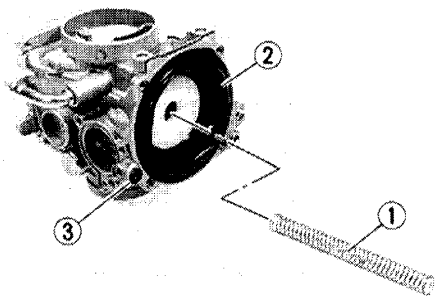
3. Remove:
   - Main jet ①
   - Pilot jet ②
   - Screw ③
   - Valve seat ④



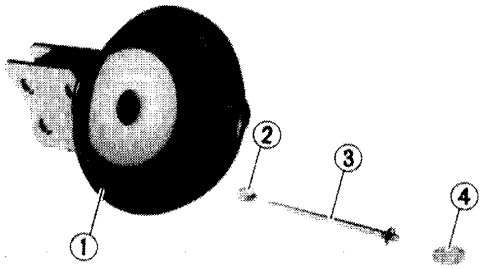
4. Remove:
   - Cover assembly ① (coasting enricher)
   - Spring ②
   - Diaphragm ③
   - O-ring ④



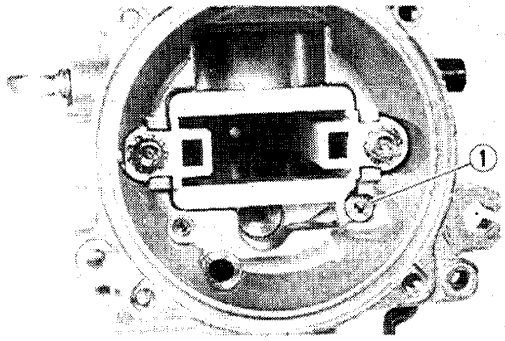
5. Remove:
   - Diaphragm cover ①



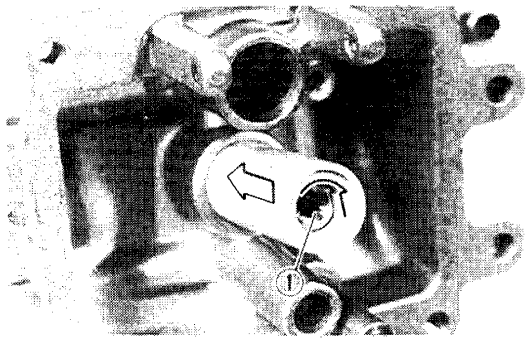
6. Remove:
   - Diaphragm spring ①
   - Diaphragm ②
   - O-ring ③



7. Remove:
   - Diaphragm ①
   - Ring ②
   - Jet needle ③
   - E-ring ④



8. Remove:
   • Pilot air jet ①

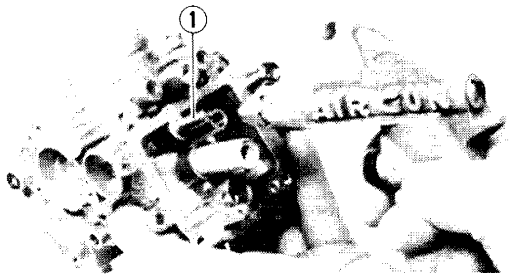


9. Remove:
   • Needle jet ①

NOTE:

Remove the needle jet towards the diaphragm side.

INSPECTION



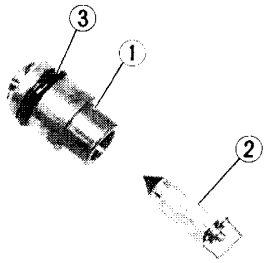
1. Inspect:
   • Carburetor body
   • Starter jet ①
   • Float chamber
     Cracks/Damage → Replace.
   • Fuel passage
     Contamination → Clean.

NOTE:

Use a petroleum based solvent for cleaning. (Do not use any caustic carburetor cleaning solution.) Blow out all passages and jets with compressed air.

CAUTION:

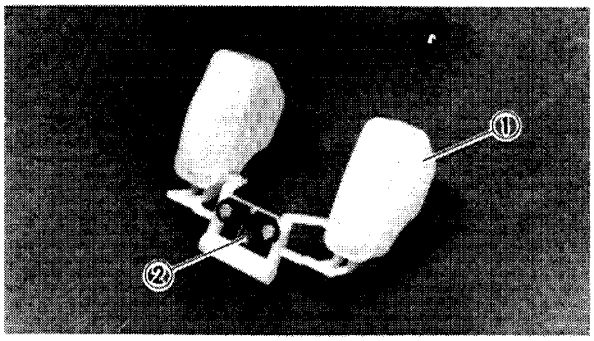
• The starter jet is press-fit so it is unremovable.
• Do not use a wire for cleaning.



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

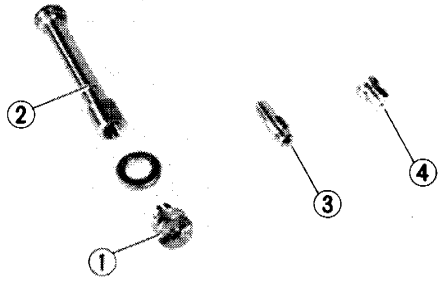
NOTE:

Always replace the needle valve and valve seat as a set.



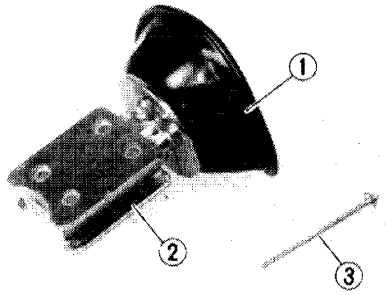
3. Inspect:
   - Float ①
   - Float arm ②

   Damage→Replace.



4. Inspect:
   - Main jet ①
   - Needle jet ②
   - Pilot jet ③
   - Pilot air jet ④

   Wear/Damage→Replace.
   Contamination→Blow out jets with compressed air.

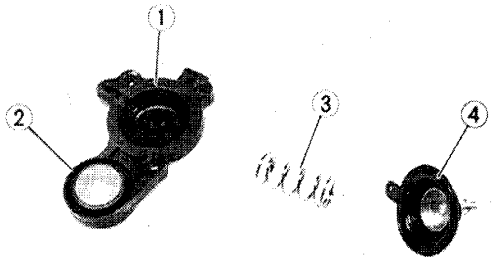


5. Inspect:
   - Diaphragm ①

   Tears/Damage→Replace diaphragm assembly.
   - Piston valve ②

   Scratches/Wear/Damage→Replace diaphragm assembly.
   - Jet needle ③

   Wear/Bend/Damage→Replace.

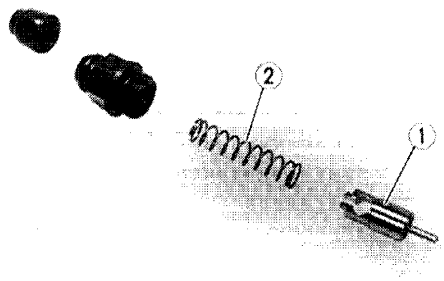


6. Inspect:
   - Cover assembly ①
   - O-ring ②

   Wear/Damage→Replace.
   - Diaphragm spring ③

   Damage→Replace diaphragm assembly.
   - Diaphragm ④

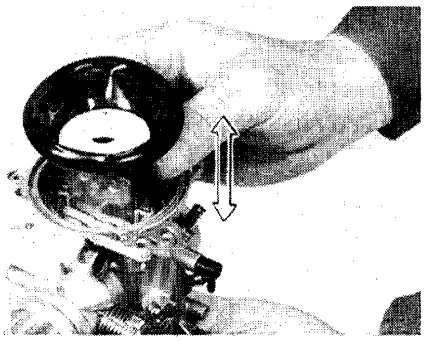
   Tears/Damage→Replace.



7. Inspect:
   - Starter plunger ①

   Bends/Wear/Damage→Replace.
   - Spring ②

   Damage→Replace.



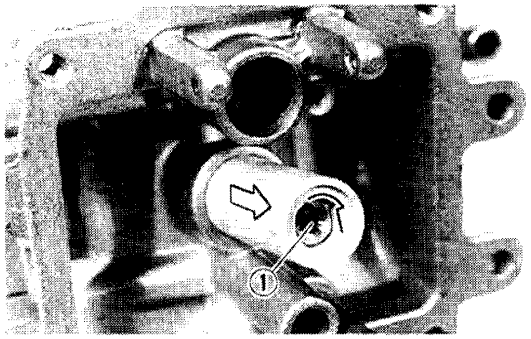
8. Check:
   - Free movement
     Stick → Replace.
     Insert the piston valve into the carburetor body, and check for free movement.

ASSEMBLY

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

CAUTION:

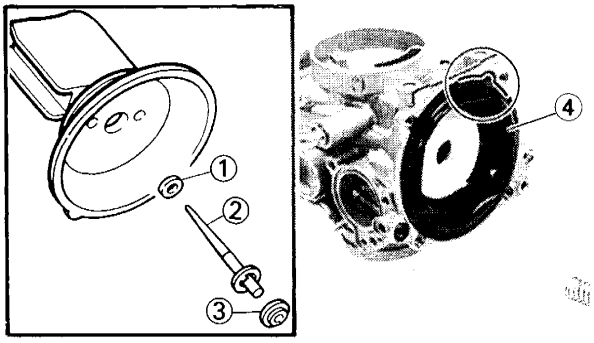
- **Before reassembling, wash the all parts in clean petroleum based solvent.**
- **Always use a new gasket.**



1. Install:
   - Needle jet ①

NOTE:

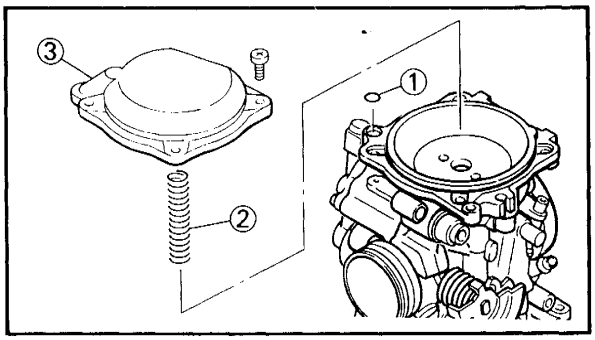
Align the cut end of the needle jet with the slot on the body.



2. Install:
   - Ring ①
   - Jet needle ②
   - E-ring ③

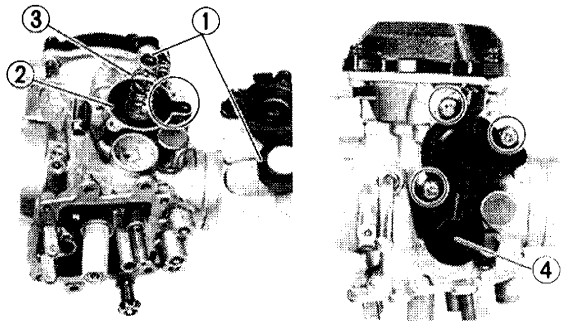
NOTE:

Match the tab on the diaphragm assembly ④ to the matching recess in the carburetor body.



3. Install:
   - O-ring ①
   - Diaphragm spring ②
   - Diaphragm cover ③

	Screw (diaphragm cover): 2 Nm (0.2 m•kg, 1.4 ft•lb)

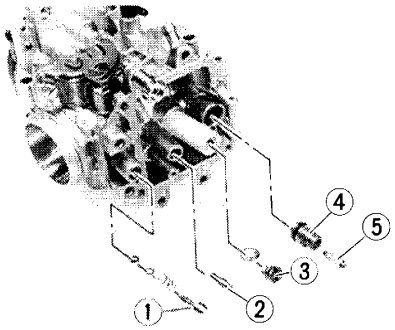


4. Install:
   - O-ring ①
   - Diaphragm ② (coasting enricher)
   - Spring ③
   - Cover assembly ④

NOTE:

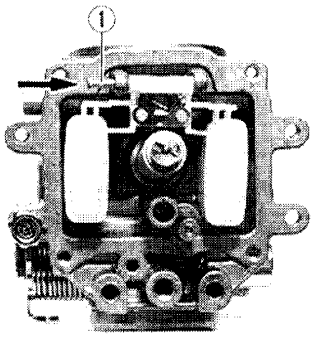
Match the tab on the rubber diaphragm to the matching recess in the carburetor body.

	Screw (cover assembly): **2 Nm (0.2 m•kg, 1.4 ft•lb)**



5. Install:
   - Pilot screw ① (except for USA)
   - Pilot jet ②
   - Main jet ③
   - Valve seat ④
   - Needle valve ⑤
     (with float)

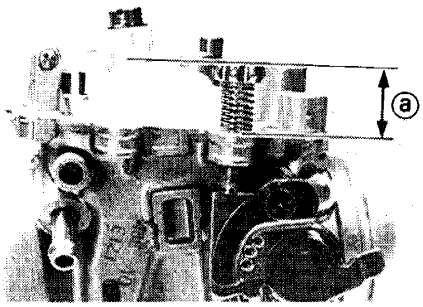
	Pilot jet: **1 Nm (0.1 m•kg, 0.7 ft•lb)** **Main jet:** **1.8 Nm (0.18 m•kg, 1.3 ft•lb)** **Screw (valve seat):** **1 Nm (0.1 m•kg, 0.7 ft•lb)**

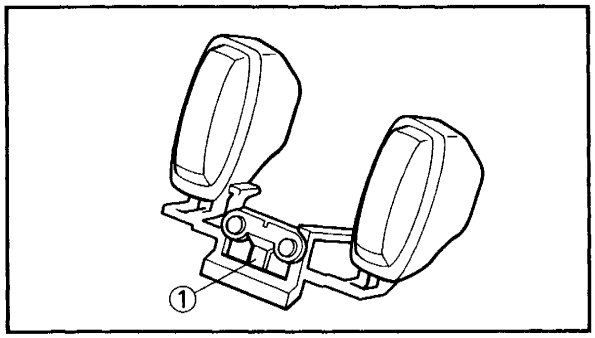


6. Install:
   - Float pin ①

NOTE:

Install the float pin reverse to the arrow.





7. Measure:
   • Float height ⓐ
   Out of specification → Adjust.

	Float height (F.H.): **14.1 ~ 15.1 mm (0.56 ~ 0.59 in)**

****

Measurement and adjustment steps:

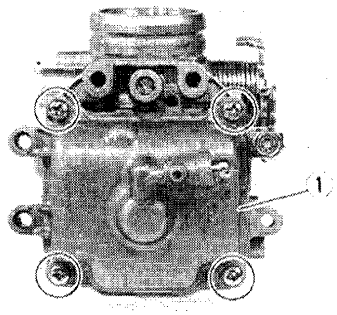
- Hold the carburetor in an upside down position.
- Measure the distance from the front mating surface of the float chamber (gasket removed) to the top of the float.

NOTE:

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

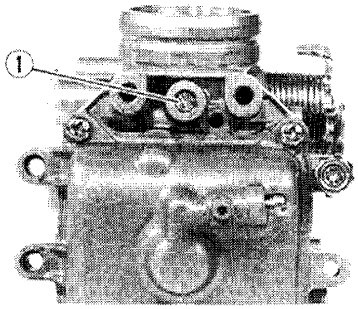
- If the float height is not within specification, inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang ① on the float.
- Recheck the float height.

****



8. Install:
   • Float chamber ①

	Screw (float chamber): **2 Nm (0.2 m•kg, 1.4 ft•lb)**



9. Adjust:
   • Pilot screw ① (Except for USA)

****

Adjustment steps:

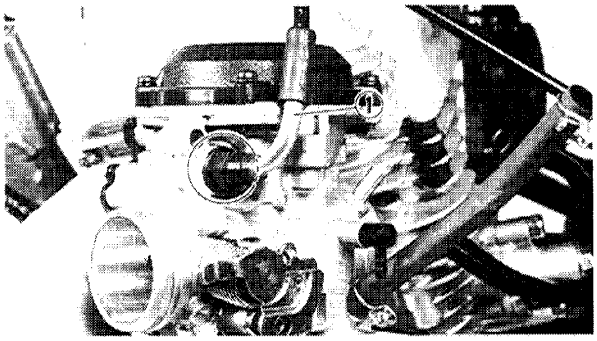
- Turn in the pilot screw until it is lightly seated.
- Back out by the specified number of turns.

	Pilot screw (turn out): **2 turns out**

****

INSTALLATION

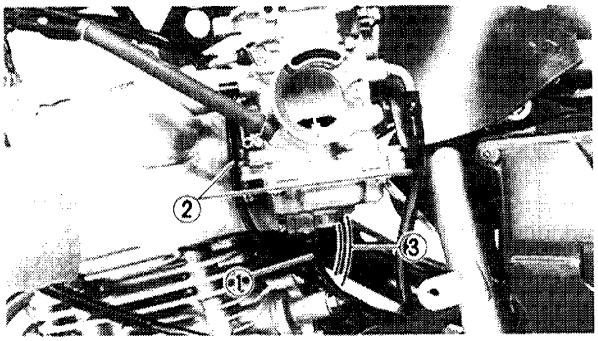
Reverse the "REMOVAL" procedures. Note the following points.



1. Install:
   - Starter cable ①

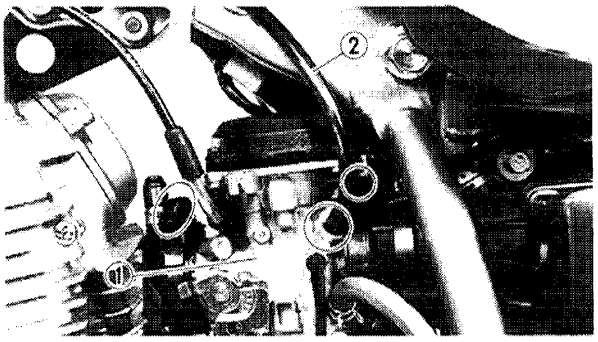
   Refer to the "CABLE ROUTING" section in the CHAPTER 2.

	Starter plunger cap: 25 Nm (0.25 m•kg, 1.8 ft•lb)



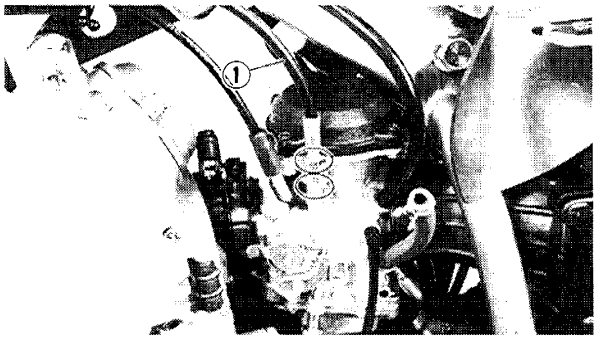
2. Connect:
   - Over flow hose ①
   - Air vent hoses ②
   - Canister hose ③ (For USA-California)

   Refer to the "CABLE ROUTING" section in the CHAPTER 2.



3. Install:
   - Carburetor assembly ①

	Screw (joint clamp): 2 Nm (0.2 m•kg, 1.4 ft•lb)



4. Connect:
   - Air vent hose ②

   (Except for USA-California)

5. Install:
   - Throttle cable ①

   Refer to the "CABLE ROUTING" section in the CHAPTER 2.

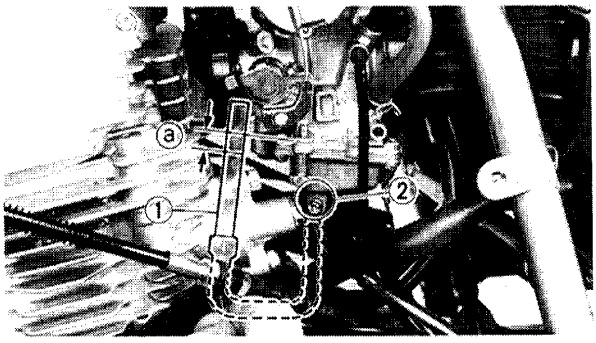
	Nut (throttle cable): 5 Nm (0.5 m•kg, 3.6 ft•lb)

6. Adjust:
   • Throttle cable free play
   Refer to the "THROTTLE CABLE FREE PLAY ADJUSTMENT" section in the CHAPTER 3.

Throttle cable free play:
3 ~ 5 mm (0.12 ~ 0.20 in)

7. Adjust:
   • Idle speed
   Refer to the "IDLE SPEED ADJUSTMENT" section in the CHAPTER 3.

Engine idle speed:
1,300 ~ 1,500 r/min



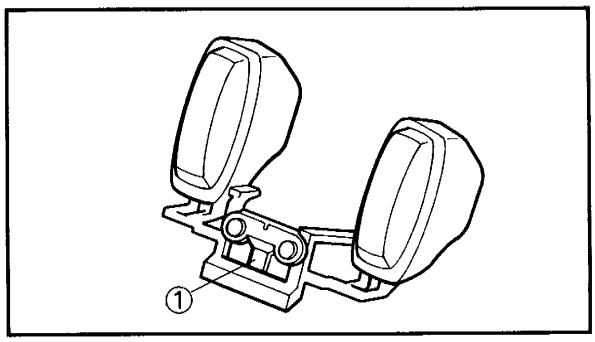
FUEL LEVEL ADJUSTMENT

1. Place the motorcycle on a level place.
2. Use the suitable stand under the frame and engine to ensure that the carburetor is positioned vertically.
3. Connect the Fuel Level Gauge ① to the float chamber drain pipe.

Fuel level gauge:
P/N. YM-01312-A
P/N. 90890-01312

4. Loosen the drain screw ②, and warm up the engine for several minutes.
5. Hold the gauge vertically next to the float chamber mating surface (front).
6. Measure:
   • Fuel level ⓐ
   Out of specification → Adjust.

Fuel level:
11.0 ~ 12.0 mm (0.43 ~ 0.47 in)
Below from the float chamber mating surface (front)



7. Adjust:
   • Fuel level

****

Adjustment steps:

- Remove the carburetor.
- 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 fuel level.

****

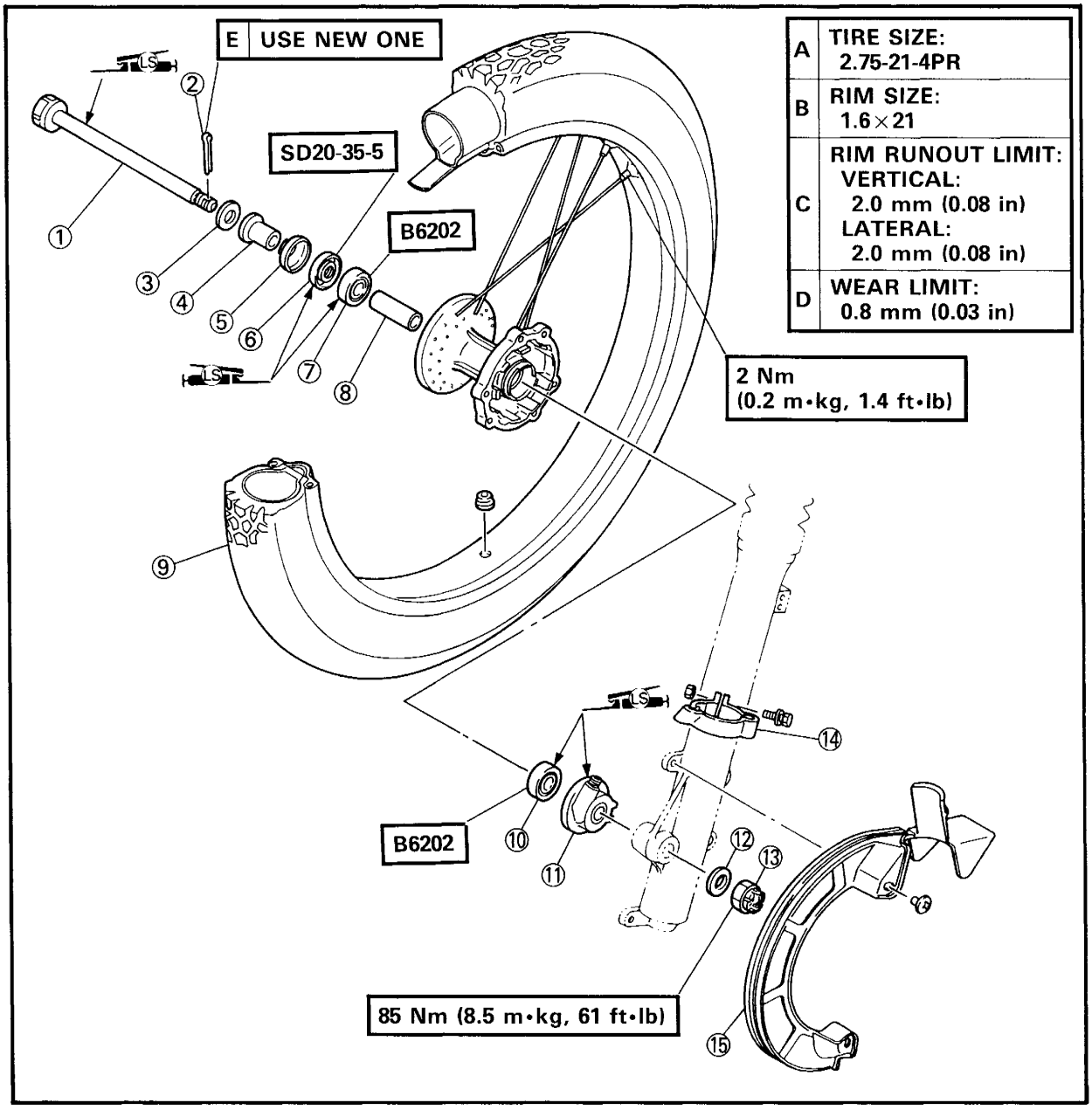
CHASSIS

FRONT WHEEL

① Wheel axle
② Cotter pin
③ Washer
④ Collar
⑤ Dust cover
⑥ Oil seal
⑦ Bearing
⑧ Spacer collar
⑨ Front wheel
⑩ Bearing
⑪ Gear unit (speedometer)
⑫ Washer
⑬ Nut
⑭ Cable band
⑮ Disc cover

TIRE AIR PRESSURE (COLD):		
Maximum load*	183 kg (403 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	125 kPa (1.25 kg/cm², 18 psi)	150 kPa (1.50 kg/cm², 21 psi)
90 kg (198 lb) ~ Maximum load*	150 kPa (1.50 kg/cm², 21 psi)	175 kPa (1.75 kg/cm², 25 psi)
High speed riding	150 kPa (1.50 kg/cm², 21 psi)	175 kPa (1.75 kg/cm², 25 psi)

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

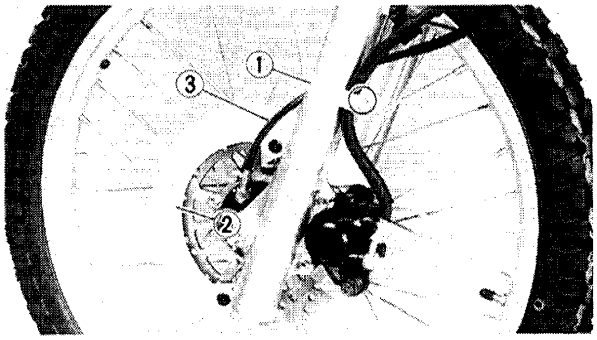


REMOVAL

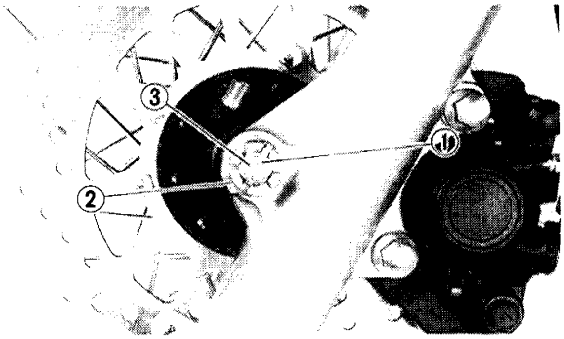
⚠ WARNING

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 a suitable stand under the frame and engine.



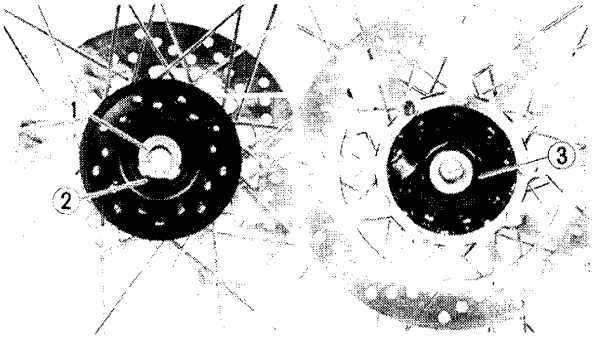
3. Remove:
   - Cable band ①
   - Disc cover ②
   - Speedometer cable ③



4. Remove:
   - Cotter pin ①
   - Nut ②
   - Wheel axle ③
   - Front wheel

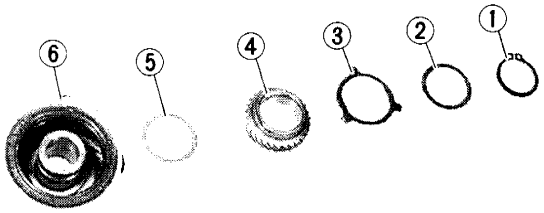
NOTE:

Do not depress the brake lever when the wheel is off the motorcycle otherwise the brake pads will be forced shut.

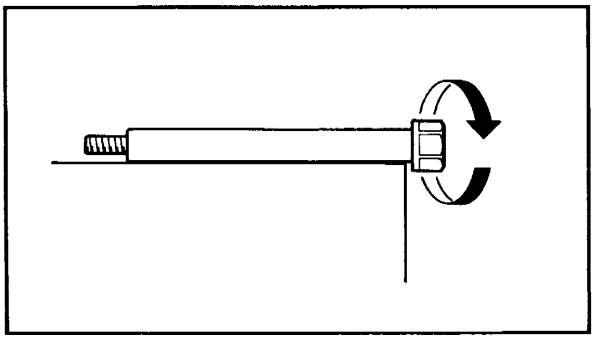


5. Remove:
   - Collar ①
   - Dust cover ②
   - Gear unit (speedometer) ③

Ⓐ Right side
Ⓑ Left side



6. Remove:
   - Circlip ①
   - Washer ②
   - Meter clutch ③
   - Meter gear ④
   - Washer ⑤
   - Gear unit case ⑥ (speedometer)



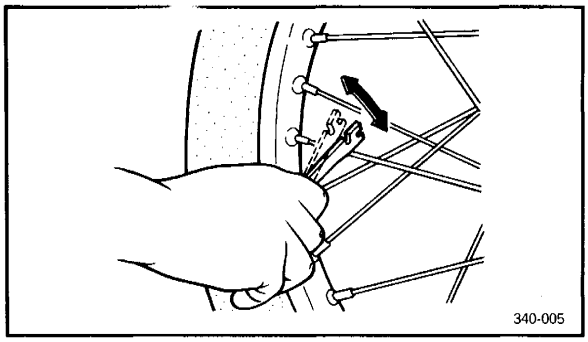
INSPECTION

1. Eliminate any corrosion from parts.
2. Inspect:
   - Wheel axle
     Roll the axle on a flat surface.
     Bends→Replace.

⚠ WARNING

Do not attempt to straighten a bent axle.

3. Inspect:
   - Tire
     Wear/Damage→Replace.
     Refer to the "TIRE INSPECTION" section in the CHAPTER 3.
   - Wheel
     Bends/Damage→Replace.
     Refer to the "WHEEL INSPECTION" section in the CHAPTER 3.



4. Check:
   - Spoke(s)
     Bend/Damage→Replace.
     Loose spoke(s)→Retighten.
     Turn the wheel and tap the spokes with a screw driver.

NOTE:

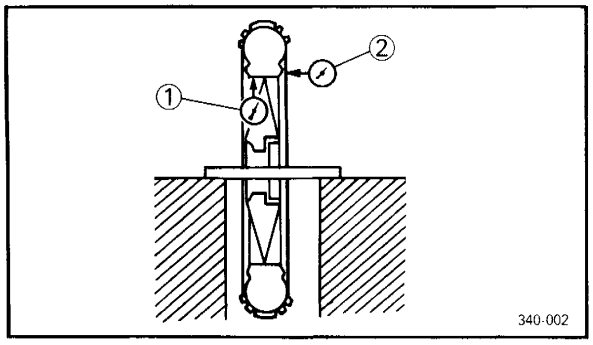
A tight spoke will emit a clear, ringing tone; a loose spoke will sound flat.

5. Tighten:
   - Loose spokes

	Nipple: **2 Nm (0.2 m•kg, 1.4 ft•lb)**

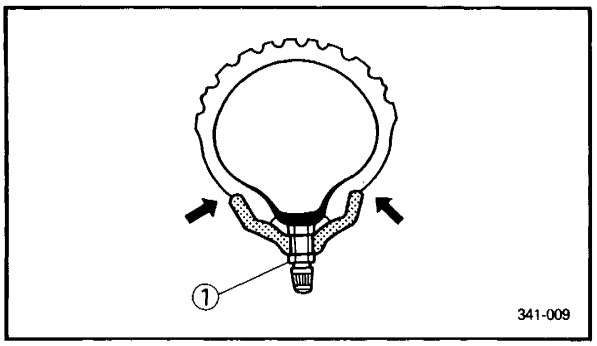
NOTE:

Check the wheel runout after tightening spoke.



6. Measure:
   - Wheel runout
     Out of specification→Check the wheel and bearing play.

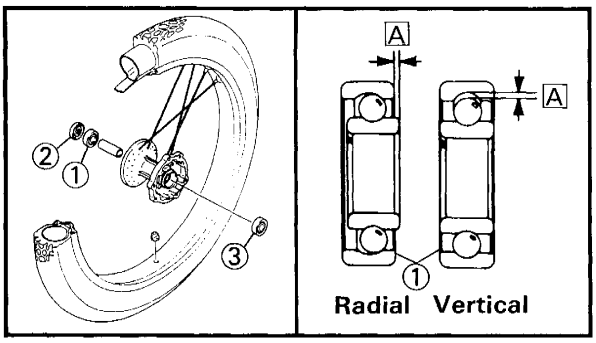
	Rim runout limits: **Vertical ①: 2.0 mm (0.08 in)** **Lateral ②: 2.0 mm (0.08 in)**



⚠ WARNING

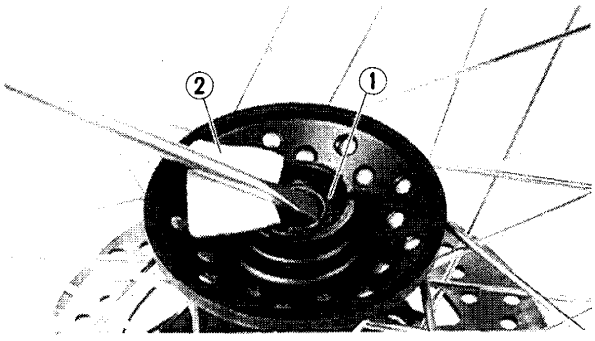
- **After mounting a tire, ride conservatively to allow proper tire to rim seating. Failure to do so may cause an accident resulting in motorcycle damage and possible operator injury.**
- **After a tire repair or replacement, be sure to torque tighten the valve stem locknut ① to specification.**

	Valve stem locknut: 1.5 Nm (0.15 m•kg, 1.1 ft•lb)



7. Check:
   - •Wheel bearings ①
     Abnormal noise/Turn roughly/Free play→ Replace.
   - •Oil seal ②
     Wear/Damage→Replace.

A Free play



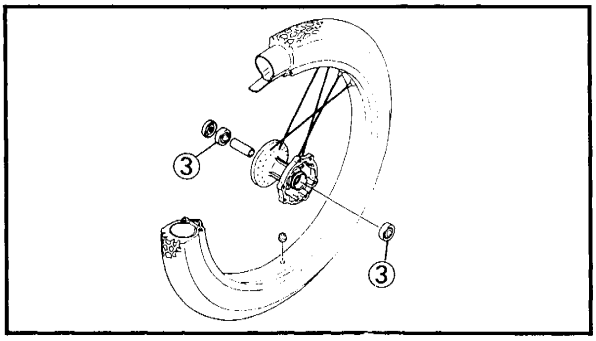
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Oil seal and wheel bearing replacement steps:

- Clean the outside of the wheel hub.
- Remove the oil seals ① use a flat-head screw driver.

NOTE:

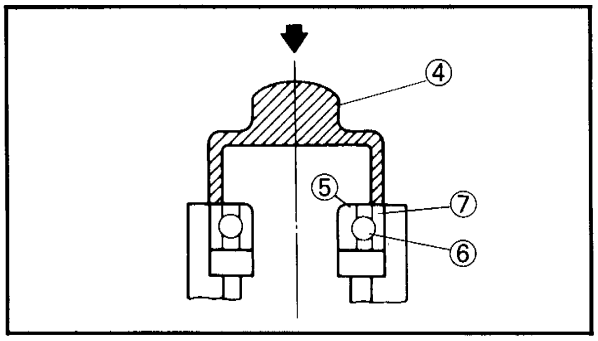
Place a rag ② on the outer edge to prevent damage.



- Remove the bearings ③ using a general bearing puller.
- Install the new bearing and new oil seal by reversing the previous steps.

NOTE:

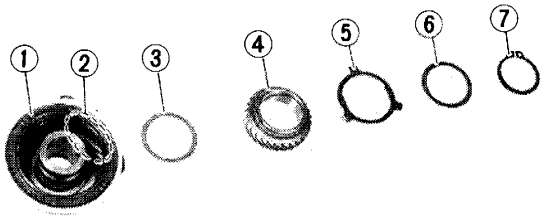
Use a socket ④ that matches the outside diameter of the race of the bearing and oil seal.



CAUTION:

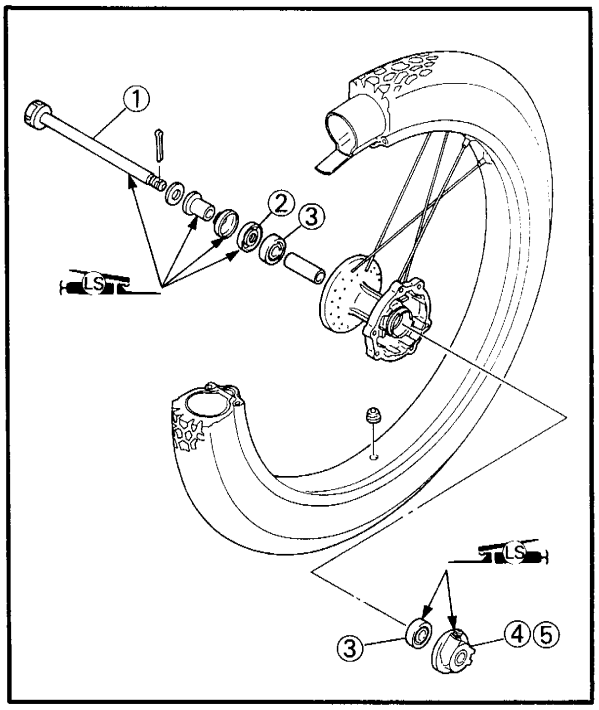
Do not strike the center race ⑤ or balls ⑥ of the bearing. Contact should be made only with the outer race ⑦.

****



8. Inspect:
   - Gear unit case ① (speedometer)
   - Driven gear ②
   - Washer ③
   - Meter gear ④
   - Meter clutch ⑤
   - Washer ⑥
   - Circlip ⑦

   Wear/Cracks/Damage→Replace gear unit.

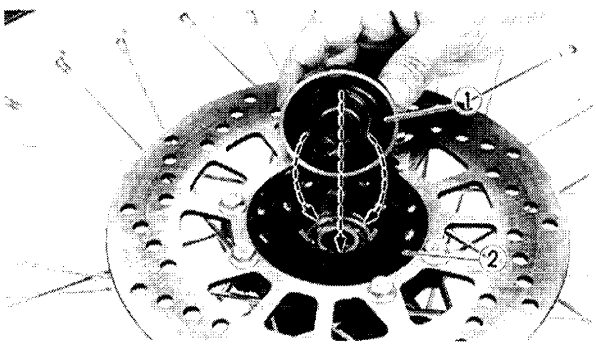


INSTALLATION

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

1. Lubricate:
   - Wheel axle ①
   - Oil seal (lip) ②
   - Bearings ③
   - Drive ④/Driven gear ⑤ (speedometer)

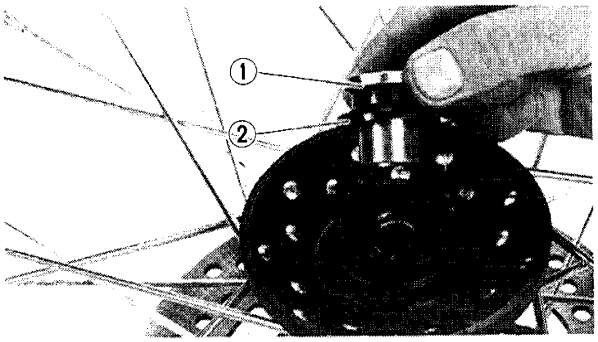
Lithium soap base grease



2. Install:
   - Gear unit assembly ①

NOTE:

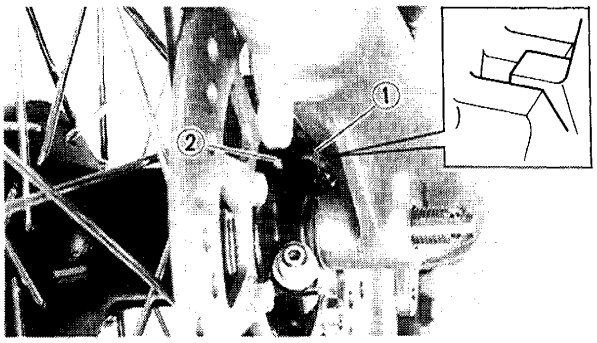
Make sure the projections on the meter clutch are meshed with the flats in the wheel hub ②.



3. Install:
   - Collar ①
   - Dust cover ②

NOTE:

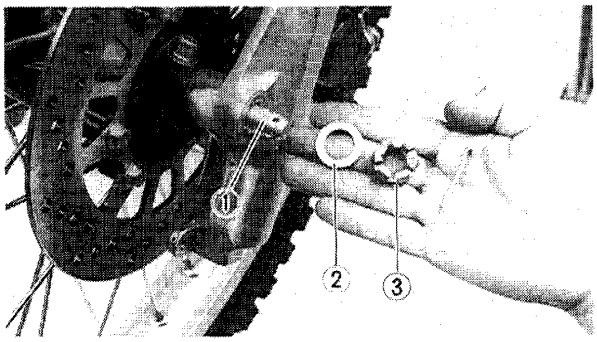
Install the oil seal taking care not to damage or reverse the lips.



4. Install:
   - Front wheel assembly

NOTE:

Be sure the boss on the outer fork tube ① correctly engages with the locating slot on the gear unit assembly ②.



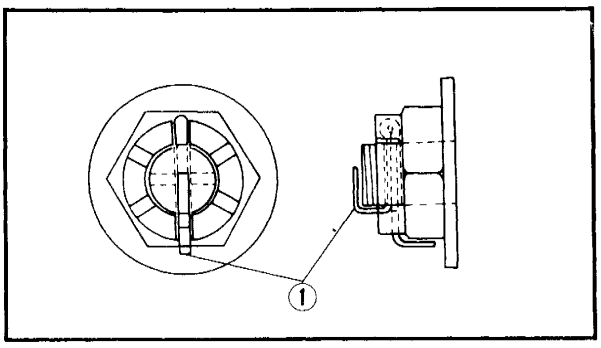
5. Install:
   - Wheel axle ①
   - Washer ②
   - Nut ③ (wheel axle)

6. Tighten:
   - Nut ③ (wheel axle)

	Nut (wheel axle): 85 Nm (8.5 m•kg, 61 ft•lb)

NOTE:

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



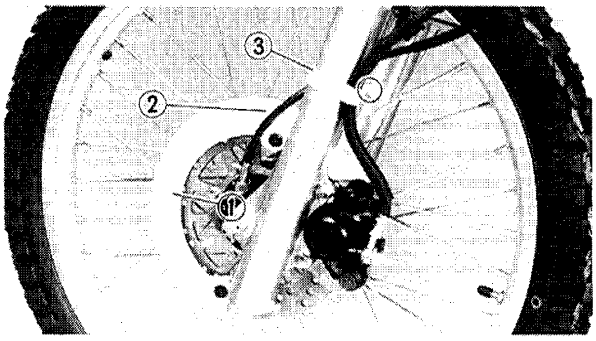
7. Install:
   - Cotter pin ①

NOTE:

Bend the ends of the cotter pin as illustration.

⚠ WARNING

Always use a new cotter pin.



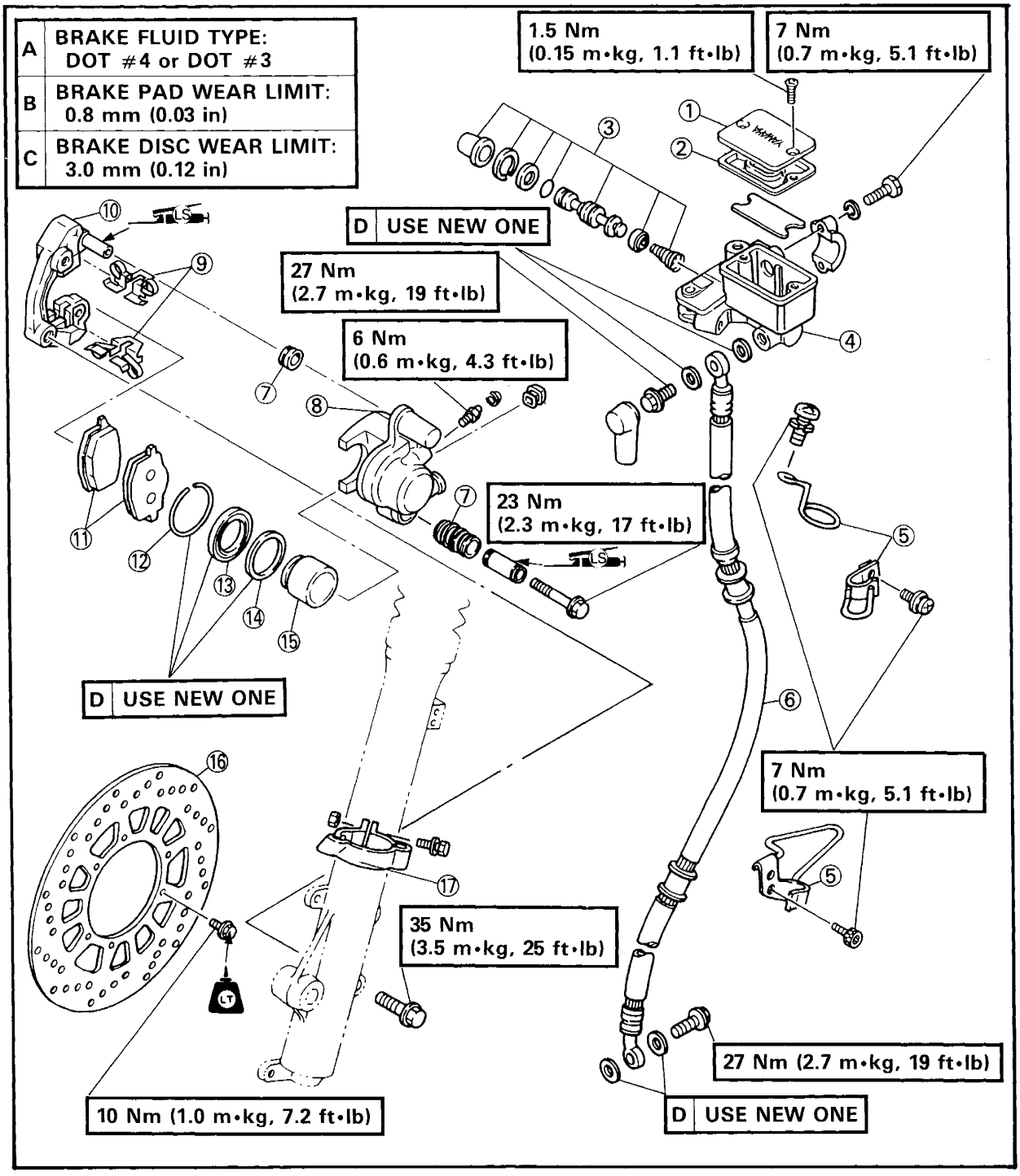
8. Install:
   - Disc cover ①
   - Speedometer cable ②
   - Cable band ③

CAUTION:

Make sure that the speedometer cable ② is routed properly. Refer to the "CABLE ROUTING" section in the CHAPTER 2.

FRONT BRAKE

① Master cylinder cap
② Diaphragm
③ Master cylinder kit
④ Master cylinder
⑤ Holder (brake hose and meter cable)
⑥ Brake hose
⑦ Rubber boot
⑧ Brake caliper body
⑨ Pad spring
⑩ Caliper bracket
⑪ Brake pads
⑫ Ring (dust boot)
⑬ Dust boot
⑭ Piston seal
⑮ Piston
⑯ Brake disc
⑰ Cable band



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 come 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 disassembly, drained, cleaned, and then properly filled and bled after reassembly.**

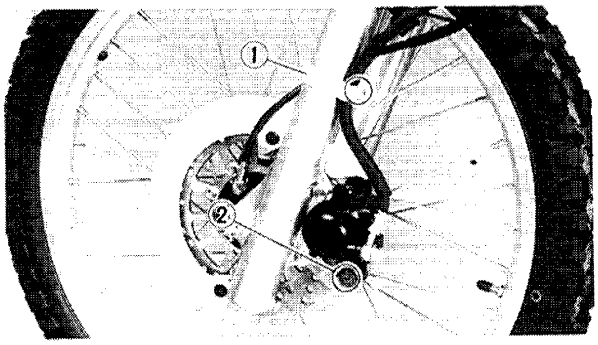
BRAKE PAD REPLACEMENT

NOTE:

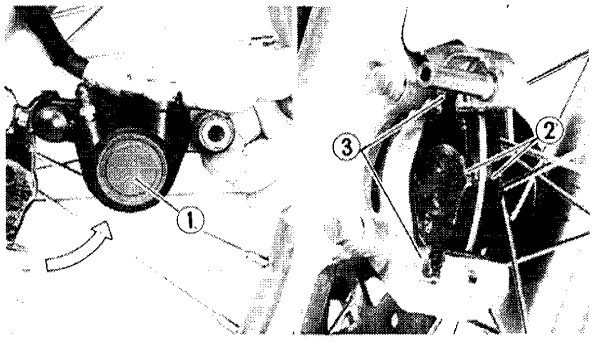
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

⚠ WARNING

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



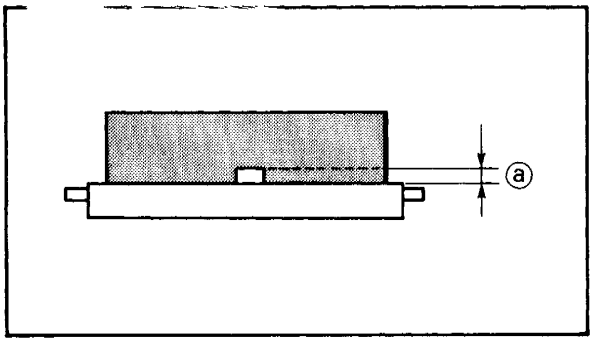
1. Remove:
   - Cable band ①
   - Retaining bolt ②



2. Remove:
   - Caliper body ①
   - Brake pads ②
   - Pad spring ③

NOTE:

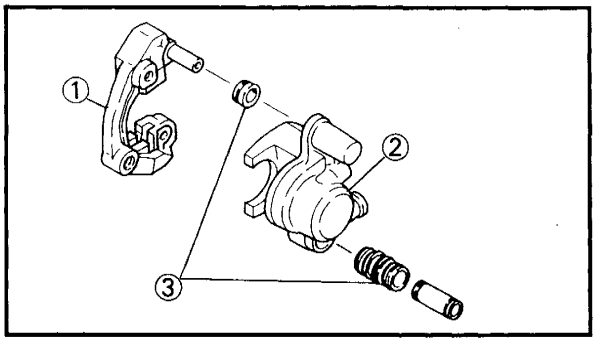
Remove the caliper body by lifting it up to the arrow direction.



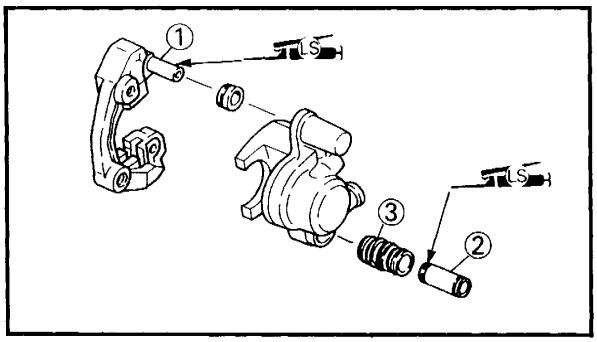
NOTE:

- 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)



3. Inspection:
   - Caliper bracket ①
   - Caliper body ②
     Cracks/Damage→Replace caliper assembly.
   - Rubber boot ③
     Wear/Cracks/Damage→Replace.

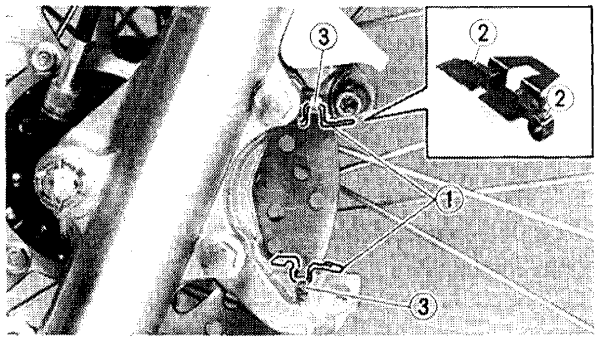


4. Lubricate:
   - Guide pin ①
   - Slide collar ②

Lithium soap base grease

NOTE:

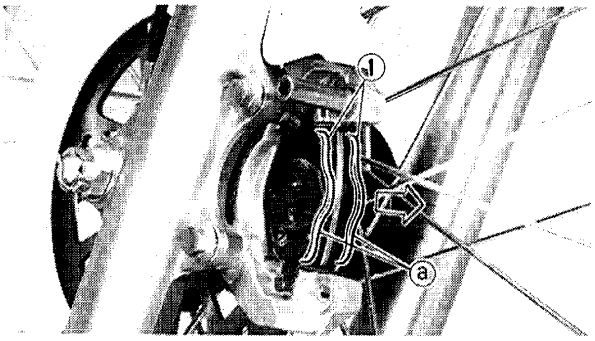
Place the rubber boot ③ securely in the groove of slide collar when installing the slide collar.



5. Install:
   - Pad springs ①

NOTE:

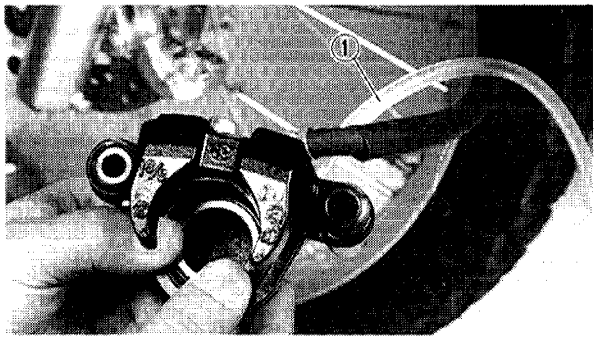
Place the projections ② securely in the groove of caliper bracket ③ when installing the pad springs.



6. Install:
   • Brake pads ①

NOTE:

Be sure to position the pad so that its round side ⓐ faces backward.



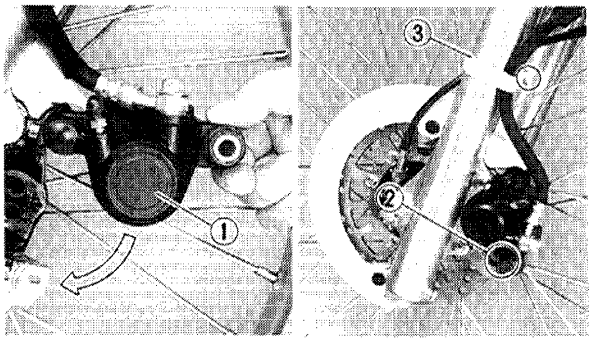
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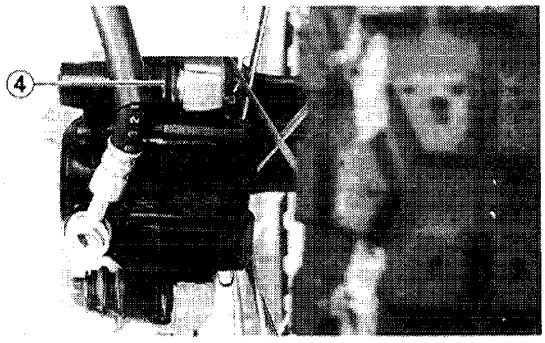
Installation steps:

- Connect the clear plastic tube ① tightly to the caliper bleedscrew. 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)**

****





7. Install:
   • Caliper body ①
   • Retaining bolts ②
   • Cable band ③

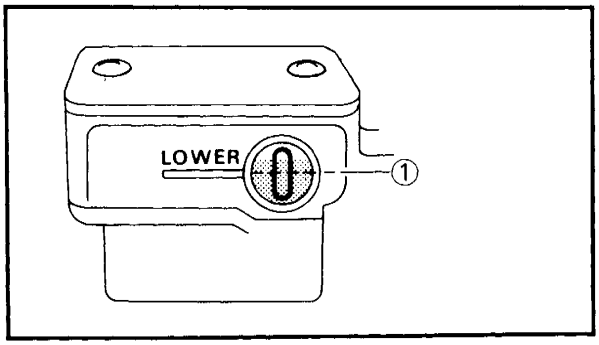
	Retaining bolt: **23 Nm (2.3 m•kg, 17 ft•lb)**

NOTE:

Place the rubber boot ④ securely in the groove of guide pin when installing the caliper body.

⚠ WARNING

Proper hose routing is essential to insure safe motorcycle operation.
Refer to the "CABLE ROUTING" section in the CHAPTER 2.



8. Inspect:
   • Brake fluid level
   Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.

① "LOWER" level line

9. Check:
   • Brake lever operation
   A softy or spongy filling→Bleed brake system.
   Refer to the "AIR BLEEDING" section in the CHAPTER 3.

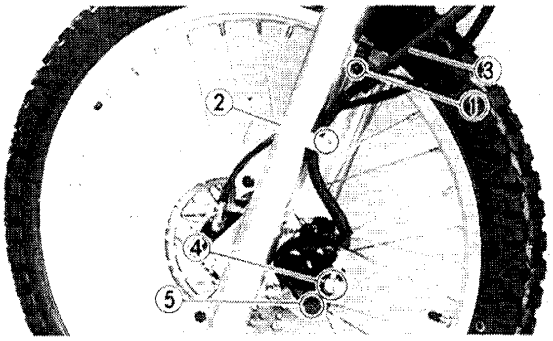
CALIPER DISASSEMBLY

NOTE:

Before disassembling the front brake caliper, drain the brake system of its brake fluid.

⚠ WARNING

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



1. Remove:
   • Bolt ① (brake hose holder)
   • Cable holder ②

2. Disconnect:
   • Brake hose ③ (from brake hose holder)

3. Loosen:
   • Union bolt ④

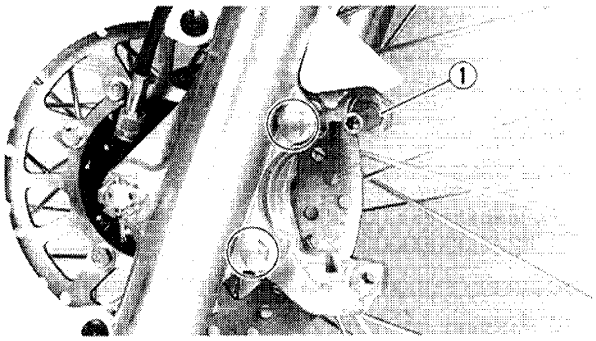
NOTE:

Loosen slightly so that brake fluid does not leak out.

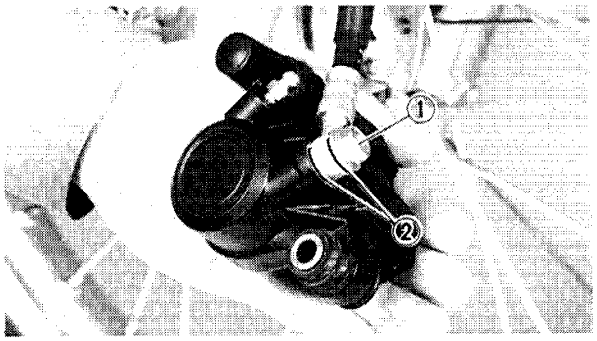
4. Remove:
   • Retaining bolt ⑤

5. Remove:
   - Caliper body
   - Brake pads
   - Pad springs

   Refer to the "BRAKE PAD REPLACEMENT" section.



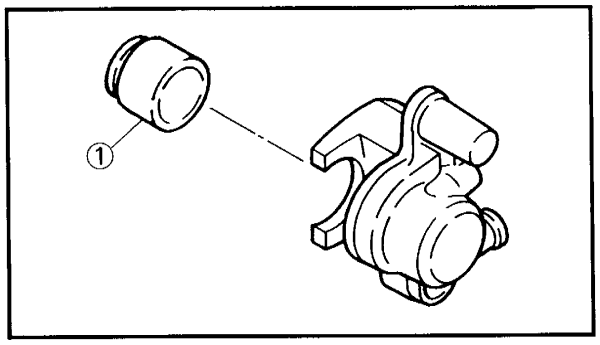
6. Remove:
   - Caliper bracket ①



7. Remove:
   - Union bolt ①
   - Copper washers ②

NOTE:

Place the container under the caliper to catch the standing brake fluid.



8. Remove:
   - Piston ①

****

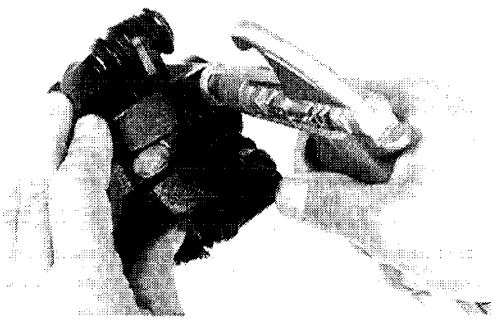
Removal steps:

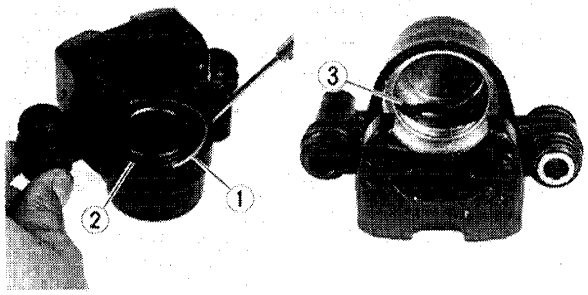
- Blow compressed air into the tube joint opening to force out the piston from the caliper body.

⚠ 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.**

****





9. Remove:
   - Ring ① (dust boot)
   - Dust boot ②
   - Piston seal ③

CAUTION:

Remove the piston seal by pushing it in with a finger. Do not use a screwdriver.

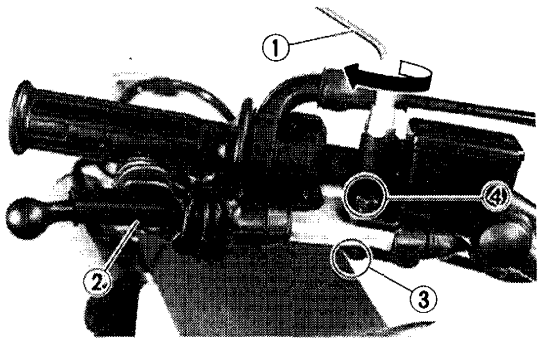
MASTER CYLINDER DISASSEMBLY

NOTE:

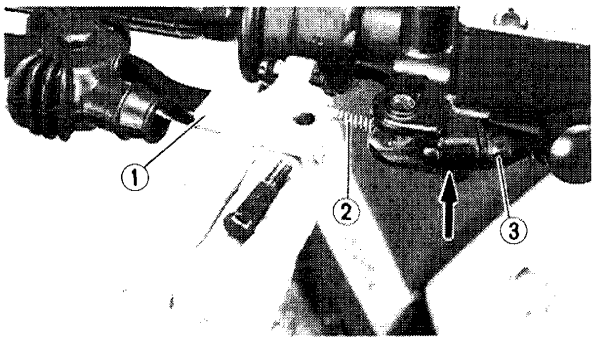
Before disassembling the front brake master cylinder, drain the brake system of the brake fluid.

⚠ WARNING

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



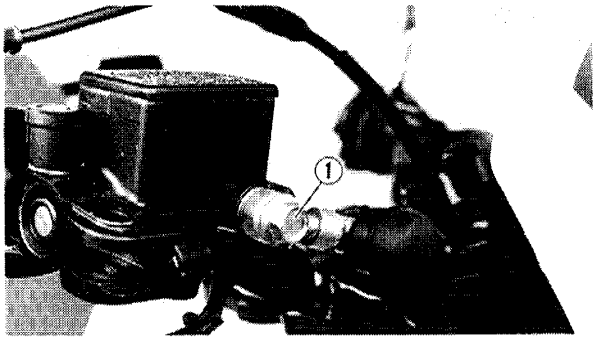
1. Remove:
   - Mirror ① (right)
   - Brake lever cover ②
   - Nut ③ (brake lever)
   - Bolt ④ (brake lever)



2. Remove:
   - Brake lever ①
   - Return spring ② (brake lever)
   - Brake switch ③

NOTE:

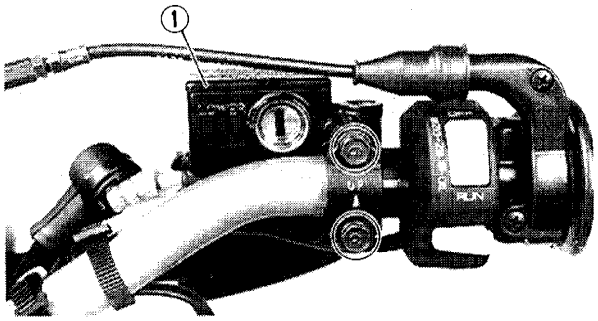
Remove the brake switch by pushing up the stopper with a thin screwdriver as shown.



3. Loosen:
   - Union bolt ①

NOTE:

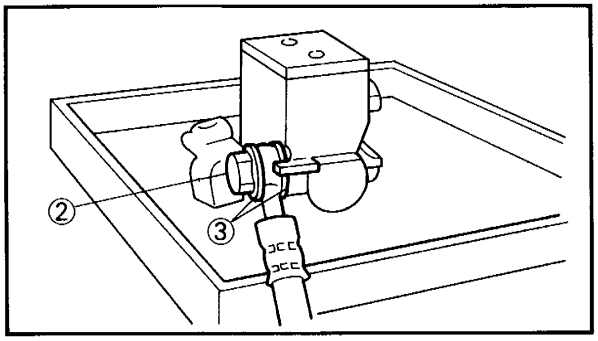
Loosen slightly so that brake fluid does not leak out.

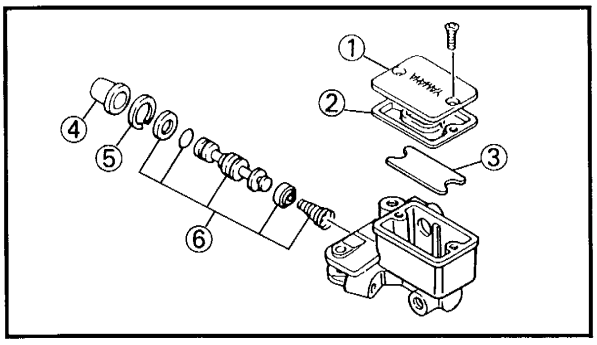


4. Remove:
   - Master cylinder ①
   - Union bolt ②
   - Copper washer ③

NOTE:

Place a container under the master cylinder to catch the standing brake fluid.

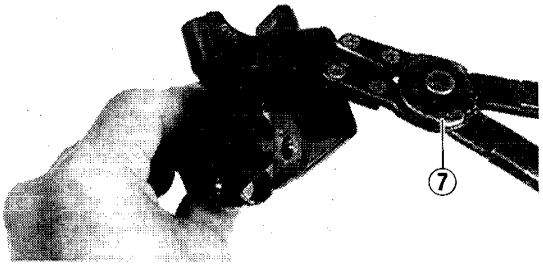




5. Remove:
   - Master cylinder cap ①
   - Diaphragm ②
   - Plate ③
   - Rubber boot ④
   - Circlip ⑤
   - Master cylinder kit ⑥

NOTE:

- Remove the circlip using circlip pliers ⑦.
- Place a container under the master cylinder to catch the standing brake fluid.



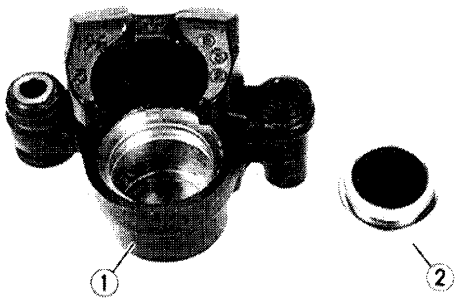
INSPECTION AND REPAIR

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

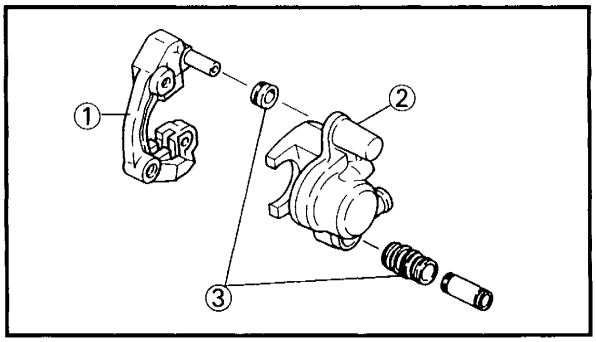
All internal parts should be cleaned in new brake fluid only. Do not use solvents will cause seals to swell and distort.



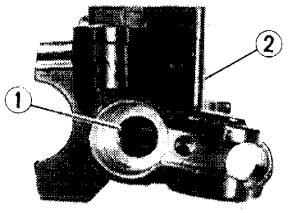
1. Inspect:
   - Caliper cylinder ①
     Wear/Scratches→Replace caliper assembly.
   - Caliper piston ②
     Scratches/Rust/Wear→Replace caliper assembly.

⚠ WARNING

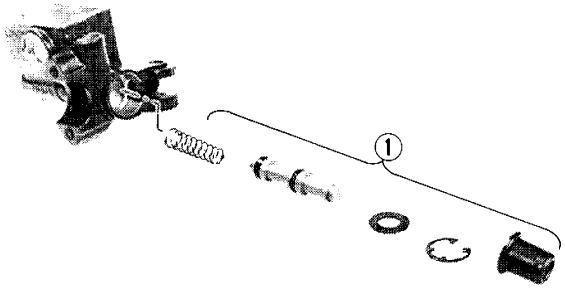
Replace the piston seal and dust boot whenever a caliper is disassembled.



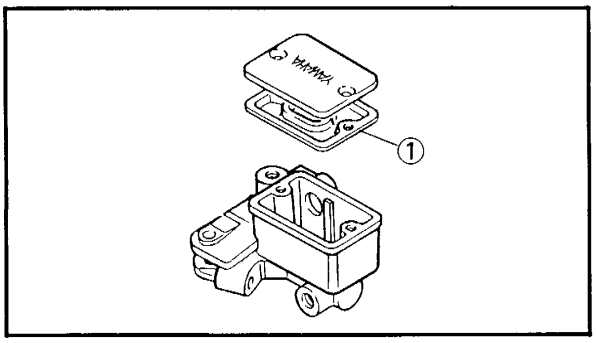
2. Inspect:
   - Caliper bracket ①
     Cracks/Damage→Replace brake caliper assembly.
   - Caliper body ②
     Cracks/Damage→Replace brake caliper assembly.
   - Rubber boots ③
     Cracks/Wear/Damage→Replace.
   - Oil delivery passage (caliper body)
     Blow out with compressed air.



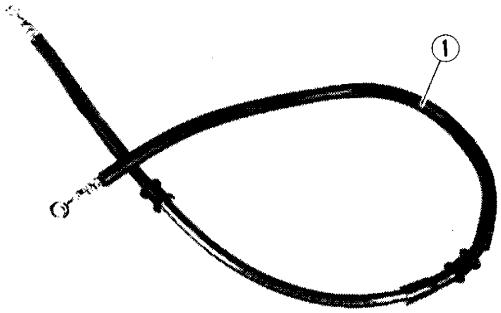
3. Inspect:
   - Master cylinder ①
     Wear/Scratches→Replace master cylinder assembly.
   - Master cylinder body ②
     Cracks/Damage→Replace.
   - Oil delivery passage (master cylinder body)
     Blow out with compressed air.



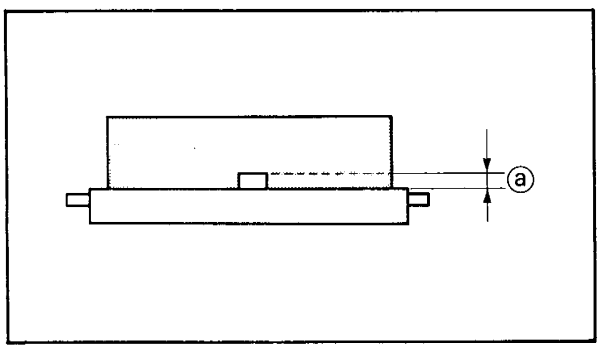
4. Inspect:
   - Master cylinder kit ①
     Scratches/Wear/Damage→Replace as a set.



5. Inspect:
   - Diaphragm ①
     Wear/Damage→Replace.



6. Inspect:
   - Brake hoses ①
     Cracks/Wear/Damage→Replace.

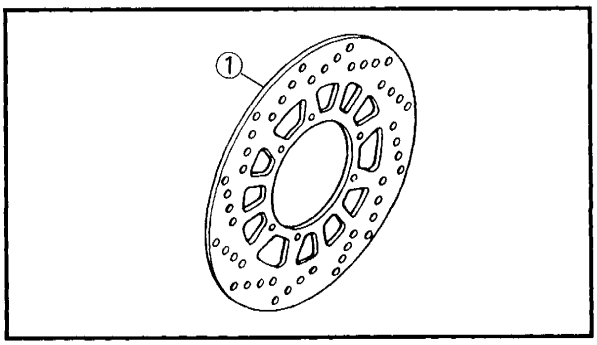


7. Measure:
   - Brake pad thickness
     Out of specification→Replace.

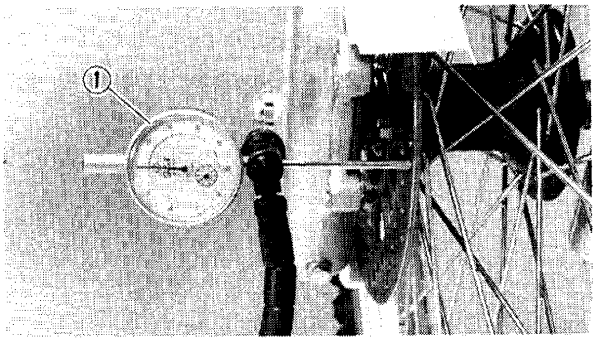
	Pad wear limit ⓐ: **0.8 mm (0.03 in)**

NOTE:

Replace the pads as a set if either if found to be worn to the wear limit.



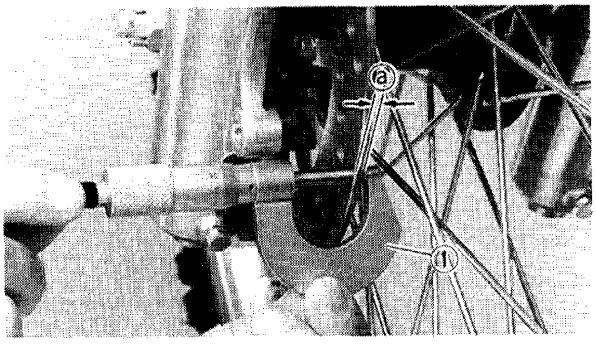
8. Inspect:
   • Brake disc ①
   Galling/Damage → Replace.



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:
0.3 mm (0.01 in)

① Dial gauge



• Brake disc thickness
Out of specification → Replace.

Brake disc thickness ⓐ:
3.5 mm (0.14 in)
<Wear limit>
3.0 mm (0.12 in)

① Micrometer

NOTE:

Tighten the bolts (brake disc) in stage using a crisscross pattern.

Bolt (brake disc):
10 Nm (1.0 m•kg, 7.2 ft•lb)
LOCTITE®.

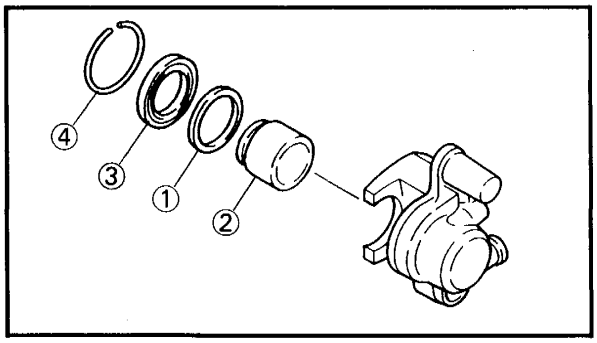
CALIPER ASSEMBLY

⚠ WARNING

- **All internal parts should be cleaned in new brake fluid only.**
- **Internal parts should be lubricated with brake fluid when installed.**

Brake fluid:
DOT #4 or DOT #3

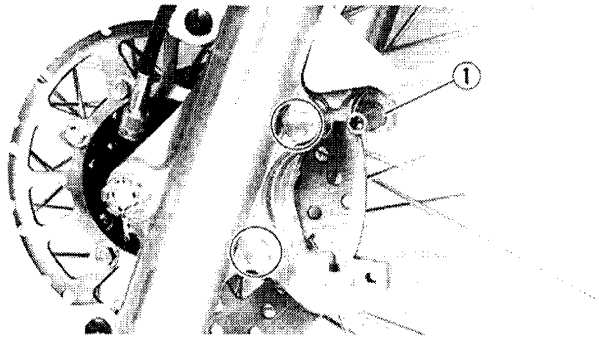
•Replace the piston seal and dust boot whenever a caliper is disassembled.



1. Install:
   - •Piston seal ①
   - •Piston ②
   - •Dust boot ③
   - •Ring ④ (dust boot)

NOTE:

First, assemble the piston seal, then assemble the piston. Stop when this is about half finished and attach the dust boot. Then, while moving the piston into position, attach the dust boot to the main unit as well. Attach the ring (dust boot) last.



2. Install:
   - •Caliper bracket ①

	Bolt (caliper bracket): 35 Nm (3.5 m•kg, 25 ft•lb)

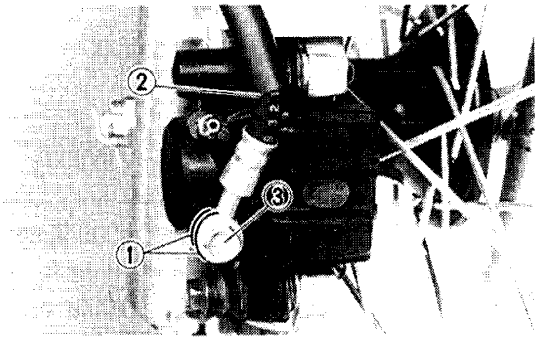
3. Install:
   - •Pad springs
   - •Brake pads
   - •Retaining bolt

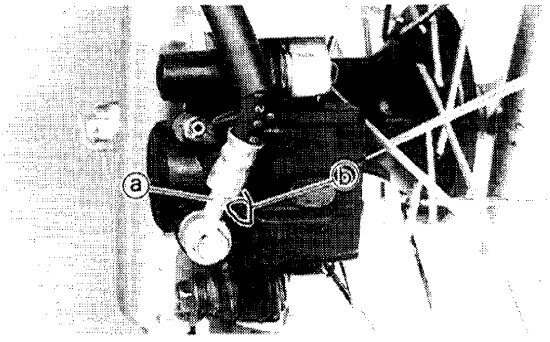
   Refer to the "BRAKE PAD REPLACEMENT" section.

NOTE:

Place the rubber boot securely in the groove of guide pin when installing the caliper body.

	Retaining bolt: **23 Nm (2.3 m•kg, 17 ft•lb)**





4. Install:
   - Copper washers ①
   - Brake hose ②
   - Union bolt ③

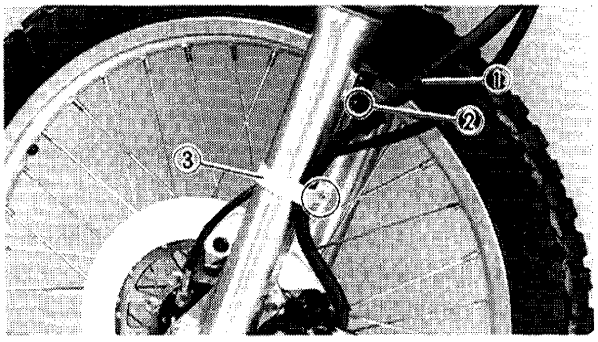
	Union bolt: **27 Nm (2.7 m•kg, 19 ft•lb)**

CAUTION:

When installing the brake hose, lightly touch the pipe portion ⓐ of the brake hose with the projection ⓑ on brake caliper.

⚠ WARNING

- **Proper hose routing is essential to insure safe motorcycle operation.**
  Refer to the "CABLE ROUTING" section in the CHAPTER 2.
- **Always use new copper washers.**



5. Connect:
   - Brake hose ①

6. Install:
   - Bolt ② (brake hose holder)
   - Cable holder ③

	Bolt (brake hose holder): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

⚠ WARNING

Proper hose routing is essential to insure safe motorcycle operation.
Refer to the "CABLE ROUTING" section in the CHAPTER 2.

7. Fill:
   • Brake fluid



Recommended brake fluid:
DOT #4 or DOT #3

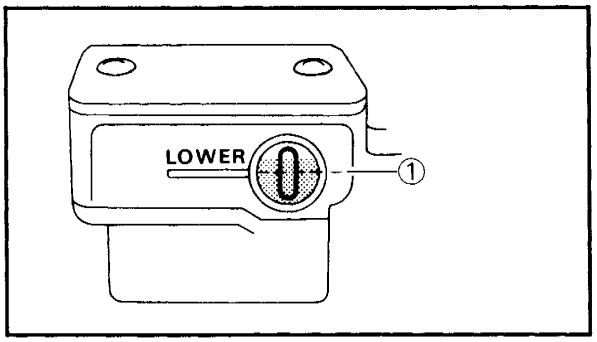
CAUTION:

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

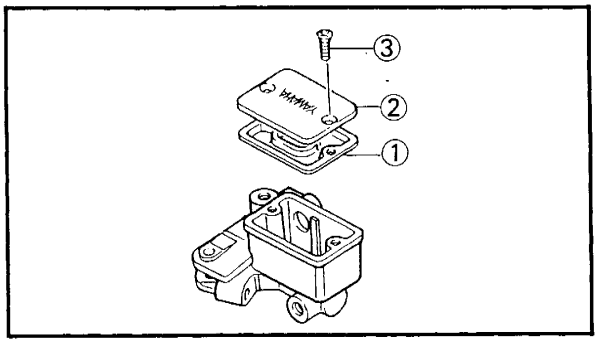
⚠ WARNING

- **Use only the 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 and may result in vapor lock.**

8. Air bleed:
   • Brake system
   Refer to the "AIR BLEEDING" section in the CHAPTER 3.



9. Inspect:
   - Brake fluid level
     Fluid level is under "LOWER" level line ①
     → Fill up.
     Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.



10. Install:
    - Diaphragm ①
    - Master cylinder cap ②
    - Screws ③

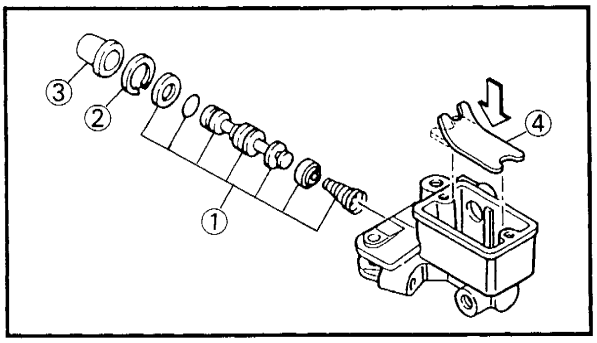
	Screw (master cylinder cap): 1.5 Nm (0.15 m•kg, 1.1 ft•lb)

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.**

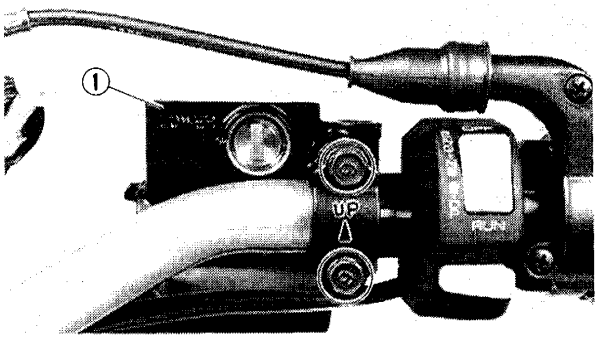
	Brake fluid: DOT #4 or DOT #3

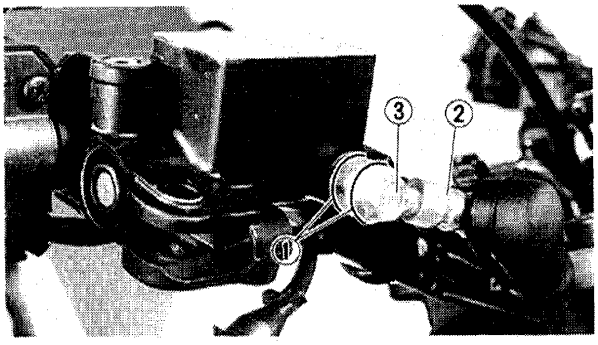


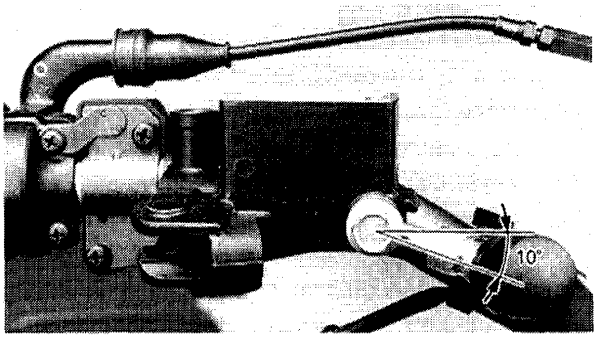
1. Install:
   - Master cylinder kit ①
   - Circlip ②
   - Rubber boot ③
   - Plate ④

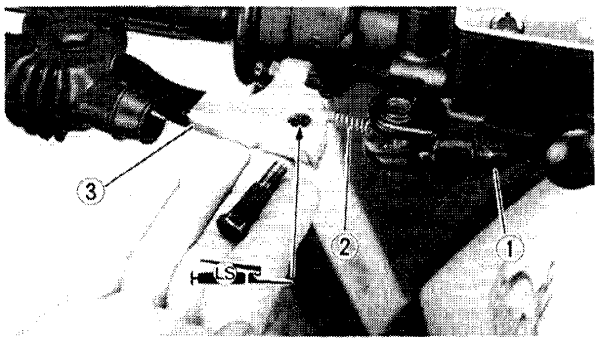
NOTE:

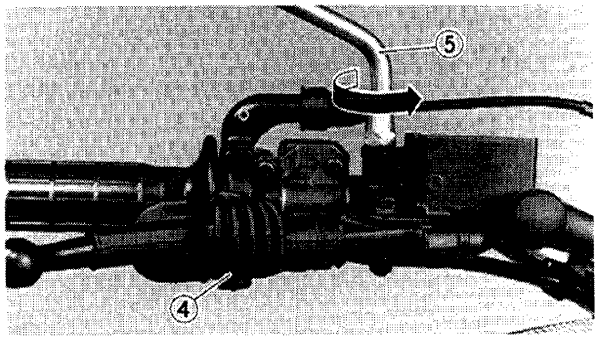
When installing the plate ④, push it in securely to the shown position.











2. Install:
   - Master cylinder ①

NOTE:
- Install the master cylinder bracket with the "UP" mark facing upward.
- Tighten first the upper bolt then the lower bolt.

	Bolt (master cylinder bracket): 7 Nm (0.7 m•kg, 5.1 ft•lb)

3. Install:
   - Copper washers ①
   - Brake hose ②
   - Union bolt ③

	Union bolt: 27 Nm (2.7 m•kg, 19 ft•lb)

NOTE:
Install the brake hose as shown.

⚠ WARNING
- **Proper hose routing is essential to insure safe motorcycle operation. Refer to the "CABLE ROUTING" section in the CHAPTER 2.**
- **Always use new copper washers.**

4. Install:
   - Brake switch ①
   - Spring ②
   - Brake lever ③
   - Brake lever cover ④
   - Mirror (right) ⑤

NOTE:
Apply lithium soap base grease to pivot shaft of brake lever.

5. Fill:
   • Brake fluid

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

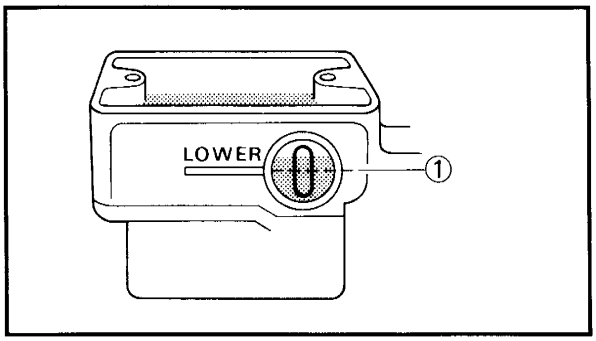
CAUTION:

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

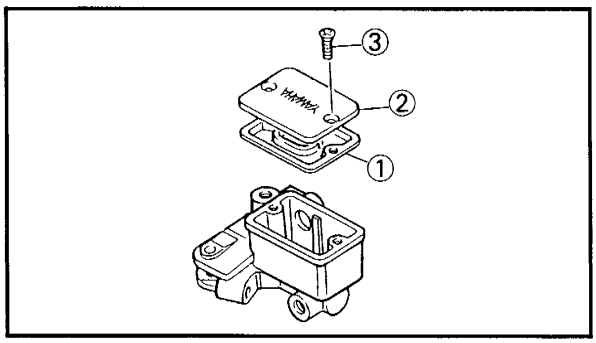
⚠ WARNING

- **Use only the 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 and may result in vapor lock.**

6. Air bleed:
   • Brake system
   Refer to the "AIR BLEEDING" section in the CHAPTER 3.



7. Inspect:
   • Brake fluid level
   Fluid level is under "LOWER" level line ①
   → Fill up.
   Refer to the "BRAKE FLUID INSPECTION" section in the CHAPTER 3.



8. Install:
   • Diaphragm ①
   • Master cylinder cap ②
   • Screws ③

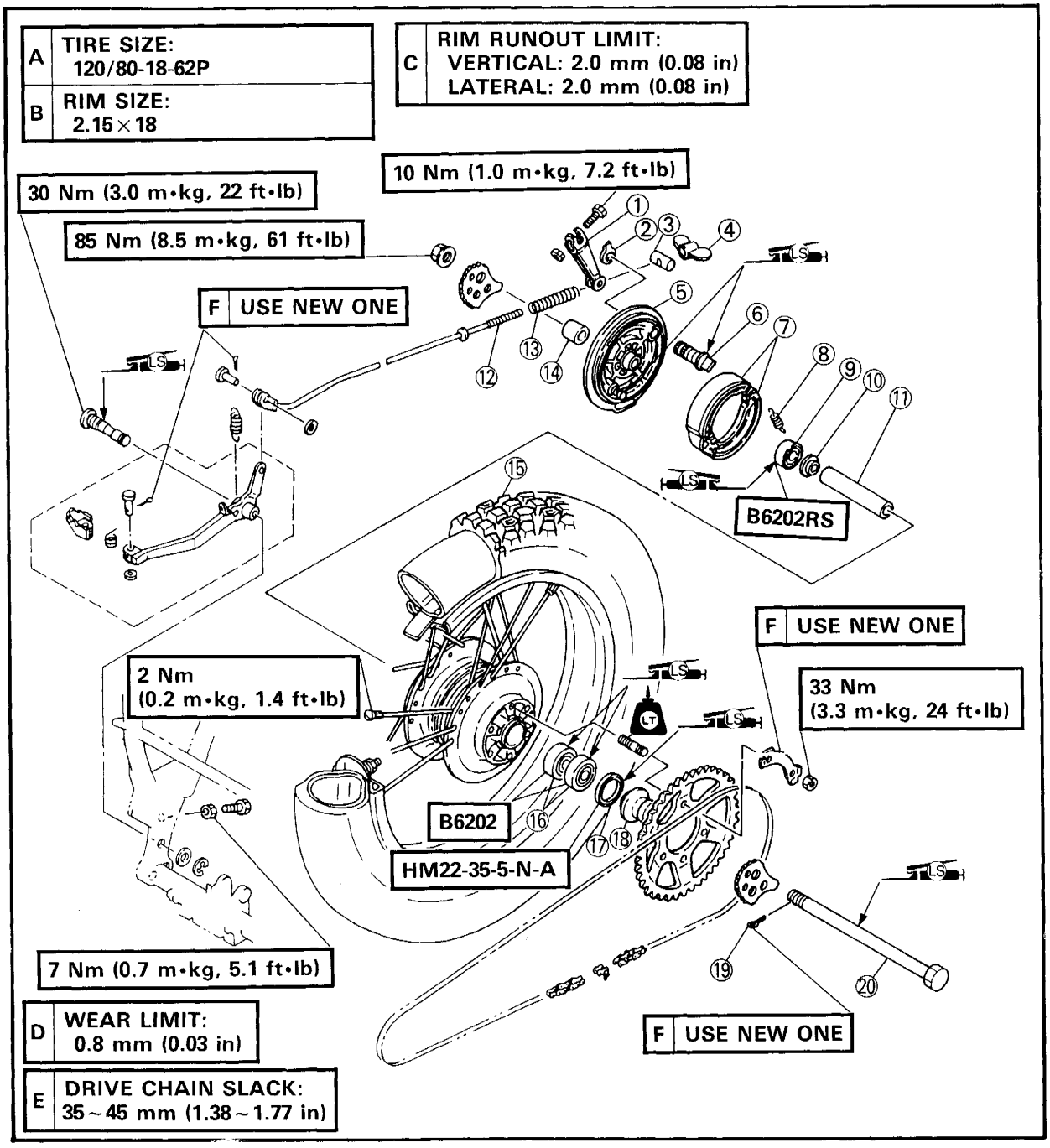
	Screw (master cylinder cap): 1.5 Nm (0.15 m•kg, 1.1 ft•lb)

REAR WHEEL

① Camshaft lever
② Wear indicator plate
③ Pin
④ Adjuster
⑤ Brake shoe plate
⑥ Camshaft
⑦ Brake shoe
⑧ Brake shoe spring
⑨ Bearing
⑩ Spacer flange
⑪ Spacer
⑫ Brake rod
⑬ Compression spring
⑭ Collar
⑮ Rear wheel
⑯ Bearing
⑰ Oil seal
⑱ Dust collar
⑲ Cotter pin
⑳ Wheel axle

TIRE AIR PRESSURE (COLD):		
Maximum load*	183 kg (403 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	125 kPa (1.25 kg/cm², 18 psi)	150 kPa (1.50 kg/cm², 21 psi)
90 kg (198 lb) ~ Maximum load*	150 kPa (1.50 kg/cm², 21 psi)	175 kPa (1.75 kg/cm², 25 psi)
High speed riding	150 kPa (1.50 kg/cm², 21 psi)	175 kPa (1.75 kg/cm², 25 psi)

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



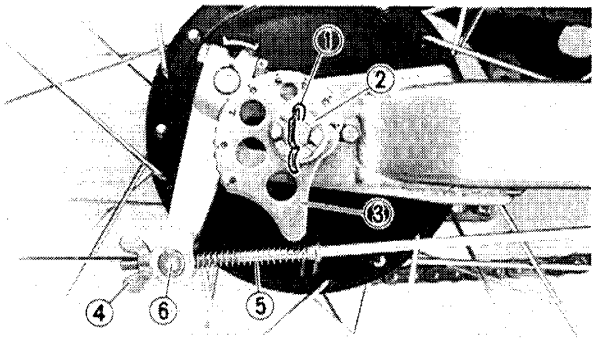
REMOVAL

Rear wheel

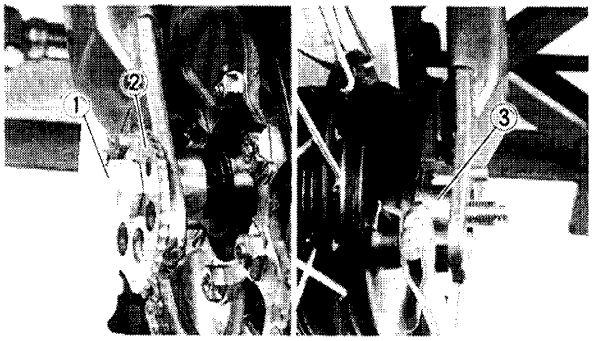
⚠ WARNING

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

1. Place the motorcycle on a level place.
2. Elevate the rear wheel by placing a suitable stand under the frame and engine.



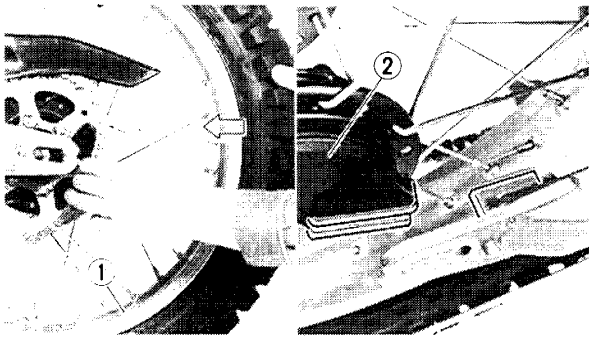
3. Remove:
   - Cotter pin ①
   - Axle nut ②
   - Chain puller ③
   - Adjuster ④
   - Compression spring ⑤
   - Pin ⑥



4. Remove:
   - Wheel axle ①
   - Chain puller ② (left)
   - Collar ③

NOTE:

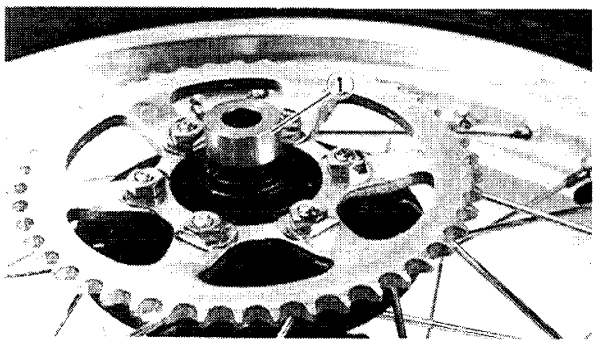
When removing the wheel axle, the collar ③ will fall off. Take care not to lose it.



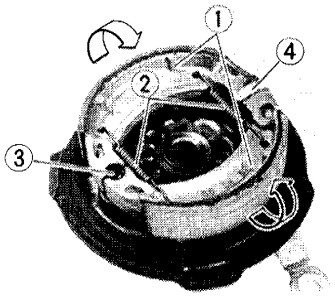
5. Remove:
   - Rear wheel ①
   - Brake shoe plate ②

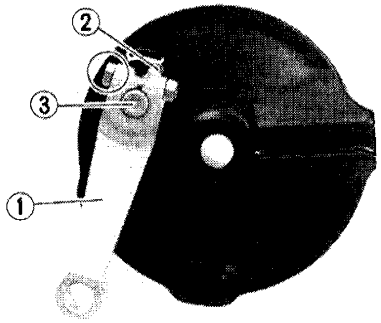
NOTE:

Before removing the rear wheel, push the wheel forward and remove the drive chain.



6. Remove:
   - Dust collar ①





Rear brake

1. Remove:
   - Brake shoe ①
   - Brake shoe spring ②

NOTE:

Remove the brake shoes by pushing them up with the pivot pin ③ and brake camshaft lever ④ as support points to the arrow direction.

2. Remove:
   - Camshaft lever ①
   - Wear indicator plate ②
   - Camshaft ③

NOTE:

Before removing the camshaft lever ①, put a match mark (punches) on the camshaft lever and camshaft to indicate their positions for easy assembly.

INSPECTION

1. Inspect:
   - Wheel axle
   - Tire
   - Wheel

   Refer to the "FRONT WHEEL—INSPECTION" section.

2. Check:
   - Spoke(s)

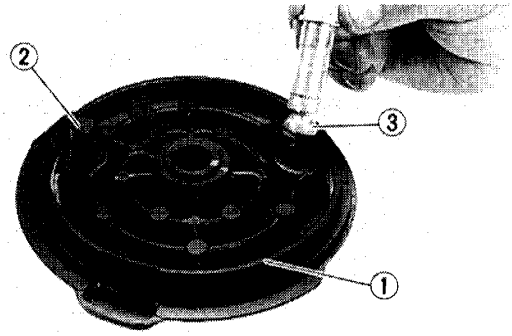
   Refer to the "FRONT WHEEL—INSPECTION" section.

3. Measure:
   - Wheel runout

   Refer to the "FRONT WHEEL—INSPECTION" section.

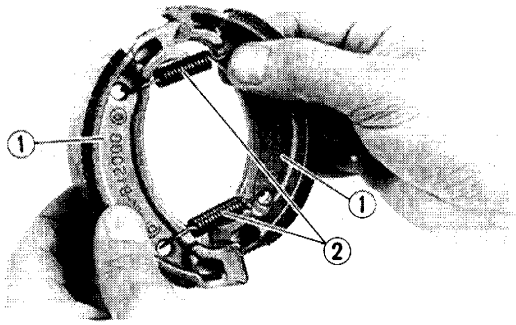
4. Check:
   - Wheel bearings
   - Oil seals

   Refer to the "FRONT WHEEL—INSPECTION" section.



5. Inspect:
   - Brake shoe plate ①
   - Pivot pin ②
   - Camshaft ③

   Cracks/Damage→Replace.

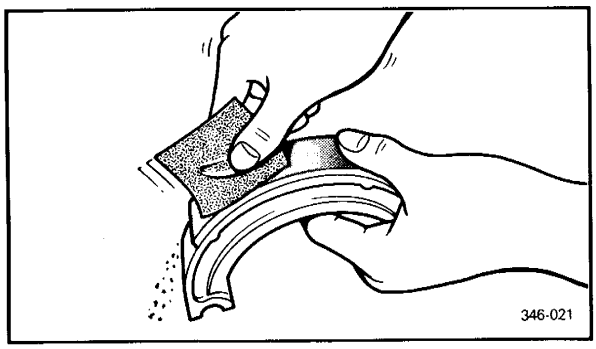


6. Inspect:
   - Brake shoe ①
   - Brake shoe spring ②

   Cracks/Damage→Replace as a set.

NOTE:

When replacing the brake shoes, replace the brake shoe springs at the same time.

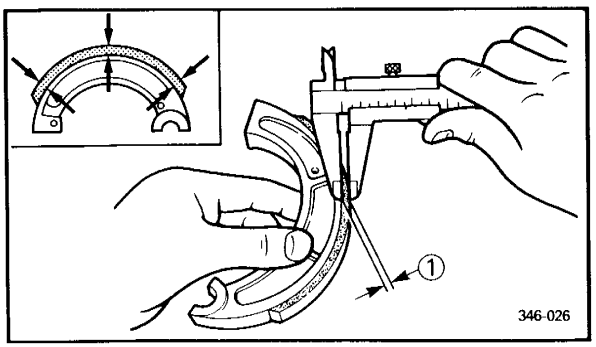


7. Inspect:
   - Brake shoe lining surface

   Glazed areas→Remove.
   Use a coarse sand paper.

NOTE:

After using the sand paper, clean of the polished particles with cloth.



8. Measure:
   - Brake shoe lining thickness

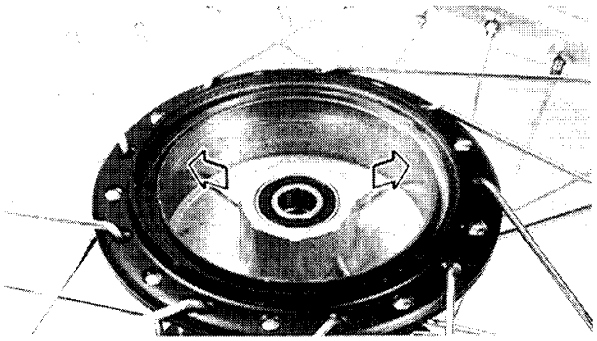
   Out of specification→Replace.

① Measuring points

NOTE:

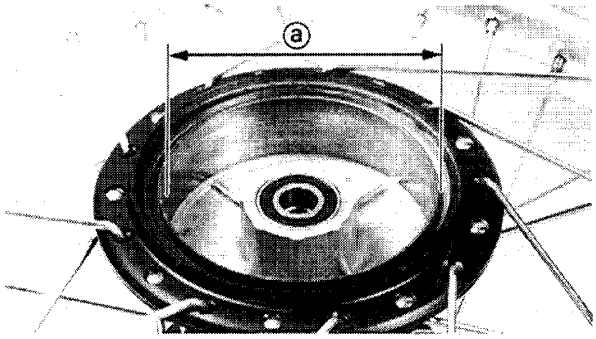
Replace the brake shoes as a set if either is found to be worn to the wear limit.

Brake lining thickness:
4 mm (0.16 in)
Wear limit:
2 mm (0.08 in)



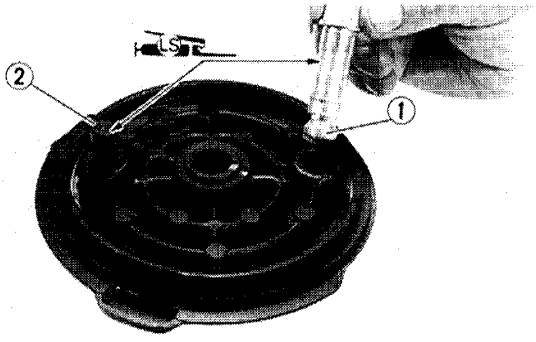
9. Inspect:
   - Brake drum inner surface
     Oil/Scratches→Replace.

Oil	**Use a rag soaked in lacquer thinner or solvent.**
Scratches	**Use a emery cloth (lightly and evenly polishing)**



10. Measure:
    - Brake drum inside diameter ⓐ
      Out of specification→Replace.

Brake drum inside diameter:
STD: 110 mm (4.33 in)
Limit: 111 mm (4.37 in)



ASSEMBLY

Rear brake

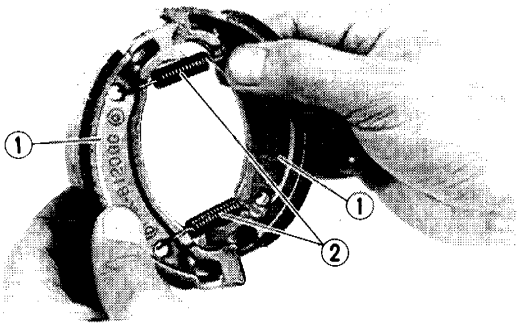
Reverse the "REMOVAL" procedure.
Note the following points.

1. Lubricate:
   - Camshaft ①
   - Pivot pin ②

Lithium soap base grease

CAUTION:

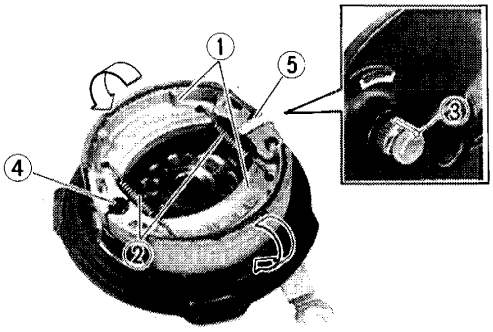
Install the camshaft and the pivot pin with lightly greased. Wipe off the excess grease.



2. Install:
   - Brake shoe ①
   - Brake shoe spring ②

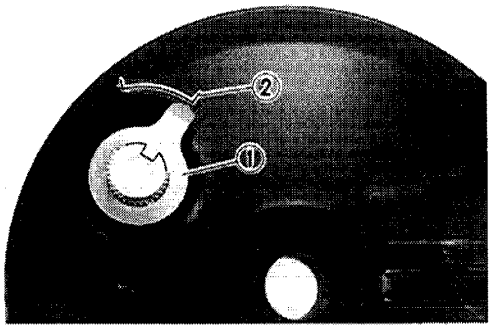
NOTE:

- When installing the camshaft, the groove ③ should face to the wear indicator.
- When installing the brake shoes, depress the brake shoes to the arrow direction with the pivot pin ④ and the brake cam lever ⑤ as support points.



CAUTION:

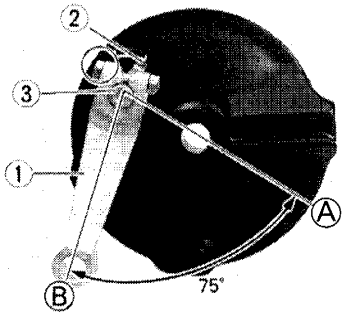
- **Do not deform or damage the spring hook or coils with pliers when installing.**
- **Do not apply grease to the brake shoe linings.**



3. Install:
   - Wear indicator plate ①

NOTE:

When installing the wear indicator plate, fit the projection to the camshaft groove and align the pointer to the wear indicator ②.



4. Install:
   - Camshaft lever ①

	Bolt (camshaft lever): 10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:

When installing the camshaft lever, make sure that Ⓐ line and Ⓑ line form a 75° angle.

INSTALLATION

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

1. Lubricate:
   - Wheel axle
   - Bearings
   - Oil seal (lip)

	Lithium soap base grease

2. Adjust:
   • Drive chain slack

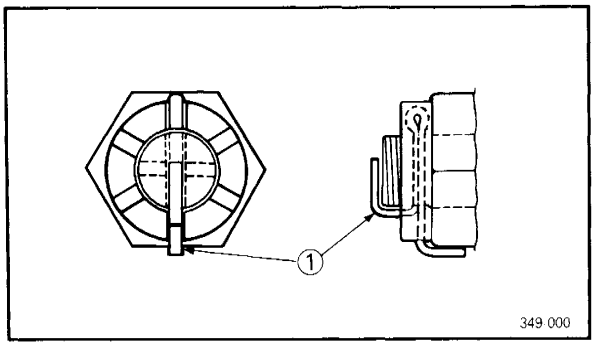
Drive chain slack:
35 ~ 45 mm (1.38 ~ 1.77 in)

Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

3. Tighten:
   • Axle nut

Axle nut:
85 Nm (8.5 m•kg, 61 ft•lb)

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



4. Install:
   • Cotter pin ①

NOTE:
Bend the ends of the cotter pin as illustration.

⚠ WARNING

Always use a new cotter pin.

5. Adjust:
   • Brake pedal free play
   Refer to the "REAR BRAKE ADJUSTMENT" section in the CHAPTER 3.

Brake pedal free play:
20 ~ 30 mm (0.8 ~ 1.2 in)

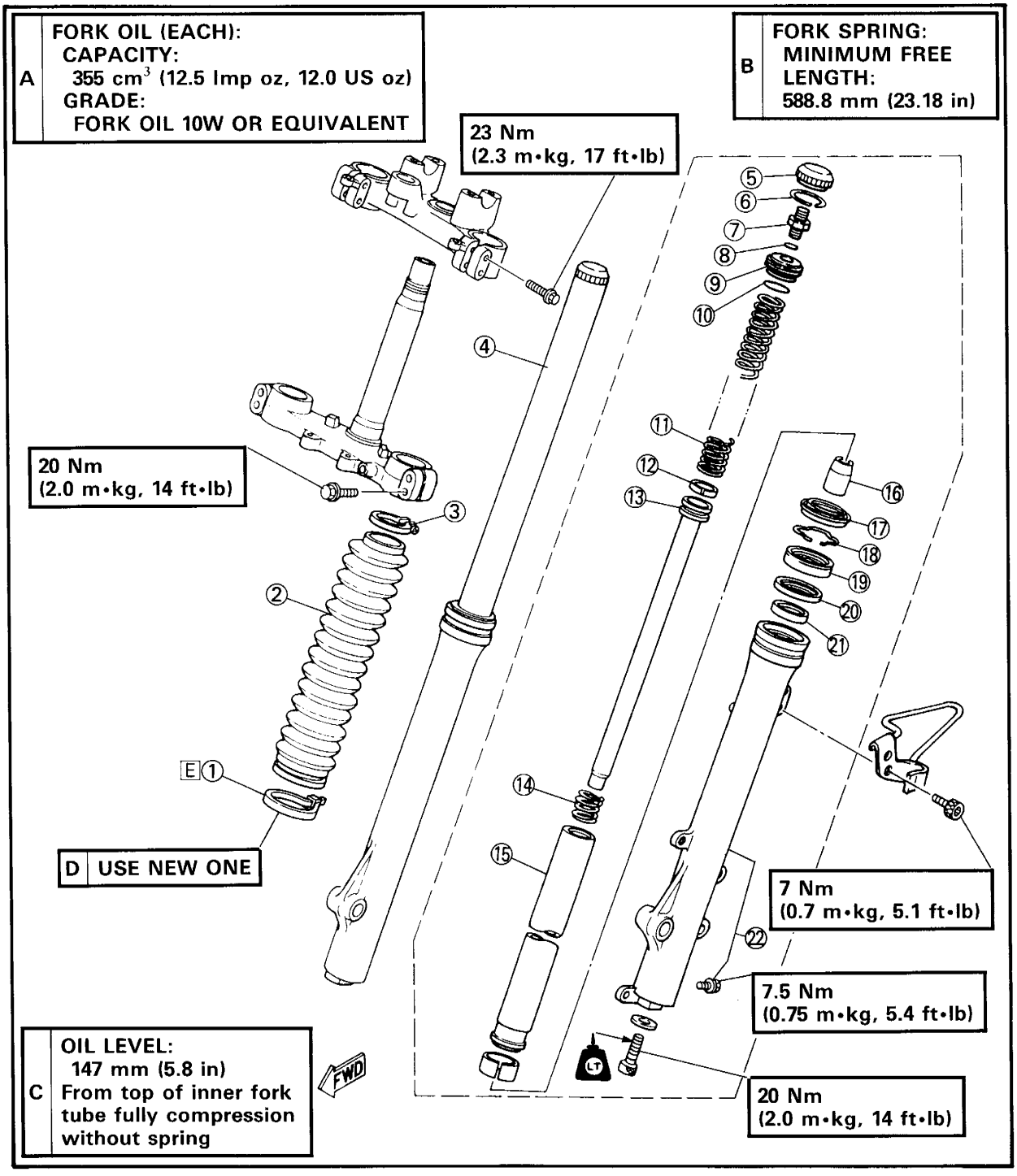
⚠ WARNING

After adjusting the brake pedal free play, brake light switch should be adjusted.

FRONT FORK

① Band (fork boot)
② Fork boot
③ Clamp (fork boot)
④ Front fork (right)
⑤ Air valve cap
⑥ Stopper ring
⑦ Air valve
⑧ O-ring
⑨ Spring seat
⑩ O-ring
⑪ Fork spring
⑫ Piston ring
⑬ Damper rod
⑭ Rebound spring
⑮ Inner fork tube
⑯ Oil lock piece
⑰ Dust seal
⑱ Oil seal stopper ring
⑲ Oil seal
⑳ Seal spacer
㉑ Guide bush
㉒ Outer fork tube
㉓ Front fork (left)

E Cut the end of the band.



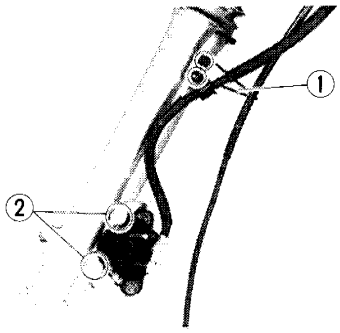
REMOVAL

⚠ WARNING

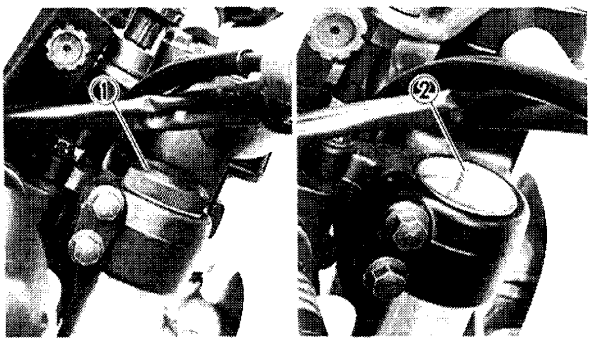
Support the motorcycle securely so there is no danger of it falling over.

1. Place the motorcycle on a level place.
2. Elevate the front wheel by placing a suitable stand under the frame and engine.
3. Remove:
   - Front wheel

   Refer to the "FRONT WHEEL—REMOVAL" section.



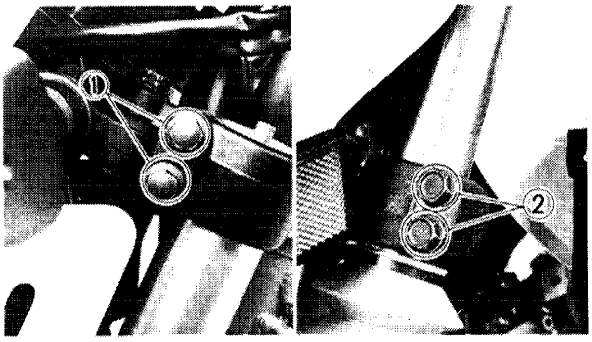
4. Remove:
   - Holder ① (brake hose and meter cable)
   - Bolt ② (brake caliper)



5. Remove:
   - Air valve cap ①

NOTE:

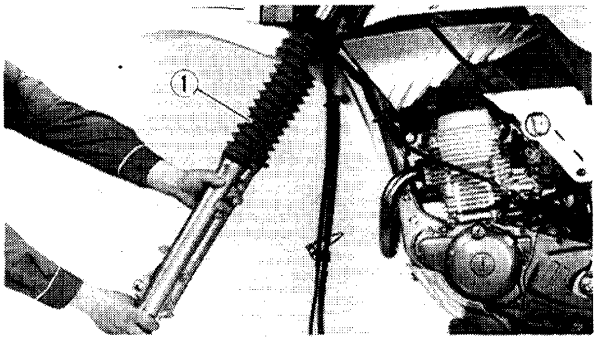
Bleed sealed air from the air valve ② with the air-sealed forks.



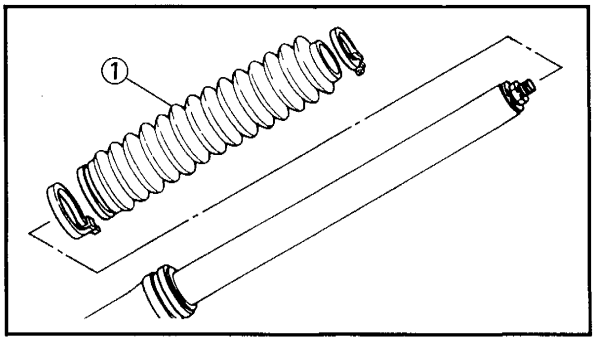
6. Loosen:
   - Pinch bolts ① (handlebar crown)
   - Pinch bolts ② (lower bracket)

⚠ WARNING

Support the fork before loosening the pinch bolt.

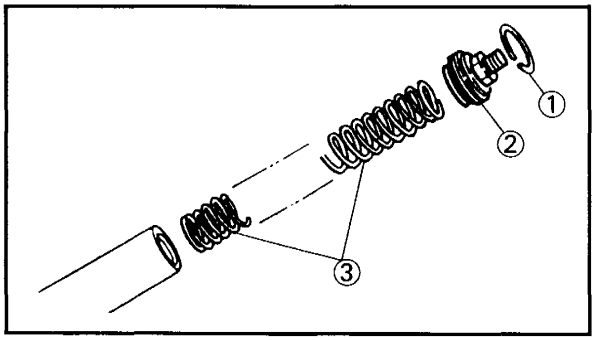


7. Remove:
   - Front fork ①



DISASSEMBLY

1. Remove:
   - Fork boot ①

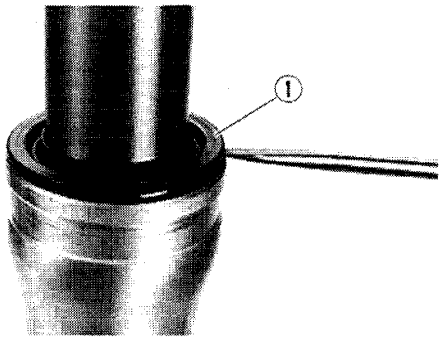


2. Remove:
   - Stopper ring ①
   - Spring seat ②
   - Fork spring ③

NOTE:

Depress the spring seat and remove the stopper ring.

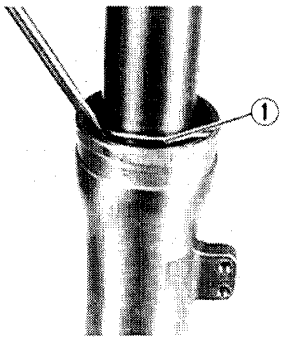
3. Drain:
   - Fork oil



4. Remove:
   - Dust seal ①

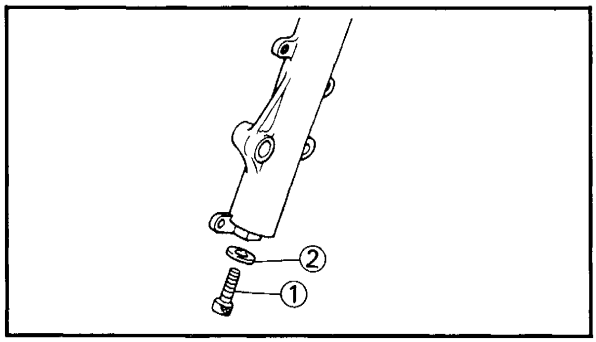
NOTE:

Use a screwdriver, and be careful not to scratch the outer fork tube.

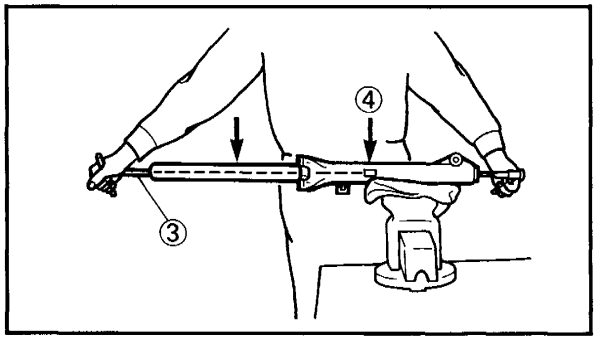


5. Remove:
   - Retaining clip ①

NOTE:
Use a thin screwdriver, and be careful not to scratch the inner fork tube.



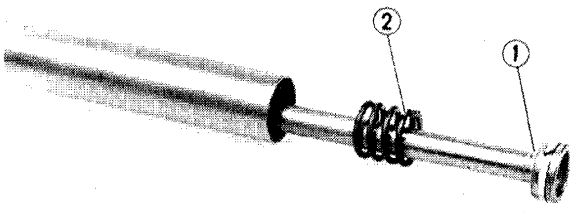
6. Remove:
   - Bolt ① (damper rod)
   - Washer ②



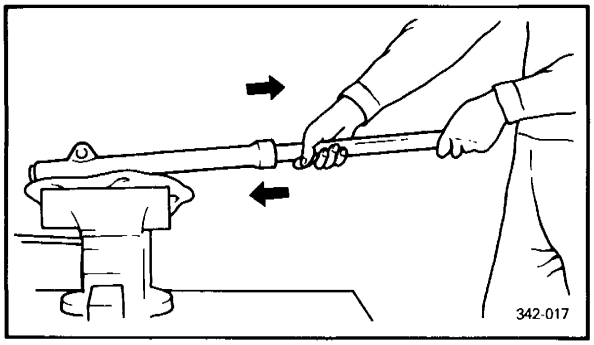
NOTE:
Hold the damper rod to loosen the bolt (damper rod) by the T-handle ③ and holder ④.



T-handle:
YM-01326
90890-01326
Holder:
YM-01300-1
90890-01294



7. Remove:
   - Damper rod ①
   - Rebound spring ②



8. Remove:
   - Inner fork tube

****

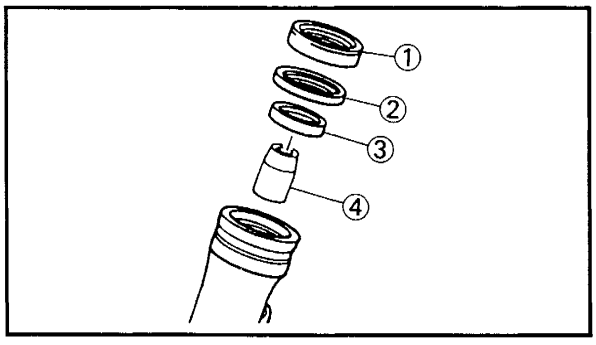
Removal steps:

- Hold the fork leg horizontally.
- Clamp the caliper mounting boss of the outer fork tube securely in a vise with soft jaws.
- Pull out the inner fork tube from the outer fork tube by forcefully, but carefully, with drawing the inner fork tube.

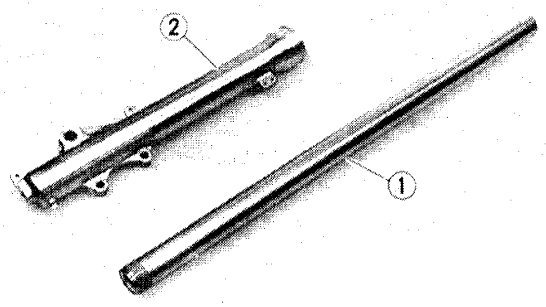
CAUTION:

- **Excessive force will damage the oil seal and/or the bushes. Damaged oil seal and bushing must be replaced.**
- **Avoid bottoming the inner fork tube in the outer fork tube during the above procedure, as the oil lock piece will be damaged.**

****



9. Remove:
   - Oil seal ①
   - Seal spacer ②
   - Guide bush ③
   - Oil lock pieces ④

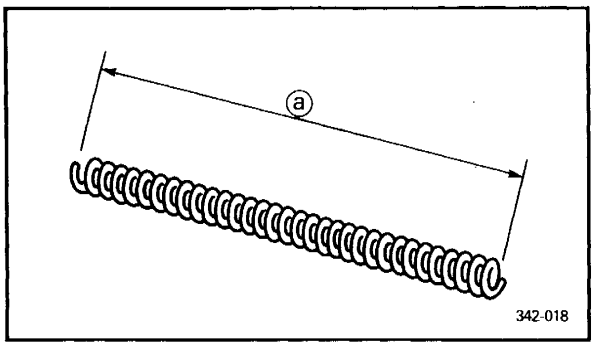


INSPECTION

1. Inspect:
   - Inner fork tube ①
   - Outer fork tube ②
     Scratches/Bends/Damage→Replace.

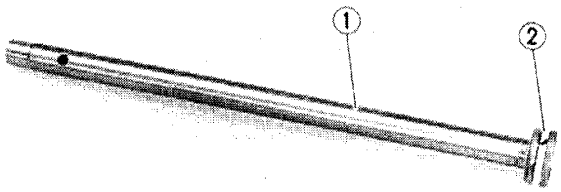
⚠ WARNING

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



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

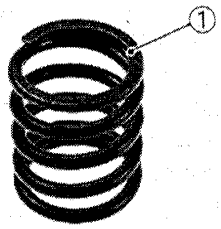
Fork spring free length:
594.7 mm (23.41 in)
Minimum free length:
588.8 mm (23.18 in)



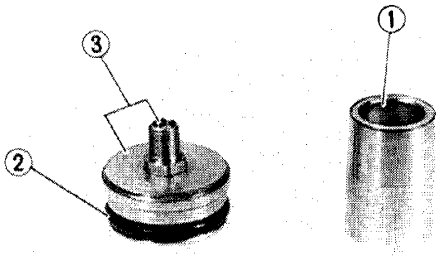
3. Inspect:
   - Damper rod ①
     Wear/Bends/Damage→Replace.
     Contamination→Blow out all oil passages with compressed air.
   - Piston ring ②
     Wear/Cracks/Damage→Replace.

⚠ WARNING

Do not attempt to straighten a bent damper rod as this may dangerously weaken the rod.



4. Inspect:
   - Rebound spring ①
     Cracks/Damage→Replace.



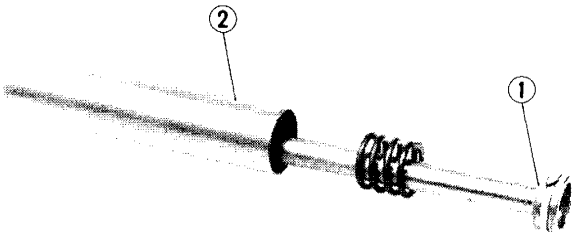
5. Inspect:
   - Oil lock piece ①
   - O-ring ②
   - Air valve and spring seat ③
     Damage→Replace.

ASSEMBLY

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

NOTE:

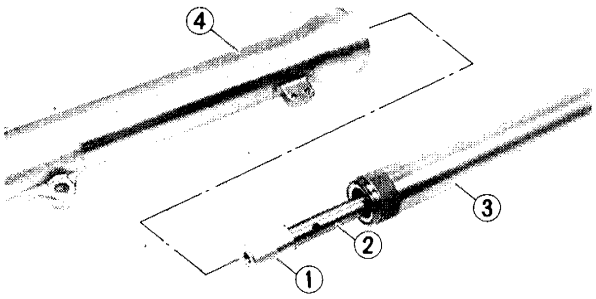
- In front fork reassembly, be sure to use following new parts.
  - ✻Guide bush
  - ✻Oil seal
  - ✻Dust seal
- Make sure all components are clean before reassembly.



1. Install:
   - Damper rod ①

CAUTION:

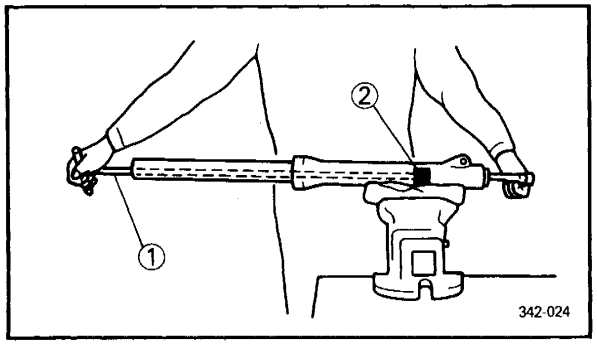
Allow the damper rod to slide slowly down the inner fork tube ② until it protrudes from the bottom, being careful not to damage the inner fork tube.



2. Install:
   • Oil lock piece ①
   (to damper rod ②)
3. Lubricate:
   • Inner fork tube (outer surface) ③

Fork oil 10W or equivalent

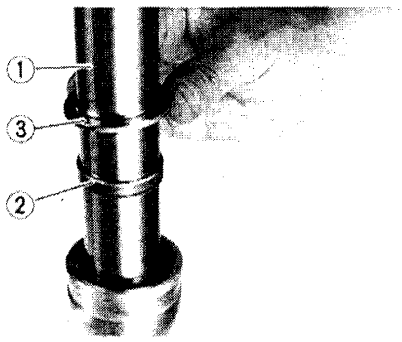
4. Install:
   • Inner fork tube
   (to outer fork tube ④)



5. Tighten:
   • Bolt (damper rod)
   Use the T-handle ① and holder ② to lock the damper rod.

T-handle:
YM-01326
90890-01326
Holder:
YM-01300-1
90890-01294

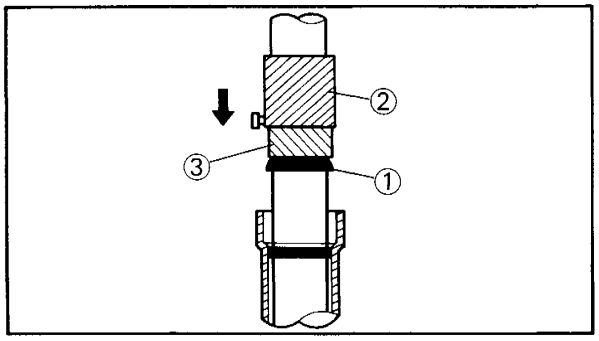
Bolt (damper rod):
20 Nm (2.0 m•kg, 14 ft•lb)
LOCTITE®.



6. Lubricate:
   • Inner fork tube (outer surface) ①

Fork oil 10W or equivalent

7. Install:
   • Guide bush ②
   • Seal spacer ③



8. Install:
   • Oil seal ①
   Use the fork seal driver weight ② and adapter ③.

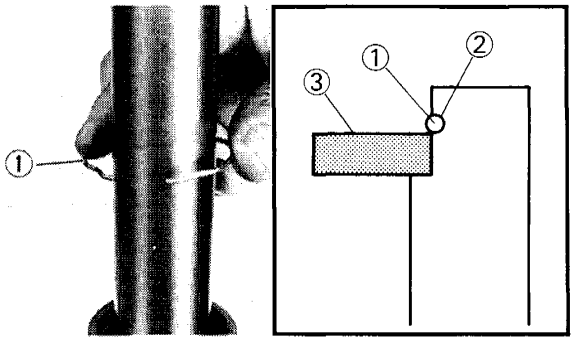
Fork seal driver weight:
YM-33963
90890-01367
Adapter
36 mm (1.42 in):
YM-08010
90890-01370

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.

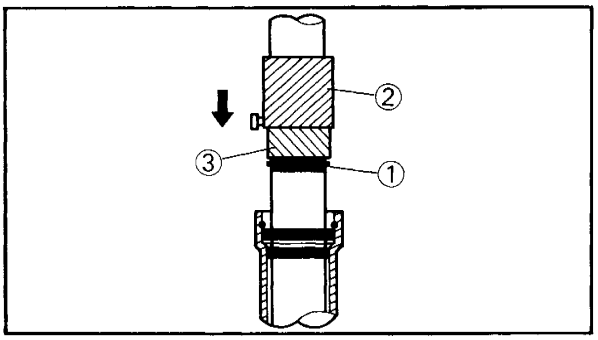


9. Install:
   • Oil seal stopper ring ①

NOTE:

Fit the oil seal stopper ring ① correctly in the groove ② in the outer fork tube.

③ Oil seal

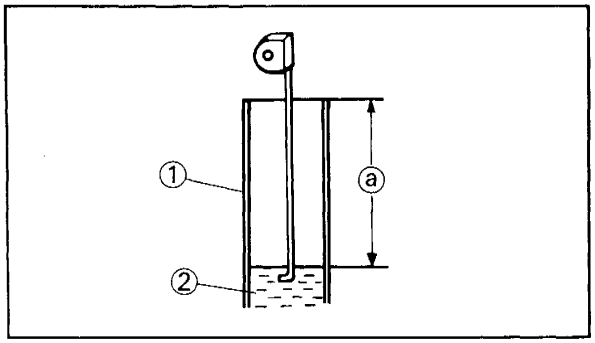


10. Install:
    • Dust seal ①
    Use the fork seal driver weight ② and adapter ③.

Fork seal driver weight:
YM-33963
90890-01367
Adapter
36 mm (1.42 in):
YM-08010
90890-01370

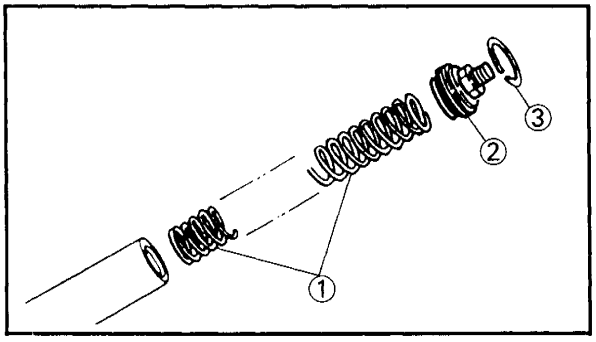
11. Fill:
    • Front fork

Each fork:
355 cm³ (12.5 Imp oz, 12.0 US oz)
Fork oil 10W or equivalent
After filling, slowly pump the fork up and down to distribute oil.

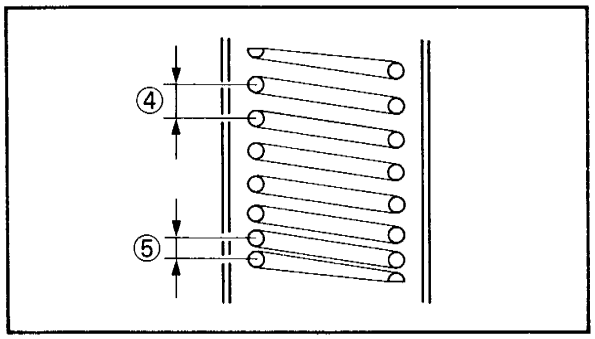


Oil level ⓐ:
147 mm (5.8 in)
From the top of inner fork tube fully compressed without spring.

① Inner fork tube
② Fork oil



12. Install:
    • Fork spring ①
    • Spring seat ②
    • Stopper ring ③

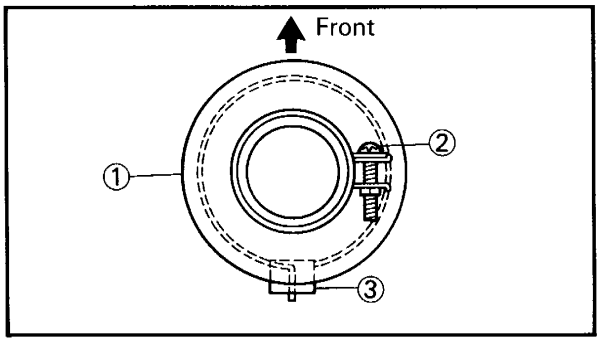


NOTE:

- Install the fork spring with larger pitch ④ facing upward.

⑤ Smaller pitch

- Before installing the spring seat, apply the grease to the O-ring.
- Depress the spring seat and install the stopper ring.



13. Install:
    - Fork boot ① (left)
    - Clamp ②
    - Band ③

NOTE:

- Install the clamp and the band as shown.
- Cut the end of the band ③.

⚠ WARNING

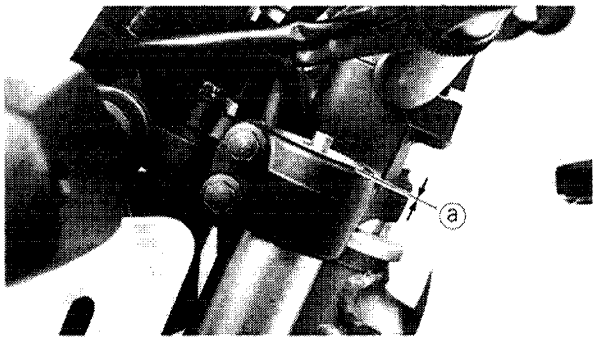
Always use a new band.

INSTALLATION

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

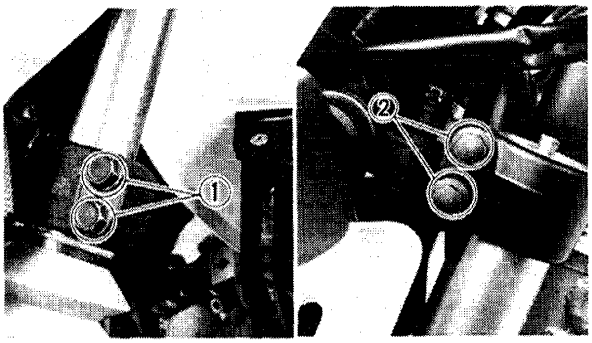
1. Install:
    - Front fork

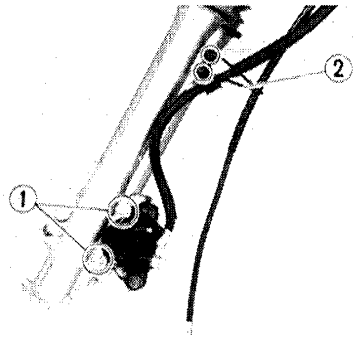
      Temporary tighten the pinch bolts.



NOTE:

Position the inner fork tube end in such a way that it is flush ⓐ with the top of the handle crown.





2. Tighten:
   - Pinch bolts ① (lower bracket)
   - Pinch bolts ② (handlebar crown)
   - Air valve cap

Pinch bolt (lower bracket):
20 Nm (2.0 m•kg, 14 ft•lb)
Pinch bolt (handlebar crown):
23 Nm (2.3 m•kg, 17 ft•lb)

3. Install:
   - Bolt ① (brake caliper)
   - Holder ② (brake hose)

Bolt (brake caliper):
35 Nm (3.5 m•kg, 25 ft•lb)
Bolt (brake hose holder):
7 Nm (0.7 m•kg, 5.1 ft•lb)

⚠ WARNING

Proper hose routing is essential to insure safe motorcycle operation. Refer to the "CABLE ROUTING" section in the CHAPTER 2.

4. Install:
   - Front wheel

Nut (wheel axle):
85 Nm (8.5 m•kg, 61 ft•lb)

Refer to the "FRONT WHEEL—INSTALLATION" section.

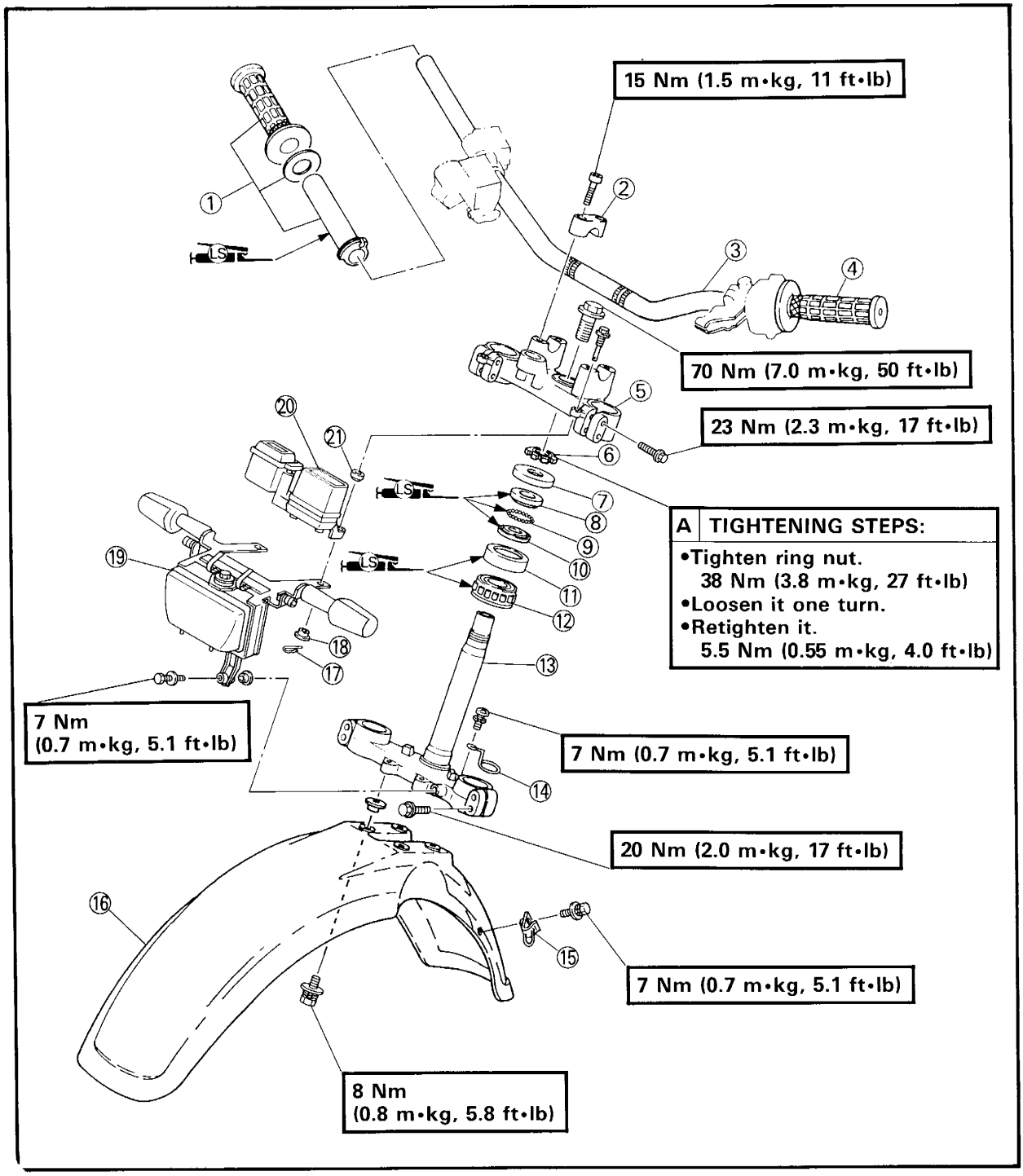
5. Adjust:
   - Air pressure

   Refer to the "FRONT FORK ADJUSTMENT" section in the CHAPTER 3.

Standard air pressure:
Zero kPa (Zero kg/cm^2, Zero psi)
Maximum air pressure:
40 kPa (0.4 kg/cm^2, 5.7 psi)

STEERING HEAD AND HANDLEBAR

① Handlebar grip (right)
② Handlebar holder (upper)
③ Handlebar
④ Handlebar grip (left)
⑤ Handlebar crown
⑥ Ring nut
⑦ Ball race cover
⑧ Ball race (upper)
⑨ Balls (3/16 in)
⑩ Ball race (lower)
⑪ Bearing race (upper)
⑫ Bearing race (lower)
⑬ Lower bracket
⑭ Holder (meter cable and brake hose)
⑮ Holder (brake hose and meter cable)
⑯ Front fender
⑰ Clip
⑱ Flange collar
⑲ Head light assembly
⑳ Meter assembly
㉑ Rubber washer



YB375001

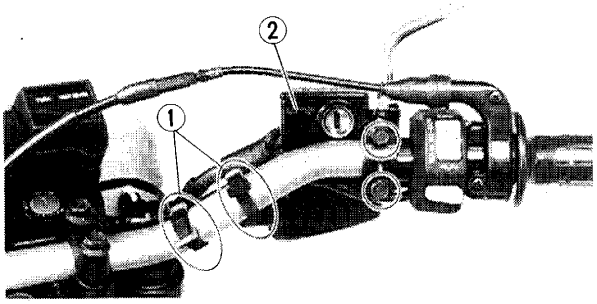
REMOVAL

Handlebar

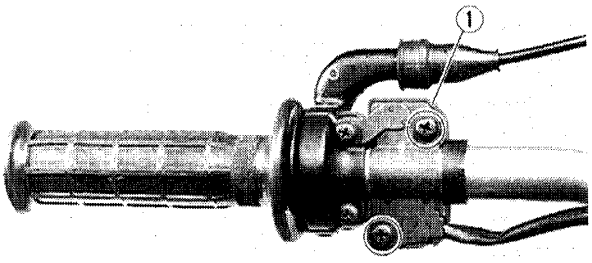
⚠ WARNING

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

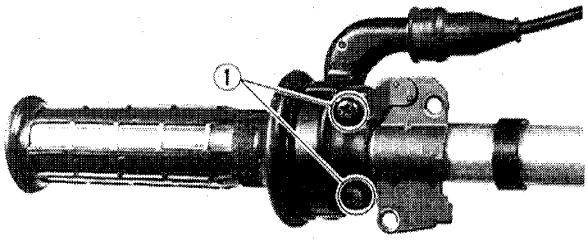
1. Place the motorcycle on a level place.



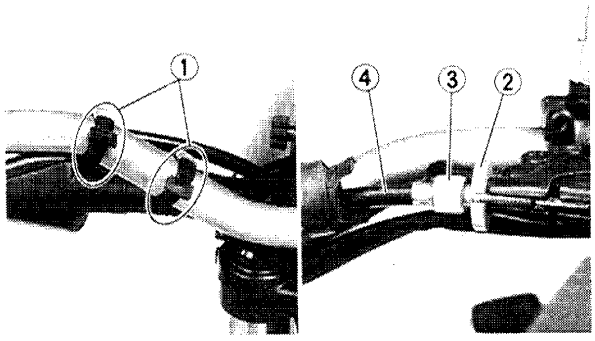
2. Disconnect:
   - Band ①
3. Remove:
   - Master cylinder ②



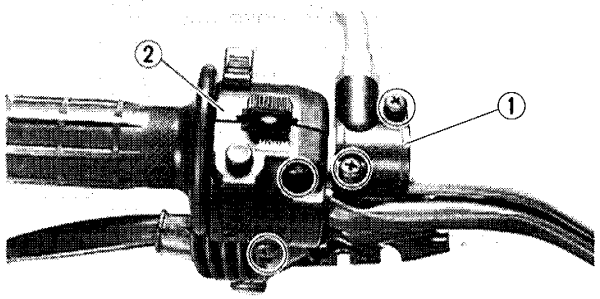
4. Remove:
   - Handlebar switch ① (right)



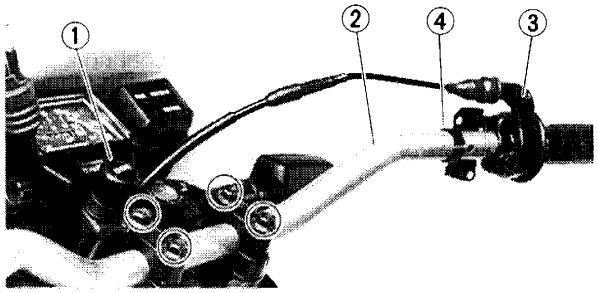
5. Loosen:
   - Screw ① (throttle grip)



6. Disconnect:
   - Band ①
7. Loosen:
   - Locknut ② (clutch cable)
   - Adjuster ③ (clutch cable)
8. Remove:
   - Clutch cable ④



9. Remove:
   - Clutch lever holder ①
   - Handlebar switch ② (left)



10. Remove:
    - "CHOKE" knob ①
    - Handlebar ②
    - Throttle grip ③
    - Collar ④

Steering head

⚠ WARNING

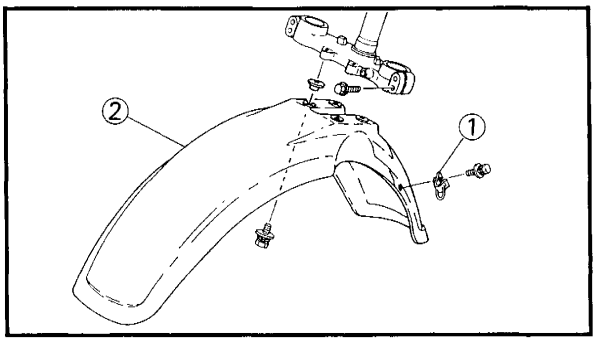
Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on a level place.
2. Elevate the front wheel by placing a suitable stand under the frame and engine.
3. Remove:
   - Handlebar

   Refer to the "HANDLEBAR—REMOVAL" section.
4. Remove:
   - Cowling (headlight)

   Refer to the "HEADLIGHT BULB REPLACEMENT" section in the CHAPTER 3.
5. Remove:
   - Front wheel

   Refer to the "FRONT WHEEL—REMOVAL" section.



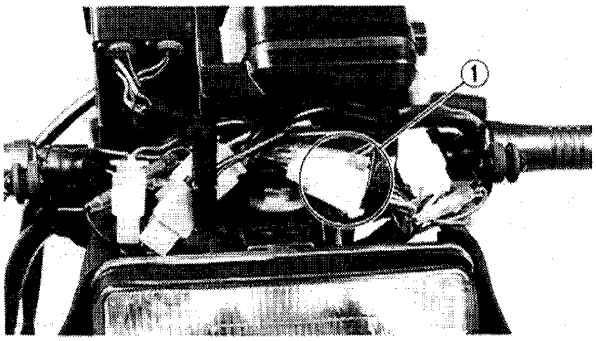
6. Remove:
   - Holder ① (brake hose and meter cable)
   - Front fender ②

7. Remove:
   - Front fork

   Refer to the "FRONT FORK—REMOVAL" section.



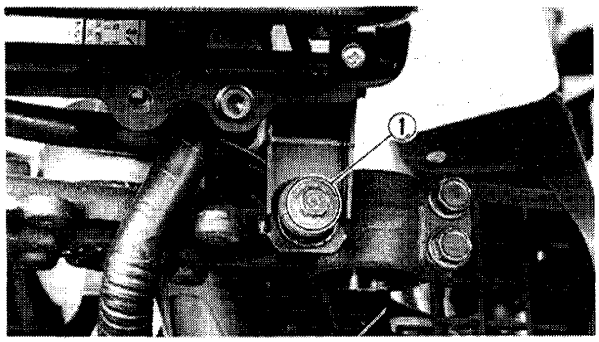
8. Remove:
   - Holder ① (meter cable and brake hose)



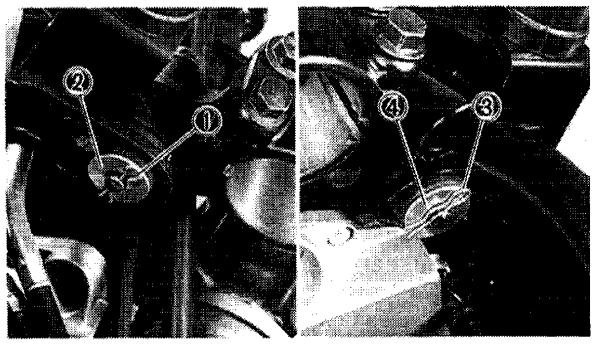
9. Disconnect:
   - Main switch coupler ①

NOTE:

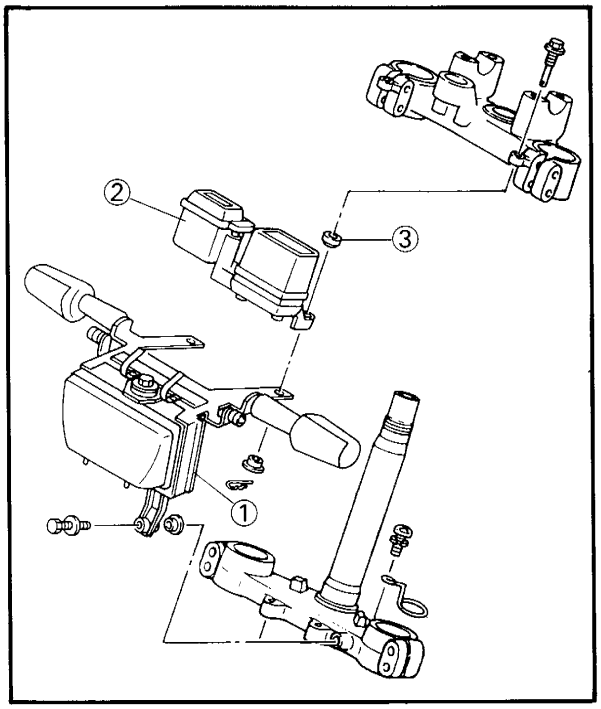
After removing the couplers, put the main switch leads outside taking care not to get entangled.



10. Remove:
    - Bolt ① (headlight stay)



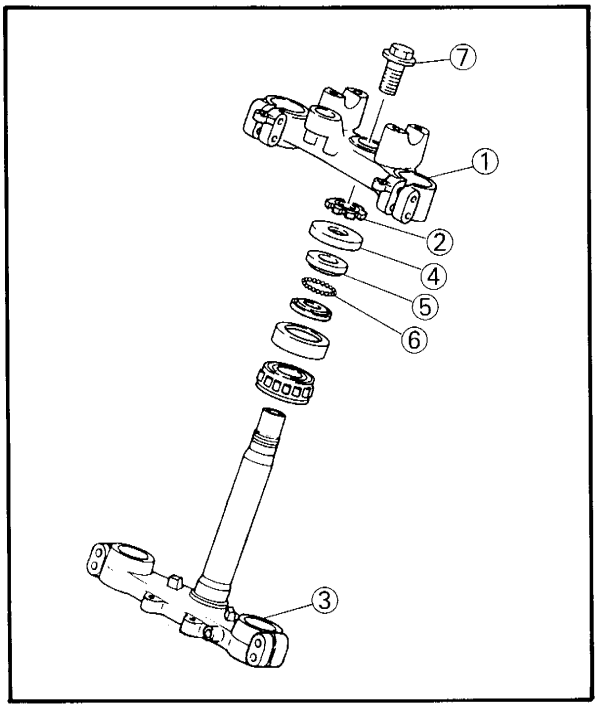
11. Disconnect:
    - Clip ① (left)
    - Flange collar ②
    - Clip ③
    - Flange collar ④



12. Remove:
- Headlight assembly ①
- Meter assembly ②
- Rubber washers ③

NOTE:

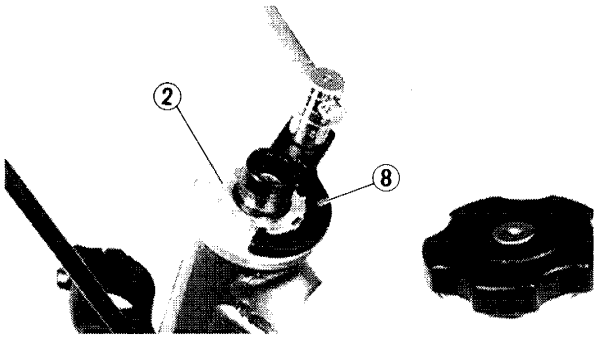
When removing the meter assembly, the rubber washer will fall off. Take care not to lose the rubber washer.

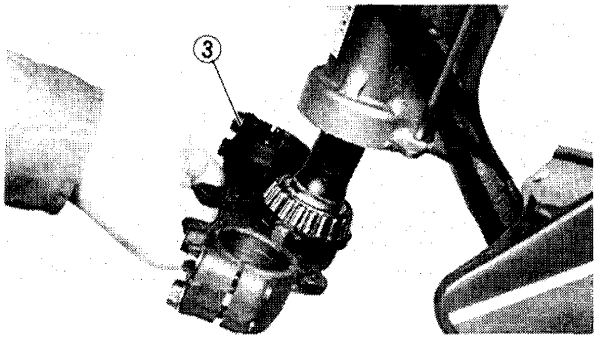


13. Remove:
- Handlebar crown ①
- Ring nut ②
- Lower bracket ③
- Ball race cover ④
- Ball race (upper) ⑤
- Balls ⑥

NOTE:
- Loosen the steering fitting bolt ⑦ and remove the handlebar crown ①. Take care not to contact the handlebar crown to the fuel tank.
- Remove the ring nut ② by the ring nut wrench ⑧.

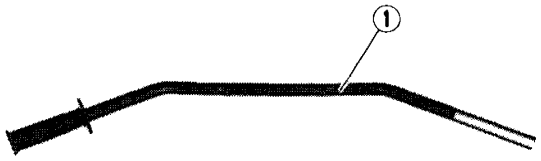
	Ring nut wrench: **P/N. YU-33975, 90890-01403**





⚠ WARNING

Support the lower bracket ③ so that it may not fall down.



YB275002

INSPECTION

1. Inspect:
   - Handlebar ①
     Bends/Cracks/Damage→Replace.

⚠ WARNING

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

****

Replacement steps:

- Remove the handlebar grip.
- Apply a light coat of an adhesive for rubber on the left new handlebar end.
- Install the handlebar grip.

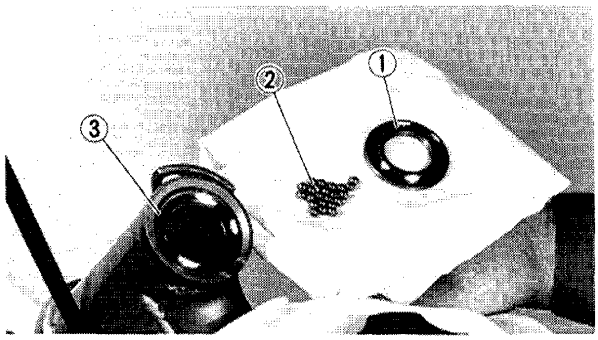
NOTE:

Wipe off excess adhesive with a clean rag.

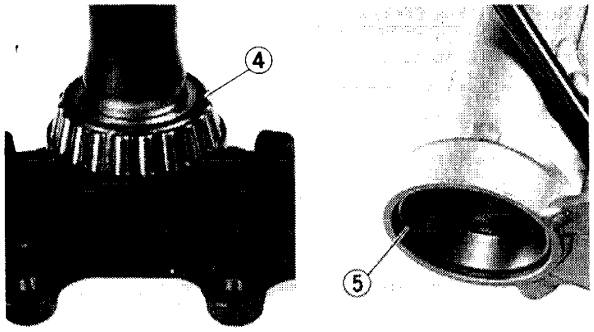
⚠ WARNING

Leave the handlebar intact until the adhesive becomes dry enough to make the grip and handlebar stuck securely.

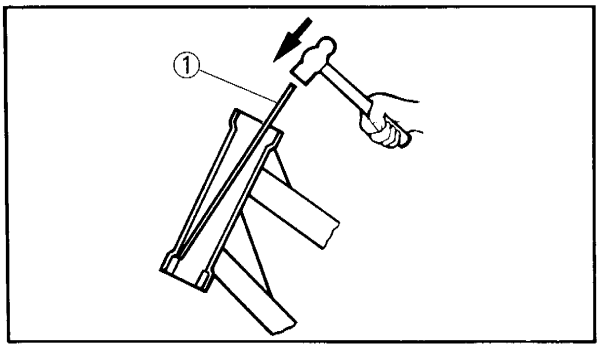
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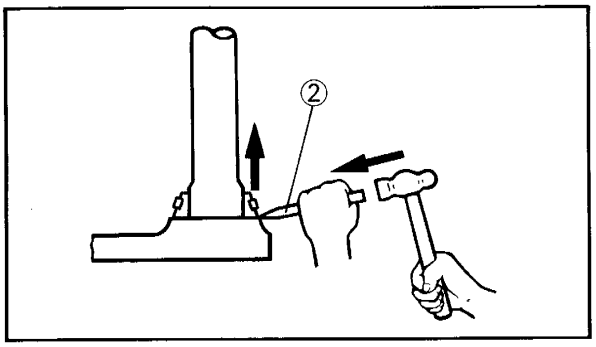


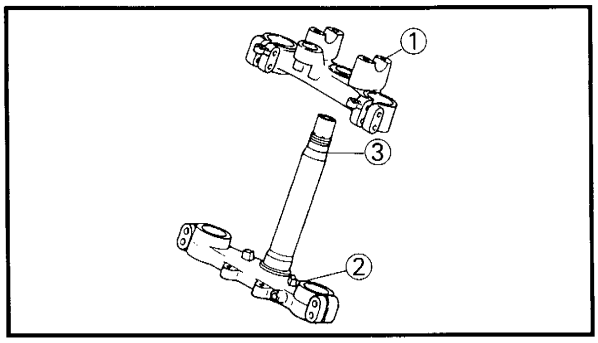
2. Inspect:
   - Ball race (upper) ①
   - Balls ②
   - Ball race (lower) ③
     Wear/Pitting/Damage→Replace as a set.



3. Inspect:
   - Bearing race ④ (lower)
     Wear/Pitting/Damage→Replace as a set.
   - Bearing race ⑤ (upper)
     Wear/Pitting/Damage→Replace as a set.







****

Replacement steps:

- Remove the bearing races from the slot on the steering head pipe using a long rod ① and hammer as shown.
- Remove the bearing race on the steering stem using the floor chisel ② and the hammer as shown.
- Install the new dust seal, bearings and races.

****

CAUTION:

- **Always replace bearings, races and dust seal as a set.**
- **A slant installation of the bearings and the ball races will damage the frame, so take care to drive into horizontally.**
- **Do not strike the balls and the roller face.**

4. Inspect:
   - Handlebar crown ①
   - Lower bracket ②
     Cracks/Damage→Replace.
   - Steering stem ③
     Bends/Damage→Replace lower bracket assembly.

⚠ WARNING

Do not attempt to straighten a bent steering stem as this may dangerously weaken the steering stem.

INSTALLATION

Handlebar

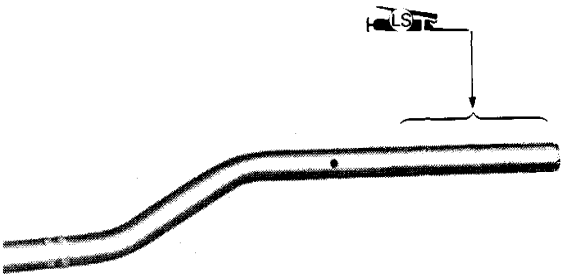
Reverse the "REMOVAL" procedure.
Note the following points.

1. Lubricate:
   - Handlebar

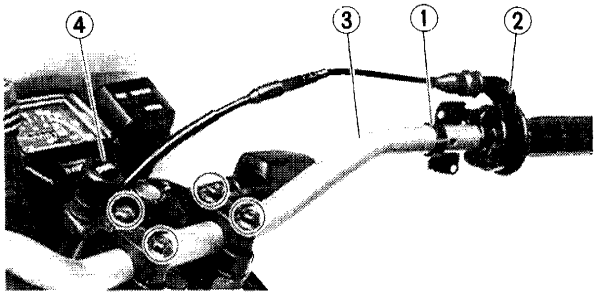
	Lithium soap base grease

NOTE:

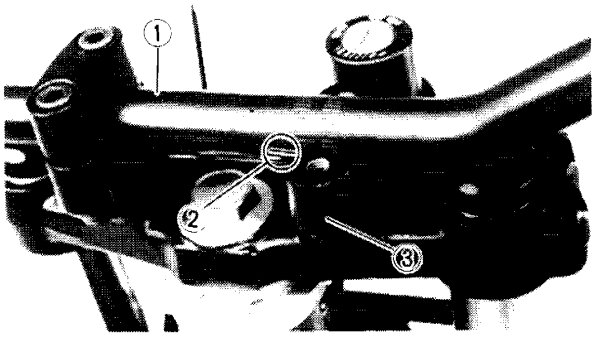
Before installing the throttle grip onto the handlebar, apply a light coat of lithium soap base grease onto the handlebar end.



2. Install:
   - Collar ①
   - Throttle grip ②
   - Handlebar ③
   - "CHOKE" knob ④

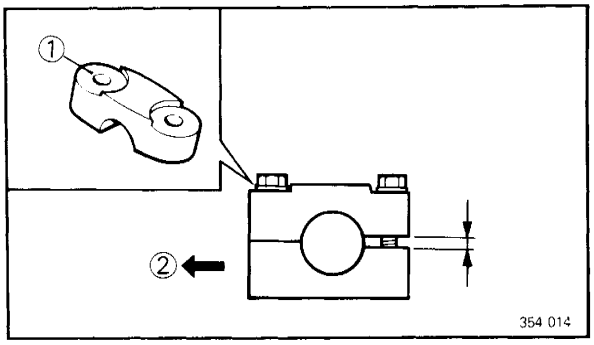


	Bolt (handlebar): **15 Nm (1.5 m•kg, 11 ft•lb)**



NOTE:

Align the match mark ② on the handlebar ① with the upper end of the right lower handlebar holder ③ and install the handlebar.



NOTE:

The upper handlebar holder should be installed with the punch mark ① forward.

② Forward

CAUTION:

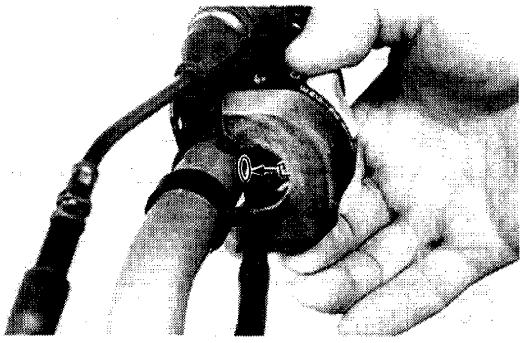
First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.

3. Install:
   - Handlebar switch (left)
   - Clutch lever holder
   - Clutch cable

NOTE:

Apply a light coat of lithium soap base grease onto the clutch cable end.

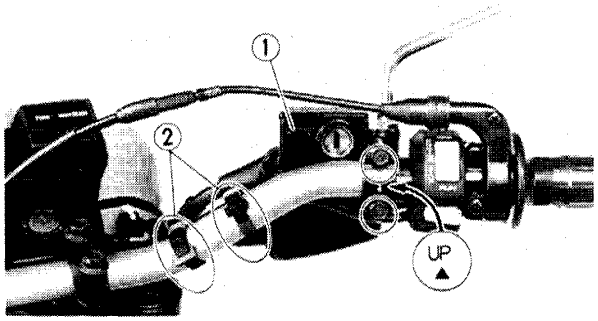
4. Connect:
   - Bands



5. Install:
   - Throttle grip
   - Handlebar switch (right)

NOTE:

When installing the handlebar switch (right) make sure its projection fits into the hole as shown.



6. Install:
   - Brake master cylinder (1)

NOTE:

- Install the master cylinder bracket with the "UP" mark facing upward.
- Tighten first the upper bolt, then the lower bolt.

	Bolt (master cylinder bracket): 7 Nm (0.7 m•kg, 5.1 ft•lb)

⚠ WARNING

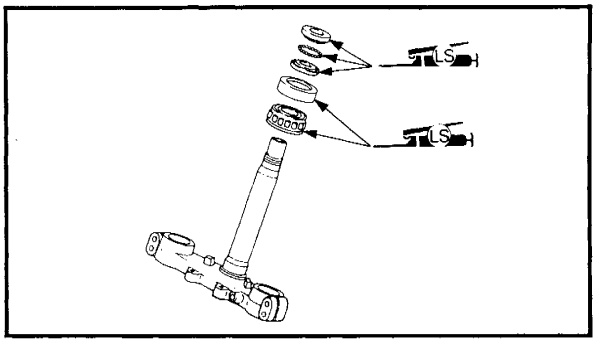
Proper hose routing is essential to insure safe motorcycle operation. Refer to the "CABLE ROUTING" section in the CHAPTER 2.

7. Connect:
   - Bands (2)

8. Adjust:
   • Clutch cable free play

Free play:
10 ~ 15 mm (0.4 ~ 0.6 in)
at lever end

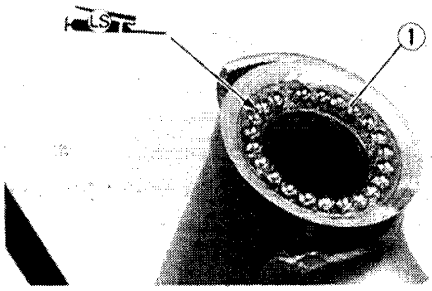
Refer to the "CLUTCH ADJUSTMENT" section in the CHAPTER 3.



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

1. Lubricate:
   • Bearing (upper and lower)
   • Ball races

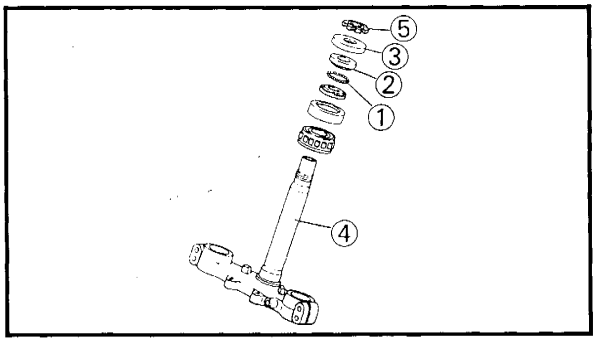
Lithium soap base grease



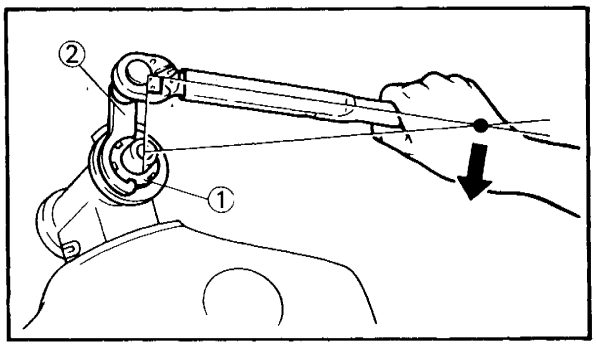
2. Install:
   • Balls ①

NOTE:
Apply grease to the ball race (lower) liberally and install the balls (22 pieces).

Lithium soap base grease



• Ball race (upper) ②
• Ball race cover ③
• Lower bracket ④
• Ring nut ⑤



3. Tighten:
   • Ring nut ①

****

Tightening steps:
● Tighten the ring nut using the ring nut wrench ②.

Ring nut wrench:
P/N. YU-33975, 90890-01403

NOTE:

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

Ring nut (lower) (initial tightening): 38 Nm (3.8 m•kg, 27 ft•lb)

- Turn the lower bracket to the left and right making sure there is no binding and then loosen the ring nut one turn.
- Retighten the ring nut using the ring nut wrench.

Ring nut (lower) (final tightening): 5.5 Nm (0.55 m•kg, 4.0 ft•lb)

⚠ WARNING

Avoid over-tightening.

NOTE:

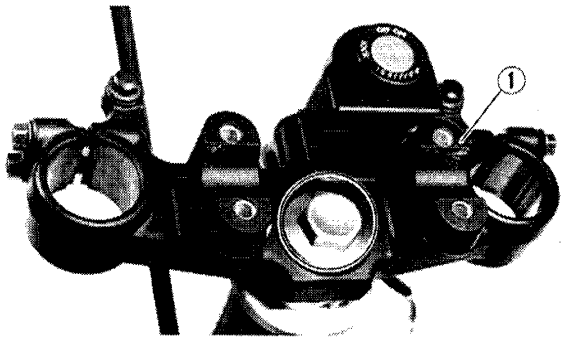
Check the steering head by turning the steering from lock to lock, after adjusting steering head. If steering is binded, loosen the ring nut but not to the extent of free play in bearing.
If steering is loosened, repeat the adjustment steps.

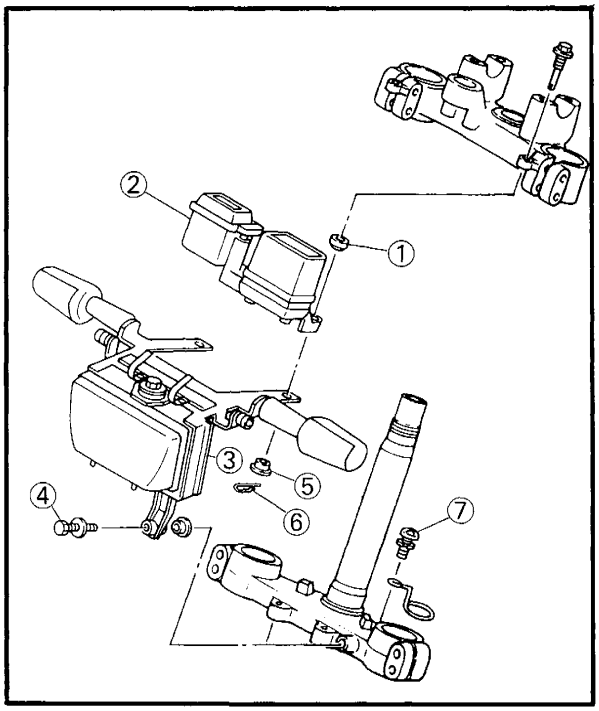
****

4. Install:
   - Handlebar crown ①

NOTE:

Temporary tighten the steering fitting bolt ②.





5. Install:
   - Rubber washers ①
   - Meter assembly ②
   - Headlight assembly ③
   - Bolt ④ (headlight stay)
   - Flange collar ⑤
   - Clip ⑥
   - Bolt ⑦ (holder)

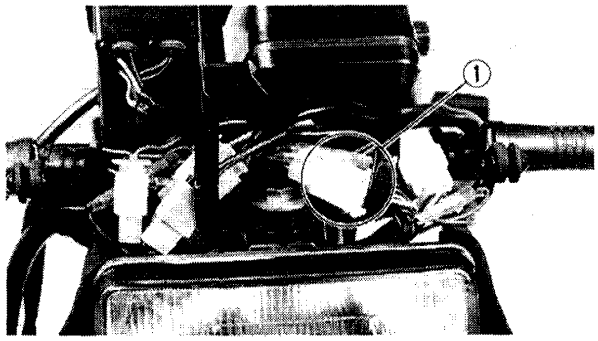
Bolt ④ (headlight stay):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Bolt ⑦ (holder):
7 Nm (0.7 m•kg, 5.1 ft•lb)

CAUTION:

Make sure that the each cables and leads are routed properly. Refer to the "CABLE ROUTING" section in the CHAPTER 2.

⚠ WARNING

Proper hose routing is essential to insure safe motorcycle operation. Refer to the "CABLE ROUTING" section in the CHAPTER 2.

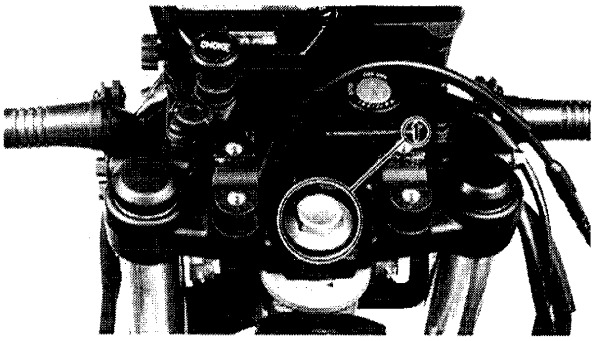


6. Connect:
   - Main switch coupler ①
   Refer to the "CABLE ROUTING" section in the CHAPTER 2.

7. Install:
   - Front fork
   Refer to the "FRONT FORK—INSTALLATION" section.

NOTE:

Temporary tighten the pinch bolts.



8. Tighten:
   • Steering fitting bolt ①

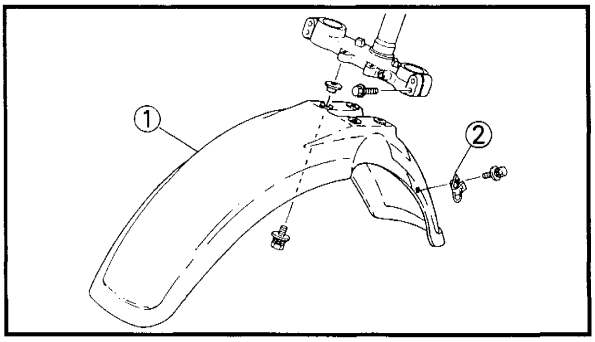
	Steering fitting bolt: **70 Nm (7.0 m•kg, 50 ft•lb)**

9. Tighten:
   • Pinch bolt (front fork)

	Pinch bolt (lower bracket): **20 Nm (2.0 m•kg, 14 ft•lb)** **Pinch bolt (handlebar crown):** **23 Nm (2.3 m•kg, 17 ft•lb)**

10. Install:
   • Brake caliper
   • Holder (brake hose and meter cable)
   • Cable band (meter cable and brake hose)
   Refer to the "FRONT FORK—INSTALLATION" section.

	Bolt (brake caliper): **35 Nm (3.5 m•kg, 25 ft•lb)** **Bolt (holder):** **7 Nm (0.7 m•kg, 5.1 ft•lb)**



11. Install:
   • Front fender ①
   • Holder ② (brake hose and meter cable)

	Bolt (front fender): **8 Nm (0.8 m•kg, 5.8 ft•lb)** **Bolt (holder):** **7 Nm (0.7 m•kg, 5.1 ft•lb)**

12. Install:
    - Front wheel
      Refer to the "FRONT WHEEL—INSTALLATION" section.



Axle nut:
85 Nm (8.5 m•kg, 61 ft•lb)

13. Install:
    - Handlebar
      Refer to the "HANDLEBAR—INSTALLATION" section.



Bolt (handlebar):
15 Nm (1.5 m•kg, 11 ft•lb)
Bolt (master cylinder bracket):
7 Nm (0.7 m•kg, 5.1 ft•lb)

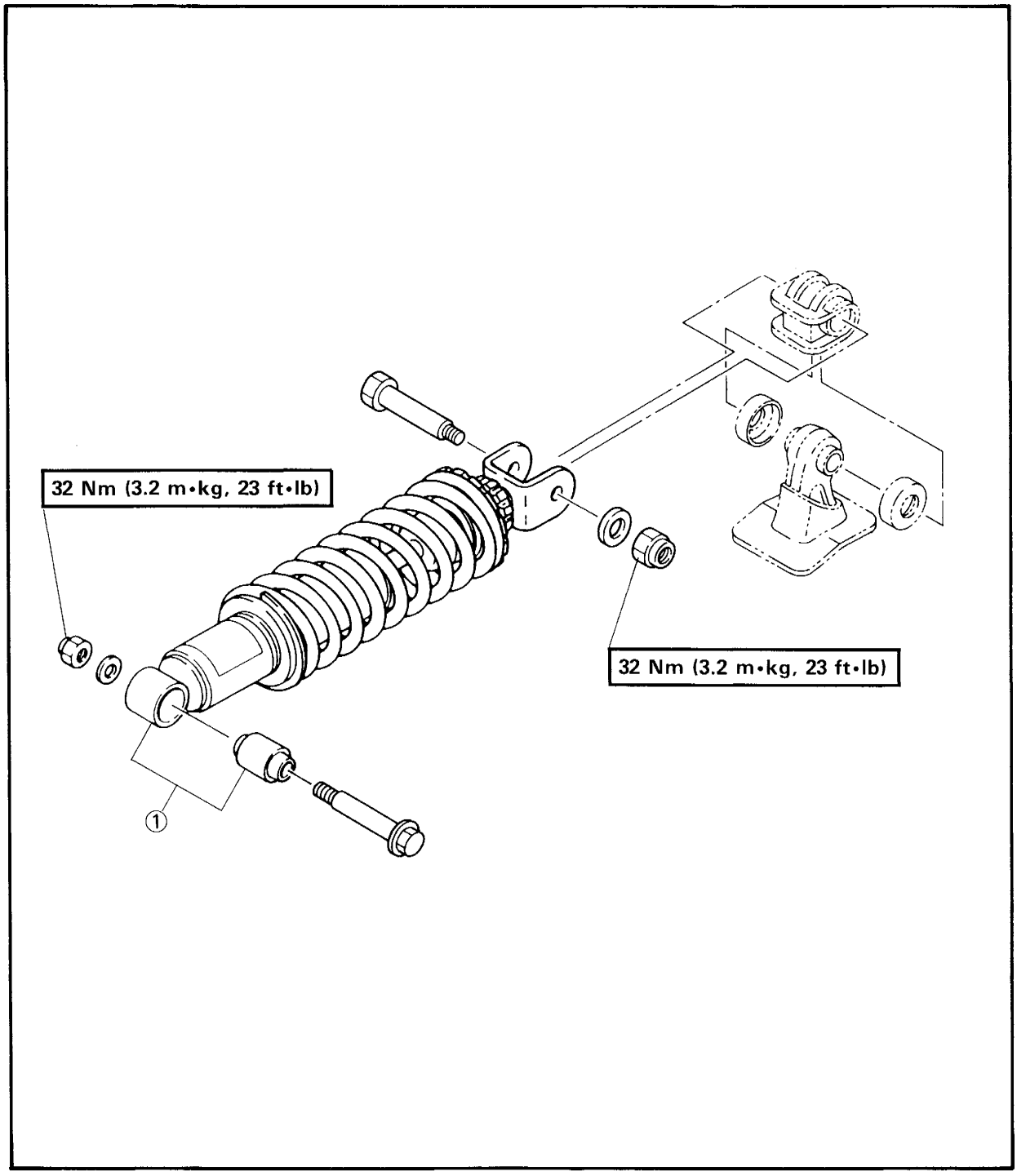
14. Install:
    - Cowling (headlight)
      Refer to the "HEADLIGHT BULB REPLACEMENT" section in the CHAPTER 3.



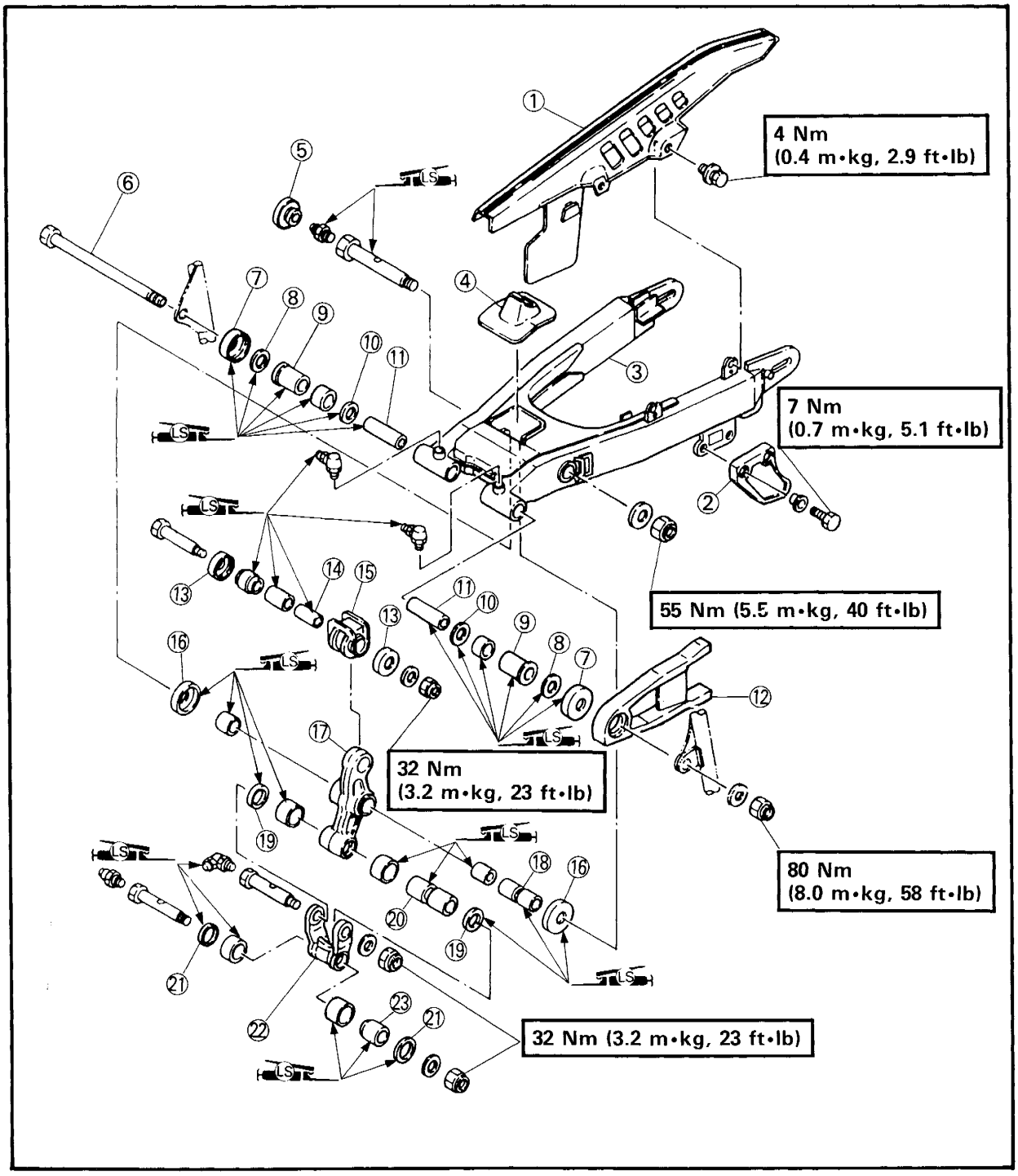
Bolt (cowling):
7 Nm (0.7 m•kg, 5.1 ft•lb)

REAR SHOCK ABSORBER AND SWINGARM

① Rear shock absorber



① Chain case
② Chain guide
③ Swingarm
④ Rubber cover
⑤ Rubber cap
⑥ Pivot shaft
⑦ Thrust cover (swingarm)
⑧ Shim
⑨ Bush
⑩ Oil seal
⑪ Collar
⑫ Chain protector
⑬ Thrust cover (relay arm)
⑭ Collar
⑮ Rubber boot
⑯ Thrust cover (relay arm)
⑰ Relay arm
⑱ Collar
⑲ Oil seal
⑳ Collar
㉑ Oil seal
㉒ Connecting arm
㉓ Collar

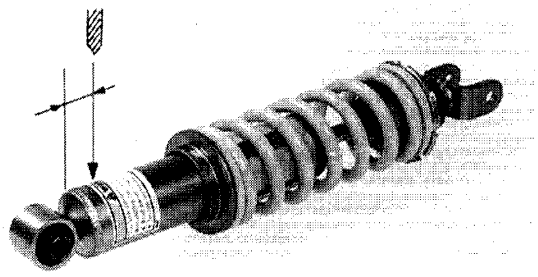


HANDLING NOTES

⚠ WARNING

This shock absorber contains highly pressurized nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

- **Do not tamper with or attempt to open the cylinder assembly.**
- **Do not subject shock absorber to an open flame or other high heat source. This may cause the unit to explode due to excessive gas pressure.**
- **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**
- **Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.**
- **When scrapping the shock absorber, refer to the "NOTES ON DISPOSAL" section.**



NOTES ON DISPOSAL

****

Shock absorber disposal steps:

Gas pressure must be released before disposing of the shock absorber assembly. To do so, drill a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the chamber case at a point 15 ~ 20 mm (0.6 ~ 0.8 in) from the end of the chamber case.

⚠ WARNING

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

****

REMOVAL

Rear shock absorber

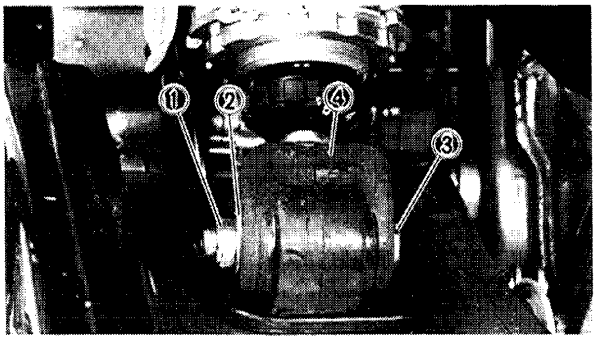
⚠ WARNING

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

1. Place the motorcycle on a level place.
2. Remove:
   - Side covers
   - Seat
   - Air scoops
   - Fuel tank

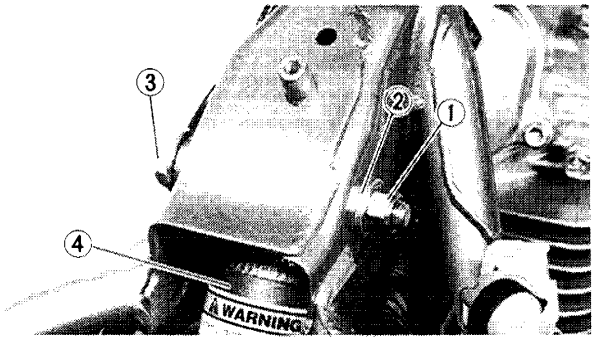
   Refer to the "SEAT, FUEL TANK AND COVER" section in the CHAPTER 3.
3. Elevate the rear wheel by placing a suitable stand under the frame and engine.
4. Remove:
   - Rear wheel

   Refer to the "REAR WHEEL—REMOVAL" section.



5. Remove:
   - Nut ①
   - Washer ②
   - Bolt ③

④ Rubber boot



6. Remove:
   - Nut ①
   - Washer ②
   - Bolt ③
   - Rear shock absorber ④

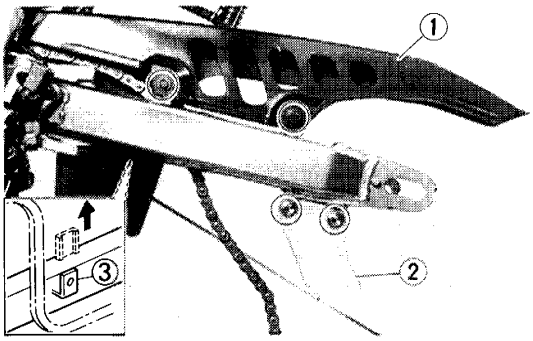
Swingarm

⚠ 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 rear wheel by placing a suitable stand under the frame and engine.
3. Remove:
   - Rear shock absorber

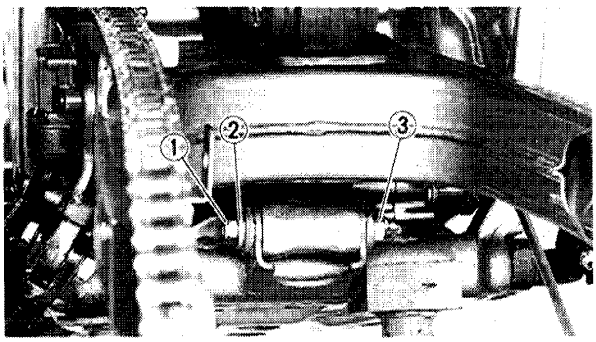
   Refer to the "REAR SHOCK ABSORBER" section.



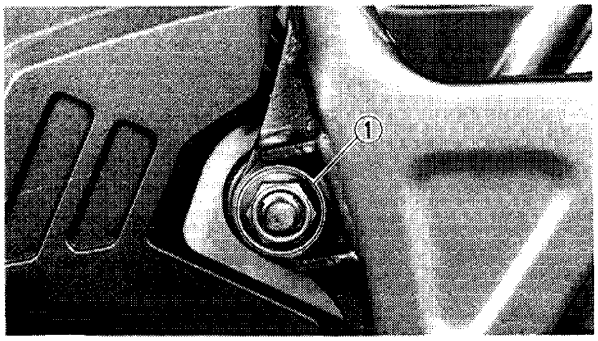
4. Remove:
   - Chain case ①
   - Chain guide ②

NOTE:

When removing the chain case, lift up and remove the chain case from the swingarm L-shaped part ③ on the back.



5. Remove:
   - Nut ① (connecting arm)
   - Washer ②
   - Bolt ③



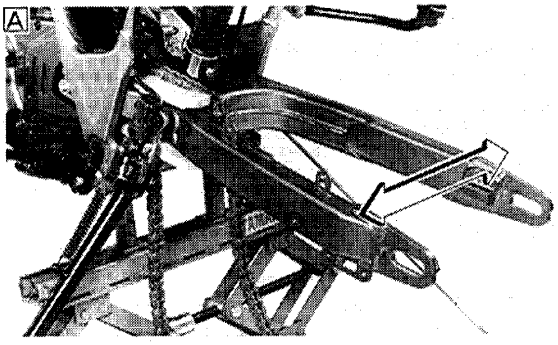
6. Check:
   - Swingarm free play

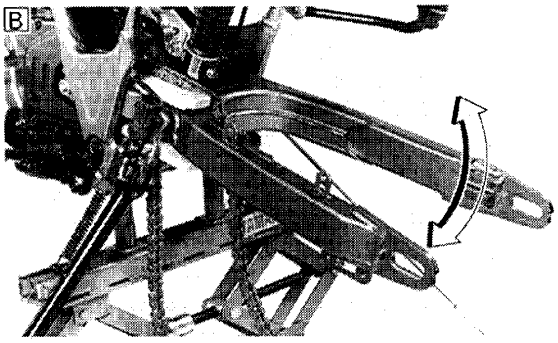
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Inspection steps:

- Check the tightening torque of the pivot shaft (swingarm) securing nut ①.

	Nut (pivot shaft): 80 Nm (8.0 m•kg, 58 ft•lb)



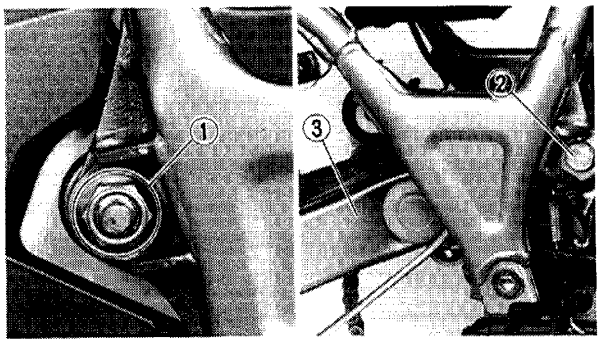


- Check the swingarm side play A by moving it from side to side.
  If side play noticeable, check the inner collar, bearing, washer and thrust cover.

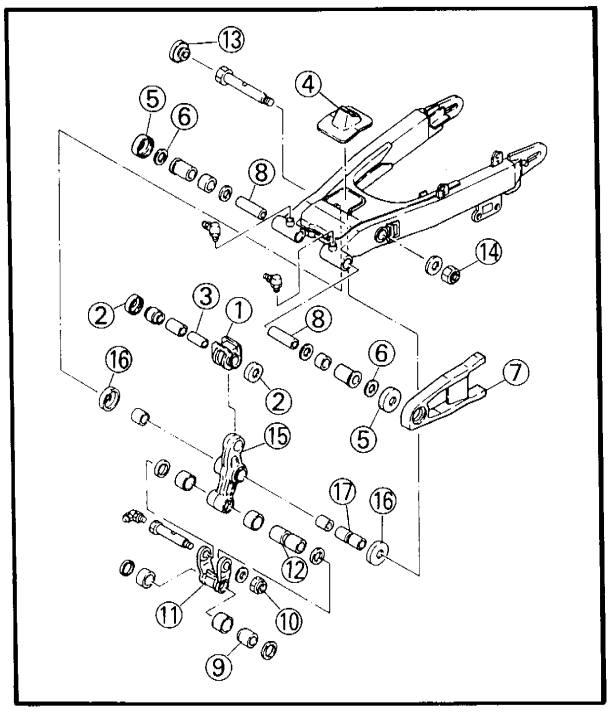
Side play (at end of swingarm):
Limit: 1.0 mm (0.04 in)

- 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.

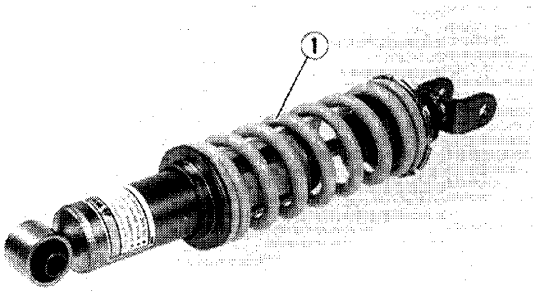
****



7. Remove:
   - Nut ① (pivot shaft)
   - Washer
   - Pivot shaft ②
   - Swingarm ③



8. Remove:
   - Rubber boot ①
   - Thrust cover ② (relay arm)
   - Collar ③ (relay arm—upper)
   - Rubber cover ④
   - Thrust cover ⑤ (swingarm)
   - Shim ⑥
   - Chain protector ⑦
   - Collar ⑧ (swingarm)
   - Collar ⑨ (connecting arm)
   - Nut ⑩ (connecting arm—relay arm)
   - Connecting arm ⑪
   - Collar ⑫ (relay arm—lower)
   - Rubber cap ⑬
   - Nut ⑭ (relay arm—swingarm)
   - Relay arm ⑮
   - Thrust cover ⑯ (relay arm)
   - Collar ⑰ (relay arm)

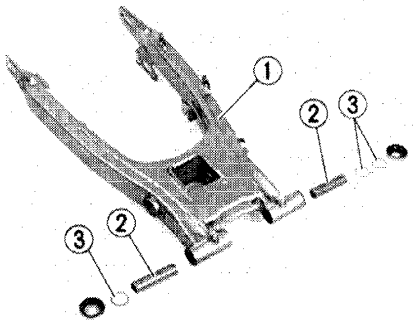


INSPECTION

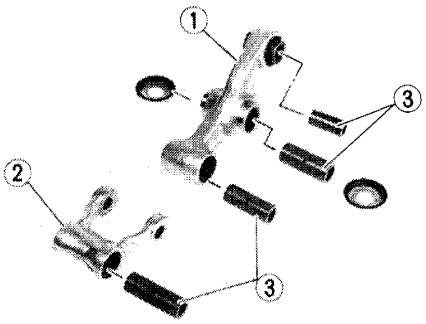
1. Inspect:
   - Rear shock absorber ①
     Oil leaks/Damage→Replace the rear shock absorber.

⚠ WARNING

Do not disassemble the shock absorber, because of the highly pressurized nitrogen gas in it.

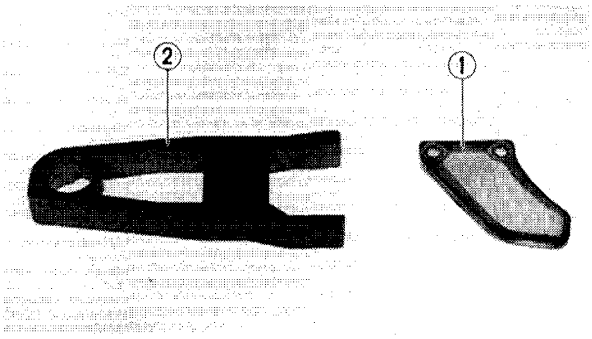


2. Inspect:
   - Swingarm ①
     Bends/Cracks/Damage→Replace.
   - Collars ②
   - Shims ③
     Wear/Damage→Replace.

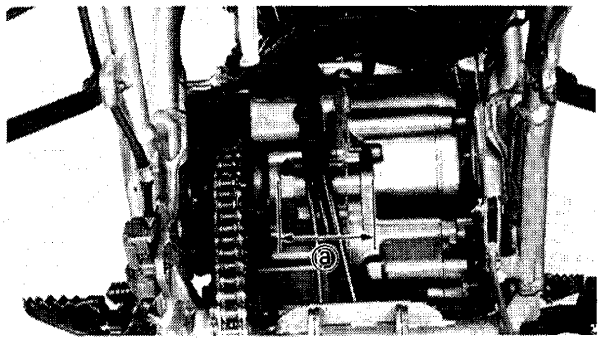


3. Inspect:
   - Relay arm ①
   - Connecting arm ②
     Bends/Cracks/Damage→Replace.
   - Collars ③
     Wear/Damage→Replace.

4. Inspect:
   - Oil seal
     Wear/Damage→Replace.
   - Washer
   - Thrust cover
   - Collar
     Wear/Damage→Replace.
   - Bush
     Scratches/Damage→Replace.



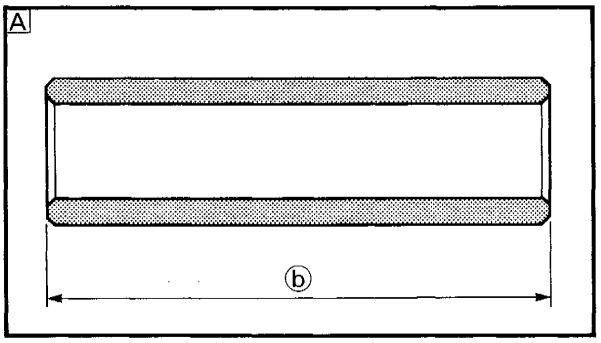
5. Inspect:
   - Chain guide ①
   - Chain protector ②
   - Cracks/Damage→Replace.



YB276005

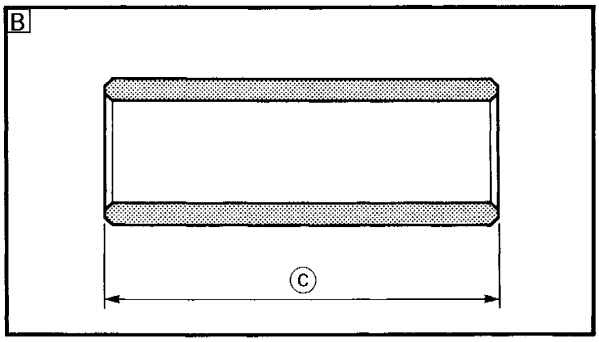
SIDE CLEARANCE ADJUSTMENT

1. Measure:
   - Engine mounting boss width ⓐ

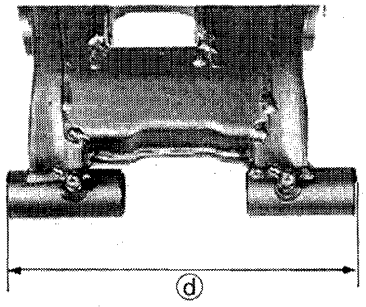


2. Measure:
   - Collar (swingarm) length ⓑ and ⓒ
     Out of specification → Replace.

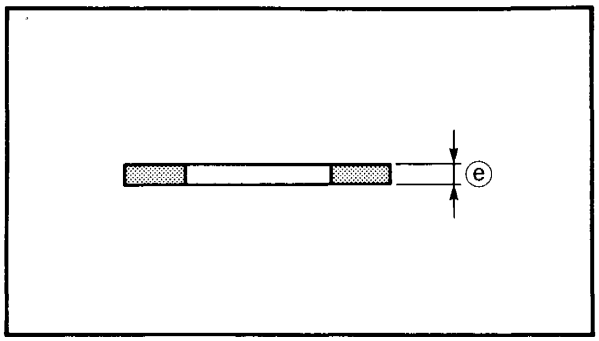
Specified length:
b: 68.75 ~ 69.05 mm (2.707 ~ 2.719 in)
c: 63.75 ~ 64.05 mm (2.510 ~ 2.522 in)



A Collar (right hand)
B Collar (left hand)



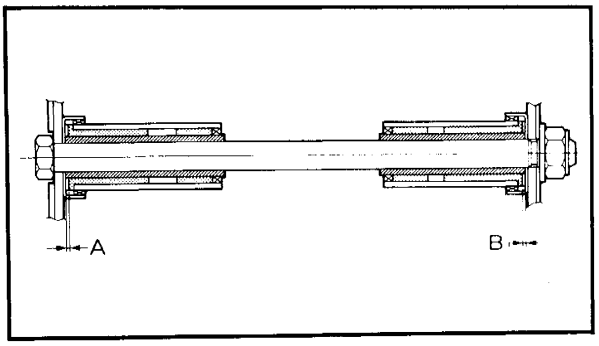
3. Measure:
   - Pivot width ⓓ



Shim thickness ⓔ:
0.3 mm (0.012 in)

4. Calculate:
   • Swingarm side clearance
   Out of specification → Adjust side clearance using shim.
   By using formula given below.

Side clearance:
$= (ⓐ + ⓑ + ⓒ) - ⓓ$



Side clearance: A + B
0.4 ~ 0.7 mm (0.016 ~ 0.028 in)

****

Example:

- If the engine mounting boss width ⓐ, collar length ⓑ, ⓒ are below.

ⓐ: 67.5 mm (2.66 in)
ⓑ: 69.0 mm (2.72 in)
ⓒ: 64.0 mm (2.52 in)

- If the pivot width ⓓ and washer thickness ⓔ are below.

ⓓ: 199.0 mm (7.83 in)
ⓔ: 0.3 mm (0.01 in)

- Side clearance
  $= (67.5 + 68.9 + 64.0) - 199.0$
  $= 200.5 \text{ mm} - 199.0 \text{ mm}$
  $= 1.5 \text{ mm}$ (0.059 in)

Shim thickness:
0.3 mm (0.012 in)

1.5 mm − 0.7 mm = 0.8 mm (0.031 in)
Then, install the three shims.

NOTE:

When shims are required in even number, install them on both right and left side and in odd number, install one more shim on the left side.

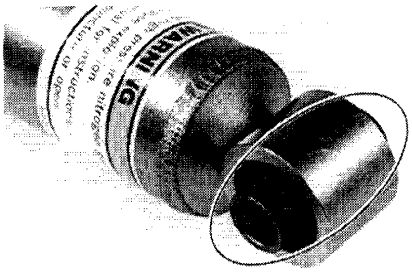
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YB276006

INSTALLATION

Rear shock absorber

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



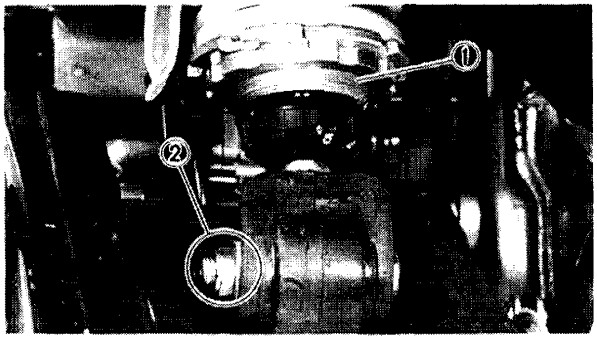
1. Lubricate:
   - Bush (inner surface)

	Lithium soap base grease



2. Install:
   - Rear shock absorber ① (upper side)
3. Tighten:
   - Nut ②

	Nut ② (upper side): **32 Nm (3.2 m•kg, 23 ft•lb)**



4. Install:
   - Rear shock absorber ① (lower side)
5. Tighten:
   - Nut ②

	Nut ② (lower side): **32 Nm (3.2 m•kg, 23 ft•lb)**

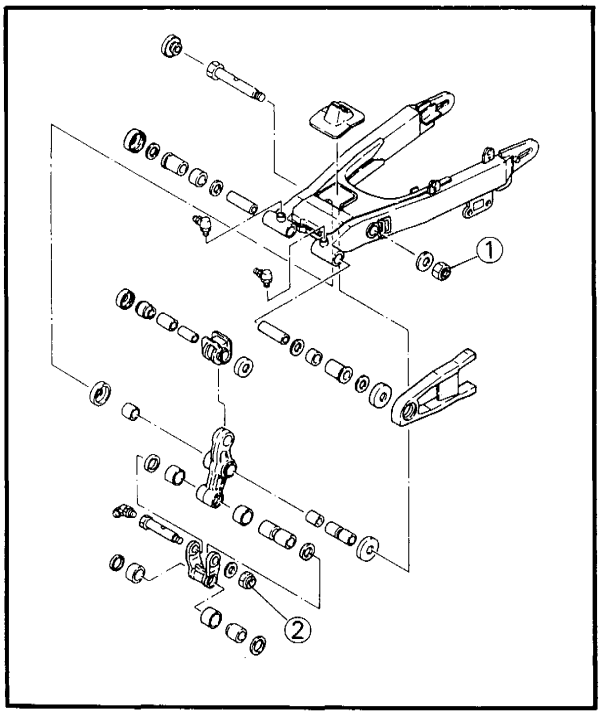
Swingarm

Reverse the "REMOVAL" procedure.

Note the following points.

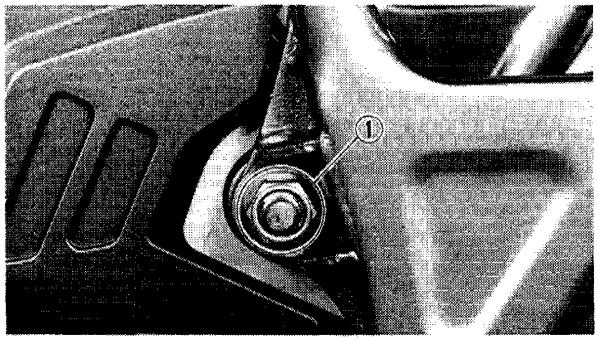
1. Lubricate:
   - Oil seal
   - Bushing
   - Thrust cover (inside)
   - Collar
   - Pivot shaft
   - Bolt (relay arm—swingarm)
   - Bolt (connecting arm—relay arm)
   - Bolt (connecting arm—frame)

Lithium soap base grease



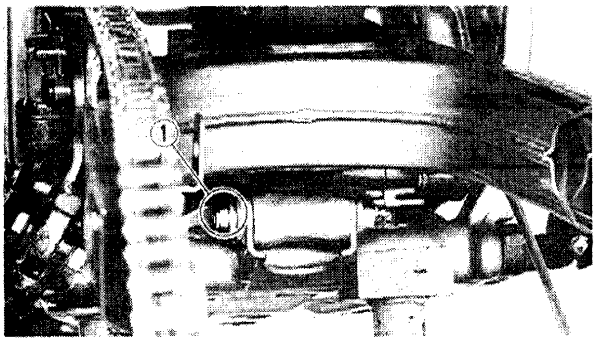
2. Tighten:
   - Nut ① (relay arm—swingarm)
   - Nut ② (relay arm—connecting arm)

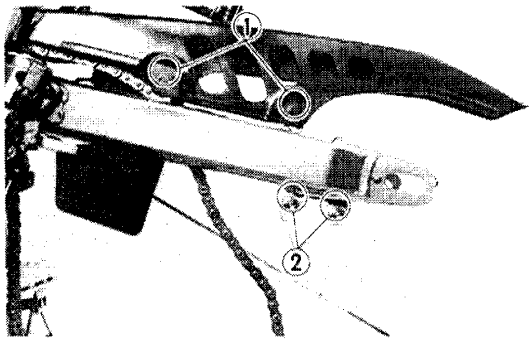
Nut (relay arm—swingarm):
55 Nm (5.5 m•kg, 40 ft•lb)
Nut (relay arm—connecting arm):
32 Nm (3.2 m•kg, 23 ft•lb)



3. Tighten:
   - Nut ① (pivot shaft)

Nut ① (pivot shaft):
80 Nm (8.0 m•kg, 58 ft•lb)





4. Tighten:
   - Nut ① (connecting arm—frame)

	Nut ① (connecting arm—frame): 32 Nm (3.2 m•kg, 23 ft•lb)

5. Tighten:
   - Bolt ① (chain case)
   - Bolt ② (chain guide)

	Bolt (chain case): 4 Nm (0.4 m•kg, 2.9 ft•lb) **Bolt (chain guide): 7 Nm (0.7 m•kg, 5.1 ft•lb)**

6. Install:
   - Rear shock absorber

   Refer to the "REAR SHOCK ABSORBER—INSTALLATION" section.

7. Install:
   - Rear wheel

   Refer to the "REAR WHEEL—INSTALLATION" section.

8. Adjust:
   - Drive chain slack

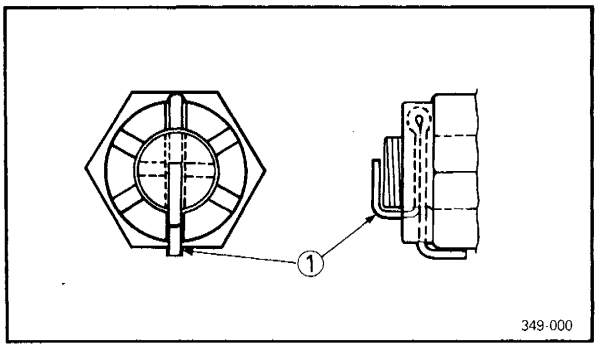
	Drive chain slack: 35~45 mm (1.38~1.77 in)

Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

9. Tighten:
   - Axle nut

	Axle nut: 85 Nm (8.5 m•kg, 61 ft•lb)

Refer to the "REAR WHEEL—INSTALLATION" section.



10. Install:
    - Cotter pin ①

NOTE:

Bend the ends of the cotter pin as illustration.

⚠ WARNING

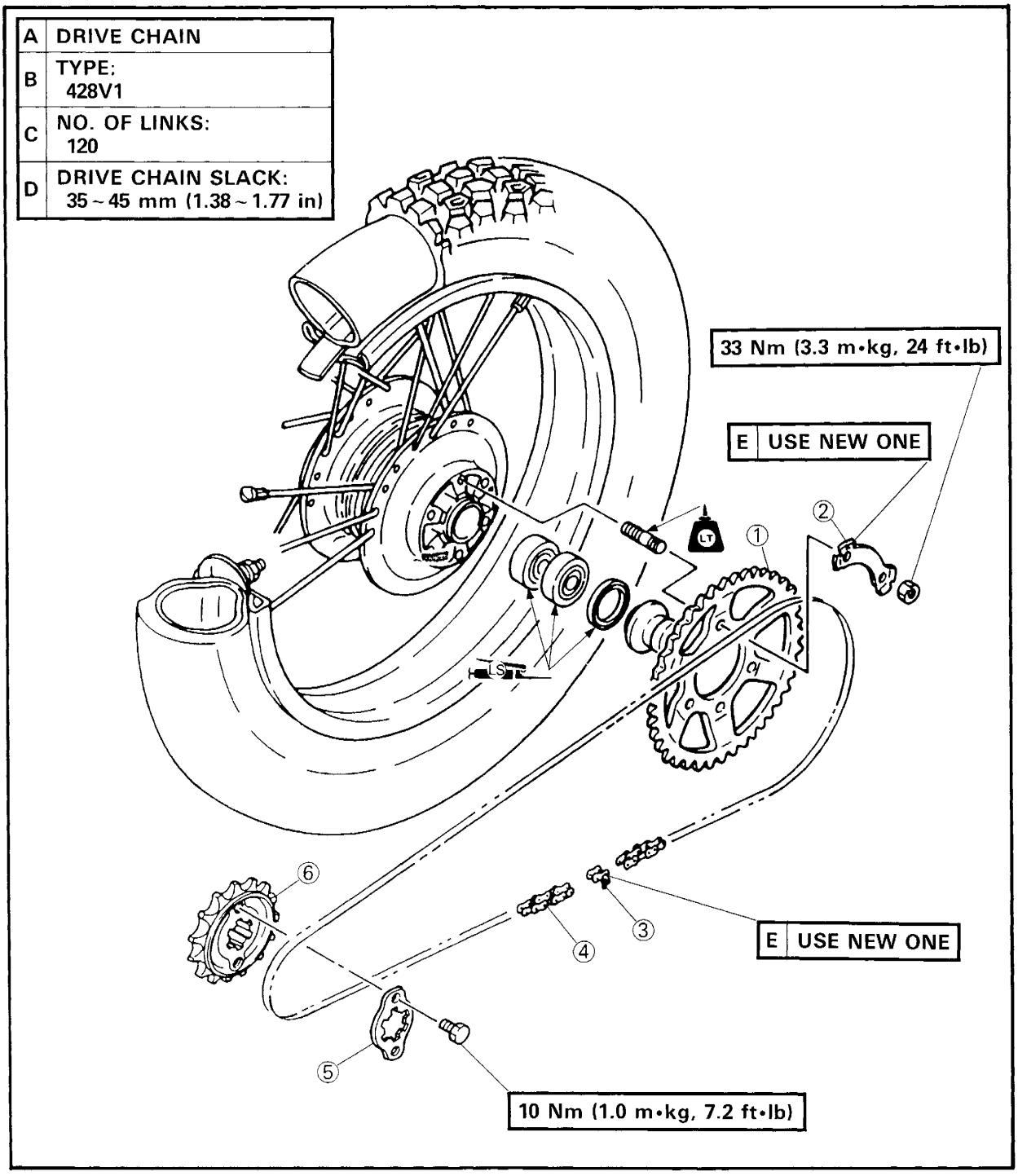
Always use a new cotter pin.

11. Install:
    - Fuel tank
    - Air scoops
    - Seat
    - Side covers

	Bolt (fuel tank, air scoop, seat and side covers): 7 Nm (0.7 m•kg, 5.1 ft•lb)

DRIVE CHAIN AND SPROCKETS

① Driven sprocket
② Lock washer
③ Chain joint
④ Drive chain
⑤ Sprocket holder
⑥ Drive sprocket



YB277000

NOTE:

Before removing the drive chain and sprockets, drive chain slack and 10-link length of drive chain should be measured.

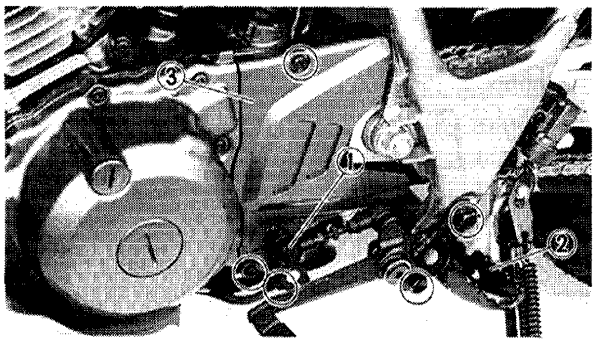
YB277001

REMOVAL

1. Elevate the rear wheel by placing a suitable stand under the frame and engine.

⚠ WARNING

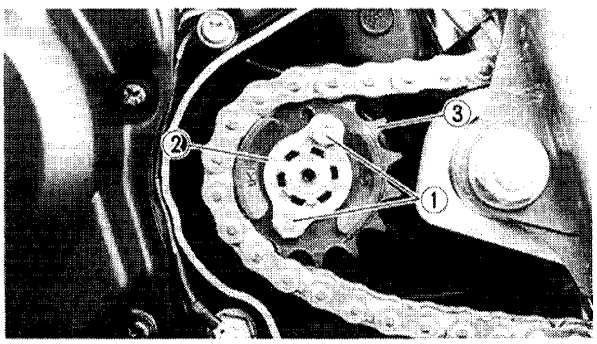
Securely support the motorcycle so there is no danger of it falling over.



2. Remove:
   - Shift arm ①
   - Footrest ② (left)
   - Crankcase cover 2 ③

3. Loosen:
   - Drive chain

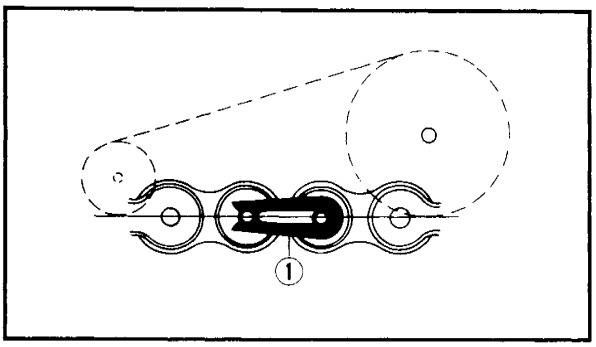
   Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.



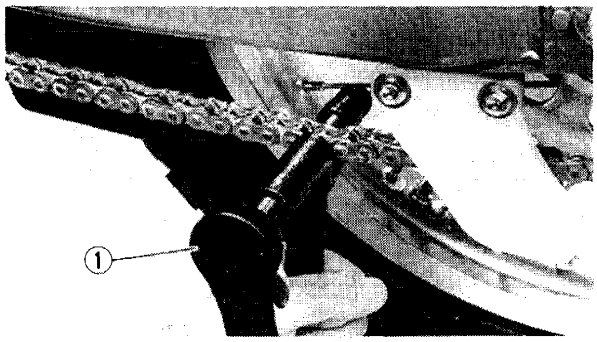
4. Remove:
   - Bolt ① (drive sprocket)
   - Sprocket holder ②
   - Drive sprocket ③

NOTE:

Loosen the bolt (drive sprocket) while applying the rear brake.

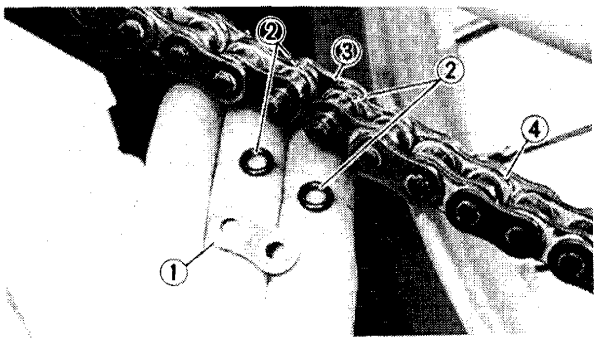


5. Remove:
   • Chain joint clip ①



6. Remove:
   • Chain joint
   Use the drive chain cutter tool ①.

	Drive chain cutter: P/N. YM-33858



7. Remove:
   • Link plate ①
   • O-ring ②
   • Joint ③
   • Drive chain ④

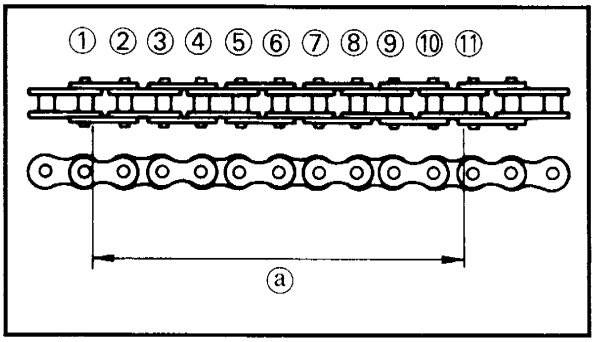
8. Remove:
   • Rear wheel
   Refer to the "REAR WHEEL—REMOVAL" section.

YB277002

INSPECTION

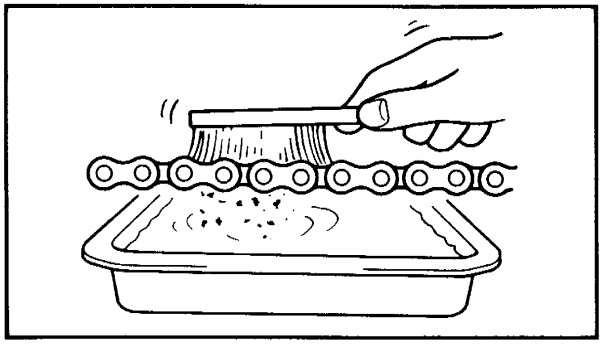
1. Measure:
   • 10-link length ⓐ (drive chain)
   Use the slide caliper tool.
   Out of specification → Replace drive chain.

	10-link length limit: 119.7 mm (4.71 in)

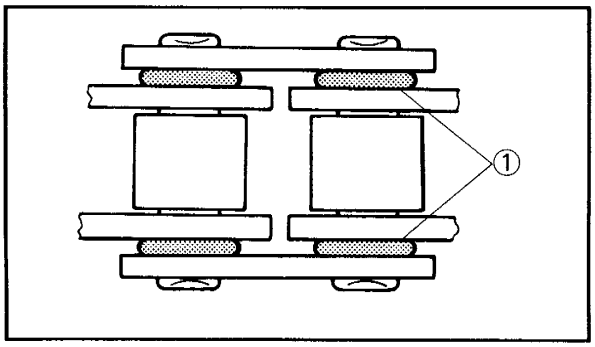


NOTE:

- 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.

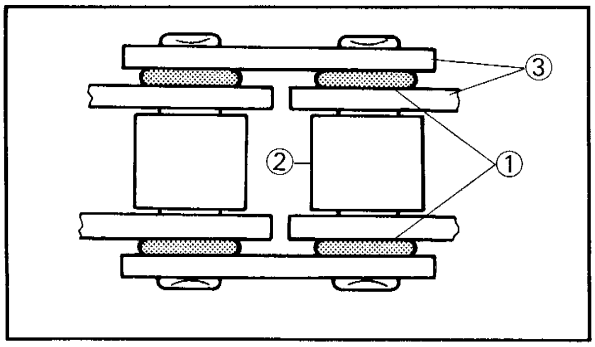


2. Clean:
   - Drive chain
     Place it in kerosene, and brush off as much dirt as possible. Then remove the chain from the kerosene and dry the chain.



CAUTION:

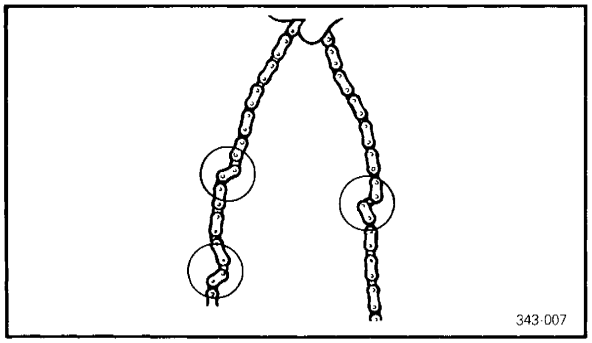
This motorcycle has a drive chain with small rubber O-rings ① between the chain plates. Steam cleaning, high-pressure washers, and certain solvent can damage these O-rings. Use only kerosene to clean the drive chain.



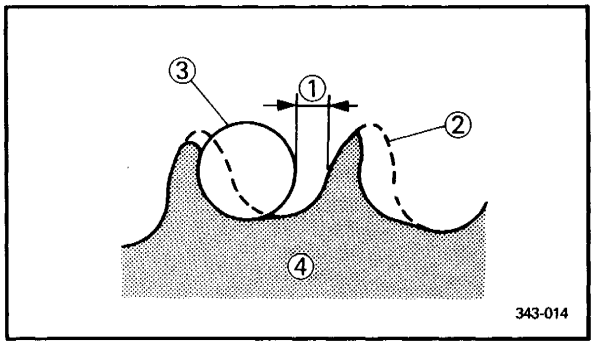
3. Inspect:
   - O-ring ① (drive chain)
     Damage→Replace drive chain.
   - Rollers ②
   - Link plates ③
     Damage/Wear→Replace drive chain.

CAUTION:

- **Replace the whole drive chain when one O-ring falls off.**
- **Replace the drive chain, the drive sprocket and the driven sprocket as a set.**

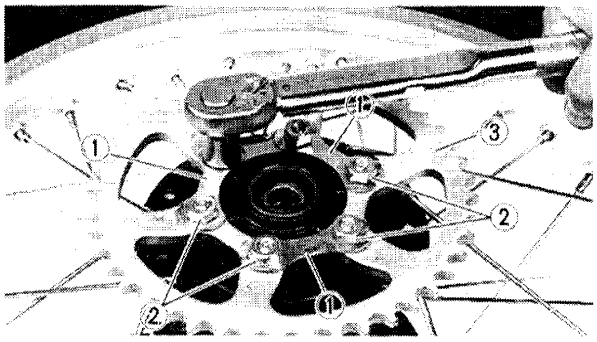


4. Inspect:
   • Drive chain stiffness
   Stiff → Clean and lubricate or replace.



5. Inspect:
   • Drive sprocket
   • Driven sprocket
   More than 1/4 teeth ① wear → Replace sprocket.
   Bent teeth → Replace sprocket.

② Correct
③ Roller
④ Sprocket



****

Replacement steps:

- Straighten the lock washer ① tabs and remove the fitting nuts ②. Then remove the driven sprocket ③.
- Install a new driven sprocket and lock washers.

NOTE:

Tighten the nuts in a crisscross pattern.

⚠ WARNING

Always use new lock washers.

Nut (driven sprocket):
33 Nm (3.3 m•kg, 24 ft•lb)

- Bend the washer tabs along the nut flats.

****

YB277003

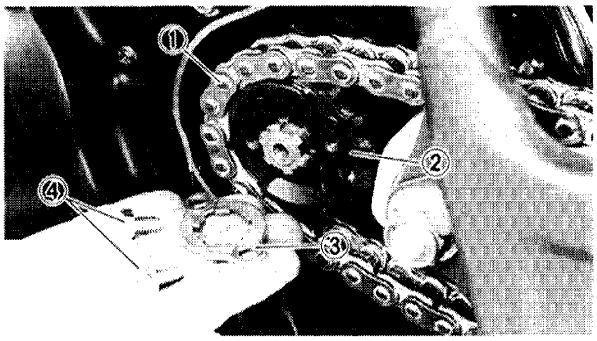
INSTALLATION

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

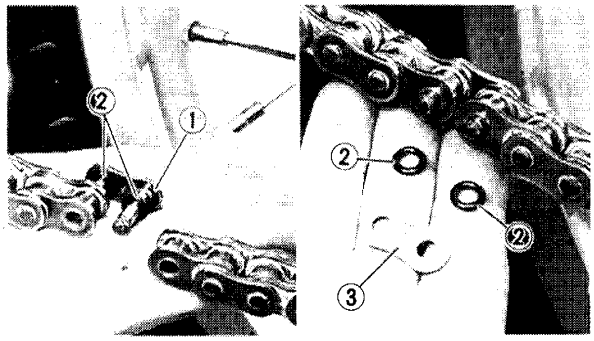
1. Lubricate:
   • Drive chain
   • Chain joint (new)

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

2. Install:
   • Rear wheel
   Refer to the "REAR WHEEL—INSTALLATION" section.

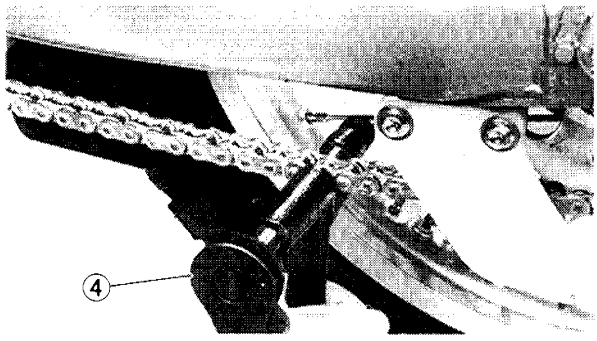


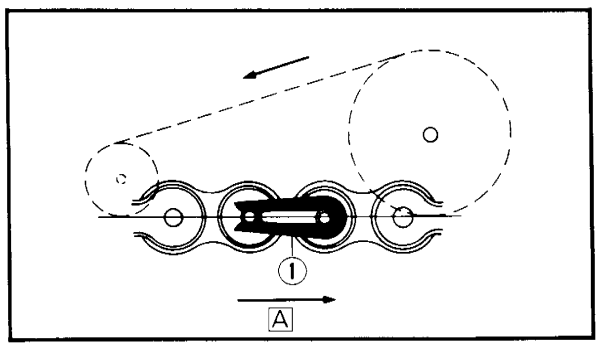
3. Install:
   • Drive chain ①
   • Drive sprocket ②
   • Sprocket holder ③
   • Bolt (drive sprocket) ④



4. Install:
   • Chain joint ①
   • O-ring ②
   • Link plate ③
   Use the drive chain cutter tool ④.

	Drive chain cutter: P/N. YM-33858





5. Install:
   • Chain joint clip ①

CAUTION:

Be sure to install the chain joint clip to the direction as shown.

A Turning direction

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

	Drive chain slack: **35 ~ 45 mm (1.38 ~ 1.77 in)**

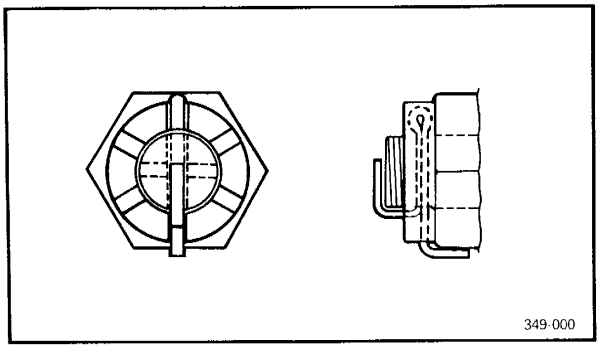
CAUTION:

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

7. Tighten:
   • Axle nut
   • Bolt (drive sprocket)

	Axle nut: **85 Nm (8.5 m•kg, 61 ft•lb)**

Refer to the "REAR WHEEL—INSTALLATION" section.



8. Install:
   • Cotter pin

NOTE:

Bend the ends of the cotter pin as illustration.

⚠ WARNING

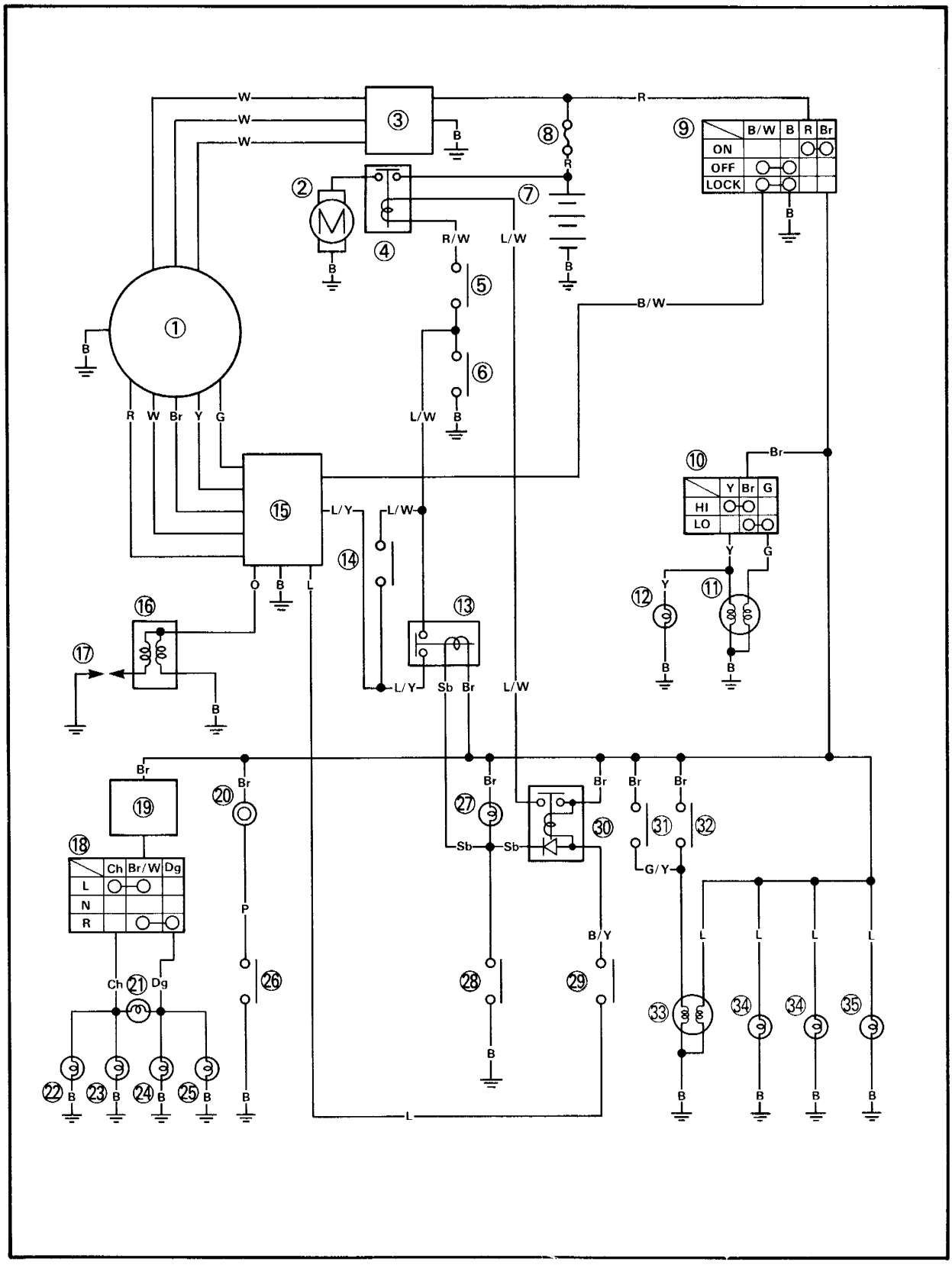
Always use a new cotter pin.

9. Install:
   • Bolt (drive sprocket)
   • Crankcase cover 2 (drive sprocket)
   • Footrest (left)
   • Shift arm
   Refer to the "ENGINE OVERHAUL—ENGINE ASSEMBLY AND ADJUSTMENT" section in the CHAPTER 4.

	Bolt (drive sprocket): **10 Nm (1.0 m•kg, 7.2 ft•lb)** **Bolt (crankcase cover 2):** **7 Nm (0.7 m•kg, 5.1 ft•lb)** **Bolt (shift arm):** **10 Nm (1.0 m•kg, 7.2 ft•lb)** **Bolt (footrest):** **32 Nm (3.2 m•kg, 23 ft•lb)**

ELECTRICAL

XT225D/DC CIRCUIT DIAGRAM



① C.D.I. magneto
② Starter motor
③ Rectifier/Regulator
④ Starter relay
⑤ "START" switch
⑥ "ENGINE STOP" switch
⑦ Battery
⑧ Fuse (main)
⑨ Main switch
⑩ "LIGHTS" (dimmer) switch
⑪ Head light
⑫ "HIGH BEAM" indicator light
⑬ Neutral relay
⑭ Sidestand switch
⑮ C.D.I. unit
⑯ Ignition coil
⑰ Spark plug
⑱ "TURN" switch
⑲ Flasher relay
⑳ Horn
㉑ "TURN" indicator light
㉒ Rear flasher light (L)
㉓ Front flasher light (L)
㉔ Front flasher light (R)
㉕ Rear flasher light (R)
㉖ "HORN" switch
㉗ "NEUTRAL" indicator light
㉘ Neutral switch
㉙ Clutch switch
㉚ Starting circuit cut-off relay
㉛ Rear brake switch
㉜ Front brake switch
㉝ Tail/Brake light
㉞ Front position light
㉟ Meter light

NOTE:

- "START" switch is closed while the button (switch) is pushed.
- "HORN" switch is closed while the button (switch) is pused.
- 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

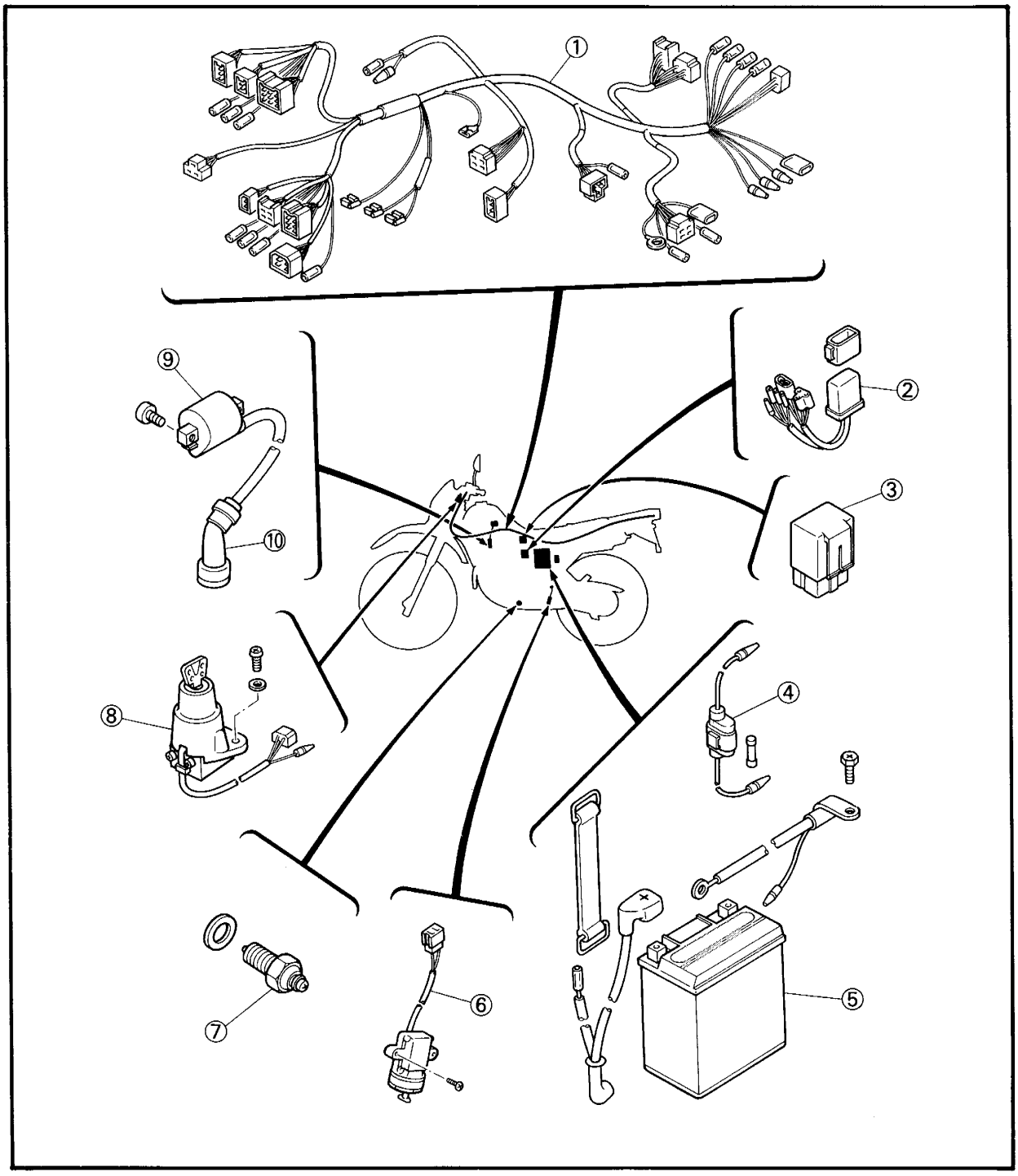
B	Black	O	Orange	B/W	Black/White
Br	Brown	P	Pink	B/Y	Black/Yellow
Ch	Chocolate	R	Red	Br/W	Brown/White
Dg	Dark green	Sb	Sky blue	L/W	Blue/White
G	Green	W	White	L/Y	Blue/Yellow
L	Blue	Y	Yellow	R/W	Red/White

ELECTRICAL COMPONENTS

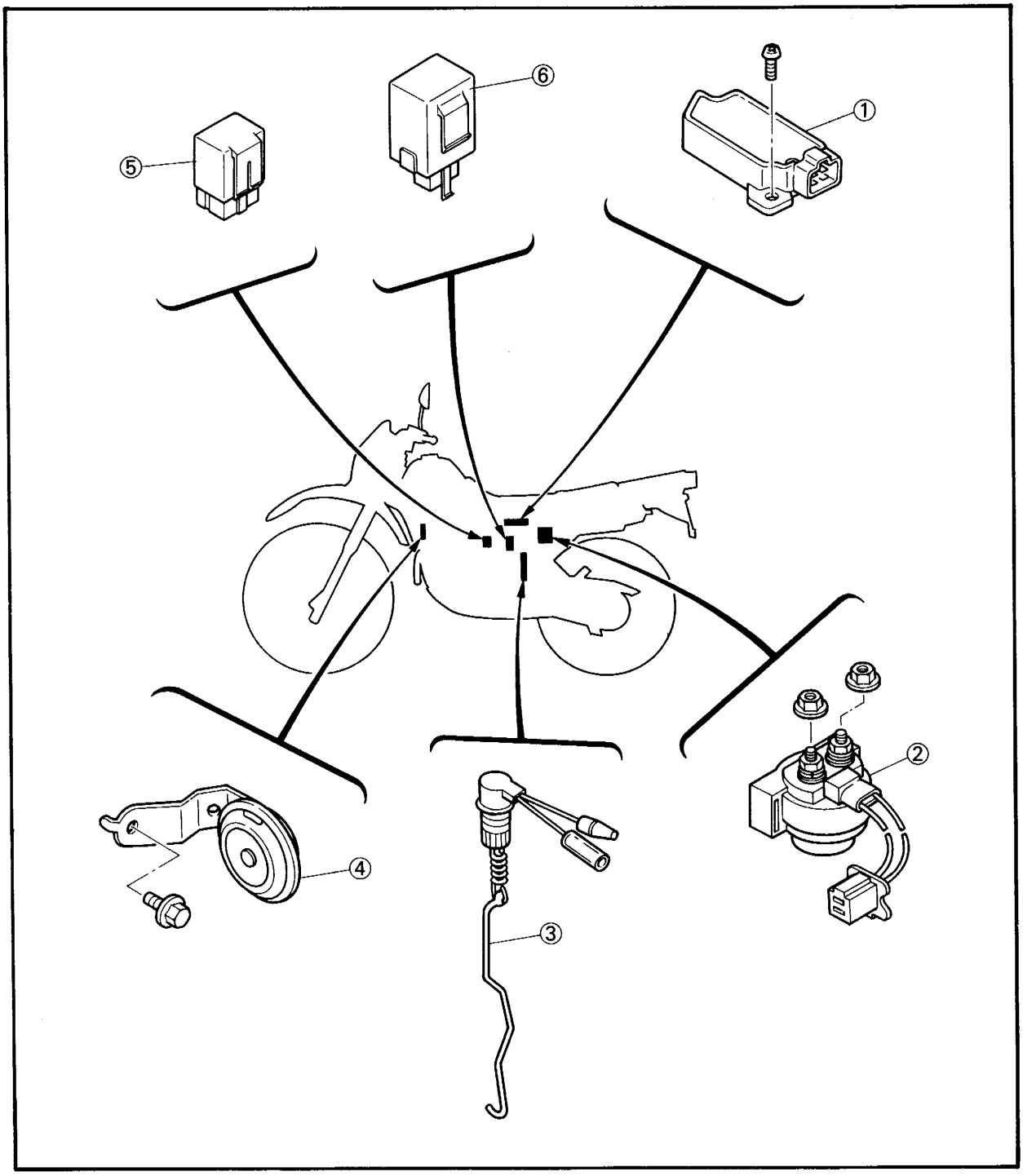
① Wireharness
② C.D.I. unit
③ Neutral relay
④ Fuse (main)
⑤ Battery
⑥ Sidestand switch
⑦ Neutral switch
⑧ Main switch
⑨ Ignition coil
⑩ Spark plug cap

BATTERY:
CAPACITY: 12V 6AH
SPECIFIC GRAVITY: 1.320

IGNITION COIL:
PRIMARY COIL RESISTANCE:
0.56 ~ 0.84Ω at 20°C (68°F)
SECONDARY COIL RESISTANCE:
5.68 ~ 8.52kΩ at 20°C (68°F)



① Rectifier/Regulator
② Starter relay
③ Rear brake switch
④ Horn
⑤ Starting circuit cut-off relay
⑥ Flasher relay



YB281000

CHECKING OF SWITCHES

NOTE:

This section is written based on a general model.

Check the switches for the continuity between the terminal to determine correct connection.

Read the following for switch inspection.

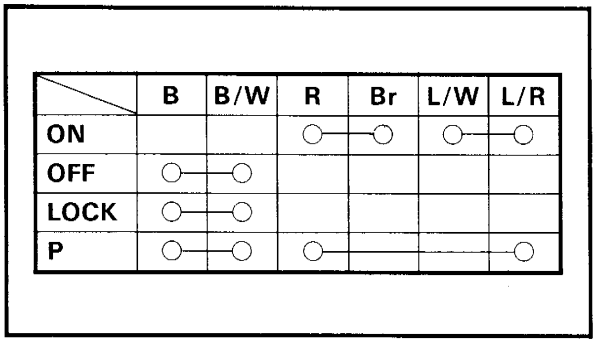
YB281001

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 of connected with the terminals in the switch component.

"○—○" indicates the terminals between which there is a continuity of electricity; i.e., a closed circit 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.

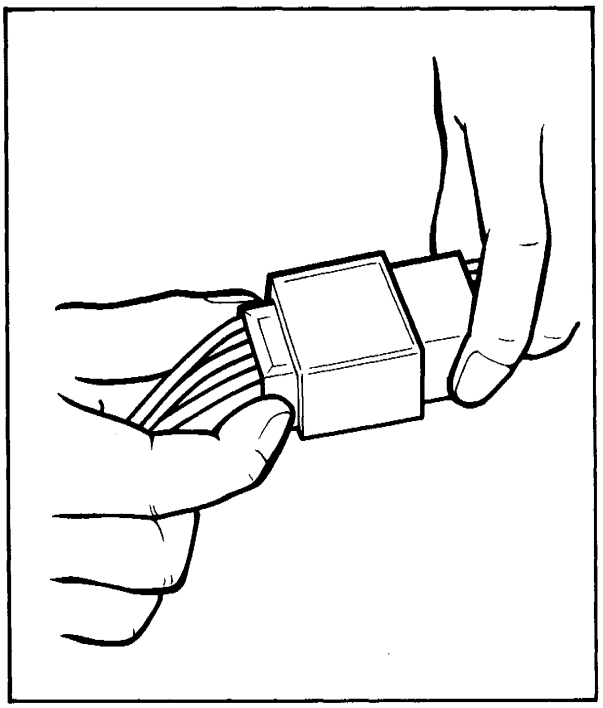
"B and B/W" is continuous with the "LOCK" switch position.

"B and B/W" and "R and L/R" are continuous with the "P" switch position.

YB281002
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.

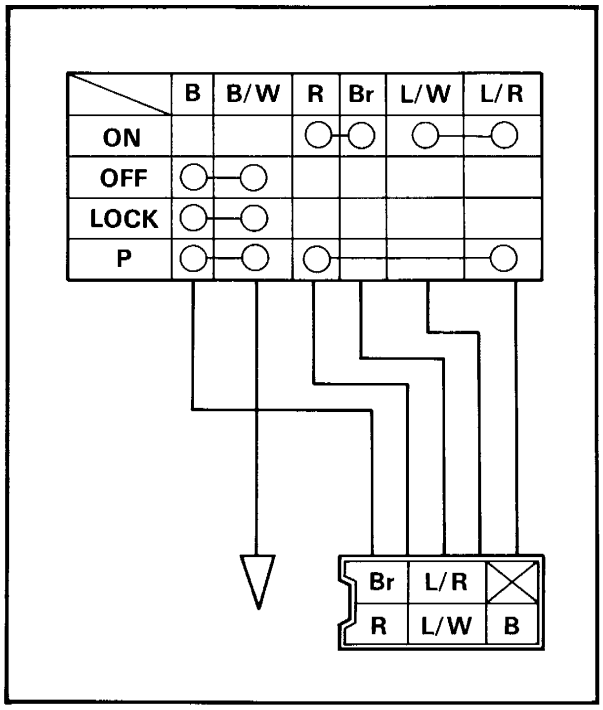
CAUTION:

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.

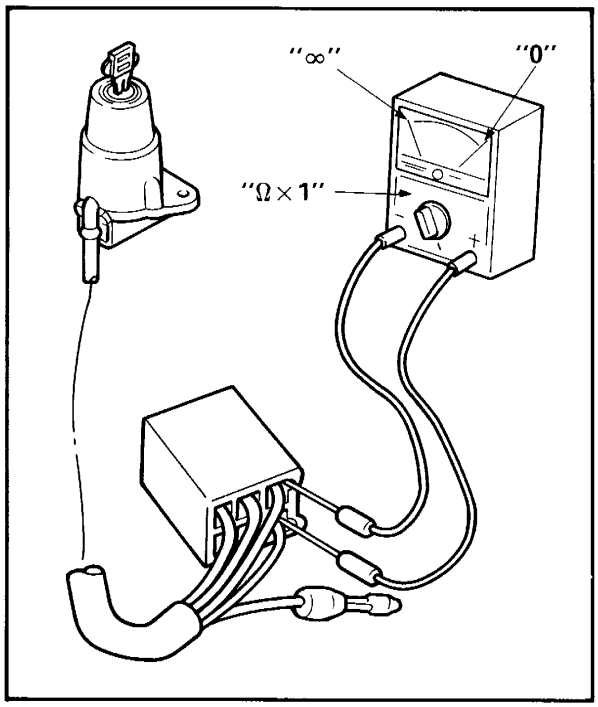
   "R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

   "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 there 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".

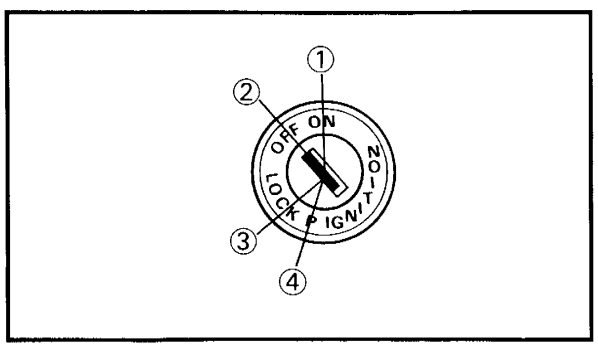
****

Checking steps:

- Turn the switch key to the "ON", "OFF", "LOCK" and "P" several times.
- Set the pocket tester selector to the "Ω×1".
- 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.

****

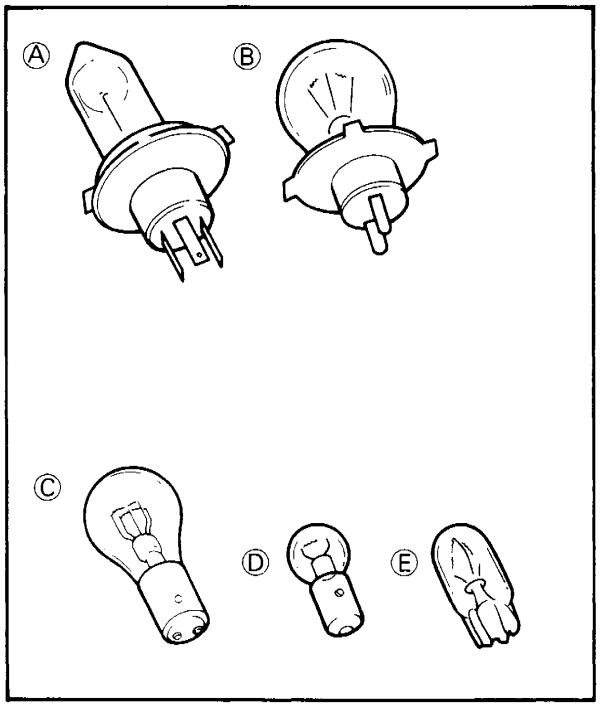
5. Next go on to checking of the continuity between "B" and "B/W", "L/W and L/R", and "R and L/R" at the respective switch positions, as in the same manner mentioned above.

6. If there is something wrong with any one of the combinations, replace the switch component.

YB282000

CHECKING OF BULBS (FOR HEADLIGHT, TAIL/BRAKE LIGHT, FLASHER LIGHT, METER LIGHT, ETC.)

Check the bulb terminal continuity for the condition of the bulb.



YB282001

KINDS OF BULBS

The bulbs used in the motorcycle are classified as shown left by the shape of the bulb socket.

Ⓐ and Ⓑ are mainly 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.

YB282002

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 turnning them counterclockwise.
- Bulbs of the Ⓔ type can be removed from the bolb 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.

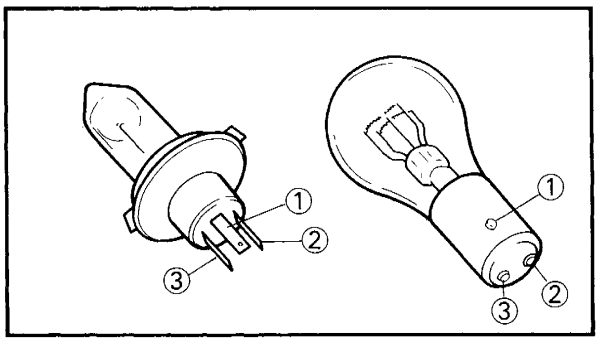
2. Check the bulb terminals for continuity.

****

Checking steps:

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

****

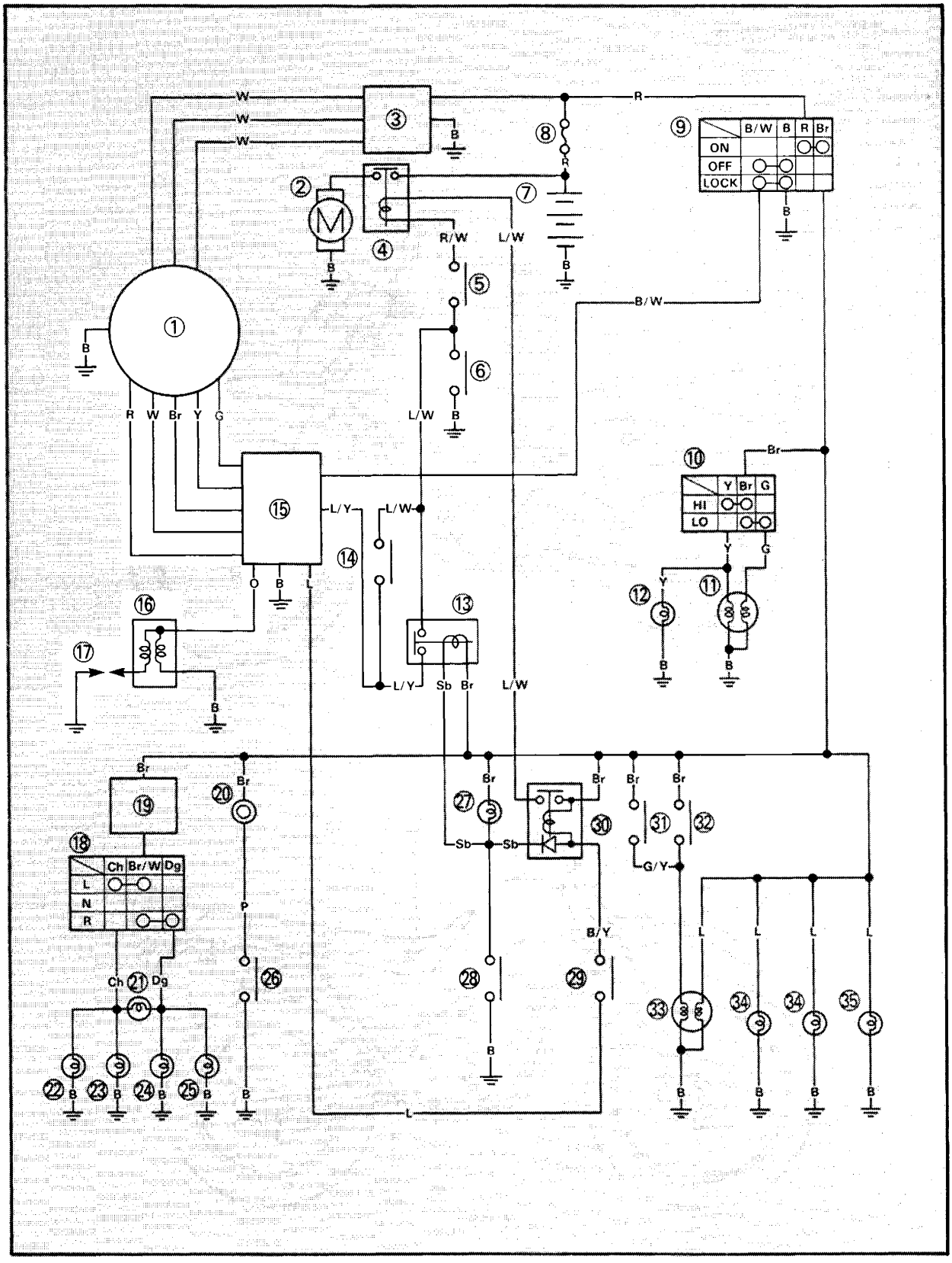


3. Check the bulb socket by installing a proven bulb to it. As in the checking of bulbs, connect the pocket tester leads to the respective leads of the socket and check for continuity in the same manner as mentioned above.

IGNITION SYSTEM

CIRCUIT DIAGRAM

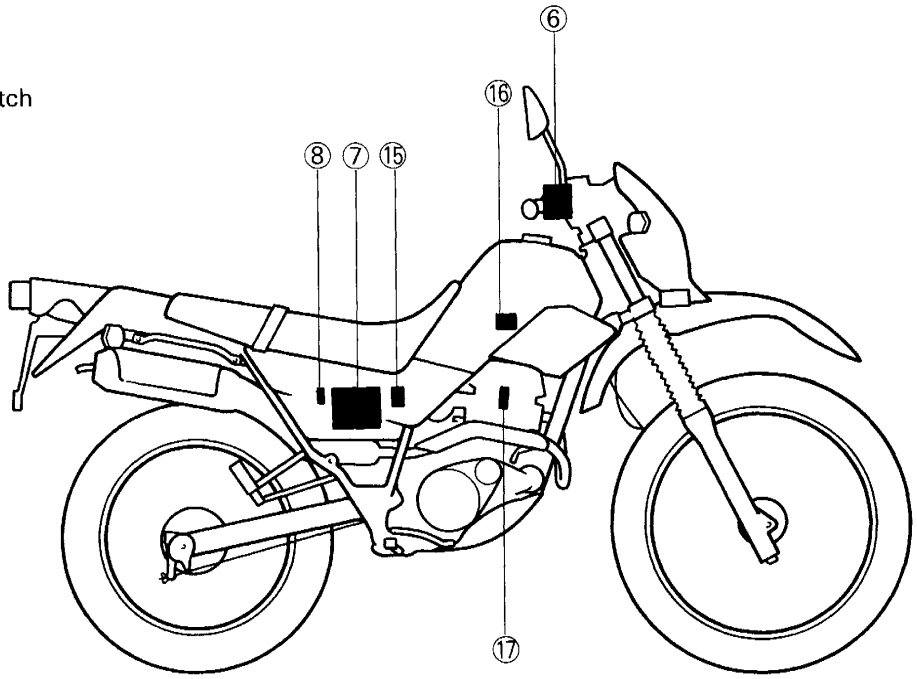
Below circuit diagram shows ignition system.

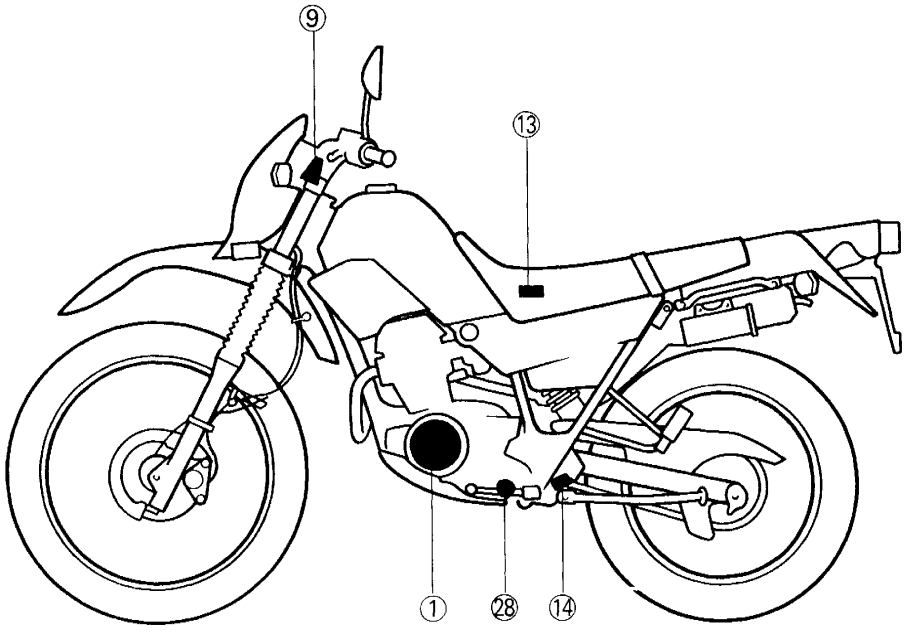


NOTE:

For the color codes, see page 7-2.

① C.D.I. magneto
⑥ "ENGINE STOP" switch
⑦ Battery
⑧ Fuse (main)
⑨ Main switch
⑬ Neutral relay
⑭ Sidestand switch
⑮ C.D.I. unit
⑯ Ignition coil
⑰ Spark plug
㉘ Neutral switch





IGNITION CONTROL CIRCUIT OPERATION

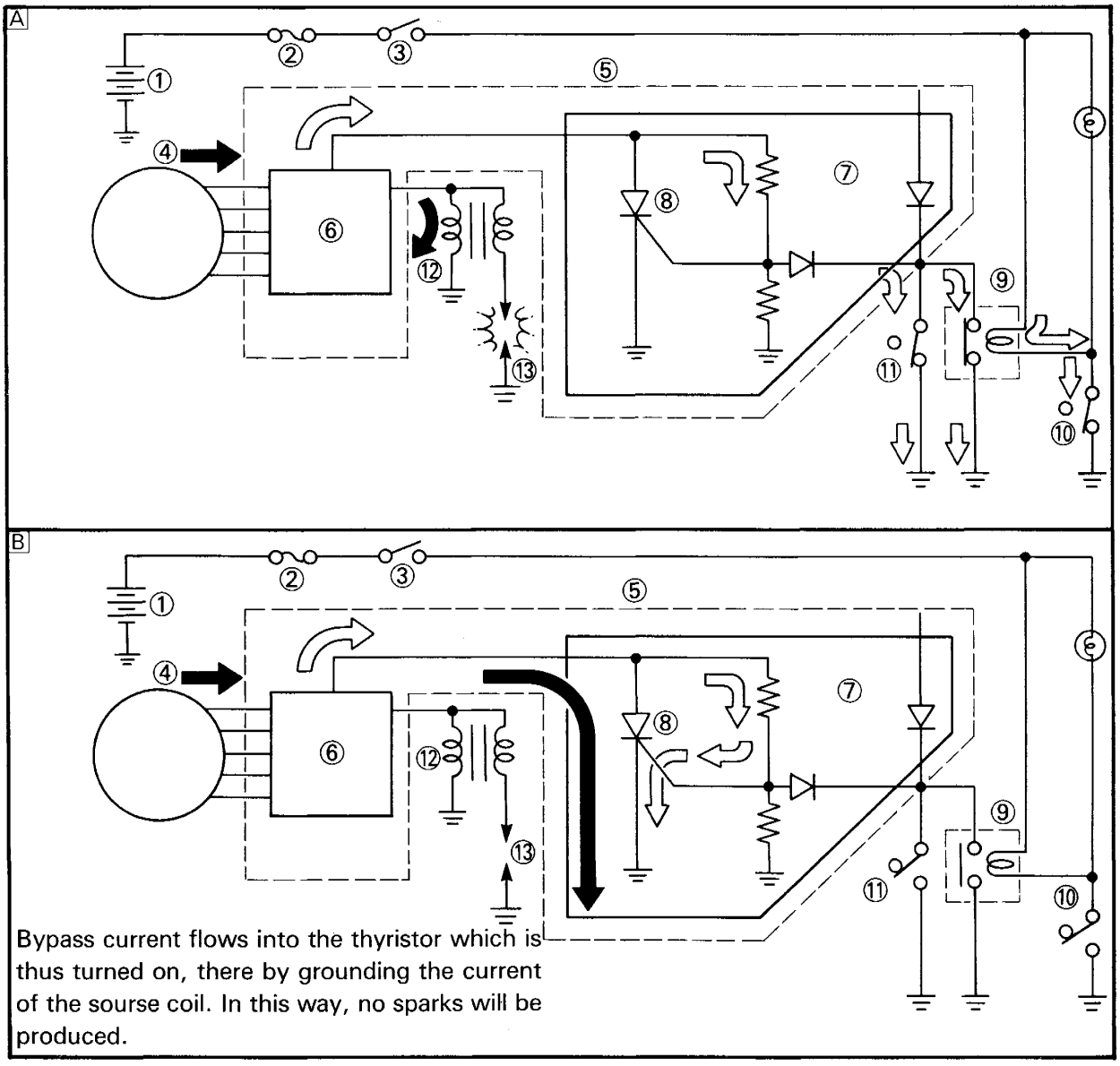
The ignition control circuit on this model consists of the ignition control unit, neutral switch, neutral indicator light, and the sidestand switch. If the engine stop switch and the main switch are both on, the ignition spark can produce only if:

1. The transmission is in neutral (the neutral switch is on).
2. The sidestand is up (the sidestand switch is on).

	Transmission (Neutral switch)	Sidestand (Sidestand switch)	Spark plug
A	Neutral (close)	Up (close)	Spark
A	Neutral (close)	Down (open)	Spark
A	IN gear (open)	Up (close)	Spark
B	IN gear (open)	Down (open)	No spark

① Battery
② Fuse (main)
③ Main switch
④ C.D.I. magneto
⑤ C.D.I. unit assembly
⑥ C.D.I. unit
⑦ Ignition control unit
⑧ Thyristor
⑨ Neutral relay
⑩ Neutral switch
⑪ Sidestand switch
⑫ Ignition coil
⑬ Spark plug

⇦ Bypass current
⬅ Current of source coil



Bypass current flows into the thyristor which is thus turned on, there by grounding the current of the sourse coil. In this way, no sparks will be produced.

TROUBLESHOOTING

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK)

Procedure

Check:

1. Fuse (main)
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. Neutral relay
12. Charge coil resistance
13. Pulser coil resistance
14. Wiring connection (Entire ignition system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Side covers
  2) Seat
  3) Air scoops
  4) Fuel tank
  5) Cowling
- Use the following special tools in this troubleshooting.



Dynamic spark tester:
P/N YM-34487
Ignition checker:
P/N. 90890-06754



Pocket tester:
P/N YU-03112, 90890-03112

1. Fuse (main)

- Remove the fuse.
- Connect the pocket tester ($\Omega \times 1$) to the fuse.
- Check the fuse for continuity.
  Refer to the "FUSE INSPECTION" section in the CHAPTER 3.

NOCONTINUITY → Fuse is faulty, replace it.

CONTINUITY ↓

2. Battery

- Check the battery condition.
  Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Voltage:
12.8V or higher at 20°C (68°F)

INCORRECT →

- Clean battery terminals.
- Recharge or replace battery.
  Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

CORRECT ↓

*

3. Spark plug

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.

Refer to the "SPARK PLUG INSPECTION" section in the CHAPTER 3.

Standard spark plug:
DR8EA (N.G.K.)
X24ESR-U (NIPPONDENSO)

Spark plug gap:
0.6 ~ 0.7 mm (0.02 ~ 0.03 in)

INCORRECT → Spark plug is faulty, replace it or repair plug gap.

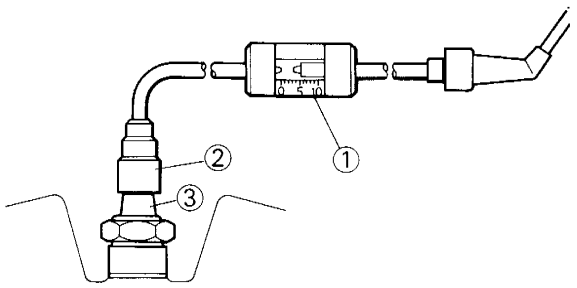
CORRECT

4. Ignition spark gap

- Disconnect the spark plug cap from spark plug.
- Connect the dynamic spark tester ① as shown.

② Spark plug cap
③ Spark plug

- Turn the main switch to "ON".



- Check the ignition spark gap.
- Start engine, and increase spark gap until misfire occurs.

Minimum spark gap:
6.0 mm (0.24 in)

MEETS SPECIFICATION → Ignition system is good.

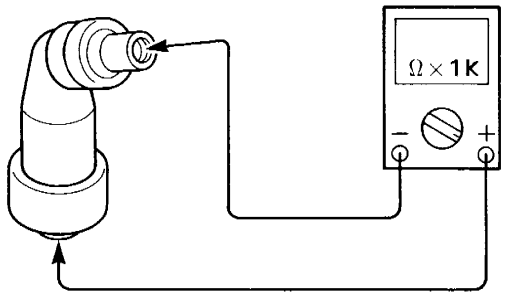
OUT OF SPECIFICATION OR NO SPARK

*

*

5. Spark plug cap resistance

- Remove the spark plug cap.
- Connect the pocket tester (Ω × 1k) to the spark plug cap.



- Check the spark plug cap for specified resistance.

Spark plug cap resistance:
10kΩ at 20°C (68°F)

OUT OF SPECIFICATION

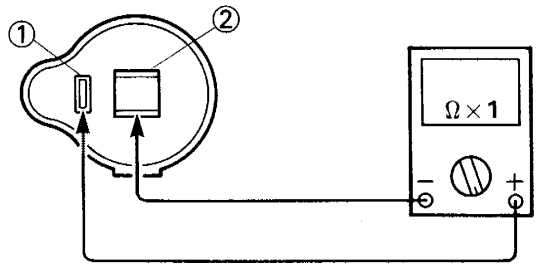
Spark plug cap is faulty, replace it.

MEETS SPECIFICATION

6. Ignition coil resistance

- Disconnect the ignition coil leads from the ignition coil.
- Connect the pocket tester (Ω × 1) to the ignition coil.

Tester (+) lead → ① terminal
Tester (–) lead → ② Body earth

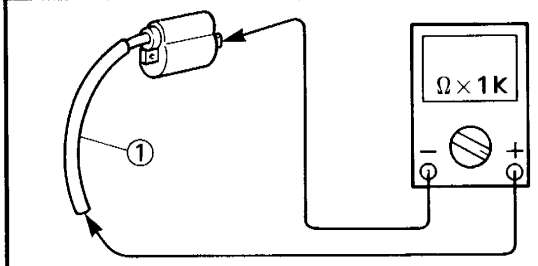


- Check the primary coil for specified resistance.

Primary coil resistance:
0.56 ~ 0.84Ω at 20°C (68°F)
(① terminal – ② Body earth

• Connect the pocket tester (Ω × 1k) to the ignition coil.

Tester (+) lead → Spark plug lead ①
Tester (−) lead → Body earth



• Check the secondary coil for specificated resistance.

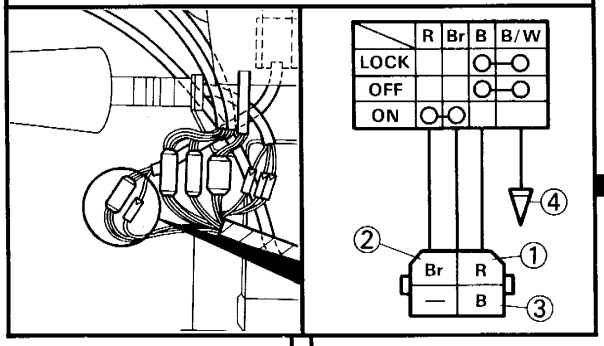
Secondary coil resistance:
5.68 ~ 8.52kΩ at 20°C (68°F)
(Spark plug lead − Body earth

INCORRECT → Ignition coil is faulty, replace it.

BOTH MEET SPECIFICATIONS

7. Main switch

• Disconnect the main switch coupler from the wire harness.
• Check the switch component for the continuity between "Red ① and Brown ②", "Black ③ and Black/White ④".
Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → Main switch is faulty, replace it.

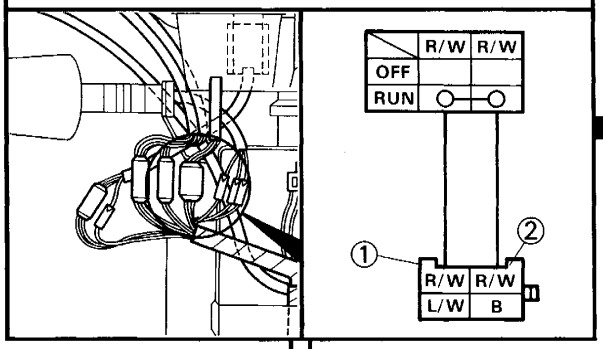
CORRECT

*

*

8. "ENGINE STOP" switch

- Disconnect the handlebar switch (right) coupler from the wireharness.
- Check the switch component for the continuity between "Red/White ① and Red/White ②". Refer to the "CHECKING OF SWITCHES" section.



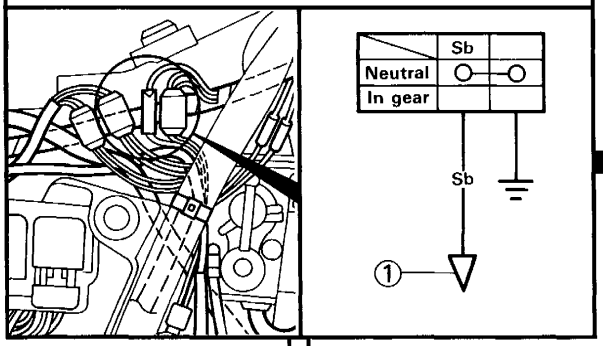
INCORRECT

"ENGINE STOP" switch is faulty, replace handlebar switch (right).

CORRECT

9. Neutral switch

- Disconnect the neutral switch lead from the wireharness.
- Check the switch component for the continuity between "Sky blue ① and ground". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Neutral switch is faulty, replace it.

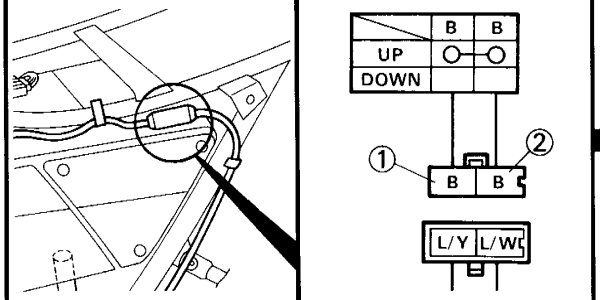
CORRECT

*

*

10. Sidestand switch

- Disconnect the sidestand switch coupler from the wireharness.
- Check the switch component for the continuity between "Black ① and Black ②". Refer to the "CHECKING OF SWITCHES" section.



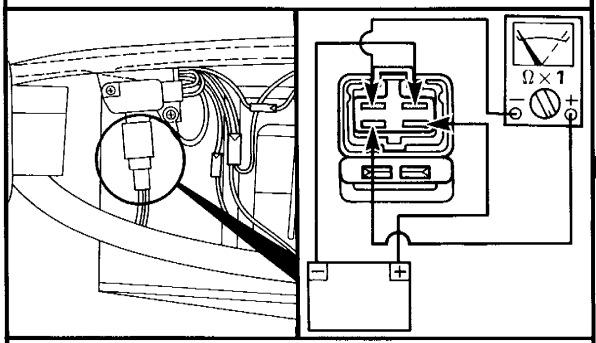
INCORRECT

Sidestand switch is faulty, replace it.

CORRECT

11. Neutral relay

- Disconnect the neutral relay from the wireharness.
- Connect the pocket tester (Ω × 1) and battery (12V) to the neutral relay.



NO CONTINUITY

Neutral relay is faulty, replace it.

- Check the neutral relay for continuity.

CONTINUITY

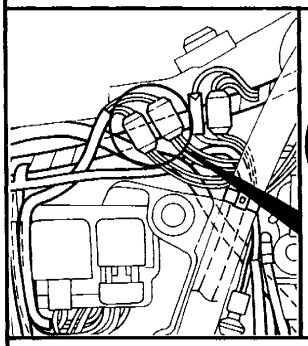
*

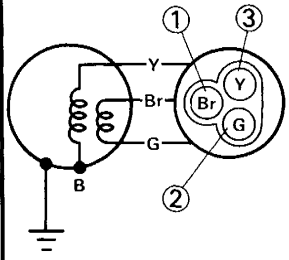
*

12. Charge coil resistance

- Disconnect the charge coil coupler from the wireharness.
- Connect the pocket tester (step 1 – Ω × 100), (Step 2 – Ω × 10) to the charge coil terminal.

Step 1:
Tester (+) lead → Brown lead ①
Tester (–) lead → Green lead ②
Step 2:
Tester (+) lead → Yellow lead ③
Tester (–) lead → Frame ground





- Check the charge coil for specified resistance.

Charge coil resistance:
Step 1:
584 ~ 876Ω at 20°C (68°F)
(Brown – Green)
Step 2:
20 ~ 30Ω at 20°C (68°F)
(Yellow – Frame ground)

OUT OF SPECIFICATION

Charge coil is faulty, replace charge coil assembly.

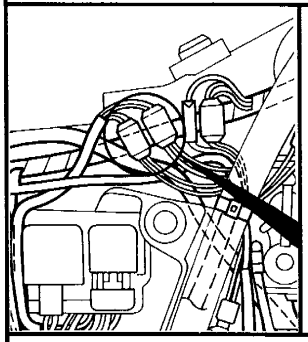
MEET SPECIFICATION

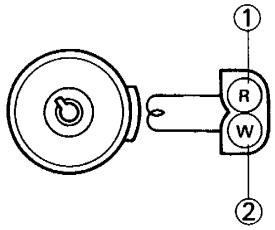
*

13. Pulser coil resistance

- Disconnect the pulser coil coupler from the wireharness.
- Connect the pocket tester (Ω × 100) to the pulser coil terminal.

Tester (+) lead → Red lead ①
Tester (−) lead → White lead ②





- Check the pulser coil for specified resistance.

Pulser coil resistance:
656 ~ 984Ω at 20°C (68°F)
(Red ① — White ②)

OUT OF SPECIFICATION → Pulser coil is faulty, replace it.

MEET SPECIFICATION

14. Wiring connection

Check the entire ignition system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct

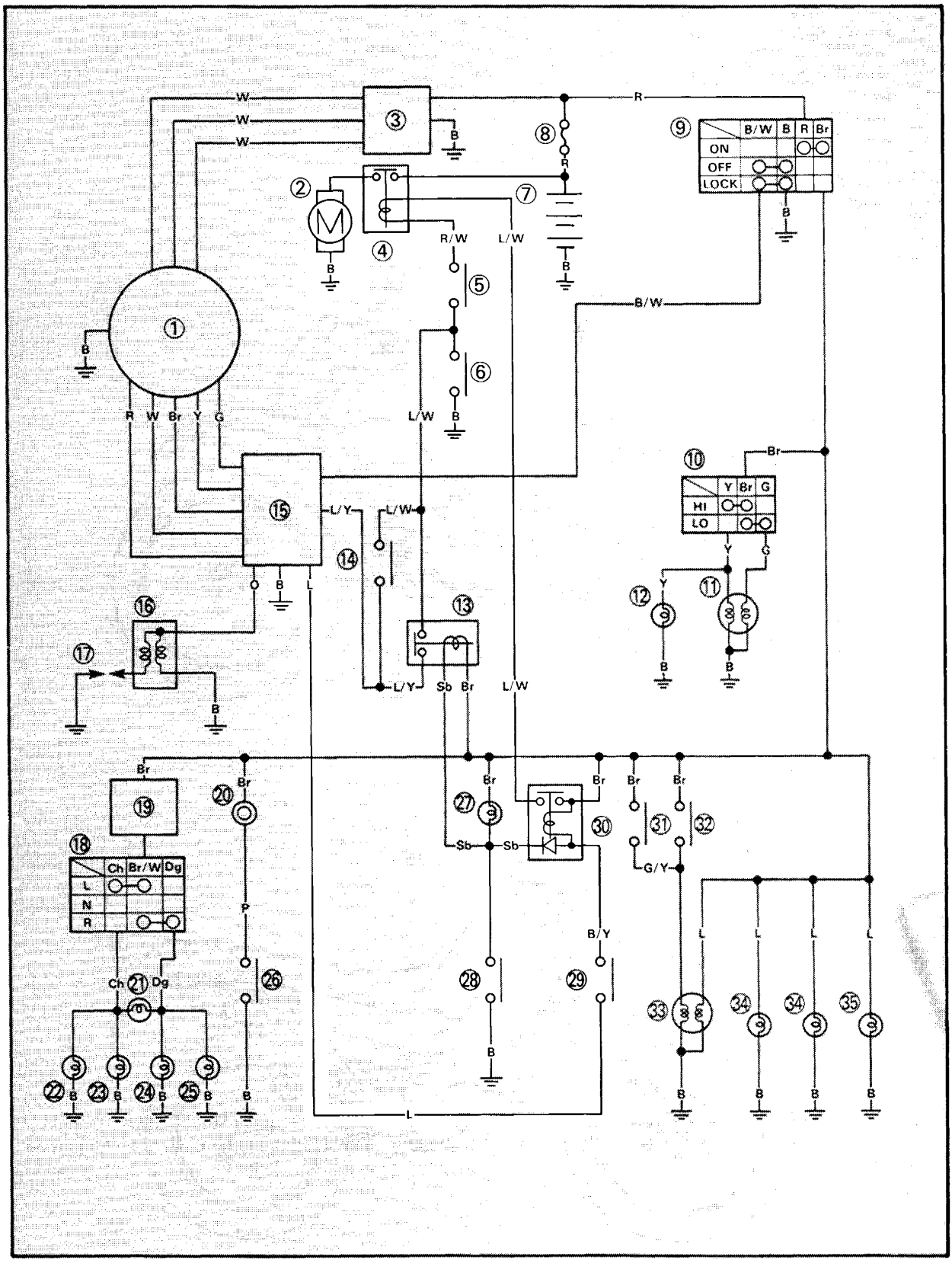
CORRECT

Replace the C.D.I. unit.

ELECTRICAL STARTING SYSTEM

CIRCUIT DIAGRAM

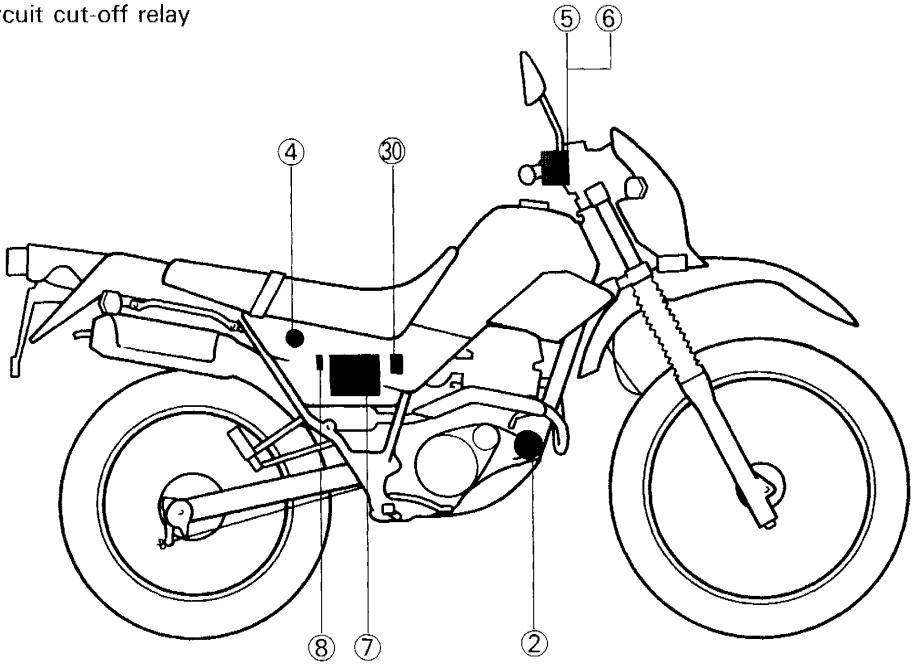
Below circuit diagram shows electrical starting system.

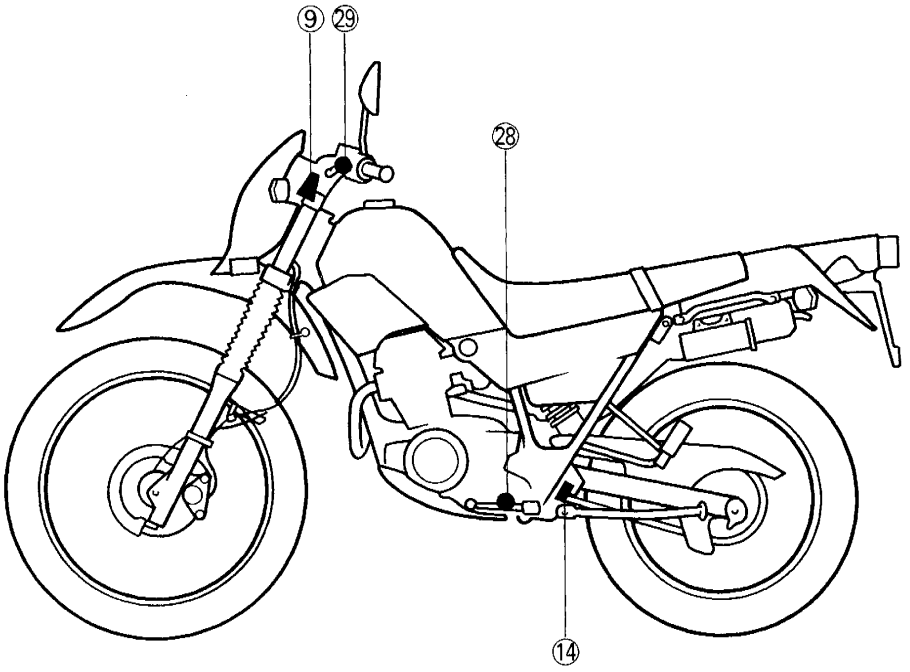


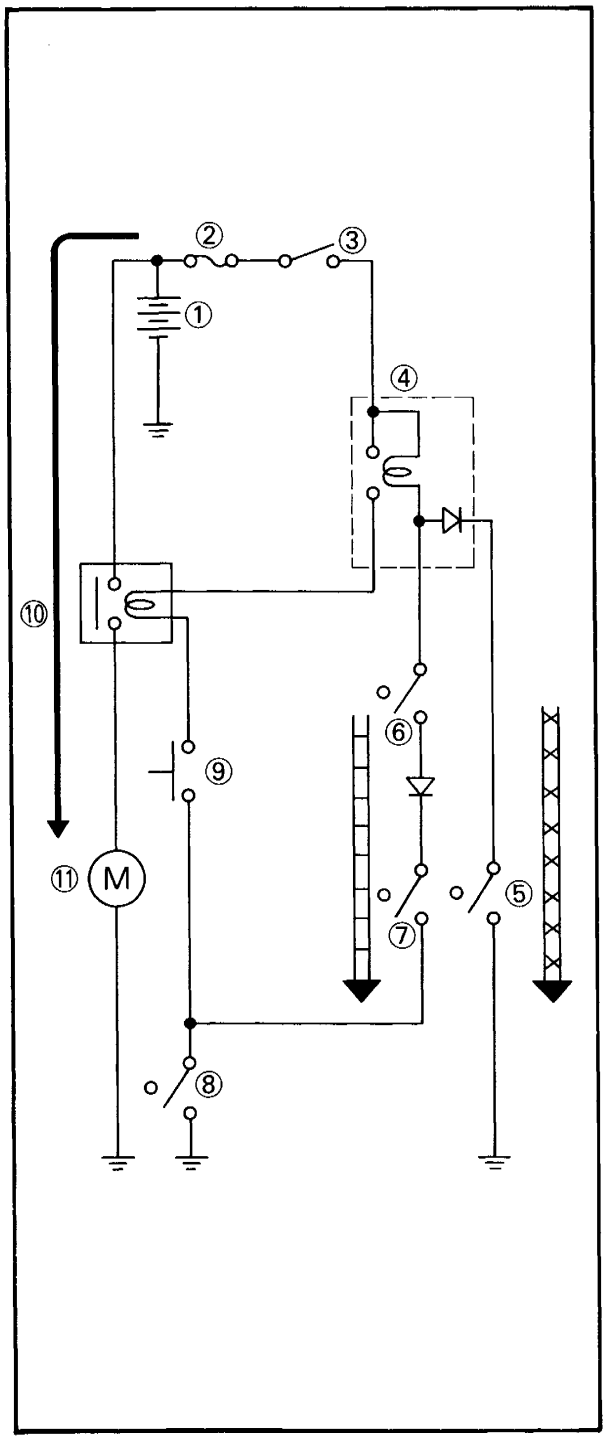
NOTE:

For the color codes, see page 7-2.

② Starter motor
④ Starter relay
⑤ "START" switch
⑥ "ENGINE STOP" switch
⑦ Battery
⑧ Fuse (main)
⑨ Main switch
⑭ Sidestand switch
㉘ Neutral switch
㉙ Clutch switch
㉚ Starting circuit cut-off relay







YB284001

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 SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED IN

WHEN THE TRANSMISSION IS IN NEUTRAL

① Battery
② Fuse (main)
③ Main switch
④ Starting circuit cut-off relay
⑤ Neutral switch
⑥ Clutch switch
⑦ Sidestand switch
⑧ "ENGINE STOP" switch
⑨ "START" switch
⑩ Starter relay
⑪ Starter motor

TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE.

Procedure

Check:

1. Fuse (main)
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. Clutch switch
10. Sidestand switch
11. "START" switch
12. Wiring connection
    (Entire electric starting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Side covers
  2) Seat
  3) Cowling
- Use the following special tool in this troubleshooting.



Pocket tester:
P/N YM-03112, 90890-03112

1. Fuse (main)
   - Remove the fuse.
   - Connect the pocket tester (Ω × 1) to the fuse.
   - Check the fuse for continuity.

NOCONTINUITY → Fuse is faulty, replace it.

CONTINUITY ↓

2. Battery
   - Check the battery condition.
     Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Voltage:
12.8V or higher at 20°C (68°F)

INCORRECT →
- Clean battery terminals.
- Recharge or replace battery.
- Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

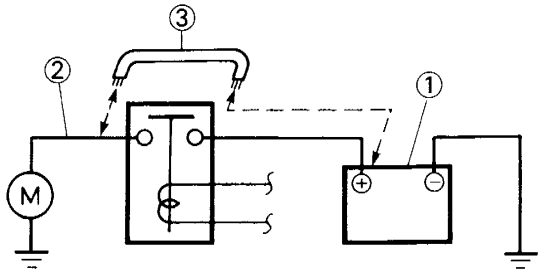
CORRECT ↓

*

*

3. Starter motor

- Connect the battery positive terminal ① and starter motor cable ② using a jumper lead ③ * as shown.



- Check the starter motor for operation.

*

⚠ WARNING

- **A wire for the 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.**

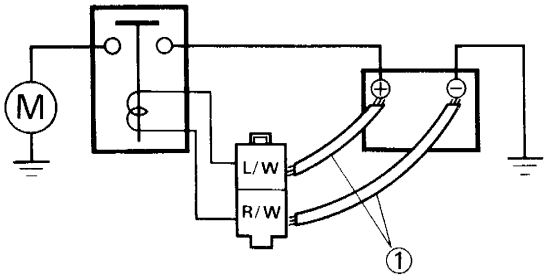
DOES NOT MOVE

Starter motor is faulty, repair or replace it.

MOVES

4. Starter relay

- Disconnect the starter relay coupler from the wireharness.
- Connect the battery to the starter relay leads as shown using the jumper leads ①.



- Check the starter motor for operation.

DOES NOT MOVE

Starter relay is faulty, replace it.

MOVES

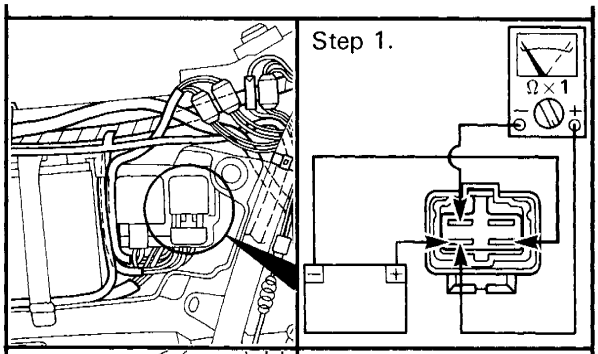
5. Starting circuit cut-off relay

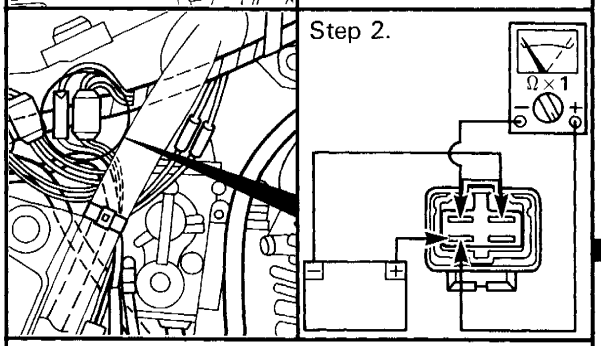
- Disconnect the starting circuit cut-off relay from the wireharness.
- Connect the pocket tester (Ω × 1) and battery (12V) to the starting circuit cut-off relay. * as shown.

*

CAUTION:

- **Take care not to reverse the battery connections because the diode will be damaged.**
- **Take care to avoid shorting the positive and negative terminals at the time of connecting the battery and relay.**





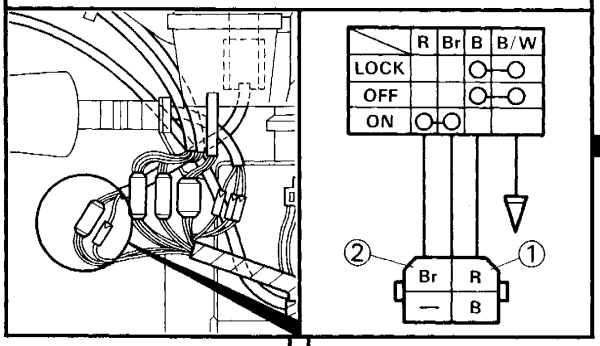
- Check the starting circuit cut-off relay for continuity.

NOCONTINUITY → Starting circuit cut-off relay is faulty, replace it.

CONTINUITY

6. Main switch

- Disconnect the main switch coupler from the wireharness.
- Check the switch component for the continuity between "Red ① and Brown ②". Refer to the "CHECKING OF SWITCHES" section.

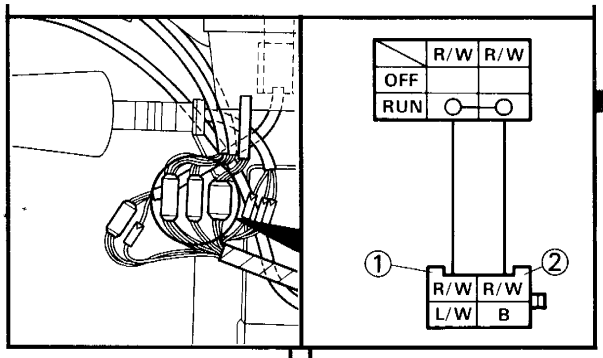


INCORRECT → Main switch is faulty, replace it.

CORRECT

7. "ENGINE STOP" switch

- Disconnect the handlebar switch (right) coupler from the wireharness.
- Check the switch component for the continuity between "Red/White ① and Red/White ②". Refer to the "CHECKING OF SWITCHES" section.



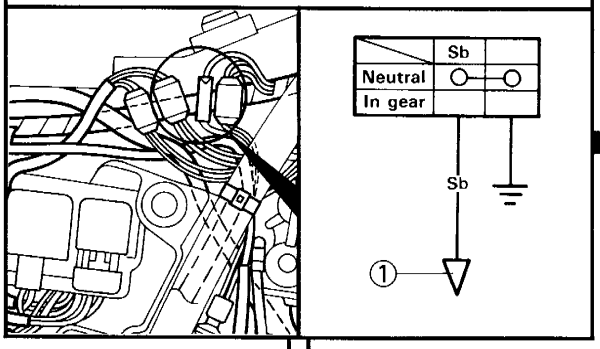
INCORRECT

"ENGINE STOP" switch is faulty, replace handlebar switch (right).

CORRECT

8. Neutral switch

- Disconnect the neutral switch lead from the wireharness.
- Check the switch component for the continuity between "Sky blue ① and Ground". Refer to the "CHECKING OF SWITCHES" section.



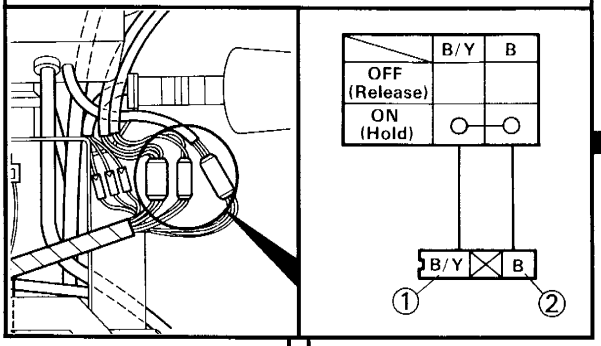
INCORRECT

Neutral switch is faulty, replace it.

CORRECT

9. Clutch switch

- Disconnect the clutch switch coupler from the wireharness.
- Check the clutch switch component for the continuity between "Black/Yellow ① and Black ②". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

Clutch switch is faulty, replace it.

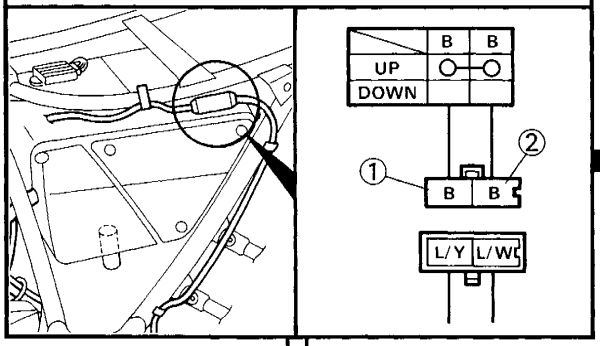
CORRECT

*

*

10. Sidestand switch

- Disconnect the sidestand switch coupler from the wireharness.
- Check the switch component for the continuity between "Black ① and Black ②". Refer to the "CHECKING OF SWITCHES" section.

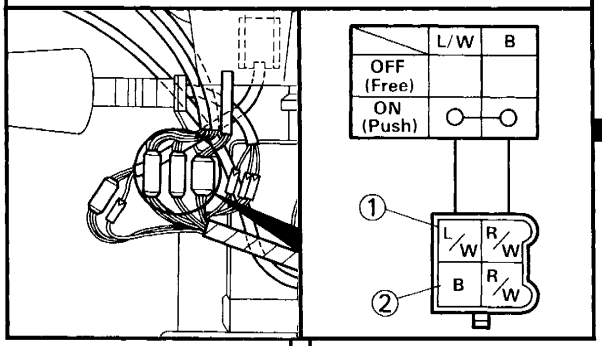


INCORRECT → Sidestand switch is faulty, replace it.

CORRECT

11. "START" switch

- Disconnect handlebar switch (right) coupler from wireharness.
- Check the "START" switch component for the continuity between "Blue/White ① and Black ②". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → "START" switch is faulty, replace handlebar switch (right).

CORRECT

12. Wiring connection

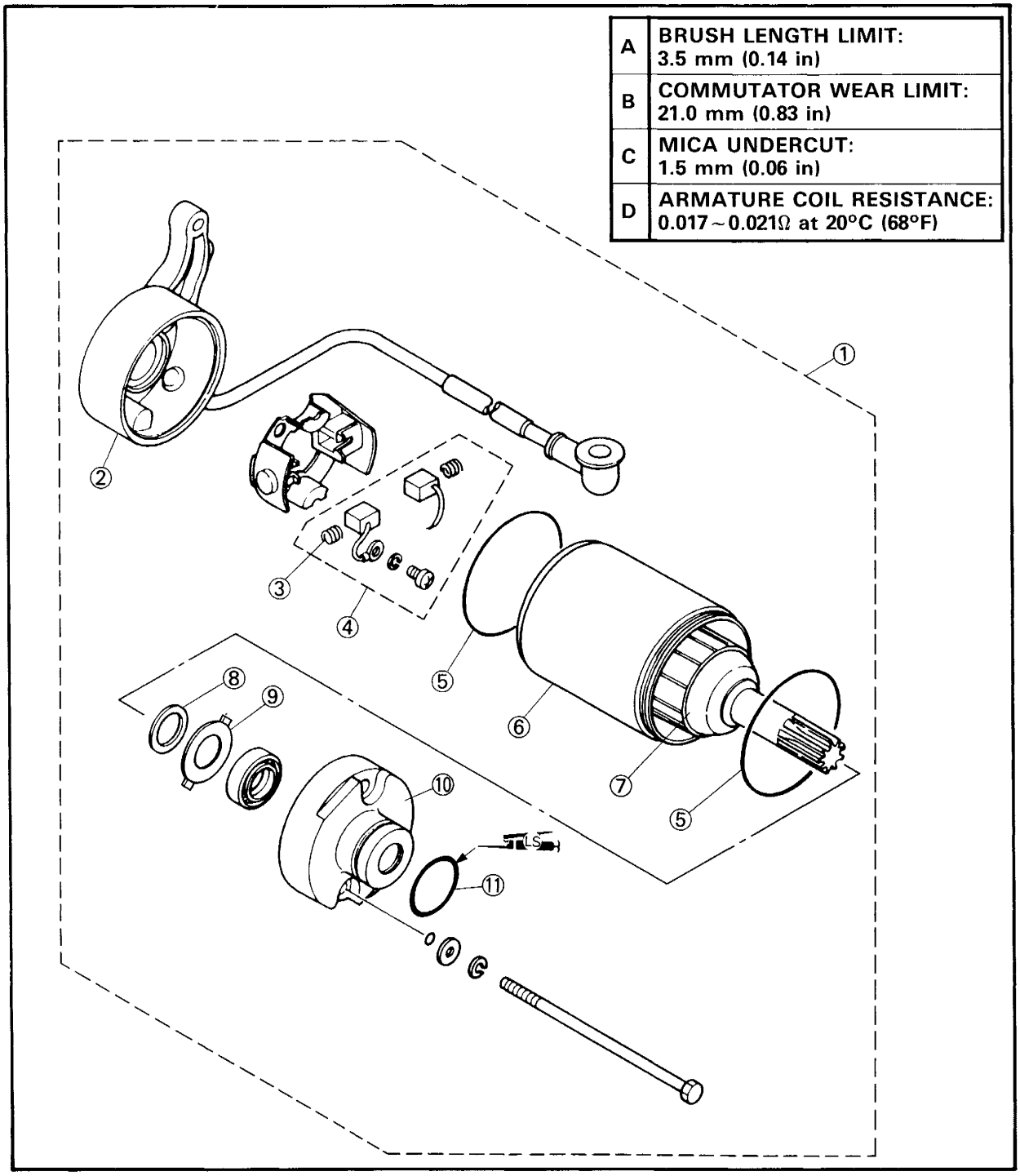
Check the entire ignition system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

STARTER MOTOR

① Starter motor assembly
② Rear bracket
③ Brush spring
④ Brush set
⑤ O-ring
⑥ Yoke
⑦ Armature
⑧ Shim
⑨ Washer
⑩ Front bracket
⑪ O-ring

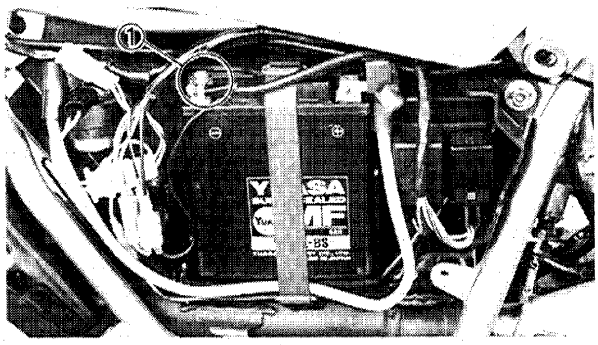
A	BRUSH LENGTH LIMIT: 3.5 mm (0.14 in)
B	COMMUTATOR WEAR LIMIT: 21.0 mm (0.83 in)
C	MICA UNDERCUT: 1.5 mm (0.06 in)
D	ARMATURE COIL RESISTANCE: 0.017 ~ 0.021Ω at 20°C (68°F)



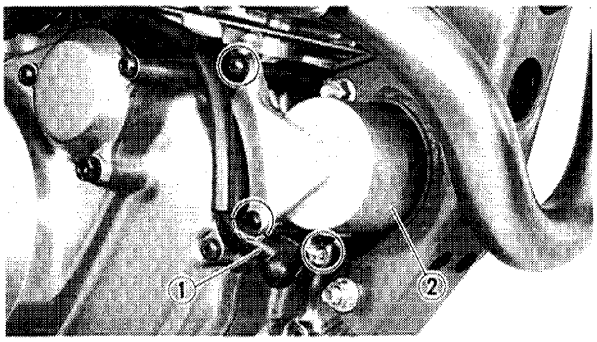
YB284002

Removal

1. Remove:
   - Engine guard
     Refer to the "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.



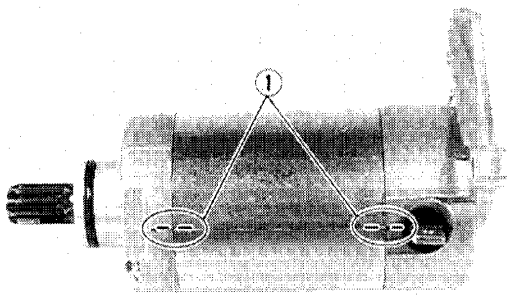
2. Disconnect:
   - Battery negative lead ①
     Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

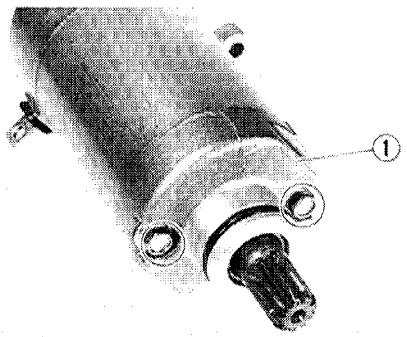


3. Remove:
   - Starter motor lead ①
   - Starter motor ②

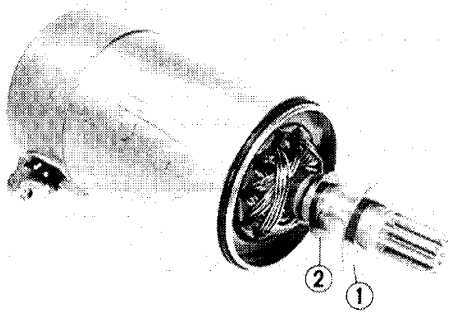
Disassembly

1. Put identifying marks ① on the brackets for reassembly as shown.

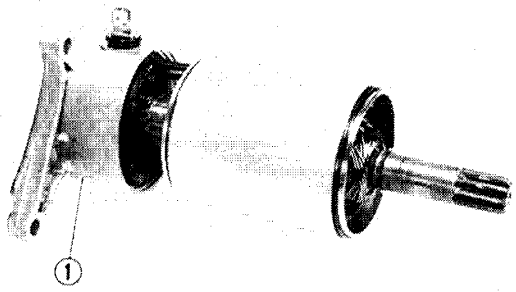




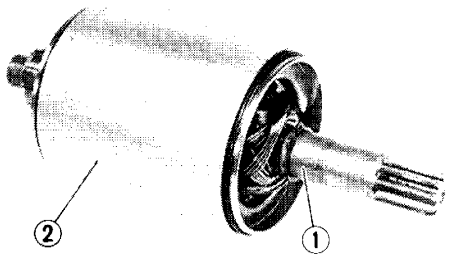
2. Remove:
   - Front bracket ①



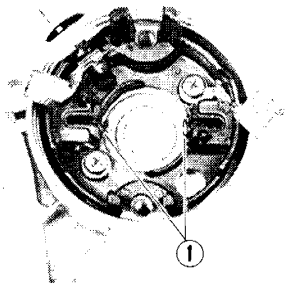
3. Remove:
   - Washer ①
   - Shim ②



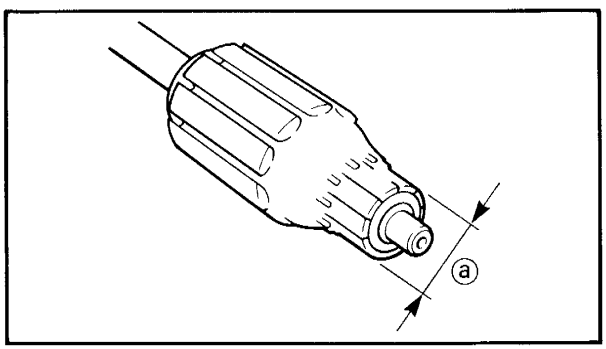
4. Remove:
   - Rear bracket ①



5. Remove:
   - Armature assembly ①
   - Yoke ②



6. Remove:
   - Brush springs ①



Inspection and repair

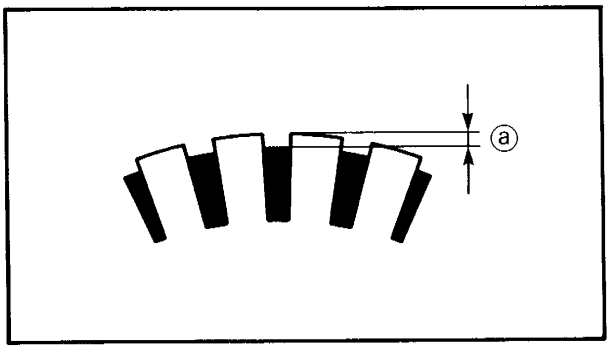
1. Inspect:
   - Commutator

   Dirty → Clean it with #600 grit sandpaper.

2. Measure:
   - Commutator diameter ⓐ

   Out of specification → Replace starter motor.

Commutator wear limit:
21 mm (0.83 in)

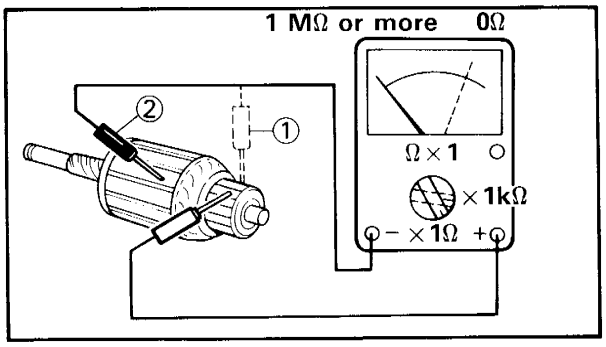


3. Measure:
   • Mica undercut ⓐ
   Out of specification → Scrape the mica to proper value use a hacksaw blade can be ground to fit.

Mica undercut:
1.5 mm (0.06 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.

****

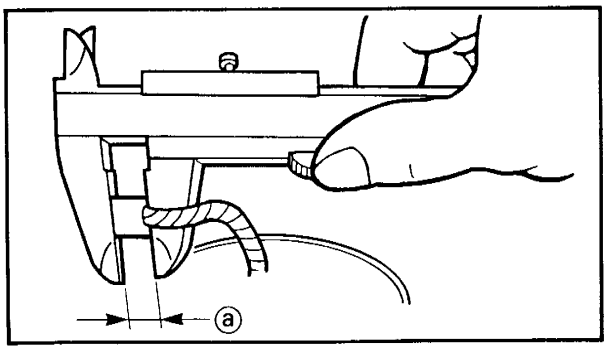
Inspecting steps:

- Connect the pocket tester for continuity check ① and insulation check ②.
- Measure the armature resistances.

Armature coil resistance:
Continuity check ①:
0.017 ~ 0.021Ω 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.

****

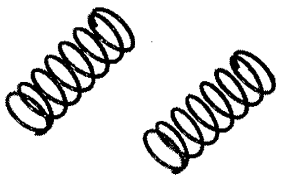


5. Measure:
   • Brush length ⓐ
   Out of specification → Replace as a set.

Brush length limit:
3.5 mm (0.14 in)

NOTE:

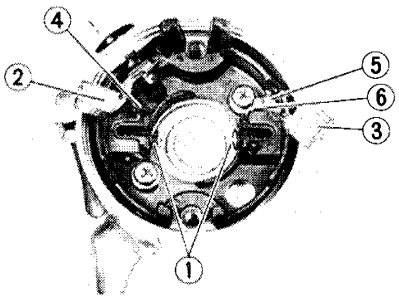
When replacing the brush, take care as one side is soldered.



6. Measure:
   • Brush spring force
     Fatigue/Out of specification → Replace as a set.

Brush spring force:
560 ~ 840 g (19.8 ~ 29.7 oz)

7. Inspect:
   • Bearing
   • Oil seal
   • Bush
     Damage → Replace the bracket.
   • O-rings
     Wear/Damage → Replace.



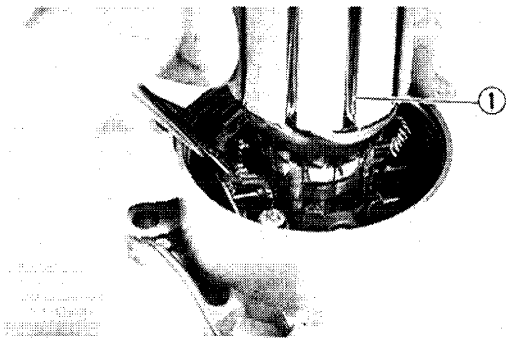
Assembly

Reserve the "Removal" procedure.
Note the following points.

1. Install:
   • Brush springs ①
   • Brush ②
   • Brush ③

NOTE:

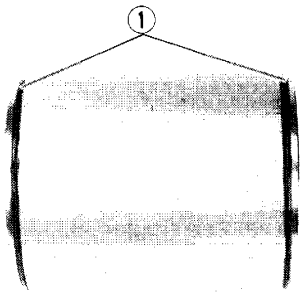
• When installing the brush ②, pass the brush lead outside of the projection ④ on the brush spring holder.
• When installing the brush ③, install the brush lead terminal ⑤ to touch lightly to the projection ⑥ on the side of brush spring holder.



2. Install:
   • Armature ①

NOTE:

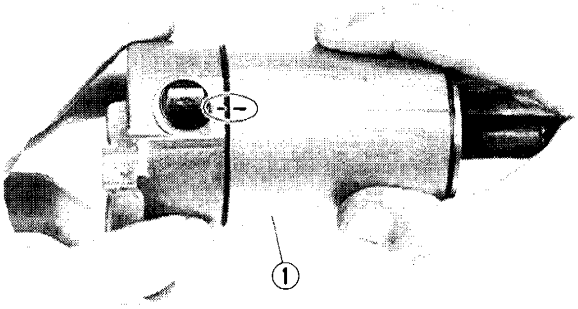
When installing the armature, press the brush with thin screwdriver, etc. to avoid damage to the brush and install.



3. Install:
   - O-rings ①

CAUTION:

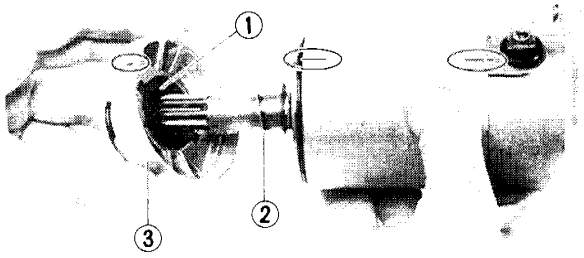
Always use new O-rings.



4. Install:
   - Yoke ①

NOTE:

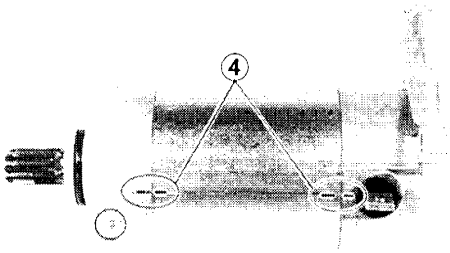
Align the match mark on the yoke with the match mark on the rear bracket.



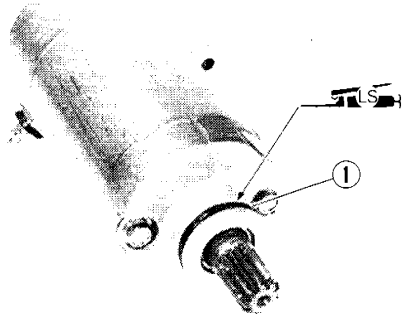
5. Install:
   - Washer ①
   - Shim ②
   - Front bracket ③

NOTE:

- Align the projection of the washer ① with the slot of the front bracket ③ and install.
- Align the match marks ④ on the yoke with the match marks on the brackets.



	Bolt: **5 Nm (0.5 m•kg, 3.6 ft•lb)**

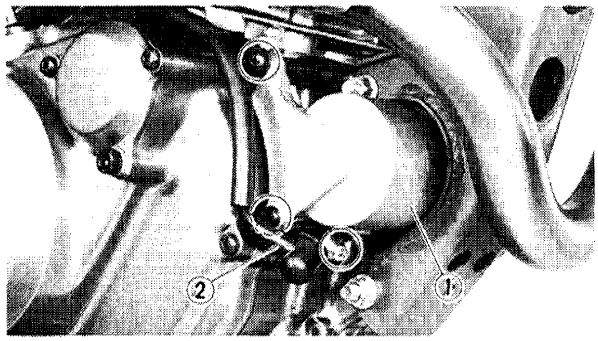


Installation

1. Apply:
   - Starter motor

NOTE:

Apply a lightly grease to the O-ring ①.



2. Install:
   - Starter motor ①
   - Starter motor lead ②

	Bolt (starter motor): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

3. Connect:
   - Battery negative lead

   Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

4. Install:
   - Engine guard

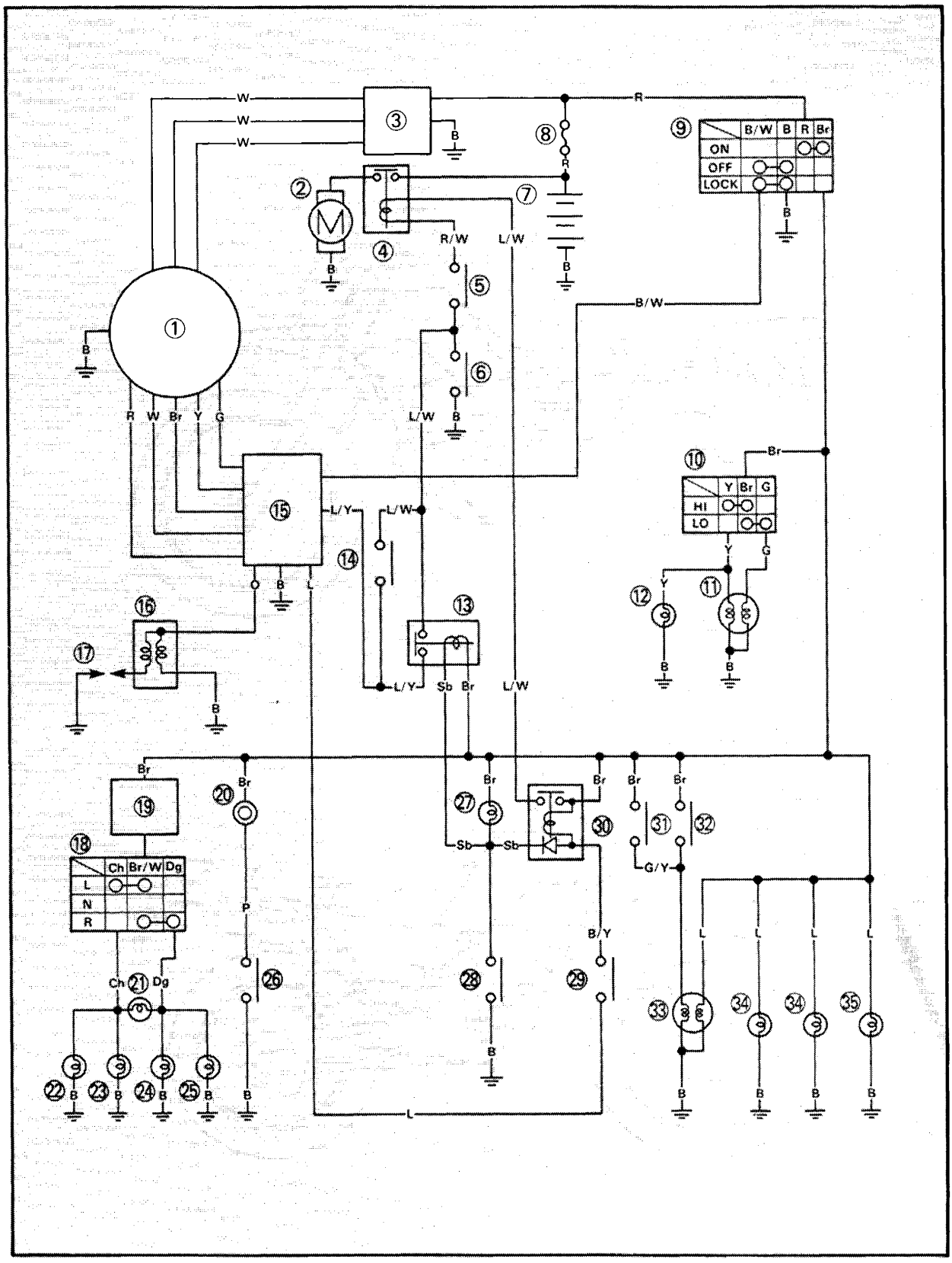
   Refer to the "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.

	Bolt (engine guard): **7 Nm (0.7 m•kg, 5.1 ft•lb)**

CHARGING SYSTEM

CIRCUIT DIAGRAM

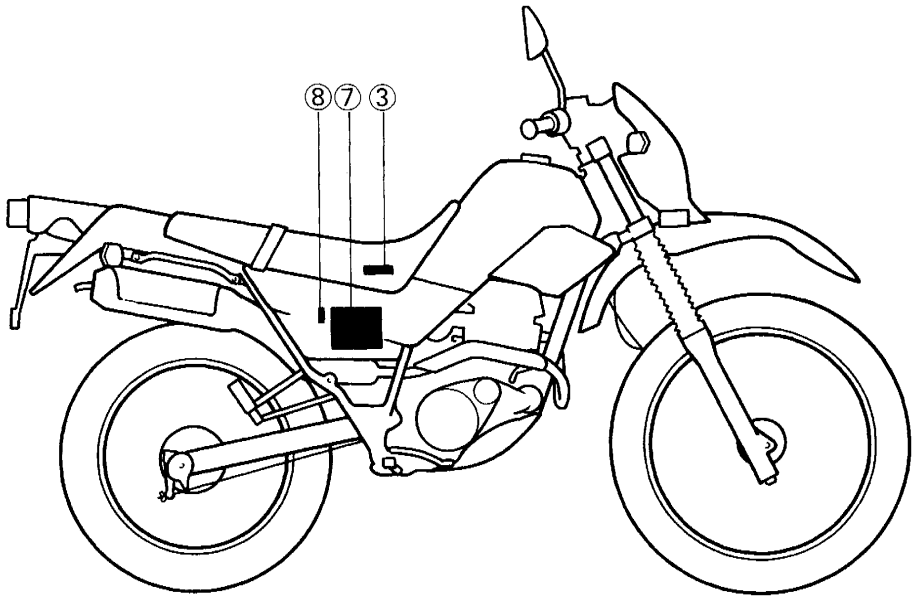
Below circuit diagram shows charging system.

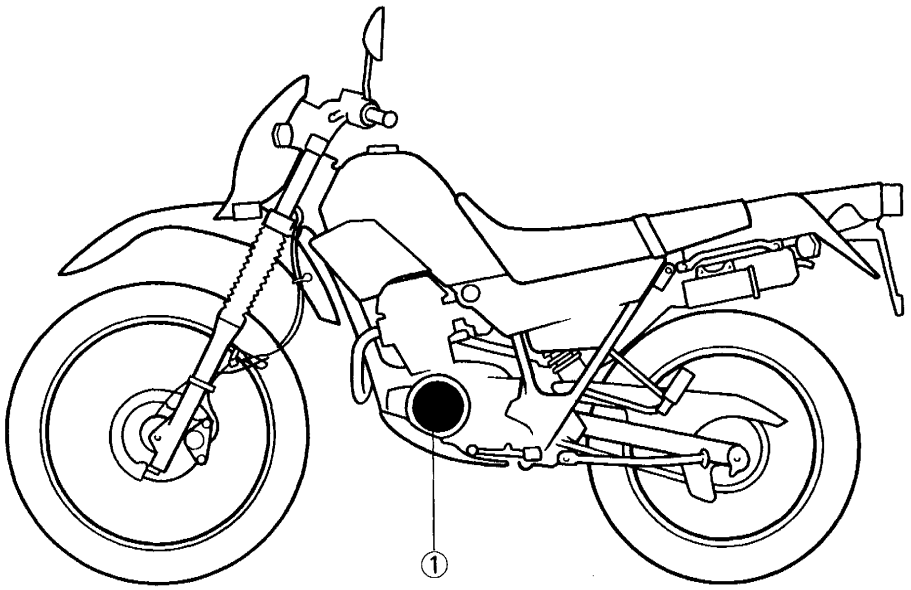


NOTE:

For the color codes, see page 7-2.

① C.D.I. magneto
③ Rectifier/Regulator
⑦ Battery
⑧ Fuse (main)





TROUBLESHOOTING

THE BATTERY IS NOT CHARGED.

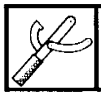
Procedure

Check:

1. Fuse (main)
2. Battery
3. Charging voltage
4. Stator coil resistance
5. Wiring connection
   (Entire charging system)

NOTE:

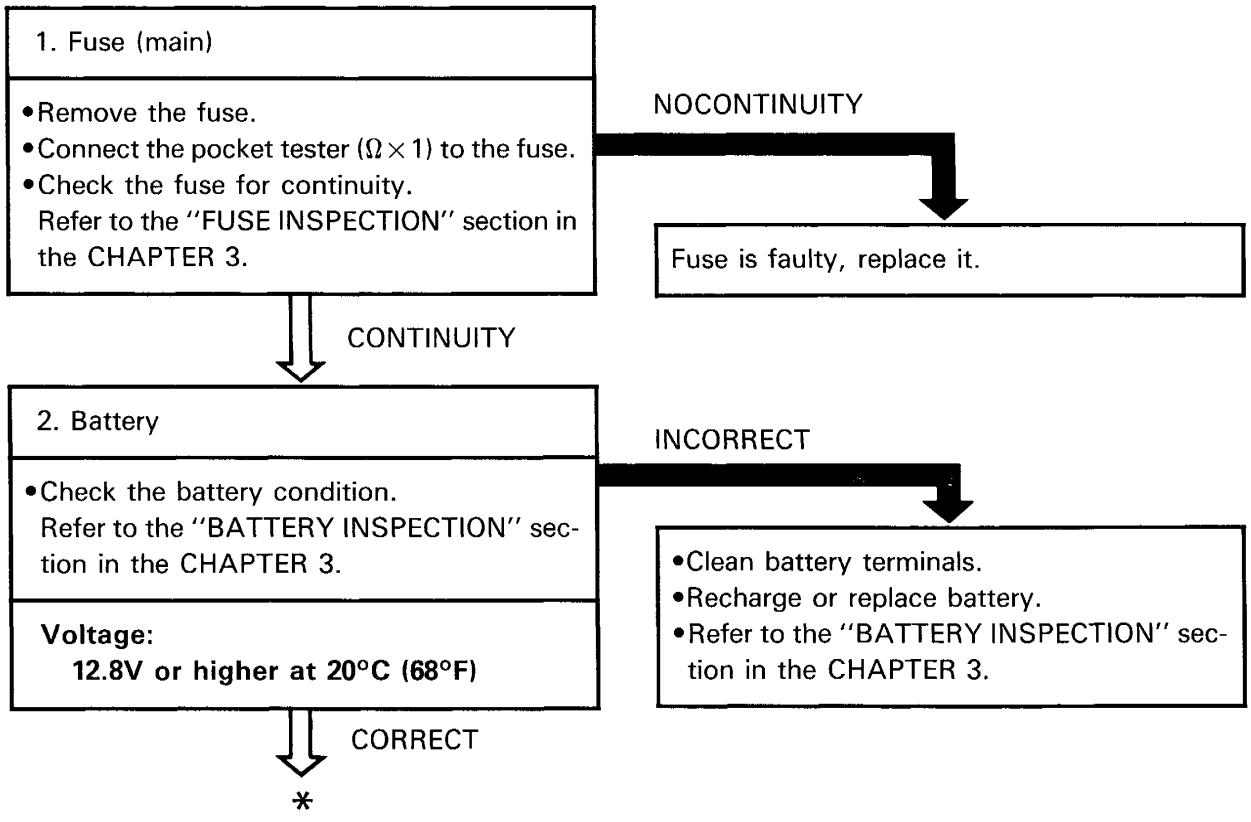
- Remove the following parts before troubleshooting.
  1) Side cover (right)
  2) Seat
- Use the following special tool(s) in this troubleshooting.



Inductive tachometer:
P/N YU-08036-A, 90890-03113



Pocket tester:
P/N YU-03112, 90890-03112

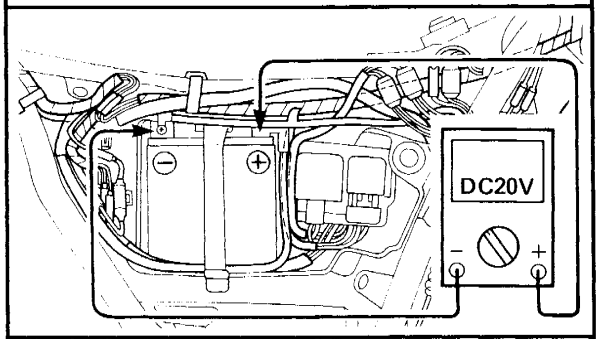


*

3. Charging voltage

- Connect the inductive tachometer to the spark plug lead.
- Connect the pocket tester (DC20V) 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:
14.0V at 5,000 r/min

NOTE:
Use a full charged battery.

MEETS SPECIFICATION

Charging circuit is good.

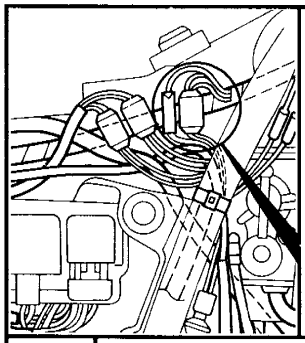
OUT OF SPECIFICATION

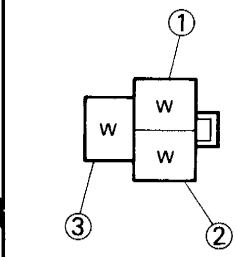
4. Stator coil resistance

- Disconnect the stator coil coupler from the wireharness.
- Connect the pocket tester (Ω × 1) to the stator coils.
- Measure the stator coil resistances.

Tester (+) lead→White lead ①
Tester (−) lead→White lead ②

Tester (+) lead→White lead ①
Tester (−) lead→White lead ③





Stator coil resistance:
0.48 ~ 0.72Ω at 20°C (68°F)

OUT OF SPECIFICATION

Stator coil is faulty, replace it.

BOTH MEET SPECIFICATIONS

5. Wiring connection

Check the entire ignition system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

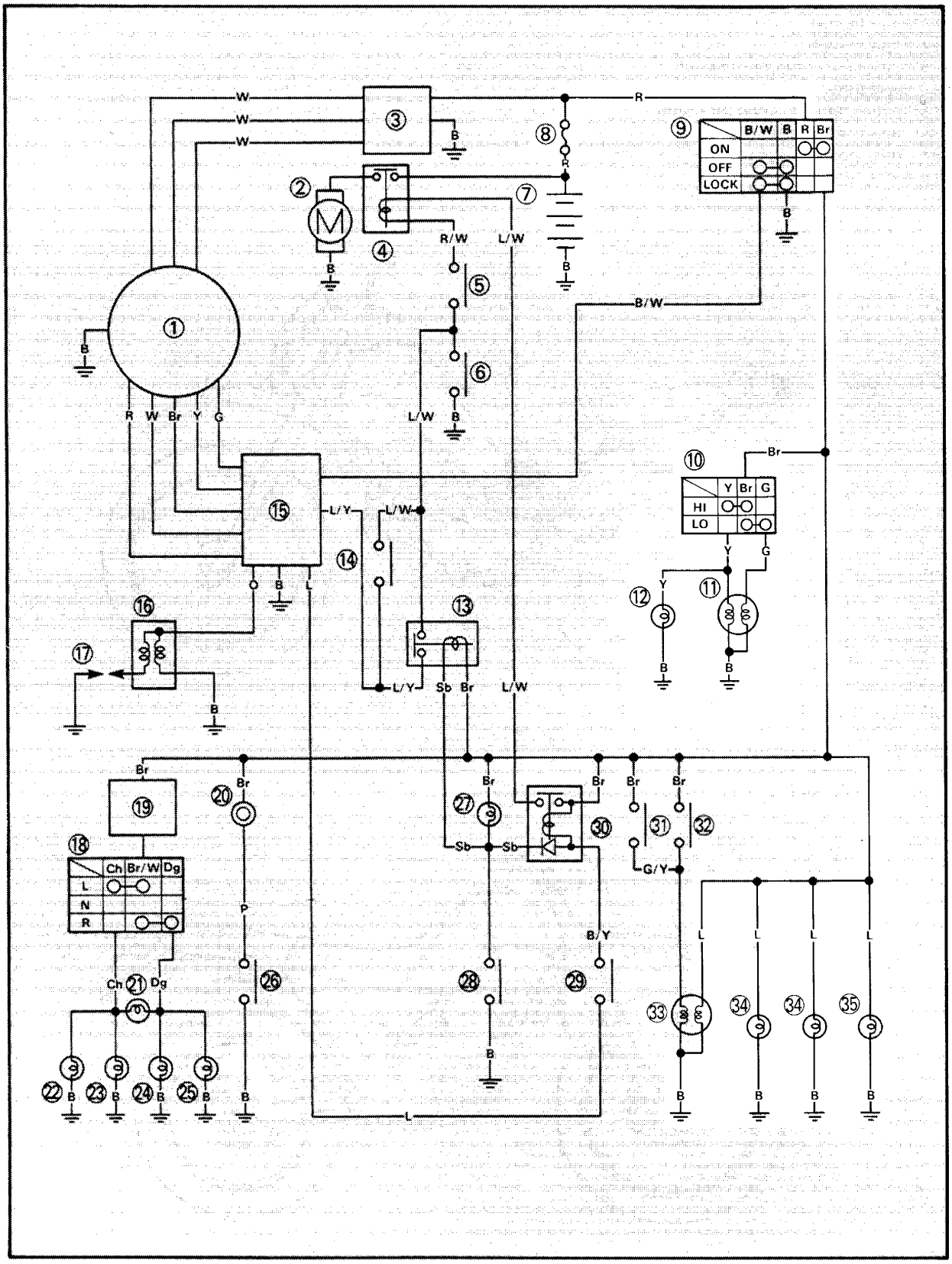
OK

Replace rectifier/regulator.

LIGHTING SYSTEM

CIRCUIT DIAGRAM

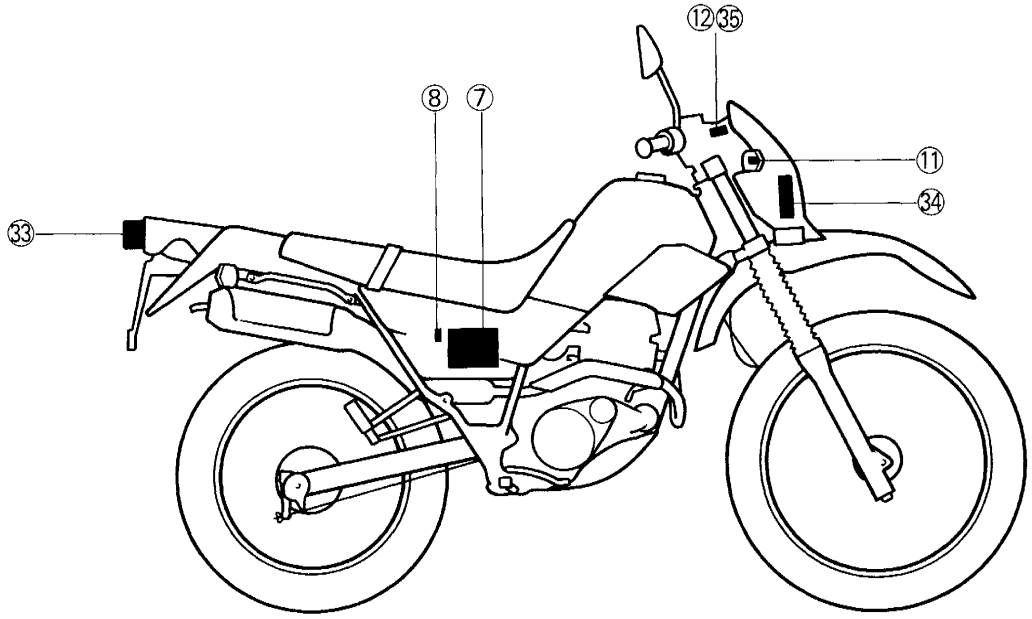
Below circuit diagram shows lighting system.

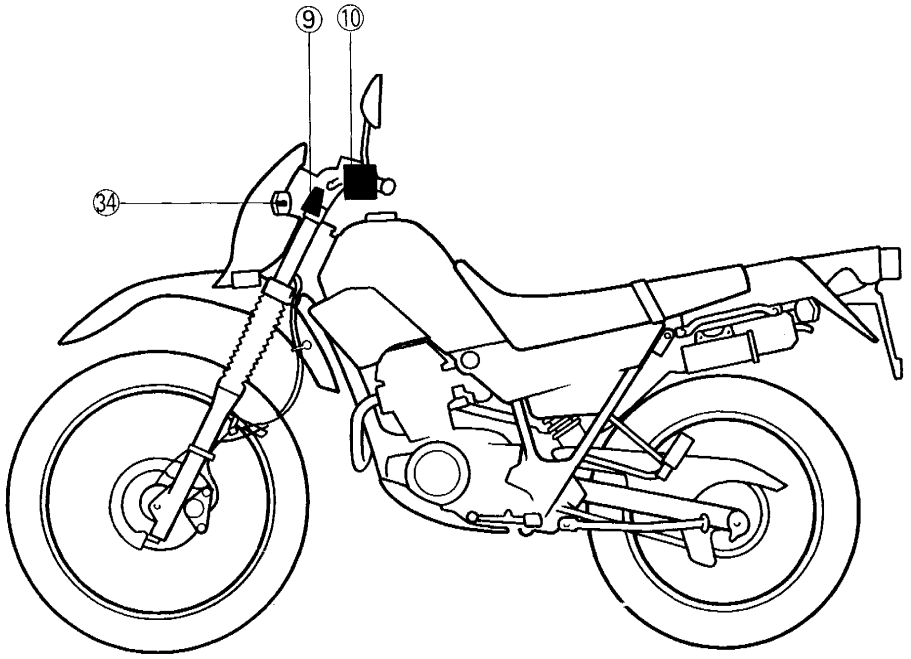


NOTE:

For color codes, see page 7-2.

⑦ Battery
⑧ Fuse (main)
⑨ Main switch
⑩ "LIGHTS" (dimmer) switch
⑪ Headlight
⑫ "HIGH BEAM" indicator light
㉝ Tail/Brake light
㉞ Front position light
㉟ Meter light





TROUBLESHOOTING

HEADLIGHT, "HIGHBEAM" INDICATOR LIGHT, TAILLIGHT AND/OR METER LIGHT DO NOT COME ON

Procedure

Check:

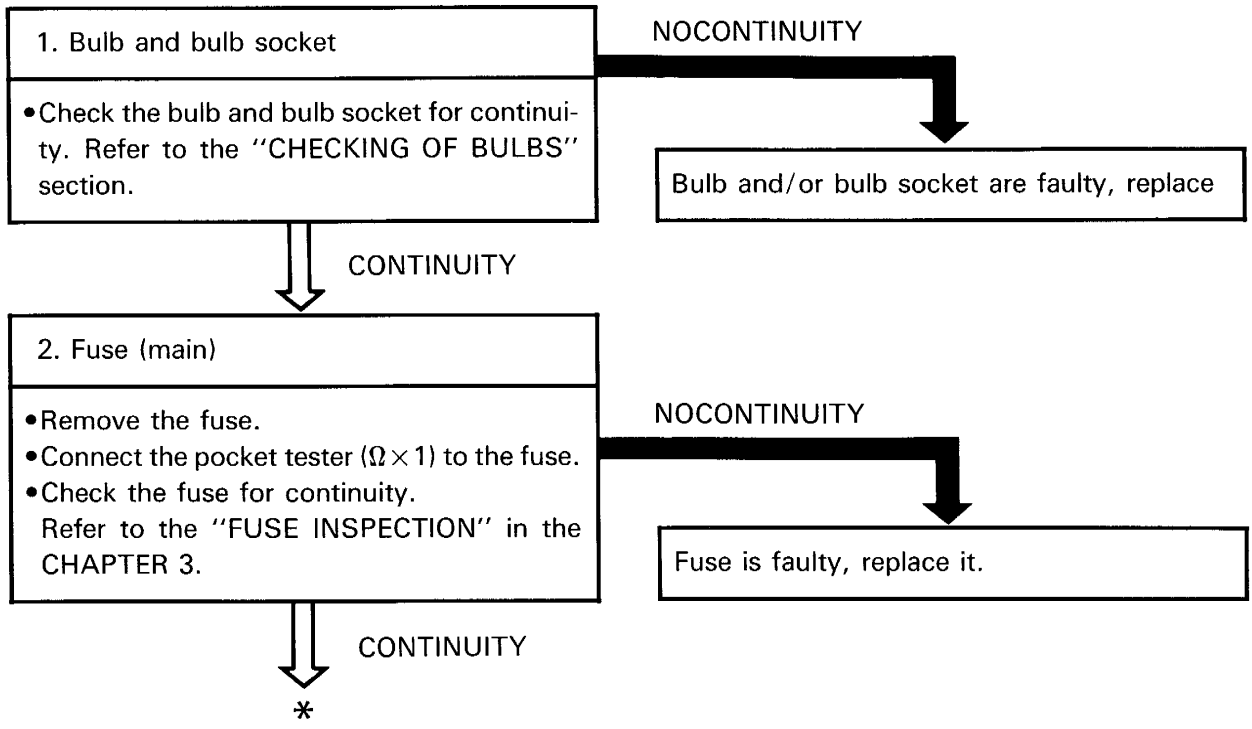
1. Bulb
2. Fuse (main)
3. Battery
4. Main switch
5. "LIGHTS" (dimmer) switch
6. Wiring connection
   (Entire lighting system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Side covers
  2) Seat
  3) Cowling
- Use the following special tool(s) in this troubleshooting.



Pocket tester:
P/N YU-03112, 90890-03112



*

3. Battery

- Check the battery condition.
  Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Voltage:
12.8V or higher at 20°C (68°F)

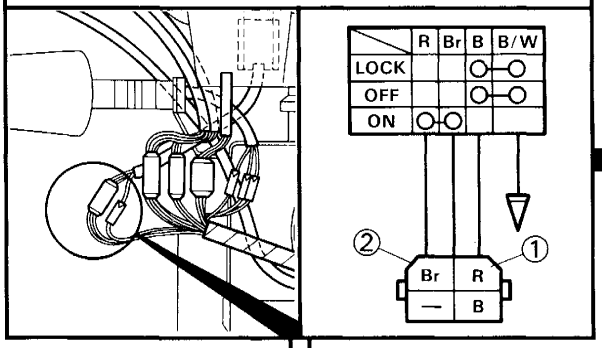
INCORRECT

- Clean battery terminals.
- Recharge or replace battery.
  Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

CORRECT

4. Main switch

- Disconnect the main switch coupler from the wireharness.
- Check the switch component for the continuity between "Red ① and Brown ②". Refer to the "CHECKING OF SWITCHES" section.



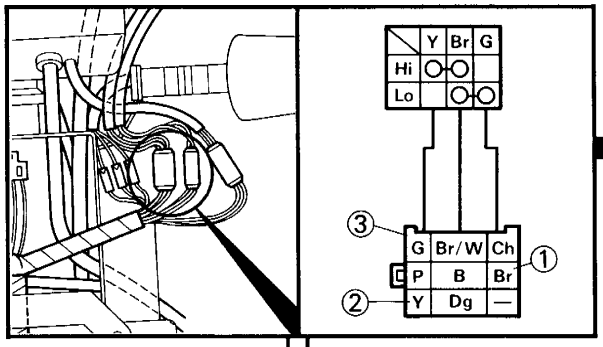
INCORRECT

Main switch is faulty, replace it.

CORRECT

5. "LIGHTS" (dimmer) switch

- Disconnect the handlebar switch (left) couple from the wireharness.
- Connect the pocket tester (Ω × 1) to the handlebar switch (left) terminal.
- Check the switch component for the continuity between "Brown ① and Yellow ②". "Brown ① and Green ③".
  Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

"LIGHTS" (dimmer) switch is faulty, replace handlebar switch (left).

CORRECT

6. Wiring connection

Check the entire lighting system for connections.
Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

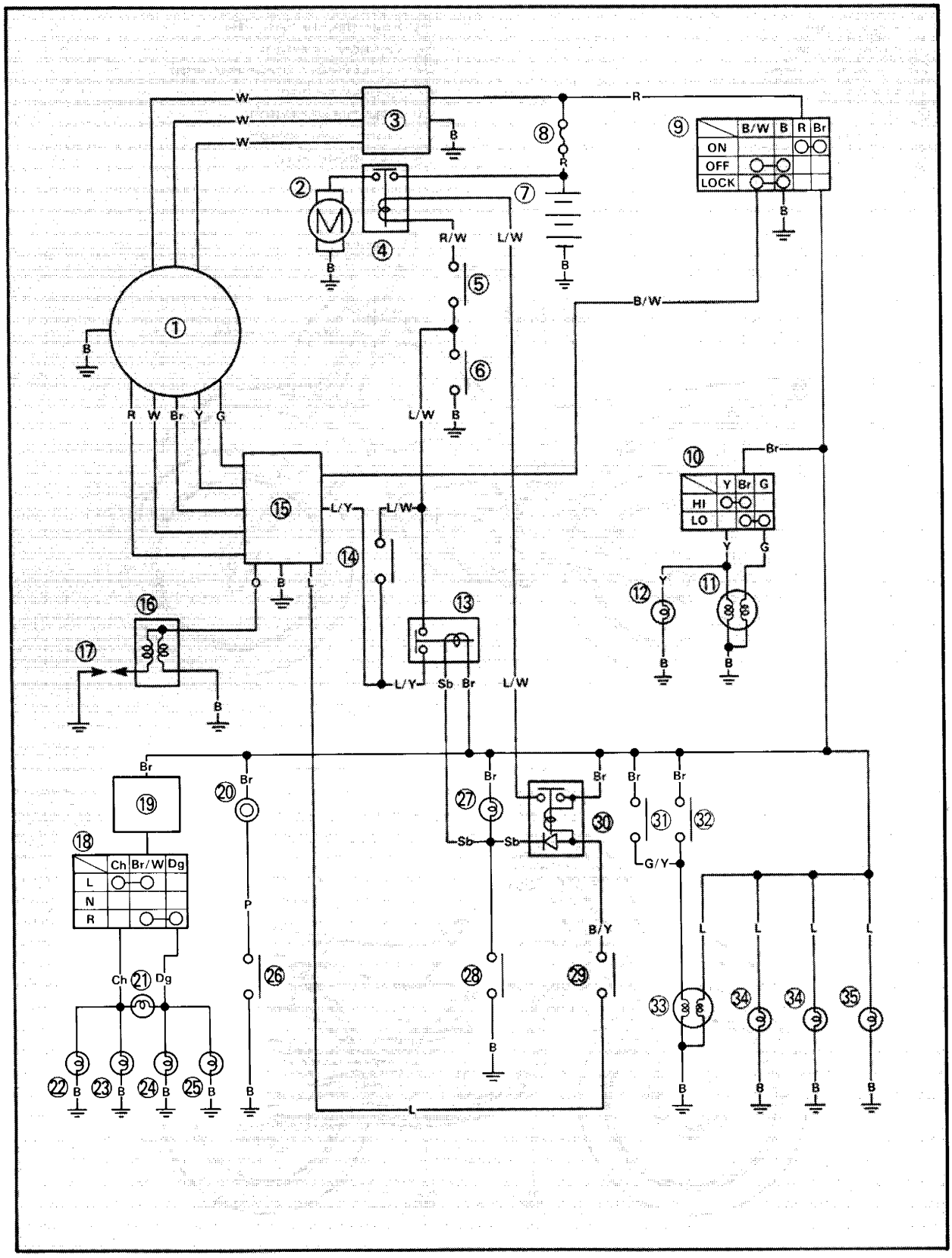
CORRECT

This circuit is good.

SIGNAL SYSTEM

CIRCUIT DIAGRAM

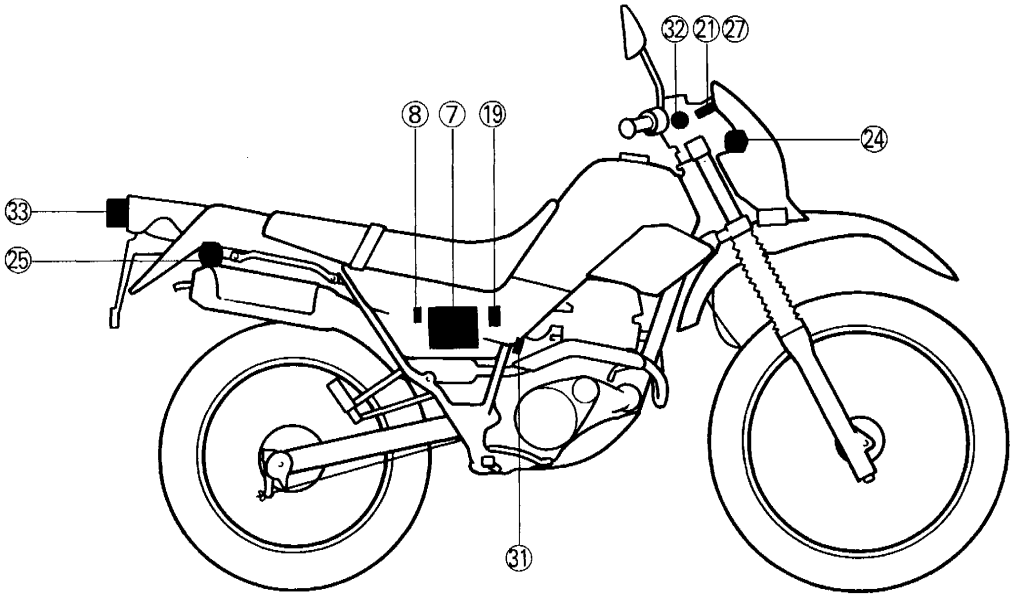
Below circuit diagram shows signal system.

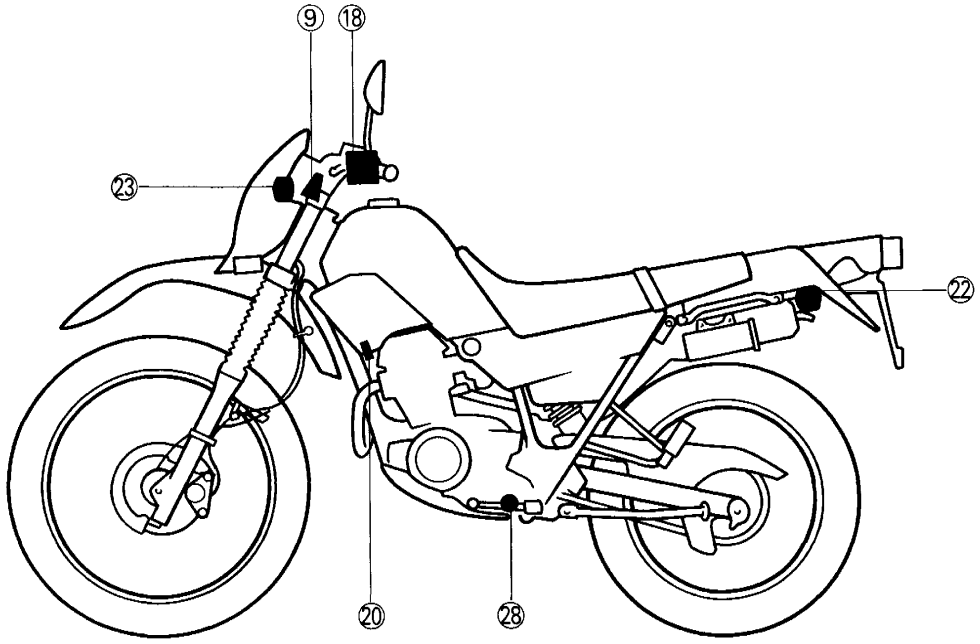


NOTE:

For the color codes, see page 7-2.

⑦ Battery
⑧ Fuse (main)
⑨ Main switch
⑱ "TURN" switch
⑲ Flasher relay
⑳ Horn
㉑ "TURN" indicator light
㉒ Rear flasher light (L)
㉓ Front flasher light (L)
㉔ Front flasher light (R)
㉕ Rear flasher light (R)
㉖ "HORN" switch
㉗ "NEUTRAL" indicator light
㉘ Neutral switch
㉛ Rear brake switch
㉜ Front brake switch
㉝ Tail/brake light



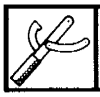


TROUBLESHOOTING

•FLASHER LIGHT, BRAKE LIGHT AND/OR INDICATOR LIGHT DO NOT COME ON.
•HORN DOES NOT SOUND.

Procedure
Check:
1. Fuse (main)
2. Battery
3. Main switch
4. Wiring connection
   (Entire signal system)

NOTE:
•Remove the following parts before troubleshooting.
1) Seat
2) Side covers
3) Air scoops
4) Fuel tank
5) Cowling
•Use the following special tool in this troubleshooting.



Pocket tester:
P/N YU-03112, 90890-03112

1. Fuse (main)

•Remove the fuses.
•Connect the pocket tester (Ω × 1) to the fuses.
•Check the fuses for continuity.
Refer to the "FUSE INSPECTION" in the CHAPTER 3.

NOCONTINUITY → Fuse is faulty, replace it.

CORRECT ↓

2. Battery

•Check the battery condition.
Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Voltage:
12.8V or higher at 20°C (68°F)

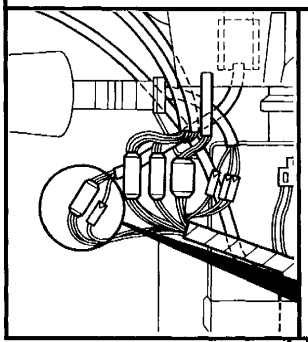
INCORRECT → •Clean battery terminals.
•Recharge or replace battery.
Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

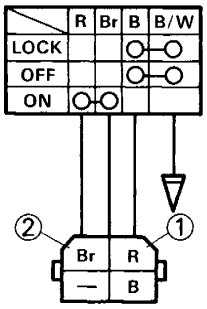
↓
*

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3. Main switch

- Disconnect the main switch coupler from the wireharness.
- Check the switch component for the continuity between "Red ① and Brown ②". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Main switch is faulty, replace it.

CORRECT

4. Wiring connection

Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

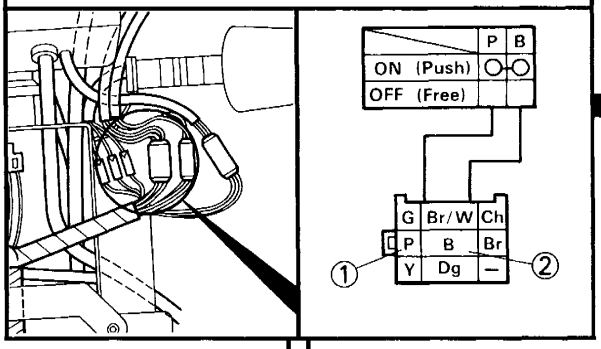
Check condition of each circuit for signal system. Refer to "SIGNAL SYSTEM CHECK" section.

SIGNAL SYSTEM CHECK

1. Horn does not sound.

1. "HORN" switch.

- Disconnect the handlebar switch (left) coupler from the wireharness.
- Check the switch component for the continuity between "Pink ① and Black ②". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT

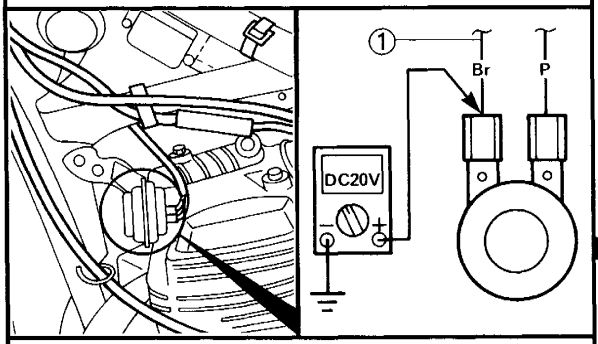
"HORN" switch is faulty, replace handlebar switch (left).

CORRECT

2. Voltage

- Connect the pocket tester (DC20V) to the horn lead.

Tester (+) lead→Brown lead ①
Tester (–) lead→Frame ground



OUT OF SPECIFICATION

- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at the horn terminal.

Wiring circuit from main switch to horn terminal is faulty, repair.

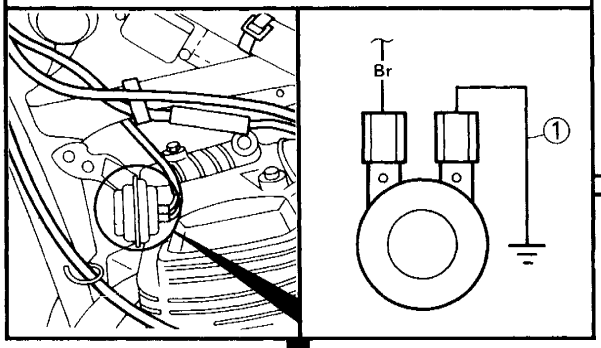
MEETS SPECIFICATION (12V)

*

*

3. Horn

- Disconnect the "Pink" lead from 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

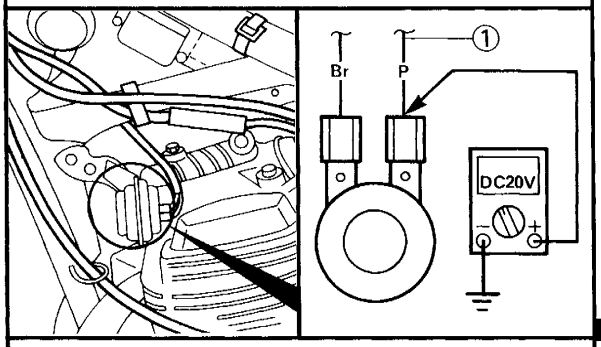
Horn is good.

HORN IS NOT SOUNDED

4. Voltage

- Connect the pocket tester (DC20V) to the horn at the "Pink" terminal.

Terminal (+) lead→Pink lead ①
Tester (−) lead→Frame ground



OUT OF SPECIFICATION

- Turn the main switch to "ON".
- Check for voltage (12V) on the "Pink" lead at the horn terminal.

Horn is faulty, replace it.

MEETS SPECIFICATION (12V)

Adjust or replace horn.

2. Brake light does not come on.

1. Bulb and bulb socket

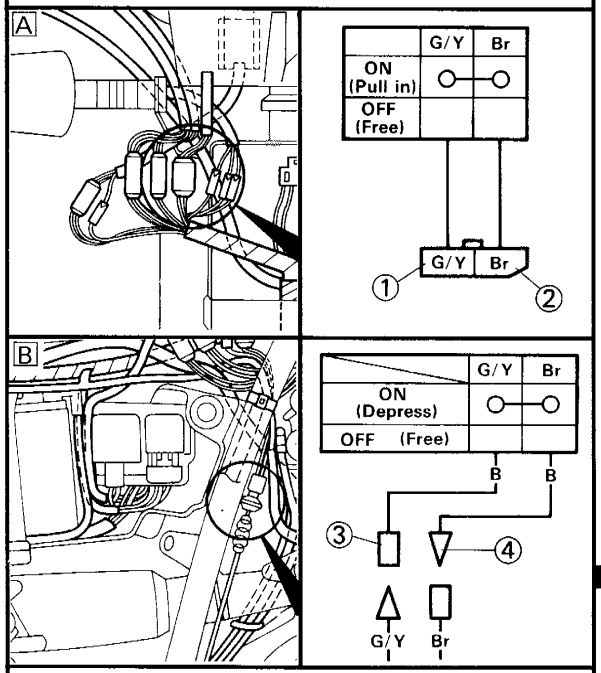
• Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. Brake switch

• Disconnect the brake switch leads from the wireharness.
• Check the switch component for the continuity between "Green/Yellow ① and Brown ②", "Black ③ and Black ④". Refer to the "CHECKING OF SWITCHES" section.



A Front brake switch
B Rear brake switch

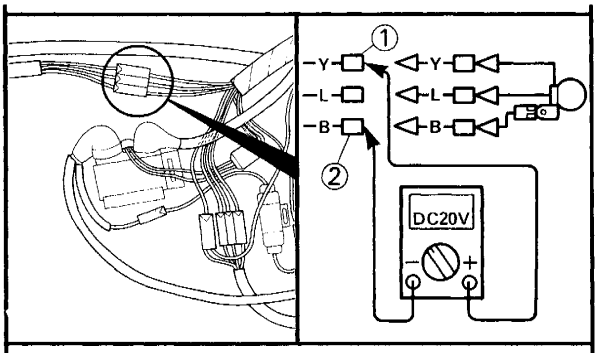
INCORRECT → Brake switch is faulty, replace it.

CORRECT ↓

3. Voltage

• Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead→Yellow ① lead
Tester (−) lead→Black ② lead



- Turn the main switch to "ON".
- The brake lever is pulled in or brake pedal is depressed.
- Check for voltage (12V) 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 (12V) ↓

This circuit is good.

3. Flasher light and/or "TURN" indicator light do not blink.

1. Bulb and bulb socket

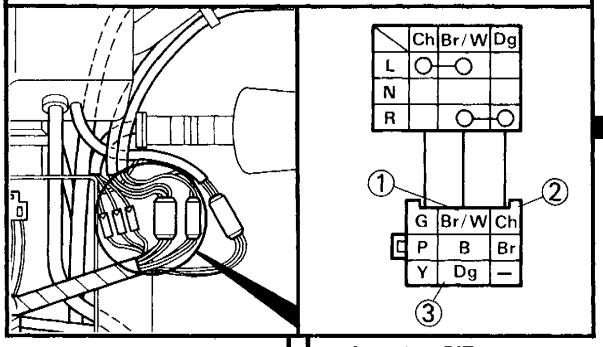
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NOCONTINUITY → Replace bulb and/or bulb socket.

CONTINUITY ↓

2. "TURN" switch

- Disconnect the handlebar switch (left) coupler from the wireharness.
- Check the switch component for the continuity between "Brown/White ① and Chocolate ②" and "Brown/White ① and Dark green ③". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → "TURN" switch is faulty, replace handlebar switch (left).

CORRECT ↓

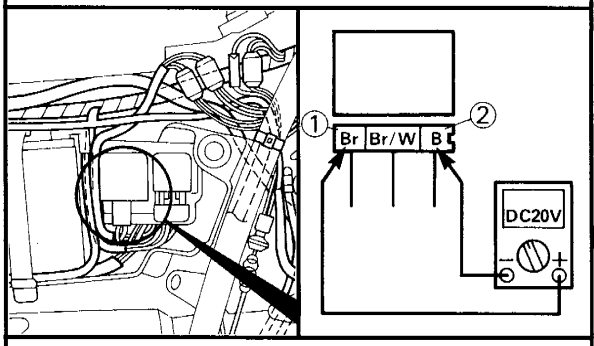
*

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3. Voltage

•Connect the pocket tester (DC20V) to the flasher relay.

Tester (+) lead→Brown lead ①
Tester (−) lead→Black lead ②



•Turn the main switch to "ON".
•Check for voltage (12V) on the "Brown" lead at the flasher relay terminal.

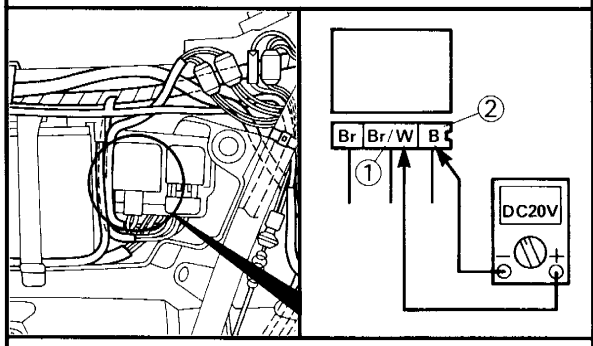
OUT OF SPECIFICATION → Wiring circuit from main switch to flasher relay connector is faulty, repair.

MEETS SPECIFICATION (12V)

4. Voltage

•Connect the pocket tester (DC20V) to the flasher relay.

Tester (+) lead→Brown/White lead ①
Tester (−) lead→Black lead ②



•Turn the main switch to "ON".
•Check for voltage (12V) on the "Brown/White" lead at the flasher relay terminal.

OUT OF SPECIFICATION → Flasher relay is faulty, replace it.

*

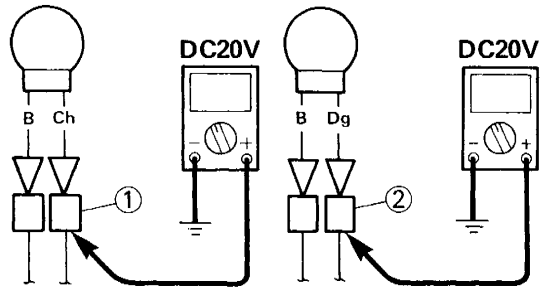
*

5. Voltage

•Connect the pocket tester (DC20V) to the bulb socket connector.

At flasher light (left):
Tester (+) lead→Chocolate lead ①
Tester (−) lead→Frame ground

At flasher light (right):
Tester (+) lead→Dark green lead ②
Tester (−) lead→Frame ground



•Turn the main switch to "ON".
•Turn the "TURN" switch to "L" or "R".
•Check for voltage (12V) 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 (12V) → This circuit is good.

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.

NOCONTINUITY → Replace bulb and/or bulb socket.

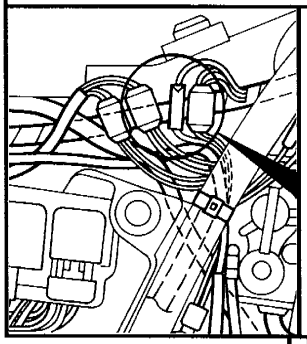
CONTINUITY

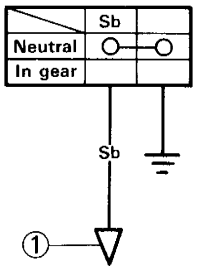
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2. Neutral switch

- Disconnect the neutral switch lead from the wireharness.
- Check the switch component for the continuity between "Sky blue ① and Ground". Refer to the "CHECKING OF SWITCHES" section.





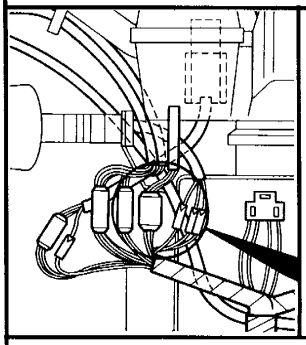
INCORRECT

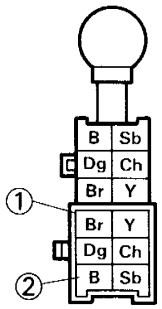
Neutral switch is faulty, replace it.

3. Voltage

- Connect the pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead→Brown lead ①
Tester (−) lead→Black lead ②





- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at bulb socket connector.

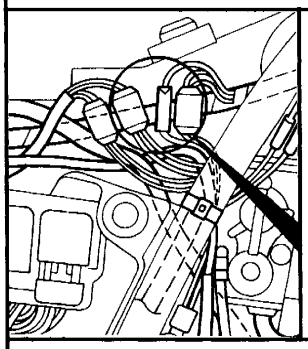
OUT OF SPECIFICATION

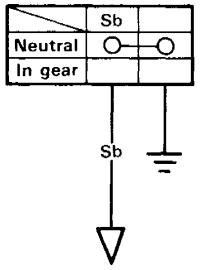
Wiring circuit from main switch to bulb socket connector is faulty, repair.

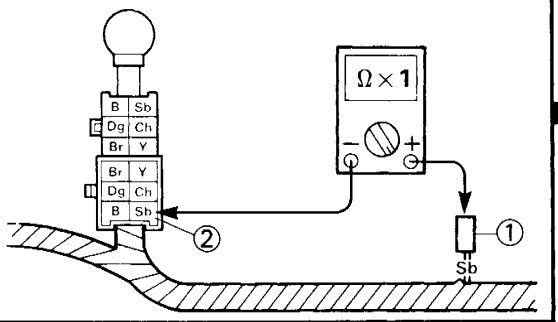
MEETS SPECIFICATION (12V)

4. Neutral switch lead

- Disconnect the neutral switch lead and bulb socket connector from the wireharness.
- Connect the pocket tester (Ω × 1) to the "Sky blue" neutral switch lead ① (wireharness side) and bulb socket terminal ②.







NOCONTINUITY

Wiring circuit from bulb socket to neutral switch lead is faulty, repair.

CONTINUITY

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 strainer • Clogged fuel breather hose • Deteriorated fuel or fuel containing water or foreign material
Fuel cock	• Clogged fuel hose • Clogged fuel filter
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 filter element	• Clogged

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
C.D.I. system	• Faulty C.D.I. unit • Faulty pulser coil • Faulty charge coil • Broken woodruff key
Switches and wiring	• Faulty main switch • Faulty "ENGINE STOP" switch • Broken or shorted wiring • Faulty neutral switch • Faulty neutral relay • Faulty "START" switch • Faulty sidestand switch • Faulty clutch switch
Starter motor	• Faulty starter motor • Faulty starter relay • Faulty circuit cut-off relay • Faulty starter clutch

COMPRESSION SYSTEM

	PROBABLE CAUSE
Cylinder and cylinder head	• Loose spark plug • Loose cylinder head or cylinder • Broken cylinder head gasket • Worn, damaged or seized cylinder
Piston and piston ring	• Improperly installed piston ring • Worn, fatigued or broken piston ring • Seized piston ring • Seized or damaged piston
Valve, camshaft and crankshaft	• Improperly sealed valve • Improperly contacted valve and valve seat • Improper valve timing • Broken valve spring • Seized camshaft • Seized crankshaft

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

	PROBABLE CAUSE
Carburetor	• Improperly returned starter plunger • Improper starter cable play • Loose pilot jet • Clogged pilot jet • Clogged pilot air jet • Improperly adjusted idle speed (Throttle stop screw) • Flooded carburetor
Electrical system	• Faulty battery • Faulty spark plug • Faulty C.D.I. unit • Faulty pulser coil • Faulty charge coil • Faulty ignition coil
Valve train	• Improperly adjusted valve clearance

POOR MEDIUM AND HIGH SPEED PERFORMANCE

POOR MEDIUM AND HIGH SPEED PERFORMANCE

Refer to the "STARTING FAILURE/HARD STARTING" and "POOR IDLE SPEED PERFORMANCE-valve train" section.

	PROBABLE CAUSE
Carburetor	• Improper jet needle clip position • Diaphragm malfunction • Improperly adjusted fuel level • Clogged or loose main jet • Deteriorated fuel containing water or foreign material
Air cleaner	• Clogged air filter element

FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to the "CLUTCH SLIPPING/DRAGGING-CLUTCH DRAGGING" section.

SHIFT PEDAL DOES NOT MOVE	PROBABLE CAUSE
Shift shaft	• 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	• Worn shift shaft lever • 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	• Loose clutch spring • Fatigued clutch spring • Worn friction plate • Worn clutch plate • Incorrectly assembled clutch
Engine oil	• Low oil level • Improper quality (Low viscosity) • Deterioration

CLUTCH DRAGGING

	PROBABLE CAUSE
Clutch	• Warped pressure plate • Unevenly tensioned clutch springs • Loose clutch boss nut • Burnt primary driven gear bushing • Bent clutch plate • Swollen friction plate • Broken clutch boss
Engine oil	• High oil level • Improper quality (High viscosity) • Deterioration

OVERHEATING

OVERHEATING

	PROBABLE CAUSE
Ignition system	• Improper spark plug gap • Improper spark plug heat range • Faulty C.D.I. unit
Fuel system	• Improper carburetor main jet (Improper setting) • Improperly adjusted fuel level • Clogged air filter element
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 pad
  - •Worn brake 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 brake disc
  - •Oily or greasy brake pad
  - •Improper brake fluid level
- Drum brake
  - •Worn brake shoe lining
  - •Worn brake drum
  - •Broken brake shoe spring
  - •Oily or greasy brake shoe lining
  - •Oily or greasy brake drum

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

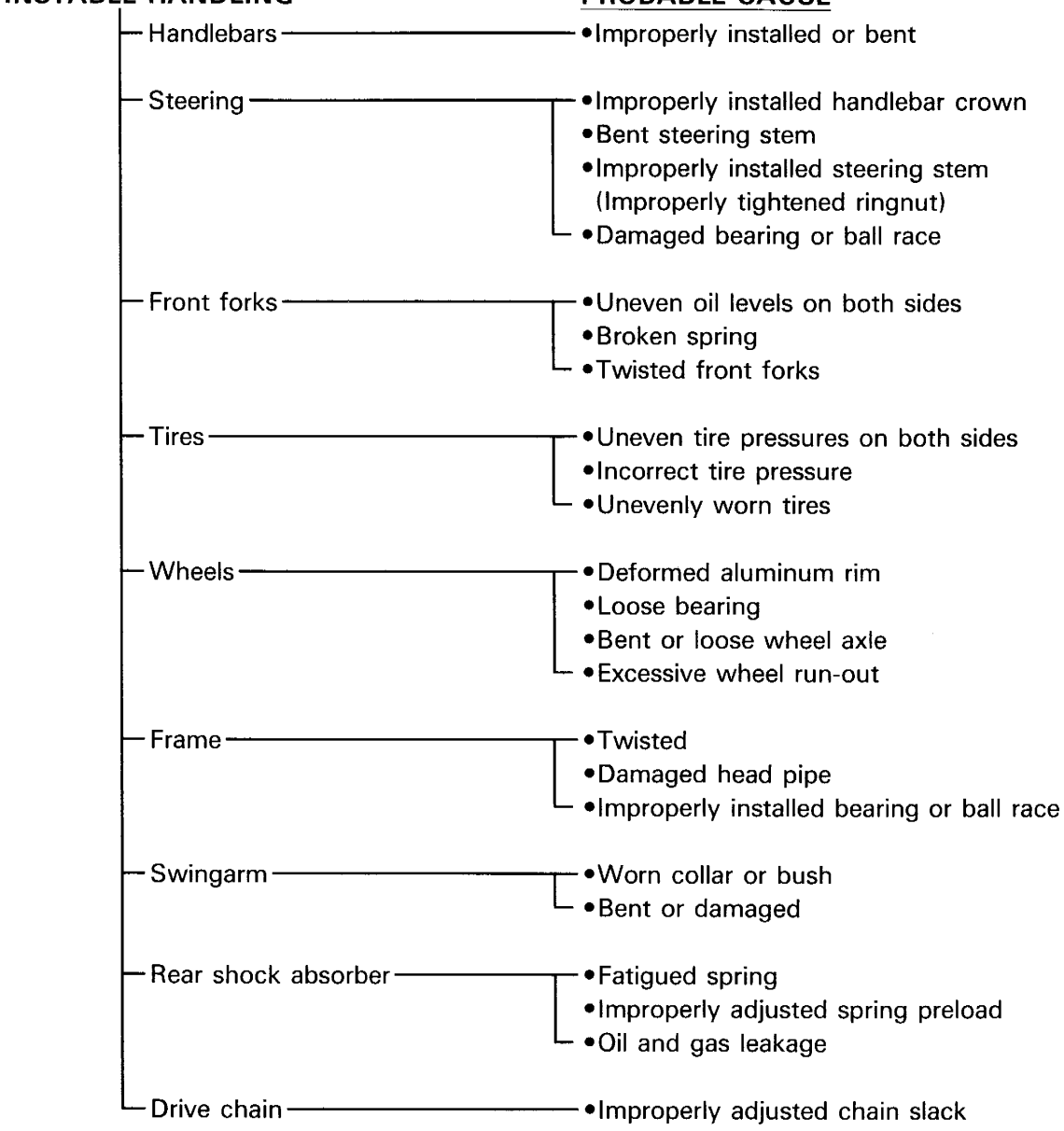
OIL LEAKAGE — **PROBABLE CAUSE**

- •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 spring seat O-ring
- •Loose drain bolt
- •Damaged drain bolt gasket

MALFUNCTION — **PROBABLE CAUSE**

- •Bent, deformed or damaged inner tube
- •Bent or deformed outer tube
- •Damaged fork spring
- •Worn or damaged guide bush
- •Bent or damaged damper rod
- •Improper oil viscosity
- •Improper oil level

INSTABLE HANDLING



FAULTY SIGNAL AND LIGHTING SYSTEM

HEADLIGHT DARK

PROBABLE CAUSE

- Improper bulb
- Too many electric accessories
- Hard charging (Broken stator coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts main or "LIGHTS" (Dimmer) switch
- Bulb life expired

BULB BURNT OUT

PROBABLE CAUSE

- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or "LIGHTS" (Dimmer) switch
- Bulb life expired

FLASHER DOES NOT LIGHT

PROBABLE CAUSE

- Improperly grounded
- Discharged battery
- Faulty "TURN" switch
- Faulty flasher relay
- Broken wireharness
- Loosely connected coupler
- Bulb burnt out

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

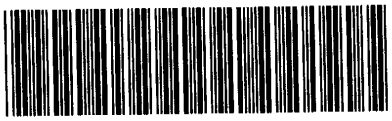
- Improper bulb
- Faulty flasher relay

HORN IS INOPERATIVE

PROBABLE CAUSE

- Faulty battery
- Faulty main and/or "HORN" switch
- Improperly adjusted horn
- Faulty horn
- Broken wireharness

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