YAMAHA

TTR250L(C)

300+1+1color

SERVICE MANUAL

LIT-11616-12-57

5GF-28197-E0

TTR250L(C)
SERVICE MANUAL
©1999 by Yamaha Motor Corporation, U.S.A.
1st edition, January 1999
All rights reserved. Any reproduction or unauthorized use without the written permission of Yamaha Motor Corporation, U.S.A. is expressly prohibited.
Printed in U.S.A.
LIT-11616-12-57

EB001000

NOTICE

This manual was produced by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual, so it is assumed that anyone who uses this book to perform maintenance and repairs on Yamaha motorcycles has a basic understanding of the mechanical ideas and the procedures of motorcycle repair. Repairs attempted by anyone without this knowledge are likely to render the motorcycle unsafe and unfit for use.

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

NOTE:
Designs and specifications are subject to change without notice.

IMPORTANT INFORMATION

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

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

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

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

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

EB002000

HOW TO USE THIS MANUAL

MANUAL ORGANIZATION

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

PAGE FEATURES

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

① : An abbreviation and symbol in the upper right corner of each page indicates the current chapter.

② : The current section title is shown at the top of each page.†

③ : Sub-section titles appear in smaller print than the section title.†

④ : Lines of asterisks (*) mark the beginning and end of a particularly important procedure. The steps of such procedures are marked with bullets (•).

⑤ : Important information such as fluids, special tools and torques are framed and marked with a corresponding symbol.

⑥ : A circled number refers to an illustrated part.

⑦ : A circled lower case letter refers to an illustrated dimension or alignment mark.

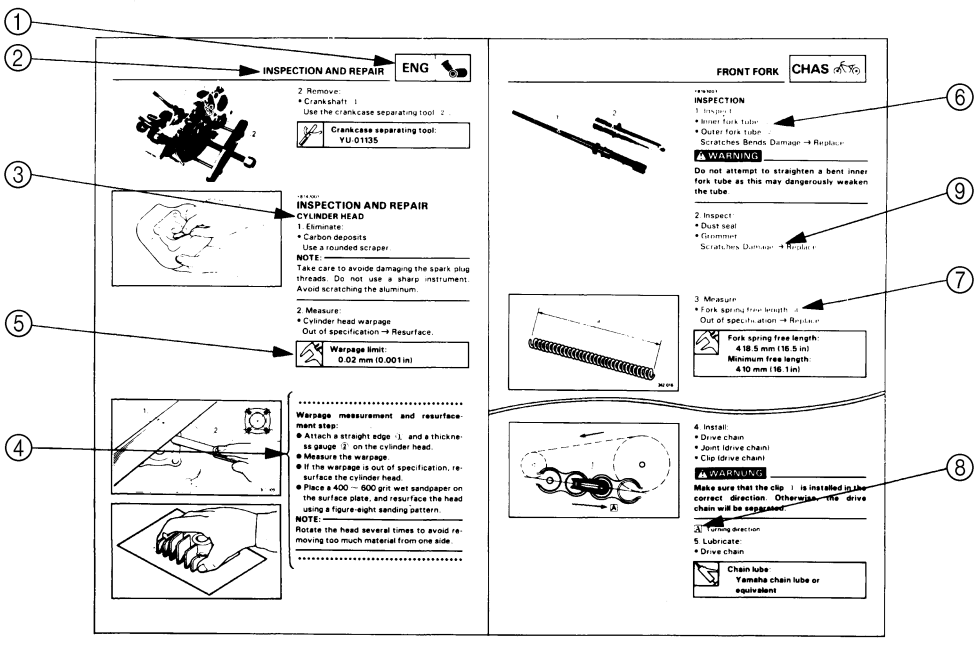
⑧ : An upper case letter in a box refers to other illustrated details.

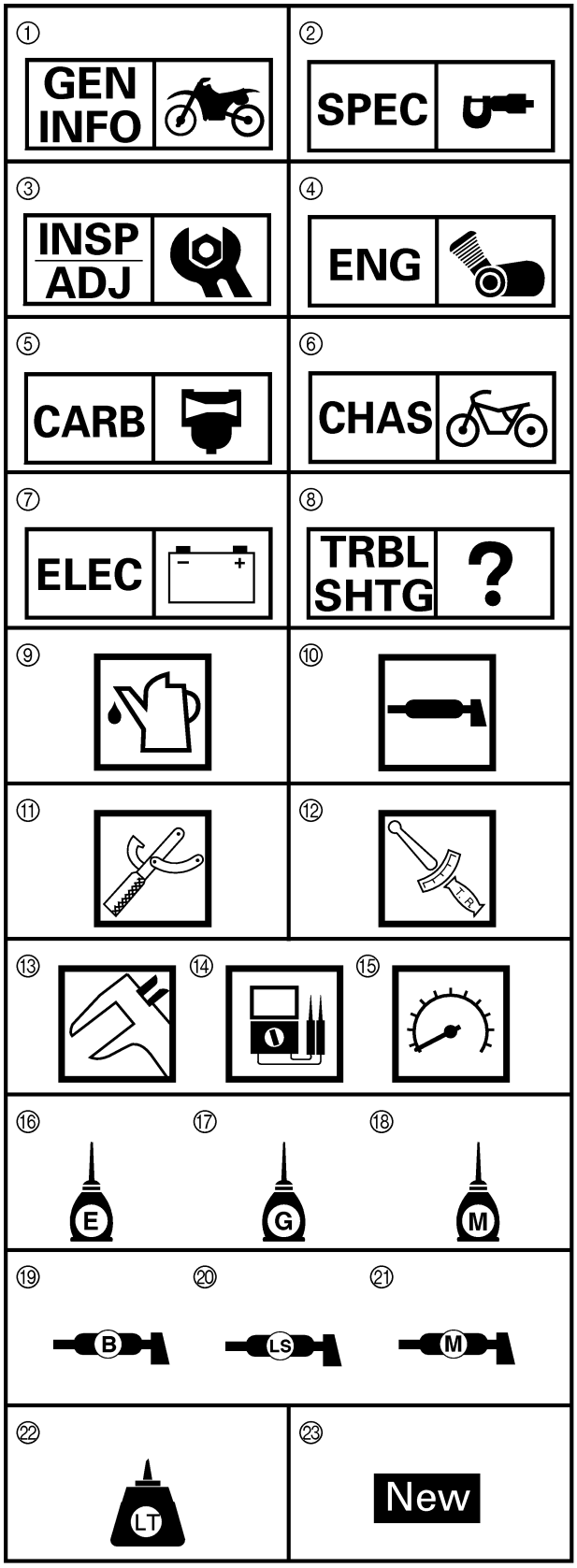
⑨ : An arrow mark after a given defect suggests the recommended course of action.

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

EXPLODED DIAGRAMS

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





EB003000

ILLUSTRATED SYMBOLS

Illustrated symbols ① to ⑧ are printed on the top right of each page and indicate the subject of each chapter.

① General information
② Specifications
③ Periodic inspections and adjustments
④ Engine overhall
⑤ Carburetor
⑥ Chassis
⑦ Electrical
⑧ Troubleshooting

Illustrated symbols ⑨ to ⑮ are used to identify the specifications appearing in the text.

⑨ Filling fluid
⑩ Lubricant
⑪ Special tool
⑫ Torque
⑬ Wear limit, clearance
⑭ Engine speed
⑮ Ω, V, A

Illustrated symbols ⑯ to ㉑ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑯ Apply engine oil
⑰ Apply gear oil
⑱ Apply molybdenum disulfide oil
⑲ Apply wheel bearing grease
⑳ Apply lightweight lithium-soap base grease
㉑ Apply molybdenum disulfide grease

Illustrated symbols ㉒ to ㉓ in the exploded diagrams indicate where to apply a locking agent ㉒ and when to install a new part ㉓.

㉒ Apply the locking agent (LOCTITE®)
㉓ Replace

TABLE OF CONTENTS

GENERAL INFORMATION	GEN INFO 1
SPECIFICATIONS	SPEC 2
PERIODIC CHECKS AND ADJUSTMENTS	CHK ADJ 3
ENGINE	ENG 4
CARBURETOR	CARB 5
CHASSIS	CHAS 6
ELECTRICAL SYSTEM	ELEC 7
TROUBLESHOOTING	TRBL SHTG 8

CONTENTS

CHAPTER 1.
GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION 1-1
- VEHICLE IDENTIFICATION NUMBER 1-1
- ENGINE SERIAL NUMBER 1-1

IMPORTANT INFORMATION 1-2
- PREPARATION FOR REMOVAL AND DISASSEMBLY 1-2
- ALL REPLACEMENT PARTS 1-3
- GASKETS, OIL SEALS, AND O-RINGS 1-3
- LOCK WASHERS/PLATES AND COTTER PINS 1-3
- BEARINGS AND OIL SEALS 1-3

SPECIAL TOOLS 1-4
- FOR TUNE UP 1-4
- FOR ENGINE SERVICE 1-5
- FOR CHASSIS SERVICE 1-6
- FOR ELECTRICAL COMPONENTS 1-7

CHAPTER 2.
SPECIFICATIONS

GENERAL SPECIFICATIONS 2-1

MAINTENANCE SPECIFICATIONS 2-4
- ENGINE 2-4
- CHASSIS 2-12
- ELECTRICAL 2-16

GENERAL TORQUE SPECIFICATIONS 2-18

LUBRICATION POINTS AND LUBRICANT TYPES 2-19
- ENGINE 2-19
- CHASSIS 2-20

LUBRICATION DIAGRAM 2-21

CABLE ROUTING 2-24

CHAPTER 3.
PERIODIC CHECKS AND ADJUSTMENTS
PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION 3-1

PERIODIC MAINTENANCE/LUBRICATION 3-1

SEAT, FUEL TANK AND COVERS 3-3
- REMOVAL 3-3
- INSTALLATION 3-4

ENGINE 3-6
- VALVE CLEARANCE ADJUSTMENT 3-6
- TIMING CHAIN ADJUSTMENT 3-13
- IDLING SPEED ADJUSTMENT 3-13
- THROTTLE CABLE FREE PLAY ADJUSTMENT 3-14
- SPARK PLUG INSPECTION 3-15
- IGNITION TIMING CHECK 3-17
- COMPRESSION PRESSURE MEASUREMENT 3-18
- ENGINE OIL LEVEL INSPECTION 3-19
- ENGINE OIL REPLACEMENT 3-20
- OIL PRESSURE INSPECTION 3-24
- CLUTCH ADJUSTMENT 3-24
- AIR FILTER CLEANING 3-25
- SPARK ARRESTER CLEANING 3-27
- CRANKCASE BREATHER HOSE INSPECTION 3-28
- FUEL LINE INSPECTION 3-28
- EXHAUST SYSTEM INSPECTION 3-28
- CARBURETOR JOINT INSPECTION 3-28

CHASSIS 3-29
- FRONT BRAKE ADJUSTMENT 3-29
- REAR BRAKE ADJUSTMENT 3-29
- BRAKE FLUID LEVEL INSPECTION 3-31
- AIR BLEEDING (HYDRAULIC BRAKE SYSTEM) 3-32
- BRAKE PAD INSPECTION 3-33
- BRAKE HOSE INSPECTION 3-34
- DRIVE CHAIN SLACK ADJUSTMENT 3-34
- DRIVE CHAIN LUBRICATION 3-36
- STEERING HEAD ADJUSTMENT 3-36
- FRONT FORK INSPECTION 3-38

FRONT FORK ADJUSTMENT 3-39
REAR SHOCK ABSORBER ADJUSTMENT 3-41
TIRE INSPECTION 3-43
WHEEL INSPECTION 3-46
SPOKES INSPECTION AND TIGHTENING 3-46
CABLE INSPECTION AND LUBRICATION 3-46
LEVER AND PEDAL LUBRICATION 3-47
SIDESTAND LUBRICATION 3-47

ELECTRICAL 3-48
BATTERY INSPECTION 3-48
FUSE INSPECTION 3-54
HEADLIGHT BEAM ADJUSTMENT 3-56
HEADLIGHT BULB REPLACEMENT 3-56

CHAPTER 4.
ENGINE OVERHAUL

ENGINE REMOVAL 4-1
SEAT, FUEL TANK AND COVERS 4-1
CARBURETOR 4-1
ENGINE GUARD 4-1
ENGINE OIL 4-1
BATTERY 4-2
EXHAUST PIPE 4-2
CRANKCASE BREATHER HOSE 4-2
STARTER MOTOR 4-2
CLUTCH CABLE AND LEADS 4-3
DRIVE SPROCKET 4-3
FOOTREST AND BRAKE PEDAL 4-4
ENGINE REMOVAL 4-4

ENGINE DISASSEMBLY 4-5
CYLINDER HEAD, CAMSHAFTS, CYLINDER AND PISTON 4-5
CLUTCH, OIL PUMP AND BALANCER GEAR 4-8
SHIFT SHAFT 4-10
ROTOR AND STARTER DRIVES 4-10
OIL FILTER 4-12
CRANKCASE 4-12
BALANCER, TRANSMISSION AND SHIFTER 4-13
CRANKSHAFT 4-14
BEARINGS AND OIL SEALS 4-14
VALVE 4-14

INSPECTION AND REPAIR 4-16
CYLINDER HEAD 4-16
VALVE SEAT 4-16
VALVE AND VALVE GUIDE 4-20
VALVE SPRING 4-21
CAMSHAFT 4-22
VALVE LIFTER 4-24
TIMING CHAIN, SPROCKET AND CHAIN GUIDE 4-24
CYLINDER AND PISTON 4-25
PISTON RING 4-27
PISTON PIN 4-27
CRANKSHAFT 4-28
BALANCER DRIVE GEAR AND BALANCER GEAR 4-29
PRIMARY DRIVE 4-30
CLUTCH 4-30
TRANSMISSION AND SHIFTER 4-31
OIL PUMP AND STRAINER 4-33
ELECTRIC STARTER DRIVE 4-34
CRANKCASE 4-35
BEARING AND OIL SEAL 4-35
CIRCLIP AND WASHER 4-35

ENGINE ASSEMBLY AND ADJUSTMENT 4-36
CRANKSHAFT AND BALANCER 4-36
CRANKSHAFT AND BALANCER SHAFT 4-37
TRANSMISSION 4-38
SHIFTER 4-39
TRANSMISSION AND SHIFTER 4-40
CRANKCASE 4-42
CRANKCASE (RIGHT) 4-43
SHIFT SHAFT 4-43
OIL PUMP 4-45
CLUTCH 4-46
OIL PUMP 4-47
CLUTCH 4-47
OIL FILTER 4-50
ROTOR AND STARTER DRIVES 4-51
ROTOR AND STARTER DRIVES 4-52
CYLINDER AND PISTON 4-54
CYLINDER AND PISTON 4-55
CYLINDER HEAD 4-57
VALVE, CAMSHAFT AND CAM CHAIN 4-58
VALVE AND CAMSHAFT 4-59
CYLINDER HEAD 4-61
REMOUNTING ENGINE 4-63

CHAPTER 5.
CARBURETOR

CARBURETOR 5-1
REMOVAL 5-2
DISASSEMBLY 5-3
INSPECTION 5-5
ASSEMBLY 5-7
INSTALLATION 5-9
FUEL LEVEL ADJUSTMENT 5-10
THROTTLE VALVE POSITION 5-11

CHAPTER 6.
CHASSIS

FRONT WHEEL 6-1
REMOVAL 6-2
INSPECTION 6-2
INSTALLATION 6-5
WHEEL STATIC BALANCE ADJUSTMENT 6-6

REAR WHEEL 6-8
REMOVAL 6-9
INSPECTION 6-9
INSTALLATION 6-10
WHEEL STATIC BALANCE ADJUSTMENT 6-11

FRONT AND REAR BRAKE 6-12
BRAKE PAD REPLACEMENT 6-14
CALIPER DISASSEMBLY 6-18
MASTER CYLINDER DISASSEMBLY 6-21
INSPECTION AND REPAIR 6-24
CALIPER ASSEMBLY 6-26
MASTER CYLINDER ASSEMBLY 6-31

FRONT FORK 6-35
REMOVAL 6-36
DISASSEMBLY 6-37
INSPECTION 6-38
ASSEMBLY 6-40
INSTALLATION 6-44

STEERING HEAD AND HANDLEBAR 6-46
REMOVAL 6-48
INSPECTION 6-51
INSTALLATION 6-52

REAR SHOCK ABSORBER AND SWINGARM 6-58
HANDLING NOTES 6-60
NOTES ON DISPOSAL 6-60
REMOVAL 6-61
INSPECTION 6-66
INSTALLATION 6-68

DRIVE CHAIN AND SPROCKETS 6-72
REMOVAL 6-73
INSPECTION 6-74
INSTALLATION 6-75

CHAPTER 7.
ELECTRICAL

TTR250L(C) CIRCUIT DIAGRAM 7-1

ELECTRICAL COMPONENTS 7-3

CHECKING OF CONNECTIONS 7-5

IGNITION SYSTEM 7-6

ELECTRICAL STARTING SYSTEM 7-12
STARTING CIRCUIT OPERATION 7-13
STARTER MOTOR 7-19

CHARGING SYSTEM 7-23

LIGHTING SYSTEM 7-26
LIGHTING SYSTEM CHECK 7-29

CHAPTER 8.
TROUBLESHOOTING

STARTING FAILURE/HARD STARTING 8-1
- FUEL SYSTEM 8-1
- ELECTRICAL SYSTEM 8-1
- COMPRESSION SYSTEM 8-1

POOR IDLE SPEED PERFORMANCE 8-2
- POOR IDLE SPEED PERFORMANCE 8-2

POOR MEDIUM AND HIGH SPEED PERFORMANCE 8-2
- POOR MEDIUM AND HIGH SPEED PERFORMANCE 8-2

FAULTY GEAR SHIFTING 8-3
- HARD SHIFTING 8-3
- SHIFT PEDAL DOES NOT MOVE 8-3
- JUMP-OUT GEAR 8-3

CLUTCH SLIPPING/DRAGGING 8-3
- CLUTCH SLIPPING 8-3
- CLUTCH DRAGGING 8-3

OVERHEATING 8-4
- OVERHEATING 8-4

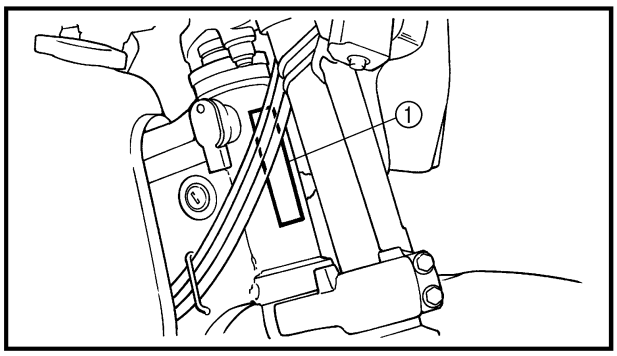
FAULTY BRAKE 8-4
- POOR BRAKING EFFECT 8-4

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION 8-4
- OIL LEAKAGE 8-4
- MALFUNCTION 8-4

INSTABLE HANDLING 8-5
- INSTABLE HANDLING 8-5

FAULTY SIGNAL AND LIGHTING SYSTEM 8-6
- HEADLIGHT DARK 8-6
- BULB BURNT OUT 8-6

TTR250L(C) WIRING DIAGRAM



GENERAL INFORMATION

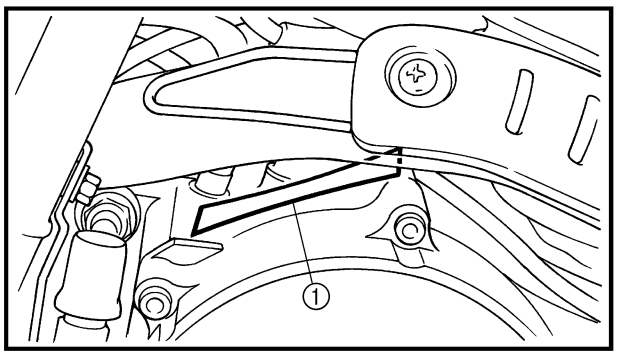
MOTORCYCLE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

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

NOTE:

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



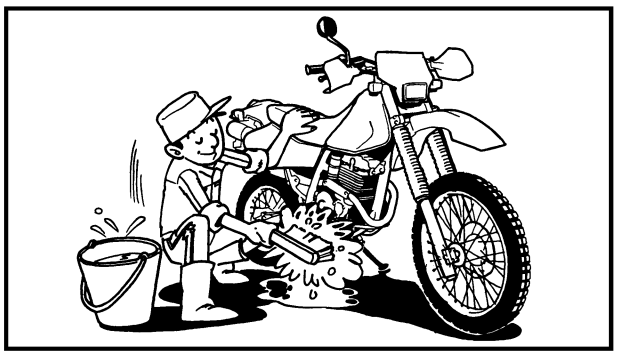
ENGINE SERIAL NUMBER

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

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.

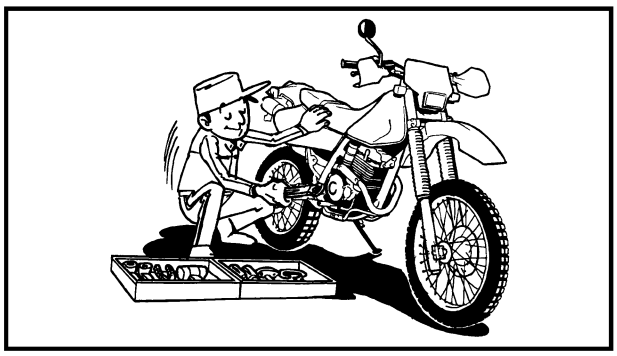
1



IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

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

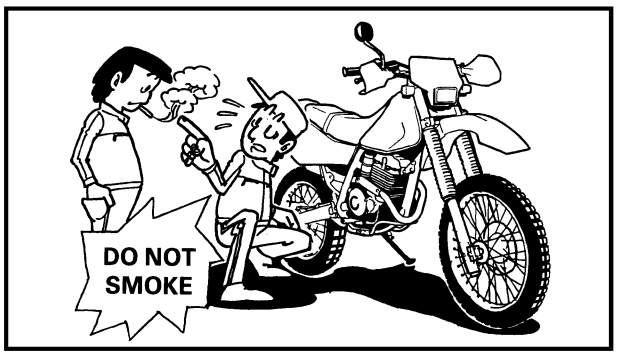


2.Use proper tools and cleaning equipment. Refer to “SPECIAL TOOLS”.

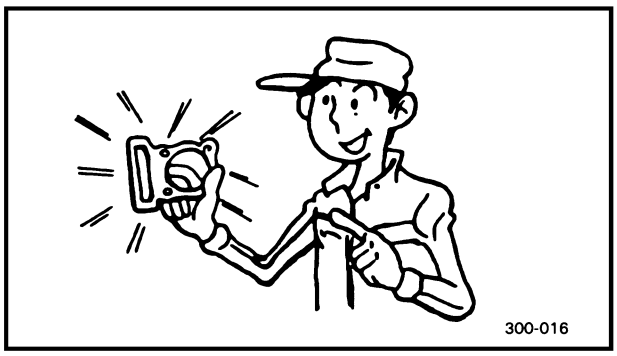


3.When disassembling the motorcycle keep mated parts together. This includes gears, cylinder, piston and other mated parts that have been “mated” through normal wear. Mated parts must be reused as an assembly or replaced.

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



5.Keep away from fire.

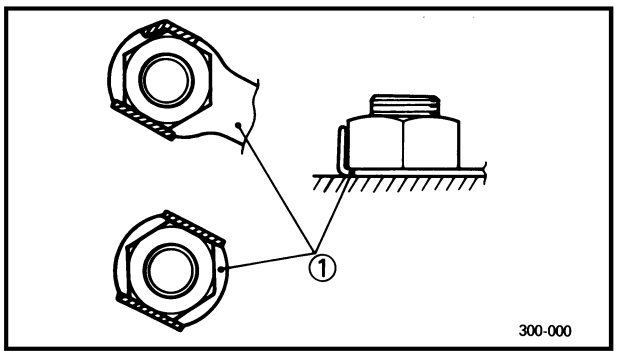


ALL REPLACEMENT PARTS

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.

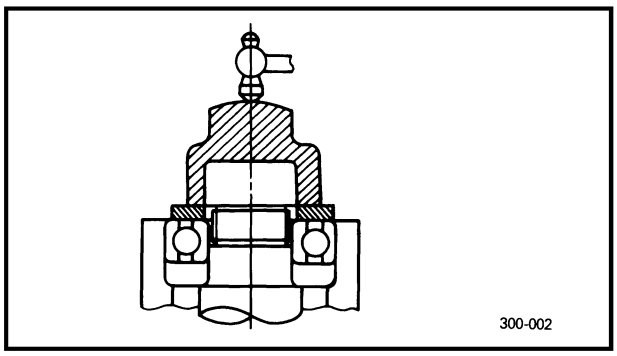
GASKETS, OIL SEALS, AND O-RINGS

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.



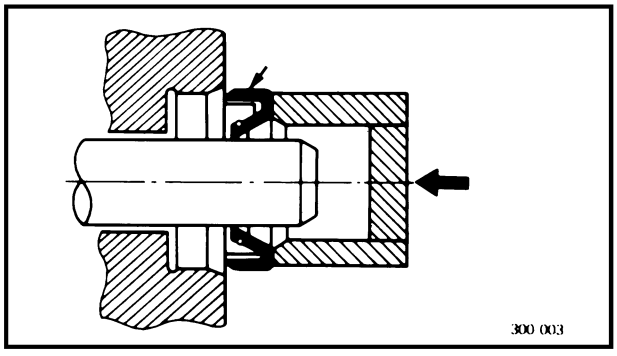
LOCK WASHERS/PLATES AND COTTER PINS

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.



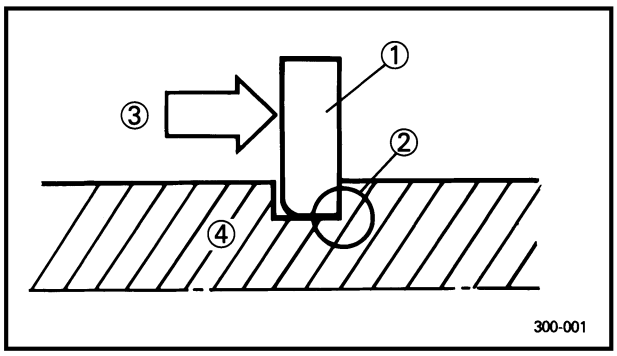
BEARINGS AND OIL SEALS

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), apply 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

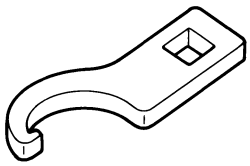
SPECIAL TOOLS

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.

FOR TUNE UP

1

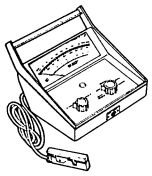
Steering nut wrench
P/N. YU-33975



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

2

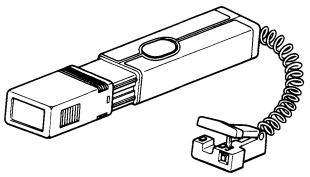
Inductive tachometer
P/N. YU-8036-A



This tool is needed for detecting engine r/min.

3

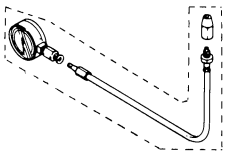
Inductive timing light
P/N. YM-33277-A



This tool is necessary for checking ignition timing.

4

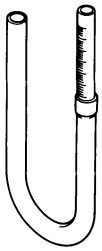
Compression gauge
P/N. YU-33223
Adapter (M12)
P/N. YU-33223-3



These gauges are used to measure the engine compression.

5

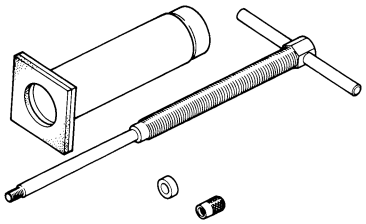
Fuel level gauge
P/N. YM-01312-A



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

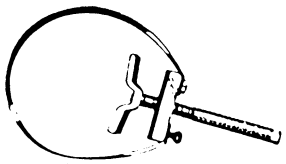
FOR ENGINE SERVICE

1
Piston pin puller
P/N. YU-01304



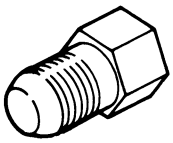
This tool is used to remove the piston pin.

2
Sheave holder
P/N. YS-01880



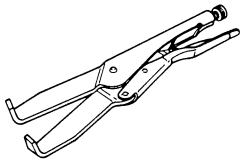
This tool is used to hold the rotor when removing or installing the rotor securing nut.

3
Rotor puller
P/N. 2K7-85555-00



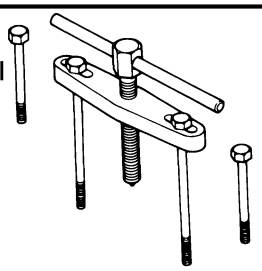
This tool is used to remove the rotor.

4
Universal clutch holder
P/N. YM-91042



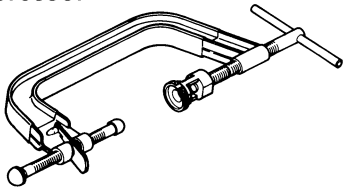
This tool is used to hold the clutch when removing or installing the clutch boss locknut.

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



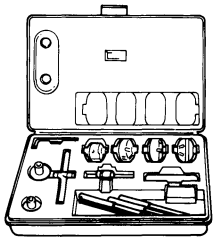
This tool is necessary to remove the crankshaft.

6
Valve spring compressor
P/N. YM-04019



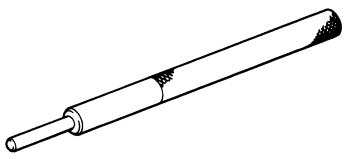
This tool is needed to remove and install the valve assemblies.

7
Valve seat cutter set
P/N. YM-91043



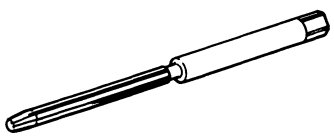
This tool is needed to resurface the valve seat.

8
Valve guide remover 5 mm (0.20 in)
P/N. YM-04097



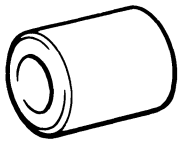
This tool is used to remove the valve guides.

9
Valve guide reamer 5 mm (0.20 in)
P/N. YM-04099



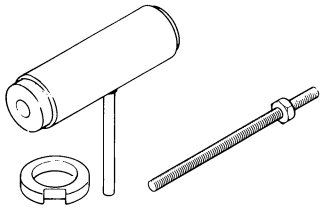
This tool is used to rebore the new valve guide.

10
Valve guide installer 5 mm (0.20 in)
P/N. YM-04098



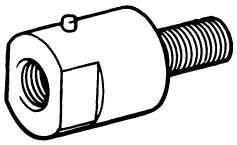
This tool is needed to install the valve guides properly.

11
Crankshaft installing set
P/N. YU-90050



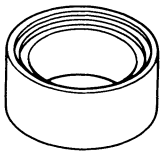
These tools are used to install the crankshaft.

12
Adapter (M10)
P/N. YU-90062



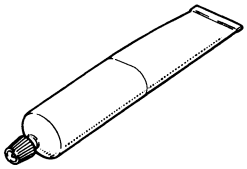
This tool is used to install the crankshaft.

13
Crank pot spacer
P/N. YU-01202



This tool is used to install the crankshaft.

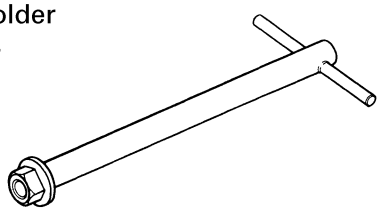
14
Quick Gasket®
P/N. ACC-11001-05-01



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

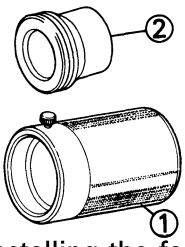
FOR CHASSIS SERVICE

1
Damper rod holder
P/N. YM-01418



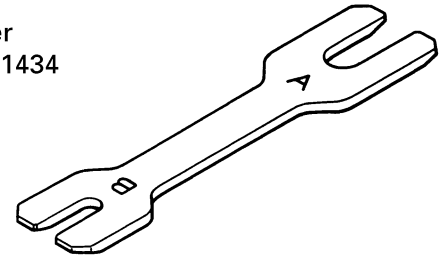
This tool is used to loosen and tighten the damper rod holding bolt.

2
Front fork seal drive weight
P/N. YM-33963-①
Adapter 43 mm (1.69 in)
P/N. YM-8020-②



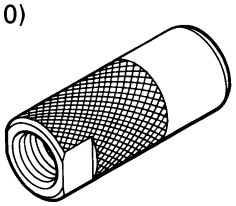
These tools are used when installing the fork oil seal.

3
Rod holder
P/N. YM-01434



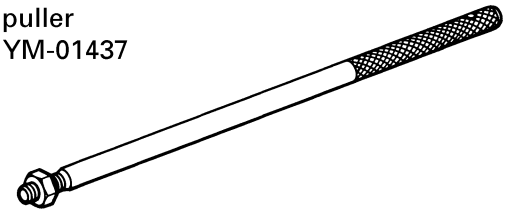
This tool is used to hold the fork spring.

4
Rod puller attachment (M10)
P/N. 90890-01436



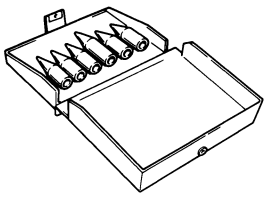
This tool is used to pull up the fork damper rod.

5
Rod puller
P/N. YM-01437



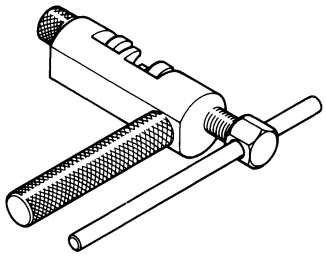
This tool is used to pull up the fork damper

6
Cylinder cup installer
P/N. 90890-01996



This tool is used to install the master cylinder kit.

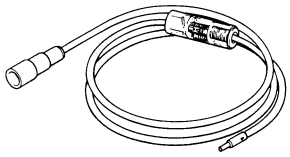
7
Drive chain cutter
P/N. YM-33858



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

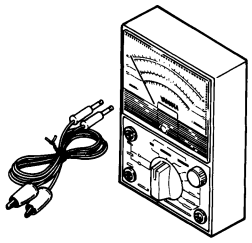
FOR ELECTRICAL COMPONENTS

1
Dynamic spark tester
P/N. YM-34487



This instrument is necessary for checking the ignition system components.

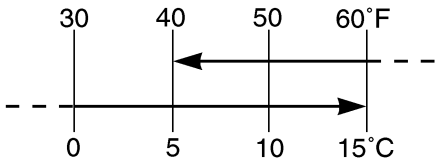
2
Pocket tester
P/N. YU-03112



This instrument is used for checking the electrical system.

SPECIFICATIONS

GENERAL SPECIFICATIONS

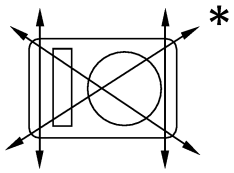
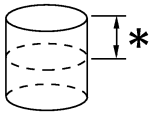
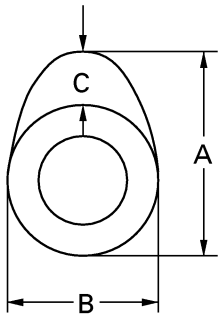
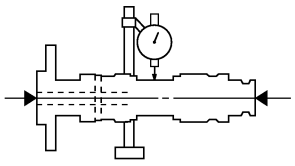
Model	TTR250L(C)
Model code:	5GF1 5GF2
Dimensions:	
Overall length	2,095 mm (82.5 in)
Overall width	835 mm (32.9 in)
Overall height	1,260 mm (49.6 in)
Seat height	915 mm (36.0 in)
Wheelbase	1,405 mm (55.3 in)
Minimum ground clearance	305 mm (12.0 in)
Minimum turning radius	2,200 mm (86.6 in)
Basic weight:	
With oil and full fuel tank	124 kg (273 lb)
Engine:	
Engine type	Air-cooled 4-stroke, DOHC
Cylinder arrangement	Forward-inclined single cylinder
Displacement	249 cm^3
Bore × stroke	73.0 × 59.6 mm (2.87 × 2.35 in)
Compression ratio	10.2 : 1
Compression pressure (STD)	1,200 kPa (12 kg/cm^2, 174 psi) at 300 r/min
Starting system	Electric starter
Lubrication system	Wet sump
Oil type or grade:	
Engine oil	 SAE 20W40 type SE motor oil SAE 10W30 type SE motor oil
Oil capacity:	
Engine oil	
Periodic oil change	1.10 L (0.97 Imp qt, 1.16 US qt)
With oil filter replacement	1.20 L (1.06 Imp qt, 1.27 US qt)
Total amount	1.45 L (1.28 Imp qt, 1.53 US qt)
Air filter:	Wet type element
Fuel:	
Type	Unleaded fuel only
Fuel tank capacity	10 L (2.20 Imp gal, 2.64 US gal)
Fuel reserve amount	2 L (0.44 Imp gal, 0.53 US gal)

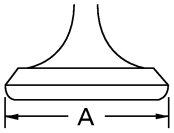
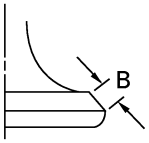
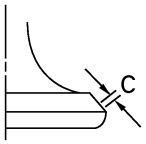
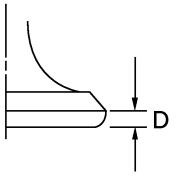
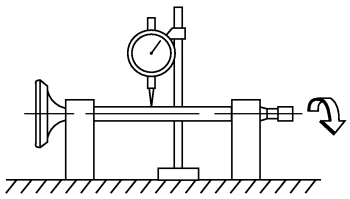
Model		TTR250L(C)
Carburetor:		
Type / quantity		Y30P/1
Manufacturer		TEIKEI
Spark plug:		
Type		CR9E/U27ESR-N
Manufacturer		NGK/DENSO
Spark plug gap		0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
Clutch type:		Wet, multiple-disc
Transmission:		
Primary reduction system		Spur gear
Primary reduction ratio		74/24 (3.083)
Secondary reduction system		Chain drive
Secondary reduction ratio		52/13 (4.000)
Transmission type		Constant mesh 6-speed
Operation		Left foot operation
Gear ratio	1st	37/15 (2.466)
	2nd	29/16 (1.812)
	3rd	30/22 (1.363)
	4th	27/25 (1.080)
	5th	24/27 (0.888)
	6th	22/29 (0.758)
Chassis:		
Frame type		Semi double cradle
Caster angle		26°
Trail		108 mm (4.25 in)
Tire:		
Type		With tube
Size	front	80/100-21 51M
	rear	100/100-18 59M
Manufacturer	front	DUNLOP
	rear	DUNLOP
Type	front	D739F
	rear	D739
Tire pressure (cold tire):		
Maximum load-except motorcycle*		90 kg (198 lb)
Off-road riding*		
	front	100 kPa (1 kg/cm^2, 14.5 psi)
	rear	100 kPa (1 kg/cm^2, 14.5 psi)
*Load is total weight of rider, and accessories.		

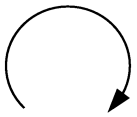
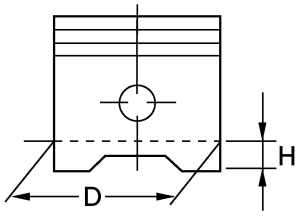
Model		TTR250L(C)
Brake:		
Front brake	type	Single disc brake
	operation	Right hand operation
Rear brake	type	Single disc brake
	operation	Right foot operation
Suspension:		
Front suspension		Telescopic fork
Rear suspension		Swingarm (link suspension)
Shock absorber:		
Front shock absorber		Coil-air spring / oil damper
Rear shock absorber		Coil spring / gas-oil damper
Wheel travel:		
Front wheel travel		280 mm (11.0 in)
Rear wheel travel		280 mm (11.0 in)
Electrical:		
Ignition system		C.D.I.
Generator system		A.C. magneto generator
Battery type		GT7B-4
Battery capacity		12 V 6.5 AH
Headlight type:		Quartz bulb (Halogen)
Bulb wattage × quantity:		
Headlight		12 V 35 W/36.5 W
Tail light		12 V 5 W/21 W

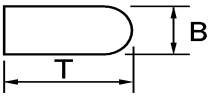
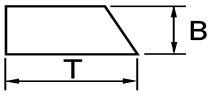
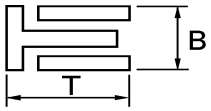
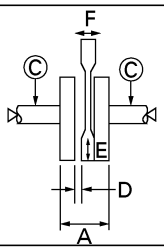
MAINTENANCE SPECIFICATIONS

ENGINE

Model	TTR250L(C)
Cylinder head:	
Volume	21.6 ~ 22.2 cm^3
<Warp limit> 	<0.03 mm (0.0012 in)> *Lines indicate straightedge measurement.
Cylinder:	
Material 	Aluminum alloy
Sleeve type	Sleeveless, surface honing
Bore size	72.97 ~ 73.02 mm (2.8728 ~ 2.8748 in)
*Measuring point	40 mm (1.57 in)
<Wear limit>	<73.1 mm (2.8779 in)>
<Warp limit>	<0.03 mm (0.0012 in)>
Camshaft:	
Drive method	Chain drive (right)
Cam cap inside diameter	24.500 ~ 24.521 mm (0.9646 ~ 0.9654 in)
Camshaft outside diameter	24.467 ~ 24.480 mm (0.9633 ~ 0.9638 in)
Shaft-to-cap clearance	0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)
Cam dimensions	
Intake  "A"	32.75 ~ 32.85 mm (1.2894 ~ 1.2933 in)
<limit>	<32.7 mm (1.287 in)>
"B"	25.0 ~ 25.1 mm (0.9843 ~ 0.9882 in)
<limit>	<24.96 mm (0.983 in)>
"C"	7.8 mm (0.3071 in)
Exhaust "A"	32.75 ~ 32.85 mm (1.2894 ~ 1.2933 in)
<limit>	<32.7 mm (1.287 in)>
"B"	25.0 ~ 25.1 mm (0.9843 ~ 0.9882 in)
<limit>	<24.96 mm (0.983 in)>
"C"	7.8 mm (0.3071 in)
Camshaft runout limit 	0.03 mm (0.0012 in)
Camshaft oil clearance	0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)
<Limit>	<0.08 mm (0.0031 in)>
Cam chain:	
Cam chain type / No. of links	82RH2010-122M/122
Cam chain adjustment method	Automatic

Model		TTR250L(C)
Valve, valve seat, valve guide:		
Valve clearance (cold)	IN	0.09 ~ 0.19 mm (0.004 ~ 0.007 in)
	EX	0.19 ~ 0.27 mm (0.007 ~ 0.011 in)
Valve dimensions:		
 Head Diameter		 Face Width
 Seat Width		 Margin Thickness
"A" head diameter	IN	28.4 ~ 28.6 mm (1.118 ~ 1.126 in)
	EX	23.9 ~ 24.1 mm (0.941 ~ 0.949 in)
"B" face width	IN	2.26 mm (0.089 in)
	EX	2.26 mm (0.089 in)
"C" seat width	IN	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
	EX	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
"D" margin thickness	IN	0.6 ~ 1.0 mm (0.024 ~ 0.039 in)
	EX	0.8 ~ 1.2 mm (0.031 ~ 0.047 in)
Stem outside diameter	IN	4.975 ~ 4.990 mm (0.1959 ~ 0.1965 in)
	EX	4.960 ~ 4.975 mm (0.1953 ~ 0.1959 in)
<Limit>	IN	<4.95 mm (0.195 in)>
	EX	<4.94 mm (0.194 in)>
Guide inside diameter	IN	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)
	EX	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)
<Limit>	IN	<5.03 mm (0.198 in)>
	EX	<5.03 mm (0.198 in)>
Stem-to-guide clearance	IN	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
	EX	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
<Limit>	IN	<0.08 mm (0.003 in)>
	EX	<0.1 mm (0.004 in)>
<Stem runout limit>		<0.01 mm (0.0004 in)>
		
Valve face material		Stellite
Valve seat width	IN	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
	EX	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
<Limit>	IN	<1.6 mm (0.06 in)>
	EX	<1.6 mm (0.06 in)>

Model		TTR250L(C)
Valve spring:		
Free length	IN	35.59 mm (1.40 in)
	EX	35.59 mm (1.40 in)
<Limit>	IN	<33.81 mm (1.33 in)>
	EX	<33.81mm (1.33 in)>
Spring rate	IN-K1	18.9 N/mm (1.93 kg/mm, 107.92 lb/in)
	IN-K2	24.5 N/mm (2.50 kg/mm, 139.9 lb/in)
	EX-K1	18.9 N/mm (1.93 kg/mm, 107.92 lb/in)
	EX-K2	24.5 N/mm (2.50 kg/mm, 139.9 lb/in)
Set length (valve closed)	IN	30.39 mm (1.2 in)
	EX	30.39 mm (1.2 in)
Compressed pressure (installed)	IN	9.3 ~ 10.7 kg (20.50 ~ 23.58 lb)
	EX	9.3 ~ 10.7 kg (20.50 ~ 23.58 lb)
<Tilt limit>	IN	<2.5° / 1.6 mm (2.5° / 0.063 in)>
	EX	<2.5° / 1.6 mm (2.5° / 0.063 in)>
Direction of winding (top view)	IN	Clockwise
	EX	Clockwise 
Valve lifter outside diameter	IN	22.476 ~ 22.500 mm (0.88 ~ 0.89 in)
<Limit>	IN	<22.451 mm (0.88 in)>
Piston:		
Piston part number		4GY-11631-00
Piston to cylinder clearance		0.04 ~ 0.06 mm (0.0016 ~ 0.0024 in)
<Limit>		<0.15 mm (0.0059 in)>
Piston size “D” 		72.92 ~ 72.97 mm (2.8709 ~ 2.8728 in)
Measuring point “H”		1 mm (0.039 in)
Piston off-set		0.5 mm (0.020 in)
Piston off-set direction		In side
Piston pin bore inside diameter		18.004 ~ 18.015 mm (0.7088 ~ 0.7093 in)
<Limit>		<18.045 mm (0.71 in)>
Piston pin outside diameter		17.991 ~ 18.000 mm (0.7083 ~ 0.7087 in)
<Limit>		<17.976 mm (0.71 in)>

Model	TTR250L(C)
Piston rings:	
Top ring	
Type 	Barrel
Dimensions (B × T)	1.0 × 3.1 mm (0.039 × 0.122 in)
End gap (installed)	0.20 ~ 0.35 mm (0.008 ~ 0.014 in)
<Limit>	<0.4 mm (0.016 in)>
Side clearance (installed)	0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in)
<Limit>	<0.12 mm (0.005 in)>
Plating/coating	Chrome plated/parkerizing
2nd ring:	
Type 	Taper
Dimensions (B × T)	1.0 × 3.1 mm (0.039 × 0.122 in)
End gap (installed)	0.20 ~ 0.35 mm (0.008 ~ 0.014 in)
<Limit>	<0.4 mm (0.016 in)>
Side clearance	0.03 ~ 0.07 mm (0.001 ~ 0.003 in)
<Limit>	<0.12 mm (0.005 in)>
Plating/coating	Parkerizing
Oil ring:	
Dimensions (B × T) 	2.0 × 2.5 mm (0.079 × 0.098 in)
End gap (installed)	0.2 ~ 0.7 mm (0.008 ~ 0.028 in)
Side clearance	0.060 ~ 0.155 mm (0.002 ~ 0.006 in)
Plating/coating	Chrome plated/parkerizing
Connecting rod:	
Connecting rod length	102.4 ~ 102.6 mm (4.03 ~ 4.04 in)
Crankshaft:	
Crank width "A" 	60.25 ~ 60.30 mm (2.372 ~ 2.374 in)
<Runout limit "C">	<0.03 mm (0.0012 in)>
Big end side clearance "D"	0.35 ~ 0.85 mm (0.014 ~ 0.033 in)
Big end radial clearance "E"	0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in)
Small end free play "F"	0.8 mm (0.0315 in)
Balancer:	
Balancer drive method	Gear
Clutch:	
Friction plate thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)
Quantity	7 pcs
<Friction plate wear limit>	<2.7 mm (0.11 in)>
Clutch plate thickness	1.5 ~ 1.7 mm (0.059 ~ 0.067 in)
Quantity	6 pcs
<Warp limit>	<0.05 mm (0.002 in)>
Clutch spring free length	42.8 mm (1.69 in)
Quantity	5 pcs
Minimum length	40.8 mm (1.61 in)
Clutch housing thrust clearance	0.08 ~ 0.33 mm (0.003 ~ 0.013 in)
Clutch housing radial clearance	0.010 ~ 0.044 mm (0.0004 ~ 0.0017 in)

Model		TTR250L(C)
Clutch release method		Inner push, cam push
<Push rod bending limit>		<0.5 mm (0.020 in)>
Transmission:		
<Main axle deflection limit>		<0.08 mm (0.003 in)>
<Drive axle deflection limit>		<0.08 mm (0.003 in)>
Shifter:		
Shifter type		Cam drum and guide bar
Shift fork thickness		4.76 ~ 4.89 mm (0.1874 ~ 0.1925 in)
Air filter oil grade:		Foam-air-filter oil or SAE 10W30 type SE motor oil
Carburetor:		
I.D. mark		5GF1 00
Main jet	(M.J)	#137
Main air jet	(M.A.J)	1.0
Jet needle	(J.N)	5C9C-3/5
Needle jet	(N.J)	2.595 (V95)
Cutaway	(C.A)	4.0
Pilot air jet	(P.A.J.1)	1.2
Pilot outlet	(P.O)	0.8
Pilot jet	(P.J)	#52
Bypass 1	(B.P.1)	1.0 × 2
Pilot screw	(P.S)	1-1/2
Valve seat size	(V.S)	2.0
Starter jet	(G.S.1)	#66
Starter jet	(G.S.2)	2.0
Float height	(F.H)	26.5 ~ 27.5 mm (1.04 ~ 1.08 in)
Fuel level	(F.L)	7.5 ~ 9.5 mm (0.30 ~ 0.37 in)
Engine idle speed		1,250 ~ 1,350 r/min
Intake vacuum		24.0 ~ 29.3 kPa (180 ~ 220 mmHg, 7.087 ~ 8.652 inHg)
Oil temperature		55 ~ 65 ˚C (131 ~ 149 ˚F)
Lubrication system:		
Oil filter type		Wire mesh type
Oil pump type		Trochoid type
Tip clearance “A” or “B”		0.15 mm (0.006 in)
<Limit>		<0.2 mm (0.008 in)>
Side clearance		0.10 ~ 0.15 mm (0.004 ~ 0.006 in)
<Limit>		<0.2 mm (0.008 in)>
Housing and rotor clearance		0.04 ~ 0.09 mm (0.002 ~ 0.004 in)
<Limit>		<0.15 mm (0.006 in)>
Oil pressure (hot)		100 kPa (1 kg/cm^2, 14.22 psi) at 1,300 r/min
Pressure check location		Crankcase cover 3

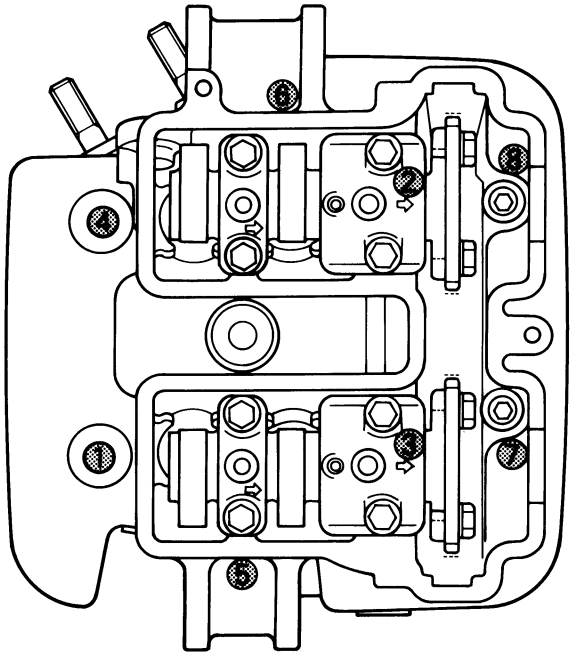
TIGHTENING TORQUES

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Cylinder head (camshaft cap)	Flange bolt	M6	8	10	1.0	7.2	
Spark plug	–	M10S	1	13	1.3	9.4	
Cylinder head (exhaust pipe)	Stud bolt	M10	2	20	2.0	14	
Cylinder head	Flange bolt	M10	4	40	4.0	29	
Cylinder head	Flange bolt	M6	2	10	1.0	7.2	
Cylinder head	Nut	M8	2	20	2.0	14	
Cylinder head cover	Bolt	M6	3	10	1.0	7.2	
Flywheel magneto	Flange bolt	M10	1	60	6.0	43	
Camshaft sprocket	Flange bolt	M7	4	24	2.4	17	
Camshaft cap	Flange bolt	M6	8	8	0.8	5.8	
Timing chain damper 2	Bolt	M6	2	8	0.8	5.8	LT
Stopper guide	Panhead screw	M6	1	7	0.7	5.1	
Oil pump assembly	Panhead screw	M6	3	6	0.6	4.3	LT
Drain bolt (oil filter)	Bolt	M6	1	10	1.0	7.2	
Oil check bolt	Bolt	M6	1	7	0.7	5.1	
Plug (oil cooler)	Plug	M12	3	32	3.2	23	
Oil delivery pipe	Union bolt	M10	2	20	2.0	14	
Oil delivery pipe	Union bolt	M8	1	18	1.8	13	
Relief valve stay	Flange bolt	M6	1	10	1.0	7.2	LT
Carburetor joint (front)	Hose clamp	M4	1	2	0.2	1.4	
Carburetor joint (air filter assembly)	Hose clamp	M5	1	5	0.5	3.6	
Air filter case assembly	Bolt with washer	M6	3	5	0.5	3.6	
Exhaust pipe (cylinder head)	Nut	M8	2	7	0.7	5.1	
Exhaust pipe (muffler)	Flange bolt	M8	1	20	2.0	14	
Muffler	Bolt	M8	2	40	4.0	29	
Spark arrester	Bolt	M6	3	7	0.7	5.1	
Muffler purging bolt	Bolt	M8	1	20	2.0	14	LT
Muffler protector	Screw	M6	2	7	0.7	5.1	
Crankcase assembly	Bolt	M6	11	10	1.0	7.2	
Crankcase cover 1	Bolt	M6	8	10	1.0	7.2	
Crankcase cover 2 (starter motor cover)	Bolt	M6	5	10	1.0	7.2	
Crankcase cover 3	Bolt	M6	10	10	1.0	7.2	
One-way clutch	Bolt	M6	6	10	1.0	7.2	LT
Primary drive gear	Nut	M16	1	80	8.0	58	
Clutch boss	Nut	M16	1	75	7.5	54	
Pressure plate	Screw with washer	M6	5	8	0.8	5.8	

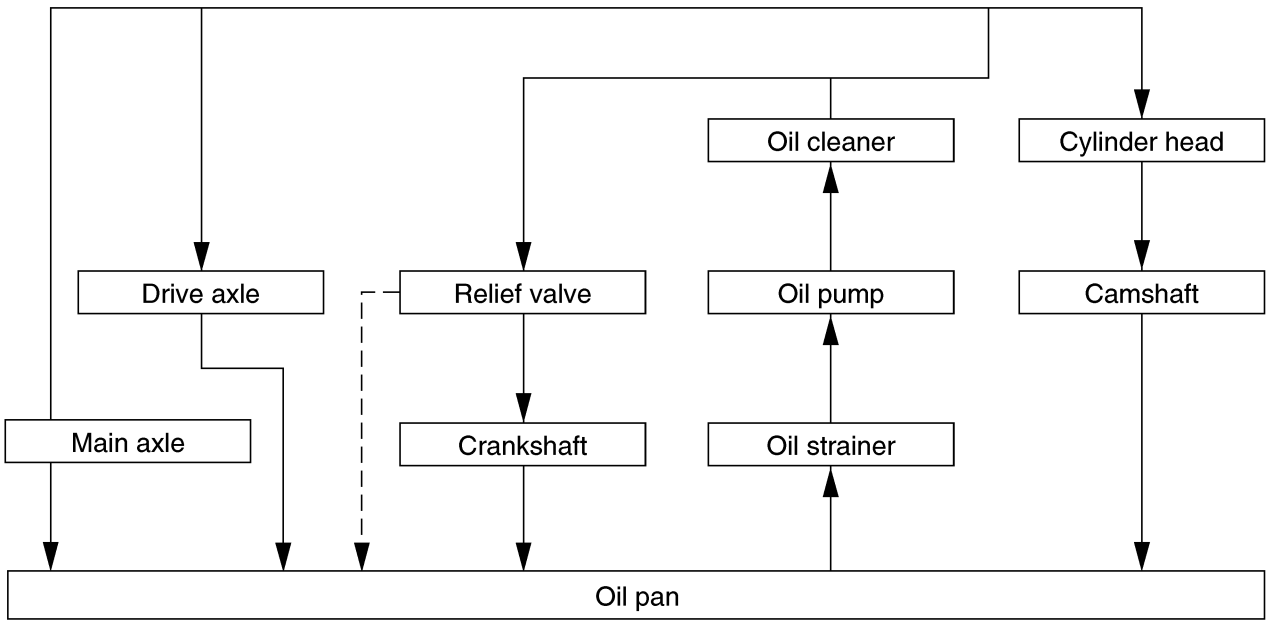
Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Push rod 2	Nut	M6	1	8	0.8	5.8	
Push lever	Screw	M8	1	12	1.2	8.7	
Clutch cable holder	Flange bolt	M6	2	10	1.0	7.2	
Drive sprocket	Nut	M18	1	110	11.0	80	
Lever stopper	Bolt	M6	1	10	1.0	7.2	LT
Shift pedal	Bolt	M6	1	10	1.0	7.2	
Starter motor	Flange bolt	M6	2	10	1.0	7.2	
Drain plug	Straight screw plug	M12	1	20	2.0	14	
Stator coil	Bolt	M5	3	7	0.7	5.1	LT

Tightening sequence

Cylinder head

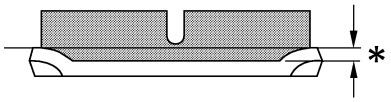
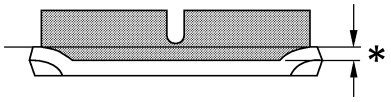


Lubrication chart



CHASSIS

Model		TTR250L(C)
Steering system:		
Steering bearing type		Taper roller bearing
Front suspension:		
Front fork travel		280 mm (11.02 in)
Fork spring free length		472 mm (18.6 in)
<Limit>		<462 mm (18.2 in)>
Spring rate	(K1)	4 N/mm (0.41 kg/mm 22.8 lb/in)
Stroke	(K1)	0 ~ 280 mm (0.00 ~ 11.02 in)
Optional spring		No
Oil capacity		555 cm^3 (19.6 Imp oz, 18.8 US oz)
Oil level		130 mm (5.12 in)
Oil grade		Suspension oil "01" or equivalent
Enclosed gas / air pressure (STD)		0 kPa (0 kg/cm^2, 0 psi)
<Min. ~ max.>		0 ~ 40 kPa (0 ~ 0.4 kg/cm^2, 0~5.8 psi)
Inner tube outer diameter		43 mm (1.69 in)
Rear suspension:		
Shock absorber travel		105 mm (4.13 in)
Spring free length		246 mm (9.69 in)
Fitting length		228 mm (8.98 in)
Spring rate	(K1)	58.8 N/mm (6 kg/mm 335.8 lb/in)
Stroke	(K1)	0 ~ 105 mm (0.00 ~ 4.13 in)
Optional spring		No
Enclosed gas / air pressure (STD)		1,000 kPa (10 kg/cm^2, 145 psi)
Swingarm:		
<Free play limit>	end	<1 mm (0.04 in)>
	side	<1 mm (0.04 in)>
Front wheel:		
Type		Spoke wheel
Rim size		1.60 × 21
Rim material		Aluminum
<Rim runout limit>	radial	<2 mm (0.08 in)>
	lateral	<2 mm (0.08 in)>
Rear wheel:		
Type		Spoke wheel
Rim size		2.15 × 18
Rim material		Aluminum
<Rim runout limit>	radial	<2 mm (0.08 in)>
	lateral	<2 mm (0.08 in)>

Model	TTR250L(C)
Drive chain:	
Type / manufacturer	520V2 / DAIDO
No. of links	110
Chain free play	35 ~ 50 mm (1.4 ~ 2.0 in)
Sealed type chain	Yes
Front disc brake:	
Type	Single
Disc outside diameter × thickness	245.0 × 3.5 mm (9.65 × 0.14 in)
<Disc thickness limit>	<3 mm (0.12 in)>
Pad thickness inner	4.2 mm (0.17 in)
<Limit>	<1 mm (0.04 in)>
Pad thickness outer	4.2 mm (0.17 in)
<Limit>	<1 mm (0.04 in)>
	
Master cylinder inside diameter	11 mm (0.43 in)
Caliper cylinder inside diameter	27 mm (1.06 in)
Brake fluid type	DOT #4
Rear disc brake:	
Type	Single
Disc outside diameter × thickness	220.0 × 4.5 mm (8.66 × 0.18 in)
<Disc thickness limit>	<4 mm (0.16 in)>
Pad thickness inner	5.6 mm (0.22 in)
<Limit>	<1 mm (0.04 in)>
Pad thickness outer	5.6 mm (0.22 in)
<Limit>	<1 mm (0.04 in)>
	
Master cylinder inside diameter	12.7 mm (0.50 in)
Caliper cylinder inside diameter	30.23 mm (1.19 in)
Brake fluid type	DOT #4
Brake lever and brake pedal:	
Brake lever free play (at lever end)	2 ~ 5 mm (0.08 ~ 0.20 in)
Brake pedal position	10 mm (0.39 in)
Clutch lever free play (at lever end)	10 ~ 15 mm (0.39 ~ 0.59 in)

TIGHTENING TORQUES

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Engine (front upper) and engine stay	M10	64	6.4	46	
Engine stay (front upper) and frame	M8	30	3.0	22	
Engine (front under) and frame	M10	64	6.4	46	
Engine (rear under) and frame	M10	64	6.4	46	
Engine (rear middle) and frame	M10	64	6.4	46	
Engine stay (rear middle) and frame	M8	23	2.3	17	
Engine (rear upper) and engine stay	M10	64	6.4	46	
Engine stay (rear upper) and frame	M8	30	3.0	22	
Engine guard and frame	M6	7	0.7	5.1	
Chain tensioner (upper) and frame	M8	19	1.9	13	
Chain tensioner (under) and frame	M6	10	1.0	7.2	
Main switch and frame	M6	7	0.7	5.1	
Back stay and frame	M8	35	3.5	25	
Pivot shaft and frame	M16	105	10.5	75	
Rear suspension (upper) and frame	M10	46	4.6	33	
Relay arm and frame	M10	46	4.6	33	
Relay arm and connecting rod	M14	59	5.9	43	
Relay arm and rear suspension	M10	40	4.0	29	
Connecting rod and swingarm	M12	59	5.9	43	
Chain protector and chain	M6	4	0.4	2.9	
Chain guide and swingarm	M6	7	0.7	5.1	
Chain protector and swingarm	M6	7	0.7	5.1	
Chain case and swingarm	M6	7	0.7	5.1	
Rear brake hose (front) and swingarm	M6	7	0.7	5.1	
Rear brake hose (rear) and swingarm	M5	4	0.4	2.9	
Swingarm and end 3	M5	4	0.4	2.9	
Swingarm and bracket	M5	4	0.4	2.9	
Handle crown and inner tube	M8	23	2.3	17	
Handle crown and steering shaft	M24	120	12.0	85	
Steering shaft and ring nut	M28	5	0.5	3.6	Refer to NOTE.
Handle under holder and handle crown	M12	40	4.0	29	
Front master cylinder cap	M4	2	0.2	1.4	
Front master cylinder and handlebar	M6	7	0.7	5.1	
Front fender and front fork	M6	7	0.7	5.1	
Speedometer and handle crown	M6	7	0.7	5.1	
Headlight and headlight stay	M6	7	0.7	5.1	
Headlight under stay and under bracket	M6	7	0.7	5.1	
Base valve and outer tube	M22	55	5.5	40	LT
Cap nut and inner tube	M40	28	2.8	20	
Fuel tank bracket and frame	M6	10	1.0	7.2	
Fuel tank and fuel cock	M6	7	0.7	5.1	
Rectifier/regulator and frame	M6	7	0.7	5.1	

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Ignition coil and frame	M6	7	0.7	5.1	
Battery box and frame	M6	7	0.7	5.1	
Side cover and frame	M6	7	0.7	5.1	
Seat and frame	M6	7	0.7	5.1	
Rear fender and frame	M6	7	0.7	5.1	
Helmet holder and frame	M6	7	0.7	5.1	
Taillight and rear fender	M6	6	0.6	4.3	
Front hub and front disk	M6	12	1.2	8.7	LT
Front wheel shaft and front fork	M14	58	5.8	42	
Axle holder and front fork	M6	10	1.0	7.2	
Front brake caliper and front fork	M10	30	3.0	22	
Union bolt (front)	M10	30	3.0	22	
Rear wheel shaft and nut	M18	105	10.5	75	
Rear hub and sprocket	M8	35	3.5	25	
Rear hub and rear disk	M6	12	1.2	8.7	LT
Union bolt (rear)	M10	30	3.0	22	
Rear caliper and protector	M6	7	0.7	5.1	
Sidestand and nut	M10	64	6.4	46	
Rear footrest and frame	M8	23	2.3	17	
Rear master cylinder and frame	M8	23	2.3	17	
Rear reservoir tank and frame	M6	7	0.7	5.1	
Rear brake pedal and frame	M8	19	1.9	13	
Footrest bracket and frame	M10	64	6.4	46	

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.

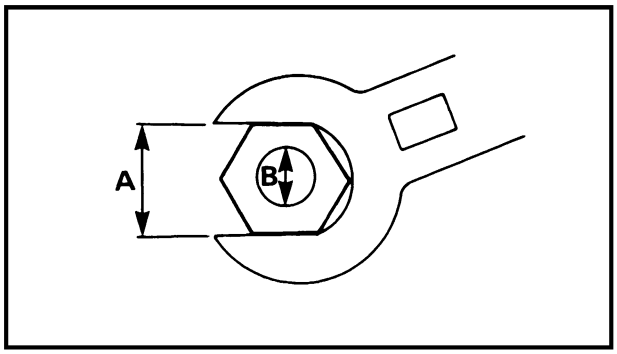
ELECTRICAL

Model	TTR250L(C)
Voltage:	12 V
Ignition system:	
Ignition timing (B.T.D.C.)	10° at 1,300 r/min
Advanced timing (B.T.D.C.)	31° at 8,500 r/min
Advancer type	Digital type
C.D.I.:	
Pickup coil resistance / color	190 ~ 230 Ω at 20 °C (68 °F) / Yellow – Blue
C.D.I. unit model / manufacturer	F8T31871 / MITSUBISHI
Ignition coil:	
Model / manufacturer	F6T535 / MITSUBISHI
Primary winding resistance	0.36 ~ 0.48 Ω at 20 °C (68 °F)
Secondary winding resistance	5.44 ~ 7.36 kΩ at 20 °C (68 °F)
Spark plug cap:	
Type	Resin type
Resistance	10 kΩ
Charging system:	
Type	A.C. magneto generator
Model / manufacturer	F4T250 / MITSUBISHI
Standard output	14 V 13.5 A at 5,000 r/min
Stator coil resistance / color	1.0 ~ 1.2 Ω at 20 °C (68 °F) / White – White
Rectifier regulator:	
Type	Semi-conductor, short-circuit type
Model / manufacturer	SH629A-12 / SHINDENGEN
No load regulated voltage (DC)	14.1 ~ 14.9 V
Capacity	10 A
Withstand voltage	200 V
Battery:	
Manufacturer	GS
Specific gravity	1.320
Electric starter system:	
Type	Constant mesh type
Starter motor	
Model / manufacturer	SM-13 / MITSUBA
Output	0.65 kW
Armature coil resistance	0.0017 ~ 0.0027 Ω
Brush overall length	10 mm (0.39 in)
<Limit>	<4 mm (0.16 in)>
Brush spring pressure	8.82 N (889 gf, 31.75 oz)
Commutator diameter	28 mm (1.10 in)
<Wear limit>	<27 mm (1.06 in)>
Mica undercut	0.7 mm (0.03 in)

Model	TTR250L(C)
Starter relay:	
Model / manufacturer	MS5D-361 / JIDECO
Amperage rating	100 A
Coil winding resistance	3.9 ~ 4.7 Ω at 20 °C (68 °F)

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: Distance across flats
B: Outside thread diameter

A (Nut)	B (Bolt)	General torque specifications		
		Nm	m • kg	ft • lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	61
22 mm	16 mm	130	13.0	94

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

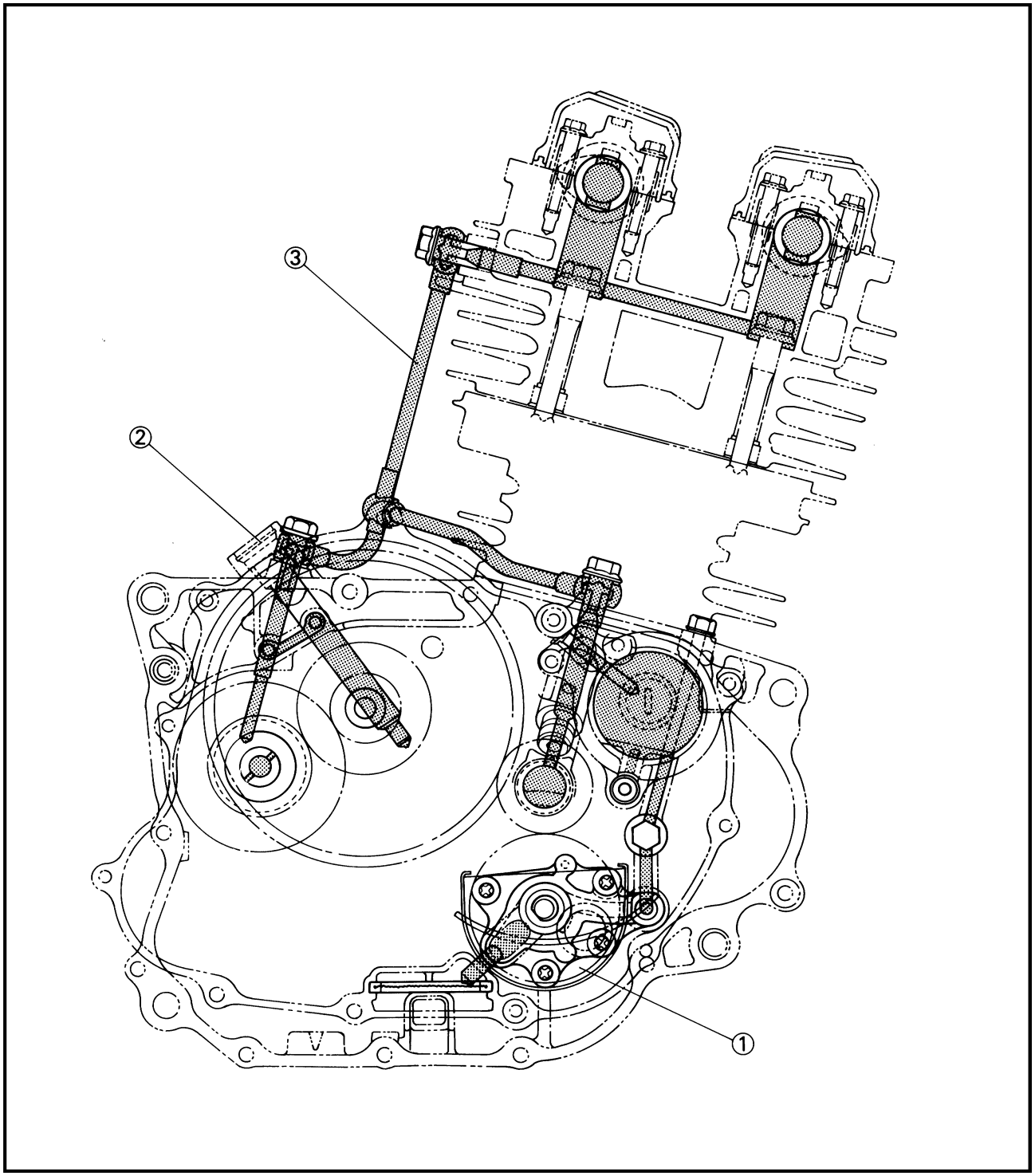
Lubrication Point	Lubricant Type
Oil seal lips	LS
O-ring	LS
Bearing	E
Piston surface	E
Piston pin	E
Crankshaft journal	E
Balancer (bearing / shaft / gear)	E
Buffer boss	E
Camshaft cam lobe / journal	M
Valve stem (IN, EX)	M
Valve stem end (IN, EX)	M
Valve lifter (IN, EX)	E
Oil pump rotor (inner / outer) shaft	E
Oil pump gasket	LS
Push lever assembly	E
Idle gear (1, 2) surface	E
Push rod assembly	LS
Primary driven gear	E
Transmission gear (wheel / pinion)	M
Axle (main / drive)	M
Shift cam	E
Shift fork / guide bar	E
Shift shaft (1, 2)	E
Matching surface (cylinder head and cylinder head cover)	Yamaha Bond No. 1215®
Crankcase matching surface	Yamaha Bond No. 1215®

CHASSIS

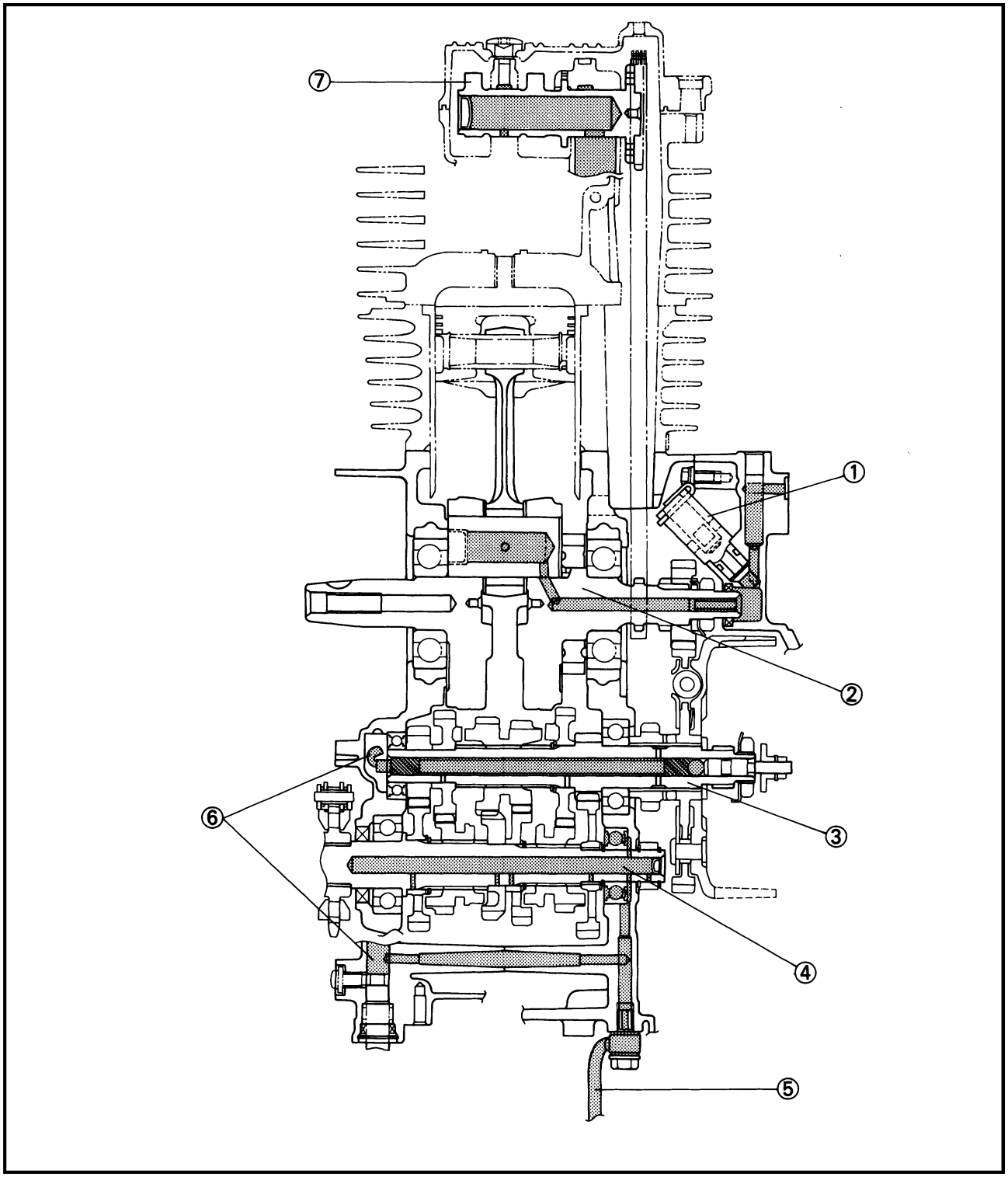
Lubrication Point	Lubricant Type
Front wheel oil seal lips	LS
Rear wheel oil seal lips	LS
Bearing, oil seal lips (connecting rod)	LS
Oil seal lips, bearings (relay arm and frame)	LS
Pivot shaft (swingarm)	LS
Bearing (relay arm and rear shock absorber)	LS
Bolts, collars, seal lips (relay arm and frame)	LS
Bolt, collars (relay arm and connecting rod)	LS
Bolt (connecting rod and swingarm)	LS
Brake pedal shaft	LS
Bearings (steering head pipe)	LS
Tube guide (throttle grip) inner surface	LS
Brake lever, sliding surface	LS
Clutch lever, sliding surface	LS
Clutch cable end	LS
Sidestand bolt, sliding surface	LS
Bush (chain tensioner)	LS

LUBRICATION DIAGRAM

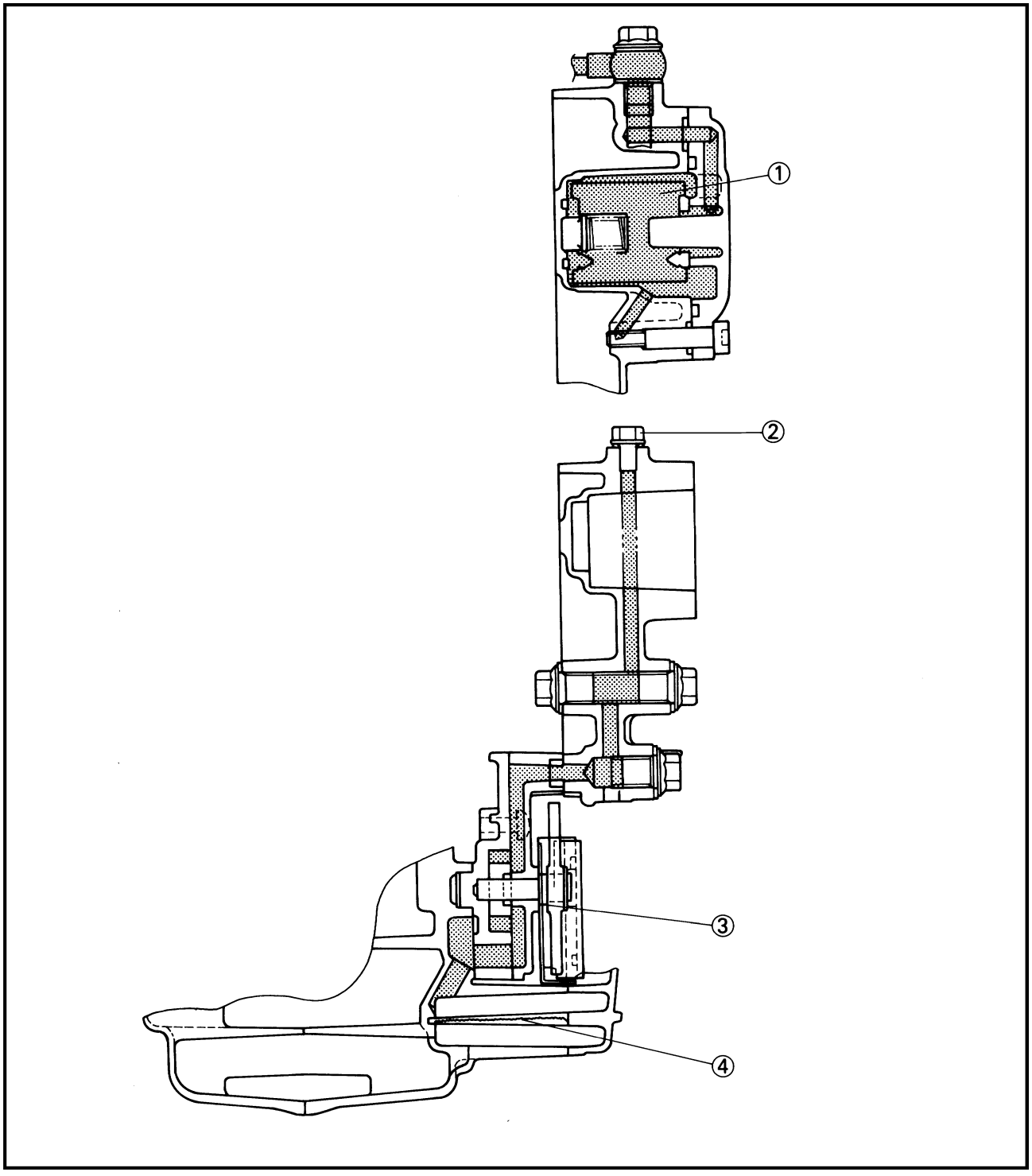
① Oil pump
② Push lever
③ Delivery pipe



① Relief valve
② Crankshaft
③ Main axle
④ Drive axle
⑤ Delivery pipe
⑥ Push lever
⑦ Camshaft



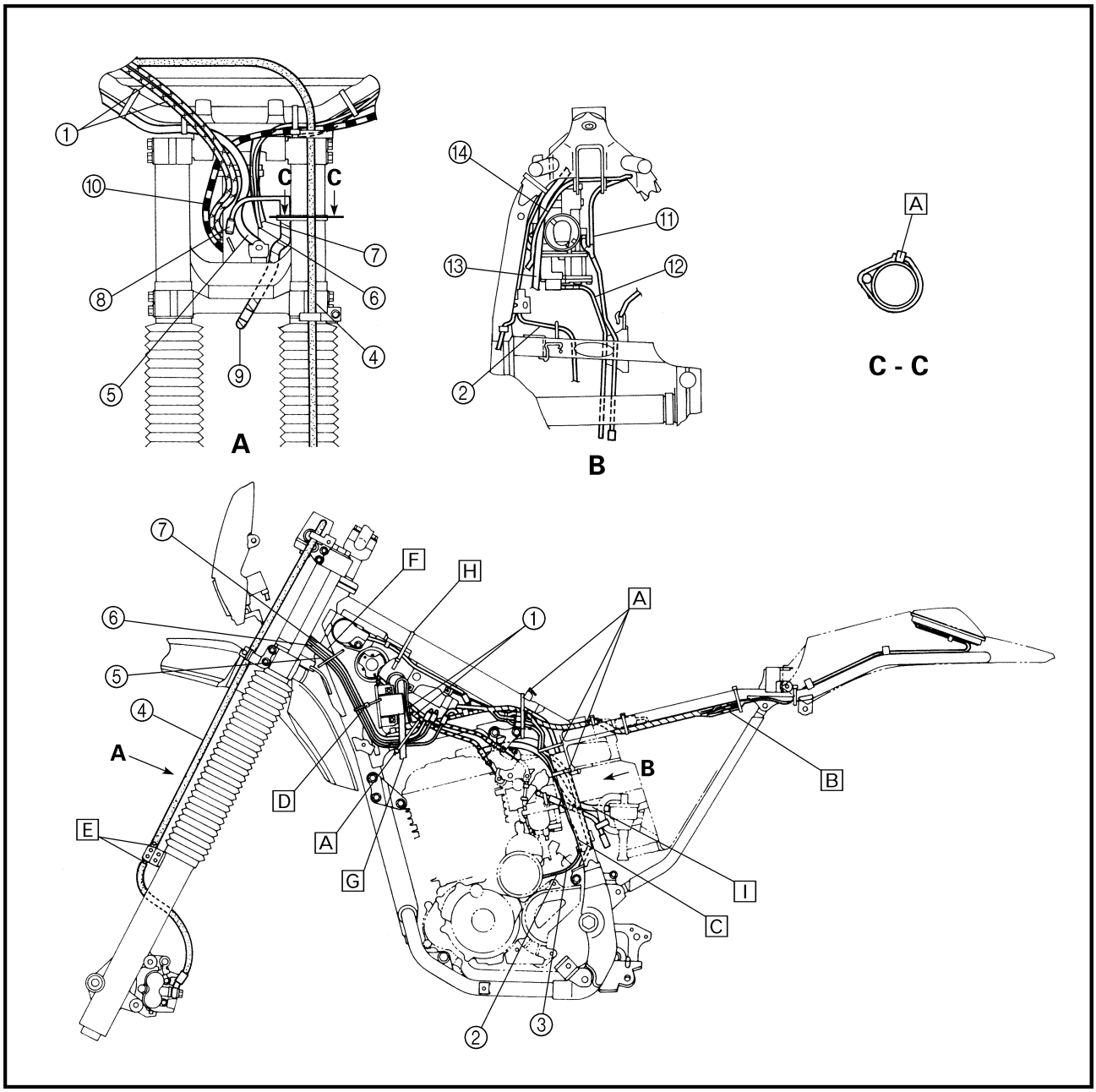
① Oil cleaner
② Check bolt
③ Oil pump
④ Oil strainer



CABLE ROUTING

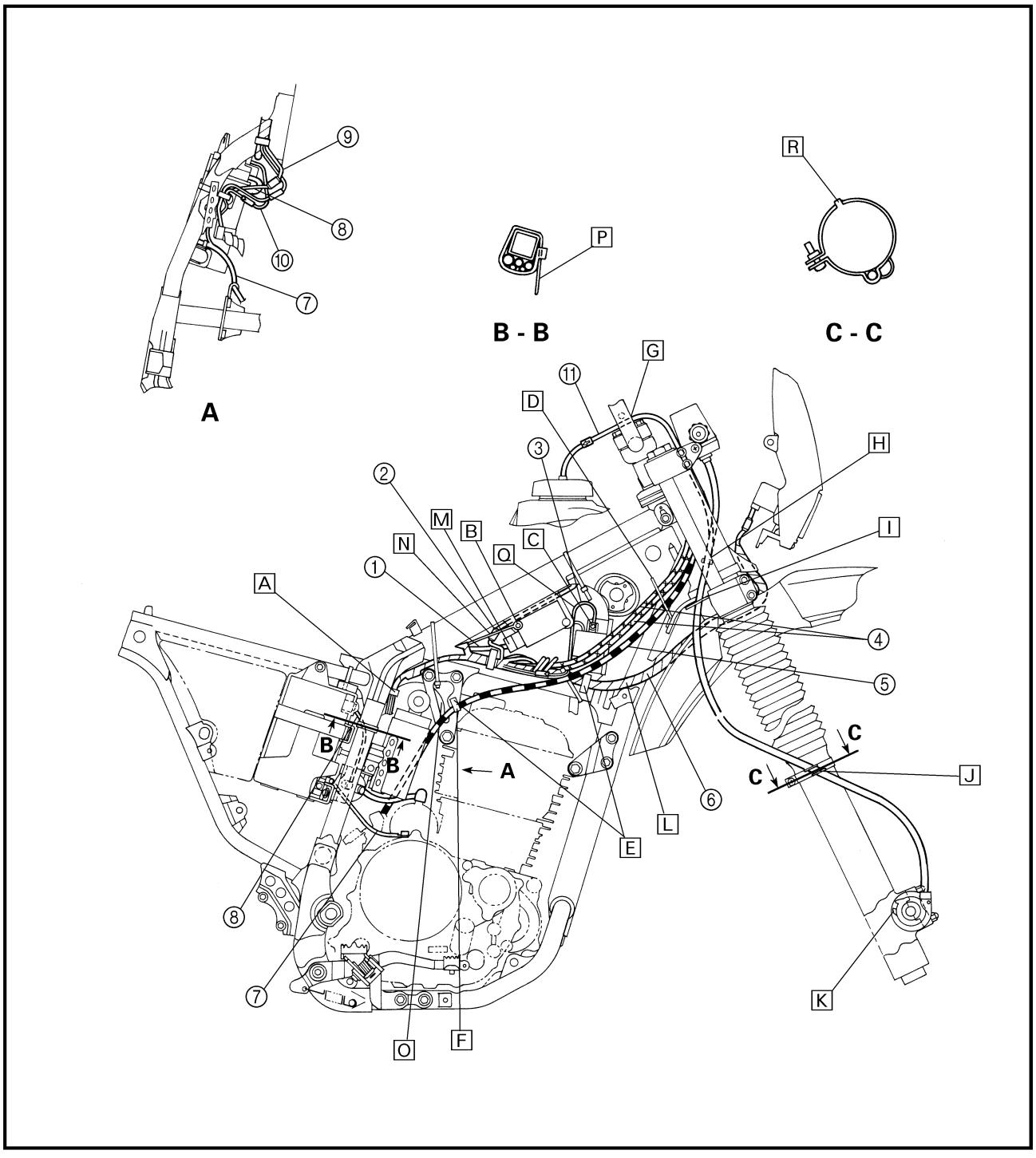
① Throttle cable
② Wire sub lead
③ A.C. magneto lead
④ Front brake hose
⑤ Handlebar switch lead (right)
⑥ Clutch switch lead
⑦ Handlebar switch lead (left)
⑧ Headlight lead
⑨ Wireharness
⑩ Clutch cable
⑪ Air vent hose (right)
⑫ Drain hose
⑬ Breather hose
⑭ Air vent hose (left)

[A] Cut the end of the band after tightening.
[B] Do not put this portion of the harness on the frame after connection.
[C] Install the clamp with its open side facing forward.
[D] Install the band, making sure its end faces backward.
[E] Clamp the front brake hose between its white mark and the slot.
[F] Put the handlebar switch (left) lead on top of the leads.
[G] Pass the spark plug lead over the leads.
[H] Install the clamp with its end facing downward.
[I] Pass the breather hose on the inside of the leads that run side by side, but do not clamp it with a band or other clamping device.

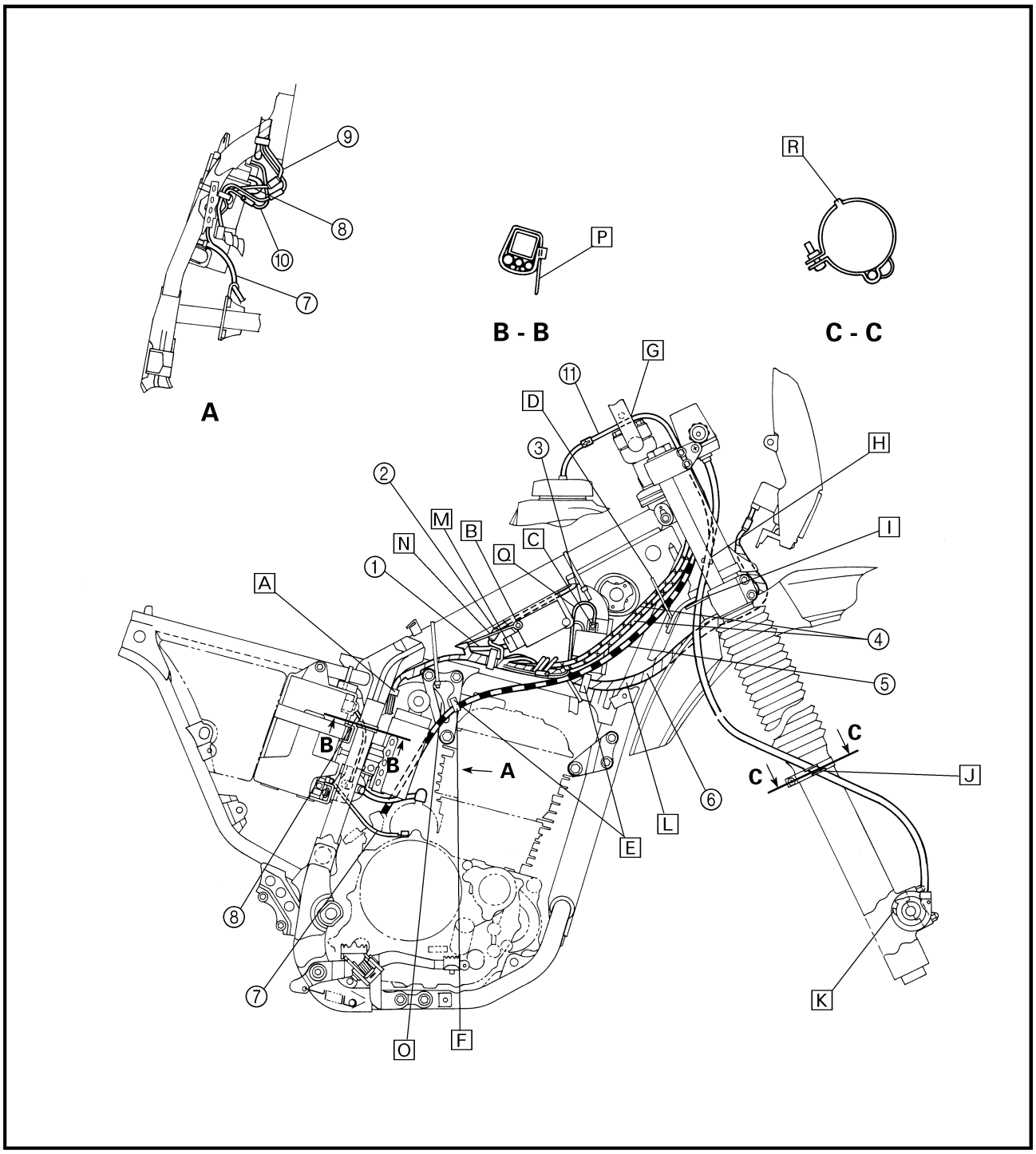


① Rectifier/regulator lead
② Main switch lead
③ Ignition coil lead
④ Throttle cable
⑤ Clutch cable
⑥ Wireharness
⑦ Battery (–) lead
⑧ Battery (+) lead
⑨ Starter relay lead
⑩ Fuse (main) lead
⑪ Fuel tank breather hose

A Install the clamp with its open side facing outward.
B Tighten the main switch lead to the rectifier/regulator.
C Tighten the ignition coil lead to the ignition coil.
D Pass the throttle cable 1 over the throttle cable 2.
E Install the clamp with its open side facing upward.
F Fasten the clutch cable at the white tape marker with a clamp.
G Pass the fuel tank breather hose under the handle tension bar.
H Affix the fuel tank breather hose and speedometer cable to the clamp.
I Pass the fuel tank breather hose and speedometer cable through the wire guide.
J Fasten the speedometer cable at the white tape marker with a clamp.

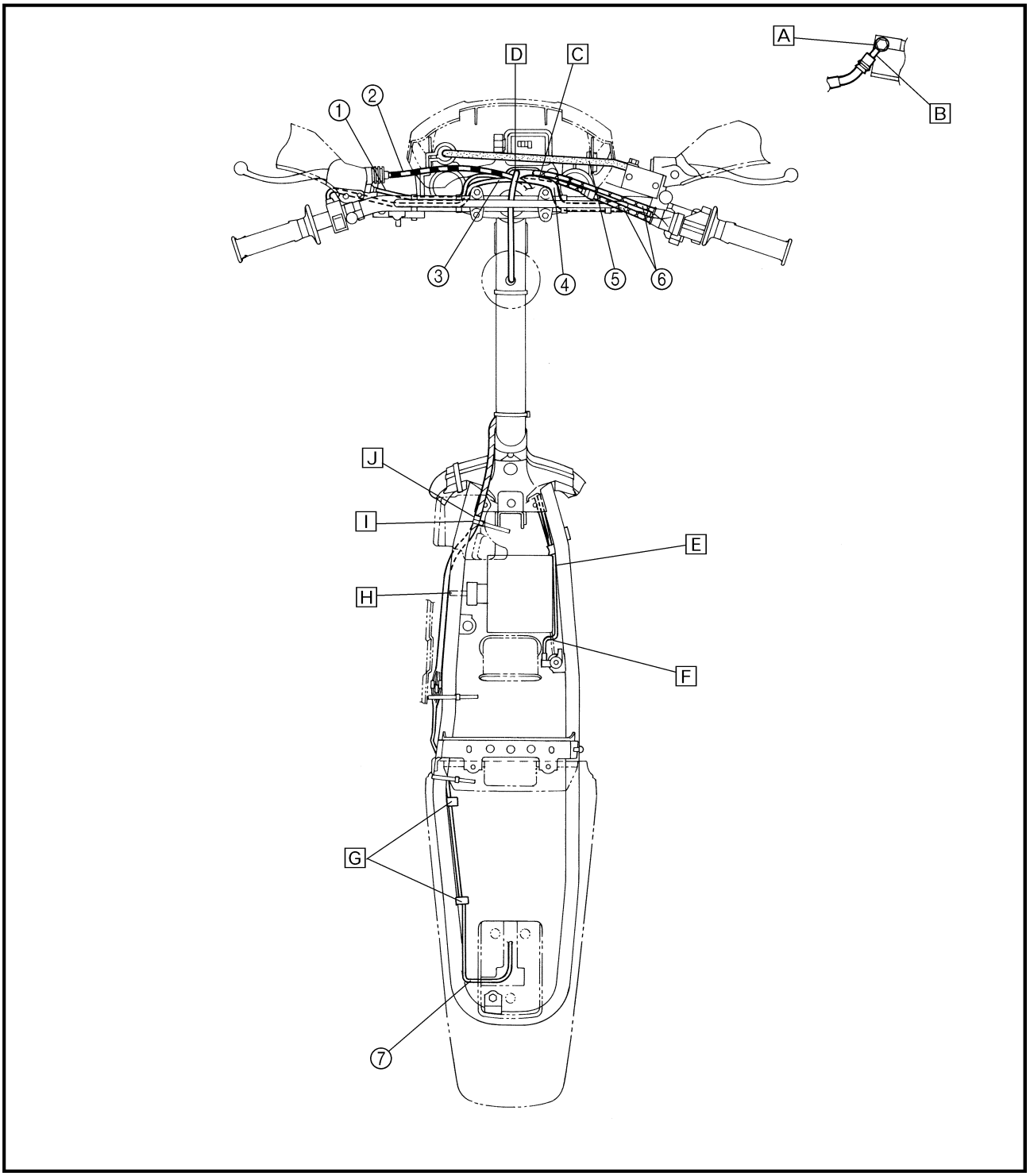


[K] Make sure the projection on the front fork is placed in the slot in the speedometer gear unit.
[L] Pass the wireharness over the fuel tank bracket.
[M] Pass the wireharness under the regulator lead coupler. Make sure the coupler does not go over the right side.
[N] Insert the coupler on the inside of the ground lead.
[O] Pass the clamp through the right engine stay.
[P] Face the band end to the inside of the vehicle.
[Q] Pass the ignition coil lead on the inside of the throttle cable.
[R] Align the slot and the projection on the front fork.



① Clutch switch lead
② Clutch cable
③ Handlebar switch (left) lead
④ Handlebar switch (right) lead
⑤ Front brake hose
⑥ Throttle cable
⑦ Taillight lead

A The pipe portion of the brake hose should touch the projection on the master cylinder.
B Install the brake hose with its white mark facing forward.
C Pass the throttle cable 1 to the inside of the throttle cable 2.
D Pass the handlebar switch (right) lead to the front of the clutch cable.
E Do not allow the air ventilation hose to go over the frame.
F Pass the air ventilation hose through the guide near the air filter intake.
G Install the clamp with its open side facing inward.
H Pass the lead under the frame.
I Fasten the wireharness to the guide on the frame with a plastic band.
J Pass the wireharness through the guide.



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.

PERIODIC MAINTENANCE/LUBRICATION

	No.		ITEM	CHECKS AND MAINTENANCE JOBS	INITIAL	EVERY	
					100 mi (150 km) or 1 month	600 mi (1.000 km) or 6 months	1,200 mi (2,000 km) or 12 months
Emission Items	1	*	Fuel line	• Check fuel hoses for cracks or damage. • Replace if necessary.		√	√
	2		Spark plug	• Check condition. • Clean, regap or replace if necessary.		√	√
	3	*	Valves	• Check valve clearance. • Adjust if necessary.			√
	4		Air filter	• Clean or replace if necessary.		√	√
	5	*	Crankcase breather system	• Check ventilation hose for cracks or damage and drain any deposit. • Replace if necessary.		√	√
	6	*	Carburetor	• Check engine idling speed and starter operation. • Adjust if necessary.	√	√	√
	7		Exhaust system	• Check for leakage. • Retighten if necessary. • Replace gasket if necessary.		√	√
	8		Engine oil	• Check oil level and vehicle for oil leakage. • Correct if necessary. • Change. (Warm engine before draining.)	√	√	√
	9		Engine oil filter element	• Clean.	√	√	√
General Items	10		Clutch	• Check operation. • Adjust or replace cable.	√	√	√
	11	*	Front brake	• Check operation, fluid level and vehicle for fluid leakage. • Correct accordingly. • Replace brake pads if necessary.	√	√	√
General Items	12	*	Rear brake	• Check operation, fluid level and vehicle for fluid leakage. • Correct accordingly. • Replace brake pads if necessary.	√	√	√
	13	*	Wheels	• Check balance, runout, spoke tightness and for damage. • Tighten spokes and rebalance, replace if necessary.	√	√	√
	14	*	Tires	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.		√	√
	15	*	Wheel bearings	• Check bearing looseness or damage. • Replace if necessary.		√	√

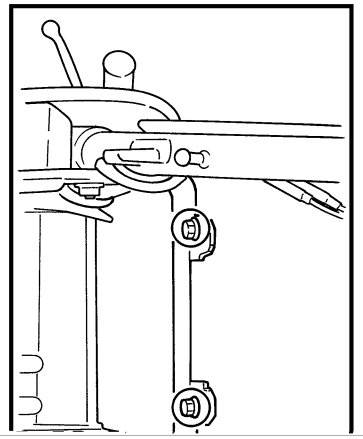
	No.		ITEM	CHECKS AND MAINTENANCE JOBS	INITIAL	EVERY	
					100 mi (150 km) or 1 month	600 mi (1.000 km) or 6 months	1,200 mi (2,000 km) or 12 months
General Items	16		Drive chain	• Check chain slack. • Adjust if necessary. Make sure that the rear wheel is properly aligned. • Clean and lubricate.	Every ride		
	17	*	Steering bearings	• Check bearing play and steering for roughness. • Correct accordingly. • Lubricate with lithium soap base grease every 1,200 mi (2,000 km) or 12 months (whichever comes first).	√		√
	18	*	Chassis fasteners	• Make sure that all nuts, bolts and screws are properly tightened. • Tighten if necessary.	√	√	√
	19		Sidestand	• Check operation. • Lubricate and repair if necessary.	√		√
	20	*	Spark arrester	• Clean.			√
	21	*	Front fork	• Check operation and for oil leakage. • Correct accordingly.		√	√
	22	*	Rear shock absorber assembly	• Check operation and shock absorber for oil leakage. • Replace shock absorber assembly if necessary.		√	√
	23	*	Rear shock absorber pivoting point	• Check operation. • Lubricate with molybdenum disulfide grease.			√

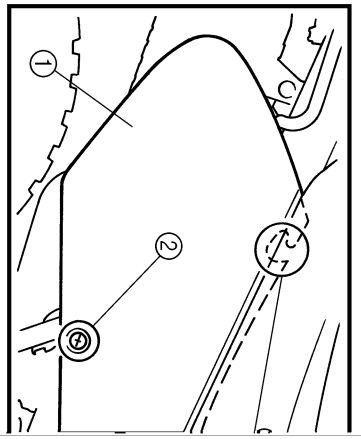
* : Since these items require special tools, data and technical skills, they should be serviced by a Yamaha dealer.

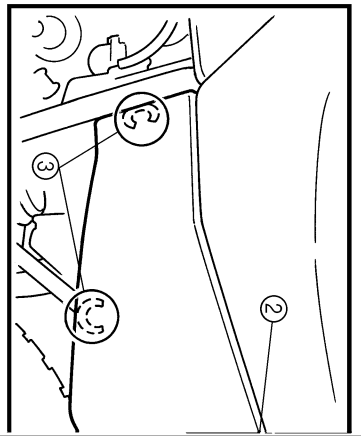
NOTE:

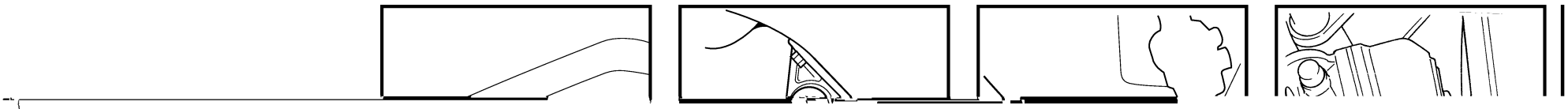
- The air filter needs more frequent service if you are riding in unusually wet or dusty areas.
- Hydraulic brake system
  - When disassembling the master cylinder or caliper cylinder, always replace the brake fluid. Check the brake fluid level regularly and fill as required.
  - Replace the oil seals on the inner parts of the master cylinder and caliper cylinder every two years.
  - Replace the brake hoses every four years, or if cracked or damaged.

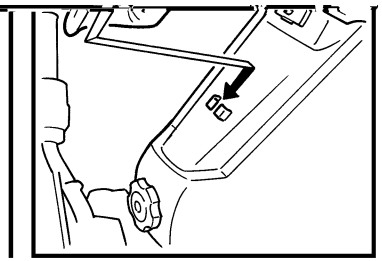

RES
FUEL

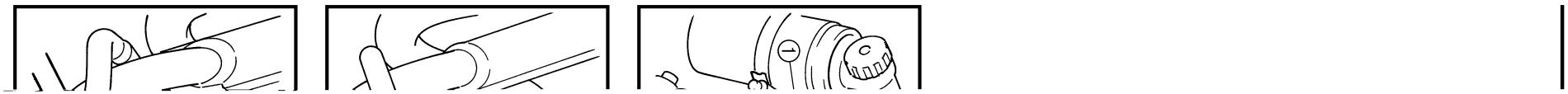


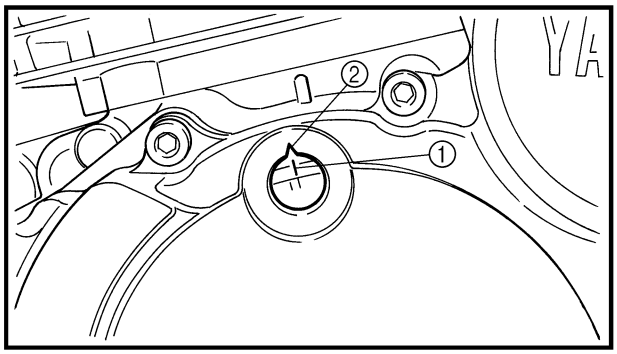

1
2

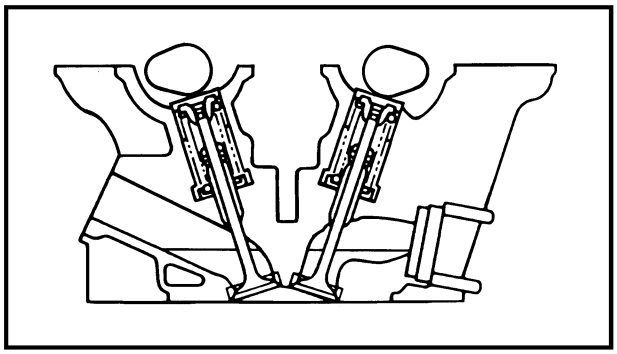

3
2

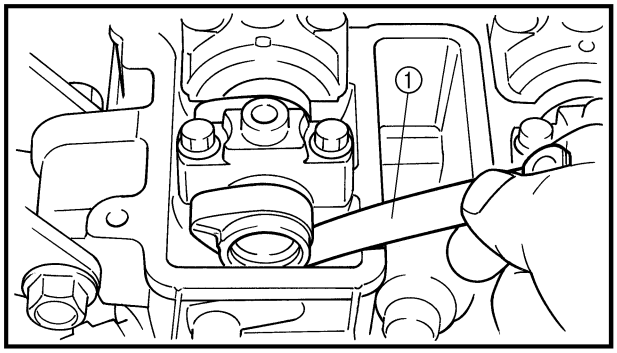












● Ali
sta
co
the
De

NOT
T.D.
• Bo
an
ali
ma
• If
clc

***

5.Ch
• Va
Me
fee
Ou

***

Che

NOT
TDC
whe
othe

● Me
fee

NOT
Recc
ance

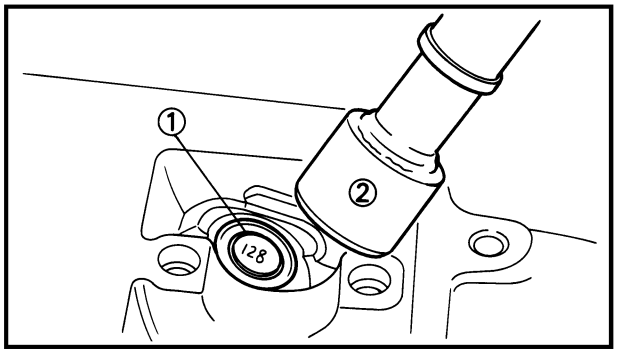
***

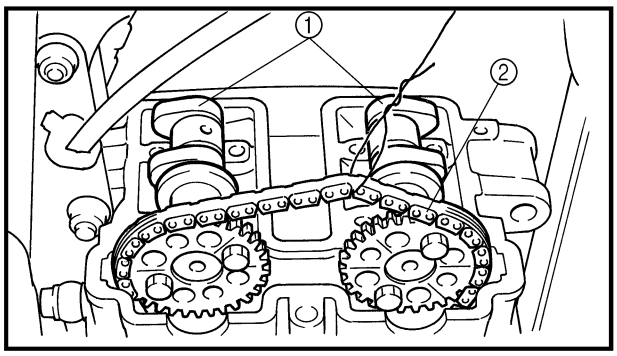
INTAKE

B MEASUR CLEARANC
0.00 ~ 0.0
0.05 ~ 0.0
0.09 ~ 0.1
0.18 ~ 0.2
0.21 ~ 0.2
0.26 ~ 0.3
0.31 ~ 0.3
0.36 ~ 0.4
0.41 ~ 0.4
0.46 ~ 0.5
0.51 ~ 0.5
0.56 ~ 0.6
0.61 ~ 0.6
0.66 ~ 0.7
0.71 ~ 0.7
0.76 ~ 0.8
0.81 ~ 0.8
0.86 ~ 0.9
0.91 ~ 0.9
0.96 ~ 1.0
1.01 ~ 1.0
1.06 ~ 1.1
1.11 ~ 1.1
1.16 ~ 1.2
1.21 ~ 1.2
1.26 ~ 1.3
1.31 ~ 1.3
1.36 ~ 1.4

EXHAUS

B MEASUR CLEARANC
0.00 ~ 0.0
0.05 ~ 0.0
0.10 ~ 0.1
0.15 ~ 0.1
0.19 ~ 0.2
0.28 ~ 0.3
0.31 ~ 0.3
0.36 ~ 0.4
0.41 ~ 0.4
0.46 ~ 0.5
0.51 ~ 0.5
0.56 ~ 0.6
0.61 ~ 0.6
0.66 ~ 0.7
0.71 ~ 0.7
0.76 ~ 0.8
0.81 ~ 0.8
0.86 ~ 0.9
0.91 ~ 0.9
0.96 ~ 1.0
1.01 ~ 1.0
1.06 ~ 1.1
1.11 ~ 1.1
1.16 ~ 1.2
1.21 ~ 1.2
1.26 ~ 1.3
1.31 ~ 1.3
1.36 ~ 1.4
1.41 ~ 1.4
1.46 ~ 1.5


①
②
128



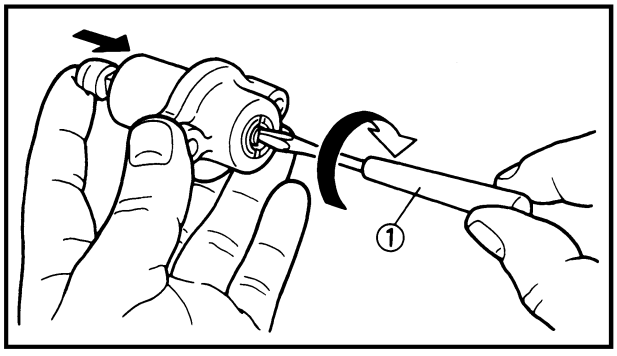
11.Install:
- Camshafts ①
- Timing chain ②
- Camshaft caps



Bolt (camshaft caps, cam chain tensioner):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Cap bolt (cam chain tensioner):
8 Nm (0.8 m • kg, 5.8 ft • lb)

NOTE:
- Install the exhaust camshaft first.
- Align the matching marks.
- Refer to "ENGINE ASSEMBLY AND ADJUSTMENT-CYLINDER AND PISTON, CYLINDER HEAD" in CHAPTER 4.
- Apply molybdenum disulfide grease to the camshaft caps.
- Tighten the bolts (camshaft cap) in a criss-cross pattern from inside.
- Turn the crankshaft counterclockwise several turns for the installed parts to settle into the correct position.

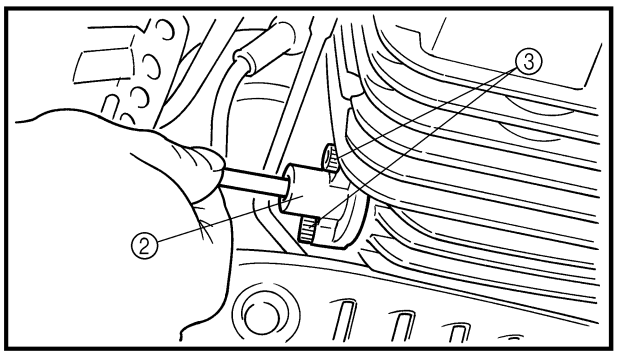
CAUTION:
The bolts (camshaft cap) must be tightened evenly, or damage to the cylinder head, camshaft caps and cam will be result.

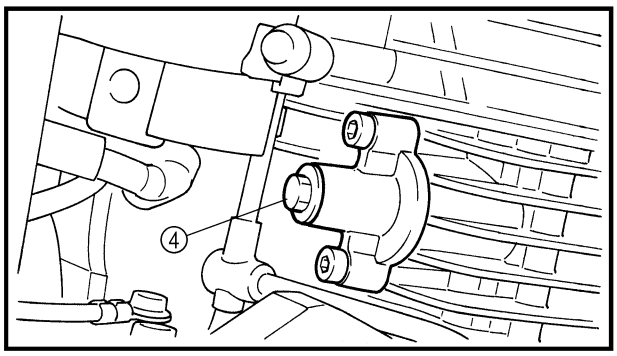


12.Install:
- Timing chain tensioner

****

Installing steps:
- While pressing the tensioner rod lightly with your fingers, use a thin screwdriver ① and wind the tensioner rod up fully clockwise.

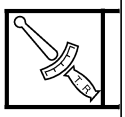




● With t
ket and
the bo



● Releas
tensio
the ga
ified to



******

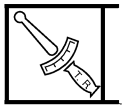
13.Meas
• Valve

******

Verificat
● Follow
steps.
● If the
adjust
ance is

******

14.Instal
Revers
• Cylind
• Spark



VA

②
①

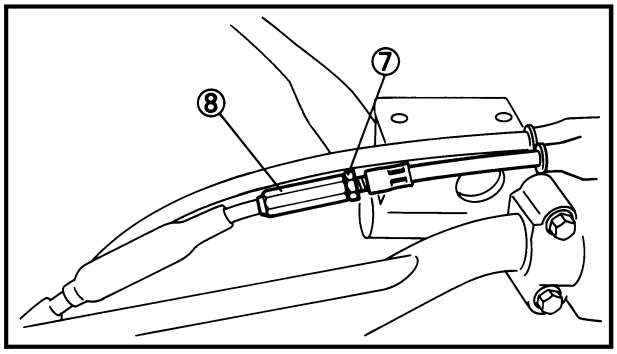
1st step:
- Loosen the locknut ③ on throttle cable #2.
- Turn the adjuster ④ in or out until all slack is removed from throttle cable #2.

2nd step:
- Loosen the locknut ⑤ on throttle cable #1.
- Turn the adjuster ⑥ in or out until the specified free play is obtained.

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

- Tighten the locknuts.

NOTE:
If the free play can not be adjusted here, adjust it at the throttle grip side of the cable.



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

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

- Tighten the locknut.

⚠ WARNING

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

****

SPARK PLUG INSPECTION

1.Disconnect:
- Spark plug cap

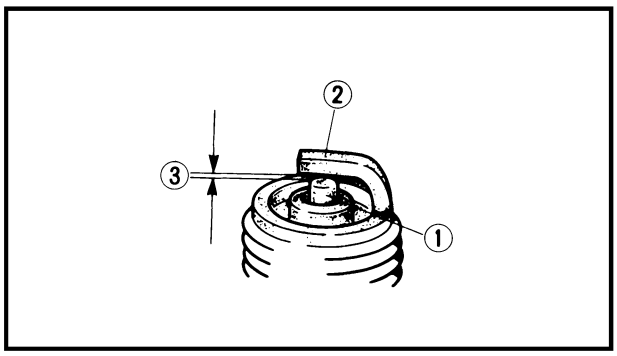
2.Remove:
- Spark plug

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:
CR9E (NGK), U27ESR-N (DENSO)

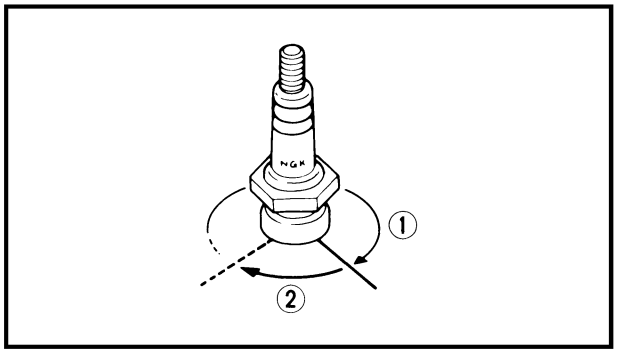


4.Inspect:
- Electrode ①
  Wear/damage → Replace.
- Insulator ②
  Abnormal color → Replace.
  Normal color is a medium-to-light tan color.

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

6.Measure:
- Plug gap ③
  Use a wire gauge or feeler gauge.
  Out of specification → Regap.

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



7.Tighten:
- Spark plug

Spark plug:
13 Nm (1.3 m • kg, 9.4 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 ② is 1/4 to 1/2 turns past finger tight ①. Have the spark plug torqued 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-8036-A
Timing light:
P/N. YM-33277-A

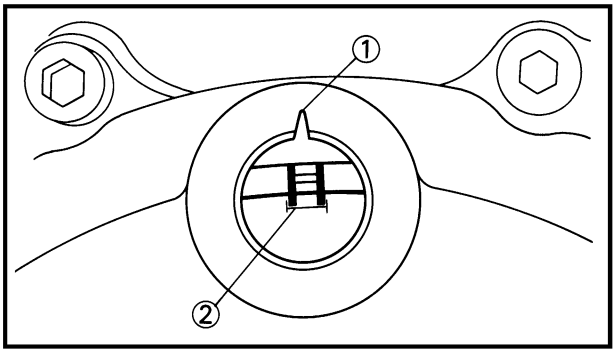
3. Check:
- Ignition timing

****

Checking steps:
- Remove the plug.
- Start the engine and let it run at the specified speed.

Engine speed:
1,250 ~ 1,350 r/min

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

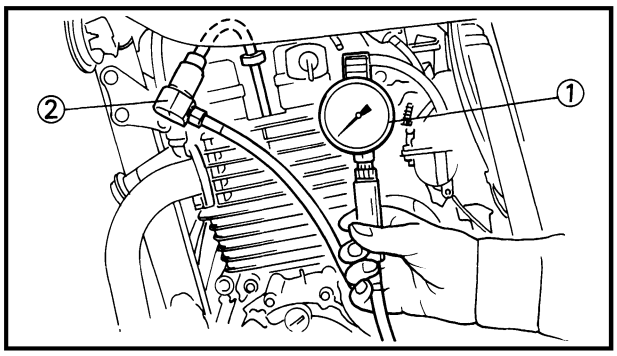


- Visually check the stationary pointer ① to verify it is within the required firing range ② indicated on the flywheel.
  Incorrect firing range → Check the pickup coil assembly.

NOTE:
Ignition timing is not adjustable.

****

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



COMPRESSION MEASUREMEN

NOTE:
Insufficient c
result in perfor

1.Check:
- Valve clearan
  Out of specifi
  Refer to "VA
  MENT".

2.Start the eng
several minut

3.Stop the engi

4.Disconnect:
- Spark plug ca

5.Remove:
- Spark plug
  Refer to "SPA

6.Attach:
- Compression
- Adapter ②

Compr
P/N.
Adapt
P/N.

7.Check:
- Compression

****

Checking steps
- Crank over t
  starter (be
  charged) with
  the compres
  stabilizes.

⚠ WARNING
When crankin
spark plug leac

- Check the rea
  els (see table

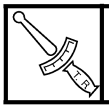
| Compre
Stand
1,20
Minin
1,00
Maxir
1,30 |
|---|

● If pressu
1) Squirt
cylind
2) Measu

(with
Re
Higher th
out oil
Same as
Above m
level

****

8.Install:
• Spark pl

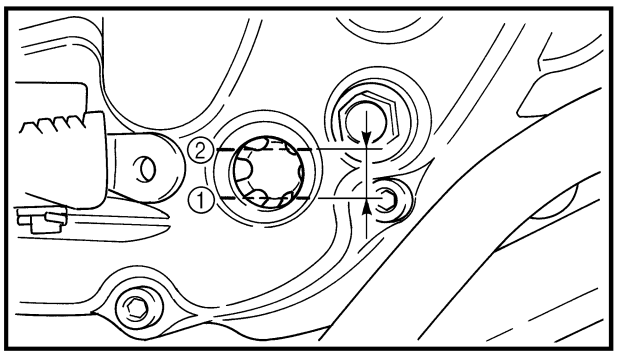


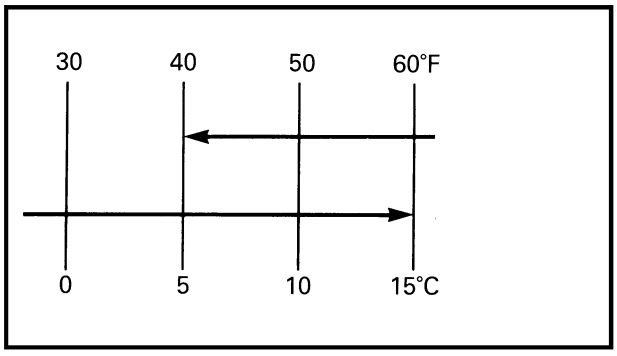
Refer to
9.Connect
• Spark pl

ENGINE C

NOTE:
Position
checking
can produ

1.Place th
2.Warm u
3.Stop the
level thr





4.Inspect:
- Oil level
  Oil level should be betwee
  and minimum ② marks.
  Low oil level → Add oil to p

NOTE:
Wait a few minutes until leve
inspecting.

Recommended oil:
SAE 20W40 type S
SAE 10W30 type S

CAUTION:
- **Do not add any chem**
  Engine oil also lubricates
  additives could cause clutc
- **Do not allow foreign mater**
  crankcase.

5.Install:
- Oil filler cap

6.Start the engine and warm
minutes.

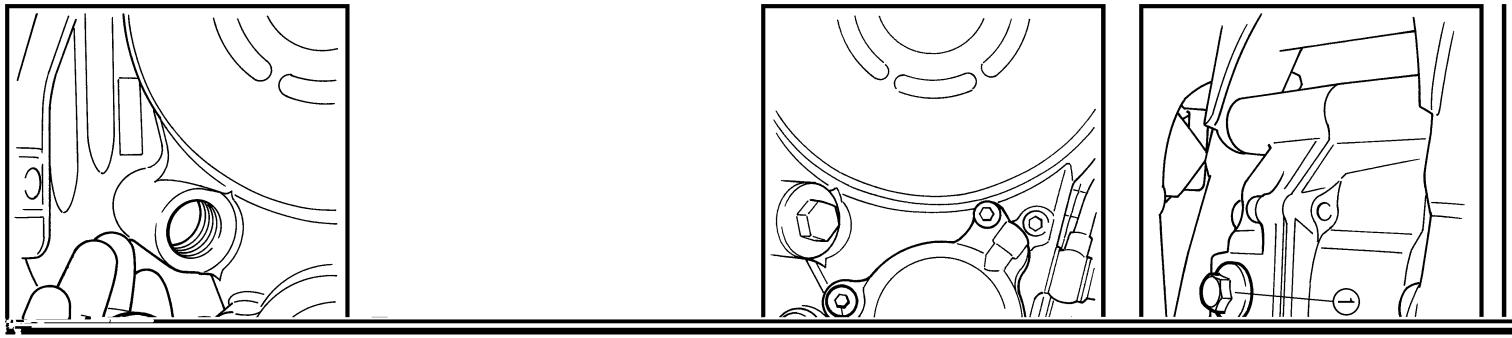
CAUTION:
When the oil tank is empty,
engine.

7.Stop the engine and inspe
once again.

Oil quantity:
Periodic oil change
1.1 L (0.97 Imp qt
With oil filter repla
1.2 L (1.06 Imp qt
Total amount:
1.45 L (1.28 Imp q

ENGINE OIL REPLACEMENT

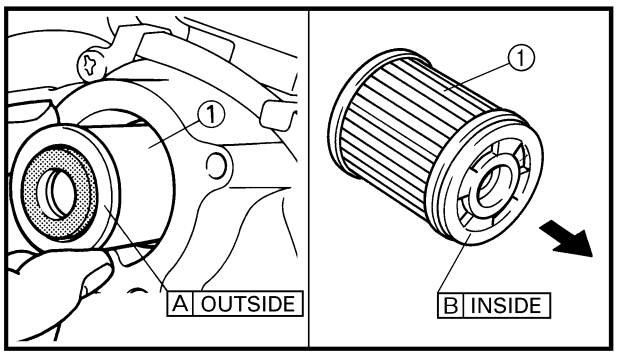
CAUTION:
- **Do not add any chem**
  Engine oil also lubricates
  additives could cause clutc
- **Do not allow foreign mater**
  crankcase.





7.Inspect:
- O-ring
  Damage → Replace.

8.Clean:
- Oil filter
  Clean it with solvent.
  Clog/damage → Repla



9.Install:
- Oil filter ①

CAUTION:
Install the oil filter as sh

- Oil filter cover
- Drain plug (crankcase)

Bolt (oil filter):
10 Nm (1.0 m
Drain plug (cra
20 Nm (2.0 m

10.Remove:
- Oil filler cap

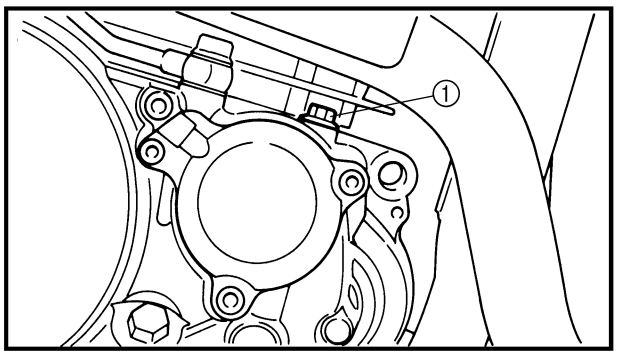
11.Fill:
- Crankcase

With oil filter r
1.2 L (1.06 Im

CAUTION:
- **Do not allow foreign**
  crankcase.
- **Do not add any**
  Engine oil also lubric
  additives could cause

12.Install:
- Oil filler cap

13.Inspect:
- Oil level
  Refer to "ENGINE
  TION".
- Oil pressure
  Refer to "OIL PRESSU
- Oil leaks



OIL PRESSURE INSPECTION

1.Remove:
- Oil check bolt ①

2.Start the engine and keep it idling for several minutes.

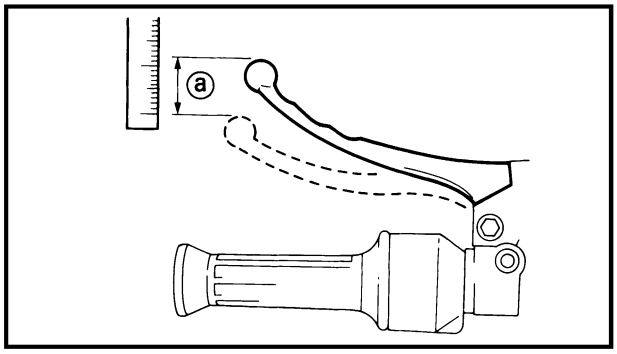
3.Inspect:
- Oil condition of the bleed hole
  Oil flows out → Oil pressure is good.
  No oil comes out → Oil pressure is bad.

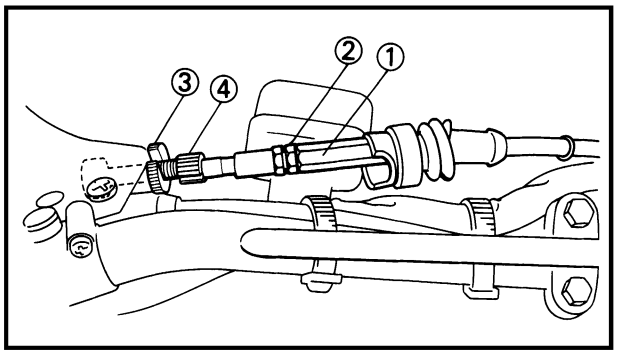
CAUTION:

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





YB2AF000

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:

1st step:
- Make sure that the adjuster ① and locknut ② are fully tightened.
- Loosen the locknut ③.
- Turn the adjusting 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).

2nd 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.

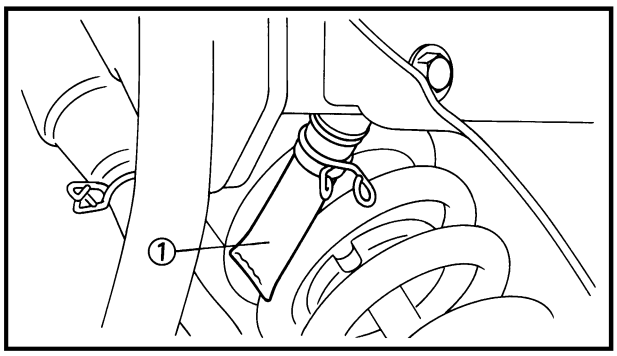
- Tighten the locknut ②.

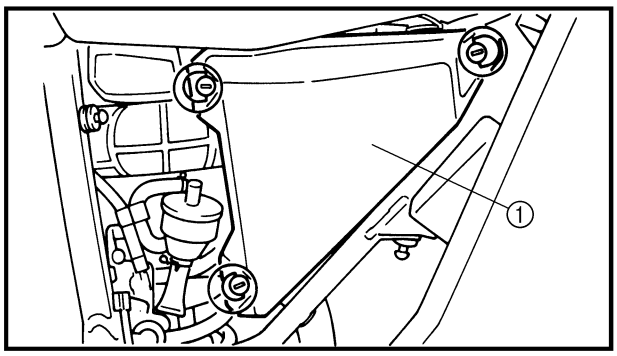
****

AIR FILTER CLEANING

NOTE:

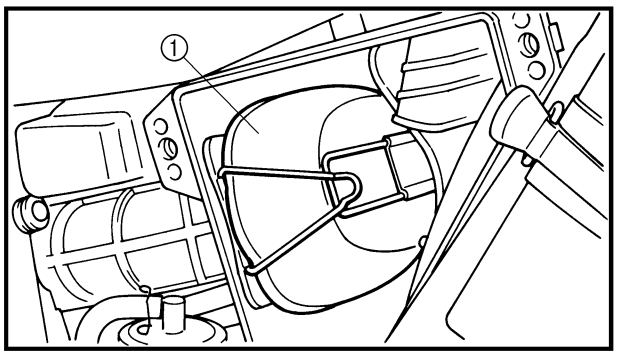
There is a check hose ① at the bottom of the air filter case. If dust and/or water collects in this hose, clean the air filter element and air filter case.





1.Remove:

- Side cover (left)
  Refer to "SEAT, FUEL TANK AND COVERS".
- Air filter case cover ①
  Refer to "REAR SHOCK ABSORBER AND SWINGARM" in CHAPTER 6.

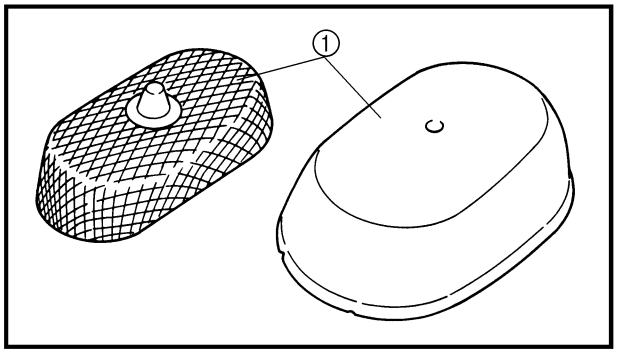


2.Remove:

- Air filter element assembly ①

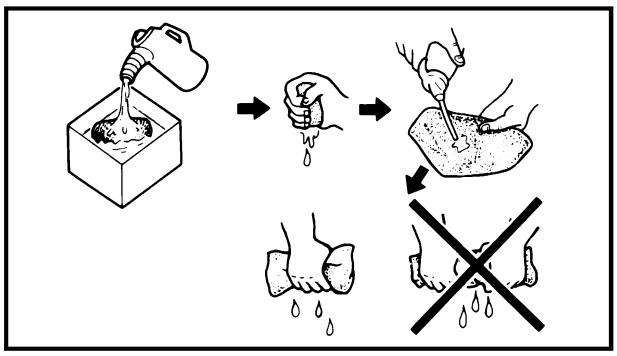
CAUTION:

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 assembly ①
  Damage → Replace.



4.Clean:
- Air filter element
  Clean it with solvent.

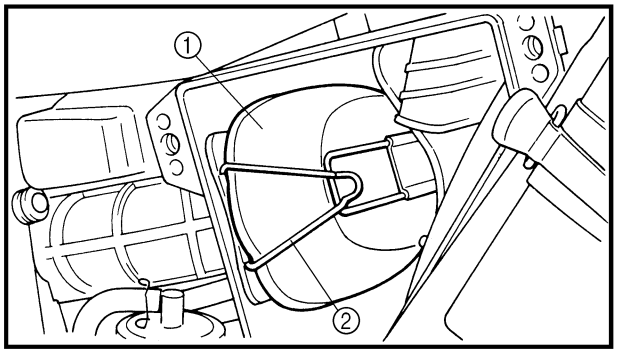
NOTE:
After cleaning, remove the remaining solvent by squeezing the element.

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

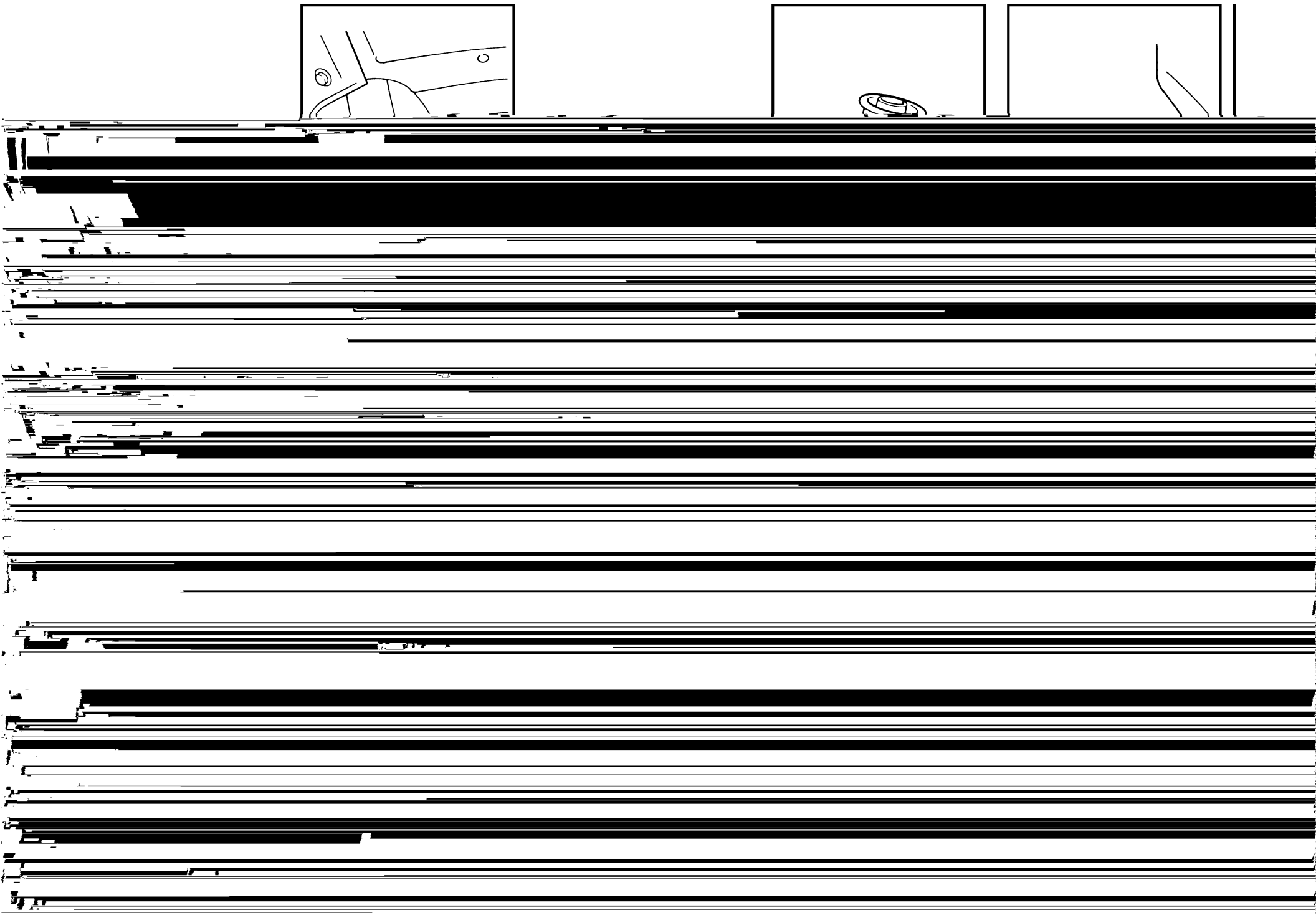
Recommended oil:
SAE 20W40 type SE motor oil or
SAE 10W30 type SE motor oil

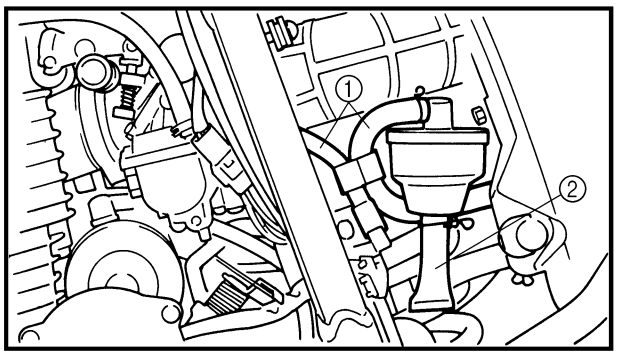


6.Install:
- Air filter element ①
- Band ②

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

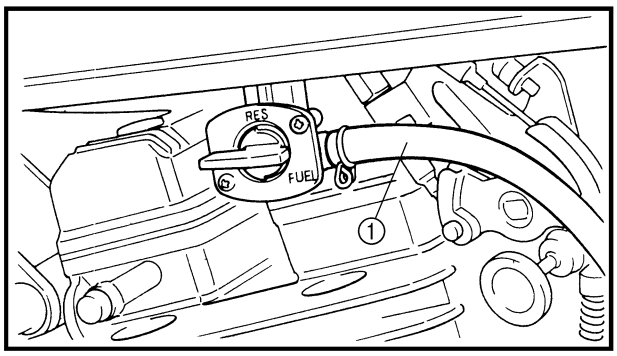
Bolt (side cover):
7 Nm (0.7 m • kg, 5.1 ft • lb)





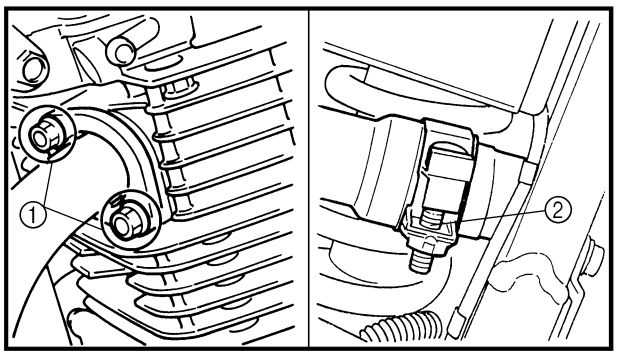
CRANKCASE BREATHER HOSE INSPECTION

1.Inspect:
- Breather hose ①
  Cracks/damage → Replace.
- Check hose ②
  Drain oil/water → Clean.



FUEL LINE INSPECTION

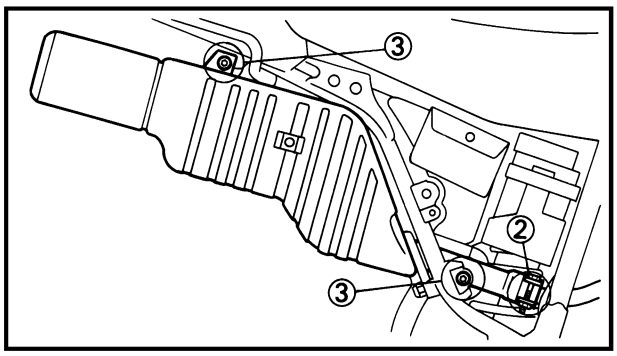
1.Inspect:
- Fuel hose ①
  Cracks/damage → Replace.



EXHAUST SYSTEM INSPECTION

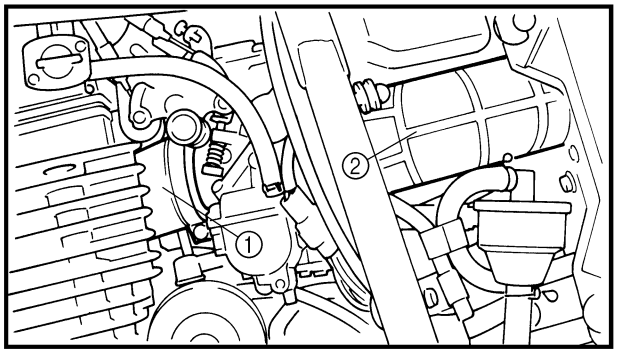
1.Inspect:
- Exhaust pipe
- Muffler
  Cracks/damage → Replace.
- Gasket
  Exhaust gas leaks → Replace.

2.Tighten:
- Exhaust pipe
- Muffler



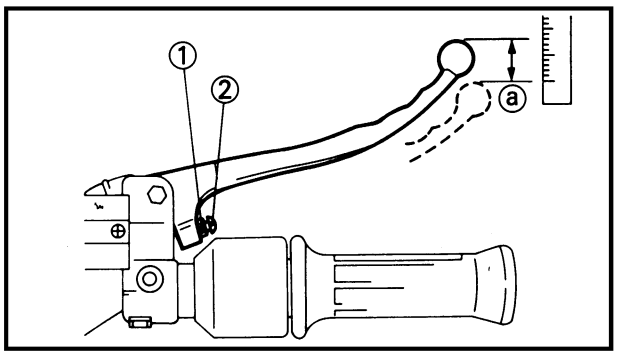


Nuts (exhaust pipe) ①:
20 Nm (2.0 m • kg, 14 ft • lb)
Bolt ②:
20 Nm (2.0 m • kg, 14 ft • lb)
Bolt ③:
40 Nm (4.0 m • kg, 29 ft • lb)



CARBURETOR JOINT INSPECTION

1.Inspect:
- Carburetor joint ①, ②
  Cracks/damage → Replace.



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

****

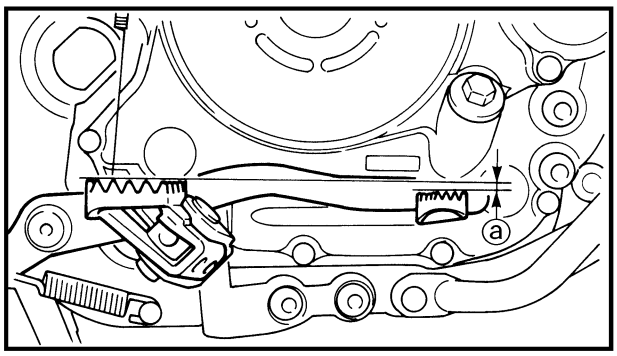
Adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified free play is obtained.

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

- Tighten the locknut.

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

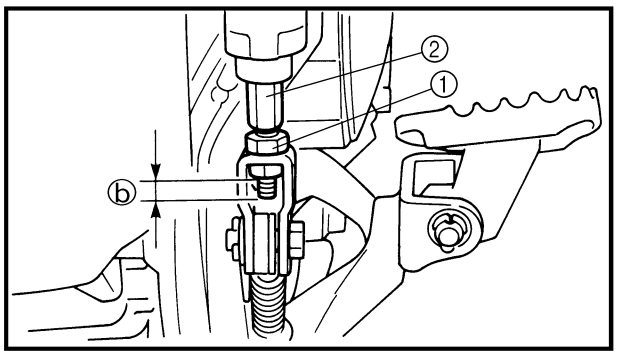
⚠ WARNING
A soft or spongy feeling in the brake lever can indicate the presence of air in the brake system. This air must be removed by bleeding the brake system before the motorcycle is operated. Air in the system will cause greatly diminished braking capability and can result in loss of control and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



REAR BRAKE ADJUSTMENT

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

Brake pedal height:
10 mm (0.39 in)
Below top of footrest.



2.Adjust:
- Brake pedal height

****

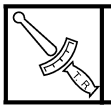
Adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ② in or out until the specified pedal height is obtained.

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

⚠ WARNING

After adjusting the brake pedal height, visually check the adjuster end. The adjuster end must appear within 3.0 ~ 5.0 mm (0.12 ~ 0.20 in) ⓑ.

- Tighten the locknut ①

	**Locknut ①:** **18 Nm (1.8 m • kg, 13 ft • lb)**

CAUTION:

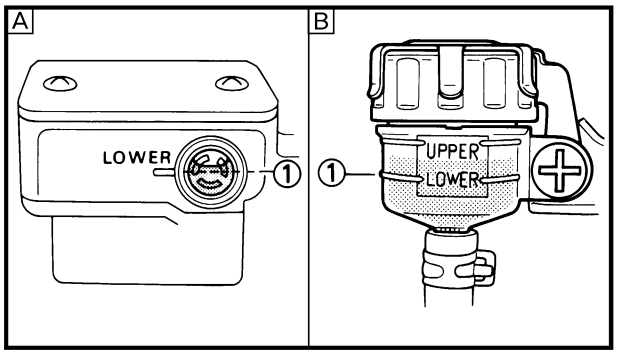
Make sure that the brake does not drag after adjusting it.

⚠ WARNING

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

****

3.Adjust:
- Brake light switch
  Refer to "BRAKE LIGHT SWITCH ADJUSTMENT".



NB1A3008
BRAKE FLUID LEVEL INSPECTION

NOTE:
Position the motorcycle straight up when inspecting the fluid level.

1.Place the motorcycle on a level surface.

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

2.Inspect:
- Fluid level
  Fluid level is under "LOWER" level line ①
  → Fill to proper level.

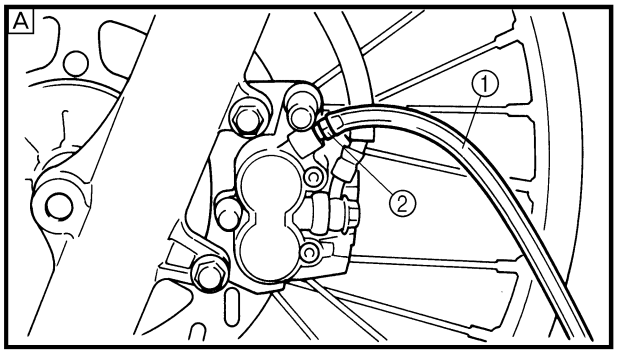
A Front
B Rear

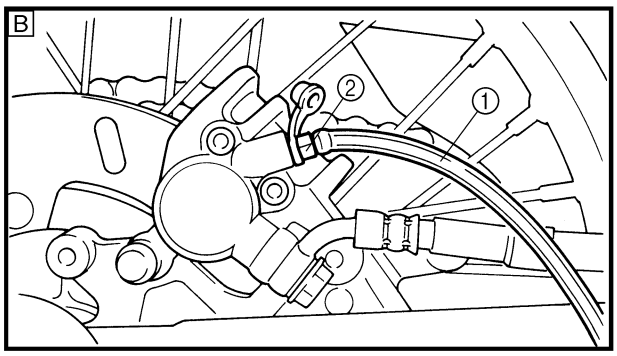
Recommended fluid:
Front:
DOT #4
Rear:
DOT #4

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

CAUTION:
The fluid may corrode painted surfaces of plastic parts. Always clean up spilled fluid immediately.

⚠ WARNING
- **Use only the designated quality fluid. Otherwise, the rubber seals may deteriorate causing leakage and poor brake performance.**
- **Refill with the same type of fluid. Mixing fluids may result in a harmful chemical reaction leading to poor brake performance.**
- **Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.**





NB1A3013

AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)

⚠ WARNING

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

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

1.Bleed:
- Brake fluid

****

Air bleeding steps:

a.Add proper brake fluid to the reservoir.

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

c.Connect a clear plastic tube ① tightly to the caliper bleed screw ②.

A Front

B Rear

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 ②:
6 Nm (0.6 m • kg, 4.3 ft • lb)

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

NOTE:

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

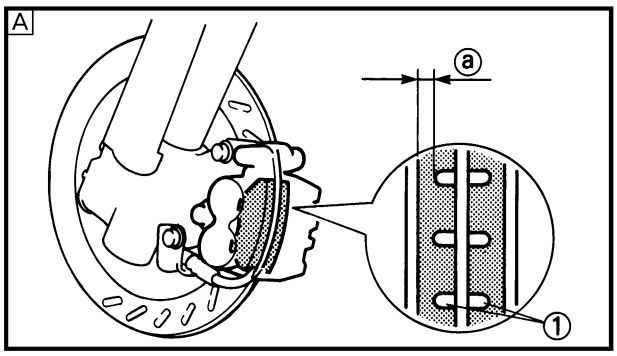
j. Add brake fluid to proper level.

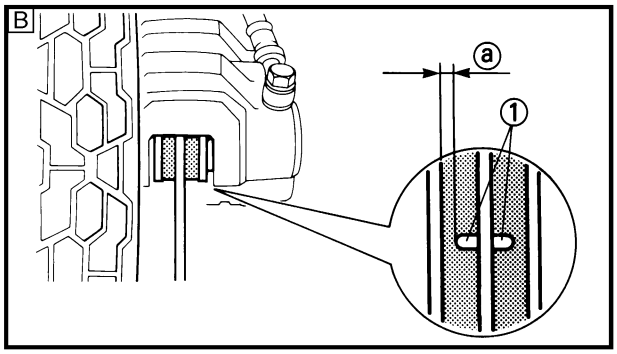
Recommended fluid:
Front:
DOT #4
Rear:
DOT #4

⚠ WARNING

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

****



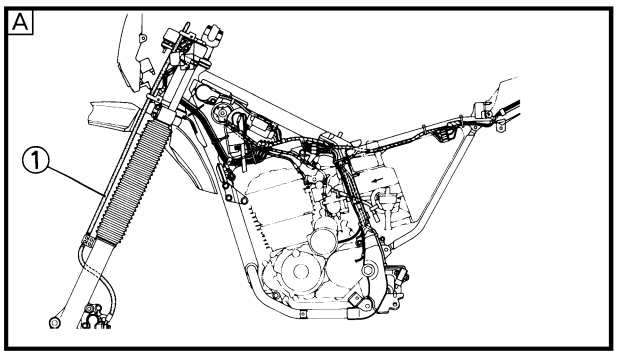


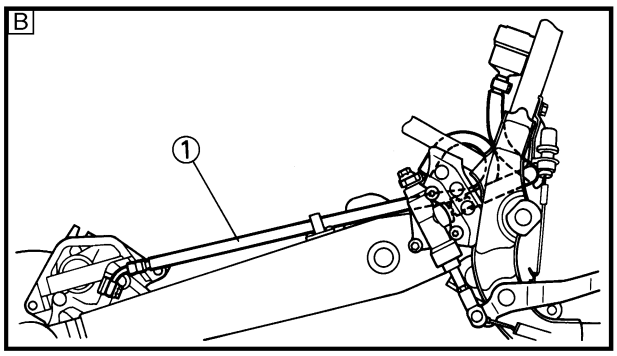
NB1A3009
BRAKE PAD INSPECTION

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

Wear limit ⓐ:
Front: 1.0 mm (0.04 in)
Rear: 1.0 mm (0.04 in)

Refer to "BRAKE PAD REPLACEMENT" in CHAPTER 6.
[A] Front
[B] Rear





NB1A3012
BRAKE HOSE INSPECTION

⚠ WARNING

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

1.Place the motorcycle on a level place.
2.Inspect:
- Brake hose(s) ①
  Cracks/wear/damage → Replace.

Ⓐ Front
Ⓑ Rear

3.Hold the motorcycle on upright position and apply the front brake and/or rear brake.
4.Check:
- Fluid leakage
  Active the brake lever and/or brake pedal several times.
  Fluid leakage → Replace.
  Refer to "FRONT AND REAR BRAKE" in CHAPTER 6.

NB1A4007
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 its "tightest" position.

CAUTION:

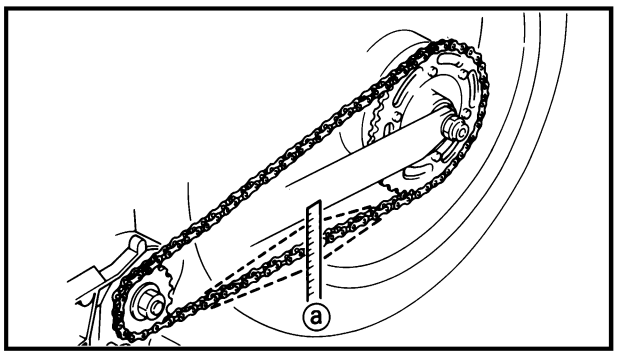
Too little chain slack will overload the engine and other vital parts. Keep the slack within the specified limits.

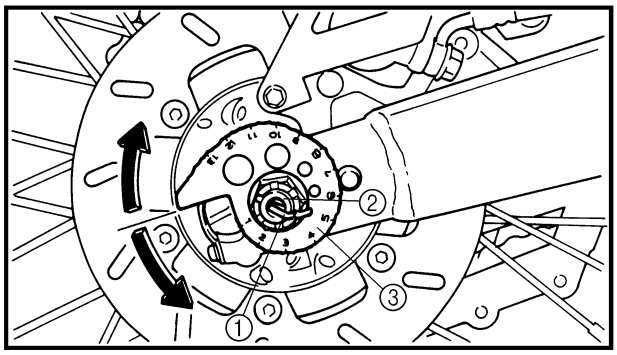
⚠ WARNING

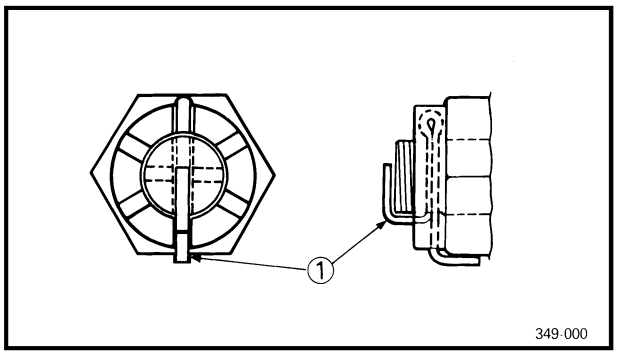
Securely support the motorcycle so there is no danger of it falling over.

1.Place the motorcycle on its centerstand.

NOTE:
Elevate the rear wheel by placing a suitable stand under the engine if a centerstand is not equipped.







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

Drive chain slack:
35 ~ 50 mm (1.38 ~ 1.97 in)
with elevated rear wheel

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 ②:
105 Nm (10.5 m • kg, 75 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.

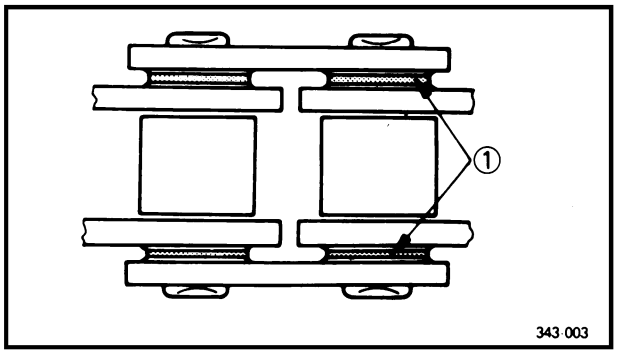
⚠ WARNING
Always use a new cotter pin.

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.



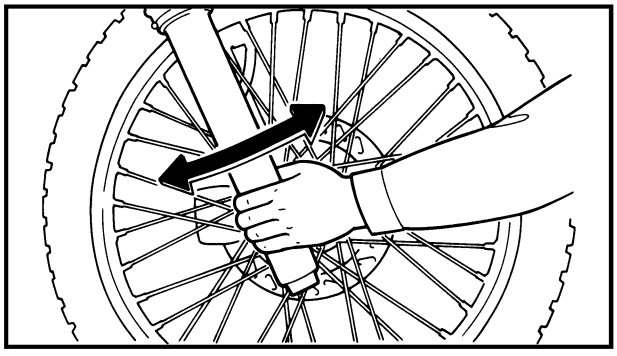
Recommended lubricant:
SAE 30 ~ 50W motor oil or chain lubricants suitable for "O-ring" chains.

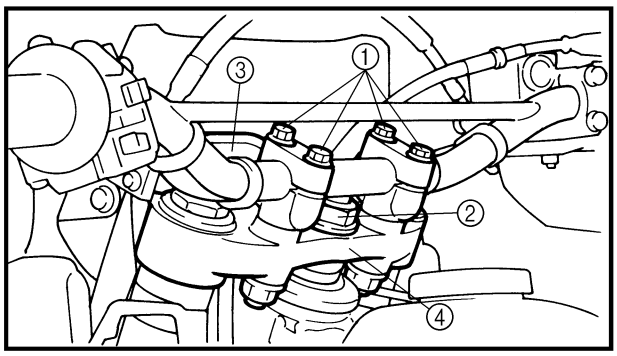
STEERING HEAD ADJUSTMENT

⚠ WARNING

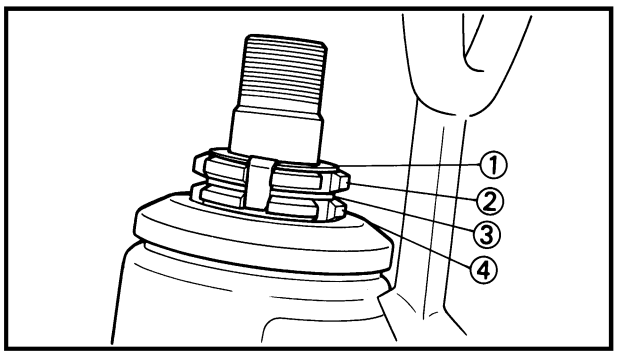
Securely support the motorcycle so there is no danger of it falling over.

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





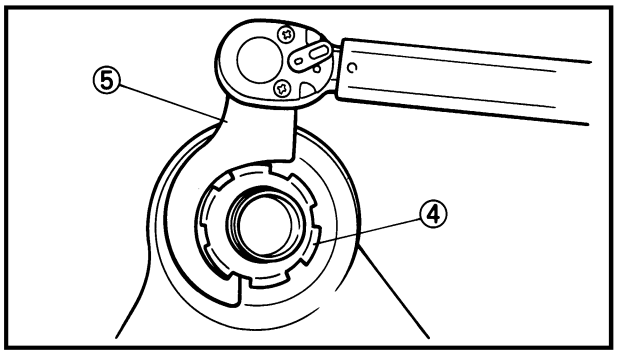
5.Remove:
- Bolts (handlebar) ①
- Nut (steering shaft) ②
- Speedometer ③
- Upper bracket ④
- Pinch bolts (upper bracket)



6.Adjust:
- Steering head

****

Adjustment steps:
- Remove the lock washer ①.
- Remove the ring nut (upper) ② and damper collar ③, then loosen the ring nut (lower) ④.
- Tighten the ring nut (lower) using ring nut wrench ⑤.



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

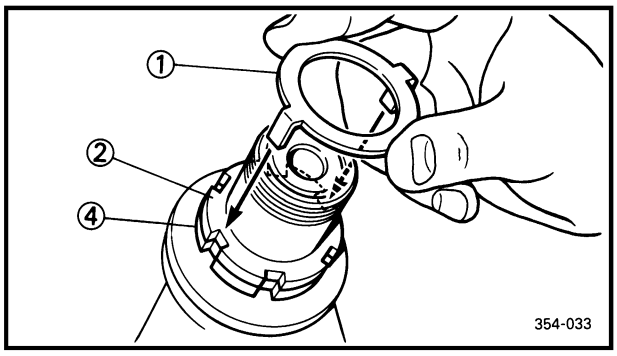
	**Ring nut wrench: P/N. YU-33975**
	**Ring nut-lower ④ (initial tightening): 38 Nm (3.8 m • kg, 27 ft • lb)**

- Loosen the ring nut (lower) one turn.
- Retighten the ring nut (lower) using the ring nut wrench.

	**Ring nut-lower ④ (final tightening): 5 Nm (0.5 m • kg, 3.6 ft • lb)**

⚠ WARNING

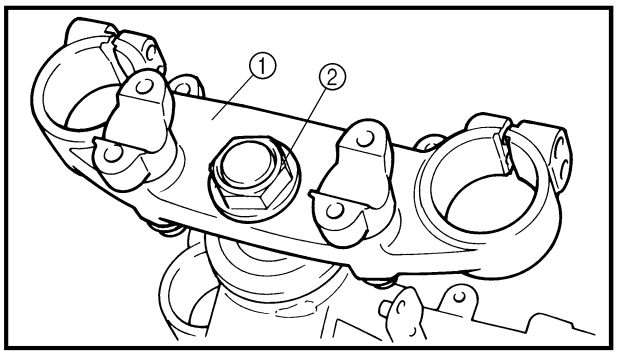
Avoid overtightening.



- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings.
- Install the damper collar and ring nut (upper) ②.
- Finger tighten the ring nut (upper) ②, then align the slots of both ring nuts. If not aligned, hold the ring nut (lower) ④ and tighten the other until they are aligned.
- Install the lock washer ①.

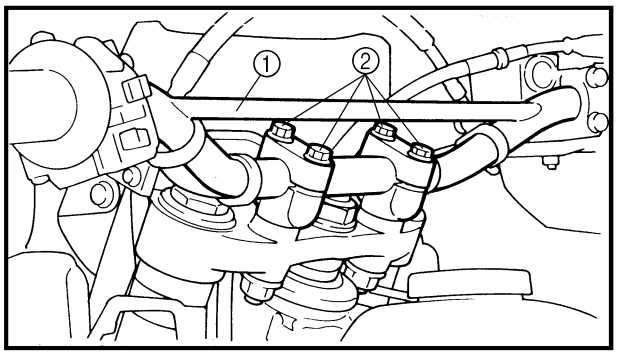
NOTE:
Make sure the lock washer tabs are placed in the slots.

****



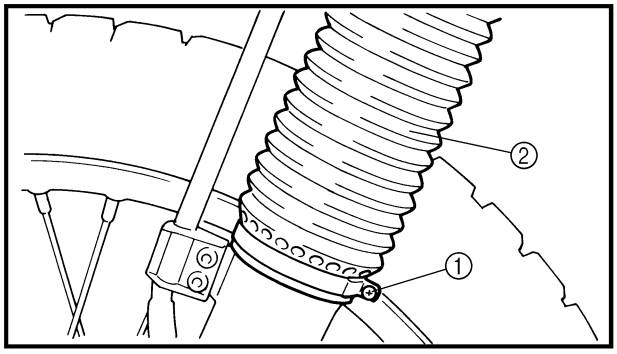
7.Install:
- Upper bracket ①
- Nut ②
  Refer to "STEERING HEAD AND HANDLEBAR" in CHAPTER 6.

	Cap nut ② (steering shaft): 120 Nm (12 m • kg, 85 ft • lb)



8.Install:
- Handlebar ①
- Bolts ② (handlebar crown)
- Pinch bolts (upper bracket)

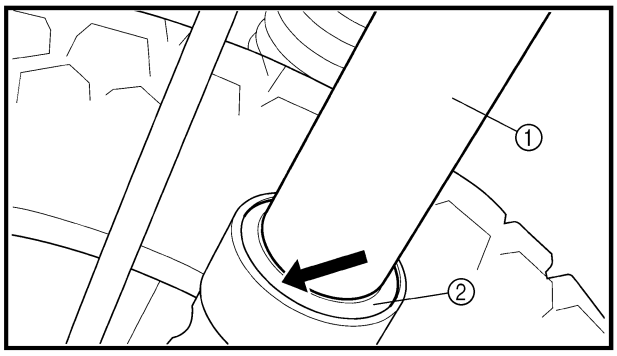
	Bolt ② (handlebar crown): 23 Nm (2.3 m • kg, 17 ft • lb) **Pinch bolt (upper bracket): 23 Nm (2.3 m • kg, 17 ft • lb)**



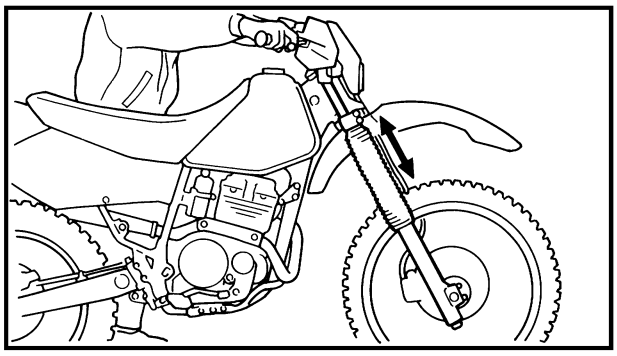
NB2A1001
FRONT FORK INSPECTION

⚠ 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



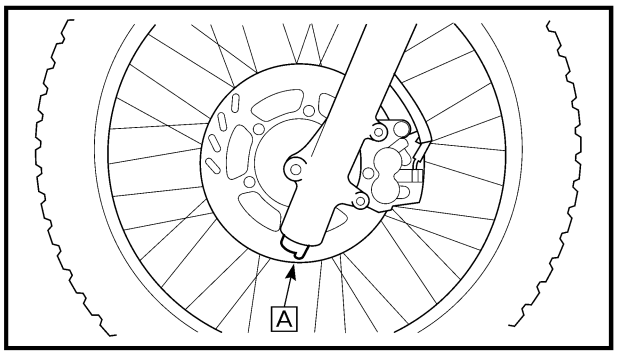
3.Check:
- Inner tube ①
  Scratch/damage → Replace.
- Dust seal ②
- Oil seal
  Excessive oil leakage → Replace.



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 "FRONT FORK" in CHAPTER 6.

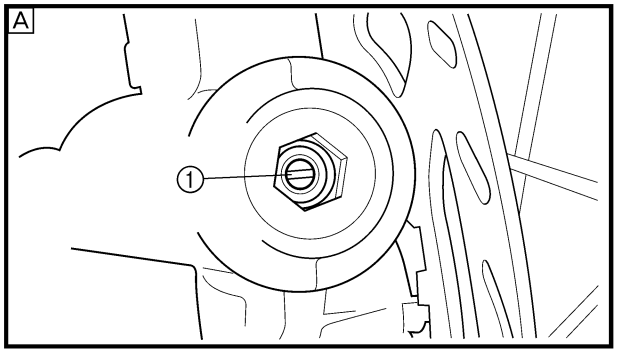
6.Install:
- Fork boots
- Band
  Refer to "FRONT FORK" in CHAPTER 6.

CAUTION:
Always use a new band.



NB1A1003
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.**



Compression damping
1.Adjust:
- Compression damping
  Turn the adjuster ① in or out.

Turning in → Compression damping is harder.
Turning out → Compression damping is softer.

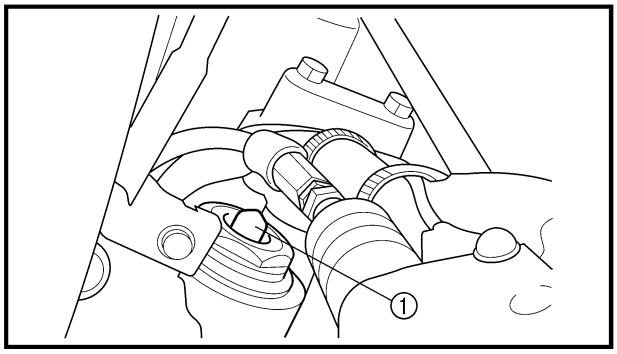
Adjuster position:
Standard: 13 clicks out
Minimum: 20 clicks out
Maximum: 1 click out from full turn in

CAUTION:
- **Always keep the adjustment level equal on both forks.**
- **Never attempt to turn the adjuster beyond the maximum or minimum setting.**

Spring preload adjusting air valve

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.

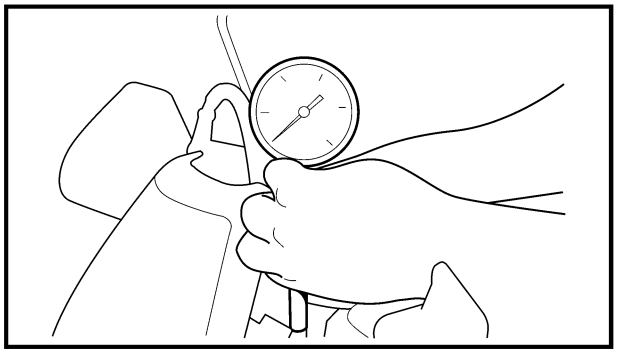


2.Remove:
- Air valve caps ①

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:
0 kPa (0 kg/cm², 0 psi)
Maximum air pressure:
40 kPa (0.4 kg/cm², 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/cm², 1.4 psi) or less.

****

4.Install:
- Air valve caps

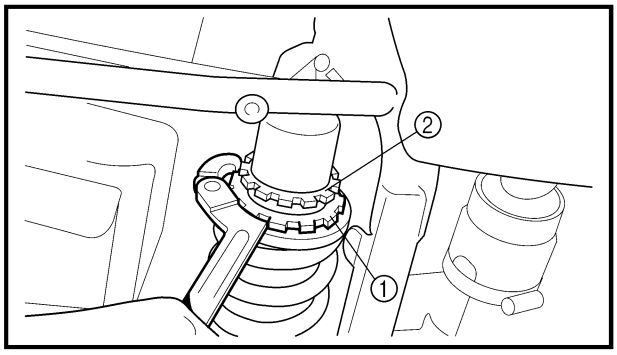
NB533012
REAR SHOCK ABSORBER ADJUSTMENT

⚠ WARNING

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

1.Remove:
- Side cover (right)
- Battery box
- Seat

  Refer to "REAR SHOCK ABSORBER AND SWINGARM" in CHAPTER 6.



Spring preload

1.Adjust:
- Spring preload

  Turn the adjuster ① in or out.

****

Adjustment steps:

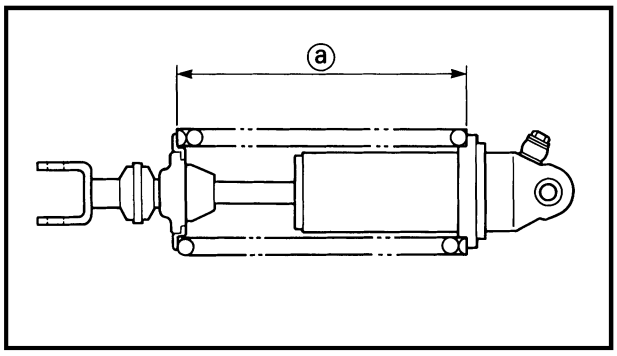
Spring preload

- Loosen the locknut ② using the ring nut wrench.

	**Ring nut wrench: P/N. 90890-01443**

- Turn the adjuster ① in or out.

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



Measurement length ⓐ:
Standard:
228 mm (9.0 in)
Minimum:
224 mm (8.8 in)
Maximum:
236 mm (9.3 in)

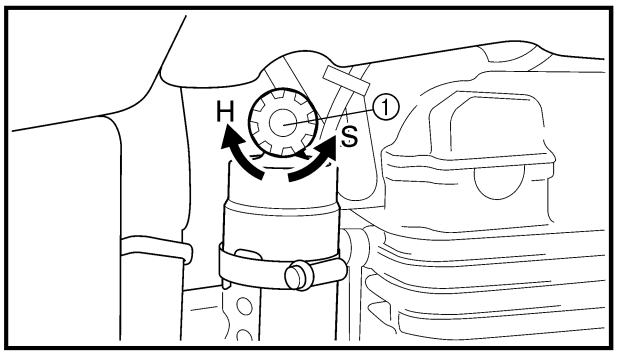
CAUTION:
Never attempt to turn the adjuster beyond the maximum or minimum setting.

● Tighten the locknut.

Locknut:
70 Nm (7.0 m • kg, 50 ft • lb)

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

****



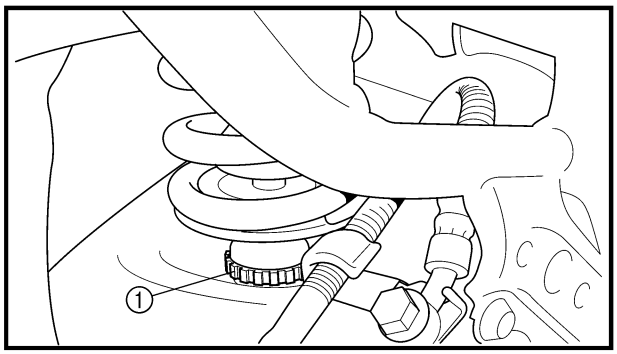
Compression damping
1. Adjust:
• Compression damping
Turn the adjuster ① to in or out.

Turning in → Compression damping is harder.

Turning out → Compression damping is softer.

Adjuster position:
Standard: 11 clicks in
Minimum: 5 click in from full turn out
Maximum: 15 clicks in

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



Rebound damping

1.Adjust:

- Rebound damping
  Turn the adjuster ① in or out.

Turning in → Rebound damping is harder.
Turning out → Rebound damping is softer.

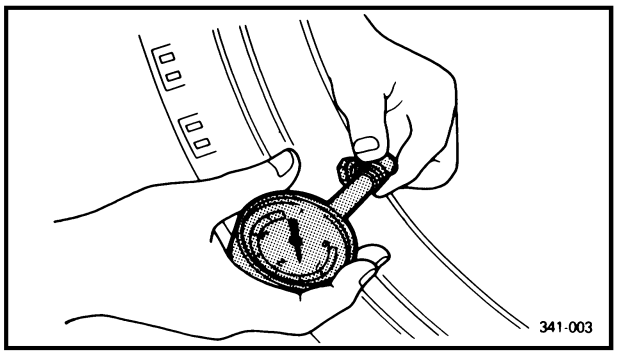
Adjuster position:
Standard: 8 clicks out
Minimum: 16 clicks out
Maximum: 1 click out from full turn in.

NB2A3013

TIRE INSPECTION

1.Measure:

- Tire pressure
  Out of specification → Adjust.



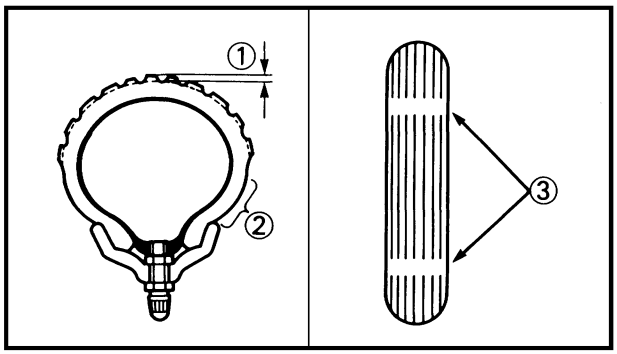
⚠ WARNING

- **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	**124 kg (273 lb)**
Maximum load- except motorcycle*	**90 kg (198 lb)**

Cold tire pressure	**Front**	**Rear**
Off-road riding*	**100 kPa (1 kg/cm², 14.5 psi)**	**100 kPa (1 kg/cm², 14.5 psi)**

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



2.Inspect:
- Tire surfaces
  Wear/damage → Replace.

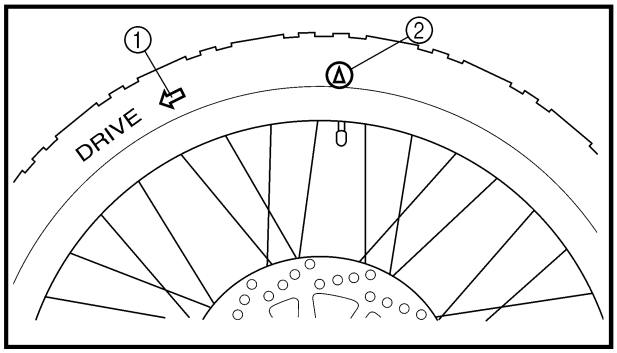
Minimum tire tread depth (front and rear):
0.8 mm (0.03 in)

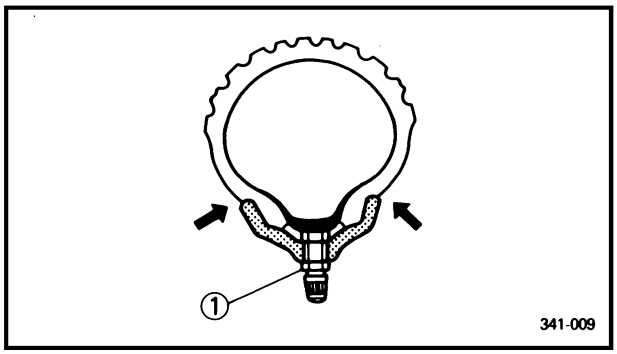
① Tread depth
② Side wall
③ Wear indicator

⚠ WARNING

- **It is dangerous to ride with a worn-out 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:

Manufacturer	Size	Type
DUNLOP	80/100-21 51M	Tube

Rear:

Manufacturer	Size	Type
DUNLOP	100/100-18 59M	Tube

NOTE:

For tires with the "DRIVE" mark ①:

- Install the wheel with the "DRIVE" mark pointing in 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.**

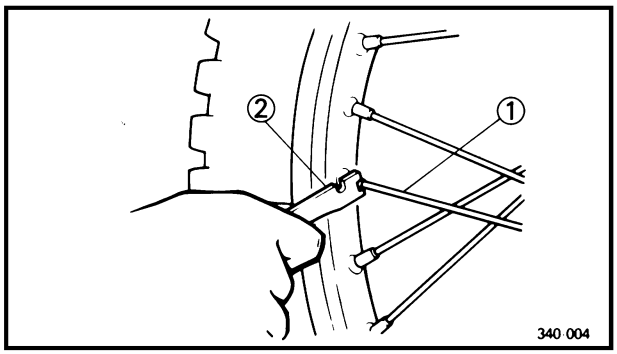
Valve stem locknut ①:
1.5 Nm (0.15 m • kg, 1.1 ft • lb)

NA2A3016
WHEEL INSPECTION

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

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

⚠ WARNING
Never attempt even small repairs to the wheel.



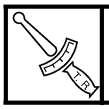
NB2A3017
SPOKES INSPECTION AND TIGHTENING

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:
3 Nm (0.3 m • kg, 2.2 ft • lb)

CABLE INSPECTION AND LUBRICATION

⚠ WARNING
A damaged cable sheath may cause corrosion and interfere with the cable movement. An unsafe condition may result, so replace such a damaged cable as soon as possible.

1.Inspect:
- Cable sheath
  Damage → Replace.

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

	Recommended lubricant: SAE 10W30 motor oil

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

NB3A3019
LEVER AND PEDAL LUBRICATION
Lubricate the lever and pedal at their pivoting points.

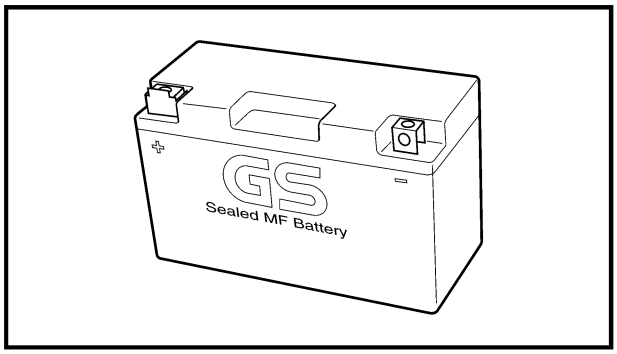
	Recommended lubricant: SAE 10W30 motor oil

NB3A5000
SIDESTAND LUBRICATION
Lubricate the sidestand at pivoting points.

	Recommended lubricant: SAE 10W30 motor oil

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 of the sealed type. Never remove sealing caps even when charging. With the sealing caps removed, the balance 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 are different from those of 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.**



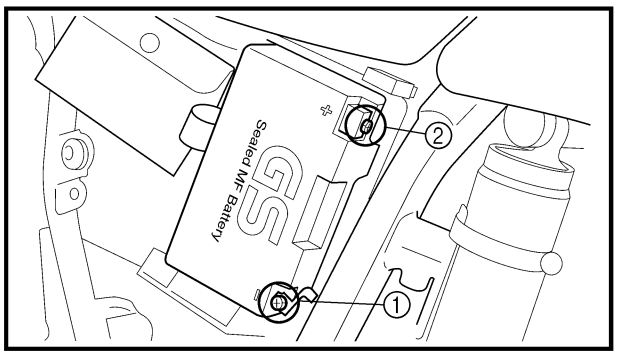
⚠ WARNING

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 (right)

Refer to "SEAT, FUEL TANK AND COVERS".

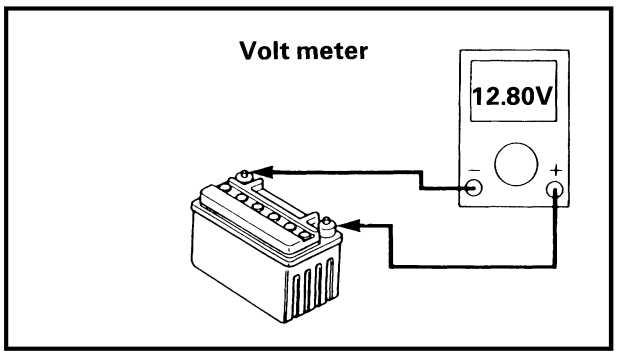


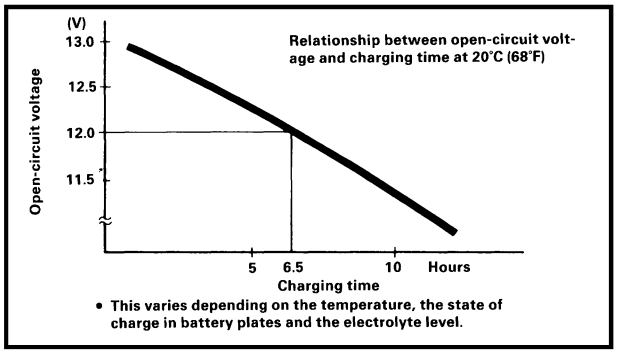
2.Disconnect:
- Battery leads

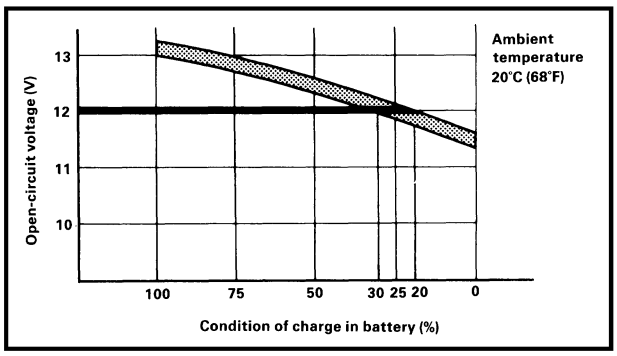
CAUTION:

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 the open-circuit voltage (the voltage measured with the positive terminal being disconnected).

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

- Check the battery condition using the given figures.

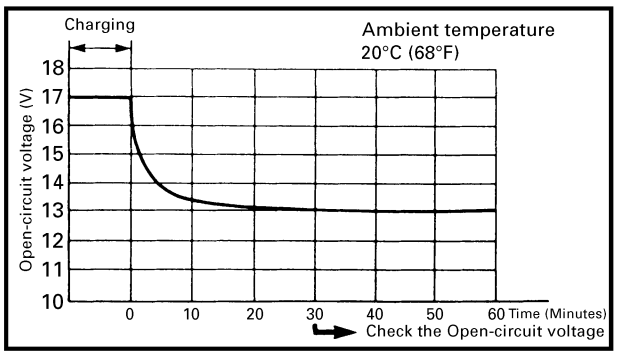
  Example:
  Open-circuit voltage = 12.0 V
  Charging time = 6.5 hours
  Condition of charge in battery = 20 ~ 30 %

****

5.Charging method of MF batteries.

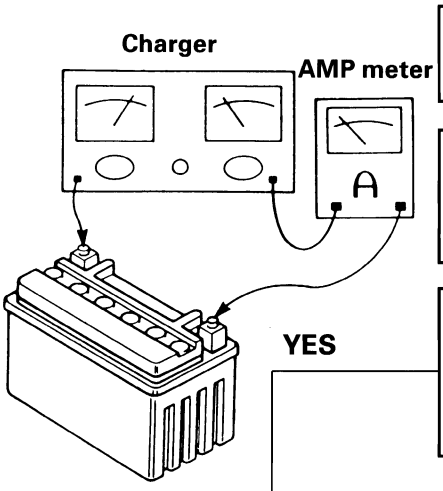
CAUTION:

- **If it is impossible to set the standard charging current, be sure not to over change.**
- **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 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 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.

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

NO

By turning the charging voltage adjust dial, set the charging voltage at 20 ~ 25 V.

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

YES

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

NO

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

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

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

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

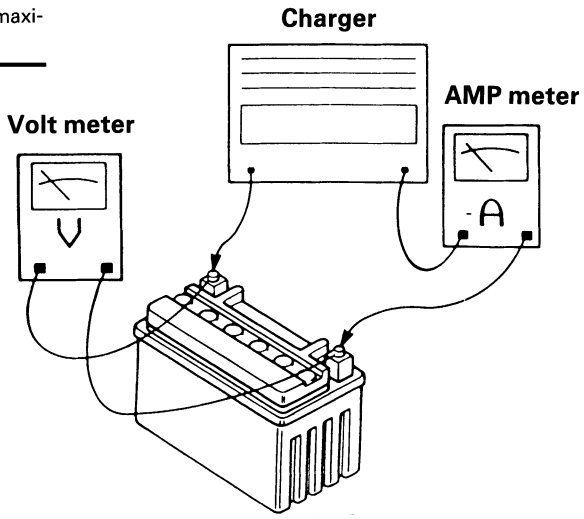
Charge the battery until the battery's charging voltage is 15 V.

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

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

NO

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



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

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

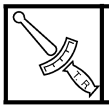
NOTE:
After cleaning the terminals, apply grease lightly to the terminals.

7.Install:
- Battery

8.Connect:
- Battery leads

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

9.Install:
- Side cover (right)

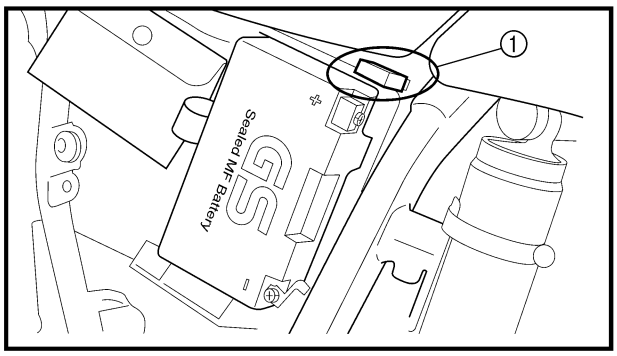


Bolt (side cover):
7 Nm (0.7 m • kg, 5.1 ft • lb)

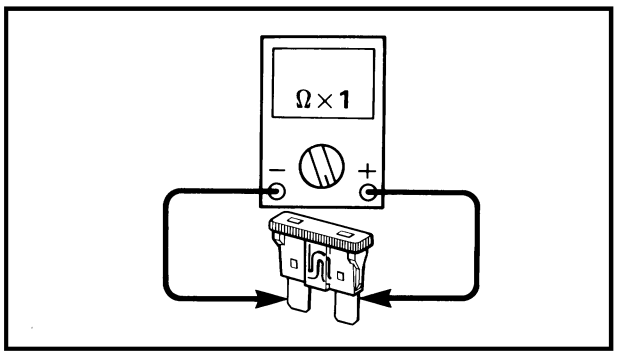
NB302001
FUSE INSPECTION

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 (right)
  Refer to "SEAT, FUEL TANK AND COVERS".



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**

● If the tester indicates ∞, the fuse is blown and needs to be replaced.

****

4.Replace:
• Blown fuse

****

Blown fuse replacement steps:

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

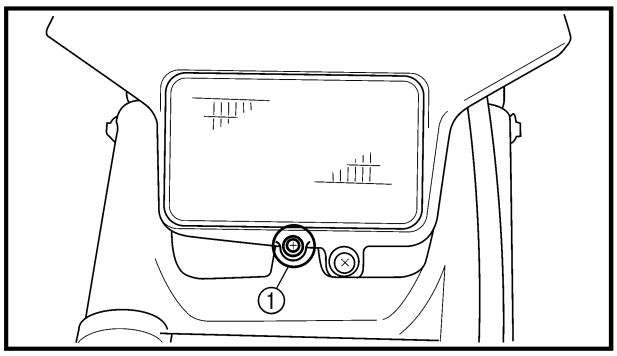
	Fuse: **15 A × 1 pc.**

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

****

⚠ WARNING

Never use a fuse with a rating other than 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.



HEADLIGHT BEAM ADJUSTMENT

1.Adjust:
- Headlight beam (vertical)

To raise the beam	**Turn adjusting screw ① counterclockwise.**
To lower the beam	**Turn adjusting screw ① clockwise.**

HEADLIGHT BULB REPLACEMENT

1.Remove:
- Cover (headlight)

2.Disconnect:
- Headlight leads

⚠ 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.

3.Install:
- Bulb (new)

CAUTION:

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

4.Install:
- Bulb cover
- Headlight leads

5.Install:
- Cover (headlight)

NB241000

ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

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

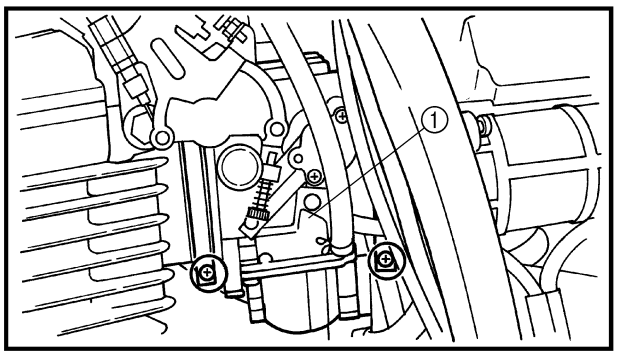
- Cylinder head
- Cylinder
- Clutch
- Oil pump
- CDI magneto

SEAT, FUEL TANK AND COVERS

1.Remove:

- Side covers
- Seat
- Fuel tank

Refer to "SEAT, FUEL TANK AND COVERS" in CHAPTER 3.

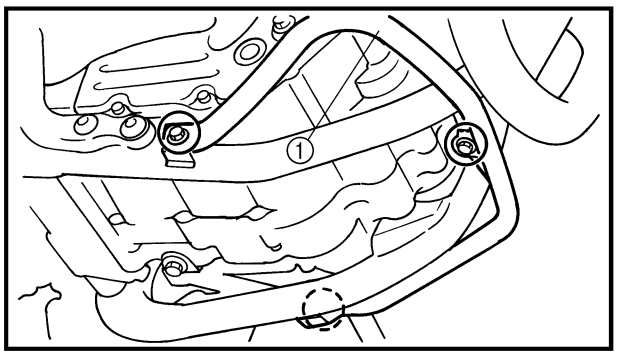


CARBURETOR

1.Remove:

- Carburetor ①

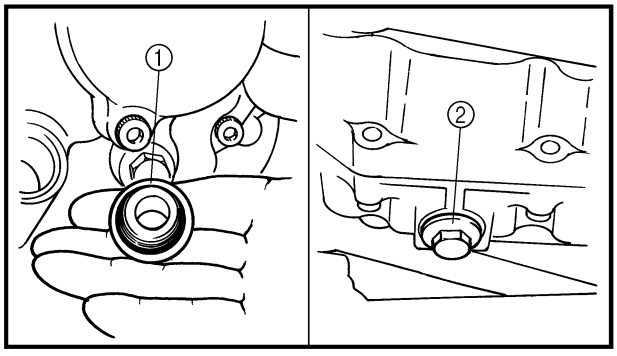
Refer to "CARBURETOR" in CHAPTER 5.



ENGINE GUARD

1.Remove:

- Engine guard ①

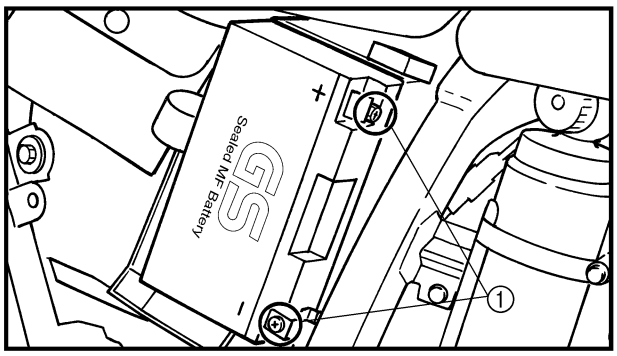


ENGINE OIL

1.Drain:

- Oil filler cap ①
- Drain plug ②

Refer to "ENGINE OIL REPLACEMENT" in CHAPTER 3.



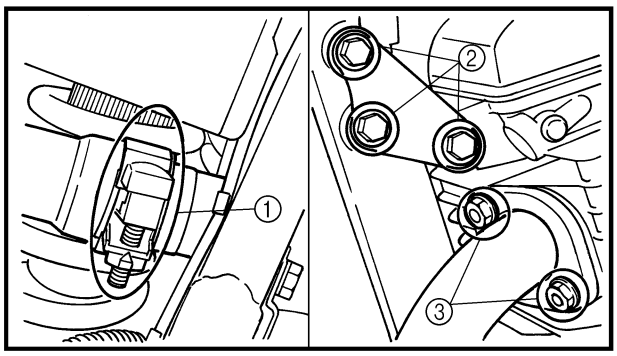
NB241003

BATTERY

1.Remove:

- Battery ①

  Refer to "BATTERY INSPECTION" in CHAPTER 3.



EXHAUST PIPE

1.Loosen:

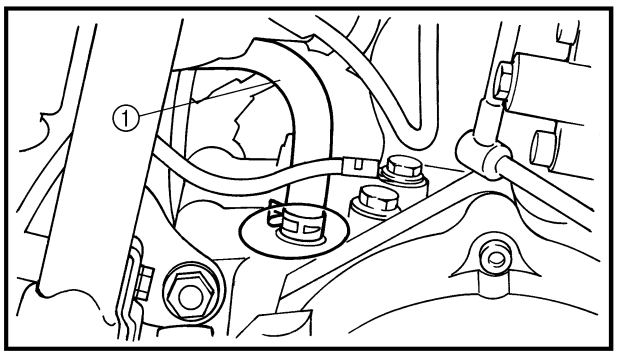
- Bolt ① (clamp)

2.Remove:

- Mounting bolts ② (front-upper)
- Nuts ③ (exhaust pipe)

3.Remove:

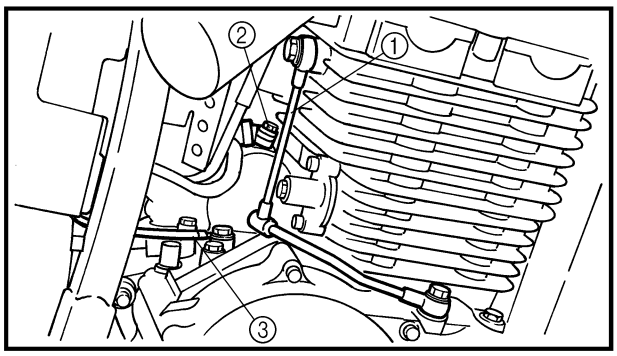
- Exhaust pipe



CRANKCASE BREATHER HOSE

1.Disconnect:

- Crankcase breather hose ①



STARTER MOTOR

1.Disconnect:

- Gas chamber

  Refer to "REAR SHOCK ABSORBER AND SWINGARM" in CHAPTER 6.

2.Remove:

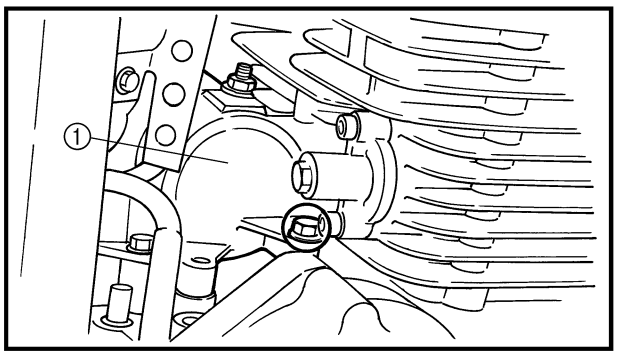
- Oil delivery pipe ①

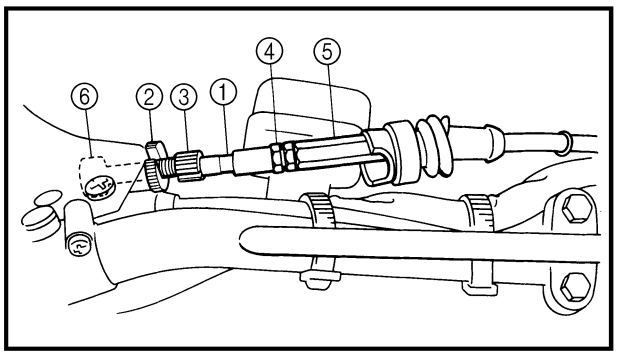
3.Disconnect:

- Starter motor lead ②
- Ground lead ③

4.Remove:

- Starter motor ①





CLUTCH CABLE AND LEADS

1.Remove:

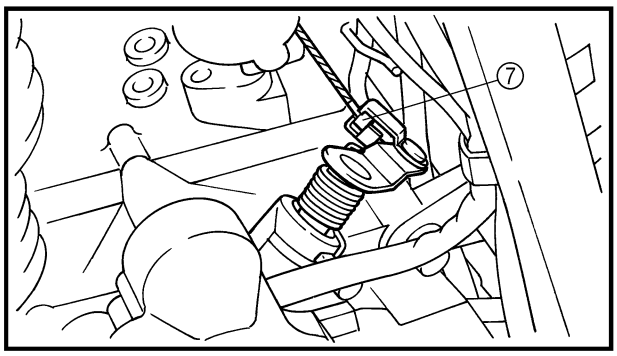
- Clutch cable ①

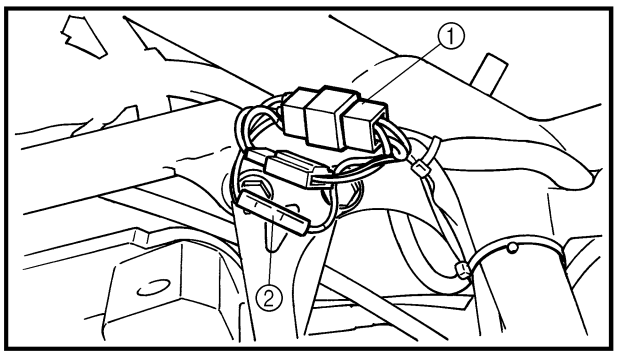
****

Removal steps:

- Loosen the locknuts ②, ④.
- Turn the adjuster ③, ⑤ enough to free the clutch cable.
- Unhook the cable end ⑥ from the clutch lever.
- Unhook the cable end from the clutch push lever ⑦.

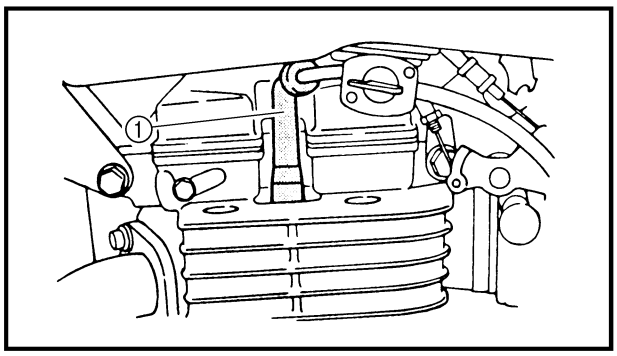
****





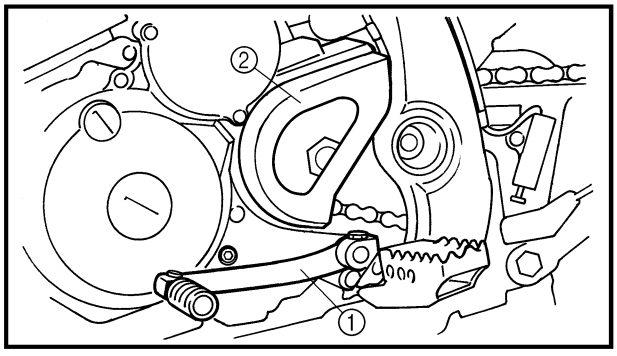
2.Disconnect:

- A.C. magneto leads ①
- Neutral switch lead ②



3.Disconnect:

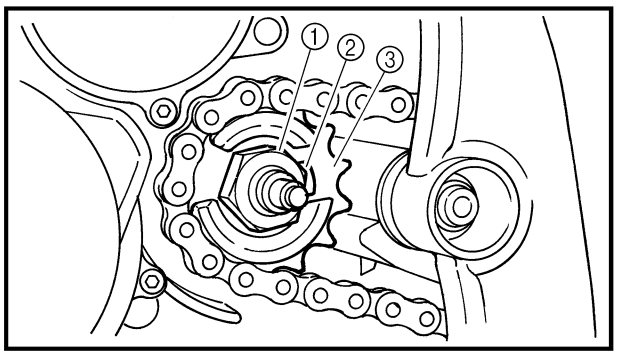
- Spark plug lead ①



DRIVE SPROCKET

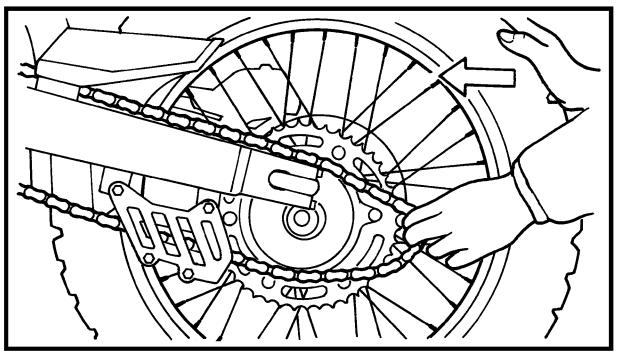
1.Remove:

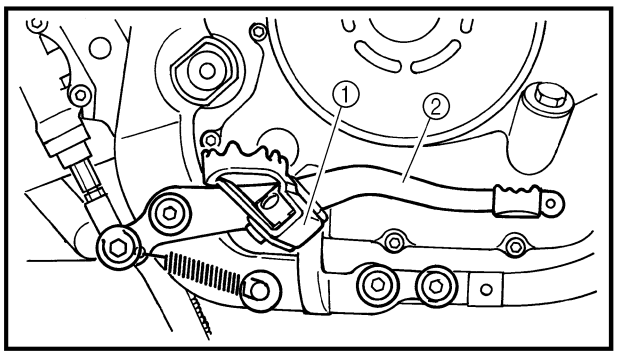
- Shift pedal ①
- Crankcase cover 3 ②



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

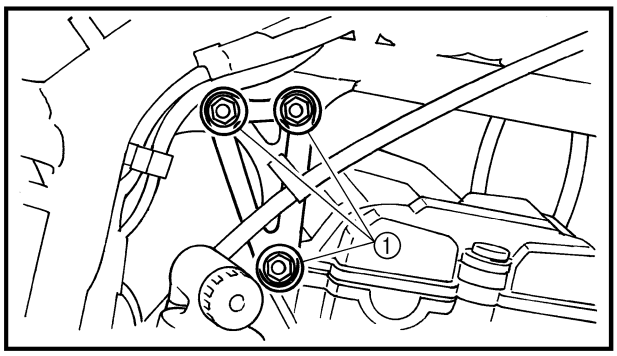
NOTE:
- Straighten the lock washer tab.
- Loosen the nut while applying the rear brake.
- First remove the drive chain on the rear sprocket side.





FOOTREST AND BRAKE PEDAL

1.Remove:
- Footrest (right) ①
- Brake pedal ②



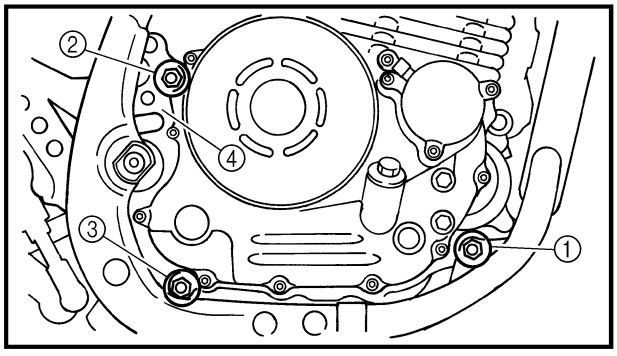
ENGINE REMOVAL

1.Place a suitable stand under the frame and engine

⚠ WARNING

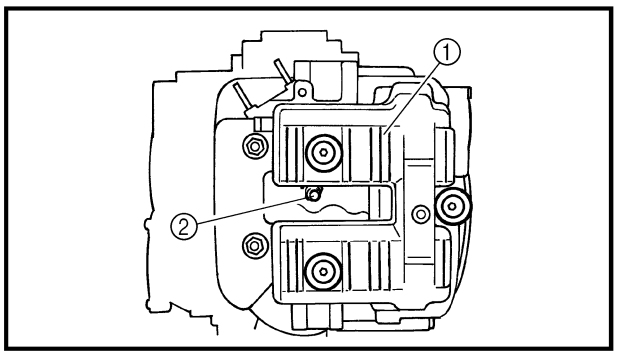
Securely support the motorcycle so there is no danger of it falling over.

2.Remove:
- Mounting bolts ① (rear-upper)



3.Remove:
- Mounting bolt ① (front-lower)
- Mounting bolt ② (rear-center)
- Mounting bolt ③ (rear-lower)
- Engine bracket ④

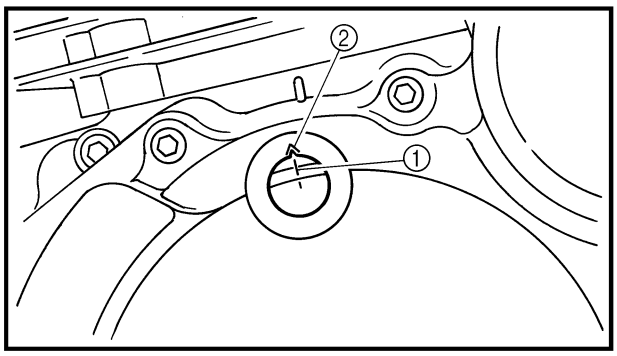
4.Remove:
- Engine assembly (from right side of motorcycle)

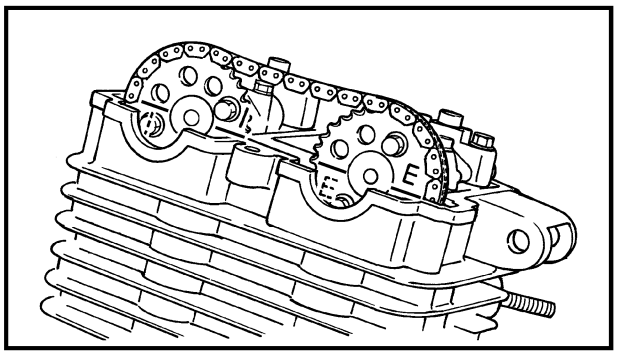


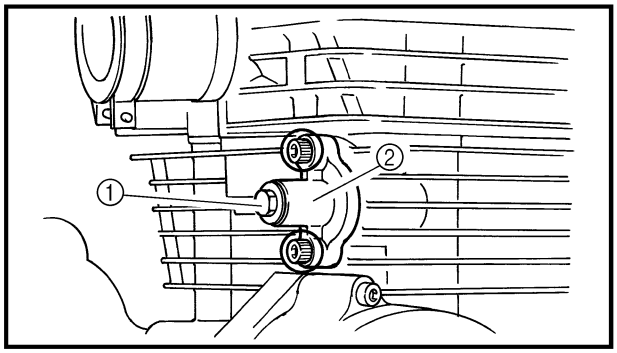
NB342002
ENGINE DISASSEMBLY
CYLINDER HEAD, CAMSHAFTS, CYLINDER AND PISTON

1.Remove:
- Cylinder head cover ①
- Spark plug ②

2.Remove:
- Plugs (with O-ring)







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

****

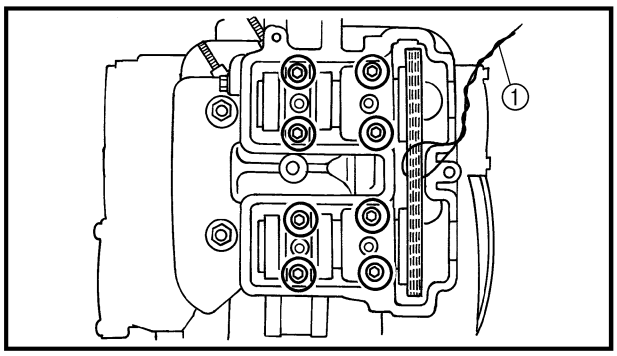
TDC alignment steps:
- Turn the crankshaft clockwise with wrench.
- Align the "T" mark ① on the rotor with the stationary pointer ② on the crankcase cover. When the "T" mark is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

NOTE:
TDC on compression stroke check:
- Both cam lobes must have a valve clearance when the cam sprockets match mark is aligned with the cylinder head match mark.
- If not, give the crankshaft one counterclockwise turn to meet above condition.

****

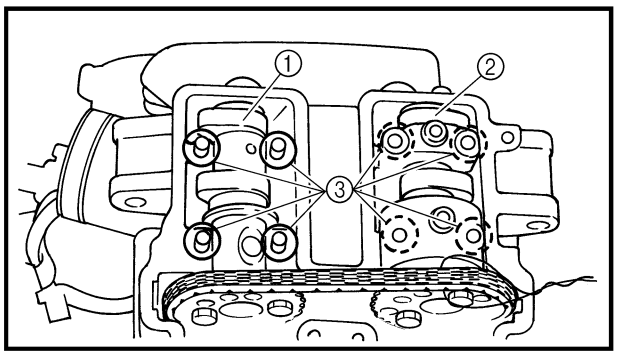
4.Loosen:
- Cap bolt ① (chain tensioner)

5.Remove:
- Chain tensioner ②



6.Remove:
- Camshaft caps

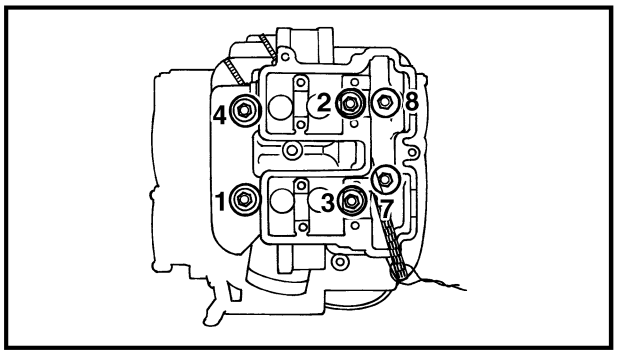
NOTE:
Fasten a safety wire ① to the timing chain to prevent it from falling into the crankcase.



7.Remove:
- Camshaft ① (intake)
- Camshaft ② (exhaust)
- Dowel pins ③

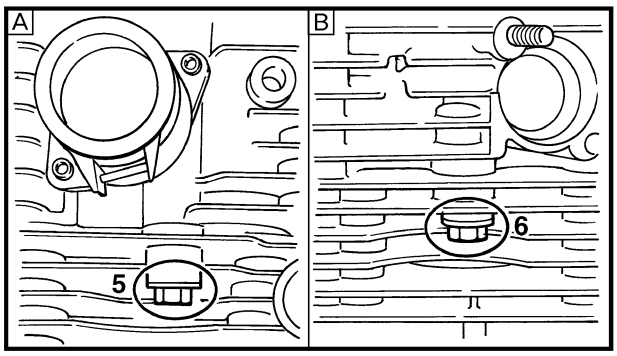
NOTE:
Remove the camshaft cap bolts in a criss-cross pattern from outside to inside.

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

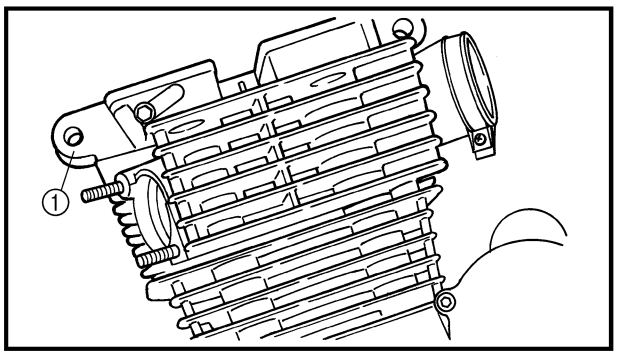


8.Remove:
- Bolts
- Nuts

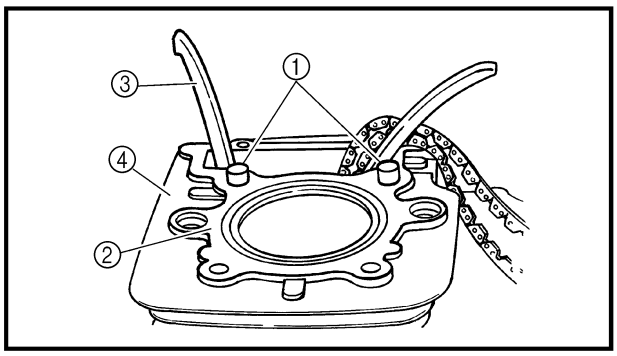
NOTE:
- Loosen the bolts and nuts in the loosening sequence indicated by the numbers.
- Loosen the bolts starting with the highest numbered one.
- Loosen the bolts 1/4 turn each and remove them after all are loosened.



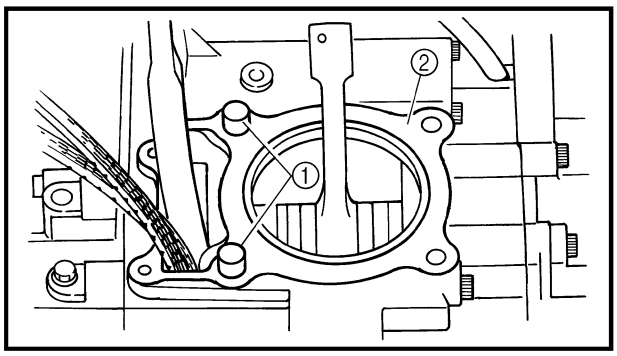
A Rear
B Front



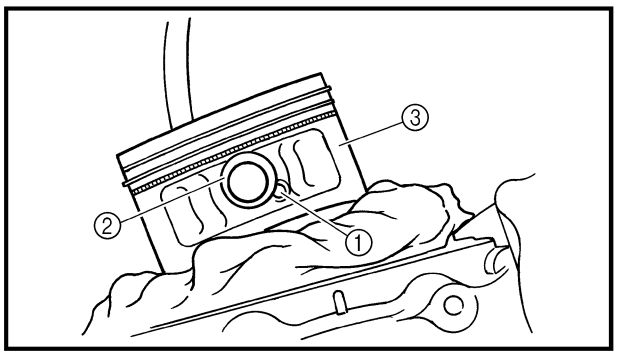
9.Remove:
- Cylinder head ①



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



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



12.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 groove and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use the piston pin puller.

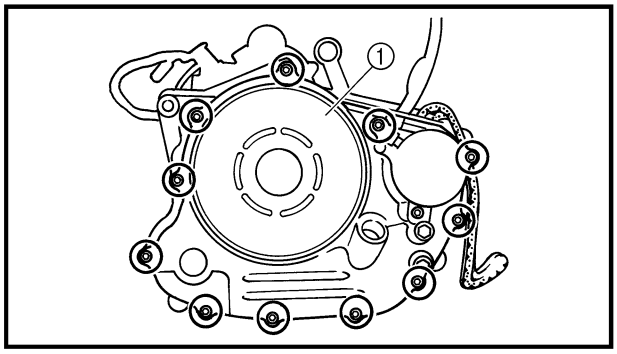


Piston pin puller:
P/N. YU-01304

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

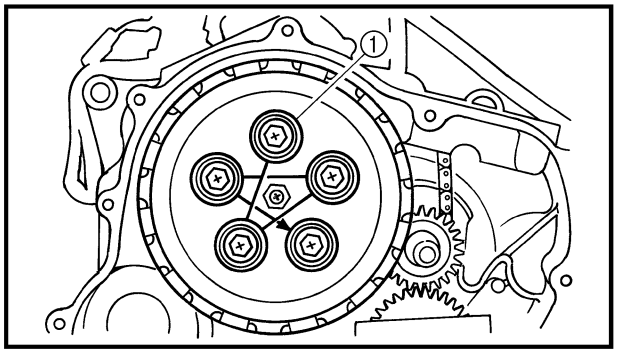
CLUTCH, OIL PUMP AND BALANCER GEAR

NOTE:
With the engine mounted, the clutch and oil pump can be maintained by removing the following parts.
- Footrest (right)
- Brake pedal



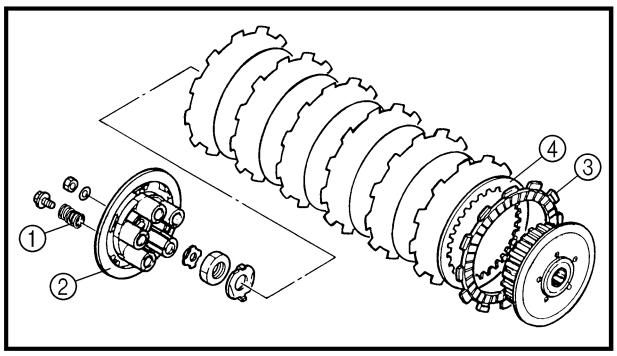
1.Remove:
- Crankcase cover ① (right)

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

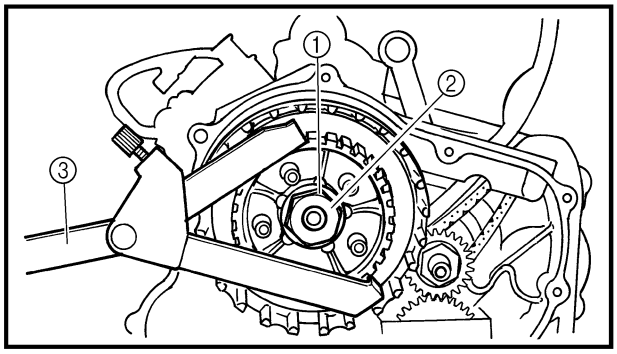


2.Remove:
- Dowel pins
- Gasket (crankcase cover)
- Bolt ①

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



3.Remove:
- Clutch springs ①
- Pressure plate ②
- Friction plates ③
- Clutch plates ④

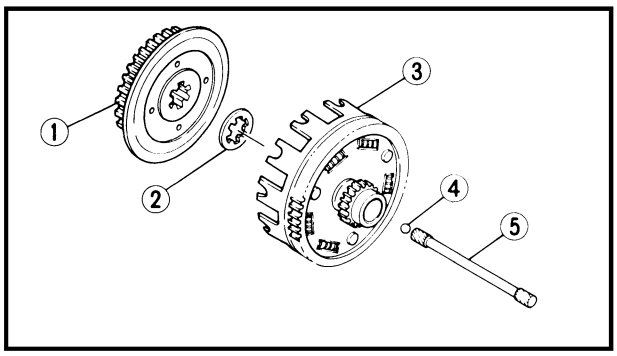


4.Straighten:
- Lock washer tab ①

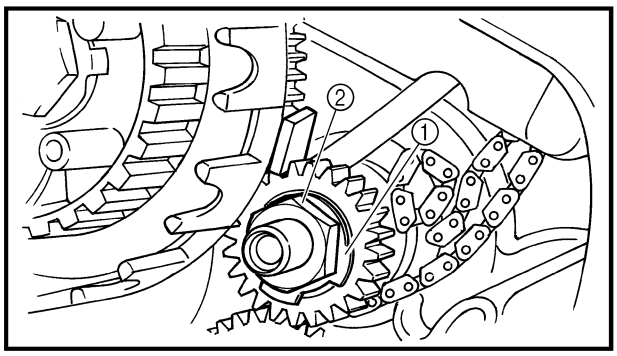
5.Loosen:
- Nut ② (clutch boss)

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

	**Universal clutch holder:** **P/N. YU-91042**



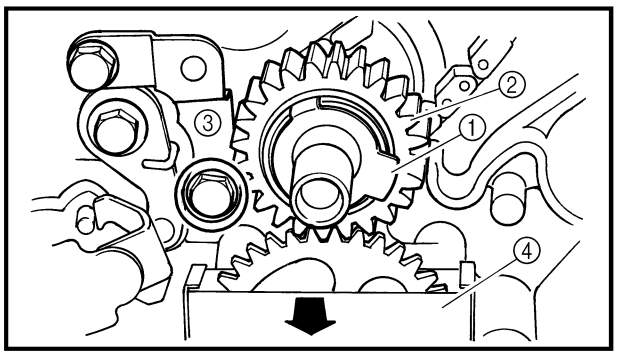
6.Remove:
- Clutch boss ①
- Thrust plate ②
- Primary driven gear ③
- Ball ④
- Push rod ⑤



7.Straighten:
- Lock washer tab ①

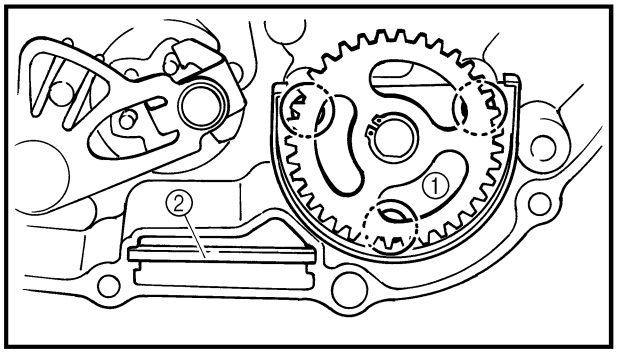
8.Loosen:
- Nut ② (crankshaft)

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

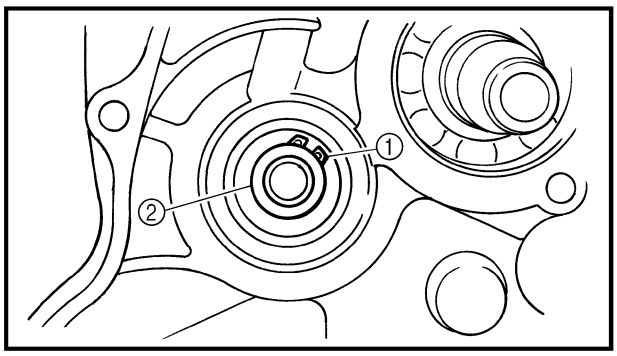


9.Remove:
- Lock washer ①
- Drive gear ②
- Timing chain guide ③
- Oil pump gear cover ④

NOTE:
Remove the cover by pulling outward as shown.



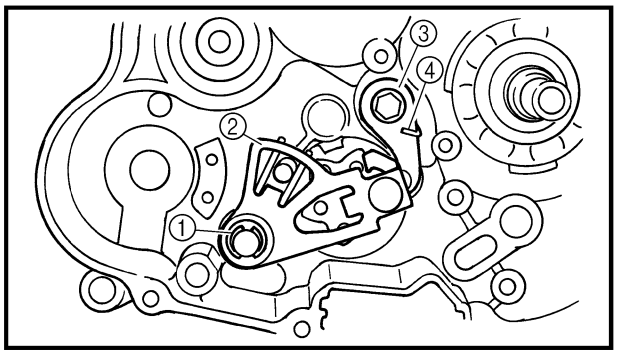
10.Remove:
- Oil pump assembly ①
- Oil strainer ②



11.Remove:
- Circlip ①
- Collar ②
- Circlip

SHIFT SHAFT

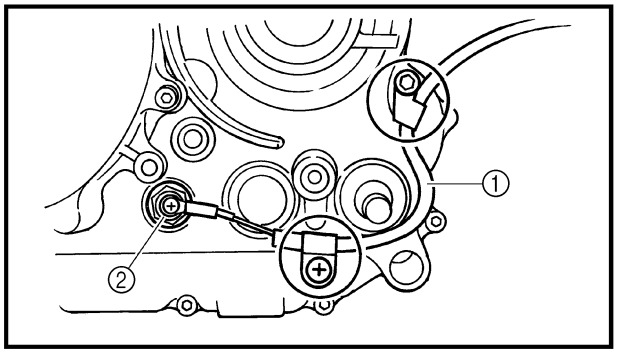
NOTE:
With the engine mounted, the shift shaft can be maintained by removing the following parts.
- Footrest (right)
- Brake pedal
- Clutch
- Oil pump



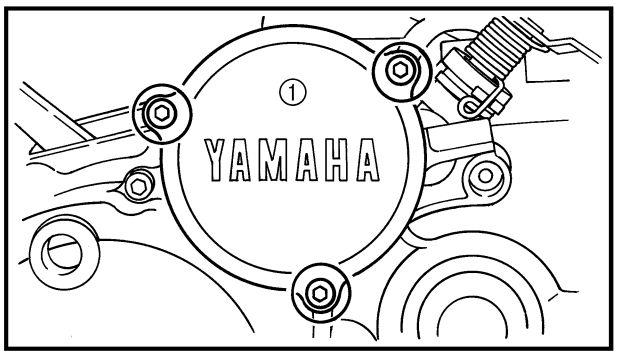
1.Remove:
- Circlip ①
- Shift lever ②
- Stopper lever ③
- Torsion spring ④

ROTOR AND STARTER DRIVES

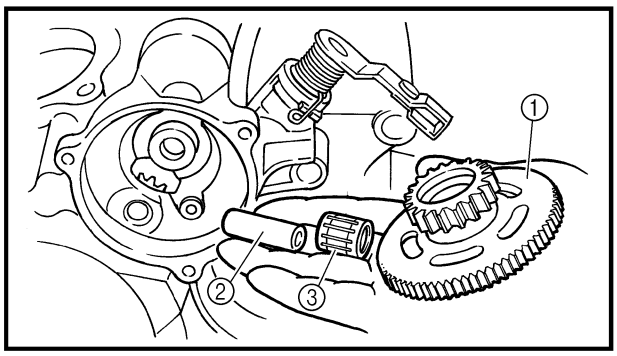
NOTE:
With the engine mounted, the CDI magneto and starter drives can be maintained by removing the following parts.
- Side cover (right)
- Shift pedal
- Fuel tank
- Seat
- Engine guard



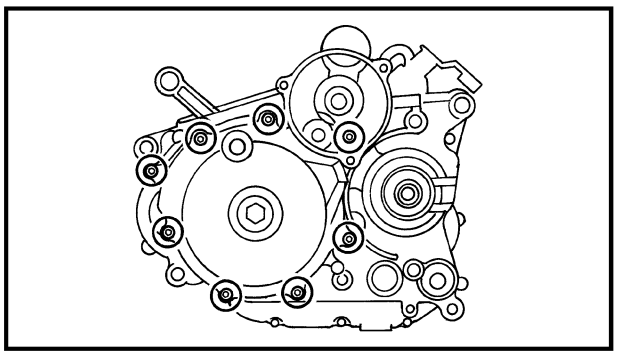
1.Disconnect:
- Neutral switch lead ①
- Neutral switch ②



2.Remove:
- Generator cover ①

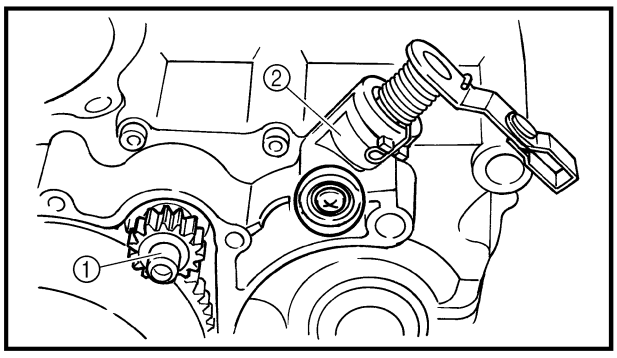


3.Remove:
- Starter idle gear 1 ①
- Shaft ②
- Bearing ③

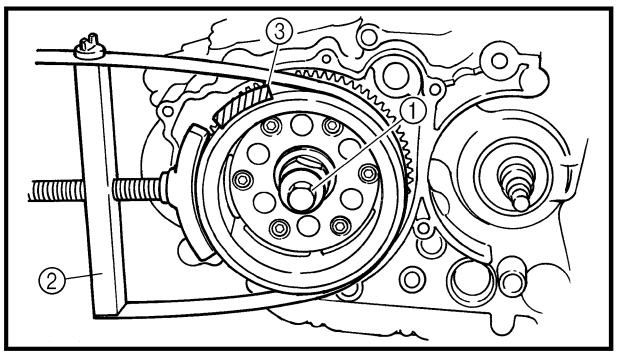


4.Remove:
- Crankcase cover 1 (left)

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

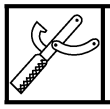


5.Remove:
- Starter idle gear 2 ①
- Push lever assembly ②



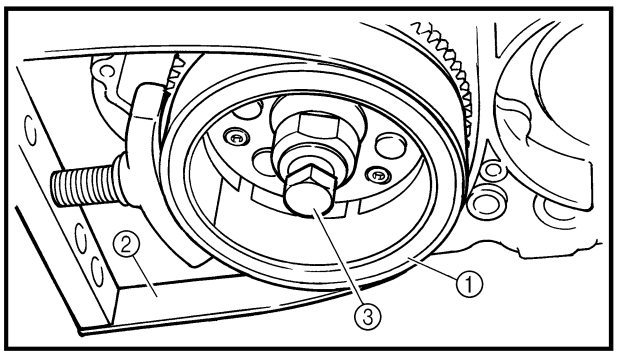
6.Remove:
- Bolt ① (rotor)

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



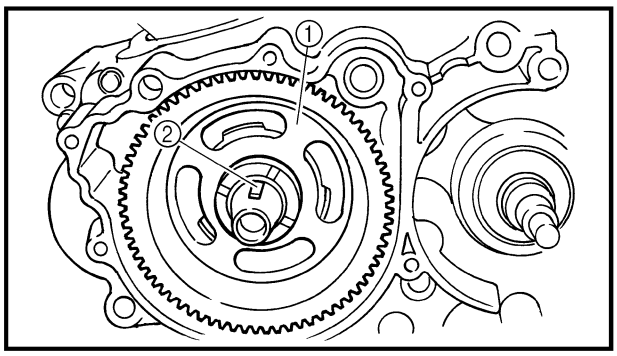
Sheave holder:
P/N. YS-01880

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

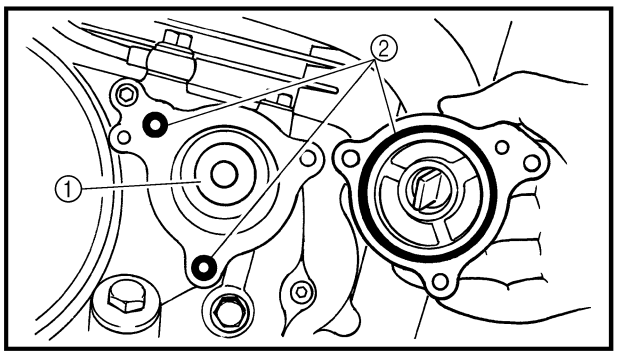


7.Remove:
- Rotor ①
  Use the sheave holder ② and rotor puller ③.

	Rotor puller: **P/N. 2K7-85555-00**

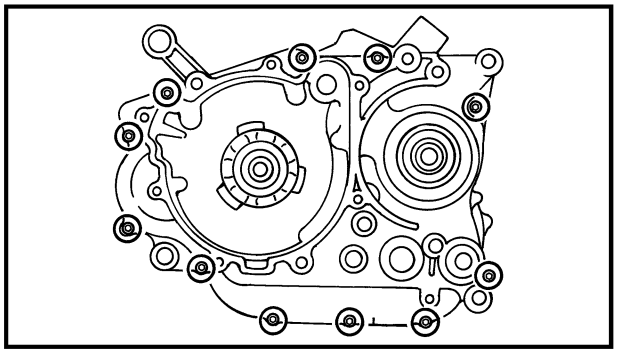


8.Remove:
- Starter wheel gear ①
- Woodruff key ②
- Bearing
- Washer



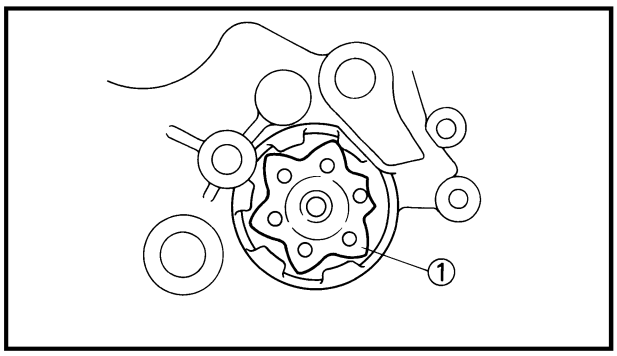
OIL FILTER
1.Remove:
- Oil filter cover

2.Remove:
- Oil filter ①
- O-rings ②



CRANKCASE
1.Remove:
- Bolts (crankcase)

NOTE:
Working in a crisscross pattern, loosen all screws 1/4 turn each. Remove them after all are loosened.

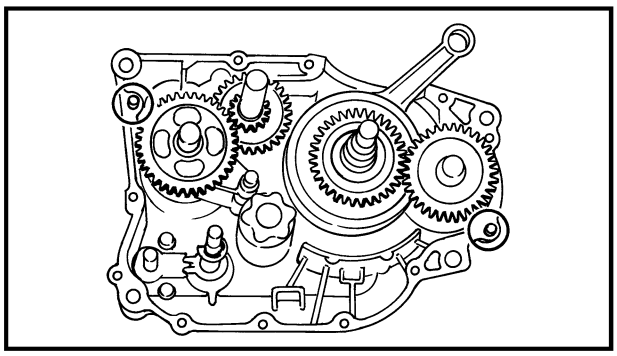


2.Align:
- Shift cam segment ①

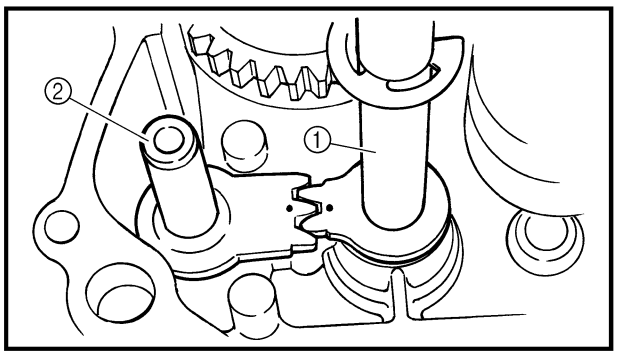
NOTE:
Turn the shift cam to the position shown in the figure so that it does not contact the crankcase when separating the crankcase.

3.Remove:
- Crankcase

CAUTION:
- **The crankcase should be separated from right side.**
- **Separate the crankcase after checking the shift cam segment and removing the drive axle circlip.**
- **Do not damage the crankcase mating surfaces.**

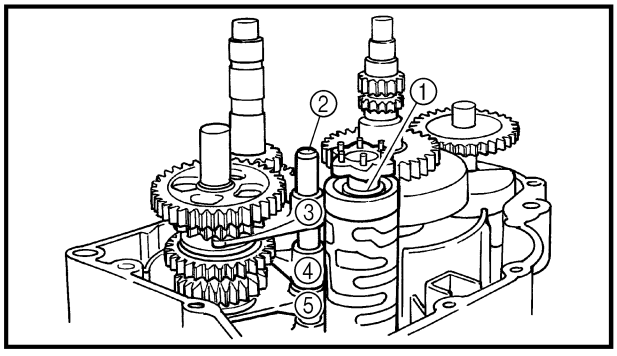


4.Remove:
- Dowel pins

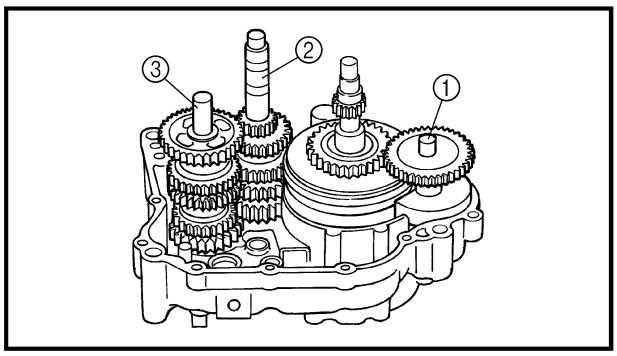


BALANCER, TRANSMISSION AND SHIFTER

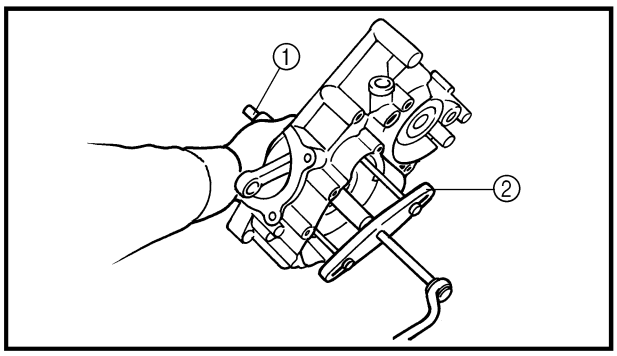
1.Remove:
- Shift shaft 1 ①
- Shift shaft 2 ②



2.Remove:
- Shift cam ①
- Shift fork guide bar ②
- Shift fork R ③
- Shift fork C ④
- Shift fork L ⑤



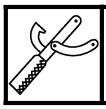
3.Remove:
- Balancer shaft ①
- Main axle shaft ②
- Drive axle shaft ③



CRANKSHAFT

1.Remove:
- Crankshaft assembly ①

Use the crankcase separating tool ②.



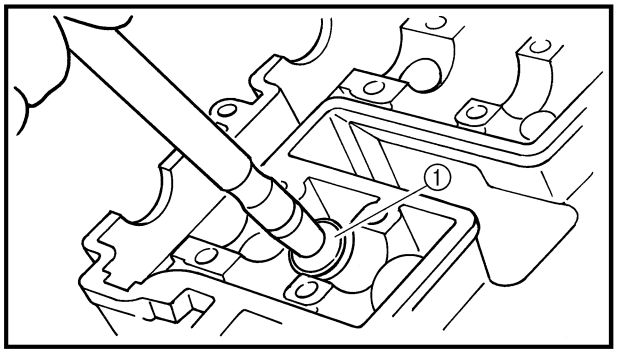
Crankcase separating tool:
P/N. YU-01135-A

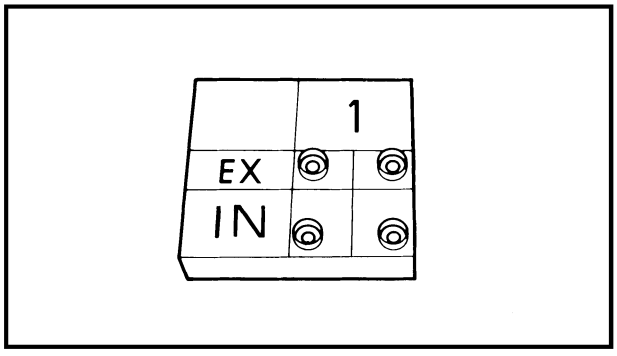
NOTE:

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.

BEARINGS AND OIL SEALS

1.Remove:
- Oil seals
- Bearings





VALVE

NOTE:

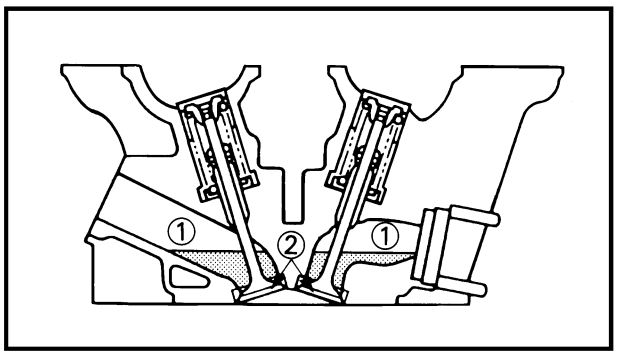
Before removing the internal parts (valve, valve spring, valve seat etc.) of the cylinder head, the valve sealing should be checked.

1.Remove:
- Lifters ①
- Pads

NOTE:

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

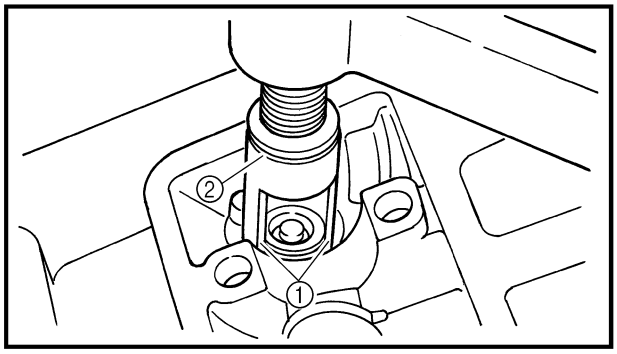
2.Check:
- Valve sealing
  Leakage at valve seat → Inspect the valve face, valve seat and valve seat width. Refer to "INSPECTION AND REPAIR-VALVE SEAT".



****

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.

****

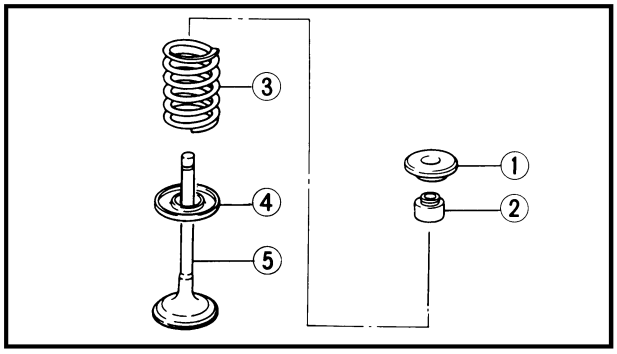


3.Remove:
- Valve cotters ①

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

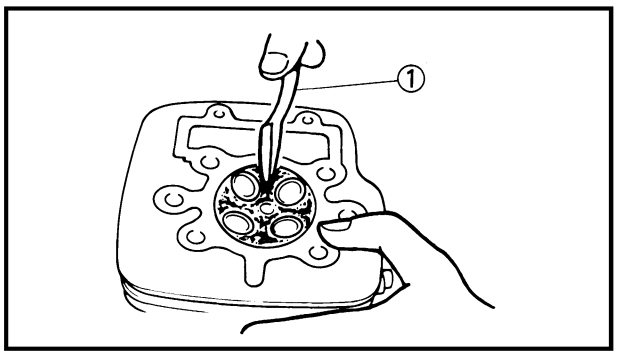


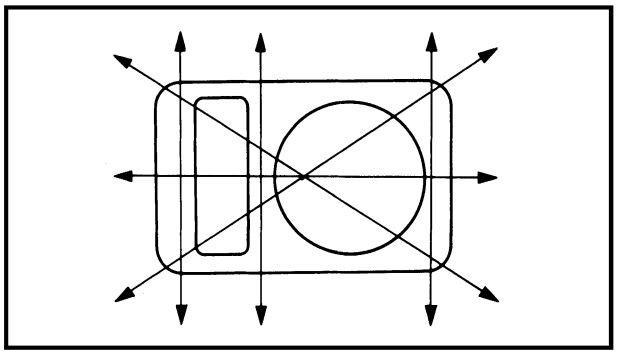
Valve spring compressor:
P/N. YM-04019

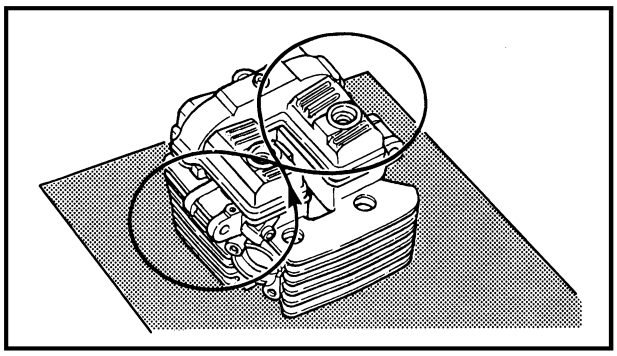


4.Remove:
- Valve retainer ①
- Oil seal ②
- Valve spring ③
- Spring seat ④
- Valve ⑤

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







NB243001
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

****

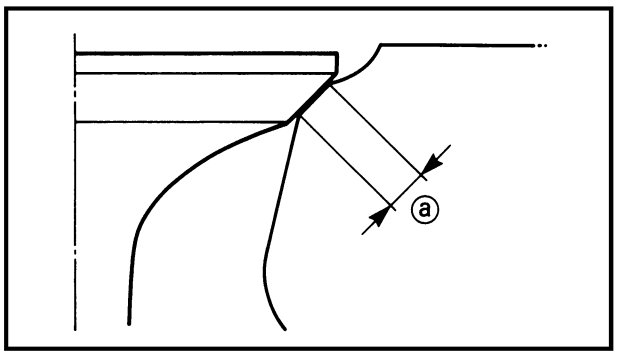
Resurfacement steps:
- Place a 400 ~ 600 grit wet sandpaper on the surface plate, and resurface the head using a figure-eight sanding pattern.

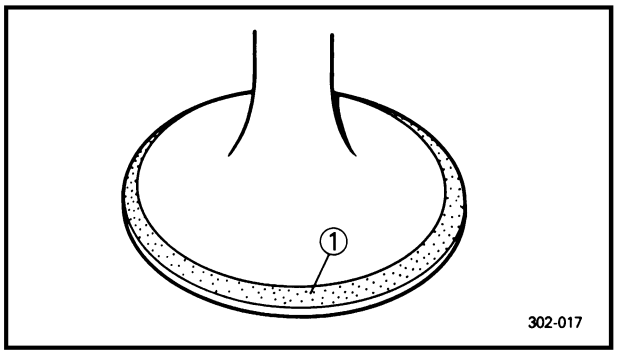
NOTE:
Rotate the head several times to avoid removing too much material from one side.

****

NB243002
VALVE SEAT
1.Eliminate:
- Carbon deposit
  (from valve face and valve seat)

2.Inspect:
- Valve seat
  Pitting/wear → Reface the valve seat.





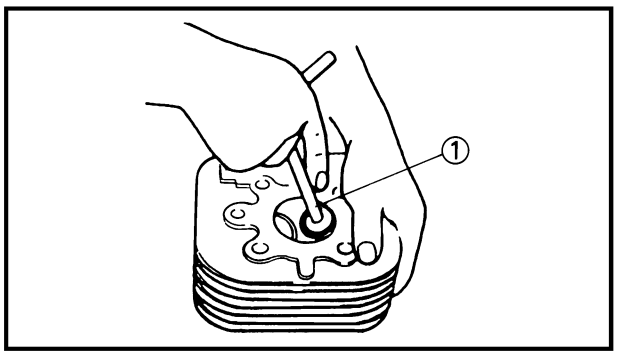
3.Measure:
- Valve seat width ⓐ
  Out of specification → Reface the valve seat.

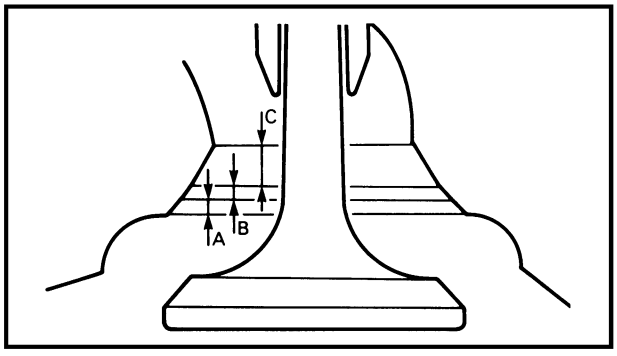
Valve seat width:
Intake:
0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
Exhaust:
0.9 ~ 1.1 mm (0.035 ~ 0.043 in)

****

Measurement steps:
- Apply the Mechanic's blueing 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, blueing 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.

****



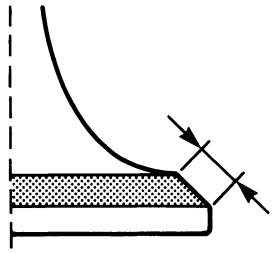


4.Reface:
- Valve seat
  Use a 30°, 45° and 60° valve seat cutter ①.

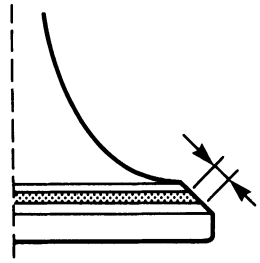
CAUTION:
When twisting the cutter, keep an even downward pressure (4 ~ 5 kg) to prevent chatter marks.

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

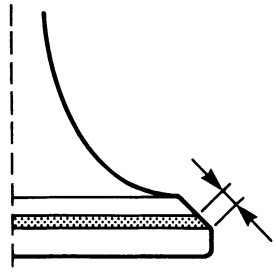
A



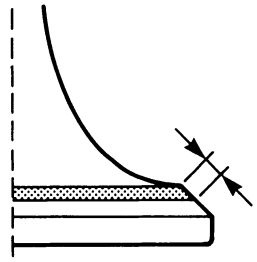
B



C



D



****

Refacing steps:

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

Valve seat cutter set		Desired result
Use lightly	45° 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.

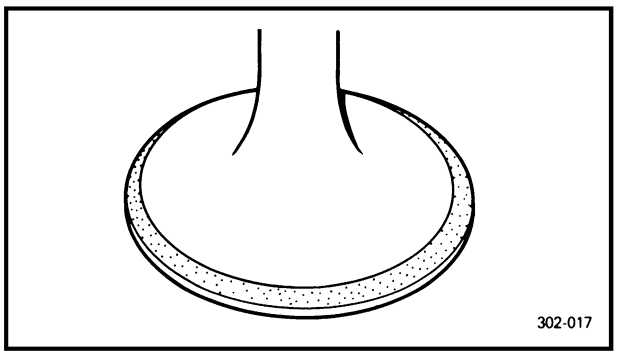
****

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.



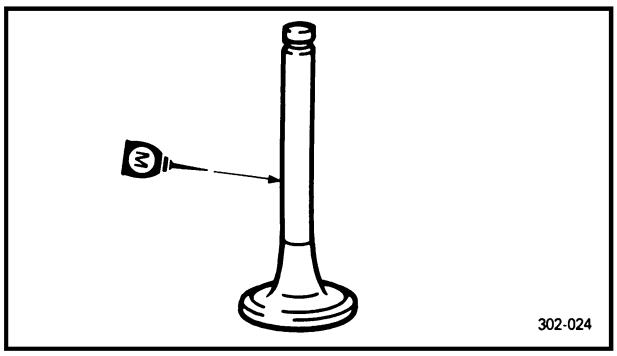
****

Lapping steps:

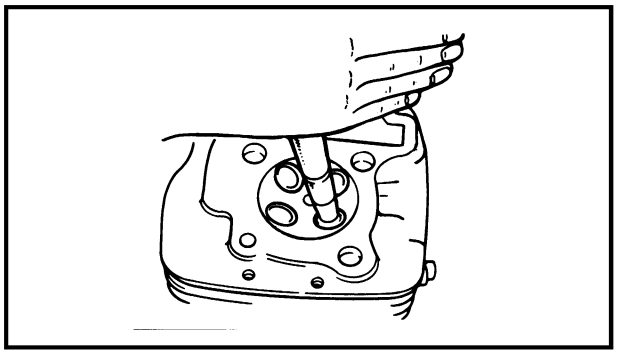
- Apply a coarse lapping compound to the valve face.

CAUTION:

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



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



NOTE:

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

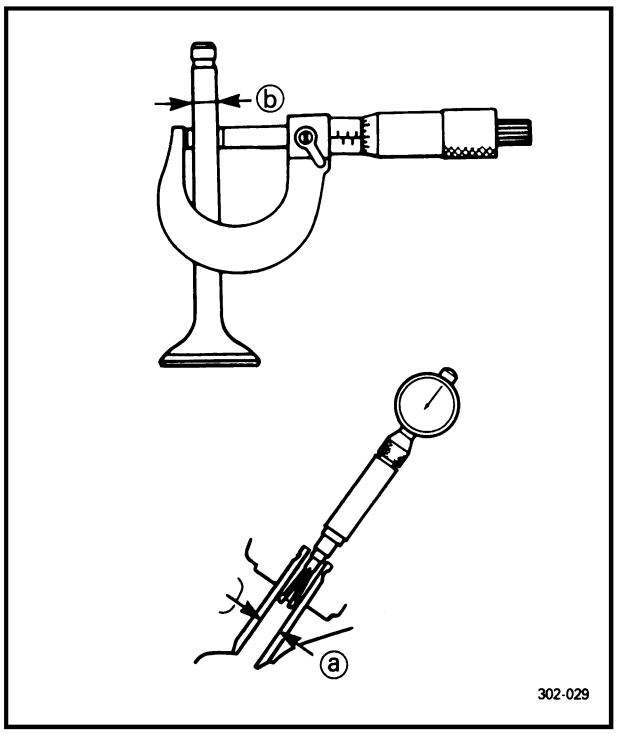
- Apply fine lapping compound to the valve face and repeat the above steps.

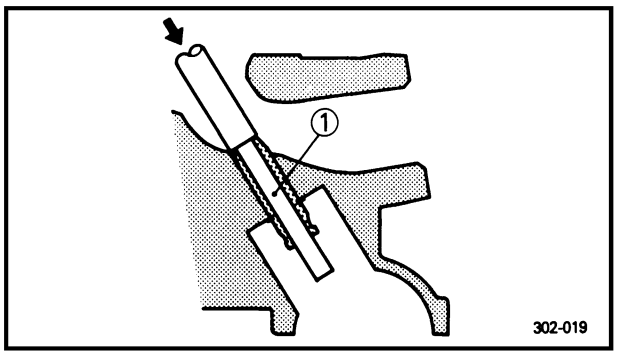
NOTE:

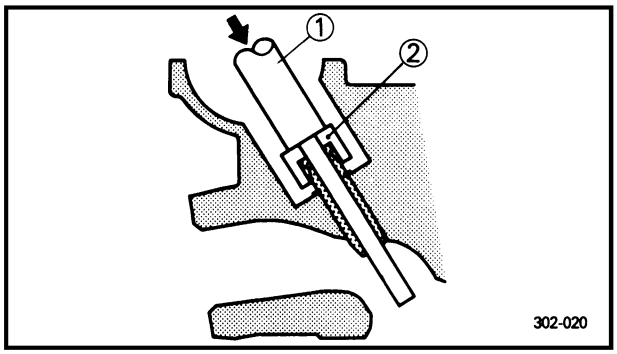
Be sure to clean off all compound from the valve face and valve seat after every lapping operation.

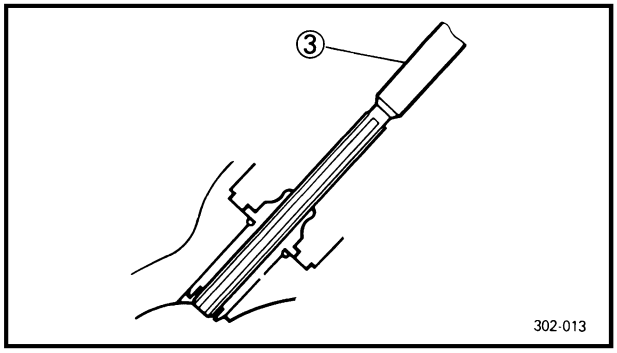
- Apply the Mechanic's blueing dye (Dykem) to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width again.
- If the valve seat width is out of specification, reface and lap the valve seat.

****









NB243003

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.

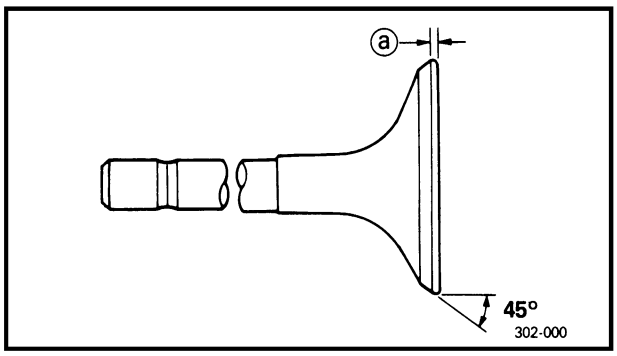
Valve guide remover:
5 mm (0.20 in):
P/N. YM-04097
Valve guide reamer:
5 mm (0.20 in):
P/N. YM-04099
Valve guide installer:
5 mm (0.20 in):
P/N. YM-04098

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

****

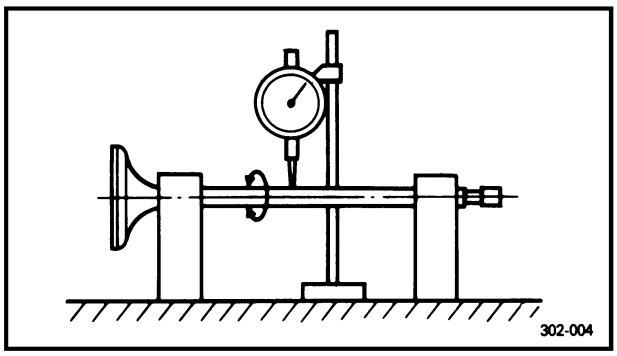
3.Eliminate:
- Carbon deposit
  (from valve face)

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



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

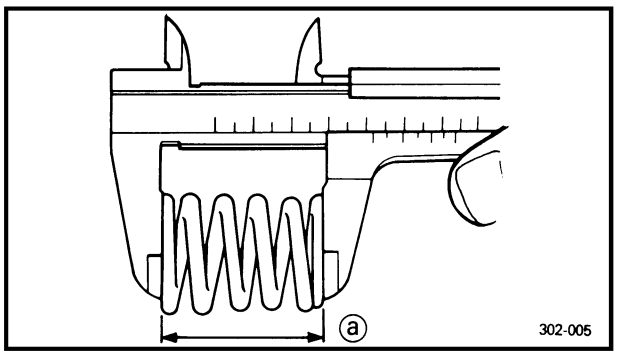
Margin thickness:
IN: 0.6 ~ 1.0 mm (0.02 ~ 0.04 in)
EX: 0.8 ~ 1.2 mm (0.03 ~ 0.05 in)



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

Runout:
Less than 0.010 mm (0.0004 in)

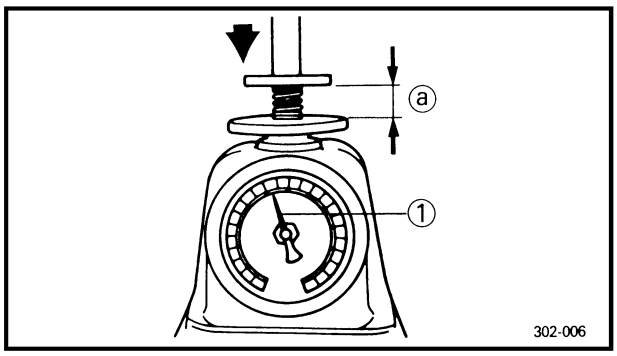
NOTE:
- Always replace the guide if the valve is replaced.
- Always replace the oil seal if the valve is removed.



NB243004
VALVE SPRING

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

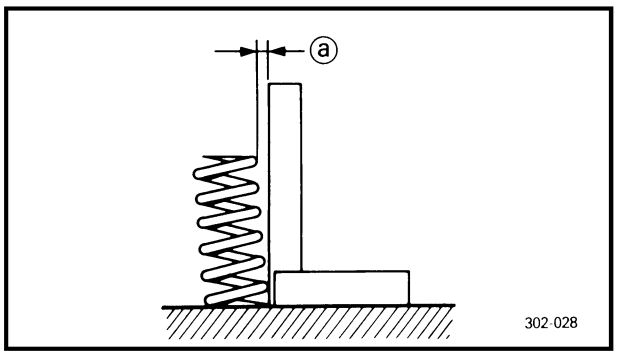
Free length (valve spring)	
Intake	33.81 ~ 35.59 mm (13.31 ~ 14.01 in)
Exhaust	



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

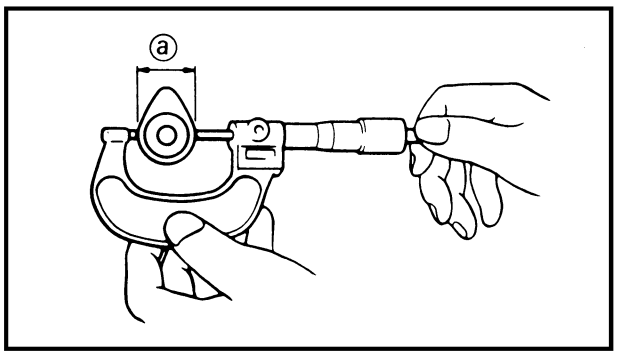
ⓐ Installed length

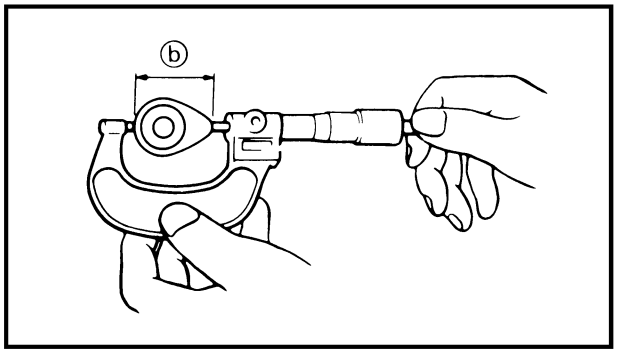
Compressed force:	
	Spring at 30.39 mm (1.20 in)
Intake	**9.3 ~ 10.7 kg (20.53 ~ 23.62 lb)**
Exhaust	**9.3 ~ 10.7 kg (20.53 ~ 23.62 lb)**



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)



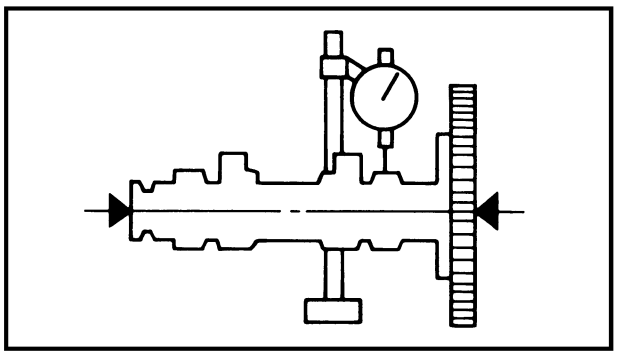


NB243005
CAMSHAFT

1.Inspect:
- Cam lobes
  Pitting/scratches/blue discoloration → Replace.

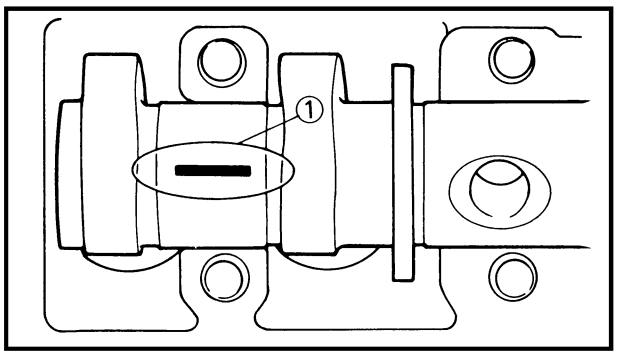
2.Measure:
- Cam lobes length ⓐ and ⓑ
  Out of specification → Replace.

Cam lobes length:
Intake, Exhaust:
ⓐ 25.00 ~ 25.10 mm (0.9843 ~ 0.9882 in)
ⓑ 32.75 ~ 32.85 mm (1.2894 ~ 1.2933 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 ~ 0.054 mm
(0.0008 ~ 0.0021 in)

****

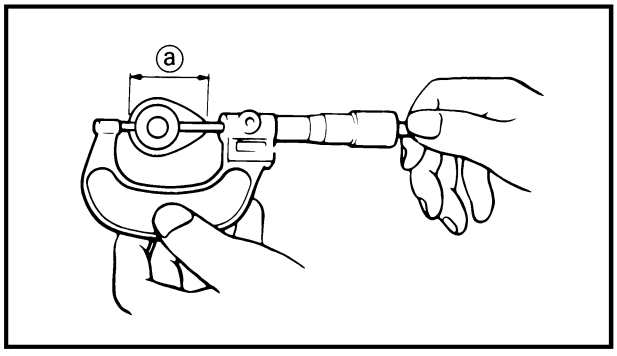
Measurement steps:
- Install the camshaft onto the cylinder head.
- Position a strip of Plastigauge® ① onto the camshaft.
- Install the dowel pins and camshaft caps.

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

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

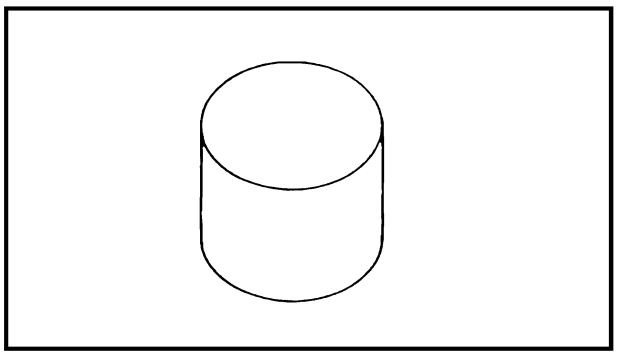
- Remove the camshaft caps and measure the width of the Plastigauge®.

****

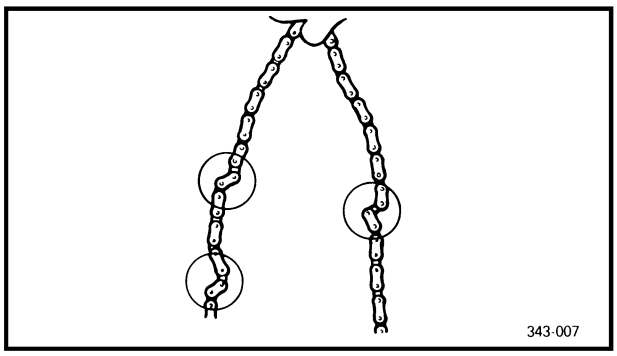


5.Measure:
- Bearing diameter ⓐ (camshaft)
  Out of specification → Replace camshaft.
  Within specification → Replace cylinder head.

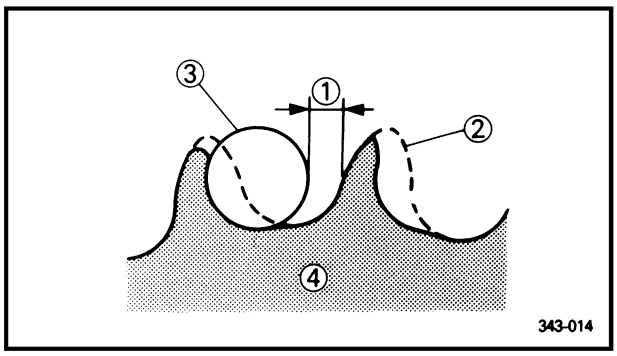
Bearing diameter (camshaft):
24.467 ~ 24.480 mm
(0.9633 ~ 0.9638 in)



NB643006
VALVE LIFTER
1.Inspect:
- Valve lifters
  Scratches/damage → Replace both lifters and camshaft case.

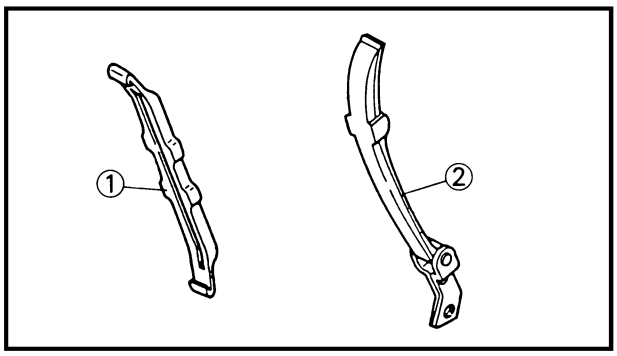


NB643007
TIMING CHAIN, SPROCKET AND CHAIN GUIDE
1.Inspect:
- Timing chain
  Stiff/cracks → Replace the timing chain and the sprockets as a set.

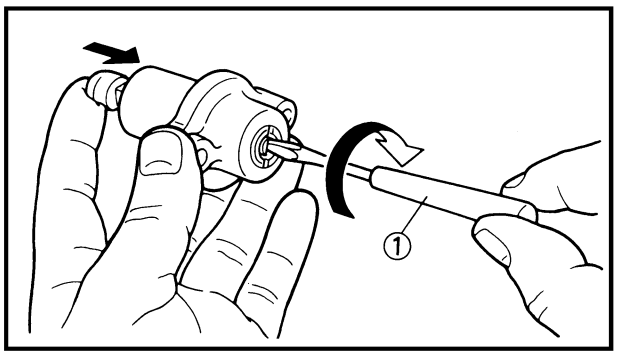


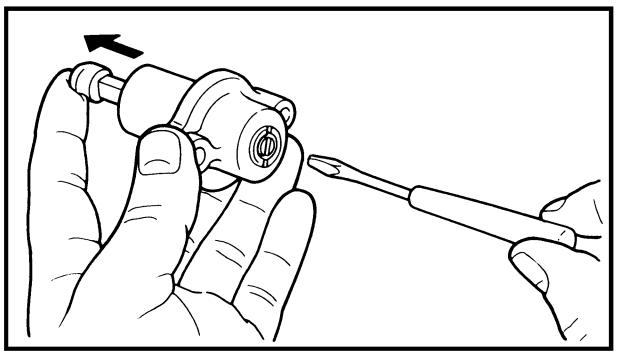
2.Inspect:
- Cam sprocket
  Wear/damage → Replace the cam sprockets and the timing chain as a set.

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.



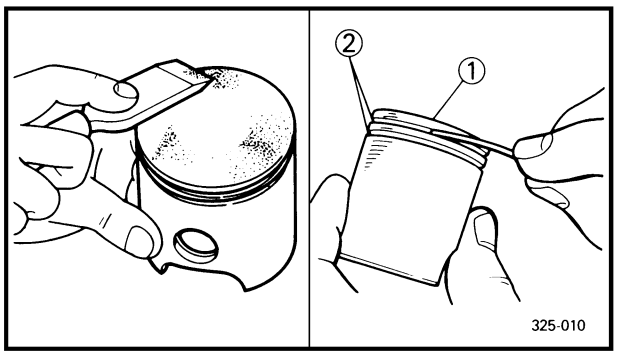


4.Check:
- Timing chain tensioner movement

****

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.

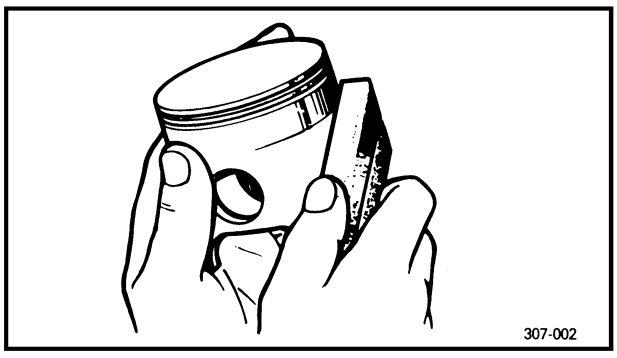
****



NB243008
CYLINDER AND PISTON

1.Eliminate:
- Carbon deposits
  (from the piston crown ① and ring grooves ②.)

2.Inspect:
- Piston wall
  Wear/scratches/damage → Replace.

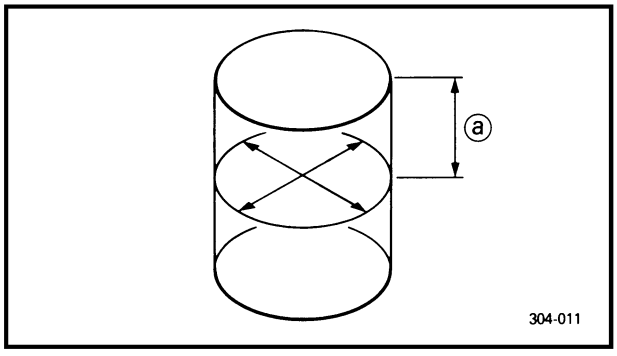


3.Eliminate:
- Score marks and lacquer deposits
  (from the side of the piston)
  Use a 600 ~ 800 grit wet sandpaper.

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:

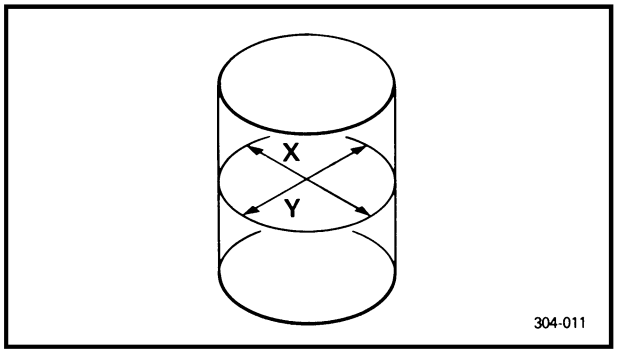
1st steps:
- Measure the cylinder bore "C" with a cylinder bore gauge.

ⓐ 40 mm (1.6 in) from the cylinder top

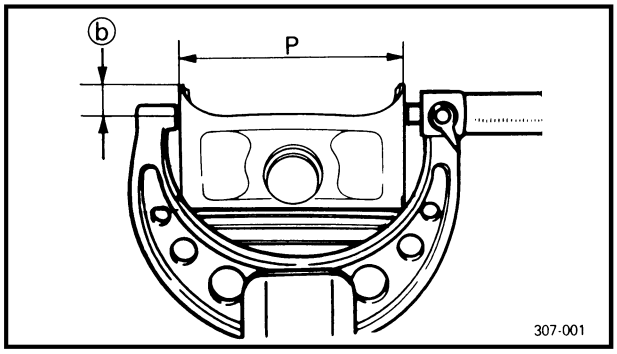
NOTE:
Measure the cylinder bore "C" in parallel to and at right angles to the crankshaft.
Then, find the average of the measurements.

Cylinder bore "C":
72.970 ~ 73.020 mm
(2.873 ~ 2.875 in)
<Limit: 73.1 mm (2.878 in)

C = (X + Y)/2



- If out of specification, rebore or replace the cylinder, and replace 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":
72.920 ~ 72.970 mm
(2.871 ~ 2.873 in)

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

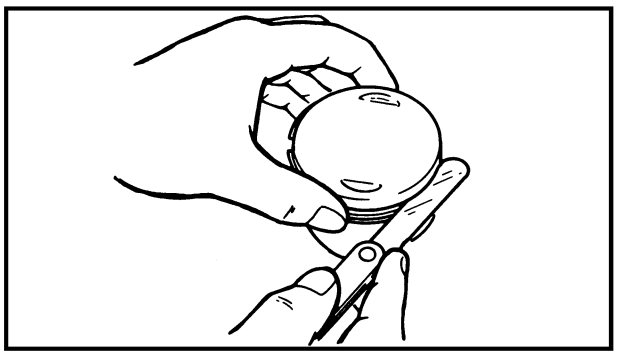
3rd steps:
- Find the piston-to-cylinder clearance with following formula.

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

Piston-to-cylinder clearance:
0.040 ~ 0.060 mm
(0.0016 ~ 0.0024 in)
<Limit: 0.1 mm (0.004 in)>

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

****



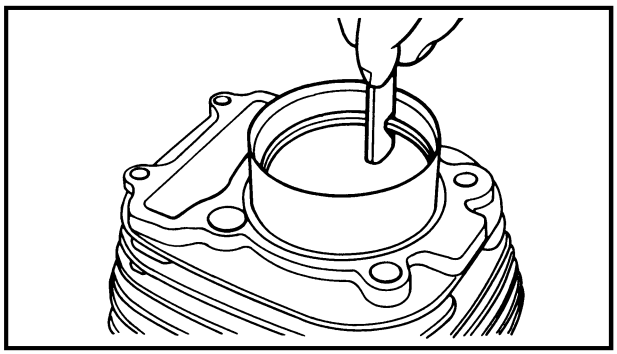
NB243009
PISTON RING

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

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

Side clearance:
Top ring:
0.040 ~ 0.080 mm
(0.0016 ~ 0.0031 in)
2nd ring:
0.030 ~ 0.070 mm
(0.0012 ~ 0.0028 in)

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

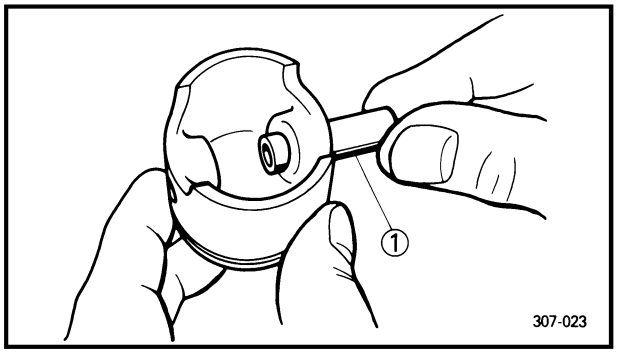


NOTE:
Push the ring with the piston crown so that the ring will be at a right angle to cylinder bore.

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

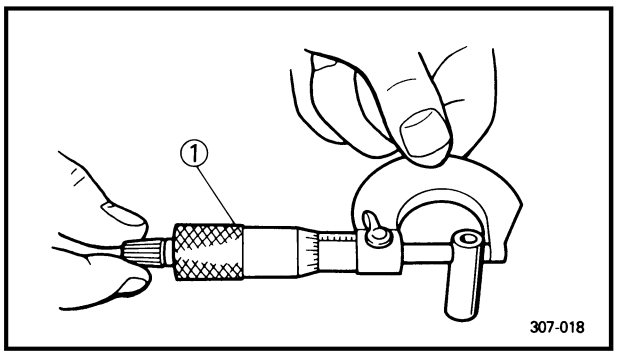
NOTE:
You cannot measure the end gap on the expander spacer of the oil control ring. If the oil control ring rails show excessive gap, replace all three rings.

End gap:
Top ring:
0.20 ~ 0.35 mm (0.008 ~ 0.014 in)
2nd ring:
0.20 ~ 0.35 mm (0.008 ~ 0.014 in)
Oil ring:
0.20 ~ 0.70 mm (0.008 ~ 0.028 in)



NB243010
PISTON PIN

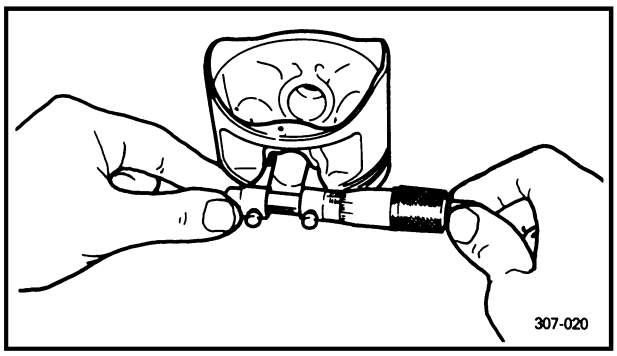
1.Inspect:
- Piston pin ①
  Blue discoloration/groove → Replace, then inspect lubrication system.



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

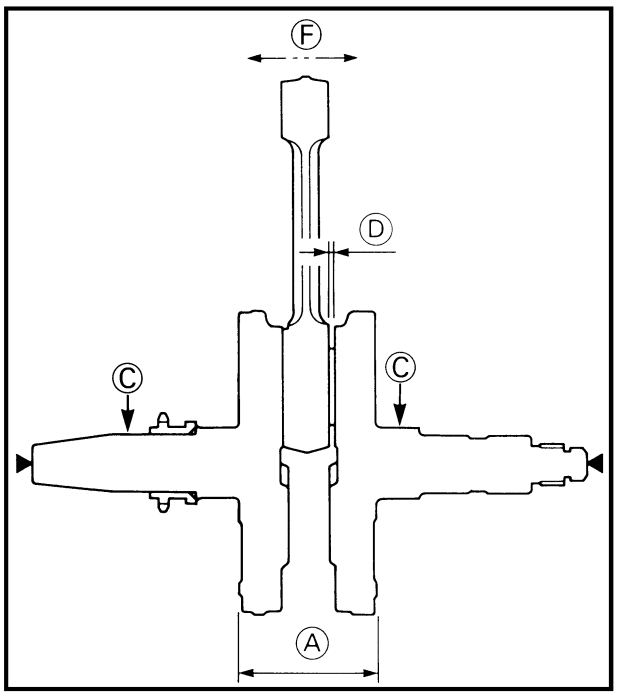
Outside diameter (piston pin):
17.991 ~ 18.000 mm
(0.7083 ~ 0.7087 in)

① Micrometer



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

Piston pin bore inside diameter:
18.004 ~ 18.015 mm
(0.7088 ~ 0.7093 in)



CRANKSHAFT

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

Crank width:
60.25 ~ 60.30 mm (2.372 ~ 2.374 in)

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

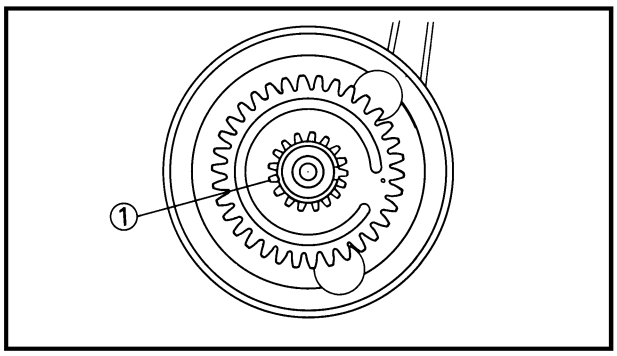
Runout limit:
0.03 mm (0.0012 in)

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

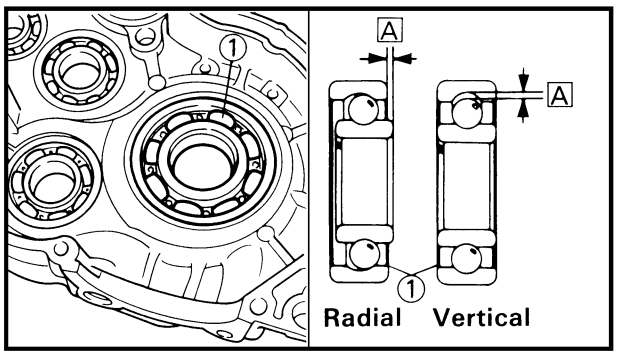
Big end side clearance:
0.35 ~ 0.85 mm (0.013 ~ 0.033 in)

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

Small end free play:
0.8 mm (0.03 in)

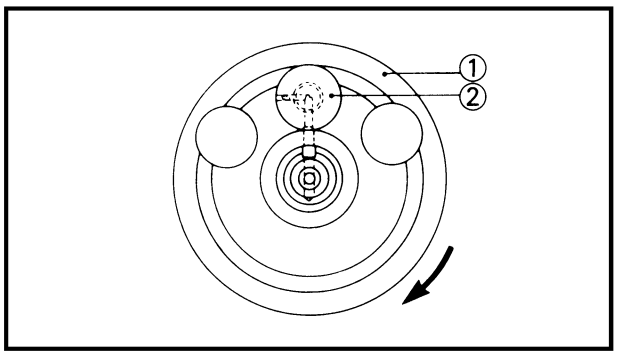


2.Inspect:
- Crankshaft sprocket (cam chain sprocket) ①
  Wear/damage → Replace the crankshaft.



3.Inspect:
- Crankcase bearing ①
  Abnormal noise/turn roughly/free play → Replace.

A Free play

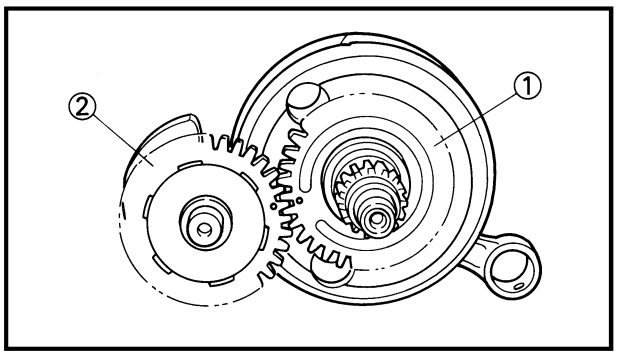


****

Crankshaft reassembling point:

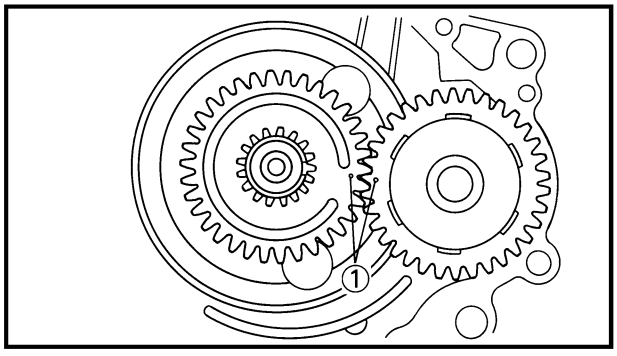
The crankshaft ① and the crank pin ② oil passages must be properly interconnected with a tolerance of less than 1 mm (0.04 in).

****

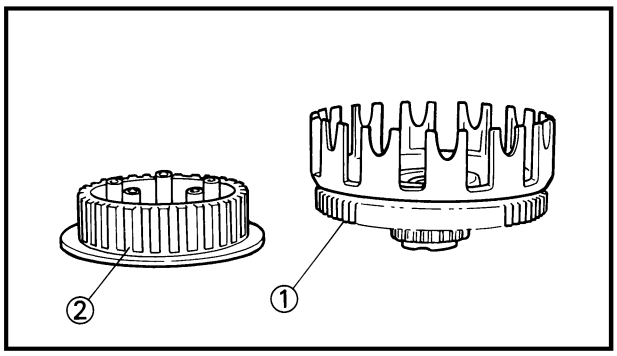


BALANCER DRIVE GEAR AND BALANCER GEAR

1.Inspect:
- Balancer drive gear teeth ①
- Balancer gear teeth ②
  Wear/damage → Replace both gears.

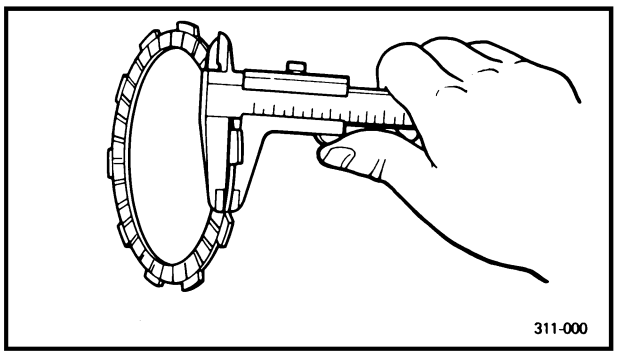


2.Inspect:
- Match marks ①
  If they are not aligned → Align match marks as shown.



NB243013
PRIMARY DRIVE

1.Inspect:
- Primary driven gear teeth ①
- Clutch boss ②
  Wear/damage → Replace.
  Excessive noise during operation → Replace.



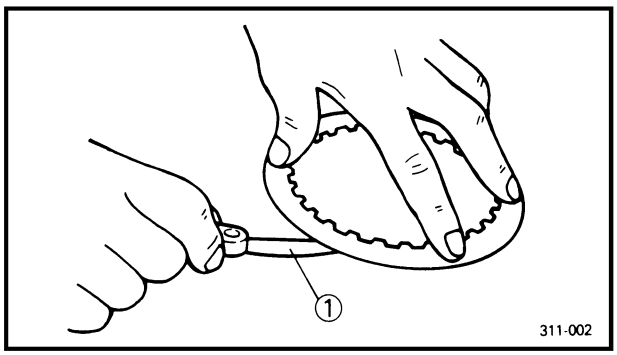
NB243014
CLUTCH

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

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

	Thickness	Wear limit
Type "A" (7 pcs.)	2.90 ~ 3.10 mm (0.114 ~ 0.122 in)	2.7 mm (0.106 in)

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

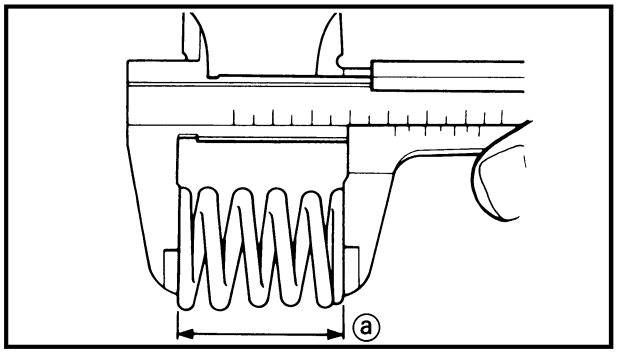


4.Measure:
- Clutch plate warpage
  Out of specification → Replace clutch plates as a set.
  Use a surface plate and feeler gauge ①.

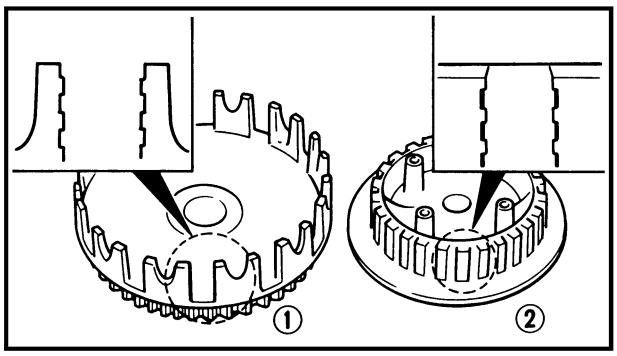
Warp limit:
Less than 0.05 mm (0.002 in)

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

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

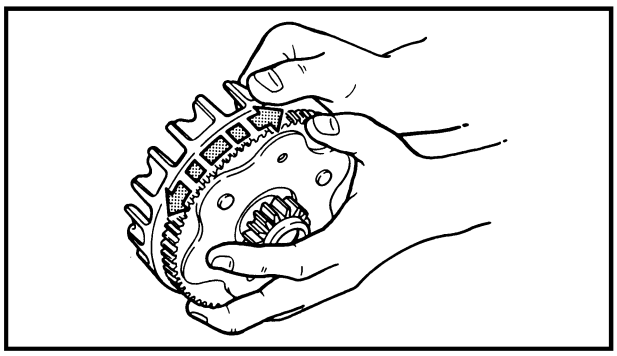


Free length (clutch spring):
42.8 mm (1.685 in)
<Limit>: 40.8 mm (1.606 in)

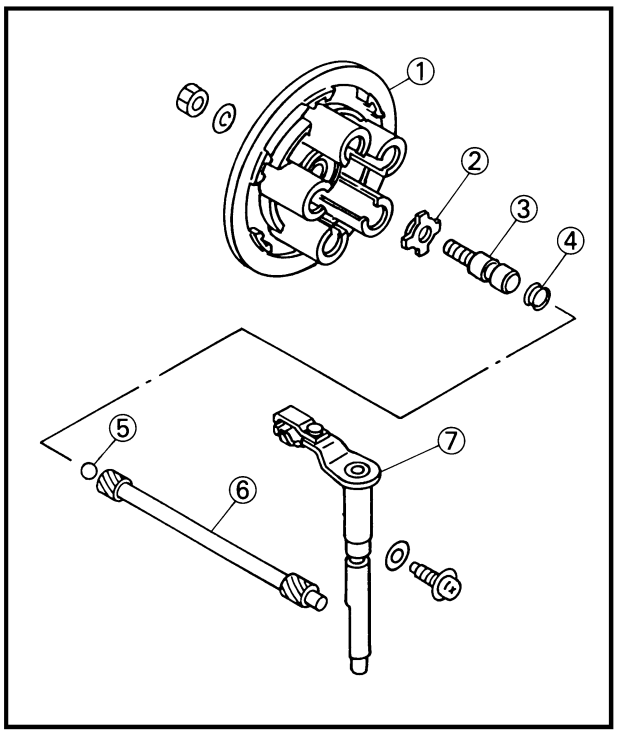


7.Inspect:
- Dogs on the primary driven gear ①
  Scoring/wear/damage → Deburr or replace.
- Clutch boss splines ②
  Scoring/wear/damage → Replace the clutch boss.

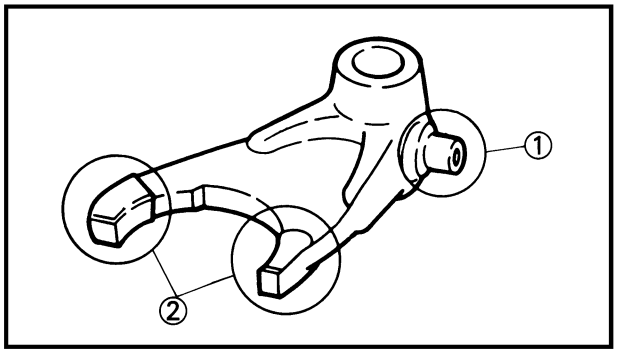
NOTE:
Scoring on the clutch housing dogs and the clutch boss splines will cause erratic operation.



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

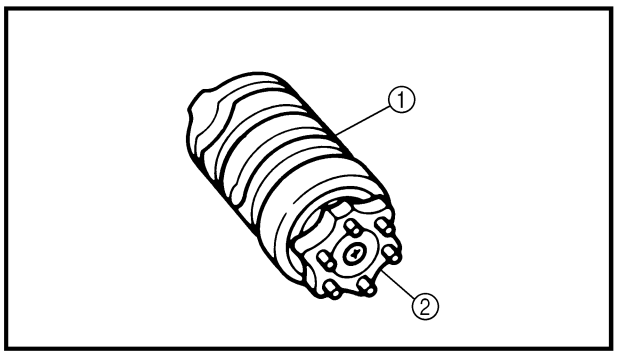


9.Inspect:
- Pressure plate ①
- Push plate ②
- Push rod 1 ③
- O-ring ④
- Ball ⑤
- Push rod 2 ⑥
- Push lever ⑦
  Wear/bend/damage → Replace.

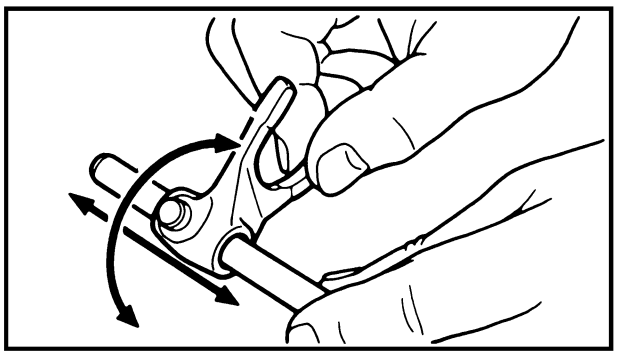


NB243015
TRANSMISSION AND SHIFTER

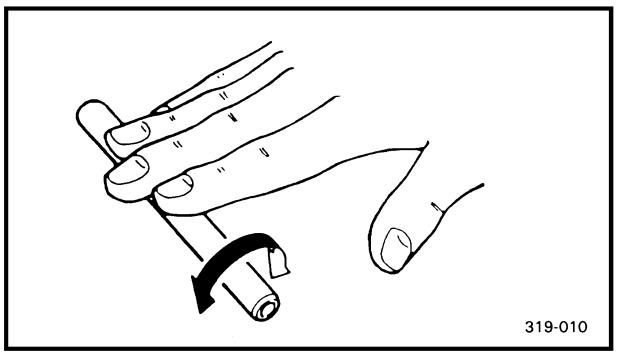
1.Inspect:
- Shift fork cam follower ①
- Shift fork pawl ②
  Scoring/bends/wear → Replace.



2.Inspect:
- Shift cam groove ①
- Shift cam segment ②
  Wear/damage → Replace.



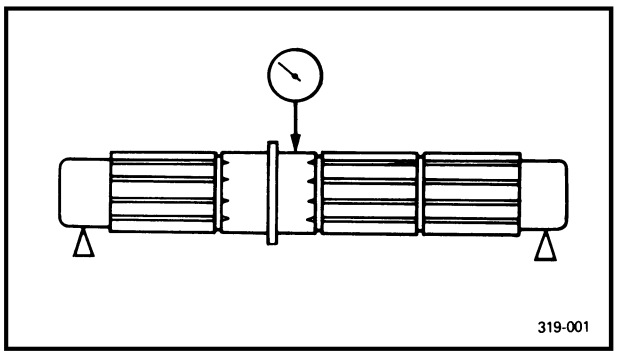
3.Check:
- Shift fork movement
  Unsmooth operation → Replace shift fork and/or guide bar.



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

⚠ WARNING

Do not attempt to straighten a bent guide bar.



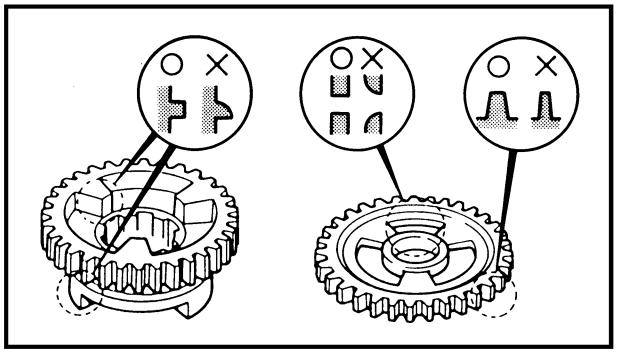
5.Measure:
- Runout (drive axle and main axle)
  Out of specification → Replace.



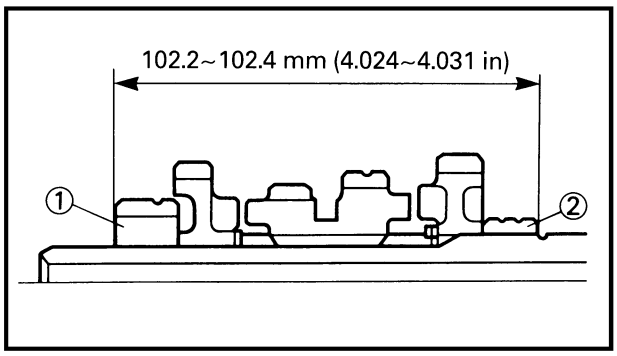
Runout:
Less than 0.08 mm (0.003 in)

⚠ 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.

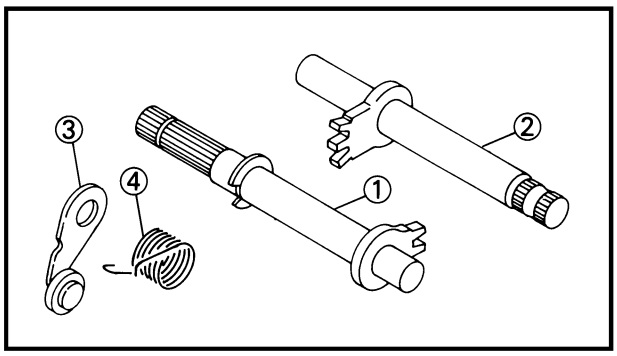


****

Reassembling point:

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

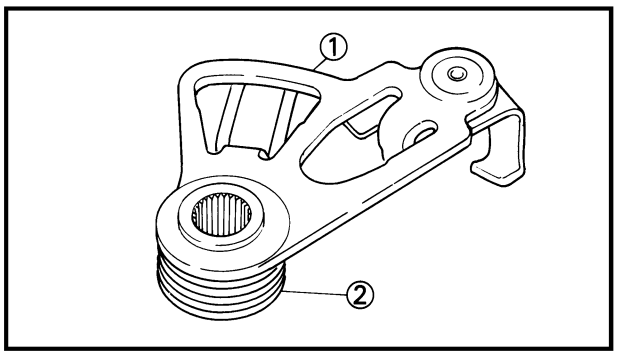
****



7.Inspect:

- Shift shaft 1 ①
- Shift shaft 2 ②
- Stopper lever ③
- Torsion spring ④

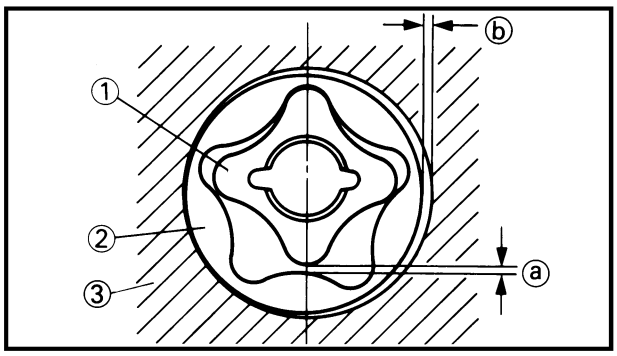
Cracks/damage → Replace.



8.Inspect:

- Shift lever ①
- Torsion spring ②

Cracks/damage → Replace.



NB243016

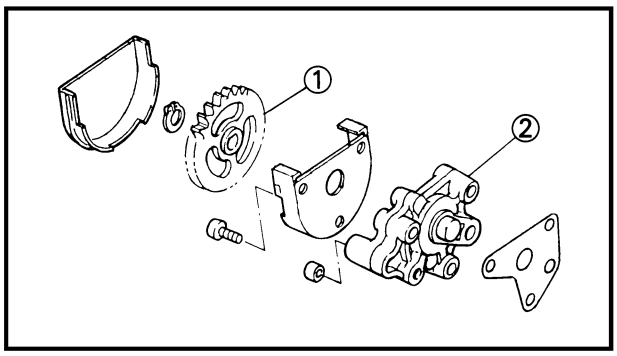
OIL PUMP AND STRAINER

1.Measure:

- Tip clearance ⓐ
  (between inner rotor ① and outer rotor ②)
- Side clearance ⓑ
  (between outer rotor ② and pump housing ③)

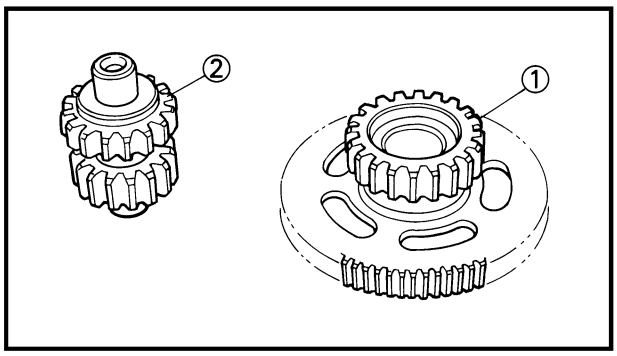
  Out of specification → Replace the oil pump.

Tip clearance:
0.15 mm (0.006 in)
Side clearance:
0.10 ~ 0.15 mm (0.004 ~ 0.006 in)



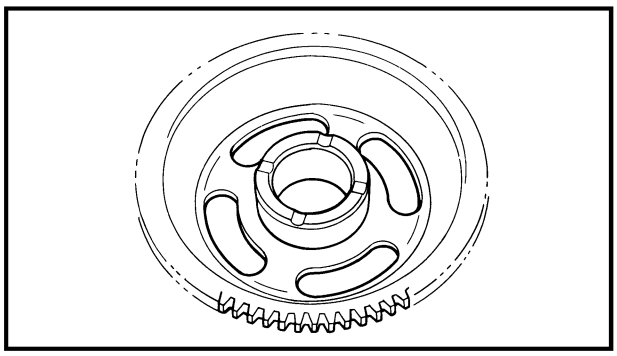
2.Inspect:
- Oil pump driven gear ①
- Oil pump ②
  Wear/cracks/damage → Replace.

3.Inspect:
- Oil strainer
  Damage → Replace.

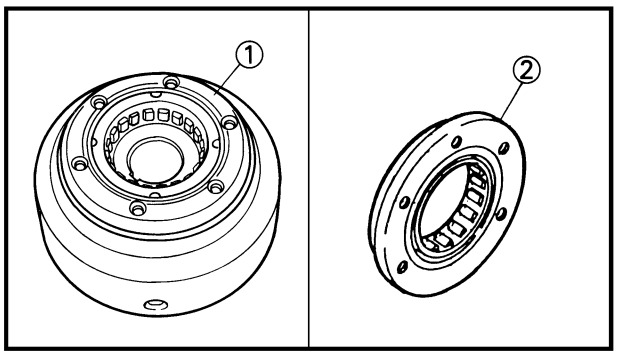


NB243012
ELECTRIC STARTER DRIVE

1.Inspect:
- Starter idle gear 1 teeth ①
- Starter idle gear 2 teeth ②
  Burrs/chips/roughness/wear → Replace.

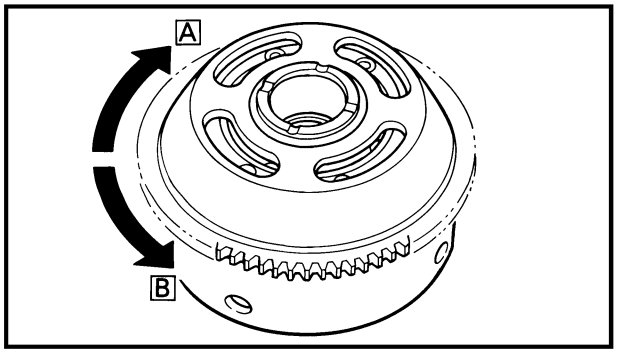


2.Inspect:
- Starter wheel gear
  (contacting surfaces)
  Pitting/wear/damage → Replace.



3.Inspect:
- Starter clutch assembly ①
- Starter clutch ②
  Wear/damage → Replace.

4.Check:
- Starter clutch operation

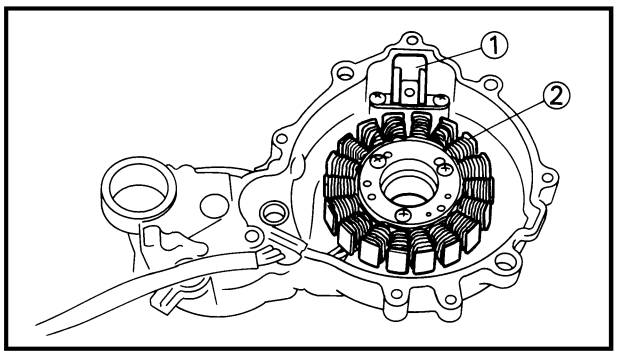


****

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 counterclockwise [B], the starter clutch gear should turn freely.
  If not, the starter clutch is faulty. Replace it.

****



5.Inspect:
- Pickup coil ①
- Stator coil ②
  Damage → Replace.

NB243018
CRANKCASE

1.Thoroughly wash the case halves with mild solvent.
2.Throughly clean all the gasket mating surfaces and crankcase mating surfaces.
3.Inspect:
- Crankcase
  Cracks/damage → Replace.
- Oil delivery passages
  Clog → Blow out with compressed air.

NB243019
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.

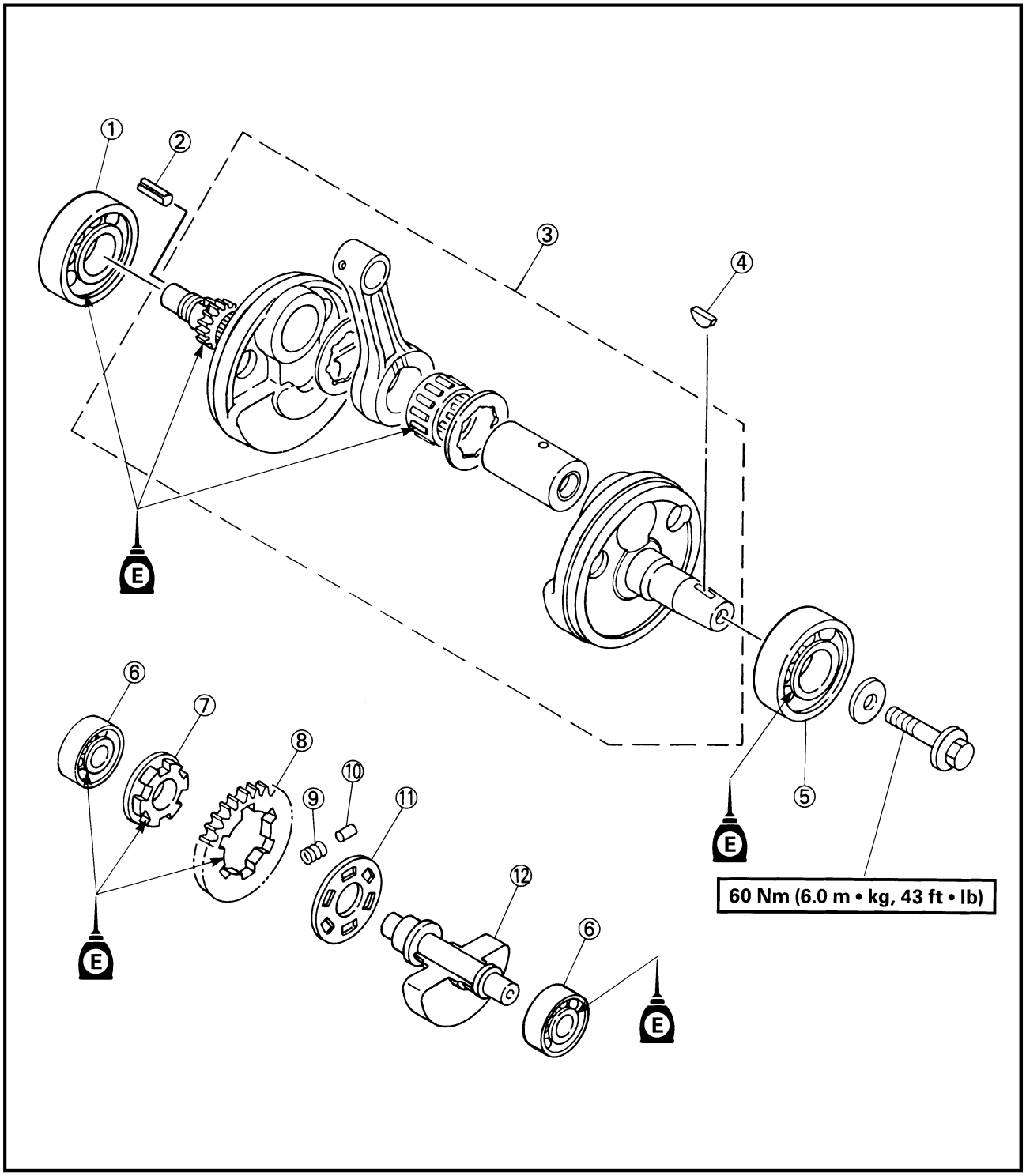
NB243020
CIRCLIP AND WASHER

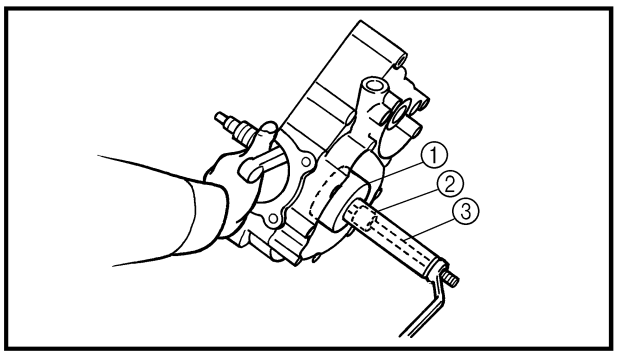
1.Inspect:
- Circlips
- Washers
  Damage/looseness/bends → Replace.

ENGINE ASSEMBLY AND ADJUSTMENT

CRANKSHAFT AND BALANCER

① Bearing
② Woodruff key
③ Crankshaft assembly
④ Woodruff key
⑤ Bearing
⑥ Bearings
⑦ Buffer boss
⑧ Balancer gear
⑨ Spring
⑩ Dowel pin
⑪ Absorber plate
⑫ Balancer weight





CRANKSHAFT AND BALANCER SHAFT

1.Attach:

- Crankshaft installing tool



Crank pot spacer ①:
P/N. YU-01202
Adapter #12 ②:
P/N. YU-90062
Crankshaft installer set ③:
P/N. YU-90050

2.Install:

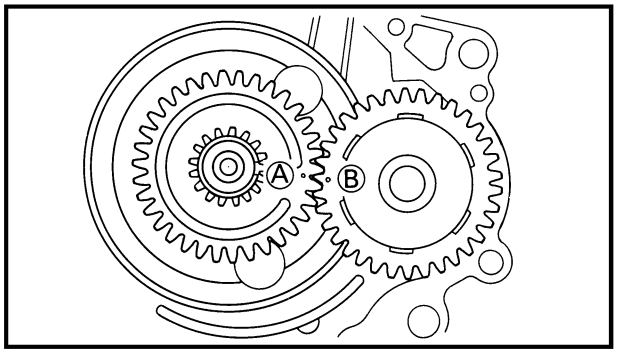
- Crankshaft

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 make installation easier, apply grease to the oil seal lips and apply engine oil to each bearing.



3.Install:

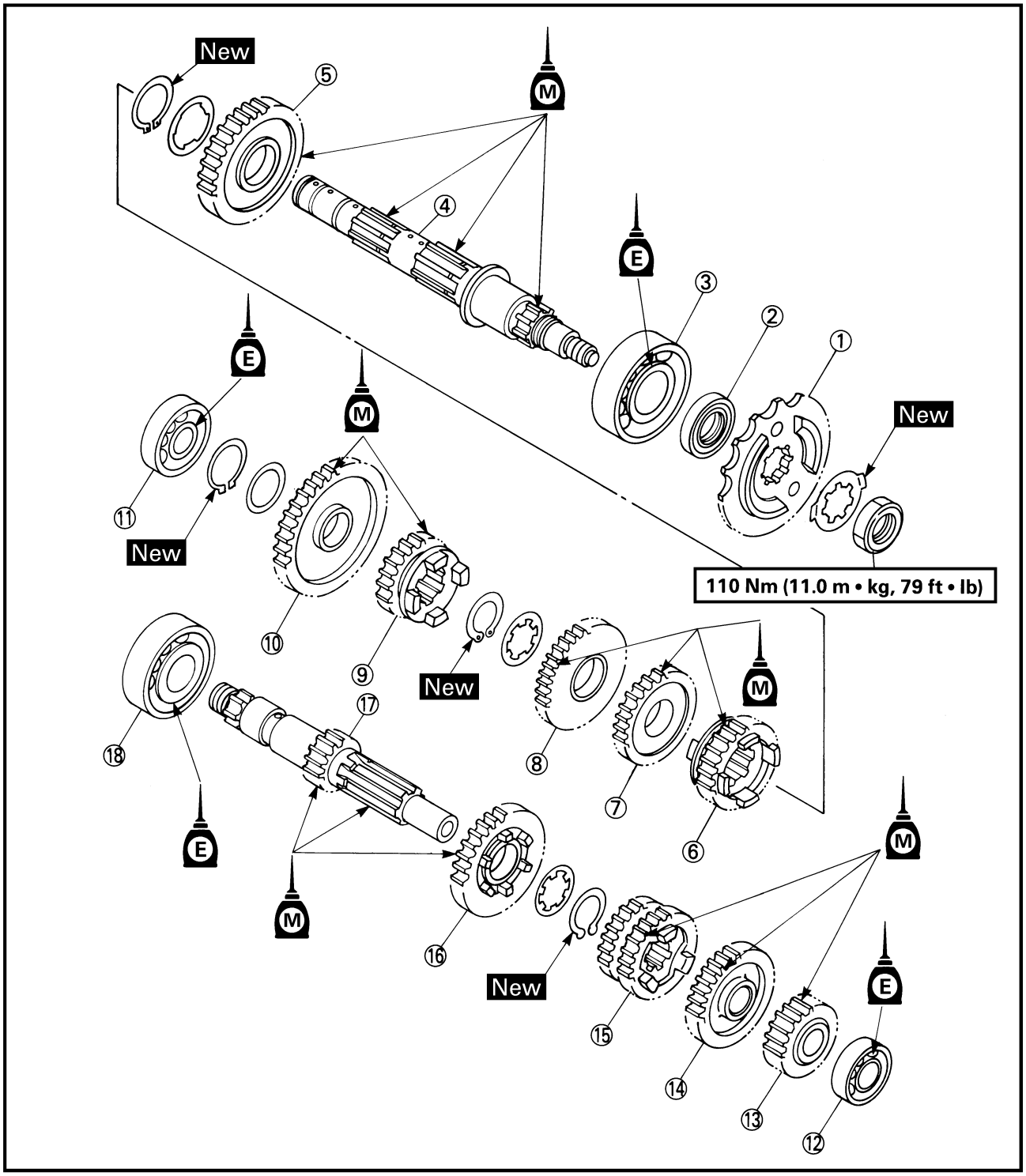
- Balancer shaft

NOTE:

When installing the balancer shaft, align the punched mark Ⓐ on the crankshaft drive gear with the punched mark Ⓑ on the balancer gear.

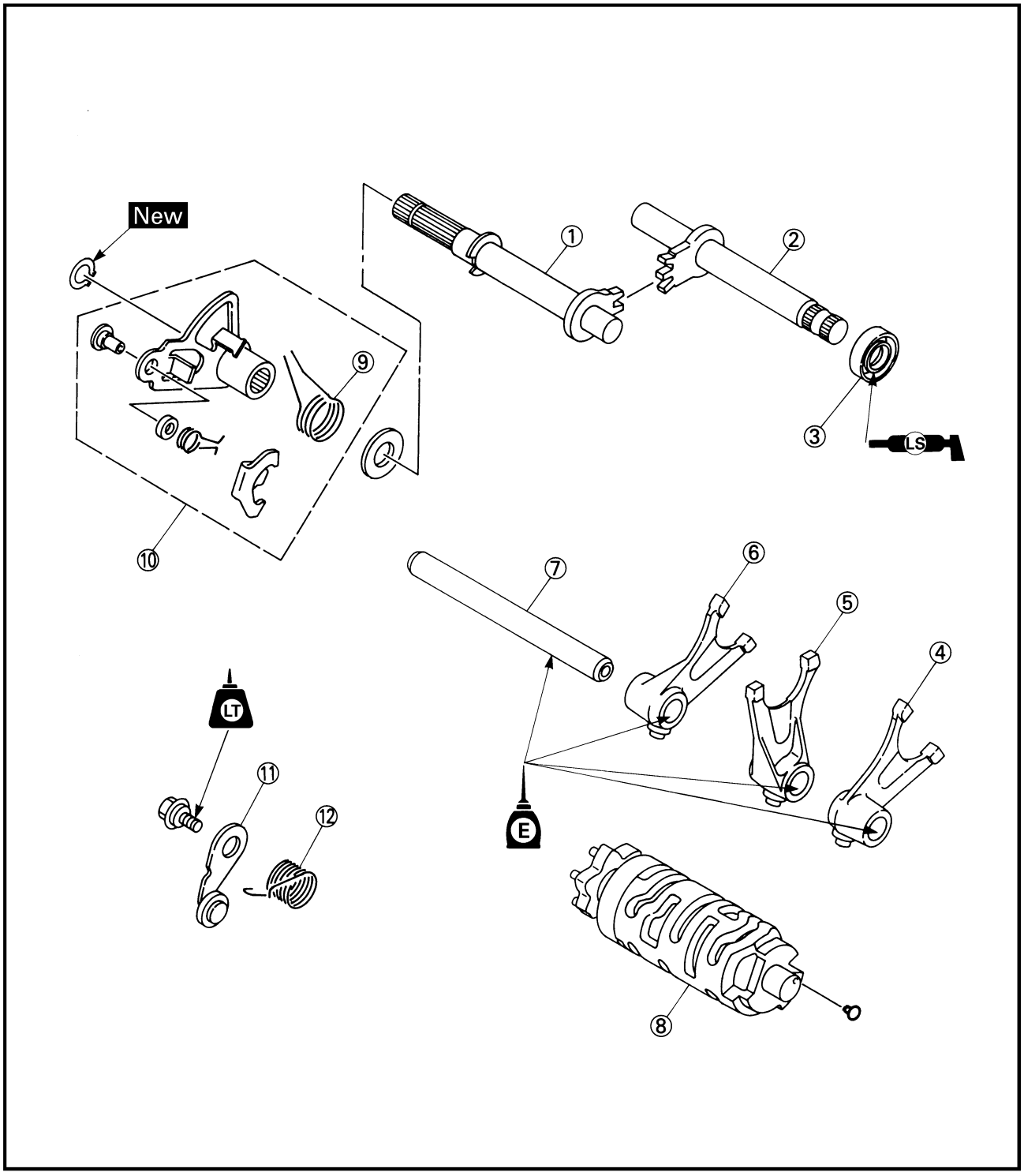
TRANSMISSION

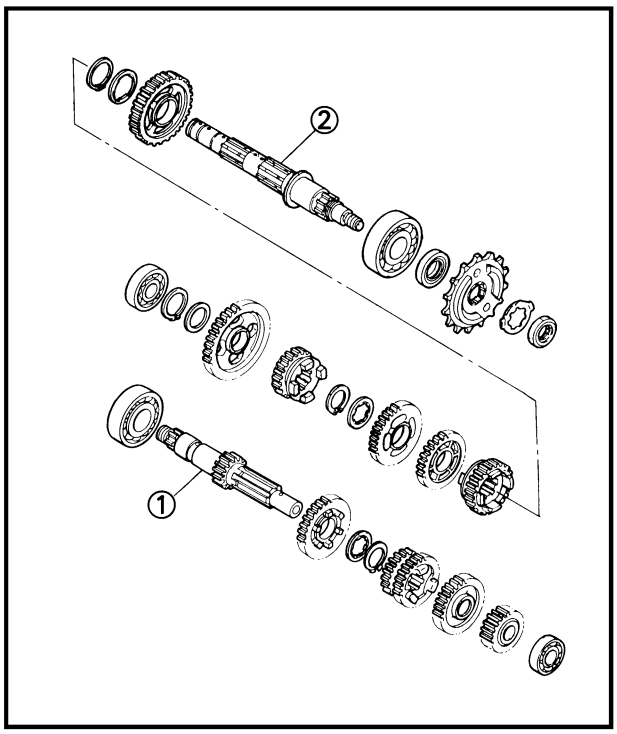
① Drive sprocket
② Oil seal
③ Bearing
④ Drive axle
⑤ 2nd wheel gear
⑥ 5th wheel gear
⑦ 4th wheel gear
⑧ 3rd wheel gear
⑨ 6th wheel gear
⑩ 1st wheel gear
⑪ Bearing
⑫ Bearing
⑬ 2nd pinion gear
⑭ 5th pinion gear
⑮ 3rd/4th pinion gear
⑯ 6th pinion gear
⑰ Main axle
⑱ Bearing



SHIFTER

① Shift shaft 1
② Shift shaft 2
③ Oil seal
④ Shift fork L
⑤ Shift fork C
⑥ Shift fork R
⑦ Shift fork guide bar
⑧ Shift cam
⑨ Torsion spring
⑩ Shift lever assembly
⑪ Stopper lever
⑫ Torsion spring



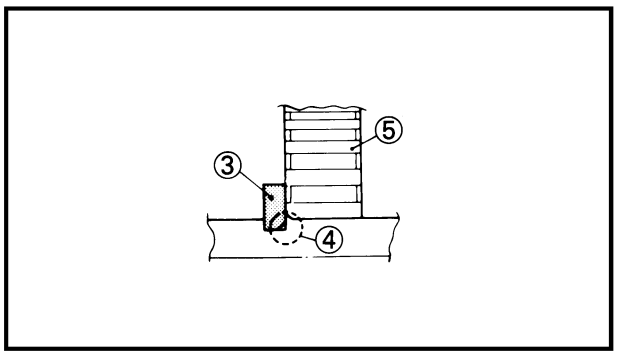


TRANSMISSION AND SHIFTER

1.Install:
- Neutral switch

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

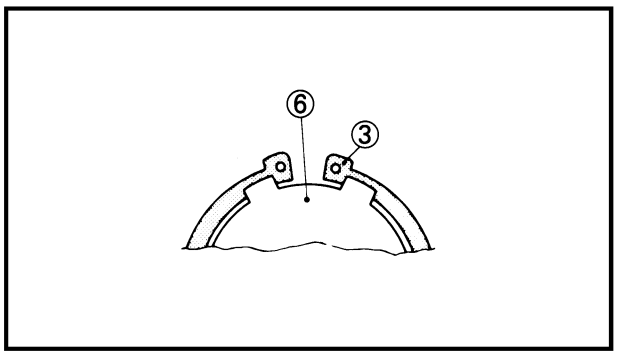
3.Install:
- Drive axle assembly ①
- Main axle assembly ②



- Circlip ③
  Install the chamfered side ④ facing the gear ⑤.

⚠ WARNING

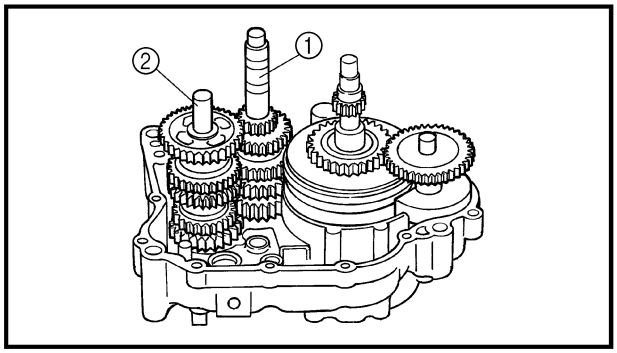
Always use a new circlip.



- Circlip ③
- Spline ⑥
  Center the circlip ends on the spline.

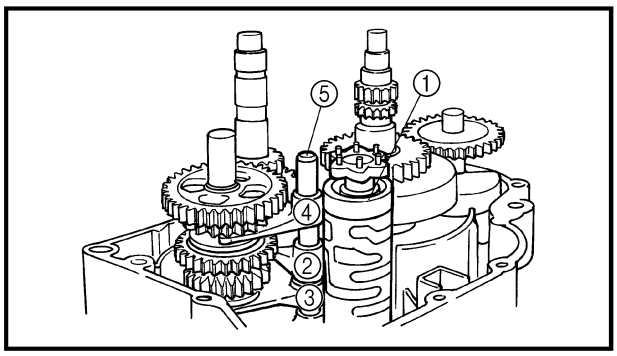
CAUTION:

Do not expand the circlip more than needed.



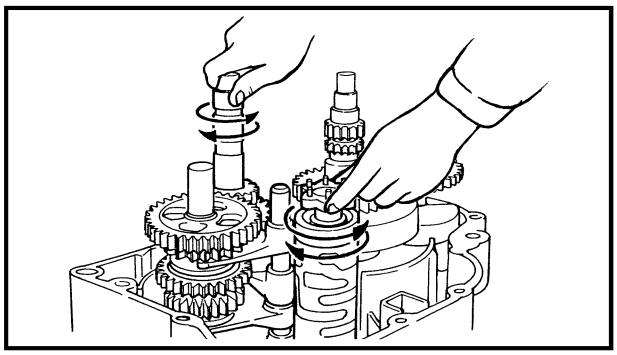
4.Install:
- Main axle assembly ①
- Drive axle assembly ②

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

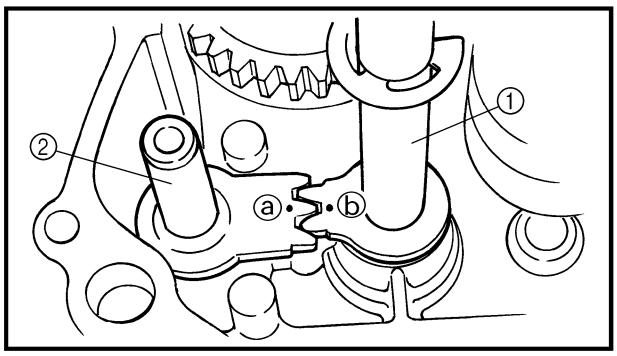


6.Install:
- Shift cam ①
- Shift fork C ②
- Shift fork L ③
- Shift fork R ④
- Shift fork guide bar ⑤

NOTE:
Install the shift forks with the embossed mark on each shift fork facing the right side of the engine.



7.Check:
- Transmission operation
  Unsmooth operation → Repair.

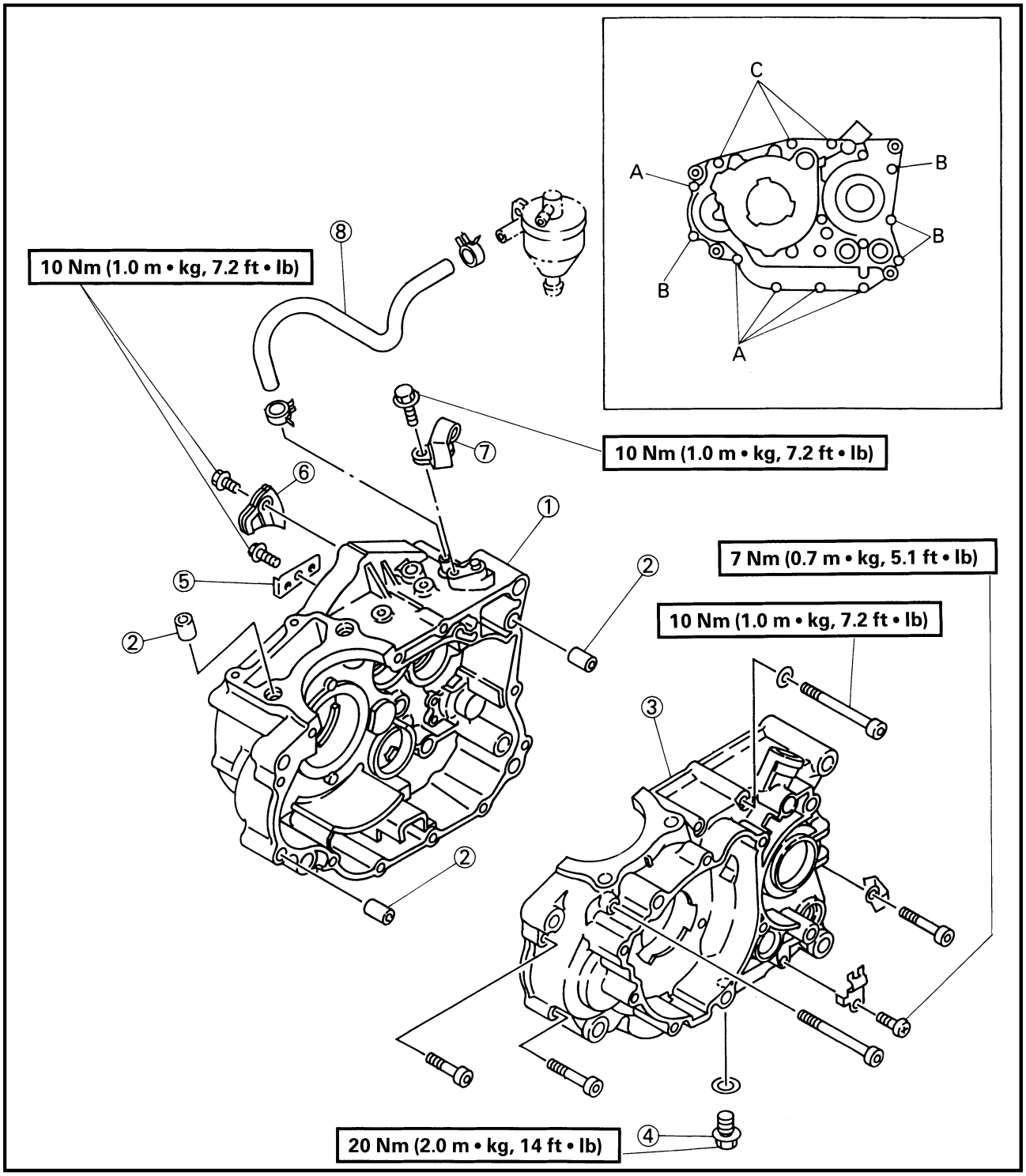


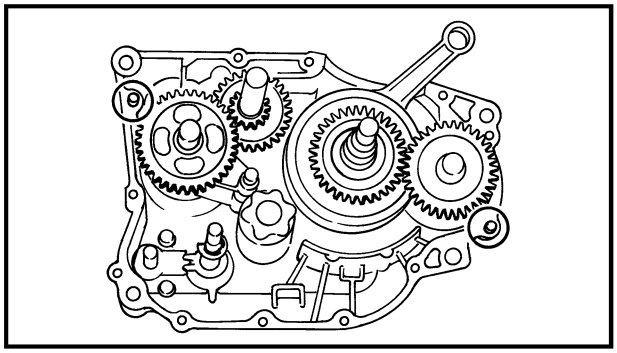
8.Install:
- Shift shaft 1 ①
- Shift shaft 2 ②

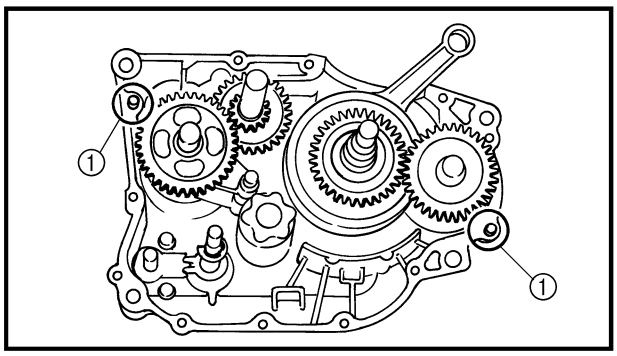
NOTE:
Mesh the shift shaft 2 mark ⓐ with the shift shaft 1 pawl center ⓑ.

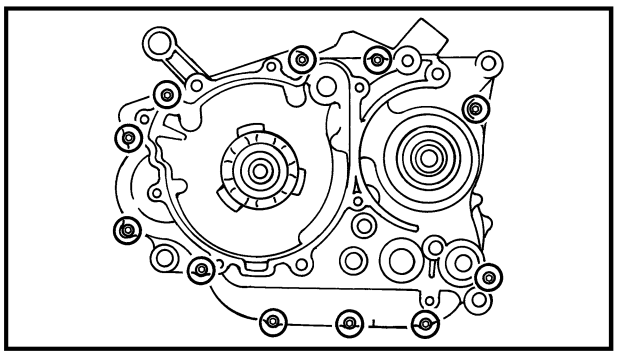
CRANKCASE

① Crankcase (right)
② Dowel pin
③ Crankcase (left)
④ Drain bolt
⑤ Breather plate 2
⑥ Breather plate 1
⑦ Holder (clutch cable)
⑧ Breather hose









CRANKCASE (RIGHT)

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

	Quick Gasket®: **P/N. ACC-11001-05-01**

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

2.Install:
- Dowel pins ①

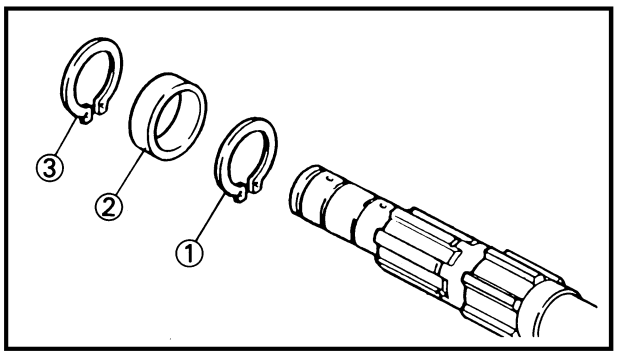
3.Fit the left crankcase onto the right case. Tap lightly on the case with a soft hammer.

4.Tighten:
- Bolt (crankcase)

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

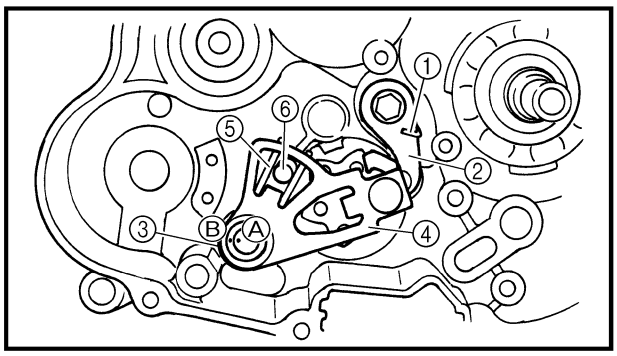
5.Apply:
- 4-stroke engine oil
  (to the crank pin, bearing and oil delivery hole)

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



SHIFT SHAFT

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

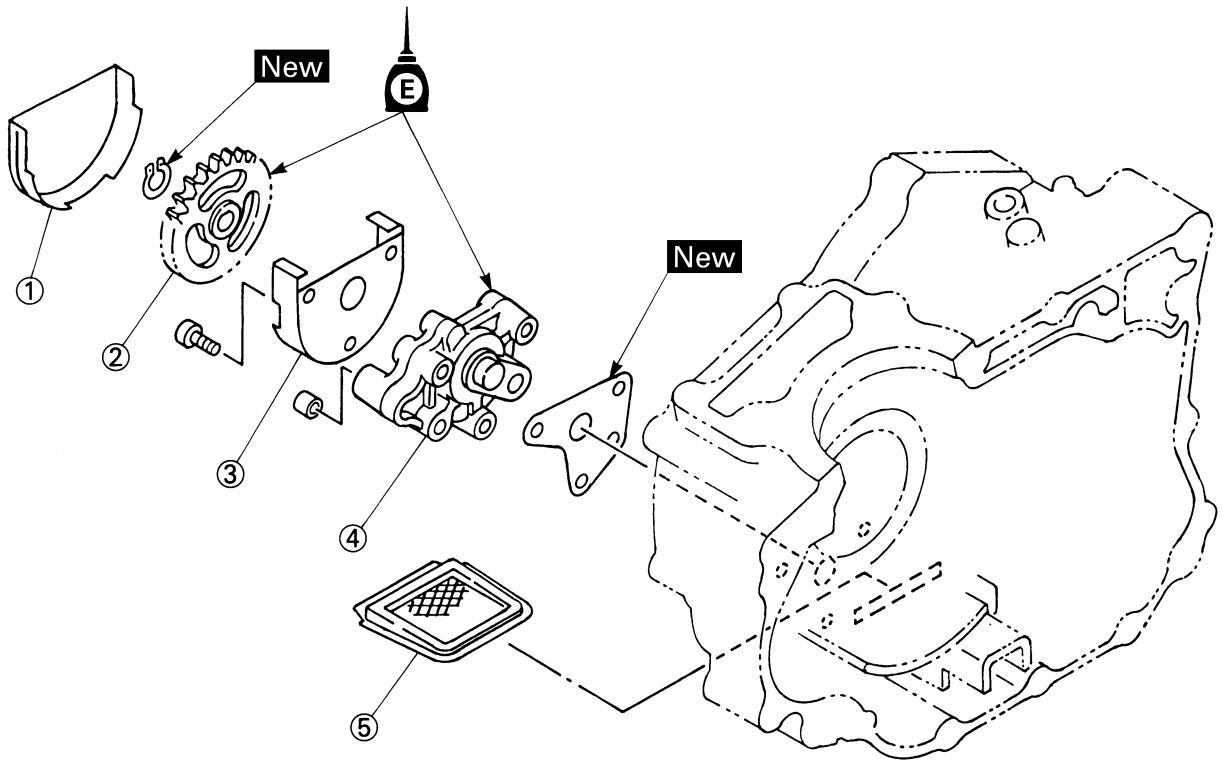


2.Install:
- Torsion spring ①
- Stopper lever ②
- Washer ③
- Shift lever ④
- Circlip
- Cam chain
- Cam chain damper

NOTE:
- Set the torsion spring ① and stopper lever ② at proper position.
- Install the torsion spring ⑤ fitting to the guide pin ⑥.
- Install the shift lever with the marks Ⓐ and Ⓑ aligned.

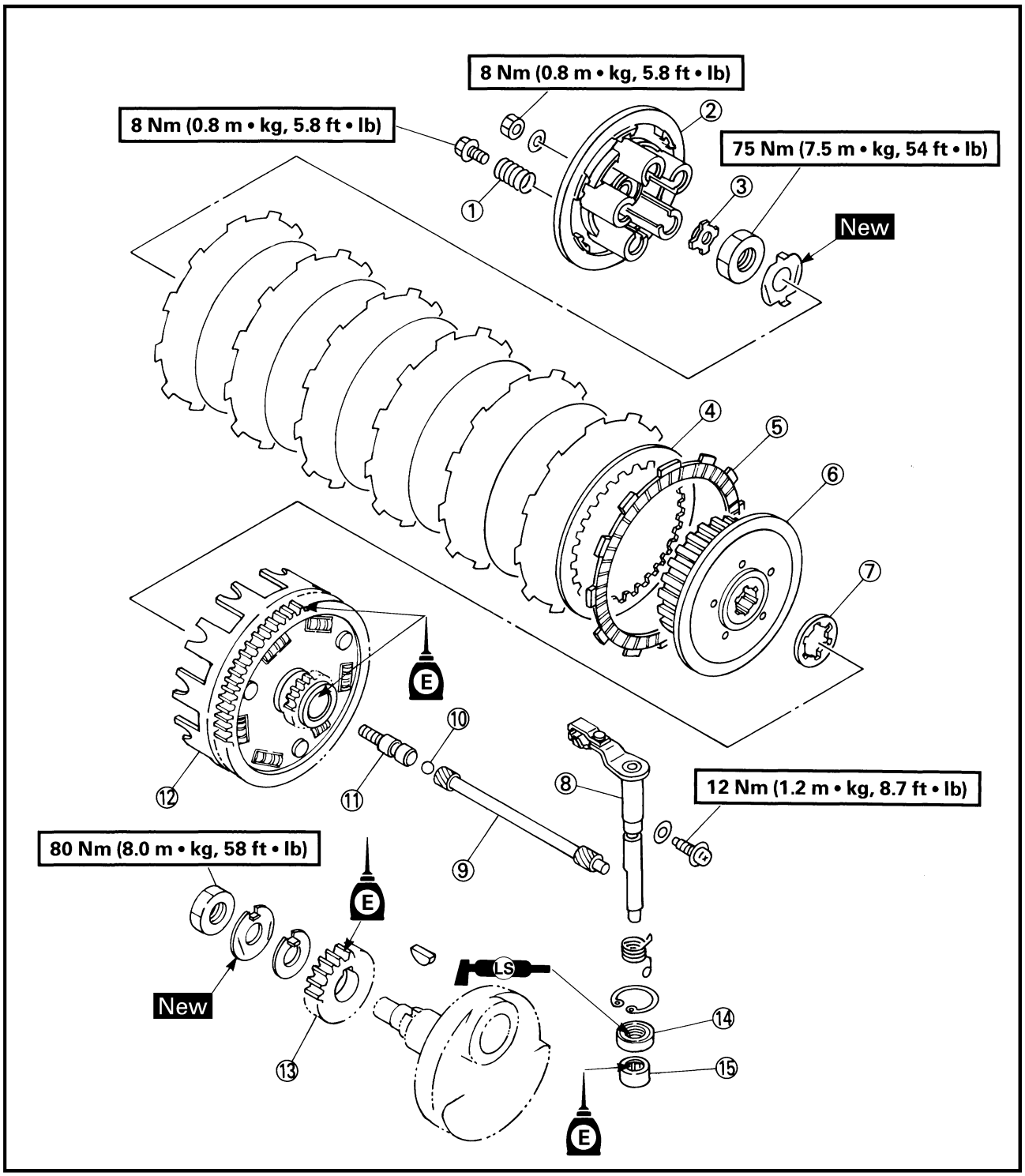
OIL PUMP

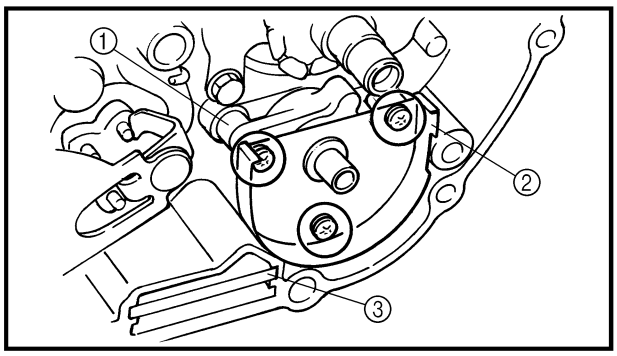
① Pump gear cover
② Pump driven gear
③ Pump cover
④ Oil pump assembly
⑤ Oil strainer



CLUTCH

① Clutch spring
② Pressure plate
③ Push plate
④ Clutch plate
⑤ Friction plate
⑥ Clutch boss
⑦ Thrust plate
⑧ Push lever
⑨ Push rod 2
⑩ Ball
⑪ Push rod 1
⑫ Primary driven gear
⑬ Primary drive gear
⑭ Oil seal
⑮ Bearing

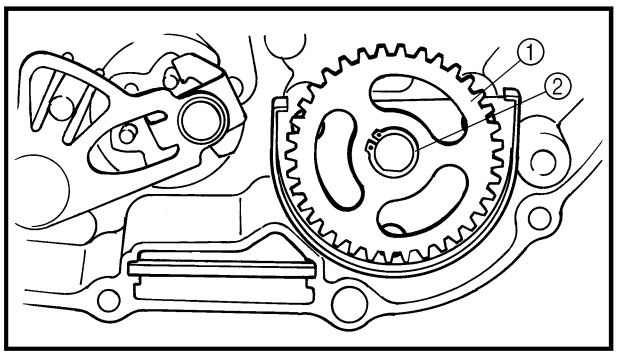




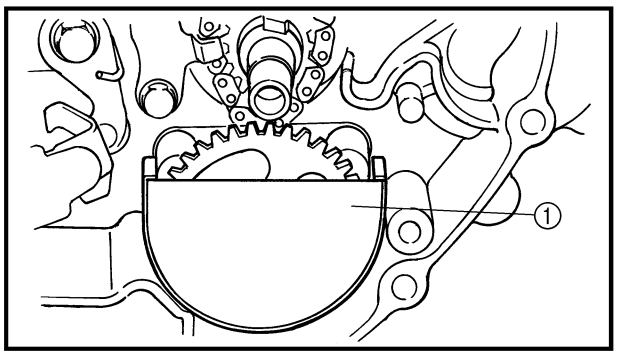
OIL PUMP

1.Install:
- Gasket
- Oil pump assembly ①
- Pump cover ②
- Oil strainer ③

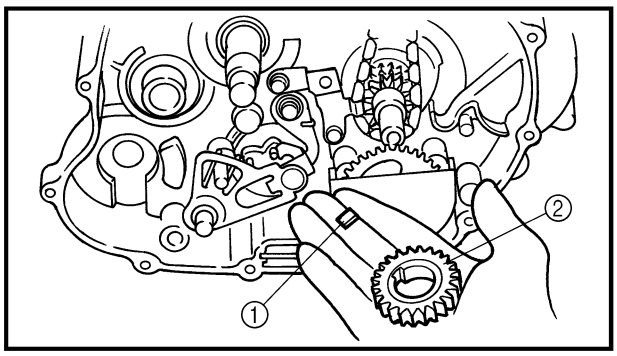
	Bolts (oil pump): **6 Nm (0.6 m • kg, 4.3 ft • lb)**



2.Install:
- Pump driven gear ①
- Circlip ②



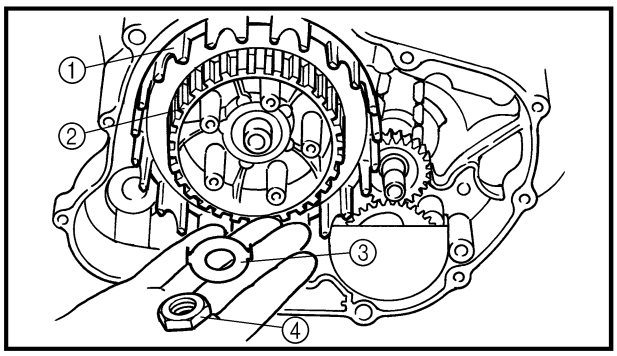
3.Install:
- Gear cover ①



CLUTCH

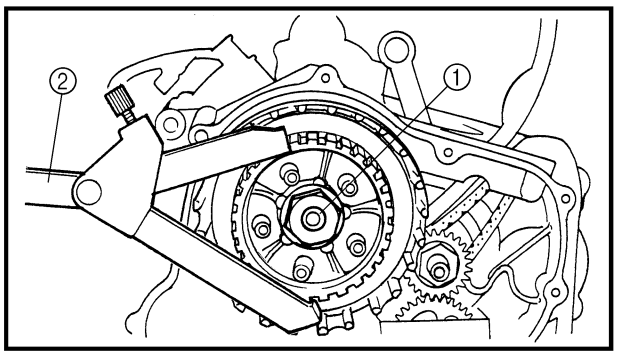
1.Install:
- Key ①
- Primary drive gear ②

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



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

NOTE:
Fit the tabs of the lock washer onto the grooves of the clutch boss.

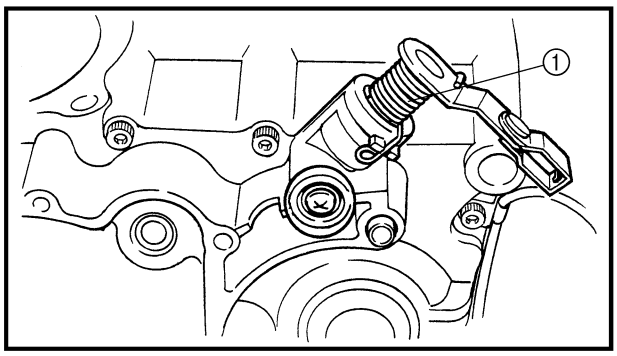


4.Tighten:
- Nut ① (clutch boss)

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

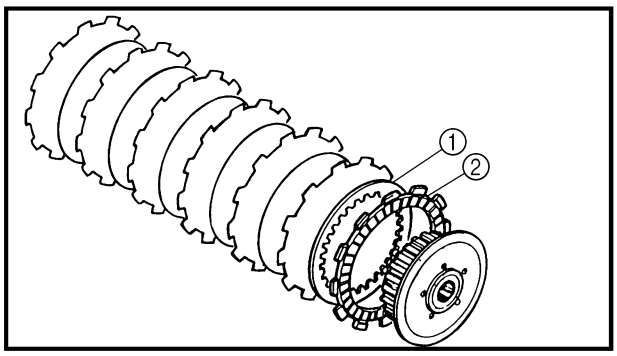
	**Universal clutch holder:** **P/N. YM-91042**
	**Nut ① (clutch boss):** **75 Nm (7.5 m • kg, 54 ft • lb)**

5.Bend:
- Lock washer tabs (along nut flats)



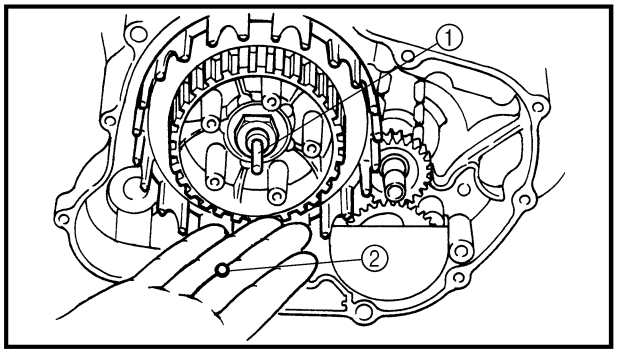
6.Install:
- Push lever assembly ①

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

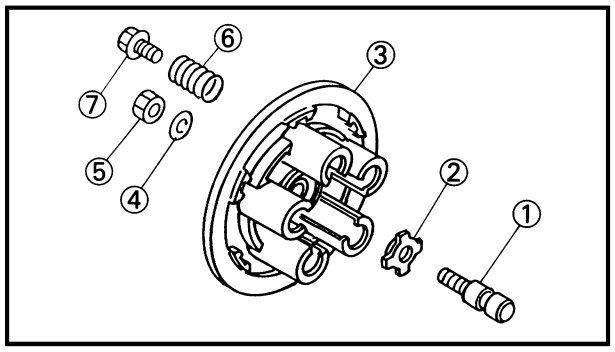


7.Install:
- Clutch plate ①
- Friction plate ②

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.



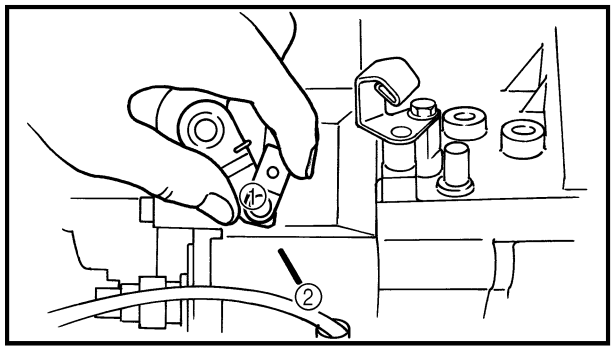
8.Install:
- Push rod 2 ①
- Ball ②



9.Install:
- Push rod 1 ①
- Push plate ②
- Pressure plate ③
- Plain washer ④
- Nut ⑤
- Spring ⑥
- Bolts ⑦

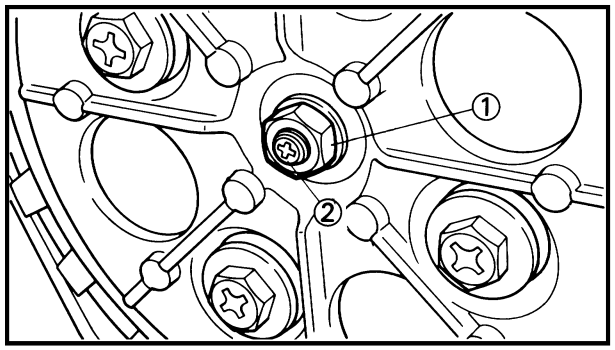
NOTE:
Tighten the bolts ⑦ in a crisscross pattern.

	Bolt ⑦ (pressure plate): **8 Nm (0.8 m • kg, 5.8 ft • lb)**



10.Check:
- Push lever position
  Push the push lever assembly in the direction of the arrow and make sure that the match marks are be aligned.
  Not aligned → Adjust.

① Match mark on the push lever assembly
② Match mark on the crankcase



11.Adjust:
- Push lever position

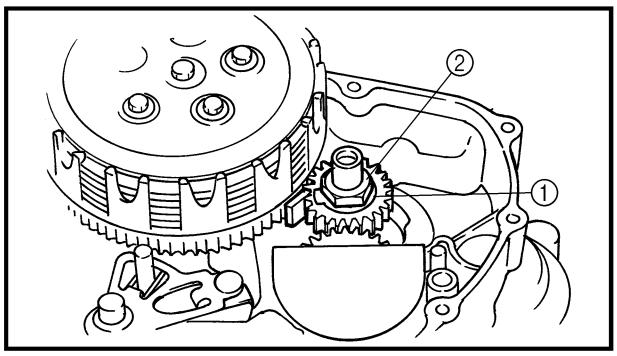
****

Adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ② clockwise or counterclockwise until both match marks are aligned.
- Hold the adjuster to prevent it from moving and thoroughly tighten the locknut.

CAUTION:
Do not overtighten the adjuster ②, as this may eliminate the necessary free play between the push rods.

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

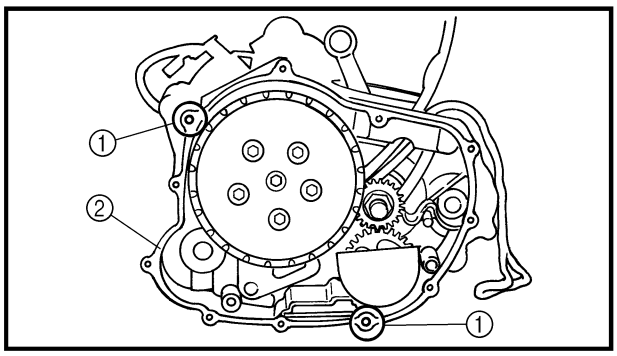
****



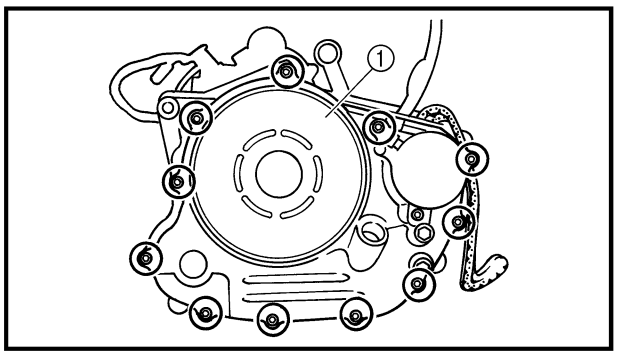
12.Install:
- Claw washer
- Lock washer ①
- Nut ②

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

13.Bend the lock washer tab along the nut flats.



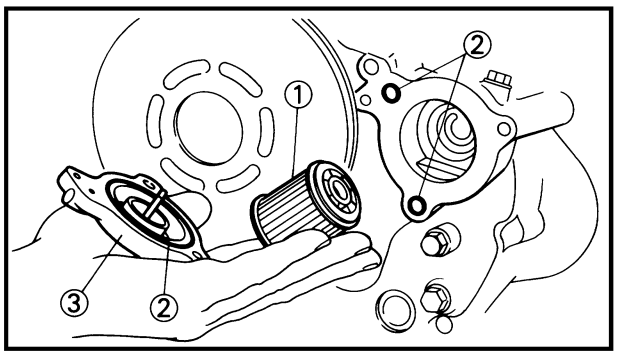
14.Install:
- Dowel pin ①
- Gasket ② (crankcase cover)



15.Install:
- Crankcase cover ① (right)

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

NOTE:
Tighten the bolts (crankcase cover) in a criss-cross pattern.

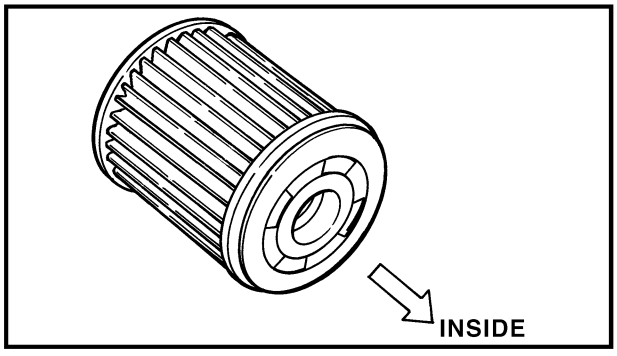


OIL FILTER

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

2.Install:
- Oil filter ①
- O-rings ②
- Oil filter cover ③

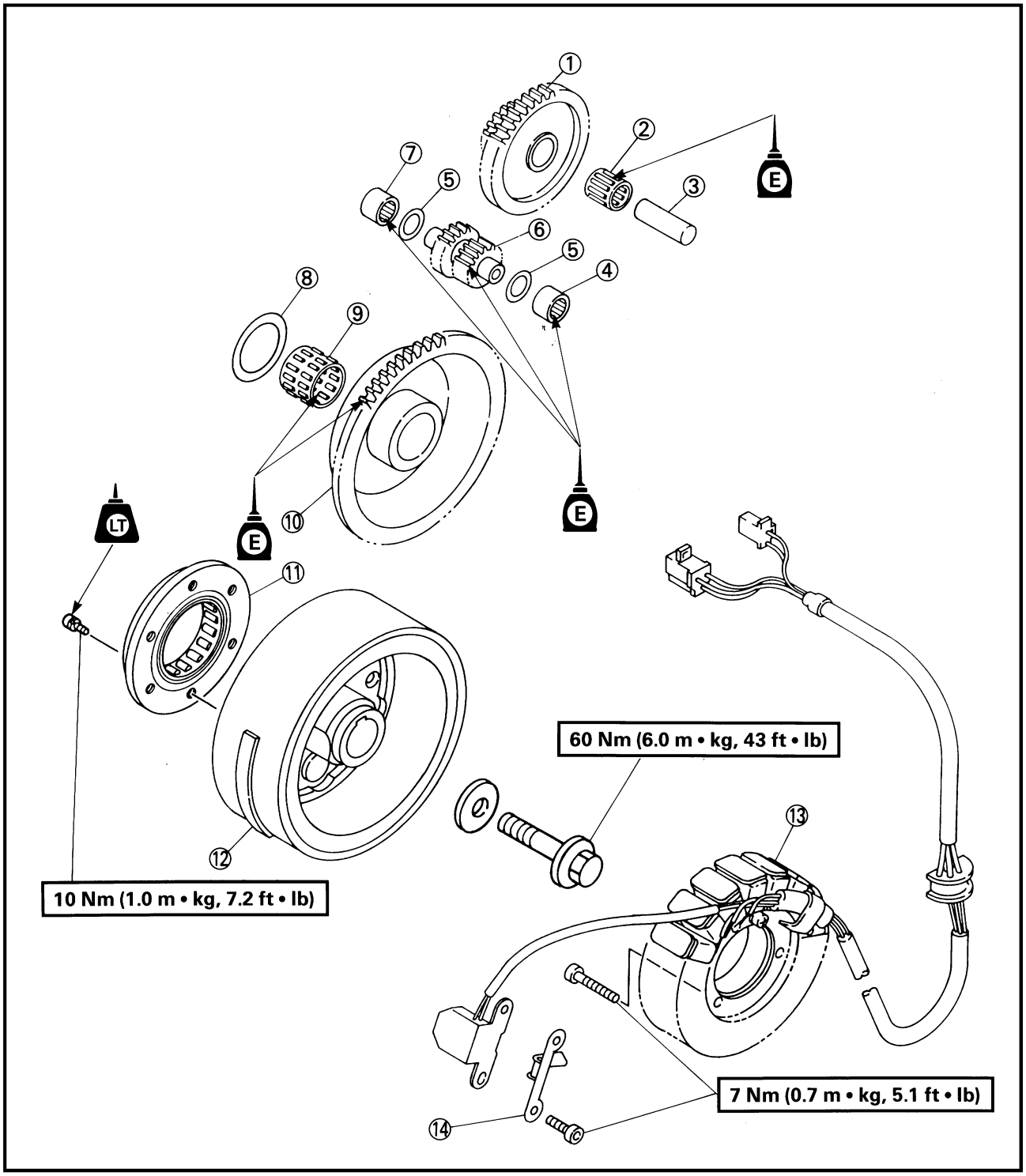
	Bolt (oil filter cover): 10 Nm (1.0 m • kg, 7.2 ft • lb)



CAUTION:
Install the oil filter as shown.

ROTOR AND STARTER DRIVES

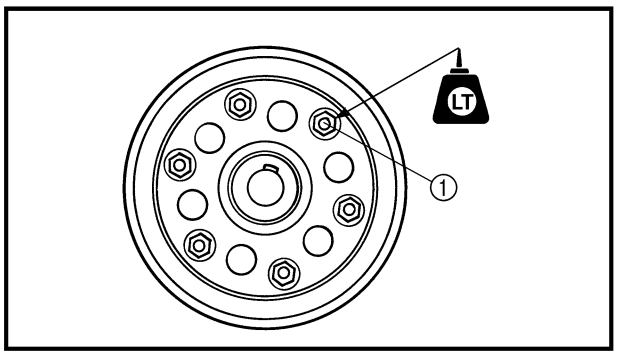
① Starter idle gear 1
② Bearing
③ Shaft 1
④ Bearing
⑤ Washer
⑥ Starter idle gear 2
⑦ Bearing
⑧ Plate washer
⑨ Bearing
⑩ Starter wheel gear
⑪ Starter clutch
⑫ Rotor
⑬ Stator coil
⑭ Clamp



ROTOR AND STARTER DRIVES

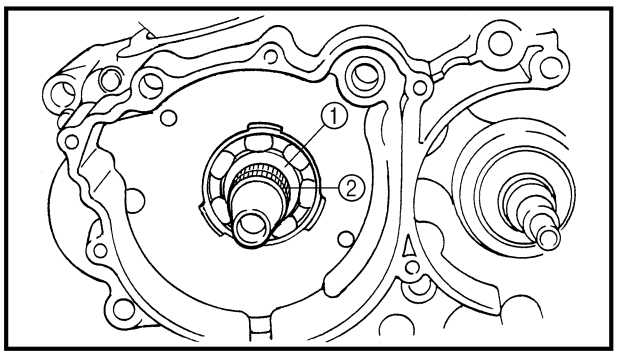
NOTE:
Fasten a safety wire to the timing chain to prevent it from falling into the crankcase.

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

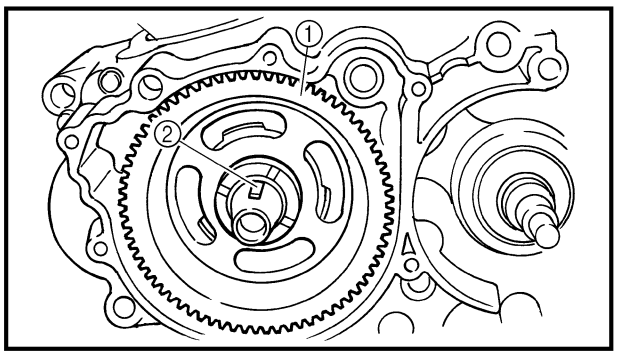


2.Install:
- Starter clutch
- Bolt ①

	**Bolt ① (Starter clutch):** **10 Nm (1.0 m • kg, 7.2 ft • lb)**



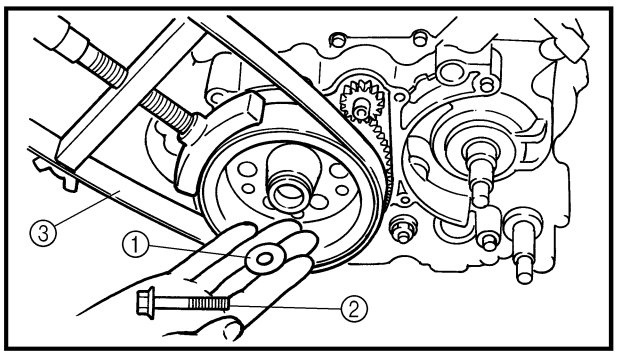
3.Install:
- Plain washer ①
- Bearing ②



4.Install:
- Starter wheel gear ①
- Woodruff key ②

5.Install:
- Rotor

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



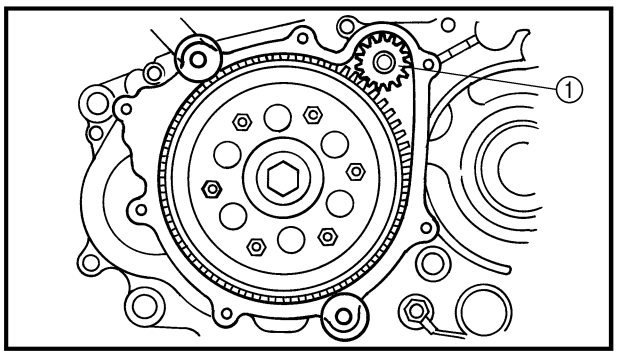
6.Install:
- Washer ①
- Bolt ②

	Bolt ② (rotor): **60 Nm (6.0 m • kg, 43 ft • lb)**

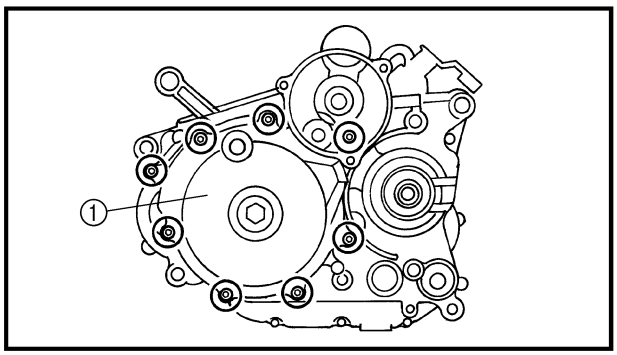
NOTE:
Tighten the bolt (rotor) while holding the rotor with the sheave holder ③.

	Sheave holder: **P/N. YS-01880**

CAUTION:
Do not allow the rotor holder to touch the projections on the rotor.

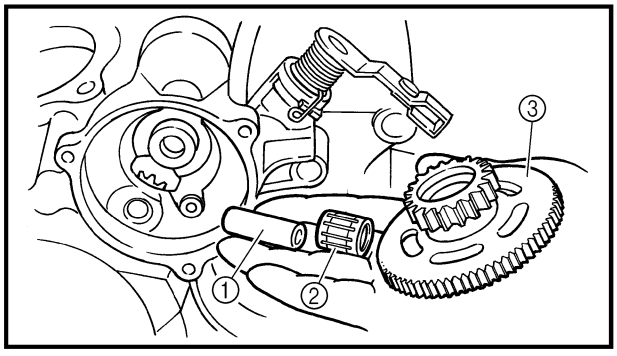


7.Install:
- Dowel pins
- Gasket (crankcase cover)
- Washers (idle gear 2)
- Idle gear 2 ①



8.Install:
- Crankcase cover 1 ①

	Bolt (crankcase cover 1): **10 Nm (1.0 m • kg, 7.2 ft • lb)**

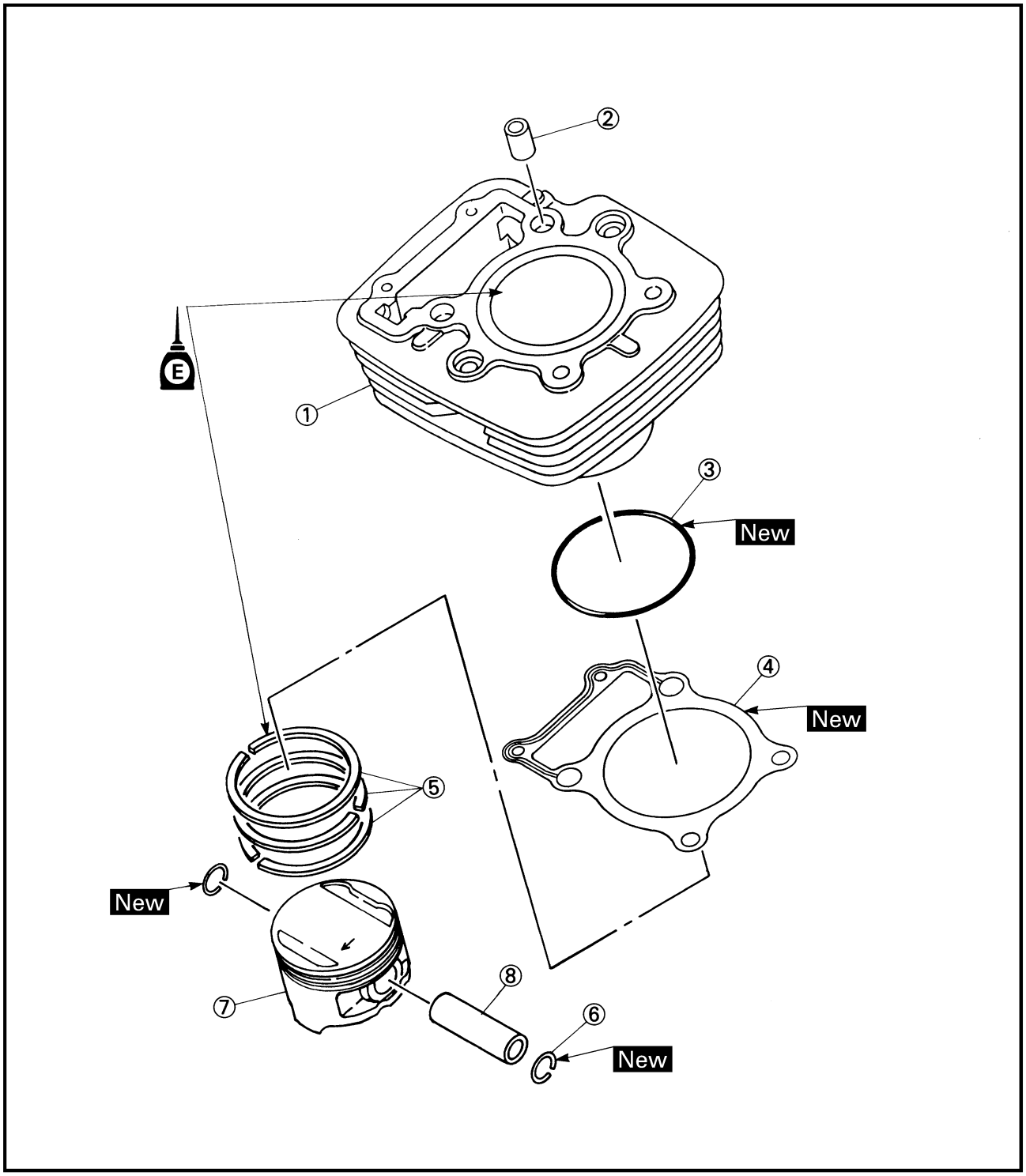


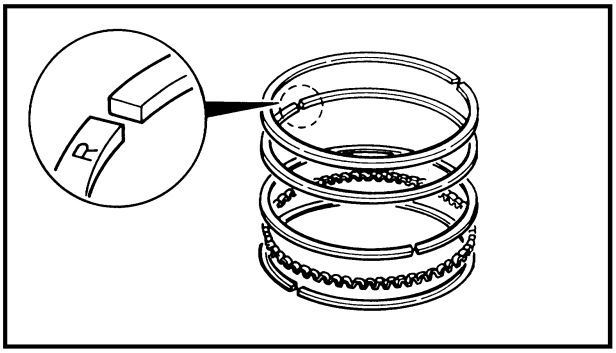
9.Install:
- Shaft ①
- Bearing ②
- Starter idle gear 1 ③
- Generator cover

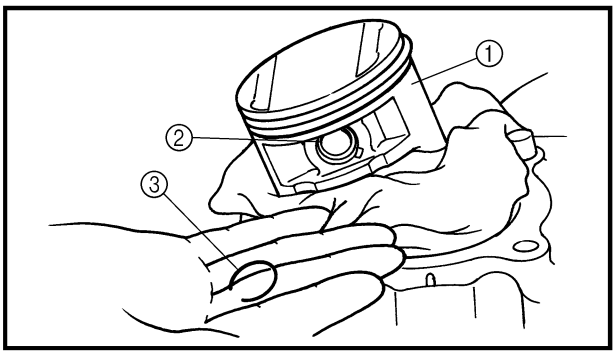
	Bolt (generator cover): **10 Nm (1.0 m • kg, 7.2 ft • lb)**

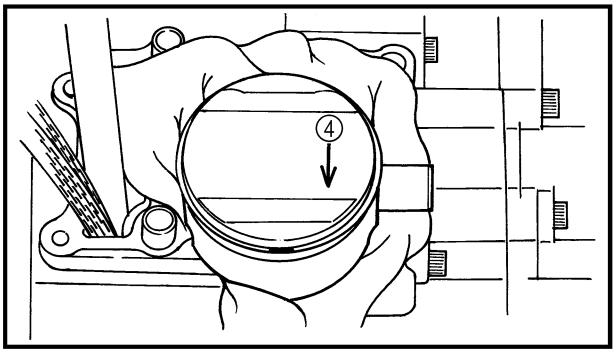
CYLINDER AND PISTON

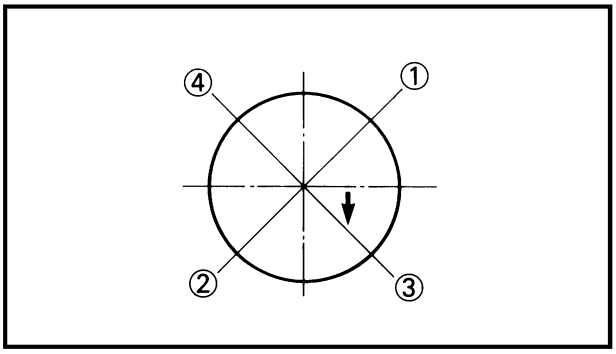
① Cylinder
② Dowel pin
③ O-ring
④ Cylinder gasket
⑤ Piston ring
⑥ Piston pin clip
⑦ Piston
⑧ Piston pin

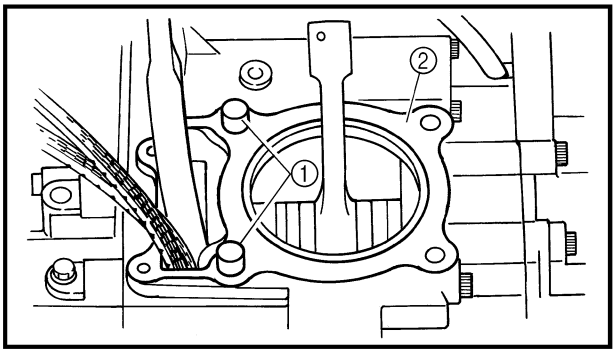












CYLINDER AND PISTON

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

2.Install:
- Piston rings

NOTE:
Be sure to install the rings so that manufacturer's marks or numbers are located on the top side of the rings.

3.Install:
- Piston ①
- Piston pin ②
- Piston pin clip ③

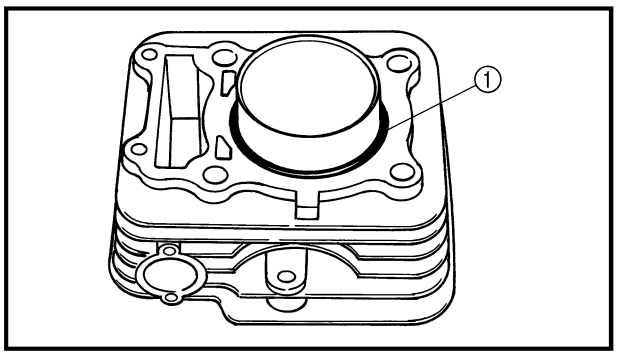
NOTE:
- The arrow ④ on the piston must point to the front of the engine.
- Before installing the piston pin clip, cover the crankcase with a clean towel or rag so you will not accidentally drop the piston pin clip and material into the crankcase.

4.Position:
- Top ring
- 2nd ring
- Oil rings

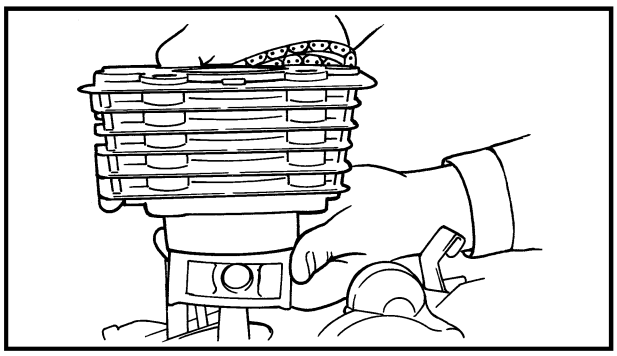
  Offset the piston ring end gaps as shown.

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)

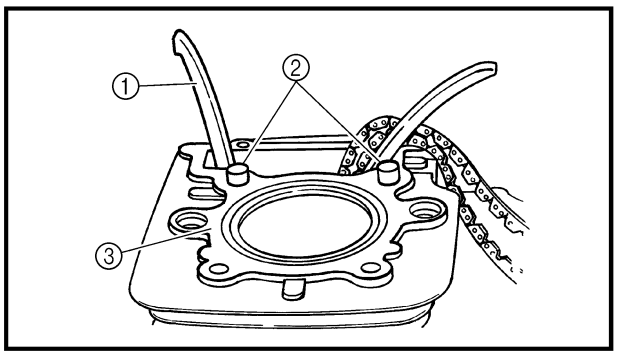


6.Install:
- O-ring ①



7.Install:
- Cylinder

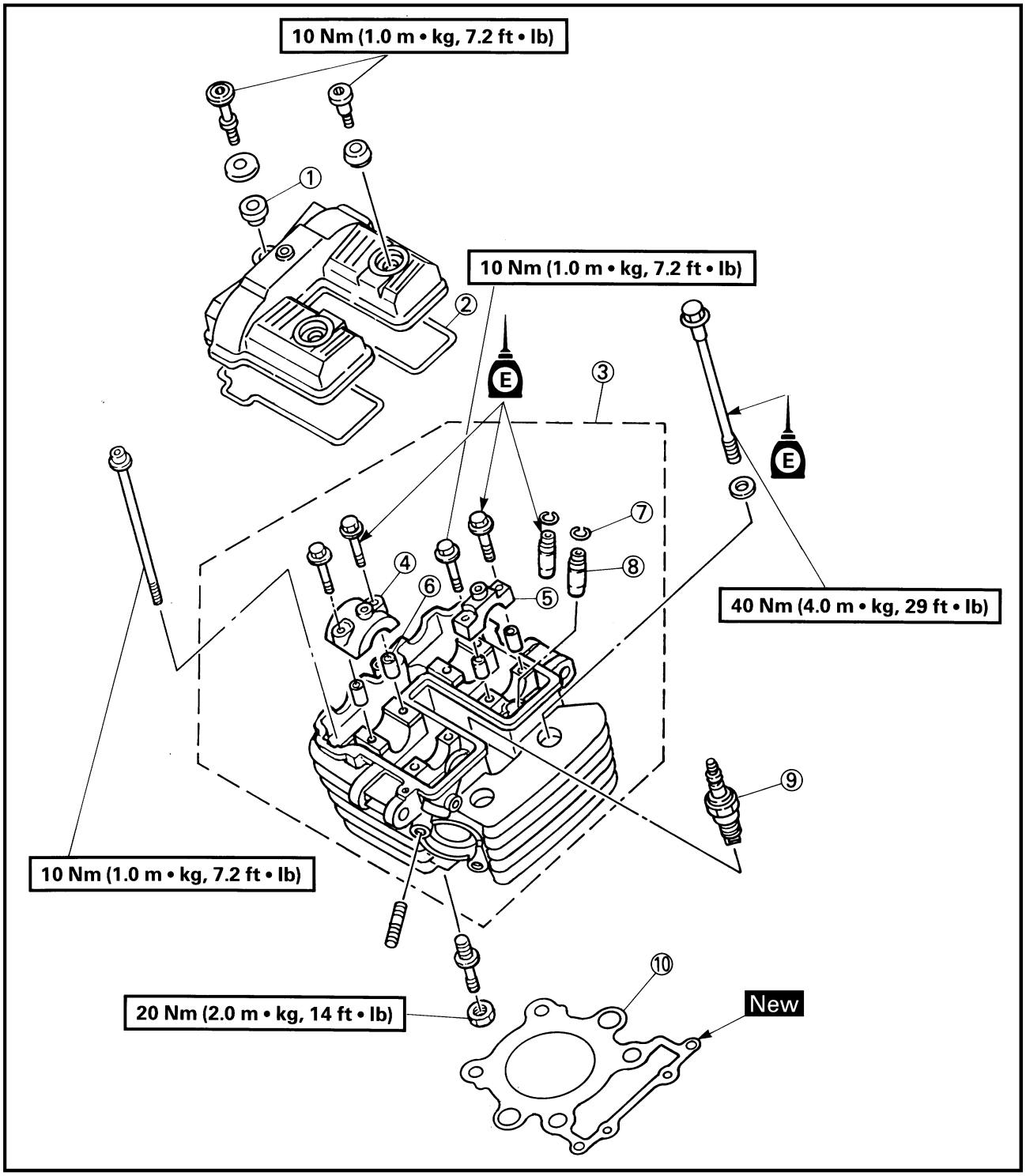
NOTE:
Install the cylinder with one hand while compressing the piston ring with the other hand.



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

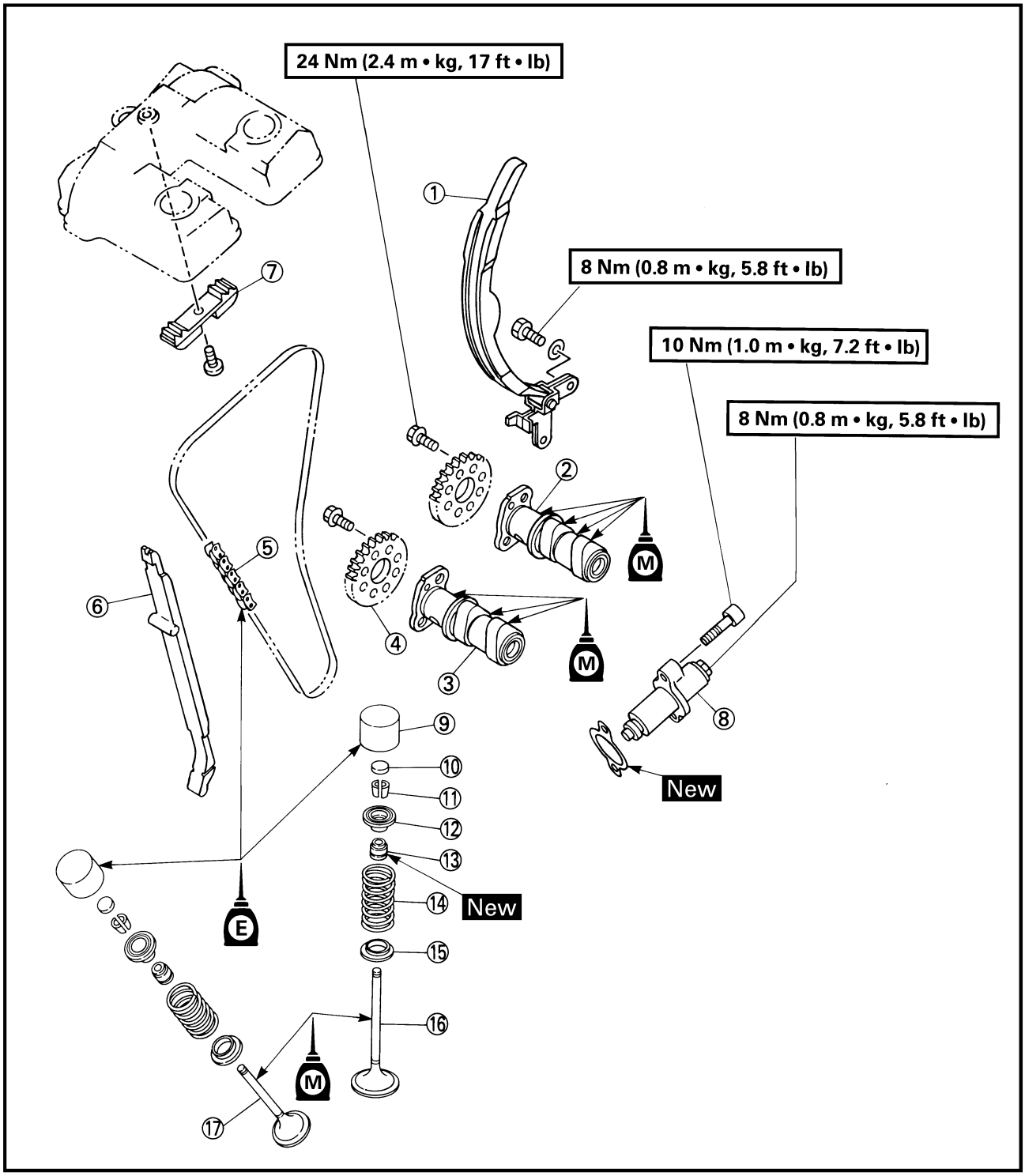
CYLINDER HEAD

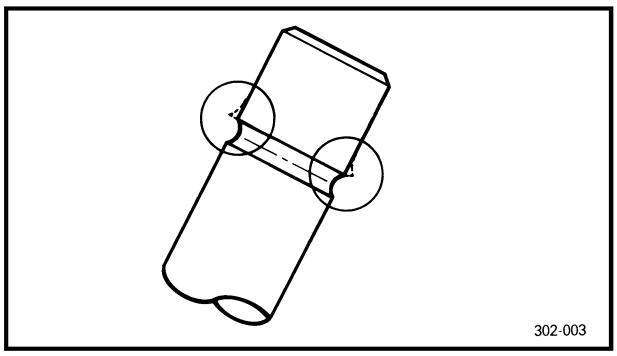
① Mount rubber
② Cylinder head cover gasket
③ Cylinder head assembly
④ Camshaft cap
⑤ Camshaft cap
⑥ Dowel pin
⑦ Circlip
⑧ Valve guide
⑨ Spark plug
⑩ Cylinder head gasket



VALVE, CAMSHAFT AND CAM CHAIN

① Timing chain guide (intake)
② Camshaft (intake)
③ Camshaft (exhaust)
④ Cam sprocket
⑤ Timing chain
⑥ Timing chain guide (exhaust)
⑦ Stopper guide
⑧ Timing chain tensioner
⑨ Valve lifter
⑩ Adjusting pad
⑪ Valve cotter
⑫ Valve retainer
⑬ Oil seal
⑭ Valve spring
⑮ Spring seat
⑯ Valve (intake)
⑰ Valve (exhaust)

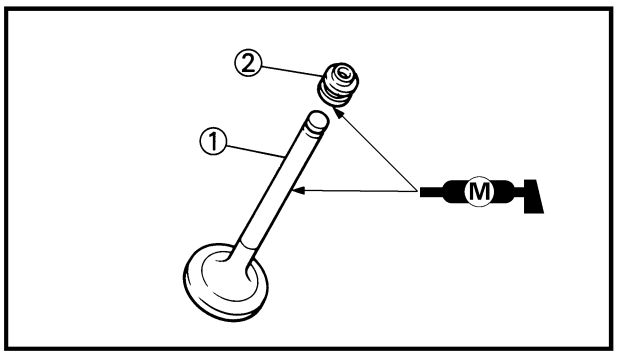




VALVE AND CAMSHAFT

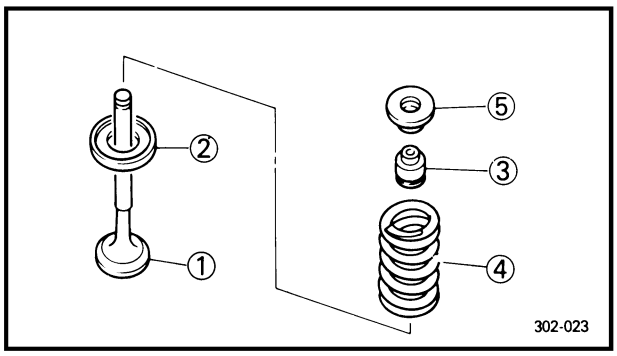
1.Deburr:

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



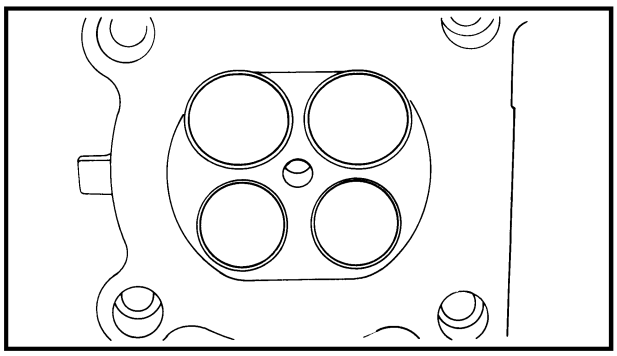
2.Apply:

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



3.Install:

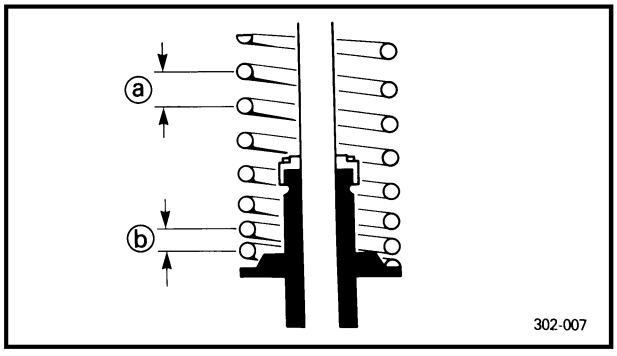
- Valve ①
- Spring seat ②
- Oil seal ③
- Valve spring ④
- Valve retainer ⑤
  (into cylinder head)

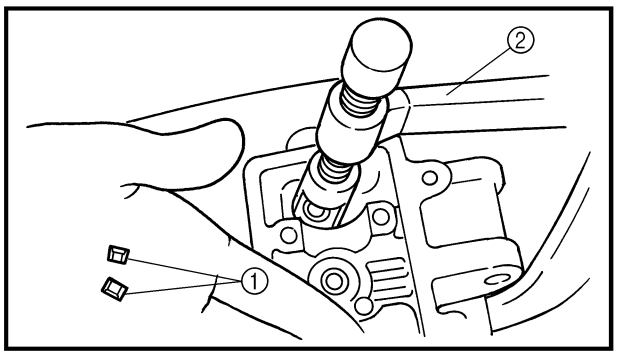


NOTE:

- Make sure that each valve is installed in its original place.
- Install the valve spring with the larger pitch ⓐ facing upwards.

ⓑ Smaller pitch





4.Install:
- Valve cotters ①

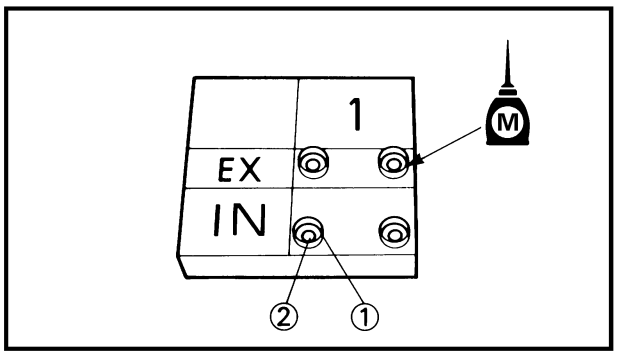
NOTE:
Install the valve cotters while compressing the valve spring with the valve spring compressor ②.

	Valve spring compressor: P/N. YM-04019

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

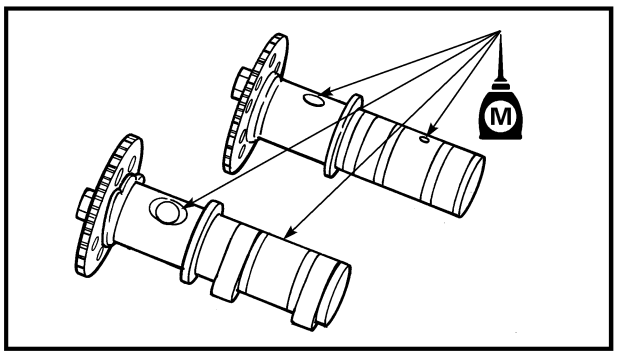
NOTE:
Do not hit so much as to damage the valve.

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

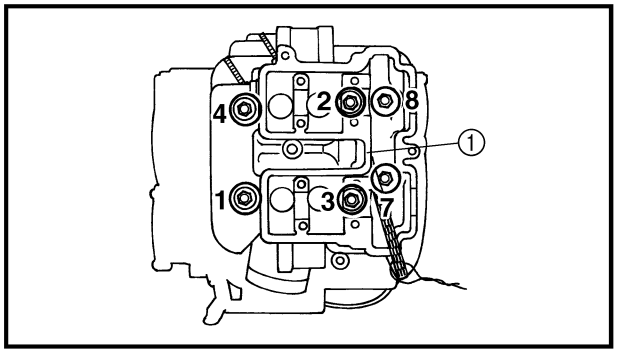


7.Install:
- Valve lifters ①
- Pads ②

NOTE:
- When rotated with a finger, the valve lifter should move smoothly.
- Identify each lifter and pad position very carefully so that they can be reinstalled in their original place.



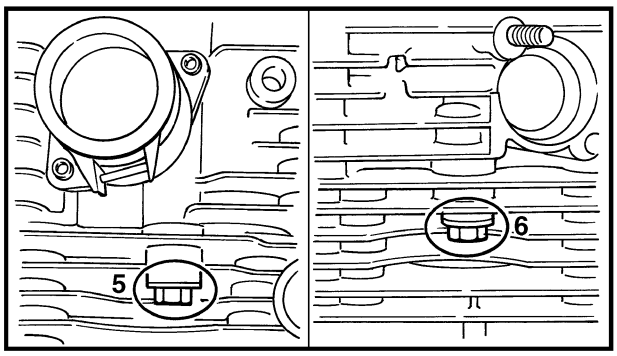
8.Apply:
- Molybdenum disulfide oil (onto camshaft journal)



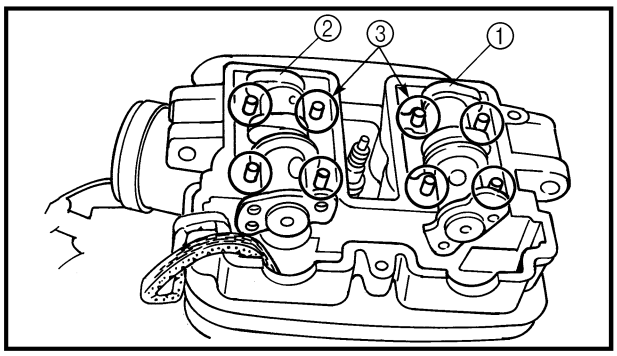
CYLINDER HEAD

1.Install:
- Cylinder head ①

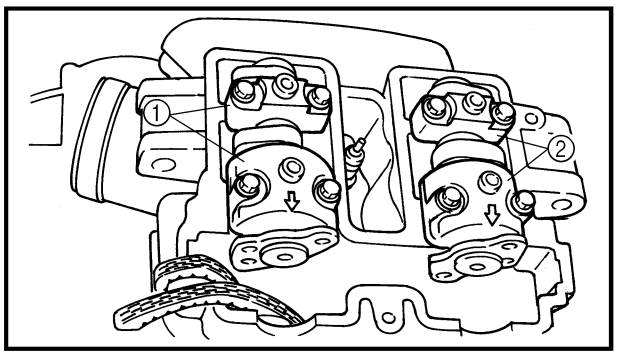
Bolts ① ~ ④ (cylinder head):
40 Nm (4.0 m • kg, 29 ft • lb)
Nuts ⑤, ⑥ (cylinder head):
20 Nm (2.0 m • kg, 14 ft • lb)
Bolts ⑦, ⑧ (cylinder head):
10 Nm (1.0 m • kg, 7.2 ft • lb)



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



2.Install:
- Exhaust camshaft ①
- Intake camshaft ②
- Dowel pins ③



3.Install:
- Camshaft caps ① (intake camshaft)
- Camshaft caps ② (exhaust camshaft)

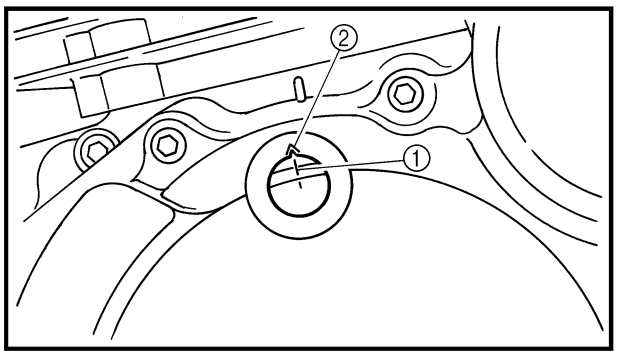
NOTE:
Install the camshaft cap with the arrow mark embossed facing right side of the engine.

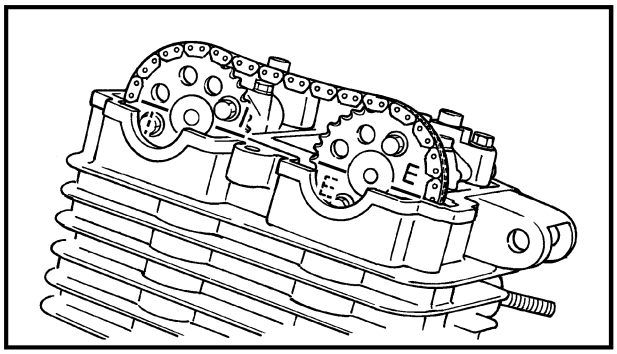
4.Tighten:
- Bolts (camshaft caps)

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

NOTE:
Tighten the bolts (camshaft caps) in a criss-cross pattern from inner most to outer caps.

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





5.Install:
- Cam sprockets

****

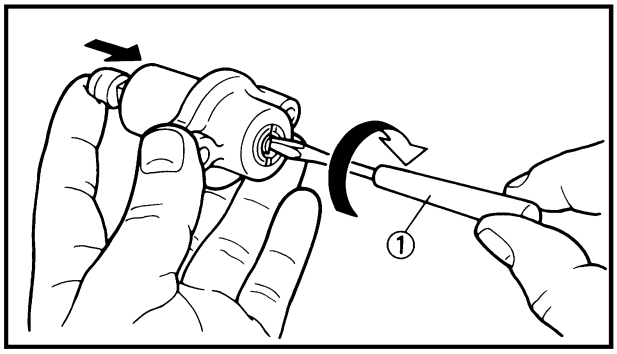
Installing steps:
- Turn the crankshaft clockwise until the TDC mark ① is aligned with the stationary pointer ②.
- Fit the timing chain onto both cam sprockets and install the cam sprockets on the camshafts.

NOTE:
When installing the cam sprockets, start with the exhaust camshaft to keep the timing chain as tense as possible on the exhaust side, and set the respective match marks to be parallel with the case surface on the corresponding sides.
"I" : Intake side
"E" : Exhaust side

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

- While holding the camshafts, temporarily tighten the bolts.

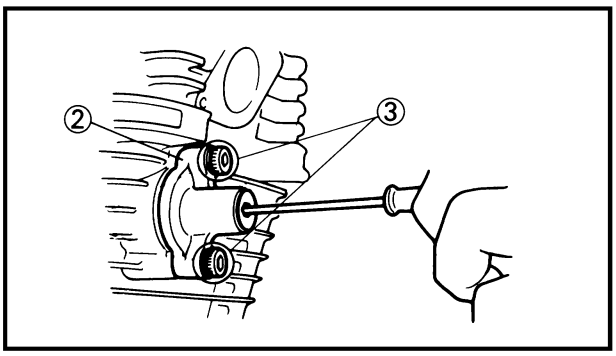
****



6.Install:
- Timing chain tensioner

****

Installation 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 and the chain tensioner ②, and tighten the bolts ③ to the specified torque.

Bolt ③ (chain tensioner):
10 Nm (1.0 m • kg, 7.2 ft • lb)

● Release the screwdriver, check if the tensioner rod comes out and tighten the gasket and the cap bolt to the specified torque.

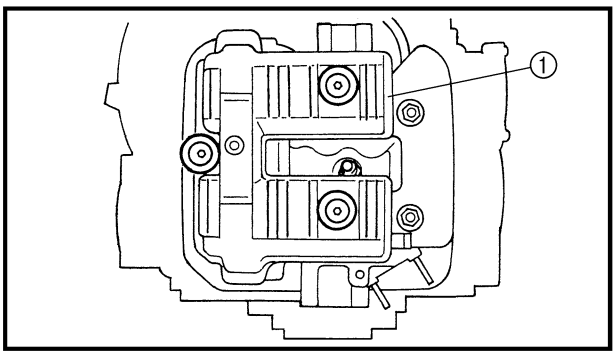
Cap bolt (timing chain tensioner):
8 Nm (0.8 m • kg, 5.8 ft • lb)

****

7.Check:
- Valve timing
  Incorrect timing → Adjust.
  Refer to above steps 4 ~ 6.

8.Check:
- Valve clearance
  Out of specification → Adjust.
  Refer to "VALVE CLEARANCE ADJUSTMENT" in CHAPTER 3.

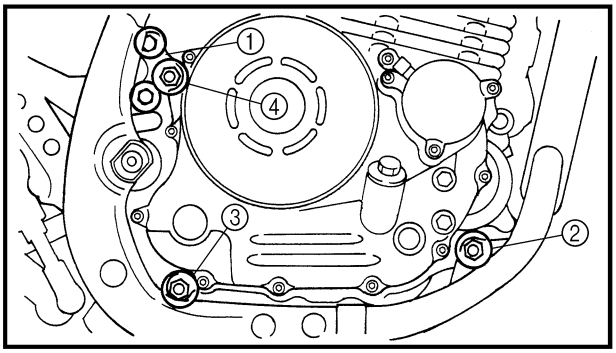
Intake valve (cold):
0.09 ~ 0.17 mm (0.004 ~ 0.007 in)
Exhaust valve (cold):
0.19 ~ 0.27 mm (0.007 ~ 0.011 in)



9.Install:
- Cylinder head cover ①

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

10.Install:
- Timing plug
- Plug



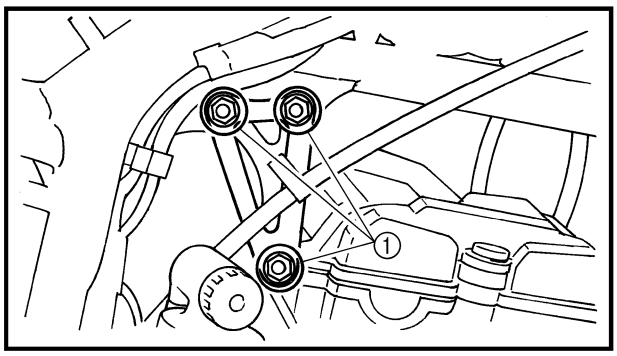
REMOUNTING ENGINE

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

1.Install:
- Bracket 1 ①
- Mounting bolt (front-lower) ②
- Mounting bolt (rear-lower) ③
- Mounting bolt (rear-upper) ④

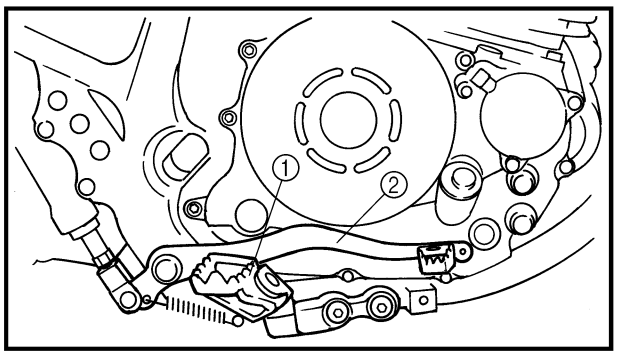
NOTE:
Install all the bolts and nuts first, and then tighten the bolts and nuts to specifications.

Bracket bolts:
23 Nm (2.3 m • kg, 17 ft • lb)
Mounting bolts:
64 Nm (6.4 m • kg, 46 ft • lb)



2.Tighten:
- Bolt ①

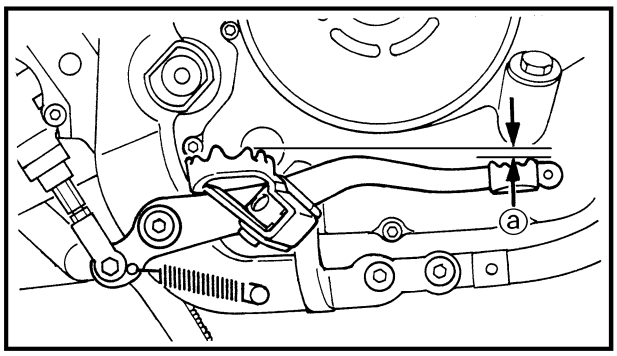
Stay bolts (cylinder head-stay):
64 Nm (6.4 m • kg, 46 ft • lb)
Stay bolts (stay-frame):
30 Nm (3.0 m • kg, 22 ft • lb)



3.Install:
- Brake pedal ①
- Footrest (right) ②

Refer to "ENGINE REMOVAL".

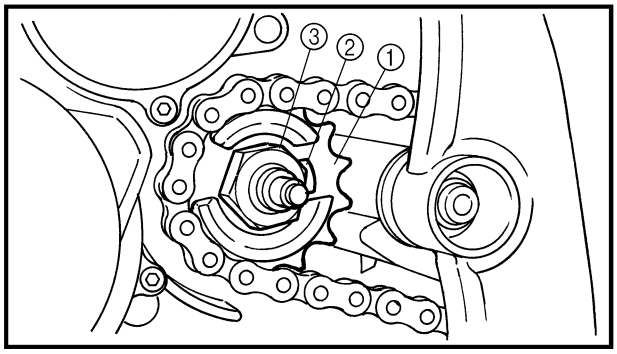
Bolt (brake pedal):
19 Nm (1.9 m • kg, 13 ft • lb)
Bolt (footrest):
64 Nm (6.4 m • kg, 46 ft • lb)



4.Adjust:
- Brake pedal height ⓐ

Refer to "REAR BRAKE ADJUSTMENT" in CHAPTER 3.

Brake pedal height:
10 mm (0.39 in)
Below top of footrest



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

Refer to "ENGINE REMOVAL".

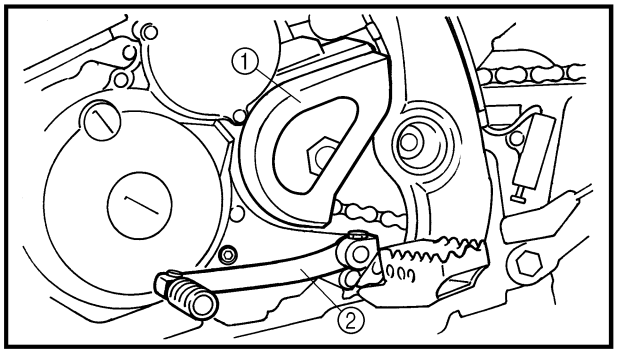
Nut ③:
110 Nm (11.0 m • kg, 80 ft • lb)

⚠ WARNING
Use a new lock washer.

6.Bend:
- Lock washer tabs
  (along nut flats)

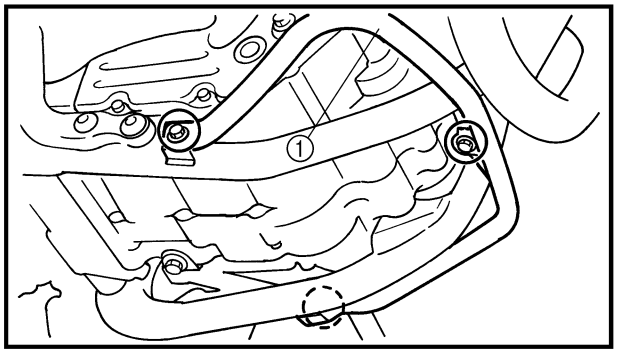
7.Adjust:
- Drive chain slack
  Refer to "DRIVE CHAIN SLACK ADJUSTMENT" in CHAPTER 3.

Drive chain slack:
35 ~ 50 mm (1.38 ~ 1.97 in)



8.Install:
- Crankcase cover 2 ①
- Shift pedal ②

Bolt (crankcase cover 2):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Bolt (shift pedal):
10 Nm (1.0 m • kg, 7.2 ft • lb)



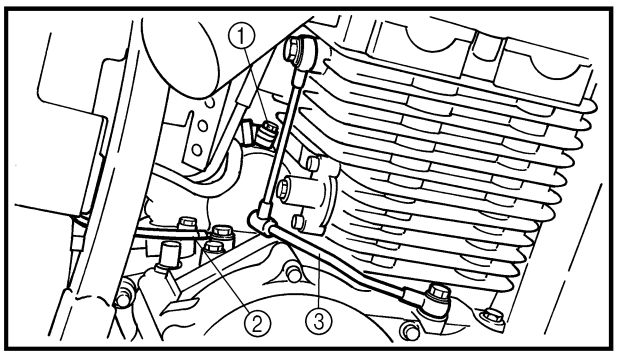
9.Install:
- Engine guard ①

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

10.Apply:
- Lithium soap base grease
  (onto the O-ring on starter motor)

11.Install:
- Starter motor

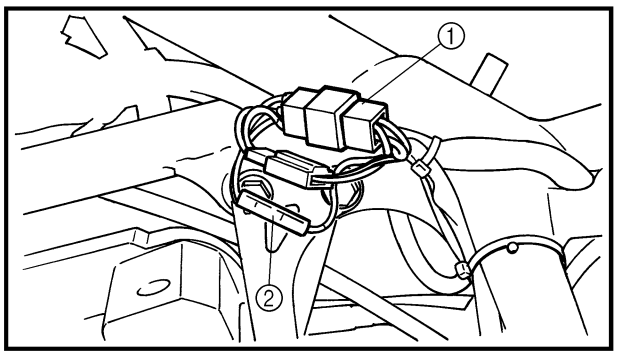
	Bolts (starter motor): **10 Nm (1.0 m • kg, 7.2 ft • lb)**



12.Connect:
- Starter motor lead ①
- Ground lead ②

13.Install:
- Gas chamber
  Refer to "ENGINE REMOVAL".

14.Install:
- Oil delivery pipe ③



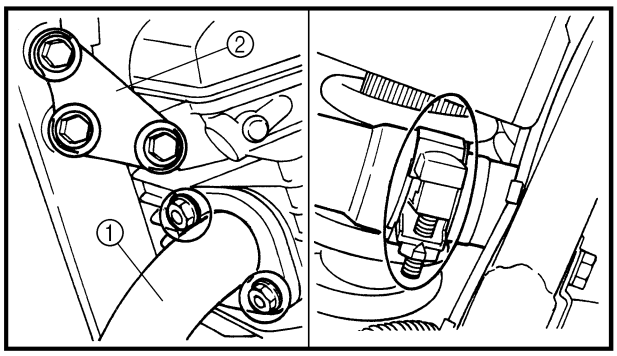
15.Connect:
- A.C. magneto lead ①
- Neutral switch lead ②

16.Connect:
- Spark plug lead

17.Connect:
- Clutch cable

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

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



19.Install:
- Exhaust pipe ①
- Engine stay ②

Nuts (exhaust pipe):
20 Nm (2.0 m • kg, 14 ft • lb)
Bolt (clamp):
20 Nm (2.0 m • kg, 14 ft • lb)
Nuts (stay-frame):
30 Nm (3.0 m • kg, 22 ft • lb)
Nut (stay-engine):
64 Nm (6.4 m • kg, 46 ft • lb)

20.Connect:
- Battery negative lead
  Refer to "BATTERY INSPECTION" in CHAPTER 3.

21.Connect:
- Carburetor
- Air vent hose
  Refer to "CARBURETOR" in CHAPTER 5.

22.Install:
- Fuel tank
  Refer to "SEAT, FUEL TANK AND COVERS" in CHAPTER 3.

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

Oil quantity:
Total amount:
1.45 L (1.28 Imp qt, 1.53 US qt)

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

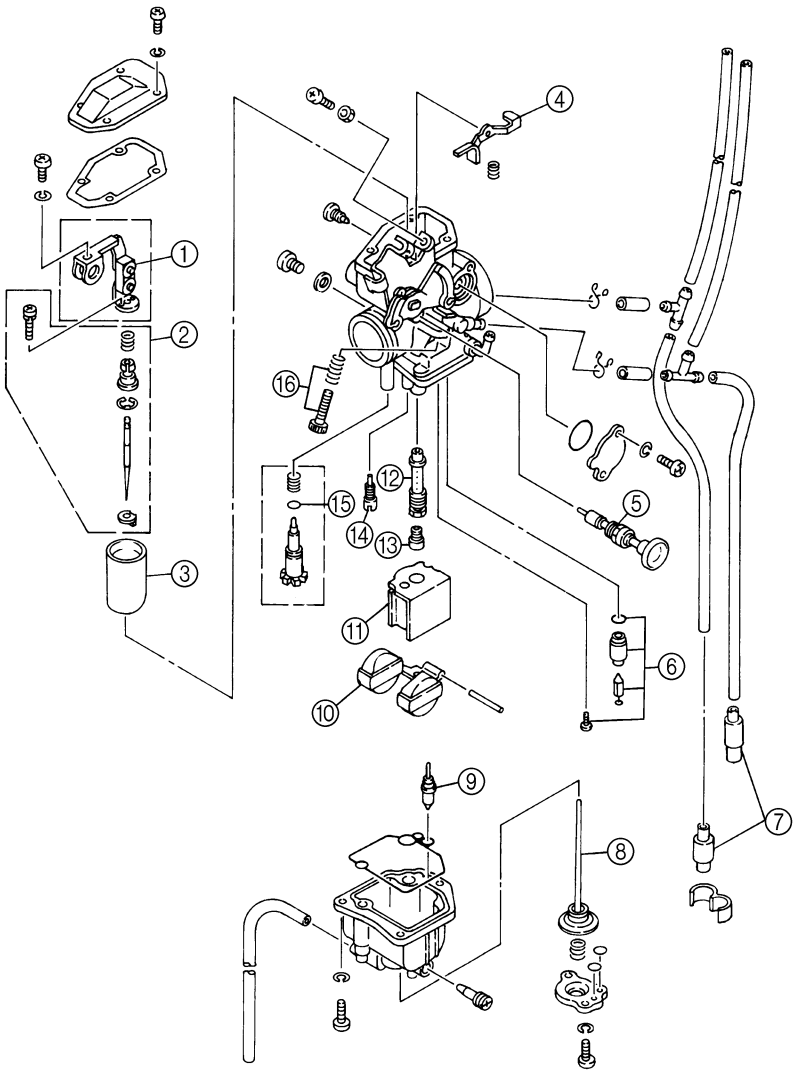
CAUTION:
Never start the engine when the oil has been drained.

CARBURETOR

CARBURETOR

① Throttle arm assembly
② Jet needle set
③ Throttle valve
④ Pump lever
⑤ Starter plunger assembly
⑥ Needle valve set
⑦ One-way valve
⑧ Diaphragm assembly (acceleration pump)
⑨ Check valve assembly
⑩ Float
⑪ Baffle plate
⑫ Needle jet
⑬ Main jet
⑭ Pilot jet
⑮ Pilot screw
⑯ Throttle stop screw

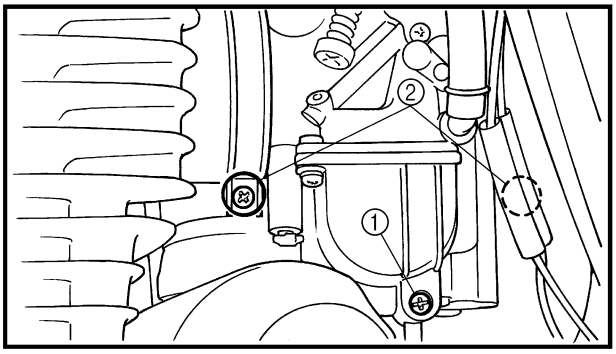
SPECIFICATIONS	
ID MARK	5GF1 00
MAIN JET (M.J.)	#137
PILOT JET (P.J.)	#52
JET NEEDLE (J.N.)	#5C9C-3/5
NEEDLE JET (N.J.)	2.595 (V95)
PILOT SCREW (P.S.)	1-1/2 turns out
FLOAT HEIGHT (F.H.)	26.5 ~ 27.5 mm (1.04 ~ 1.08 in)
FUEL LEVEL [A] (F.L.)	7.5 ~ 9.5 mm (0.30 ~ 0.37 in) Below the float chamber mating surface
ENGINE IDLING SPEED	1,250 ~ 1,350 r/min



REMOVAL

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

Refer to "SEAT, FUEL TANK AND COVERS" in CHAPTER 3.

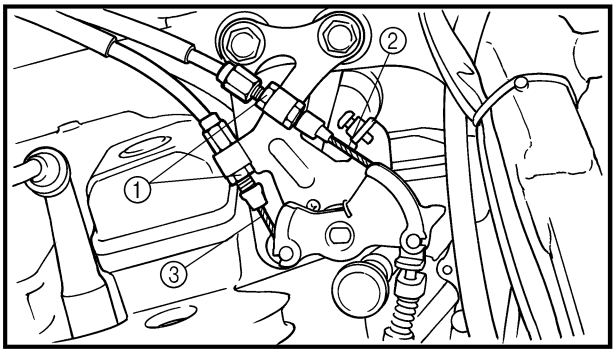


2.Drain:
- Fuel ① (float chamber)

Refer to "ENGINE REMOVAL" in CHAPTER 4.

3.Loosen:
- Clamps ② (carburetor joint)

4.Remove:
- Bolts (air filter case)



5.Loosen:
- Locknuts ①

6.Disconnect:
- Throttle cable 1 ②
- Throttle cable 2 ③

(from throttle lever and cable holder)
- Air vent hoses
- Fuel hose
- Over flow pipe

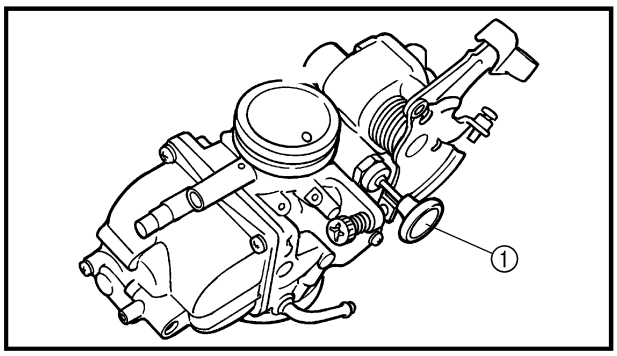
7.Remove:
- Carburetor

NOTE:

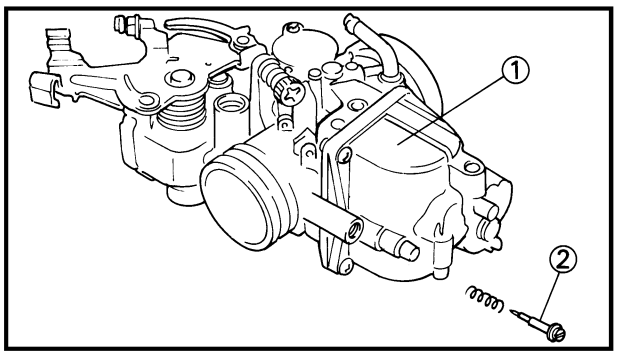
The air filter case must be pulled back so that the carburetor can be remored.

DISASSEMBLY

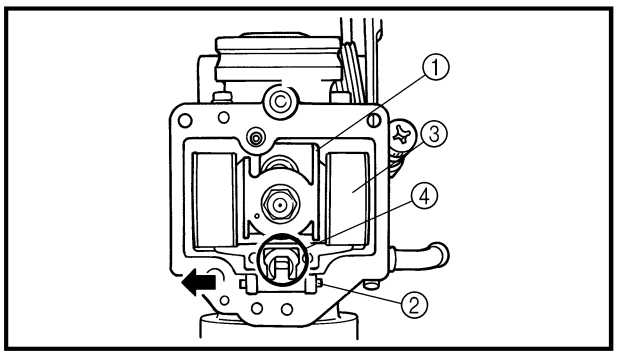
NOTE:
The following parts can be cleaned and inspected without disassembly.
- Starter plunger
- Throttle stop screw
- Pilot screw



1.Disconnect:
- Starter plunger assembly ①

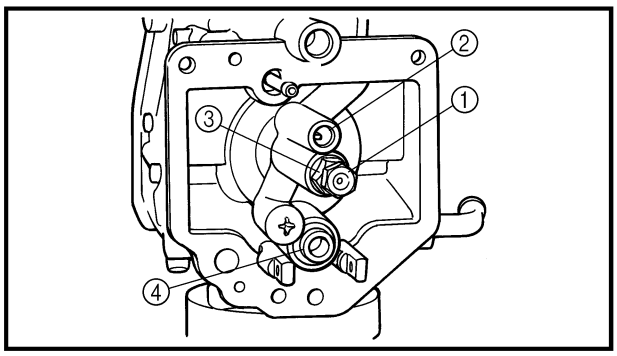


2.Remove:
- Float chamber ①
- Pilot screw ②

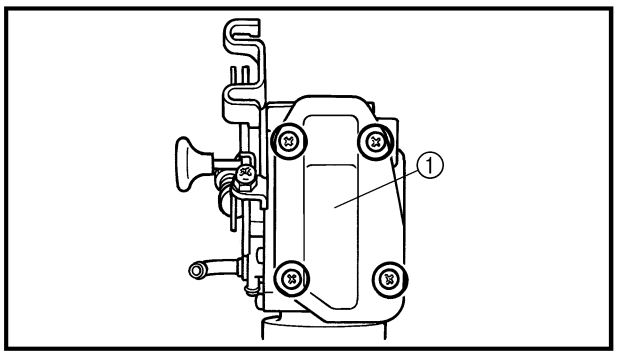


3.Remove:
- Baffle plate ①
- Float pin ②
- Float ③
- Needle valve assembly ④

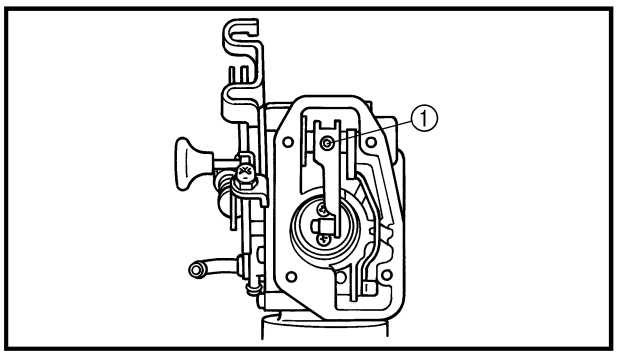
NOTE:
Remove the float pin in the arrow direction.



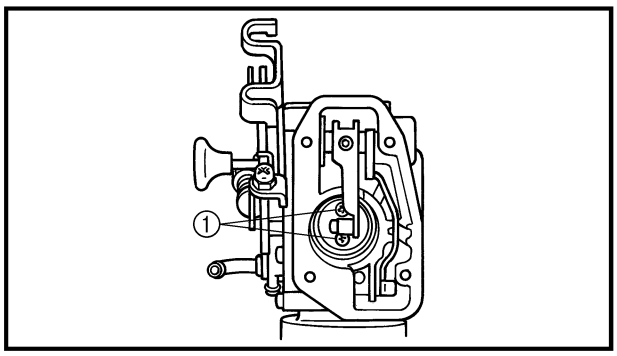
4.Remove:
- Main jet ①
- Pilot jet ②
- Main nozzle ③
- Valve seat ④



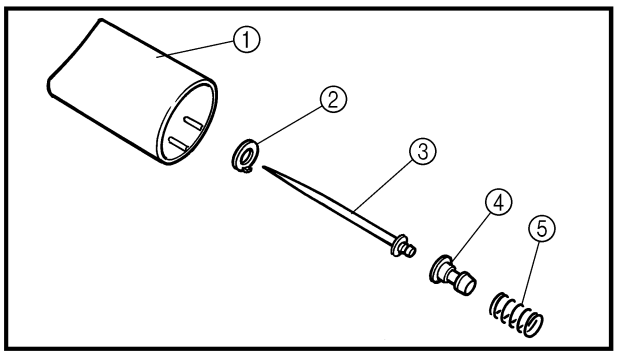
5.Remove:
- Cap (carburetor mixing chamber body) ①



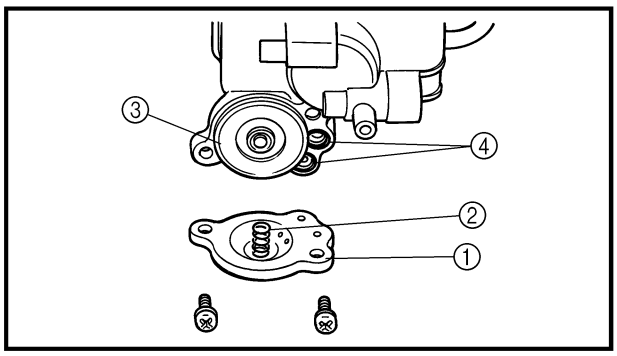
6.Remove:
- Screw (throttle arm) ①



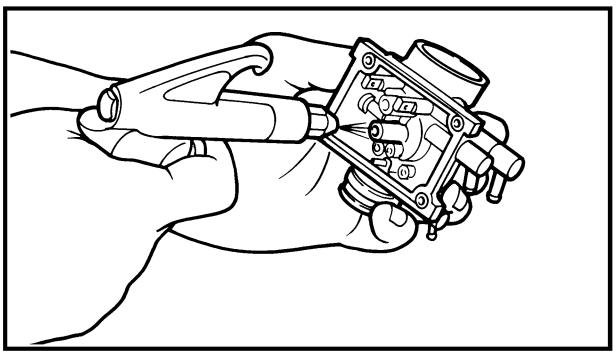
7.Remove:
- Screws (throttle valve) ①



8.Remove:
- Throttle valve ①
- Ring ②
- Jet needle ③
- Needle holder ④
- Spring ⑤



9.Remove:
- Cover assembly ①
- Spring ②
- Diaphragm ③
- O-ring ④

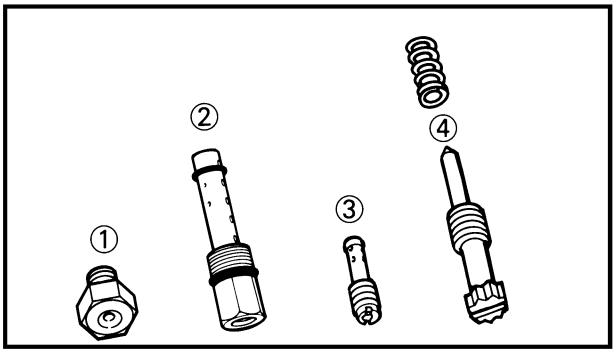


INSPECTION

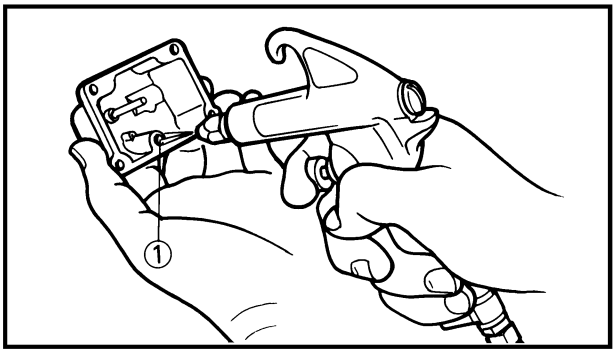
1.Inspect:
- Carburetor mixing chamber body
- Carburetor float chamber body
  Contamination → Blow out passages with compressed air.

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.**

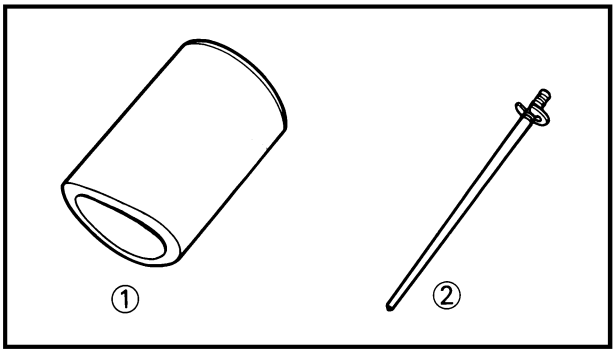


2.Inspect:
- Main jet ①
- Main nozzle ②
- Pilot jet ③
- Pilot screw ④
  Wear/damage → Replace.
  Clogs → Blow out the jets with compressed air.

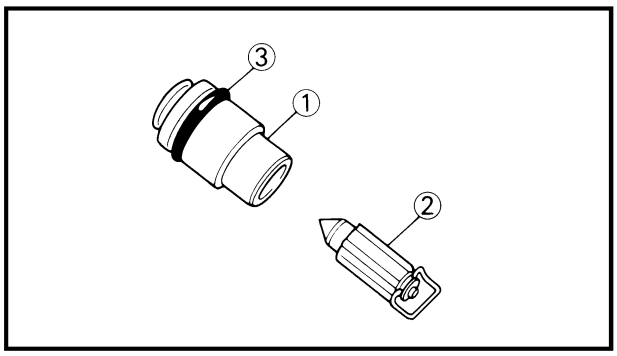


3.Inspect:
- Starter jet ①
  Contamination → Clean.

NOTE:
The starter jet is of a fixed type.

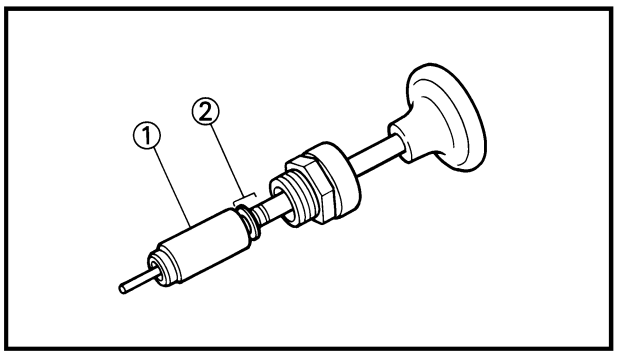


4.Inspect:
- Throttle valve ①
  Scratches/wear/damage → Replace diaphragm assembly.
- Jet needle ②
  Wear/bend/damage → Replace.

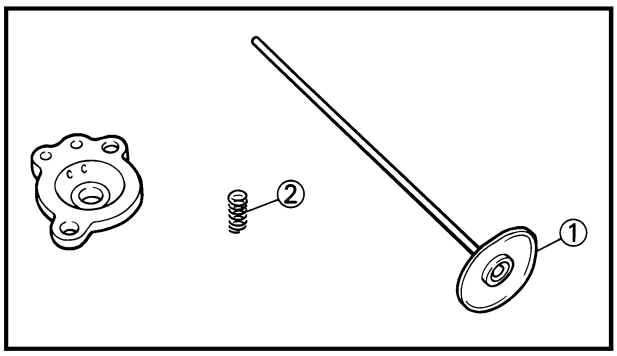


5.Inspect:
- Valve seat ①
- Needle valve ②
- O-ring ③
  Damage/wear → Replace as a set.

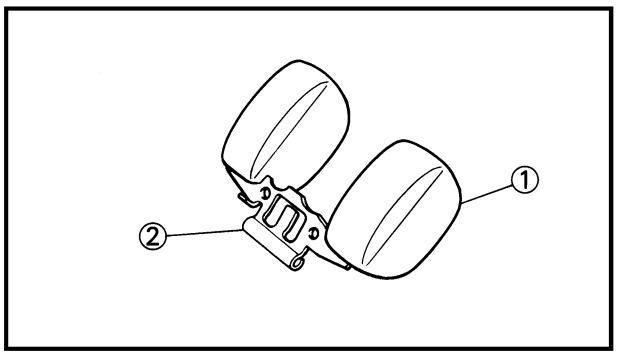
NOTE:
Always replace the needle valve and valve seat as a set.



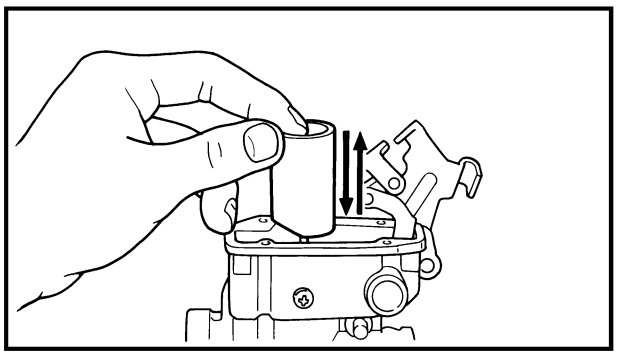
6.Inspect:
- Starter plunger ①
  Bends/wear/damage → Replace.
- Spring ②
  Damage → Replace.



7.Inspect:
- Diaphragm ①
  Tears/damage → Replace diaphragm assembly.
- Spring ②
  Damage → Replace.



8.Inspect:
- Float ①
- Float arm ②
  Damage → Replace.



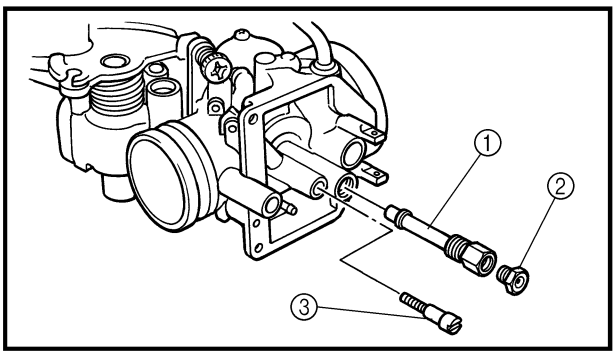
9.Check:
- Free movement
  Stick → Replace.
  Insert the throttle valve into the carburetor body, and check for free movement.

ASSEMBLY

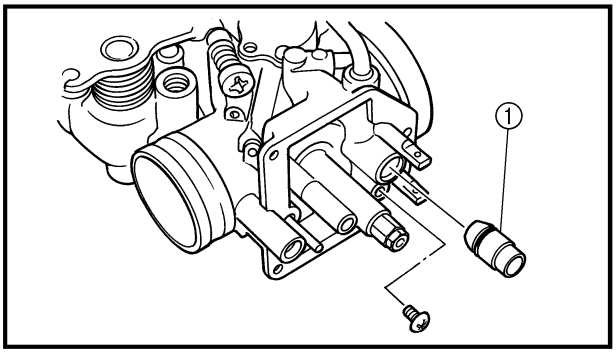
Reverse the "DISASSEMBLY" procedures. Note the following points.

CAUTION:

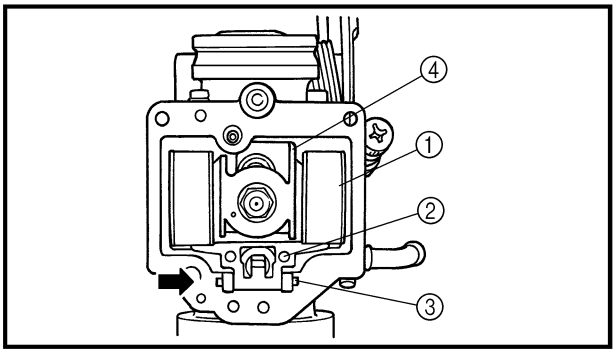
Before reassembling, wash all the parts in clean petroleum based solvent.
Always use a new gasket.



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

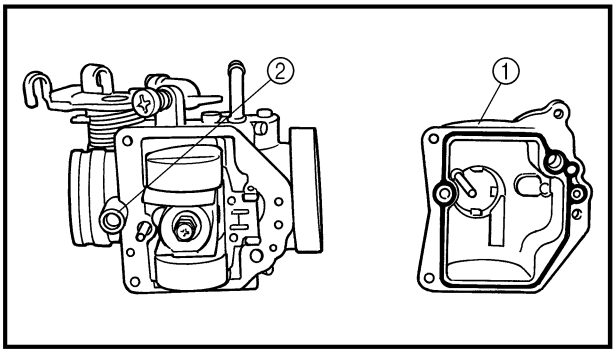


2.Install:
- Valve seat ①

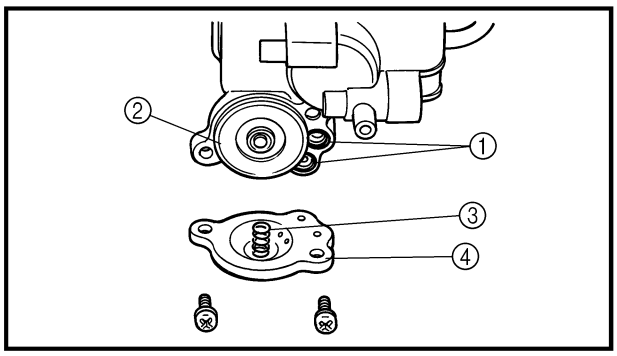


3.Install:
- Float ①
- Needle valve assembly ②
- Float pin ③
- Baffle plate ④

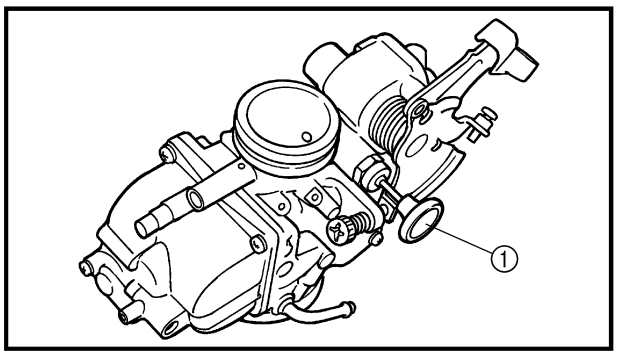
NOTE:
Install the float pin in the arrow direction.



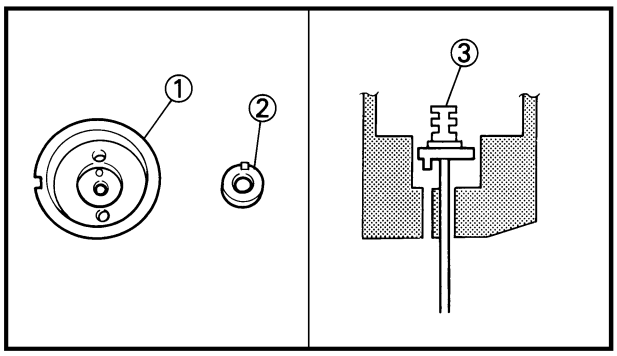
4.Install:
- Float chamber ①
- Pilot screw ②



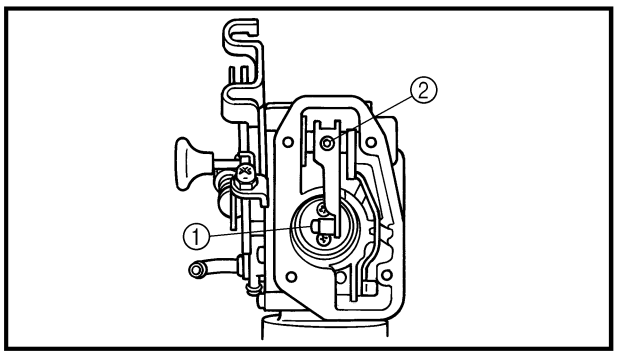
5.Install:
- O-ring ①
- Diaphragm ②
- Spring ③
- Cover assembly ④



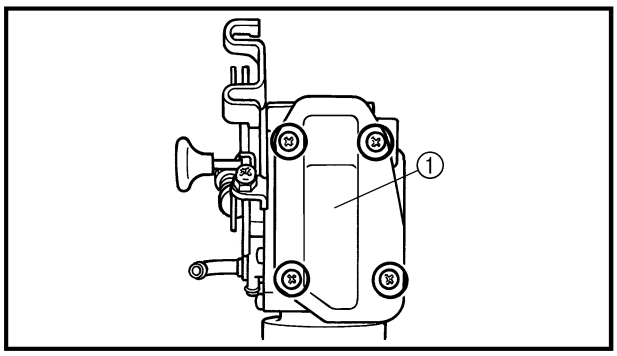
6.Install:
- Starter plunger assembly ①



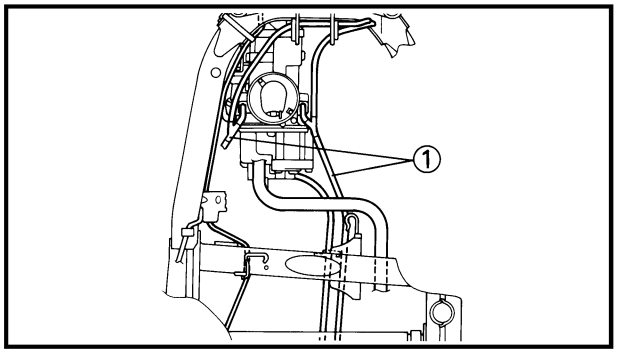
7.Install:
- Throttle valve ①
- Ring ②
- Jet needle ③



8.Install:
- Throttle valve ①
- Throttle arm ②



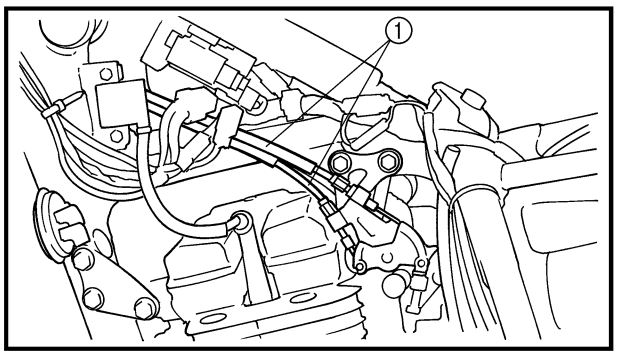
9.Install:
- Cap (mixing chamber assembly) ①



10.Install:
- Air vent hose ①
- Fuel hose
- Air vent hose

INSTALLATION

1.Install:
- Carburetor assembly
  Refer to "ENGINE REMOVAL" in CHAPTER 4.



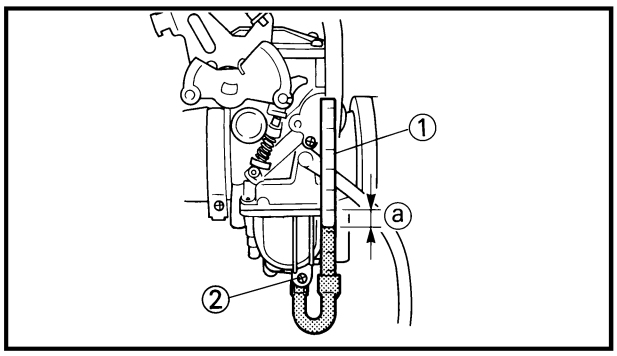
2.Install:
- Throttle cables ①
  Refer to "CABLE ROUTING" in CHAPTER 2.

3.Adjust:
- Throttle cable free play
  Refer to "THROTTLE CABLE FREE PLAY ADJUSTMENT" in CHAPTER 3.

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

4.Adjust:
- Idle speed
  Refer to "IDLING SPEED ADJUSTMENT" in CHAPTER 3.

Engine idle speed:
1,250 ~ 1,350 r/min



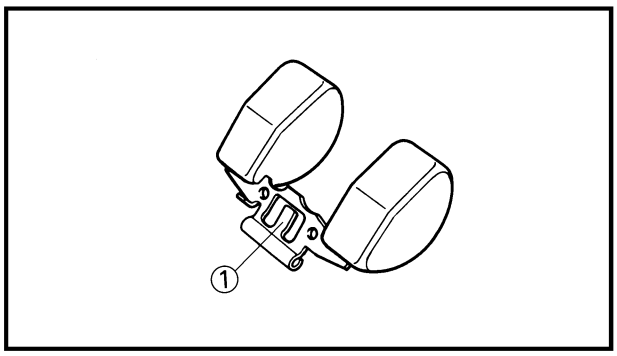
FUEL LEVEL ADJUSTMENT

1.Place the motorcycle on a level place.
2.Use a 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

4.Turn the fuel cock to "ON" or "RES".
5.Loosen the drain screw ②.
6.Hold the gauge vertically next to the float chamber mating surface (front).
7.Measure:
• Fuel level ⓐ
Out of specification → Adjust.

Fuel level:
7.5 ~ 9.5 mm (0.30 ~ 0.37 in)
Below the float chamber mating surface (front)



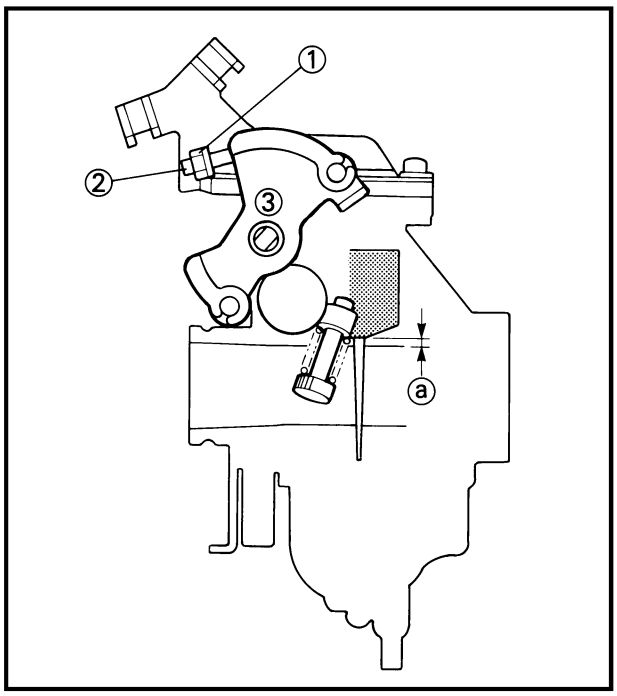
8.Adjust:
• Fuel level

****

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.

****



THROTTLE VALVE POSITION

1.Adjust:

- Throttle valve position

****

Adjustment steps:

- Loosen the locknut ①.
- Turn the throttle grip to the full-throttle position ③.
- Turn the adjuster ② in or out so that throttle valve bottom is positioned within the limits as specified.

Throttle valve position ⓐ:
0 ~ 1 mm (0 ~ 0.04 in)

- Tighten the locknut.

****

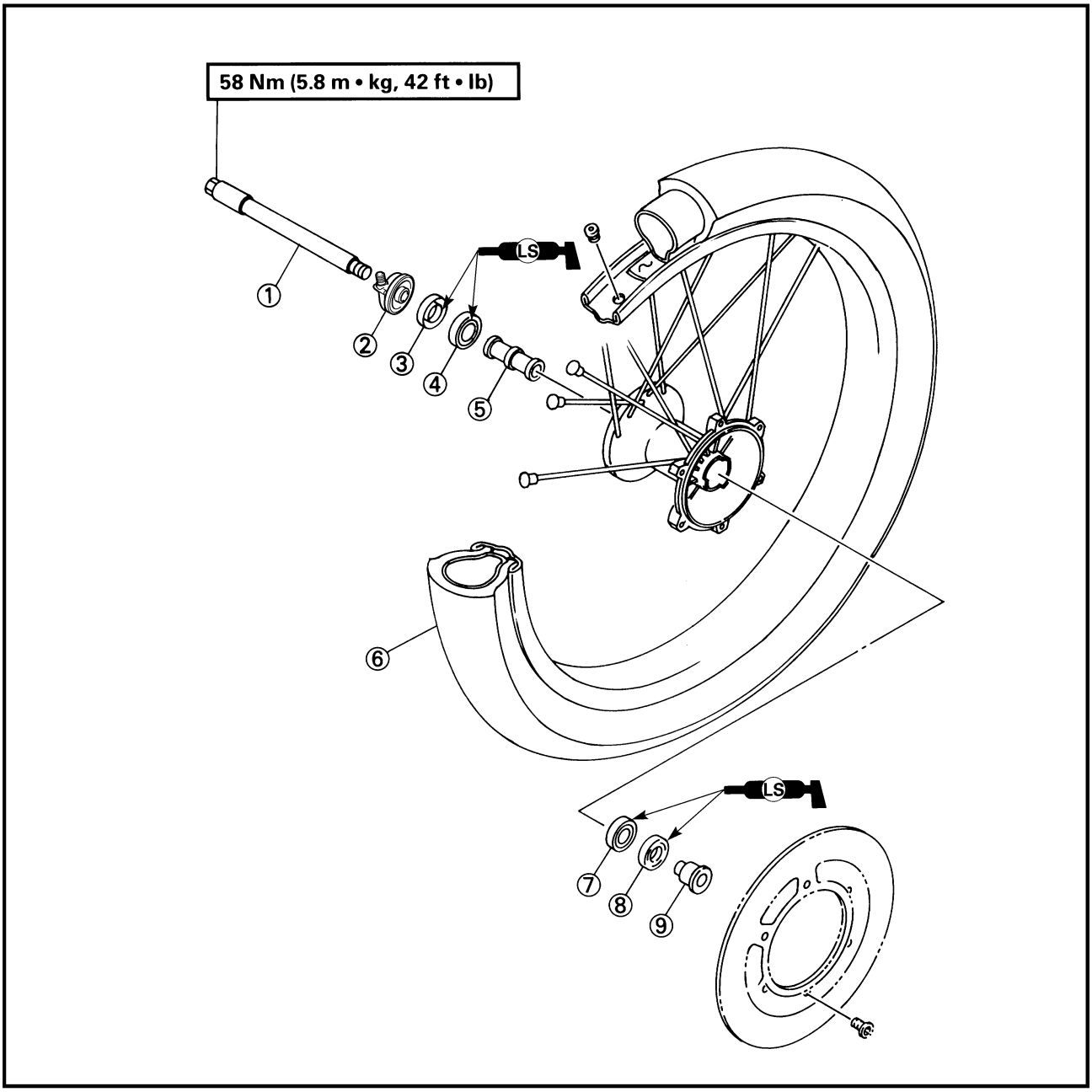
CHASSIS

FRONT WHEEL

① Wheel axle
② Speedometer gear unit
③ Oil seal
④ Bearing
⑤ Spacer
⑥ Front wheel
⑦ Bearing
⑧ Oil seal
⑨ Collar

TIRE AIR PRESSURE (COLD):		
Maximum load-except motorcycle*	90 kg (198 lb)	
Cold tire pressure	Front	Rear
Off-road riding*	100 kPa (1 kg/cm², 14.5 psi)	100 kPa (1 kg/cm², 14.5 psi)

* Load is the total weight of rider and accessories.

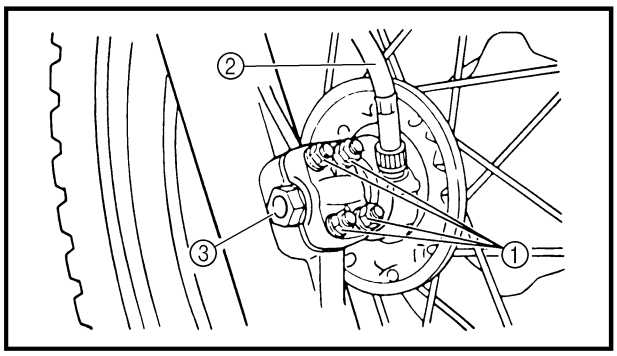


REMOVAL

⚠ 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.

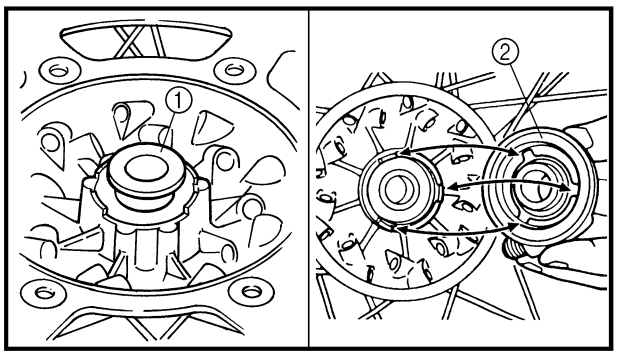


3.Loosen:
- Nuts (axle holder) ①

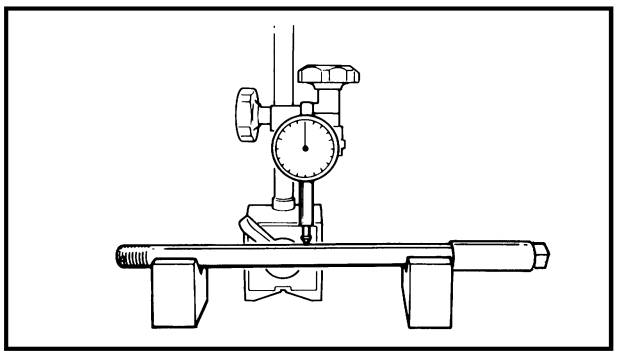
4.Remove:
- Speedometer cable ②
- Wheel axle ③
- Front wheel

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 (left) ①
- Speedometer gear unit ②



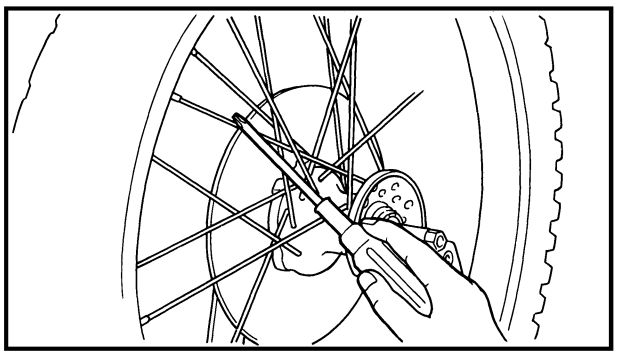
INSPECTION

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 "TIRE INSPECTION" in CHAPTER 3.
- Wheel
  Bends/damage → Replace.
  Refer to "WHEEL INSPECTION" in CHAPTER 3.



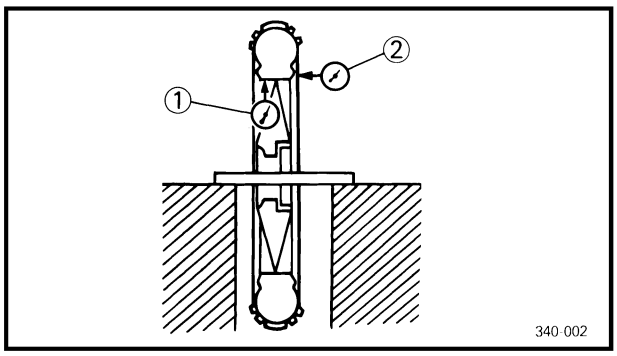
4.Check:
- Spoke(s)
  Bend/damage → Replace.
  Loose spoke(s) → Retighten.
  Turn the wheel and tap the spokes with a screwdriver.

NOTE:
A tight spoke will emit a clear, ringing tone; a loose spoke will sound flat.

5.Tighten:
- Loose spokes

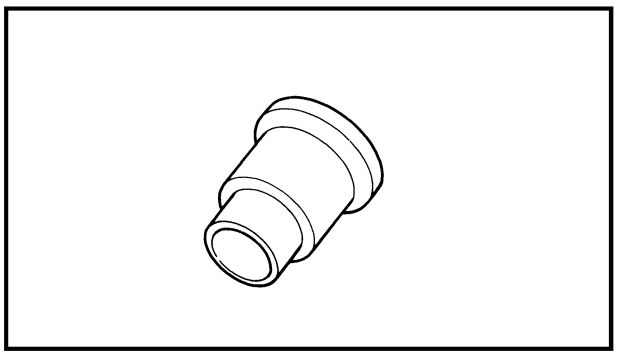
Nipple:
2 Nm (0.2 m • kg, 1.4 ft • lb)

NOTE:
Check the wheel runout after tightening the spokes.



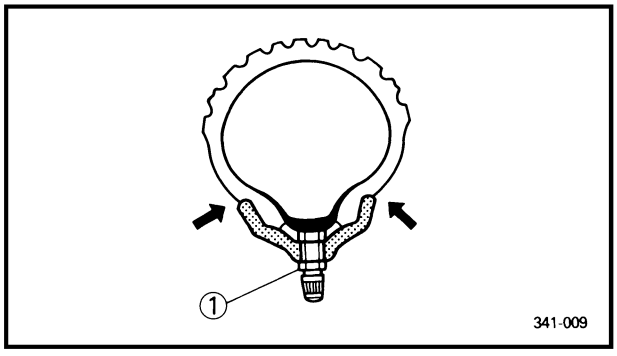
6.Measure:
- Wheel runout
  Out of specification → Check the wheel and bearing play.

Rim runout limits:
Vertical ①: 2.0 mm (0.08 in)
Lateral ②: 2.0 mm (0.08 in)

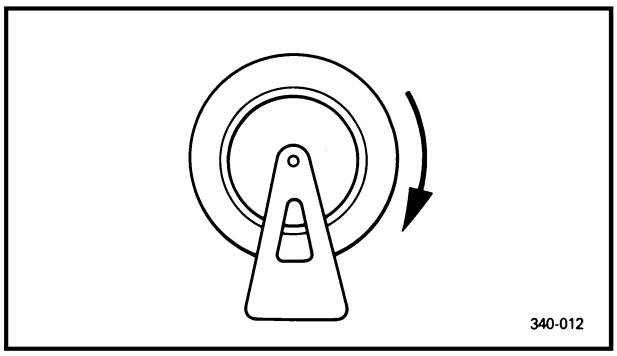


7.Inspect:
- Collar
  Wear/damage → Replace.

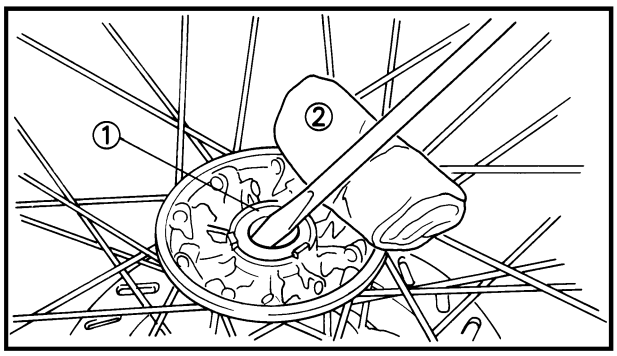
⚠ WARNING
- **After mounting a tire, ride conservatively to allow proper tire to rim seating. Failure to do so may cause an accident resulting in motorcycle damage and possible operator injury.**
- **After a tire repair or replacement, be sure to torque tighten the valve stem locknut ① to specification.**

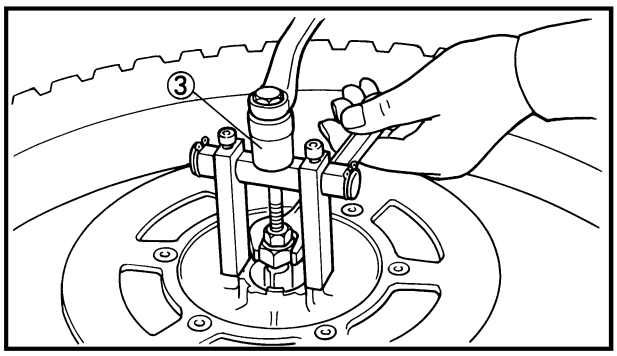


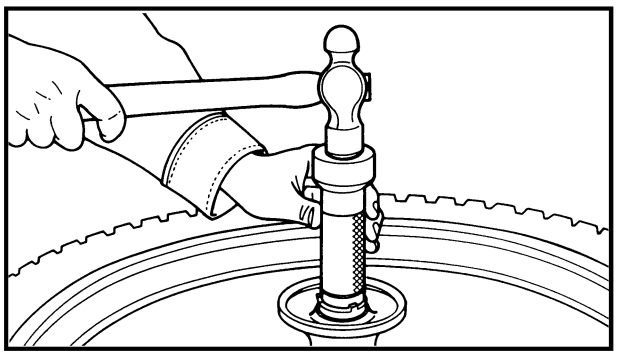
Valve stem locknut:
1.5 Nm (0.15 m • kg, 1.1 ft • lb)



8.Check:
- Wheel bearings
  Abnormal noise/turn roughly/free play → Replace.
- Oil seals
  Wear/damage → Replace.







****

Oil seal and wheel bearing replacement steps:

- Clean the outside of the wheel hub.
- Remove the oil seal ① using a flat-head screwdriver.

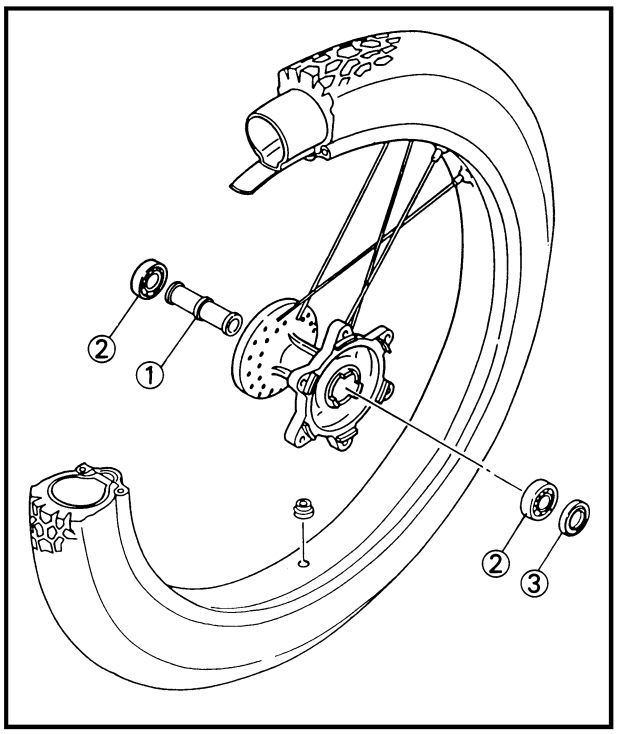
NOTE:
Place a rag ② on the outer edge to prevent damage.

- 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 that matches the outside diameter of the race of the bearing and oil seal.

CAUTION:
Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.

****



INSTALLATION

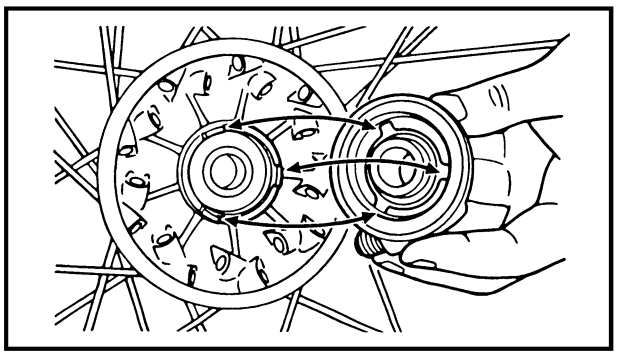
Reverse the "Removal" procedure.
Note the following points.

1.Lubricate:
- Wheel axle
- Spacer ①
- Bearings ②
- Oil seal (lips) ③

	Lithium soap base grease

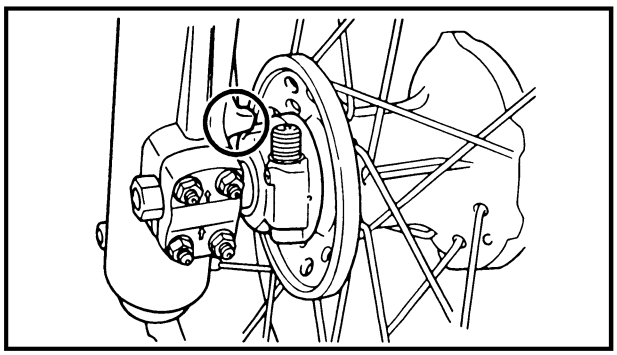
2.Install:
- Collar

NOTE:
Install the oil seal taking care not to damage or reverse the lips.



3.Install:
- Speedometer gear unit

NOTE:
Make sure that the wheel hub and the speedometer gear unit are installed with the projections meshed into the slots.

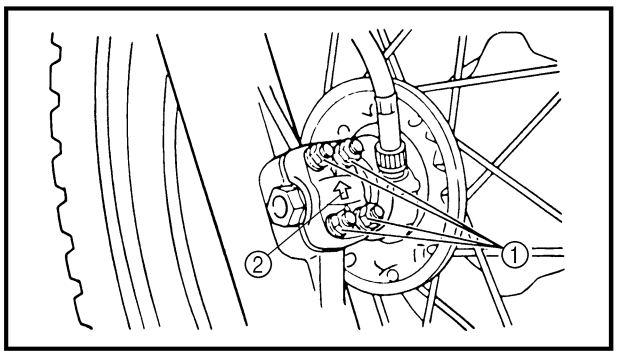


4.Install:
- Front wheel assembly

NOTE:
Make sure that the slot in the speedometer gear unit fits over the stopper on the front fork outer tube.

5.Tighten:
- Wheel axle

	Wheel axle: **58 Nm (5.8 m • kg, 42 ft • lb)**



6.Tighten:
- Nuts (axle holder) ①

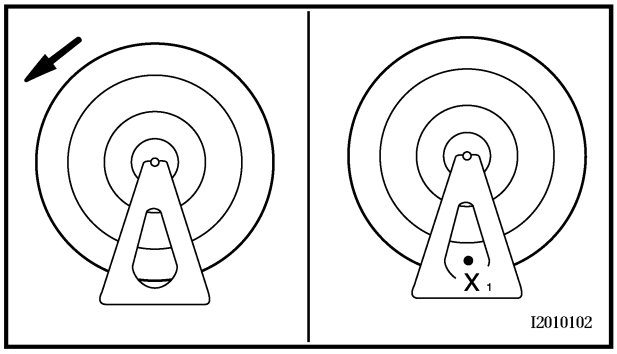
Nuts ①:
10 Nm (1.0 m • kg, 7.2 ft • lb)

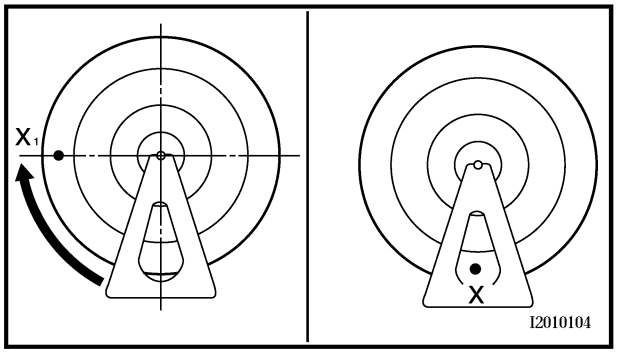
CAUTION:
The axle holder should be installed with the arrow mark ② facing upward.

WHEEL STATIC BALANCE ADJUSTMENT

NOTE:
- After replacing the tire and/or rim, the wheel static balance should be adjusted.
- Adjust the wheel static balance with the brake disc installed.

1.Remove:
- Balancing weight



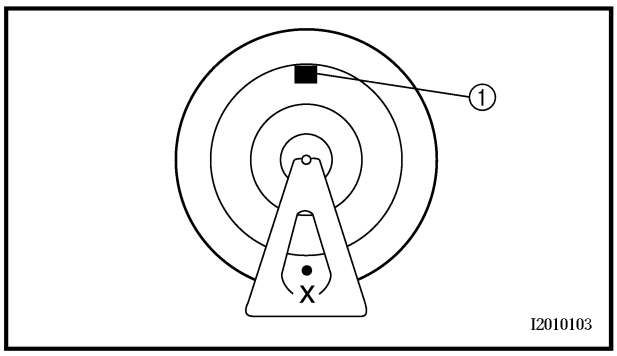


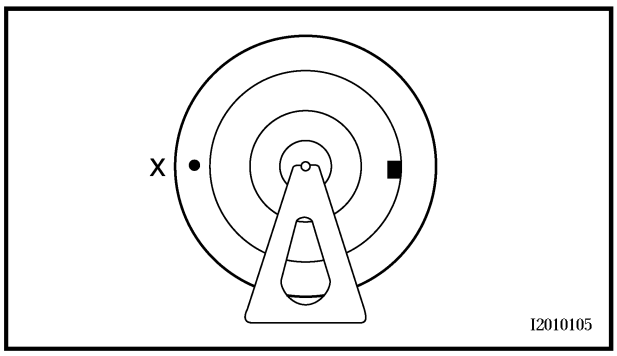
2.Set the wheel on a suitable stand.
3.Find:
- Heavy spot

****

Procedure:
a.Spin the wheel and wait for it to rest.
b.Put an "X_1" mark on the wheel bottom spot.
c.Turn the wheel so that the "X_1" mark is 90° up.
d.Left the wheel fall and wait for it to rest. Put an "X_2" mark on the wheel bottom spot.
e.Repeat the above, b., c., and d. several times until these marks come to the same spot.
f. This spot is the heavy spot "X".

****





4.Adjust:
- Wheel static balance

****

Adjusting steps:
- Install a balancing weight ① on the rim exactly opposite to the heavy spot "X".

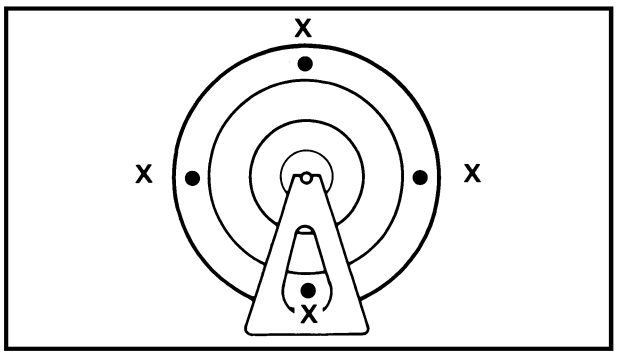
NOTE:
Start with the smallest weight.

- Turn the wheel so that the heavy spot is 90° up.
- Check that the heavy spot is at rest there. If not, try another weight until the wheel is balanced.

NOTE:
For the first and second measurements, mount a balancing weight or weights on the opposite side of the brake disc. For the third measurement and the following, mount them on the brake disc side.

CAUTION:
Do not install more than 4 pieces of balancing weight.

****



5.Check:
- Wheel static balance

****

Checking steps:
- Turn the wheel so that it comes to each point as shown.
- Check that the wheel is at rest at each point. If not, readjust the wheel static balance.

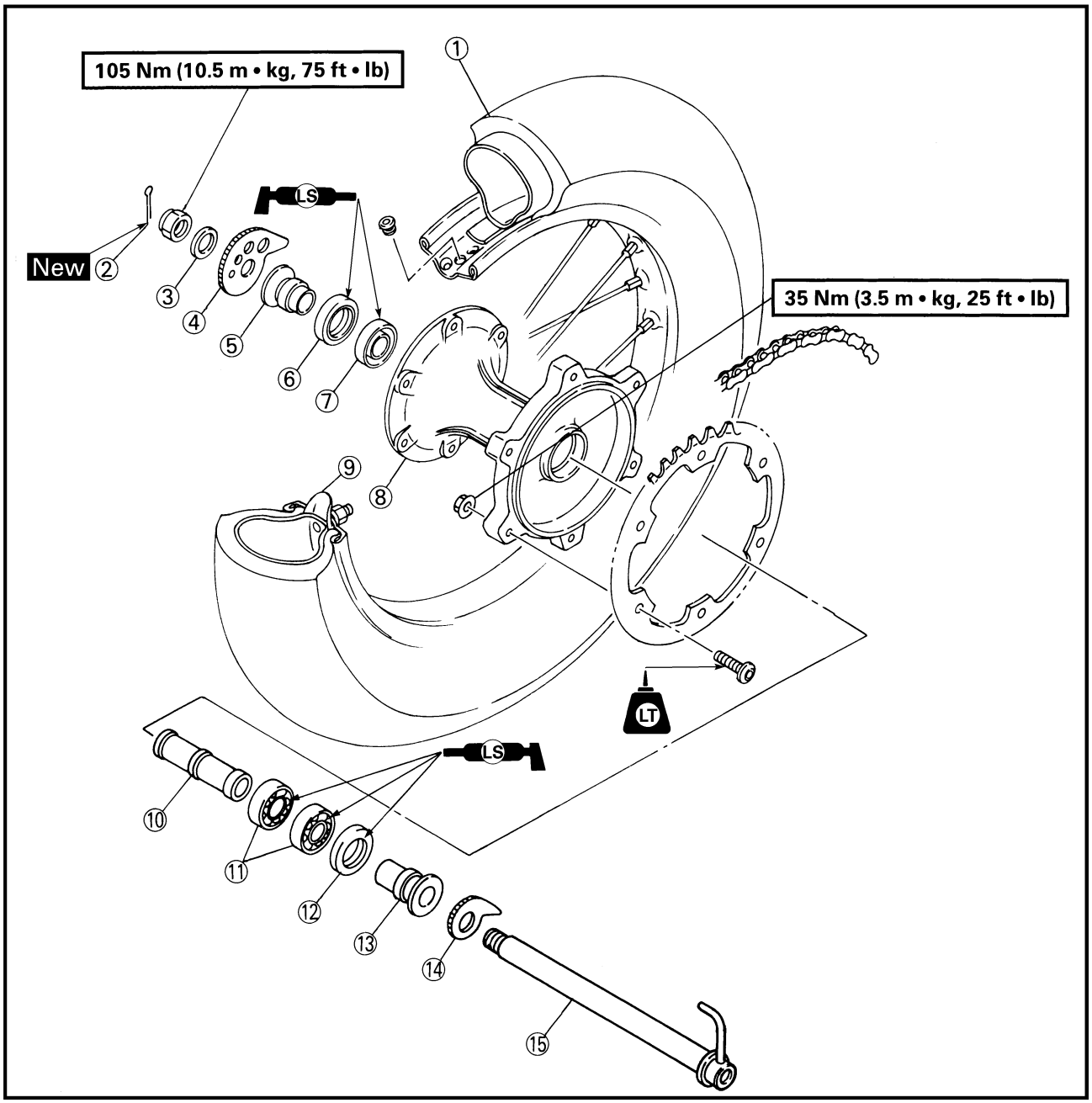
****

REAR WHEEL

① Rear wheel
② Cotter pin
③ Washer
④ Chain puller 2
⑤ Collar
⑥ Oil seal
⑦ Bearing
⑧ Rear hub
⑨ Bead stopper
⑩ Spacer
⑪ Bearing
⑫ Oil seal
⑬ Collar
⑭ Chain puller 1
⑮ Wheel axle

TIRE AIR PRESSURE (COLD):		
Maximum load-except motorcycle*	90 kg (198 lb)	
Cold tire pressure	Front	Rear
Off-road riding*	100 kPa (1 kg/cm², 14.5 psi)	100 kPa (1 kg/cm², 14.5 psi)

* Load is the total weight of rider and accessories.



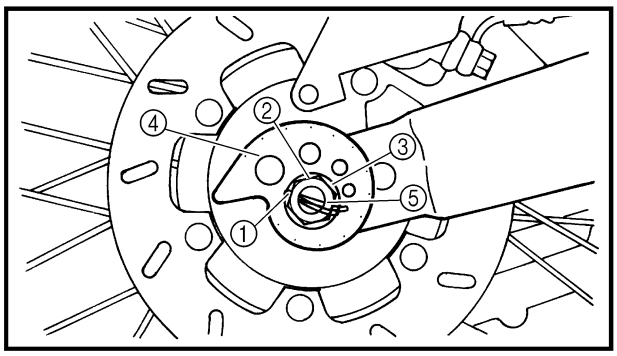
REMOVAL

1.Place the motorcycle on a level place.

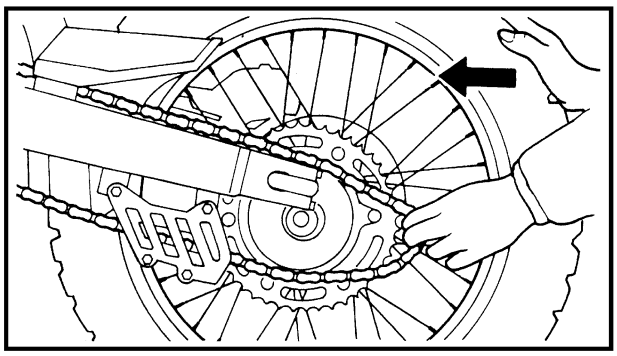
⚠ WARNING

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

2.Elevate the rear wheel by placing a suitable stand under the swingarm.



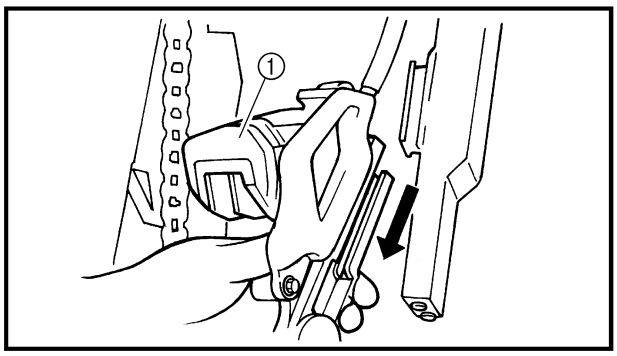
3.Remove:
- Cotter pin ①
- Axle nut ②
- Washer ③
- Chain puller 1 ④
- Wheel axle ⑤



4.Remove:
- Rear wheel

NOTE:

Before removing the rear wheel, push the wheel forward and remove the drive chain.



5.Remove:
- Rear brake caliper assembly ①

INSPECTION

1.Inspect:
- Tire
- Rear wheel axle
- Wheel

  Refer to "FRONT WHEEL".

2.Measure:
- Wheel runout
  Refer to "FRONT WHEEL".

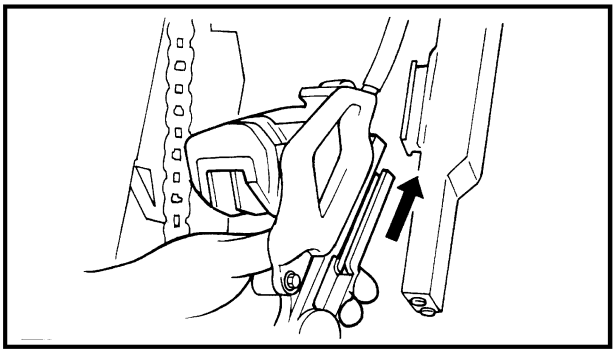
3.Check:
- Spoke(s)
- Wheel bearings
- Oil seals
  Refer to "FRONT WHEEL".

INSTALLATION

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

1.Lubricate:
- Rear wheel axle
- Bearings
- Oil seals

	Recommended lubricant: **Lithium soap base grease**



2.Install:
- Rear brake caliper assembly

3.Install:
- Rear wheel

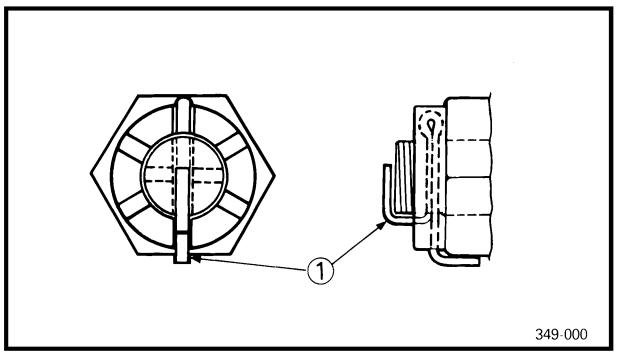
4.Adjust:
- Drive chain slack

	Drive chain slack: **35 ~ 50 mm (1.38 ~ 1.97 in)**

Refer to "DRIVE CHAIN SLACK ADJUSTMENT" in CHAPTER 3.

5.Tighten:
- Nut (rear wheel axle)

	Nut (rear wheel axle): **105 Nm (10.5 m • kg, 75 ft • lb)**



6.Install:
- Cotter pin ①

NOTE:
Bend the ends of the cotter pin.

⚠ WARNING
Always use a new cotter pin.

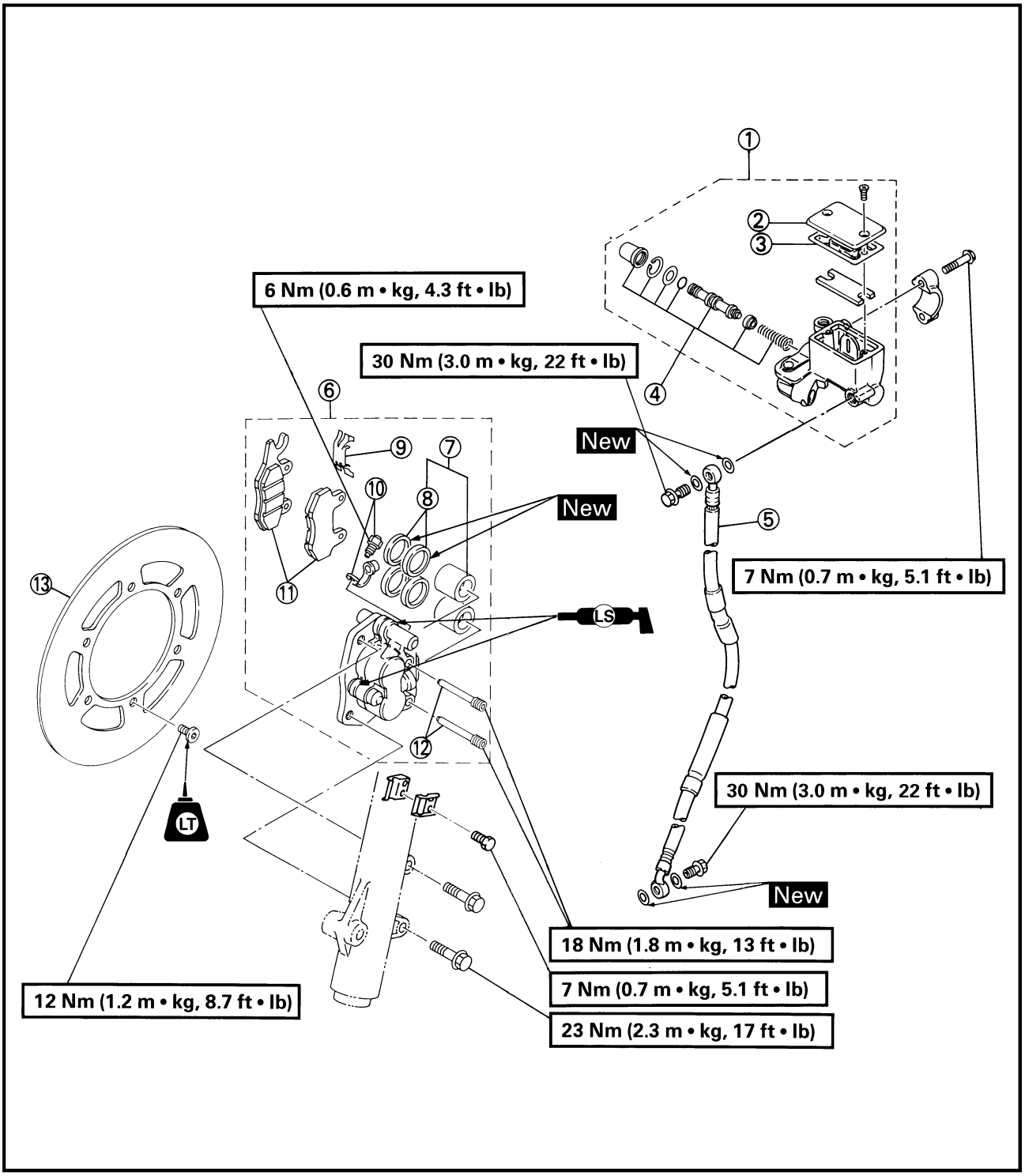
NB272004
WHEEL STATIC BALANCE ADJUSTMENT

NOTE:
- After replacing the tire and/or rim, the wheel static balance should be adjusted.
- Adjust the wheel static balance with the brake disc and the wheel hub installed.

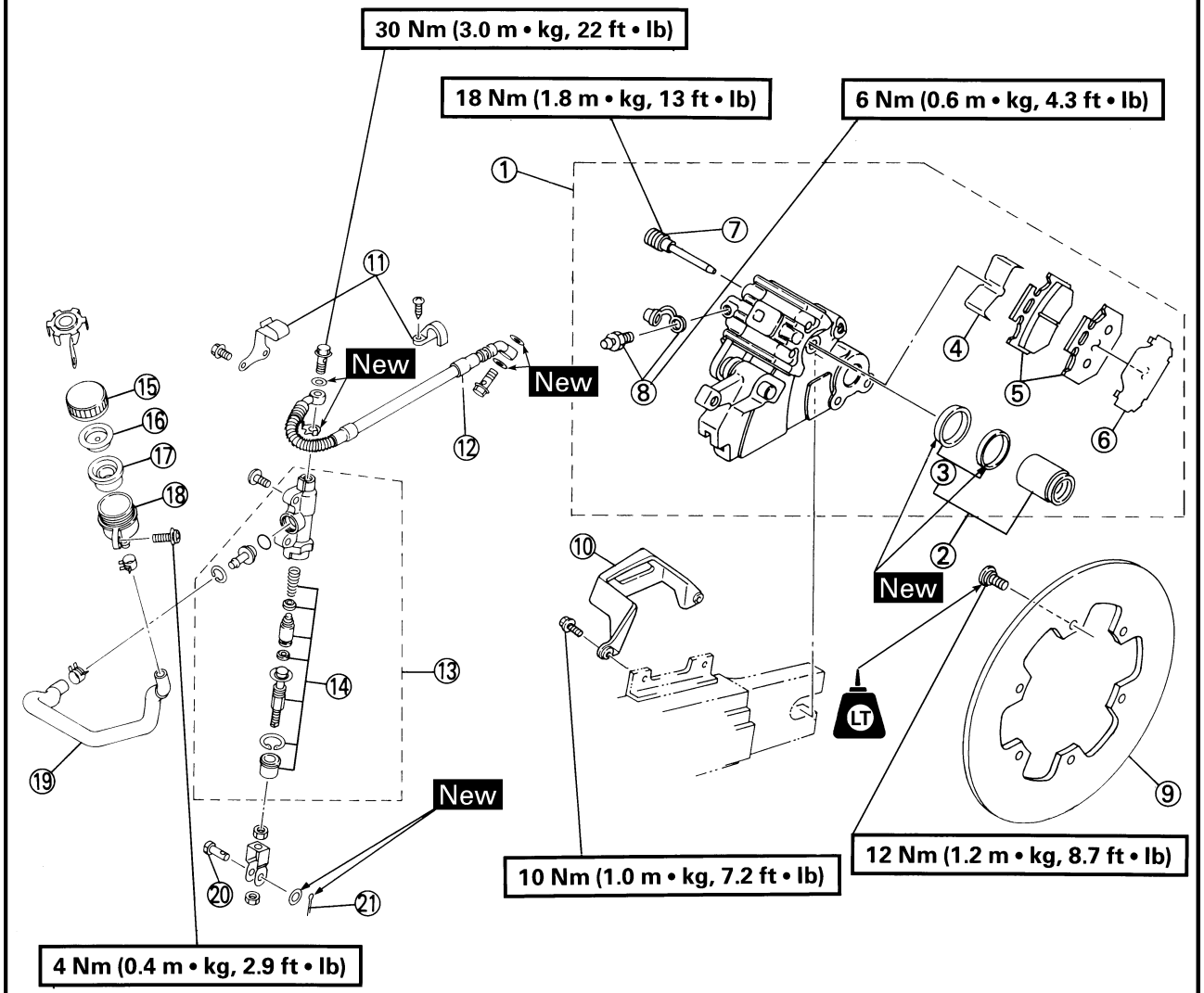
1.Adjust:
- Wheel static balance
  Refer to "FRONT WHEEL – WHEEL STATIC BALANCE ADJUSTMENT".

FRONT AND REAR BRAKE

① Master cylinder assembly
② Master cylinder cap
③ Diaphragm
④ Master cylinder kit
⑤ Brake hose
⑥ Brake caliper assembly
⑦ Caliper piston assembly
⑧ Caliper seal kit
⑨ Pad spring
⑩ Bleed screw
⑪ Brake pads
⑫ Pad pin
⑬ Brake disc



① Brake caliper assembly
② Caliper piston assembly
③ Caliper seal kit
④ Pad spring
⑤ Brake pads
⑥ Shim
⑦ Pad pin
⑧ Bleed screw
⑨ Brake disc
⑩ Protector
⑪ Brake hose holder
⑫ Brake hose
⑬ Master cylinder assembly
⑭ Master cylinder kit
⑮ Reservoir tank cap
⑯ Diaphragm bush
⑰ Diaphragm
⑱ Reservoir tank
⑲ Reservoir hose
⑳ Pin
㉑ Cotter pin



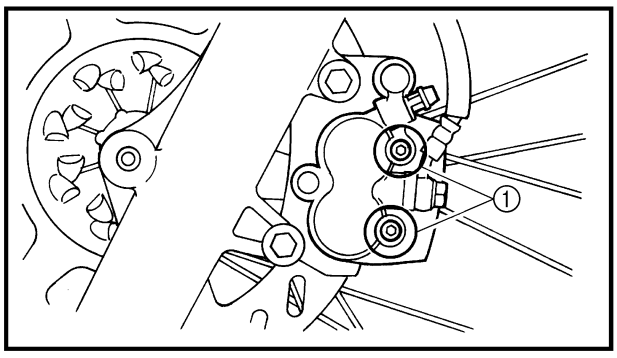
CAUTION:

Disc brake components rarely require disassembly. DO NOT:

- **Disassemble 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 disassembled, drained, cleaned, and then properly filled and bled after reassembly.**

⚠ WARNING

- **Use only designated quality brake fluid: Otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.**
- **Refill with the same type of brake fluid: mixing fluids may result in a harmful chemical reaction and lead to poor performance.**
- **Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.**



BRAKE PAD REPLACEMENT

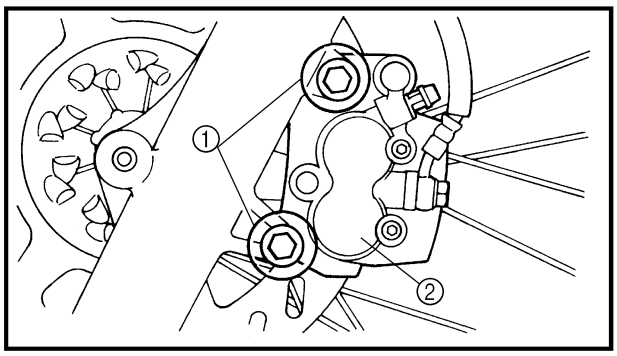
NOTE:

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

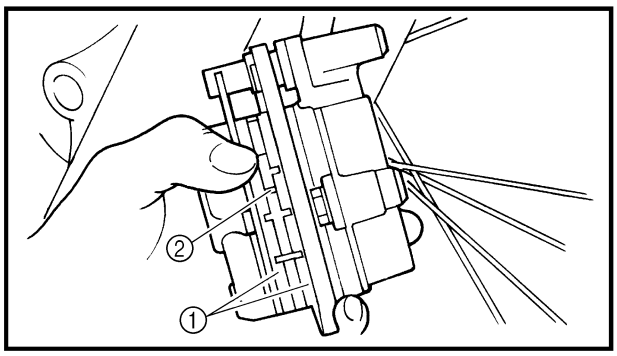
Front brake

1.Loosen:

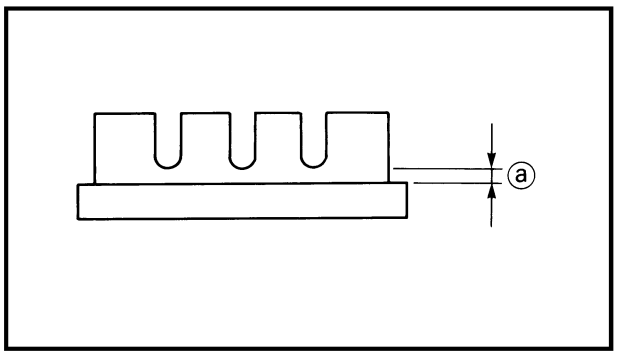
- Pad pins ①



2.Remove:
- Bolts ①
- Caliper body ②

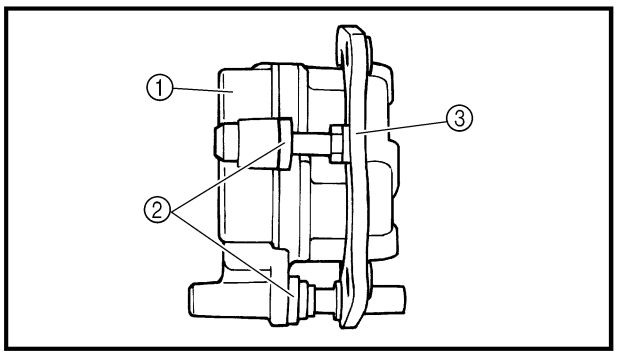


3.Remove:
- Pad pins
- Brake pads ①
- Pad spring ②



NOTE:
- Replace the pad spring if pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit.

Wear limit ⓐ:
1.0 mm (0.04 in)



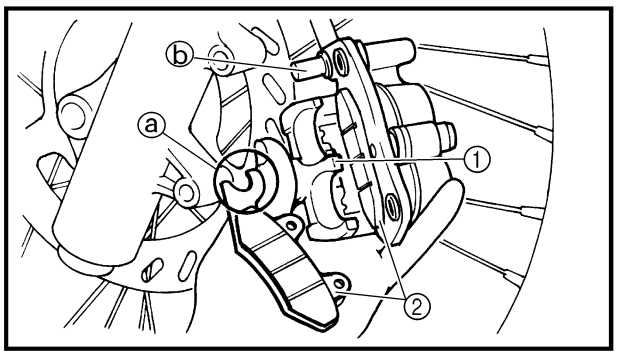
4.Inspect:
- Caliper body ①
  Cracks/damage → Replace caliper assembly.
- Rubber boot ②
  Wear/cracks/damage → Replace.
- Caliper bracket ③

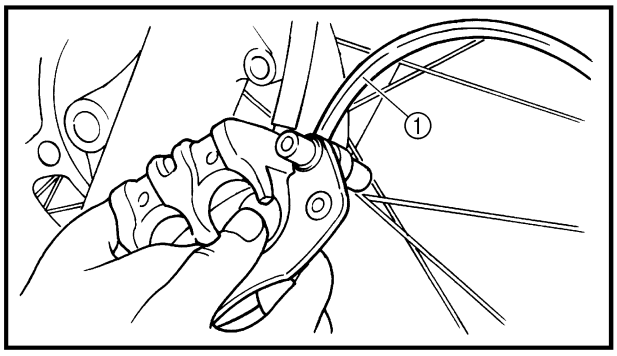
5.Lubricate:
- Guide pins

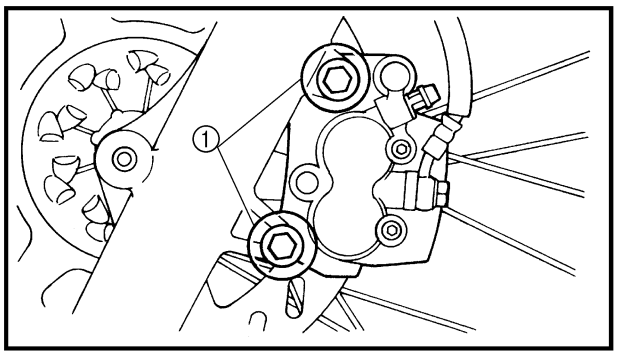
Recommended lubricant:
Lithium soap base grease

NOTE:
Place the rubber boot ② securely in the groove of the slide collar when installing the guide pin.

6.Install:
- Caliper bracket







7.Install:
- Pad spring ①
- Brake pads ②
- Pad pins

	Pad pins: **18 Nm (1.8 m • kg, 13 ft • lb)**

NOTE:
Install the brake pad (inner) with its ⓐ portion aligning with ⓑ of the caliper.

****

Installation steps:
- Connect a clear plastic tube ① tightly to the caliper bleed screw. Then, place the other end of this hose into an open container.
- Loosen the caliper bleed screw and push the piston into the caliper with your finger.
- Tighten the caliper bleed screw.

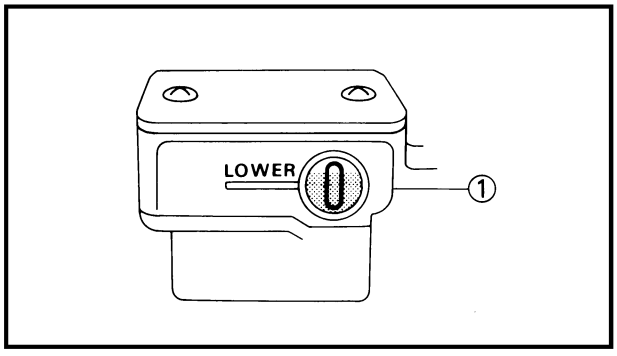
	Caliper bleed screw: **6 Nm (0.6 m • kg, 4.3 ft • lb)**

****

8.Install:
- Caliper body

	Bolts ① (caliper body): **23 Nm (2.3 m • kg, 17 ft • lb)**

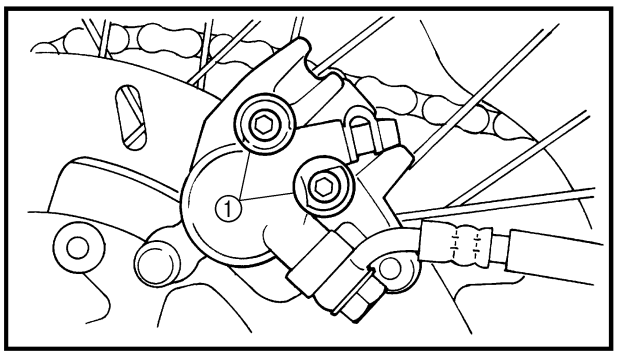
⚠ WARNING
Proper hose routing is essential to insure safe motorcycle operation.
Refer to "CABLE ROUTING" in CHAPTER 2.



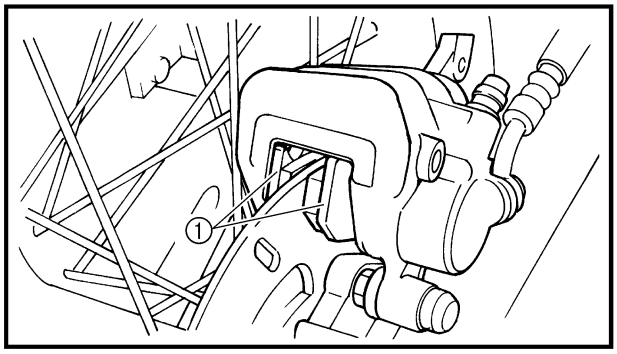
9.Inspect:
- Brake fluid level
  Refer to "BRAKE FLUID INSPECTION" in CHAPTER 3.

① "LOWER" level line

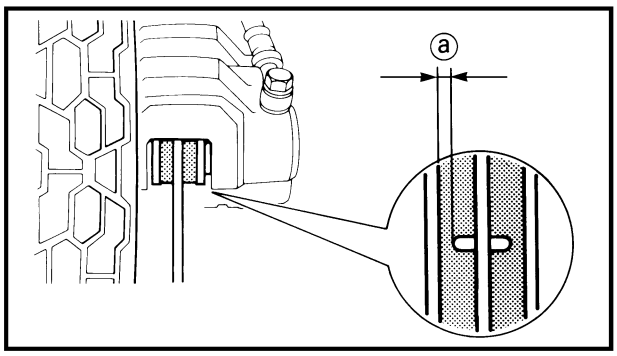
10.Check:
- Brake lever operation
  A soft or spongy feeling → Bleed the brake system.
  Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.



Rear brake
1.Remove:
- Caliper protector
- Pad pins ①



2.Remove:
- Brake pads ①
- Shim (piston side)

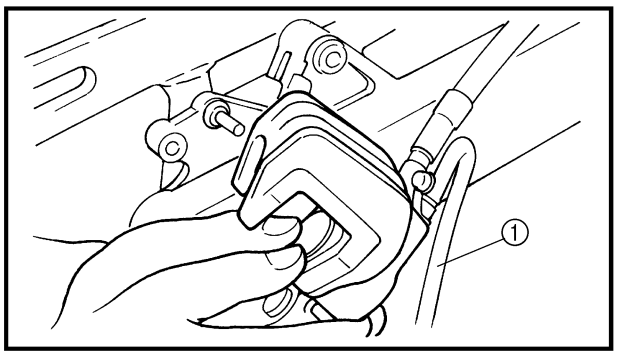


3.Measure:
- Pad thickness ⓐ
  Out of specification → Replace.

NOTE:
- Replace the pad spring if pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit.

Wear limit:
1.0 mm (0.04 in)

4.Install:
- Brake pads (with pad shim)
- Pad pins



****

Installation steps:

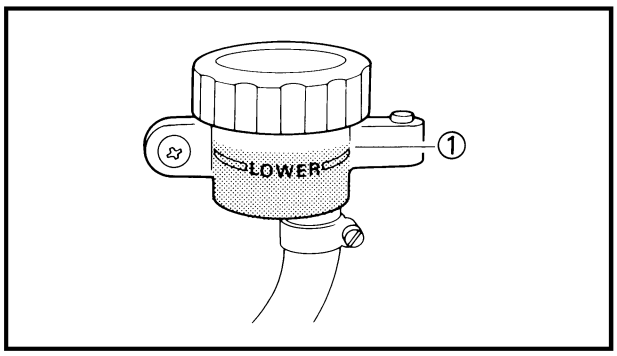
- Connect a suitable hose ① tightly to the caliper bleed screw. Then, place the other end of this hose into an open container.
- Loosen the caliper bleed screw and push the pistons into the caliper with your finger.
- Tighten the caliper bleed screw.

	Caliper bleed screw: **6 Nm (0.6 m • kg, 4.3 ft • lb)**

- Install the pad spring (new).
- Install the pad shims (new) to the brake pads (new).
- Install the brake pads and pad pins.
- Tighten the pad pins.

	Pad pins (brake pads): **18 Nm (1.8 m • kg, 13 ft • lb)**

****



5.Inspect:

- Brake fluid level
  Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.

① "LOWER" level line

6.Check:

- Brake pedal operation
  A soft or spongy feeling → Bleed the brake system.
  Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.

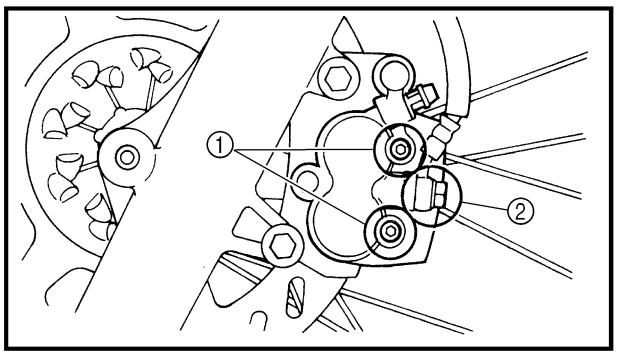
CALIPER DISASSEMBLY

NOTE:

Before disassembling the front brake caliper or rear brake caliper, drain the brake hoses, master cylinders, brake calipers and reservoir tanks of their brake fluid.

⚠ WARNING

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



Front brake

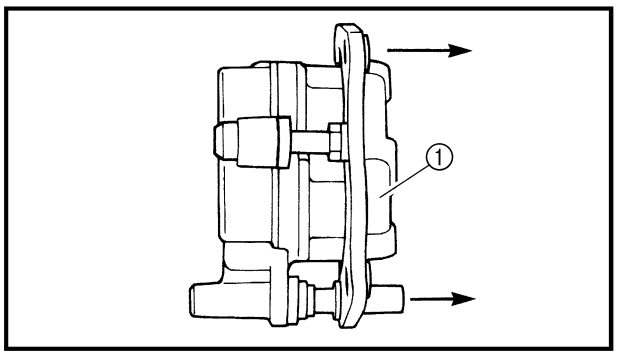
1.Loosen:
- Pad pins ①
- Union bolt ②

2.Remove:
- Caliper body
  Refer to "BRAKE PAD REPLACEMENT".

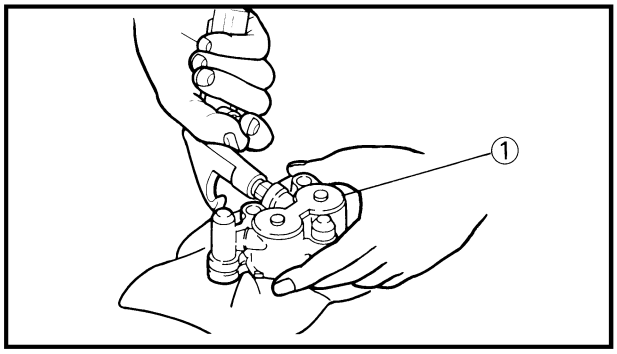
3.Remove:
- Pad pins
- Union bolt
- Copper washers

NOTE:
Place a container under the caliper to collect any remaining brake fluid.

4.Remove:
- Brake pads
- Pad spring



5.Remove:
- Support bracket ①



6.Remove:
- Piston ①

****

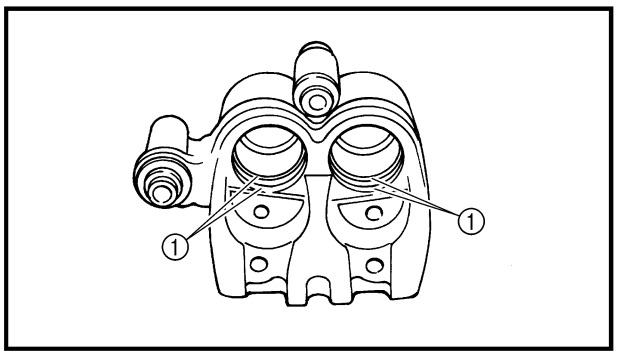
Removal steps:

- 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 the piston does not cause injury as it is expelled from the cylinder.**

****



7.Remove:
- Piston seals ①

CAUTION:

Remove the piston seal by pushing it in with a finger. Do not use a screwdriver.

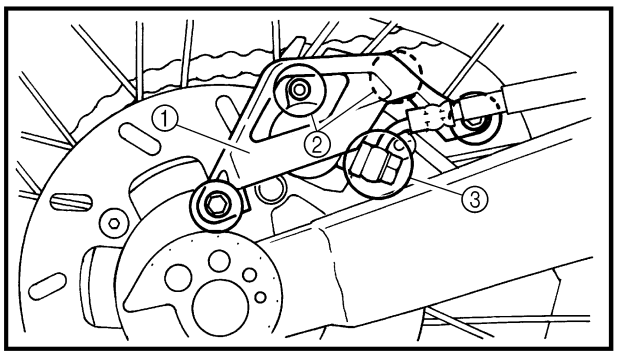
Rear brake

NOTE:

Before disassembling the rear brake caliper, drain the brake system of its brake fluid.

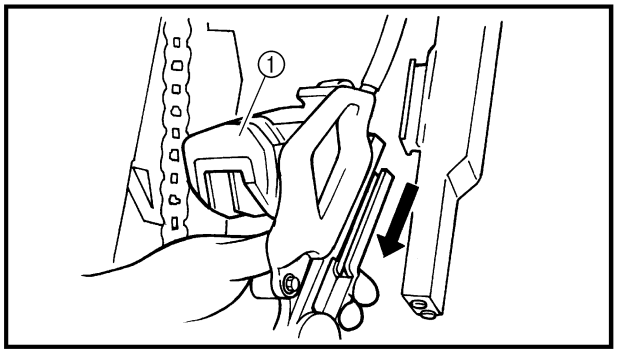
⚠ WARNING

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

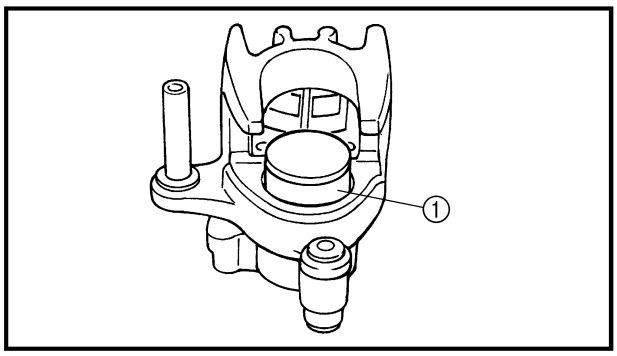


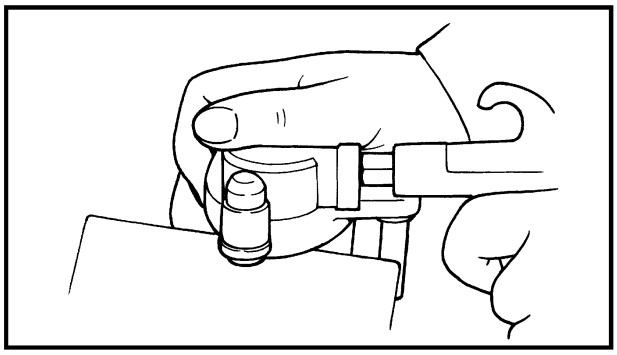
1.Remove:
- Cover ①

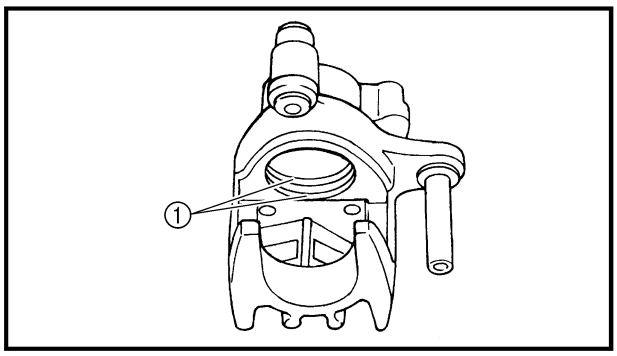
2.Loosen:
- Pad pins ②
- Union bolt ③



3.Remove:
- Rear wheel
- Caliper assembly ①
  Refer to “REAR WHEEL”.







4.Remove:
- Union bolt
- Pad pins
- Brake pads (with pad shim)
- Pad spring

Refer to "BRAKE PAD REPLACEMENT".

5.Remove:
- Piston ①

****

Removal steps:

- Blow compressed air into the hose joint opening to force out the caliper pistons from the caliper body.

⚠ WARNING

- **Never try to pry out the piston.**
- **Cover the piston with a rag. Use care so that the piston does not cause injury as it is expelled from the cylinder.**

****

6.Remove:
- Piston seals ①

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 or rear brake master cylinders, drain the brake hoses, master cylinders, brake calipers and reservoir tanks of their brake fluid.

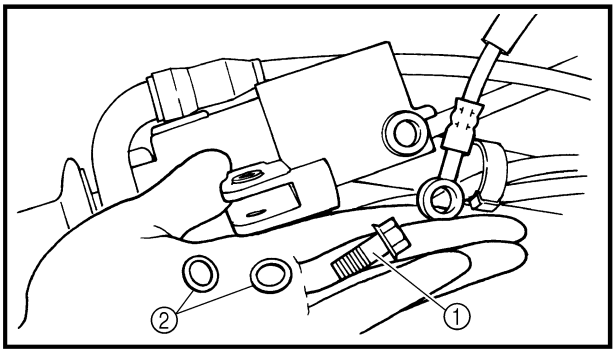
⚠ WARNING

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

Front brake

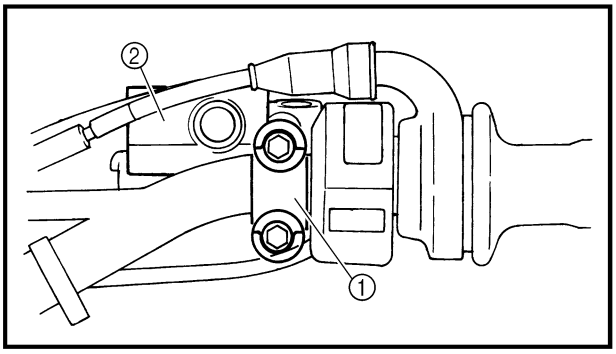
1.Remove:
- Brush guard
- Brake lever
- Return spring (brake lever)
- Brake switch

NOTE:
Remove the brake switch by pushing up the stopper with a thin screwdriver.

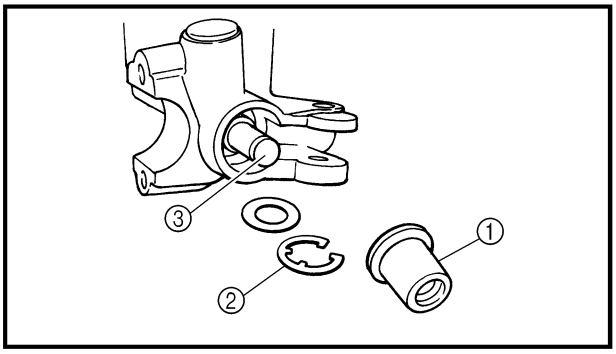


2.Remove:
- Union bolt ①
- Copper washers ②

NOTE:
Place a container under the master cylinder to collect any remaining brake fluid.

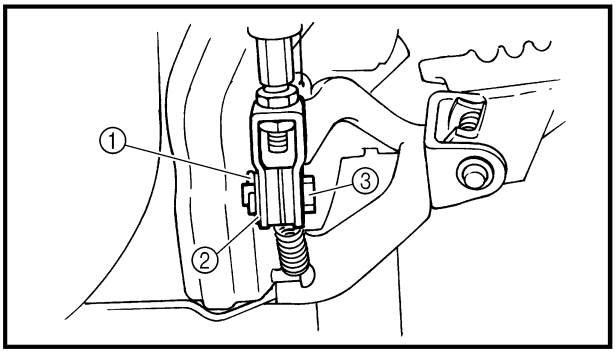


3.Remove:
- Master cylinder bracket ①
- Master cylinder ②



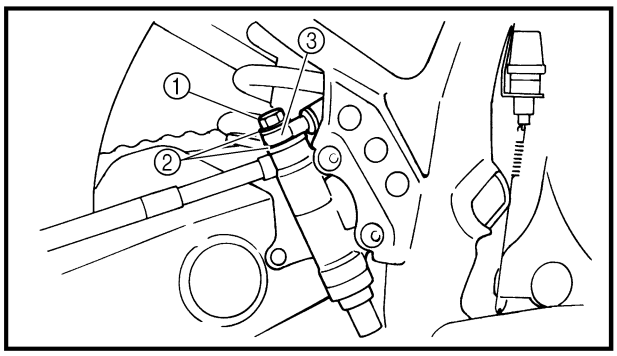
4.Remove:
- Master cylinder cap
- Diaphragm
- Rubber boot ①
- Circlip ②
- Master cylinder kit ③

NOTE:
- Remove the circlip using circlip pliers.
- Place a container under the master cylinder to collect any remaining brake fluid.



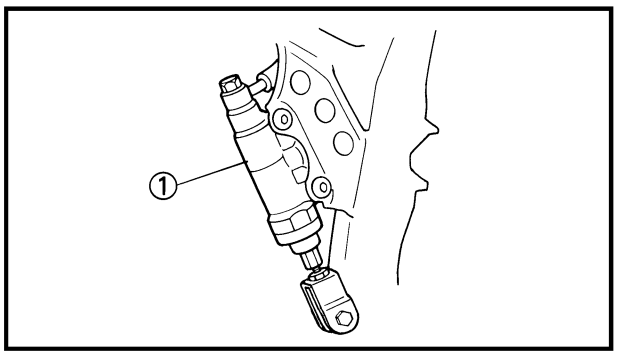
Rear brake

1.Remove:
- Cotter pin ①
- Washer ②
- Pin ③

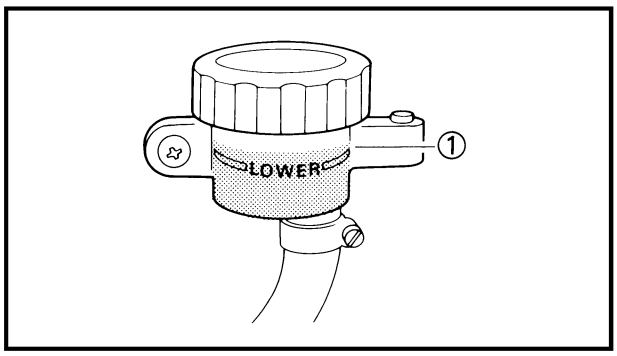


2.Remove:
- Union bolt ①
- Copper washers ②

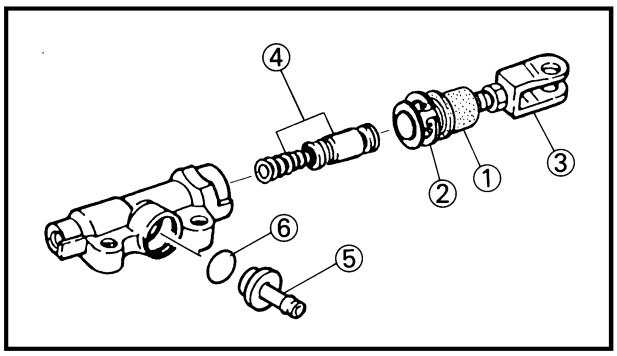
3.Disconnect:
- Brake hoses ③



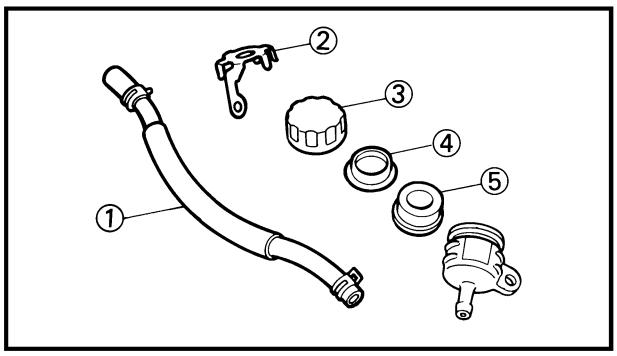
4.Remove:
- Master cylinder ①



5.Remove:
- Reservoir tank ①



6.Remove:
- Dust boot ①
- Circlip ②
- Push rod ③
- Master cylinder kit ④
- Joint (brake hose) ⑤
- O-ring ⑥



7.Remove:
- Brake hose ①
- Cap stopper (reservoir tank) ②
- Cap (reservoir tank) ③
- Inner cap (reservoir tank) ④
- Diaphragm ⑤

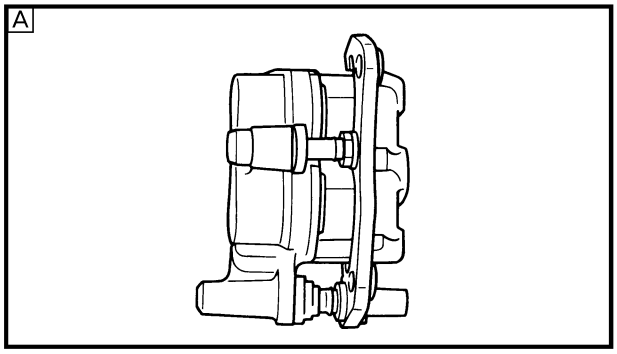
INSPECTION AND REPAIR

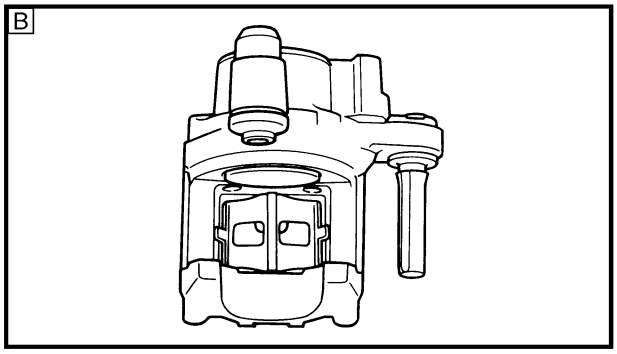
Recommended brake component replacement schedule:

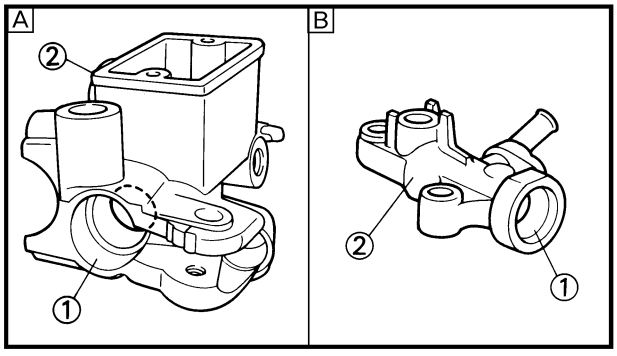
Brake pads	**As required**
Piston seals	**Every two years**
Brake hoses	**Every four years**
Brake fluid	**Replace only when brakes are disassembled.**

⚠ WARNING

All internal parts should be cleaned in new brake fluid only. Do not use solvents as they will cause seals to swell and distort.







1.Inspect:
- Caliper cylinder
  Wear/scratches → Replace the caliper assembly.
- Caliper piston
  Scratches/rust/wear → Replace the caliper assembly.
- Caliper body
  Cracks/damage → Replace the brake caliper assembly.
- Oil delivery passage (caliper body)
  Blow out with compressed air.

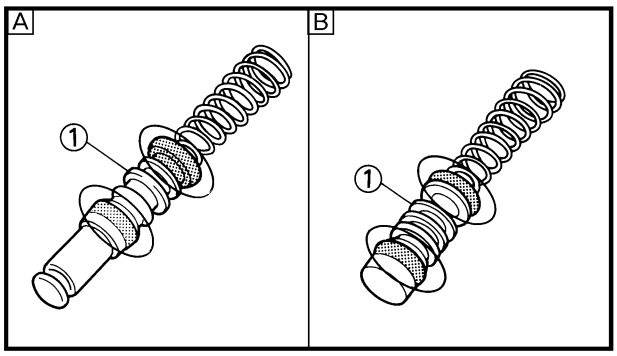
[A] Front
[B] Rear

⚠ WARNING

Replace the piston seals whenever a caliper is disassembled.

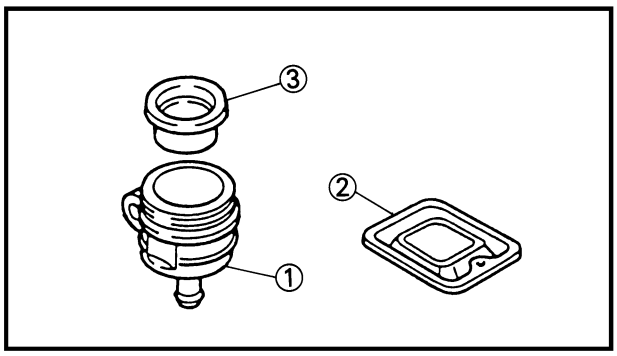
2.Inspect:
- Master cylinder ①
  Wear/scratches → Replace the master cylinder assembly.
- Master cylinder bodies ②
  Cracks/damage → Replace.
- Oil delivery passages
  (master cylinder bodies)
  Blow out with compressed air.

[A] Front
[B] Rear

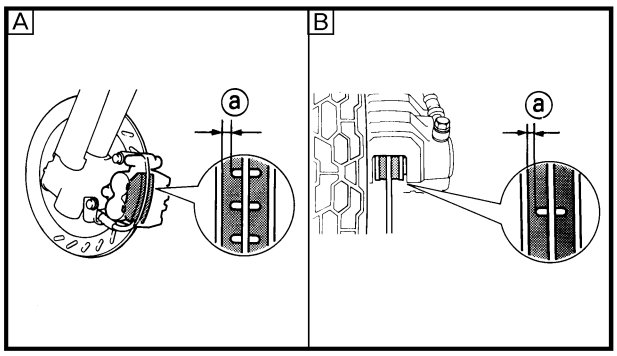


3.Inspect:
- Master cylinder kits ①
  Scratches/wear/damage → Replace as a set.

A Front
B Rear



4.Inspect:
- Reservoir tank ① Cracks/damage → Replace.
- Diaphragm (front) ②
- Diaphragm (rear) ③
  Wear/damage → Replace.



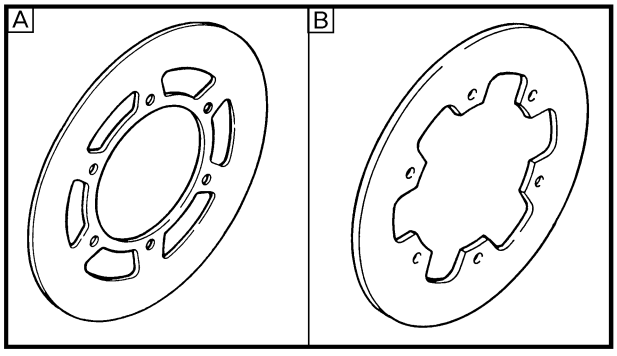
5.Inspect:
- Brake hoses (front, rear)
  Cracks/wear/damage → Replace.

6.Measure:
- Brake pads (thickness ⓐ)
  Out of specification → Replace.

A Front
B Rear

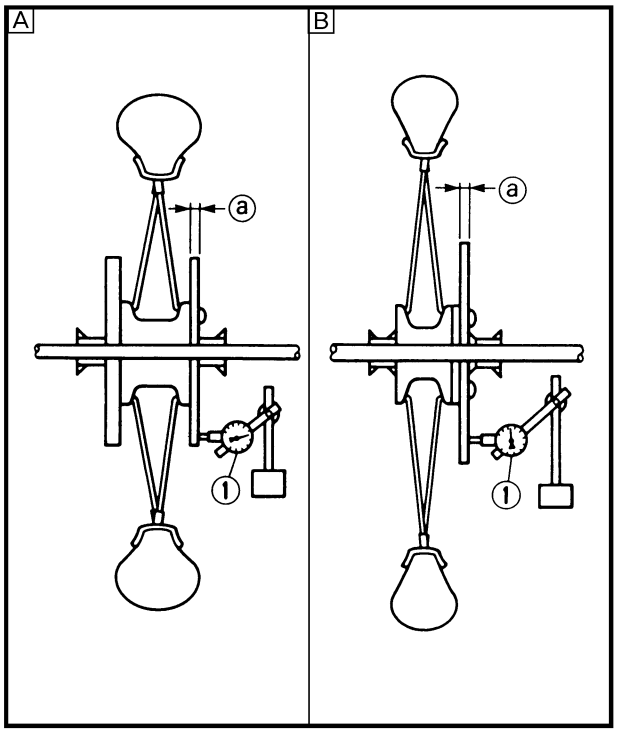
Wear limit:
1.0 mm (0.04 in)

NOTE:
- Replace the pad spring as a set if pad replacement is required.
- Replace the pads as a set if either is found to be worn to the wear limit.



7.Inspect:
- Brake discs (front and rear)
  Galling/damage → Replace.

A Front
B Rear



8.Measure:
- Brake disc deflection
  Out of specification → Inspect wheel runout.
  If the wheel runout is within the limits replace the brake disc.

Maximum deflection:
0.5 mm (0.020 in)

① Dial gauge
- Brake disc thickness ⓐ
  Out of specification → Replace.

Minimum thickness:
Front:
3 mm (0.118 in)
Rear:
4 mm (0.157 in)

NOTE:
Tighten the bolts (brake disc) in stage using a crisscross pattern.

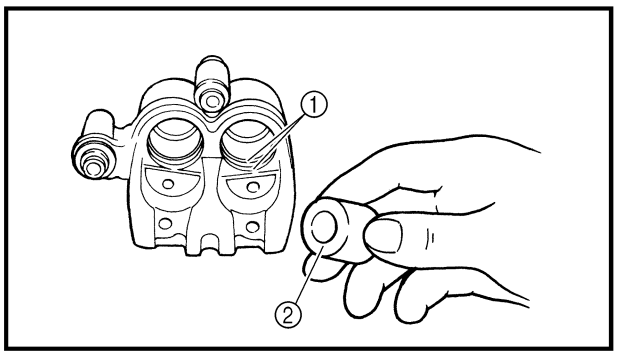
Bolts (brake disc):
Front:
12 Nm (1.2 m • kg, 8.7 ft • lb)
LOCTITE®
Rear:
12 Nm (1.2 m • kg, 8.7 ft • lb)
LOCTITE®

CALIPER ASSEMBLY

⚠ WARNING
- **All internal parts should be cleaned in new brake fluid only.**
- **Internal parts should be lubricated with brake fluid when installed.**

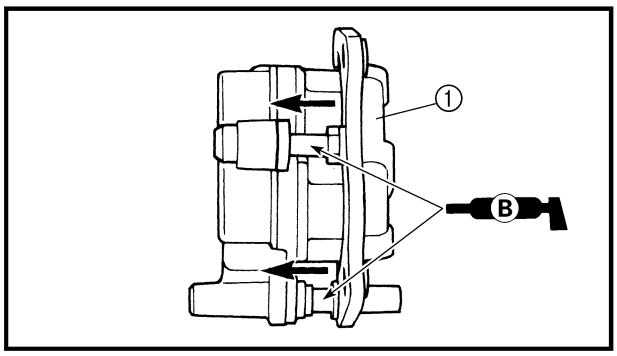
Brake fluid:
DOT #4

- **Replace the piston seal and dust boot whenever a caliper is disassembled.**



Front brake

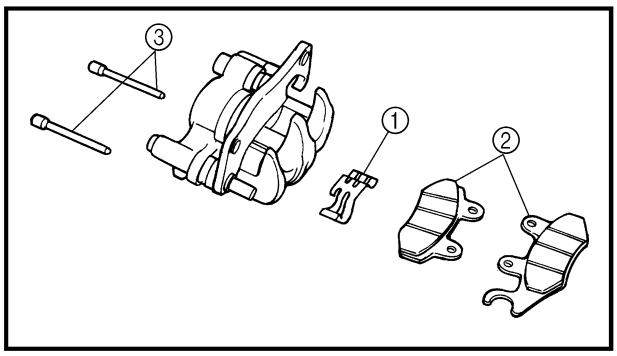
1.Install:
- Piston seals ①
- Pistons ②



2.Install:
- Support bracket ①

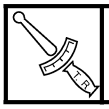
NOTE:

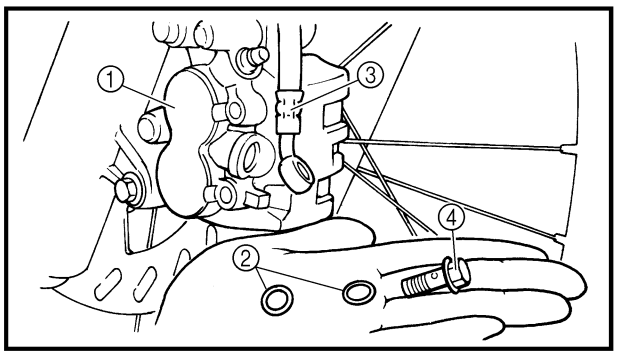
Place the rubber boot securely in the groove of the guide pin when installing the caliper body.



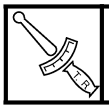
3.Install:
- Pad spring ①
- Brake pads ②
- Pad pins ③

  Refer to "BRAKE PAD REPLACEMENT".

	**Pad pins ③:** **18 Nm (1.8 m • kg, 13 ft • lb)**



4.Install:
- Caliper ①
- Copper washers ②
- Brake hose ③
- Union bolt ④

	**Union bolt ④:** **30 Nm (3.0 m • kg, 22 ft • lb)**

⚠ WARNING
- **Proper hose routing is essential to insure safe motorcycle operation.**

  Refer to "CABLE ROUTING" in CHAPTER 2.
- **Always use new copper washers.**

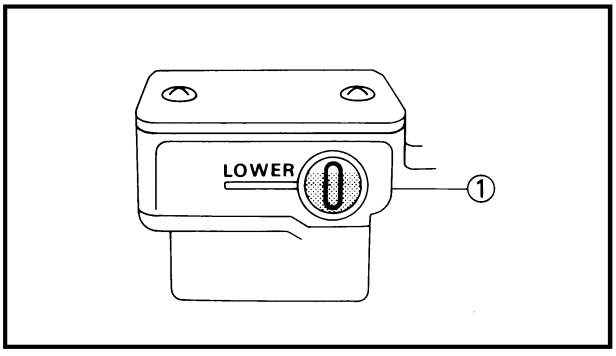
5.Fill:
- Brake fluid

	Recommended brake fluid: DOT #4

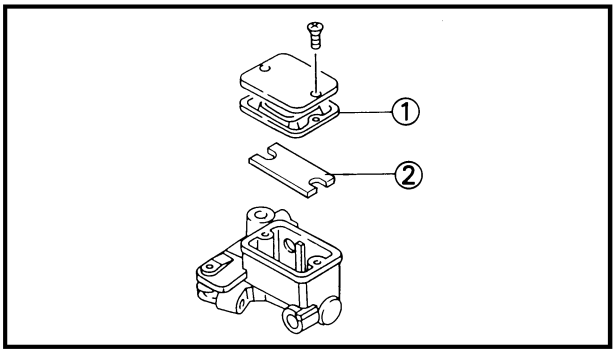
CAUTION:
Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.

⚠ 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.**

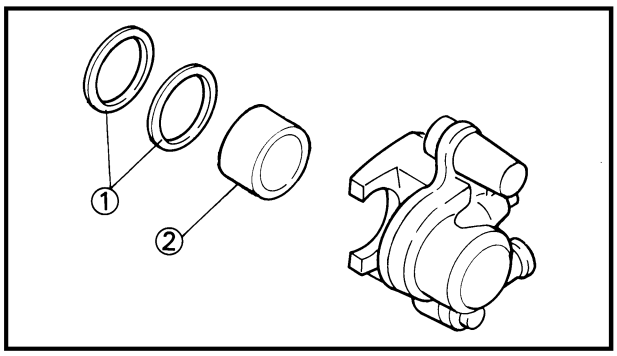
6.Air bleed:
- Brake system
  Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.



7.Inspect:
- Brake fluid level
  Fluid level is under "LOWER" level line ①
  → Fill up.
  Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.



8.Install:
- Diaphragm ①
- Plate ②



Rear brake

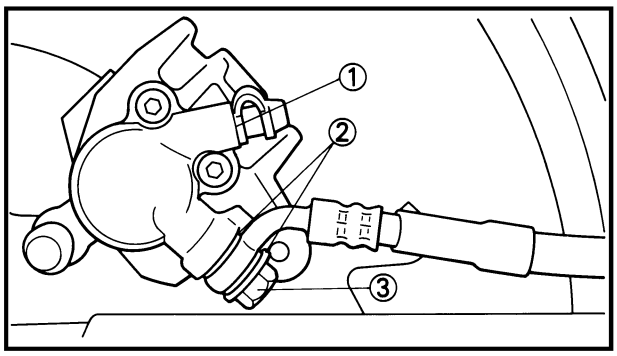
1.Install:
- Piston seals ①
- Caliper piston ②

⚠ WARNING

Always use new piston seals.

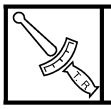
2.Install:
- Pad spring
- Brake pads (with pad shim)
- Pad pins

  Refer to "BRAKE PAD REPLACEMENT".



3.Install:
- Caliper assembly ①
- Copper washers ②
- Union bolt ③
- Rear wheel

  Refer to "REAR WHEEL".

	**Union bolt ③:** **30 Nm (3.0 m • kg, 22 ft • lb)**

CAUTION:

When installing the brake hose to the caliper, lightly touch the brake pipe with the projection on the caliper.

⚠ WARNING

- **Proper hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING" in CHAPTER 2.**
- **Always use new copper washers.**

4.Fill:
- Brake fluid

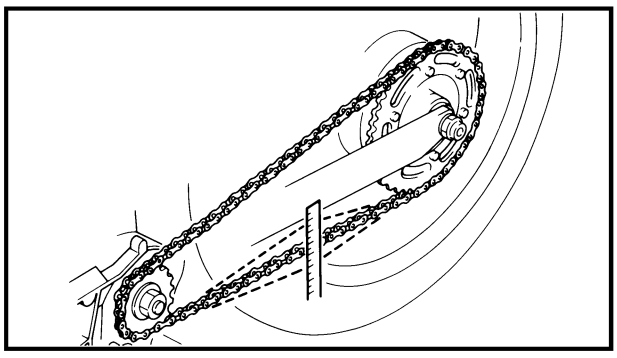
Recommended brake fluid:
DOT #4

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.**

5.Air bleed:
- Brake system
  Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.

6.Inspect:
- Brake fluid level
  Fluid level is under "LOWER" level line → Replenish.
  Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.



7.Adjust:
- Drive chain slack

Drive chain slack:
35 ~ 50 mm (1.38 ~ 1.97 in)

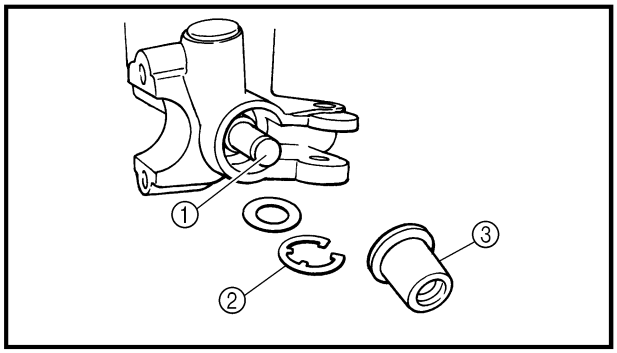
Refer to "DRIVE CHAIN SLACK ADJUSTMENT" in CHAPTER 3.

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.**

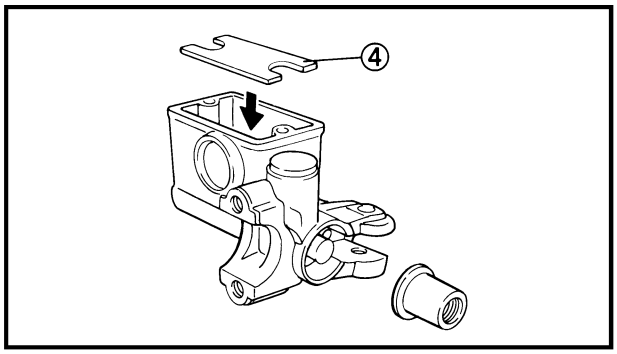
Brake fluid:
DOT #4

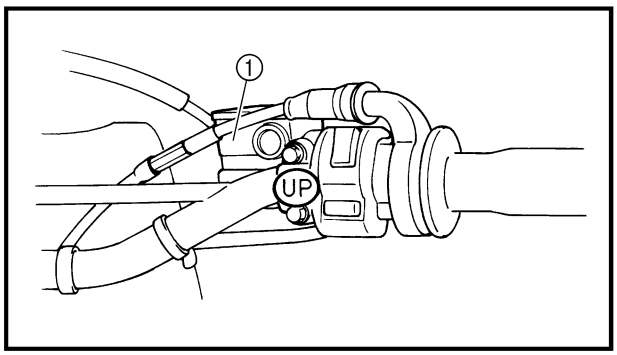


Front brake

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.

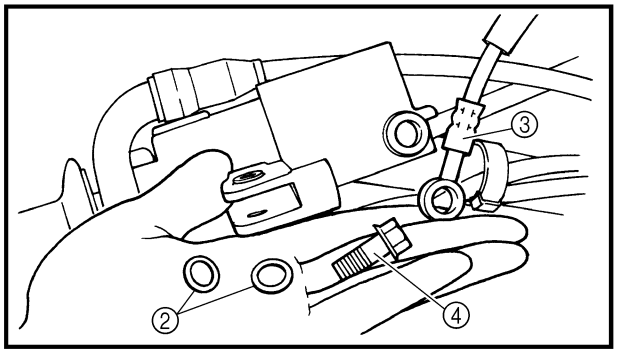




2.Install:
- Master cylinder ①

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 ②
- Brake hose ③
- Union bolt ④

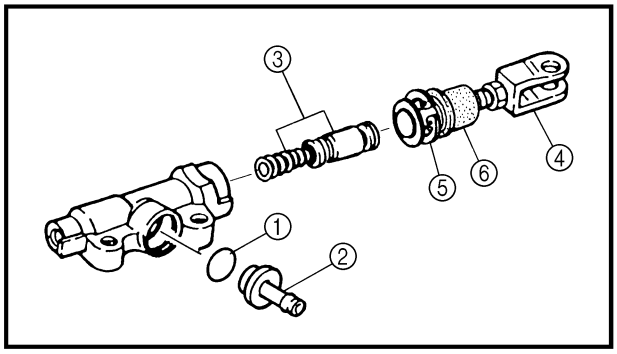
Union bolt ④:
30 Nm (3.0 m • kg, 22 ft • lb)

NOTE:
Install the brake hose as shown.

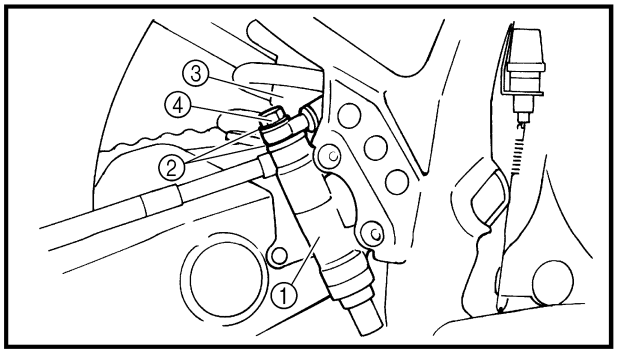
⚠ WARNING
- **Proper hose routing is essential to insure safe motorcycle operation.**
  Refer to "CABLE ROUTING" in CHAPTER 2.
- **Always use new copper washers.**

4.Install:
- Brake switch
- Spring
- Brake lever
- Brake lever cover
- Mirror (right)

NOTE:
Apply lithium soap base grease to the pivot shaft of the brake lever.



Rear brake
1.Install:
- O-ring ①
- Joint (brake hose) ②
- Master cylinder kit ③
- Push rod ④
- Circlip ⑤
- Dust boot ⑥



2.Install:
- Master cylinder ①
- Copper washers ②
- Brake hose ③
- Union bolt ④

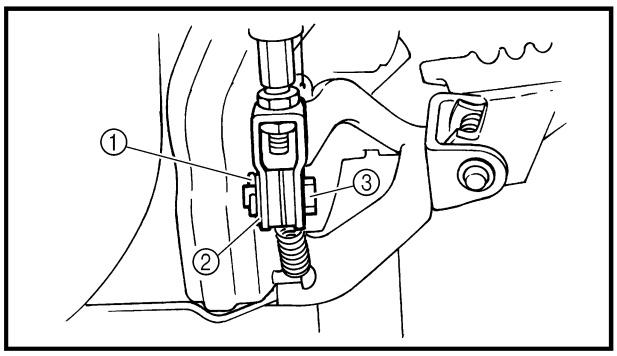


Bolts (master cylinder):
23 Nm (2.3 m • kg, 17 ft • lb)
Union bolt ④:
30 Nm (3.0 m • kg, 22 ft • lb)

NOTE:
When installing the brake hose to the master cylinder, make sure the brake pipe lightly touches the projection on the copper washer (lower).

⚠ WARNING

- **Proper hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING" in CHAPTER 2.**
- **Always use new copper washers.**



3.Install:
- Pin ①
- Washer ②
- Cotter pin ③

⚠ WARNING

Always use a new cotter pin.

4.Install:
- Reservoir tank

NOTE:

At this time, temporarily install the reservoir tank without its cap and cap stopper.

5.Connect:
- Brake hose

6.Fill:
- Brake fluid

Recommended brake fluid:
DOT #4

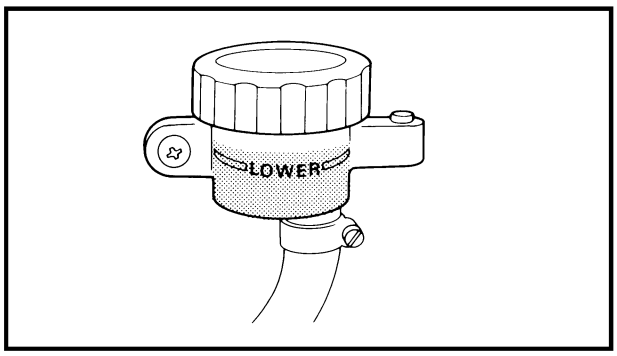
CAUTION:

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

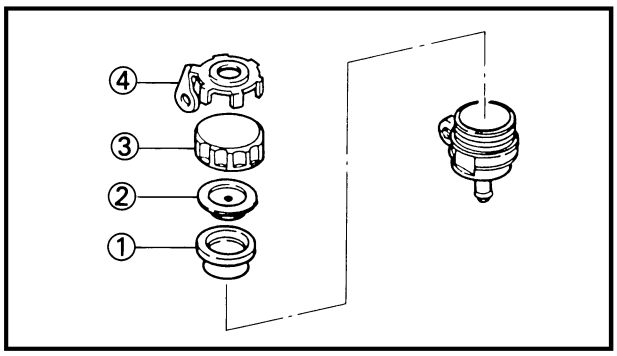
⚠ WARNING

- **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.**

7.Air bleed:
- Brake system
  Refer to "AIR BLEEDING (HYDRAULIC BRAKE SYSTEM)" in CHAPTER 3.



8.Inspect:
- Brake fluid level
  Fluid level is under the "LOWER" level line → Replenish.
  Refer to "BRAKE FLUID LEVEL INSPECTION" in CHAPTER 3.



9.Install:
- Diaphragm ①
- Holder (diaphragm) ②
- Cap (reservoir tank) ③
- Stopper (reservoir tank cap) ④
- Reservoir tank

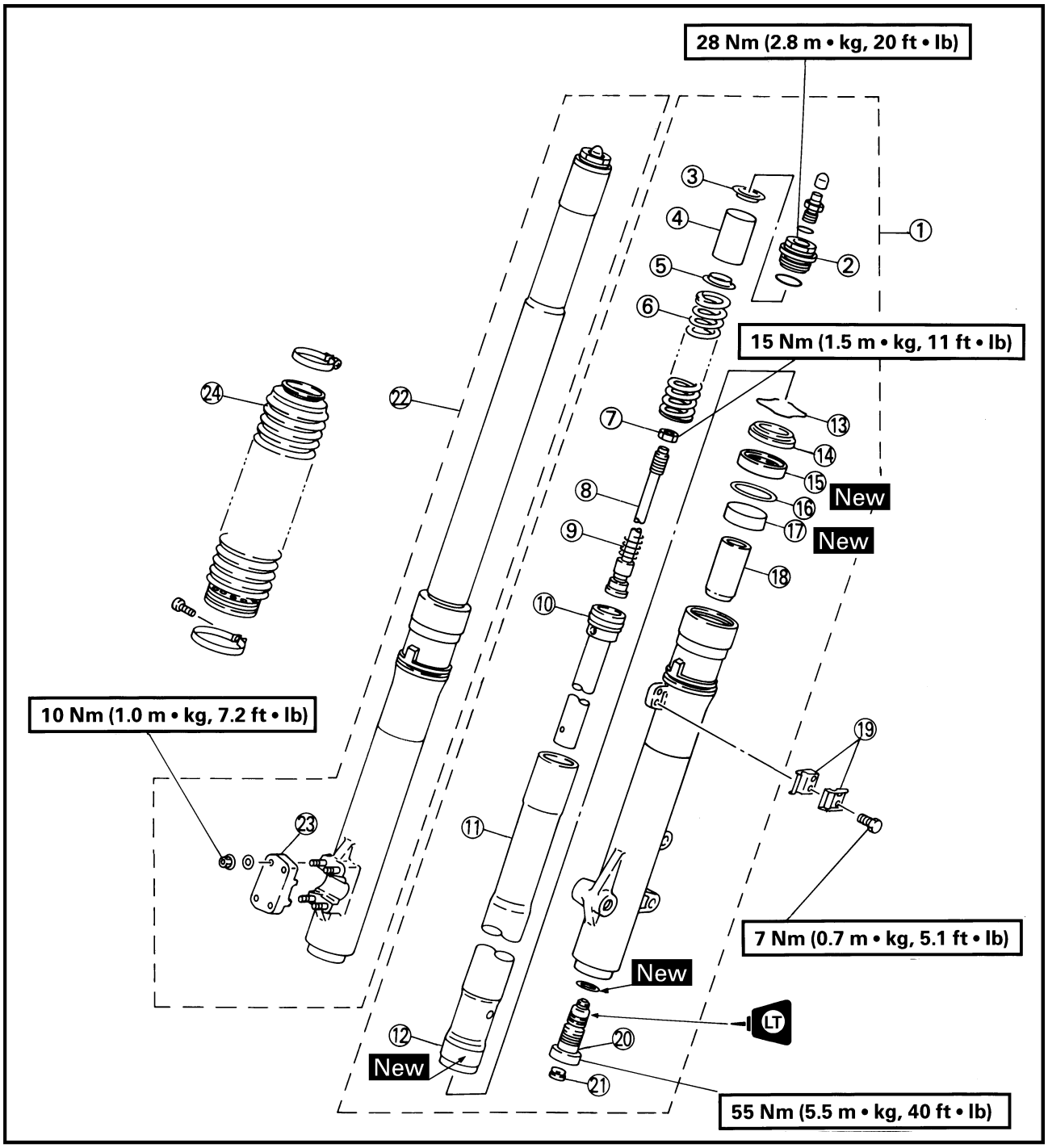
10.Adjust:
- Rear brake pedal height

Pedal height:
10 mm (0.394 in)
(below the top of the footrest)

Refer to "REAR BRAKE ADJUSTMENT" in CHAPTER 3.

FRONT FORK

① Front fork assembly (left)
② Cap bolt
③ Upper seat
④ Collar
⑤ Lower seat
⑥ Fork spring
⑦ Locknut
⑧ Piston rod
⑨ Rebound spring
⑩ Damper rod
⑪ Inner tube
⑫ Piston metal
⑬ Retaining clip
⑭ Dust seal
⑮ Oil seal
⑯ Plain washer
⑰ Slide metal
⑱ Oil lock pieces
⑲ Brake hose holder
⑳ Base valve assembly
㉑ Cap
㉒ Front fork assembly (right)
㉓ Axle holder
㉔ Boot



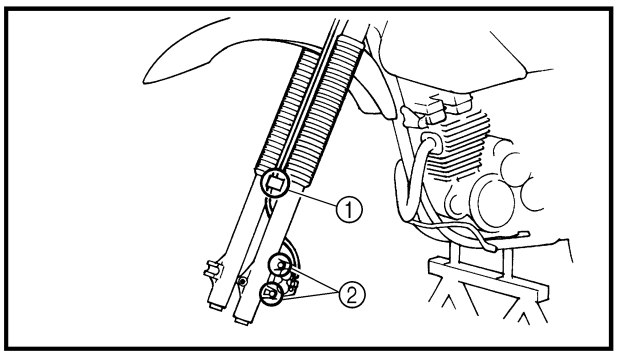
REMOVAL

⚠ WARNING

Support the motorcycle securely so there is no danger of it falling over.

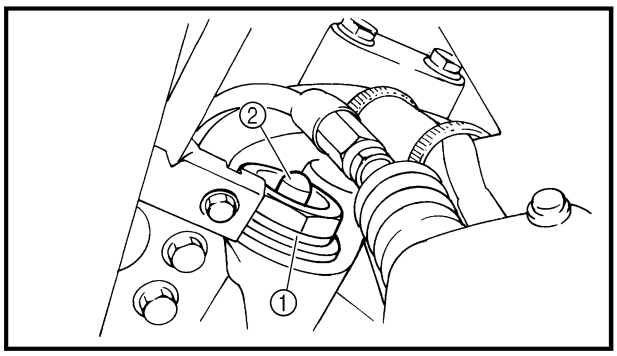
1.Place the motorcycle on a level place.
2.Elevate the front wheel by placing a suitable stand under the frame and engine.
3.Remove:
- Front wheel
  Refer to "FRONT WHEEL".

4.Remove:
- Holder ① (brake hose)
- Bolts ② (brake caliper)



5.Loosen:
- Cap bolt ①

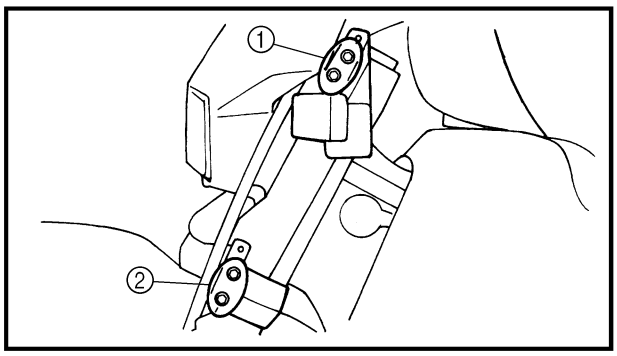
NOTE:
Before loosening the cap bolt, the fork legs must be bled by pushing the air valve ②.



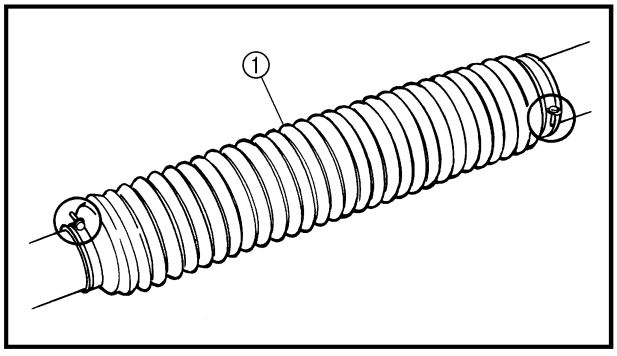
6.Loosen:
- Pinch bolts ① (handlebar crown)
- Pinch bolts ② (lower bracket)

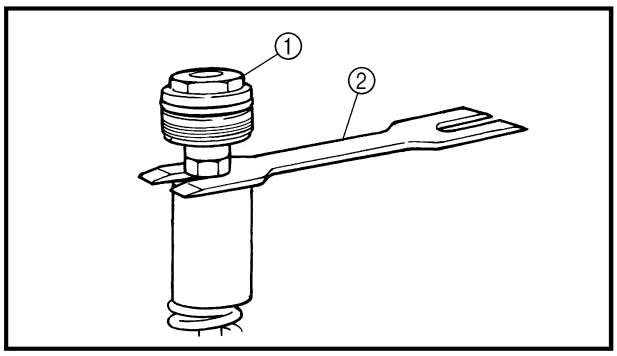
⚠ WARNING

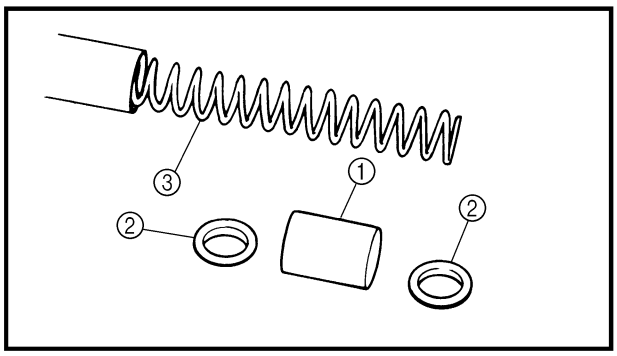
Support the fork before loosening the pinch bolt.

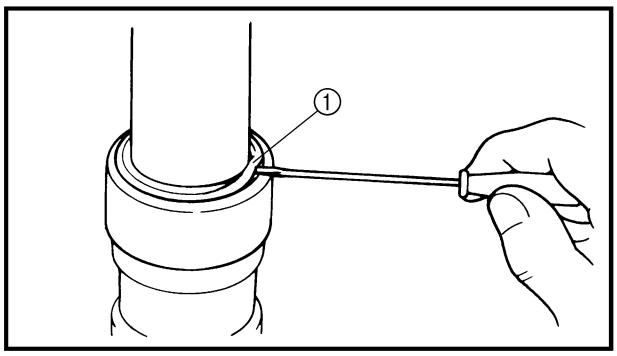


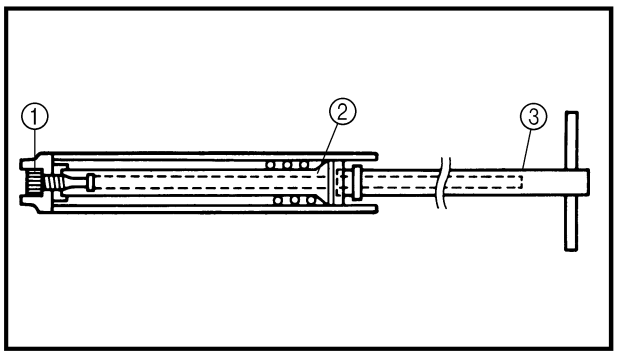
7.Remove:
- Front fork
- Fork boot ①











DISASSEMBLY

1.Remove:
- Cap bolt (from the inner tube)

2.Remove:
- Cap bolt ① (from the piston rod)

NOTE:
Remove the cap bolt using the rod holder ②.



Rod holder:
P/N. YM-01434

3.Remove:
- Collars ①
- Spring seats ②
- Fork spring ③

4.Drain:
- Fork oil

5.Remove:
- Retaining clip ①

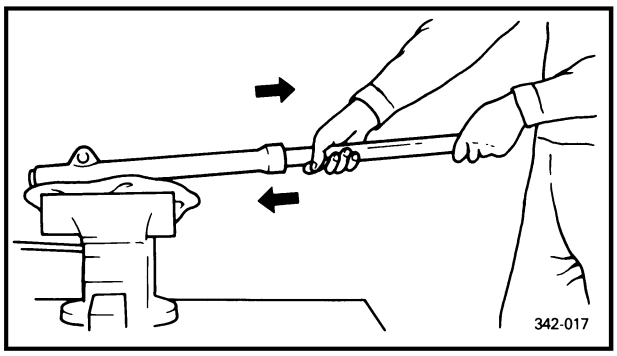
NOTE:
Use a thin screwdriver, and be careful not to scratch the inner fork tube.

6.Remove:
- Base valve ①
- Damper rod assembly ②
- Damper rod holder ③

NOTE:
When loosening the base valve ① (damper rod ②), the damper rod must be held with the damper rod holder ③.



Damper rod holder:
P/N. YM-01418



7.Remove:
- Inner fork tube

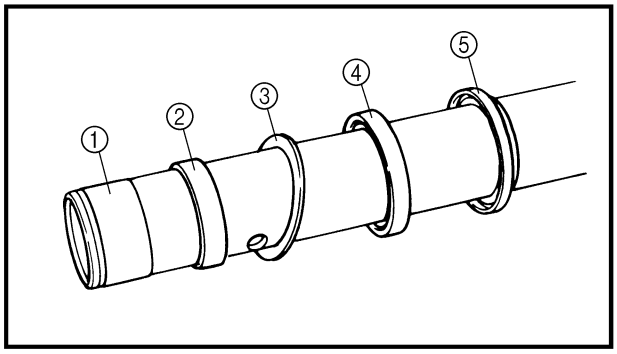
****

Removal steps:
- Hold the fork leg horizontally.
- Clamp the caliper mounting boss of the outer fork tube securely in a vise with soft jaws.
- Separate the inner tube from the outer tube by pulling forcefully but carefully on the inner tube.

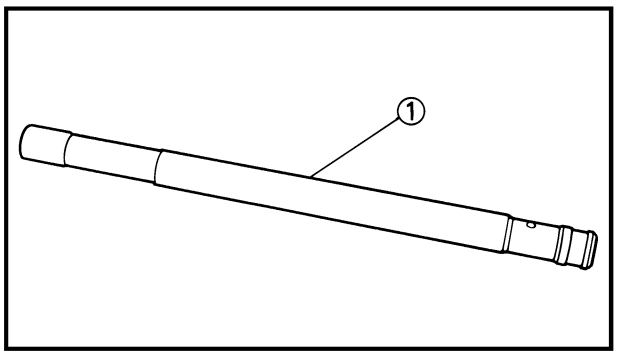
CAUTION:

- **Excessive force will damage the oil seal and/or the slide and piston metals. Damaged oil seal, slide metal and piston metal 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.**

****



8.Remove:
- Piston metal ①
- Slide metal ②
- Plain washer ③
- Oil seal ④
- Dust seal ⑤
- Oil lock piece



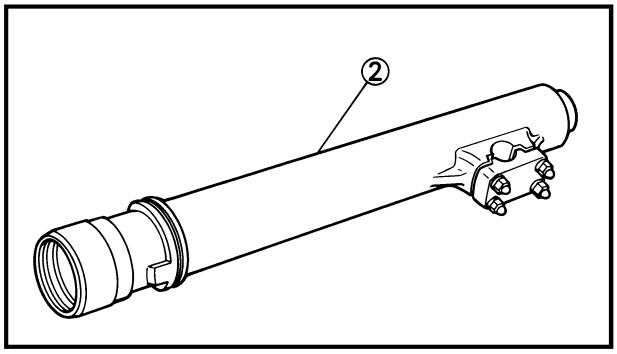
INSPECTION

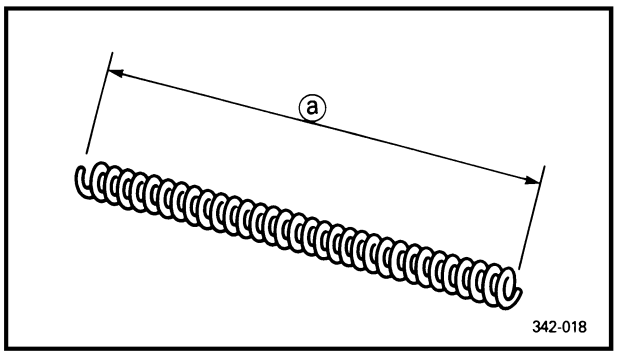
1.Inspect:
- Inner fork tube ①
- Outer fork tube ②

  Scratches/bends/damage → Replace.

⚠ WARNING

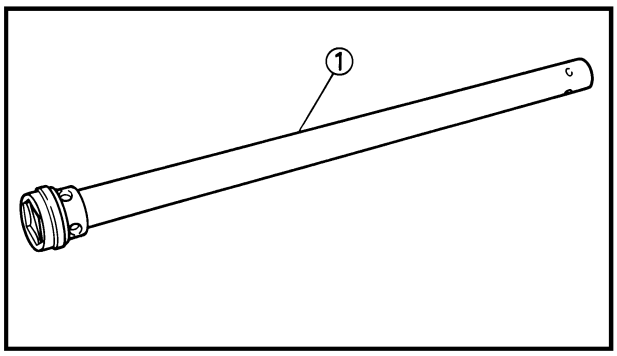
Do not attempt to straighten a bent inner fork tube as this may dangerously weaken the tube.





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

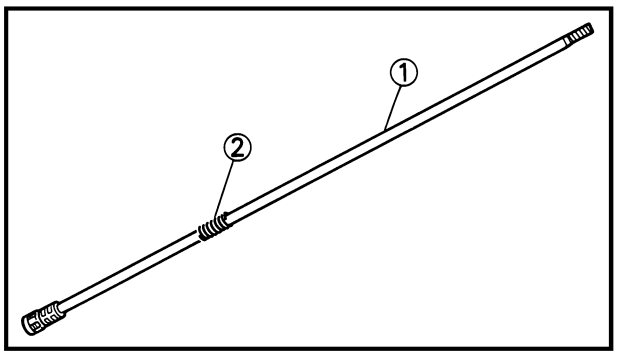
Fork spring free length:
472 mm (18.58 in)
Minimum free length:
462 mm (18.19 in)



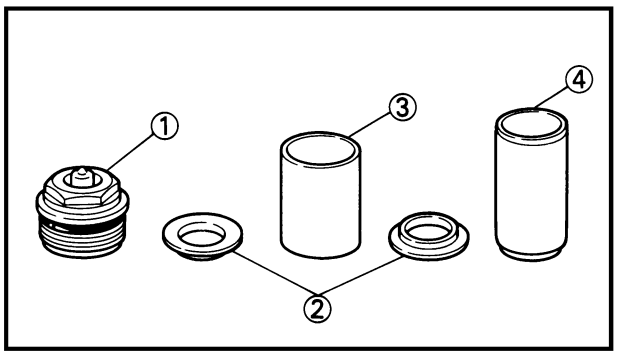
3.Inspect:
- Damper rod ①
  Wear/bends/damage → Replace.
  Contamination → Blow out all oil passages with compressed air.

⚠ WARNING

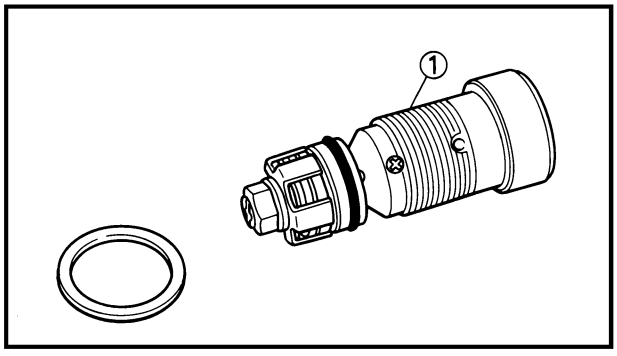
Do not attempt to straighten a bent damper rod as this may dangerously weaken the rod.



4.Inspect:
- Piston rod ①
- Rebound spring ②
  Wear/bends/damage → Replace.



5.Inspect:
- Cap bolt ①
- Spring seats ②
- Spacer ③
- Oil lock piece ④
  Damage → Replace.



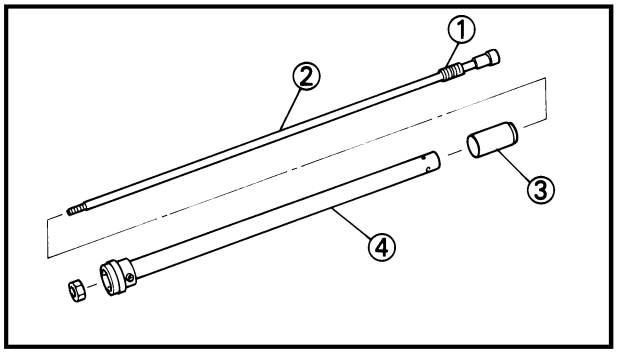
6.Inspect:
- Base valve ①
  Damage → Replace.
  Contamination → Blow out all oil passages with compressed air.

ASSEMBLY

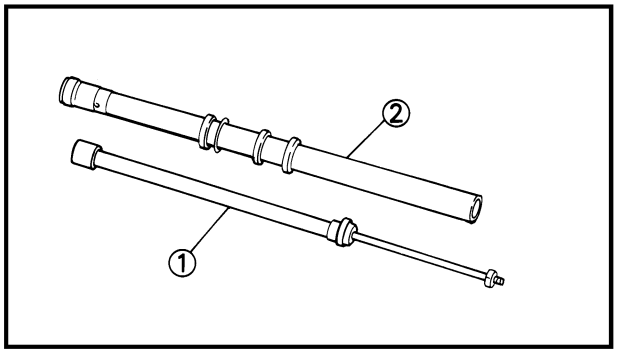
Reverse the "DISASSEMBLY" procedure. Note the following points.

NOTE:

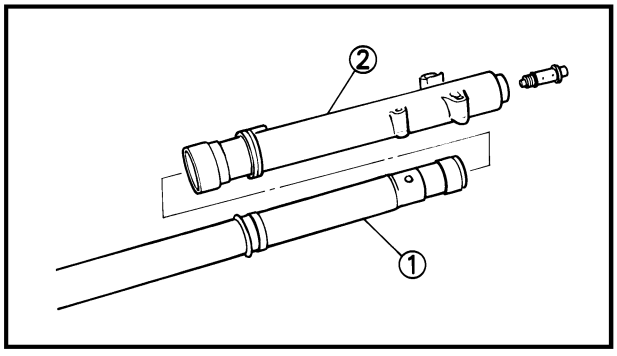
- When assembling the front fork, be sure to replace the following parts.
  * Piston metal
  * Slide metal
  * Oil seal
  * Dust seal
- Make sure all components are clean before assembling the fork.



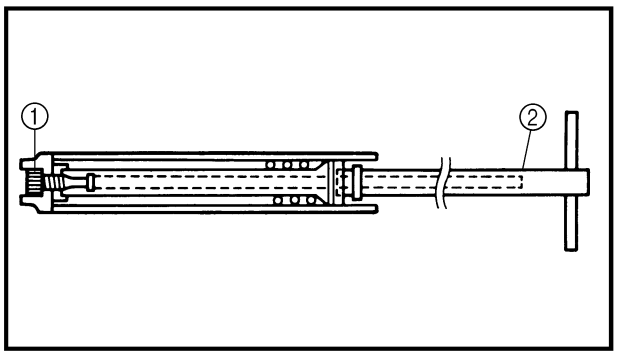
1.Install:
- Rebound spring ①
- Piston rod ②
- Oil lock piece ③
- Damper rod ④



2.Install:
- Damper rod assembly ①
  (to the inner tube ②)



3.Install:
- Inner fork tube ①
  (to the outer fork tube ②)



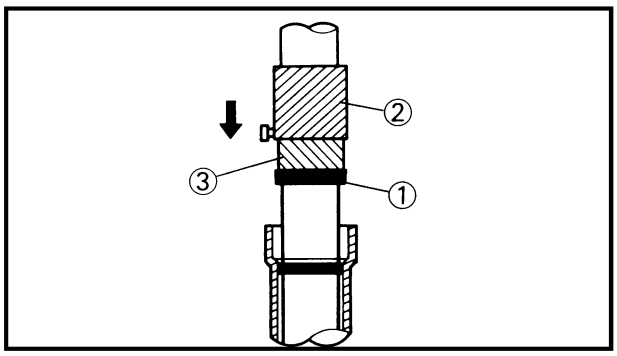
4.Tighten:
- Base valve ① (damper rod)
  Use the damper rod holder ② to hold the damper rod.

Damper rod holder:
YM-01418

Base valve (damper rod):
55 Nm (5.5 m • kg, 40 ft • lb)
LOCTITE®

⚠ WARNING

Always use a new copper washer.



5.Install:
- Oil seal ①
  Use the fork seal driver weight ② and adapter ③.

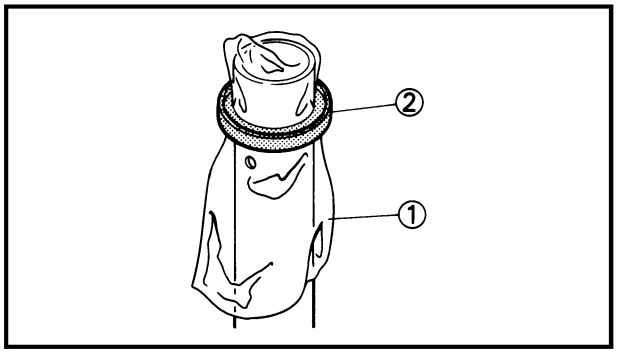
Fork seal driver weight:
YM-33963
Adapter:
43 mm (1.69 in):
YM-8020

NOTE:

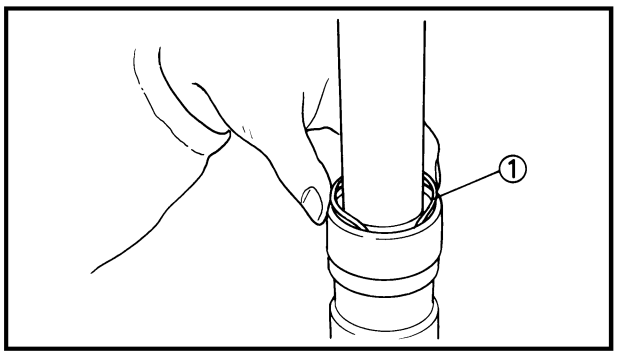
Before installing the oil seal, apply the lithium soap base grease onto the oil seal lips.

CAUTION:

Be sure that the oil seal numbered side faces upward.



NOTE:
- Apply fork oil on the inner tube.
- When installing the oil seal and dust seal ②, use a plastic sheet ① lubricated with fork oil to protect the oil seal lip.
- Install the oil seal with its manufacturer's marks or number facing the axle holder side.



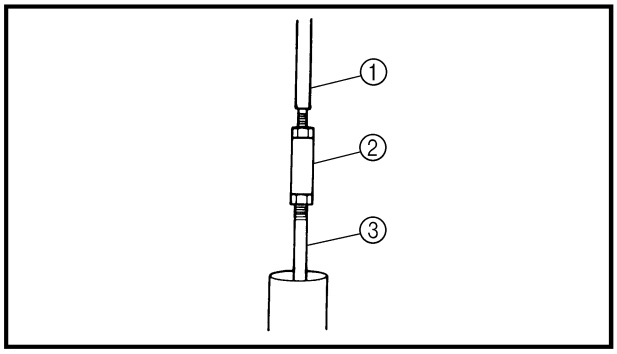
6.Install:
- Retaining clip

NOTE:
Fit the oil seal retaining clip ① correctly in the groove of the outer fork tube.

7.Fill:
- Front fork oil
  To the top of the inner tube with the recommended fork oil.

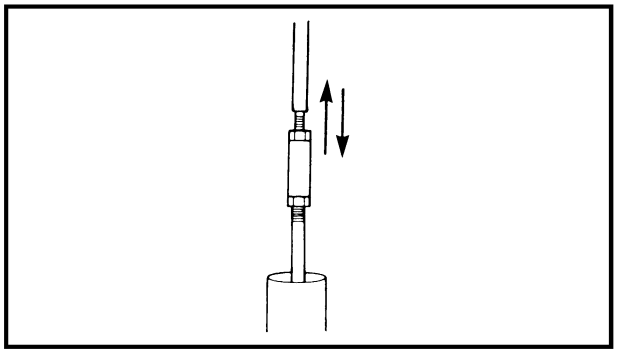
Fork oil capacity:
555 cm³
(19.57 Imp oz, 18.76 US oz)
Recommended oil:
Yamaha suspension oil 01 or equivalent

CAUTION:
- **Be sure to use the recommended fork oil. If other oils are used, they may have an adverse effect on the front fork performance.**
- **NEVER allow foreign materials to enter the front fork.**



8.Attach:
- Rod puller ①
- Rod puller attachment ②
  (to damper rod ③)

Rod puller:
P/N. YM-01437
Rod puller attachment:
P/N. 90890-01436



9.After filling the front fork leg, pump the damper rod ③ slowly up and down more than 10 times to distribute the fork oil.

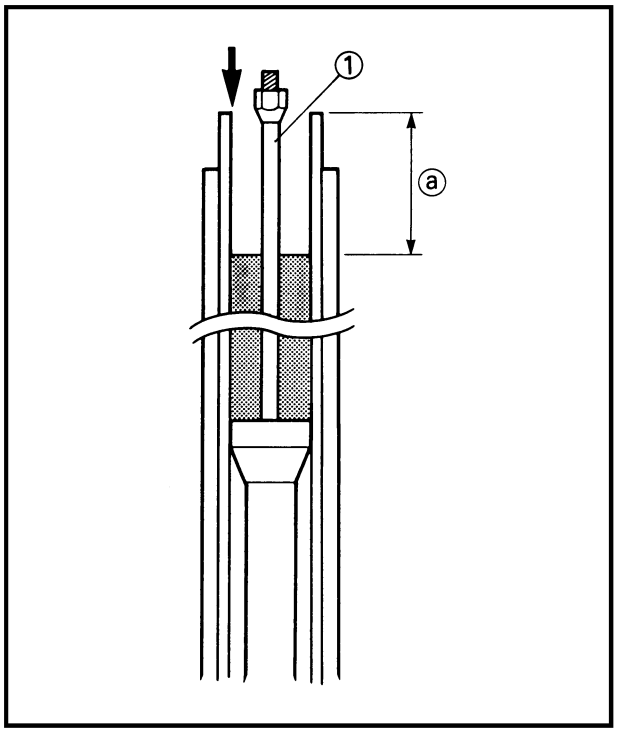
NOTE:
Be sure to pump the damper rod slowly because the fork oil may spurt out.

10.After filling, pump the inner tube slowly up and down (about 150 mm (5.90 in)) to distribute the fork oil once more.

NOTE:
Be careful not to stroke the inner tube over. A stroke of 150 mm (5.90 in) or more will cause air to enter. In this case, repeat the steps 8 to 9.

11.Wait ten minutes until the air bubbles have dispersed from the front fork, and the oil has been distributed evenly in the system before setting the recommended oil level.

NOTE:
Pour the fork oil up to the top of the inner tube to ensure that it spreads to all its parts. Failing to do so will make it impossible to obtain the correct level.
Be sure to bleed the front forks after filling them with oil.

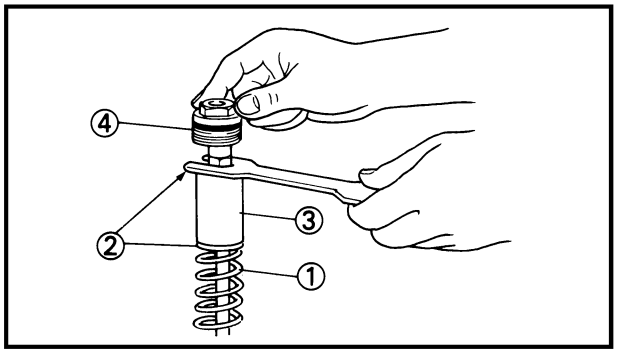


12.Measure:
- Oil level (left and right) ⓐ
  Out of specification → Adjust.

Fork oil level ⓐ:
130 mm (5.12 in)

From the top of the outer tube with inner tube and damper rod ① fully compressed without spring.

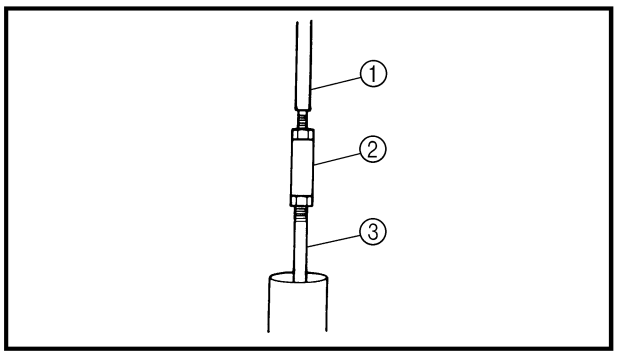
⚠ WARNING
Never fail to fill to the specified oil level ⓐ and always make sure to adjust each front fork leg to the same level. Uneven adjustment can cause poor handling and loss of stability.

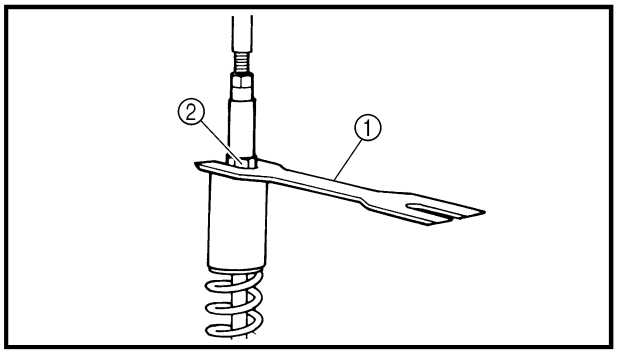


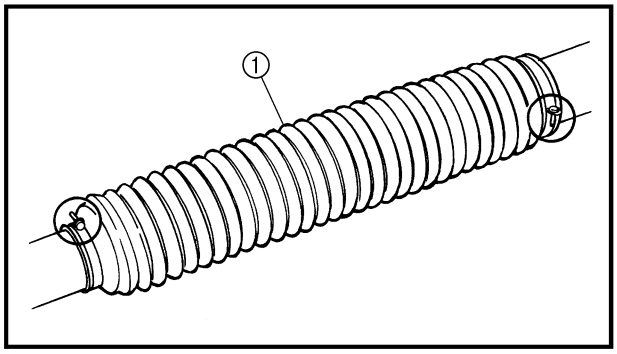
13.Install:
- Fork spring ①
- Spring seats ②
- Collar ③
- Cap bolt ④
  Fully tighten with your finger.

14.Tighten:
- Locknut

Nut:
15 Nm (1.5 m • kg, 11 ft • lb)







****

Installing steps:

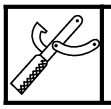
- Install the rod puller ① and attachment ② to the damper rod ③.



Rod puller:
P/N. YM-01437
Rod puller attachment:
P/N. 90890-01436

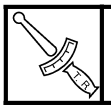
- Install the fork spring, spring seats and collars.
- Pull up the rod puller and set the rod holder ① between the locknut ② and spring seat.

NOTE:
Use the "B" -marked side of rod holder.



Rod holder:
P/N. YM-01434

- Remove the rod puller and attachment.
- Temporarily install the cap bolt.
- Tighten the locknut.



Locknut ②:
15 Nm (1.5 m • kg, 11 ft • lb)

- Remove the rod holder.

NOTE:
Be careful, this fork spring is compressed.

****

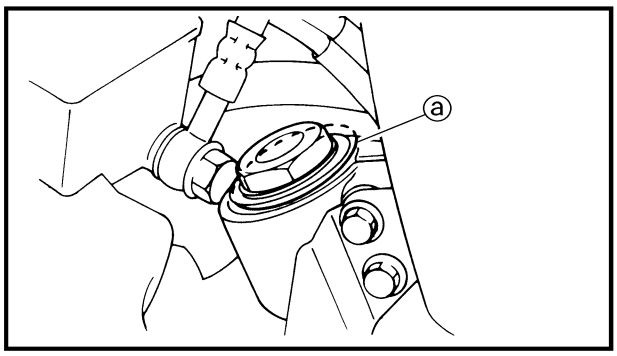
15.Install:
- Inner tube (to cap bolt)
  Temporarily tighten the cap bolt.

16.Install:
- Fork boot ①

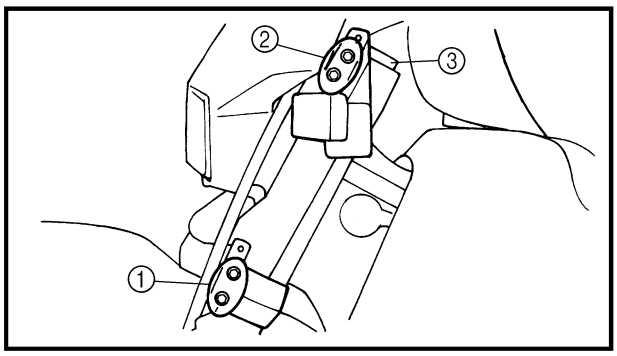
INSTALLATION

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

1.Install:
- Front fork
  Temporarily 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)
- Cap bolt ③

Pinch bolt ① (lower bracket):
30 Nm (3.0 m • kg, 22 ft • lb)
Pinch bolts ② (handlebar crown):
23 Nm (2.3 m • kg, 17 ft • lb)
Cap bolt ③:
28 Nm (2.8 m • kg, 20 ft • lb)

3.Install:
- Bolt (brake caliper)
- Holder (brake hose)

Bolt (brake caliper):
23 Nm (2.3 m • kg, 17 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 "CABLE ROUTING" in CHAPTER 2.

4.Install:
- Front wheel

Bolt (wheel axle):
58 Nm (5.8 m • kg, 42 ft • lb)

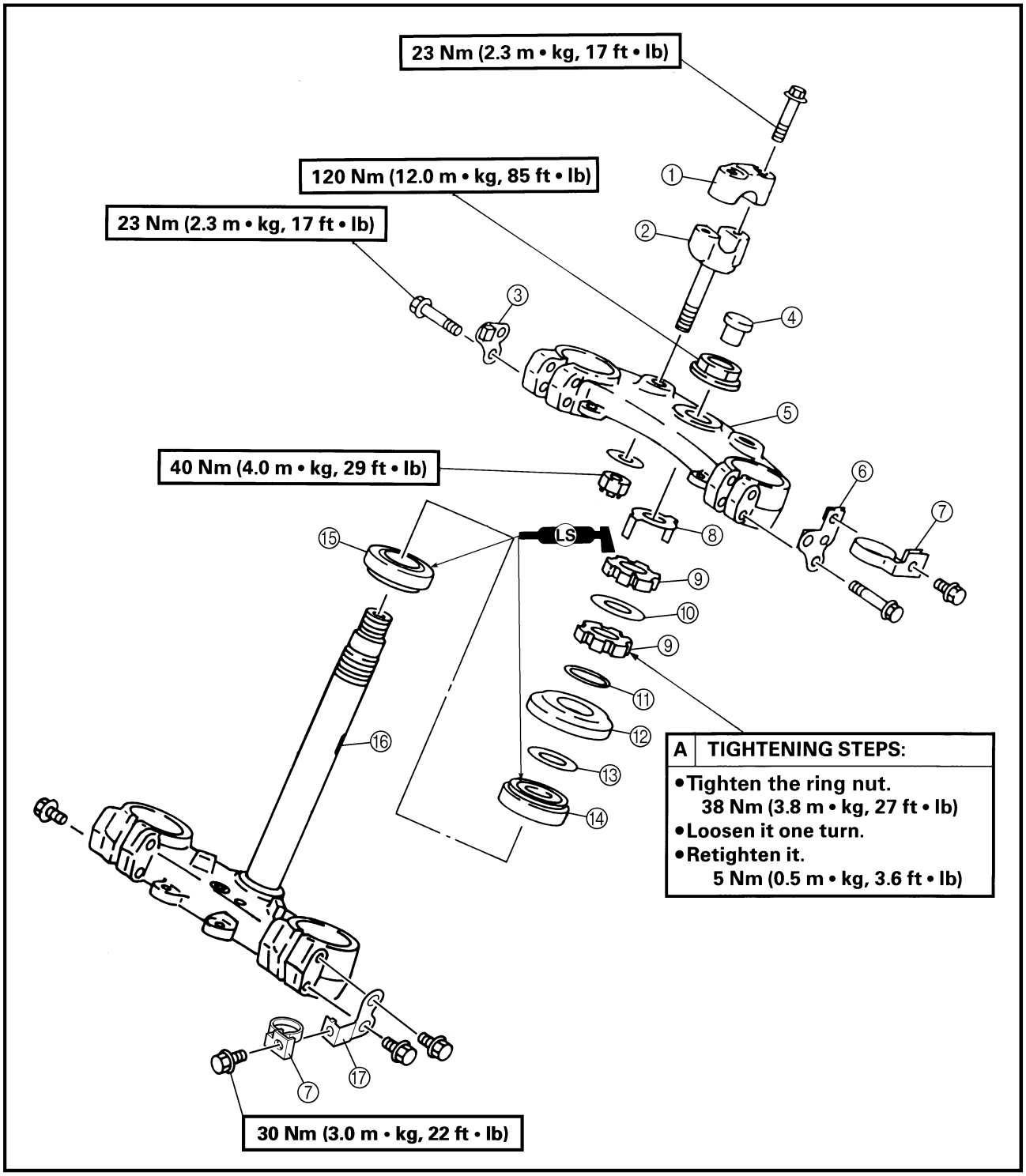
Refer to "FRONT WHEEL".

5.Adjust:
- Air pressure
  Refer to "FRONT FORK ADJUSTMENT" in CHAPTER 3.

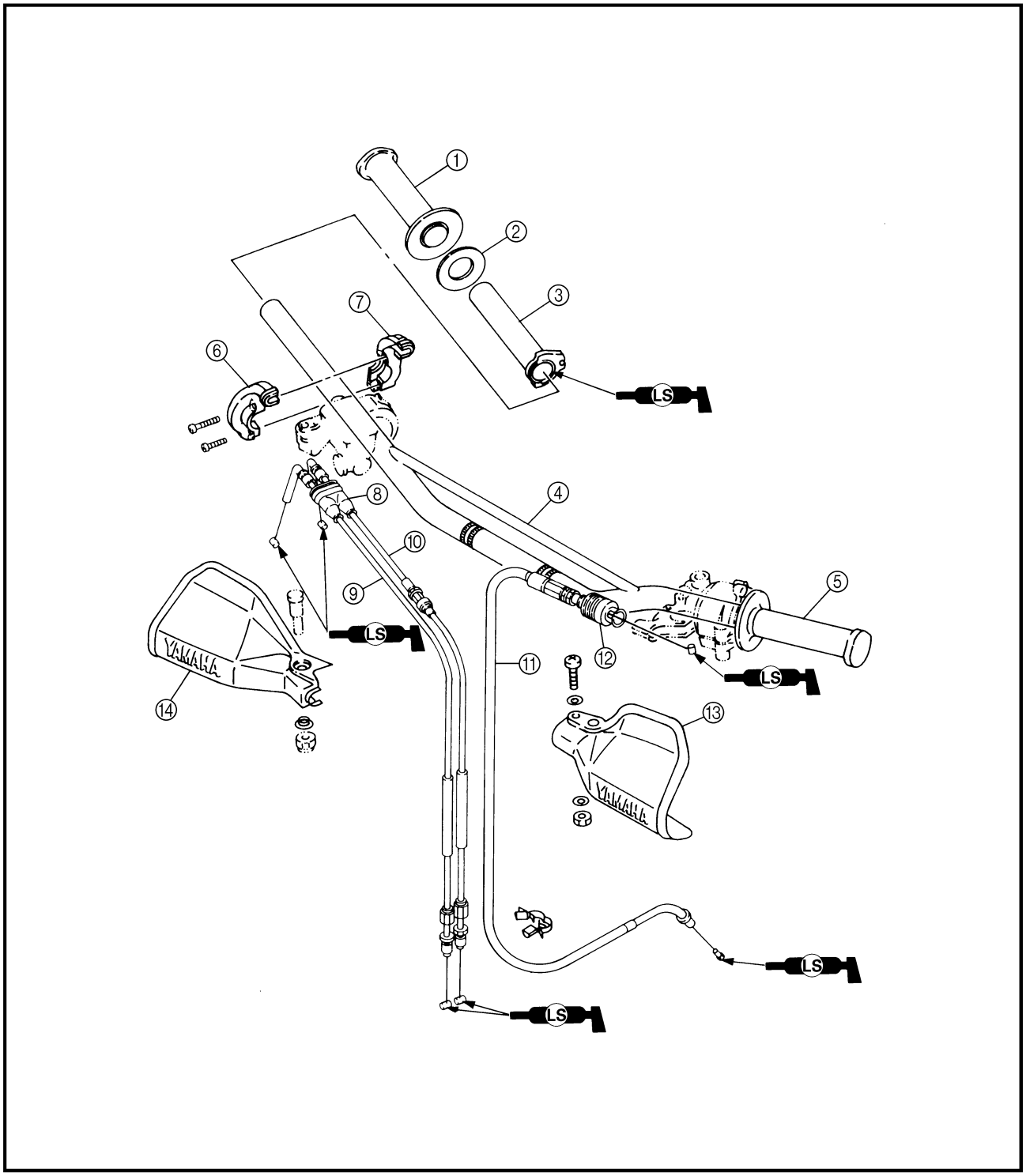
Standard air pressure:
0 kPa (0 kg/cm², 0 psi)
Maximum air pressure:
40 kPa (0.4 kg/cm², 5.7 psi)

STEERING HEAD AND HANDLEBAR

① Handlebar holder (upper)
② Handlebar holder (lower)
③ Headlight stay 2
④ Cap
⑤ Handlebar crown
⑥ Headlight stay 1
⑦ Brake hose holder
⑧ Lock washer
⑨ Ring nut
⑩ Damper collar
⑪ Washer
⑫ Cover
⑬ Washer
⑭ Bearing (upper)
⑮ Bearing (lower)
⑯ Steering shaft
⑰ Stay



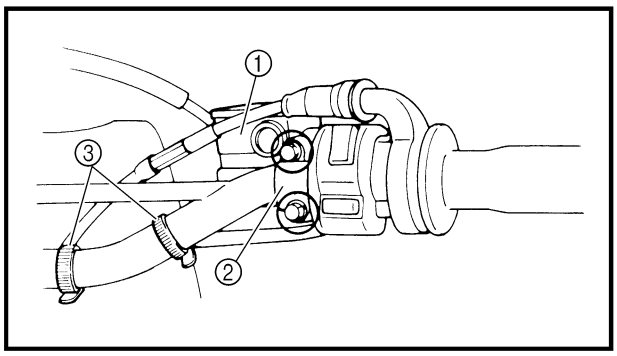
① Handlebar grip (right)
② Leaf ring
③ Throttle guide tube
④ Handlebar
⑤ Handlebar grip (left)
⑥ Throttle cable holder (front)
⑦ Throttle cable holder (rear)
⑧ Boot
⑨ Throttle cable 1
⑩ Throttle cable 2
⑪ Clutch cable
⑫ Boot
⑬ Brush guard (left)
⑭ Brush guard (right)



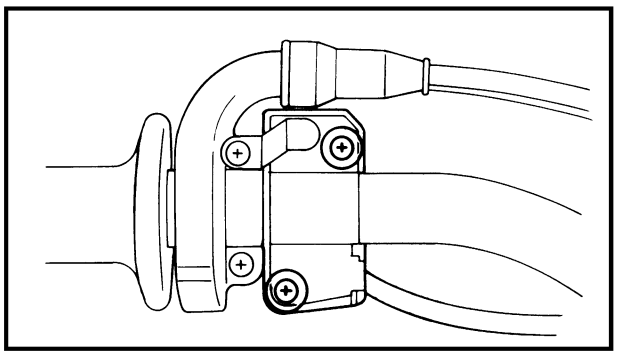
REMOVAL
Handlebar

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

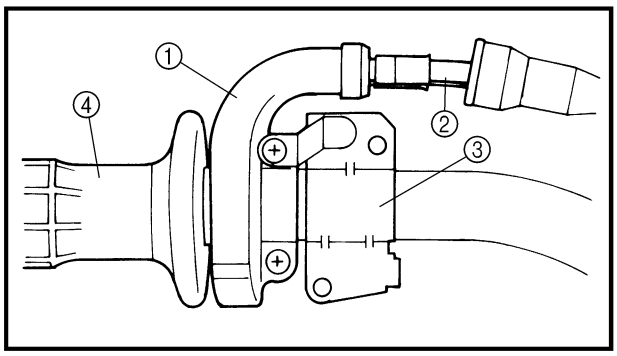
1.Place the motorcycle on a level place.



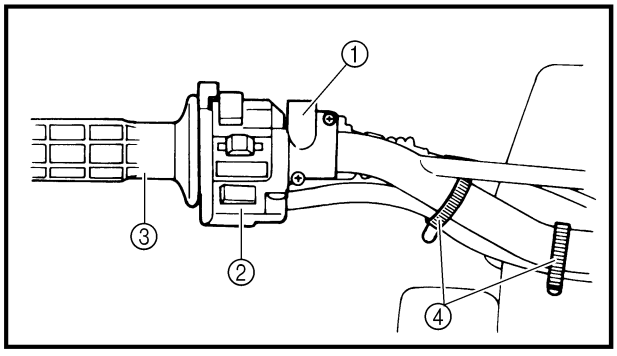
2.Remove:
- Master cylinder assembly ①
- Master cylinder bracket ②
- Bands ③



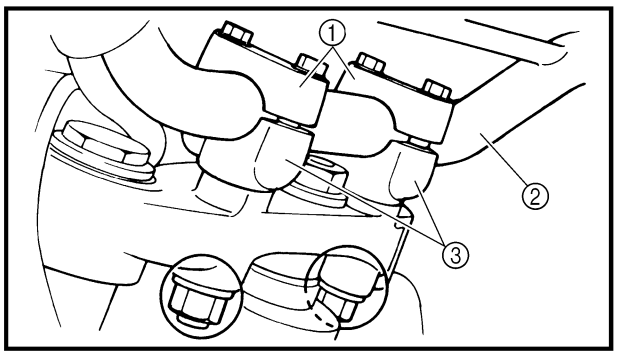
3.Remove:
- Handlebar switch (right)



4.Remove:
- Throttle cable holder ①
- Throttle cable ②
- Plate ③
- Throttle grip ④



5.Remove:
- Lever holder ①
- Handlebar switch ② (left)
- Grip ③
- Bands ④



6.Remove:
- Handlebar upper holder ①
- Handlebar ②
- Handlebar lower holder ③

Steering head

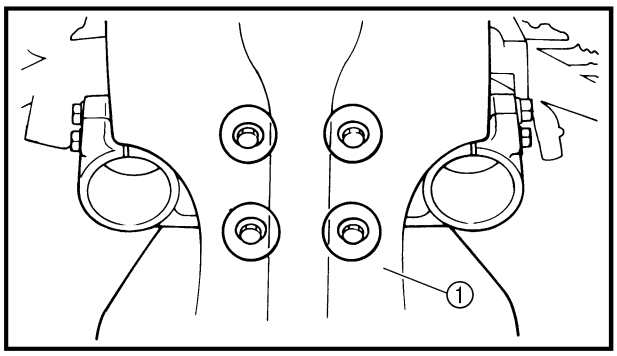
⚠ WARNING

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.

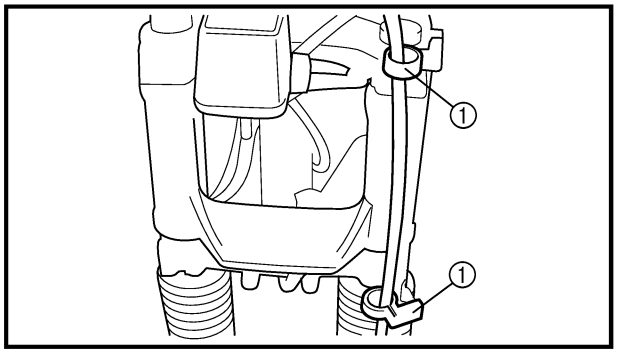
3.Remove:
- Handlebar
  Refer to "Handlebar".

4.Remove:
- Front wheel
  Refer to "FRONT WHEEL".



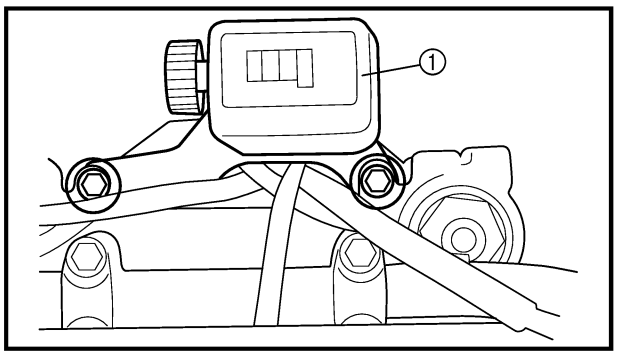
5.Remove:
- Front fork
  Refer to "FRONT FORK".

6.Remove:
- Front fender ①

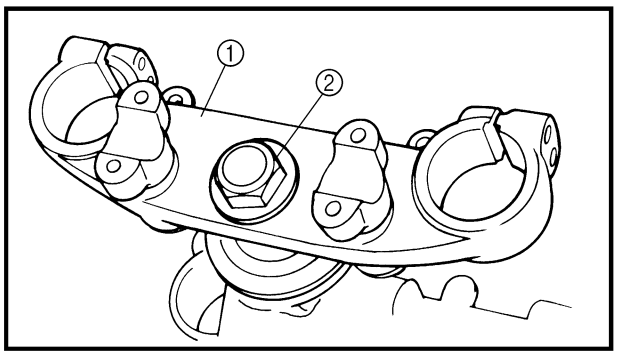


7.Remove:
- Holder ① (brake hose)

8.Disconnect:
- Speedometer cable

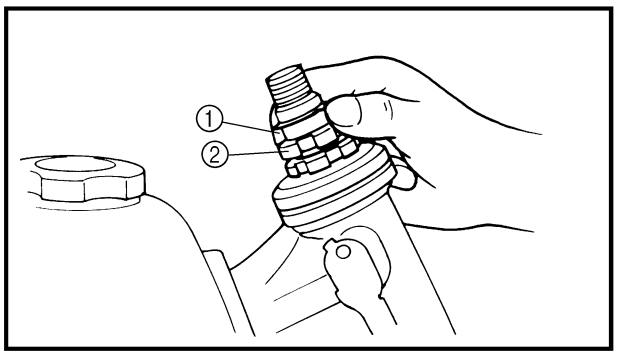


9.Remove:
- Speedometer assembly ①

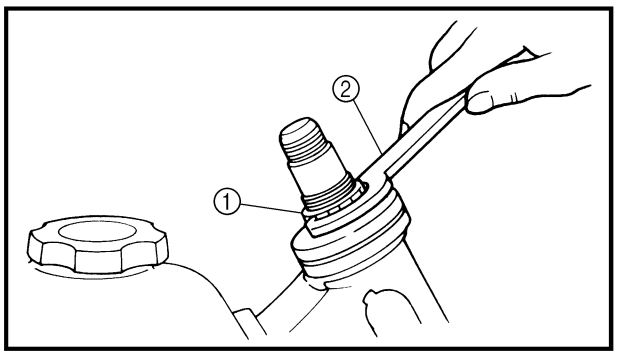


10.Remove:
- Handlebar crown ①

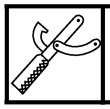
NOTE:
Loosen the steering stem nut ② and remove the handlebar crown ①. Take care that the handlebar crown does not touch the fuel tank.



11.Remove:
- Lock washer ①
- Ring nut ②
- Rubber washer

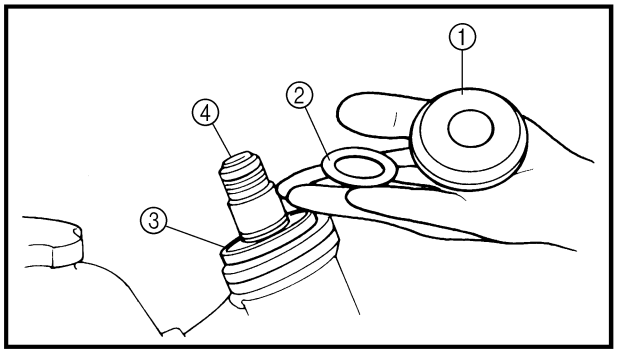


NOTE:
Remove the ring nut ① by using the ring nut wrench ②.

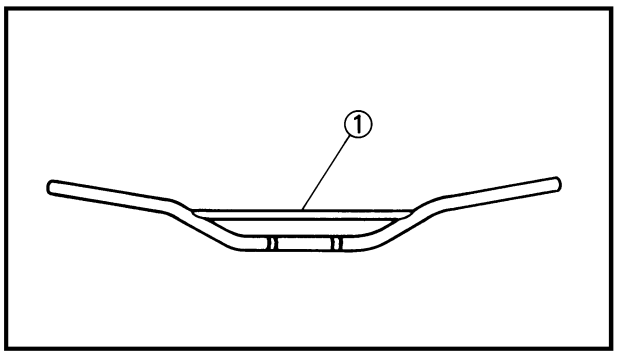


Ring nut wrench:
P/N. YU-33975

⚠ WARNING
Support the lower bracket so that it may not fall down.



12.Remove:
- Washer
- Cover ①
- Washer ②
- Bearing ③ (upper)
- Steering stem ④



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.

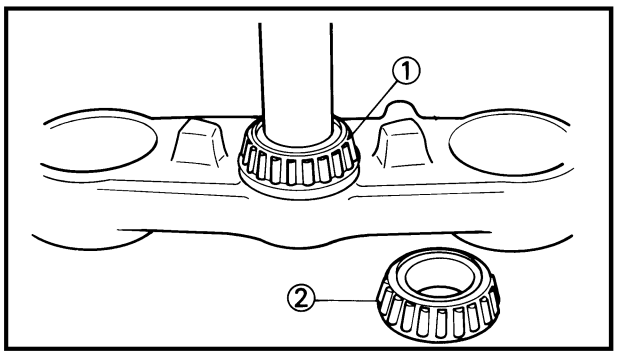
NOTE:

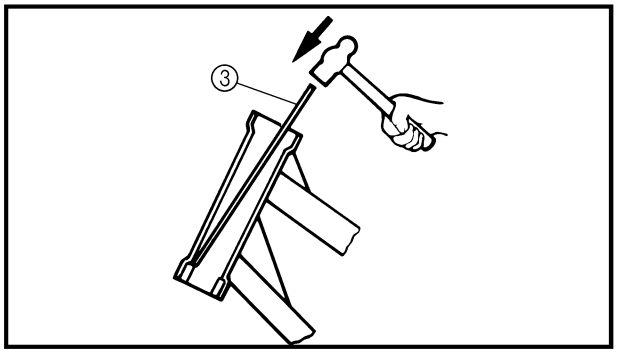
Wipe off excess adhesive with a clean rag.

⚠ WARNING

Leave the handlebar intact until the adhesive becomes dry enough to make the grip and handlebar stuck securely.

****



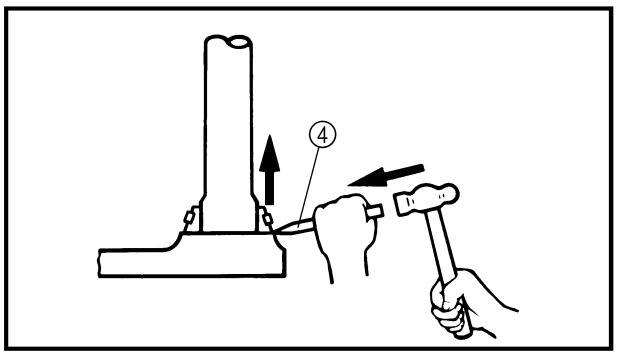


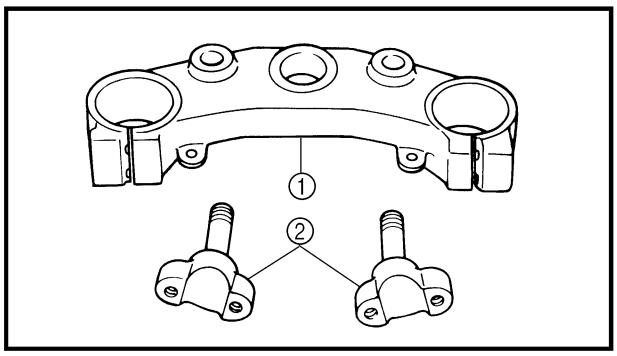
2.Inspect:
- Bearing ① (lower)
- Bearing ② (upper)
- Bearing race
  Wear/pitting/damage → Replace as a set.

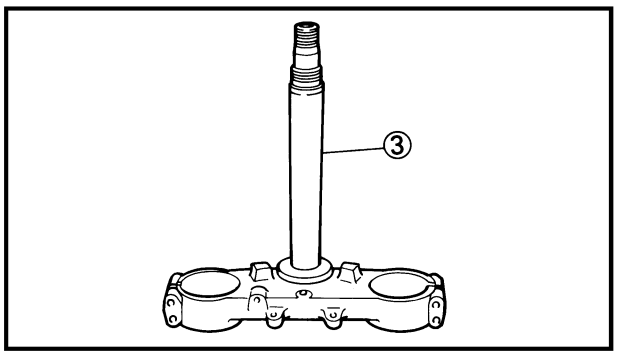
****

Replacement steps:
- Remove the bearing races from the slot on the steering head pipe using a long rod ③ and hammer as shown.
- Remove the bearing race on the steering stem using the floor chisel ④ and the hammer as shown.
- Install the new dust seal, bearings and races.

****







CAUTION:

- **Always replace bearings and races as a set.**
- **A slant installation of the bearings and the races will damage the frame, so take care to install them horizontally.**
- **Do not strike the rollers.**

3.Inspect:
- Handlebar crown ①
- Lower bracket ②
  Cracks/damage → Replace.
- Steering shaft ③
  Bends/damage → Replace the lower bracket assembly.

⚠ WARNING

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

INSTALLATION

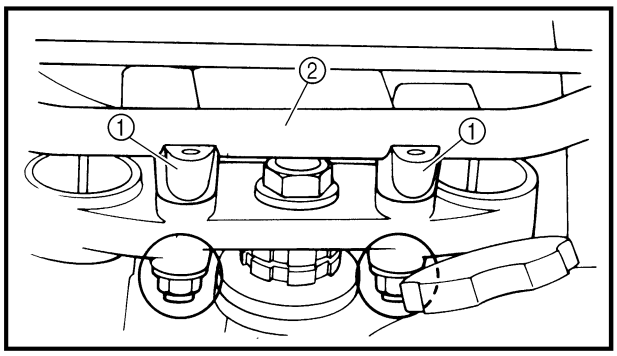
Handlebar

Reverse the "REMOVAL" procedure.
Note the following points.
1.Lubricate:
- Handlebar

	Lithium soap base grease

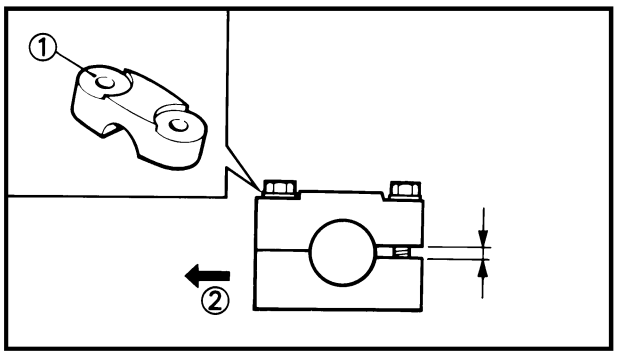
NOTE:

Before installing the throttle grip onto the handlebar, apply a light coat of lithium soap base grease onto the handlebar end.



2.Install:
- Handlebar holder ① (lower)
- Clip
- Handlebar ②

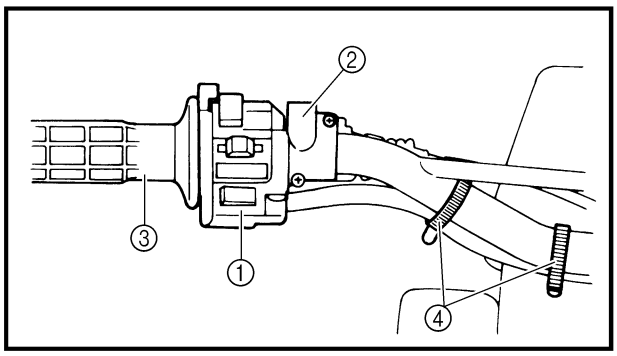
	Bolt (handlebar): 23 Nm (2.3 m • kg, 17 ft • lb)



NOTE:
The upper handlebar holder should be installed with the punch mark ① facing forward.

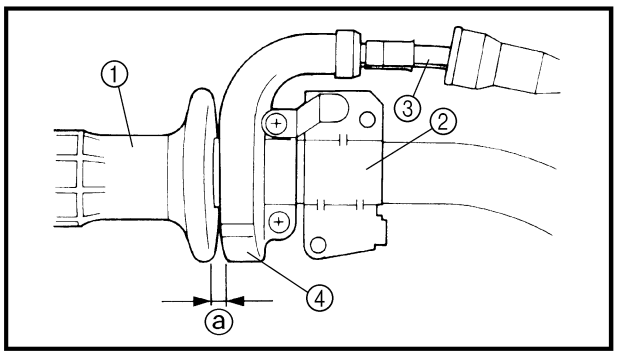
② Forward

CAUTION:
First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.



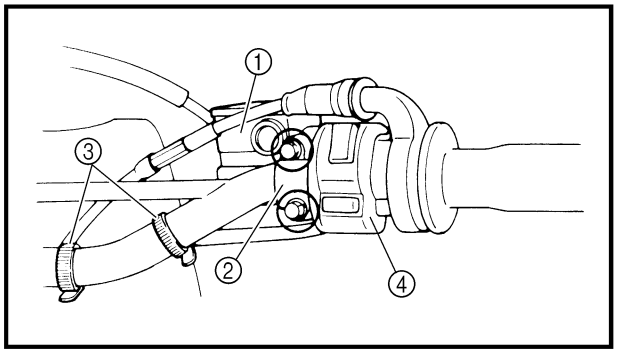
3.Install:
- Handlebar switch ① (left)
- Lever holder ②
- Grip ③
- Bands ④

NOTE:
Apply a light coat of lithium soap base grease onto the clutch cable end.



4.Install:
- Throttle grip ①
- Plate ②
- Throttle cable ③
- Throttle cable holder ④

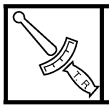
⚠ WARNING
Provide a clearance of 1 mm (0.04 in) ⓐ between the throttle grip and the throttle cable holder.



5.Install:
- Master cylinder assembly ①
- Master cylinder bracket ②
- Bands ③
- Handlebar switch (right) ④

NOTE:
When installing the handlebar switch (right), make sure its projection fits into the hole.

- 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

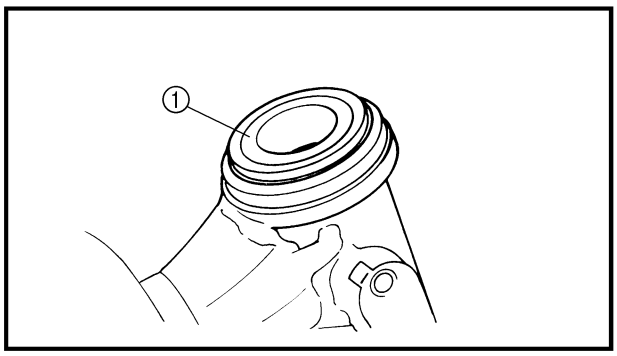
Proper hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING" in CHAPTER 2.

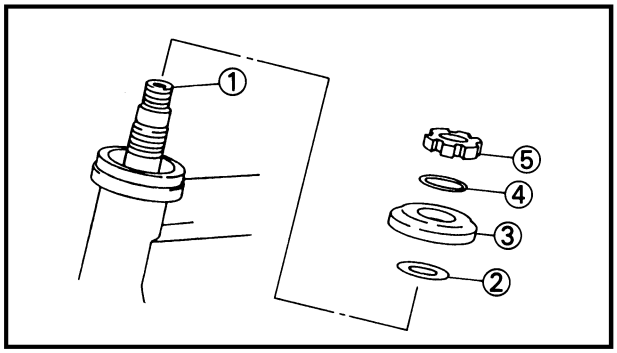
6.Adjust:

- Clutch cable free play

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

Refer to "CLUTCH ADJUSTMENT" in CHAPTER 3.





Steering head

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

1.Lubricate:

- Bearing (upper ① and lower)
- Bearing races

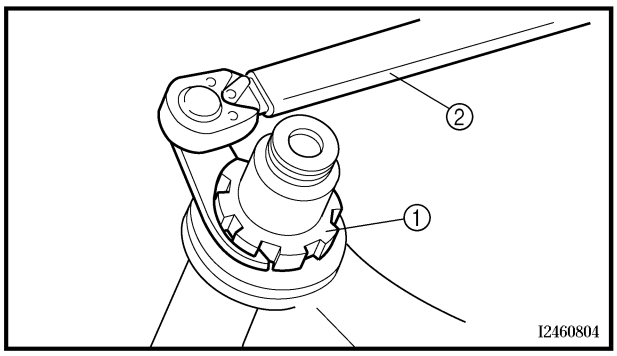
	**Lithium soap base grease**

2.Install:

- Steering shaft ①
- Washer ②
- Cover ③
- Washer ④
- Ring nut ⑤

CAUTION:

Hold the steering shaft until it is secured.



3.Tighten:
- Ring nut ①

****

Tightening steps:
- Tighten the ring nut using the ring nut wrench ②.

	Ring nut wrench: **P/N. YU-33975**

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

	Ring nut ① (lower) (initial tightening): **5 Nm (0.5 m • kg, 3.6 ft • lb)**

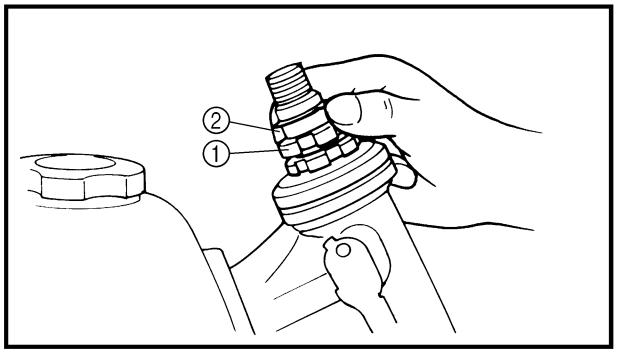
- Turn the lower bracket to the left and right making sure there is no binding, and then loosen the ring nut one turn.
- Retighten the ring nut using the ring nut wrench.

	Ring nut ① (lower) (final tightening): **38 Nm (3.8 m • kg, 27 ft • lb)**

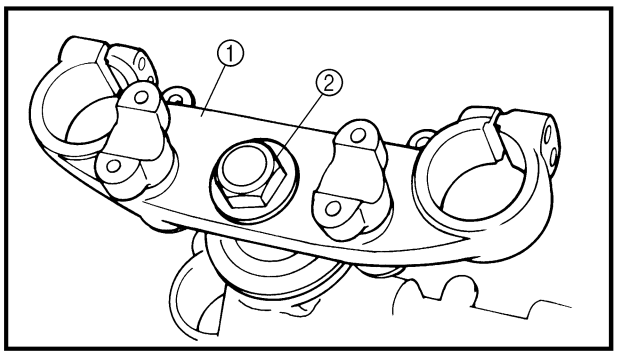
⚠ WARNING
Avoid over tightening.

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

****



4.Install:
- Rubber washer
- Ring nut ①
- Lock washer ②



5.Install:
- Handlebar crown ①

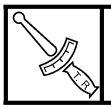
NOTE:
Temporarily tighten the steering stem nut ②.

6.Install:
- Brake hose holder
- Front flasher assembly

7.Install:
- Front fork
  Refer to "FRONT FORK".

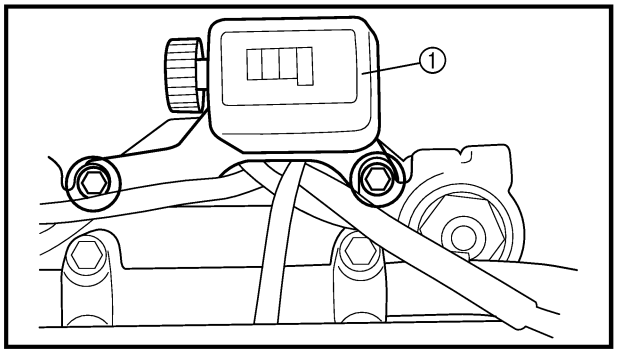
NOTE:
Temporarily tighten the pinch bolts.

8.Tighten:
- Steering stem nut

	**Steering stem nut:** **120 Nm (12 m • kg, 85 ft • lb)**

9.Tighten:
- Pinch bolts (front fork)

	**Pinch bolt (lower bracket):** **30 Nm (3.0 m • kg, 22 ft • lb)** **Pinch bolt (handlebar crown):** **23 Nm (2.3 m • kg, 17 ft • lb)**



10.Install:
- Speedometer assembly ①

CAUTION:
Make sure that the cables and leads are routed properly. Refer to "CABLE ROUTING" in CHAPTER 2.

⚠ WARNING

Proper hose routing is essential to insure safe motorcycle operation. Refer to "CABLE ROUTING" in CHAPTER 2.

11.Connect:
- Speedometer cable
  Refer to "CABLE ROUTING" in CHAPTER 2.

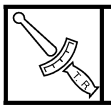
12.Install:
- Headlight assembly
- Front cover

13.Install:
- Brake caliper
- Holder (brake hose)
  Refer to "FRONT FORK".



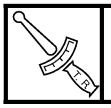
Bolt (brake caliper):
30 Nm (3.0 m • kg, 22 ft • lb)
Bolt (holder):
7 Nm (0.7 m • kg, 5.1 ft • lb)

14.Install:
- Front fender



Bolt (front fender):
8 Nm (0.8 m • kg, 5.8 ft • lb)

15.Install:
- Front wheel
  Refer to "FRONT WHEEL".



Wheel axle:
58 Nm (5.8 m • kg, 42 ft • lb)

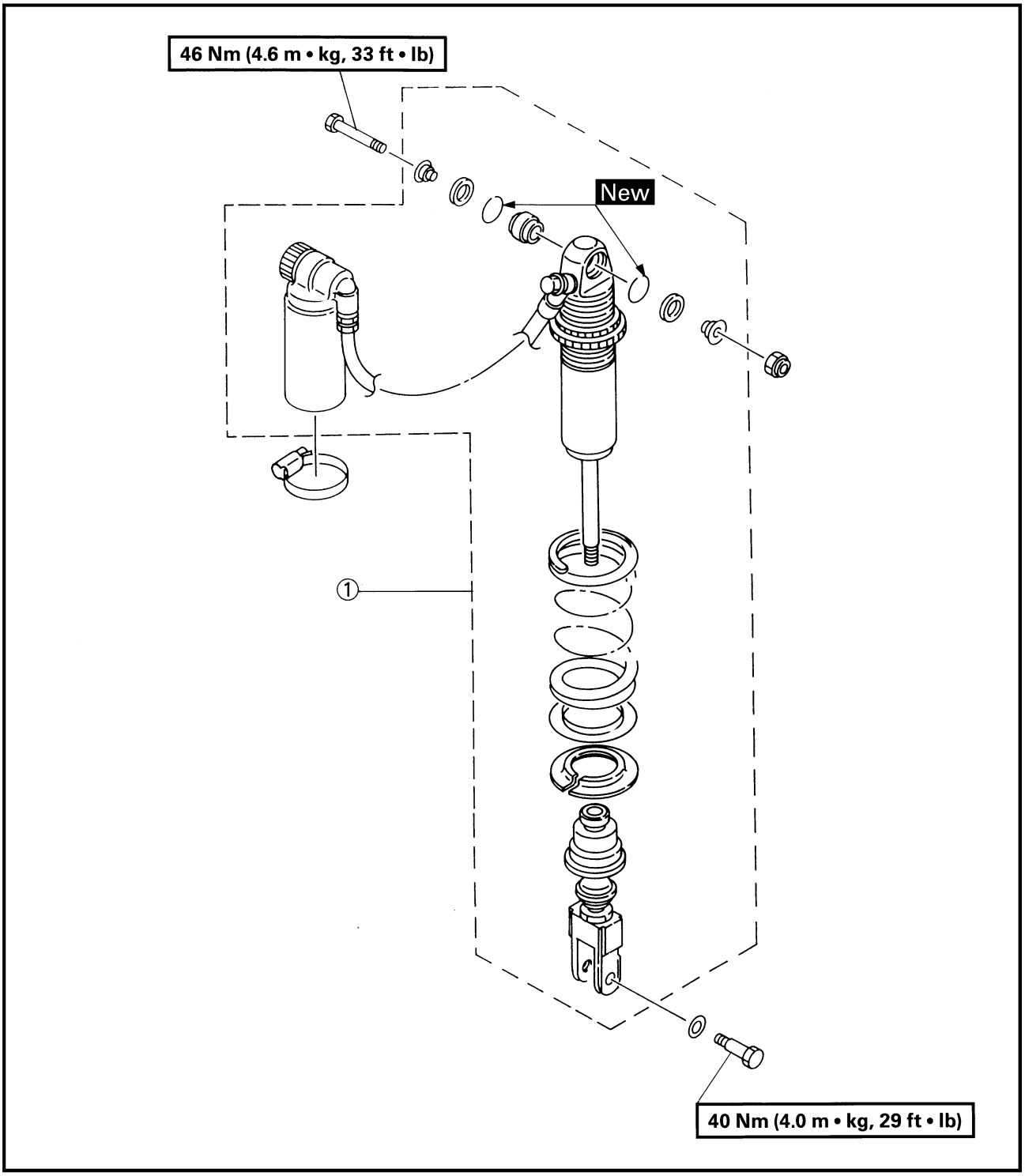
16.Install:
- Handlebar
  Refer to "Handlebar".



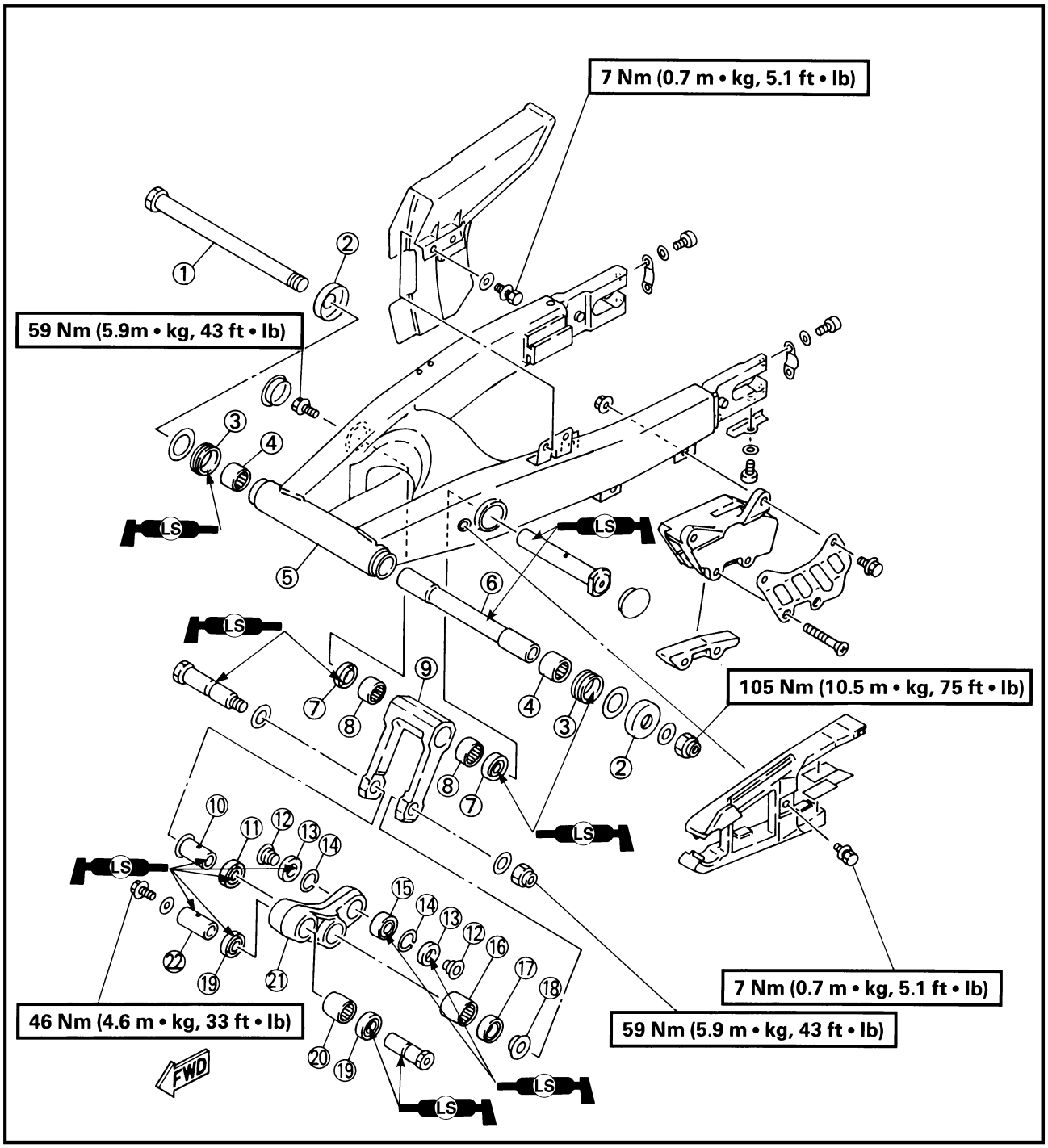
Bolt (handlebar):
23 Nm (2.3 m • kg, 17 ft • lb)
Bolt (master cylinder bracket):
7 Nm (0.7 m • kg, 5.1 ft • lb)

REAR SHOCK ABSORBER AND SWINGARM

① Rear shock absorber



① Pivot shaft
② Thrust cover (swingarm)
③ Oil seal
④ Bearing
⑤ Swingarm
⑥ Bush
⑦ Oil seal
⑧ Bearing
⑨ Connecting rod
⑩ Collar
⑪ Oil seal
⑫ Collar
⑬ Dust seal
⑭ Circlip
⑮ Bearing
⑯ Bearing
⑰ Oil seal
⑱ Collar
⑲ Oil seal
⑳ Bearing
㉑ Relay arm
㉒ Collar

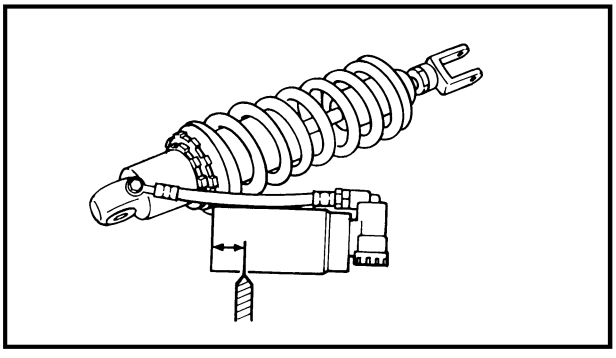


HANDLING NOTES

⚠ 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 "NOTES ON DISPOSAL".**



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 gas cylinder at a point 15 ~ 20 mm (0.6 ~ 0.8 in) from the end or the gas cylinder case.

⚠ WARNING

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

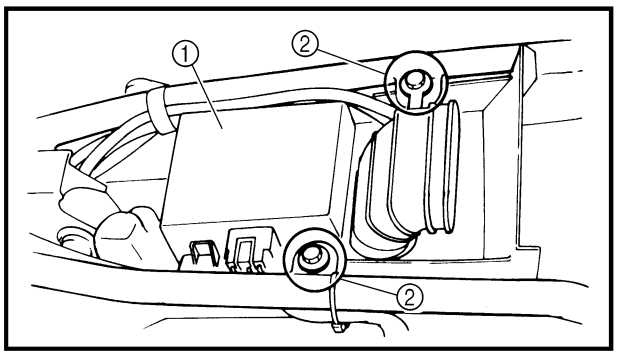
****

REMOVAL
Air filter case

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

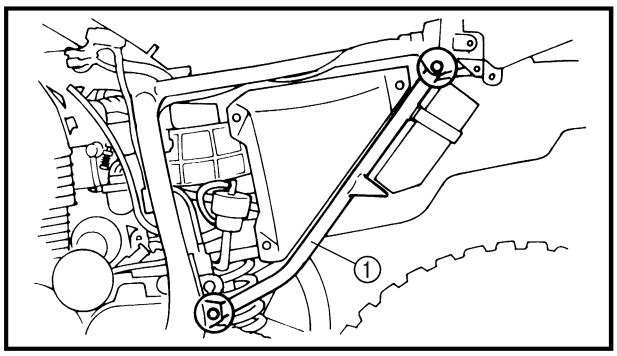
1.Place the motorcycle on a level place.
2.Remove:
- Side covers
- Seat
- Fuel tank
  Refer to "SEAT, FUEL TANK AND COVERS" in CHAPTER 3.

3.Elevate the rear wheel by placing a suitable stand under the frame and engine.
4.Disconnect:
- CDI unit ①
- Bolts ②

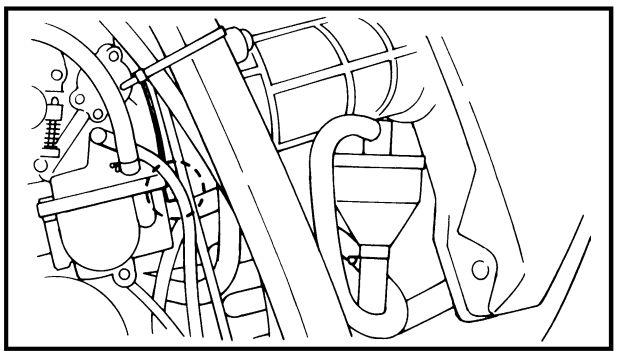


5.Remove:
- Rear frame 2 ①

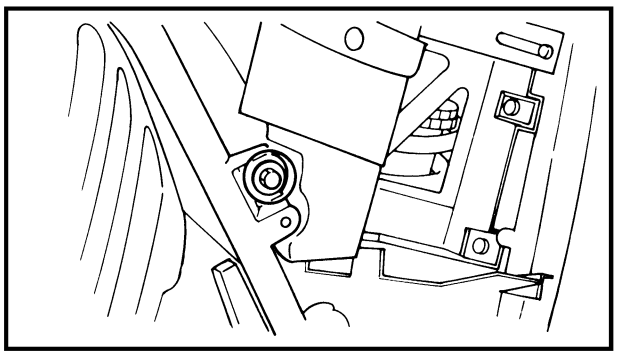
6.Disconnect:
- Breather hose 1
- Breather hose 2
  Refer to "CRANKCASE BREATHER HOSE INSPECTION" in CHAPTER 3.

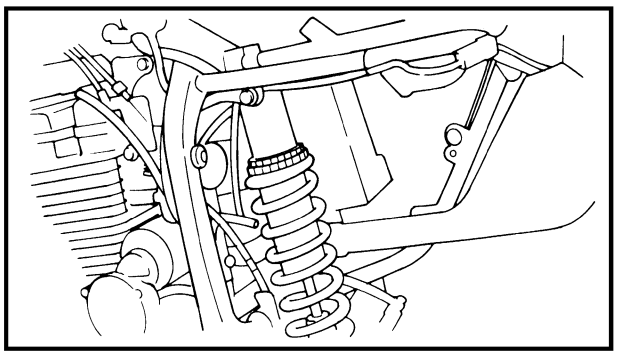


7.Loosen:
- Screw (carburetor joint clamp)



8.Remove:
- Bolts





9.Remove:
- Air filter case assembly

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
- Fuel tank

  Refer to "SEAT, FUEL TANK AND COVERS" in CHAPTER 3.

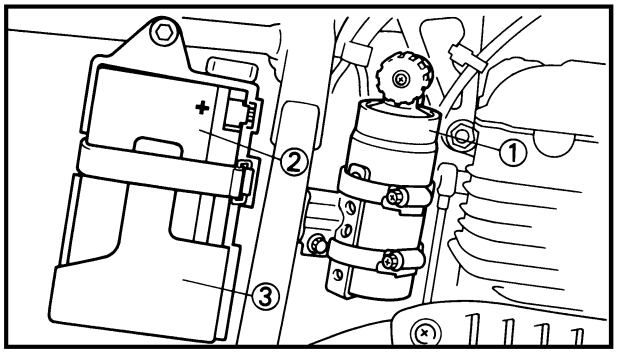
3.Elevate the rear wheel by placing a suitable stand under the frame and engine.

4.Remove:
- Air filter case assembly

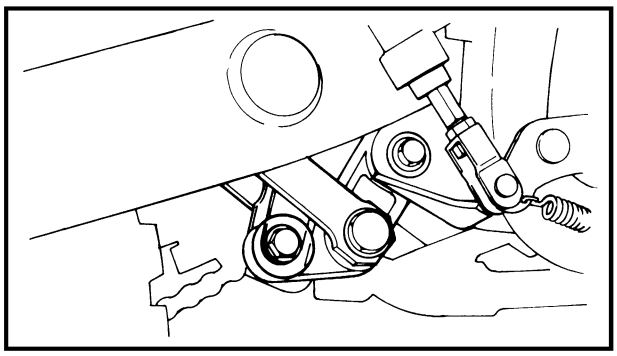
  Refer to "Air filter case".

5.Disconnect:
- Carburetor assembly

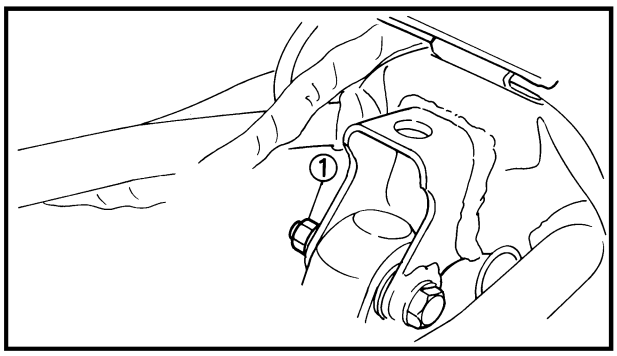
  Refer to "CARBURETOR" in CHAPTER 5.



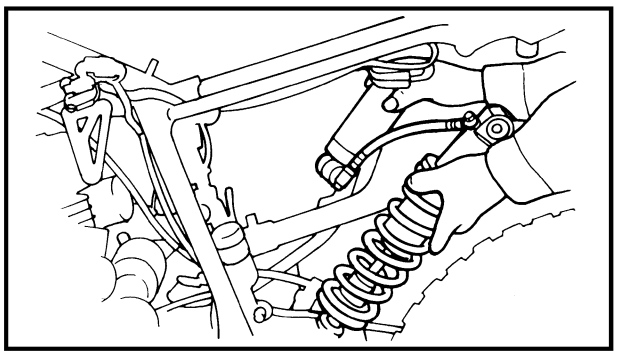
6.Remove:
- Gas cylinder ① (shock absorber assembly)
- Battery ②
- Battery case ③



7.Remove:
- Rear shock absorber bolt (lower)



8.Remove:
- Rear shock absorber nut ① (upper)



9.Remove:
- Rear shock absorber

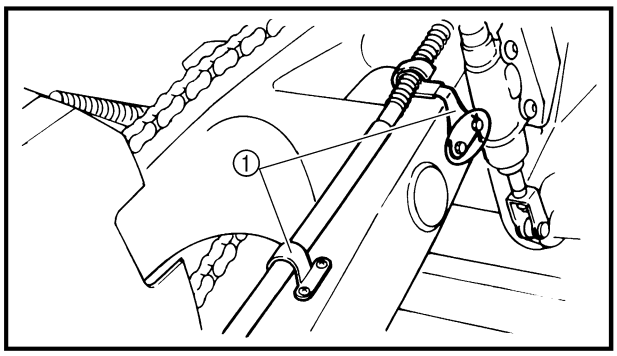
Swingarm

⚠ WARNING

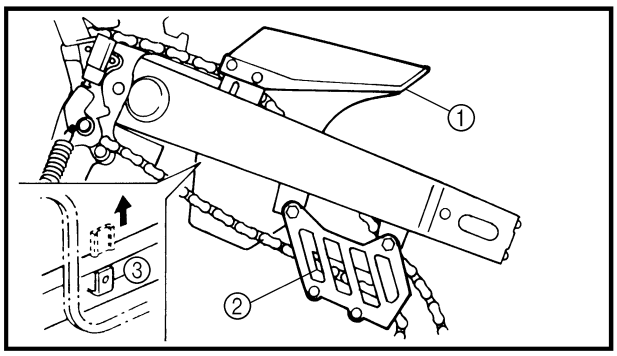
Securely support the motorcycle so there is no danger of it falling over.

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 “Rear shock absorber”.

4.Remove:
- Rear wheel
  Refer to “REAR WHEEL”.

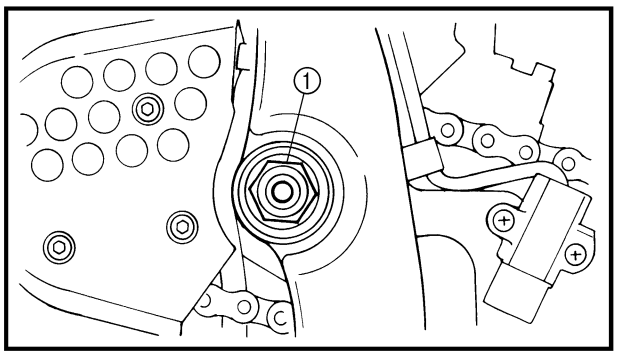


5.Remove:
- Brake hose holders ①
- Rear brake caliper



6.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.

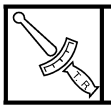


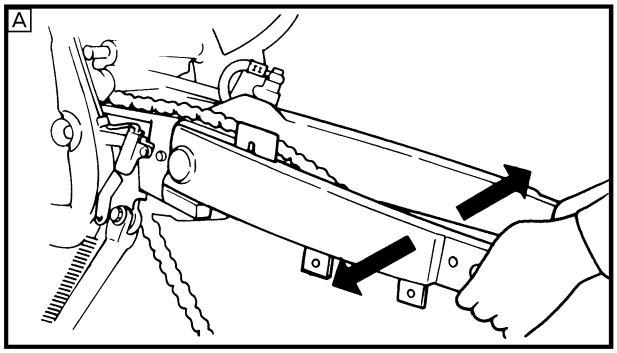
7.Check:
- Swingarm free play

****

Inspection steps:

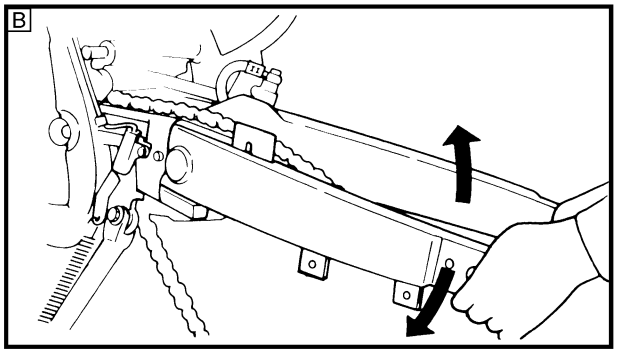
- Check the tightening torque of the pivot shaft (swingarm) securing nut ①.

	**Nut ① (pivot shaft):** **105 Nm (10.5 m • kg, 75 ft • lb)**



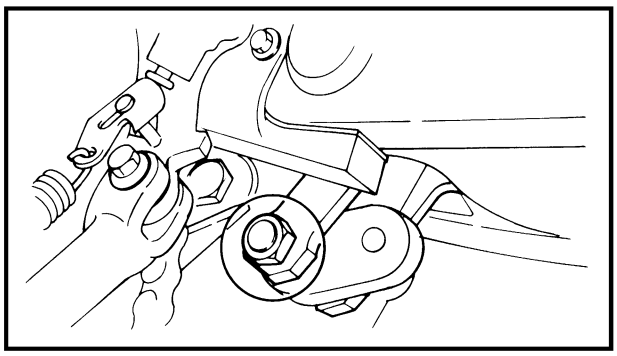
- Check the swingarm side play A by moving it from side to side.
  If side play is noticeable, check the inner collar, bearing, washer and thrust cover.

	**Side play (at end of swingarm):** **Limit: 1.0 mm (0.04 in)**

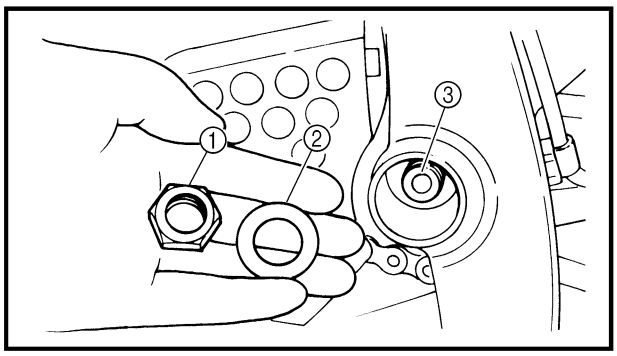


- Check the swingarm vertical movement B by moving it up and down.
  If vertical movement is tight or if these is binding, check the inner collar, bearing, washer and thrust cover.

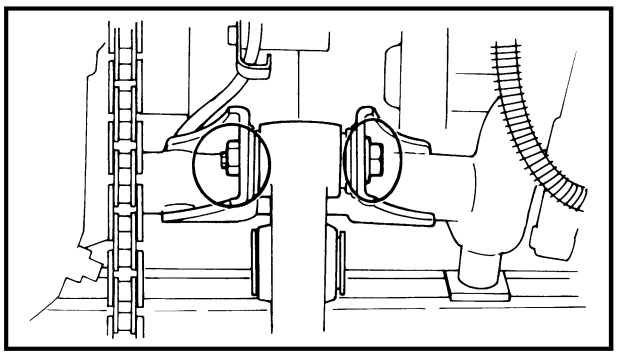
****



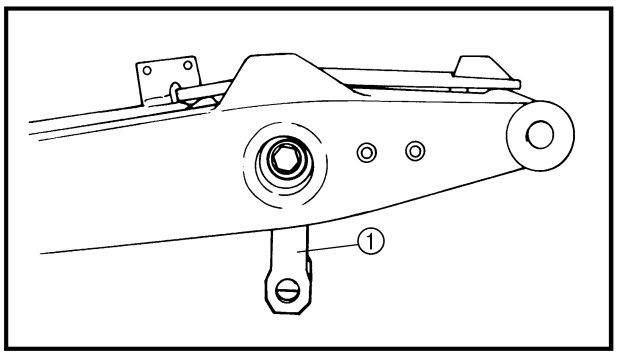
8.Remove:
- Bolt (relay arm-connecting rod)
- Nut



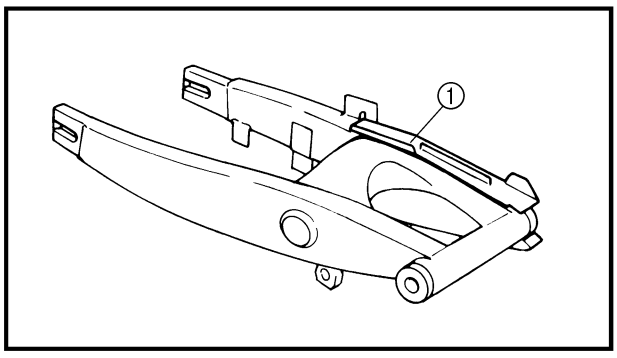
9.Remove:
- Nut ① (pivot shaft)
- Washer ②
- Pivot shaft ③
- Swingarm



10.Remove:
- Relay arm



11.Remove:
- Caps
- Connecting arm ①



12.Remove:
- Chain protector ①

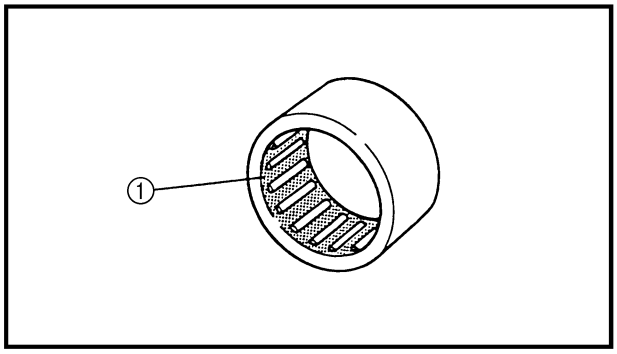
INSPECTION

1.Inspect:

- Rear shock absorber
  Oil leaks/damage → Replace the rear shock absorber.
- Gas cylinder
  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:

- Bearing
  Pitting/noise/damage → Replace.
  Loss of solid lubrication ① → Replace.

NOTE:

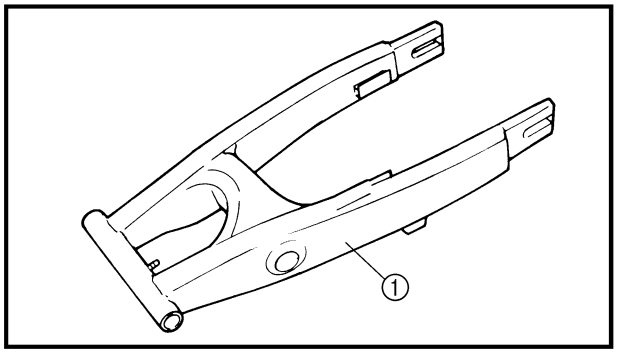
Polylube bearings*, with solid lubrication, have been adopted with the intent to make the needle bearings, used in this model, maintenance free. With polylube bearings, no grease nipple and regular lubrication is necessary. However, grease should be applied to all oil seals and collars when removed or installed.

*Polylube bearing

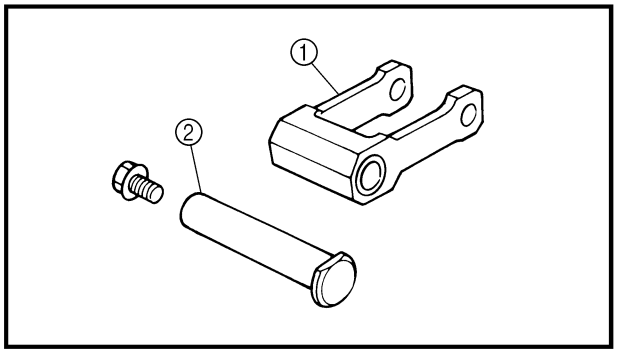
Grease and an ultra-high molecular weight polyethylene are the lubricating elements which are used. These two elements become solid after heat treatment, where they are sealed into the bearing race and perform as a solid lubricant to reduce friction when necessary.

Features
- Water seepage is no longer a problem since the polylube is solid. If water seeps into the bearing, it will emulsify and will not flow out.
- Lubrication can continuously be supplied to the contact points when heat is generated by the friction caused by the centrifugal forces, since the lubricant is solid and always remains inside the bearing.

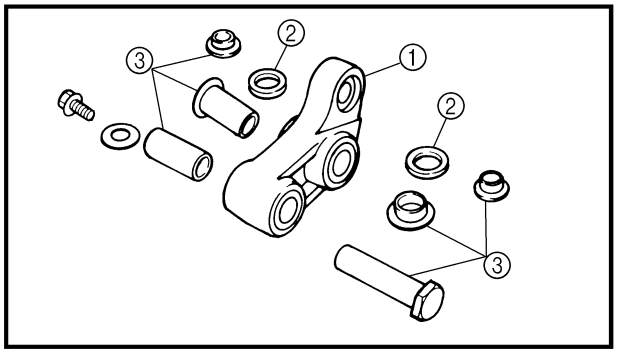
CAUTION:
- **Be careful not to damage the solid lubrication of the bearing when removing, inspecting, or installing the bearing.**
- **If the bearing is damaged, replace it with a new one.**



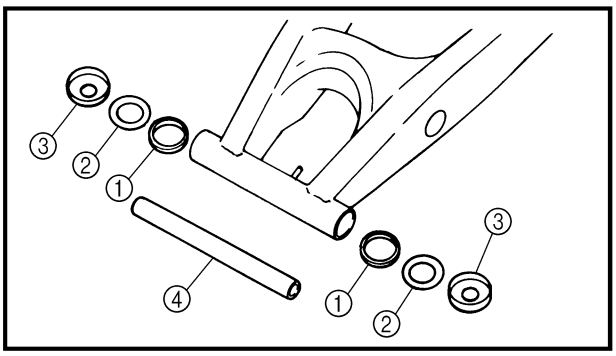
3.Inspect:
- Swingarm ①
  Bends/cracks/damage → Replace.



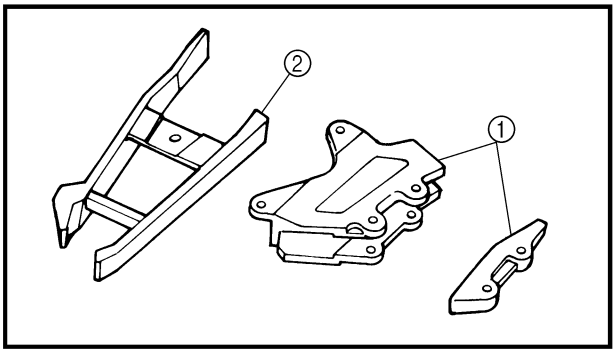
4.Inspect:
- Connecting arm ①
  Bends/cracks/damage → Replace.
- Collars ②
  Wear/damage → Replace.



5.Inspect:
- Relay arm ①
  Bends/cracks/damage → Replace.
- Oil seals ②
  Wear/damage → Replace.
- Collars ③
  Wear/damage → Replace.



6.Inspect:
- Oil seal ①
  Wear/damage → Replace.
- Washer ②
- Thrust cover ③
- Bush ④
  Scratches/damage → Replace.



7.Inspect:
- Chain guide ①
- Chain protector ②
  Cracks/damage → Replace.

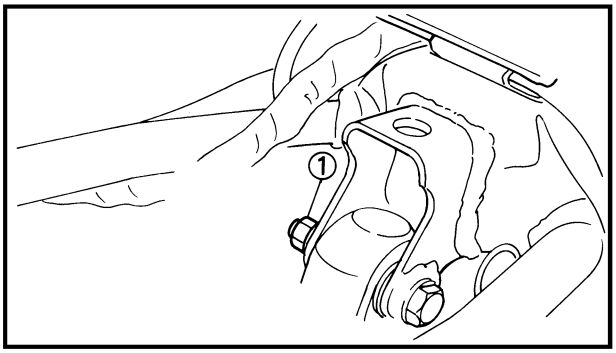
INSTALLATION

Rear shock absorber

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

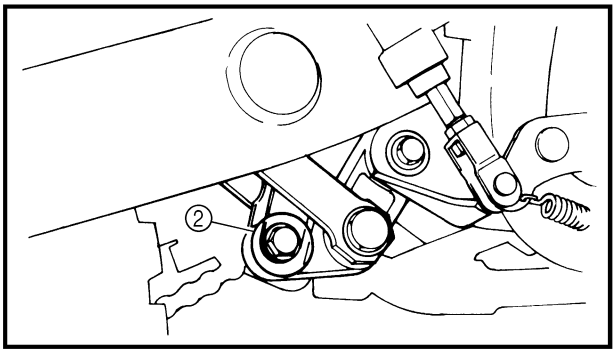
1.Lubricate:
- Collars (inner surface)

	Molybdenum disulfide grease



2.Install:
- Rear shock absorber

3.Tighten:
- Nut ① (upper side)



4.Tighten:
- Bolt ② (lower side)

	Nut ① (upper side): **46 Nm (4.6 m • kg, 33 ft • lb)** **Bolt ② (lower side):** **40 Nm (4.0 m • kg, 29 ft • lb)**

5.Install:
- Gas cylinder
- Carburetor assembly

6.Install:
- Air filter case
  Refer to "REAR SHOCK ABSORBER AND SWINGARM".

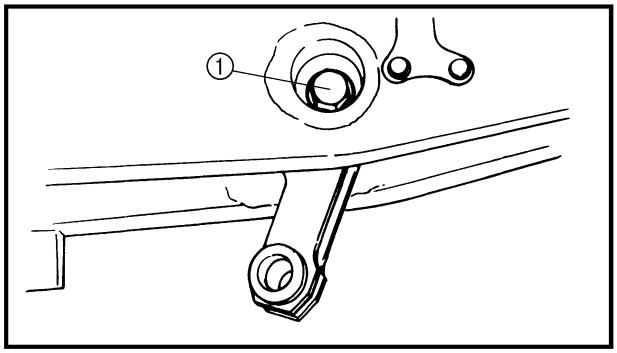
7.Install:
- CDI unit
- Rear frame 2

Swingarm

Reverse "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)

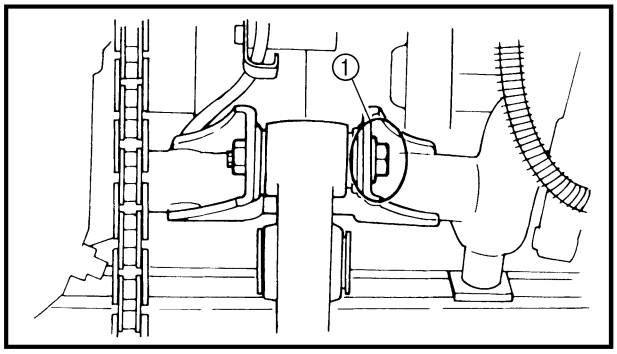
	Molybdenum disulfide grease



2.Tighten:
- Nut ① (swingarm-connecting arm)

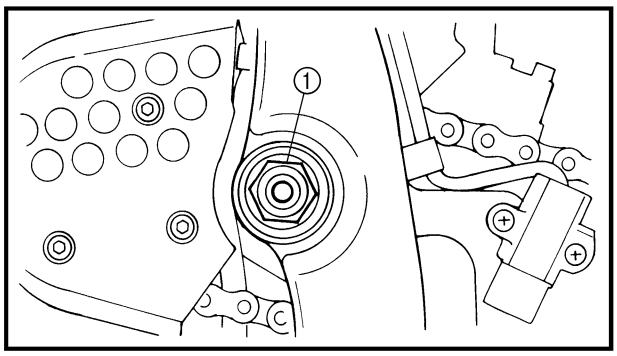
	Nut ① (swingarm-connecting arm): 59 Nm (5.9 m • kg, 43 ft • lb)

3.Install:
- Rubber caps
- Chain protector



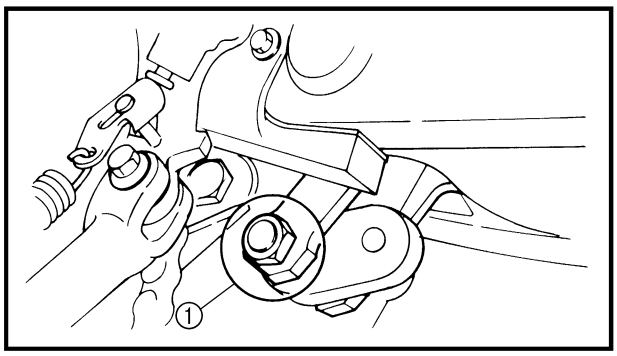
4.Install:
- Bolt ① (frame-relay arm)

	Bolt ① (relay arm): 46 Nm (4.6 m • kg, 33 ft • lb)



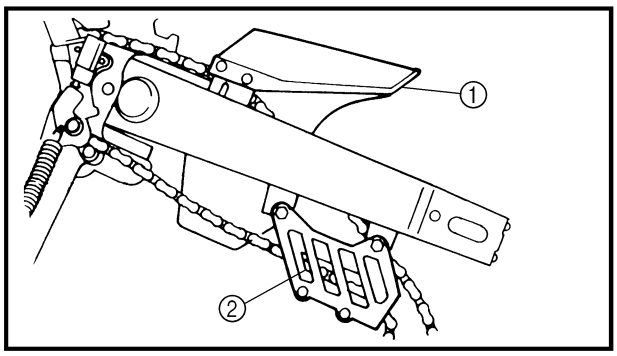
5.Tighten:
- Swingarm
- Nut ① (pivot shaft)

	Nut ① (pivot shaft): **105 Nm (10.5 m • kg, 75 ft • lb)**



6.Install:
- Nut ① (connecting arm-relay arm)

	Nut ① (connecting arm-relay arm): **59 Nm (5.9 m • kg, 43 ft • lb)**



7.Tighten:
- Bolt ① (chain case)
- Bolt ② (chain guide)

	Bolt ① (chain case): **7 Nm (0.7 m • kg, 5.1 ft • lb)** **Bolt ② (chain guide):** **7 Nm (0.7 m • kg, 5.1 ft • lb)**

8.Install:
- Rear shock absorber
  Refer to “REAR SHOCK ABSORBER”.

9.Install:
- Rear wheel
  Refer to “REAR WHEEL”.

10.Adjust:
- Drive chain slack

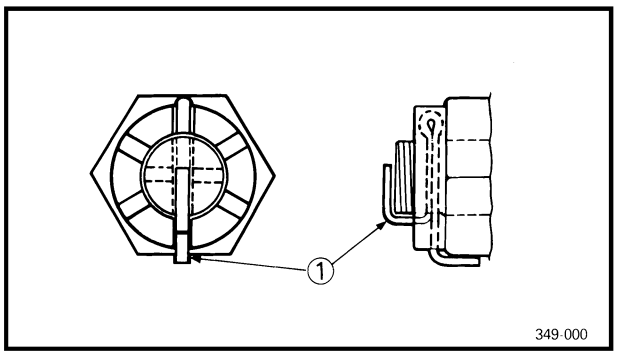
	Drive chain slack: **35 ~ 50 mm (1.38 ~ 1.97 in)**

Refer to “DRIVE CHAIN SLACK ADJUSTMENT” in CHAPTER 3.

11.Tighten:
- Axle nut

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

Refer to "REAR WHEEL".



12.Install:
- Cotter pin ①

NOTE:
Bend the ends of the cotter pin as illustrated.

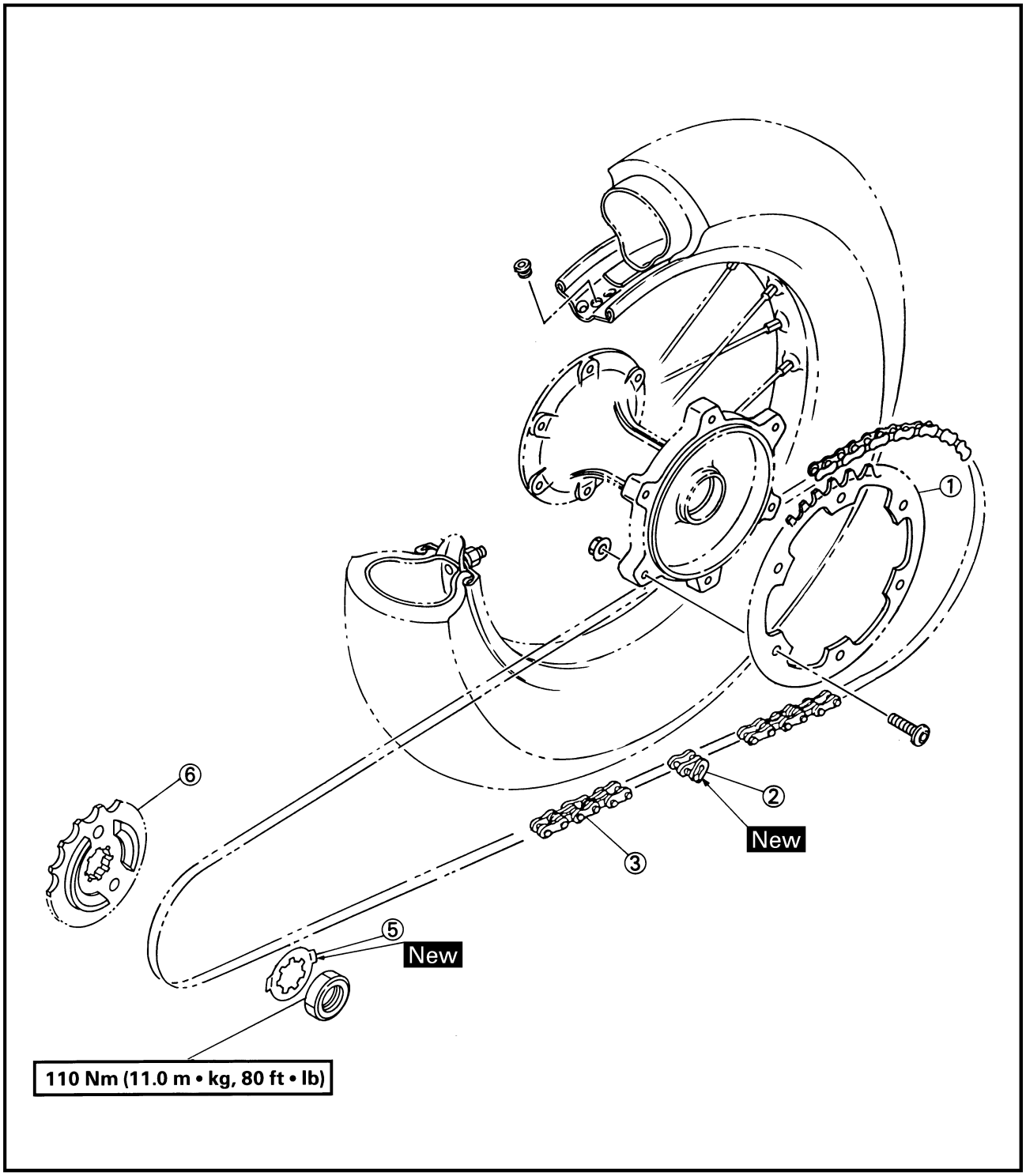
⚠ WARNING
Always use a new cotter pin.

13.Install:
- Fuel tank
- Seat
- Side covers

	Bolt **(fuel tank, seat and side covers):** **7 Nm (0.7 m • kg, 5.1 ft • lb)**

DRIVE CHAIN AND SPROCKETS

① Driven sprocket
② Chain joint
③ Drive chain
④ Washer
⑤ Drive sprocket

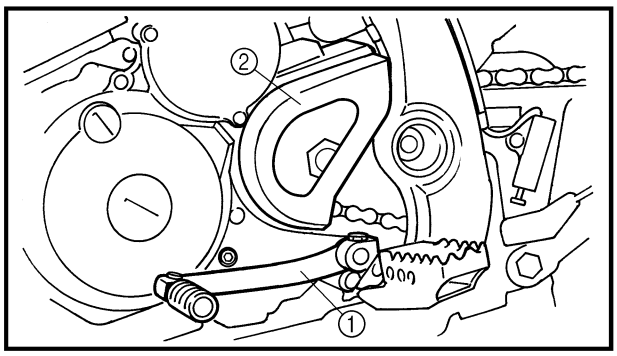


NOTE:
Before removing the drive chain and sprockets, drive chain slack and 10-link length of drive chain should be measured.

REMOVAL

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

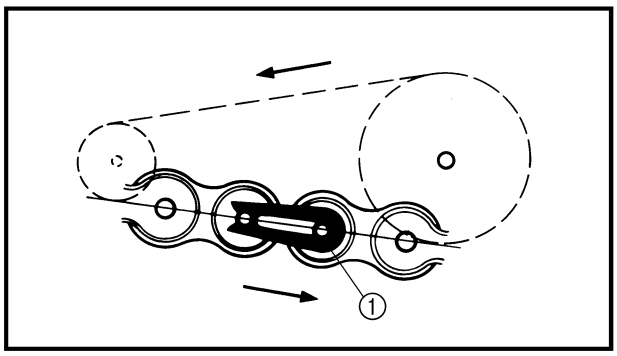
⚠ WARNING
Securely support the motorcycle so there is no danger of it falling over.



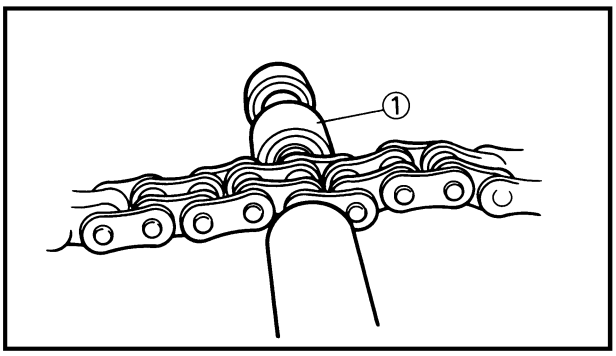
2.Remove:
- Shift pedal ①
- Crankcase cover 2 ②

3.Remove:
- Drive sprocket
- Drive chain

Refer to "ENGINE REMOVAL" in CHAPTER 4.

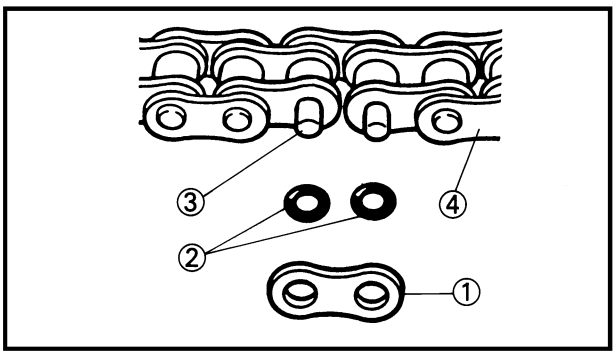


4.Remove:
- Chain joint clip ①



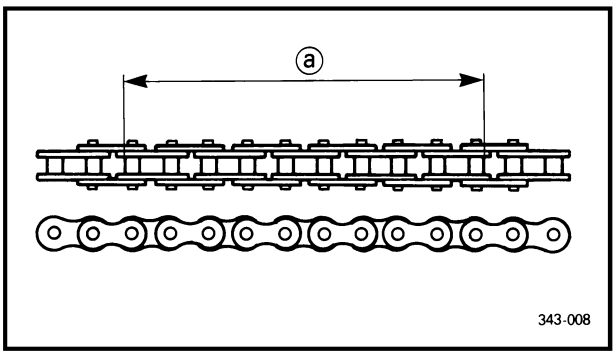
5.Remove:
- Chain joint
  Use the drive chain cutter tool ①.

	Drive chain cutter: **P/N. 90890-01286**



6.Remove:
- Link plate ①
- O-ring ②
- Pin ③
- Drive chain ④

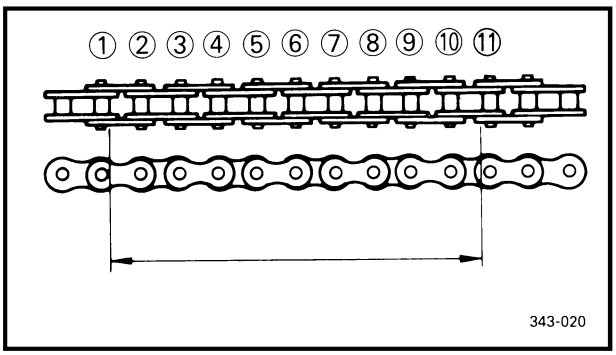
7.Remove:
- Rear wheel
  Refer to "REAR WHEEL".



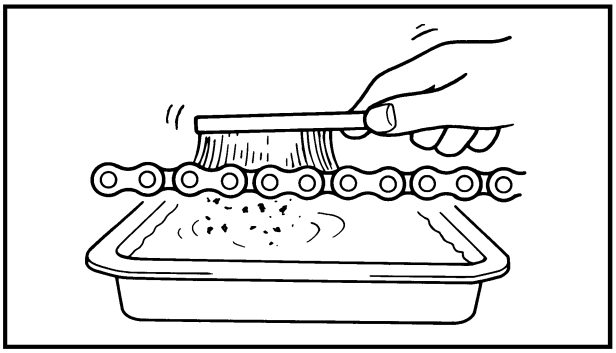
INSPECTION

1.Measure:
- 10-link length ⓐ (drive chain)
  Use ⓐ vernier caliper gauge.
  Out of specification → Replace the drive chain.

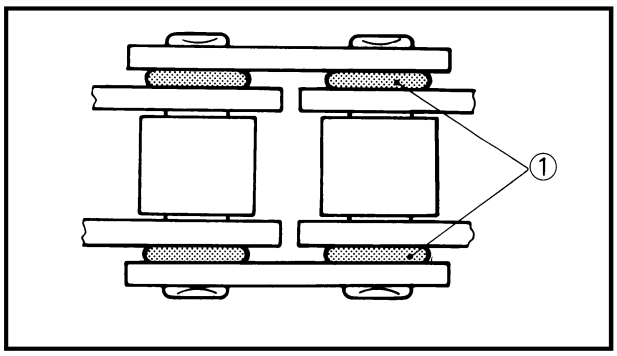
	10-link length limit: **150.1 mm (5.90 in)**



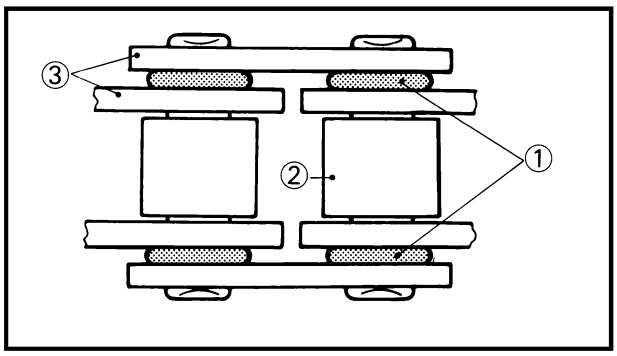
NOTE:
- For measurement, increase the chain tension with you finger.
- 10-link length is a measurement between the inside edges of the ① and ⑪ rollers as shown.
- Two or three different 10-link lengths should be measured.



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 it off.

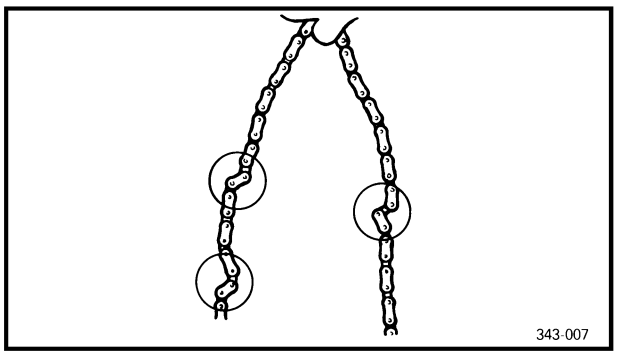


CAUTION:
This motorcycle has a drive chain with small rubber O-rings ① between the chain plates. Steam cleaning, high-pressure washers, and certain solvents can damage these O-rings. Use only kerosene to clean the drive chain.

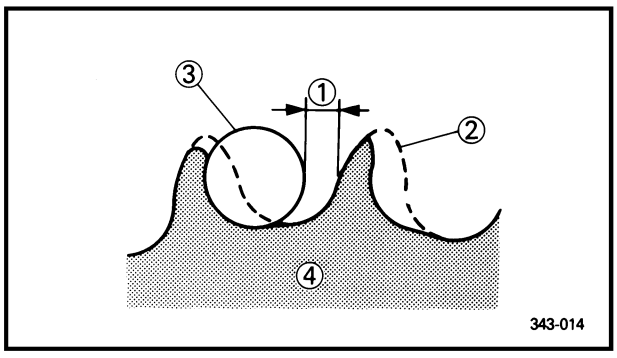


3.Inspect:
- O-ring ① (drive chain)
  Damage → Replace the drive chain.
- Rollers ②
- Chain joint ③
  Damage/wear → Replace the drive chain.

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 tooth ① wear → Replace the sprocket.
  Bent teeth → Replace the sprocket.

② Correct
③ Roller
④ Sprocket

INSTALLATION

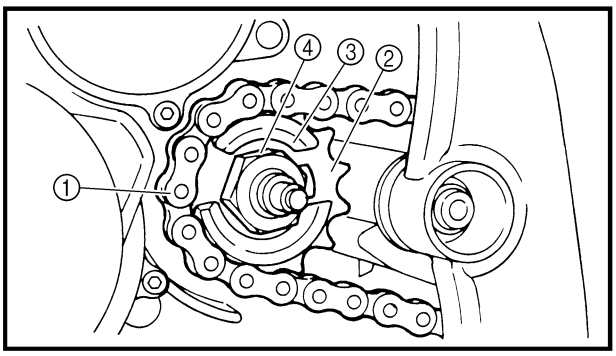
Reverse the "REMOVAL" procedure.
Note the following points.

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 "REAR WHEEL".

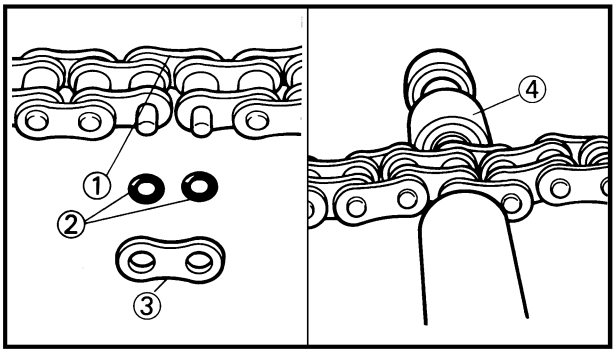
3.Install:
- Drive chain ①
- Drive sprocket ②
- Washer ③
- Nut ④



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

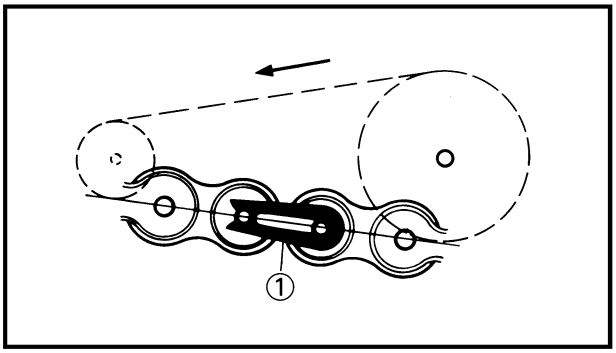
NOTE:
Tighten the nut (drive sprocket) while applying the rear brake.

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

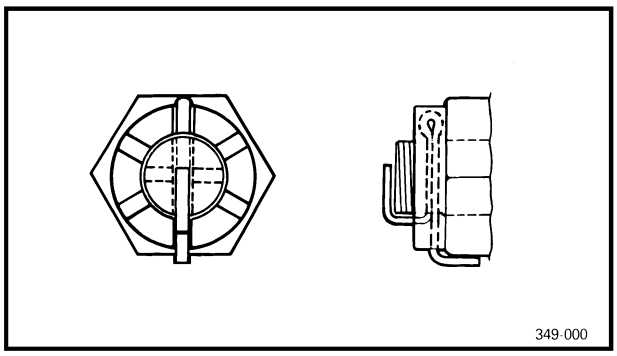


CAUTION:
Be sure to install the chain joint clip to the direction as shown.

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

	Drive chain slack: **35 ~ 50 mm (1.38 ~ 1.97 in)**

CAUTION:
Too little 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:
105 Nm (10.5 m • kg, 75 ft • lb)

Refer to "REAR WHEEL".

8.Install:
- Cotter pin

NOTE:
Bend the ends of the cotter pin as illustrated.

⚠ WARNING
Always use a new cotter pin.

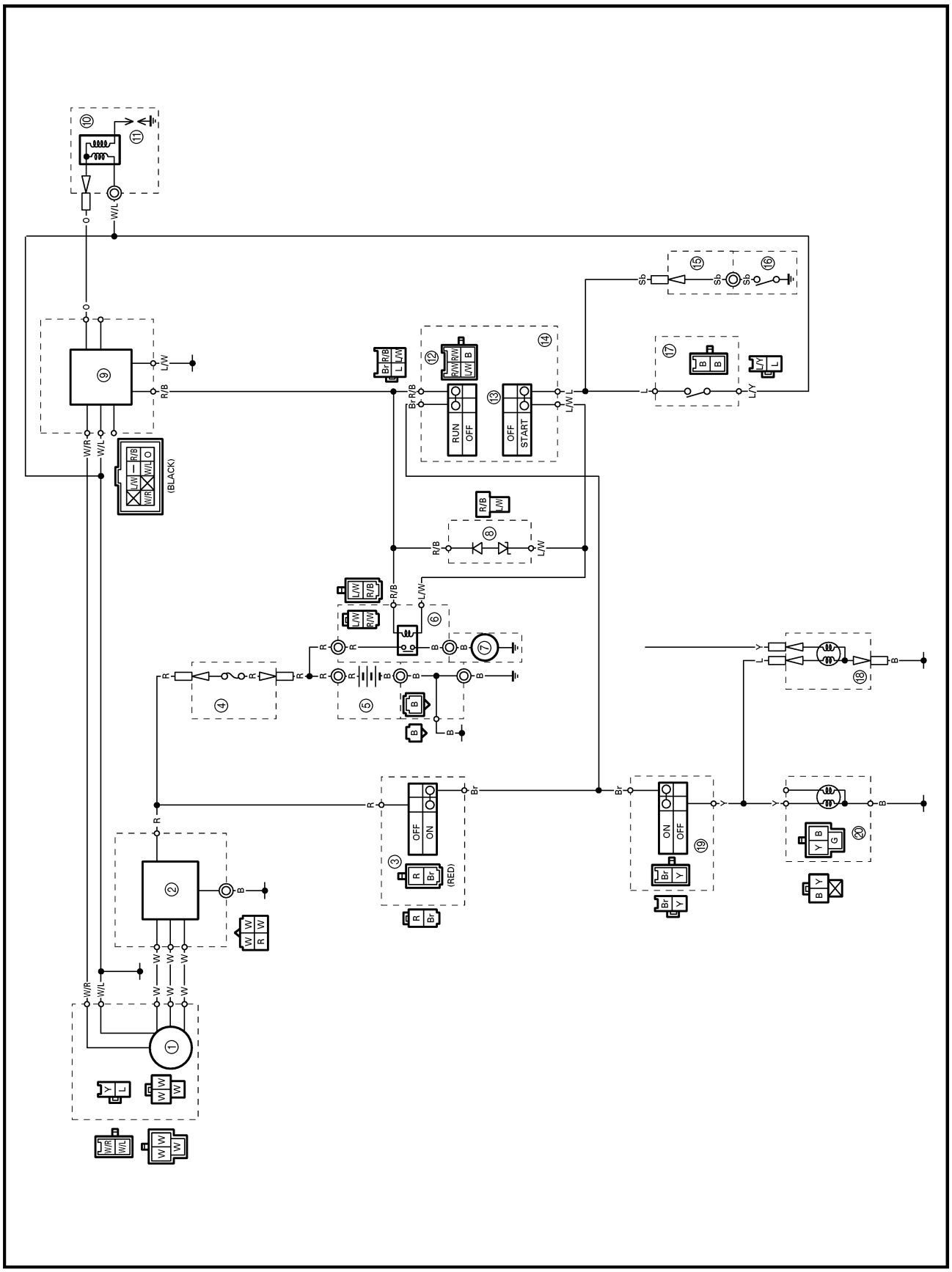
9.Install:
- Crankcase cover 2 (drive sprocket)
- Shift pedal

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

Bolt (crankcase cover 2):
10 Nm (1.0 m • kg, 7.2 ft • lb)
Bolt (shift pedal):
10 Nm (1.0 m • kg, 7.2 ft • lb)

ELECTRICAL

TTR250L(C) CIRCUIT DIAGRAM



① AC magneto
② Rectifier/regulator
③ Main switch
④ Fuse (main)
⑤ Battery
⑥ Starter relay
⑦ Starter motor
⑧ Diode
⑨ CDI unit
⑩ Ignition coil
⑪ Spark plug
⑫ "ENGINE STOP" switch
⑬ "START" switch
⑭ Handlebar switch (right)
⑮ Wire sub lead
⑯ Neutral switch
⑰ Clutch switch
⑱ Tail light
⑲ "LIGHTS" switch
⑳ Headlight

NOTE:
- The "START" switch is closed while the button (switch) is pushed.
- The clutch switch is closed while the clutch lever is pulled.
- The neutral switch is closed while the transmission is in neutral.

COLOR CODE

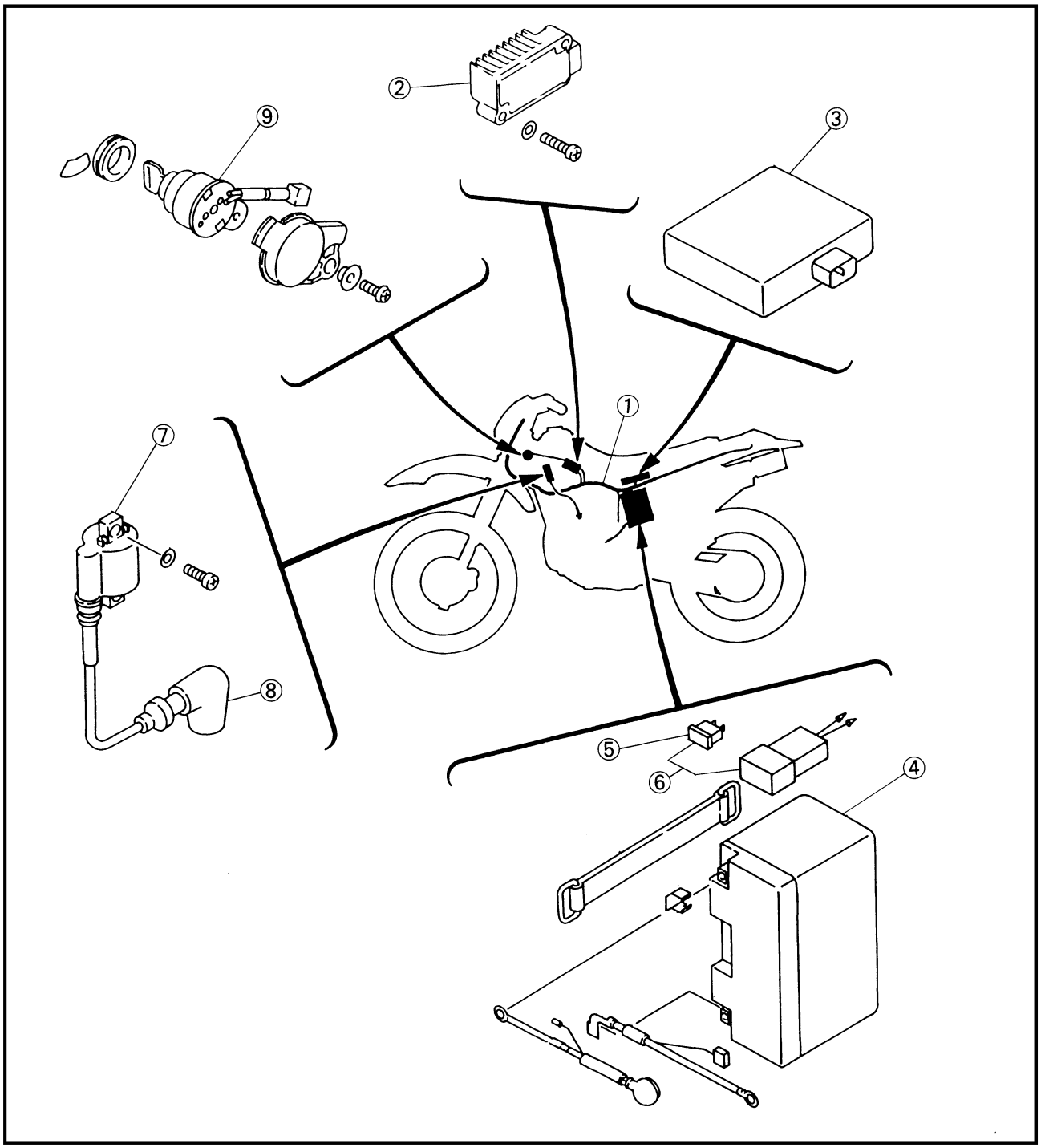
B	Black	R	Red	L/Y	Blue/Yellow
Br	Brown	Sb	Sky blue	R/B	Red/Black
G	Green	W	White	R/W	Red/White
L	Blue	Y	Yellow	W/L	White/Blue
O	Orange	L/W	Blue/White	W/R	White/Red

ELECTRICAL COMPONENTS

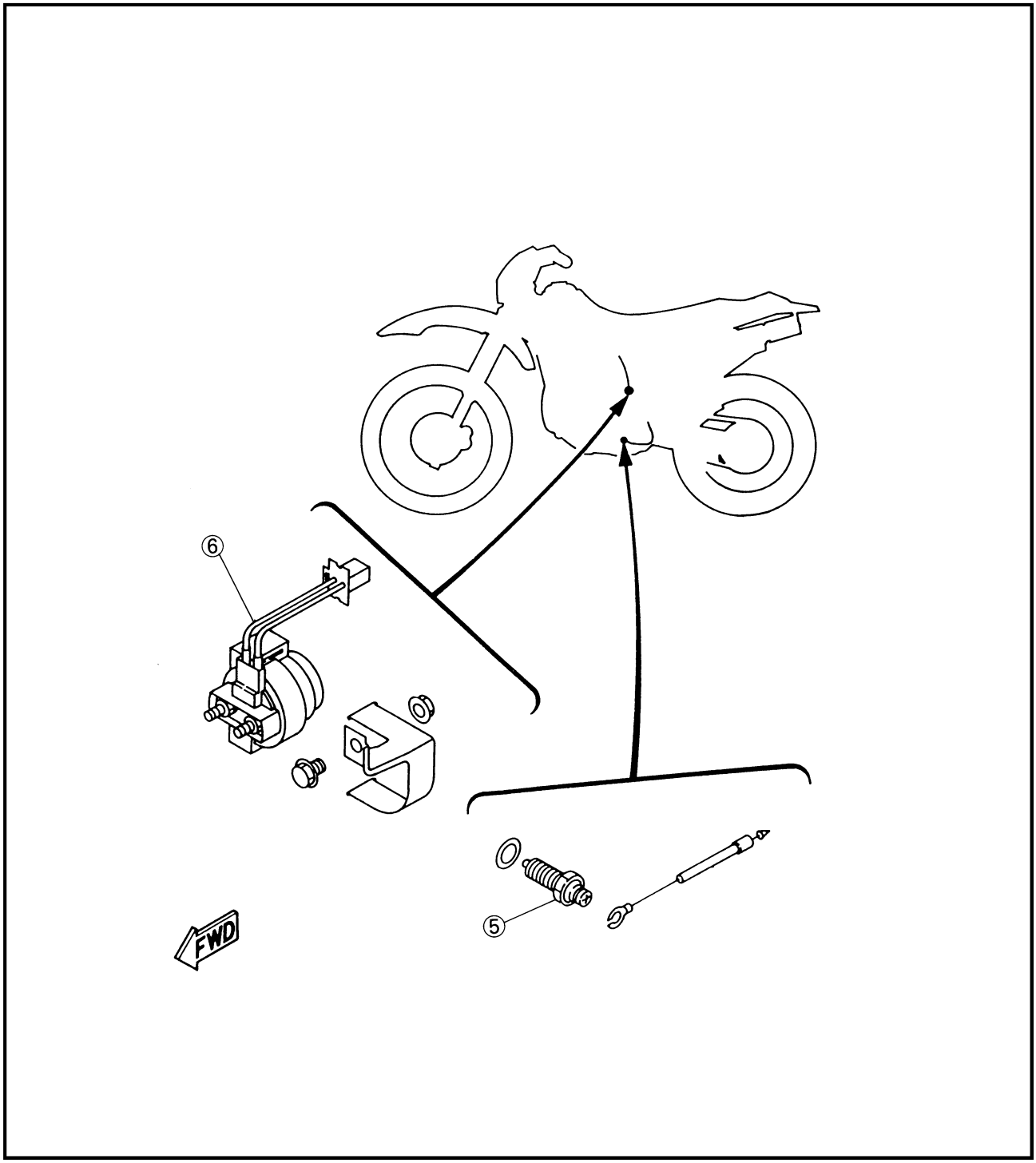
① Wireharness
② Rectifier/regulator
③ CDI unit
④ Battery
⑤ Fuse
⑥ Fuse holder assembly
⑦ Ignition coil
⑧ Plug cap
⑨ Main switch assembly

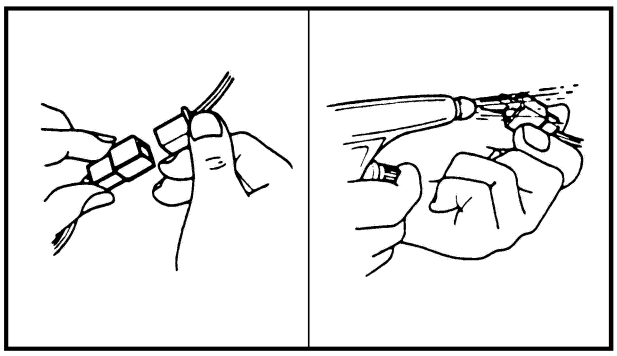
BATTERY:
SPECIFIC GRAVITY: 1.320

IGNITION COIL:
PRIMARY COIL RESISTANCE:
0.36 ~ 0.48 Ω at 20 °C (68 °F)
SECONDARY COIL RESISTANCE:
5.4 ~ 7.4 kΩ at 20 °C (68 °F)



① Neutral switch
② Starter relay



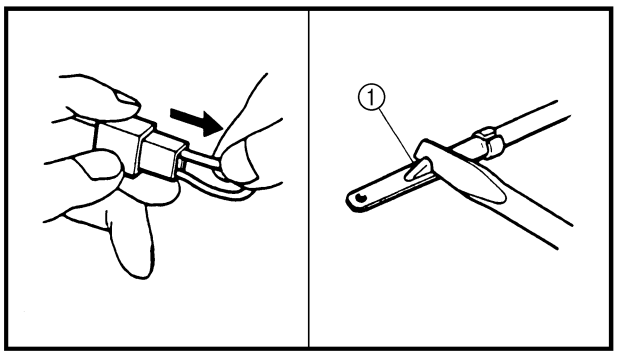


CHECKING OF CONNECTIONS

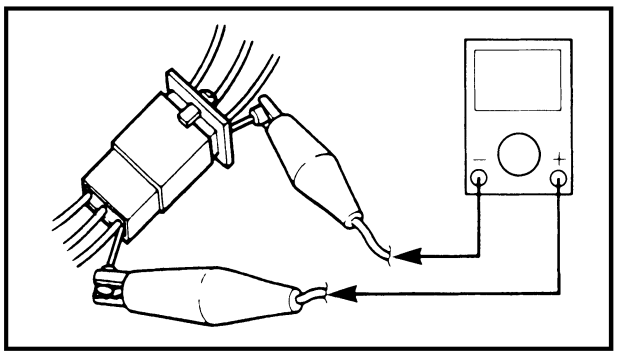
Dealing with stains, rust, moisture, etc. on the connector.

1.Disconnect:
- Connector

2.Dry each terminal with an air blower.

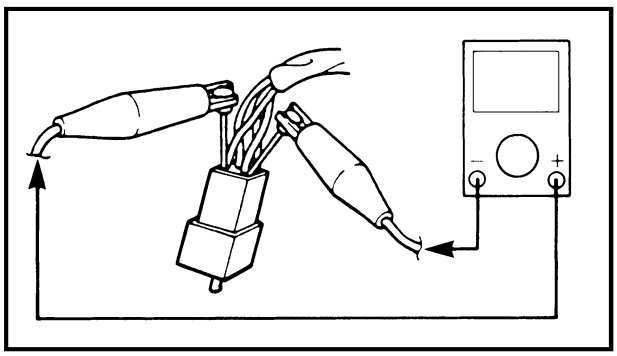


3.Connect and disconnect the connector two or three times.
4.Pull the lead to check that it will not come off.
5.If the terminal comes off, bend up the pin ① and reinsert the terminal into the connector.



6.Connect:
- Connector

7.Check for continuity with a tester.



NOTE:
- If there is no continuity, clean the terminals.
- Be sure to perform the above steps 1 to 7 when checking the wireharness.
- When replacing the CDI unit, be sure to check its connector.
- For a field remedy, use a contact revitalizer available on the market.
- Use the tester on the connector as shown.

I
C

①
②
④
⑤
⑧
⑩
⑪

NB283000
TROUBLESHO

NB283100
Procedure
Check:
1.Fuse (main)
2.Battery
3.Spark plug
4.Ignition spark
5.Spark plug ca
6.Ignition coil r

NB283110
NOTE:
- Remove the
  bleshooting.

1)Seat
2)Side covers
3)Fuel tank

NB283120

1.Fuse (main)
• Remove the • Connect the fuse. • Check the fu

EB283130

2.Battery
• Check the ba Refer to "E CHAPTER 3.
Open circuit 12.8 V or m

*

EB283140

3.Spark plug

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.
  Refer to "SPARK PLUG INSPECTION" in CHAPTER 3.

Standard spark plug:
CR9E (NGK), U27ESR-N (N.D.)

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

INCORRECT

Repair or replace the spark plug.

CORRECT

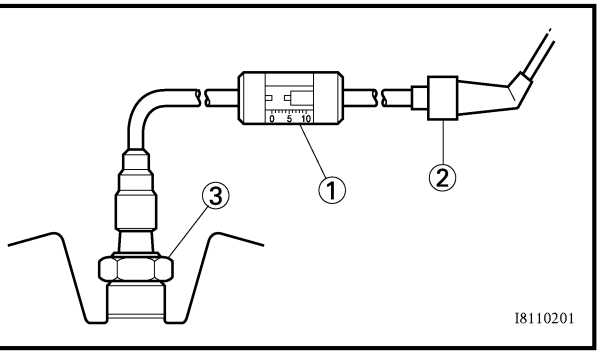
NB283150

4.Ignition spark gap

- Disconnect the spark plug cap from the 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 the engine, and increase the spark gap until a misfire occurs.



Minimum spark gap:
6.0 mm (0.24 in)

MEETS SPECIFICATION

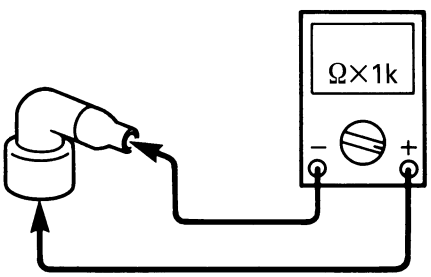
Ignition system is good.

OUT OF SPECIFICATION OR NO SPARK

NB283160

5.Spark plug cap resistance

- Remove the spark plug cap.
- Connect the pocket tester (Ω × 1 k) to the spark plug cap.



- Check the spark plug cap for specified resistance.

Spark plug cap resistance:
10 kΩ at 20 °C (68 °F)

OUT OF SPECIFICATION → Replace the spark plug cap.

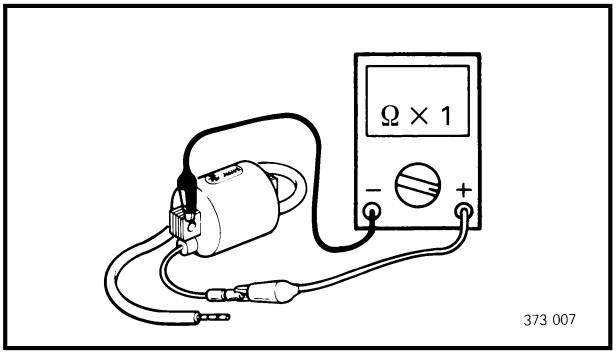
MEET SPECIFICATION

NB283170

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 → (+) Orange lead
Tester (–) lead → (–) Body earth

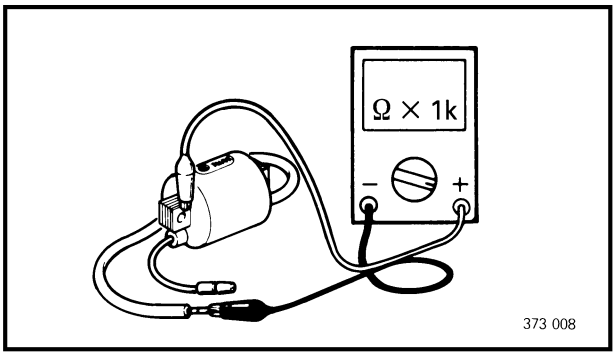


- Check the primary coil for specified resistance.

Primary coil resistance:
0.36 ~ 0.48 Ω at 20 °C (68 °F)

- Connect the pocket tester (Ω × 1 k) to the ignition coil.

Tester (+) lead → Spark plug lead
Tester (–) lead → Body earth



- Check the secondary coil for specified resistance.

Secondary coil resistance:
5.44 ~ 7.36 kΩ at 20 °C (68 °F)
(Spark plug lead-spark plug lead)

OUT OF SPECIFICATION → Replace the ignition coil.

BOTH MEET SPECIFICATIONS

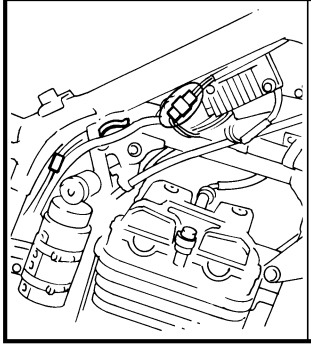
*

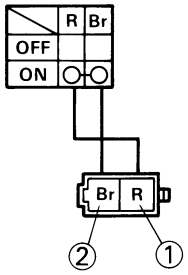
*

NB283180

7.Main switch

- Disconnect the main switch coupler from the wireharness.
- Check the switch component for continuity between “Red ① and Brown ②”.





INCORRECT

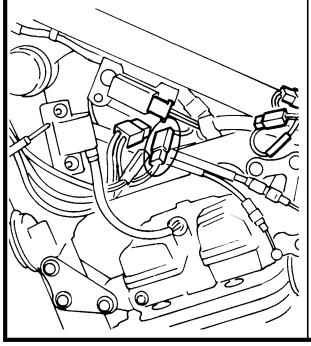
Replace the main switch.

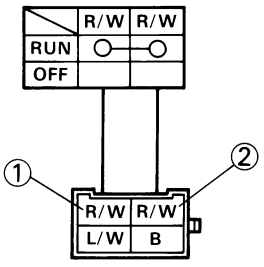
CORRECT

NB283190

8.“ENGINE STOP” switch

- Disconnect the handlebar switch (right) coupler from the wireharness.
- Check the switch component for continuity between “Red/White ① and Red/White ②”.





INCORRECT

Replace the handlebar switch (right).

CORRECT

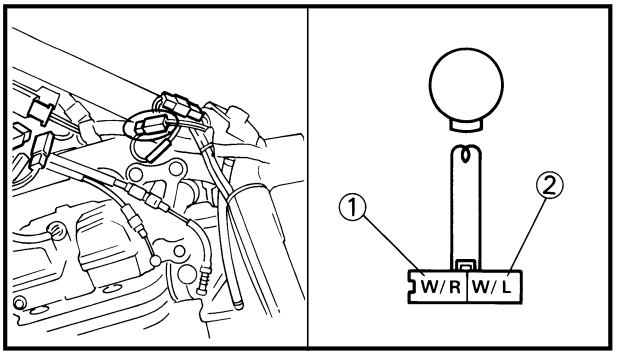
*

*

9.Pickup coil resistance

- Disconnect the pickup coil coupler from the wireharness.
- Connect the pocket tester (Ω × 100) to the pickup coil terminal.

Tester (+) lead → White/Red ①
Tester (–) lead → White/Blue ②



- Check the pickup coil for specified resistance.

Pickup coil resistance:
190 ~ 230 Ω at 20 °C (68 °F)
(White/Red-White/Blue)

OUT OF SPECIFICATION

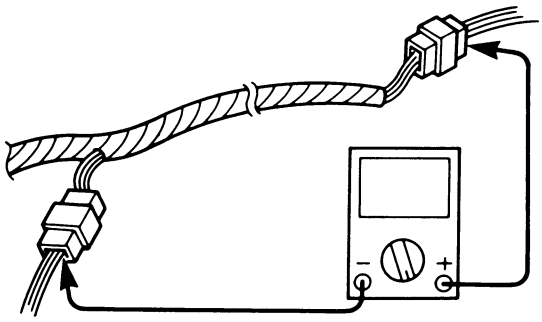
Replace the pickup coil.

MEET SPECIFICATION

NB283240

10.Wiring connection

- Check the entire ignition system for connections.
  Refer to “WIRING DIAGRAM”.



POOR CONNECTION

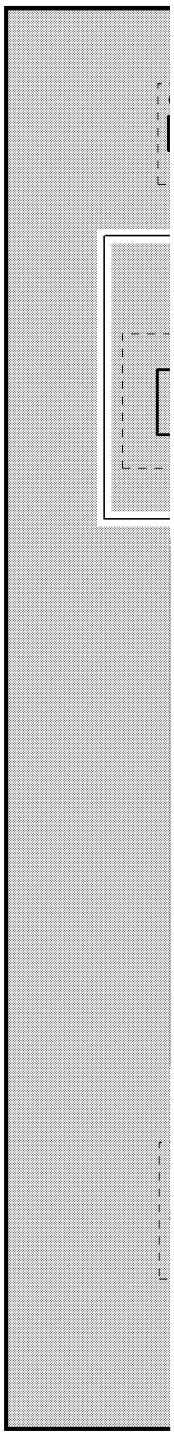
Correct.

CORRECT

Replace the CDI unit.

ELECTRIC
CIRCUIT DIA

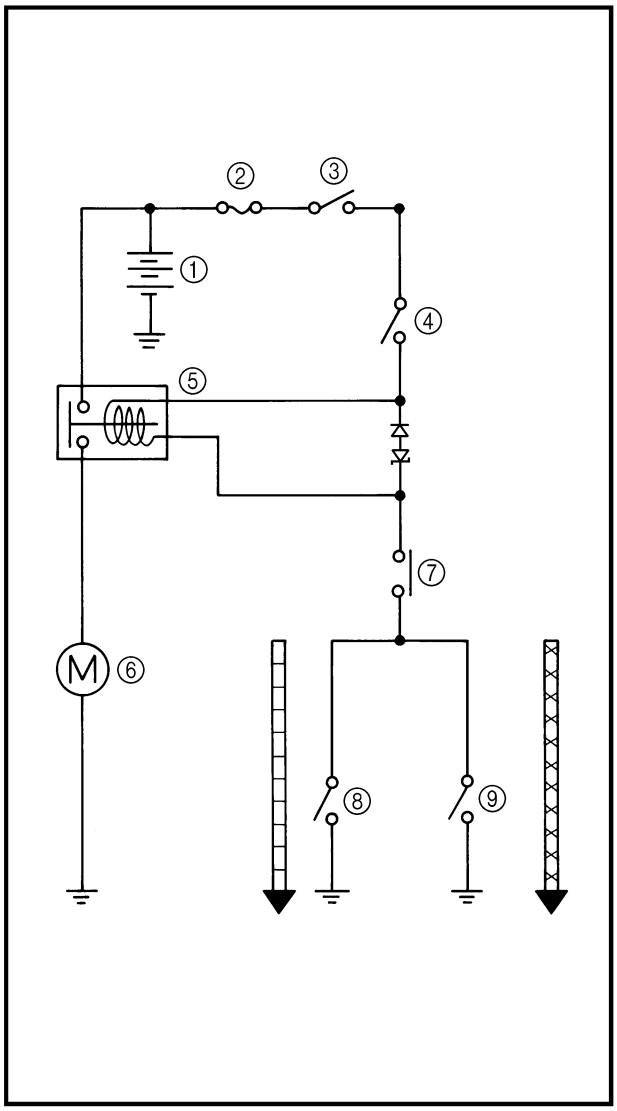
③ Main switc
④ Fuse (mair
⑤ Battery
⑥ Starter rel
⑦ Starter mc
⑧ Diode
⑫ "ENGINE S



NB284001
STARTING CIRCUIT OPERATION

The starting circuit on this model consist of the starter motor and starter 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).



The starter relay prevents the starter from operating when neither of these conditions have been met. In this instance, the starter relay is open so current cannot reach the starter motor.

When one of both of the above conditions have been met, however, the starter relay is closed, and the engine can be started by pressing the starter switch.

WHEN THE TRANSMISSION IS IN NEUTRAL

WHEN THE CLUTCH LEVER IS PULLED IN

① Battery
② Fuse
③ Main switch
④ "ENGINE STOP" switch
⑤ Starter relay
⑥ Starter motor
⑦ "START" switch
⑧ Clutch switch
⑨ Neutral switch

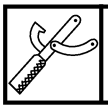
NB284100
TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE.

NB284110
Procedure
Check:
1.Fuse (main)
2.Battery
3.Starter motor
4.Starter relay
5.Main switch
6."ENGINE STOP" switch
7.Neutral switch
8.Clutch switch
9."START" switch
10.Wiring connection
(entire electric starting system)

NB284120

NOTE:
Remove the following parts before trouble-shooting.
1)Seat
2)Side covers
3)Fuel tank
4)Engine guard



Pocket tester:
YU-03112

NB284130

1.Fuse (main)

- Remove the fuse.
- Connect the pocket tester (Ω × 1) to the fuse.
- Check the fuse for continuity.

NO CONTINUITY → Replace the fuse.

CONTINUITY ⇩

NB284140

2.Battery

- Check the battery condition.
  Refer to "BATTERY INSPECTION" in CHAPTER 3.

Open circuit voltage:
12.8 V or more at 20 °C (68 °F)

INCORRECT →
- Clean the battery terminals.
- Recharge or replace the battery.

CORRECT ⇩

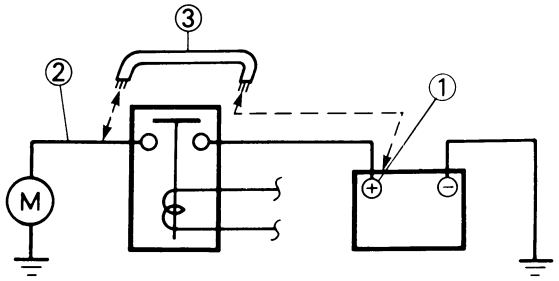
*

*

NB284150

3.Starter motor

- Connect the battery positive terminal ① and starter motor cable ② using a jumper lead ③*.
- Check the starter motor for operation.



⚠ WARNING

- **A wire for jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may cause the jumper lead to be burned.**
- **This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.**

DOES NOT MOVE

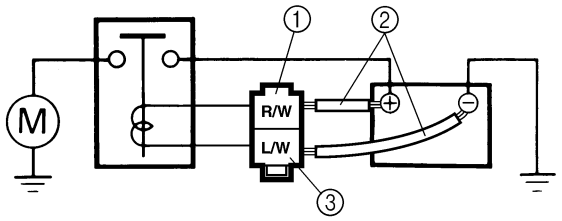
Repair or replace the starter motor.

MOVES

NB284160

4.Starter relay

- Disconnect the starter relay coupler from the wireharness.
- Connect the starter relay lead "Red/White" ① to the battery positive terminal using the jumper lead ②.
- Ground the starter relay lead "Blue/White" ③ to the frame using the jumper lead ②.
- Check the starter motor for operation.



DOES NOT MOVE

Replace the starter relay.

MOVES

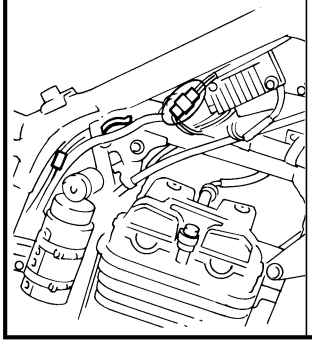
*

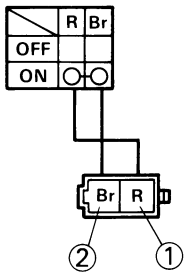
*

NB284170

5.Main switch

- Disconnect the main switch coupler from the wireharness.
- Check the switch component for continuity between "Red ① and Brown ②".





INCORRECT

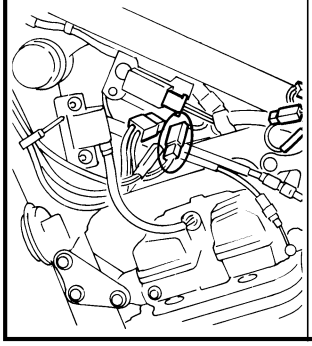
Replace the main switch.

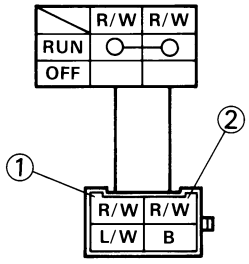
CORRECT

NB284190

6."ENGINE STOP" switch

- Disconnect the handlebar switch (right) coupler from the wireharness.
- Check the switch component for continuity between "Red/White ① and Red/White ②".





INCORRECT

Replace the handlebar switch (right).

CORRECT

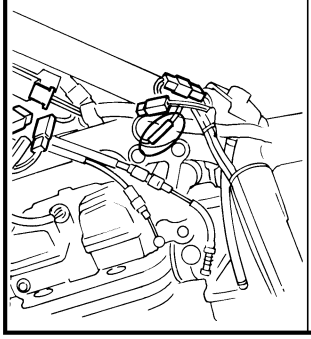
*

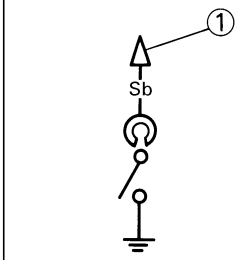
*

NB284200

7.Neutral switch

- Disconnect the neutral switch lead from the wireharness.
- Check the switch component for continuity between “Sky blue ① and Ground”.





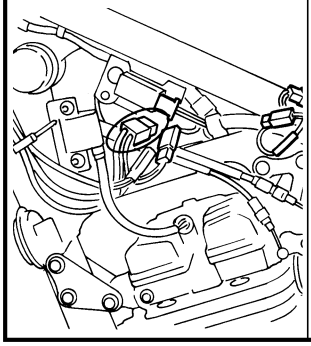
INCORRECT

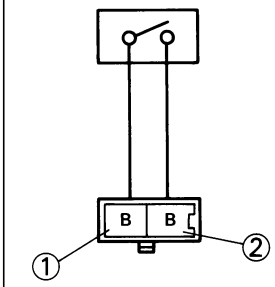
Replace the neutral switch.

CORRECT

8.Clutch switch

- Disconnect the clutch switch coupler from the wireharness.
- Check the clutch switch component for continuity between “Black ① and Black ②”.





INCORRECT

Replace the clutch switch.

CORRECT

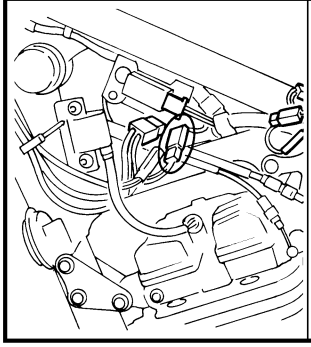
*

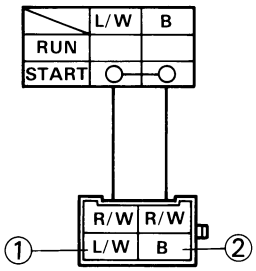
*

NB284230

9."START" switch

- Disconnect the handlebar switch (right) coupler from the wireharness.
- Check the "START" switch component for continuity between "Blue/White ① and Black ②".





INCORRECT

Replace the handlebar switch (right).

CORRECT

10.Wiring connection

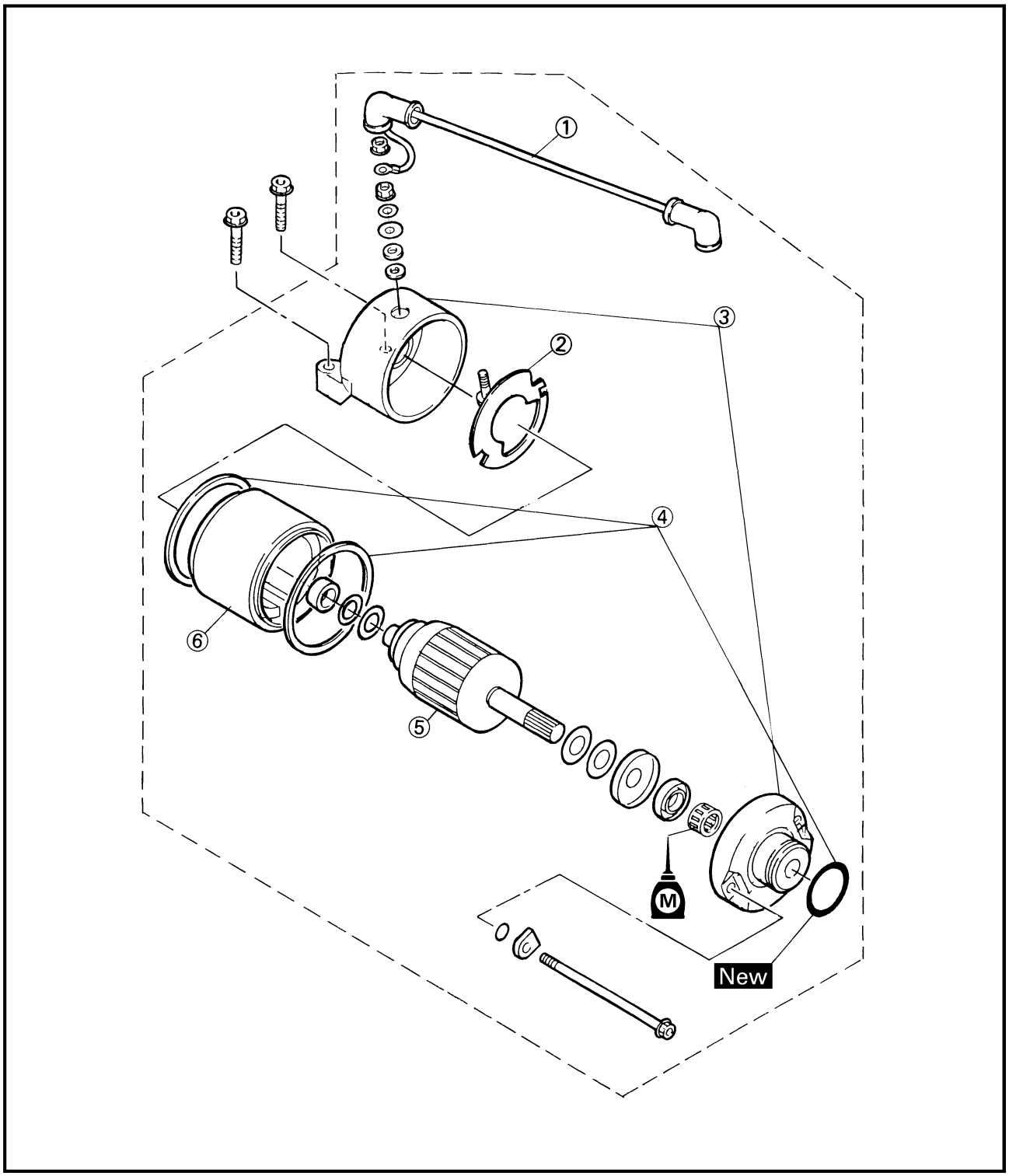
- Check the entire starting system for connections.
  Refer to "WIRING DIAGRAM".

POOR CONNECTION

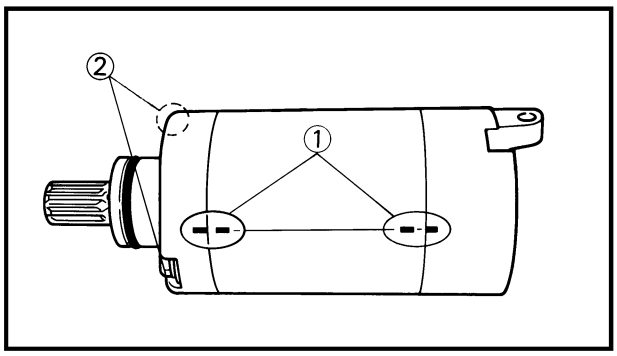
Correct.

STARTER MOTOR

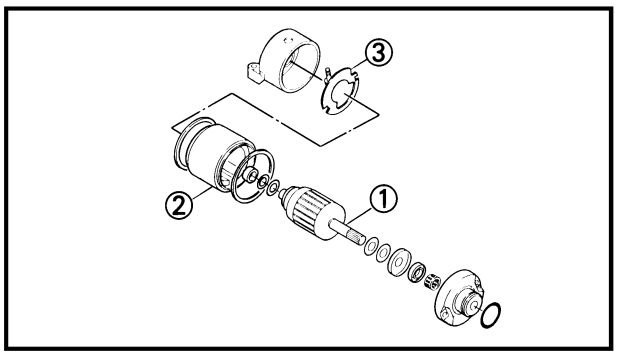
① Starter motor lead
② Brush
③ Bracket
④ O-ring
⑤ Armature
⑥ Yoke



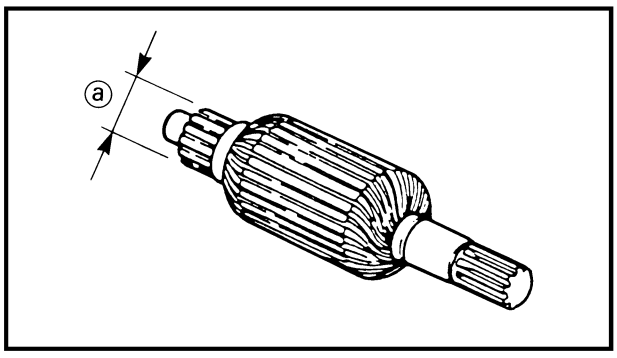
NB284250
Removal
1.Remove:
- Starter motor
  Refer to "ENGINE DISASSEMBLY" in CHAPTER 4.



NB284251
Disassembly
1.Put identifying marks ① on the brackets for reassembly as shown.
2.Remove:
- Bolts ②

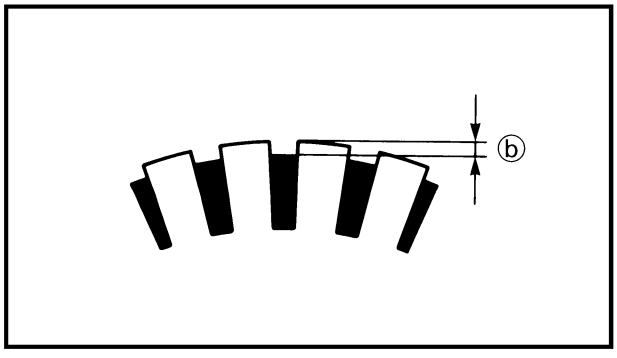


3.Remove:
- Armature ①
- Yoke ②
- Brush ③



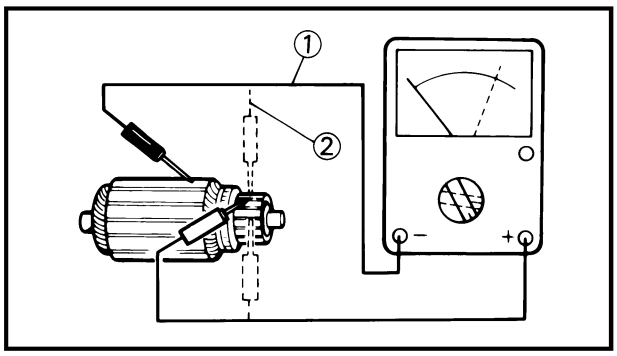
NB284252
Inspection and repair
1.Inspect:
- Commutator
2.Measure:
- Commutator diameter ⓐ
  Out of specification → Replace the starter motor.

Commutator wear limit:
27 mm (1.06 in)



3.Measure:
- Mica undercut ⓑ
  Out of specification → Scrape the mica to proper value using a hacksaw blade ground to fit.

Mica undercut:
0.7 mm (0.028 in)



NOTE:
The mica insulation of the commutator must be undercut to ensure proper operation of the commutator.

4.Inspect:
- Armature coil (insulation/continuity)
  Defects → Replace the starter motor.

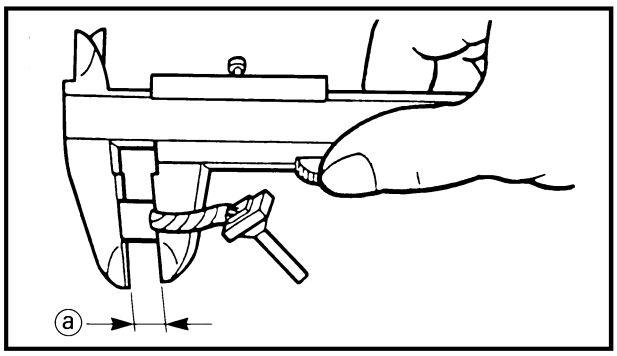
****

Inspecting steps:
- Connect the pocket tester for continuity check ① and insulation check ②.
- Measure the armature resistances.

Armature coil resistance:
Continuity check ①:
0.0017 ~ 0.0027 Ω at 20 °C (68 °F)
Insulation check ②:
More than 1 MΩ at 20 °C (68 °F)

- If ⓐ resistance is incorrect, replace the starter motor.

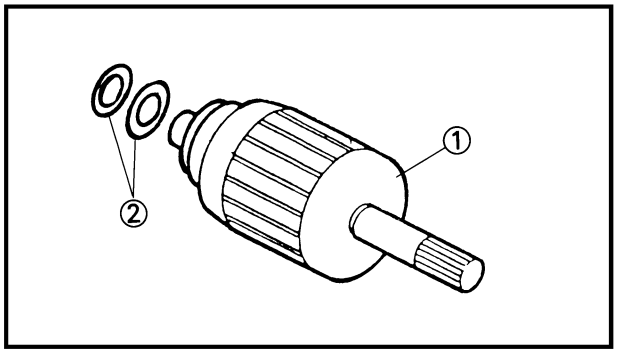
****



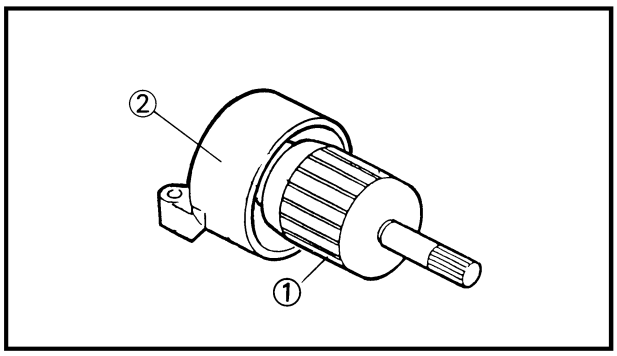
5.Measure:
- Brush length ⓐ
  Out of specification → Replace.

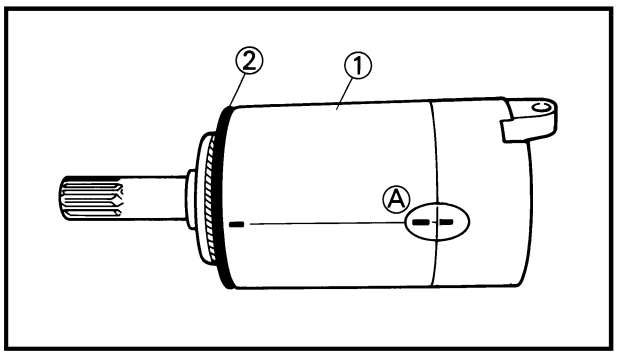
Brush length limit:
4 mm (0.16 in)

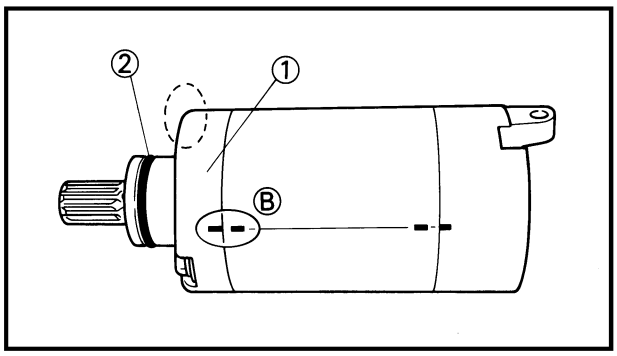
6.Inspect:
- Bearing
- Oil seal
- O-rings
- Bush
  Damage → Replace.



Assembly
Reverse the "Removal" procedure.
Note the following points.
1.Install:
- Armature ①
- Washers ②







2.Install:
- Brush set

NOTE:
Align the projection on the brush seat with the slot on the housing.

3.Install:
- Armature ①
- Bracket ②

NOTE:
When installing the armature, avoid damage to the brush.

4.Install:
- Yoke ①
- O-ring ②

NOTE:
Align the match mark Ⓐ and install.

5.Install:
- Bracket ①
- O-ring ②

6.Tighten:
- Bolts

	Bolt: **5 Nm (0.5 m • kg, 3.6 ft • lb)**

NOTE:
Align the match mark Ⓑ and install.

Installation

1.Install:
- Starter motor

NOTE:
Apply a thin coat of grease onto the O-ring.

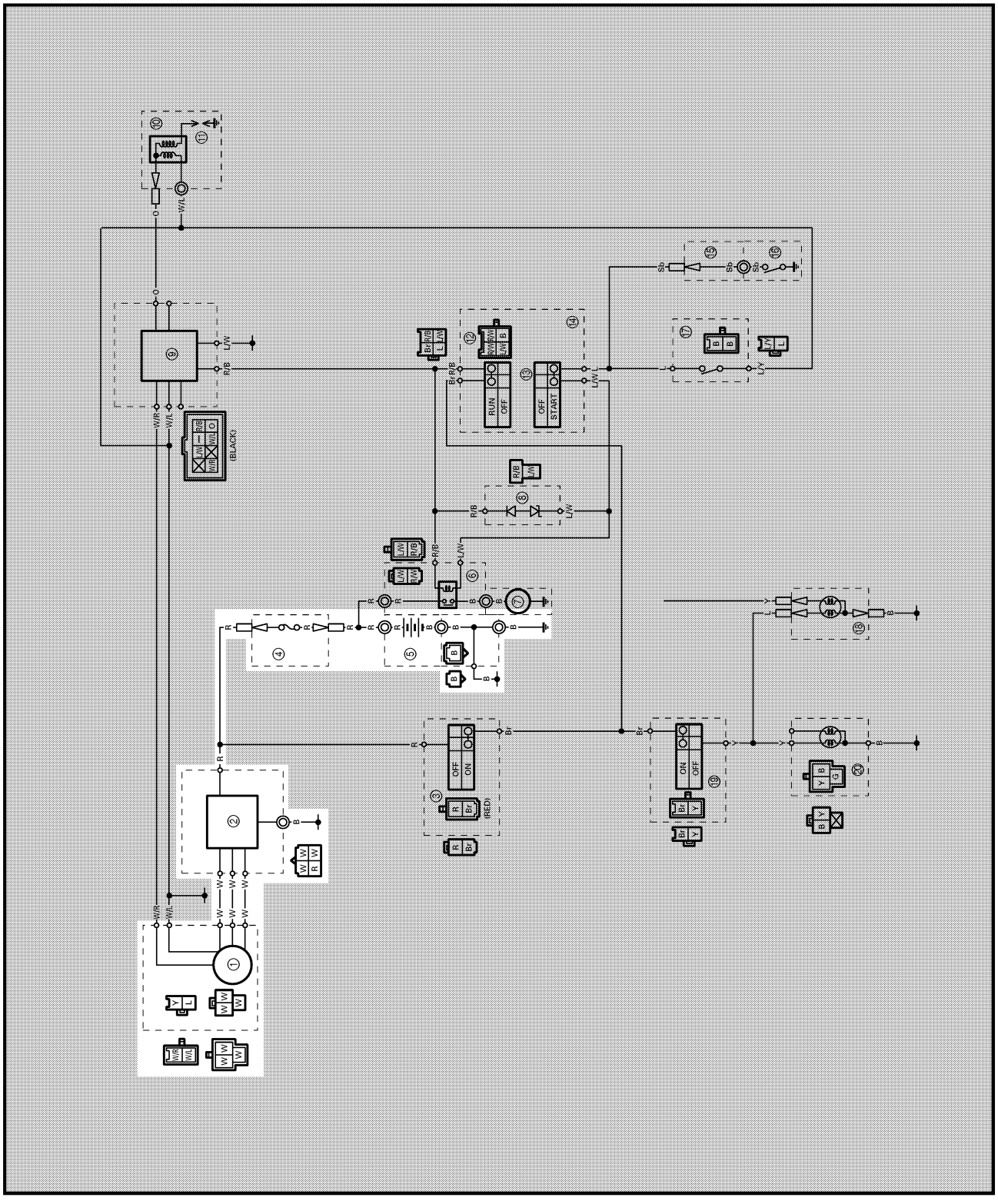
	Bolt (starter motor): **10 Nm (1.0 m • kg, 7.2 ft • lb)**

Refer to "ENGINE ASSEMBLY" in CHAPTER 4.

CHARGING SYSTEM

CIRCUIT DIAGRAM

① A.C. magneto
② Rectifier/regulator
④ Fuse (main)
⑤ Battery



NB285000
TROUBLESHOOTING

THE BATTERY IS NOT CHARGED.

NB285100
Procedure
Check:
1.Fuse (main)
2.Battery
3.Charging voltage
4.Stator coil resistance
5.Wiring connection
(entire charging system)

NB285110

NOTE:
- Remove the following parts before troubleshooting.

1)Seat
2)Side covers
3)Fuel tank

- Use the following special tool(s) in this troubleshooting.



Inductive tachometer:
YU-8036-A
Pocket tester:
YU-03112

NB285120

1.Fuel (main)

- Remove the fuse.
- Connect the pocket tester (Ω × 1) to the fuse.
- Check the fuse for continuity.

NO CONTINUITY → Replace the fuse.

CONTINUITY ↓

NB285130

2.Battery

- Check the battery condition.
  Refer to "BATTERY INSPECTION" in CHAPTER 3.

Open circuit voltage:
12.8 V or more at 20 °C (68 °F)

INCORRECT →
- Clean the battery terminals.
- Recharge or replace the battery.

CORRECT ↓

NB285140

3.Charging voltage

- Connect the inductive tachometer to the spark plug lead.
- Connect the pocket tester (DC 20 V) to the battery.

Tester (+) lead → Battery (+) terminal
Tester (–) lead → Battery (–) terminal

- Start the engine and accelerate to about 3,000 r/min.
- Check the charging voltage.

Charging voltage:
13.0 ~ 15.0 V at 3,000 r/min.

NOTE:
Use a fully charged battery.

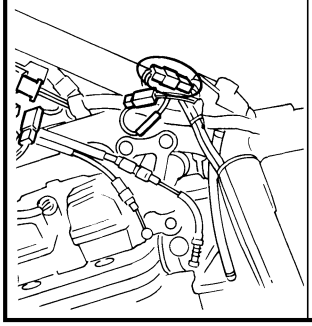
MEETS SPECIFICATION → Charging circuit is good.

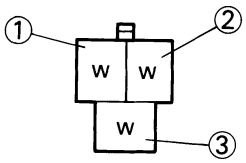
OUT OF SPECIFICATION ↓

NB285150

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:
1.0 ~ 1.2 Ω at 20°C (68°F)

OUT OF SPECIFICATION → Replace the stator assembly.

BOTH MEET SPECIFICATIONS ↓

NB285160

5.Wiring connection

- Check the entire charging system for connections.
  Refer to "WIRING DIAGRAM".

POOR CONNECTION → Correct.

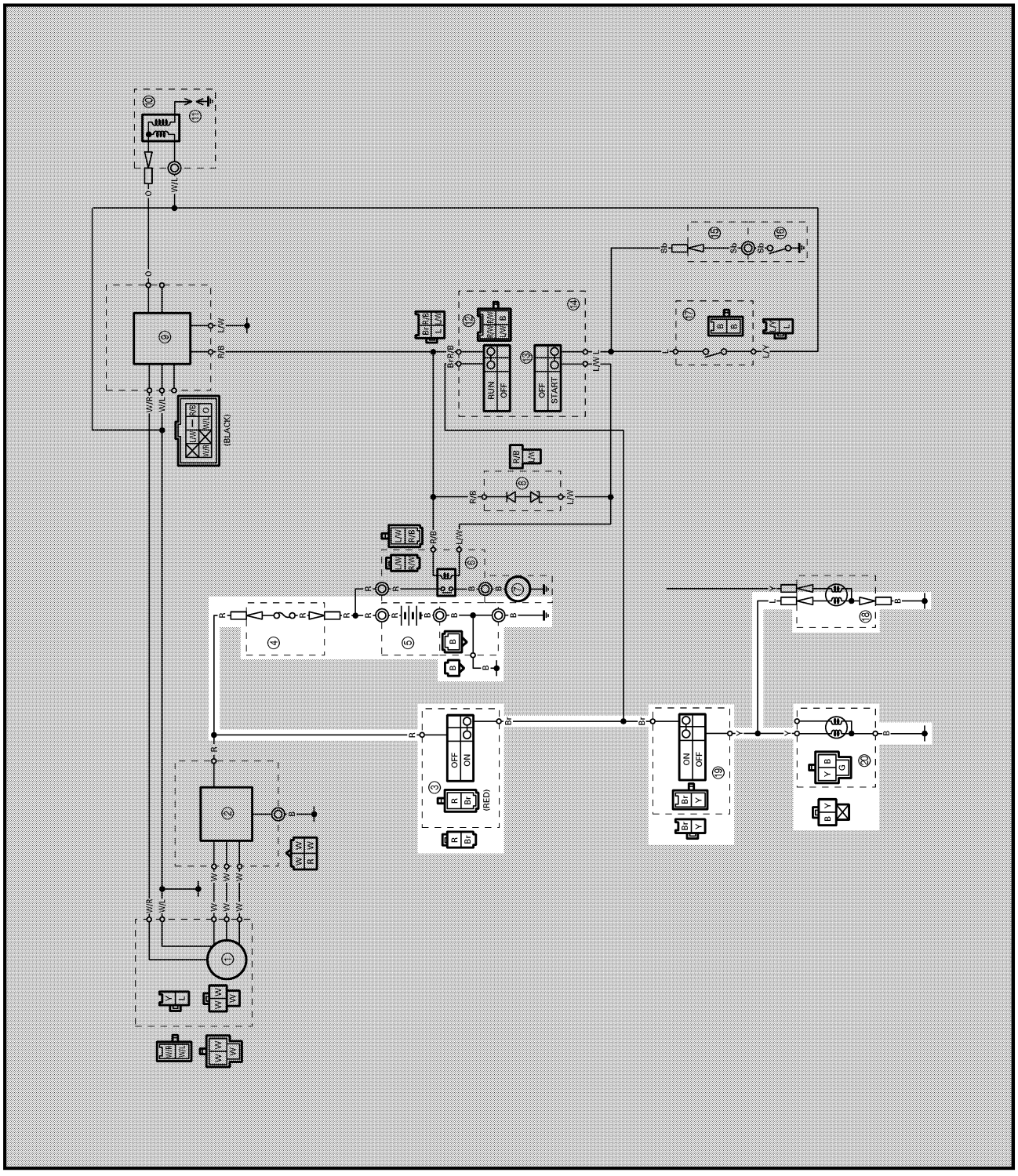
CORRECT ↓

Replace the rectifier/regulator.

LIGHTING SYSTEM

CIRCUIT DIAGRAM

③ Main switch
④ Fuse (main)
⑤ Battery
⑱ Tail light
⑲ "LIGHTS" switch
⑳ Headlight



NB286000
TROUBLESHOOTING

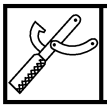
HEADLIGHT, "HIGH BEAM" INDICATOR LIGHT, AND/OR TAILLIGHT DO NOT COME ON

NB286100
Procedure
Check;
1.Fuse (main)
2.Battery
3.Main switch
4."LIGHTS" switch
5.Wiring connection
(entire charging system)

NB286110
NOTE:
- Remove the following parts before trouble shooting.

1)Seat
2)Side covers
3)Fuel tank

- Use the following special tool(s) in this trouble shooting.



Pocket tester:
YU-03112

NB286120
1.Fuse (main)
- Remove the fuse.
- Connect the pocket tester (Ω × 1) to the fuse.
- Check the fuse for continuity.

NO CONTINUITY → Replace the fuse.

CONTINUITY ↓

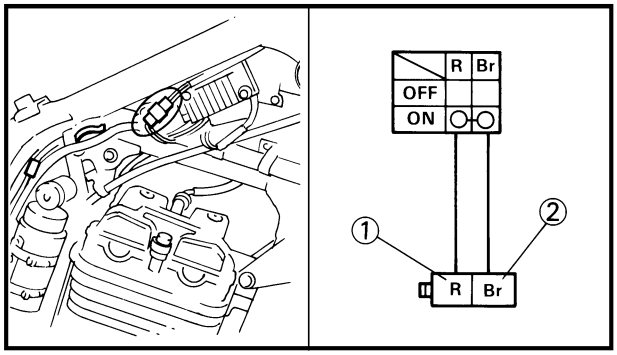
NB286130
2.Battery
- Check the battery condition.
  Refer to "BATTERY INSPECTION" in CHAPTER 3.

Open circuit voltage:
12.8 V or more at 20 °C (68 °F)

INCORRECT →
- Clean the battery terminals.
- Recharge or replace the battery.

CORRECT ↓

NB286140
3.Main switch
- Disconnect the main switch coupler from the wireharness.
- Check the switch component for continuity between "Red ① and Brown ②".



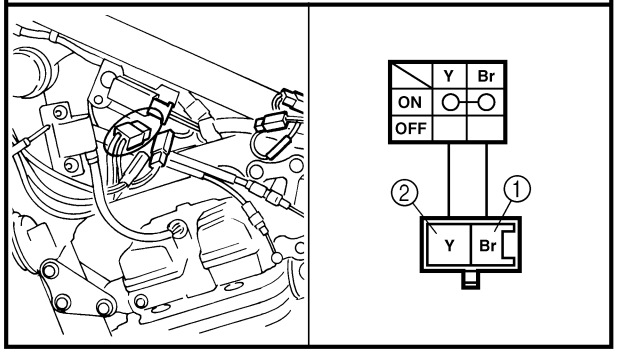
INCORRECT

Replace the main switch.

CORRECT

4."LIGHTS" switch

- Disconnect the "LIGHTS" switch coupler from the wireharness.
- Check the switch component for continuity between "Brown ① and Yellow ②".



INCORRECT

Replace the handlebar switch (right).

CORRECT

NB286160

5.Wiring connection

- Check the entire lighting system for connections.
  Refer to "WIRING DIAGRAM".

POOR CONNECTION

Correct.

CORRECT

Check condition of each circuit of the lighting system.
Refer to "LIGHTING SYSTEM CHECK".

NB286170

LIGHTING SYSTEM CHECK

1.The headlight and "HIGH BEAM" indicator light do not come on.

1.Bulb and bulb socket
• Check the bulb and bulb socket for continuity.

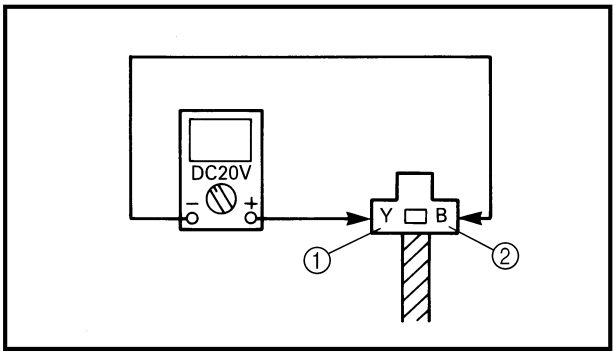
NO CONTINUITY → Replace the bulb and/or bulb socket.

CONTINUITY ↓

NB286180

2.Voltage
• Connect the pocket tester (DC 20 V) to the headlight couplers.

Headlight:
Tester (+) lead → Yellow ① lead
Tester (–) lead → Black ② lead



- Turn the main switch to "ON".
- Turn the "LIGHTS" switch to the "ON" position.
- Check for voltage (12 V) on the "Yellow" lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION ↓

This circuit is good.

2.Taillight does not come on.

1.Bulb and bulb socket

- Check the bulb and bulb socket for continuity.

NO CONTINUITY → Replace the bulb and/or bulb socket.

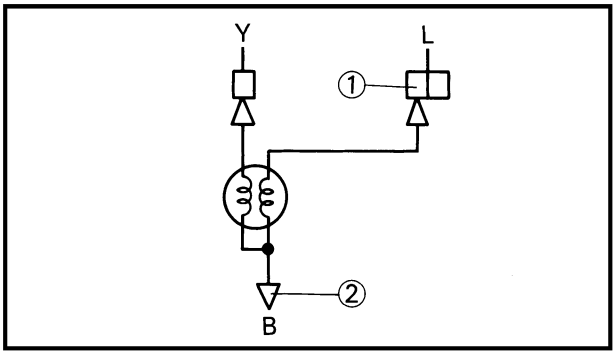
CONTINUITY ⇩

NB286220

2.Voltage

- Connect the pocket tester (DC 20 V) to the bulb socket connector.

Tester (+) lead → Blue ① terminal
Tester (–) lead → Black ② terminal



- Turn the main switch to “ON”.
- Check for voltage (12 V) on the “Blue” lead at the bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION ⇩

This circuit is good.

NB291000
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.

NB291100
STARTING FAILURE/HARD STARTING

FUEL SYSTEM

Fuel tank
- Empty
- Clogged fuel filter
- Clogged fuel strainer
- Deteriorated fuel, fuel containing water or foreign material
- Clogged fuel breather hose

Fuel cock
- Clogged fuel hose
- Clogged fuel filter

Air filter element
- Clogged

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
- Faulty starter plunger
- Improperly adjusted pilot screw

NB291120
ELECTRICAL SYSTEM

Spark plug
- Improper plug gap
- Worn electrodes
- Severed wire between terminals broken
- Improper heat range
- Faulty spark plug cap

Ignition coil
- Broken or shorted primary/secondary
- Faulty spark plug lead
- Broken body

CDI system
- Faulty CDI unit
- Faulty pickup coil
- Broken woodruff key

COMPRESSION SYSTEM

Cylinder and cylinder head
- Loose spark plug
- Loose cylinder head or cylinder
- Broken cylinder head gasket
- Worn, damaged or seized cylinder

Crankcase and crankshaft
- Improperly sealed crankcase
- Seized crankshaft

Starter motor
- Faulty starter motor
- Faulty starter relay
- Faulty starter clutch

Switches and wiring
- Faulty main switch
- Faulty "ENGINE STOP" switch
- Broken or shorted wiring
- Faulty neutral switch
- Faulty "START" switch
- Faulty clutch switch

Valve and camshaft
- Improperly sealed valve
- Improper valve to valve seat contact
- Improper valve timing
- Broken valve spring
- Seized camshaft

Piston and piston ring
- Improperly installed piston ring
- Worn, fatigued or broken piston ring
- Seized piston ring
- Seized or damaged piston

POOR IDLE SPEED PERFORMANCE

POOR IDLE SPEED PERFORMANCE

Carburetor
- Improperly returned starter plunger
- Loose pilot jet
- Clogged pilot air jet
- Improperly adjusted idle speed (throttle stop screw/air screw)
- Improper throttle cable free play
- Flooded carburetor

Electrical system
- Faulty battery
- Faulty spark plug
- Faulty CDI unit
- Faulty pickup coil
- Faulty ignition coil

Valve train
- Improperly adjusted valve clearance

NB292120
POOR MEDIUM AND HIGH SPEED PERFORMANCE

POOR MEDIUM AND HIGH SPEED PERFORMANCE

Refer to "Starting failure/Hard starting".
(FUEL SYSTEM, ELECTRICAL SYSTEM, COMPRESSION SYSTEM AND VALVE TRAIN)

Carburetor
- Improper jet needle clip position
- Diaphragm malfunction
- Improperly adjusted fuel level
- Clogged or loose main jet

Air filter
- Clogged air filter element

NB293100
FAULTY GEAR SHIFTING

HARD SHIFTING

Refer to “CLUTCH DRAGGING”.

NB293120
SHIFT PEDAL DOES NOT MOVE

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

NB293140
JUMP-OUT GEAR

Shift shaft
- Improperly adjusted shift lever position
- Improperly returned stopper lever

Shift fork
- Worn shift fork

Shift cam
- Improper thrust play
- Worn shift cam groove

Transmission
- Worn gear dog

NB294100
CLUTCH SLIPPING/DRAGGING

CLUTCH SLIPPING

Clutch
- Improperly adjusted clutch cable
- 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

NB294120
CLUTCH DRAGGING

Engine oil
- High oil level
- Improper quality (high viscosity)
- Deterioration

Clutch
- Warped clutch plate
- Unevenly tensioned clutch spring
- Match mark not aligned
- Loose clutch boss nut
- Burnt primary driven gear bushing
- Bent clutch plate
- Swollen friction plate
- Broken clutch boss

NB295100

OVERHEATING

OVERHEATING

Ignition system
- Improper spark plug gap
- Improper spark plug heat range
- Faulty ignition coil

Compression system
- Heavy carbon built-up

Brake
- Dragging brake

Fuel system
- Improper carburetor main jet (improper setting)
- Improperly adjusted fuel level
- Clogged air filter element

Engine oil
- Incorrect oil level
- Improper oil viscosity
- Inferior oil quality

FAULTY BRAKE

POOR BRAKING EFFECT

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

FRONT FORK OIL LEAKAGE AND FRONT FORK MALFUNCTION

OIL LEAKAGE
- Bent, damaged or rusty inner tube
- Damaged or cracked outer tube
- Damaged oil seal lip
- Improperly installed oil seal
- Improper oil level (too much)
- Loose damper rod holding bolt
- Broken cap bolt O-ring
- Loose drain bolt
- Damaged drain bolt gasket

MALFUNCTION
- Bent, deformed or damaged inner tube
- Bent or deformed outer tube
- Damaged fork spring
- Worn or damaged slide metal
- Bent or damaged damper rod
- Improper oil viscosity
- Improper oil level

INSTABLE HANDLING

INSTABLE HANDLING

Handlebars
- Improperly installed or bent

Tires
- Uneven tire pressures on both sides
- Incorrect tire pressure
- Unevenly worn tires

Front forks
- Uneven oil level on both sides
- Uneven spring tension (uneven damping adjuster position)
- Broken spring
- Twisted front fork

Drive chain
- Improperly adjusted chain slack

Swingarm
- Worn bearing or bush
- Bent or damaged

Rear shock absorber
- Fatigued spring
- Improperly adjusted spring preload
- Oil and gas leakage

Steering
- Improperly installed upper bracket
- Bent steering stem
- Improperly installed steering stem (improperly tightened ring nut)
- Damaged bearing or bearing race

Wheels
- Incorrect wheel balance
- Deformed cast wheel
- Loose bearing
- Bent or loose wheel axle
- Excessive wheel run-out

Frame
- Twisted
- Damaged head pipe
- Improperly installed bearing race

NB299100

FAULTY SIGNAL AND LIGHTING SYSTEM

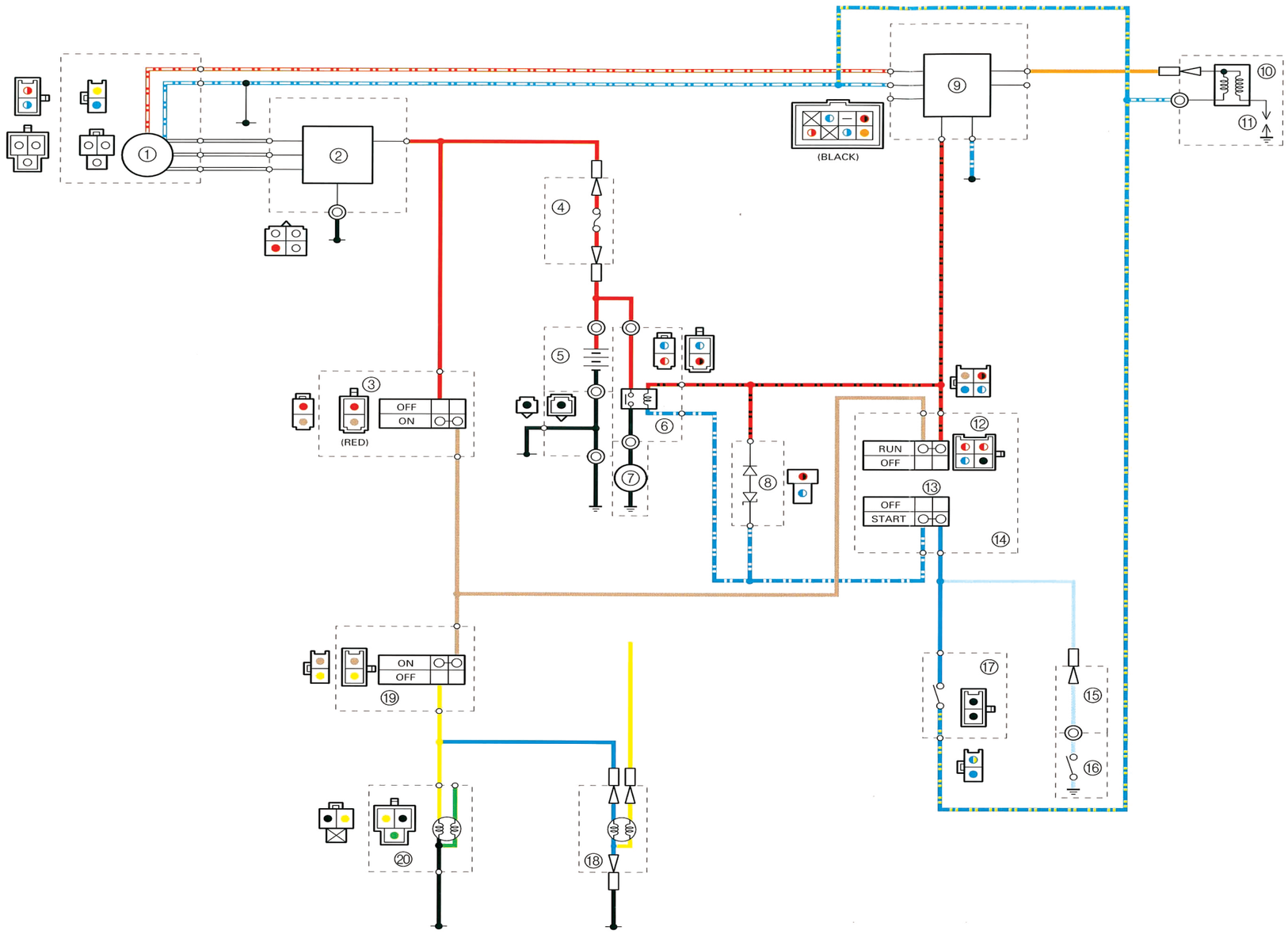
HEADLIGHT DARK

- Improper bulb
- Too many electric accessories
- Hard charging (broken stator coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contact (main or "LIGHTS" switch)
- Bulb life expired

BULB BURNT OUT

- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or "LIGHTS" switch
- Bulb life expired

TTR250L(C) WIRING DIAGRAM



① AC magneto
② Rectifier/regulator
③ Main switch
④ Fuse (main)
⑤ Battery
⑥ Starter relay
⑦ Starter motor
⑧ Diode
⑨ CDI unit
⑩ Ignition coil
⑪ Spark plug
⑫ "ENGINE STOP" switch
⑬ "START" switch
⑭ Handlebar switch (right)
⑮ Wire sub lead
⑯ Neutral switch
⑰ Clutch switch
⑱ Tail light
⑲ "LIGHTS" switch
⑳ Headlight

COLOR CODE

Black	Green	Sky blue	Blue/White	Red/White
Blue	Orange	White	Blue/Yellow	White/Blue
Brown	Red	Yellow	Red/Black	White/Red