YAMAHA

YFA1W

Service Manual

LIT-11616-YF-00

3FA-28197-10

YAMAHA

YFA1M(C)

SUPPLEMENTARY SERVICE MANUAL

LIT-11616-13-04

3FA-28197-11

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the YFA1M(C). For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with the following manual.

YFA1 ('89) SERVICE MANUAL: LIT-11616-06-75 (3FA-28197-10)

YFA1M(C)
SUPPLEMENTARY
SERVICE MANUAL

First Edition, June 1999

Printed in U.S.A.
LIT-11616-13-04

NOTICE

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

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

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

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

⚠	The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!
⚠ WARNING	Failure to follow WARNING instructions could result in severe injury or death to the machine operator, a bystander, or a person inspecting or repairing the machine.
CAUTION:	A CAUTION indicates special precautions that must be taken to avoid damage to the machine.
NOTE:	A NOTE provides key information to make procedures easier or clearer.

HOW TO USE THIS MANUAL

CONSTRUCTION OF THIS MANUAL

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

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

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

3rd title ③: This is a final title.

MANUAL FORMAT

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspections.

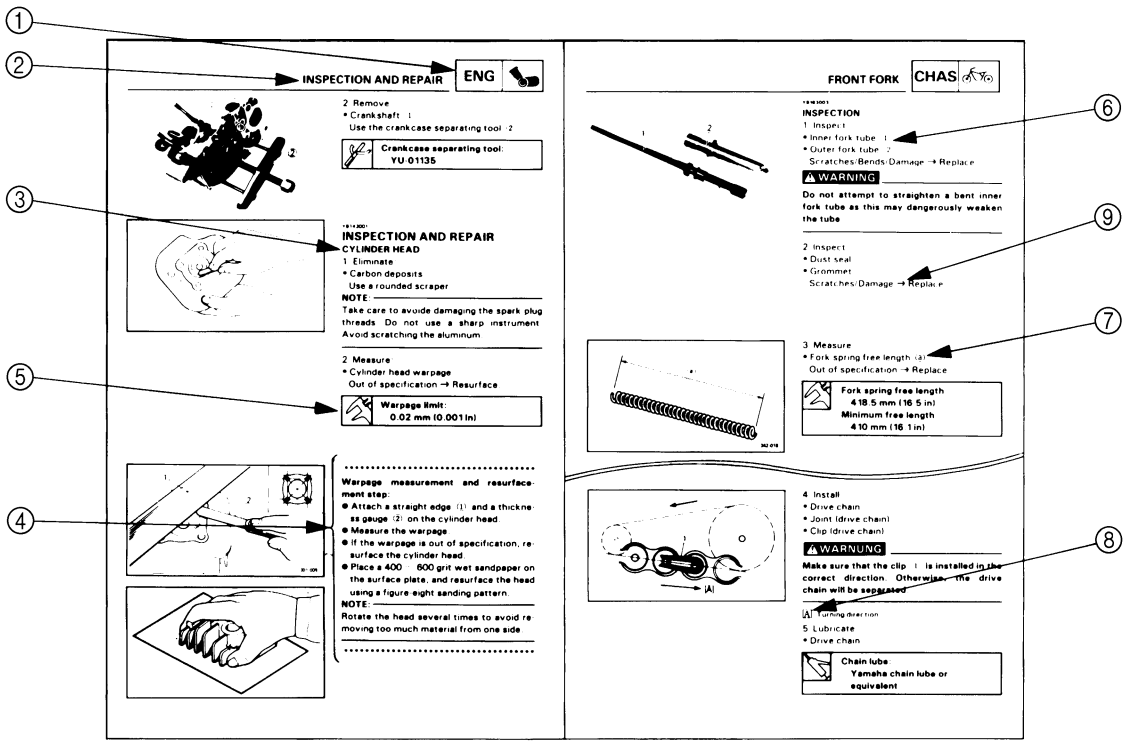
A set of particularly important procedure ④ is placed between a line of asterisks "*" with each procedure preceded by "●".

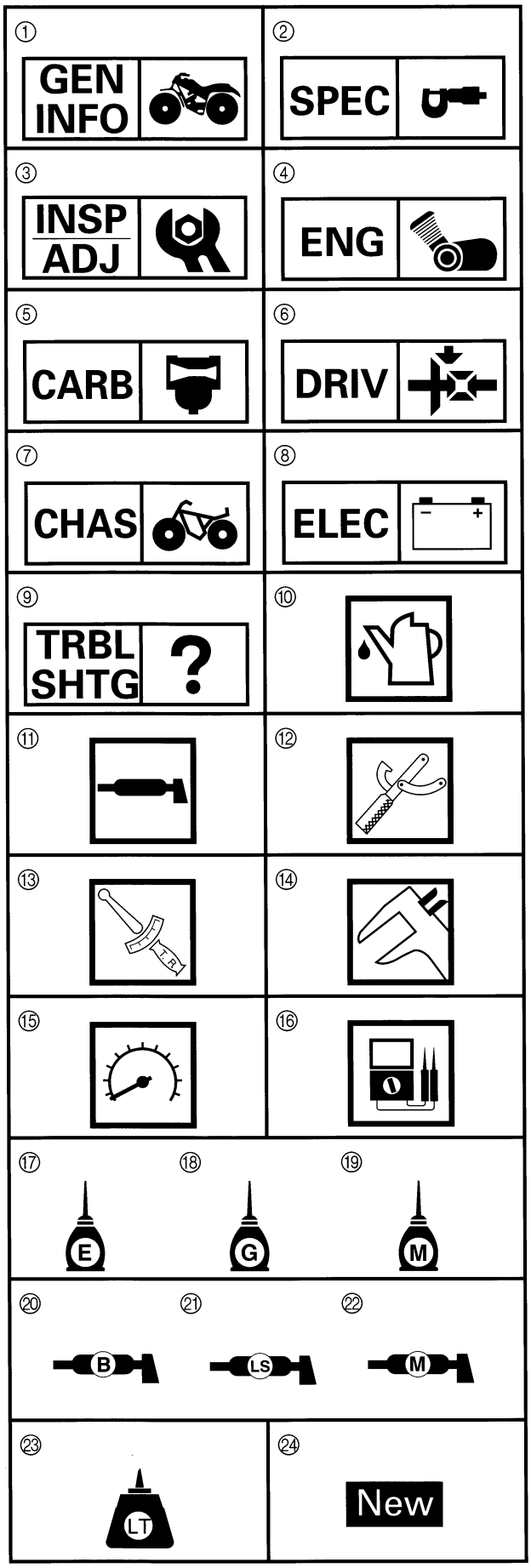
IMPORTANT FEATURES

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

EXPLODED DIAGRAM

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





ILLUSTRATED SYMBOLS
(Refer to the illustration)

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

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Carburetion
⑥ Drive train
⑦ Chassis
⑧ Electrical
⑨ Troubleshooting

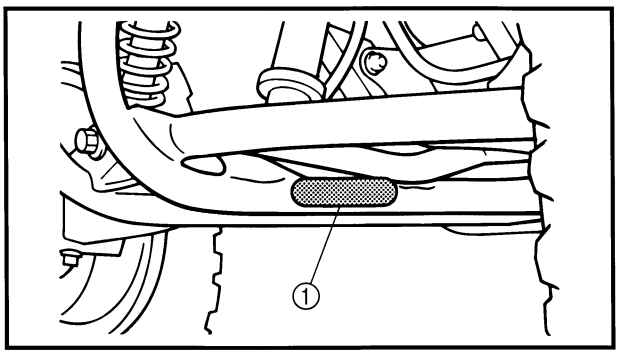
Illustrated symbols ⑩ to ⑯ are used to identify the specifications appearing in the text.

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

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

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

CONTENTS

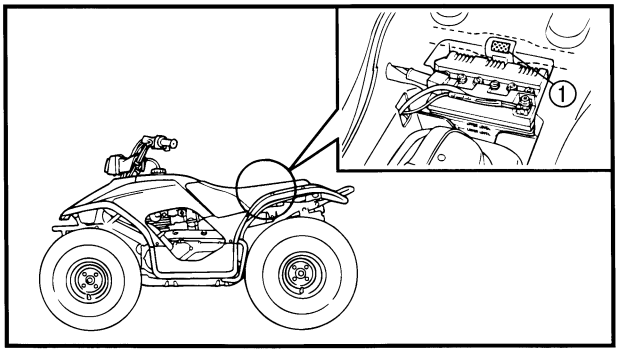


GENERAL INFORMATION

MACHINE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the left side of the frame.

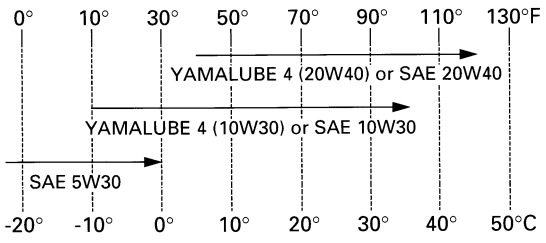


MODEL LABEL

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

SPECIFICATIONS

GENERAL SPECIFICATIONS

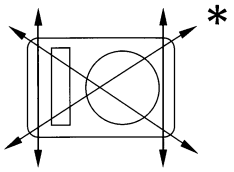
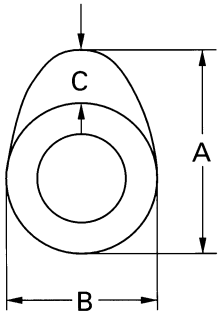
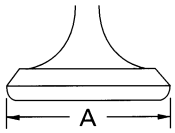
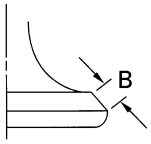
Model	YFA1M(C)
Model code:	3FAR (Except for California) 3FAP (For California)
Dimension:	
Overall length	1,640 mm (64.6 in)
Overall width	965 mm (38.0 in)
Overall height	980 mm (38.6 in)
Seat height	690 mm (27.2 in)
Wheelbase	1,080 mm (42.5 in)
Minimum ground clearance	145 mm (5.7 in)
Minimum turning radius	2,900 mm (114.2 in)
Basic weight:	
With oil and full fuel tank	144 kg (318 lb)
Engine:	
Engine type	Air cooled 4-stroke, SOHC
Cylinder arrangement	Forward inclinde single cylinder
Displacement	124 cm^3
Bore × stroke	49 × 66 mm (1.93 × 2.60 in)
Compression ratio	9.0 : 1
Compression pressure	850 kPa (8.5 kg/cm^2, 121 psi)
Starting system	Electric starter
Lubrication system:	
Type	Wet sump
Engine oil type	 API service SE, SF type or higher
Oil quantity:	
Engine oil	
Periodic oil change	1.25 L (1.10 Imp qt, 1.32 US qt)
Total amount	1.45 L (1.28 Imp qt, 1.53 US qt)
Transmission oil	0.60 L (0.53 Imp qt, 0.63 US qt)
Air filter:	
Type	Wet type element
Fuel:	
Type	Regular gasoline
Fuel tank capacity	7.0 L (1.54 Imp gal, 1.85 US gal)
Reserve amount	1.3 L (0.28 Imp gal, 0.34 US gal)

Model	YFA1M(C)
Carburetor:	
Type/quantity	VM18SH/1
Manufacturer	MIKUNI
Spark plug:	
Type (manufacturer)	C7HSA (NGK), U22FS-U (DENSO)
Spark plug gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Transmission:	
Primary reduction system	Helical gear/spur gear
Primary reduction ratio	43/14 × 40/17 (7.226)
Secondary reduction system	Chain drive
Secondary reduction ratio	32/12 (2.666)
Clutch type	Dry, centrifugal automatic
Transmission type	Single speed automatic (V-belt)
Operation	Centrifugal automatic type
Single speed automatic	2.303 ~ 0.821 : 1
Reverse ratio	49/14 × 49/15 × 40/17 (26.902)
Chassis:	
Frame type	Steel tube frame
Caster angle	6°
Camber angle	1.5°
Kingpin angle	10.5°
Trail	15 mm (0.59 in)
Tread	
Front	695 mm (27.36 in)
Rear	710 mm (27.95 in)
Toe-in	0 ~ 10.0 mm (0 ~ 0.39 in)
Tire:	
Type	Tubeless
Size	
Front	AT20 × 7- 8
Rear	AT22 × 10- 8
Manufacturer (type)	
Front	DUNLOP (KT536A)
Rear	DUNLOP (KT537A)
Tire pressure (cold tire):	
Maximum load-except motorcycle	100 kg (221 lb)
Minimum	
Front	17 kPa (0.17 kg/cm^2, 2.4 psi)
Rear	22 kPa (0.22 kg/cm^2, 3.1 psi)
Maximum	
Front	23 kPa (0.23 kg/cm^2, 3.3 psi)
Rear	28 kPa (0.28 kg/cm^2, 4.0 psi)

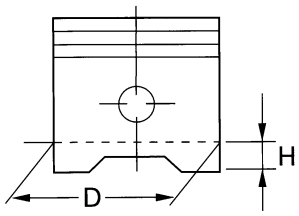
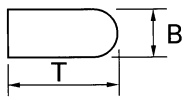
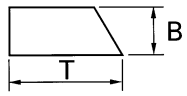
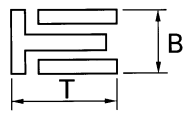
Model	YFA1M(C)
Brake:	
Front brake type	Drum brake
Front brake operation	Right hand operation
Rear brake type	Drum brake
Rear brake operation	Left hand operation
Suspension:	
Front	Swing axle
Rear	Swingarm
Shock absorber:	
Front	Coil spring/oil damper
Rear	Coil spring/oil damper
Wheel travel:	
Front	70 mm (2.76 in)
Rear	80 mm (3.15 in)
Electrical:	
Ignition system	C.D.I.
Generator system	C.D.I. magneto
Battery capacity	12 V 12 AH
Battery type	12N12C-4A-2
Headlight type	Bulb type
Headlight bulb type	Incandescence
Bulb wattage (quantity)	
Headlight	12 V 25 W/25 W (1)
Taillight	12 V 3.8 W (1)
Neutral indicator light	12 V 3.4 W (1)
Reverse indicator light	12 V 3.4 W (1)

MAINTENANCE SPECIFICATIONS

ENGINE

Model	YFA1M(C)
Cylinder head:	
Warp limit 	0.03 mm (0.0012 in) * Lines indicate straightedge measurement.
Cylinder:	
Bore size	48.99 ~ 49.03 mm (1.9287 ~ 1.9303 in)
<Wear limit>	<49.15 mm (1.9350 in)>
Measuring point	45 mm (1.7717 in)
Camshaft:	
Drive method 	Chain drive (left)
Cam dimensions	
Intake "A"	26.17 ~ 26.27 mm (1.0303 ~ 1.0342 in)
"B"	21.06 ~ 21.16 mm (0.8292 ~ 0.8331 in)
"C"	5.16 ~ 5.28 mm (0.2031 ~ 0.2078 in)
Exhaust "A"	26.17 ~ 26.27 mm (1.0303 ~ 1.0342 in)
"B"	21.06 ~ 21.17 mm (0.8292 ~ 0.8331 in)
"C"	5.16 ~ 5.28 mm (0.2031 ~ 0.2078 in)
Camshaft runout limit	0.03 mm (0.0012 in)
Timing chain:	
Type	DID 25
No. of links	92 links
Adjustment method	Automatic
Rocker arm/rocker arm shaft:	
Inside diameter (rocker arm)	10.000 ~ 10.015 mm (0.3937 ~ 0.3943 in)
Outside diameter (shaft)	9.981 ~ 9.991 mm (0.3930 ~ 0.3933 in)
Arm-to-shaft clearance	0.009 ~ 0.034 mm (0.0004 ~ 0.0013 in)
Valve, valve seat, valve guide:	
Valve clearance (cold)	
Intake	0.08 ~ 0.12 mm (0.0031 ~ 0.0047 in)
Exhaust	0.10 ~ 0.14 mm (0.0039 ~ 0.0055 in)
Valve dimensions	
"A" head diameter 	
Intake	25.9 ~ 26.1 mm (1.0197 ~ 1.0276 in)
Exhaust	21.9 ~ 22.1 mm (0.8622 ~ 0.8701 in)
"B" face width 	
Intake	1.4 ~ 3.0 mm (0.0551 ~ 0.1181 in)
Exhaust	1.7 ~ 2.8 mm (0.0669 ~ 0.1102 in)

Model	YFA1M(C)
"C" seat width	
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
"D" margin thickness	
Intake	0.4 ~ 0.8 mm (0.0157 ~ 0.0315 in)
Exhaust	0.8 ~ 1.2 mm (0.0315 ~ 0.0472 in)
Outside diameter (valve stem)	
Intake	4.975 ~ 4.990 mm (0.1959 ~ 0.1965 in)
Exhaust	4.960 ~ 4.975 mm (0.1953 ~ 0.1959 in)
Inside diameter (valve guide)	
Intake	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)
Exhaust	5.000 ~ 5.012 mm (0.1969 ~ 0.1973 in)
Stem-to-guide clearance	
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
Valve seat width	
Intake	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
Exhaust	0.9 ~ 1.1 mm (0.0354 ~ 0.0433 in)
Valve spring:	
Free length	
Intake	30.35 mm (1.1949 in)
Exhaust	30.35 mm (1.1949 in)
Set length (valve closed)	
Intake	25.7 mm (1.0118 in)
Exhaust	25.7 mm (1.0118 in)
Compressed pressure (installed)	
Intake	92.2 ~ 109.8 N (9.40 ~ 11.20 kg, 20.7 ~ 24.7 lb)
Exhaust	92.2 ~ 109.8 N (9.40 ~ 11.20 kg, 20.7 ~ 24.7 lb)
Direction of winding (top view)	Intake: Clockwise; Exhaust: Clockwise

Model	YFA1M(C)
Piston:	
Piston size "D"	48.96 ~ 49.00 mm (1.9276 ~ 1.9291 in)
Measuring point "H"	6 mm (0.362 in) From bottom of the piston.
	
Piston-to-cylinder clearance	0.020 ~ 0.040 mm (0.0008 ~ 0.0016 in)
<Wear limit>	<0.15 mm (0.0060 in)>
Piston off-set	0.5 mm (0.0197 in)
Piston off-set direction	Intake side
Inside diameter (piston pin bore)	13.002 ~ 13.013 mm (0.5119 ~ 0.5123 in)
Outside diameter (piston pin)	12.996 ~ 13.000 mm (0.5117 ~ 0.5118 in)
Piston ring:	
Type	
Top ring	Barrel
2nd ring	Taper
Dimension (B × T)	
Top ring 	1.0 × 2.0 mm (0.0394 × 0.0787 in)
2nd ring 	1.0 × 2.0 mm (0.0394 × 0.0787 in)
Oil ring 	2.0 × 2.2 mm (0.0787 × 0.0866 in)
End gap (installed)	
Top ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in)
2nd ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in)
Oil ring	0.20 ~ 0.80 mm (0.0079 ~ 0.0315 in)
Side clearance	
Top ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
2nd ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)

Model		YFA1M(C)
Crankshaft:		
Crank width "A"		44.95 ~ 45.00 mm (1.7697 ~ 1.7717 in)
Runout limit "C"		0.03 mm (0.0012 in)
Big end side clearance "D"		0.05 ~ 0.45 mm (0.0020 ~ 0.0177 in)
Big end radial clearance "E"		0.010 ~ 0.025 mm (0.0004 ~ 0.0010 in)
Small end free play "F"		0.80 ~ 1.00 mm (0.0315 ~ 0.0394 in)
Ballancer:		
Drive method		Gear
Automatic centrifugal clutch:		
Clutch shoe thickness		3.5 mm (0.1378 in)
<Wear limit>		<2.0 mm (0.0787 in)>
Free length (clutch spring)		27.5 mm (1.0827 in)
Clutch-in revolution		2,300 ~ 2,600 r/min
Clutch-stall revolution		3,400 ~ 3,800 r/min
Transmission:		
Runout limit		
Main axle		0.08 mm (0.0031 in)
Drive axle		0.08 mm (0.0031 in)
Shifter:		
Type		Cam drum and guide bar
Air filter oil grade:		Air cooled 2-stroke engine oil
Carburetor:		
I.D. mark		3FA01 (Except for California) 3FAP10 (For California)
Main jet	(M.J.)	#82.5 (Except for California) #77.5 (For California)
Main air jet	(M.A.J.)	1.3
Jet needle	(J.N.)	4H36-3 (Except for California) 4HPY-46 (For California)
Needle jet	(N.J.)	N-6 (Except for California) 0-1M (For California)
Cutaway	(C.A.)	2.5
Pilot air jet	(P.A.J.)	#130
Pilot outlet	(P.O.)	0.7
Pilot jet	(P.J.)	#12.5
Bypass 1	(B.P.1)	1.1
Pilot screw	(P.S.)	2 1/2
Valve seat size	(V.S.)	1.8
Starter jet	(G.S.)	#45
Float height	(F.H.)	21.8 mm (0.86 in)
Fuel level	(F.L.)	4.0 ~ 6.0 mm (0.1575 ~ 0.2362 in) With special tool

Model	YFA1M(C)
Engine idling speed	1,650 ~ 1,750 r/min
Intake vacuum	26.7 kPa (200 mmHg, 7.88 inHg)
Oil pump:	
Type	Trochoid type
Tip clearance	0.15 mm (0.0059 in)
Side clearance	0.06 ~ 0.10 mm (0.0024 ~ 0.0039 in)

CHASSIS

Model	YFA1M(C)
Suspension:	
Suspension travel	
Front	41 mm (1.61 in)
Rear	60 mm (2.36 in)
Free length (spring)	
Front	148 mm (5.83 in)
Rear	205 mm (8.07 in)
Spring rate	
Front	29.4 N/mm (2.94 kg/mm, 167.9 lb/in)
Rear	36.3 N/mm (3.63 kg/mm, 207.3 lb/in)
Stroke	
Front	0 ~ 41.0 mm (0 ~ 1.61 in)
Rear	0 ~ 60.0 mm (0 ~ 2.36 in)
Optional spring	
Front	No
Rear	No
Wheel:	
Wheel type	
Front	Panel wheel
Rear	Panel wheel
Rim size	
Front	8 × 5.5 AT
Rear	8 × 8.0 AT
Rim material	
Front	Steel
Rear	Steel
Rim runout limit	
Front	
Vertical	2.0 mm (0.08 in)
Lateral	2.0 mm (0.08 in)
Rear	
Vertical	2.0 mm (0.08 in)
Lateral	2.0 mm (0.08 in)
Drive chain:	
Type/manufacturer	520V-6/DAIDO
Number of links	74 links
Chain slack	30 mm (1.18 in)

Model	YFA1M(C)
Front brake (drum brake):	
Type	Leading, trailing
Inside diameter (brake drum)	110 mm (4.33 in)
<Wear limit>	<111 mm (4.37 in)>
Lining thickness	4.0 mm (0.16 in)
<Wear limit>	<2.0 mm (0.08 in)>
Free length (shoe spring)	34.5 mm (1.36 in)
Rear brake (drum brake):	
Type	Leading, trailing
Inside diameter (brake drum)	130 mm (5.12 in)
<Wear limit>	<131 mm (5.16 in)>
Lining thickness	4.0 mm (0.16 in)
<Wear limit>	<2.0 mm (0.08 in)>
Free length (shoe spring)	36.5 mm (1.44 in)
Brake lever:	
Free play	
Front brake	10 ~ 12 mm (0.39 ~ 0.47 in) at lever pivot
Rear brake	5 ~ 8 mm (0.20 ~ 0.31 in) at lever pivot

ELECTRICAL

Model	YFA1M(C)
Voltage:	12 V
Ignition system:	
Ignition timing (B.T.D.C.)	7° at 1,700 r/min
Advanced timing (B.T.D.C.)	27° at 5,000 r/min
Advancer type	Electrical type
C.D.I.:	
Magneto model/manufacturer	F3FA/YAMAHA
Pickup coil resistance	248 ~ 372 Ω at 20°C (68°F)
(lead color)	(Red-Gray)
Source coil resistance	264 ~ 396 Ω at 20°C (68°F)
(lead color)	(Brown-Green)
Lighting coil resistance	0.56 ~ 0.84 Ω at 20°C (68°F)
(lead color)	(White-Brack)
	0.32 ~ 0.48 Ω at 20°C (68°F)
	(Yellow-Brack)
C.D.I. unit model/manufacturer	3FA1/YAMAHA
Ignition coil:	
Model/manufacturer	2JN/YAMAHA
Primary coil resistance	0.184 ~ 0.276 Ω at 20°C (68°F)
Secondary coil resistance	6.32 ~ 9.48 kΩ at 20°C (68°F)
Spark plug cap:	
Type	Resin type
Resistance	10 kΩ at 20°C (68°F)
Rectifier/regulator:	
Model/manufacturer	EHU-01TR31A/MATSUSHITA
Regulator type	Semi conductor short circuit type
No load regulated voltage (DC)	14.0 ~ 15.0 V
No load regulated voltage (AC)	13.0 ~ 14.0 V
Rectifier capacity (DC)	8 A
Rectifier capacity (AC)	8 A
Withstand voltage	200 V
Battery:	
Specified gravity	1.280
Electric starting system:	
Type	Constant mesh type
Starter motor	
Model/manufacturer	3FA1/YAMAHA
Output	0.4 kw
Armature coil resistance	0.019 ~ 0.023 Ω at 20°C (68°F)
Overall length (brush)	10.0 mm (0.39 in)
<Limit>	<3.5 mm (0.14 in)>
Brush spring pressure	5.52 ~ 8.28 N (19.87 ~ 29.80 oz)
Commutator diameter	22.0 mm (0.87 in)

Model	YFA1M(C)
<Wear limit>	<21.0 mm (0.83 in)>
Mica undercut	1.5 mm (0.06 in)
Starter relay	
Mode/manufacturer	MS5D-611/JIDECO
Amperage rating	100 A
Coil resistance	3.87 ~ 4.37 Ω at 20°C (68°F)
Starting circuit cut off relay	
Model/manufacturer	ACA1211-9/MATSUSHITA
Coil resistance	72 ~ 88 Ω at 20°C (68°F)
Diode	No
Circuit breaker:	
Type	Fuse
Amperage for individual circuit	
Main	5 A

PERIODIC INSPECTION AND ADJUSTMENT

INTRODUCTION

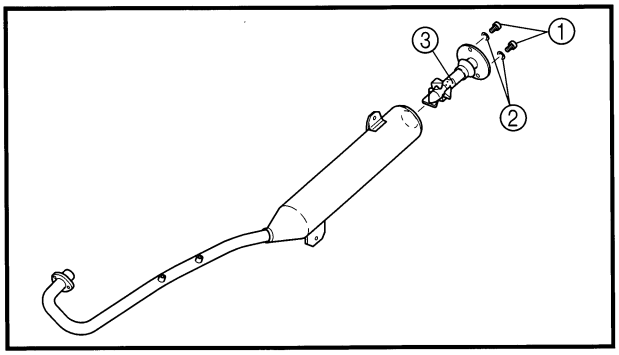
This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information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

ITEM	ROUTINE	INITIAL			EVERY	
		1 month	3 months	6 months	6 months	1 year
Valves*	• Check valve clearance. • Adjust if necessary.	○		○	○	○
Spark plug	• Check condition. • Adjust gap and clean. • Replace if necessary.	○	○	○	○	○
Air filter element (for engine and V-belt compartment)	• Clean. • Replace if necessary.	Every 20 ~ 40 hours (More often in wet or dusty areas.)				
Carburetor*	• Check idle speed/starter operation. • Adjust if necessary.		○	○	○	○
Cylinder head cover breather system*	• Check breather hose for cracks or damage. • Replace if necessary.			○	○	○
Exhaust system*	• Check leakage. • Retighten if necessary. • Replace gasket if necessary.			○	○	○
Spark arrester	• Clean.			○	○	○
Fuel line*	• Check fuel hose for cracks or damage. • Replace if necessary.			○	○	○
Engine oil	• Replace (warm engine before draining).	○		○	○	○
Oil strainer*	• Clean. • Replace if necessary.	○		○		○
Drive chain	• Check and adjust slack/alignment/clean/lube.	○	○	○	○	○
Transmission oil	• Check oil level/oil leakage. • Replace every 12 months.	○				○
Brake*	• Check operation. • Adjust if necessary.	○	○	○	○	○
V-belt*	• Check operation. • Replace if damage or excessive wear.	○				○
Wheels*	• Check balance/damage/runout. • Replace if necessary.	○		○	○	○
Wheel bearings*	• Check bearing assembly for looseness/damage. • Replace if damaged.	○		○	○	○
Steering system*	• Check operation. • Replace if damaged. • Check toe-in. • Adjust if necessary.	○	○	○	○	○

ITEM	ROUTINE	INITIAL			EVERY	
		1 month	3 months	6 months	6 months	1 year
Knuckle shafts/ Steering shaft*	• Lubricate every 6 months.**			○	○	○
Fittings and Fasteners*	• Check all chassis fittings and fasteners. • Correct if necessary.	○	○	○	○	○
Battery*	• Check specific gravity. • Check breather hose for proper operation. • Correct if necessary.	○	○	○	○	○

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



ENGINE

SPARK ARRESTER CLEANING

1. Remove the bolt ①.

NOTE:
Make sure to not loose the washer ② when removing the bolt.

2. Remove the tailpipe ③ by pulling it out of the muffler.
3. Tap the tailpipe lightly with a soft-face hammer or suitable tool, then use a wire brush to remove any carbon deposits from the spark arrester portion of the tailpipe and the inner contact surfaces of the muffler.
4. Insert the tailpipe ③ into the muffler and align the bolt holes.
5. Install the bolt ① and tighten it.

NOTE:
Make sure to install the washer ② when installing the bolt.

⚠ WARNING

Always let the exhaust system cool before performing this operation.
Do not start the engine when cleaning the spark arrester or exhaust system.

YAMAHA MOTOR CO., LTD.
2500 SHINGAI IWATA SHIZUOKA JAPAN

PRINTED IN U.S.A.

YAMAHA

YFA1W

SERVICE MANUAL

LIT-11616-06-75

3FA-28197-10

YFA1W
SERVICE MANUAL

1st edition, November 1988

LIT-11616-06-75

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha machines have a basic understanding of the mechanical concepts and procedures inherent in machine repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.
Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

TECHNICAL PUBLICATIONS
SERVICE DIVISION
MOTORCYCLE GROUP
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

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

⚠ CAUTION: **A CAUTION** indicates special procedures that must be followed to avoid damage to the machine.

⚠ WARNING: **A WARNING** indicates special procedures that must be followed to avoid injury to a machine operator or person inspecting or repairing the machine.

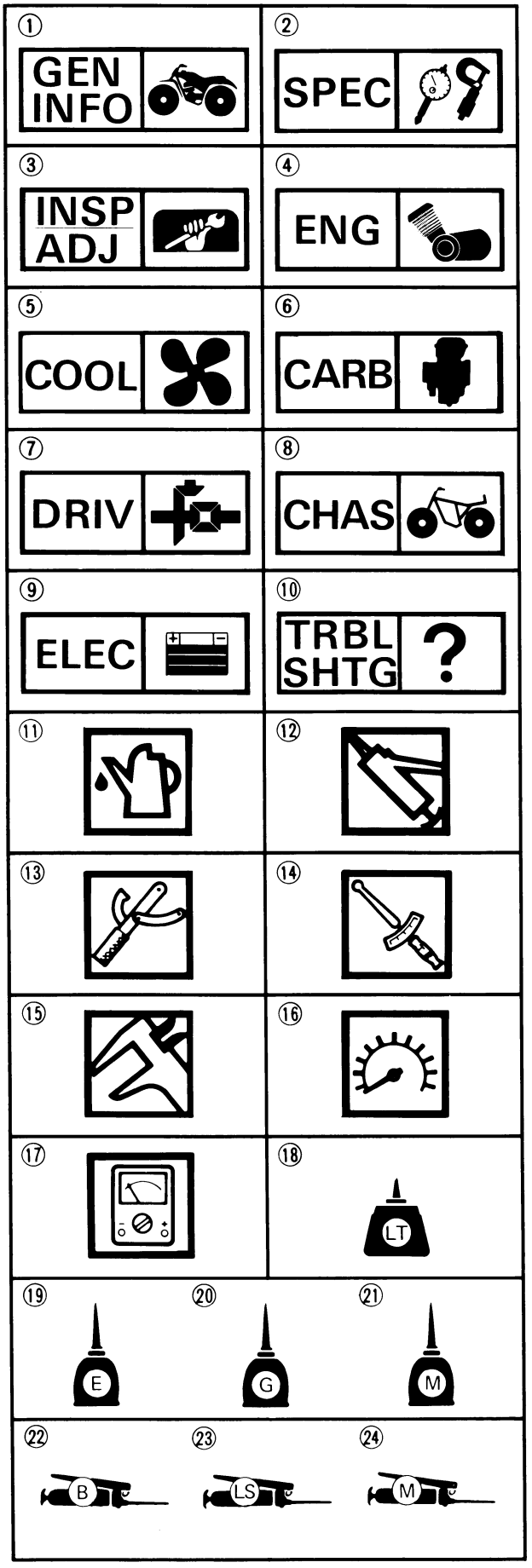
MANUAL FORMAT

All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.
In this revised format, the condition of a faulty component will precede an arrow symbol and the course of action required will follow the symbol, e.g.,

- Bearings
  Pitting/Damage → Replace.

EXPLODED DIAGRAM

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



ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑩ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Specifications
③ Periodic inspection and adjustment
④ Engine
⑤ Cooling system
⑥ Carburetion
⑦ Drive train
⑧ Chassis
⑨ Electrical
⑩ Troubleshooting

Illustrated symbols ⑪ to ⑰ are used to identify the specifications appearing in the text.

⑪ Filling fluid
⑫ Lubricant
⑬ Special tool
⑭ Tightening
⑮ Wear limit, clearance
⑯ Engine speed
⑰ Ω, V, A

Illustrated symbols ⑱ to ㉔ in the exploded diagram indicate grade of lubricant and location of lubrication point.

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

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GENERAL INFORMATION

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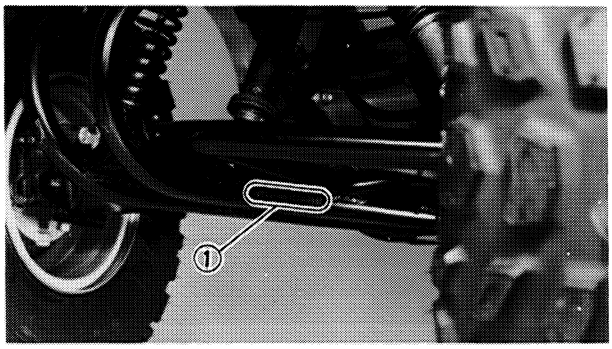
CHAPTER 5.
CARBURETION

CHAPTER 6.
CHASSIS

CHAPTER 7.
ELECTRICAL

CHAPTER 8.
TROUBLESHOOTING

GENERAL INFORMATION



MACHINE IDENTIFICATION

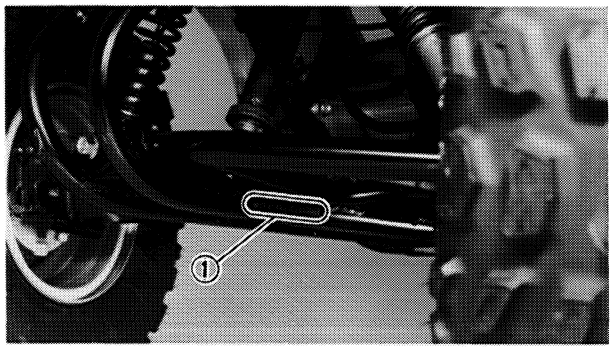
VEHICLE IDENTIFICATION NUMBER (FOR USA, CDN AND AUS)

The vehicle identification number ① is stamped into the left side of the frame.

NOTE:

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

Starting Serial Number:
JY43FAW0 * KC000101 (USA, AUS)
JY43FAN0 * KC031101 (CDN)



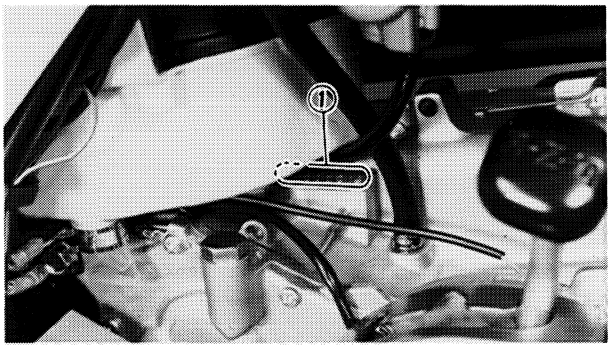
FRAME SERIAL NUMBER (EXCEPT FOR USA, CDN AND AUS)

The frame serial number ① is stamped into the left side of frame.

NOTE:

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

Starting Serial Number:
3FA-031101



ENGINE SERIAL NUMBER

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

NOTE:

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

Starting Serial Number:
3FA-000101 (USA, AUS)
3FA-031101 (CDN, CH, F, NL, S, DK)

NOTE:

Designs and specifications are subject to change without notice.

1

IMPORTANT INFORMATION

PREPARATION FOR REMOVAL

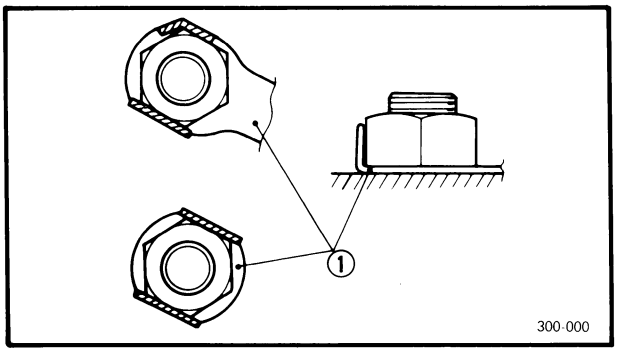
1. Remove all dirt, mud, dust and foreign material before removal and disassembly.
2. Use proper tools and cleaning equipment. Refer to "CHAPTER 1. GENERAL INFORMATION-SPECIAL TOOLS" section.
3. When disassembling the machine, keep mated parts together. This includes gears, cylinder, piston and other parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.
4. During the machine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled.
5. Keep away from fire.

ALL REPLACEMENT PARTS

1. We recommended to use Yamaha genuine 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.

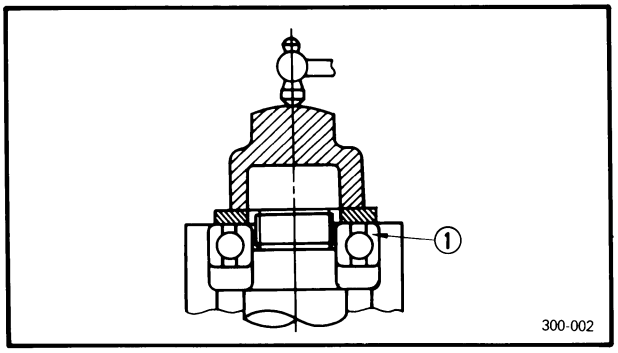
GASKETS, OIL SEALS, AND O-RINGS

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.

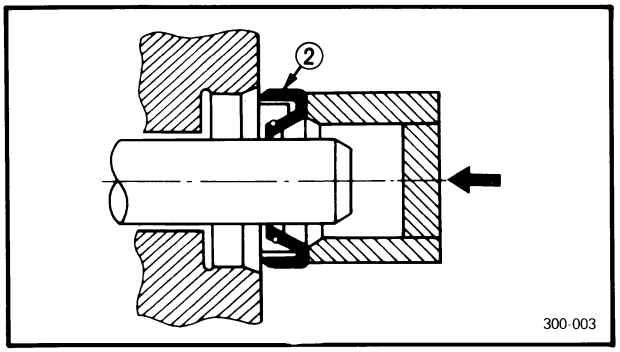


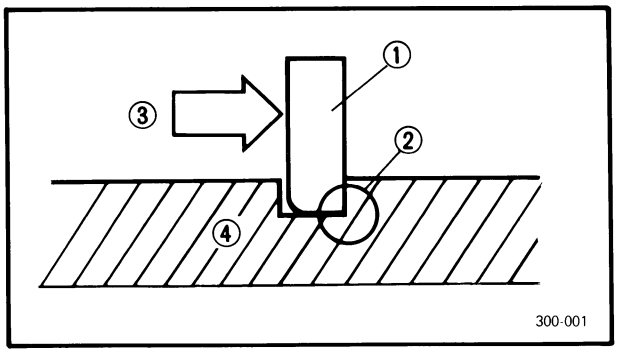
BEARINGS AND OIL SEALS

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.

⚠ WARNING:

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





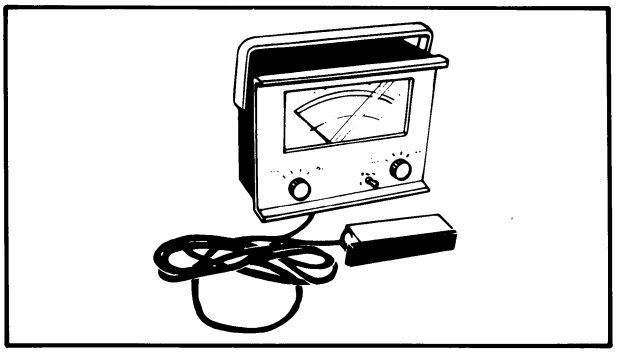
CIRCLIPS

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

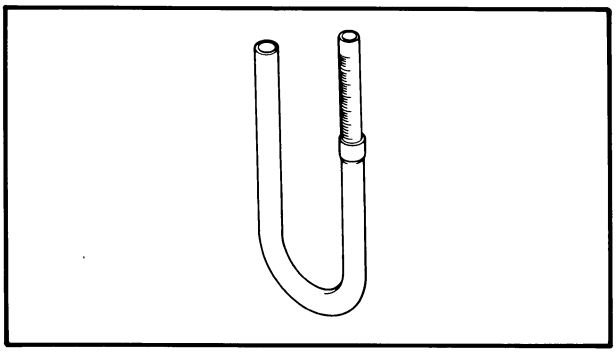
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

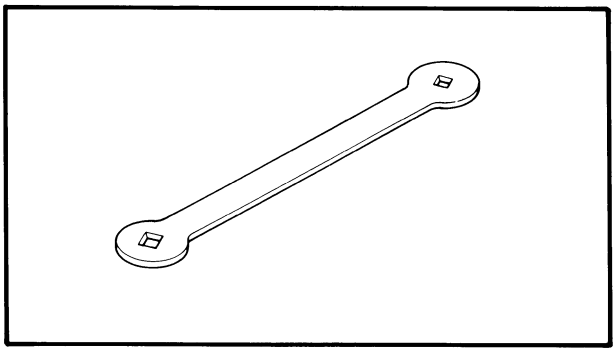
1. Inductive Tachometer
   P/N YU-08036
   P/N 90890-03113

This tool is needed for detecting engine rpm.



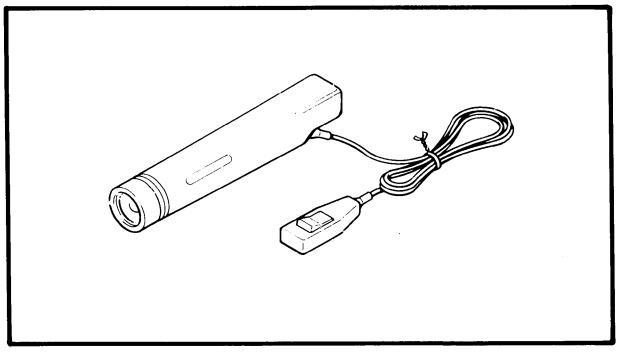
2. Fuel Level Gauge
   P/N YM-01312-A
   P/N 90890-01312

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



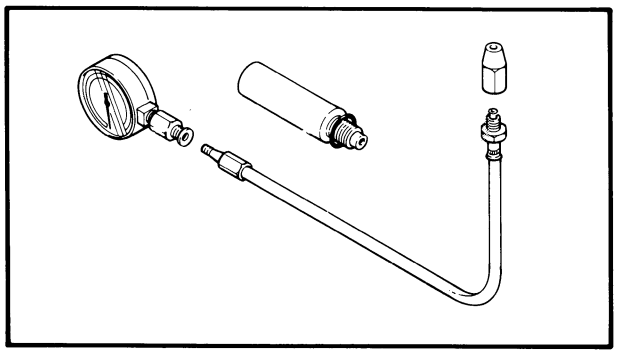
3. Valve Adjusting Tool
   P/N YM-08035
   P/N 90890-01311

This tool is necessary for adjusting the valve clearance.



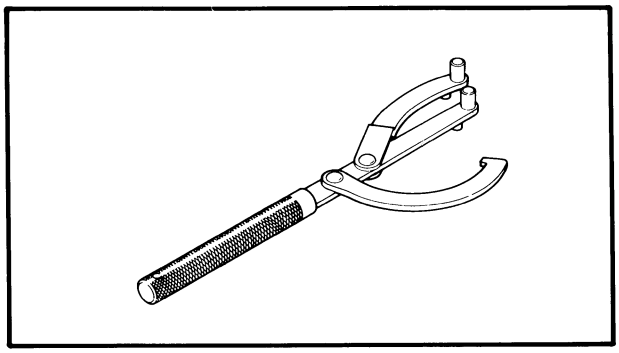
4. Timing Light
   P/N YM-33277
   P/N 90890-03109

This tool is necessary for checking timing.



5. Compression Gauge
   P/N YU-33223
   P/N 90890-03081

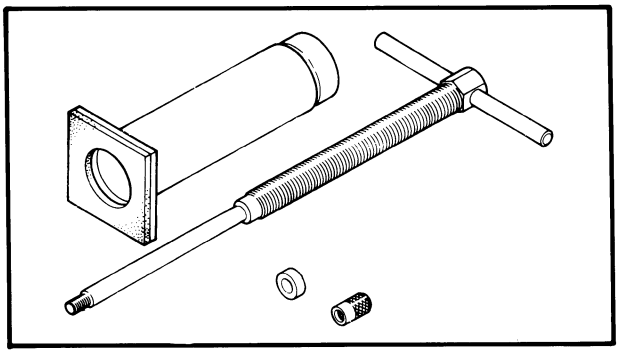
This gauge is used to measure engine compression.



FOR ENGINE SERVICE

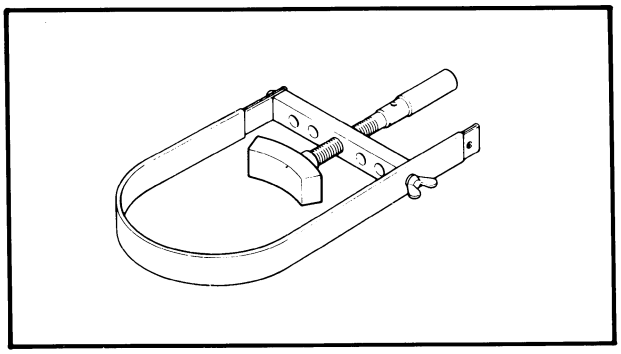
1. Rotor Holder
   P/N YU-01235
   P/N 90890-01235

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



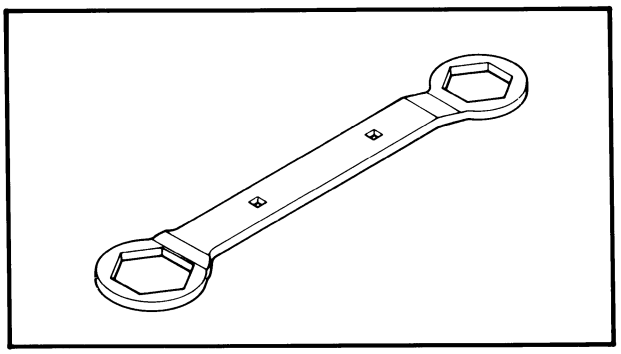
2. Piston Pin Puller
   P/N YU-01304
   P/N 90890-01304

This tool is used to remove the piston pin.



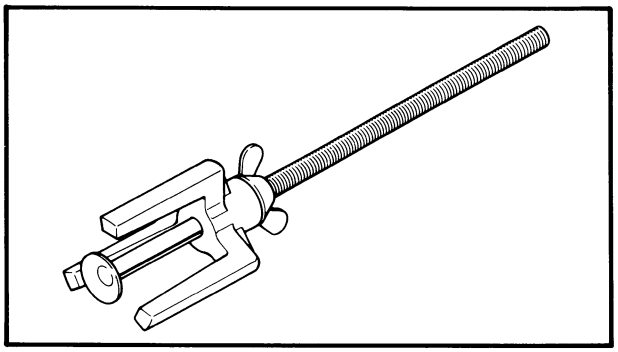
3. Sheave Holder
   P/N YU-01880
   P/N 90890-01701

This tool is used when holding the clutch hub.



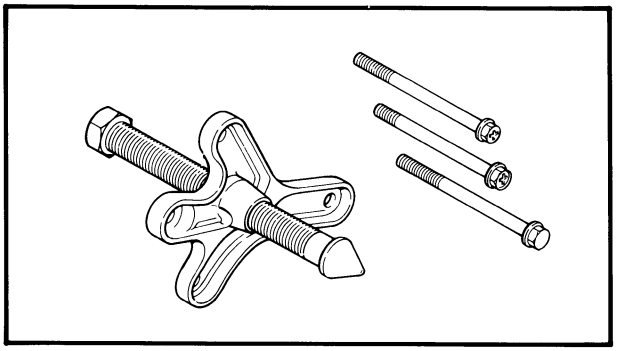
4. Locknut Wrench
   P/N YM-4045-A
   P/N 90890-01348

This tool is used to remove and install the secondary sheave nut.



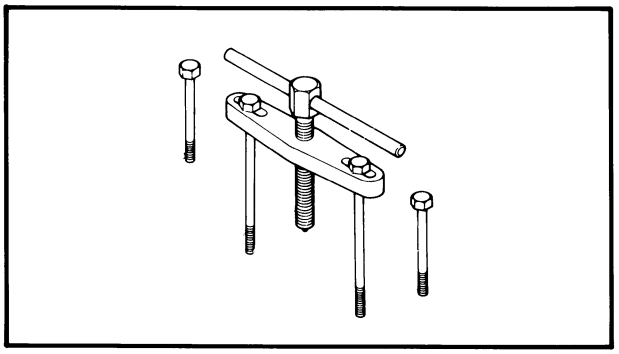
5. Spring Holder
   P/N YS-28891
   P/N 90890-01337

This tool is used to compress the clutch spring.



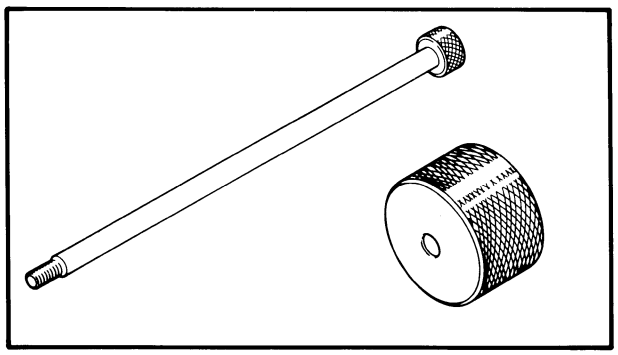
6. Universal Puller
   P/N YU-33270
   P/N 90890-01362

This tool is used to remove the CDI rotor.



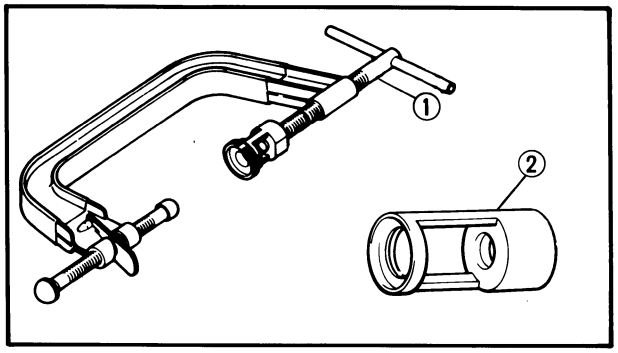
7. Crankcase Separating Tool
   P/N YU-01135
   P/N 90890-01135

This tool is used to separate the crankcase.



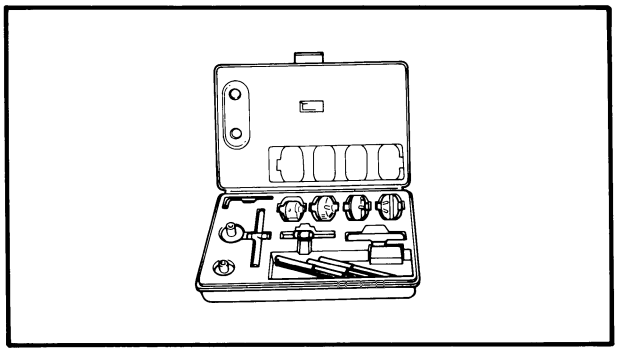
8. Slide Hammer Set
   P/N YU-01083
   P/N 90890-01084, 90890-01085

These tools are used to remove and install the rocker arm shafts.



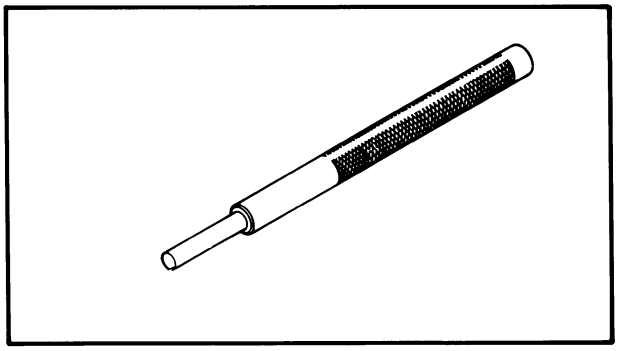
9. Valve Spring Compresser – ①
   P/N YM-04019
   P/N 90890-04019
   Adapter – ②
   P/N YM-4108
   P/N 90890-04108

These tools are used to remove and install the valve assemblies.



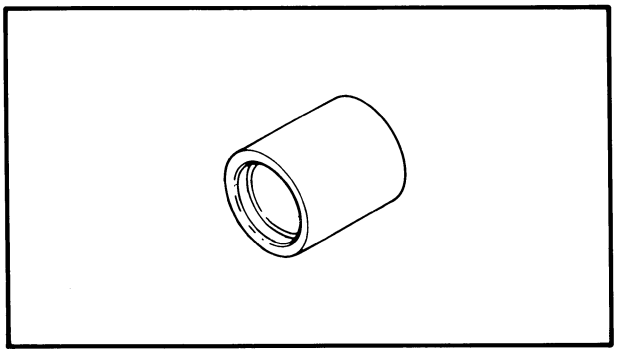
10. Valve Seat Cutter
    P/N YM-91043

These tools are used to resurface the valve seat.



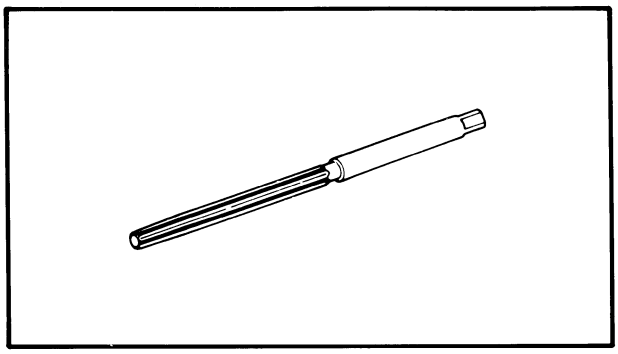
11. Valve Guide Remover
    P/N YM-4097
    P/N 90890-04097

This tool is needed to install the valve guides properly.



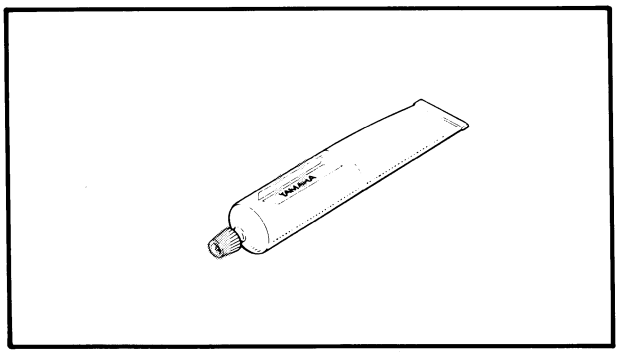
12. Valve Guide Installer
    P/N YM-4098
    P/N 90890-04098

This tool is needed to install the valve guides properly.



13. Valve Guide Reamer
    P/N YM-4099
    P/N 90890-04099

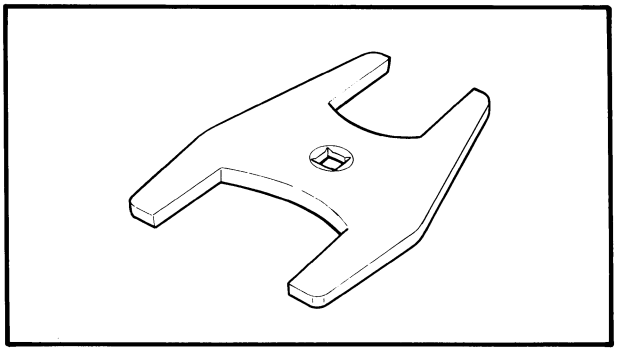
This tool is used to rebore the new valve guide.



14. Sealant (Quick Gasket®)
    P/N ACC-11001-05-01
    P/N 90890-85505

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

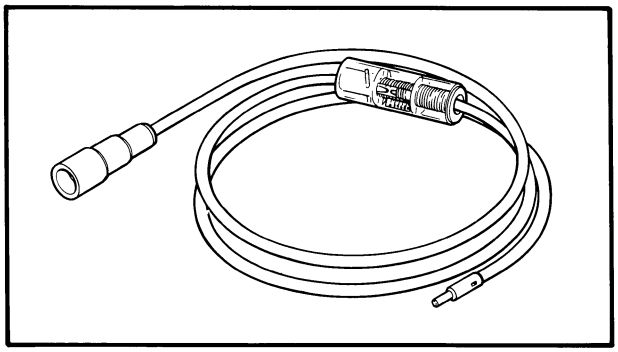
1



FOR CHASSIS SERVICE

1. Rear Axle Nut Wrench
   P/N YM-37132
   P/N 90890-01419

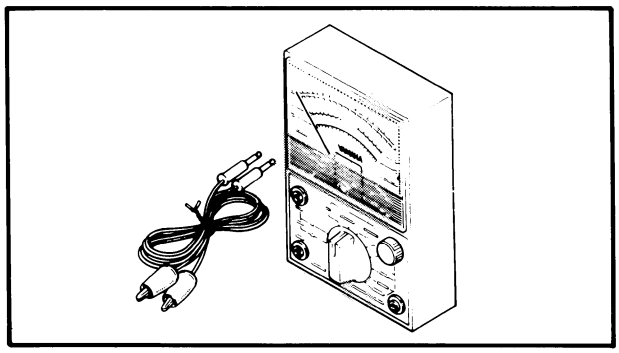
This tool is used to loosen and tighten the rear axle nut.



FOR ELECTRICAL COMPONENTS

1. Dynamic Coil Tester
   P/N YU-34487
   P/N 90890-03144

This instrument is necessary for checking the ignition system components.

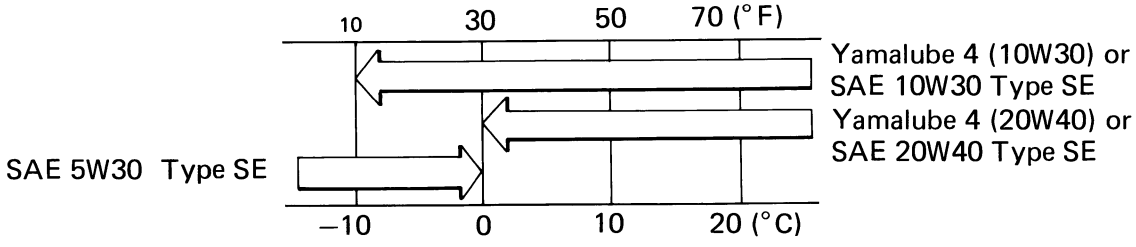


2. Pocket Tester
   P/N YU-03112
   P/N 90890-03112

This instrument is invaluable for checking the electrical system.

SPECIFICATIONS

GENERAL SPECIFICATIONS

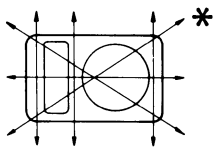
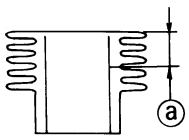
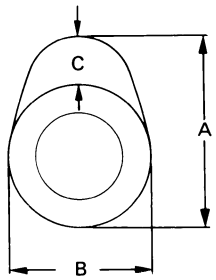
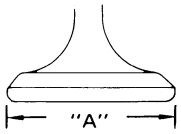
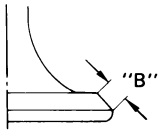
Model	YFA1 (W)
Model Code Number	3FA
Engine Starting Number	3FA-000101 (USA, AUS) 3FA-031101 (CDN, CH, F, NL, S, DK)
Vehicle Identification Number	JY43FAW0 * KC000101 (USA, AUS) JY43FAN0 * KC031101 (CDN)
Frame Starting Number	3FA-031101 (CH, F, NL, S, DK)
Dimension:	
Overall Length	1,640 mm (64.6 in)
Overall Width	965 mm (38.0 in)
Overall Height	980 mm (38.6 in)
Seat Height	690 mm (27.2 in)
Wheelbase	1,080 mm (42.5 in)
Minimum Ground Clearance	145 mm (5.7 in)
Basic Weight:	
With Oil and Full Fuel Tank	144 kg (317 lb)
Minimum Turning Radius	2,900 mm (114.2 in)
Engine:	
Engine Type	Air Cooled 4-Stroke, SOHC
Cylinder Arrangement	Forward Inclinde Single Cylinder
Displacement	124 cm^3
Bore x Stroke	49 x 66 mm (1.93 x 2.60 in)
Compression Ratio	9.0 : 1
Compression Pressure	850 kPa (8.5 kg/cm^2, 120 psi)
Starting System	Electric Starter
Lubrication system:	
Type	Wet Sump
Engine Oil Type	
Transmission Oil Type	Yamalube 4 (10W30 or 20W40), SAE10W 30 Type SE or SAE 20W40 Type SE *Yamalube 4 (10W30 and 20W40) are for USA and CDN.

Model	YFA1 (W)
Oil Quantity:	
Engine Oil	
Periodic Oil Change	1.25 L (1.10 Imp qt, 1.32 US qt)
Total Amount	1.45 L (1.28 Imp qt, 1.53 US qt)
Transmission Oil	0.60 L (0.53 Imp qt, 0.63 US qt)
Air Filter:	
Type	Wet Type Element
Fuel:	
Type	Regular Gasoline
Fuel Tank Capacity	7.0 L (1.54 Imp gal, 1.85 US gal)
Reserve Amount	1.3 L (0.28 Imp gal, 0.34 US gal)
Carburetor:	
Type/Quantity	VM18SH/1 pc.
Manufacturer	MIKUNI
Spark Plug:	
Type (Manufacturer)	C7HSA (NGK), U22FS-U (ND) (USA, AUS) CR7HS (NGK) (CDN, CH, F, NL, S, DK)
Spark Plug Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Transmission:	
Primary Reduction System	Helical Gear
Primary Reduction Ratio	43/14 x 40/17 (7.226)
Secondary Reduction System	Chain Drive
Secondary Reduction Ratio	32/12 (2.666)
Clutch Type	Dry, Centrifugal Automatic
Transmission Type	Single Speed Automatic (V-Belt)
Operation	Centrifugal Automatic Type
Single Speed Automatic	2.303 ~ 0.821
Reverse Ratio	(2.3 ~ 0.82) x 49/14 x 49/15 x 40/17 (61.874 ~ 22.059)
Chassis:	
Frame Type	Steel Tube Frame
Caster Angle	6°
Camber	1.5°
Trail	15 mm (0.59 in)
Tread	
Front	695 mm (27.4 in)
Rear	710 mm (28.0 in)
Toe-in	0.0 ~ 10.0 mm (0.0 ~ 0.4 in)
Tire:	
Type	Tubeless
Size	
Front	AT20 x 7 – 8
Rear	AT22 x 10 – 8
Manufacturer (Type)	
Front	DUNLOP (KT536)
Rear	DUNLOP (KT537)
Wear Limit	3.0 mm (0.12 in)

Model	YFA1 (W)
Tire Pressure (Cold Tire):	
Recommended	
Front	20 kPa (0.20 kg/cm², 2.8 psi)
Rear	25 kPa (0.25 kg/cm², 3.5 psi)
Minimum	
Front	17 kPa (0.17 kg/cm², 2.4 psi)
Rear	22 kPa (0.22 kg/cm², 3.1 psi)
Maximum	
Front	23 kPa (0.23 kg/cm², 3.3 psi)
Rear	28 kPa (0.28 kg/cm², 4.0 psi)
Brake:	
Front Brake Type	Drum Brake
Front Brake Operation	Right Hand Operation
Rear Brake Type	Drum Brake
Rear Brake Operation	Left Hand Operation
Suspension:	
Front	Swing Axle
Rear	Swingarm
Shock Absorber:	
Front	Coil Spring/Oil Damper
Rear	Coil Spring/Oil Damper
Wheel Travel:	
Front	70 mm (2.76 in)
Rear	80 mm (3.15 in)
Electrical:	
Ignition System	CDI
Generator System	A.C. Magneto Generator
Battery Capacity	12V 12AH
Battery Type	12N12C-4A-1
Headlight Type	Bulb Type
Bulb Wattage (Quantity)	
Headlight	12V 25W/25W (1 pc.)
Tail/Brake Light	12V 3.8W (1 pc.) (USA, AUS, CH, F, NL, S, DK) 12V 7.5W (1 pc.) (CDN)
Neutral Indicator Light	12V 3.4W (1 pc.)
Reverse Indicator Light	12V 3.4W (1 pc.)

MAINTENANCE SPECIFICATIONS

ENGINE

Model	YFA1 (W)
Cylinder Head: Warp Limit 	0.03 mm (0.0012 in) * Lines indicate straightedge measurement.
Cylinder: Bore Size < Wear Limit > Measuring Point "a" 	49.030 ~ 49.045 mm (1.930 in) < 49.15 mm (1.935 in) > 45 mm (1.77 in)
Camshaft: Drive Method Cam Dimensions Intake "A" "B" "C" Exhaust "A" "B" "C" Camshaft Runout Limit 	Chain Drive (Left) 26.17 ~ 26.27 mm (1.030 ~ 1.034 in) 21.06 ~ 21.17 mm (0.829 ~ 0.833 in) 15.66 ~ 15.77 mm (0.616 ~ 0.621 in) 26.17 ~ 26.27 mm (1.030 ~ 1.034 in) 21.06 ~ 21.17 mm (0.829 ~ 0.833 in) 15.66 ~ 15.77 mm (0.616 ~ 0.621 in) 0.03 mm (0.0012 in)
Timing Chain: Type No. of Links Adjustment Method	 DID 25 92 Links Automatic
Rocker Arm/Rocker Arm Shaft: Inside Diameter (Rocker Arm) Outside Diameter (Shaft) Arm-to-Shaft Clearance	 10.000 ~ 10.015 mm (0.394 in) 9.981 ~ 9.991 mm (0.393 in) 0.009 ~ 0.034 mm (0.0003 ~ 0.0013 in)
Valve, Valve Seat, Valve Guide: Valve Clearance (Cold) Intake Exhaust Valve Dimensions "A" Head Diameter Intake Exhaust  "B" Face Width Intake Exhaust 	 0.08 ~ 0.12 mm (0.003 ~ 0.005 in) 0.10 ~ 0.14 mm (0.004 ~ 0.006 in) 25.9 ~ 26.1 mm (1.02 ~ 1.03 in) 21.9 ~ 22.1 mm (0.86 ~ 0.87 in) 2.5 ~ 3.5 mm (0.10 ~ 0.14 in) 1.7 ~ 4.0 mm (0.07 ~ 0.16 in)

Model	YFA1 (W)
"C" Seat Width	
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
"D" Margin Thickness	
Intake	0.4 ~ 0.8 mm (0.016 ~ 0.031 in)
Exhaust	0.8 ~ 1.2 mm (0.031 ~ 0.047 in)
Outside Diameter (Valve Stem)	
Intake	4.975 ~ 4.990 mm (0.196 in)
Exhaust	4.960 ~ 4.975 mm (0.195 ~ 0.196 in)
Inside Diameter (Valve Guide)	
Intake	5.000 ~ 5.012 mm (0.197 in)
Exhaust	5.000 ~ 5.012 mm (0.197 in)
Stem-to-Guide Clearance	
Intake	0.010 ~ 0.037 mm (0.004 ~ 0.0014 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
Stem Runout Limit	0.01 mm (0.0004 in)
Valve Seat Width	
Intake	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
Exhaust	0.9 ~ 1.1 mm (0.035 ~ 0.043 in)
Valve Spring:	
Free Length	
Intake	28.63 mm (1.127 in)
Exhaust	28.63 mm (1.127 in)
Set Length (Valve Closed)	
Intake	24.9 mm (0.980 in)
Exhaust	24.9 mm (0.980 in)
Compressed Pressure (Installed)	
Intake	8.8 ~ 10.8 kg at 24.9 mm (19.4 ~ 23.8 lb at 0.980 in)
Exhaust	8.8 ~ 10.8 kg at 24.9 mm (19.4 ~ 23.8 lb at 0.980 in)
Tilt Limit	
Intake	2.5° or 1.2 mm (0.047 in)
Exhaust	2.5° or 1.2 mm (0.047 in)
Direction of Winding (Top View)	

Intake	Exhaust
Clockwise	Clockwise

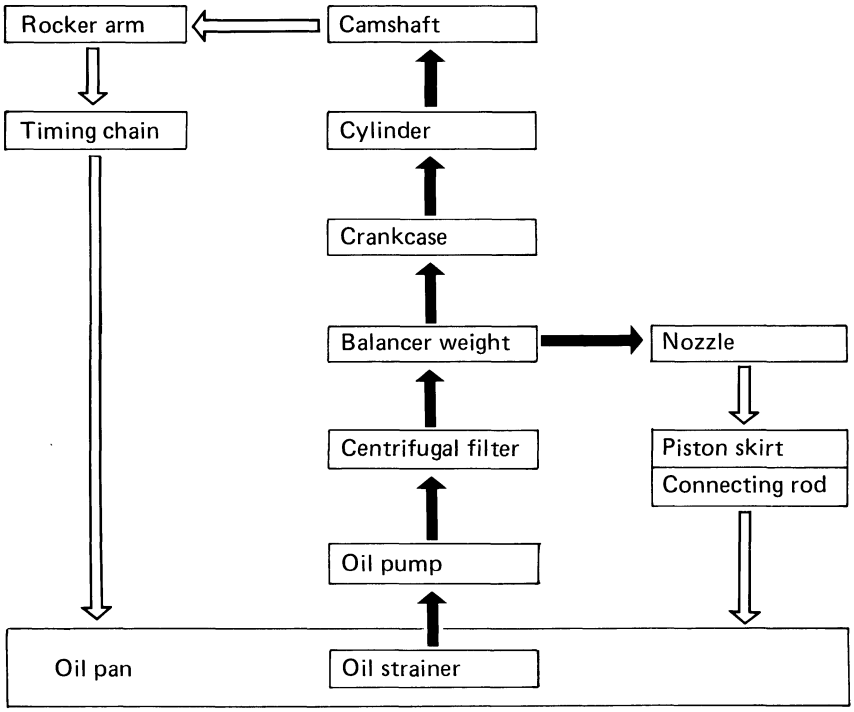
Model	YFA1 (W)
Piston:	
Piston Size "D"	48.96 ~ 49.00 mm (1.927 ~ 1.929 in)
Measuring Point "H"	6 mm (0.24 in)
	From bottom of the piston.
Piston-to-Cylinder Clearance	0.020 ~ 0.040 mm (0.0008 ~ 0.0016 in)
< Wear Limit >	< 0.15 mm (0.006 in) >
Over Size 2nd	49.5 mm (1.95 in)
4th	50.0 mm (1.97 in)
Piston Off-Set	0.5 mm (0.02 in)
Piston Off-Set Direction	Intake side
Inside Diameter (Piston Pin Bore)	13.002 ~ 13.013 mm (0.512 in)
Outside Diameter (Piston Pin)	12.996 ~ 13.000 mm (0.512 in)
Piston Pin-to-Piston Clearance	0.002 ~ 0.017 mm (0.0001 ~ 0.0006 in)
< Limit >	< 0.07 mm (0.003 in) >
Piston Ring:	
Dimension (B x T)	
Top Ring	1.0 x 2.0 mm (0.039 x 0.079 in)
Second Ring	1.0 x 2.0 mm (0.039 x 0.079 in)
Oil Ring	2.0 x 2.2 mm (0.079 x 0.087 in)
End Gap (Installed)	
Top Ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
Second Ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
Oil Ring	0.30 ~ 0.90 mm (0.012 ~ 0.036 in)
Side Clearance	
Top Ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0027 in)
Second Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
Connecting Rod:	
Length	111.95 ~ 112.05 mm (4.407 ~ 4.411 in)
Crankshaft:	
Crank Width "A"	44.95 ~ 45.00 mm (1.770 ~ 1.772 in)
Runout Limit "C"	0.03 mm (0.0012 in)
Big End Side Clearance "D"	0.05 ~ 0.45 mm (0.0020 ~ 0.0177 in)
Small End Free Play "F"	0.80 ~ 1.00 mm (0.031 ~ 0.039 in)

Model		YFA1 (W)
Ballancer:		
Drive Method		Gear
Automatic Centrifugal Clutch:		
Clutch Shoe Thickness		3.5 mm (0.138 in)
< Wear Limit >		< 2.0 mm (0.079 in) >
Free Length (Clutch Spring)		27.5 mm (1.083 in)
Free Length (Sliding Sheave Spring)		79.6 mm (3.134 in)
Compressed Pressure of Sliding Sheave Spring (Installed)		27.2 kg (60.0 lb) at 52.1 mm (2.051 in)
Inside Diameter (Clutch Housing)		119.9 ~ 120.1 mm (4.720 ~ 4.728 in)
Clutch-In Revolution		2,300 ~ 2,600 r/min
Clutch-Stall Revolution		3,400 ~ 3,800 r/min
V-Belt:		
Width		20.1 mm (0.791 in)
< Wear Limit >		18.1 mm (0.712 in)
Transmission:		
Runout Limit		
Main Axle		0.08 mm (0.003 in)
Drive Axle		0.08 mm (0.003 in)
Shifter:		
Type		Cam Drum and Guide Bar
Runout Limit (Guide Bar)		0.03 mm (0.0012 in)
Shift Fork Thickness		4.76 ~ 4.89 mm (0.184 ~ 0.192 in)
Air Filter Oil Grade:		Foam-Air-Filter Oil or SAE 10W30
Carburetor:		
I.D. Mark		3FA00
Main jet	(M.J.)	# 82.5
Main Air Jet	(M.A.J.)	ϕ 1.3
Jet Needle	(J.N.)	4H36-3/5
Needle Jet	(N.J.)	N-6
Cutaway	(C.A.)	2.5
Pilot Air Jet	(P.A.J.)	# 130
Pilot Outlet	(P.O.)	ϕ 0.7
Pilot Jet	(P.J.)	# 12.5
Pilot Screw	(P.S.)	2 and 1/2 turns out
Valve Seat Size	(V.S.)	1.8
Starter Jet	(G.S.)	# 45
Float Height	(F.H.)	21.8 ~ 22.8 mm (0.858 ~ 0.898 in)
Fuel Level	(F.L.)	2.0 ~ 4.0 mm (0.08 ~ 0.16 in)
		With Special Tool
Engine Idling Speed		1,650 ~ 1,750 r/min

Model	YFA1 (W)
Oil Pump:	
Type	Trochoid Type
Tip Clearance	0.15 mm (0.006 in)
Side Clearance	0.06 ~ 0.10 mm (0.002 ~ 0.004 in)

Lubrication Chart:

: Pressured feed
: Splashed



Tightening torque:

Parts to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Cylinder head cover and cylinder head	M6 x 1.0	7	0.7	5.1	
Spark plug	M10 x 1.0	13	1.3	9.4	
Stud bolt (exhaust manifold)	M6 x 1.0	7	0.7	5.1	
Bearing retainer (camshaft) and cylinder head	M6 x 1.0	12	1.2	8.7	
Cylinder head and cylinder	M8 x 1.25	22	2.2	16	
Locknut (valve clearance adjuster)	M5 x 0.8	7	0.7	5.1	
Cylinder head and cylinder	M6 x 1.0	10	1.0	7.2	
Cam sprocket and camshaft	M8 x 1.25	26	2.6	19	
Timing chain tensioner and cylinder	M6 x 1.0	10	1.0	7.2	
Plug (timing chain tensioner)	M8 x 1.25	7	0.7	5.1	
Intake manifold and cylinder head	M6 x 1.0	12	1.2	8.7	
Intake manifold and carburetor	M6 x 1.0	10	1.0	7.2	
Muffler and cylinder head	M6 x 1.0	10	1.0	7.2	
Protector and muffler	M6 x 1.0	8	0.8	5.8	
Muffler and frame	M8 x 1.25	27	2.7	19	
Air filter case cover and air filter case	M5 x 0.8	4	0.4	2.9	
Air filter and air filter case cover	M6 x 1.0	7	0.7	5.1	
Drain plug (for engine oil)	M35 x 1.5	32	3.2	23	
Drain plug (for transmission oil)	M14 x 1.5	23	2.3	17	
Filler plug (for transmission oil)	M14 x 1.5	23	2.3	17	
Checking screw (for transmission oil)	M8 x 1.25	16	1.6	11	
Air duct	M6 x 1.0	7	0.7	5.1	
Crankcase cover (left) and crankcase	M6 x 1.0	7	0.7	5.1	
Crankcase cover (right) and crankcase	M6 x 1.0	7	0.7	5.1	
Chain case cover and crankcase	M6 x 1.0	7	0.7	5.1	
Crankcase (left) and crankcase (right)	M6 x 1.0	7	0.7	5.1	
Oil pump and crankcase	M6 x 1.0	7	0.7	5.1	
Shift lever and shift shaft	M6 x 1.0	10	1.0	7.2	
Shift lever guide and crankcase	M6 x 1.0	10	1.0	7.2	
Shift lever switch and crankcase	M5 x 0.8	6	0.6	4.3	
Plug (shift cam stopper)	M14 x 1.5	10	1.0	7.2	
Lever (shift lever switch) and crankcase	M6 x 1.0	10	1.0	7.2	LT
Drive sprocket and drive axle	M20 x 1.5	75	7.5	54	Lock washer
Bearing housing (drive axle bearing) and crankcase	M6 x 1.0	10	1.0	7.2	LT
Bearing retainer (drive axle bearing)	M55 x 1.5	60	6.0	43	LT
Primary fixed sheave and crankshaft	M12 x 1.0	55	5.5	40	Lock washer
Cover (primary fixed sheave) and housing (primary fixed sheave)	M4 x 0.7	3	0.3	2.2	
Bearing retainer (primary drive axle)	M6 x 1.0	7	0.7	5.1	LT
Clutch housing and primary drive axle	M14 x 1.5	60	6.0	43	
Clutch assembly	M36 x 1.5	90	9.0	65	
Main jet		2	0.2	1.4	
Pilot jet		1	0.1	0.7	
Needle jet		3	0.3	2.2	
Bulb seat holder		1	0.1	0.7	
Starter plunger		3	0.3	2.2	
Float chamber		2	0.2	1.4	
CDI magneto	M12 x 1.25	70	7.0	51	
Stator assembly	M6 x 1.0	7	0.7	5.1	

CHASSIS

Model	YFA1 (W)
Suspension:	
Suspension Travel	
Front	41 mm (1.614 in)
Rear	60 mm (2.362 in)
Free Length (Spring)	
Front	148 mm (5.827 in)
Rear	205 mm (8.071 in)
Spring Rate	
Front	30 N/mm (3.0 kg/mm, 165.2 lb/in)
Rear	37 N/mm (3.7 kg/ mm, 203.8 lb/in)
Stroke	
Front	0.0 ~ 41mm (0.0 ~ 1.614 in)
Rear	0.0 ~ 60mm (0.0 ~ 2.362 in)
Optional Spring	
Front	No
Rear	No
Wheel:	
Wheel Type	
Front	Panel Wheel
Rear	Panel Wheel
Rim Size	
Front	8 x 5.5 AT
Rear	8 x 8.0 AT
Rim Material	
Front	Steel
Rear	Steel
Rim Runout Limit	
Front	
Vertical	2.0 mm (0.08 in)
Lateral	2.0 mm (0.08 in)
Rear	
Vertical	2.0 mm (0.08 in)
Lateral	2.0 mm (0.08 in)
Drive Chain:	
Type/Manufacturer	520V-S/DAIDO
Number of Links	74 Links
Chain Slack	30 mm (1.18 in)
10-Link Length Limit	150.1 mm (5.909 in)
Front Brake (Drum Brake):	
Type	Leading, Trailing
Inside Diameter (Brake Drum)	110 mm (4.33 in)
< Wear Limit >	< 111 mm (4.37 in) >
Lining Thickness	4.0 mm (0.16 in)
< Wear Limit >	< 2.0 mm (0.08 in) >
Free Length (Shoe Spring)	34.5 mm (1.36 in)

Model	YFA1 (W)
Rear Brake (Drum Brake):	
Type	Leading, Trailing
Inside Diameter (Brake Drum)	130 mm (5.12 in)
< Wear Limit >	< 131 mm (5.16 in) >
Lining Thickness	4.0 mm (0.16 in)
< Wear Limit >	< 2.0 mm (0.08 in) >
Free Length (Shoe Spring)	36.5 mm (1.44 in)
Brake Lever:	
Free Play	
Front Brake	10 ~ 12 mm (0.39 ~ 0.47 in) At lever pivot.
Rear Brake	5 ~ 8 mm (0.20 ~ 0.31 in) At lever pivot.

Tightening torque:

Parts to be tightened	Thread size	Tightening torque			Remarks
		Nm	m · kg	ft · lb	
Engine stay (front) and frame	M8 x 1.25	33	3.3	24	
Engine (front) and engine stay	M10 x 1.25	42	4.2	30	
Engine (rear – upper) and engine stay	M10 x 1.25	42	4.2	30	
Engine (rear – lower) and engine stay	M10 x 1.25	42	4.2	30	
Pivot shaft and frame	M12 x 1.25	80	8.0	58	
Swingarm and lower guard	M8 x 1.25	23	2.3	17	
Rear shock absorber and frame	M10 x 1.25	45	4.5	32	
Front arm and frame	M10 x 1.25	32	3.2	23	
Front shock absorber and front arm	M10 x 1.25	45	4.5	32	
Front shock absorber and frame	M10 x 1.25	45	4.5	32	
Tie-rod and steering column	M10 x 1.25	25	2.5	18	
Tie-rod and knuckle arm	M10 x 1.25	25	2.5	18	
Locknut (tie-rod)	M10 x 1.25	30	3.0	22	
Steering column and frame	M10 x 1.25	30	3.0	22	
Bracket (steering column) and frame	M8 x 1.25	23	2.3	17	Lock washer
Steering column and handlebar holder	M8 x 1.25	20	2.0	14	
Front arm and steering knuckle	M10 x 1.25	30	3.0	22	
Front wheel hub and wheel panel	M10 x 1.25	55	5.5	40	
Front wheel hub and steering knuckle	M14 x 1.5	70	7.0	50	
Camshaft lever (front brake) and camshaft	M6 x 1.0	9	0.9	6.5	
Rear alxe and ring nut	M33 x 1.5				See "NOTE"
Rear wheel hub and wheel panel	M10 x 1.25	55	5.5	4.0	
Rear wheel hub and rear axle	M14 x 1.5	120	12.0	85	
Swingarm (rear) and hub					
Upper	M12 x 1.25	85	8.5	61	
Lower	M10 x 1.25	60	6.0	43	
Brake drum (rear brake) and boss	M8 x 1.25	21	2.1	15	Lock washer
Driven sprocket and hub	M10 x 1.25	62	6.2	45	
Camshaft lever (rear brake) and camshaft	M6 x 1.0	9	0.9	6.5	
Locknut (drive chain slack adjuster)	M8 x 1.25	16	1.6	11	
Locknut (lock bolt)	M8 x 1.25	16	1.6	11	
Bracket (foot board) and frame	M8 x 1.25	33	3.3	24	
Fuel cock and fuel tank	M6 x 1.0	5	0.5	3.6	
Front bumper and frame	M8 x 1.25	23	2.3	17	
Rear bumper and frame	M8 x 1.25	23	2.3	17	
Tensioner (drive chain) and frame	M8 x 1.25	20	2.0	14	

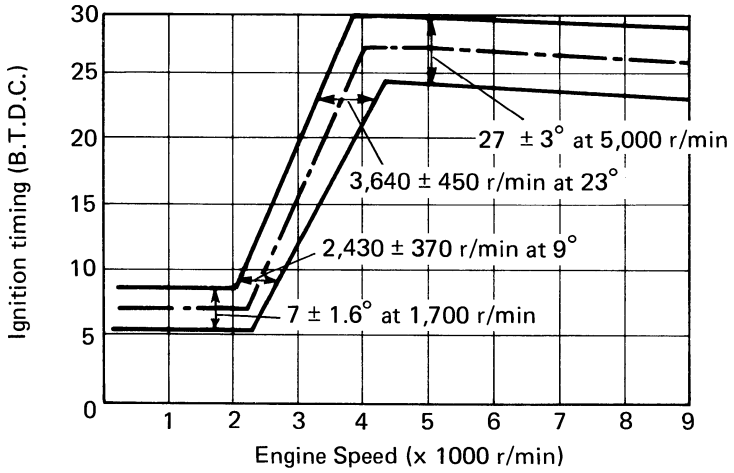
NOTE:

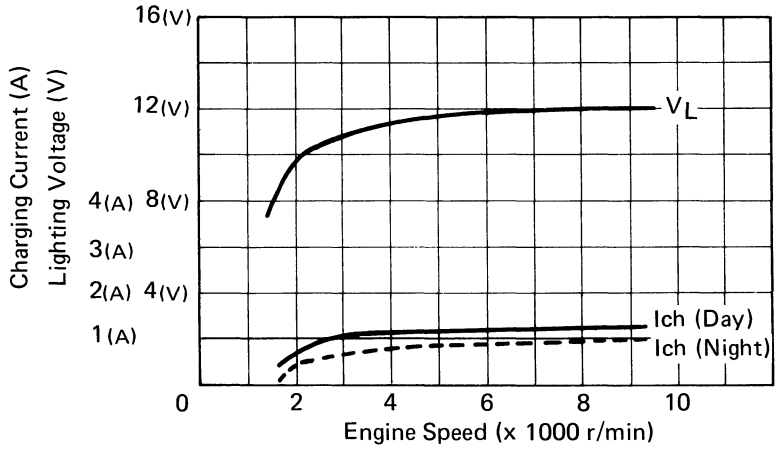
Apply locking agent (LOCTITE®) to nuts threads.

1. Tighten the nut (inside) to 55 Nm (5.5 m · kg, 40 ft · lb) while holding the rear axle.
2. Hold the nut (inside) and tighten the nut (outside) to 190 Nm (19.0 m · kg, 140 ft · lb).
3. Hold the nut (outside) and tighten back the nut (inside) to 240 Nm (24.0 m · kg, 170 ft · lb).

ELECTRICAL

Model	YFA1 (W)
Voltage:	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	7° at 1,700 r/min
Advanced Timing (B.T.D.C.)	27° at 5,000 r/min
Advancer Type	Electrical Type
C.D.I.:	
Magneto Model/Manufacturer	F3FA/YAMAHA
Pickup Coil Resistance	280 ~ 420Ω at 20°C (68°F)
(Lead Color)	(Red-Gray)
Source Coil Resistance	310 ~ 400Ω at 20°C (68°F)
(Lead Color)	(Brown-Green)
C.D.I. Unit Model/Manufacturer	3FA1/YAMAHA
Ignition Coil:	
Model/Manufacturer	3FA1/YAMAHA
Minimum Spark Gap	6.0 mm (0.24 in)
Primary Coil Resistance	0.56 ~ 0.84Ω at 20°C (68°F)
Secondary Coil Resistance	5.7 ~ 8.5kΩ at 20°C (68°F)
Spark Plug Cap:	
Type	Rubber Type
Resistance	8 ~ 12kΩ at 20°C (68°F)
Charging System:	
Type	A.C. Magneto Generator
Magneto Model/Manufacturer	F3FA/YAMAHA
Charging Coil Resistance	0.56 ~ 0.84Ω at 20°C (68°F)
(Lead Color)	(White-Black)
Charging Current	
Day (Minimum)	0.8A at 3,000 r/min
(Maximum)	1.3A at 8,000 r/min
Night (Minimum)	0.6A at 3,000 r/min
(Maximum)	1.1A at 8,000 r/min

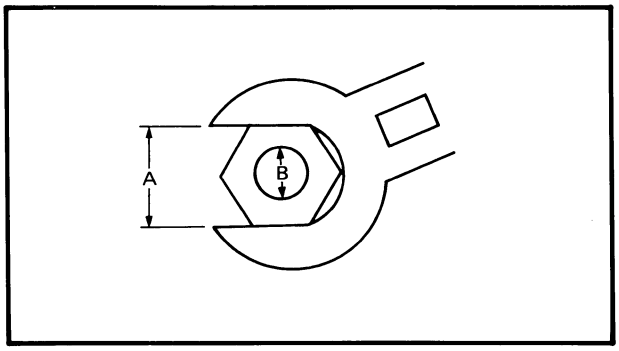


Model	YFA1 (W)
Lighting Coil Resistance (Lead Color) Lighting Voltage (Minimum) (Maximum)	0.32 ~ 0.48 Ω at 20°C (68°F) (Yellow-Black) 12.0V at 3,000 r/min 14.8V at 8,000 r/min
	
Rectifier/Regulator: Model/Manufacturer Regulator Type No Load Regulated Voltage Rectifier Capacity Withstand Voltage	 TR31/MATSUSHITA Semi Conductor Short Circuit Type 14.0 ~ 15.0V 4.0A 240V
Battery: Specified Gravity	 1.280
Electric Starting System: Starter Motor Model/Manufacturer Output Armature Coil Resistance Overall Length (Brush) < Limit > Brush Spring Pressure Commutator Diameter < Wear Limit > Mica Undercut Starter Relay Mode/Manufacturer Amperage Rating Coil Resistance Starting Circuit Cut Off Relay Model/Manufacturer Coil Resistance Diode	 3FA1/YAMAHA 0.4kw 0.016 ~ 0.024 Ω at 20°C (68°F) 10.0 mm (0.39 in) < 3.5 mm (0.14 in) > 560 ~ 840 g 22.0 mm (0.87 in) < 21.0 mm (0.83 in) > 1.5 mm (0.06 in) MS5D-191/HITACHI 100A 3.87 ~ 4.73Ω at 20°C (68°F) ACA1211-9/MATSUSHITA 72 ~ 88 Ω at 20°C (68°F) Yes
Circuit Breaker: Type Amperage for Individual Circuit Main	 Fuse 5A

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 multifastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

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



A: Distance across flats
B: Outside thread diameter

DEFINITION OF UNITS

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

LUBRICATION POINTS AND LUBRICANT TYPE

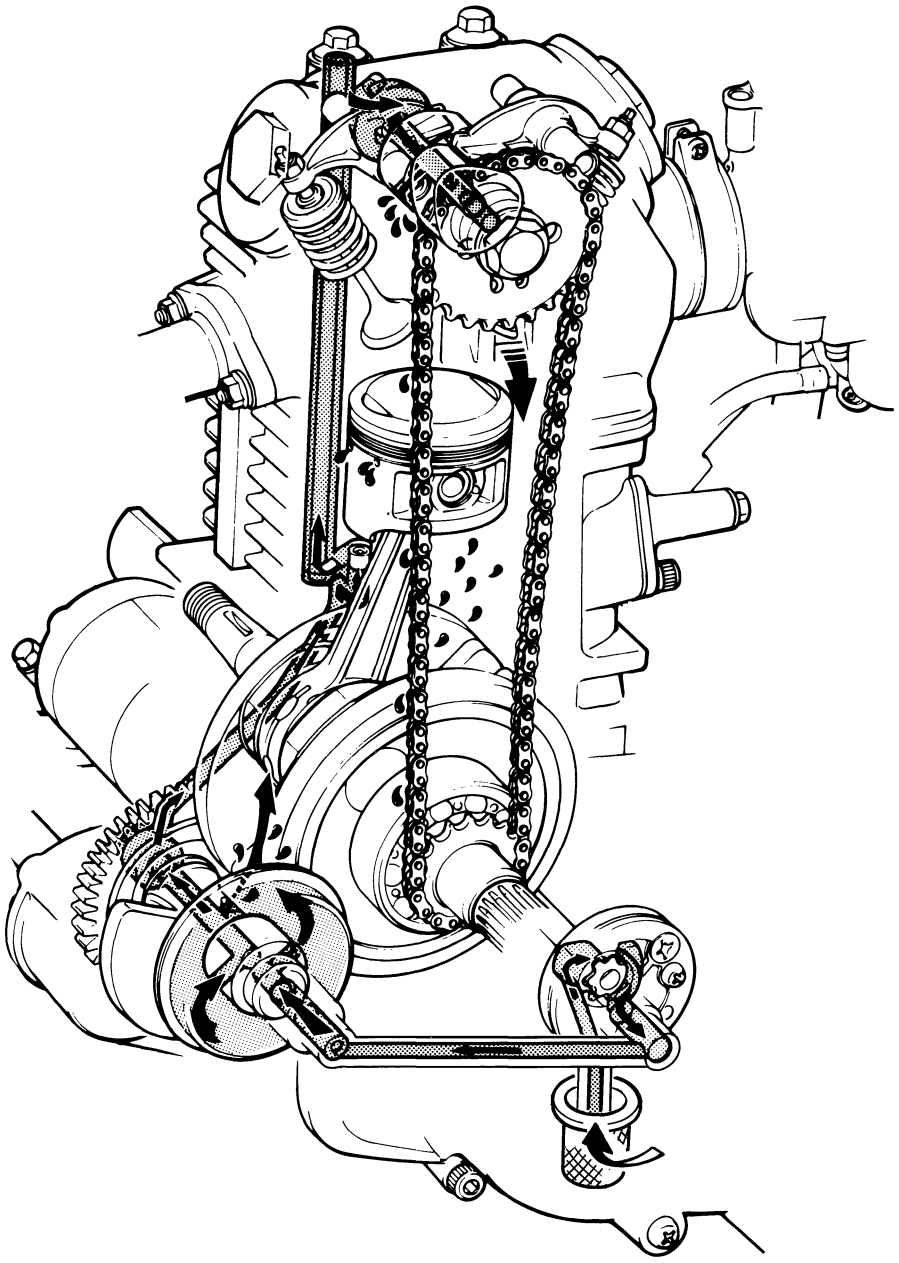
ENGINE

Lubrication Points	Lubricant Type
Bearing retainer (all)	E
Oil seal lips (all)	LS
O-rings (all)	LS
Valve stem and valve guide	M
Oil seal (valve stem end)	M
Rocker arm shaft and rocker arm	M
Cam (camshaft)	E
Crank pin	E
Piston, piston rings and piston pin	E
Rotor and rotor housing (oil pump)	E
Weights (primary sliding sheave)	LS
Torque cams (secondary sliding sheave) and grooves	M
O-rings (secondary sliding sheave)	BEL-LAY Assembly Lube®
Oil seals (secondary sliding sheave)	BEL-LAY Assembly Lube®
Ball (shift cam stopper)	LS
Guide bar (shift fork)	M
Crankcase mating surfaces	Sealant (Quick Gasket)® Yamaha Bond No. 4

CHASSIS

Lubrication Points	Lubricant Type
Oil seal lips (all)	LS
O-rings (all)	LS
Pivoting points (steering knuckle)	LS
Cam shafts (front brake)	LS
Pivoting points (front arm)	LS
Bushes (steering column)	LS
Brake cable ends (at lever side)	LS
Throttle cable end (at lever side)	LS
Cam shafts (rear brake)	LS
Pivoting points (swingarm)	LS
Shaft (rear shock absorber – lower)	LS

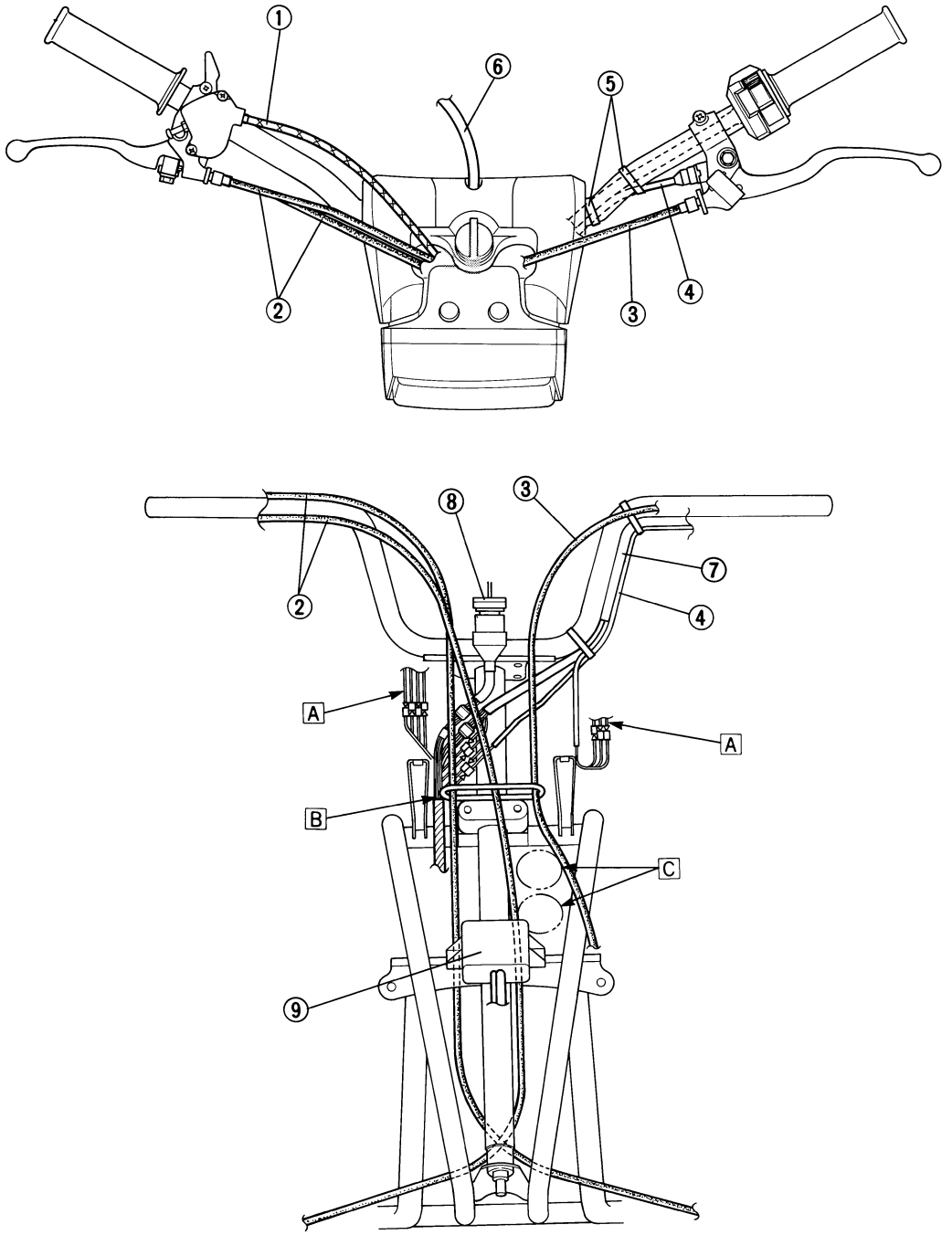
LUBRICATION DIAGRAM



CABLE ROUTING

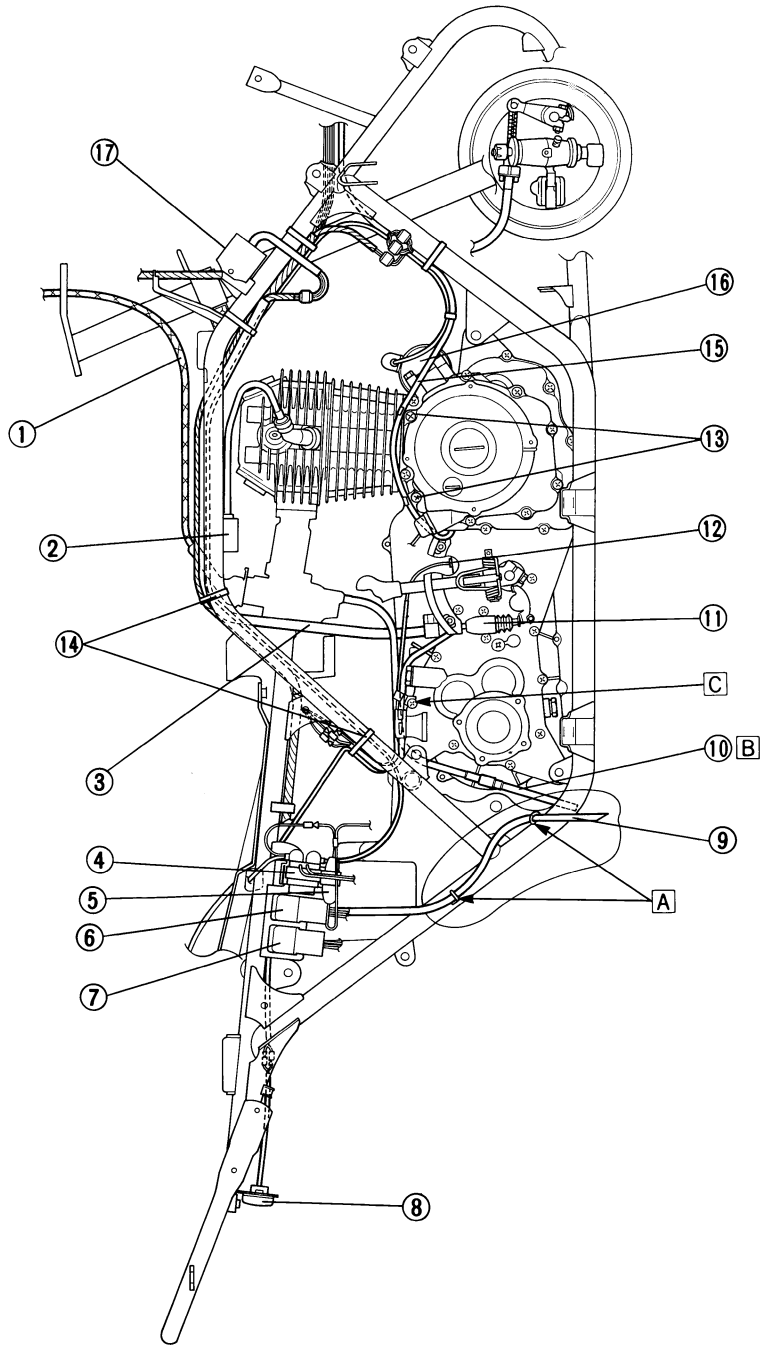
① Throttle cable
② Front brake cable
③ Rear brake cable
④ Brake switch lead
⑤ Band
⑥ Breather hose
⑦ Handlebar switch lead
⑧ Main switch
⑨ CDI unit

[A] Pass leads in front of the brake cable and connect them inside the headlight body.
[B] Pass the brake cables through the cable guide.
[C] Pass the inlet and outlet hoses between the brake cables.



① Throttle cable
② Ignition coil
③ Breather hose (transmission case)
④ Starter relay
⑤ Fuse holder
⑥ Starting circuit cut-off relay
⑦ Reverse relay
⑧ Taillight
⑨ Battery breather hose
⑩ Over flow hose
⑪ Shift lever switch
⑫ Neutral switch lead
⑬ Clamp
⑭ Band
⑮ CDI magneto lead
⑯ Starting motor
⑰ Rectifier/regulator

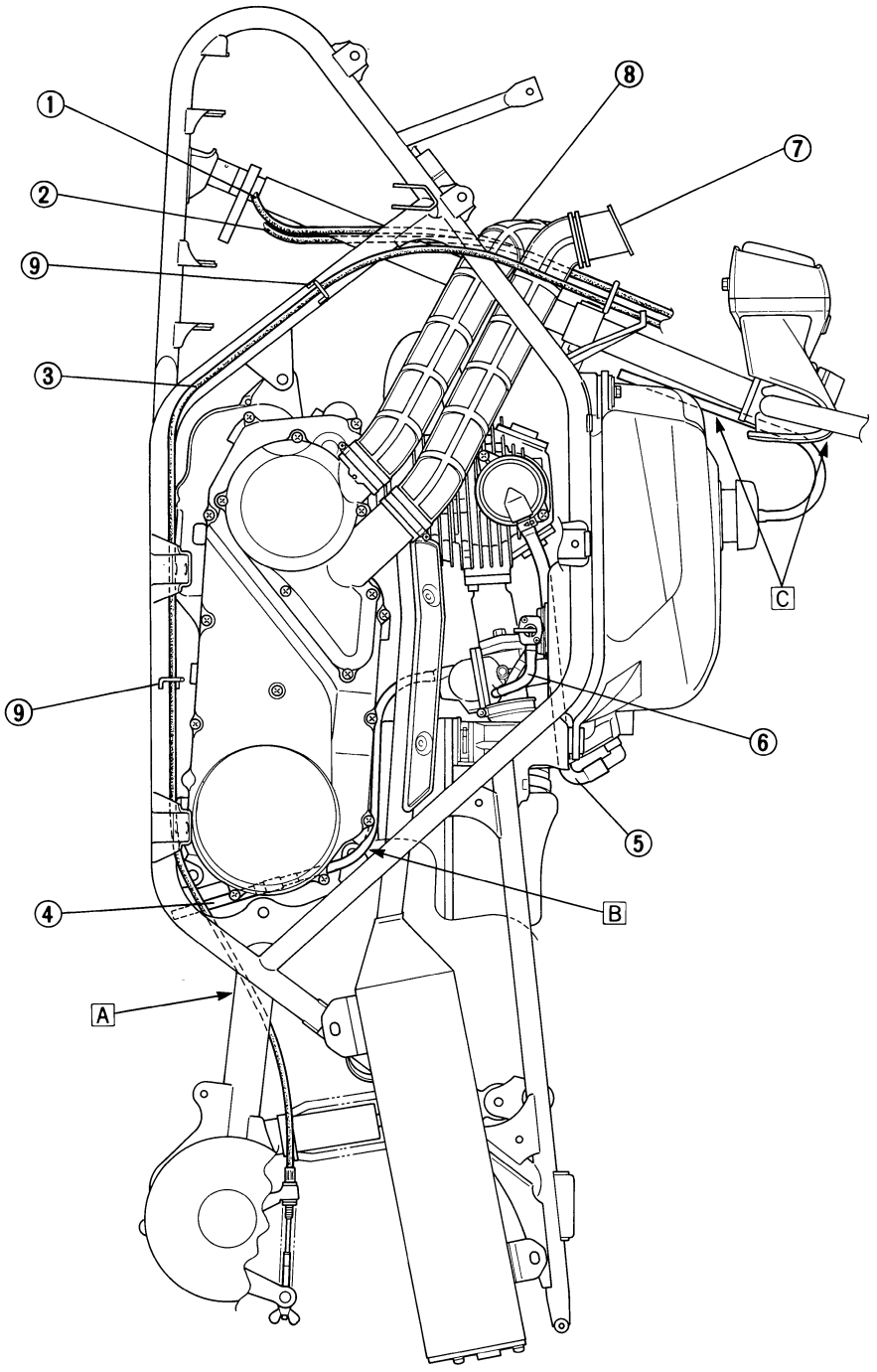
[A] Pass the breather hose through the guides.
[B] Pass the over flow hose between the engine and swing arm.
[C] Hold the clamp and ground lead to the crankcase with a screw.



① Front brake cable (right)
② Front brake cable (left)
③ Rear brake cable
④ Over flow hose
⑤ Breather hose (crankcase)
⑥ Fuel hose
⑦ Outlet hose
⑧ Inlet hose
⑨ Guide

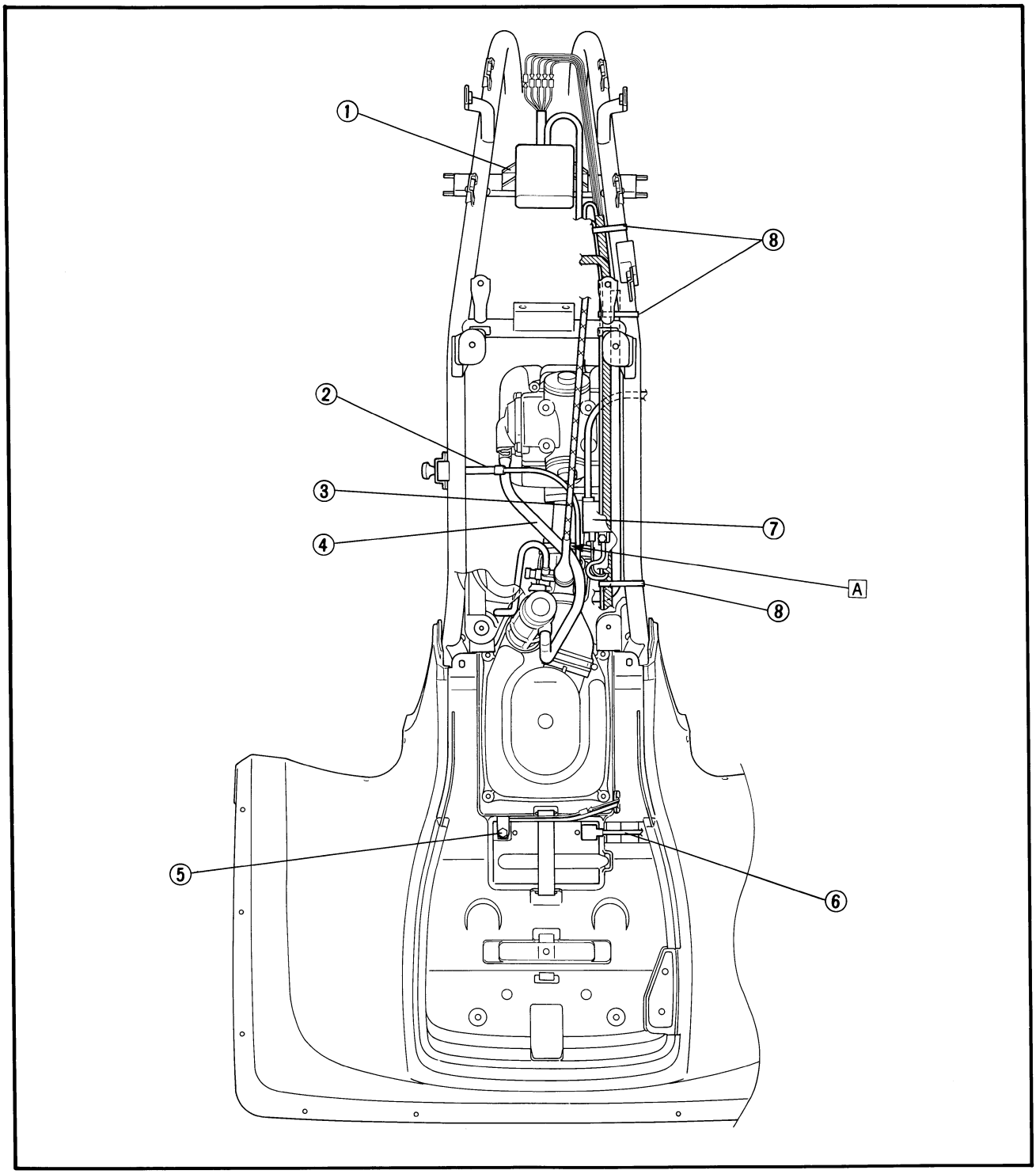
[A] Pass the brake cable inside the swingarm.
[B] Pass the over flow hose left side of the engine stay.
[C] Pass the breather hose through the hole of handlebar cover and then between the steering column and fuel tank.

2



① CDI unit
② Starter cable
③ Throttle cable
④ Breather hose (crankcase)
⑤ Battery negative lead
⑥ Battery positive lead
⑦ Ignition coil
⑧ Band

[A] Pass the breather hose between the throttle cable and starter cable.



PERIODIC INSPECTION AND ADJUSTMENT

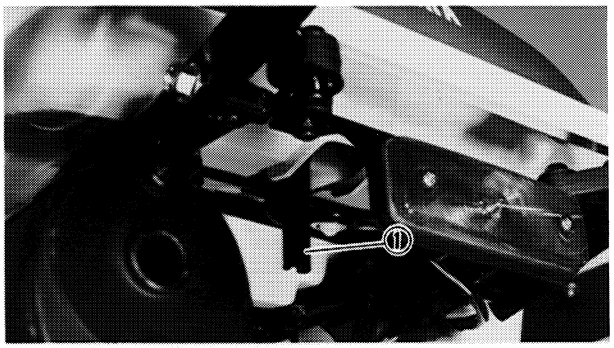
INTRODUCTION

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 INTERVALS

Item	Remarks	Initial			Every	
		1 month	3 months	6 months	6 months	1 year
Valve(s)*	Check valve clearance. Adjust if necessary.	O		O	O	O
Speak plug(s)	Check condition. Clean or replace if necessary.	O	O	O	O	O
Air filter element (for engine and V-belt compartment)	Clean. Replace if necessary.		O	O	O	O
Carburetor*	Check idle speed/starter operation. Adjust if necessary.		O	O	O	O
Fuel line*	Check fuel hose for cracks or damage. Replace if necessary.			O	O	O
Engine oil	Replace (Warm engine before draining).	O		O	O	O
Oil strainer*	Clean. Replace if necessary.	O				O
Transmission oil	Check oil leakage. Replace every 12 months.	O				O
Brake*	Check operation. Adjust if necessary.	O	O	O	O	O
V-belt*	Check operation/replace if damage or excessive wear.	O				O
Wheels*	Check balance/damage/runout. Repair if necessary.	O		O	O	O
Wheel bearings*	Check bearings assembly for looseness/damage. Replace if damaged.	O		O	O	O
Steering system*	Check operation/replace if damage. Check toe-in/adjust if necessary.	O	O	O	O	O
Knuckle shafts*	Lubricate every 6 months.***			O	O	O
Fittings/Fasteners*	Check all chassis fittings and fasteners. Correct if necessary.	O	O	O	O	O
Battery*	Check specific gravity. Check breather pipe for proper operation. Correct if necessary.	O	O	O	O	O

* It is recommended that these items be serviced by a Yamaha dealer.
*** Lithium soap base grease.

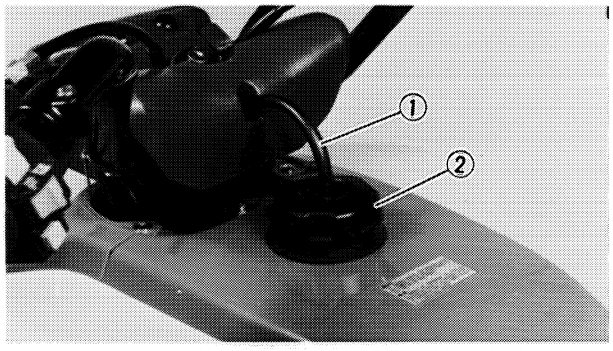


FENDERS

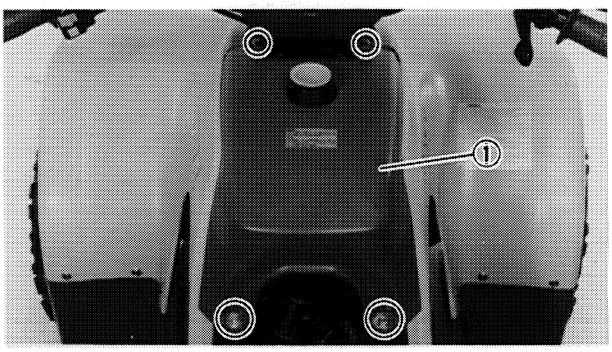
REMOVAL

1. Remove:
   - Seat

NOTE:
Pull the lock lever ① backward, then pull up the seat at the rear.

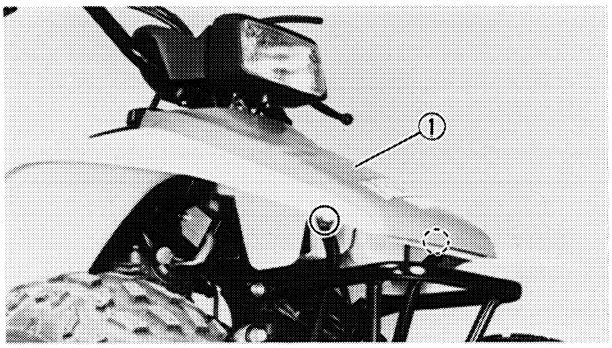


2. Disconnect:
   - Breather hose ① (fuel tank)
3. Remove:
   - Tank cap ②

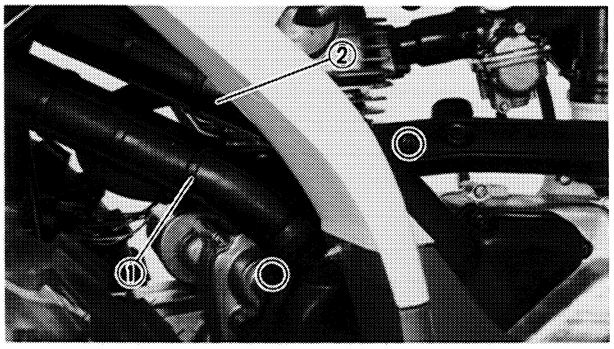


4. Remove:
   - Cover ① (center)

NOTE:
Put on the fuel tank cap after removing the cover (center) to prevent dust, mud, etc. from entering the fuel tank.

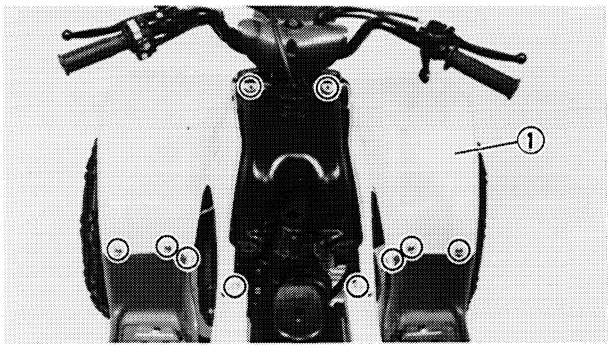


5. Remove:
   - Cover ① (front)

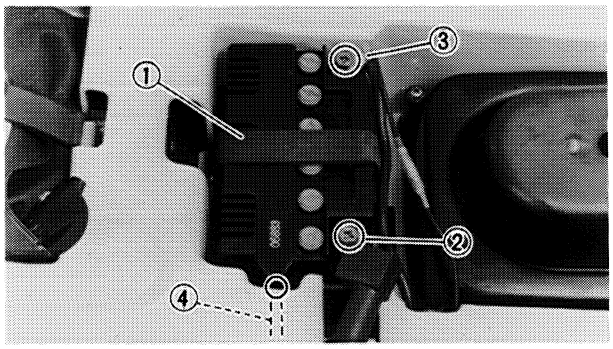


6. Disconnect:
   - Inlet hose ① (air duct)
   - Outlet hose ② (air duct)

NOTE:
Cover the holes of the air duct with a clean rug after disconnecting the hoses to prevent dust, mud, etc. from entering the V-belt compartment.



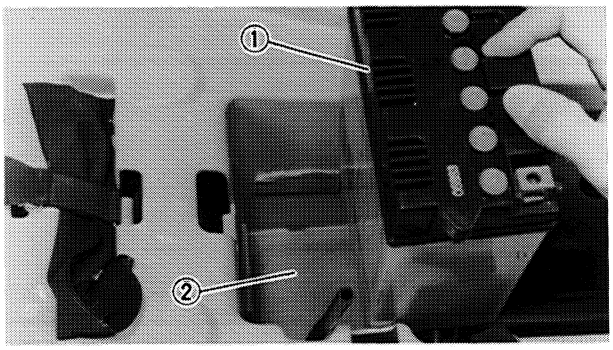
7. Remove:
   - Front fender ①



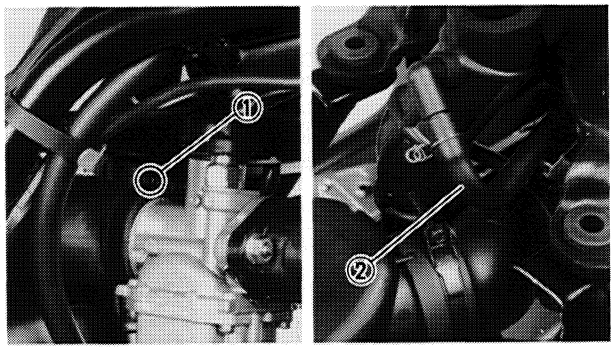
8. Remove:
   - Battery band ①
9. Disconnect:
   - Battery positive lead ②
   - Battery negative lead ③
   - Breather hose ④

⚠ CAUTION:

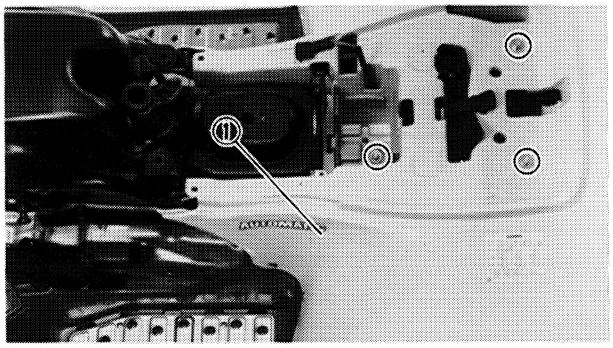
Disconnect the negative lead first, and then disconnect the positive lead.



10. Remove:
    - Battery ①
    - Battery seat ②



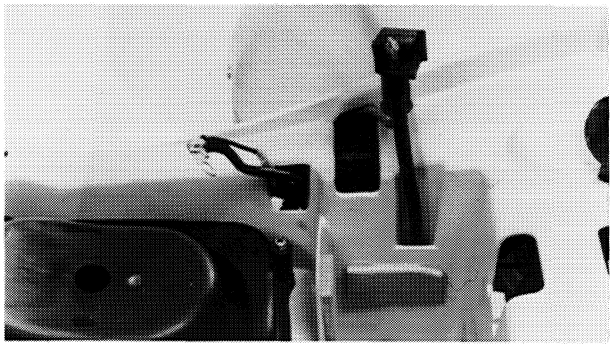
11. Loosen:
    - Screw ① (carburetor joint)
12. Disconnect:
    - Breather hose ② (crankcase)



13. Remove:
    - Rear fender ①

NOTE:

Cover the carburetor with a clean rug after disconnecting carburetor joint to prevent dust, mud, etc. from entering the carburetor.



INSTALLATION

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

1. Install:
   - Rear fender

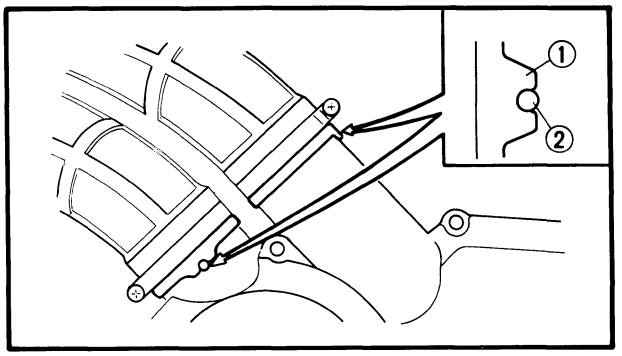
NOTE:

Pass the battery positive lead and battery negative lead through the holes of the rear fender.

2. Install:
   - Battery

⚠CAUTION:

- **Connect the positive lead first, and then connect the negative lead.**
- **Make sure that the battery leads are connected properly. Reversing leads can seriously damage the electrical system.**

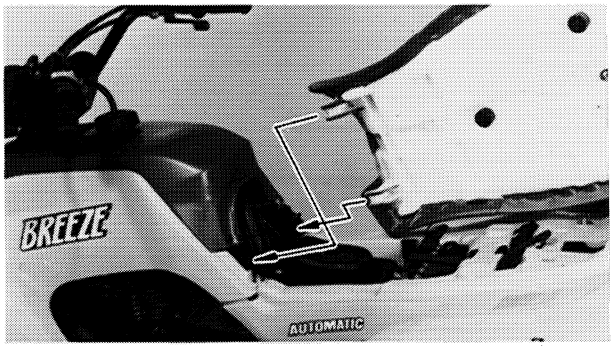


3. Connect:
   - Inlet hose (air duct)
   - Outlet hose (air duct)

NOTE:

- Pass through the both hoses inside the frame. Refer to the "CABLE ROUTING" section in the CHAPTER 2.
- Align the notch ① of the hose with the projection ② of the air duct.

	Screw (clamp): **7 Nm (0.7 m · kg, 5.1 ft. · lb)**



4. Install:
   - Seat

NOTE:

Insert the lobes of the seat front into the receptacles of the frame, then push down the seat at the rear.

ENGINE

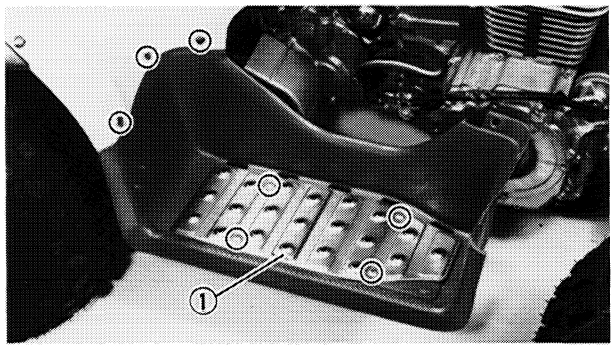
VALVE CLEARANCE ADJUSTMENT

NOTE:

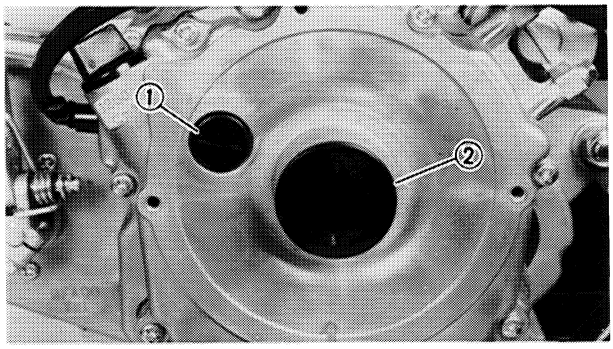
- The valve clearance should be adjusted when the engine is cool to the touch.
- Check and adjust the valve clearance when the piston is at Top Dead Center (T.D.C.) on compression stroke.

1. Remove:
   - Seat
   - Cover (front)
   - Cover (center)
   - Front fender

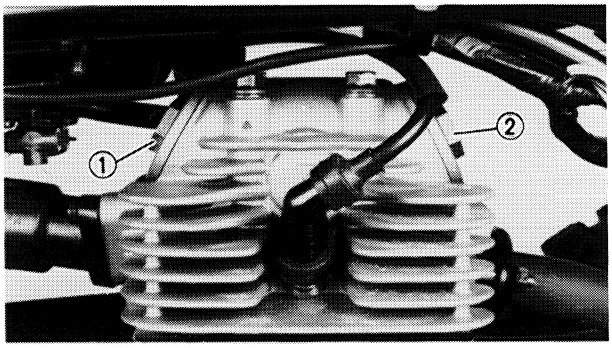
   Refer to the "FENDERS" section for removal.



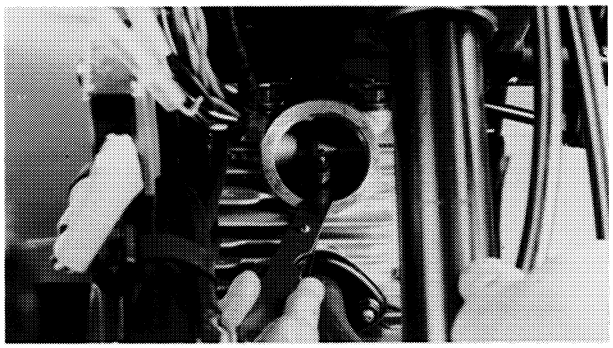
2. Remove:
   - Foot board ① (right)



3. Remove:
   - Plug ①
   - Plug ②

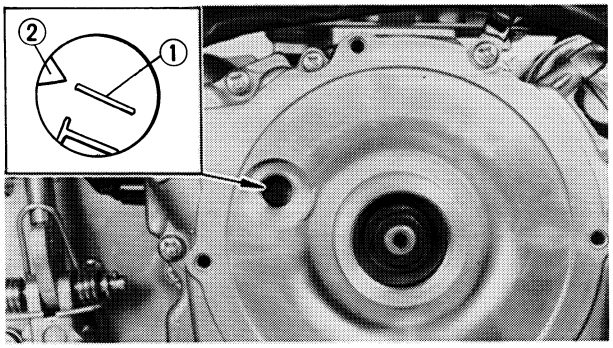


4. Remove:
   - Tappet cover ① (intake)
   - Tappet cover ② (exhaust)

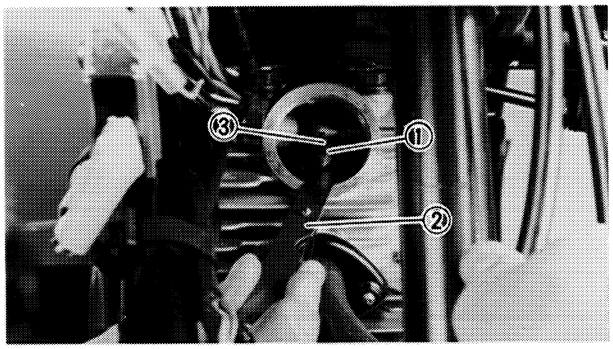


5. Check:
- Valve clearance
  Out of specification → Adjust.

Valve clearance (cold):
Intake valve
0.08 ~ 0.12 mm (0.003 ~ 0.005 in)
Exhaust valve
0.10 ~ 0.14 mm (0.004 ~ 0.006 in)



Checking steps:
- Turn the crankshaft counterclockwise with a wrench.
- Align the TDC mark ① with the stationary pointer ②.
- Measure the valve clearance by using a feeler gauge.

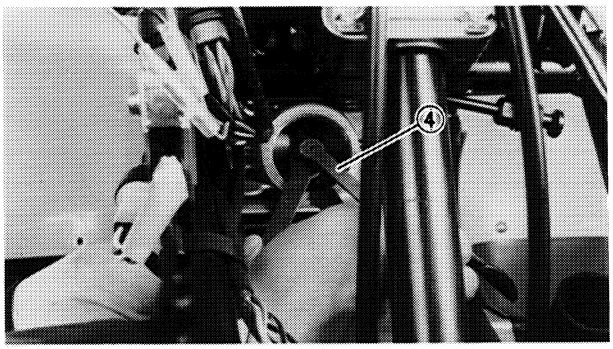


6. Adjust:
- Valve clearance

Adjustment steps:
- Loosen the locknut ①.
- Insert the feeler gauge ② between the adjuster end and the valve end.
- Turn the adjuster ③ in or out with the Valve adjusting tool ④ until specified clearance is obtained.

Turning in	Valve clearance is decreased.
Turning out	Valve clearance is increased.

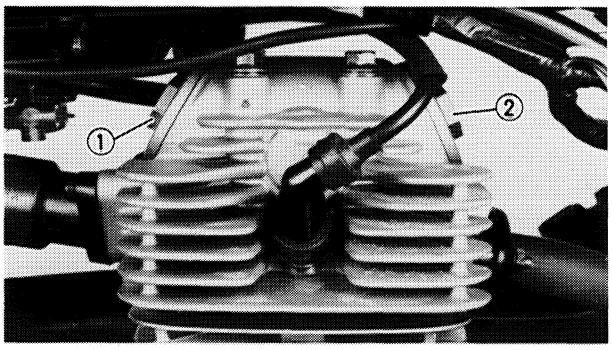
Valve adjusting tool:
P/N YM-08035, 90890-01311



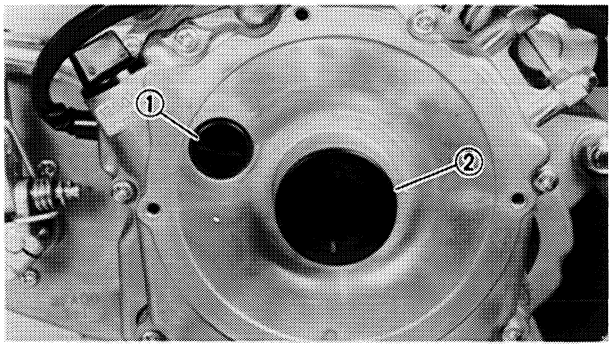
- Hold the adjuster to prevent it from moving and thoroughly tighten the locknut.

Locknut:
7 Nm (0.7 m · kg, 5.1 ft · lb)

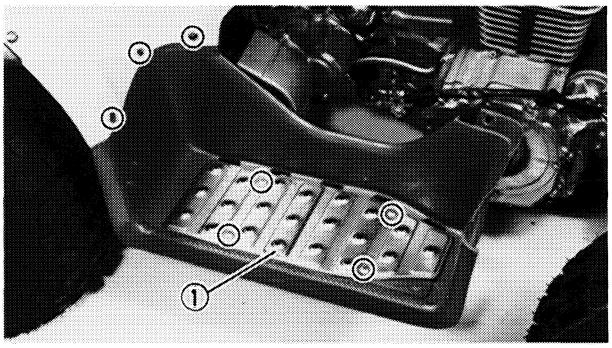
- Measure the valve clearance.
- If the valve clearance is incorrect, repeat above steps until the specified clearance is obtained.



7. Install:
   - Tappet cover ① (intake)
   - Tappet cover ② (exhaust)



8. Install:
   - Plug ①
   - Plug ②



9. Install:
   - Foot board ① (right)

10. Install:
    - Front fender
    - Cover (center)
    - Cover (front)
    - Seat

    Refer to the "FENDERS" section for installation.

TIMING CHAIN ADJUSTMENT

Adjustment free.

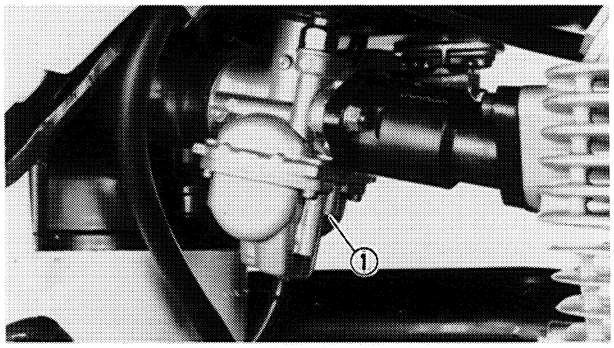
IDLING SPEED ADJUSTMENT

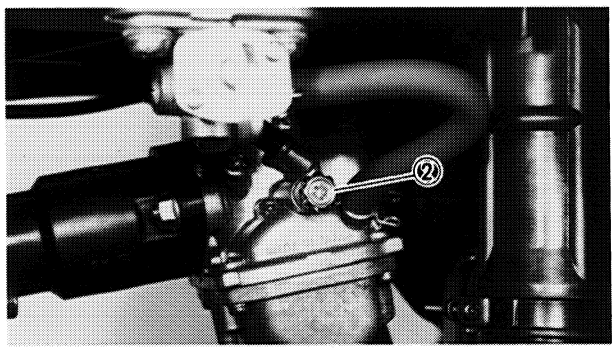
1. Start the engine and let it warm up for several minutes.
2. Attach:
   - Inductive tachometer
     (to the speak plug lead)

	Inductive tachometer: **P/N YU-08036, 90890-03113**

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

	Engine idling speed: **1,650 ~ 1,750 r/min**





4. Adjust:
   - Engine idling speed

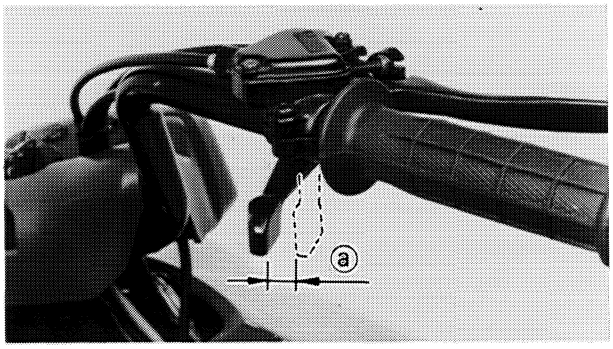
Adjustment steps: • Turn in the pilot screw ① until it is lightly seated. • Turn out the pilot screw for the specified number of turns.	
Pilot screw: **2 and 1/2 turns out**	
• Turn the throttle stop screw ② in or out until specified idling speed is obtained.	
Turning in	**Idling speed becomes higher.**
Turning out	**Idling speed becomes lower.**

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

	Free play: **1.0 ~ 4.0 mm (0.04 ~ 0.16 in)**

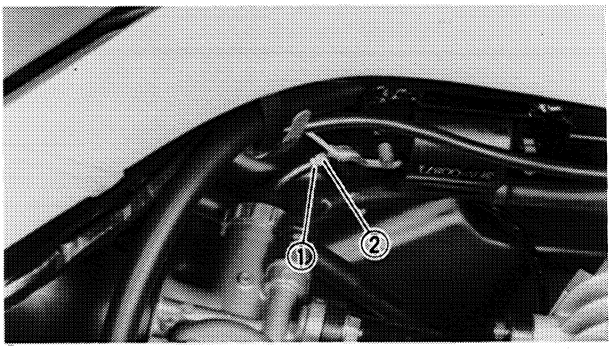
THROTTLE CABLE FREE PLAY ADJUSTMENT

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



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

Throttle cable free play:
1.0 ~ 4.0 mm (0.04 ~ 0.16 in)
at throttle lever end.



2. Adjust:
   - Throttle cable free play

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

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

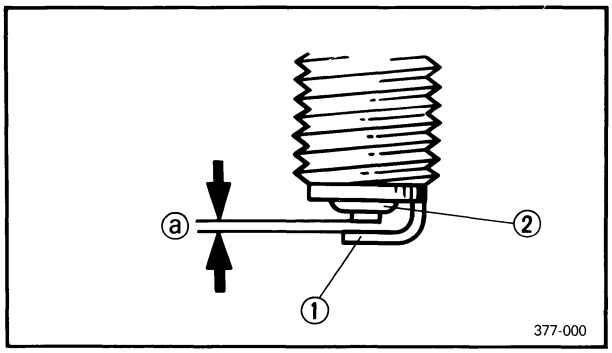
- Tighten the locknut.

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

SPARK PLUG INSPECTION

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

Standard spark plug:
C7HSA (NGK), U22FS-U (ND) (USA, AUS), CR7HS (NGK) (CDN, CH, F, NL, S, DK)



3. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator ②
     Abnormal color → Replace.
     Normal color is a medium-to-light tan color.
4. Clean the speak plug with a spark plug cleaner or a wire brush.
5. Measure:
   - Plug gap ⓐ
     Use a wire gauge or feeler gauge.
     Out of specification → Replace.

Plug gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

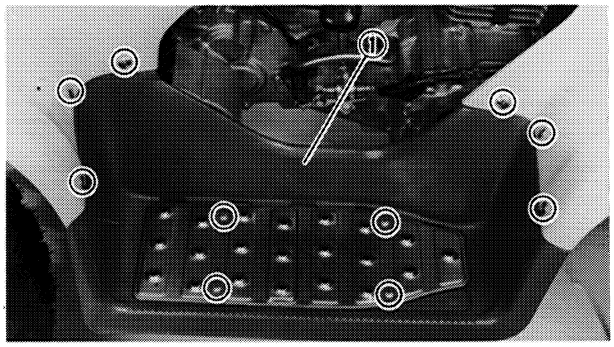
6. Tighten:
   - Spark plug

Spark plug:
13 Nm (1,3 m · kg, 9.4 ft · lb)

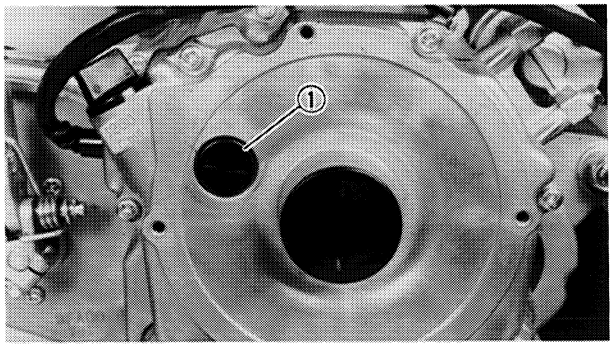
NOTE:
- Before installing a spark plug, clean the gasket surface and plug surface.
- If a torque wrench is not available when you are installing a spark plug, a good estimate of the correct torque is 1/4 to 1/2 turns part finger tight. Have the spark plug torqued to the correct value as soon as possible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

IGNITION TIMING CHECK

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

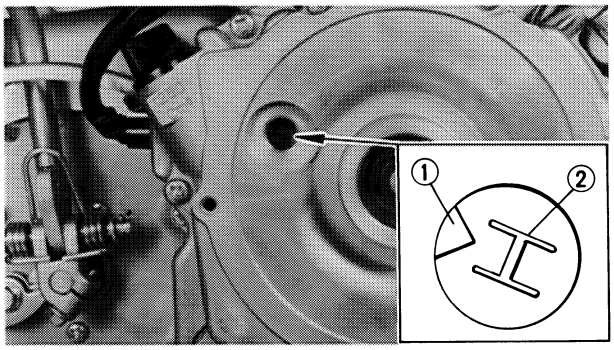


1. Remove:
   - Foot board ① (right)



2. Remove:
   - Plug ①
3. Attach:
   - Timing light
   - Inductive tachometer
     (to the spark plug lead).

Timing light:
P/N YM-33277, 90890-03109
Inductive tachometer:
P/N YU-08036, 90890-03113



4. Check:
   - Ignition timing

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

Engine speed:
1,650 ~ 1,750 r/min

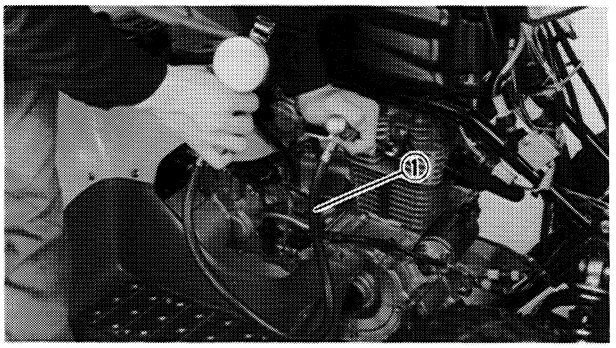
- Visually check the stationary pointer ① to verify it is within the required firing range ② indicated on the flywheel.
  Incorrect firing range → check flywheel and/or pickup assembly (tighteness damage).

5. Install:
   - Plug
   - Foot board (right)

COMPRESSION PRESSURE MEASUREMENT

NOTE:
Insufficient compression pressure will result in performance loss.

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



5. Attach:
   - Compression gauge ①

	Compression gauge: **P/N YU-33223, 90890-03081**

6. Measure
   - Compression pressure

Above the maximum pressure → Inspect cylinder head, valve surfaces, and piston crown for carbon deposits.

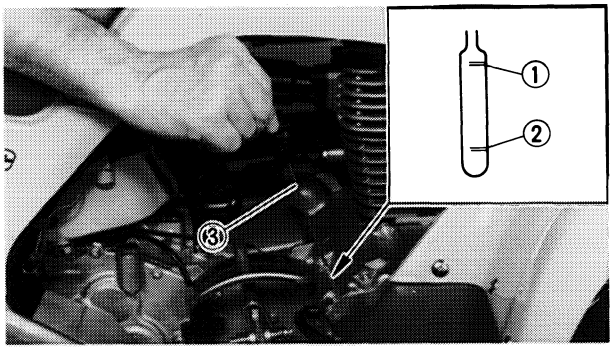
Below the minimum pressure → Squirt a few drops of oil into affected cylinder and cylinder and measure again.
Follow the table below.

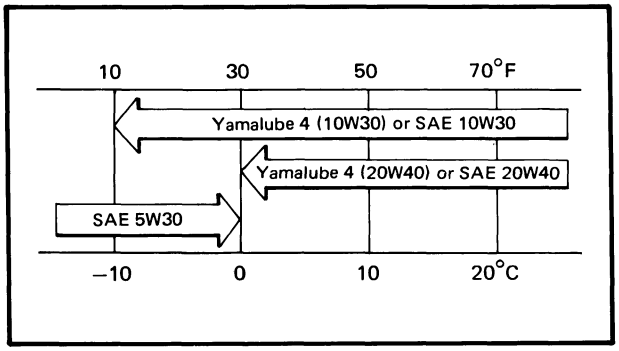
Compression pressure (with oil introduced into cylinder)	
Reading	Diagnosis
Higher than without oil	Worn or damaged piston
Same as without oil	Defective ring(s), valves, cylinder head gasket or piston is possible.

Compression pressure (at sea level):
850 kPa (8.5 kg/cm² , 120 psi)

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

⚠ WARNING:
When cranking the engine, ground the spark plug lead to prevent from sparking.





ENGINE OIL LEVEL INSPECTION

1. Place the machine on a level surface.
2. Inspect:
   - Oil level
     Oil level should be between maximum ① and minimum ② marks.
     Oil level low → Add oil to proper level.

NOTE:
Do not screw the dipstick ③ . Insert the dipstick lightly when inspecting the oil level.

Recommended oil:
Follow the left chart.

NOTE:
For USA only.
Recommended oil classification:
API Service "SE", "SF" type or equivalent (e.g. "SF-SE", "SF-SE-CC", "SF-SE-SD" etc).

⚠CAUTION:
Do not allow foreign material to enter the crankcase.

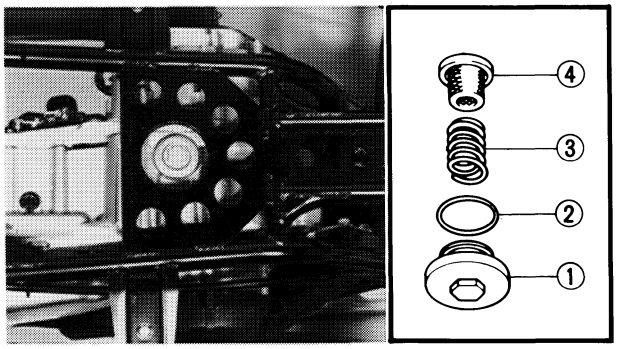
3. Start the engine and let it warm up for several minutes.
4. Stop the engine and inspect the oil level once again.

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

⚠WARNING:
Never attempt to remove the dipstick just after high speed operation. The heated oil could spout out, causing danger. Wait until the oil cools down.

ENGINE OIL REPLACEMENT

1. Start the engine and let it warm up for several minutes.
2. Stop the engine and place an oil pan under the engine.



3. Remove:
   - Dipstick
   - Drain plug ①
   - O-ring ②
   - Compression spring ③
   - Oil strainer ④

   Drain the crankcase of its oil.

⚠ CAUTION:

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

4. Inspect:
   - Oil strainer
   - O-ring

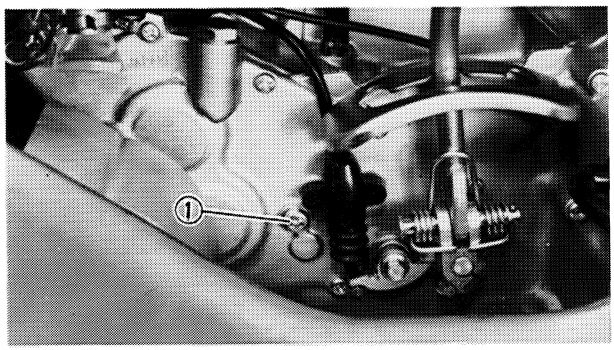
   Damage → Replace.
5. Install:
   - Oil strainer
   - Compression spring
   - O-ring
   - Drain plug

Drain plug:
32 Nm (3.2 m · kg, 23 ft · lb)

6. Fill:
   - Crankcase

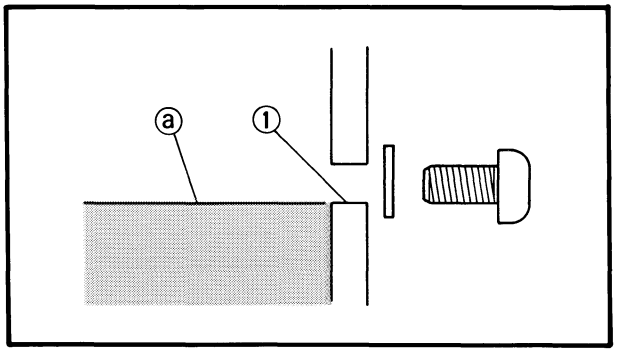
Oil quantity:
1.25 L (1.10 imp qt, 1.32 usqt)

Refer to the "ENGINE OIL LEVEL INSPECTION" section.



TRANSMISSION OIL LEVEL INSPECTION

1. Place the machine on a level place.
2. Remove:
   - Checking screw ①



3. Inspect:
   - Oil level ⓐ

   Oil level should be up to bottom brim ① of hole.

   Oil level low → Add oil to proper level.

Recommended oil:
Yamalube 4 (10W30 or 20W40), SAE 10W30 Type SE or SAE 20W40 Type SE

NOTE:
For USA only.
Recommended oil classification:
API Service "SE", "SF" type or equivalent (e.g. "SF-SE", "SF-SE-CC", "SF-SE-SD" etc).

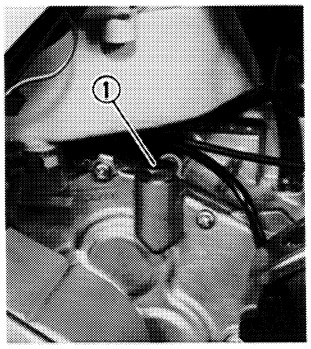
⚠ CAUTION:
Do not allow foreign material to enter the transmission case.

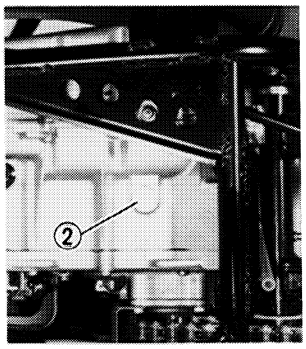
⚠ WARNING:
Never attempt to remove the checking screw just after high speed operation. The heated oil could spout out, causing danger wait until the oil cools down.

4. Install:
   - Checking screw
   - Oil filler bolt

Checking screw:
16 Nm (1.6 m · kg, 11 ft · lb)
Oil filter bolt:
23 Nm (2.3 m · kg, 17 ft · lb)

NOTE:
Check the gasket (checking screw). If damaged, replace it with a new one.





TRANSMISSION OIL REPLACEMENT

1. Place an open pan under the transmission case.
2. Remove:
   - Oil filler bolt ①
   - Drain plug ②

   Drain the transmission case of its oil.
3. Install:
   - Drain plug

Drain plug:
23 Nm (2.3 m · kg, 17 ft · lb)

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

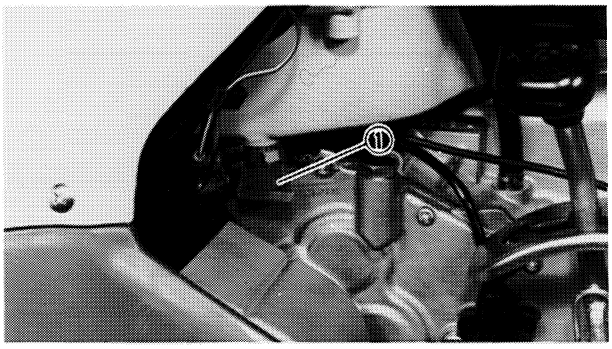
4. Fill
   - Transmission case

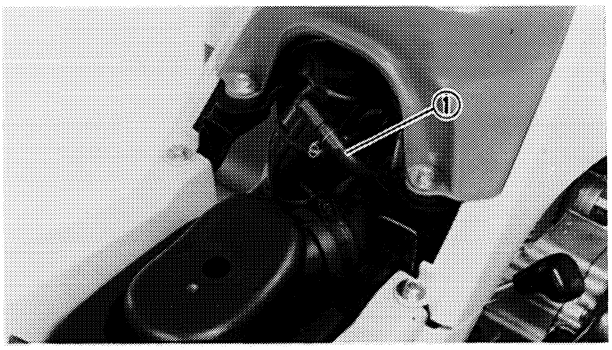
	Oil quantity: **0.60 L (0.53 imp qt, 0.63 us qt)**

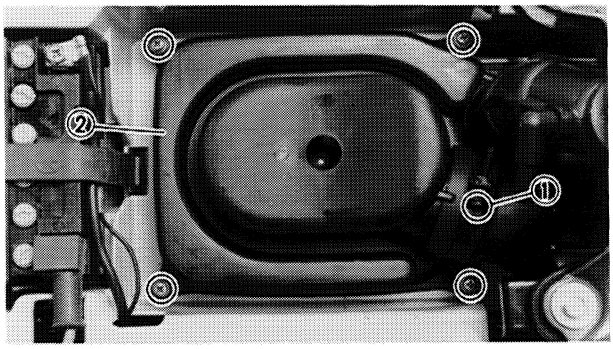
Refer to the "TRANSMISSION OIL LEVEL INSPECTION" section.

5. Install:
   - Oil filler bolt

	Oil filler bolt: **23 Nm (2.3 m · kg, 17 ft · lb)**







AIR FILTER CLEANING

For Engine:

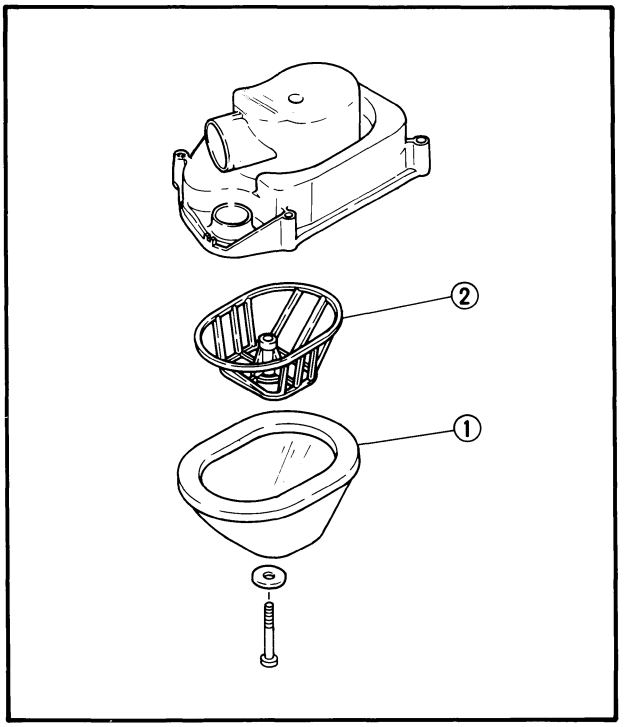
NOTE:

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:
   - Seat

   Refer to the "FENDERS" section for removal.
2. Disconnect:
   - Breather hose ① (crankcase)

3. Loosen:
   - Screw ① (carburetor joint)
4. Remove:
   - Cover ② (air filter case)

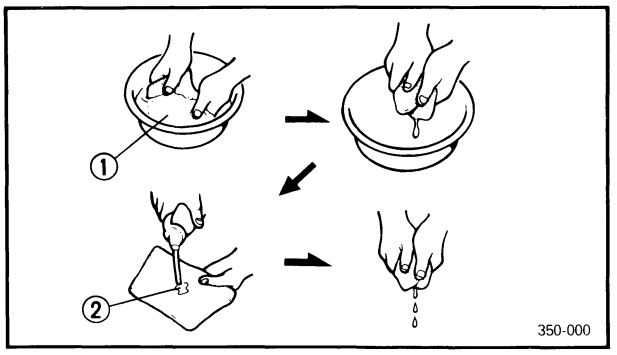


5. Remove:
   - Air filter element ①
   - Element guide ②

NOTE:
Each time filter element maintenance is performed, check the air inlet to the filter case for obstructions. Check the air cleaner joint rubber to the carburetor and manifold fittings for an air-tight seal. Tighten all fittings thoroughly to avoid the possibility of unfiltered air entering the engine.

⚠ 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 jetting with subsequent poor performance and possible engine overheating.

6. Inspect:
   - Air filter element
     Damage → Replace.



7. Clean:
   - Air filter element

Cleaning steps:
- Wash the element gently, but throughly in solvent ①.

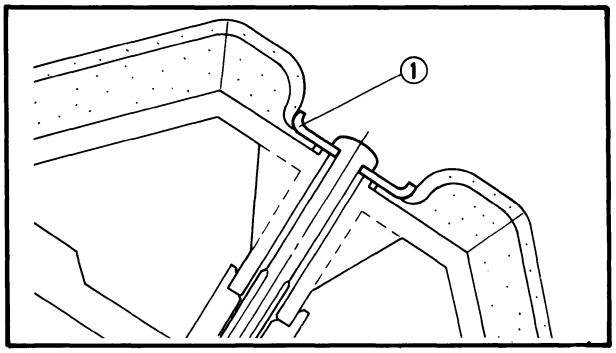
⚠ WARNING:
Use parts cleaning solvent only. Never use gasoline or low flash point solvents which may lead to a fire or explosion.

- Squeeze the excess solvent out of the element and let dry.

⚠ CAUTION:
Do not twist or wring out the foam element. This could damage the foam material.

- Apply the engine oil ②.
- Squeeze out the excess oil.

NOTE:
The element should be wet but not dripping.



8. Install:
   - Element guide
   - Air filter element

⚠CAUTION:
Install the washer ① with its bent fringe upward as shown.

	Screw (air filter element): 7 Nm (0.7 m · kg, 5.1 ft · lb)

9. Install:
   - Cover (air filter case)

	Screw (cover): 4 Nm (0.4 m · kg, 2.9 ft · lb)

10. Tighten:
    - Screw (carburetor joint)
11. Connect:
    - Breather hose (crankcase)
12. Install:
    - Seat

    Refer to the "FENDER" section for installation.

For V-Belt Compertment:

1. Remove:
   - Cover (front)

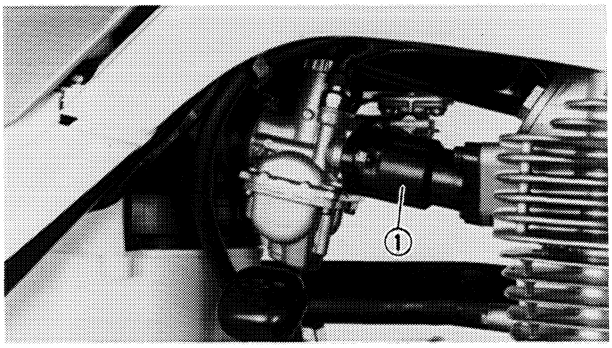
   Refer to the "FENDERS" section for removal.

2. Remove:
   - Cover ① (air filter case)
   - Air filter element ②
3. Inspect:
   - Air filter element
     Damage → Replace.

4. Clean:
   - Air filter element

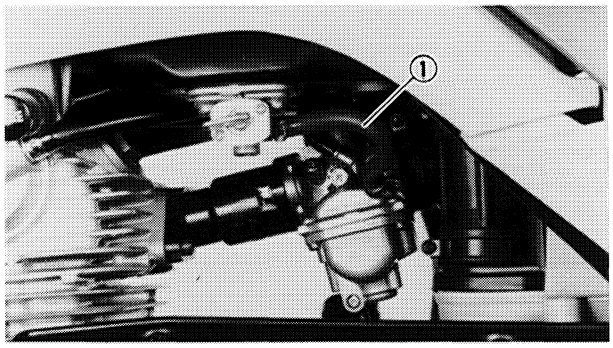
Cleaning steps:
- Tap the element lightly to remove most of the dust and dirt.
- Blow out the remaining dirt with compressed air.

5. Install:
   - Air filter element
   - Cover (air filter case)
6. Install:
   - Cover (front)



CARBURETOR JOINT INSPECTION

1. Inspect:
   - Carburetor joint ①
     Crack/Damage → Replace.
     Refer to the "CARBURETOR" section in the CHAPTER 5 for replacement.



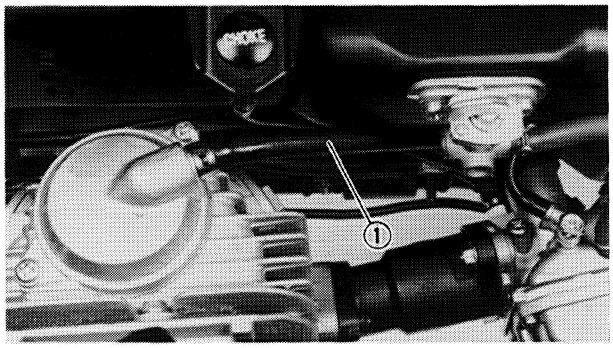
FUEL LINE INSPECTION

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

CRANKCASE BREATHER HOSE INSPECTION

1. Remove:
   - Seat
   - Cover (center)
   - Cover (front)
   - Front fender

   Refer to the "FENDERS" section for removal.



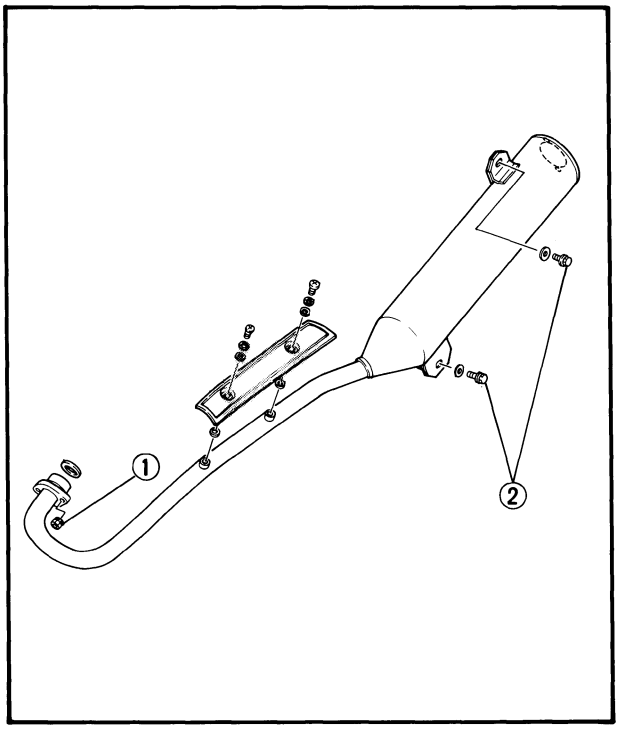
2. Inspect:
   - Crankcase breather hose ①

   Crack/Damage → Replace
3. Install:
   - Front fender
   - Cover (front)
   - Cover (center)
   - Seat

EXHAUST SYSTEM INSPECTION

1. Remove:
   - Seat
   - Cover (center)
   - Cover (front)
   - Front fender
   - Rear fender

   Refer to the "FENDERS" section for removal.



2. Inspect:
   - Muffler

   Cracks/Damage → Replace.
   - Gasket

   Exhaust gas leaks → Replace.

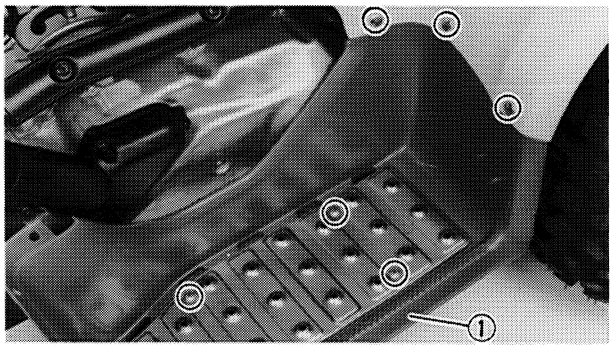
Nut ① (exhaust pipe):
10 Nm (1.0 m · kg, 7.2 ft · lb)
Bolt ② (muffler):
27 Nm (2.7 m · kg, 19 ft · lb)

3. Install:
   - Rear fender
   - Front fender
   - Cover (front)
   - Cover (center)
   - Seat

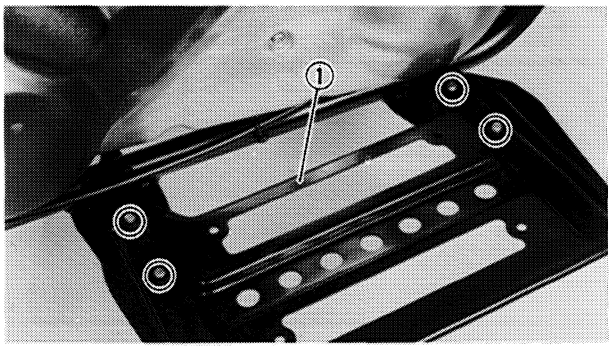
V-BELT INSPECTION

1. Remove:
   - Seat
   - Cover (center)
   - Cover (front)
   - Front fender

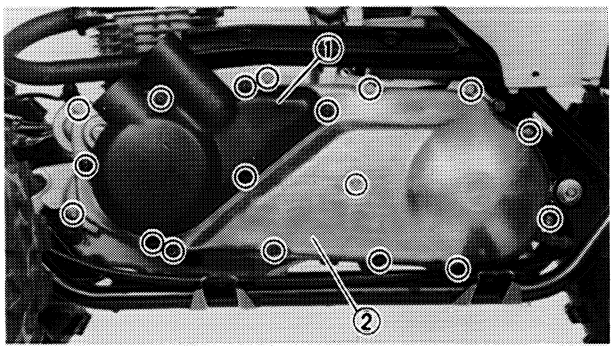
   Refer to the "FENDERS" section for removal.



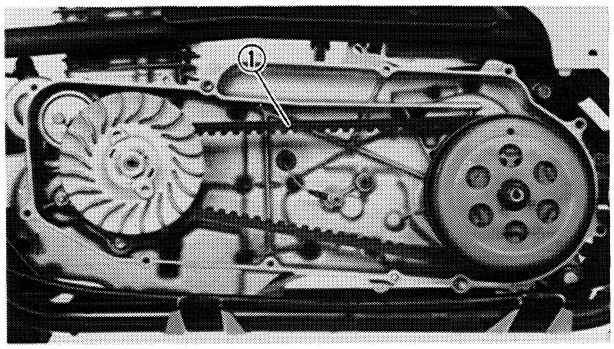
2. Remove:
   - Foot board ① (left)



3. Remove:
   - Bracket ① (foot board)

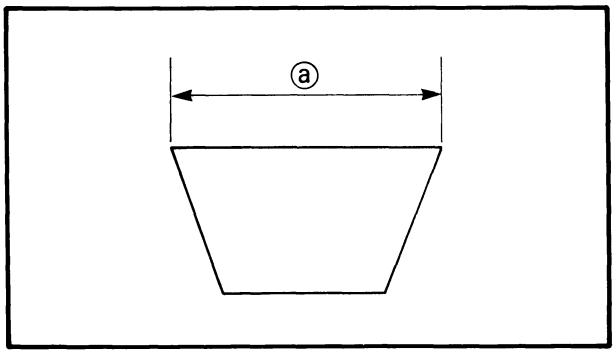


4. Remove:
   - Air duct ①
   - Crankcase cover ② (left)



5. Inspect:
   - V-belt ①

   Crack/Wear/Scaling/Chipping → Replace.
   Oil or grease adhered to the V-belt → Check the primary and secondary sheaves.
   Refer to the "INSPECTION AND REPAIR" section in the CHAPTER 4.



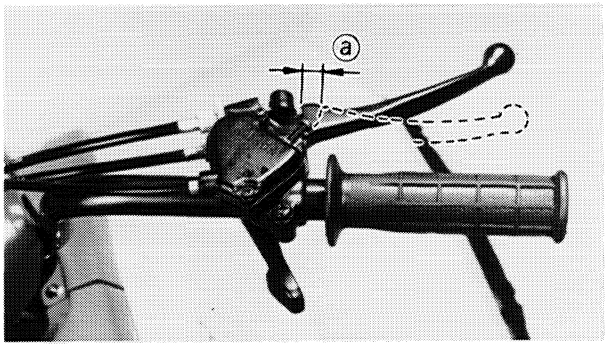
6. Measure:
   - V-belt width ⓐ
     Out of specification → Replace.

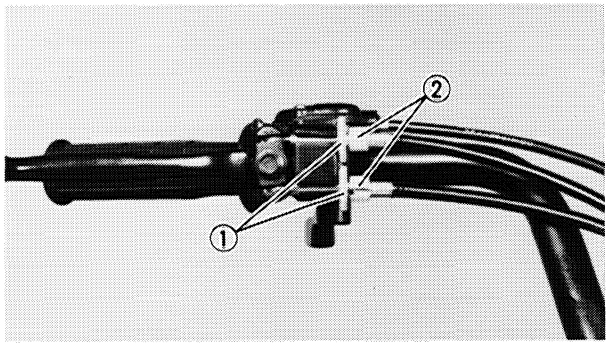
V-belt width:
20.1 mm (0.791 in)
< Wear limit >:
< 18.1 mm (0.712 in) >

7. Install:
   - Crankcase cover (left)
   - Air duct
   - Bracket (foot board)

Bolt (crankcase cover):
7 Nm (0.7 m · kg, 5.1 ft · lb)
Bolt (air duct):
7 Nm (0.7 m · kg, 5.1 ft · lb)
Bolt (bracket):
33 Nm (3.3 m · kg, 24 ft · lb)

8. Install:
   - Front fender
   - Cover (fender)
   - Cover (center)
   - Seat





CHASSIS

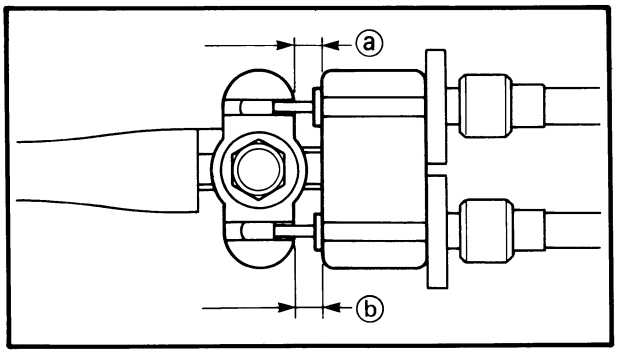
FRONT BRAKE ADJUSTMENT

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

Free play:
10 ~ 12 mm (0.4 ~ 0.5 in)
at brake lever pivot.

2. Adjust:
   - Brake lever free play

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

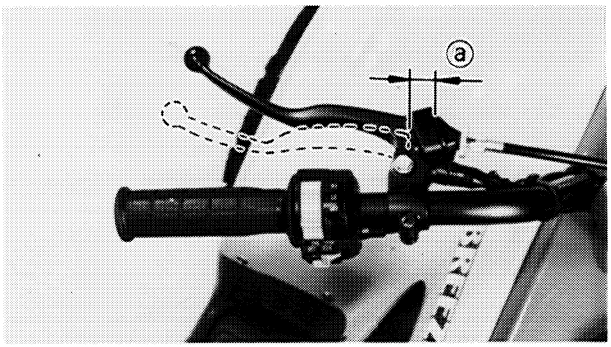


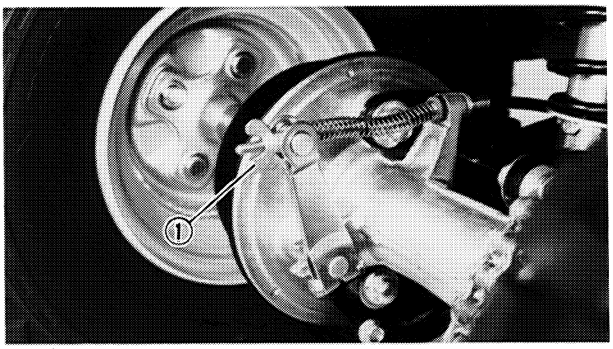
Turning in	Free play is increased.
Turning out	Free play is decreased.

NOTE:
The difference between both clearances (ⓐ and ⓑ) should be 2 mm (0.08 in) or less when front brake is applied.

- Tighten the locknuts.

⚠ CAUTION:
Make sure that the brake does not drag after adjusting.





REAR BRAKE ADJUSTMENT

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

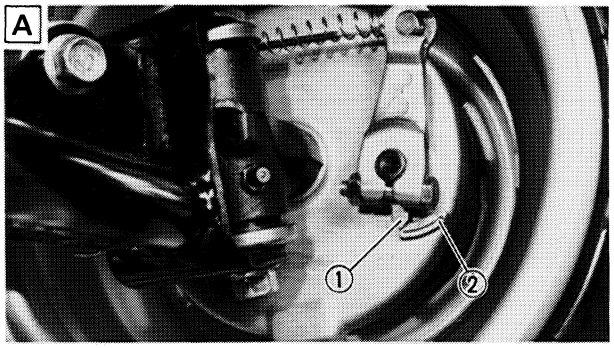
Free play:
5 ~ 8 mm (0.2 ~ 0.3 in)
at brake lever pivot.

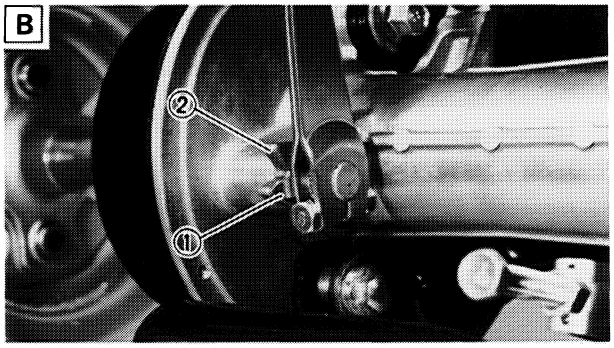
2. Adjust:
   - Brake lever free play

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

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

⚠ CAUTION:
Make sure that the brake does not drag after adjusting.





BRAKE SHOE INSPECTION

1. Apply the brake (front brake or rear brake).
2. Inspect:
   - Brake shoe
     Wear indicator ① reaches the wear limit line ② → Replace shoes as a set.

[A] Front brake
[B] Rear brake

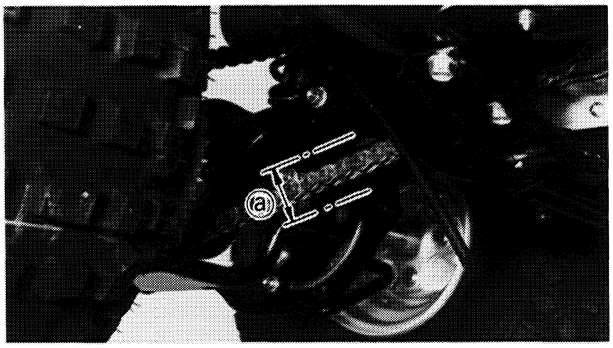
DRIVE CHAIN SLACK ADJUSTMENT

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

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

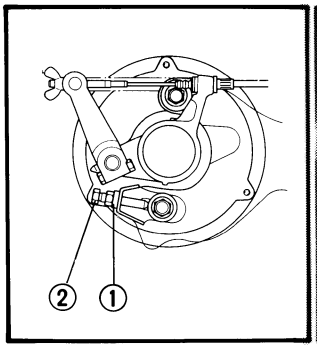
1. Place the machine on a level place.

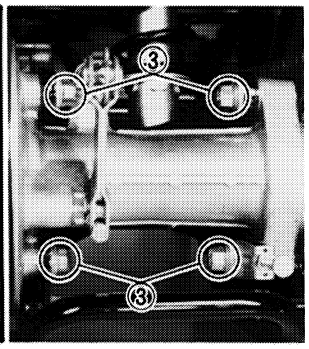
NOTE:
Wheels should be on the ground without the rider on it.



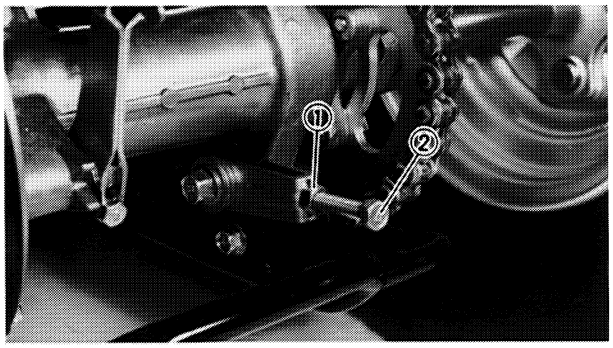
2. Check:
   - Drive chain slack ⓐ
     Out of specification → Adjust.

Drive chain slack:
Approximately 30 mm (1.18 in)

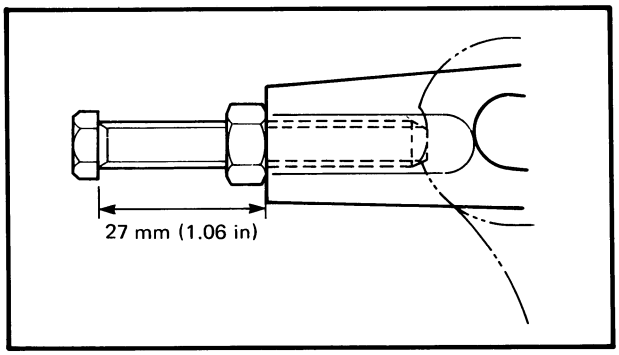




3. Loosen:
   - Locknut ① (hub locknut)
   - Hub lockbolt ②
   - Bolt ③ (hub)



4. Adjust:
   - Drive chain slack



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

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

⚠ CAUTION:

If the adjuster measures less than 27 mm (1.06 in), replace the drive chain and both sprockets.

- Tighten the bolts (hub) to the specification, while pushing up or down on the chain to zero slack.

Bolt (hub):
Upper
85 Nm (8.5 m · kg, 61 ft · lb)
Lower
60 Nm (6.0 m · kg, 43 ft · lb)

- Tighten the locknut (adjuster).

Locknut (adjuster):
16 Nm (1.6 m · kg, 11 ft · lb)

5. Tighten:
   - Locknut (hub lockbolt)

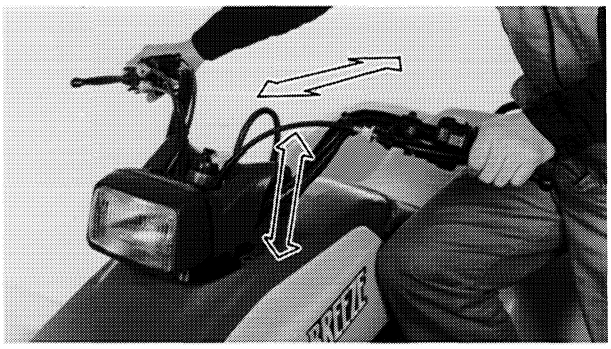
Locknut (hub lockbolt):
16 Nm (1.6 m · kg, 11 ft · lb)

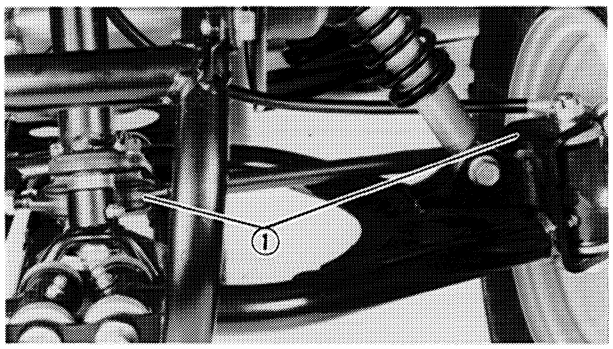
DRIVE CHAIN LUBRICATION

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

This machine has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, and certain solvents can damage these O-rings. Use only kerosene to clean the drive chain. Wipe it dry, and thoroughly lubricate it with SAE 30 ~ 50W motor oil. Do not use any other lubricants on the drive chain. They may contain solvents that could damage the O-rings.

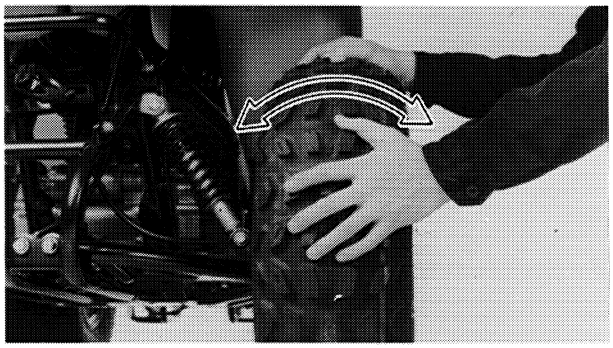
Recommended lubricant:
SAE 30 ~ 50 Motor Oil



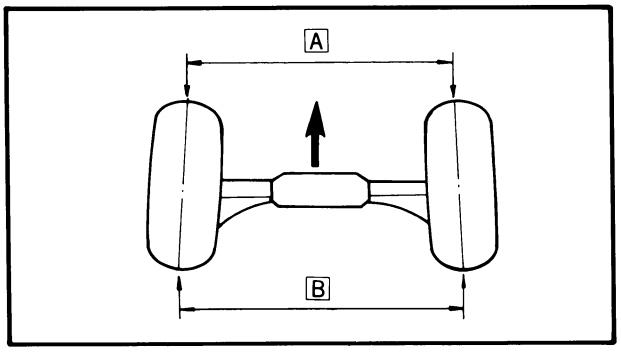


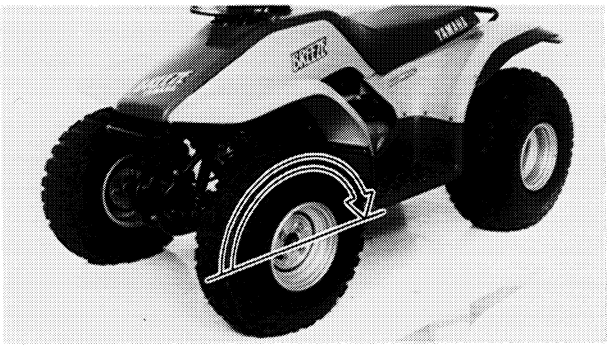
STEERING SYSTEM INSPECTION

1. Place the machine on a level place.
2. Check:
   - Steering column bushings and bearings
     Move the handlebar up and down, and/or back and forth.
     Excessive play → Replace the steering column bushings and or bearings.
     Refer to the "STEERING SYSTEM" section in the CHAPTER 6.
3. Check:
   - Tie-rod ends
     Turn the handlebar to the left and/or right until it stops completely, then slightly move the handlebar from left to right.
     Tie-rod end ① has any vertical play → Replace the tie-rod end(s).
     Refer to the "STEERING SYSTEM" section in the CHAPTER 6.



4. Raise the front end of the machine so that there is no weight on the front wheels.
5. Check:
   - Ball joints and/or wheel bearings
     Move the wheels latelly back and forth. Excessive free play → Replace the front arms and/or wheel bearings.
     Refer to the "FRONT SUSPENSION" and "FRONT WHEEL" section in the CHAPTER 6.





TOE-IN ADJUSTMENT

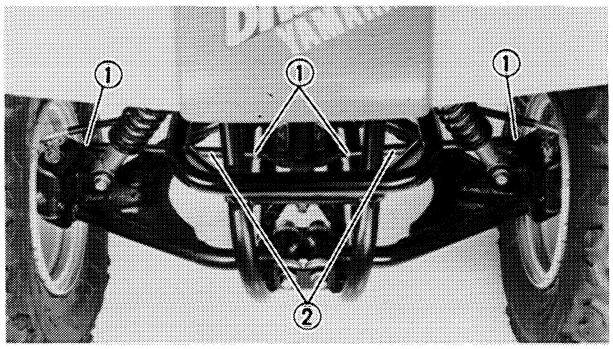
1. Place the machine on a level place.
2. Measure:
   - Toe-in
     Out of specification → Adjust.

Toe-in measurement steps:
- Mark both front tire tread centers.
- Raise the front end of the machine so that there is no weight on the front tires.
- Fix the handlebar straight ahead.
- Measure the width [A] between the marks.
- Rotate the front tires 180 degrees until the marks come exactly opposite.
- Measure the width [B] between the marks.
- Calculate the toe-in using the formula given below.

Toe-in = [B] − [A]

Toe-in:
0 ~ 10 mm (0 ~ 0.39 in)

- If the toe-in is incorrect, adjust the toe-in.



3. Adjust:
   • Toe-in

Adjustment steps:
- Mark both tie-rods ends.
  This reference point will be needed during adjustment.
- Loosen the locknuts (tie-rod end) ① of both tie-rods.
- The same number of turns should be given to both tie-rods ② right and left until the specified toe-in is obtained, so that the lengths of the rods will be kept the same.
- Tighten the rod end locknuts of both tie-rods.

Locknut (rod end):
30 Nm (3.0 m · kg, 22 ft · lb)

⚠ WARNING:

- **Be sure that both tie-rods are turned the same amount. If not, the machine will drift right or left even though the handlebar is positioned straight which may lead to mishandling and accident.**
- **After setting the toe-in to specification, run the machine slowly for some distance with hands placed lightly on the handlebar and check that the handlebar responds correctly. If not, turn either the right or left tie-rod within the toe-in specification.**

3

TIRE INSPECTION

⚠ WARNING:

This model is equipped with low pressure tires. It is important that they be inflated correctly and maintained at the proper pressures.

• TIRE CHARACTERISTICS

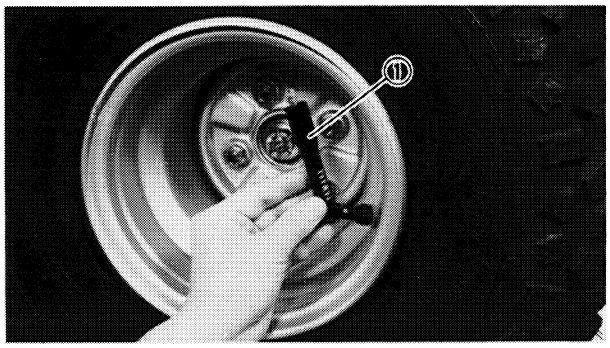
1) Tire characteristics influence the handling of ATV's. The tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. If other tire combinations are used, they can adversely affect your machine's handling characteristics and are therefore not recommended.

	Manufacturer	Size	Type
Front	Dunlop	AT20 x 7-8	KT536
Rear	Dunlop	AT22 x 10-8	KT537

• TIRE PRESSURE

1) Recommende tire pressure
   Front 20 kPa (0.20 kg/cm^2, 2.8 psi)
   Rear 25 kPa (0.25 kg/cm^2, 3.6 psi)
2) Tire pressure below the minimum specified could cause the tire to dislodge from the rim under severe riding conditions.
   The following are minimums:
   Front 17 kPa (0.17 kg/cm^2, 2.4 psi)
   Rear 22 kPa (0.22 kg/cm^2, 3.1 psi)
3) Use no more than
   Front 250 kPa (2.5 kg/cm^2, 36 psi)
   Rear 250 kPa (2.5 kg/cm^2, 36 psi)
   When seating the tire beads. Higher pressures may cause the tire to burst.
   Inflate the tires very slowly and carefully. Fast inflation could cause the tire to burst.

1. Measure:
   • Tire pressure (cold tire pressure)
     Out of specification → Adjust.



NOTE:

The low-pressure tire gauge ① is included in the standard equipment.

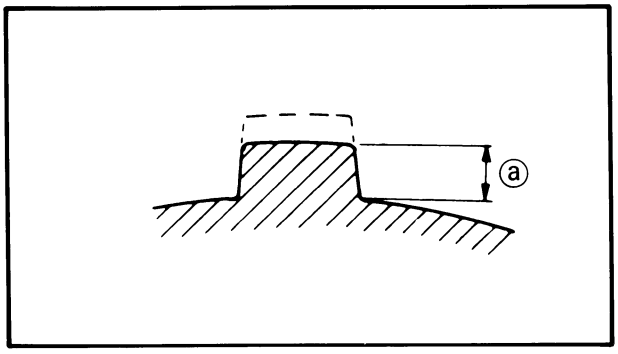
If dust or the like is stuck to this gauge, it does not provide correct readings. Therefore, make two measurements on the tire pressure and get the second reading.

Cold tire pressure	Front	Rear
Standard	20 kPa (0.2 kg/cm², 2.8 psi)	25 kPa (0.25 kg/cm², 3.6 psi)
Minimum	17 kPa (0.17 kg/cm², 2.4 psi)	22 kPa (0.22 kg/cm², 3.1 psi)
Maximum	23 kPa (0.23 kg/cm², 3.2 psi)	28 kPa (0.28 kg/cm², 3.4 psi)

⚠ WARNING:

Uneven or improper tire pressure may adversely affect the handling of this machine and may cause loss of control.

- **Maintain proper tire pressures.**
- **Set tire pressures when the tires are cold.**
- **Tire pressures must be equal in both front tires and equal in both rear tires.**



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

Tire wear limit ⓐ:
Front and rear: 3.0 mm (0.12 in)

⚠ WARNING:

It is dangerous to ride with a wornout tire. When a tire wear is out of specification, replace the tire immediately.

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.**
- **Ride conservatively after installing a tire to allow it to seat itself properly on the rim.**

CABLE INSPECTION AND LUBRICATION

⚠ WARNING:

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

1. Inspect:
   - Cable sheath
     Damage → Replace.
2. Check:
   - Cable operation
     Unsmooth operation → Lubricate or replace.

Recommended lubricant:
SAE 10W30 Motor Oil

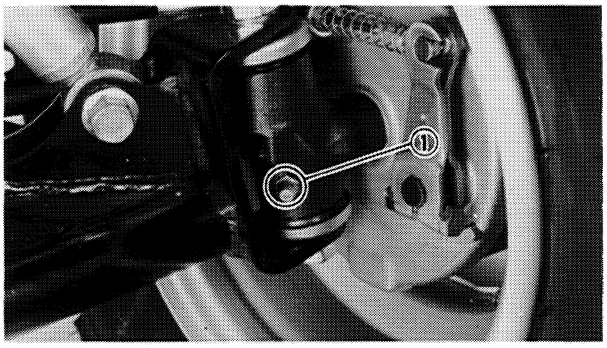
NOTE:
Hold cable end high and apply several drops of lubricant to cable.

3. Apply:
   - Lithium soap base grease
     (onto end of the cable)

LEVER LUBRICATION

1. Lubricate the pivoting parts of each lever.

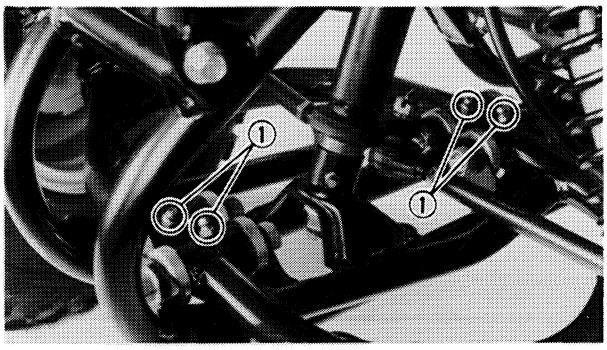
Recommended lubricant:
SAE 10W30 Motor Oil



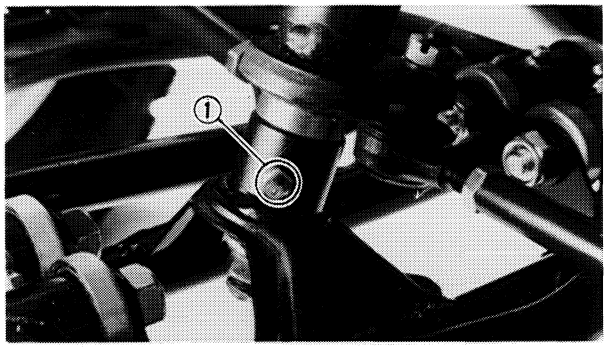
FRONT SUSPENSION LUBRICATION

1. Inject grease into the nipples ① using a grease gun until slight over flow is observed from the thrust covers.

Lightweight lithium-soap base grease



NOTE:
Wipe off the excess grease.

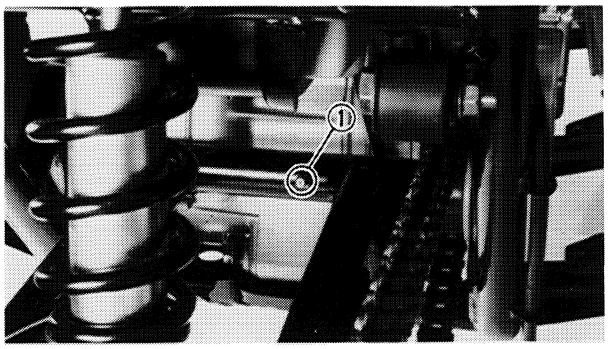


STEERING COLUMN LUBRICATION

1. Inject grease into the nipple ① using a grease gun.

Lightweight lithium-soap base grease

NOTE:
Wipe off the excess grease.



REAR SUSPENSION LUBRICATION

1. Inject grease into the nipple ① using a grease gun.

Lightweight lithium-soap base grease

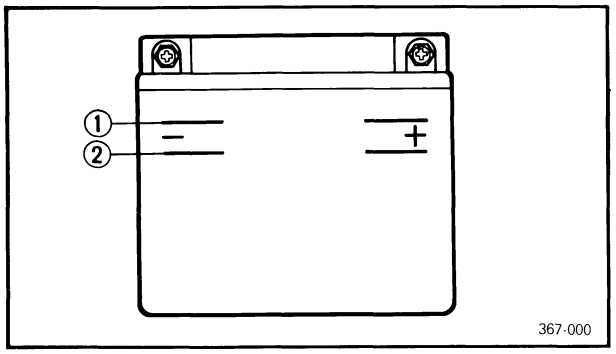
NOTE:
Wipe off the excess grease.

ELECTRICAL

BATTERY INSPECTION

1. Remove:
   - Seat

   Refer to the "FENDERS" section for removal.



2. Inspect:
   - Fluid level

   Fluid level should be between upper ① and lower ② level marks.
   Incorrect → Refill.

⚠CAUTION:

Refill with distilled water only; tap water contains minerals harmful to a battery.

3. Inspect:
   - Battery terminal

   Dirty terminal → Clean with wire brush.
   Poor connection → Correct.

NOTE:

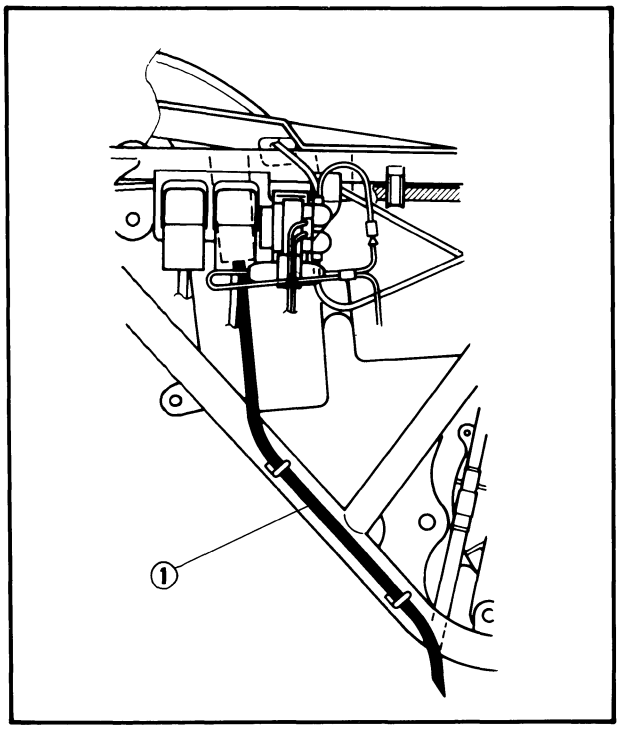
After cleaning the terminals, apply grease lightly to the terminals.

4. Inspect:
   - Breather hose

   Obstruction → Remove.
   Damage → Replace.

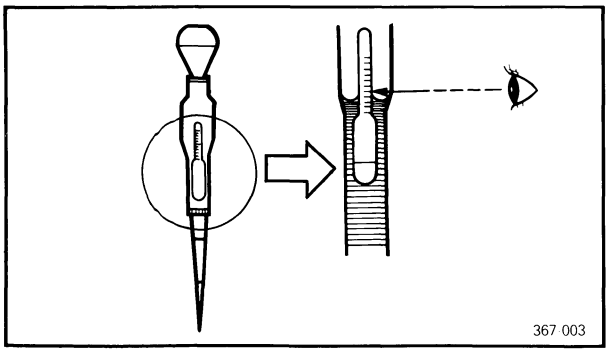
⚠CAUTION:

When inspecting the battery, be sure the breather hose is routed correctly. If the breather hose touches the frame or exits in such a way as to cause battery electrolyte or gas to exit onto the frame, structural and cosmetic damage to the machine can occur.



5. Connect:
   - Breather hose ①

   Be sure the hose is properly attached and routed.



6. Check:
   - Specific gravity

   Less than 1.280 → Recharge battery.

Charging current:	**1.2 amps/10 hrs**
Specific gravity:	**1.280 at 20°C (68°F)**

Replace the battery if:
- Battery voltage will not rise to a specific value or bubbles fail to rise even after many hours of charging.
- Sulfation of one or more cells occurs, as indicated by the plates turning white, or an accumulation of material exists in the bottom of the cell.
- Specific gravity readings after a long, slow charge indicate one cell to be lower than the rest.
- Warpage or buckling of plates or insulators is evident.

⚠ CAUTION:

Always charge a new battery before using it to ensure maximum performance.

⚠ 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):

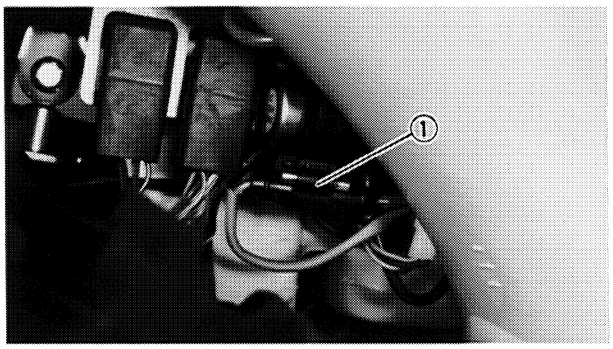
- **Drink large quantities of water or milk follow with milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.**

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.

7. Install:
   - Seat

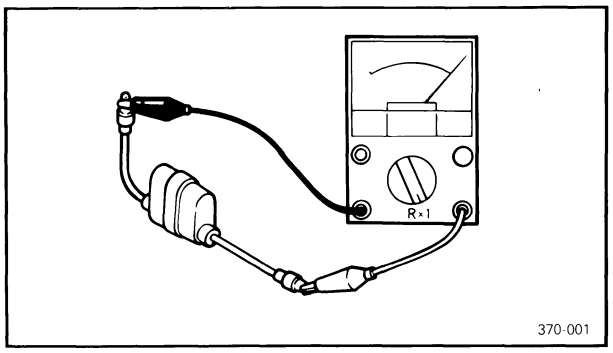


FUSE INSPECTION

⚠ CAUTION:

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

1. Remove:
   - Fuse ①



2. Inspect:
   • Fuse

Inspection steps:
• Connect the pocket tester (Ω x 1) to the fuse and check it for continuity.

Pocket tester:
P/N YU-03113, 90890-03112

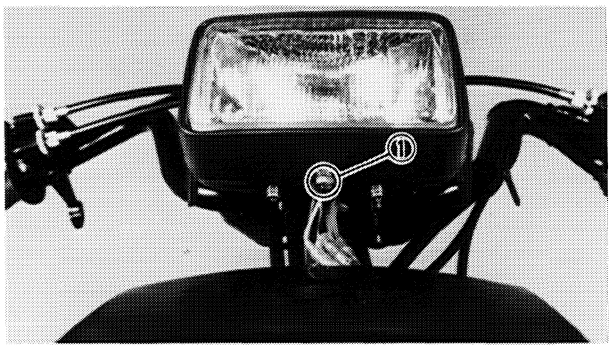
• If the tester is indicated at ∞. The fuse is blown, replace it.

3. Replace:
   • Blown fuse

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

⚠ WARNING:

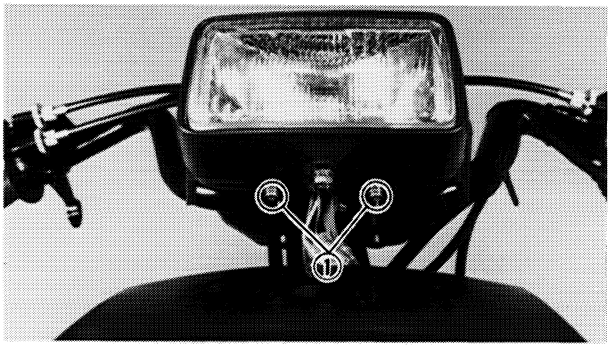
Never use a fuse with a rating other then specified, or other material in place of a fuse. An improper fuse may cause damage to the electrical system and possible cause a fire, or the lighting and/or ignition may cease to function.

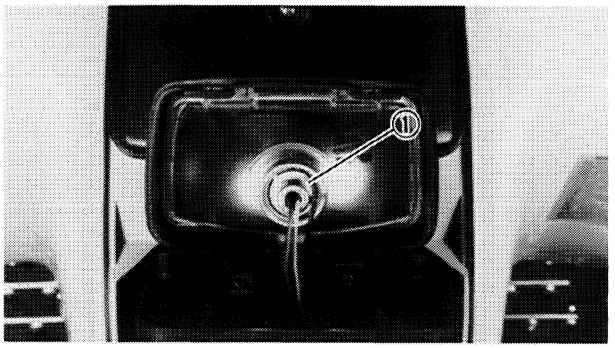


HEADLIGHT BEAM ADJUSTMENT

1. Adjust:
   • Headlight beam (vertical)

To raise the beam, loosen the adjusting screw ① and pull it toward you. To lower the beam, push it away from you. After adjusting, retighten it.





HEADLIGHT BULB REPLACEMENT

1. Remove:
   - Bolts ① (headlight unit)

2. Remove:
   - Bulb holder ①
   - Bulb

NOTE:
Turn the bulb holder counterclockwise and remove the defective bulb.

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

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

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

4. Install:
   - Bolt (headlight unit)

ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

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

- Cylinder head
- Cylinder
- Pinston/Piston ring
- Camshaft/Rocker arm/Valve
- Centrifugal clutch
- Primary sheave
- Secondary sheave
- V-belt
- Starter clutch
- Oil pump
- CDI magneto

ENGINE OIL

1. Drain:
   - Engine oil

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

TRANSMISSION OIL

1. Drain:
   - Transmission oil

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

FENDERS

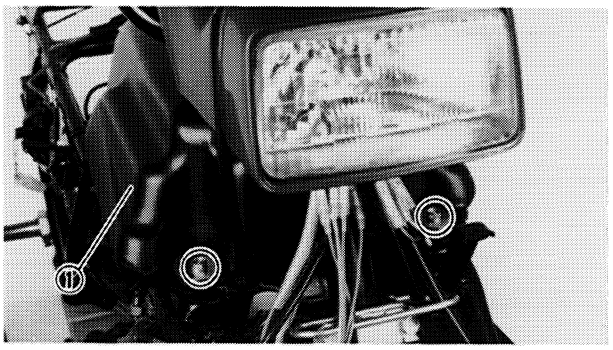
1. Remove:
   - Seat
   - Cover (front)
   - Cover (center)
   - Front fender
   - Rear fender

   Refer to the "FENDERS" section in the CHAPTER 3.

CARBURETOR

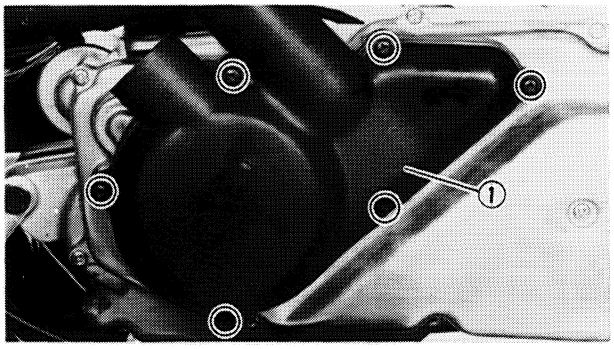
1. Remove:
   - Carburetor

   Refer to the "CARBURETOR – REMOVAL" section in the CHAPTER 5.

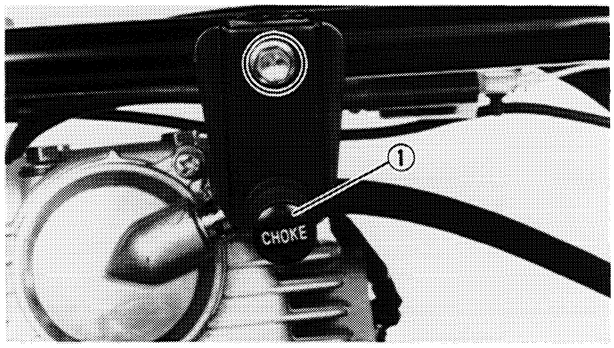


MUFFLER

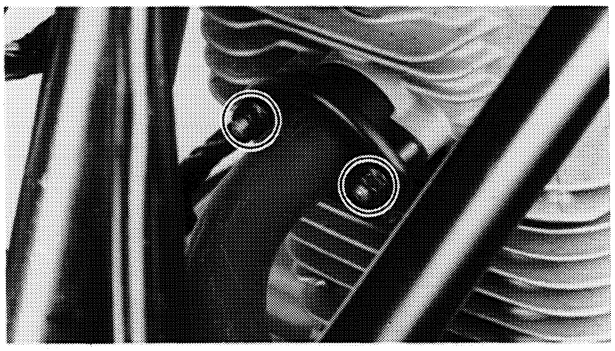
1. Remove:
   - Fuel tank ①



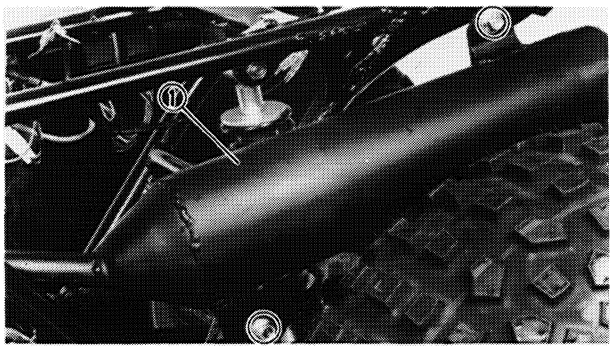
2. Remove:
   - Air duct ①

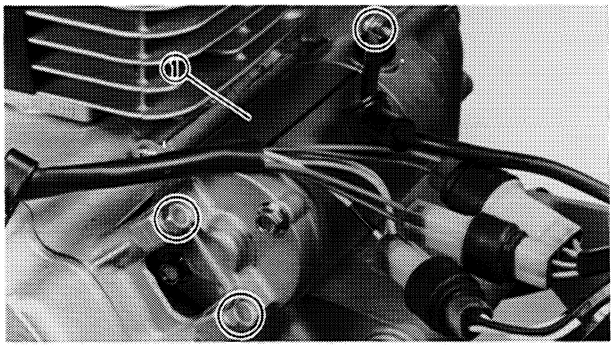


3. Remove:
   - Starter cable ① (with bracket)



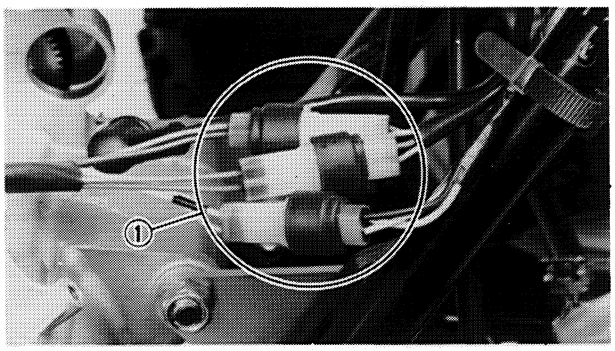
4. Remove:
   - Muffler ①





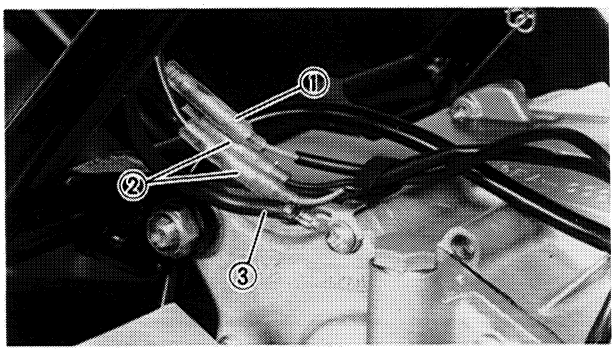
STARTING MOTOR

1. Remove:
   - Starting motor ①

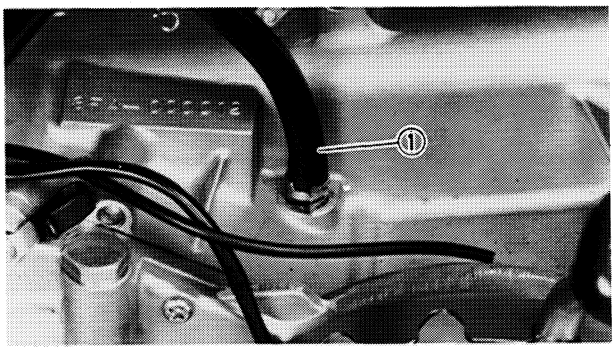


LEADS AND HOSES

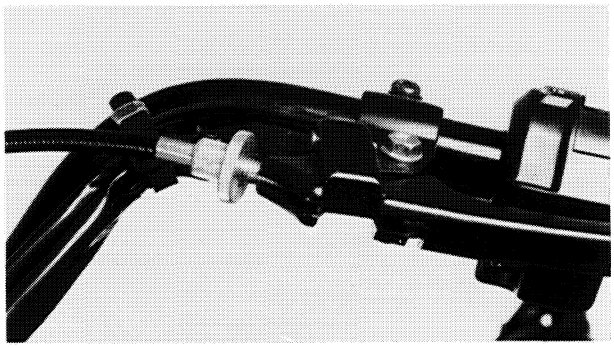
1. Disconnect:
   - CDI magneto leads ①



2. Disconnect:
   - Neutral switch lead ①
   - Select lever switch lead ②
   - Ground lead ③

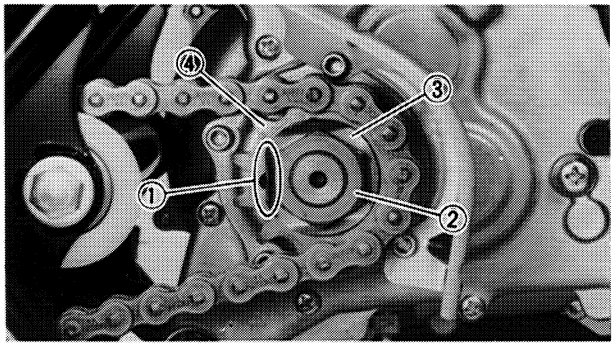


3. Disconnect:
   - Breather hose ① (transmission case)

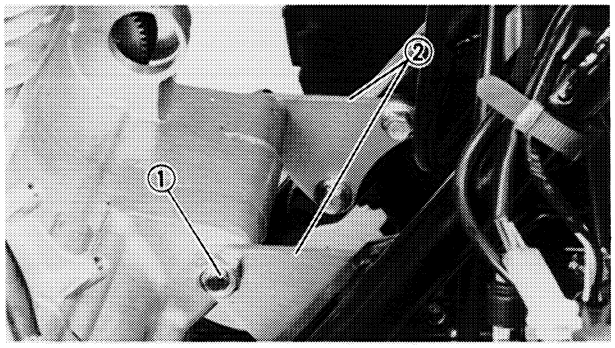


ENGINE REMOVAL

1. Apply:
   - Parking brake

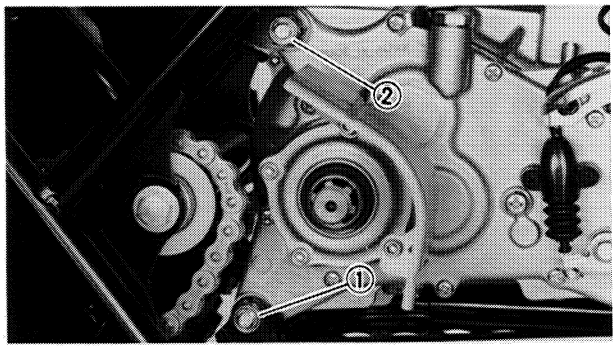


2. Straighten:
   - Lock washer tab ①
3. Remove:
   - Nut ②
   - Lock washer ③
   - Drive sprocket ④

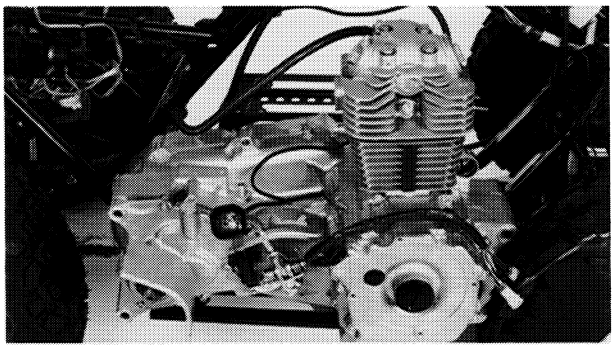


4. Remove:
   - Mounting bolt ① (front)
   - Engine bracket ②

4



5. Remove:
   - Mounting bolt ① (rear-lower)
   - Mounting bolt ② (rear-upper)



6. Remove:
   - Engine assembly
     (to the right side of the machine)

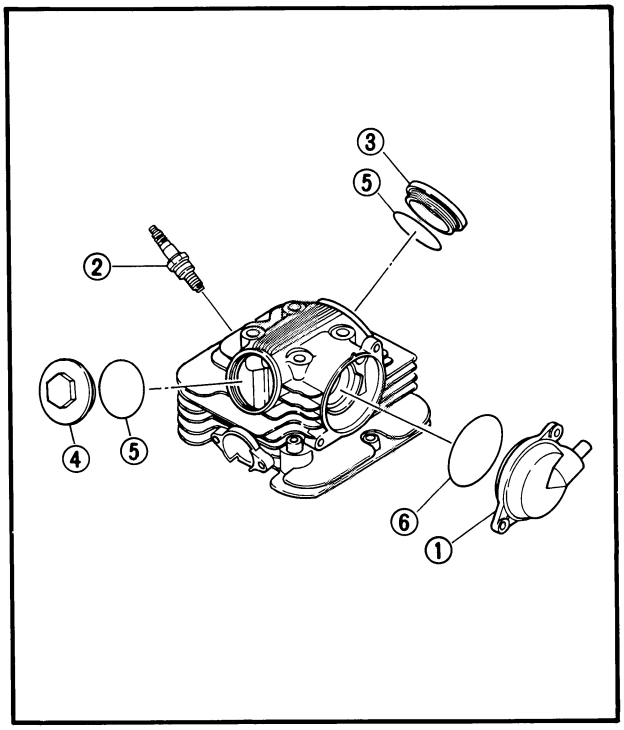
ENGINE DISASSEMBLY

CYLINDER HEAD, CYLINDER AND PISTON

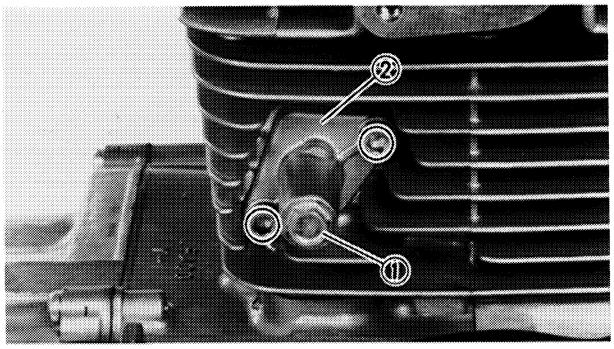
NOTE:

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

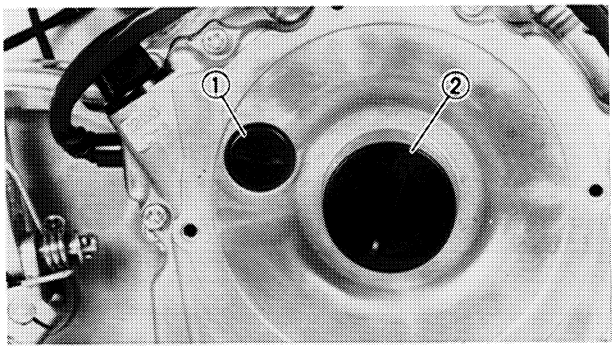
- Seat
- Cover (front)
- Cover (center)
- Front fender
- Rear fender
- Muffler



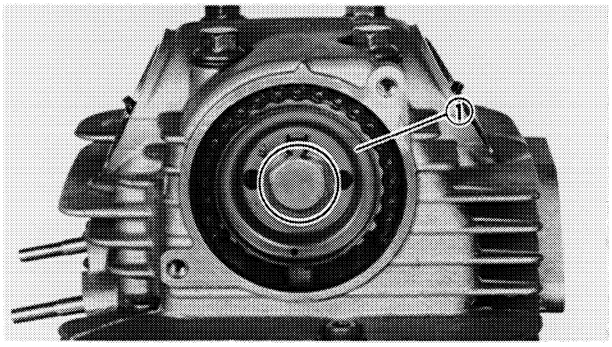
1. Remove:
   - Cylinder head cover ①
   - Spark plug ②
   - Tappet cover ③ (intake)
   - Tappet cover ④ (exhaust)
   - O-rings ⑤ (Tappet covers)
   - O-ring ⑥ (Cylinder head cover)



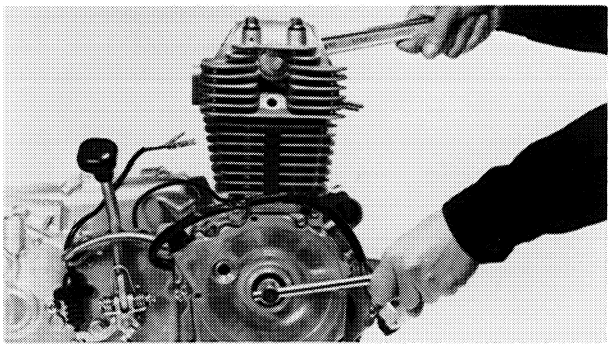
2. Loosen:
   - Plug ① (timing chain tensioner)
3. Remove:
   - Timing chain tensioner ②



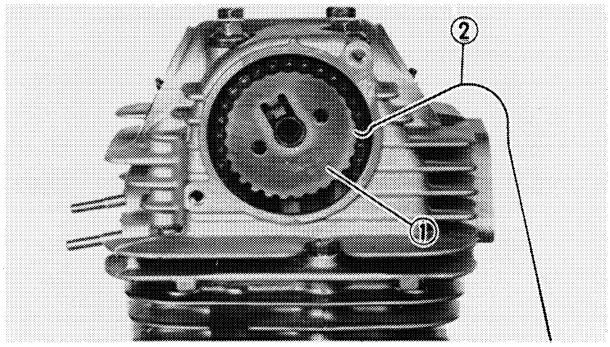
4. Remove:
   - Plug ①
   - Plug ②



5. Remove:
- Baffle plate ①

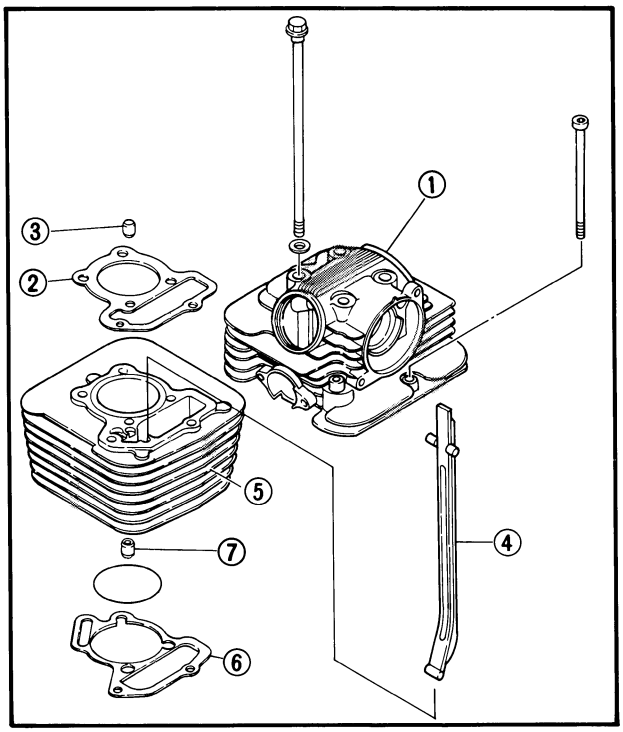


NOTE:
Loosen the bolt (baffle plate) while holding the nut (CDI magneto) with a wrench.



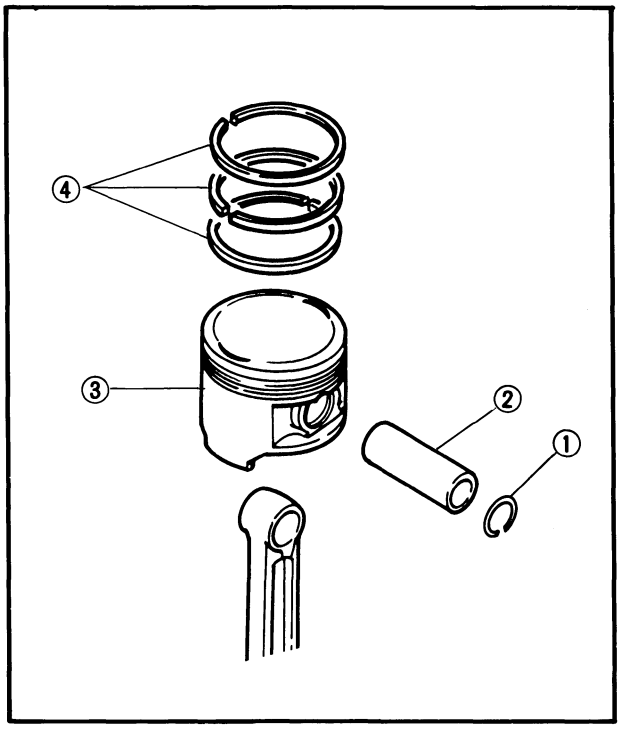
6. Remove:
- Cam sprocket ①

NOTE:
Fasten a safety wire ② to the timing chain to prevent it from falling into the crankcase.



7. Remove:
- Cylinder head ①
- Gasket ② (cylinder head)
- Dowel pins ③
- Chain guide ④ (exhaust)
- Cylinder ⑤
- Gasket ⑥ (cylinder)
- Dowel pins ⑦

NOTE:
Loosen each bolt 1/4 turn, and remove them after all bolts are loosened.



8. Remove:
   - Piston pin clip ①
   - Piston pin ②
   - Piston ③
   - Piston rings ④

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

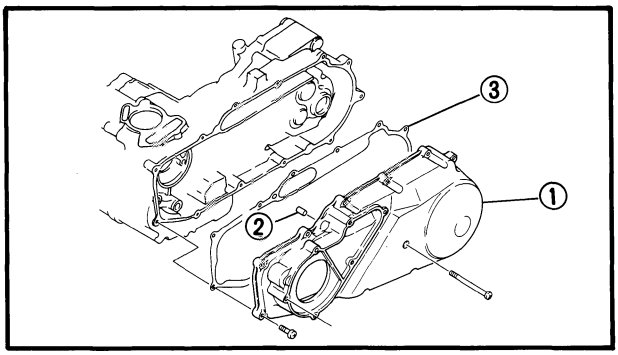
Piston Pin Puller:
P/N YU-01304, 90890-01304

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

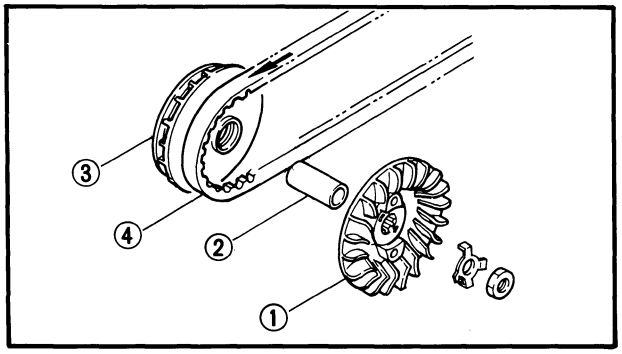
4

PRIMARY SHEAVE AND SECONDARY SHEAVE

NOTE:
With the engine mounted, the primary sheave and secondary sheave can be maintained by removing the following parts.
- Seat
- Cover (front)
- Cover (center)
- Front fender
- Foot board (left)
- Bracket (foot board)

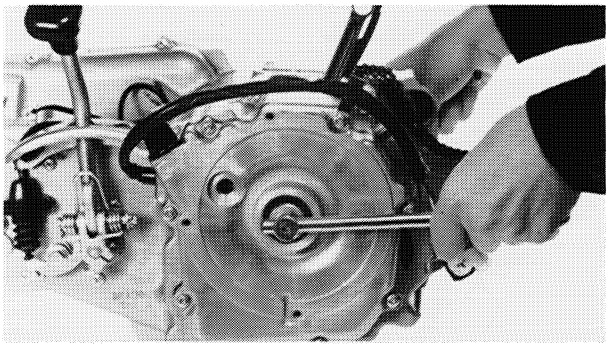


1. Remove:
   - Crankcase cover ① (left)
   - Dowel pins ②
   - Gasket ③ (crankcase cover)

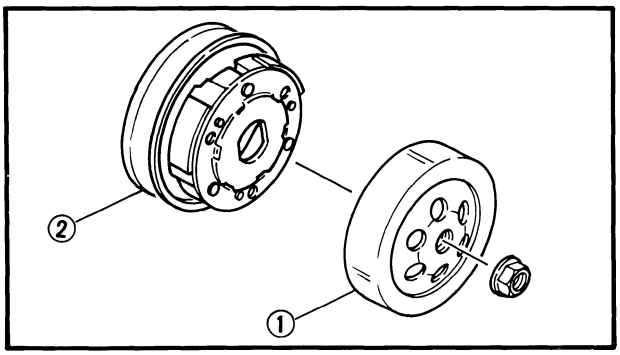


2. Remove:
   - Primary fixed sheave ①
   - Collar ②
   - Primary sliding sheave ③
   - V-belt ④

NOTE:
- Before loosening the nut (primary sheave), straighten the lock washer tab.
- Loosen the nut (primary sheave) while holding the nut (CDI Magneto) with a wrench.



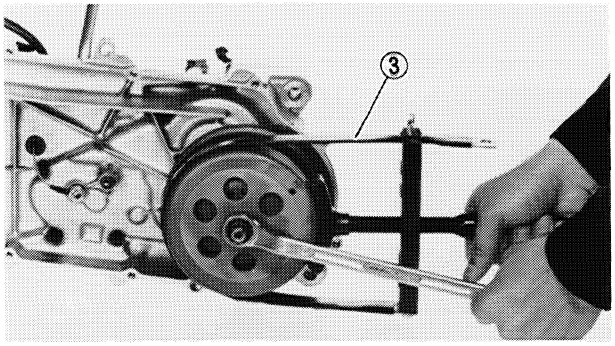
4

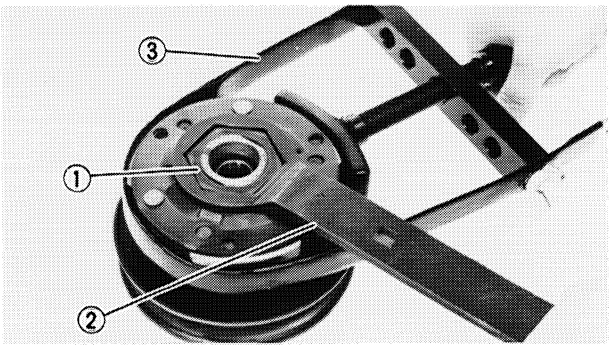


3. Remove:
   - Clutch housing ①
   - Secondary sheave assembly (with clutch shoes) ②

NOTE:
Loosen the nut (clutch housing) while holding the clutch housing with the sheave holder ③.

Sheave holder:
P/N YS-01880, 90890-01701



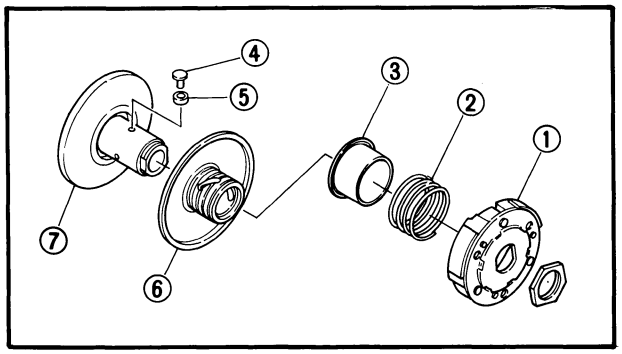


4. Loosen:
   - Nut ① (secondary sheave)

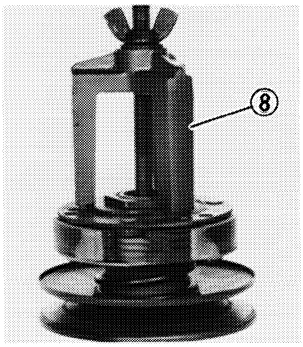
NOTE:
Loosen the nut (secondary sheave) by the locknut wrench ② while holding the clutch shoes with the sheave holder ③.

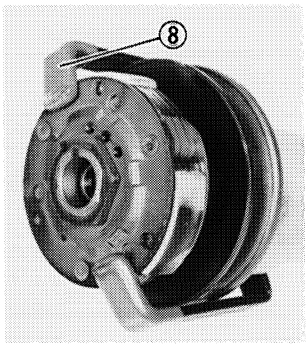
Sheave holder:
P/N YS-01880, 90890-01701
Locknut wrench:
P/N YM-4045-A, 90890-01348

⚠ CAUTION:
Do not remove the nut yet.



5. Remove:
   - Clutch shoes ①
   - Sliding sheave spring ②
   - Spring seat ③
   - Guide pins ④
   - Collars ⑤
   - Secondary sliding sheave ⑥
   - Secondary fixed sheave ⑦



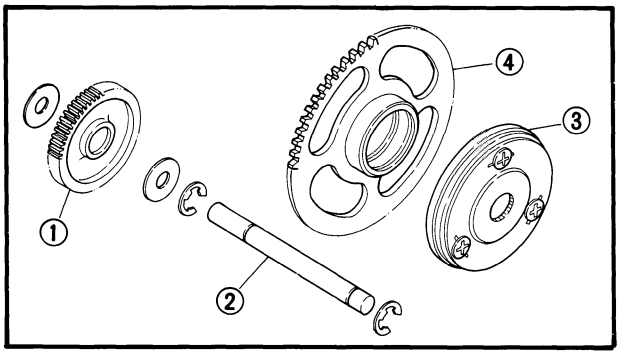


NOTE:
Before removing the nut (secondary sheave assembly), compress the sliding sheave spring with the spring holder ⑧ and then, remove the nut.

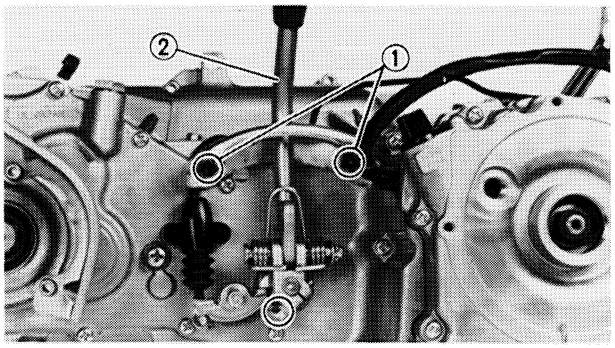
Spring holder:
P/N YS-28891, 90890-01337

ELECTRIC STARTING DRIVE

NOTE:
With the engine mounted, the starter clutch and gears can be maintained by removing the following parts.
- Seat
- Cover (center)
- Cover (front)
- Front fender
- Foot board (left)
- Bracket (foot board)
- Crankcase cover (left)
- Primary sheave
- V-belt

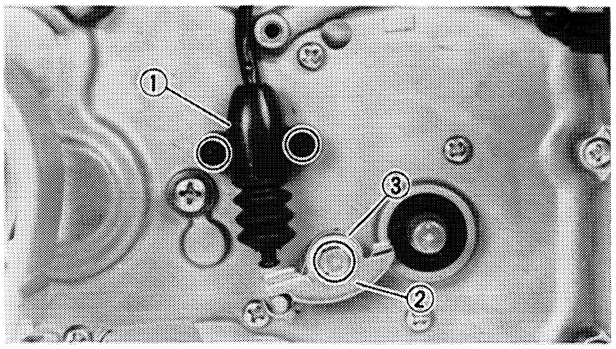


1. Remove:
   - Starter idle gear ①
   - Shaft ② (starter idle gear)
   - Starter clutch ③
   - Starter wheel gear ④



SHIFT LEVER

1. Move the shift lever to "N" position.
2. Remove:
   - Bolts ① (shift lever guide)
   - Shift lever ②



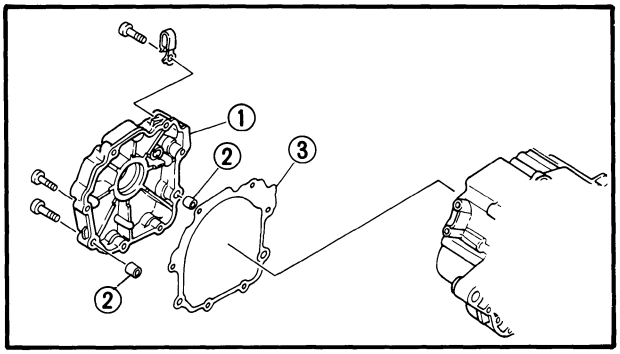
3. Remove:
   - Shift lever switch ①
   - Lever ②
   - Torsion spring ③

CDI MAGNETO

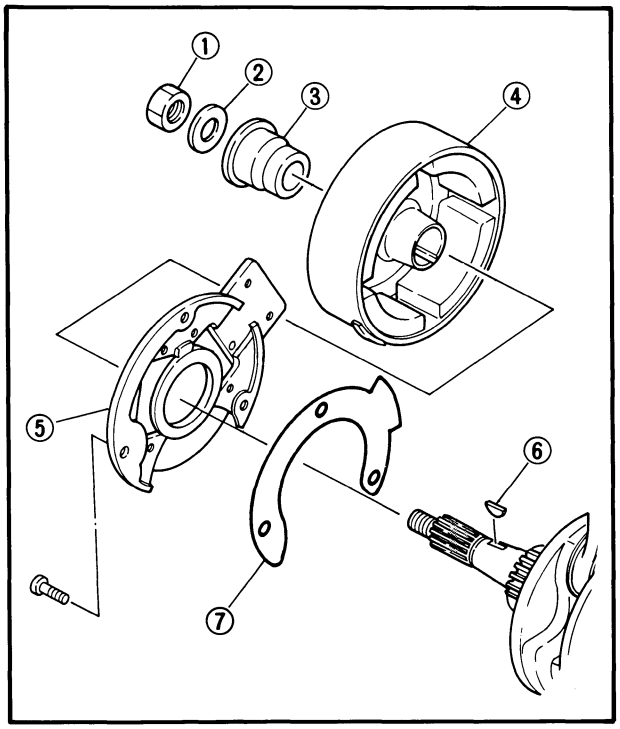
NOTE:

With the engine mounted, the CDI magneto can be maintained by removing the following parts.

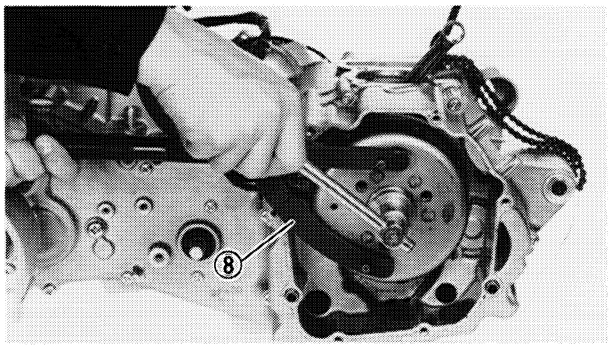
- Seat
- Cover (front)
- Cover (center)
- Front fender



1. Remove:
   - Crankcase cover ①
   - Dowel pins ②
   - Gasket ③

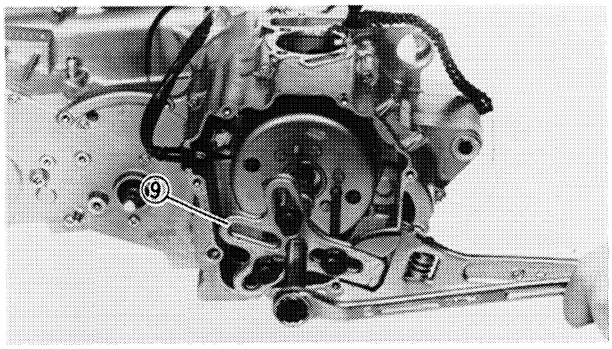


2. Remove:
- Nut ① (CDI magneto)
- Washer ②
- Collar ③
- Rotor ④ (CDI magneto)
- Startor assembly ⑤
- Woodruff key ⑥
- Gasket ⑦



NOTE:
Loosen the nut (CDI magneto) while holding the CDI rotor with the rotor holder ⑧.

Rotor holder:
P/N YU-01235, 90890-01235

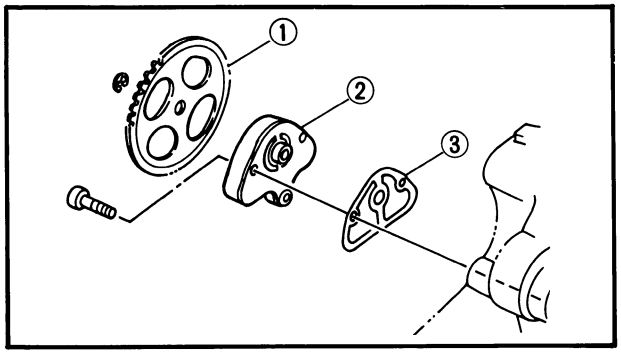


NOTE:
Remove the rotor by the rotor puller ⑨.

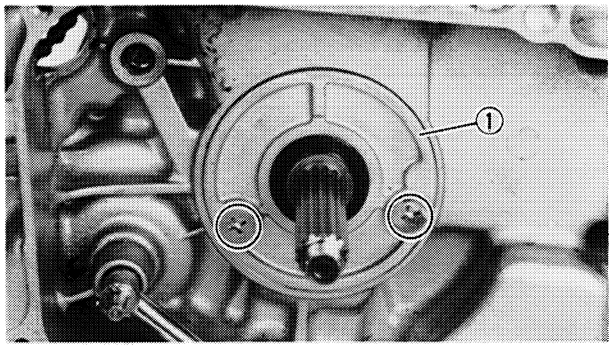
Rotor puller:
P/N YU-33270, 90890-01362

OIL PUMP

NOTE:
With the engine mounted, the oil pump can be maintained by removing the following parts.
- Seat
- Cover (front)
- Cover (center)
- Front fender
- CDI magneto

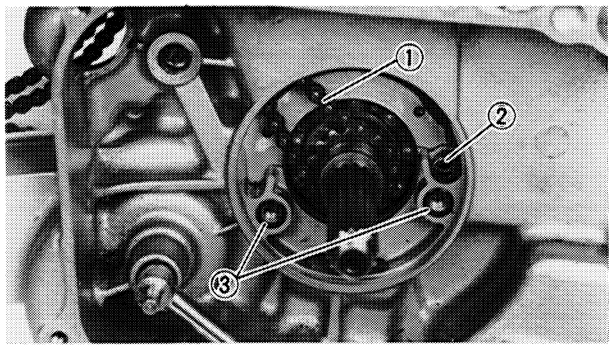


1. Remove:
   - Oil pump gear ①
   - Oil pump ②
   - Gasket ③ (oil pump)

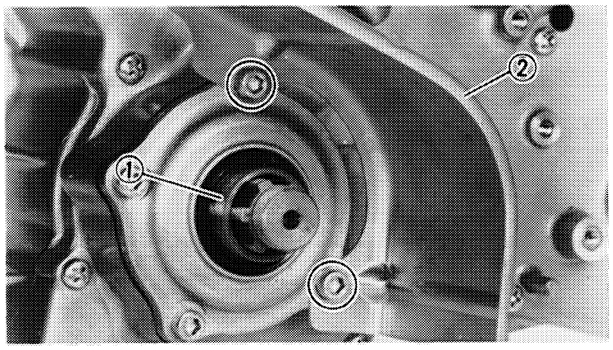


TIMING CHAIN

1. Remove:
   - Cover ①

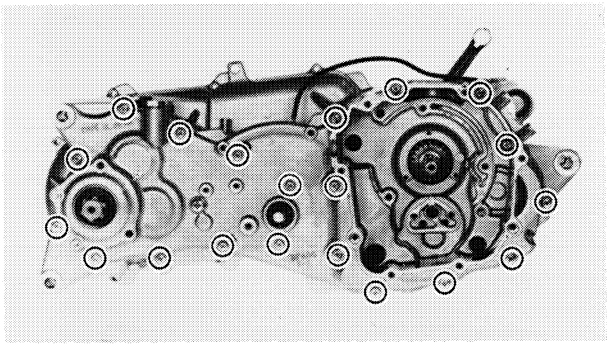


2. Remove:
   - Timing chain ①
   - Chain guide ② (intake)
   - O-rings ③



CRANKCASE (RIGHT)

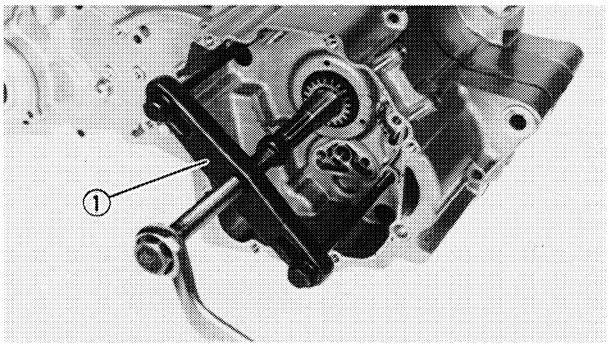
1. Remove:
   - Collar ①
   - Chain cover ②

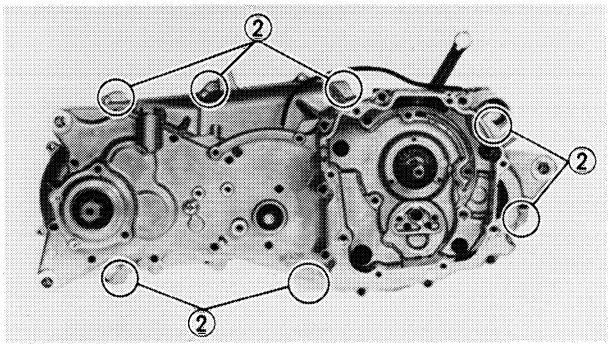


2. Remove:
   - Crankcase (right)
   - Dowel pins

NOTE:

Loosen each bolt 1/4 turn, and remove them after all bolts are loosened.





Removal steps:

- Attach the Crankcase separating tool ①.

Crankcase separating tool:
P/N YU-01135, 90890-01135

NOTE:

Fully tighten the tool holding bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.

- As pressure is applied, alternately tap on the front engine mounting boss and drive axle. Then, remove the crankcase (right).

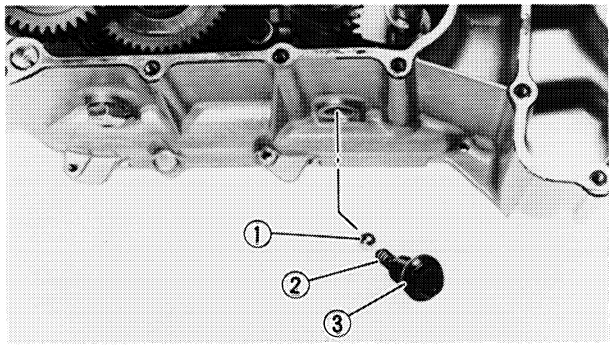
NOTE:

If the crankcase will not come off, use the lever guides ② for removal.

⚠ CAUTION:

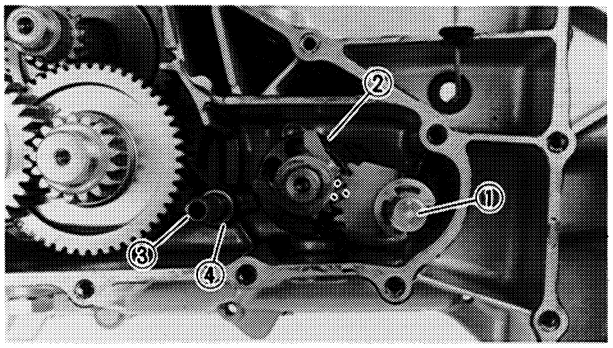
- **Be sure not to give damages to the mating surface.**
- **Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs", take pressure off the push screw, realign, and start over. If the cases do not separate, check for a remaining case screw or fitting. Do not force.**

4

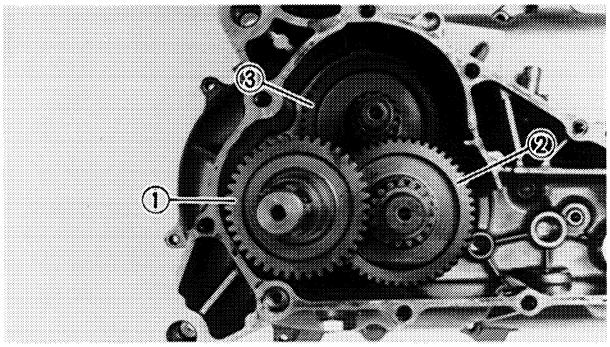


SHIFTER AND TRANSMISSION

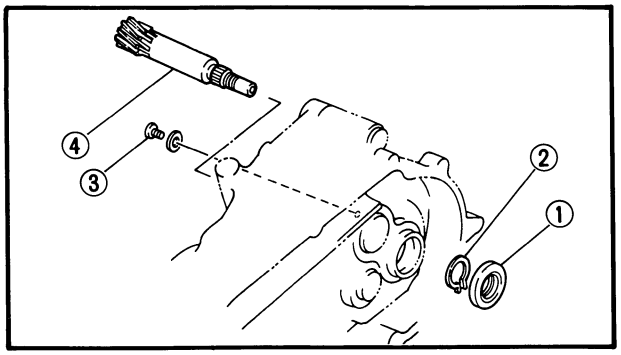
1. Remove:
   - Plug ① (shift cam stopper)
   - Spring ②
   - Shift cam stopper ③



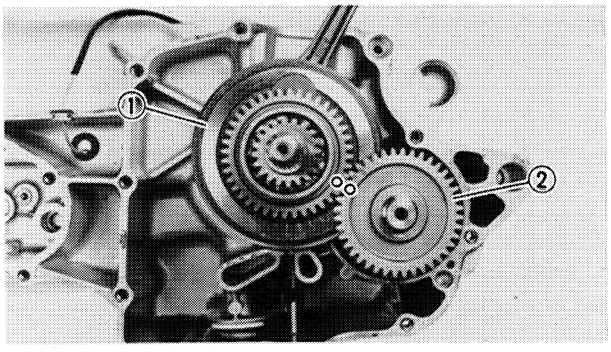
2. Remove:
   - Shift shaft ①
   - Shift cam ②
   - Guide bar ③
   - Shift fork ④



3. Remove:
   - Drive axle ①
   - Counter axle ②
   - Main axle ③



4. Remove:
   - Oil seal ①
   - Circlip ②
   - Screw ③ (with washer)
   - Primary drive axle ④



CRANKSHAFT AND BALANCER

1. Remove:
   - Crankshaft ①
   - Balancer ②

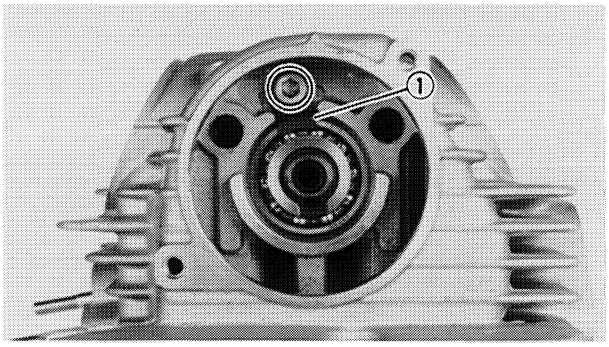
   Tap the crankshaft lightly with a soft hammer.

CAMSHAFT, ROCKER ARM AND VALVE

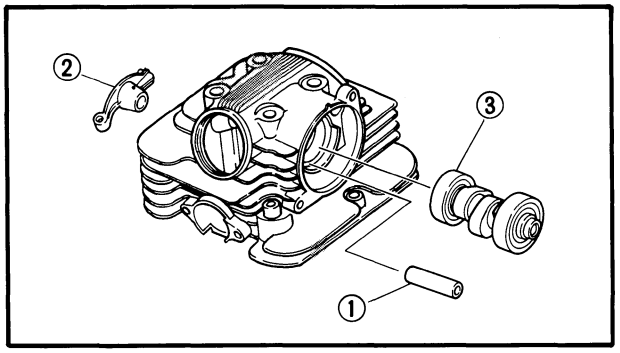
NOTE:

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

- Seat
- Cover (front)
- Cover (center)
- Front fender
- Fuel tank
- Exhaust pipe



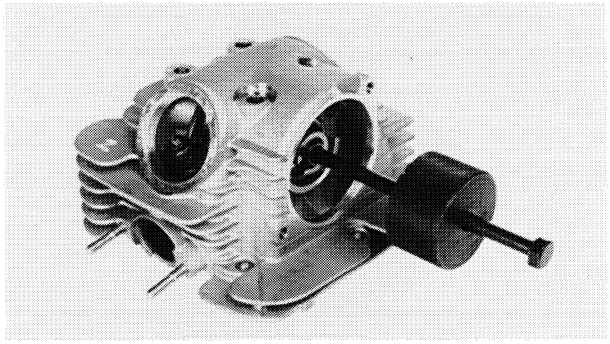
1. Remove:
   - Bearing retainer ①

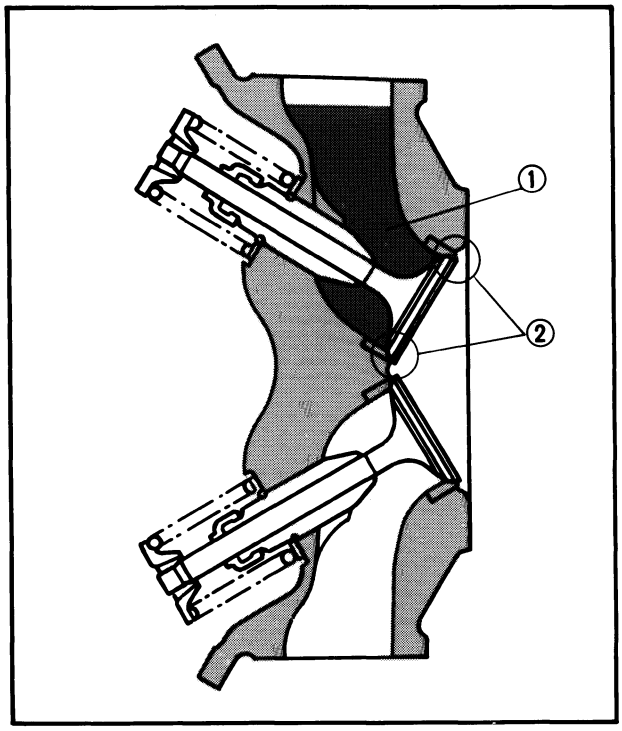


2. Remove:
   - Rocker arm shaft ①
   - Rocker arm ②
   - Camshaft ③

   Use the slide hammer.

Slide hammer:
P/N YU-01083
90890-01084, 90890-01085



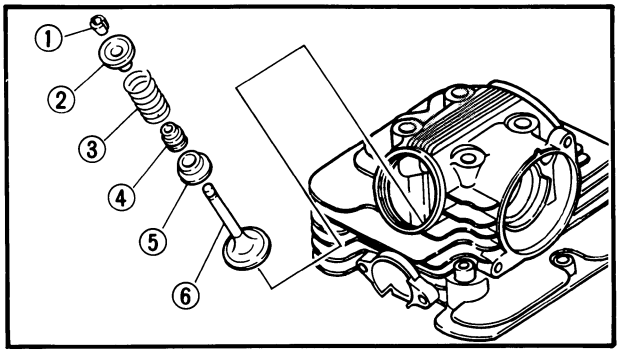


3. Check:
   - Valve sealing

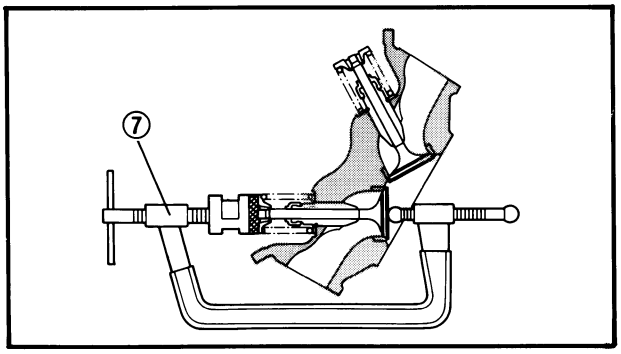
   Leakage at valve seat → Inspect the valve face, valve seat and valve seat width.
   Refer to the "INSPECTION AND REPAIR – VALVE SEAT" section.

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

Valve seal checking steps:
- Supply a clean solvent ① into the intake and exhaust ports.
- Check the valve sealing. There should be no leakage at the valve seats ②.



4. Remove:
   - Valve cotter ①
   - Spring retainer ②
   - Valve spring ③
   - Oil seal ④
   - Spring seat ⑤
   - Valve ⑥

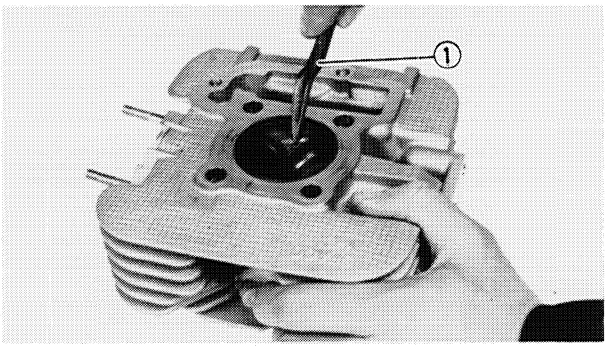


NOTE:

Compress the valve spring to remove the valve cotters by the Valve spring compressor ⑦.

Valve spring compressor:
P/N YM-04019, 90890-04019
Adapter:
P/N YM-4108, 90890-04108

4



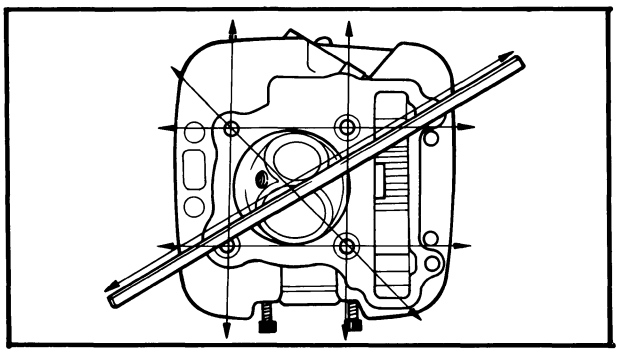
INSPECTION AND REPAIR

CYLINDER HEAD

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

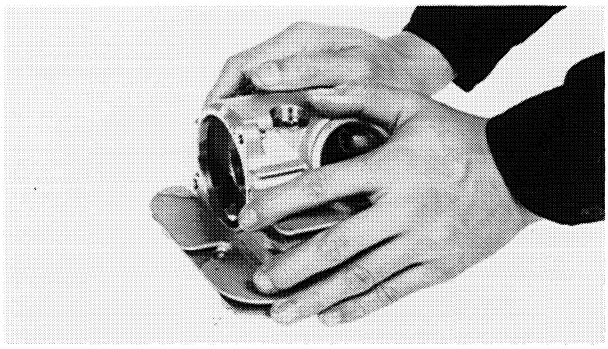
NOTE:
Do not use a sharp instrument and avoid damaging or scratching:
- Spark plug threads
- Valve seat

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)



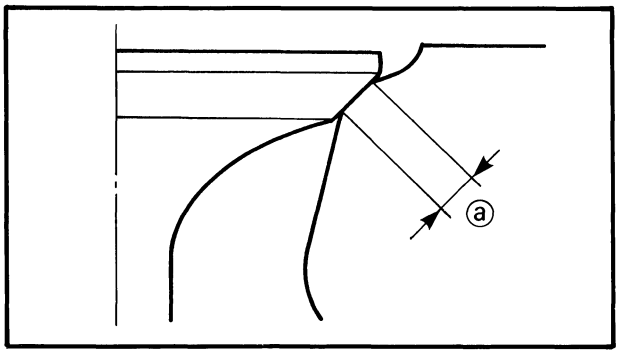
4. Resurface:
   - Cylinder head

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.

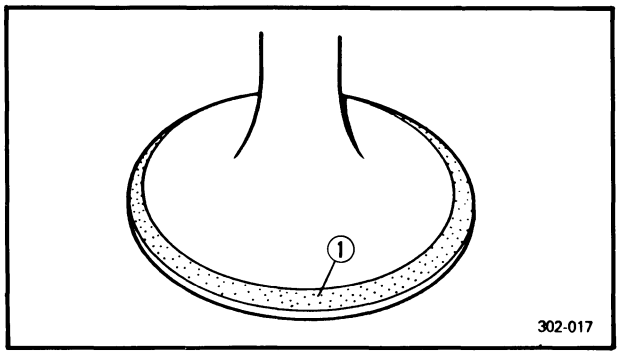
VLAVE SEAT

1. Eliminate:
   - Carbon deposit
     (from valve face and valve seat)
2. Inspect:
   - Valve seat
     Pitting/Wear → Reface the valve seat.



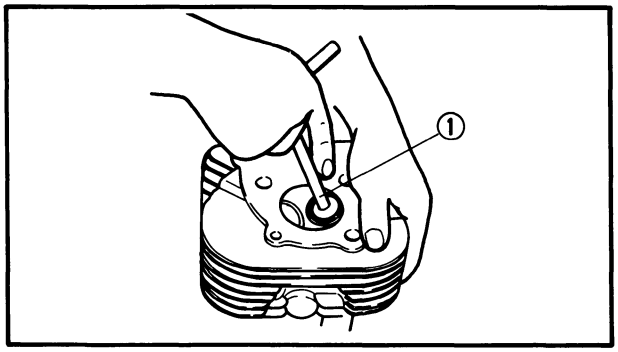
3. Measure:
   - Valve seat width ⓐ
     Out of specification → Reface valve seat.

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 bluing dye (Dykem) ① to the valve face.
- Install the valve into the cylinder head.
- Press the valve through the valve guide and onto the valve seat to make a clear pattern.
- Measure the valve seat width. Wherever the valve seat and valve face made contact, bluing will have been removed.
- If the valve seat width is too wide, too narrow, or seat has not centered, the valve seat must be refaced.

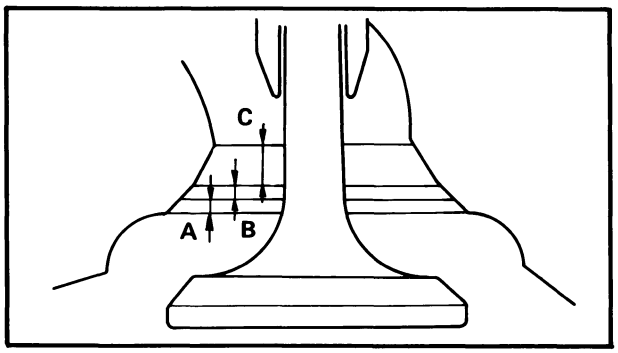
4. Reface:
   - Valve seat
     Use a 30°, 45° and 60° Valve Seat Cutter ①.



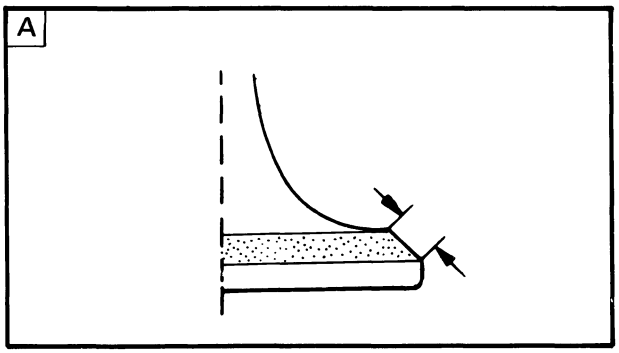
Valve seat cutter:
P/N YM-91043

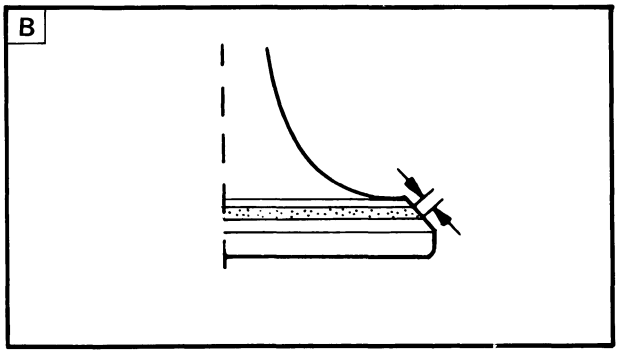
⚠ CAUTION:

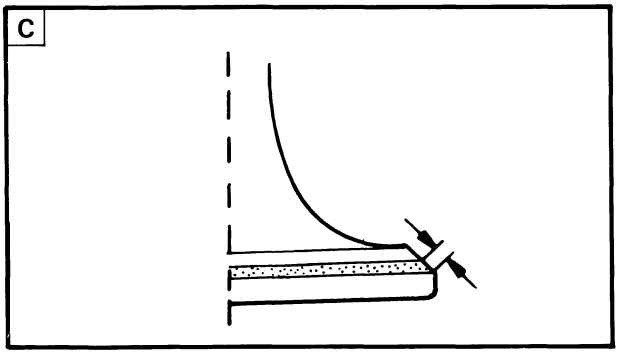
When twisting cutter, keep an even downward pressure (4 ~ 5 kg) to prevent chatter marks.

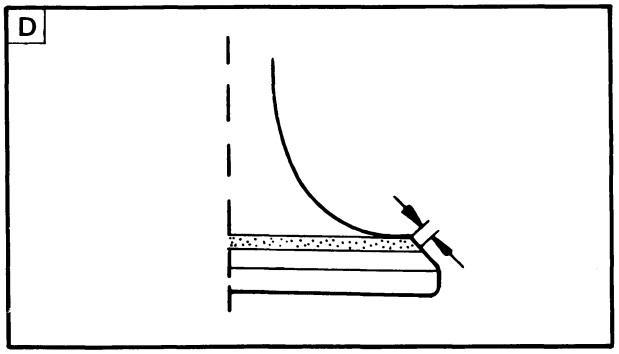


Cut sections as follows	
Section	Cutter
A	30°
B	45°
C	60°









Refacing steps:

[A] Valve face indicates that valve seat is centered on valve face but is too wide.

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

[B] Valve seat is in the middle of the valve face but 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 right up near valve margin.

Valve seat cutter set		Desired result
Use	30° cutter, first	To center the seat and to achieve its width of 1.0 mm (0.039 in).
	45° cutter	

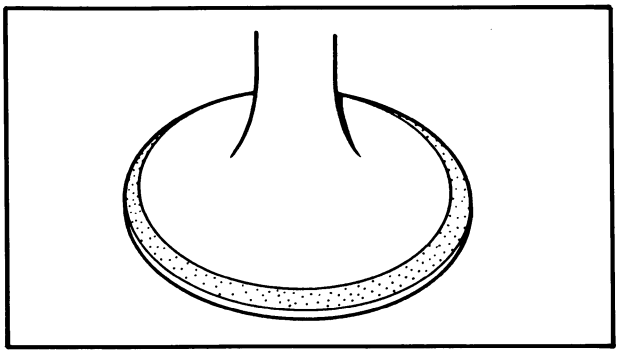
[D] Valve seat is too narrow and is located down near the bottom edge of the valve face.

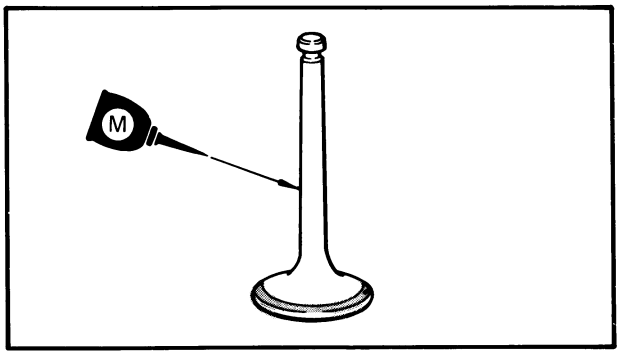
Valve seat cutter set		Desired result
Use	60° cutter, first	To center the seat and increase its width.
	45° cutter	

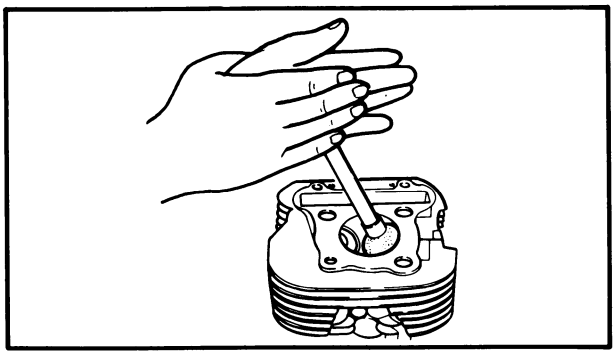
4

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.

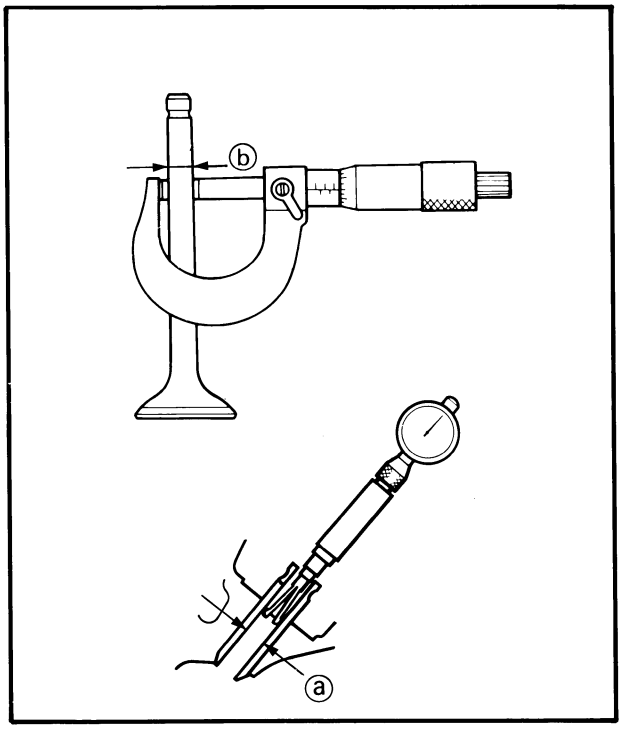
- Apply a molybdenum disulfide oil to the valve stem.
- Install the valve into the cylinder head.
- Turn the valve until the valve face and valve seat are evenly polished, then clean off all compound.

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

- Apply a 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 operaton.

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



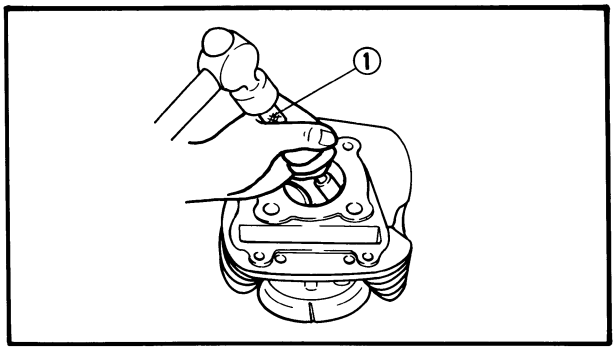
VALVE AND VALVE GUIDE

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 ~ 0.0014 in)
<Limit: 0.06 mm (0.002 in)>
Exhaust 0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
<Limit: 0.08 mm (0.003 in)>

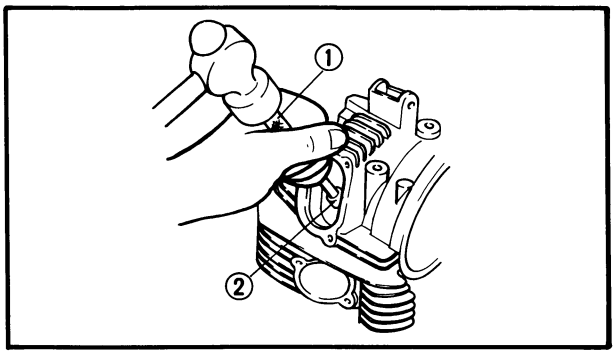


2. Replace:
   - Valve guide

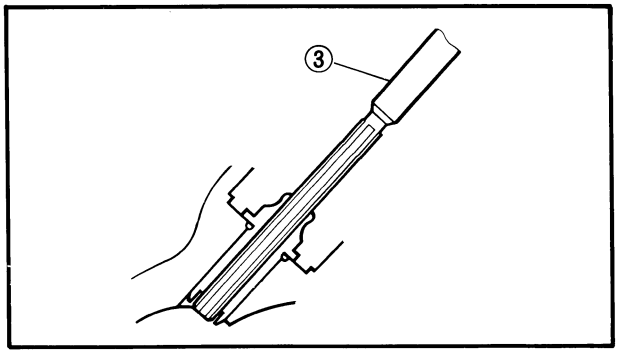
Replacement steps:

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.

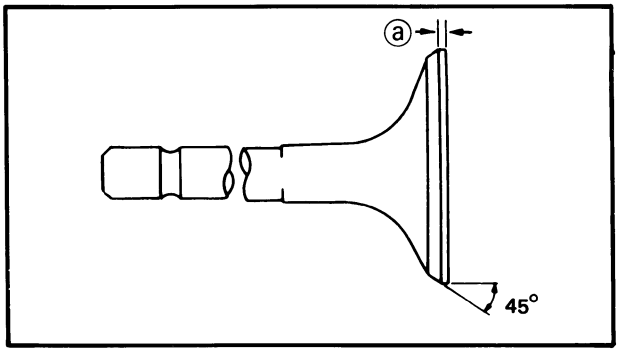


Valve guide remover:
P/N YM-04097, 90890-04097
Valve guide installer:
P/N YM-04098, 90890-04098
Valve guide reamer:
P/N YM-04099, 90890-04099



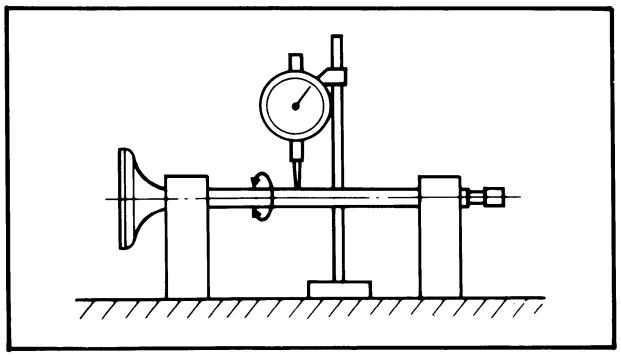
NOTE:
Reface the valve seat after replacing the valve guide.

3. Eliminate:
   - Carbon deposit (from valve face)
4. Inspect:
   - Valve face
     Pitting/Wear → Grind the face.
   - Valve stem end
     Mushroom shape or diameter larger than rest of stem → Replace.



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

Margin thickness:
Intake
0.4 ~ 0.8 mm (0.016 ~ 0.031 in)
Exhaust
0.8 ~ 1.2 mm (0.031 ~ 0.047 in)



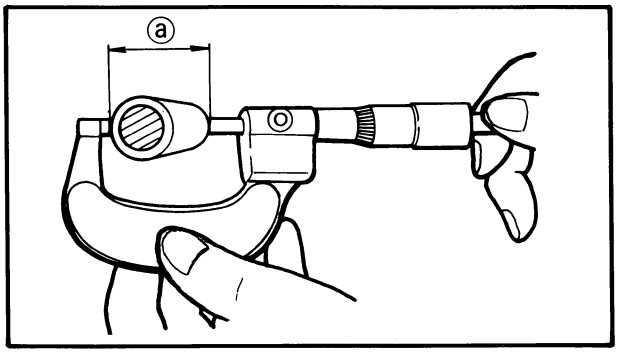
6. Measure:
   - Runout (valve stem)
     Out of specification → Replace.

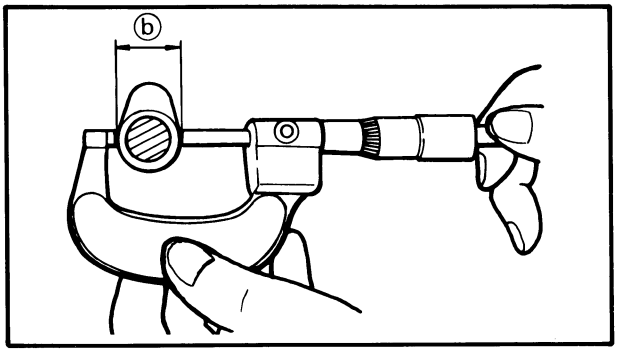
Runout:
Less than 0.01 mm (0.0004 in)

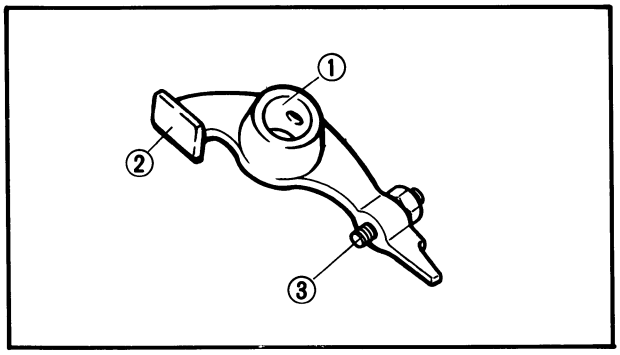
NOTE:
- Always replace the guide if the valve is replaced.
- Always replace the oil seal if the valve is removed.

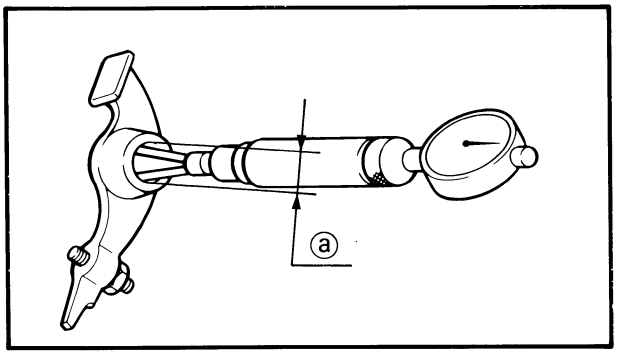
CAMSHAFT

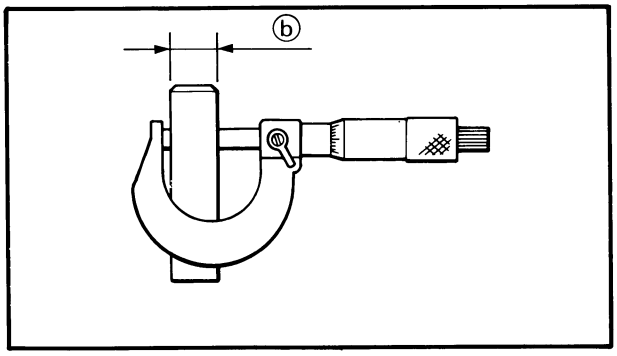
1. Inspect:
   - Cam lobes
     Pitting/Scratches/Blue discoloration → Replace.











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

Cam lobe length:
Intake
ⓐ 26.17 ~ 26.27 mm (1.030 ~ 1.034 in)
ⓑ 21.06 ~ 21.17 mm (0.829 ~ 0.833 in)
Exhaust
ⓐ 26.17 ~ 26.27 mm (1.030 ~ 1.034 in)
ⓑ 21.06 ~ 21.17 mm (0.829 ~ 0.833 in)

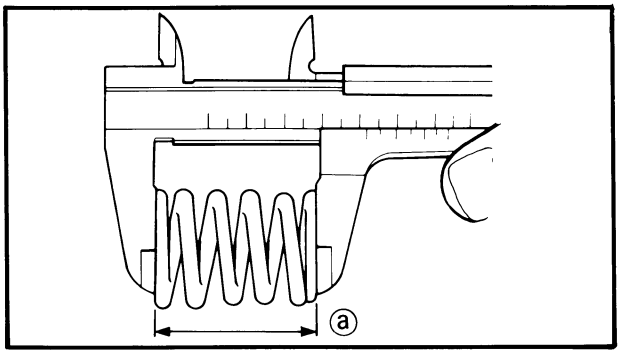
ROCKER ARM AND ROCKER ARM SHAFT

1. Inspect:
   - Rocker arm shaft
     Blue discoloration/Grooves → Replace, then inspect lubrication system.
2. Inspect:
   - Bore (rocker arm shaft) ①
   - Cam lobe contact surface ②
   - Adjuster surface ③
     Wear/Pitting/Scratches/Blue discoloration → Replace, then inspect lubrication system.

3. Measure:
   - Arm-to-shaft clearance
     Out of specification → Replace as a set.

Arm-to-shaft clearance =
Bore size (rocker arm shaft) ⓐ –
Outside diameter (rocker arm shaft) ⓑ

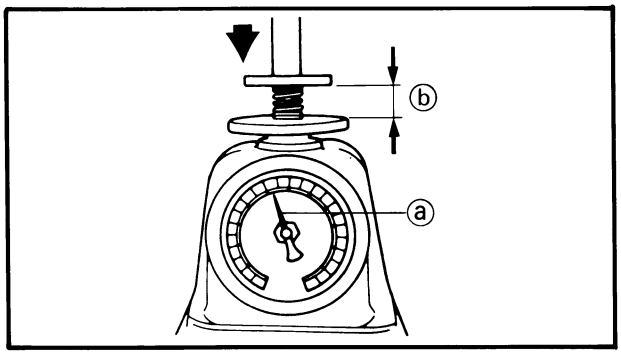
Arm-to-shaft clearance:
0.009 ~ 0.034 mm
(0.0003 ~ 0.0013 in)
< Limit: 0.10 mm (0.004 in)>



VALVE SPRING

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

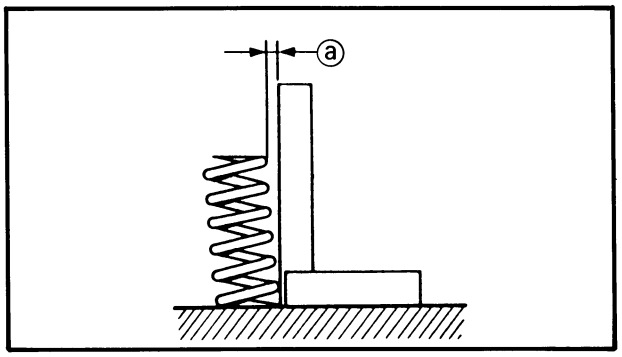
Free length (valve spring):
28.63 mm (1.127 in)



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

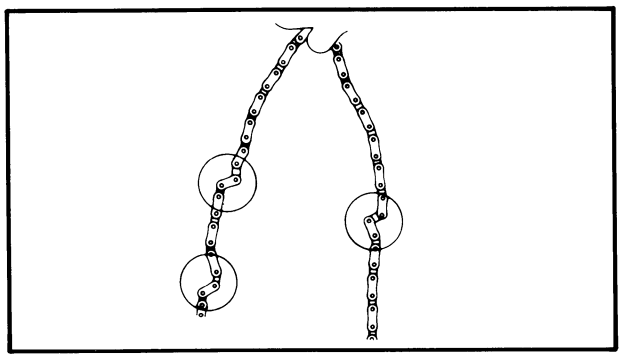
ⓑ Installed length

Compressed force (valve spring):
8.8 ~ 10.8 kg (19.4 ~ 23.8 lb)
at 24.9 mm (0.980 in)



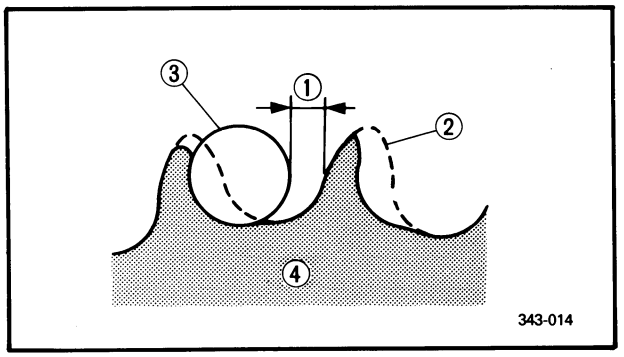
3. Measure:
   - Spring Tilt ⓐ
     Out of specification → Replace.

Spring tilt:
Less than 1.2 mm (0.047 in)



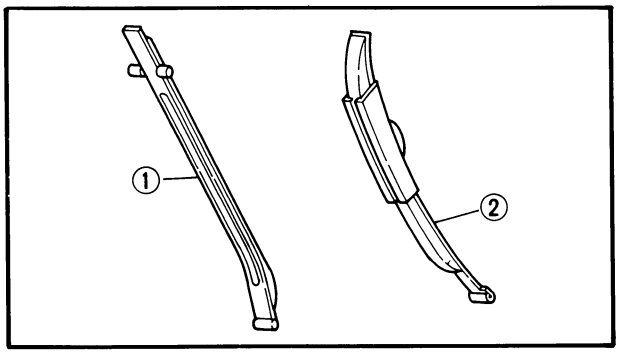
TIMING CHAIN, CHAIN GUIDE AND SPROCKET

1. Inspect:
   - Timing chain
     Stiff/Cracks → Replace timing
     Chain and sprocket as a set.



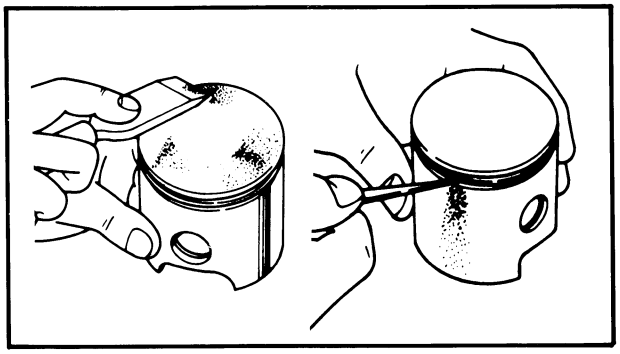
2. Inspect:
   - Sprocket
     Wear/Damage → Replace sprocket and timing chain as a set.

① 1/4 tooth
② Correct
③ Roller
④ Sprocket



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

   Wear/Damage → Replace.



CYLINDER AND PISTON

1. Eliminate:
   - Carbon deposits

   (from the piston crown and ring grooves)
2. Inspect:
   - Piston wall

   Wear/Scratches/Damage → Replace.

3. Eliminate:
   - Score marks and lacquer deposits

   From the sides of piston.

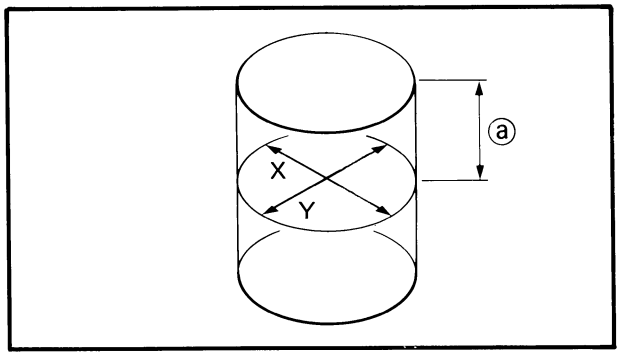
   Use a 600 ~ 800 grit wet sandpaper.

NOTE:

Sand in a crisscross pattern. Do not sand excessively.

4. Inspect:
   - Cylinder wall

   Wear/Scratches → Rebore or replace.



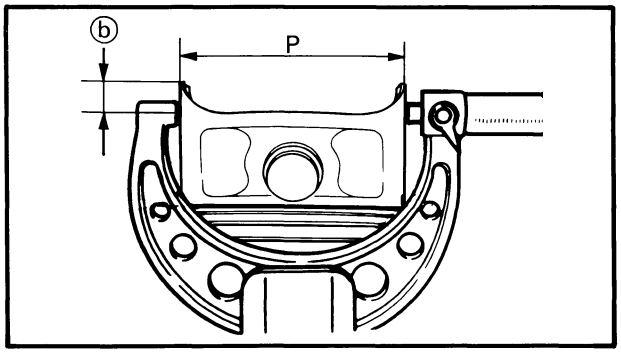
5. Measure:
   - Piston-to-cylinder clearance

Piston-to-cylinder clearance measurement steps:

First steps

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

ⓐ 45 mm (1.77 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":
49.030 ~ 49.045 mm (1.930 in)
<Limit: 49.15 mm (1.935 in)>

$$C = \frac{X + Y}{2}$$

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

2nd steps

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

ⓑ 6 mm (0.24 in) from the piston bottom edge

Piston skirt diameter "P":
48.96 ~ 49.00 mm
(1.927 ~ 1.929 in)

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

3rd steps

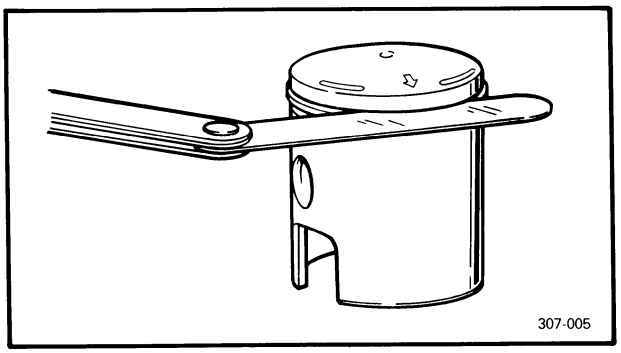
- Find the piston-to-cylinder clearance with following formula.

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

Piston-to-cylinder clearance:
0.020 ~ 0.040 mm
(0.0008 ~ 0.0016 in)
<Limit: 0.15 mm (0.006 in)>

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

4



PISTON RING

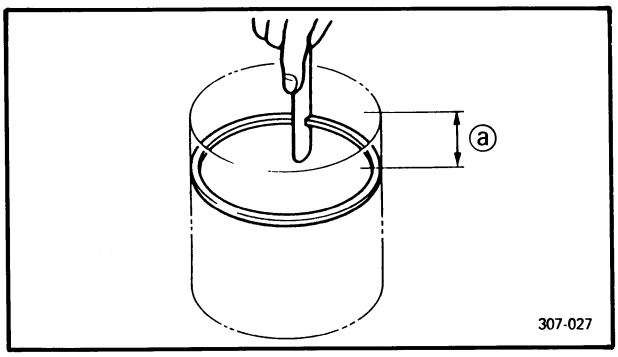
1. Measure:
   - Side clearance

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

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

Side clearance:
Top ring
0.03 ~ 0.07 mm
(0.0012 ~ 0.0027 in)
2nd ring
0.02 ~ 0.06 mm
(0.0008 ~ 0.0024 in)

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



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

ⓐ : 20 mm (0.8 in)

3. Measure:
   - End gap

   Out of specification → Replace.

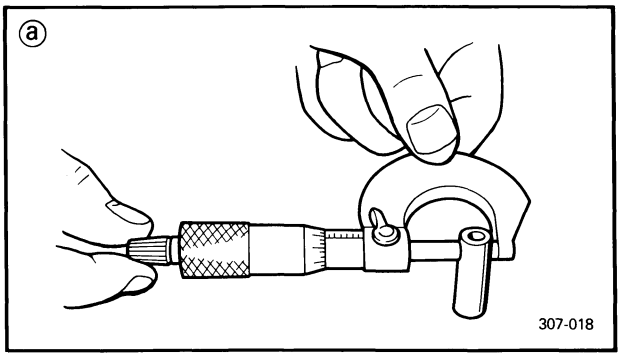
NOTE:
You cannot measure end gap on expander spacer of oil control ring. If oil control ring rails show excessive gap, replace all three rings.

End Gap:
Top ring
0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
2nd ring
0.15 ~ 0.30 mm (0.006 ~ 0.012 in)
Oil ring
0.30 ~ 0.90 mm (0.012 ~ 0.036 in)

PISTON PIN

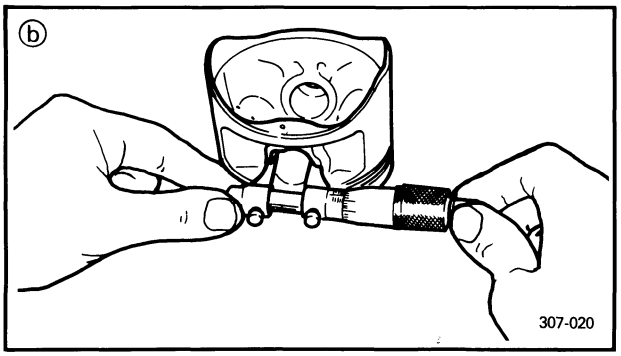
1. Inspect:
   - Piston pin

   Blue discoloration/Grooves → Replace, then inspect lubrication system.



2. Measure:
   • Outside diameter ⓐ (piston pin)
   Out of specification → Replace.

Outside diameter (piston pin):
12.996 ~ 13.000 mm (0.512 in)

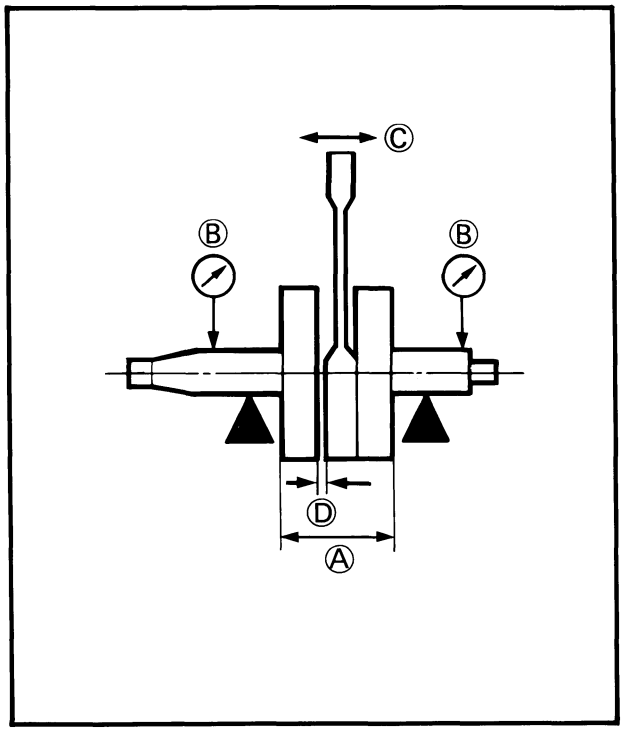


3. Measure:
   • Piston pin-to-piston clearance
   Out of specification → Replace piston.

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

Piston pin-to-piston clearance:
0.002 ~ 0.017 mm
(0.0001 ~ 0.0006 in)
<Limit: 0.07 mm (0.003 in)>

4



CRANKSHAFT AND CONNECTING ROD

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

Crank width:
44.95 ~ 45.00 mm
(1.770 ~ 1.772 in)

   • Runout Ⓑ
   Out of specification → Replace crankshaft and/or bearing.

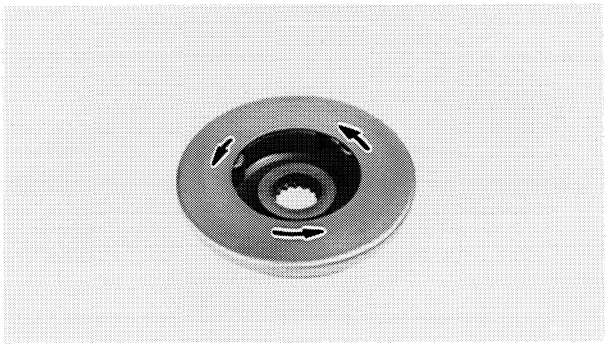
Runout:
Less than 0.03 mm (0.001 in)

- Small end free play Ⓒ
  Out of specification → Replace big end bearing, crank pin and/or connecting rod.

Samll end free play:
0.8 ~ 1.0 mm (0.031 ~ 0.039 in)

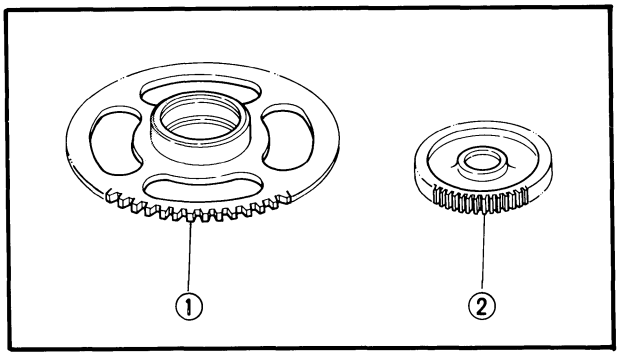
- Side clearance Ⓓ
  Out of specification → Replace connecting rod.

Big end side clearance:
0.05 ~ 0.45 mm
(0.0020 ~ 0.0177 in)

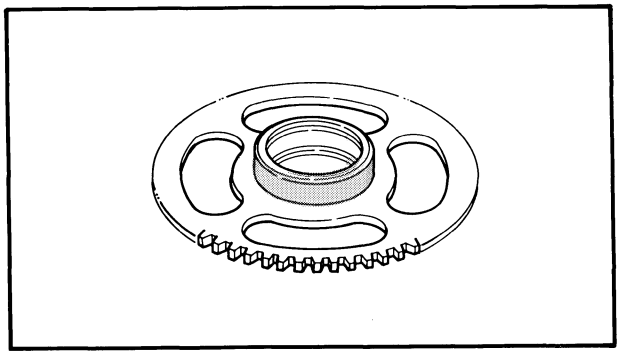


ELECTRIC STARTER DRIVES

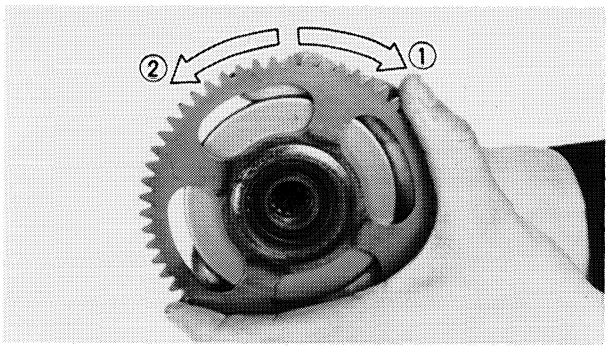
1. Inspect:
   - Starter clutch
     Push the dowel pin to arrow direction.
     Unsmooth operation → Replace starter clutch assembly.



2. Inspect:
   - Starter wheel gear teeth ①
   - Idle gear teeth ②
     Burrs/Chips/Roughness/Wear → Replace.



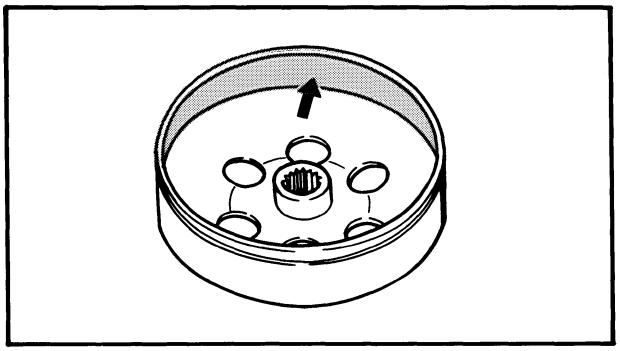
3. Inspect:
   - Contacting surfaces
     Pitting/Wear/Damage → Replace.

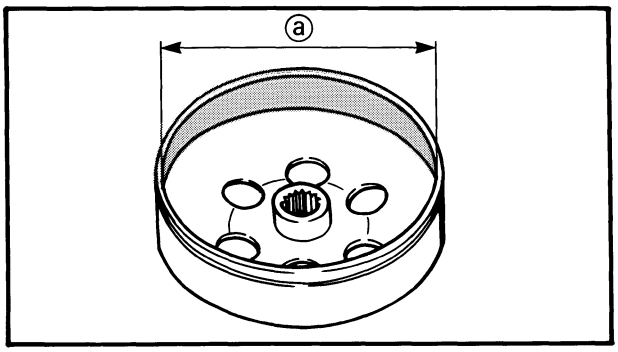


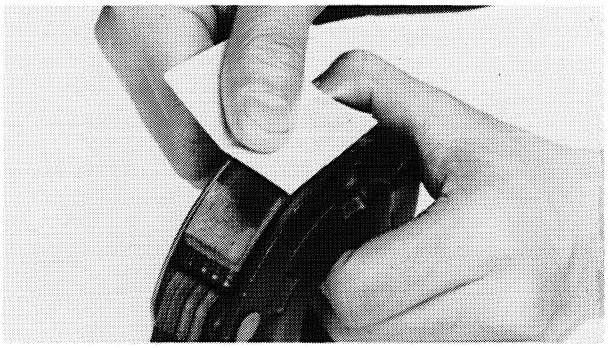
4. Check:
   • Starter clutch operation

Clutch operation checking steps:
- Install the starter wheel gear to the starter clutch, and hold the starter clutch.
- When turning the wheel gear clockwise ① the starter clutch and the wheel gear should be engaged.
  If not, the starter clutch is faulty. Replace it.
- When turning the wheel gear counterclockwise ② , the wheel gear should turn freely.
  If not, the starter clutch is faulty. Replace it.

4







CLUTCH

1. Inspect:
   • Clutch housing inner surface
   Oil/Scratches → Remove.

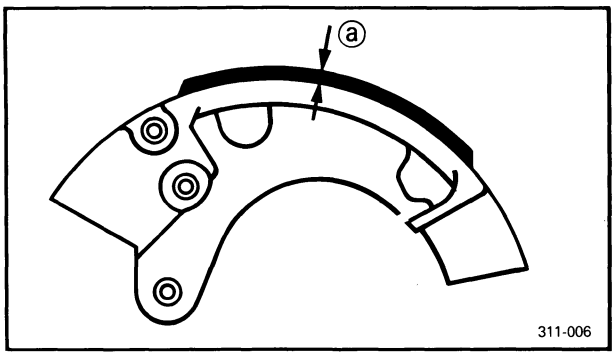
Oil	**Use a rag soaked in lacquer thinner or solvent.**
Scratches	**Use an emery clotch (lightly and evenly polishing).**

2. Measure:
   • Clutch housing inside cliameter ⓐ
   Out of specification → Replace.

Clutch housing inside diameter:
119.9 ~ 120.1 mm
(4.720 ~ 4.728 in)

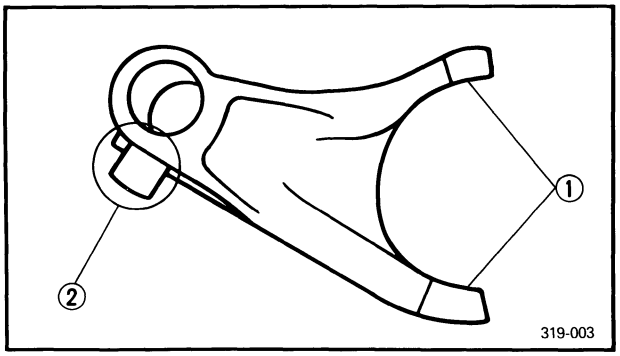
3. Inspect:
   • Clutch shoes
   Glazed parts → Sand with coarse sandpaper.

NOTE:
After using the sandpaper, clean of the polished particles with cloth.



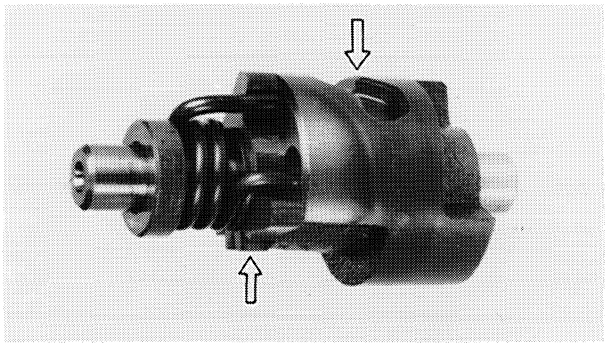
4. Measure:
   - Clutch shoe thickness ⓐ
     Out of specification → Replace.

Clutch shoe thickness:
3.5 mm (0.14 in)
< Wear limit >:
2.0 mm (0.08 in)

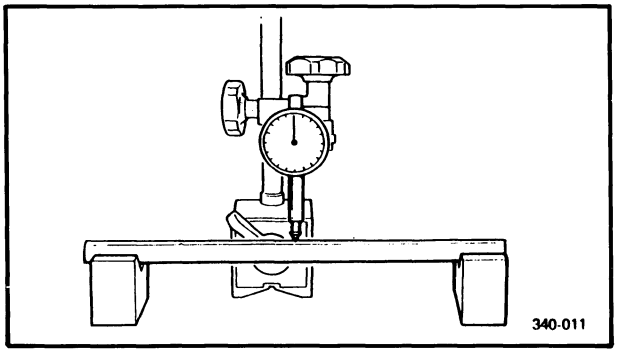


TRANSMISSION AND SHIFTER

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



2. Inspect:
   - Shift cam groove
   - Shift cam gear
     Wear/Damage → Replace.



3. Measure:
   - Runout (guide bar)
     Out of specification → Replace.

Runout:
Less than 0.03 mm (0.0012 in)

⚠ WARNING:

Do not attempt to straighten a bent guide bar.

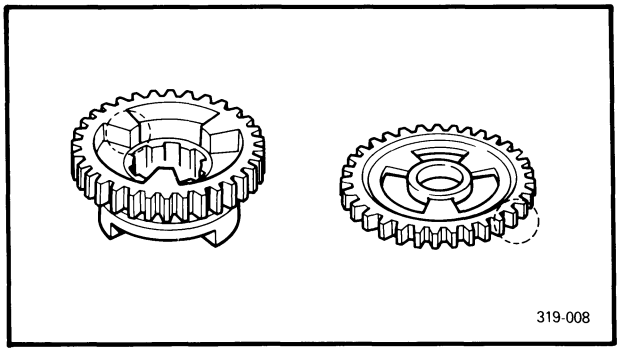
4

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

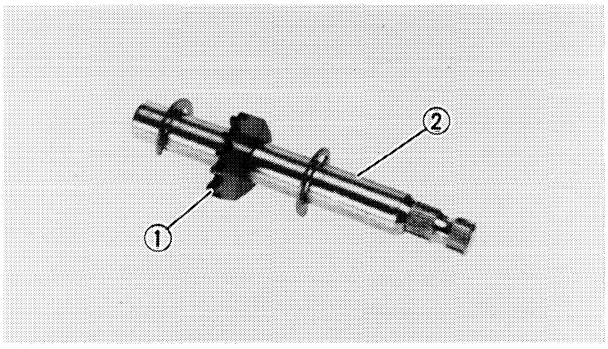
Runout:
Less than 0.08 mm (0.003 in)

⚠ WARNING:

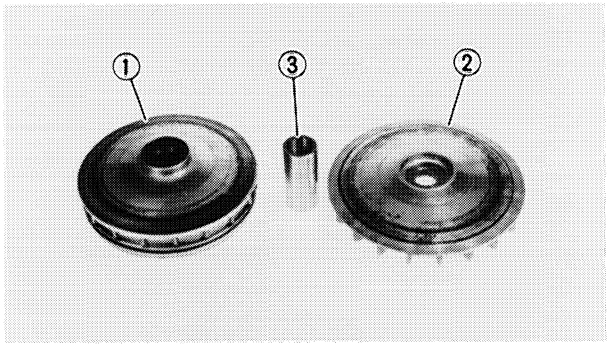
Do not attempt to straighten a bent axle.



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

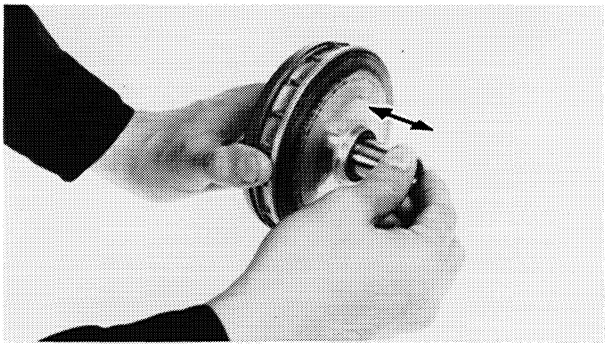


6. Inspect:
   - Gear ①
     Damage → Replace.
   - Shift shaft ②
     Damage/Bends/Wear → Replace.

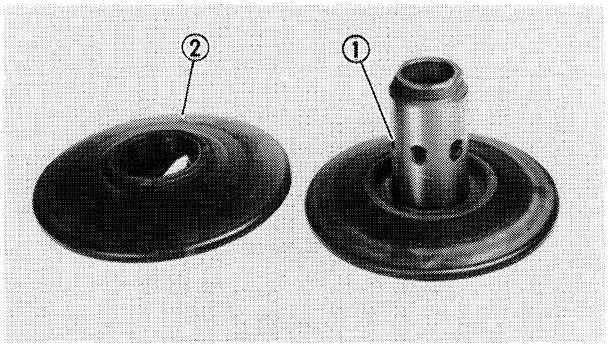


PRIMARY SHEAVE AND SECONDARY SHEAVE

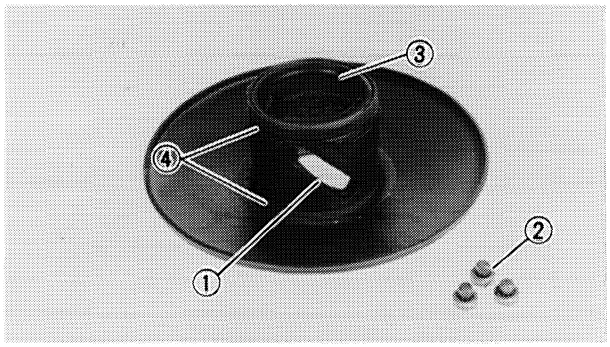
1. Inspect:
   - Primary sliding sheave ①
   - Primary fixed sheave ②
   - Collar ③
     Wear/Cracks/Scratch/Damage → Replace.



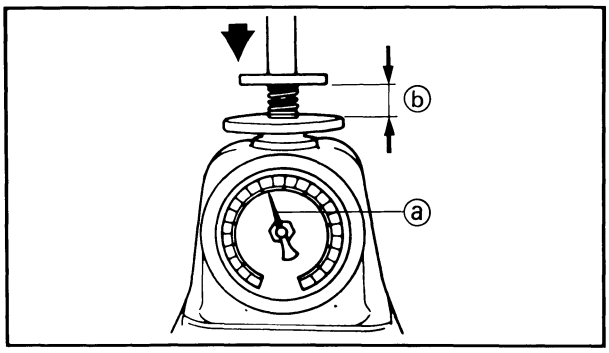
2. Check:
   - Free movement
     Insert the collar into the primary sliding sheave, and check for free movement.
     Stick or excessive play → Replace the sheave or collar.



3. Inspect:
   - Secondary fixed sheave ①
   - Secondary sliding sheave ②
     Scratch/Crack/Damage → Replace as a set.



4. Inspect:
   - Torque cam groove ①
   - Guide pin ②
     Wear/Damage → Replace as a set.
   - Oil seals ③
   - O-rings ④
     Damage → Replace.



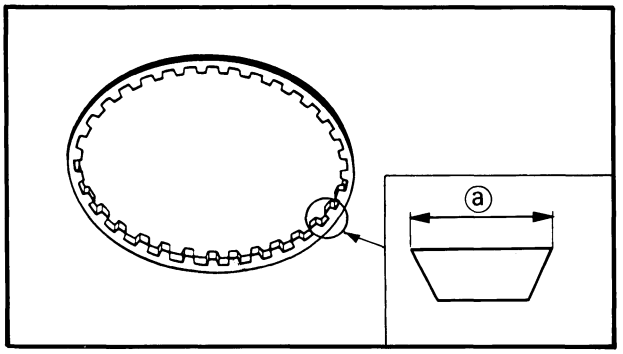
5. Measure:
   - Compressed force ⓐ (sliding sheave spring)
     Out of specification → Replace.
     ⓑ Installed length.

Compressed force:
27.2 kg at 52.1 mm
(60.016 at 2.051 in)

V-BELT

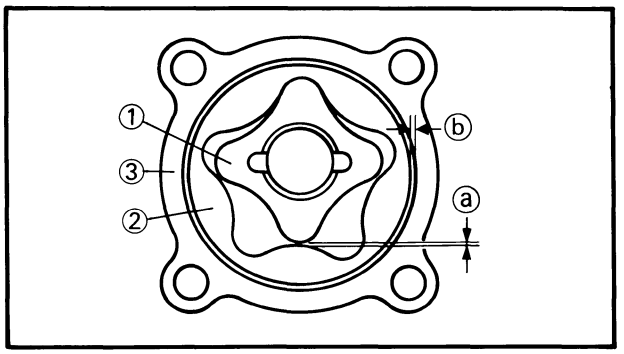
1. Inspect:
   - V-belt
     Crack/Wear → Replace.

NOTE:
Replace the V-belt smeared with a lot of oil or grease.



2. Measure:
   • V-belt width ⓐ
   Out of specification → REplace.

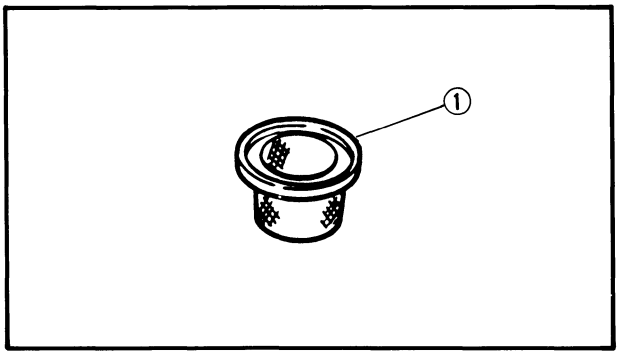
V-belt width:
20.1 mm (0.791 in)
< Wear limit >:
18.1 mm (0.712 in)



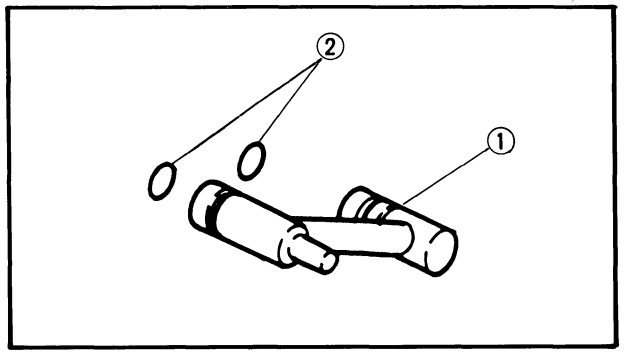
OIL PUMP AND STRAINER

1. Measure:
   • Tip clearance ⓐ
   (between inner rotor ① and outer rotor ②)
   • Side clearance ⓑ
   (between outer rotor ② and pump housing ③)
   Out of specifications → Replace oil pump.

Tip clearance:
Less than 0.15 mm (0.006 in)
Side clearance:
0.06 ~ 0.10 mm (0.002 ~ 0.004 in)



2. Inspect:
   • Oil strainer ①
   Damage → Replace.



OIL DELIVERY PIPE

1. Inspect:
   • Oil delivery pipe ①
   Cracks/Damages → Replace.
   Clog → Blow out with compressed air.
   • O-rings ②
   Damage → Replace.

CRANKCASE

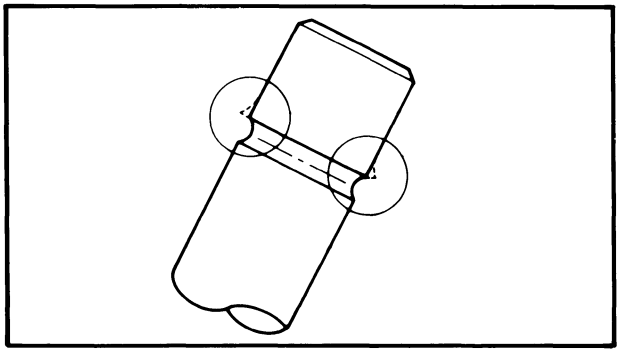
1. Thoroughly wash the case halves in mild solvent.
2. Clean all the gasket mating surfaces and crankcase mating surfaces thoroughly.
3. Inspect:
   - Crankcase
     Cracks/Damage → Replace.
   - Oil delivery passages
     Clog → Blow out with compressed air.

BEARINGS AND OIL SEALS

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

CIRCLIPS AND WASHERS

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

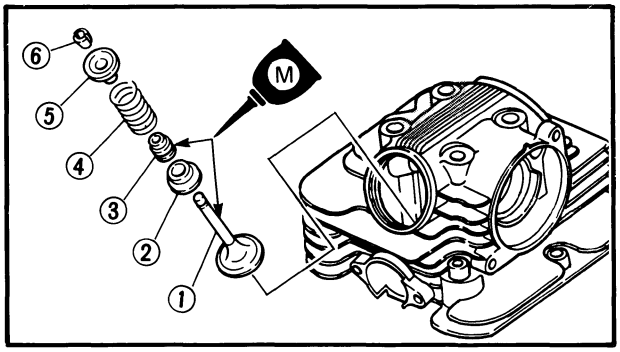


ENGINE ASSEMBLY AND ADJUSTMENT

CAMSHAFT, ROCKER ARM AND VALVE

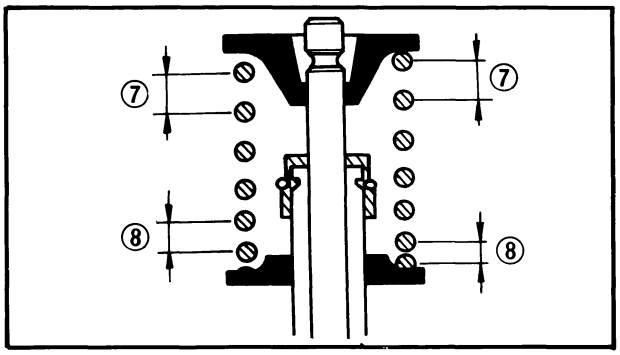
1. Deburr:
   - Valve stem end

   Use an oil stone to smooth the stem end.



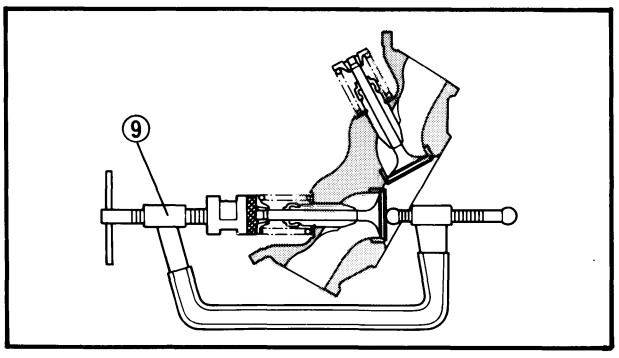
2. Apply:
   - High-Quality molybdenum disulfide motor oil

   (to the valve stem and oil seal.)
3. Install:
   - Valve ①
   - Valve spring seat ②
   - Oil seal ③
   - Valve spring ④
   - Spring retainer ⑤
   - Valve cotters ⑥



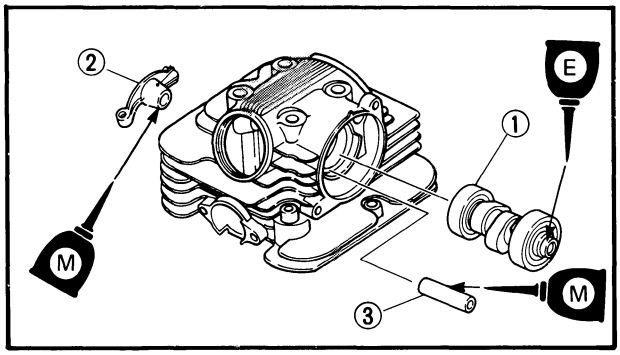
NOTE:
Install the valve spring with widergapped coils facing upwards as shown.

⑦ Lager pitch
⑧ Smaller pitch



NOTE:
Compress the valve spring with the Valve, spring compressor ⑨ and then, install the valve cotters.

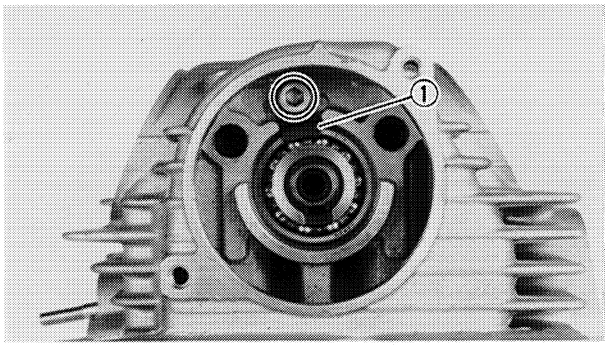
Valve spring compressor:
P/N YM-04019, 90890-04019
Adapter:
P/N YM-4108, 90890-04108



4. Apply:
   - Engine oil

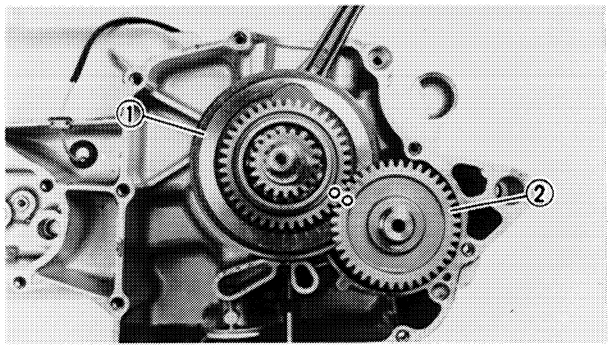
   (to the bearing of the camshaft)
   - High-Quality molybdenum disulfide motor oil

   (to the rocker arm and shaft)
5. Install:
   - Camshaft ①
   - Rocker arm ②
   - Rocker arm shaft ③



6. Install:
   - Bearing retainer ①

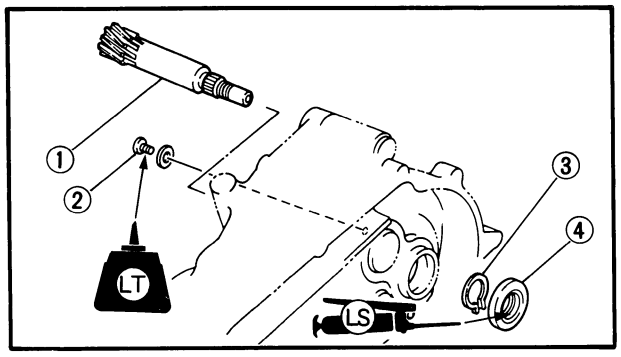
	Bolt (bearing retainer): **12 Nm (1.2 m·kg, 8.7 ft·lb)**



CRANKSHAFT AND BALANCER

1. Remove:
   - Crankshaft ①
   - Balancer ②
     (to the crankcase (left))

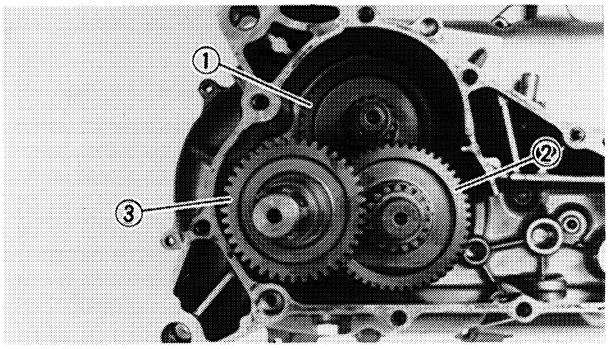
NOTE:
Align the mark on the balancer gear with the mark on the crankshaft gear.



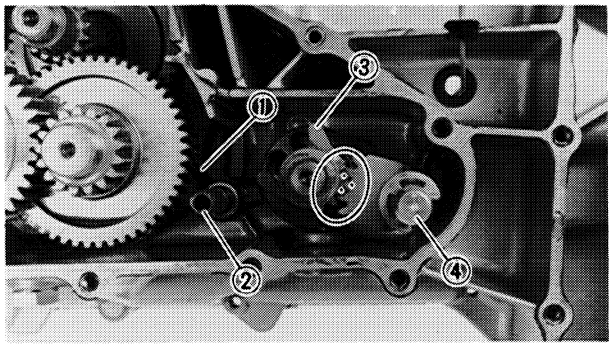
SHIFTER AND TRANSMISSION

1. Apply:
   - Lithium soap base grease
     (to the oil seal lips)
2. Install:
   - Primary drive axle ①
   - Screw ② (with washer)
   - Circlip ③
   - Oil seal

	Screw: **7 Nm (0.7 m·kg, 5.1 ft·lb)** **Apply LOCTITE®**

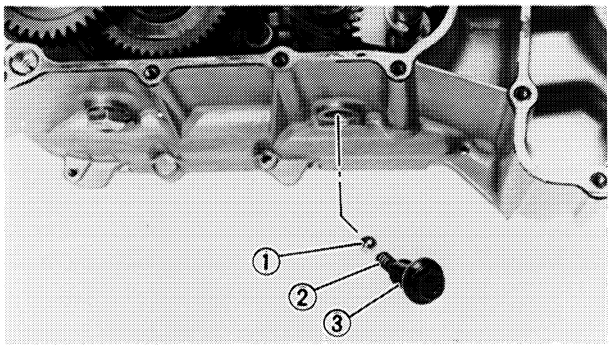


3. Install:
   - Main axle ①
   - Counter axle ②
   - Drive axle ③



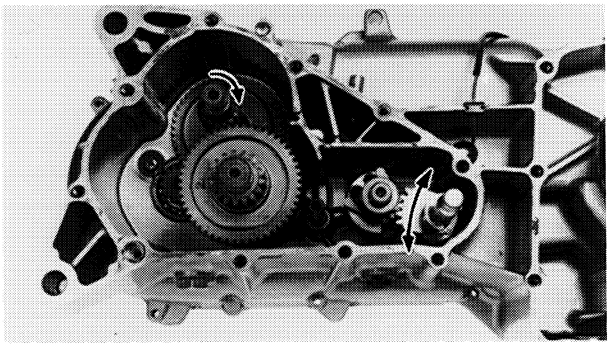
4. Install:
   - Shift fork ①
   - Guide bar ②
   - Shift cam ③
   - Shift shaft ④

NOTE:
Align the mark on the shift shaft gear with the mark on the shift shaft gear.



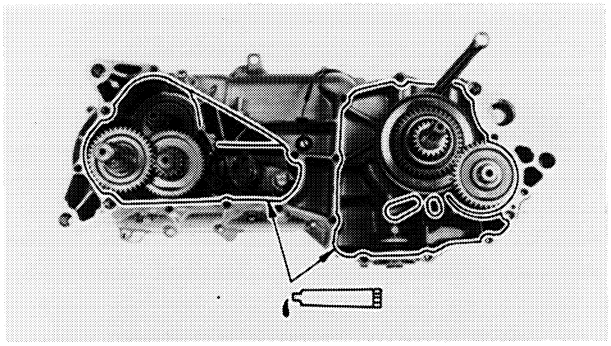
5. Apply:
   - Lighium soap base grease
     (to the shift cam stopper)
6. Install:
   - Shift cam stopper ①
   - Spring ②
   - Plug ③ (shift cam stopper)

	Plug (shift cam stopper): **10 Nm (1.0 m·kg, 7.2 ft·lb)**



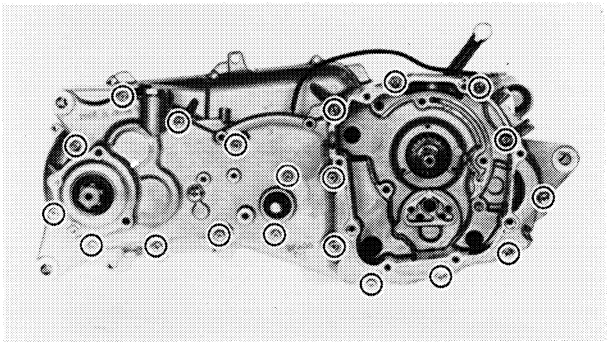
7. Check:
   - Transmission operation
     Unsmooth operation → Repair.

CRANKCASE (RIGHT)



1. Apply:
   - Gasket
     (to the mating surfaces of both case halves).

	Quick gasket®: **ACC-11001-05-01** **Yamaha bond No. 1215:** **P/N 90890-85505**



2. Install:
   - Dowel pins
   - Crankcase (right)

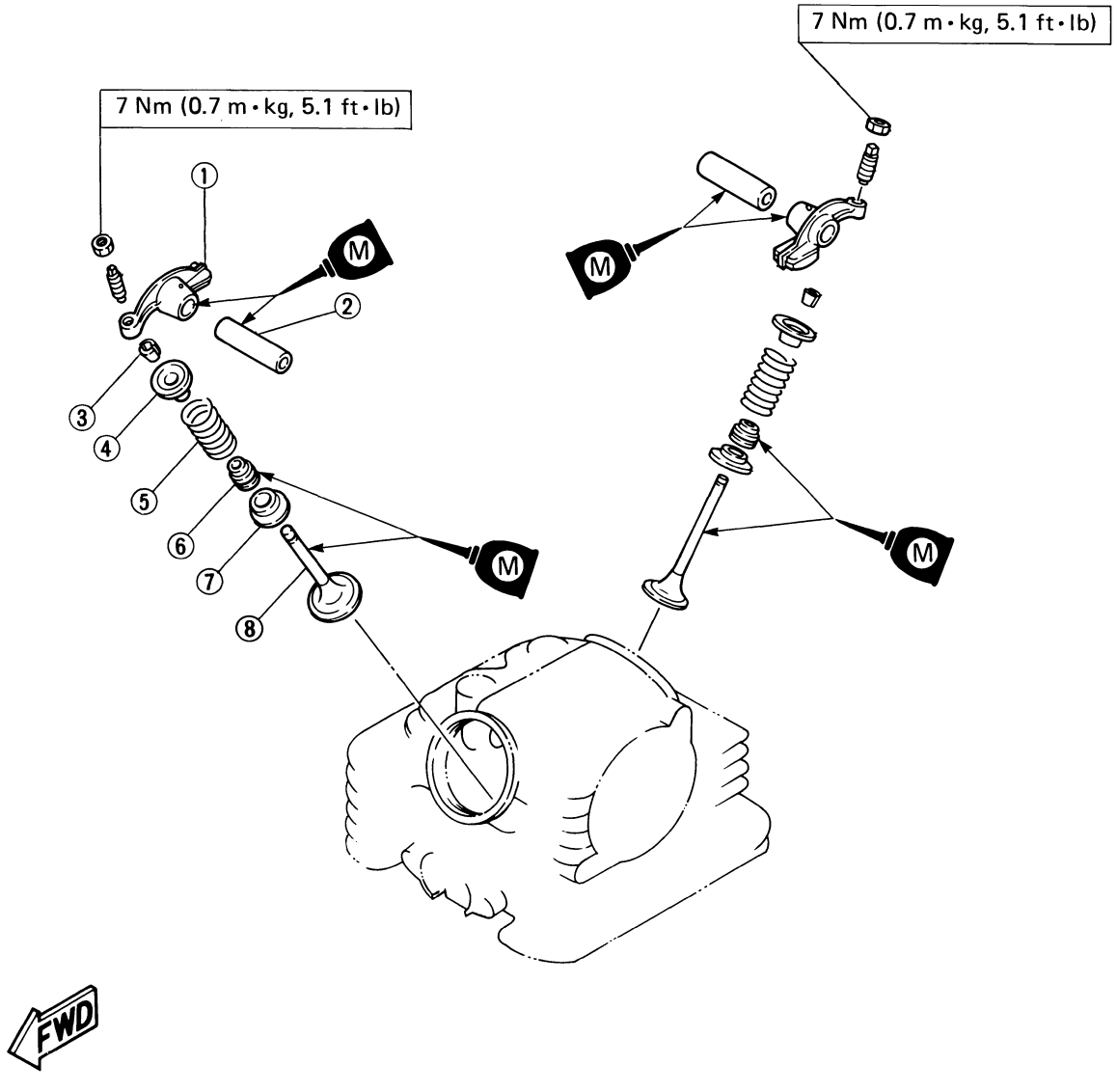
	Bolt (crankcase): **7 Nm (0.7 m·kg, 5.1 ft·lb)**

NOTE:
Tighten the bolts using crisscross pattern.

VALVE AND ROCKER ARM

① Rocker arm
② Rocker arm shaft
③ Valve cotter
④ Valve retainer
⑤ Valve spring
⑥ Oil seal
⑦ Spring seat
⑧ Valve

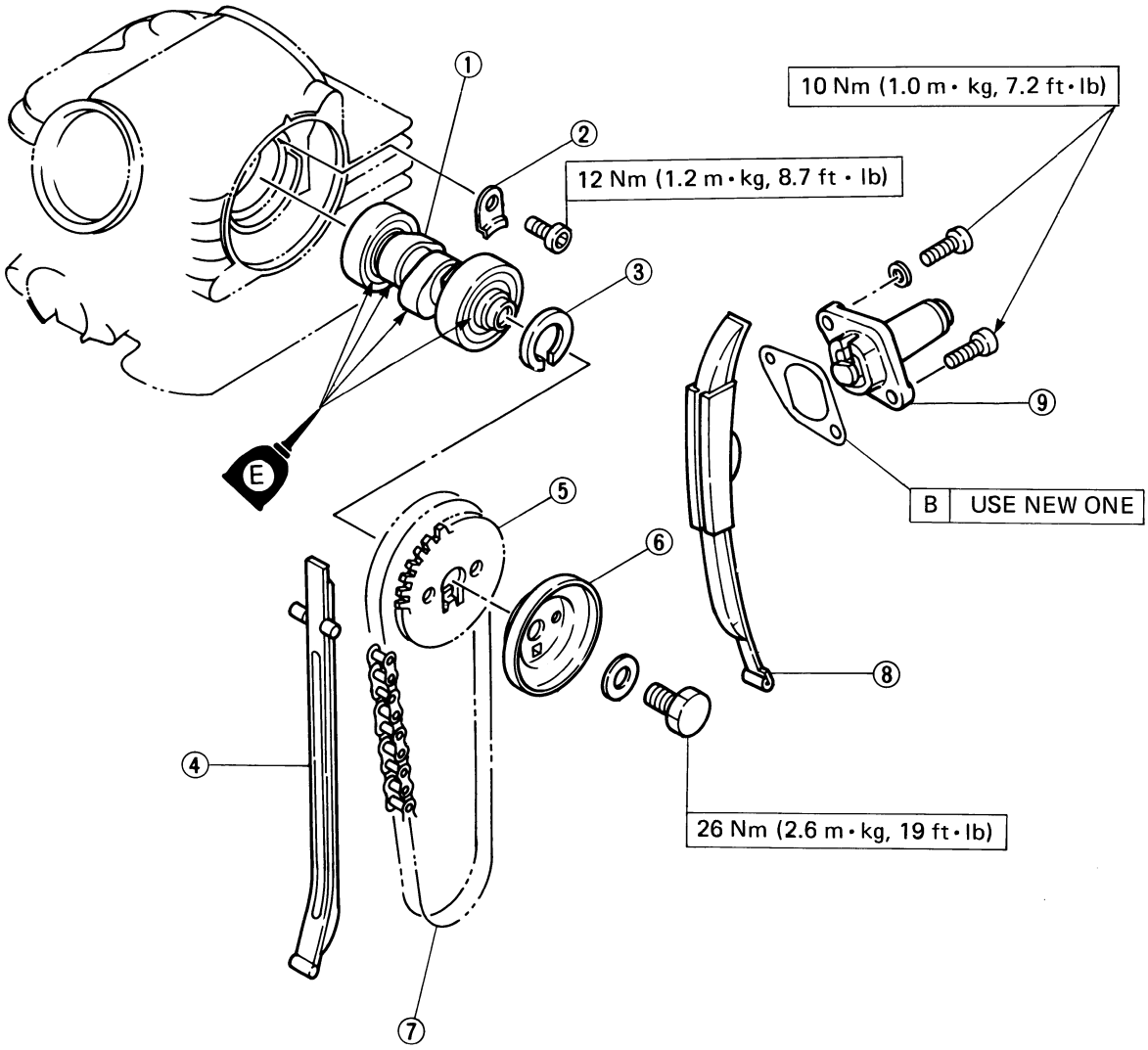
A	VALVE CLEARANCE (COLD): Intake: 0.08 ~ 0.12 mm (0.003 ~ 0.005 in) Exhaust: 0.10 ~ 0.14 mm (0.004 ~ 0.006 in)
B	VALVE SPRING TILT LIMIT: Inner spring: 2.5° or 1.2 mm (0.047 in) Outer spring: 2.5° or 1.2 mm (0.047 in)
C	STEM RUNOUT LIMIT: 0.01 mm (0.0004 in)
D	VALVE SEAT WIDTH: 0.9 ~ 1.1 mm (0.035 ~ 0.043 in)



CAMSHAFT AND TIMING CHAIN

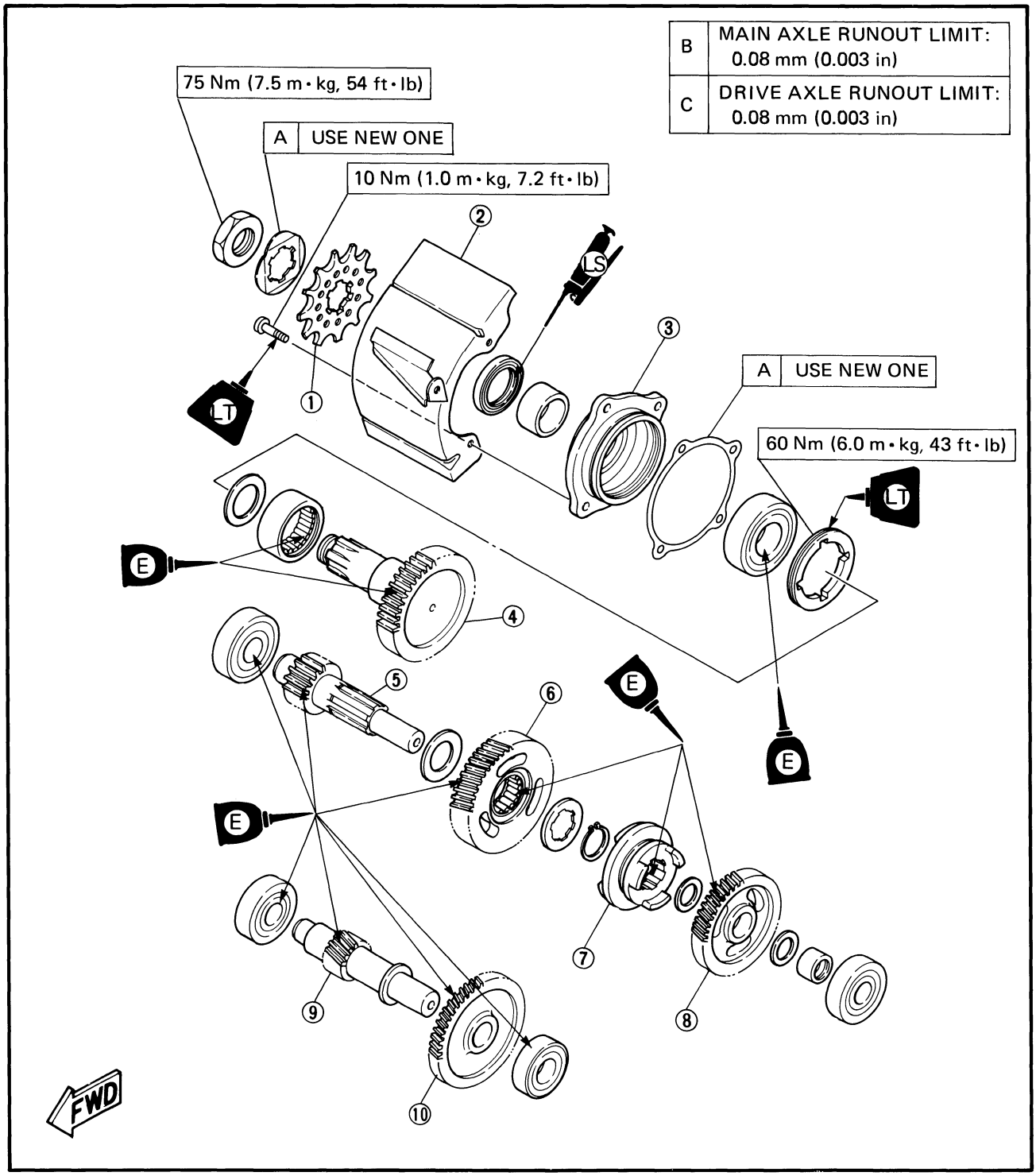
① Camshaft
② Bearing retainer
③ Collar
④ Chain guide (exhaust)
⑤ Cam sprocket
⑥ Baffle plate
⑦ Timing chain
⑧ Chain guide (intake)
⑨ Timing chain tensioner

A	CAMSHAFT RUNOUT LIMIT: 0.03 mm (0.0012 in)



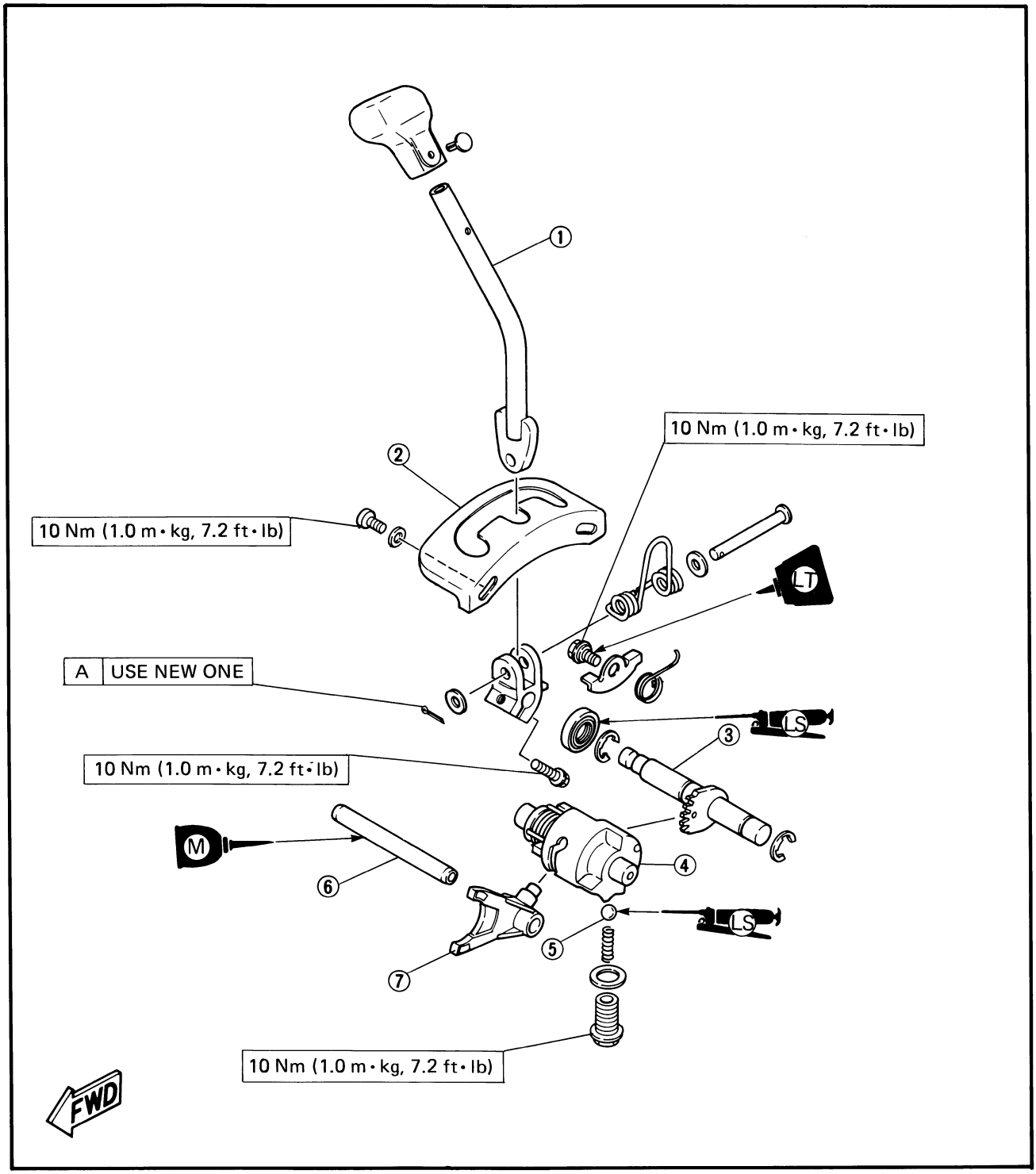
TRANSMISSION

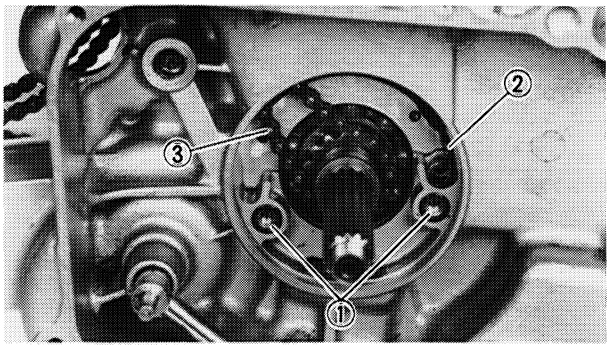
① Drive sprocket
② Chain case cover
③ Bearing housing
④ Drive axle
⑤ Main axle
⑥ Reverse wheel gear
⑦ Clutch dog
⑧ Primary driven gear
⑨ Counter axle
⑩ Reverse pinion gear



SHIFTER

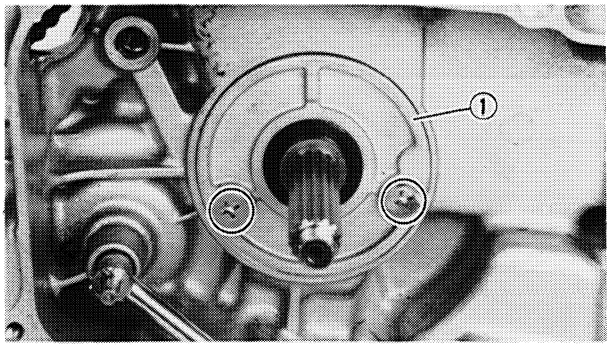
① Select lever
② Select lever guide
③ Shift shaft
④ Shift cam
⑤ Ball (Shift cam stopper)
⑥ Guide bar
⑦ Shift fork



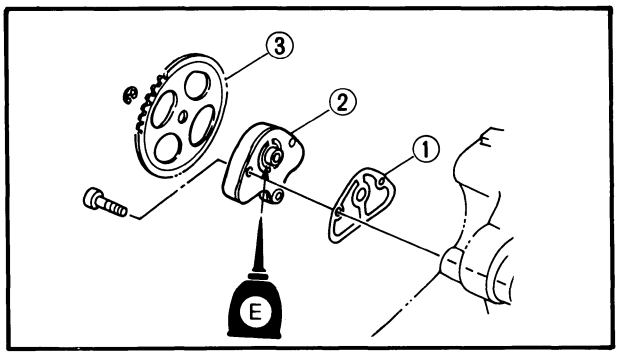


TIMING CHAIN

1. Apply:
   - Lithium soap base grease (to the o-rings)
2. Install:
   - O-rings ①
   - Chain guide ② (intake)
   - Timing chain ③



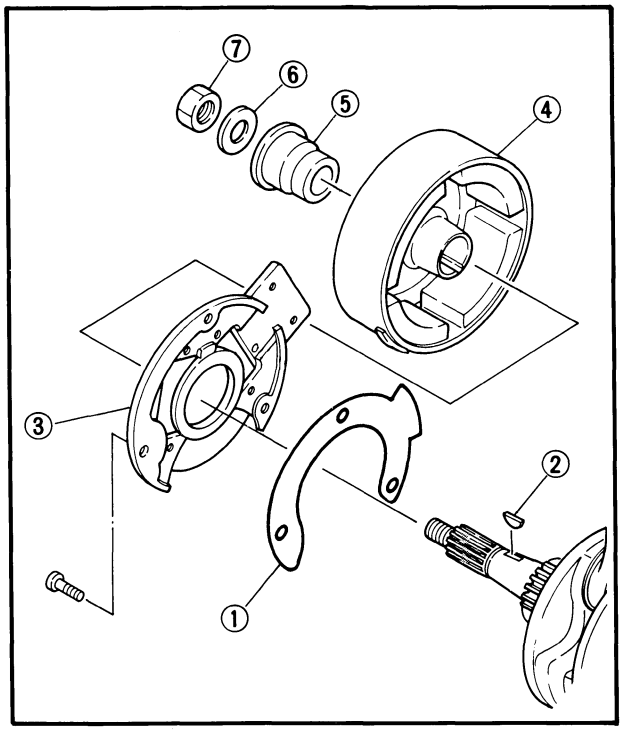
3. Install:
   - Cover ①



OIL PUMP

1. Apply:
   - Engine oil (to the oil pump)
2. Install:
   - Gasket ① (oil pump)
   - Oil pump ②
   - Oil pump gear ③

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

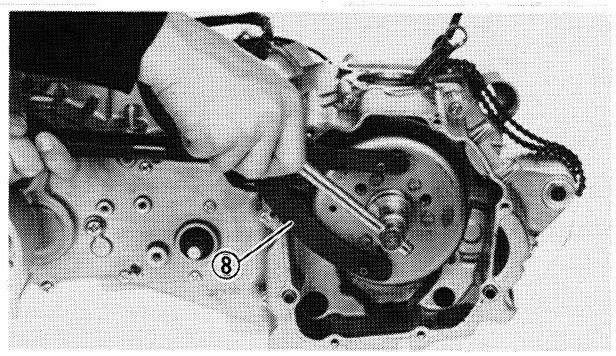


CDI MAGNETO

1. Install:
   - Gasket ①
   - Woodruff key ②
   - Stator assembly ③
   - Rotor ④ (CDI magneto)
   - Collar ⑤
   - Wahser ⑥
   - Nut ⑦ (CDI magneto)

	Bolts (startor assembly): 7 Nm (0.7 m·kg, 5.1 ft·lb) **Nut (CDI magneto): 70 Nm (7.0 m·kg, 51 ft·lb)**

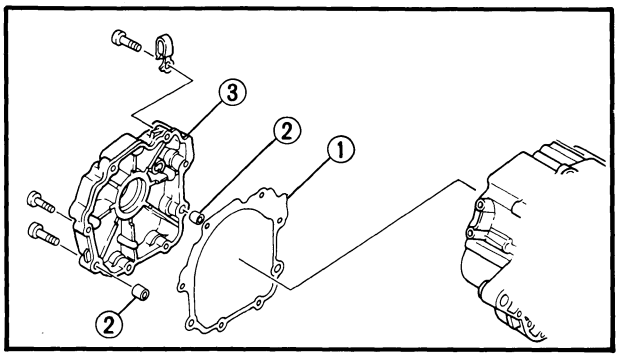
4



NOTE:

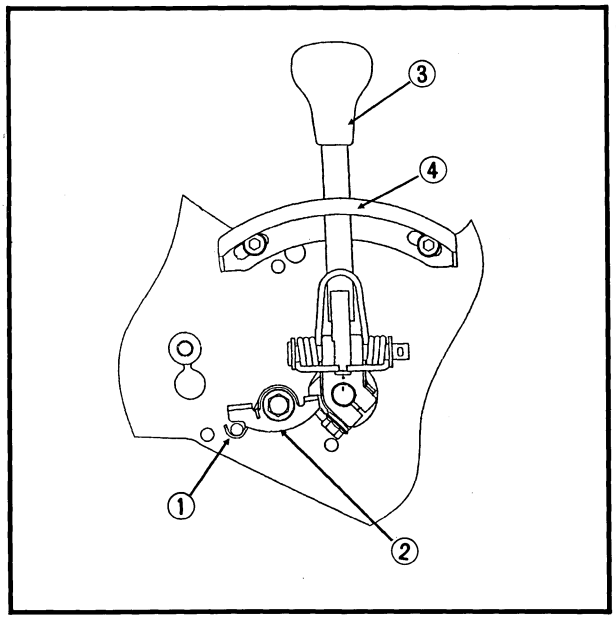
- When installing the C.D.I. rotor, make sure the woodruff key is properly seated in the keyway of the crankshaft. Apply a light coating of lithium soap base grease to the tapered portion of the crankshaft end.
- Tighten the nut (CDI rotor) while rolding the CDI rotor by the rotor holder⑧.

Rotor holder:
P/N YU-01235, 90890-01235



2. Install:
   - Gasket ①
   - Dowel pins ②
   - Crankcase cover ③

4



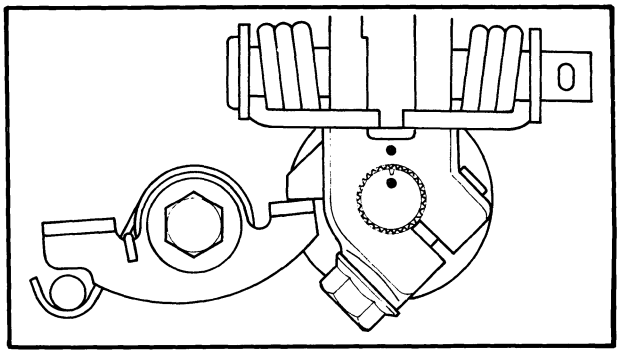
SHIFT LEVER

1. Install:
   - Torsion spring ①
   - Lever ②

Bolt (lever):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Apply LOCTITE®

2. Install:
   - Shift lever ③
   - Shift lever guide ④

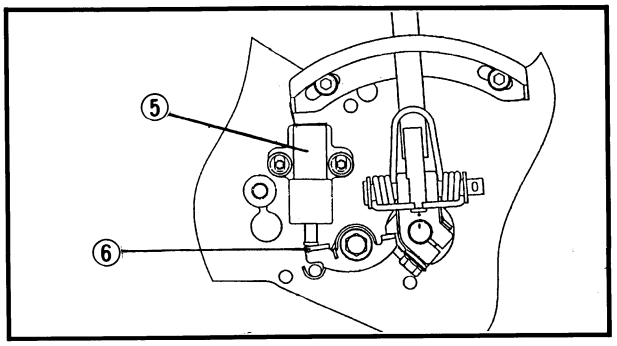
Bolt (shift lever):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolts (shift lever guide):
10 Nm (1.0 m·kg, 7.2 ft·lb)



NOTE:

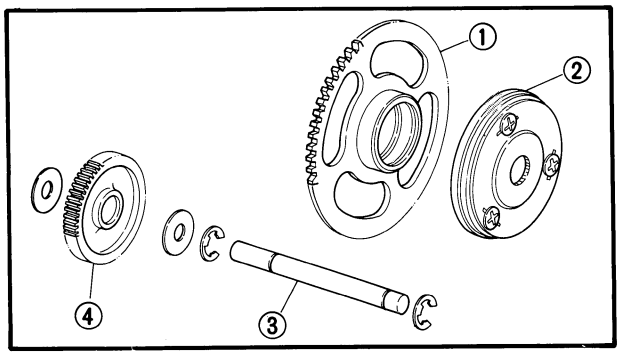
Align the mark on the shift lever with the mark on the shift shaft.

Shift the transmission into neutral and then, tighten the bolts (guide).



3. Install the shift lever switch ⑤ with its tip touching the lever ⑥.

	Screws (Shift Lever Switch): 6Nm (0.6m-kg, 4.3 ft-lb)

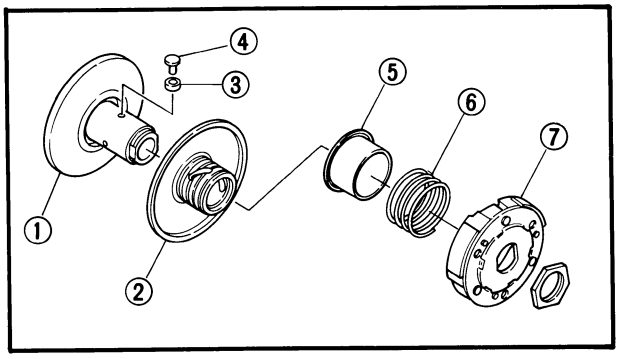


ELECTRIC STARTING DRIVE

1. Install:
   - Starter wheel gear ①
   - Starter clutch ②
   - Shaft ③ (starter idle gear)
   - Starter idle gear ④

PRIMARY SHEAVE AND SECONDARY SHEAVE

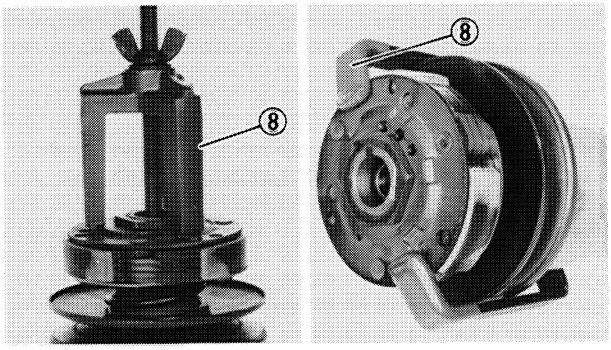
1. Apply:
   - BEL-LAY Assembly Lube®
     (to the o-rings and oil seals of the secondary sliding sheave)
   - Molybdenum disulfide grease
     (to the guide pins)



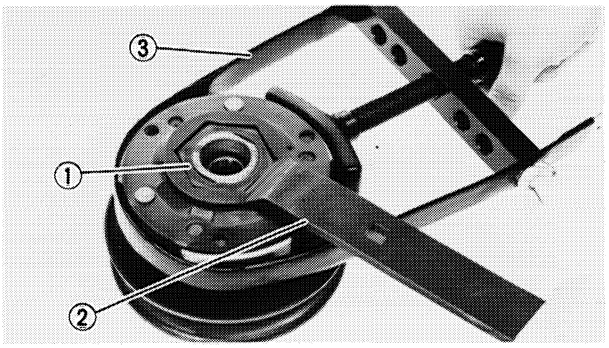
2. Install:
   - Secondary fixed sheave ①
   - Secondary sliding sheave ②
   - Collars ③
   - Guide pins ④
   - Spring seat ⑤
   - Sliding sheave spring ⑥
   - Clutch shoes ⑦

NOTE:

Before installing the nut (secondary sheave assembly), compress the sliding sheave spring with the spring holder ⑧ and then, install the nut.



	Spring holder: P/N YS-28891, 90890-01337



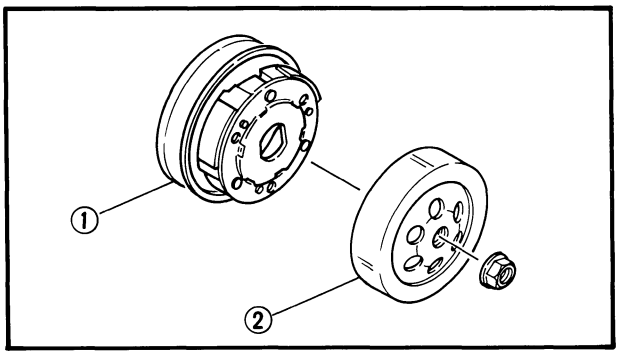
3. Tighten:
   - Nut ① (secondary sheave)

	Nut (secondary sheave): **90 Nm (9.0 m·kg, 65 ft·lb)**

NOTE:
Tighten the nut (secondary sheave) by the locknut wrench ② while holding the clutch shoes with the sheave holder ③.

	Sheave holder: **P/N YS-01880, 90890-01701** **Locknut wrench:** **P/N YM-4045-A, 90890-01348**

4

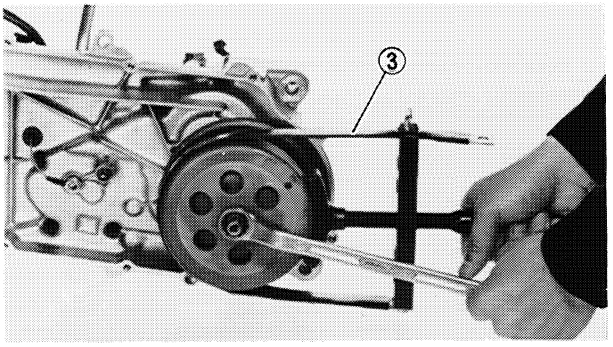


4. Install:
   - Secondary sheave assembly (with clutch shoes) ①
   - Clutch housing ②

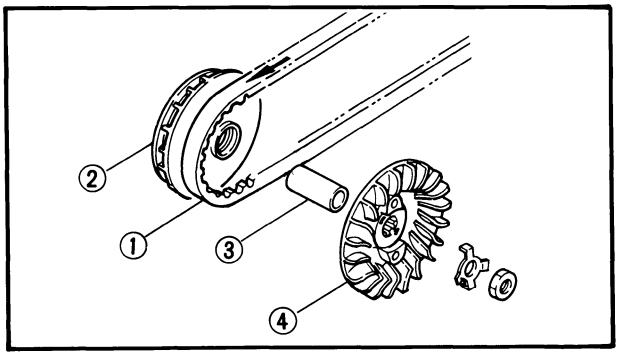
	Nut (clutch housing): **60 Nm (6.0 m·kg, 43 ft·lb)**

NOTE:
Tighten the nut (clutch housing) while holding the clutch housing with the sheave holder ③.

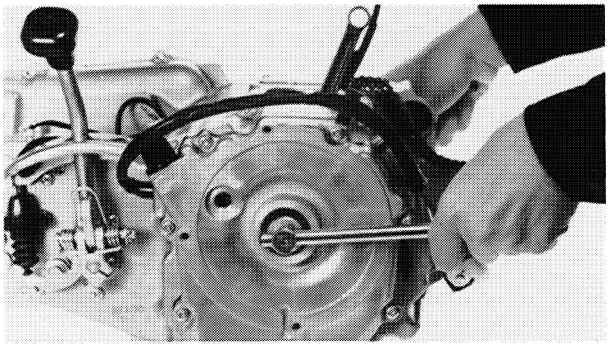
	Sheave holder: **P/N YS-01880, 90890-01701**



5. Install:
   - V-belt ①
   - Primary sliding sheave ②
   - Collar ③
   - Primary fixed sheave ④

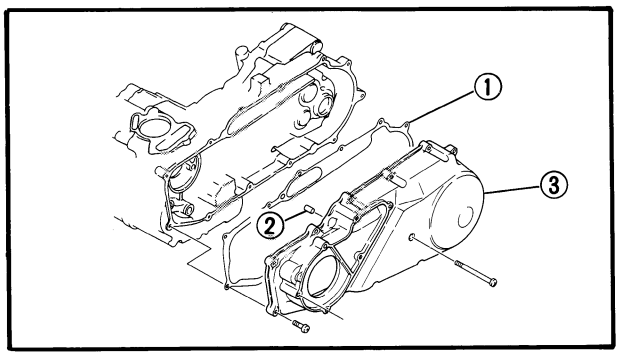


NOTE:
The V-belt should be installed with the allow mark facing the direction of travel.



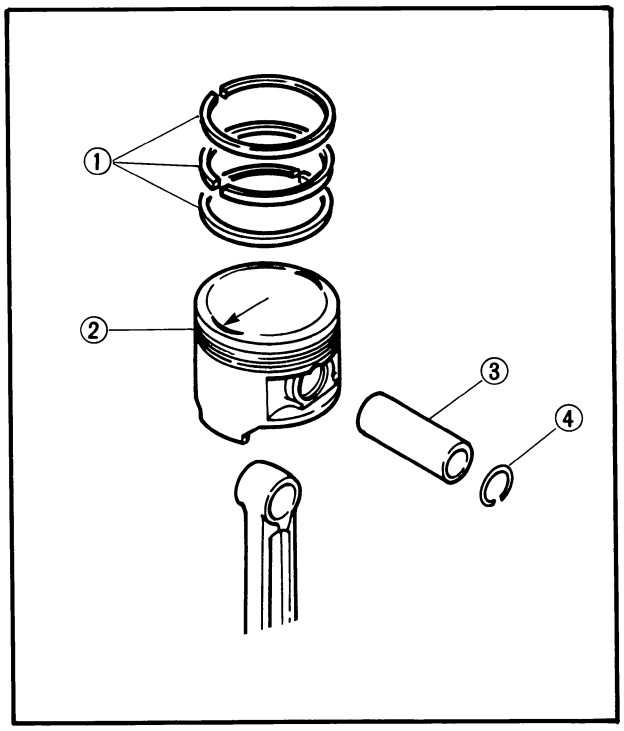
	Nut (primary sheave): **55 Nm (5.5 m·kg, 40 ft·lb)**

NOTE:
- Tighten the nut (primary sheave) while holding the nut (CDI rotor) with a wrench.
- After tightening the nut (primary sheave), bend the lock washer tab along the nut flats.



6. Install:
   - Gasket ① (crankcase cover)
   - Dowel pins ②
   - Crankcase cover ③ (left)

	Bolts (crankcase cover): **7 Nm (0.7 m·kg, 5.1 ft·lb)**



CYLINDER HEAD, CYLINDER AND PISTON

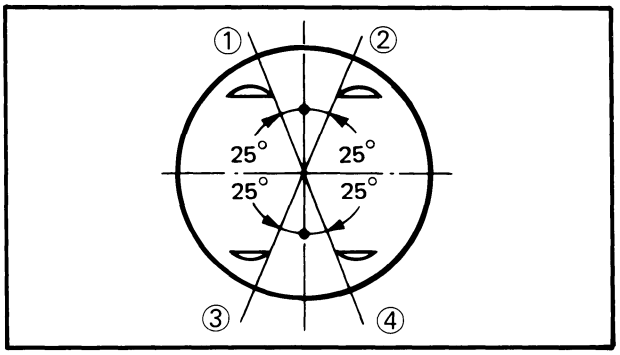
1. Apply:
   - Engine oil
     (to the piston pin and piston rings)

2. Install:
   - Piston rings ①
   - Piston ②
   - Piston pin ③
   - Piston pin clip ④

NOTE:
- The arrow 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 pin clip and material into the crankcase.

⚠ WARNING:

Always use a new piston pin clip.

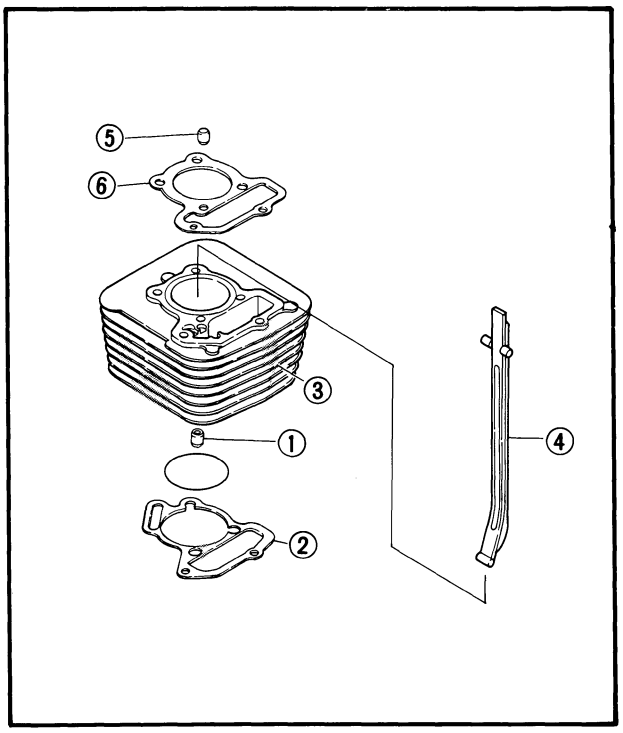


2. Offset the piston ring end gaps as shown.

NOTE:
Be sure to check the manufactuer's marks or numbers stamped on the rings are on the top side of the rings.

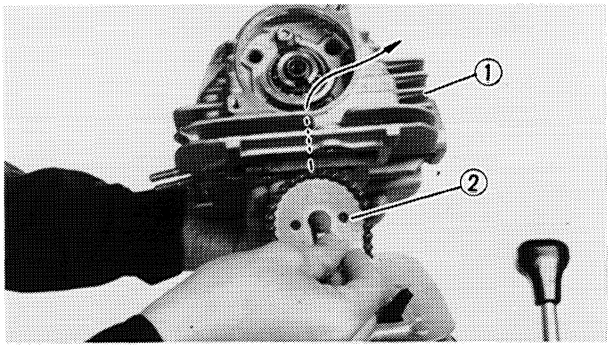
① Top ring
② Oil ring (lower rail)
③ Oil ring (upper rail)
④ 2nd ring

4



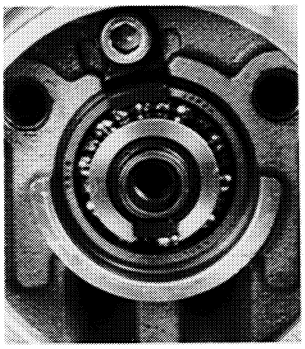
3. Install:
- Dowel pins ①
- Gasket ② (cylinder)
- Cylinder ③
- Chain guide ④ (exhaust)
- Dowel pins ⑤
- Gasket ⑥ (cylinder)

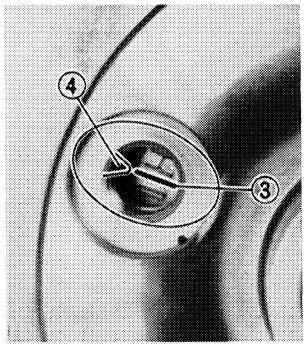
NOTE:
- Install the cylinder with one hand while compressing the piston rings with the other hand.
- Tie the timing chain with a piece of mechanics wire and feed it through the chain opening.



4. Install:
- Cylinder head ①
- Cam sprocket ②

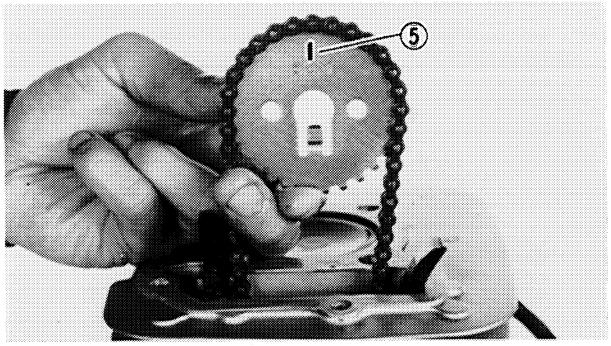
Bolts (cylinder head (M8)):
22 Nm (2.2 m·kg, 16 ft·lb)
Bolts (cylinder head (M6)):
10 Nm (1.0 m·kg, 7.2 ft·lb)

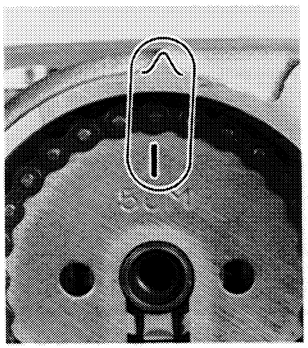


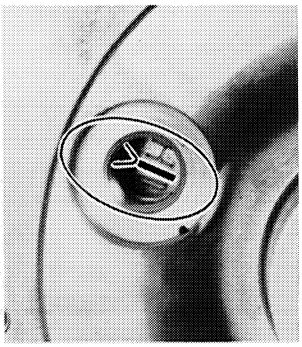


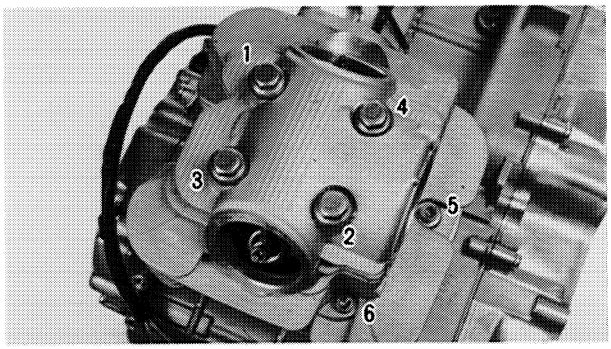
Installing steps:
- Rotate the camshaft as shown.
- Pull the timing chain up and rotate the crankshaft until the TDC mark ③ on the CDI rotor is aligned with the stationary pointer ④.
- Install the cam sprocket to the timing chain with the mark ⑤ on the cam sprocket at twelve o'clock position.
- Pass the timing chain with cam sprocket through the cylinder head.
- Install the cam sprocket onto the camshaft.

NOTE:
When the mark on the cam sprocket is aligned with the mark on the cylinder head, the TDC mark on the CDI rotor should be aligned with the stationary pointer.

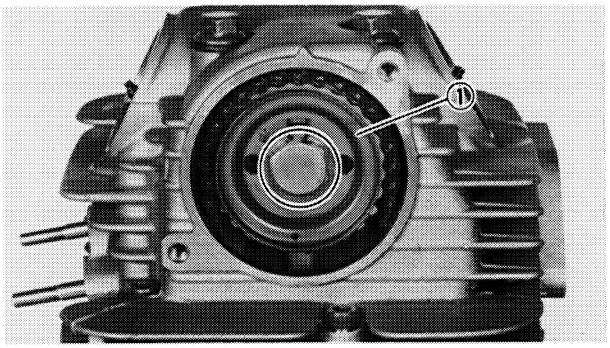








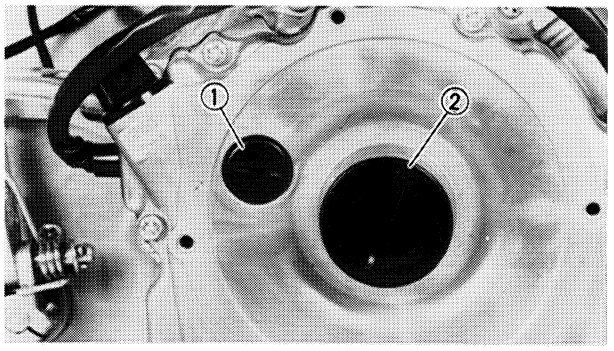
NOTE:
The numbers in the photo designate the cylinder head tightening sequence.



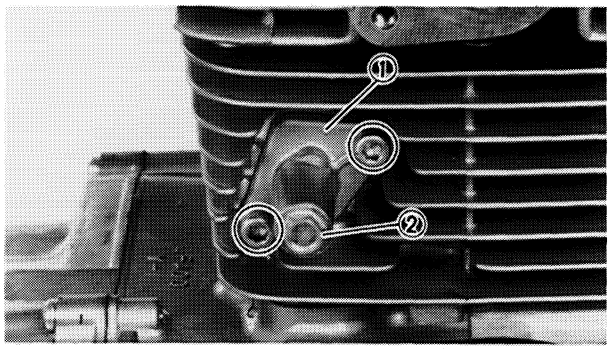
5. Install:
   - Baffle plate ①

	Bolt (baffle plate): **26 Nm (2.6 m·kg, 19 ft·lb)**

NOTE:
Tighten the bolt (baffle plate) while holding the nut (CDI rotor) with a wrench.

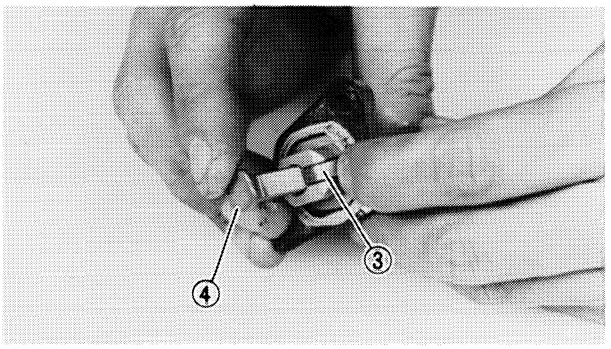


6. Install:
   - Plug ①
   - Plug ②



7. Install:
   - Timing chain tensioner ①
   - Plug 2 (timing chain tensioner)

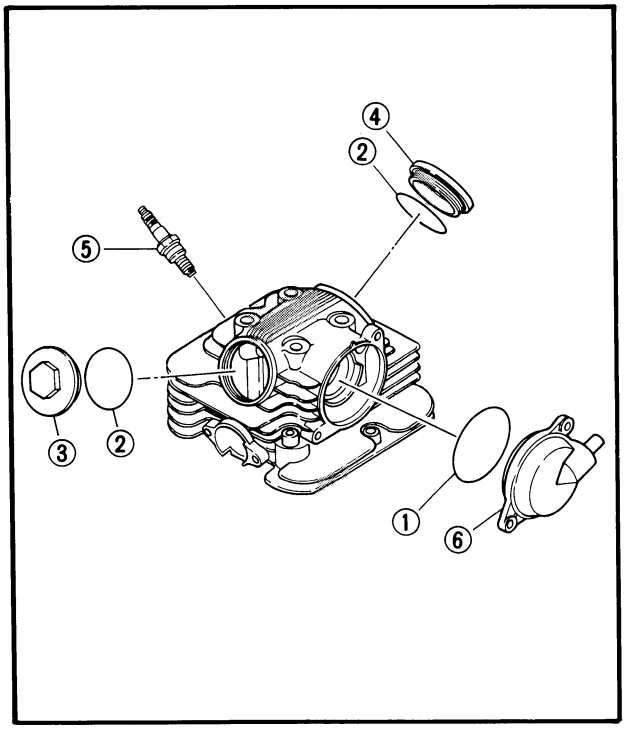
Bolts (timing chain tensioner):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Plug (timing chain tensioner):
7 Nm (0.7 m·kg, 5.1 ft·lb)



NOTE:
Before installing the chain tensioner, unhook the ratched ③ and push the rod ④ into the body.

8. Adjust:
   - Valve clearance
     Refer to the "VALVE CLEARANCE ADJUSTMENT" section in the CHAPTER 3.

Valve clearance (cold):
Intake 0.08 ~ 0.12 mm (0.003 ~ 0.005 in)
Exhaust 0.10 ~ 0.14 mm (0.004 ~ 0.006 in)

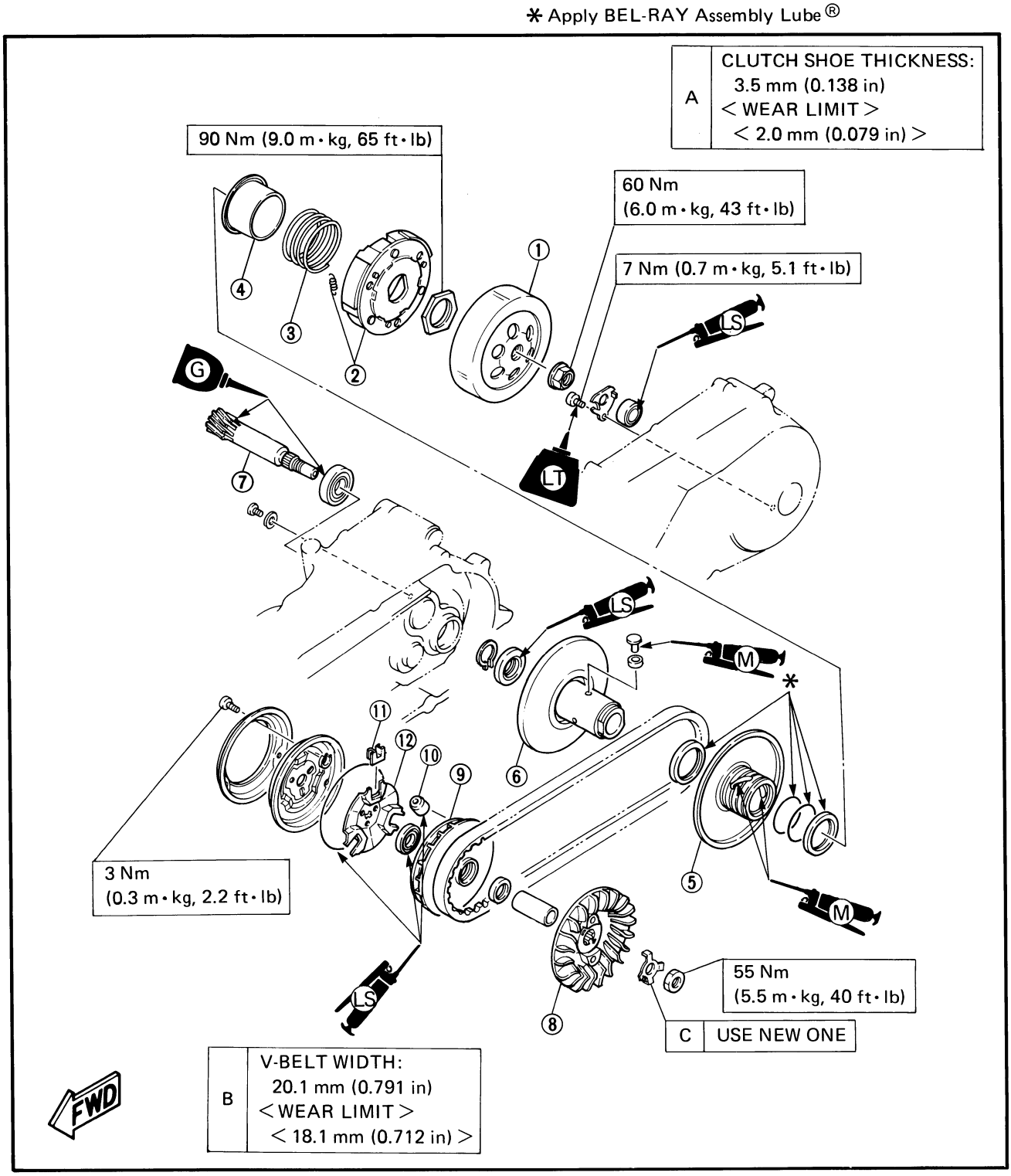


9. Apply:
   - Lithium soap base greace (to the o-rings)
10. Install:
    - O-ring ① (cylinder head cover)
    - O-rings ② (tappet covers)
    - Tappet cover ③ (exhaust)
    - Tappet cover ④ (intake)
    - Spark plug ⑤
    - Cylinder head cover ⑥

Spark plug:
13 Nm (1.3 m·kg, 9.4 ft·lb)
Bolts (cylinder head cover):
7 Nm (0.7 m·kg, 5.1 ft·lb)

PRIMARY SHEAVE AND SECONDARY SHEAVE

① Clutch housing
② Clutch assembly
③ Sliding sheave spring
④ Spring seat
⑤ Secondary sliding sheave
⑥ Secondary fixed sheave
⑦ Primary drive axle
⑧ Primary fixed sheave
⑨ Primary sliding sheave
⑩ Weight
⑪ Slider
⑫ Cam

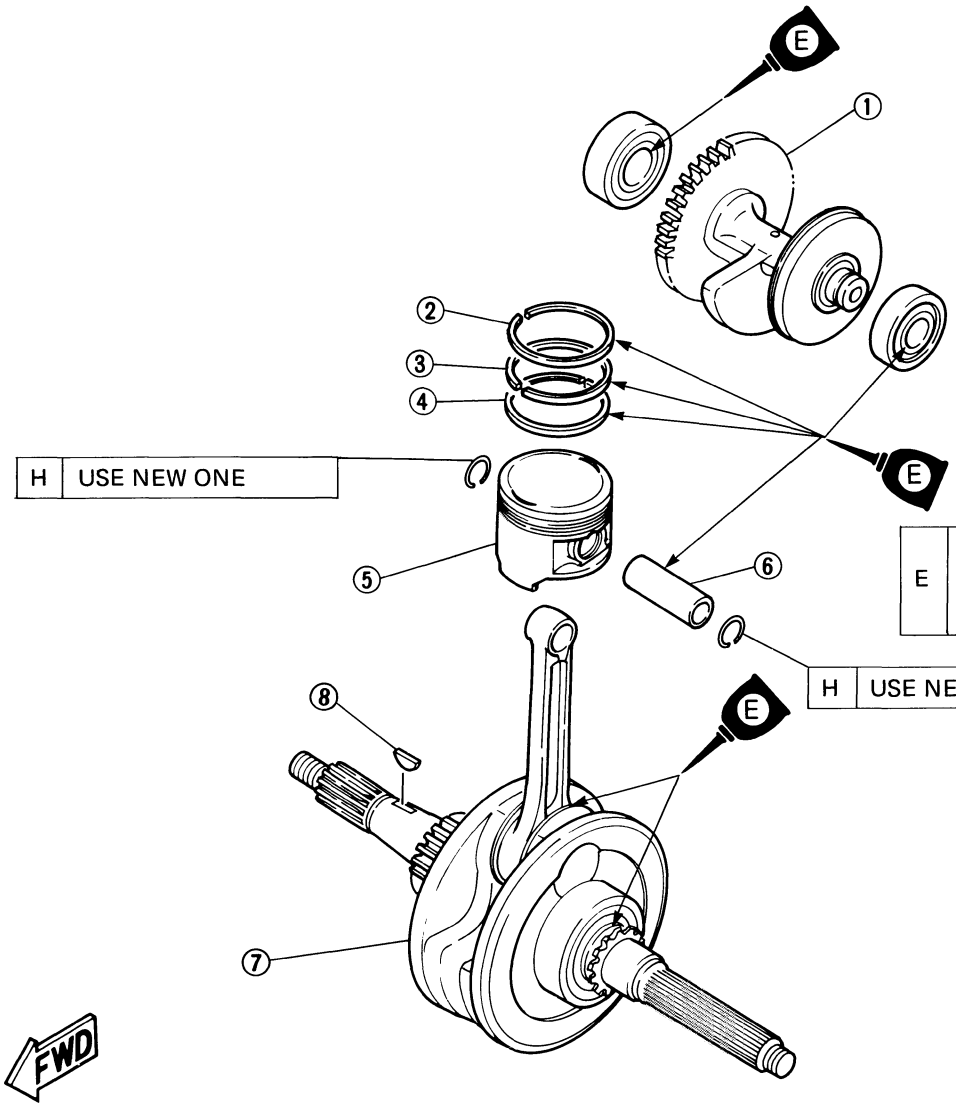


CRANKSHAFT,PISTON AND BALANCER

① Balancer assembly
② Top ring
③ Second ring
④ Oil ring
⑤ Piston
⑥ Piston pin
⑦ Crankshaft assembly
⑧ Woodruff key

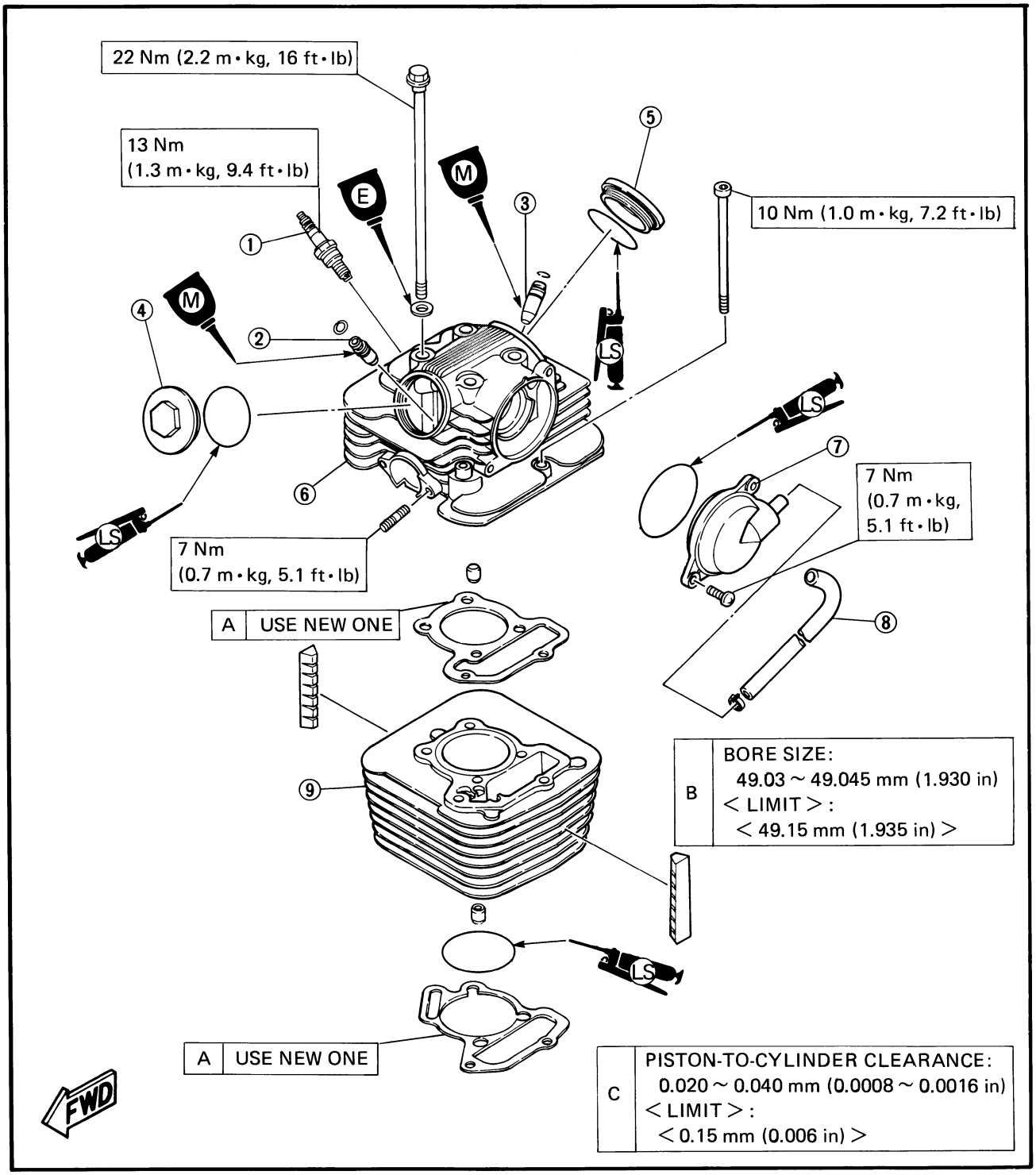
A	CRANK WIDTH: 44.95 ~ 45.00 mm (1.770 ~ 1.772 in)
B	RUNOUT LIMIT: 0.03 mm (0.0012 in)
C	SMALL END FREE PLAY: 0.8 ~ 1.0 mm (0.031 ~ 0.039 in)
D	BIG END SIDE CLEARANCE: 0.05 ~ 0.45 mm (0.0020 ~ 0.0177 in)

F	PISTON RING END GAP: Top: 0.15 ~ 0.30 mm (0.006 ~ 0.012 in) 2nd: 0.15 ~ 0.30 mm (0.006 ~ 0.012 in) Oil: 0.30 ~ 0.90 mm (0.012 ~ 0.036 in)
G	PISTON RING SIDE CLEARANCE: Top: 0.03 ~ 0.07 mm (0.0012 ~ 0.0027 in) 2nd: 0.02 ~ 0.07 mm (0.0008 ~ 0.0024 in)



CYLINDER AND CYLINDER HEAD

① Spark plug
② Valve stem (exhaust)
③ Valve stem (intake)
④ Tappet cover (exhaust)
⑤ Tappet cover (intake)
⑥ Cylinder head
⑦ Cylinder head cover
⑧ Breather hose (crankcase)
⑨ Cylinder



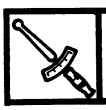
REMOUNTING ENGINE

When remounting the engine, reverse the "ENGINE REMOVAL" procedure.
Note the following points.

1. Install:
   - Engine assembly

Bolts (engine stay):
33 Nm (3.3 m·kg, 24 ft·lb)
Nuts:
42 Nm (4.2 m·kg, 30 ft·lb)

2. Install:
   - Drive sprocket
   - Drive chain



Nut (drive sprocket):
75 Nm (7.5 m·kg, 54 ft·lb)

NOTE:
Bend the lock washer tab along the nut flates.

3. Adjust:
   - Drive chain slack

Drive chain slack:
30 mm (1.18 in)

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

4. Install:
   - Starting motor

Bolts (starting motor):
7 Nm (0.7 m·kg, 5.1 ft·lb)
Use LOCTITE®

NOTE:
Before installing the starting motor into the crankcase, apply lithium soap base grease onto the o-ring of the starting motor.

5. Install:
   - Muffler

Bolts (muffler):
27 Nm (2.7 m·kg, 19 ft·lb)
Nuts (exhaust pipe):
10 Nm (1.0 m·kg, 7.2 ft·lb)

6. Install:
   - Air duct

Bolts (air duct):
7 Nm (0.7 m·kg, 5.1 ft·lb)

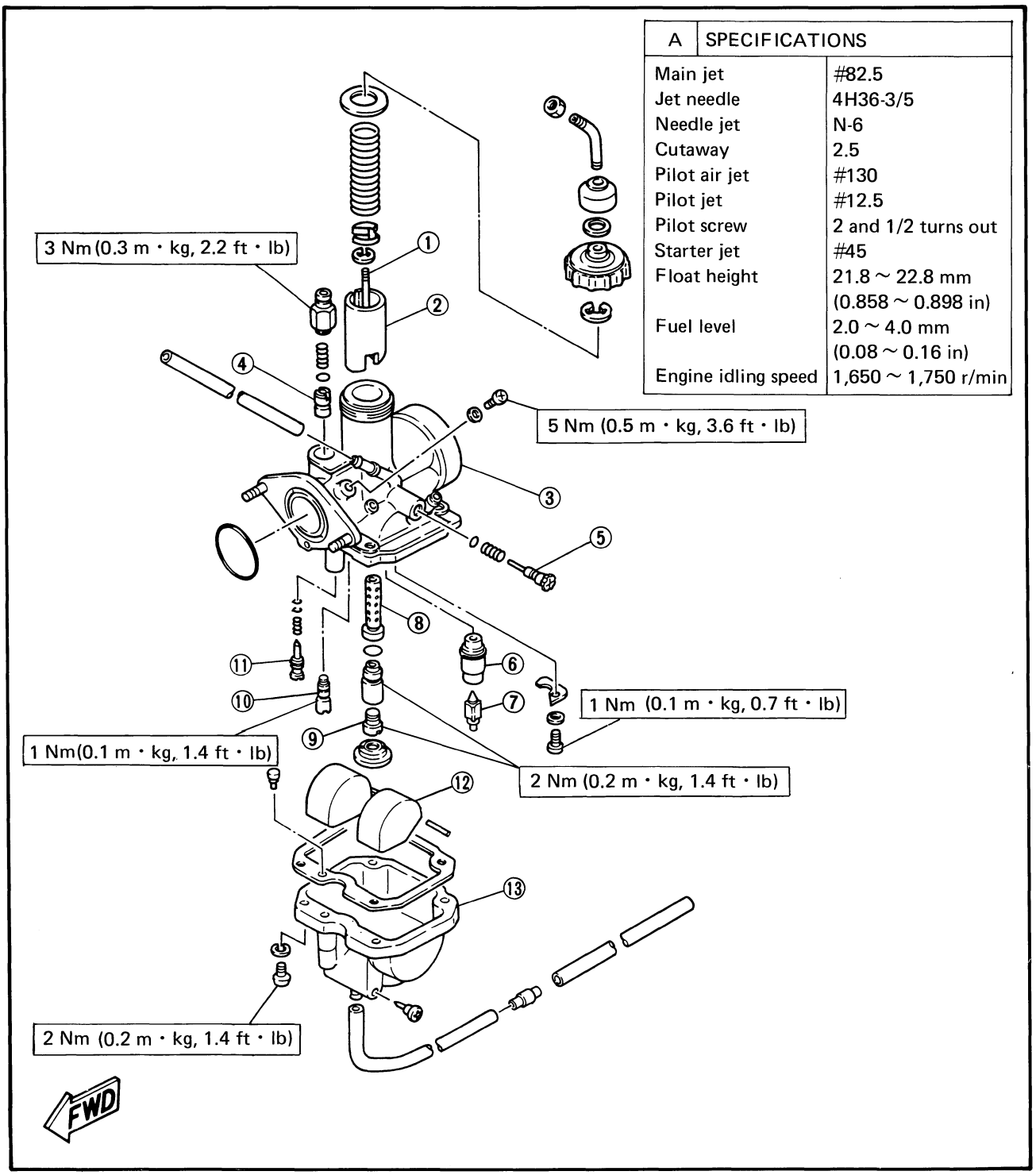
7. Fill:
   - Transmission case
     Refer to the "TRANSMISSION OIL REPLACEMENT" section in the CHAPTER 3.
   - Crankcase
     Refer to the "ENGINE OIL REPLACEMENT" section in the CHAPTER 3.

CARBURETION

CARBURETOR

① Jet needle
② Throttle valve
③ Carburetor body
④ Starter plunger
⑤ Throttle stop screw
⑥ Valve seat
⑦ Needle valve
⑧ Needle jet
⑨ Main jet
⑩ Pilot jet
⑪ Pilot screw
⑫ Float
⑬ Float chamber

A	SPECIFICATIONS
Main jet	#82.5
Jet needle	4H36-3/5
Needle jet	N-6
Cutaway	2.5
Pilot air jet	#130
Pilot jet	#12.5
Pilot screw	2 and 1/2 turns out
Starter jet	#45
Float height	21.8 ~ 22.8 mm (0.858 ~ 0.898 in)
Fuel level	2.0 ~ 4.0 mm (0.08 ~ 0.16 in)
Engine idling speed	1,650 ~ 1,750 r/min

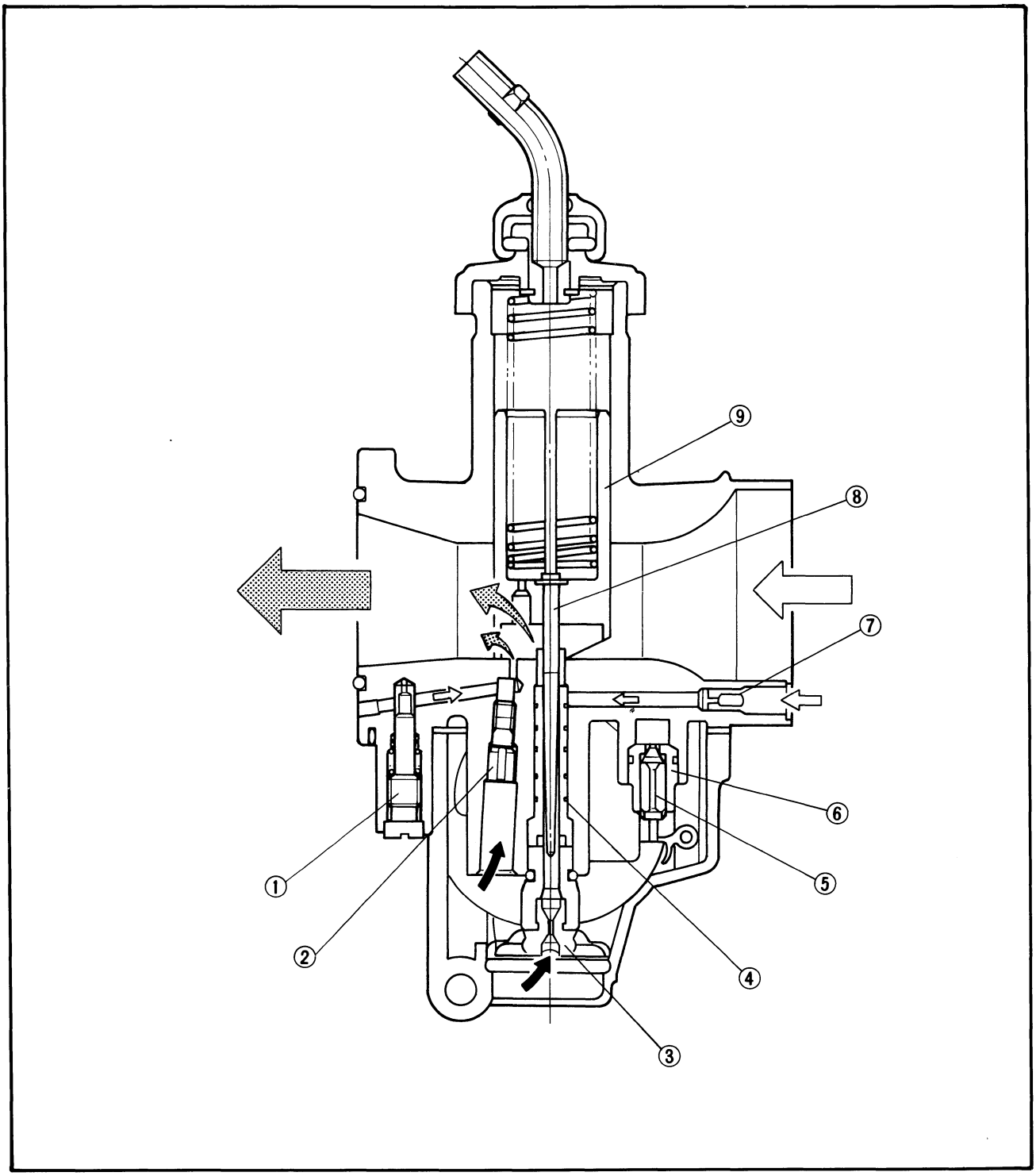


5

SECTIONAL VIEW

① Pilot screw
② Pilot jet
③ Main jet
④ Needle jet
⑤ Needle valve
⑥ Valve seat
⑦ Main air jet
⑧ Jet needle
⑨ Throttle valve

: Air
: Fuel
: Mixture



REMOVAL

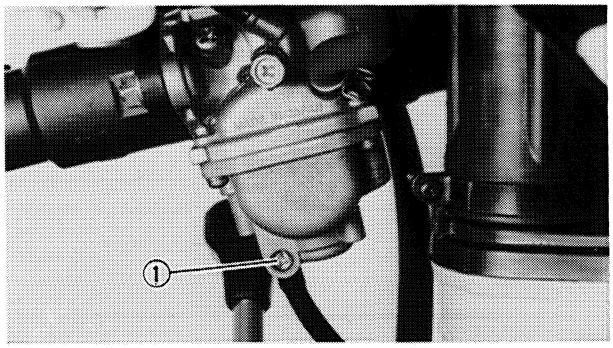
NOTE:

The following parts can be cleaned and inspected without disassembly.

- Throttle valve
- Starter piunger
- Throttle stop screw
- Pilot screw

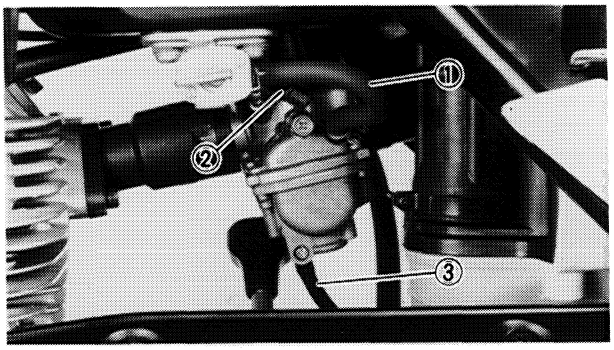
1. Remove:
   - Seat
   - Cover (front)
   - Cover (center)
   - Front fender

   Refer to the "FENDERS" Section in the CHAPTER 3.

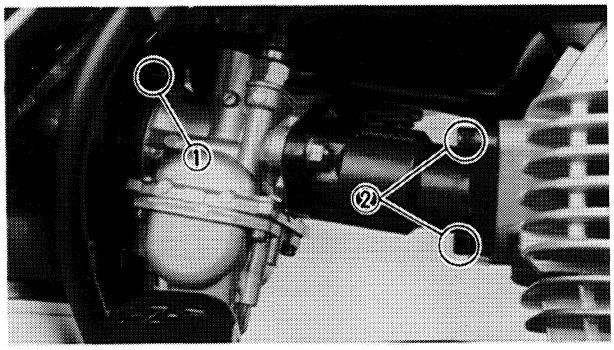


2. Turn the fuel cock to "OFF" position.
3. Loosen:
   - Drain screw ①.

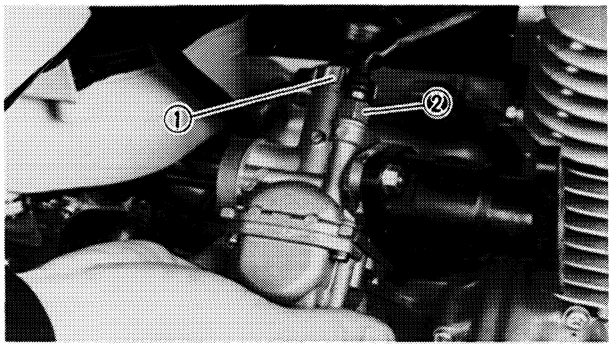
   Drain the float chamber of its fuel.



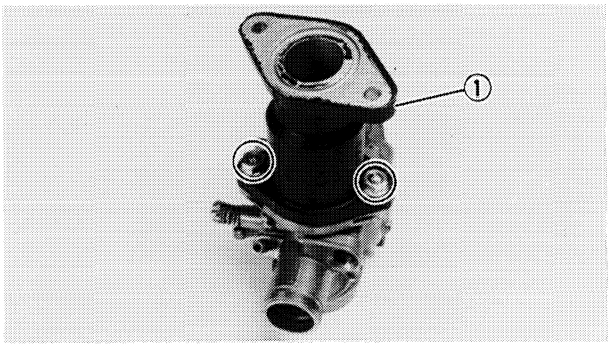
4. Disconnect:
   - Fuel hose ①
   - Air ventilation hose ②
   - Drain hose ③



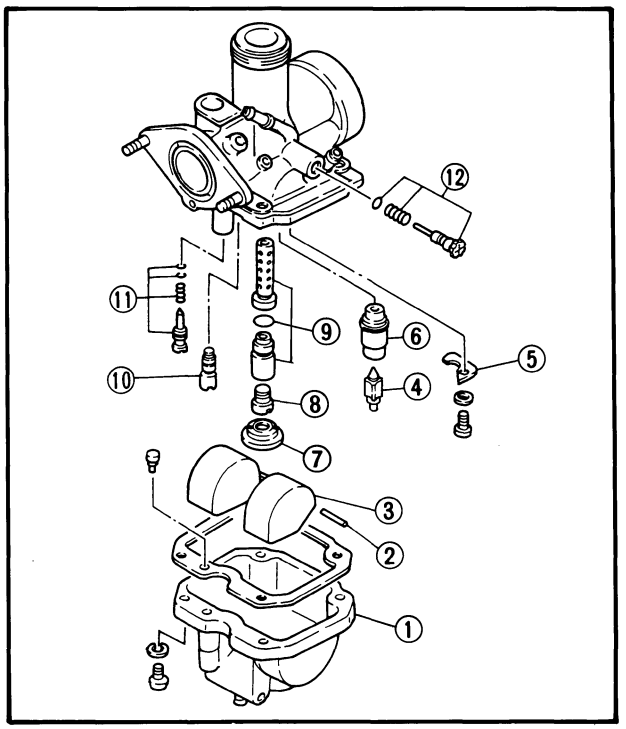
5. Loosen:
   - Screw ① (carburetor joint)
6. Remove:
   - Bolt ② (intake manifold)



7. Remove:
   - Top cover ① (with throttle valve)
   - Starter plunger ②

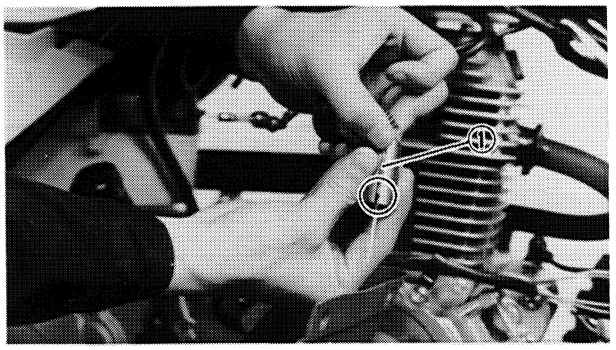


8. Remove:
   - Intake manifold ①



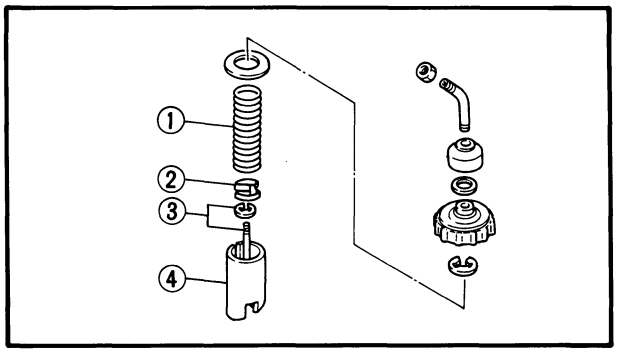
DISASSEMBLY

1. Remove:
   - Float chamber ①
   - Float pin ②
   - Float ③
   - Needle valve ④
   - Valve seat holder ⑤
   - Valve seat ⑥
   - Cover ⑦
   - Main jet ⑧
   - Needle jet ⑨
   - Pilot jet ⑩
   - Pilot screw ⑪
   - Throttle stop screw ⑫

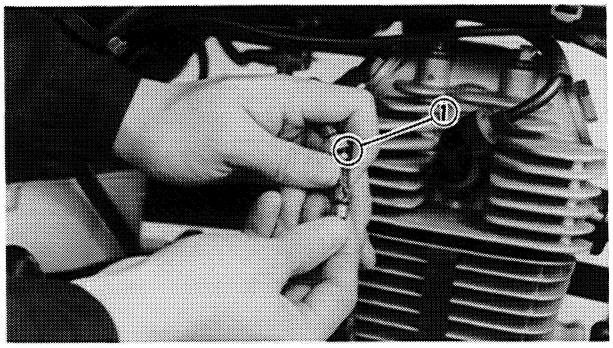


2. Disconnect:
   - Throttle cable ①
     (from throttle valve)

NOTE:
Compress the spring to disconnect the throttle cable by hand.

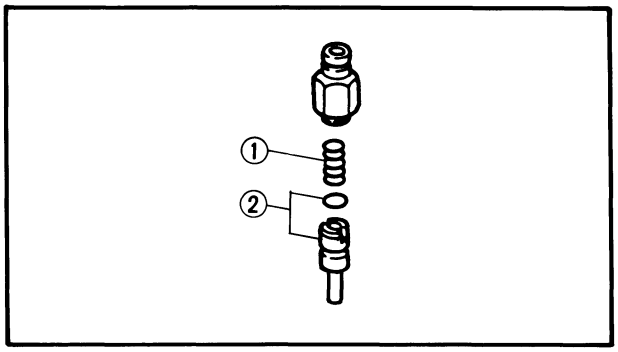


3. Remove:
   - Spring ①
   - Jet needle holder ②
   - Jet needle ③
   - Throttle valve ④

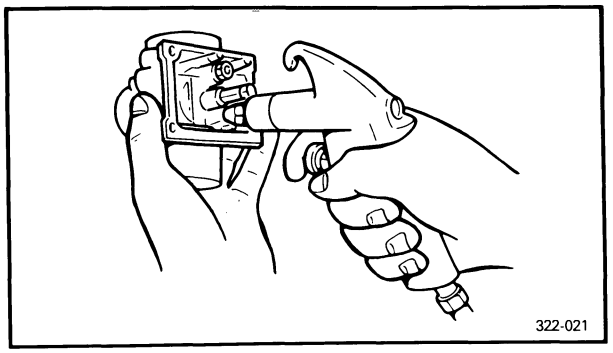


4. Disconnect:
   - Starter cable ①
     (from the starter plunger)

NOTE:
Compress the spring to disconnect the starter cable by hand.



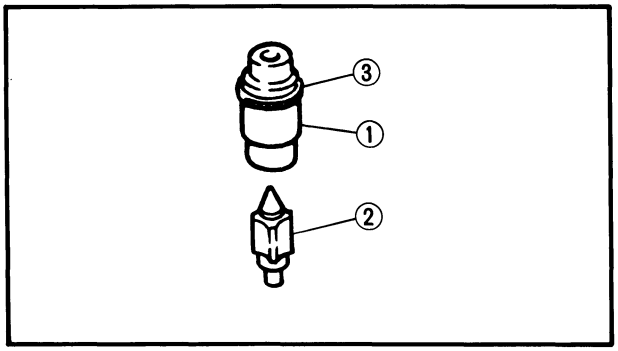
5. Remove:
   - Spring ①
   - Starter plunger ②



INSPECTION

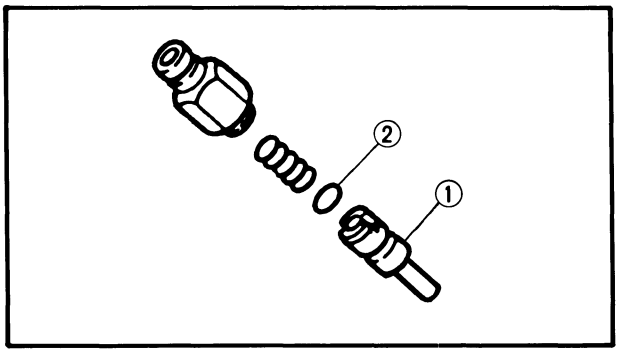
1. Inspect:
   - Carburetor body
     Crack/Damage → Replace.
     Contamination → Clean.

NOTE:
Use a petroleum based solvent for cleaning. Blow out all passages and jets with compressed air.

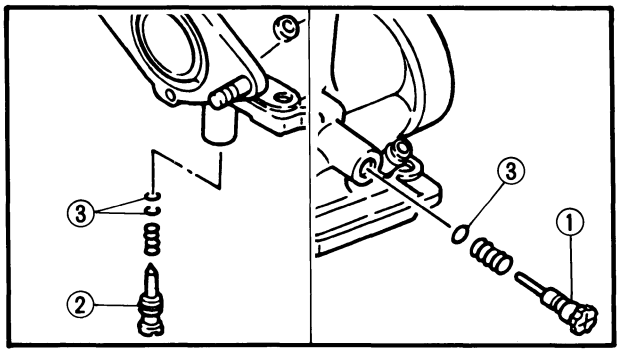


2. Inspect:
   - Valve seat ①
   - Needle valve ②
     Wear/Contamination → Replace.
   - O-ring ③
     Damage → Replace.

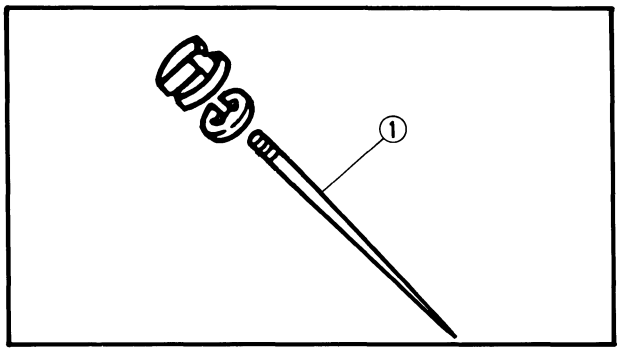
NOTE:
Always replace the needle valve and valve seat as a set.



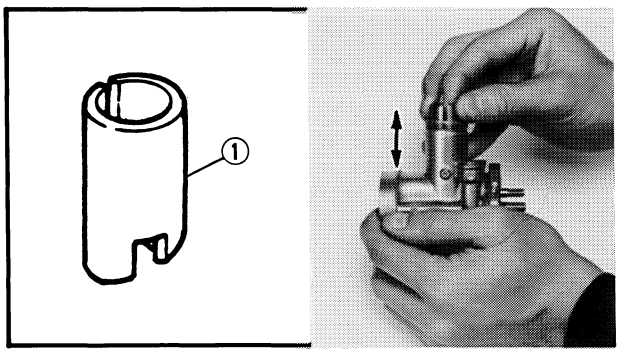
3. Inspect:
   - Starter plunger ①
     Wear/Contamination → Replace.
   - O-ring ②
     Damage → Replace.



4. Inspect:
   - Throttle stop screw ①
     Pilot screw ②
     Wear/Contamination → Replace.
   - O-ring ③
     Damage → Replace.

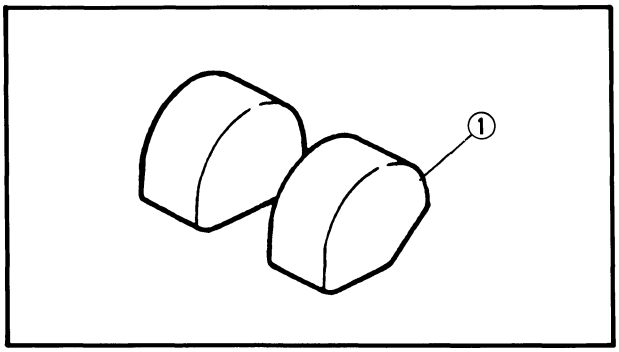


5. Inspect:
   - Jet needle ①
     Bends/Wear → Replace.

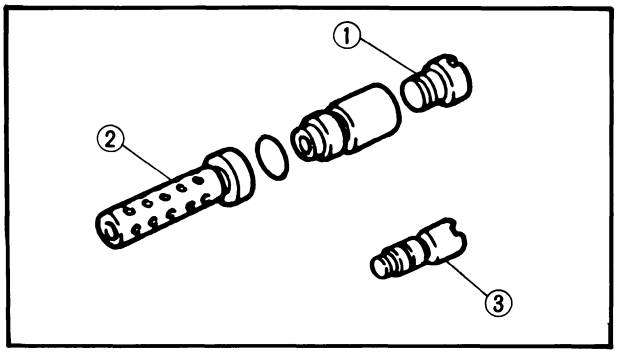


6. Inspect:
   - Throttle valve ①
     Wear/Damage → Replace.
7. Check:
   - Free movement
     Stick → Replace.

   Insert the throttle valve into the carburetor body, and check for free movement.



8. Inspect:
   - Float ①
     Damage → Replace.



9. Inspect:
   - Main jet ①
   - Needle jet ②
   - Pilot jet ③

   Contamination → Clean.

NOTE:
Blow out the jets with compressed air.

ASSEMBLY

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

⚠ CAUTION:
Before reassembling, wash the all parts with a clean gasoline.

1. Tighten:
   - Needle jet
   - Main jet
   - Pilot jet
   - Screw (needle valve holder)
   - Screws (float chamber)

Needle jet:
3 Nm (0.3 m · kg, 2.2 ft · lb)
Main jet:
2 Nm (0.2 m · kg, 1.4 ft · lb)
Pilot jet:
1 Nm (0.1 m · kg, 0.7 ft · lb)
Screw (needle valve holder):
1 Nm (0.1 m · kg, 0.7 ft · lb)
Screws (float chamber):
2 Nm (0.2 m · kg, 1.4 ft · lb)

INSTALLATION

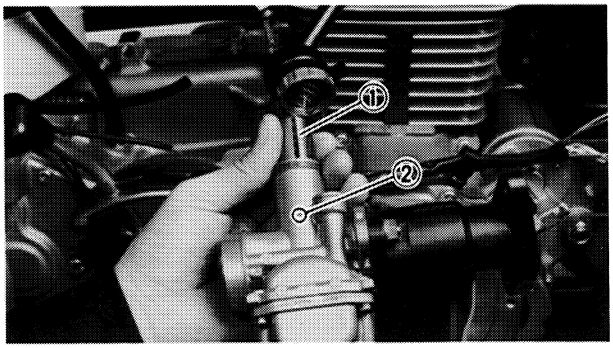
Reverse the "REMOVAL" procedures. Note the following points.

1. Install:
   - Intake manifold

Nut (intake manifold):
10 Nm (1.0 m · kg, 7.2 ft · lb)

2. Install:
   - Starter plunger
   - Top cover (with throttle valve)

	Starter plunger: **3 Nm (0.3 m · kg, 2.2 ft · lb)**



NOTE:
Align the groove ① of the throttle valve with the projection ② of the carburetor body.

3. Tighten:
   - Bolts (cylinder head and intake manifold)

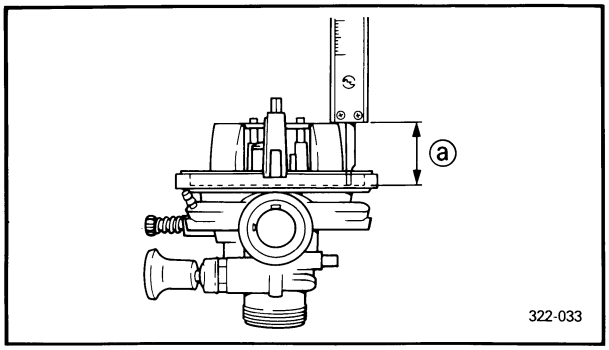
	Bolts (cylinder head and intake manifold): **12 Nm (1.2 m · kg, 8.7 ft · lb)**

5

FLOAT HEIGHT ADJUSTMENT

NOTE:
After the float, valve seat and needle valve are installed to the carbureter body, float height should be adjusted.

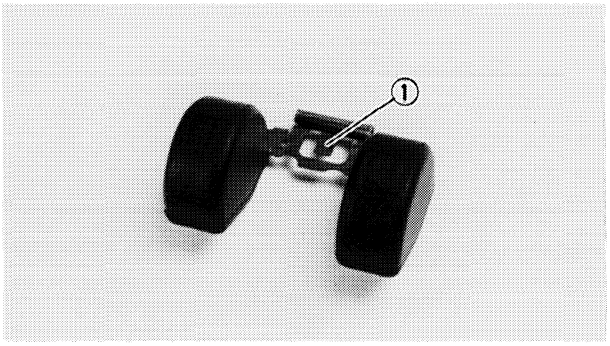
1. Hold the carburetor in an upside down position.



2. Measure:
   - Float height ⓐ
     Out of specification → Adjust.

	Float height (F.H.): **21.8 ~ 22.8 mm (0.858 ~ 0.898 in)**

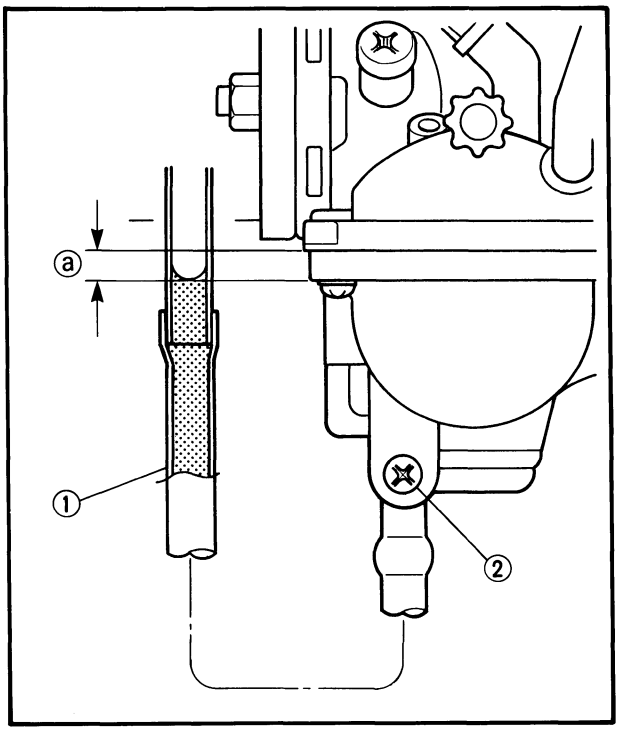
NOTE:
- Measure the distance from the mating surface of the float chamber (gasket removed) to the top of the float.
- The float arm should be resting on the needle valve, but not compressing the needle valve.



3. Adjust:
   - Float height

Adjustment steps:
- Inspect the valve seat and needle valve. If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang ① on the float.
- Recheck the float height.

5



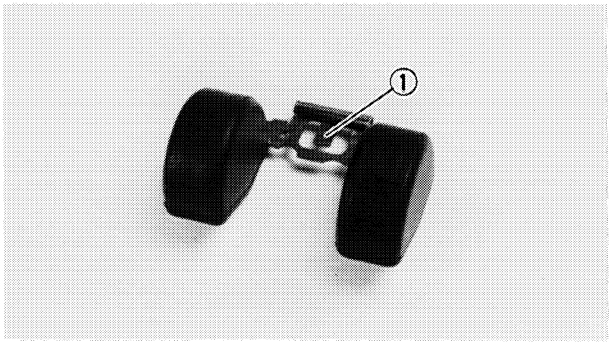
FUEL LEVEL ADJUSTMENT

1. Place the machine on a level place.
2. Use a garage jack under the engine to ensure that the carburetor is positioned vertically.
3. Attach the Fuel level gauge ① to the float chamber nozzle.

Fuel level gauge:
P/N YM-01312, 90890-01312

4. Loosen the drain screw ② , and warm up the engine for several minutes.
5. Measure:
   - Fuel level ⓐ
     Out of specification → Adjust.

Fuel level:
2.0 ~ 4.0 mm (0.08 ~ 0.16 in)
below the carburetor body edge.



6. Adjust:
   - Fuel level

Adjustment steps:
- Remove the carburetor.
- Inspect the valve seat and needle valve.
- If either is worn, replace them both.
- If both are fine, adjust the float height by bending the float tang ① on the float.
- Recheck the fuel level.

CHASSIS

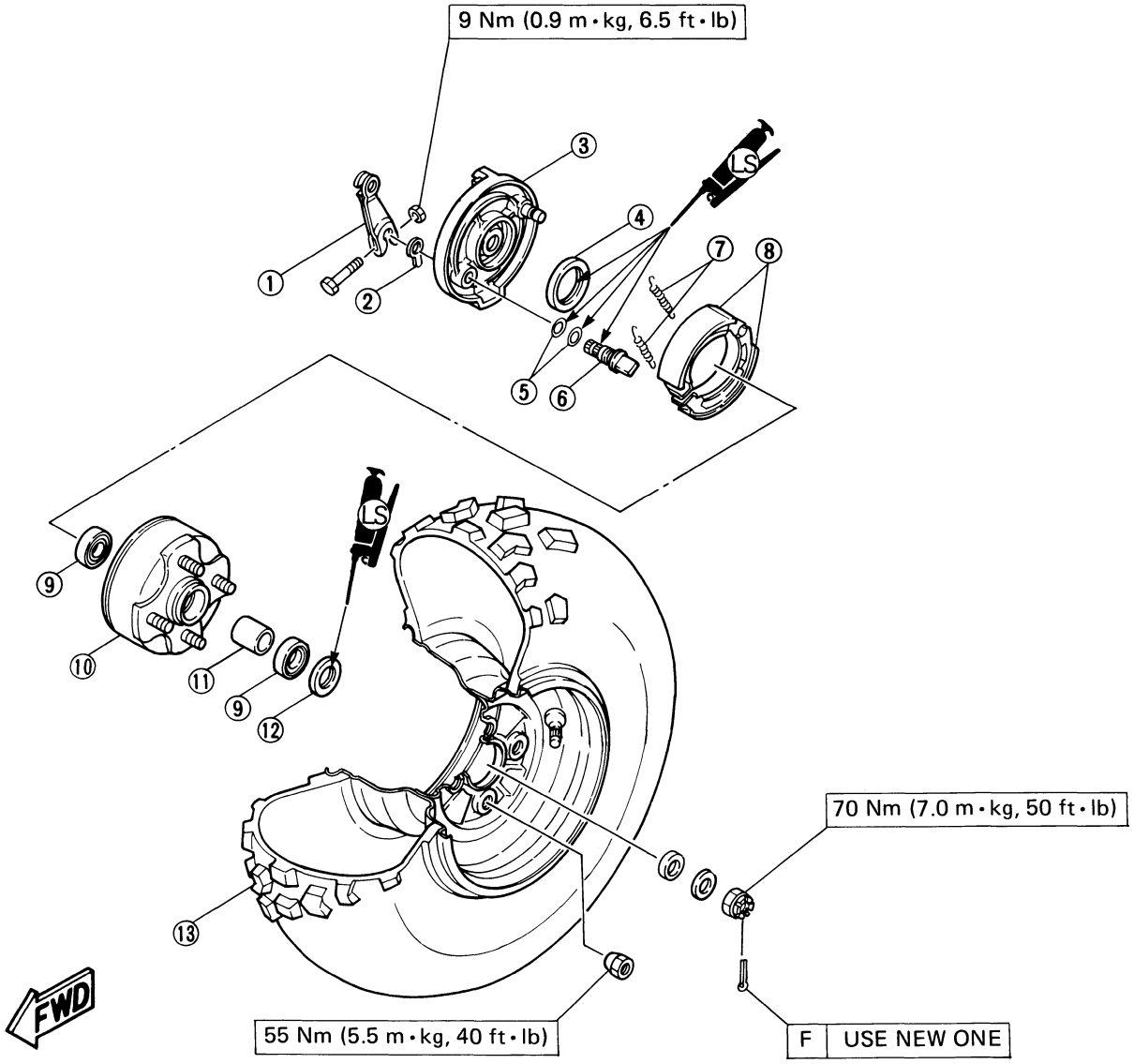
FRONT WHEEL

① Camshaft lever
② Wear indicator
③ Brake shoe plate
④ Oil seal
⑤ O-ring
⑥ Camshaft
⑦ Spring
⑧ Brake shoe
⑨ Bearing
⑩ Wheel hub
⑪ Collar
⑫ Oil seal
⑬ Wheel assembly

TIRE AIR PRESSURE		
COLD TIRE PRESSURE	FRONT	REAR
STANDARD	20 kPa (0.20 kg/cm², 2.8 psi)	25 kPa (0.25 kg/cm², 3.6 psi)
MINIMUM	17 kPa (0.17 kg/cm², 2.4 psi)	22 kPa (0.22 kg/cm², 3.1 psi)
MAXIMUM	23 kPa (0.23 kg/cm², 3.3 psi)	28 kPa (0.28 kg/cm², 4.0 psi)

A	TIRE SIZE: AT20 x 7 - 8
B	WHEEL RUNOUT LIMIT VERTICAL: 2.0 mm (0.08 in) LATERAL: 2.0 mm (0.08 in)
C	TIRE WEAR LIMIT: 3.0 mm (0.12 in)

D	BRAKE DRUM INSIDE DIAMETER: 110 mm (4.33 in) < WEAR LIMIT > : < 111 mm (4.37 in) >
E	BRAKE SHOE THICKNESS: 4.0 mm (0.16 in) < WEAR LIMIT > : < 2.0 mm (0.08 in) >



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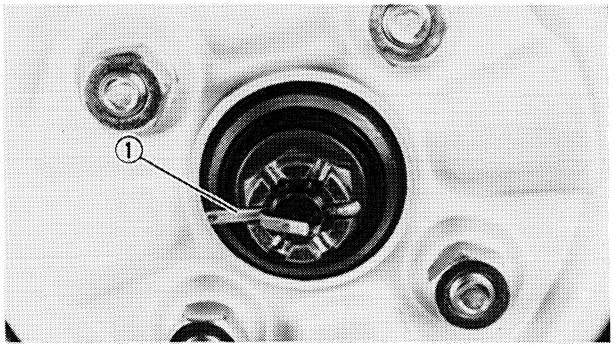
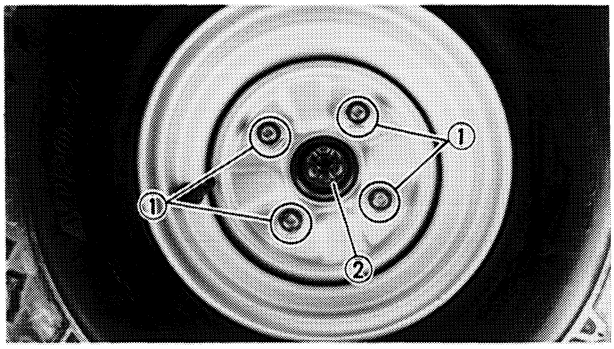


REMOVAL

1. Place the machine on a level place.
2. Remove:
   - Cotter pin ①



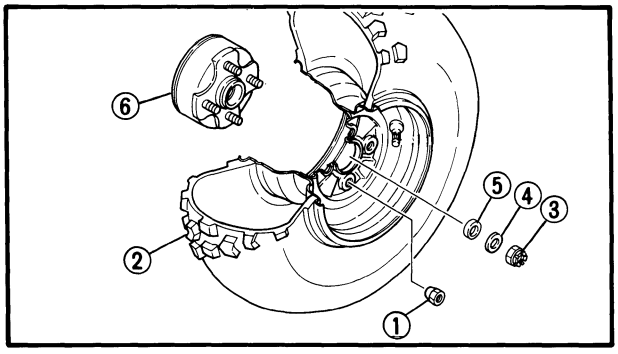
3. Loosen:
   - Nuts ① (wheel panel)
   - Nut ② (wheel hub)

NOTE:
Loosen the nut while applying the front brake.

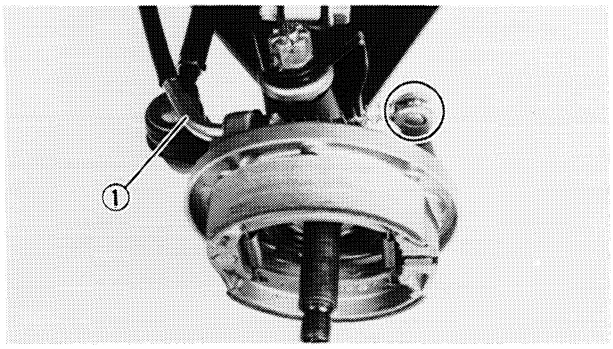
4. Elevate the front wheels by placing a suitable stand under the frame.

⚠ WARNING:
Support the machine securely so there is no danger of it falling over.

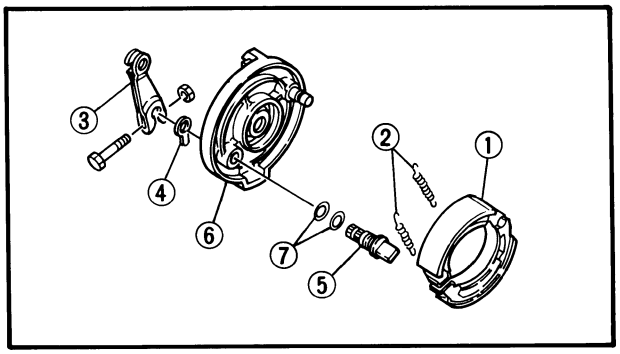
6



5. Remove:
   - Nuts ①
   - Front wheel ②
   - Nut ③
   - Washer ④
   - Collar ⑤
   - Wheel hub ⑥



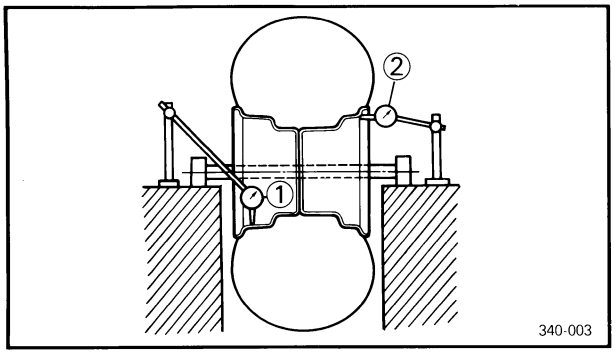
6. Loosen:
   - Locknut
     (at brake lever)
7. Tighten:
   - Adjuster
     (at brake lever)
8. Disconnect:
   - Front brake cable ①
     (from brake cam lever)



9. Remove:
   - Brake shoes ①
   - Springs ②
   - Camshaft lever ③
   - Wear indicator ④
   - Camshaft ⑤
   - Brake shoe plate ⑥
   - O-rings ⑦

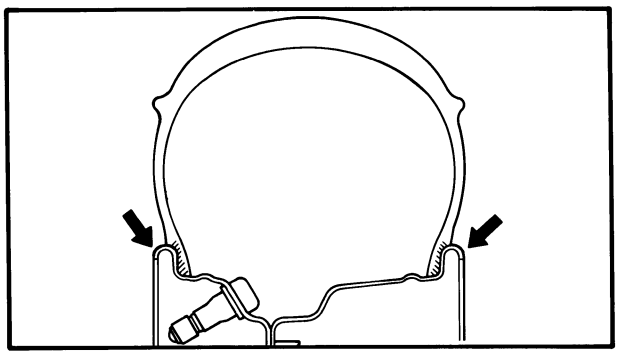
INSPECTION

1. Inspect:
   - Wheel
     Cracks/Bends/Warpage → Replace.



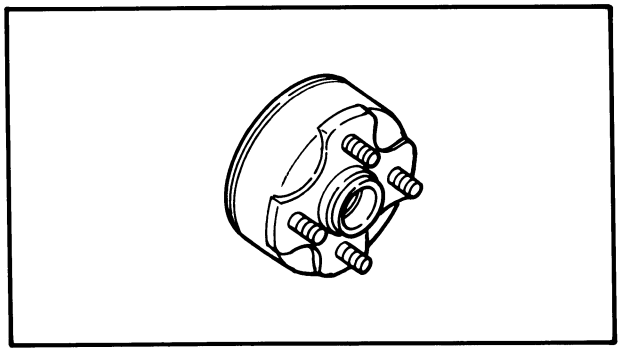
2. Measure:
   - Wheel runout
     Out of specification → Replace wheel or check bearing play.

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

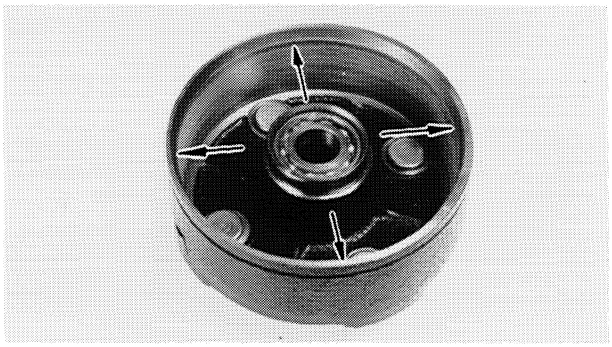


⚠ WARNING:

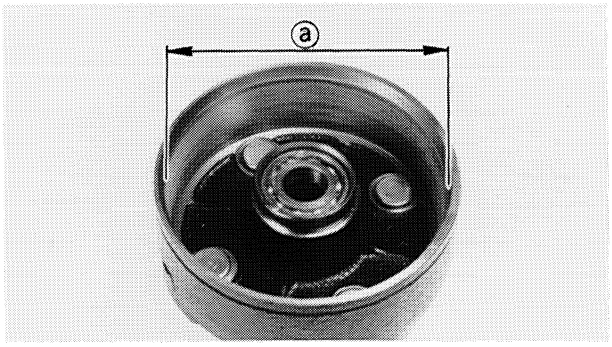
After replacing the tire, ride conservatively to allow the tire to be properly seated in the rim. Failure to do so may cause an accident resulting in machine damage and possible operator injury.



3. Inspect:
   - Front wheel hub
     Cracks/Damage → Replace.

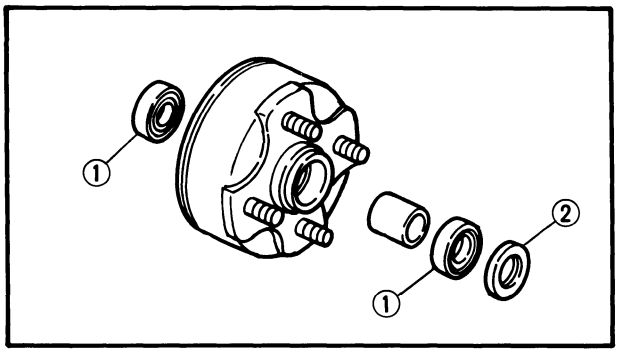


4. Inspect:
   - Brake drum (inner surface)
     Oil → Wipe off brake drum with rag soaked in lacquer thinner or solvent.
     Scratches → Polish brake drum lightly and evenly with emery cloth.



5. Measure:
   - Inside diameter (brake drum) ⓐ
     Out of specification → Replace.

Inside diameter (brake drum):
110 mm (4.33 in)
< Wear Limit >
111 mm (4.37 in)



6. Inspect:
   - Bearings ① (front wheel hub)
     Bearings allow play in the wheel hub or the wheel turns roughly → Replace.
   - Oil seal ②
     Wear/Damage → Replace.

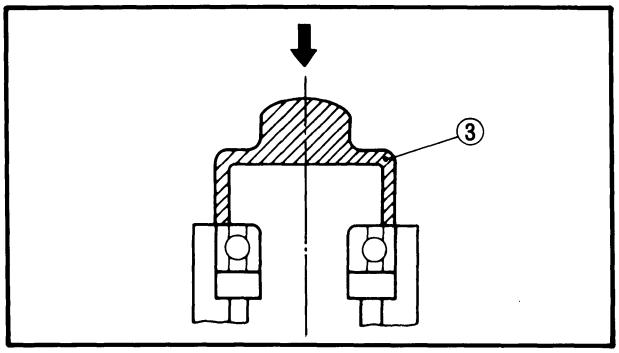
Replacement steps:
- Clean the outside of the wheel hub.
- Remove the oil seal use a flat-head screw driver.

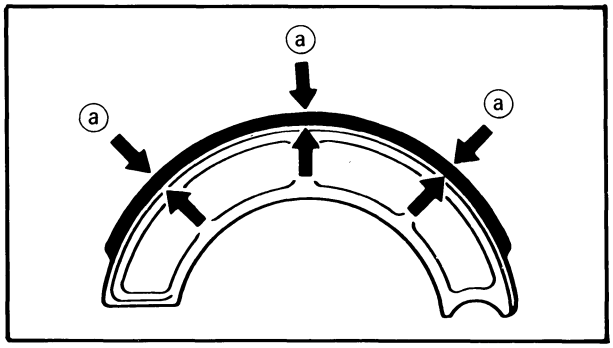
NOTE:
Place a wood block against the outer edge to protect this edge.

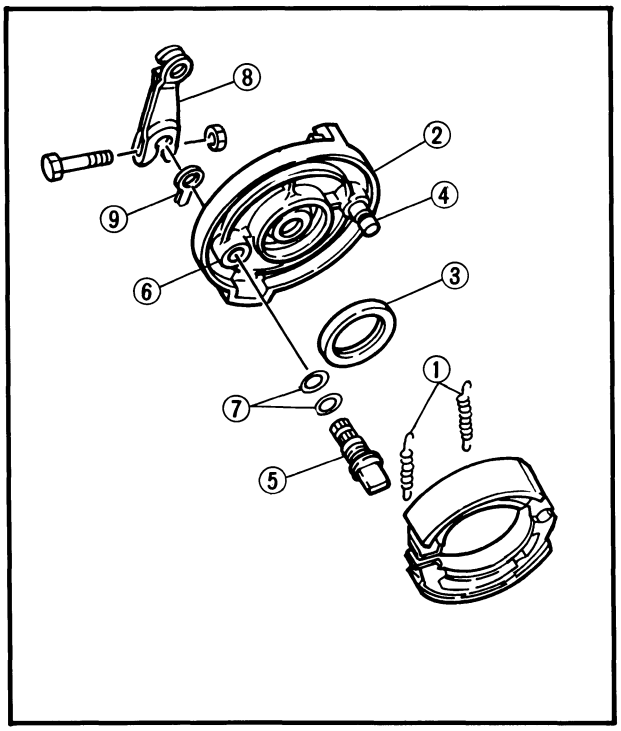
- Remove the bearing using a general bearing puller.
- Install the new bearing and oil seal by reversing the previous steps.

NOTE:
Use a socket ③ 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.







7. Inspect:
   - Brake shoes
     Glazed parts → Sand with coarse sandpaper.
8. Measure:
   - Lining thickness ⓐ
     Out of specification → Replace.

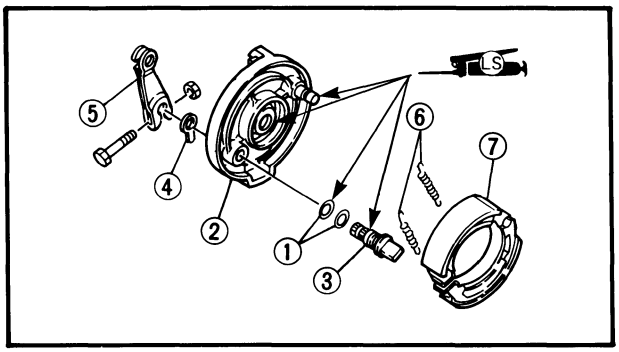
Lining thickness:
4.0 mm (0.16 in)
< Wear Limit >:
2.0 mm (0.08 in)

9. Inspect:
   - Shoe springs ①
     Damage → Replace.
   - Brake shoe plate ②
     Cracks/Damage → Replace.
   - Oil seal ③
   - Brake shoe pivot pin ④
     Wear/Damage → Replace.
   - Camshaft ⑤
   - Camshaft hole ⑥
     Scratches/Excessive wear → Replace.
   - O-rings ⑦
     Damage → Replace.
   - Camshaft lever ⑧
     Damage → Replace.
   - Wear indicator ⑨
     Damage → Replace.

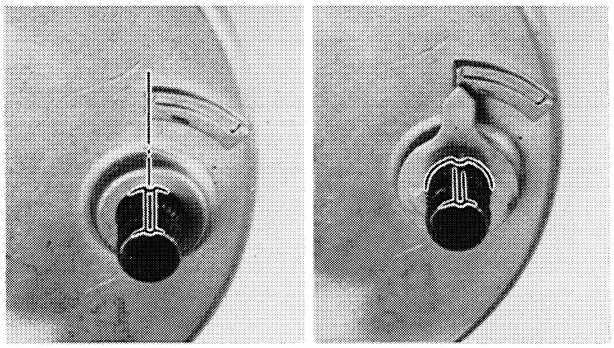
INSTALLATION

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

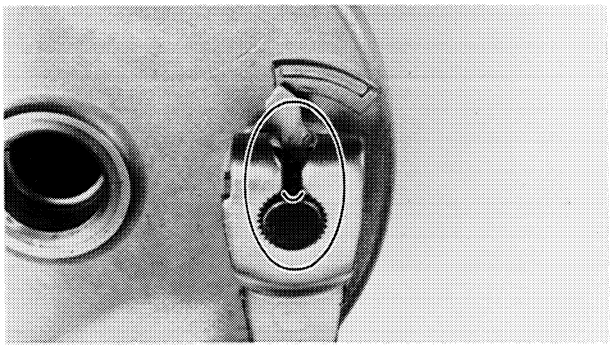
1. Apply:
   - Lithium soap base grease
     (onto the o-rings, oil seal lips, pivot pin of brake shoe and camshaft)
2. Install:
   - O-rings ①
   - Brake shoe plate ②
   - Camshaft ③
   - Wear indicator ④
   - Camshaft lever ⑤
   - Springs ⑥
   - Brake shoes ⑦

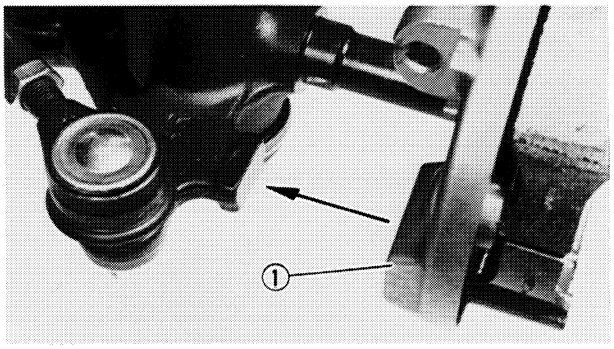


Bolt (camshaft lever):
9 Nm (0.9 m · kg, 6.5 ft · lb)



NOTE:
- Install the camshaft to the brake shoe plate with the slot of the camshaft placing at base line of the wear indicator scale.
- Align the projection with the slot of the camshaft when installing the wear indicator to the camshaft.
- Align the cut-out of the camshaft lever with the slot of the camshaft when installing the camshaft lever to the camshaft.





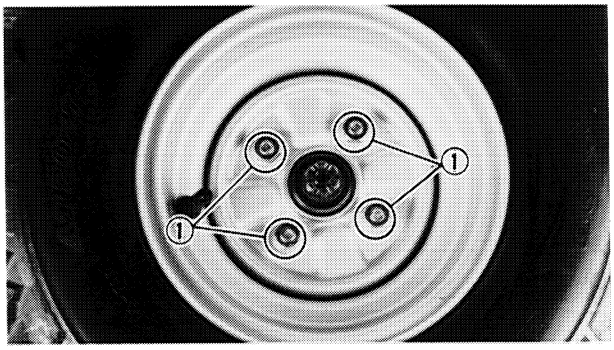
3. Install:
   - Brake shoe plate ①

NOTE:
Make sure that the boss on the knuckle correctly engages with the locating slot on the brake shoe plate.

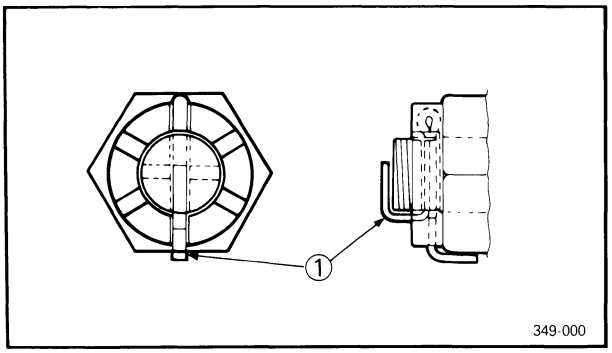
6

4. Apply:
   - Lithium soap base grease.
     (onto the bearings and oil seal lips of the wheel hub).
5. Tighten:
   - Nut (wheel hub)
   - Nuts (wheel panel)

Nut (wheel hub):
70 Nm (7.0 m · kg, 50 ft · lb)
Nuts (wheel panel):
55 Nm (5 5 m · kg, 40 ft · lb)



⚠ WARNING:
Tapered wheel nuts ① are used for front wheels. Install the nuts with its tapered side towards the wheel.



6. Install:
   • Cotter pin ① (new)

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

⚠ WARNING:
Always use a new cotter pin.

7. Adjust:
   • Front brake cable free play
   Refer to the "FRONT BRAKE ADJUSTMENT" section in the CHAPTER 3.

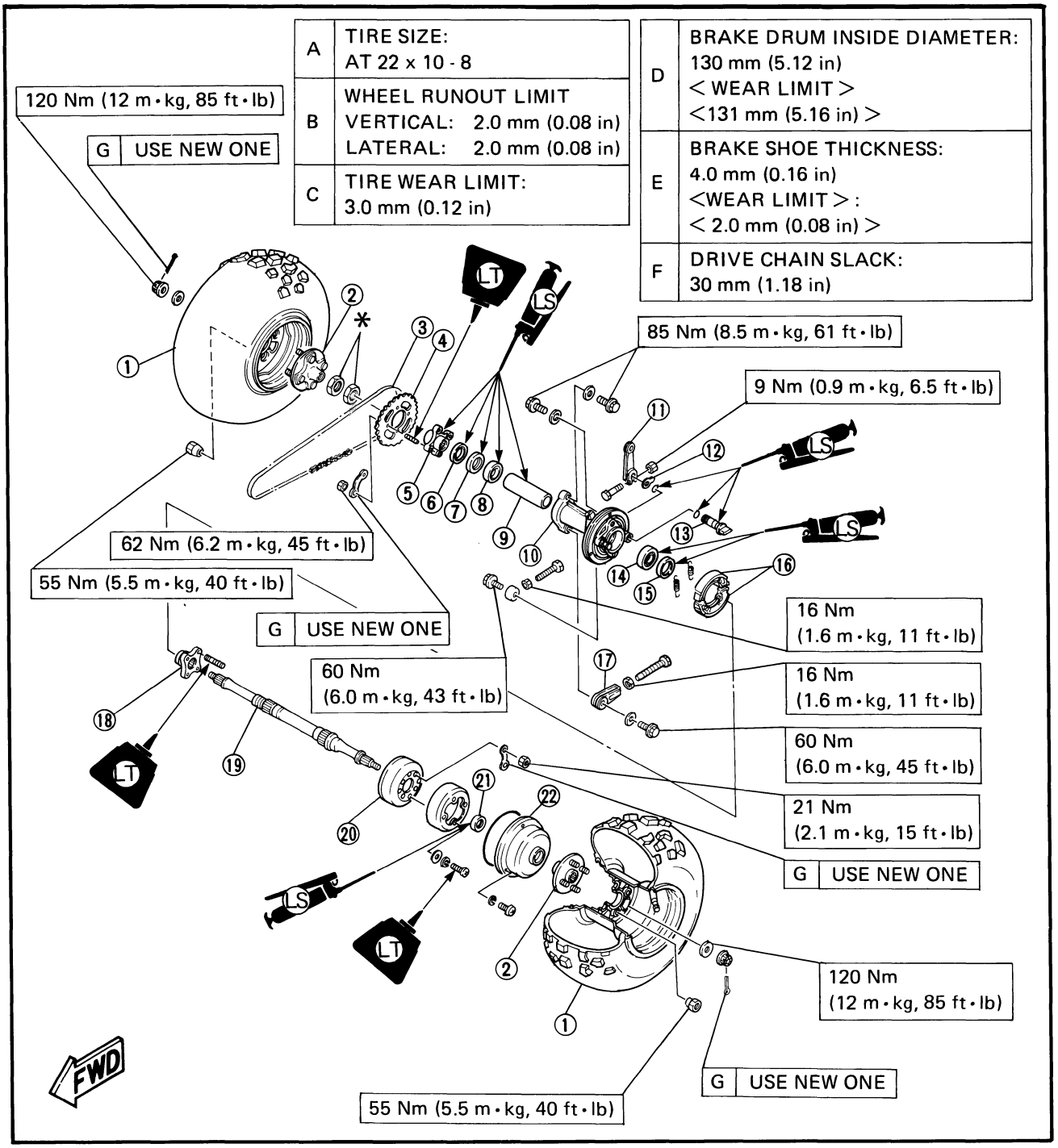
Brake cable free play:
10 ~ 12 mm (0.39 ~ 0.47 in)
at lever pivot.

REAR WHEEL

① Rear wheel assembly
② Wheel hub
③ Drive chain
④ Driven sprocket
⑤ Sprocket hub
⑥ Dust seal
⑦ Oil seal
⑧ Bearing
⑨ Collar
⑩ Rear axle hub
⑪ Brake cam lever
⑫ Wear indicator
⑬ Brake cam
⑭ Bearing
⑮ Oil seal
⑯ Brake shoe
⑰ Chain puller
⑱ Brake drum hub
⑲ Rear axle
⑳ Brake drum
㉑ Oil seat
㉒ Drum cover

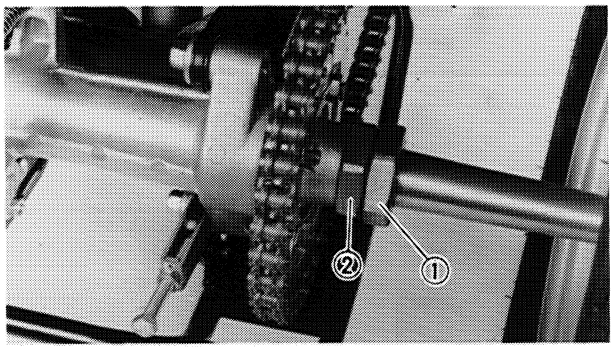
✻ Rear Axle Nut Tightening Steps:
Apply locking agent (LOCTITE®) to rear axle nuts threads. 1st: Tighten the inner rear axle nut. 55 Nm (5.5 m • kg, 40 ft • lb) 2nd: Tighten the outer rear axle nut while holding the inner rear axle nut. 190 Nm (19.0 m • kg, 140 ft • lb) 3rd: Loosen the inner rear axle nut while holding the outer rear axle nut. 240 Nm (24.0 m • kg, 170 ft • lb)

A	TIRE SIZE: AT 22 x 10 - 8
B	WHEEL RUNOUT LIMIT VERTICAL: 2.0 mm (0.08 in) LATERAL: 2.0 mm (0.08 in)
C	TIRE WEAR LIMIT: 3.0 mm (0.12 in)
D	BRAKE DRUM INSIDE DIAMETER: 130 mm (5.12 in) < WEAR LIMIT > <131 mm (5.16 in) >
E	BRAKE SHOE THICKNESS: 4.0 mm (0.16 in) <WEAR LIMIT > : < 2.0 mm (0.08 in) >
F	DRIVE CHAIN SLACK: 30 mm (1.18 in)



REMOVAL

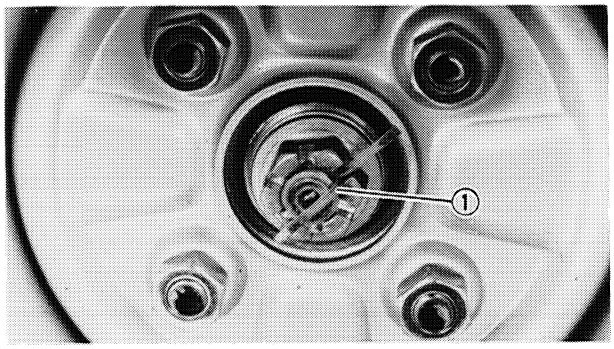
1. Place the machine on a level place.
2. Apply:
   - Front brake
   - Parking brake



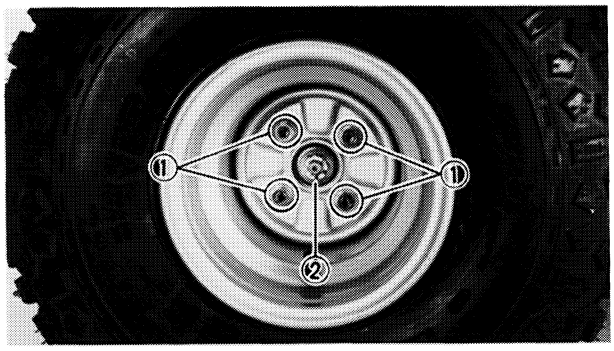
3. Loosen:
   - Rear axle nut ① (outer)
   - Rear axle nut ② (inner)

   Use the nut wrench.

Nut wrench:
P/N YM-37132, 90890-01419



4. Remove
   - Cotter pin ①



5. Loosen:
   - Nuts ① (wheel panel)
   - Nuts ② (wheel hub)

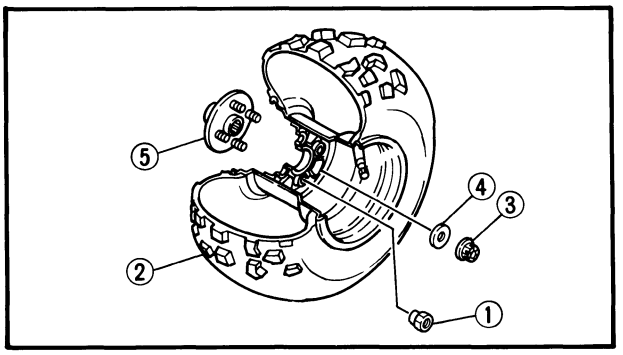
   (of the both rear wheels)

6. Elevate the rear wheels by placing a suitable stand under the rear of frame.

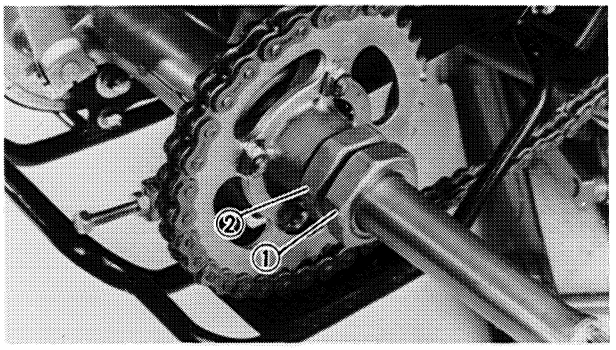
⚠ WARNING:

Support the machine securely so there is no danger of it falling over.

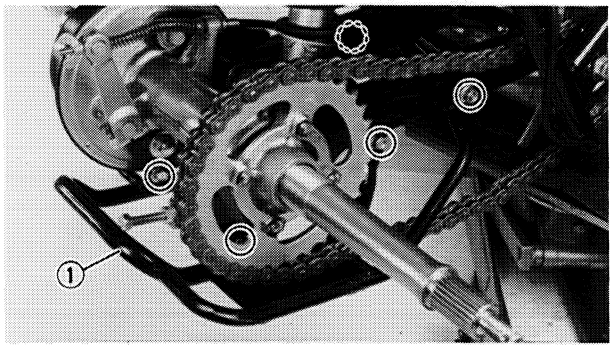
6



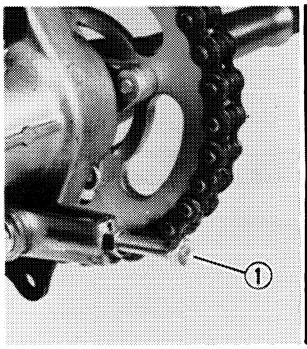
7. Remove:
   - Nuts ① (wheel panel)
   - Rear wheels ②
   - Nuts ③ (wheel hub)
   - Washers ④
   - Wheel hubs ⑤

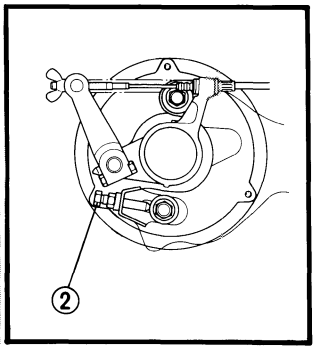


8. Remove:
   - Rear axle nut ① (outer)
   - Rear axle nut ② (inner)

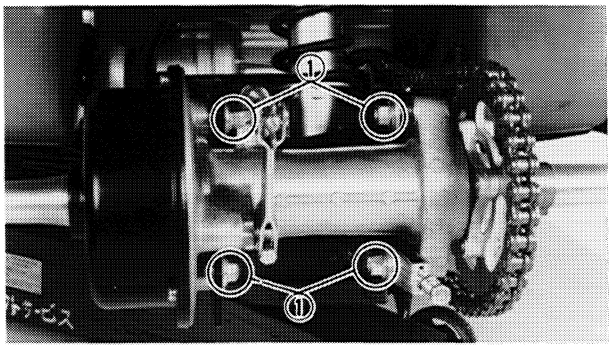


9. Remove:
   - Lower guard ①

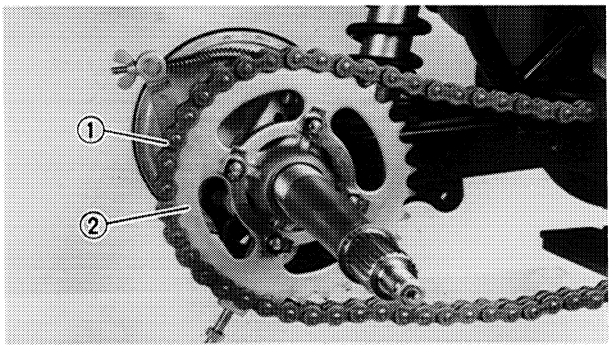




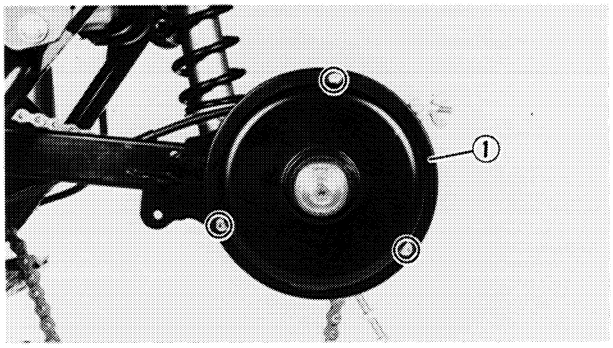
10. Loosen:
    - Adjuster ① (drive chain slack)
    - Lock bolt ②



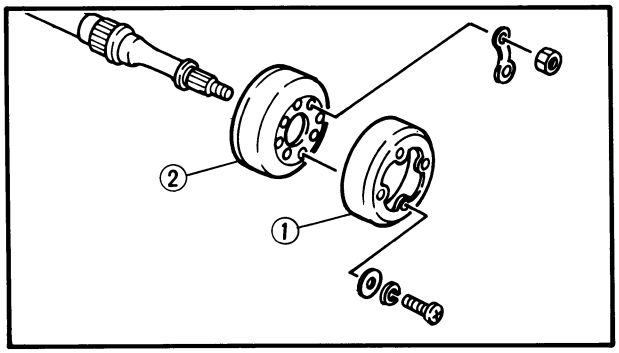
11. Loosen:
    - Bolts ① (rear axle hub)



12. Remove:
- Drive chain ①
  (from driven sprocket)
- Driven sprocket ②

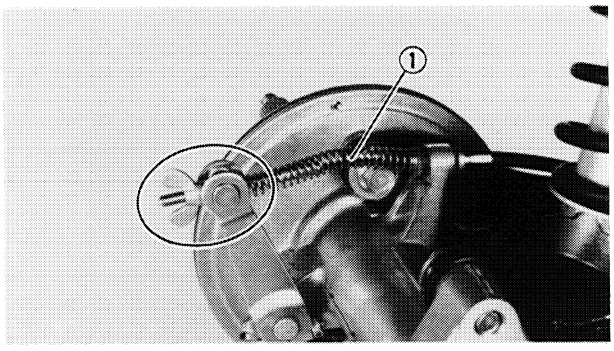


13. Remove:
- Brake drum cover ① (outer)

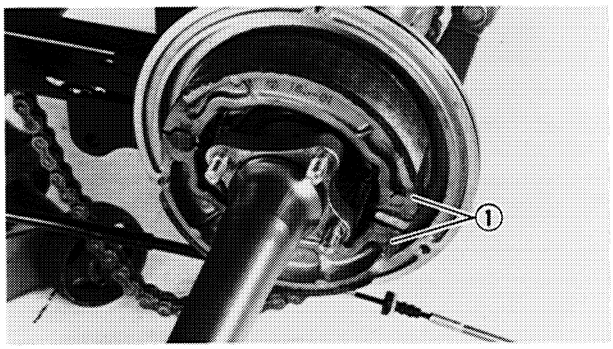


14. Straighten:
- Lock washer tabs

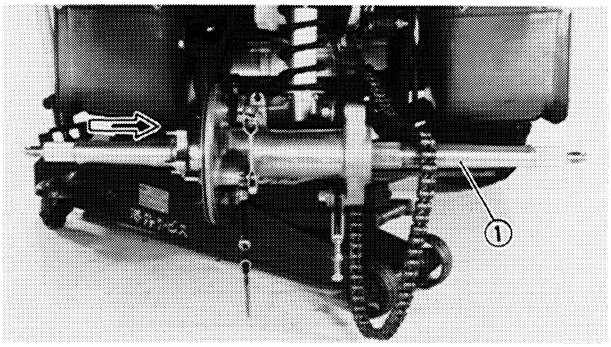
15. Remove:
- Brake drum cover ① (inner)
- Brake drum ②



16. Disconnect:
- Rear brake cable ①
  (from the camshaft lever)



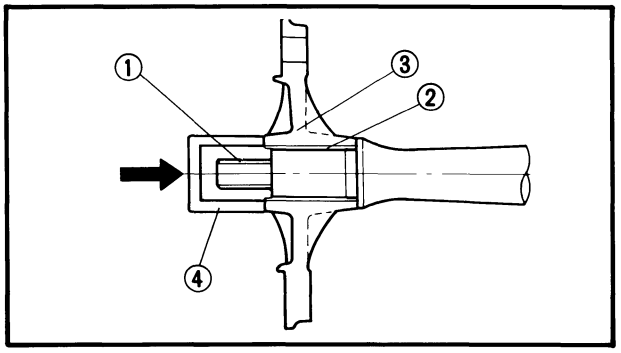
17. Remove:
- Brake shoes ①

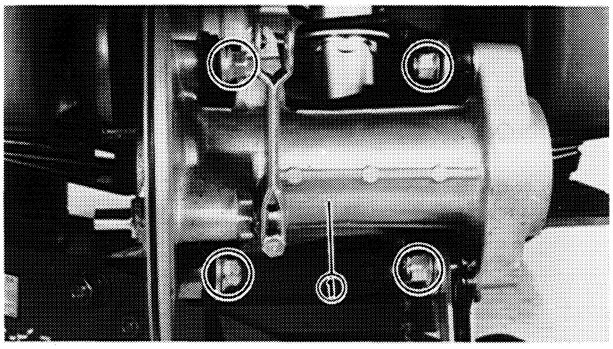


18. Remove:
    - Rear axle ①
      (from right side)

⚠ CAUTION:

- **Never directly tap the axle end with a hammer, this will result in damage to the axle thread ① and spline ②.**
- **Install the wheel boss ③ and a suitable socket ④ on the axle end to prevent the thread and spline from damage.**





19. Remove:
    - Rear axle hub ①

6

INSPECTION

1. Inspect:
   - Wheel
     Refer to the "WHEEL INSPECTION" section in the CHAPTER 3.
2. Measure:
   - Wheel runout
     Refer to the "FRONT WHEEL – INSPECTION" section.

Wheel runout limit:
Vertical: 2.0 mm (0.08 in)
Lateral: 2.0 mm (0.08 in)

3. Inspect:
   - Brake drum (inner surface)
     Refer to the "FRONT WHEEL – INSPECTION" section.

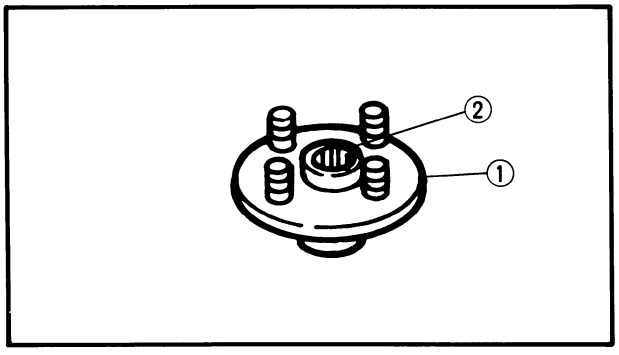
4. Measure:
   • Inside diameter (brake drum)
   Refer to the "FRONT WHEEL – INSPECTION" section.

Inside diameter (brake drum):
130 mm (5.12 in)
< Wear Limit >:
131 mm (5.16 in)

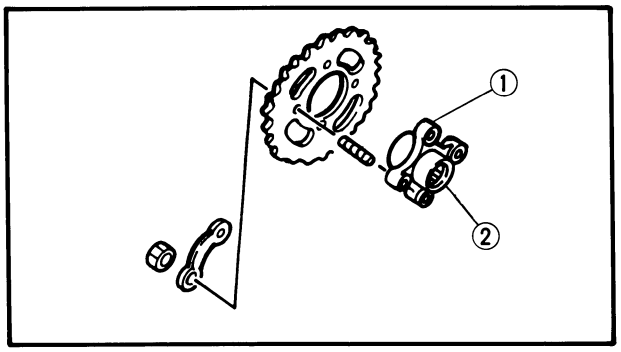
5. Inspect:
   • Brake shoes
   Refer to the "FRONT WHEEL – INSPECTION" section.

6. Measure:
   • Lining thickness
   Refer to the "FRONT WHEEL – INSPECTION" section.

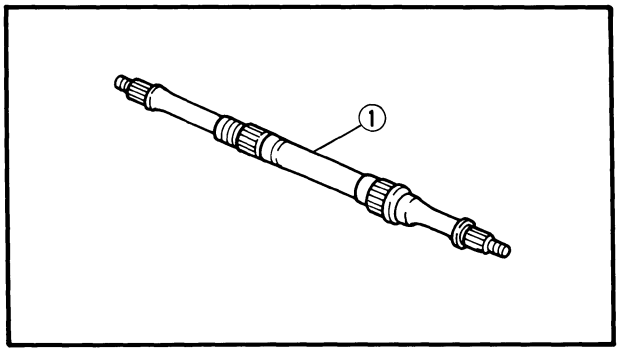
Lining thickness:
4.0 mm (0.16 in)
< Wear Limit >:
2.0 mm (0.08 in)



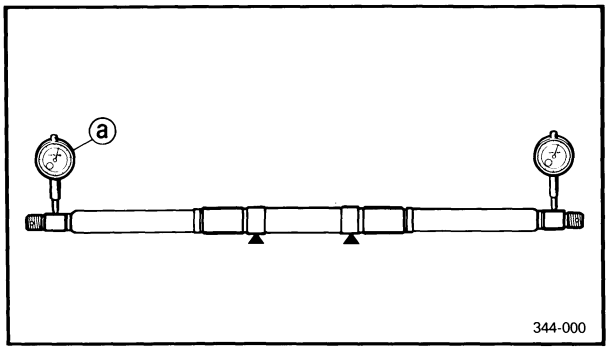
7. Inspect:
   • Wheel hub ①
   Cracks/Damage → Replace.
   • Splines ② (wheel hub)
   Wear/Damage → Replace.



8. Inspect:
   • Sprocket hub ①
   Cracks/Damage → Replace.
   • Splines ② (sprocket hub)
   Wear/Damage → Replace.



9. Inspect:
   - Rear axle ①
     Scratched (excessively)/Damage → Replace.
   - Splines/Threads (rear axle)
     Wear/Damage → Replace.

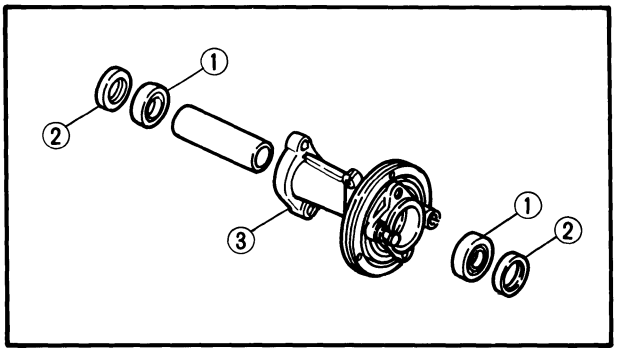


10. Measure:
    - Rear axle runout ⓐ
      Out of specification → Replace.

Rear Axle Runout:
Less than 1.5 mm (0.06 in)

⚠ WARNING:

Do not attempt to straighten a bent axle.

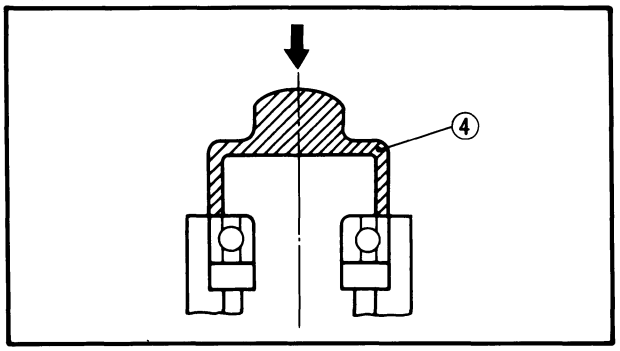


11. Inspect:
    - Bearings ① (rear axle hub)
      Bearings allow play in the axle hub or the bearing turns roughly → Replace.
    - Oil seals ②
      Wear/Damage → Replace.
    - Rear axle hub ③
      Cracks/Bend/Damage → Replace.

Bearing and oil seal replacement steps:
- Clean the outside of the rear axle.
- Remove the oil seal by a flat-head screw driver.

NOTE:
Place a wood block against the outer edge to protect this edge.

- Remove the bearing by a general bearing puller.
- Install the new bearings and oils seal by reversing the previous steps.



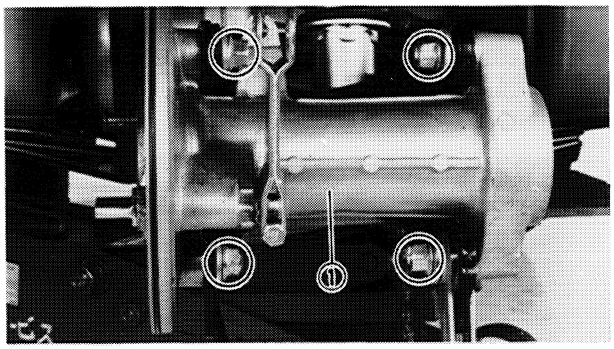
NOTE:
Use a socket ④ that matches the outside diameter of the race of the bearing and oil seal.

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

INSTALLATION

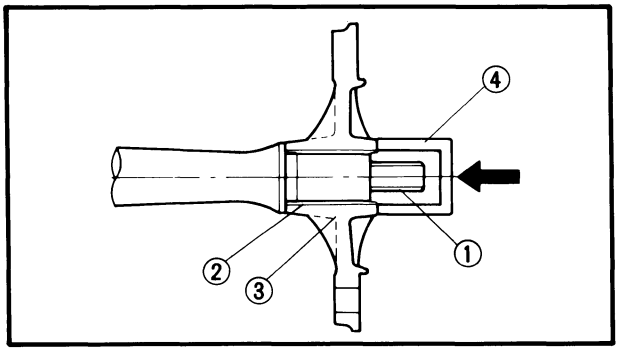
Reverse the "REMOVAL" procedures.
Note the following points.

1. Apply:
   - Lithium soap base grease
     (onto the oil seal lips, bearings and bushes)



2. Install:
   - Rear axle hub ①

NOTE:
At this time, the rear axle hub should not be tightened completely. Final tightening is done after the chain slack adjustment.



3. Install:
   - Rear axle

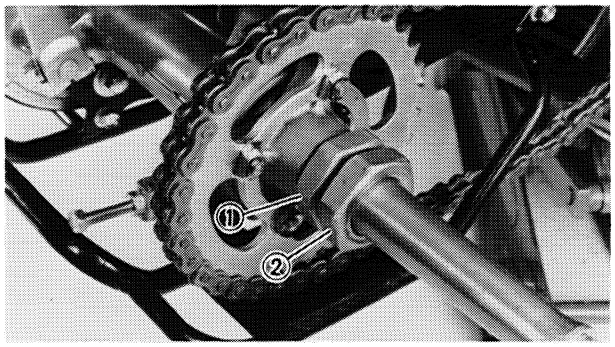
⚠ CAUTION:
- **Never directly tap the axle end with a hammer, this will result in damage to the axle thread ① and spline ②.**
- **Install the wheel boss ③ and suitable socket ④ on the right axle end to prevent the thread and spline from damage.**

4. Install:
   - Brake drum

	Nuts (brake drum): **21 Nm (2.1 m · kg, 15 ft · lb)**

⚠ WARNING:

Always use a new lock washer.



5. Bend:
   - Lock washer tabs (at brake drum)
6. Tighten:
   - Nut ① (rear axle – inner)
   - Nut ② (rear axle – outer)

Rear axle nuts tightening steps:

NOTE:

Before tightening the nuts, apply the LOCKTITE® to the thread portion of the rear axle.

- Tighten the nut (inner) with the nut wrench to specification while holding the rear axle.

	Nut wrench: **P/N YM-37132, 90890-01419**
	Nut (inner) – (first tightening): **55 Nm (5.5 m · kg, 40 ft · lb)**

- Hold the nut (inner) and tighten the nut (outer) with the nut wrench to specification.

	Nut (outer): **190 Nm (19.0 m · kg, 140 ft · lb)**

- Hold the nut (outer) and tighten back the nut (inner) with the nut wrench to specification.

	Ring nut (inner) – (final tightening): **240 Nm (24.0 m · kg, 170 ft · lb)**

6

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

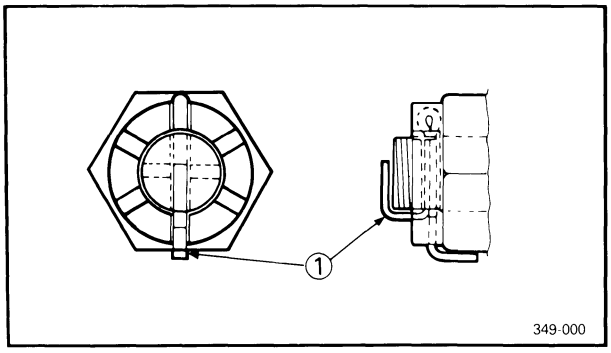
Drive chain slack:
30 mm (1.18 in)

Bolt (rear axle hub):
Upper
85 Nm (8.5 m · kg, 61 ft · lb)
Lower
60 Nm (6.0 m · kg, 43 ft · lb)
Locknut (adjuster):
16 Nm (1.6 m · kg, 11 ft · lb)
Locknut (hub lockbolt):
16 Nm (1.6 m · kg, 11 ft · lb)

8. Install:
   - Wheel hub
   - Plate washer
   - Nut (wheel hub)

Nut (wheel hub):
120 Nm (12 m · kg, 87 ft · lb)

9. Install:
   - Cotter pins (new) ①



NOTE:
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.

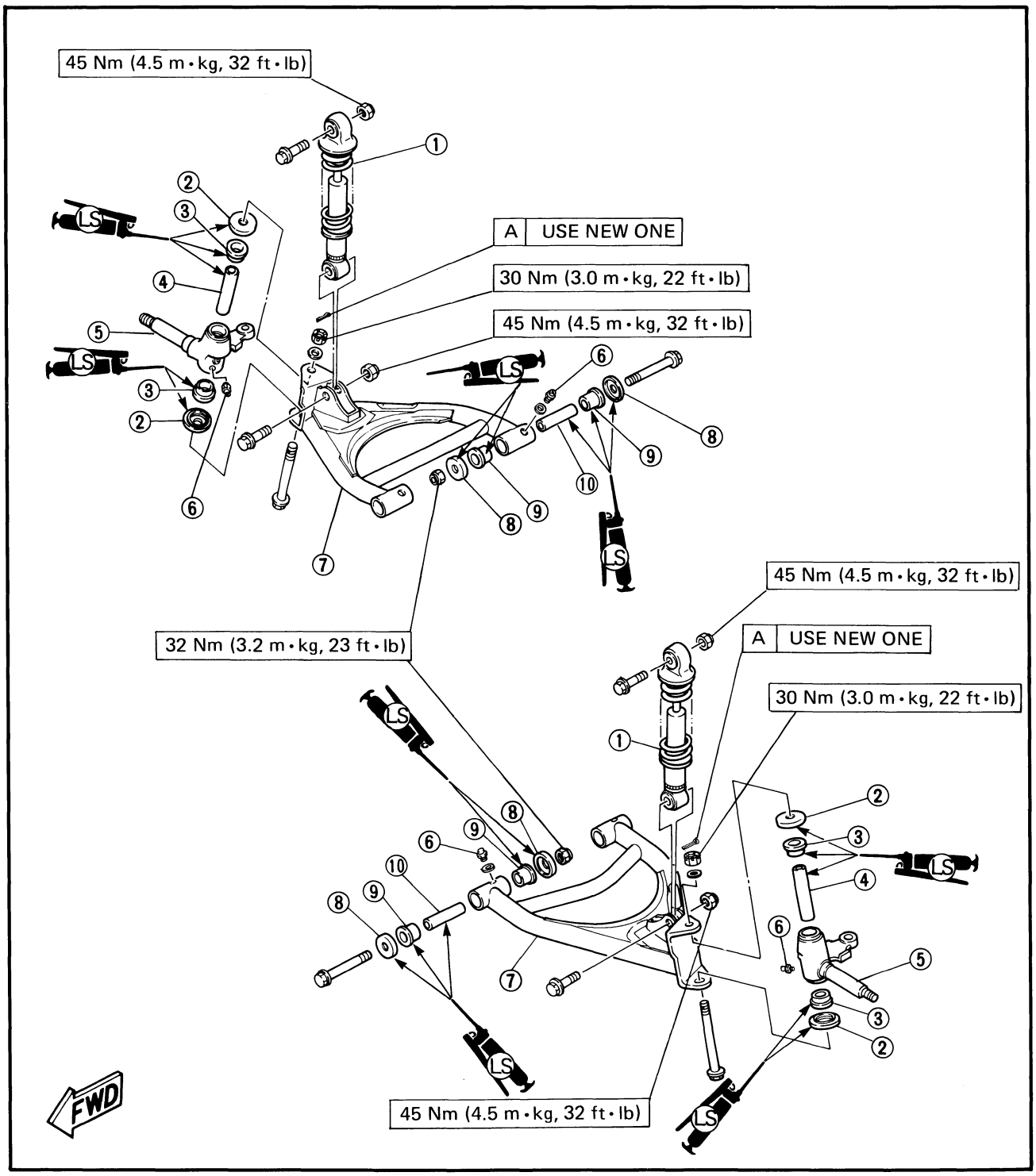
10. Install:
    - Rear wheel

Nut (rear wheel):
55 Nm (5.5 m · kg, 40 ft · lb)

⚠ WARNING:
Tapered wheel nuts are used for rear wheels. Install the nuts with its tapered side towards the wheel.

FRONT SUSPENSION

① Shock absorber
② Thrust cover
③ Bush
④ Spacer
⑤ Steering knuckle
⑥ Grease nipple
⑦ Front arm
⑧ Thrust cover
⑨ Bush
⑩ Spacer



REMOVAL

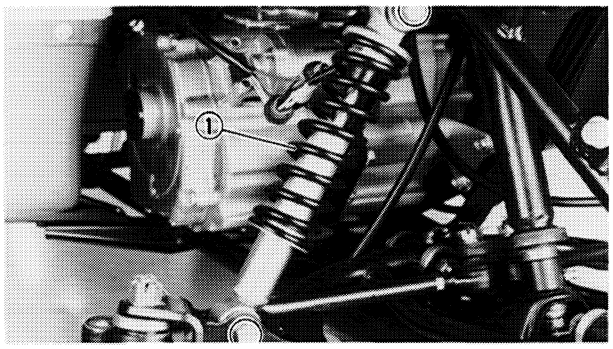
1. Elevate the front wheels by placing a suitable stand under the frame.

⚠ WARNING:

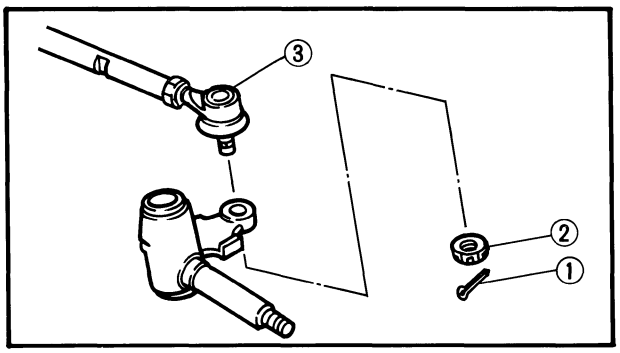
Support the machine securely so there is no danger of it falling over.

2. Remove:
   - Front wheel
   - Wheel hub
   - Brake shoe plate

   Refer to "FRONT WHEEL – REMOVAL" section.

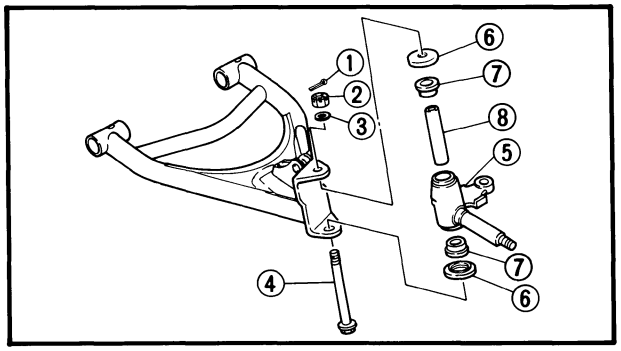


3. Remove:
   - Shock absorber ①



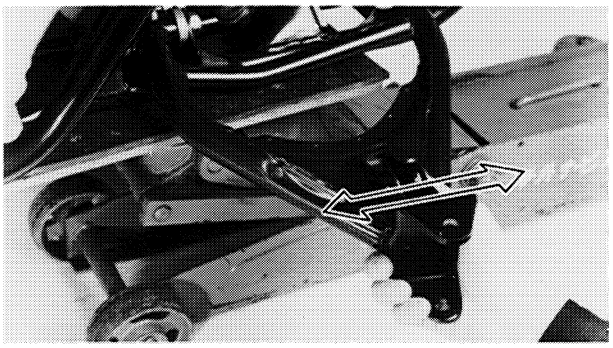
4. Remove:
   - Cotter pin ①
   - Nut ②
   - Tie-rod ③

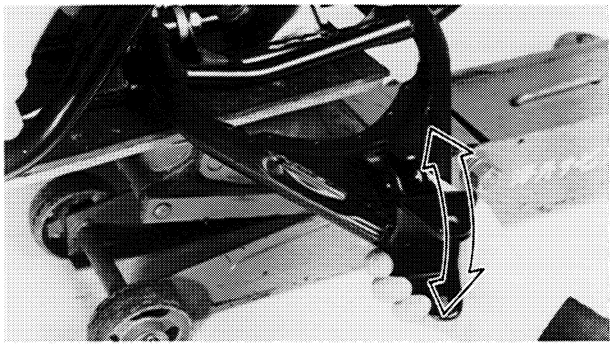
   (from steering knuckle)



5. Remove:
   - Cotter pin ①
   - Nut ②
   - Washer ③
   - Bolt ④
   - Steering knuckle ⑤
   - Covers ⑥
   - Collars ⑦
   - Bush ⑧

6





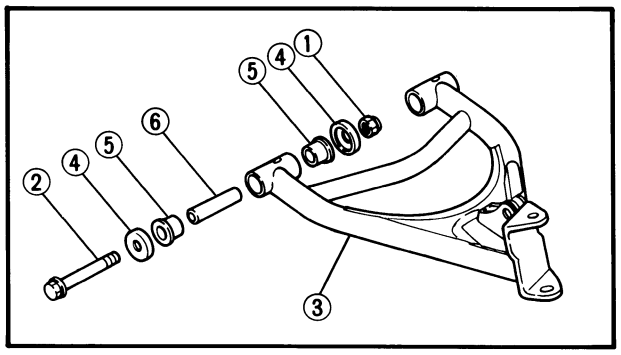
6. Check:
   - Front arm free play

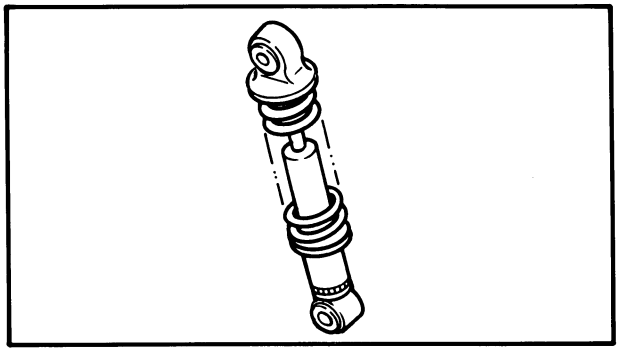
Inspection steps:
- Check the front arm brackets of the frame.
  If bent, cracked or damaged, repair or replace the frame.
- Check the tightening torque of the front arms securing nuts.

Nut (front arm):
32 Nm (3.2 m · kg, 23 ft · lb)

- Check the front arm side play [A] by moving it from side to side. If side play noticeable, replace the inner collar, bushings and thrust covers as a set.
- Check the front arm vertical movement [B] by moving it up and down.
  If vertical movement is tight, binding or rough, replace the inner collar, bushings and thrust covers as a set.

6

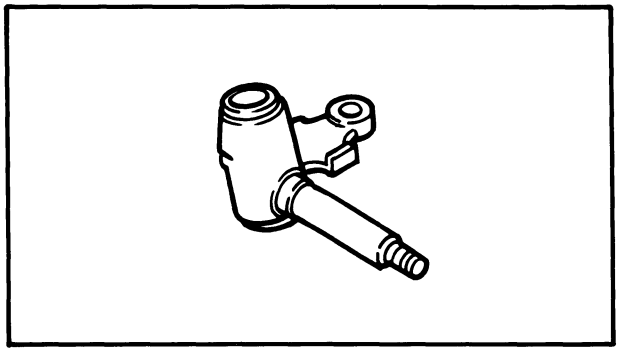




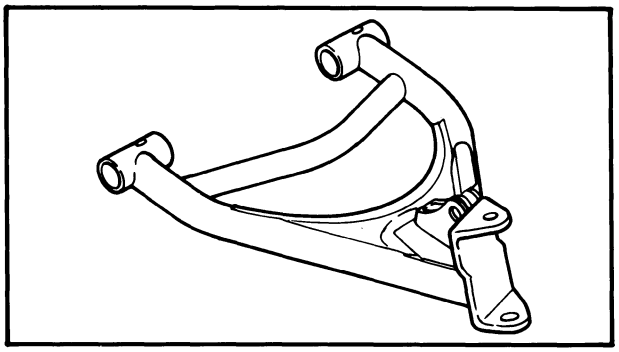
7. Remove:
   - Nuts ①
   - Bolts ②
   - Front arm ③
   - Covers ④
   - Collars ⑤
   - Bushes ⑥

INSPECTION

1. Inspect:
   - Shock absorber rod
     Bends/Damage → Replace the shock absorber assembly.
   - Shock absorber
     Oil leakes → Replace the shock absorber assembly.
   - Spring
     Fatigue → Replace the shock absorber assembly.
     Move the spring up and down.



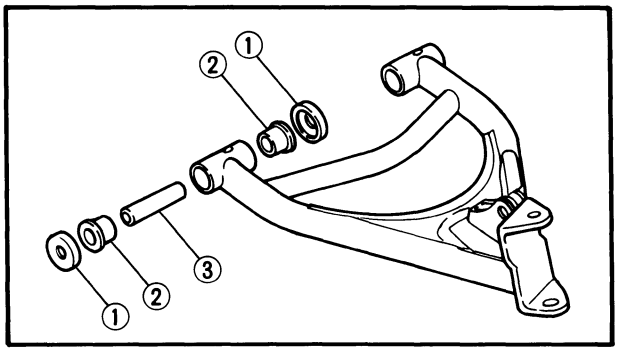
2. Inspect:
   - Steering knuckle
     Cracks/Pitting/Damage → Replace.



3. Inspect:
   - Front arm
     Cracks/Bends/Damage → Replace.

⚠ WARNING:

Do not attempt to straighten a bent arm; this may dangerously weaken the arm.



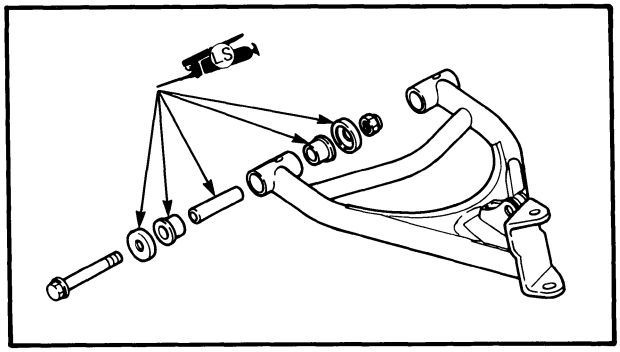
4. Inspect:
   - Cover ①
   - Collar ②
   - Bush ③
     Wear/Damage → Replace.

6

INSTALLATION

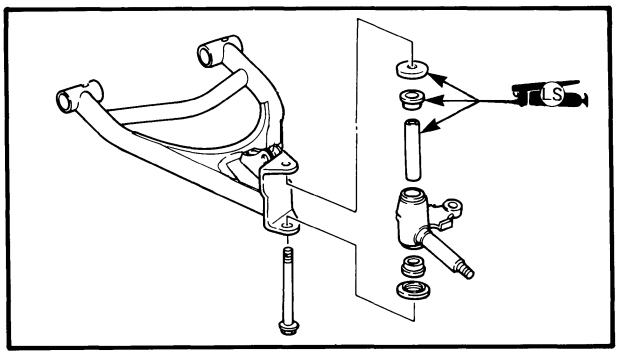
Reverse the "REMOVAL" procedures.
Note the following points.

1. Apply:
   - Lithium soap base grease
     (onto the bushes, collars and covers)



2. Install:
   - Front arm
     (onto the frame)

	Nuts (front arm): **32 Nm (3.2 m · kg, 23 ft · lb)**



3. Apply:
   - Lithium soap base grease
     (onto the bush, collars and covers)
4. Install:
   - Steering knuckle
     (onto the front arm)

	Nut (steering knuckle): **30 Nm (3.0 m · kg, 22 ft · lb)**

⚠ WARNING:

Always use a new cotter pin.

5. Install:
   - Tie-rod
     (onto the steering knuckle)

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

⚠ WARNING:

Always use a new cotter pin.

6. Install:
   - Shock absorber

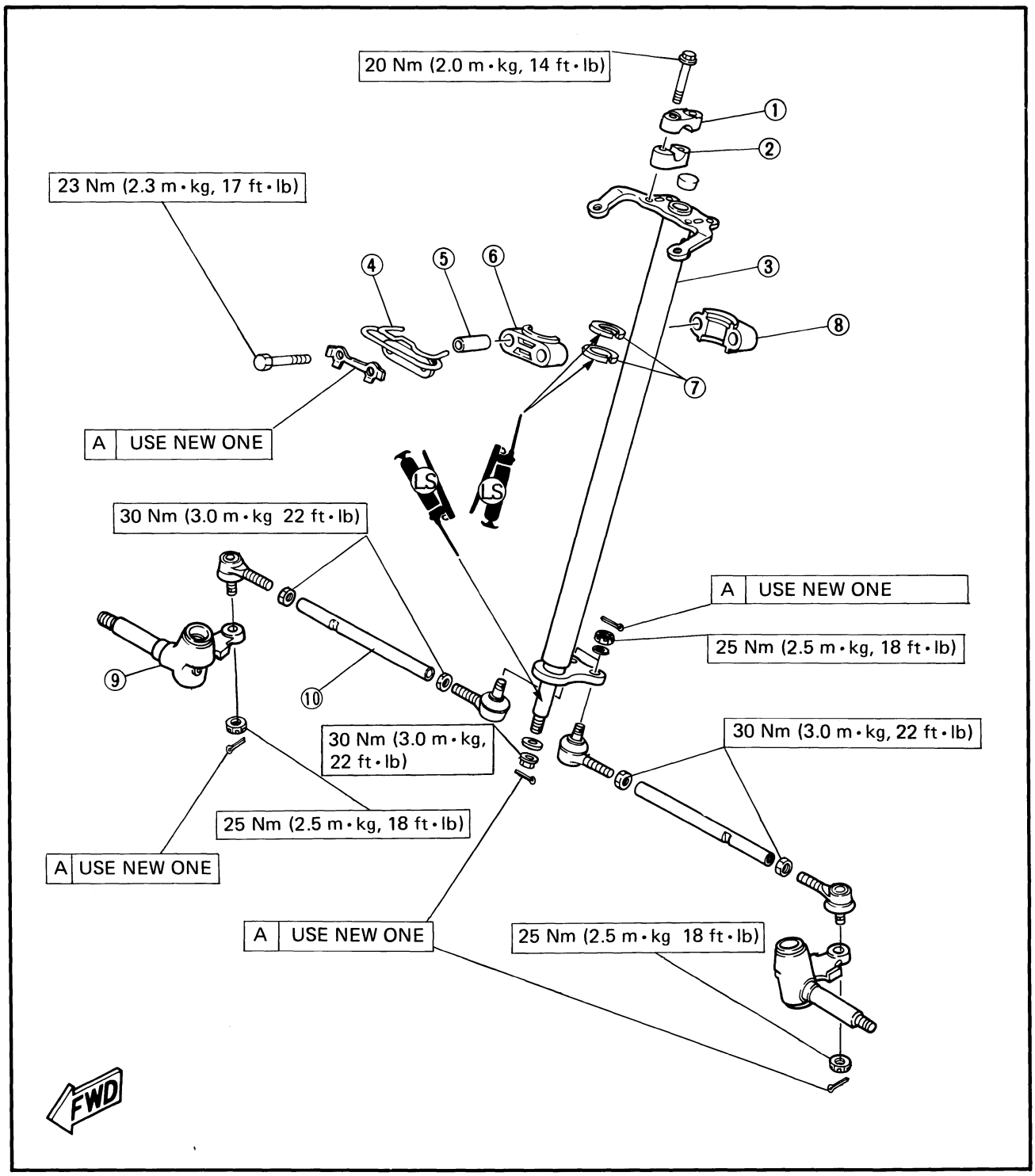
	Nuts (shock absorber): **45 Nm (4.5 m · kg, 32 ft · lb)**

7. Install:
   - Brake shoe plate
   - Wheel hub
   - Front wheel

   Refer to the "FRONT WHEEL – INSTALLATION" section.

STEERING SYSTEM

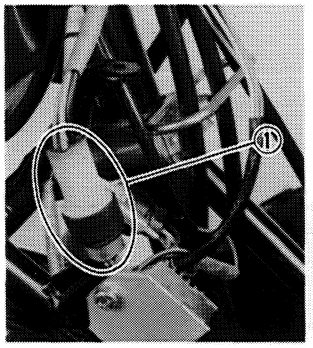
① Handlebar holder (upper)
② Handlebar holder (lower)
③ Steering column
④ Cable guide
⑤ Collar
⑥ Steering bracket
⑦ Oil seal
⑧ Steering bracket
⑨ Steering knuckle
⑩ Tie-rod

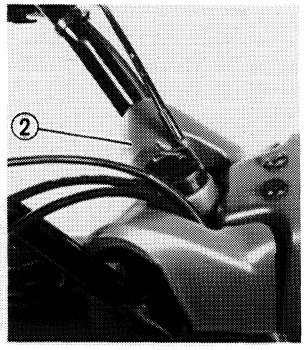


REMOVAL

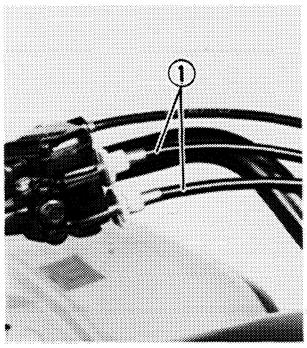
1. Remove:
   - Seat
   - Cover (front)
   - Cover (center)
   - Front fender

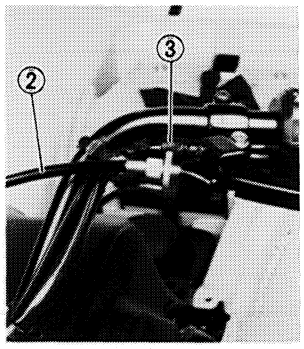
   Refer to the "FENDERS" section in the CHAPTER 3.





2. Disconnect:
   - Main switch lead ①
3. Remove:
   - Handlebar cover ② (with main switch)

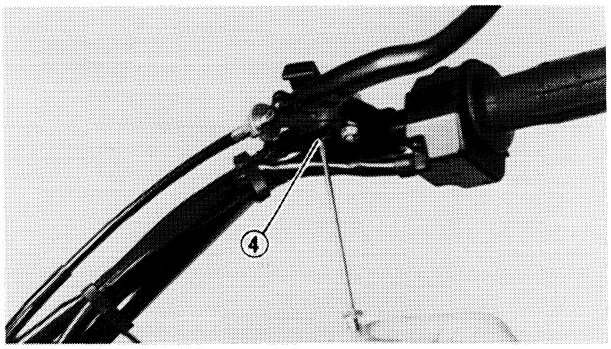


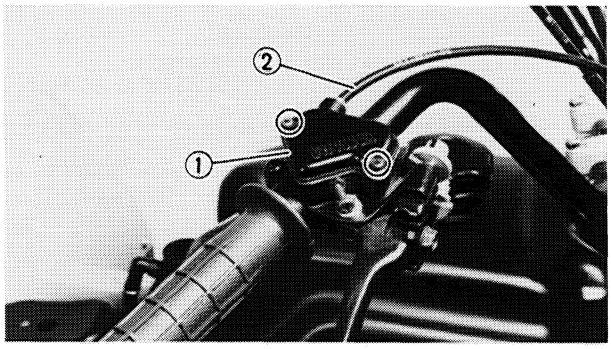


4. Disconnect:
   - Front brake cables ①
     (from the brake lever)
   - Rear brake cable ②
     (from the brake lever)
   - Brake switch ③
     (from the bracket of the brake lever)

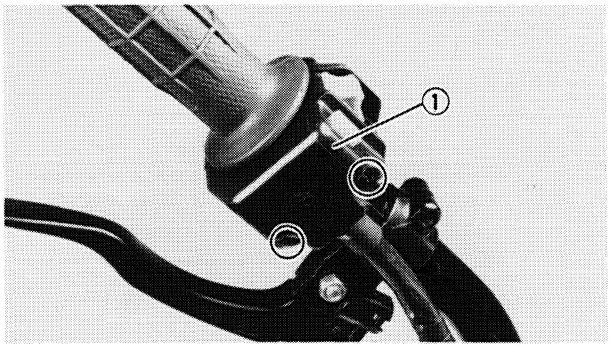
NOTE:

Disconnect the brake switch from the bracket of the brake lever while pushing the hook ④ of the brake switch with a driver.

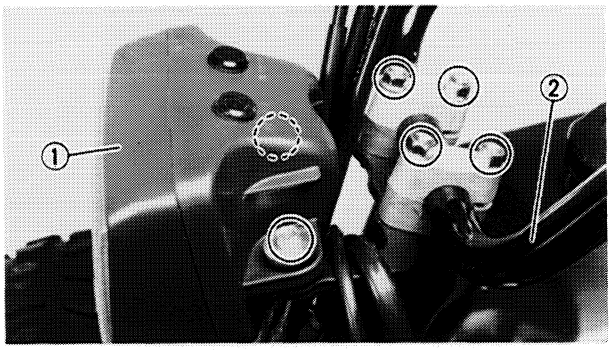




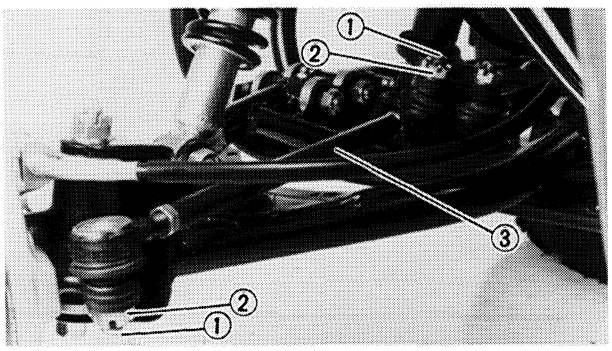
5. Remove:
   - Cover ① (throttle housing)
6. Disconnect:
   - Throttle cable ②
     (from the lever)



7. Remove:
   - Handlebar switch ①

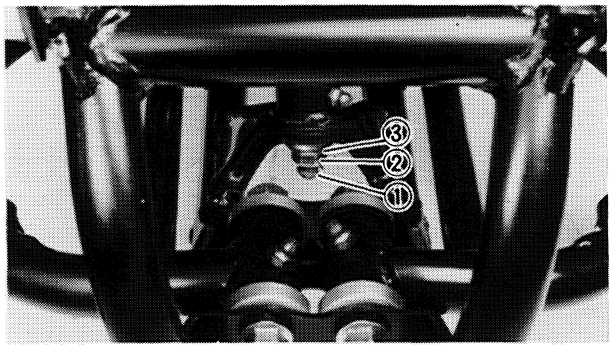


8. Remove:
   - Headlight unit ①
   - Handlebar ②

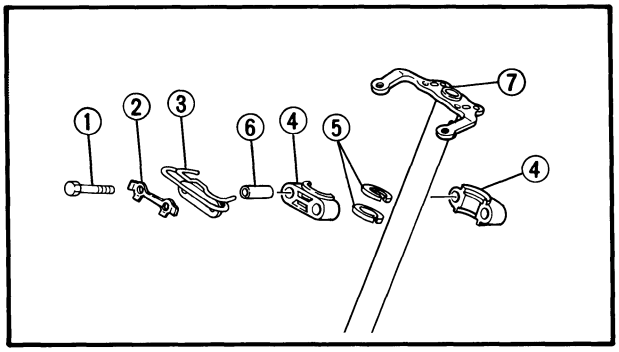


9. Remove:
   - Cotter pins ①
   - Nuts ②
   - Tie-rods ③

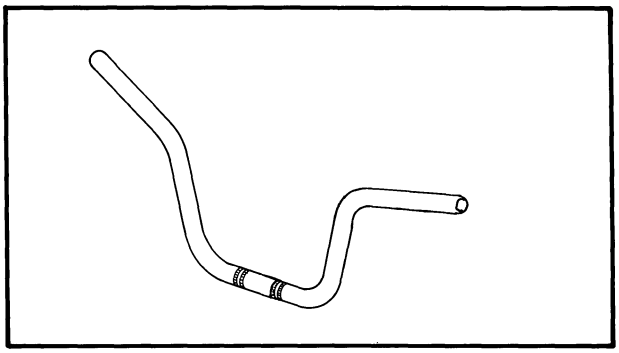
NOTE:
Remove the end of the tie-rod from the steering column and steering knuckle with a general bearing puller.



10. Remove:
    - Cotter pin ①
    - Nut ② (steering column)
    - Washer ③

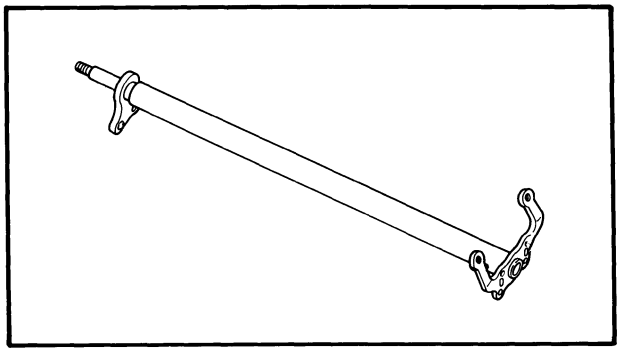


11. Straighten:
    - Lock washer tabs
12. Remove:
    - Bolts ①
    - Lock washer ②
    - Cable holder ③
    - Steering brackes ④
    - Oil seals ⑤
    - Collars ⑥
    - Steering column ⑦



INSPECTION

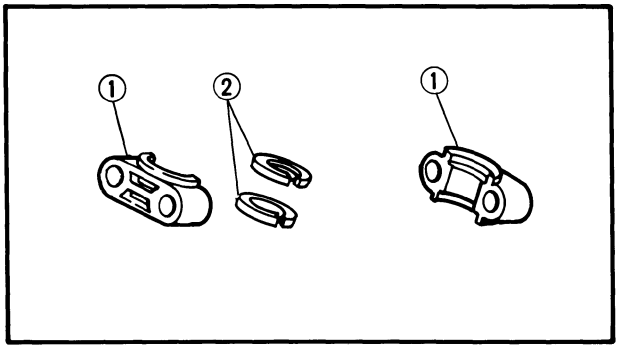
1. Inspect:
   - Handlebar
     Cracks/Bends/Damage → Replace.



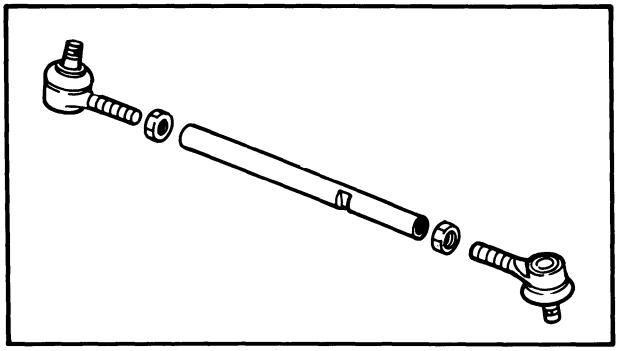
2. Inspect:
   - Steering column
     Bends/Damage → Replace.

⚠ WARNING:

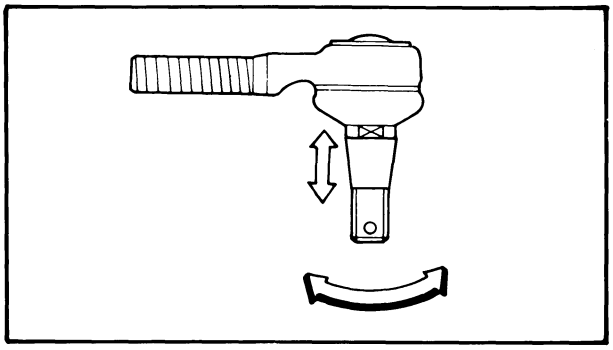
Do not attempt to straighten a bent shaft; this may dangerously weaken the shaft.



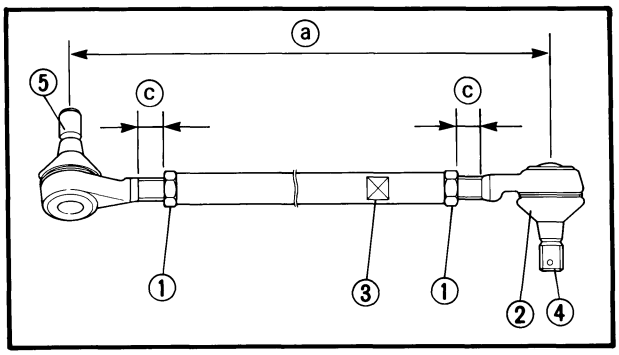
3. Inspect:
   - Steering brackets ①
   - Oil seal ②
     Wear/Damage → Replace.

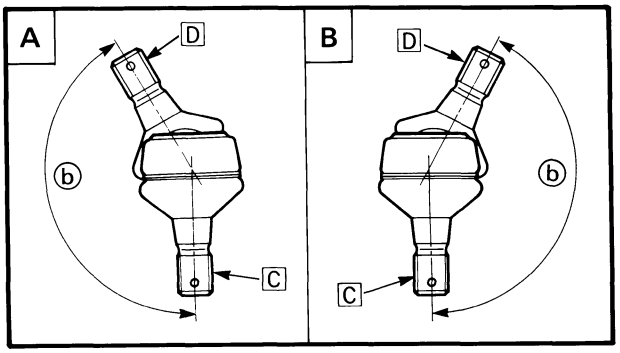


4. Inspect:
   - Tie-rod
     Bend/Damage → Replace.



5. Check:
   - Tie-rod end movement
     Tie-rod end exists free play → Replace.
     Tie-rod end turns roughly → Replace.
   - Tapered surface (Tie-rod end)
     Pitting/Wear/Damage → Replace.





6. Adjust:
   - Tie-rod length and rod-end angle

Adjustment steps:

(The following procedures are done on both tie-rods, right and left:)

- Loosen the locknuts ①.
- Adjust the tie-rod length ⓐ by turning both tie-rod ends.

Tie rod length:
277 mm (10.9 in)

- Set the rod-end ② (knuckle arm side) in an angle where the indentation surface ③ of the tie-rod is parallel to the rod-end shaft ④, and then tighten the locknut.

Locknut (rod-end):
30 Nm (3.0 m · kg, 22 ft · lb)

- Set the other rod-end ⑤ (steering column side) in an angle as shown in figures A and B, and then tighten the locknut.

Rod-end (tie rod) angle ⓑ:
164° ~ 166°

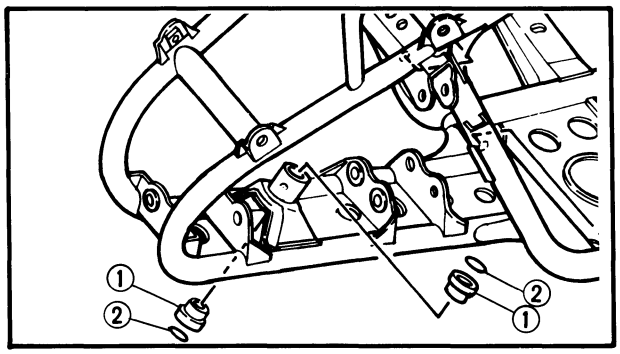
Locknut (rod-end):
30 Nm (3,0 m · kg, 22 ft · lb)

NOTE:

The threads ⓒ on both rod-ends must be of the same length.

- After making adjustment on both tie rods, be sure to mark them R and L for identification.

A Right-hand tie-rod
B Left-hand tie-rod
C To knuckle arm D To steering column



7. Inspect:
   - Bushings ①
   - O-rings ②
   - Wear/Damage → Replace.

INSTALLATION

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

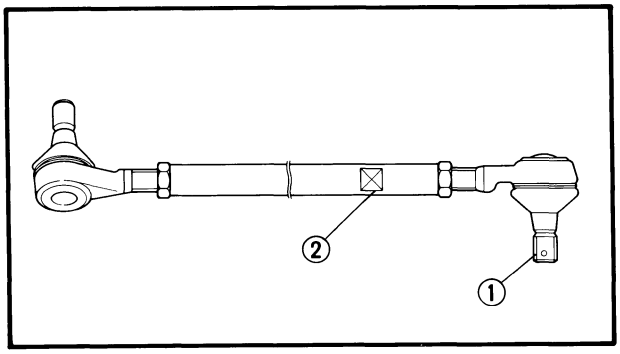
1. Apply:
   - Lithium soap base grease (onto the o-rings, oil seals and bushes).
2. Install:
   - Steering column

Nut (steering column end):
30 Nm (3.0 m · kg, 22 ft · lb)
Bolts (steering bracket):
23 Nm (2.3 m · kg, 17 ft · lb)

⚠ WARNING:

Always use a new cotter pin and lock washer.

3. Bend:
   - Lock washer tabs
   - Ends of cotter pin
4. Install:
   - Tie rods



Nuts:
25 Nm (2.5 m · kg, 18 ft · lb)

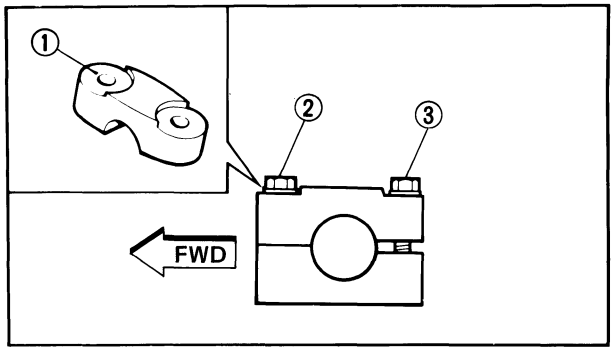
NOTE:

Be sure that the rod-end ① on the identation ② side is connected to the knuckle arm.

⚠ WARNING:

Always use a new cotter pin.

5. Bend:
   - Ends of cotter pin
6. Install:
   - Handlebar



Bolt (handlebar holder):
20 Nm (2.0 m · kg, 14 ft · lb)

NOTE:

Be sure the upper handlebar holder mark ① face to front.

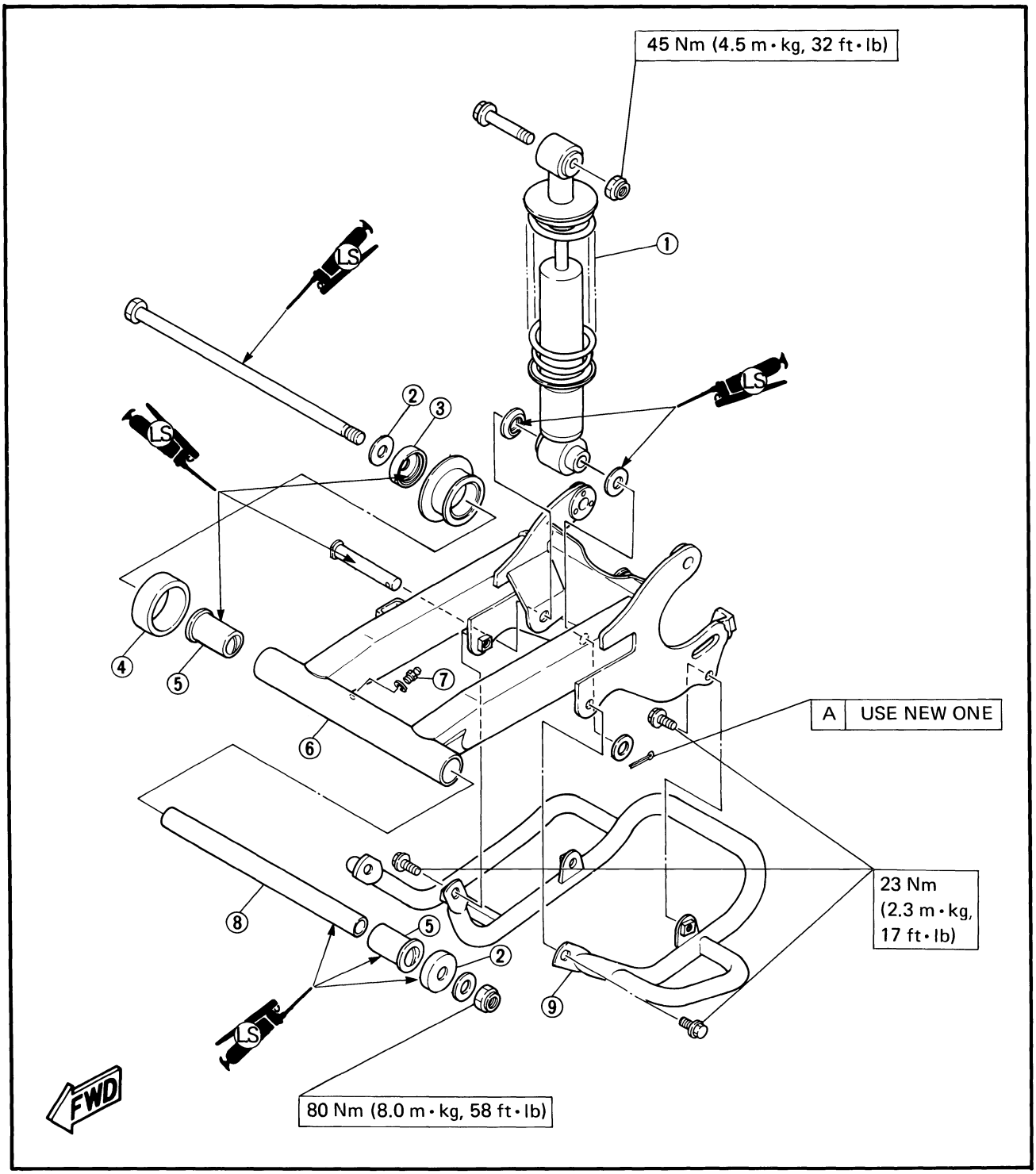
⚠ CAUTION:

First tighten the bolts ② on the front side of the handlebar holder, and then tighten the bolts ③ on the rear side.

7. Apply:
   - Lithium soap base grease
     (onto the end of the throttle cable and end of the brake cable).
8. Adjust:
   - Toe-in
     Refer to the "TOE-IN ADJUSTMENT" section in the CHAPTER 3.
   - Front brake
     Refer to the "FRONT BRAKE ADJUSTMENT" section in the CHAPTER 3.
   - Rear brake
     Refer to the "REAR BRAKE ADJUSTMENT" section in the CHAPTER 3.

SWINGARM

① Rear shock absorber
② Thrust cover
③ Chain guard (inner)
④ Chain guard (outer)
⑤ Bush
⑥ Swingarm
⑦ Grease nipple
⑧ Collar
⑨ Lower guard



REMOVAL

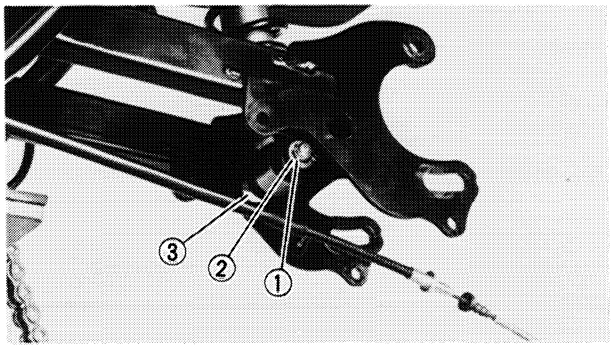
1. Place the machine on a level place.
2. Elevate the rear wheels by placing a suitable stand under the rear of frame.

⚠ WARNING:

Support the machine securely so there is no danger of it falling over.

3. Remove:
   - Rear wheels
   - Rear hub (with rear axle)

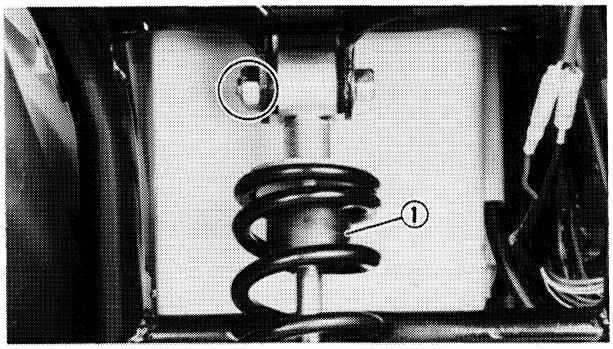
   Refer to the "REAR WHEEL – REMOVAL" section.



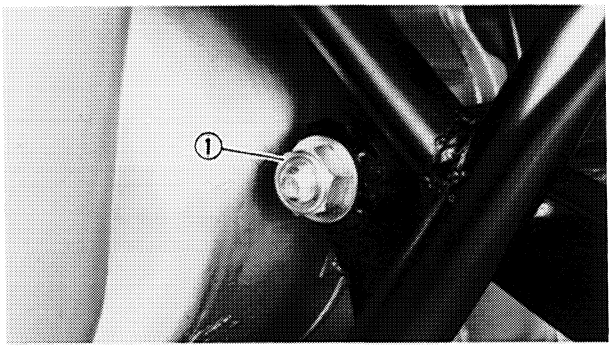
4. Remove:
   - Cotter pin ①
   - Washer ②
   - Shaft ③

NOTE:

When removing the lower shaft, hold the swingarm so that it does not drop downwards when the shaft is removed.



5. Remove:
   - Shock absorber ①

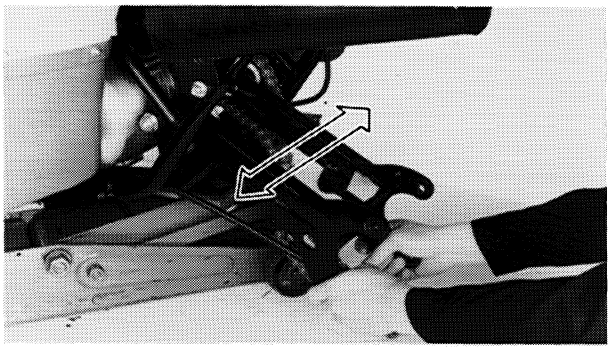


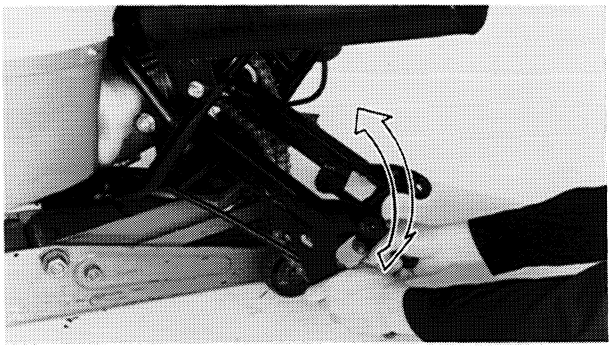
6. Check:
   - Swingarm free play

Swingarm free play inspection steps:

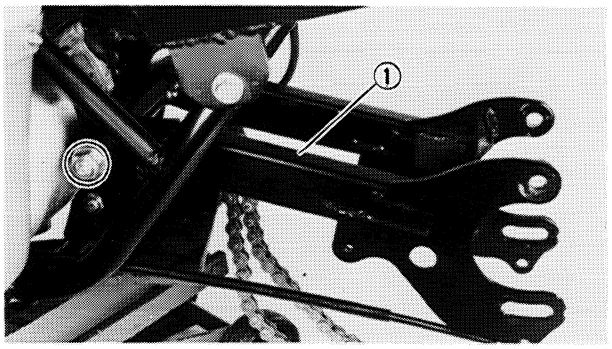
- Check the tightening torque of the pivot shaft (swingarm) securing nut ①.

	Nut (swingarm-pivot shaft): 80 Nm (8.0 m · kg, 58 ft · lb)

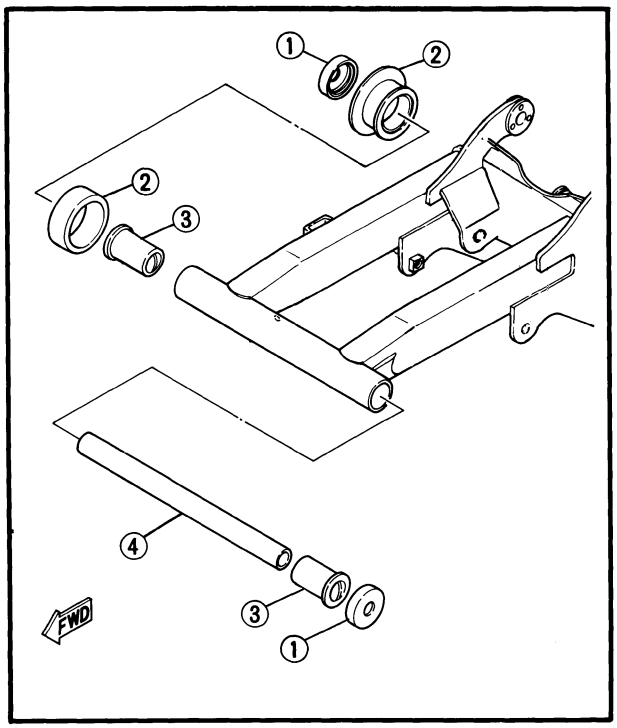




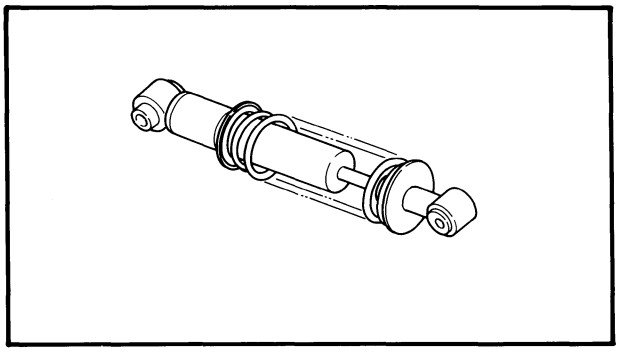
- Check the swingarm side play [A] by moving it from side to side.
  If side play noticeable, check the inner collar, bearing, bushing and thrust cover, or adjust the shim.
- Check the swingarm vertical movement [B] by moving it up and down.
  If vertical movement is tight, binding or rough, check the inner collar, bearing, bushing and thrust cover, or adjust the shim.



7. Remove:
   - Swingarm ①

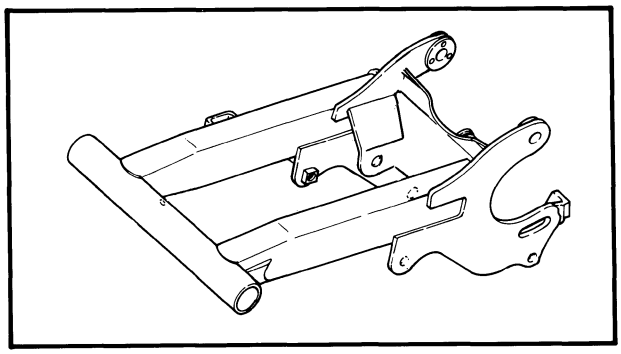


8. Remove:
   - Thrust covers ①
   - Chain guards ②
   - Bushes ③
   - Collar ④

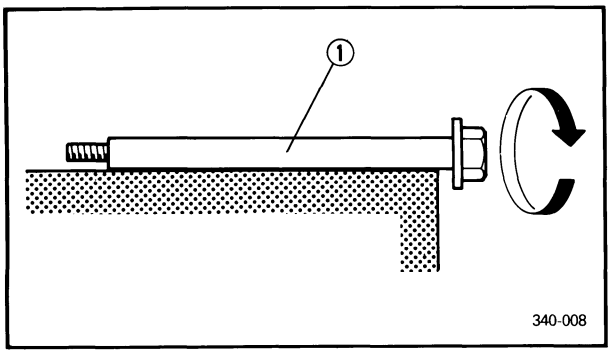


INSPECTION

1. Inspect:
   - Shock absorber rod
     Bends/Damage → Replace the shock absorber assembly.
   - Shock absorber
     Oil leaks → Replace the shock absorber assembly.
   - Spring
     Fatigue → Replace the shock absorber assembly.
     Move the spring up and down.



2. Inspect:
   - Swingarm
     Crack/Bend/Damage → Replace.



3. Inspect:
   - Pivot shaft ①
     Roll the axle on a flat surface.
     Bends → Replace.

⚠ WARNING:

Do not attempt to straighten a bent axle.

4. Inspect:
   - Thrust cover
   - Chain guard
   - Collar
   - Bush
     Wear/Damage → Replace.

INSTALLATION

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

1. Apply:
   - Lithium soap base grease
     (onto the collar, bushes, pivot shaft and and thrust cover).
2. Install:
   - Swingarm

Nut (pivot shaft):
80 Nm (8.0 m · kg, 58 ft · lb)

3. Install:
   - Shock absorber

Nut (shock absorber – upper):
45 Nm (4.5 m · kg, 32 ft · lb)

⚠ WARNING:

Always use a new cotter pin.

4. Install:
   - Rear hub
   - Rear wheels
     Refer to the "REAR WHEEL – INSTALLATION" section.
5. Adjust:
   - Drive chain slack
     Refer to the "DRIVE CHAIN SLACK ADJUSTMENT" section in the CHAPTER 3.

Drive chain slack:
30 mm (1.18 in)

6

DRIVE CHAIN AND SPROCKET

NOTE:

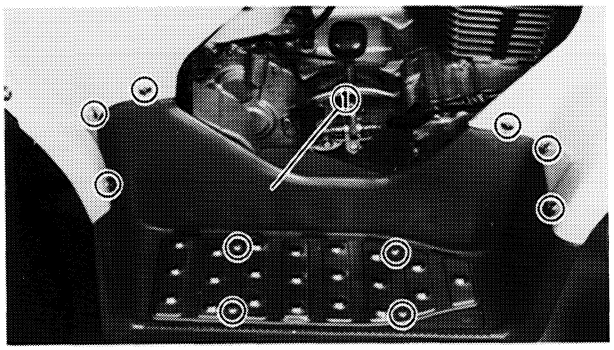
Before removing the drive chain and sprockets, drive chain slack and 10-link length of drive chain should be measured.

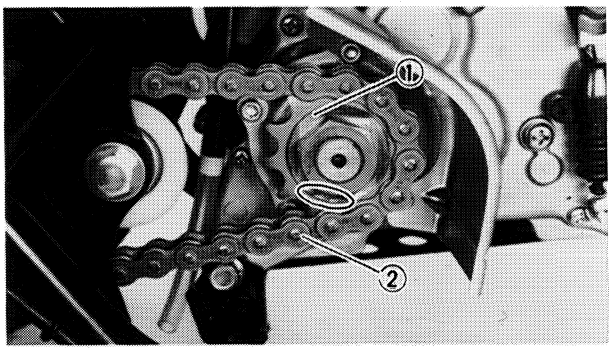
REMOVAL

1. Remove:
   - Rear wheels
   - Rear hub (with rear axle)

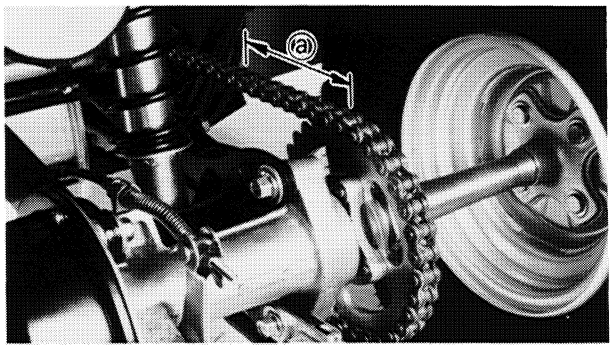
   Refer to the "REAR WHEEL – REMOVAL" section.
2. Remove:
   - Swingarm

   Refer to the "SWINGARM – REMOVAL" section.
3. Remove:
   - Foot board ① (right)





4. Straighten:
   - Lock washer tab
5. Remove:
   - Drive sprocket ①
   - Drive chain ②

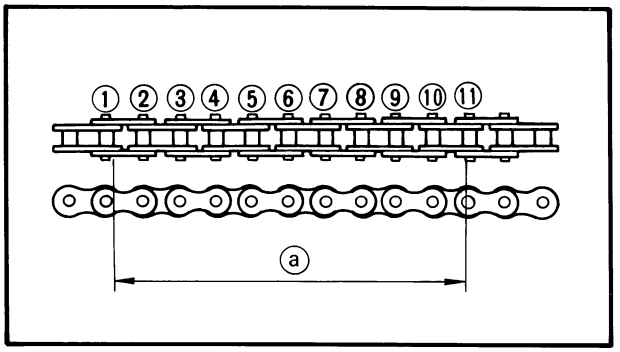


INSPECTION

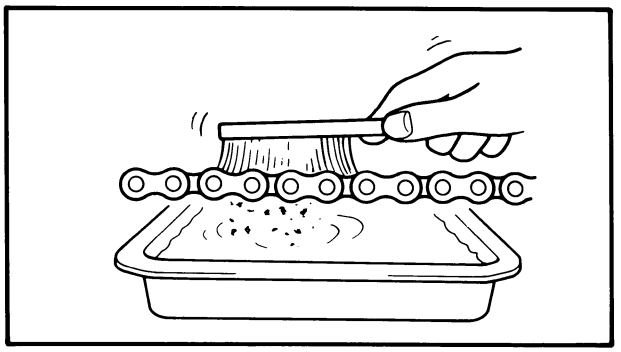
1. Measure:
   - 10-link length ⓐ (drive chain)

   Out of specification → Replace drive chain.

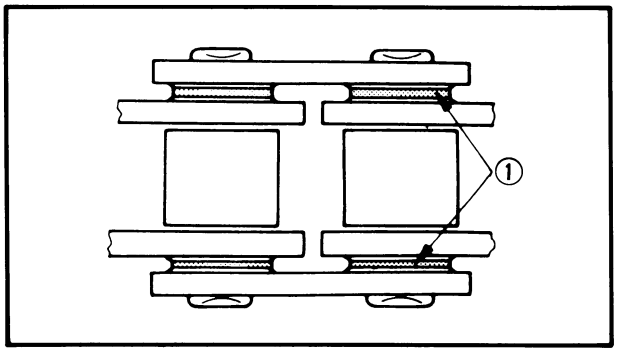
	10-Link length limit: 150.1 mm (5.91 in)



NOTE:
- For measurement make the chain tense by finger.
- 10-link length is a measurement between the insides of the ① and ⑪ rollers as shown.
- Two or three different 10-link lengths should be measured.

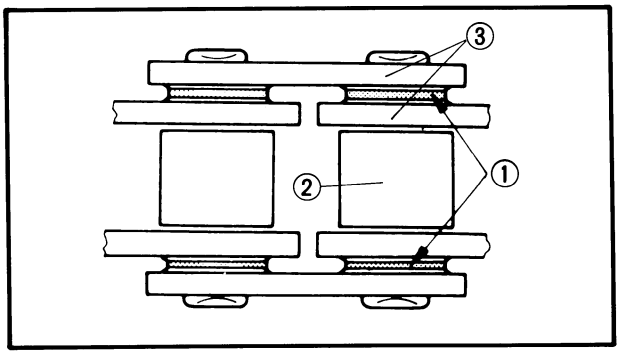


2. Clean:
   - Drive chain
     Place it in kerosene, and brush off as much dirt as possible. Then remove the chain from the kerosene and dry the chain.



⚠ CAUTION:

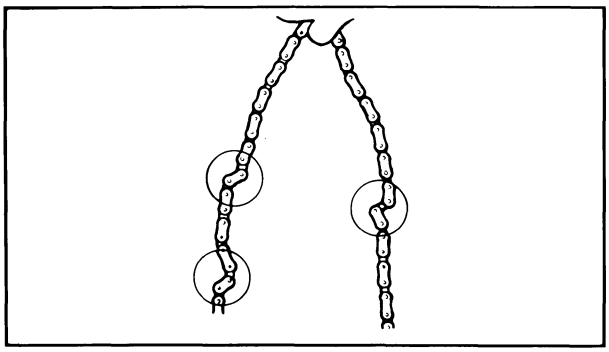
This machine has a drive chain with small rubber O-rings ① between the chain plates. Steam cleaning, high-pressure washes, and certain solvent can damage these O-rings. Use only kerosene to clean the drive chain.



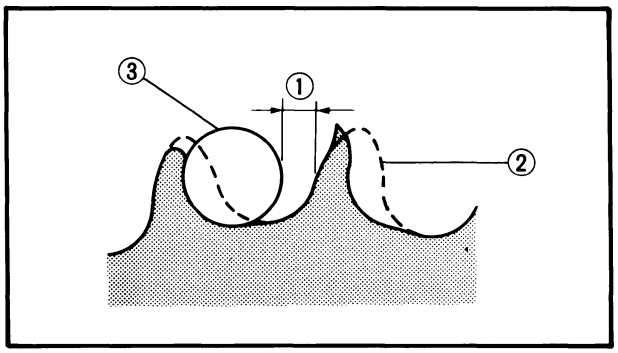
3. Inspect:
   - O-rings ① (drive chain)
     Damage → Replace drive chain.
   - Rollers ②
   - Side plates ③
     Damage/Wear → Replace drive chain.

4. Lubricate:
   - Drive chain

Drive chain lubricant:
SAE 30 ~ 50 Motor oil

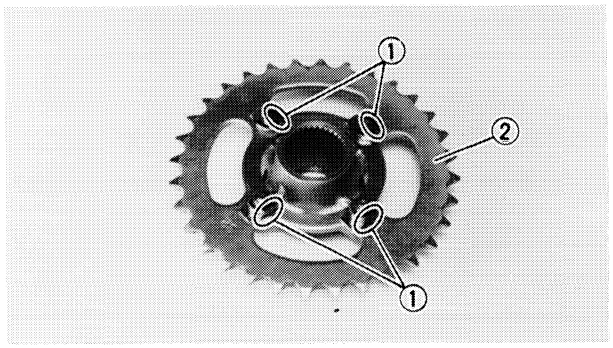


5. Inspect:
   - Drive chain stiffness
     Stiff → Clean and lubricate or replace.



6. Inspect:
   - Drive sprocket
   - Driven sprocket
     More than 1/4 teeth ① wear → Replace sprocket.
     Bent teeth → Replace sprocket.

②Correct
③Roller
④Sprocket



Driven sprocket replacement steps:
- Straighten the lock washer ① tabs and remove the driven sprocket ② .
- Install a new driven sprocket and lock washers.

⚠ WARNING:
Always use a new lock washers.

	Nuts (driven sprocket): 62 Nm (6.2 m · kg, 45 ft · lb)

- Bend the lock washer tabs along the nut flats.

6

INSTALLATION

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

1. Install:
   - Drive sprocket

	Nut (drive sprocket): 75 Nm (7.5 m · kg, 54 ft · lb)

2. Install:
   - Swingarm

   Refer to the "SWINGARM – INSTALLATION" section.
3. Install:
   - Rear hub (with rear axle)
   - Rear wheels

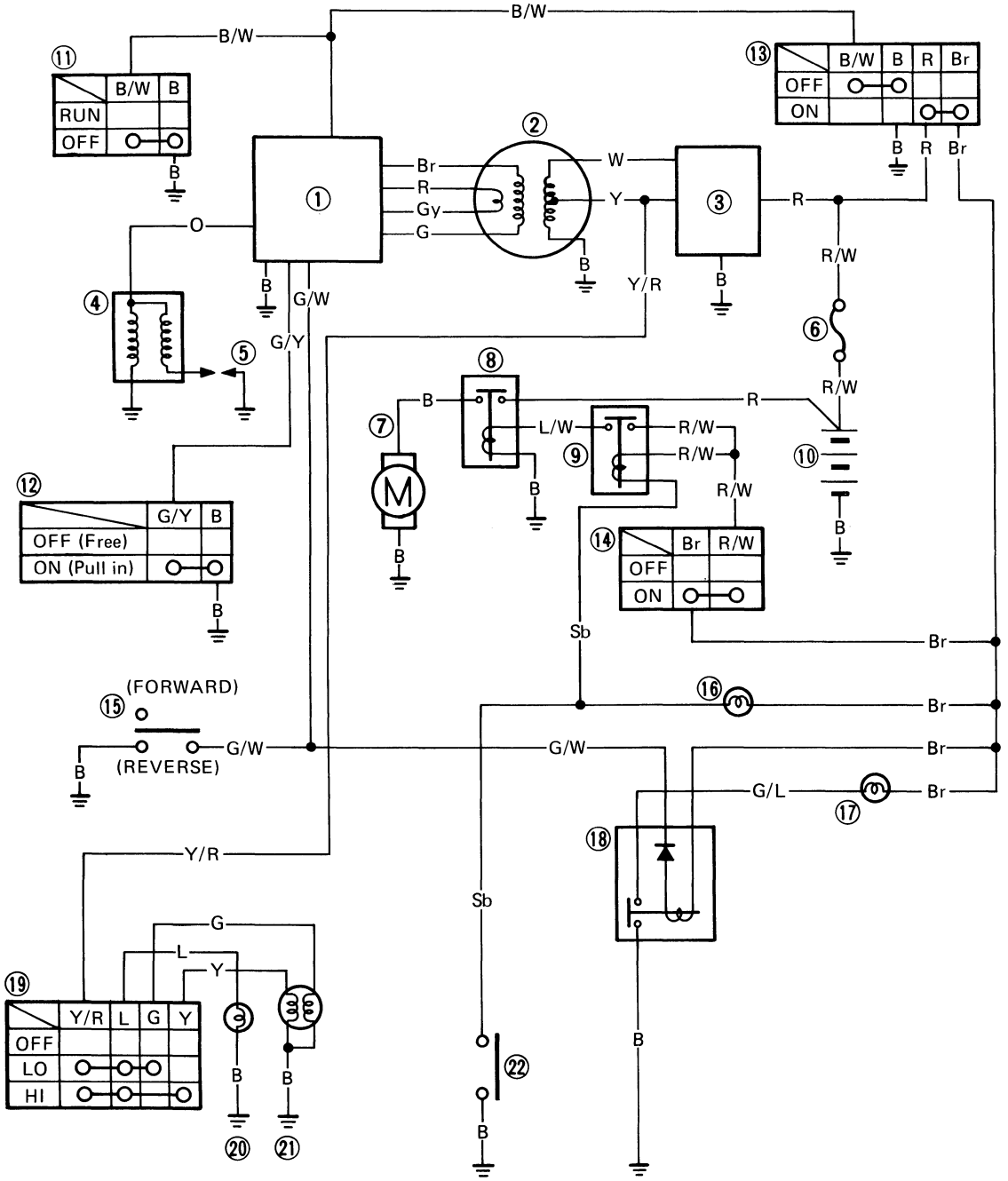
   Refer to the "REAR WHEEL – INSTALLATION" section.
4. Adjust:
   - Drive chain slack

   Refer to the "DRIVE CHAIN – SLACK ADJUSTMENT" section in the CHAPTER 3.

Drive chain slack:
30 mm (1.18 in)

ELECTRICAL

YFA1(W) CIRCUIT DIAGRAM



① CDI unit
② CDI magneto
③ Rectifier/Regulator
④ Ignition coil
⑤ Spark plug
⑥ Fuse
⑦ Starting motor
⑧ Starter relay
⑨ Starting circuit cut-off relay
⑩ Battery
⑪ "ENGINE STOP" switch
⑫ Brake switch
⑬ Main switch
⑭ "START" switch
⑮ Shift lever switch
⑯ "NEUTRAL" indicator light
⑰ "REVERSE" indicator light
⑱ Reverse relay
⑲ "LIGHTS" (Dimmer) switch
⑳ Taillight
㉑ Headlight
㉒ Neutral switch

COLOR CODE

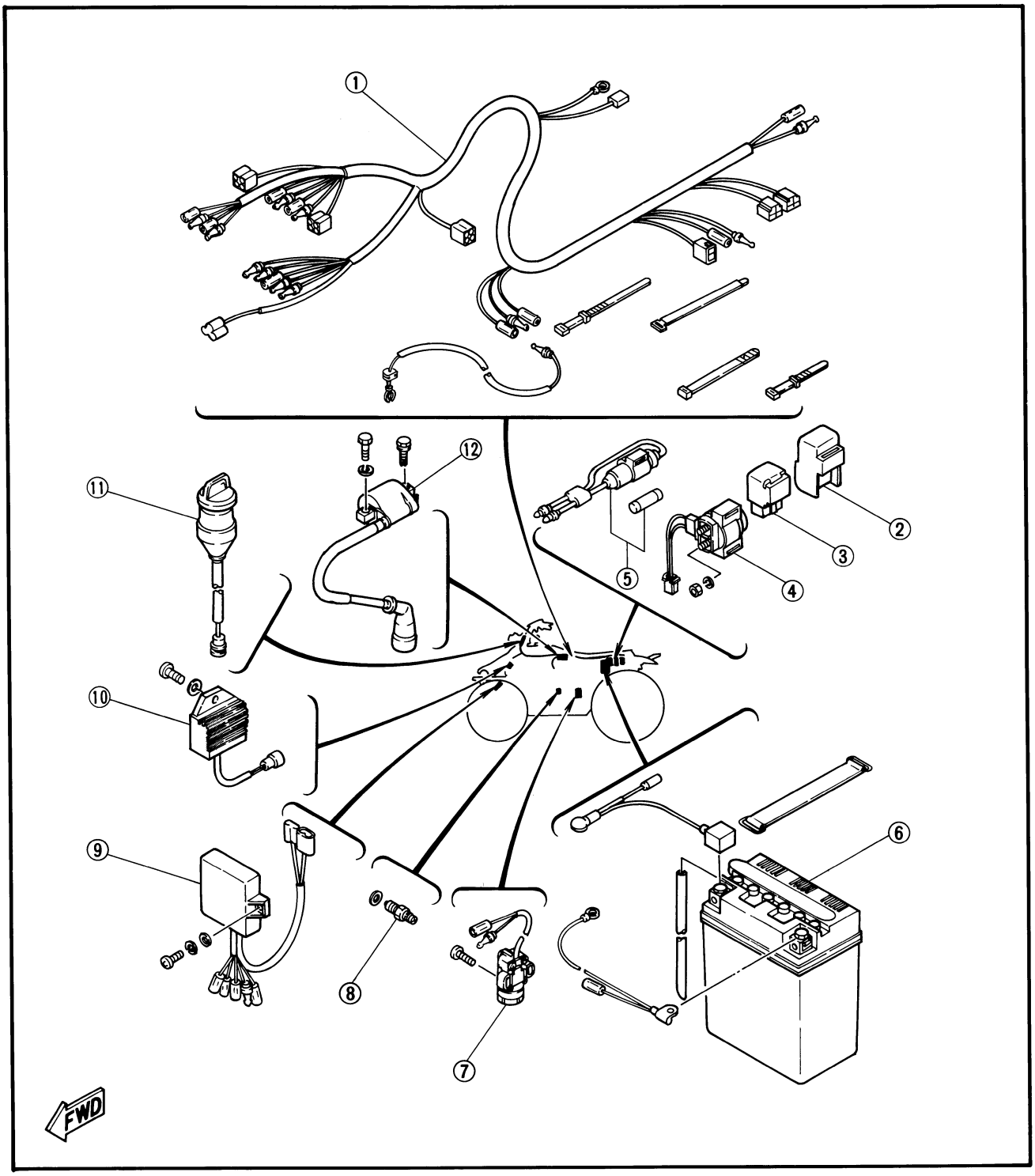
B	Black	R/W	Red/White
R	Red	B/W	Black/White
W	White	Y/R	Yellow/Red
Br	Brown	L/W	Blue/White
Y	Yellow	G/Y	Green/Yellow
G	Green	G/W	Green/White
O	Orange	G/L	Green/Blue
L	Blue		
Sb	Sky blue		
Gy	Gray		

ELECTRICAL COMPONENTS

① Wireharness
② Starting circuit cut-off relay
③ Reverse relay
④ Starter relay
⑤ Fuse
⑥ Battery
⑦ Shift lever switch
⑧ Neutral switch
⑨ CDI unit
⑩ Rectifier/Regulator
⑪ Main switch
⑫ Ignition coil

BATTERY:
CAPACITY: 12V 12AH
SPECIFIC GRAVITY: 1,280

IGNITION COIL:
PRIMARY COIL RESISTANCE
0.56 ~ 0.84Ω at 20°C (68°F)
SECONDARY COIL RESISTANCE
5.7 ~ 8.5kΩ at 20°C (68°F)



7

CHECKING OF SWITCHES

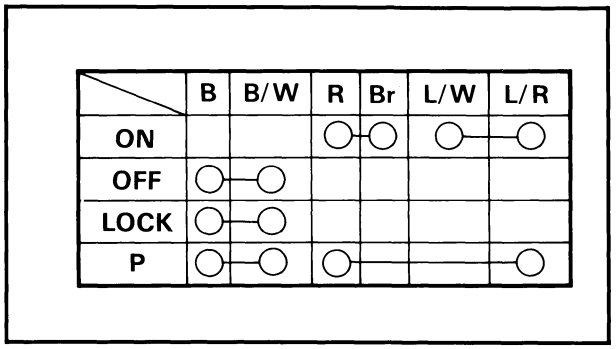
Check the switches for the continuity between the terminals to determine correct connection.

Read the following for switch inspection.

SWITCH CONNECTION AS SHOWN IN MANUAL

The manual contains a connection chart as shown left showing the terminal connections of the switches (e.g., main switch, handlebar switch, brake switch, lighting switch, etc.)

The extreme left column indicates the switch positions and the top line indicates the colors of leads connected with the terminals in the switch component.



"○—○" indicates the terminals between which there is a continuity of electricity; i.e., a closed circuit at the respective switch positions.

In this chart:
"R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

"B and B/W" is continuous with the "OFF" switch position.

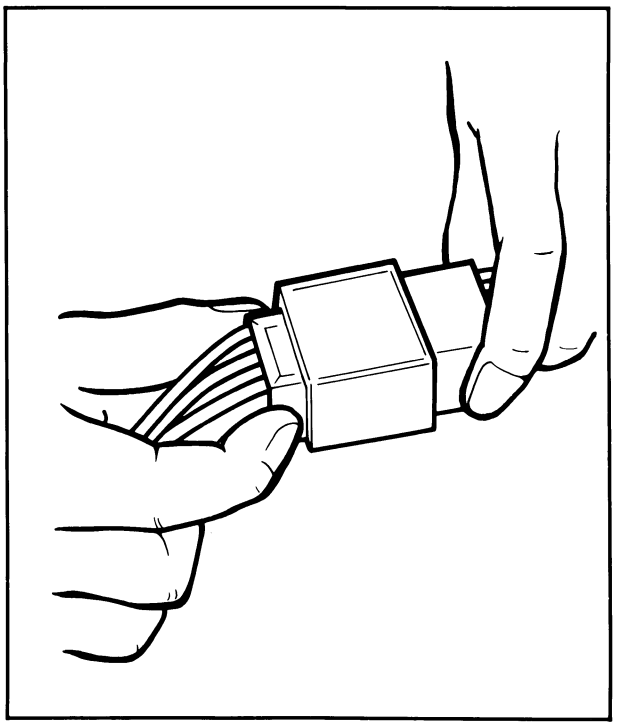
"B and B/W" is continuous with the "LOCK" switch position.

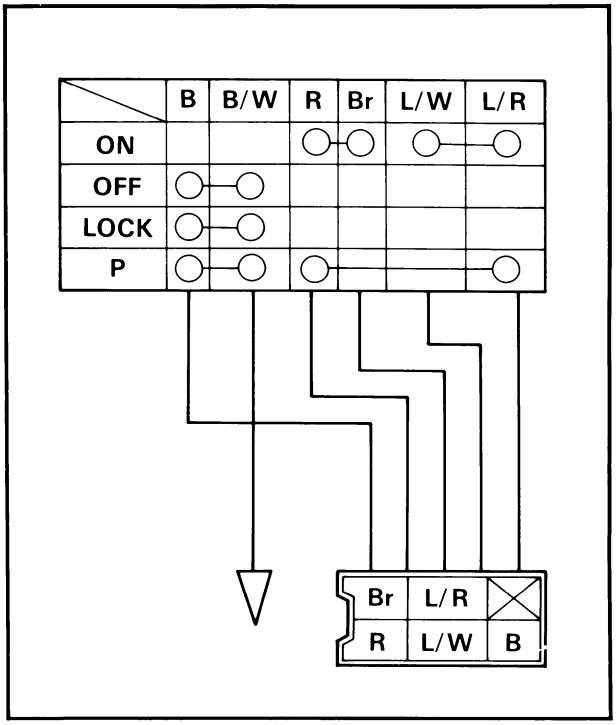
"B and B/W" and "R and L/R" are continuous with the "P" switch position.

CHECKING SWITCH FOR TERMINAL CONNECTION

Before checking the switch, refer to the connection chart as shown above and check for the correct terminal connection (closed circuit) by the color combination.

To explain how to check the switch, the main switch is taken for example in the following.





1. Disconnect the main switch coupler from the wireharness.

⚠CAUTION:

Never disconnect the main switch coupler by pulling the leads. Otherwise, leads may be pulled off the terminals inside the coupler.

2. Inspect whether any lead is off the terminal inside the coupler. If it is, repair it.

NOTE:

If the coupler is clogged with mud or dust, blow it off by compressed air.

3. Use the connection chart to check the color combination for continuity (a closed circuit). In this example, the continuity is as follows.

   "R and Br" and "L/W and L/R" are continuous with the "ON" switch position.

   "B and B/W" is continuous with the "OFF" switch position.

   "B and B/W" is continuous with the "LOCK" switch position.

   "B and B/W" and "R and L/R" are continuous with the "P" switch position.

   Please note that there is no continuity (an open circuit) at all for the color combinations other than the above.

4. Check the switch component for the continuity between "R and Br".

Checking steps:
- Turn the switch key to the "ON", "OFF", "LOCK", and "P" several times.
- Set the pocket tester selector to the "Ω × 1".
- Connect the tester (+) lead to the "R" lead terminal in the coupler and the (−) lead to the "Br" lead terminal.

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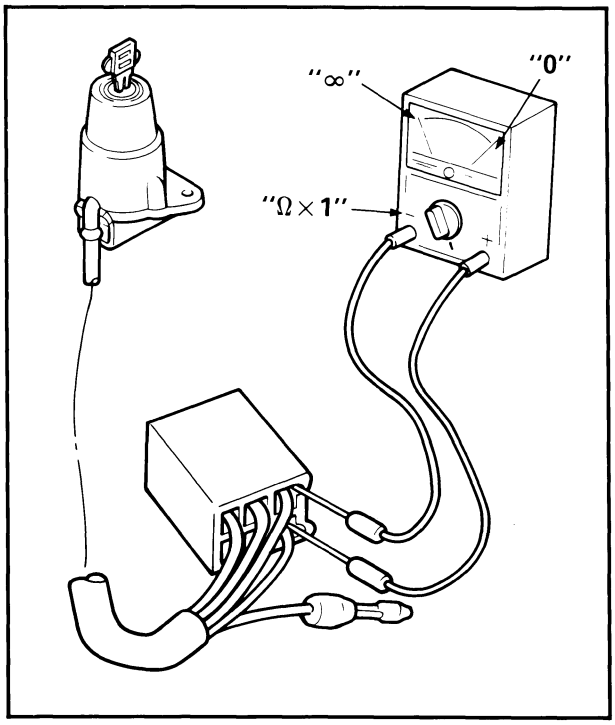


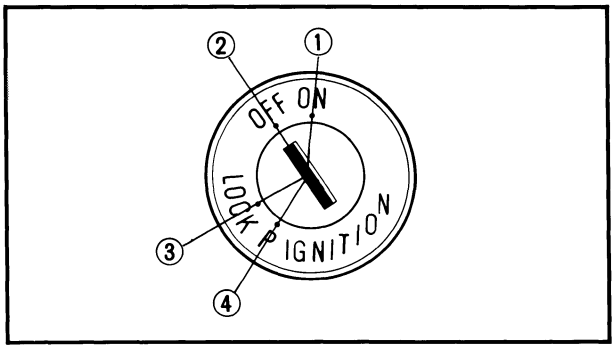
NOTE:

Use thin probes for checking the continuity. Otherwise, the probes may contact other terminals inside the coupler.

- Check the continuity between "R" and "Br" at the respective switch positions of "ON" ①, "OFF" ②, "LOCK" ③, and "P" ④. There must be continuity (the tester indicating "0") at the "ON" switch position, and there must be no continuity (the tester indicating "∞") at "OFF", "LOCK", or "P". There is something wrong between "R" and "Br" if there is no continuity at the "ON" position or if there is some continuity either at the "OFF" or "LOCK" or "P".

NOTE:

Check the switch for continuity several times.



5. Next go on to checking of the continuity between "B and B/W", "L/W and L/R", and "R and L/R" at the respective switch positions, as in the same manner mentioned above.

6. If there is something wrong with any one of the combinations, replace the switch component.

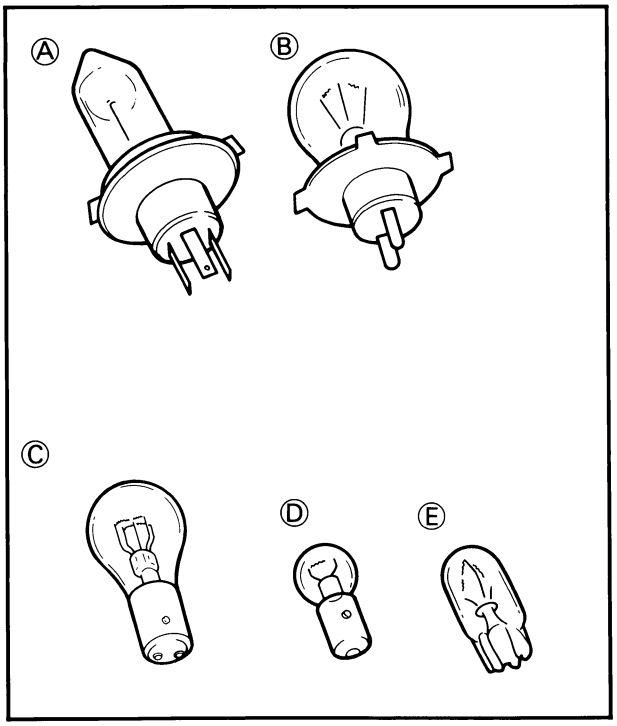
7

CHECKING OF BULBS (FOR HEADLIGHT, TAIL/BRAKE LIGHT, FLASHER LIGHT, METER LIGHT, ETC.)

Check the bulb terminal continuity for the condition of the bulb.

KINDS OF BULBS

The bulbs used in the motorcycle are classified as shown left by the shape of the bulb socket.



Ⓐ and Ⓑ are mainly used for the headlight.

Ⓒ is mainly used for the flasher light and tail/brake light.

Ⓓ and Ⓔ are mainly used for the meter light and other indicator lights.

CHECKING BULB CONDITION

1. Remove the bulb.

NOTE:

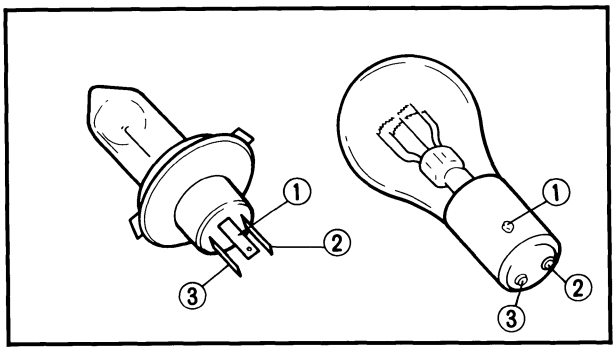
- Bulbs of the Ⓐ and Ⓑ type uses a bulb holder. Remove the bulb holder before removing the bulb itself. Most of the bulb holders for this type can be removed by turning them counterclockwise.
- Most of the bulbs of Ⓒ and Ⓓ type can be removed from the bulb sockets by pushing and turning them counterclockwise.
- Bulbs of the Ⓔ type can be removed from the bulb sockets by simply pulling them out.

⚠ CAUTION:

Be sure to hold the socket firmly when removing the bulb. Never pull the lead. Otherwise, the lead may be pulled off the terminal in the coupler.

⚠ WARNING:

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



2. Check the bulb terminals for continuity.

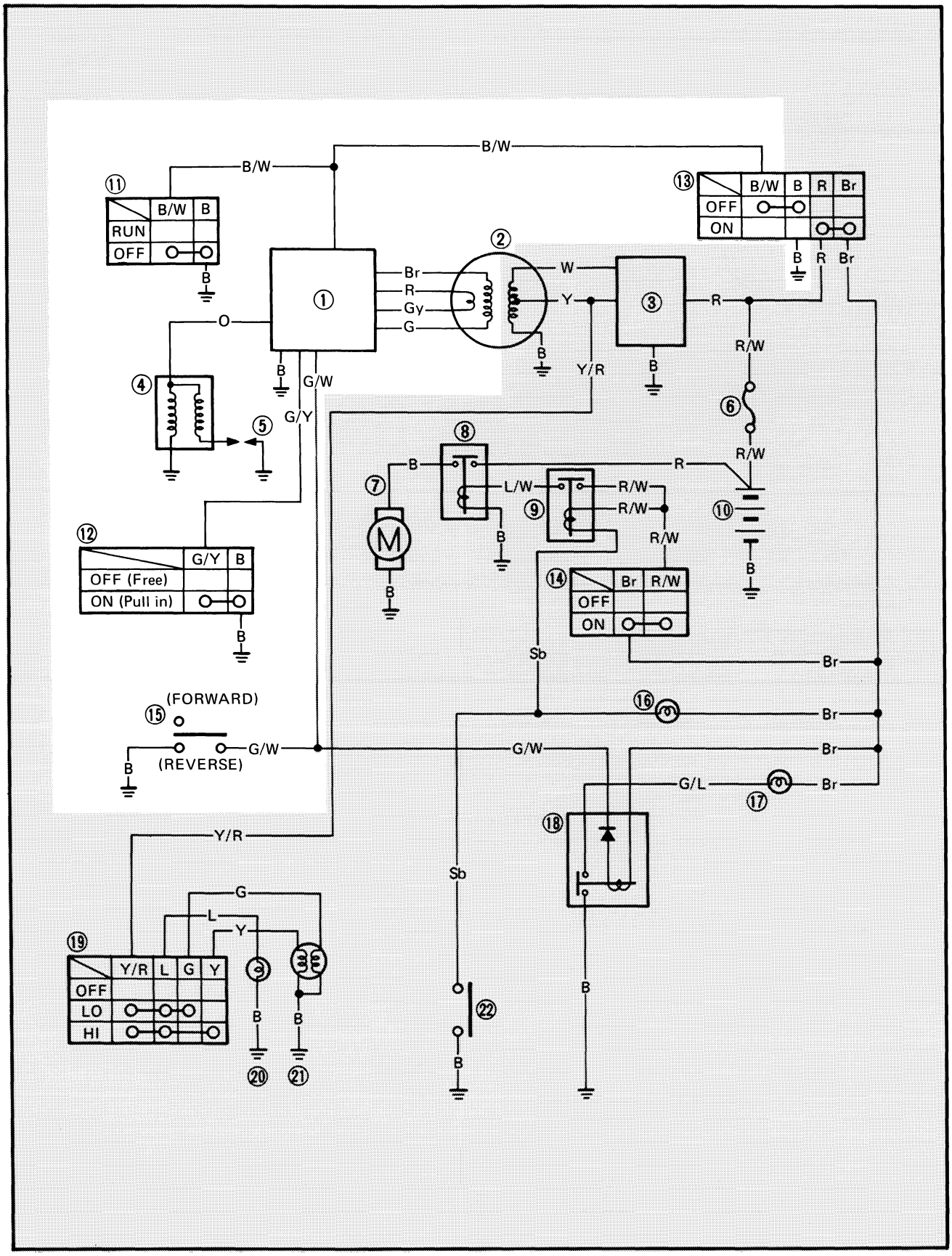
Checking steps:
- Set the pocket tester selector to the "Ω × 1".
- Connect the tester leads to the respective bulb terminals. Take for example a 3-terminal bulb as shown left. First check the continuity between the ① and ② terminals by connecting the tester (+) lead to the ① terminal and the tester (−) lead to the ② terminal. Then check the continuity between the ① and ③ terminals by connecting the tester (+) lead still to the ① terminal and the tester (−) lead to the ③ terminal. If the tester shows "∞" in either case, replace the bulb.

3. Check the bulb socket by installing a proven bulb to it. As in the checking of bulbs, connect the pocket tester leads to the respective leads of the socket and check for continuity in the same manner as mentioned above.

IGNITION SYSTEM

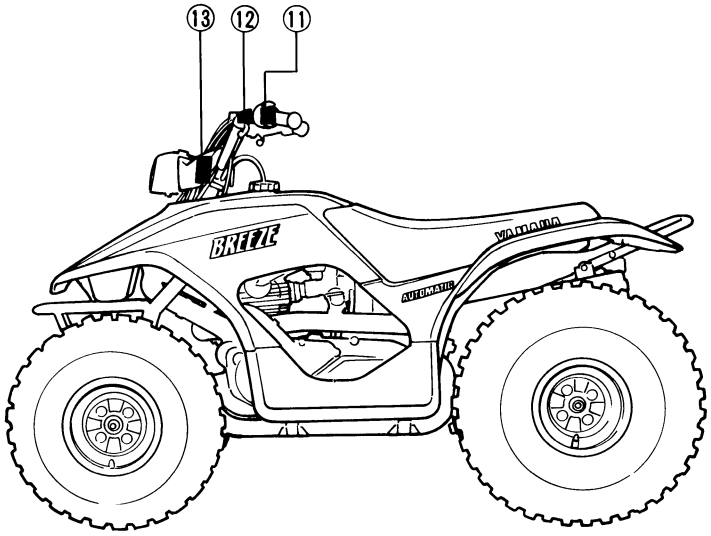
CIRCUIT DIAGRAM

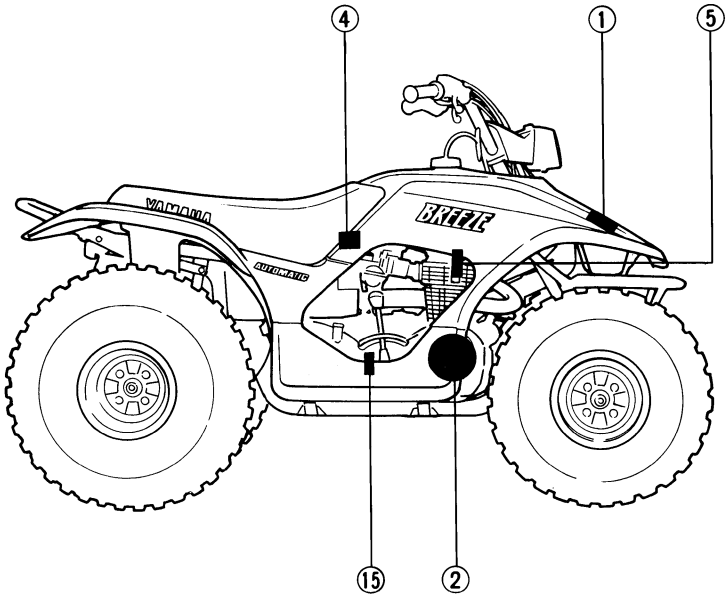
Below circuit diagram shows ignition circuit.



NOTE:
For the color codes, see page 7-2.

① CDI unit
② CDI magneto
④ Ignition coil
⑤ Spark plug
⑪ "ENGINE STOP" switch
⑫ Brake switch
⑬ Main switch
⑮ Shift lever switch





7

TROUBLESHOOTING

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK).

Procedure

Check;

1. Spark plug
2. Ignition spark gap
3. Spark plug cap resistance
4. Ignition coil resistance
5. "ENGINE STOP" switch
6. Main switch
7. Shift lever switch
8. Brake switch
9. Pickup coil resistance
10. Source coil resistance
11. Wiring connection. (Entire ignition system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Cover (front)
  3) Cover (center)
  4) Front fender
  5) Rear fender
- Use the following special tools in this troubleshooting.

Dynamic spark tester:
P/N. YM34487, 90890-03144

Pocket tester:
P/N. YU-03112, 90890-03112

1. Spark plug

- Check the spark plug condition.
- Check the spark plug type.
- Check the spark plug gap.

Refer to the "SPARK PLUG INSPECTION" section in the CHAPTER 3.

Standard spark plug:
C7HSA (NGK), U22FS-U (ND) ..... USA, AUS
CR7HS (NGK) .. CDN, CH, F, NL, S, DK

Spark plug gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

INCORRECT → Repair or replace spark plug.

CORRECT ↓

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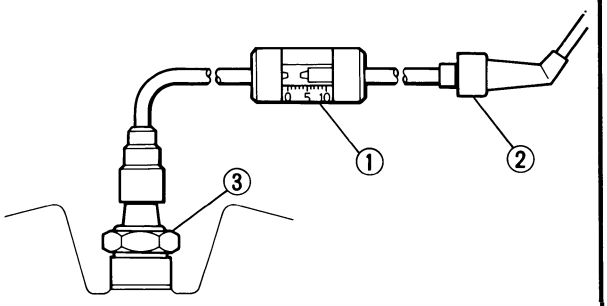
*

2. 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".
- Kick the kick crank



- Check the ignition spark gap.
- Start engine, and increase spark gap until misfire occurs.

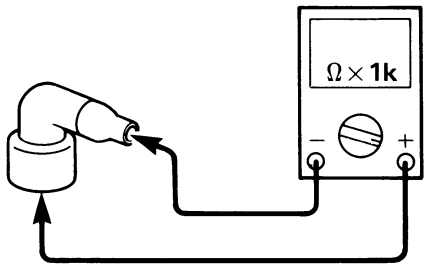
Minimum spark gap:
6.0 mm (0.24 in)

MEETS SPECIFICATION → Ignition system is good.

OUT OF SPECIFICATION OR NO SPARK

3. Spark plug cap resistance

- Remove the spark plug cap.
- Connect the pocket tester (Ω x 1k) to the saprk plug cap.



- Check the spark plug cap for specificated resistance.

Spark plug cap resistance:
8 ~ 12kΩ at 20°C (68°F)

OUT OF SPECIFICATION → Spark plug cap is faulty, replace it.

MEETS SPECIFICATION

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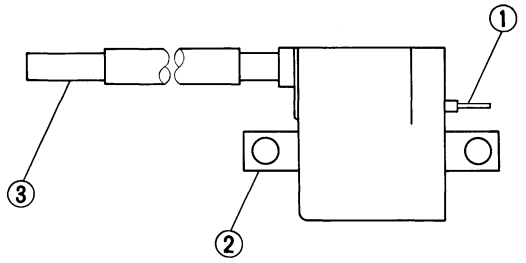
4. Ignition coil resistance

- Disconnect the ignition coil lead (Orange) from the ignition coil.
- Connect the pocket tester (Ω x 1) to the ignition coil.

Tester (+) lead → Lead terminal ①
Tester (–) lead → Ignition coil base ②



- Check the primary coil for specificated resistance.

Primary coil resistance:
0.56 ~ 0.84Ω at 20°C (68°F)
(Lead terminal – Ignition coil base)
coil base)

- Disconnect the spark plug lead from the plug cap.
- Connect the Pocket tester (Ω x 1k) to the ignition coil.

Tester (+) lead → Lead terminal ①
Tester (–) lead → Spark plug lead ③

- Check the secondary coil for specificated resistance.

Secondary coil resistance:
5.7 ~ 8.5kΩ at 20°C (68°F)
(Lead terminal – spark plug lead)

OUT OF SPECIFICATION

Ignition coil is faulty, replace it.

BOTH MEET SPECIFICATIONS

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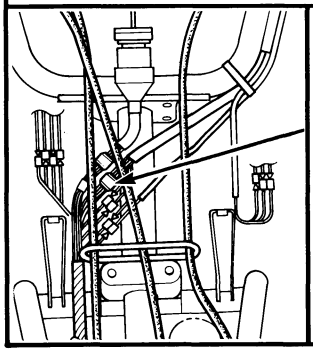
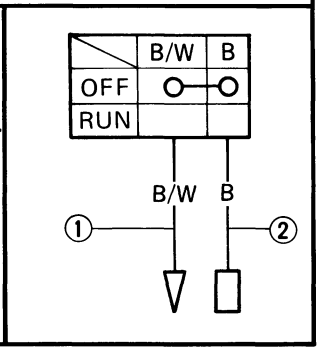
5. "ENGINE STOP" switch

- Disconnect the "ENGINE STOP" switch leads from the wireharness.
- Check the switch component for the continuity between "Black/White ① and Black ② ". Refer to the "CHECKING OF SWITCHES" section.





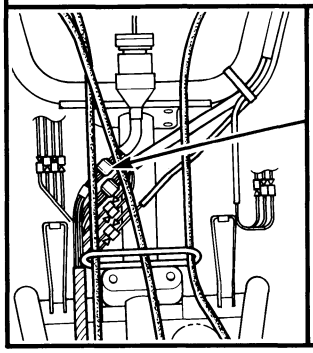
INCORRECT

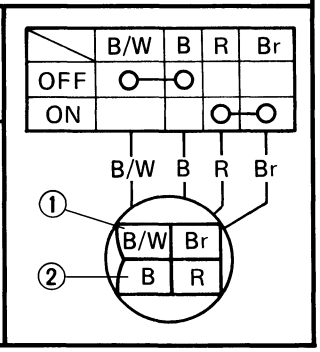
"ENGINE STOP" switch is faulty, replace handlebar switch (Left).

CORRECT

6. Main switch

- Disconnect the main switch coupler from the wireharness.
- Check the switch component for the continuity between "Black/White ① and Black ② ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Main switch is faulty, replace it.

CORRECT

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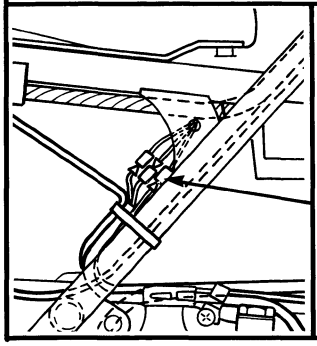
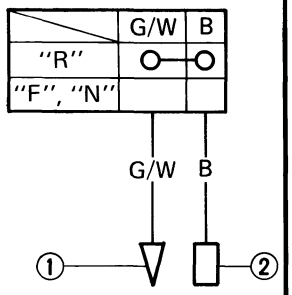
7. Shift lever switch

- Disconnect the shift lever switch leads from the wireharness.
- Check the switch component for the continuity between "Green/White ① and Black ② ". Refer to the "CHECKING OF SWITCHES" section.





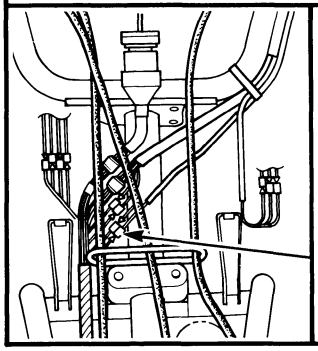
INCORRECT

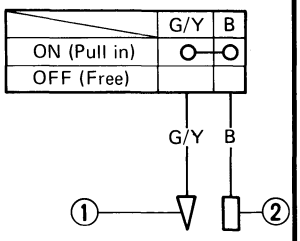
Shift lever switch is faulty, replace it.

CORRECT

8. Brake switch

- Disconnect the brake switch leads from the wireharness.
- Check the switch component for the continuity between "Green/Yellow ① and Black ② ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Brake switch is faulty, replace it.

CORRECT

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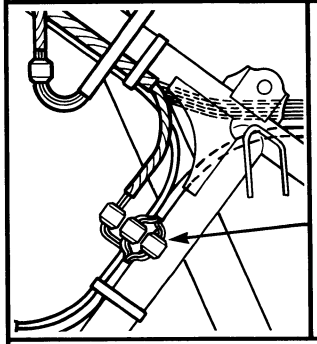
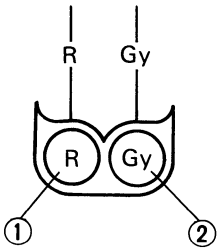
9. Pickup coil resistance

- Disconnect the CDI magneto coupler from the wireharness.
- Connect the Pocket tester (Ω x 100) to the pickup coil leads.

Tester (+) lead → Red ① lead
Tester (—) lead → Gray ② lead





- Check the pickup coil for specificated resistance.

Pickup coil resistance:
280 ~ 420Ω at 20°C (68°F)
(Red — Gray)

OUT OF SPECIFICATION

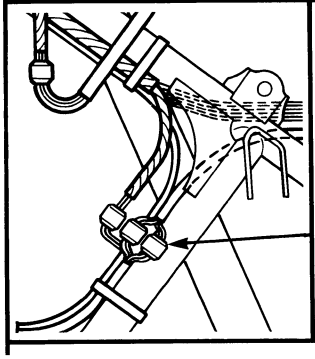
Pickup coil is faulty, replace it.

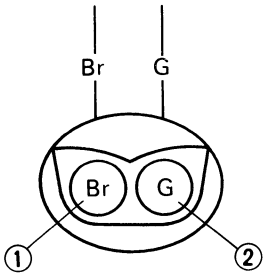
MEET SPECIFICATION

10. Source coil resistance

- Disconnect the CDI magneto coupler from the the wireharness.
- Connect the Pocket tester (Ω x 100) to the source coil leads.

Tester (+) lead → Brown ① lead
Tester (—) lead → Green ② lead





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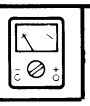
• Check the source coil for specificated resistance.



Source coil resistance:
310 ~ 400Ω at 20°C (68°F)
(Brown – Green)

OUT OF SPECIFICATION

Source coil is faulty, replace it.

MEETS SPECIFICATION

11. Wiring connection

Check the entire ignition system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct

CORRECT

CDI unit is faulty, replace it.

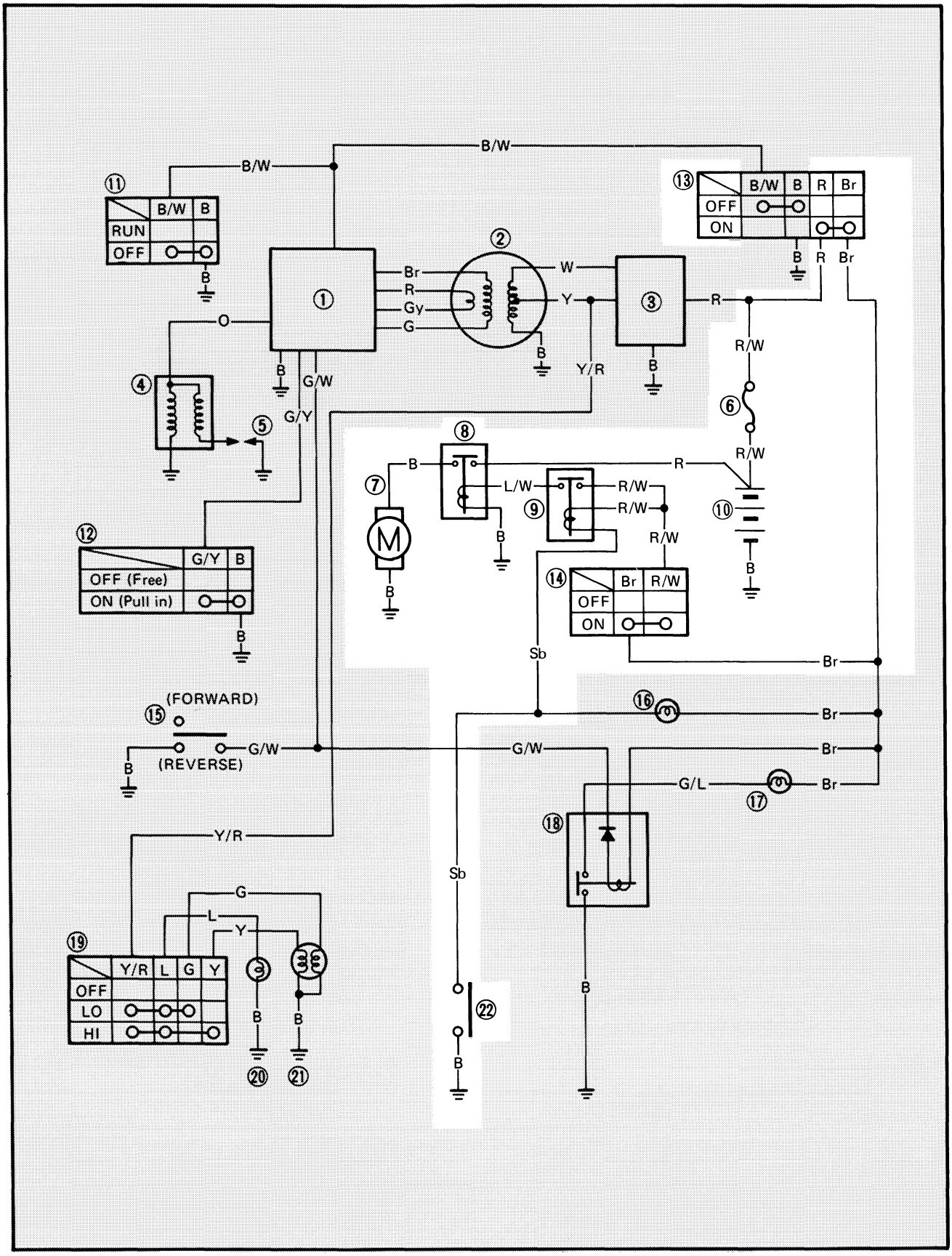
7

— MEMO —

ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM

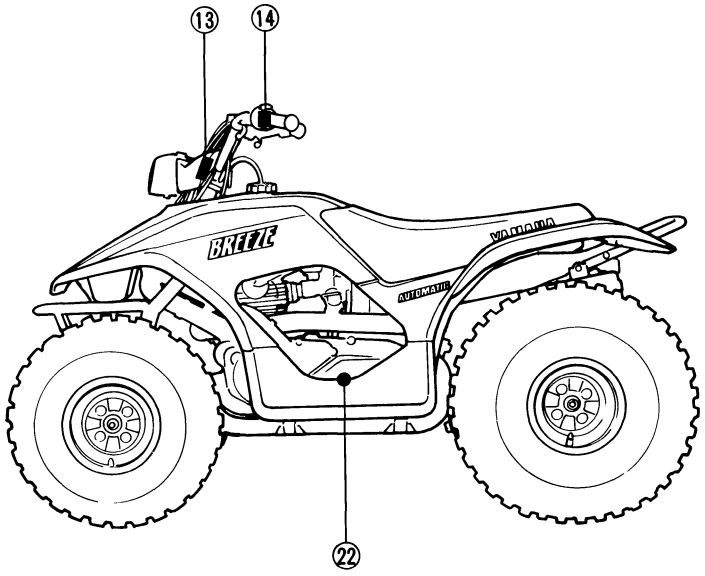
Below circuit diagram shows electric starting circuit.

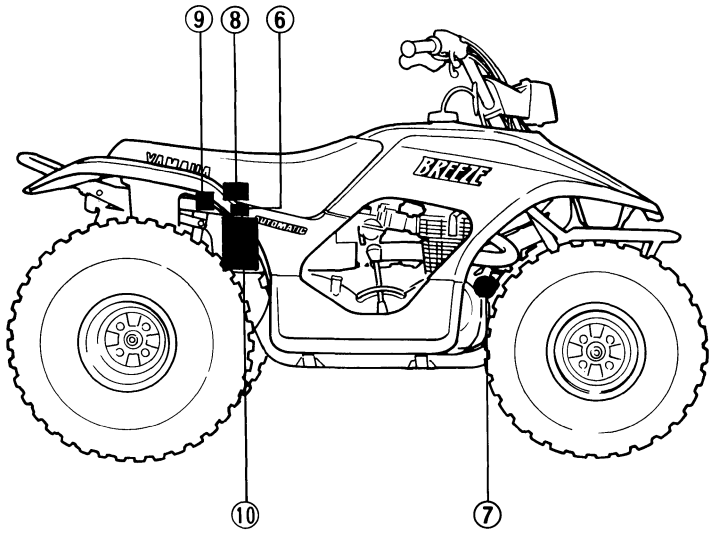


NOTE:

For the color codes, see page 7-2.

⑥ Fuse
⑦ Starting motor
⑧ Starter relay
⑨ Starting circuit cut-off relay
⑩ Battery
⑬ Main switch
⑭ "START" switch
㉒ Neutral switch





7

TROUBLESHOOTING

STARTING MOTOR DOES NOT OPERATE.

Procedure (1)
Check;
1. Starting motor
2. Battery
3. Starter relay
4. Wiring connection

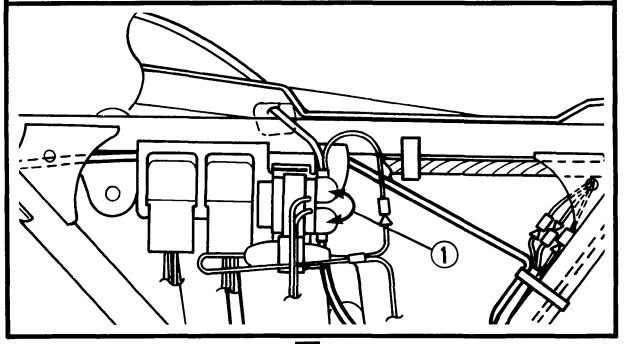
Procedure (2)
Check;
1. Fuse
2. Main switch
3. "START" switch
4. Starting circuit cut-off relay
5. Neutral switch
6. Wiring connection

NOTE:
- Remove the following parts before troubleshooting.
  1) Seat
  2) Cover (front)
  3) Cover (center)
  4) Front fender
  5) Rear fender
- Use the following special tool(s) in this troubleshooting.

Pocket tester:
P/N. YU-03112, 90890-03112

Procedure (1)

1. Starting motor
- Connect the battery leads to the battery.
- Connect the terminals of the starter relay using a jumper lead ① . *
- Check starting motor operation.



STARTING MOTOR DOES NOT OPERATE.

*

*

⚠ WARNING:
- **A wire for the jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may cause the jumper lead to be burned.**
- **This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.**

STARTING MOTOR OPERATES.

Go to the "Procedure (2)".

*

2. Battery

- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific gravity:
1.280 at 20°C (68°F)

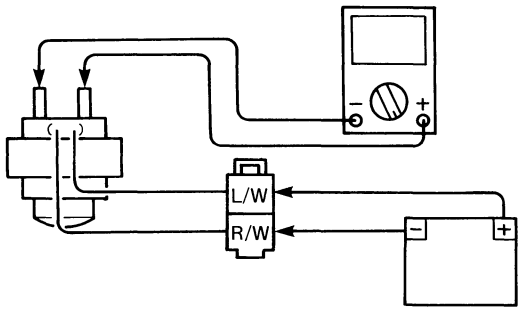
INCORRECT

- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

CORRECT

3. Starter relay

- Disconnect the battery lead* and starting motor lead from the starter relay.
- Disconnect the starter relay coupler from the wireharness.
- Connect the battery and Pocket tester (Ω x 1) to the starter relay as shown.



- Check the starter relay for continuity.

*

⚠ CAUTION:

Cover the battery lead end with a electrical tape to prevent sparks.

NO CONTINUITY

Starter relay is faulty, replace it.
Correct.

CONTINUITY

4. Wiring connection

- Check the entire starting system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

Starting motor is faulty, check it.
Refer to the "STARTING MOTOR" section for check.

7

Procedure (2)

1. Fuse

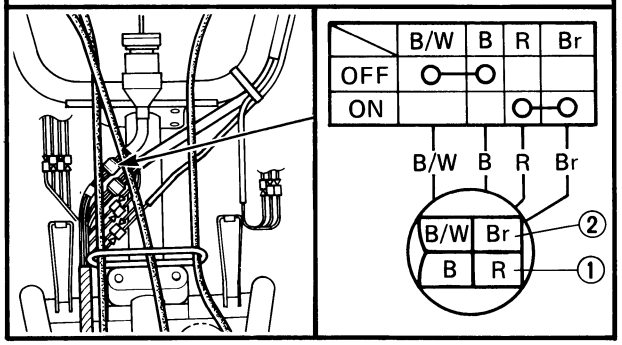
- Check the fuse condition. Refer to the "FUSE INSPECTION" section in the CHAPTER 3.

INCORRECT → Fuse is faulty, replace it.

CORRECT ⇩

2. Main switch

- Disconnect the main switch coupler from the wireharness.
- Check the switch component for the continuity between "Red ① and Brown ② ". Refer to the "CHECKING OF SWITCHES" section.

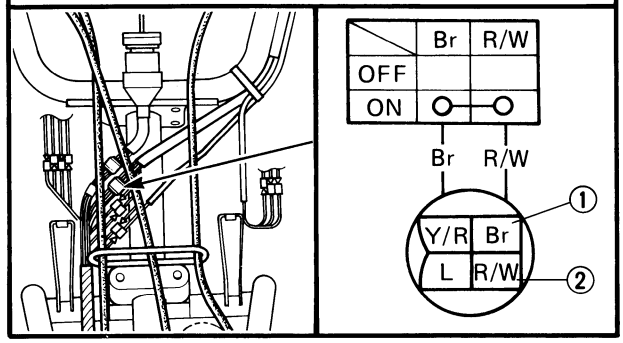


INCORRECT → Main switch is faulty, replace it.

CORRECT ⇩

3. "START" switch

- Disconnect the handlebar switch coupler from the wireharness.
- Check the switch component for the continuity between "Brown ① and Red/White ② ". Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → "START" switch is faulty, replace handlebar switch (left).

CORRECT ⇩

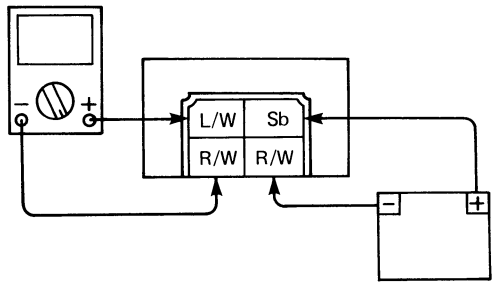
*

7

*

4. Starting circuit cut-off relay

- Disconnect the starting circuit cut-off relay from the wireharness.
- Connect the battery and Pocket tester as shown.



- Check the starting circuit cut-off relay for continuity.

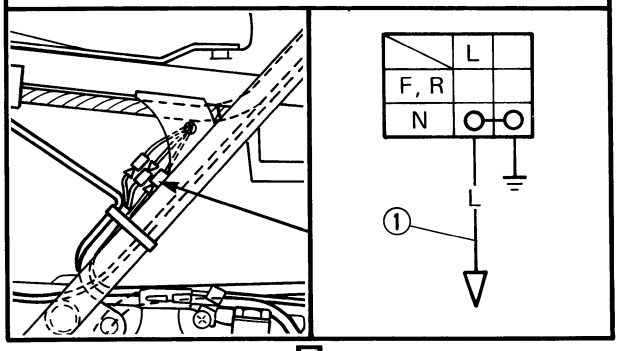
NO CONTINUITY

Starting circuit cut-off relay is faulty, replace it.

CONTINUITY

5. Neutral switch

- Disconnect the neutral switch lead from the wireharness.
- Check the switch component for the continuity between "Blue ① and Ground". Refer to the "CHECKING OF SWITCH" section.



INCORRECT

Neutral switch is faulty, replace it.

CORRECT

6. Wiring connection

- Check the entire starting system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

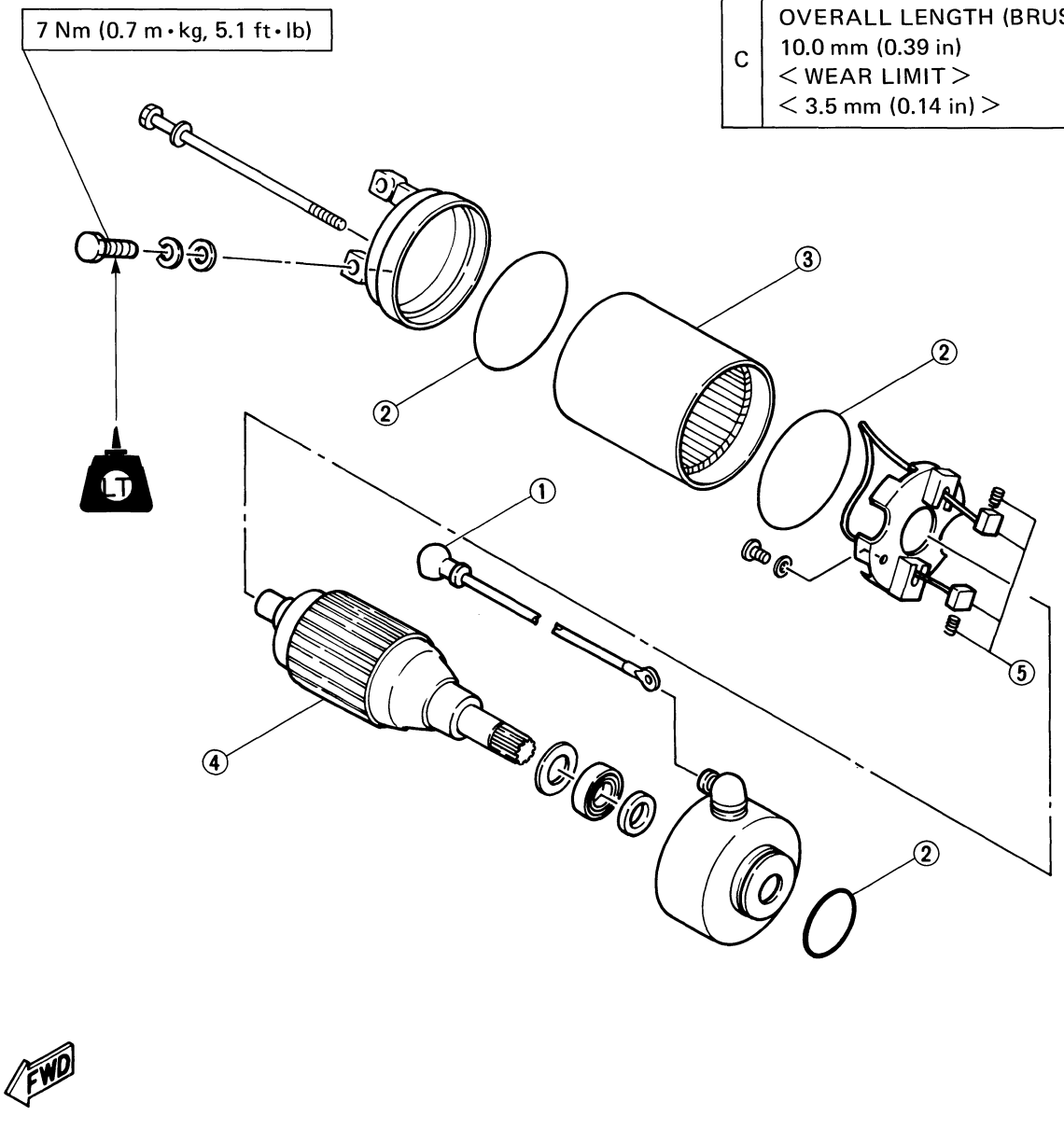
Electric starting system is good.

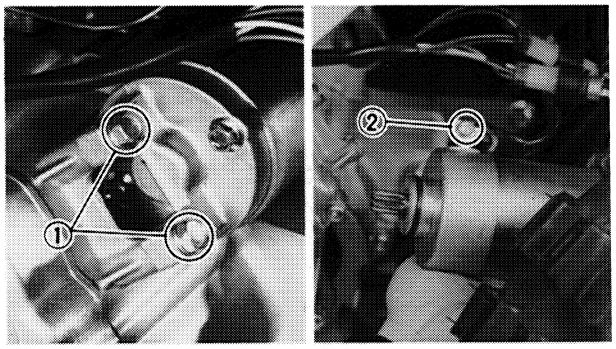
7

STARTING MOTOR

① Starting motor lead
② O-ring
③ Yoke assembly
④ Armature coil assembly
⑤ Brush assembly

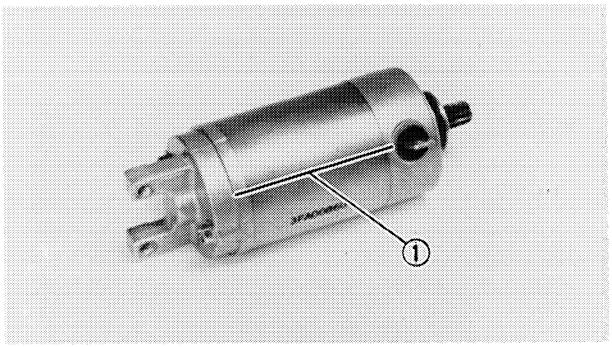
A	MICA UNDERCUT: 1.5 mm (0.06 in)
B	COMMUTATOR DIAMETER: 22.0 mm (0.87 in) < WEAR LIMIT > < 21.0 mm (0.83 in) >
C	OVERALL LENGTH (BRUSH): 10.0 mm (0.39 in) < WEAR LIMIT > < 3.5 mm (0.14 in) >





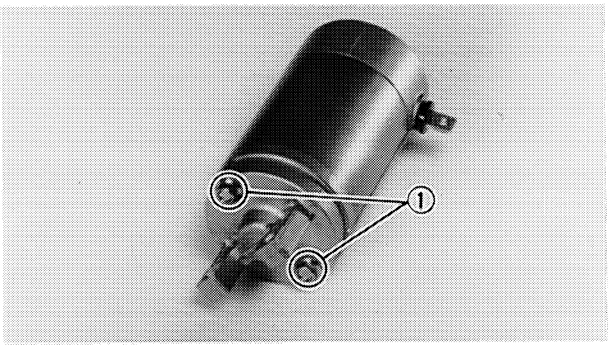
Removal

1. Remove:
   - Bolts ①
   - Screw ② (starting motor lead)

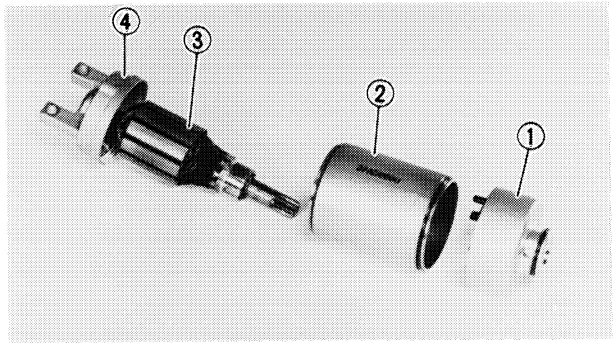


Disassembly

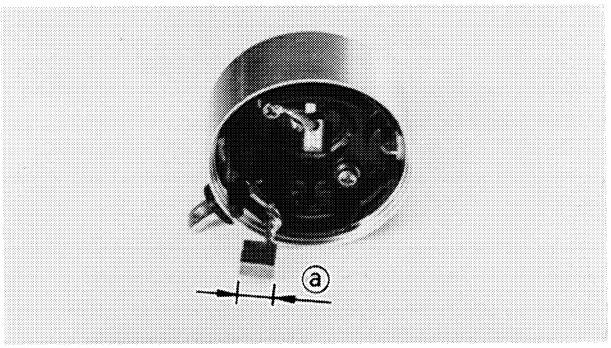
1. Put identifying marks ① on the brackets for reassembly as shown.



2. Remove:
   - Screws ①



3. Remove:
   - Bracket (rear) ①
   - Yoke assembly ②
   - Armature coil assembly ③
   - Bracket (front) ④

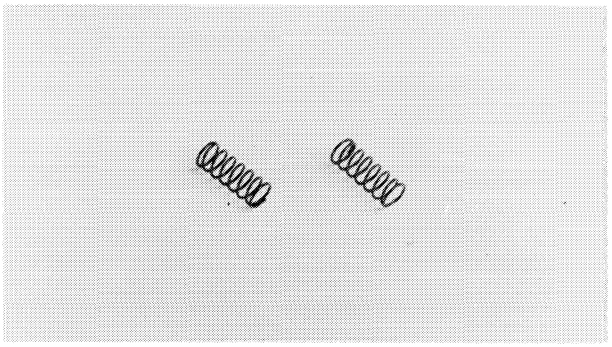


Inspection

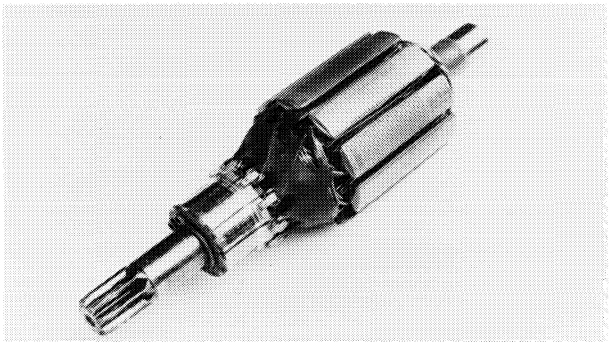
1. Measure:
   - Brush length (each) ⓐ

   Out of specification → Replace brush.

Brush length:
10.0 mm (0.39 in)
< Wear limit > :
< 3.5 mm (0.14 in) >

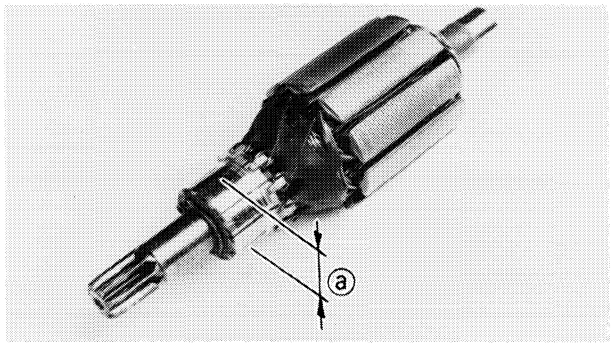


2. Inspect:
   - Brush spring
     Damage → Replace.



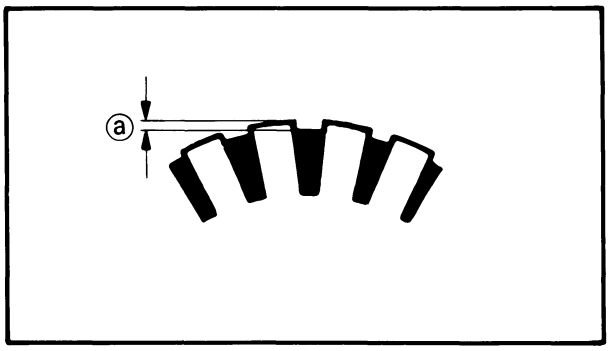
3. Inspect:
   - Commutator (outer surface)
     Grooved wear/Burning/scratches → Smooth out of using a sandpaper (# 500 ~ 600).

NOTE:
Sand the commutator outer surface lightly and evenly.



4. Measure:
   - Commutator diameter ⓐ
     Out of specification → Replace.

Outside diameter:
22 mm (0.87 in)
< Wear limit > :
< 21 mm (0.83 in) >

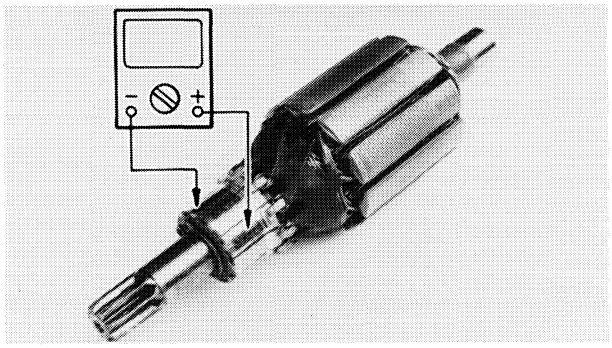


5. Measure:
   - Mica undercut ⓐ
     Out of specification → Scrape mica using a hacksaw blade.

Mica undercut:
1.5 mm (0.06 in)

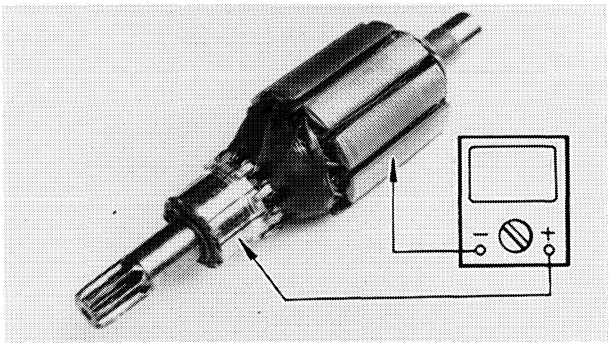
NOTE:
The mica insulation of the commutator must be undercut to ensure proper operation of the commutator.

7



6. Measure:
   - Armature coil resistance
     Out of specification → Replace.

Armature coil resistance:
0.016 ~ 0.024Ω at 20°C (68°F)

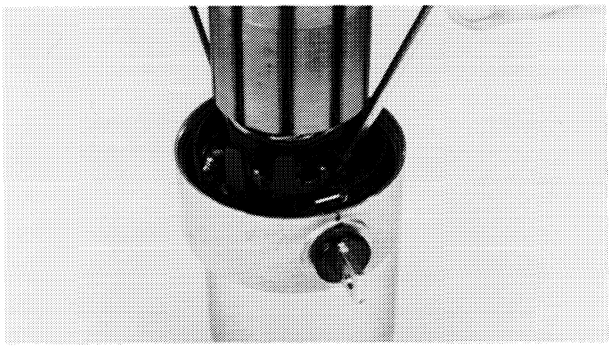


7. Check:
   - Armature coil insulation
     Set the pocket tester selector to "Ω x 1K" position.
     Continuity → Replace.

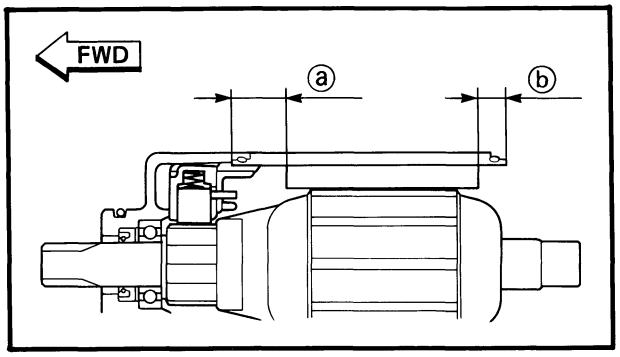
Assembly and Installation

Reverse the "Removal" and "Disassembly" procedures. Note the following points.

1. Apply:
   - Lithium soap base grease
     (onto oil seal lips and o-rings)



2. Install:
   - Brush springs
   - Brushes
   - Armature coil assembly
     (by means of thin screw driver)

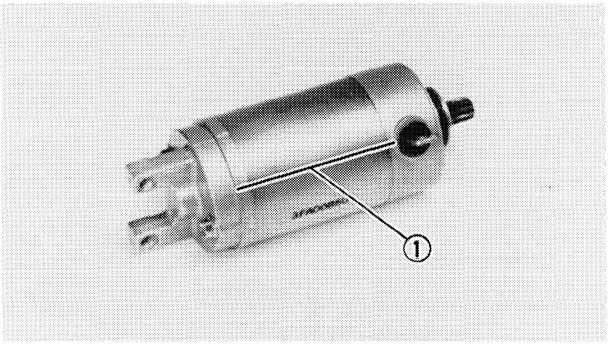


3. Install:
   - Yoke assembly

NOTE:

Install the yoke assembly with its long skirt ⓐ forward as shown.

ⓐ Long skirt
ⓑ Short skirt



NOTE:
Align identifying marks ① on the brackets as shown.

4. Install:
   Starting motor

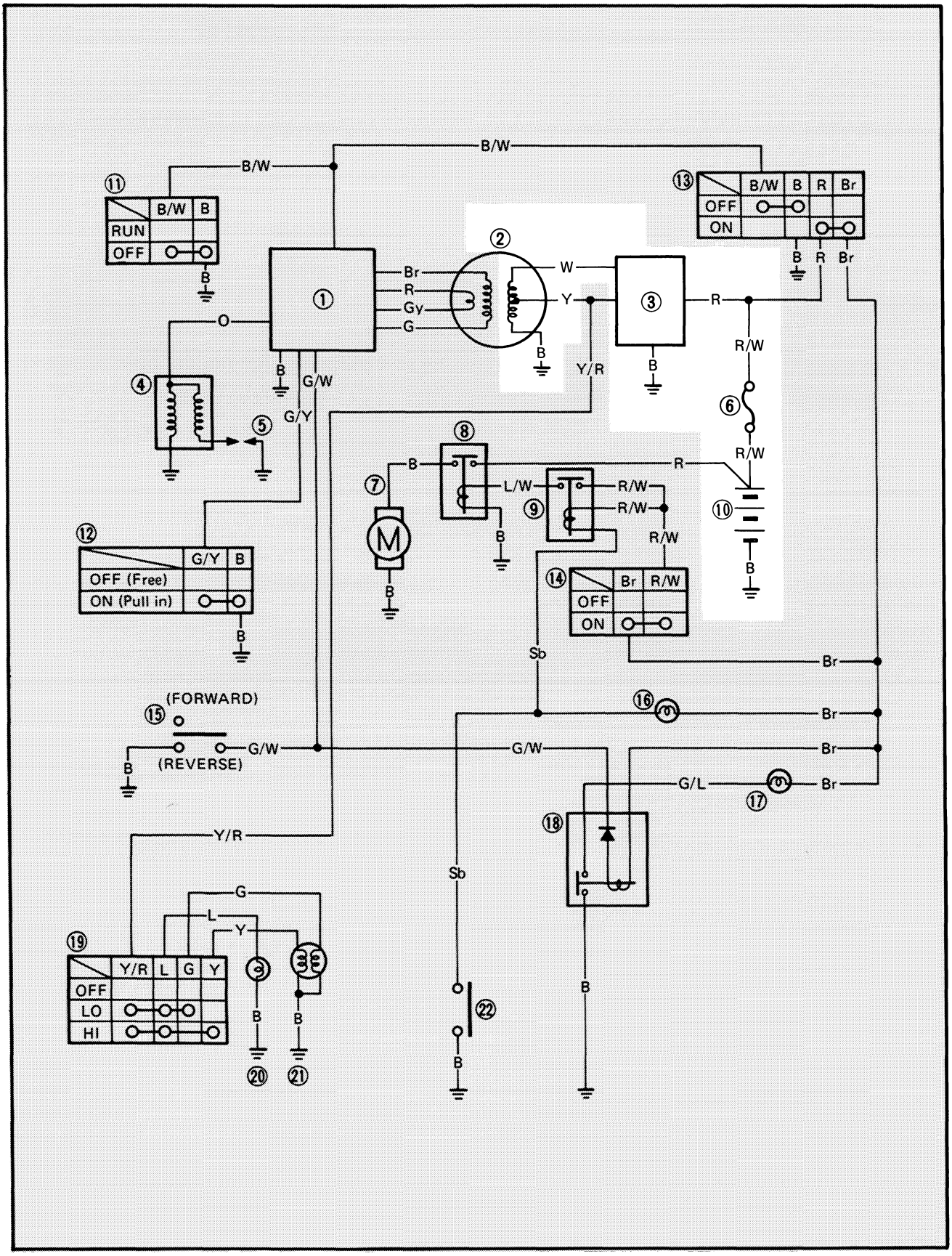
Bolts (starting motor):
7 Nm (0.7 m · kg, 5,1 ft · lb)
Use LOCTITE®

— MEMO —

CHARGING SYSTEM

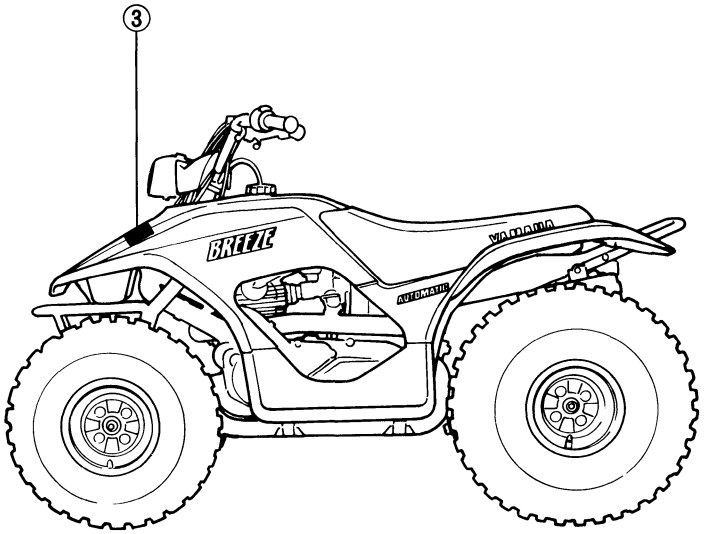
CIRCUIT DIAGRAM

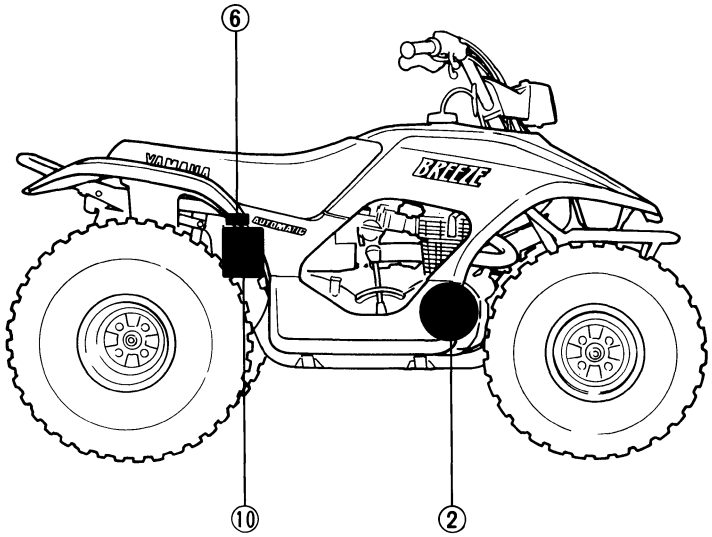
Below circuit diagram shows charging circuit.



NOTE:
For the color codes, see page 7-2.

② CDI magneto
③ Rectifier/Regulator
⑥ Fuse
⑩ Battery





7

TROUBLESHOOTING

THE BATTERY IS NOT CHARGED.

Procedure

Check;

1. Fuse
2. Battery
3. Charging output
4. Charging coil resistance
5. Wiring connection
   (Entire charging system)

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
- Use the following special tool(s) in this troubleshooting.

Inductive tachometer:
P/N. YU-08036, 90890-03113

Pocket tester:
P/N. YU-03112, 90890-03112

1. Fuse

- Check the fuse condition. Refer to the "FUSE INSPECTION" section in the CHAPTER 3.

INCORRECT → Fuse is faulty, replace it.

CORRECT ↓

2. Battery

- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific gravity:
1.280 at 20°C (68°F)

INCORRECT →

- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery

CORRECT ↓

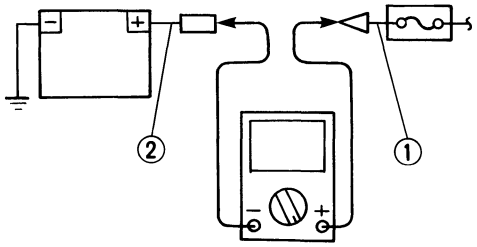
3. Charging output

- Disconnect the battery positive lead (red) from the wireharness.
- Connect the Inductive tachometer to the spark plug lead.

7

- Connect the Pocket tester (DCA-5) to the battery positive lead.

Tester (+) lead → Fuse ① lead
Tester (—) lead → Battery positive ② lead



- Turn the "LIGHT" (Dimmer) switch to "OFF" position.
- Start the engine.
- Accelerate the engine to specifications and check the charging amperage.

⚠ CAUTION:

Never disconnect the leads from the battery before stopping the engine.

Charging output amperage:
0.8A or more at 3,000 r/min
1.3A or more at 8,000 r/min

MEETS SPECIFICATION → Charging system is good.

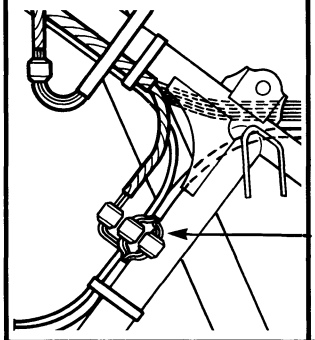
OUT OF SPECIFICATION ↓

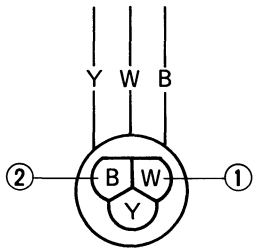
4. Charging coil resistance

- Disconnect the CDI magneto coupler from the wireharness.
- Connect the Pocket tester (Ω x 1) to the charging coil leads.

7

Charging coil:
Tester (+) lead → White lead ①
Tester (—) lead → Black lead ②





- Check the charging coil for specificated resistance.

Charging coil resistance:
0.56 ~ 0.84Ω at 20°C (68°F)
(White — Black)

OUT OF SPECIFICATION → Charging coil is faulty, replace it.

MEETS SPECIFICATIONS

5. Wiring connection

- Check the entire charging system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION → Correct.

CORRECT

Rectifier/Regulator is faulty, replace it.

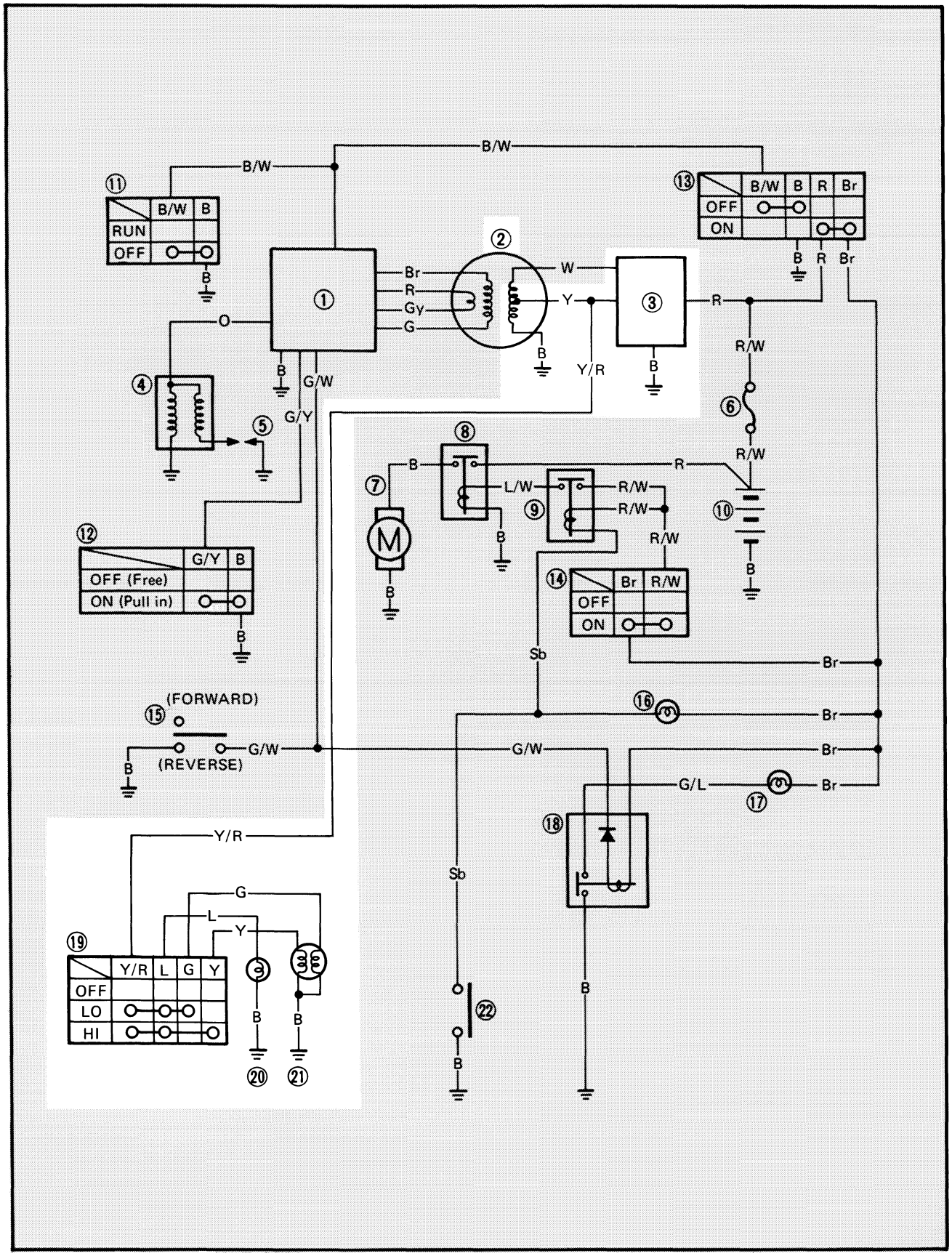
7

— MEMO —

LIGHTING SYSTEM

CIRCUIT DIAGRAM

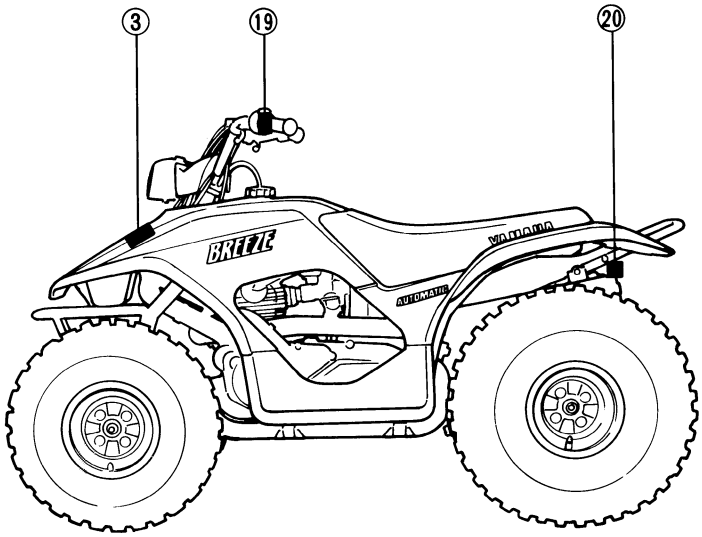
Below circuit diagram shows lighting circuit.

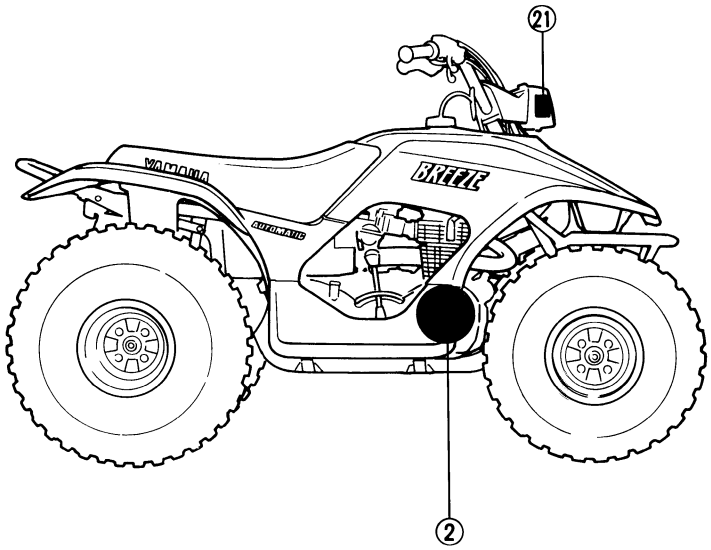


NOTE:

For the color codes, see page 7-2.

② CDI magneto
③ Rectifier/Regulator
⑲ "LIGHTS" (Dimmer) switch
⑳ Taillight
㉑ Headlight





TROUBLESHOOTING

HEADLIGHT AND/OR TAILLIGHT DOES NOT COME ON.

Procedure

Check;

1. Bulb and bulb socket (Headlight/Taillight)
2. "LIGHTS" (Dimmer) switch
3. Lighting voltage
4. Lighting coil resistance
5. Wiring connection

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
  2) Cover (front)
  3) Cover (center)
- Use the following special tool(s) in this troubleshooting.

Inductive tachometer: P/N. YU-08036, 90890-03113	**Pocket tester:** P/N. YU-03112, 90890-03112

1. Bulb and bulb socket (Headlight/Taillight)

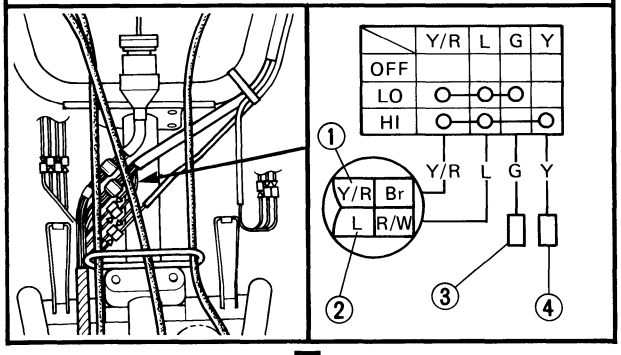
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

NO CONTINUITY → Bulb and/or bulb socket are faulty, replace.

CONTINUITY ↓

2. "LIGHTS" (Dimmer) switch

- Disconnect the handlebar switch coupler and leads from the wireharness.
- Check the switch component for the continuity between "Yellow/Red ① and Blue ② ", "Yellow/Red ① and Green ③ " and "Yellow/Red ① and Yellow ④ ".
  Refer to the "CHECKING OF SWITCHES" section.



INCORRECT → "LIGHTS" (Dimmer) switch is faulty, replace handlebar switch (Left).

CORRECT ↓

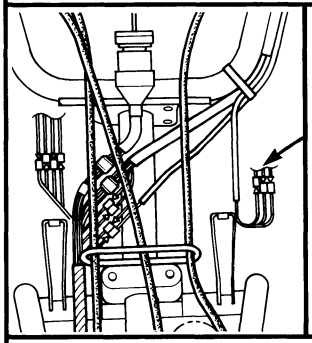
*

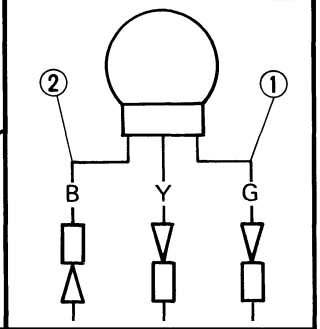
*

3. Lighting voltage

- Connect the inductive tachometer to the spark plug lead.
- Connect the Pocket tester (ACV-20) to the headlight leads.

Tester (+) lead → Green lead ①
Tester (—) lead → Black lead ②





- Turn the "LIGHTS" (Dimmer) switch to "LO" position.
- Start the engine.
- Accelerate the engine to specifications and check the lighting voltage.

Lighting output voltage:
Minimum
12.0V or more at 3,000 r/min
Maximum
14.8V or less at 8,000 r/min

MEETS SPECIFICATION → Lighting system is good.

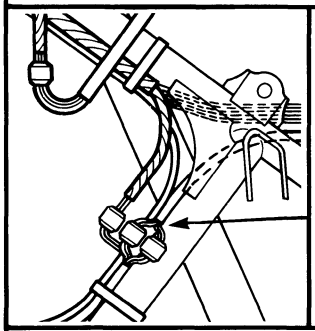
OUT OF SPECIFICATION

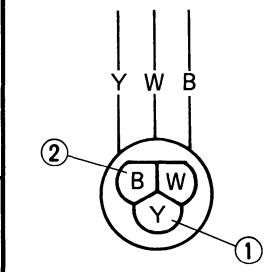
4. Lighting coil resistance

- Disconnect the CDI magneto coupler from the wireharness.
- Connect the Pocket tester (Ω x 1) to the the lighting coil leads.

7

Tester (+) lead → Yellow lead ①
Tester (—) lead → Black lead ②





- Check the lighting coil for specified resistance.

Lighting coil resistance:
0.32 ~ 0.48Ω at 20°C (68°F)
(Yellow — Black)

OUT OF SPECIFICATION

Lighting coil is faulty, replace it.

MEETS SPECIFICATION

5. Wiring connection

- Check the entire lighting system for connections. Refer to the "WIRING DIAGRAM" section.

POOR CONNECTION

Correct.

CORRECT

Rectifier/Regulator is faulty, replace it.

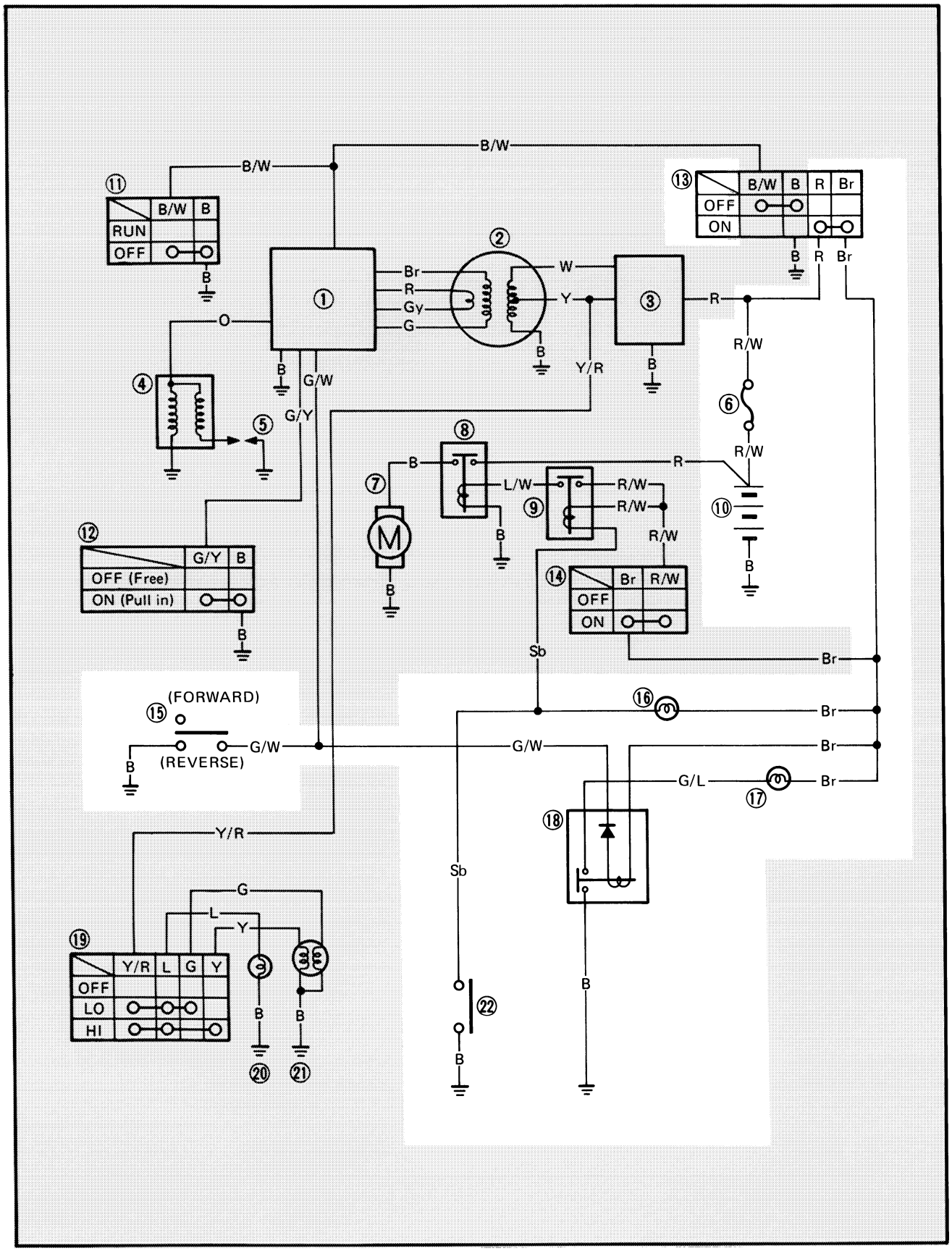
7

— MEMO —

SIGNAL SYSTEM

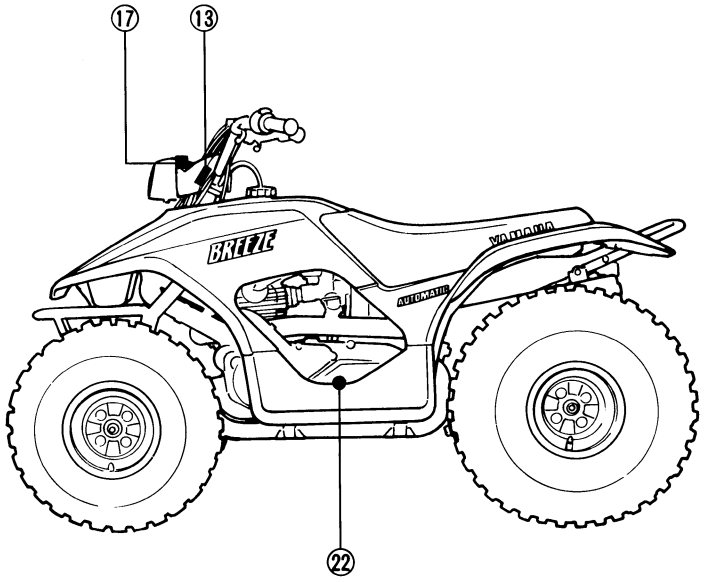
CIRCUIT DIAGRAM

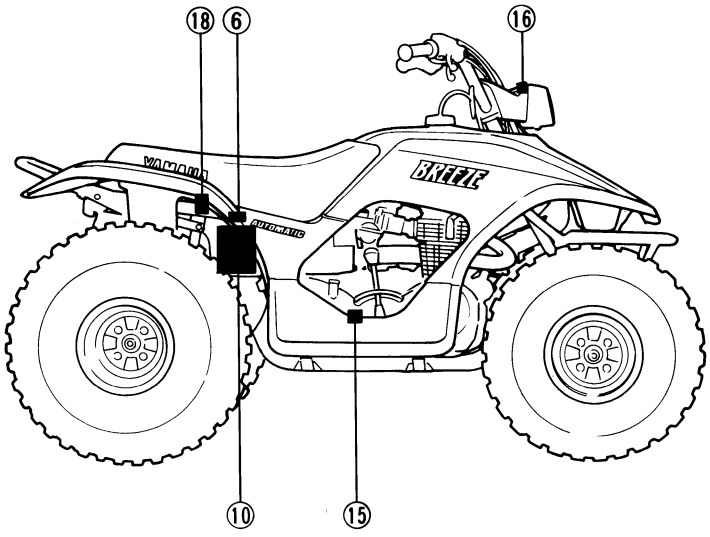
Below circuit diagram shows signal circuit.



NOTE:
For the color codes, see page 7-2.

⑥ Fuse
⑩ Battery
⑬ Main switch
⑮ Shift lever switch
⑯ "NEUTRAL" indicator light
⑰ "REVERSE" indicator light
⑱ Reverse relay
㉓ Neutral switch





7

TROUBLESHOOTING

- "NEUTRAL" INDICATOR LIGHT DOES NOT COME ON.
- "REVERSE" INDICATOR LIGHT DOES NOT COME ON.

Procedure

Check;

1. Fuse
2. Battery
3. Main switch
4. Wiring connection

NOTE:

- Remove the following parts before troubleshooting.
  1) Seat
- Use the following special tool(s) in this troubleshooting.

Pocket tester:
P/N. YU-03112, 90890-03112

1. Fuse
- Check the fuse condition. Refer to the "FUSE INSPECTION" section in the CHAPTER 3.

INCORRECT → Fuse is faulty, replace it.

CORRECT ↓

2. Battery
- Check the battery condition. Refer to the "BATTERY INSPECTION" section in the CHAPTER 3.

Specific gravity:
1.280 at 20°C (68°F)

INCORRECT →
- Refill battery fluid.
- Clean battery terminals.
- Recharge or replace battery.

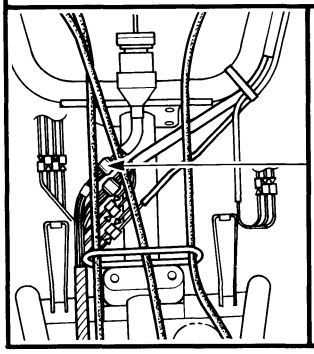
CORRECT ↓

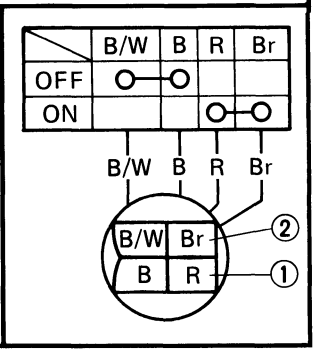
*

*

3. Main switch

- Disconnect the main switch coupler from the wireharness.
- Check the switch component for the continuity between "Red ① and Brown ② ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT

Main switch is faulty, replace it.

CORRECT

4. Wiring connection

- Check the entire signal system for connections. Refer to the "WIRING DIAGRAM" section.

CORRECT

Check condition of each circuit for signal system. Refer to "SIGNAL SYSTEM CHECK" section.

POOR CONNECTION

Correct.

7

SIGNAL SYSTEM CHECK

1. "NEUTRAL" indicator light does not come on.

1. Bulb and bulb socket

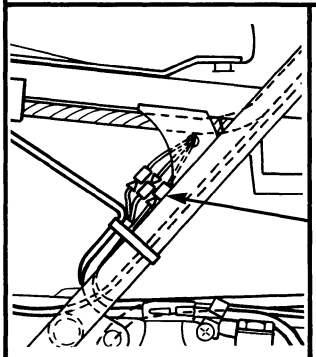
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

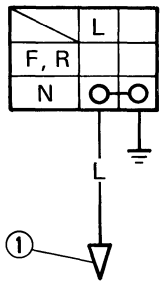
NO CONTINUITY → Bulb and/or bulb socket are faulty, replace.

CONTINUITY ↓

2. Neutral switch

- Disconnect the neutral switch lead from the wireharness.
- Check the switch component for the continuity between "Blue ① and Ground". Refer to the "CHECKING OF SWITCHES" section.





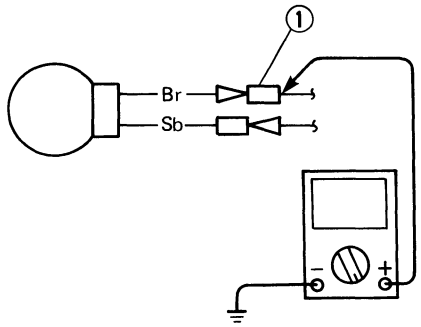
INCORRECT → Neutral switch is faulty, replace it.

CORRECT ↓

3. Voltage

- Connect the Pocket tester (DC20V) to the bulb socket connector.

Tester (+) lead → Brown ① lead
Tester (–) lead → Frame ground



7

- Turn the main switch to "ON".
- Check for voltage (12V) on the "Brown" lead at bulb socket connector.

OUT OF SPECIFICATION → Wiring circuit from main switch to bulb socket connector is faulty, repair.

MEETS SPECIFICATION (12V)

This circuit is good.

2. "REVERSE" indicator light does not come on.

1. Bulb and bulb socket

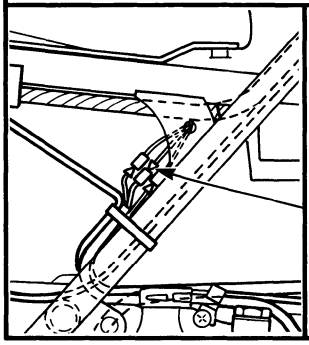
- Check the bulb and bulb socket for continuity. Refer to the "CHECKING OF BULBS" section.

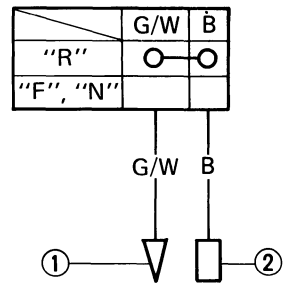
NO CONTINUITY → Bulb and/or bulb socket are faulty, replace.

CONTINUITY

2. Shift lever switch

- Disconnect the shift lever switch leads from the wireharness.
- Check the switch component for the continuity between "Green/White ① and Black ② ". Refer to the "CHECKING OF SWITCHES" section.





INCORRECT → Select lever switch is faulty, replace it.

CORRECT

*

7

TROUBLESHOOTING

NOTE:

The following troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to troubleshooting. Refer to the relative procedure in this manual for inspection, adjustment and replacement of parts.

STARTING FAILURE/HARD STARTING

FUEL SYSTEM	PROBABLE CAUSE
Fuel tank	• Empty • Clogged fuel filter • Clogged fuel breather hose • Deteriorated fuel or fuel containing water or foreign material
Fuel cock	• Clogged fuel hose
Carburetor	• Deteriorated fuel, fuel containing water or foreign material • Clogged pilot jet • Clogged pilot air passage • Sucked-in air • Deformed float • Groove-worn needle valve • Improperly sealed valve seat • Improperly adjusted fuel level • Improperly set pilot jet • Clogged starter jet • Starter plunger malfunction
Air cleaner	• Clogged air filter

STARTING FAILURE/HARD STARTING

ELECTRICAL SYSTEM

	PROBABLE CAUSE
Spark plug	• Improper plug gap • Worn electrodes • Wire between terminals broken • Improper heat range • Faulty spark plug cap
Ignition coil	• Broken or shorted primary/secondary • Faulty spark plug lead • Broken body
C.D.I. unit system	• Faulty C.D.I. unit • Faulty source coil • Faulty pick-up coil • Broken woodruff key
Switches and wiring	• Faulty main switch • Faulty engine stop switch • Broken or shorted wiring • Faulty shift lever switch • Faulty brake switch
Starter motor	• Faulty starter motor • Faulty starter relay • Faulty starting circuit cut-off relay • Faulty battery

COMPRESSION SYSTEM

	PROBABLE CAUSE
Cylinder and cylinder head	• Loose spark plug • Loose cylinder head or cylinder • Broken cylinder head gasket • Broken cylinder gasket • Worn, damaged or seized cylinder
Piston and piston rings	• Improperly installed piston ring • Worn, fatigued or broken piston ring • Seized piston ring • Seized or damaged piston
Crankcase and crankshaft	• Improperly seated crankcase • Seized crankshaft

POOR IDLE SPEED PERFORMANCE

FUEL SYSTEM	PROBABLE CAUSE
Carburetor	• Improperly returned starter plunger • Clogged or loose pilot jet • Clogged pilot air jet • Improperly adjusted idle speed (Throttle stop screw) • Improper throttle cable play • Flooded carburetor
Air cleaner	• Clogged air filter

POOR MEDIUM AND HIGH SPEED PERFORMANCE

FUEL SYSTEM	PROBABLE CAUSE
Fuel tank	• Clogged fuel filter • Deteriorated fuel or fuel containing water or foreign material
Fuel cock	• Clogged fuel hose
Carburetor	• Deteriorated fuel, fuel containing water or foreign material • Sucked-in air • Deformed float • Groove-worn needle valve • Improperly sealed valve seat • Improperly set clip position of jet needle • Improperly adjusted fuel level • Clogged or loose main jet • Clogged or loose needle jet
Air cleaner	• Clogged air filter

POOR MEDIUM AND HIGH SPEED PERFORMANCE

TRBL SHTG ?

ELECTRICAL SYSTEM — **PROBABLE CAUSE**

- Spark plug
  - ●Improper plug gap
  - ●Worn electrodes
  - ●Wire between terminals broken
  - ●Improper heat range
  - ●Faulty spark plug cap
- C.D.I. unit system
  - ●Faulty C.D.I. unit
  - ●Faulty source coil
  - ●Faulty pick-up coil

COMPRESSION SYSTEM — **PROBABLE CAUSE**

- Cylinder and cylinder head
  - ●Loose spark plug
  - ●Broken cylinder head gasket
  - ●Broken cylinder gasket
  - ●Loose cylinder head or cylinder
  - ●Worn, damaged or seized cylinder
- Piston and piston ring
  - ●Improperly installed piston ring
  - ●Worn, fatigued or broken piston ring
  - ●Seized piston ring
  - ●Seized or damaged piston
- Crankcase and crankshaft
  - ●Improperly seated crankcase
  - ●Seized crankshaft

8

FAULTY GEAR SHIFTING

HARD SHIFTING

	PROBABLE CAUSE
Shift cam and shift fork	• Groove jammed with impurities • Seized shift fork • Bent shift fork guide bar
Transmission	• Seized transmission gear • Jammed impurities • Incorrectly assembled transmission
Transmission oil	• High oil level • Improper quality (High viscosity) • Deterioration

SHIFT LEVER DOES NOT MOVE

	PROBABLE CAUSE
Shift cam and shift fork	• Groove jammed with impurities • Seized shift fork • Bent shift fork guide bar
Transmission	• Seized transmission gear • Jammed impurities • Incorrectly assembled transmission

JAMP-OUT GEAR

	PROBABLE CAUSE
Shift fork	• Worn shift fork
Shift cam	• Improper thrust play • Worn shift cam groove
Transmission	• Worn gear dog

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FAULTY AUTOMATIC TRANSMISSION (V-BELT TYPE)

MACHINE DOES NOT MOVE WHILE ENGINE IS OPERATING.

	PROBABLE CAUSE
V-belt	•Worn, damaged or slipped V-belt
Primary sheave	•Worn or damaged cam plate •Worn or damaged slider bushing
Secondary sheave	•Broken compression spring •Pealed lining from clutch shoe •Worn spline of clutch housing

CLUTCH-OUT FAILURE

	PROBABLE CAUSE
Primary sheave	•Seized primary sliding sheave and collar
Secondary sheave	•Broken or fatigued clutch shoe spring

POOR STANDING START (LOW CLIMBING ABILITY)

	PROBABLE CAUSE
V-belt	•Worn or slipped V-belt
Primary sheave	•Worn or improper operation of weight
Secondary sheave	•Fatigued compression spring •Improper operation of secondary sliding sheave

POOR ACCELERATION (POOR HIGH SPEED)

	PROBABLE CAUSE
V-belt	•Worn or greasy V-belt
Secondary sheave	•Worn or greasy clutch shoe •Improper operation of secondary sliding sheave

8

FAULTY BRAKE

POOR BRAKING EFFECT	PROBABLE CAUSE
Drum brake	• Worn brake shoe • Worn or rusty brake drum • Improperly adjusted brake free play • Improper brake cam lever position • Improper brake shoe position • Fatigue/Damaged return spring • Oily or greasy brake shoe • Oil or greasy brake drum • Broken brake cable

SHOCK ABSORBER MALFUNCTION

MALFUNCTION	PROBABLE CAUSE
	• Bent or damaged damper rod • Damaged oil seal lip • Fatigued shock absorber spring

OVERHEATING

OVERHEATING	PROBABLE CAUSE
Ignition system	• Improper spark plug gap • Improper spark plug heat range • Faulty C.D.I. unit
Fuel system	• Improper carburetor main jet (Improper setting) • Improperly adjusted fuel height • Clogged air cleaner element
Compression system	• Heavy carbon build-up
Engine oil	• Incorrect oil level • Improper oil viscosity • Inferior oil quality
Brake	• Dragging brake

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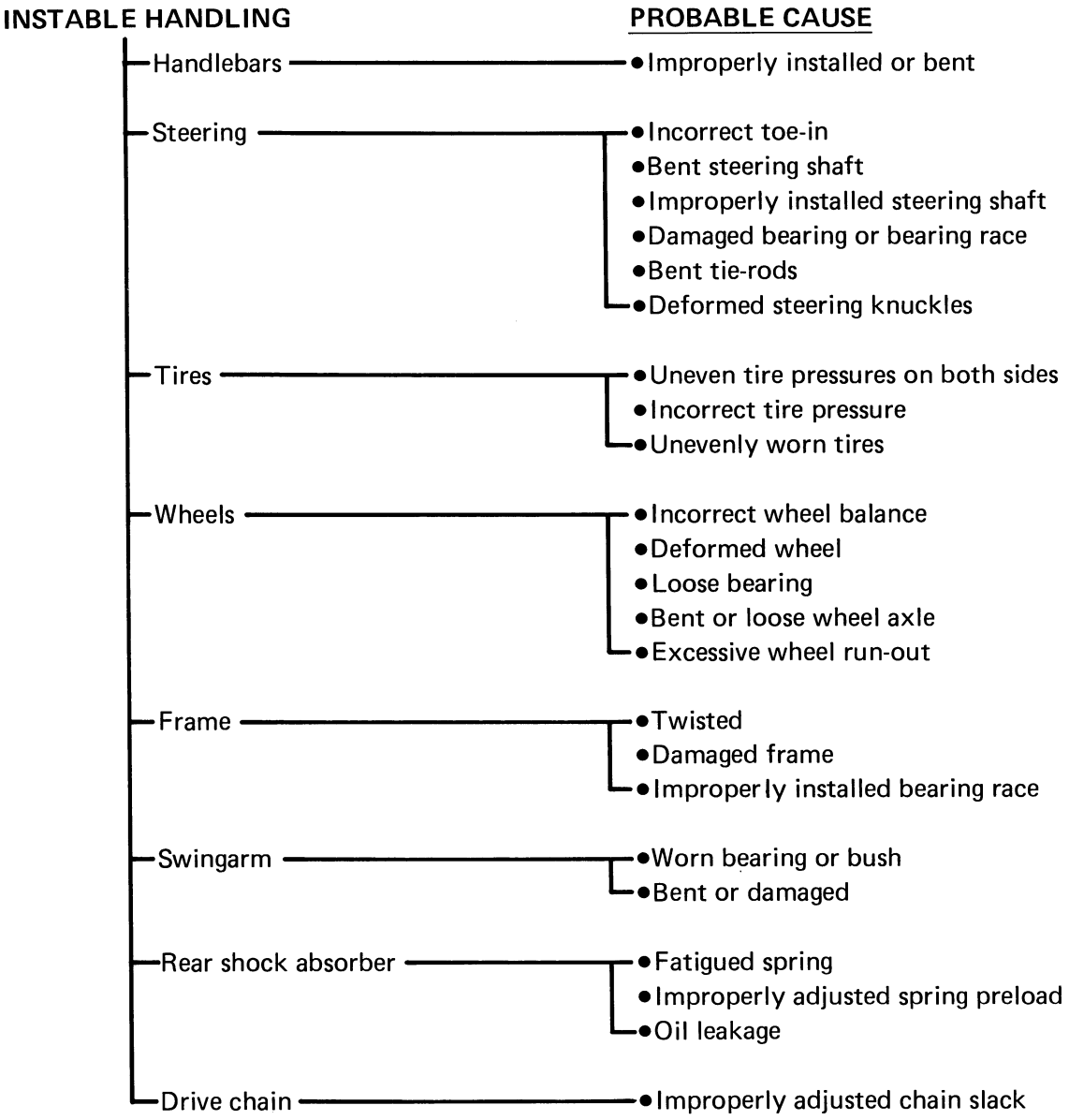
INSTABLE HANDLING



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FAULTY SIGNAL AND LIGHTING SYSTEM

HEADLIGHT DARK

PROBABLE CAUSE

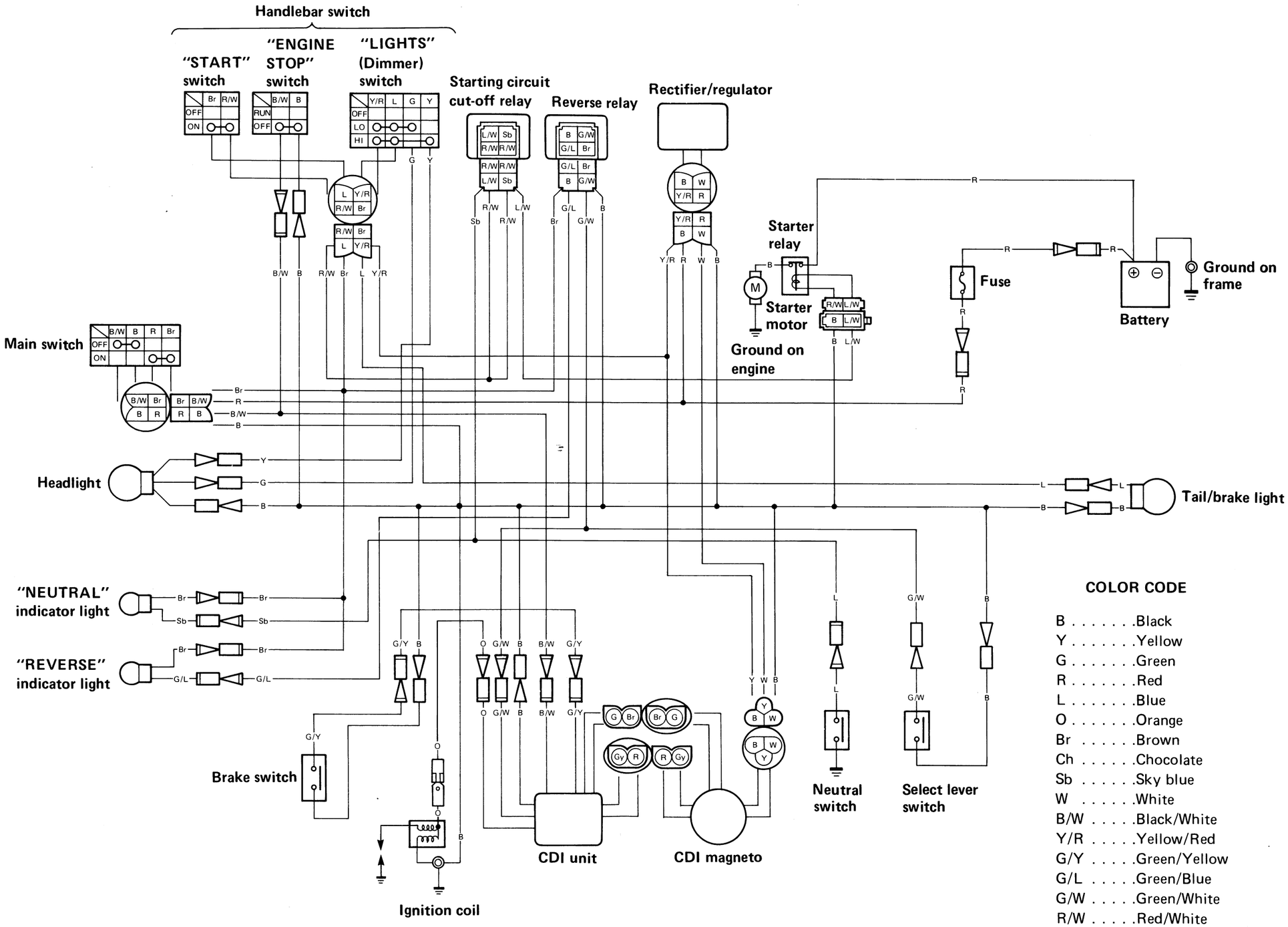
- Improper bulb
- Too many electric accessories
- Hard charging (Broken charging coil and/or faulty rectifier/regulator)
- Incorrect connection
- Improperly grounded
- Poor contacts (main or light switch)
- Bulb life expired

BULB BURNT OUT

PROBABLE CAUSE

- Improper bulb
- Faulty battery
- Faulty rectifier/regulator
- Improperly grounded
- Faulty main and/or light switch
- Bulb life expired

YFA1(W) WIRING DIAGRAM



COLOR CODE

B	Black
Y	Yellow
G	Green
R	Red
L	Blue
O	Orange
Br	Brown
Ch	Chocolate
Sb	Sky blue
W	White
B/W	Black/White
Y/R	Yellow/Red
G/Y	Green/Yellow
G/L	Green/Blue
G/W	Green/White
R/W	Red/White
L/W	Blue/White

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