YAMAHA

PW50W

SERVICE MANUAL

LIT-11616-20-15

5PG-28197-10

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PW50W
SERVICE MANUAL

First edition, May 2006

Printed in U.S.A.
P/N LIT-11616-20-15

NOTICE

This manual was produced by the Yamaha Motor Company, Ltd. primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to include all the knowledge of a mechanic in one manual. Therefore, anyone who uses this book to perform maintenance and repairs on Yamaha vehicles should have a basic understanding of mechanics and the techniques to repair these types of vehicles. Repair and maintenance work attempted by anyone without this knowledge is likely to render the vehicle unsafe and unfit for use.

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

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

NOTE:

- This Service Manual contains information regarding periodic maintenance to the emission control system. Please read this material carefully.
- Designs and specifications are subject to change without notice.

IMPORTANT MANUAL INFORMATION

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

⚠ 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 vehicle operator, a bystander or a person checking or repairing the vehicle.

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

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

HOW TO USE THIS MANUAL

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

① The manual is divided into chapters. An abbreviation and symbol in the upper right corner of each page indicate the current chapter.
Refer to "SYMBOLS".

② Each chapter is divided into sections. The current section title is shown at the top of each page, except in Chapter 3 ("PERIODIC CHECKS AND ADJUSTMENTS"), where the sub-section title(s) appears.

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

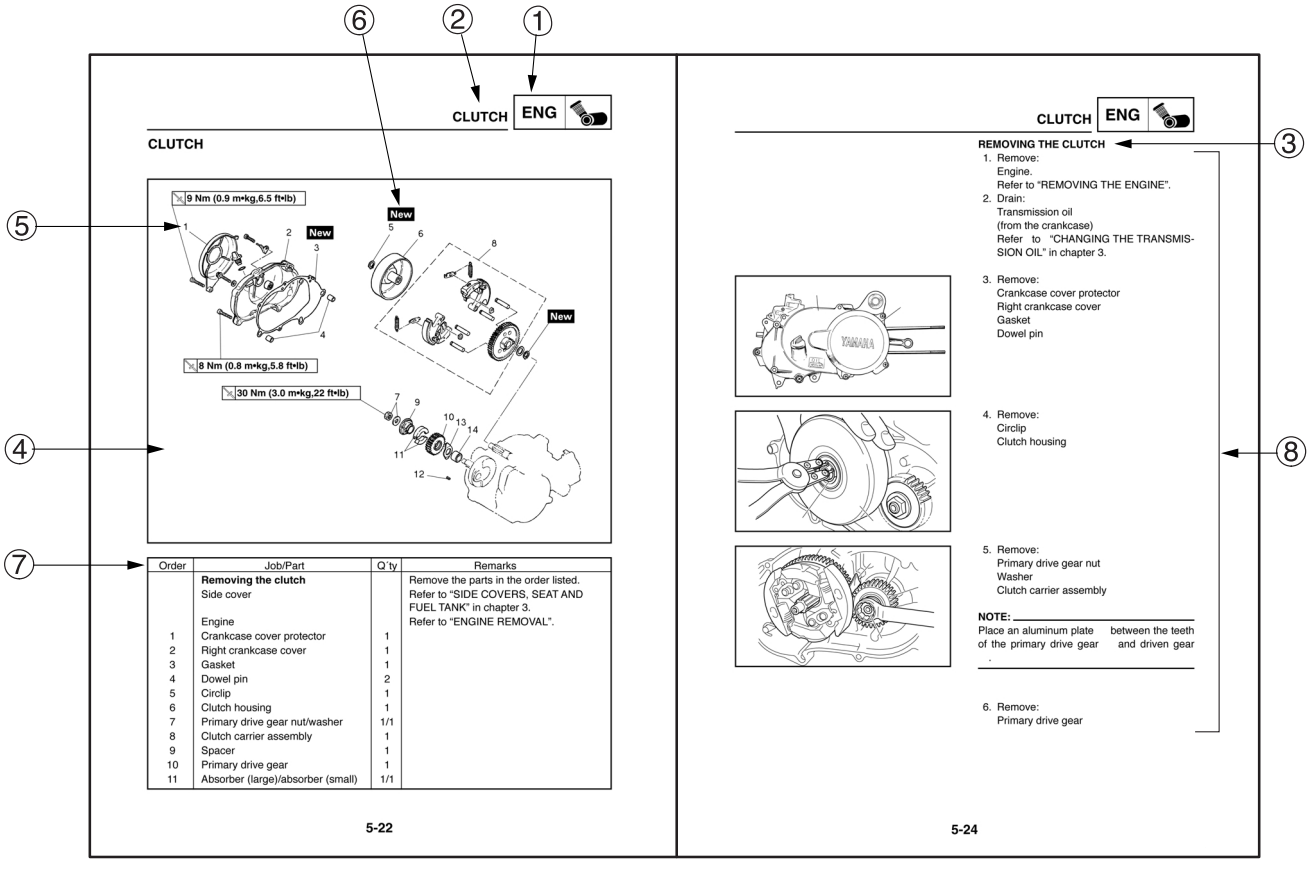
④ To help identify parts and clarify procedure steps, there are exploded diagrams at the start of each removal and disassembly section.

⑤ Numbers are given in the order of the jobs in the exploded diagram. A circled number indicates a disassembly step.

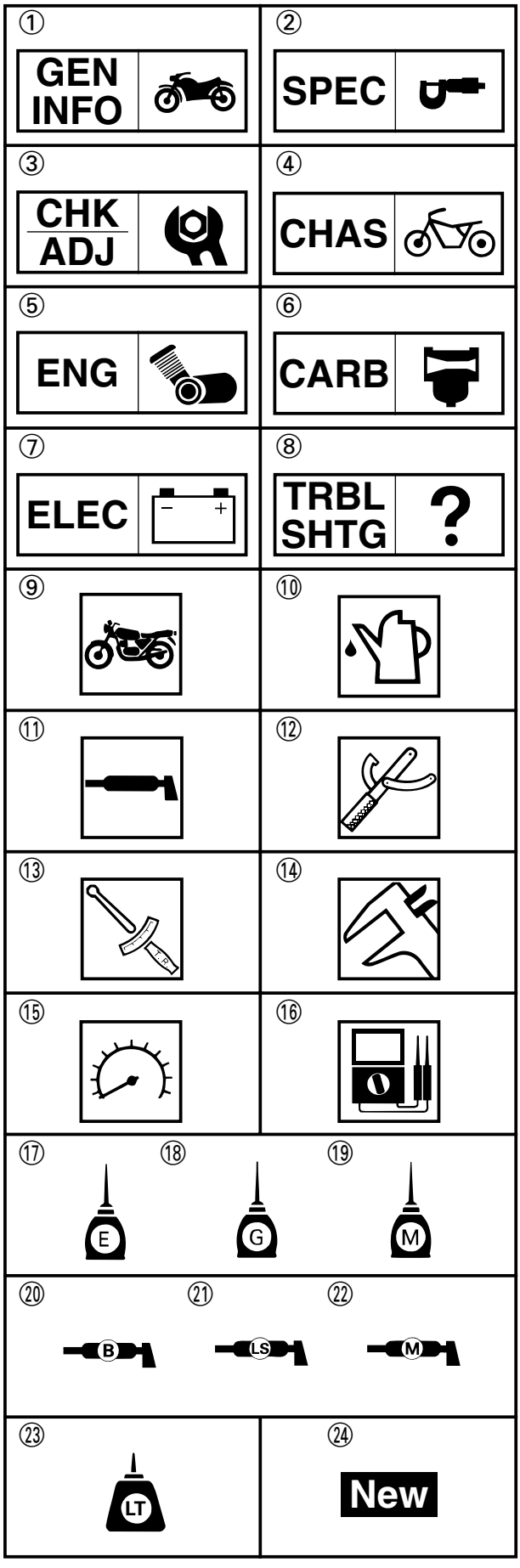
⑥ Symbols indicate parts to be lubricated or replaced.
Refer to "SYMBOLS".

⑦ A job instruction chart accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.

⑧ Jobs requiring more information (such as special tools and technical data) are described sequentially.



Order	Job/Part	Q'ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
	Side cover		Refer to "SIDE COVERS, SEAT AND FUEL TANK" in chapter 3.
	Engine		Refer to "ENGINE REMOVAL".
1	Crankcase cover protector	1	
2	Right crankcase cover	1	
3	Gasket	1	
4	Dowel pin	2	
5	Circlip	1	
6	Clutch housing	1	
7	Primary drive gear nut/washer	1/1	
8	Clutch carrier assembly	1	
9	Spacer	1	
10	Primary drive gear	1	
11	Absorber (large)/absorber (small)	1/1	



SYMBOLS

The following symbols are not relevant to every vehicle.

Symbols ① to ⑧ indicate the subject of each chapter.

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

Symbols ⑨ to ⑯ indicate the following.

⑨ Serviceable with engine mounted
⑩ Filling fluid
⑪ Lubricant
⑫ Special tool
⑬ Tightening torque
⑭ Wear limit, clearance
⑮ Engine speed
⑯ Electrical data

Symbols ⑰ to ㉒ in the exploded diagrams indicate the types of lubricants and lubrication points.

⑰ Engine oil
⑱ Gear oil
⑲ Molybdenum-disulfide oil
⑳ Wheel-bearing grease
㉑ Lithium-soap-based grease
㉒ Molybdenum-disulfide grease

Symbols ㉓ to ㉔ in the exploded diagrams indicate the following.

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

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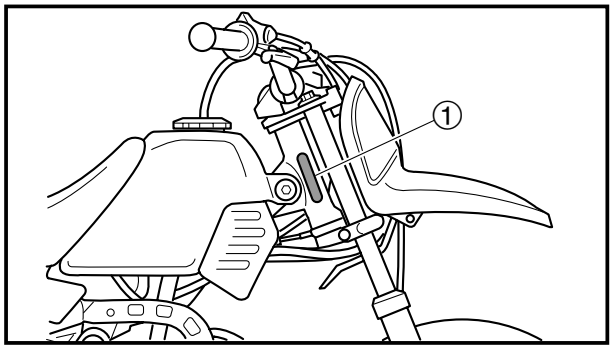
CHAPTER 1
GENERAL INFORMATION

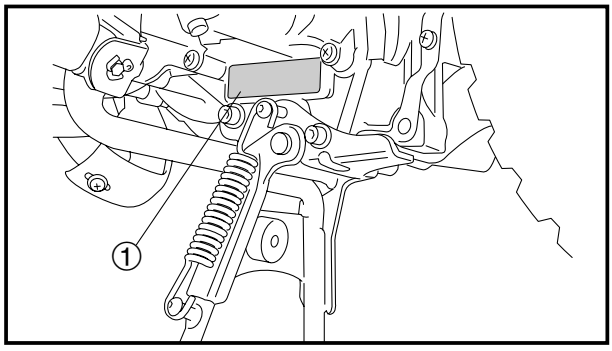


GENERAL INFORMATION

VEHICLE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

The number ① is stamped into the frame head pipe.

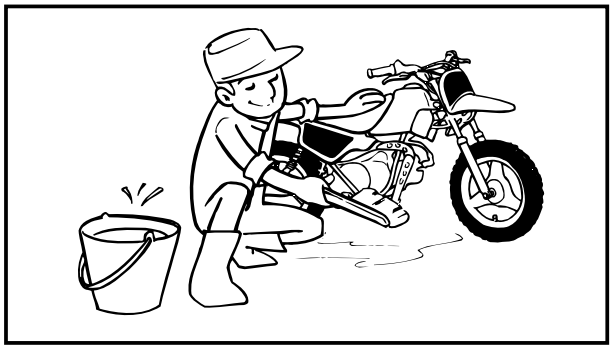


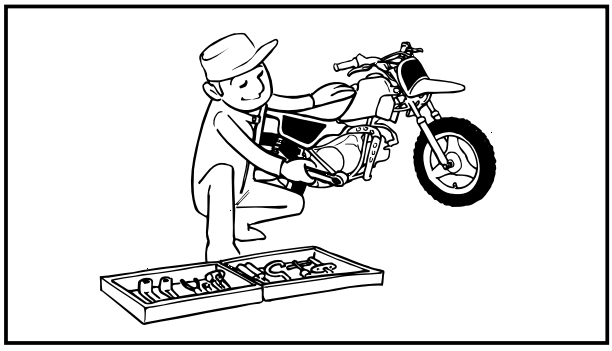
ENGINE SERIAL NUMBER

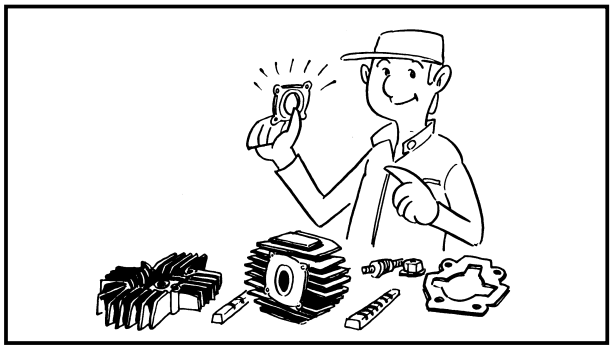
The engine serial number ① is stamped into the crankcase.

NOTE:

Designs and specifications are subject to change without notice.







IMPORTANT INFORMATION

PREPARATION FOR REMOVAL AND DISASSEMBLY

1. Before removal and disassembly, remove all dirt, mud, dust and foreign material.
2. Use only the proper tools and cleaning equipment.
   Refer to the “SPECIAL TOOLS”.
3. When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been “mated” through normal wear. Mated parts must always be reused or replaced as an assembly.
4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
5. Keep all parts away from any source of fire.

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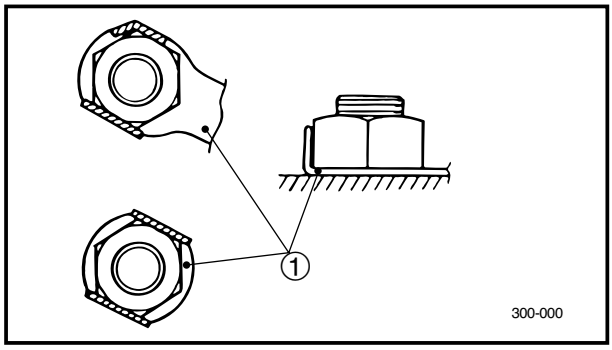
REPLACEMENT PARTS

Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.

EAS00022

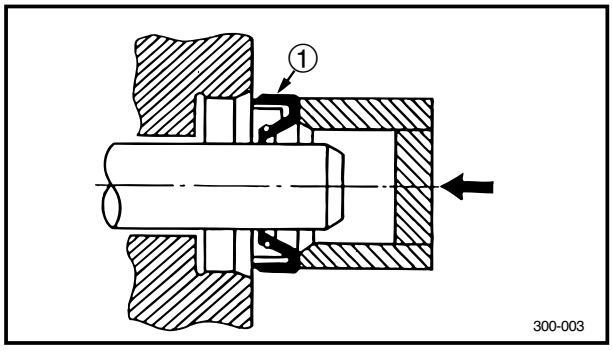
GASKETS, OIL SEALS AND O-RINGS

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



LOCK WASHERS/PLATES AND COTTER PINS

After removal, replace all lock washers/plates ① and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



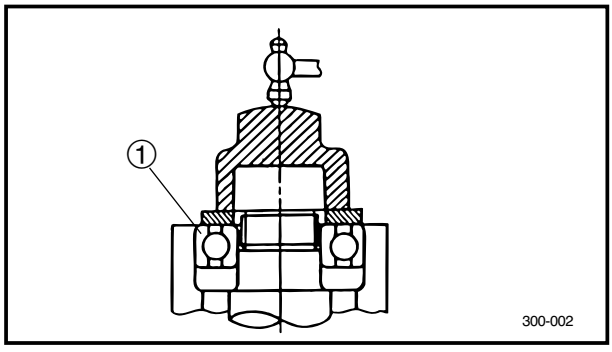
BEARINGS AND OIL SEALS

Install bearings and oil seals so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

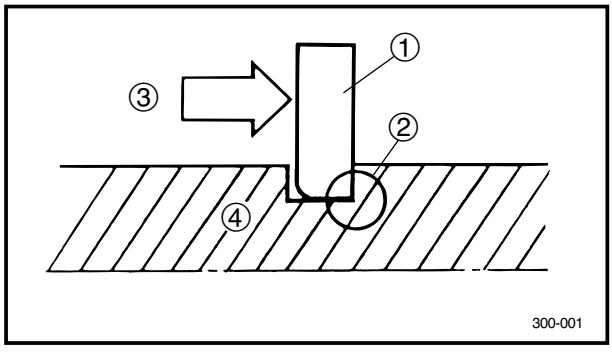
① Oil seal

CAUTION:

Do not spin the bearing with compressed air because this will damage the bearing surfaces.



① Bearing



CIRCLIPS

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

④ Shaft

CHECKING THE CONNECTIONS

Check the leads, couplers, and connecters for stains, rust, moisture, etc.

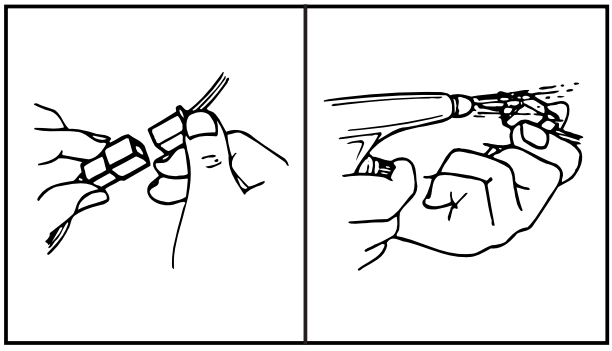
1. Disconnect:
   - lead
   - coupler
   - connector
2. Check:
   - lead
   - coupler
   - connector

   Moisture → Dry with compressed air.
   Rust/stains → Connect and disconnect several times.
3. Check:
   - all connections

   Loose connection → Connect properly.

NOTE:

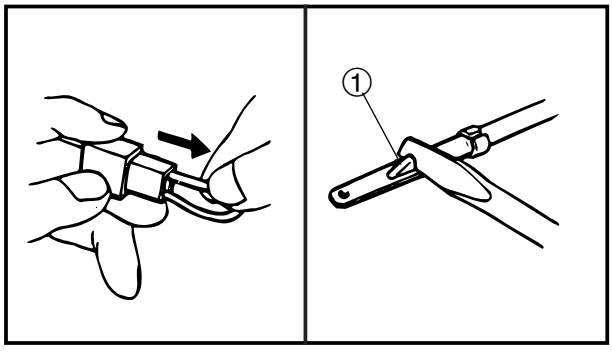
If the pin ① on the terminal is flattened, bend it up.



4. Connect:
   - lead
   - coupler
   - connector

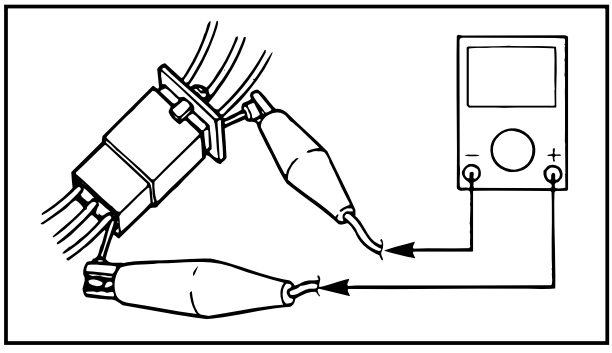
NOTE:

Make sure all connections are tight.



5. Check:
   - continuity

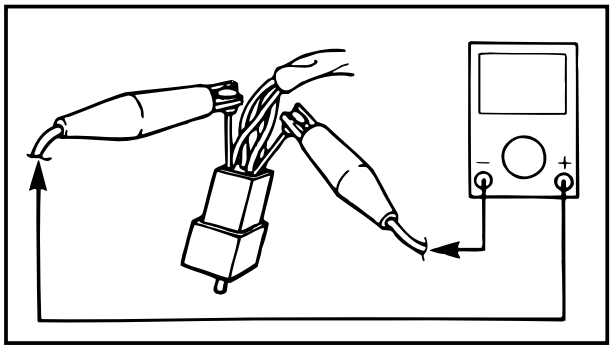
   (with the pocket tester)



	**Pocket tester** **90890-03112, YM-03112**

NOTE:

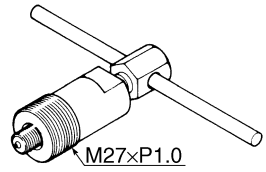
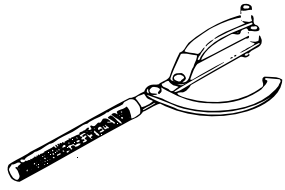
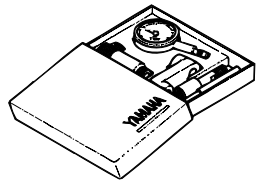
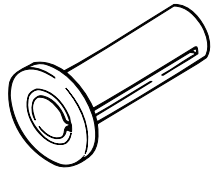
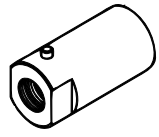
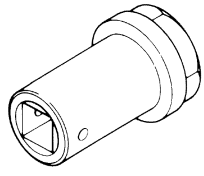
- If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.

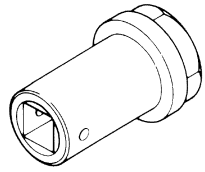
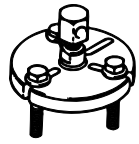
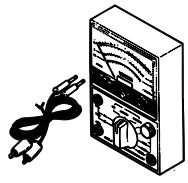
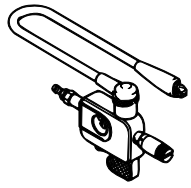
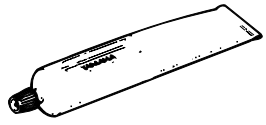


SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use only the appropriate special tools as this will help prevent damage caused by the use of inappropriate tools or improvised techniques. Special tools, part numbers or both may differ depending on the country.

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

Tool No.	Tool name/Usage	Illustration
90890-01189 YM-01189	Flywheel puller This tool is used for removing the rotor.	
90890-01235 YU-01235	Rotor holding tool This tool is necessary for removing and installing the rotor.	
90890-01252	Dial gauge and stand set These tools are for measuring the crankshaft runout.	
90890-01274 YU-90058	Crankshaft instoller pot This tool is necessary for installing the crankshaft.	
90890-01275 YU-90060	Crankshaft installer bolt This tool is necessary for installing the crankshaft.	
90890-01278 YU-90063	Adapter (M12) This tool is necessary for installing the crankshaft.	
90890-01306 YM-01306	Hex. wrench (25 mm) This tool is needed for removing the middle gear screw.	

Tool No.	Tool name/Usage	Illustration
90890-01307 YM-01307	Hex. wrench (22 mm) This tool is needed for removing the shaft drive screw.	
90890-01362 YU-33270	Flywheel puller This tool is used for separating the crankcase.	
90890-03112 YU-03112-U	Pocket tester This instrument is necessary for checking the electrical system.	
90890-06760 YU-06760	Digital tachometer This tool is needed for observing engine r/min.	
90890-06754 YM-34487	Ignition checker This instrument is necessary for checking the ignition system components.	
90890-85505	Yamaha bond No.1215 (Three bond No.1215®) This bond is used on crankcase mating surfaces,etc.	

CHAPTER 2
SPECIFICATIONS

SPECIFICATIONS

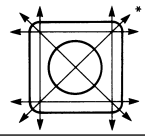
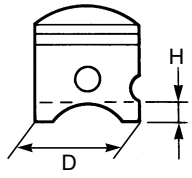
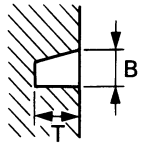
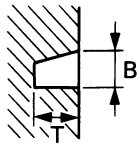
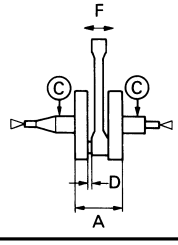
GENERAL SPECIFICATIONS

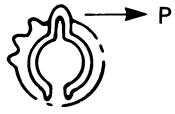
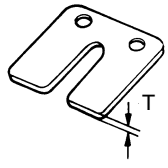
Model name:	PW50W (Except for EUROPE) PW50 (For EUROPE)
Model code number:	5PGD (Except for EUROPE) 5PGE (For EUROPE)
Dimensions:	
Overall length	1245 mm (49.0 in)
Overall width	575 mm (22.6 in)
Overall height	715 mm (28.1 in)
Seat height	485 mm (19.1 in)
Wheelbase	855 mm (33.7 in)
Ground clearance	105 mm (4.13 in)
Minimum turning radius	1300 mm (51.2 in)
Weight:	
With oil and fuel	39.0 kg (86 lb)

MAINTENANCE SPECIFICATIONS

ENGINE

Item	PW50
Engine type:	Air cooled 2-stroke
Induction system	Reed valve
Displacement	49.0 cm^3 (2.99 cu.in)
Cylinder arrangement	Forward-inclined single cylinder
Bore x stroke	40.0 x 39.2 mm (1.57 x 1.54 in)
Compression ratio	6.00 :1
Starting system	Kickstarter
Fuel:	
Recommended fuel	Regular unleaded gasoline only (For CANADA, EUROPE) Unleaded gasoline only (Except for CANADA,EUROPE)
Fuel tank capacity	2.0 L (0.53 US gal) (0.44 Imp.gal)
Engine oil:	
Lubrication system	Separate lubrication (Yamaha autolube)
Type	YAMALUBE 2 or 2-stroke engine oil
Engine oil quantity	
Quantity	0.30 L (0.32 US qt) (0.26 Imp.qt)
Transmission oil:	
Type	YAMALUBE 4 (10W30) or SAE 10W30 (Except for EUROPE) SAE 10W30 (For EUROPE) API service SG type or higher JASO standard MA
Total amount	0.35 L (0.37 US qt) (0.31 Imp.qt)
Oil change quantity	0.30 L (0.32 US qt) (0.26 Imp.qt)
Autolube pump:	
Plunger diameter	3.50 mm (0.14 in)
Color code	YELLOW
Minimum stroke	0.25-0.30 mm (0.010-0.012 in)
Maximum stroke	1.00-1.15 mm (0.04-0.05 in)
Minimum output/200 strokes	0.48-0.57 cm^3 (0.03-0.04 cu.in)
Pulley adjusting mark	At idle
Spark plug (s):	
Manufacturer/model	NGK/BP4HS (Except for CANADA,EUROPE) NGK/BPR4HS (For CANADA, EUROPE) DENSO/W14FPL (Except for CANADA,EUROPE)
Spark plug gap	0.6-0.7 mm (0.024-0.028 in)

Item	PW50
Cylinder head: 	
Volume	6.80 cm³ (0.41 cu.in)
Warpage limit	0.03 mm (0.0012 in)
Cylinder:	
Bore	39.993-40.012 mm (1.5745-1.5753 in)
Wear limit	40.100 mm (1.5787 in)
Taper limit	0.050 mm (0.0020 in)
Out of round limit	0.010 mm (0.0004 in)
Piston: 	
Piston-to-cylinder clearance	0.034-0.047 mm (0.0013-0.0019 in)
Limit	0.10 mm (0.0039 in)
Diameter D	39.952-39.972 mm (1.5729-1.5737 in)
Height H	5.0 mm (0.20 in)
Offset	0.20 mm (0.0079 in)
Offset direction	Exhaust side
Piston pin bore inside diameter	10.004-10.015 mm (0.3939-0.3943 in)
Limit	10.035 mm (0.3951 in)
Piston pin outside diameter	9.994-10.000 mm (0.3935-0.3937 in)
Limit	9.974 mm (0.3927 in)
Piston ring:	
Top ring	
Ring type 	Keystone
Dimensions (B x T)	1.50 x 1.80 mm (0.06 x 0.07 in)
End gap (installed)	0.15-0.35 mm (0.0059-0.0138 in)
Limit	0.50 mm (0.0197 in)
Ring side clearance	0.020-0.060 mm (0.0008-0.0024 in)
Limit	0.080 mm (0.0032 in)
2nd ring	
Ring type 	Keystone
Dimensions (B x T)	1.50 x 1.80 mm (0.06 x 0.07 in)
End gap (installed)	0.15-0.35 mm (0.0059-0.0138 in)
Limit	0.50 mm (0.0197 in)
Ring side clearance	0.020-0.060 mm (0.0008-0.0024 in)
Limit	0.080 mm (0.0032 in)
Crankshaft: 	
Width A	37.90-37.95 mm (1.492-1.494 in)
Runout limit C	0.050 mm (0.0020 in)
Big end side clearance D	0.350-0.550 mm (0.0138-0.0217 in)
Big end radial clearance	0.350-0.550 mm (0.0138-0.0217 in)
Small end free play F	0.40-0.80 mm (0.02-0.03 in)

Item	PW50
Automatic centrifugal clutch:	
Clutch type	Wet, centrifugal automatic
Clutch housing inside diameter	105 mm (4.13 in)
Wear limit	106 mm (4.17 in)
Clutch shoe thickness	1.0 mm (0.04 in)
Wear limit	0.7 mm (0.03 in)
Clutch shoe spring free length	34.5 mm (1.36 in)
Llimit	35.5 mm (1.40 in)
Clutch-in revolution	2700 r/min
Clutch-stall revolution	3500 r/min
Transmission:	
Primary reduction system	Spur gear
Primary reduction ratio	63/33 (1.909)
Secondary reduction system	Shaft drive
Secondary reduction ratio	19/15 x 54/11 (6.218)
Kickstarter: 	
Kickstarter type	Ratchet
Kick clip friction force P	1-5 N (0.34-1.33 lbf) (0.15-0.60 kgf)
Air filter:	
Air filter oil grade	Foam air-filter oil or SAE10W30SE
Carburetor:	
Type x quantity	VM12SC x 1
Manufacturer	MIKUNI
ID mark	5PG1 10
Main jet	#70
Air jet	2.5
Jet needle	3X24-1
Needle jet	E-2
Pilot outlet	0.9
Pilot jet	#40
Valve seat size	1.2
Starter jet 1	#30
Float height	15.5-17.5 mm (0.61-0.69 in)
Fuel level (using fuel level gauge)	2.0-4.0 mm (0.08-0.16 in)
Idling condition:	
Engine idling speed	1650-1750 r/min
Throttle cable free play:	1.5-3.5 mm (0.06-0.14 in)
Reed valve: 	
Thickness T	0.200 mm (0.0079 in)
Valve stopper height	4.6-5.0 mm (0.18-0.20 in)
Llimit	7.4-7.8 mm (0.291-0.307 in)
Valve bending limit	0.2 mm (0.01 in)

Part to be tightened	Thread size	Q'ty	Tightening torque			Remarks
			Nm	m·kg	ft·lb	
Spark plug	M14 x 1.25	1	20	2.0	14	
Cylinder head	M6 x 1.0	4	10	1.0	7.2	
Autolube pump	M5 x 0.8	2	4	0.4	2.9	
Autolube pump cover	ø5 Tapping	1	4	0.4	2.9	
Primary drive gear	M10 x 1.25	1	30	3.0	22	
Kick crank	M6 x 1.0	1	10	1.0	7.2	
Reed valve-Manifold	M6 x 1.0	4	8	0.8	5.8	
Air filter case	M6 x 1.0	1	4	0.4	2.9	
Ignition coil	M6 x 1.0	2	9	0.9	6.5	
Rotor	M12 x 1.25	1	43	4.3	31	
Stator	M6 x 1.0	2	9	0.9	6.5	
Exhaust manifold	M6 x 1.0	2	9	0.9	6.5	
Exhaust chamber assembly	M8 x 1.25	1	18	1.8	13	
Muffler	M8 x 1.25	1	18	1.8	13	
Exhaust chamber protector	M6 x 1.0	4	9	0.9	6.5	
Bearing retainer (Main axle)	M6 x 1.0	2	12	1.2	8.7	
Middle driven pinion (Screw)	M45 x 1.5	1	60	6.0	43	Left hand thread
Plate bearing cover (Ring gear)	M6 x 1.0	2	12	1.2	8.7	
Crankcase	M6 x 1.0	8	8	0.8	5.8	Yamaha bond No.1215
Crankcase cover (Right)	M6 x 1.0	5	8	0.8	5.8	
Transmission oil drain bolt	M8 x 1.25	1	14	1.4	10	
Oil plug	M14 x 1.5	1	2	0.2	1.4	
Protector (Crankcase cover Right)	M6 x 1.0	1	9	0.9	6.5	
Magneto cover (Left)	M5 x 0.8	3	4	0.4	2.9	
Plate cover (Crankcase Right)	M6 x 1.0	1	9	0.9	6.5	

CHASSIS

Item	PW50
Chassis:	
Frame type	Steel tube backbone
Caster angle	25.50 degree
Trail	50.0 mm (1.97 in)
Front wheel:	
Wheel type	Panel wheel
Rim size	10x1.50
Rim material	Steel
Wheel travel	60.0 mm (2.36 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Rear wheel:	
Wheel type	Panel wheel
Rim size	10x1.50
Rim material	Steel
Wheel travel	50.0 mm (1.97 in)
Radial wheel runout limit	2.0 mm (0.08 in)
Lateral wheel runout limit	2.0 mm (0.08 in)
Front tire:	
Type	With tube
Size	2.50-10 4PR
Manufacturer/model	BRIDGESTONE/KNOBBY
Manufacturer/model	IRC/KNOBBY
Wear limit (front)	0.8 mm (0.03 in)
Rear tire:	
Type	With tube
Size	2.50-10 4PR
Manufacturer/model	BRIDGESTONE/KNOBBY
Manufacturer/model	IRC/KNOBBY
Wear limit (rear)	0.8 mm (0.03 in)
Tire air pressure (measured on cold tires)	
Front	100 kPa (15 psi) (1.00 kgf/cm^2) (1.00 bar)
Rear	100 kPa (15 psi) (1.00 kgf/cm^2) (1.00 bar)

Item	PW50
Front brake:	
Type	Drum brake
Operation	Right hand operation
Front brake lever free play	10.0-20.0 mm (0.39-0.79 in)
Front drum brake	
Drum brake type	Leading, trailing
Brake drum inside diameter	80.0 mm (3.15 in)
Limit	80.5 mm (3.17 in)
Lining thickness	3.5 mm (0.14 in)
Limit	1.5 mm (0.06 in)
Shoe spring free length	44.5 mm (1.75 in)
Rear brake:	
Type	Drum brake
Operation	Left hand operation
Rear brake lever free play	10.0-20.0 mm (0.39-0.79 in)
Rear drum brake	
Drum brake type	Leading, trailing
Brake drum inside diameter	80.0 mm (3.15 in)
Limit	80.5 mm (3.17 in)
Lining thickness	3.5 mm (0.14 in)
Limit	1.5 mm (0.06 in)
Shoe spring free length	44.5 mm (1.75 in)
Steering:	
Steering bearing type	Ball and race bearing
Lock to lock angle (left)	48.0 degree
Lock to lock angle (right)	48.0 degree
No./size of steel balls	
(Upper)	26 pcs 0.156 in
(Lower)	26 pcs 0.156 in
Front suspension:	
Type	Telescopic fork
Spring/shock absorber type	Coil spring/oil damper
Front fork travel	60.0 mm (2.36 in)
Fork spring free length	115.0 mm (4.53 in)
Limit	112.7 mm (4.44 in)
Spring rate K1	3.92 N/mm (22.38 lb/in) (0.40 kgf/mm)
Spring stroke K1	-5.0-60.0 mm (-0.20-2.36 in)
Inner tube outer diameter	22.2 mm (0.87 in)
Optional spring available	No
Quantity	35.0 cm^3 (1.18 US oz) (1.23 Imp.oz)

Item	PW50
Rear suspension:	
Type	Unit swing
Spring/shock absorber type	Coil spring/oil damper
Rear shock absorber assembly travel	30.0 mm (1.18 in)
Spring free length	153 mm (6.02 in)
Installed length	146 mm (5.75 in)
Spring rate K1	11.89 N/mm (67.94 lb/in) (1.22 kgf/mm)
Spring rate K2	33.4 N/mm (190.71 lb/in) (3.40 kgf/mm)
Spring stroke K1	0.0-27.0 mm (0.00-1.06 in)
Spring stroke K2	27.0-37.0 mm (1.06-1.46 in)
Optional spring available	No

Part to be tightened	Thread size	Q'ty	Tightening torque			Remarks
			Nm	m·kg	ft·lb	
Front wheel axle	M10 x 1.25	1	40	4.0	29	
Handlebar	M8 x 1.25	2	19	1.9	13	
Upper bracket — Steering stem	M10 x 1.25	1	32	3.2	23	
Upper bracket — Inner tube	M10 x 1.25	2	32	3.2	23	
Lower bracket — Inner tube	M8 x 1.25	2	23	2.3	17	
Steering nut	BC1	Refer to NOTE				
Engine mount	M10 x 1.25	1	48	4.8	35	
Rear wheel axle nut	M12 x 1.25	1	60	6.0	43	
Rear shock — upper	M6 x 1.0	2	11	1.1	8.0	
— lower	M8 x 1.25	2	23	2.3	17	
Swing arm (L) — Engine (Front)	M8 x 1.25	3	26	2.6	19	Yamaha bond No.1215
— Gear housing (Rear)	M8 x 1.25	3	26	2.6	19	Yamaha bond No.1215
Swing arm (R) — Engine (Front)	M8 x 1.25	2	29	2.9	21	
— Bearing housing (Rear)	M8 x 1.25	2	33	3.3	24	
Front brake — Cam shaft lever	M5 x 0.8	1	4	0.4	2.9	
Side cover — Frame	M6 x 1.0	2	7	0.7	5.1	
Rear brake — Cam shaft lever	M5 x 0.8	1	6	0.6	4.3	
Housing cover	M6 x 1.0	3	9	0.9	6.5	
Drive pinion (Screw)	M35 x 1.5	1	50	5.0	36	
Starter lever	M11 x 1.25	1	1	0.1	0.7	
Main stand bracket	M6 x 1.0	2	15	1.5	11	

NOTE:

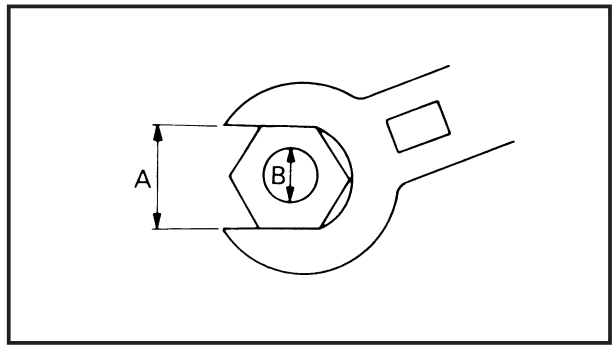
1. First tighten the ring nut to 10 Nm (1.0 m • kg, 7.2 ft • lb). Then, after moving the steering a few times right and left, loosen the ring rut.
2. Retighten the ring nut to 0.7 Nm (0.07 m• kg, 0.5 ft • lb) by using the torque wrench.

ELECTRICAL

Item	PW50
Ignition system:	
Ignition system	CDI
Advancer type	Fixed
Ignition timing (B.T.D.C.)	16.0 degree/5000 r/min
CDI:	
Magneto model/manufacturer	F3L6/YAMAHA
Pickup coil resistance	18.0-22.0 Ω W/R-B
Source coil resistance	297-363 Ω B/R-B
CDI unit model/manufacturer	3PT-00/YAMAHA
Ignition coil:	
Model/manufacturer	2JN/YAMAHA
Primary coil resistance	0.32-0.48 Ω
Secondary coil resistance	5.68-8.52 kΩ
Minimum ignition spark gap	6.0 mm (0.24 in)
Spark plug cap:	
Material	Resin
Resistance	5.0 kΩ
Flywheel magneto:	
Lighting coil resistance	0.57-0.69 Ω W-B

EAS20330
GENERAL TIGHTENING TORQUE SPECIFICATIONS

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.



A: Distance between flats
B: Outside thread diameter

A (nut)	B (bolt)	General tightening torques	
		Nm	m·kg
10 mm	6 mm	6	0.6
12 mm	8 mm	15	1.5
14 mm	10 mm	30	3.0
17 mm	12 mm	55	5.5
19 mm	14 mm	85	8.5
22 mm	16 mm	130	13.0

DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm cm	Millimeter Centimeter	10^{-3} m 10^{-2} m	Length Length
kg	Kilogram	10^{3} gram	Weight
N	Newton	1 kg × m/sec^2	Force
N•m	Newton meter	N × m	Torque
m•kg	Meter-kilogram	m × kg	Torque
Pa	Pascal	N/m^2	Pressure
N/mm	Newton per millimeter	N/mm	Spring rate
L cm^3	Litter Cubic centimeter	—	Volume or Capacity
tr/mn	Rotation per minute	—	Engine speed

LUBRICATION POINTS AND LUBRICANT TYPES

ENGINE

Lubrication point	Lubricant
Oil seal lips	LS
Bearings	E
O-rings	LS
Piston pin	E
Piston outside and ring groove	E
Piston ring	E
Cylinder inner surface	E
Connecting rod big end	E
Connecting rod small end	E
Main axle	G
Drive and driven pinion teeth	G
Drive axle	G
Shaft drive spline	LS
Kickstarter gear inner surface	G
Kickstarter shaft	G
Crankcase mating surface	Yamaha bond No.1215

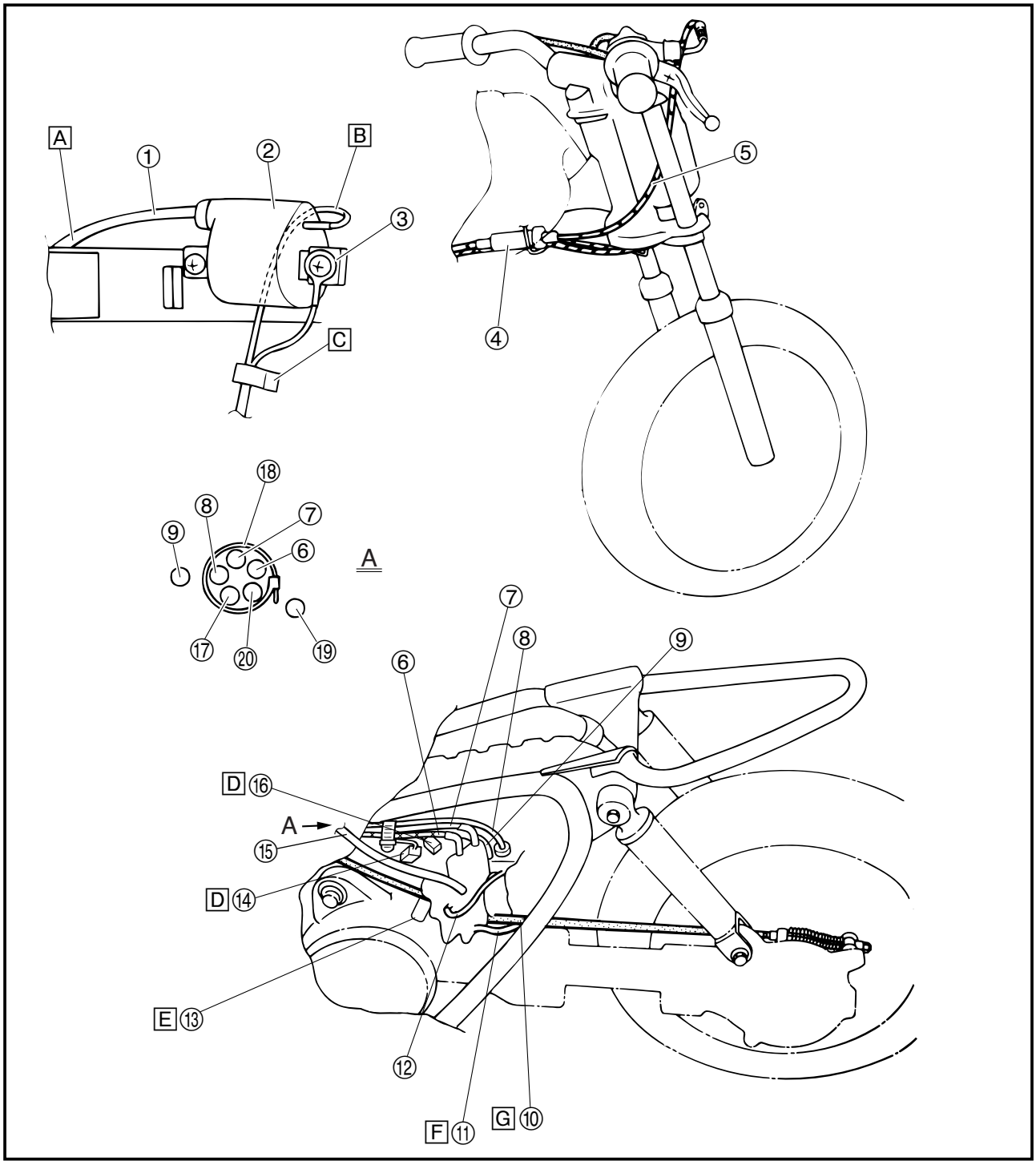
CHASSIS

Lubrication point	Lubricant
Front wheel oil seal lips	LS
Front brake camshaft	LS
Rear wheel oil seal lips	LS
Rear brake camshaft	LS
Front wheel axle	LS
Rear wheel axle	LS
Throttle grip tube guide inner surface	LS
Brake lever pivot bolt	LS
Steering head bearing inner race	LS
Steering head bearing outer race	LS
Steering head upper bearing	LS
Steering head lower bearing	LS
Pivot shaft (Engine mount)	LS
Mainstand pivot shaft	LS
Throttle reel	LS
Wire end	LS
Front fork inner tube	LS
Front fork bushing	LS

CABLE ROUTING

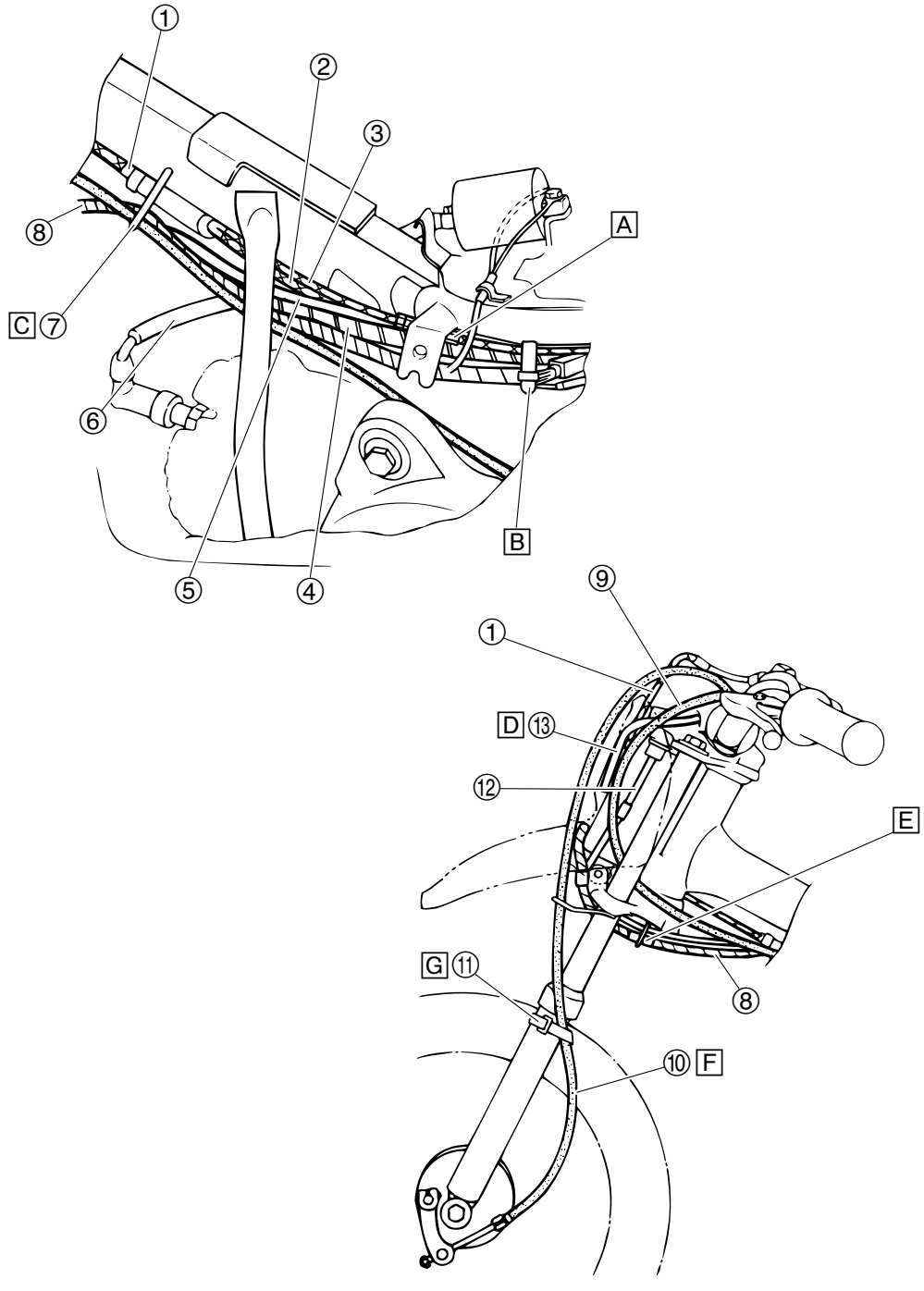
① Spark plug lead
② Ignition coil
③ Ground
④ Wire cylinder
⑤ Throttle cable 1
⑥ Throttle cable 2
⑦ Starter cable
⑧ Oil pump cable
⑨ Oil pipe
⑩ Rear brake cable
⑪ Carburetor overflow pipe
⑫ Oil delivery pipe
⑬ C.D.I. magneto lead wire
⑭ C.D.I. unit coupler
⑮ Fuel pipe
⑯ Control unit coupler
⑰ C.D.I unit lead
⑱ Switch cord band
⑲ Fuel pipe
⑳ Control unit lead

[A] Route it under the down tube.
[B] Pass the ignition coil lead under the ignition coil.
[C] Clamp the lead wire to the frame.
[D] Clamp the coupler lead under the throttle cable 2 and starter cable.
[E] Route it inside the rear brake cable.
[F] Route it under the rear brake cable.
[G] Route it outside the air filter stay.



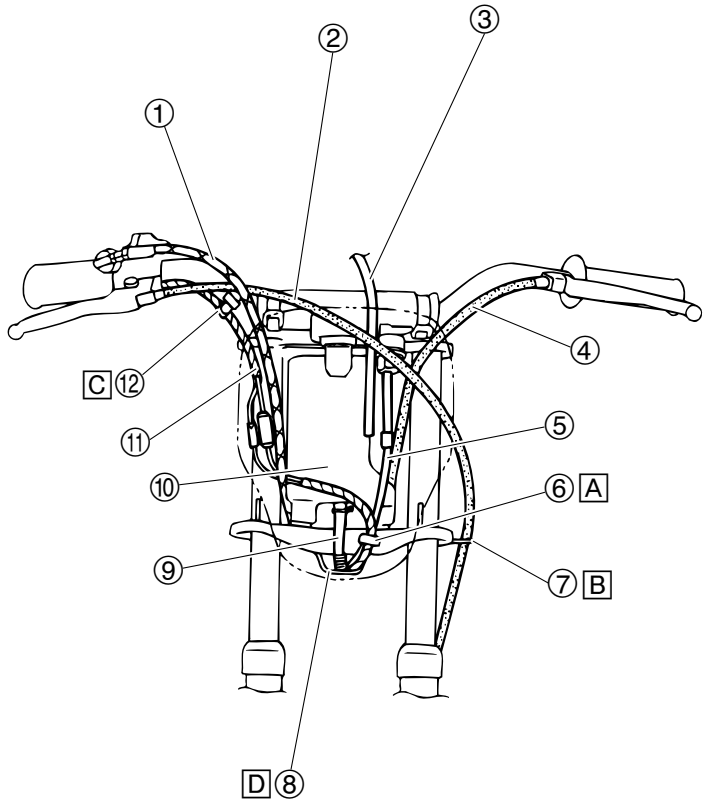
① Throttle cable 1
② Throttle cable 2
③ Oil pump cable
④ Oil pipe
⑤ Starter cable
⑥ Spark plug lead
⑦ Wire harness guide
⑧ Wire harness
⑨ Rear brake cable
⑩ Front brake cable
⑪ Band
⑫ Starter cable
⑬ Fuel tank breather hose

[A] Clamp the oil pump cable on top of all of the wire harness, starter cable, throttle cable 2 and oil pipe.
[B] Clamp with the switch cord band the wire harness, throttle cable 2, oil pump cable and starter cable behind the ignition coil lead.
[C] Pass through the wire harness, stater cable, rear brake cable, oil pipe, and the wire cylinder.
[D] Fuel tank cap→ between the handlebar protector and front brake cable→ Left side of the front fender installed position→ in front of the oil tank.
[E] Align the tape on the wire harness with the guide 1.
[F] Don't twist the front brake cable.
[G] Clamp the front brake cable.



① Throttle cable 1
② Front brake cable
③ Fuel tank breather hose
④ Rear brake cable
⑤ Starter cable
⑥ Clamp
⑦ Guide 2 (front brake cable)
⑧ Guide 1 (Wire harness, oil pipe, starter cable)
⑨ Oil pipe
⑩ Oil tank
⑪ Wire harness
⑫ Switch cord band

[A] Clamp the wire harness and starter cable.
[B] Pass the front brake cable.
[C] Clamp the wire harness to the handlebar.
[D] Pass the wire harness, oil pipe and starter cable.



CHAPTER 3
PERIODIC CHECKS AND ADJUSTMENTS

EAS00036

PERIODIC CHECKS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

EAS00037

PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

NOTE:

- From 18 months, repeat the maintenance intervals starting from 6 months.
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

NO.		ITEM	CHECK OR MAINTENANCE JOB	INITIAL			THEREAFTER EVERY	
				1 month	3 months	6 months	6 months	12 months
1	*	**Fuel line**	• Check fuel hoses for cracks or damage. • Replace if necessary.	√	√	√	√	
2		**Spark plug**	• Check condition. • Adjust gap and clean. • Replace if necessary.	√	√	√	√	
3		**Air filter element**	• Clean with solvent. • Replace if necessary.		√	√	√	
4	*	**Carburetor**	• Check engine idling speed and starter operation.		√	√	√	
			• Adjust if necessary. • Clean.			√		√
5	*	**Cylinder head and exhaust system**	• Check for leakage. • Tighten if necessary. • Decarbonize if necessary.		√	√	√	
6	*	**Spark arrester**	• Clean.			√	√	

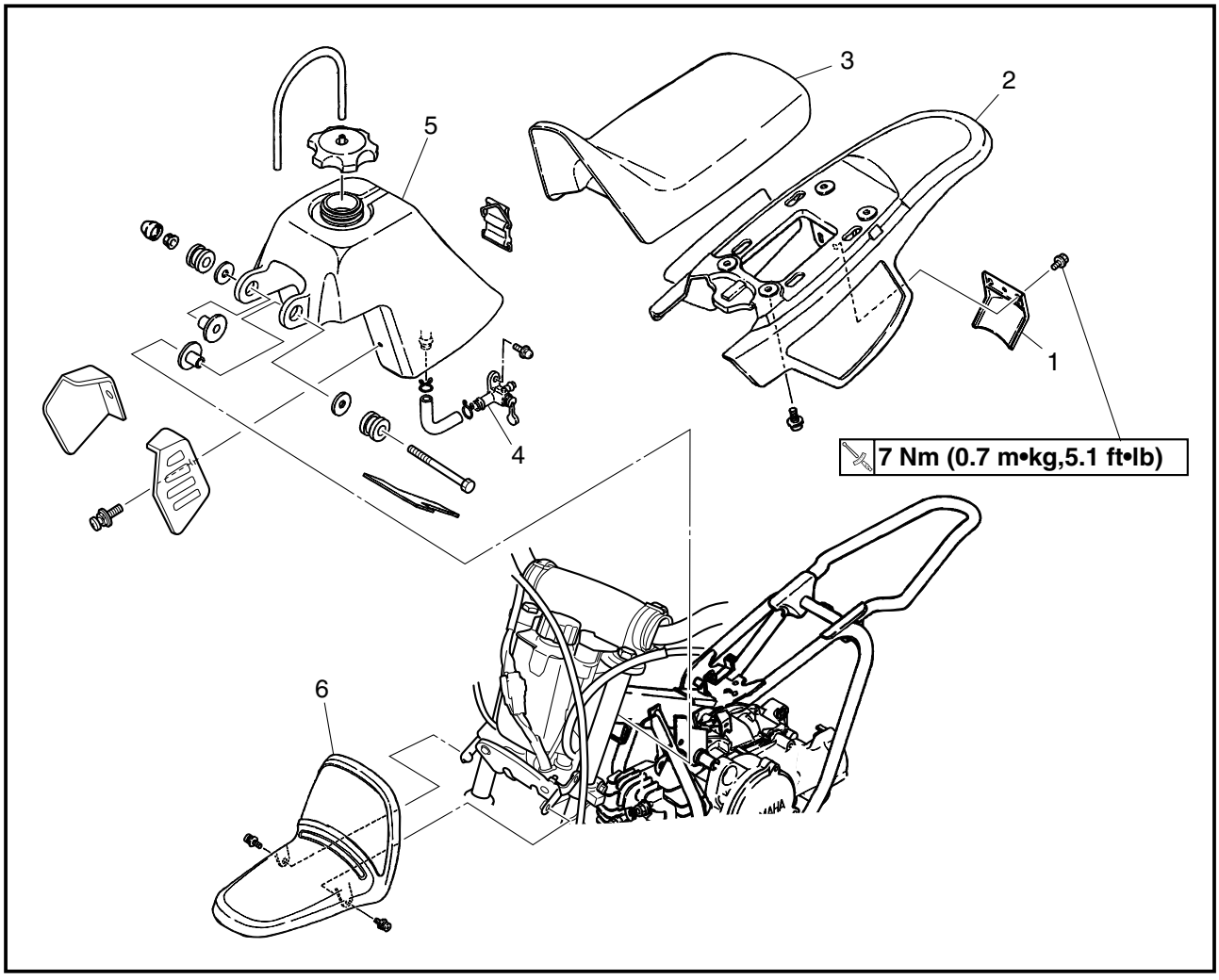
GENERAL MAINTENANCE AND LUBRICATION CHART

NO.		ITEM	CHECK OR MAINTENANCE JOB	INITIAL			THEREAFTER EVERY	
				1 month	3 months	6 months	6 months	12 months
1	*	**Front brake**	• Check operation. • Adjust brake lever free play.	√	√	√	√	
			• Replace brake shoes.	Whenever worn to the limit				
2	*	**Rear brake**	• Check operation. • Adjust brake lever free play.	√	√	√	√	
			• Replace brake shoes.	Whenever worn to the limit				
3	*	**Wheels**	• Check runout and for damage. • Replace if necessary.	√	√	√	√	
4	*	**Tires**	• Check tread depth and for damage. • Replace if necessary. • Check air pressure. • Correct if necessary.	√	√	√	√	
5	*	**Wheel bearings**	• Check bearings for smooth operation. • Replace if necessary.					√
6	*	**Steering bearings**	• Check bearing assemblies for looseness. • Moderately repack with lithium-soap-based grease every 2 years.			√		√
7	*	**Middle and final gear cases**	• Check for grease leakage.	√	√	√	√	√
			• Check gears for damage and wear. • Lubricate gears with lithium-soap-based grease.	Every 2 years				
8	*	**Chassis fasteners**	• Check all chassis fitting and fasteners. • Correct if necessary.	√	√	√	√	
9	*	**Autolube pump**	• Check operation. • Correct if necessary. • Bleed.	√	√	√	√	
10	*	**Transmission oil**	• Check for oil leakage. • Correct if necessary.	√	√	√	√	
			• Change.	√		√		√
11	*	**Front and rear brake lever pivot**	• Apply lithium-soap-based grease (all-purpose grease) lightly.		√	√	√	
12	*	**Centerstand pivot**	• Check operation. • Apply lithium-soap-based grease (all-purpose grease) lightly.		√	√	√	
13	*	**Shock absorber assemblies**	• Check operation and for oil leakage. • Replace if necessary.	√	√	√	√	
14	*	**Control cable**	• Apply Yamaha chain and cable lube or engine oil 10W-30 lightly.		√	√		√
15	*	**Throttle grip housing and cable**	• Check operation and free play. • Apply Yamaha chain and cable lube or engine oil 10W-30 lightly.	√	√	√	√	

NOTE:

The air filter needs more frequent service if you are riding in unusually wet or dusty areas.

SIDE COVERS, SEAT AND FUEL TANK



Order	Job/Part	Q´ty	Remarks
	Removing the side covers, seat and fuel tank		Remove the parts in the order listed.
1	Flap	1	
2	Side cover	1	
3	Seat	1	
4	Fuel cock	1	Set the fuel cock to “S”.
5	Fuel tank	1	
6	Front fender	1	
			For installation, reverse the removal procedure.

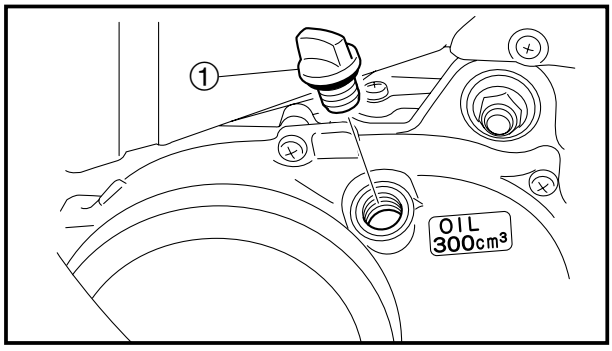
ENGINE

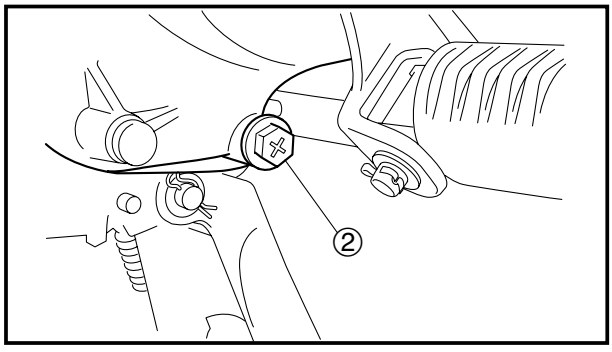
CHANGING THE TRANSMISSION OIL

1. Stand the vehicle on a level surface.

NOTE:

- Place the vehicle on the mainstand.
- Make sure the vehicle is upright.





2. Start the engine, warms it up for several minutes, and then turn it off.
3. Place a container under the transmission.
4. Remove.
   - Oil filler cap ①
   - Transmission oil drain bolt ②
     Completely drain the transmission oil.
5. Install:
   - Transmission oil drain bolt

	14 Nm (1.4 m•kg, 10 ft•lb)

6. Fill:
   - Transmission oil
     (with the specified amount of the recommended transmission oil)

Type:
YAMALUBE 4 (10W30) or
SAE 10W30
(Except for EUROPE)
SAE 10W30 (For EUROPE)
Recommended engine oil grade:
API service SG type or higher
JASO standard MA
Quantity:
Periodic oil change
0.3 L (0.32 US qt) (0.26 Imp.qt)
Over haul
0.35 L (0.37 US qt) (0.31 Imp.qt)

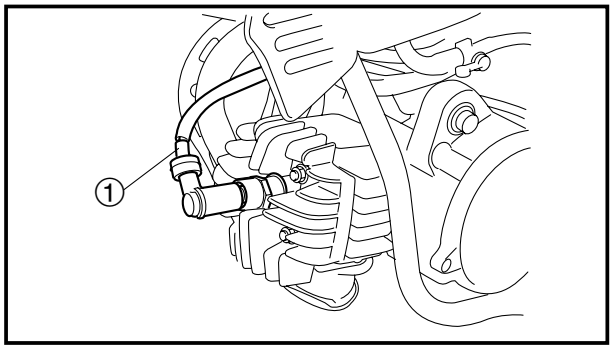
7. Install.
   - Oil filler cap

CHECKING THE ENGINE IDLING SPEED

NOTE:

Prior to checking the engine idling speed, the air filter element should be clean, and the engine should have adequate compression.

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

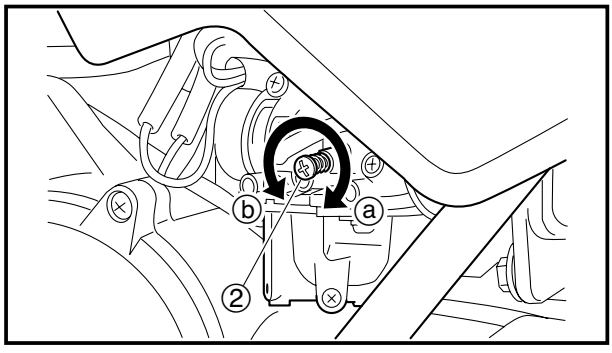


2. Install:
   - Digital tachometer
     (onto the spark plug lead ① of cylinder)

	Digital tachometer **90890-06760, YU-06760**

3. Check:
   - Engine idling speed
     Out of specification → Adjust the throttle stop screw.

	Engine idling speed **1650-1750 r/min**



4. Adjust:
   - Engine idling speed

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a. Install the digital tachometer onto the spark plug lead.
b. Turn the throttle stop screw ② in direction ⓐ or ⓑ until the specified engine idling speed is obtained.

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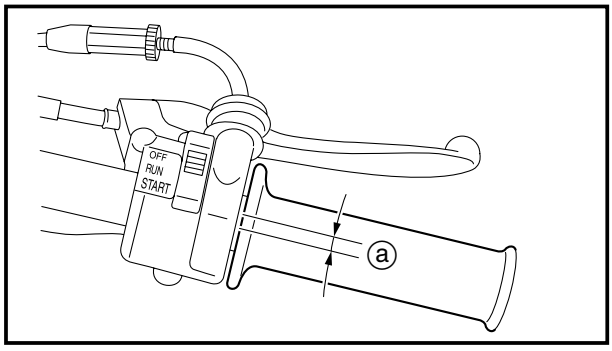
ADJUSTING THE THROTTLE CABLE FREE PLAY

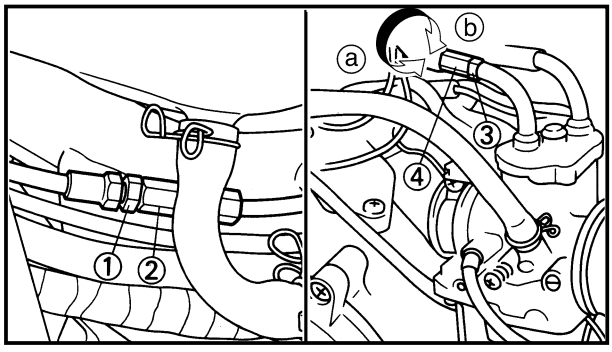
NOTE:

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



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

	Throttle cable free play **1.5-3.5 mm (0.06-0.14 in)**



2. Adjust:
   - Throttle cable free play

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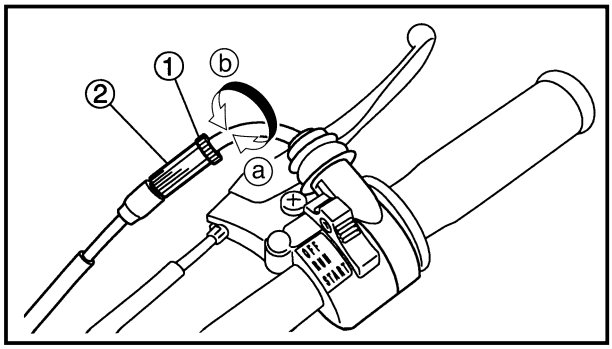
a. Loosen the locknut ① and adjusting nut ②(oil pump cable).
b. Loosen the locknut ③(carburetor side), and then turn the adjusting nut ④ in direction ⓐ or ⓑ until the specified throttle cable free play is obtained.
c. Tighten the locknut.
d. Adjust the autolube pump cable. Refer to "ADJUSTING THE AUTOLUBE PUMP CABLE".
e. Loosen the locknut ①(handle grip side), and then turn the adjusting nut ② in direction ⓐ or ⓑ until the specified throttle cable free play is obtained.



Direction ⓐ	**Throttle cable free play is increased.**
Direction ⓑ	**Throttle cable free play is decreased.**

f. Tighten the locknut.

⚠WARNING

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

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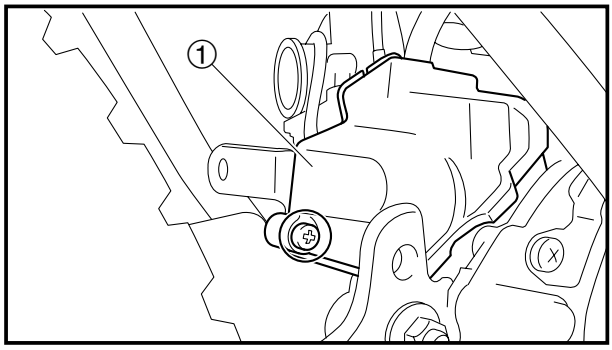
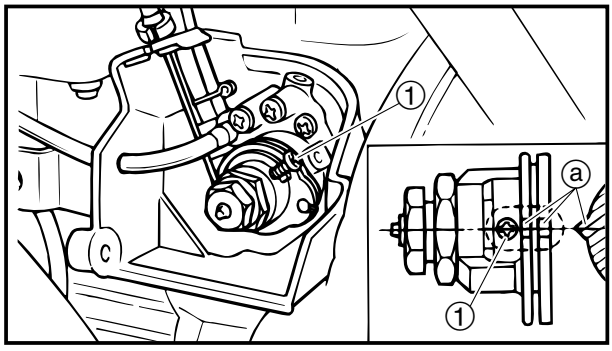
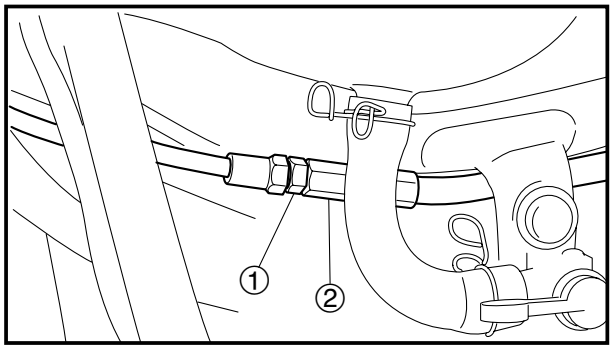


ADJUSTING THE AUTOLUBE PUMP CABLE

1. Remove:
   - Muffler
   - Exhaust chamber assembly
2. Start the engine and turn the throttle grip slowly until slack off the pump cable.
3. Remove:
   - Autolube pump cover (outer) ①



4. Check
   - Pin ①
     Align with the mark ⓐ on the autolube pump.
     Not aligned → Adjust.



5. Adjust:
   - Autolube pump → alignment mark

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a. Loosen the locknut ①.
b. Turn the adjust nut ② until align the pin with the mark ⓐ on the autolube pump.
c. Tighten the locknut ①.

NOTE:

After adjusting, be sure to tighten the locknut completely.

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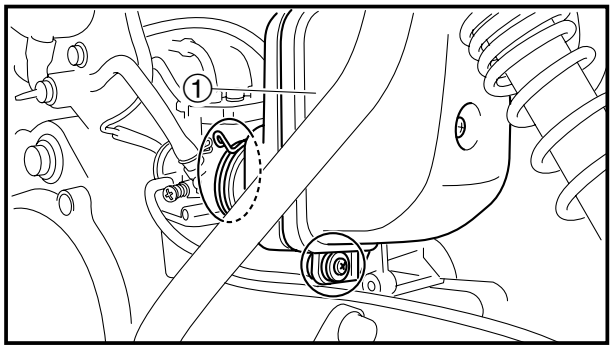
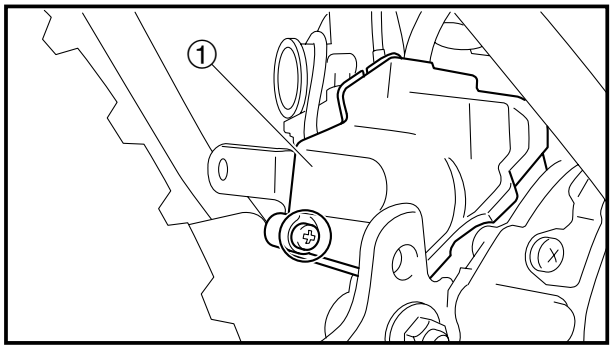
6. Install:
   - Autolube pump cover

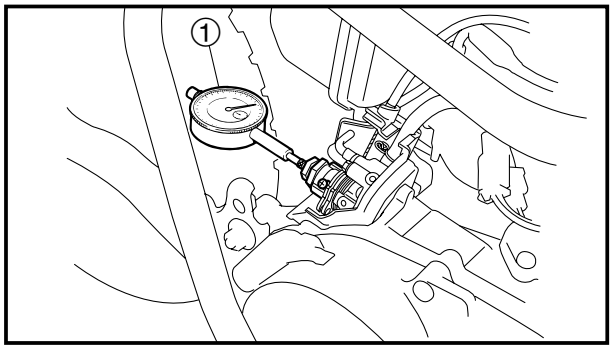


ADJUSTING THE AUTOLUBE PUMP MINIMUM STROKE

1. Remove:
   - Seat assembly
   - Muffler
   - Exhaust chamber assembly
   - Air filter case assembly ①



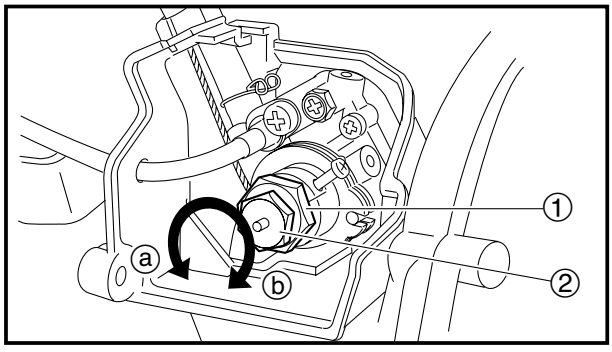
2. Remove:
   - Autolube pump cover (outer) ①



3. Install:
   - Dial gauge ①

   Install the dial gauge to the autolube pump plunger, so that the top end is attached.

	Dial gauge and stand set **90890-01252**



4. Check:
   - Autolube pump minimum stroke

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a. Measure the autolube pump stroke while turning the kick crank slowly.
b. Loosen the locknut ① and turn the adjusting bolt ② direction ⓐ or ⓑ for proper adjustment.

Direction ⓐ	**Autolube pump stroke is increased.**
Direction ⓑ	**Autolube pump stroke is decreased.**

	Minimum stroke: **0.25-0.30 mm (0.010-0.012 in)** **Maximum stroke:** **1.00-1.15 mm (0.04-0.05 in)**

c. Tighten the locknut ①.

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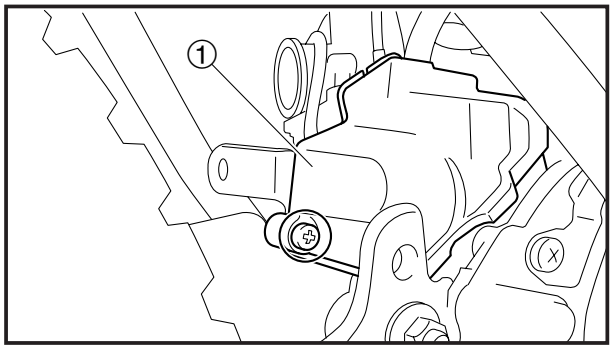
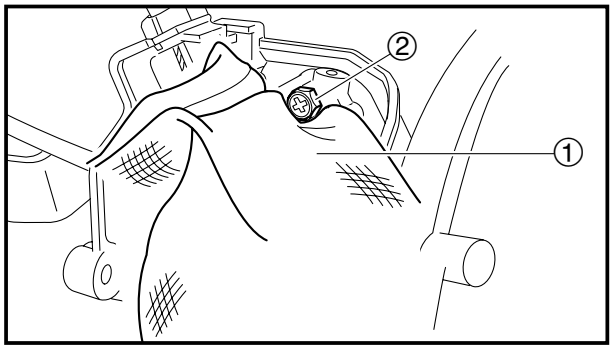
AIR BLEEDING THE AUTOLUBE PUMP

CAUTION:

- **Whenever remove the autolube pump or oil hose, be sure to air bleed the autolube pump.**
- **Make sure that the engine oil is filled in the engine oil tank.**
- **If the engine oil is not in the engine oil tank, fill the engine oil tank.**



1. Remove:
   - Seat assembly
   - Muffler
   - Exhaust chamber assembly
   - Autolube pump cover (outer) ①



2. Place rags ① around the air bleed screw to catch any oil that might spill.
3. Remove:
   - Air bleed screw ②

4. Bleed
   - Autolube system

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a. Start the engine at idling speed.
b. Pull the oil pump cable slightly and keep the engine speed until all air bubbles flow out from the air bleed hole.
c. When there are no air bubbles left, tighten the air bleed screw.

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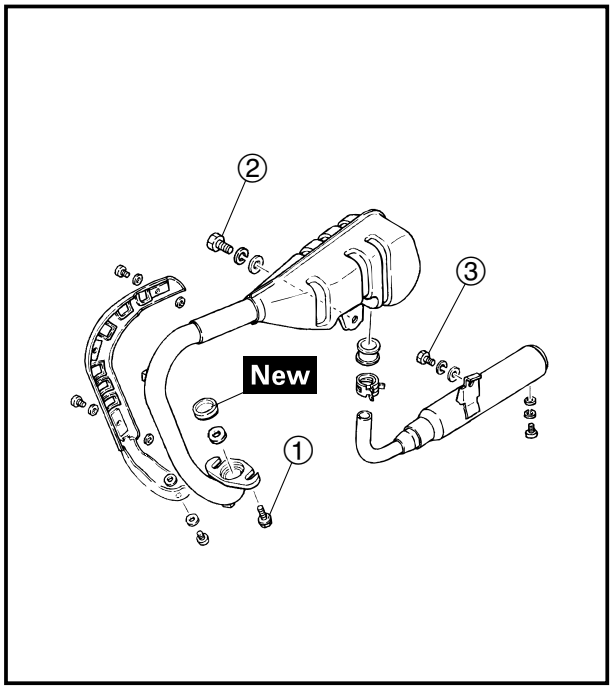
5. Install:
   - Autolube pump cover(outer)
   - Exhaust chamber assembly
   - Muffler
   - Seat assembly

CHECKING THE EXHAUST SYSTEM

⚠WARNING

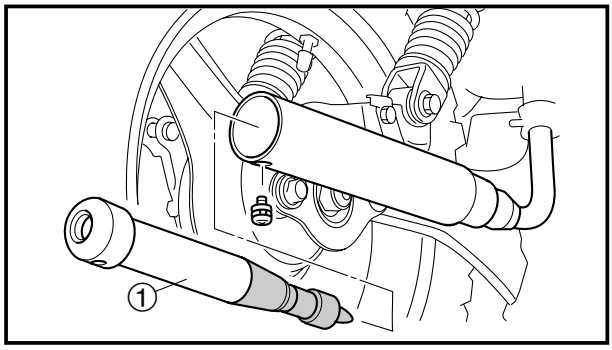
- **Always let the exhaust system cool prior to touching exhaust components.**
- **Do not start the engine when cleaning the exhaust system.**



1. Check
   - Exhaust chamber assembly
   - Muffler
     Cracks/damage → Replace.
     Exhaust gas leaks → Replace the gasket.

2. Check:
   - Tightening torque

Exhaust manifold bolt ①
9 Nm (0.9 m•kg, 6.5 ft•lb)
Exhaust chamber bolt ②
18 Nm (1.8 m•kg, 13 ft•lb)
Muffler bolt ③
18 Nm (1.8 m•kg, 13 ft•lb)



CLEANING THE SPARK ARRESTER AND EXHAUST CHAMBER

1. Remove:
   - Tail pipe ①
   - Muffler
   - Exhaust chamber assembly
   - Gasket

2. Check:
   - Tail pipe

NOTE:
- Use a wire brush to remove any carbon deposits from the spark arrester portion of the tail pipe.
- Tap the tail pipe lightly and remove the carbon deposits from the outside portion of the tail pipe.

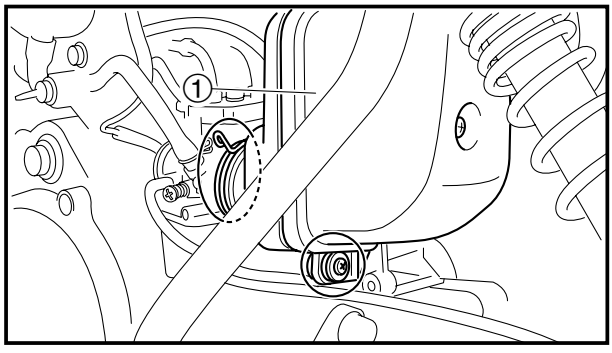
   - Exhaust chamber
     If the carbon deposit use the round scraper to remove the carbon deposit.

3. Install:
   - Gasket **New**
   - Exhaust manifold bolt

     9Nm (0.9m•kg, 6.5 ft•lb)
   - Exhaust chamber assembly

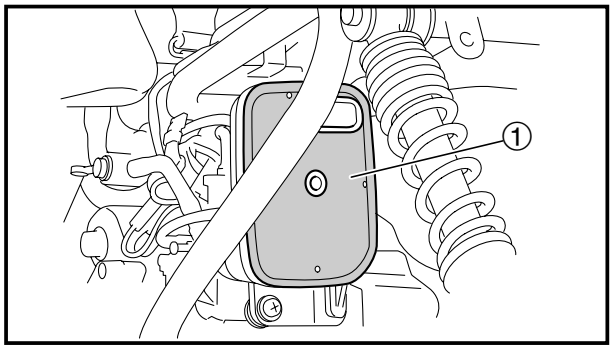
     18Nm (1.8 m•kg, 13 ft•lb)
   - Muffler

     18Nm (1.8 m•kg, 13 ft•lb)
   - Spark arrester

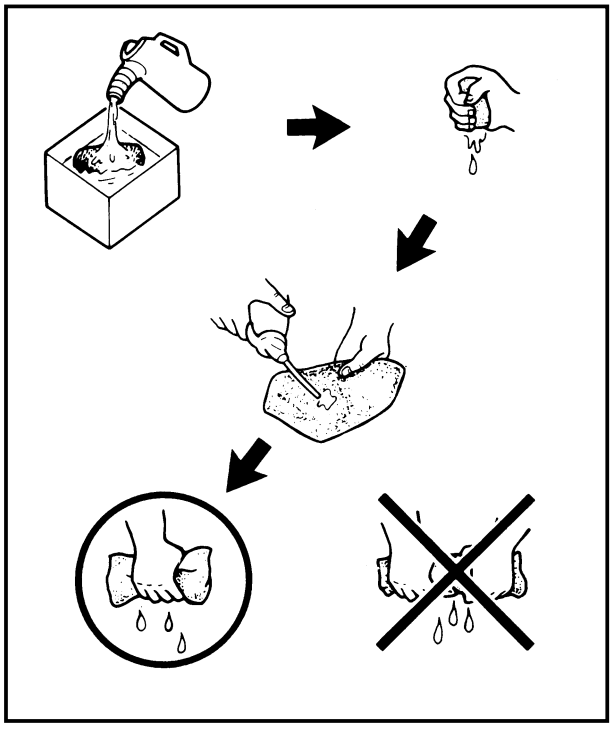


CLEANING THE AIR FILTER ELEMENT

1. Remove:
   - Seat assembly
   - Air filter case cover ①



2. Remove:
   - Air filter element ①



3. Clean:
   - Air filter element
     Clean them with solvent.

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

4. Check:
   - Air filter element

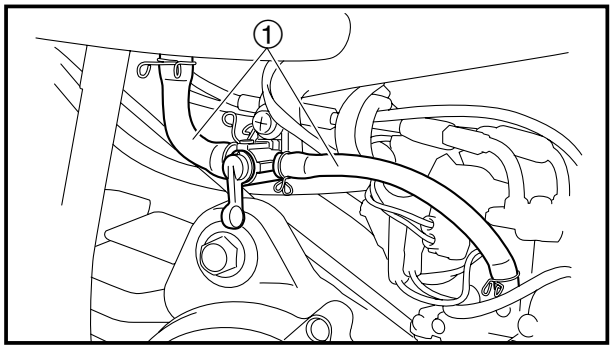
5. Apply:
   - Foam-air-filter oil or equivalent oil
     To the element.

NOTE:
Squeeze out the excess oil. Element should be wet but not dripping.

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

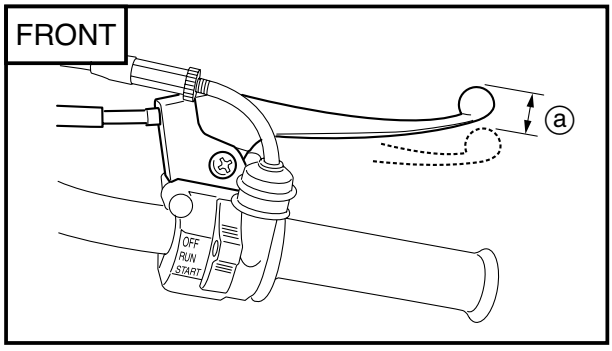
CAUTION:
Never operate the engine without the air filter element installed. Unfiltered air will cause rapid wear of engine parts and may damage the engine. Operating the engine without the air filter element will also affect carburetor tuning, leading to poor engine performance and possible overheating.

NOTE:
When installing the air filter element into the air filter case cover, make sure that the sealing surfaces are aligned to prevent any air leaks.



CHECKING THE FUEL HOSE

1. Check:
   - Fuel hose ①
     Clack/Damage → Replace



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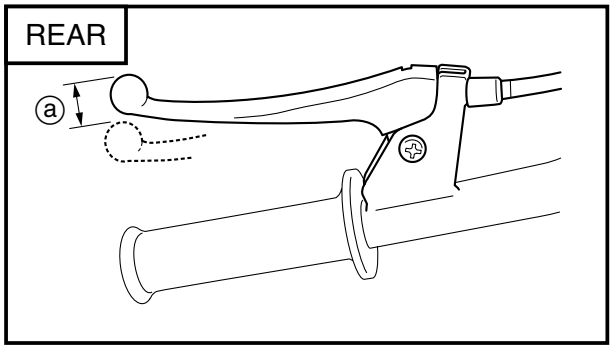
ADJUSTING THE FRONT AND REAR BRAKE

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

Brake lever free play (at the end of the brake lever)
10.0-20.0 mm (0.39-0.79 in)



2. Adjust:
   - Brake lever free play

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a. Turn the adjuster ① in direction ⓐ or ⓑ until the specified brake lever free play is obtained.

Direction ⓐ	**Brake lever free play is increased.**
Direction ⓑ	**Brake lever free play is decreased.**

CAUTION:

After adjusting the brake lever free play, make sure there is no brake drag.

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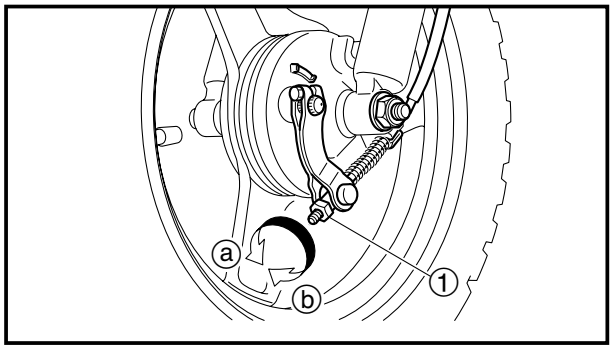
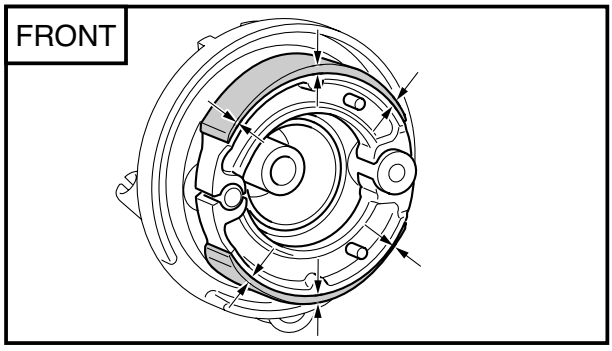
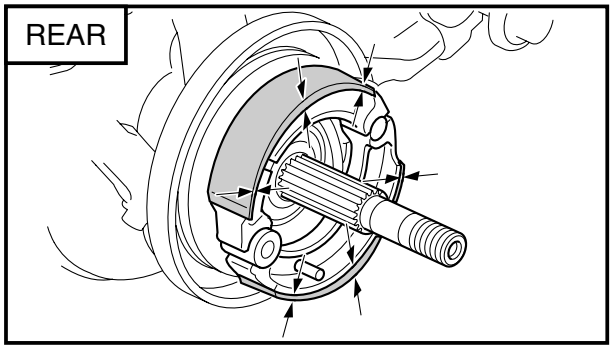


CHECKING THE FRONT AND REAR BRAKE SHOES

NOTE:

To remove the front wheel:
Refer to “FRONT WHEEL” in chapter 4.
To remove the rear wheel: See
Refer to “REAR WHEEL” in chapter 4.





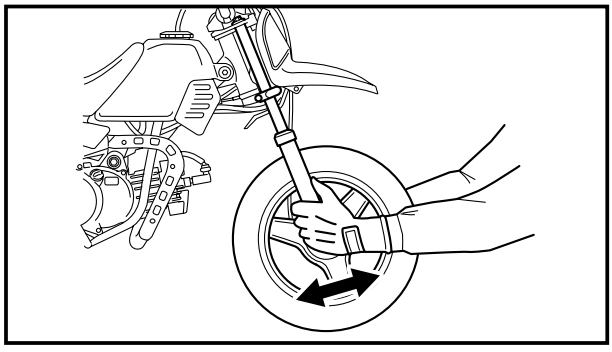
2. Check:
- Wear indicator
  If the lining thickness of a brake shoe is less than 1.5 mm (0.06 in)→ Replace the front or rear brake shoes as a set.
  Refer to “FRONT WHEEL, REAR WHEEL AND BRAKE “in chapter 4.

NOTE:
Be sure to measure the brake lining at the thinnest portion.

CHECKING AND ADJUSTING THE STEERING HEAD

1. Stand the vehicle on a level surface.

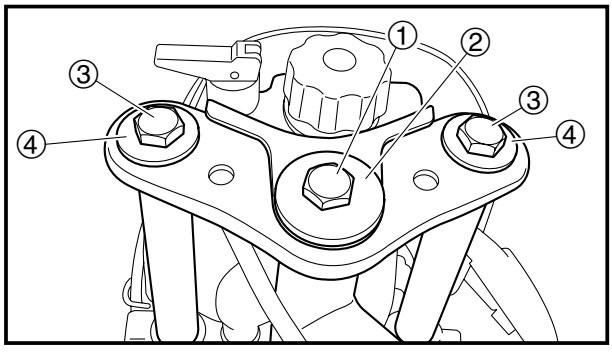
⚠WARNING
Securely support the vehicle so that there is no danger of it falling over.



NOTE:
Place the vehicle on a suitable stand so that the front wheel is elevated.

2. Check:
- Steering head
  Grasp the bottom of the front fork legs and gently rock the front fork.
  Blinding/looseness → Adjust the steering head.

3. Remove:
- Handle protector
- Handle
  Refer to “STEERING “in chapter 4.



4. Adjust:
- Steering head

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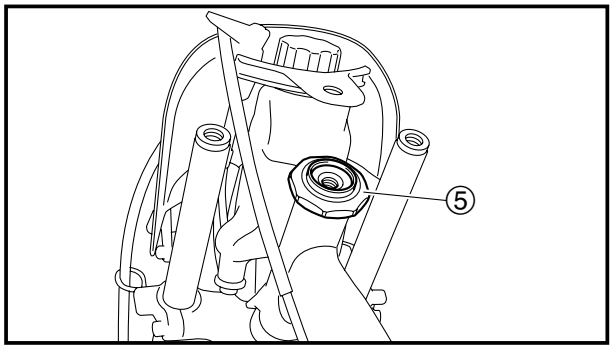
a. Remove the steering stem bolt ①, washer ② and cap bolt ③ washer ④.



b. Tighten the steering nut ⑤ with a wrench.

	Steering nut (1st) **10 Nm (1.0 m·kg, 7.2 ft·lb)**

c. Lock to lock the steering head a few times.
d. Fully loosen the steering nut and then tighten the steering nut to specified torque.

⚠WARNING

Do not over tighten the steering nut.

	Steering nut (2nd) **0.7 Nm (0.07 m•kg, 0.5 ft•lb)**

e. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings. Refer to "STEERING" in chapter 4.
f. Install the oil tank bracket, washer and steering stem bolt, and then tighten the steering stem bolt to specified torque.

	Steering stem bolt **32 Nm (3.2 m•kg, 23 ft•lb)**

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5. Install:
- Washer
- Cap bolt — **32Nm (3.2 m•kg, 23 ft•lb)**
- Handle
- Handle protector

Refer to "STEERING "in chapter 4.

CHECKING THE FRONT FORK

1. Stand the vehicle on a level surface.

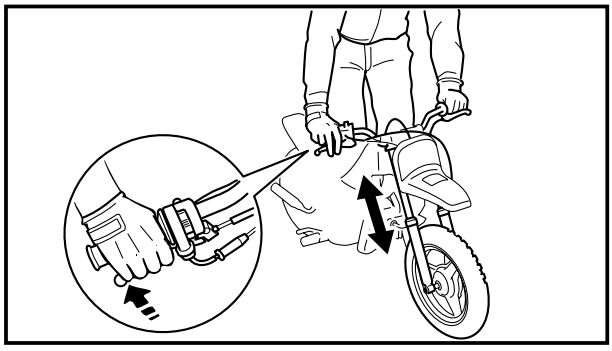
⚠WARNING

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

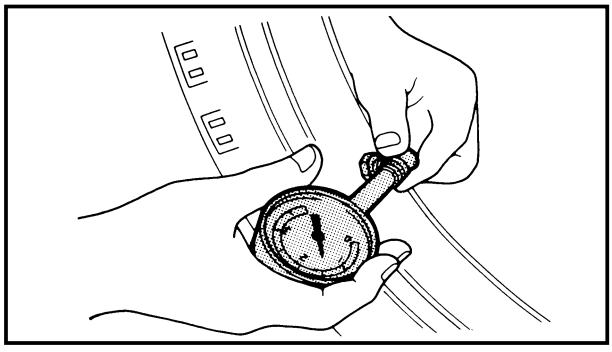
NOTE:

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

2. Check:
- Inner tube
  Damage/scratches → Replace.
  Refer to “FRONT FORK” in chapter 4.



3. Hold the vehicle upright and apply the front brake.
4. Check:
- Front fork operation
  Push down hard on the handlebar several times and check if the front fork rebounds smoothly.
  Rough movement → Repair.
  Refer to “FRONT FORK” in chapter 4.



CHECKING THE TIRES

The following procedure applies to both of the tires.

1. Tire pressure
   Out of specification → Regulate.

⚠WARNING

- **The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.**
- **The tire pressure and the suspension must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.**
- **Operation of an overloaded vehicle could cause tire damage, an accident or an injury.**

NEVER OVERLOAD THE VEHICLE.

⚠WARNING

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.

2. Check:
• Tire surfaces
Damage/wear → Replace the tire.

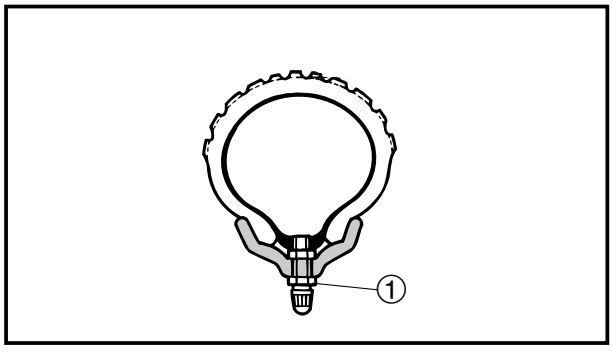
⚠WARNING

• Do not use a tubeless tire on a wheel designed only for tube tires to avoid tire failure and personal injury from sudden deflation.
• When using a tube tire, be sure to install the correct tube.
• Always replace a new tube tire and a new tube as a set.
• To avoid pinching the tube, make sure the wheel rim band and tube are centered in the wheel groove.
• Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.

Tube wheel	Tube tire only
Tubeless wheel	Tube or tubeless tire

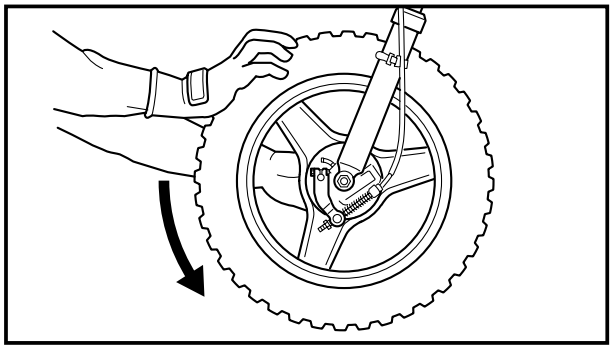
⚠WARNING

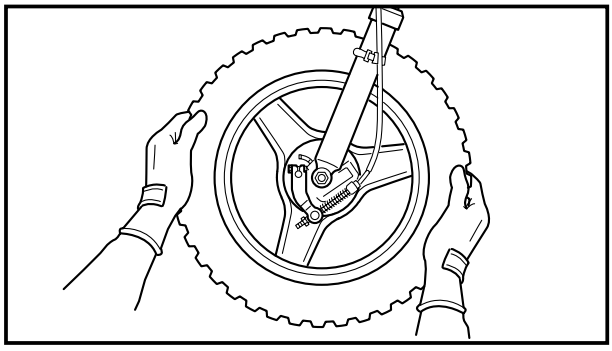
After extensive tests, the tires listed below have been approved by Yamaha Motor Co., Ltd. for this model. The front and rear tires should always be by the same manufacturer and of the same design. No guarantee concerning handling characteristics can be given if a tire combination other than one approved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



⚠WARNING

After a tire has been repaired or replaced, be sure to tighten the tire air valve stem nut ① to specification.





CHECKING THE WHEELS

The following procedure applies to both of the wheels.

1. Check:
   - Wheel
     Damage/out-of-round → Replace.

⚠WARNING

Never attempt to make any repairs to the wheel.

NOTE:

After a tire or wheel has been changed or replaced, always balance the wheel.

CHECKING AND LUBRICATING THE CABLES

The following procedure applies to all of the inner and outer cables.

⚠WARNING

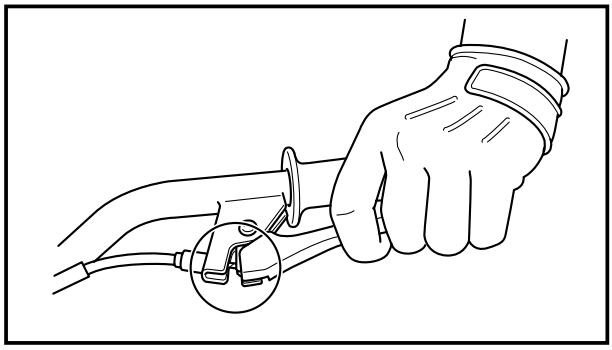
Damaged outer cable may cause the cable to corrode and interfere with its movement. Replace damaged outer cable and inner cables as soon as possible.

1. Check:
   - Outer cable
     Damage → Replace.
2. Check:
   - Cable operation
     Rough movement → Lubricate.

Recommended lubricant
Engine oil or a suitable cable lubricant

NOTE:

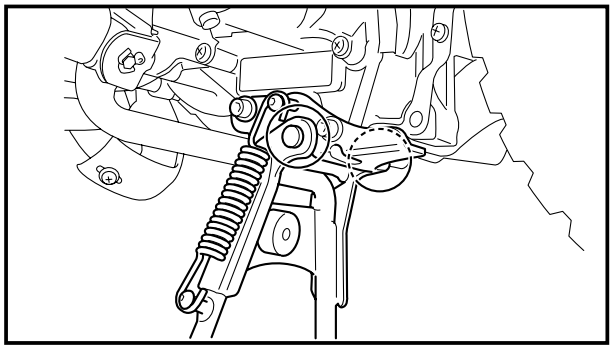
Hold the cable end upright and pour a few drops of lubricant into the cable sheath or use a suitable lubricating device.



LUBRICATING THE LEVER

Lubricate the pivoting point and metal-to-metal moving parts of the lever.

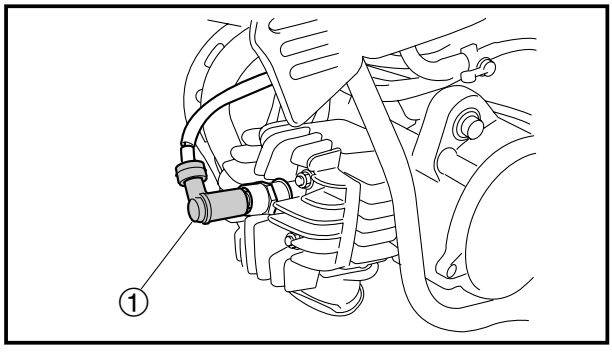
Recommended lubricant
Lithium-soap-based grease



LUBRICATING THE MAINSTAND

Lubricate the pivoting point and metal-to-metal moving parts of the mainstand.

Recommended lubricant
Lithium-soap-based grease



ELECTRICAL

CHECKING THE SPARK PLUG

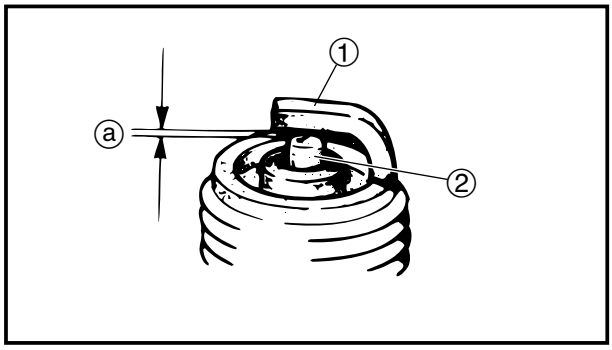
1. Disconnect:
   - Spark plug cap ①
2. Remove:
   - Spark plug

CAUTION:

Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

3. Check:
   - Spark plug type
     Incorrect → Change.

Manufacturer/model
NGK/BP4HS or
DENSO/W14FP-L
(Except for CANADA, EUROPE)
NGK/BPR4HS
(For CANADA, EUROPE)



4. Check:
- Electrode ①
  Damage/wear → Replace the spark plug.
- Insulator ②
  Abnormal color → Replace the spark plug.
  Normal color is medium-to-light tan.

5. Clean:
- Spark plug
  (with a spark plug cleaner or wire brush)

6. Measure:
- Spark plug gap ⓐ
  (with a wire thickness gauge)
  Out of specification → Regap.

Spark plug gap
0.6-0.7 mm (0.024-0.028 in)

7. Install:
- Spark plug — **20 Nm (2.0 m•kg, 14 ft•lb)**

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

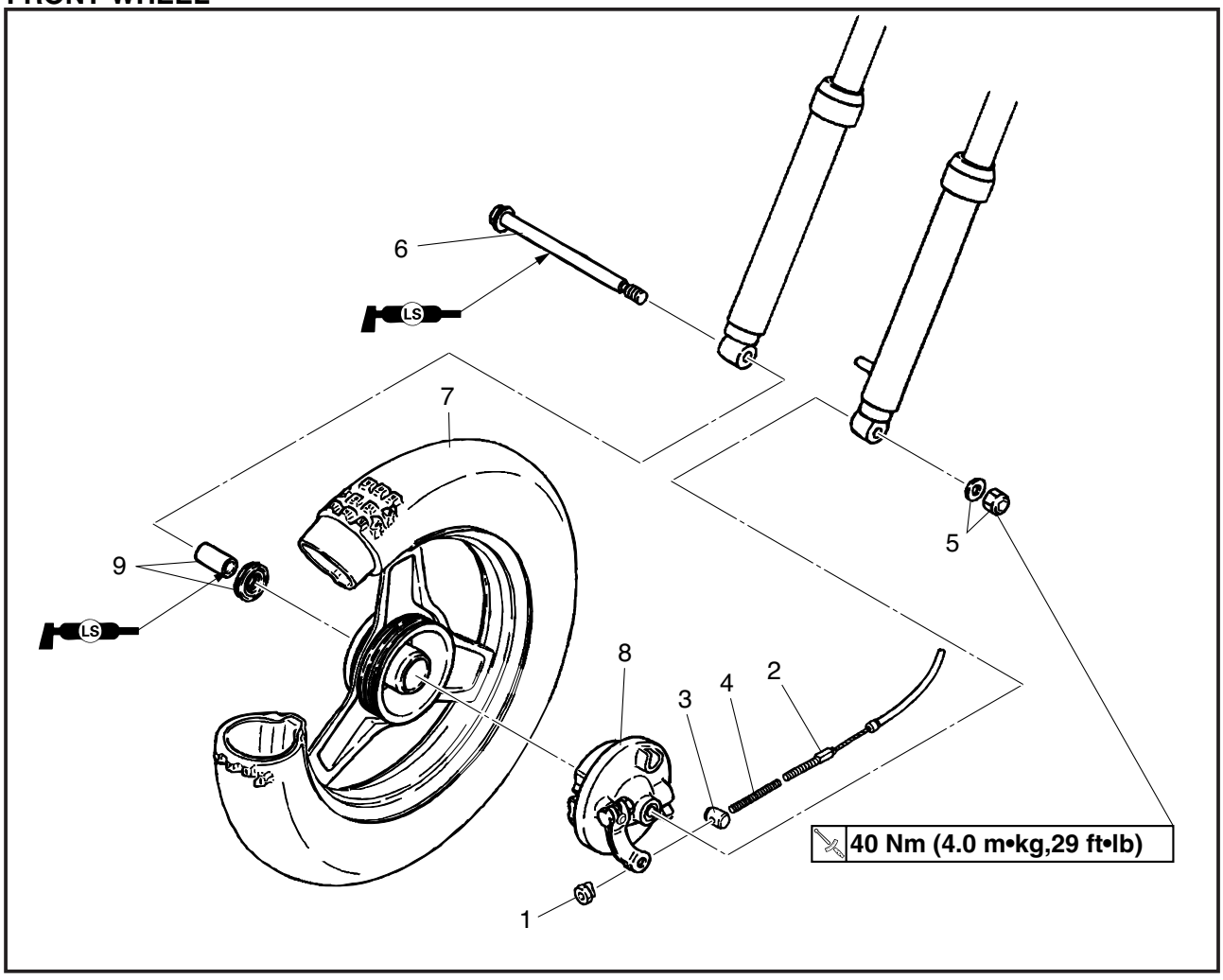
8. Connect:
- Spark plug cap

CHAPTER 4
CHASSIS

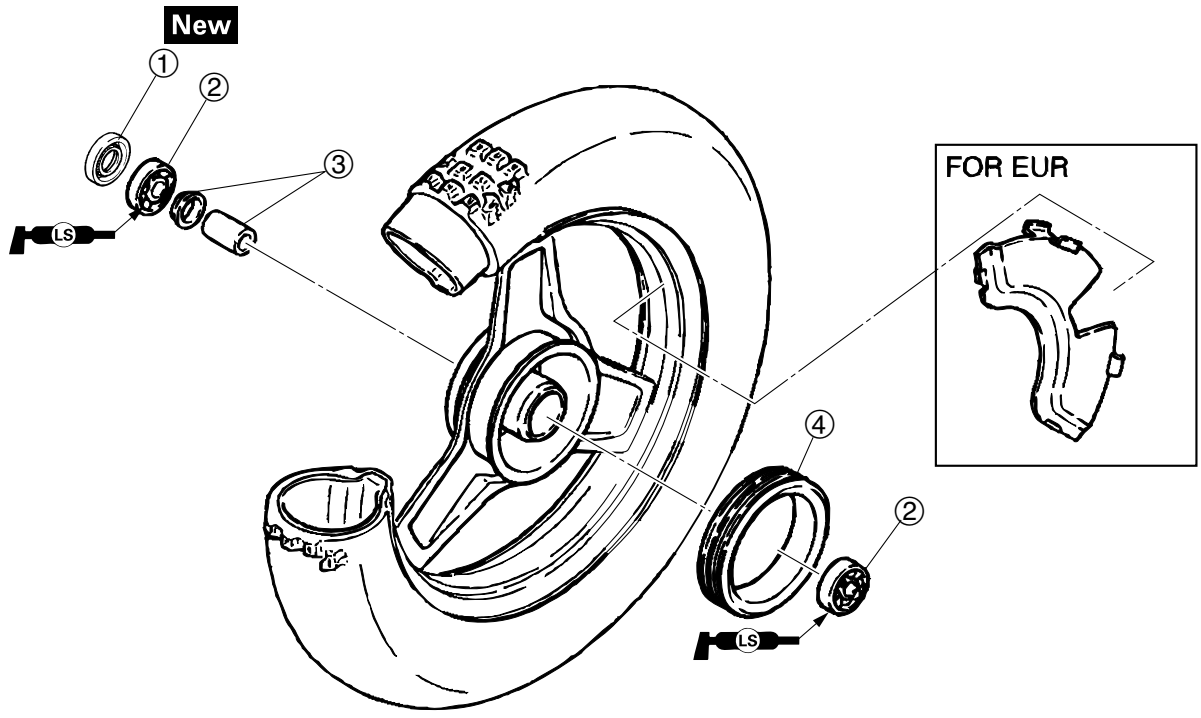
CHASSIS

FRONT WHEEL, REAR WHEEL AND BRAKE

FRONT WHEEL



Order	Job/Part	Q´ty	Remarks
	Removing the front wheel		Remove the parts in the order listed.
1	Brake cable adjusting nut	1	
2	Front brake cable	1	
3	Pin	1	
4	Spring	1	
5	Axle nut/washer	1/1	
6	Wheel axle	1	
7	Front wheel	1	
8	Brake shoe plate	1	
9	Spacer/color	1/1	
			For installation, reverse the removal procedure.



Order	Job/Part	Q´ty	Remarks
	Disassembling the front wheel		Disassemble the parts in the order listed.
①	Oil seal	1	
②	Bearing	2	
③	Spacer/coller	1/1	
④	Ring 1	1	
			For assembly, reverse the disassembly procedure.

REMOVING THE FRONT WHEEL

1. Stand the vehicle on a level surface.

⚠WARNING

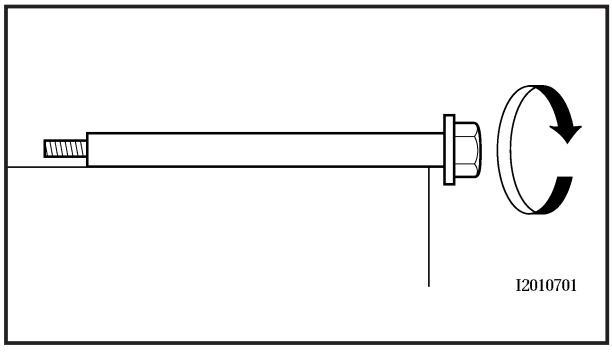
Securely support the vehicle so that there is no danger of it falling over.

NOTE:

Place the vehicle on the mainstand so that the front wheel is elevated.

2. Remove:
   - Brake cable adjusting nut
3. Disconnect:
   - Front brake cable
     at the brake camshaft lever.

4. Remove:
   - Axle nut
   - Washer
   - Wheel axle
   - Front wheel
   - Brake shoe plate
   - Spacer
   - Coller



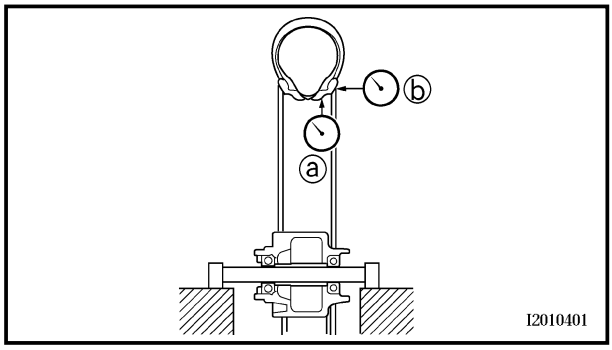
CHECKING THE FRONT WHEEL

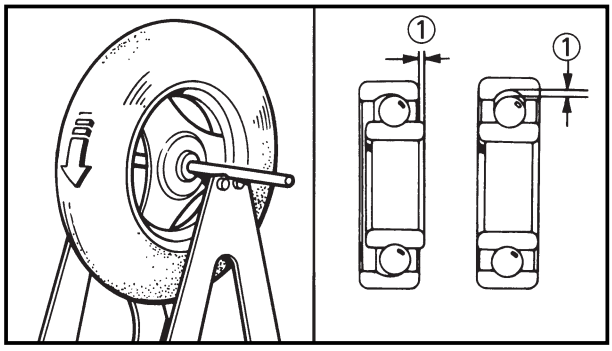
1. Check:
   - Wheel axle
     Roll the wheel axle on a flat surface.
     Bends → Replace.

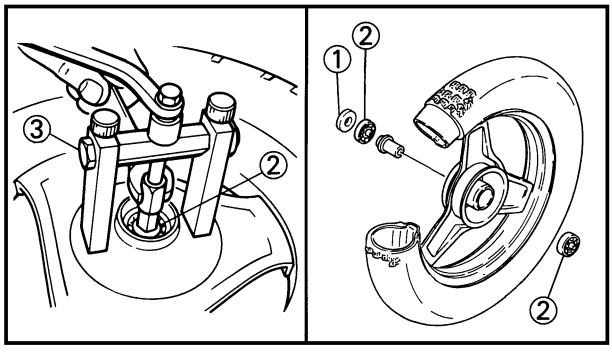
⚠WARNING

Do not attempt to straighten a bent wheel axle.

2. Check:
   - Tire
   - Front wheel
     Damage/wear → Replace.
     Refer to “CHECKING THE TIRES” and “CHECKING THE WHEELS” in chapter 3.







3. Measure:
   - Radial wheel runout ⓐ
   - Lateral wheel runout ⓑ

   Over the specified limits → Replace the wheel.

Radial wheel runout limit
2.0 mm (0.08 in)
Lateral wheel runout limit
2.0 mm (0.08 in)

4. Check:
   - Wheel bearings

   Front wheel turns roughly ① or is loose → Replace the wheel bearings.

DISASSEMBLING THE FRONT WHEEL

1. Remove:
   - Oil seals
   - Wheel bearings

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

NOTE:

To prevent damaging the wheel, place a rag between the screwdriver and the wheel surface.

c. Remove the wheel bearings ② with a general bearing puller ③.

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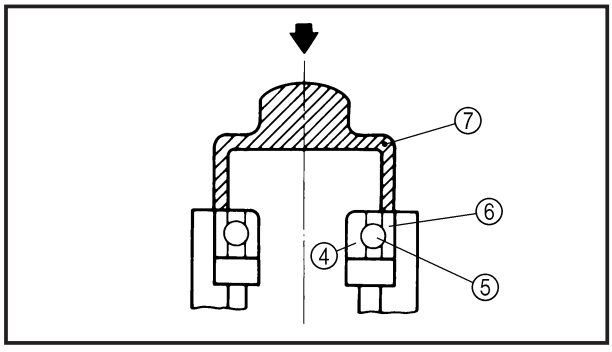

ASSEMBLING THE FRONT WHEEL

1. Install:
   - Wheel bearings
   - Oil seal **New**

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   a. Install the new wheel bearings and oil seal in the reverse order of disassembly.

CAUTION:

Do not contact the wheel bearing inner race ④ or balls ⑤. Contact should be made only with the outer race ⑥.

NOTE:

Use a socket ⑦ that matches the diameter of the wheel bearing outer race and oil seal.

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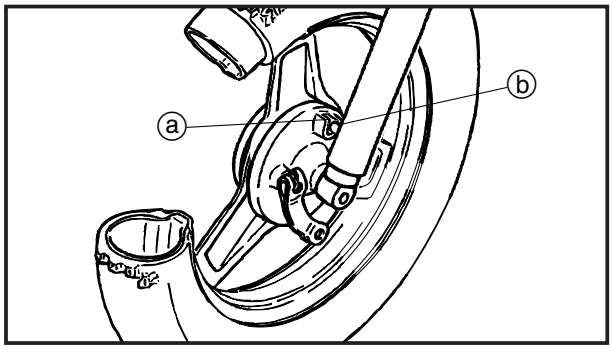
INSTALLING THE FRONT WHEEL

1. Lubricate:
   - Front wheel axle
   - Wheel bearing
   - Oil seal lip

	Recommended lubricant **Lithium-soap-based grease**



2. Install:
   - Spacer
   - Front wheel
   - Brake shoe plate

NOTE:

Make sure the slot ⓐ in the brake shoe plate fits over the stopper ⓑ on the outer tube.

3. Tighten:
- Front wheel axle nut

40 Nm (4.0 m·kg, 29 ft·lb)

⚠WARNING

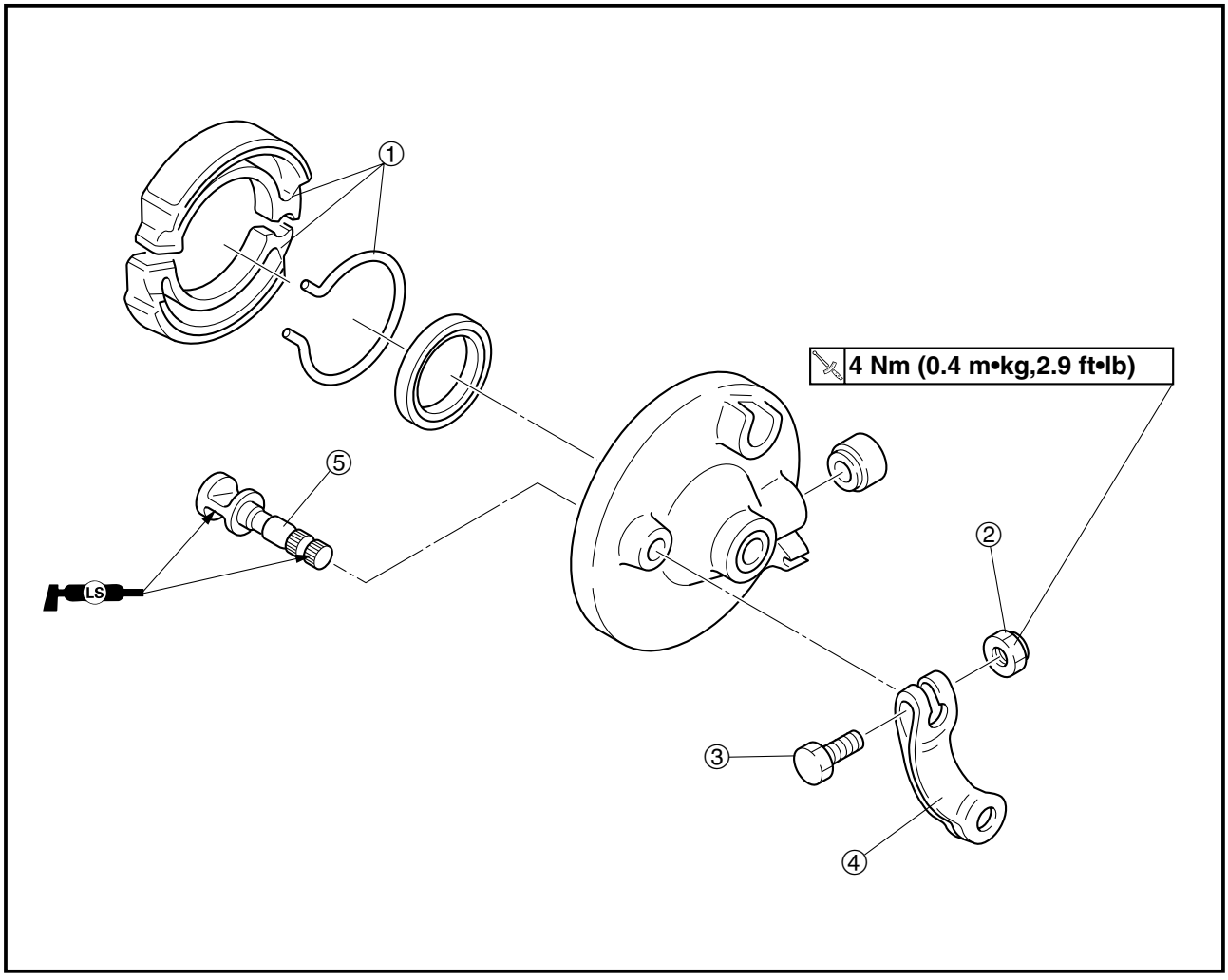
Make sure the brake cable is routed properly.

CAUTION:

Before tightening the wheel axle nut, push down hard on the handlebar(s) several times and check if the front fork rebounds smoothly.

4. Connect:
- Front brake cable
  at the brake camshaft lever.
5. Install:
- Brake cable adjusting nut
6. Adjust:
- Brake lever free play
  Refer to “CHECKING THE BRAKE LEVER FREE PLAY” in chapter 3.

FRONT BRAKE



Order	Job/Part	Q´ty	Remarks
	Disassembling the front wheel		Disassemble the parts in the order listed.
①	Brake shoe/brake shoe spring	2/1	
②	Nut	1	
③	Bolt	1	
④	Brake camshaft lever	1	
⑤	Brake camshaft	1	
			For assembly, reverse the disassembly procedure.

REMOVING THE FRONT BRAKE

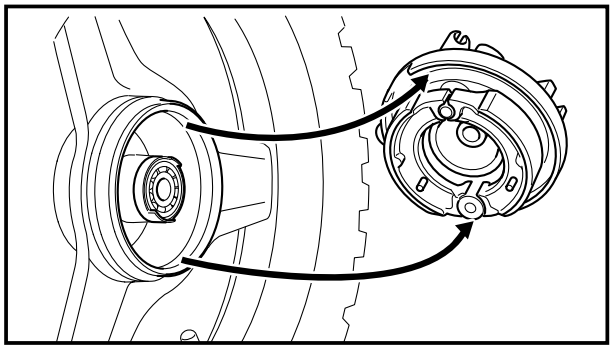
1. Stand the vehicle on a level surface.

⚠WARNING

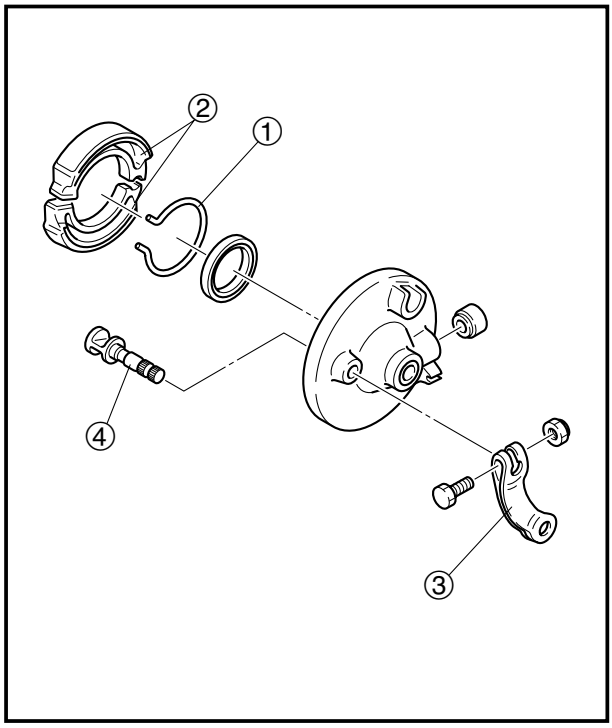
Securely support the vehicle so that there is no danger of it falling over.

NOTE:

Place the vehicle on the mainstand so that the front wheel is elevated.

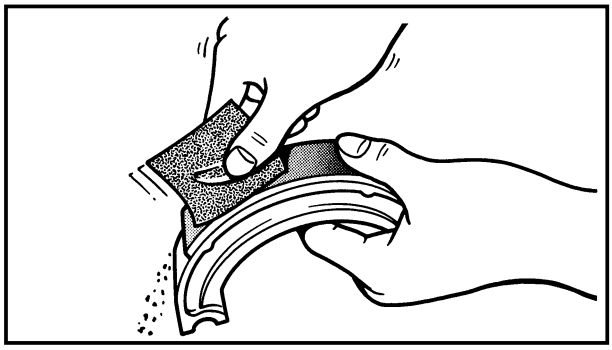


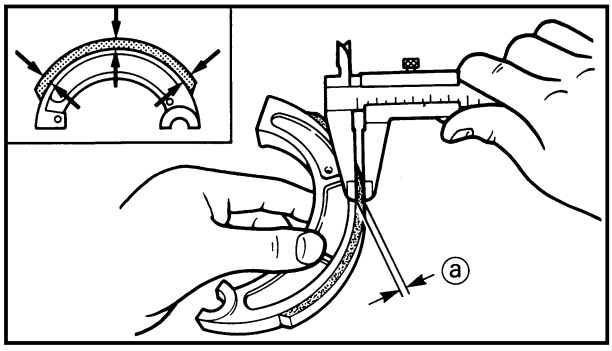
2. Remove the front wheel.
   Refer to "REMOVING THE FRONT WHEEL"
3. Remove:
   - Brake shoe plate
     from the front wheel.



DISASSEMBLING THE FRONT BRAKE SHOE PLATE

1. Remove:
   - Brake shoe spring ①
   - Brake shoe ②
   - Brake camshaft lever ③
   - Brake camshaft ④





CHECKING THE FRONT BRAKE

1. Check:
   - Brake shoe lining
     Glazed areas → Repair.
     Sand the glazed areas with course sandpaper.

NOTE:

After sanding the glazed areas, clean the brake shoe with a cloth.

2. Measure:
   - Brake shoe lining thickness ⓐ
     Out of specification → Replace the brake shoe and brake shoe spring as a set.

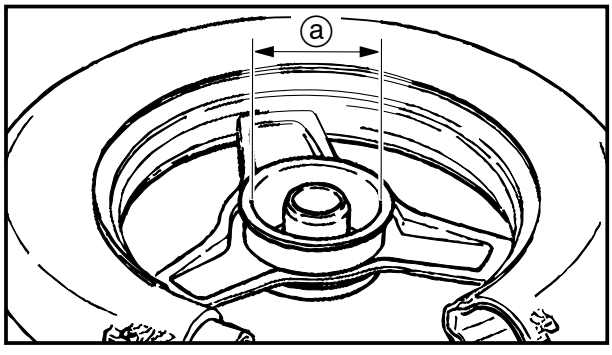
Limit
1.5 mm (0.06 in)

⚠WARNING

Do not allow oil or grease to contact the brake shoes.

NOTE:

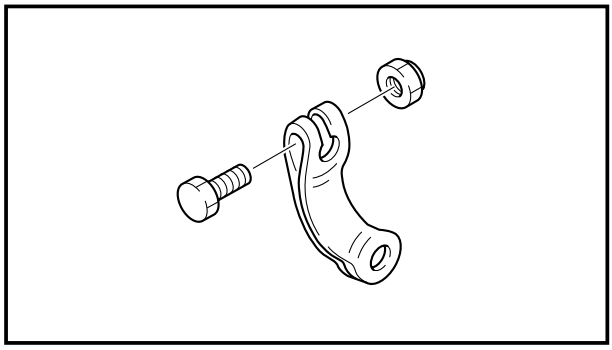
Replace the brake shoes as a set, if either is worn to the wear limit.



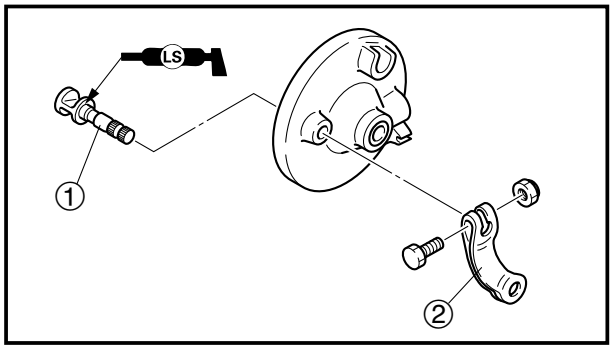
3. Measure:
   - Brake drum inside diameter ⓐ
     Out of specification → Replace the wheel.

Brake drum inside diameter limit
80.5 mm (3.17 in)

4. Check:
   - Brake drum inner surface
     Oil deposits → Clean.
     Remove the oil with a rag soaked in lacquer thinner or solvent.
     Scratches → Repair.
     Lightly and evenly polish the scratches with an emery cloth.



5. Check:
- Brake camshaft
  Damage/wear → Replace the brake camshaft



ASSEMBLING THE FRONT BRAKE SHOE PLATE

1. Install:
- Brake camshaft ①
- Brake camshaft lever ②

4 Nm (0.4 m·kg, 2.9 ft·lb)

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a. Install the brake camshaft so its punch mark ⓐ is positioned as shown.
b. Align the projection on the brake shoe wear indicator with the notch in the brake camshaft.
c. Align the punch mark in the brake camshaft with the mark on the brake camshaft lever.
d. Check that the brake shoes are properly positioned.

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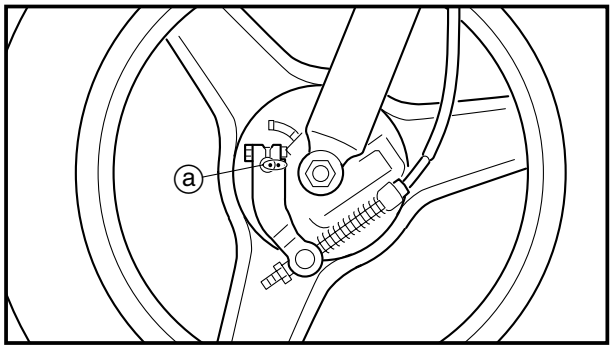
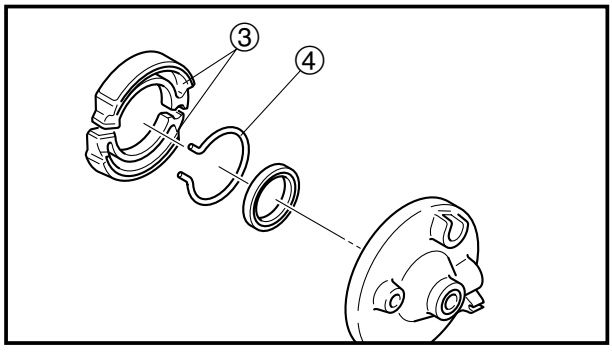
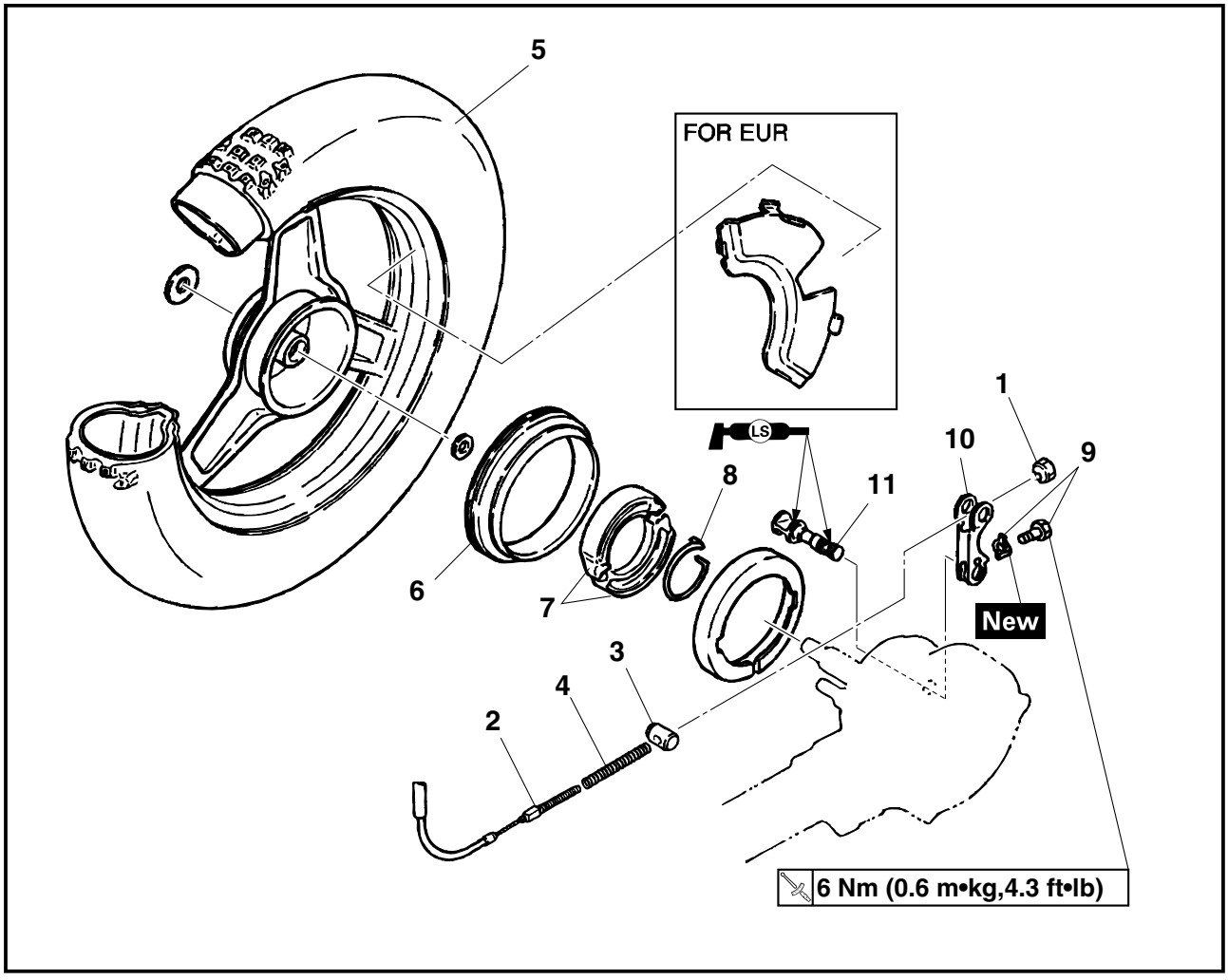




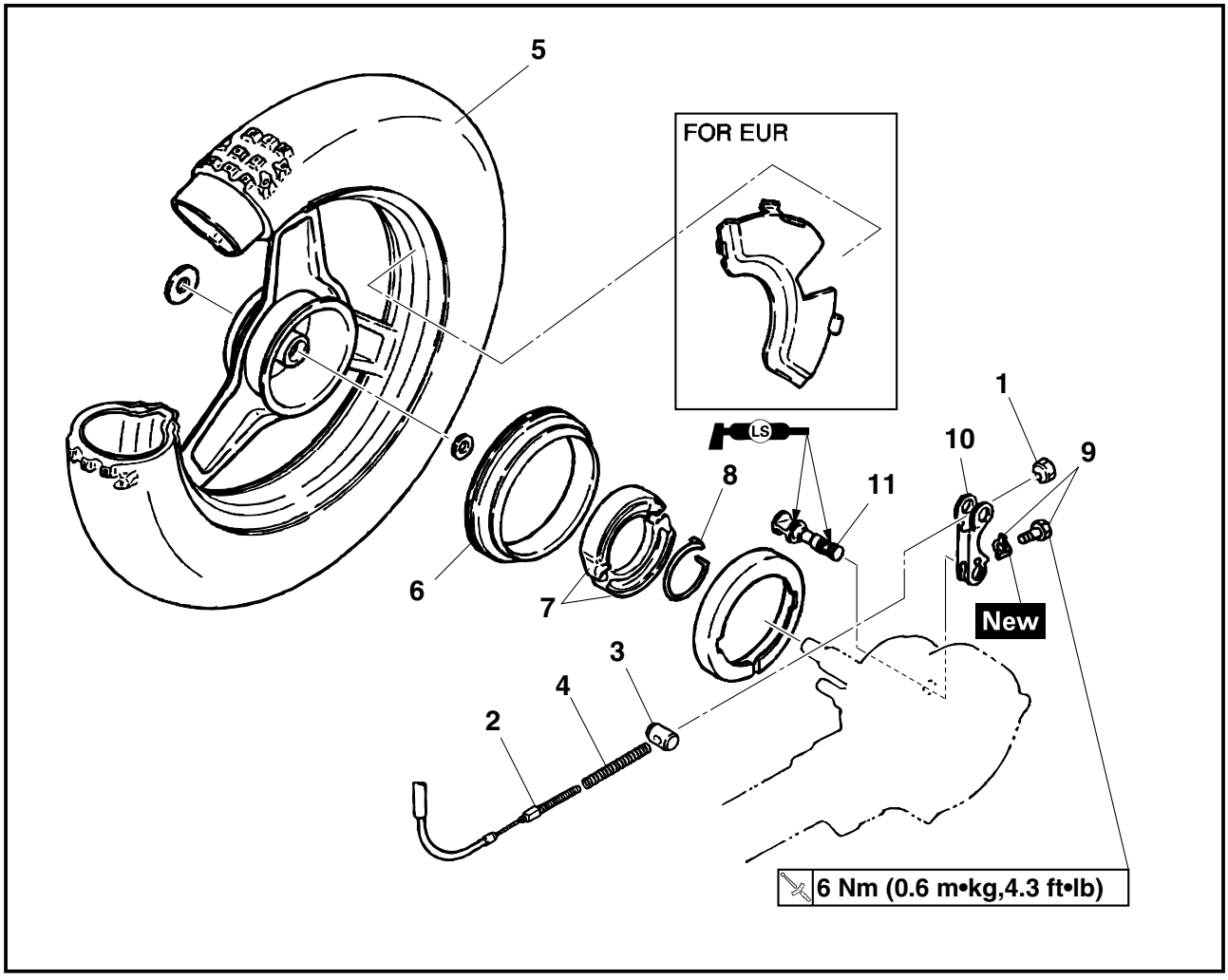
2. Install:
- Brake shoe ③
- Brake shoe spring ④

NOTE:
Install the shoe spring as shown.

REAR WHEEL AND BRAKE



Order	Job/Part	Q´ty	Remarks
	Removing the rear wheel and brake		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
	Muffler		Refer to “ENGINE REMOVAL” in chapter 5.
	Rear shock absorber lower bolt (right)		Refer to “REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM”.
	Swingarm		
1	Brake cable adjusting nut	1	
2	Rear brake cable	1	
3	Pin	1	
4	Spring	1	
5	Rear wheel	1	
6	Ring 1	1	
7	Brake shoe	2	
8	Brake shoe spring	1	
9	Brake camshaft bolt/lockwasher	1/1	



Order	Job/Part	Q´ty	Remarks
10	Brake camshaft lever	1	
11	Brake camshaft	1	
			For installation, reverse the removal procedure.

REMOVING THE REAR WHEEL

1. Stand the vehicle on a level surface.

⚠WARNING

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

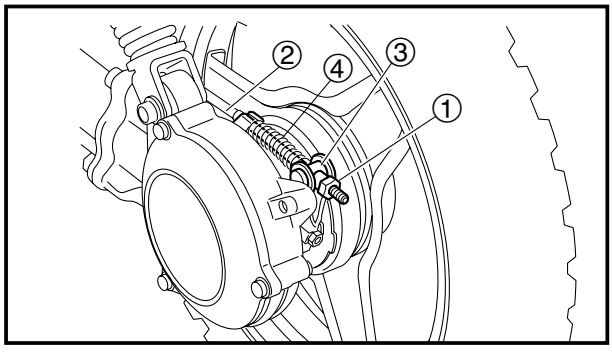
NOTE:

Place the vehicle on the mainstand so that the rear wheel is elevated.

2. Remove
   - Exhaust chamber assembly
   - Muffler.

   Refer to "ENGINE REMOVAL" in chapter 5.
3. Remove
   - Swingarm

   Refer to "REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM".



4. Remove:
   - Brake cable adjusting bolt ①
   - Rear brake cable ②
   - Pin ③
   - Spring ④

   at the brake camshaft lever.

CHECKING THE REAR WHEEL

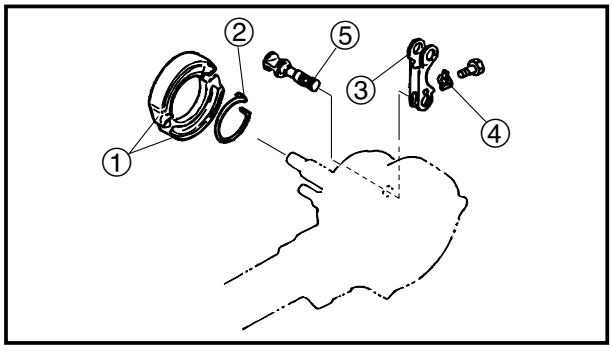
1. Check:
   - Rear wheel

   Refer to "CHECKING THE FRONT WHEEL".
2. Check:
   - Tire
   - Rear wheel

   Damage/wear → Replace the rear wheel.

   Refer to "CHECKING THE TIRES" and "CHECKING THE WHEELS" in chapter 3.
3. Measure:
   - Radial wheel runout
   - Lateral wheel runout

   Refer to "CHECKING THE FRONT WHEEL".

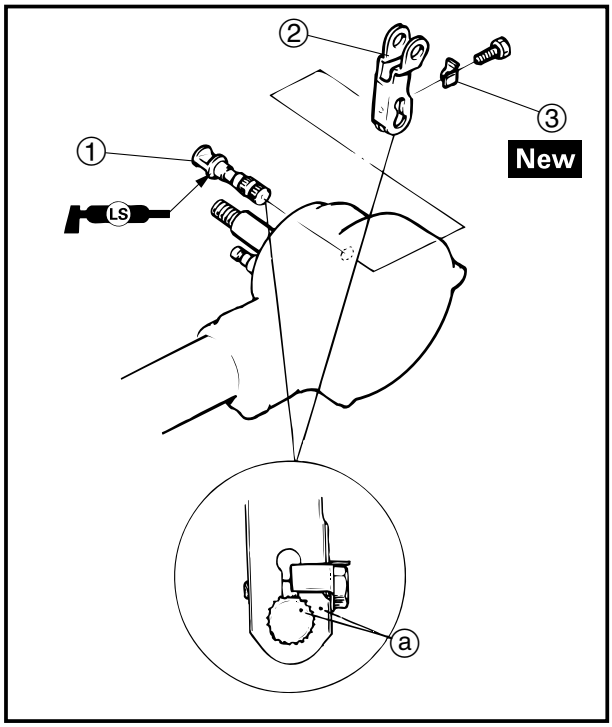


DISASSEMBLING THE REAR BRAKE

1. Remove:
   - Brake shoe ①
   - Brake shoe spring ②
   - Brake camshaft lever ③
   - Lockwasher ④
   - Brake camshaft ⑤

CHECKING THE REAR BRAKE

1. Check:
   - Brake shoe lining
     Refer to "CHECKING THE FRONT BRAKE".
2. Measure:
   - Brake shoe lining thickness
     Refer to "CHECKING THE FRONT BRAKE".
3. Measure:
   - Brake drum inside diameter
     Refer to "CHECKING THE FRONT BRAKE".
4. Check:
   - Brake drum inner surface
     Refer to "CHECKING THE FRONT BRAKE".
5. Check:
   - Brake camshaft
     Refer to "CHECKING THE FRONT BRAKE".



ASSEMBLING THE REAR BRAKE

1. Install:
   - Brake camshaft ①
   - Brake camshaft lever ②
   - Lock washer New ③
     Bend the tab of the lockwasher.
   - Brake shoe
   - Brake shoe spring

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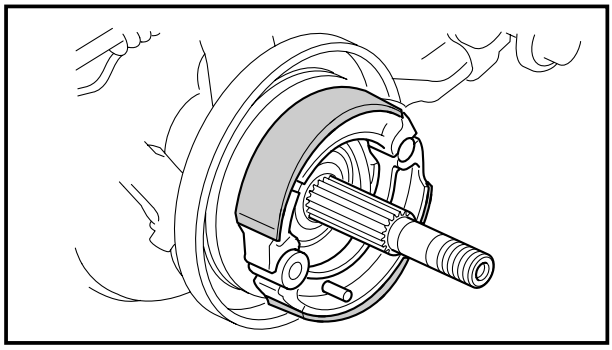
a. Install the brake camshaft so its punch mark ⓐ is positioned as shown.

NOTE:

Hock the return spring onto the stopper.



b. Check that the brake shoes are properly positioned.

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INSTALLING THE REAR WHEEL

1. Stand the vehicle on a level surface.

⚠WARNING

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

NOTE:

Place the vehicle on the mainstand so that the rear wheel is elevated.

2. Install:
   - Rear wheel
   - Swingarm
     Refer to "REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM".
   - Rear axle nut

3. Tighten
   - Rear axle nut

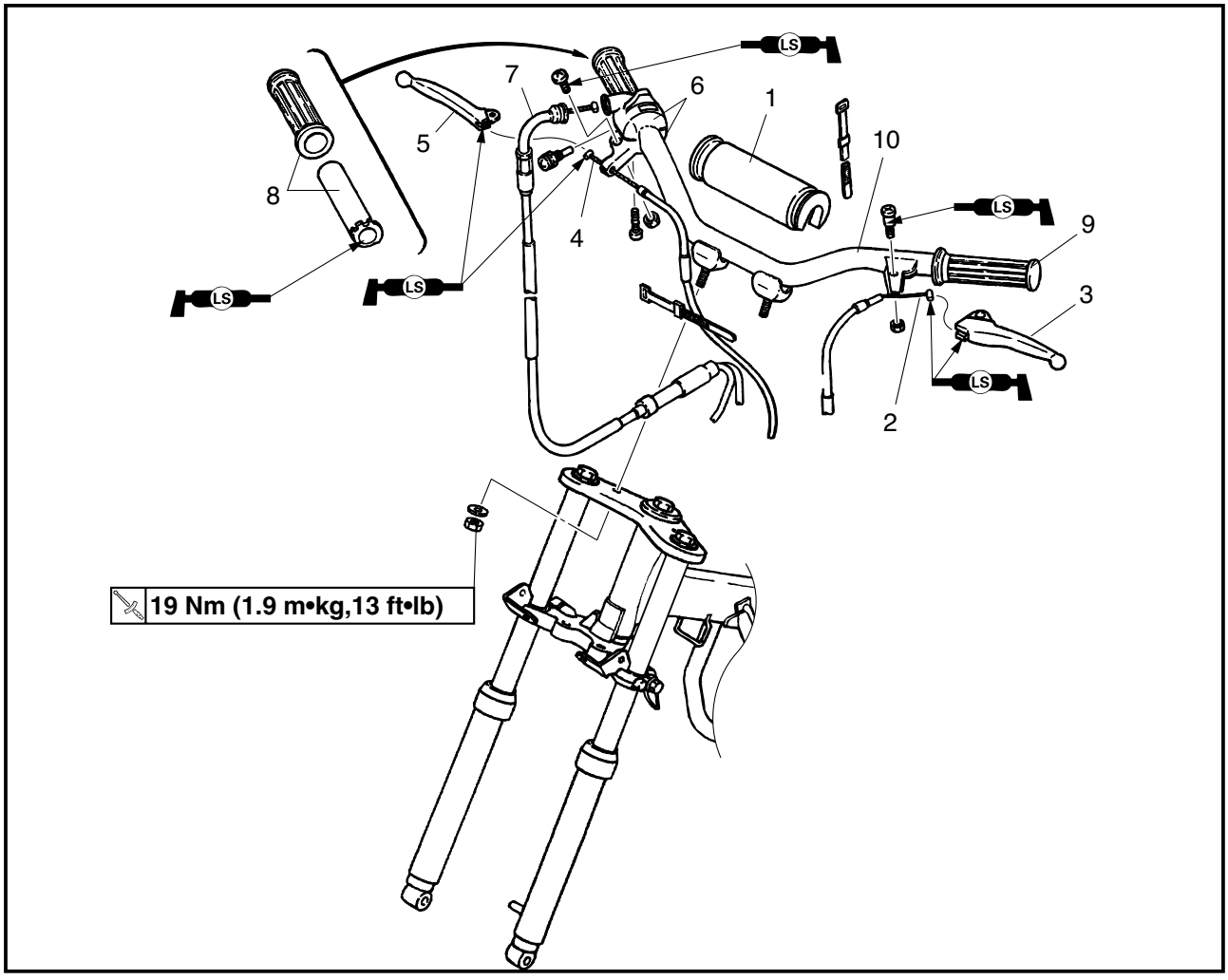
60 Nm (6.0 m·kg, 43 ft·lb)

NOTE:

While apply the rear brake to Tighten the rear axle nut.

4. Install the exhaust chamber assembly and muffler. Refer to "CLEANING THE SPARK ARRESTER AND MUFFLER" in chapter 3.

HANDLEBAR



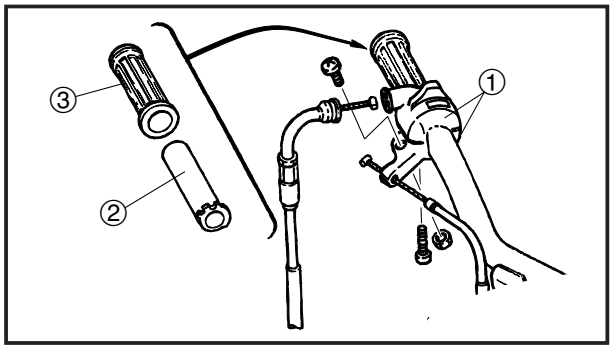
Order	Job/Part	Q´ty	Remarks
	Removing the handlebar		Remove the parts in the order listed.
	Front fender		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
	Oil tank		Refer to “STEERING”.
1	Handle protector	1	
2	Rear brake cable	1	
3	Rear brake lever	1	
4	Front brake cable	1	
5	Front brake lever	1	
6	Ignition control switch	1	
7	Throttle cable	1	
8	Throttle grip assembly	1	
9	Grip	1	
10	Handlebar	1	
			For installation, reverse the removal procedure.

REMOVING THE HANDLEBAR

1. Stand the vehicle on a level surface.

⚠WARNING

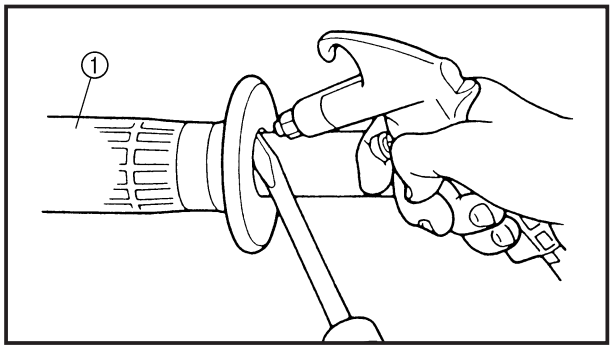
Securely support the vehicle so that there is no danger of it falling over.



2. Remove:
   - Handle protector
   - Ignition control switch ①
   - Throttle cable
   - Throttle grip ②

NOTE:

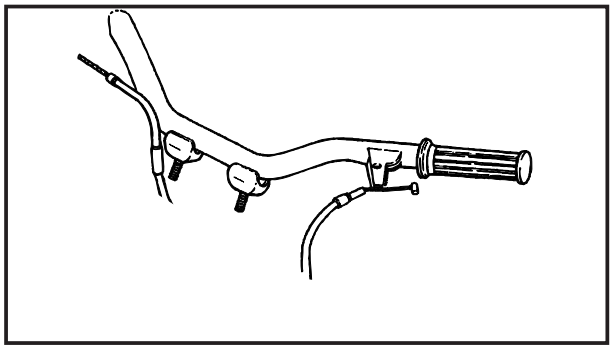
While removing the ignition control switch, pull back the rubber cover ③.



3. Disconnect:
   - Rear brake lever
4. Remove:
   - Grip ①

NOTE:

Blow compressed air between the left handlebar and the handlebar grip, and gradually push the grip off the handlebar.



CHECKING THE HANDLEBAR

1. Check:
   - Handlebar
     Bends/cracks/damage → Replace.

⚠WARNING

Do not attempt to straighten a bent handlebar as this may dangerously weaken it.

INSTALLING THE HANDLEBAR

1. Stand the vehicle on a level surface.

⚠WARNING

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

2. Install:
   - Handlebar

3. Tighten:
   - Handlebar — **19 Nm (1.9 m·kg, 13 ft·lb)**

4. Install:
   - Grip

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Apply a thin coat of rubber adhesive onto the left end of the handlebar.
b. Slide the handlebar grip over the left end of the handlebar.
c. Wipe off any excess rubber adhesive with a clean rag.

⚠WARNING

Do not touch the handlebar grip until the rubber adhesive has fully dried.

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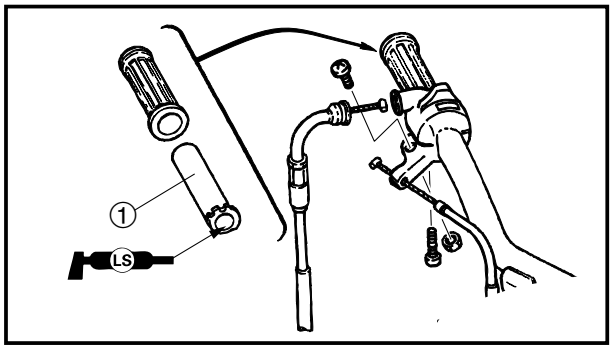


5. Install:
   - Throttle cable
   - Throttle grip ①

NOTE:

Lubricate the inside of the throttle grip with a thin coat of lithium-soap-based grease and install it onto the handlebar.

6. Install:
   - Ignition control switch

⚠WARNING

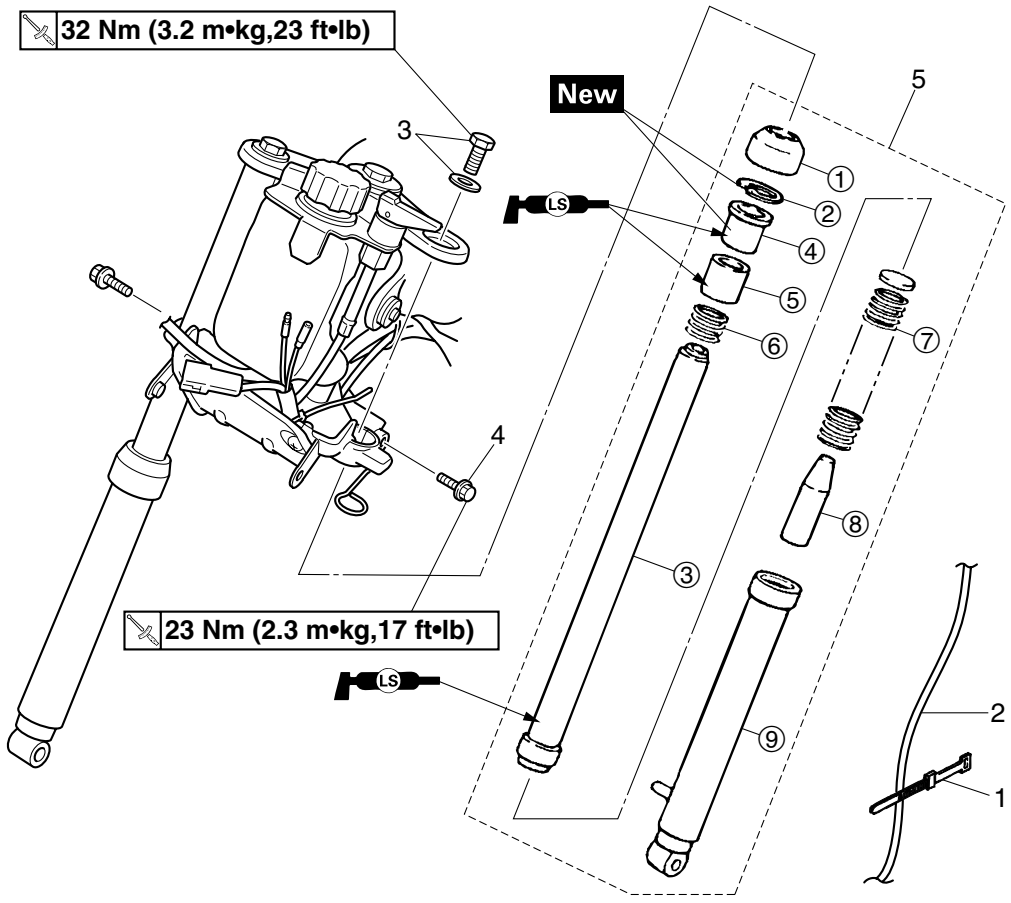
Make sure the throttle grip operates smoothly.

NOTE:

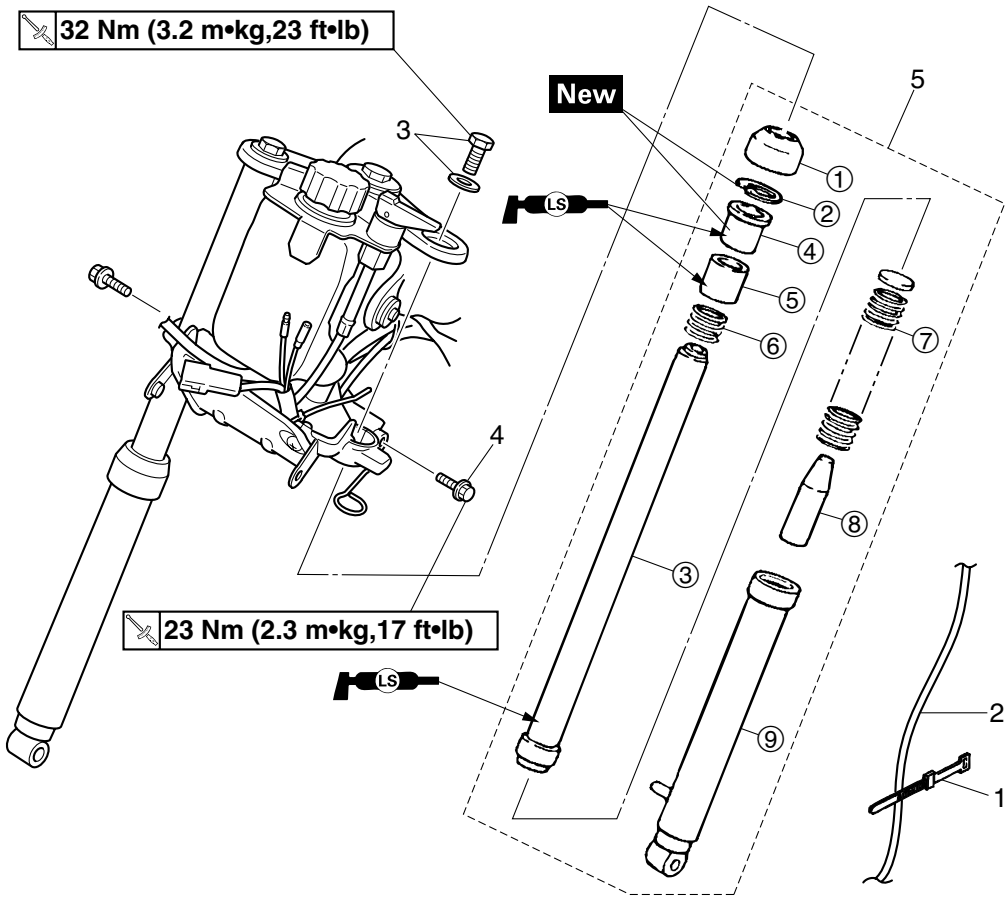
Align the same angle of the ignition control switch with left lever holder, and then install the ignition control switch.

7. Connect:
   - Front brake cable
   - Rear brake cable
8. Install:
   - Handle protector
9. Adjust:
   - Throttle cable free play
     Refer to “ADJUSTING THE THROTTLE CABLE FREE PLAY” in chapter 3.

FRONT FORK



Order	Job/Part	Q´ty	Remarks
	Removing the front fork		Remove the parts in the order listed.
	Handlebar		Refer to “HANDLEBAR”.
	Oil tank		Refer to “STEERING”
1	Band	1	
2	Front brake cable	1	
3	Cap bolt/washer	2/2	
4	Lower bracket pinch bolt	2	Loosen.
5	Front fork	2	Do not disassemble the front fork (right) For installation, reverse the removal procedure.
	Disassembling the front fork (left side only)		Disassemble the parts in the order listed.
①	Dust seal	1	
②	Circlip	1	
③	Inner tube	1/1	
④	Bushing	1	
⑤	Coller	1	



Order	Job/Part	Q´ty	Remarks
⑥	Spring	1	
⑦	Fork spring	1	
⑧	Damper rubber	1	
⑨	Outer tube	1	
			For assembly, reverse the disassembly procedure.

REMOVING THE FRONT FORK LEGS

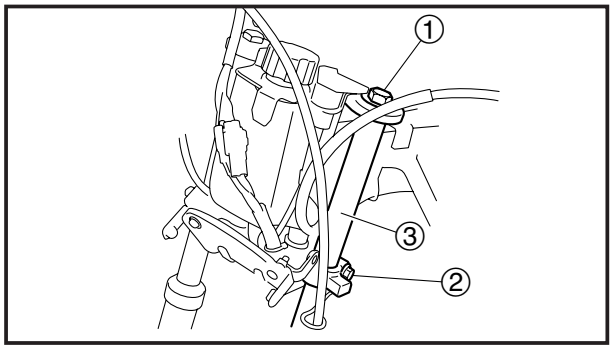
The following procedure applies to both of the front fork legs.

1. Stand the vehicle on a level surface.

⚠WARNING

- **Securely support the vehicle so that there is no danger of it falling over.**
- **Place the vehicle on a suitable stand so that the front wheel is elevated.**

2. Remove:
   - Handlebar
     Refer to “REMOVING THE HANDLEBAR”.
3. Remove:
   - Front wheel
     Refer to “REMOVING THE FRONT WHEEL”.

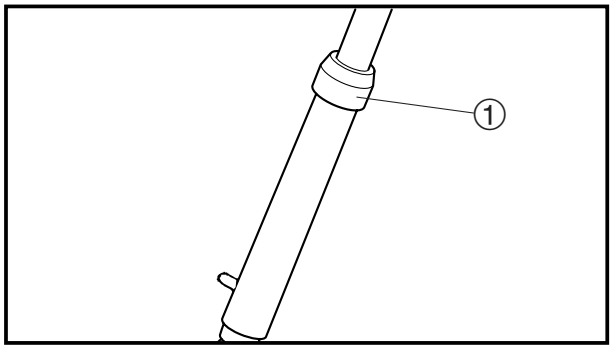


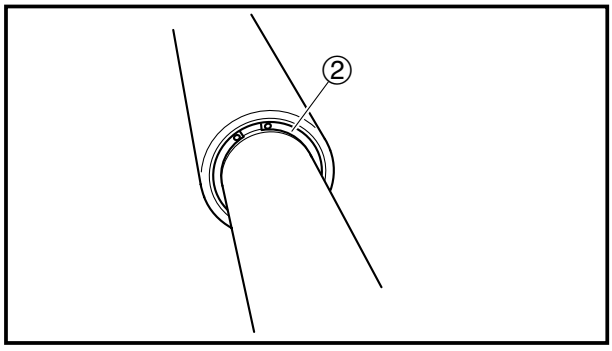
4. Remove:
   - Front fork cap bolt ①
   - Washer
5. Loosen:
   - Lower bracket pinch bolt ②

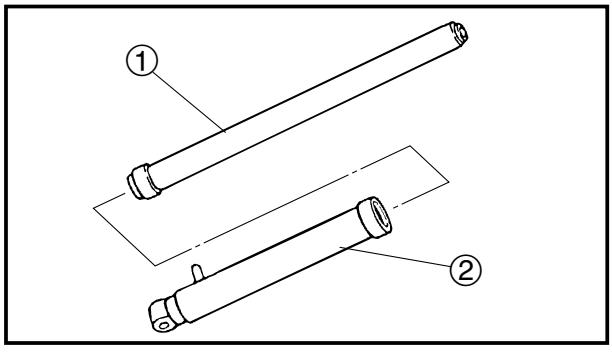
⚠WARNING

Before loosening the lower bracket pinch bolts, support the front fork leg.

6. Remove:
   - Front fork ③







DISASSEMBLING THE FRONT FORK LEG

The following procedure applies to the front fork leg.

CAUTION:

Do not disassembly the right front fork leg.

1. Remove:
   - Dust seal ①
   - Circlip ②

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a. Hold the inner tube vertically.
b. Securely clamp the inner tube in a vise with soft jaws.

CAUTION:

Do not scratch the inner tube.

c. Remove the dust seal from outer tube.
d. While pressing down on the front fork, remove the circlip.

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2. Remove:
   - Inner tube ①
   - Outer tube ②

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Hold the front fork leg horizontally.
b. Securely clamp the outer tube in a vise with soft jaws.
c. Separate the inner tube from the outer tube by pulling the inner tube forcefully but carefully.

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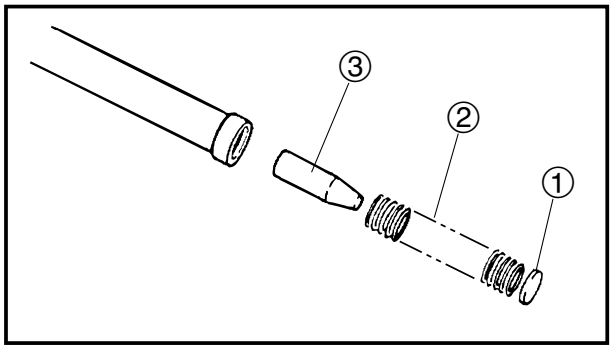


3. Remove:
   - Spring seat ①
   - Fork spring ②
   - Damper rubber ③

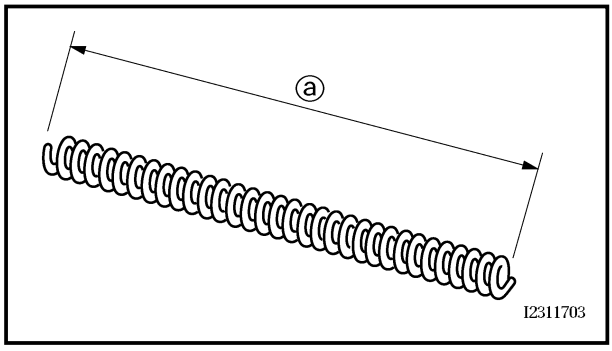
CHECKING THE FRONT FORK LEG

The following procedure applies to the front fork leg.

1. Check:
   - Inner tube assembly
     Bends/damage/scratches → Replace.

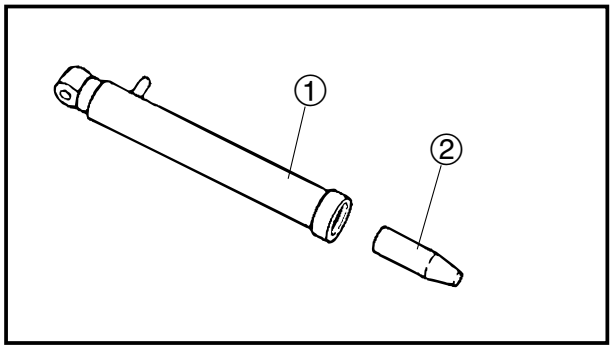
⚠WARNING

Do not attempt to straighten a bent inner tube as this may dangerously weaken it.



2. Measure:
   - Spring free length ⓐ
     Out of specification → Replace.

Spring free length
115.0 mm (4.53 in)



3. Check:
   - Outer tube assembly ①
     Damage/wear → Replace.

CAUTION:

When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.

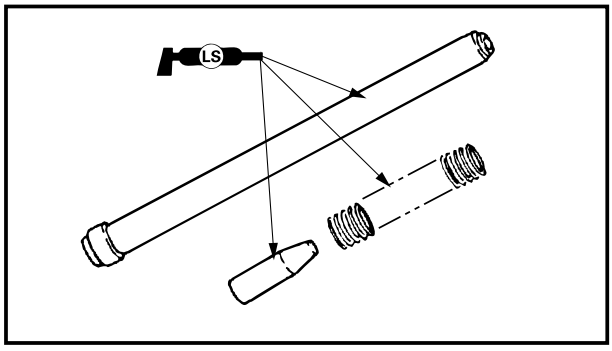
4. Check:
   - Damper rubber ②
     Damage/wear → Replace.

ASSEMBLING THE FRONT FORK LEG

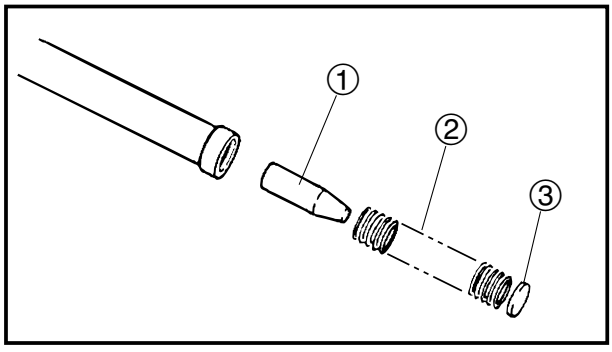
The following procedure applies to the front fork leg.

NOTE:

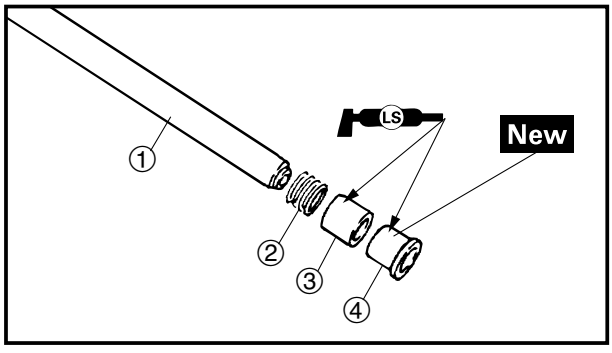
- When assembling the front fork leg, be sure to replace the following parts:
- Before assembling the front fork leg, make sure all of the components are clean.



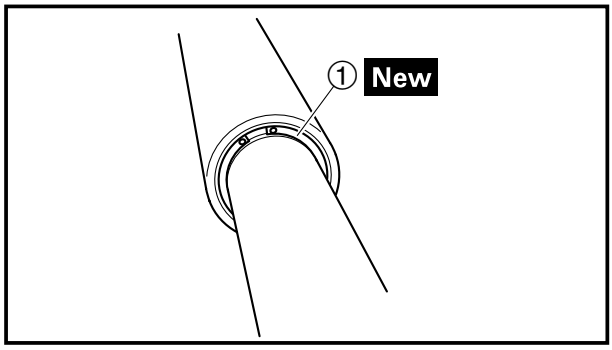
1. Lubricate:
   - Inner tube's outer surface
   - Fork spring
   - Damper rubber



2. Install:
   - Damper rubber ①
   - Fork spring ②
   - Spring seat ③



3. Install:
   - Inner tube assembly ①
   - Spring ②
   - Coller ③
   - Bushing ④ **New**
     (strike with the flat head driver)



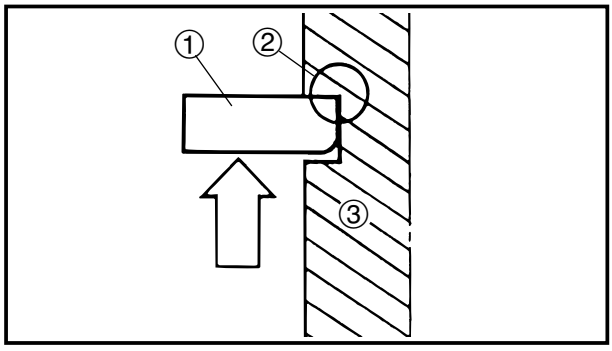
4. Install:
   - Circlip New ①

⚠WARNING

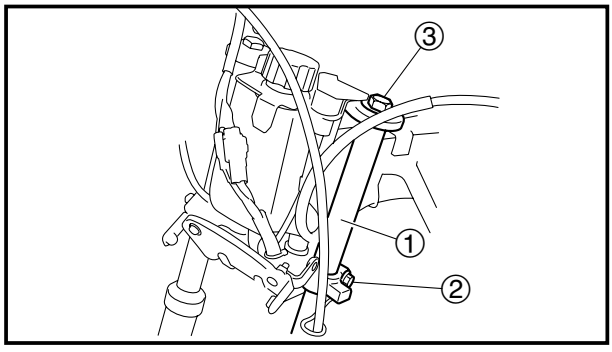
Always use a new circlip.

NOTE:

- Fully compress the front fork leg, and then install the circlip.
- When installing the circlip ①, make sure the sharp-edged corner ② is positioned opposite the thrust that the circlip receives.



③ Outer tube



INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Install:
   - Front fork ①
     Temporarily tighten the lower bracket pinch bolt.
2. Tighten:
   - Lower bracket pinch bolt ②

23 Nm (2.3 m·kg, 17 ft·lb)

3. Install:
   - Washer
   - Cap bolt
4. Tighten:
   - Cap bolt ③

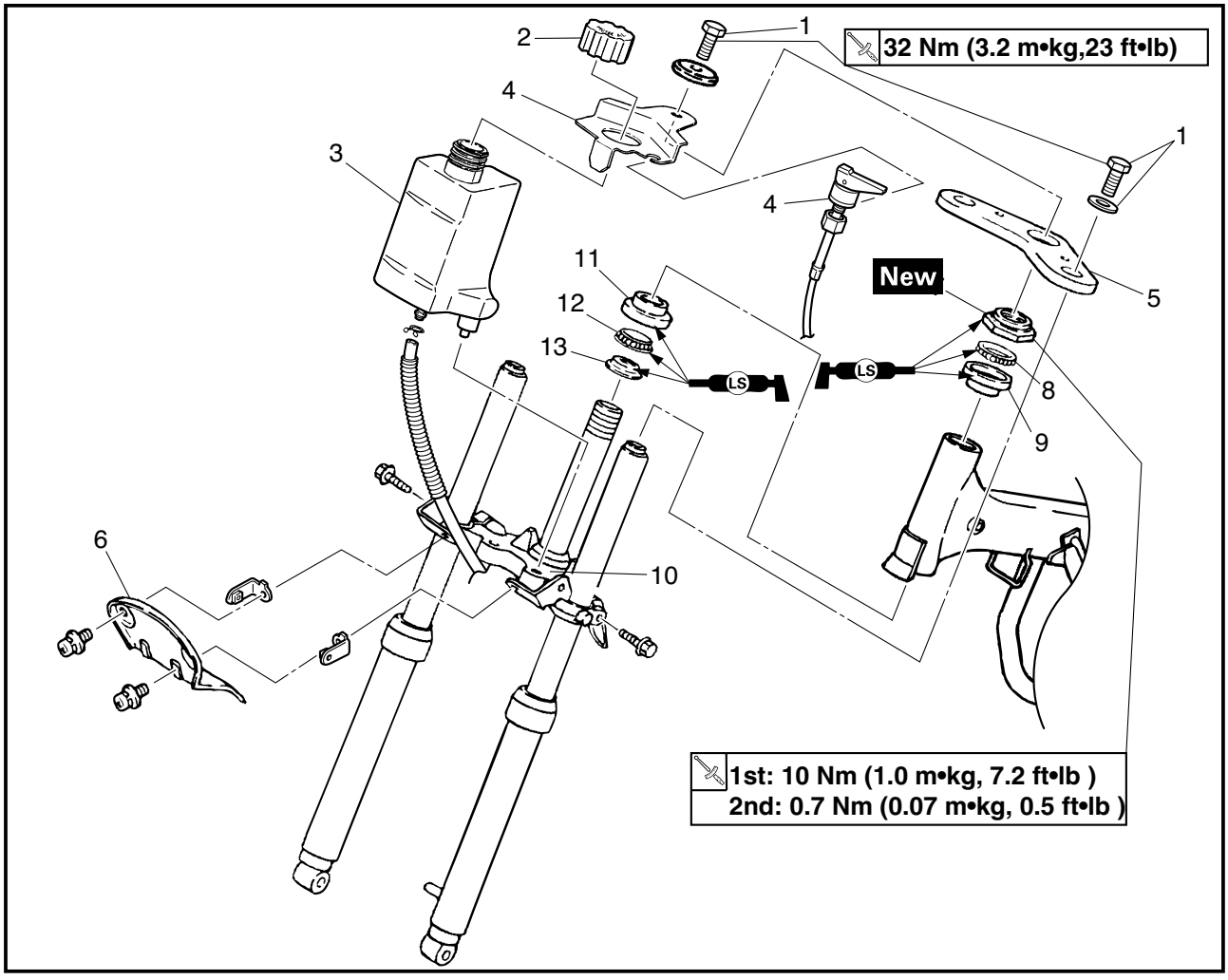
32 Nm (3.2 m·kg, 23 ft·lb)

⚠WARNING

Make sure the brake cables are routed properly.

5. Install:
   - Front wheel
     Refer to “REMOVING THE FRONT WHEEL”.
   - Handlebar
     Refer to “REMOVING THE HANDLEBAR”.

STEERING HEAD



Order	Job/Part	Q´ty	Remarks
	Removing the steering head		Remove the parts in the order listed.
	Handlebar		Refer to “HANDLEBAR”.
1	Steering stem bolt/cap bolt	1/2	
2	Oil tank cap	1	
3	Oil tank	1	Drain the engine oil.
4	Oil tank bracket/starter cable	1/1	
5	Upper bracket	1	
6	Inner fender	1	
7	Ring nut	1	
8	Upper bearing	1	
9	Bearing inner race	1	
10	Lower bracket	1	
11	Bearing inner race	1	
12	Lower bearing	1	
13	Bearing outer race	1	
			For installation, reverse the removal procedure.

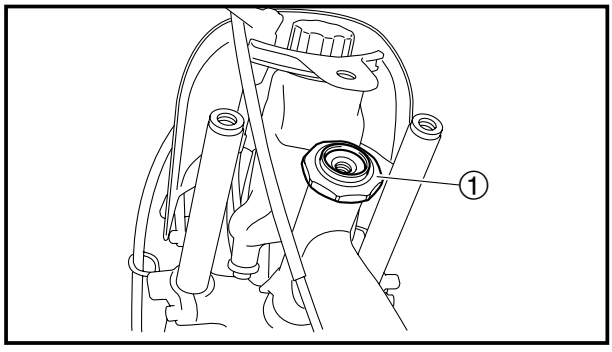
REMOVING THE LOWER BRACKET

1. Stand the vehicle on a level surface.

⚠WARNING

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

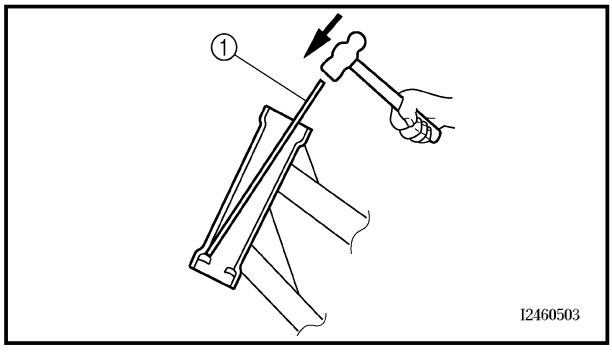
2. Remove:
   - Handlebar
     Refer to "REMOVING THE HANDLEBAR".



3. Remove:
   - Steering stem bolt
   - Washer
   - Upper bracket
   - Oil tank bracket
   - Ring nut ①
   - Upper ball bearing
   - Lower bracket
   - Lower ball bearing

CHECKING THE STEERING HEAD

1. Wash:
   - Ball bearing
2. Check:
   - Ball bearing
   - Bearing race
     Damage/pitting → Replace.
3. Replace:
   - Ball baring
   - Bearing race



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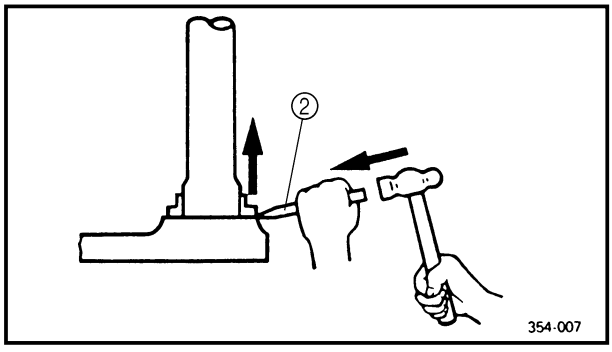
a. Remove the bearing races from the steering head pipe with a long rod ① and hammer.



b. Remove the bearing race from the lower bracket with a floor chisel ② and hammer.
c. Install a new bearing races.

CAUTION:

If the bearing race is not installed properly, the steering head pipe could be damaged.

NOTE:

- Always replace the bearings and bearing races as a set.
- Whenever the steering head is disassembled, replace the rubber seal.

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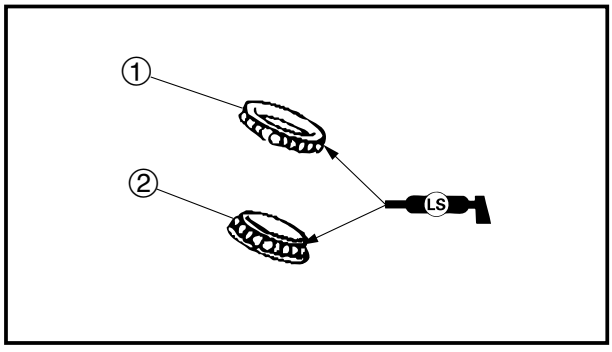


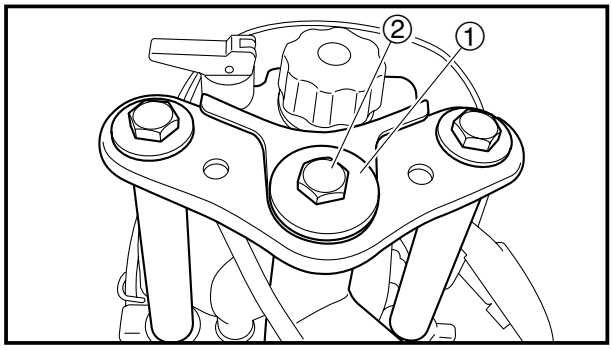
INSTALLING THE STEERING HEAD

1. Lubricate:
   - Upper ball bearing ①
   - Lower ball bearing ②
   - Bearing race

	Recommended lubricant **Lithium-soap-based grease**

2. Install:
   - Lower bracket
   - Ring nut

   Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" in chapter 3.

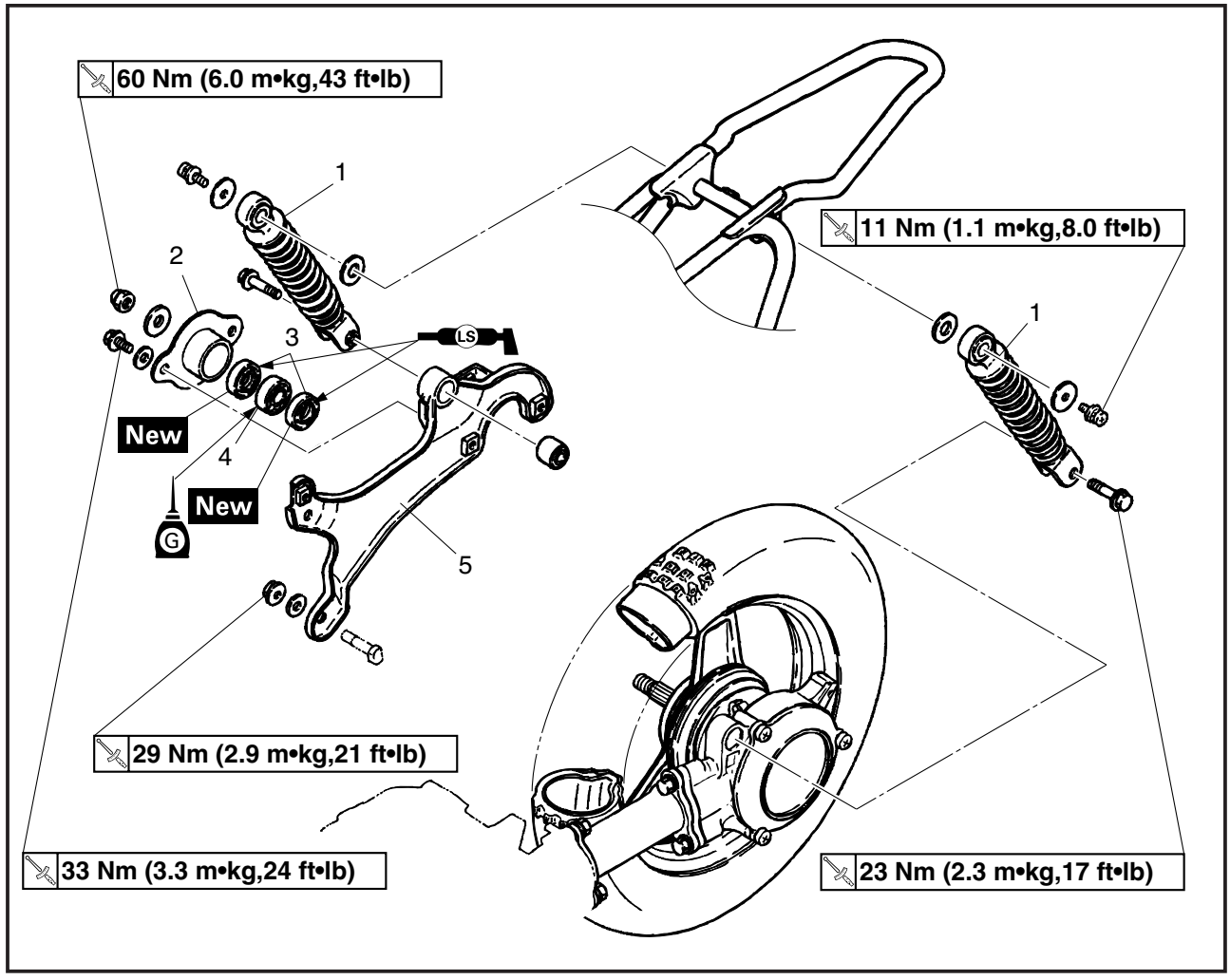


3. Install:
- Oil tank
- Upper bracket
- Washer ①
- Steering stem bolt ②

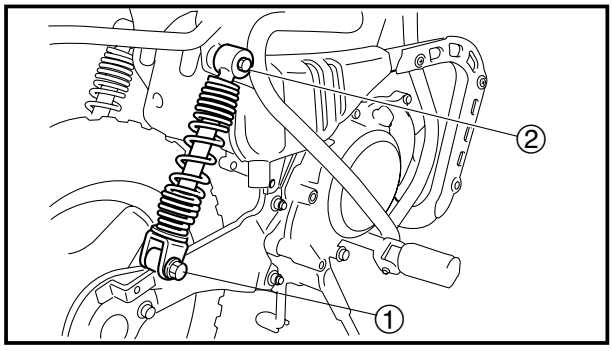
32 Nm (3.2 m·kg, 23 ft·lb)

4. Bleed:
- Autolube pump
  Refer to “AIR BLEEDING THE AUTOLUBE PUMP” in chapter 3.

REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM



Order	Job/Part	Q´ty	Remarks
	Removing the rear shock absorber and swingarm		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
	Muffler		Refer to “ENGINE REMOVAL” in chapter 5.
1	Rear shock absorber assembly (Left/right)	1/1	
2	End cap	1	
3	Oil seal	2	
4	Bearing	1	
5	Swingarm	1	
			For installation, reverse the removal procedure.



REMOVING THE REAR SHOCK ABSORBER ASSEMBLIES

1. Stand the vehicle on a level surface.

⚠WARNING

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

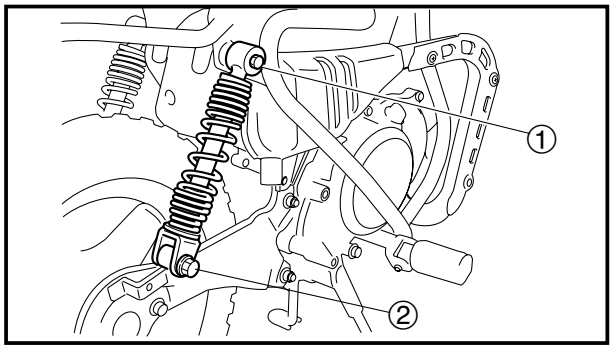
NOTE:

Place the vehicle on a suitable stand so that the rear wheel is elevated.

2. Remove:
- Rear shock absorber assembly bolt (lower) ①
- Rear shock absorber assembly bolt (upper) ②
- Rear shock absorber assembly

CHECKING THE REAR SHOCK ABSORBER ASSEMBLY

1. Check:
- Rear shock absorber rod
  (rear shock absorber assembly)
  Damage/wear → Replace.
- Rear shock absorber
  Oil leaks → Replace the rear shock absorber assembly
- Rear shock absorber spring
  Damage/wear → Replace.
- Bushing
  Damage/wear → Replace.
- Bolt
  Bend/damage/wear → Replace.



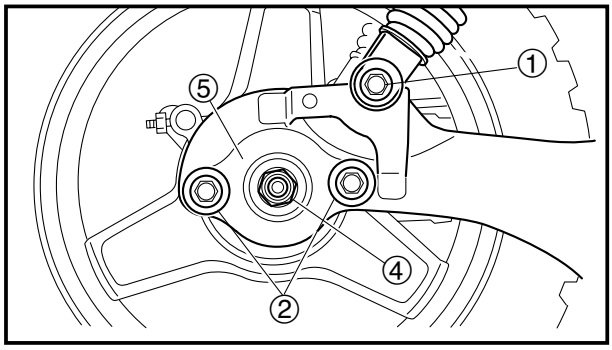
INSTALLING THE REAR SHOCK ABSORBER ASSEMBLIES

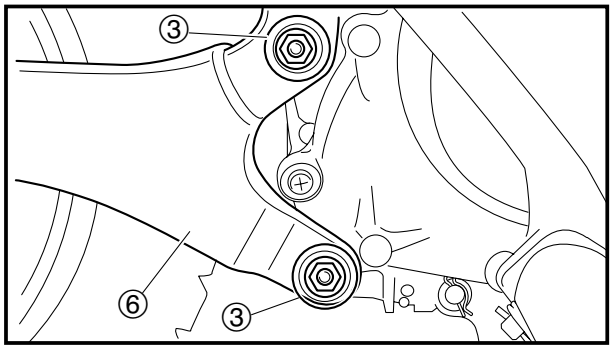
1. Install:
- Rear shock absorber assembly
- Rear shock absorber bolt (upper) ①
- Rear shock absorber bolt (lower) ②
2. Tighten:
- Rear shock absorber bolt (upper)

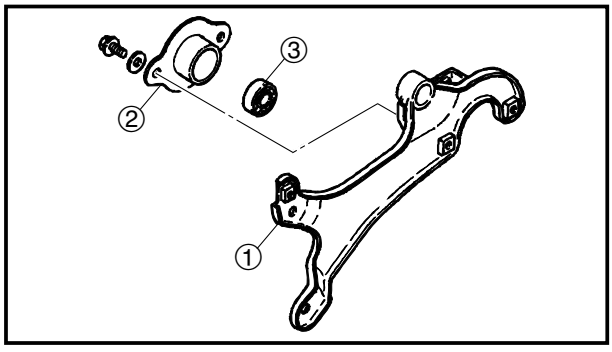
	11 Nm (1.1 m·kg, 8.0 ft·lb)

- Rear shock absorber bolt (lower)

	23 Nm (2.3 m·kg, 17 ft·lb)







REMOVING THE SWINGARM

1. Remove:
   - Rear shock absorber bolt (lower/right) ①
2. Loosen:
   - Swingarm bolt (rear) ②
   - Swingarm bolt (front) ③
3. Loosen:
   - Rear axle nut ④

NOTE:

While applying the rear brake, loosen the rear axle nut.

4. Remove:
   - End cap ⑤
   - Rear axle nut
   - Swingarm ⑥

CHECKING THE SWINGARM

1. Check:
   - Swingarm ①
     Bend/damage → Replace.
2. Check:
   - End cap ②
     Damage/wear → Replace.
3. Check:
   - Bearing ③
     Damage/pitting → Replace.

INSTALLING THE SWINGARM

1. Install:
   - Oil seal **New**
   - Swingarm
   - Rear axle nut
   - Swingarm bolt (front)
   - End cap
   - Swingarm bolt (rear)
   - Rear shock absorber bolt (lower/right)

2. Tighten
   - Swingarm bolt (front)

     29 Nm (2.9 m·kg, 21 ft·lb)

   - Swingarm bolt (rear)

     33 Nm (3.3 m·kg, 24 ft·lb)

   - Rear axle nut

     60 Nm (6.0 m·kg, 43 ft·lb)

   - Rear shock absorber bolt (lower/right)

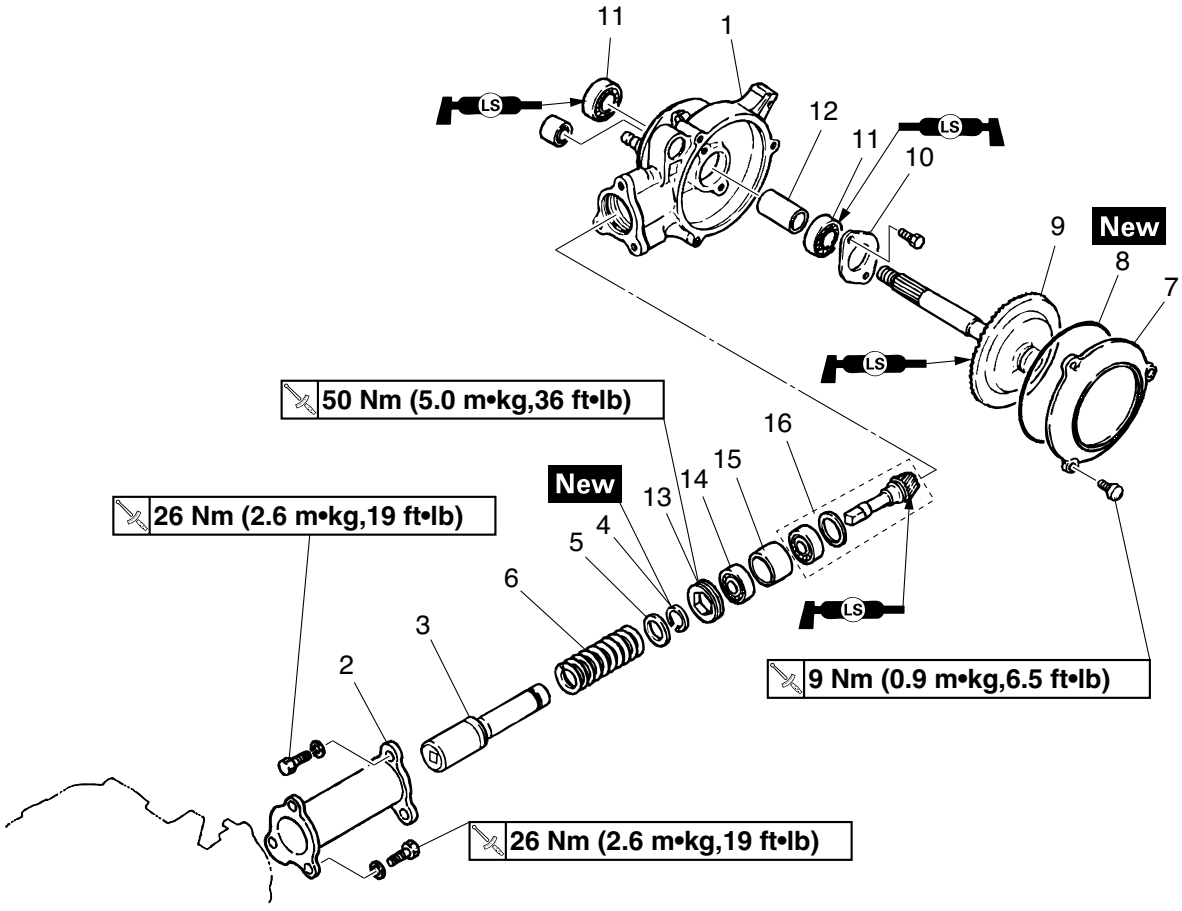
     23Nm (2.3 m·kg, 17 ft·lb)

NOTE:

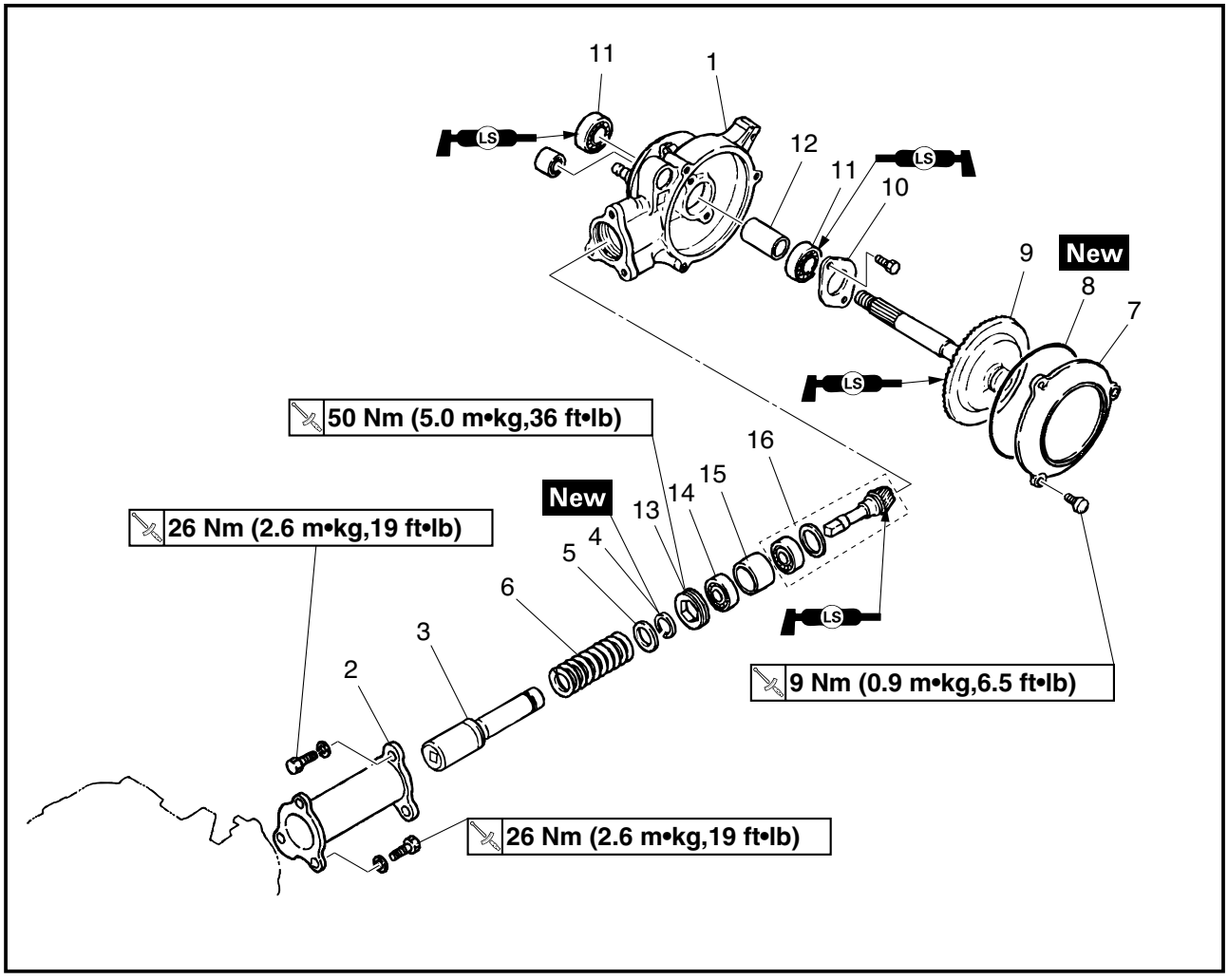
While apply the rear brake to tighten the rear axle nut.

3. Install:
   - Exhaust chamber assembly
   - Muffler.
     Refer to “ENGINE REMOVAL” in chapter 5.

SHAFT DRIVE



Order	Job/Part	Q´ty	Remarks
	Removing the shaft drive		Remove the parts in the order listed.
	Rear shock absorber (left/right)		Refer to “REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM”.
	Swingarm		
	Rear wheel		Refer to “FRONT WHEEL, REAR WHEEL AND BRAKE”.
1	Drive shaft housing	1	
2	Rear arm	1	
3	Drive shaft	1	
4	Circlip	1	
5	Spring retainer	1	
6	Compression spring	1	
7	Housing cover	1	
8	O-ring	1	
9	Ring gear	1	
10	Plate cover	1	
11	Bearing	2	



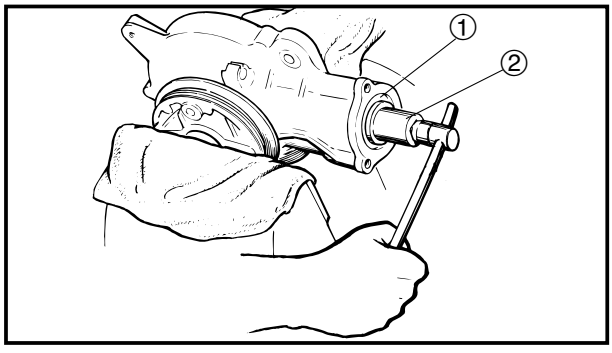
Order	Job/Part	Q´ty	Remarks
12	Spacer	1	
13	Screw	1	
14	Bearing	1	
15	Spacer	1	
16	Drive pinion gear	1	
			For installation, reverse the removal procedure.

DISASSEMBLING THE SHAFT DRIVE ASSEMBLY

1. Remove:
   - Housing cover
   - O-ring
   - Ring gear

NOTE:

1/4 of a turn. After all of the bolts are fully loosened, remove them.



2. Remove:
   - Screw ①
     (with the special tool ②)

	Hexagon wrench: **90890-01307, YM-01307**

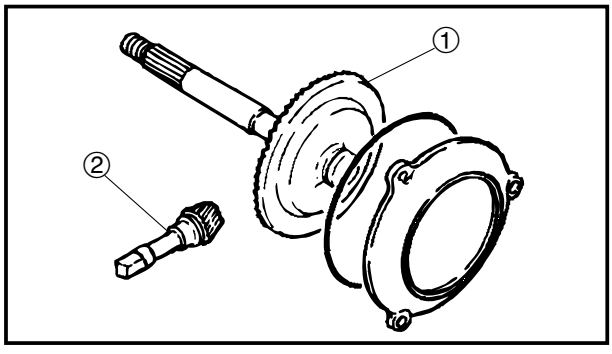
3. Remove:
   - Spacer
   - Bearing
   - Shim

CAUTION:

The drive pinion gear should only be removed if ring gear replacement is necessary.

NOTE:

Lightly tap on the end of the drive pinion gear with a soft hammer.



CHECKING THE SHAFT DRIVE

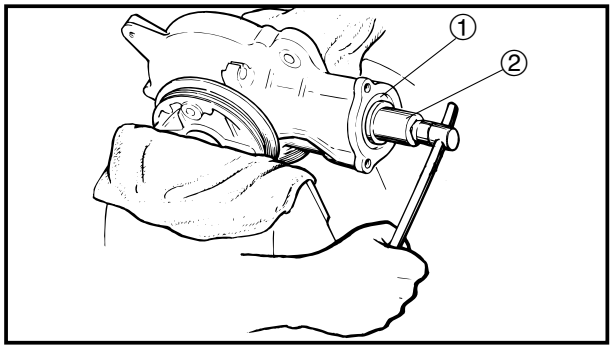
1. Check:
   - Ring gear ①
     Galling/pitting/wear → Replace.
2. Check:
   - Drive pinion gear ②
     Galling/pitting/wear → Replace.
3. Check:
   - Bearing
     Damage/pitting → Replace.

ASSEMBLING THE SHAFT DRIVE ASSEMBLY

1. Lubricate:
   - Drive pinion gear
   - Ring gear

	Recommended lubricant **Lithium-soap-based grease**

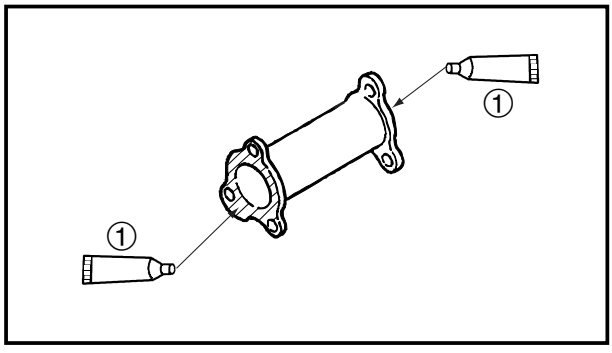
2. Install:
   - Drive pinion gear
   - Shim
   - Bearing
   - Spacer
   - Bearing



3. Install:
   - Screw ① **50 Nm (5.0 m·kg, 36 ft·lb)**
     (with the special tool ②)

	Hexagon wrench: **90890-01307, YM-01307**

4. Install:
   - Ring gear
   - O-ring **New**
   - Housing cover



INSTALLING THE REAR ARM

1. Apply:
   - Yamaha bond No. 1215 (Three Bond No. 1215®) ①
     (to the mating surfaces of both arm ends)

	Yamaha bond No. 1215 **(Three Bond No. 1215®)** **90890-85505**

NOTE:
Clean the contacting surface of rear arm ends before applying the sealant.

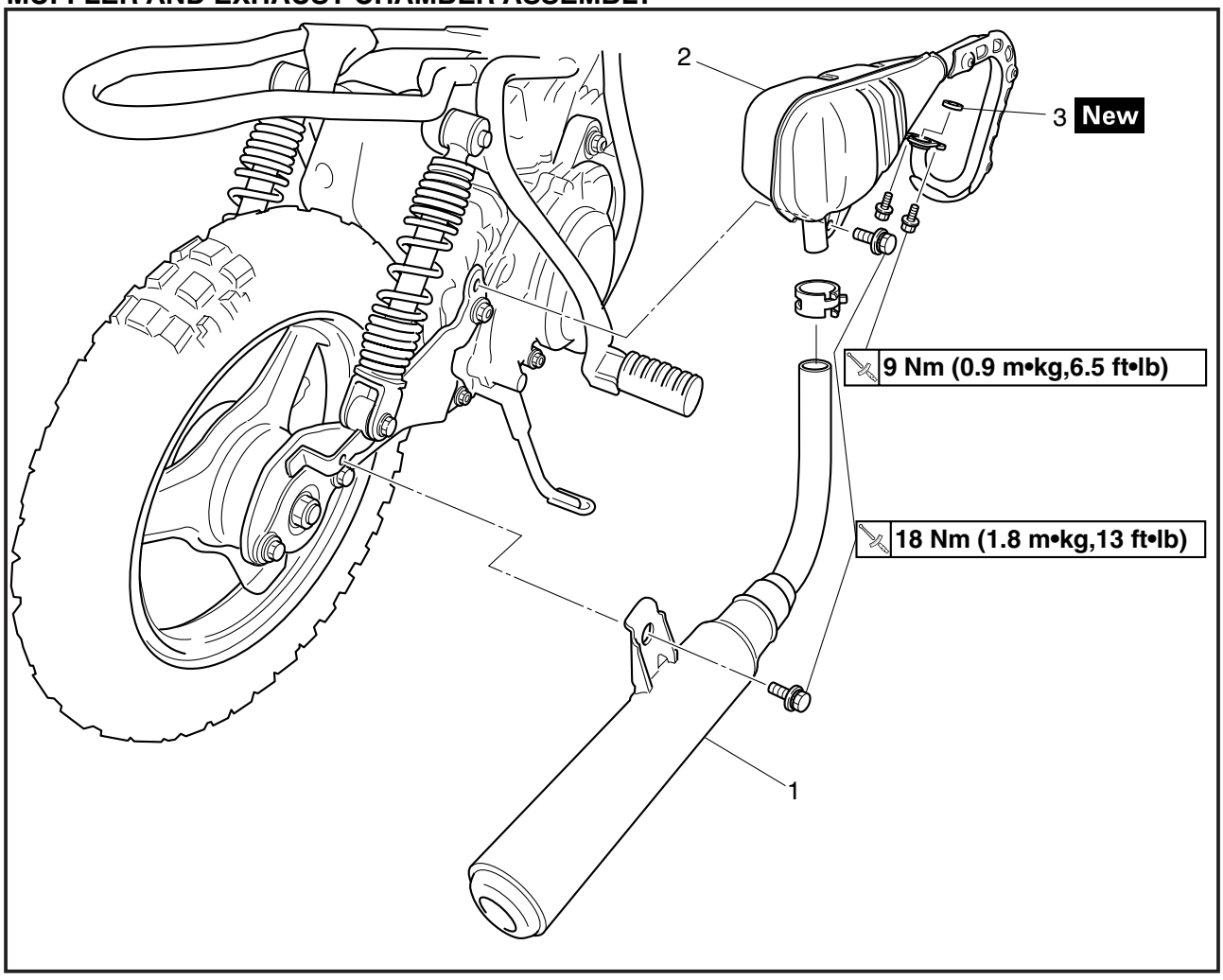
2. Tighten:
   - Rear arm bolt **26 Nm (2.6 m·kg, 29 ft·lb)**

CHAPTER 5
ENGINE

ENGINE

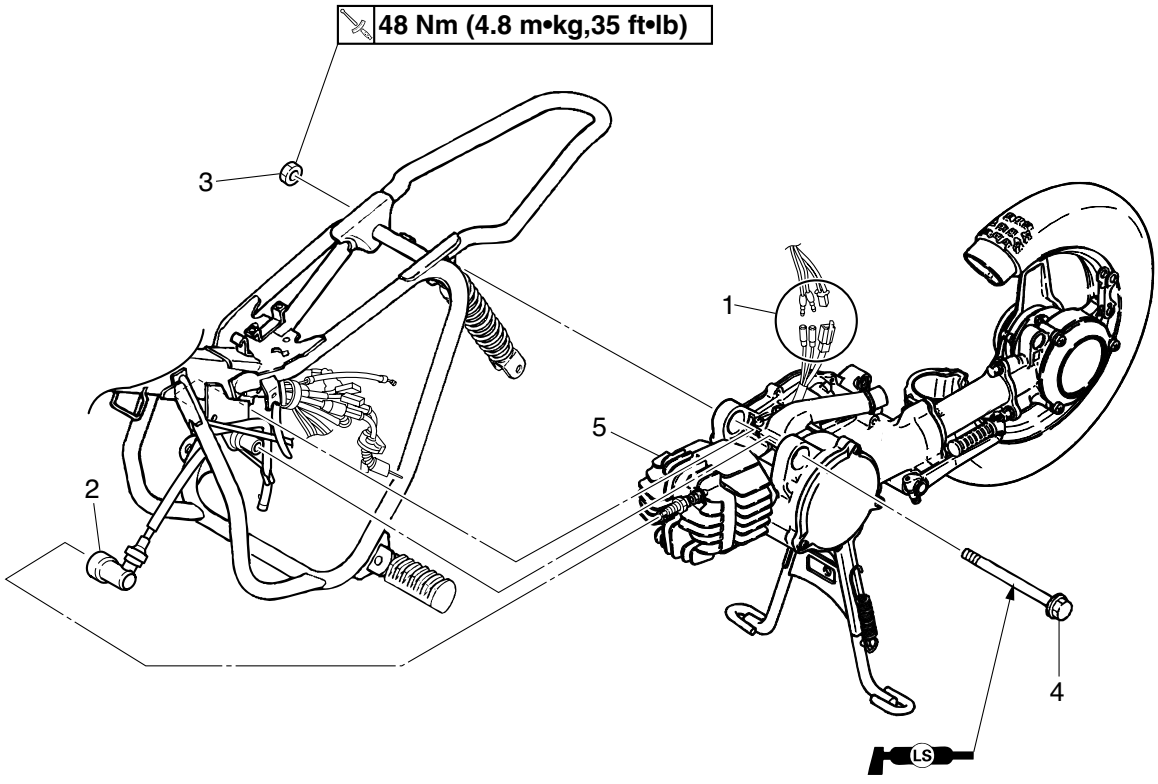
ENGINE REMOVAL

MUFFLER AND EXHAUST CHAMBER ASSEMBLY



Order	Job/Part	Q´ty	Remarks
	Removing the muffler and exhaust chamber assembly		Remove the parts in the order listed.
1	Muffler assembly	1	
2	Exhaust chamber assembly	1	
3	Gasket (Power reduction plate)	1	
			For installation, reverse the removal procedure.

ENGINE



Order	Job/Part	Q´ty	Remarks
	Removing the engine		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
	Rear shock absorber bolt (lower)		Refer to “REAR SHOCK ABSORBER ASSEMBLY AND SWINGARM” in chapter 4.
	Swingarm		Refer to “SWINGARM” in chapter 4.
	Rear brake cable		Refer to “REAR WHEEL” in chapter 4.
	Oil hose/autolube pump assembly		Refer to “AUTOLUBE PUMP”.
	Air filter case/carburetor		Refer to “CARBURETOR” in chapter 6.
1	CDI magneto lead coupler/connector	1/2	Disconnect.
2	Spark plug cap	1	Disconnect.
3	Pivot shaft nut	1	
4	Pivot shaft	1	
5	Engine assembly	1	
			For installation, reverse the removal procedure.

REMOVING THE ENGINE

1. Stand the vehicle on a level surface.

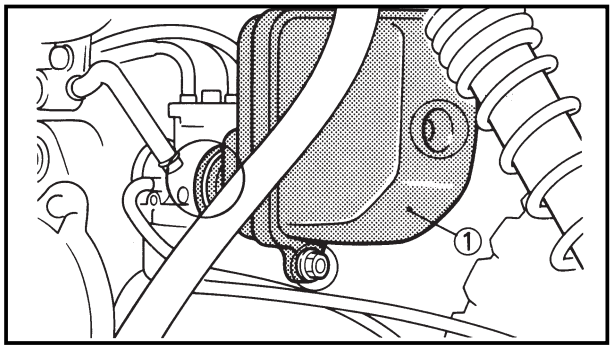
⚠WARNING

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

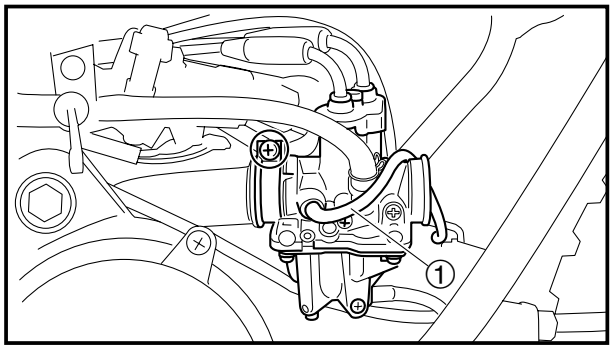
NOTE:

Place the vehicle on the mainstand so that the rear wheel is elevated.

2. Remove:
   - Side cover
     Refer to "SIDE COVERS SEAT AND FUEL TANK" in chapter 3.



3. Remove:
   - Air filter case assembly ①



4. Disconnect:
   - Oil hose
   - Oil delivery hose ①
   - Fuel hose

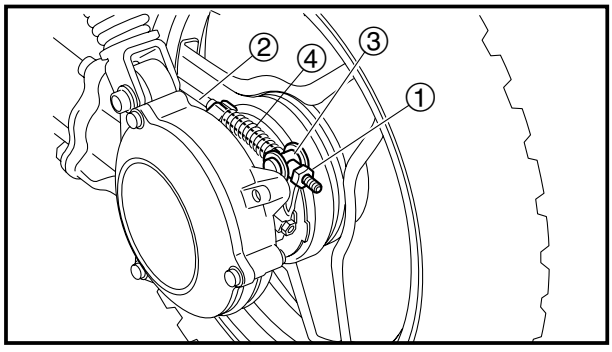
⚠WARNING

Turn the fuel cock lever to "S" position, and then disconnect the fuel hose.

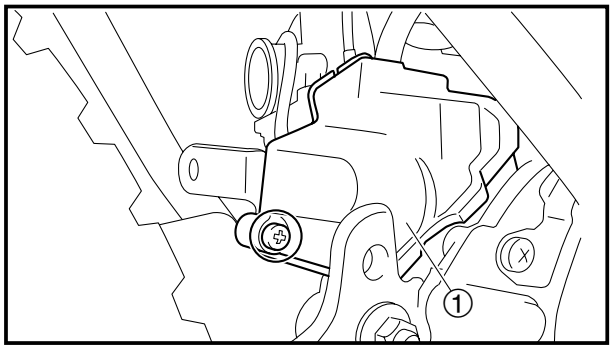
5. Remove:
   - Carburetor assembly
     Refer to "CARBURETOR" in chapter 6.

6. Remove:
- Muffler assembly
- Exhaust chamber assembly

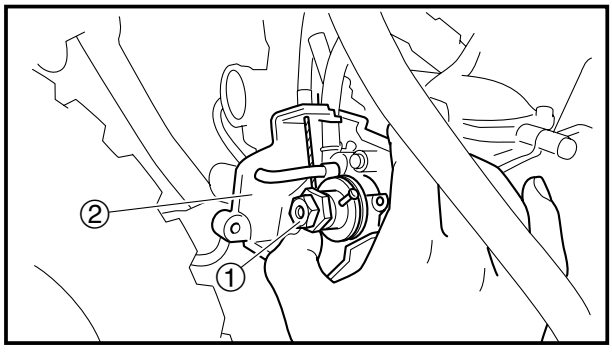
7. Remove:
- Rear shock absorber bolt (lower/right side)
- Rear axle nut
- Rear shock absorber arm
  Refer to "REAR SHOCK ABSORBER ASSEMBLY AND SWINARM" in chapter 4.



8. Remove:
- Brake cable adjusting nut ①
- Rear brake cable ②
- Pin ③
- Spring ④



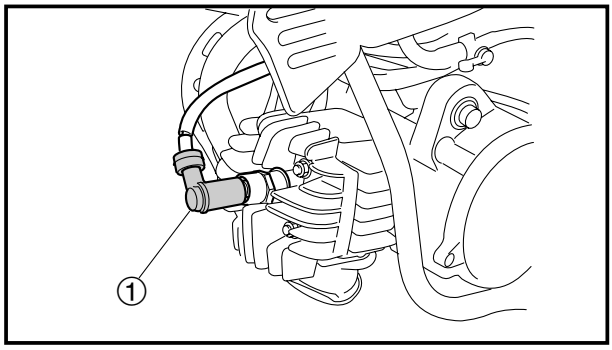
9. Remove:
- Autolube pump cover (outer) ①



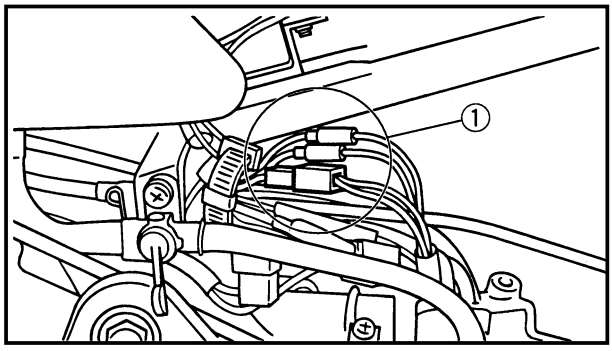
10. Remove:
- Oil hose/autolube pump cable
- Autolube pump assembly ①
  (remove with the autolube pump cover (inner) ②)

CAUTION:

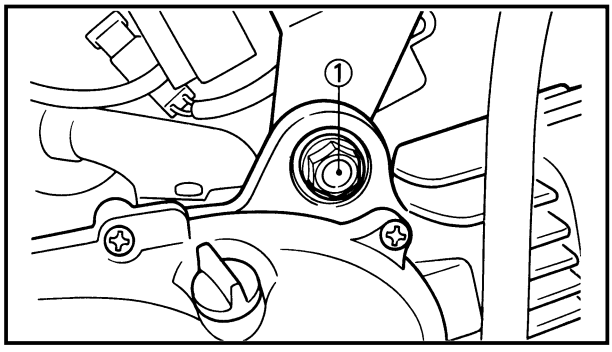
Whenever disconnect the oil delivery hose, be sure cap the oil hose by proper bolt to prevent the engine oil to spilt out.



11. Remove:
    - Spark plug cap ①
    - Rear shock absorber bolt (lower/left)



12. Disconnect:
    - CDI magneto lead coupler/connector ①



13. Remove:
    - Pivot shaft ①

NOTE:
- While removing the engine, pull out the pivot shaft, and then remove the frame assembly.
- Be sure to check the wire, cable and hose disconnected.

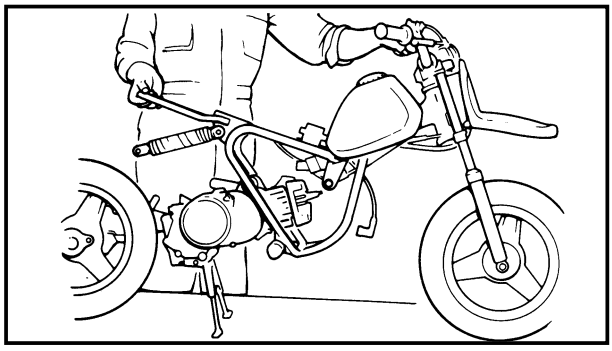
INSTALLING THE ENGINE

⚠WARNING

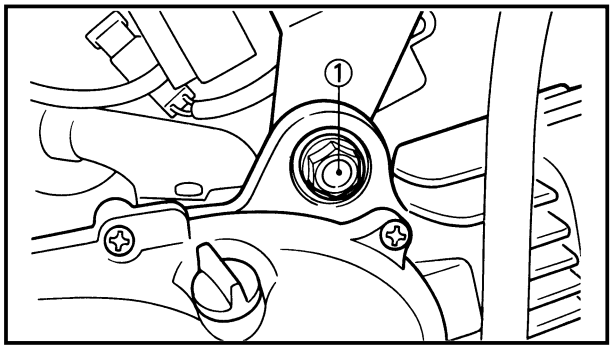
Securely support the engine assembly so that there is no danger of it falling over.

NOTE:

Place the engine assembly on the mainstand so that the rear wheel is elevated.



1. Install:
    - Engine assembly
      To install the frame.

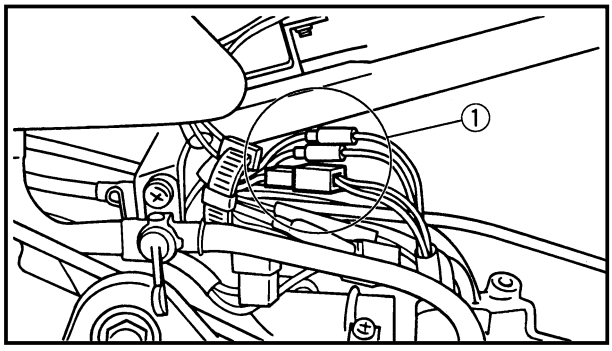


2. Install:
   - Pivot shaft ①
   - Pivot shaft nut

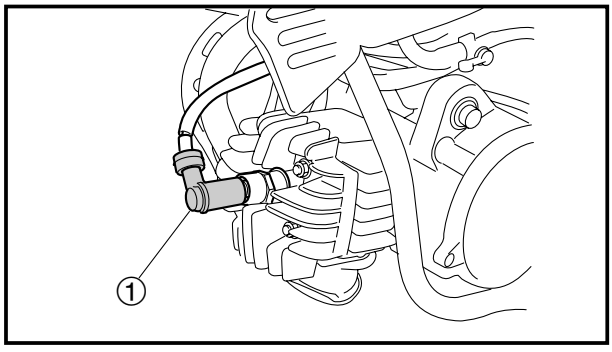
NOTE:
Install the pivot shaft to temporarily.

3. Tighten:
   - Pivot shaft nut

48 Nm (4.8 m·kg, 35 ft·lb)



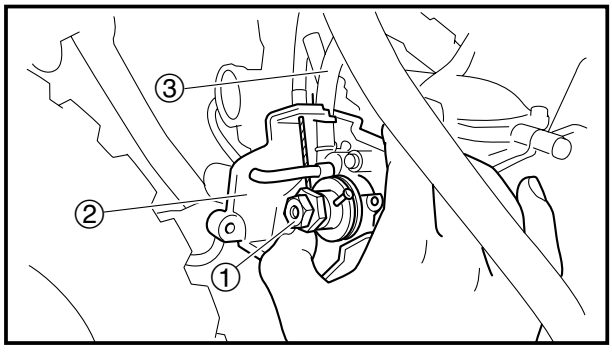
4. Connect:
   - CDI magneto lead coupler/connector ①



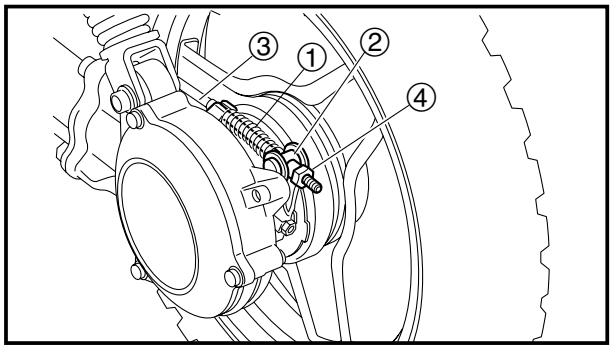
5. Install:
   - Rear shock absorber bolt (lower/left)

23 Nm (2.3 m·kg, 17 ft·lb)

   - Spark plug cap ①



6. Install:
   - Autolube pump assembly ①
     With the autolube pump cover (inner) ②
   - Autolube pump cable/oil hose ③
   - Autolube pump cover (outer)



7. Install:
   - Spring ①
   - Pin ②
   - Rear brake cable ③
   - Brake cable adjusting nut ④

8. Install
   - Swingarm bolt (front)

     29 Nm (2.9 m·kg, 21 ft·lb)

   - Swingarm bolt (rear)

     33 Nm (3.3 m·kg, 24 ft·lb)

   - Rear axle nut

     60 Nm (6.0 m·kg, 43 ft·lb)

   - Rear shock absorber bolt (lower/right)

     23Nm (2.3 m·kg, 17 ft·lb)

NOTE:

While apply the rear brake to tighten the rear axle nut.

9. Install:
   - Exhaust manifold bolt

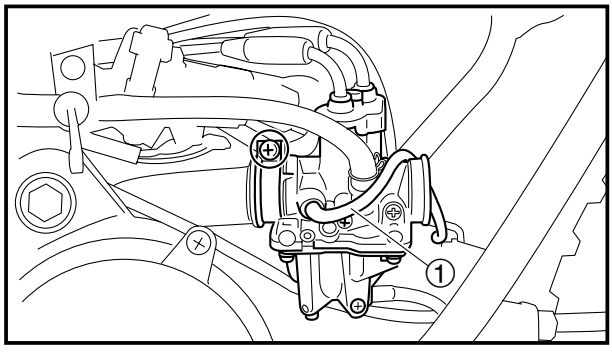
     9 Nm (0.9 m·kg, 6.5 ft·lb)

   - Exhaust chamber bolt

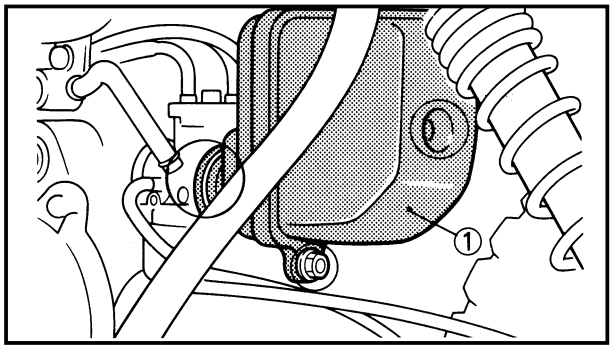
     18 Nm (1.8 m·kg, 13 ft·lb)

   - Muffler bolt

     18 Nm (1.8 m·kg, 13 ft·lb)



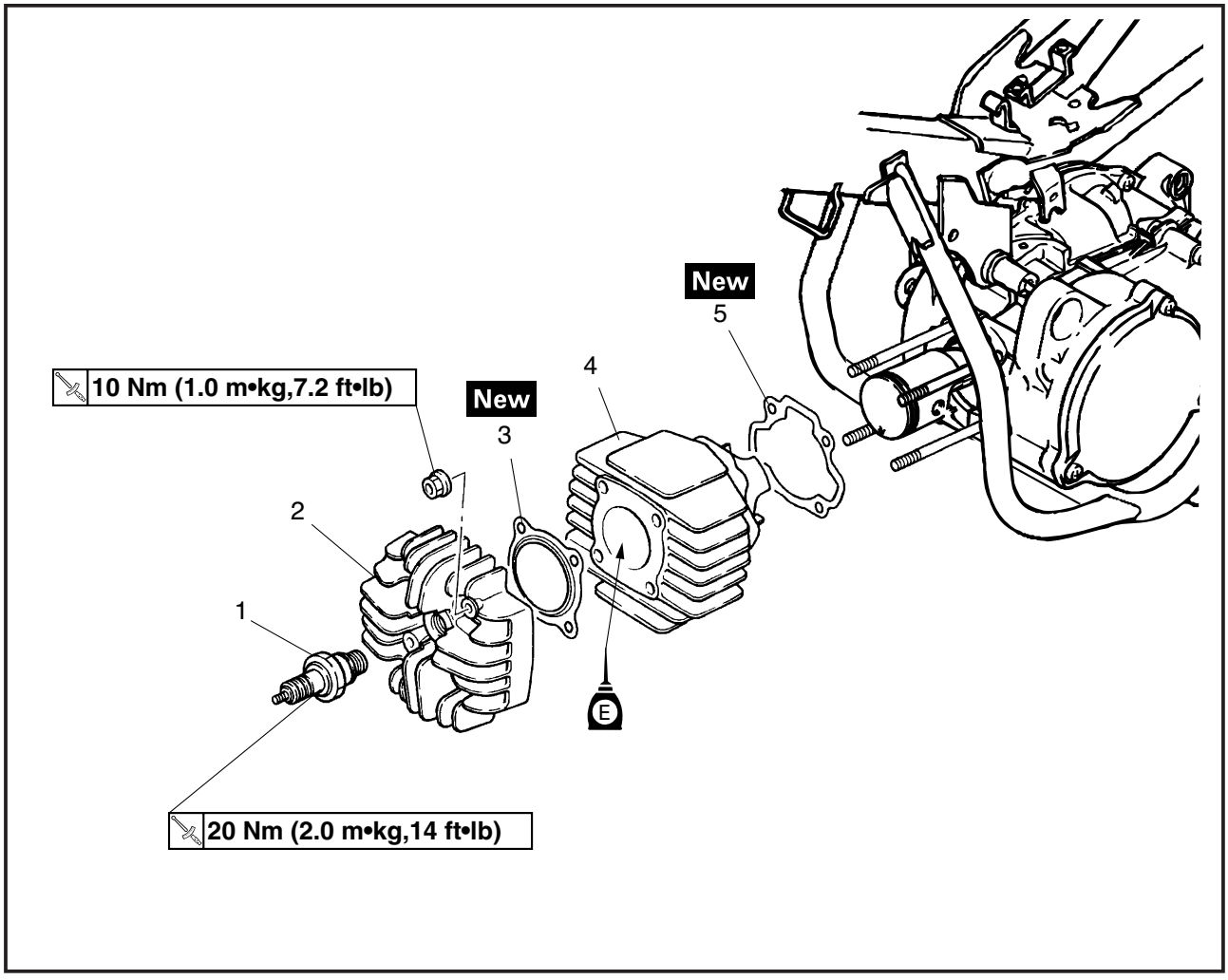
10. Install:
    - Carburetor assembly
      Refer to “CARBURETOR” in chapter 6.
11. Connect:
    - Fuel hose
    - Oil delivery hose ①
    - Oil hose



12. Install:
    - Air filter case assembly ①
13. Install:
    - Side cover
      Refer to “SIDE COVERS SEAT AND FUEL TANK” in chapter 3.
14. Bleed:
    - Autolube pump
      Refer to “AIR BLEEDING THE AUTOLUBE PUMP” in chapter 3.

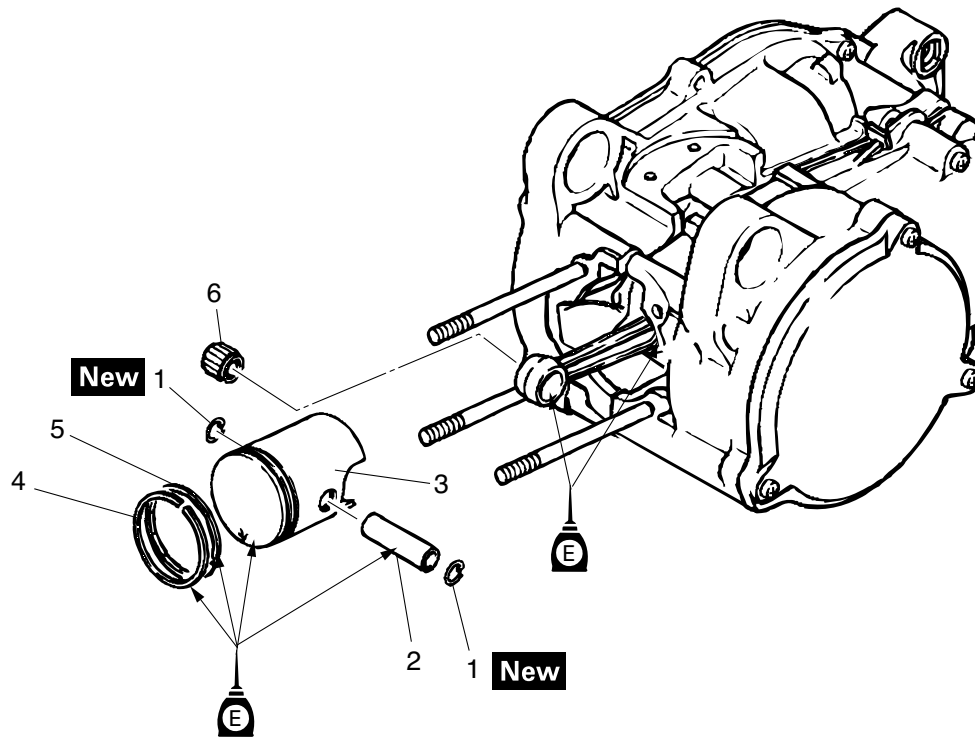
CYLINDER HEAD, CYLINDER AND PISTON

CYLINDER HEAD AND CYLINDER

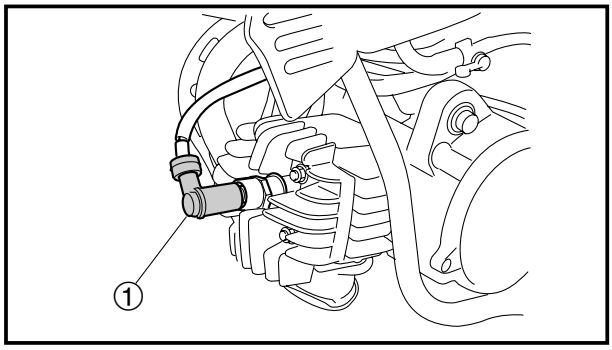


Order	Job/Part	Q´ty	Remarks
	Removing the cylinder		Remove the parts in the order listed.
	Exhaust chamber assembly		Refer to “ENGINE REMOVAL.
	Spark plug cap		
1	Spark plug	1	
2	Cylinder head	1	
3	Gasket	1	
4	Cylinder	1	
5	Gasket	1	
			For installation, reverse the removal procedure.

PISTON

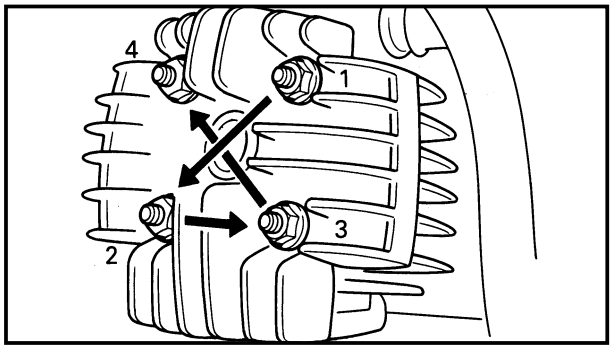


Order	Job/Part	Q´ty	Remarks
	Removing the piston		Remove the parts in the order listed.
	Cylinder head		
	Cylinder		
1	Piston pin clip	2	
2	Piston pin	1	
3	Piston	1	
4	Top ring	1	
5	2nd ring/expander ring	1/1	
6	Connecting rod small end bearing	1	
			For installation, reverse the removal procedure.



REMOVING THE CYLINDER HEAD

1. Remove:
   - Exhaust chamber assembly
   - Spark plug cap ①
   - Spark plug



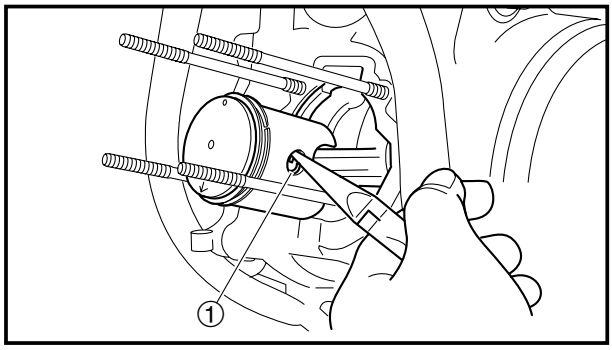
2. Remove:
   - Cylinder head
   - Gasket

NOTE:

Loosen the nut to in the crisscross pattern and 2 or 3 stages as shown.

REMOVING THE CYLINDER

1. Remove:
   - Cylinder
   - Gasket

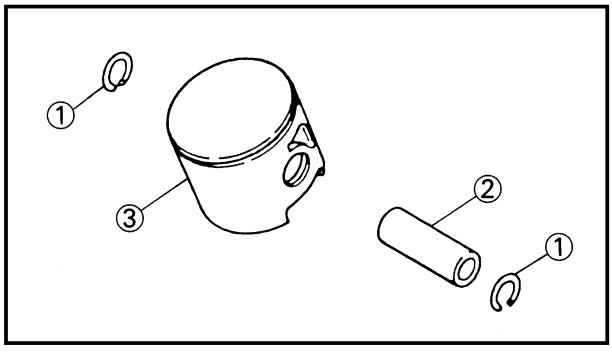


REMOVING THE PISTON

1. Remove:
   - Piston pin clips ①
   - Piston pin ②
   - Piston ③

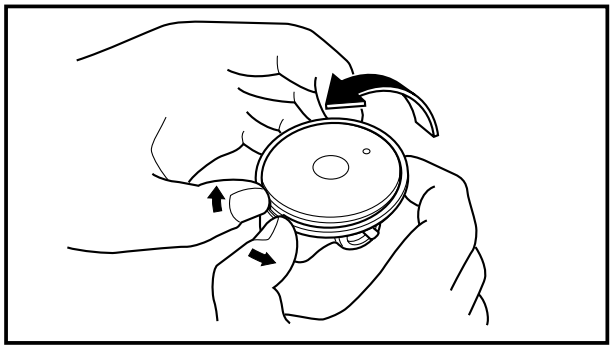
CAUTION:

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



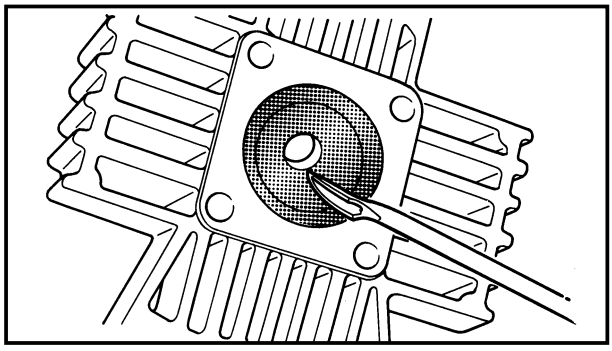
NOTE:

- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip's groove and the piston's pin bore area. If both areas are deburred and the piston pin is still difficult to remove.



2. Remove:
- Top ring
- Second ring
  (with expander ring)

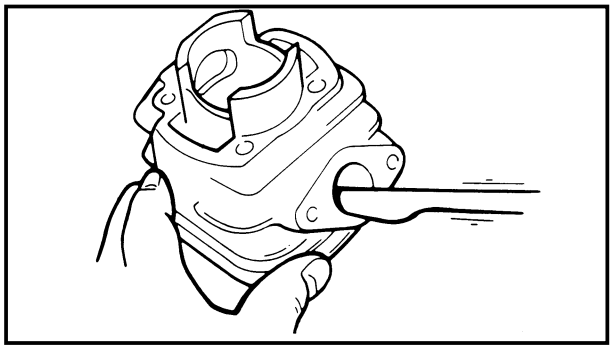
NOTE:
When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.



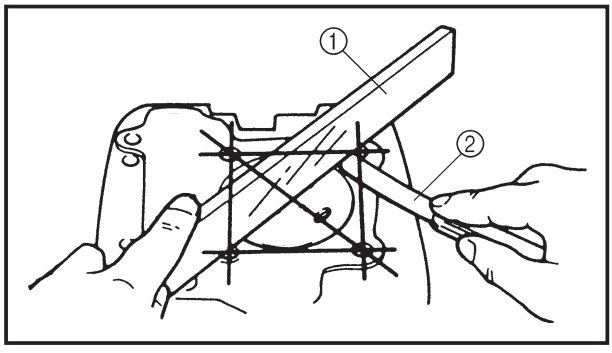
CHECKING THE CYLINDER HEAD

1. Eliminate:
- Combustion chamber carbon deposits
  (with a rounded scraper)

NOTE:
Do not use a sharp instrument to avoid damaging or scratching.
•Spark plug bore threads



2. Eliminate:
- Exhaust port carbon deposits
  (with a rounded scraper)



3. Check:
- Cylinder head
  Damage/scratches → Replace the cylinder head.

4. Measure:
- Cylinder head warpage
  Out of specification → Resurface the cylinder head.

	Warpage limit **0.03 mm (0.0012 in)**

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

a. Place a straightedge ① and a thickness gauge ② across the cylinder head.
b. Measure the warpage.
c. If the limit is exceeded, resurface the cylinder head as follows.
d. Place a 400-600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

NOTE:

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

e. After resurfacing, out of specification → Replace the cylinder head.

▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲▲

CHECKING THE CYLINDER AND PISTON

1. Check:
- Piston wall
- Cylinder wall
  Vertical scratches → Rebore or replace the cylinder, and replace the piston and piston rings as a set.

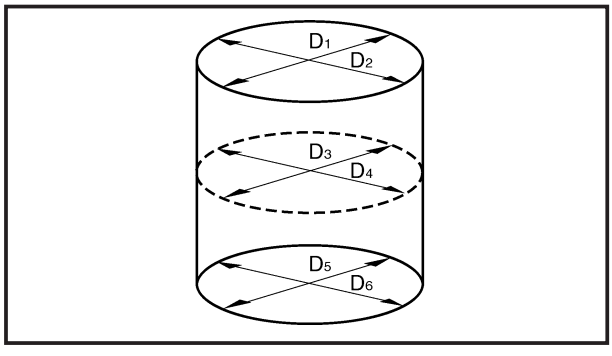
2. Measure:
- Piston-to-cylinder clearance

▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼▼

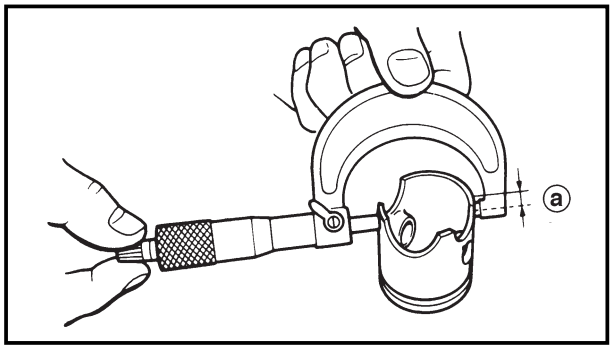
a. Measure cylinder bore "C" with the cylinder bore gauge.

NOTE:

Measure cylinder bore "C" by taking side-to-side and front-to-back measurements of the cylinder. Then, find the average of the measurements.



Bore "C"
Bore
39.993-40.012 mm (1.5745-1.5753 in)
Taper limit "T"
Warp limit
0.050 mm (0.0020 in)



"C"= maximum of D_1–D_6
"T"= (maximum of D_1 or D_2)-(maximum of D_5 or D_6)

b. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.
c. Measure piston skirt diameter "D" with the micrometer.

ⓐ 5 mm (0.20 in) from the bottom edge of the piston

Diameter D
39.952-39.972 mm (1.5729-1.5737 in)

d. If out of specification, replace the piston and piston rings as a set.
e. Calculate the piston-to-cylinder clearance with the following formula.
Piston-to-cylinder clearance =
Cylinder bore "C" -Piston
skirt diameter "D"

Piston-to-cylinder clearance
0.034-0.047 mm (0.0013-0.0019 in)
Limit
0.10 mm (0.0039 in)

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

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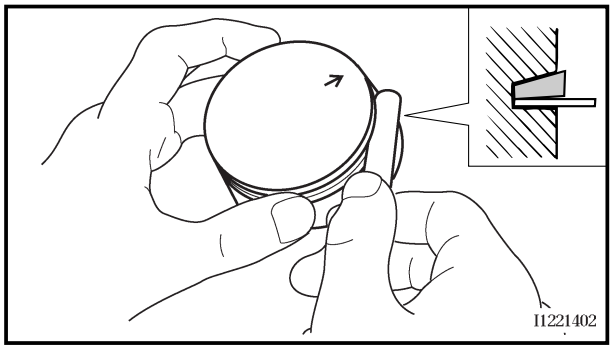
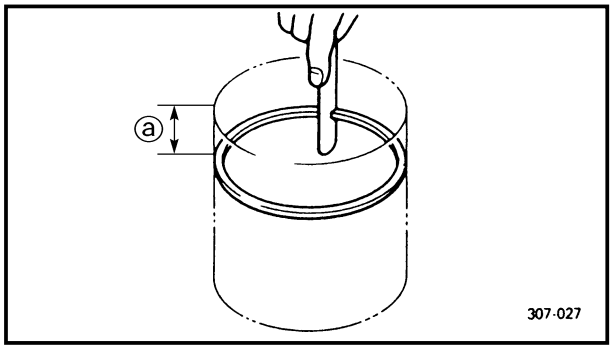


CHECKING THE PISTON RINGS

1. Measure:
• Piston ring side clearance
Out of specification → Replace the piston and piston rings as a set.

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

Piston ring side clearance
Ring side clearance
0.020-0.060 mm (0.0008-0.0024 in)
Limit
0.080 mm (0.0032 in)



2. Measure:
• Piston ring end gap
Out of specification → Replace the piston ring and cylinder as a set.

Piston ring end gap
0.15-0.35 mm (0.0059-0.0138 in)
Limit
0.50 mm (0.0197 in)

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a. Install a piston ring into the cylinder.

NOTE:
Level the piston ring into the cylinder with the piston crown.

ⓐ 40 mm (1.57 in)

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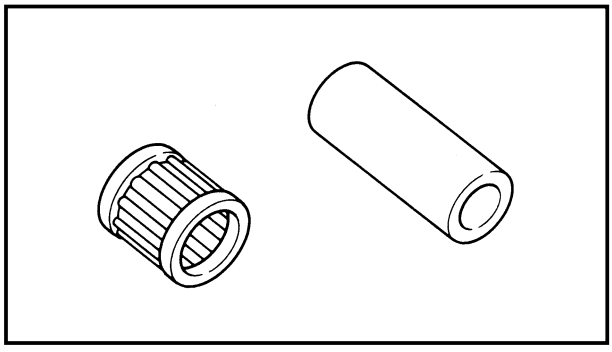
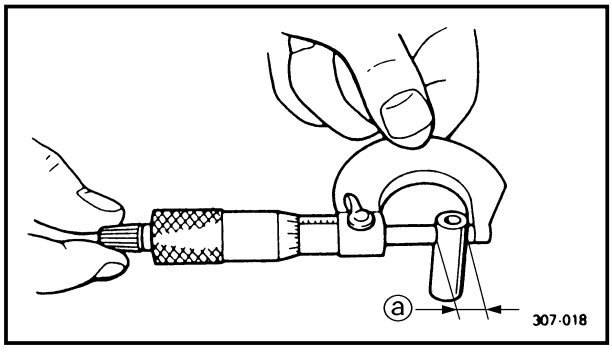


CHECKING THE PISTON PIN AND SMALL END BEARINGS

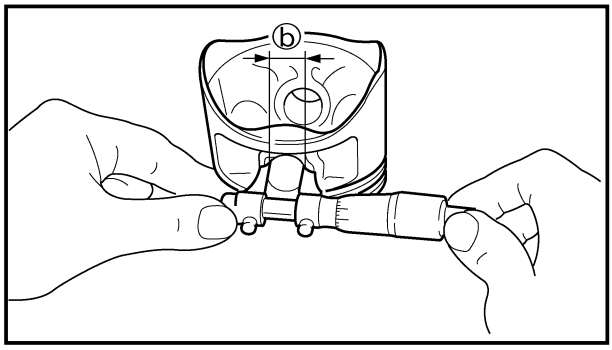
1. Check:
• Piston pin
Blue discoloration/grooves → Replace the piston pin.

2. Check:
• Connecting rod small end bearing
Blue discoloration/grooves → Replace.



3. Measure:
• Piston pin outside diameter ⓐ
Out of specification → Replace the piston pin and small end bearing as a set.

Piston pin outside diameter
9.994-10.000 mm (0.3935-0.3937 in)
Limit
9.974 mm (0.3927 in)

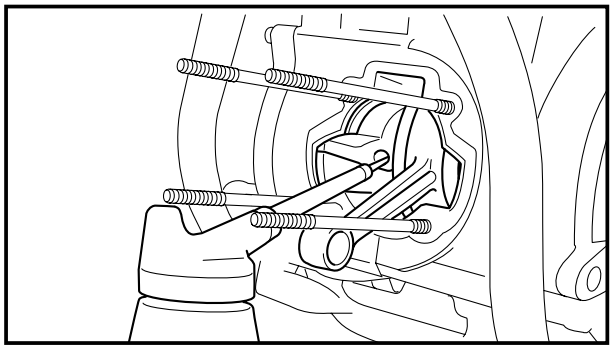


4. Measure:
- Piston pin bore diameter ⓑ
  Out of specification → Replace the piston, piston pin and small end bearing as a set.

Piston pin bore inside diameter
10.004-10.015 mm (0.3939-0.3943 in)
Limit
10.035 mm (0.3951 in)

5. Calculate:
- Piston-pin-to-piston-pin-bore clearance
  Out of specification → Replace the piston and piston pin as a set.
  Piston-pin-to-piston-pin-bore clearance =Piston pin bore diameter ⓑ-Piston pin outside diameter ⓐ

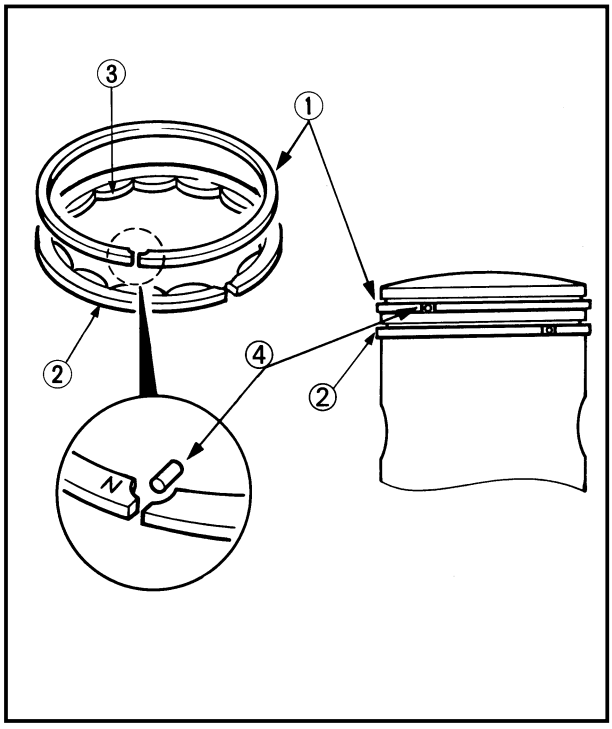
Piston-pin-to-piston-pin-bore clearance
0.004-0.021 mm (0.0002-0.0008 in)
Limit
0.061 mm (0.0024 in)



INSTALLING THE PISTON RING AND PISTON

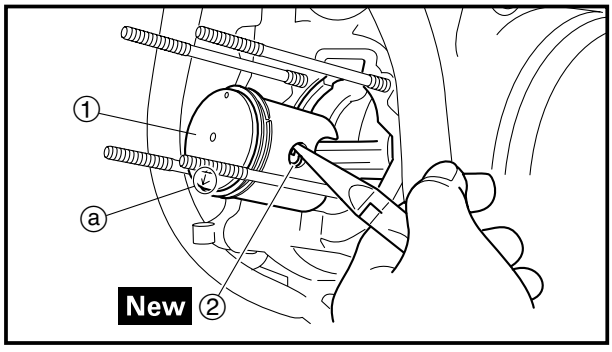
1. Lubricate:
- Connecting rod big end bearing
- Connecting rod small end bearing
  (with the recommended lubricant)

Recommended lubricant
Engine oil



2. Install:
   - Top ring ①
   - 2nd ring ②
     (with expander ring ③)

NOTE:
- Be sure to install the top ring and 2nd ring so that the manufacturer's marks or numbers face up.
- Align the piston ring gap with the pin ④.
- After installing the piston ring, check the smooth movement of it.



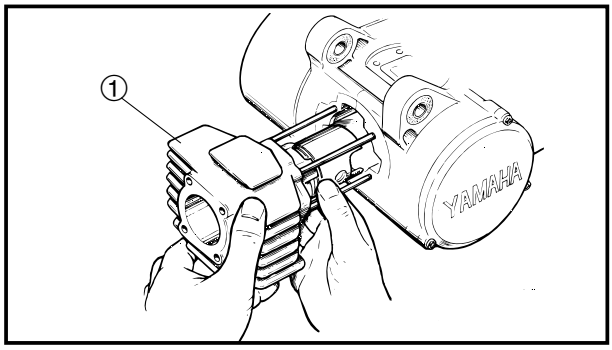
3. Install:
   - Piston ①
   - Piston pin
   - Piston pin clips ② **New**

NOTE:
- Apply engine oil the piston pin.
- Make sure the arrow mark ⓐ on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.

INSTALLING THE CYLINDER AND CYLINDER HEAD

1. Install:
   - Gasket **New**
2. Lubricate:
   - Piston
   - Piston rings
   - Cylinder wall
     (with the recommended lubricant)

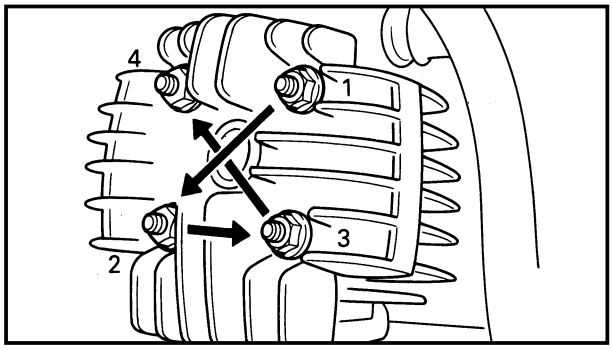
	Recommended lubricant **Engine oil**



3. Install:
   - Cylinder ①

NOTE:
While compressing the piston rings with one hand, install the cylinder with the other hand.

   - Gasket **New**
   - Cylinder head



4. Tighten:
   - Cylinder head nut

10 Nm (1.0 m•kg, 7.2 ft•lb)

NOTE:
Tighten the cylinder head nut 2 stages and in a crisscross pattern.

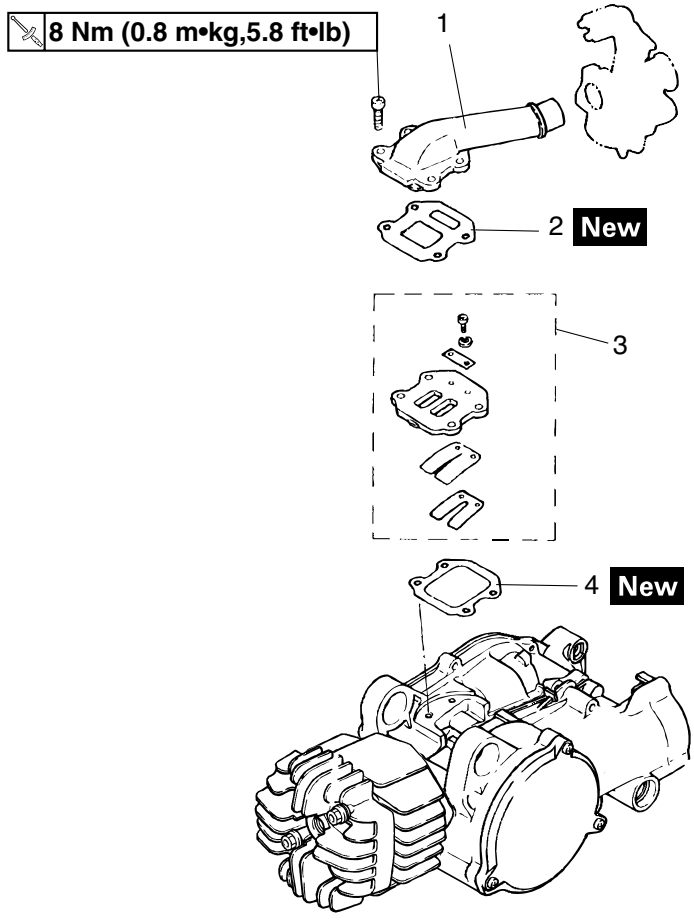
5. Install:
   - Spark plug
6. Tighten:
   - Spark plug

20 Nm (2.0 m•kg, 14 ft•lb)

7. Install:
   - Spark plug cap
   - Exhaust chamber assembly

9 Nm (0.9 m•kg, 6.5 ft•lb)

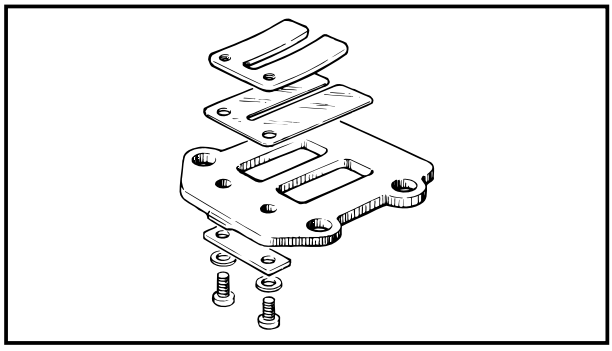
REED VALVE



Order	Job/Part	Q´ty	Remarks
	Removing the reed valve		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
	Engine		Refer to “ENGINE REMOVAL”.
1	Intake manifold	1	
2	Upper valve seat gasket	1	
3	Reed valve assembly	1	
4	Lower valve seat gasket	1	
			For installation, reverse the removal procedure.

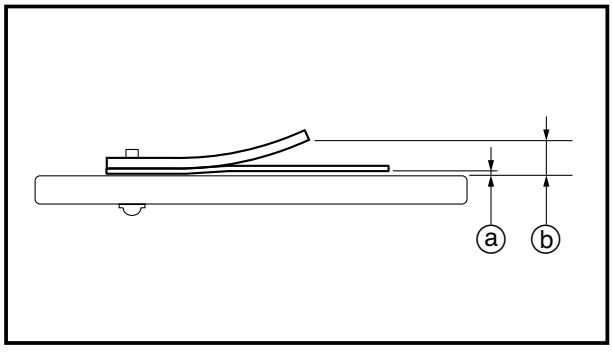
REMOVING THE REED VALVE

1. Remove:
   - Air filter case assembly
   - Carburetor assembly
   Refer to “REMOVING THE ENGINE”
2. Remove:
   - Intake manifold
   - Upper valve seat gasket
   - Reed valve assembly
   - Lower valve seat gasket



CHECKING THE REED VALVE

1. Check:
   - Reed valve assembly
   Cracks/damage → Replace the reed valve assembly.



2. Check:
   - Reed valve bending ⓐ
   Out of specification → Replace the reed valve.

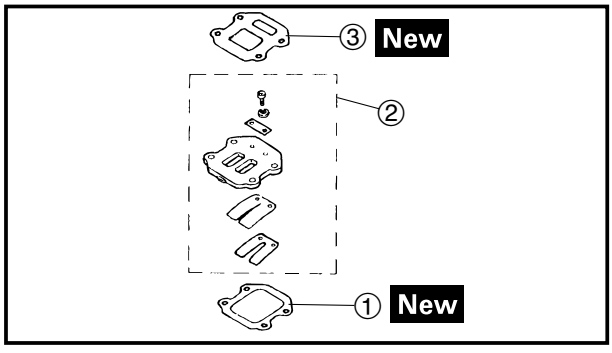
Reed valve bending limit
0.2 mm (0.01 in)

3. Check:
   - Valve stopper height ⓑ
   Out of specification → Replace the reed valve stopper.

Reed valve stopper height
4.6-5.0 mm (0.18-0.20 in)
Limit
7.4-7.8 mm (0.291-0.307 in)

ASSEMBLING AND INSTALLING THE REED VALVE

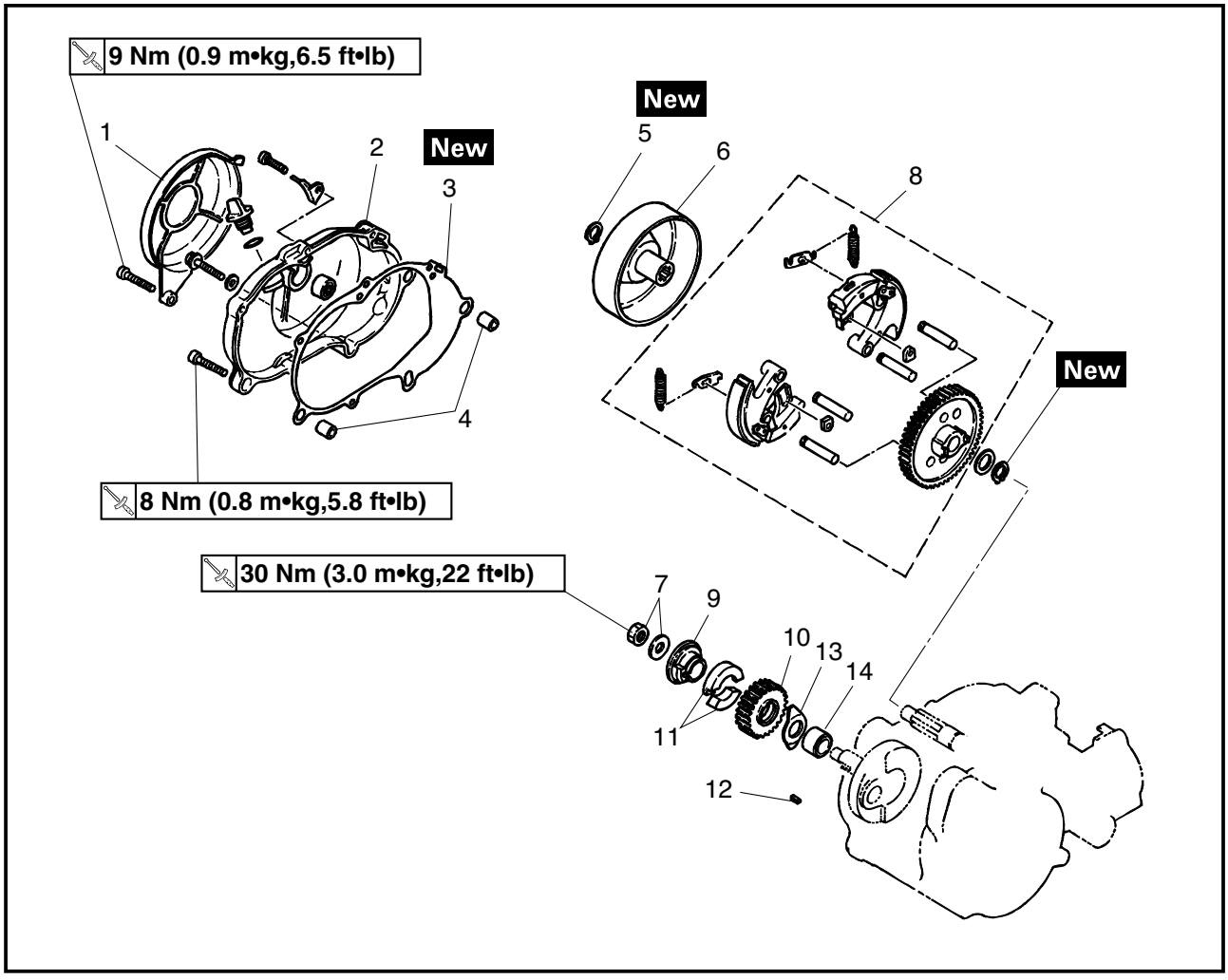
1. Install:
   - Reed valve
   - Reed valve stopper



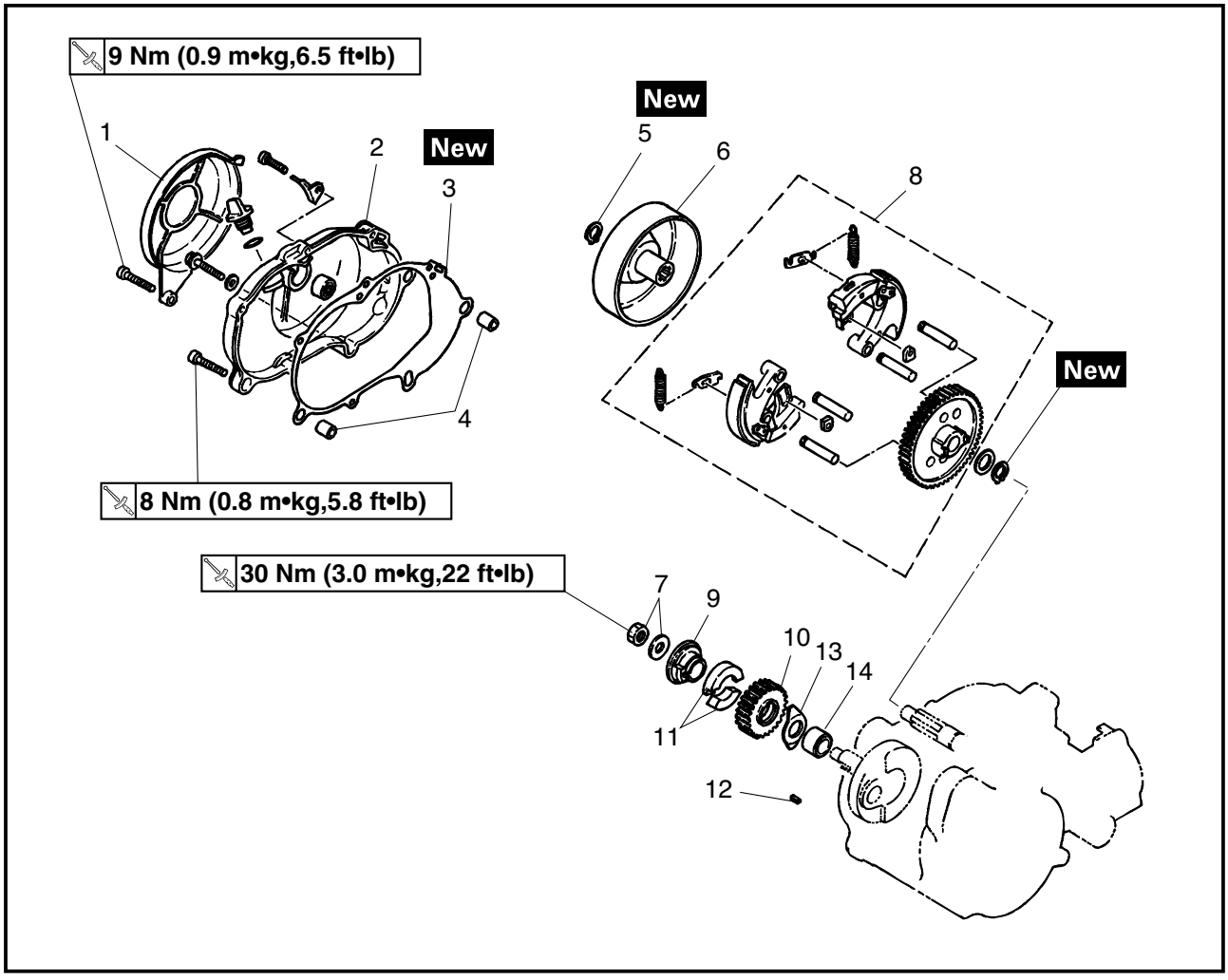
2. Install:
   - Lower valve seat gasket New ①
   - Reed valve assembly ②
   - Upper valve seat gasket New ③
   - Intake manifold

3. Install:
   - Carburetor assembly
   - Air filter case assembly
     Refer to “INSTALLING THE ENGINE”

CLUTCH



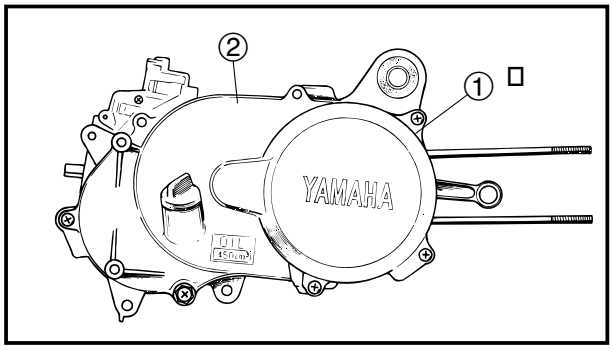
Order	Job/Part	Q´ty	Remarks
	Removing the clutch		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
	Engine		Refer to “ENGINE REMOVAL”.
1	Crankcase cover protector	1	
2	Right crankcase cover	1	
3	Gasket	1	
4	Dowel pin	2	
5	Circlip	1	
6	Clutch housing	1	
7	Primary drive gear nut/washer	1/1	
8	Clutch carrier assembly	1	
9	Spacer	1	
10	Primary drive gear	1	
11	Absorber (large)/absorber (small)	1/1	



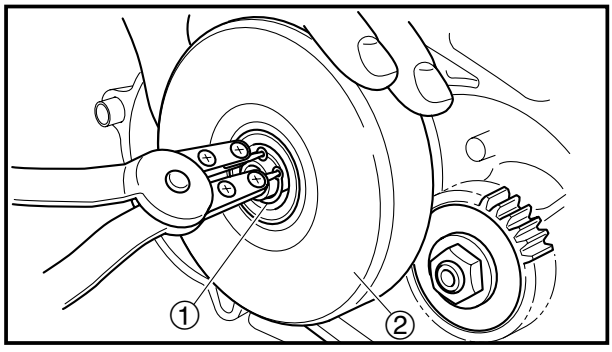
Order	Job/Part	Q´ty	Remarks
12	Straight key	1	
13	Thrust plate	1	
14	Coller	1	
			For installation, reverse the removal procedure.

REMOVING THE CLUTCH

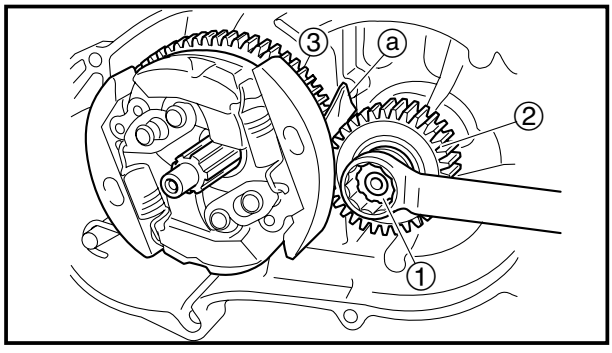
1. Remove:
   - Engine.
     Refer to “REMOVING THE ENGINE”.
2. Drain:
   - Transmission oil
     (from the crankcase)
     Refer to “CHANGING THE TRANSMISSION OIL” in chapter 3.



3. Remove:
   - Crankcase cover protector ①
   - Right crankcase cover ②
   - Gasket
   - Dowel pin



4. Remove:
   - Circlip ①
   - Clutch housing ②

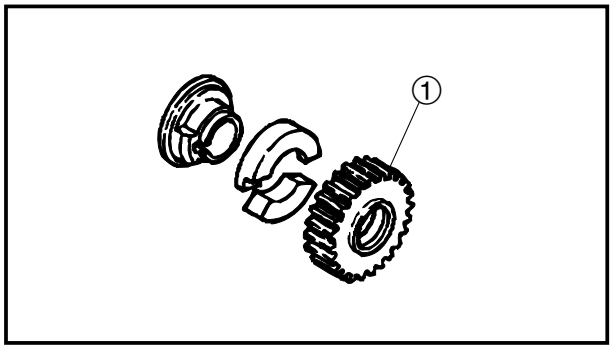


5. Remove:
   - Primary drive gear nut ①
   - Washer
   - Clutch carrier assembly

NOTE:

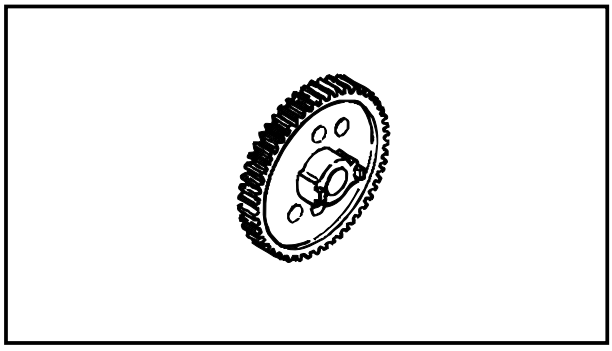
Place an aluminum plate ⓐ between the teeth of the primary drive gear ② and driven gear ③.

6. Remove:
   - Primary drive gear



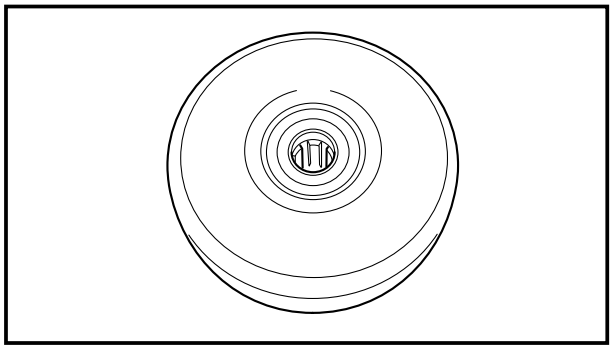
CHECKING THE PRIMARY DRIVE GEAR

1. Check:
   - Primary drive gear ①
     Damage/wear → Replace the primary drive and clutch carrier assembly.
     Excessive noise during operation → Replace the primary drive and clutch carrier assembly as a set.



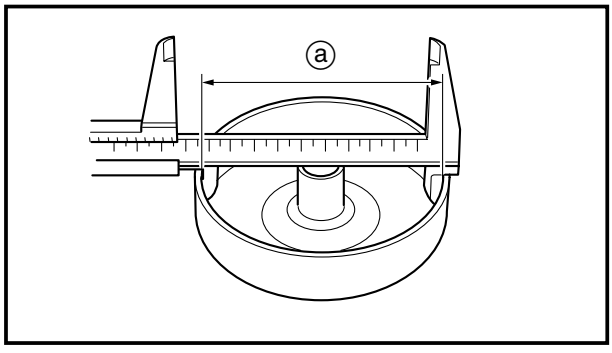
CHECKING THE PRIMARY DRIVEN GEAR

1. Check:
   - Primary driven gear
     Damage/wear → Replace the primary drive and clutch carrier assembly as a set.
     Excessive noise during operation → Replace the primary drive and clutch carrier assembly as a set.



CHECKING THE CLUTCH HOUSING

1. Check:
   - Clutch housing
     Damage/wear → Replace the clutch housing.



2. Measure:
   - Clutch housing inside diameter
     Out of specification → Replace the clutch housing.

Clutch housing inside diameter
105 mm (4.13 in)
Limit
106 mm (4.17 in)

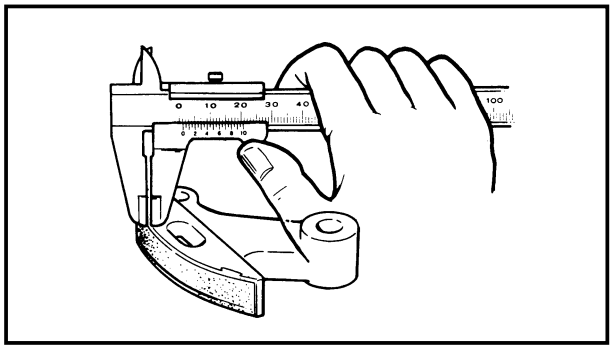
CHECKING THE CLUTCH SHOES

The following procedure applies to all of the clutch shoes.

1. Check:
   - Clutch shoe
     Damage/wear → Replace the clutch shoes and springs as a set.
     Glazed areas → Sand with course sandpaper.

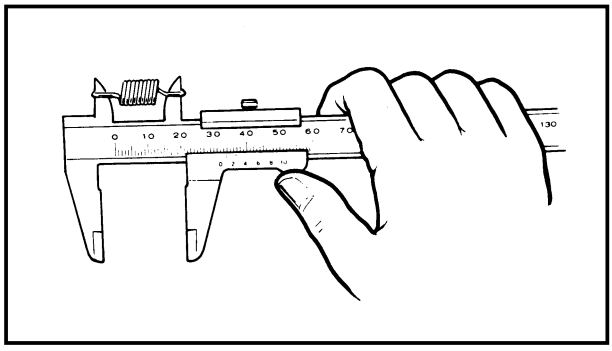
NOTE:

- After sanding the glazed areas, clean the clutch with a cloth.
- Do not apply the grease or oil on the clutch shoes.



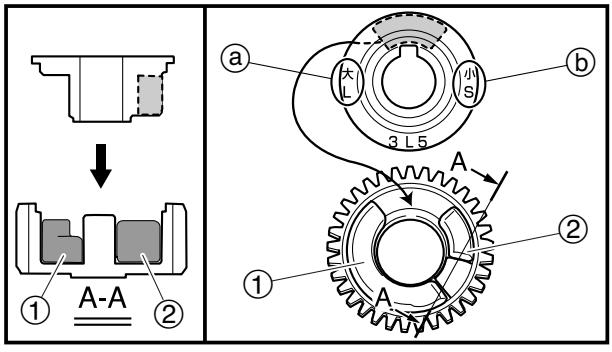
2. Measure:
- Clutch shoe thickness
  Out of specification → Replace the clutch shoes and springs as a set.

Clutch shoe thickness
1.0 mm (0.04 in)
Wear limit
0.7 mm (0.03 in)



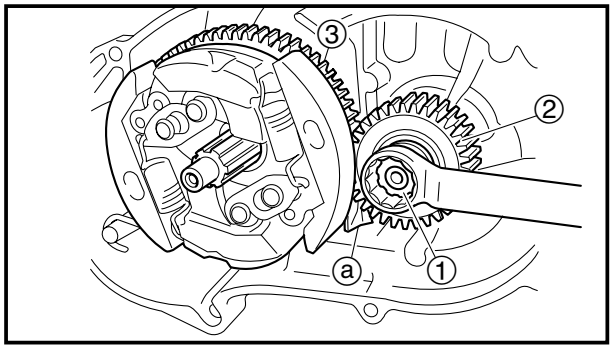
3. Measure:
- Clutch shoe spring free length
  Out of specification → Replace the clutch shoes and springs as a set.

Clutch shoe spring free length
34.5 mm (1.36 in)
Wear limit
35.5 mm (1.40 in)



INSTALLING THE CLUTCH
1. Install:
- Absorber (large) ①
- Absorber (small) ②

NOTE:
Install the absorber (large) to “L” side ⓐ and install the absorber (small) to “S” side ⓑ.

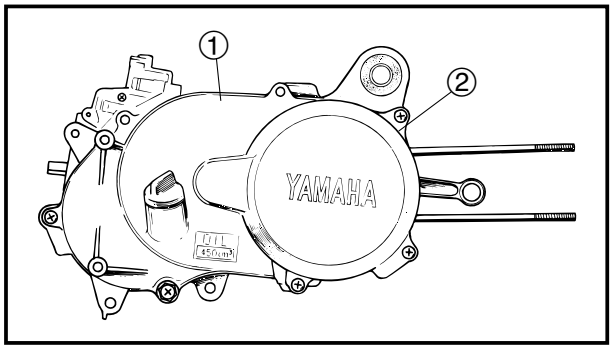


2. Install:
- Primary drive gear
- Clutch carrier assembly
- Clutch housing
- Circlip **New**
  (to the clutch carrier assembly)
3. Tighten:
- Primary drive gear nut ①

30 Nm (3.0 m•kg, 22 ft•lb)

NOTE:
Place an aluminum plate ⓐ between the teeth of the primary drive gear ② and driven gear ③.

4. Install:
- Dowel pin
- Gasket **New**



5. Install:
   - Right crank case cover ①

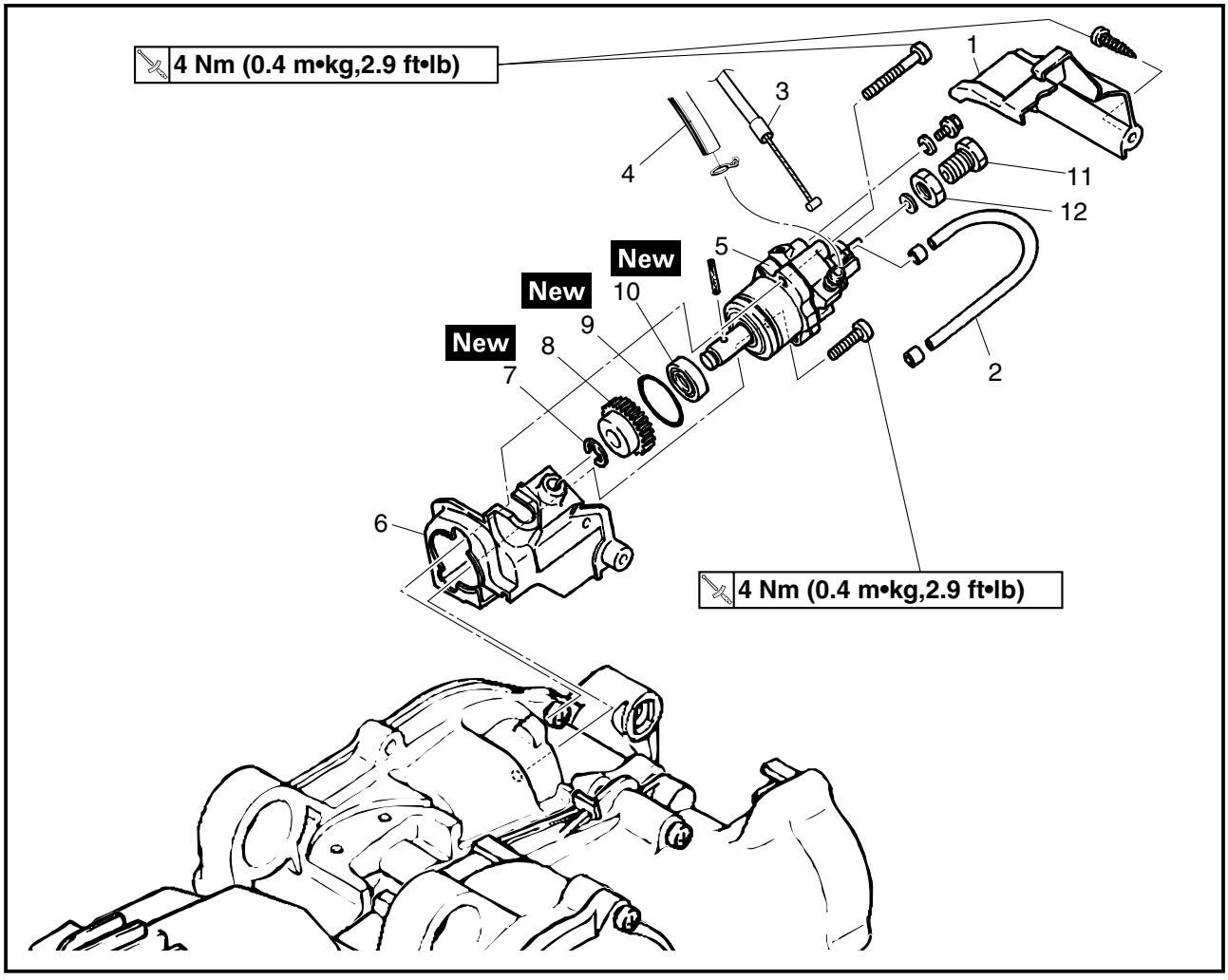
     8 Nm (0.8 m•kg, 5.8 ft•lb)

   - Crankcase cover protector ②

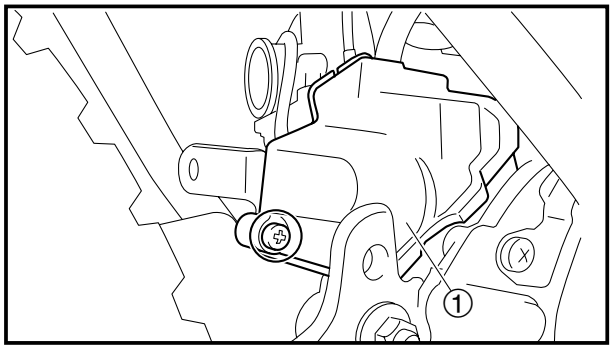
     9 Nm (0.9 m•kg, 6.5 ft•lb)

6. Fill:
   - Transmission oil
     Refer to “CHANGING THE TRANSMISSION OIL” in chapter 3.

AUTOLUBE PUMP

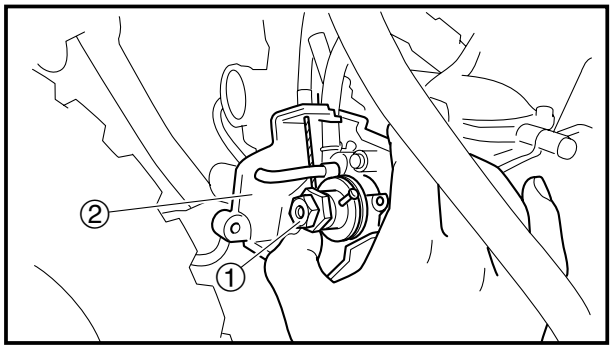


Order	Job/Part	Q´ty	Remarks
	Removing the autolube pump		Remove the parts in the order listed.
	Muffler/exhaust chamber assembly		Refer to “ENGINE REMOVAL”.
1	Autolube pump cover (outer)	1	
2	Oil delivery hose	1	
3	Autolube pump cable	1	
4	Oil hose	1	Be sure cap the oil hose by proper bolt to prevent the engine oil to spilt out.
5	Autolube pump assembly	1	
6	Autolube pump cover (inner)	1	
7	Circlip	1	
8	Worm wheel gear	1	
9	O-ring	1	
10	Oil seal	1	
11	Adjusting bolt	1	
12	Locknut	1	
			For installation, reverse the removal procedure.

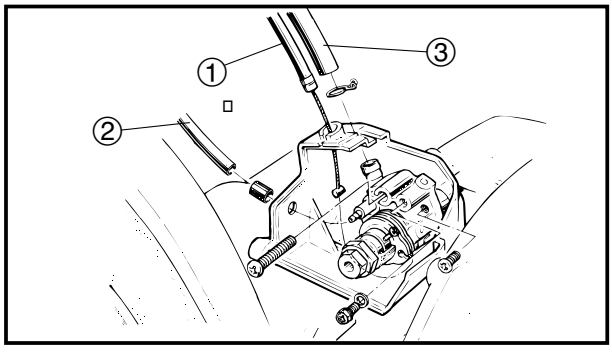


REMOVING THE AUTOLUBE PUMP

1. Remove:
   - Muffler assembly
   - Exhaust chamber assembly
     Refer to “ENGINE REMOVAL”.
   - Autolube pump cover (outer) ①



2. Remove:
   - Autolube pump assembly ①
     (with autolube pump cover (inner) ②)

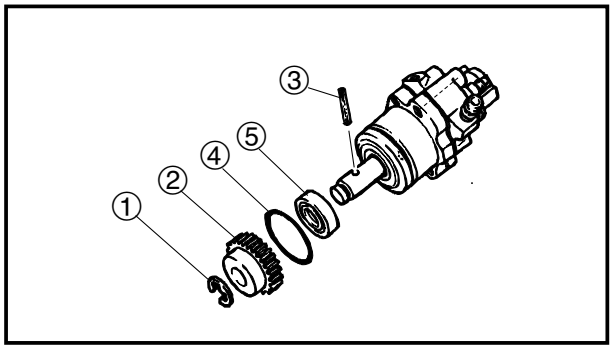


3. Remove:
   - Oil pump cable ①
   - Oil delivery hose ②
     (disconnect the autolube pump side)

4. Disconnect:
   - Oil hose ③
     (disconnect the autolube pump side)

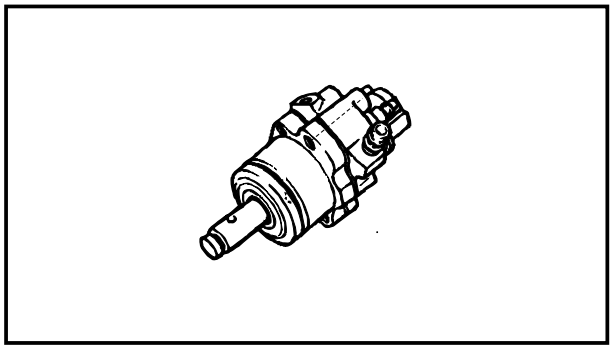
CAUTION:

Whenever disconnect the oil hose, be sure cap the oil hose by proper bolt to prevent the engine oil to spilt out.



DISASSEMBLING THE AUTOLUBE PUMP

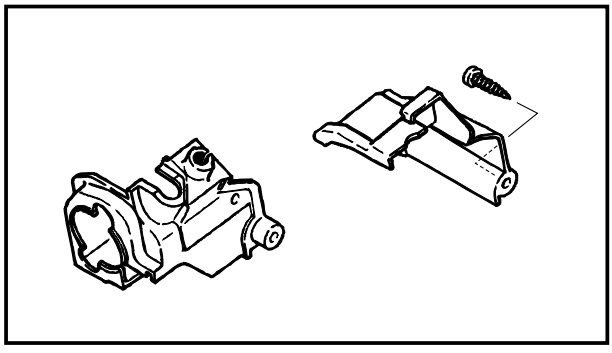
1. Remove:
   - Circlip ①
   - Worm wheel gear ②
   - Pin ③
   - O-ring ④
   - Oil seal ⑤



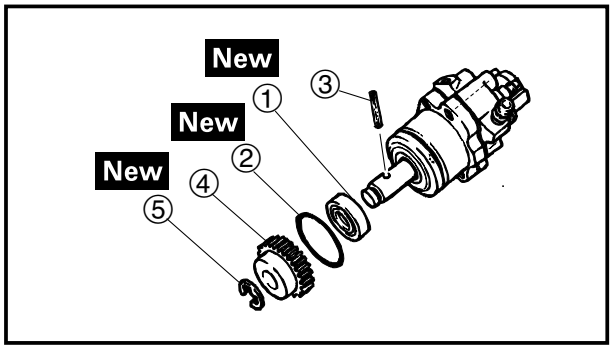
CHECKING THE AUTOLUBE PUMP

1. Check:
   - Autolube pump
     Damage/cracks → Replace the autolube pump assembly.

2. Check:
   - Worm wheel gear
     Worn/damage → Replace the oil pump drive gear.

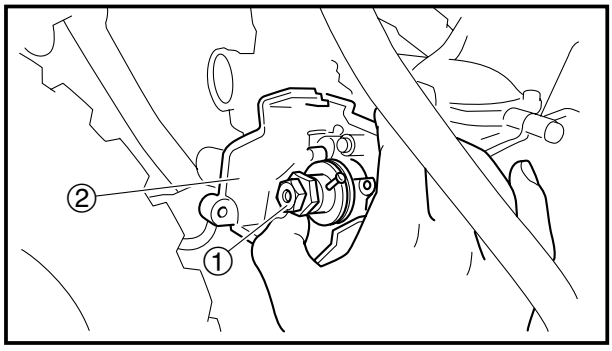


3. Check:
   - Autolube pump cover
     Damage/cracks → Replace the autolube pump cover.



ASSEMBLING THE AUTOLUBE PUMP

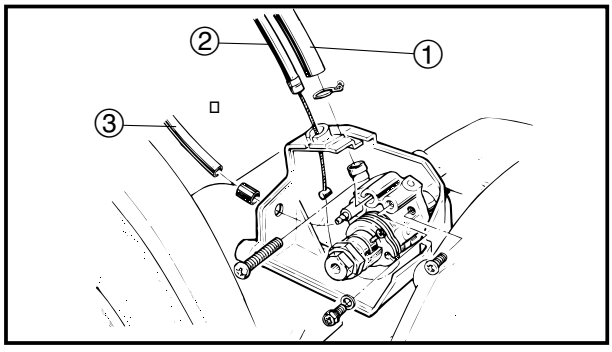
1. Install:
   - Oil seal ① **New**
   - O-ring ② **New**
   - Pin ③
   - Worm wheel gear ④
   - Circlip ⑤ **New**



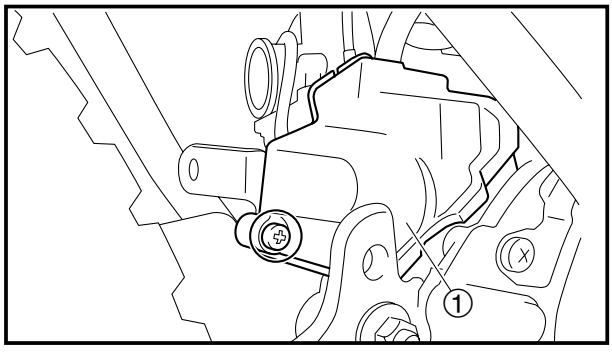
INSTALLING THE AUTOLUBE PUMP

1. Install:
   - Autolube pump assembly ①
     (with autolube pump cover (inner) ②)

4 Nm (0.4 m•kg, 2.9 ft•lb)



2. Connect:
   - Oil hose ①
3. Install:
   - Oil pump cable ②
   - Oil delivery hose ③



4. Install:
   - Autolube pump cover (outer) ①

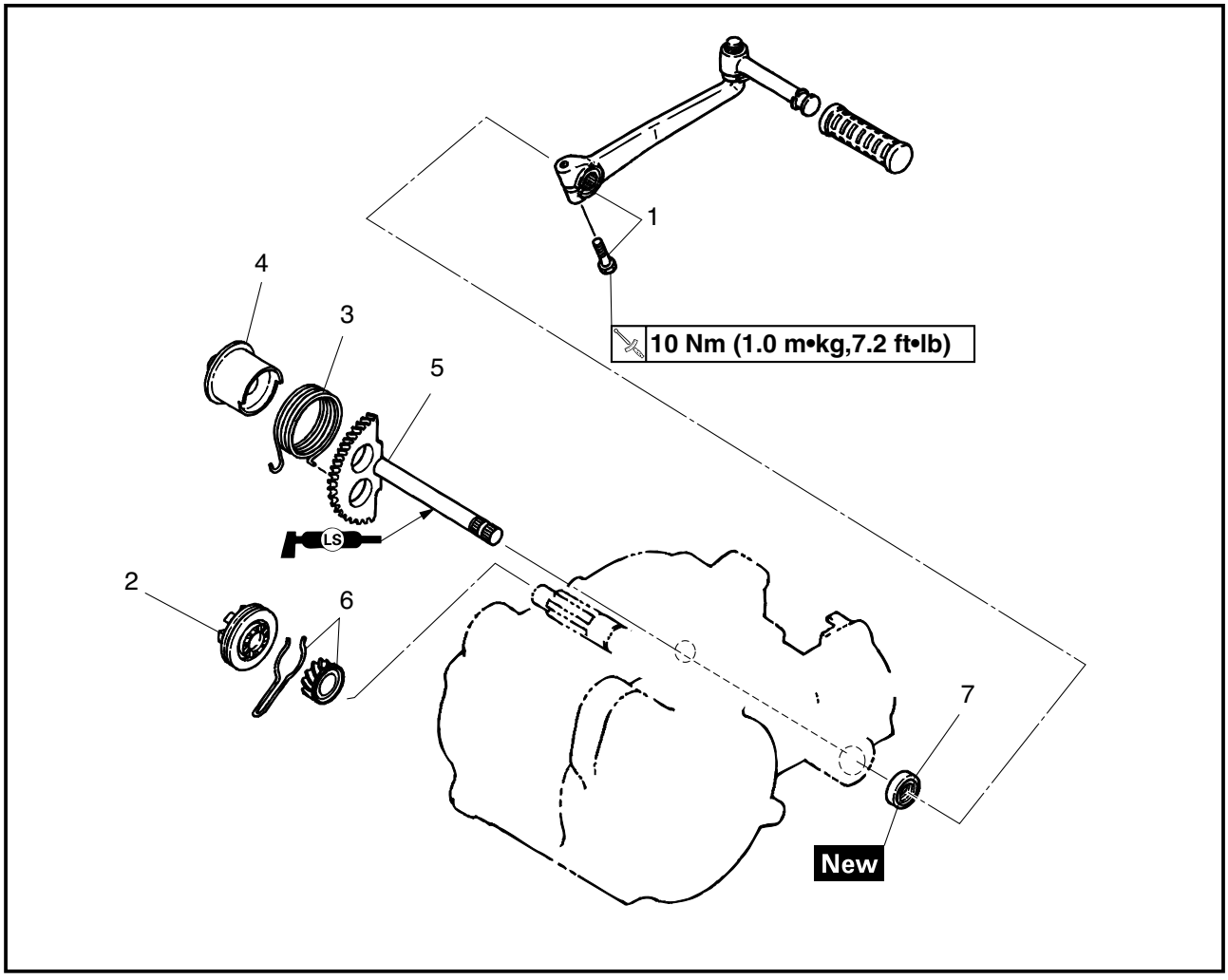
4 Nm (0.4 m•kg, 2.9 ft•lb)

5. Install:
   - Air cleaner case

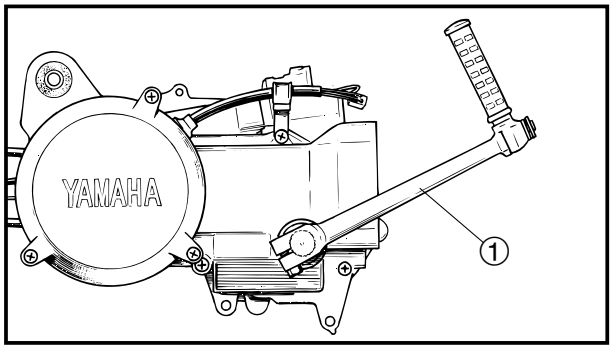
NOTE:

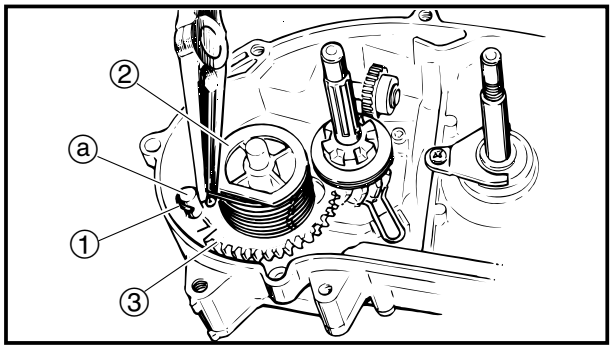
Whenever autolube pump disassembly and reassembly be sure to air bleed and pump strok the autolube pump. Refer to “AIR BLEEDING THE AUTOLUBE PUMP” and “ADJUSTING THE AUTOLUBE PUMP MINIMUM STROKE” in chapter 3.

KICK STARTER



Order	Job/Part	Q´ty	Remarks
	Removing the kick starter		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
	Engine		Refer to “ENGINE REMOVAL”.
	Clutch		Refer to “CLUTCH”.
1	Kick crank/bolt	1/1	
2	Pump drive gear	1	
3	Torsion spring	1	
4	Spring guide	1	
5	Kick shaft	1	
6	Kick pinion gear/clip	1/1	
7	Oil seal	1	
			For installation, reverse the removal procedure.





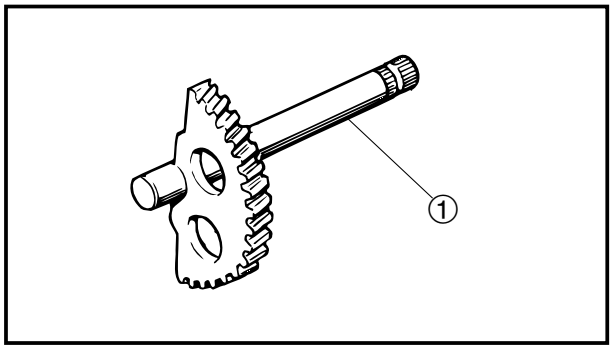
REMOVING THE KICK STARTER

1. Remove
   - Engine
     Refer to “REMOVING THE ENGINE”.
2. Remove:
   - Clutch assembly.
     Refer to “REMOVING THE CLUTCH”.
3. Remove:
   - Oil pump drive gear
4. Remove:
   - Kick crank ①
5. Remove:
   - Torsion spring ①
   - Spring guide ②
   - Kick shaft ③

NOTE:

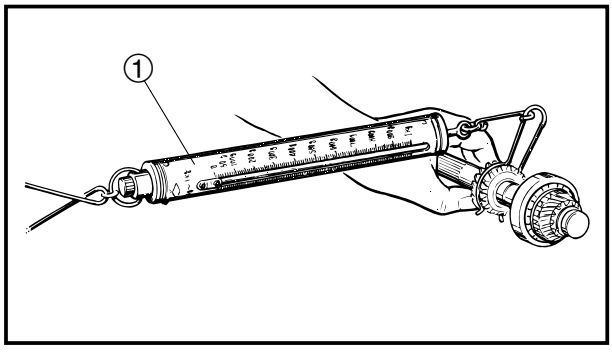
Unhook the torsion spring ① from the stopper ⓐ in the crankcase.

6. Remove:
   - Kick pinion gear
   - Clip



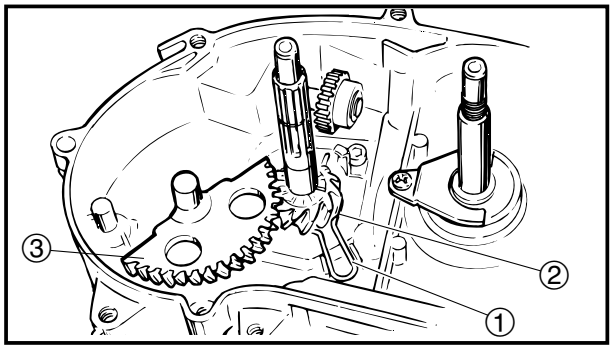
CHECKING THE KICK STARTER

1. Check:
   - Kick shaft ①
     Bend/damage → Replace the kick shaft.
   - Kick gear tooth
   - Kick pinion gear tooth
     Worn/crack → Replace the kick shaft or kick pinion gear



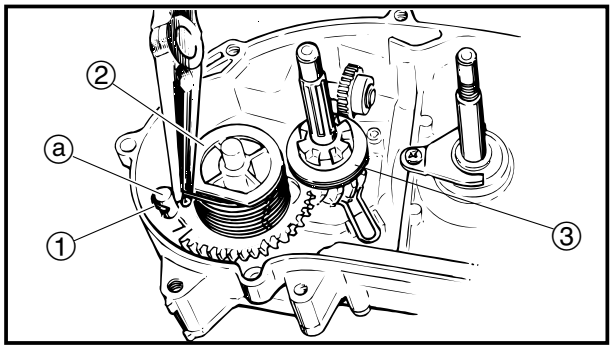
2. Measure:
   - Kick gear clip friction force
     Out of specification → Replace the kick gear clip.
     Use a spring gauge ①.

Kick gear clip friction force
1-5 N (0.34-1.33 lbf) (0.15-0.40 kgf)



INSTALLING THE KICK STARTER

1. Install:
   - Clip ①
   - Kick pinion gear ②
   - Kick shaft ③



2. Install:
   - Torsion spring ①
   - Spring guide ②

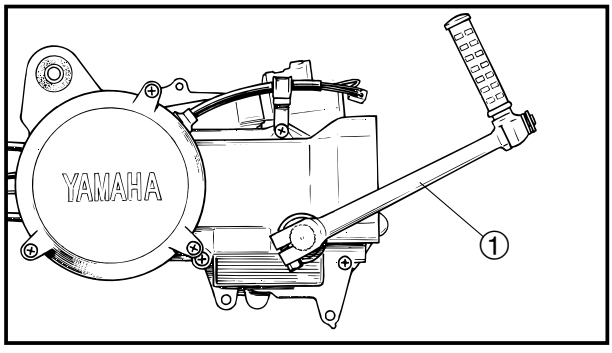
NOTE:

Turn the torsion spring clockwise and hook onto the stopper ⓐ in the crankcase.

3. Install:
   - Oil pump drive gear ③

NOTE:

Align the oil pump drive gear tooth with oil pump drive gear tooth, and then install it.

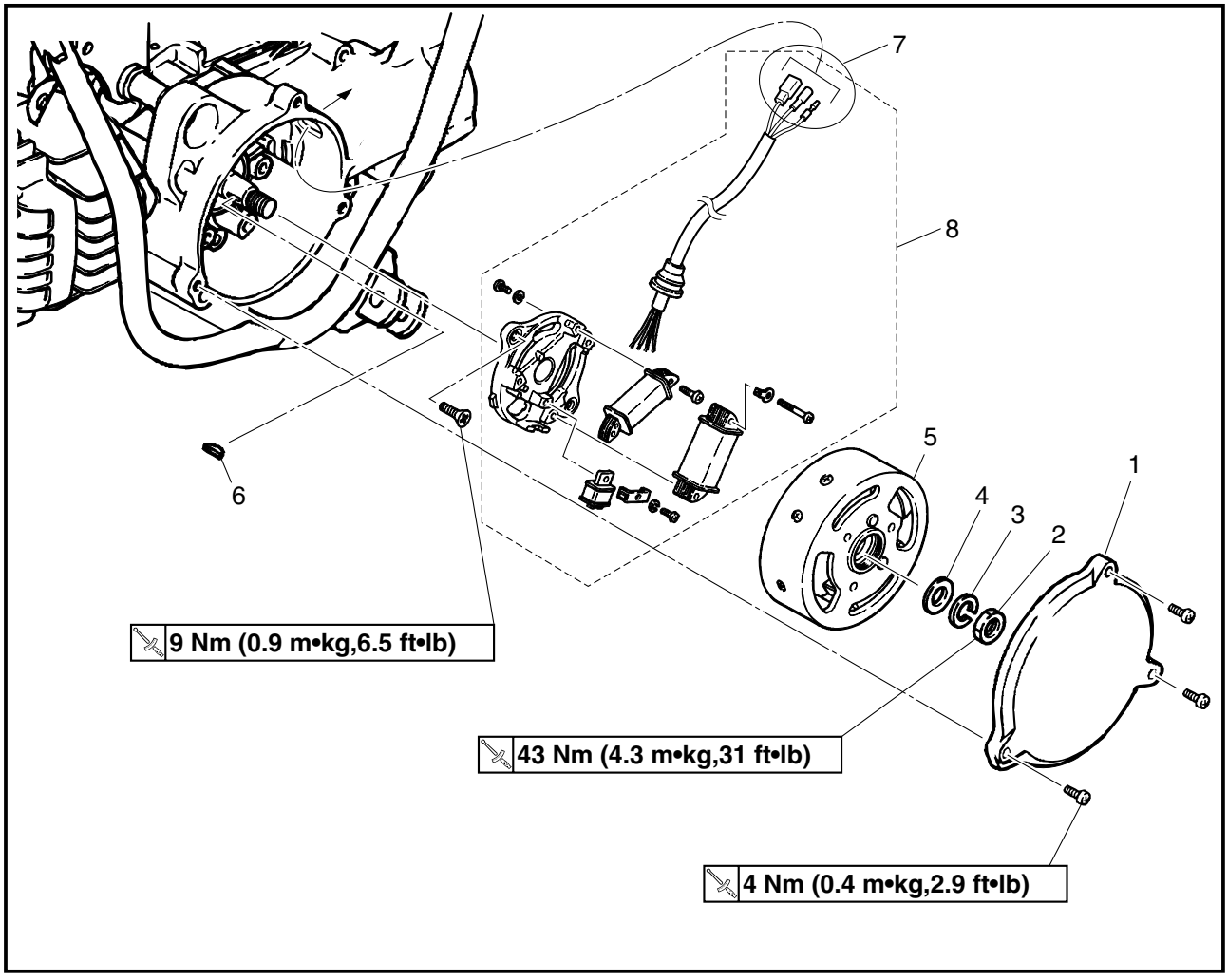


4. Install:
   - Kick crank ①
5. Tighten:
   - Kick crank bolt

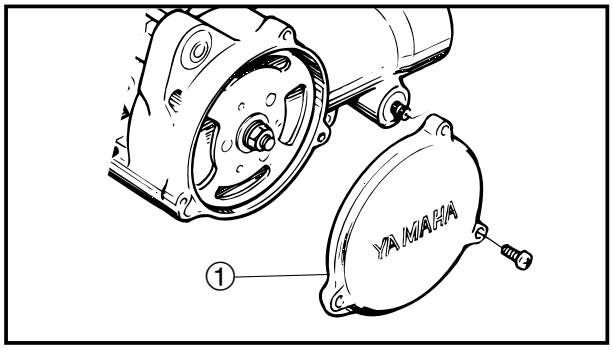
10 Nm (1.0 m·kg, 7.2 ft·lb)

6. Install:
   - Clutch assembly
     Refer to “INSTALLING THE CLUTCH”
7. Install:
   - Engine
     Refer to “INSTALLING THE ENGINE”

CDI MAGNETO

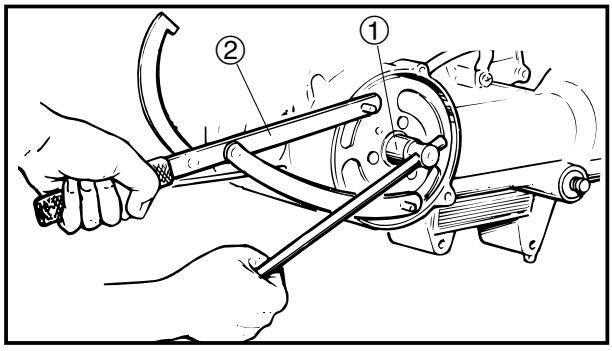


Order	Job/Part	Q´ty	Remarks
	Removing the CDI magneto		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
1	Magneto cover	1	
2	Rotor nut	1	
3	Spring washer	1	
4	Washer	1	
5	CDI magneto rotor	1	
6	Woodruff key	1	
7	CDI magneto coupler/connecter	1/2	
8	Stator assembly	1	
			For installation, reverse the removal procedure.



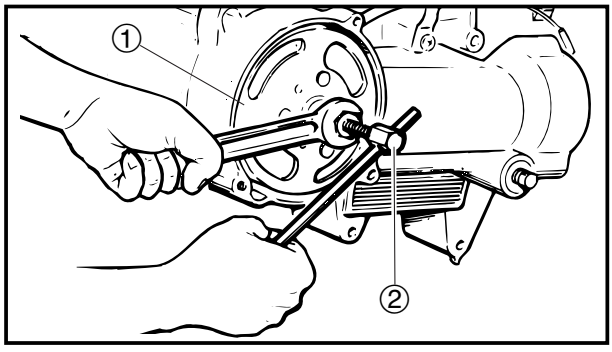
REMOVING THE CDI MAGNETO

1. Remove:
   - Magneto cover ①



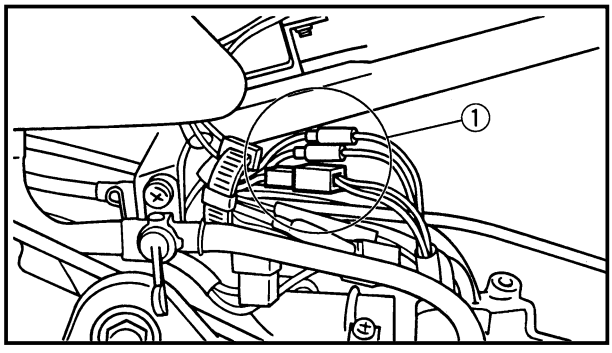
2. Loosen:
   - Rotor nut ①
     Use with the rotor holding tool ②.

	Rotor holding tool **90890-01235, YU-01235**

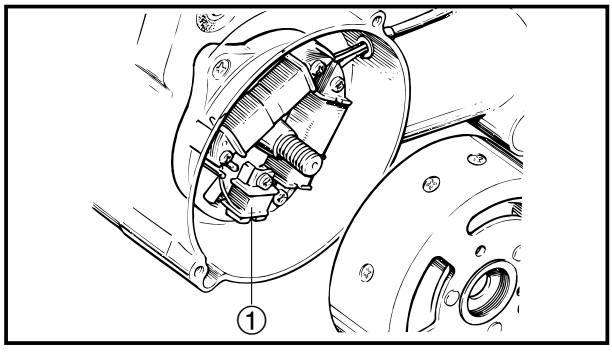


3. Remove:
   - Rotor nut
   - Spring washer
   - Washer
   - CDI magneto rotor ①
     Use with the flywheel puller ②.
   - Woodruff key

	Flywheel puller **90890-01189, YU-01189**



4. Disconnect:
   - CDI magneto lead coupler/connector ①



5. Remove:
   - Stator assembly ①

CHECKING THE CDI MAGNETO

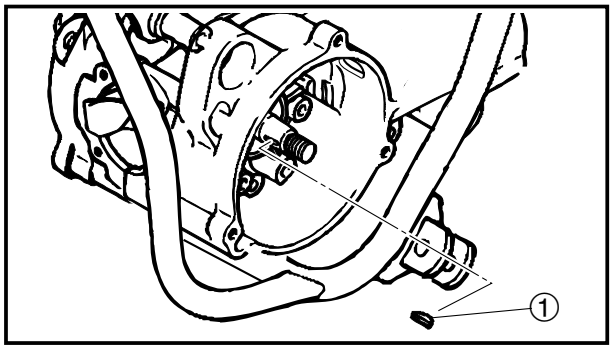
1. Check:
   - Magneto rotor inner surface
   - Stator outer surface
   Damage → Check the crankshaft runout and crankshaft bearing.
   If necessary, replace CDI magneto and/or stator.

2. Check:
   - Woodruff key
   Damage → Replace the woodruff key.

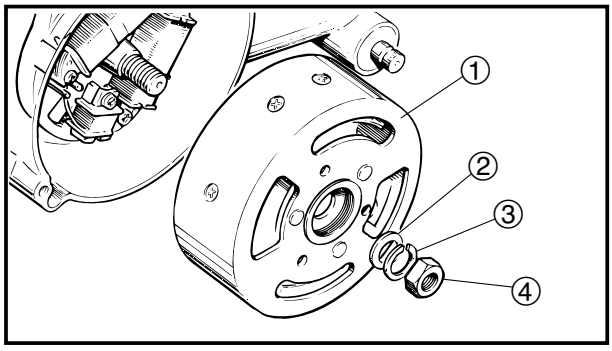
INSTALLING THE CDI MAGNETO

1. Install:
   - Stator assembly
2. Tighten:
   - Stator assembly screw

	9 Nm (0.9 m·kg, 6.5 ft·lb)



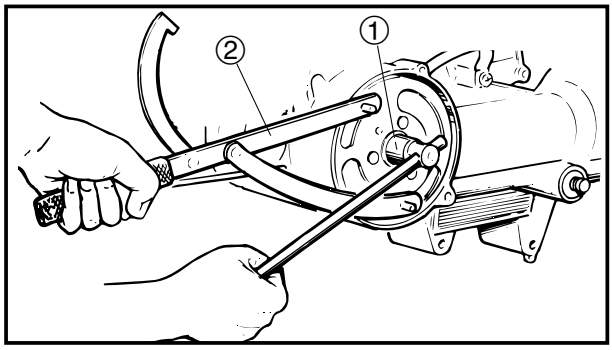
3. Install:
   - Wooruff key ①
   (to install the crankshaft key way)



4. Install:
   - CDI magneto rotor ①
   - Washer ②
   - Spring washer ③
   - Rotor nut ④

NOTE:

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



5. Tighten:
   - Rotor nut ①
     Use the rotor holding tool ②

43 Nm (4.3 m·kg, 31 ft·lb)

NOTE:
While holding the CDI magneto rotor with the rotor holding tool, tighten the rotor nut.

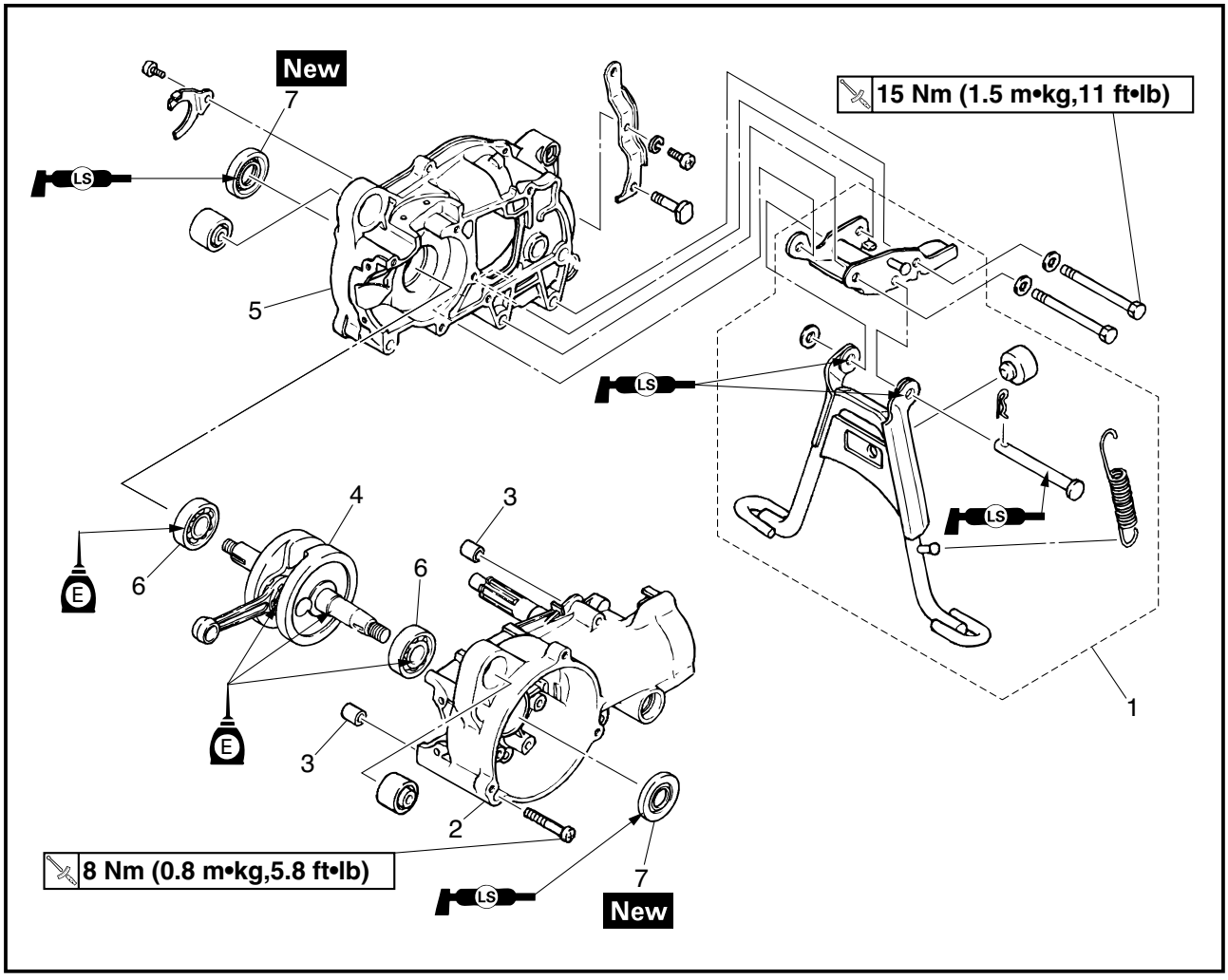
	Rotor holding tool **90890-01235, YU-01235**

6. Install:
   - Magneto cover

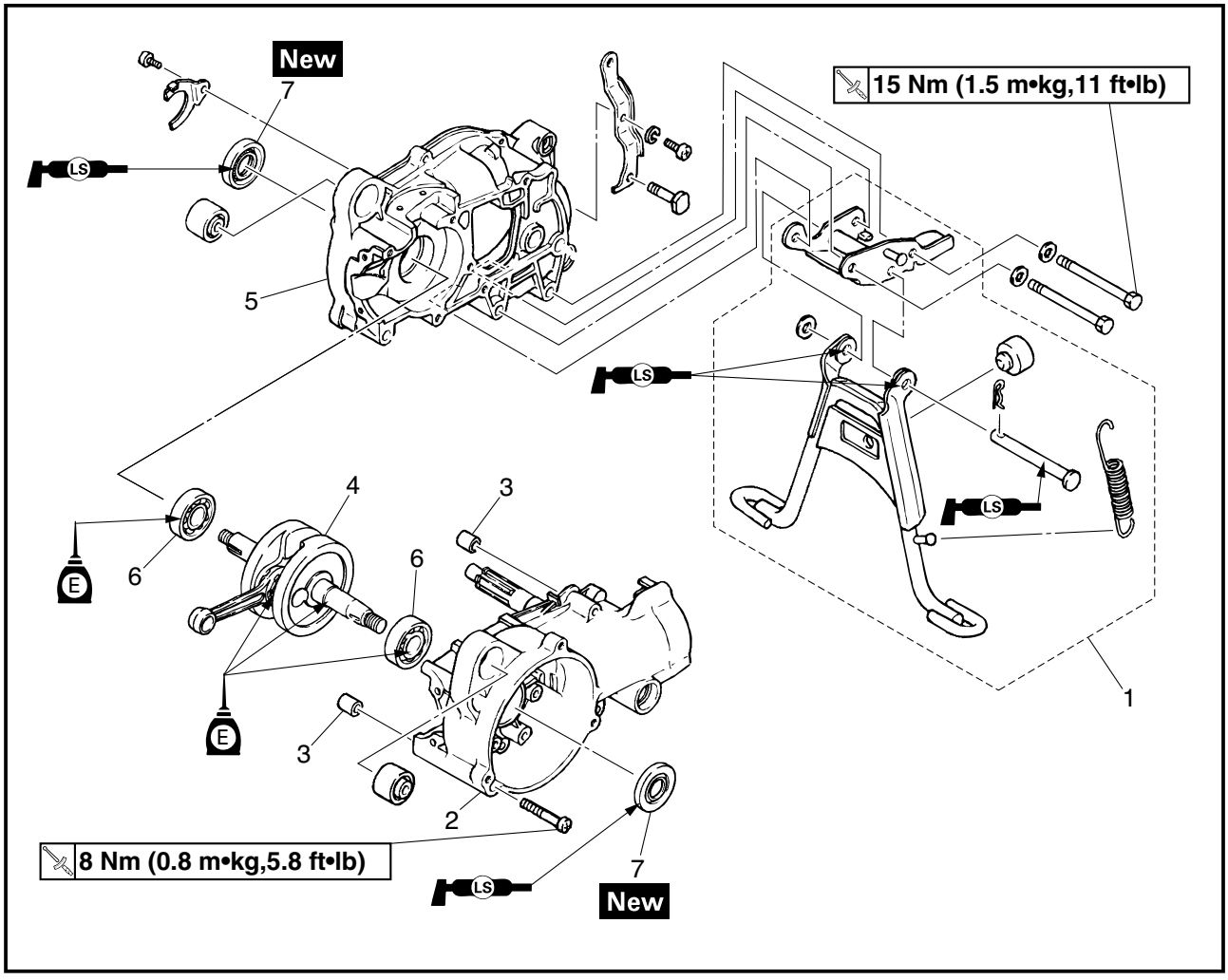
4 Nm (0.4 m·kg, 2.9 ft·lb)

7. Connect:
   - CDI magneto coupler/connecter

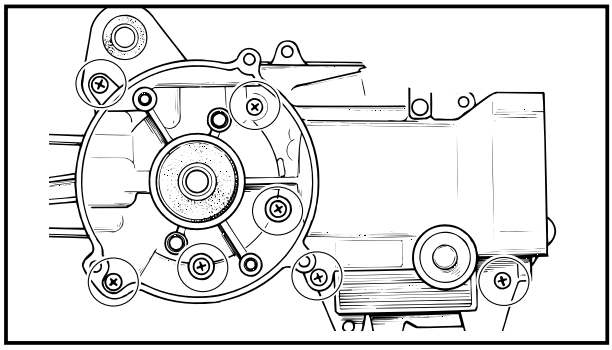
CRANKCASE AND CRANKSHAFT



Order	Job/Part	Q´ty	Remarks
	Separating the crankcase and removing the crankshaft		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
	Engine		Refer to “ENGINE REMOVAL”.
	Cylinder head/cylinder/piston		Refer to “CYLINDER HEAD, CYLINDER AND PISTON”.
	Reed valve		Refer to “REED VALVE”.
	Clutch		Refer to “CLUTCH”.
	Kick starter		Refer to “KICK STARTER”.
	CDI magneto		Refer to “CDI magneto”.
	Shaft drive		Refer to “SHAFT DRIVE” in chapter 4.
	Middle gear		Refer to “MIDDLE GEAR”.
1	Mainstand assembly	1	
2	Crankcase (left)	1	
3	Dowel pin	2	



Order	Job/Part	Q´ty	Remarks
4	Crankshaft assembly	1	
5	Crankcase (right)	1	
6	Bearing	2	
7	Oil seal	2	
			For installation, reverse the removal procedure.

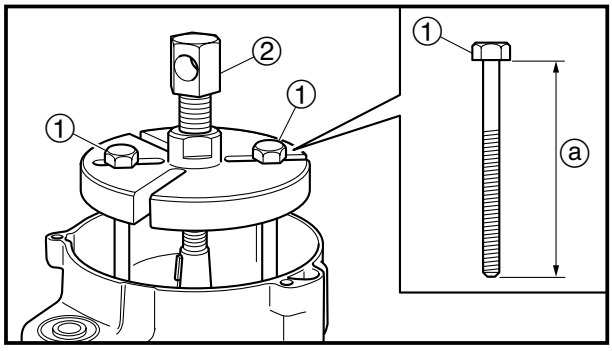


REMOVING THE CRANKCASE

1. Remove:
   - Crankcase screw

NOTE:

Loosen each screw 1/4 of a turn at a time, in stages and in a crisscross pattern. After all of the screw are fully loosened, remove them.



2. Separate:
   - Crankcase (left)

   Use the bolts (M8×1.25, length 95 mm (3.74 in)) ① and a flywheel puller ②.

	Flywheel puller **90890-01362, YU-33270**

ⓐ 95 mm (3.74 in)

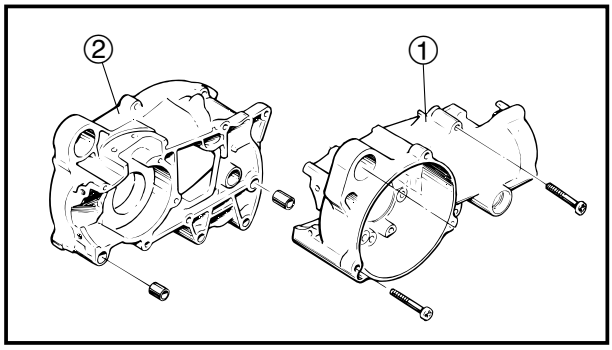
NOTE:

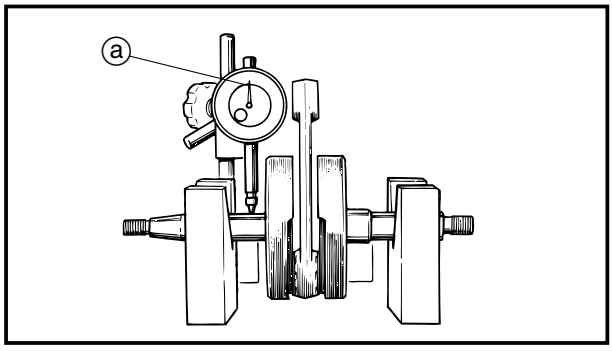
- Fully tighten the tool holding bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.
- As pressure is applied, alternately tap on the front engine mounting boss and transmission shafts.

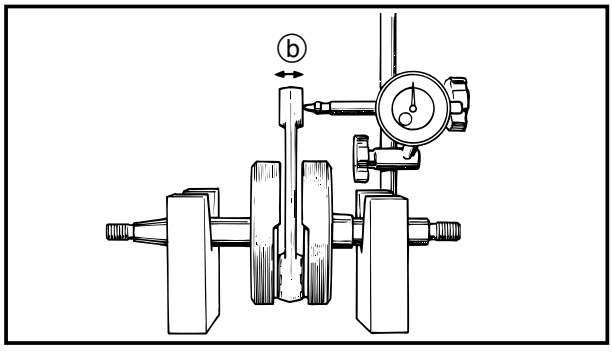
3. Remove:
   - Crankshaft

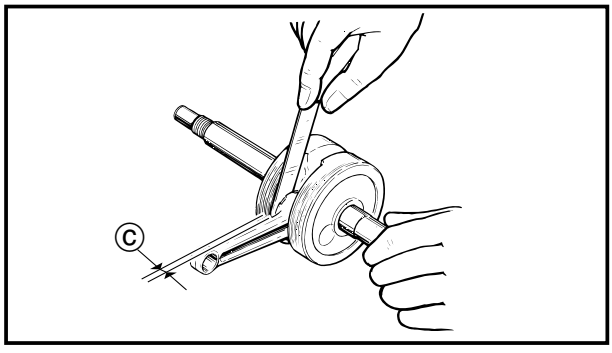
CHECKING THE CRANKCASE

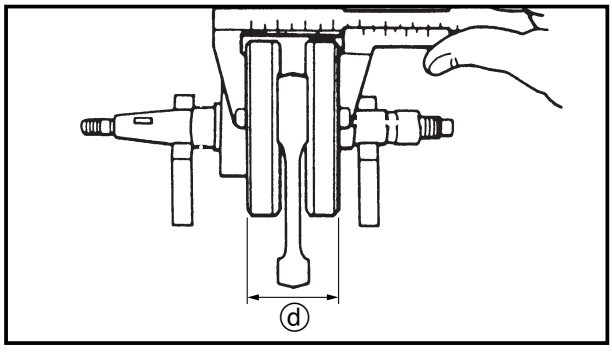
1. Thoroughly wash the crankcase halves in a mild solvent.
2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.











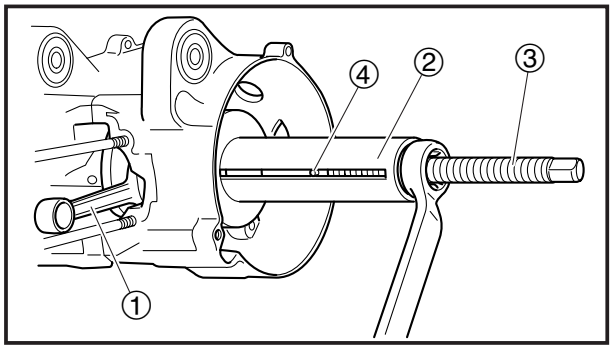
3. Check:
- Crankcase (left) ①
- Crankcase (right) ②
  Cracks/damage → Replace the crankcase.
4. Check:
- Bearing
  Unsmooth operation → Replace the bearing.

CHECKING THE CRANKSHAFT

1. Measure:
- Runout ⓐ
- Small end free play ⓑ
- Connecting rod big end side clearance ⓒ
- Crank width ⓓ
  Out of specification → Replace the crankshaft assembly.
  Use the dial gauge and thickness gauge.

	Dial gauge and stand **90890-01252**

	Runout **0.050 mm (0.0020 in)** **Small end free play** **0.40-0.80 mm (0.02-0.03 in)** **Connecting rod big end side clearance** **0.350-0.550 mm (0.0138-0.0217 in)** **Crank width** **37.90-37.95 mm (1.492-1.494 in)**



INSTALLING THE CRANKSHAFT

1. Install:
   - Crankshaft ①
     Use the crank installing tools ②, ③, ④.

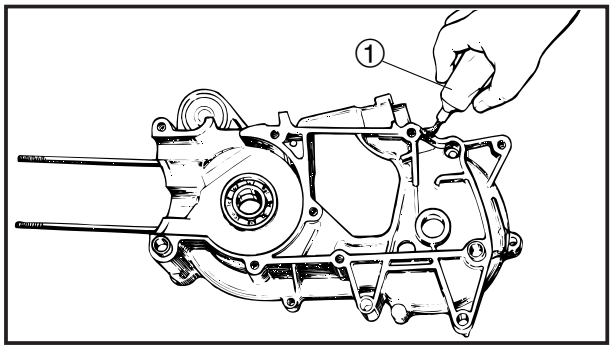
Crankshaft installing pot ②
90890-01274, YU-90058
Crankshaft installing bolt ③
90890-01275, YU-90060
Adapter (M12) ④
90890-001278, YU-090063

NOTE:

- Hold the connecting rod at top dead center with one hand while turning the nut of the installing tool with the other. Operate the installing tool until the crankshaft bottoms against the bearing.
- Before installing the crankshaft, clean the contacting surface of crankcase.
- Apply the lithium soap base grease on the oil seal lip.

CAUTION:

Do not use a hammer to drive in the crankshaft.



2. Apply:
   - Yamaha bond No. 1215 (Three Bond No. 1215®) ①
     (to the mating surfaces of both case halves)

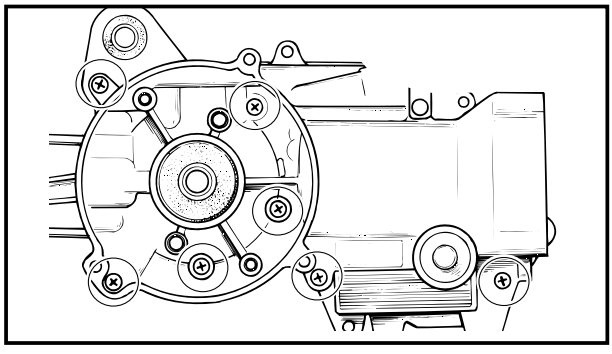
Yamaha bond No. 1215
(Three Bond No. 1215®)
90890-85505

NOTE:

Clean the contacting surface of left and right crankcase before applying the sealant.

3. Install:
   - Dowel pin
   - Right crankcase
     To the left crankcase.

NOTE:
- Fit the right crankcase onto the left crankcase. Tap lightly on the case with soft hammer.
- When installing the crankcase, the connecting rod should be positioned at TDC (top dead center).



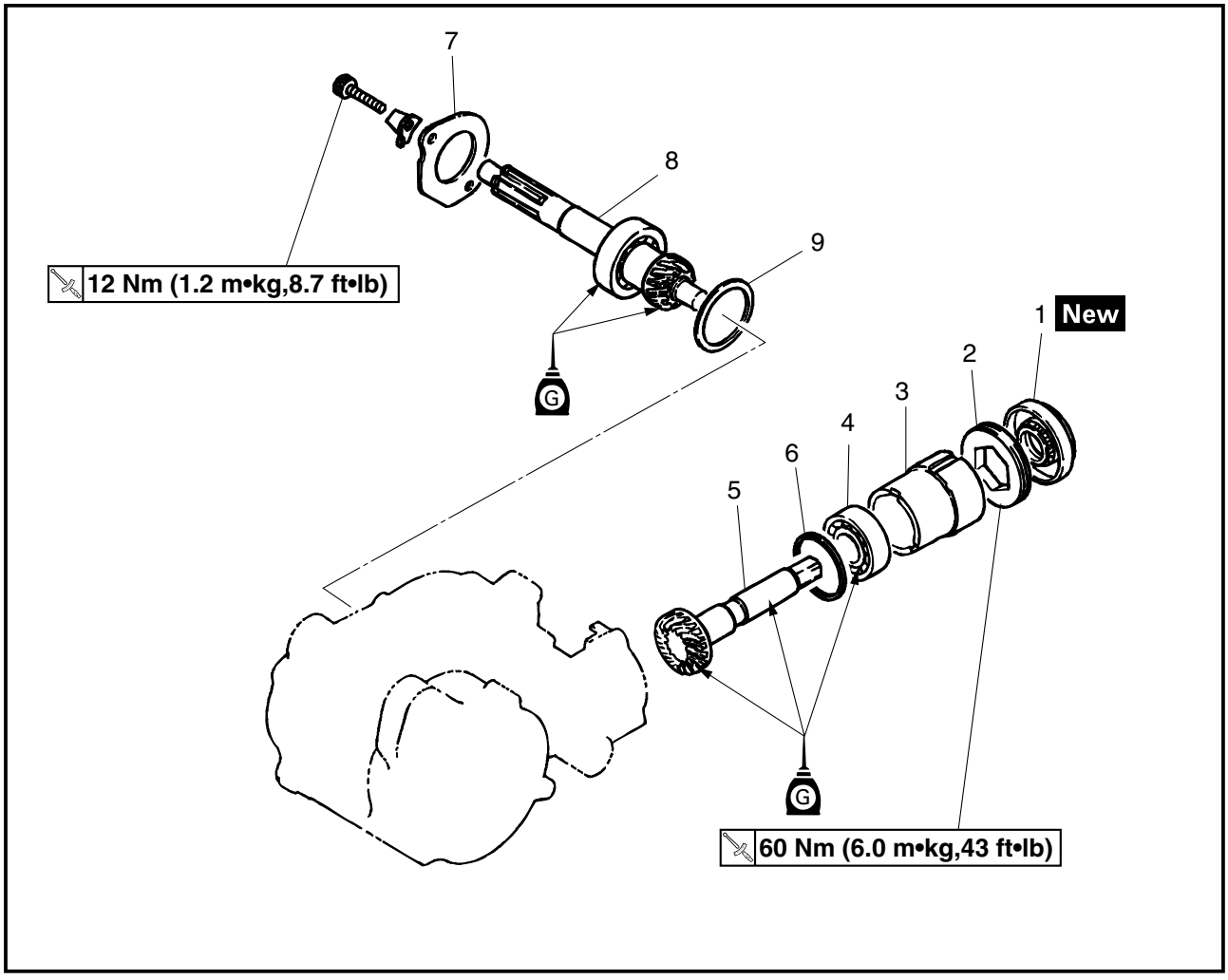
4. Tighten
   - Screw (crankcase)

8 Nm (0.8 m•kg, 5.8 ft•lb)

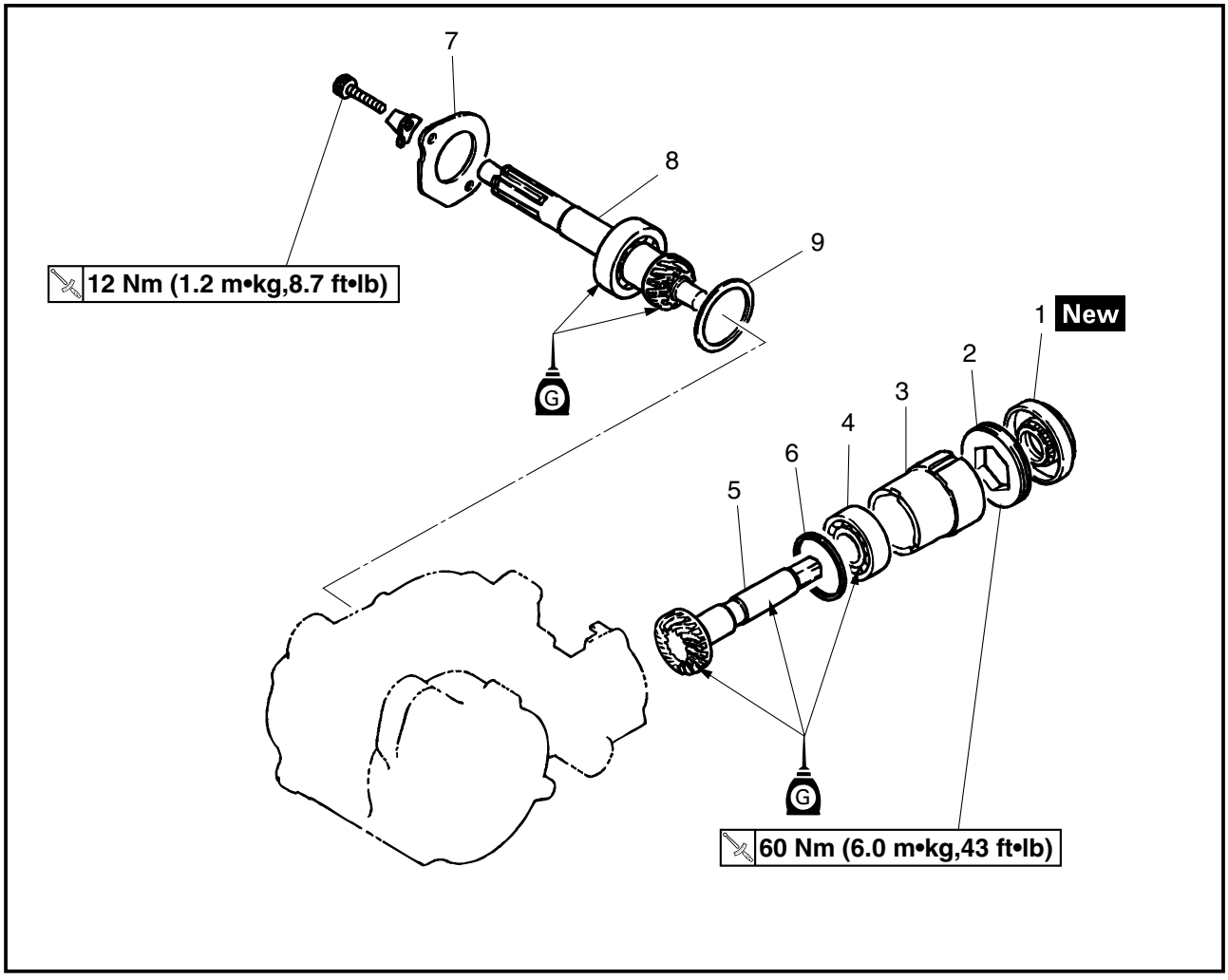
NOTE:
Tighten the crankcase tightening screws in stage, using a crisscross pattern.

5. Remove:
   - Sealant
     Forced out on the cylinder mating surface.
6. Apply:
   - Engine oil
     To the crank pin, bearing and connecting rod end washer.
7. Check:
   - Crankshaft and transmission operation
     Unsmooth operation → Repair.

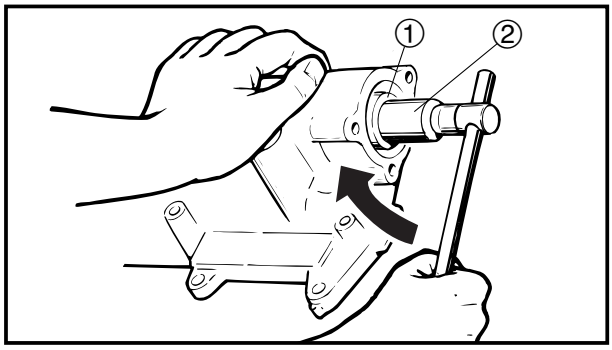
MIDDLE GEAR



Order	Job/Part	Q´ty	Remarks
	Removing the middle gear		Remove the parts in the order listed.
	Engine		Refer to “ENGINE REMOVAL”.
	Clutch		Refer to “CLUTCH”.
	Kick starter		Refer to “KICK STARTER”.
	Rear wheel		Refer to “FRONT WHEEL, REAR WHEEL AND BRAKE” in chapter 4.
	Shaft drive		Refer to “SHAFT DRIVE” in chapter 4.
1	Oil seal	1	
2	Screw	1	Left hand thread.
3	Distance coller	1	
4	Bearing	1	
5	Driven pinion	1	
6	Thrust shim	1	
7	Bearing retainer	1	



Order	Job/Part	Q´ty	Remarks
8	Main axle assembly	1	
9	Pinion shim	1	
			For installation, reverse the removal procedure.



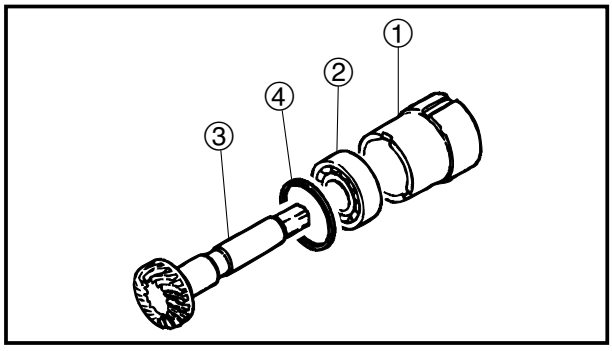
REMOVING THE MIDDLE DRIVE SHAFT ASSEMBLY

1. Remove:
   - Oil seal
   - Screw ①
     Attach the hexagon wrench ②.

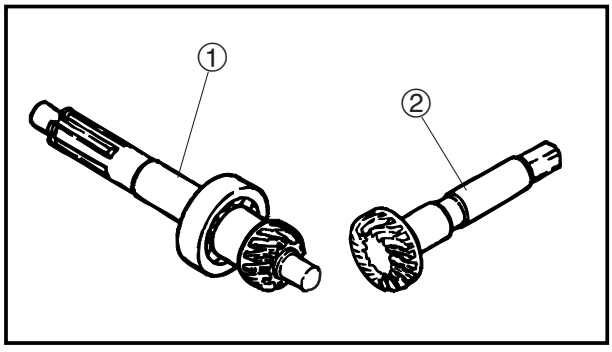
	Hexagon wrench **90890-01306, YM-01306**

NOTE:

Loosen the screw clockwise.

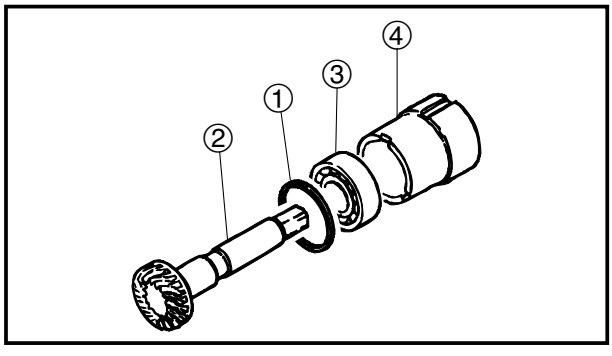


2. Remove:
   - Distance coller ①
   - Bearing ②
   - Driven pinion ③
   - Thrust shim ④



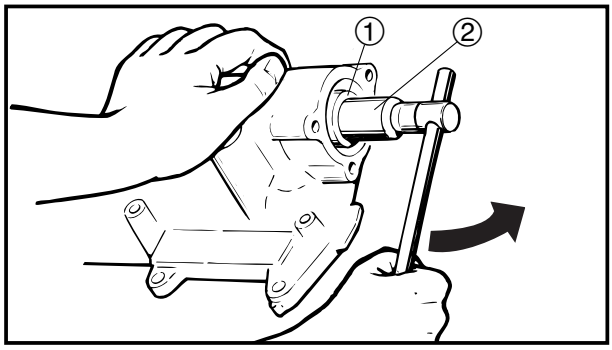
CHECKING THE MEDDLE GEAR

1. Check:
   - Main axle ①
     Galling/pitting/wear → Replace.
2. Check:
   - Driven pinion ②
     Galling/pitting/wear → Replace.
3. Check:
   - Bearing
     Damage/pitting → Replace.



INSTALLING THE MEDDLE GEAR

1. Install:
   - Thrust shim ①
   - Driven pinion ②
   - Bearing ③
   - Distance coller ④



2. Install:
   - Screw ①
     Attach the hexagon wrench ②.

60 Nm (6.0 m•kg, 43 ft•lb)

Hexagon wrench 90890-01306, YM-01306

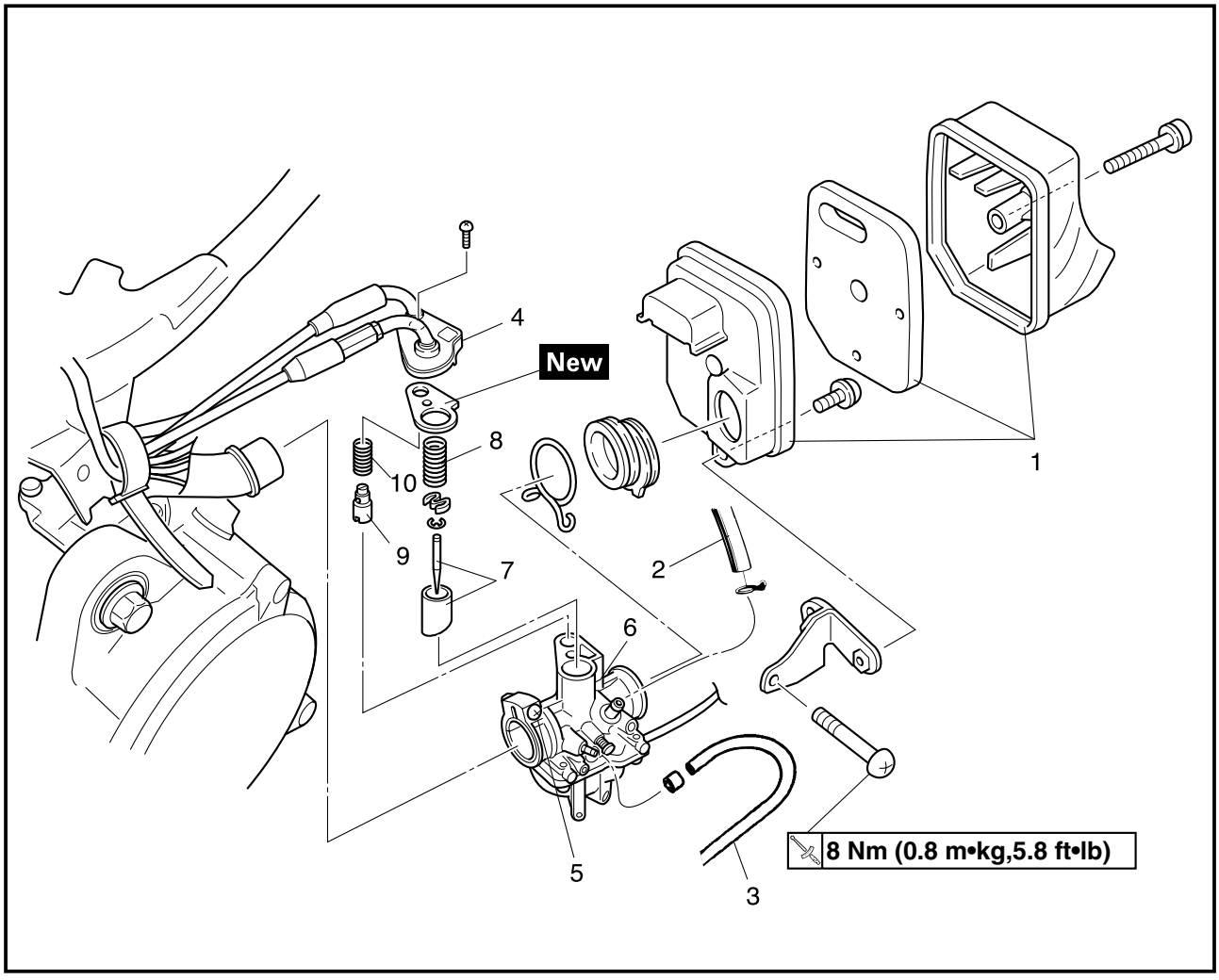
NOTE:
Tighten the screw counterclockwise.

3. Install:
   - Oil seal **New**

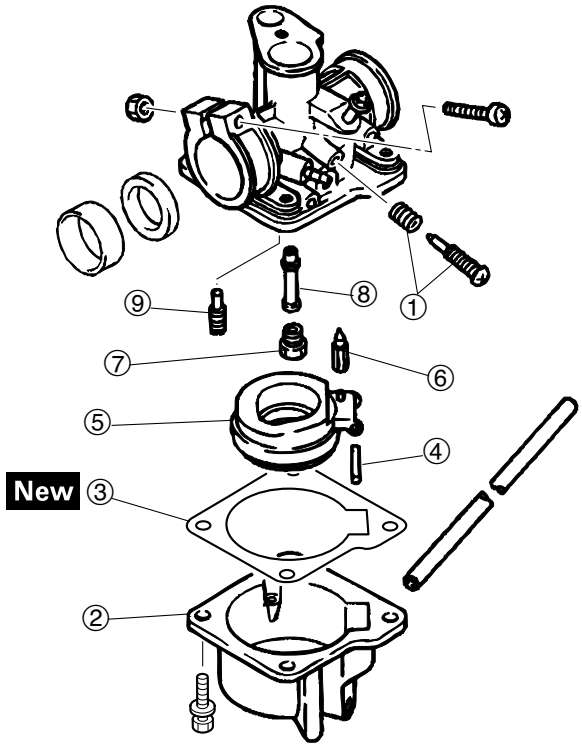
CHAPTER 6
CARBURETOR

CARBURETOR

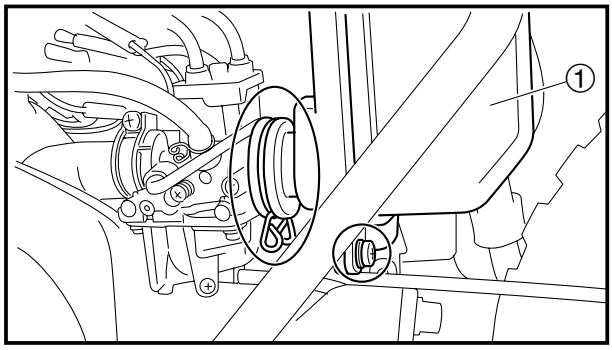
CARBURETOR



Order	Job/Part	Q´ty	Remarks
	Removing the carburetor		Remove the parts in the order listed.
	Side cover		Refer to “SIDE COVERS, SEAT AND FUEL TANK” in chapter 3.
1	Air filter assembly	1	
2	Fuel hose	1	Set the fuel cock to “S”.
3	Oil delivery hose	1	
4	Mixing chamber top	1	
5	Carburetor clamp screw	1	Loosen.
6	Carburetor assembly	1	
7	Throttle valve/needle set	1/1	
8	Throttle spring	1	
9	Starter plunger	1	
10	Plunger spring	1	
			For installation, reverse the removal procedure.

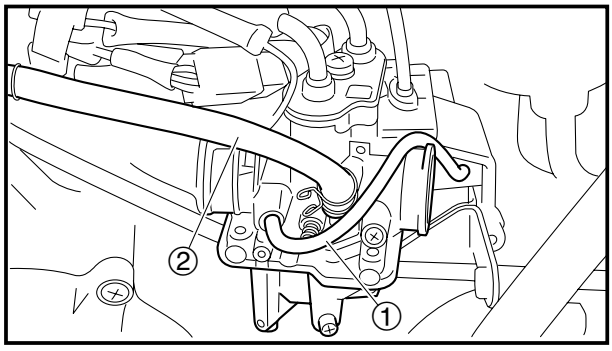


Order	Job/Part	Q´ty	Remarks
	Disassembling the carburetor		Disassemble the parts in the order listed.
①	Throttle stop screw set	1	
②	Float chamber body	1	
③	Float chamber gasket	1	
④	Float pin	1	
⑤	Float	1	
⑥	Needle valve	1	
⑦	Main jet	1	
⑧	Main nozzle	1	
⑨	Pilot jet	1	
			For assembly, reverse the disassembly procedure.

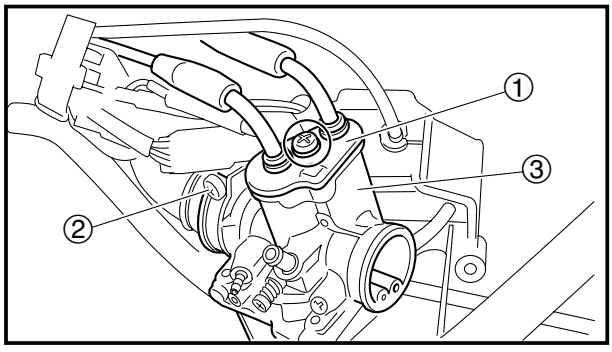


REMOVING THE CARBURETOR

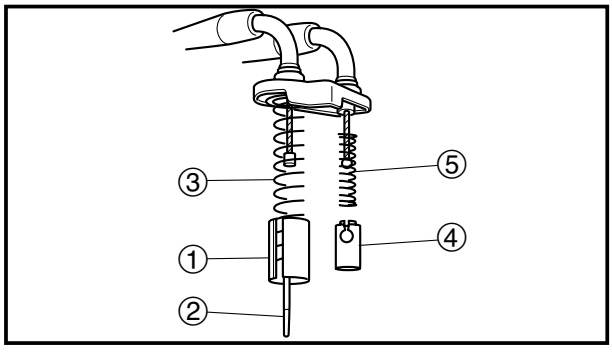
1. Remove:
   - Side cover
   - Seat
   - Clip
   - Air filter assembly ①



2. Remove:
   - Oil delivery hose ①
   - Fuel hose ②



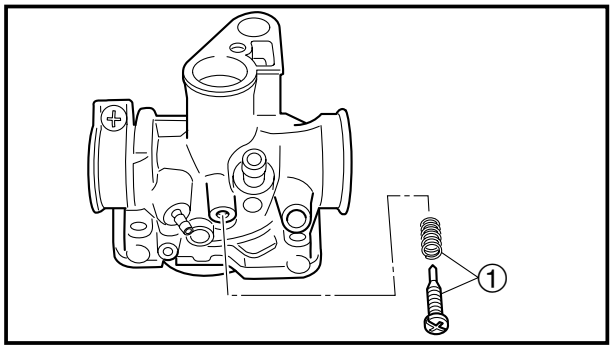
3. Remove:
   - Mixing chamber top ①
4. Loosen:
   - Carburetor clamp screw ②
5. Remove:
   - Carburetor assembly ③



6. Remove:
   - Throttle valve ①
   - Needle set ②
   - Throttle spring ③
   - Starter plunger ④
   - Plunger spring ⑤

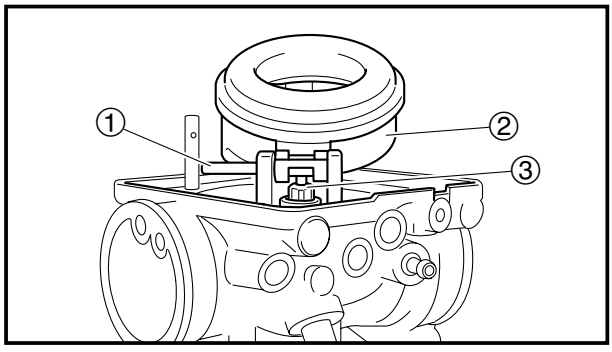
DISASSEMBLING THE CARBURETOR

1. Loosen the drain plug, and then drain the fuel from float chamber body.

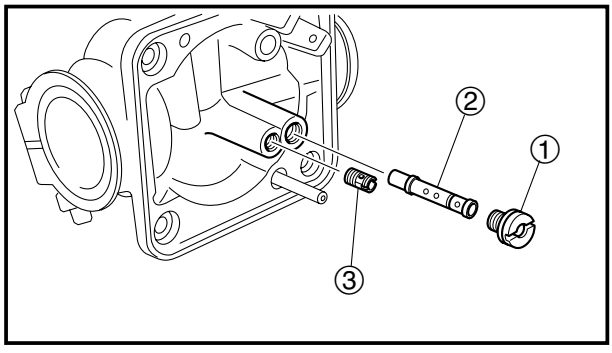


2. Remove:
   - Throttle stop screw set ①

3. Remove:
   - Float chamber body
   - Float chamber gasket



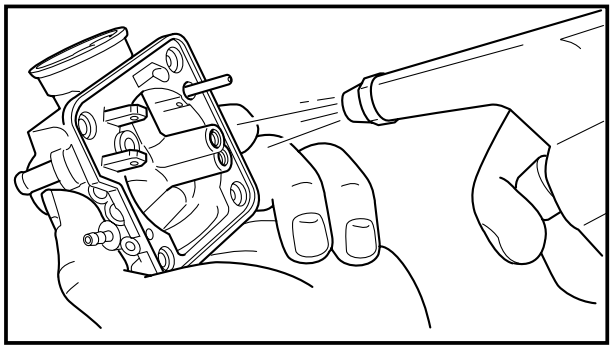
4. Remove:
   - Float pin ①
   - Float ②
   - Needle valve assembly ③



5. Remove:
   - Main jet ①
   - Main nozzle ②
   - Pilot jet ③

CHECKING THE CARBURETOR

1. Check:
   - Carburetor body
     Cracks/damage → Replace.



2. Check:
- Fuel passages
  Obstruction → Clean.

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a. Wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solution.
b. Blow out all of the passages and jets with compressed air.

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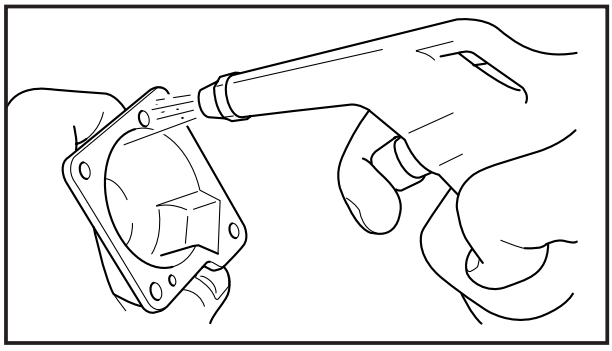
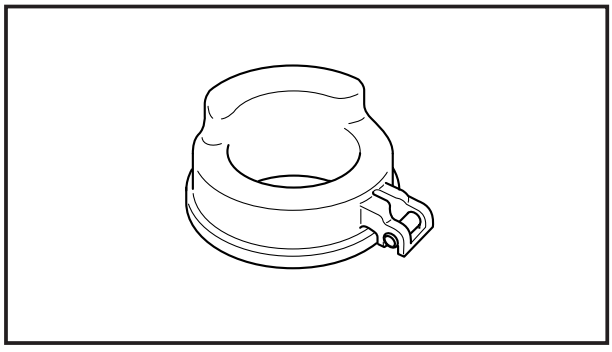
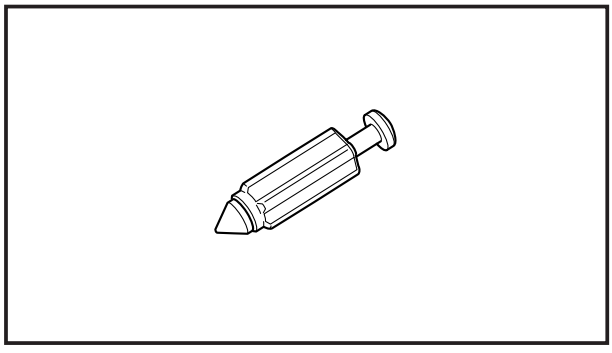


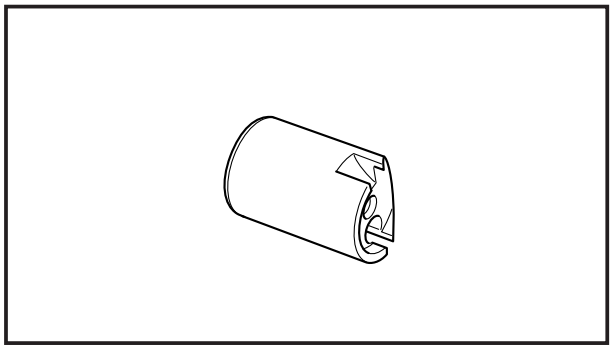
3. Check:
- Float chamber body
  Dirt → Clean.



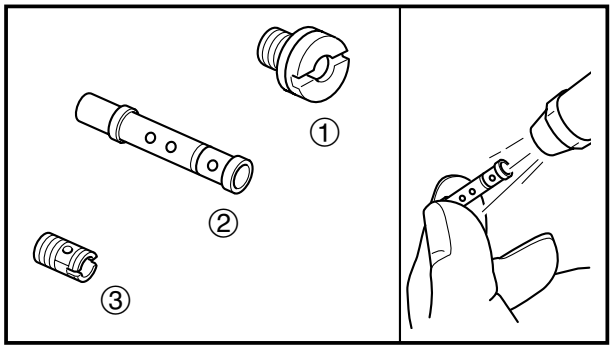
4. Check:
- Float
  Damage → Replace.



5. Check:
- Needle valve
- Needle valve seat
  Damage/obstruction/wear → Replace the needle valve, needle valve seat and O-ring as a set.



6. Check:
- Throttle valve
  Damage/scratches/wear → Replace.



7. Check:
   - Main jet ①
   - Main nozzle ②
   - Pilot jet ③

   Blow out the jets with compressed air.

8. Check:
   - Throttle valve movement

   Insert the throttle valve into the carburetor body and move it up and down.
   Tightness → Replace the throttle valve.

9. Check:
   - Starter plunger
   - Starter plunger spring

   Bends/cracks/damage → Replace.

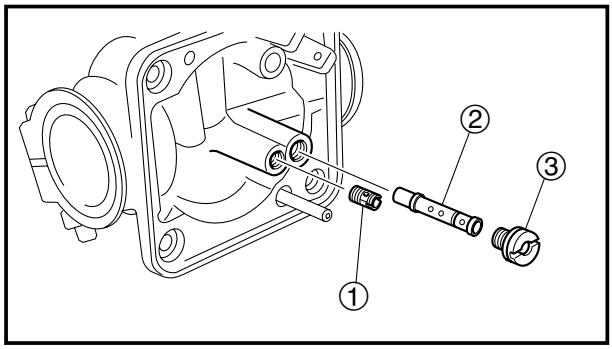
10. Check:
    - Fuel hose
    - Oil delivery hose

    Cracks/damage/wear → Replace.
    Obstruction → Clean.
    Blow out the hoses with compressed air.

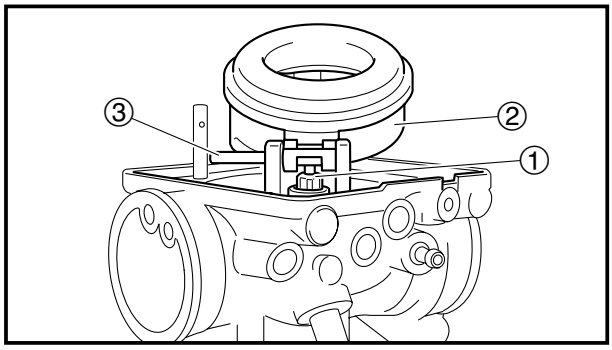
ASSEMBLING THE CARBURETOR

CAUTION:

Before assembling the carburetor, wash all of the parts in a petroleum-based solvent. Always use a new gasket.

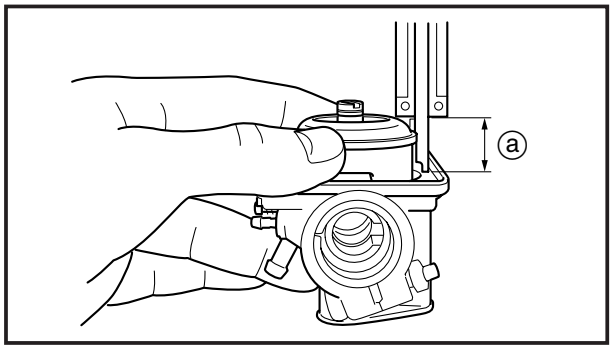


1. Install:
   - Pilot jet ①
   - Main nozzle ②
   - Main jet ③



2. Install:
   - Needle valve ①
   - Float ②
   - Float pin ③

NOTE:
Install the float pin as shown.



3. Measure:
   - Float height ⓐ
     Out of specification → Replace the needle valve and the float

	Float height **15.5-17.5 mm (0.61-0.69 in)**

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a. Hold the carburetor in an upside down position.
b. Measure the distance between the mating surface of the float chamber and top of the float using a vernier calipers.

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

c. If the float height is not within specification, replace the needle valve and float.

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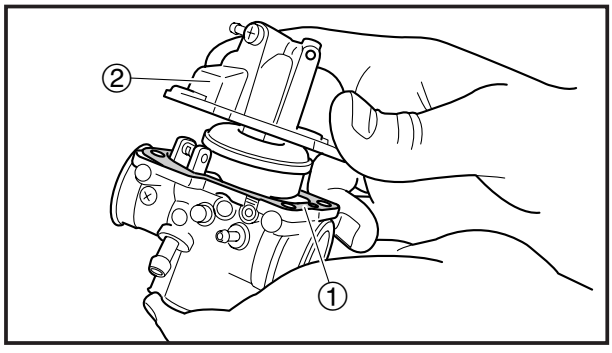
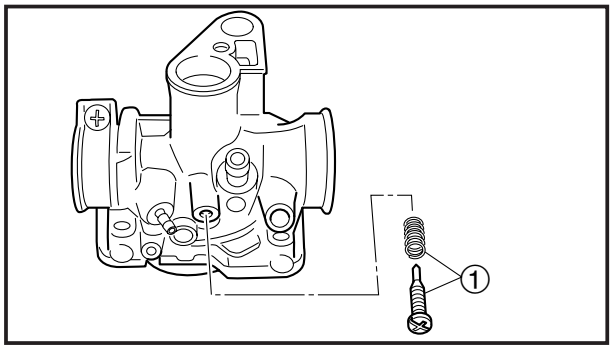
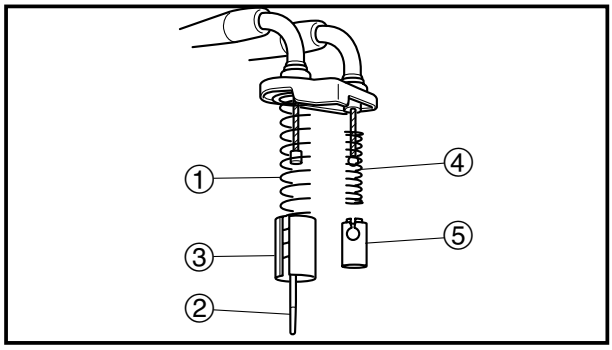


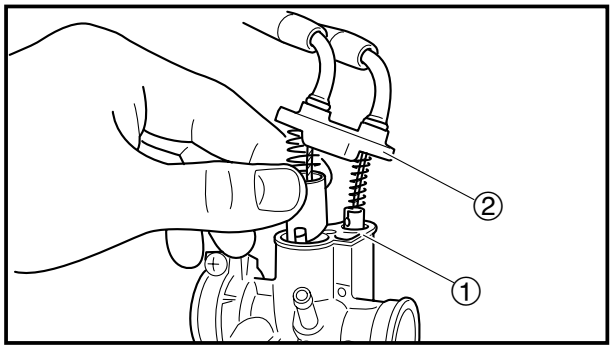
4. Install:
   - Float chamber gasket ① **New**
   - Float chamber ②



5. Install:
   - Throttle screw set ①



6. Install:
- Throttle valve spring ①
- Needle set ②
- Throttle valve ③
- Plunger spring ④
- Starter plunger ⑤



7. Install:
- Gasket **New** ①
- Mixing chamber top ②

NOTE:

Align the slot on the throttle valve with projection of the mixing chamber top, and then install them.

INSTALLING THE CARBURETOR

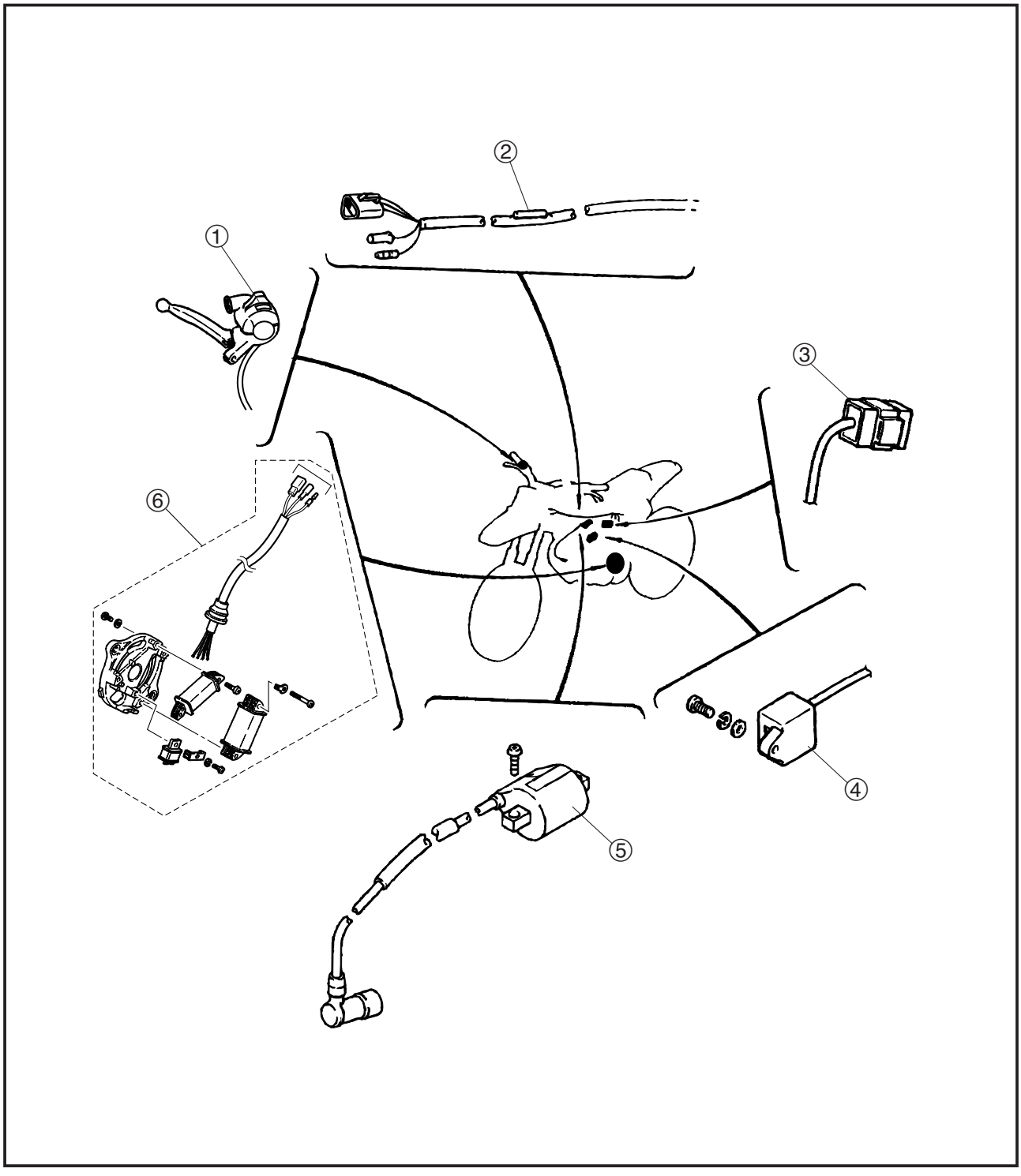
1. Adjust:
- Engine idling speed
  Refer to "ADJUSTING THE ENGINE IDLING SPEED" in chapter 3.
2. Adjust:
- Throttle cable free play
  Refer to "ADJUSTING THE THROTTLE CABLE FREE PLAY" in chapter 3.

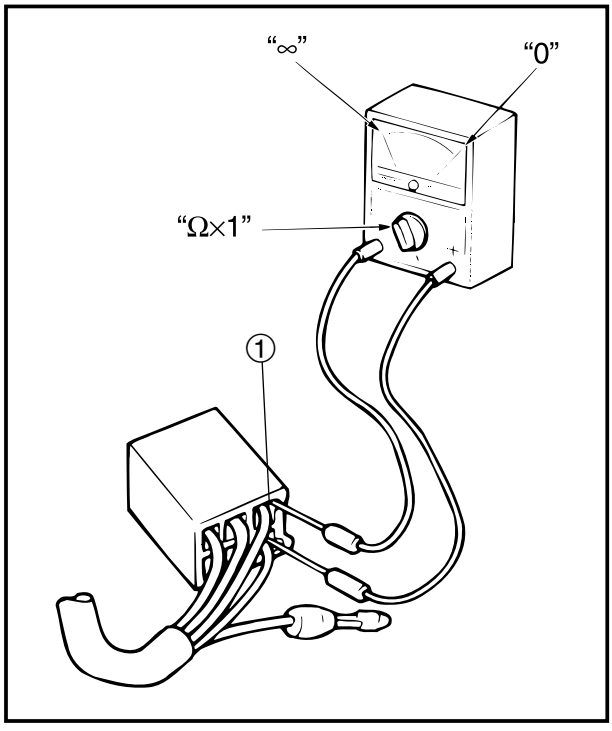
CHAPTER 7
ELECTRICAL SYSTEM

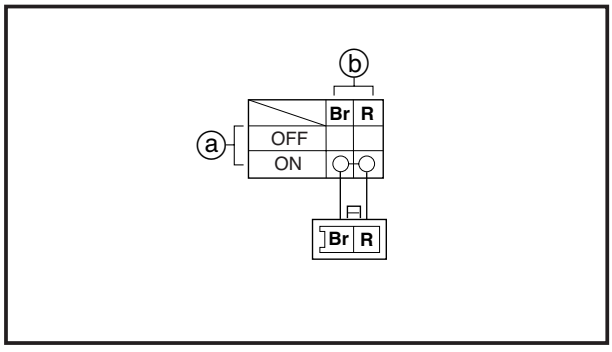
ELECTRICAL SYSTEM

ELECTRICAL COMPONENTS

①Ignition control switch
②Diode
③Control unit
④CDI unit
⑤Ignition coil
⑥Stater assembly







CHECKING SWITCH CONTINUITY

Check each switch for continuity with the pocket tester. If the continuity reading is incorrect, check the wiring connections and if necessary, replace the switch.

CAUTION:

Never insert the tester probes into the coupler terminal slots ① . Always insert the probes from the opposite end of the coupler, taking care not to loosen or damage the leads.

Pocket tester
90890-03112

NOTE:

- Before checking for continuity, set the pocket tester to "0" and to the "Ω×1" range.
- When checking for continuity, switch back and forth between the switch positions a few times.

The terminal connections for switches (e.g., main switch, engine stop switch) are shown in an illustration similar to the one on the left.
The switch positions ⓐ are shown in the far left column and the switch lead colors ⓑ are shown in the top row in the switch illustration.

NOTE:

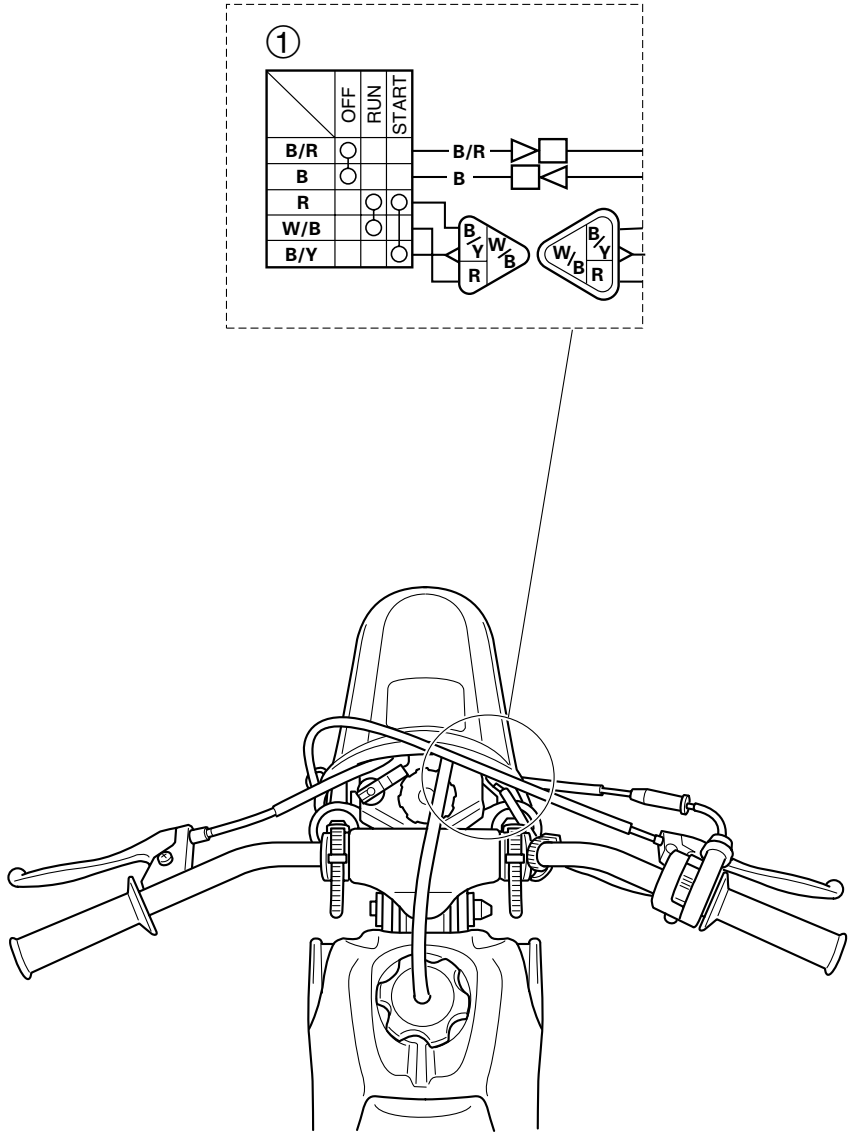
"○—○" indicates a continuity of electricity between switch terminals (i.e., a closed circuit at the respective switch position).

The example illustration on the left shows that:
There is continuity between red and brown when the switch is set to "ON".

CHECKING THE SWITCHES

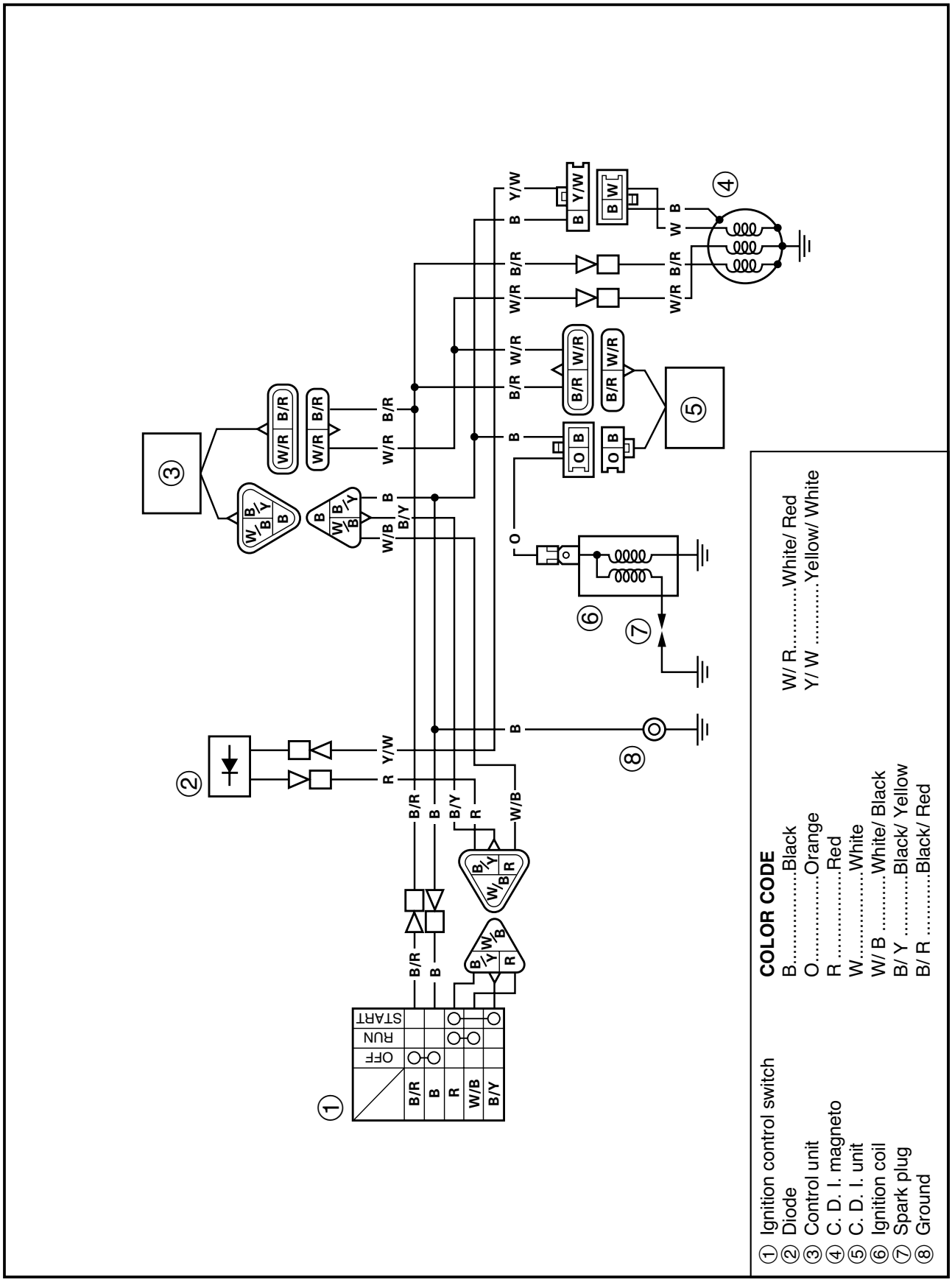
Check each switch for damage or wear, proper connections, and also for continuity between the terminals. Refer to “CHECKING SWITCH CONTINUITY”.

Damage/wear → Repair or replace.
Improperly connected → Properly connect.
Incorrect continuity reading → Replace the switch.



① Ignition control switch

IGNITION SYSTEM
CIRCUIT DIAGRAM



TROUBLESHOOTING

The ignition system fails to operate (no spark or intermittent spark).

Check:
1. Spark plug
2. Ignition spark gap
3. Spark plug cap resistance
4. Ignition coil resistance
5. Pickup coil resistance
6. Charge coil resistance
7. Lighting coil resistance
8. Ignition control switch
9. Control unit
10. Wiring connections (of the entire ignition system)

NOTE:

- Before troubleshooting, remove the following part(s):

1. Seat
2. Front fender

- Troubleshoot with the following special tool(s).

Ignition checker
90890-06754, YM-06754
Pocket tester
90890-03112, YM-03112

1. Spark plug

- Check the condition of the spark plug.
- Check the spark plug type.
- Measure the spark plug gap.
  Refer to "CHECKING THE SPARK PLUG" in chapter 3.

Standard spark plug
NGK/BP4HS or DENSO/W14FPL (Except for CANADA and EUROPE)
NGK/BPR4HS (For CANADA and EUROPE)
Spark plug gap
0.6–0.7 mm (0.024–0.028 in)

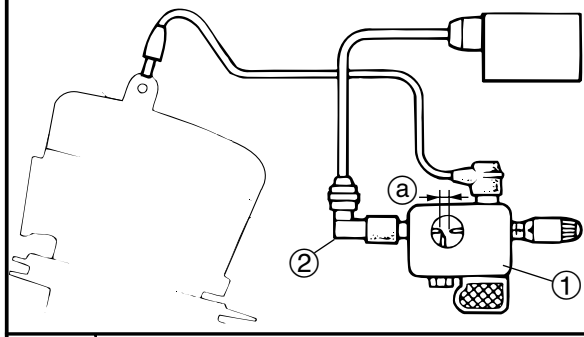
- Is the spark plug in good condition, is it of the correct type, and is its gap within specification?

YES ⇩ NO ⇩

Re-gap or replace the spark plug.

2. Ignition spark gap

- Disconnect the spark plug cap from the spark plug.
- Connect the ignition checker ① as shown.
  ② Spark plug cap
- Set the main switch to "ON".
- Crank the engine by pushing the start switch and gradually increase the spark gap until a misfire occurs.
- Measure the ignition spark gap ⓐ.



Minimum ignition spark gap
6.0 mm (0.24 in)

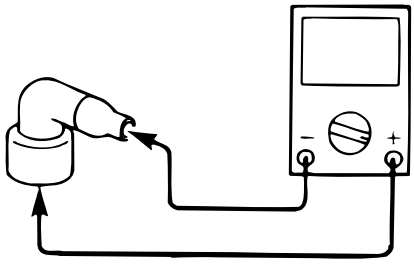
- Is there a spark and is the spark gap within specification?

NO ⇩ YES ⇩

The ignition system is OK.

3. Spark plug cap resistance

- Remove the spark plug cap from the spark plug lead.
- Connect the pocket tester ("Ω × 1k" range) to the spark plug cap as shown.
- Measure the spark plug cap resistance.



Spark plug cap resistance
5.0 kΩ at 20°C (68°F)

- Is the spark plug cap OK?

YES

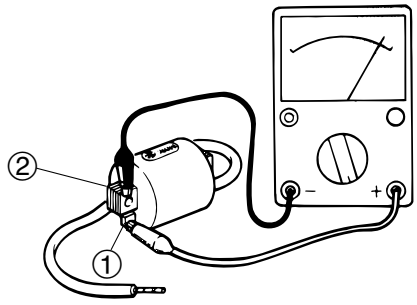
NO

Replace the spark plug cap.

4. Ignition coil resistance

- Disconnect the ignition coil connector from the ignition coil terminal.
- Connect the pocket tester ("Ω × 1" range) to the ignition coil as shown.

Positive tester probe → terminal ①
Negative tester probe →
ignition coil base ②

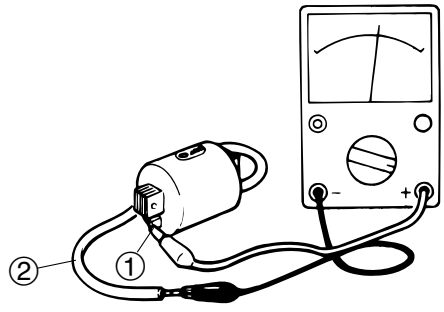


- Measure the primary coil resistance.

Primary coil resistance
0.32–0.48 Ω at 20°C (68°F)

- Connect the pocket tester ("Ω × 1k" range) to the ignition coil as shown.

Negative tester probe → terminal ①
Positive tester probe →
spark plug lead ②



- Measure the secondary coil resistance.

Secondary coil resistance
5.68–8.52 kΩ at 20°C (68°F)

- Is the ignition coil OK?

YES

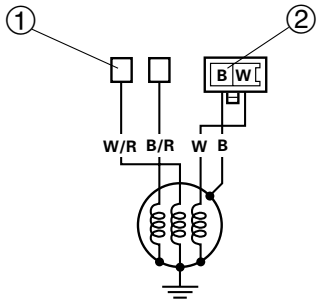
NO

Replace the ignition coil.

5. Pickup coil resistance

- Disconnect the pickup coil coupler from the wire harness.
- Connect the pocket tester ("Ω×1" range) to the pickup coil terminal as shown.

Positive tester probe → white/red ①
Negative tester probe → black ②



- Measure the pickup coil resistance.

Pickup coil resistance
18.0–22.0 Ω at 20°C (68°F)
(between white/red and black)

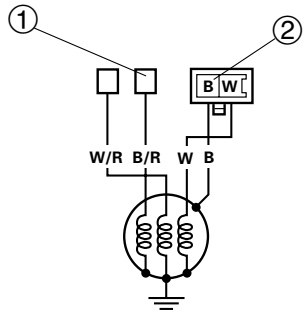
- Is the pickup coil OK?

YES → NO → Replace the stator coil/pickup coil assembly.

6. Charge coil resistance

- Disconnect the charge coil coupler from the wire harness.
- Connect the pocket tester ("Ω×100" range) to the charge coil terminal as shown.

Positive tester probe → black/red ①
Negative tester probe → black ②



- Measure the charge coil resistance.

Charge coil resistance
297–363 Ω at 20°C (68°F)
(between black/red and black)

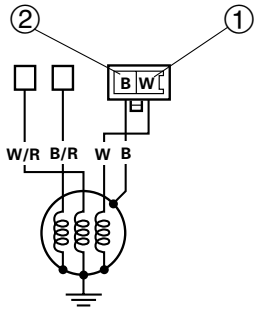
- Is the charge coil OK?

YES → NO → Replace the stator coil assembly.

7. Lighting coil resistance

- Disconnect the lighting coil coupler from the wire harness.
- Connect the pocket tester ("Ω×1" range) to the lighting coil terminal as shown.

Positive tester probe → white ①
Negative tester probe → black ②



- Measure the charge coil resistance.

Lighting coil resistance
0.57–0.69 Ω at 20°C (68°F)
(between white and black)

- Is the lighting coil OK?

YES → NO

Replace the stator coil assembly.

8. Ignition control switch

- Check the ignition control switch for continuity. Refer to "CHECKING THE SWITCHES".
- Is the ignition control switch OK?

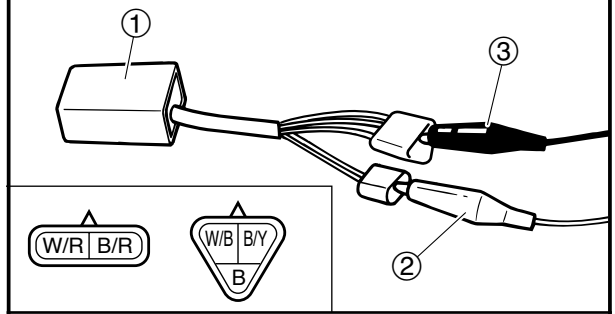
YES → NO

Replace the ignition control switch.

9. Control unit resistance

- Disconnect the control unit ① coupler from the wire harness.
- Connect the pocket tester ("Ω×1k" range) to the control unit terminal as shown.

Positive tester probe ②
Negative tester probe ③



- Measure the control unit resistance.

Control unit resistance

Tester positive lead	Tester negative lead: B/R	W/R	W/B	B/Y	B	Range
B/R		100 – 200 kΩ	80 – 200 kΩ	80 – 200 kΩ	80 – 200 kΩ	× 1 kΩ
W/R	∞		∞	∞	∞	
W/B	80 – 200 kΩ	30 – 50 kΩ		10 – 20 kΩ	1 – 5 kΩ	
B/Y	80 – 200 kΩ	30 – 80 kΩ	10 – 20 kΩ		10 – 20 kΩ	
B	80 – 200 kΩ	20 – 50 kΩ	1 – 5 kΩ	7 – 15 kΩ		

- Is the control unit OK?

YES → NO

Replace the control unit assembly.

10. Wiring

- Check the entire ignition system wiring. Refer to “CIRCUIT DIAGRAM”.
- Is the ignition system wiring properly connected and without defects?

YES ⇩

Replace the C.D.I. unit.

NO ⇩

Properly connect or repair the ignition system wiring.

CHAPTER 8
TROUBLESHOOTING

EAS28450

TROUBLESHOOTING

EAS28460

GENERAL INFORMATION

NOTE:

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic troubleshooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

EAS28470

STARTING FAILURES

ENGINE

Cylinder(s) and cylinder head(s)

- Loose spark plug
- Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- Worn or damaged cylinder

Piston(s) and piston ring(s)

- Improperly installed piston ring
- Damaged, worn or fatigued piston ring
- Seized piston ring
- Seized or damaged piston

Air filter

- Improperly installed air filter
- Clogged air filter element

Crankcase and crankshaft

- Improperly assembled crankcase
- Seized crankshaft

Reed valve

- Deformed reed valve stopper
- Improperly sealed reed valve stopper
- Incorrect tightened manifold
- Damaged gasket
- Damaged reed valve

FUEL SYSTEM

Fuel tank

- Empty fuel tank
- Deteriorated or contaminated fuel

Fuel cock

- Clogged or damaged fuel hose

Carburetor(s)

- Improperly adjusted throttle stop screw
- Deteriorated or contaminated fuel
- Clogged pilot jet
- Clogged pilot air passage
- Sucked-in air
- Damaged float
- Worn needle valve
- Improperly installed needle valve seat
- Incorrect fuel level
- Improperly installed pilot jet
- Clogged starter jet
- Faulty starter plunger
- Improperly adjusted starter cable

ELECTRICAL SYSTEM

Spark plug(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil(s)

- Cracked or broken ignition coil body
- Broken or shorted primary or secondary coils
- Faulty spark plug lead

Ignition system

- Faulty CDI unit
- Faulty pickup coil
- Faulty charge coil
- Faulty lighting coil
- Faulty control unit
- Faulty diode
- Broken generator rotor woodruff key

Switches and wiring

- Faulty ignition control switch
- Broken or shorted wiring
- Improperly grounded circuit
- Loose connections

EAS28490

INCORRECT ENGINE IDLING SPEED

ENGINE

Air filter

- Clogged air filter element

FUEL SYSTEM

Carburetor(s)

- Faulty starter plunger
- Loose or clogged pilot jet
- Loose or clogged pilot air jet
- Damaged or loose carburetor joint
- Improperly adjusted engine idling speed
- Improper throttle cable free play
- Flooded carburetor

ELECTRICAL SYSTEM

Spark plug(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- Faulty spark plug cap

Ignition coil(s)

- Broken or shorted primary or secondary coils
- Faulty spark plug lead
- Cracked or broken ignition coil

Ignition system

- Faulty CDI unit
- Faulty pickup coil
- Faulty charge coil
- Faulty lighting coil
- Faulty control unit
- Faulty diode
- Broken generator rotor woodruff key

EAS28510

POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to “STARTING FAILURES”.

ENGINE

Autolube pump

- Faulty autolube pump

Air filter

- Clogged air filter element

Exhaust system

- Carbon buildup

FUEL SYSTEM

Carburetor(s)

- Incorrect fuel level
- Loose or clogged main jet

EAS28580

FAULTY CLUTCH

ENGINE OPERATES BUT VEHICLE WILL NOT MOVE

Clutch spring(s)

- Damaged clutch spring

Transmission gear(s)

- Damaged transmission gear

Shaft drive

- Broken shaft drive

CLUTCH SLIPS

Clutch shoe spring(s)

- Damaged, loose or worn clutch shoe spring

Clutch shoe(s)

- Damaged or worn clutch shoe

POOR STARTING PERFORMANCE

Clutch shoe(s)

- Bent, damaged or worn clutch shoe
- Poor speed performance

EAS28590

OVERHEATING

ENGINE

Cylinder head(s) and piston(s)

- Heavy carbon buildup

Autolube pump

- Faulty autolube pump
- Incorrect engine oil grade

FUEL SYSTEM

Carburetor(s)

- Incorrect main jet setting
- Incorrect fuel level
- Damaged or loose carburetor joint

Air filter

- Clogged air filter element

CHASSIS

Brake(s)

- Dragging brake

ELECTRICAL SYSTEM

Spark plug(s)

- Incorrect spark plug gap
- Incorrect spark plug heat range

Ignition system

- Faulty CDI unit

EAS28630

POOR BRAKING PERFORMANCE

- Worn brake shoe
- Worn or rusty brake drum
- Incorrect brake pedal position (above the top of the rider footrest)
- Incorrect brake lever free play
- Incorrect brake camshaft lever position
- Incorrect brake shoe position
- Damaged or fatigued brake shoe spring
- Oil or grease on the brake shoe
- Oil or grease on the brake drum

EAS28660

FAULTY FRONT FORK LEGS

- Bent, damaged or rusty inner tube
- Cracked or damaged outer tube
- Damaged damper rubber
- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- Incorrect grease viscosity

EAS28670

UNSTABLE HANDLING

Handlebar
- Bent or improperly installed handlebar

Steering head components
- Improperly installed upper bracket
- Improperly installed lower bracket (improperly tightened ring nut)

Bent steering stem
- Damaged ball bearing or bearing race

Front fork leg(s)
- Broken fork spring
- Bent or damaged inner tube
- Bent or damaged outer tube

Swingarm
- Bent or damaged swingarm

Rear shock absorber assembly(-ies)
- Faulty rear shock absorber spring
- Leaking oil

Tire(s)
- Uneven tire pressures (front and rear)
- Incorrect tire pressure
- Uneven tire wear

Wheel(s)
- Deformed panel wheel
- Damaged wheel bearing
- Bent or loose wheel axle
- Excessive wheel runout

Frame
- Bent frame
- Damaged steering head pipe
- Improperly installed bearing race

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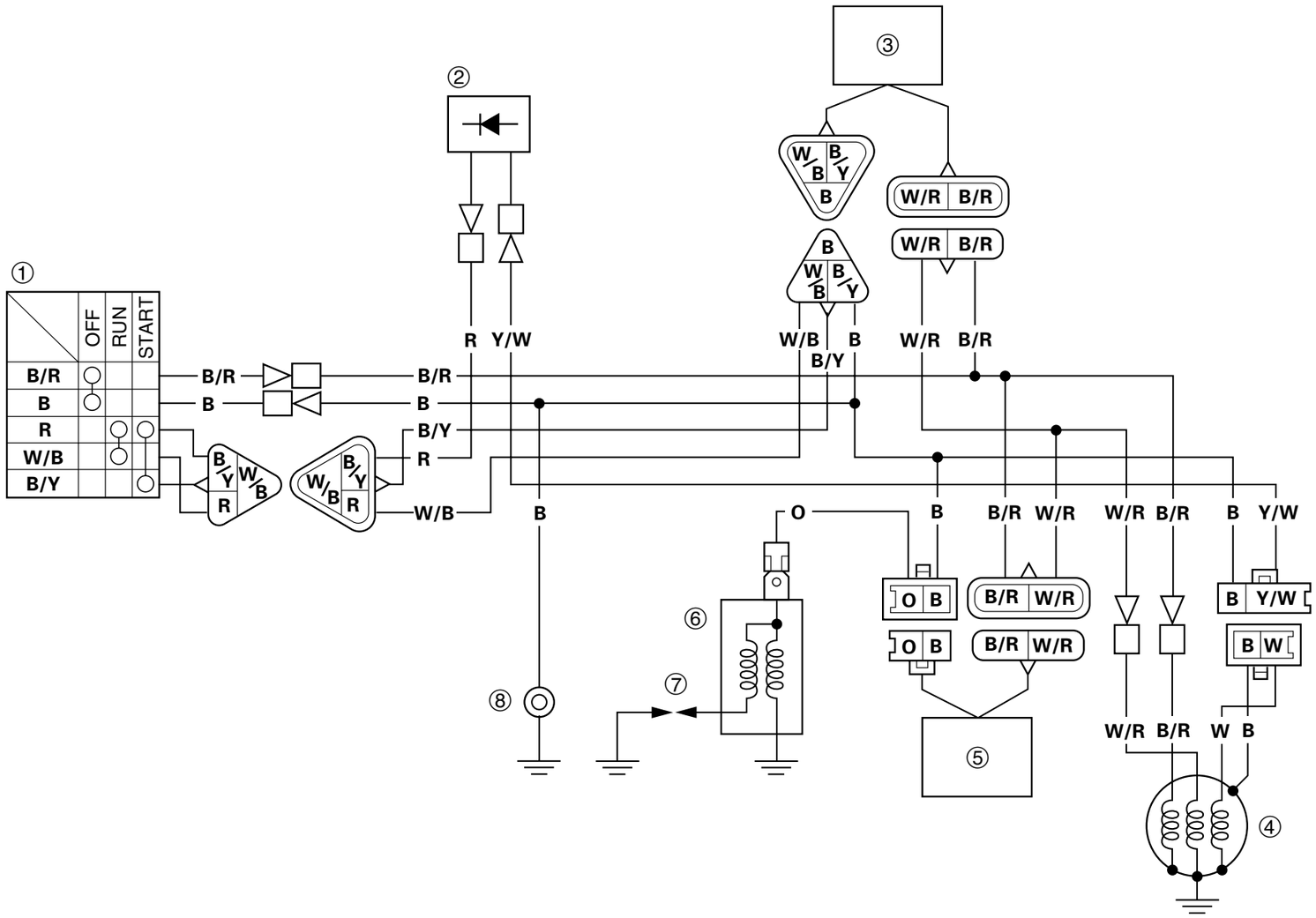
PW50W WIRING DIAGRAM

① Safety switch
② Diode
③ Control unit
④ C. D. I. magneto
⑤ C. D. I. unit
⑥ Ignition coil
⑦ Spark plug
⑧ Ground

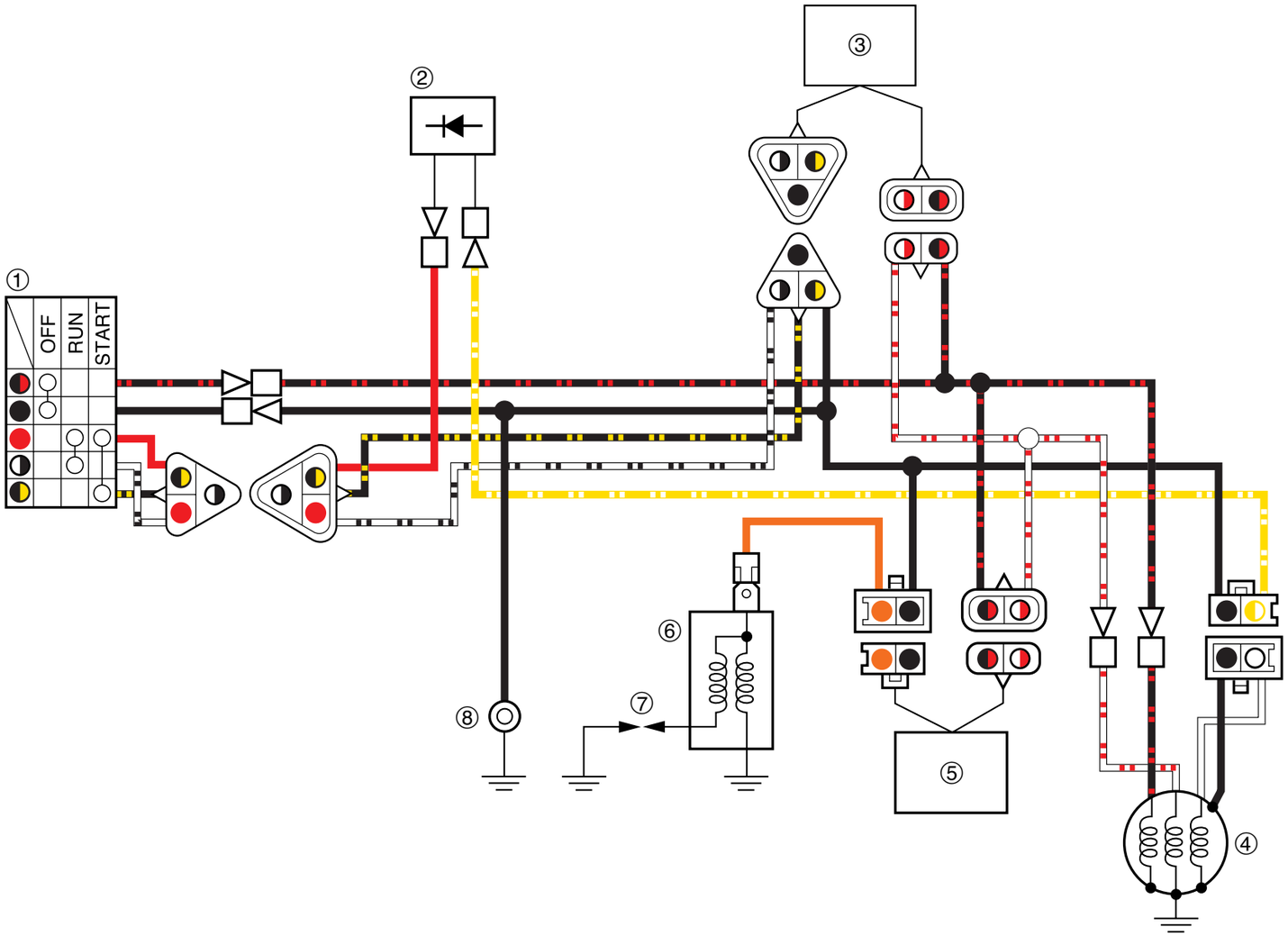


COLOR CODE

B.....Black	W.....White	B/ R .....Black/ Red
O.....Orange	W/ B .....White/ Black	W/ R.....White/ Red
R .....Red	B/ Y .....Black/ Yellow	Y/ W .....Yellow/ White

PW50W 2007 WIRING DIAGRAM

① Ignition control switch
② Diode
③ Control unit
④ C. D. I. magneto
⑤ C. D. I. unit
⑥ Ignition coil
⑦ Spark plug
⑧ Ground



- Black
- Orange
- Red
- White
- White/Black
- Black/Yellow
- Black/Red
- White/Red
- Yellow/White