YAMAHA

BW200N

Service Manual

Lit11616BW20

BW200N
SERVICE MANUAL

1st Edition, June 1984

Printed in U.S.A.
P/N LIT-11616-04-63

NOTICE

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

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

OVERSEAS SERVICE
OVERSEAS OPERATIONS
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

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

CAUTION: A CAUTION indicates special procedures that must be followed to avoid damage to the motorcycle.

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

MANUAL FORMAT

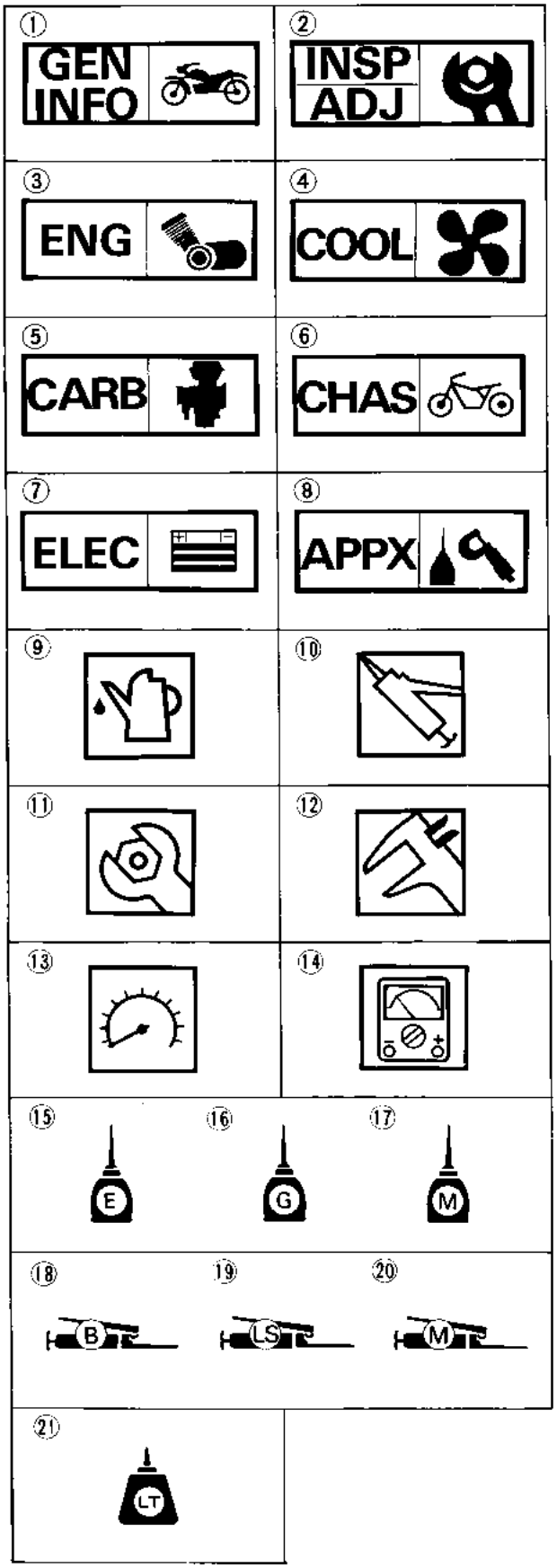
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.
In this revised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

- Bearings;

Pitting/Damage→Replace.

EXPLODED DIAGRAM

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



SYMBOLS
(Refer to the illustration)

Symbols ① to ⑧ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Periodic inspection and adjustment
③ Engine
④ Cooling system
⑤ Carburetion
⑥ Chassis
⑦ Electrical
⑧ Appendices

Symbols ⑨ to ⑭ indicate specific data as the following items:

⑨ Filling fluid
⑩ Lubricant
⑪ Tightening
⑫ Wear limit, clearance
⑬ Engine speed
⑭ Ω, V, A

Symbols ⑮ to ㉑ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑮ Apply engine oil
⑯ Apply gear oil
⑰ Apply molybdenum disulfide oil
⑱ Apply wheel bearing grease
⑲ Apply lightweight lithium soap base grease
⑳ Apply molybdenum disulfide grease
㉑ Apply locking agent (LOCTITE®)

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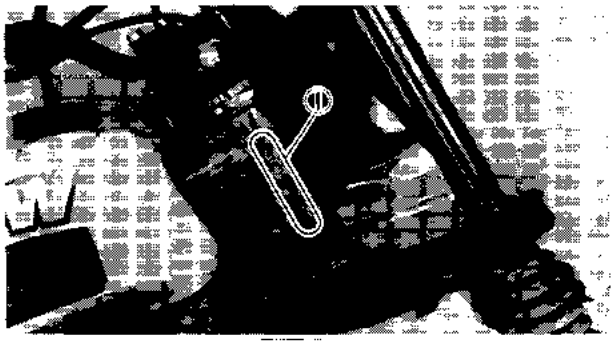
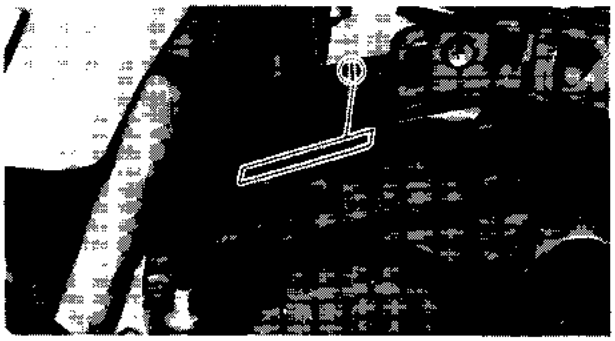
CHAPTER 1.
GENERAL INFORMATION





GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is on the left side of the steering head pipe.

Starting Serial Number:
BW200N JYA54G00*FA000101

ENGINE SERIAL NUMBER

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

Starting Serial Number:
BW200N 54G-000101

NOTE:

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

NOTE:

Designs and specifications are subject to change without notice.

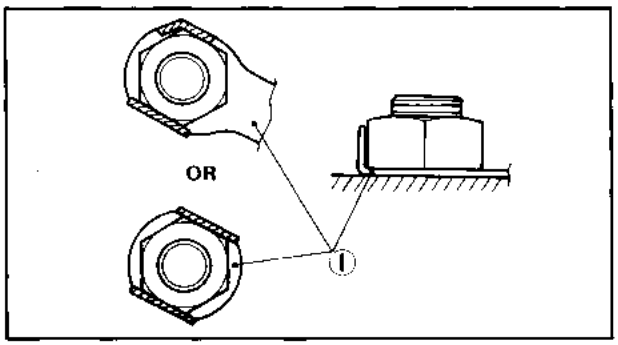
IMPORTANT INFORMATION

ALL REPLACEMENT PARTS

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

GASKETS, OIL SEALS, AND O-RINGS

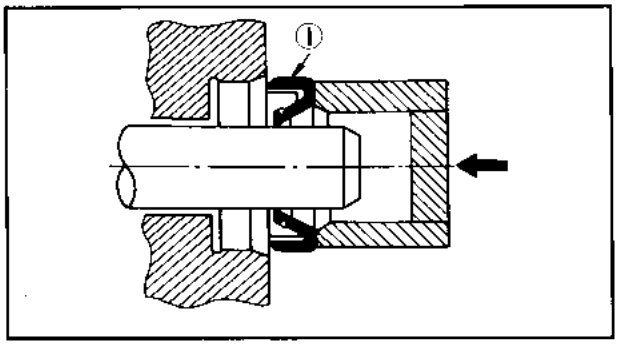
1. All gaskets, seals, and O-rings should be replaced when an engine is overhauled. All gasket surfaces, oil seal lips and O-rings must be cleaned.
2. Properly oil all mating parts and bearings during reassembly. Apply grease to the oil seal lips.

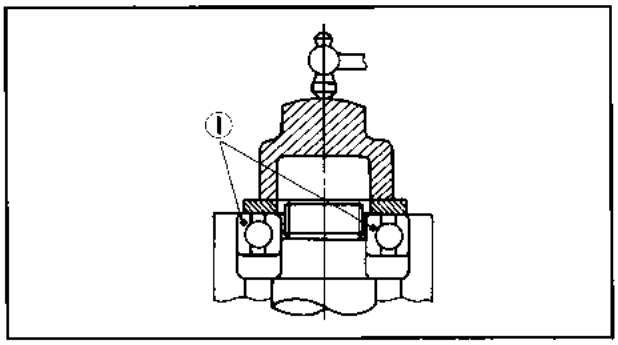


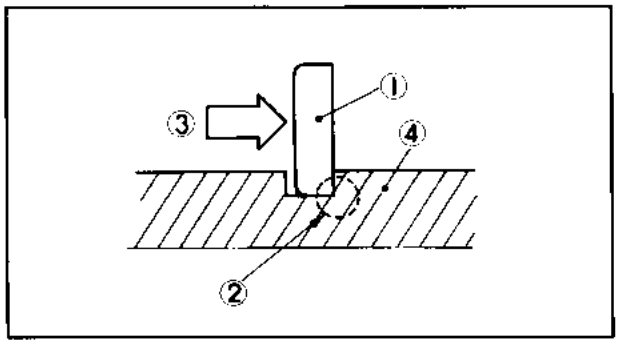
LOCK WASHERS/PLATES AND COTTER PINS

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

IMPORTANT INFORMATION







BEARINGS AND OIL SEALS

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

① Oil seal

CAUTION:

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

① Bearing

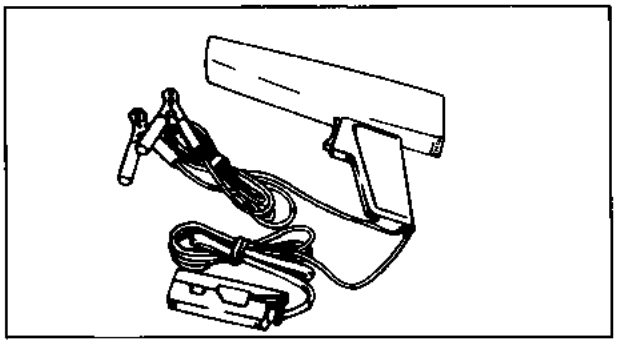
CIRCLIPS

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

④ Shaft

SPECIAL TOOLS

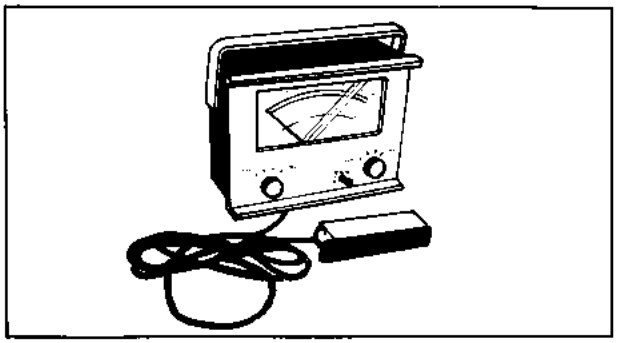
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE-UP

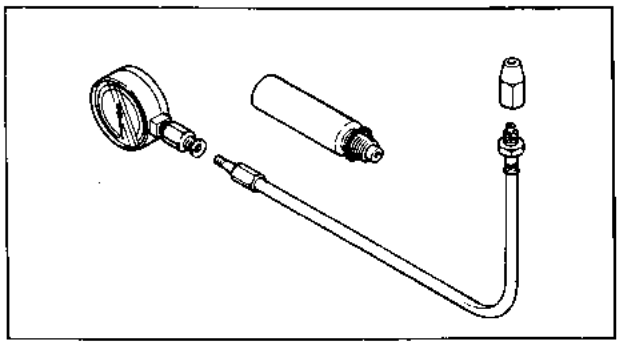
1. Timing Light

P/N. YU-08037



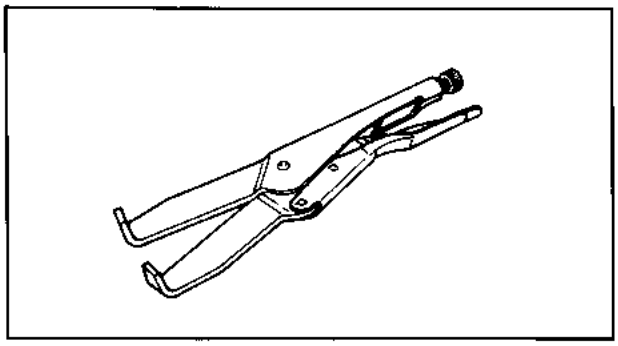
2. Inductive Tachometer

P/N. YU-08036



3. Compression Gauge and Adapter

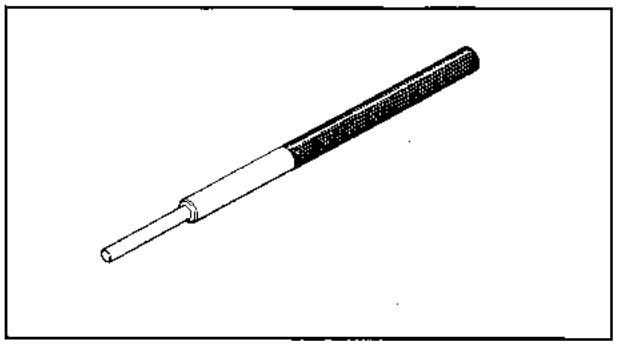
P/N. YU-33223
YU-33223-3



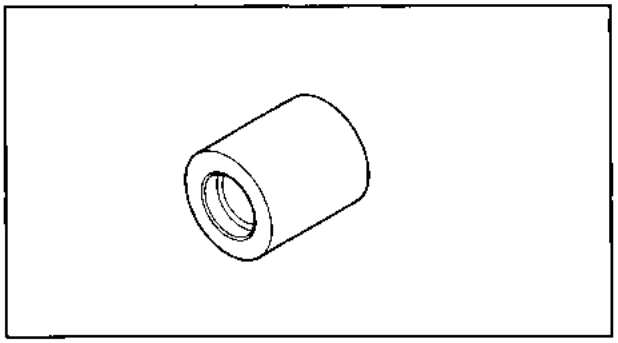
FOR ENGINE SERVICE

1. Clutch Hub Holder

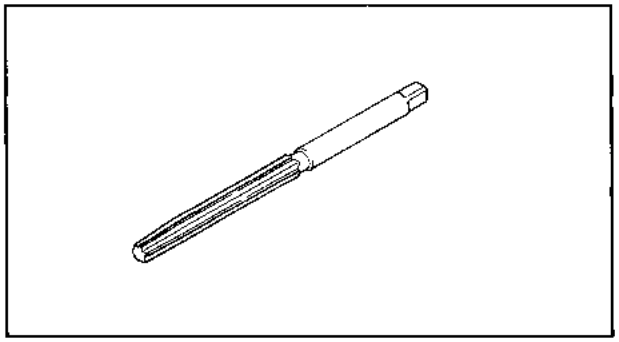
P/N. YM-91042



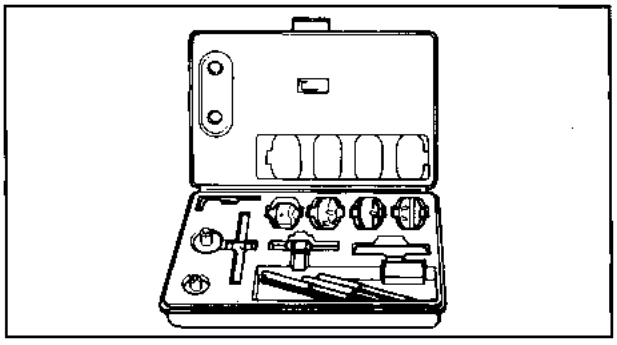
2. Valve Guide Remover
P/N. YM-4064-A



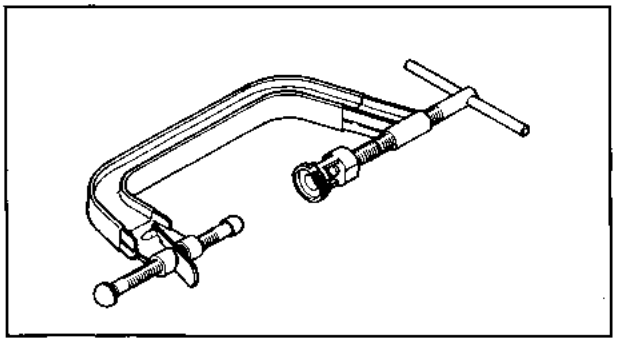
3. Valve Guide Installer
P/N. YM-4065



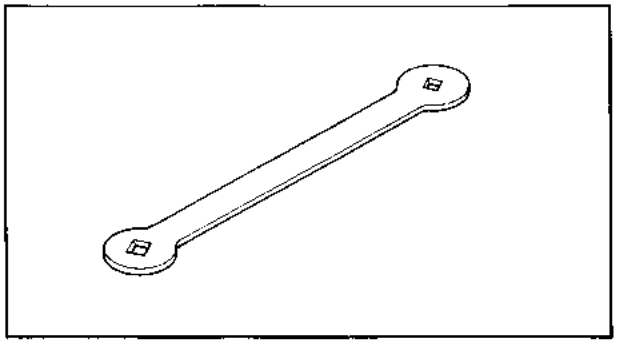
4. Valve Guide Reamer
P/N. YM-4066



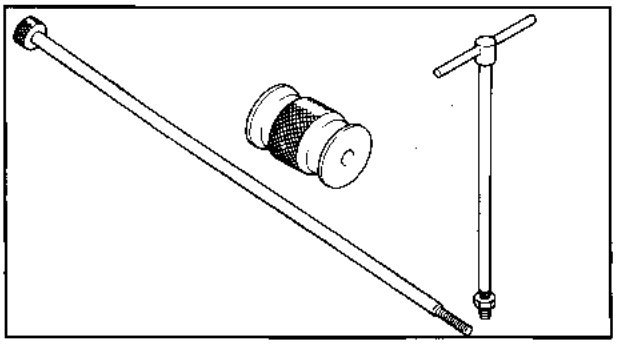
5. Valve Seat Cutter
P/N. YM-91043



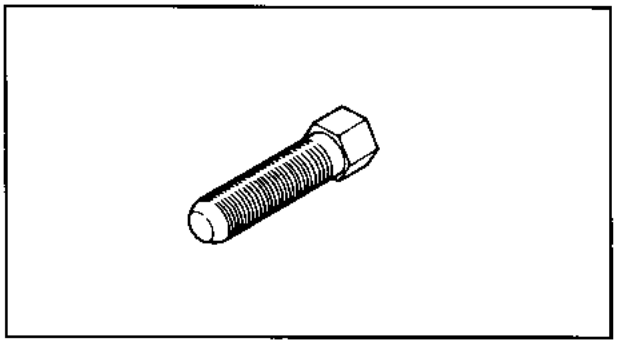
6. Valve Spring Compressor
P/N. YM-04019



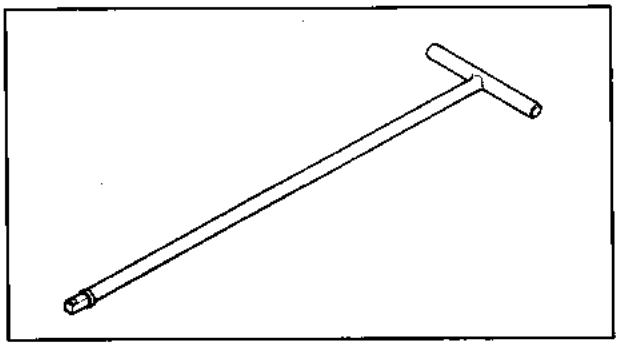
7. Valve Adjusting Tool
P/N. YM-08035



8. Slide Hammer
P/N. YU-01083-A

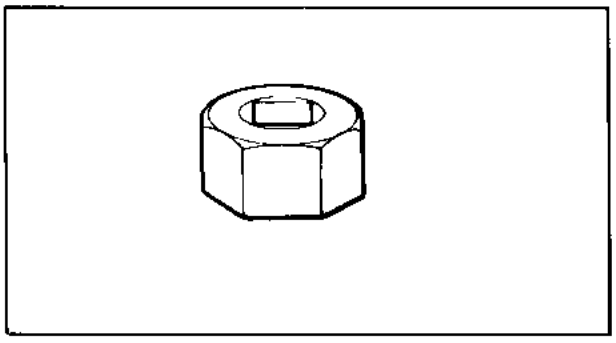


9. Rotor Puller
P/N. YM-01080-A



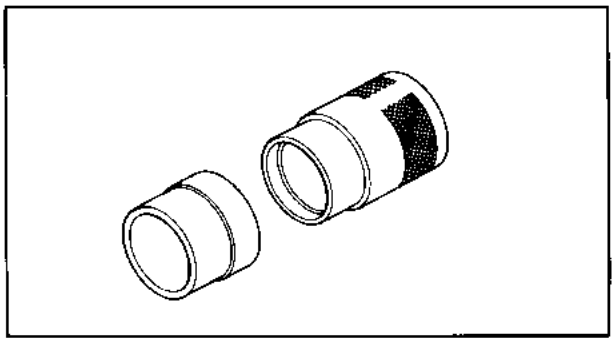
FOR CHASSIS SERVICE

1. T-Handle
P/N. YM-01326

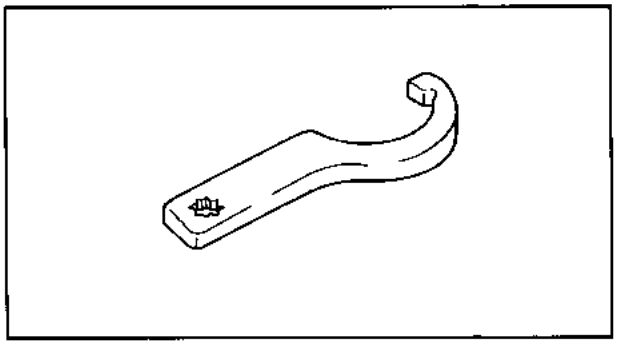


2. Fork Damper Rod Holder
P/N. YM-33256

SPECIAL TOOLS

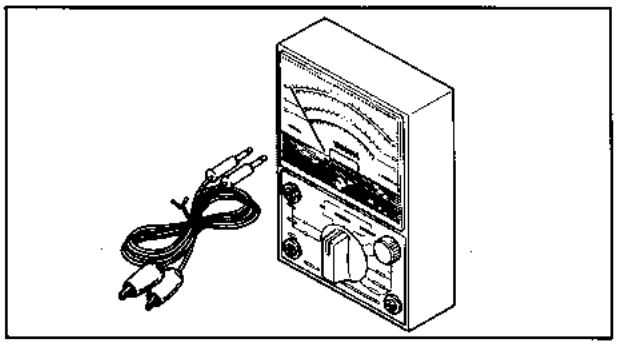


3. Fork Oil Seal Driver Weight and Attachment
P/N. YM-33963
YM-1369

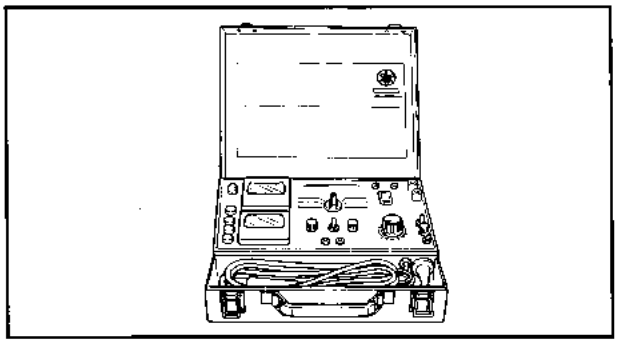


4. Steering Nut Wrench
P/N. YU-33975

FOR ELECTRICAL COMPONENTS



1. Pocket Tester
P/N. YU-03112



2. Electro Tester
P/N. YU-03021

CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENT

PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

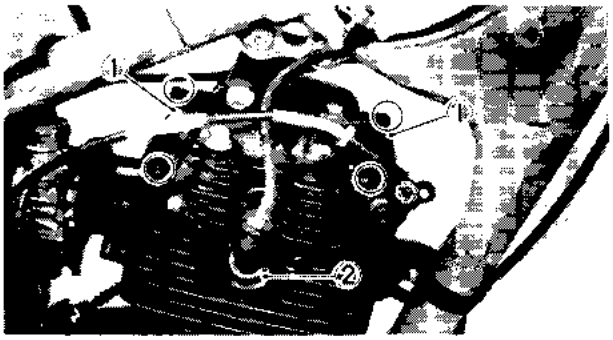
This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information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

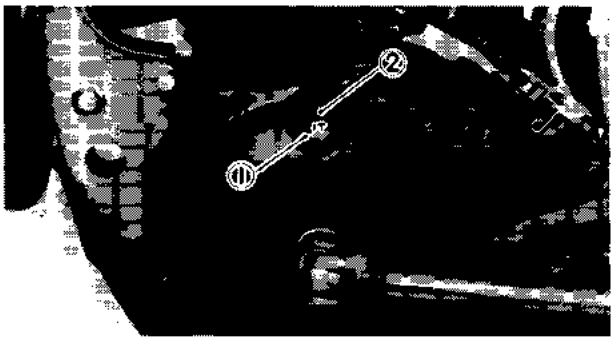
PERIODIC MAINTENANCE/LUBRICATION

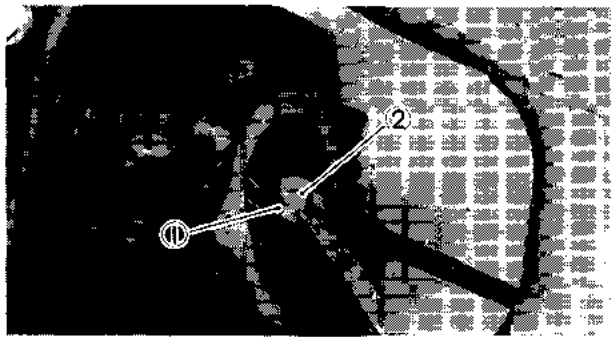
Unite: km (mi)

Item	Remarks	Initial			Every	
		1 month	3 months	6 months	6 months	1 year
Valve(s)	Check valve clearance. Adjust if necessary.	O		O	O	O
Cam chain	Check chain tension. Adjust if necessary.	O		O	O	O
Spark plug	Check condition. Clean or replace if necessary.	O	O	O	O	O
Air filter	Clean. Replace if necessary.		O	O	O	O
Carburetor	Check idle speed/starter operation. Adjust if necessary.		O	O	O	O
Fuel line	Check fuel hose for cracks or damage. Replace if necessary.			O	O	O
Engine oil	Replace (Warm engine before draining).	O		O	O	O
Engine oil filter	Replace.	O		O		O
Engie oil strainer	Clean. Replace if necessary.	O		O		O
Brake	Check operation. Adjust if necessary.	O	O	O	O	O
Clutch	Check operation. Adjust if necessary.	O		O	O	O
Drive chain	Check operation/Adjust as required/ Replace as required.	O	O	O	1 Month	
Decompression system	Check operation. Adjust if necessary.			O	O	O
Wheels	Check balance/damage/runout. Repair if necessary.	O		O	O	O
Wheel bearings	Check bearings assembly for looseness/damage. Replace if damaged.	O		O	O	O
Rear arm pivot	Apply grease lightly every 12 months.**					O
Middle sprockets shaft	Lubricate every 6 months.**			O	O	O
Steering bearing	Check bearing assembly for looseness. Moderately repack every 12 months.*	Check		Check	Check	O
Fittings/ Fasteners	Check all chassis fittings and fasteners. Correct if necessary.	O	O	O	O	O

* Medium weight wheel bearing grease.
** Lithium soap base grease.







ENGINE

VALVE CLEARANCE

Measurement

1. Remove:
   - Seat
   - Fuel tank
   - Valve covers ①
   - Spark plug ②

2. Remove:
   - Timing window plug
   - Crankshaft end cover

3. Align:
   - "T" mark ①
     (on the flywheel with the stationary pointer ② on the crankcase cover)

4. Measure:
   - Valve clearance
     Out of specification → Adjust

Valve Clearance: (Cold)
Intake: 0.09 ~ 0.13 mm
(0.0035 ~ 0.0043 in)
Exhaust: 0.15 ~ 0.19 mm
(0.0059 ~ 0.0075 in)

Adjustment

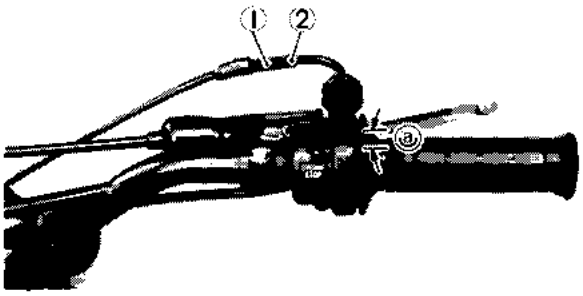
1. Loosen:
   - Locknut ①
2. Adjust:
   - Valve clearance
3. Tighten
   - Locknut ①

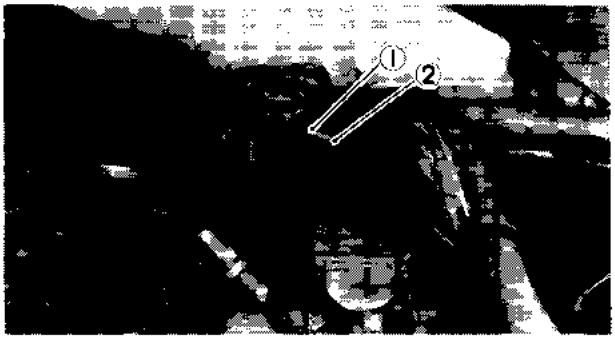
② Valve adjusting tool

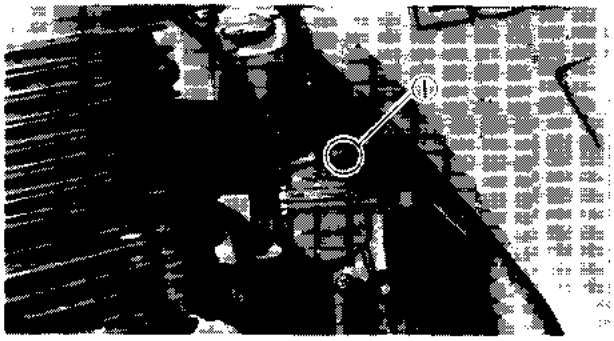
Locknut:
7 Nm (0.7 m•kg, 5.1 ft•lb)

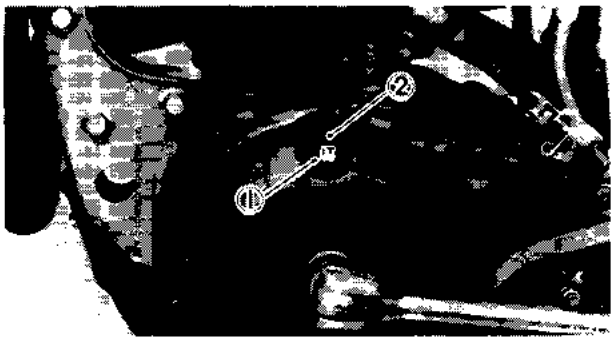
Spark Plug:
20 Nm (2.0 m•kg, 14 ft•lb)
Valve Cover:
7 Nm (0.7 m•kg, 5.1 ft•lb)

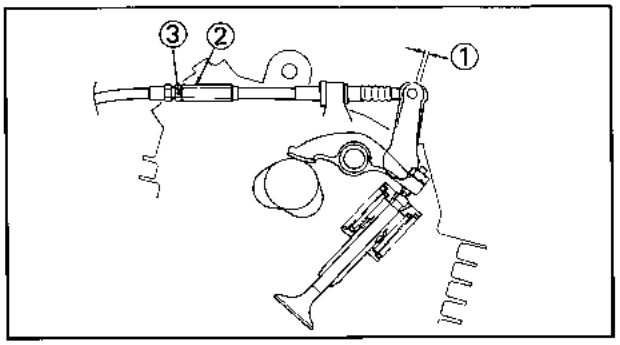
THROTTLE CABLE/IDLE SPEED/ DECOMPRESSION CABLE











THROTTLE CABLE

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

Free Play: 5 mm (0.2 in)

① Adjuster
② Locknut

2. Adjust:
   - Throttle grip free play ⓐ
     (by turning the adjuster ① in or out)

NOTE:

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

② Locknut

IDLE SPEED

1. Start the engine and warm it up for a few minutes.
2. Adjust:
   - Idle speed
     (by turning the throttle stop screw ① in or out)

1,350±50 r/min

DECOMPRESSION CABLE

1. Align:
   - "T" Mark ①
     (on the flywheel with the stationary pointer ② on the crankcase cover)

NOTE:

Be sure piston is at Top Dead Center (TDC) on compression stroke.

2. Adjust:
   - Decompression cable free play ①
     (by turning the adjuster ② in or out)

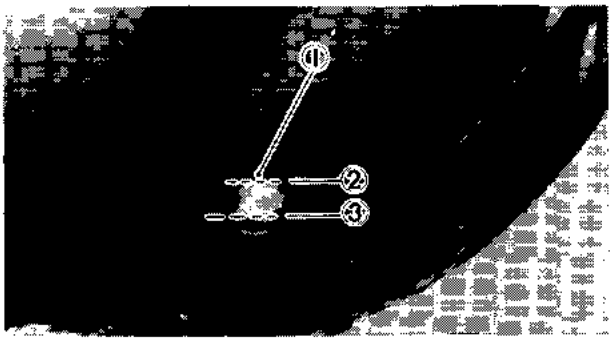
Free Play:
2~3 mm (0.08~0.12 in)

③ Locknut

ENGINE OIL

Checking

1. Start the engine and warm it up for a few minutes.
2. Hold the motorcycle in an upright position.



3. Check:
   - Oil level
     (through the level window ①)

NOTE:

Wait a few minutes untill the oil level settles before checking.

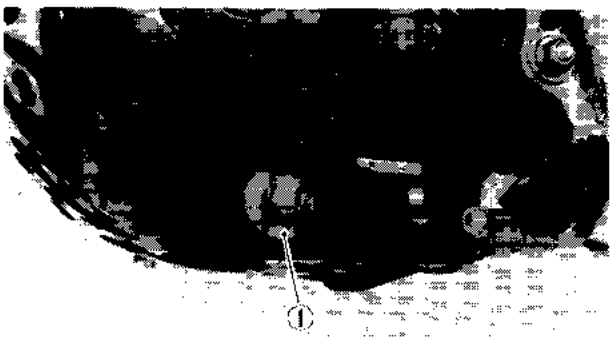
② Maximum level
③ Minimum level

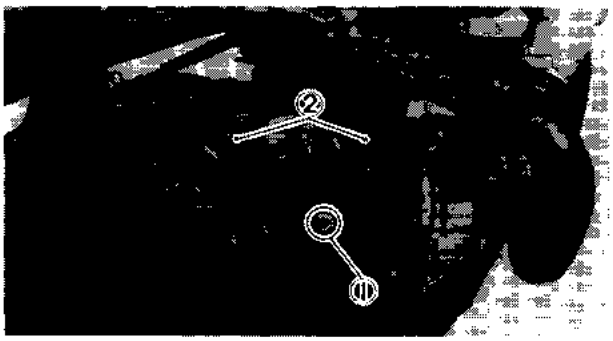
Oil and Oil Filter Replacement

1. Start the engine and warm it up for a few minutes. Place an oil pan under the engine.
2. Remove:
   - Oil filler cap
   - Drain plug ①

CAUTION:

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

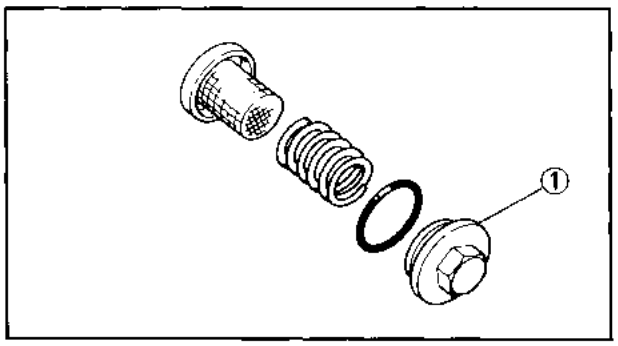




3. Remove:
   - Drain bolt ①
   - Filter cover screws ②

NOTE:

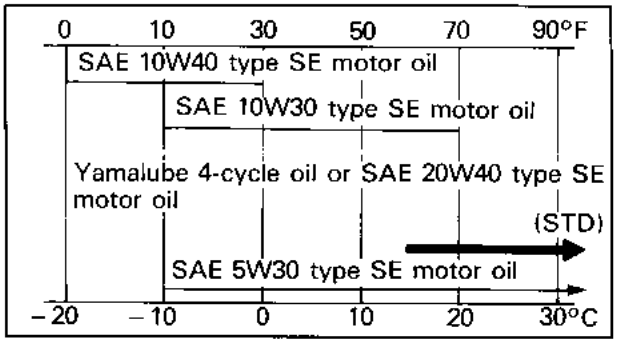
If the oil filter is not replaced, remove only drain bolt and drain the oil in the filter case.

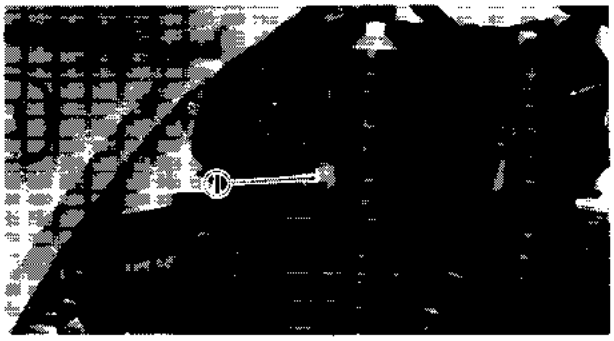


4. Install:
   - Removed parts

Drain Plug ①:
43 Nm (4.3 m•kg, 31 ft•lb)
Filter Cover Screw:
7 Nm (0.7 m•kg, 5.1 ft•lb)
Drain bolt (Filter Cover):
10 Nm (1.0 m•kg, 7.2 ft•lb)

ENGINE OIL/AIR FILTER CLEANING





5. Fill
   - Engine oil

Recommended Oil:
SAE 20W40 type SE motor oil
Periodic Oil Change:
1.0 L (0.88 Imp qt, 1.06 US qt)
With Oil Filter Change:
1.1 L (0.97 Imp qt, 1.16 US qt)

6. Install:
   - Filler cap
7. Start the engine and check oil level.

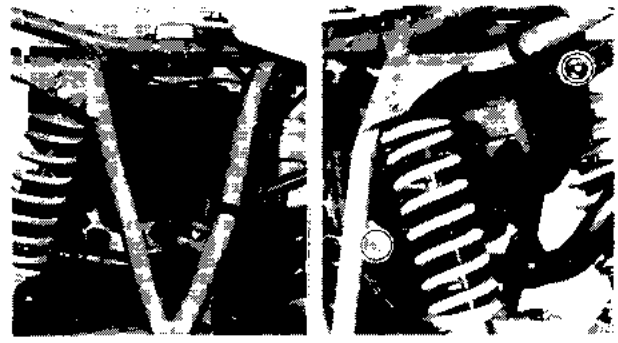
CAUTION:

After replacing the engine oil, be sure to check the oil flow as described below.

- **Slightly loosen the oil gallery bolt ① from the cylinder head.**
- **Start the engine and keep it idling until oil flows out of the check hole. If no oil comes out after a lapse of one minute, turn off the engine immediately so it will not seize.**
- **Turn the engine off, and tighten the bolt to specification.**

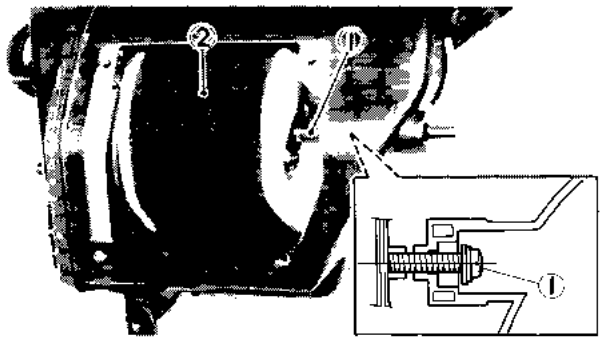
Oil Gallery Bolt:
7 Nm (0.7 m•kg, 5.1 ft•lb)

Locate and resolve the problem then recheck the oil pressure.

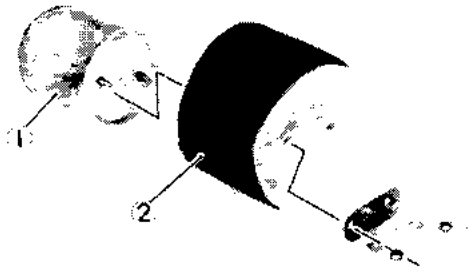


AIR FILTER CLEANING

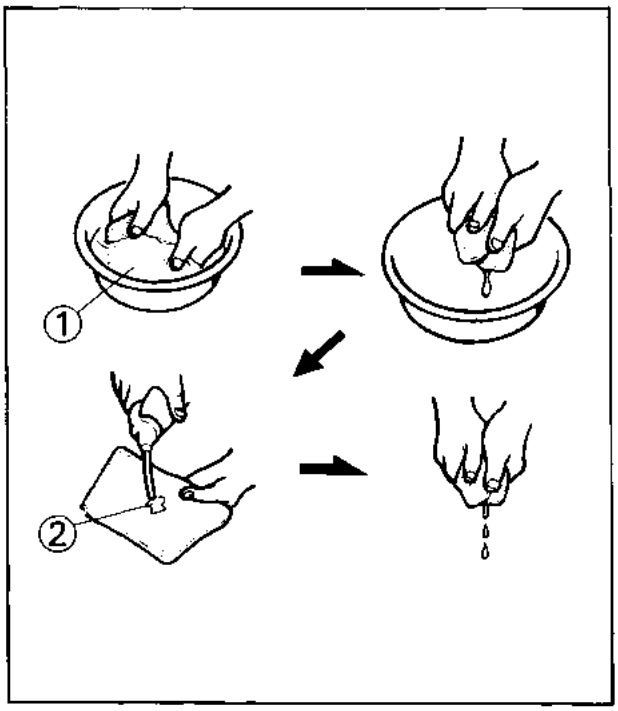
1. Remove:
   - Seat
   - Side covers
   - Air filter case assembly



2. Remove:
   - Air filter case cover
3. Loosen:
   - Air filter element holding screw ①
4. Remove:
   - Air filter element ②
     (from air filter case)



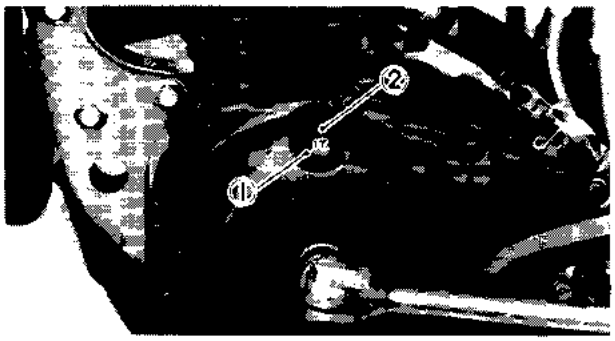
5. Remove:
   - Element guide ①
     (from air filter element ②)



Air Cleaner Element

1. Clean:
   - Air cleaner element
     Wash the element in solvent.
     Squeeze excess solvent out of the element and dry.

2. Apply:
   - A small quantity of 2-stroke engine oil
     Squeeze excess oil.

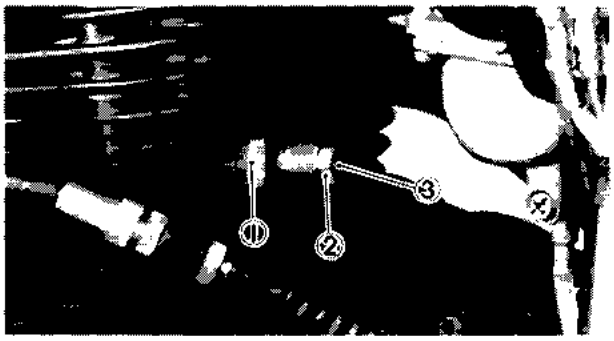


CAM CHAIN

1. Remove
   - Timing window
   - Crankshaft end cover
2. Align
   - "T" mark ①
     (on the flywheel with the stationary pointer ② on the crankcase cover)

NOTE:

Be sure piston is at Top Dead Center (TDC) on compression stroke.



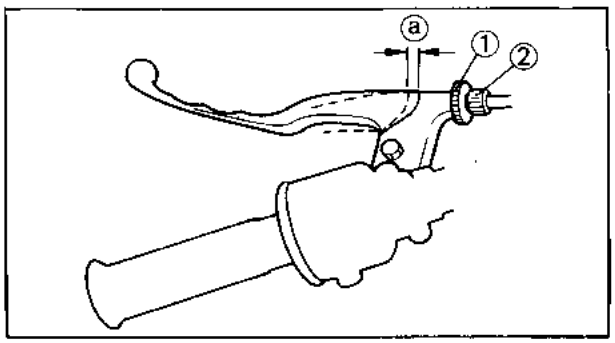
3. Remove:
   - Adjuster cap
4. Loosen
   - Adjuster locknut ①
5. Turn the adjuster ② in until the push rod ③ (inside the adjuster) is flush with the end of the adjuster.

NOTE:

Start the engine. While keeping it idling, check the movement of the push rod. If it moves slightly, the adjustment is correct. If it does not move at all, the adjuster is too tight. Loosen the adjuster so the push rod moves slightly.

6. Tighten:
   - Adjuster locknut
7. Install:
   - Adjuster cap
   - Timing window plug
   - Crackshaft end cover

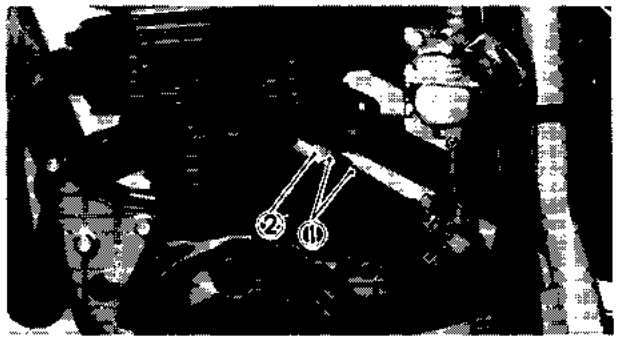
Adjuster Locknut:
30 Nm (3.0 m•kg, 22 ft•lb)
Adjuster Cap:
5 Nm (0.5 m•kg, 3.6 ft•lb)



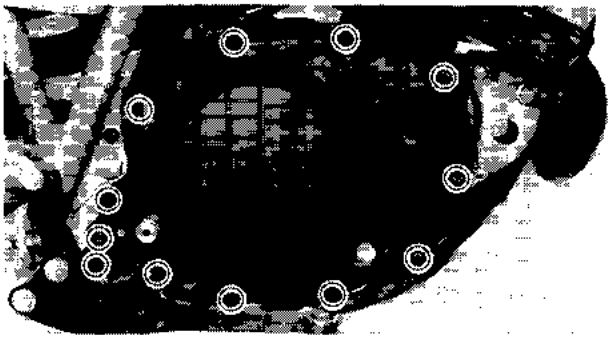
CLUTCH

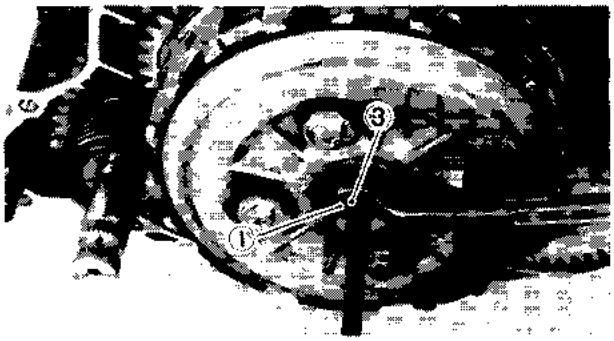
Free play adjustment

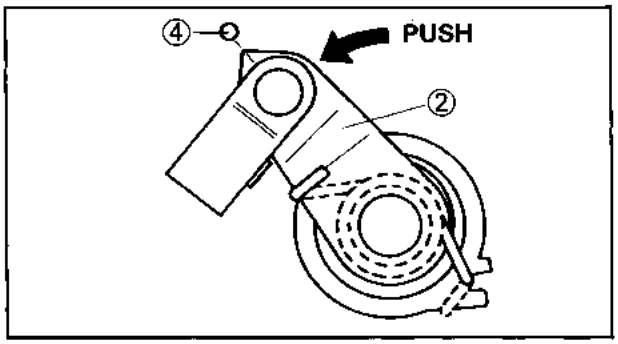
1. Loosen:
   - Locknuts ①
2. Adjust:
   - Free play ⓐ
     (by turning the adjuster ②)

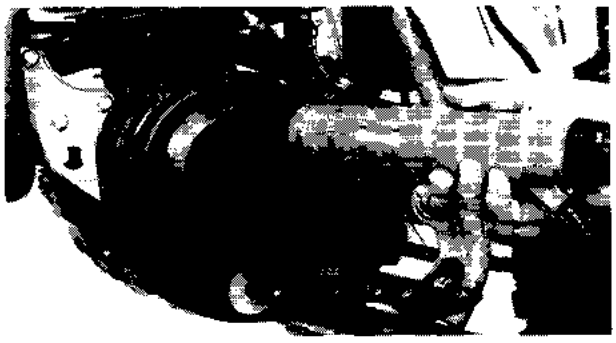


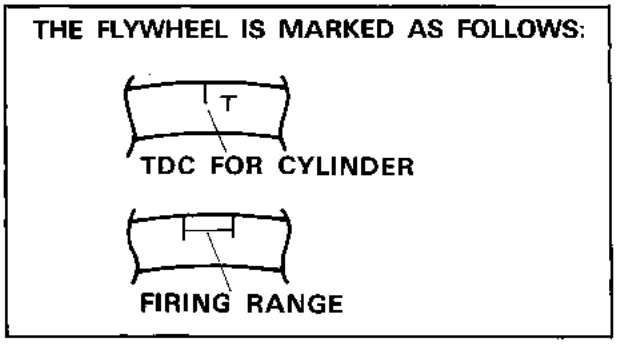
Clutch Lever Free Play:
2 ~ 3 mm (0.08 ~ 0.12 in)











Mechanism Adjustment

1. Loosen:
   - Cable adjusters (handlebar and engine side)
2. Drain:
   - Engine oil
3. Remove:
   - Kick starter lever
   - Right side crankcase cover
4. Loosen:
   - Mechanism adjuster locknut ①
5. Push the push lever ② toward the front of the engine with your finger until it stops. With the push lever in this position, turn the adjuster ③ either in or out until the push lever mark and crankcase match mark ④ are aligned. Tighten the locknut.

IGNITION TIMING

1. Remove:
   - Timing window plug
2. Check:
   - Ignition timing
     Use Timing Light (YU-08037) and Inductive Tachometer (YU-08036)

	Engine Speed: 1,350 r/min

NOTE:

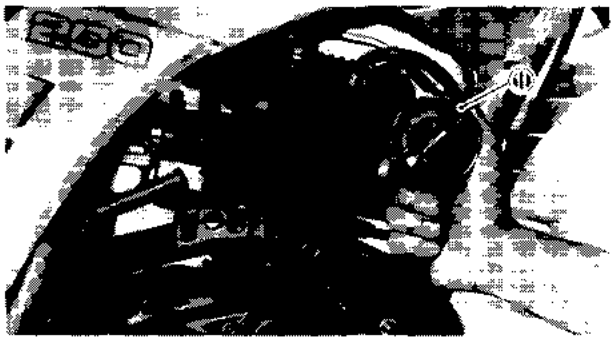
The stationary pointer (in the timing window) should be within the firing range shown on the flywheel. If the pointer is not within the range or if it is not steady, check the flywheel and/or pickup assembly for tightness and damage. (See "Chapter 6: Electrical" for further information.)

COMPRESSION PRESSURE

NOTE:

Insufficient compression pressure will result in performance loss.

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
     (See page 2-2)
2. Check:
   - Decomp lever free play.
     No free play → Adjust.
     (See page 2-3)
3. Warm up the engine.
4. Remove:
   - Spark plug



Compression Pressure Measurement Steps:

- Install the Compression Gauge (YM-33223) ① using an adapter.
- Crank over the engine with the kick starter with the throttle wide open until the compression reading on the gauge stabilizes.
- Check readings with specified levels (See chart).

Compression Pressure (at sea level):

Standard:
882 kPa (9 kg/cm^2, 128 psi)
Minimum:
785 kPa (8 kg/cm^2, 114 psi)
Maximum:
1,030 kPa (10.5 kg/cm^2, 149 psi)

WARNING:

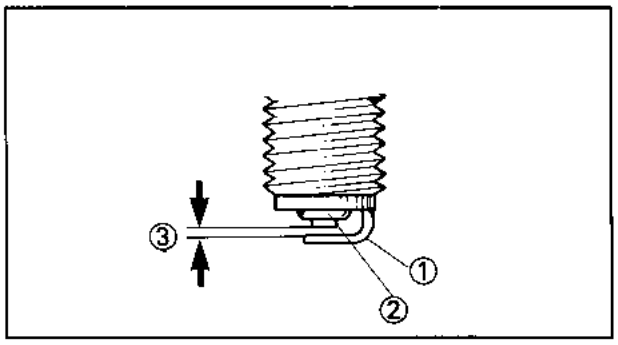
When cranking the engine, ground spark plug wire to prevent sparking.

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

Compression Pressure (with oil introduced into cylinder)	
Reading	**Diagnosis**
Higher than without oil	Worn or damaged piston
Same as without oil	Defective ring, valves, cylinder head gasket or piston is possible.
Above maximum level	Inspect cylinder head, valve surfaces, or piston crown for carbon deposits.

SPARK PLUG

1. Remove:
   - Side cover (right)
   - Spark plug cap
   - Spark plug



2. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator color ②
3. Measure:
   - Plug gap ③
     Out of specification → Regap.
     Use a Wire Gauge or Feeler Gauge.

Spark Plug Gap:
0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

Clean the plug with a spark plug cleaner if necessary.

Standard spark Plug:
D8EA (NGK)
X24ES-U (NIPPONDENSO)

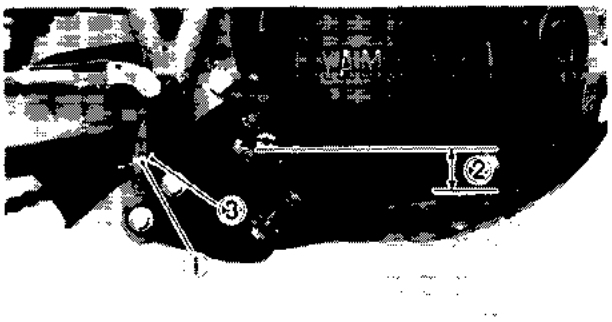
Before installing a spark plug, clean the gasket surface and plug surface.

4. Tighten:
   - Spark plug

20 Nm (2.0 m•kg, 14 ft•lb)

NOTE:

Finger-tighten the spark plug(s) before torquing to specification.



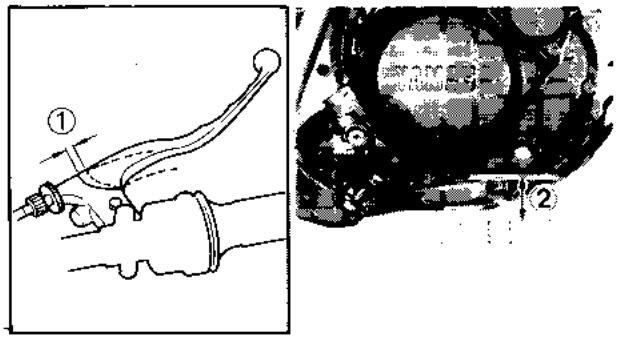
CHASSIS

FRONT AND REAR BRAKES

Rear Brake Pedal Height Adjustment

1. Loosen:
   - Adjuster locknut ①
2. Adjust:
   - Brake pedal height ②
     by turning the adjuster ③ in or out.

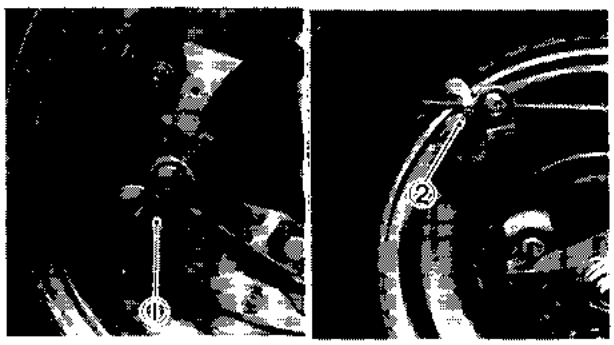
Brake Pedal Height:
10 mm (0.4 in)
Above the top of the footrest



Free Play Adjustment

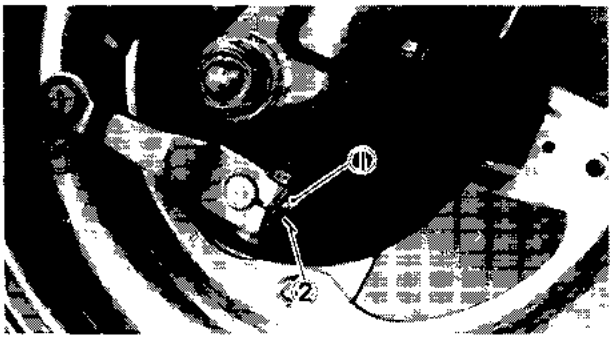
1. Check:
   - Brake lever/pedal free play
     Out of specification → Adjust

Brake Lever Free Play:
Front ①:
3 ~ 7 mm (0.1 ~ 0.3 in)
Rear ②:
20 ~ 30 mm (0.8 ~ 1.2 in)



2. Adjust:
   - Brake lever/pedal free play
     (by turning the adjuster in or out)

① Front brake adjuster
② Rear brake adjuster



Brake Lining Inspection

1. See the wear indicator ① position while applying the brake.
   Indicator reaches to the wear limit line ②
   → Replace.

NOTE:

For the rear brake lining inspection, it is necessary to remove the rear wheel. See Chapter 5.

TIRES

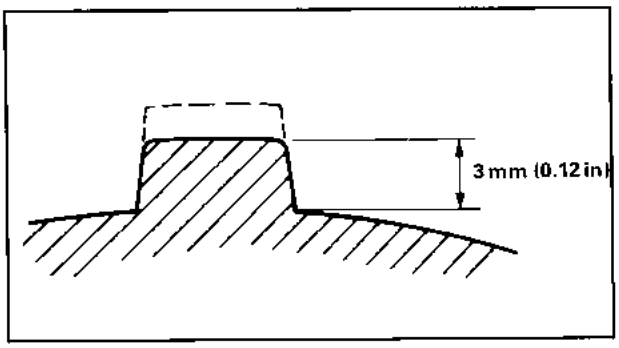
1. Measure:
   - Air pressure
     Use an air gauge

Reference tire pressure: (Front and Rear)
29.4 kPa (0.3 kg/cm², 4.3 psi)
Minimum tire pressure:
11.8 kPa (0.12 kg/cm², 1.8 psi)

WARNING:

This model is euipped with low pressure tires. Pay attention to the following points:
Recommended tire pressure:
29.4 kPa (0.3 kg/cm², 4.3 psi)
Vehicle load limit: 100 kg (220 lb)
Tire size: Front 25.0×8—12
Rear 23.0×12—9

1. **Excessive tire pressure (over 137 kPa 1.4 kg/cm², 20 psi)) may cause tire to burst. Inflate tires very slowly. Fast inflation could cause tire to burst.**
2. **Too low a pressure (below 11.8 kPa (0.12 kg/cm², 1.8 psi)) will cause the rim to dislodge from the tire.**
3. **Set tire pressures cold.**



WARNING:

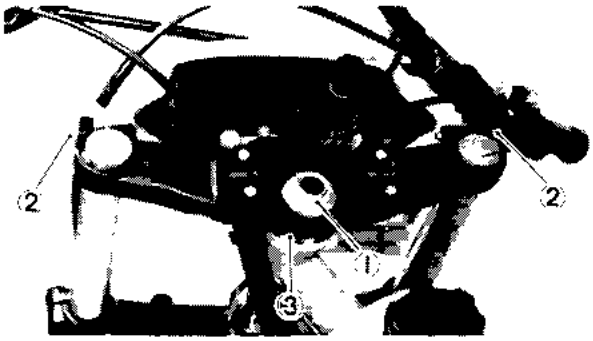
If a tire is cracked, damaged or abnormally worn, replace it. If a tire is imbedded with pebbles or metal pieces, remove them.

Tire Wear Limit:
3 mm (0.12 in)

STEERING HEAD ADJUSTMENT

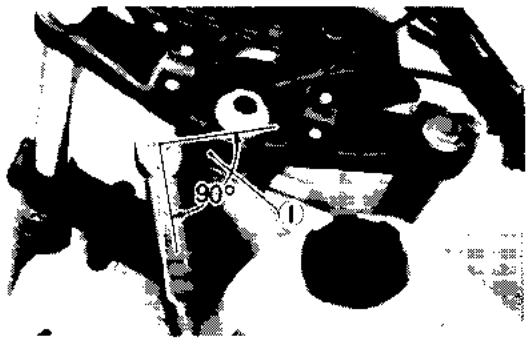
Steering Head Inspection

1. Place the motorcycle on a proper stand, then elevate the front wheel.
2. Check:
   - Steering assembly bearings
     Grasp the bottom of the forks and gently rock the fork assembly back and forth.
     Looseness → Adjust steering head.



Steering Head Adjustment

1. Remove:
   - Handlebar assembly
2. Loosen:
   - Steering shaft nut ①
   - Inner tube pinch bolts ②



3. Tighten:
   - Ring nut
     Use Ring Nut Wrench (YU-33975) ①

Tightening Steps:
Using the steering nut wrench as shown, tighten the nut with specified torque shown below, and back it out 1/3 or 1/4 turn.

Ring Nut Tightening Torque:
38 Nm (3.8 m · kg, 27 ft · lb)

NOTE:
- The nut should be installed with the beveled side facing downward.
- The nut should be tightened so that the front forks can be turned smoothly, but not too loosely.

4. Tighten:
   - Steering shaft nut
   - Inner tube pinch bolts
   - Handlebar assembly

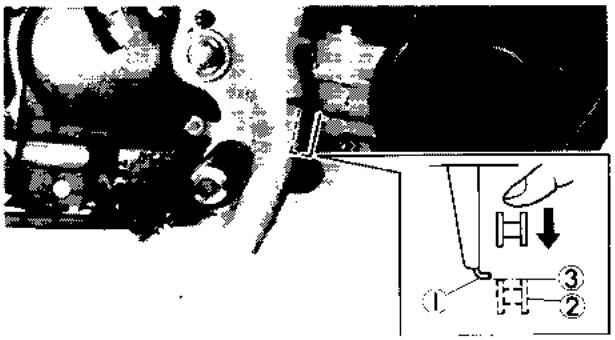
Steering Shaft Nut:
85 Nm (8.5 m•kg, 61 ft•lb)
Handlebar:
20 Nm (2.0 m•kg, 14 ft•lb)
Inner Tube Pinch Bolt:
20 Nm (2.0 m•kg, 14 ft•lb)

DRIVE CHAIN

Slack Check

NOTE:

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

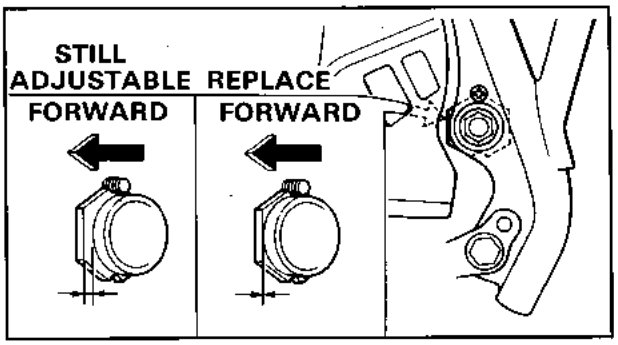


(Primary)

1. Hold the motorcycle in an upright position.
2. Check:
   - Slack

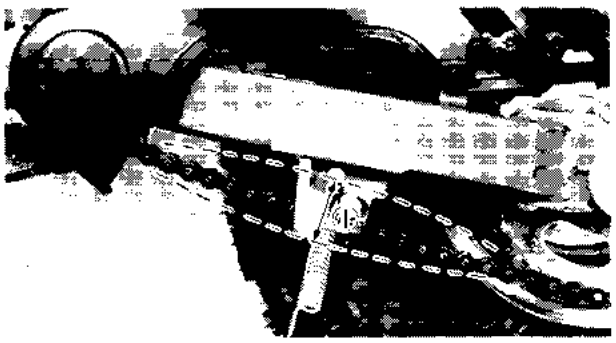
   Push the chain ② downward by the fingers. If the chain top is in line with the indicator ①, adjust or replace the chain as required.

③ Limit



NOTE:

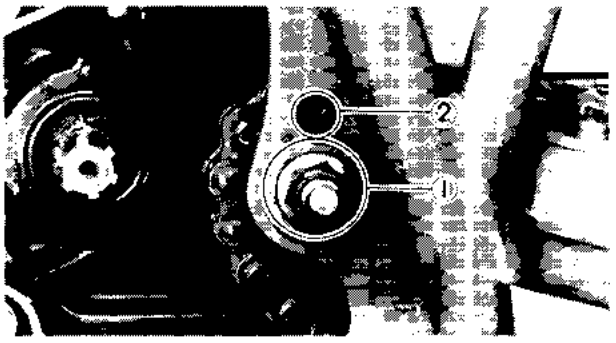
The primary drive chain slack can be adjusted only once. If the chain is slack again after the adjusted, replace the chain and sprockets.



(Secondary)

1. Check:
   - Slack ①

20 ~ 40 mm (0.8 ~ 1.6 in)

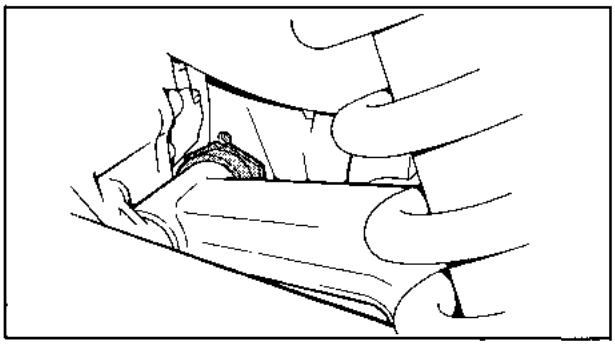


Slack Adjustment

(Primary)

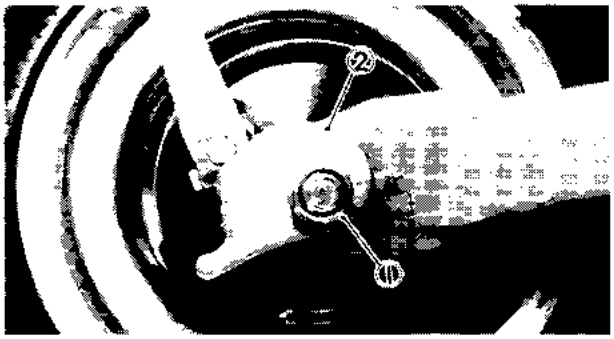
1. Loosen:
   - Pivot shaft nut ①
2. Remove:
   - Stopper screws ②

DRIVE CHAIN



3. Use the special tool (included in the owner's tool kit) and turn both adjusting nuts (thrust covers) halfway in either direction so the adjusting nut cut can be in line with the screw hole.
4. Install:
   - Stopper screws
5. Tighten:
   - Pivot shaft nut

Pivot Shaft:
80 Nm (8.0 m•kg, 58 ft•lb)



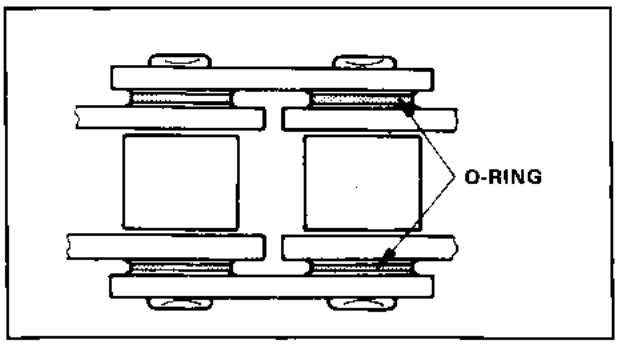
(Secondary)

1. Loosen:
   - Axle nut ①
2. Turn the chain puller ② both left and right until axle is situated in same puller slot position on each side.

3. Tighten:
   - Axle nut

Axle Nut:
85 Nm (8.5 m•kg, 61 ft•lb)

4. Adjust:
   - Brake pedal free play



Cleaning and lubrication

CAUTION:

<Primary drive chain only>
This machine has a drive chain with small rubber O-rings between the chain plates. Steam cleaning, high-pressure washes, and certain solvent can damage these O-rings. Use only kerosene to clean the drive

chain. Wipe it dry, and thoroughly lubricate it with SAE 30~50W motor oil. Do not use any other lubricants on the drive chain. They may contain solvents that could damage the O-rings.

Recommended Lubricant:
Primary: SAE 30~50W motor oil
Secondary: Yamaha chain and cable lube or SAE 10W30 motor oil

MIDDLE SPROCKETS SHAFT

Using a grease pump, grease the middle sprockets shaft till a little grease leak out from oil seal lip.

Lithium-soap Base Grease

CABLE INSPECTION AND LUBRICATION

Cable Inspection and Lubrication Steps:

- Remove the two screws that secure throttle housing to handlebar.
- Hold cable end high and apply several drops of lubricant to cable.
- Coat metal surface of disassembled throttle twist grip with suitable all-purpose grease to minimize friction.
- Check for damage to cable insulation. Replace any corroded or obstructed cables.
- Lubricate any cables that do not operate smoothly.

BRAKE PEDAL/BRAKE AND CLUTCH LEVERS/ SIDESTAND/FRONT FORK OIL CHANGE

SAE 10W30 Type SE Motor Oil

BRAKE PEDAL/BRAKE AND CLUTCH LEVERS

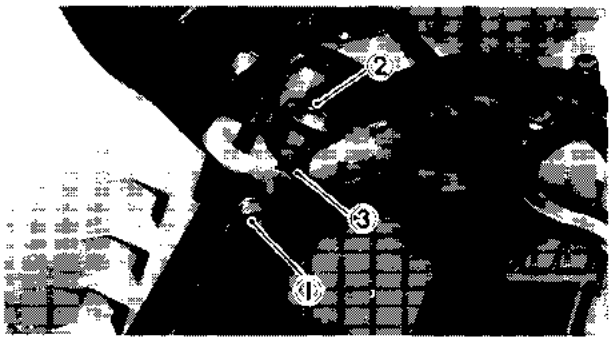
Lubricate pivoting parts of each lever and pedal.

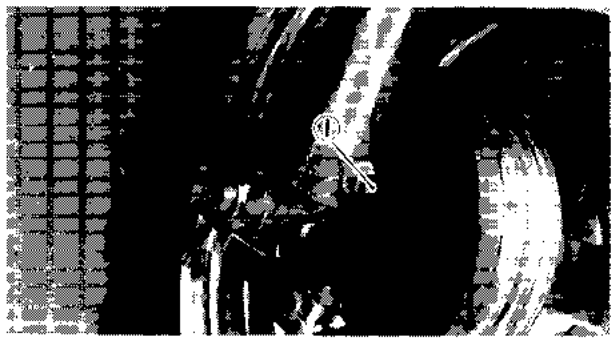
SAE 10W30 Type SE Motor Oil

SIDESTAND

Lubricate sidestand at their pivot point.

SAE 10W30 Type SE Motor Oil





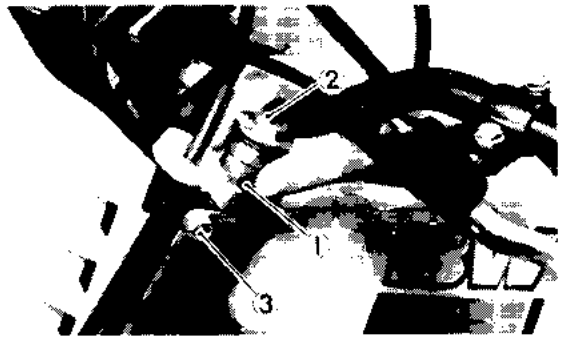
FRONT FORK OIL CHANGE

1. Elevate the front wheel by placing a suitable stand under the engine.
2. Loosen:
   - Front fork pinch bolt ①
3. Remove:
   - Cap bolt ②
   - Spacer ③
4. Place an open container under the drain hole.
5. Remove:
   - Drain screw ①
6. Slowly raise and lower the inner tube to pump out the oil.
7. Install:
   - Drain screw

Drain Screw:
2 Nm (0.2 m·kg, 1.4 ft·lb)

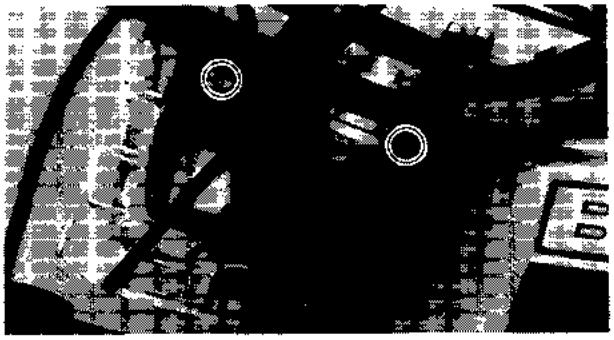
8. Fill:
   - Front fork

Recommended Fork Oil:
Yamaha Fork Oil 10wt
Capacity:
272 cm³ (9.59 Imp oz, 9.20 US oz)
Oil Level:
140 mm (5.51 in)



9. Install:
   - Spacer ①
   - Cap bolt ②
10. Tighten:
   - Pinch bolt ③

Cap Bolt:
23 Nm (2.3 m•kg, 17 ft•lb)
Pinch Bolt:
20 Nm (2.0 m•kg, 14 ft•lb)

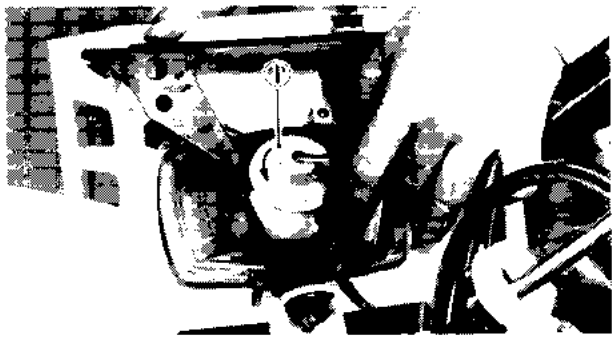


ELECTRICAL

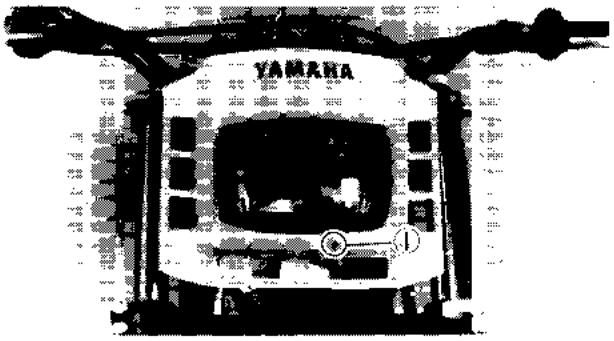
HEADLIGHT

Headlight Bulb Replacement

1. Remove:
   - Headlight assembly



3. Remove:
   - Bulb
     Turn the bulb holder ① counterclockwise to release bulb.
4. Install:
   - Bulb (New)
     Secure the new bulb with the bulb holder.
   - Headlight cover assembly



Headlight Beam Adjustment

1. Adjust:
   - Headlight
     (Vertically)

Vertical Adjustment	
Higher	Turn the adjusting screw ① clockwise
Lower	Turn the adjusting screw ① counterclockwise

CHAPTER 3.
ENGINE OVERHAUL

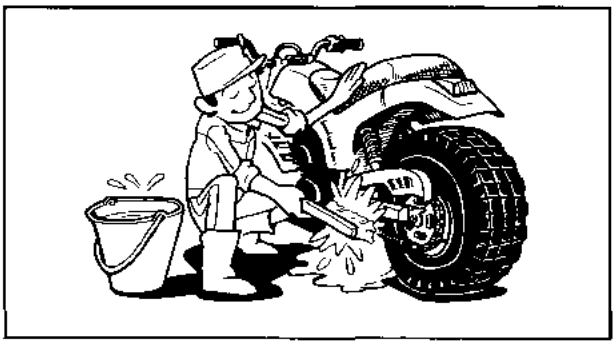
ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

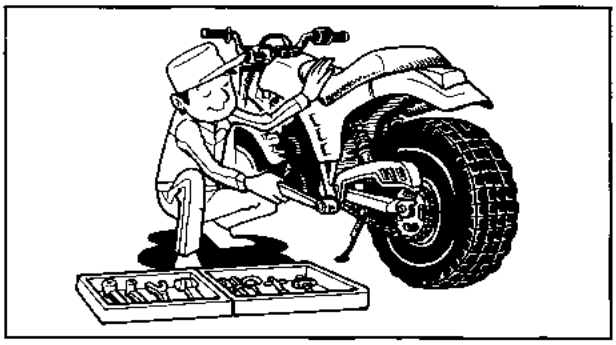
It is not necessary to remove the engine in order to remove the following components:

- Clutch/Primary drive gear
- Kick starter
- Shift shaft
- Flywheel magneto



PREPARATION FOR REMOVAL

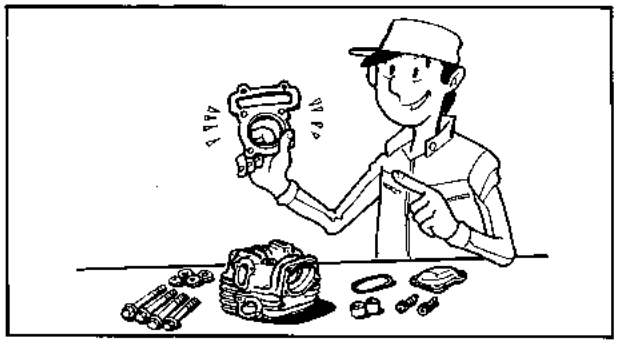
1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.



2. Use proper tools and cleaning equipment. Refer to chapter 1 "SPECIAL TOOL"

NOTE:

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

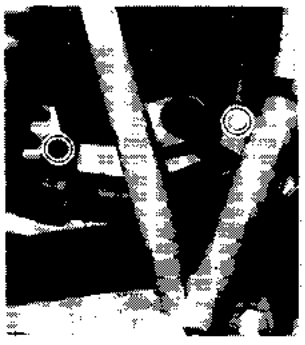


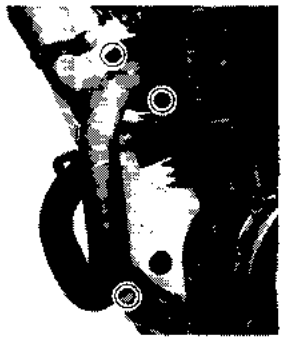
3. During engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.

4. Drain:
   - Engine oil

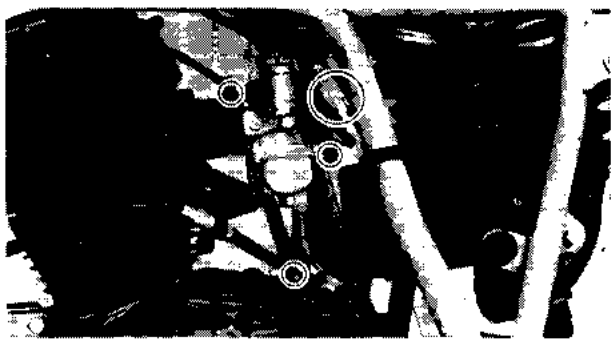
REMOVAL

1. Remove:
   - Side covers
   - Seat
2. Disconnect:
   - Fuel pipe
3. Remove:
   - Fuel tank



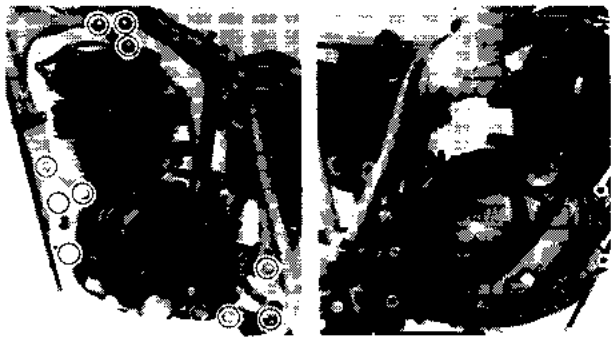


4. Remove:
   - Exhaust pipe (without muffler body)
   - Spark plug cap
   - Engine guard



5. Remove:
   - Carburetor
6. Disconnect
   - Clutch cable
   - Crankcase ventilation hose
   - Electrical lead wires

7. Remove:
   - Shift pedal
   - Sprocket cover
   - Drive sprocket



8. Remove:
   - Engine mounting bolts
   - Left footrest
   - Engine
     (from the right side of frame)

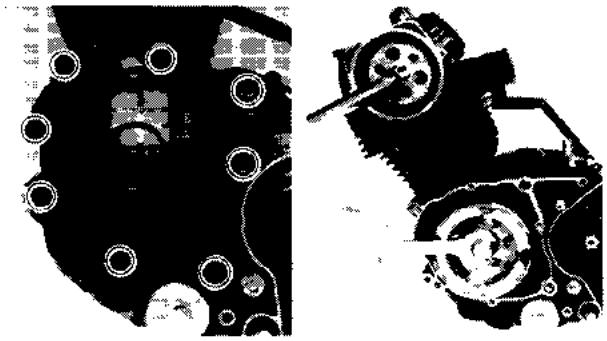
NOTE:
The engine and rear arm are installed using the same pivot shaft. Therefore, take care so that the pivot shaft is pulled, not entirely out, but for enough to set the engine free.

DISASSEMBLY

CYLINDER HEAD, CYLINDER AND PISTON

1. Disconnect:
   Decomp wire

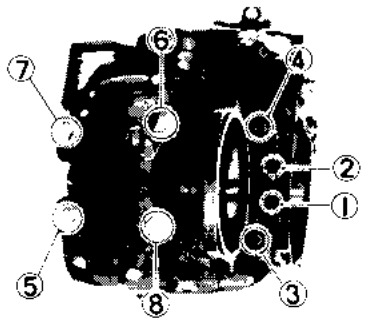
2. Remove:
   - Cam chain tensioner assembly ①



3. Remove:
   - Cam sprocket cover
   - Left crankcase cover
   - Cam sprocket holding bolt

NOTE:
Hold the flywheel securing bolt to remove cam sprocket bolt.

   - Cam sprocket



4. Remove:
   Cylinder head bolts

NOTE:

Loosen the bolts in the order indicated in the photo.

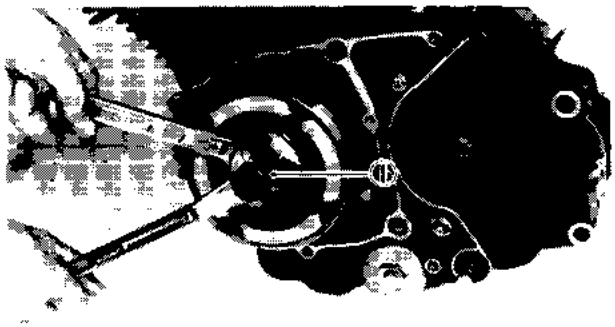
- Cylinder head
- Cylinder
- Cam chain guide #1

5. Remove:
   - Piston pin clip

NOTE:

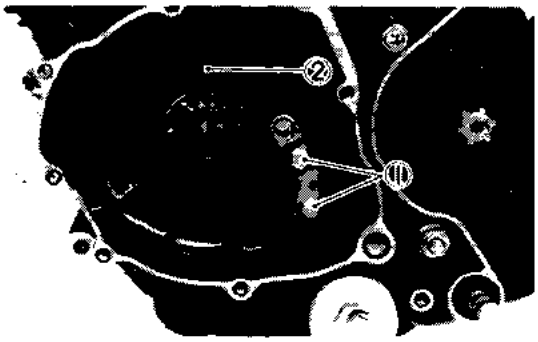
Cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.

- Piston pin
- Piston



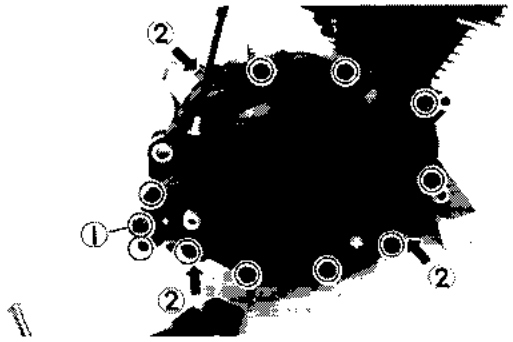
FLYWHEEL MAGNETO

1. Romove:
   - Flywheel securing bolt
   - Flywheel
     Use Rotor Puller (YU-01080)①



2. Romove:
   - Woodruff key
   - Cam chain guide #2①
   - Cam chain②

DISASSEMBLY

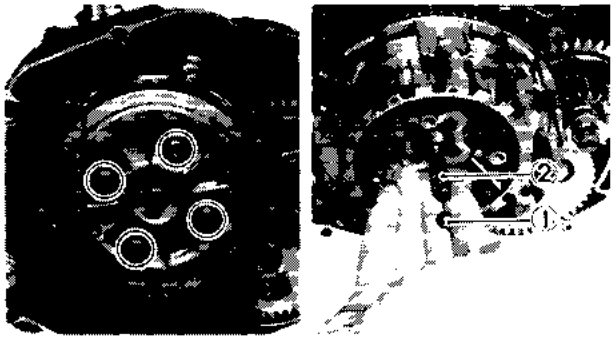


CLUTCH

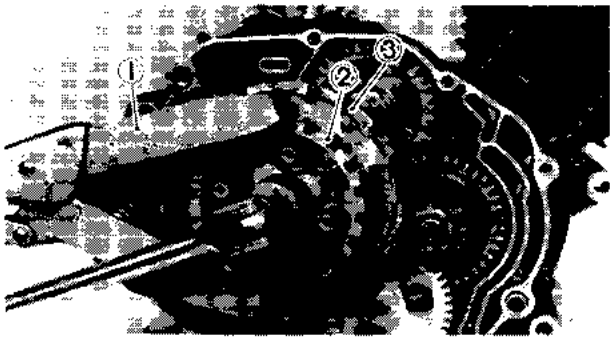
1. Remove:
   - Kick crank
   - Decomp lever ①
   - Right crankcase cover

NOTE:

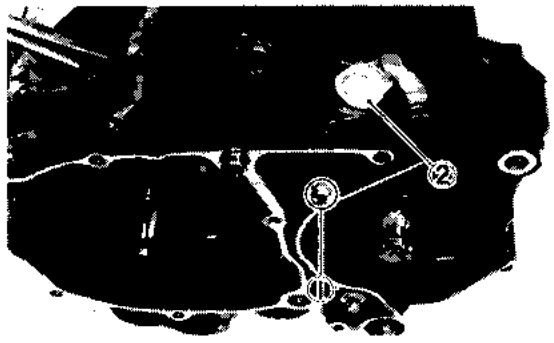
For this removal, slits ② in the crankcase can be used as shown.



2. Remove:
   - Clutch spring holding screws
   - Pressure plate
   - Clutch plates/Friction plates
   - Ball ①
   - Push rod ②

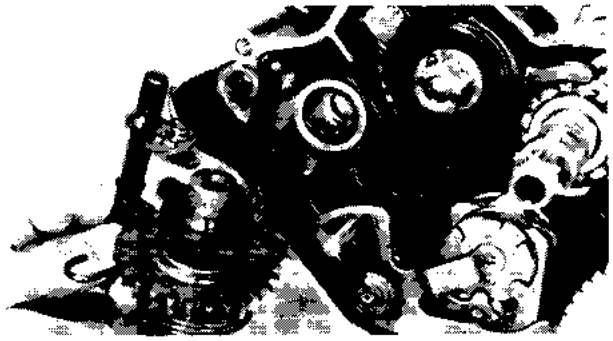


3. Remove:
   - Locknut
   - Lock washer
     Use Clutch Boss Holder (YM-91042) ① to hold clutch boss.
   - Clutch boss ②
   - Clutch housing ③

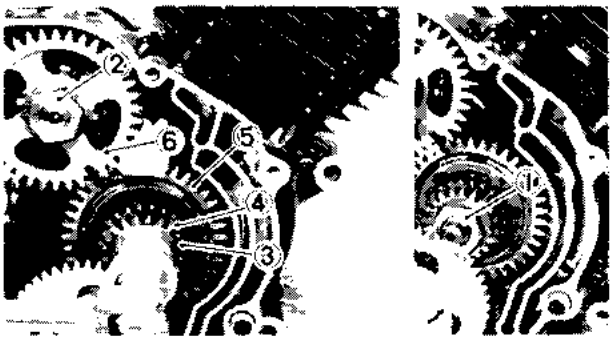


4. Remove:
   - Set screw ①
   - Push lever ②

KICK STARTER



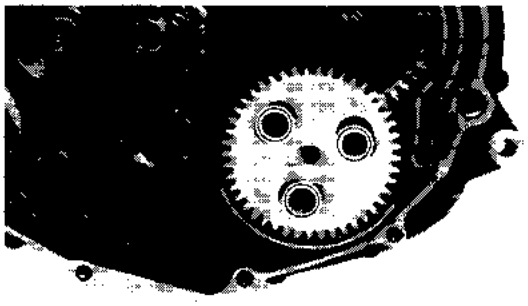
1. Remove:
   - Kick axle assembly
   - Decomp lever shaft
   - Kick idle gear



PRIMARY DRIVE GEAR AND BALANCER DRIVEN GEAR

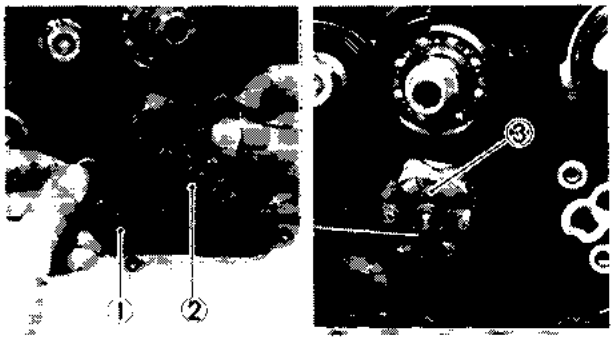
1. Loosen
   - Prmary drive gear securing nut ①
   - Balancer gear securing nut ②
     (Place a folded rag between the teeth of the balancer drive gear and driven gear to lock them.)

2. Remove:
   - Oil pump drive gear ③
   - Primary drive gear ④
   - Balancer drive gear ⑤
   - Balancer driven gear ⑥



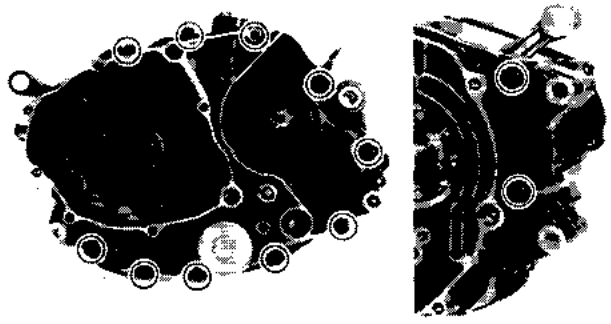
OIL PUMP

1. Remove:
   - Oil pump assembly



SHIFT SHAFT

1. Remove:
   - Shift shaft assembly ①
   - Stopper lever ②
   - Segment ③

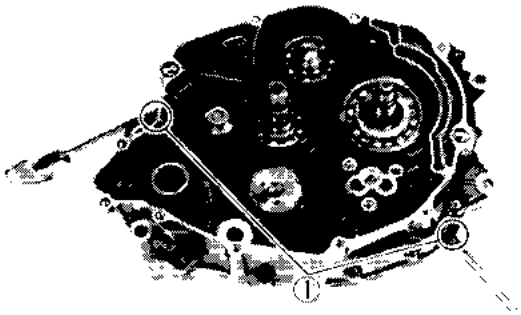


CRANKCASE

1. Remove:
   - Crankcase securing screws

NOTE:

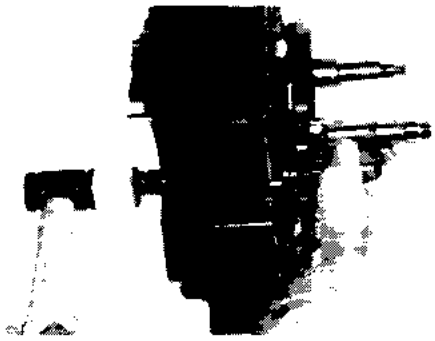
Working in a crisscross pattern, loosen all screws 1/4 turn each. Remove them after all are loosened.



2. Remove:
   - Right crankcase

NOTE:

For this removal, slits ① in the crankcase can be used as shown.

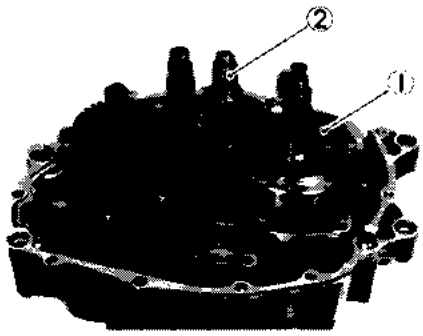


TRANSMISSION, CRANKSHAFT AND BALANCER

1. Remove:
   - Transmission
   - Shift forks
   - Shift cam

NOTE:

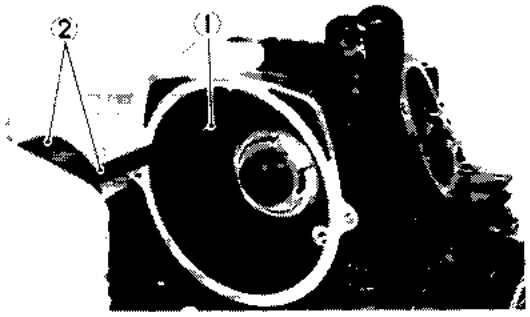
Tap lightly on drive shaft with a soft hammer.

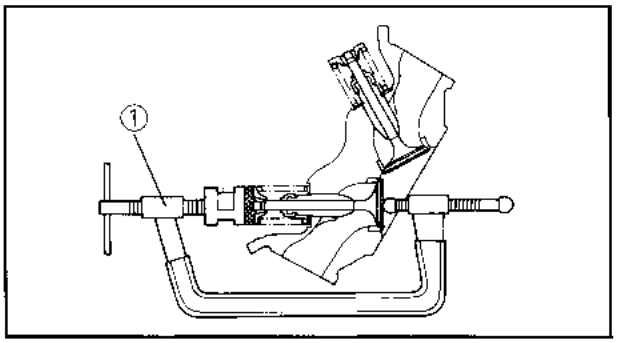


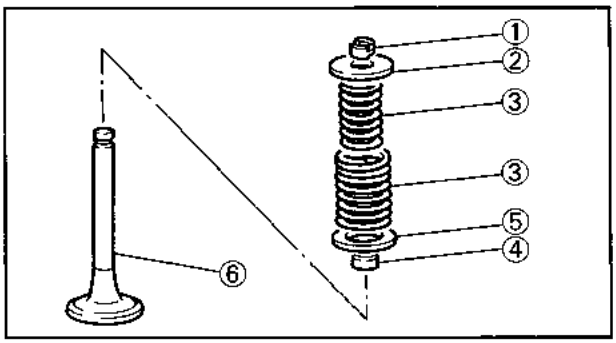
2. Remove:
   - Crankshaft ①
   - Balancer ②

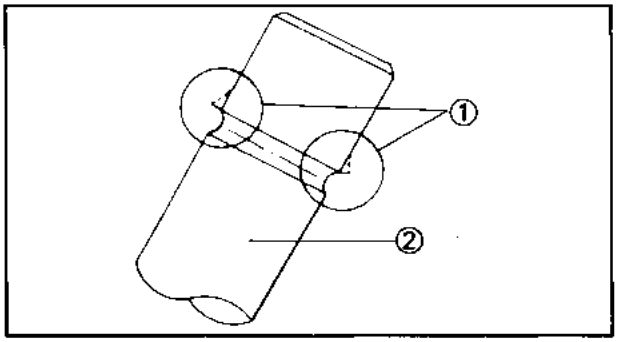
NOTE:

Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.









INSPECTION AND REPAIR

CYLINDER HEAD

1. Remove:
   - Tappet covers
   - Bearing stopper plate
2. Remove:
   - Rocker arm shaft ①
     Use 6 mm (0.24 in) screw ② or Slide Hammer (YU-01083-A)
   - Rocker arm
   - Camshaft
     Use 10mm (0.39 in) bolt
3. Attach:
   - Valve Spring Compressor (YM-04019) ①
4. Remove:
   - Valve retainers ①
   - Valve spring seat ②
   - Valve springs ③
   - Oil seal ④
   - Valve spring seat ⑤
   - Valve ⑥

NOTE:

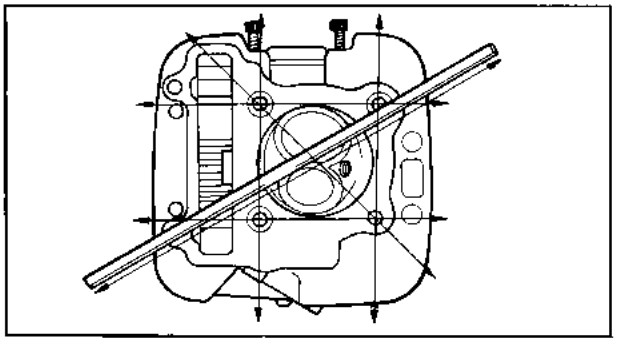
Deburr any deformed valve stem end. Use an oil stone to smooth the stem end.

① Deburr
② Valve stem

5. Eliminate:
   - Carbon deposit
     Use rounded scraper

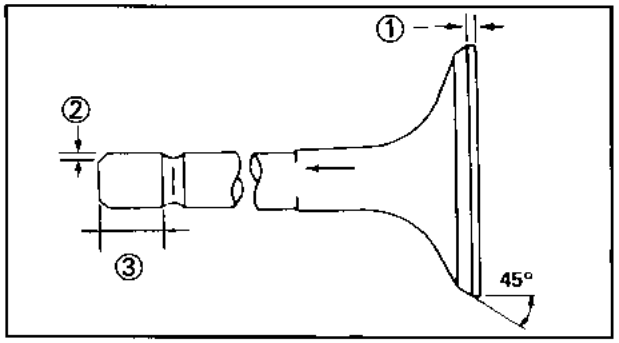
NOTE:

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



6. Measure:
   - Cylinder head warpage
     Under specification → Resurface.
     Over specification → Replace.

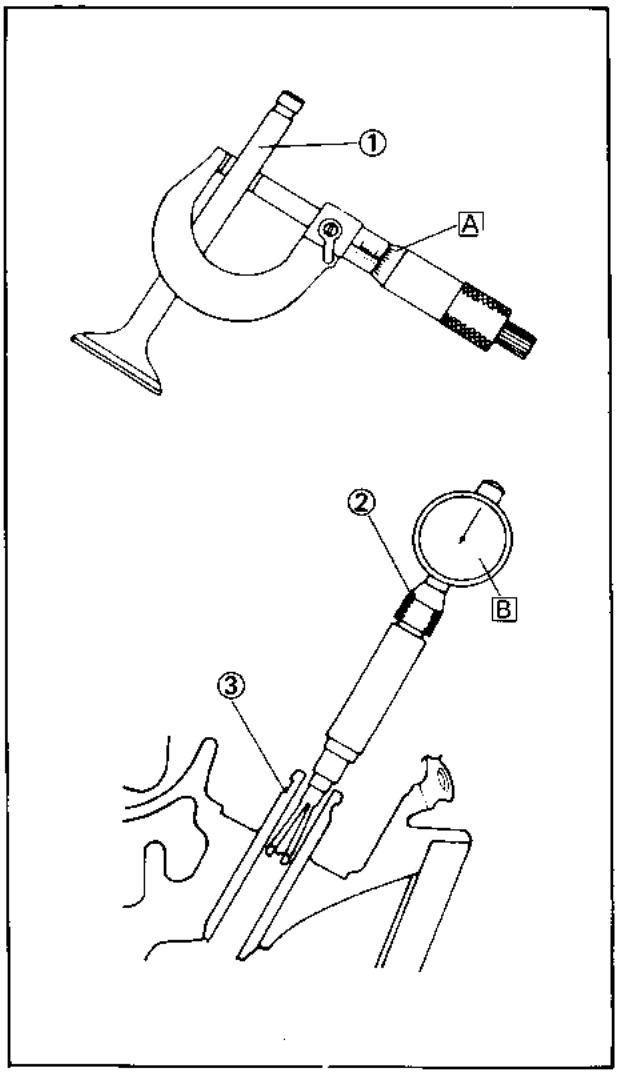
Less than 0.05 mm (0.002 in)



VALVE, VALVE GUIDE, VALVE SEAT AND VALVE SPRING

Intake and Exhaust Valve

1. Inspect:
   - Valve face
   - Stem end
     Wear/Pitting/Out of specification → Replace.



Margin Thickness ①:
1.0 ± 0.2 mm (0.039 ± 0.008 in)
Beveled ②: 0.5 mm (0.020 in)
Minimum Length (Service limit) ③:
4.0 mm (0.157 in)

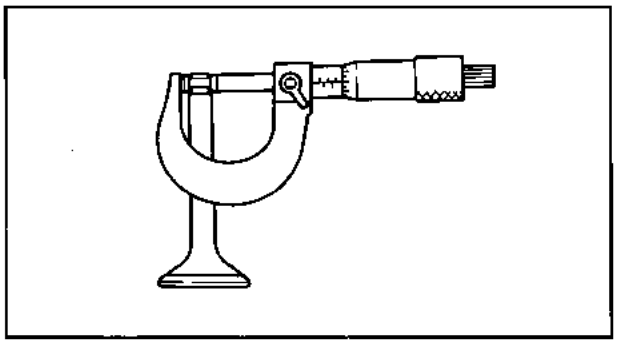
2. Measure:
   - Valve stem clearance (cold)
     Out of specification → Replace either valve and/or guide.

	Valve stem clearance	Maximum
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.10 mm (0.0039 in)

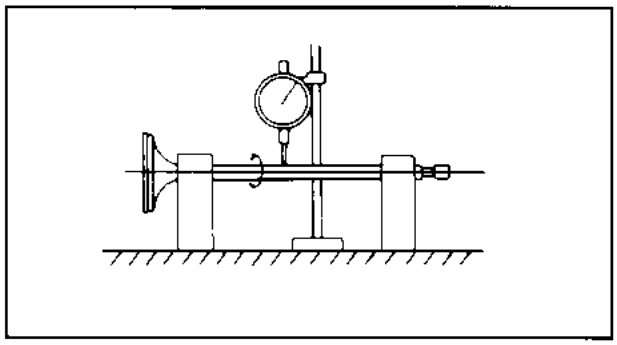
Valve clearance = [B] − [A]

① Valve
② Bore gauge
③ Valve guide

[A] Valve stem outside diameter
[B] Valve guide inside diameter



3. Inspect:
   - Valve stem end
     Mushroom shape/Larger diameter than rest of stem → Replace valve, valve guide, and oil seal.



4. Measure:
   - Valve stem runout
     Out of specification → Replace.

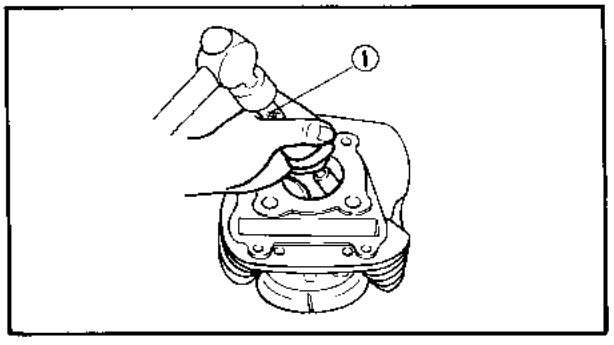
Maximum Runout:
0.03 mm (0.0012 in)

Valve Guide

NOTE:

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

1. Inspect:
   - Valve guide
     Wear/Oil leakage into cylinder → Replace.

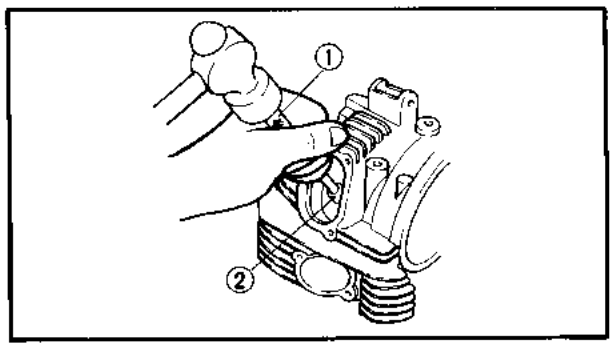


Valve Guide Removal

NOTE:

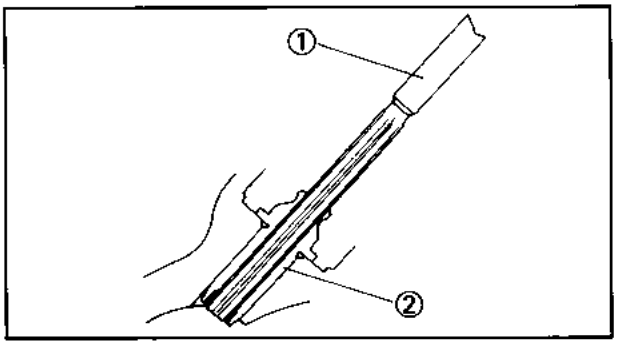
- Heat the head in an oven to 100°C (212°F) to ease guide removal and installation and to maintain correct interference fit.

1. Remove:
   - Valve guide
     Use Valve Guide Remover (YM-04064) ①



Valve Guide Installation

1. Install:
   - Valve guide (Oversize)
     Use Valve Guide Remover (YM-04064) ① with Valve Guide Installer (YM-04065) ②

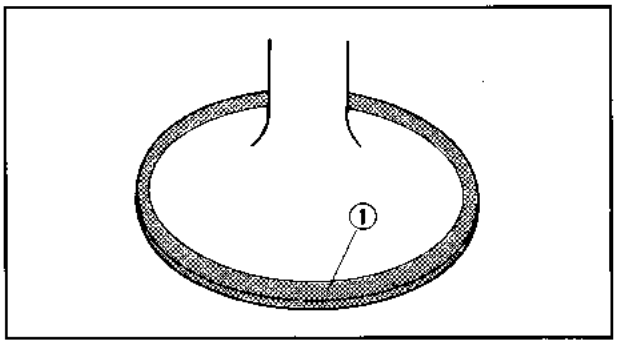


NOTE:

After installing valve guide:

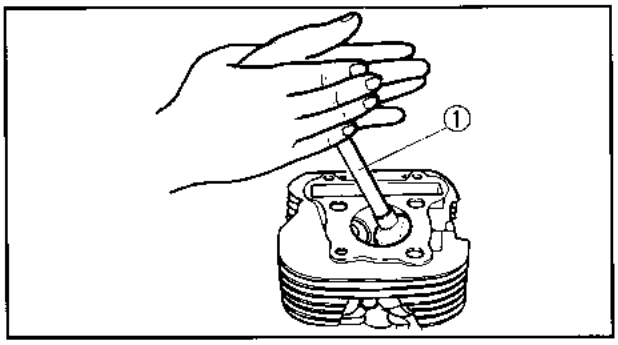
- Use 6 mm (0.24 in) Valve Guide Reamer (YM-04066) ① to obtain proper valve guide/valve stem clearance.
- Recut the the valve seat.

② Valve guide

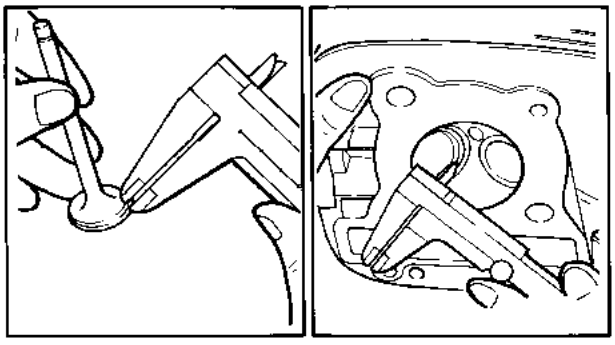


Valve Seat

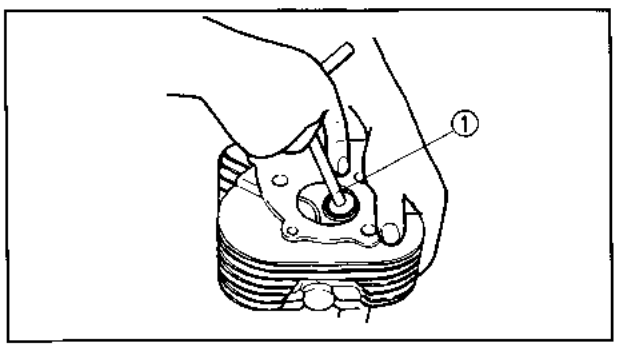
1. Remove:
   - Carbon
     (from valve seat and valveface)
2. Apply:
   - Mechanics bluing dye (Dykem) ①
     (to valve face)



3. Insert:
   - Valves
     (to cylinder head)
     Lap the valve to the seat by rotating the lapping stick ① in both directions.
4. Remave:
   - Valves
5. Measure:
   - Valve face/Valve seat contact surface.
     Wherever valve seat and valve face made contact, bluing will have been removed.
     Out of specification/Pitting/Variation of valve seat width→Cut valve seat further.



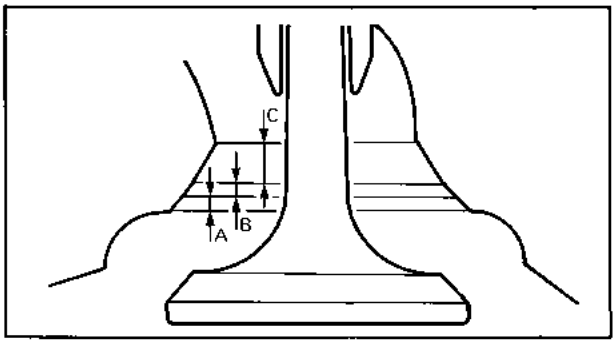
Seat Width:
Std: 1.0±0.1 mm
(0.039±0.0039 in)
Limit: 1.6 mm (0.063 in)



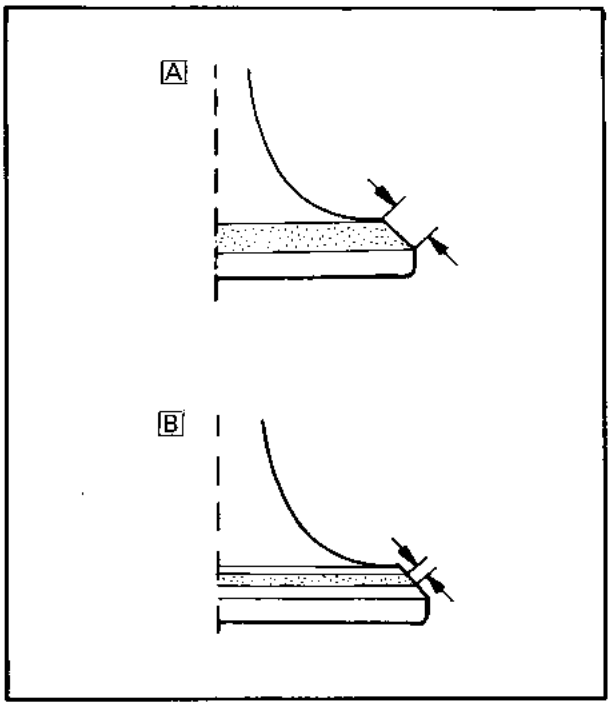
6. Resurface:
   - Valve Seats
     Use a 30°, 45° and 60° Valve Seat Cutter/YM-91043) ①

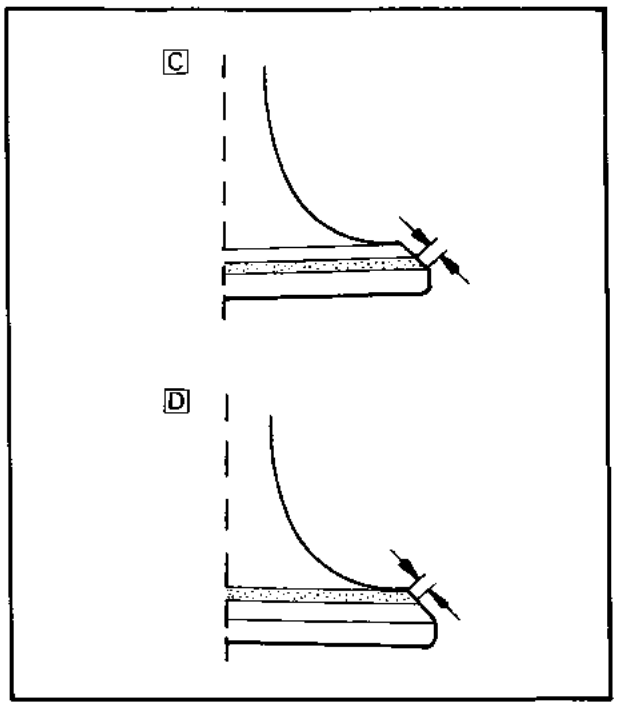
CAUTION:

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



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





Valve Seat Recutting Steps:

- Valve seat is uniform around perimeter of valve face but too wide or not centered on valve face.

Valve Seat Cutter Set		Desired Result
Use either	30° cutter	To center the seat or to reduce its width
	45° cutter	
	60° cutter	

- Valve face indicates that valve seat is centered on valve face but is too wide (see "A" diagram).

Valve Seat Cutter Set		Desired Result
Use lightly	30° cutter	To reduce valve seat width to 1.0 mm (0.039 in)
	60° cutter	

- Valve seat is in the middle of the valve face but too narrow (see "B" diagram).

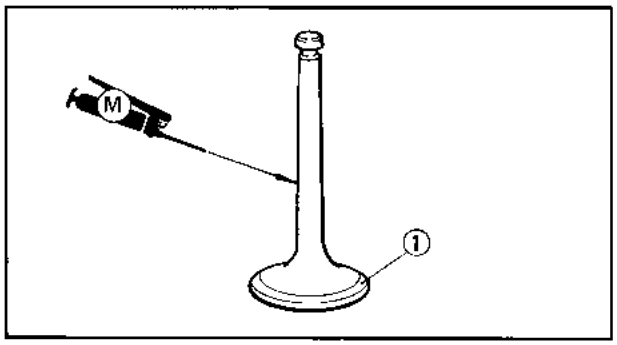
Valve Seat Cutter Set		Desired Result
Use	45° cutter	To achieve a uniform valve seat width of 1.0 mm (0.039 in)

- Valve seat is too narrow and right up near vaive margin (see "C" diagram).

Valve Seat Cutter Set		Desired Result
Use	30° cutter, first	To center the seat and to achieve its width of 1.0 mm (0.039 in)
	45° cutter	

- Valve seat is too narrow and is located down near the bottom edge of the valve face (see diagram "D").

Valve Seat Cutter Set		Desired reslut
Use	60° cutter, first	To center the seat and increase its width
	45° cutter	



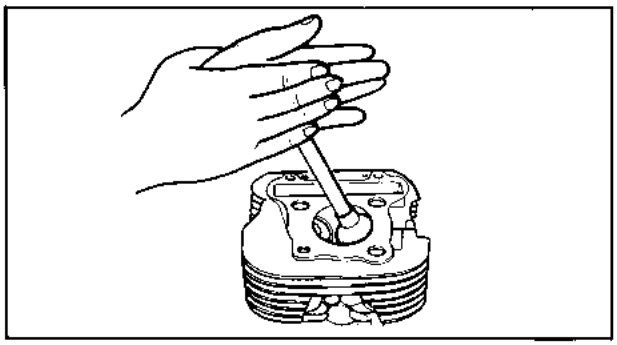
Valve/Valve Seat Assembly Lapping

1. Apply:
   - Coarse lapping compound (small amount) (to valve face①)
   - Molybdenum disulfide oil (to valve stem)

CAUTION:

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

2. Position:
   - Valve (in cylinder head)



3. Rotate:
   - Valve

   Turn until valve and valve seat are evenly polished, then clean off all compound.

NOTE:

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

4. Apply:
   - Fine lapping compound (small amount) (to valve face)
5. Repeat steps 2 and 3.

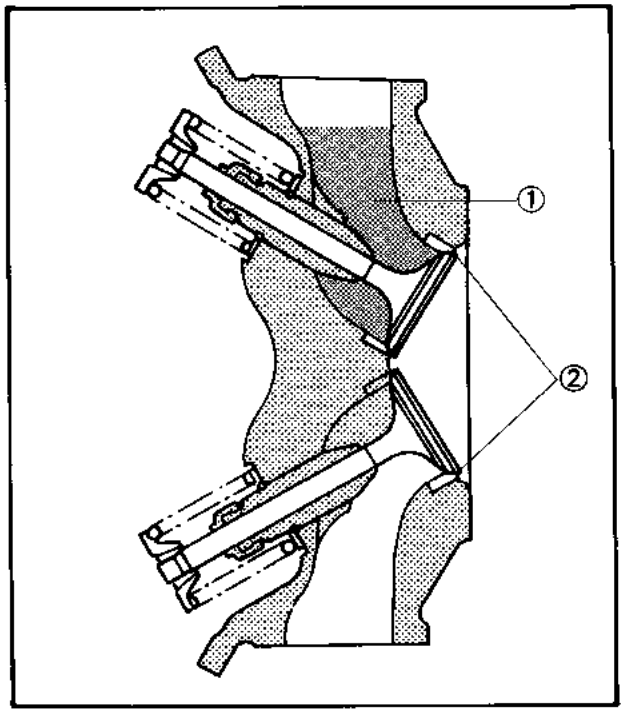
NOTE:

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

6. Inspect:
   - Valve face

   Not yet uniformly smooth→Repeat procedure from step 1.
7. Apply:
   - Mechanics bluing dye (Dykem) (to valve face and seat)

8. Rotate:
   - Valve
9. Inspect:
   - Valve face
     Valve must make full seat contact indicated by grey surface all around. The valve face where bluing was removed.
     Faulty contact→Repla (See procedure below)



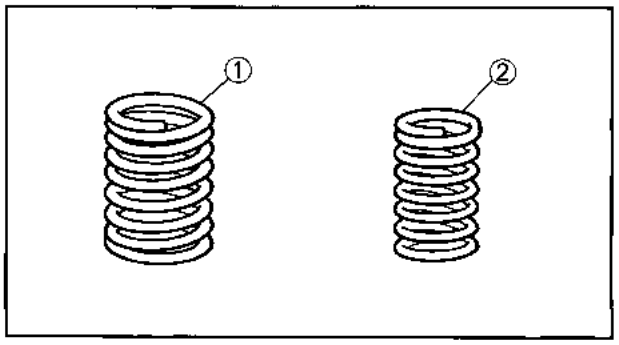
10. Clean:
    - Intake/Exhaust port and valve assembly (spray solvent with compressed air)

NOTE:

After the lapping has been completed and the valve assemblies have been reinstalled the valve seal should be tested.
Pour solvent ① into intake and exhaust ports. There should be no leakage past the seat ②.

11. Check:
    - Valve seal
      Leakage past valve seat→Relap.
      (See procedure below)

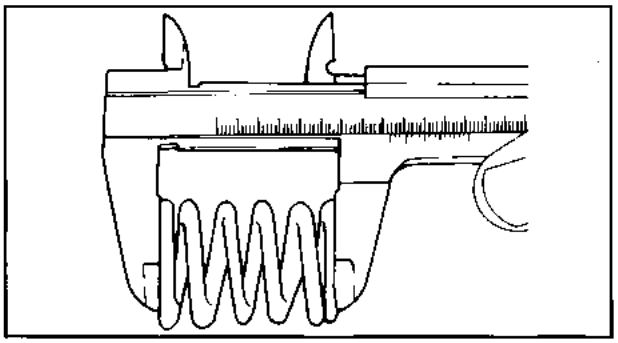
Relapping steps:
- Disassemble head parts.
- Repeat lapping steps using fine lapping compound.
- Clean all parts thoroughly.
- Reassemble and check for leakage again using solvent.
- Repeat steps as often as necessary to achieve satisfactory seal.



Valve Spring

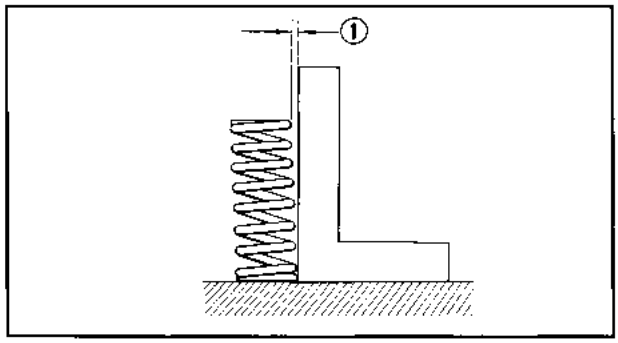
This engine uses two springs of different sizes to prevent valve float or surging. Valve spring specifications show the basic value characteristics.

① Outer spring
② Inner spring



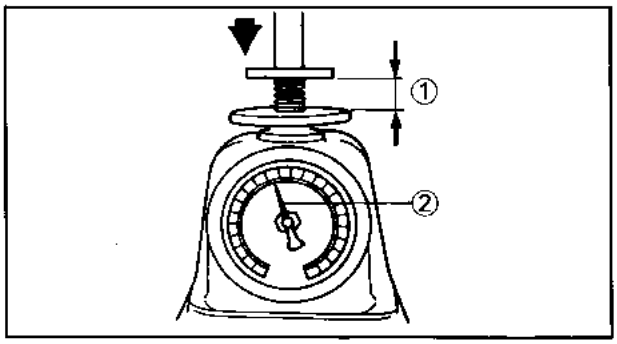
1. Measure:
   - Spring free length
     Out of specification→Replace.

Minimum Free Length:
Outer: 37.2 mm (1.46 in)
Inner: 35.5 mm (1.40 in)



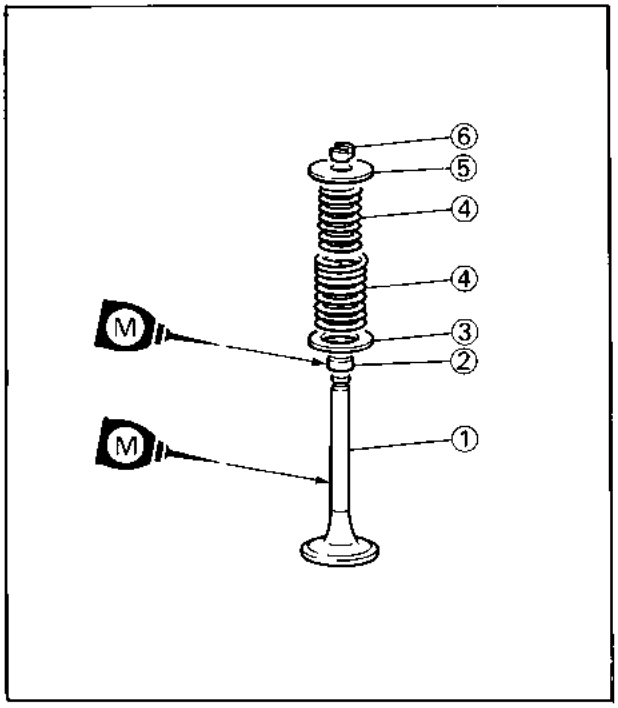
2. Measure:
   - Spring tilt ①
     Out of specification→Replace.

Tilt Limit:
25° or 1.2 mm (0.047 in)



3. Measure:
   - Spring force (Installed length) ①
     Out of specification→Replace.

Compressed Force ②/Installed Leugth ①:
Outer: 18.5±1.9 kg
(40.8±4.2 lb)/32.0 mm (1.26 in)
Inner: 93±0.9 kg
(20.5±2.0 lb)/30.5 mm (1.20 in)

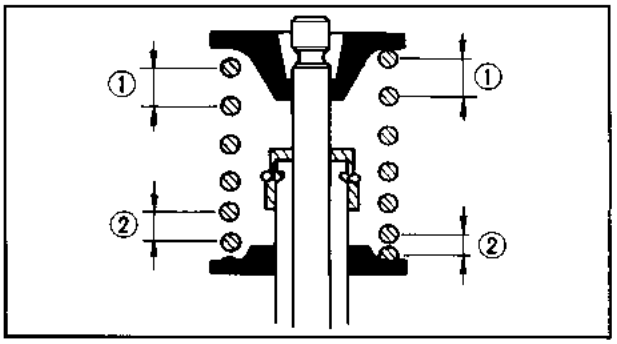


Valve Installation

1. Lubricate
   - Valve stem ①
   - Oil seal ②

High-Quality Molybdenum Disulfide Motor Oil or Molybdenum Disulfide Grease

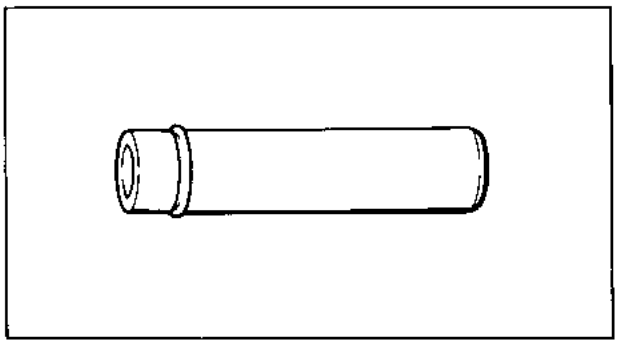
2. Install:
   - Valve ①
   - Oil seal ②
   - Valve spring seat ③
   - Valve springs ④
   - Valve spring seat ⑤
   - Valve retainers ⑥



NOTE:

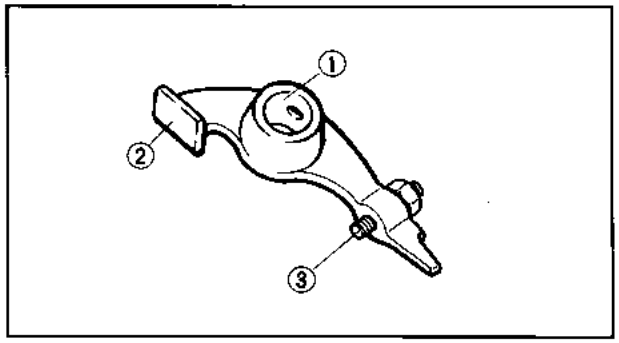
Intall both springs with wider-gapped coils ① facing upwards as shown.

① Larger pitch
② Smaller pitch

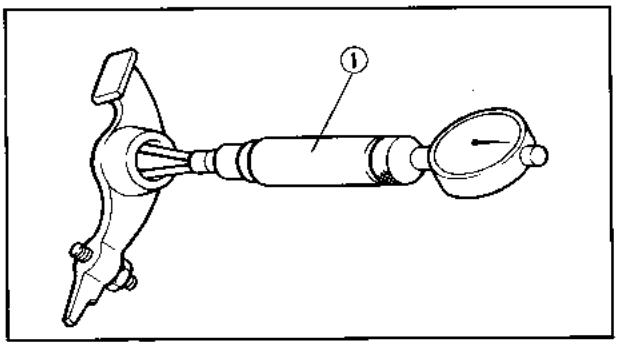


ROCKER ARM AND ROCKER ARM SHAFTS

1. Inspect:
   - Rocker arm shaft
     Groove can be felt (bearing surface). Blue discoloration (rocker arm shaft)→Replace then inspect lubrication system.

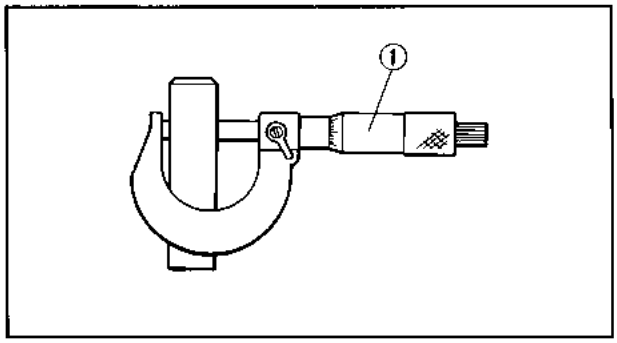


2. Inspect:
   - Rocker arm shaft hole ①
   - Cam lobe contact surface ②
   - Adjuster surface ③
     Wear/Pitting/Scratches/Blue discoloration→Replace.



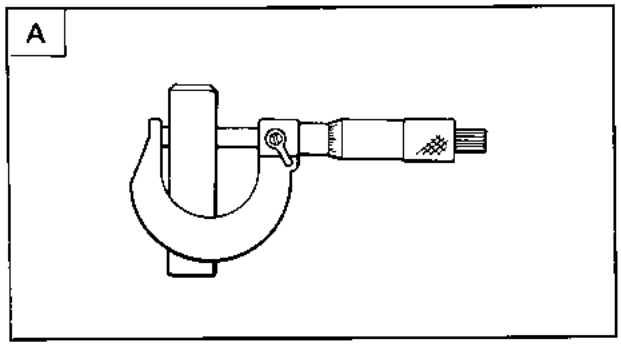
3. Measure:
   - Rocker arm inside diameter
     Use a Bore Gauge ①
     Out of specification→Replace.

Rocker arm Inside Diameter:
12 $^{+0.018}_{-0}$ mm (0.4724 $^{+0.0007}_{-0}$ in)

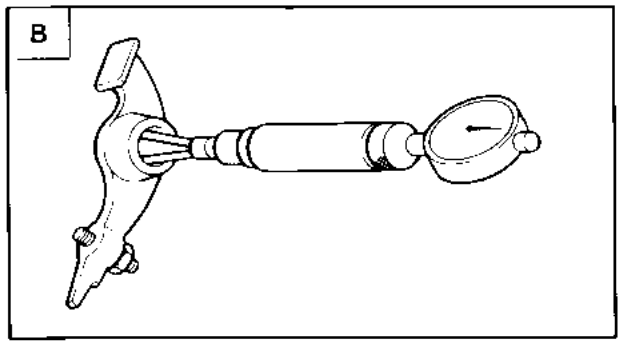


4. Measure:
   - Rocker arm shaft outside diameter
     Use a Micrometer ①
     Out of specification→Replace.

Rocker arm shaft Outside Diameter:
12 $^{-0.009}_{-0.019}$ mm (0.4724 $^{+0.0004}_{-0.0008}$ in)



5. Measure:
   - Rocker arm/Rocker shaft clearance
     Calculate clearance by substracting outside diameter [A] or rocker arm shaft from inside diameter [B] of rocker.

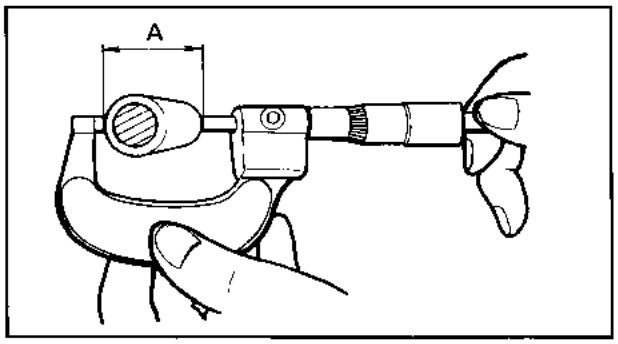


Arm-to Shaft Clearance:
0.009 ~ 0.037 mm (0.0004 ~ 0.0015 in)
Limit: 0.1 mm (0.004 in)

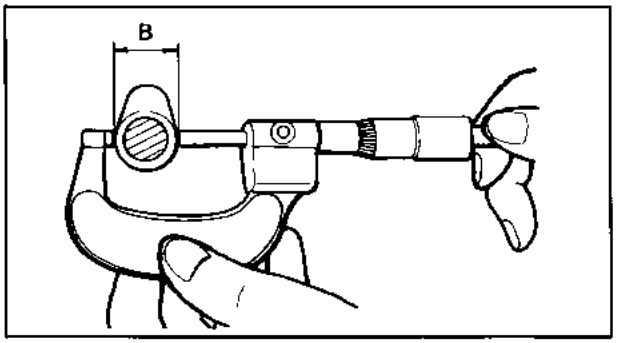
CAMSHAFT, CAMSHAFT BUSHING AND CAM SPROCKET

Camshaf

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



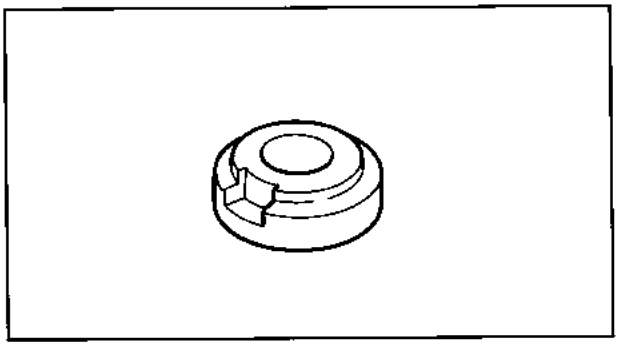
2. Measure:
   - Cam lobes
     Use Micrometer
     Out of specification→Replace



	A	B
Intake	36.59 ± 0.05 mm (1.440 ± 0.002 in)	30.20 ± 0.05 mm (11.89 ± 0.002 in)
Exhaust	36.59 ± 0.05 mm (1.440 ± 0.002 in)	30.20 ± 0.05 mm (11.89 ± 0.002 in)

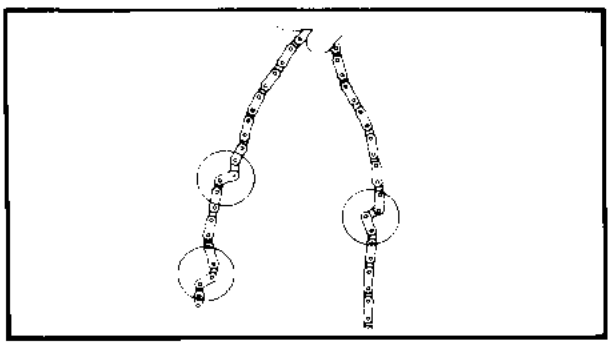
Camshaft Bushing

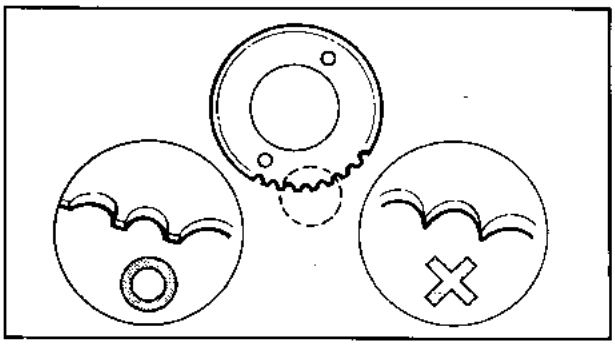
1. Clean and dry bushings
2. Inspect:
   - Bushings (Inner surfaces)
     Rust spots/Pitting/Scoring→Replace.



Cam Chain

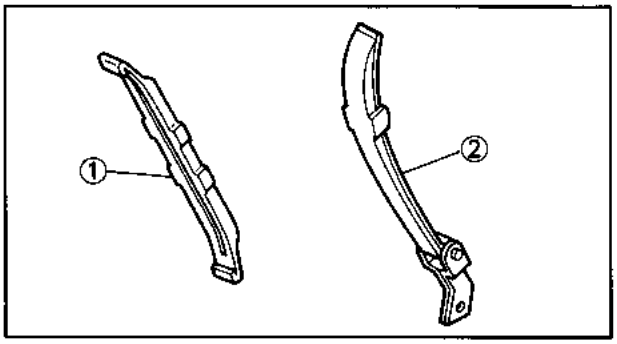
1. Inspect:
   - Cam chain
     Chain stretch/Cracks→Replace.





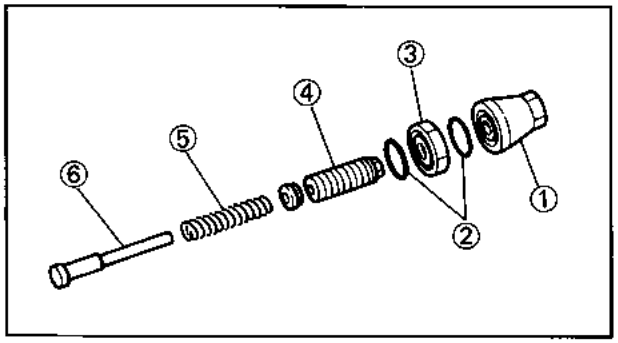
Cam Sprockets

1. Inspect:
   - Cam sprockets
     Wear/Damage→Replace.



Cam Chain Guide

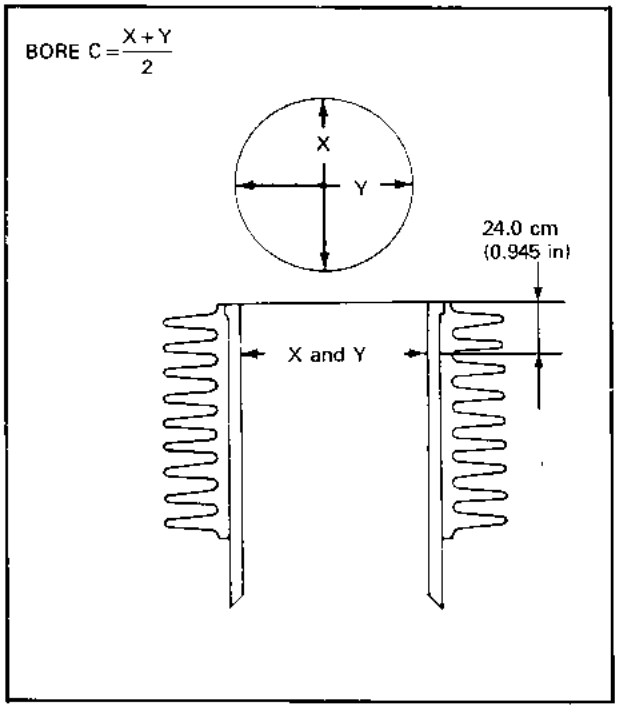
1. Inspect:
   - Front Guide
   - Rear Guide
     Wear/Damage→Replace



Cam Chain Tensioner

2. Inspect:
   - All parts
     Damage/Wear→Replace.

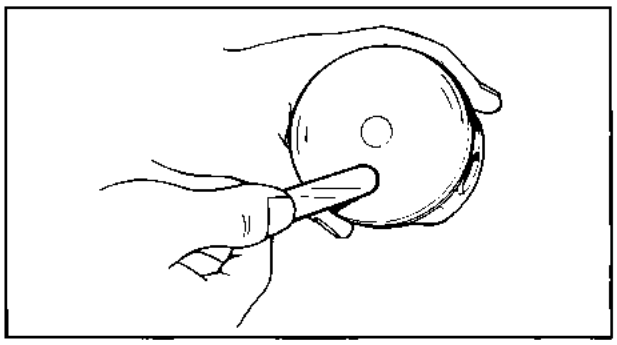
① End Cap
② O-rings
③ Locknut
④ Adjuster
⑤ Spring
⑥ Tensioner rod

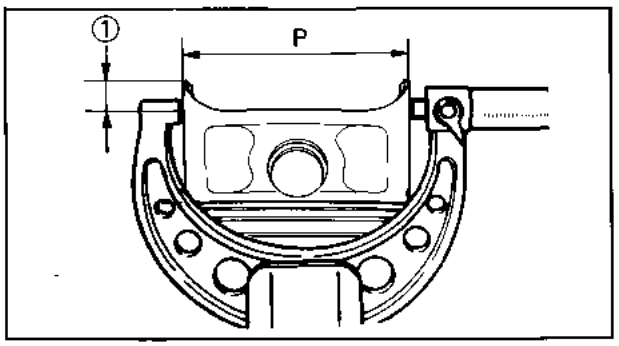


CYLINDER

1. Inspect:
   - Cylinder wall
     Wear/Scratches→Rebore or replace.
2. Measure:
   - Cylinder bore "C"
     Use Cylinder Bore Gauge
     Measure the cylinder bore "C" hrizontally and laterally at 24.0 mm (0.945 in) from the cylinder top.
     Then find the coverage of the measurements.
     Out of specification→Rebore.

	Standard	Wear limit
Cylinder bore C:	$67^{+0.02}_{-0.03}$ mm ($2.6378^{+0.0004}_{-0.0006}$ in)	67.1 mm (2.647 in)





PISTON

1. Inspect:
   - Wear/Scratches/Damage→Replace.
     Carbonized/→Remove

NOTE:

Do not use a sharp instrument and avoid damaging or scratching.

2. Measure:
   - Piston outside diameter P
     Use micrometer
     Out of specification→Replace.

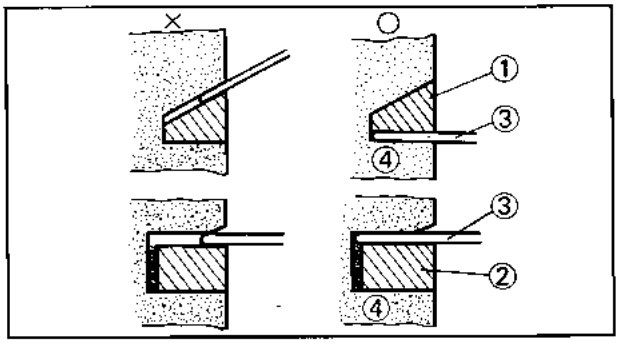
NOTE:

Measurement should be made at a point 7.5 mm (0.30 in) ① above the bottom edge of the piston.

	Size A
Standard	67.0 mm (2.638 in)
Oversize 2	67.50 mm (2.657 in)
Oversize 4	68.00 mm (2.677 in)

3. Measure:
   - Piston clearance
     Out of specification→Rebore cylinder or replace piston.

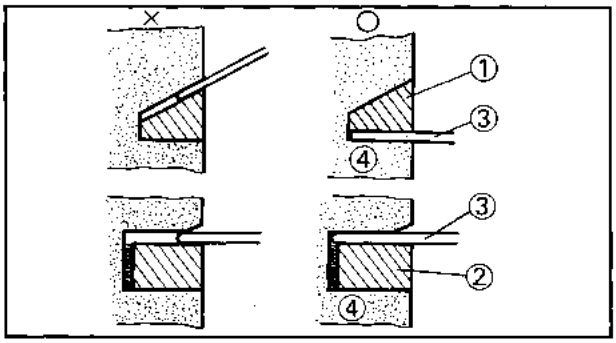
Piston Clearance = C-P:
0.025 ~ 0.045 mm
(0.0010 ~ 0.0018 in)
Limit: 0.1 mm (0.004 in)

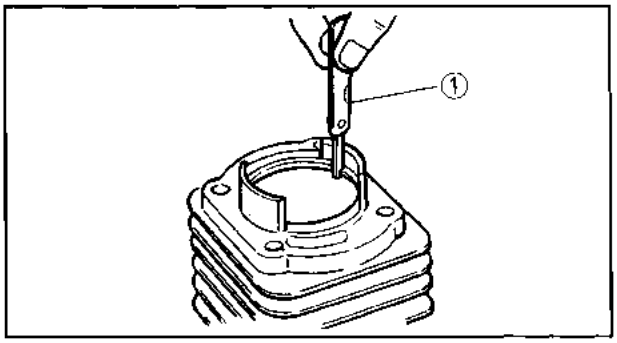


C: Cylinder bore

Piston Ring

1. Measure:
   - Side clearance use a feeler gauge ③
     Out of specification→Replace piston and/or rings.





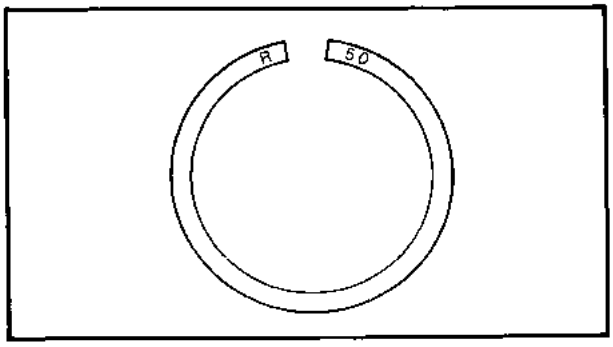
	Standard	Limit
Top ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)	0.12 mm (0.0047 in)
2nd ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)	0.12 mm (0.0047 in)

① Piston ring (Keystone)
② Piston ring (barrel)
④ Piston

2. Position
   - Piston ring
     (into cylinder)
     Push the ring with the piston crown.

3. Measure:
   - End gap
     Use feeler gauge ①
     Out of specification→Replace rings as a set.

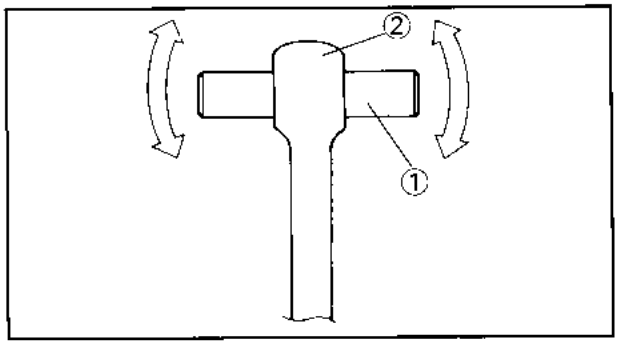
	Standard	Limit
Top ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.6 mm (0.024 in)
2nd ring	0.15 ~ 0.30 mm (0.006 ~ 0.012 in)	0.6 mm (0.024 in)
Oil control (Rails)	0.30 ~ 0.90 mm (0.012 ~ 0.035 in)	–



Oversize Piston Rings

- The oversize top and middle ring sizes are stamped on top of the ring

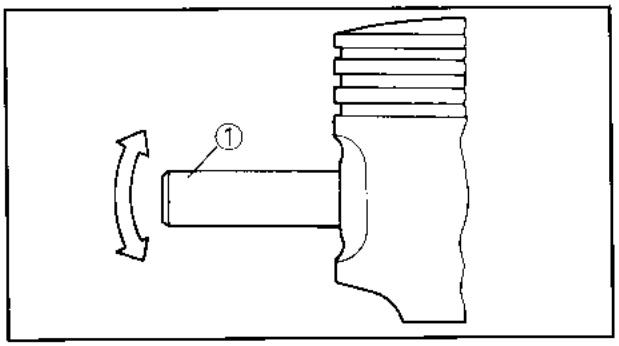
Oversize 2	0.50 mm (0.0197 in)
Oversize 4	1.00 mm (0.0394 in)



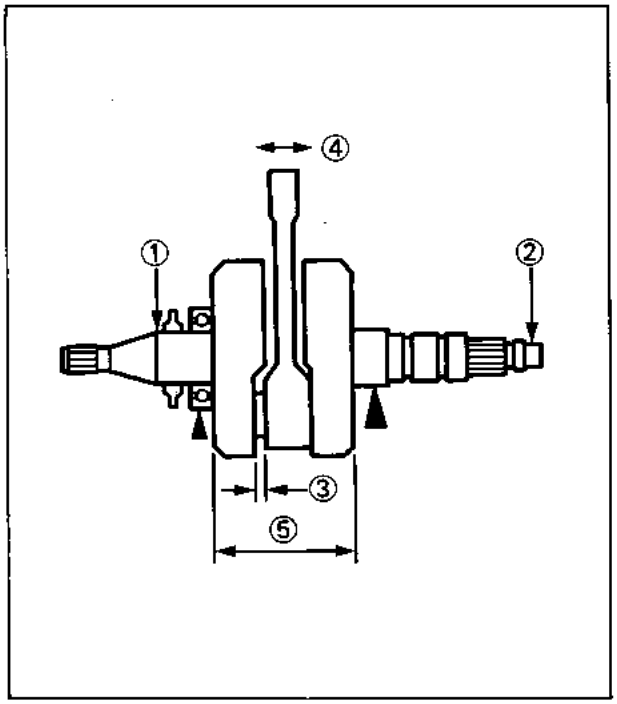
Piston Pin

1. Lubricate:
   - Piston pin ① (lightly)
2. Install:
   - Piston pin
     (into small ② end of connecting rod)

3. Check:
   - Free play
     Free play→Inspect connecting rod for wear.
     Wear→Inspect connecting rod and piston pin.



4. Position
   - Pisition pin ①
     (into piston)
5. Check:
   - Free play
     When pin is in place in piston
     ree play→Replace piston pin and/or piston.



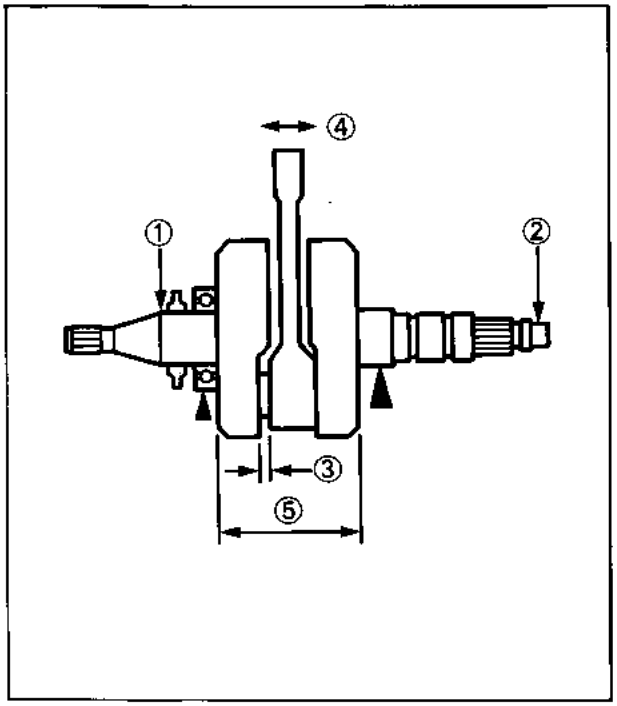
CRANKSHAFT

1. Measure:
   - Runout ①, ②
     Use V-Blocks and Dial Gauge (YU-03097)
     Out of specification→Replace.

Runout Limit:
0.03 mm (0.0012 in)

   - Side clearance ③
     Out of specification→Replace the connecting rod.

Big End Side Clearanace:
0.35 ~ 0.65 mm (0.014 ~ 0.026 in)



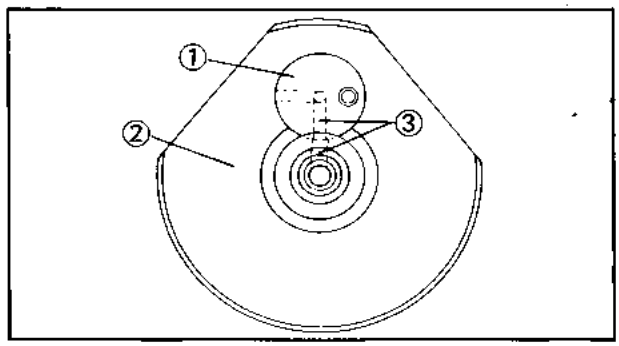
- Small end free play ④
  Out of specification 4→Replace connecting rod.

Small End Free Play:
STD: 0.8~1.0 mm (0.031~0.039 in)
Limit: 2.0 mm (0.079 in)

- Assembly width ⑤
  Out of specification→Replace crankshaft

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

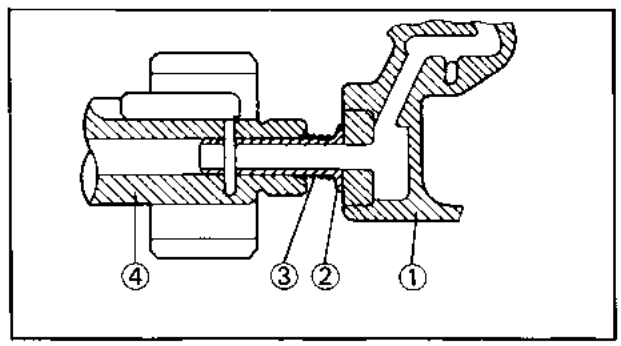
5. Check:
   - Crankshaft bearing
     Play→Replace.



6. To disassemble and reassemble the crank, follow the illustration.

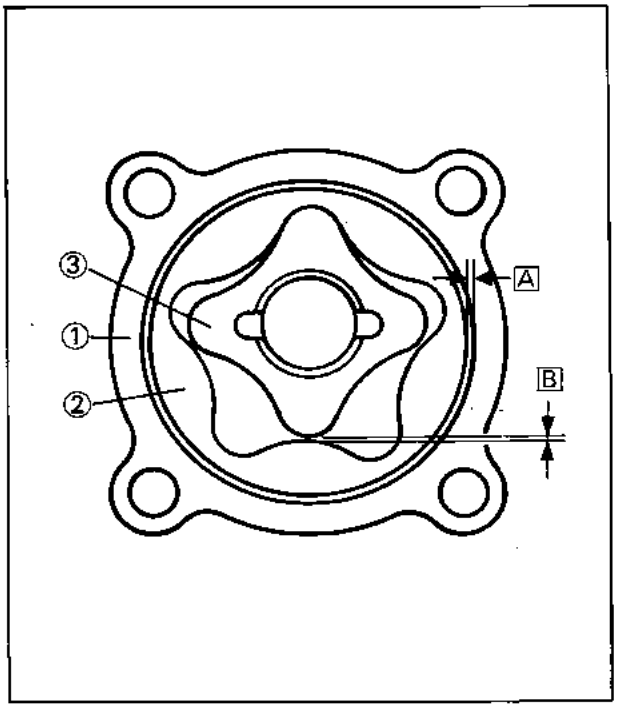
NOTE:
Make sure the oil passages of the crank and crank pin are lined up during assembly.

① Crank assembly
② Oil passage
③ Oil passage



NOTE:
Oil from the oil pump flows to the crankshaft passage by the pin.
Check the movement of the pin and the stretch force.

① Crankcase cover
② Pin
③ Spring
④ Crankshaft



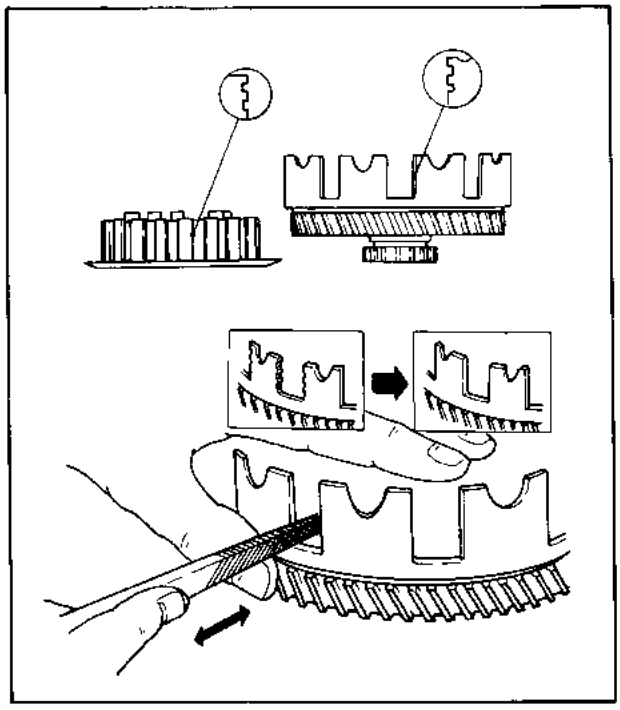
OIL PUMP

1. Measure:
   - Housing ①/outer rotor ② clearance [A]
     Use Feeler Gauge.
     Out of specification→Replace oil pump assembly.

Side Clearance "A":
0.03 ~ 0.09 mm
(0.0012 ~ 0.0035 in)

2. Measure:
   - Outer rotor ②/inner rotor ③ clearanc [B]
     Use Feeler Gauge
     Out of specification→Replace oil pump assembly.

Tip Clearance "B":
0.09 ~ 0.15 mm (0.0035 ~ 0.0059 in)



CLUTCH

Clutch Housing

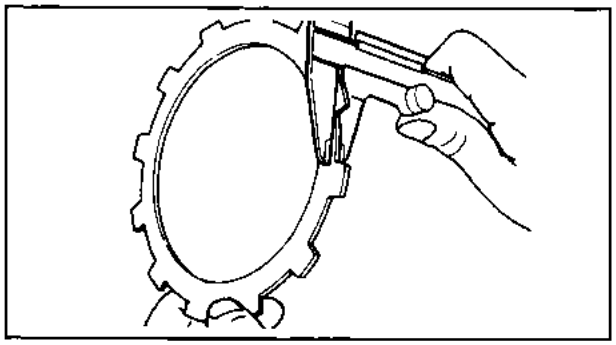
1. Inspect:
   - Dogs on the housing
     Cracks/Wear/Damage→Deburr or replace.
   - Clutch housing bearing
     Chafing/Wear/Damage→Replace.

Clutch Boss

1. Inspect:
   - Clutch boss splines
     Scoring/Wear/Damage→Replace clutch boss assembly.

NOTE:

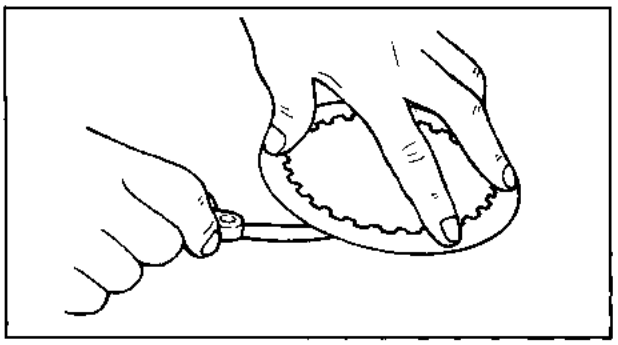
Scoring on the clutch plate splines will cause erratic operation.



Friction Plates

1. Inspect:
   - Friction plate
     Damage/Wear→Replace friction plate as a set.
2. Measure:
   - Friction plate thickness
     Measure all at four point.
     Out of specification→Replace friction plate as a set.

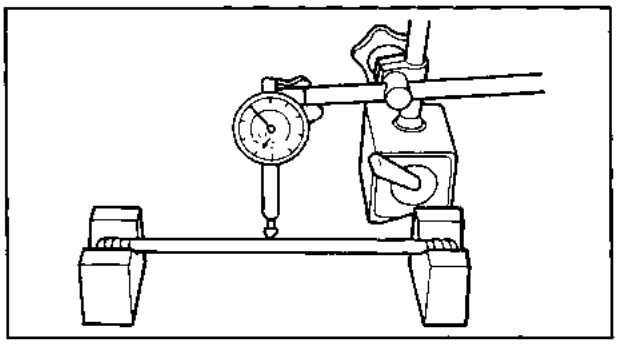
Wear Limit:
2.8 mm (0.11 in)



Clutch Plates

1. Measure:
   - Clutch plate warpage
     Use surface plate and feeler gauge
     Out of specification→Replace.

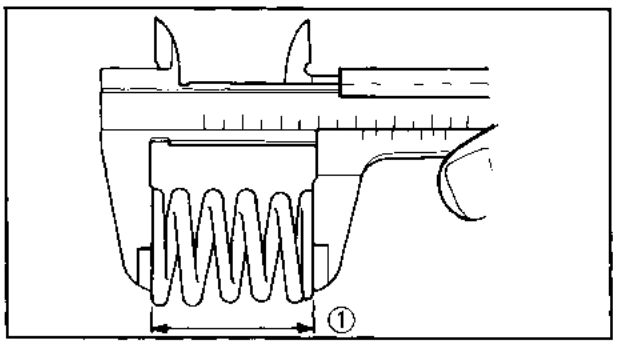
Warp Limit:
0.2 mm (0.0079 in)



Push Rod

1. Measure:
   - Push rod runout (long rod)
     Use V-Blocks and Dial Gauge
     Out of specification→Replace.

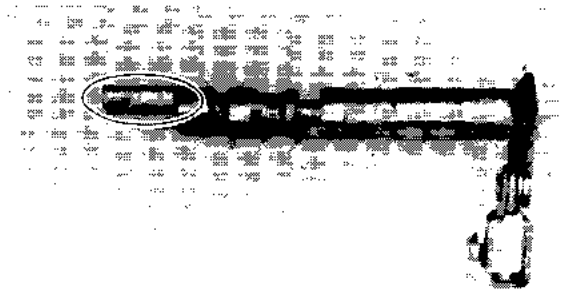
Bending Limit:
0.2 mm (0.008 in)



Clutch Springs

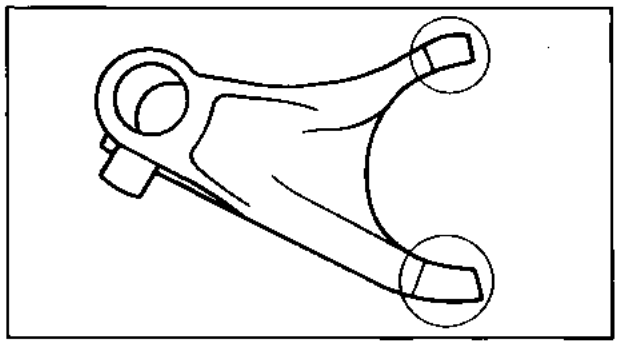
1. Measure:
   - Clutch spring free length
     Out of specification→Replace springs as a set.

Clutch Spring Minimum Length:
22.4 mm (0.88 in)



Clutch Push Lever

1. Inspect:
   - Push lever
     Wear→Repair using 300 – 400 grit sand paper.

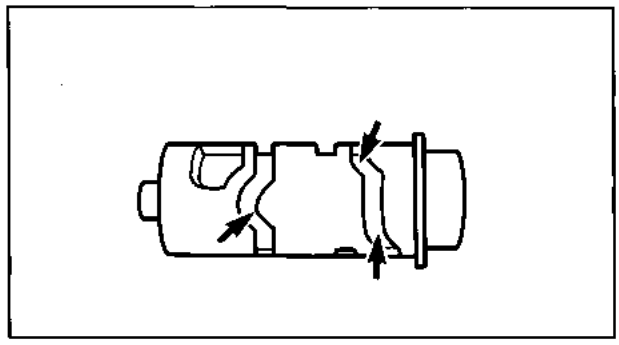


TRANSMISSION

Shift Fork

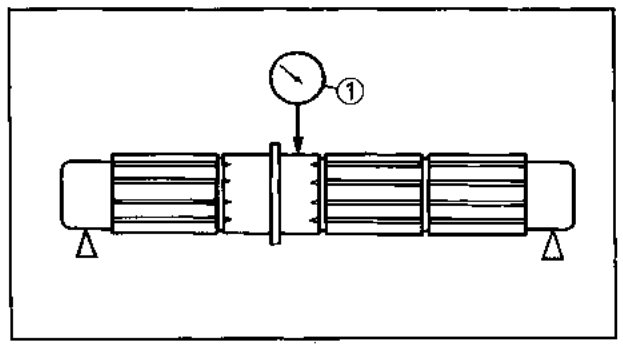
1. Inspect:
   - Shift forks
     (on the gear and shift cam contact surfaces)
     Wear/Chafing/Beds/Damage→Replace.

2. Check:
   - Shift fork movement
     (on its guide bar)
     Unsmooth operation→Replace fork and/or guide bar.



Shift Cam

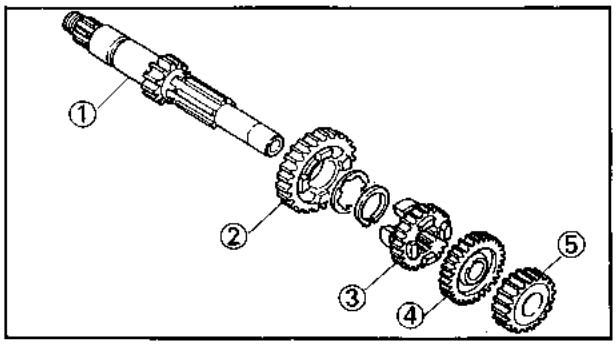
1. Inspect:
   - Shift cam grooves
     Wear/Damage/Scratches→Replace.
   - Shift cam segment
     Damage/Wear→Replace.



Main and Drive Axles

1. Measure:
   - Axle runout
     Use centering device and Dial Gauge ①.
     Out of specification→Replace.

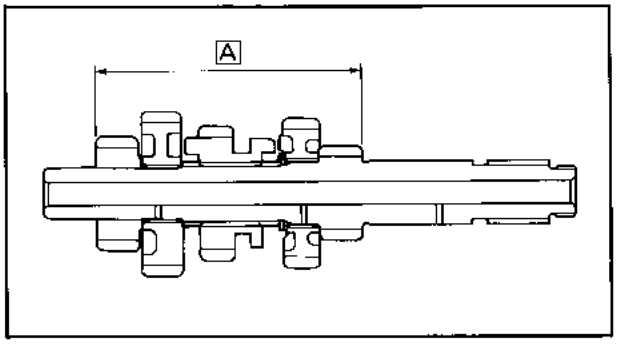
Runout Limit: 0.08 mm (0.0031 in)



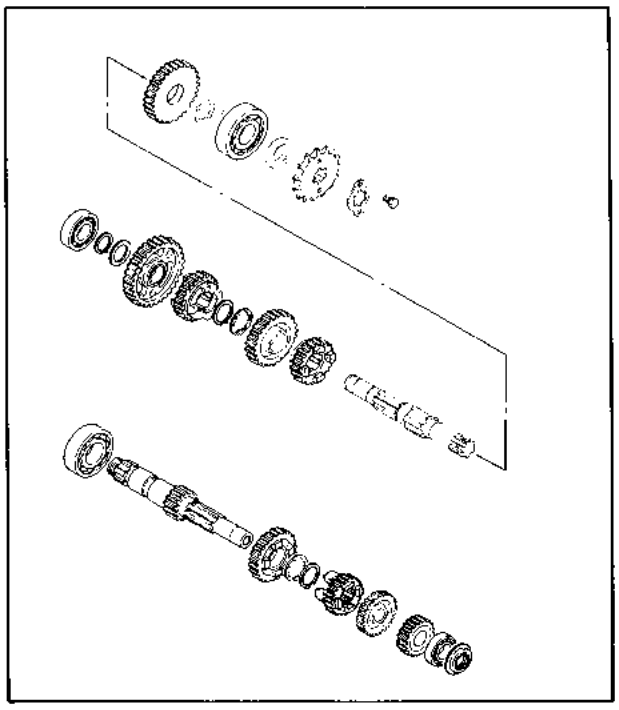
2. When replacing the main axle or pinions, take the following steps:
a. Apply molybdenum oil to the 4th and 5th pinion bosses.
b. Using a hydraulic press, force-fit the 2nd pinion ⑤ to the position specified below.

① Main axle
② 4th pinion
③ 3rd pinion
④ 5th pinion
⑤ 2nd pinion

c. After installing the pinions onto the main axle, make sure the 4th and 5th pinions turn freely around the main axle.



A: 9.1 mm (3.59 in)

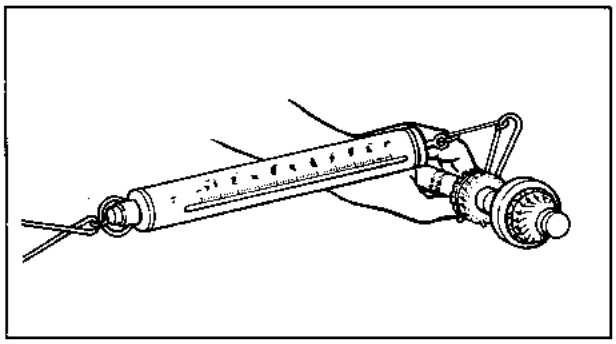


Gears

1. Inspect:
   • Gears
   Damage/Wear → Replace.
2. check:
   • Gear movement
   Unsmooth operation → Replace.
3. Inspect:
   • Mating dogs
   Cracks/Wear/Damage → Replace.

STARTER

1. Inspect:
   • Kick gear
   • Idle gear
   Pitting/Damage → Replace.



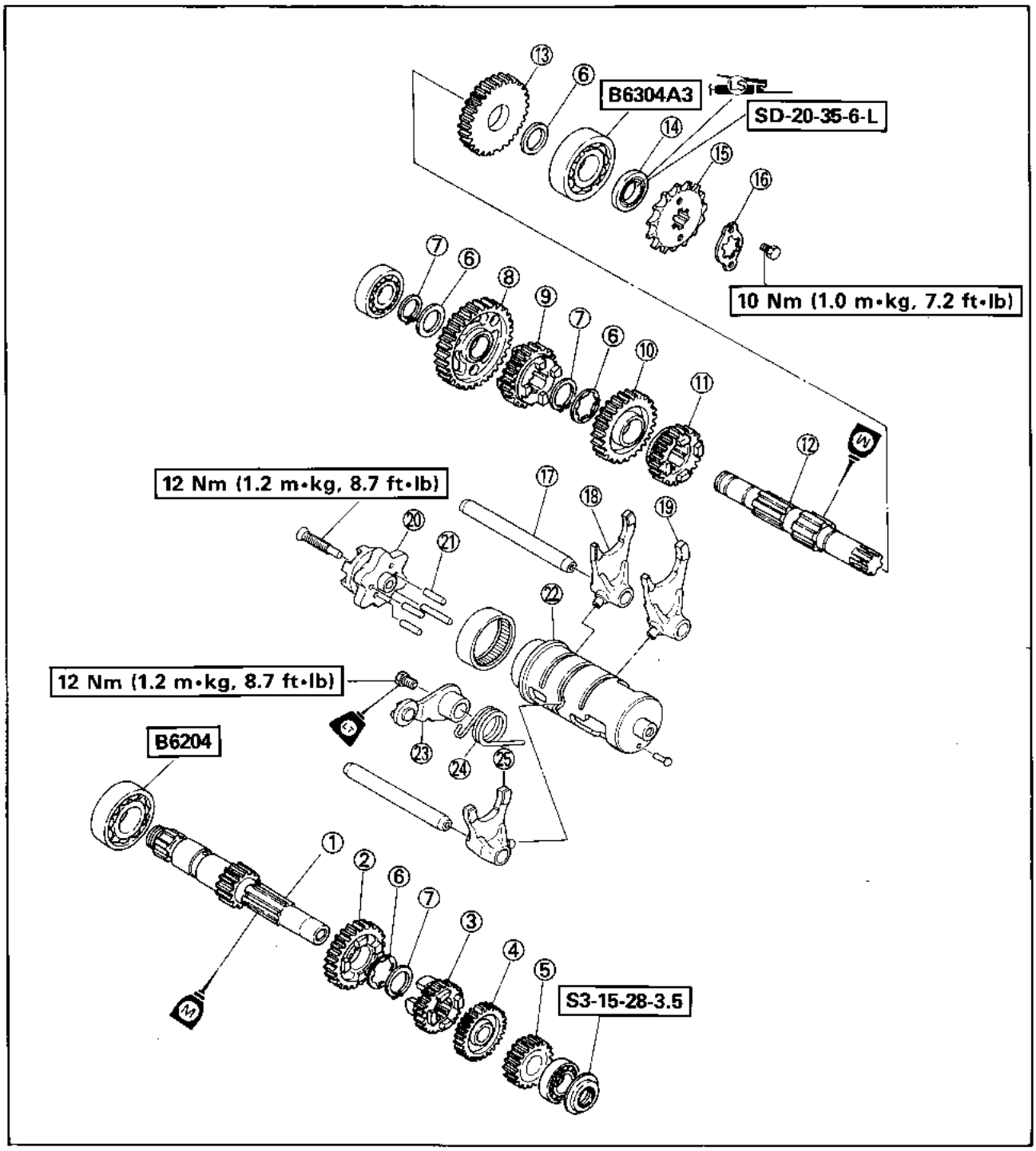
2. Measure:
   - Kick gear spring clip tension
     out of specification → Replace.

Kick Clip Tension:
0.65 ~ 1.05kg (1.43 ~ 2.3116)

ENGINE ASSEMBLY AND ADJUSTMENT

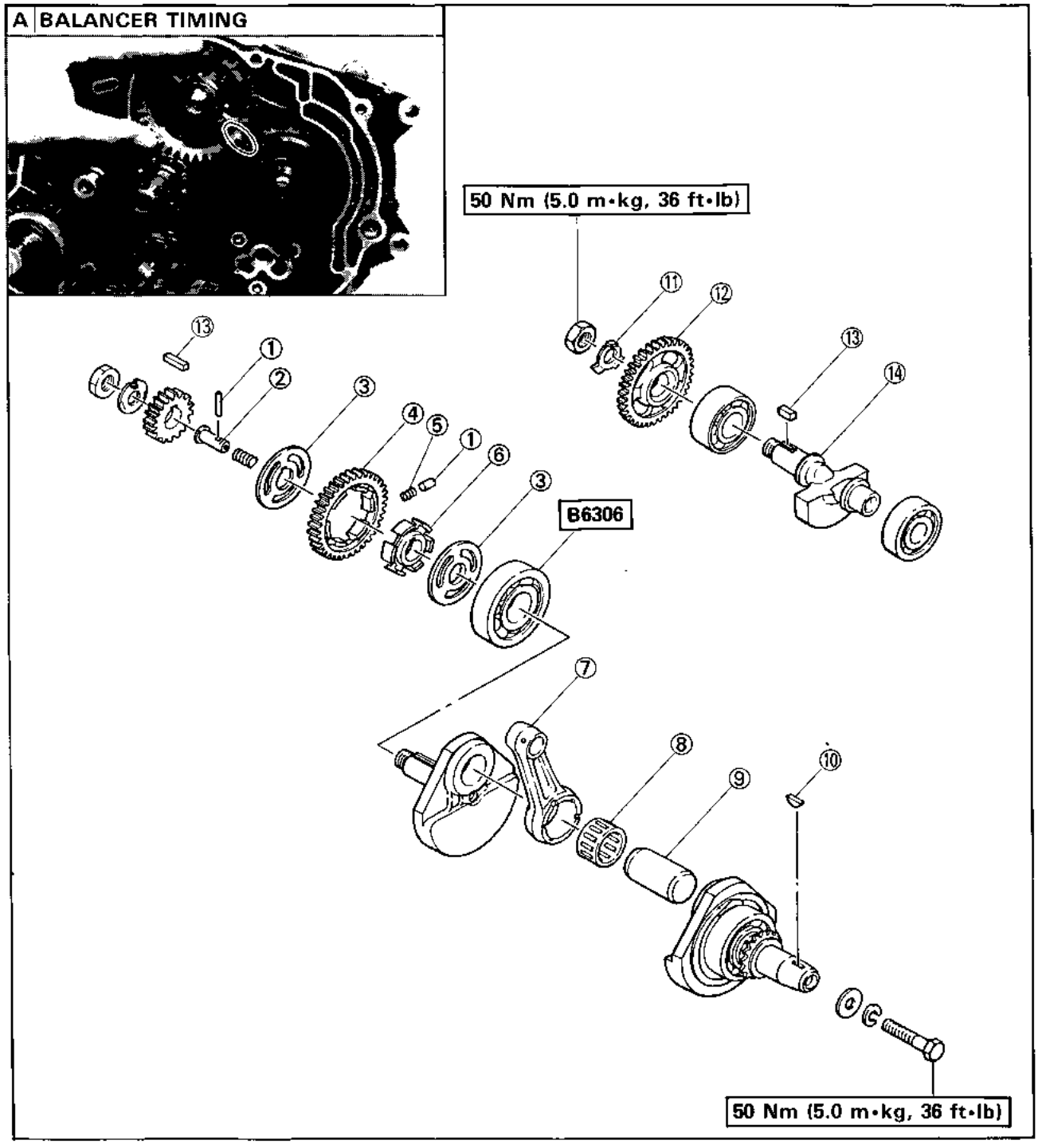
CRANKSHAFT, TRANSMISSION, AND CRANKCASE

① Main axle
② 5th pinion
③ 3rd pinion
④ 4th pinion
⑤ 2nd pinion
⑥ Washer
⑦ Circlip
⑧ 1st wheel
⑨ 5th wheel
⑩ 3rd wheel
⑪ 4th wheel
⑫ Drive axle
⑬ 2nd wheel
⑭ Oil seal
⑮ Drive sprocket
⑯ Sprocket holder
⑰ Guide bar
⑱ Shift fork 1
⑲ Shift fork 2
⑳ Segment
㉑ Dowel pin
㉒ Shift cam
㉓ Stopper lever
㉔ Stopper spring
㉕ Shift fork 3

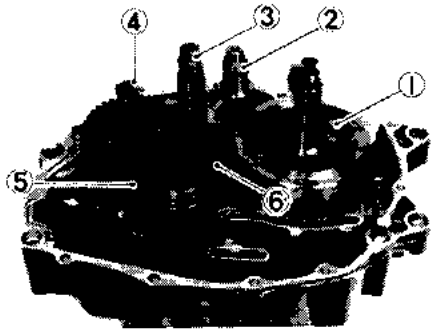


CRANKSHAFT AND BALANCER

① Dowel pin
② Clevis pin
③ Claw washer
④ Balancer pump drive gear
⑤ Spring
⑥ Buffer boss
⑦ Connecting rod
⑧ Big end bearing
⑨ Crank pin
⑩ Woodruff key
⑪ Lock washer
⑫ Balancer driven gear
⑬ Straight key
⑭ Balancer



ENGINE ASSEMBLY AND ADJUSTMENT

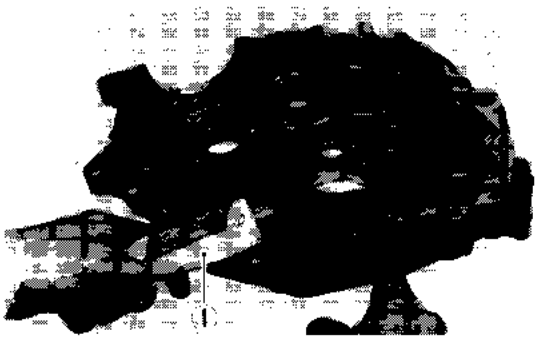


1. Install:
   - Crankshaft ①
     (onto the right case half by tapping the crank pin area with a soft head hammer while turning the crankshaft.)
   - Balancer ②

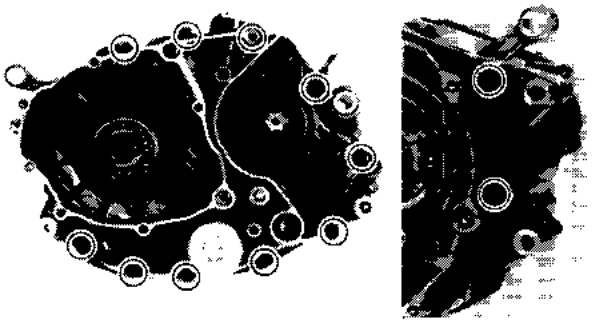
2. Install:
   - Main axle ③/Drive axle ④
   - Shift cam
   - Shift fork 1, 2/Guide bar ⑤
   - Shift fork 3/Guide bar ⑥

NOTE:

Oil each gear and bearing thoroughly.

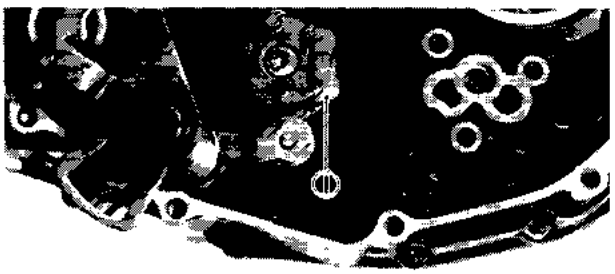


3. Apply:
   - Quick Gasket® (ACC-11001-05-0 1) ①
     (to the mating surfaces of the both case halves)



4. Install:
   - Left-half crankcase
     Tap the case on lightly using a soft hammer.
5. Tighten:
   - Crankcase securing screws
     (in numerical order)

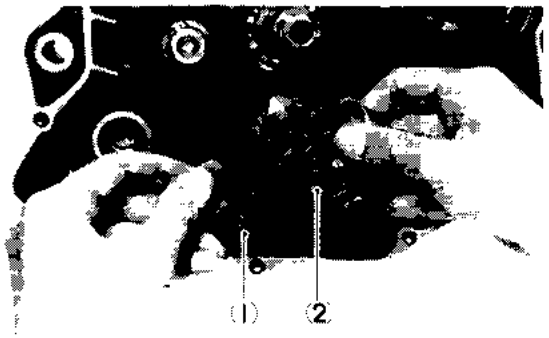
7 Nm (0.7 m•kg, 5.1 ft•lb)



SHIFTER

1. Install:
   - Segment ①
     (Apply LOCTITE® to the securing bolt)

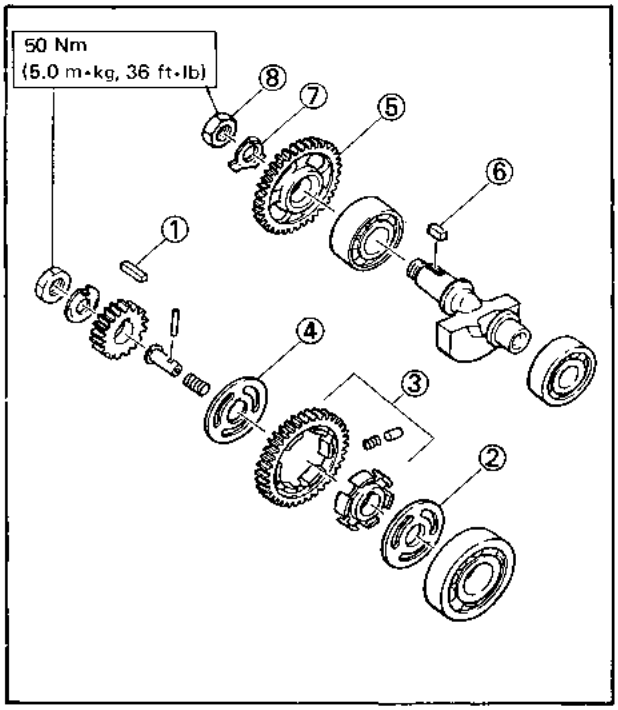
12 Nm (1.2 m•kg, 8.7 ft•lb)



2. Install
   - Stopper lever ①

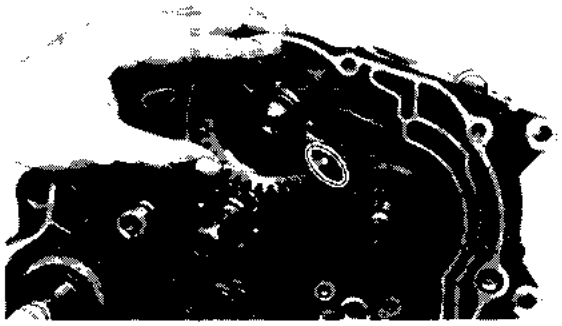
NOTE:
Take care for stopper lever spring position.

   - Shift shaft assembly ②



BALANCER DRIVE GEAR AND DRIVEN GEAR

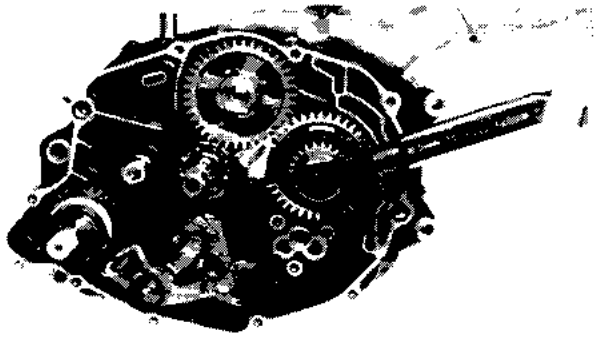
1. Assemble:
   - Balancer drive gear ③
2. Install
   - Straight key ①
   - Washer ②
   - Balancer drive gear assembly ③
   - Washer ④

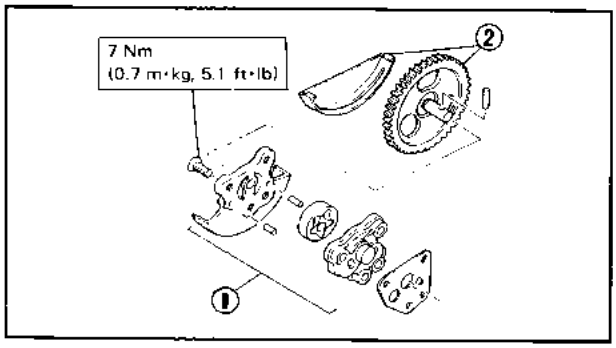


3. Install:
   - Balancer driven gear ⑤
     (with the punch marks in alignment)
   - Straight key ⑥
   - Lock washer ⑦
4. Tighten:
   - Balancer driven gear securing nut ⑧

	50 Nm (5.0 m•kg, 36 ft•lb)

Bend lock washer tab against nut flat.





5. Install:
   - Primary drive gear
   - Oil pump drive gear
   - Lock washer
6. Tighten
   - Primary drive gear securing nut

50 Nm (5.0 m•kg, 36 ft•lb)

Bend lock washer tab against nut flat.

OIL PUMP

1. Install:
   - Oil pump rotor assembly ①

NOTE:

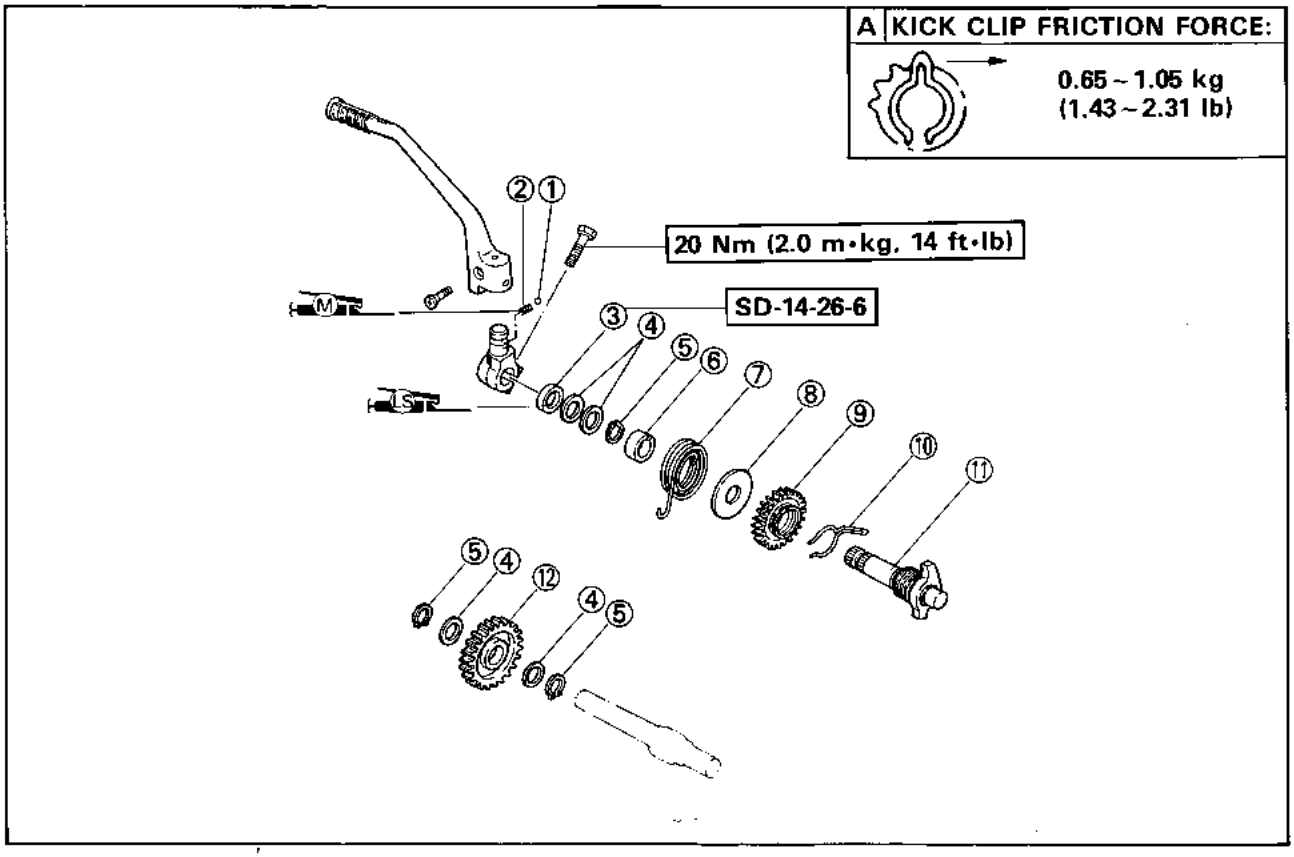
Apply liveral coating of 4-stroke engine oil to the oil pump rotor.

7 Nm (0.7 m•kg, 5.1 ft•lb)

- Pump cover/driven gear ②

KICK STARTER

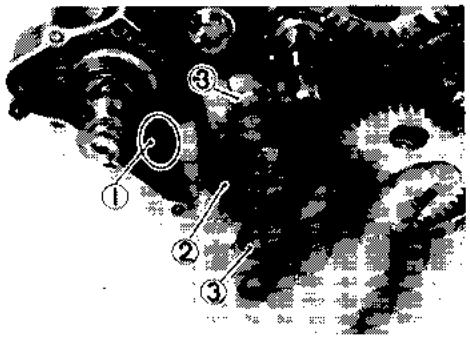
① Ball
② Spring
③ Oil seal
④ Washer
⑤ Circlip
⑥ Spacer
⑦ Return spring
⑧ Spring cover
⑨ Kick gear
⑩ Kick clip
⑪ Kick axle
⑫ Kick idle gear



1. Install:
   - Decomp lever shaft
   - Kick axle

NOTE:

Make sure the decomp lever and kick axle are properly engaged. And the kick clip fits into its home position.

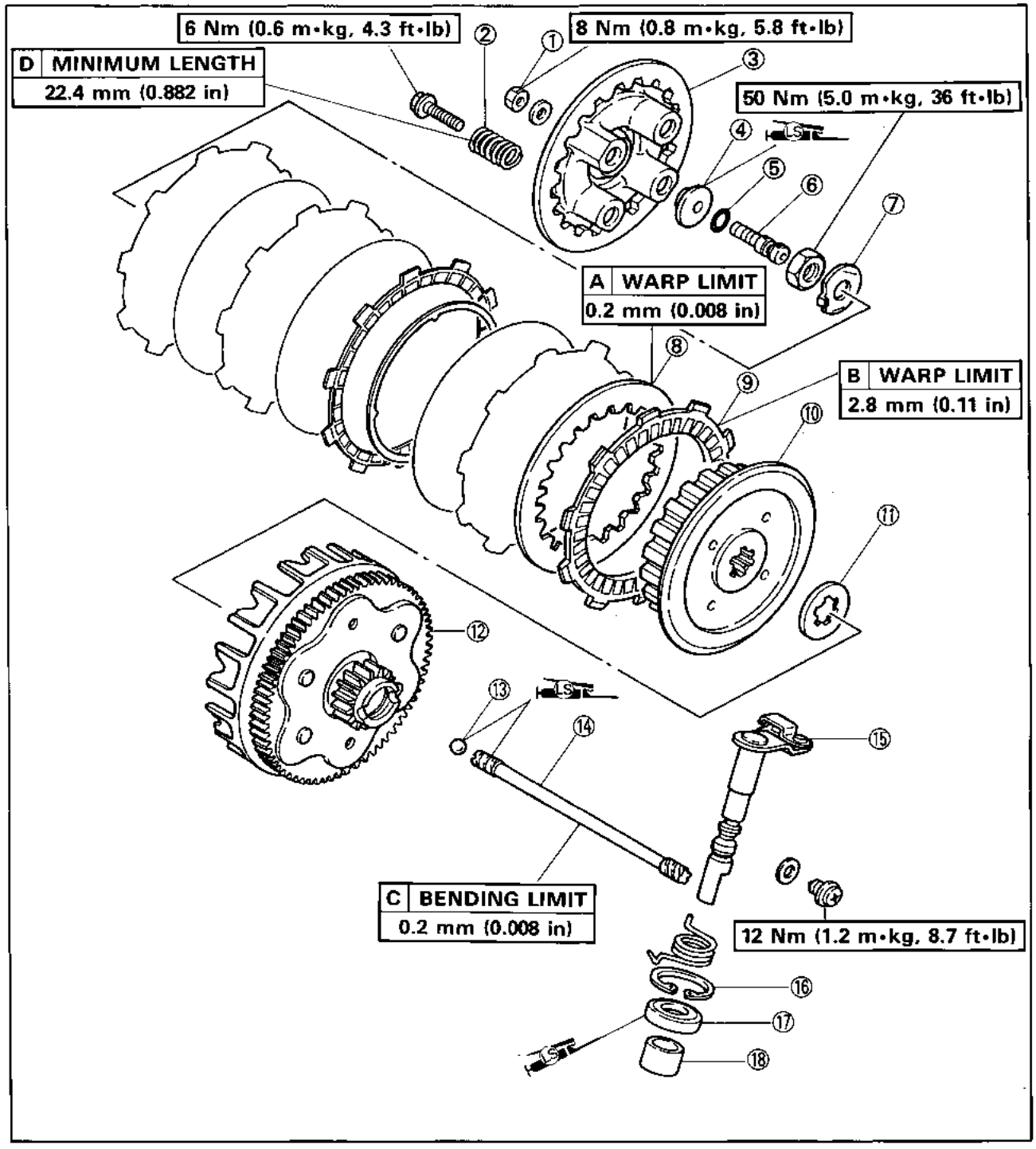


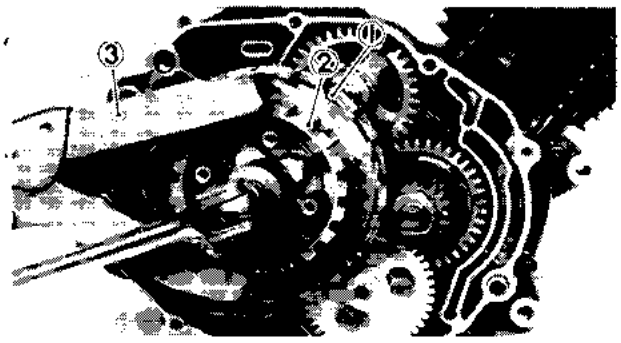
2. Hook
   - Return spring ①
3. Install:
   - Kick idle gear ②
4. Check:
   - Kick gear opration
     Faulty or unsmooth operation→Reassemble.

③ Washer

CLUTCH

① Locknut
② Clutch spring
③ Pressure plate
④ O-ring
⑤ Push plate
⑥ Adjuster
⑦ Lock washer
⑧ Clutch plate
⑨ Friction plate
⑩ Clutch boss
⑪ Thrust washer
⑫ Clutch housing
⑬ Ball
⑭ Push rod
⑮ Push lever
⑯ Cir clip
⑰ Oil seal
⑱ Bush



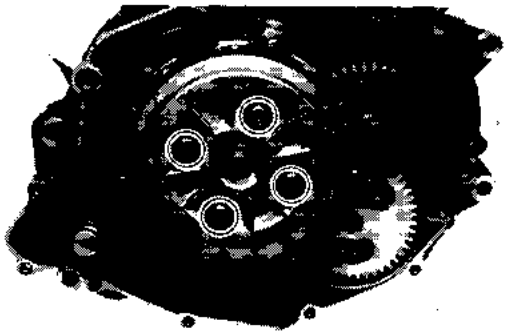


1. Install:
   - Clutch housing ①
   - Thrust washer
   - Clutch boss ②

2. Install:
   - Lock washer
3. Tighten:
   - Clutch securing nut
     Use Clutch Boss Holder (YM-91042) ③

50 Nm (5.0 m•kg, 36 ft•lb)

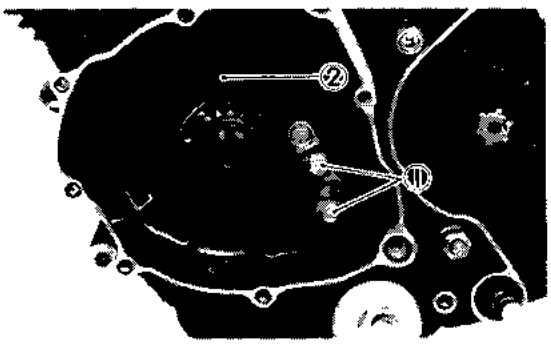
Bend lock washer tab against nut flat.



4. Install:
   - Ball
   - Friction plates/Clutch plates
   - Pressure plate
   - Clutch springs
   - Clutch spring holding screws

6 Nm (0.6 m•kg, 4.3 ft•lb)

5. Adjust:
   - Clutch push rod free play
     (See "CLUTCH" on page 2-7)



CAM CHAIN

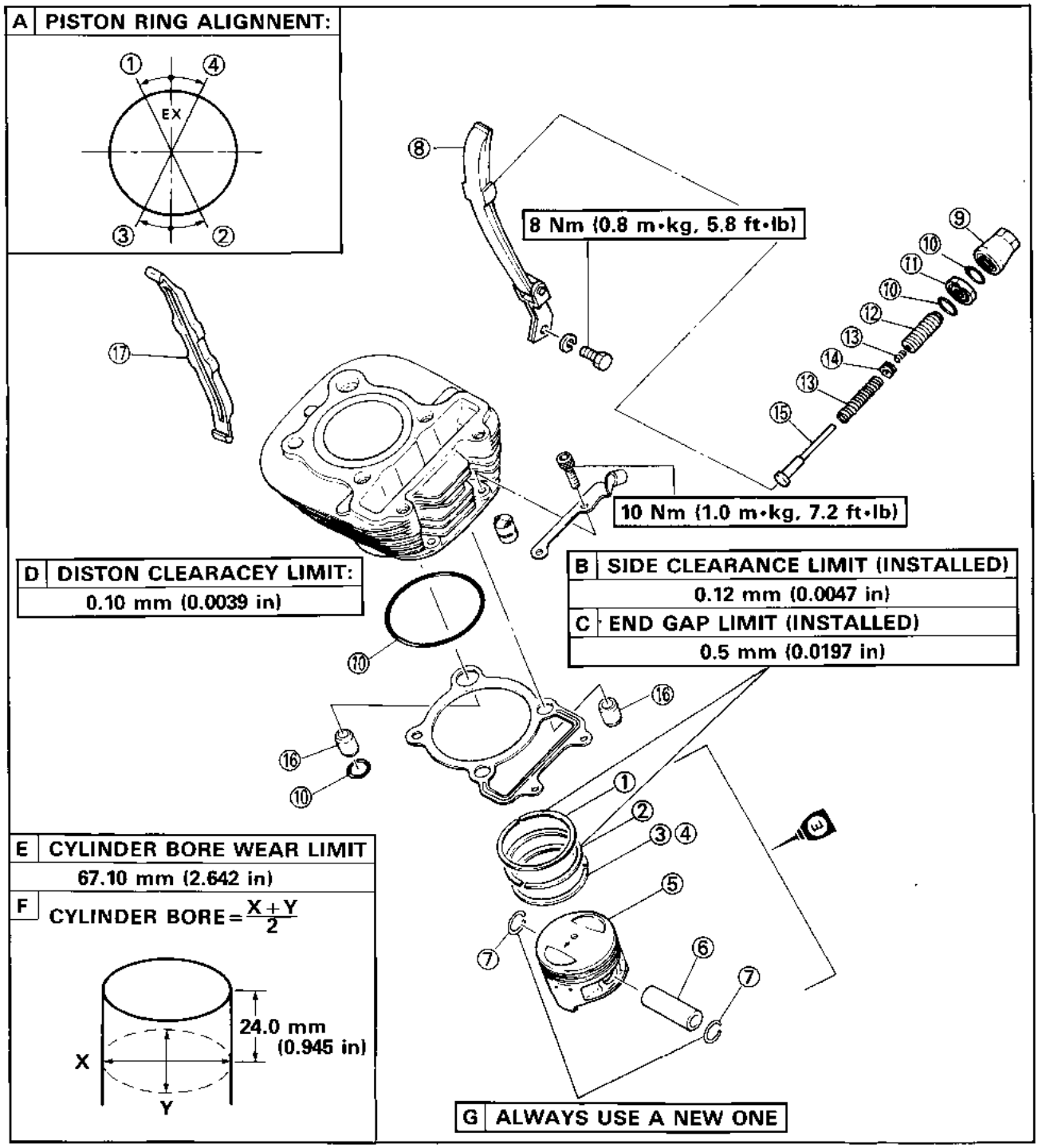
1. Install:
   - Cam chain guide 1
   - Cam chain guide 2 ①

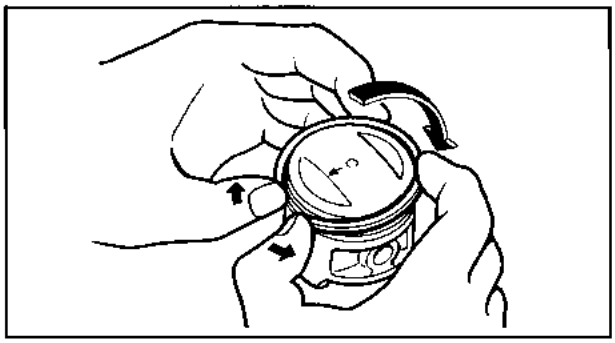
8 Nm (0.8 m•kg, 5.8 ft•lb)

- Cam chain ②

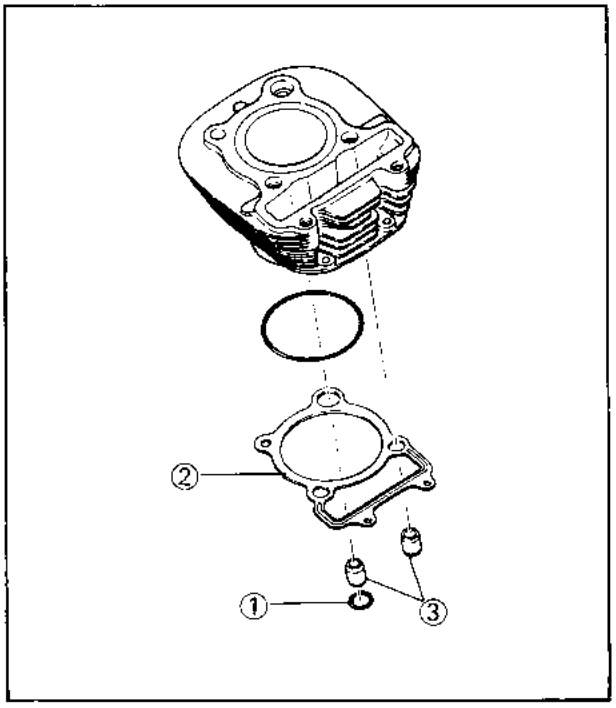
PISTON AND CYLINDER

① Top ring
② 2nd ring
③ Oil ring (Upper)
④ Oil ring (Lower)
⑤ Piston
⑥ Piston pin
⑦ Piston pin clip
⑧ Cam chain guide 2
⑨ Chain tensioner cap
⑩ O-ring
⑪ Locknut
⑫ Adjuster
⑬ Spring
⑭ Damper
⑮ Push rod
⑯ Dowel pin
⑰ Cam chain guide 1

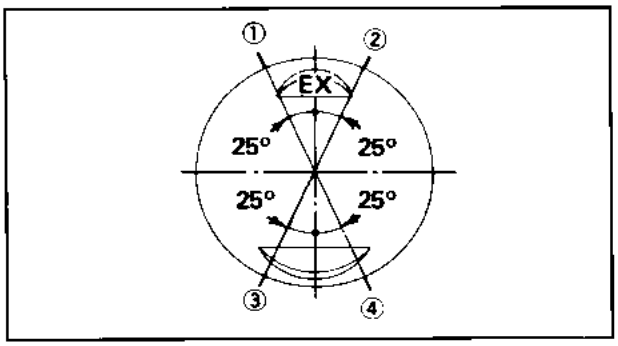




1. Install:
   - Piston rings
     (onto the piston)
   - Piston
     (onto the connecting rod)
   - Piston pin
     Apply engine oil
   - Piston pin clip



2. Install:
   - O-ring (new) ①
   - Gasket (new) ②
   - Dowel pin ③



3. Align:
   - Piston ring ends

① Top
② Oil ring (Lower rail)
③ Oil ring (Upper rail)

NOTE:

Manufacturer's marks or numbers stamped on rings should be on top of rings.

4. Lubricate:
   - Piston
   - Piston rings
   - Cylinder
   (with engine oil)

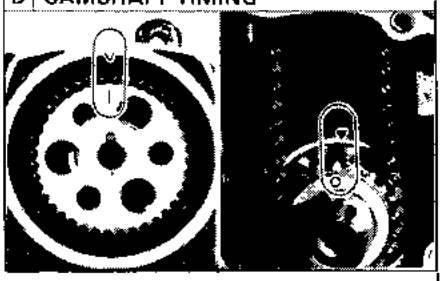
5. Install:
   - Cylinder
   Route cam chain and cam chain guide through cam chain journal in each cylinder. Compress piston rings with fingers and hand install cylinders.
   - Cylinder holding bolts

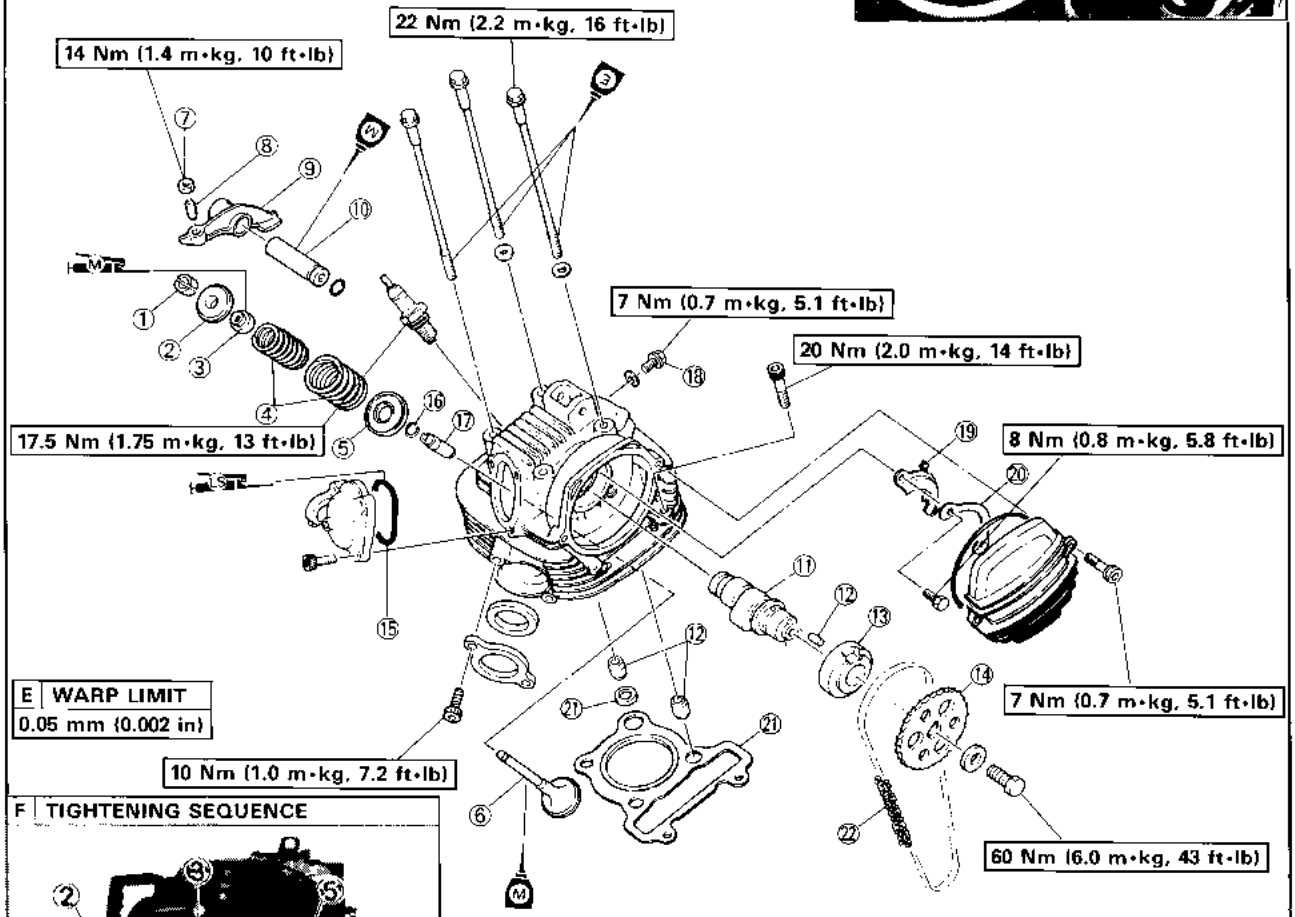
CYLINDER HEAD

① Valve cotter
② Valve spring retainer
③ Valve stem seal
④ Valve spring
⑤ Valve spring seat
⑥ Intake valve
⑦ Locknut
⑧ Adjuster
⑨ Rocker arm
⑩ Rocker shaft (Exhaust)
⑪ Camshaft
⑫ Dowel pin
⑬ Camshaft bushing
⑭ Cam sprocket
⑮ O-ring
⑯ Circlip
⑰ Valve guide
⑱ Oil checking bolt
⑲ Camshaft bearing plate
⑳ Lock washer
㉑ Gasket
㉒ Cam chain

A	VALVE CLEARANCE (COLD)
B	INTAKE: 0.09 ~ 0.13 mm (0.0035 ~ 0.0051 in)
C	EXHAUST: 0.15 ~ 0.19 mm (0.0059 ~ 0.0075 in)

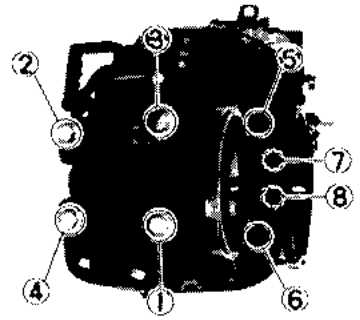
D CAMSHAFT TIMING



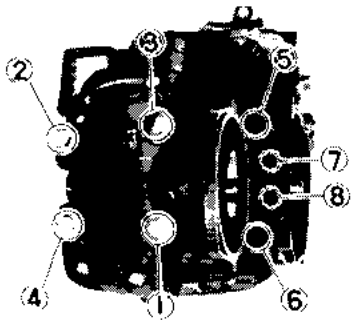


E	WARP LIMIT
	0.05 mm (0.002 in)

F TIGHTENING SEQUENCE

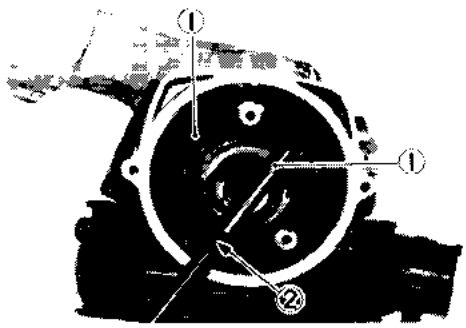


	D8EA (N.G.K.) X24ES-U (N.D)
G	GAP: 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)



1. Install:
   - Cylinder head gasket
   - Dowel pins
   - Cylinder head
2. Tighten
   - Cylinder head bolts
     (in the order indicated in the photo)

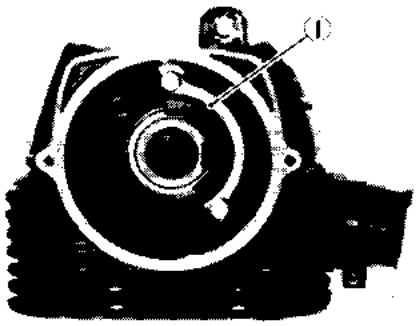
8 mm Frange Bolt (4pcs): ①~④
22 Nm (2.2 m•kg, 16 ft•lb)
8 mm Bolt (2pcs) ⑤, ⑥
20 Nm (2.0 m•kg, 14 ft•lb)
6 mm Bolt (2pcs) ⑦, ⑧
10 Nm (1.0 m•kg, 7.2 ft•lb)



3. Install:
   - Rocker arms
   - Rocker arm shafts ①

NOTE:

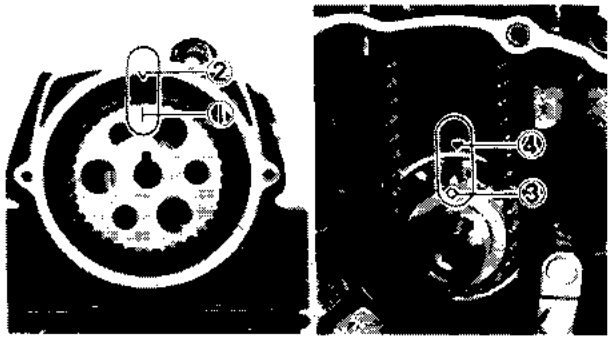
Rocker arm shaft end, with inside thread, ② must face out of cylinder head otherwise rocker shaft cannot be removed.



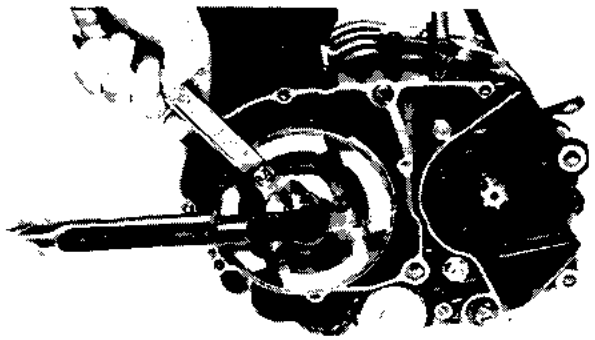
4. Install:
   - Cam shaft
   - Bearing stopper plate
   - Lock washer ①

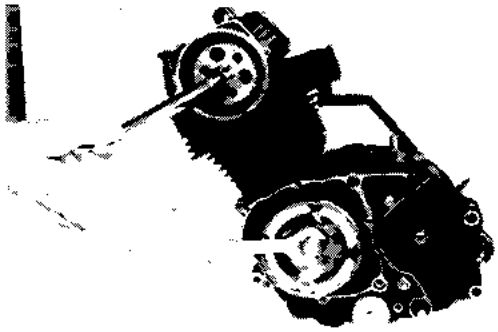
8 Nm (0.8 m•kg, 5.8 ft•lb)

Bend lock washer tab against bolt flat.



5. Install:
   - Cam sprocket
     Align sprocket timing mark ① with cylinder head timing mark ② and at the same time, align crankshaft timing mark ③ with crankcase timing mark ④.
   - Washer
   - Bolt





FLYWHEEL MAGNETO AND CAM CHAIN TENSIONER

1. Install:
   - Woodruff key
   - Flywheel magneto

50 Nm (5.0 m•kg, 36 ft•lb)

2. Tighten:
   - Cam sprocket bolt

60 Nm (6.0 m•kg, 43 ft•lb)

3. Install:
   - Cam chain tensioner

   Adjust the tensioner (Refer to Chapte 2, "CAM CHAIN" on page 2-**.)

4. Install:
   - Cam sprocket cover
   - Crankcase cover (L and R)
   - Kick crank
   - Drain plug

Cam Sprocket Cover:
10 Nm (1.0 m•kg, 7.2 ft•lb)
Crankcase Cover (L and R):
7 Nm (0.7 m•kg, 5.1 ft•lb)
Kick Crank:
15 Nm (1.5 m•kg, 11 ft•lb)
Drain Plug:
43 Nm (4.3 m•kg, 31 ft•lb)

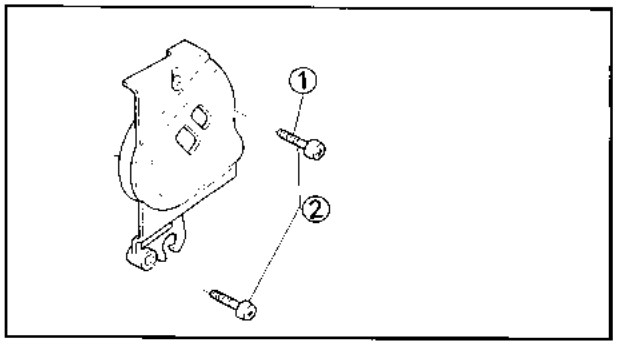
ENGINE ASSEMBLY AND ADJUSTMENT

ENGINE MOUNTING

1. Install:
   - Engine
     (from right side)
   - Engine stay
2. Tighten:
   - Engine mounting bolts

8 mm Bolt:
32 Nm (3.2 m•kg, 23 ft•lb)
Pivot Bolt:
80 Nm (8.0 m•kg, 58 ft•lb)

3. Install:
   - Carburetor
4. Connect:
   - Stater lead wires
   - Plug cap
   - Crankcase ventilation hose
   - Clutch cable
   - Throttle cable



5. Install:
   - Drive sprocket:
   - Sprocket cover:
   - Shift pedal

① Apply Yamaha bond #4

Sprocket:
10 Nm (1.0 m•kg, 7.2 ft•lb)
Cover ②:
8 Nm (0.8 m•kg, 5.8 ft•lb)
Shift Pedal:
10 Nm (1.0 m•kg, 7.2 ft•lb)

6. Install:
   - Exhaust pipe
   - Engine guard

Exhaust Pipe:
10 Nm (1.0 m•kg, 7.2 ft•lb)
Engin Guard:
20 Nm (2.0 m•kg, 15 ft•lb)

   - Fuel tank
   - Seat
   - Side covers

7. Fill:
   - Engine oil

Total Amount:
1.3 L (1.14 Imp qt, 1.37 US qt)

8. Adjust:
   - Decomp wire free play ①
     (See "DECOMPRESSION CABLE" on page 2-3)

② Adjuster
③ Locknut

Free play:
2~3 mm (0.08~0.12 in)

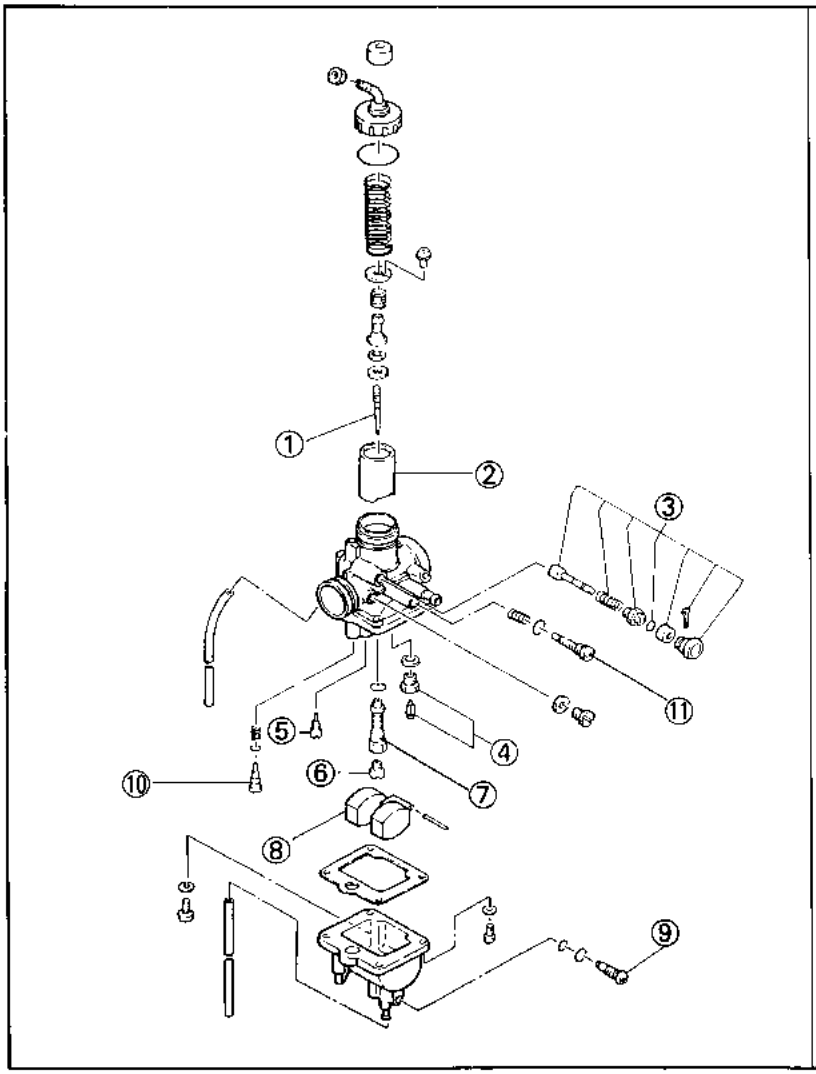
CHAPTER 4.
CARBURETION

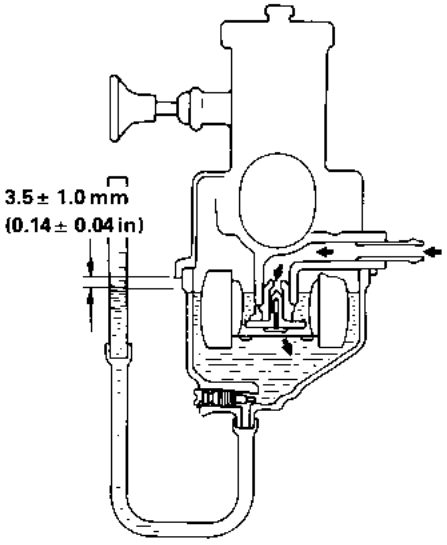
CHAPTER 4
CARBURETION

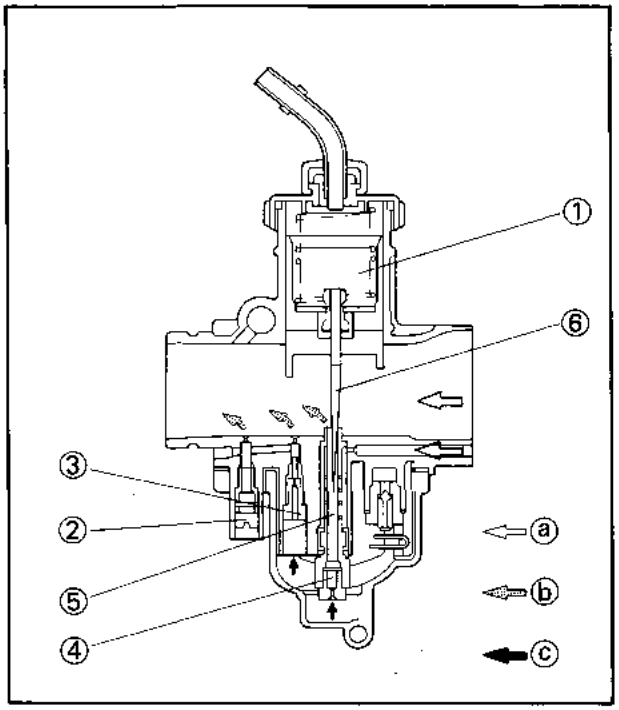
CARBURETOR

① Jet needle
② Throttle valve
③ Starter plunger
④ Needle valve assembly
⑤ Pilot jet
⑥ Main jet
⑦ Needle jet
⑧ Float
⑨ Drain screw
⑩ Pilot screw
⑪ Throttle stop screw

SPECIFICATIONS	
Main jet	#108
Jet needle	4C81-5
Needle jet	2,600
Pilot jet	#38
Pilot screw	1 1/2 ± 1/8
Starter jet	#58
Valve seat	ø2.0
Float height	25.0 ± 1.0 mm (0.98 ± 0.04 in)
Fuel level	3.5 ± 1.0 mm (0.14 ± 0.04 in)
Engine idle speed	1,350 ± 50 r/min



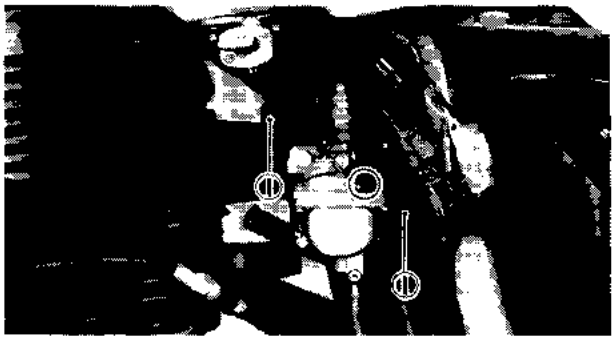


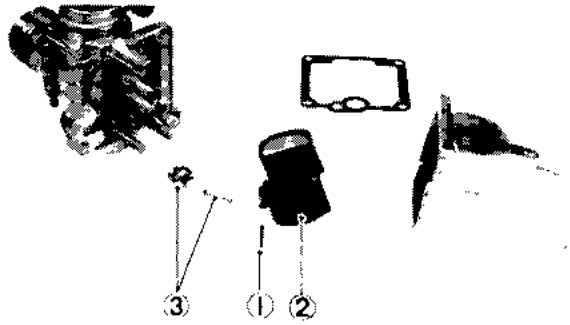


SECTION VIEW

① Throttle valve
② Pilot screw
③ Pilot jet
④ Main jet
⑤ Needle jet
⑥ Jet needle

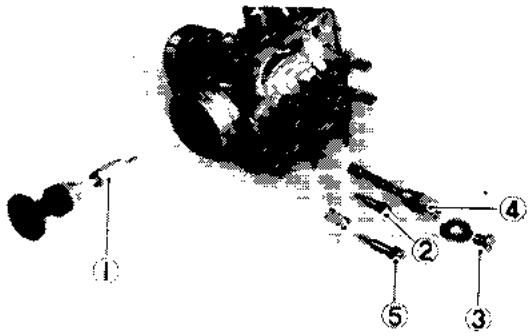
ⓐ Air
ⓑ Mixture
ⓒ Fuel



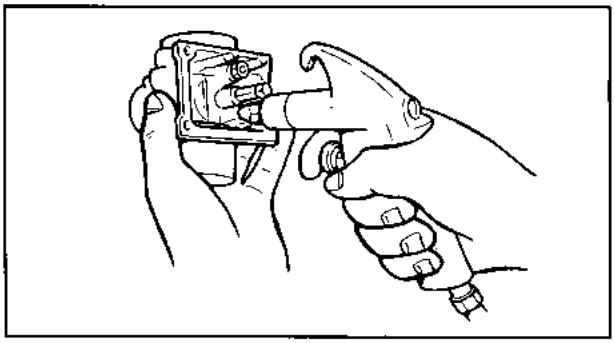


CARBURETOR OVERHAUL
REMOVAL AND DISASSEMBLY

1. Remove:
   - Side cover (Left)
2. Disconnect:
   - Fuel hose
3. Loosen:
   - Hose clamps ①
4. Remove:
   - Carburetor assembly
5. Remove:
   - Carburetor top
   - Throttle valve assembly ①
6. Remove:
   - Float pin ①
   - Float ②
   - Float valve assembly ③

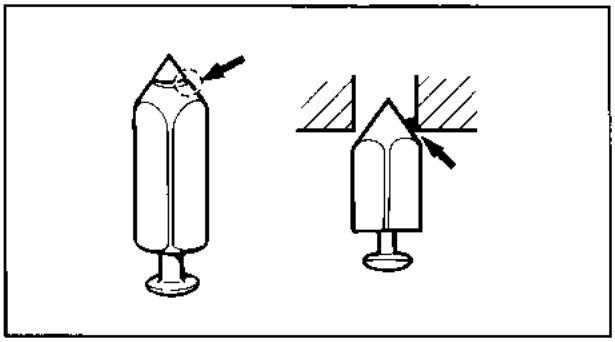


7. Remove:
   - Starter plunger assembly ①
   - Pilot jet ②
   - Main jet ③
   - Needle jet ④
   - Pilot screw ⑤

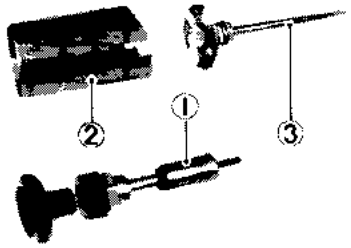


INSPECTION

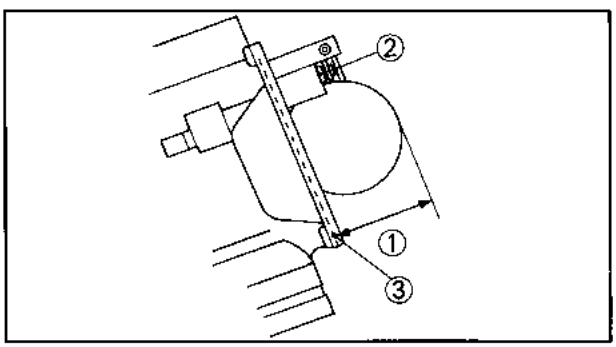
1. Inspect:
   - Carburetor body
   - Fuel and Air passages
     Contanination → Wash in petroleum-based solvent.
2. Blow out all passages and jets with compressed air.



3. Inspect:
   - Float
     Damaged → Replace.
   - Needle valve
   - Valve seat
     Wear → Replace as a set.



4. Inspect:
   - Starter plunger ①
   - Throttle valve ②
     Damage/Wear → Replace.
   - Jet needle ③
     Bend/Wear → Replace.

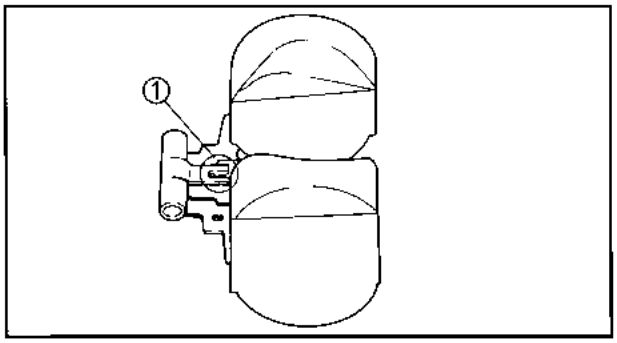


5. Measure:
   - Float height ①

Float height measurement steps:
- Hold the carburetor in an upside down position.
- Incline the carburetor at 60° ~ 70° (so that the end of the float valve ② does not hang down of float weight.
  Measure the distance from the mating surface ③ of the float chamber (gasket removed) to the top of the float using a gauge.

NOTE:
The float should be just resting on, but not depressing, the spring loaded inlet valve.

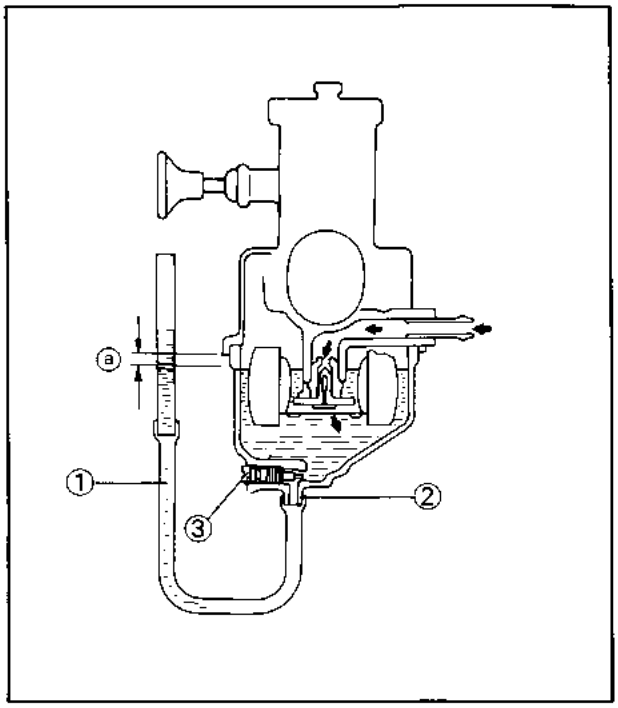
Float Height:
25.0 ± 1.0 mm (0.98 ± 0.04 in)



Float height adjustment step:
- Remove the float.
- Adjust float height by bending the float tang ① slightly.

ASSEMBLY AND INSTALLATION

1. Reverse disassembly and removal steps.

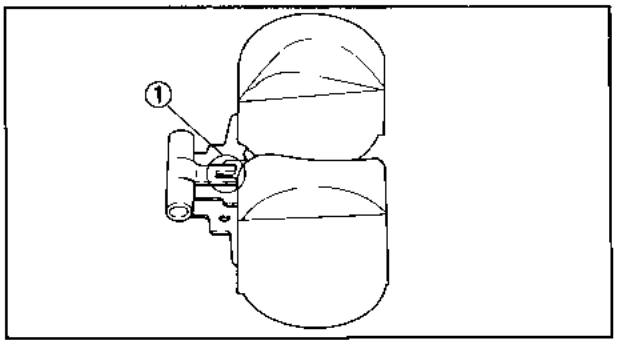


FUEL LEVEL ADJUSTMENT

1. Measure:
   - Fuel level ①
     Out of specification → Adjust.

Fuel Level:
3.5 ± 1.0 mm (0.14 ± 0.04 in)

Measurement Steps:
- Place the motorcycle on a level surface.
- Use a garage jack under the engine to ensure that the carburetor is positioned vertically.
- Connect the Fuel Level Gauge ① (90890-01312) to the drain pipe ② .
- Loosen the drain screw ③ and start the engine.
- Check the fuel level (a).



2. Adjust:
   - Fuel level
     If necessary.

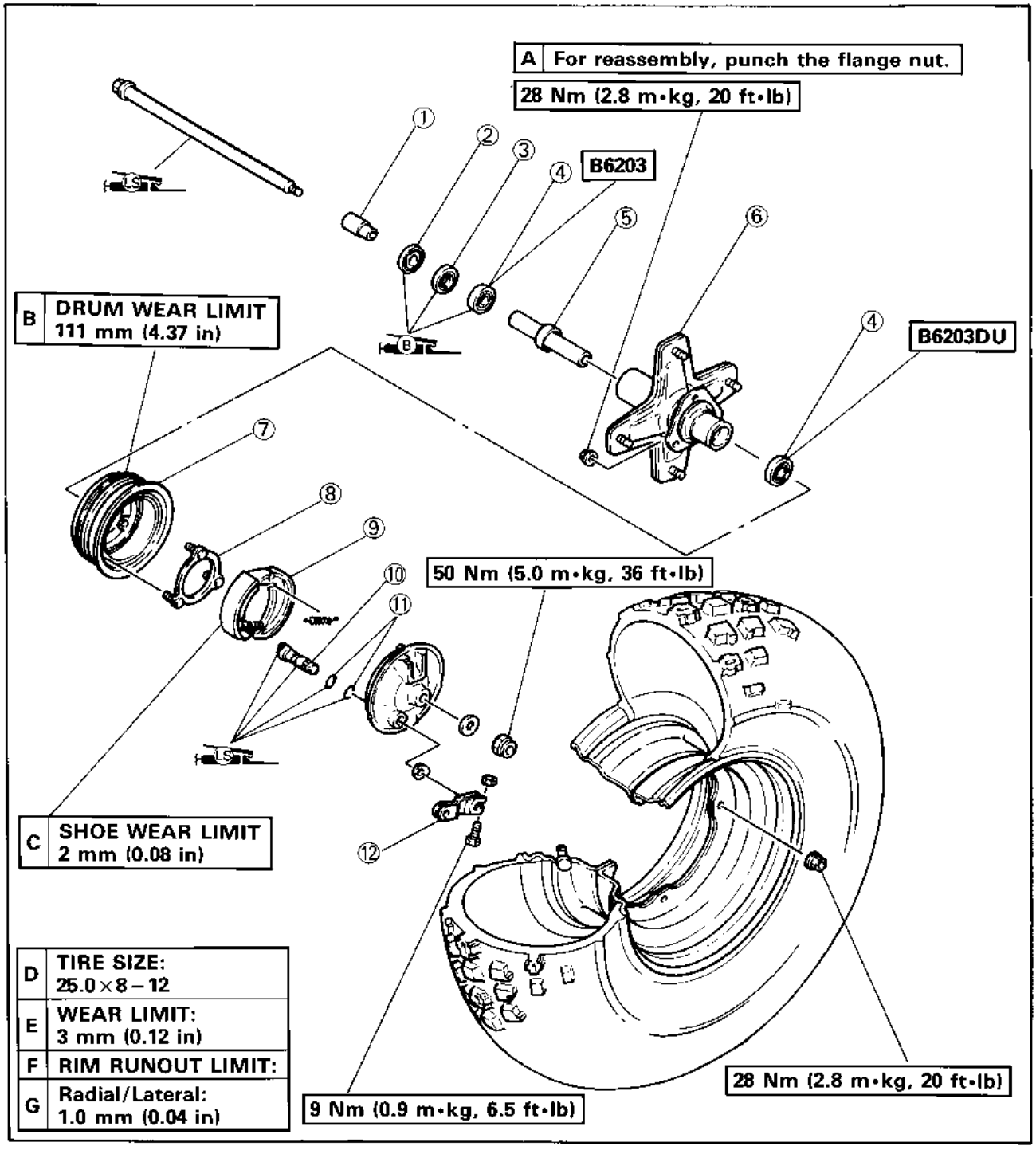
Adjustment Steps:
- Remove the float chamber.
- Adjust float level by bending the float tang ① slightly.

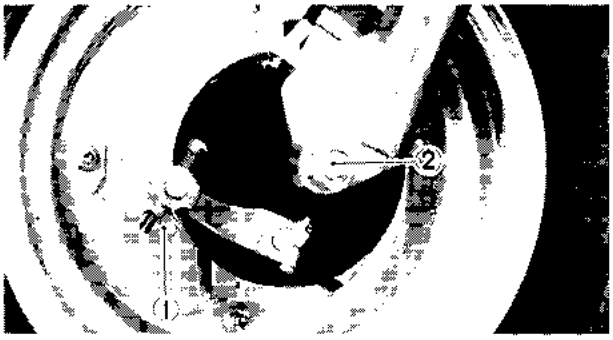
CHAPTER 5.
CHASSIS

CHAPTER 5.
CHASSIS

FRONT WHEEL

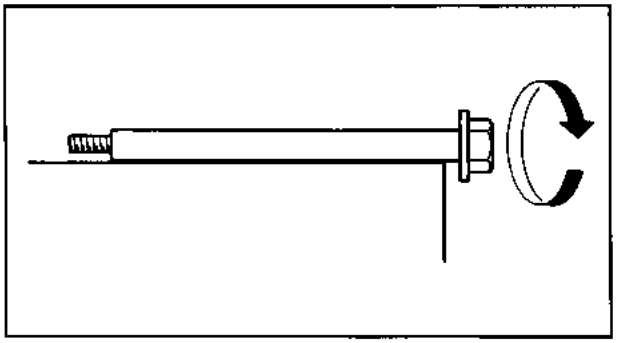
① Collar
② Dust cover
③ Oil seal
④ Bearing
⑤ Spacer
⑥ Hub
⑦ Drum
⑧ Ring
⑨ Brake shoe
⑩ Camshaft
⑪ O-ring
⑫ Camshaft lever





REMOVAL

1. Place the motorcycle on a proper stand.
2. Remove:
   - Brake adjuster ①
   - Axle shaft ②
   - Front wheel



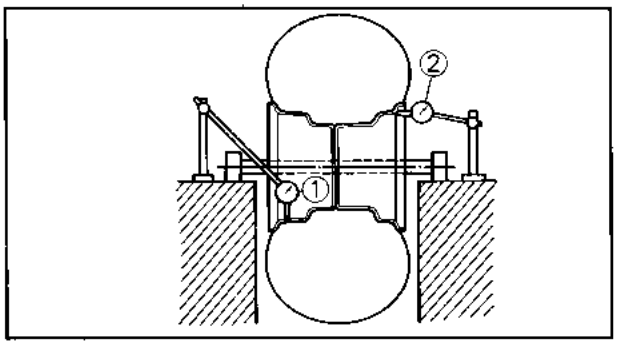
INSPECTION

Wheel and Axle

1. Inspect:
   - Axle shaft
     Roll the axle on a Flat Surface.
     Bends → Replace.

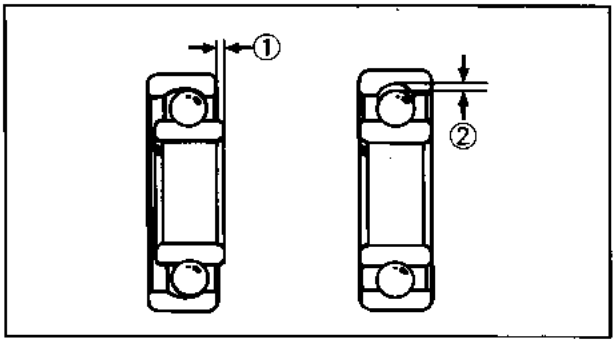
WARNING:

Do not attempt to straighten a dent axle.



2. Inspect:
   - Wheel:
     Cracks/Bends/Warpage → Replace.
3. Measure:
   - Wheel runout
     Out of specification → Replace.

Rim Runout Limits:
Radial — 1.0 mm (0.04 in)
Lateral — 1.0 mm (0.04 in)



4. Inspect:
   - Wheel bearings
     Bearings allow play in the wheel hub or wheel turns roughly → Replace.

Wheel Bearing Replacement Steps:
- Clean the outside of the wheel hub.
- Drive out the bearing.
  1. Lateral free play ①
  2. Radial free play ②

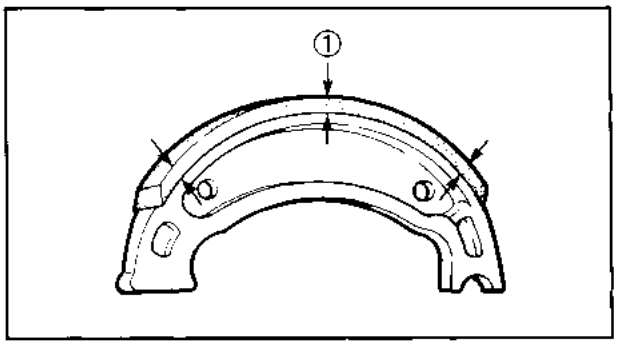
WARNING:

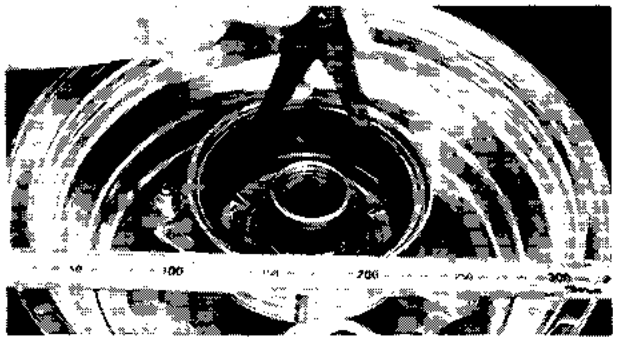
Eye protection is recommended when using striking tools.

- Install the new bearing by reversing the previous steps.

CAUTION:

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





Brake Shoe

1. Inspect:
   - Brake shoes
     Glazing → File with coarse sandpaper.
2. Measure:
   - Lining thickness ①
     Out of specification → Replace.

Brake Shoe Thickness
STD: 4.0 mm (0.16 in)
Limit: 2.0 mm (0.08 in)

Brake Drum

1. Inspect:
   - Brake drum
     Scratch/Rust → Remove with a emery cloth.

2. Measure:
   - Brake drum inside diameter
     Out of specification → Replace.

Brake Drum Inside Diameter
STD: 110 mm (4.33 in)
Limit: 111 mm (4.37 in)

INSTALLATION

When installing the front wheel, reverse the removal procedure. Note the following points.

1. Apply:
   - Brake camshaft/Pivot shaft
   - Oil seal lips
   - Axle shaft

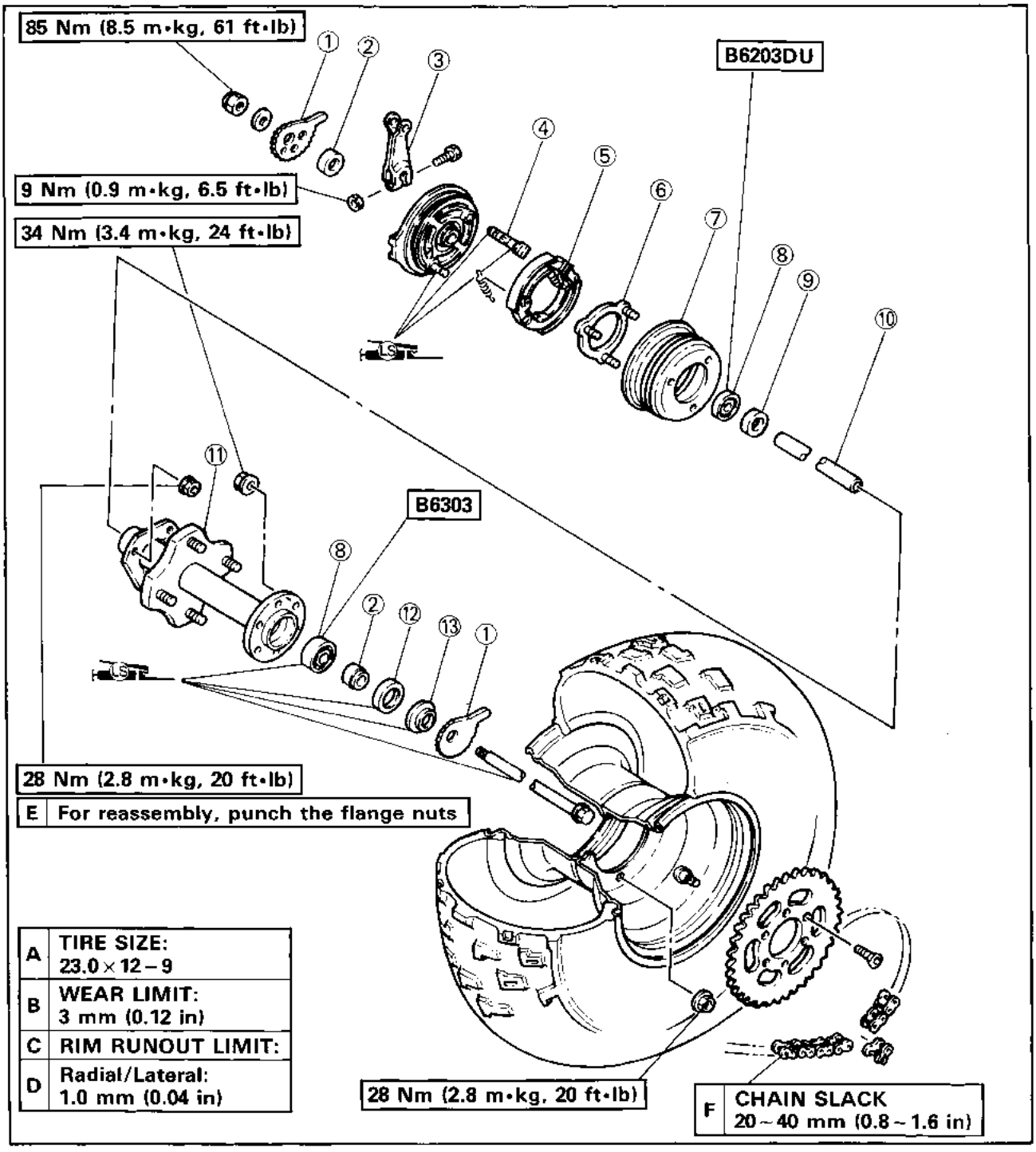
Lightweight Lithium-soap Base Grease

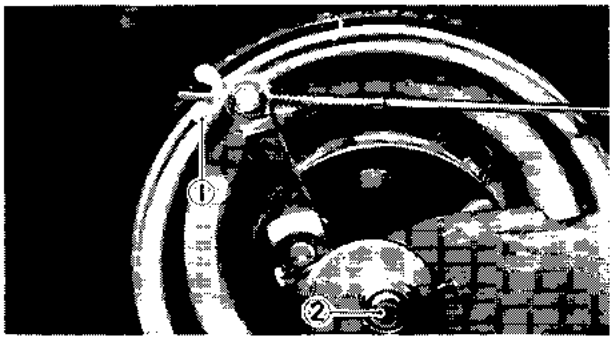
2. Check for proper engagement of the boss on the outer fork tube with the locating slot on the brake shoe plate.

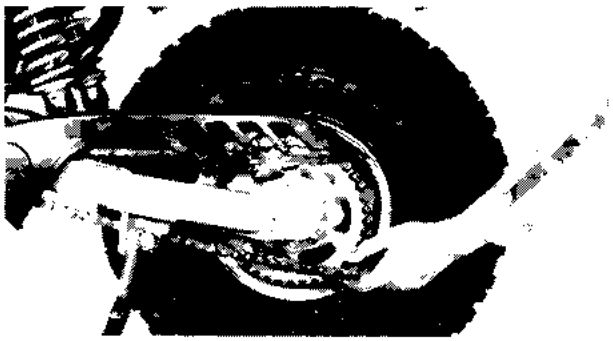
Front Wheel Axle Nut:
50 Nm (5.0 m•kg, 36 ft•lb)

REAR WHEEL

① Chain puller
② Collar
③ Camshaft lever
④ Camshaft
⑤ Brake shoe
⑥ Ring
⑦ Drum
⑧ Bearing
⑨ Wheel collar
⑩ Spacer
⑪ Hub
⑫ Oil seal
⑬ Dust cover





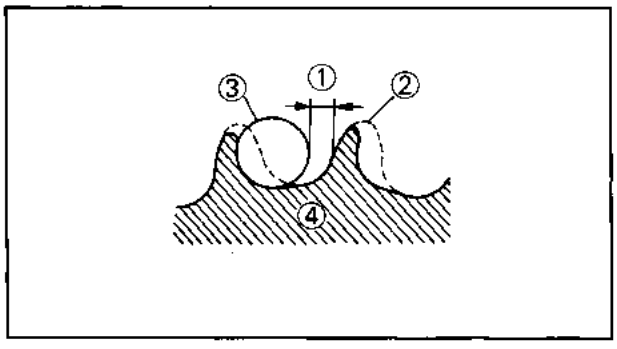


REMOVAL

1. Place the motorcycle on a proper stand.
2. Remove:
   - Brake adjuster
3. Unfook:
   - Drive chain
4. Remove:
   - Axle shaft
   - Rear wheel

INSPECTION

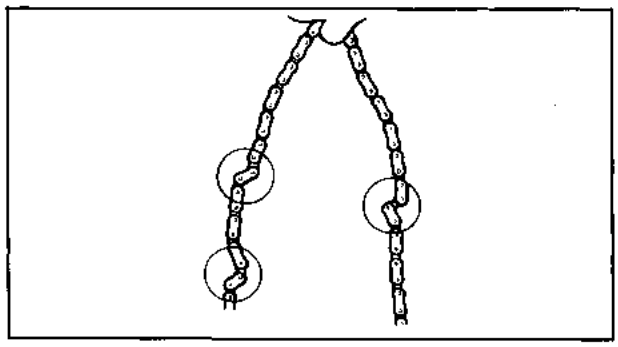
Inspection for rear wheel, axle shaft, brake shoe and brake drum, refer to "FRONT WHEEL" section.



Drive Chain and Sprockets

1. Check:
   - Sprocket wear
     Wear → Replace chain and sprockets as a set.

① 1/4 tooth ② Correct ③ Roller ④ Sprocket

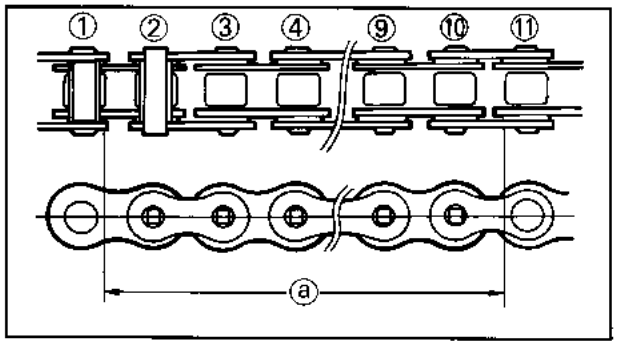


2. Check:
   - Drive chain
     Stiff → Lubricate or replace.

NOTE:

For the primary drive chain checking, this method is not available.

   - Side plates/Rollers
     Damage/Play → Replace.



3. Measure:
   - Drive chain
     Out of specification → Replace.

Drive Chain Wear Limit:
150.1 mm (5.91 in)/
10-Pitch distance

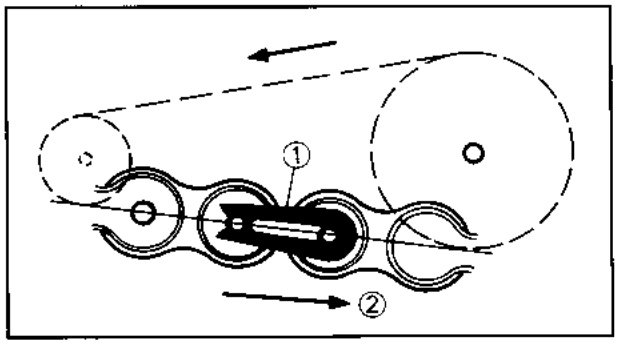
ⓐ 10-pitch distance

INSTALLATION

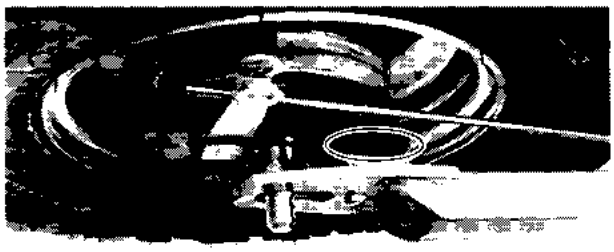
When Installing the rear wheel, reverse the removal procedure. Pay attention to the following points:

1. Grease:
   - Brake camshaft/Pivot shaft
   - Oil seal lips
   - Axle shaft

Lightweight Lithium-soap Base Grease



2. When installing the chain, make certain the closed end of the master link clip ① is facing direction of rotation ②.
3. Check for proper engagement of the boss on the swingarm with the locating slot on the brake shoe plate.
4. Adjust the drive chain slack.
5. Adjust the rear brake.

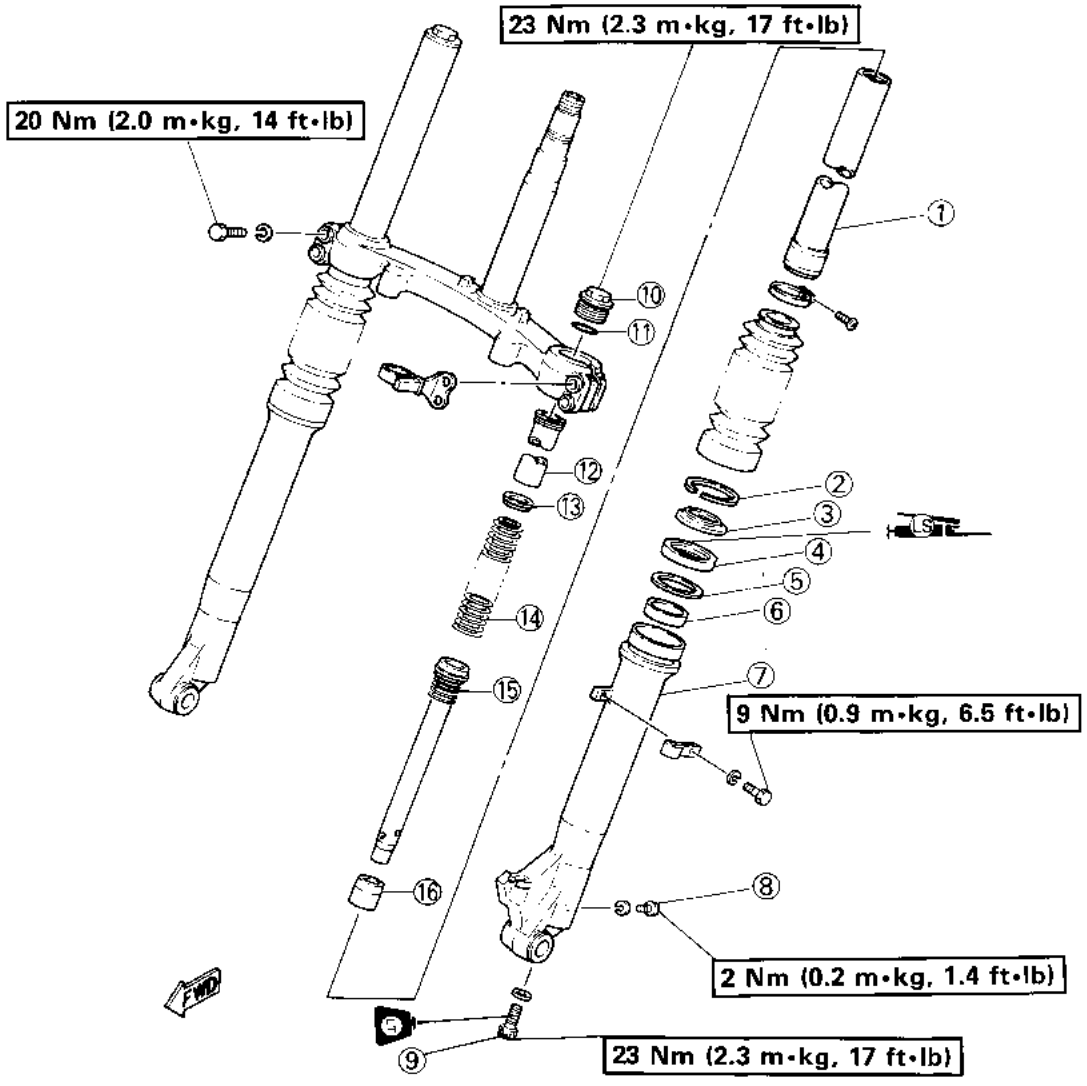


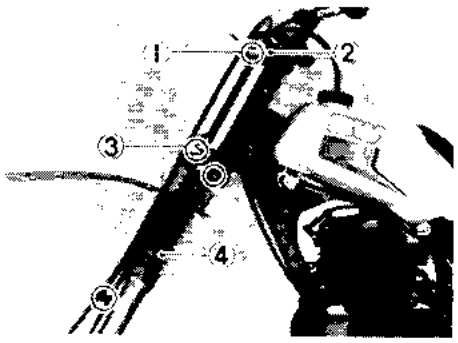
Rear Wheel Axle Shaft:
85 Nm (8.5 m•kg, 61 ft•lb)

FRONT FORK

① Inner tube
② Snap ring
③ Dust seal
④ Oil seal
⑤ Oil seal washer
⑥ Slide metal
⑦ Outer tube
⑧ Drain screw
⑨ Damper rod bolt
⑩ Cap bolt
⑪ O-ring
⑫ Spacer
⑬ Spring seat
⑭ Spring
⑮ Damper rod
⑯ Taper spindle

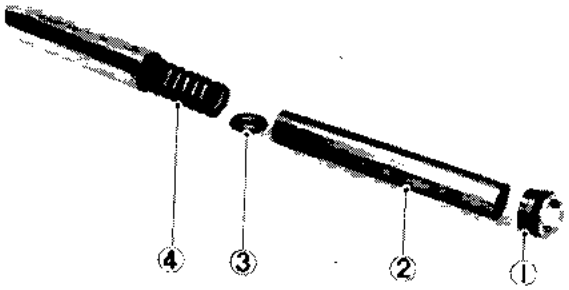
A	FORK OIL (EACH):
B	Capacity: 272 cm^3 (9.59 Imp oz, 9.20 US oz)
C	Grade: Yamaha fork oil 10 wt
D	FORK SPRING:
E	Free length limit: 372.5 mm (14.67 in)



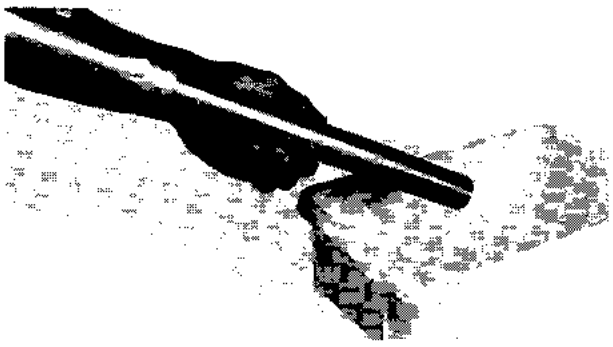


REMOVAL AND DISASSEMBLY

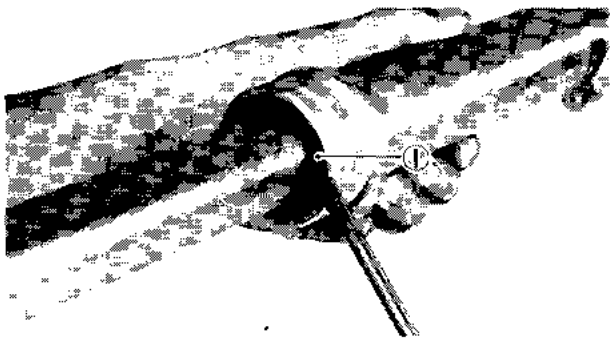
1. Remove:
   - Front wheel
   - Brake cable
2. Loosen:
   - Front fork pinch bolt (Upper) ①
   - Front fork cap bolt ②
   - Front fork pinch bolts (Lower) ③
3. Remove:
   - Front fork
   - Fork boot ④



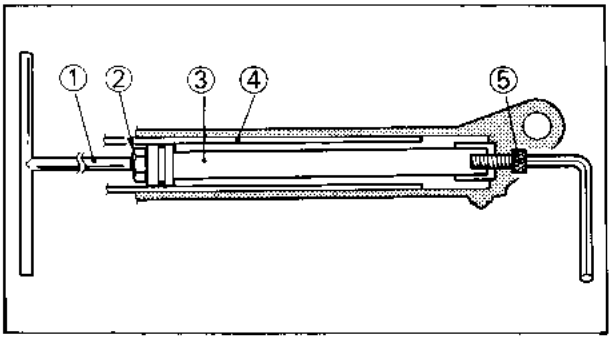
4. Remove:
   - Cap bolt ①
   - Spacer ②
   - Spring seat ③
   - Spring ④



5. Drain
   - Fork oil

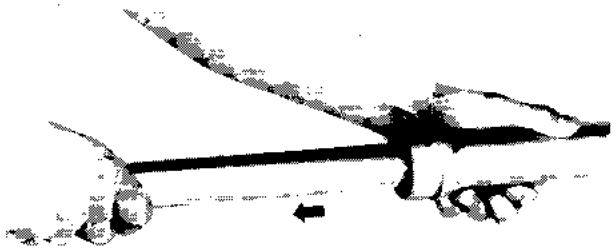


6. Remove:
   - Spring clip ①

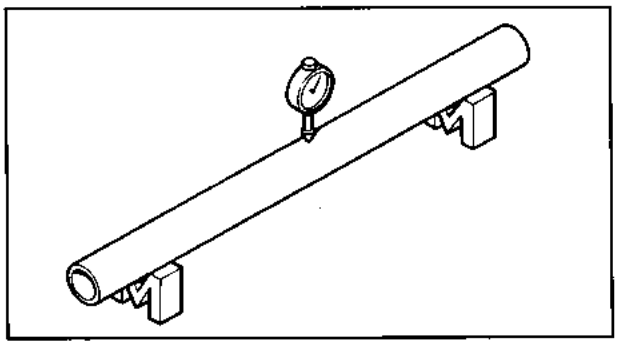


7. Remove:
   - Damper rod securing bolt ⑤.
     Use T-Handle (YM-01326) ① and Fork Damper Rod Holder (YM-33256) ②

③ Damper rod
④ Inner tube



Outer Tube Bushings Removal Steps:
- Hold fork leg horizontally.
- Clamp the axle mounting boss of the outer tube securely in a vise with soft jaws.
- Remove the bushings from the outer tube by forcefully, but carefully, with drawing the inner tube.

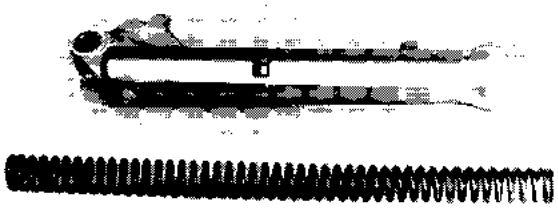


INSPECTION

1. Inspect:
   - Inner fork tube
     Scratches/ Bends → Replace.

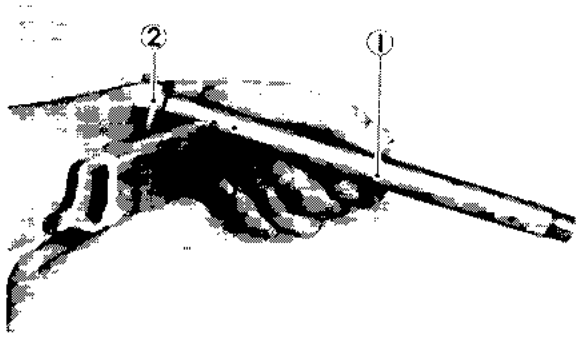
WARNING:

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



2. Inspect:
   - Outer fork tube
     Scratches/ Bends/ Damage → Replace.
   - Fork spring
     Over specified limit → Replace.

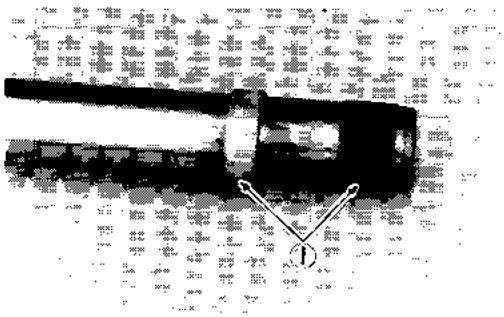
Fork Spring Free Length:
376.5 mm (14.82 in)
Limit:
372.5 mm (14.67 in)



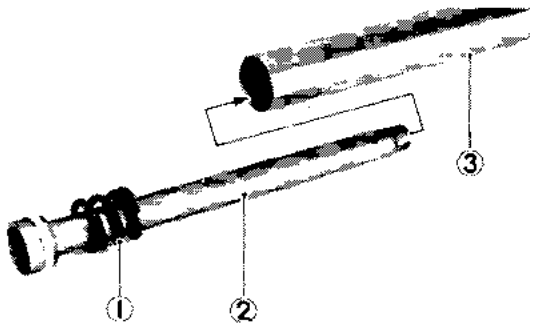
3. Inspect:
   - Damper rod ①
   - Piston ring ②
     Wear/ Damage → Replace.

NOTE:

Blow out all oil passages with compressed air.



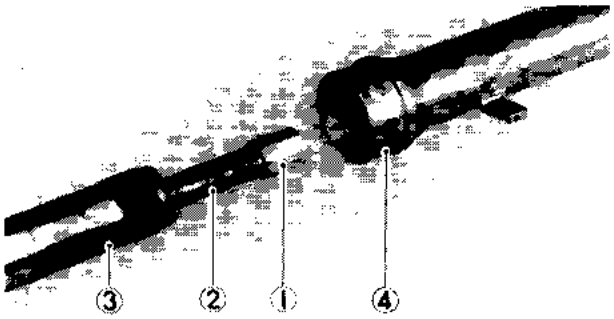
4. Inspect:
   - Slide metals ①
     Wear/Damage → Replace.



REASSEMBLY

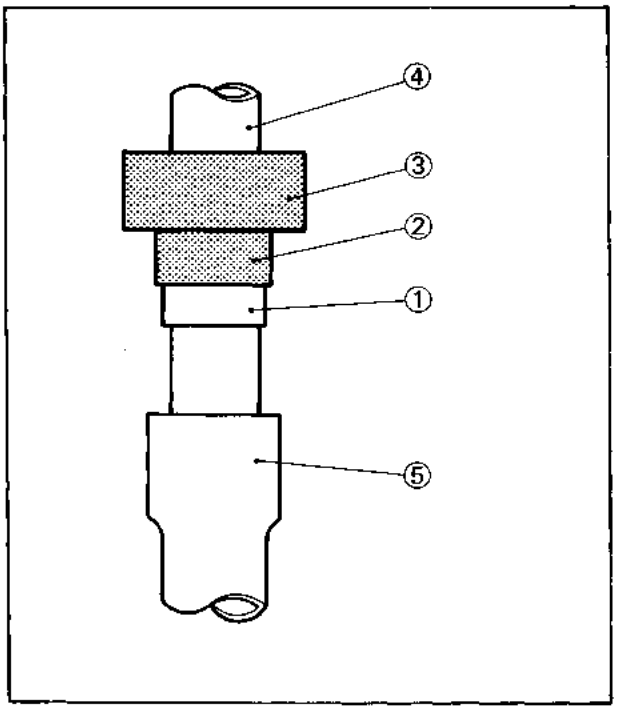
Before reassembling, clean and inspect all parts and replace when necessary.

1. Install:
   - Damper rod rebound spring ①
   - Damper rod ②
     (into inner fork tube ③)
     Allow the rod to slide slowly down the tube until the it protrudes from the bottom.



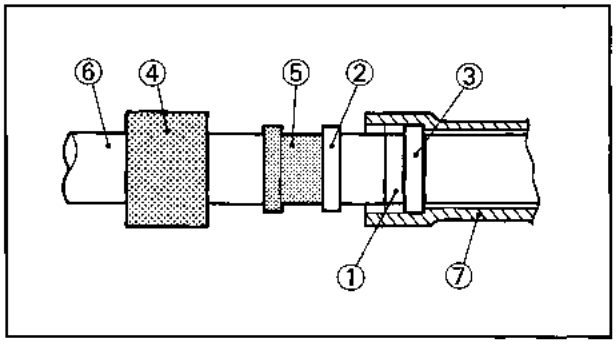
2. Install:
   - Taper spindle ①
     (onto damper rod ②)
   - Inner fork tube ③
     (into outer tube ④)
3. Tighten:
   - Damper securing bolt
     Use Damper Rod Holder (YM-33256) and T-Handle (YM-01326).

23 Nm (2.3 m•kg, 17 ft•lb)
LOCTITE®



4. Install:
   - Slide metal ①
     (into outer tube)
     Use Fork Seal Driver (Weight (YM-33963) ③ and Adaper (YM-1369) ②)

④ Inner tube
⑤ Outer tube



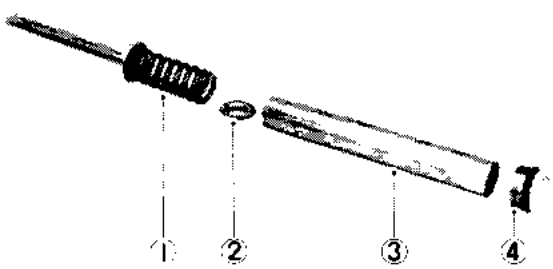
5. Install:
   - Washer ①
     (on top of the slide metal ③)
   - Oil seal ②
     Use Seal Driver Weight (YM-33963) ④ and Adapter (YM-1369) ⑤). Grease the lips and install with numbered side up.

⑥ Inner tube
⑦ Outer tube

6. Install:
   - Dust seal
     Use special tools ④
     (YM-33963, YM-1369)
   - Snap ring

7. Fill:
   - Front fork

Oil Quantity:
272 cm³ (9.59 Imp oz, 9.20 US oz) (each):
Oil Level:
140 mm (5.51 in)
(From top of inner tube fully compressed without spring.)
Oil Grade:
Yamaha fork oil 10wt
(After filling, slowly pump the fork up and down to distribute oil.)



8. Install:
   - Spring ①
   - Spring seat ②
   - Spacer ③
   - Cap bolt ④
   - Fork boot

INSTALLATION

1. Install:
   - Fork
2. Tighten:
   - Inner tube pinch bolts
   - Cap bolt

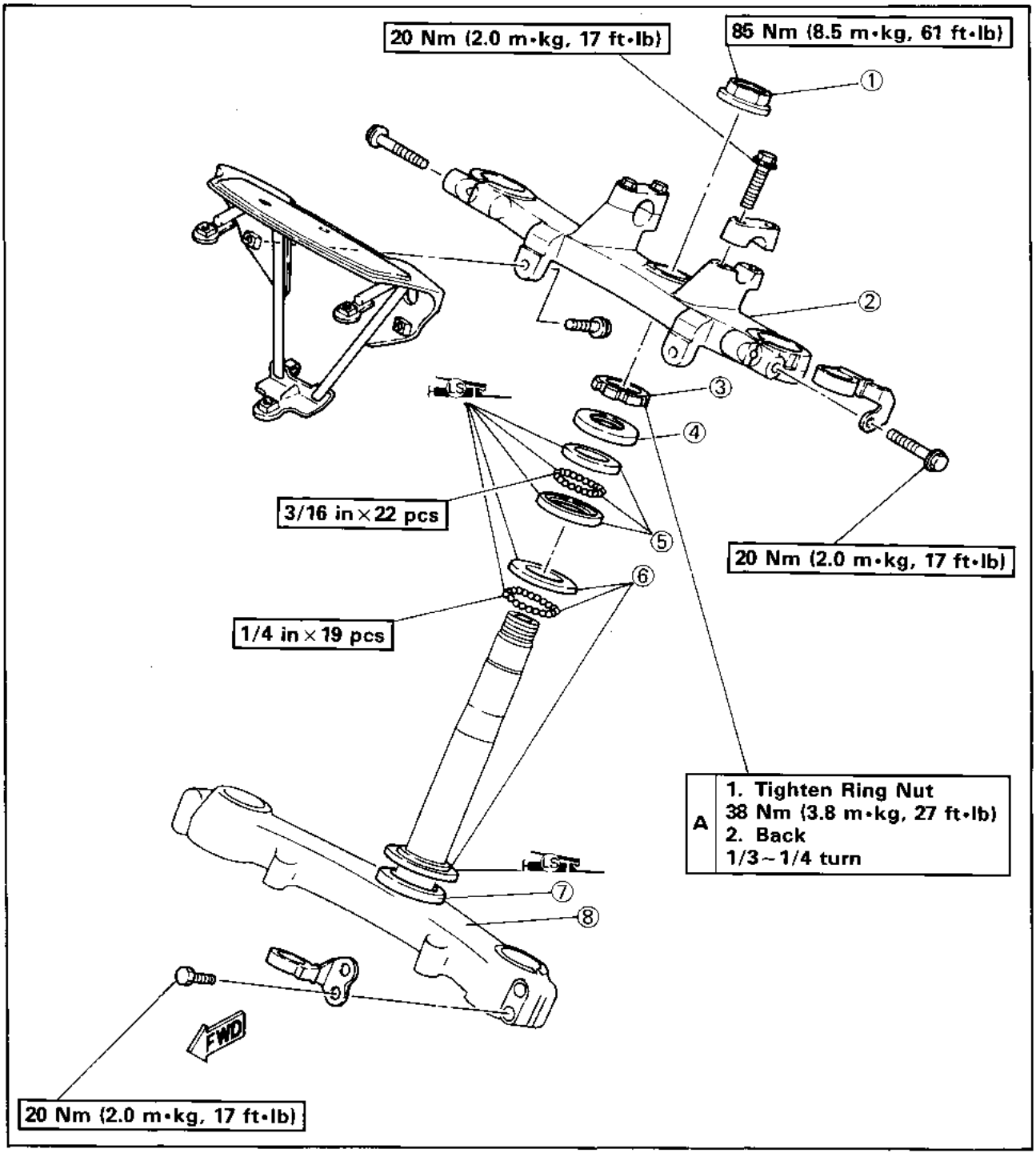
Inner Tube Pinch Bolt:
20 Nm (2.0 m•kg, 14 ft•lb)
Cap Bolt:
23 Nm (2.3 m•kg, 17 ft•lb)

3. Continue Installation; Reverse the removal procedures.

STEERING HEAD

① Steering shaft nut
② Handle crown
③ Ring nut
④ Bearing cover
⑤ Bearing (Upper)
⑥ Bearing (Lower)
⑦ Steering seal
⑧ Lower bracket

	RING NUT WRENCH: P/N YU-33975

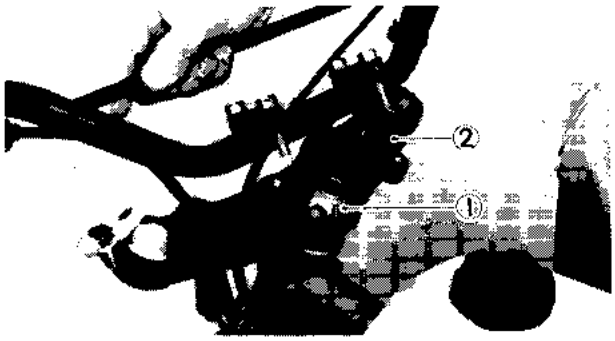


STEERING HEAD

REMOVAL

1. Remove:
   - Front wheel
   - Front forks
   - Front fender
   - Headlight assembly

2. Disconnect:
   - Electrical lead wires
   - Brake cable



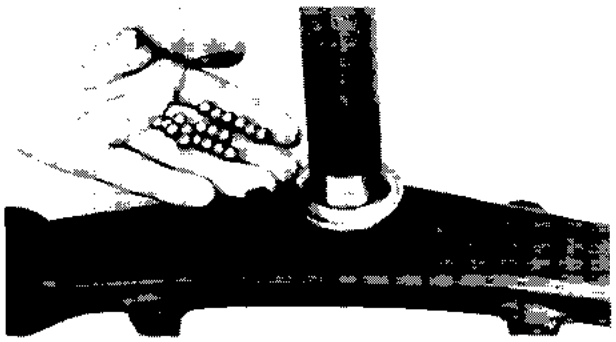
3. Remove:
   - Handlebar
     (and put aside)
   - Steering fitting nut ①
   - Handle crown ②

4. Remove:
   - Ring nuts ①
     Use Steering Nut Wrench (YU-01268)

NOTE:

Support the lower bracket not to drop the balls.

   - Lower bracket ②



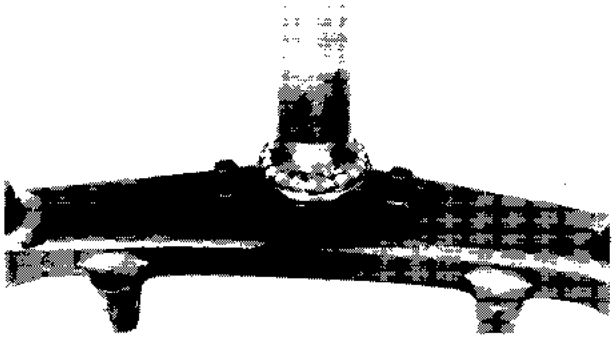
INSPECTION

1. Clean the balls and the races.
2. Inspect:
   - Balls
   - Races
     Pitting/ Dent/ Rust → Replace as a set.

3. When removing the race, drive out by striking it in steps. And fit the race squarely in the head pipe.

CAUTION:

If the ball race is fitted not squarely, the head pipe could be damaged.



INSTALLATION

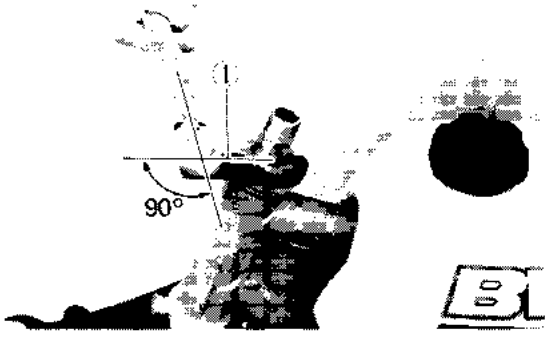
1. Grease the races and put the balls in it.

NOTE:

Make sure the balls are of the same size and the quantity is correct.

Upper . . . . . 22 psc 3/16 in
Lower . . . . . 19 pcs 1/4 in

2. Install:
   - Lower bracket ①
   - Bearing cover ②
   - Ring nut ③



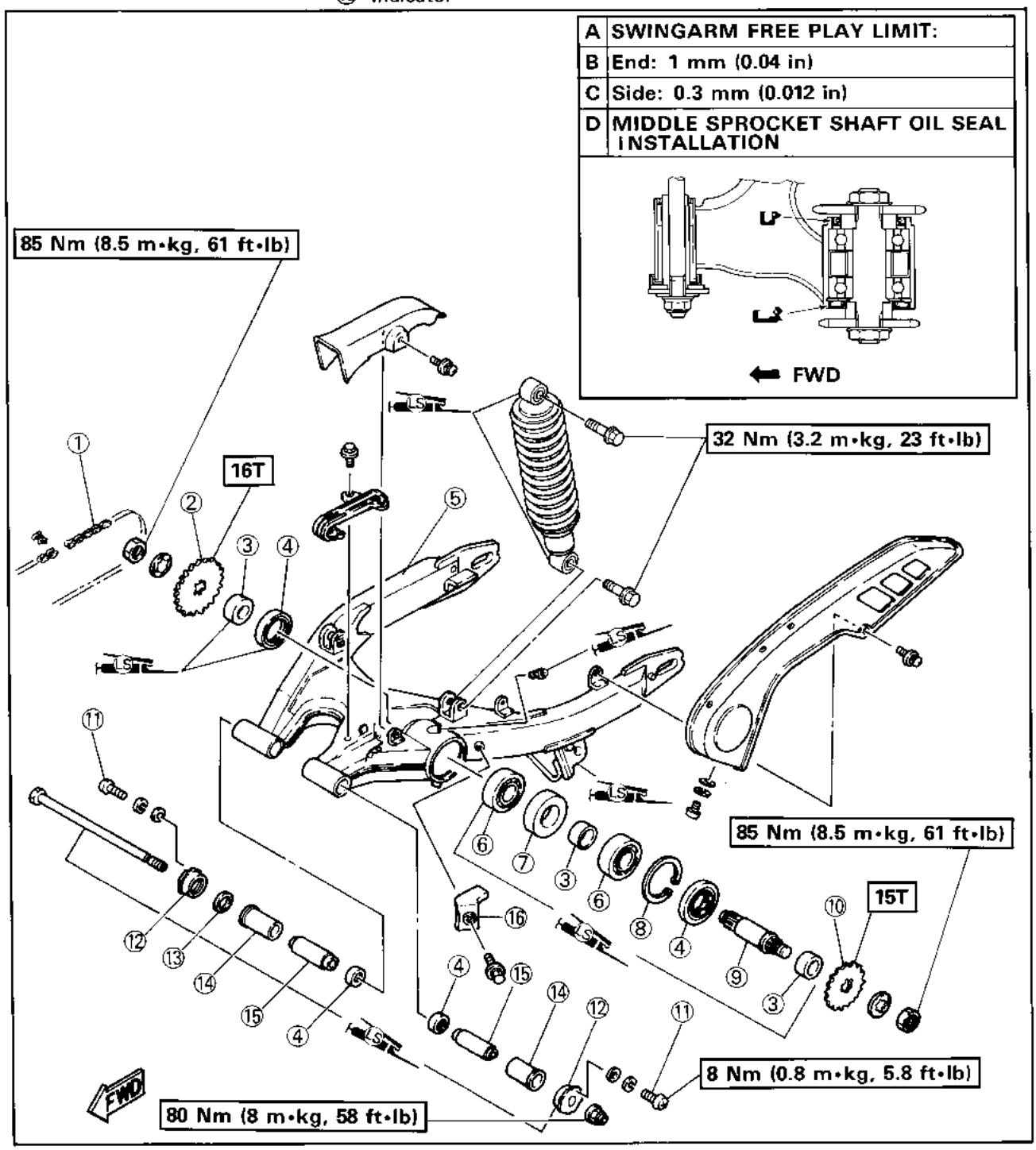
3. Tighten:
   - Ring nut
     Use Ring Nut Wrench (YU-33975) ①
     See Chapter 2 "Steering Head Adjustment".

4. Continue Assembly; Reverse the disassembly procedures.

Steering Shaft Nut:
85 Nm (8.5 m•kg, 61 ft•lb)
Handlebar:
20 Nm (2.0 m•kg, 14 ft•lb)
Inner Tube Pinch Bolt:
20 Nm (2.0 m•kg, 14 ft•lb)

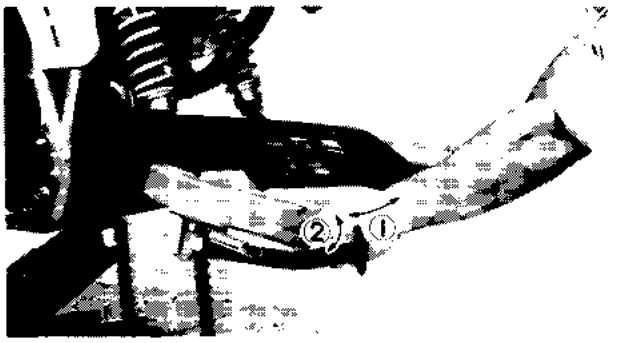
SWINGARM, MIDDLE SPROCKETS SHAFT AND REAR SHOCK ABSORBER

① Drive chain
② Middle sprocker (IN)
③ Collar
④ Oil seal
⑤ Swingarm
⑥ Bearing
⑦ Rubber
⑧ Circlip
⑨ Middle sprockets shaft
⑩ Middle sprocket (OUT)
⑪ Stopper screw
⑫ Adjusting nut (Thrust cover)
⑬ Shim
⑭ Bush
⑮ Distance collar
⑯ Indicator



SWINGARM FREE PLAY INSPECTION

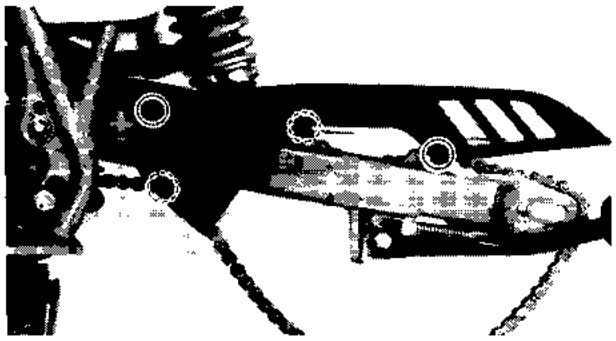
1. Remove:
   - Rear wheel
   - Rear shock absorber lower bolts

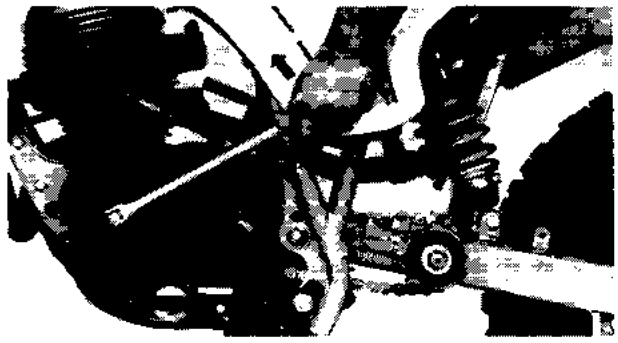


2. Check:
   - Swingarm side play ①
     Grasp and move from side to side.
     Side play → Check and adjust bearing.
   - Swingarm vertical movement ②
     Tighteness/Binding/Rough spots → Check and adjust bearing.
     Damage → Replace bearing.

REMOVAL

1. Remove:
   - Rear wheel
   - Chain covers

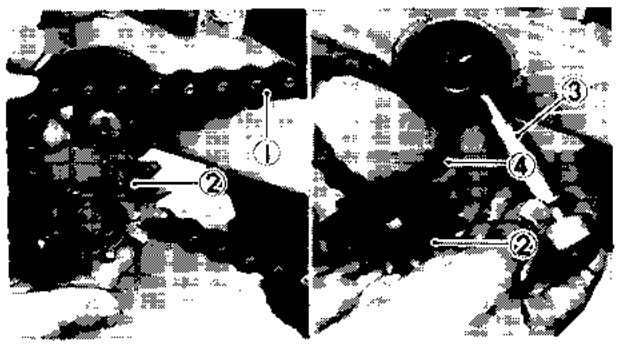




2. Loosen:
   - Middle sprockets shaft nuts (inside and outside)

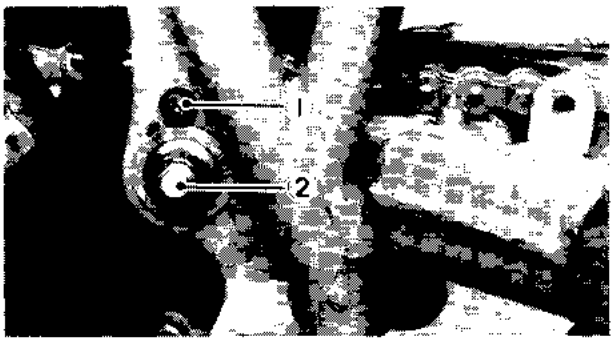
NOTE:

Apply rear brake to lock the shaft. If stiff, put the transmission in first gear and turn the crankshaft as shown.

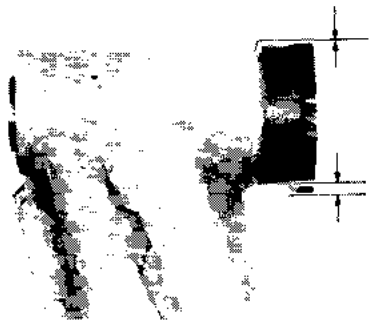


3. Remove:
   - Secondary drive chain ①
   - Sprockets ②
   - Middle gears shaft ③
4. Disconnect:
   - Primary drive chain ④
     Use Drive Chain Cutter (YM-33858)

SWINGARM, MIDDLE SPROCKETS SHAFT AND REAR SHOCK ABSORBER



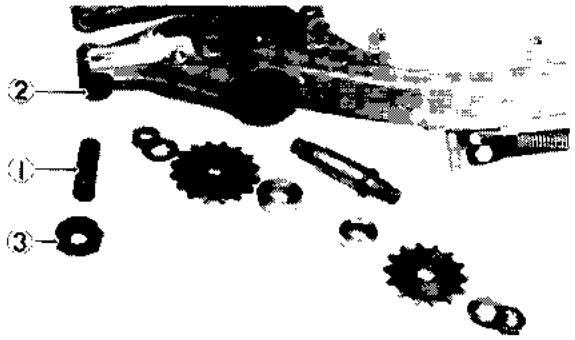
5. Remove:
   - Shock absorber pivoting bolts (lower)
   - Stopper screws ①
   - Pivot shaft ②
   - Swingarm



NOTE:

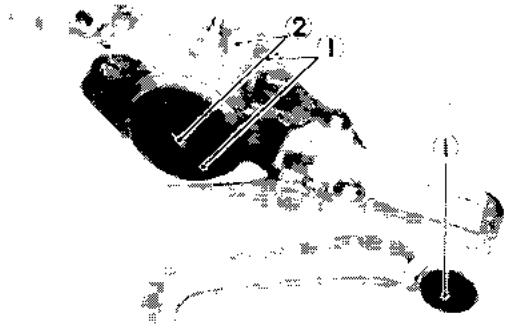
Note the adjusting nut (thrust cover) direction.

6. Remove:
   - Rear shock absorber



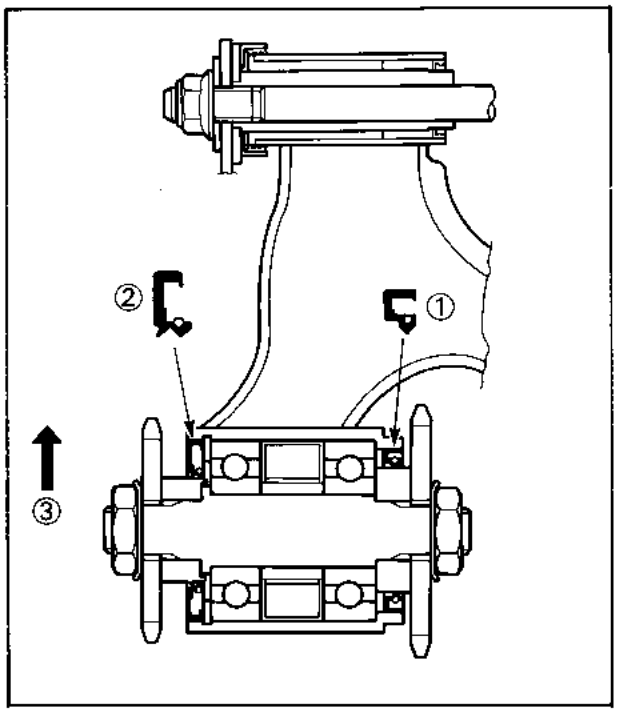
INSPECTION

1. Inspect:
   - Collars ①
   - Bushes ②
     Wear/ Damage/ Rust → Replace.
   - Thrust cover ③
     Wear/ Damage → Replace.



2. Inspect:
   - Oil seals ①
     Wear/ Damage → Replace.
   - Bearings ②
     Tighteness/ Binding/ Rough spots → Replace.

3. Inspect:
   - Shock absorber
     Oil leakage/ Bending push rod → Replace.



INSTALLATION

When installing the swingarm, reverse the removal procedure. Note the following points.

1. Apply grease to the collors, bushes, oil seal lips, pivot shaft bearings and shock absorber bushes.

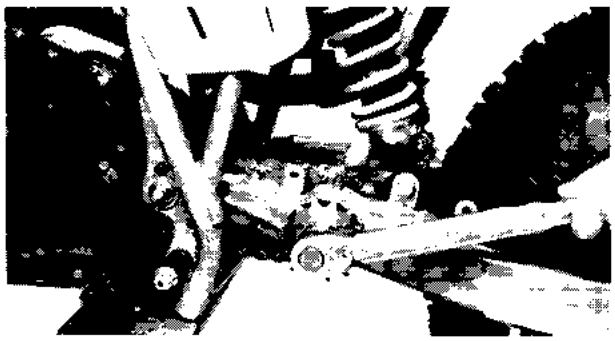
Lithium-soap Base Grease

2. Fit the oil seals in the direction as shown.

① Oil seal (Inside)
② Oil seal (Outside)
③ Frontward

3. Fit the adjusting nuts (Thrust covers) in the same direction as before disassembly.
4. Then make sure that the adjusting nuts are properly fitted with stopper screws in the nuts notches.

Stopper Screw:
8 Nm (0.8 m•kg, 5.8 ft•lb)
Pivot Shaft:
80 Nm (8 m•kg, 58 ft•lb)



4. Tighten the middle sprockets and bend the lock washers tabs against nut flats.

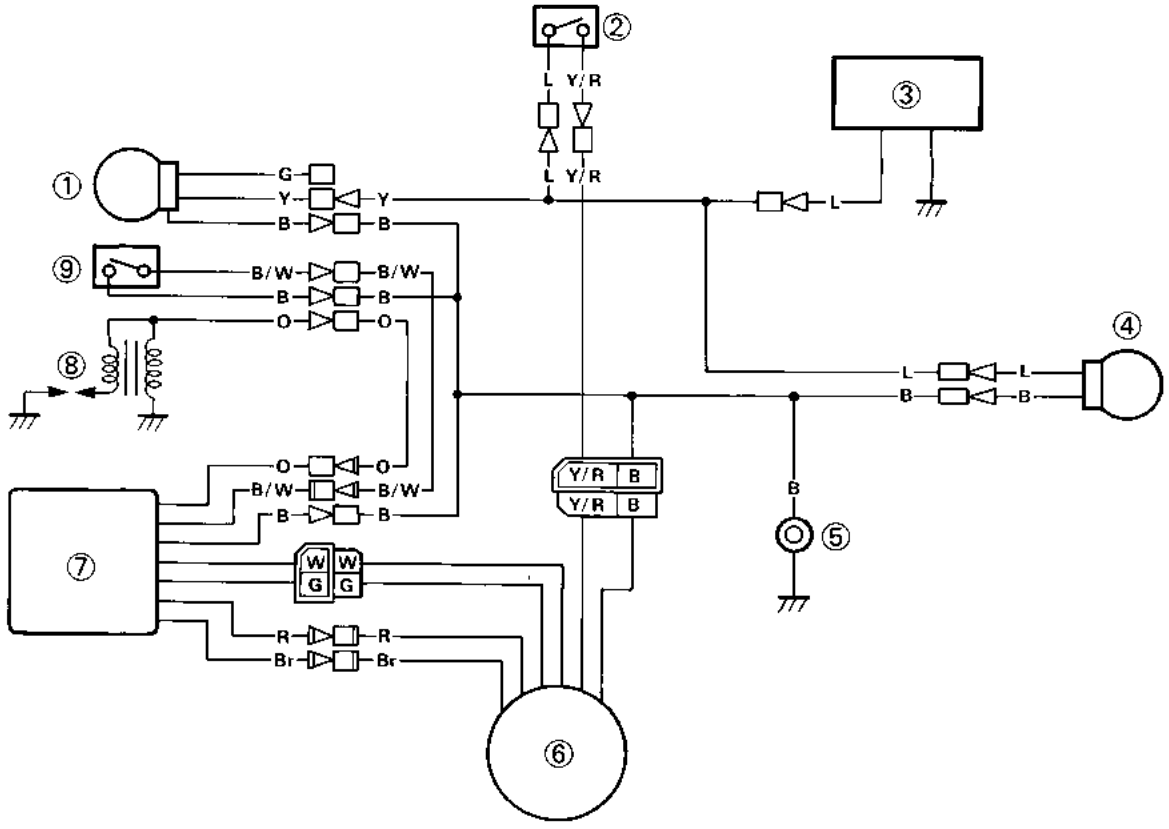
Middle Sprocket:
85 Nm (8.5 m•kg, 61 ft•lb)

5. Adjust:
   - Secondary drive chain slack
   - Rear brake

CHAPTER 6.
ELECTRICAL

CHAPTER 6.
ELECTRICAL

CIRCUIT DIAGRAM

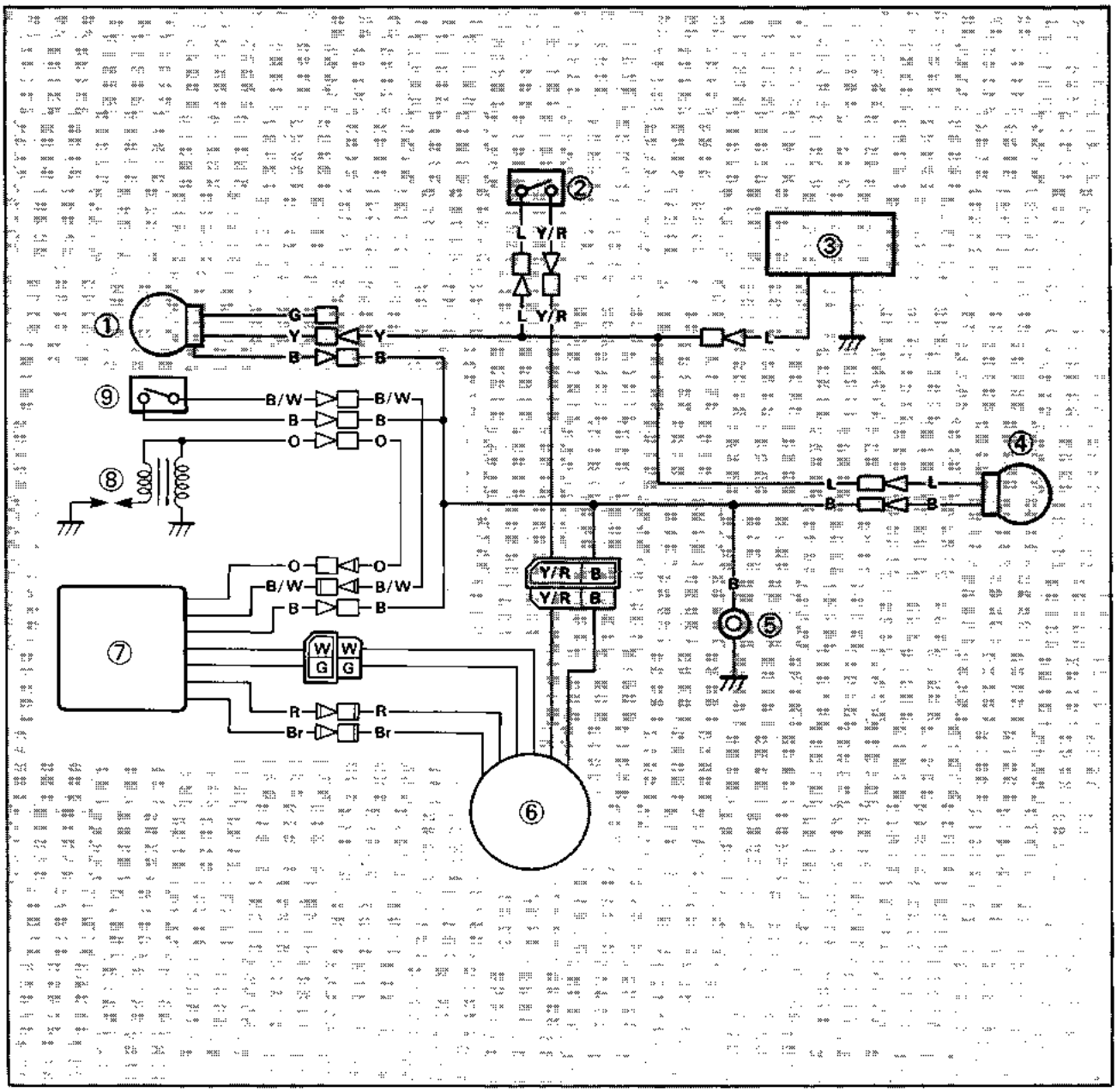


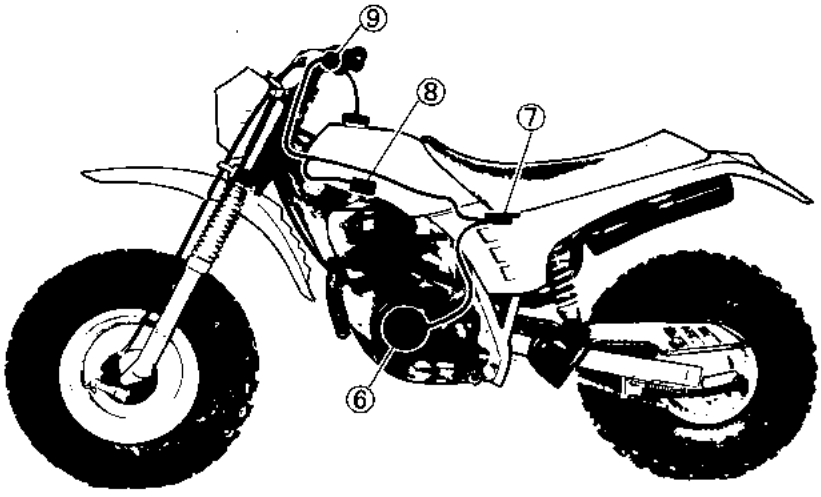
① Headlight
② Lighting switch
③ Regulator
④ Taillight
⑤ Body earth
⑥ C.D.I. magneto
⑦ C.D.I. unit
⑧ Ignition coil
⑨ Engine stop switch

COLOR CODE

B . . . . . Black
Br . . . . . Brown
G . . . . . Green
L . . . . . Blue
O . . . . . Orange
R . . . . . Red
W . . . . . White
B/W . . . . . Black/White
Y/R . . . . . Yellow/Red

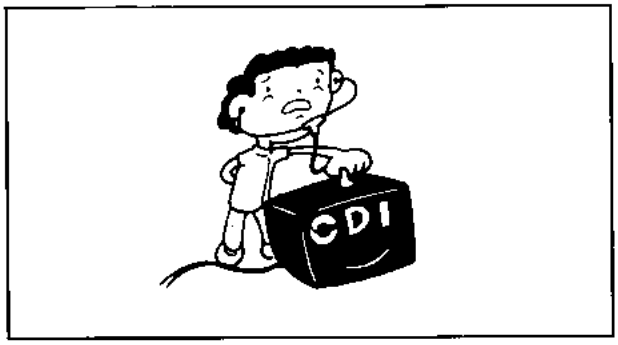
IGNITION SYSTEM





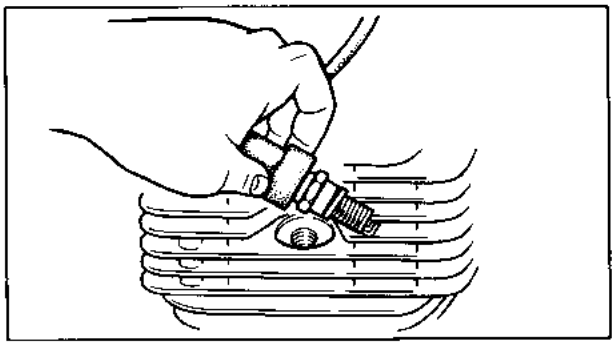
① Headlight
② Lighting switch
③ Regulator
④ Taillight
⑤ Body earth
⑥ **C.D.I. magneto**
⑦ **C.D.I. unit**
⑧ **Ignition coil**
⑨ **Engine stop switch**

IGNITION SYSTEM



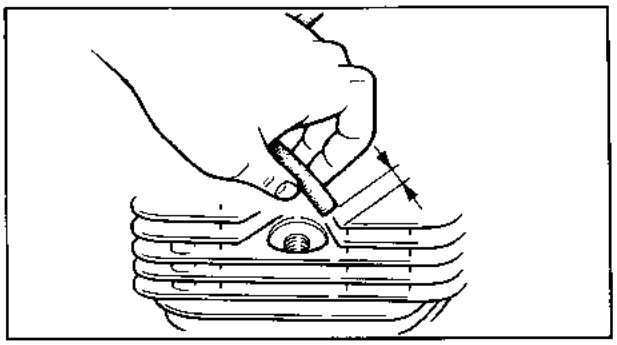
TROUBLESHOOTING

If the ignition spark is of poor quality or if there is no spark at all, use the following procedure, to locate and repair the problem.



1. Check:
   - Spark plug
     Ground the spark plug to the cylinder head, and kick the starter.

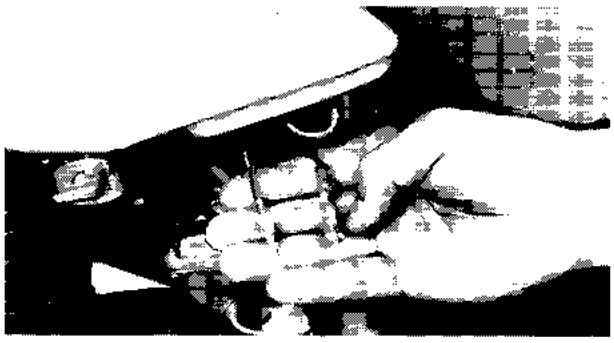
⇩ No spark



2. Check:
   - Spark gap
     Hold the high tension lead 6 mm (0.24 in) from the cylinder head, and kick the starter.

Good Spark → Check plug cap.
Replace spark plug.

⇩ No spark



3. Check:
   - Engine stop switch
     Disconnect the Black/White lead of engine stop switch at C.D.I. unit.

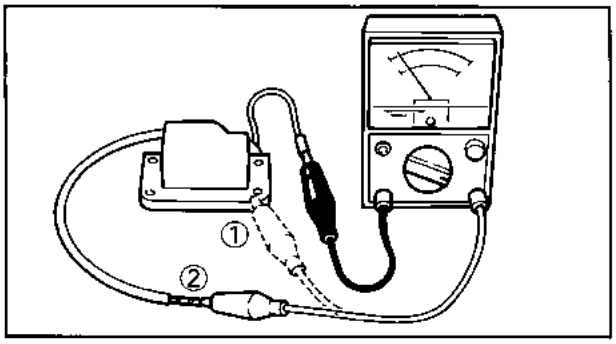
If start → Replace.

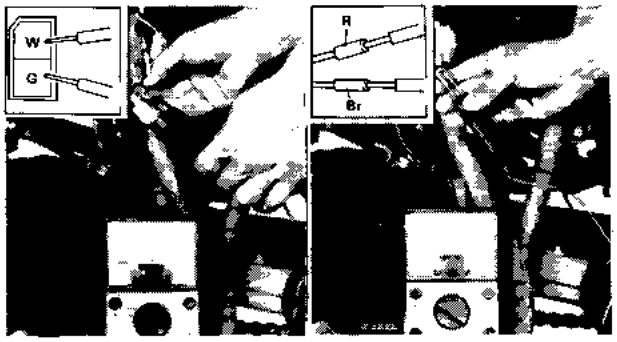
⇩ Does not start

4. Check:
   - All connectors and couplers

Loose/Dirt/Rust → Correct connection.

⇩ OK





5. Measure:
   - Ignition coil windings

   Out of specification → Replace.

Primary Coil Resistance ①:
1.6Ω ± 10%
Secondary Coil Resistance ②:
6.6kΩ ± 20%

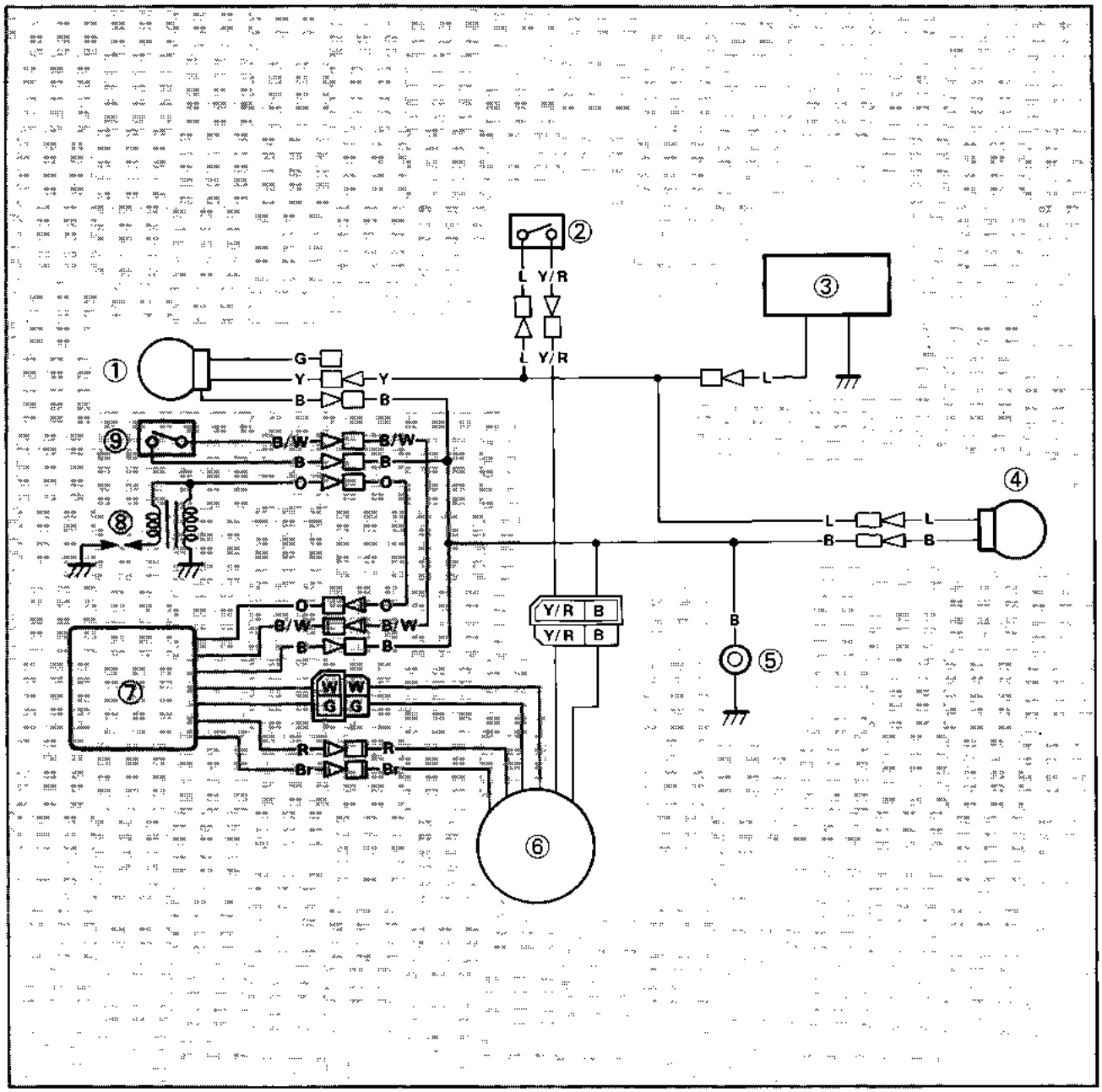
⇩ OK

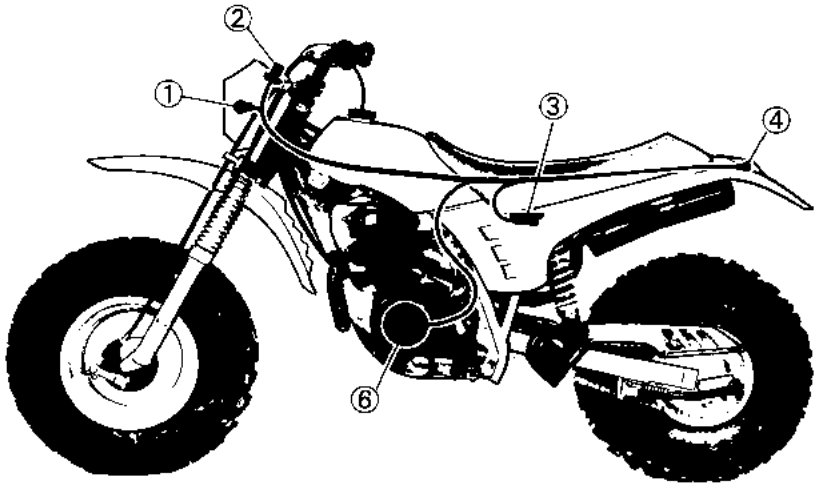
6. Measure:
   - Pickup coil resistance
   - Source coil resistance

   Out of specification → Replace pickup coil or stator assembly.

Pickup Coil Resistance:
265Ω ± 10% (White — Green)
Source Coil Resistance:
415Ω ± 10% (Red — Brown)

LIGHTING SYSTEM





① **Headlight**
② **Lighting switch**
③ **Regulator**
④ **Taillight**
⑤ **Body earth**
⑥ **C.D.I. magneto**
⑦ C.D.I. unit
⑧ Ignition coil
⑨ Engine stop switch

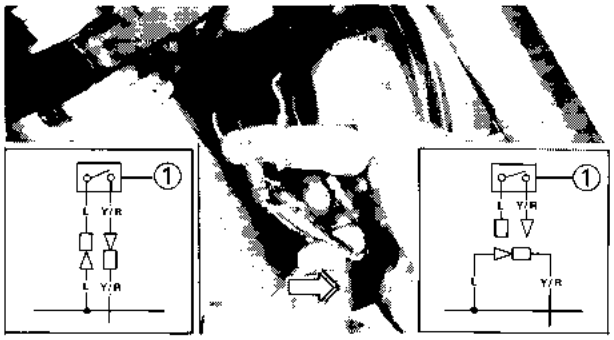
TROUBLESHOOTING

If the headlight or taillight will not come on, make checkups in the following sequence to determine the cause of trouble, and repair or replace the light (bulb).

1. Check:
   - Bulb

   Burn out → Replace.

⇩ OK



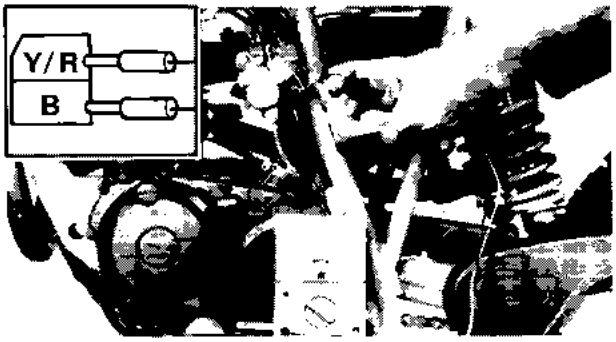
2. Check:
   - Headlight switch

   Disconnect the leads from the lighting switch, and connect the Yellow/Red lead directly to the Blue lead.

   Comes on → Repair or replace.

   ① Headlight switch

⇩ Does not come on

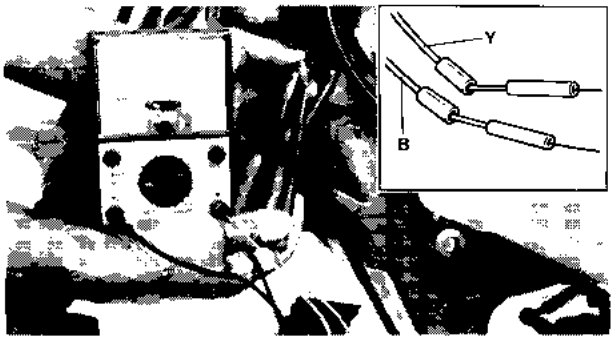


3. Measure:
   - Lighting coil resistance

   Out of specification → Replace.

Lighting Coil Resistance:
0.494Ω ± 10% (Yellow/Red—Black)

⇩ OK



4. Measure:
   - Lighting voltage

   To check, use the pocket tester in the AC20V range.

   Out of specification → Check all connectors and coupers or replace the bulb.

⇩ OK

CHAPTER 7.
APPENDICES

CHAPTER 7
APPENDICES

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	BW200N
Model Code Number	54G
Vehicle Identification Number	JYA54G00*FA000101
Engine Starting Number	54G-000101
Dimensions:	
Overall Length	1,985 mm (78.1 in)
Overall Width	830 mm (32.7 in)
Overall Height	1,090 mm (42.9 in)
Seat Height	795 mm (31.3 in)
Wheelbase	1,380 mm (54.3 in)
Minimum Ground Clearance	240 mm (9.45 in)
Basic Weight:	
With Oil and Full Fuel Tank	116 kg (256 lb)
Minimum Turning Radius	2,100 mm (82.7 in)
Engine:	
Engine Type	Air cooled, 4-stroke, gasoline, SOHC
Cylinder Arrangement	Single cylinder, Forward inclined
Displacement	196 cm^3
Bore × Stroke	67.0 × 55.7 mm (2.64 × 2.19 in)
Compression Ratio	9.5 : 1
Starting System	Kick starter
Lubrication System	Wet sump
Oil Type or Grade:	
Engine Oil	Yamalube 4-cycle oil or SAE 20W 40 type SE motor oil
Oil Capacity:	
Engine oil	
Periodic Oil Change	1.0 L (0.88 Imp qt, 1.06 US qt)
With Oil Filter Replacement	1.1 L (0.97 Imp qt, 1.16 US qt)
Total Amount	1.3 L (1.14 Imp qt, 1.37 US qt)
Air Filter	Wet type element
Fuel:	
Type	Regular gasoline
Tank Capacity	6.5 L (1.43 Imp gal, 1.72 US gal)
Reserve Amount	0.5 L (0.11 Imp gal, 0.13 US gal)
Carburetor:	
Type/Manufacturer	Y24P-3P/TEIKEI
Spark Plug:	
Type/Manufacturer	D8EA (NGK) or X24ES-U (NIPPON DENSO)
Gap	0.6 ~ 0.7 mm (0.024 ~ 0.028 in)

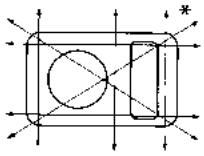
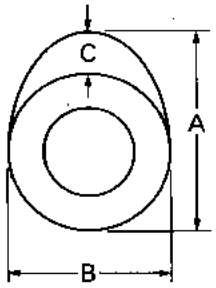
Model	BW200N
Clutch Type	Wet, multiple-disc
Transmission:	
Primary Reduction System	Gear
Primary Reduction Ratio	74/20 (3,700)
Secondary Reduction System	Chain drive
Secondary Reduction Ratio	16/12×37/14 (3,524)
Transmission Type	Constant mesh, 5-speed
Operation	Left foot operation
Gear Ratio	
1st	34/12 (2.833)
2nd	34/19 (1.789)
3rd	29/22 (1.318)
4th	26/25 (1.040)
5th	23/28 (0.821)
Chassis:	
Frame Type	Steel tube Diamond
Caster Angle	27.25°
Trail	88 mm (3.46 in)
Tire:	
Type	Tubeless
Size (F)	25.0×8-12
Size (R)	23.0×12-9
Tire Pressure (Cold tire):	
Reference tire pressure	29.4 kPa (0.3 kg/cm^2, 4.3 psi)
Minimum	11.8 kPa (0.12 kg/cm^2, 1.8 psi)
Maximum	137 kPa (1.4 kg/cm^2, 20 psi)
Brake:	
Front Brake Type	Drum brake
Operation	Right hand operation
Rear Brake Type	Drum brake
Operation	Right foot operation
Suspension:	
Front Suspension	Telescopic fork
Rear Suspension	Swing arm
Shock Absorber:	
Front Shock Absorber	Coil spring, Oil damper
Rear Shock Absorber	Gas, Coil spring, Oil damper

GENERAL SPECIFICATIONS

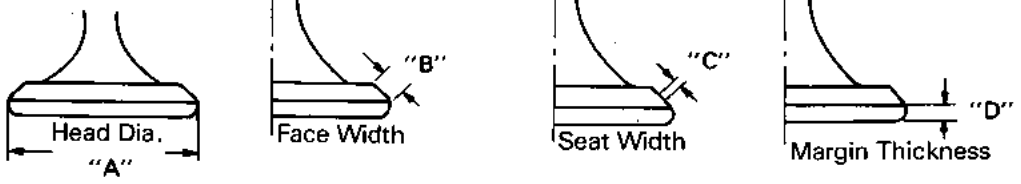
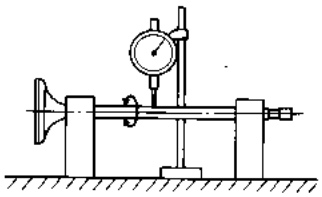
Model	BW200N
Wheel Travel:	
Front Whel Travel	160 mm (6.30 in)
Rear Wheel Travel	160 mm (6.30 in)
Electrical:	
Ignition System	C.D.I. Magneto
Generator System	Flywheel magneto
Headlight Type	Bulb type
Bulb Wattage/ Quantity:	
Headlight	45W/ 45W × 1
Tail Light	5W × 1

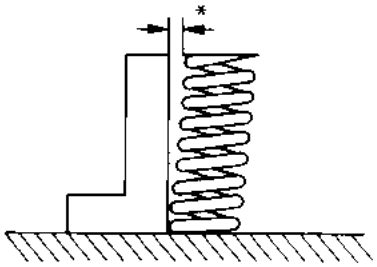
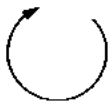
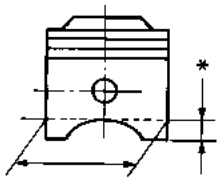
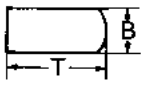
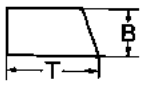
MAINTENANCE SPECIFICATIONS

A. ENGINE

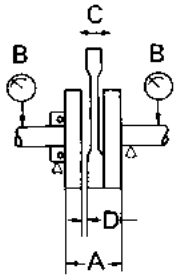
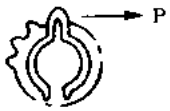
Model	BW200N
Cylinder Head:	
Warp Limit 	0.05 mm (0.002 in) *Lines indicate straightedge measurement:
Cylinder:	
Bore Size	$67\ ^{+0.02}_{-0.03}$ mm (2.6378 $^{+0.0004}_{-0.0006}$ in)
<Limit>	67.1 mm (2.642 in)
Camshaft:	
Drive Method	Chain (Left)
Cam Cap Inside Diameter	R/H = $25\ ^{+0.021}_{0}$ mm (0.9843 $^{+0.0008}_{0}$ in) L/H = $20\ ^{+0.021}_{0}$ mm (0.7874 $^{+0.0008}_{0}$ in)
Camshaft Outside Diameter	R/H = $25\ ^{-0.021}_{0}$ mm (0.9843 $^{-0.0008}_{0}$ in) L/H = $20\ ^{-0.021}_{0}$ mm (0.7874 $^{-0.0008}_{0}$ in)
Shaft-to Cap Clearance	0.021 ~ 0.061 mm (0.00083 ~ 0.00240 in)
Cam Dimensions:	
Intake  "A"	36.59 ± 0.05 mm (1.440 ± 0.002 in)
"B"	30.20 ± 0.05 mm (1.189 ± 0.002 in)
"C"	6.59 mm (0.259 in)
Exhaust "A"	36.63 ± 0.05 mm (1.442 ± 0.002 in)
"B"	30.32 ± 0.05 mm (1.194 ± 0.002 in)
"C"	6.63 mm (0.261 in)
Camshaft Runout Limit:	0.03 mm (0.0012 in)
Cam Chain Type/Number of Links	D.I.D. 25SH/104 Links
Cam Chain Adjustment Method	Manual
Rocker Arm/Rocker Arm Shaft:	
Rocker Arm Inside Diameter	$12\ ^{+0.018}_{0}$ mm (0.4724 $^{+0.0007}_{0}$ in)
Shaft Outside Diameter	$12\ ^{-0.009}_{-0.019}$ mm (0.4724 $^{-0.0004}_{-0.0008}$ in)
Arm-to Shaft Clearance	0.009 ~ 0.037 mm (0.0004 ~ 0.0015 in)
Valve Clearance (Cold)	
IN.	0.09 ~ 0.13 mm (0.0035 ~ 0.0043 in)
EX.	0.15 ~ 0.19 mm (0.0059 ~ 0.0075 in)

MAINTENANCE SPECIFICATIONS

Model		BW200N
Valve Dimensions:		
		
"A" Head Dia.	IN.	34 ± 0.1 mm (1.339 ± 0.004 in)
	EX.	28.5 ± 0.11 mm (1.122 ± 0.004 in)
"B" Face Width	IN.	2.26 ± 0.2 mm (0.089 ± 0.008 in)
	EX.	2.26 ± 0.2 mm (0.089 ± 0.008 in)
"C" Seat Limit Width	IN.	1.0 ± 0.1 mm (0.039 ± 0.004 in)
	EX.	1.0 ± 0.1 mm (0.039 ± 0.004 in)
"D" Margin Thickness Limit		
	IN.	1.0 ± 0.2 mm (0.039 ± 0.008 in)
	EX.	1.0 ± 0.2 mm (0.039 ± 0.008 in)
Stem Outside Diameter	IN.	$6\ ^{-0.010}_{-0.025}$ mm ($0.2362\ ^{-0.0004}_{-0.0010}$ in)
	EX.	$6\ ^{-0.025}_{-0.040}$ mm ($0.2362\ ^{-0.0010}_{-0.0016}$ in)
Guide Inside Diameter	IN.	$6\ ^{+0.012}_{0}$ mm ($0.2362\ ^{+0.0005}_{0}$ in)
	EX.	$6\ ^{+0.012}_{0}$ mm ($0.2362\ ^{+0.0005}_{0}$ in)
Stem-to Guide Clearance	IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
	EX.	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
Stem Runout Limit		0.03 mm (0.0012 in)
		
Valve Seat Width Standard/ <Limit>		1.0 ± 0.1 mm (0.0394 ± 0.0039 in)/1.6 mm (0.063 in)
Valve Spring:		
Free Length		
Inner Spring	IN.	35.5 mm (1.40 in)
	EX.	35.5 mm (1.40 in)
Outer Spring	IN.	37.2 mm (1.46 in)
	EX.	37.2 mm (1.46 in)
Compressed Length (Valve Closed)		
Inner Spring	IN.	30.5 mm (1.20 in)
	EX.	30.5 mm (1.20 in)
Outer Spring	IN.	32.0 mm (1.26 in)
	EX.	32.0 mm (1.26 in)

Model		BW200N
Tilt Limit*		
Inner Spring	IN.& EX.	2.5° or 1.5 mm (0.059 in)
Outer Spring	IN. & EX.	2.5° or 1.5 mm (0.059 in)
		
Direction of Winding (Top view)		Inner Spring:  Outer Spring: 
Piston:		
Piston Size/ Measuring Point*		 $67^{-0.015}_{-0.065}$ mm ($2.6378^{-0.0006}_{-0.0026}$ in)/7.5 mm (0.30 in) (From bottom line of piston skirt)
Piston Clearance/ <Limit>		0.025 ~ 0.045 mm (0.0010 ~ 0.0018 in) <0.1 mm (0.004 in)>
Oversize	2nd	67.50 mm (2.657 in)
	4th	68.00 mm (2.677 in)
Piston Ring:		
Sectional Sketch		
	Top Ring	Barrel B = $1.2^{-0.01}_{-0.03}$ mm ($0.0472^{-0.0004}_{-0.0012}$ in) T = 2.7 ± 0.1 mm (0.106 ± 0.0039 in)
	2nd Ring	Taper B = $1.2^{-0.01}_{-0.03}$ mm ($0.0472^{-0.0004}_{-0.0012}$ in) T = 2.7 ± 0.1 mm (0.106 ± 0.0039 in)
	Oil Ring	B = $2.5^{+0.03}_{+0.01}$ mm ($0.098^{+0.012}_{+0.004}$ in) T = 2.8 ± 0.15 mm (0.110 ± 0.006 in)
End gap (Installed)	Top Ring	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in)
	2nd Ring	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in)
	Oil Ring	0.3 ~ 0.9 mm (0.0118 ~ 0.0354 in)
<Limit>	Top Ring	0.6 mm (0.0236 in)
	2nd Ring	0.6 mm (0.0236 in)
Side Clearance	Top Ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
	2nd Ring	0.02 ~ 0.06 mm (0.008 ~ 0.0024 in)
<Limit>	Top Ring	0.12 mm (0.0047 in)
	2nd Ring	0.12 mm (0.0047 in)

MAINTENANCE SPECIFICATIONS

Model	BW200N
Crankshaft: 	
Crank Width "A"	56 $^{0}_{-0.05}$ mm (2.205 $^{0}_{-0.0020}$ in)
Runout Limit "B"	0.03 mm (0.0012 in)
Small End Free Play "C"	0.8 ~ 1.0 mm (0.0315 ~ 0.0394 in)
<Limit>	2.0 mm (0.079 in)
Big End Side Clearance "D"	0.35 ~ 0.65 mm (0.014 ~ 0.026 in)
Balancer Drive Method	Gear
Clutch:	
Friction Plate Thickness/Quantity	3 ± 0.1 mm (0.118 ± 0.004 in)/5
Wear Limit	2.8 mm (0.11 in)
Clutch Plate Thickness/Quantity	1.6 mm (0.063 in)/4
Warp Limit	0.2 mm (0.008 in)
Clutch Spring Free Length/Quantity	37.3 mm (1.469 in)/4
Clutch Spring Minimum Length	22.4 mm (0.882 in)
Primary Reduction Gear	
Backlash Tolerance	0.009 ~ 0.073 mm (0.0004 ~ 0.0029 in)
Clutch Release Method	Inner push (Cam Push)
Push Rod Bending Limit	0.2 mm (0.0079 in)
Transmission:	
Main Axle Deflection Limit	0.08 mm (0.0031 in)
Drive Axle Deflection Limit	0.08 mm (0.0031 in)
Shifter Type	Guide bar
Kick Starter:	
Kick Starter Type	Kick & Mesh,
Kick Clip Friction Weight	P = 0.85 kg (1.87 lb)
<Min. ~ Max.> 	0.65 ~ 1.05 kg (1.43 ~ 2.31 lb)
Air Filter Oil Grade (Oiled Filter)	SAE 10W 30 SE motor oil

Model		BW200N
Carburetor:		
Type/Manufacturer/Quantity		Y24P-3P/TEIKEI/1
I.D. Mark		54G00
Main Jet	(M.J.)	#108
Main Air Jet	(M.A.J.)	ø1.4
Jet Needle-clip Position	(J.N.)	4C81-5
Needle Jet	(N.J.)	2,600
Pilot Jet	(P.J.)	#38
Pilot Air Jet	(P.A.J.)	ø2.1
Air Screw (turns out)	(P.A.S.)	1 1/2±1/8
Valve Seat	(V.S.)	ϕ2.0
Starter Jet	(G.S.)	GS_1 #58, GS_2 #70
Fuel Level	(F.L.)	3.5±1.0 mm (0.14±0.04 in)
Float Height	(F.H.)	25±1.0 mm (0.98±0.04 in)
Engine Idling Speed		1,350±50 r/min
Lubrication System:		
Oil Filter Type		Wire mesh
Oil Pump Type		Trochoid pump
Tip Clearance		0.09~0.15 mm (0.0035~0.0059 in)
Side Clearance		0.03~0.09 mm (0.0012~0.0035 in)
Bypass Valve Setting Pressure		78.5~117.7 kPa (0.8~1.2 kg/cm², 11.4~17.1 psi)

Tightening Torque

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Cylinder head	Flange bolt	M8	4	22	2.2	16.0	Apply oil.
		M8	2	20	2.0	14.0	
Cylinder body	Hex bolt	M6	2	10	1.0	7.2	
Cylinder head cover	Hex bolt	M6	5	10	1.0	7.2	
	Pan head screw	M6	2	7	0.7	5.1	
Camshaft bearing plate	Hex bolt	M6	2	8	0.8	5.8	Use lock washer.
Oil checking bolt	Hex bolt	M6	1	7	0.7	5.1	
Spark plug	—	M14	1	17.5	1.75	13.0	
Balancer weight	Hex nut	M14 × 1.0	1	50	5.0	36.0	Use lock washer.
Flywheel magneto	Hex nut	M10 × 1.25	1	50	5.0	36.0	
Valve clearance (Lock nut)	Hex nut	M6	2	14	1.4	10.0	
Cam sprocket	Bolt	M10	1	60	6.0	43.0	
Chain guide	Bolt	M6	2	8	0.8	5.8	
Oil pump	Panhead screw	M6	3	7	0.7	5.1	
Drain plug	—	M35	1	43	4.3	31.0	
Filter cover	Hex bolt	M6	1	10	1.0	7.2	
	Panhead screw	M6	2	7	0.7	5.1	
Carburetor joint	Hex bolt	M6	2	12	1.2	8.7	
Carburetor clamp hose	Panhead screw	M5	1	2	0.2	1.4	
Muffler mount	Hex bolt	M6	1	10	1.0	7.2	
	Flange bolt	M8	1	27	2.7	19.0	
Exhaust pipe	Hex bolt	M6	2	10	1.0	7.2	Use Loctite®
Exhaust pipe protector	Panhead screw	M6	2	10	1.0	7.2	
Crankcase, case cover	Panhead screw	M6	11	7	0.7	5.1	
Clutch spring	Hex bolt	M6	4	6	0.6	4.3	
Clutch boss	Hex nut	M14	1	50	5.0	36.0	
Primary drive gear	Hex nut	M14	1	50	5.0	36.0	
Push lever stopper	Hex bolt	M8	1	12	1.2	8.7	
Push rod adjustment	Hex nut	M6	1	8	0.8	5.8	
Drive sprocket	Hex bolt	M6	2	10	1.0	7.2	
Shift pedal	Hex bolt	M6	1	10	1.0	7.2	
Magneto base	Panhead screw	M6	4	7	0.7	5.1	

B. CHASSIS

Model		BW200N
Steering System:		
Steering Bearing Type		Ball Bearing
No. Size of Steel Balls	Upper	22 pcs/3/16 in
	Lower	19 pcs/1/4 in
Front Suspension:		
Front Fork Travel		160 mm (6.30 in)
Fork Spring Free Length		376.5 mm (14.82 in)
Spring Rate/Stroke		K_1 = 4.90 N/mm (0.5 kg/mm, 28.0 lb/in)/ 0 ~ 160 mm (0 ~ 6.30 in)
Optional Spring		No.
Oil Capacity or		272 ± 4 cm³ (9.59 ± 0.14 Imp oz, 9.20 ± 0.13 US oz)
Oil Level		140 mm (5.51 in) (From top of inner tube fully compressed without spring.)
Oil Grade		Yamaha fork oil 10 wt
Rear Suspension:		
Shock Absorber Travel		62 mm (3.23 in)
Spring Free Length		187.5 mm (8.86 in)
Spring Rate/Stroke		K_1 = 55.41 N/mm (5.65 kg/mm, 316.3 lb/in)/ 0 ~ 62 mm (0 ~ 2.17 in)
Optional Spring		No.
Enclosed Gas Pressure		1176.84 kPa (12 kg/cm², 170.64 psi)
Rear Arm:		
Side Clearance Free Play Limit	End	1.0 mm (0.039 in) 0.4 ~ 0.7 mm (0.016 ~ 0.028 in)
Wheel:		
Front Wheel Type		Panel Wheel
Rear Wheel Type		Panel Wheel
Front Rim Size/Material		12 × 6.5/Aluminum
Rear Rim Size/Material		9 × 9/Aluminum
Rim Runout Limit	Vertical	1.0 mm (0.04 in)
	Lateral	1.0 mm (0.04 in)
Drive Chain:		
Type/Manufacturer	Primary/2ndary	50HDL/520D/D.I.D.
Number of Links	Primary/2ndary	42 Links/74 Links
Chain Free Play	Primary/2ndary	—/25 ~ 40 mm (0.98 ~ 1.57 in)

MAINTENANCE SPECIFICATIONS

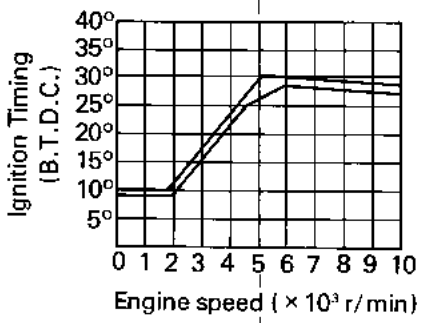
Model		BW200N
Drum Brake:		
Type	Front	Leading and Trailing
	Rear	Leading and Trailing
Drum Inside Dia	Front	110 mm (4.33 in)
	<Limit>	111 mm (4.37 in)
	Rear	110 mm (4.33 in)
	<Limit>	111 mm (4.37 in)
Lining Thickness		4 mm (0.16 in)
	<Limit>	2 mm (0.08 in)
Shoe Spring Free Length	Front	54.0 ± 0.5 mm (2.13 ± 0.02 in)
	Rear	54.0 ± 0.5 mm (2.13 ± 0.02 in)
Brake Lever & Brake Pedal:		
Brake Lever Free Play/ Position		3 ~ 7 mm (0.12 ~ 0.28 in) at lever pivot
Brake Pedal Position		10 mm (0.4 in) Vertical height below footrest top
Brake Pedal Free Play		20 ~ 30 mm (0.79 ~ 1.18 in)/ Vertical height below brake pedal top
Clutch Lever Free Play/ Position		2 ~ 3 mm (0.08 ~ 0.12 in)/ at lever pivot

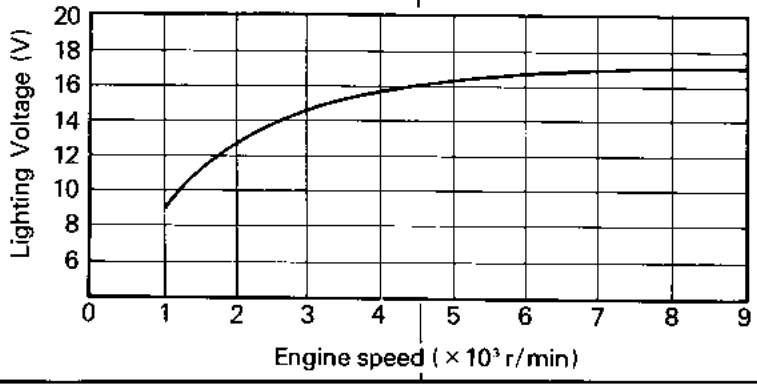
Tightening torque

Part to be tightened	Thread size	Q'ty	Tightening torque		
			Nm	m · kg	ft · lb
Front axle nut	M14 × 1.5	1	50	5.0	36
Handle crown — Inner tube	M 8 × 1.25	2	20	2.0	14.0
— Steering shaft	M14 × 1.25	1	85	8.5	61.0
— Handle upper holder	M 8 × 1.25	4	20	2.0	14.0
Under bracket — Inner tube	M 8 × 1.25	4	20	2.0	14.0
Front fork (Cylinder)	M10 × 1.0	2	23	2.3	17.0
(Cap bolt)		2	23	2.3	17.0
(Drain screw)	M 4 × 0.7	2	2	0.2	1.4
Steering ring nut	M25 × 1.0	1	38	3.8	27.0
Wheel panel — Hub (Front and Rear)	M 8 × 1.25	8	28	2.8	20.0
Brake cam lever — Shaft (Front and Rear)	M 6 × 1.0	2	9	0.9	6.5
Engine Mount (All)	M 8 × 1.25	4	33	3.3	24.0
Pivot shaft	M12 × 1.25	1	80	8.0	58.0
Middle sprockets	M16 × 1.0	2	85	8.5	61.0
Rear axle nut	M16 × 1.5	1	85	8.5	61.0
Rear sprocket	M 8 × 1.25	6	28	2.8	20
Rear shock absorber	M10 × 1.25	4	32	3.2	23.0
Footrest (Left)	M12 × 1.25	2	60	6.0	43.0
Footrest (Right)	M10 × 1.25	2	45	4.5	32.0

C. ELECTRICAL

Model	BW200N
Voltage	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	9° ± 1° at 1,300 r/min
Advanced Timing (B.T.D.C.)	29° ± 1.3° at 6,000 r/min
Advancer Type	Electrical
C.D.I.:	
Magneto — Model/Manufacture	F36X/YAMAHA
Pickup Coil Resistance (Color)	265Ω ± 10% at 20°C (68°F) (White — Green)
Charging Coil Resistance (Color)	415Ω ± 10% at 20°C (68°F) (Red — Brown)
C.D.I. Unit-Model/Manufacturer	12V-MO/YAMAHA
Ignition Coil:	
Model/Manufacturer	C2T4/YAMAHA
Minimum Spark Gap	15 kV or more at 5,000 r/min 12 kV or less at 8,000 r/min or 6 mm (0.24 in)
Primary Winding Resistance	1.6Ω ± 10% at 20°C (68°F)
Secondary Winding Resistance	6.6 kΩ ± 20% at 20°C (68°F)
Charging System/Type	Flywheel magneto
F.W. Magneto:	
Lighting Voltage	13.5V or more at 3,000 r/min 17.5 V or less at 8,000 r/min
Lighting Coil Resistance (Color)	0.494Ω ± 10% at 20°C (68°F) (Yellow — Black)



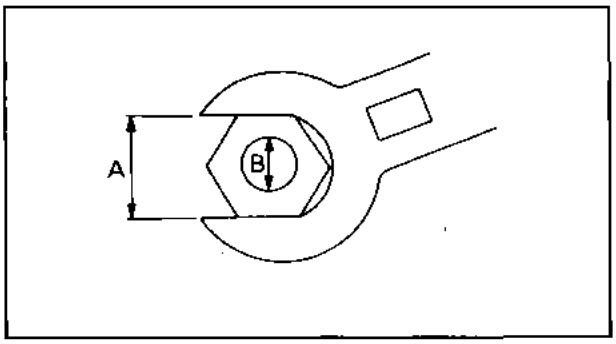


MAINTENANCE SPECIFICATIONS

Model	BW200N
Voltage Regulator:	
Type	Semi Conductor
Model/Manufacture	SU229Y/STANLEY
No Load Regulated Voltage	13.5 ± 0.5V
Circuit Breaker:	
Type	Fuse
Amperage for Individual Circuit/Quantity	
Main	10A × 1
Reserve	10A × 1

GENERAL TORQUE SPECIFICATIONS

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.



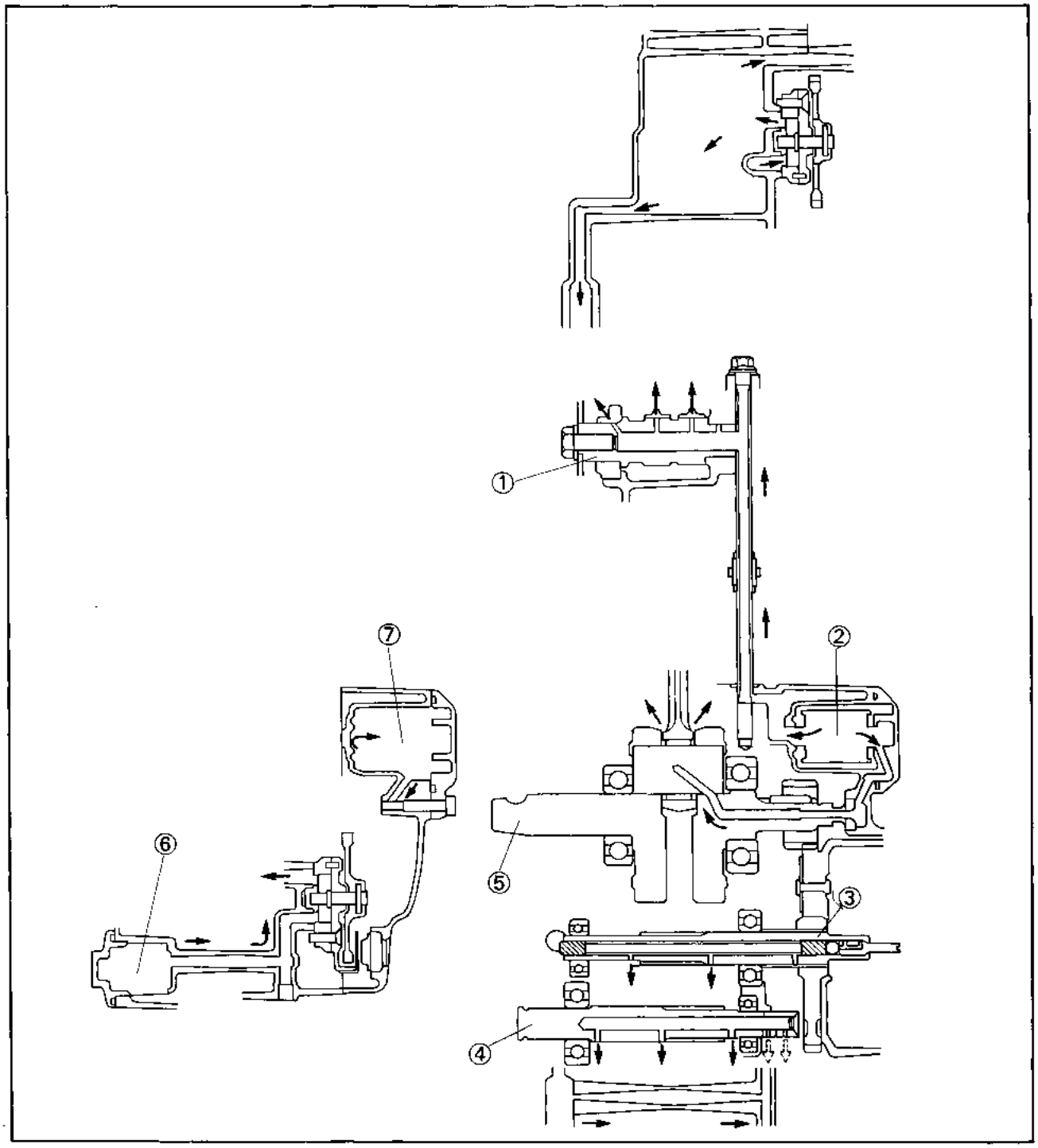
A (Nut)	B (Bolt)	General torque specifications		
		Nm	m·kg	ft·lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	51
22 mm	16 mm	130	13.0	94

DEFINITION OF UNITS

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

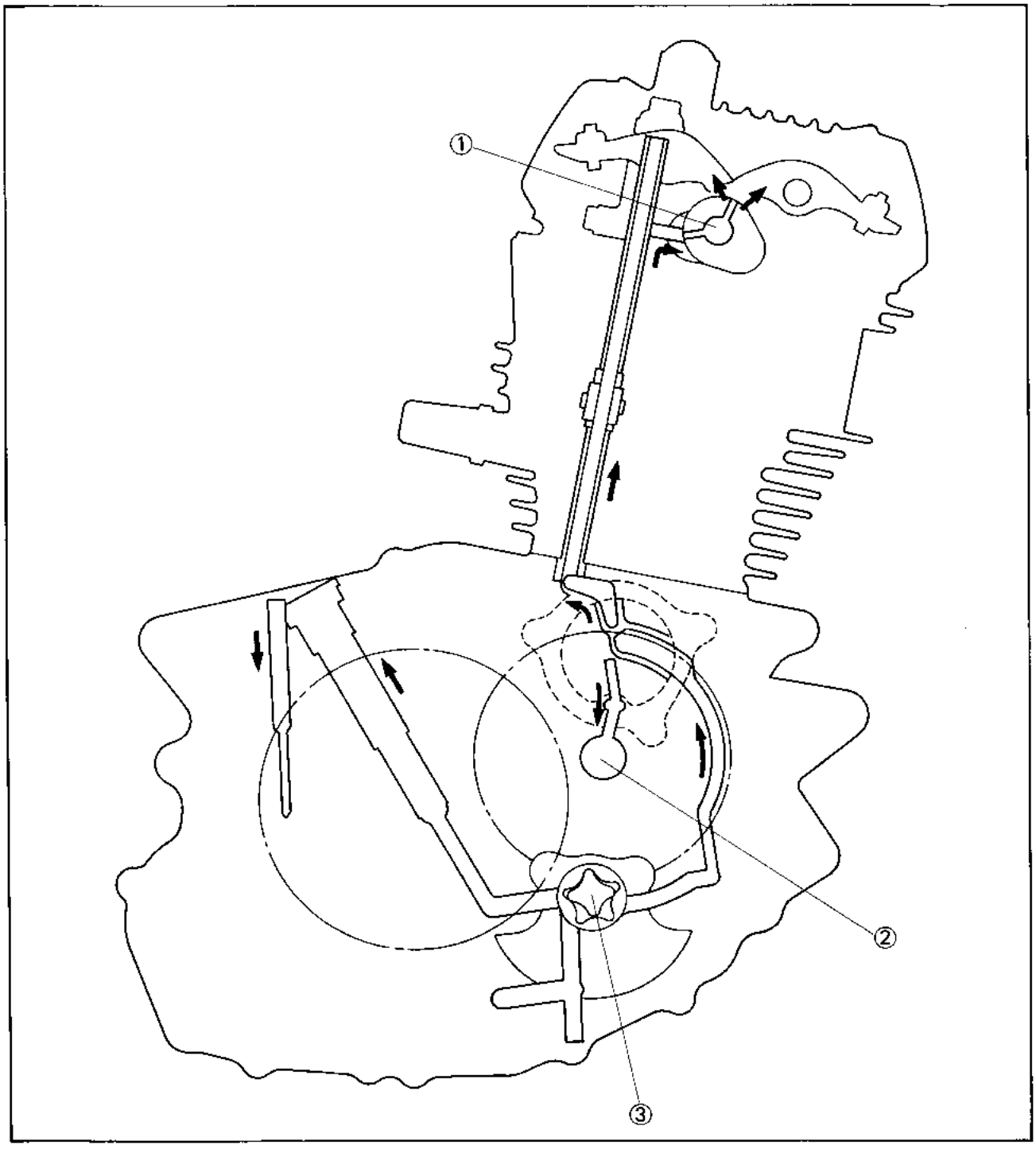
LUBRICATION DIAGRAMS

① Camshaft
② Oil cleaner
③ Main axle
④ Drive axle
⑤ Crankshaft
⑥ Oil filter
⑦ Oil cleaner element



LUBRICATION DIAGRAMS

① Camshaft
② Crankcase
③ Oil pump

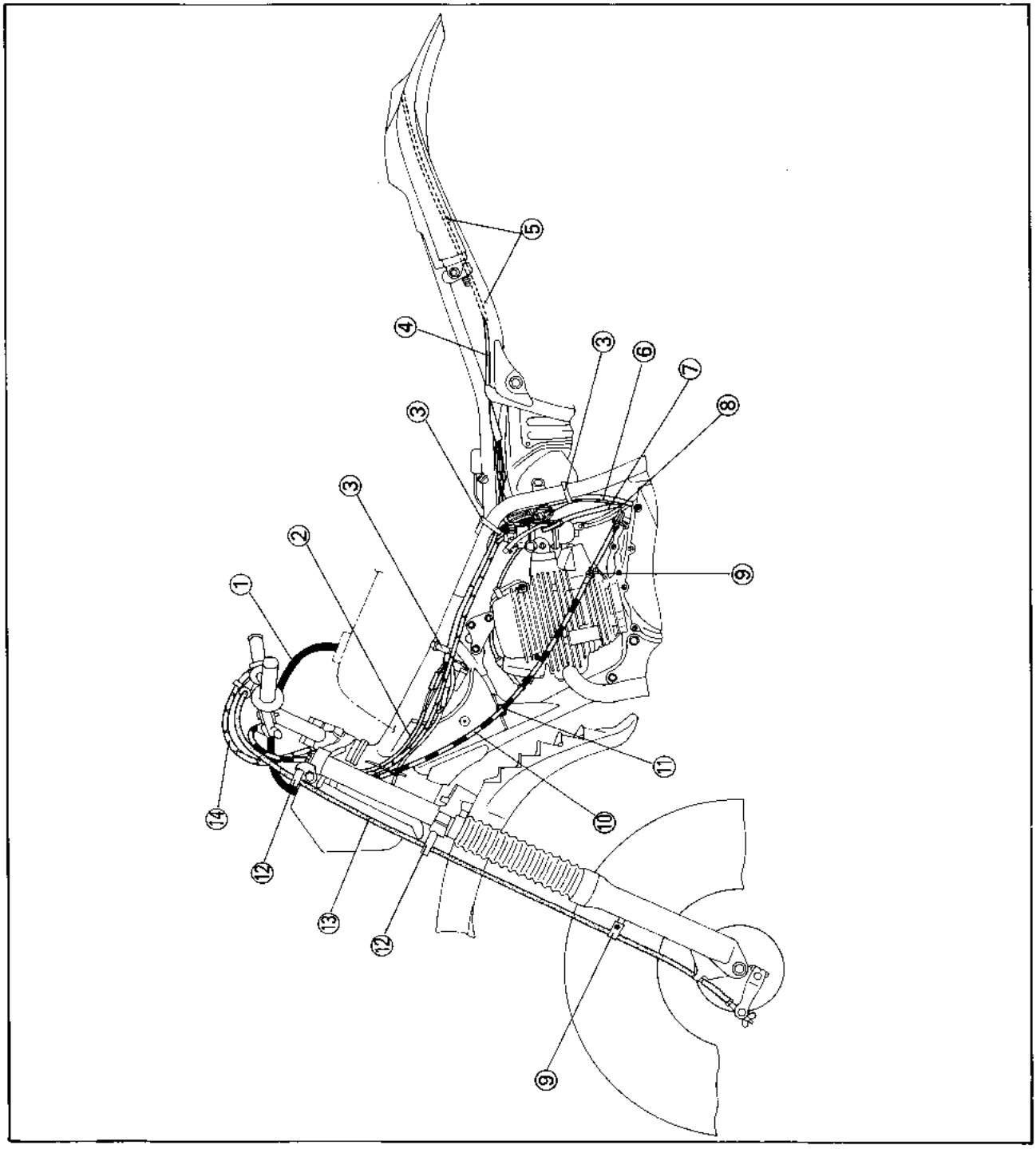


CABLE ROUTING

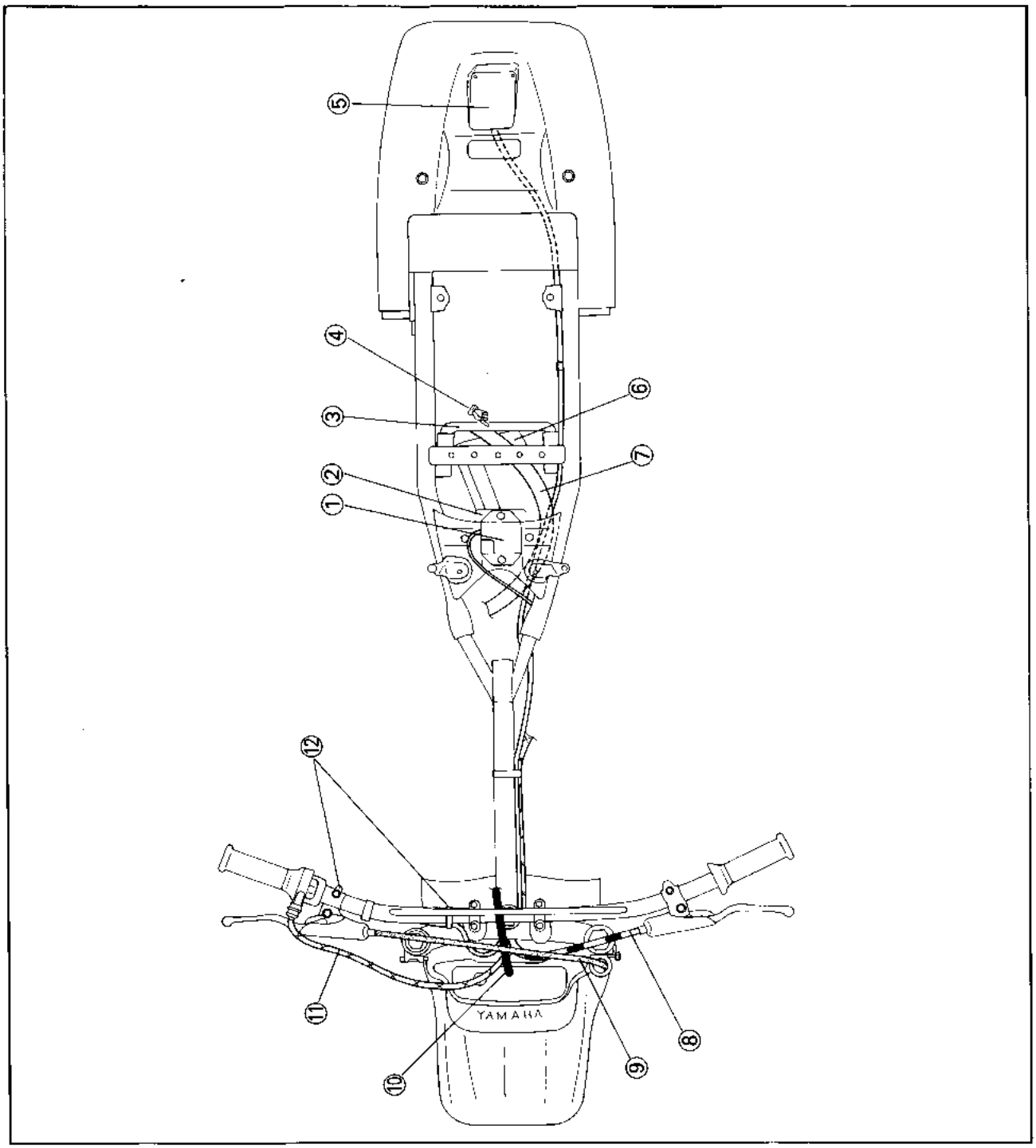
① Engine stop switch lead
② Fuel tank breather pipe
③ Band
④ Taillight lead
⑤ Clamp
⑥ C.D.I. magneto lead
⑦ Carburetor ventilation pipe
⑧ Carburetor breather pipe
⑨ Cable holder
⑩ Clutch cable
⑪ Pass the cluch cable through the cable guide
⑫ Cable guide
⑬ Brake cable
⑭ Throttle cable

CAUTION:

Proper cable and lead routing is essential to insure safe vehicle operation.

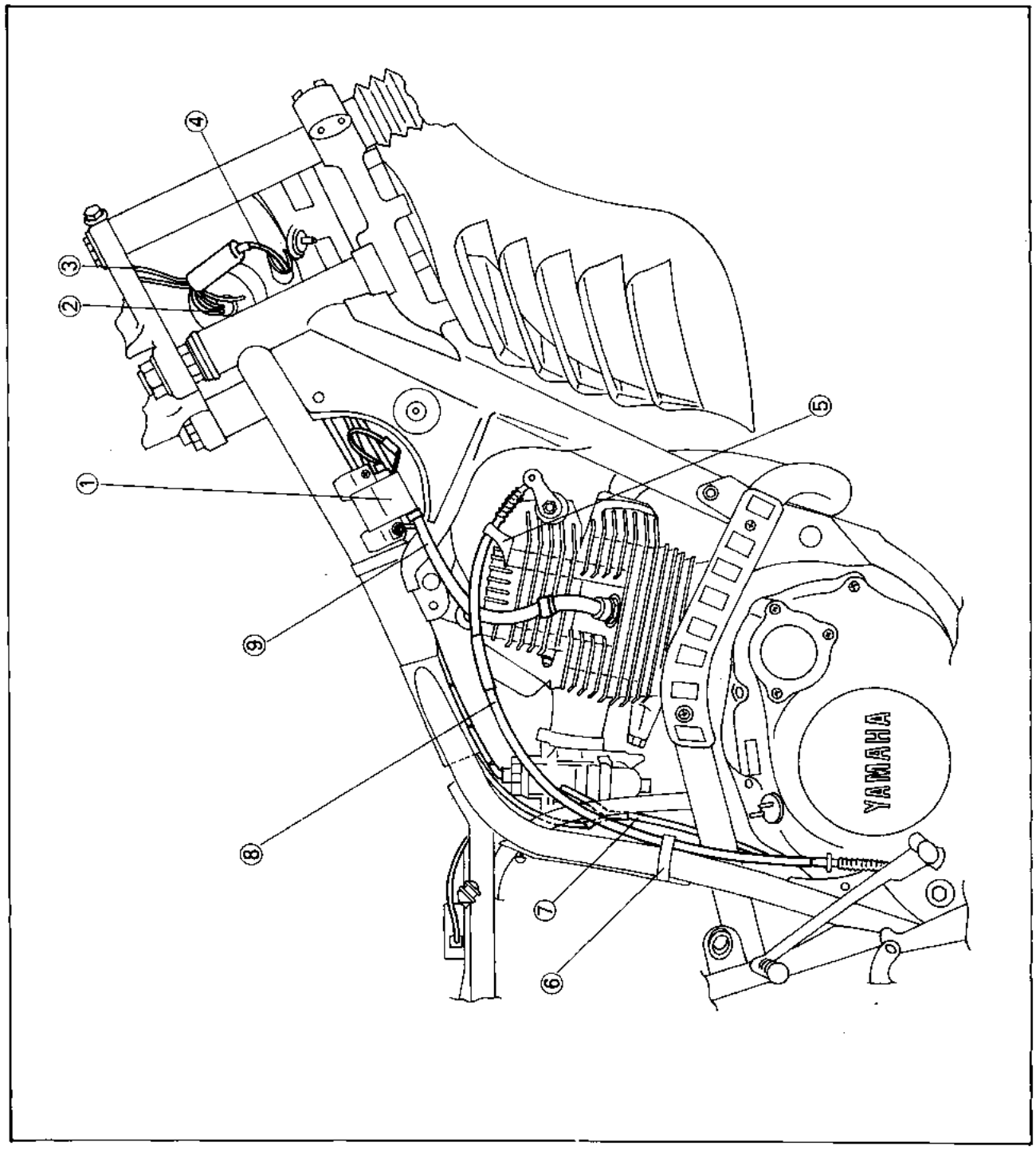


① Regulator
② C.D.I. unit
③ Pass through the ventilation hose between the air filter case and mud guard.
④ Mud guard
⑤ Taillight
⑥ Air filter case
⑦ Ventilation hose
⑧ Clutch cable
⑨ Brake cable
⑩ Fuel tank breather pipe
⑪ Throttle cable
⑫ Band

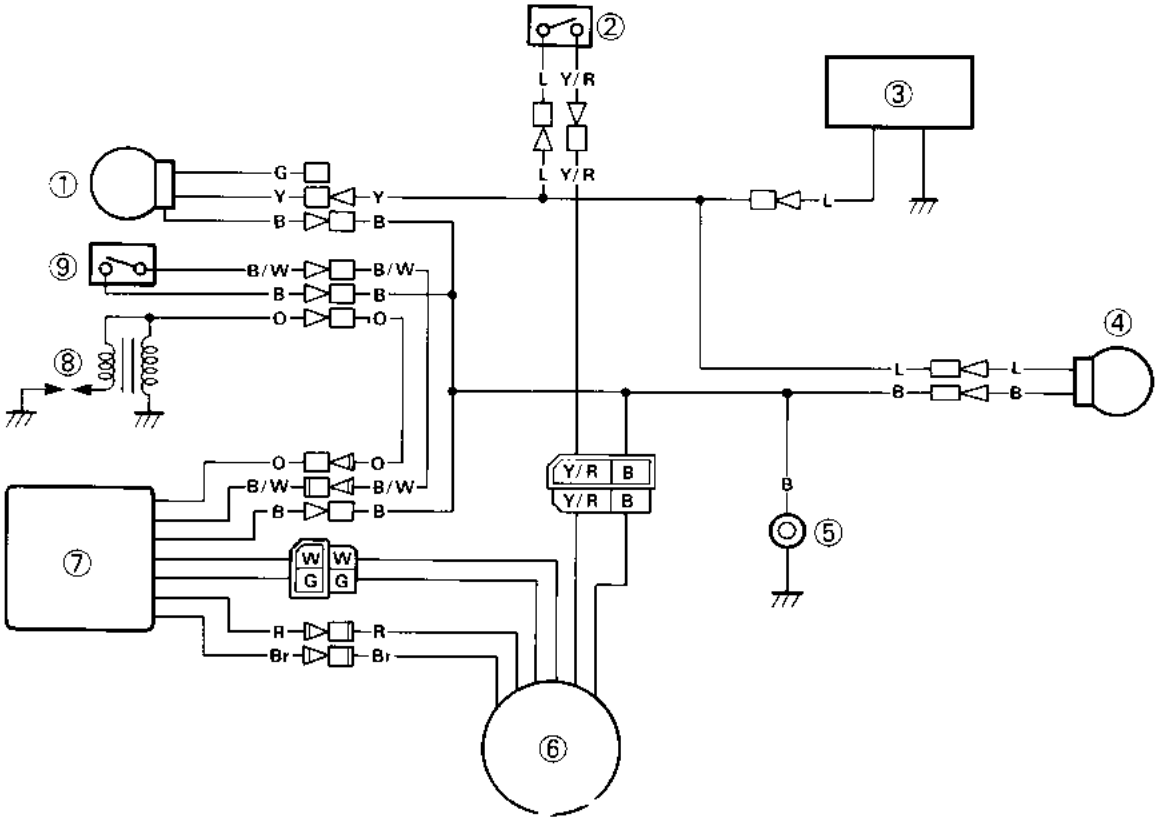


CABLE ROUTING

① Ignition coil
② Headlight lead
③ Headlight switch lead
④ Wire harness
⑤ Clamp the decompression wire
⑥ Band
⑦ Carburetor ventilation pipe
⑧ Decompression wire
⑨ High tension cord



BW200N WIRING DIAGRAM



① Headlight
② Lighting switch
③ Regulator
④ Taillight
⑤ Body earth
⑥ C.D.I. magneto
⑦ C.D.I. unit
⑧ Ignition coil
⑨ Engine stop switch

COLOR CODE

B . . . . . Black
Br . . . . . Brown
G . . . . . Green
L . . . . . Blue
O . . . . . Orange
R . . . . . Red
W . . . . . White
B/W . . . . . Black/White
Y/R . . . . . Yellow/Red

YAMAHA

BW200ES

Supplementary

Service Manual

LIT-11616-05-21

1RL-28197-10

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the BW200ES. For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with following manual.

BW200N Service Manual (LIT-11616-04-63)

BW200ES
SUPPLEMENTARY SERVICE MANUAL

1st Edition, November 1985

Printed in U.S.A.
P/N LIT-11616-05-21

NOTICE

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

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

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

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

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

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

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

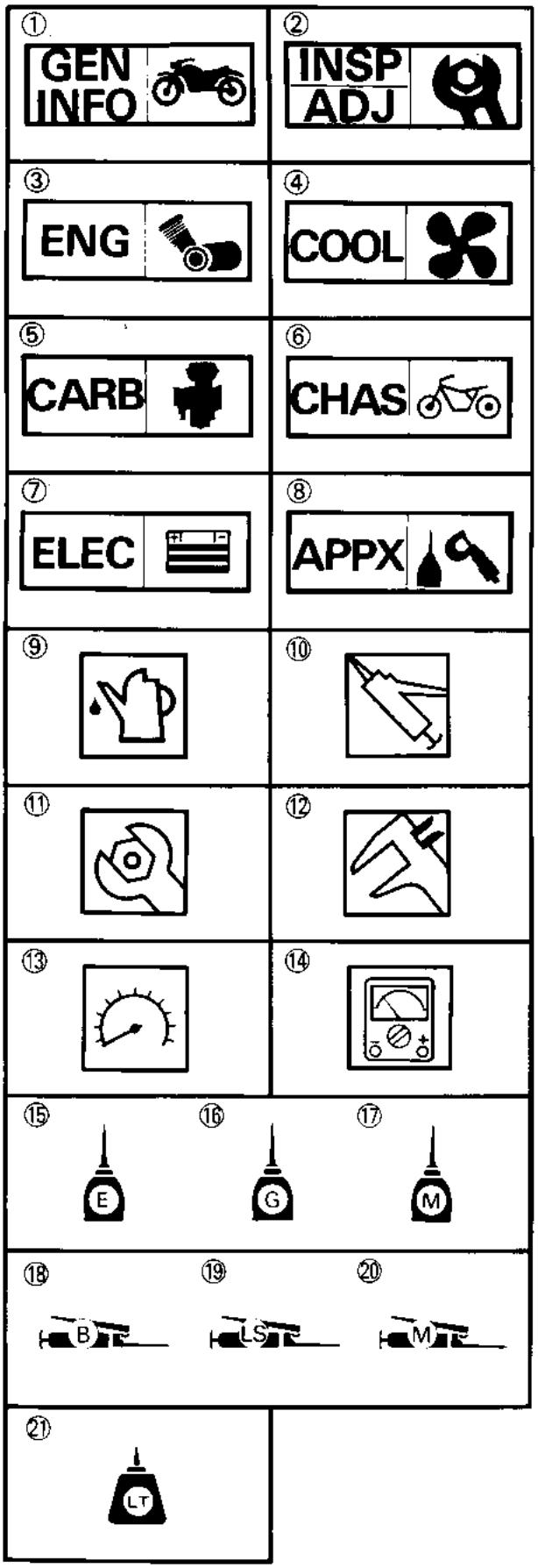
MANUAL FORMAT

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

•Bearings
Pitting/Damage→Replace.

EXPLODED DIAGRAM

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



ILLUSTRATED SYMBOLS (Refer to the illustration)

Illustrated symbols ① to ⑧ are designed as thumb tabs to indicate the chapter's number and content.

① General information
② Periodic inspection and adjustment
③ Engine
④ Cooling system
⑤ Carburetion
⑥ Chassis
⑦ Electrical
⑧ Appendices

Illustrated symbols ⑨ to ⑭ are used to identify the specifications appearing in the text.

⑨ Filling fluid
⑩ Lubricant
⑪ Tightening
⑫ Wear limit, clearance
⑬ Engine speed
⑭ Ω, V, A

Illustrated symbols ⑮ to ㉑ in the exploded diagram indicate grade of lubricant and location of lubrication point.

⑮ Apply engine oil
⑯ Apply gear oil
⑰ Apply molybdenum disulfide oil
⑱ Apply wheel bearing grease
⑲ Apply lightweight lithium-soap base grease
⑳ Apply molybdenum disulfide grease
㉑ Apply locking agent (LOCTITE®)

CONTENTS

PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

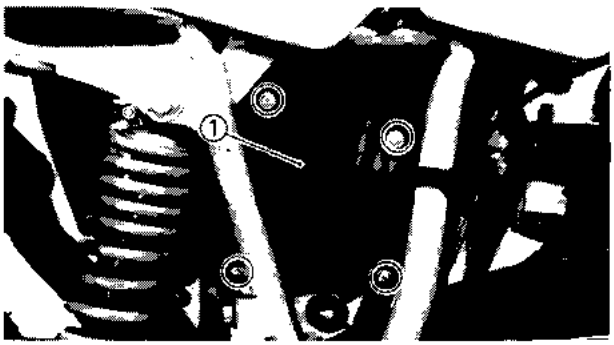
This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information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

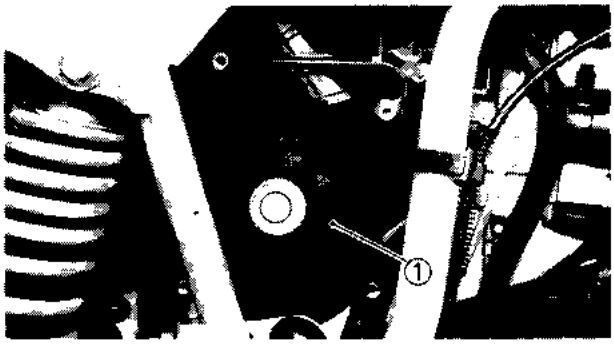
PERIODIC MAINTENANCE/LUBRICATION

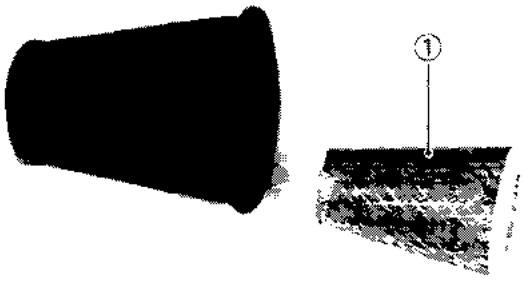
Unit: km (mi)

Item	Remarks	Initial			Every	
		1 month	3 months	6 months	6 months	1 year
Valve(s)	Check valve clearance. Adjust if necessary.	○		○	○	○
Cam chain	Check chain tension. Adjust if necessary.	○		○	○	○
Spark plug	Check condition. Clean or replace if necessary.	○	○	○	○	○
Air filter	Clean. Replace if necessary.		○	○	○	○
Carburetor	Check idle speed/starter operation. Adjust if necessary.		○	○	○	○
Fuel line	Check fuel hose for cracks or damage. Replace if necessary.			○	○	○
Engine oil	Replace (Warm engine before draining.)	○		○	○	○
Engine oil filter	Clean. Replace if necessary.	○		○		○
Engine oil strainer	Clean. Replace if necessary.	○		○		○
Brake	Check operation. Adjust if necessary.	○	○	○	○	○
Clutch	Check operation. Adjust if necessary.	○		○	○	○
Drive chain	Check operation/Adjust as required/Replace as required.	○	○	○	1 Month	
Decompression system	Check operation. Adjust if necessary.			○	○	○
Wheels	Check balance/damage/runout. Repair if necessary.	○		○	○	○
Wheel bearings	Check bearings assembly for looseness/damage. Replace if damaged.	○		○	○	○
Rear arm pivot	Apply grease lightly every 12 months.**					○
Middle sprockets shaft	Lubricate every 6 months.**			○	○	○
Steering bearing	Check bearing assembly for looseness. Moderately repack every 12 months.*	Check		Check	Check	○
Fittings/Fasteners	Check all chassis fittings and fasteners. Correct if necessary.	○	○	○	○	○
Battery	Top-up/Check specific gravity and breather pipe.	○	○	○	○	○

* Medium weight wheel bearing grease.
** Lithium soap base grease.







CHASSIS

AIR FILTER CLEANING

1. Remove:
   - Side cover (Right)
   - Air filter case cover (Right) ①

NOTE:

Do not remove air filter case cover (Left).

2. Remove:
   - Air filter element ①

CAUTION:

The engine should never be run without the air filter element; excessive piston and/or cylinder wear may result.

3. Remove:
   - Filter guide ①

4. Wash the element gently, but thoroughly, in solvent.

WARNING:

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

5. Squeeze the excess solvent out of the filter and let dry.

CAUTION:

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

6. Pour a small quantity of foam-air-filter oil or Yamalube 2-cycle oil onto the filter element and work thoroughly into the porous foam material.

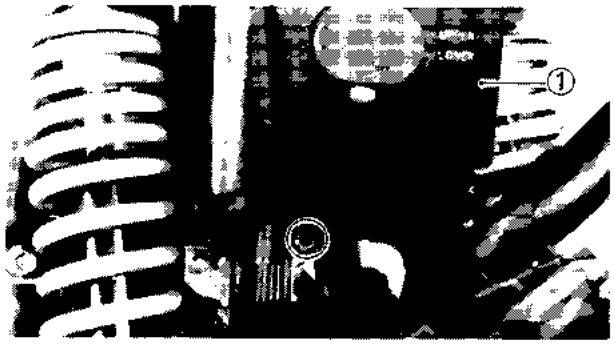
NOTE:

In order to function properly, the element must be damp with oil at all times, but not dripping with oil.

7. Install:
   - Air filter element
   - Filter element guide
   - Air filter case cover (Right)
   - Side cover (Right)

NOTE:

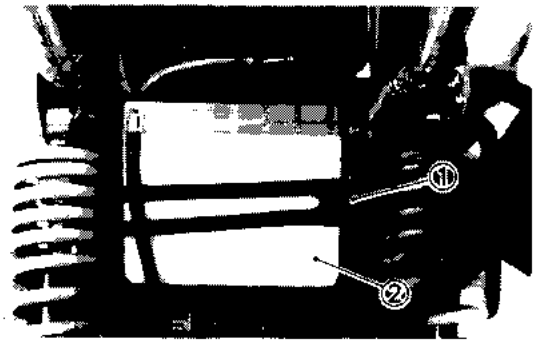
Fit the filter element on the filter case and coat the sealing edge of the element with light grease to provide an airtight seal.



ELECTRICAL

BATTERY INSPECTION

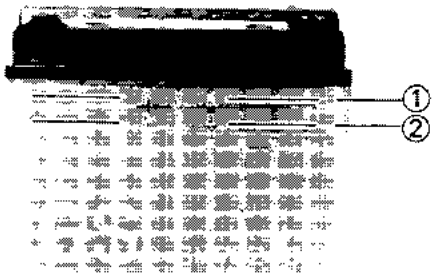
1. Remove:
   - Cover ①



2. Remove:
   - Band ①
   - Battery ②

NOTE:

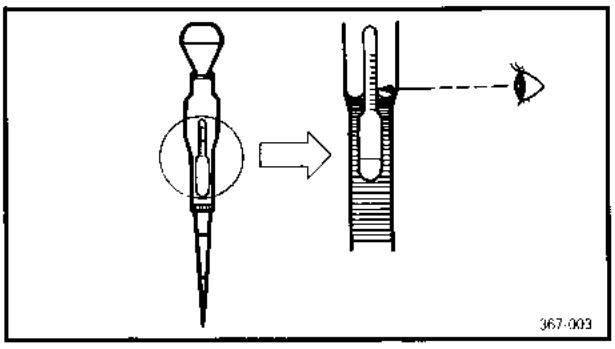
Disconnect the negative lead first, and then disconnect the positive lead.



3. Check:
   • Fluid level
   Incorrect → Refill.
   Fluid level should be between upper ① and lower ② level marks.

CAUTION:

Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.



4. Inspect:
   • Battery fluid specific gravity
   Out of specification → Charge.

Charging Current:
0.7 Amps/10 Hrs.
Specific Gravity:
1.280 at 20°C (68°F)

WARNING:

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

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

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

BATTERY INSPECTION

Batteries also generate explosive hydrogen gas, therefore you should always follow these preventive measures:

- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)**
- **DO NOT SMOKE when charging or handling batteries.**

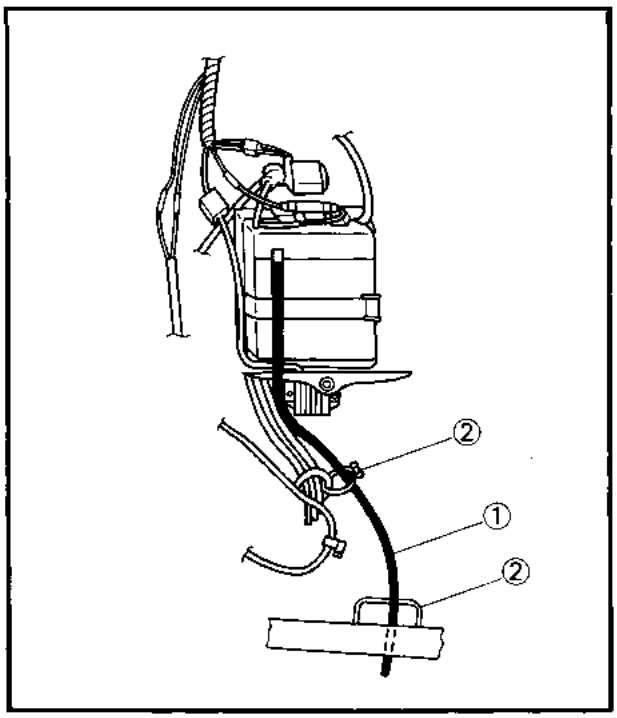
KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

5. Inspect:
   - Battery breather pipe
     Obstruction → Remove.
     Damage → Replace.

6. Install:
   - Battery

NOTE:

Connect the positive lead first, and then connect the negative lead.

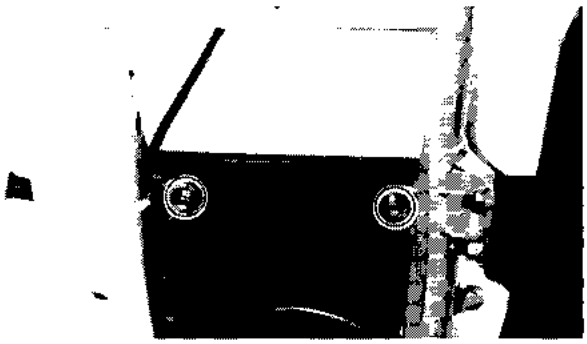


7. Connect/Inspect:
   • Battery breather pipe ①
   Be sure the pipe is properly attached and routed.

② Pass through clamp

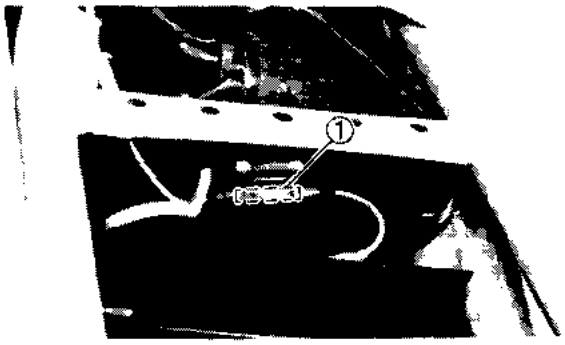
CAUTION:

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



FUSE INSPECTION

1. Remove:
   • Seat



2. Inspect:
   • Fuse ①
   Defective → Replace.
   Blow fuse (New) → Inspect circuit.

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

WARNING:

Do not use fuses of higher amperage rating than recommended. Extensive electrical system damage and fire could result from substitution of a fuse of improper amperage.

FUSE INSPECTION

Description	Amperage	Quantity
Main	10A	1
Reserve	10A	1

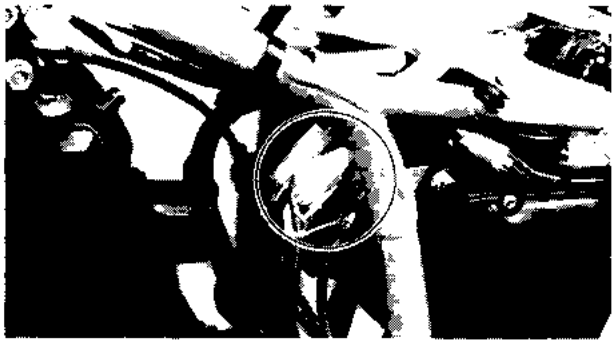
ENGINE OVERHAUL

ENGINE REMOVAL

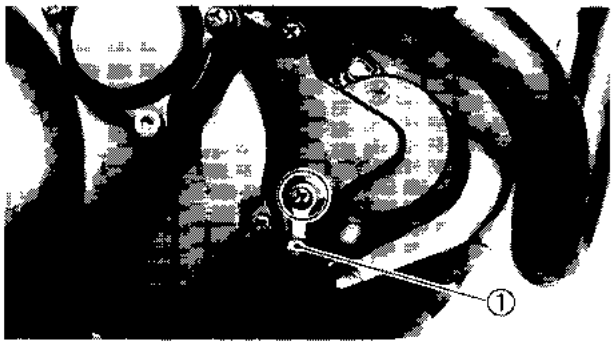
REMOVAL

1. Remove:
   - Side covers (Left and right)
   - Seat
   - Fuel tank
   - Exhaust pipe
   - Carburetor

   Refer to "ENGINE REMOVAL" in BW200N (LIT-11616-04-63) SERVICE MANUAL.

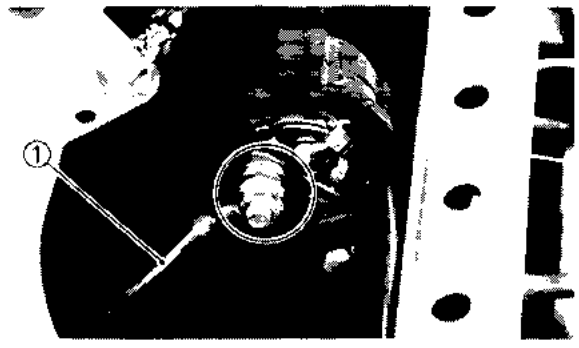


2. Disconnect:
   - CDI magneto leads
   - Neutral switch lead



3. Remove:
   - Frame earth lead ①

   (at starter motor)



4. Remove:
   - Starter motor lead ①

   (at starter relay)
   - Engine assembly

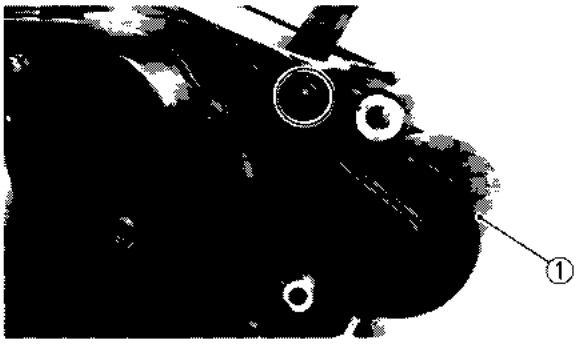
   Refer to "ENGINE REMOVAL" in BW200N (LIT-11616-04-63) SERVICE MANUAL.

ENGINE REMOVAL

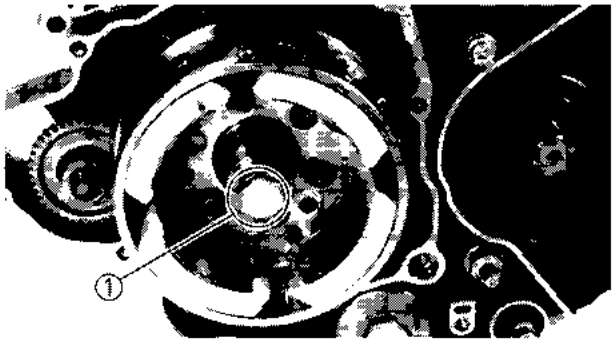
DISASSEMBLY

1. Remove:
   - Cylinder head
   - Cylinder
   - Piston

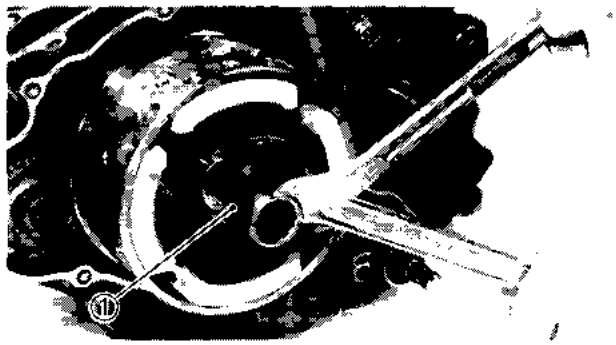
   Refer to "DISASSEMBLY" in BW200N (LIT-11616-04-63) SERVICE MANUAL.



2. Remove:
   - Starter motor ①



3. Remove:
   - Bolt (CDI magneto) ①



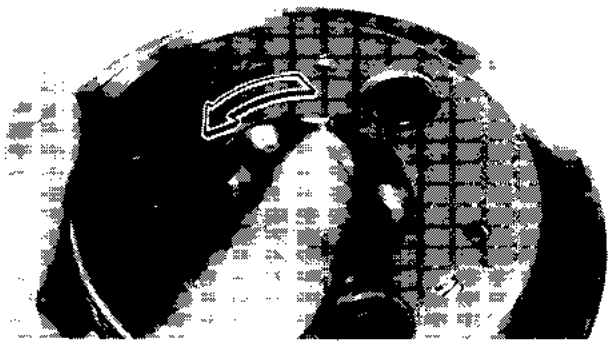
4. Remove:
   - CDI magneto

   Use the Rotor Puller (YM-01080) ①.

5. Remove:
   - Starter idle gear ①
   - Idle gear axle ②
   - Starter wheel gear ③

6. Remove:
   - Cam chain and guide
   - Clutch
   - Kick starter
   - Oil pump
   - Balancer gears
   - Shifter
   - Crankcase
   - Crankshaft

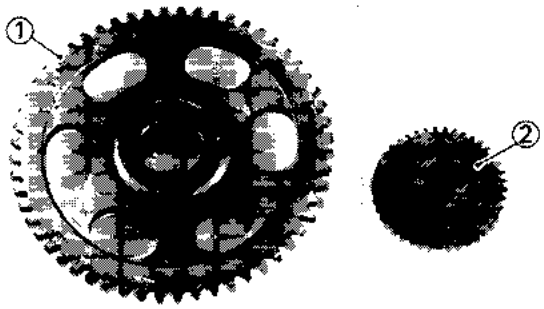
   Refer to "DISASSEMBLY" in BW200N (LIT-11616-04-63) SERVICE MANUAL.



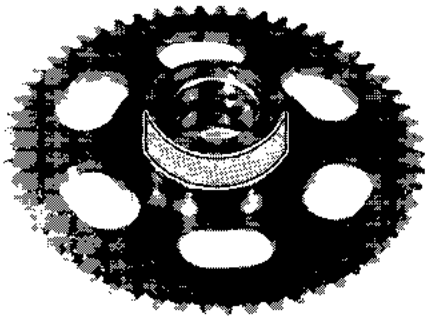
INSPECTION AND REPAIR

STARTER DRIVES

1. Check:
   - Roller operation
     Push the roller to arrow direction.
     Unsmooth operation → Replace starter clutch.



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



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

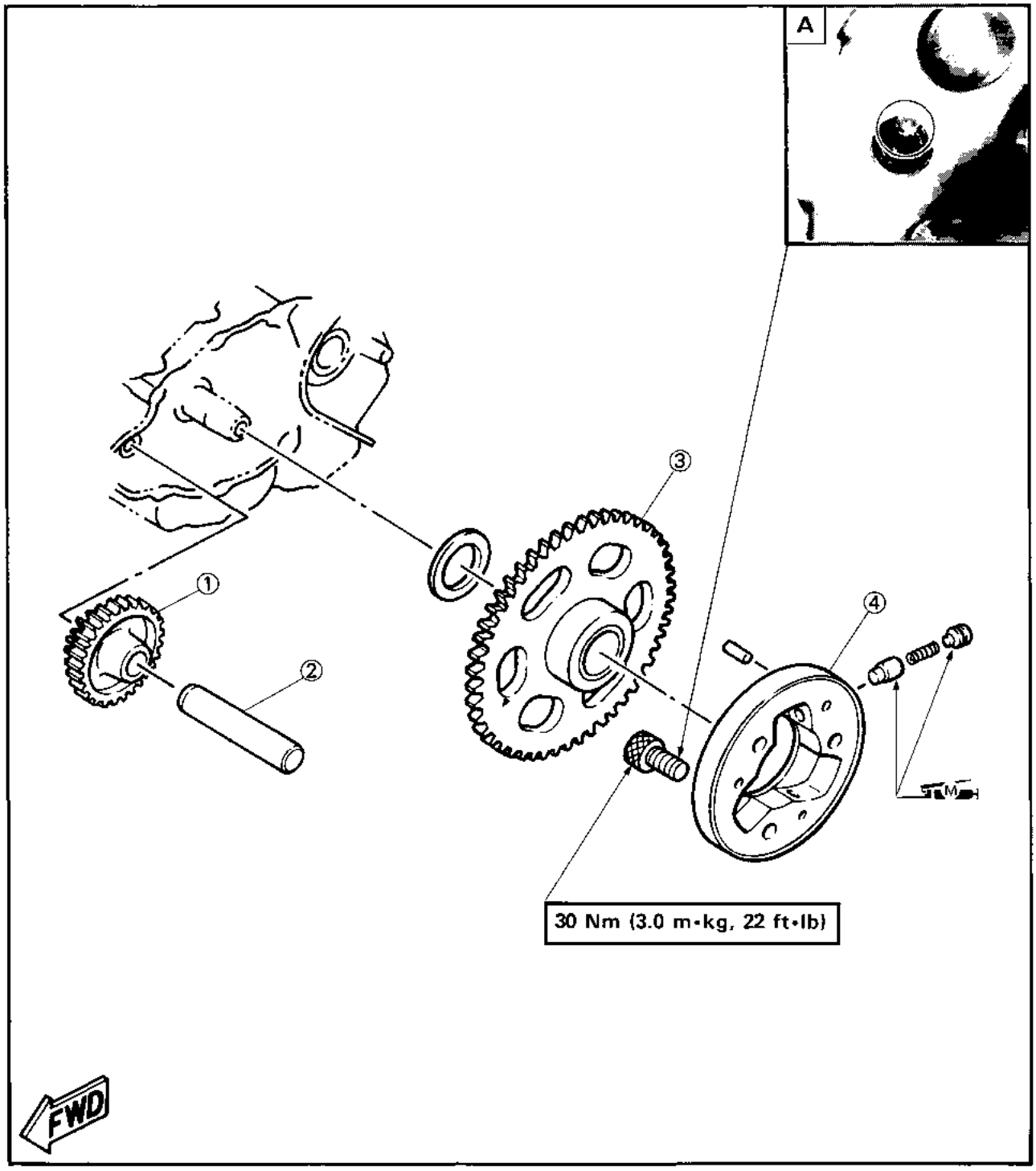
4. Check:
   - Starter clutch operation

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

STARTER DRIVES

① Starter idle gear
② Idle gear axle
③ Starter wheel gear
④ Starter clutch

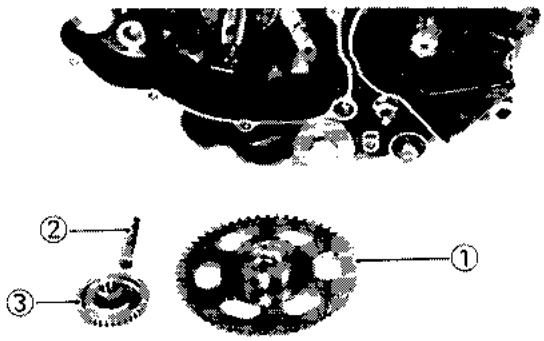
A AFTER INSTALLING THE STARTER CLUTCH, CALK THE BOLT END, AS SHOWN.



ENGINE ASSEMBLY

1. Install:
   - Crankshaft
   - Crankcase
   - Shifter
   - Balancer gears
   - Oil pump
   - Kick starter
   - Clutch
   - Cam chain and guide

   Refer to "ENGINE ASSEMBLY AND ADJUSTMENT" in BW200N (LIT-11616-04-63) SERVICE MANUAL.



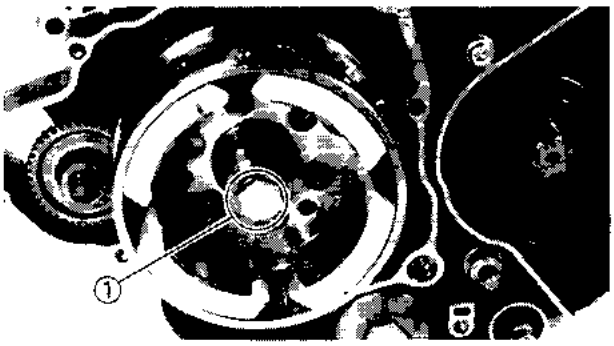
2. Install:
   - Starter wheel gear ①
   - Idle gear axle ②
   - Starter idle gear ③

3. Apply:
   - Molybdenum disulfide oil (to the starter clutch roller)

4. Install:
   - CDI magneto

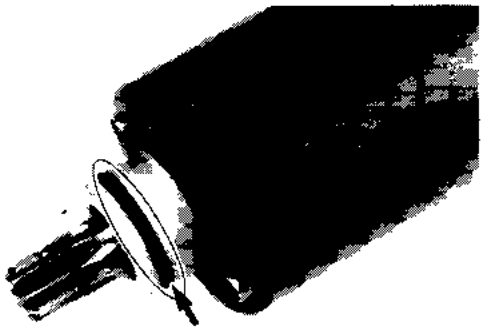
NOTE:

When installing the CDI magneto, make sure the woodruff key is properly seated in the key way of the crankshaft. Apply a light coating of lithium soap base grease to the tapered portion of the crankshaft end.

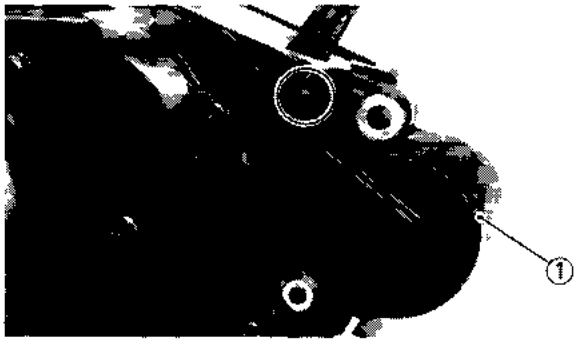


5. Tighten:
   • Bolt (CDI magneto) ①

	50 Nm (5.0 m•kg, 36 ft•lb)



6. Apply:
   • Lithium soap base grease (to O-ring)



7. Install:
   • Starter motor ①

8. Install:
   • Piston
   • Cylinder
   • Cylinder head

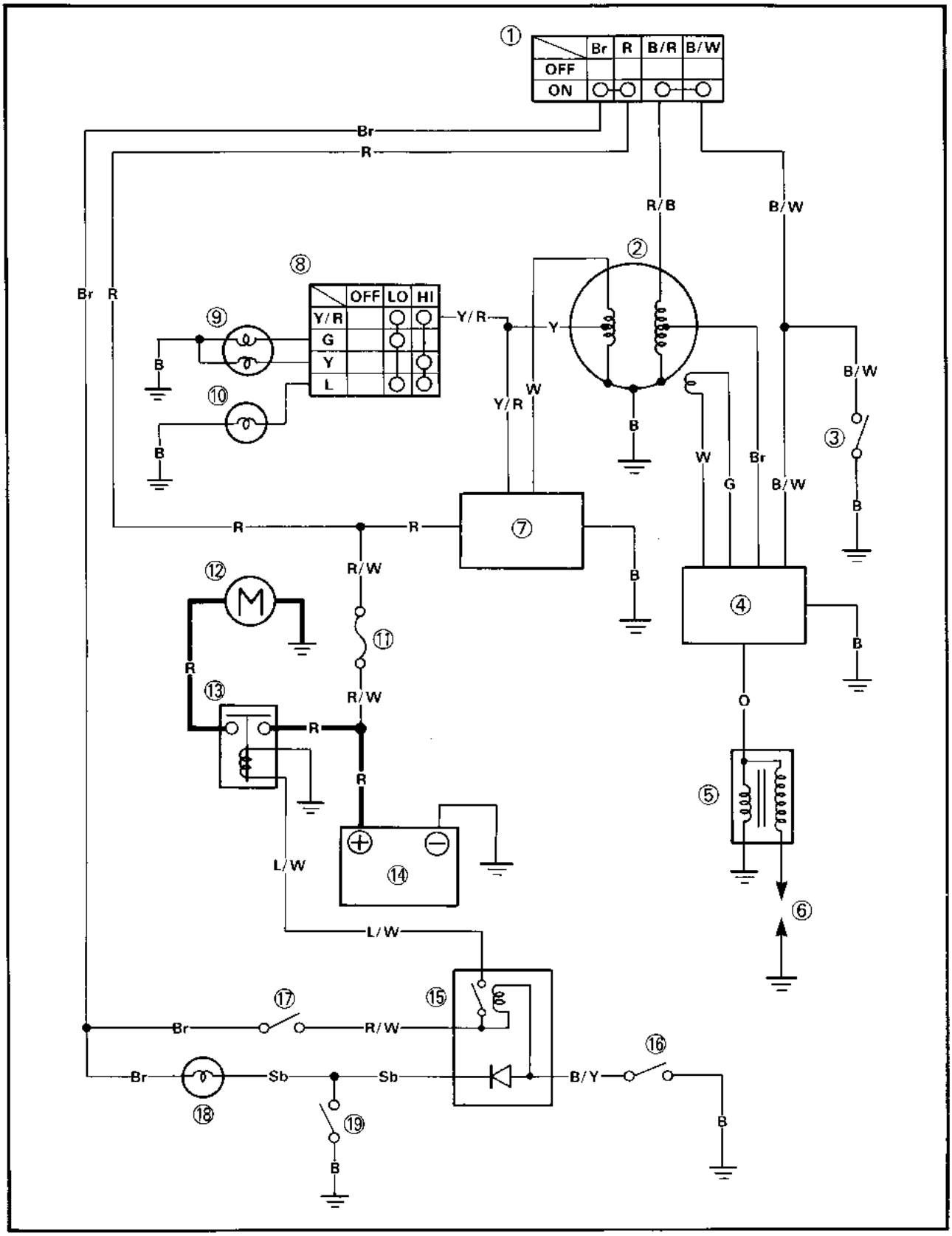
   Refer to "ENGINE ASSEMBLY AND ADJUSTMENT" in BW200N (LIT-11616-04-63) SERVICE MANUAL.

ENGINE MOUNTING

Refer to "ENGINE MOUNTING" in BW200N (LIT-11616-04-63) SERVICE MANUAL.

ELECTRICAL

BW200ES CIRCUIT DIAGRAM



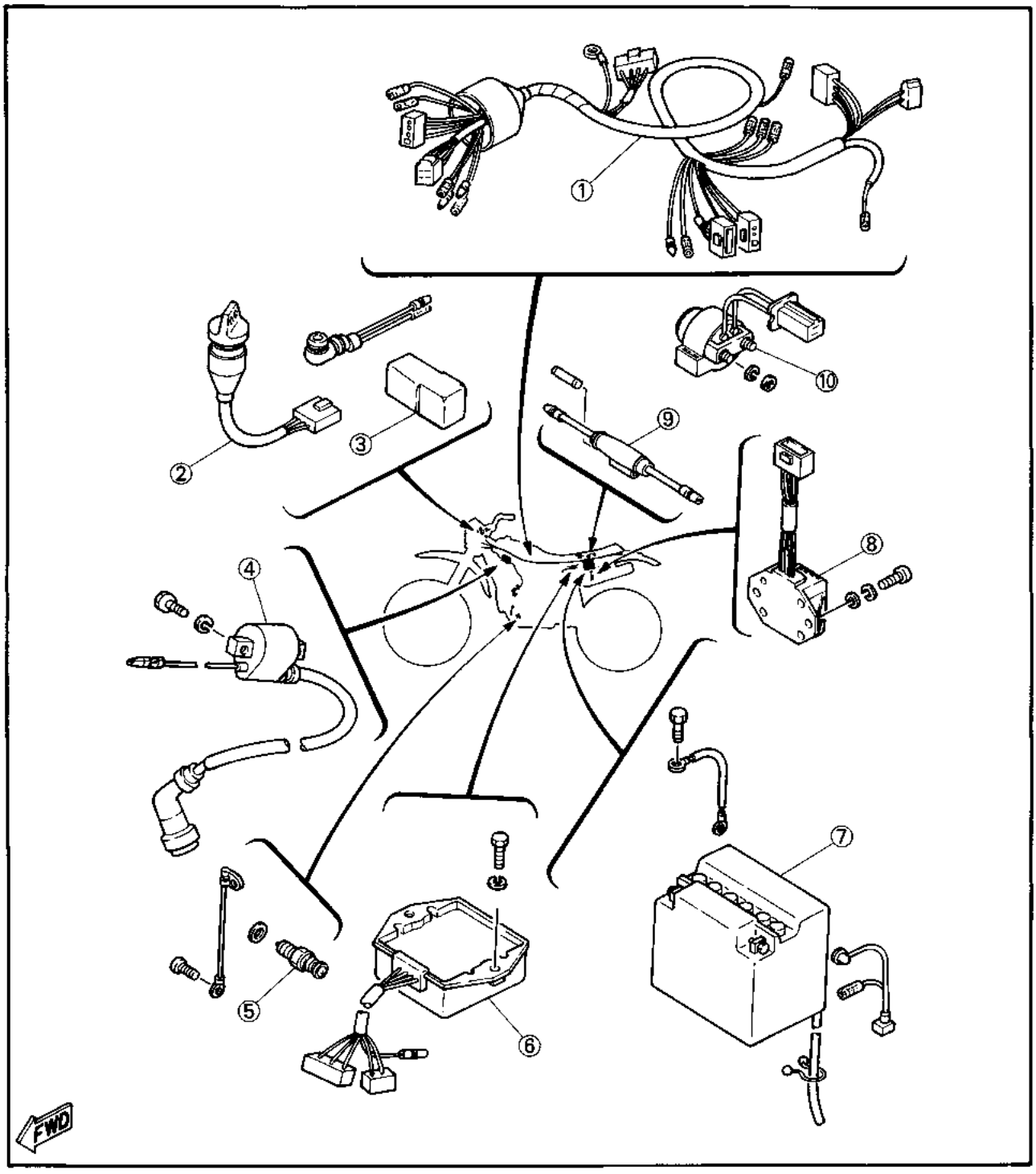
① Main switch
② CDI magneto
③ "ENGINE STOP" switch
④ CDI unit
⑤ Ignition coil
⑥ Spark plug
⑦ Rectifier/Regulator
⑧ "LIGHTS" switch
⑨ Headlight
⑩ Taillight
⑪ Fuse
⑫ Starter motor
⑬ Starter relay
⑭ Battery
⑮ Starting circuit cut-off relay
⑯ Clutch switch
⑰ "START" switch
⑱ Neutral light
⑲ Neutral switch

COLOR CODE

R	Red
W	White
B	Black
Br	Brown
G	Green
Y	Yellow
L	Blue
Sb	Sky blue
O	Orange
B/R	Black/Red
B/W	Black/White
Y/R	Yellow/Red
R/W	Red/White
L/W	Blue/White
B/Y	Black/Yellow
R/B	Red/Black

ELECTRICAL COMPONENTS

① Wire harness
② Main switch
③ Starting circuit cut-off relay
④ Ignition coil
⑤ Neutral switch
⑥ CDI unit
⑦ Battery
⑧ Rectifier/Regulator
⑨ Fuse
⑩ Starter relay

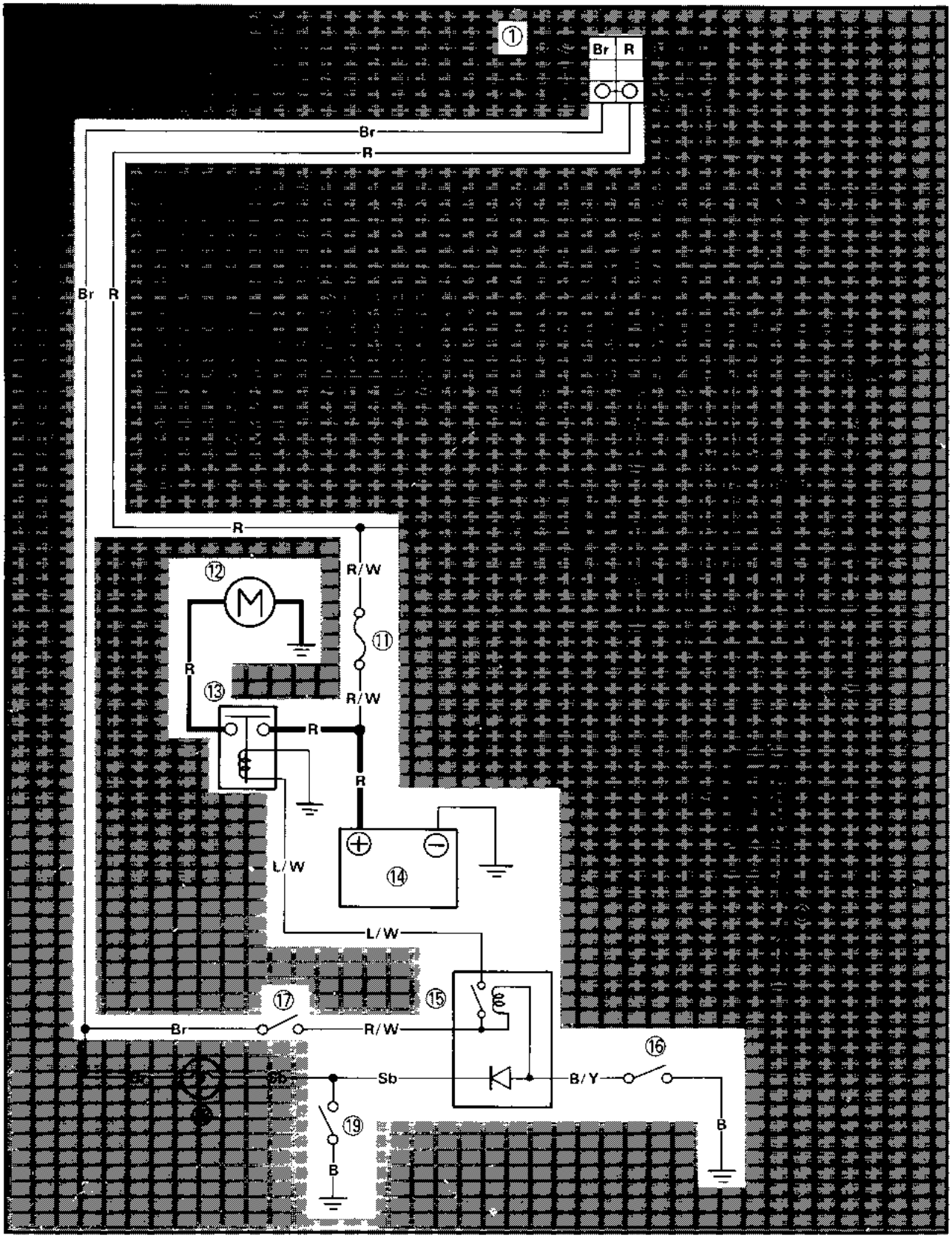


MEMO

ELECTRICAL STARTING SYSTEM

CIRCUIT DIAGRAM

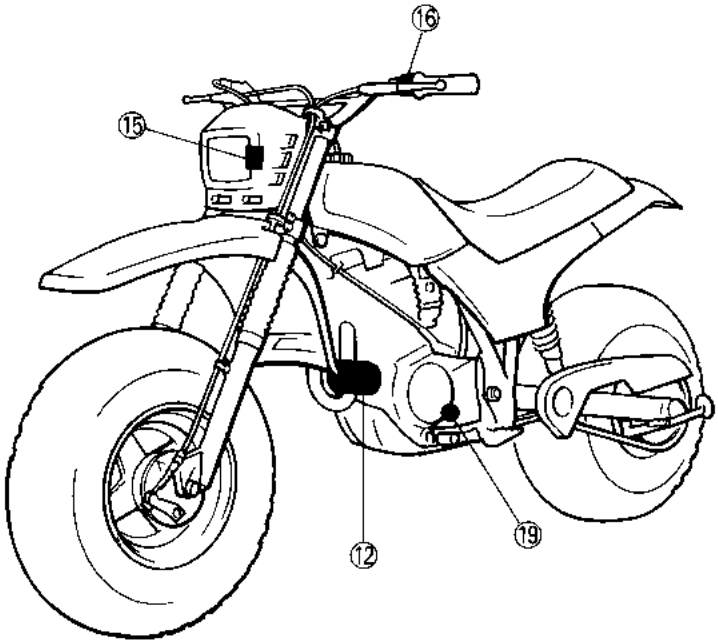
Below circuit diagram shows electrical starting circuit.

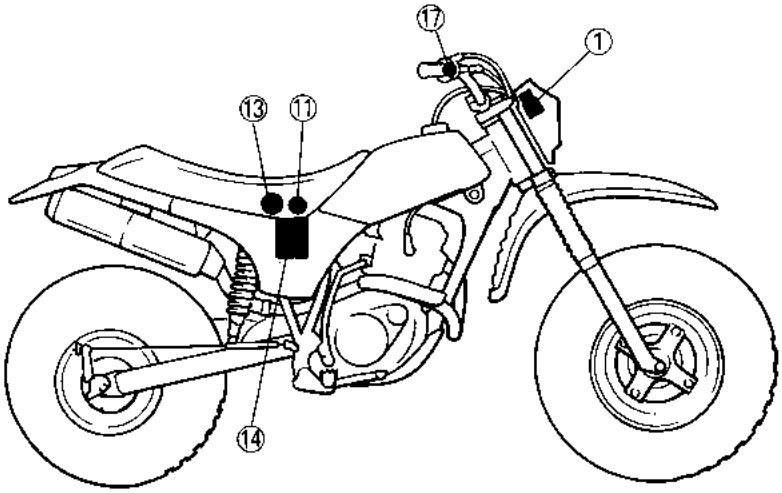


NOTE:

For the color codes, see page 16.

① Main switch
⑪ Fuse
⑫ Starter motor
⑬ Starter relay
⑭ Battery
⑮ Starting circuit cut-off relay
⑯ Clutch switch
⑰ "START" switch
⑲ Neutral switch



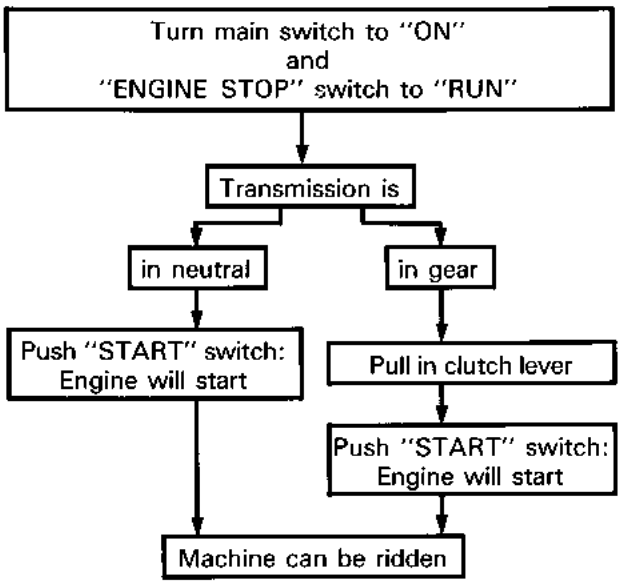


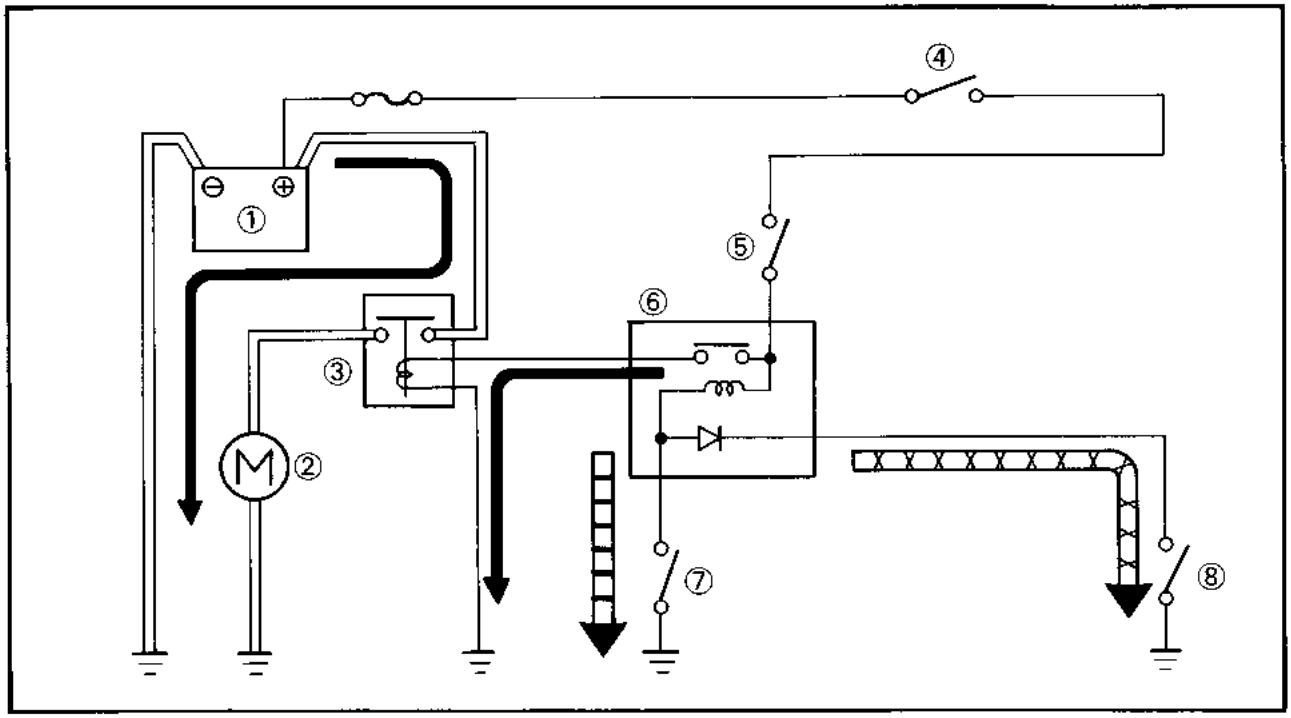
ELECTRICAL STARTING SYSTEM

STARTING CIRCUIT OPERATION

The starting circuit on this model consists of the starter motor, starter relay and starting circuit cut-off relay. If the "ENGINE STOP" switch and the main switch are both on, the starter motor can operate only if:

- The transmission is in neutral (the neutral switch is on).
- The clutch lever is pulled in (clutch switch is on).





① Battery
② Starter motor
③ Starter relay
④ Main switch
⑤ "START" switch
⑥ Starting circuit cut-off relay
⑦ Clutch switch
⑧ Neutral switch

WHEN THE TRANSMISSION IS IN NEUTRAL.

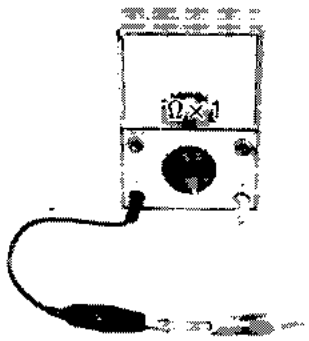
WHEN THE CLUTCH LEVER IS PULLED IN.

TROUBLESHOOTING

STARTER MOTOR DOES NOT OPERATE.

NOTE:

Before this troubleshooting, remove side covers, seat and fuel tank.



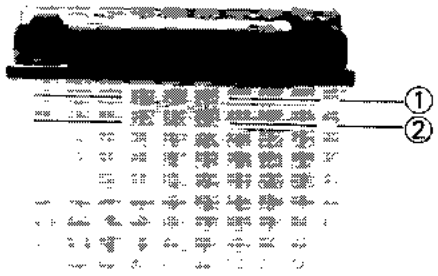
1. Fuse inspection
   - Remove fuse.
   - Connect Pocket Tester (YU-03112) to fuse and check it for continuity.

NOTE:

Set tester selector to "Ω × 1" position.

Continuity (0Ω) → 2. Battery fluid level inspection

No continuity (∞) → • Replace fuse.



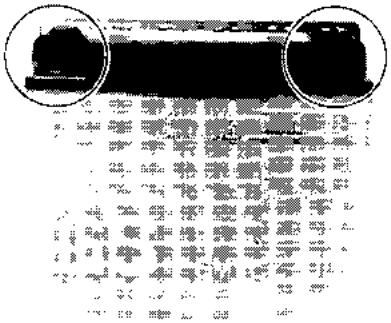
- Fuel level should be between upper ① and lower ② level mark.

Correct → End

Incorrect → • Refill battery fluid.

CAUTION:

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



3. Battery terminal inspection
   - Inspect battery terminal and connections.

OK

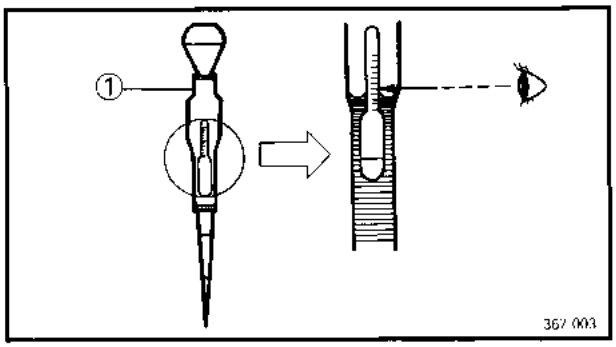
Dirty or poor connection

- Clean battery terminals using wire brush.

NOTE:

After cleaning terminals, apply grease lightly to both terminals.

- Connect battery leads correctly.



4. Battery fluid specific gravity inspection
   - Remove caps.
   - Inspect specific gravity of all cell using Battery Hydrometer ①.

Specific Gravity:
1.280±0.01 at 20°C (68°F)

WARNING:

Battery electrolyte is poisonous and dangerous, causing severe burns, etc. It contains sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL-Flush with water. INTERNAL-Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call a physician immediately.
Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes etc., away. Ventilate when charging or using in an enclosed space. Always shield your eyes when working near batteries.
KEEP OUT OF REACH OF CHILDREN.

OK

Low specific gravity

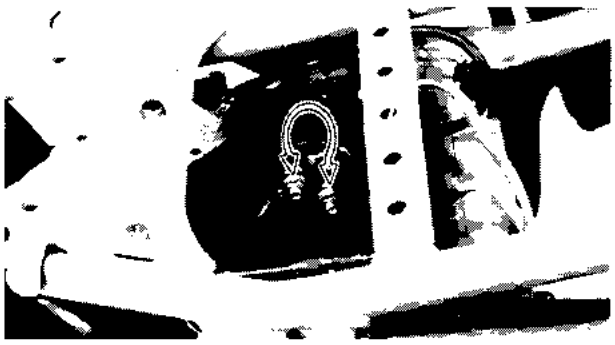
- Recharge battery

Charging Current:
0.7 amps/10 hrs

NOTE:

Replace the battery if:

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



5. Connect battery positive (+) lead and starter motor lead; use heavy duty jumper lead.

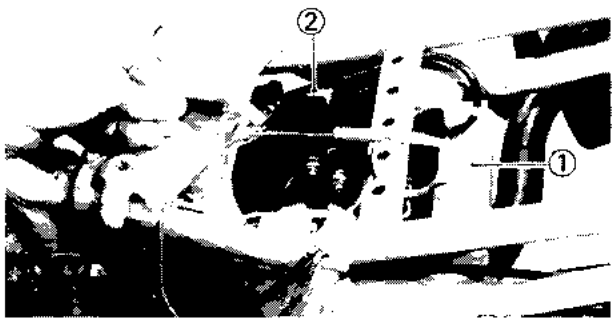
WARNING:

This test should be perfomed within a few seconds to prevent further damage. Also, there should be no flammables close to the starter relay.

Starter motor runs.

Starter motor does not run.

Inspect and repair the starter motor. Refer to "STARTER MOTOR" section.



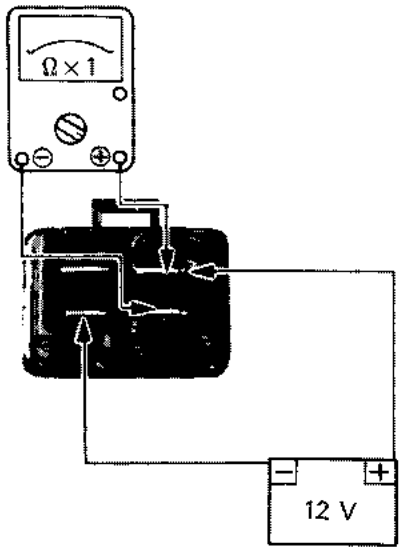
6. Starter relay conduct check
   - Disconnect starter relay leads (Blue/White, Red/White) and connect them to battery positive and negative lead use a jumper leads.

① Positive lead
② Negative lead

Starter motor runs. ↓ Starter motor does not run.

Starter relay is faulty, replace it.

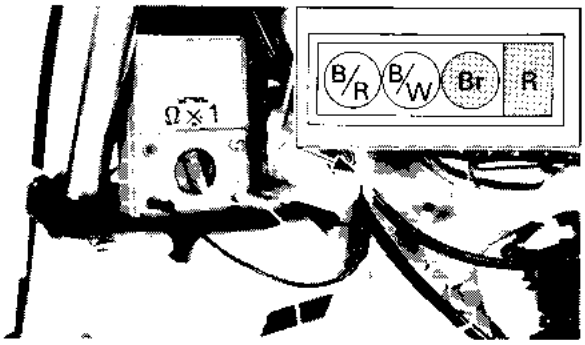
7. Starting circuit cut-off relay conduct check
   - Remove starting circuit cut-off relay from headlight stay.
   - Connect 12V battery and Pocket Tester (YU-03112) to starting circuit cut-off relay terminals as shows.



NOTE:
- Use full charge battery.
- Set tester selector to "Ω×1" position.

Continuity (0Ω) ↓ No continuity (∞)

Starting circuit cut-off relay is faulty, replace it.



8. Main switch conduct check
   - Disconnect main switch coupler (Brown, Red, Black/Red, Black/White leads).
   - Connect Pocket Tester (YU-03112) to main switch leads (Brown, Red).

Tester (+) lead→Red lead
Tester (−) lead→Brown lead

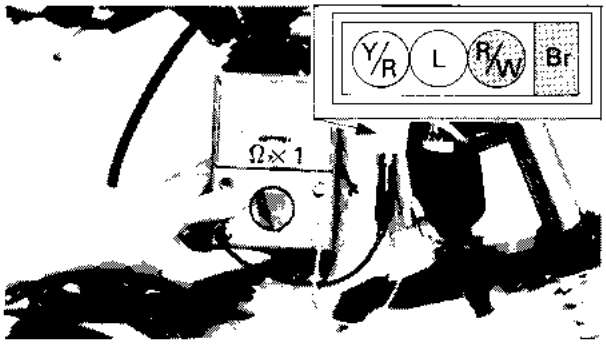
NOTE:

Set tester selector to "Ω×1" position.

- Turn main switch to "ON" position and check it for continuity.

Continuity (0Ω) → No continuity (∞)

Main switch is faulty, replace it.



9. "START" switch conduct check
   - Disconnect handlebar switch coupler (Yellow/Red, Blue, Red/White, Brown leads).
   - Connect Pocket Tester (YU-03112) to handlebar switch leads (Red/White, Brown).

Tester (+) lead→Brown lead
Tester (−) lead→Red/White lead

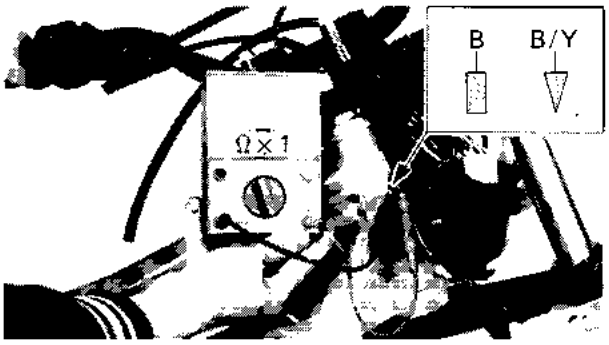
NOTE:

Set tester selector to "Ω×1" position.

- Push on "START" switch and check it for continuity.

Continuity (0Ω) → No continuity (∞)

Handlebar switch is faulty, replace it.



10. Clutch switch conduct check
- Disconnect clutch switch leads (Black/Yellow, Black).
- Connect Pocket Tester (YU-03112) to clutch switch leads.

Tester (+) lead→Black/Yellow lead
Tester (−) lead→Black lead

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

- Clutch lever is pulled and check clutch switch for continuity.

Continuity (0Ω) → No continuity (∞)

Clutch switch is faulty, replace it.

11. Neutral switch conduct check
- Disconnect neutral switch lead (Sky blue).
- Connect Pocket Tester (YU-03112) to neutral switch lead and frame earth lead.

Tester (+) lead→Sky blue lead
Tester (−) lead→Frame earth lead

NOTE:

Set tester selector to "Ω × 1" position.

- Transmission is in neutral and check neutral switch for continuity.

Continuity (0Ω) → Neutral switch is faulty, replace it.

No continuity (∞)

12. Check entire electrical starting system for connections. Refer to "WIRING DIAGRAM" section.

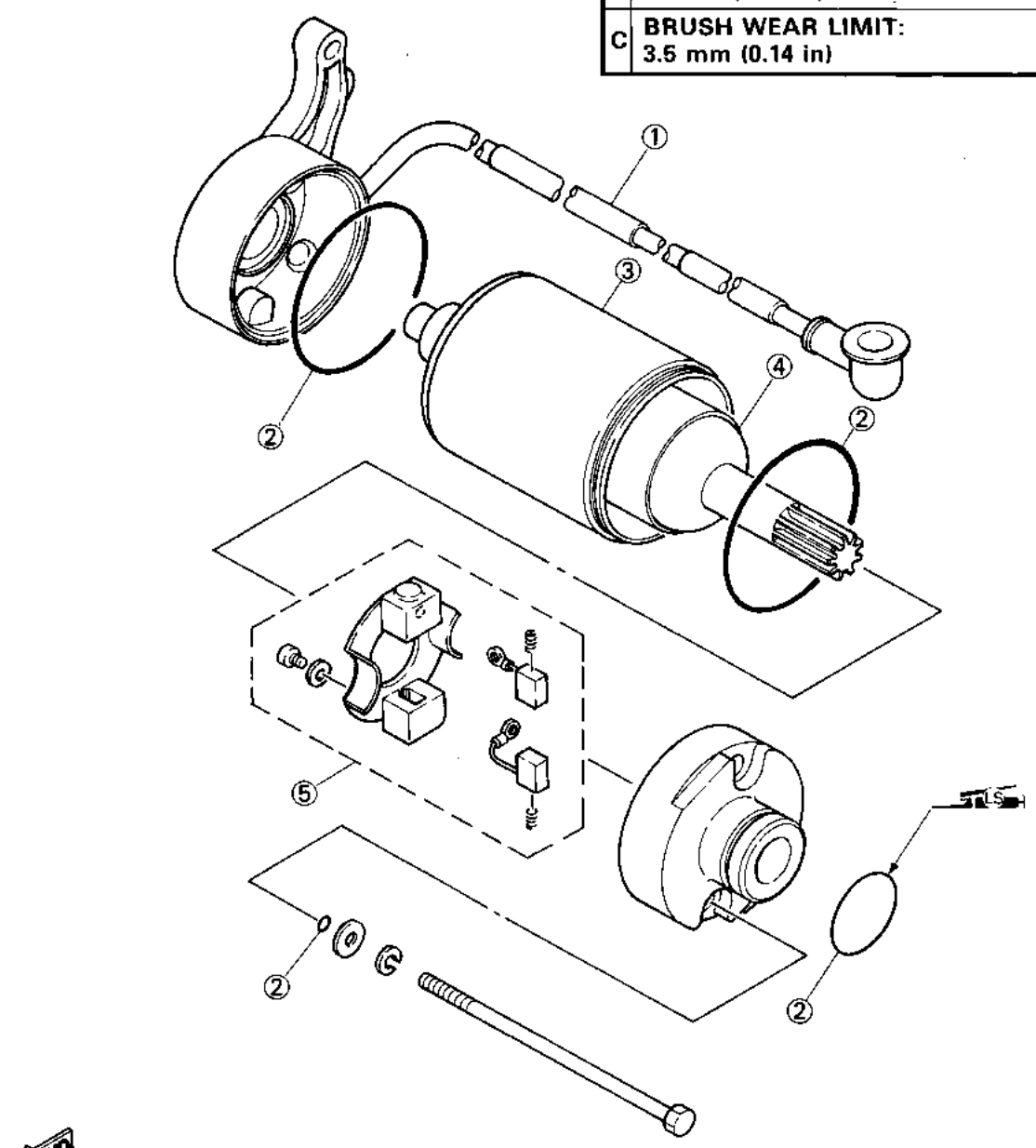
OK → Correct. → Electrical starting system is good.

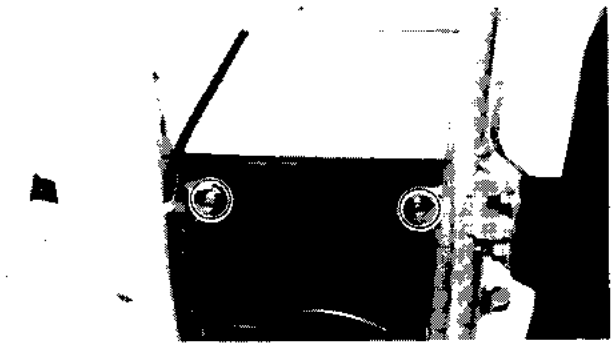
Poor connection

STARTER MOTOR

① Starter motor lead
② O-ring
③ Yoke assembly
④ Armature coil assembly
⑤ Brush assembly

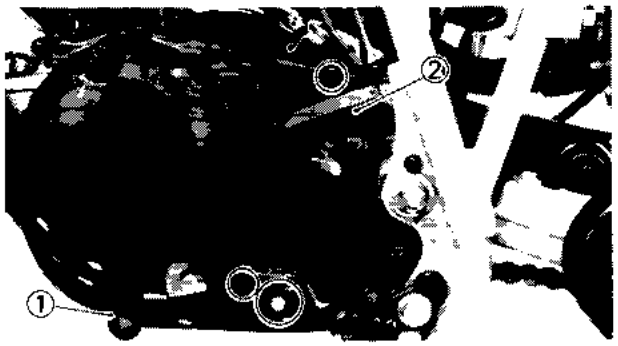
A	COMMUTATOR UNDER CUT: 1.5 mm (0.06 in)
B	COMMUTATOR DIAMETER WEAR LIMIT: 21 mm (0.87 in)
C	BRUSH WEAR LIMIT: 3.5 mm (0.14 in)



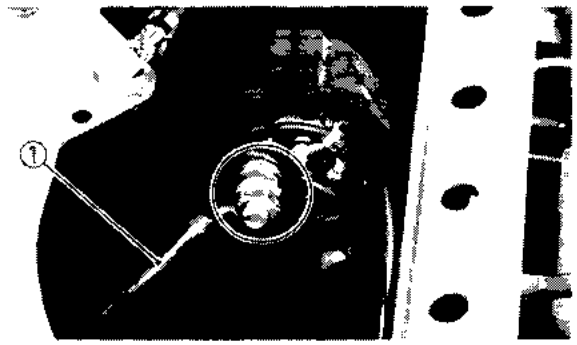


Removal

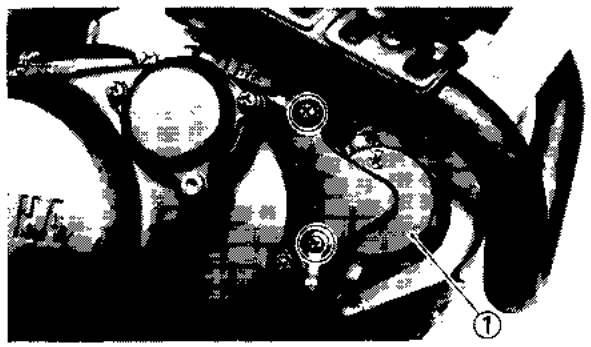
1. Remove:
   - Side cover (Left)
   - Seat



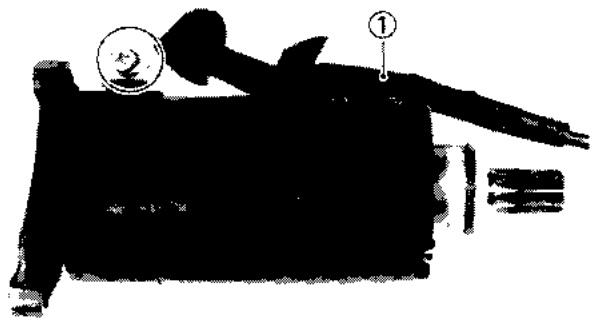
2. Remove:
   - Change pedal ①
   - Drive sprocket cover ②



3. Disconnect:
   - Starter motor lead ①

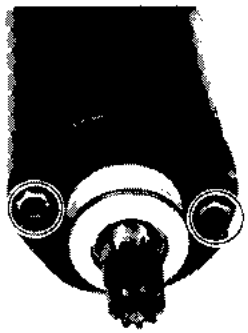


4. Remove:
   - Starter motor ①

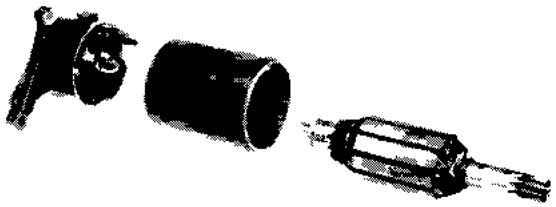


Disassembly

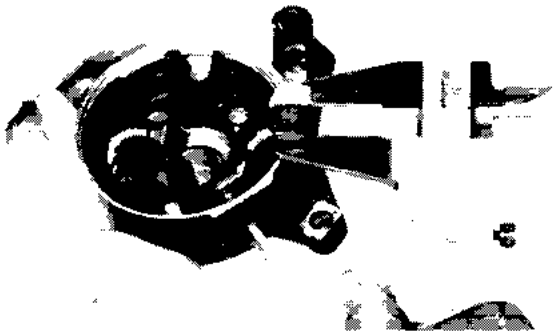
1. Remove:
   - Starter motor lead ①



2. Remove:
   • Yoke assembly



3. Remove:
   • Armature coil assembly

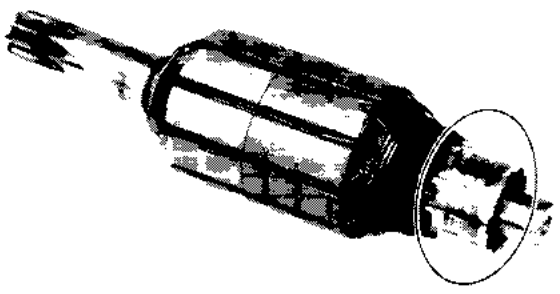


Inspection and repair

1. Measure:
   • Brush length (each)
   Out of specification → Replace brush.

	Minimum Brush Length: **3.5 mm (0.14 in)**

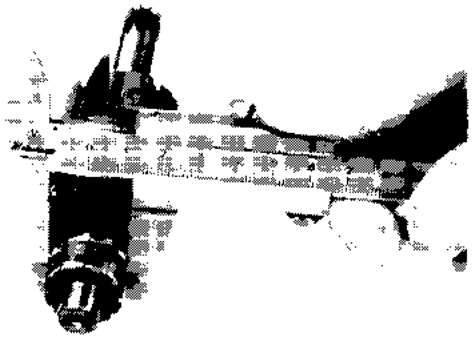
2. Inspect:
   • Brush spring
   Damage → Replace.



3. Inspect:
   • Commutator (Outer surface)
   Grooved wear/Burning/scratches → Smooth out using a sandpaper (#500 ~ 600).

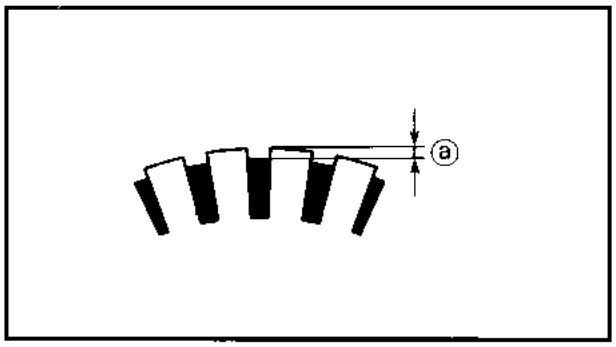
NOTE:

Sand the commutator outer surface lightly and evenly.



4. Measure:
   • Commutator diameter
   Out of specification → Replace.

Outside Diameter Limit:
21 mm (0.87 in)



5. Measure:
   • Mica undercut ⓐ
   Out of specification → Scrape mica using a hacksaw blade.

Mica Undercut ⓐ:
1.5 mm (0.06 in)

NOTE:

The mica insulation of the commutator must be undercut to ensure proper operation of the commutator.

6. Measure:
   • Armature coil resistance
   Out of specification → Replace.

Armature Coil Resistance:
0.02Ω at 20°C (68°F)

7. Check:
   • Armature coil insulation
   Set the pocket tester selector to "Ω × 1K" position.
   Continuity → Replace.

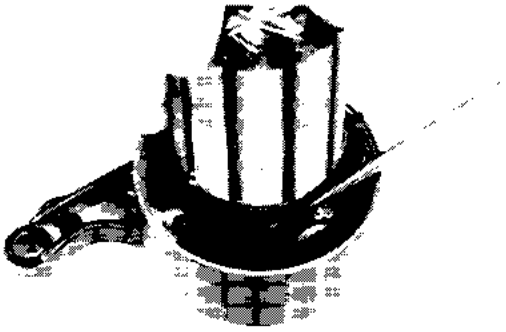
Assembly

Reverse the "Removal" and "Disassembly" procedure.

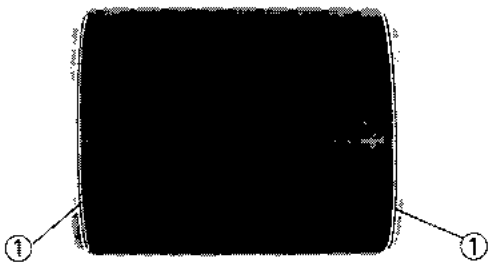
Note the following points.

1. Install:
   - Brushes
   - Brush springs

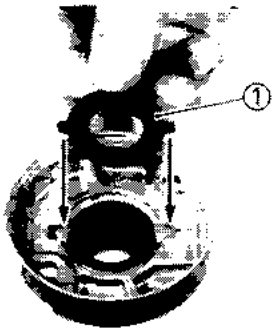
   Using a thin screw driver.



2. Install:
   - Armature coil assembly



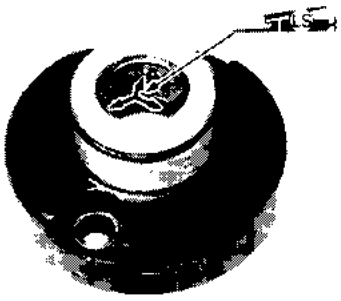
3. Install:
   - O-rings (New) ①



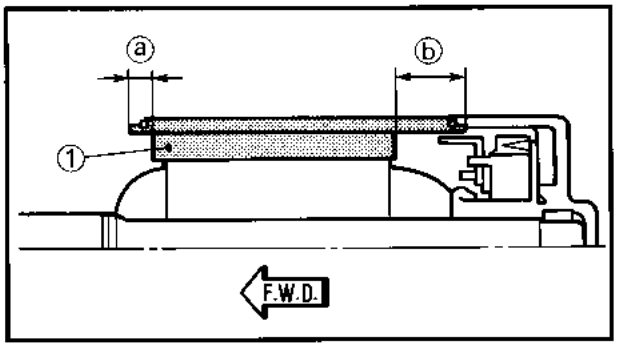
4. Install:
   - Washer ①

NOTE:

Fit the washer on the bracket as shown.



5. Apply:
   - Lithium soap bace grease (to oil seal and bearing)

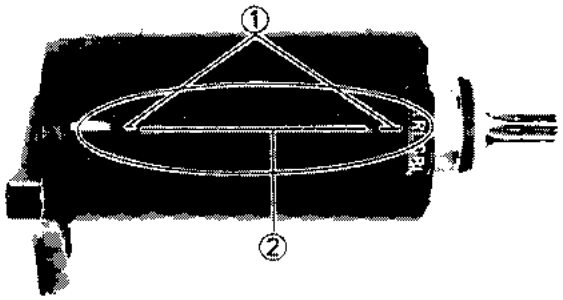


6. Install:
   - Yoke assembly ①

NOTE:

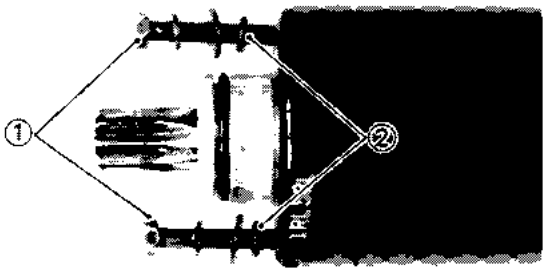
Install the yoke assembly ① with its short skirt ⓐ forward.

ⓐ : Short skirt
ⓑ : Long skirt

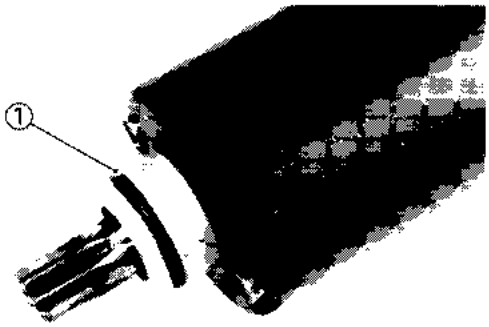


NOTE:

Align the match marks ① on the bracket with the match marks ② on the housing.



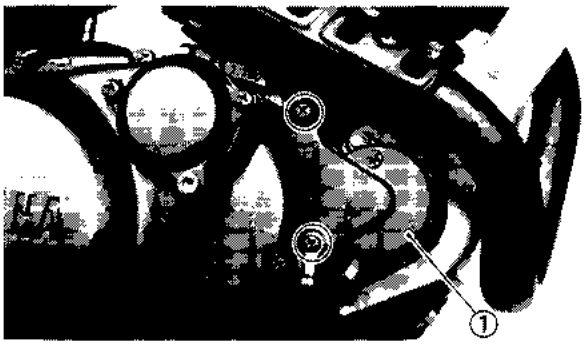
7. Install:
   - Bolts ①
   - O-rings (New) ②



8. Install:
   - O-ring (New) ①

NOTE:

Apply a grease lightly.



Installation

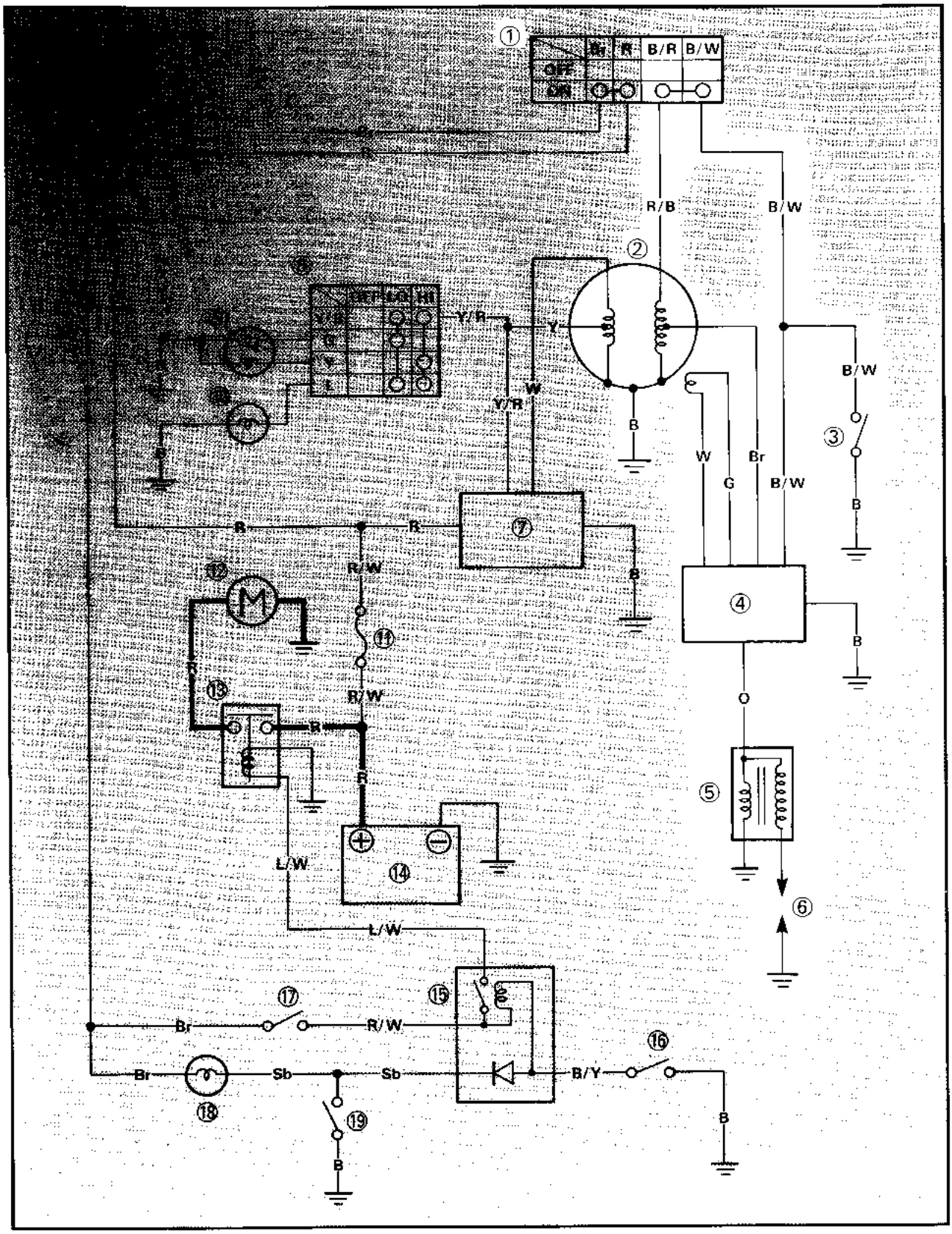
1. Install:
   - Starter motor ①

MEMO

IGNITION SYSTEM

CIRCUIT DIAGRAM

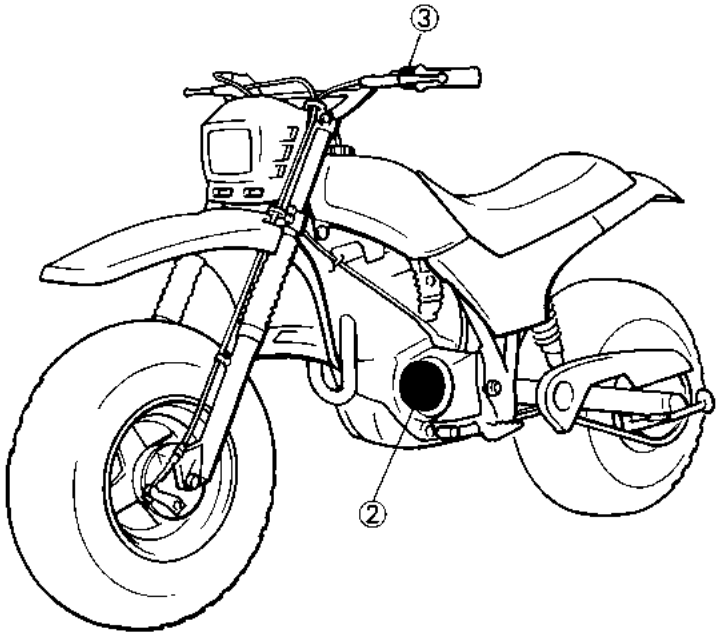
Below circuit diagram shows ignition circuit.

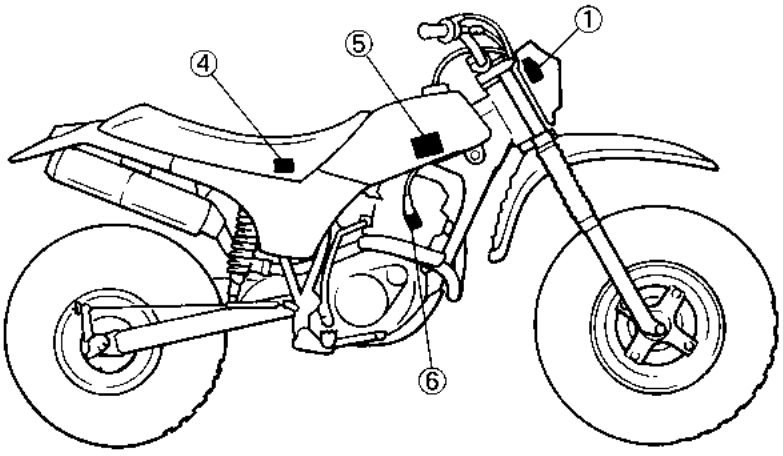


NOTE:

For the color codes, see page 16.

① Main switch
② CDI magneto
③ "ENGINE STOP" switch
④ CDI unit
⑤ Ignition coil
⑥ Spark plug



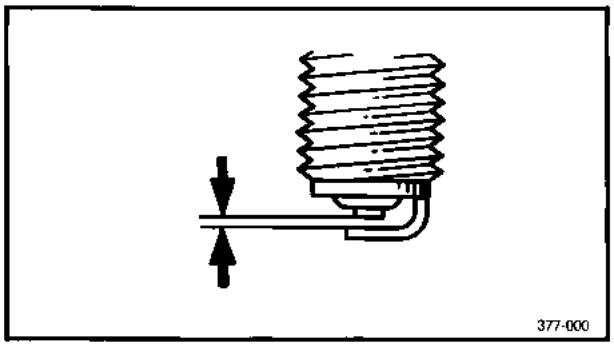


TROUBLESHOOTING

IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK).

NOTE:

Before this troubleshooting, remove side covers, seat and fuel tank.



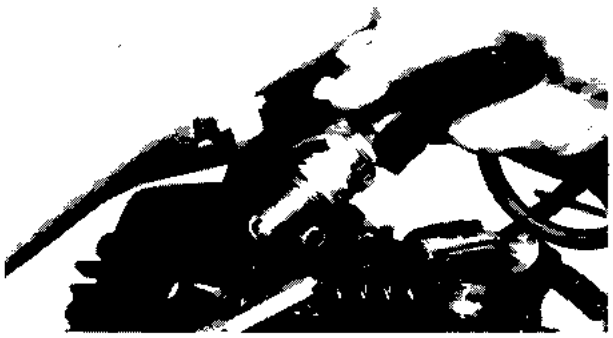
1. Spark plug inspection
   - Remove spark plug.
   - Clean spark plug with spark plug cleaner, if necessary.
   - Inspect electrode, insulator and plug gap. Refer to "CHAPTER 2—SPARK PLUG INSPECTION" section in BW200N SERVICE MANUAL (LIT-11616-04-63).

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

OK

No good

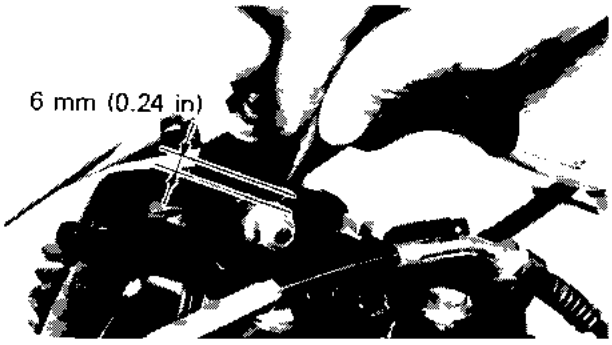
Replace or regap spark plug.



2. Ignition spark test
   - Install spark plug to plug cap.
   - Ground spark plug to cylinder head.
   - Turn main switch to "ON".
     Then, kick starter or start starter motor (Push on "START" switch).

No spark → Spark

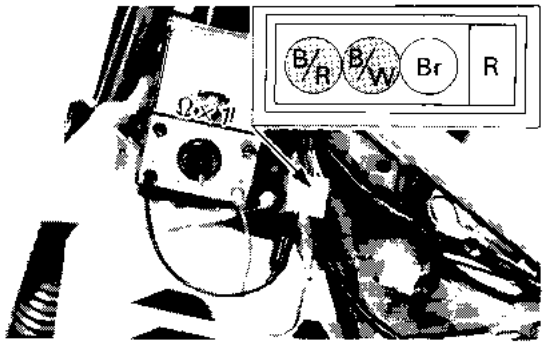
Ignition circuit is good.



3. Ignition spark gap test
   - Remove spark plug and plug cap.
   - Hold spark plug lead 6 mm (0.24 in) from cylinder head.
   - Kick starter or start starter motor (Push on "START" switch).

No spark → Spark

Replace spark plug and/or plug cap.



4. Main switch conduct check
   - Disconnect main switch coupler (Brown, Red, Black/Red, Black/White leads).
   - Connect Pocket Tester (YU-03112) to main switch leads (Black/Red, Black/White)

Tester (+) lead→Black/Red lead
Tester (−) lead→Black/White lead

NOTE:

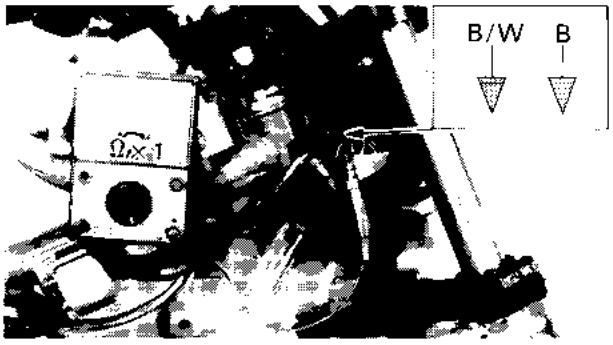
Set tester selector to "Ω×1" position.

- Turn main switch to "ON" position and check it for continuity.

Continuity (0Ω)

No conitnuity (∞)

Main switch is faulty, replace it.



5. "ENGINE STOP" switch conduct check
   - Disconnect handlebar switch leads (Black/White, Black).
   - Connect Pocket Tester (YU-03112) to handlebar switch leads.

Tester (+) lead→Black/White lead
Tester (−) lead→Black lead

NOTE:

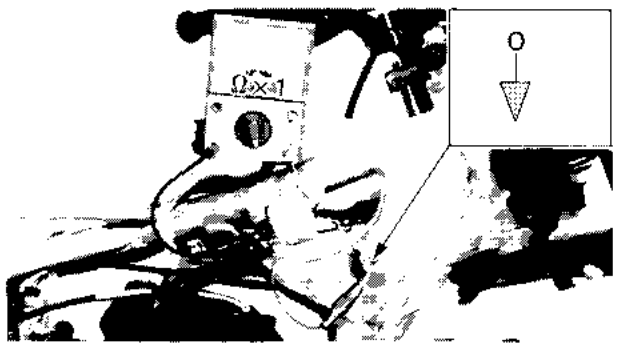
Select tester selector to "Ω×1" position.

- Turn "ENGINE STOP" switch to "RUN" position and check it for continuity.

No continuity (∞)

Continuity (0Ω)

Handlebar switch is faulty, replace it.



6. Ignition coil resistance test
   - Disconnect ignition coil lead (Orange).
   - Connect Pocket Tester (YU-03112) to ignition coil lead (Orange) and ignition coil base.

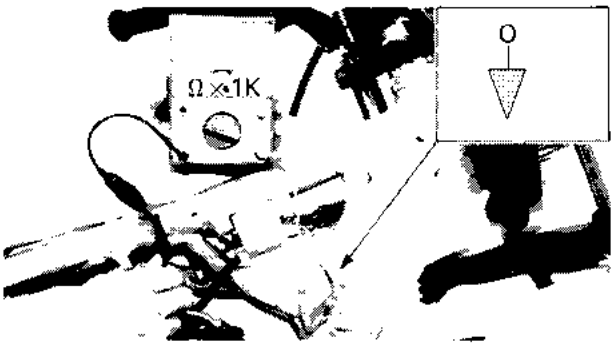
Tester (+) lead→Orange lead
Tester (−) lead→Ignition coil base

NOTE:

Set tester selector to "Ω × 1" position.

- Measure primary coil resistance.

Primary Coil Resistance:
1.44 ~ 1.76 Ω at 20°C (68°F)



- Connect Pocket Tester (YU-03112) to ignition coil lead (Orange) and spark plug lead.

Tester (+) lead → Orange lead
Tester (−) lead → Spark plug lead

NOTE:

Set tester selector to "Ω × 1K" position.

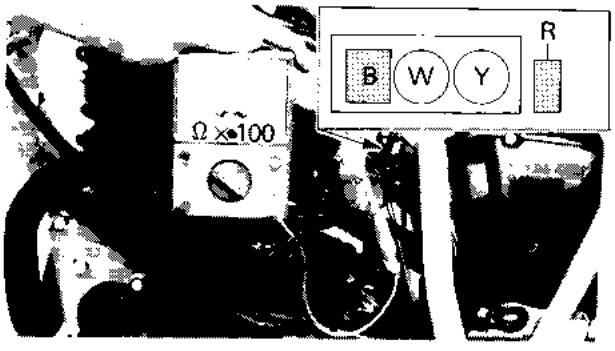
- Measure secondary coil resistance.

Secondary Coil Resistance:
5.28 ~ 7.92 kΩ at 20°C (68°F)

Both resistances meet specifications

Out of specification

Ignition coil is faulty, replace it.



7. Source coil resistance test
   - Disconnect CDI magneto leads.
   - Connect Pocket Tester (YU-03112) to CDI magneto leads (Black, Red).

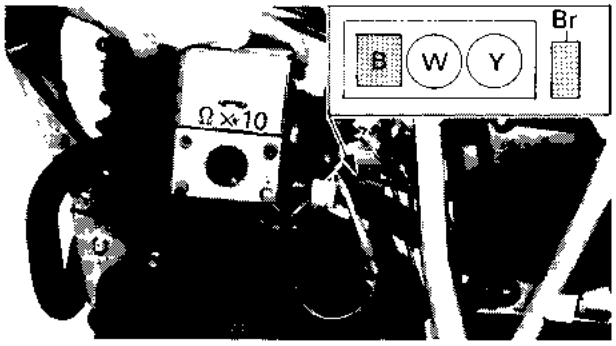
Tester (+) lead → Red lead
Tester (−) lead → Black lead

•Measure source coil (1) resistance.

NOTE:

Set tester selector to "Ω × 100" position.

Source Coil (1) Resistance (R—B):
396 ~ 484Ω at 20°C (68°F)



•Connect Pocket Tester to CDI magneto leads (Brwon, Black).

Tester (+) lead→Brown lead
Tester (−) lead→Black lead

•Measure source coil (2) resistance.

NOTE:

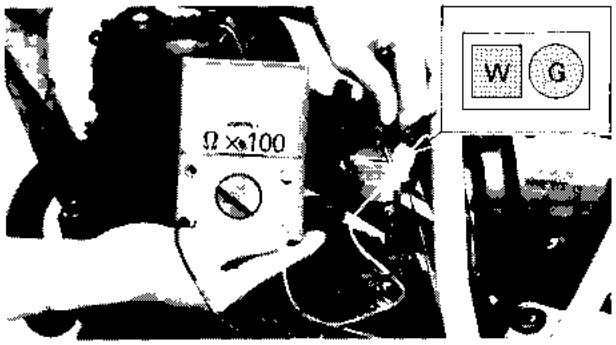
Set tester selector to "Ω × 10" position.

Source Coil (2) Resistance (Br—B):
27.9 ~ 34.1Ω at 20°C (68°F)

Both resistances meet specifications

Out of specification

Source coil is faulty, replace it.



8. Pick-up coil resistance test
   - •Disconnect pick-up coil leads (White, Green).
   - •Connect Pocket Tester (YU-03112) to pick-up coil leads.

Tester (+) lead→White lead
Tester (−) lead→Green lead

•Measure pick-up coil resistance.

NOTE:

Set tester selector to "Ω × 100" position.

Pick-up Coil Resistance (W—G):
648 ~ 792Ω at 20°C (68°F)

Resistance meet specification

Out of specification

Pick-up coil is faulty, replace it.

9. Check entire ignition system for connections. Refer to "WIRING DIAGRAM" section.

OK

Poor connection

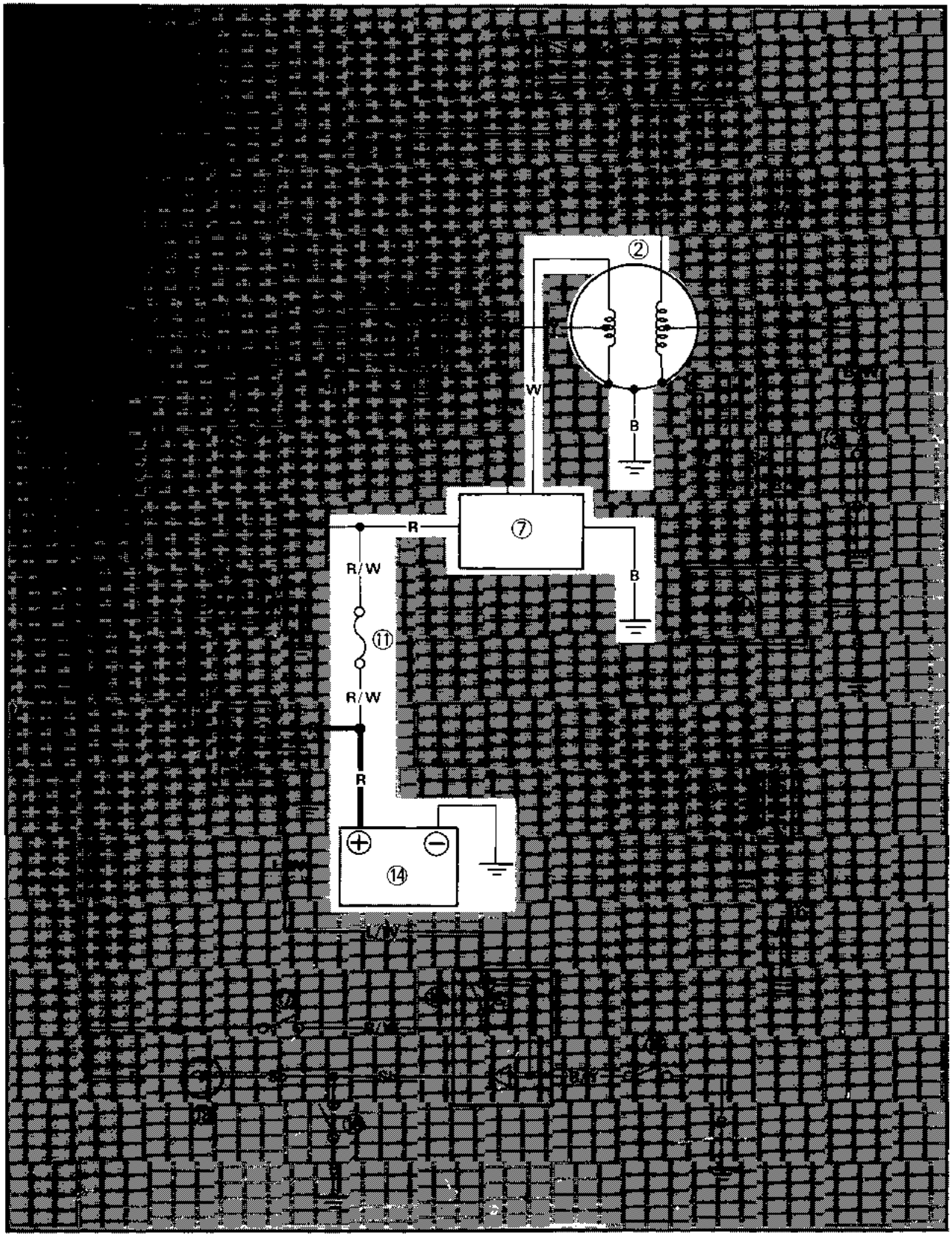
Correct.

CDI unit is faulty, replace it.

CHARGING SYSTEM

CIRCUIT DIAGRAM

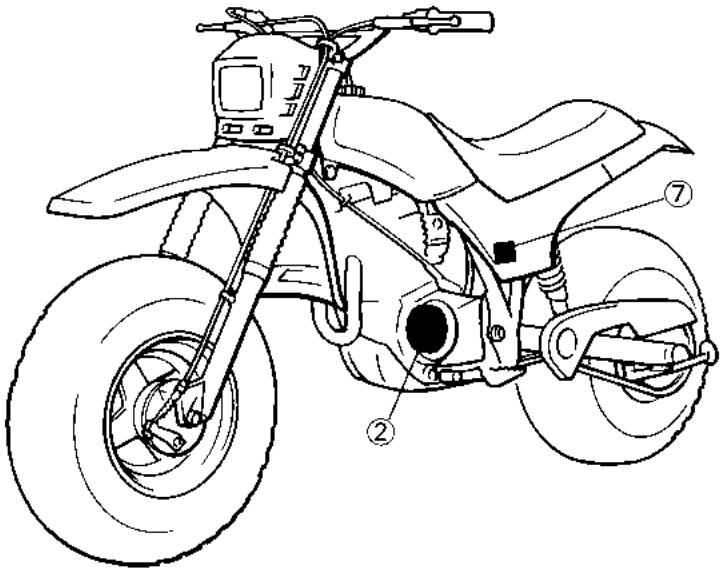
Below circuit diagram shows charging circuit.

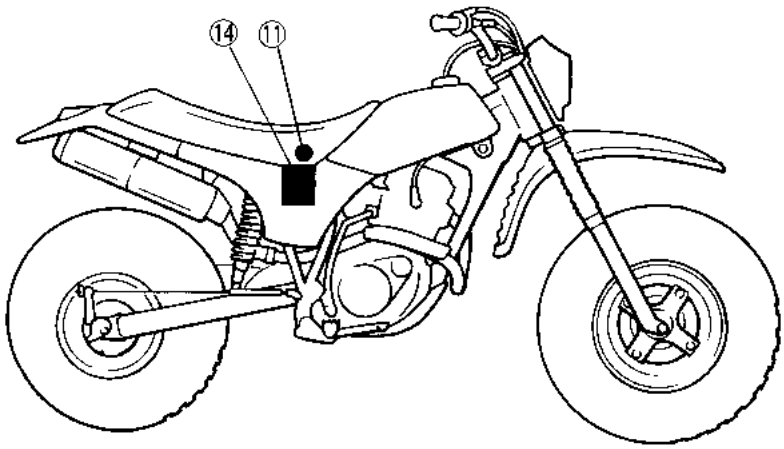


NOTE:

For the color codes, see page 16.

② CDI magneto
⑦ Rectifier/Regulator
⑪ Fuse
⑭ Battery



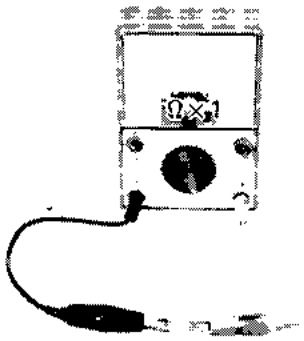


TROUBLESHOOTING

THE BATTERY IS NOT CHARGED.

NOTE:

Before this troubleshooting, remove side covers and seat.



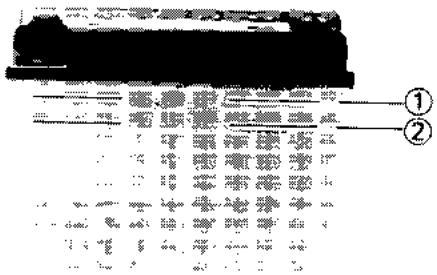
1. Fuse inspection
   - Remove fuse.
   - Connect Pocket Tester (YU-03112) to fuse and check it for continuity.

NOTE:

Set tester selector to "Ω × 1" position.

Continuity (0Ω) → Replace fuse.

No continuity (∞) → Replace fuse.



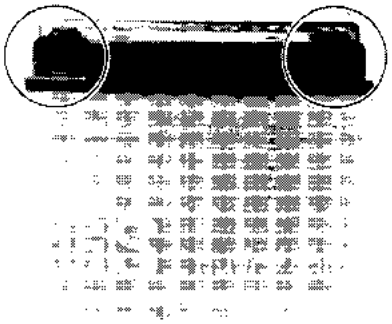
2. Battery fluid level inspection
   - Fluid level should be between upper ① and lower ② level mark.

Correct

Incorrect → • Refill battery fluid.

CAUTION:

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



3. Battery terminal inspection
   - Inspect battery terminal and connections.

OK

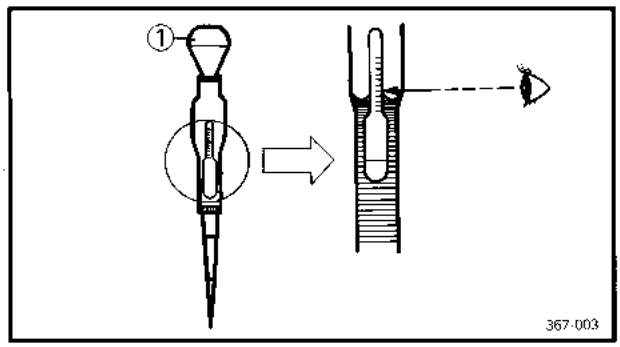
Dirty or poor connection

- Clean battery terminals using wire brush.

NOTE:

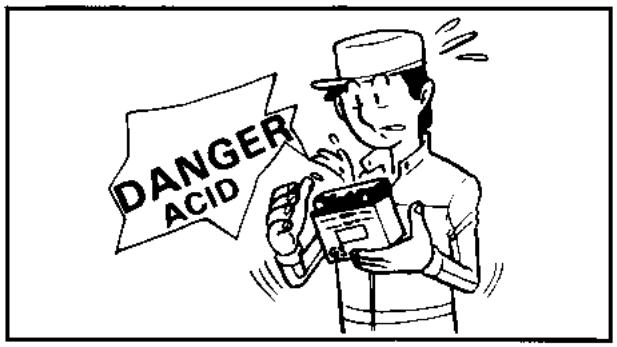
After cleaning terminals, apply grease lightly to both terminals.

- Connect battery leads correctly.



4. Battery fluid specific gravity inspection
   - Remove caps.
   - Inspect specific gravity of all cell using Battery Hydrometer ①.

Specific Gravity:
1.280±0.01 at 20°C (68°F)



WARNING:

Battery electrolyte is poisonous and dangerous, causing severe burns, etc. It contains sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL-Flush with water. INTERNAL-Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call a physician immediately.

Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes etc., away. Ventilate when charging or using in an enclosed space. Always shield your eyes when working near batteries. KEEP OUT OF REACH OF CHILDREN.

OK

Low specific gravity

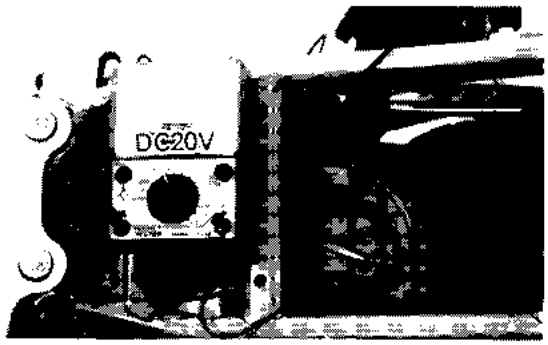
- Recharge battery

Charging Current:
0.7 amps/10 hrs

NOTE:

Replace the battery if:

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



5. Charging voltage test
   - Connect Inductive Tachometer (YU-08036) to spark plug lead.
   - Connect Pocket Tester (YU-03112) to battery.

NOTE:

Set tester selector to "DC20V" position.

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

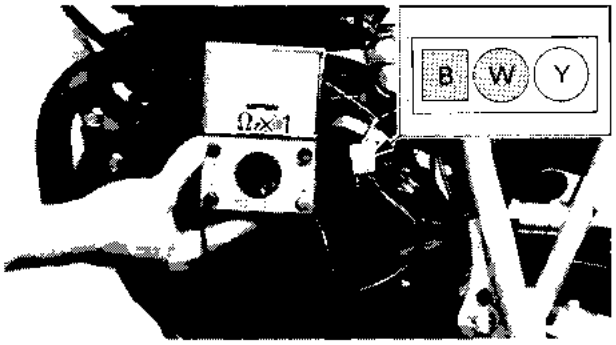
- Start engine and accelerate to about 5,000 r/min.
- Measure charging voltage.

Charging Voltage:
14 ~ 15 V at 5,000 r/min

Out of specification

Charging voltage meets specification.

Battery is faulty, replace it.



6. Charging coil resistance test
   - Disconnect CDI magneto leads (Yellow, White, Black).
   - Connect Pocket Tester (YU-03112) to CDI magneto leads.

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

Tester (+) lead→White lead
Tester (−) lead→Black lead

- Measure charging coil resistance.

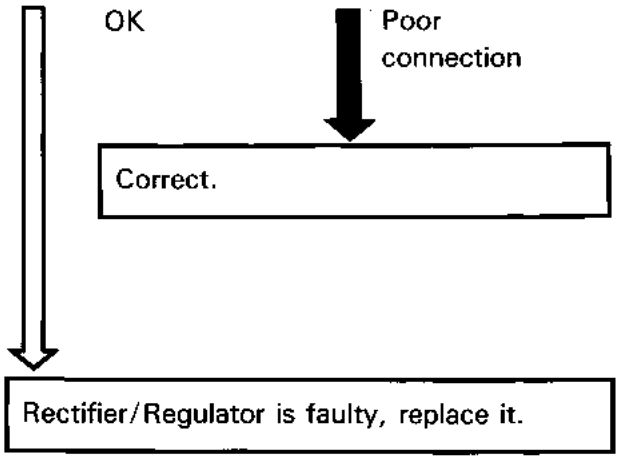
Charging Coil Resistance (W—B):
0.36 – 0.44Ω at 20°C (68°F)

Resistance meets specification.

Out of specification

Charging coil is faulty, replace it.

7. Check entire charging system for connections. Refer to "WIRING DIAGRAM" section.

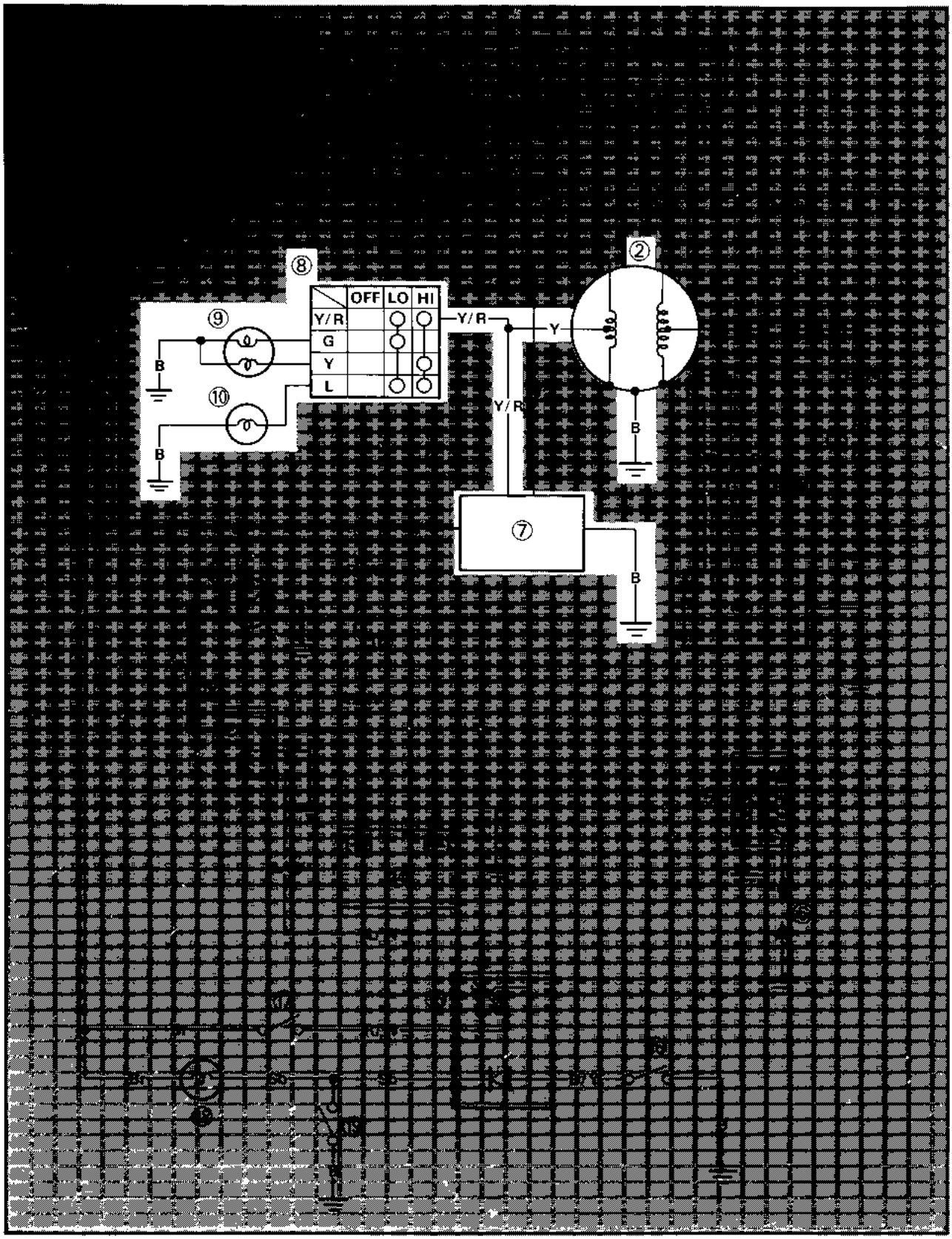

OK
Poor connection
Correct.
Rectifier/Regulator is faulty, replace it.

MEMO

LIGHTING SYSTEM

CIRCUIT DIAGRAM

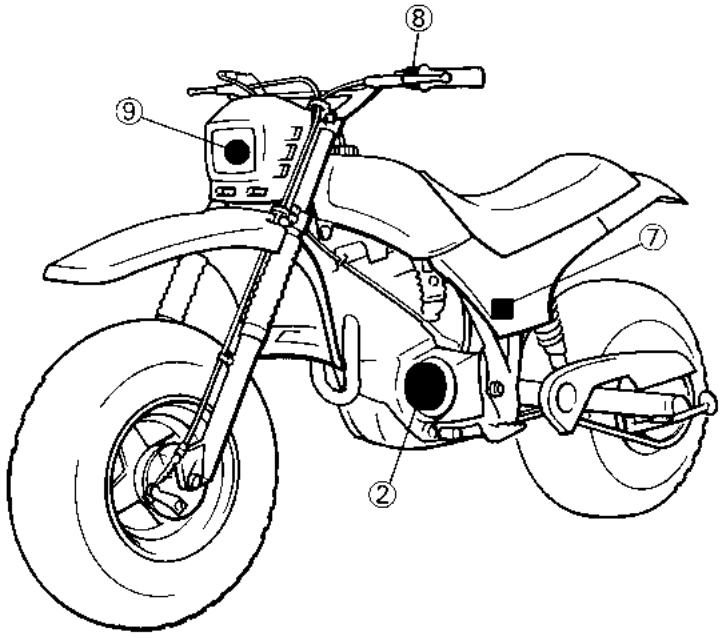
Below circuit diagram shows lighting circuit.

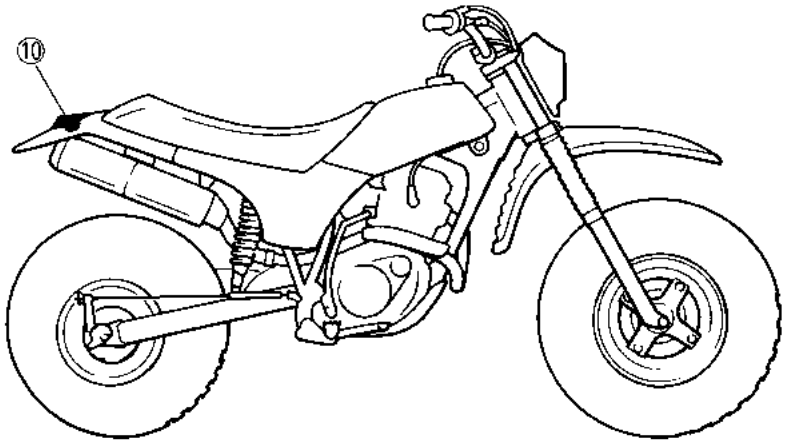


NOTE:

For the color codes, see page 16.

② CDI magneto
⑦ Rectifier/Regulator
⑧ "LIGHT" switch
⑨ Headlight
⑩ Taillight





TROUBLESHOOTING

HEADLIGHT AND/OR TAILLIGHT DOES NOT COME ON.

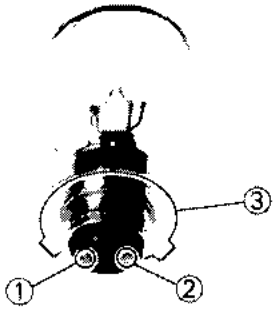
NOTE:

Before this troubleshooting, remove side covers and seat.

1. Headlight bulb conduct check
   - Disconnect headlight leads (Green, Yellow, Black) and remove headlight unit.
   - Remove headlight bulb.

WARNING:

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



- Connect Pocket Tester (YU-03112) to bulb terminals and check bulb for continuity.

Tester (+) lead→Terminal 1 **Tester (−) lead→Terminal 3**
Tester (+) lead→Terminal 2 **Tester (−) lead→Terminal 3**

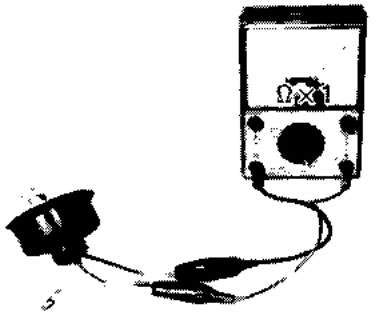
NOTE:

Set tester selector to "Ω×1" position.

Continuity exists on both circuits.

Continuity does not exist on one circuit.

Bulb is faulty, replace it.



2. Headlight bulb socket conduct check
   - Install bulb to headlight socket.
   - Connect Pocket Tester (YU-03112) to headlight leads and check it for continuity.

Tester (+) lead→Green lead **Tester (−) lead→Black lead**
Tester (+) lead→Yellow lead **Tester (−) lead→Black lead**

NOTE:

Set tester selector to "Ω×1" position.

Continuity exists on both circuits.

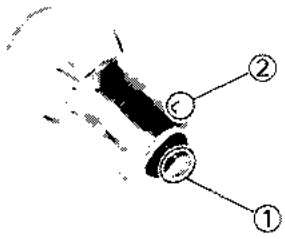
Continuity does not exist on one circuit.

Bulb socket is faulty, replace it.

3. Taillight bulb conduct check
   - Remove taillight lens and bulb.

WARNING:

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

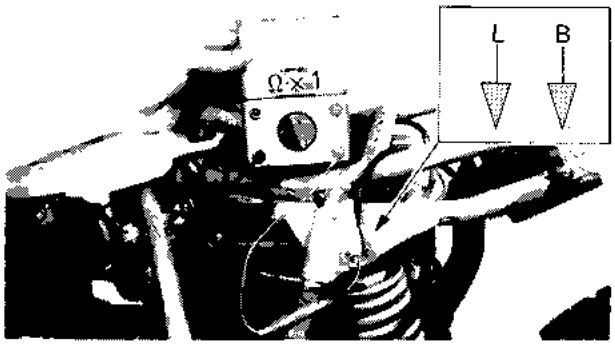


- Connect Pocket Tester (YU-03112) to bulb terminals and check bulb for continuity.

Tester (+) lead→Terminal 1 **Tester (−) lead→Terminal 2**

NOTE:

Set tester selector to "Ω×1" position.



4. Taillight bulb socket conduct check
   - Install bulb to taillight socket.
   - Disconnect taillight leads (Blue, Black).
   - Connect Pocket Tester (YU-03112) to taillight leads and check it for continuity.

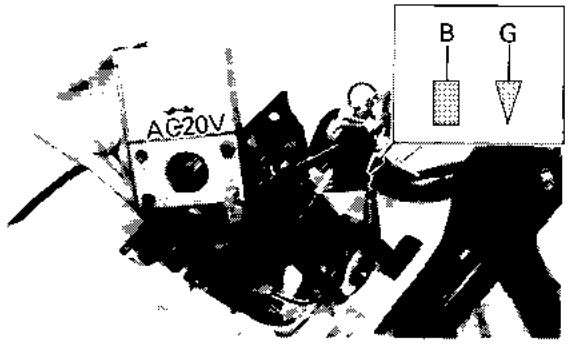
Tester (+) lead→Blue lead
Tester (−) lead→Black lead

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

Continuity

No continuity (∞)

Bulb socket is faulty, replace it.



5. Lighting voltage test
   - Connect Pocket Tester (YU-03112) to headlight leads (Green, Black).

Tester (+) lead→Green lead
Tester (−) lead→Black lead

NOTE:
Set tester selector "AC20V" position.

   - Connect Inductive Tachometer (YU-08036) to spark plug lead.
   - Turn "LIGHT" switch to "LO" position.
   - Start engine and accelerate to about 5,000 r/min.

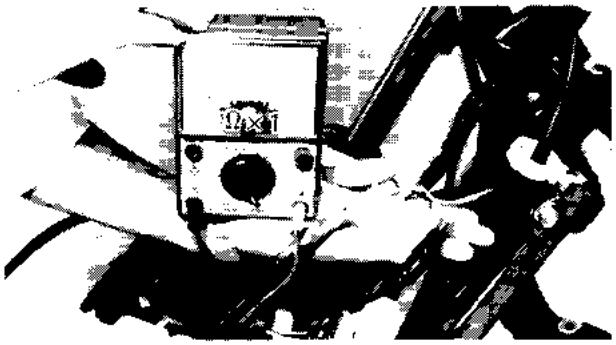
•Measure lighting voltage.

Lighting Voltage:
13 ~ 14 at 5,000 r/min

Out of specification

Lighting voltage meets specification.

Lighting system is good.



6. "LIGHT" switch conduct check
   - Disconnect "LIGHT" switch leads (Yellow/Red, Blue, Red/White, Brown).
   - Connect Pocket Tester to "LIGHT" switch leads and check it for continuity.

If switch is turned to "LO" position.
Tester (+) lead→Yellow/Red lead
Tester (−) lead→Green lead

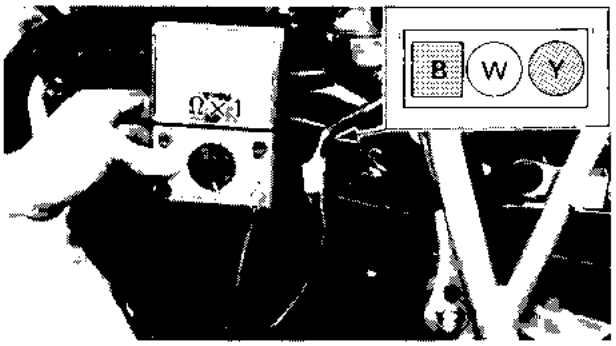
If switch is turned to "HI" position.
Tester (+) lead→Yellow/Red lead
Tester (−) lead→Yellow lead

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

Continuity exists on both circuits.

Continuity does not exist on one circuit.

Handlebar switch is faulty, replace it.



7. Lighting coil resistance test
   - Disconnect CDI magneto leads (Yellow, White, Black).
   - Connect Pocket Tester (YU-03112) to CDI magneto leads.

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

Tester (+) lead→Yellow lead
Tester (−) lead→Black lead

- Measure lighting coil resistance.

Lighting Coil Resistance (Y—B):
0.27~0.33Ω at 20°C (68°F)

Resistance meets specification.

Out of specification

Lighting coil is faulty, replace it.

8. Check entire lighting system for connections. Refer to "WIRING DIAGRAM" section.

OK

Poor connection

Correct.

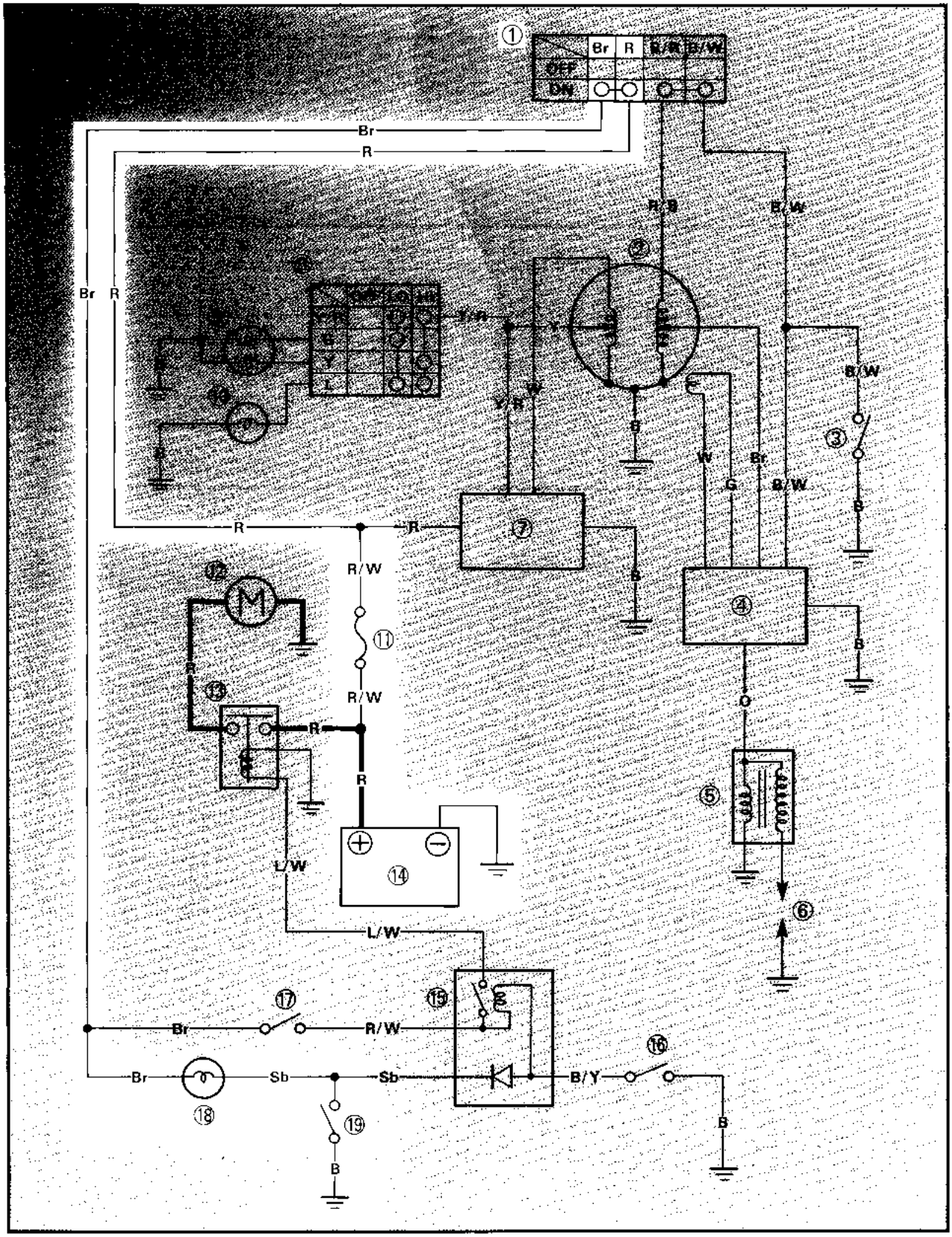
Rectifier/Regulator is faulty, replace it.

MEMO

SIGNAL SYSTEM

CIRCUIT DIAGRAM

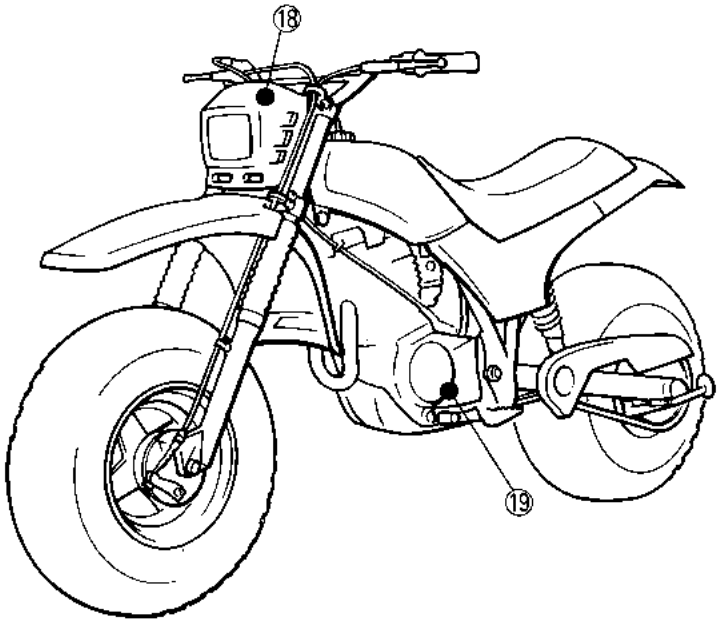
Below circuit diagram shows signal circuit.

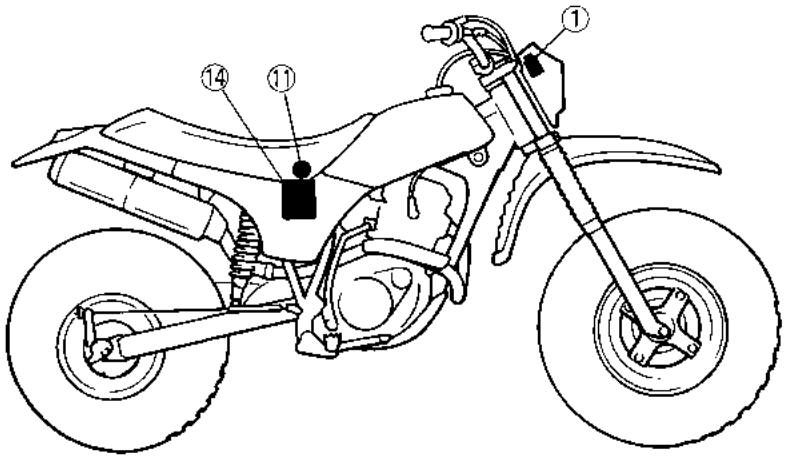


NOTE:

For the color codes, see page 16.

① Main switch
⑪ Fuse
⑭ Battery
⑱ "NEUTRAL" indicator light
⑲ Neutral switch





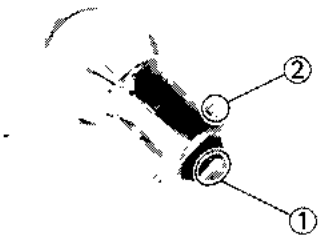
TROUBLESHOOTING

WHEN TRANSMISSION IS IN NEUTRAL, "NEUTRAL" INDICATOR LIGHT DOES NOT COME ON.

NOTE:

Before this troubleshooting, remove side covers, seat and fuel tank.

1. "NEUTRAL" indicator light bulb conduct check
   - Disconnect "NEUTRAL" indicator light leads (Sky blue, Black) and remove it.
   - Remove bulb.
   - Connect Pocket Tester (YU-03112) to bulb terminals and check bulb for continuity.



Tester (+) lead→Terminal 1
Tester (−) lead→Terminal 2

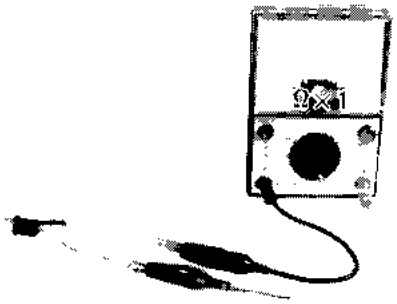
NOTE:

Set tester selector to "Ω×1" position.

Continuity

No continuity (∞)

Bulb is faulty, replace it.



2. "NEUTRAL" indicator light socket conduct check
   - Install bulb to "NEUTRAL" indicator light socket.
   - Connect Pocket Tester (YU-03112) to indicator light leads (Sky blue, Black) and check socket for continuity.

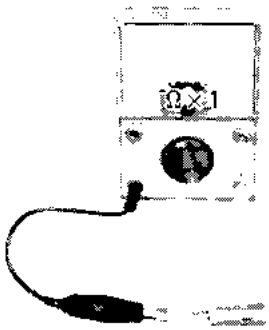
Tester (+) lead→Sky blue lead
Tester (−) lead→Black lead

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

Continuity

No continuity (∞)

3. Fuse inspection
   - Remove fuse.
   - Connect Pocket Tester (YU-03112) to fuse and check it for continuity.

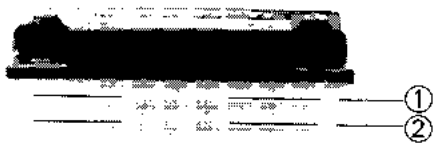


NOTE:
Set tester selector to "Ω×1" position.

Continuity (0Ω)

No continuity (∞)

- Replace fuse.



4. Battery fluid level inspection
   - Fluid level should be between upper ① and lower ② level mark.

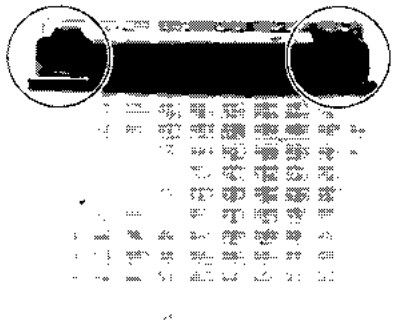
Correct ↓ Incorrect

- Refill battery fluid.

CAUTION:

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

5. Battery terminal inspection
   - Inspect battery terminal and connections.



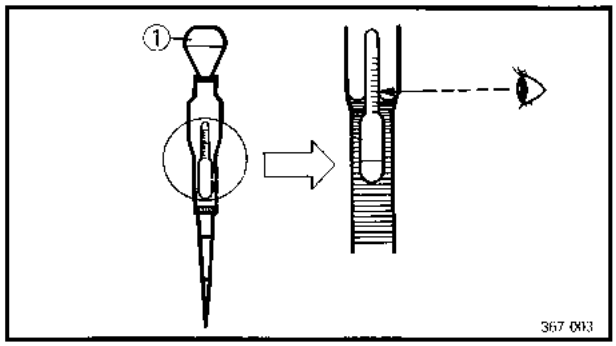
OK ↓ Dirty or poor connection

- Clean battery terminals using wire brush.

NOTE:

After cleaning terminals, apply grease lightly to both terminals.

- Connect battery leads correctly.



6. Battery fluid specific gravity inspection
   - Remove caps.
   - Inspect specific gravity of all cell using Battery Hydrometer ①.

Specific Gravity:
1.280 ± 0.01 at 20°C (68°F)

WARNING:

Battery electrolyte is poisonous and dangerous, causing severe burns, etc. It contains sulfuric acid. Avoid contact with skin, eyes or clothing. Antidote: EXTERNAL-Flush with water. INTERNAL-Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call a phy-

sician immediately.
Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes etc., away. Ventilate when charging or using in an enclosed space. Always shield your eyes when working near batteries. KEEP OUT OF REACH OF CHILDREN.

OK

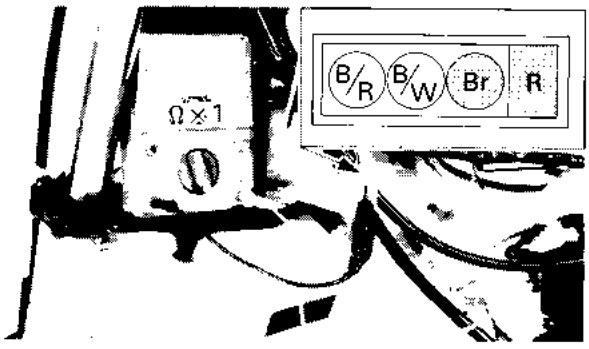
Low specific gravity

- Recharge battery.

Charging Current:
0.7 amps/10 hrs

NOTE:

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



7. Main switch conduct check
   - Disconnect main switch coupler (Brown, Red, Black/Red, Black/White leads).
   - Connect Pocket Tester (YU-03112) to main switch leads (Brown, Red).

Tester (+) lead→Red lead
Tester (−) lead→Brown lead

NOTE:

Set tester selector to "Ω×1" position.

- Turn main switch to "ON" position and check it for continuity.

Continuity (0Ω) → Main switch is faulty, replace it.

No continuity (∞)

8. Neutral switch conduct check
   - Disconnect neutral switch lead (Sky blue).
   - Connect Pocket Tester (YU-03112) to neutral switch lead and frame earth lead.

Tester (+) lead→Sky blue lead
Tester (−) lead→Frame earth lead

NOTE:

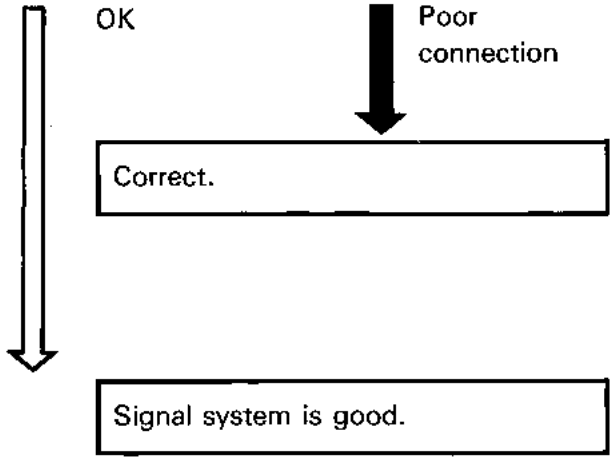
Set tester selector to "Ω×1" position.

- Transmission is in neutral and check neutral switch for continuity.

Continuity (0Ω)

No continuity (∞) → Neutral switch is faulty, replace it.

9. Check entire signal system for connections.
   Refer to "WIRING DIAGRAM" section.



APPENDICES

SPECIFICATIONS

GENERAL SPECIFICATIONS

Model	BW200ES
Model Code Number	1RL
Vehicle Identification Number	JYA 1RL00*G000101
Engine Starting Number	1RL-000101
Basic Weight: With Oil and Fuel Tank	 123 kg (271 lb)
Engine: Starting System	 Electric and Kick Starter
Spark Plug: Type (Manufacturer) Gap	 D8EA (NGK), X24ES-U (N.D.) 0.6 ~ 0.7 mm (0.024 ~ 0.028 in)
Bulb Wattage (Quantity): Headlight Tail/Brake light	 12V 45W/45W (1) 12V 6W (1)

MAINTENANCE SPECIFICATIONS

Engine

Model			BW200ES
Cylinder Head:			
Warp Limit			0.03 mm (0.0012 in) *Lines indicate straightedge measurement:
Camshaft:			
Cam Cap Inside Diameter			25.000 ~ 25.021 mm (0.984 ~ 0.985 in)
Camshaft Outside Diameter			24.96 ~ 24.98 mm (0.982 ~ 0.983 in)
Shaft-to Cap Clearance			0.021 ~ 0.016 mm (0.0008 ~ 0.0024 in)
Cam Dimension			
Intake		"A"	36.538 ~ 36.638 mm (1.438 ~ 1.442 in)
		"B"	30.152 ~ 30.252 mm (1.187 ~ 1.191 in)
		"C"	6.588 mm (0.259 in)
Exhaust		"A"	36.58 ~ 36.68 mm (1.440 ~ 1.444 in)
		"B"	30.226 ~ 30.366 mm (1.190 ~ 1.195 in)
		"C"	6.63 mm (0.261 in)
Valve Clearance (Cold):			
Intake			0.10 ~ 0.14 mm (0.0039 ~ 0.0055 in)
Exhaust			0.16 ~ 0.20 mm (0.0063 ~ 0.0078 in)
Valve Spring:			
Free Length			
Inner Spring		IN.	36.2 mm (1.42 in)
		EX.	36.2 mm (1.42 in)
Outer Spring		IN.	36.6 mm (1.44 in)
		EX.	36.6 mm (1.44 in)
Compressed Length (Valve Closed)			
Inner Spring		IN.	30.5 mm (1.20 in)
		EX.	30.5 mm (1.20 in)
Outer Spring		IN.	32.0 mm (1.26 in)
		EX.	32.0 mm (1.26 in)
Tilt Limit*			
Inner Spring		IN.&EX.	2.5° or 1.6 mm (0.063 in)
Outer Spring		IN.&EX.	2.5° or 1.6 mm (0.063 in)

SPECIFICATIONS

Model		BW200ES	
Direction of Winding (Top view)		Inner Spring	Outer Spring
			
Carburetor:			
Type/Manufacturer/Quantity		Y24P-3P/TEIKEI/1	
I.D. Mark		1RL00	
Main Jet	(M.J.)	#120	
Main Air Jet	(M.A.J.)	ϕ1.4	
Jet Needle-clip Position	(J.N.)	4C813-2/5	
Needle Jet	(N.J.)	2,600	
Pilot Jet	(P.J.)	#42	
Pilot Air Jet	(P.A.J.)	ϕ1.1	
Air Screw (turns out)	(P.A.S.)	1 1/2±1/8	
Valve Seat	(V.S.)	ϕ2.0	
Starter Jet	(G.S.)	GS_1 #70, GS_2 #70	
Fuel Level	(F.L.)	7.0±1.0 mm (0.27±0.04 in)	
Float Height	(F.H.)	25±1.0 mm (0.98±0.04 in)	
Engine Idling Speed		1,350±50 r/min	

Chassis

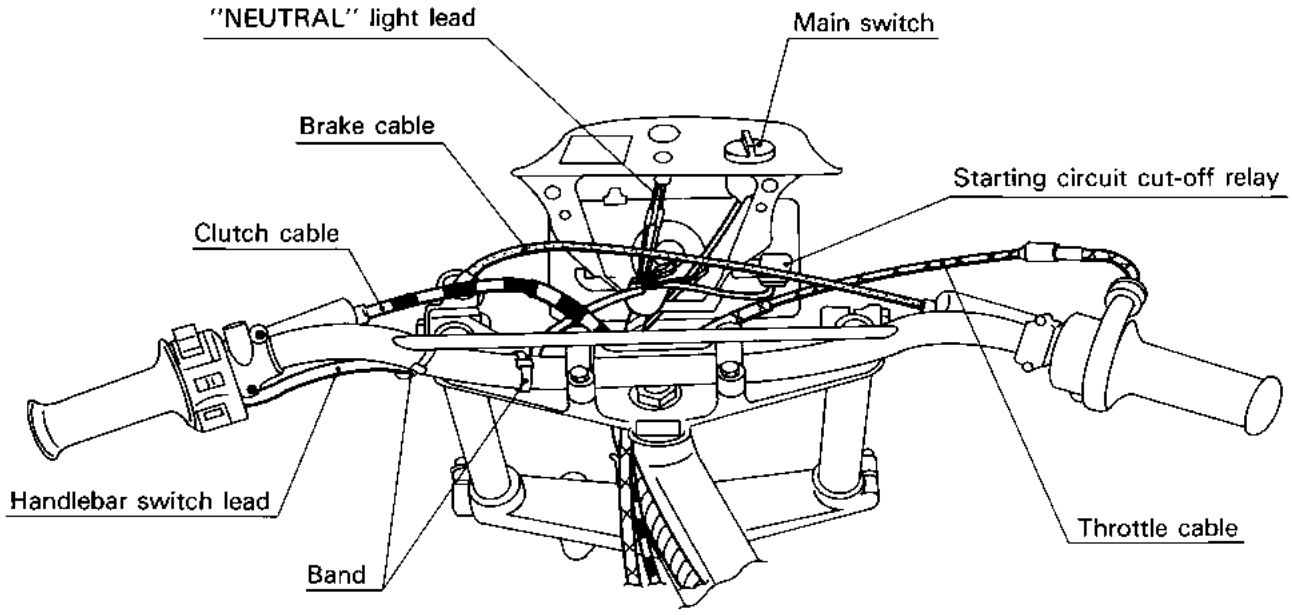
Model		BW200ES
Rear Suspension:		
Shock Absorber Travel		62 mm (3.23 in)
Spring Free Length		187.5 mm (14.82 in)
Spring Rate	(K1)	44.1 N/mm (4.5 kg/mm, 247.9 lb/in)
	(K2)	78.4 N/mm (8.0 kg/mm, 440.6 lb/in)
Stroke		0.0 ~ 62 mm (0.0 ~ 2.17 in)
Optional Spring		No.
Drive Chain:		
Type/Manufacturer	(Primary)	50 HDL/D.I.D.
	(Secondary)	52 OD/D.I.D.
Number of Links	(Primary)	42 Links
	(Secondary)	74 Links
Chain Free Play	(Secondary)	25 ~ 40 mm (0.98 ~ 1.57 in)

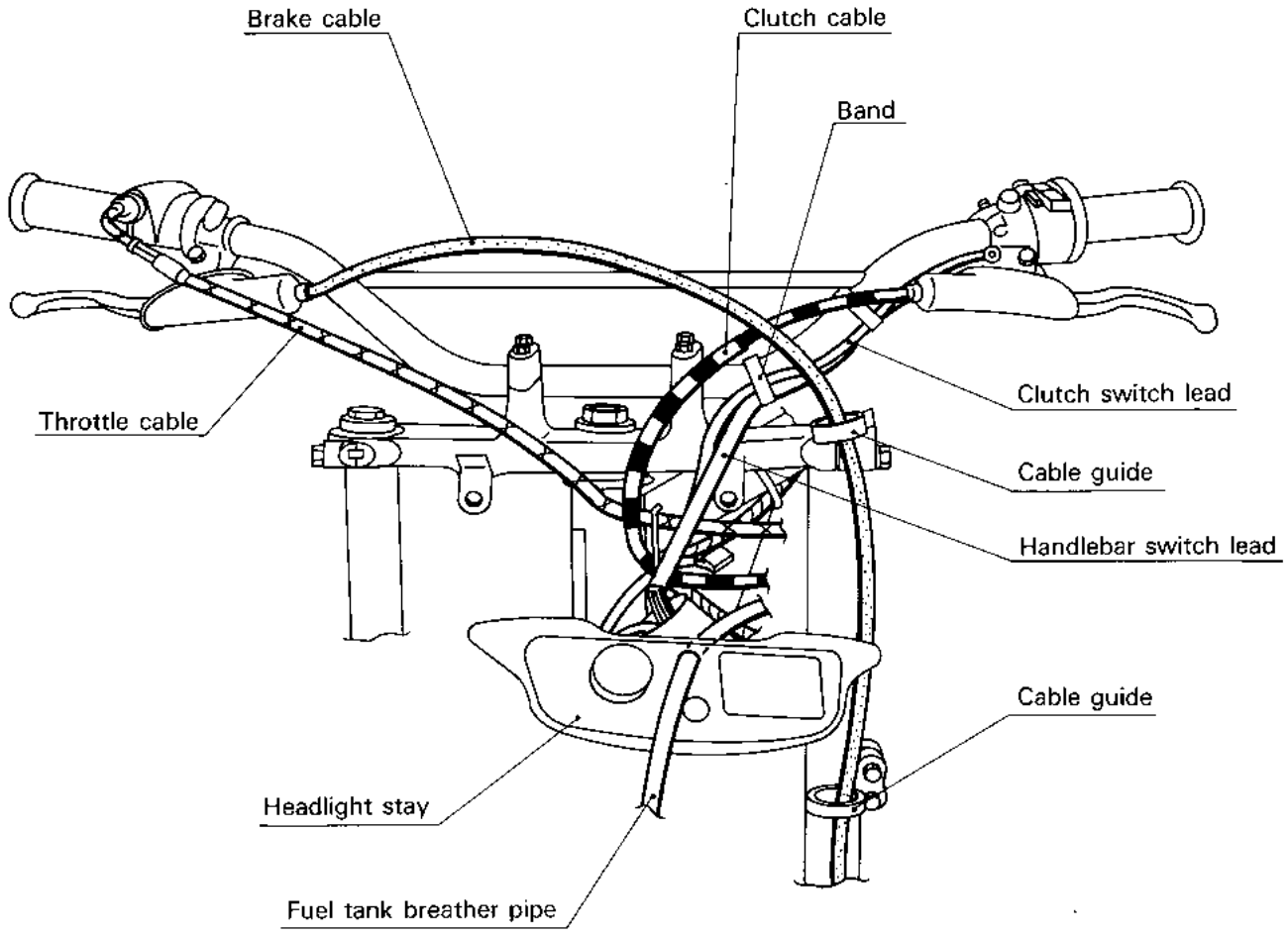
SPECIFICATIONS

Electrical

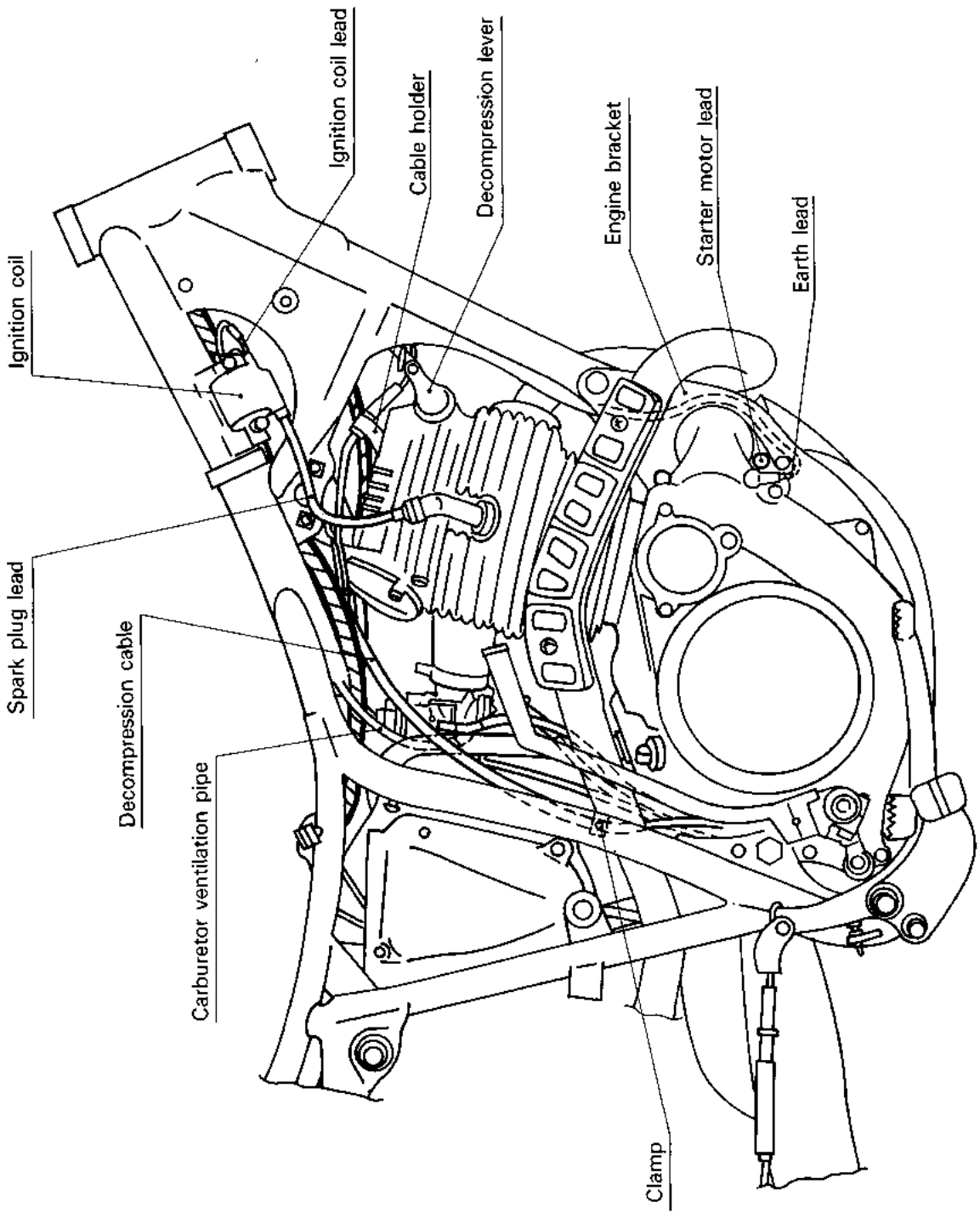
Model	BW200ES
C.D.I.:	
Magneto Model/Manufacture	F1RL/YAMAHA
Source Coil Resistance (Color)	396 ~ 484 Ω at 20°C (68°F) (Black — Red) 27.9 ~ 34.1 Ω at 20°C (68°F) (Black — Brown)
Pick-up Coil Resistance (Color)	648 ~ 792 Ω at 20°C (68°F) (White — Green)
C.D.I. Unit Model/Manufacture	1LR-M0/YAMAHA
Charging System:	
Type	Flywheel Magneto
Charging Voltage	14 ~ 15V at 5000 r/min
Charging Coil Resistance (Color)	0.36 ~ 0.44 Ω at 20°C (68°F) (Black — White)
Lighting System:	
Type	Flywheel Magneto
Lighting Voltage	13 ~ 14 V at 5000 r/min
Lighting Coil Resistance (Color)	0.27 ~ 0.33 Ω at 20°C (68°F) (Black — Yellow)
Voltage Regulator/Rectifier:	
Type	Semi Conductor-Short Circuit Type
Model/Manufacture	EHU-01TR18/MATSUSHITA
No Load Regulated Voltage	13 ~ 14 V
Battery:	
Model/Manufacture	GM7CZ-3D/G.S.
Capacity	12 V 7AH
Specific Gravity	1.280 at 20°C (68°F)
Electric Starting System:	
Type	Constant Mesh Type
Model/Manufacture	1RL-M0/YAMAHA
Out Put	0.4 kw
Armature Coil Resistance	0.019 Ω
Brush Wear Limit	3.5 mm (0.014 in)
Commutator Diameter/ < Limit >	22 mm (0.87 in)/ < 21 mm (0.83 in) >
Mica Undercut	1.5 mm (0.06 in)
Starter Relay:	
Model/Manufacturer	A104-132/HITACHI
Starting Circuit Cut Off Relay:	
Model/Manufacturer	ACA 1212-1/MATSUSHITA

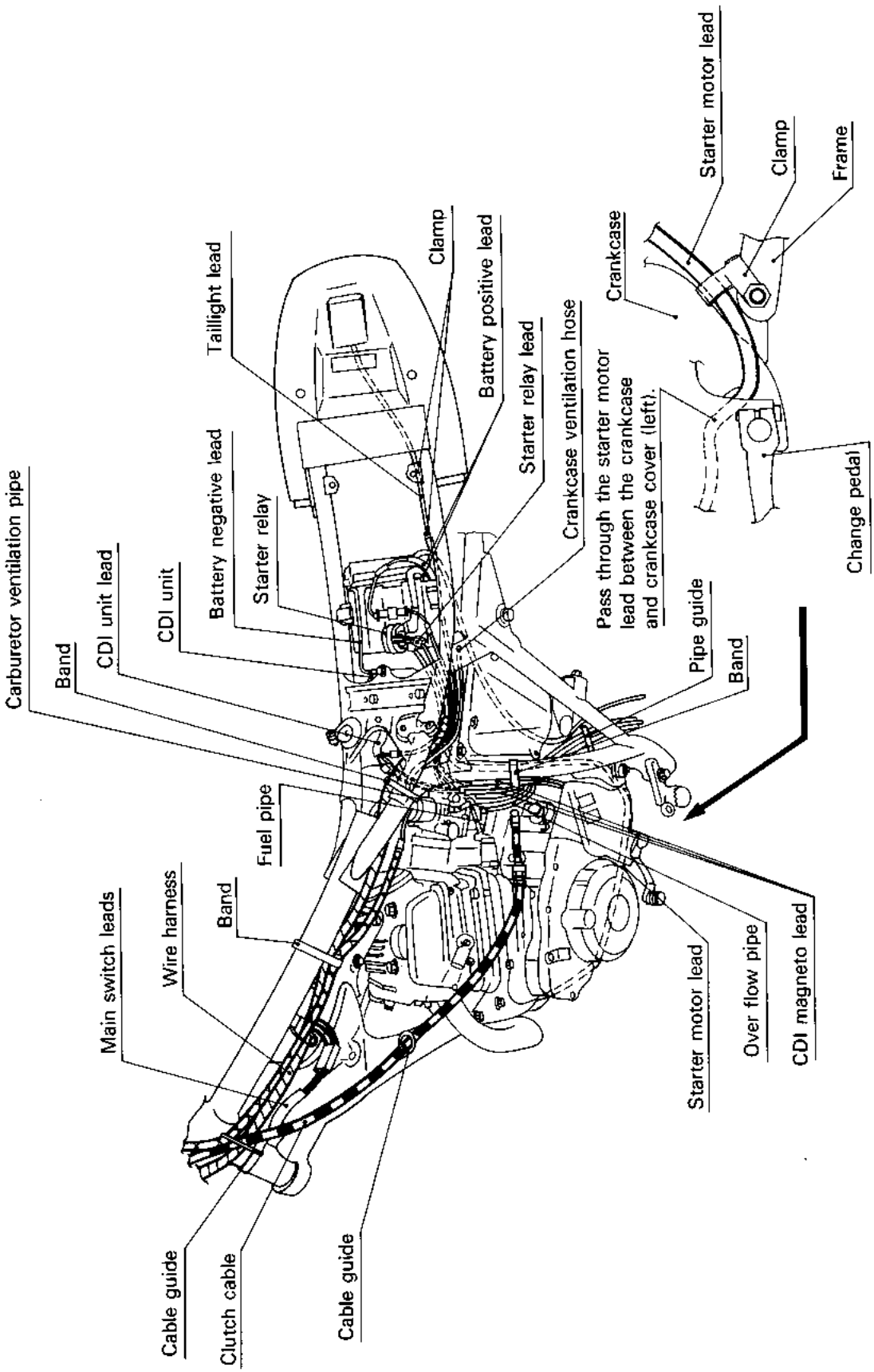
CABLE ROUTING



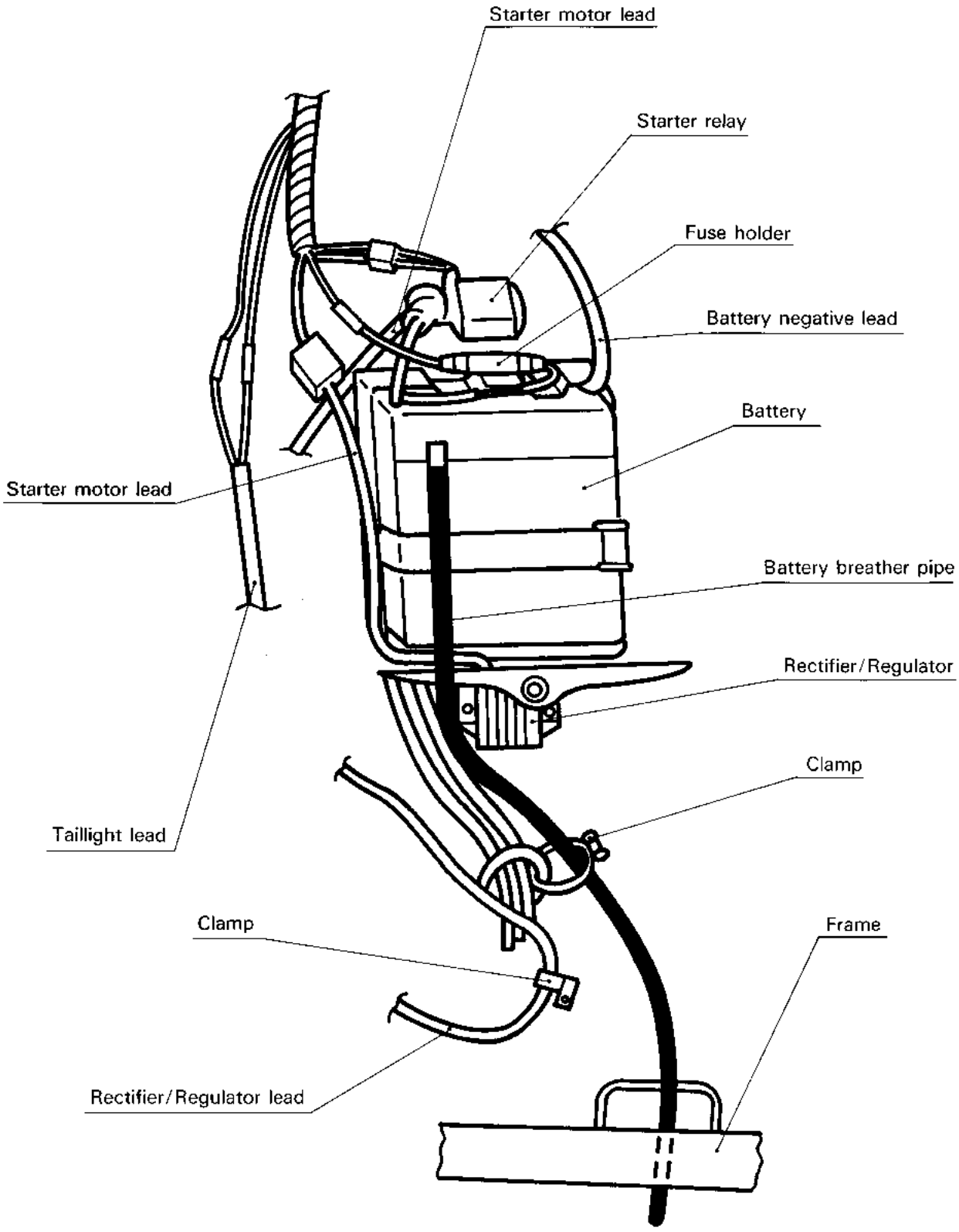


CABLE ROUTING




Carburetor ventilation pipe
Band
CDI unit lead
CDI unit
Battery negative lead
Starter relay
Taillight lead
Clamp
Battery positive lead
Starter relay lead
Crankcase ventilation hose
Pass through the starter motor lead between the crankcase and crankcase cover (left).
Crankcase
Starter motor lead
Clamp
Frame
Change pedal
Pipe guide
Band
Fuel pipe
Band
Wire harness
Main switch leads
Cable guide
Clutch cable
Cable guide
Starter motor lead
Over flow pipe
CDI magneto lead

CABLE ROUTING



BW200ES WIRING DIAGRAM