YAMAHA

XV535T
XV535TC

Service Manual

.IT-11616-05-54

XV535T/XV535TC
SERVICE MANUAL
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1st edition, October 1986
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U.S.A. is expressly prohibited.
Printed in U.S.A.
LIT-11616-05-54

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.

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

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

NOTE:

This Service Manual contains information regarding periodic maintenance to the emission control system for the XV535T/TC. Please read this material carefully.

TECHNICAL PUBLICATIONS
SERVICE DIVISION
MOTORCYCLES 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

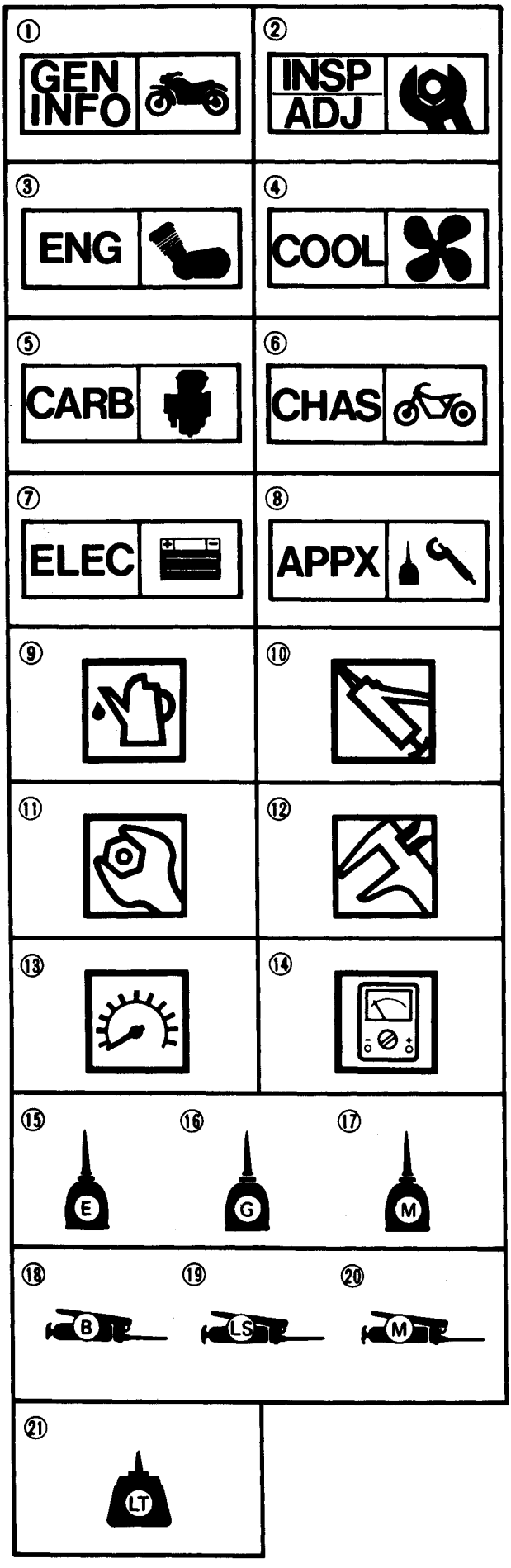
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.

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.



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.

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®)

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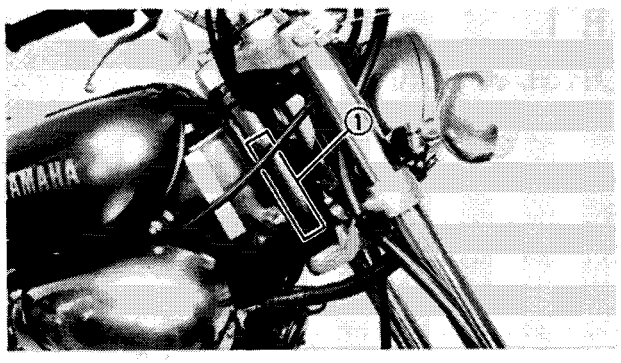
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CHASSIS	CHAS 5
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CHAPTER 1.
GENERAL INFORMATION

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ENGINE SERIAL NUMBER 1-1

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GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

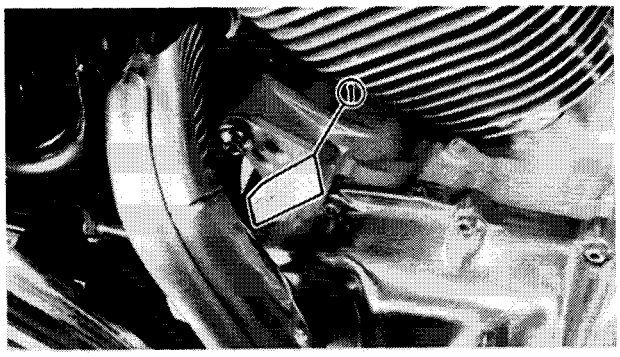
VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the steering head pipe.

NOTE:

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

Starting Serial Number:
XV535T JYA2GV00 *HA000101
XV535TC JYA2JU00 *HA000101



ENGINE SERIAL NUMBER

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

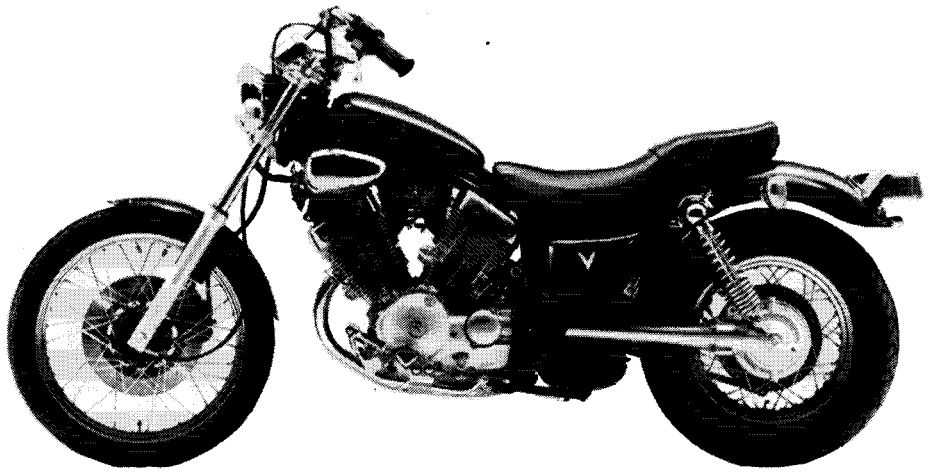
NOTE:

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

Starting Serial Number:
XV535T 2GV-000101
XV535TC 2JU-000101

NOTE:

Designs and specifications are subject to change without notice.



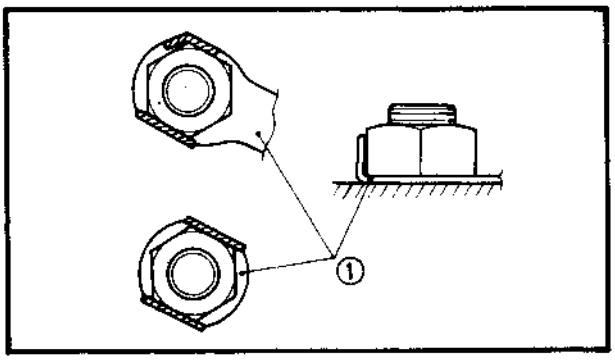
IMPORTANT INFORMATION

ALL REPLACEMENT PARTS

1. We recommend to use Yamaha genuine parts for all replacements. Use oil and/or grease recommended by Yamaha for assembly and adjustment.

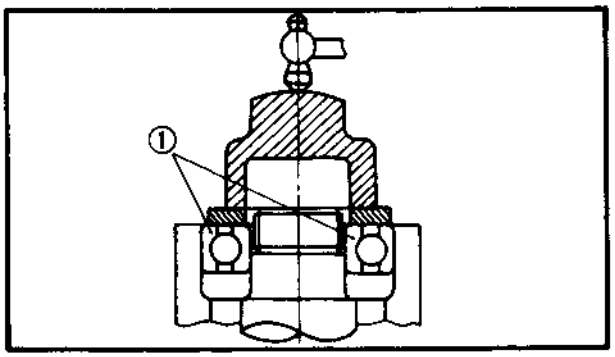
GASKETS, OIL SEALS, AND O-RINGS

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



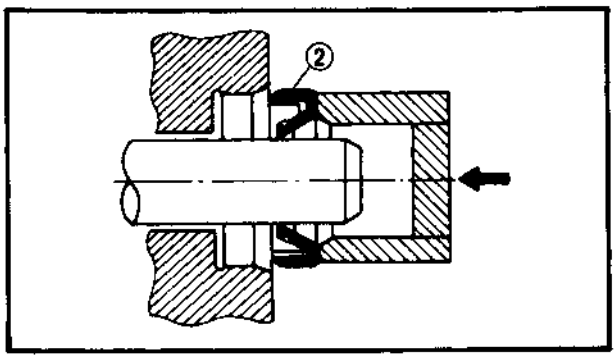
LOCK WASHERS/PLATES AND COTTER PINS

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



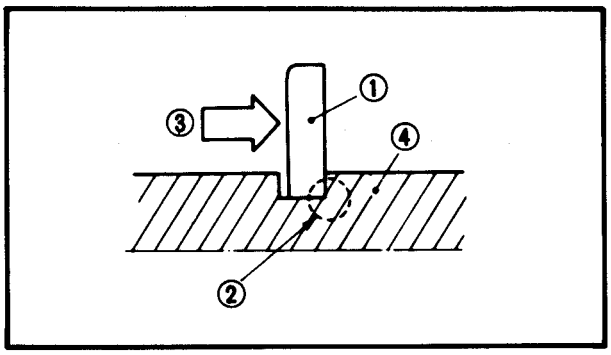
BEARINGS AND OIL SEALS

1. Install the bearing(s) ① and oil seal(s) ② with their manufacturer's marks or numbers facing outward. (In other words, the stamped letters must be on the side exposed to view.) When installing oil seal(s), apply a light coating of light-weight lithium base grease to the seal lip(s). Oil the bearings liberally when installing.



CAUTION:

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



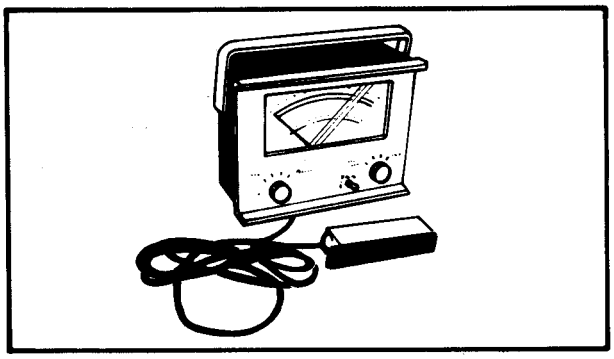
CIRCLIPS

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

④ Shaft

SPECIAL TOOLS

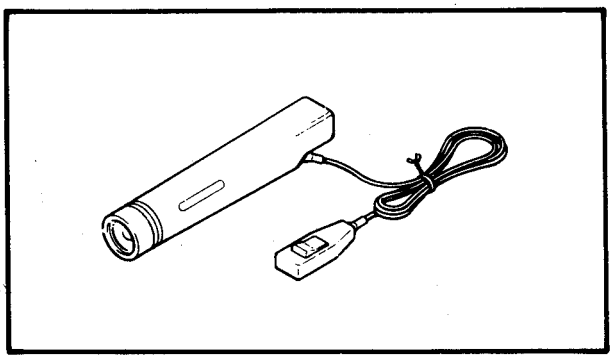
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

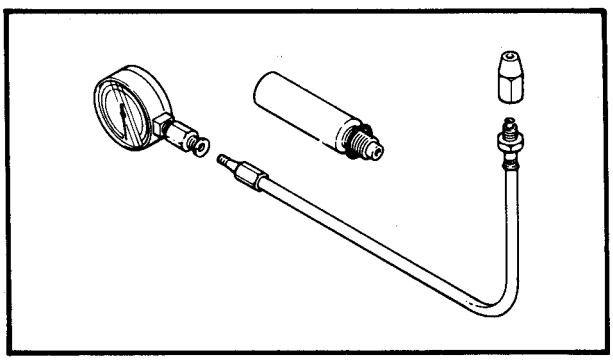
1. Inductive Tachometer
   P/N YU-08036

This tool is needed for detecting engine rpm.



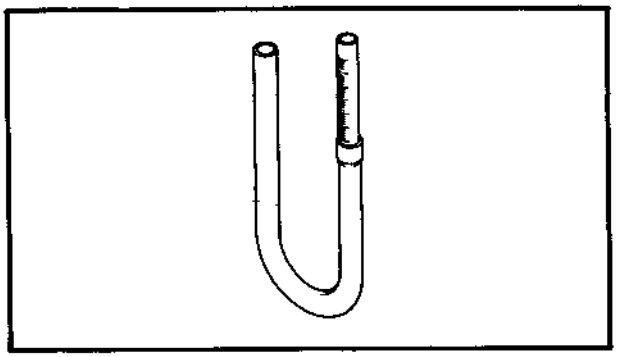
2. Inductive Timing Light
   P/N YM-33277

This tool is necessary for checking ignition timing.



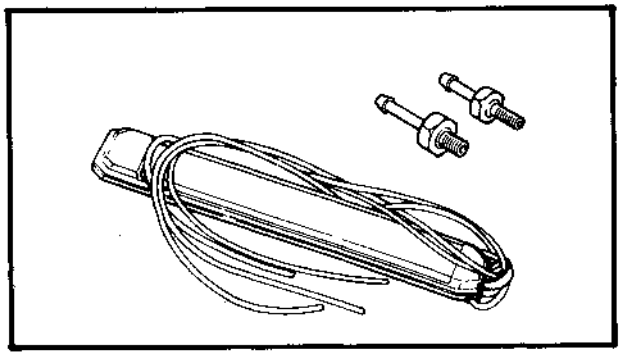
3. Compression Gauge
   P/N YU-33223

This gauge is used to measure the engine compression.



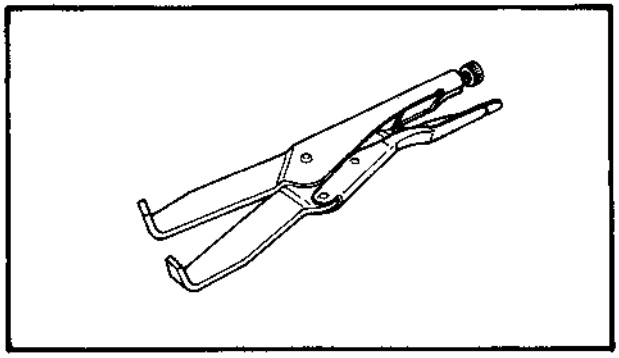
4. Fuel Level Gauge
   P/N YM-01312-A

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



5. Vacuum Gauge
   P/N YU-08030-A

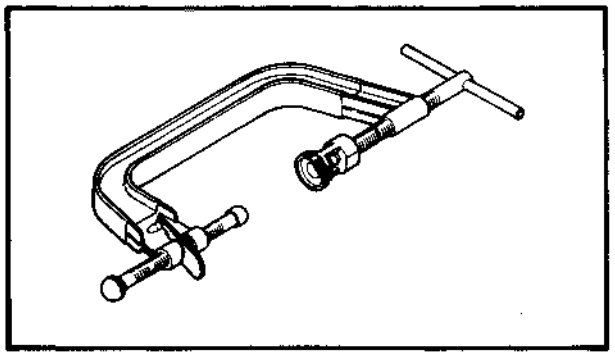
This gauge is needed for carburetor synchronization.



FOR ENGINE SERVICE

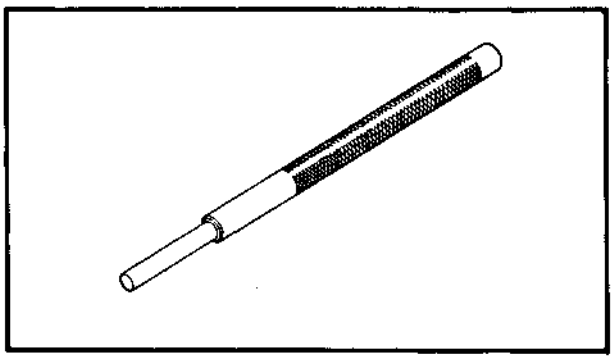
1. Clutch Holder
   P/N YM-91042

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



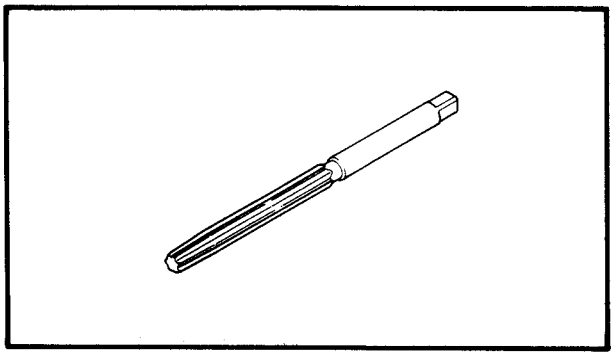
2. Valve Spring Compressor
   P/N YM-04019

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

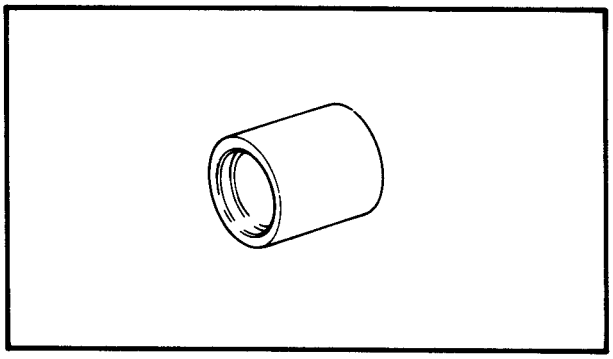


3. Valve Guide Remover (7.0 mm)
   P/N YM-01225

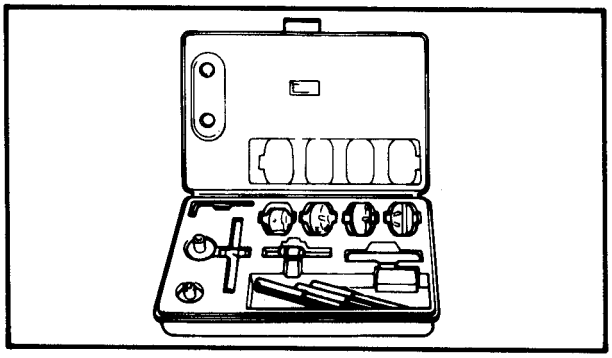
This tool is used to remove the valve guides.



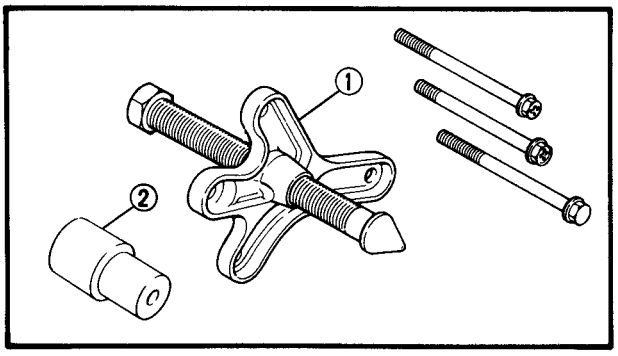
4. Valve Guide Reamer (7.0 mm)
   P/N YM-01227
This tool is used to rebore the new valve guide.



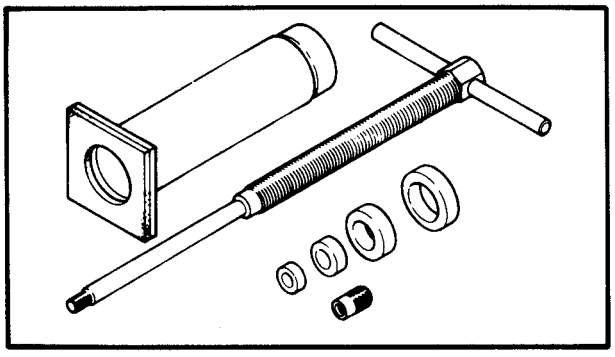
5. Valve Guide Installer
   P/N YM-04017
This tool is needed to install the valve guides properly.



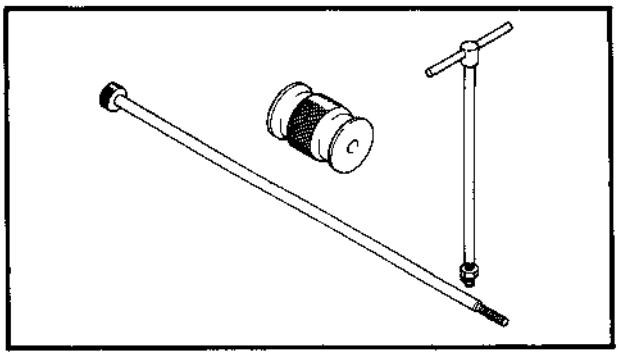
6. Valve Seat Cutter Set
   P/N YM-91043
This tool is needed to resurface the valve seat.



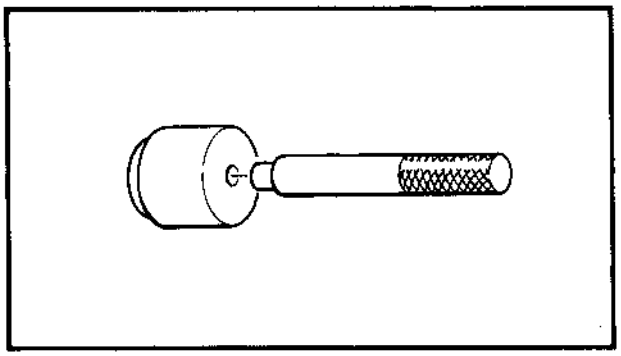
7. Flywheel Puller
   P/N YU-33270 – ①
   Adapter
   P/N YM-33282 – ②
These tools are used to remove the flywheel.



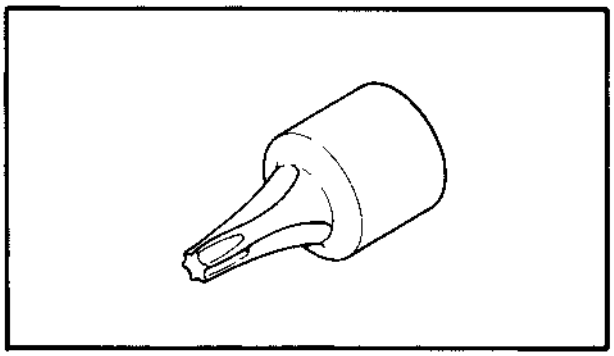
8. Piston Pin Puller
   P/N YU-01304
This tool is used to remove the piston pin.



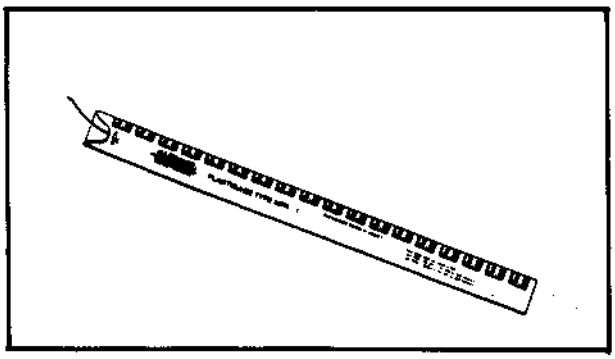
9. Slide Hammer Set
   P/N YU-01083
These tools are used when removing the rocker arm shaft.



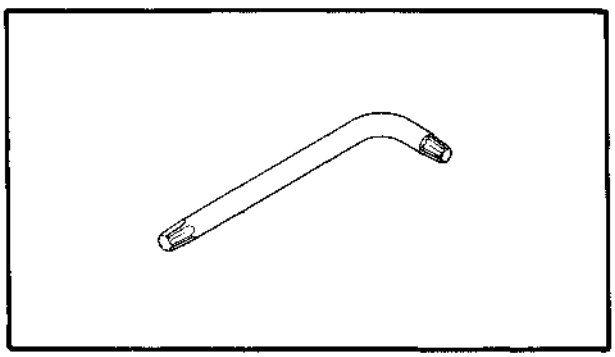
10. Plain Bearing Installer and Remover Set
    P/N YM-28898
These tools are used to removal and assemble the plain bearing.



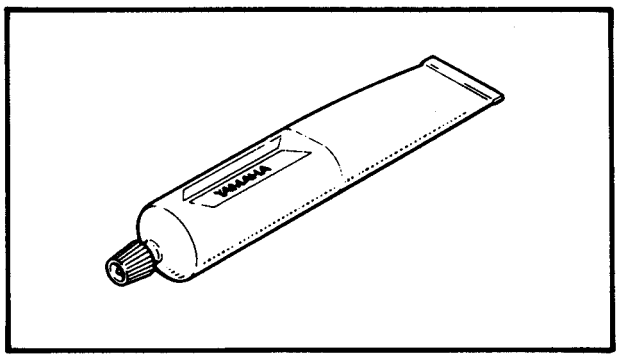
11. # 30 Torx Driver
    P/N YU-29843-6
This tool is used to loosen or tighten the drive axle bearing retainer bolt.



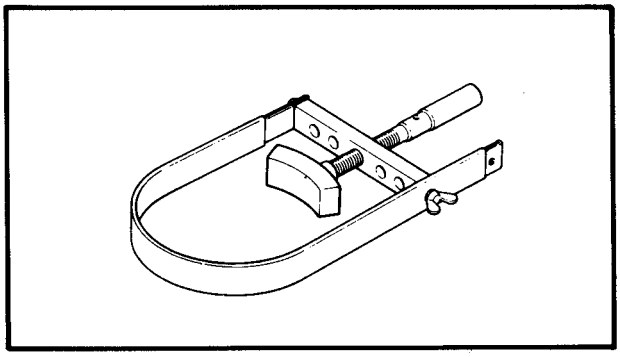
12. Plastigage® Set "Green"
    P/N YU-33210
This gauge is needed to measure the clearance for the connecting rod bearing.



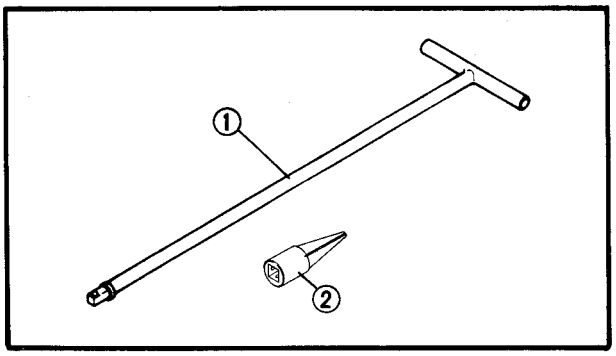
13. Special Torx Driver
    P/N YU-05258
This tool is used when overhauling the carburetors.



14. Sealant (Quick Gasket®)
P/N ACC-11001-05-01
This sealant (bond) is used for crankcase mating surfaces, etc.

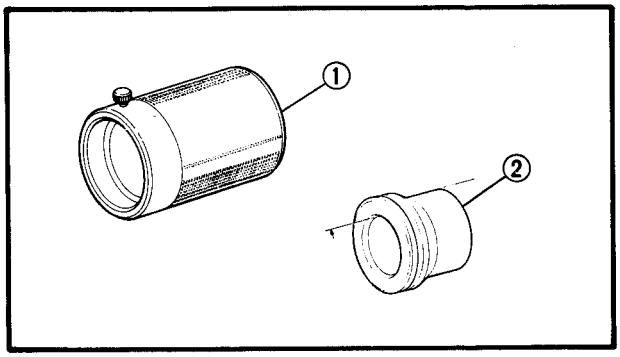


15. Sheave Holder
P/N YS-01880
This tool is used to hold the rotor when removing or installing the rotor securing bolt.

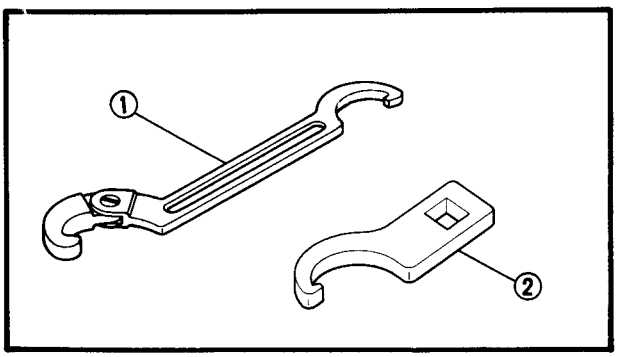


FOR CHASSIS SERVICE

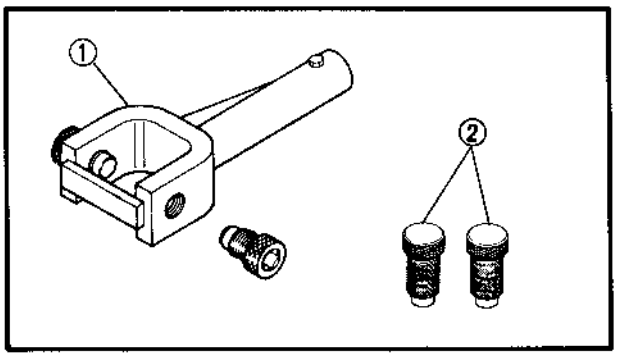
1. T-Handle
P/N YM-01326 – ①
Damper Rod Holder
P/N YM-01300-1 – ②
These tools are used to loosen and tighten the front fork cylinder holding bolt.



2. Front Fork Seal Driver Weight
P/N YM-01367 – ①
Adapter (36 mm)
P/N YM-8010 – ②
These tools are used when installing the fork seal.



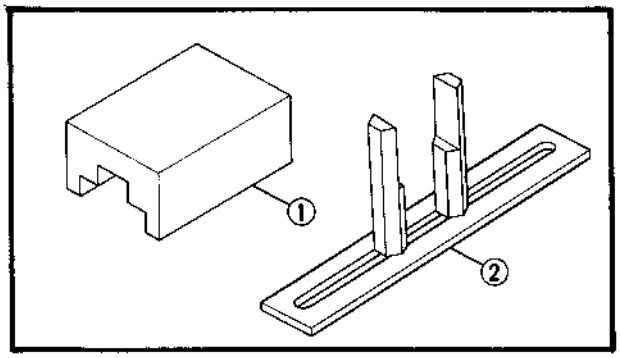
3. Ring Nut Wrench
P/N YU-01268 – ①
P/N YU-33975 – ②
These tools are used to loosen and tighten the steering ring nut.



FOR MIDDLE AND FINAL GEAR SERVICE

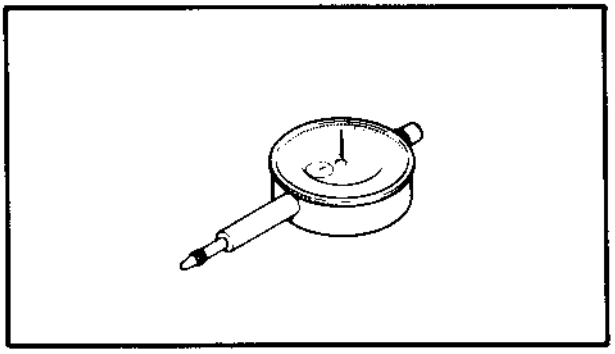
1. Universal Joint Holder
   P/N YM-04062 – ①
   Attachment
   P/N YM-33291 – ②

These tools are used to loosen and tighten the middle driven shaft nut.



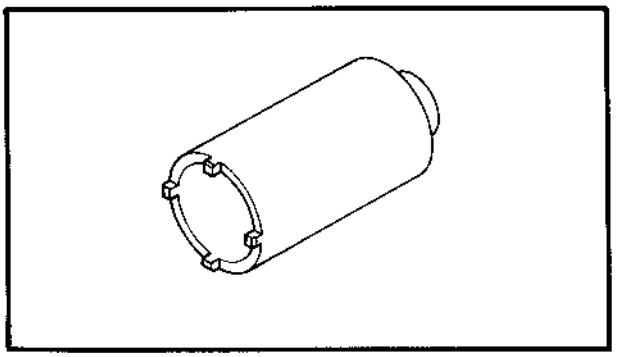
2. Damper Spring Compressor
   P/N YM-33286 – ①
   Middle Drive Gear Holder
   P/N YM-33222 – ②

These tools are used to disassemble and reassemble the middle gear damper.



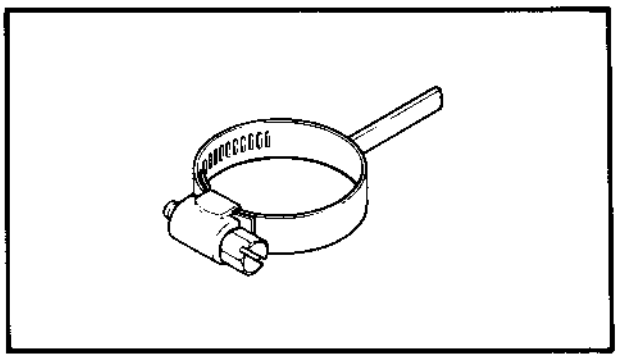
3. Dial Gauge
   P/N YM-03097

This tool is used to measure the gear lash for the middle gear and final gear.



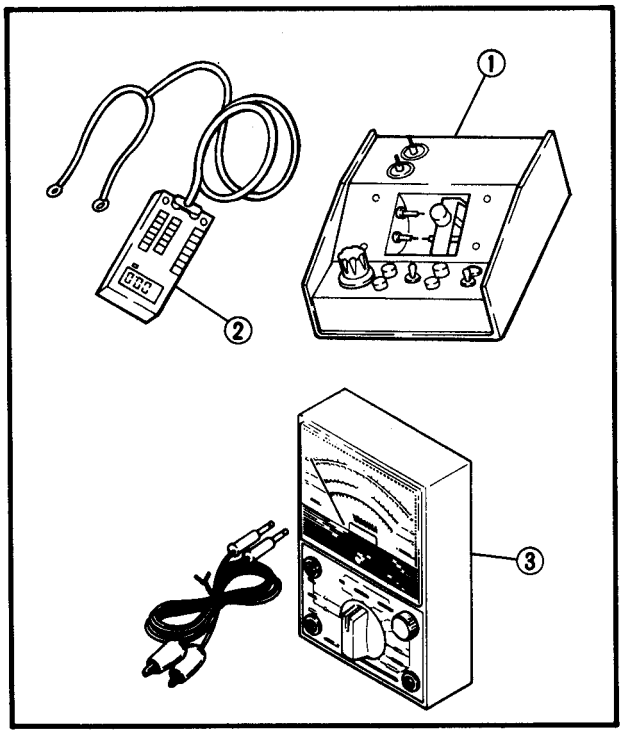
4. Final Drive Shaft Bearing Retainer Wrench
   P/N YM-33214

This tool is used to remove and install the bearing retainer.



5. Gear Lash Measurement Tool
   P/N YM-01230

This tool is used to measure gear lash.



FOR ELECTRICAL COMPONENTS

1. Coil Tester
   P/N YU-33261 – ①

This instrument is necessary for checking the ignition system components.

2. Pocket Tester
   P/N YU-33263 – ② or
   P/N YU-03112 – ③

This instrument is invaluable for checking the electrical system.

CHAPTER 2.
PERIODIC INSPECTINS AND ADJUSTMENTS

INTRODUCTION 2-1

MAINTENANCE INTERVALS CHARTS 2-1
PERIODIC MAINTENANCE EMISSIN CONTROL SYSTEM 2-1
GENERAL MAINTENANCE/LUBRICATION 2-2

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CAM CHAIN ADJUSTMENT 2-10
CARBURETOR SYNCHRONIZATION 2-10
IDLE SPEED ADJUSTMENT 2-11
THROTTLE CABLE FREE PLAY ADJUSTMENT 2-11
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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.

MAINTENANCE INTERVALS CHARTS

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

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

No.	Item	Remarks	Initial	Odometer readings				
			1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)
1*	Valve clearance	Check and adjust valve clearance when engine is cold	○	○	○	○	○	○
2	Spark plug	Check condition. Adjust gap and clean. Replace at 13,000 km (or 13 months) and thereafter every 12,000 km (or 12 months).		○	Replace	○	Replace	○
3*	Crankcase ventilation system	Check ventilation hose for cracks or damage. Replace if necessary.		○	○	○	○	○
*4	Fuel line	Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary.		○	○	○	○	○
*5	Exhaust system	Check for leakage. Retighten if necessary. Replace gasket(s) if necessary.		○	○	○	○	○
*6	Carburetor synchronization	Adjust synchronization of carburetors.	○	○	○	○	○	○
7*	Idle speed	Check and adjust engine idle speed. Adjust cable free play.		○	○	○	○	○

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

NOTE:

For farther odometer reading, repeat the above maintenance at the period established; **1: Every 6,000 km (3,800 mi) and **2: Every 12,000 km (7,600 mi) intervals.

GENERAL MAINTENANCE/LUBRICATION

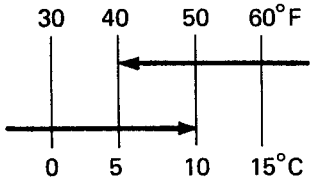
No.	Item	Remarks	Type	Initial	Odometer readings				
				1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	**3 25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)
1	Engine oil	Warm-up engine before draining.	See NOTE	○	○	○	○	○	○
2*	Oil filter	Replace.	—	○		○		○	
3*	Air filter	Clean with compressed air. Replace if necessary.	—		○	○	○	○	○
4*	Brake system	Adjust free play. Replace pads if necessary.(Front) Replace shoes if necessary. (Rear)	—	○	○	○	○	○	○
5*	Clutch	Adjust free play.	—	○	○	○	○	○	○
6*	Final gear oil	Check oil level and leakage. Replace every 24,000 km or 24 months.	SAE 80 API "GL-4" hypoid gear oil	Replace		Check		○	
7	Control and meter cable	Apply chain lube thoroughtly.	Yamaha chain or SAE 10W30 motor oil.	○	○	○	○	○	○
8*	Rear arm pivot bearing	Check bearing assembly for looseness. Moderately repack every 24,000 km. (15,200 mi)	Medium weight wheel bearing grease.					Repack	
9	Brake/Clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
10	Brake pedal and change pedal shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
11*	Sidestand pivot	Check operation and lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
12*	Front fork oil	Check operation and leakage.	—		○	○	○	○	○
13*	Steering bearings	Check bearings assembly for looseness. Moderately repack every 24,000 km. (15,200 mi)	Medium weight wheel bearing grease.		○	○	○	Repack	○

No.	Item	Remarks	Type	Initial	Odometer readings				
				1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	**3 25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)
14*	Wheel bearings	Check bearings for smooth rotation.	–		○	○	○	○	○
15	Battery	Check specific gravity and breather pipe for proper operation.	–		○	○	○	○	○
16*	Sidestand switch	Check and clean or replace if necessary.	–	○	○	○	○	○	○

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

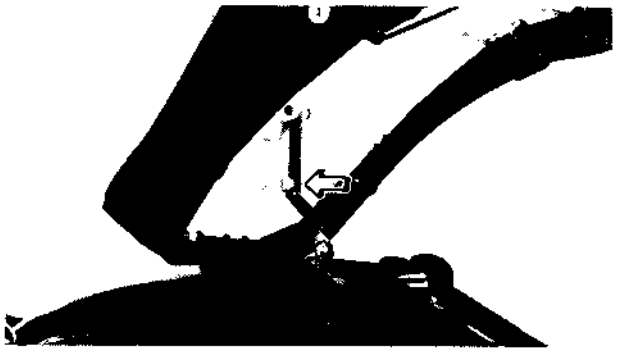
NOTE:

- For farther odometer reading, repeat the above maintenance at the period established; **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi), and **3: Every 24,000 km (15,200 mi) intervals.
- Brake system:
  1) When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
  2) We recommended that, on the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
  3) We recommended that, replace the brake hoses every four years, or it cracked or damaged.
- Engine oil:



Yamalube 4 or
SAE 20W40 Type SE Motor Oil

SAE 10W30 Type SE Motor Oil



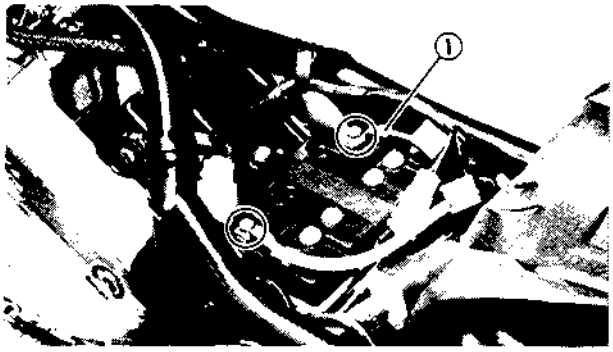
ENGINE

VALVE CLEARANCE ADJUSTMENT

Removal

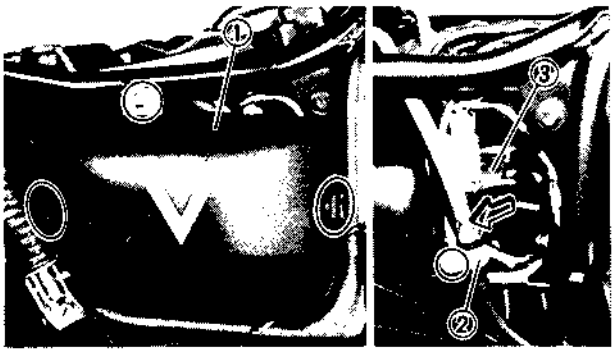
1. Open:
   - Seat

NOTE:
Make sure that the seat lever is locked correctly.



2. Disconnect:
   - Battery leads

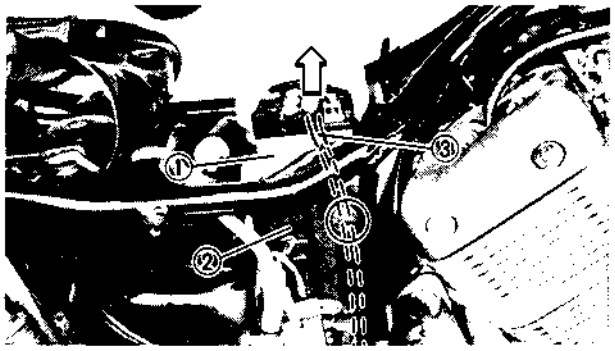
NOTE:
Disconnect the negative lead ① first.



3. Remove:
   - Rear side cover (Right) ①
   - Clamp (Fuel hose) ②
   - Starter relay ③

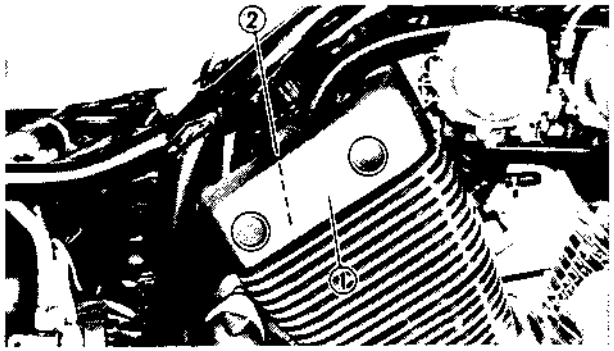
   Pull out the starter relay.

NOTE:
Do not disconnect the leads of the starter relay at this point.

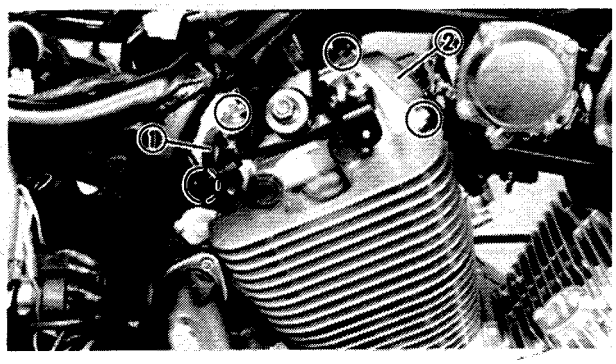


4. Remove:
   - Battery band
   - Battery ①
   - Battery box ②

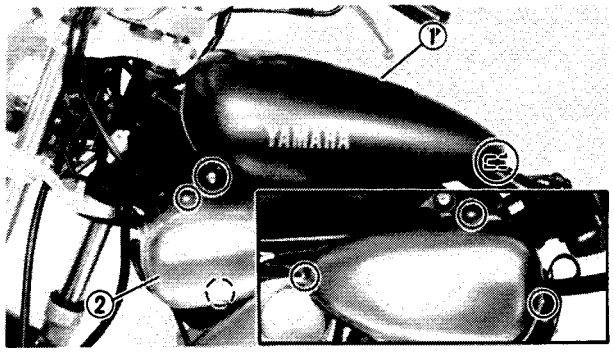
NOTE:
Before removing the battery, disconnect the battery breather hose ③ .



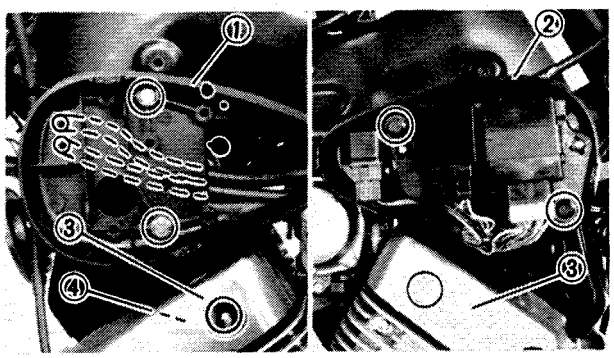
5. Remove:
   - Side covers (Rear cylinder – Left and right) ①
   - Spark plug (Rear cylinder) ②



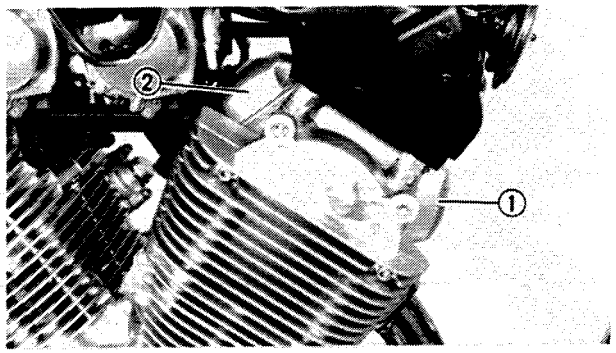
6. Remove:
   - Tappet cover (Rear cylinder – Exhaust) ①
   - Tappet cover (Rear cylinder – Intake) ②



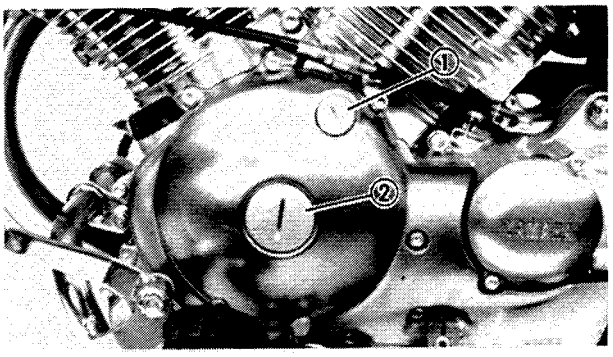
7. Remove:
   - Top cover ①
   - Front side cover (Left) ②
   - Front side cover (Right) ③



8. Remove:
   - Front side cover bracket (Left) ①
     Disconnect the carburetor hoses.
   - Electrical component board (Front side cover – Right) ②
   - Side covers (Front cylinder – Left and right) ③
   - Spark plug (Front cylinder) ④



9. Remove:
   - Tappet cover (Front cylinder – Exhaust) ①
   - Tappet cover (Front cylinder – Intake) ②



10. Remove:
    - Timing plug ①
    - Crankcase cover plate ②

Measurement and Adjustment

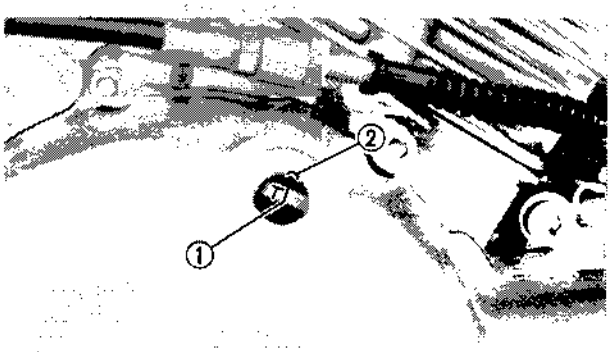
1. Measure:
   - Valve clearance

Valve clearance measurement steps:

- Turn the crankshaft clockwise with wrench.

NOTE:

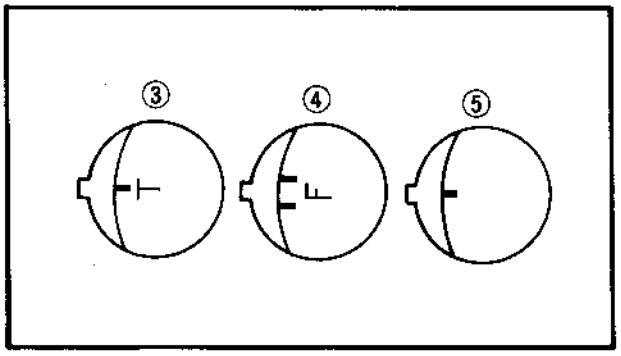
Valve clearance must be measured when the engine is cool to the touch.



- Align the "T" mark (For rear cylinder) ① on the flywheel with the stationary pointer ② on the crankcase cover. When the "T" mark is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

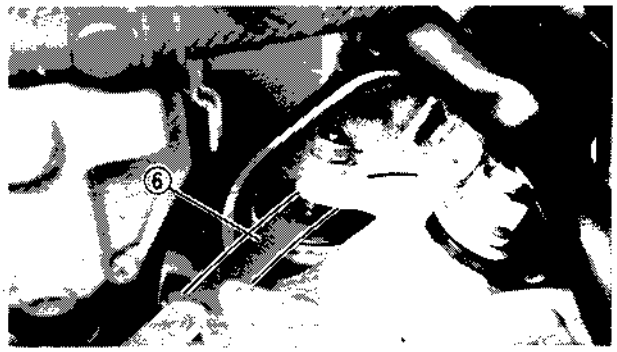
NOTE:

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



- Note marks on flywheel to obtain correct valve clearance measurements.

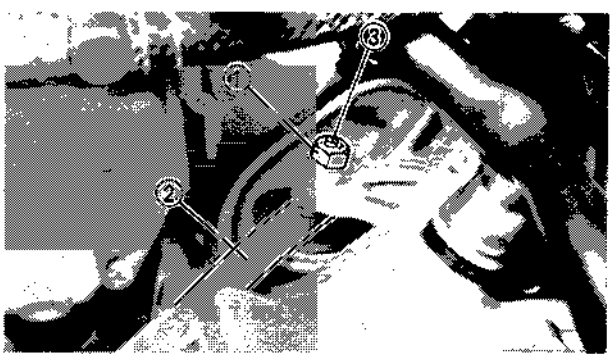
③ TDC for rear cylinder
④ Firing range for rear cylinder
⑤ TDC for front cylinder



- Measure the valve clearance using a Feeler Gauge ⑥.
  Out of specification → Adjust clearance.

Intake Valve (Cold):
0.07 ~ 0.12 mm (0.003 ~ 0.005 in)
Exhaust Valve (Cold):
0.12 ~ 0.17 mm (0.005 ~ 0.007 in)

- Repeat the above steps for front cylinder.



2. Adjust:
   - Valve clearance

Valve clearance adjustment steps:

- Loosen the locknut ①.
- Insert a Feeler Gauge ② between the adjuster end and the valve end.
- Turn the adjuster ③ clockwise or counterclockwise with a wrench until proper clearance is attained.

Intake Valve (Cold):
0.07 ~ 0.12 mm (0.003 ~ 0.005 in)
Exhaust Valve (Cold):
0.12 ~ 0.17 mm (0.005 ~ 0.007 in)

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

Valve Clearance Adjusting Locknut:
14 Nm (1.4 m·kg, 10 ft·lb)

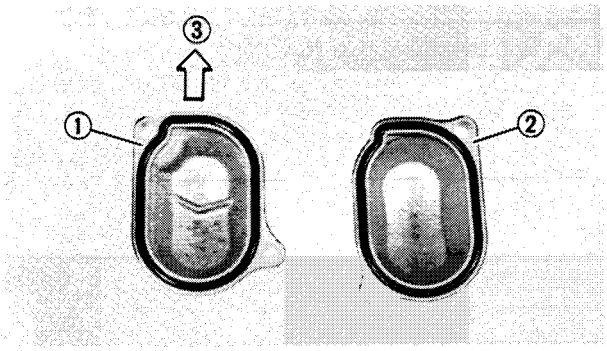
- Measure the valve clearance.
- If the clearance is incorrect, repeat above steps until the proper clearance is obtained.
- Repeat above steps for front cylinder.

Assembly

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

1. Inspect:
   - O-rings (Tappet covers)
   - O-ring (Timing plug)
   - O-ring (Crankcase cover plate)

   Damage → Replace.



2. Install:
   - Tappet covers (Intake — Front and rear) ①
   - Tappet covers (Exhaust — Front and rear) ②

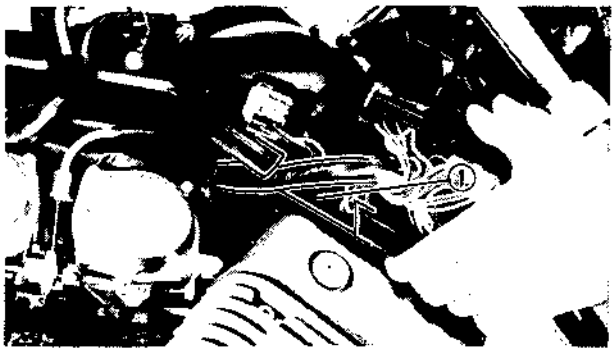
NOTE:
Install the intake tappet covers with its ridge facing upward ③ .

Tappet Covers:
10 Nm (1.0 m·kg, 7.2 ft·lb)

3. Install:
   - Spark plugs (Front and rear)
   - Side covers (Front and rear cylinder)
   - Electrical component board (Front side cover — Right)
   - Front side cover bracket (Left)

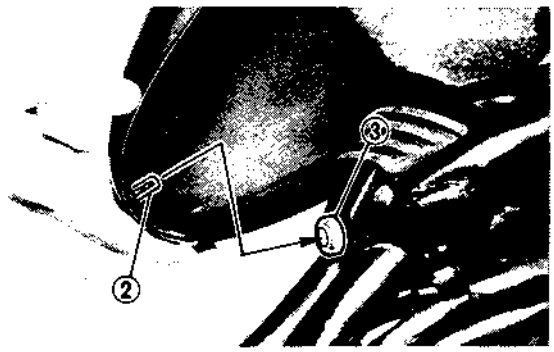
   Connect the carburetor hoses.

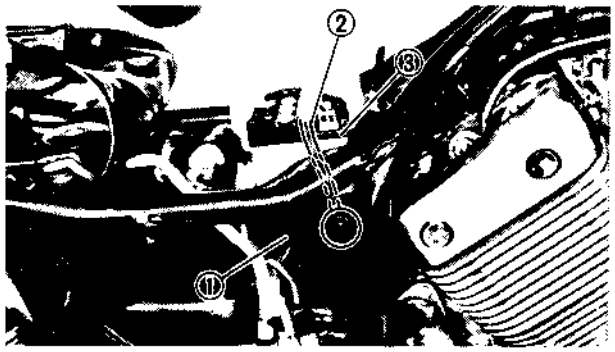
Spark Plugs:
20 Nm (2.0 m·kg, 14 ft·lb)
Side Covers (Cylinder Head):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Bolts (Front Side Covers – Left and Right):
10 Nm (1.0 m·kg, 7.2 ft·lb)



4. Install:
   - Front side cover (Right)
   - Front side cover (Left)
   - Top cover

NOTE:
- Pass the wireharness into the cut ① on the front side cover (Right).
- Insert the lobe ② on the top cover into the receptacle ③ on the frame.

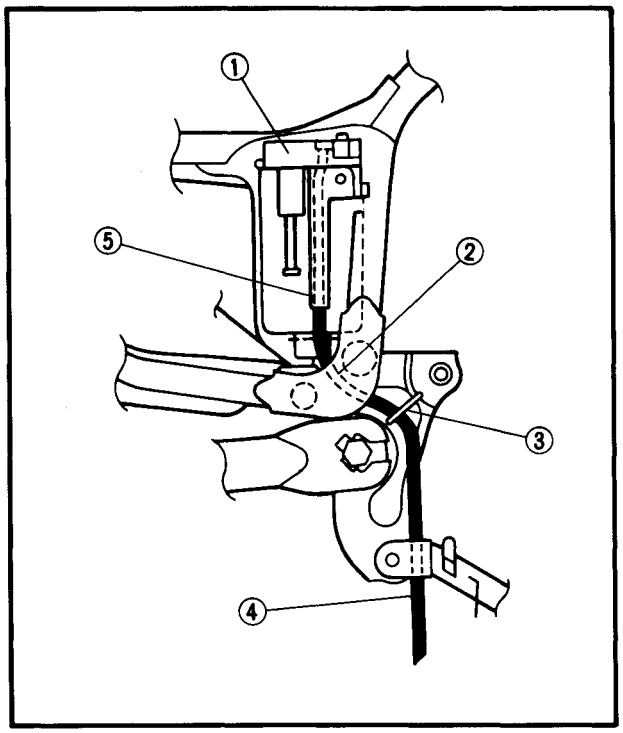




5. Install:
   - Battery box ①
   - Battery breather hose ②
   - Battery ③

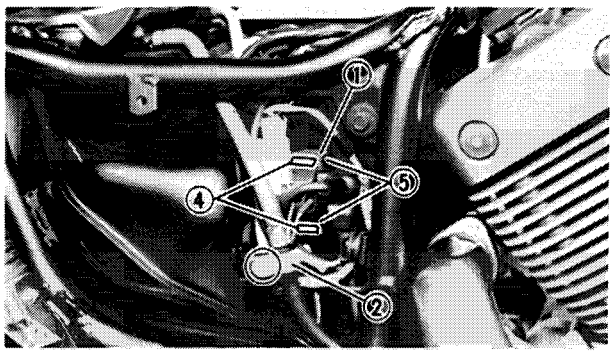
NOTE:
Be sure the breather hose is properly attached and routed.

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



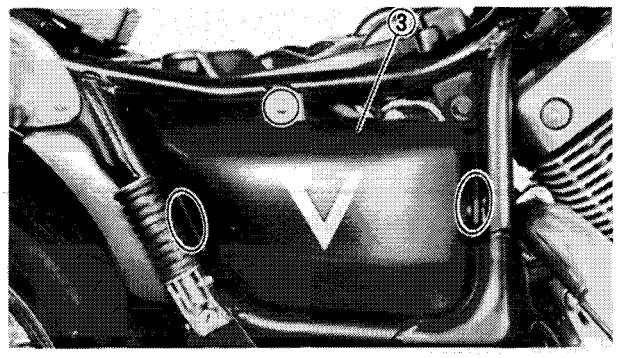
Battery Box:
7 Nm (0.7 m·kg, 5.1 ft·lb)

① Battery
② Route inside the frame
③ Pass through the clamp
④ Route inside the bracket
⑤ Route inside the battery box

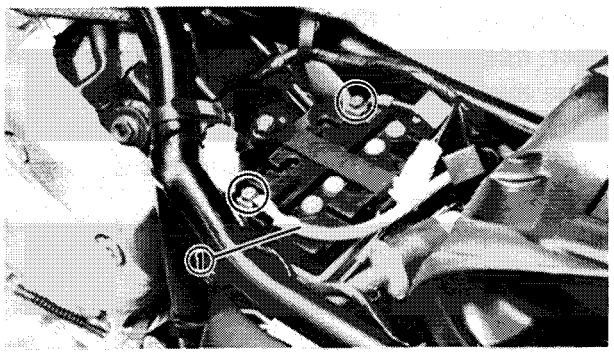


6. Install:
   - Starter relay ①
   - Clamp (Fuel hose) ②
   - Rear side cover (Right) ③

NOTE:
Insert the lobes ④ on the battery box into the receptacles ⑤ on the relay band.



Rear Side Cover:
7 Nm (0.7 m·kg, 5.1 ft·lb)

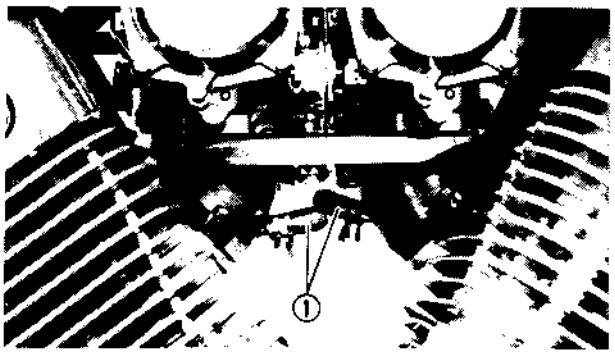


7. Conncet:
   - Battery leads

NOTE:
Connect the positive lead ① first.

CAM CHAIN ADJUSTMENT

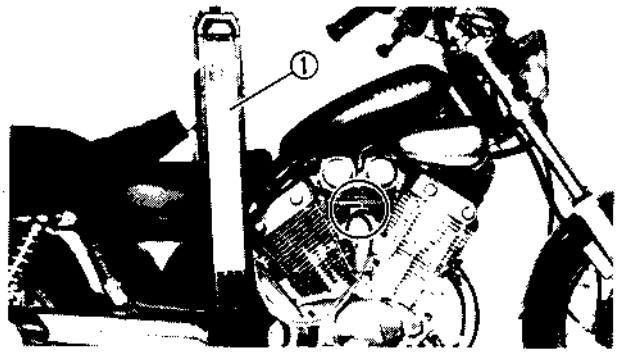
This model has been equipped the automatic cam chain tensioner. No adjustment is necessary.



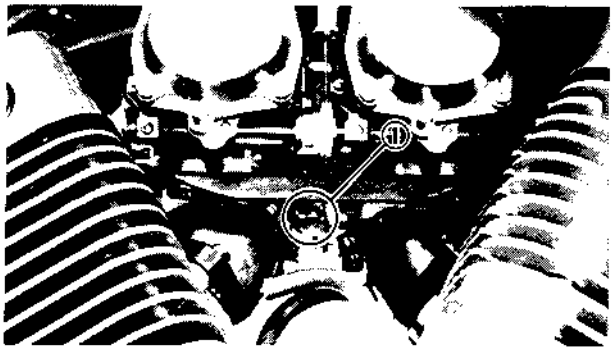
CARBURETOR SYNCHRONIZATION

NOTE:

Valve clearance must be set properly before synchronizing the carburetors.

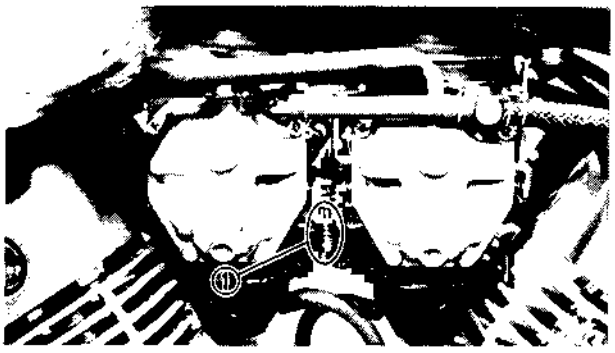


1. Remove:
   - Vacuum plug caps (Front and rear) ①
2. Attach:
   - Vacuum Gauge ① (YU-08030-A)
     To the vacuum plugs.
3. Start the engine and let it warm up.



4. Adjust:
   - Idle speed
     Out of specification →
     Turn the throttle stop screw ① to adjust.

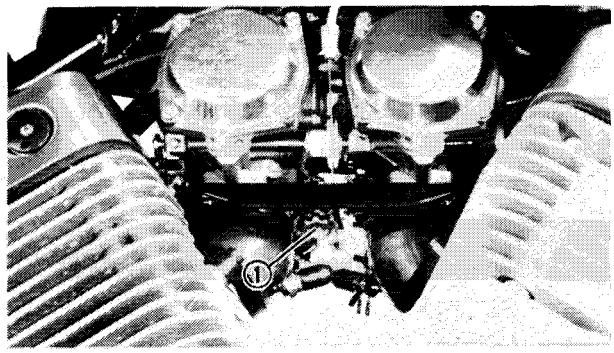
	Idle Speed: **1,150 ~ 1,250 r/min**

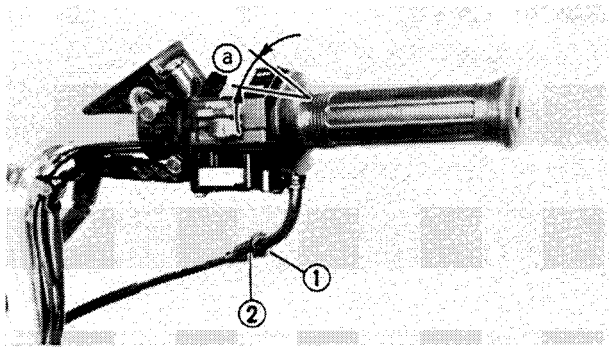


5. Adjust:
   - Carburetor synchronization

Carburetor synchronization adjustment steps:
- Synchronize carburetor (Rear) to carburetor (Front) by turning synchronizing screw ① until both gauges read the same.
- Reverse the engine for a fraction of a second, two or three times, and check the synchronization again.

Vacuum Pressure at Idle Speed:
30.6 kPa (230 mm Hg, 9.06 in Hg)
Vacuum Synchronous Difference:
1.3 kPa (10 mm Hg, 0.39 in Hg)





IDLE SPEED ADJUSTMENT

1. Adjust:
   - Idle speed

   Warm up the engine and turn the throttle stop screw ① to adjust.

Idle Speed:
1,150 ~ 1,250 r/min

THROTTLE CABLE FREE PLAY ADJUSTMENT

NOTE:
Before adjusting the throttle cable free play, the engine idling speed should be adjusted.

1. Check:
   - Throttle cable free play ⓐ

   Out of specification → Adjust.

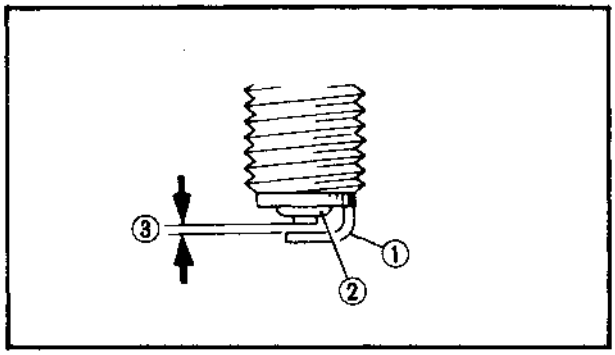
Throttle Cable Free Play ⓐ :
3 ~ 5 mm (0.12 ~ 0.20 in)

2. Adjust:
   - Throttle cable free play

Throttle cable adjustment steps:
- Loosen the locknut ①.
- Turn the adjuster ② clockwise or counterclockwise until proper free play is attained.
- Tighten the locknut.

SPARK PLUG INSPECTION

1. Remove:
   - Side cover (Front cylinder – Left)
   - Side cover (Rear cylinder – Right)
   - Spark plugs



2. Inspect:
   - Electrode ①
     Wear/Damage → Replace.
   - Insulator color ②
     Normal condition is a medium to light tan color.
     Distinctly different color → Check the engine condition.

③ Spark plug gap

3. Clean:
   - Spark plug
     Clean the spark plug with a spark plug cleaner or wire brush.
4. Inspect:
   - Spark plug type
     Incorrect → Replace

Standard Spark Plug:
BP7ES (N.G.K.) or
W22EP-U (N.D.)

5. Measure:
   - Spark plug gap
     Out of specification → Regap.
     Use a wire gauge.

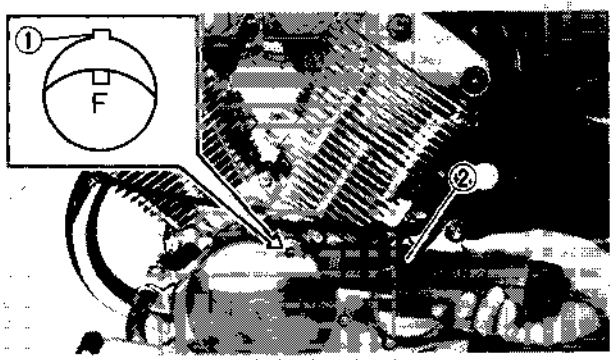
Spark Plug Gap:
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

6. Tighten:
   - Spark plugs
   - Side cover (Front cylinder — Left)
   - Side cover (Rear cylinder — Right)

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

Spark Plugs:
20 Nm (2.0 m·kg, 14 ft·lb)
Side Covers (Front and Rear Cylinders):
10 Nm (1.0 m·kg, 7.2 ft·lb)





IGNITION TIMING CHECK

1. Check:
   - Ignition timing

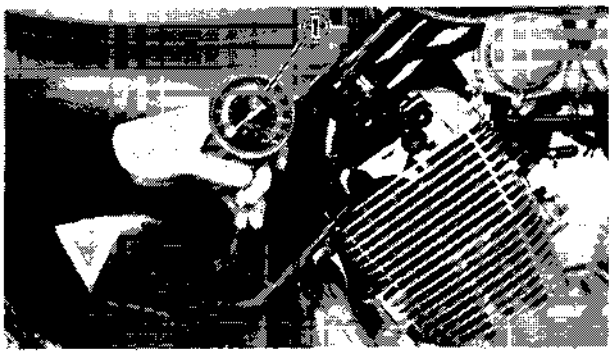
Ignition timing check steps:
- Remove the timing plug ①.
- Connect the Timing Light ② (YM-33277) to rear (# 1) cylinder spark plug lead.
- Warm up the engine and let it idle at the specified idle speed of 1,200 r/min.
- Visually check the stationary pointer ③ in the timing window to verify it is within the required firing range indicated on the flywheel.

Incorrect firing range → Check flywheel and/or pickup assembly (Tightness damage).
Refer to "CHAPTER 6, ELECTRICAL" for further information.

COMPRESSION PRESSURE MEASUREMENT

NOTE:
Insufficient compression pressure will result in performance loss.

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
2. Warm up the engine.
3. Remove:
   - Spark plugs
4. Measure:
   - Compression pressure



Compression pressure measurement steps:
- Install the Compression Gauge ① (YU-33223) using an adapter.
- Crank over the engine with the electric starter (Be sure the battery is fully charged) with the throttle wide open until the compression reading on the gauge stabilizes.
- Check redings with specified levels (See chart)

Compression Pressure (At sea level):
Standard:
1,100 kPa (11 kg/cm², 156 psi)

Minimum:
1,000 kPa (10 kg/cm², 142 psi)
Maximum:
1,200 kPa (12 kg/cm², 171 psi)

WARNING:

When cranking the engine, ground all of the spark plug leads to prevent sparking.

- Repeat the previous steps for the other cylinders.
- If pressure falls bellow the minimum level:
  1) Squirt a few drops of oil into the affected cylinder.
  2) Measure the compression again.

Compression Pressure (with oil introduced into cylinder)

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

NOTE:
The difference between the highest and lowest cylinder compression readings must not vary more than the specified value.

Difference Between Each Cylinder:
Less than 100 kPa
(1 kg/cm², 14 psi)

ENGINE OIL LEVEL INSPECTION

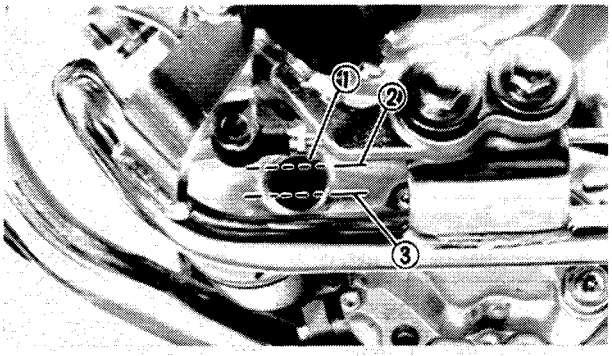
1. Inspect:
   - Oil level
     Oil level low → Add sufficient oil.

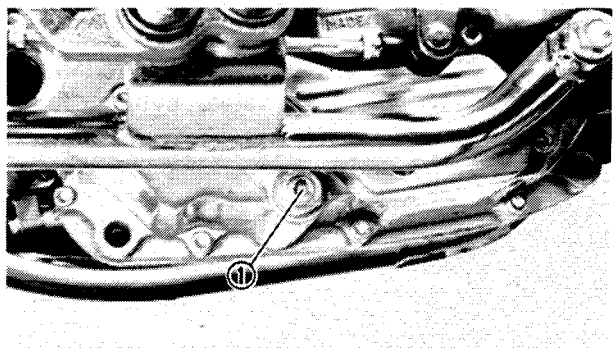
Engine oil level visual inspection steps:
- Place the motorcycle on a level place and support the motorcycle with a suitable stand.

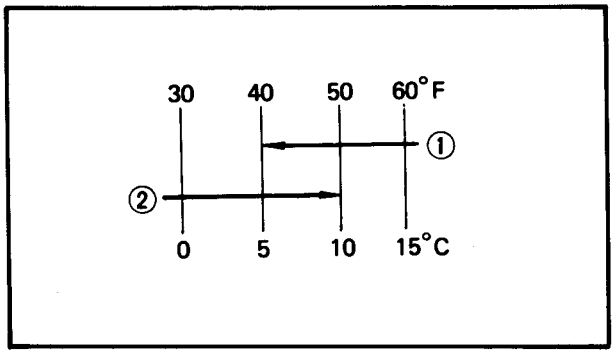
NOTE:
Position motorcycle straight up when checking oil level, a slight tilt to the side can produce false readings.

- Warm up the engine for several minutes.
- Stop the engine and visually check the oil level through the level window ①.

② Maximum
③ Minimum







ENGINE OIL REPLACEMENT

1. Warm up the engine for serveral minutes, then place an oil pan under the engine.
2. Remove:
   - Oil filler cap
   - Drain plug ①

   Drain the engine oil.
3. Tighten:
   - Drain plug ①

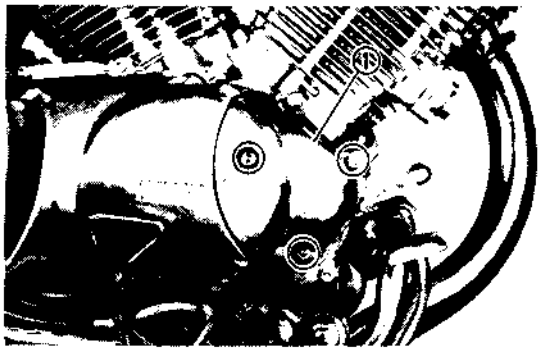
Drain Plug:
43 Nm (4.3 m·kg, 31 ft·lb)

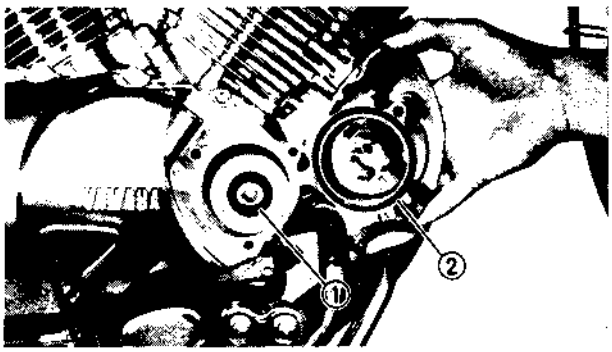
4. Fill:
   - Crankcase

Recommended Oil:
At 5°C (40°F) or Highter ① :
Yamalube 4 or
SAE 20W40 Type SE Motor Oil
At 15°C (60°F) or Lower ② :
SAE 10W30 Type SE Motor Oil
Periodic Oil Change:
2.6 L (2.3 Imp qt, 2.7 US qt)

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

5. Install:
   - Filler cap
6. Inspect:
   - Oil leaks
   - Oil level





ENGINE OIL FILTER REPLACEMENT

1. Warm up the engine and place an oil pan under the engine.
2. Remove:
   - Oil filler cap
   - Drain plug

   Drain the engine oil.
3. Remove:
   - Oil filter cover ①
4. Install:
   - Drain plug

Drain Plug:
43 Nm (4.3 m·kg, 31 ft·lb)

   - Oil filter (New) ①
   - O-ring (New) ②
   - Oil filter cover

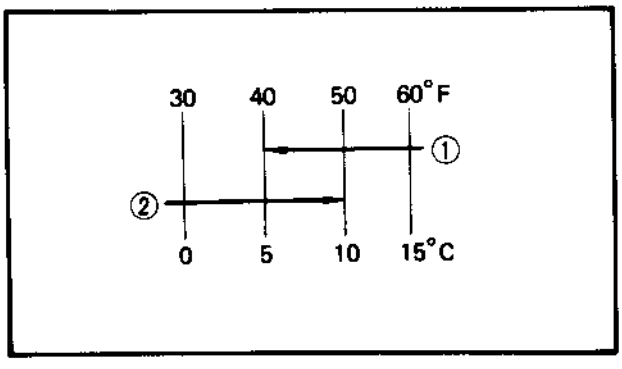
NOTE:
Be sure the O-ring is positioned properly.

5. Tighten:
   - Bolt (Oil filter)

Bolt (Oil Filter):
10 Nm (1.0 m·kg, 7.2 ft·lb)

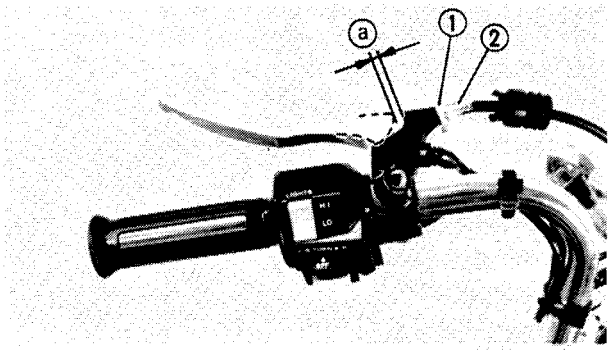
6. Fill:
   - Crankcase

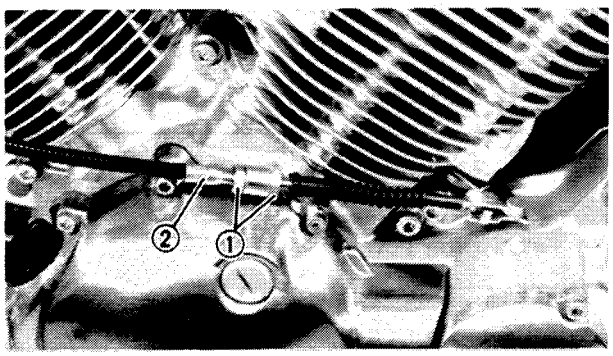
Recommended Oil:
At 5°C (40°F) or Higher ①:
Yamalube 4 or
SAE 20W40 Type SE Motor Oil
At 15°C (60°F) or Lower ②:
SAE 10W30 Type SE Motor Oil
With Oil Filter Replacement:
2.8 L (2.5 Imp qt, 3.0 US qt)



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

7. Install:
   - Oil filter cap
8. Inspect:
   - Oil leaks
   - Oil level





CLUTCH ADJUSTMENT

Free Play Adjustment

1. Loosen:
   - Locknuts ①
2. Adjust:
   - Free play ⓐ

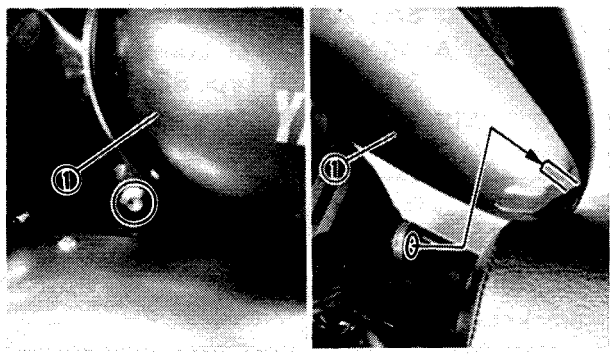
   Turn the adjusters ② until the free play is within the specified limits.

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

3. Tighten:
   - Locknuts

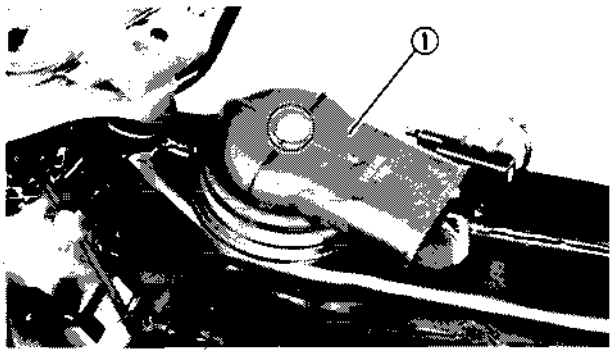
NOTE:

The above procedure provides for maximum cable free play to allow for proper clutch actuating mechanism adjustment. Refer to "CHAPTER 3, ENGINE OVERHAUL – ENGINE ASSEMBLY AND ADJUSTMENT" section.

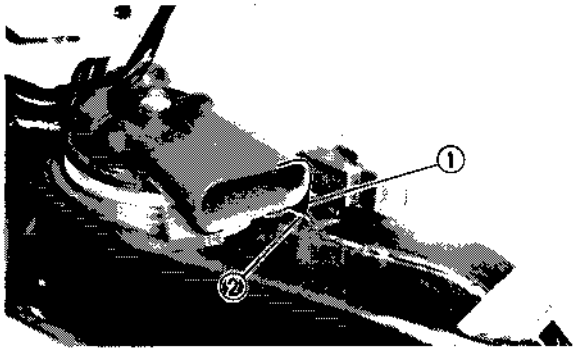


AIR FILTER CLEANING

1. Remove:
   - Top cover ①







2. Remove:
   - Air filter case cover ①
   - Air filter element

CAUTION:

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

3. Eliminate:
   - Dust

   Use the compressed air.
   Blow out dust in the element from the outer surface.
4. Inspect:
   - Element

   Damage → Replace.
5. Install:
   - Element
   - Air filter case cover
   - Top cover

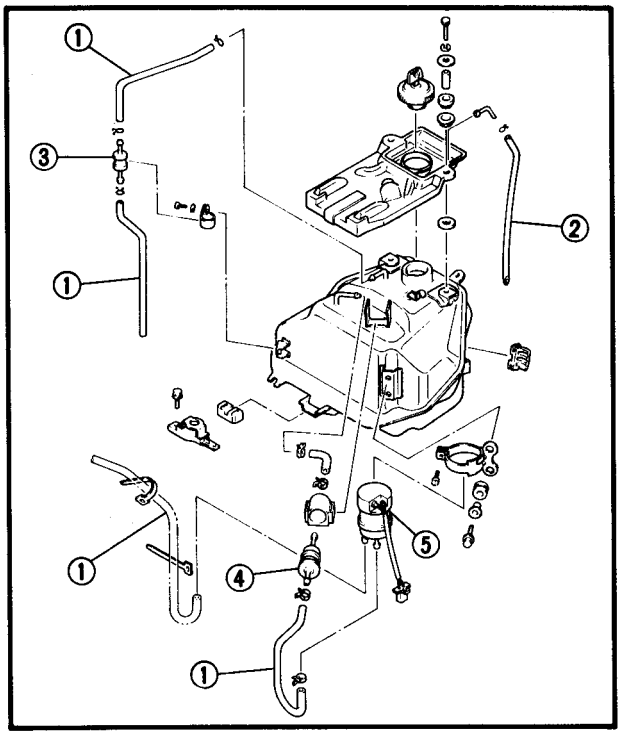
NOTE:
When installing the filter case cover, lightly touch the projection on the case cover ① with the projection on the frame ② .

Air Filter Case Cover:
7 Nm (0.7 m·kg, 5.1 ft·lb)
Top Cover:
7 Nm (0.7 m·kg, 5.1 ft·lb)

CARBURETOR JOINT INSPECTION

1. Tighten:
   - Clamps (Carburetors)
   - Bolts (Carburetor joints)
2. Inspect:
   - Carburetor joints
   - O-rings (Carburetor joints)
   - Intake manifolds

   Cracks/Damage → Replace.



FUEL LINE INSPECTION

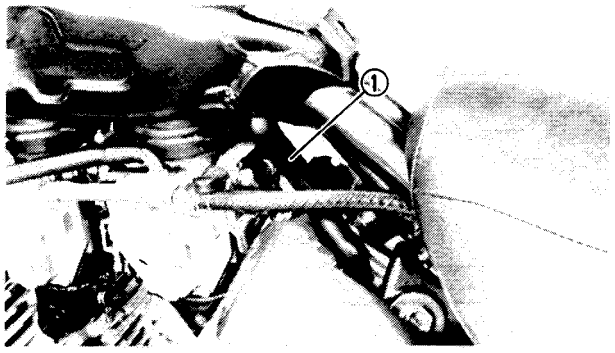
1. Inspect:
   - Fuel hoses ①
   - Breather hose ②
   - Roll over valve ③

   Cracks/Damage → Replace.
   Clogs → Clean.
2. Inspect:
   - Fuel filter ④

   Dirty/Damage → Replace.

NOTE:

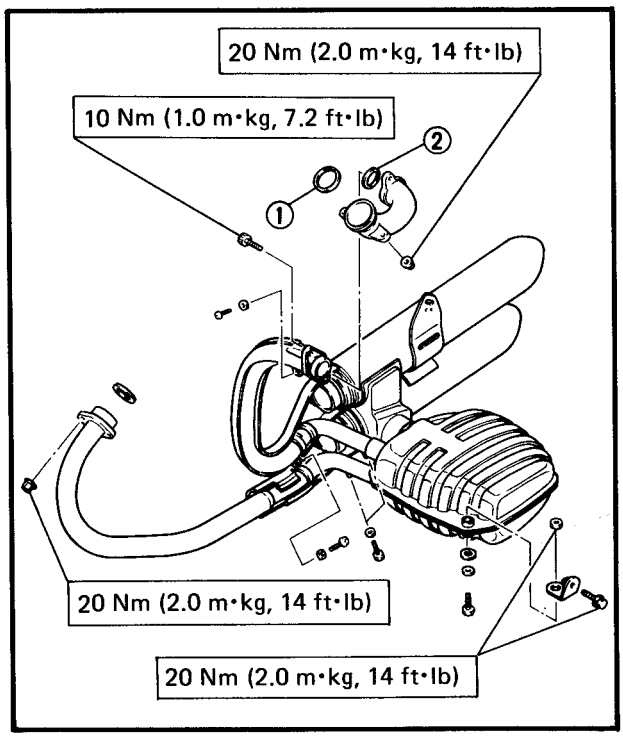
- Drain and flush fuel tank if abrasive damage to any components is evident.
- Arrow mark on the fuel filter should face toward the fuel pump ⑤ side.



CRANKCASE VENTILATION HOSE INSPECTION

1. Inspect:
   - Crankcase ventilation hose ①

   Cracks/Damage → Replace.

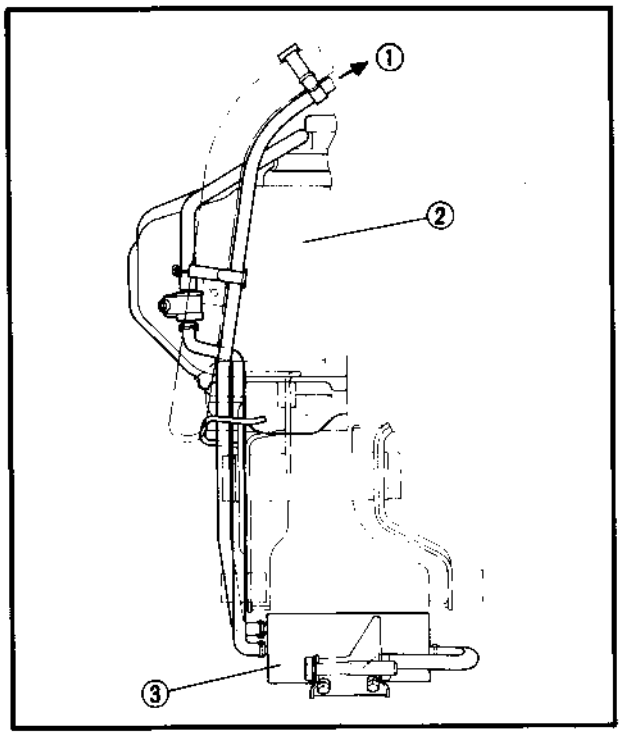


EXHAUST SYSTEM INSPECTION

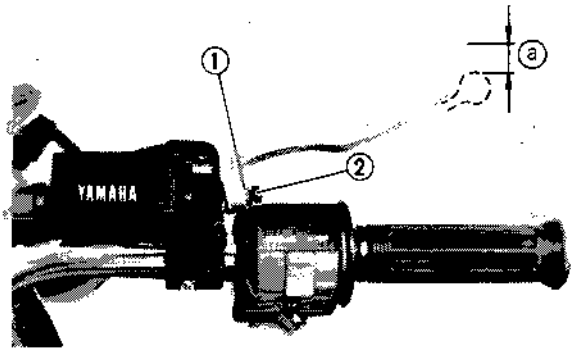
1. Inspect:
   - Gaskets (Exhaust pipes) ①
   - Gasket (Exhaust pipe – Rear joint) ②

   Damage → Replace.
   Exhaust gas leakage → Repair.
2. Tighten:
   - Nuts (Exhaust pipes)
   - Bolts (Exhaust pipe – Rear joint)
   - Nut (Muffler chamber)
   - Bolt (Muffler chamber)

Exhaust Pipes:
20 Nm (2.0 m·kg, 14 ft·lb)
Rear Joint (Exhaust Pipe):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Muffler Chamber:
20 Nm (2.0 m·kg, 14 ft·lb)



① To carburetor
② Fuel tank
③ Canister



CANISTER INSPECTION (XV535TC ONLY)

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

CHASSIS

FRONT BRAKE ADJUSTMENT

1. Loosen:
   - Lockunt ①
2. Adjust:
   - Free play ⓐ
     Turn the adjuster ② until the free play ⓐ is within the specified limits.

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

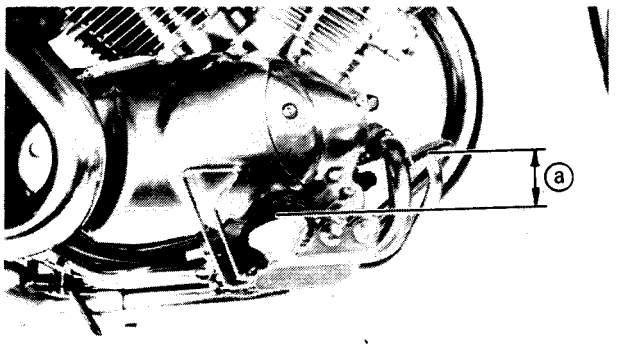
CAUTION:

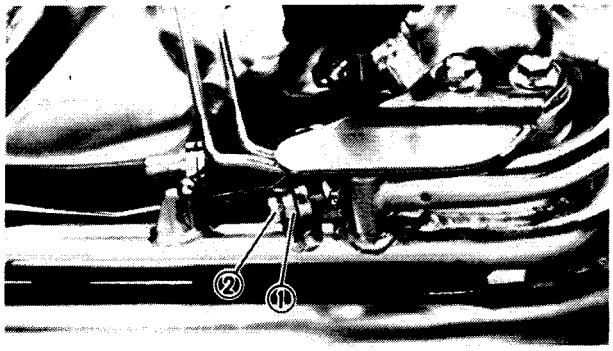
Proper lever free play is essential to avoid excessive brake drag.

WARNING:

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

3. Tighten:
   - Locknut





REAR BRAKE ADJUSTMENT

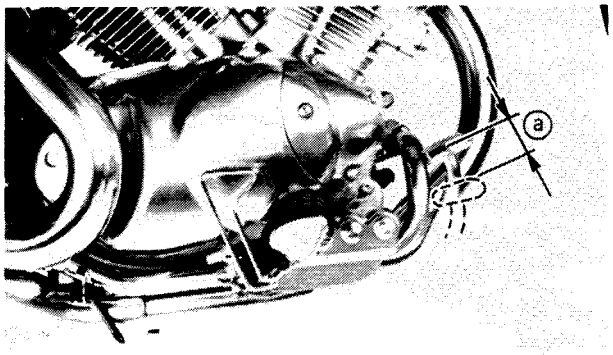
Brake Pedal Height Adjustment

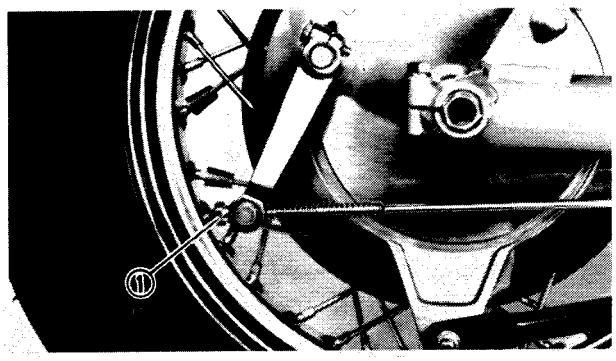
1. Loosen:
   - Locknut ①
2. Adjust:
   - Brake pedal height ⓐ
     Turn the adjuster ② until the brake pedal position is at the specified height.

Brake Pedal Height ⓐ :
38 mm (1.5 in)
Above the Top of the Footrest

WARNING:

Check the operation of the brake light after adjusting the brake pedal height.





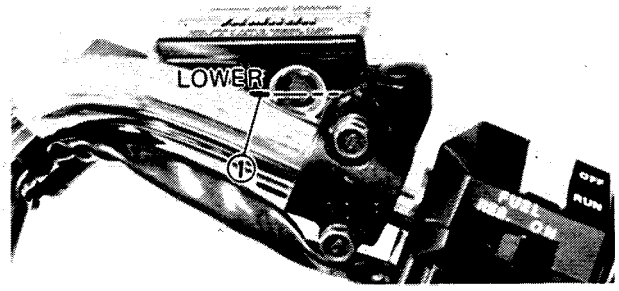
Brake Pedal Free Play Adjustment

1. Adjust:
   - Brake pedal free play ⓐ
     Turn the adjuster ① until the free play is within the specified limits.

Free Play ⓐ :
20 ~ 30 mm (0.8 ~ 1.2 in)

WARNING:

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



BRAKE FLUID LEVEL INSPECTION

1. Inspect:
   - Brake fluid level
     Level low → Replenish fluid.

Brake Fluid:
DOT # 3

① Lower level

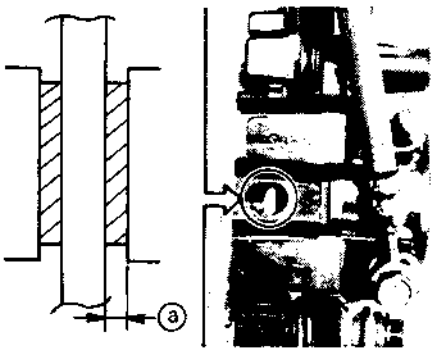
NOTE:

Be sure that:

1) The master cylinder top is horizontal by turning the handlebars.
2) Spilled fluid is cleaned up immediately to prevent painted surfaces or plastic parts from eroding.

WARNING:

- **Use only the designated quality brake fluid, otherwise poor brake performance will result.**
- **Water does not enter the master cylinder when refilling, otherwise poor brake performance.**



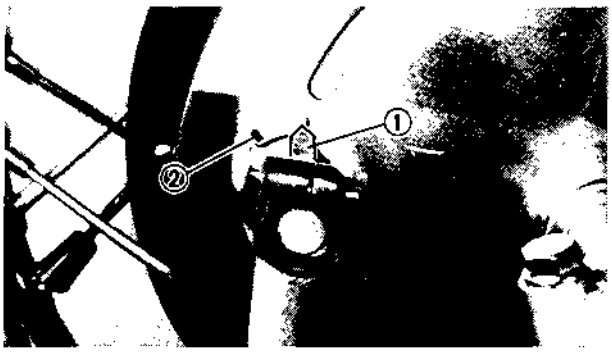
FRONT BRAKE PAD INSPECTION

1. Remove:
   - Blind plug
2. Inspect:
   - Wear limit ⓐ

   Out of specification → Replace pads.

Wear Limit:
0.8 mm (0.03 in)

Refer to "CHAPTER 5. CHASSIS" section.

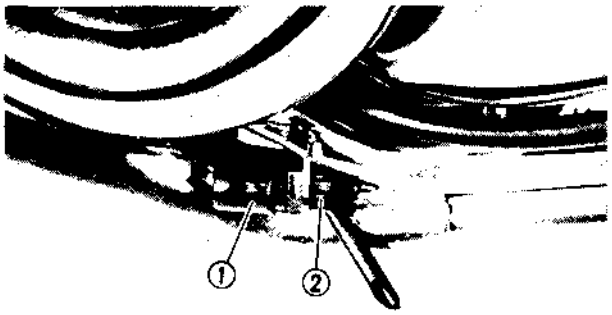


REAR BRAKE SHOE INSPECTION

1. Activate the brake pedal.
2. Inspect:
   - Wear indicator ①

   Indicator reaches wear limit line ② → Replace shoes.

   Refer to "CHAPTER 5. CHASSIS" section.



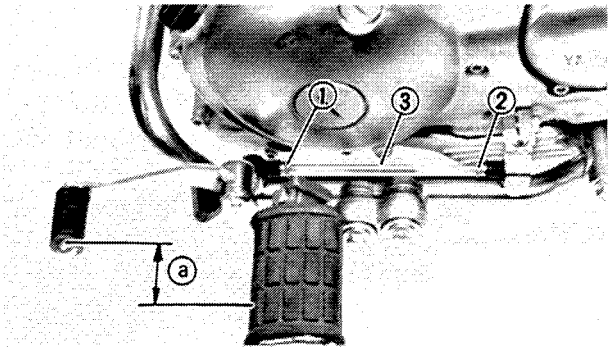
BRAKE LIGHT SWITCH ADJUSTMENT

1. Adjust:
   - Brake light operating timing

   Hold the main body ① of the switch with your hand so it does not rotate, and turn the adjuster ② until the operating timing is correct.

BRAKE HOSE INSPECTION

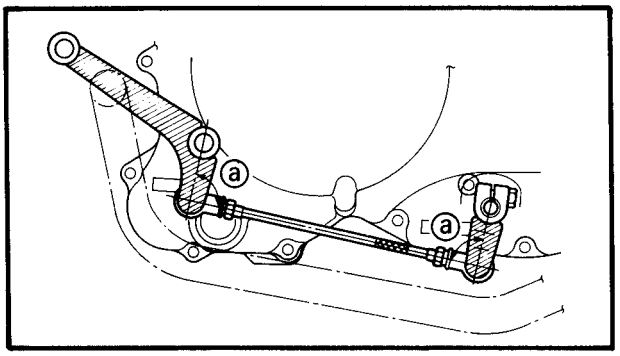
1. Inspect:
   - Brake hose
     Cracks/Wear/Damage → Replace.



CHANGE PEDAL ADJUSTMENT

1. Loosen:
   - Locknut (Front) ①
   - Locknut (Rear) ②

NOTE:
The locknut (Front) has left-hand threads.



2. Adjust:
   - Change pedal height ⓐ
     Turn the adjuster rod ③ until the change pedal position is at the specified height.

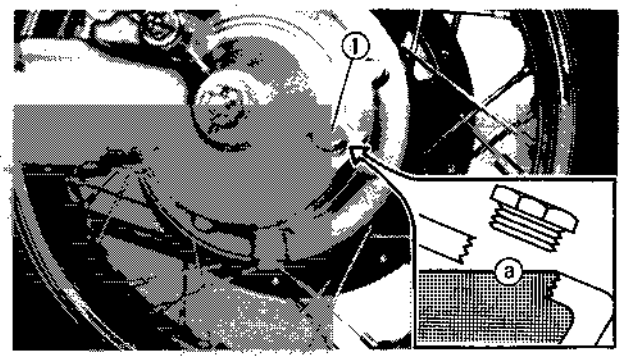
Change Pedal Height:
50 ~ 60 mm (2.0 ~ 2.4 in)
Above the Top of the Footrest

WARNING:

After adjusting the change pedal height, visually check the angle of change pedal arms. The angle of arms must be at right angles ⓐ with the adjuster rod.

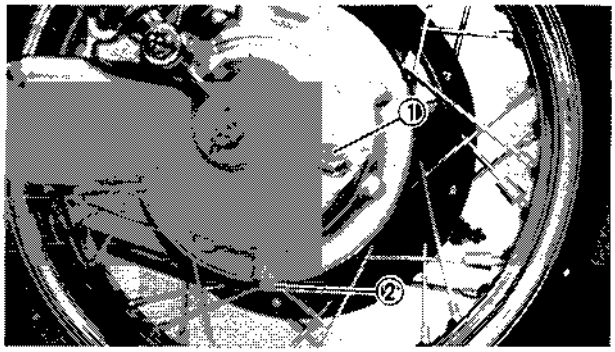
FINAL GEAR OIL LEVEL INSPECTION

1. Inspect:
   - Final gear oil level
     Oil level low → Add sufficient oil.



Final gear oil level visual inspection steps:
- Place the motorcycle on a level area and support the motorcycle with a suitable stand.
- Remove the oil filler cap ①.
- Visually check the oil level. Correct oil level ⓐ should be at the brim of the hole.
- If the oil level is low, add sufficient oil.
- Tighten the oil filler cap to specification.

Oil Filler Cap (Final Gear):
23 Nm (2.3 m·kg, 17 ft·lb)



FINAL GEAR OIL REPLACEMENT

1. Place an oil pan under the final gear case.
2. Remove:
   - Oil filler cap ①
   - Drain plug ②

   Drain the oil.
3. Install:
   - Drain plug

Drain Plug (Final Gear):
23 Nm (2.3 m·kg, 17 ft·lb)

4. Fill:
   - Final gear case

Oil Capacity:
0.19 L (0.17 Imp qt, 0.20 US qt)
Final Gear Oil:
SAE 80 API "GL-4" Hypoid Gear Oil
If desired, an SAE 80W90 Hypoid gear oil may be used for all conditions.

WARNING:

Do not allow the gear oil to contact the tire or wheel.

5. Install:
   - Oil filler cap

Oil Filler Cap (Final Gear):
23 Nm (2.3 m·kg, 17 ft·lb)

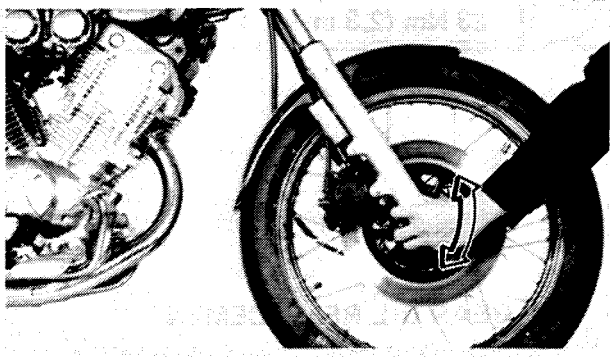
STEERING HEAD ADJUSTMENT

Inspection

WARNING:

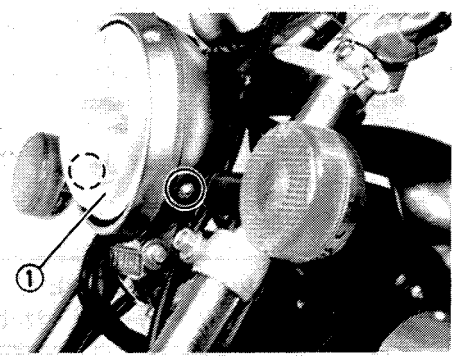
Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on a level place.
2. Elevate the front wheel by placing a suitable stand under the engine.
3. Check:
   - Steering assembly bearings
     Grasp the bottom of the forks and gently rock the fork assembly back and forth.
     Looseness → Adjust steering head.

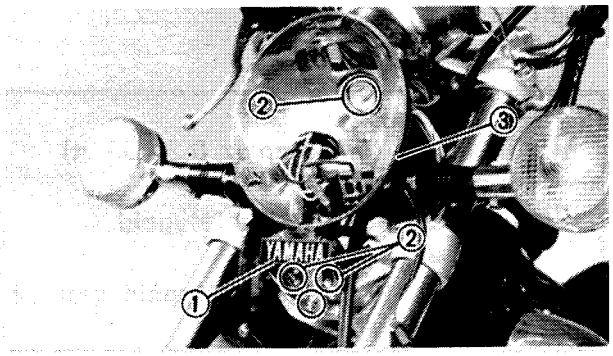


Adjustment

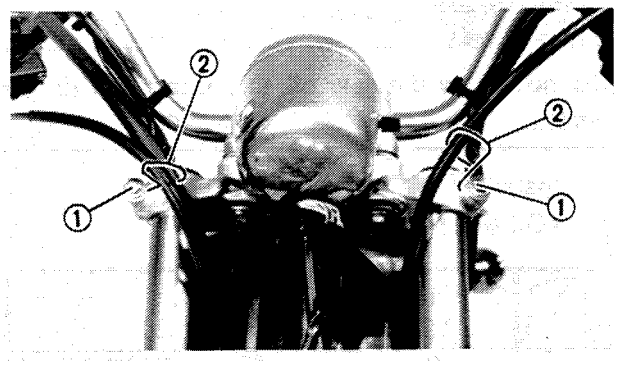
1. Remove:
   - Headlight lens unit ①
2. Disconnect:
   - All leads (In the headlight body)

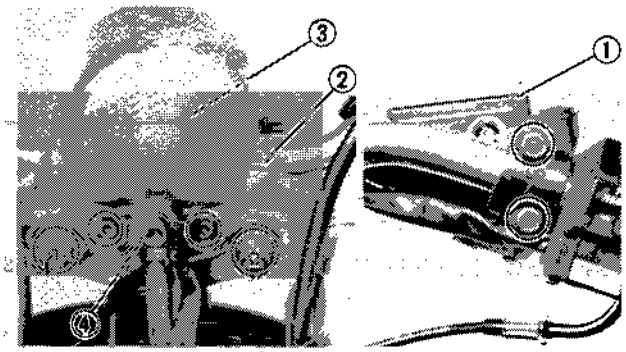


3. Remove:
   - Emblem ①
   - Bolts (Headlight body bracket) ②
   - Headlight and flasher light bracket assembly ③
     Pull down the bracket assembly.



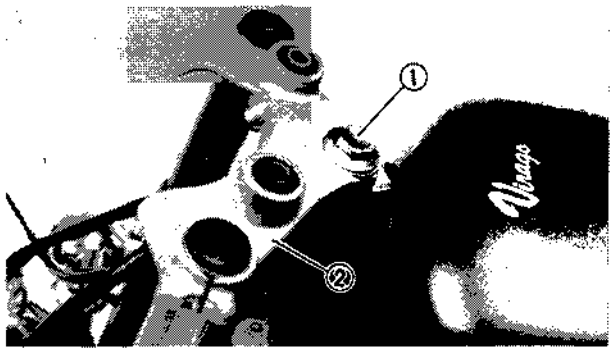
4. Remove:
   - Bolts (Front fork – Top) ①
   - Cable holders (Left and right) ②



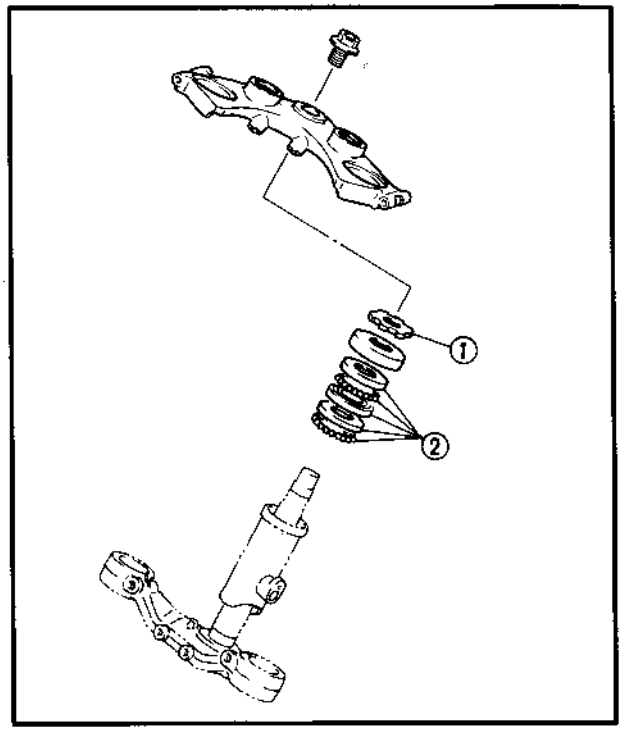


5. Remove:
   - Master cylinder assembly ①
   - Handlebar holder assembly ②
   - Indicator box ③
   - Speedometer with bracket ④

NOTE:
Take care not to lose the clevis pins.



6. Remove:
   - Bolt (Steering stem) ①
   - Steering crown ②



7. Adjust:
   - Steering head tightening condition

Steering head adjustment steps:
- Loosen the ring nut ① completely.
- Tighten the ring nut using the Ring Nut Wrench (YU-33975).

NOTE:
Set the Torque Wrench to the Ring Nut Wrench so that they form a right angle.

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

- Loosen the ring nut completely and retighten it to specification.

WARNING:
Do not over-tightening.

Ring Nut (Final Tightening):
10 Nm (1.0 m·kg, 7.2 ft·lb)

- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings ②.
  Refer to "CHAPTER 5. STEERING HEAD" for more details.

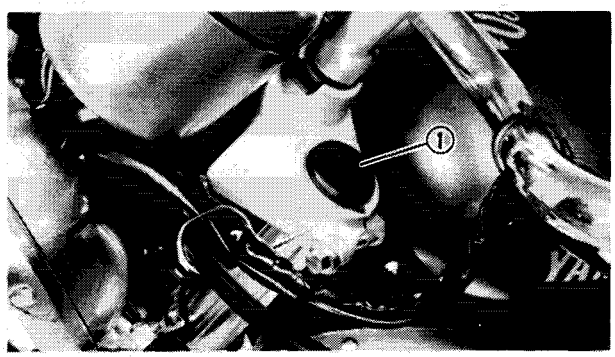
8. Install:
   Reverse the removal steps "8 ~ 1".

NOTE:
- Do not forget to fit:
  1) The clevis pins to the handlebar holders.
  2) The cable holders to the front fork top.
- After installing the headlight lens unit, adjust the headlight beam.

Bolt (Steering Stem):
54 Nm (5.4 m·kg, 39 ft·lb)
Bracket (Speedometer):
7 Nm (0.7 m·kg, 5.1 ft·lb)
Handlebar Holder (Lower):
20 Nm (2.0 m·kg, 14 ft·lb)
Master Cylinder Bracket:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Flasher Light Bracket:
7 Nm (0.7 m·kg, 5.1 ft·lb)
Bolts (Front Fork Top):
20 Nm (2.0 m·kg, 14 ft·lb)
Headlight Body Bracket:
7 Nm (0.7 m·kg, 5.1 ft·lb)

FRONT FORK OIL REPLACEMENT

WARNING:
- **Fork oil leakage can cause loss of stability and safe handling. Have any problem corrected before operating the motorcycle.**
- **Securely support the motorcycle so there is no danger of it falling over.**

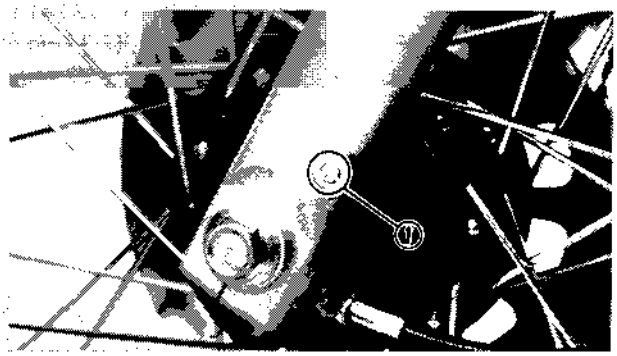


1. Elevate the front wheel by placing a suitable stand under the engine.
2. Remove:
   - Fork caps ①



3. Loosen:
   - Pinch bolts (Steering crown) ①
4. Remove:
   - Stopper rings ②
   - Spring seats ③

   Depress the spring seat with a suitable bar to remove the stopper ring.



5. Place an oil pan under the drain screws.
6. Remove:
   - Drain screws ①

   Drain the fork oil.

WARNING:

Do not allow any oil to contact the disc brake components. If oil is discovered, be sure to remove it, otherwise diminished braking capacity and damage to the rubber components of the brake assembly will occur.

7. Inspect:
   - O-rings (Spring seat)
   - Gaskets (Drain screw)

   Wear/Damage → Replace.
8. Install:
   - Drain screws
9. Fill:
   - Front forks

Each Fork:
228 cm³ (8.03 Imp oz, 7.71 US oz)
Yamaha Fork Oil 10wt or Equivalent

After filling, pump the forks slowly up and down to distribute the oil.

10. Install:

    Reverse the removal steps "4 ~ 1".

WARNING:

Always use a new stopper ring.

Pinch Bolts (Steering Crown):
20 Nm (2.0 m·kg, 14 ft·lb)

TIRE INSPECTION

1. Measure:
   - Tire pressure

   Out of specification → Adjust.

Basic weight: With oil and full fuel tank	185 kg (408 lb) ** 186 kg (410 lb)	
Maximum load*	230 kg (507 lb) ** 229 kg (505 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	200 kPa (2.0 kg/cm², 28 pis)	230 kPa (2.3 kg/cm², 32 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)
High speed riding	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)

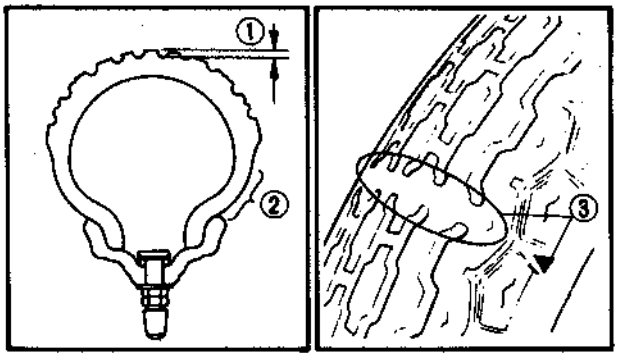
* Load is the total weight of cargo, rider, passenger, and accessories.
** For California

WARNING:

- Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature.
Tire inflation pressure must be adjusted according to total weight of cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model), and vehicle speed.
- Proper loading of your motorcycle is important for the handling, braking, and other performance and safety characteristics of your motorcyle. Do not carry loosely packed items that can shift. Securely pack your heaviest items close to the center of the motorcycle, and destribute the weight evenly from side to side. Properly adjust the suspension for your load, and check the condition and pressure of your tires. NEVER OVERLOAD YOUR MOTORCYCLE. Make sure the total weight of the cargo, rider, passenger, and accessories (fairing, saddlebags, etc. if approved for this model) does not exceed the maximum load of the motorcycle. Operation of an overloaded motorcycle could cause tire damage, an accident, or even injury.

WHEEL INSPECTION/SPOKE INSPECTION AND TIGHTENING

INSP ADJ



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

Minimum Tire Tread Depth:
(Front and Rear)
1.0 mm (0.04 in)

① Tread depth
② Side wall
③ Wear indicator

WARNING:

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

WHEEL INSPECTION

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

NOTE:

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

WARNING:

- **Never attempt even small repairs to the wheel.**
- **Ride conservatively after installing a tire to allow it to seat itself properly on the rim.**

SPOKE INSPECTION AND TIGHTENING

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

Nipple:
6 Nm (0.6 m·kg, 4.3 ft·lb)

CABLE INSPECTION AND LUBRICATION

Cable inspection and lubrication steps:
- Remove the 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.



Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil

BRAKE AND CHANGE PEDALS/BRAKE AND CLUTCH LEVERS LUBRICATION

Lubricate pivoting parts of each lever and pedal.



Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil

SIDESTAND LUBRICATION

Lubricate the centerstand and sidestand at their pivot points.



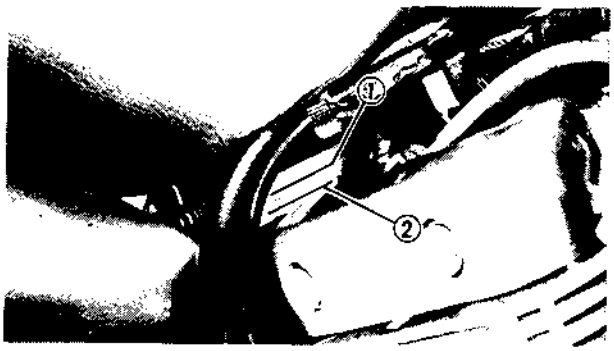
Ymaha Chain and Cable Lube or SAE 10W30 Motor Oil

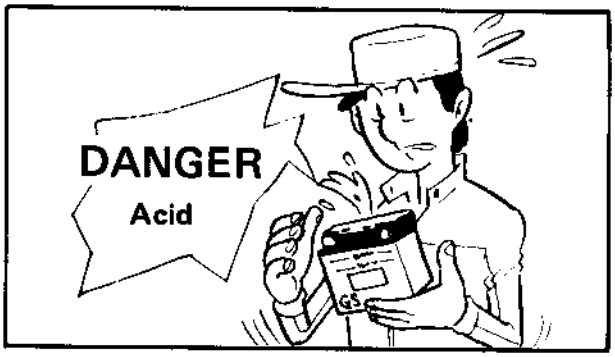
SWINGARM LUBRICATION

Lubricate the swingarm bearing.



Medium Weight Wheel Bearing Grease





ELECTRICAL

BATTERY INSPECITON

1. Inspect:
   - Battery fluid level
     Battery fluid level low → Fill.
     Fluid level should be between upper and lower level marks.

① Upper level
② Lower level

CAUTION:

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

WARNING:

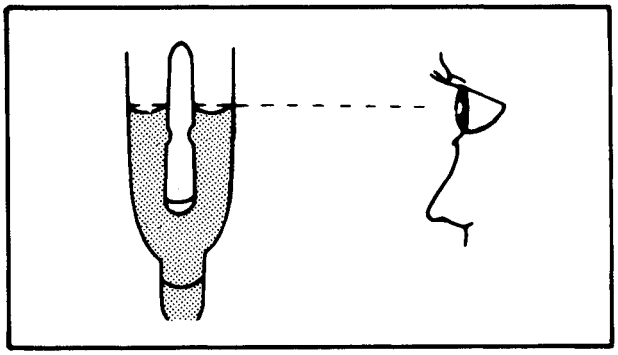
Battery electrolyte is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.
Always follow these preventive measures:
- **Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.**
- **Wear protective eye gear when handling or working near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

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

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

Batteries also generate explosive hydrogen gas, therefore you should always follow these preventive measures:
- **Charge batteries in a well-ventilated area.**
- **Keep batteries away from fire, sparks, or open flames (e.g., welding equipment, lighted cigarettes, etc.)**
- **DO NOT SMOKE when charging or handling batteries.**

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

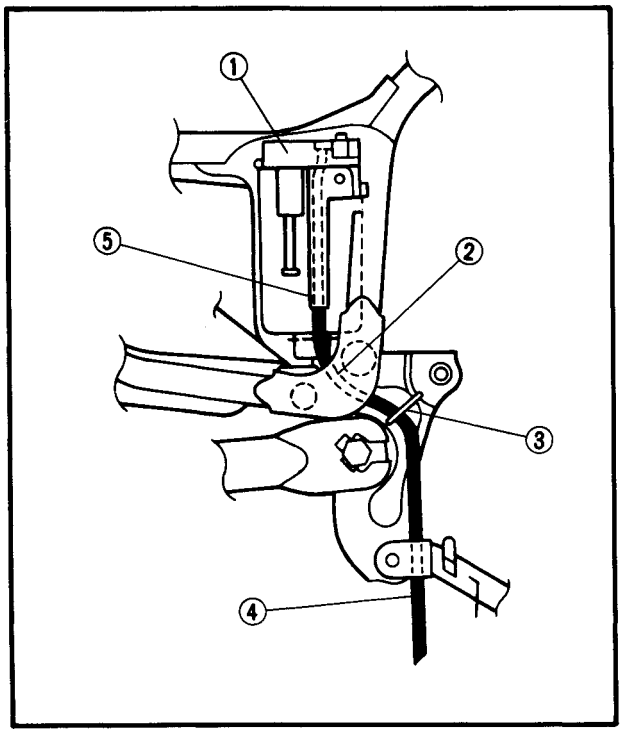


2. Remove:
   • Battery
3. Inspect:
   • Battery fluid specific gravity
   Out of specification → Charge.

CAUTION:

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

Charging Current:
1.2 amps/10 hrs
Specific Gravity:
1.280 at 20°C (68°F)



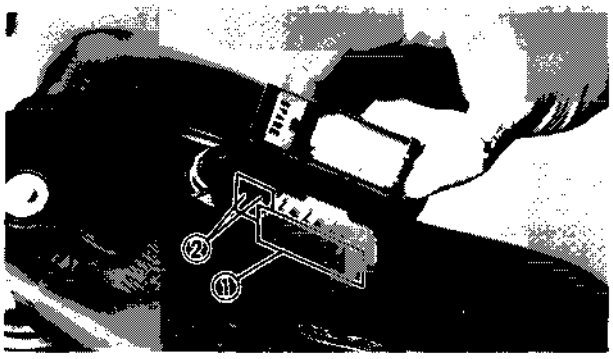
4. Install:
   • Battery
5. Connect:
   • Breather hose
   Be sure the hose is properly attached and routed.

CAUTION:

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

① Battery
② Route inside the frame
③ Pass through the clamp
④ Route inside the bracket
⑤ Route inside the battery box

6. Inspect:
   • Breather hose
   Obstruction → Remove.
   Damage → Replace.



FUSE INSPECTION

The fuse panel is located under the top cover.

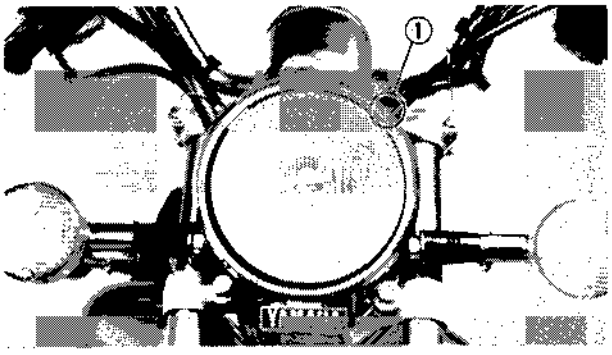
1. Inspect:
   - Fuses ①
     Defective → Replace.
     Blown fuse (new) → Inspect circuit.

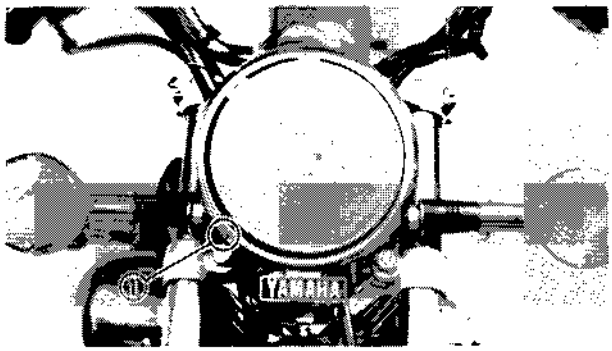
② Spare fuses

CAUTION:

Do not use fuses of higher amperage rating than those recommended.
Substitution of a fuse of improper rating can cause extensive electrical system damage and possibly a fire.

Description	Amperage	Quantity
Main	20A	1
Headlight	10A	1
Signal	10A	1
Ignition	10A	1
Reserve	20A	1
	10A	1





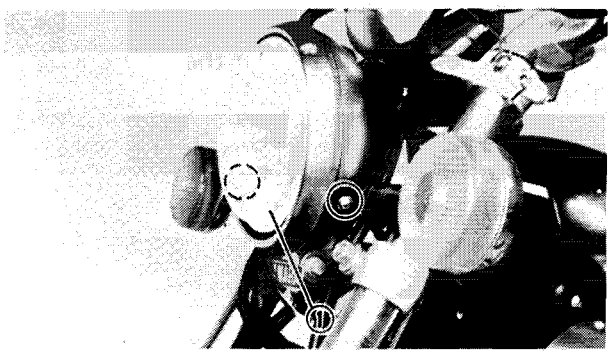
HEADLIGHT BEAM ADJUSTMENT

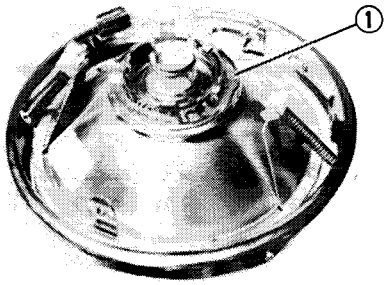
1. Adjust:
   - Headlight beam (Horizontally)

Horizontal Adjustment	
Right	Turn adjusting screw ① clockwise
Left	Turn adjusting screw ① counter-clockwise

2. Adjust:
   - Headlight beam (Vertically)

Vertical Adjustment	
Higher	Turn the adjusting screw ① clock-wise.
Lower	Turn the adjusting screw ① counter-clockwise.





HEADLIGHT BULB REPLACEMENT

1. Remove:
   - Headlight lens unit ①
2. Disconnect:
   - Headlight lens unit leads
3. Remove:
   - Bulb

   Turn the bulb holder ① counterclockwise to release bulb.

WARNING:

Do not touch headlight bulb when it is on as the bulb generates enormous heat; keep flammable objects away.

4. Install:
   - Bulb (new)

   Secure the new bulb with the bulb holder.
5. Install:
   - Headlight lens unit
6. Adjust:
   - Headlight beam

   Refer to "HEADLIGHT BEAM ADJUSTMENT" section.

CHAPTER 3.

ENGINE OVERHAUL

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ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

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

- Clutch
- Carburetor
- AC magneto

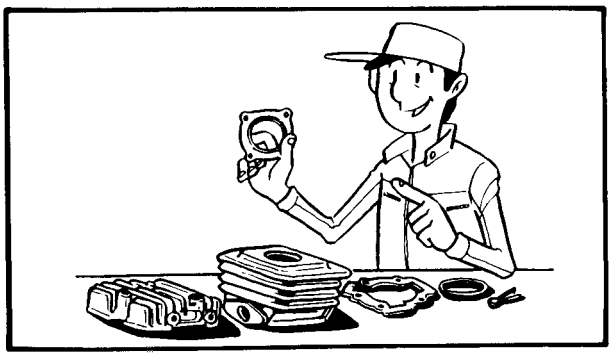
PREPARATION FOR REMOVAL

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" section.

NOTE:

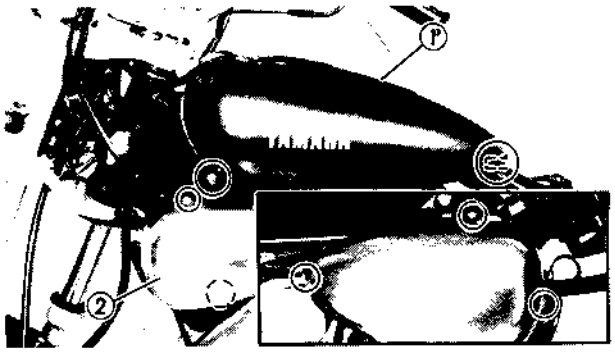
When disassembling the engine, keep mated parts together. This includes gears, cylinders, pistons, and other parts that have been "mated" through normal wear. Mated parts must be reused as an assembly or replaced.





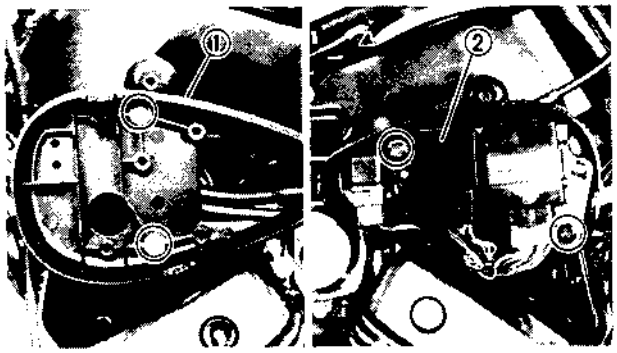
3. During engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.

4. Drain engine oil completely.
   Refer to "CHAPTER 2. ENGINE OIL REPLACEMENT" section.



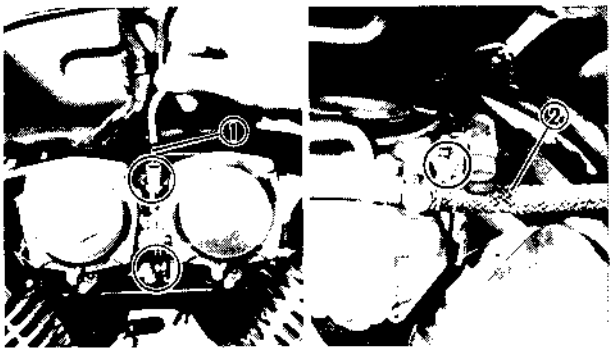
CARBURETOR

1. Remove:
   - Top cover ①
   - Front side cover (Left) ②
   - Front side cover (Right) ③

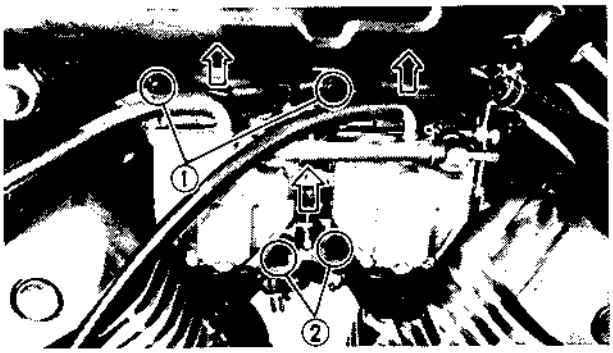


2. Remove:
   - Front side cover bracket (Left) ①
   - Electrical component board (Front side cover – Right) ②

   Disconnect the carburetor hoses and relay couplers.

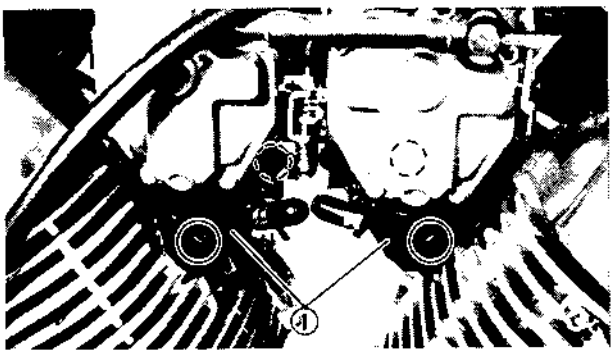


3. Disconnect:
   - Throttle cable ①
   - Fuel hose ②

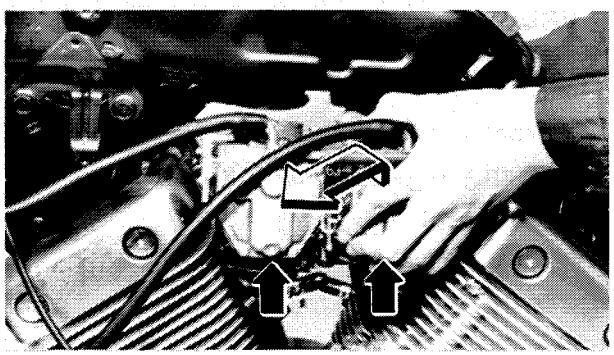


4. Loosen:
   - Screws (Air cleaner joints) ①
   - Screws (Carburetor joints) ②

   Push in the air cleaner joints into the air cleaner case, and move up the carburetor.

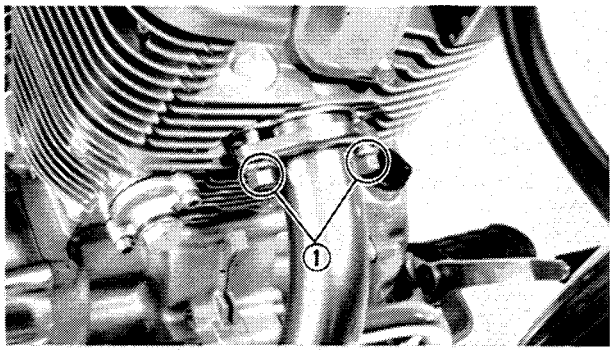


5. Remove:
   - Carburetor joints (Front and rear) ①



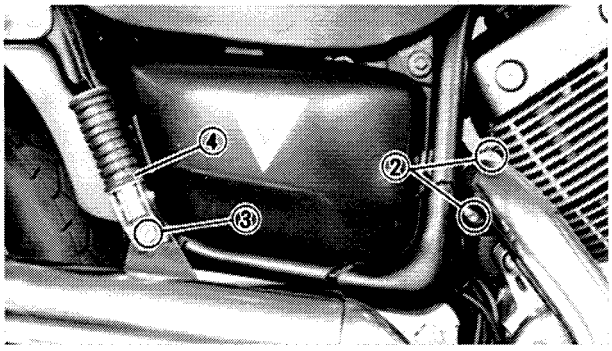
6. Remove:
   - Carburetor assembly
     Pull out the carburetor to the left side.

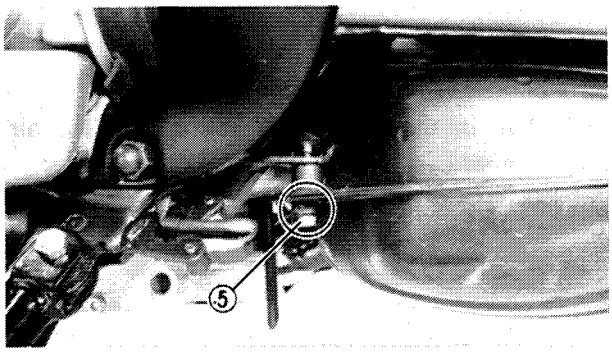
NOTE:
Cover the carburetor with a clean rag to prevent dirt or foreign matter into the carburetor.

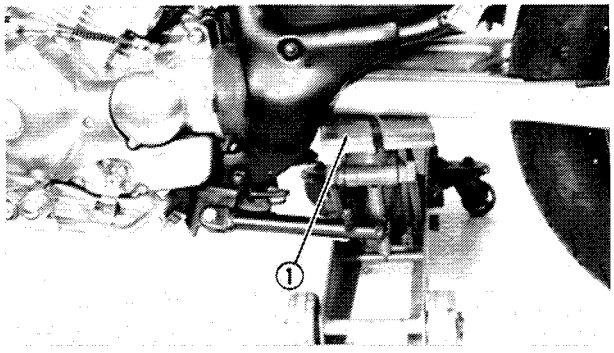


MUFFLER ASSEMBLY

1. Remove:
   - Nuts (Front cylinder – Exhaust pipe) ①
   - Bolts (Rear cylinder – Rear joint) ②
   - Bolt (Muffler bracket) ③
   - Rear footrest (Right) ④
   - Bolt (Muffler chamber) ⑤
   - Muffler assembly

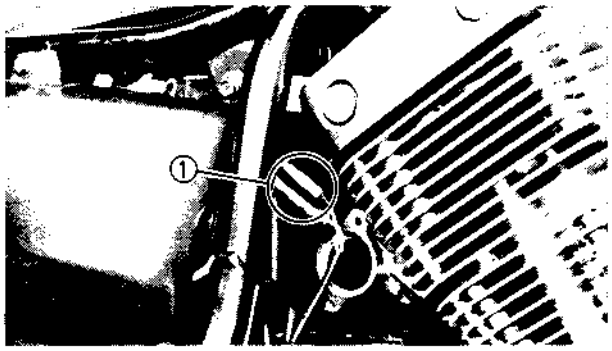






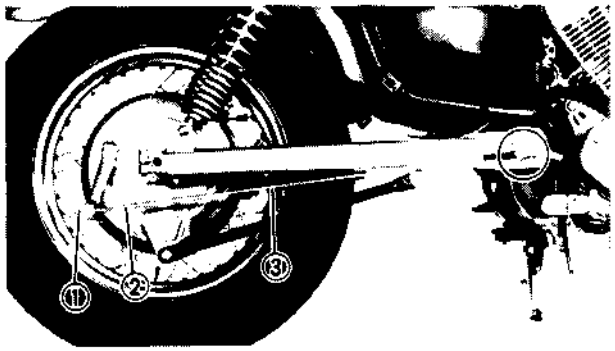
2. Support the motorcycle with a suitable stand ① at the swingarm pivot.

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

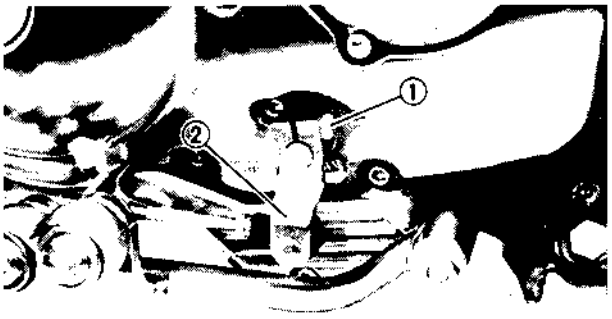


BRAKE PEDAL/FOOTREST (RIGHT) AND CHANGE PEDAL/FOOTREST (LEFT)

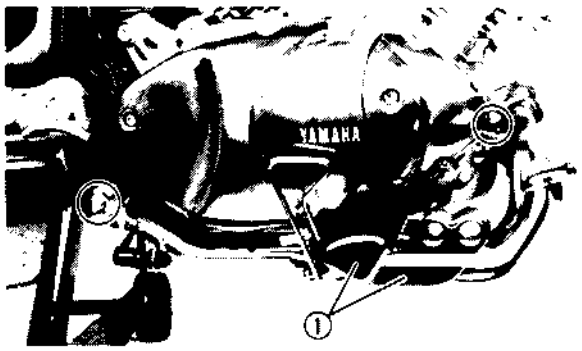
1. Disconnect:
   - Brake light switch leads (Brown and Yellow) ①



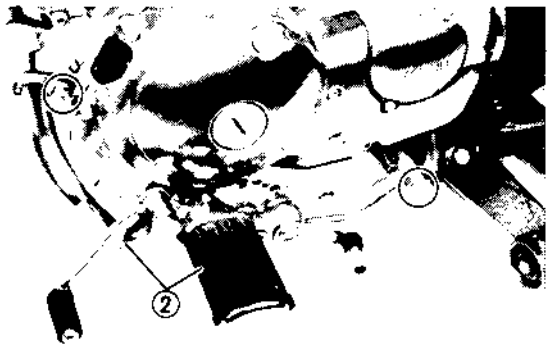
2. Remove:
   - Adjuster (Rear brake) ①
   - Spring ②
   - Brake rod ③

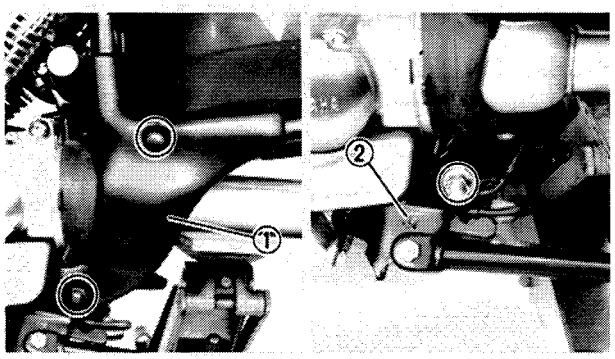


3. Remove:
   - Bolt (Change pedal) ①
   - Change pedal ②



4. Remove:
   - Brake pedal and footrest (Right) assembly ①
   - Change pedal and footrest (Left) assembly ②



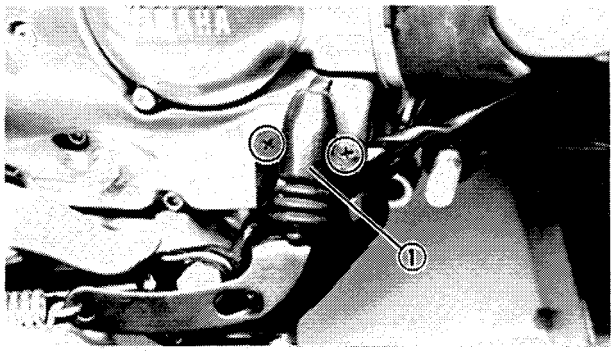


SIDESTAND AND SIDESTAND SWITCH

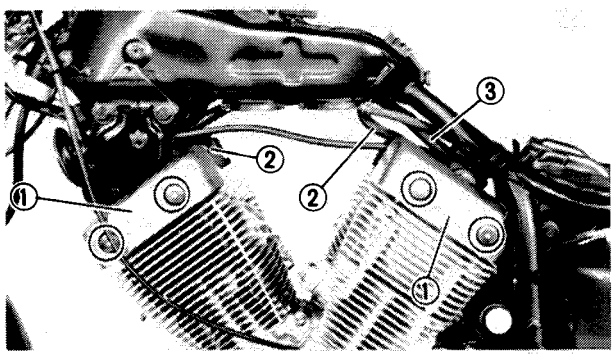
1. Remove:
   - Rear-under-side cover ①
   - Sidestand ②

WARNING:

Before removing the sidestand, securely support the motorcycle so there is no danger of it falling over.

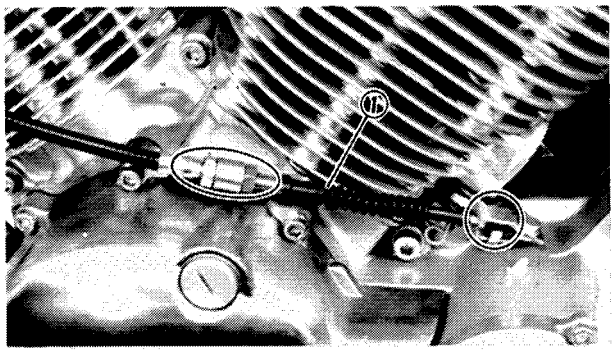


2. Remove:
   - Sidestand switch ①



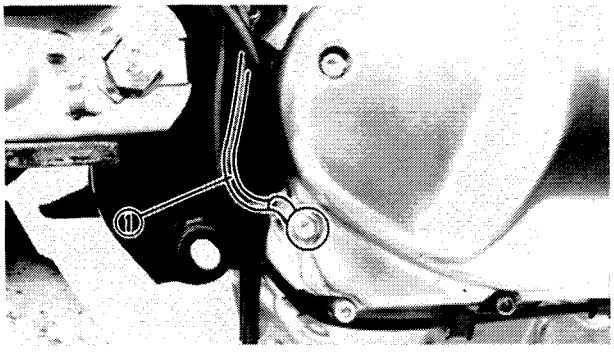
WIRING AND CABLES

1. Remove:
   - Side covers (Front and rear cylinders) ①
   - Spark plug leads (Front and rear cylinders) ②
   - Crankcase ventilation hose ③

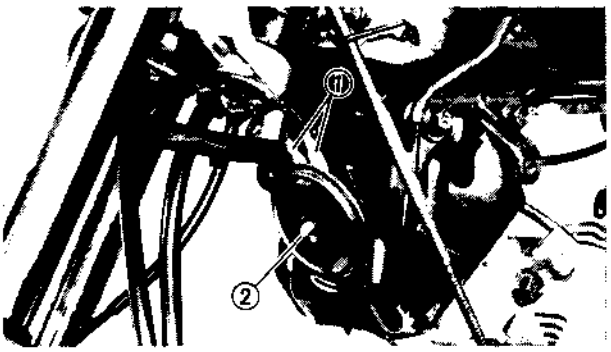


2. Disconnect:
   - Clutch cable ①

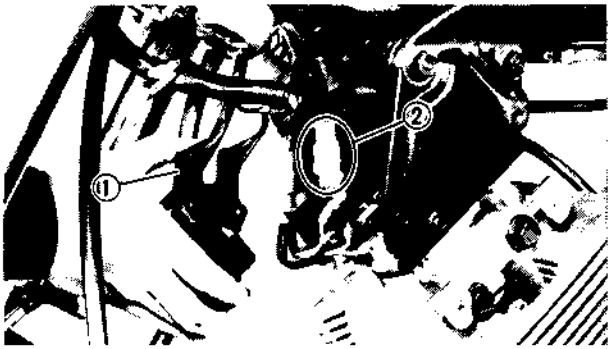
   Loosen the locknuts and disconnect the clutch cable.



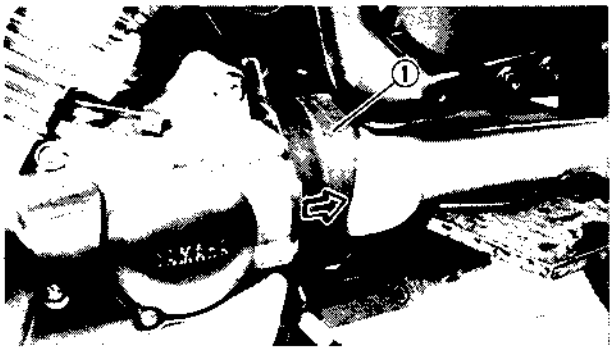
3. Disconnect:
   - Ground lead ①



4. Disconnect:
   - Horn leads ①
5. Remove:
   - Horn ②



6. Remove:
   - Cover (Ignition coil) ①
7. Disconnect:
   - Ignition coil couplers ②



8. Pull out the rubber boot ①

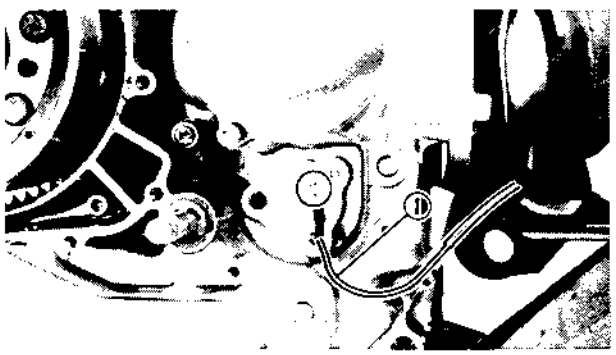


CRANKCASE COVER (LEFT)

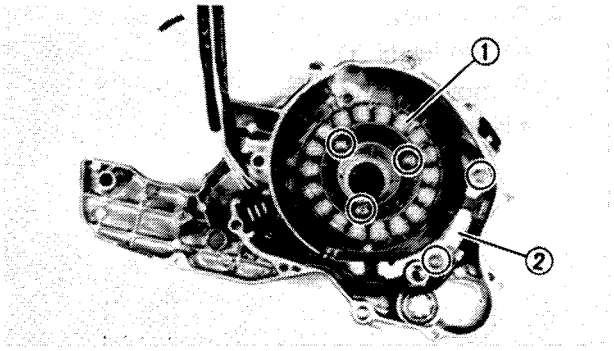
1. Remove:
   - Crankcase cover (Left) ①
   - Dowel pins
   - Gasket

NOTE:

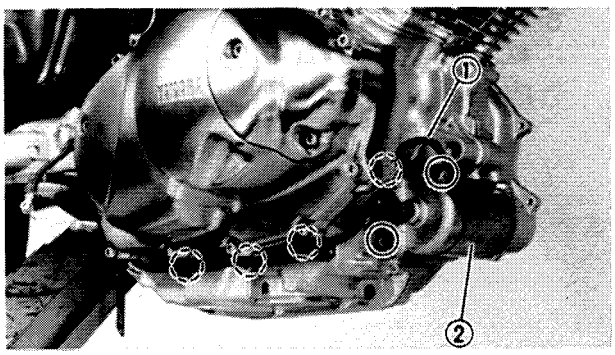
- Working in a crisscross pattern, loosen the bolts 1/4 turn each. Remove them after all are loosened.
- For this removal, slit in the crankcase cover can be use.
- Be sure not to give damages to the mating surface.



2. Disconnect:
   - Neutral switch lead ①

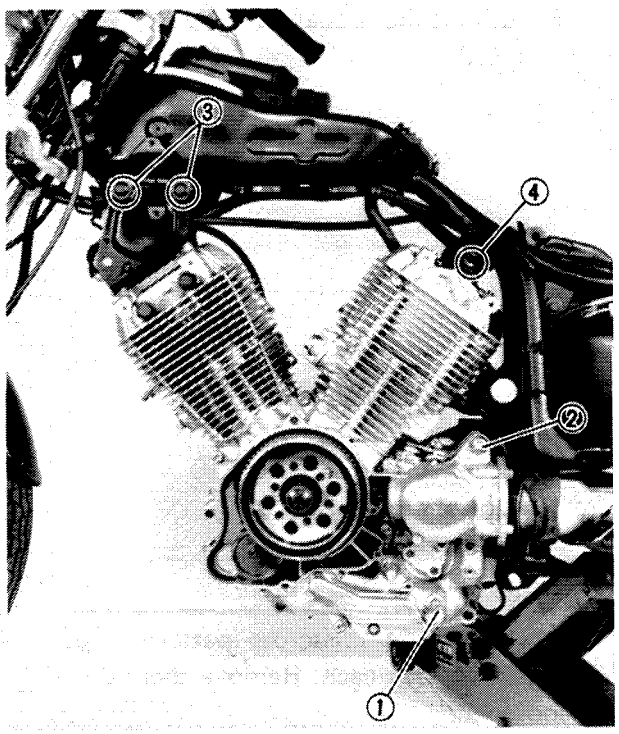


3. Remove:
   - Stator assembly ①
   - Pickup coil assembly ②



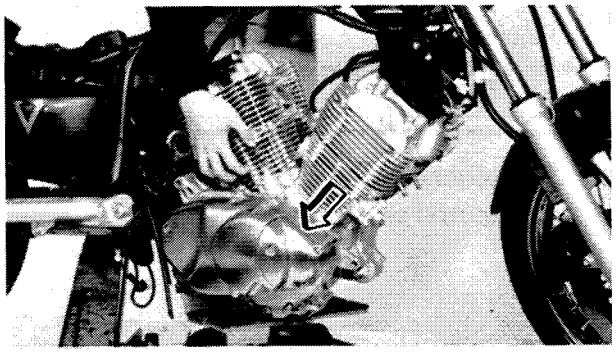
STARTER MOTOR

1. Disconnect:
   - Starter motor lead ①
     Loosen the clamp holding bolts.
   - Starter motor ②

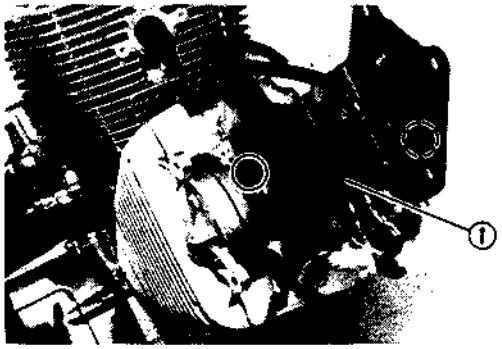


ENGINE REMOVAL

1. Place a suitable stand under the engine.
2. Remove:
   - Shaft (Crankcase – Rear Bottom) ①
   - Bolts (Crankcase – Rear Top) ②
   - Bolts (Front cylinder) ③
   - Bolts (Rear cylinder) ④



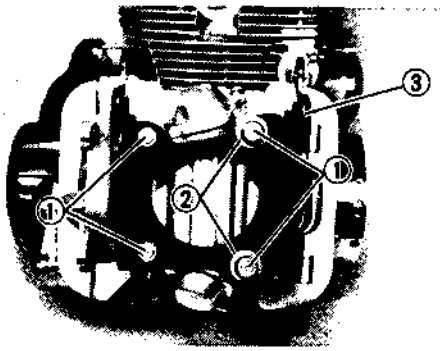
3. Remove:
   - Engine assembly
     From the right side.



DISASSEMBLY

ENGINE MOUNTING BRACKET AND IGNITION COILS

1. Remove:
   - Bracket (Ignition coils) ①
   - Spark plugs (Front and rear cylinder)



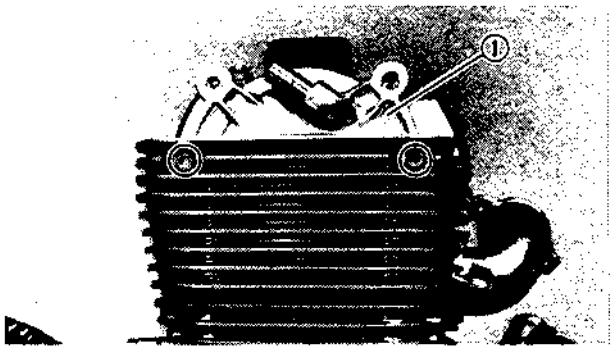
2. Remove:
   - Nuts (Front cylinder) ①
   - Washers (Front cylinder – Bracket Outside) ②
   - Bracket (Engine mounting) ③
   - Washers (Front cylinder – Bracket Inside)

CYLINDER HEAD/CYLINDER AND PISTON

NOTE:

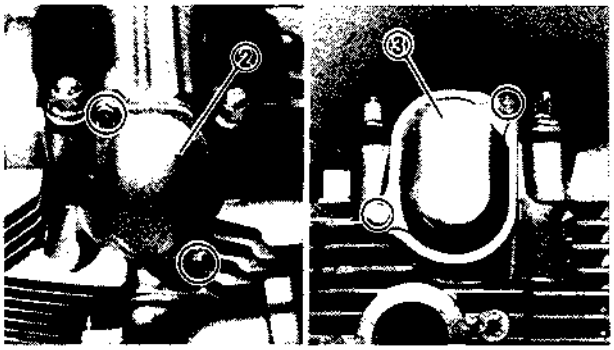
Identify following parts position carefully so that they can be reinstalled in them original place.

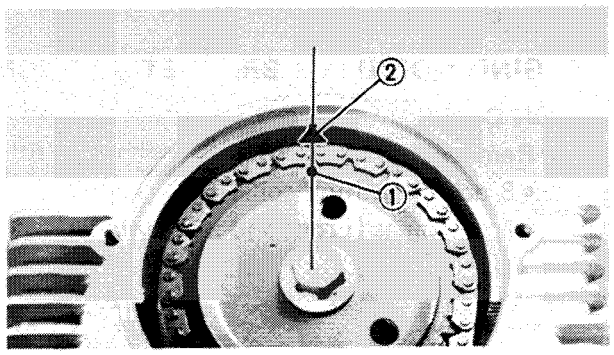
- Cam sprocket
- Cylinder head
- Cylinder
- Piston

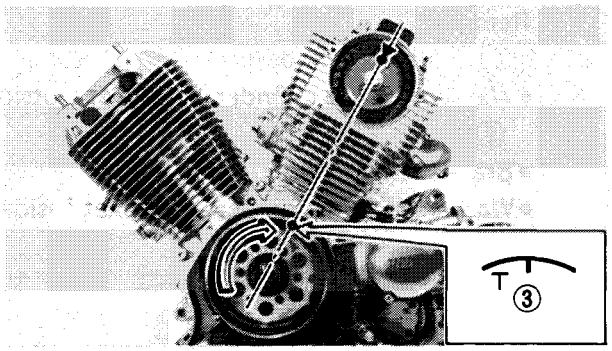


Rear Side

1. Remove:
   - Cam sprocket cover ①
   - O-ring (Cam sprocket cover)
   - Tappet cover (Exhaust) ②
   - O-ring (Exhaust cover)
   - Tappet cover (Intake) ③
   - O-ring (Intake cover)



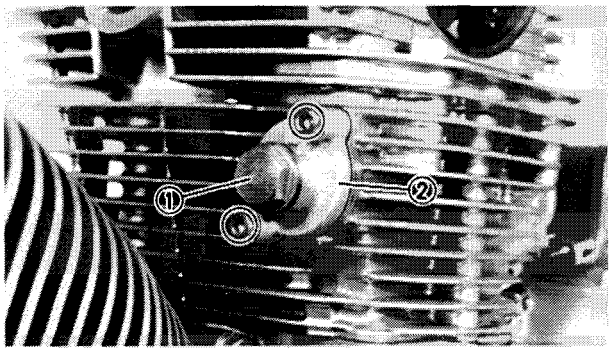




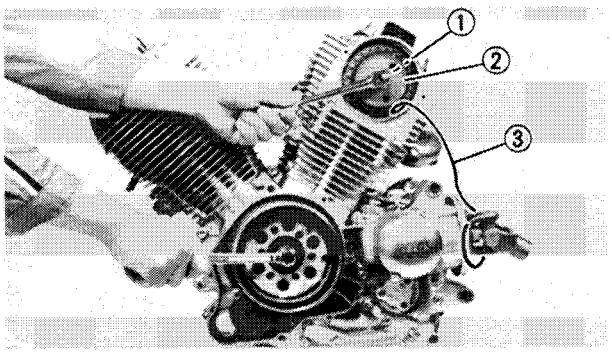
2. Align:
   - Cam sprocket punch mark
     With the stationary pointer on the rear cylinder head.

TDC alignment steps (Rear cylinder):
- Turn the crankshaft clockwise with wrench.
- Align the cam sprocket punch mark ① with the stationary pointer ② on the rear cylinder head. When the punch mark is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

NOTE:
TDC on compression stroke check:
- Both rocker arms must have a valve clearance when the "T" mark ③ on the rotor is aligned with the center line of the rear cylinder.
- If not, give the crankshaft one clockwise turn too meet above condition.

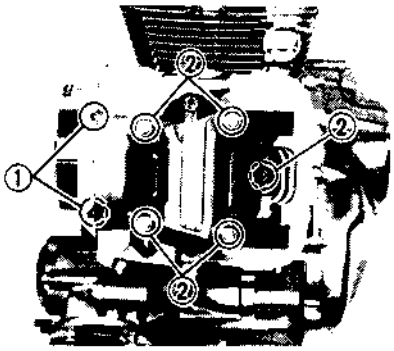


3. Loosen:
   - End plug (Cam chain tensioner) ①
4. Remove:
   - Cam chain tensioner ②
   - Gasket



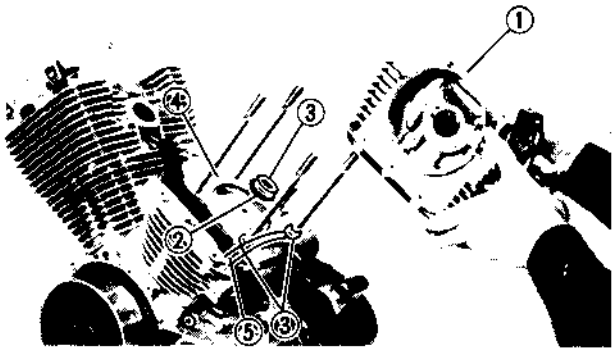
5. Remove:
   - Cam sprocket ①
   - Oil baffle plate (Rear cylinder only) ②
   - Dowel pin (Cam sprocket positioning)

NOTE:
- Hold the crankshaft end with a wrench.
- Fasten a safety wire ③ to the cam chain.
- When removing the cam sprocket, it is not necessary to separate the cam chain.

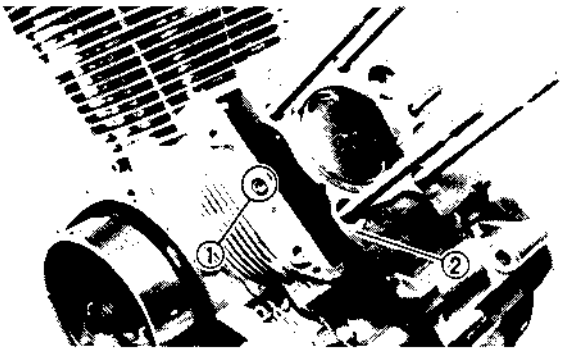


6. Remove:
   - Bolts (Cylinder head) ①
   - Nuts (Cylinder head) ②
   - Washers
   - Bracket (Engine mounting)

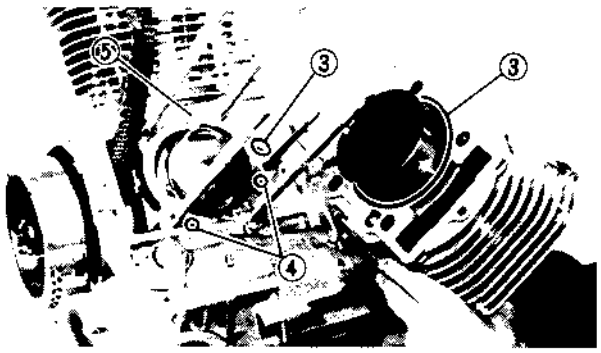
NOTE:
Loosen the bolts and nuts in this stage, using a crisscross pattern.

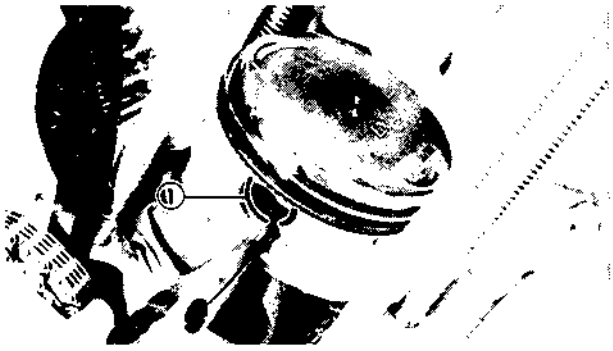


7. Remove:
   - Cylinder head ①
   - O-ring ②
   - Dowel pins ③
   - Gasket ④
   - Cam chain damper (Exhaust) ⑤



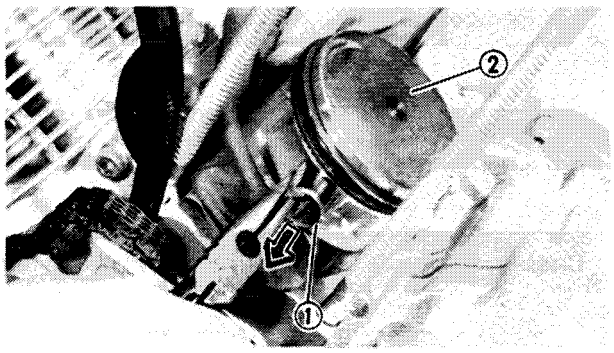
8. Remove:
   - Bolt (Cylinder) ①
   - Cylinder ②
   - O-rings ③
   - Dowel pins ④
   - Gasket ⑤





9. Remove:
   - Piston pin clip ①

NOTE:
Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.



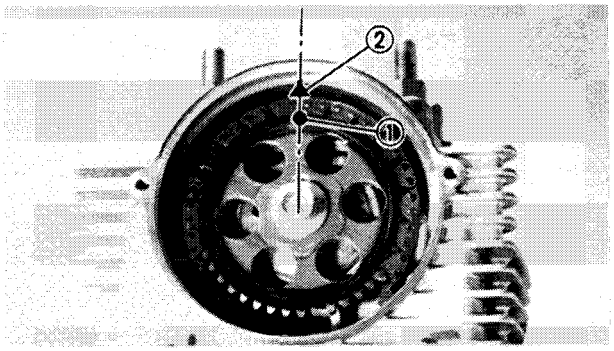
10. Remove:
    - Piston pin ①
    - Piston ②

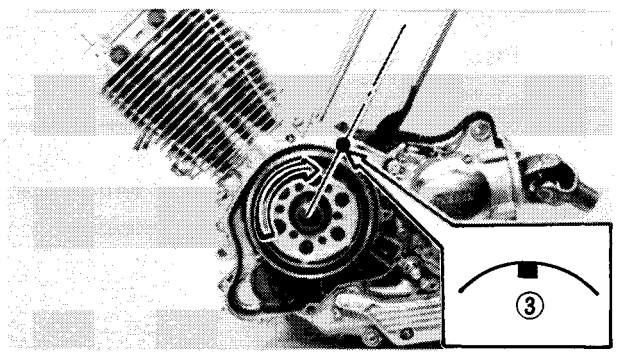
NOTE:
Before removing the piston pin, deburr the clip groove and pin hole area. If the piston pin groove is deburred and piston pin is still difficult to remove, use Piston Pin Puller (YU-01304).

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

Front Side
When removing the front side components, repeat the rear side removal procedure. However, note the following points.

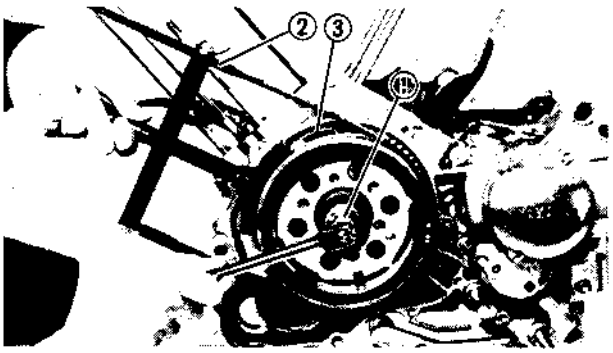
1. Align:
    - Cam sprocket punch mark
      With the stationary pointer on the front cylinder head.





TDC alignment steps (Front cylinder):
- Turn the crankshaft clockwise with wrench.
- Align the cam sprocket punch mark ① with the stationary pointer ② on the front cylinder head. When the slit ③ is aligned with the stationary pointer, the piston is at Top Dead Center (TDC).

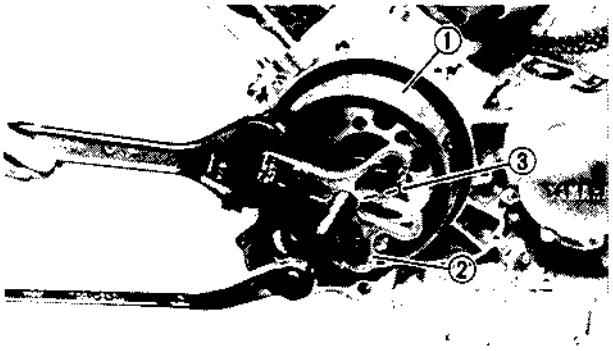
NOTE:
TDC on compression stroke check:
- Both rocker arms must have a valve celarance when the slit on the rotor is aligned with the center line of the rear cylinder.
- If not, give the crankshaft one clockwise turn too meet above condition.



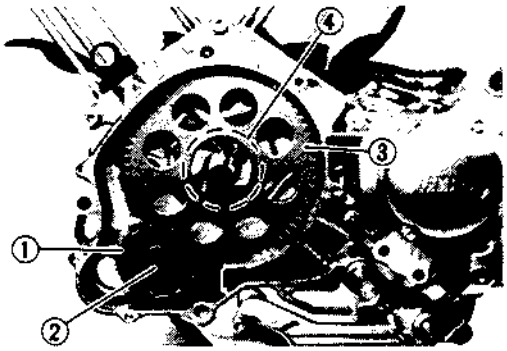
CDI MAGNETO

1. Remove:
   - Bolt (Rotor) ①
     Using the Sheave Holder ② (YS-01880) to lock the rotor.

NOTE:
Do not allow the special tool to touch the projection ③ on the rotor.

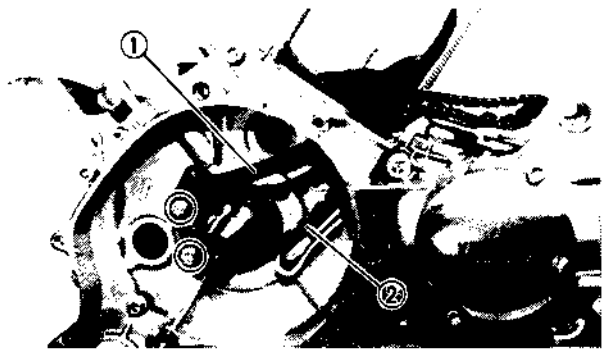


2. Remove:
   - Rotor ①
     Use the Flywheel Puller Set ② (YU-33270) and Adapter (YM-33282) ③.
   - Woodruff key



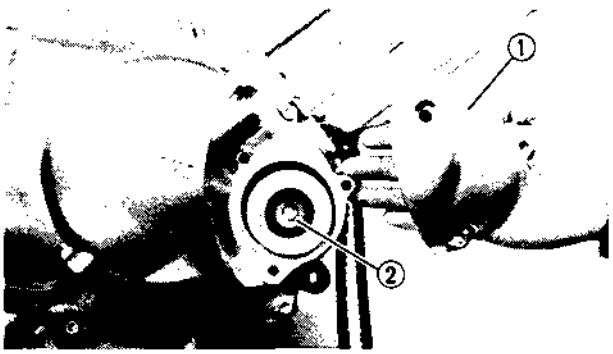
3. Remove:
   - Idler gear # 1 ①
   - Shaft (Idler gear # 1) ②
   - Idler gear # 2 ③
   - Washer ④

NOTE:
When removing the idler gear # 2, the washer ④ fall out. Take care not to lose it.

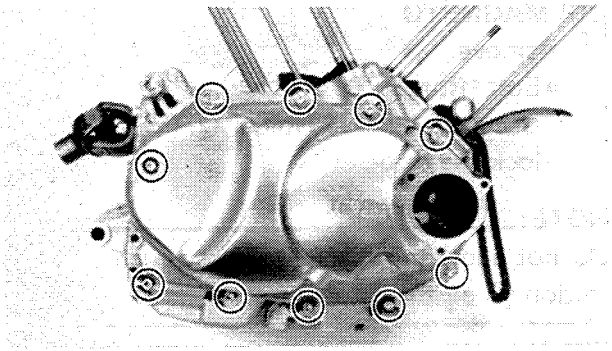


4. Remove:
   - Cam chain damper (Rear cylinder — Intake) ①
   - Cam chain ②

CRANKCASE COVER (RIGHT)

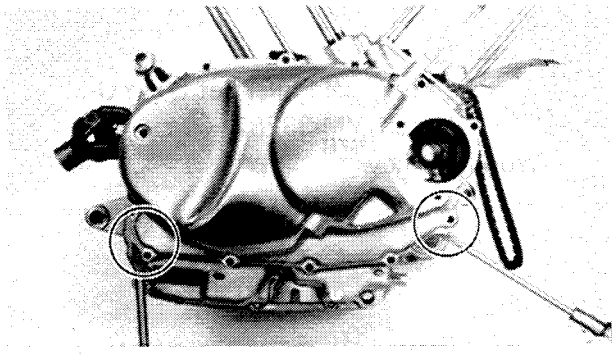


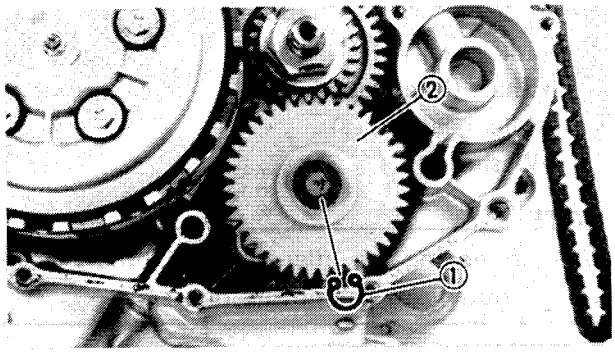
1. Remove:
   - Oil filter cover ①
   - Oil filter ②
   - O-ring (Filter cover)



2. Remove:
   - Crankcase cover (Right)
   - Gasket
   - Dowel pins

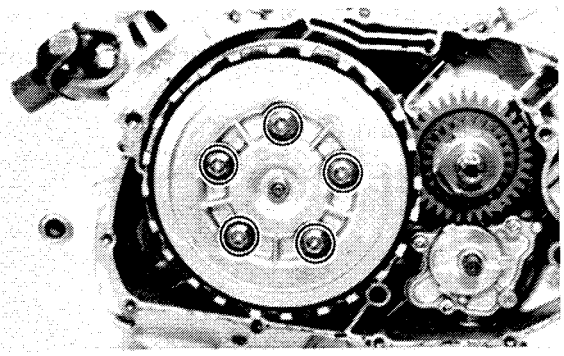
NOTE:
- Working in a crisscross pattern, loosen bolt 1/4 turn each. Remove them after all are loosened.
- For this removal, slits in the crankcase can be use as shown.
- Be sure not to give damages to the mating surface.





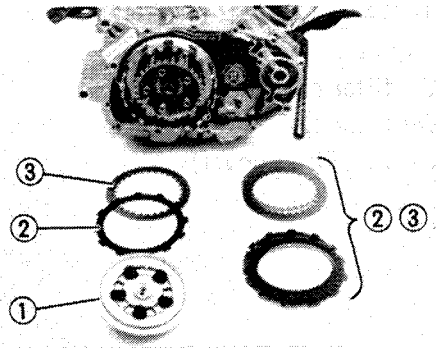
CLUTCH

1. Remove:
   - Clip ①
   - Oil pump gear ②

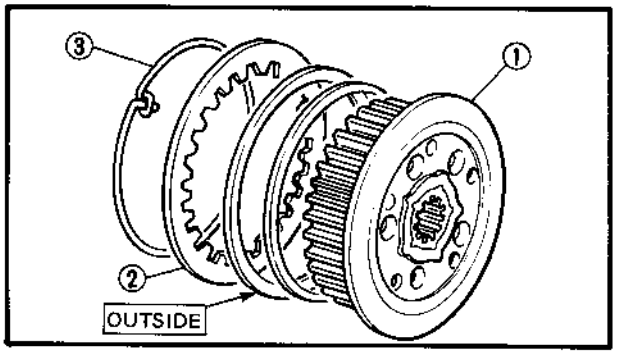


2. Remove:
   - Screws (Clutch spring)
   - Clutch springs

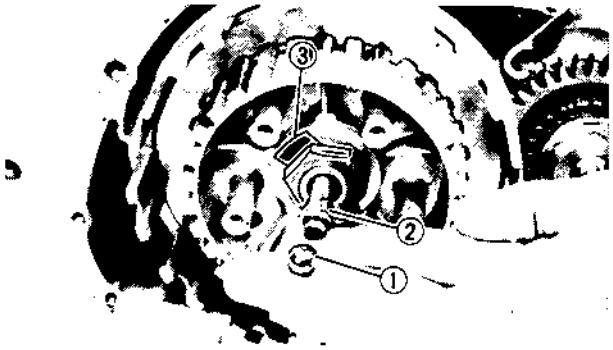
NOTE:
Loosen the screws in this stage, using a crisscross pattern.



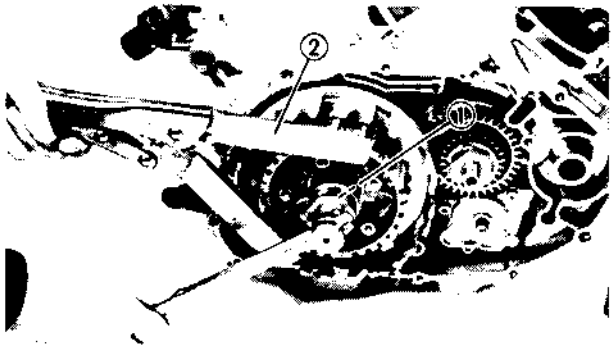
3. Remove:
   - Pressure plate ①
   - Friction plates (6 pcs.) ②
   - Clutch plates (5 pcs.) ③



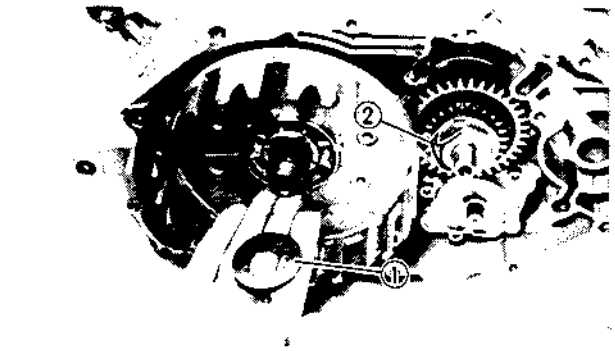
NOTE:
The clutch boss ① contains a built-in damper beneath the clutch plate ② . It is not necessary to remove the wire circlip ③ and disassemble the built-in damper unless there is serious clutch chattering.



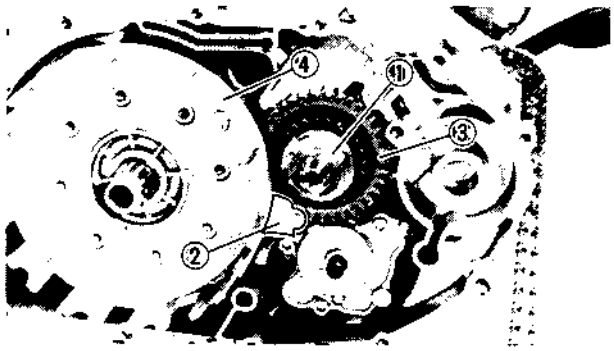
4. Remove:
   - Ball ①
   - Push rod # 2 ②
5. Straighten:
   - Lock washer tab ③



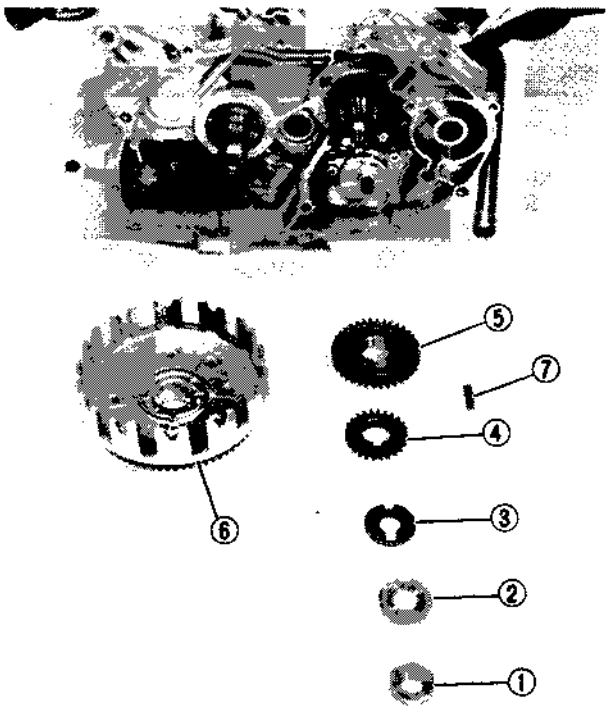
6. Remove:
   - Locknut (Clutch boss) ①
     Use the Universal Clutch Holder ② (YM-91042) to hold the clutch boss.
   - Lock washer
   - Clutch boss



7. Remove:
   - Holding plate ①
8. Straighten:
   - Lock washer tabs (Primary drive gear) ② .

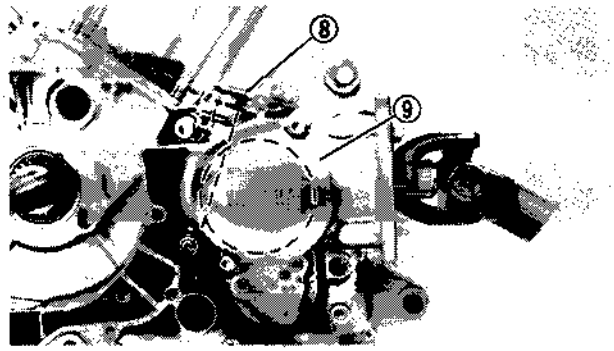


9. Loosen:
   - Nut (Primary drive gear) ①
     Place a folded rag ② between the teeth of the drive gear ③ and driven gear ④ to lock them.



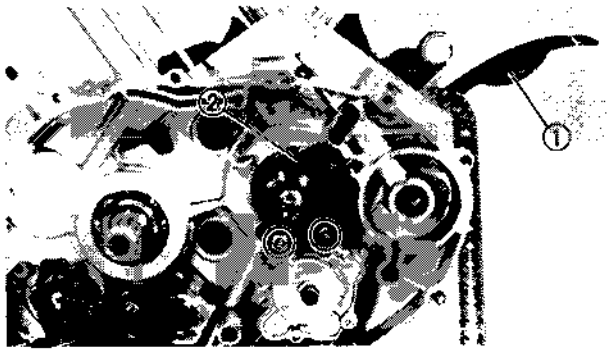
10. Remove:
- Nut (Primary drive gear) ①
- Lock washer ②
- Holding plate ③
- Oil pump drive gear ④
- Primary driven gear ⑤
- Primary drive gear ⑥
- Key ⑦

NOTE:
It is necessary to remove the middle drive gear ⑨ in order to remove the clutch push lever axle ⑧.

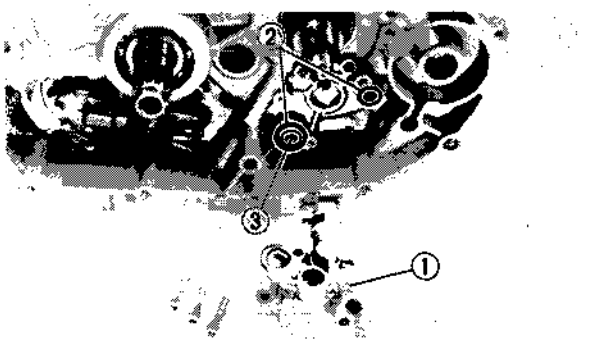


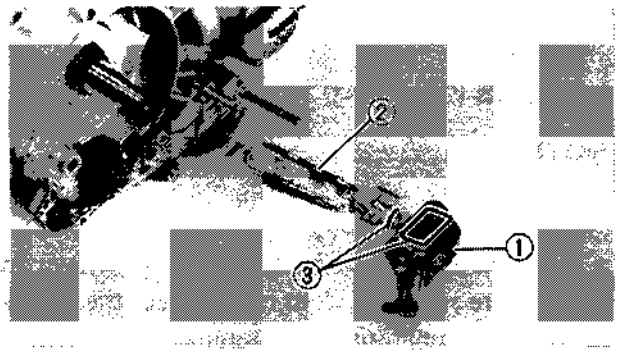
OIL PUMP

1. Remove:
- Cam chain damper (Front cylinder – Exhaust) ①
- Cam chain ②

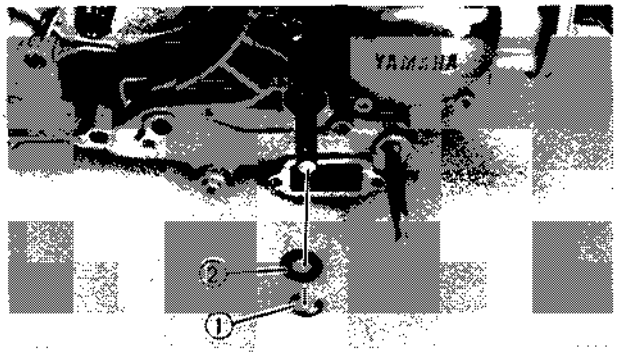


2. Remove:
- Oil pump assembly ①
- O-rings ②
- Powel pin ③



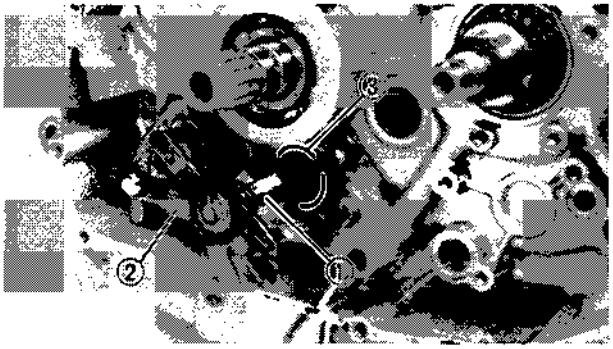


3. Remove:
   - Oil passage housing ①
   - Oil strainer ②
   - O-rings ③



SHIFT SHAFT

1. Remove:
   - Circlip ①
   - Plain washer ②



2. Unhook the torsion spring from its position.
3. Remove:
   - Shift shaft ①
   - Stopper lever ②

   Pull out the shift shaft with stopper lever.

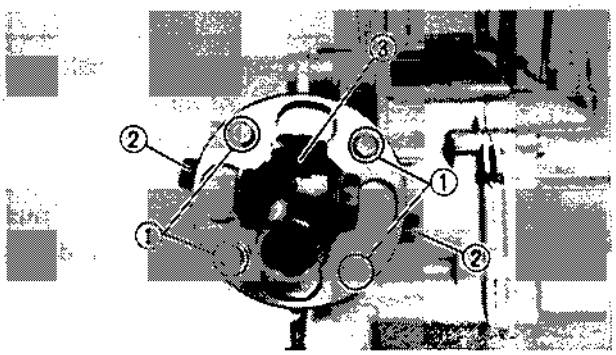
NOTE:

When removing the shift shaft, the plain washer ③ will fall out. Take care not to lose it.

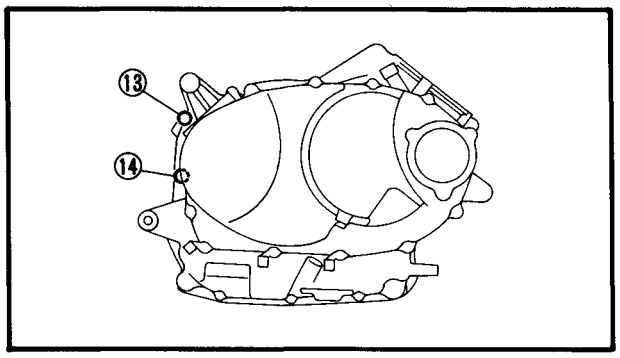


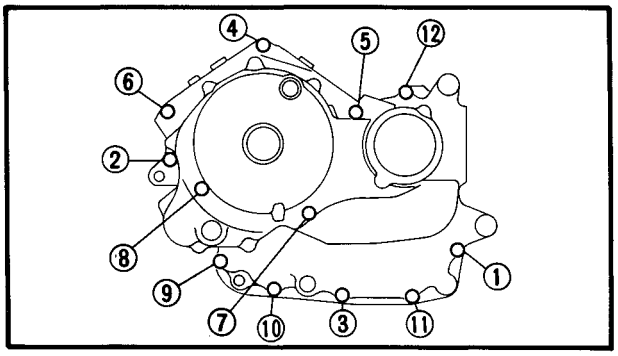
MIDDLE DRIVEN GEAR

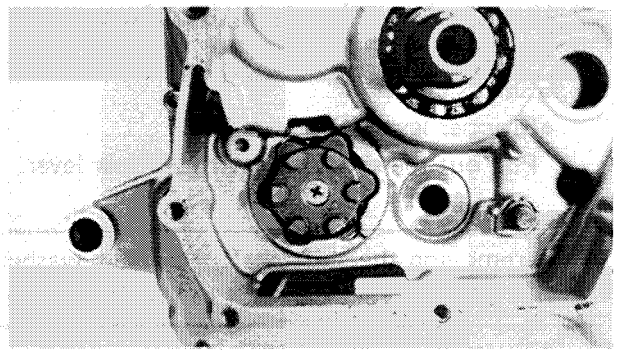
1. Remove:
   - Middle gear case ①
   - O-ring

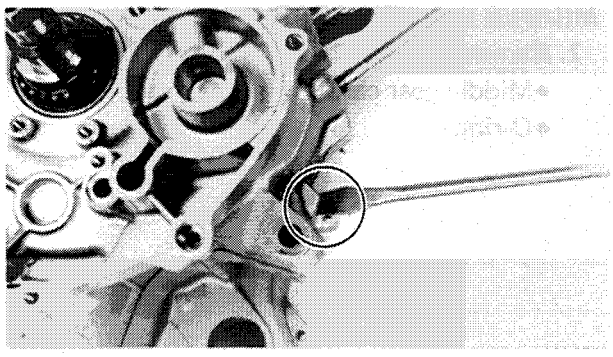


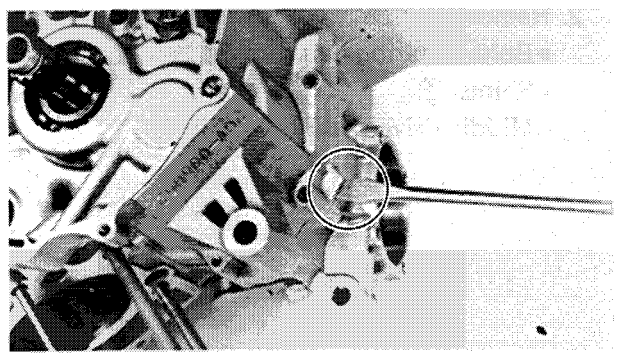
2. Remove:
   - Bolts (Bearing housing) ①
   - Shims ②
   - Middle driven gear assembly ③











CRANKCASE

1. Remove:
   - Bolts (Crankcase) ① ~ ⑭

NOTE:
- Remove the bolts starting with the highest numbered one.
- Turn the shift cam to the position shown in the figure so that it does not contact the crankcase when separating the crankcase.

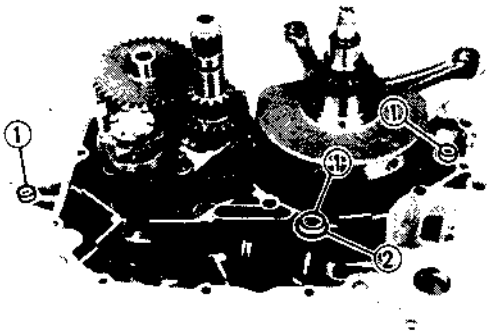
2. Remove:
   - Crankcase (Right)

   As pressure is applied, alternately tap on the front engine mounting boss, transmission shafts, and shift cam.

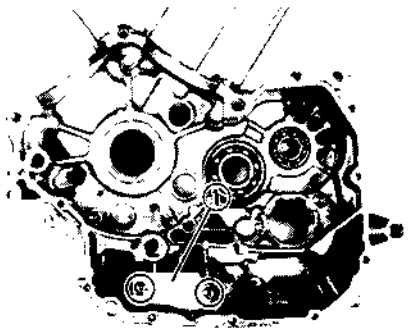
NOTE:
- Fot this removal , slits in the crankcase can be use as shown.
- Be sure not to give damages to the mating surface.

CAUTION:

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



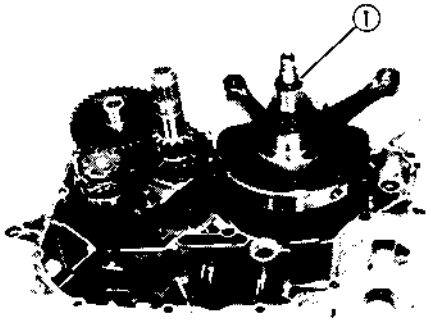
3. Remove:
   - Dowel pins ①
   - O-ring ②



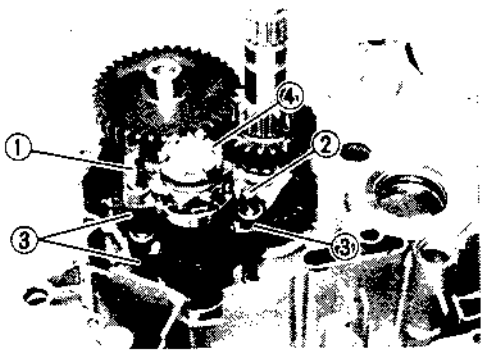
4. Remove:
   - Oil baffle plate ①

NOTE:
If the crankcase (Right) has to be replaced, remove the oil baffle plate; otherwise, the removal of the oil baffle plate is unnecessary.

CRANKSHAFT AND TRANSMISSION

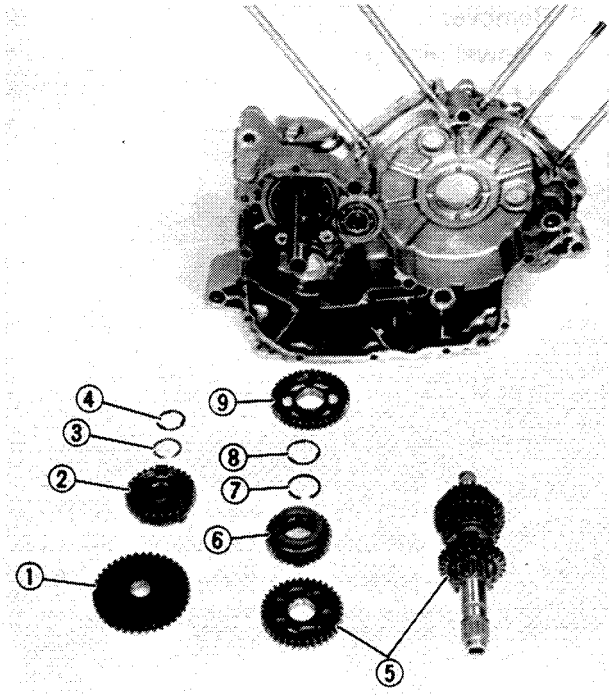


1. Remove:
   - Crankshaft ①

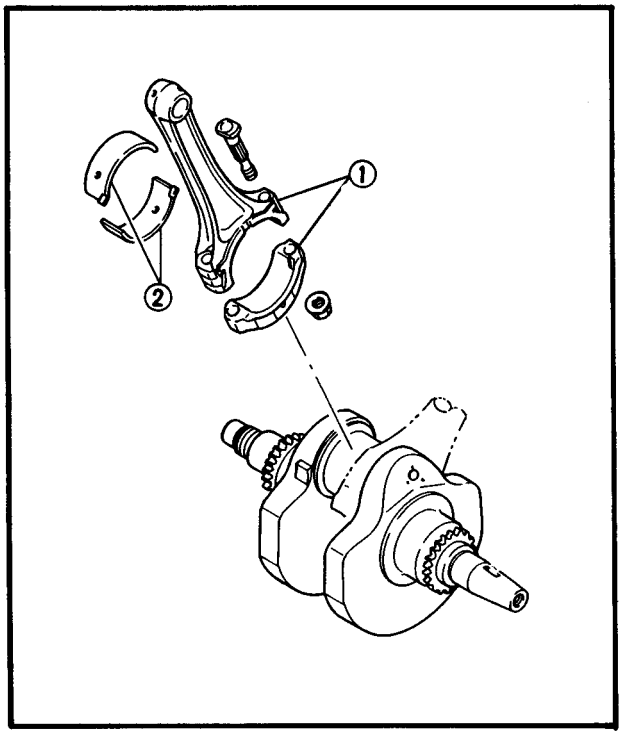


2. Remove:
   - Guide bar (Rear — Longer) ①
   - Guide bar (Front — Shorter) ②
   - Shift forks ③
   - Shift cam ④

NOTE:
Note the position of each part. Pay particular attention to the location and direction of shift forks.



3. Remove:
   - 1st wheel gear (38T) ①
   - 4th wheel gear (28T) ②
   - Circlip ③
   - Washer ④
   - 3rd wheel gear (35T) and main axle assembly ⑤
   - 5th wheel gear (29T) ⑥
   - Circlip ⑦
   - Washer ⑧
   - 2nd wheel gear (38T) ⑨



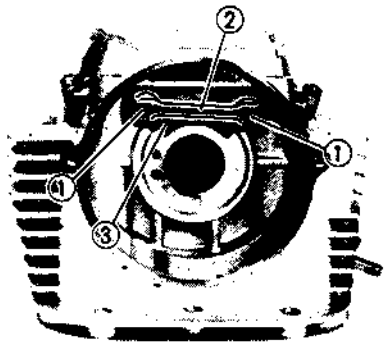
4. Remove:
   - Connecting rod ①
   - Connecting rod bearings ②

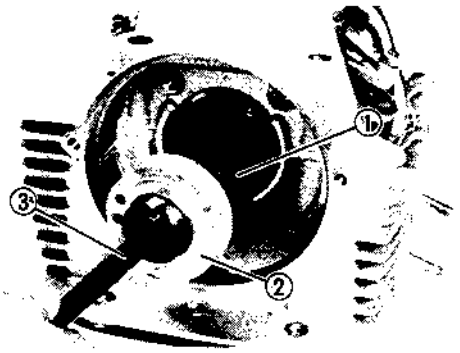
   From the crankshaft.

INSPECTION AND REPAIR

ROCKER ARMS AND ROCKER ARM SHAFTS

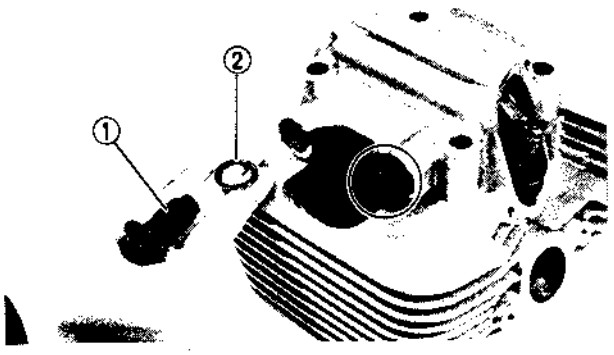
1. Remove:
   - Tappet covers (Intake and exhaust)
2. Loosen:
   - Locknuts
   - Adjusters
3. Straighten:
   - Lock washer tabs
4. Remove:
   - Bolts (Camshaft) ①
   - Lock washer ②
   - Retainer ③



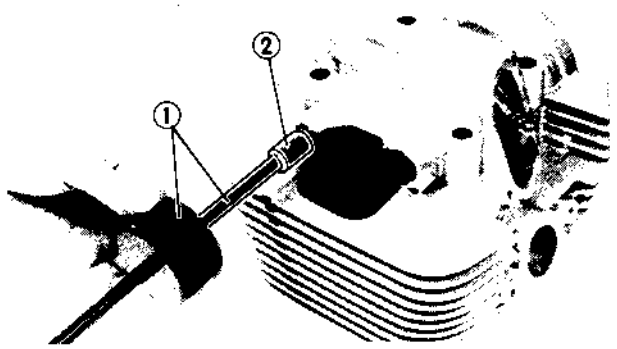


5. Remove:
   - Camshaft ①
   - Camshaft bushing ②

NOTE:
Screw in a suitable length of 10 mm bolt ③ into the thread hole on the camshaft, and pull out the camshaft.

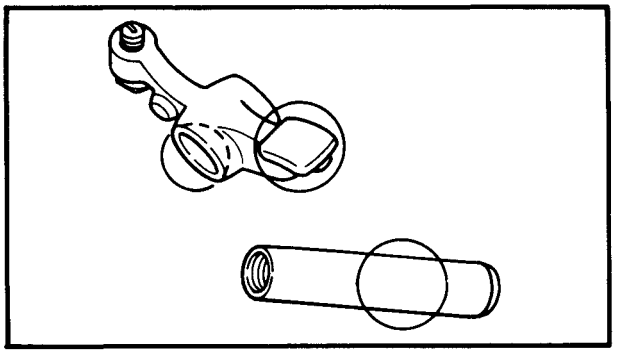


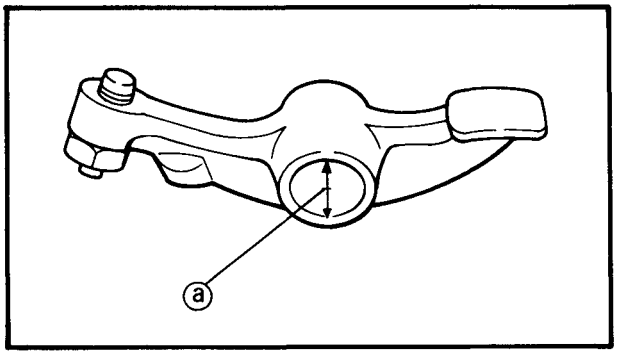
6. Remove:
   - Holding bolts (Rocker arm shafts) ①
   - Copper washers ②

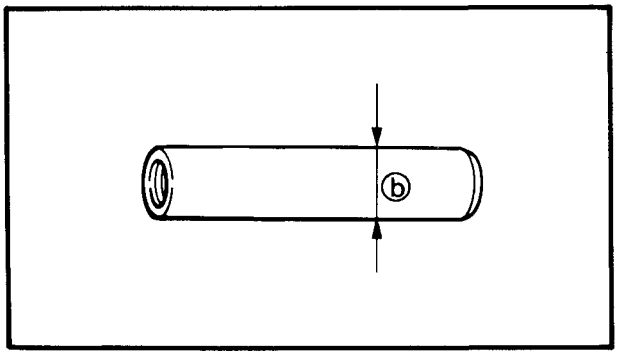


7. Attach:
   - Slide Hammer Set ① (YU-01083)
8. Remove:
   - Rocker arm shafts ②
   - Rocker arms (Intake and Exhaust)

NOTE:
Remove the rocker arm (Exhaust) through the rocker arm hole (Intake).







9. Inspect:
   - Rocker arm shafts
   - Rocker arms

   Wear/Damage → Replace.

Rocker arm shaft and arm inspection steps:
- Inspect the two areas on the rocker arm for sings of unusual wear.
  1) Rocker arm shaft hole.
  2) Cam-lobe-contact surface.
     Excessive wear → Replace.
- Inspect the surface condition of the rocker arm shaft.
  Pitting/Scratches/Blue discoloration → Replace/Check lubrication.
- Measure the inside diameter ⓐ of the rocker arm hole.
  Out of specification → Replace.

Rocker Arm Inside Diameter Limit:
14.078 mm (0.5543 in)

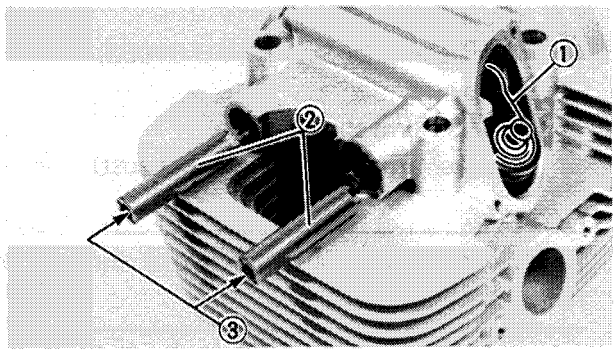
- Measure the outside diameter ⓑ of the rocker arm shaft.
  Out of specification → Replace.

Rocker Arm Shaft Outside Diameter Limit:
13.950 mm (0.5492 in)

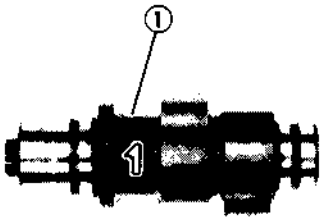
- Calculate the clearance by subtracting the rocker-arm-shaft outside diameter from the rocker-arm inside diameter.
  Clearance is greater tha 0.08 mm (0.0032 in) → Replace either or both parts.

Arm-to-shaft Clearance (Standard):
0.009 ~ 0.038 mm
(0.0004 ~ 0.0015 in)

10. Install:
    - Rocker arms ①
    - Rocker arm shafts ②



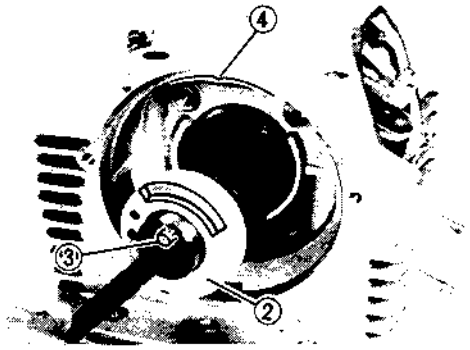
NOTE:
- Install the rocker arm (Exhaust) through the rocker arm hole (Intake).
- Thread hole ③ of the rocker arm shaft should be placed outside.
- Do not install the holding bolts at this point.



11. Install:
    - Camshaft ①
    - Camshaft bushing ②

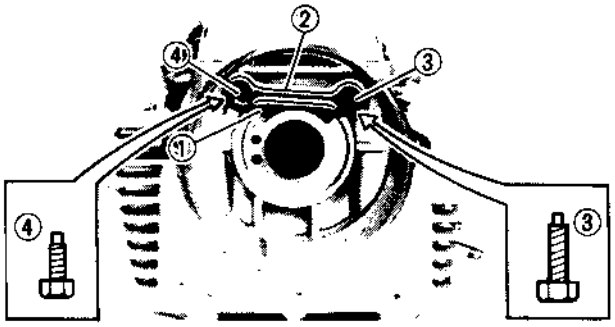
    To the cylinder head.

NOTE:
- Install the # 1 camshaft into the rear cylinder head.
- The pin ③ on the end of the camshaft must align with the timing mark ④ on the cylinder head.
- The cut-out portion of the bushing must be flush with the cylinder head.



CAUTION:

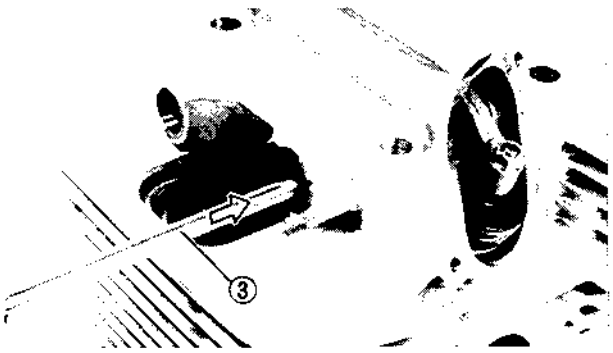
Do not cock the bushing during installation. The bushing must be perpendicular to the camshaft during installation.



12. Install:
    - Retainer ①
    - Lock washer (New) ②
    - Bolt (Camshaft – Exhaust) ③
    - Bolt (Camshaft – Intake) ④

CAUTION:

The bolt (Exhaust side) has longer length, and the bolt (Intake side) has shorter length.

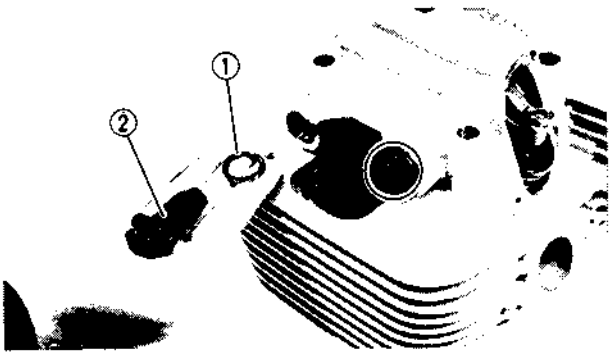


Bolts (Camshaft):
20 Nm (2.0 m·kg, 14 ft·lb)

13. Bend the lock washer tabs.
14. Install:
    - Copper washers ①
    - Holding bolts (Rocker arm shafts) ②

NOTE:

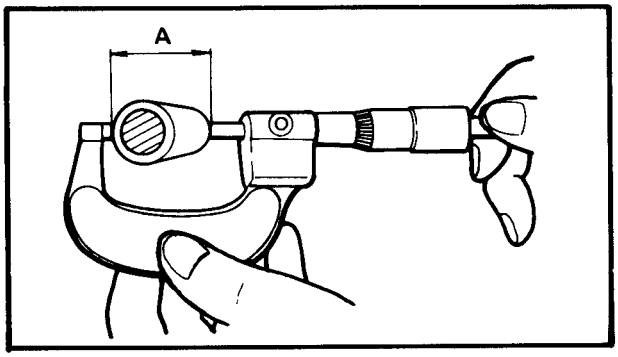
Before tightening the holding bolts, slightly turn and push the rocker arm shaft using the screwdriver ③ until the bolt end fits into the slot in the rocker arm shaft end.

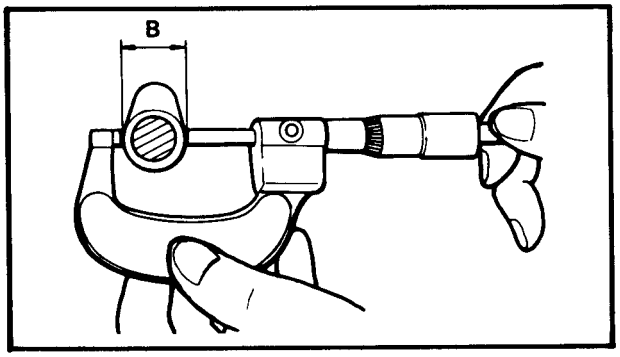


Holding Bolts (Rocker Arm Shaft):
38 Nm (3.8 m·kg, 27 ft·lb)

CAMSHAFT

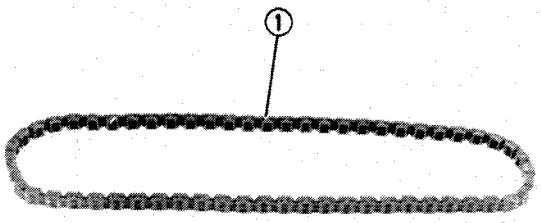
1. Remove:
   - Camshaft
     Refer to "ROCKER ARMS AND ROCKER ARM SHAFTS" section.
2. Inspect:
   - Camshaft bushing
     Wear/Damage → Replace.





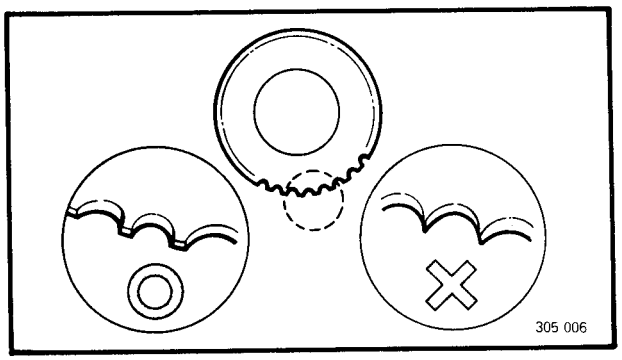
3. Inspect:
   - Cam lobes
     Pitting/Scratches/Blue discoloration → Replace.
4. Measure:
   - Cam lobes
     Use a Micrometer.
     Out of specification → Replace.

	Cam Lobe Limit "A"	Cam Lobe Limit "B"
Intake	39.73 mm (1.564 in)	32.22 mm (1,269 in)
Exhaust	39.67 mm (1.562 in)	31.30 mm (1.232 in)



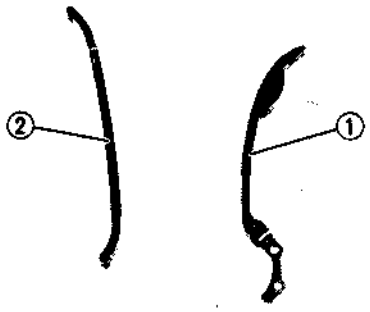
CAM CHAIN

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



CAM SPROCKET

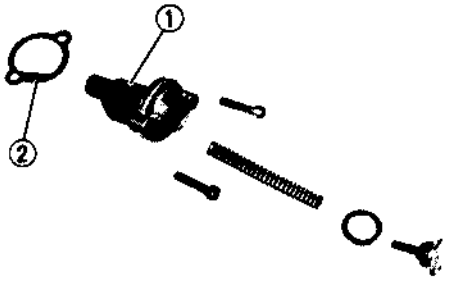
1. Inspect:
   - Cam sprocket
     Wear/Damage → Replace.



CHAIN DAMPERS

1. Inspect:
   - Cam chain damper (Intake) ①
   - Cam chain damper (Exhaust) ②

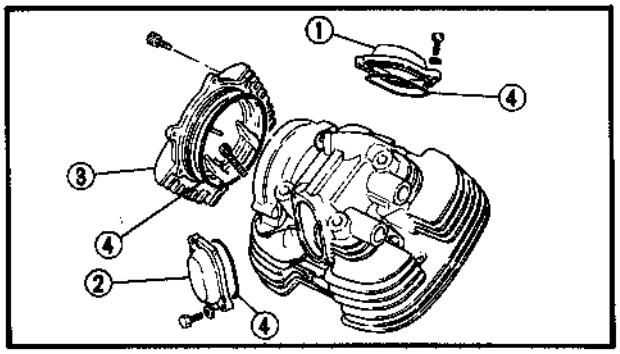
   Wear → Replace.



CAM CHAIN TENSIONER

1. Inspect:
   - Chain tensioner rod ①
   - Gasket ②

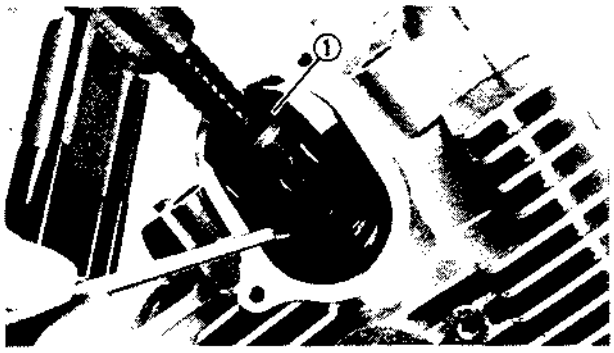
   Damage/Wear → Replace.



TAPPET COVER AND CAM SPROCKET COVER

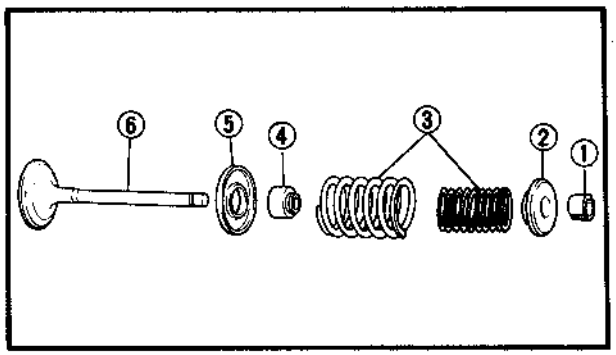
1. Inspect:
   - Tappet covers (Intake and exhaust) ①, ②
   - Cam sprocket cover ③
   - O-rings ④

   Damage → Replace.

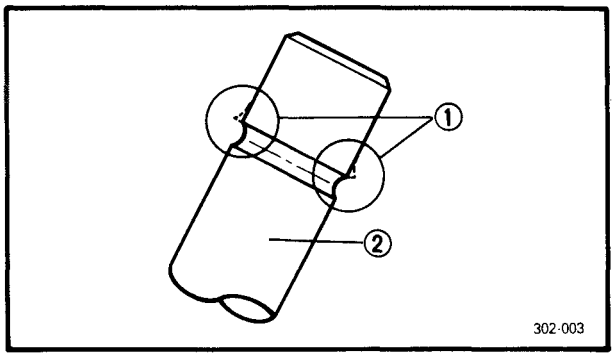


CYLINDER HEAD

1. Attach:
   - Valve Spring Compressor ① (YM-04019)



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

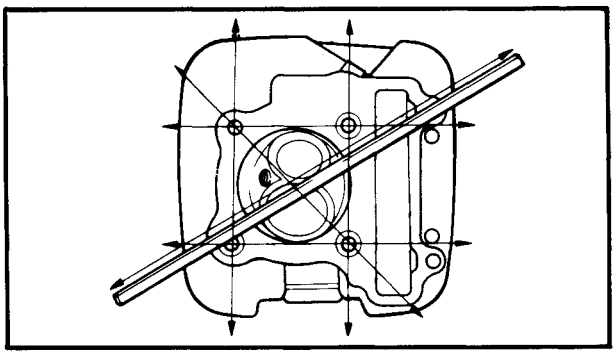


NOTE:
Deburr any deformed valve stem end. Use an oil stone to smooth the stem end.

① Deburr
② Valve stem

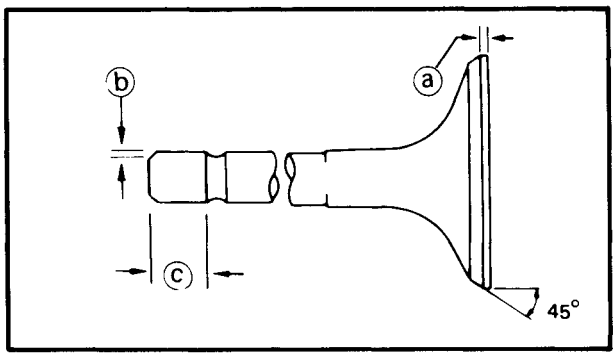
3. Eliminate:
   • Carbon deposit
   Use the rounded scraper.

NOTE:
Do not use a sharp instrument and avoid damaging or scratching:
• Spark plug thread
• Valve seat
• Cylinder head



4. Measure:
   • Cylinder head warpage
   Out of specification → Resurface/Replace.

Cylinder Head Warp.Limit:
Less than 0.03 mm (0.0012 in)

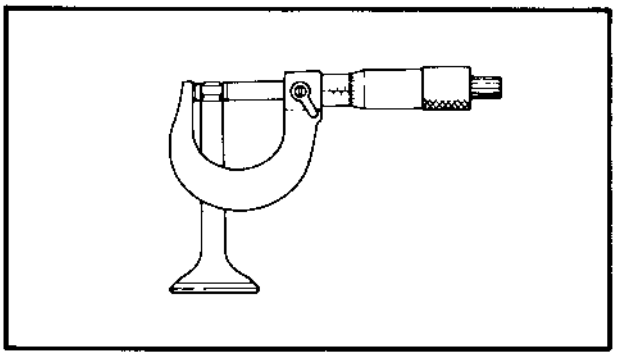


VALVE, VALVE GUIDE, AND VALVE SEAT

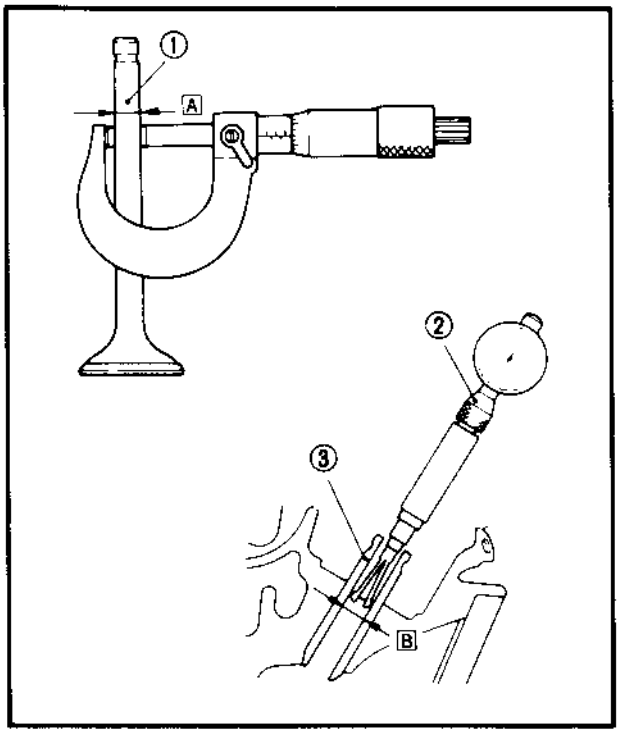
Intake and Exhaust Valve

1. Check:
   • Valve face
   • Stem end
   Wear/Pitting/Out of specification → Replace.

Minimum Thickness (Service Limit) ⓐ:
0.8 mm (0.031 in)
Beveled ⓑ: 0.5 mm (0.020 in)
Minimum Length (Service Limit) ⓒ:
4.0 mm (0.157 in)



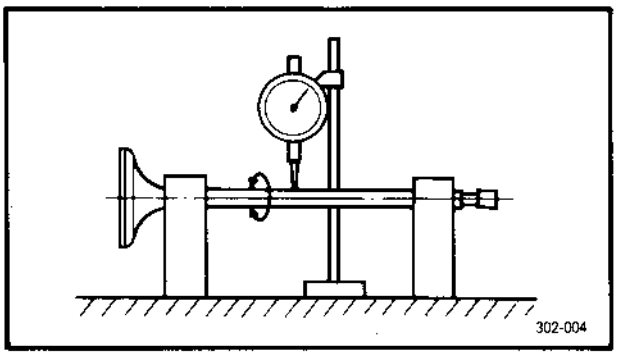
2. Inspect:
- Valve stem end
  Mushroom shape/Larger diameter than rest of stem → Replace valve, valve guide, and oil seal.



3. Measure:
- Valve stem clearance
  Use the Micrometer and Bore Gauge ②.
  Out of specification → Replace either valve ① and/or guide ③.

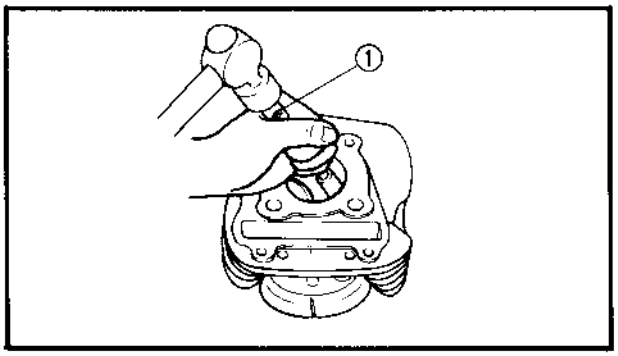
Valve Stem Clearance = B – A		
	Valve Stem Clearance	Maximum
Intake	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.10 mm (0.0039 in)

[A] VALVE STEM OUTSIDE DIAMETER
[B] VALVE GUIDE INSIDE DIAMETER



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

Maximum Runout: 0.03 mm (0.0012 in)



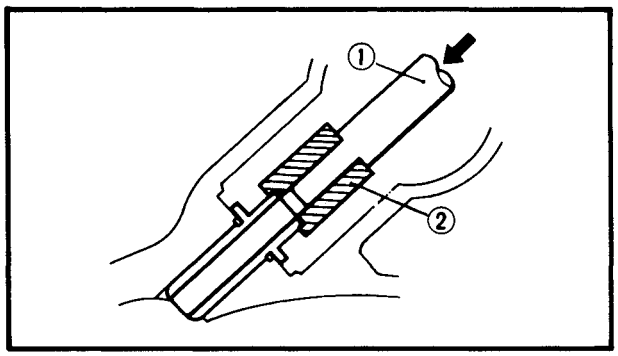
Valve Guide

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

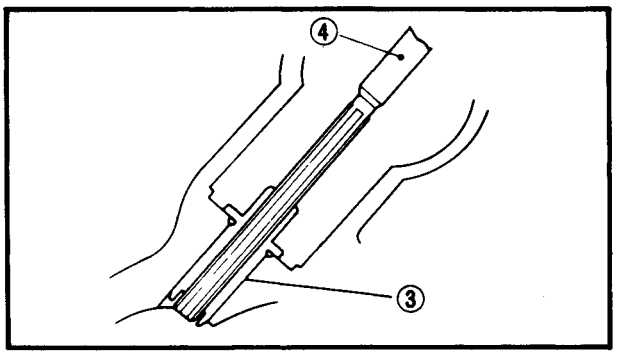
1. Remove:
- Valve guide
  Use a Valve Guide Remover ① (YM-01225).

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

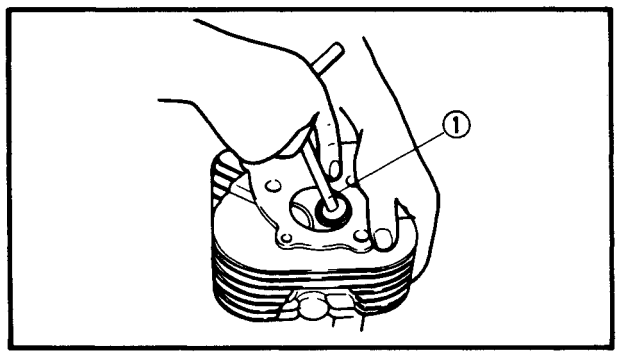
2. Inspect:
   - Valve guides
     Wear/Oil leakage into cylinder → Replace.



3. Install:
   - Circlip (New)
   - Valve guide (Oversize)
     Use a Valve Guide Remover ① with Valve Guide Installer ② (YM-04017).



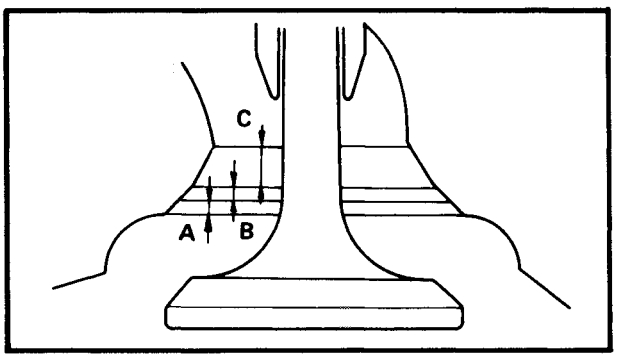
NOTE:
After installing valve guide ③ :
- Use the 7.0 mm Valve Guide Reamer ④ (YM-01227) to obtain proper valve guide/valve stem clearance.
- Recut the valve seat.



Valve Seat

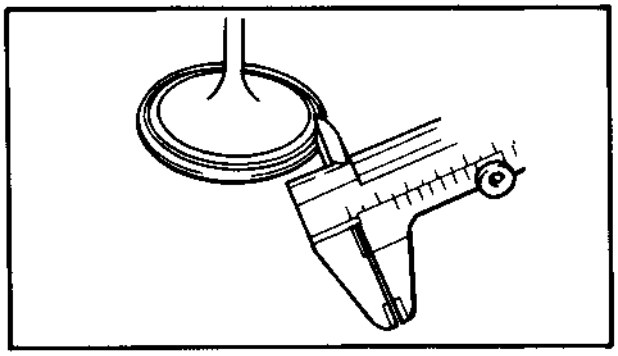
1. Inspect:
   - Valve seats
     Wear/Pitting/Valve replacement → Resurface seat at 45° angle.

CAUTION:
Clean valve seat if pitted or worn using the 45° Valve Seat Cutter (YM-91043) ①. When twisting cutter, keep an even downward pressure to prevent chatter marks.



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

2. Measure:
   • Valve seat width
3. Apply:
   • Mechanics bluing dye (Dykem)
   To valve and seat.
4. Position:
   • Valves
   Into cylinder head.
   Press the valve through the valve guide and onto the valve seat to make a clear pattern.



5. Inspect:
   • Valve seat surface
   Wherever valve seat and valve face made contact, bluing will have been removed.
6. Measure:
   • Valve seat width "a"
   Out of specification/Pitting/Variation of valve seat width → Cut valve seat further.

CAUTION:

Remove just enough material to achieve satisfactory seat.

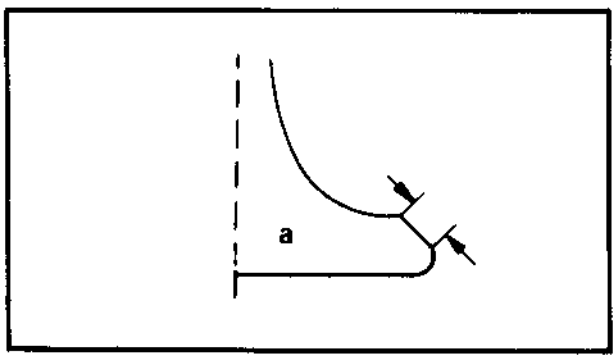
Seat Width:
Standard:
1.0 ~ 1.2 mm (0.04 ~ 0.005 in)
Wear Limit:
1.4 mm (0.055 in)

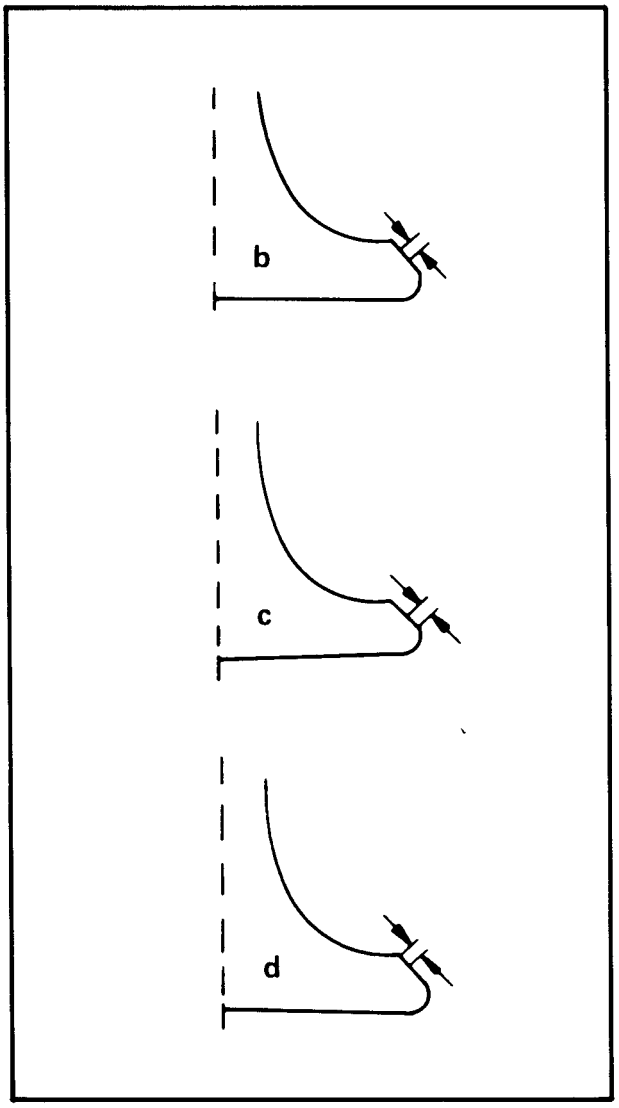
Valve seat recutting steps are necessary if:
• Valve seat is uniform around perimeter of valve face but too wide or not centered on valve face.

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).

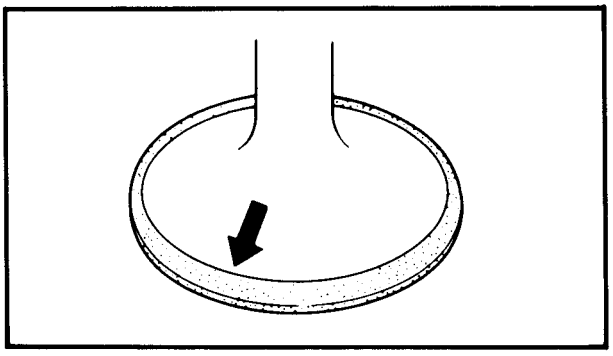
Valve Seat Cutter Set		Desired Result
Use	45° cutter	To achieve a uniform valve seat width of 1.0 mm (0.039 in)

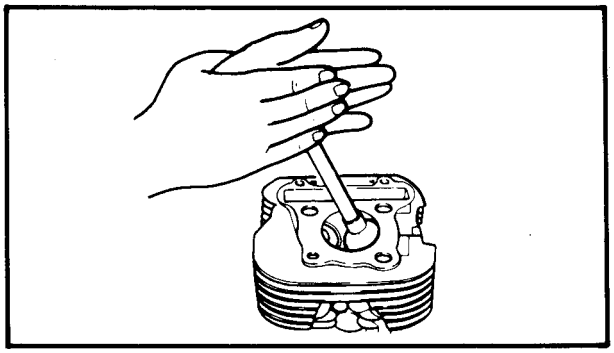
- Valve seat is too narrow and right up near valve margin (see "c" diagram).

Valve Seat Cutter Set		Desired Result
Use	30° cutter, first	To center the seat and to increase its width
	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 Result
Use	60° cutter, first	To center the seat and to increase its width
	45° cutter	





Valve/Valve Seat Assembly Lapping

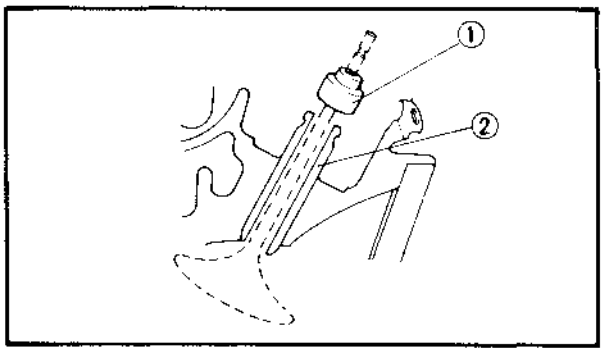
1. Apply:
   - Coarse lapping compound (Small amount)
     To valve face.
   - Molybdenum disulfide oil
     To valve stem.
2. Position:
   - Valves
     In cylinder head.
3. Rotate:
   - Valve
     Turn until valve and valve seat are evenly polished, then clean off all compound.
4. Apply:
   - Fine 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. Install:
   - Valves
     Into cylinder head.
     Press the valve through the valve guide and onto the valve seat to make a clear pattern.
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 → Replace.
     See procedure below.
10. Apply:
    - Solvent
      Into each intake and exhaust port.

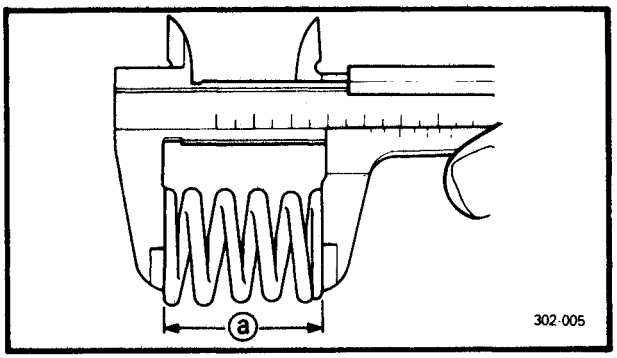
NOTE:
Pour solvent into intake and exhaust ports only after completion of all valve work and assembly of all head parts.

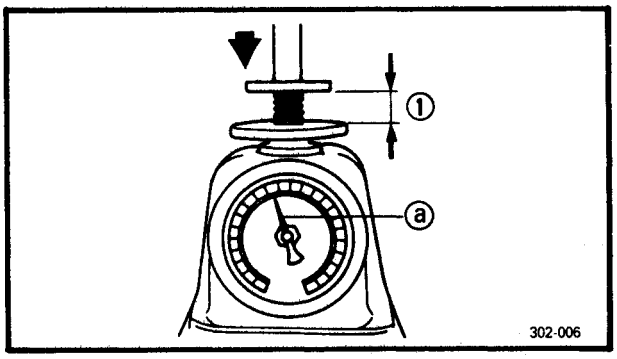


11. Check:
    - Valve seals ①
      Leakage past valve seat → Replace valve.
      (See procedure below)

② Valve guide

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 effect a satisfactory seal.





Valve Spring

1. Measure:
   - Spring free length ⓐ

   Out of specification → Replace.

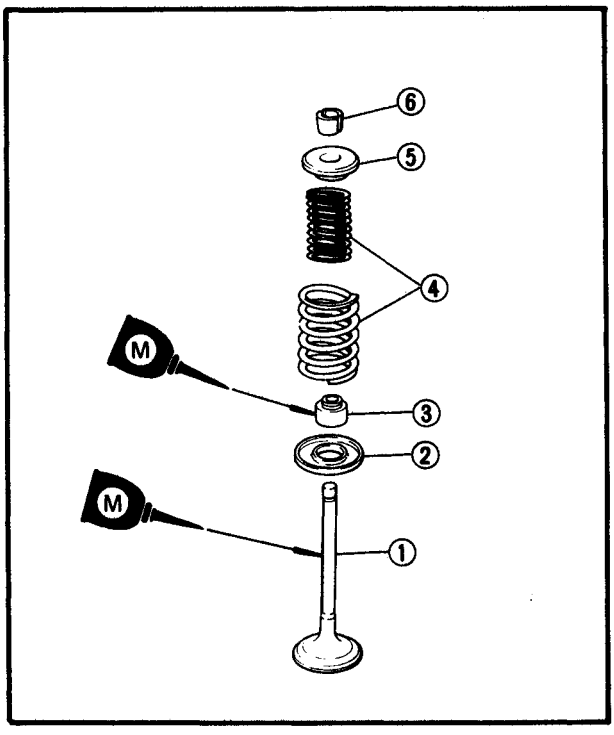
Minimum Free Length:
Inner Spring:
37.7 mm (1.484 in)
Outer Spring:
41.4 mm (1.630 in)

2. Measure:
   - Spring force (Installed length) ⓐ

   Out of specification → Replace.

Valve Compressed Force:
Inner Spring:
9.5 ~ 11.1 kg (21.0 ~ 24.5 lb)
at 34.1 mm (1.343 in)
Outer Spring:
18.7 ~ 21.9 kg (41.2 ~ 48.3 lb)
at 37.1 mm (1.461 in)

① Installed length

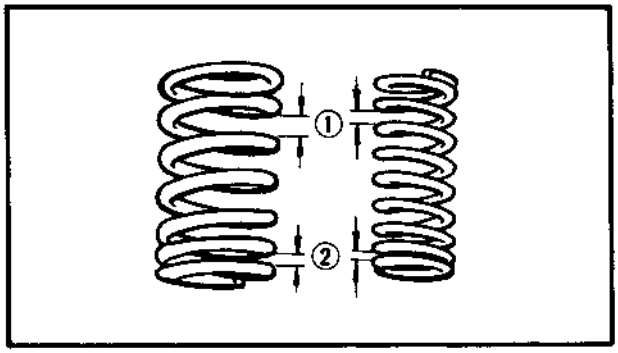


Valve Installation

1. Lubricate:
   - Valve stem
   - Oil seal

High-Quality Molybdenum Disulfide Motor Oil or Molybdenum Disulfide Grease

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

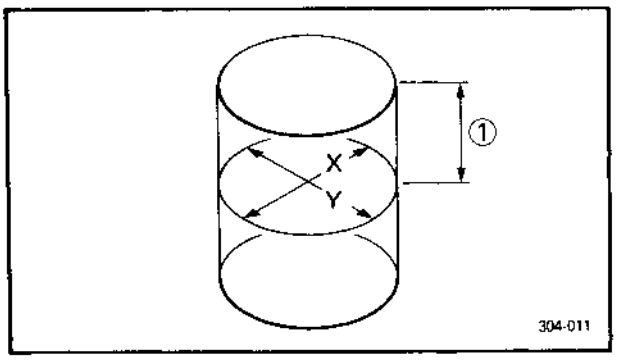


NOTE:
Install spring with wider-gapped coil facing upwards, as shown.

① Larger pitch
② Smaller pitch

CYLINDER AND PISTON

1. Inspect:
   - Cylinder and piston walls
     Vertical scratches → Rebore or replace cylinder and piston.
2. Measure:
   - Piston-to-cylinder clearance



Piston-to-cylinder clearance measurement steps:

First pipe:

- Measure the cylinder bore "C" with the Cylinder Bore Gauge.

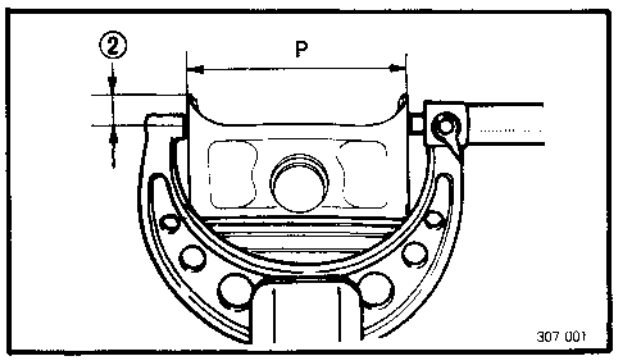
① 40 mm (1.57 in) from the cylinder top

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

	Standard	Wear Limit
Cylinder Bore "C":	75.98 ~ 76.02 mm (2.991 ~ 2.993 in)	76.10 mm (2.996 in)

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

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



Second step:

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

② 3.5 mm (0.14 in) from the piston bottom edge

Piston Outside Diameter "P"	
Standard	75.92 ~ 75.97 mm (2.989 ~ 2.991 in)
Oversize 2	76.50 mm (3.012 in)
Oversize 4	77.00 mm (3.031 in)

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

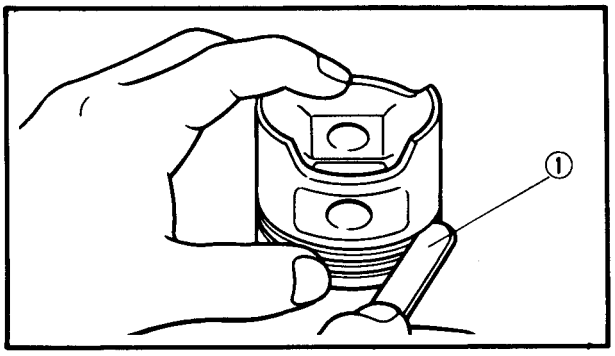
Third step:

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

Piston-to-cylinder Clearance = Cylinder Bore "C" — Piston Skirt Diameter "P"

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

Piston-to-cylinder Clearance: 0.035 ~ 0.055 mm (0.0014 ~ 0.0022 in)



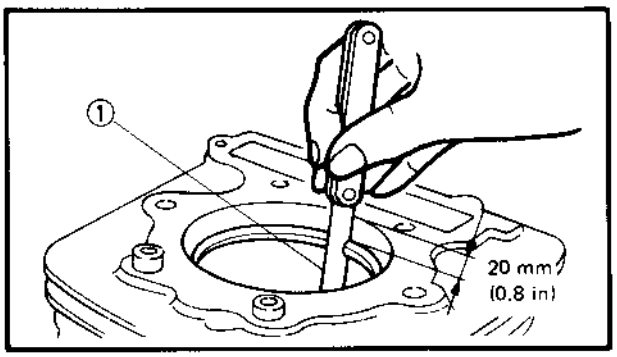
PISTON RING AND PISTON PIN

Piston Ring

1. Measure:
   - Side clearance
     Use the Feeler Gauge ① .
     Out of specification → Replace piston and/or rings.

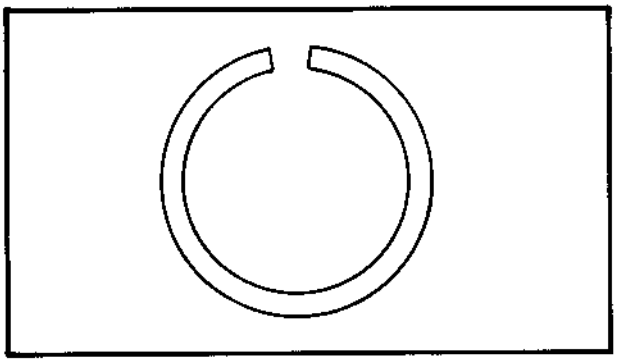
	Side Clearance	
	Standard	Limit
Top Ring	0.03 ~ 0.07 mm (0.001 ~ 0.003 in)	0.12 mm (0.005 in)
2nd Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)	0.005 mm (0.005 in)

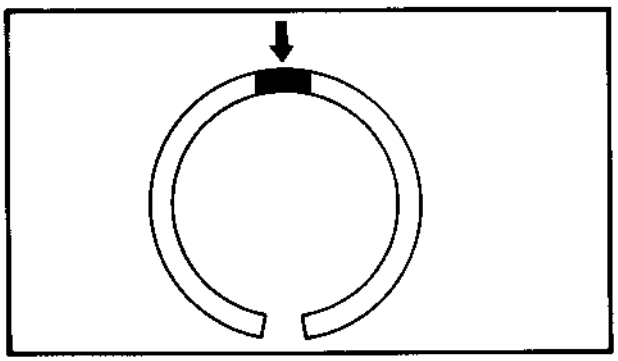
2. Position:
   - Piston ring
     Push the ring with the piston crown.



3. Measure:
   • End gap
   Use a Feeler Gauge ①
   Out of specification → Replace rings as set.

	End Gap	
	Standard	Limit
Top Ring	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.7 mm (0.028 in)
2nd Ring	0.30 ~ 0.45 mm (0.012 ~ 0.018 in)	0.8 mm (0.031 in)
Oil Ring	0.2 ~ 0.8 mm (0.008 ~ 0.031 in)	–





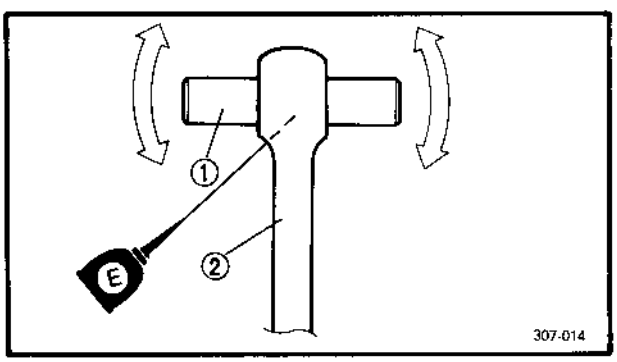
Piston Ring Oversize

• Top and 2nd piston ring
Oversize top and middle ring sizes are stamped on top of ring.

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

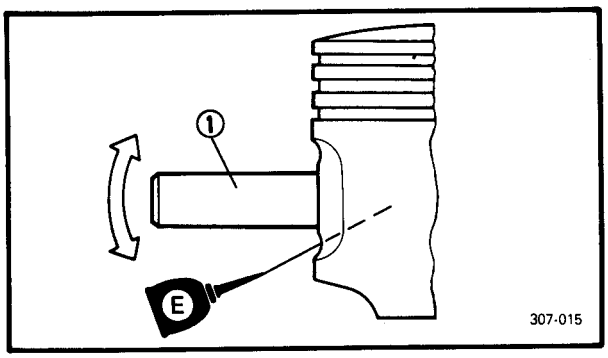
• Oil control ring
Expander spacer of bottom ring (oil control ring) is color-coded to identify sizes.

Size	Color
Oversize 2	Blue
Oversize 4	Yellow

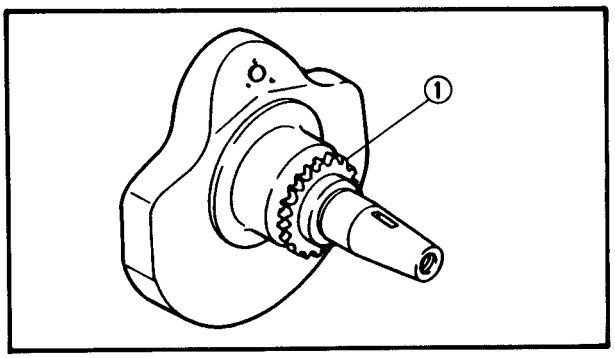


Piston Pin

1. Lubricate:
   • Piston pin (Lightly)
2. Install:
   • Piston pin ①
   Into small end of connecting rod ② .
3. Check:
   • Free play
   Free play → Inspect connecting rod and piston pin for wear.

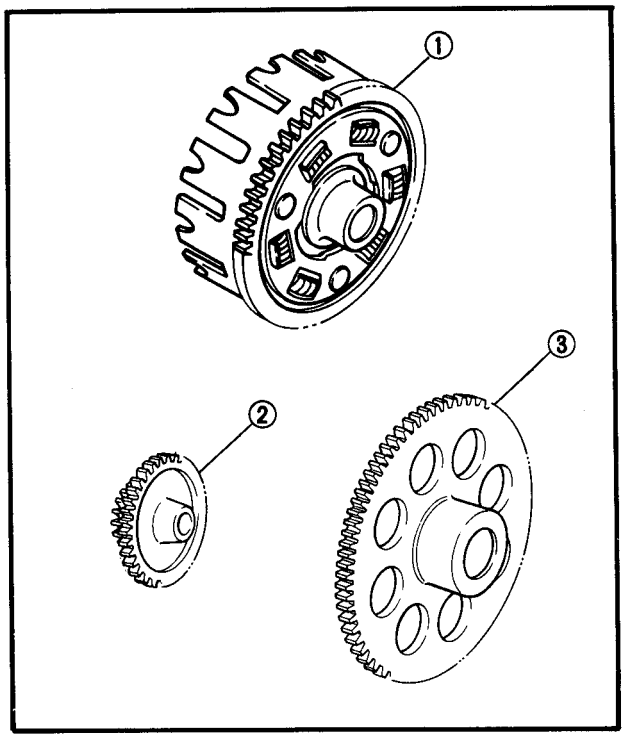


4. Position:
   - Piston pin ①
     Into piston.
5. Check:
   - Free play
     When pin is in place in piston.
     Free play → Replace piston pin and/or piston.

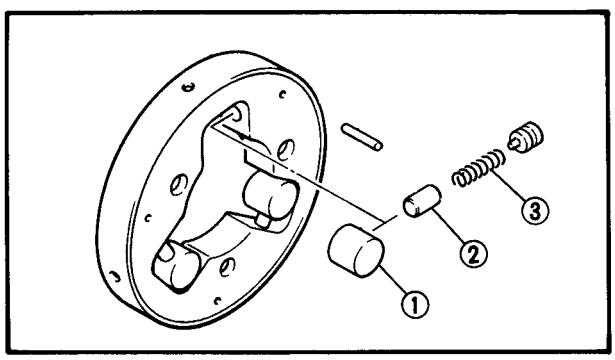


PRIMARY GEARS AND STARTER

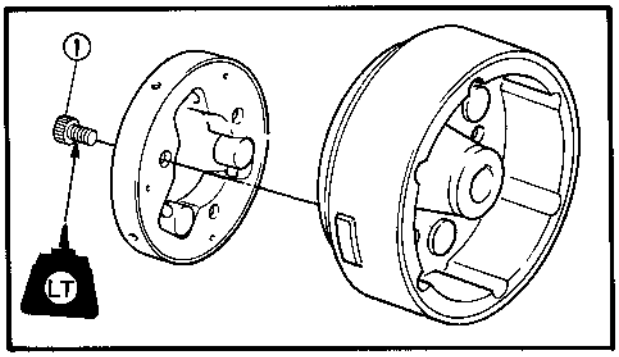
1. Inspect:
   - Drive gear ①
     Scratches/Wear/Damage → Replace crankshaft.



2. Inspect:
   - Driven gear ①
     Scratches/Wear/Damage → Replace clutch housing assembly.
   - Idler gears (# 1 and # 2) ② ③
     Scratches/Wear/Damage → Replace.



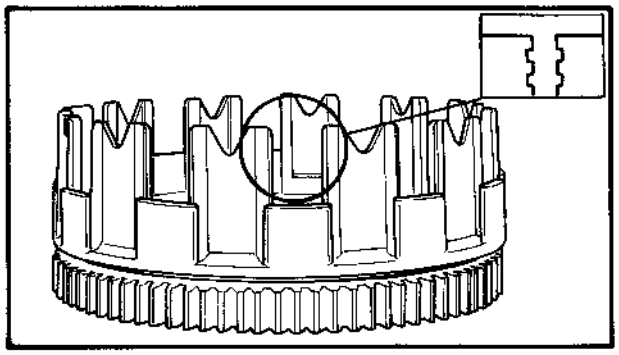
3. Check:
   - Roller ① operation
   - Spring cap ② operation
   - Spring ③ operation
     Unsmooth operation → Replace one-way clutch.



4. Inspect:
   - Bolts (Starter clutch) ①
     Loose → Replace with a new one, and clinch the end of the bolt.

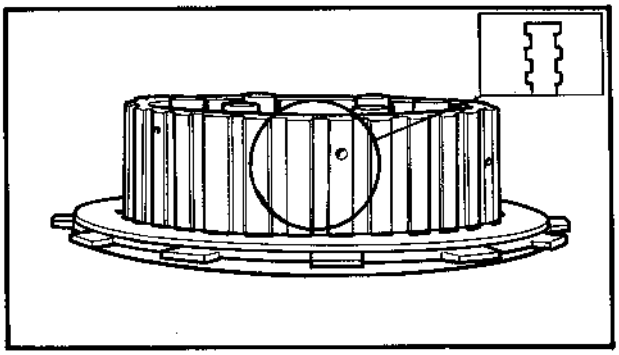
NOTE:
The arrow mark on the starter clutch must face inward, away from the CDI rotor.

Bolts (Starter Clutch):
20 Nm (2.0 m·kg, 14 ft·lb)
LOCTITE®
Stake Over the End of the Bolt

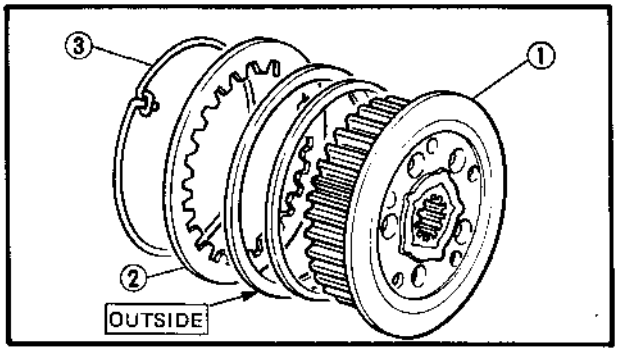


CLUTCH
Clutch Housing

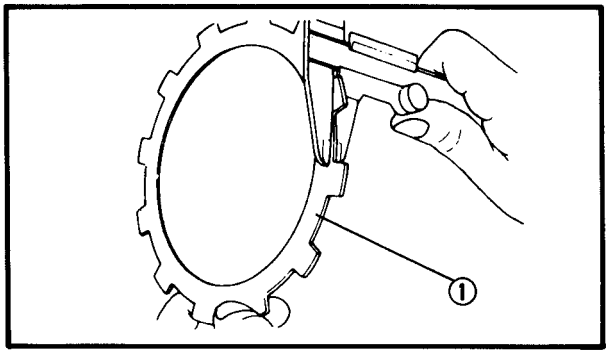
1. Inspect:
   - Dogs on the housing
     Cracks/Wear/Damage → Deburr or replace.
   - Clutch housing bearing
     Chafing/Wear/Damage → Replace.



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



NOTE:
- Scoring on the clutch plate splines will cause erratic operation.
- The clutch boss ① contains a built-in damper beneath the clutch plate ② . It is not necessary to remove the wire circlip ③ and disassemble the built-in damper unless there is serious clutch chattering.



Friction Plates

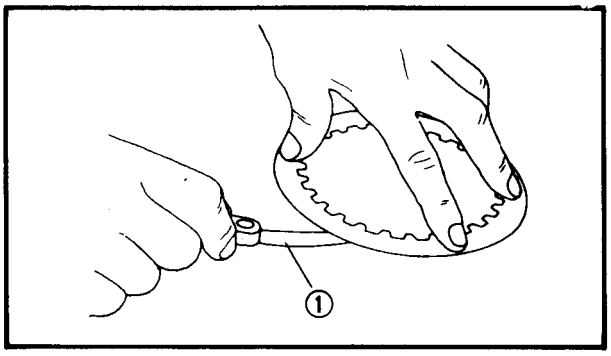
1. Inspect:
   - Friction plate ①

   Damage/Wear → Replace friction plate as a set.
2. Measure:
   - Friction plate thickness

   Measure at all four points.

   Out of specification → Replace friction plate as a set.

Wear Limit:
2.6 mm (0.102 in)



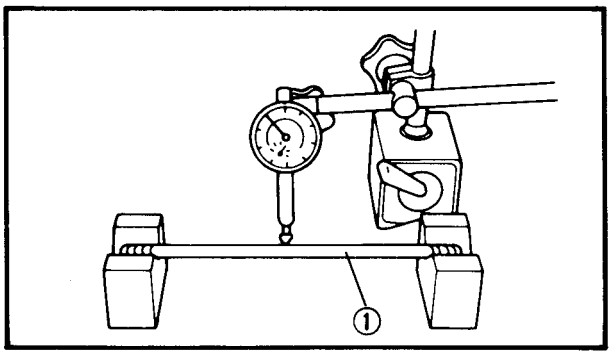
Clutch Plates

1. Measure:
   - Clutch plate warpage

   Use the surface plate and the Feeler Gauge ①.

   Out of specification → Replace.

Warp Limit:
0.2 mm (0.008 in)



Push Rod

1. Measure:
   - Push rod runout ①

   Use V-Blocks and the Dial Gauge.

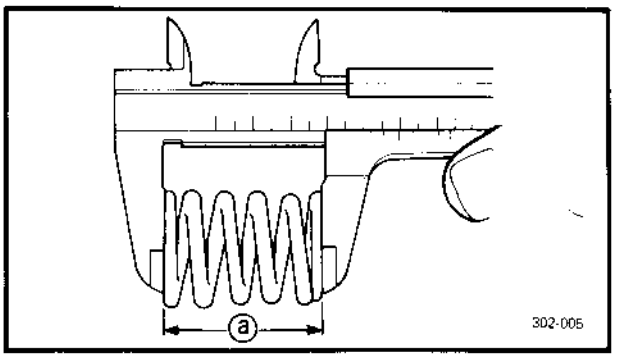
   Out of specification → Replace.

Bending Limit:
0.5 mm (0.02 in)

Clutch Bearing

1. Inspect:
   - Bearing

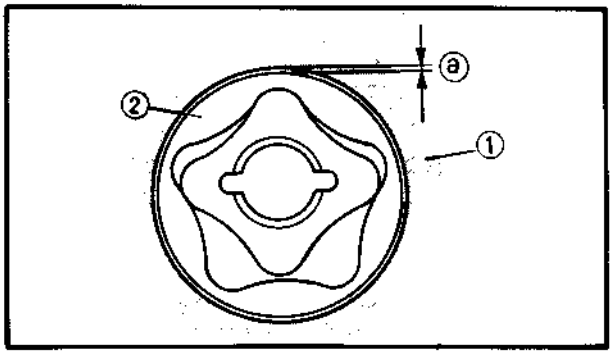
   Pitting/Damage → Replace.

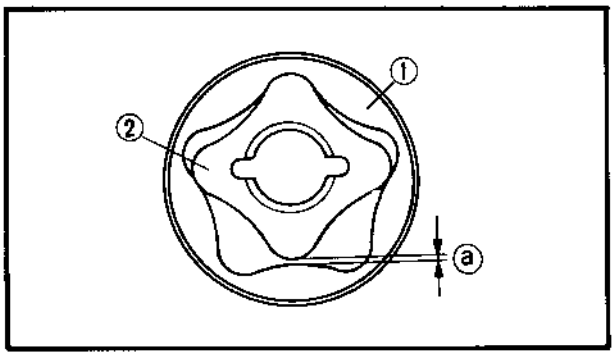


Clutch Spring

1. Inspect:
   - Clutch spring
     Wear/Damage → Replace.
2. Measure:
   - Clutch spring free length ⓐ
     Out of specification → Replace springs as a set.

Clutch Spring Minimum Length:
38.5 mm (1.52 in)





OIL PUMP

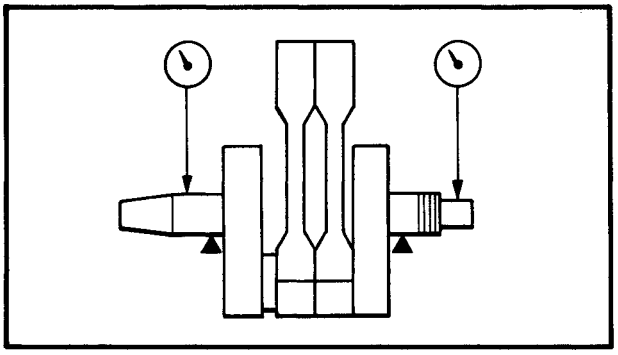
1. Measure:
   - Housing ① /Outer rotor ② clearance ⓐ
     Use a Feeler Gauge.
     Out of specification → Replace oil pump assembly.

Side Clearance Limit:
0.08 mm (0.003 in)

2. Measure:
   - Outer rotor ① /Inner rotor ② clearance ⓐ
     Use a Feeler Gauge.
     Out of specification → Replace oil pump assembly.

Tip Clearance Limit:
0.17 mm (0.007 in)

3. Inspect:
   - Oil pump drive gear
   - Oil pump driven gear
     Wear/Damage → Replace.



CRANKSAHFT

Crankshaft

1. Measure:
   - Runout
     Use the V-Blocks and Dial Gauge.
     Out of specification → Replace.

Runout Limit:
0.03 mm (0.0012 in)

Journal Oil Clearance Measurement

1. Measure:
   - Journal oil clearance

Journal oil clearance measurement steps:

CAUTION:

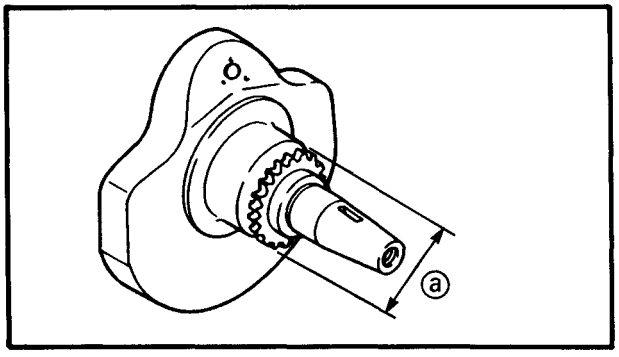
On the journal, the larger value is used as a basis for calculation of the oil clearance, and on the journal bearing, the smaller value is used.

- Clean the surface of crankshaft journal and journal bearings.
- Check the bearing surface. If the bearing surface is worn or scratched, the bearings should be replaced.

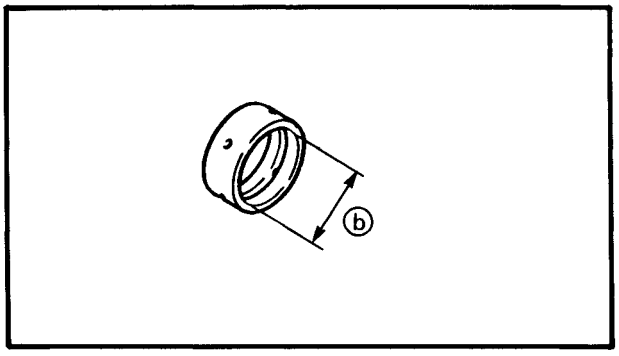
NOTE:

If either of the right or left journal bearing is worn or scratched, both bearings should be replaced as a set.

- Measure the outside diameter ⓐ of each crankshaft journal at two places. If it is out of specification, replace the crankshaft.



Outside Diameter Limit
(Crankshaft Journal):
44.958 mm (1.767 in)

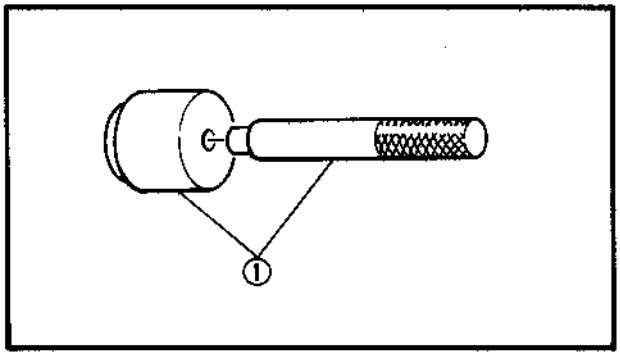


- Measure the inside diameter ⓑ of each journal bearing at two places.
- To find oil clearance use following formula:

Journal Oil Clearance =
Crankshaft Journal Diameter –
Journal Bearing Inside Diameter

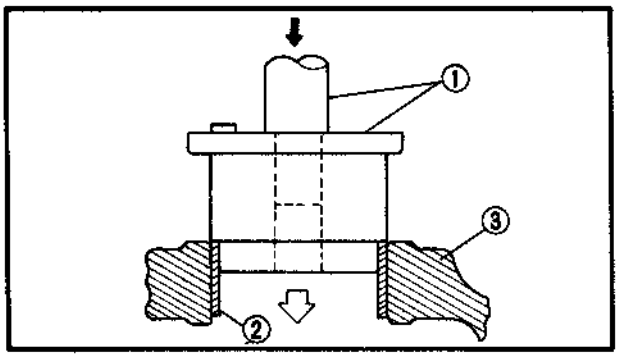
- If the oil clearance is out of specification, replace both journal bearings.

Journal Oil Clearance:
0.020 ~ 0.052 mm
(0.0008 ~ 0.0020 in)



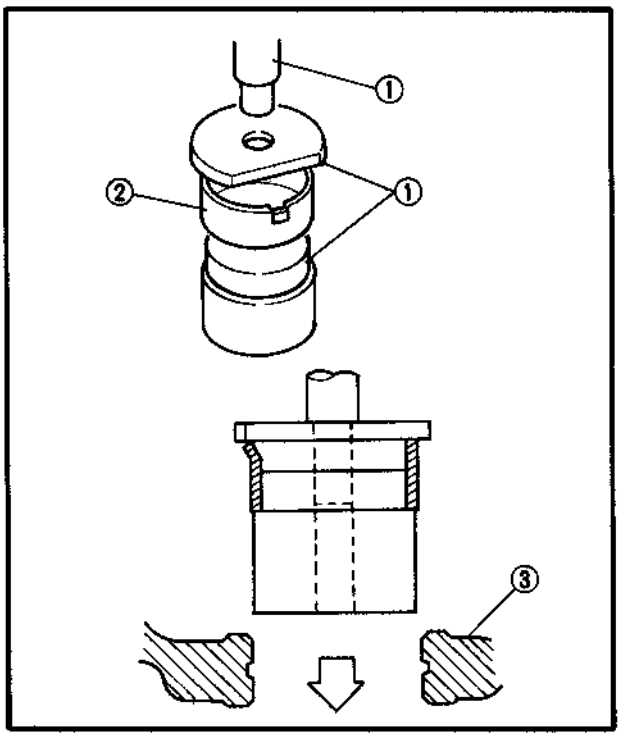
Journal Bearing Removal and Installation

NOTE:
To remove or force-fit the journal bearings, be sure to use the special tool set and a hydraulic press.



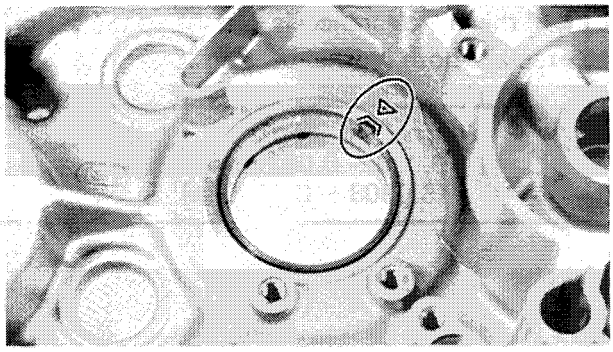
1. Attach:
   - Plain Bearing Remover and Installer set ① (YM-28898)
   To the crankcase.
2. Remove:
   - Journal bearing ②
   Press the tool end using a hydraulic press.

③ Crankcase



3. Clean:
   - Crankcase surface (Outside of journal bearing)
4. Select:
   - Journal bearings
   Refer to "Journal Bearing Selection" section.
5. Attach:
   - Plain Bearing Remover and Installer Set ① (YM-28898)
   - Journal bearing (New) ②
   To the crankcase.

③ Crankcase

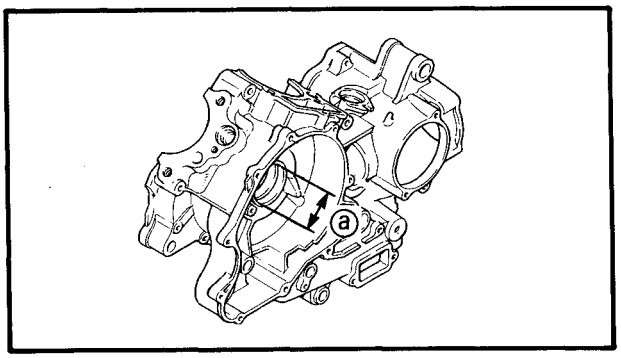


6. Install:
   • Journal bearing
     Press the tool end using a hydraulic press.

NOTE:
Make sure that the key aligns with the keyway in the crankcase.

Journal Bearing Selection

1. Remove:
   • Journal bearing
     Refer to "Journal Bearing Removal and Installation" section.
2. Select:
   • Journal bearing



Journal bearing selection steps:
- Clean the counterbore in the crankcase where the journal bearing is fitted.
- Measure the diameter ⓐ of counterbore at two places.

NOTE:
If the diameter of counterbore in the crankcase exceeds 49.02 mm (0.930 in), the crankcase should be replaced with a new one. The new crankcase is already fitted with journal bearings, and their inside diameters are normally 45.000 ~ 45.012 mm (1.7715 ~ 1.7721 in).

CAUTION:
The average of the two values is used to choose the bearing.

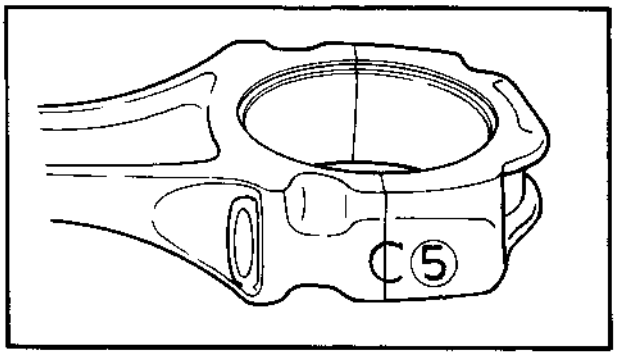
- Select the proper oversize journal bearing with the following table.

Diameter of Counterbore in Crankcase	Color Code
49.000 ~ 49.010 mm (1.9291 ~ 1.9295 in)	Blue
49.011 ~ 49.020 mm (1.9296 ~ 1.9299 in)	Green

3. Install:
   • Journal bearing
   Refer to "Journal Bearing Removal and Installation" section.

Connecting Rod Bearing Clearance Measurement

1. Clean all parts.
2. Install:
   • Connecting rod bearings
   Into connecting rod and cap.
3. Attach:
   • Plastigage® (YU-33210)
   Onto the crank pin.
4. Install:
   • Connecting rod
   • Connecting rod cap



NOTE:
Be sure the letter on both components align to form perfect character.

5. Lubricate:
   • Bolt threads (Connecting rod)

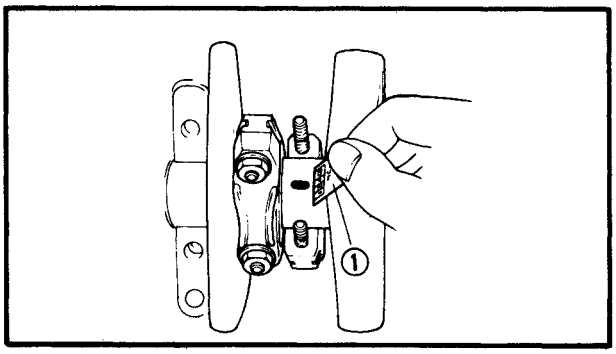
Molybdenum Disulfide Grease

6. Tighten:
   • Nuts (Connecting rod cap)

NOTE:
Do not turn connecting rod until clearance measurement has been completed.

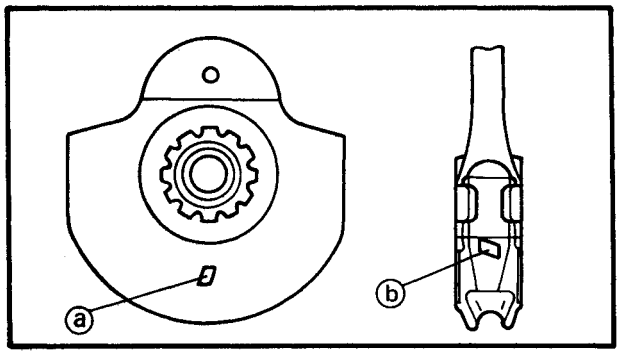
CAUTION:
Tighten to full torque specification without pausing. Apply continuous torque between 3.2 and 3.6 m·kg. Once you reach 3.2 m·kg, DO NOT STOP TIGHTENING until final torque is reached. If tightening is interrupted between 3.2 and 3.6 m·kg, loosen nut to less than 3.2 m·kg and start again.

Connecting Rod Cap:
36 Nm (3.6 m·kg, 25 ft·lb)



7. Remove:
   - Connecting rod cap
     Use care in removing.
8. Measure:
   - Width of Plastigage® ①
     Out of specification → Replace bearings and/or replace crankshaft if necessary.

Connecting Rod Bearing Clearance:
0.026 ~ 0.050 mm
(0.001 ~ 0.002 in)



Connecting Rod Bearing Selection

1. Select:
   - Connecting rod

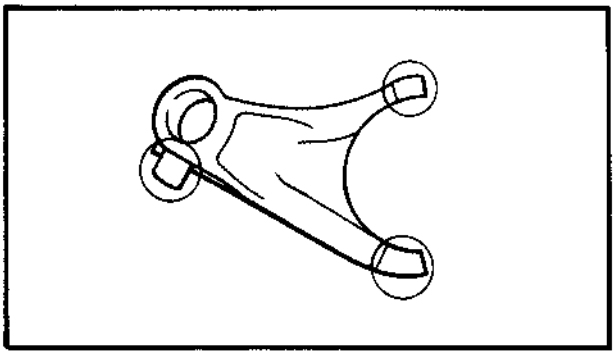
Connecting rod bearing selection steps:
- The numbers used to indicate crankpin sizes ⓐ is stamped on the crankweb (Left).
- The numbers used to indicate connecting rod sizes ⓑ is stamped in link on the rod.
- To find connecting rod bearing size use following formula:

Connecting Rod Bearing Size = Connecting Rod No. ⓑ − Crankpin No. ⓐ

- Select the proper size bearing with the following table.

Bearing Color	Code
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green

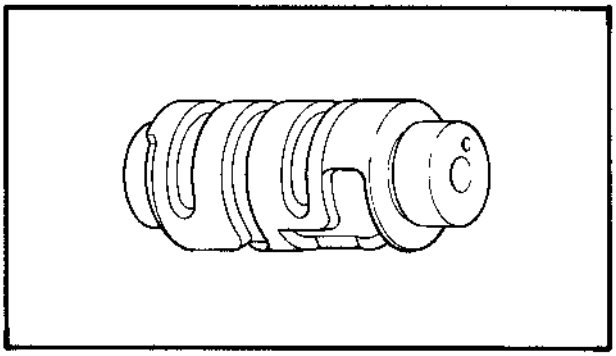
Example:
Rod No. − Crankpin No.
= 4 − 1 = 3
Therefore, use brown (No. 3) bearing inserts.



TRANSMISSION

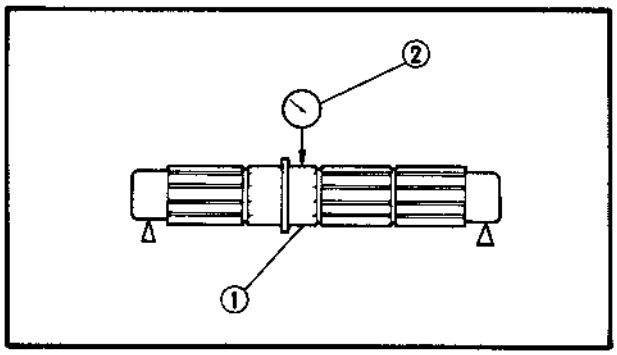
Shift Fork

1. Inspect:
   - Shift forks
     On the gear and shift cam contact surfaces.
     Wear/Chafing/Bends/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.
   - Shift cam bearing
     Pitting/Damage → Replace.

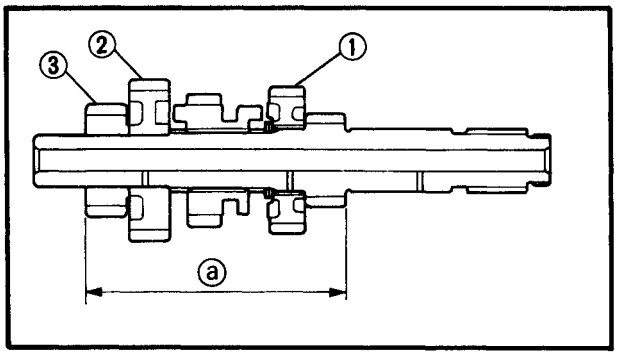


Main/Drive Axles and Gears

1. Measure:
   - Axle runout ①
     Use the centering device and Dial Gauge ② .
     Out of specification → Replace.

Runout Limit:
0.08 mm (0.0031 in)

2. Inspect:
   - Gears
     Damage/Wear → Replace.
3. Check:
   - Gear movement
     Unsmooth operation → Replace.
4. Inspect:
   - Mating dogs
     Cracks/Wear/Damage → Replace.



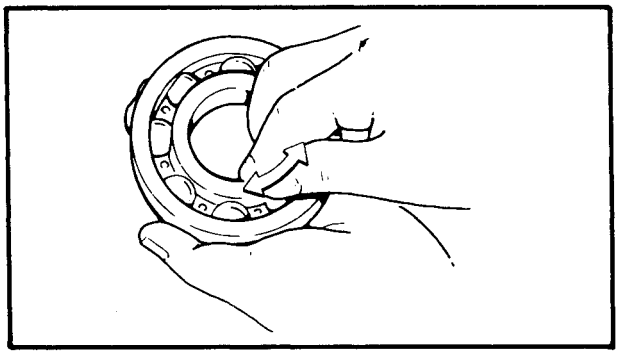
NOTE:

When replacing the main axle or pinions, take the following steps:

- Apply molybdenum oil to the 4th ① and 5th ② pinion gear bosses.
- Using a hydraulic press; force-fit the 2nd pinion gear ③ to the position specified ⓐ.

2nd Pinion Gear Position ⓐ :
103.1 mm (4.06 in)

- After installing the pinions onto the main axle, make sure the 4th and 5th pinion gears turn freely.



BEARINGS

1. Inspect:
   - Axle bearings
   - Shift cam bearing

   Pitting/Damage → Replace.

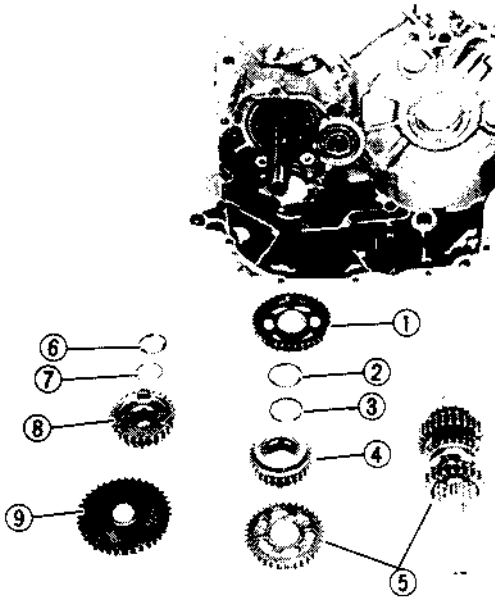
CIRCLIPS AND WASHERS

1. Inspect:
   - Circlips
   - Washers

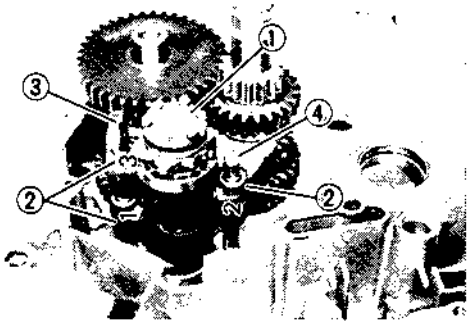
   Damage/Looseness/Bends → Replace.

ENGINE ASSEMBLY AND ADJUSTMENT

TRANSMISSION AND CRANKSHAFT



1. Install:
   - 2nd wheel gear (38T) ①
   - Washer ②
   - Circlip ③
   - 5th wheel gear (29T) ④
   - 3rd wheel gear (35T) and main axle assembly ⑤
   - Washer ⑥
   - Circlip ⑦
   - 4th wheel gear (28T) ⑧
   - 1st wheel gear (38T) ⑨



2. Install:
   - Shift cam ①
   - Shift forks ②
   - Guide bar (Rear – Longer) ③
   - Guide bar (Front – Shorter) ④

NOTE:
Each shift forks is identified by a number cast on its side. All the numbers should face the left side.

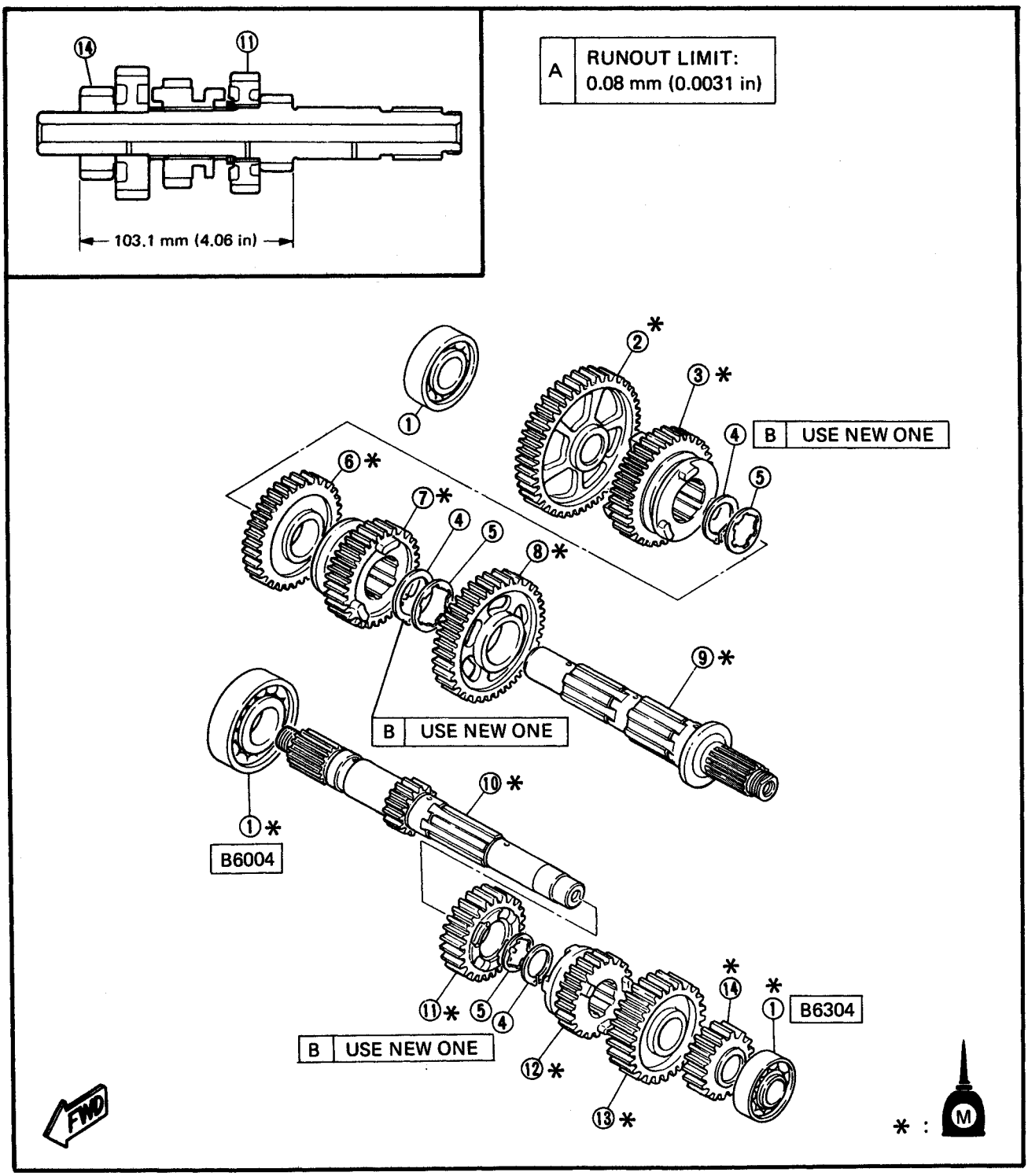


3. Check:
   - Shifter operation
     Unsmooth operation → Repair.

NOTE:
- Oil each gear and bearing thoroughly.
- Before assembling the crankcase, be sure that the transmission is in neutral and that the gears turn freely.

TRANSMISSION

① Bearing
② 1st wheel gear (38T)
③ 4th wheel gear (28T)
④ Circlip
⑤ Washer
⑥ 3rd wheel gear (35T)
⑦ 5th wheel gear (29T)
⑧ 2nd wheel gear (38T)
⑨ Drive axle
⑩ Main axle
⑪ 4th pinion gear (24T)
⑫ 3rd pinion gear (24T)
⑬ 5th pinion gear
⑭ 2nd pinion gear (20T)



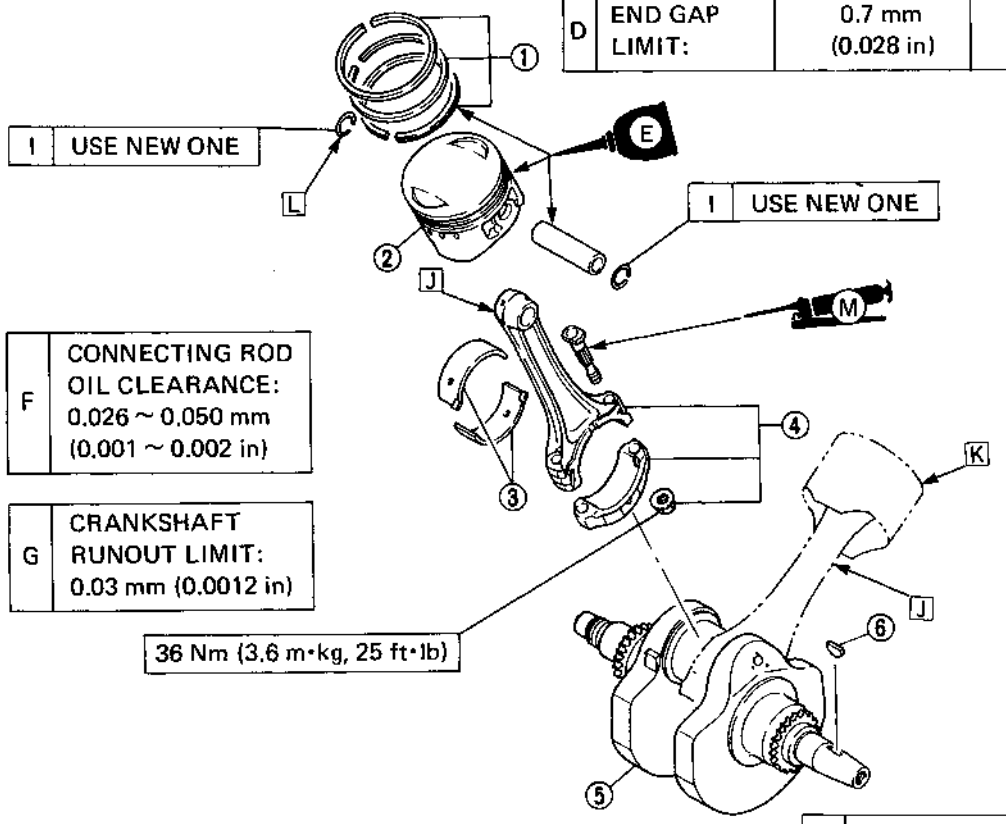
CRANKSHAFT

① Piston ring set
② Piston
③ Connecting rod bearing
④ Connecting rod assembly
⑤ Crankshaft
⑥ Woodruff key

[J] "Y" mark towards the outside.
[K] For rear cylinder
[L] For front cylinder

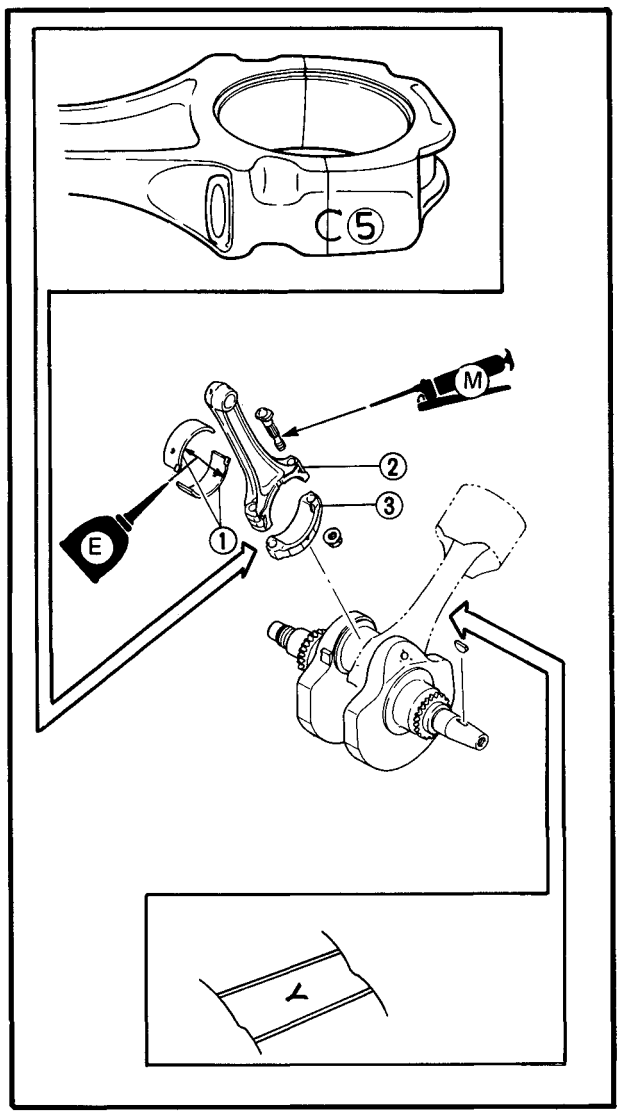
		A TOP RING	B 2ND RING
C	SIDE CLEARANCE LIMIT:	0.12 mm (0.005 in)	0.12 mm (0.005 in)
D	END GAP LIMIT:	0.7 mm (0.028 in)	0.8 mm (0.031 in)

E	PISTON CLEARANCE: 0.035 ~ 0.055 mm (0.0014 ~ 0.0022 in)



F	CONNECTING ROD OIL CLEARANCE: 0.026 ~ 0.050 mm (0.001 ~ 0.002 in)
G	CRANKSHAFT RUNOUT LIMIT: 0.03 mm (0.0012 in)
H	CRANKSHAFT JOURNAL OIL CLEARANCE: 0.020 ~ 0.052 mm (0.0008 ~ 0.0020 in)

FWD



4. Install:
   - Connecting rod assembly

Connecting rod assembly installation steps:
- Clean the all components.
- Install the connecting rod bearins ① onto the connecting rods ② and rod caps ③ .

NOTE:
Align the projection on the bearing with the groove in the rod or cap.

- Apply 4-stroke engine oil to the connecting rod bearings.
- Install the rod caps to the connecting rods.

NOTE:
Be sure the letters on both components align to form a perfect character.

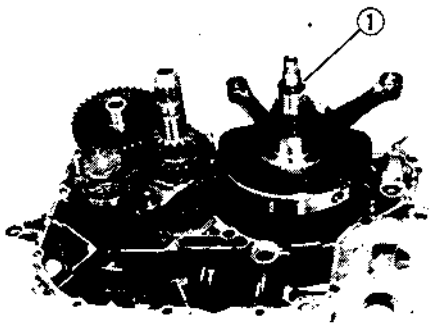
- Separate the caps and rods, and then install the caps and rods onto the crankshaft.

NOTE:
- The "Y" mark on each rod must face the outside.
- Apply the molybdenum disulfide grease to the rod cap bolt threads and nut surfaces.

- Tighten the connecting rod cap nuts to specification.

CAUTION:
When tightening the rod cap, apply continuous torque between 3.2 and 3.6 m·kg. Once you reach 3.2 m·kg of torque, DO NOT STOP TIGHTENING until final torque is reached. If tightening is interrupted between 3.2 and 3.6 m·kg, loosen the nut to less than 3.2 m·kg, and start again. Tighten to full-torque specification without pausing.

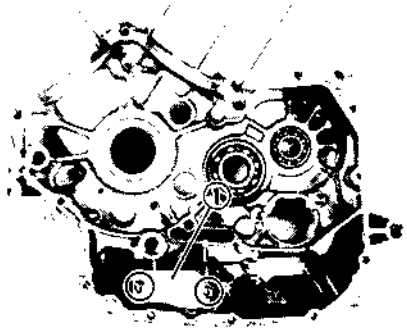
Connecting Rod Cap:
36 Nm (3.6 m·kg, 25 ft·lb)



5. Install:
   - Crankshaft ①

   Into the crankcase (Left).

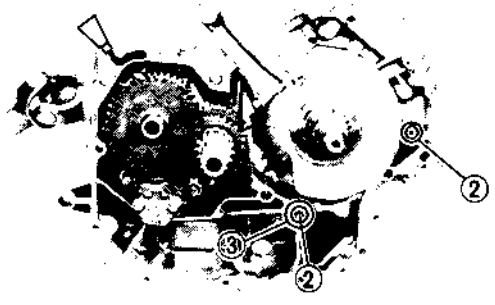
NOTE:
- Install the tapered end of the crankshaft (Left side) into the crankcase.
- Align the left connecting rod with the rear cylinder sleeve hole.
- The rod must be in this hole when the crankshaft is properly installed.



CRANKCASE

1. Install:
   - Oil baffle plate ①

	Oil Baffle Plate: **10 Nm (1.0 m·kg, 7.2 ft·lb)**

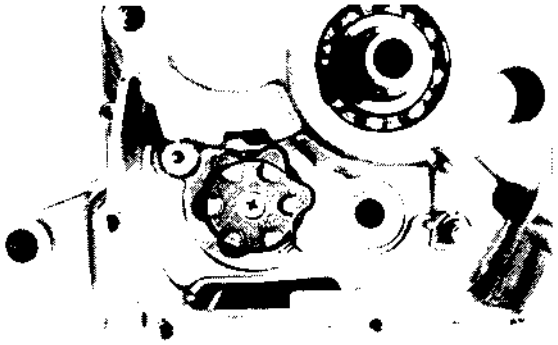


2. Apply:
   - Sealant (Quick Gasket®) ① (ACC-11001-05-01)

   To the mating surfaces of both case halves.
3. Install:
   - Dowel pins ②
   - O-ring ③
4. Fit the right crankcase onto the left case. Tap lightly on the case with a soft hammer.

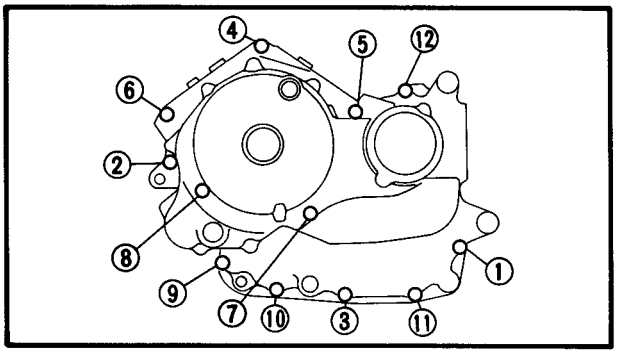
NOTE:

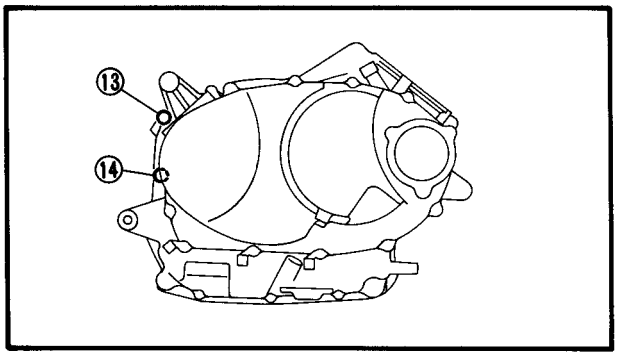
Turn the shift cam to the position shown in the figure so that it does not contact the crankcase when installing the crankcase.

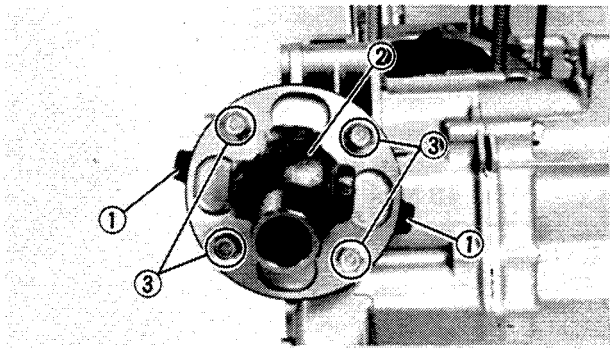


CAUTION:

Before installing and torquing the crankcase holding bolts, be sure to check whether the transmission is functioning properly by manually rotating the shift cam either way.







5. Tighten:
   - Bolts (Crankcase) ① ~ ⑭

NOTE:
Tighten the bolts starting with the lowest numbered one.

6 mm Bolts (Crankcase):
10 Nm (1.0 m·kg, 7.2 ft·lb)
8 mm Bolts (Crankcase):
24 Nm (2.4 m·kg, 17 ft·lb)

6. Apply:
   - 4-stroke engine oil
     To the crank pin, bearing and oil delivery hole.
7. Check:
   - Crankshaft and transmission operation
     Unsmooth operation → Repair.

MIDDLE DRIVEN GEAR

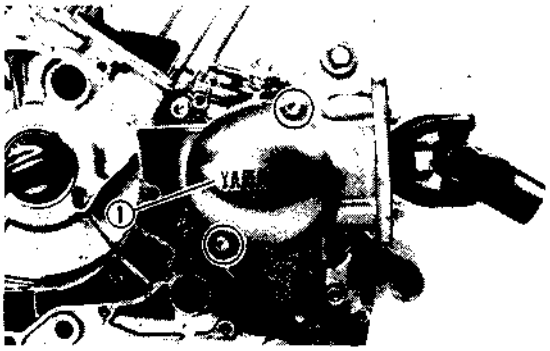
1. Install:
   - Shims ①
   - Middle driven gear assembly ②
   - Bolts (Bearing housing) ③

NOTE:
Finger tighten the mounting bolts, do not torque them at this point.

2. Check:
   - Middle gear operation
     Unsmooth operation → Reinstallation.
3. Tighten:
   - Bolts (Bearing housing)

NOTE:
Before tightening the bolts, adjust the gear lash of the middle gear. Refer to "MIDDLE GEAR SERVICE – ADJUSTMENT" section.

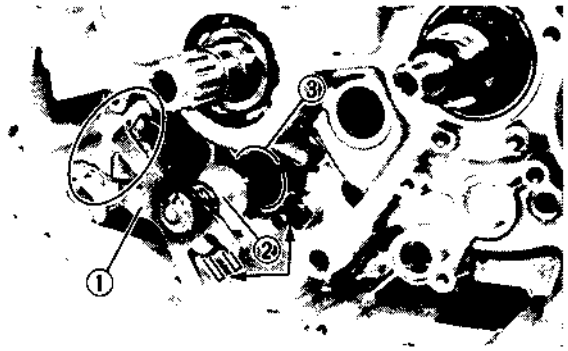
Bolts (Bearing Housing):
25 Nm (2.5 m·kg, 18 ft·lb)



4. Install:
   - O-ring
   - Middle gear case ①

NOTE:
Inspect the o-ring. If damaged, replace it.

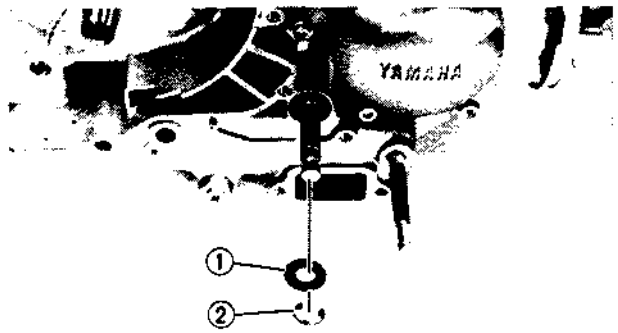
Middle Gear Case:
10 Nm (1.0 m·kg, 7.2 ft·lb)



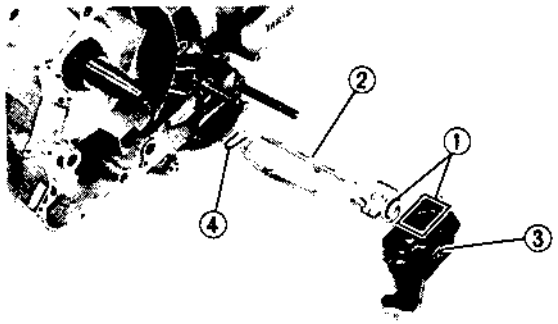
SHIFT SHAFT

1. Install:
   - Stopper lever ①
   - Shift shaft ②

NOTE:
Before installing the shift shaft, do not forget to fit the plain washer ③.



2. Set the stopper lever and torsion spring as properly position.
3. Install:
   - Plain washer ①
   - Circlip ②
4. Check:
   - Change operation
     Unsmooth operation → Repair.

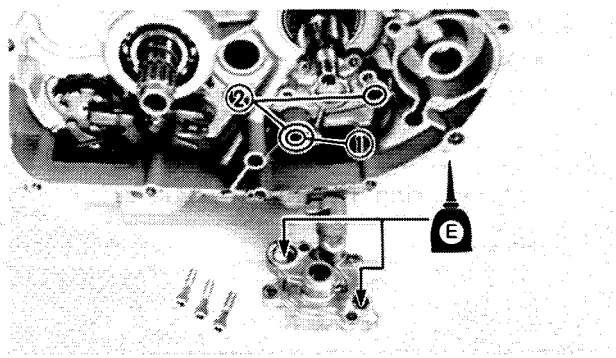


OIL PUMP

1. Install:
   - O-rings ①
   - Oil strainer ②
   - Oil passage housing ③

NOTE:
- Inspect the O-ring. If damaged, replace it.
- The tab ④ on the end of the oil strainer should be engaged in the crankcase groove.

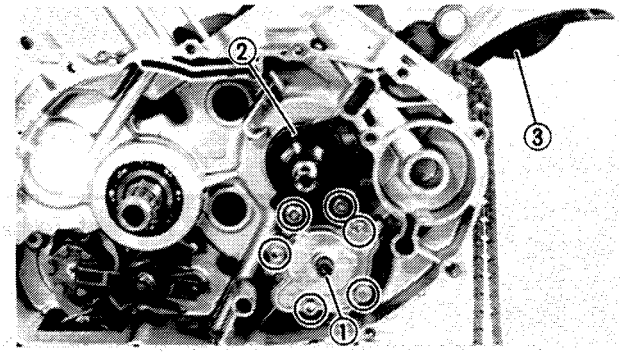
Oil Passage Housing:
10 Nm (1.0 m·kg, 7.2 ft·lb)



2. Install:
   - Dowel pin ①
   - O-rings ②
3. Apply 4-stroke engine oil to the oil pump passages.

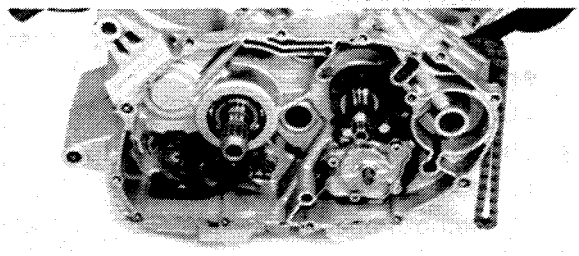
CAUTION:

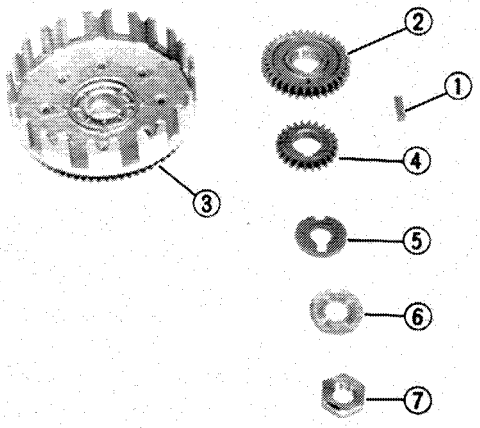
Apply a liberal amount of 4-stroke engine oil to the oil pump passages in the crankcase, or the engine may be damaged.



4. Install:
   - Oil pump assembly ①
   - Cam chain ②
   - Cam chain damper (Front cylinder – Exhaust) ③

Oil Pump:
7 Nm (0.7 m·kg, 5.1 ft·lb)
Cam Chain Damper:
10 Nm (1.0 m·kg, 7.2 ft·lb)



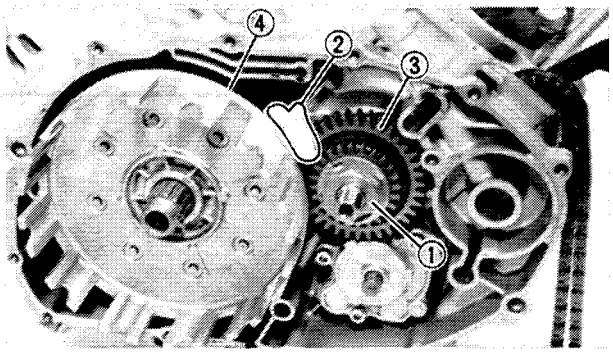


CLUTCH

1. Install:
   - Key ①
   - Primary drive gear ②
   - Primary driven gear ③
   - Oil pump drive gear ④
   - Holding plate ⑤
   - Lock washer (New) ⑥
   - Nut (Primary drive gear) ⑦

NOTE:

- Make sure that the tab of the lock washer engages the slots in the holding plate.
- Finger tighten the nut, do not torque it at this point.



2. Tighten:
   - Nut (Primary drive gear) ①

   Place a folded rag ② between the teeth of the drive gear ③ and driven gear ④ to lock them.

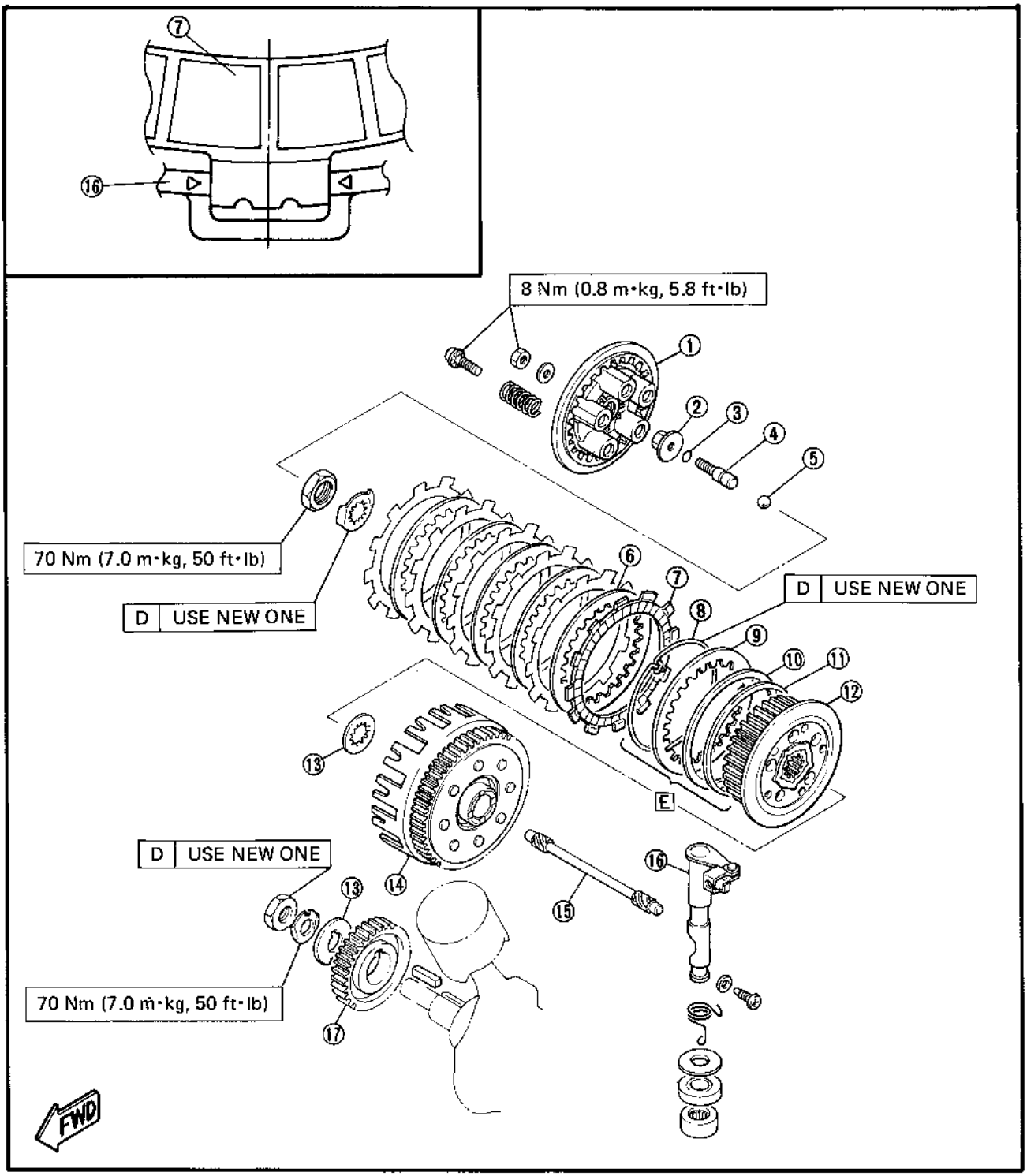
Nut (Primary Drive Gear):
70 Nm (7.0 m·kg, 50 ft·lb)

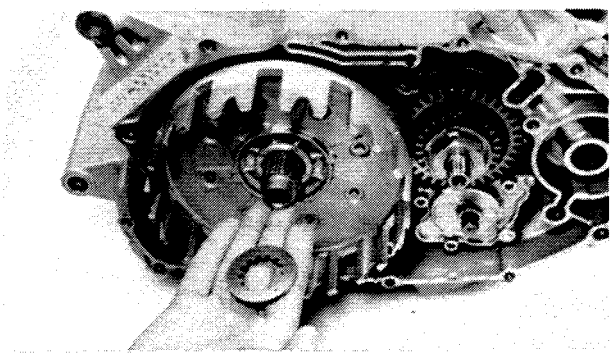
3. Bend the lock washer tab along the nut flats.

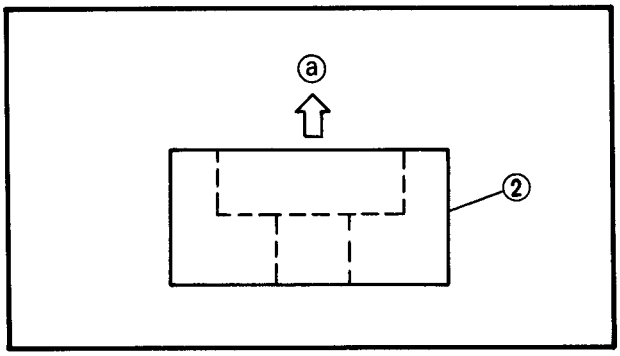
CLUTCH

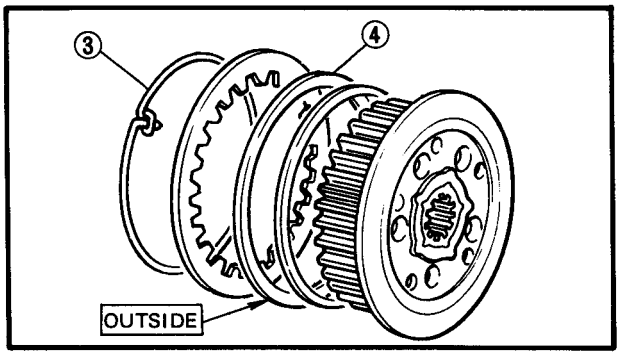
① Pressure plate
② Push plate
③ O-ring
④ Push rod # 1
⑤ Ball
⑥ Clutch plates (5 pcs.)
⑦ Friction plates (6 pcs.)
⑧ Wire circlip
⑨ Clutch plate (1 pc.)
⑩ Seat spring
⑪ Seat plate
⑫ Clutch boss
⑬ Holding plate
⑭ Clutch housing
⑮ Push rod # 2
⑯ Push lever assembly
⑰ Primary drive gear

E It is not necessary to remove the wire circlip and disassemble the built-in damper unless there is serious clutch chattering.





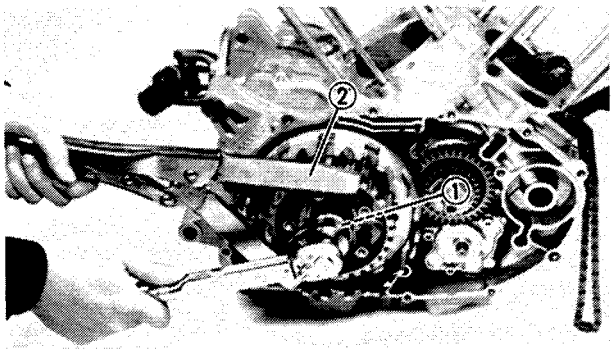




4. Install:
   - Holding plate ①
   - Clutch boss
   - Lock washer (New)
   - Locknut (Clutch boss)

NOTE:
- Make sure that the tab of the lock washer engages the slots in the clutch boss.
- Install the nut ② with its recessed side ⓐ facing the clutch boss.
- If the wire circlip ③ is removed, take care reinstall them as shown.
- Install the seat spring ④ with its "OUTSIDE" mark on the outside.

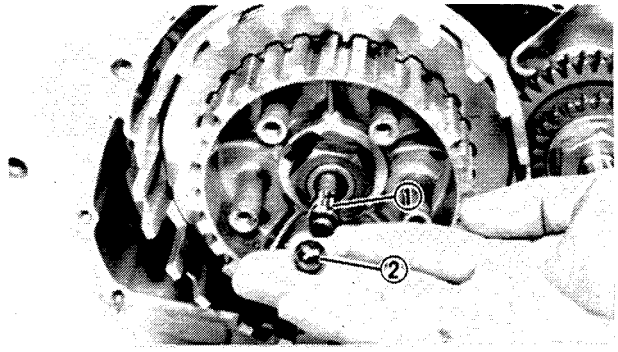
CAUTION:
Always use a new wire circlip.



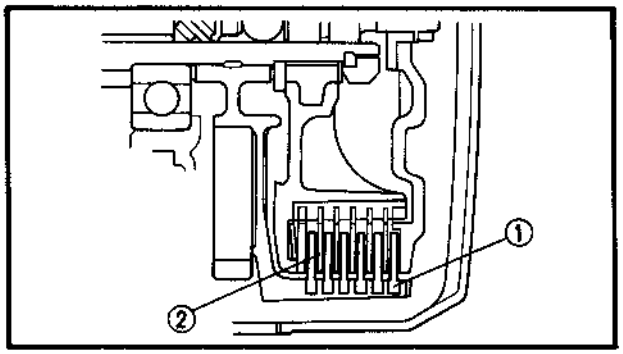
5. Tighten:
   - Locknut (Clutch boss) ①
     Use the Universal Clutch Holder ② (YM-91042) to hold the clutch boss.

Locknut (Clutch Boss):
70 Nm (7.0 m·kg, 50 ft·lb)

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

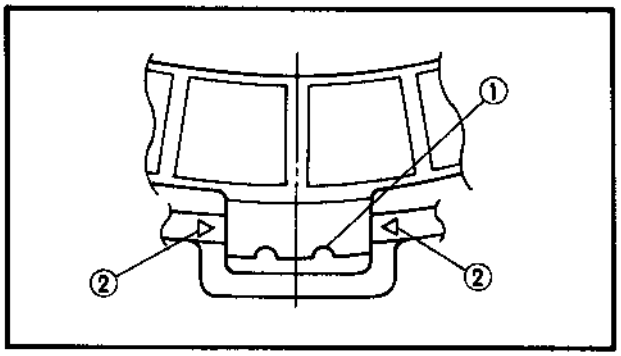


7. Install:
   - Push rod # 2 ①
   - Ball ②



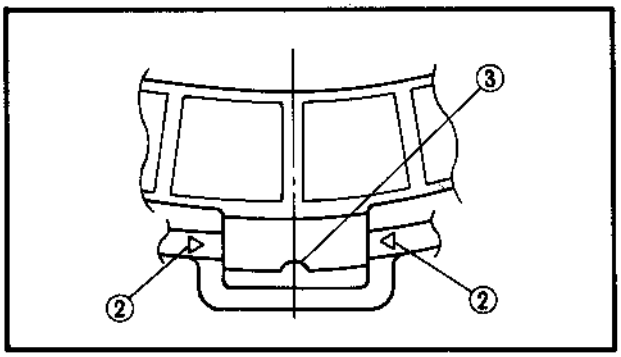
8. Install:
   - Friction plates ①
   - Clutch plates ②

NOTE:
Install the clutch plates and friction plate alternately on the clutch boss, starting with a friction plate and ending with a friction plate.



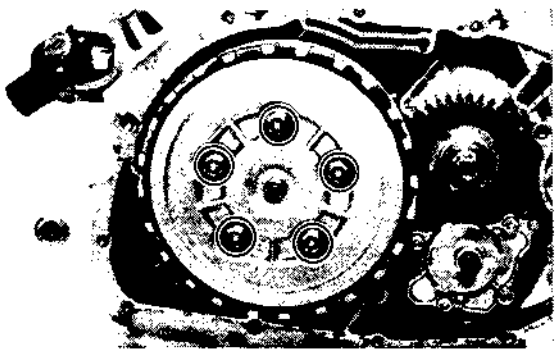
Friction plates and clutch plates installation steps:
- Install the friction plates (with the double semi-circular slots) and the five clutch plates.

NOTE:
Be sure the double semi-circular slots ① on the friction plate is aligned with the clutch housing embossed match marks ② .



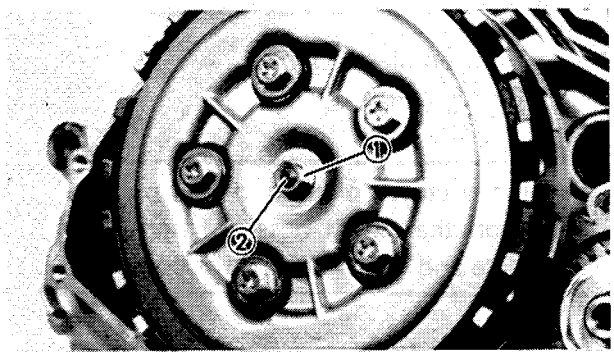
- If the clutch does not release due to hard meshing between the friction plates and the clutch housing, check to see if any of the friction plates fit too snugly into the clutch housing. Any tight-fitting friction plates must be repositioned as follows.
  1) Remove the friction plates and the clutch plates.
  2) Install the six friction plate (with the double semi-circular slots) and the five clutch plates.

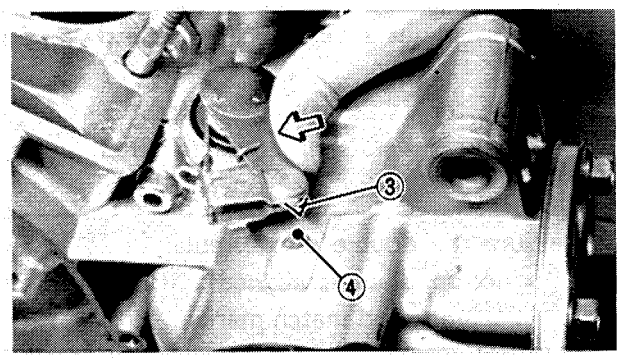
NOTE:
- Invert the friction plates.
- Be sure the single semi-circular slot ③ on the friction plate is aligned with the clutch housing embossed match marks ② .



9. Install:
   - Pressure plate
   - Clutch springs
   - Screws (Clutch spring)

Screws (Clutch Spring):
8 Nm (0.8 m·kg, 5.8 ft·lb)

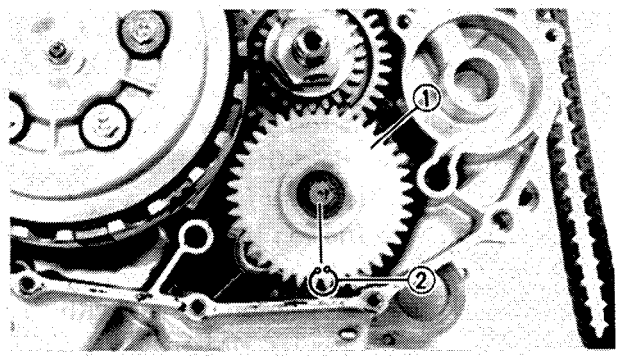




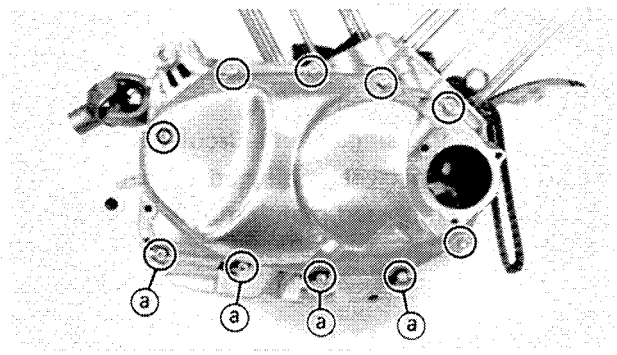
10. Adjust:
    - Clutch mechanism free play

Clutch mechanism free play adjustment steps:
- Loosen the locknut ①.
- Push the push lever toward the front of the engine with your finger until it stops.
- With the push lever in this position, turn the adjuster ② either in or out until the push lever mark ③ and crankcase match mark ④ are aligned.
- Tighten the locknut.

Locknut:
8 Nm (0.8 m·kg, 5.8 ft·lb)



11. Install:
    - Oil pump gear ①
    - Clip ②



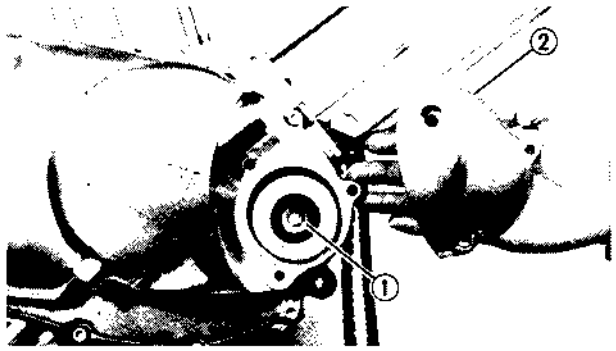
CRANKCASE COVER (RIGHT)

1. Install:
    - Dowel pins
    - Gasket (New)
    - Crankcase cover (Right)
2. Tighten:
    - Bolts (Crankcase cover)

ⓐ With clamp

NOTE:
- Finger tighten the four bolts with clamps at this point.
- Tighten the bolts in stage, using a crisscross pattern.

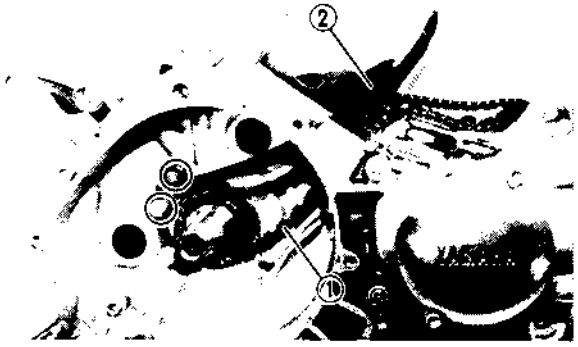
Bolts (Crankcase Cover):
10 Nm (1.0 m·kg, 7.2 ft·lb)

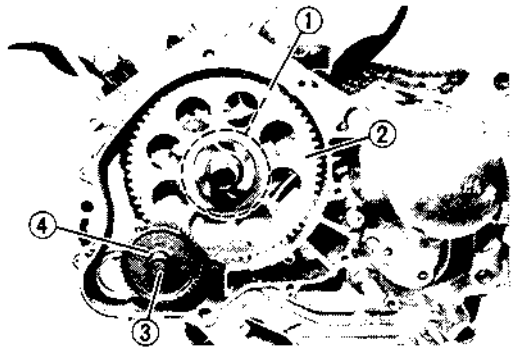


3. Install:
   - O-ring (Filter cover)
   - Oil filter ①
   - Oil filter cover ②

NOTE:
Inspect the O-ring and oil filter. If damaged, replace them.

Oil Filter Cover:
10 Nm (1.0 m·kg, 7.2 ft·lb)





CDI MAGNETO

1. Install:
   - Cam chain ①
   - Cam chain damper (Rear cylinder – Intake) ②

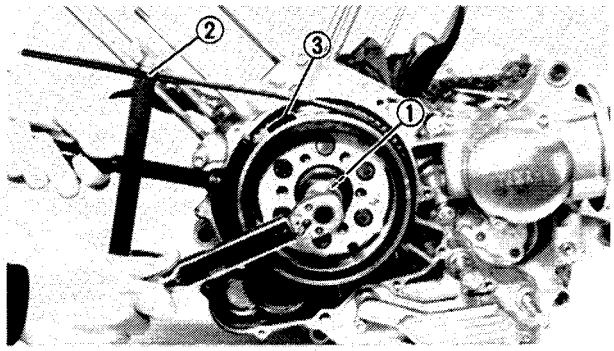
Cam Chain Damper:
10 Nm (1.0 m·kg, 7.2 ft·lb)

2. Install:
   - Washer ①
   - Idler gear # 2 ②
   - Shaft (Idler gear # 1) ③
   - Idler gear # 1 ④

NOTE:
Before installing the idler gear # 2, do not forget to fit the washer ①.

3. Install:
   - Woodruff key
   - Rotor
   - Plain washer
   - Nut (Rotor)

NOTE:
- Before installing the rotor, clean the outside of the crankshaft and inside of the rotor.



- When installing the CDI rotor, make sure the woodruff key is properly seated in the key way of the crankshaft.

2. Tighten:
   - Nut (Rotor) ①

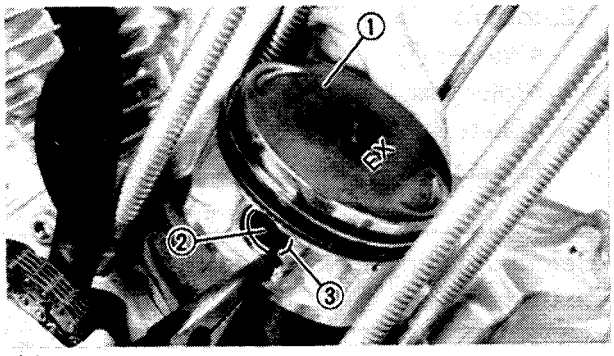
     Use the Sheave Holder ② (YS-01880) to lock the rotor.

NOTE:
Do not allow the special tool to touch the projection ③ on the rotor.

	Nut (CDI Rotor): 80 Nm (8.0 m·kg, 58 ft·lb)

PISTON/CYLINDER AND CYLINDER HEAD

NOTE:
Identify following parts position carefully so that they can be installed in its original place.
- Piston
- Cylinder
- Cylinder head
- Cam sprocket



Rear Side

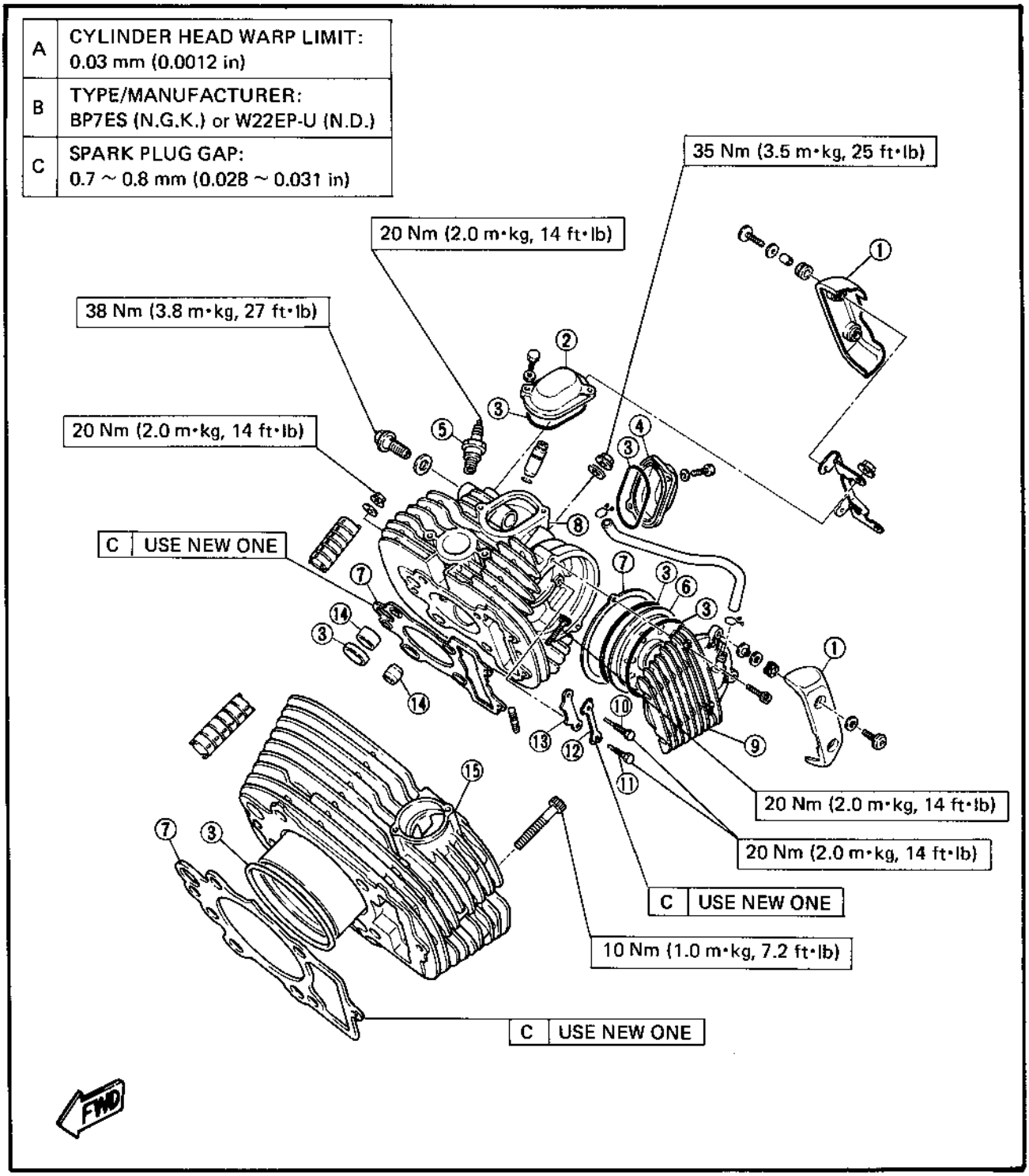
1. Install:
   - Piston ①
   - Piston pin ②
   - Piston pin clip ③

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

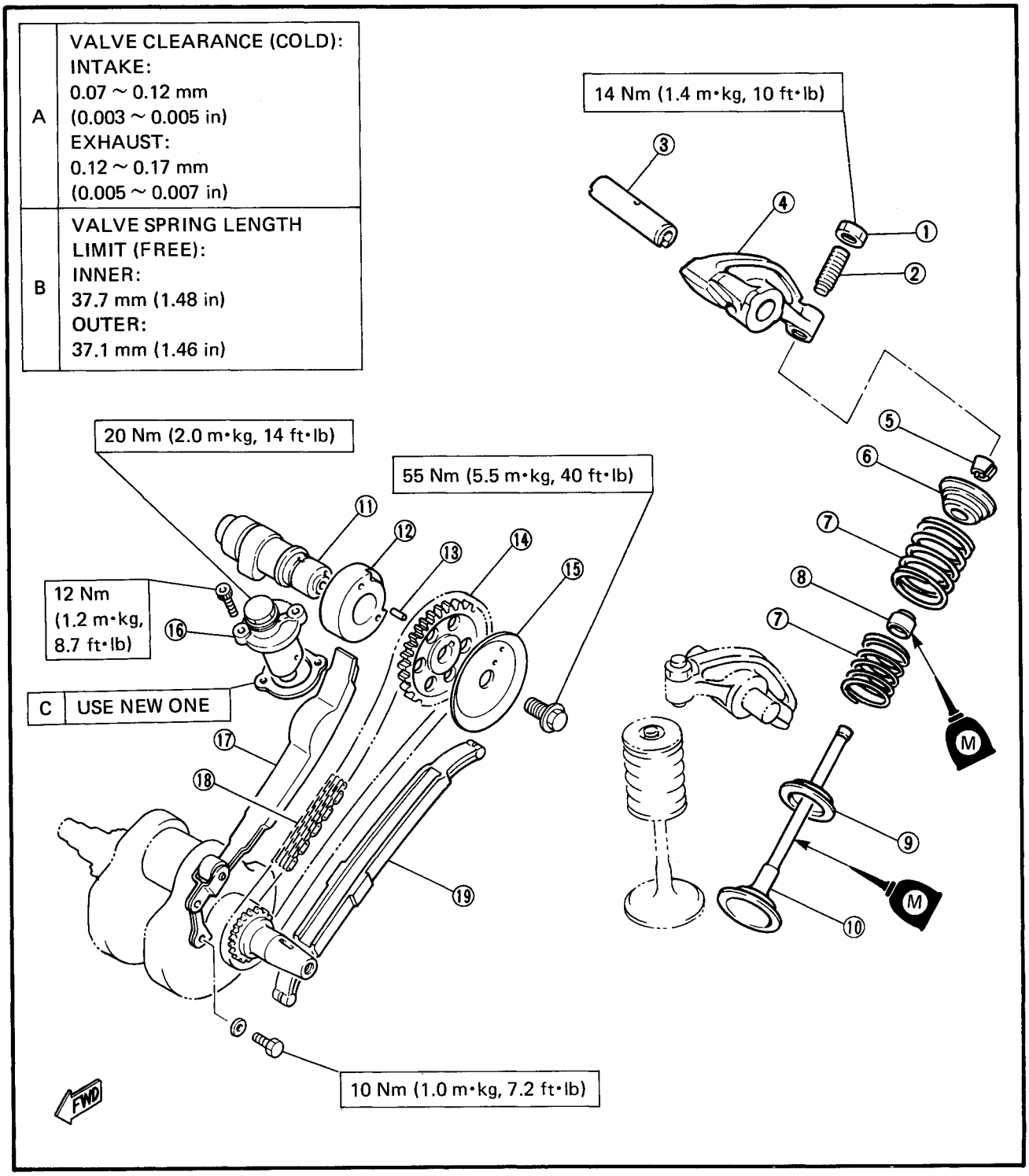
WARNING:
Always use a new piston pin clip.

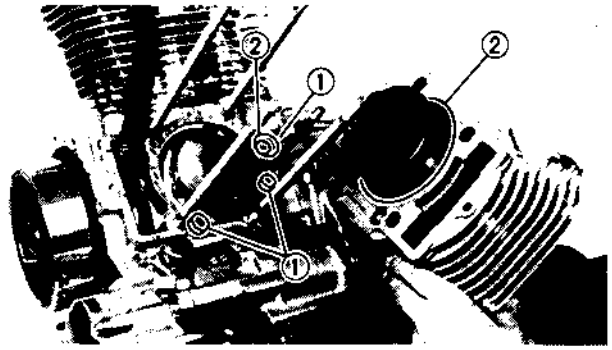
CYLINDER AND CYLINDER HEAD

① Side cover (Cylinder head)
② Tappet cover (Intake)
③ O-ring
④ Tappet cover (Exhaust)
⑤ Spark plug
⑥ Oil baffle plate (Rear only)
⑦ Gasket
⑧ Cylinder head (Rear)
⑨ Cam sprocket cover
⑩ Longer bolt
⑪ Shorter bolt
⑫ Lock washer
⑬ Retainer
⑭ Dowel pin
⑮ Cylinder (Rear)



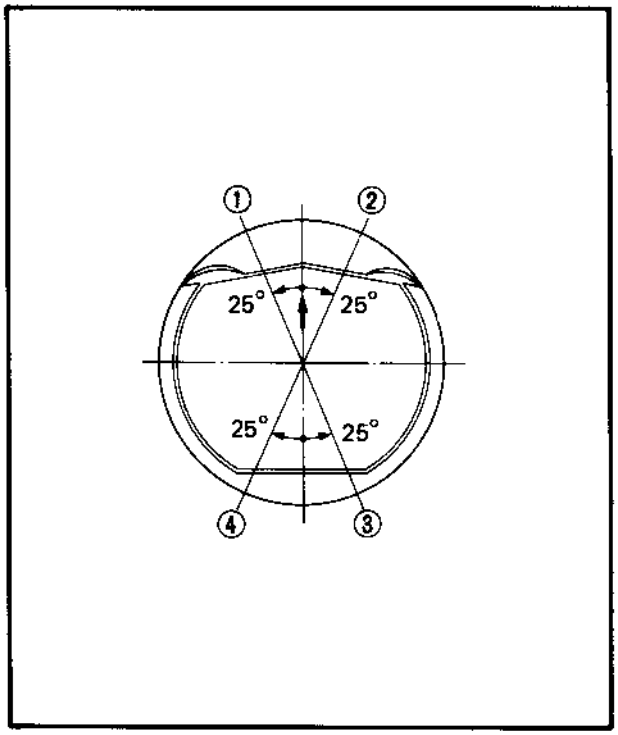
① Locknut (Valve adjusting)
② Adjuster (Valve adjusting)
③ Rocker arm shaft
④ Rocker arm
⑤ Valve retainers
⑥ Valve spring seat
⑦ Valve springs
⑧ Oil seal
⑨ Valve spring seat
⑩ Valve
⑪ Camshaft
⑫ Camshaft bushing
⑬ Positioning pin
⑭ Cam sprocket
⑮ Oil baffle plate (Rear only)
⑯ Cam chain tensioner
⑰ Cam chain damper (Intake)
⑱ Cam chain
⑲ Cam chain damper (Exhaust)





2. Apply:
   - 4-stroke engine oil

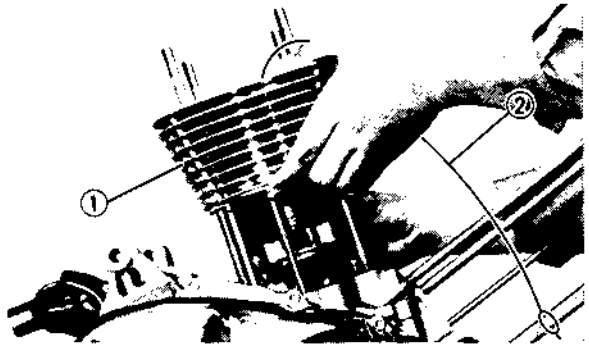
   To the piston pin, bearing, piston ring grooves and piston skirt areas.
3. Install:
   - Gasket (New)
   - Dowel pins ①
   - O-rings ②



4. Offset the piston ring end gaps as shown.

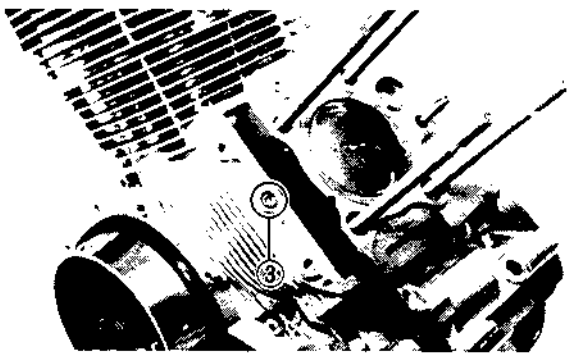
NOTE:
- Be sure to check the manufacturer's marks or numbers stamped on the rings are on the top side of the rings.
- Before installing the cylinder, apply a liberal coating of 4-stroke engine oil to the piston rings.

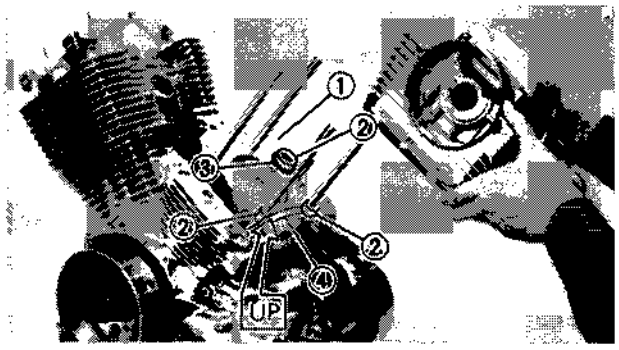
① Top ring
② Oil ring (Lower rail)
③ 2nd ring
④ Oil ring (Upper rail)



5. Install:
   - Cylinder ①

NOTE:
- Install the cylinder with one hand while compressing the piston rings with the other hand.
- Tie the cam chain with a piece of mechanics wire ② , and feed it through the chain opening.
- Finger tighten the bolt ③ in this point.





6. Install:
   - Gasket (New) ①
   - Dowel pins ②
   - O-ring ③
   - Cam chain damper (Exhaust) ④

NOTE:
The cam chain damper should be installed with the "UP" mark upward.

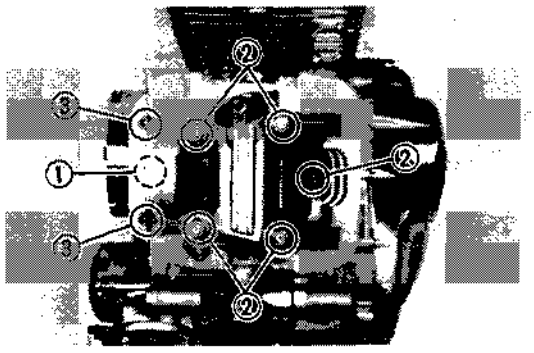
7. Install:
   - Cylinder head
   - Washers
   - Bracket (Engine mounting)

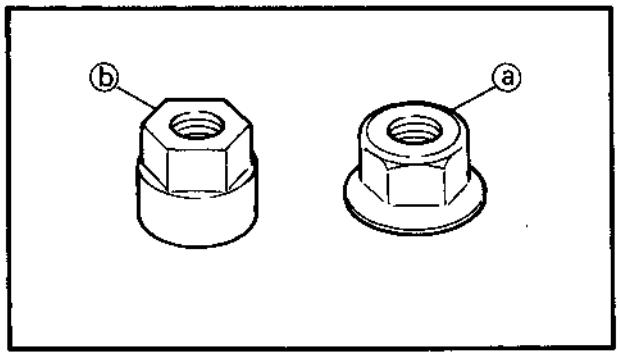
NOTE:
- Tie the cam chain so that it does not fall into the crankcase.
- The bracket with its has projected nut facing the inside.



8. Tighten:
   - Bolt (Cylinder) ①
   - Nuts (Cylinder head) ②
   - Bolts (Cylinder head) ③

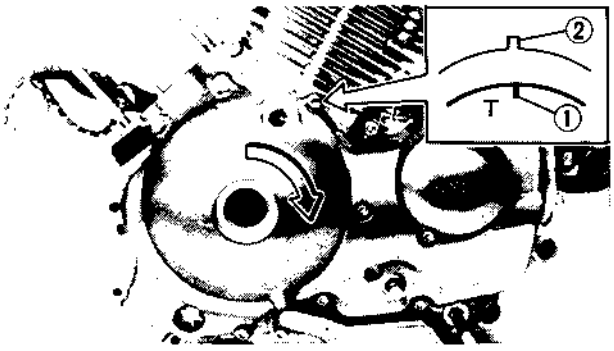
NOTE:
- Before tightening the bolts and nuts, make sure that the top end of cam chain damper engages with slot in the cylinder head.
- Tighten the bolts and nuts in this stage, using a crisscross pattern.
- Do not forget to tighten the bolt (Cylinder).
- There are two different nuts (Cylinder head) used on this model. The shorter nuts ⓐ go on the rear cylinder, the taller nuts ⓑ on the front cylinder.

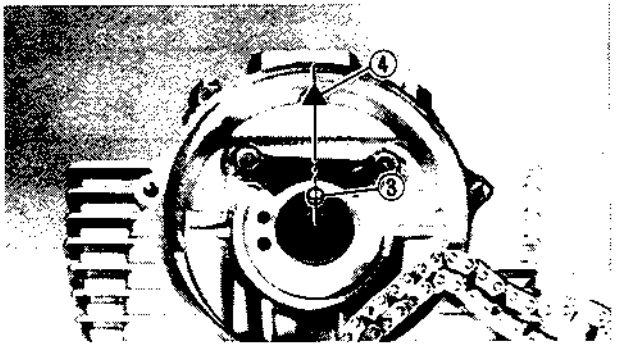


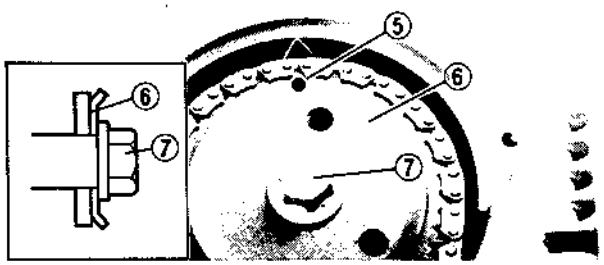


Bolt (Cylinder):
10 Nm (1.0 m·kg, 7.2 ft·lb)
10 mm Nuts (Cylinder Head):
35 Nm (3.5 m·kg, 25 ft·lb)
8 mm Nut (Cylinder Head):
20 Nm (2.0 m·kg, 14 ft·lb)
Bolts (Cylinder Head):
20 Nm (2.0 m·kg, 14 ft·lb)

9. Install:
   - Dowel pin (Cam sprocket positioning)
   - Oil baffle plate (Rear cylinder only)
   - Cam sprocket







Cam sprocket installing steps:
- Temporarily install the crankcase cover (Left) in this stage.
- Remove the timing plug and crankcase cover plate.
- Turn the crankshaft clockwise with wrench.
- Align the "T" mark ① on the rotor with the stationary pointer ② on the crankcase cover .
- Install the dowel pin (Cam sprocket positioning) securely.

CAUTION:

Do not fall the pin during the sprocket installation.

- Align the positioning pin ③ on the camshaft with the stationary pointer ④ on the rear cylinder head.
- Install the cam sprocket with the punched mark ⑤ facing outward.
- Install the oil baffle plate (Rear cylinder only) ⑥ and sprocket bolt ⑦ , and finger tighten the bolt.

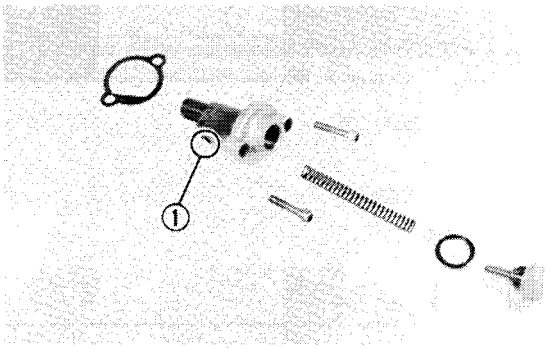
NOTE:

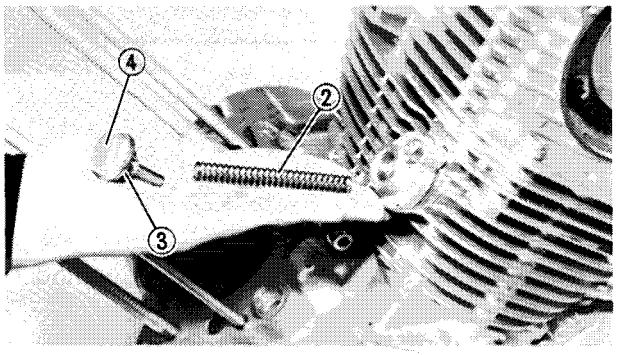
The bented side of oil baffle plate must face inward.

- Force the camshaft clockwise to remove the cam chain slack.
- Insert your finger into the cam chain tensioner hole, and push the cam chain damper inward.
- While pushing the cam chain damper, be sure the cam sprocket punch mark aligns with the stationary pointer on the cylinder head at TDC.
- If marks are aligned, tighten the cam sprocket bolt.

Cam Sprocket:
55 Nm (5.5 m·kg, 40 ft·lb)

- If marks do not align, change the meshing position of sprocket and chain.





10. Install:
    - Gasket (New)
    - Cam chain tensioner

Cam chain tensioner installation steps:
- Remove the tensioner end cap bolt and spring.
- Release the cam chain tensioner one-way cam ①.
- Install the tensioner with a new gasket into the cylinder.

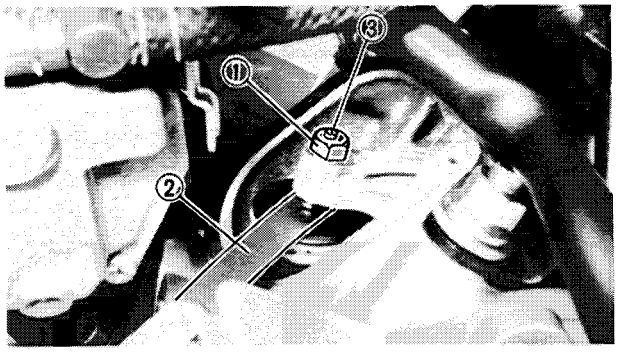
Cam Chain Tensioner Body:
12 Nm (1.2 m·kg, 8.7 ft·lb)

- Install the tensioner spring ②, copper washer ③ and end cap bolt ④.

End Bolt (Cam Chain Tensioner):
20 Nm (2.0 m·kg, 14 ft·lb)

11. Adjust:
    - Valve clearance
      Refer to "CHAPTER 2. VALVE CLEARANCE ADJUSTMENT" section.

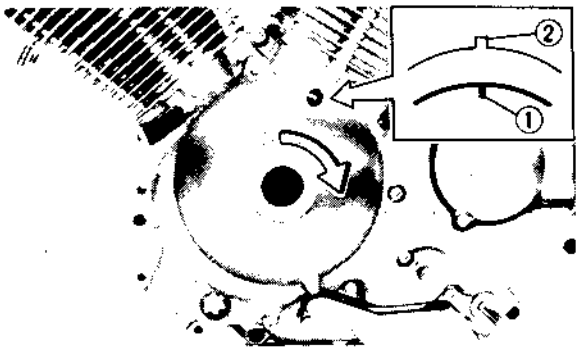
Intake Valve (Cold):
0.07 ~ 0.12 mm
(0.003 ~ 0.005 in)
Exhaust Valve (Cold):
0.12 ~ 0.17 mm
(0.005 ~ 0.007 in)

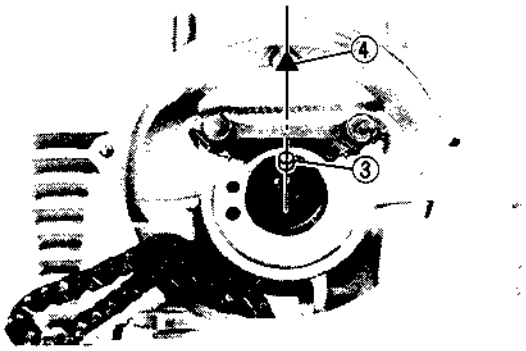


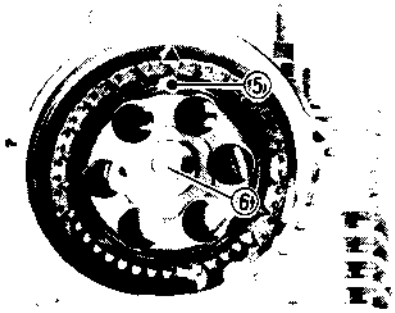
12. Install:
    - O-rings
    - Tappet cover (Intake) ①
    - Tappet cover (Exhaust) ②
    - Cam sprocket cover

NOTE:
- Inspect the O-rings. If damaged, replace them.
- Install the intake tappet cover with its ridge facing upward ③.

Tappet Covers:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Cam Sprocket Cover:
10 Nm (1.0 m·kg, 7.2 ft·lb)







Front Side
When installing the front side components, repeat the rear side installation procedure. However, note the following points.

1. Install:
   - Dowel pin (Cam sprocket positioning)
   - Cam sprocket

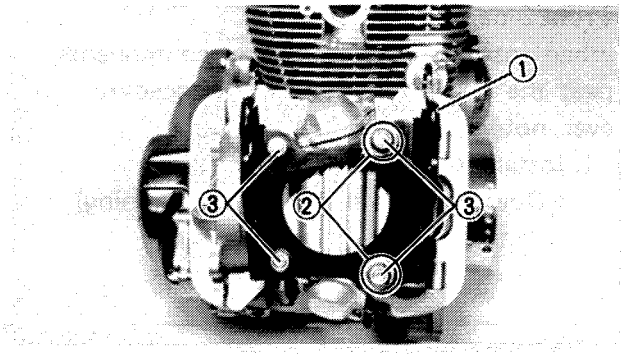
Cam sprocket installing steps:
- Turn the crankshaft clockwise with wrench.
- Align the slit ① on the rotor with the stationary pointer ② on the crankcase cover.
- Install the dowel pin (Cam sprocket positioning) securely.

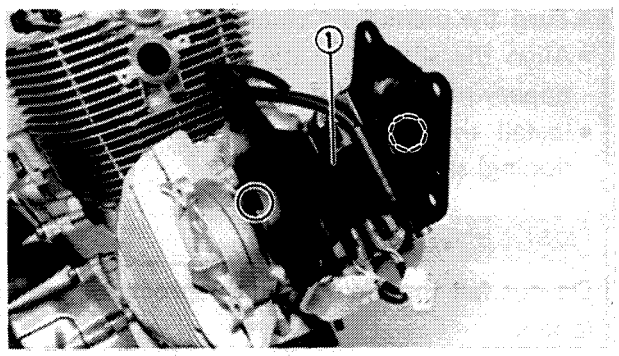
CAUTION:
Do not fall the pin during the sprocket installation.

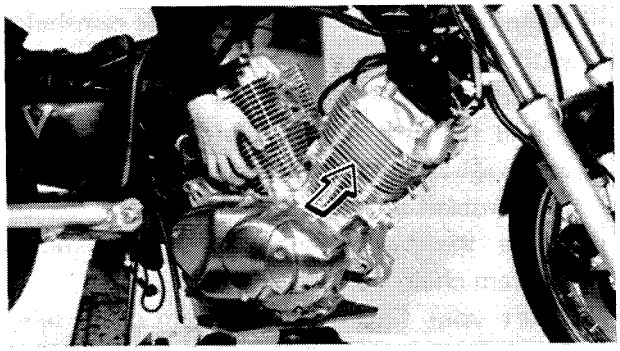
- Align the positioning pin ③ on the camshaft with the stationary pointer ④ on the front cylinder head.
- Install the cam sprocket with the punched mark ⑤ facing outward, and finger tighten the sprocket bolt ⑥ .
- Force the camshaft clockwise to remove the cam chain slack.
- Insert your finger into the cam chain tensioner hole, and push the cam chain damper inward.
- While pushing the cam chain damper, be sure the cam sprocket punch mark aligns with the stationary pointer on the cylinder head at TDC.
- If marks are aligned, tighten the cam sprocket bolt. Install the timing plug and crankcase cover plate, and remove the crankcase cover (Left).

Cam Sprocket:
55 Nm (5.5 m·kg, 40 ft·lb)

- If marks do not align, change the meshing position of sprocket and chain.







ENGINE MOUNTING BRACKET AND IGNITION COILS

1. Install:
   - Washers (Front cylinder — Bracket Inside)
   - Bracket (Engine mounting) ①
   - Washers (Front cylinder — Bracket Outside) ②
   - Nuts (Front cylinder) ③

Engine Mounting Bracket:
55 Nm (5.5 m·kg, 40 ft·lb)

2. Install:
   - Spark plugs (Front and rear cylinder)
   - Bracket (Ignition coils) ①

Bracket (Ignition Coils):
7 Nm (0.7 m·kg, 5.1 ft·lb)
Spark Plugs:
20 Nm (2.0 m·kg, 14 ft·lb)

REMOUNTING ENGINE

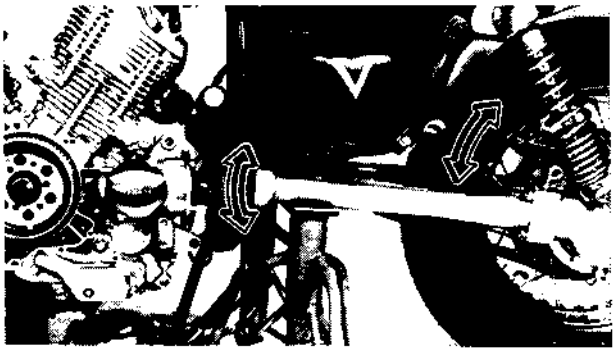
When remounting the engine, reverse the removal procedure. Note the following points.

1. Place the suitable stands under the engine and frame.

WARNING:

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

2. Install:
   - Engine assembly
     To the right side.
3. Apply:
   - Molbdenum disulfide grease
     To the drive shaft spline.
4. Connect:
   - Universal joint
     To the drive shaft spline.



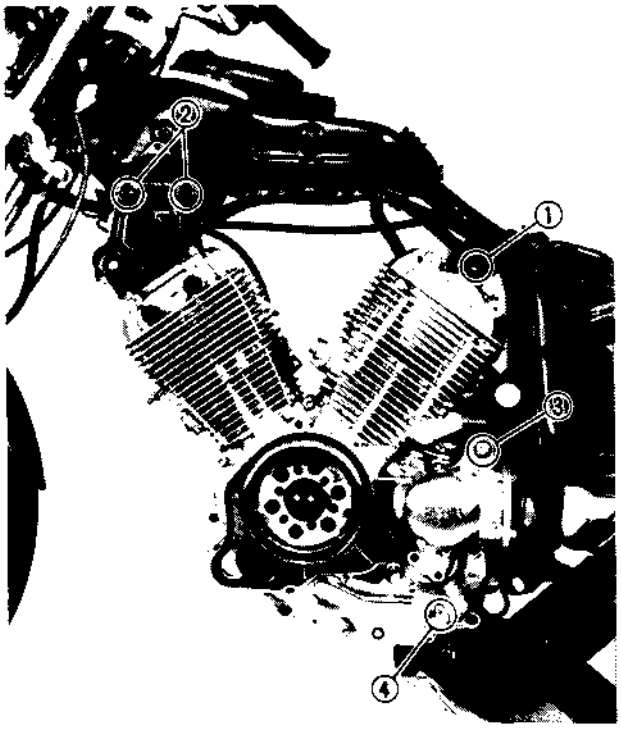
5. Check:
   - Shaft drive operation

Drive shaft operation checking steps:
- Temporarily install the engine mounting bolts.
- Make sure that the motorcycle is off the ground at the rear.

WARNING:

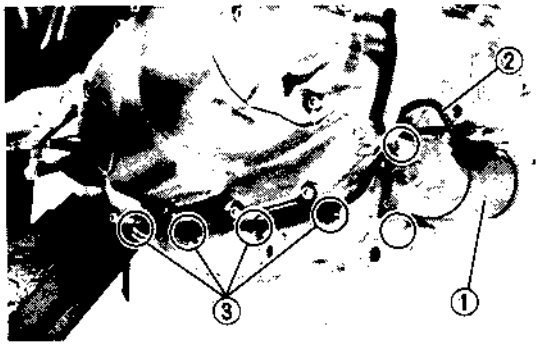
Securely support the motorcycle so there is no danger of it falling over.

- Turn the rear wheels back and forth.
- Check the drive shaft operation. If the operation is unsmooth, reinstall the engine properly.



6. Install:
   - Bolts (Rear cylinder) ①
   - Bolts (Front cylinder) ②
   - Bolts (Crankcase – Rear Top) ③
   - Shaft (Crankcase – Rear Bottom) ④

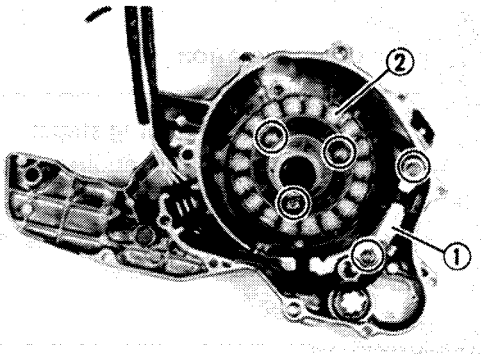
Engine Stay (Front) and Frame:
55 Nm (5.5 m·kg, 40 ft·lb)
Engine Stay (Rear) and Frame:
55 Nm (5.5 m·kg, 40 ft·lb)
Engine Mounting (Rear – Top) and Frame:
55 Nm (5.5 m·kg, 40 ft·lb)



7. Install:
   - Starter motor ①
   - Starter motor lead ②

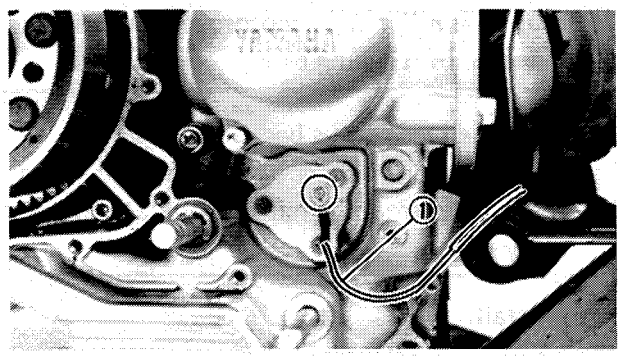
NOTE:
- Inspect the O-ring. If damaged, replace it.
- After connecting the lead, secure the lead with clamps ③ and then tighten the bolts (Crankcase cover).

Starter Motor:
7 Nm (0.7 m·kg, 5.1 ft·lb)
Bolts (Crankcase Cover):
10 Nm (1.0 m·kg, 7.2 ft·lb)

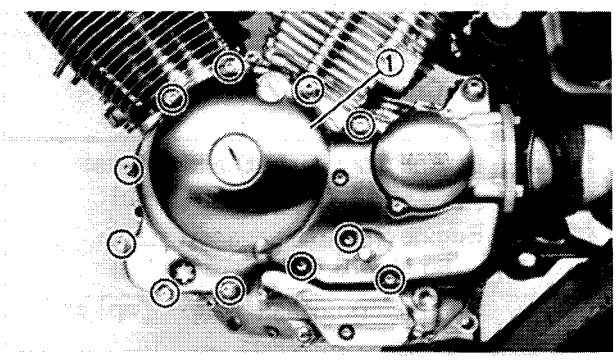


8. Install:
   - Pickup coil assembly ①
   - Stator assembly ②

	Pickup Coil Assembly: **7 Nm (0.7 m·kg, 5.1 ft·lb)** **Stator Assembly:** **7 Nm (0.7 m·kg, 5.1 ft·lb)**



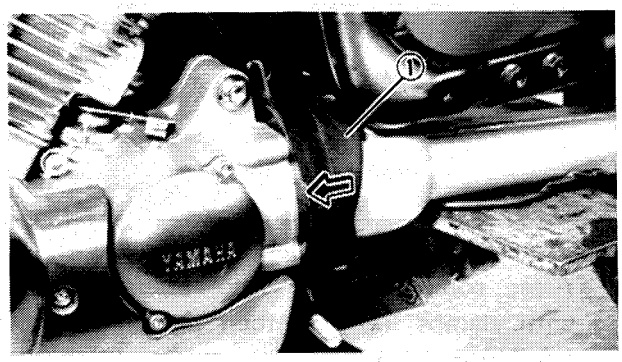
9. Connect:
   - Neutral switch lead ①



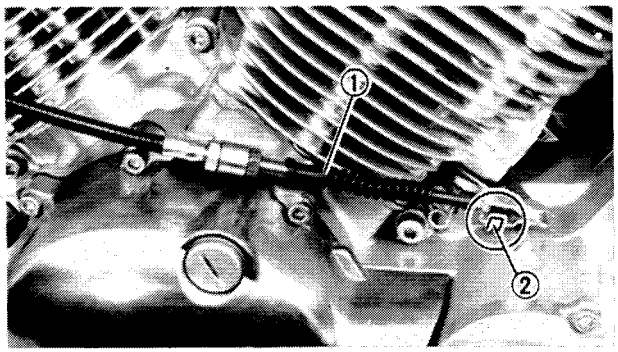
10. Install:
    - Gasket (New)
    - Dowel pins
    - Crankcase cover (Left) ①

NOTE:
Tighten the bolts in this stage, using a crisscross pattern.

	Crankcase Cover: **10 Nm (1.0 m·kg, 7.2 ft·lb)**

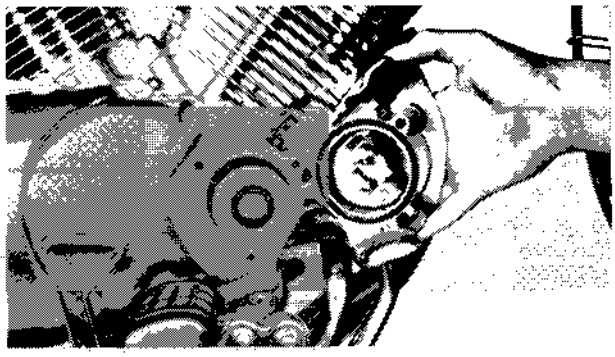


11. Pull in the rubber boot ① completely.



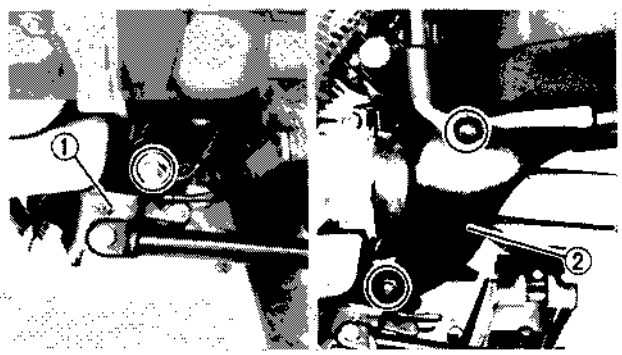
12. Connect:
    - Clutch cable ①

    Bend the lock tab ② securely.



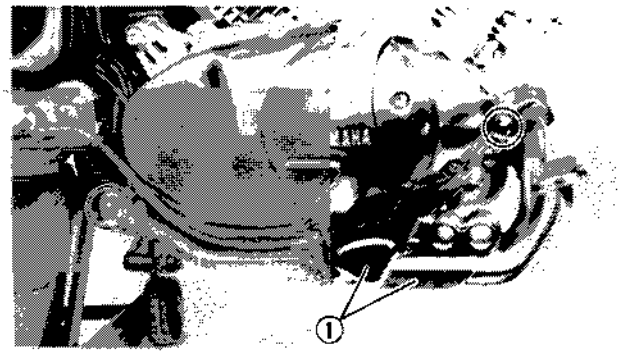
13. Adjust:
- Clutch cable free play ⓐ
  Refer to "CHAPTER 2. CLUTCH ADJUSTMENT" section.

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



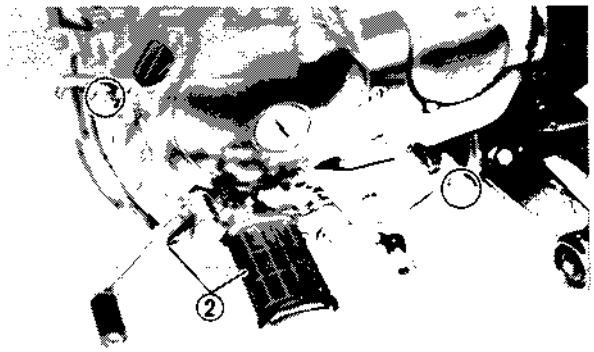
14. Install:
- Sidestand switch
- Sidestand ①
- Rear-under-side cover ②

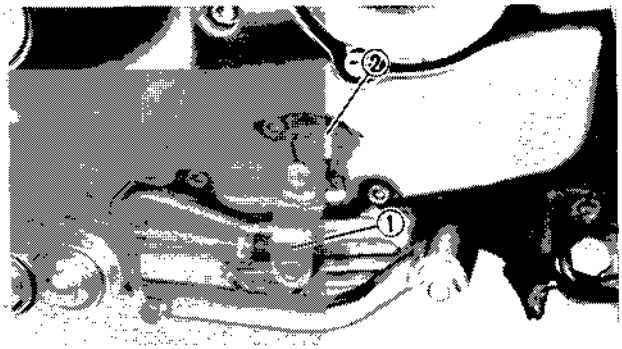
Sidestand:
26 Nm (2.6 m·kg, 19 ft·lb)
Rear-under-side Cover:
Top: 7 Nm (0.7 m·kg, 5.1 ft·lb)
Bottom: 20 Nm (2.0 m·kg, 14 ft·lb)



15. Install:
- Brake pedal and footrest (Right) assembly ①
- Change pedal and footrest (Left) assembly ②

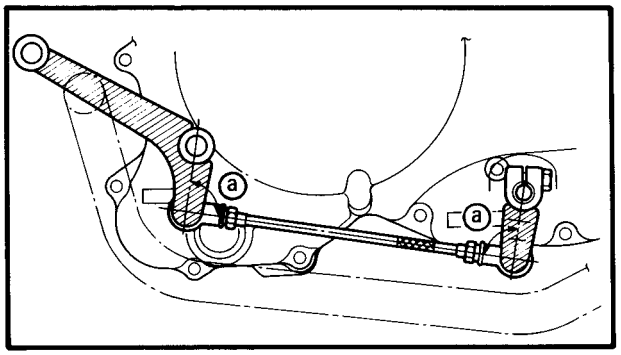
Engine Mounting (Rear – Bottom) and Frame:
70 Nm (7.0 m·kg, 50 ft·lb)
Engine and Footrest Bar (Front):
55 Nm (5.5 m·kg, 40 ft·lb)
Engine and Footrest Bar (Rear):
55 Nm (5.5 m·kg, 40 ft·lb)





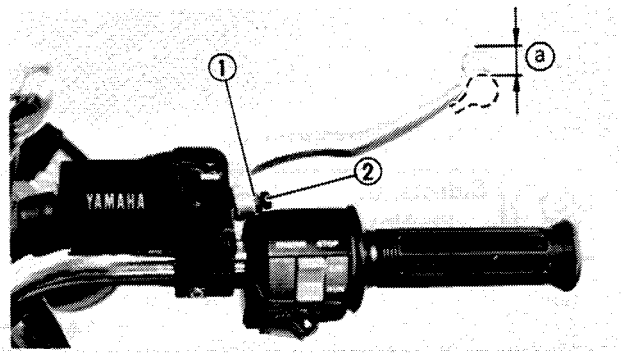
16. Install:
- Change pedal ①
- Bolt (Change pedal) ②

Bolt (Change Pedal):
10 Nm (1.0 m·kg, 7.2 ft·lb)



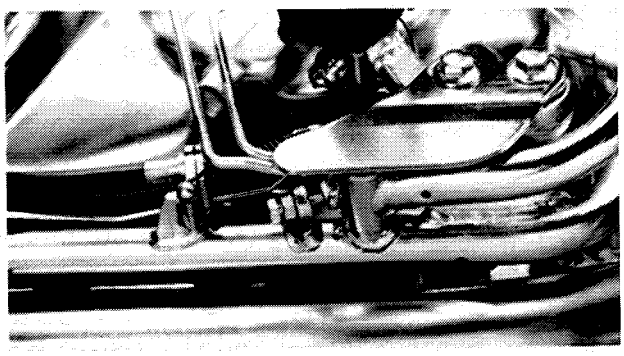
17. Adjust:
- Change pedal height ⓐ
  Refer to "CHAPTER 2. CHANGE PEDAL ADJUSTMENT" section.

Change Pedal Height:
50 ~ 60 mm (2.0 ~ 2.4 in)
Above the Top of the Footrest.

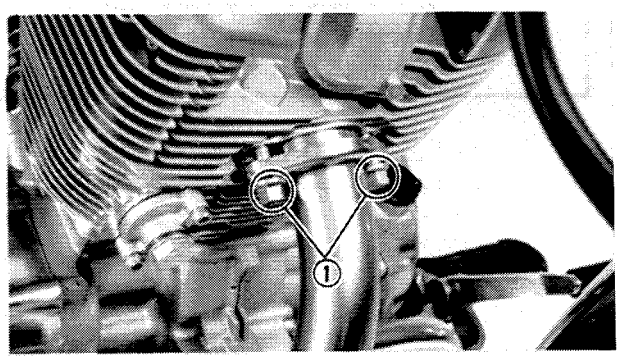


18. Adjust:
- Brake pedal height ⓐ
- Brake pedal free play ⓑ
  Refer to "CHAPTER 2. REAR BRAKE ADJUSTMENT" section.

WARNING:
- **Check the operation of the brake light after adjusting the brake pedal height.**
- **After adjusting the pedal height, adjust the brake pedal free play.**

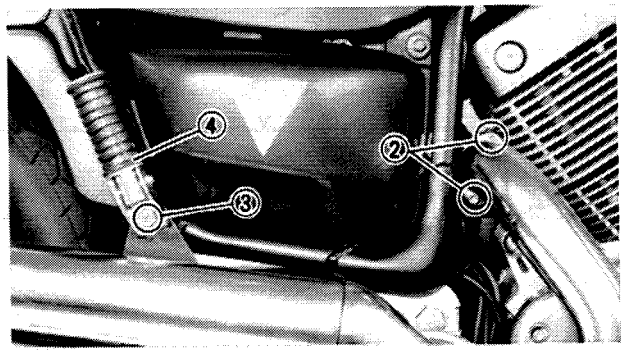


Brake Pedal Height:
38 mm (1.5 in)
Above the Top of the Footrest.
Brake Pedal Free Play:
20 ~ 30 mm (0.8 ~ 1.2 in)

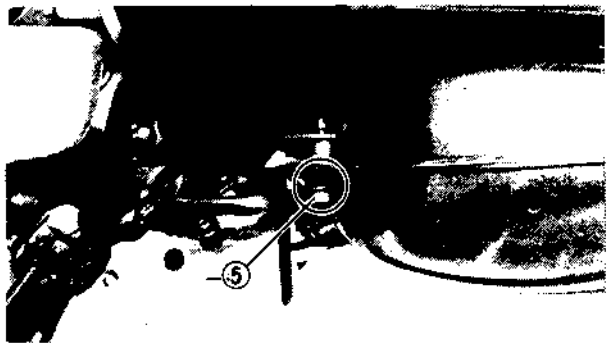


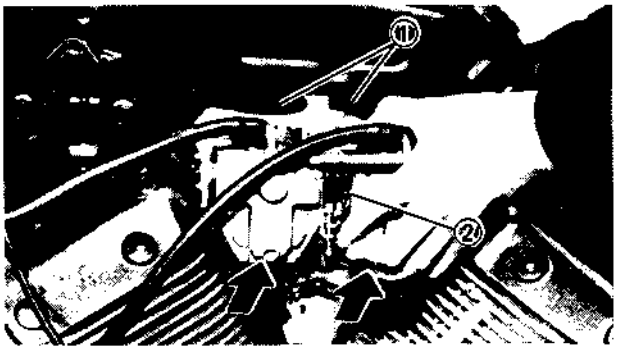
19. Tighten:
- Nuts (Front cylinder – Exhaust pipe) ①
- Bolts (Rear cylinder – Rear joint) ②
- Bolt (Muffler bracket) ③
- Rear footrest (Right) ④
- Bolt (Muffler chamber) ⑤

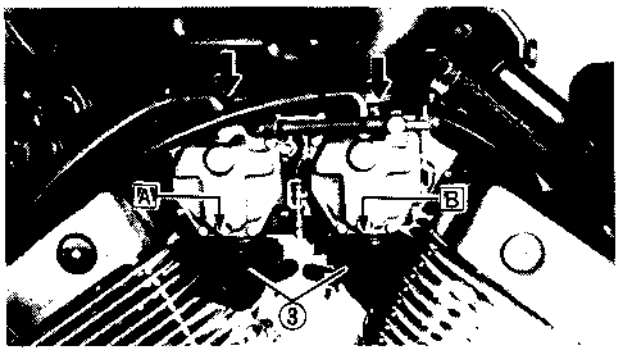
NOTE:
Inspect the gaskets. If damaged, replace them.



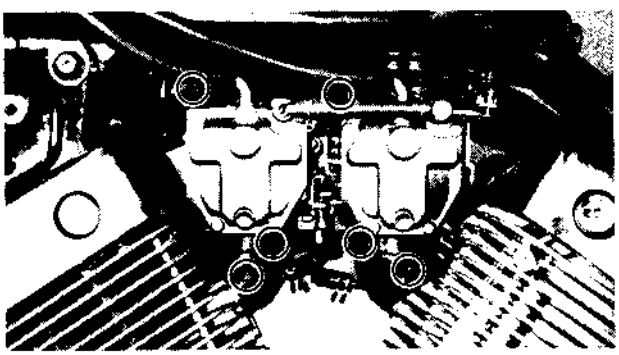
Exhaust Pipes:
20 Nm (2.0 m·kg, 14 ft·lb)
Rear Joint (Exhaust Pipe):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Rear Footrest:
45 Nm (4.5 m·kg, 32 ft·lb)
Muffler Chamber:
20 Nm (2.0 m·kg, 14 ft·lb)











20. Install:
    - Carburetor assembly

Carburetor installation steps:
- Make sure that the air cleaner joints ① have already been pushed into the air cleaner case.
- Push the carburetor assembly ② to the left side and connect the air cleaner joints.
- Install the carburetor joints (Front and rear) ③ to the carburetors.

NOTE:
- Inspect the O-rings. If damaged, replace them.
- The carburetor joints should be installed with the "A" (Front) and "B" (Rear) marks upward.
- Do not torque the carburetor joints at this point.

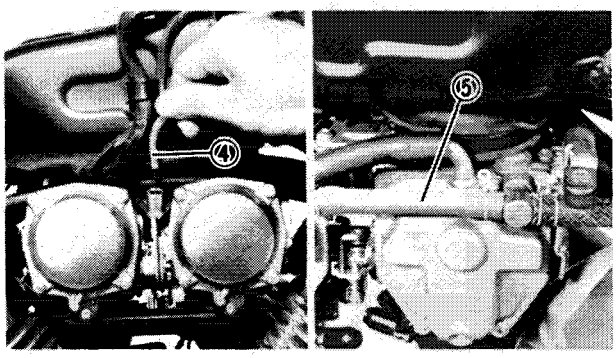
CAUTION:
Do not damage the O-rings during the carburetor reinstallation.

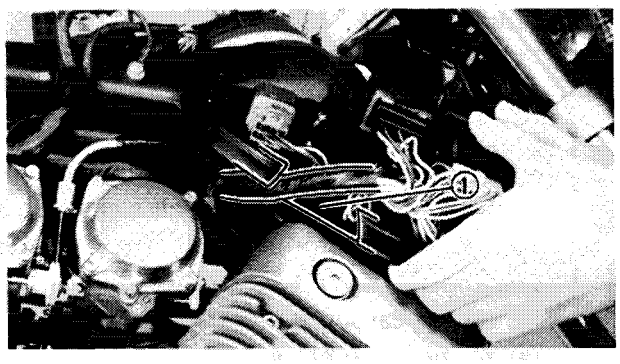
- Using a suitable tool, pull the air cleaner joints back in their original place ⓐ.

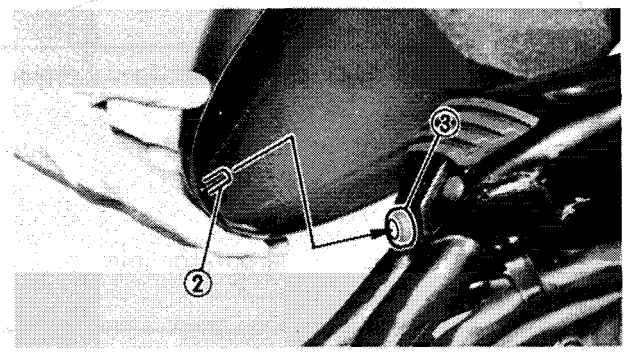
CAUTION:
Be sure not to give damages to the air cleaner joints and carburetor joints.

- Tighten the joint screws securely, and tighten the joint bolts to specification.

Carburetor Joints:
12 Nm (1.2 m·kg, 8.7 ft·lb)







- Connect the throttle cable ④ and fuel hose ⑤ .
- Adjust the following items of the carburetors. Refer to "CHAPTER 2. PERIODIC INSPECTIONS AND ADJUSTMENTS" section.
  1) Carburetor synchronization
  2) Idle speed
  3) Throttle cable free play

21. Install:
    - Front side cover (Right)
    - Front side cover (Left)
    - Top cover

NOTE:
- Pass the wireharness into the cut ① on the front side cover (Right).
- Insert the lobe ② on the top cover into the receptacle ③ on the frame.

22. Fill:
    - Crankcase

    Refer to "CHAPTER 2. ENGINE OIL REPLACEMENT" section.

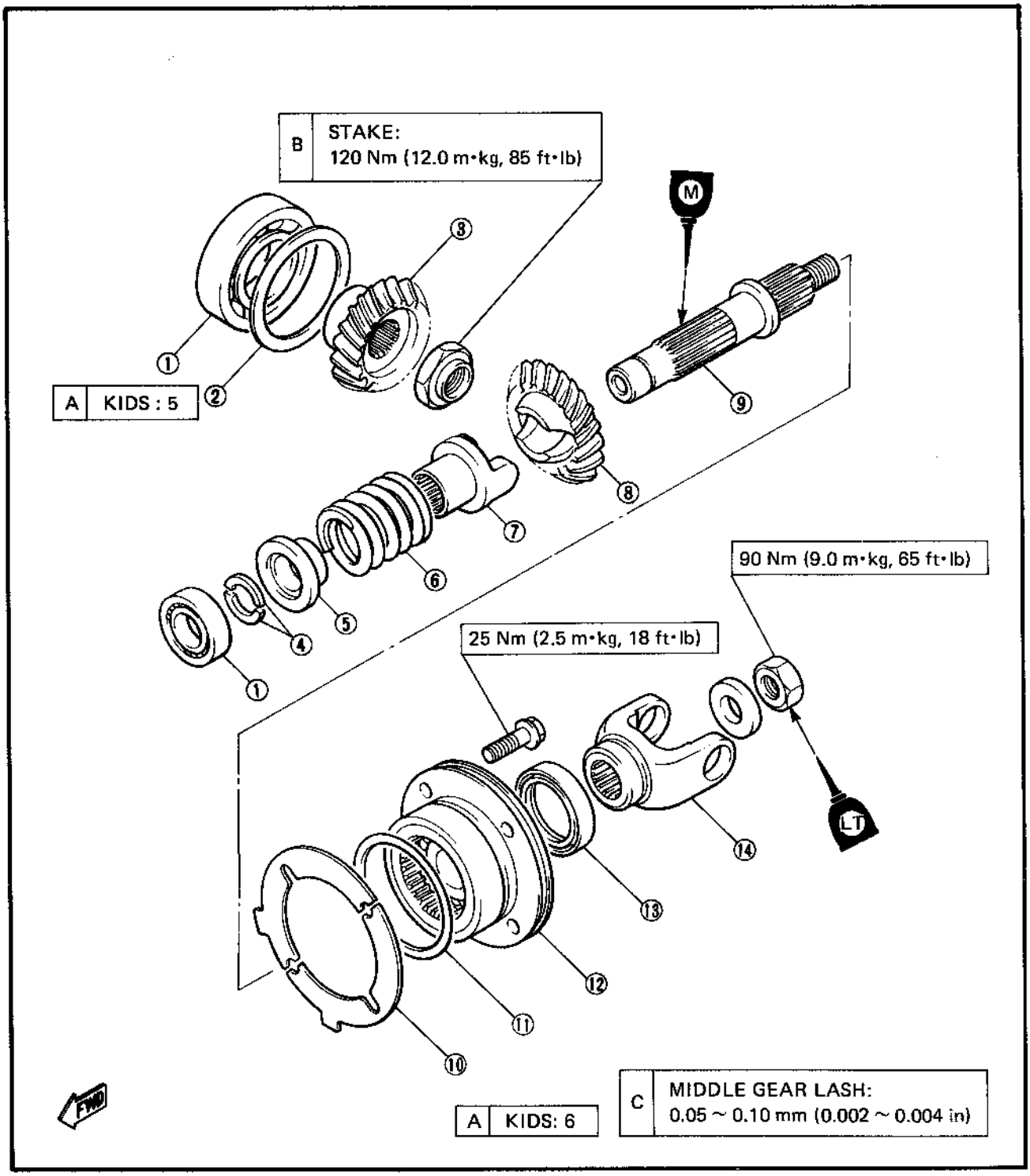
CAUTION:
Do not allow foreign material to enter the crankcase.

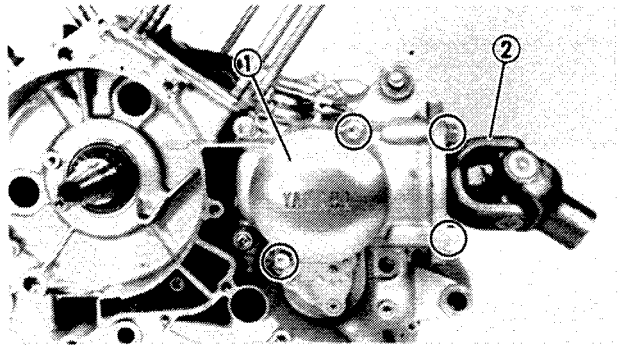
Total Amount:
3.2 L (2.8 Imp qt, 3.4 US qt)

23. Inspect:
    - Oil leaks
    - Oil level

MIDDLE GEAR SERVICE

① Bearing
② Thrust shims
③ Middle drive gear
④ Retainers
⑤ Holder
⑥ Damper spring
⑦ Damper cam
⑧ Middle driven gear
⑨ Middle driven shaft
⑩ Shims
⑪ O-ring
⑫ Bearing housing assembly
⑬ Oil seal
⑭ Universal joint



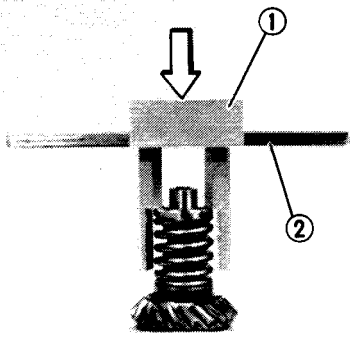


REMOVAL

Middle Driven Gear

1. Remove:
   - Middle gear case ①
   - Middle driven gear assembly ②

   Refer to "ENGINE REMOVAL – MIDDLE DRIVEN GEAR" section.



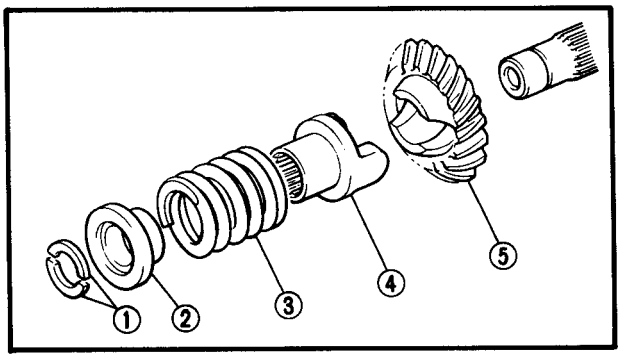
DISASSEMBLY

Middle Driven Shaft

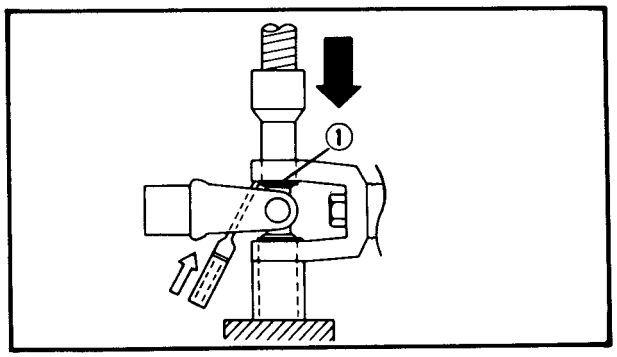
1. Attach:
   - Damper Spring Compressor ① (YM-33286)
   - Middle Drive Gear Holder ② (YM-33222)

   Onto the holder of middle driven gear.
2. Position:
   - Middle driven shaft assembly

   Onto a Hydraulic Press.
3. Compress the damper spring on the middle driven gear assembly.
4. Remove:
   - Retainers ①
   - Holder ②
   - Damper spring ③
   - Damper cam ④
   - Middle driven gear ⑤



5. Remove:
   - Universal joint

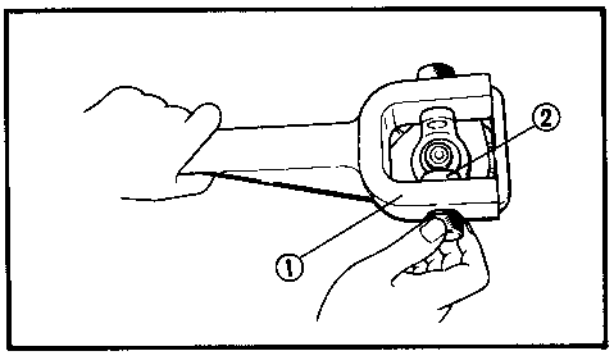


Universal joint removal steps:
- Remove the circlips ①.
- Place the U-joint in a press.
- With a suitable diameter pipe beneath the yoke, press the bearing into the pipe as shown.

NOTE:
It may be necessary to lightly tap the yoke with a punch.

- Repeat the steps for the opposite bearing.
- Remove the yoke.

NOTE:
It may be necessary to lightly tap the yoke with a punch.



6. Attach:
   - Universal Joint Holder ① (YM-04062)
   - Attachment ② (YM-33291)

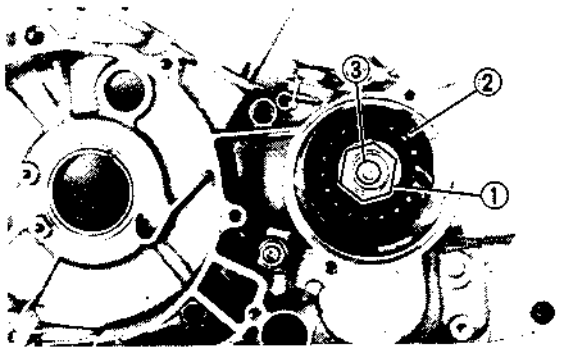
   Onto the universal joint yoke.
7. Remove:
   - Nut (Middle driven shaft)
   - Washer
   - O-ring
   - Yoke
   - Middle drive shaft

   From the bearing housing assembly.
   Lightly tap the end of the axle with soft hammer.

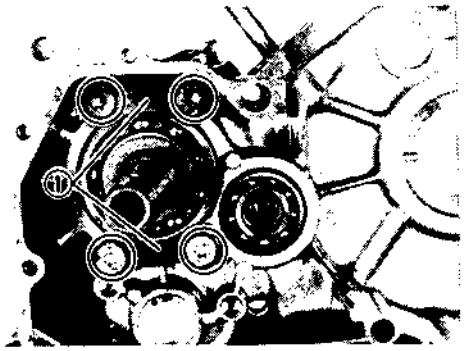
Middle Drive Shaft

NOTE:
Before removing the middle drive shaft, separate the crankcase.

1. Secure the middle drive shaft in a vice or other support.

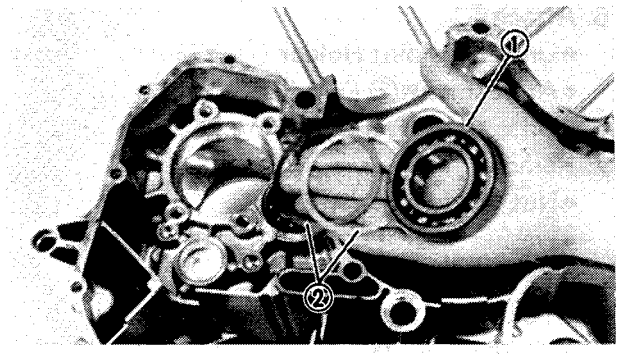


2. Flatten the punched portion of the middle drive gear nut using the drift punch.
3. Remove:
   - Nut (Middle drive gear) ①
   - Middle drive gear ②
   - Middle drive axle ③



4. Remove:
   - Bearing retainers ①

   Use # 30 Torx Driver (YU-29843-6).

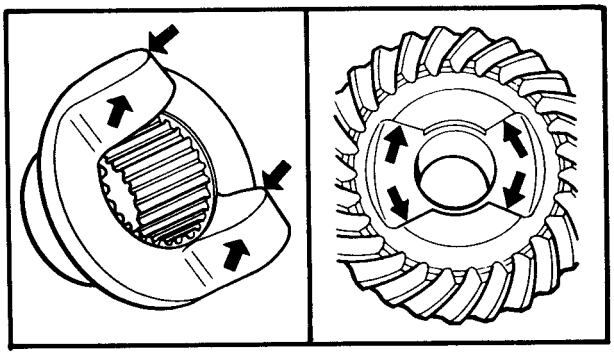


5. Remove:
   - Bearing ①
   - Shim ②

INSPECTION

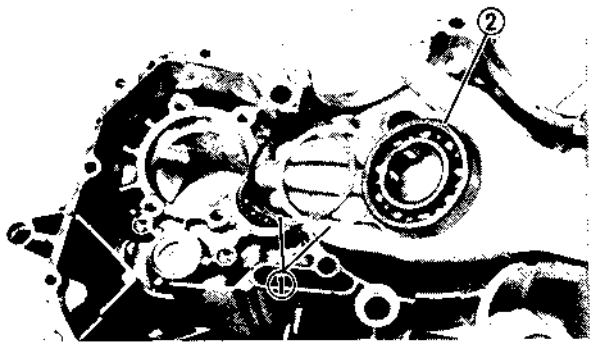
Middle Drive Shaft

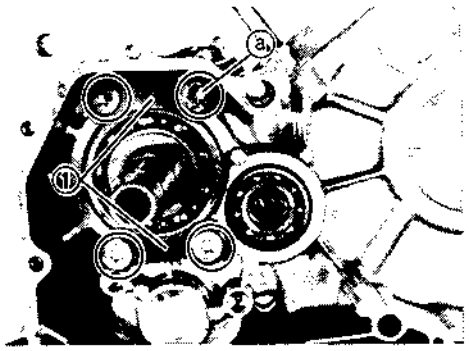
1. Inspect:
   - Gear teeth
     Pitting/Galling/Wear → Replace middle gear as a set.
   - Bearing
     Pitting/Damage → Replace.

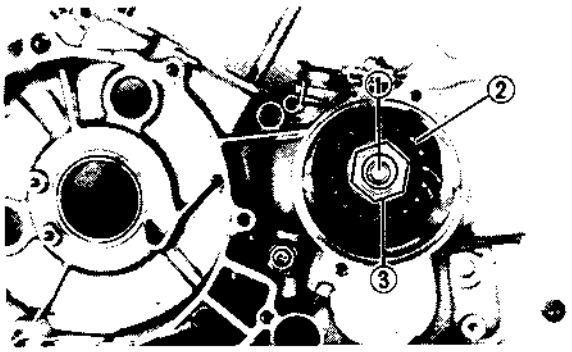


Middle Driven Shafts

1. Inspect:
   - Damper cam surfaces
     Wear/Scratches → Replace damper and middle driven gear as a set.
2. Inspect:
   - Damper spring
     Damage/Cracks → Replace.
3. Inspect:
   - Gear teeth
     Pitting/Galling/Wear → Replace middle gear as a set.
4. Inspect:
   - O-ring
   - Oil seal
     Damage → Replace.
   - Bearings
     Pitting/Damage → Replace.
5. Check:
   - U-joint movement
     Roughness → Replace U-joint.







REASSEMBLY

Middle Drive Shaft

1. Install:
   - Shim ①
   - Bearing ②

2. Install:
   - Bearing retainers ①
     Use # 30 Torx Driver (YU-29843-6).

CAUTION:

The shorter bolt ⓐ (1 pc.) should be installed as shown. If the longer bolt is installed, the clutch push axle is hold down.

Bearing Retainer:
25 Nm (2.5 m·kg, 18 ft·lb)
LOCTITE®

3. Lock the screw head ② with drift punch.
4. Install:
   - Middle drive axle ①
   - Middle drive gear ②
   - Nut (Middle drive gear) ③
     Secure the middle drive axle in a vice or other support.

Nut (Middle Drive Gear):
120 Nm (12.0 m·kg, 85 ft·lb)

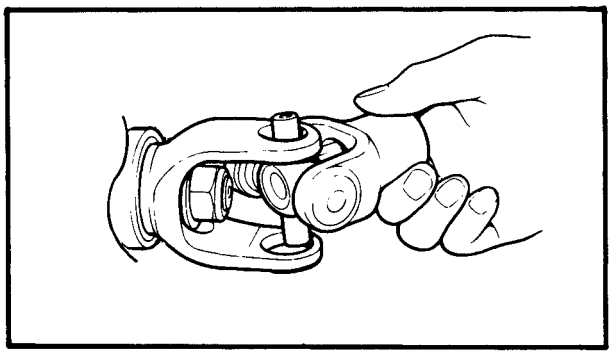
5. Lock the threads with drift punch.

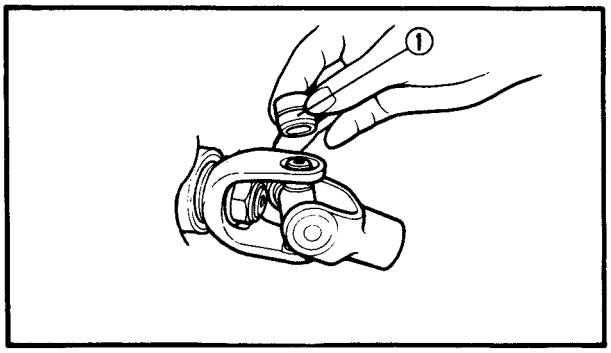
Middle Driven Shaft

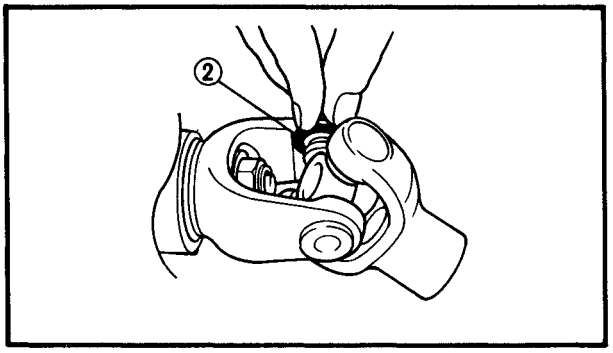
1. Apply:
   - Lithium base grease
     To the O-ring and oil seals.
2. Install:
   - Bearing housing assembly
   - Yoke
   - O-ring
   - Washer
   - Nut (Middle driven shaft)
     To the middle driven shaft.
3. Attach:
   - Universal Joint Holder (YM-04062)
   - Attachment (YM-04096)
     Onto the universal joint yoke.

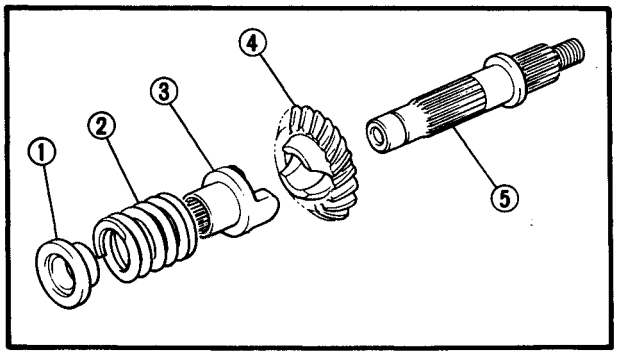
4. Tighten:
   - Nut (Middle driven shaft)
     Torque the nut carefully, little by little.

	Nut (Middle Driven Shaft): **90 Nm (9.0 m·kg, 65 ft·lb)** **LOCTITE®**









5. Install:
   - Universal joint

Universal joint installation steps:
- Install the opposite yoke into the U-joint.
- Apply the wheel bearing grease to the bearings.
- Install the bearing ① onto the yoke.

CAUTION:

Check each bearing. The needles can easily fall out of their races. Slide the yoke back and forth on the bearings; the yoke will not go all the way onto a bearing if a needle is out of place.

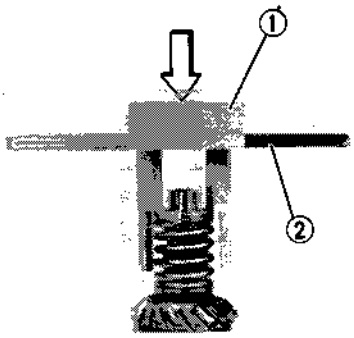
- Press each bearing into the U-joint using a suitable socket.

NOTE:

Bearing must be inserted far enough into U-joint so that circlip can be installed.

- Install the circlips ② into the groove of each bearing.

6. Apply:
   - Molybdenum disulfide grease
     To the middle driven shaft.
7. Install:
   - Middle driven gear ①
   - Damper cam ②
   - Damper spring ③
   - Holder ④
     To the middle driven shaft ⑤.



8. Attach:
   - Damper Spring Compressor ① (YM-33286)
   - Middle Drive Gear Holder ② (YM-33222)

   Onto the holder of middle driven gear.
9. Position:
   - Middle driven shaft assembly

   Onto a Hydraulic Press.
10. Compress the damper spring on the holder.
11. Install:
    - Retainers

    Into the middle driven shaft groove.

INSTALLATION

Middle Driven Gear

1. Install:
   - Middle driven gear assembly
   - Middle gear case

NOTE:

Before tightening the bolts;

1) Adjust the gear lash of the middle gear. Refer to "ADJUSTMENT" section.
2) Check the middle driven gear operation.

Bolts (Middle Driven Gear Assembly): 25 Nm (2.5 m·kg, 18 ft·lb)

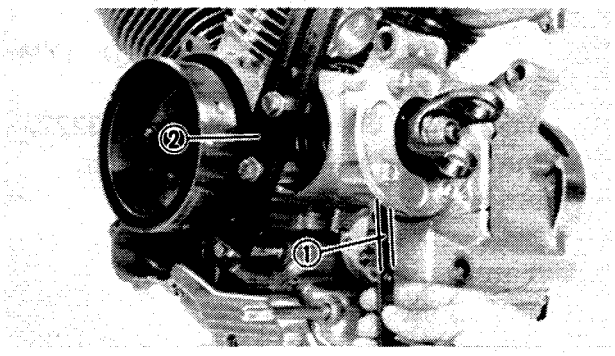
ADJUSTMENT

Middle Gear Gear Lash Adjustment

1. Remove:
   - Middle gear case
   - Bolts (Bearing housing)

NOTE:

After removing the bolts, pull out the middle driven shaft assembly slightly.

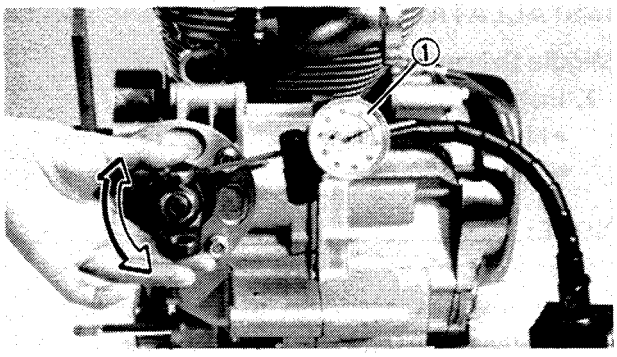


2. Install:
   - Bolts (Four — Bearing housing)
     On the bearing housing.
     Finter-tighten the bolts.

NOTE:
Clearance between the crankcase and bearing housing should be about 2 mm. Measure gap with Feeler Gauge ① .

3. Attach:
   - Middle Drive Gear Holder ② (YM-33222)
     Onto the crankcase.

CAUTION:
Finger tighten the bolt until it holds the middle drive gear. Otherwise, the drive gear will be damaged.



4. Position:
   - Dial Gauge (YM-03097) ①
     On the outside edge of U-joint.

NOTE:
Be sure the gauge is positioned over the center-line of the yoke bearing hole.

5. Rotate:
   - U-joint
     Move it gently back and forth.
6. Measure:
   - Gear lash
     Over specification → Follow next steps.
     Under or same specification → Incorrect; check for faulty parts and/or reassemble bearing housing.

Middle Gear Gear Lash:
0.05 ~ 0.10 mm (0.002 ~ 0.004 in)

NOTE:
Check the gear lash at four positions. Rotate the U-joint 90 degrees each time and repeat the gear lash check.

7. Tighten:
   - Bolt (Four)
     Tighten carefully one-thread turn only. Push in bearing housing and hold in position while tightening bearing housing bolts.

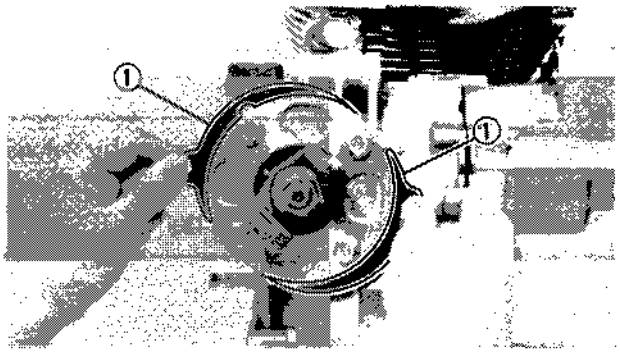
CAUTION:

Do not overtighten bearing housing bolts or you may obtain too little gear lash and cause damage to gears. If over tightened, loosen the 4 bolts so that crankcase/bearing housing clearance is about 2 mm (0.08 in) and repeat all previous steps.

8. Repeat steps 5 and 6 until correct gear lash is achieved.

Middle Gear Lash:
0.05 ~ 0.10 mm (0.002 ~ 0.004 in)

9. Measure:
   - Crankcase/bearing housing clearance
     Use a Feeler Gauge.



10. Select:
    - Shim(s) ①

Example: Selection of the drive pinion gear shim;
- If the clearance is 0.46 mm.
- The shim can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim(s).

Hundredths	Round Valve
0, 1, 2	0
3, 4, 5, 6	5
7, 8, 9	10

- In the example above, the measured shim thickness is 0.46 mm. The chart instructs you, however, to round off the 6 to 5. Thus you should use 0.15 mm and 0.30 mm shims.
- Shim sizes are supplied in the following thickness.

Middle Driven Gear Shim

Thickness (mm)	0.10 0.30	0.15 0.40	0.20 0.50

11. Tighten:
    • Bolts (Bearing housing)

	Bolts (Bearing Housing): **25 Nm (2.5 m·kg, 18 ft·lb)**

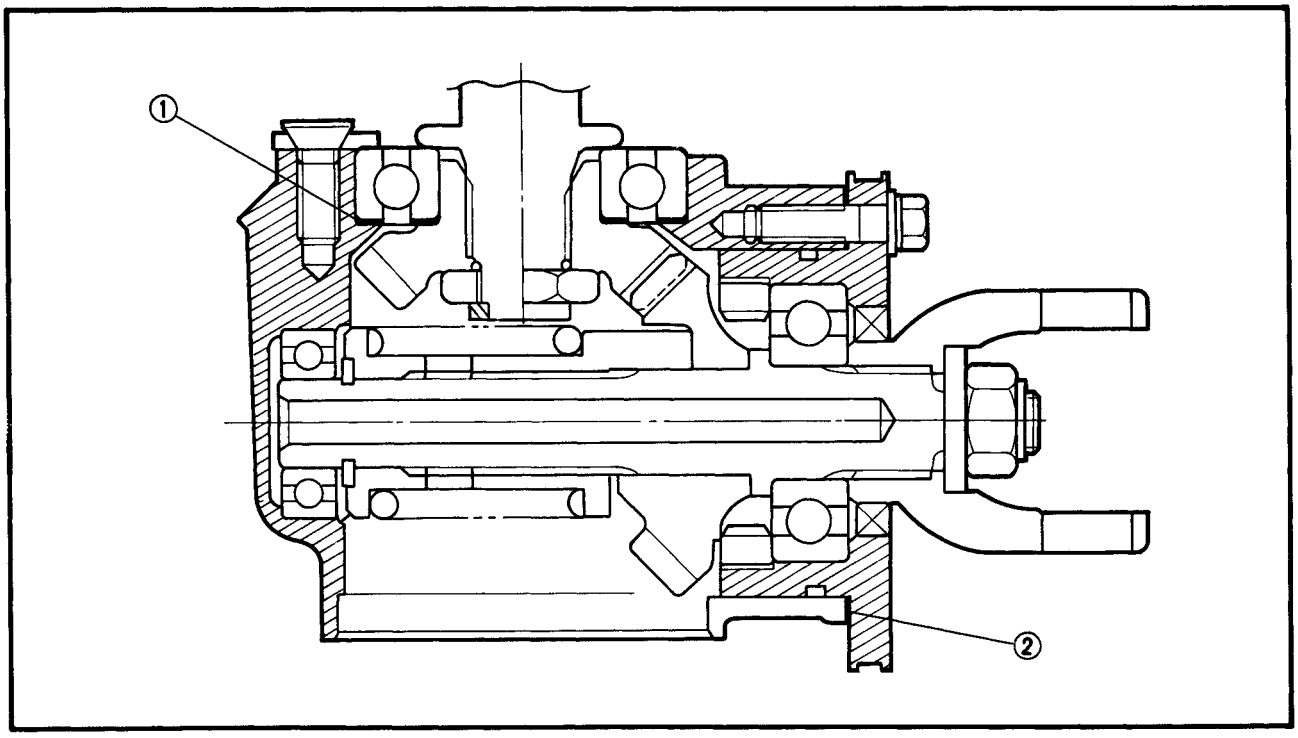
12. Measure:
    • Gear lash

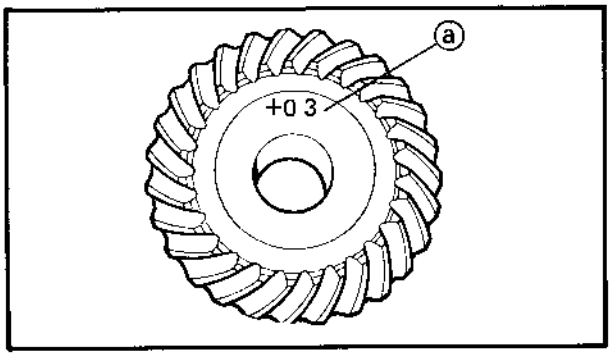
MIDDLE DRIVE GEAR AND DRIVEN GEAR POSITIONNING

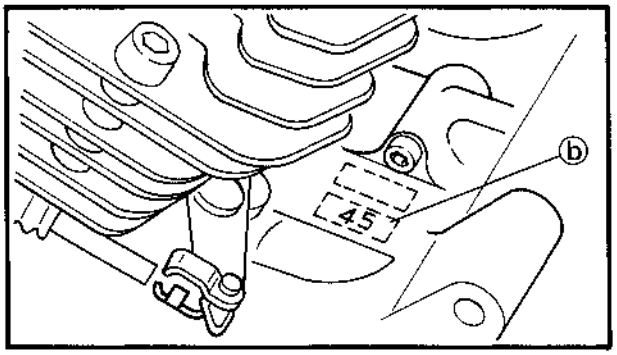
NOTE:
Gear positioning is necessary when any of the following parts are replaced.
- Crankcase assembly
- Middle drive shaft
- Bearing

1. Select:
    • Middle drive gear shim ①

NOTE:
Select the middle driven gear shim ② by calculating out the middle drive gear shim ① and then actually measuring the gear lash.







Middle drive gear shim selection steps:

- Position middle drive gear by using shims ① with their respective thickness calculated from information marked on crankcase and drive gear end.

① Shim thickness "A" (Middle drive gear)

- To find shim thickness "A" use following formula:

Middle Drive Gear Shim Thickness:
A = ⓐ − ⓑ

Where:

ⓐ = a numeral (usually a decimal number) on the drive gear is either added to or substracted from "44".

ⓑ = a numeral (usually a decimal number) on the crankcase is either added to or substracted from "43.5".

Example:

1) If the drive gear is marked "+03"
. . . . . ⓐ is 44.03
2) If the crankcase is marked "45"
. . . . . ⓑ is 43.45
A = 44.03 − 43.45
= 0.58
3) Therefore, shim thickness is 0.58 mm. Shim sizes are supplied in following thickness:

	Middle Drive Gear Shim	
Thickness (mm)	0.15 0.30 0.50	0.20 0.40

Because shims can only be selected in 0.05 mm increments, round off hundred the digit and select appropriate shim(s).

Hundredths	Round value
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	10

In the example above, the calculated shim thickness is 0.58 mm. The chart instructs you, however, to round off the 8 to 10.
Thus you may choose either 2 pcs. – 0.30 mm shims, or 1 pc. – 0.30 mm and 2 pcs. – 0.15 mm shims.

CHAPTER 4.

CARBURETION

CARBURETOR 4-1
REMOVAL 4-2
DISASSEMBLY 4-2
INSPECTION 4-6
ASSEMBLY 4-7
INSTALLATION 4-9
ADJUSTMENT 4-9

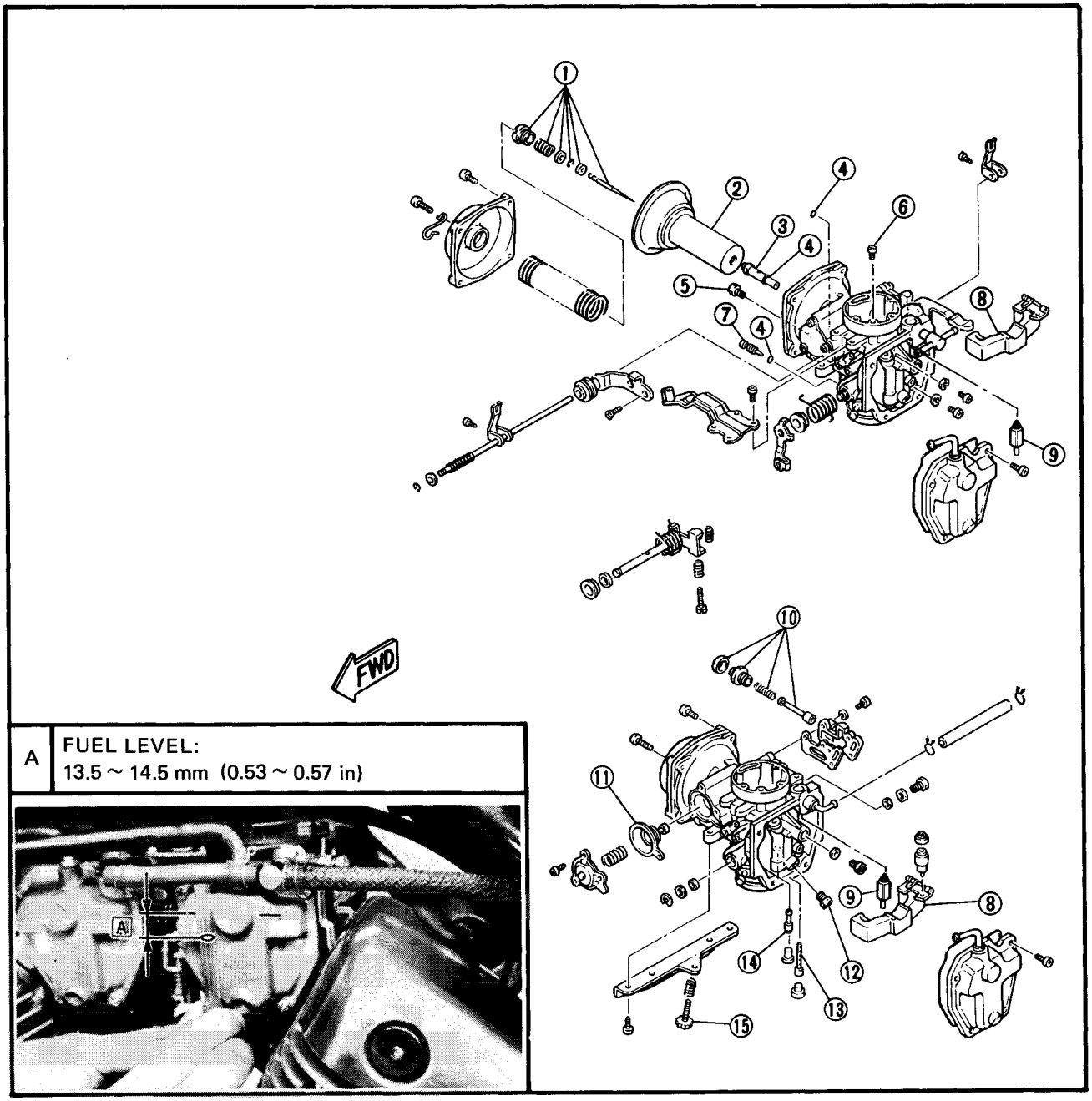
CARBURETION

CARBURETOR

① Jet needle set
② Vacuum piston
③ Main nozzle
④ O-ring
⑤ Pilot air jet # 2
⑥ Pilot air jet # 1
⑦ Drain screw
⑧ Float
⑨ Needle valve
⑩ Starter plunger assembly
⑪ Diaphragm (Coasting enricher)
⑫ Main jet
⑬ Main bleed pipe
⑭ Pilot jet
⑮ Throttle stop screw

SPECIFICATIONS	
MAIN JET	# 137.5
MAIN AIR JET	# 140
JET NEEDLE	*: 5DZ7-1 **: 5DZ-8
NEEDLE JET	Y-0
PILOT JET	# 32.5
PILOT SCREW	PRESET
STARTER JET	# 40
FUEL LEVEL	13.5 ~ 14.5 mm (0.53 ~ 0.57 in)
ENGINE IDLING SPEED	1,150 ~ 1,250 r/min

*: FRONT **: REAR



A	FUEL LEVEL: 13.5 ~ 14.5 mm (0.53 ~ 0.57 in)

REMOVAL

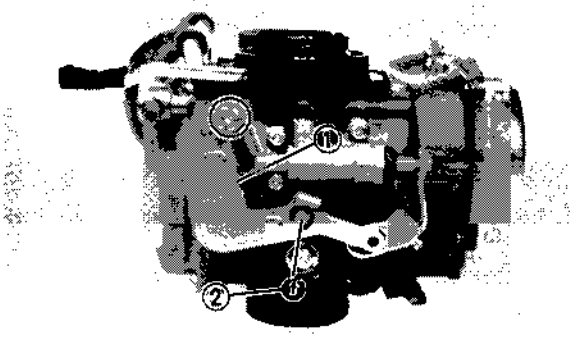
1. Remove:
   - Carburetor assembly
     Refer to engine removal section.

NOTE:
The following parts can be cleaned and inspected without disassembly.
- Vacuum piston
- Starter plunger
- Coasting enricher
- Throttle stop screw

WARNING:
The pilot screw settings are adjusted for maximum performance at the factory with special equiment. DO NOT attempt to change these settings. If all other engine systems are functioning correctly, any changes will decrease performance and cause increased exhaust emissions.

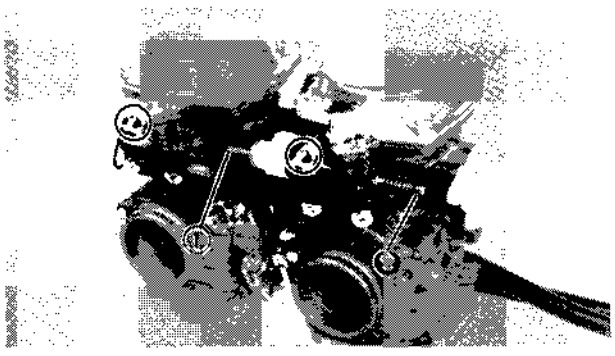
DISASSEMBLY

1. Remove:
   - Starter lever ①



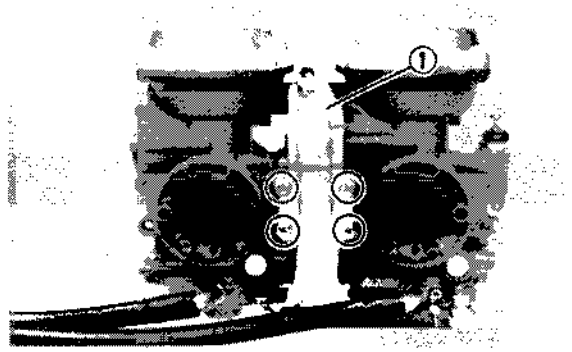
NOTE:
When removing the starter lever, be sure not to lose the clip ② and plastic washers that may fall out.

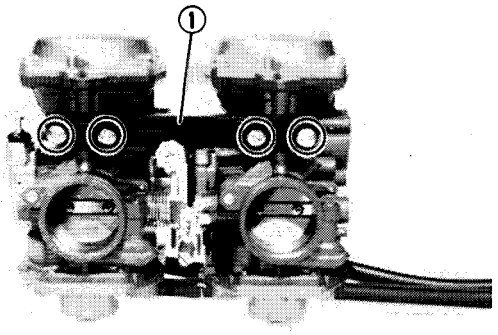
2. Remove:
   - Starter link ①



NOTE:
When removing the starter link, be sure not to lose the clip, spring and plastic holders that may fall out.

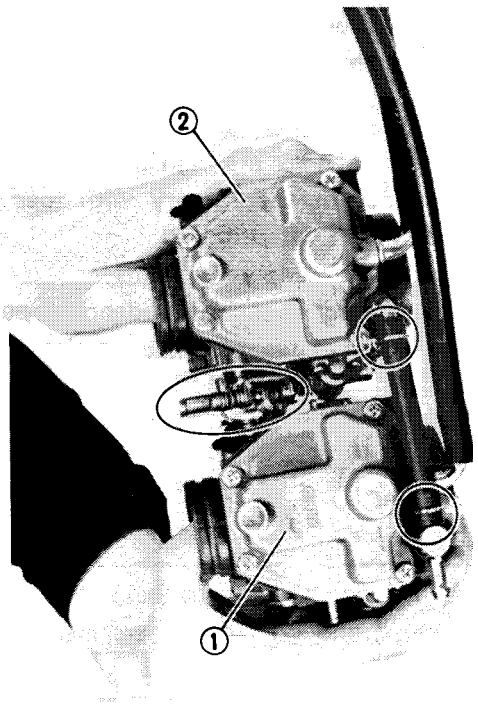
3. Remove:
   - Stay plate (Upper) ①





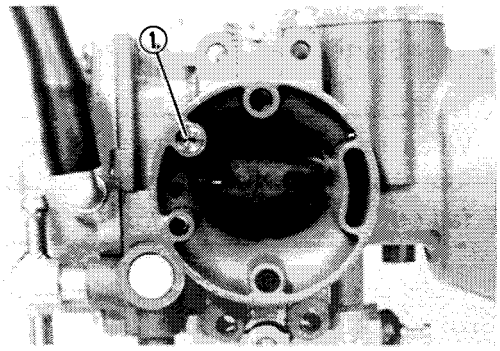
4. Remove:
   - Stay plate (Lower) ①

NOTE:
Before separating the carburetors, number each carburetor for reinstallation.

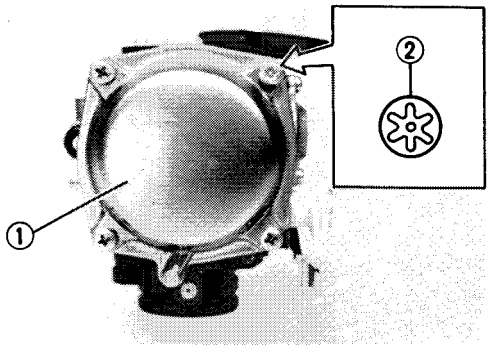


5. Separate:
   - Carburetor (Rear) ①
   - Carburetor (Front) ②

NOTE:
- When separating the carburetors, be sure not to lose the spring (Syncronization screw) that may fall out
- The rear and front carburetors are connected by the fuel hose and synchronization screw. To separate the carburetors, pull them apart, applying an equal amount of force on each carburetor.

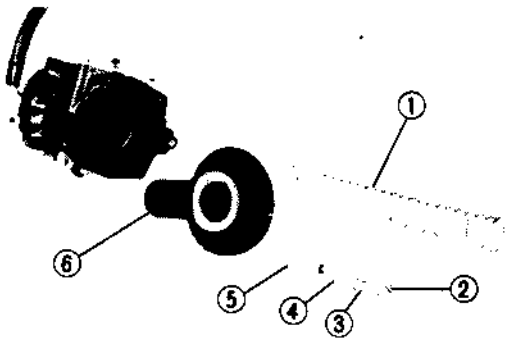


6. Remove:
   - Pilot air jet # 1 ①



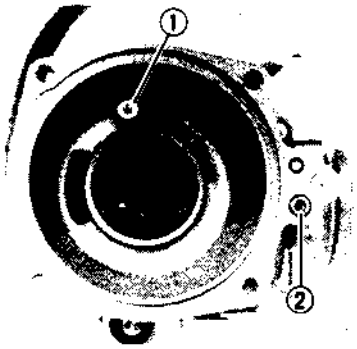
7. Remove:
   - Vacuum chamber cover ①
     Use the Special Torx Driver (YU-05258).

② Tamperproof screw

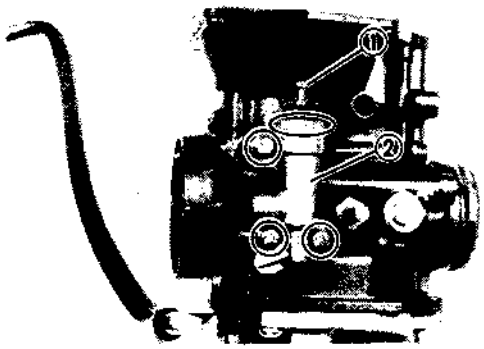


8. Remove:
   - Spring (Larger) ①
   - Holder (Jet needle) ②
   - Spring (Smaller) ③
   - Washer ④
   - Jet needle assembly ⑤
   - Vacuum piston ⑥

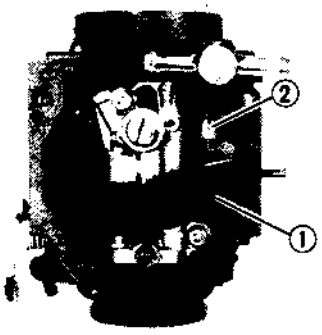
NOTE:
When removing the jet needle assembly, be sure not to lose holder, spring (Small) and washer that may fall out.



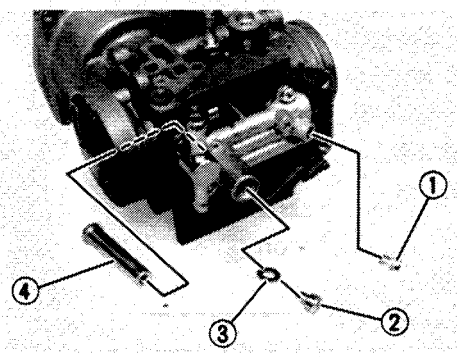
9. Remove:
   - Pilot air jet # 2 ①
   - O-ring ②



10. Remove:
    - Starter plunger assembly ①
    - Starter plunger body ②
    - Gasket

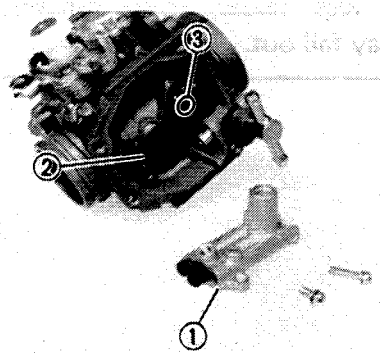


11. Remove:
    - Froat chamber cover
    - Float ①
    - Needle valve ②

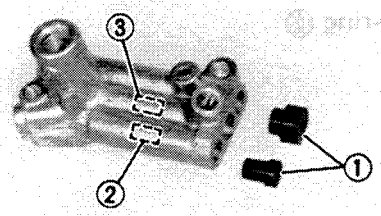


12. Remove:
- Main jet ①
- Holder (Main nozzle) ②
- Washer (Holder) ③
- Main nozzle ④

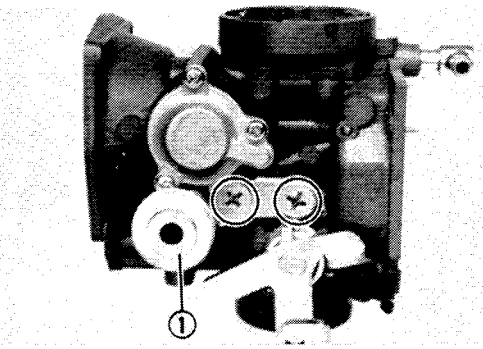
NOTE:
Move the main nozzle toward the vacuum piston.



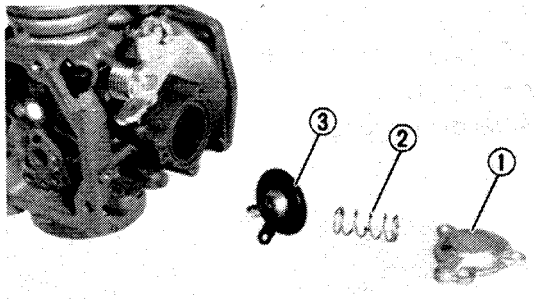
13. Remove:
- Jet block ①
- Gasket ②
- O-ring ③



14. Remove:
- Rubber caps ①
- Pilot jet ②
- Main bleed pipe ③



15. Remove:
- Pulley bracket (Throttle cable) ①



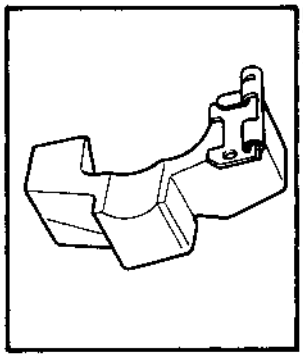
16. Remove:
- Cover (Coasting enricher) ①
- Spring ②
- Diaphragm ③

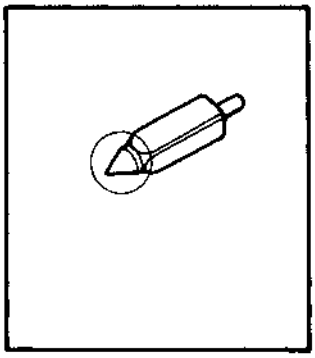
NOTE:
When removing the cover, be sure to lose the spring that may fall out.

INSPECTION

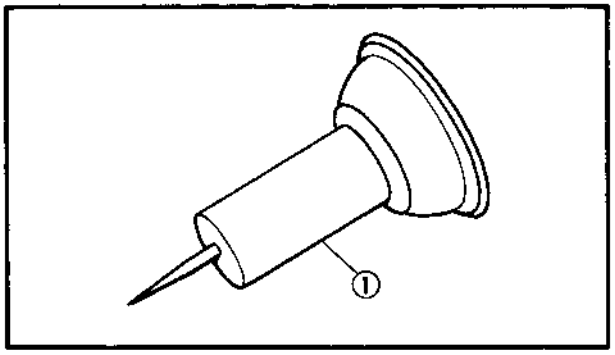
1. Inspect:
   - Carburetor body
     Contamination → Clean.

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



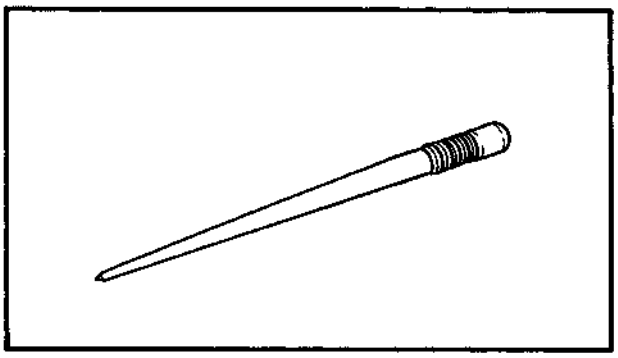


2. Inspect:
   - Float
     Damage → Replace.
   - Needle valve
     Wear/Contamination → Replace.

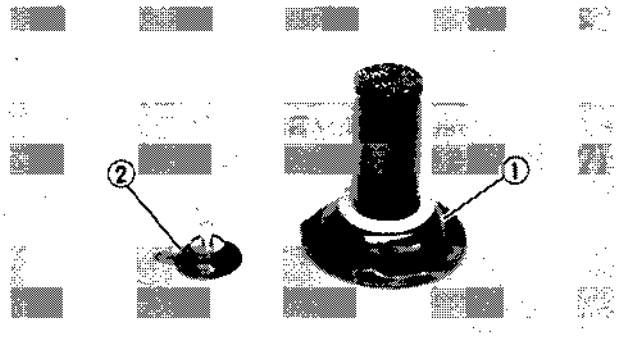


3. Inspect:
   - Vacuum piston ①
     Cracks → Replace.

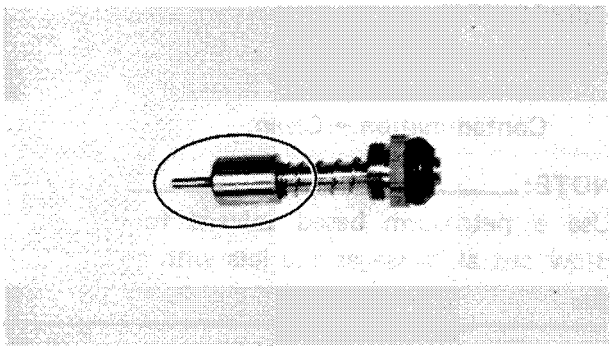
NOTE:
If you suspect the piston valve has been damaged, check the component for cracks by pouring gasoline into the valve. If it leaks, replace with a new piston valve.



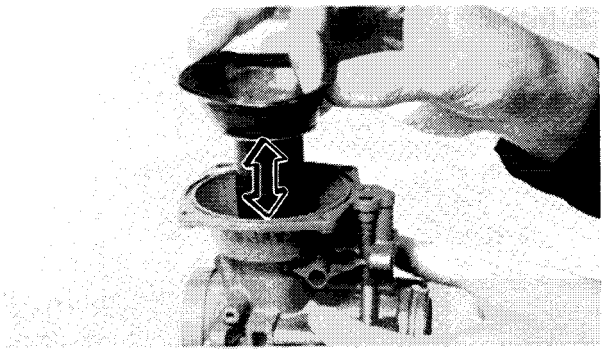
4. Inspect:
   - Jet needle
     Bends/Wear → Replace.



5. Inspect:
   - Diaphragm (Vacuum piston) ①
   - Diaphragm (Coasting enricher) ②
     Tears → Replace.



6. Inpsect:
   - Starter plunger
     Damage/Wear → Replace.
7. Inspect:
   - O-ring
   - Gasket
     Damage → Replace.



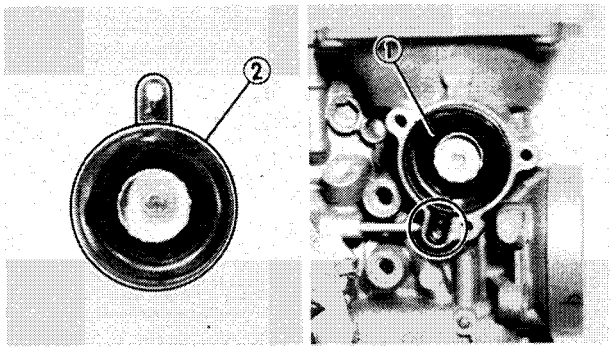
8. Check:
   - Free movement
     Stick → Replace.
     Insert the vacuum piston into the carburetor body, and check for free movement.

ASSEMBLY

To assemble the carburetors, reverse the disassembly procedures. Note the following points.

CAUTION:

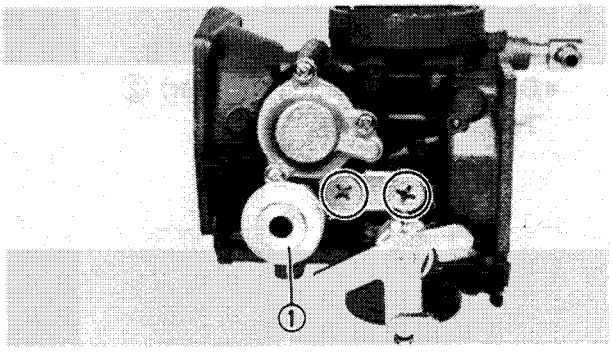
- **Before reassembling, wash all parts in clean gasoline.**
- **Always use a new gasket.**



1. Install:
   - Diaphragm (Coasting enricher) ①

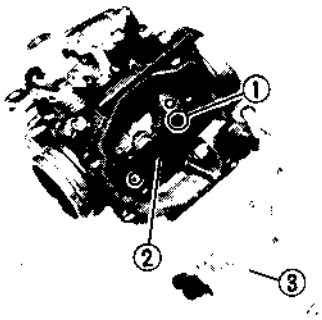
NOTE:

- Match the tab on the diaphragm to the matching recess in the coasting enricher.
- The round lip ② side face to carburetor body.



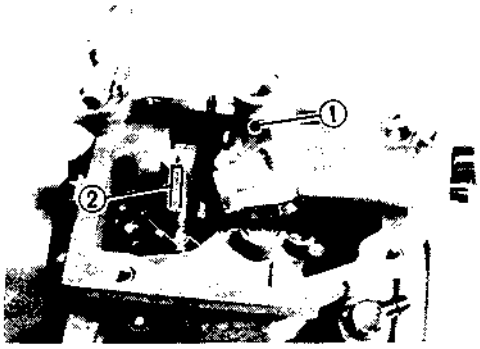
2. Install:
   - Pulley bracket (Throttle cable) ①

Screws (Pulley Bracket):
5 Nm (0.5 m·kg, 3.6 ft·lb)
LOCTITE®



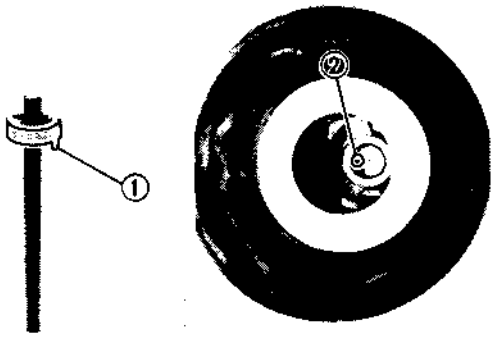
3. Install:
   - O-ring ①
   - Gasket (New) ②
   - Jet block ③

NOTE:
Make sure the projections on the carburetor body are meshed with the holes on the gasket.



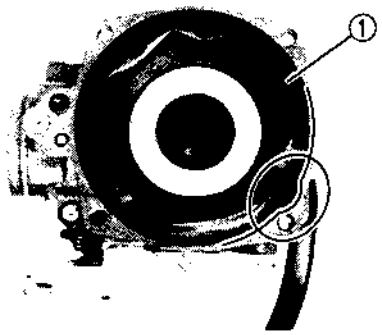
4. Install:
   - Main nozzle

NOTE:
- Insert the main nozzle from the vacuum piston.
- Make sure the projection ① on the jet block is meshed with the groove ② on the needle jet.



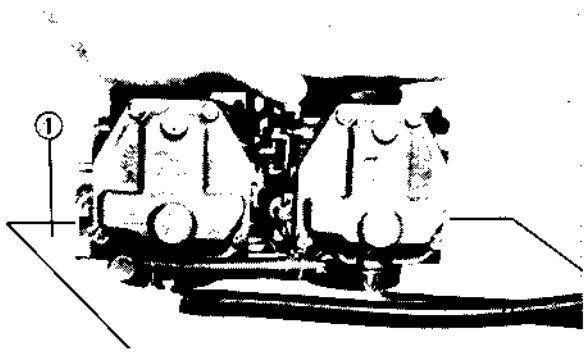
5. Install:
   - Jet needle assembly
     To the vacuum piston.

NOTE:
Be sure to install the jet needle plate so that the projection ① is located toward the hole ② in the vacuum piston.



6. Install:
   - Vacuum piston ①

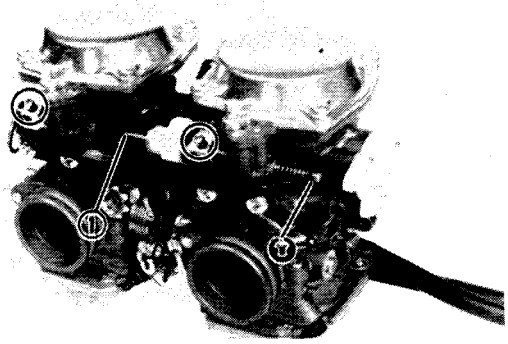
NOTE:
Match the tab on the diaphragm to the matching recess in the vacuum piston.



7. Install:
   - Stay plate (Upper)
   - Stay plate (Lower)

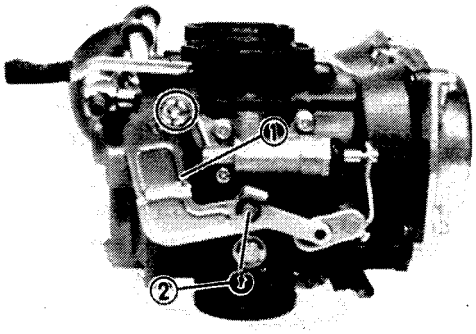
NOTE:
When reassembling, the surface plate ① should be used for proper carburetor alignment.

	Stay Plate: **5 Nm (0.5 m·kg, 3.6 ft·lb)**



6. Install:
   • Starter link ①

NOTE:
- Apply LOCTITE® to the starter plunger lever securing screws.
- Do not forget to fit the plastic holders, spring and clip.



7. Install:
   • Starter lever ①

NOTE:
Do not forget to fit the plastic washers and clip ② .

8. Check:
   • Starter lever operation
   Unsmooth operation → Reinstall.

INSTALLATION

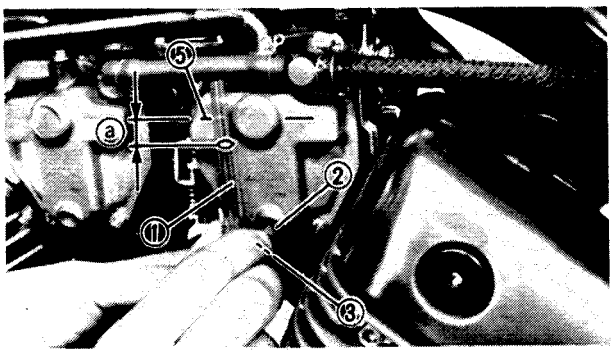
1. Install:
   • Carburetors
   Reverse the removal steps.

ADJUSTMENT

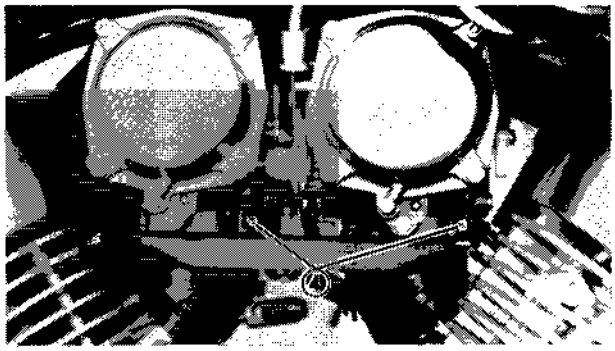
Fuel Level Adjustment

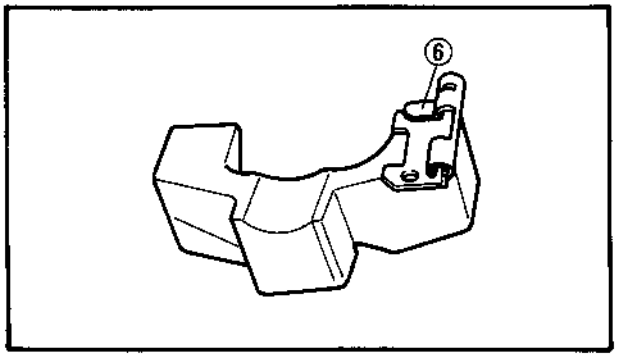
1. Measure:
   • Fuel level
   Out of specification → Adjust.

Fuel Level:
13.5 ~ 14.5 mm (0.53 ~ 0.57 in)
Below the Carburetor Piston Valve Center Mark.



Fuel level measurement and adjustment 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 (YM-01312-A) to the drain pipe ② using a level gauge adapter ③ .
- Loosen the drain screw ④ and warm up the engine for several minutes.





- Measure the fuel level ⓐ with the gauge.

⑤ Piston valve center mark

- Repeat the above procedure for other carburetors.
- If the fuel level(s) is incorrect, adjust the fuel level(s).
- Remove the carburetors.
- Inspect the needle valve.
- If it is worn, replace it.
- If it is fine, adjust float level by bending the float tang ⑥ slightly.
- Repeat the procedure for the other carburetors.

CHAPTER 5.
CHASSIS

FRONT WHEEL 5-1
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- INSPECTION 5-2
- INSTALLATION 5-4

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- MASTER CYLINDER DISASSEMBLY 5-14
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- BRAKE REASSEMBLY 5-16
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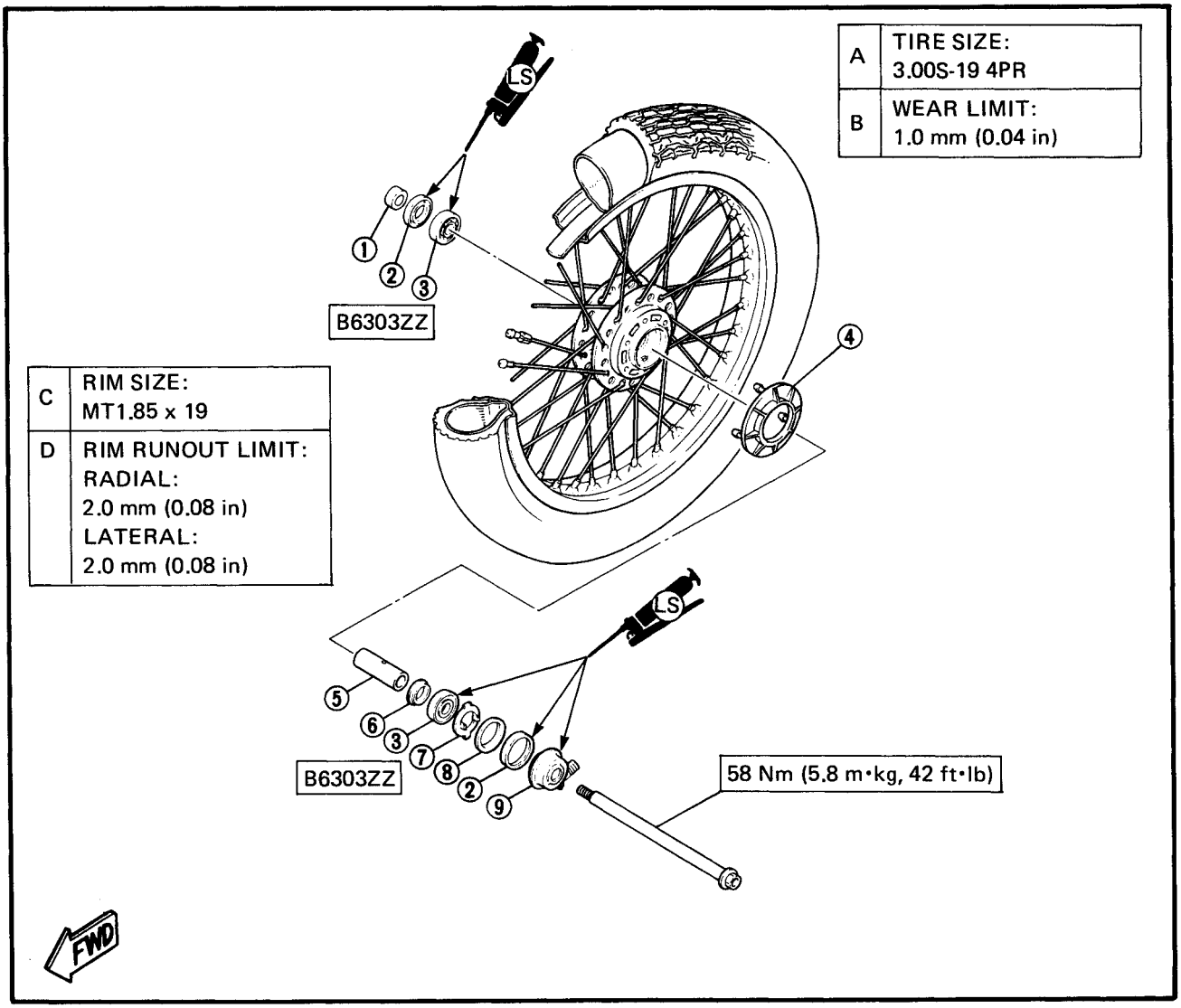
CHASSIS

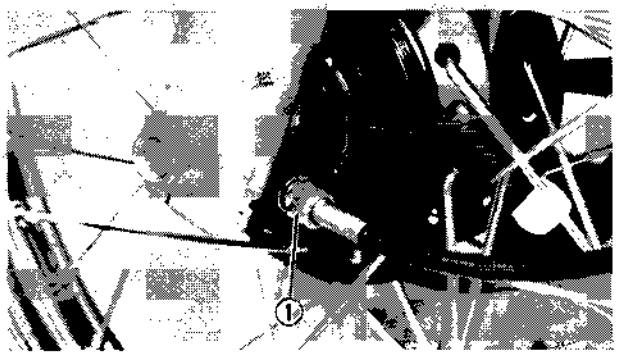
FRONT WHEEL

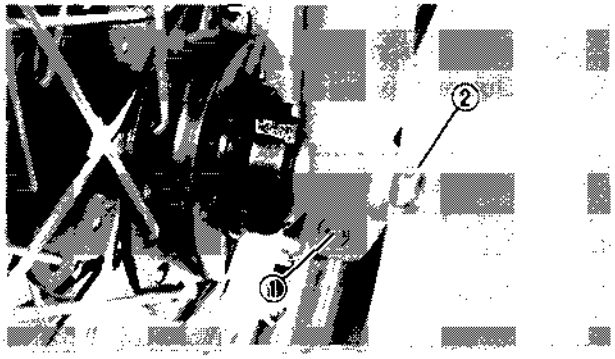
① Collar
② Oil seal
③ Bearing
④ Hub cover
⑤ Spacer
⑥ Spacer flange
⑦ Meter clutch
⑧ Clutch retainer
⑨ Gear unit

Basic weight: With oil and full fuel tank	185 kg (408 lb) CAL: 186 kg (507 lb)	
Maximum load*	230 kg (507 lb) CAL: 229 kg (505 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	200 kPa (2.0 kg/cm², 28 psi)	230 kPa (2.3 kg/cm², 32 psi)
90 kg (198 lb) ~ Maximum load*	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)
High speed riding	200 kPa (2.0 kg/cm², 28 psi)	250 kPa (2.5 kg/cm², 36 psi)

* Load is the total weight of cargo, rider, passenger, and accessories.
CAL: For Carifornia







REMOVAL

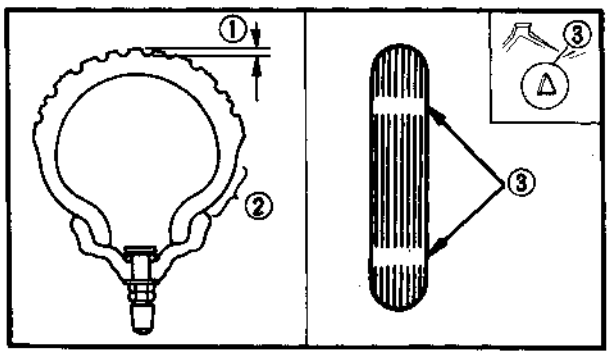
WARNING:

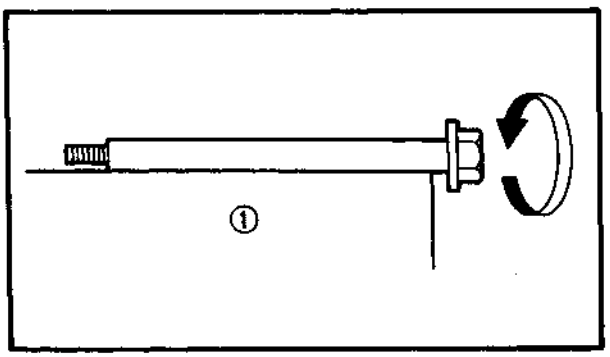
Securely support the motorcycle so there is no danger of it falling over.

1. Place the motorcycle on level place.
2. Remove:
   - Speedometer cable ①
3. Loosen:
   - Pinch bolt (Front axle) ①
   - Front axle ②
4. Elevate the front wheel by placing a suitable stand under the engine.
5. Remove:
   - Front axle
   - Front wheel

NOTE:

Do not squeeze the brake lever while the wheel is off the motorcycle.





INSPECTION

1. Inspect:
   - Tire

   Tire tread shows crosswise lines (Minimum tread depth)/Cracks → Replace.

Minimum Tire Tread Depth: 1.0 mm (0.04 in)

① Tread depth ② Sidewall ③ Wear indicator

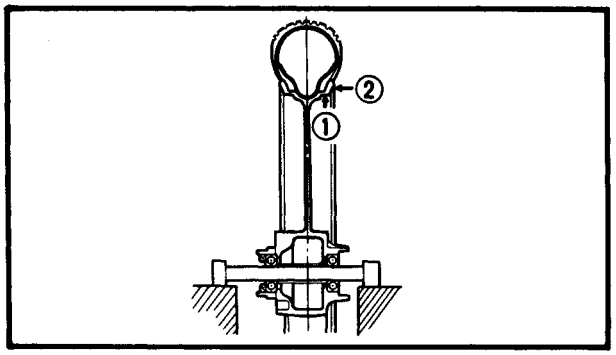
2. Inspect:
   - Front axle

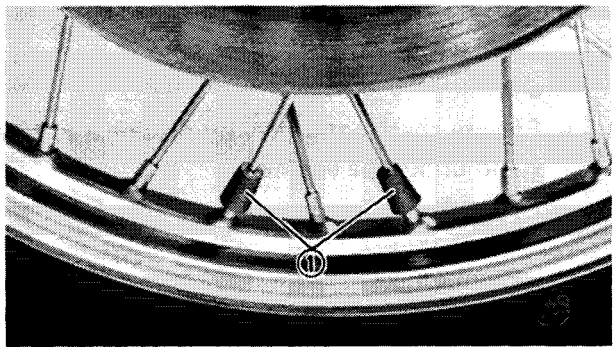
   Bends → Replace.

   Roll the axle on a flat surface ① .

WARNING:

Do not attempt to straighten a bent axle.





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

Rim Runout Limits:
Raidal ① : 2.0 mm (0.08 in)
Lateral ② : 2.0 mm (0.08 in)

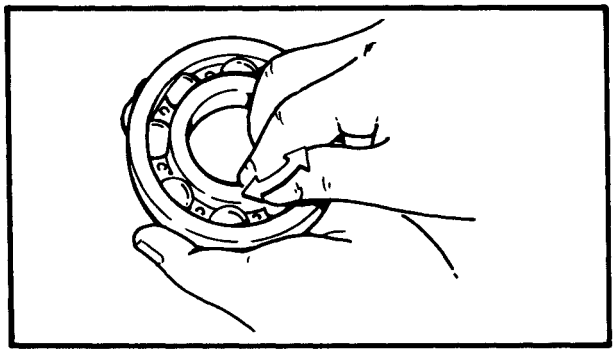
5. Check:
   - Wheel balance
     Out of balance → Adjust.

NOTE:
Balance wheels with the brake discs installed.

① Balancer weight

CAUTION:
Be sure the valve stem locknut is tightened securely after repairing or replacing a tire and/or wheel.

WARNING:
Ride conservatively after installing a tire to allow the tire to seat itself correctly on the rim.



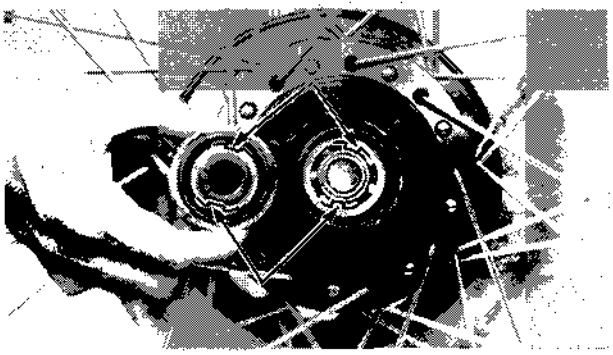
6. Inspect:
   - Wheel bearings
     Bearings allow play in the wheel hub or wheel turns roughly → Replace.

Wheel bearing replacement steps:
- Clean the outside of the wheel hub.
- Drive out the bearing.

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.



INSTALLATION

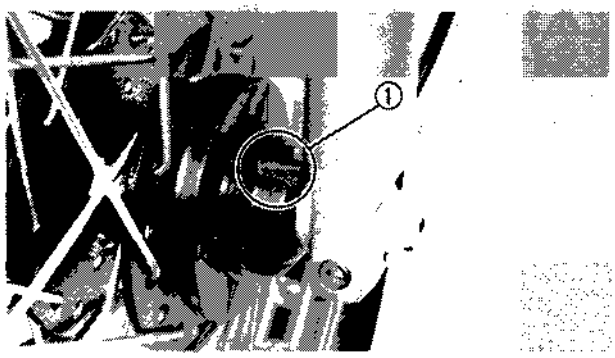
When installing the front wheel, reverse the removal procedure. Note the following points.

1. Apply:
   - Lithium base grease

   Lightly grease to the oil seal and gear unit.
2. Install:
   - Gear unit assembly

NOTE:

Be sure that the two projections inside the wheel hub mesh with the two slots in the gear unit assembly.



3. Install:
   - Front wheel

NOTE:

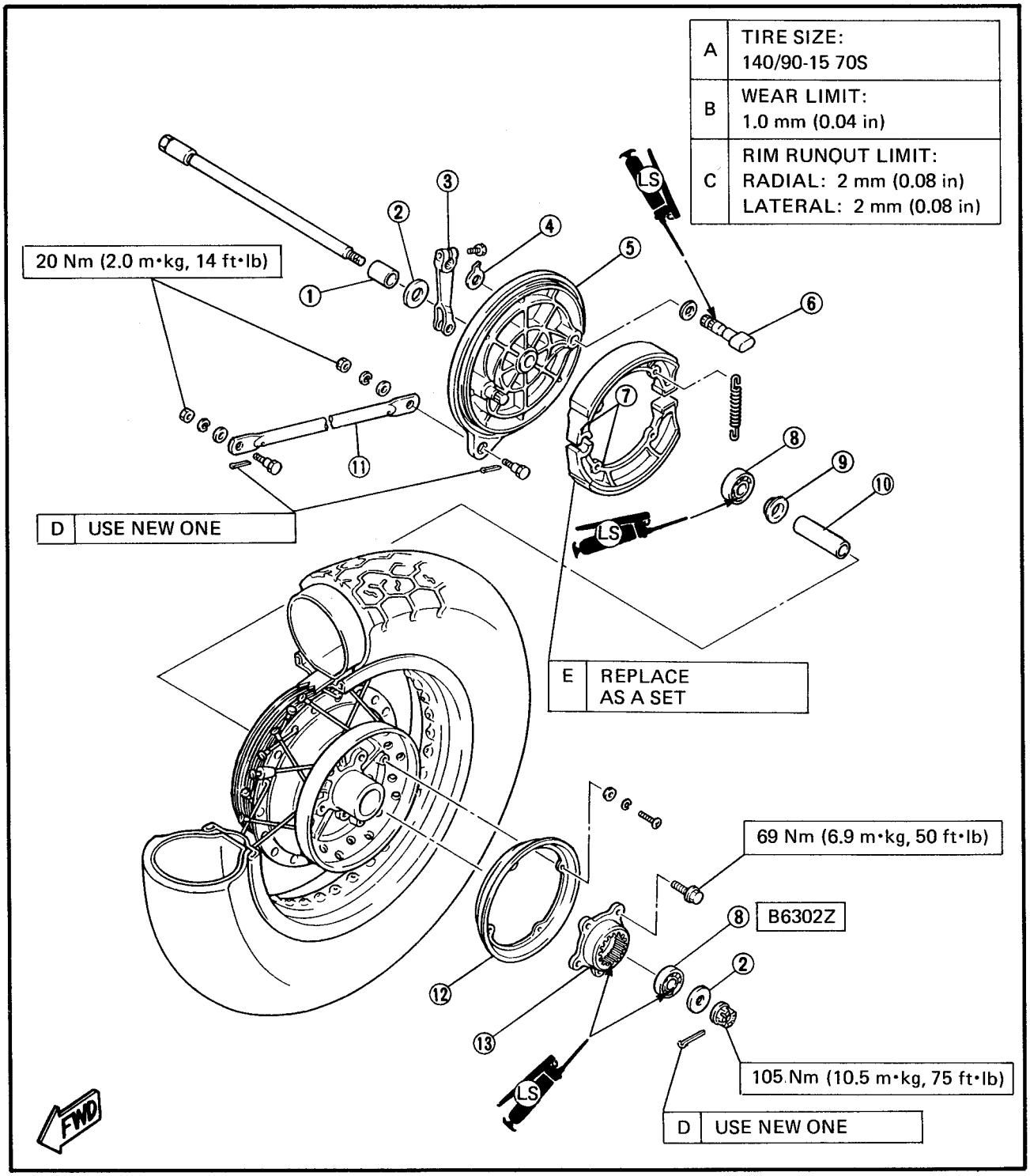
Be sure that the projecting portion (Torque stopper) ① of the gear unit housing is positioned correctly.

4. Tighten:
   - Front axle
   - Pinch bolt (Front axle)

Front Axle:
58 Nm (5.8 m·kg, 42 ft·lb)
Pinch Bolt (Front Axle):
20 Nm (2.0 m·kg, 14 ft·lb)

REAR WHEEL

① Collar
② Washer
③ Camshaft lever
④ Indicator plate
⑤ Brake shoe plate
⑥ Brake camshaft
⑦ Brake shoe set
⑧ Bearing
⑨ Spacer flange
⑩ Spacer
⑪ Tension bar
⑫ Hub dust seal
⑬ Clutch hub

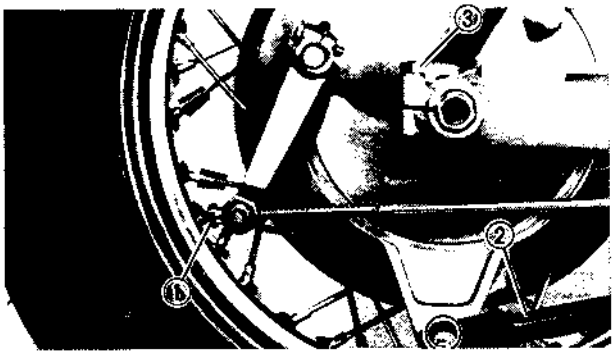


REMOVAL

WARNING:

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

1. Place the motorcycle on level place.



2. Remove:
   - Adjuster (Rear brake) ①
   - Tension bar ②
3. Loosen:
   - Pinch bolt (Rear axle) ③
4. Remove:
   - Cotter pin
   - Nut (Rear axle)
   - Plain washer
5. Elevate the rear wheel by placing a suitable stand.
6. Remove:
   - Rear axle
   - Rear wheel
   - Plain washer
   - Collars (Shorter and longer)

NOTE:

Move the rear wheel to the right side to separate it from the final gear case, and remove the wheel.

INSPECTION

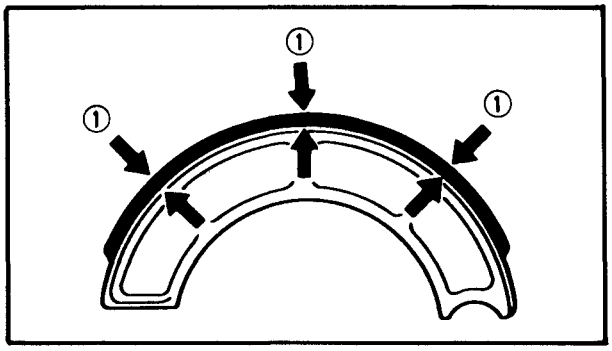
1. Inspect:
   - Tire
   - Rear axle
   - Wheel
   - Wheel bearings

   Refer to "FRONT WHEEL – INSPECTION" section.

2. Measure:
   • Wheel runout
   Refer to "FRONT WHEEL – INSPECTION" section.
3. Check:
   • Wheel balance
   Refer to "FRONT WHEEL – INSPECTION" section.

4. Inspect:
   • Brake lining surface
   Glazed areas → Remove.
   Use a coarse sand paper.

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



5. Measure:
   • Brake lining thickness
   Out of specification → Replace.

① Measuring points

NOTE:
Replace the brake shoes as a set if either is found to be worn to the wear limit.

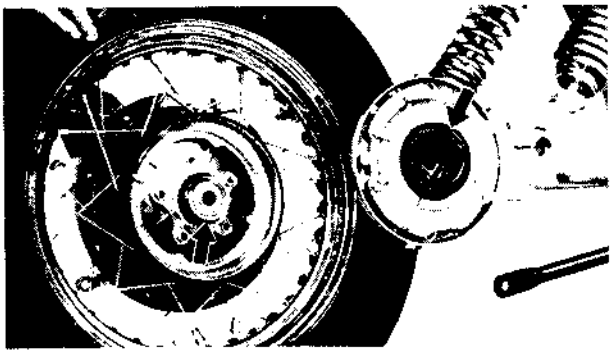
Brake Lining Thickness:
4 mm (0.16 in)
Wear Limit:
2 mm (0.08 in)

6. Inspect:
   • Brake drum inner surface
   Oil/Scratches → Replace.

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

7. Inspect:
   • Camshaft face
   Wear → Replace.

NOTE:
Before removing the cam lever, put a match mark (Punches) on the cam lever and camshaft to indicate their positions for easy assembly.



8. Inspect:
   - Gear teeth (Clutch hub)
   - Gear teeth (Ring gear)

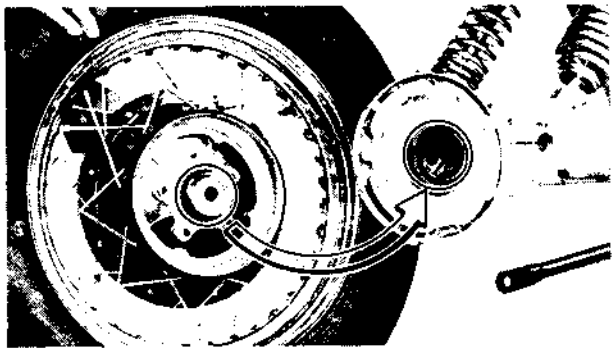
   Pitting/Galling/Wear → Replace clutch hub and ring gear as a set.

INSTALLATION

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

1. Apply:
   - Lithium base grease

   To the oil seals, bearing, final gear splines and rear wheel hub splines.



2. Install:
   - Rear wheel

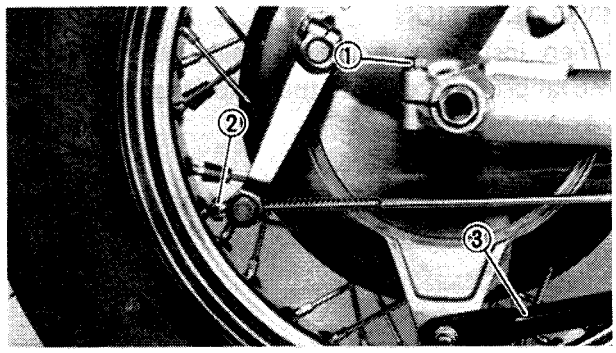
NOTE:
- Make sure that the splines on the wheel hub fit into the final gear case.
- Do not forget to fit the collars (Shorter and longer) and plain washer.

3. Install:
   - Plain washer
   - Nut (Rear axle)
   - Cotter pin (New)

WARNING:

Always use a new cotter pin.

Nut (Rear Axle):
105 Nm (10.5 m·kg, 75 ft·lb)



4. Tighten:
   - Pinch bolt (Rear axle) ①

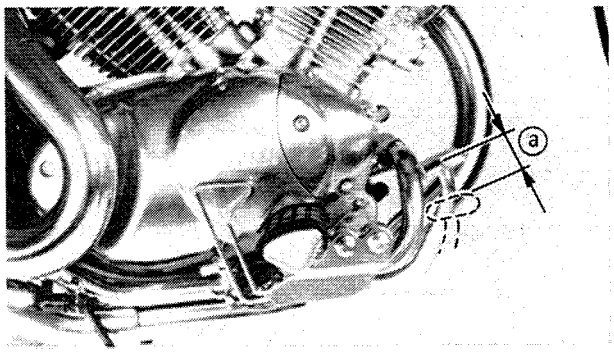
Pinch Bolt (Rear Axle):
16 Nm (1.6 m·kg, 11 ft·lb)

5. Install:
   - Tension bar ②
   - Adjuster (Rear brake) ③

WARNING:

Always use a new cotter pin.

Tension Bar:
20 Nm (2.0 m·kg, 14 ft·lb)



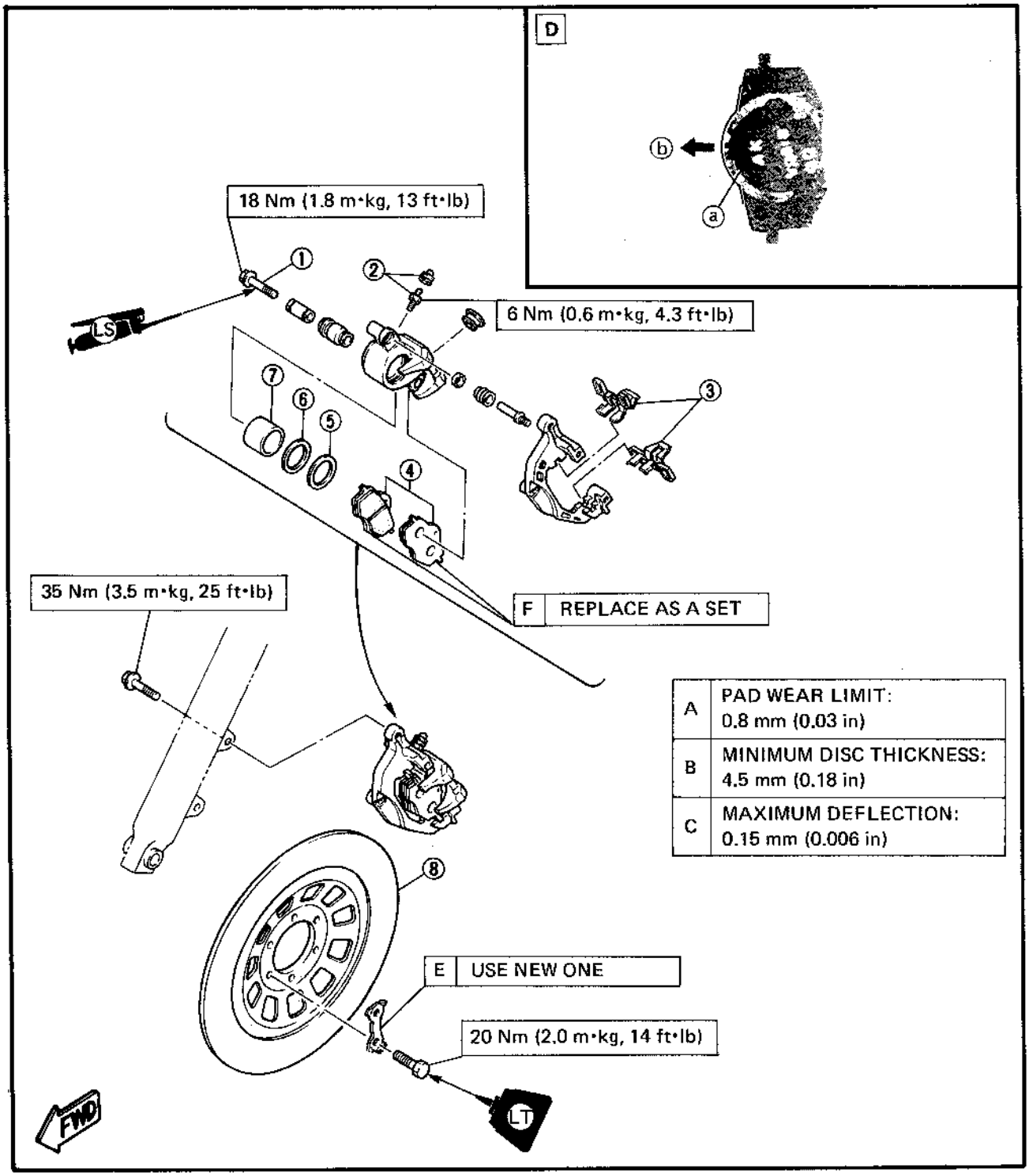
6. Adjust:
   - Brake pedal free play ⓐ
     Refer to "CHAPTER 2. REAR BRAKE ADJUSTMENT" section.

Brake Pedal Free Play:
20 ~ 30 mm (0.8 ~ 1.2 in)

FRONT BRAKE

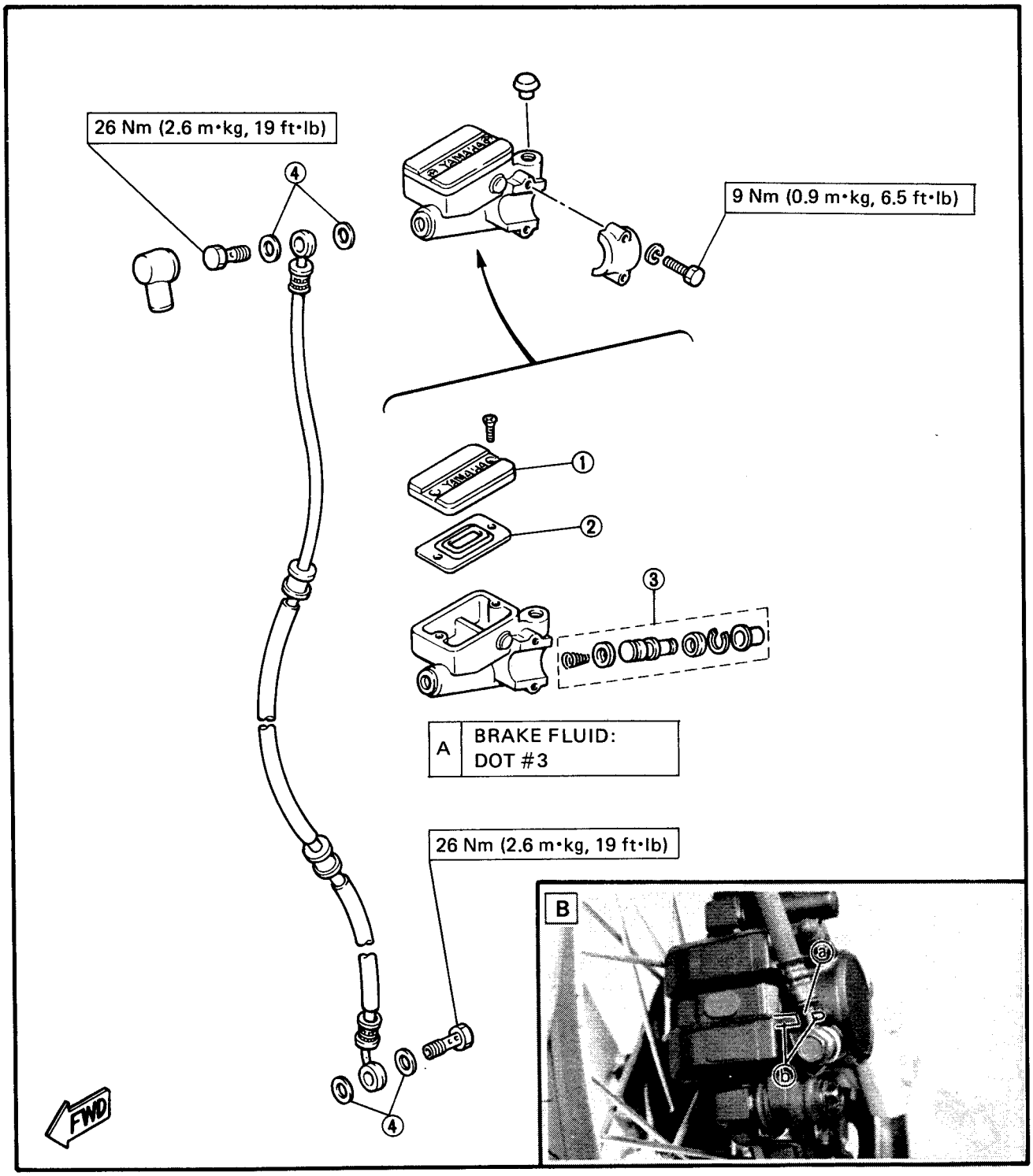
① Retaining bolt
② Air bleed screw
③ Pad springs
④ Brake pads
⑤ Dust seal
⑥ Piston seal
⑦ Piston
⑧ Brake disc

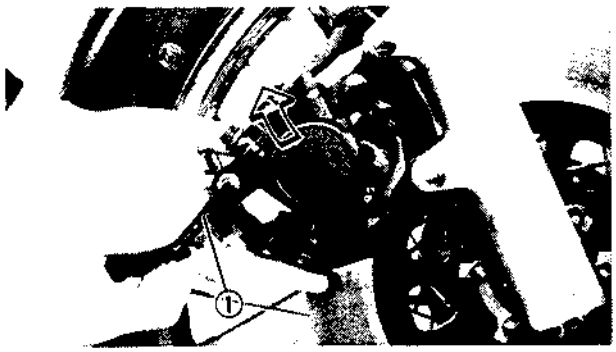
D Be sure to position the pad so that its round side ⓐ is backward ⓑ.



① Master cylinder cap
② Diaphragm
③ Master cylinder kit
④ Copper washer

B When installing the brake hose, lightly touch the brake pipe ⓐ with projections ⓑ on the caliper.

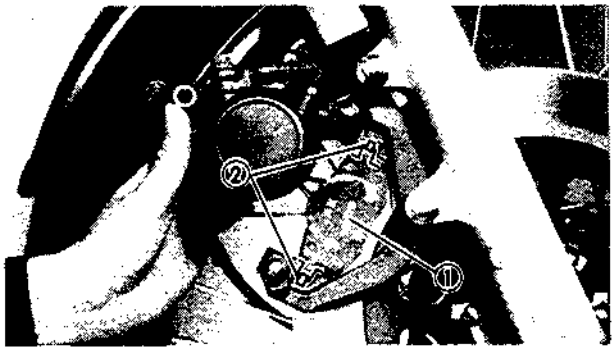




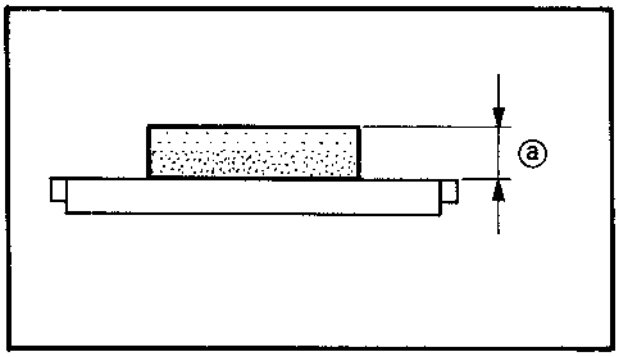
CALIPER PAD REPLACEMENT

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

1. Remove:
   - Retaining bolt ①
2. Turn the caliper body clockwise.



3. Remove:
   - Pads ①
   - Pad springs ②



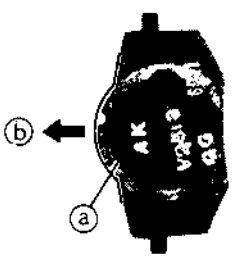
4. Measure:
   - Pad thickness ⓐ

   Out of specification → Replace.

NOTE:

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

Wear Limit:
0.8 mm (0.03 in)



5. Install:
   - Pad springs (New)
   - Pads (New)

   To the caliper.

NOTE:

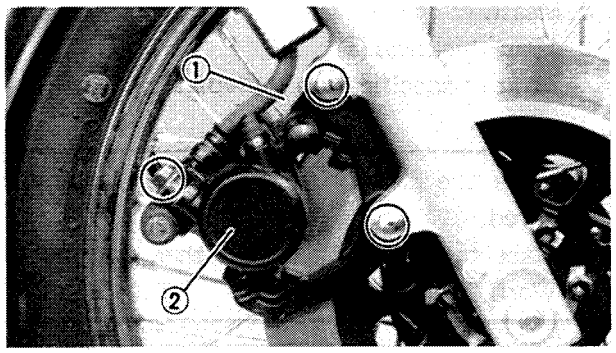
Be sure to position the pad so that its round side ⓐ is backward ⓑ .

6. Apply:
   - Lithium base grease
     To the retaining bolt.
7. Set caliper body at the original position.
8. Install:
   - Retaining bolt

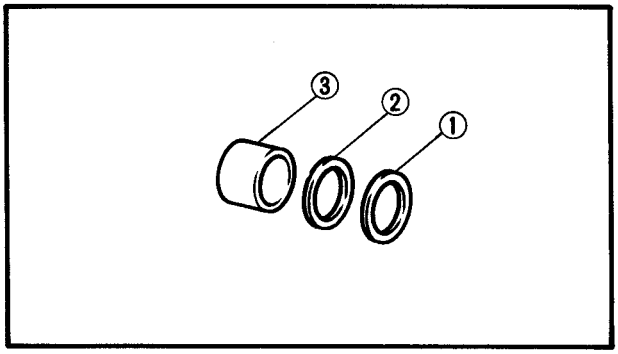
Retaining Bolt:
18 Nm (1.8 m·kg, 13 ft·lb)

CALIPER DISASSEMBLY

1. Remove:
   - Retaining bolt
   - Pads
   - Pad springs
     Refer to the "CALIPER PAD REPLACEMENT" section.



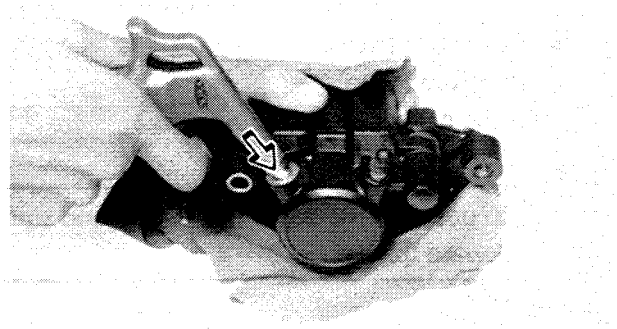
2. Remove:
   - Brake hose ①
     Place the open hose end into a container and pump the old fluid out carefully.
   - Caliper ②



3. Remove:
   - Dust seal ①
   - Piston seal ②
   - Piston ③

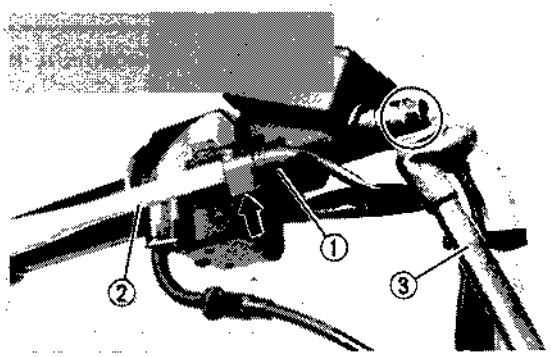
Caliper piston removal steps:
- Blow compressed air into the tube joint opening to force out the caliper piston from the caliper body.

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



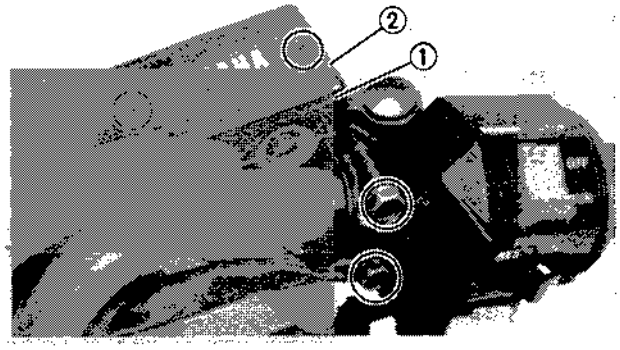
MASTER CYLINDER DISASSEMBLY

NOTE:
Drain the brake fluid before removing master cylinder.

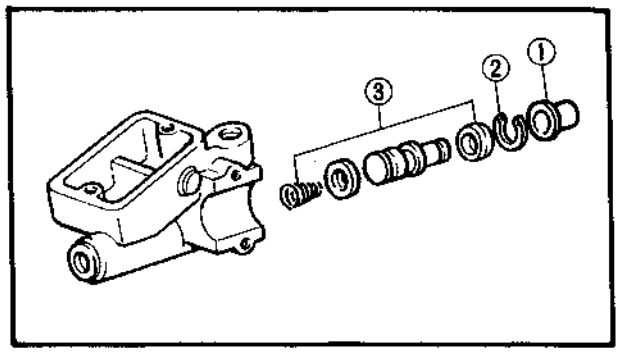


1. Remove:
   - Brake light switch lead ①
   - Brake lever ②
   - Lever spring
2. Disconnect:
   - Brake hose ③

   Drain the fluid.



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



4. Remove:
   - Dust boot ①
   - Circlip ②
   - Master cylinder kit ③

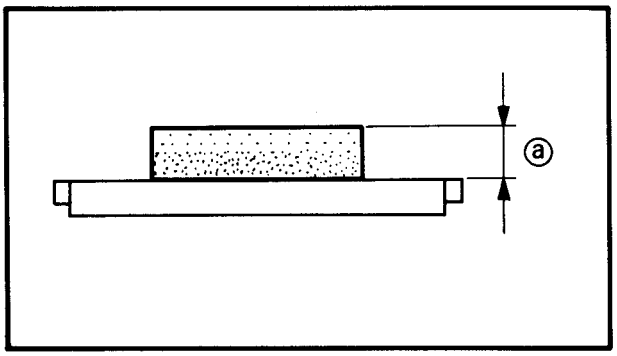
BRAKE INSPECTION AND REPAIR

Recommended Brake Component Replacement Schedule:	
Brake pads	As required
Piston seal, dust seal	Every two years
Brake hoses	Every four years
Brake fluid	Replace only when brakes are disassembled

WARNING:

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

1. Inspect:
   - Brake pads (Thickness) ⓐ
     Out of specification → Replace.



NOTE:

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

Wear Limit:
0.8 mm (0.03 in)

2. Inspect:
   - Caliper piston
     Rust/Wear/Damage → Replace.
   - Dust seal/Piston seal
     Damage → Replace.

WARNING:

Replace the piston and dust seals whenever a caliper is disassembled.

   - Master cylinder kit
   - Master cylinder body
     Scratches/Wear → Replace.
   - Brake hose
     Cracks/Wear/Damage → Replace.

3. Inspect:
   - Brake disc
     Out of specification → Replace.

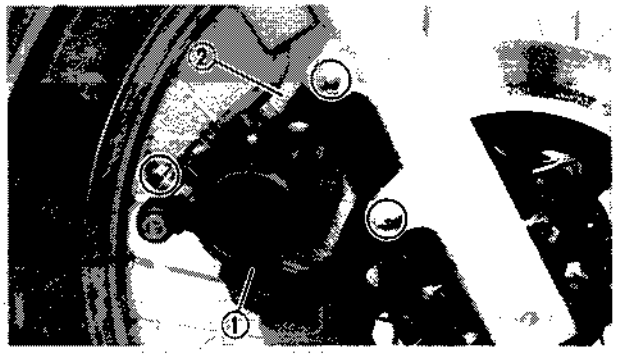
Maximum Deflection:
0.15 mm (0.006 in)
Minimum Disc Thickness:
4.5 mm (0.18 in)

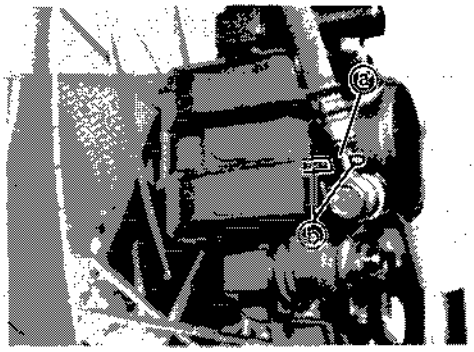
BRAKE REASSEMBLY

WARNING:

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

Brake Fluid:
DOT #3





Caliper Reassembly

When assembling the caliper, reverse the disassembly procedure. Note the following points.

1. Install:
   - Brake caliper ①
   - Brake hose ②

CAUTION:

When installing the brake hose, lightly touch the brake pipe ⓐ with projections ⓑ on the caliper.

Brake Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)
Brake Hose:
26 Nm (2.6 m·kg, 19 ft·lb)

2. Install:
   - Pad springs
   - Pads
   - Retaining bolt

   Refer to "CALIPER PAD REPLACEMENT" section.
3. Bleed:
   - Air

   Refer to "AIR BLEEDING" section.

Master Cylinder Reassembly

When assembling the master cylinder, reverse the disassembly procedure. Note the following points.

1. Install:
   - Master cylinder kit

WARNING:

Internal parts should be lubricated with brake fluid when installed.



2. Install:
   - Master cylinder
   - Brake hose

NOTE:

Install the master cylinder bracket with its "UP" mark to top.

Bracket (Master Cylinder):
9 Nm (0.9 m·kg, 6.5 ft·lb)
Brake Hose:
26 Nm (2.6 m·kg, 19 ft·lb)

3. Fill:
   - Master cylinder

Brake Fluid:
DOT #3

4. Bleed:
   - Air

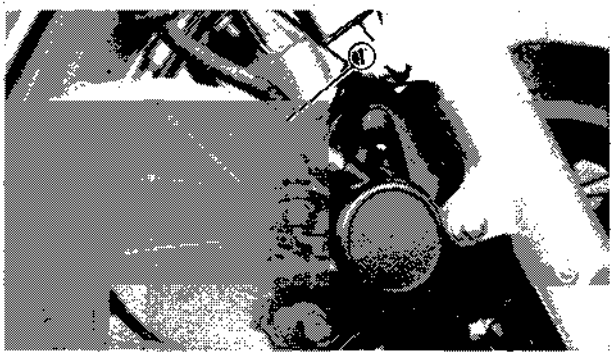
   Refer to "AIR BLEEDING" section.

AIR BLEEDING

WARNING:

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

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



1. Bleed:
   - Brake fluid

Air bleeding steps:

a. Add proper brake fluid to the reservoir.
b. Install the diaphragm. Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect the clear plastic tube ① tightly to the caliper bleed screw.
d. Place the other end of the tube into a container.
e. Slowly apply the brake lever several times.
f. Pull the lever in. Hold the lever in position.
g. Loosen the bleed screw and allow the lever to travel towards its limit.
h. Tighten the bleed screw when the lever limit has been reached; then release the lever.

Bleed Screw:
6 Nm (0.6 m·kg, 4.3 ft·lb)

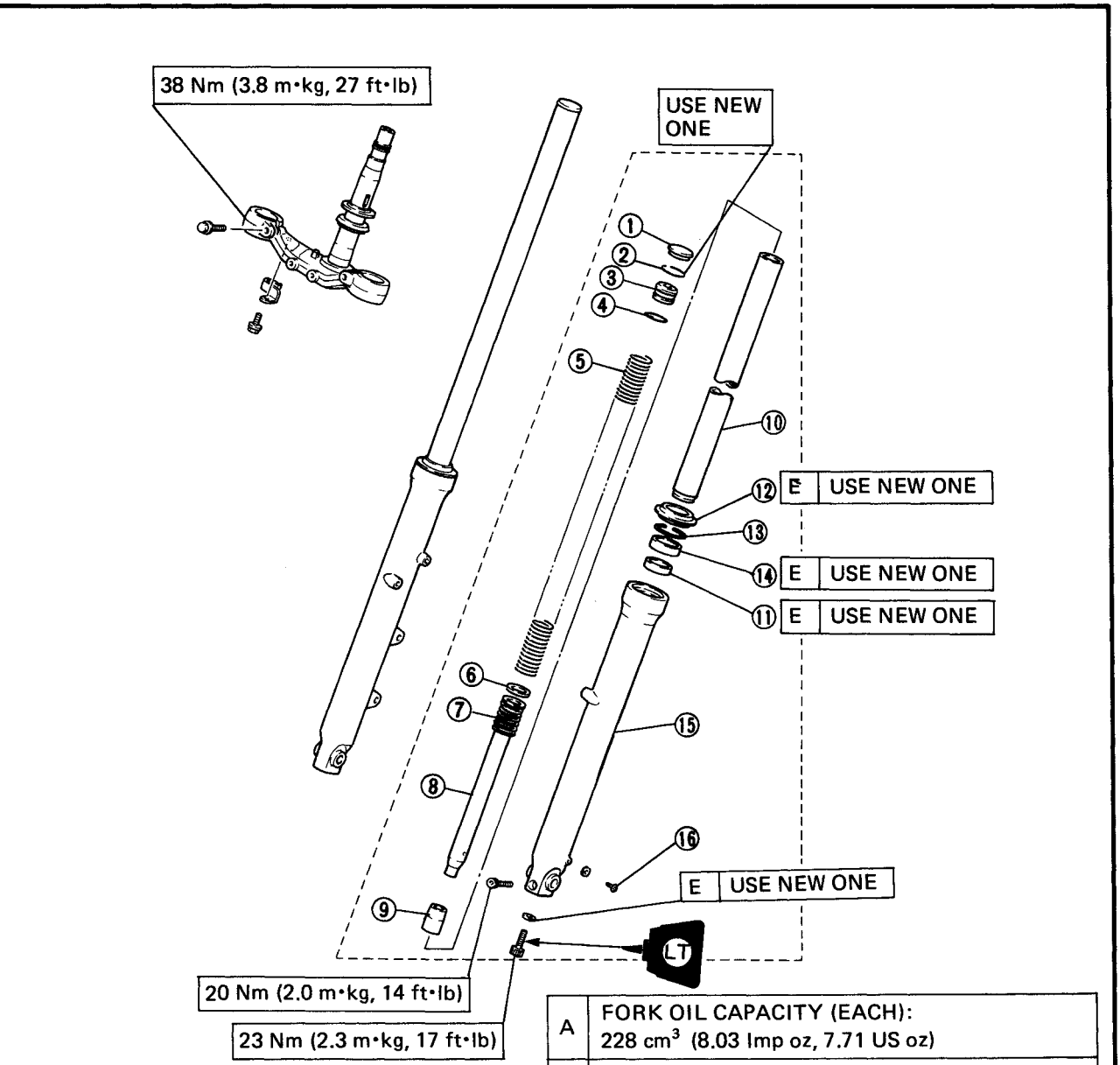
i. Repeat steps (e) to (h) until of the air bubbles have been removed from the system.

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

j. Add brake fluid to the level line on the reservoir.

FRONT FORK

① Fork cap
② Stopper ring
③ Spring seat
④ O-ring
⑤ Fork spring
⑥ Piston ring
⑦ Rebound spring
⑧ Cylinder complete
⑨ Oil lock piece
⑩ Inner tube
⑪ Slide bush
⑫ Dust cover
⑬ Retaining clip
⑭ Oil seal
⑮ Outer tube
⑯ Drain screw



A	FORK OIL CAPACITY (EACH): 228 cm³ (8.03 Imp oz, 7.71 US oz)
B	FORK OIL LEVEL (FROM TOP OF FULLY COMPRESSED INNER TUBE WITHOUT FORK SPRING): 176 mm (6.93 in)
C	GRADE: YAMAHA FORK OIL 10WT OR EQUIVALENT
D	FORK SPRING FREE LENGTH (LIMIT): 526.6 mm (20.7 in)

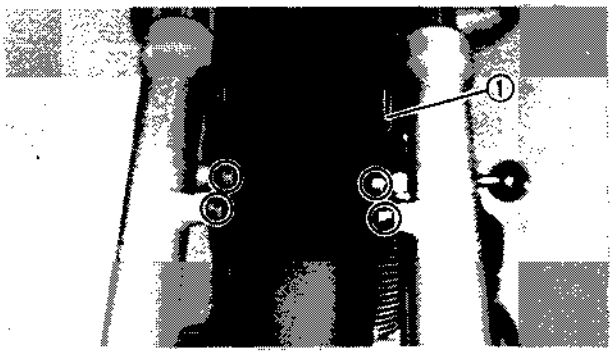
REMOVAL

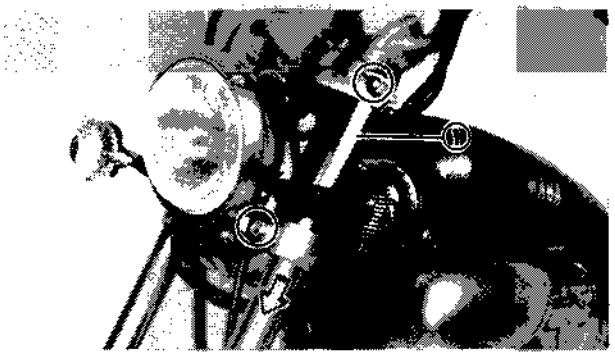
WARNING:

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

1. Remove:
   - Front wheel
   - Brake caliper (Right)

   Refer to "FRONT WHEEL and FRONT BRAKE" sections.
2. Remove:
   - Front fender ①
3. Remove:
   - Fork caps





4. Loosen:
   - Pinch bolts (Steering crown)
   - Pinch bolts (Under bracket)
5. Remove:
   - Front fork(s) ①

DISASSEMBLY

1. Remove:
   - Stopper ring
   - Spring seat
   - Fork spring

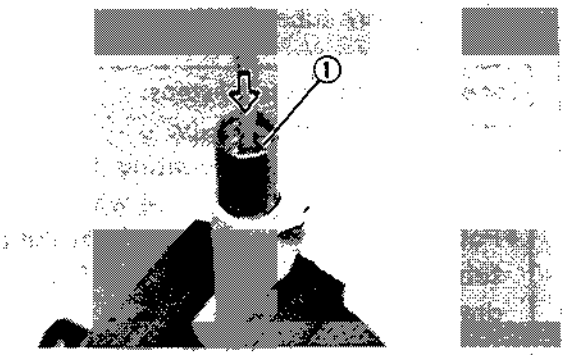
Removal steps:

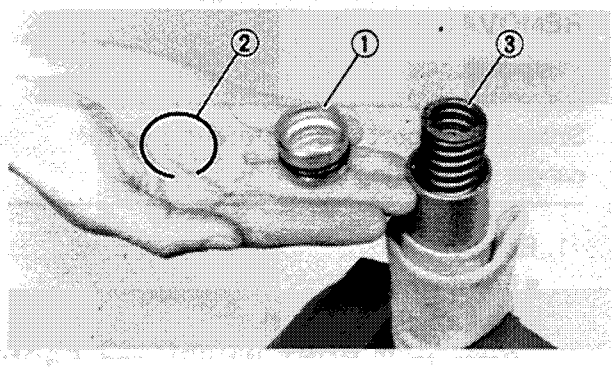
- Hold fork leg vertically.
- Clamp the inner tube securely in a vise with soft jaws.

CAUTION:

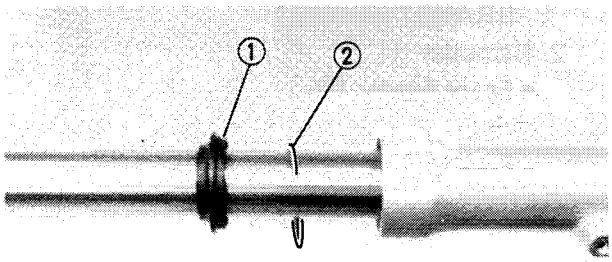
Do not to give damages to the inner tube surface.

- Depress the spring seat ① with a suitable bar.



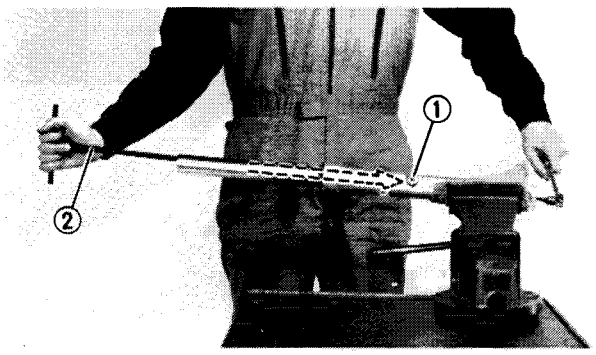


- Hold the spring seat, and remove the stopper ring ② with a thin screwdriver.
- Remove the spring seat ① and fork spring ③.
- Place an oil pan under the fork, and fork upside down and drain the oil.



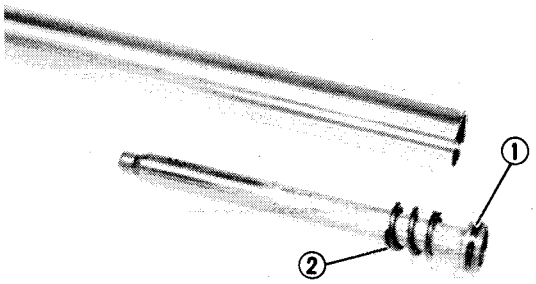
2. Remove:
   - Dust cover ①
   - Retaining clip ②

   Use a thin screwdriver, and be careful not to scratch the inner fork tube.

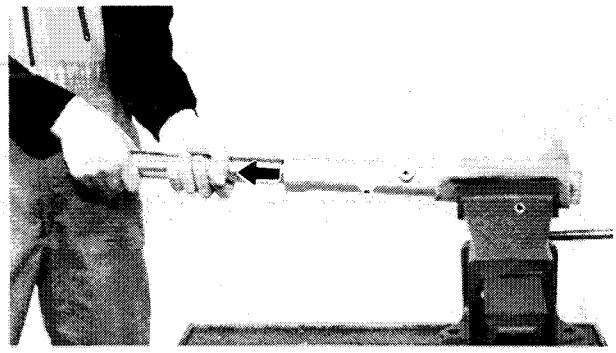


3. Remove:
   - Bolt (Cylinder complete)

   Use the Damper Rod Holder ① (YM-01300-1) and the T-Handle ② (YM-01326) to lock the damper rod.



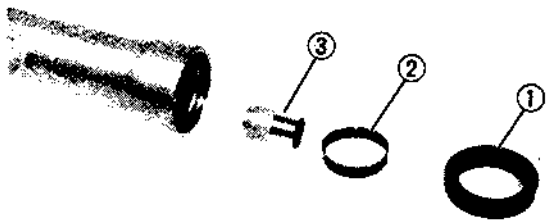
4. Remove:
   - Damper rod (Cylinder complete) ①
   - Rebound spring ②



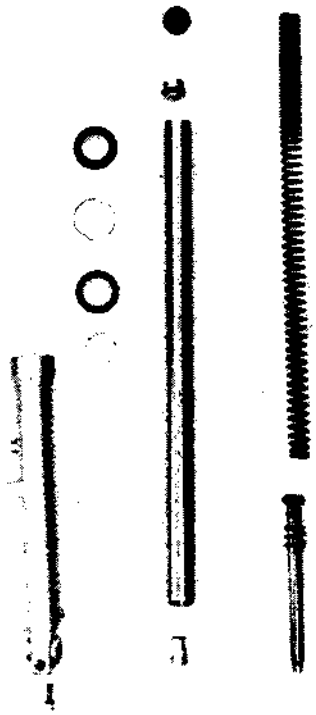
5. Remove:
   - Inner fork tube

Inner fork tube removal steps:
- Hold fork leg horizontally.
- Clamp the caliper mounting boss of the outer tube securely in a vise with soft jaws.
- Pull out the inner fork tube from the outer tube by forcefully, but carefully, with drawing the inner tube.

NOTE:
- Excessive force will damage the oil seal and/or the bushes. Damaged oil seal and bushing must be replaced.
- Avoid bottoming the inner tube in the outer tube during the above procedure, as the oil lock piece will be damaged.



6. Remove:
   - Oil seal ①
   - Slide bush ②
   - Oil lock piece ③



INSPECTION

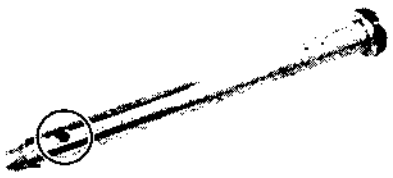
1. Inspect:
   - Inner fork tube
     Scratches/Bends → Replace.

WARNING:

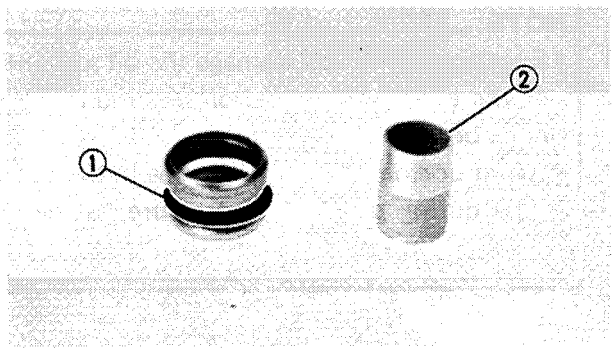
Do not attempt to straighten a bent inner fork tube as this may dangerously weaken the tube.

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

Fork Spring Free Length (Limit):
526.6 mm (20.7 in)

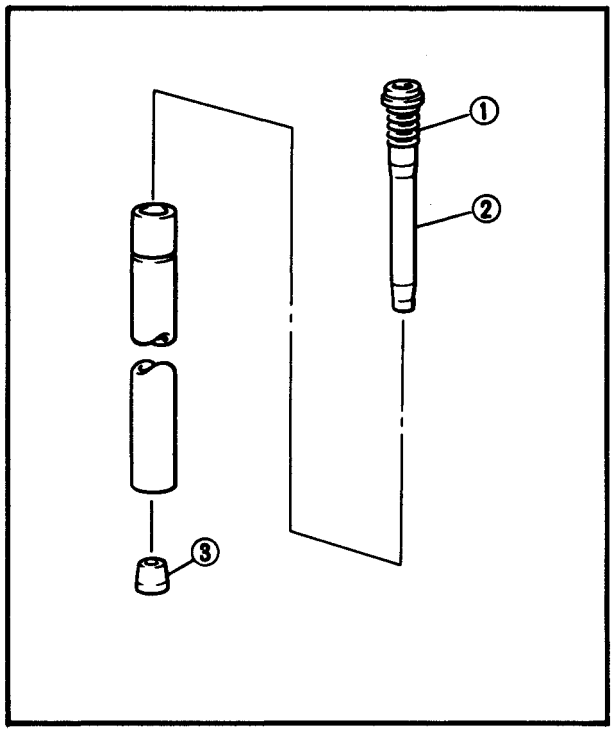


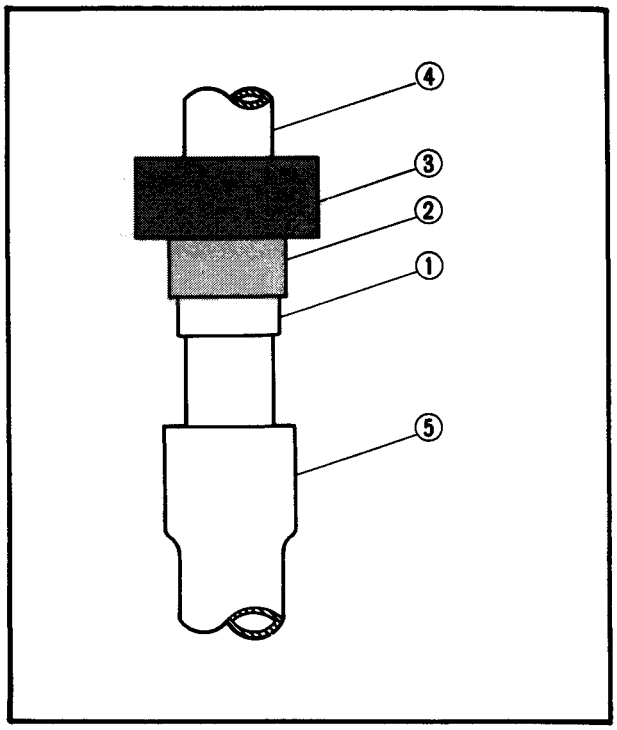
2. Inspect:
   - Damper rod
     Wear/Damage → Replace.
     Contamination → Blow out all oil passages with compressed air.



3. Inspect:
   - O-ring (Spring seat) ①
   - Oil lock piece ②

   Damage → Replace.





ASSEMBLY

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

NOTE:

In front fork assembly, be sure to use following new parts. Do not reuse them.

- Slide bush
- Oil seal
- Dust seal

1. Install:
   - Rebound spring ①
   - Damper rod ②

   Allow the rod to slide slowly down the tube until the it protrudes from the bottom.
   - Oil lock piece ③

   Fit oil lock piece over damper rod sticking out of the inner fork tube.
2. Install:
   - Inner fork tube

   Into outer tube.
3. Tighten:
   - Bolt (Cylinder complete)

   Use the Damper Rod Holder (YM-01300-1) and the T-Handle (YM-01326).

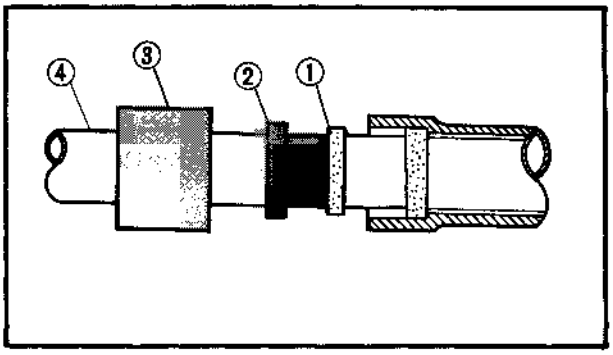
Bolt (Cylinder Complete):
23 Nm (2.3 m·kg, 17 ft·lb)
LOCTITE®

4. Install:
   - Slide bush ①

   Into outer tube.

   Use the Fork Seal Driver Weight ③ (YM-01367) and the Adapter ② (YM-8010).

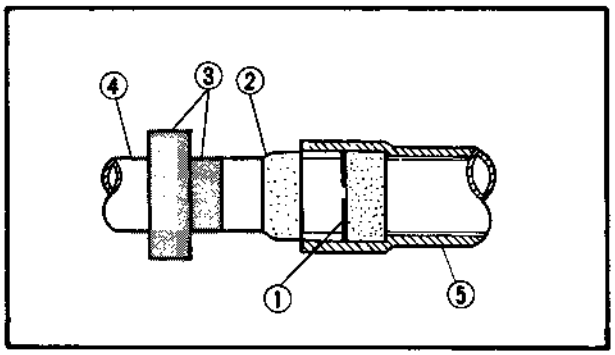
④ Inner tube
⑤ Outer tube



5. Install:
   - Oil seal ①

   Use the Fork Seal Driver Weight ③ (YM-01367) and the Adapter ② (YM-8010), and install with numbered side up.

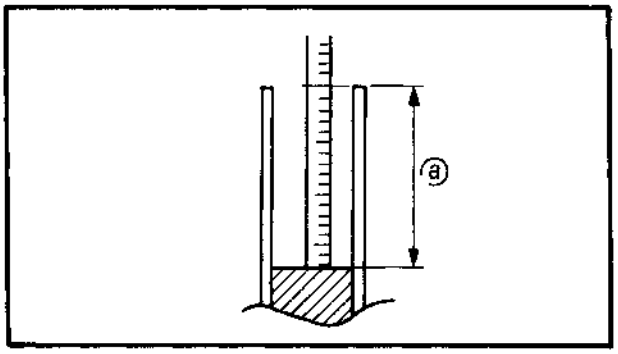
④ Inner tube
⑤ Outer tube



6. Install:
   - Retaining clip ①
   - Dust seal ②

   Use the Special Tools ③ (YM-01367, YM-8010).

④ Inner tube
⑤ Outer tube



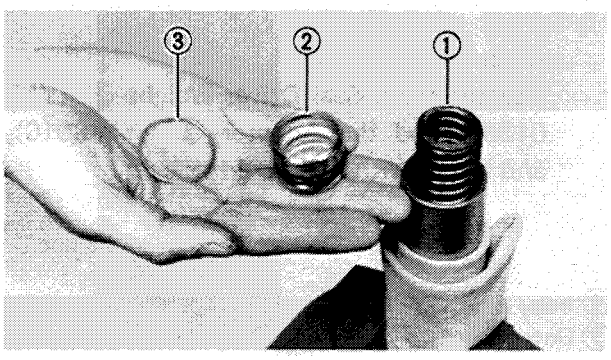
7. Fill:
   - Front fork

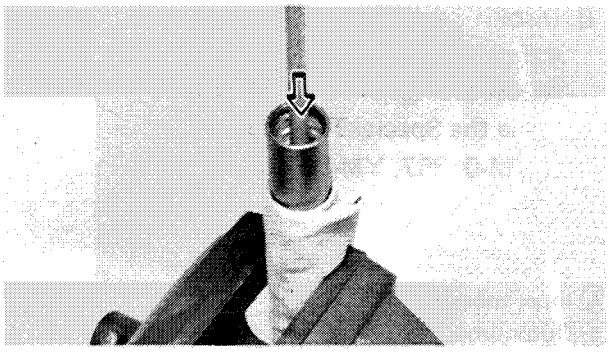
Fork Oil Capacity (Each):
228 cm³ (8.03 Imp oz, 7.71 US oz)
Fork Oil Level ⓐ (From Top of Fully Compressed Inner Tube Without Fork Spring):
176 mm (6.93 in)
Grade:
Yamaha fork oil 10wt or equivalent
After filling, slowly pump the fork up and down to distribute oil.

8. Install:
   - Fork spring
   - Spring seat
   - Stopper ring

Installation steps:
- Hold the fork leg vertically.
- Clamp the inner tube in a vise with soft jaws.

CAUTION:
Do not to give damages to the inner tube surface.

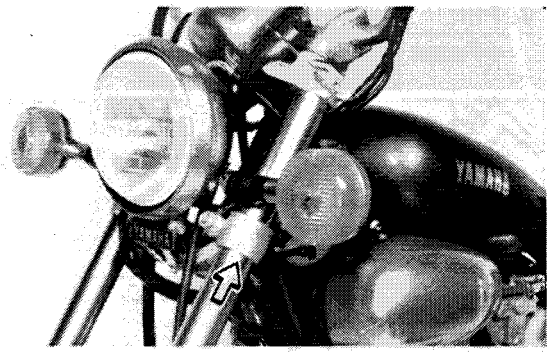




- Install the fork spring ① into the inner tube.

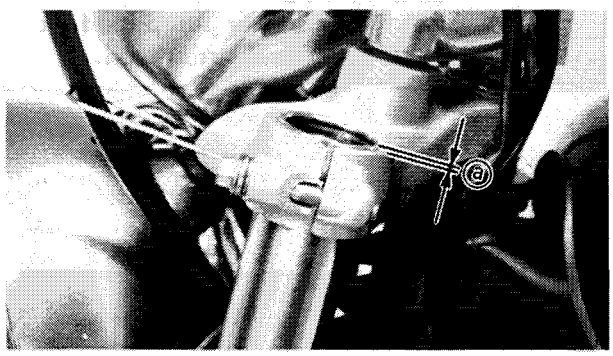
NOTE:
Install the fork spring with its smaller pitch side up.

- Inspect the O-ring (Spring seat). If damaged, replace it.
- Fit the spring seat ② onto the fork spring, depress the spring seat with a suitable bar.
- Hold the spring seat, and install the stopper ring ③ into the inner tube.



INSTALLATION

1. Install:
   - Front fork(s)
     Into the underbracket and steering crown.



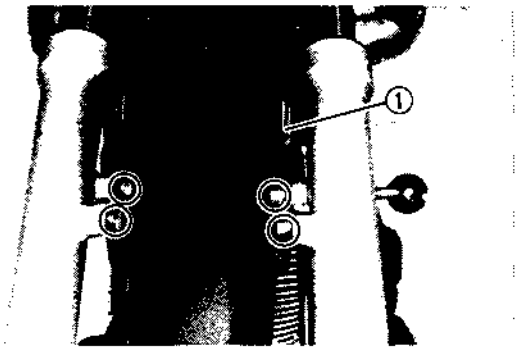
2. Tighten:
   - Pinch bolts (Under bracket)
     Temporarily tighten the pinch bolts.

NOTE:
Position the inner tube end so that it is flush ⓐ with the top of the steering crown.

3. Tighten:
   - Pinch bolts (Under bracket)
   - Pinch bolts (Steering crown)

NOTE:
Do not forget to fit the cable holders to the front fork top.

Pinch Bolts (Under Bracket):
38 Nm (3.8 m·kg, 27 ft·lb)
Pinch Bolts (Steering Crown):
20 Nm (2.0 m·kg, 14 ft·lb)



4. Install:
   - Fork caps
   - Front fender ①

	Front Fender: **10 Nm (1.0 m·kg, 7.2 ft·lb)**

5. Install:
   - Front wheel
   - Brake caliper (Right)

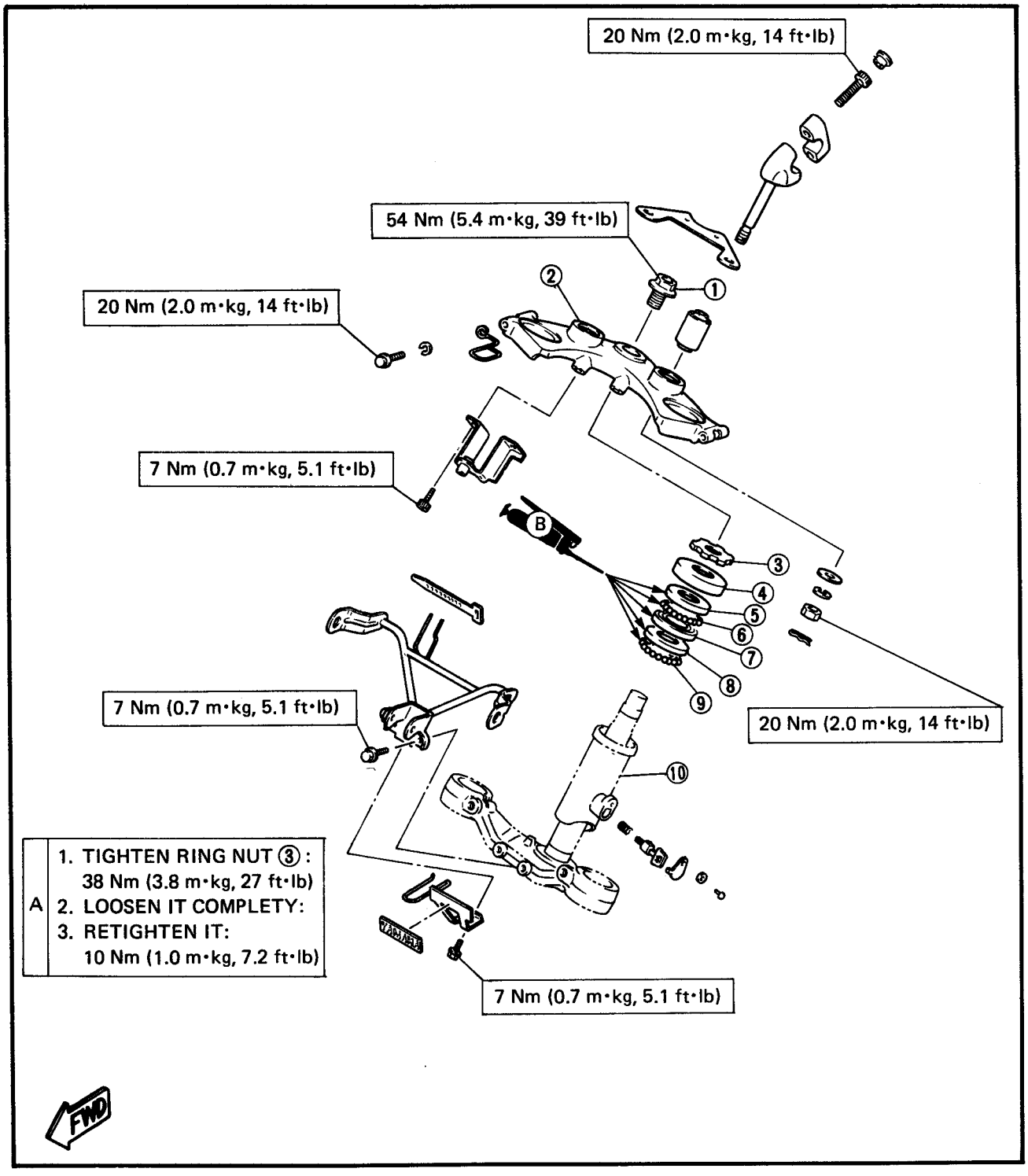
   Refer to "FRONT WHEEL and FRONT BRAKE" section.
6. Inspect:
   - Fork operation

     Unsmooth operation → Repair.
   - Oil leaks

     Leakage → Repair.

STEERING HEAD

① Steering stem bolt
② Steering crown
③ Ring nut
④ Bearing cover
⑤ Ball race (Upper – Top)
⑥ Ball (19 pcs.)
⑦ Ball race (Upper – Bottom)
⑧ Ball race (Lower – Top)
⑨ Ball (19 pcs.)
⑩ Steering stem



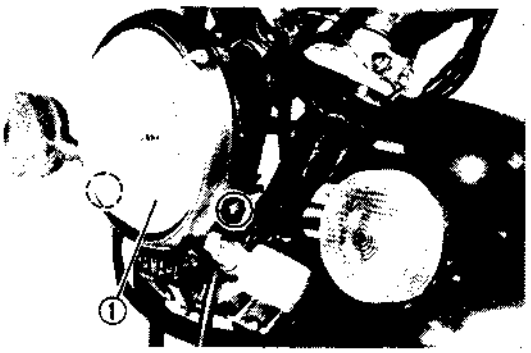
REMOVAL

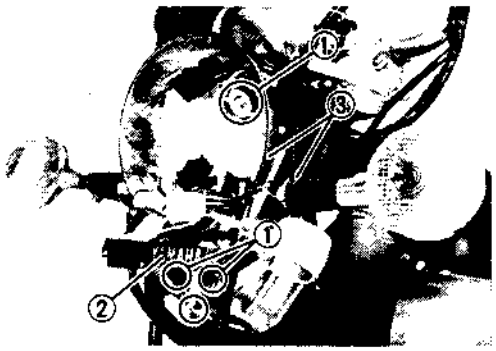
WARNING:

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

1. Remove:
   - Front wheel
   - Front forks

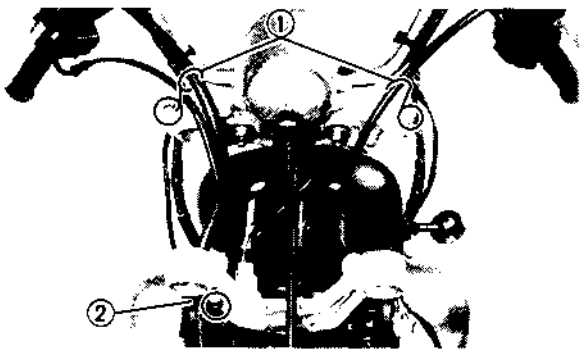
   Refer to "FRONT HWEEL and FRONT FORK" section.
2. Remove:
   - Headlight lens unit ①
3. Disconnect:
   - All leads (In the headlight body)



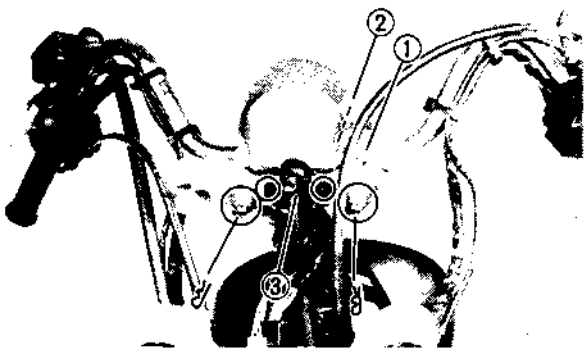


4. Remove:
   - Emblem ②
   - Bolts (Headlight body bracket) ①
   - Headlight bracket and flasher light bracket assembly ③

   Pull down the bracket assembly.



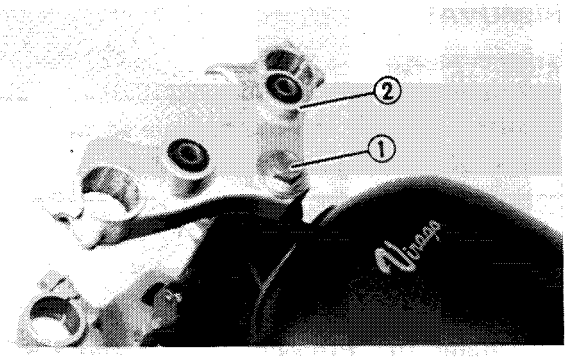
5. Remove:
   - Cable holders (Left and right) ①
   - Brake hose holder ②



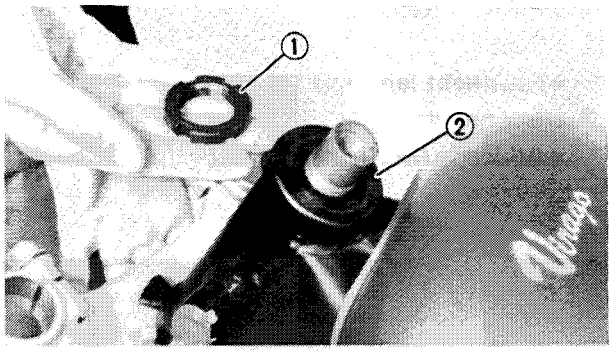
6. Remove:
   - Handlebar holder assembly ①
   - Indicator box ②
   - Speedometer with bracket ③

NOTE:

Take care not to lose the clevis pins.



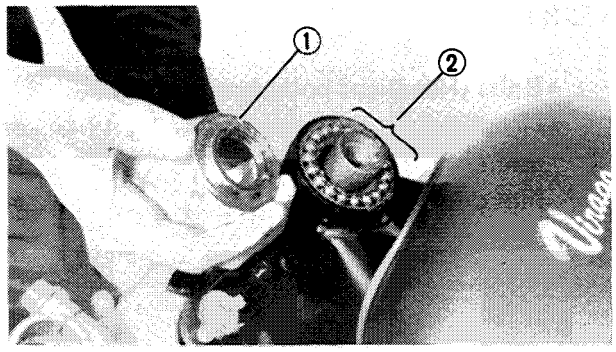
7. Remove:
   - Bolt (Steering crown) ①
   - Steering crown ②



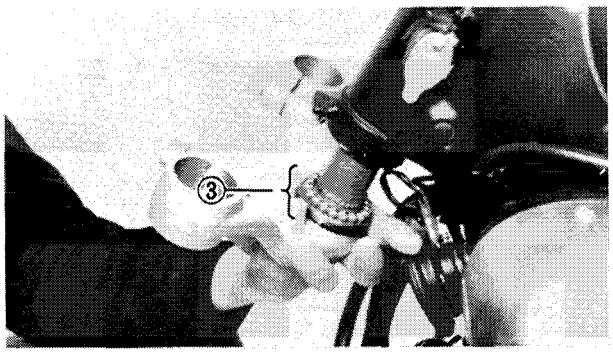
8. Remove:
   - Ring nut ①
     Use the Ring Nut Wrench (YU-33975).
   - Bearing cover ②

WARNING:

Support the under bracket so that it may not fall down.



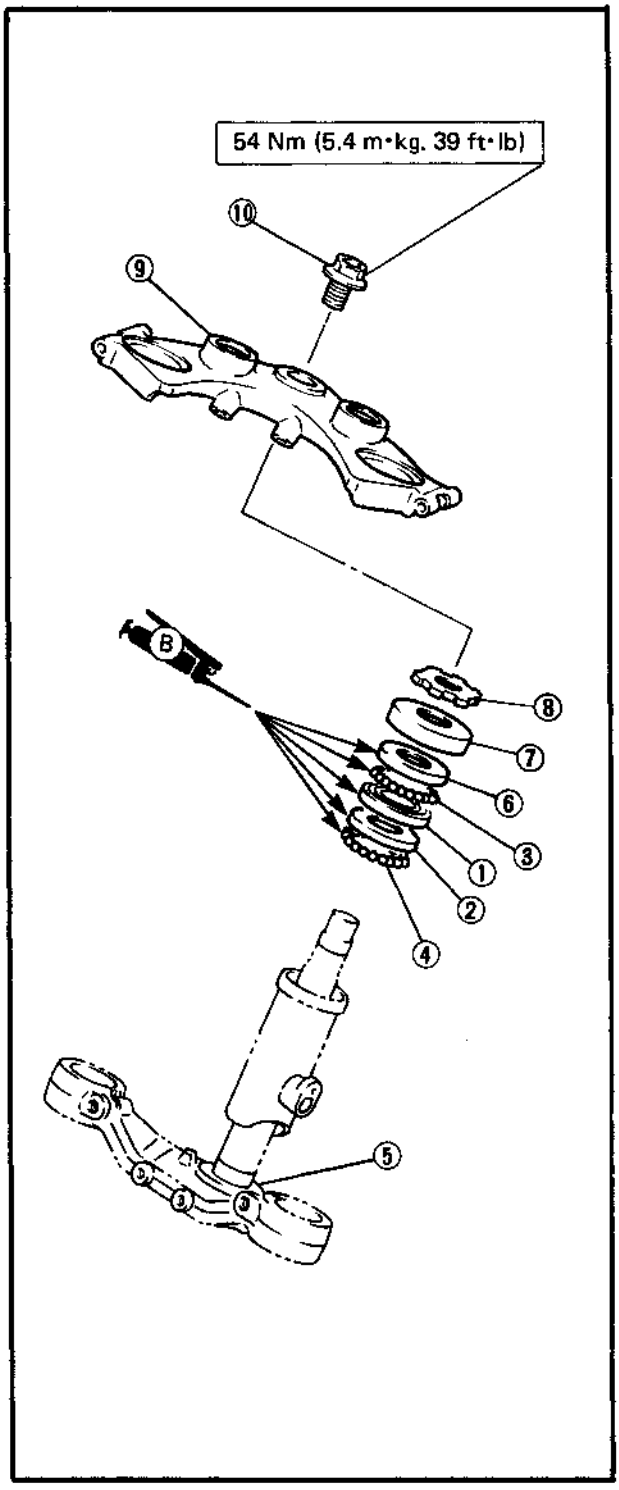
9. Remove:
   - Steering stem
   - Ball race (Upper – Top) ①
   - Ball (19 pcs.) ②
   - Ball (19 pcs.) ③



10. Remove:
    - Ball race (Upper – Bottom)
    - Ball race (Lower – Top)
      Use a drift punch and a hammer.

NOTE:

Work the race out gradually by tapping lightly around its complete backside diameter.



INSPECTION

1. Wash the bearing in a solvent.
2. Inspect:
   - Balls
   - Ball races

   Pitting/Damage → Replace.

NOTE:

Always replace ball and race as a set.

INSTALLATION

1. Install:
   - Ball race (Upper — Bottom) ①
   - Ball race (Lower — Top) ②

   Tap in the new races in the head pipe.
2. Lubricate:
   - Ball race (Upper — Bottom)
   - Ball race (Lower — Top)

Wheel Bearing Grease

3. Install:
   - Balls (Upper and lower) ③ , ④

   Arrange the balls around race, and apply more grease.

Ball Quantity/Size:
19 pcs./1/4 in

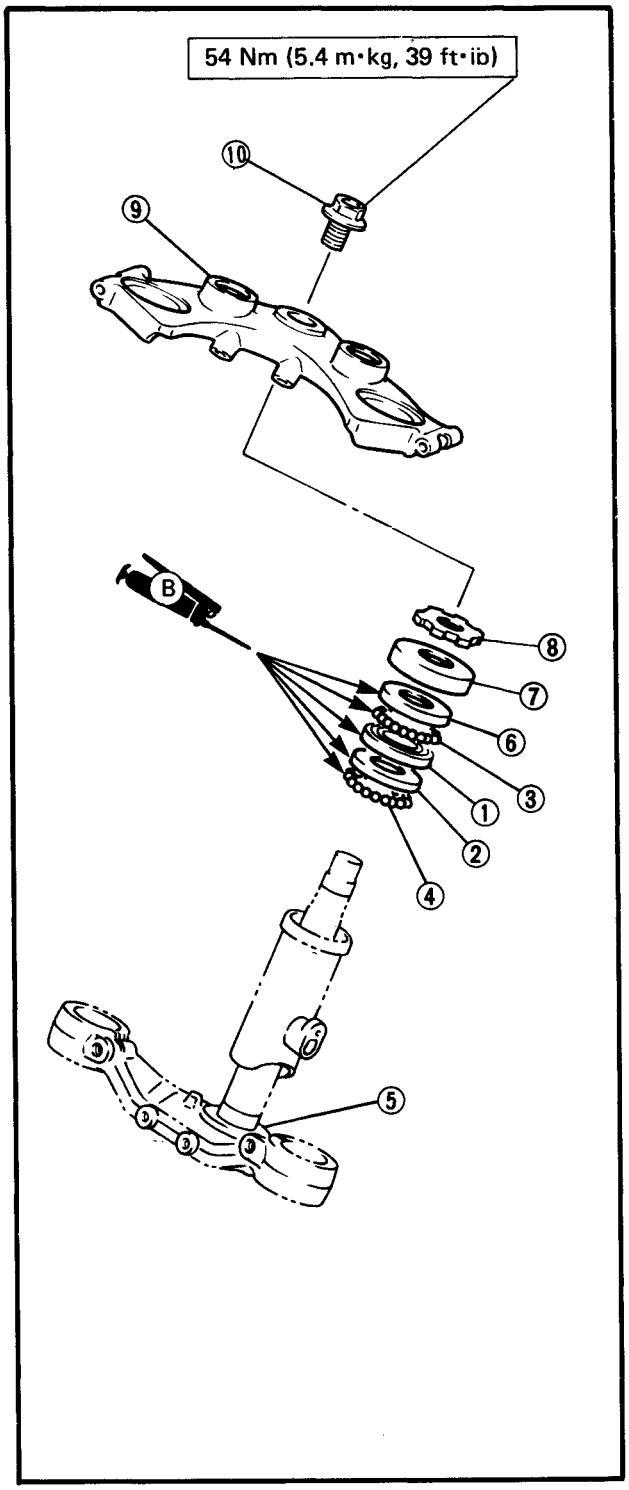
4. Install:
   - Steering stem ⑤
   - Ball race (Upper — Top) ⑥
   - Bearing cover ⑦
   - Ring nut ⑧

NOTE:

The tapered side of ring nut must face downward.

CAUTION:

Hold the steering stem until it is secured.



5. Tighten:
   - Ring nut ⑧

Ring nut tightening steps:

NOTE:
Set the Torque Wrench to the Ring Nut Wrench so that they form a right angle.

- Tighten the ring nut ⑧ using the Ring Nut Wrench (YU-33975).

Ring Nut (Initial Tightening): 38 Nm (3.8 m•kg, 27 ft•lb)

- Loosen the ring nut ⑧ completely and re-tighten it to specification.

WARNING:
Do not over-tightening.

Ring Nut (Final Tightening): 10 Nm (1.0 m•kg, 7.2 ft•lb)

- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings ④, ⑥.
- Install the steering crown ⑨ and tighten the steering stem nut ⑩ to specification.

Nut (Steering Stem): 54 Nm (5.4 m•kg, 39 ft•lb)

6. Install:
   - Components in aforementioned list (Removal steps "6 ~ 1")
     Refer to "FRONT FORK and FRONT WHEEL" section.

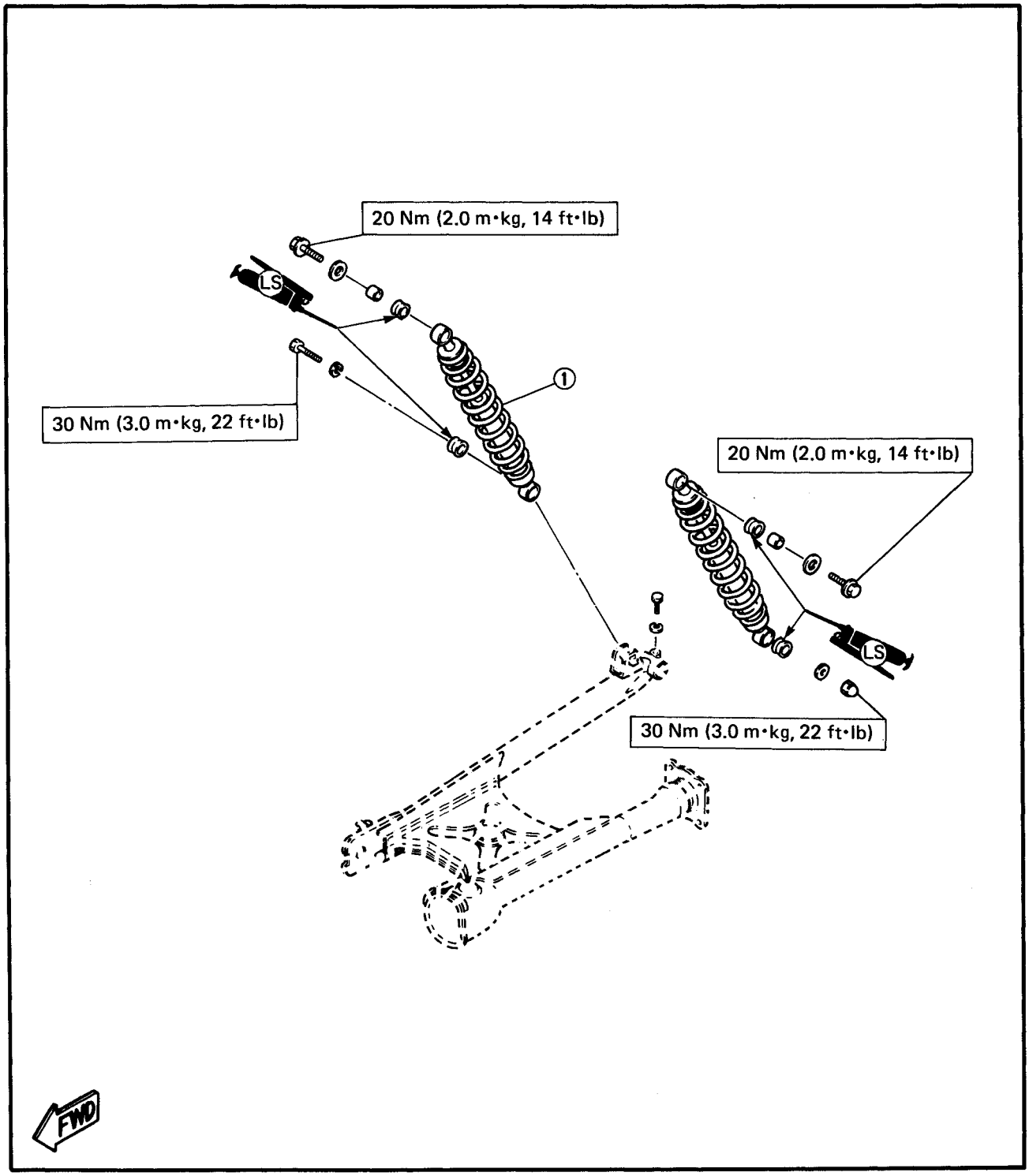
NOTE:
Do not forget to fit:
- The clevis pins to the handlebar holders.
- The cable holders to the front fork top.

Headlight Stay:
7 Nm (0.7 m·kg, 5.1 ft·lb)
Pinch Bolts (Steering Crown):
20 Nm (2.0 m·kg, 14 ft·lb)
Handlebar Holder (Lower):
20 Nm (2.0 m·kg, 14 ft·lb)

7. Adjust:
   - Headlight beam
     Refer to "CHAPTER 2. HEADLIGHT BEAM ADJUSTMENT" section.

REAR SHOCK ABSORBER

① Rear shock absorber assembly

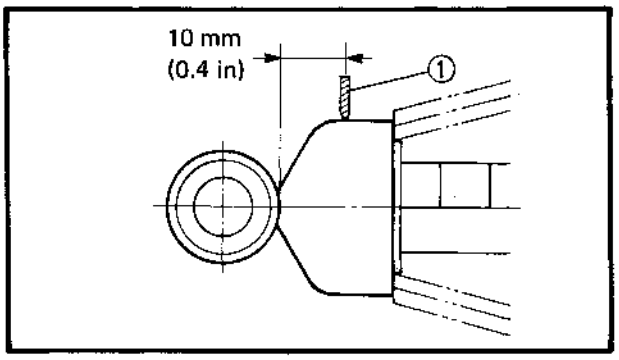


HANDLING NOTES

WARNUNG:

This shock absorber contains highly pressurized nitrogen gas. Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

- **Do not tamper with or attempt to open the cylinder assembly.**
- **Do not subject shock absorber to an open flame or other high heat source. This may cause the unit to explode due to excessive gas pressure.**
- **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**
- **Take care not to scratch the contact surface of the piston rod with the cylinder; or oil could leak out.**
- **When scrapping the shock absorber, follow the instructions on disposal.**



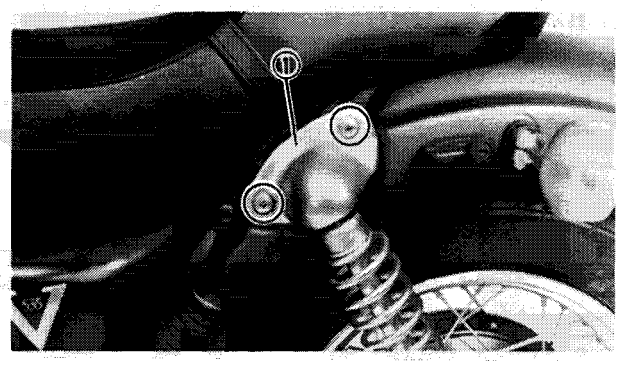
NOTE ON DISPOSAL

Shock absorber disposal steps:

Gas pressure must be released before disposing of shock absorber. To do so, drill ① a 2 ~ 3 mm (0.08 ~ 0.12 in) hole through the cylinder wall at a point 10 mm (0.4 in) from the top end of the gas chamber.

CAUTION:

Wear eye protection to prevent eye damage from escaping gas and/or metal chips.

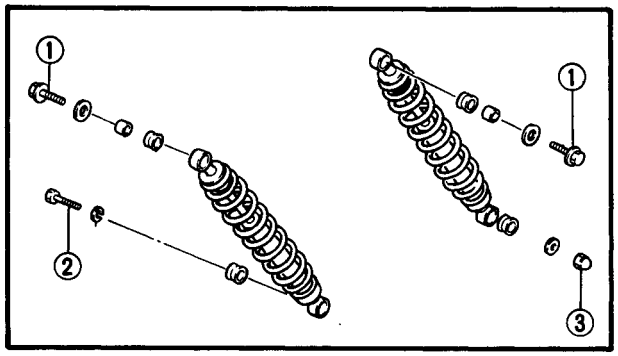


REMOVAL

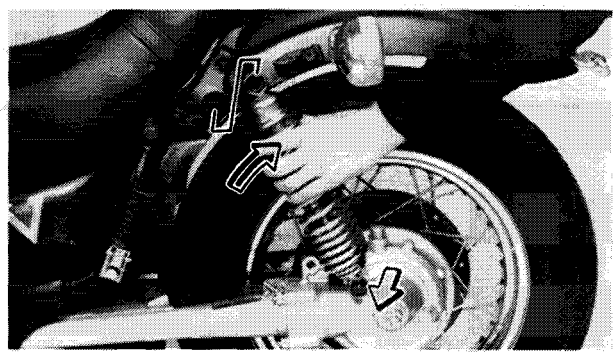
WARNING:

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

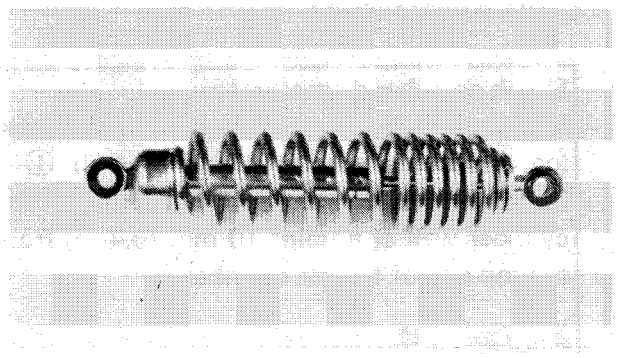
1. Place the motorcycle on level place.
2. Remove:
   - Covers (Rear shock absorber) ①



3. Remove:
   - Bolts (Rear shock absorber – Top) ①
   - Bolt (Rear shock absorber – Right bottom) ②
   - Nut (Rear shock absorber – Left bottom) ③
4. Elevate the rear wheel by placing a suitable stand under the engine.



5. Pull out the shock absorber top, and turn the shock absorber clockwise.
6. Remove:
   - Rear shock absorbers



INSPECTION

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

INSTALLATION

When installing the rear shock absorber, reverse the removal procedure. Note the following points.

1. Apply:
   - Lithium base grease

   To the pivot points.



2. Install:
   - Rear shock absorbers

NOTE:

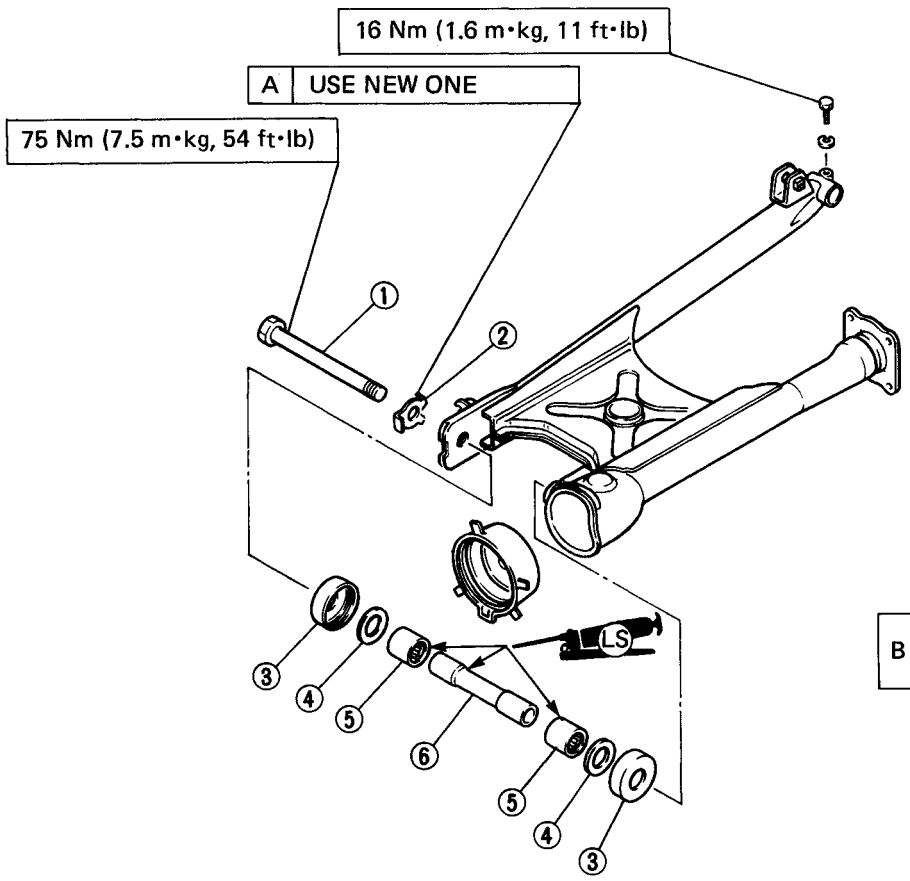
The rear shock absorber should be installed so that the gas chamber ① on the shock absorber faces topward ② .

3. Tighten:
   - Bolts (Shock absorber – Top)
   - Bolt (Shock absorber – Right bottom)
   - Nut (Shock absorber – Left bottom)
   - Covers (Shock absorber)

Bolts (Shock Absorber – Top):
20 Nm (2.0 m·kg, 14 ft·lb)
Bolt (Shock Absorber – Right Bottom):
30 Nm (3.0 m·kg, 22 ft·lb)
Nut (Shock Absorber – Left Bottom):
30 Nm (3.0 m·kg, 22 ft·lb)
Covers (Shock Absorber):
9 Nm (0.9 m·kg, 6.5 ft·lb)

SWINGARM

① Pivot shaft
② Lockwasher
③ Thrust cover
④ Plain washer
⑤ Taper roller bearing
⑥ Bushing



FREE PLAY INSPECTION

WARNING:

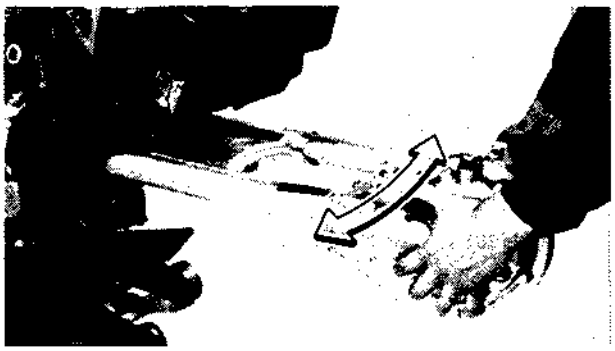
Securely support the motorcycle so there is no danger of it falling over.

1. Remove:
   - Rear wheel
   - Rear shock absorbers

   Refer to "REAR WHEEL and REAR SHOCK ABSORBER" sections.
2. Check:
   - Swingarm (Side play)

   Side play → Replace taper roller bearings and bushing.

   Move the swingarm from side to side.



Side Play (At End of Swingarm):
1.0 mm (0.04 in)



3. Check:
   - Swingarm (Vertical movement)

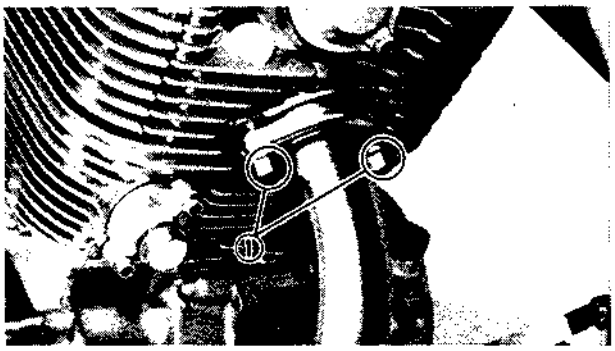
   Tightness/Binding/Rough spots → Replace bearings.

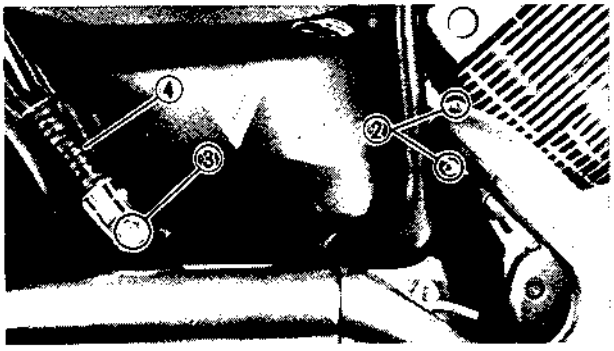
   Move the swingarm up and down.

REMOVAL

WARNING:

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

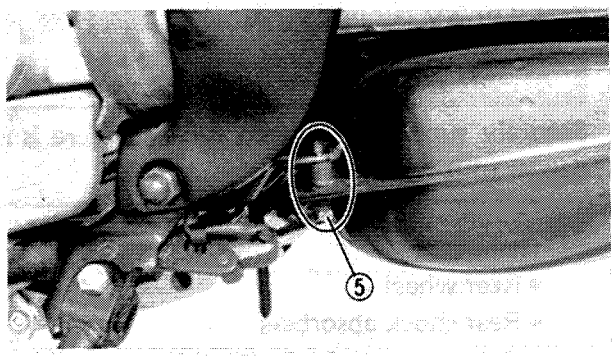


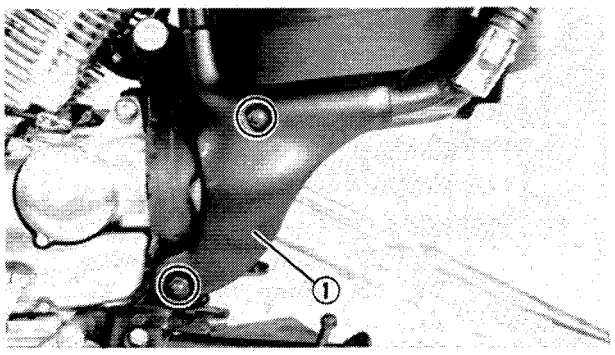


1. Remove:
   - Nuts (Front cylinder – Exhaust pipe) ①
   - Bolts (Rear cylinder – Rear joint) ②
   - Bolt (Muffler bracket) ③
   - Rear footrest (Right) ④
   - Bolt (Muffler chamber) ⑤
   - Muffler assembly

NOTE:

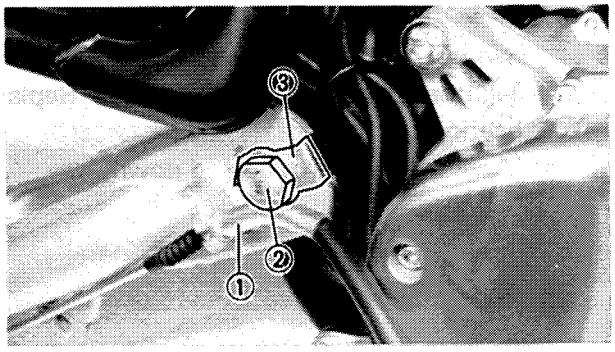
After removing the muffler assembly elevate the rear wheel by placing a suitable stand under the engine.





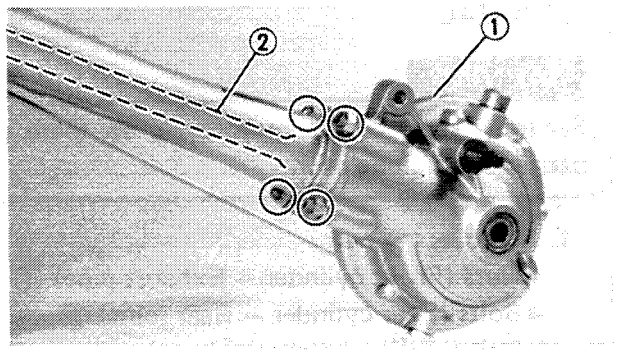
2. Remove:
   - Rear wheel
   - Rear shock absorbers

   Refer to "REAR WHEEL and REAR SHOCK ABSORBER" sections.
3. Remove:
   - Rear-under-side cover ①

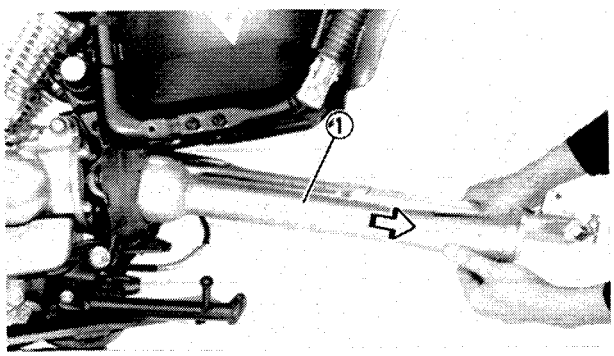


4. Unhook the rear brake cable ① .
5. Flatten:
   - Lock washer tab

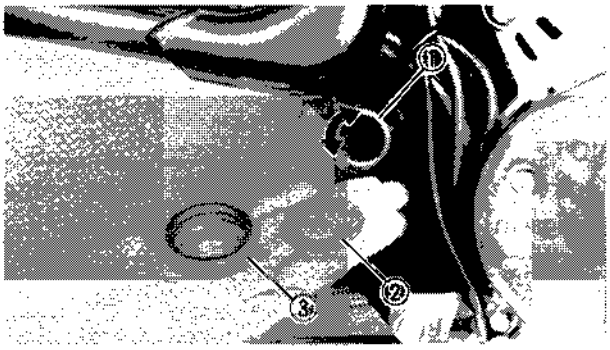
   Use a blunt chisel.
6. Remove:
   - Pivot shaft ②
   - Lock washer ③



7. Remove:
   - Final gear assembly ①
   - Drive shaft ②

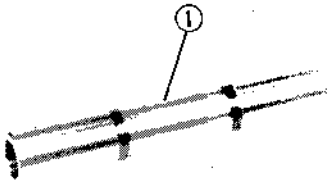


8. Remove:
   - Swingarm ①

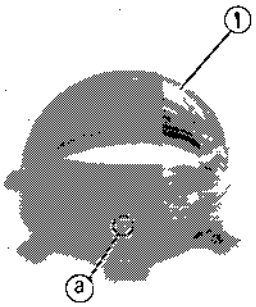


INSPECTION

1. Wash the bearings in a solvent.
2. Inspect:
   - Bearings (Race/Rollers) ①
     Pitting/Damage → Replace.
   - Plain washer ②
   - Thrust cover ③
     Damage → Replace.



3. Inspect:
   - Bushing ①
     Scratches/Damage → Replace.



4. Inspect:
   - Rubber boot ①
     Damage → Replace.

NOTE:
The rubber boot should be installed so that the hole ⓐ on the boot face downward.

INSTALLATION

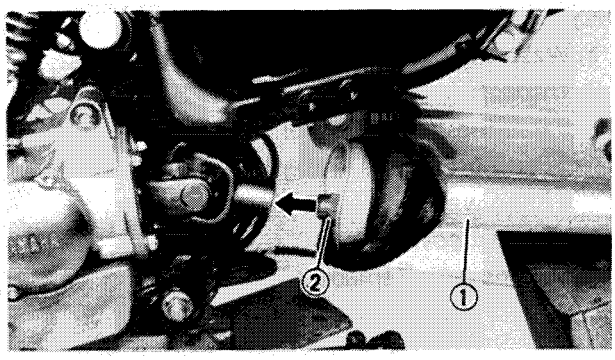
When installing the swingarm, reverse the removal procedures. Note the following points.

1. Lubricate:
   - Bearings
   - Bushing

Lithium Base Waterproof Wheel Bearing Grease

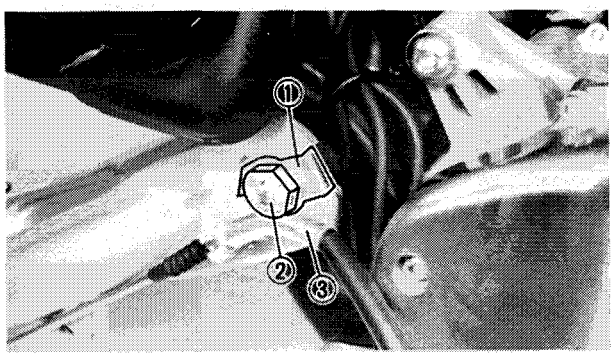
2. Lubricate:
   - Drive shaft splines

Molybdenum Disulfide Grease



3. Install:
   - Swingarm (Without final gear assembly) ①
   - Drive shaft ②

NOTE:
Insert the drive shaft properly through the swingarm into the universal joint.

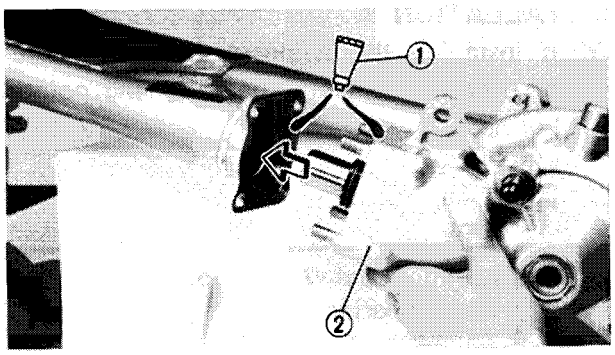


4. Install:
   - Lock washer (New) ①
   - Pivot shaft ②

NOTE:
Make sure that the tab of the lock washer engages the slot in the swingarm.

Pivot Shaft:
70 Nm (7.0 m·kg, 54 ft·lb)

5. Bend the lock washer tab along the bolt head flats.
6. Hook the rear brake cable ③ .



7. Apply:
   - Sealant (Quick Gasket®) (ACC-11001-05-01) ①

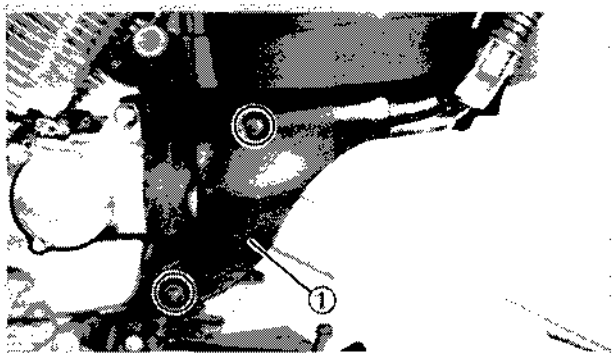
   To the mating surfaces of both case halves.
8. Install:
   - Final gear assembly ②

NOTE:
Fit the coupling gear over the drive shaft properly.

Nuts (Final Gear Assembly):
42 Nm (4.2 m·kg, 30 ft·lb)

9. Check:
   - Side play (Swingarm)
   - Vertical movement (Swingarm)

   Faulty → Repair.
   Refer to "FREE PLAY INSPECTION" section.



10. Install:
    - Rear-under-side cover ①

Rear-under-side Cover:
Top: 7 Nm (0.7 m·kg, 5.1 ft·lb)
Bottom: 20 Nm (2.0 m·kg, 14 ft·lb)

11. Install:
    - Rear shock absorbers
    - Rear wheel

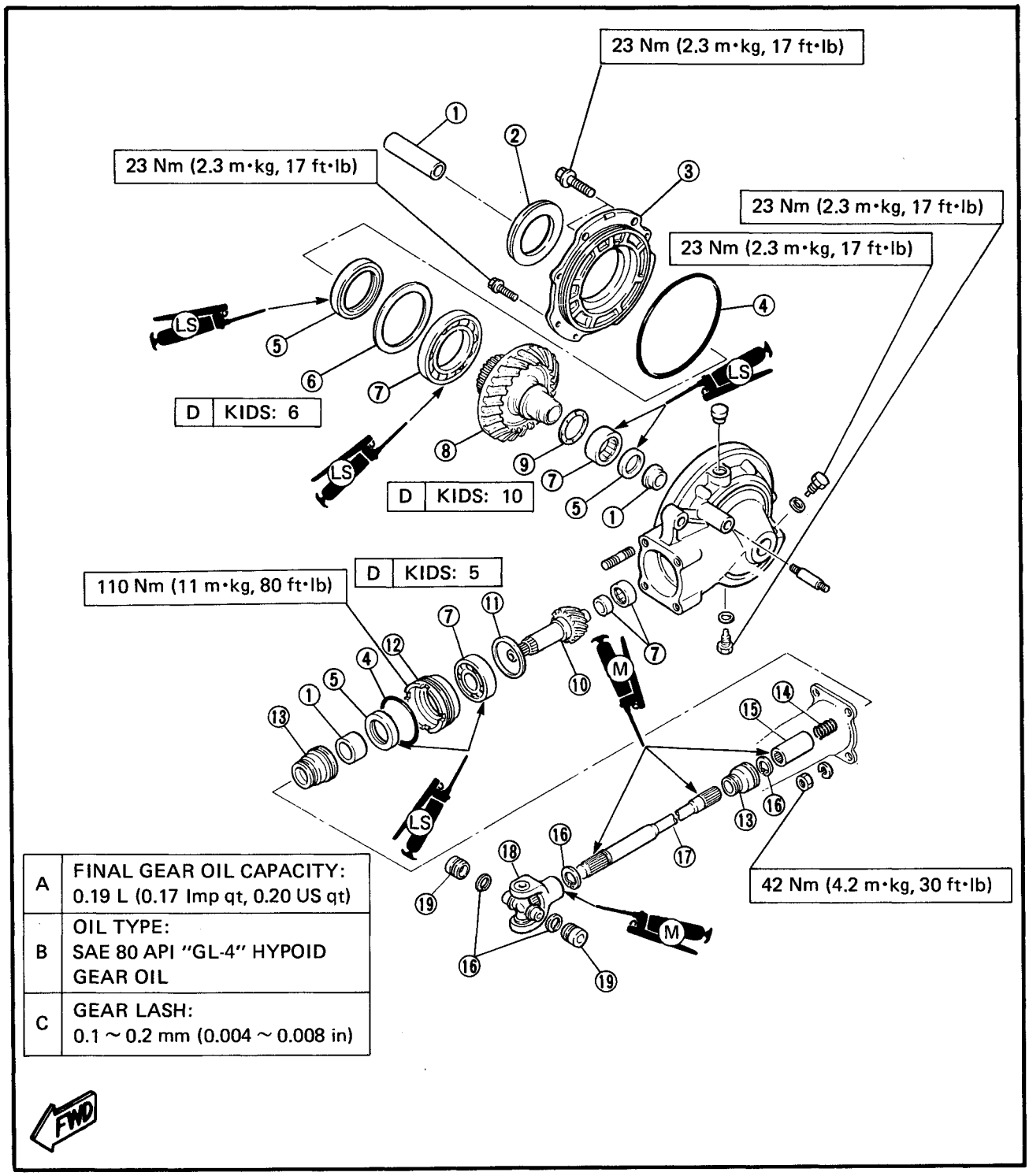
    Refer to "REAR SHOCK ABSORBER and REAR WHEEL" sections.
12. Install:
    - Muffler assembly

NOTE:
Inspect the gaskets. If damaged, replace them.

Exhaust Pipe:
20 Nm (2.0 m·kg, 14 ft·lb)
Rear Joint (Exhaust Pipe):
10 Nm (1.0 m·kg, 7.2 ft·lb)
Rear Footrest:
45 Nm (4.5 m·kg, 32 ft·lb)
Muffler Chamber:
20 Nm (2.0 m·kg, 14 ft·lb)

SHAFT DRIVE

① Collar
② Dust seal
③ Bearing housing
④ O-ring
⑤ Oil seal
⑥ Ring gear shim
⑦ Bearing
⑧ Ring gear
⑨ Thrust washer
⑩ Drive pinion gear
⑪ Final drive gear shim
⑫ Bearing retainer
⑬ Boot
⑭ Spring
⑮ Coupling gear
⑯ Circlip
⑰ Drive shaft
⑱ Universal joint
⑲ Bearing



TROUBLESHOOTING

The following conditions may indicate damaged shaft drive components:

A	Symptoms	B	Possible Causes
1. A pronounced hesitation or "jerky" movement during acceleration, deceleration, or sustained speed. (This must not be confuse with engine surging or tansmission characteristics.) 2. A "rolling rumble" noticeable at low speed; a high-piched whine; a "clunk" from a shaft drive component or area. 3. A locked-up condition of the shaft drive mechanism; no power transmitted from engine to rear wheel.		A. Bearing damage. B. Improper gear lash. C. Gear tooth damage. D. Broken drive shaft. E. Broken gear teeth. F. Seizure due to lack of lubrication. G. Small foreign object lodged between moving parts.

NOTE:

Areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from normal motorcycle operating noise. If there is reason to believe these components are damaged, remove the components for specific inspection.

Inspection Notes

1. Inrestigate any unusual noises

The following "Noises" may indicate a mechanical defect:

a. A "rolling rumble" noise during coasting, acceleration, or deceleration. The noise increases with rear wheel speed, but it does not increase with higher engine or transmission speeds.
   Diagnosis: Possible wheel bearing damage.

b. A "whining" noise that varies with acceleration and deceleration.
   Diagnosis: Possible incorrect reassembly, too-little gear lash.

CAUTION:

Too-little gear lash is extremely destructive to the gear teeth. If a test ride following reassembly indicates this condition, stop riding immediately to minimize gear damage.

c. A slight "thunk" evident at low speed operation. This noise must be distinguished from normal motorcycle operation.
   Diagnosis: Possible broken gear teeth.

WARNING:

Stop riding immediately if broken gear teeth are suspected. This condition could result in a locking-up of the shaft drive assembly, causing loss of control of the dike and possible injury to the rider.

2. Inspect:
   - Drained oil
     Drain plug shows large amount of metal.
     Particles → Check bearing fur seizure.

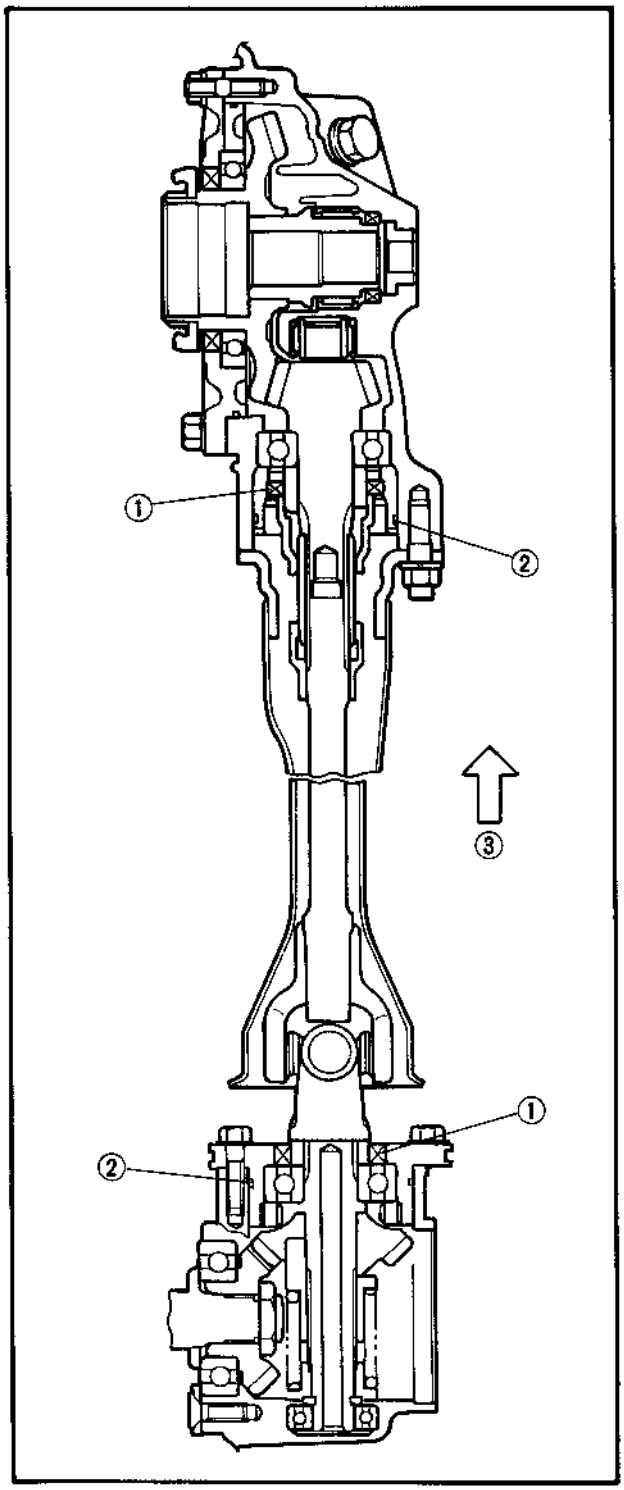
NOTE:

A small amount of metal particles in the oil is normal.

3. Inspect:
   • Oil leakage

Oil leakage inspection steps:
- Clean the entire motorcycle thoroughly, then dry it.
- Apply a leak-localizing compound or dry powder spray to the shaft drive.
- Road test the motorcycle for the distance necessary to locate the leak.

Leakage → Inspect component housing, gasket, and/or seal for damage.
Damage → Replace component.

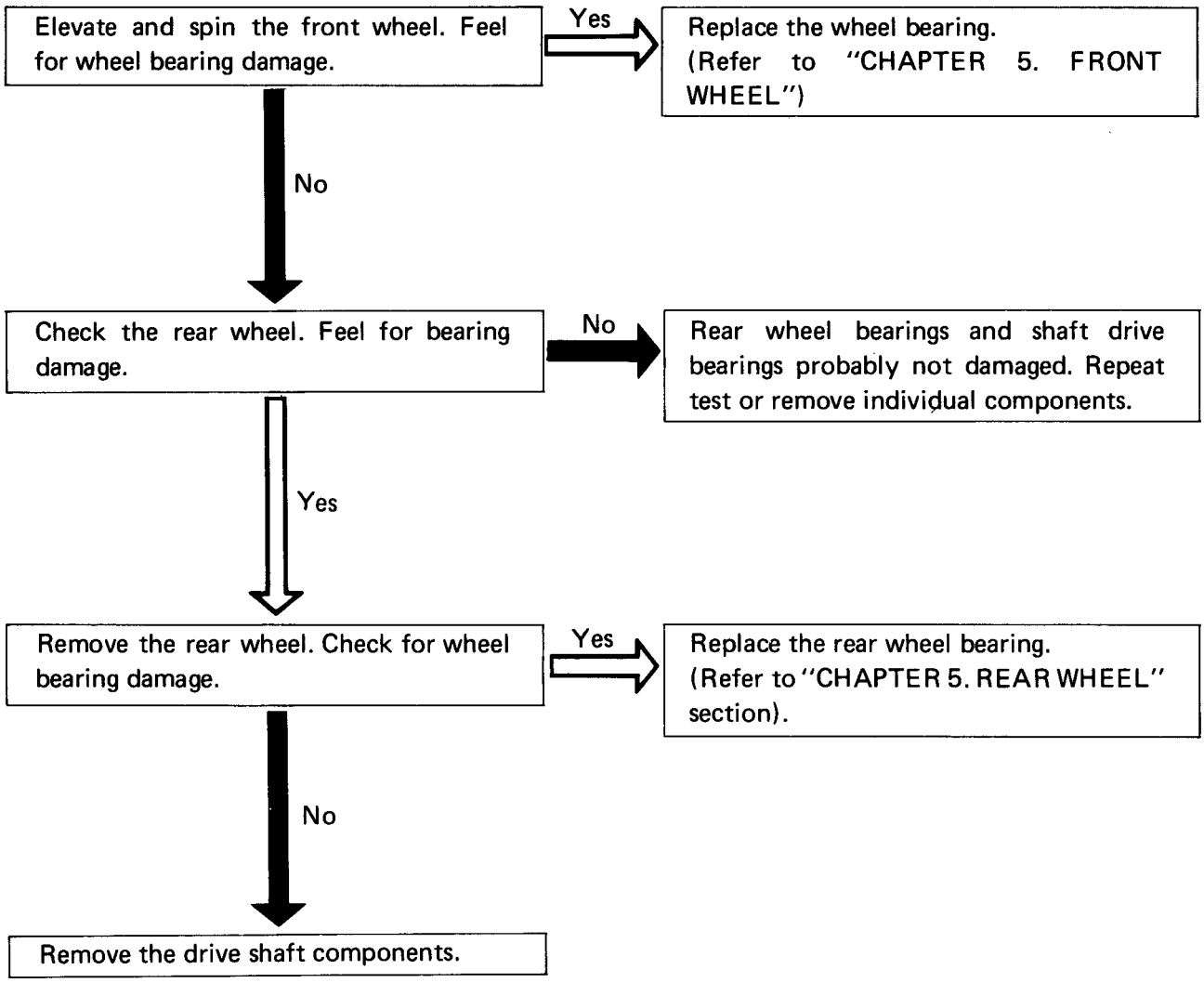


① Oil seal
② O-ring
③ Forward

NOTE:
- An apparent oil leak on a new or nearly new motorcycle may be the result of a rest-preventative coating or excessive seal lubrication.
- Always clean the motorcycle and recheck the suspected location of an apparent leakage.

Troubleshooting Chart

When basic conditions "a" and "b" above exist, check the following points:



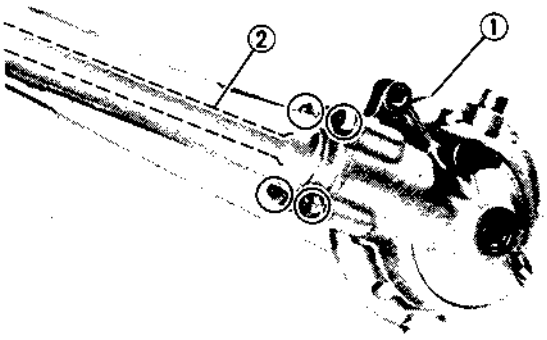
REMOVAL

WARNING:

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

1. Remove:
   - Rear wheel
   - Rear shock absorbers

   Refer to "REAR WHEEL and REAR SHOCK ABSORBER" sections.
2. Remove:
   - Final gear assembly ①
   - Drive shaft ②

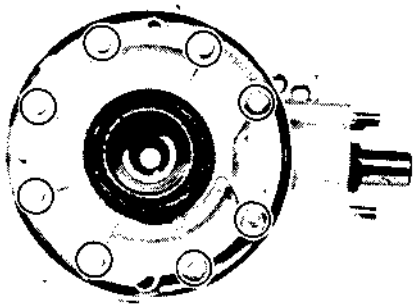


DISASSEMBLY

NOTE:

Before disassembling the rear final gear, drain the oil completely.

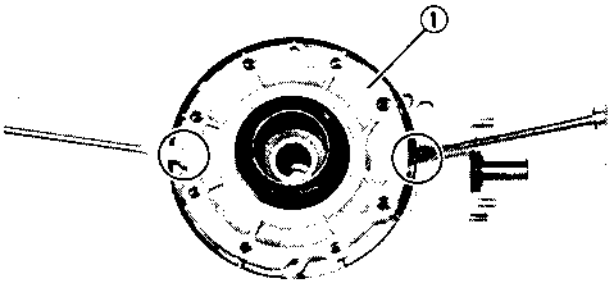
1. Remove:
   - 8 mm bolts (Bearing housing)
   - 10 mm bolts (Bearing housing)



NOTE:

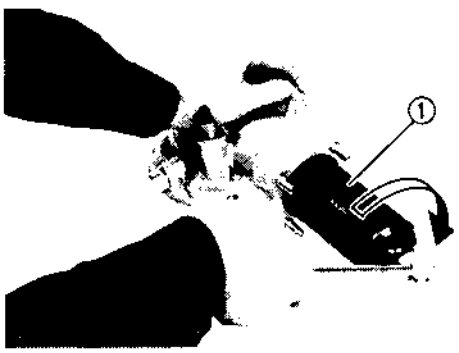
Working in a crisscross pattern, loosen bolt 1/4 turn each. Remove them after all loosened.

2. Remove:
   - Bearing housing with ring gear ①
   - Shim(s)
   - Thrust washer



3. Remove:
   - Coupling gear
   - Bearing retainer (Final drive shaft)

   Use a Final Drive Shaft Bearing Reatiner ① (YM-33214).



CAUTION:

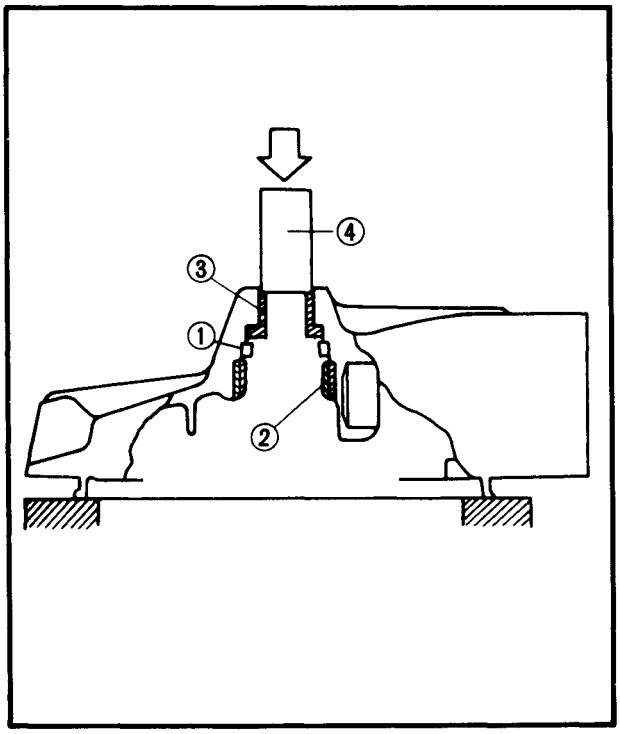
Final-drive-shaft-bearing-retainer has left-hand threads. Turn retainer clockwise to loosen it.

4. Remove:
   - Final drive pinion gear assembly

   Tap lightly on the final drive pinion gear end with a soft hammer.

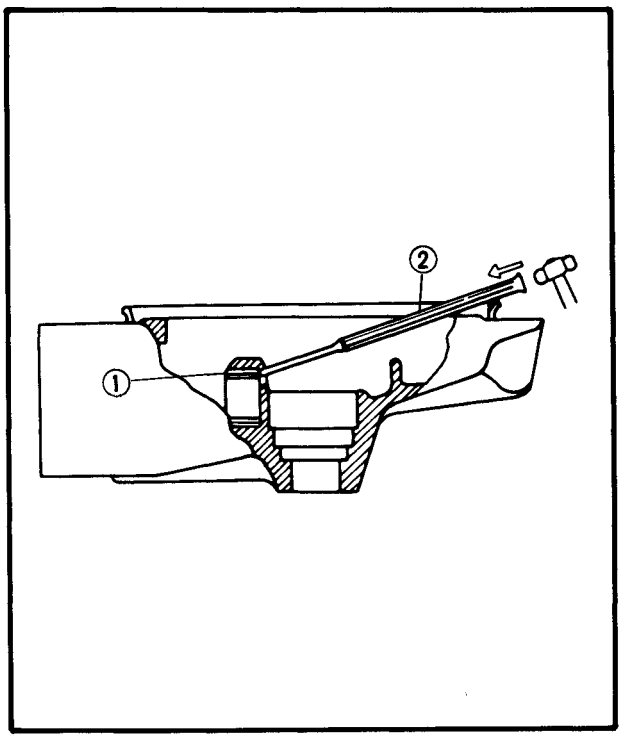
CAUTION:

Final drive pinion gear removal should be performed only if gearing replacement is necessary. Do not reuse bearings or races after removal.



5. Remove:
   - Oil seal ①
   - Roller-bearing (Large) ②
   - Guide collar ③

   Use a suitable press tool ④ and an appropriate support for the main housing.



6. Remove:
   - Final drive shaft roller bearing (Small) ①

Roller bearing (Small) removal steps:
- Heat the bare housing to 150°C (302°F).
- Remove the roller bearing outer race with an appropriately shaped punch ② .
- Remove the inner race from the final drive shaft.

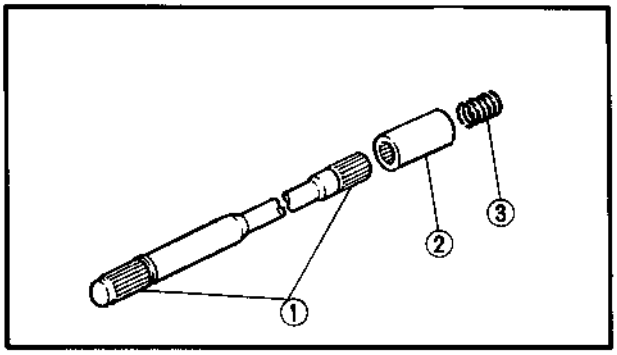
NOTE:

The removal of the final drive shaft roller bearing is difficult and seldom necessary.

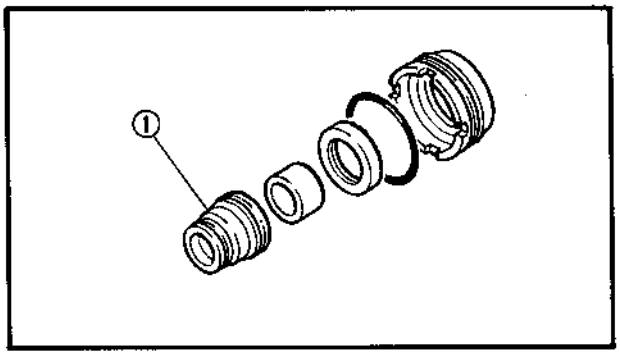
INSPECTION

1. Inspect:
   - Gear teeth
     Pitting/Galling/Wear → Replace drive pinion gear and ring gear as a set.
   - Oil seal
   - O-ring
     Damage → Replace.
2. Inspect:
   - Roller bearing
     Damage → Replace.

NOTE:
Reuse of roller bearing OK, but Yamaha recommends installation of new bearing. Do not reuse the oil seal.



3. Inspect:
   - Drive shaft splines ①
   - Coupling gear spline ②
     Wear/Damage → Replace.
   - Spring ③
     Fatigue → Replace.
     Move the spring up and down.



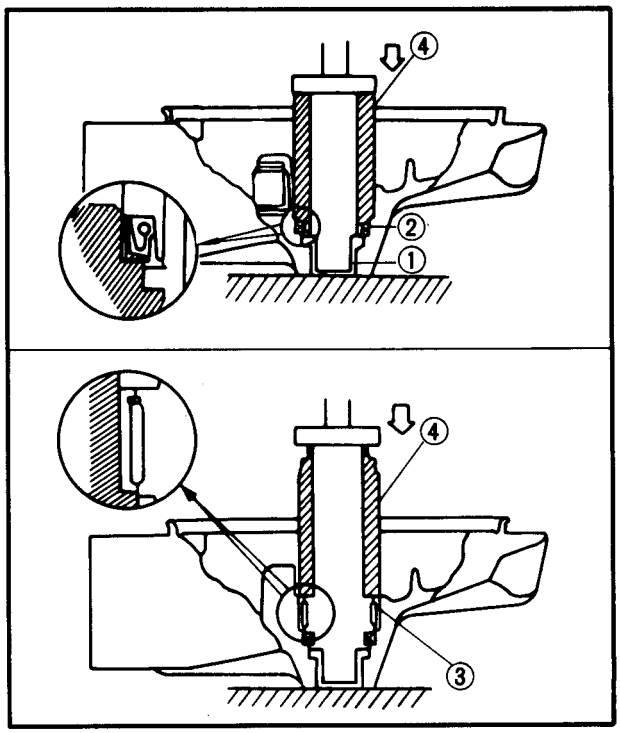
4. Inspect:
   - Boot ①
     Damage → Replace.

REASSEMBLY

When reassembling the final gear, reverse the disassembly procedures. Note the following points.

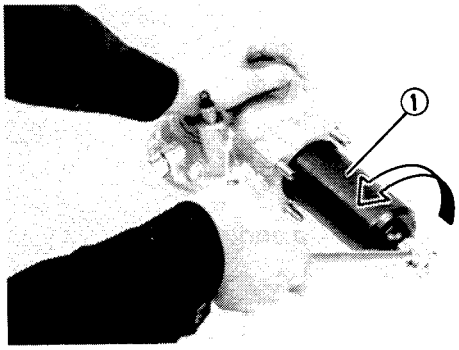
1. Install:
   - Roller bearing (Small-New)

Roller bearing (Small) installation steps:
- Heat the bare bearing to 150°C (302°F).
- Install the roller bearing outer race using the proper adapted.
- Install the inner race onto the drive shaft.



2. Install:
   - Guide collar ①
   - Oil seal (New) ②
   - Roller bearing (Large) ③

   Use a suitable press tool ④ and a press to install the above components into the main housing.



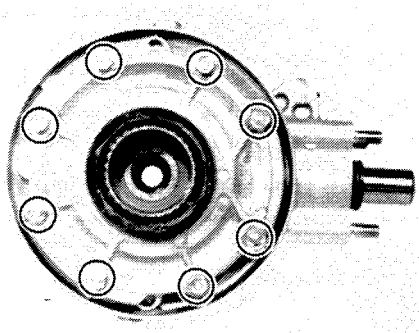
3. Install:
   - Shims
   - Final drive pinion gear assembly
   - Bearing retainer (Final drive shaft)

   Use a Final Drive Shaft Bearing Retainer Wrench ① (YM-33214).

NOTE:
The bearing retainer has left-hand threads; turn retainer counterclockwise to tighten it.

Bearing Retainer:
110 Nm (11 m·kg, 80 ft·lb)

4. Install:
   - Thrust washer
   - Shim(s)
   - Bearing housing with ring gear



5. Install:
   - 10 mm bolts (Bearing housing)
   - 8 mm bolts (Bearing housing)

NOTE:
Tighten the bolts in stage, using a crisscross pattern.

10 mm Bolts (Bearing Housing):
23 Nm (2.3 m·kg, 17 ft·lb)
8 mm Bolts (Bearing Housing):
23 Nm (2.3 m·kg, 17 ft·lb)

6. Check:
   - Gear lash
     Out of specification → Adjust.
     Refer to "MEASUREMENT AND ADJUSTMENT" section.
7. Fill:
   - Rear final gear case

WARNING:

Take care not to allow foreign material to enter the final gear case.

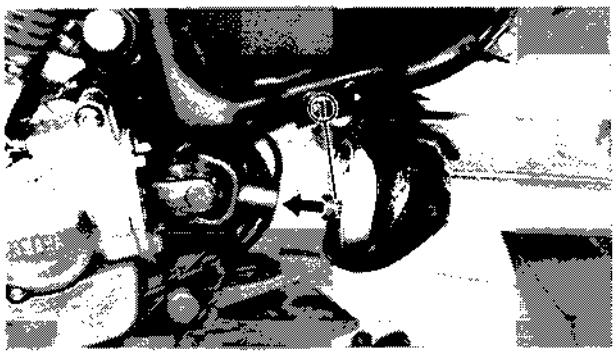
Oil Capacity:
0.19 L (0.17 Imp qt, 0.20 US qt)
Recommended Oil:
SAE 80 API "GL-4" Hypoid Gear Oil
If desired, and SAE 80W90 Hypoid gear oil may be used for all conditions.

INSTALLATION

When installing the final gear, reverse the removal procedure. Note the following points.

1. Lubricate:
   - Shaft splines

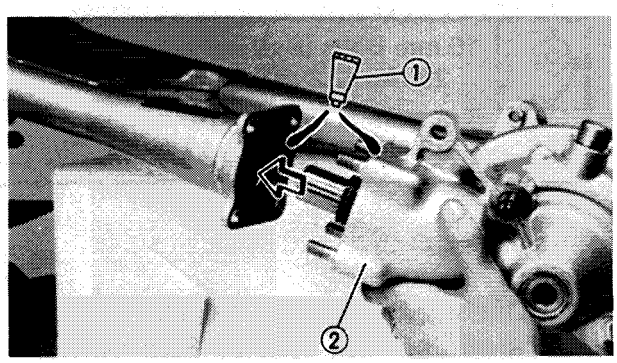
Molybdenum Disulfide Grease



2. Install:
   - Drive shaft ①

NOTE:

Insert the drive shaft properly through the swingarm into the universal joint.

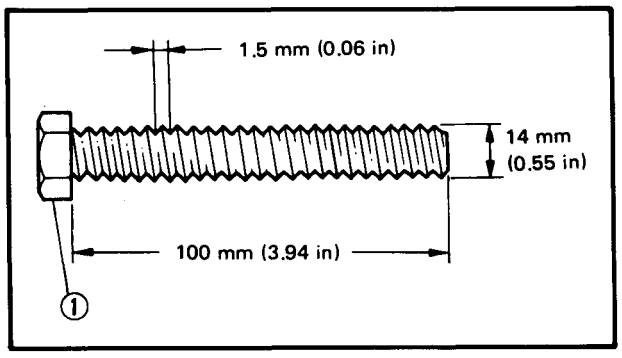


3. Apply:
   - Sealant (Quick Gasket®) (ACC-11001-05-01) ①
     To the mating surfaces of both case halves.
4. Install:
   - Final gear assembly ②

NOTE:
Fit the coupling gear over the drive shaft properly.

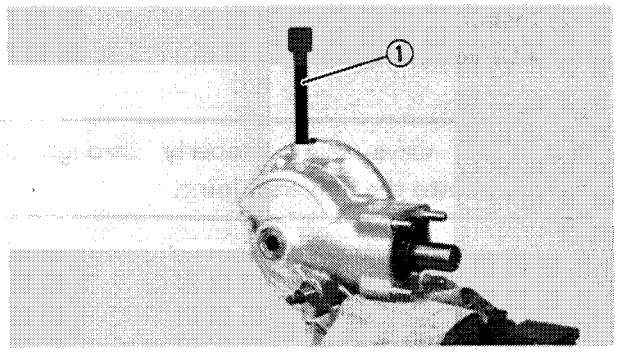
Nuts (Final Gear Assembly): 42 Nm (4.2 m·kg, 30 ft·lb)

5. Install:
   - Rear shock absorbers
   - Rear wheel
     Refer to "REAR SHOCK ABSORBER and REAR WHEEL" sections.



MEASUREMENT AND ADJUSTMENT

NOTE:
Before measuring and adjusting the gear back lash, drain the oil completely.

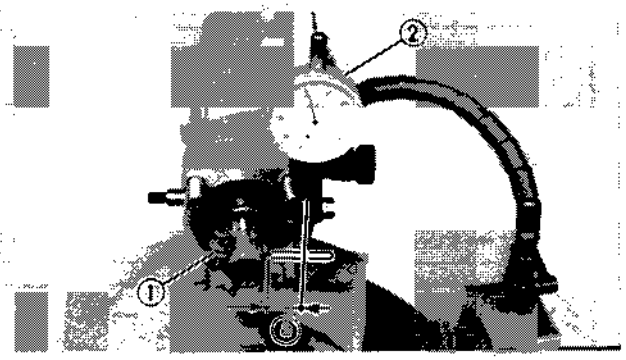


Final Gear Gear Lash Measurement

1. Secure the gear case in a vise or other support.
2. Remove:
   - Drain plug
     Drain the oil.
3. Install:
   - A bolt of the specified size ①
     Into the drain plug hole.

CAUTION:

Finger tighten the bolt until it holds the ring gear. Otherwise, the ring gear will be damaged.



4. Attach:
   - Gear Lash Measurement Tool ① (YM-01230)
   - Dial Gauge ② (YM-03097)

ⓐ Measuring point

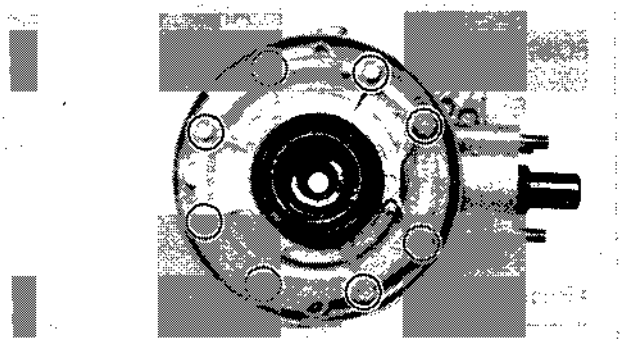
5. Measure:
   - Gear lash

   Gently rotate the gear coupling from engagement to engagement.
   Over specified limit → Adjust.

Rear Final Gear Gear Lash:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

NOTE:

Measure the gear lash at 4 positions. Rotate the shaft 90° each time.

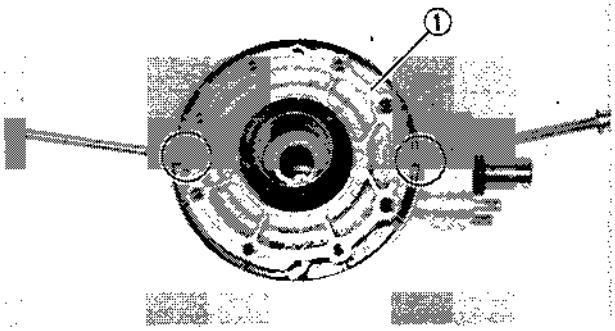


Final Gear Gear Lash Adjustment

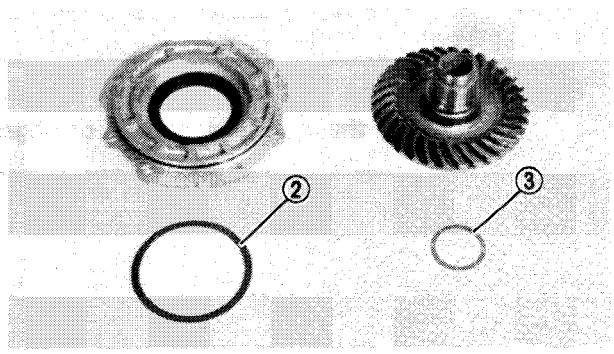
1. Remove:
   - 8 mm bolts (Bearing housing)
   - 10 mm bolts (Bearing housing)

NOTE:

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



2. Remove:
   - Bearing housing ①
   - Shim(s) ②
   - Thrust washer ③
3. Adjust:
   - Gear lash



Gear lash adjustment steps:
- Select the suitable shims and thrust washer by the following chart.

Too-little gear lash →
Reduce shim thickness.

Too-large gear lash →
Increase shim thickness.

To Add or Reduce Ring Gear Shim Thickness	
Increase by more than 0.1 mm (0.004 in)	Reduce by more than 0.1 mm (0.004 in)
Reduce thrust washer thickness by 0.1 mm (0.004 in) for every 0.1 mm of ring gear shim increase.	Reverse procedure

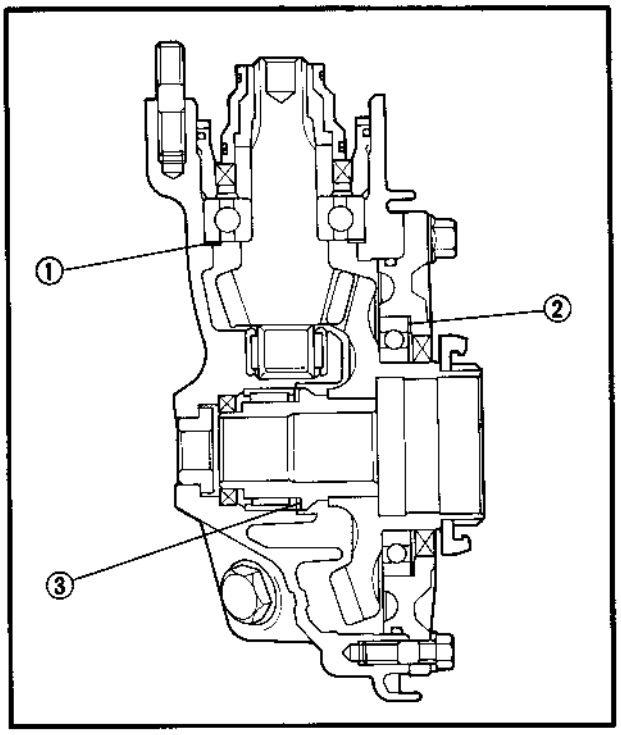
Ring Gear Shim			
Thickness (mm)	0.25	0.30	0.35
	0.40	0.45	0.50

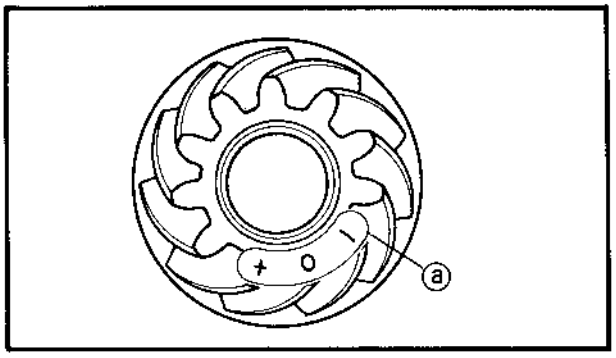
Thrust Washer			
Thickness (mm)	1.2	1.3	1.4
	1.5	1.6	1.7
	1.8	1.9	2.0
	2.1		

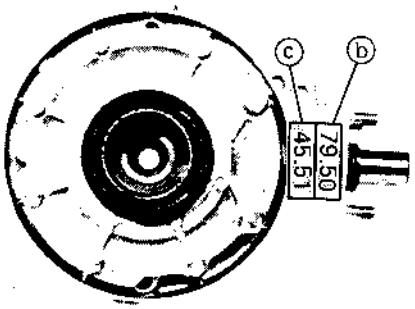
FINAL DRIVE GEAR AND RING GEAR POSITIONING

NOTE:
Gear positioning is necessary when any of the following parts are replaced:
- Final gear case
- Ring gear bearing housing
- Bearing(s)

1. Select:
   - Final drive gear shim
   - Ring gear shim







Final drive/Ring gear shim selection steps:

- Position final drive shaft gear and ring gear by using shims ① and ② with their respective thicknesses calculated from information marked on final gear case, drive gear end and ring gear.

① Shim thickness "A"
② Shim thickness "B"
③ Thrust washer

- To find shim thickness "A" use following formula:

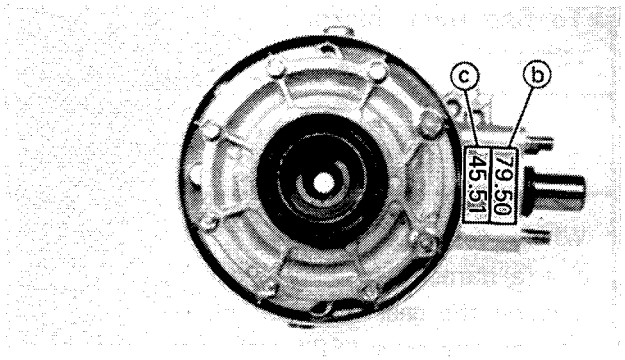
Final Drive Gear Shim Thickness:
A = ⓐ − ⓑ

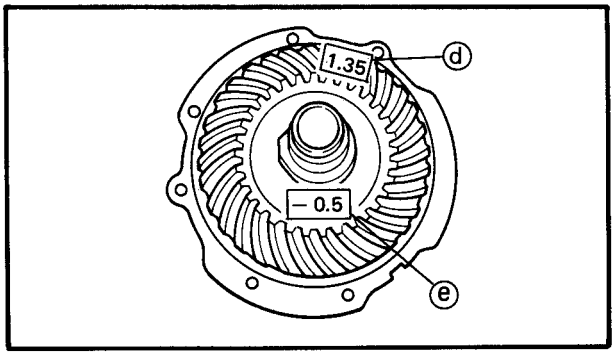
Where:
ⓐ = ⓐ numeral (usually a decimal number) on the gear is either added to or subtracted from "80".
ⓑ = ⓐ numeral on the gear case (i.e. 79.50)
Example:
1) If final drive shaft gear is marked "+01" . . . "ⓐ" is 80.01.
2) If the gear case is marked "79.50" . . . "ⓑ" is 79.50.
A = 80.01 − 79.50
= 0.51
3) Therefore, shim thickness is 0.51 mm.
Shim sizes are supplied in following thicknesses:

	Final Drive Gear Shim	
Thickness (mm)	0.15 0.40 0.60	0.30 0.50

Because shims can only be selected in 0.05 mm increments, round off hundred the digit and select appropriate shim(s).

Hundredths	Round value
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	





In the example above, the calculated shim thickness is 0.51 mm. The chart instructs you, however, to round off the 1 to 0. Thus you should use a 0.50 mm shim.

- To find shim thickness "B", use following formula:

Ring Gear Shim Thickness:
B = ⓒ + ⓓ – (ⓔ + ⓕ)

Where:
- ⓒ = numeral on gear case (i.e. 45.51)
- ⓓ = numeral on outside of ring gear bearing housing (i.e. 1.35)
- ⓔ = numeral (usually a decimal number) on inside of ring gear either added to or subtracted from 35.40.
- ⓕ = bearing thickness (considered constant).

Bearing Thickness " ⓕ " = 11.00 mm

Example:
1) If gear case is marked "45.51" . . . " ⓒ " is 45.51.
2) If ring gear bearing housing is marked "1.35" . . . " ⓓ " is 1.35.
3) If ring gear is marked "–05" . . . " ⓔ " is 35.40 – 0.05 = 35.35.
4) " ⓕ " is 11.00.
   B = ⓒ + ⓓ – (ⓔ + ⓕ)
   = 45.51 + 1.35 – (35.35 + 11.00)
   = 46.86 – 46.35
   = 0.51
5) Therefore, shim thickness is 0.51 mm.
   Shim sizes are supplied in following thickness:

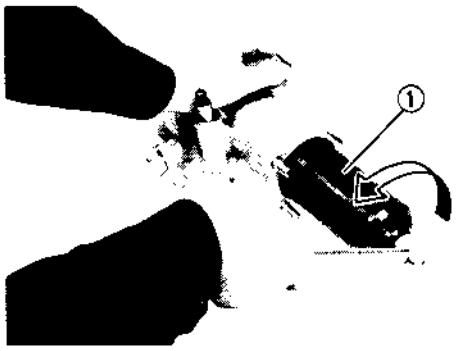
Ring Gear Shim

Thickness (mm)	0.25	0.30	0.35
	0.40	0.45	0.50

Because shims can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim(s).

Hundredths	Round value
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	10

In the example above, the calculated shim thickness is 0.51 mm. The chart instructs you, however, to round off the 1 to 0. Thus you should use a 0.50 mm shims.



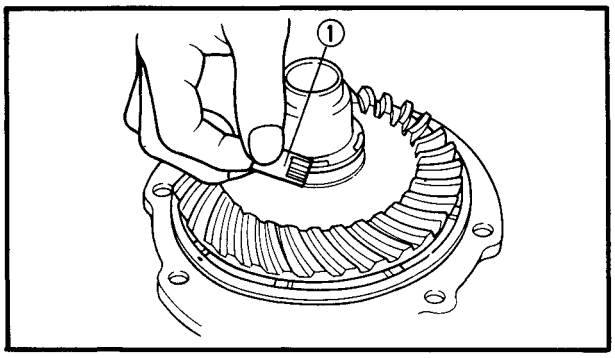
2. Install:
   - Shims (Proper size as calculated)
   - Final drive pinion gear assembly
   - Bearing retainer (Final drive shaft)
     Use a Final Drive Shaft Bearing Retainer Wrench ① (YM-33214).

NOTE:
The bearing retainer has left-hand threads; turn retainer counterclockwise to tighten it.

Bearing Reatiner:
110 Nm (11 m·kg, 80 ft·lb)

3. Install:
   - Coupling gear
   - Ring gear assembly (Without thrust washer)
4. Adjust:
   - Gear lash
     Refer to "Gear Lash Measurement and Adjustment" section.
5. Measure/Select:
   - Ring gear thrust clearance

Thrust clearance measurement steps:
- Remove the ring gear assembly.
- Place four pieces of Plastigage® between originally fitted thrust washer and ring gear.



- Install the ring gear assembly and tighten the bolts to specification.

8 mm Bolts (Bearing Housing):
23 Nm (2.3 m·kg, 17 ft·lb)
10 mm Bolt (Bearing Housing):
23 Nm (2.3 m·kg, 17 ft·lb)

NOTE:
Do not turn the shaft drive and ring gear when measuring clearance with Plastigage®.

- Remove the ring gear assembly.
- Measure the thrust clearance. Calculate width of flattened Plastigage® ① .

Ring Gear Thrust Clearance:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

- If the correct clearance, install the ring gear assembly.
- If the out of specification, select the correct washer.

Thrust washer selection steps:
- Select the suitable thrust washer by the following chart.

Thrust Washer			
Thickness (mm)	1.2	1.3	1.4
	1.5	1.6	1.7
	1.8	1.9	2.0
	2.1		

- Repeat measurement steps until the ring gear thrust clearance is within the specified limits.

Ring Gear Thrust Clearance:
0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

CHAPTER 6.
ELECTRICAL

XV535T/TC CIRCUIT DIAGRAM 6-1

ELECTRICAL COMPONENTS 6-3

ELECTRIC STARTING SYSTEM 6-5
CIRCUIT DIAGRAM 6-5
STARTING CIRCUIT OPERATION 6-7
TROUBLESHOOTING 6-8
STARTER MOTOR TEST 6-13

CHARGING SYSTEM 6-17
CIRCUIT DIAGRAM 6-17
TROUBLESHOOTING 6-19

IGNITION SYSTEM 6-21
CIRCUIT DIAGRAM 6-21
TROUBLESHOOTING 6-23

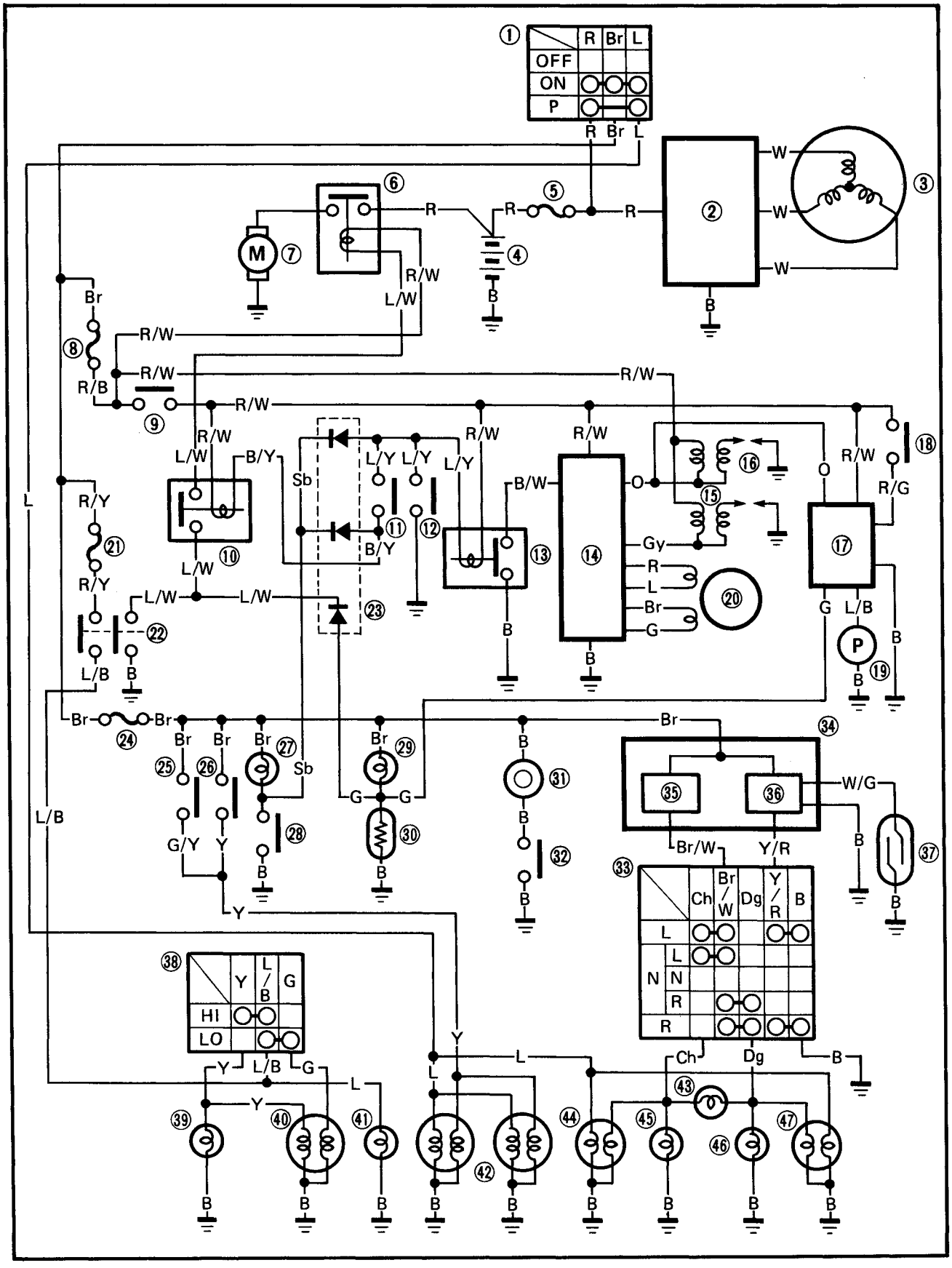
LIGHTING SYSTEM 6-29
CIRCUIT DIAGRAM 6-29
TROUBLESHOOTING 6-31

SIGNAL SYSTEM 6-35
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TROUBLESHOOTING 6-37
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FUEL SYSTEM 6-47
CIRCUIT DIAGRAM 6-47
FUEL PUMP CIRCUIT OPERATION 6-49
TROUBLESHOOTING 6-50
FUEL PUMP TEST 6-63

ELECTRICAL

XV535T/TC CIRCUIT DIAGRAM



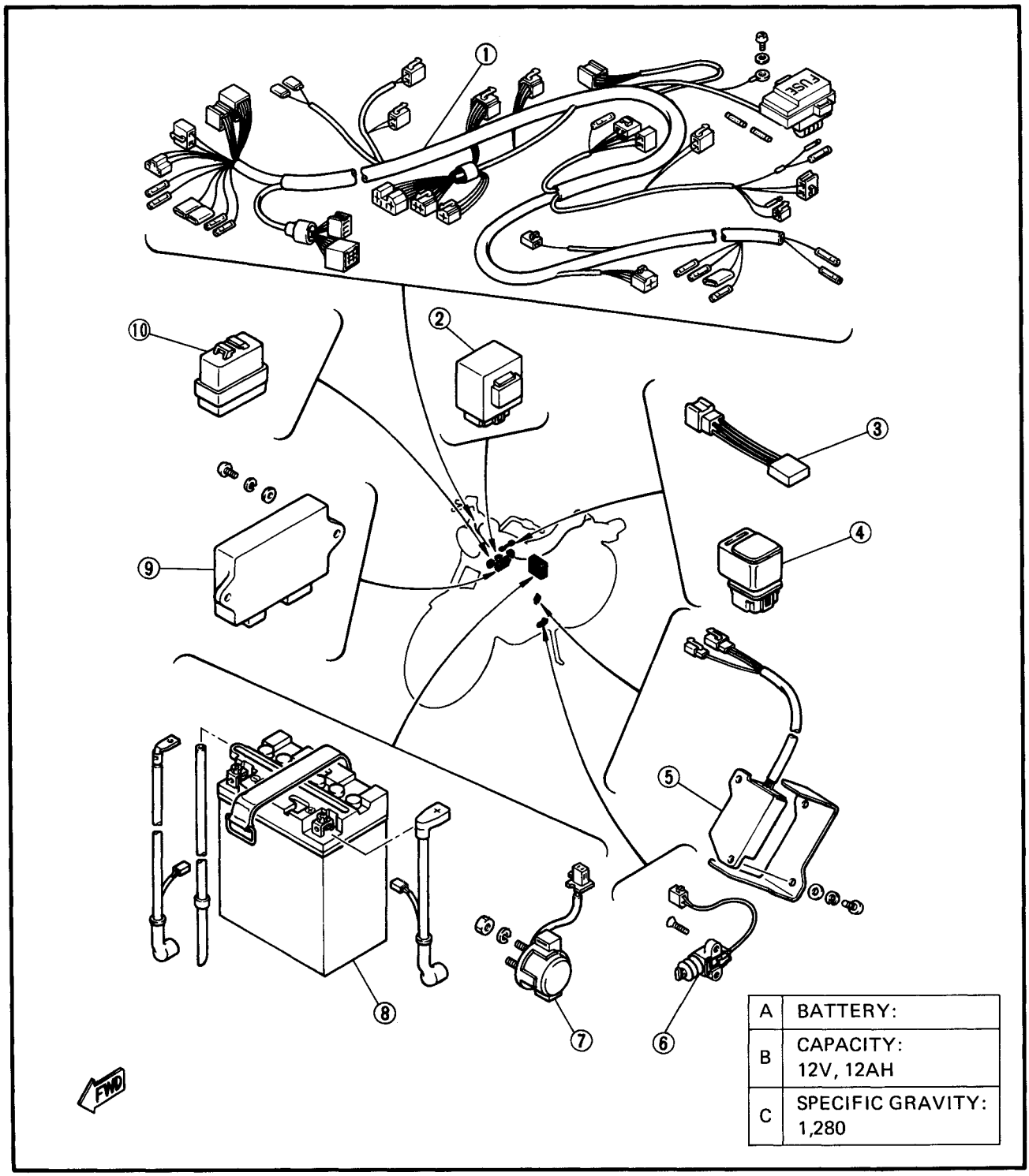
① Main switch
② Rectifier/regulator
③ A.C. magneto
④ Battery
⑤ Fuse "MAIN"
⑥ Starter relay
⑦ Starter motor
⑧ Fuse "IGNITION"
⑨ "START" switch
⑩ Starting circuit cut-off relay
⑪ Clutch switch
⑫ Sidestand switch
⑬ Sidestand relay
⑭ Ignitor unit
⑮ Ignition coil
⑯ Spark plug
⑰ Fuel pump relay
⑱ "FUEL" (Reserve) switch
⑲ Fuel pump
⑳ Pickup coil
㉑ Fuse "HEAD"
㉒ "ENGINE STOP" switch
㉓ Diode
㉔ Fuse "SIGNAL"
㉕ Front brake switch
㉖ Rear brake switch
㉗ "NEUTRAL" indicator light
㉘ Neutral switch
㉙ "FUEL" warning light
㉚ Fuel sender
㉛ Horn
㉜ "HORN" switch
㉝ "TURN" switch
㉞ Relay assembly
㉟ Flasher relay
㊱ Cancelling unit
㊲ Reed switch
㊳ "LIGHTS" (Dimmer) switch
㊴ "HIGH BEAM" indicator light
㊵ Headlight
㊶ Meter light
㊷ Tail/brake light
㊸ "TURN" indicator light
㊹ Front position light/
Front flasher light (Left)
㊺ Rear flasher light (Left)
㊻ Rear flasher light (Right)
㊼ Front position light/
Front flasher light (Right)

COLOR CODE

B . . . . . .Black
L . . . . . .Blue
O . . . . . .Orange
G . . . . . .Green
R . . . . . .Red
P . . . . . .Pink
Y . . . . . .Yellow
W . . . . . .White
Br. . . . . .Brown
Dg . . . . . .Dark green
Ch . . . . . .Chocolate
Sb . . . . . .Sky blue
Gy . . . . . .Gray
G/R . . . . . .Green/Red
G/Y . . . . . .Green/Yellow
B/W . . . . . .Black/White
B/Y . . . . . .Black/Yellow
L/Y . . . . . .Blue/Yellow
L/B. . . . . .Blue/Black
L/W . . . . . .Blue/White
R/W . . . . . .Red/White
R/G . . . . . .Red/Green
R/B . . . . . .Red/Black
R/Y . . . . . .Red/Yellow
W/G . . . . . .White/Green
Y/R . . . . . .Yellow/Red
Br/W. . . . . .Brown/White

ELECTRICAL COMPONENTS (1)

① Wireharness
② Fuel pump relay
③ Diode
④ Sidestand relay
⑤ Rectifier/regulator
⑥ Sidestand switch
⑦ Starter relay
⑧ Battery
⑨ Ignitor unit
⑩ Relay assembly

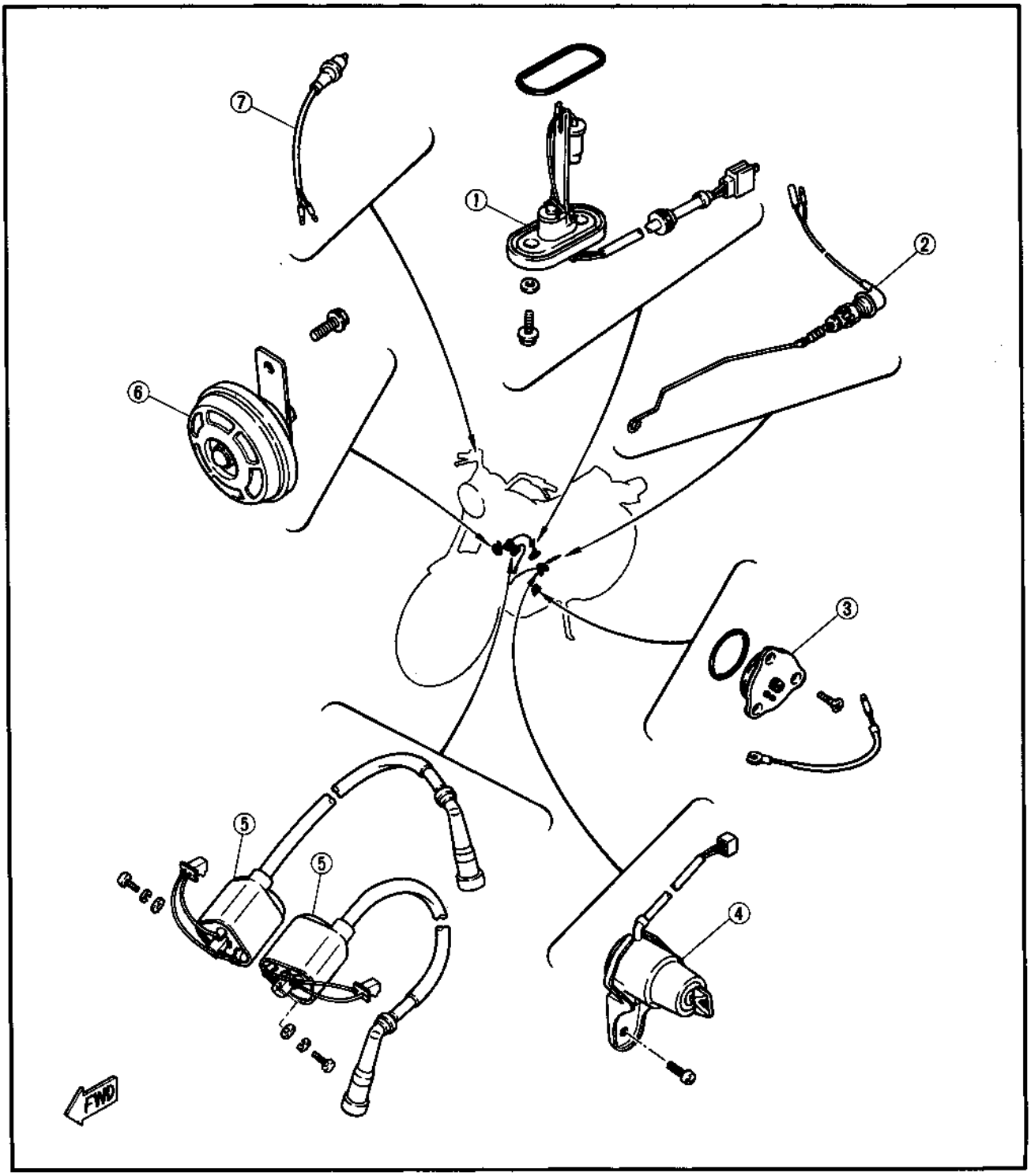


A	BATTERY:
B	CAPACITY: 12V, 12AH
C	SPECIFIC GRAVITY: 1,280

ELECTRICAL COMPONENTS (2)

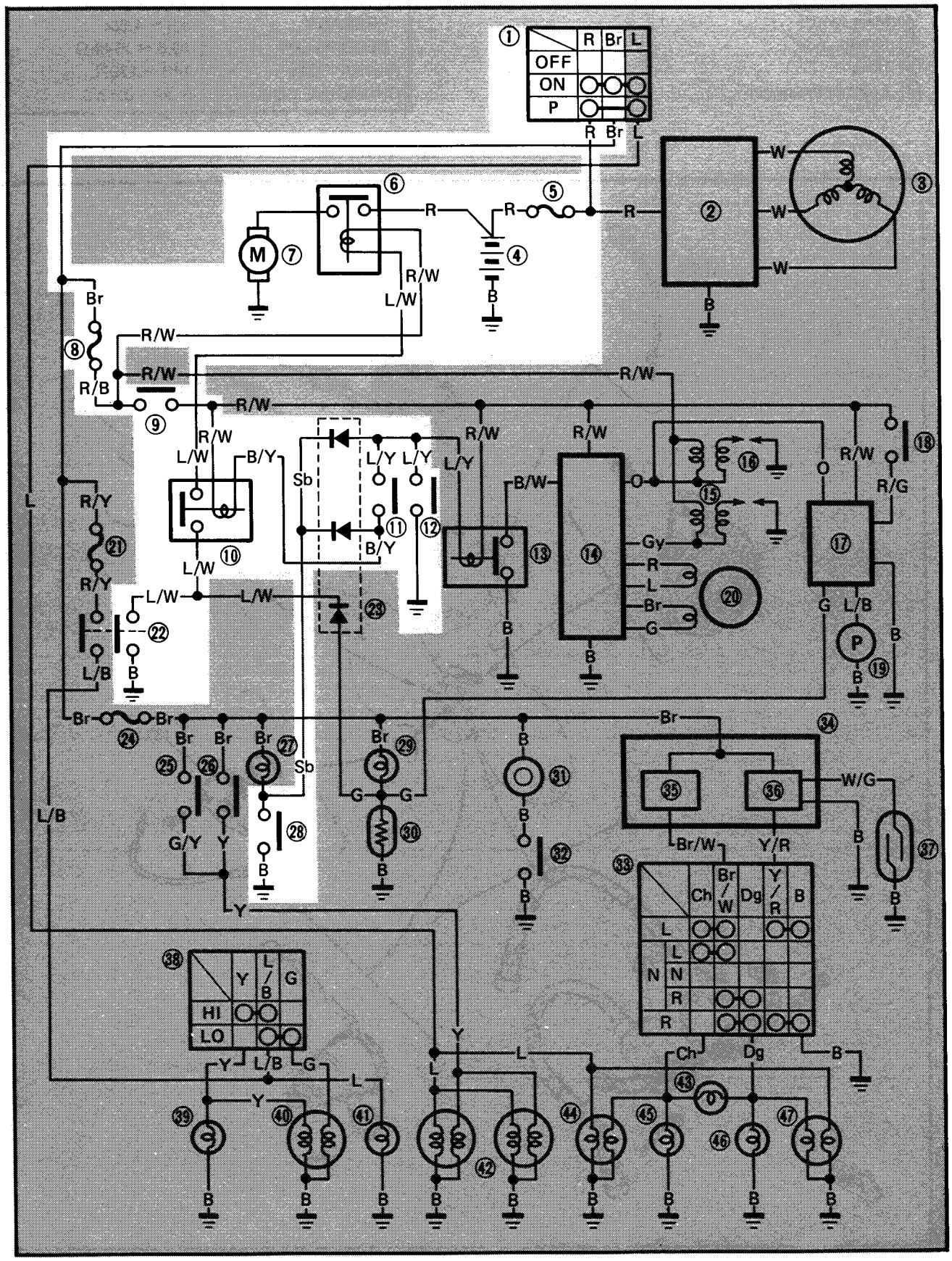
① Fuel sender
② Rear brake switch
③ Neutral switch
④ Main switch
⑤ Ignition coil
⑥ Horn
⑦ Front brake switch

SPECIFICATIONS	RESISTANCE
IGNITION COIL:	
PRIMARY	3.8 ~ 4.6Ω
SECONDARY	10.6 ~ 15.8kΩ
PICKUP COIL	140 ~ 170Ω
CHARGING COIL	0.34 ~ 0.42Ω



ELECTRIC STARTING SYSTEM

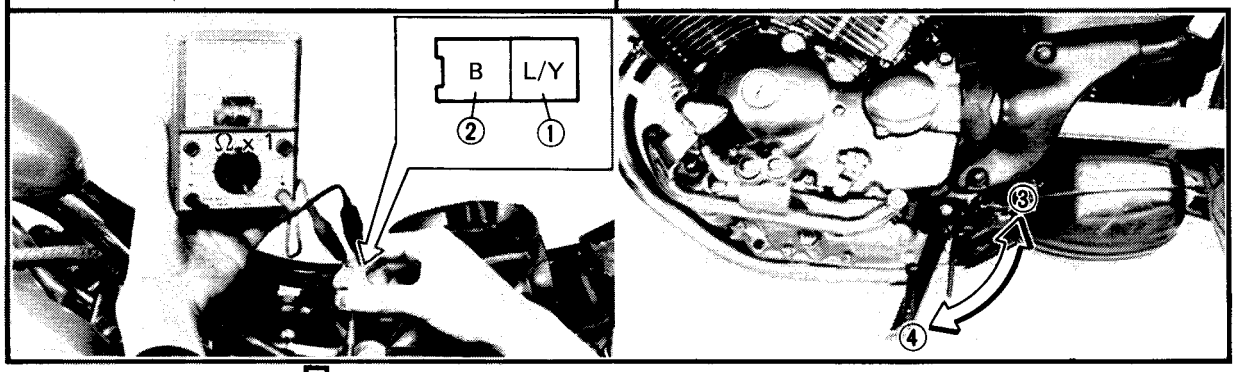
CIRCUIT DIAGRAM



Sidestand Position	Good Condition	Bad Condition		
Up ③	○	○	X	X
Down ④	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → Sidestand switch is faulty. Replace it.



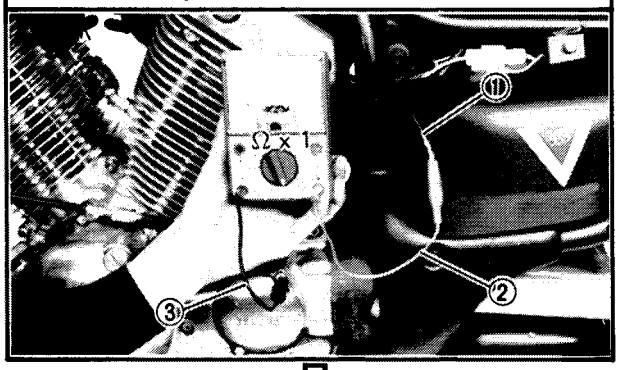
GOOD CONDITION

6. Neutral switch conduct test
   - Disconnect the neutral switch lead (Sky blue) ① from the wire harness.
   - Connect the positive lead ② of the Pocket Tester (YU-03112) to the neutral switch lead.
   - Ground the negative lead ③ of the Tester to the engine.
   - Shift the gear, and check the switch for continuity.

BAD CONDITION → Neutral switch is faulty. Replace it.

Transmission Position	Good Condition	Bad Condition		
In neutral	○	○	X	X
In gear	X	○	X	○

○: Continuity X: Nocontinuity



GOOD CONDITION

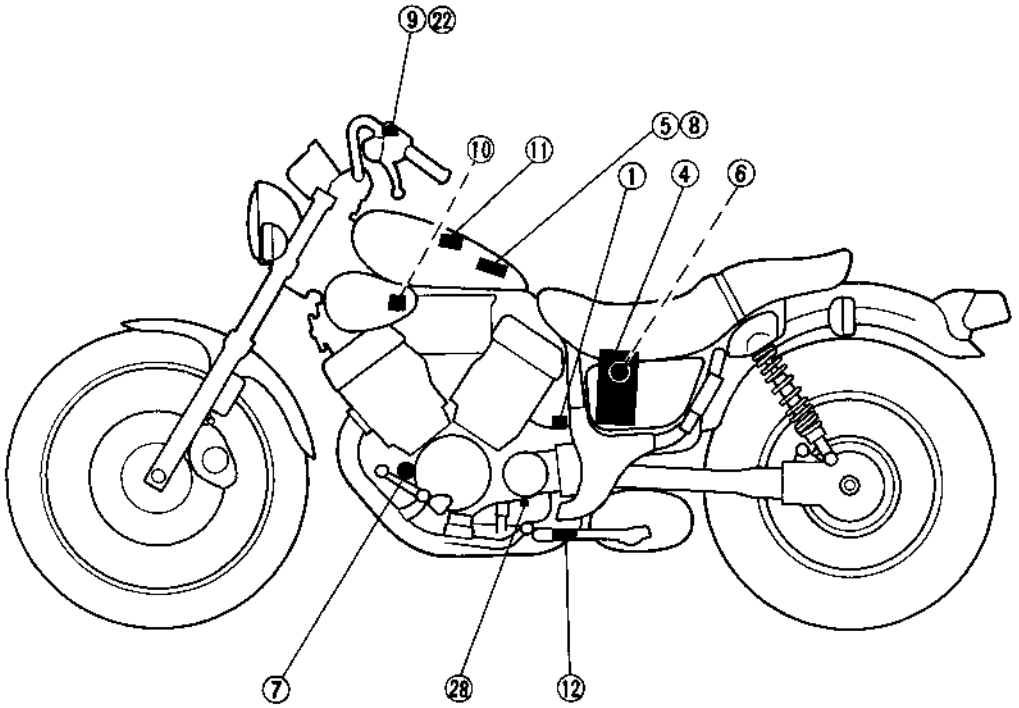
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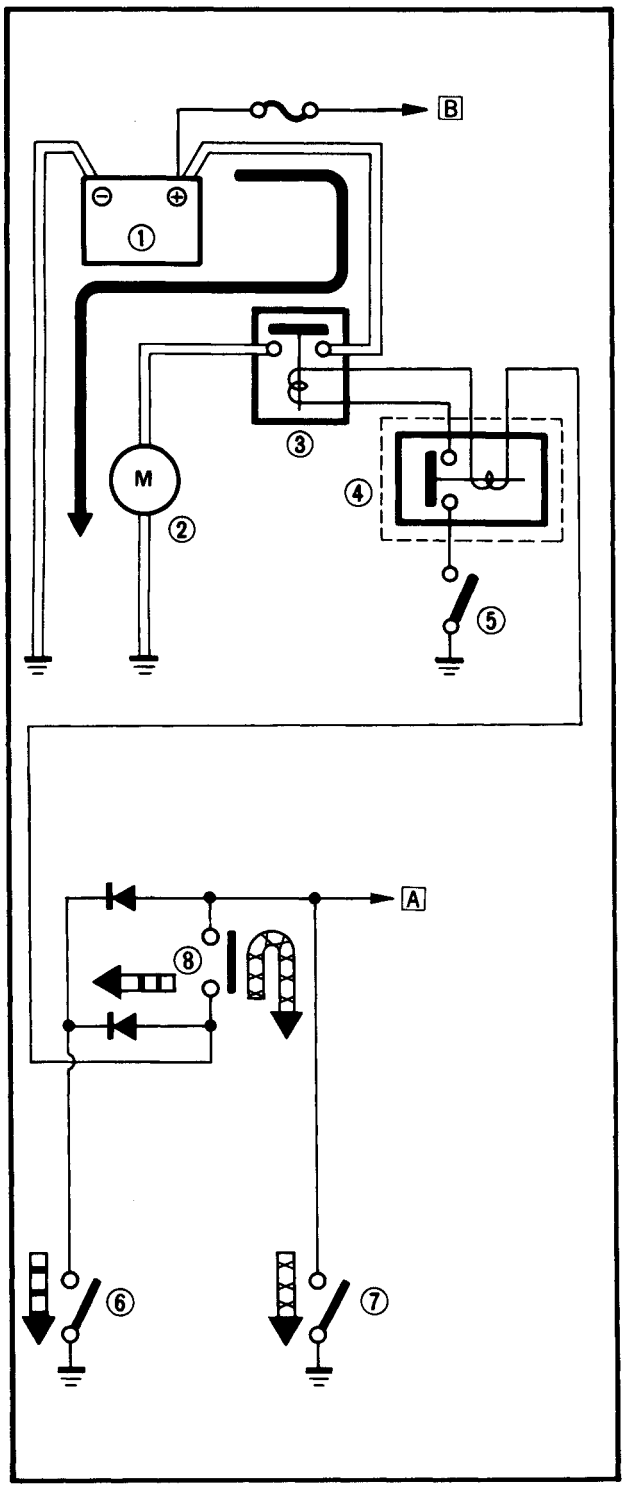
Aforementioned circuit diagram shows electrical starting circuit in wiring diagram.

NOTE:

For the color codes, see page 6-2.

① Main switch
④ Battery
⑤ Fuse "MAIN"
⑥ Starter relay
⑦ Starter motor
⑧ Fuse "IGNITION"
⑨ "START" switch
⑩ Starting circuit cut-off relay
⑪ Diode
⑫ Sidestand switch
㉒ "ENGINE STOP" switch
㉘ Neutral switch





STARTING CIRCUIT OPERATION

The starting circuit on this model consist of the starter motor, starter relay, and the relay unit (starting circuit cut-off relay). If the engine stop switch and the main switch are both closed, the starter motor can operate only if:

The transmission is in neutral (the neutral switch is closed).

or if

The clutch lever is pulled to the handlebar (the clutch switch is closed) and the sidestand is up (the sidestand switch is closed.)

The starting circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the starter motor.

When one of both of the above conditions have been met, however, the starting circuit cut-off relay is closed, and the engine can be started by pressing the starter switch.

WHEN THE TRANSMISSION IS IN NEUTRAL
WHEN THE SIDESTAND IS UP AND THE CLUTCH LEVER IS PULLED IN

① Battery
② Starter motor
③ Starter relay
④ Starting circuit cut-off relay
⑤ Engine stop switch
⑥ Neutral switch
⑦ Sidestand switch
⑧ Clutch switch

A To sidestand relay
B To main switch

TROUBLESHOOTING

NOTE:

Before this troubleshooting, remove the seat, top cover and side cover.

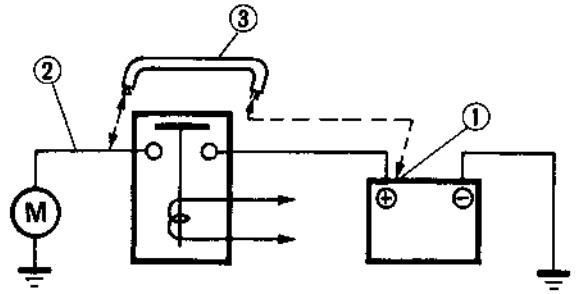
STARTER MOTOR DOES NOT OPERATE.

1. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

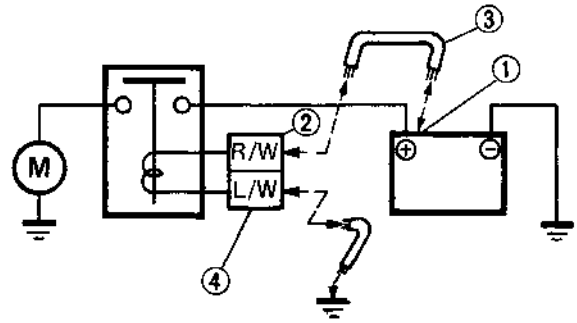
FAULTY → Battery is faulty. Recharge or replace it.

OK ↓

2. Starter relay test
   - Connect the battery positive terminal ① and starter motor cable ② using the jumper lead ③ *.
   - Check the starter motor operation.



- If the starter motor is operated, go to the next steps. If not, repair and/or replace the starter motor.
- Disconnect the starter relay coupler (Red/White and Blue/White).
- Connect the battery positive terminal ① and starter relay coupler (Red/White) ② using the jumper lead ③ .
- Ground the starter relay coupler (Blue/White) ④ to the frame using the jumper lead ③ .
- Check the starter motor operation.



FAULTY → Starter motor is faulty. Repair and/or replace it.

OK ↓

*

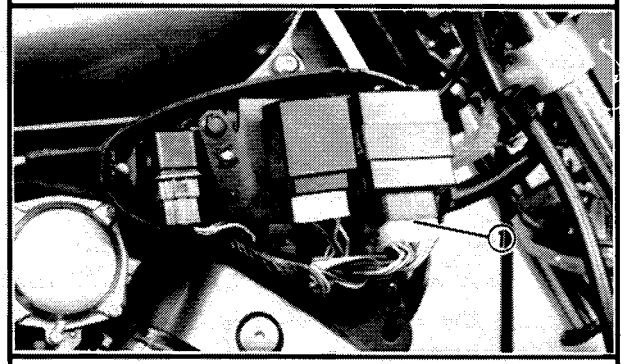
*

WARNING:

- **A wire for the jumper lead must have the equivalent capacity as that of the battery lead or more, otherwise it may cause the jumper lead to be burned.**
- **This check is likely to produce sparks, so be sure that no flammable gas or fluid is in the vicinity.**

* OK

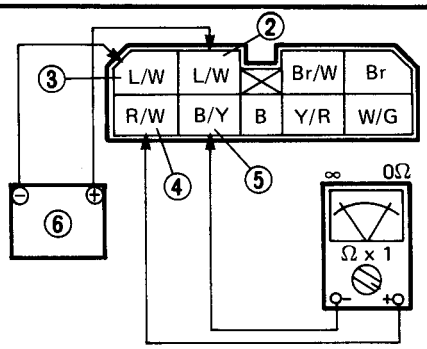
3. Starting circuit cut-off relay test
   - Disconnect the relay assembly ① coupler (Brown, White/Green, Brown/White, Yellow/Red, Black, Blue/White, Black/Yellow, Blue/White and Red/White) from the wire harness.



   - Connect the Pocket Tester (YU-03112) and battery (12V) ⑥ to the relay (Blue/White ② , Blue/White ③ , Red/White ④ and Blue/Yellow ⑤).
   - Check the relay for continuity.

	Good Condition	Bad Condition		
Battery Connected	○	○	X	X
Battery Disconnected	X	○	X	○

○: Continuity X: Nocontinuity



FAULTY → Starting circuit cut-off relay is faulty. Replace relay assembly.

OK

*

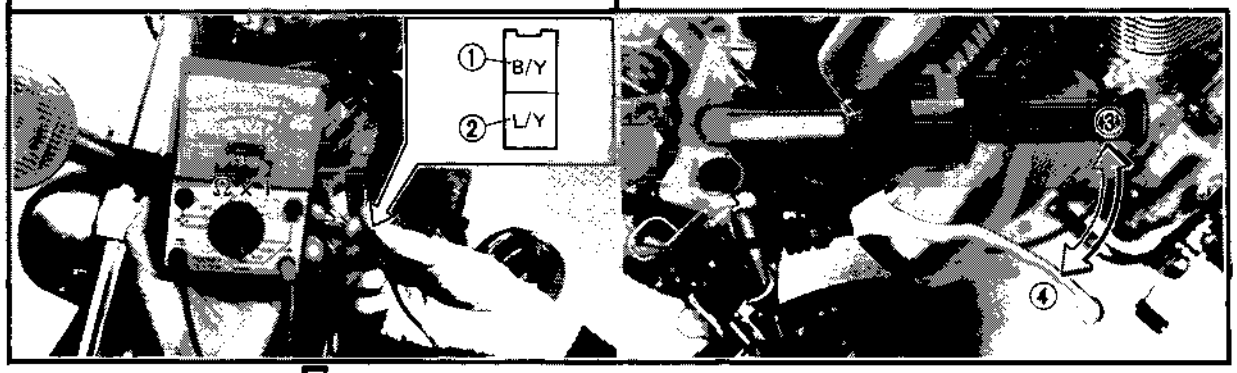
OK

4. Clutch switch conduct check
   - Disconnect the clutch switch coupler (Blue/Yellow ② and Black/Yellow ①) from the wire harness.
   - Connect the Pocket Tester (YU-03112) to the clutch switch coupler.
   - Grab or release the clutch lever, and check the clutch switch for continuity.

Clutch Lever Position	Good Condition	Bad Condition		
Grab ③	○	○	X	X
Release ④	X	○	X	○

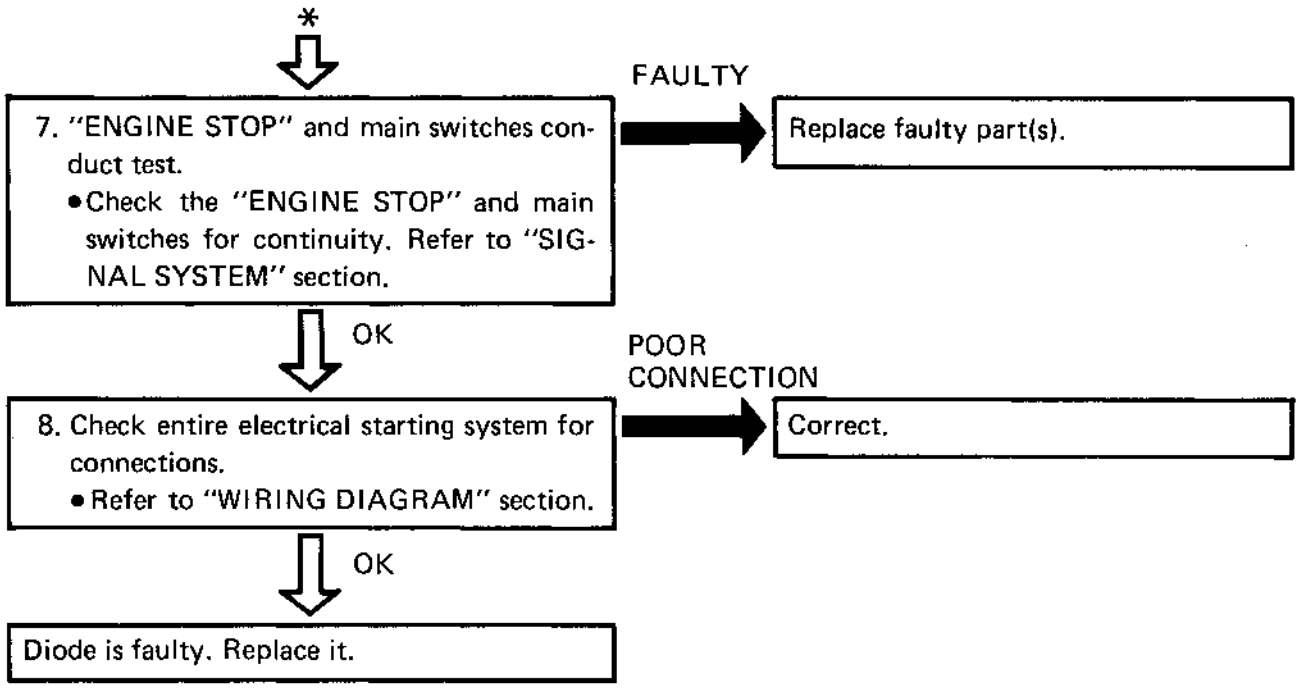
○: Continuity X: Nocontinuity

BAD CONDITION → Clutch switch is faulty. Replace it.



GOOD CONDITION

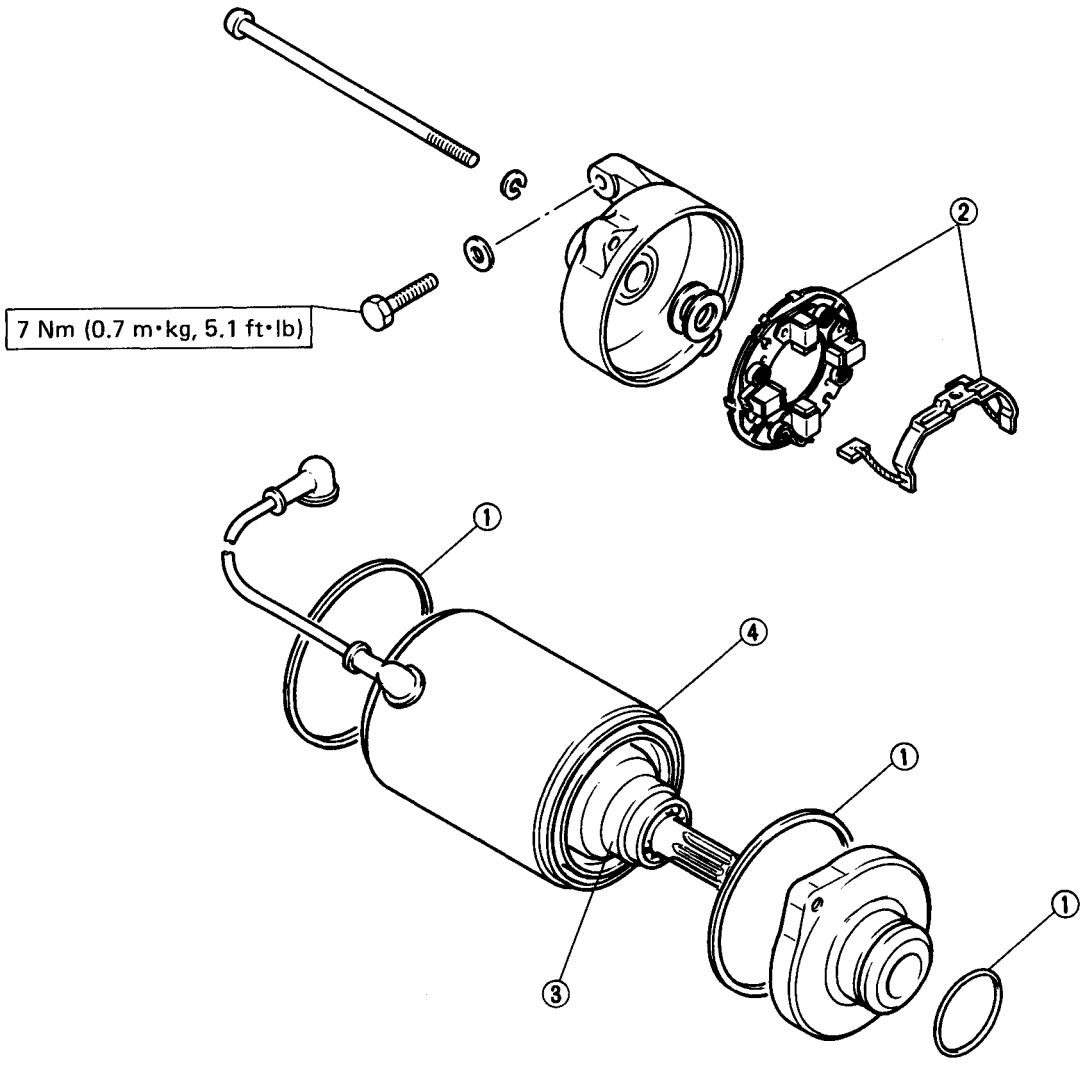
5. Sidestand switch conduct check
   - Disconnect the sidestand switch coupler (Blue/Yellow ① and Black ②) from the wire harness.
   - Connect the Pocket Tester (YU-03112) to the sidestand switch coupler.
   - Move the sidestand up or down, and check the sidestand switch for continuity.


*
7. "ENGINE STOP" and main switches conduct test.
• Check the "ENGINE STOP" and main switches for continuity. Refer to "SIGNAL SYSTEM" section.
FAULTY
Replace faulty part(s).
OK
8. Check entire electrical starting system for connections.
• Refer to "WIRING DIAGRAM" section.
POOR CONNECTION
Correct.
OK
Diode is faulty. Replace it.

STARTER MOTOR TEST

① O-ring
② Brush set
③ Armature
④ Stator

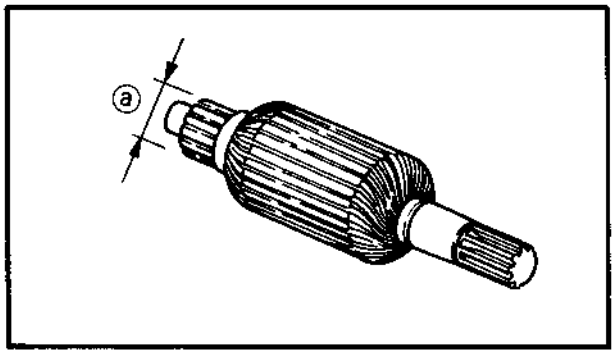
A	BRUSH WEAR LIMIT: 5.0 mm (0.20 in)
B	COMMUTATOR WEAR LIMIT: 27 mm (1.06 in)
C	MICA UNDERCUT: 1.6 mm (0.063 in)

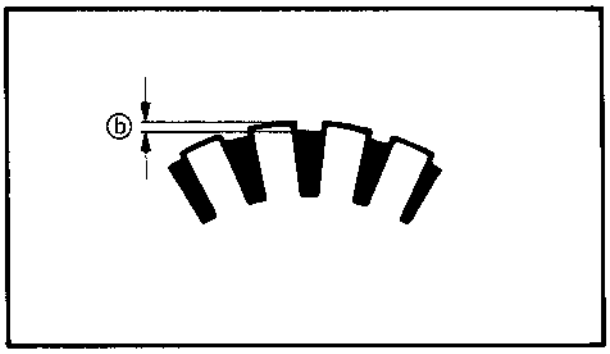


Removal

1. Remove:
   - Starter motor

   Refer to "CHAPTER 3. ENGINE OVERHAUL – ENGINE REMOVAL" section.





Inspection and Repair

1. Inspect:
   - Commutator

   Dirty → Clean it with #600 grit sandpaper.
2. Measure:
   - Commutator diameter ⓐ

   Out of specification → Replace starter motor.

Commutator Wear Limit:
27 mm (1.06 in)

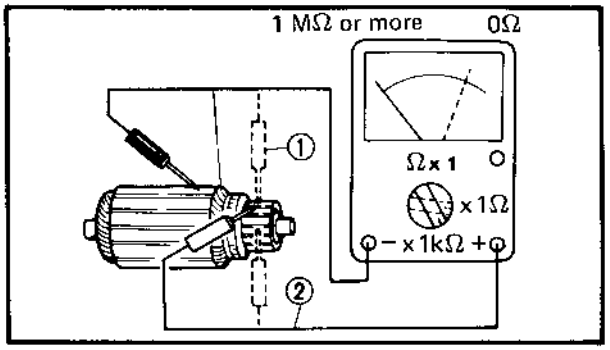
3. Measure:
   - Mica undercut ⓑ

   Out of specification → Scrape the mica to proper value use a hacksaw blade can be ground to fit.

Mica Undercut ⓑ :
1.6 mm (0.063 in)

NOTE:

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



4. Inspect:
   - Armature coil (insulation/continuity)

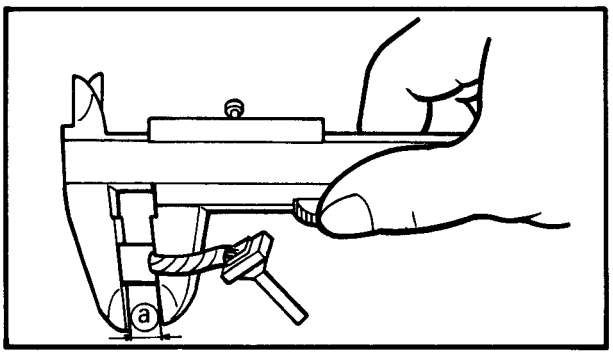
   Defects(s) → Replace starter motor.

Armature coil inspecting steps:
- Connect the Pocket Tester (YU-03112) for continuity check ① and insulation check ② .
- Measure the armature coil resistances.

Armature Coil Resistance:
Continuity Check ① :
0Ω at 20°C (68°F)
Insulation Check ② :
More than 1MΩ at 20°C (68°F)

- If the resistance is incorrect, replace the starter motor.

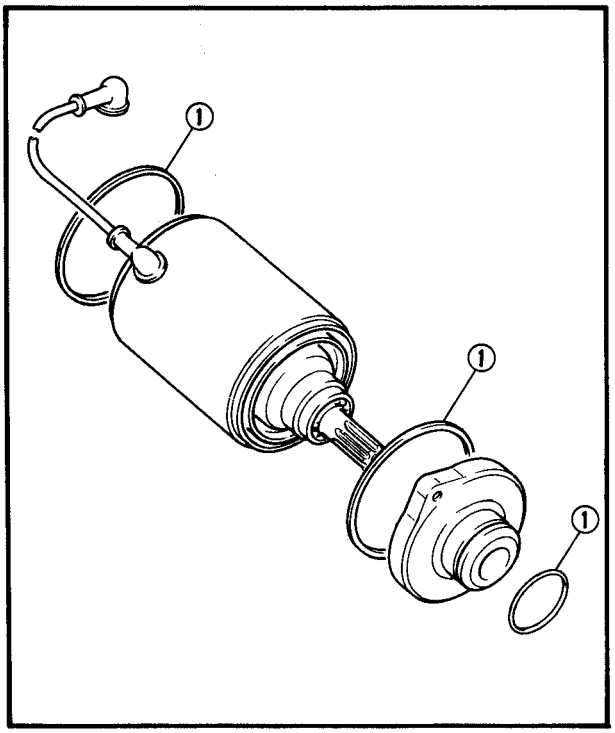
5. Measure:
   - Brush length ⓐ
     Out of specification → Replace.



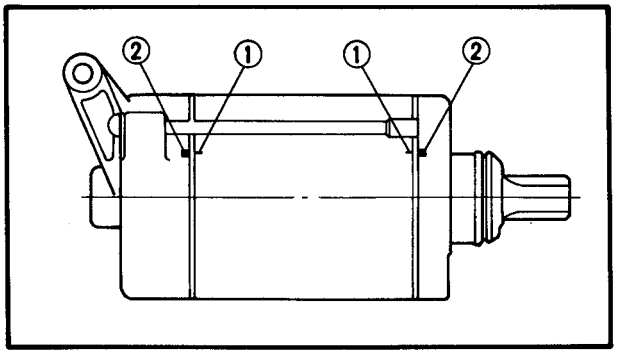
Brush Length Limit:
5.0 mm (0.20 in)

6. Measure:
   - Brush spring pressure
     Fatigue/Out of specification → Replace as a set.

Brush Spring Pressure:
520 ~ 920 g (18.3 ~ 32.4 oz)



7. Inspect:
   - Bearing
   - Oil seal
   - O-rings ①
     Wear/Damage → Replace.



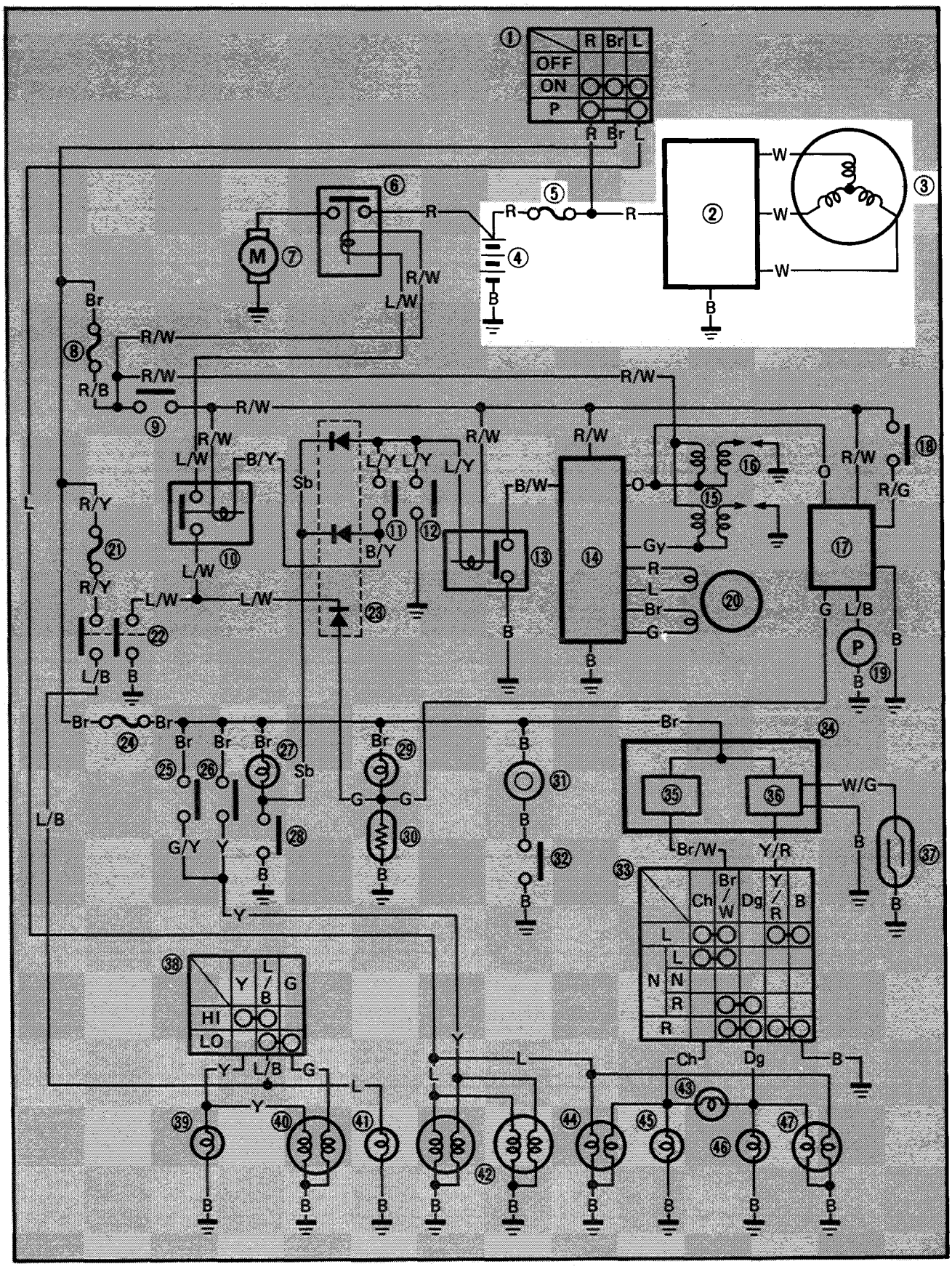
Installation

1. Install:
   - Starter motor

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

CHARGING SYSTEM

CIRCUIT DIAGRAM

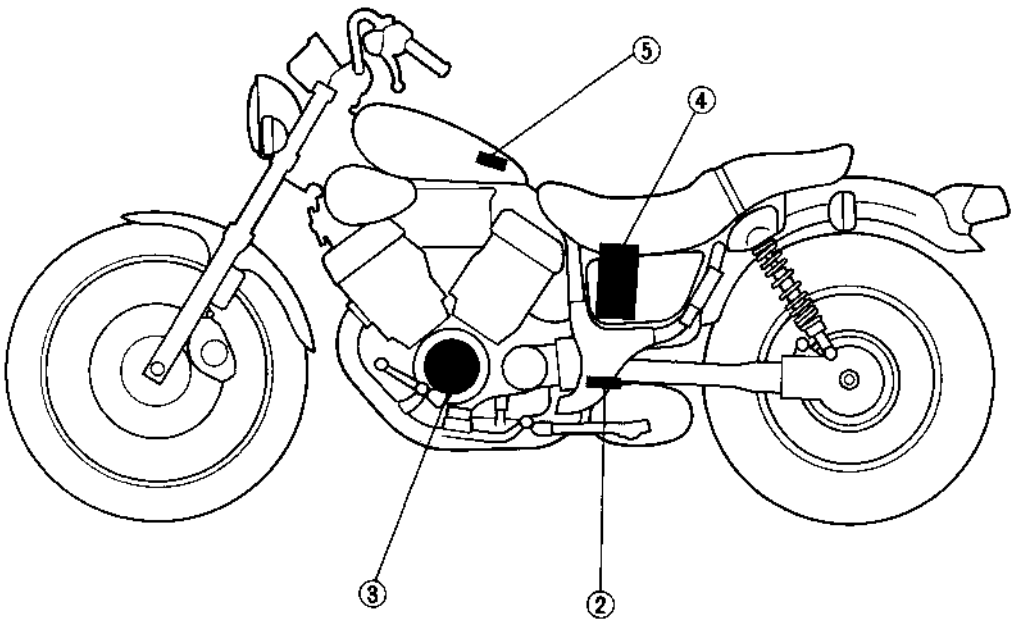


Aforementioned circuit diagram shows charging circuit in circuit diagram.

NOTE:

For the color codes, see page 6-2.

② Rectifier with regulator
③ A.C. magneto
④ Battery
⑤ Fuse "MAIN"



TROUBLESHOOTING

NOTE:

Before this troubleshooting, remove the seat and top cover.

BATTERY IS NOT CHARGED.

1. Fuse inspection
   - Check the fuse condition. Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

OK ↓

2. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

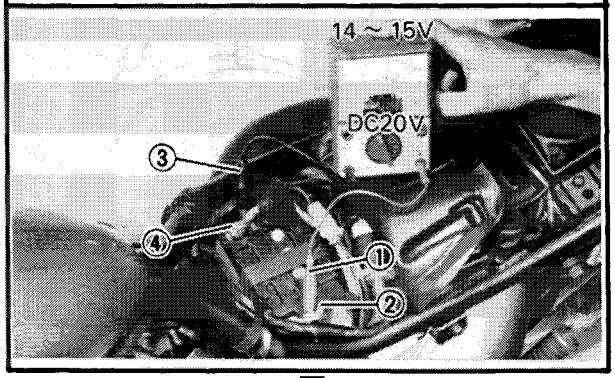
FAULTY → Battery is faulty. Recharge or replace it.

OK ↓

3. Charging voltage test
   - Connect the Pocket Tester (YU-03112) to the battery.
   - Start the engine and accelerate to about 5,000 r/min.
   - Measure the charging voltage.

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

① Positive lead (Pocket Tester)
② Positive terminal (Battery)
③ Negative lead (Pocket Tester)
④ Negative terminal (Battery)



CHARGING VOLTAGE MEETS SPECIFICATION → Battery is faulty. Replace it.

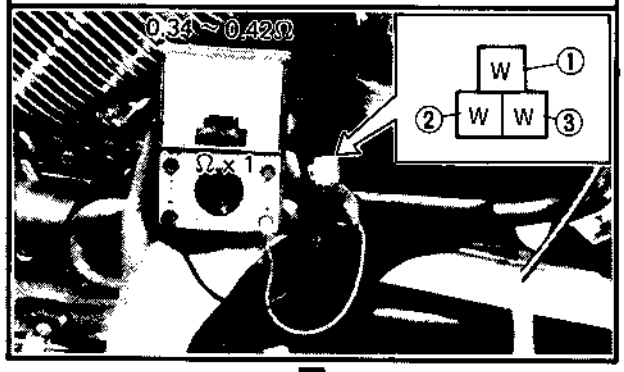
OUT OF SPECIFICATION ↓

*

*

4. Charging coil resistance test
   - Disconnect the A.C. magneto coupler (White ① , White ② and White ③) from the wire harness.
   - Connect the Pocket Tester (YU-03112) to the A.C. magneto coupler.
   - Measure the charging coil resistance.

Charging Coil Resistance
(White ① – White ② ,
White ① – White ③):
0.34 ~ 0.42 Ω at 20°C (68°F)



OUT OF SPECIFICATION → Charging coil is faulty. Replace stator assembly.

RESISTANCE MEETS SPECIFICATION

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

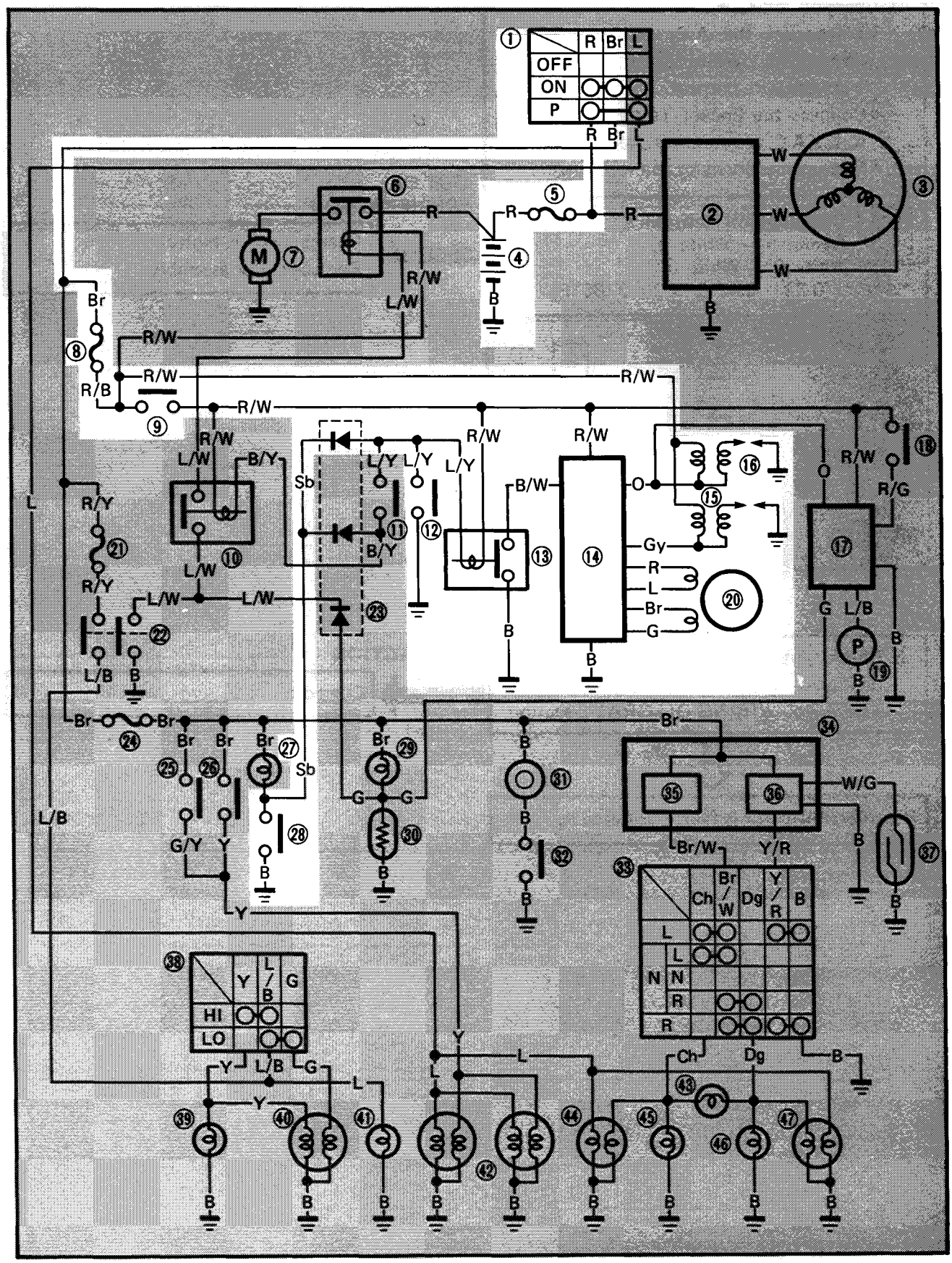
POOR CONNECTION → Correct.

OK

Rectifier/Regulator is faulty. Replace it.

IGNITION SYSTEM

CIRCUIT DIAGRAM

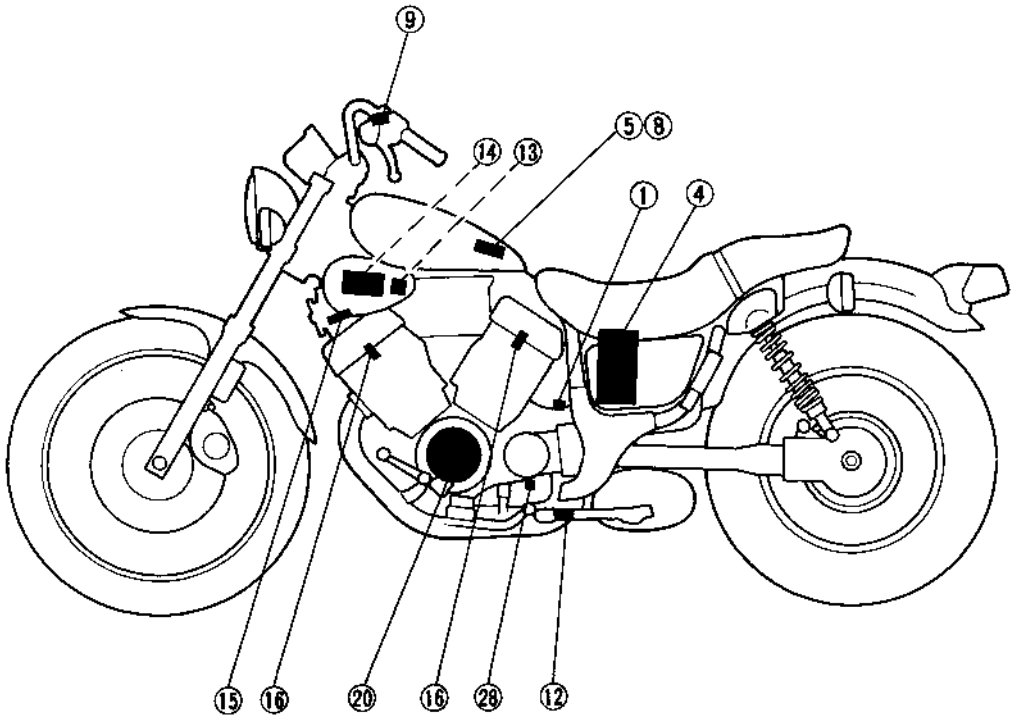


Aforementioned circuit diagram shows ignition circuit in circuit diagram.

NOTE:

For the color codes, see page 6-2.

① Main switch
④ Battery
⑤ Fuse "MAIN"
⑧ Fuse "IGNITION"
⑨ "START" switch
⑫ Sidestand switch
⑬ Sidestand relay
⑭ Ignitor unit
⑮ Ignition coil
⑯ Spark plug
⑳ Pickup coil
㉘ Neutral switch



TROUBLESHOOTING

NOTE:

Before this troubleshooting, remove the seat, top cover and front side cover.

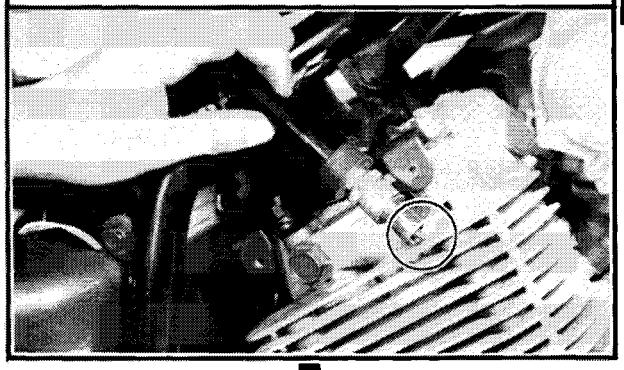
IF IGNITION SYSTEM SHOULD BECOME INOPERATIVE (NO SPARK OR INTERMITTENT SPARK).

1. Spark plug inspection
   - Check the spark plug condition. Refer to "CHAPTER 2. SPARK PLUG INSPECTION" section.

FAULTY → Replace or regap spark plug.

OK ↓

2. Ignition spark test (With spark plug)
   - Install the spark plug to the plug cap.
   - Ground the spark plug to the cylinder head.
   - Turn the main switch to "ON" and "ENGINE STOP" switch to "RUN" then, shift the gear in neutral.
   - Push the "START" switch.
   - Check the ignition spark condition.



SPARK → Ignition circuit is good.

NO SPARK ↓

*

*

3. Ignition spark gap test (Without spark plug and cap)
   - Remove the spark plug and plug cap.
   - Hold the spark plug lead 6 mm (0.24 in) from the cylinder head.
   - Repeat the aforementioned test.
   - Check the ignition spark condition.

SPARK → Spark plug and/or plug cap is faulty. Replace faulty part(s).

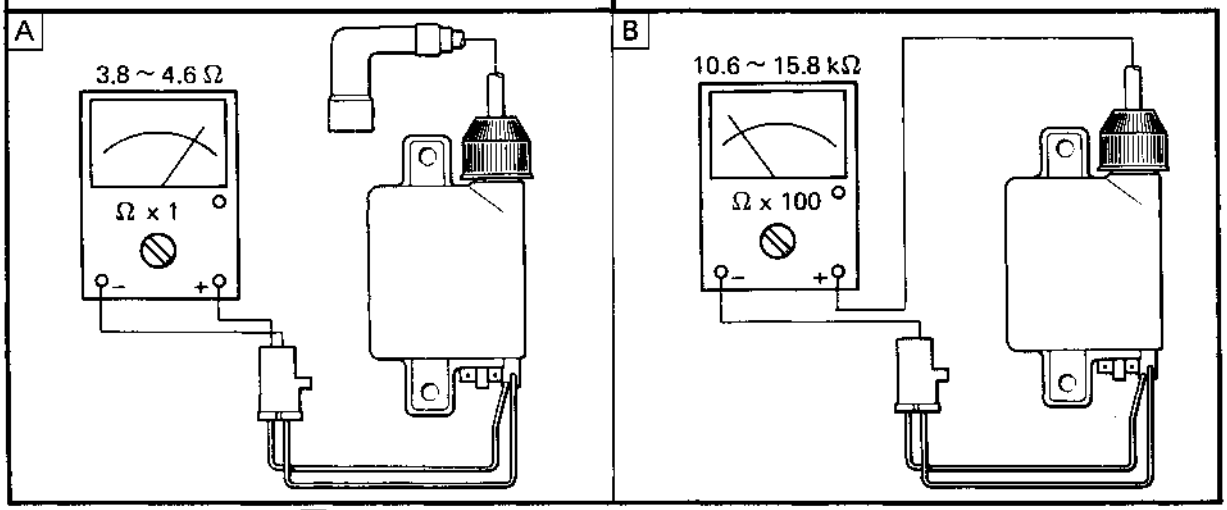


NO SPARK

4. Ignition coil resistance test
   - Disconnect the ignition coil coupler and spark plug lead.
   - Connect the Pocket Tester (YU-03112) as shown.
   - Measure the primary and secondary coil resistances.

Primary Coil Resistance A :
3.8 ~ 4.6 Ω at 20°C (68°F)
Secondary Coil Resistance B :
10.6 ~ 15.8 kΩ at 20°C (68°F)

OUT OF SPECIFICATION → Ignition coil is faulty. Replace it.



BOTH RESISTANCES MEET SPECIFICATIONS

*

*

5. "START" and main switches conduct check.
   - Check the "START" and main switches for continuity. Refer to "SIGNAL SYSTEM" section.

FAULTY → "START" and/or main switches are faulty. Replace faulty part(s).

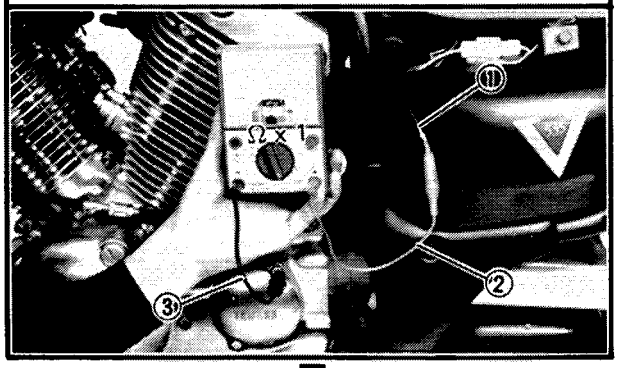
OK

6. Neutral switch conduct test
   - Disconnect the neutral switch lead (Sky blue) ① from the wire harness.
   - Connect the positive lead ② of the Pocket Tester (YU-03112) to the neutral switch lead.
   - Ground the negative lead ③ of the Tester to the engine.
   - Shift the gear, and check the switch for continuity.

BAD CONDITION → Neutral switch is faulty. Replace it.

Transmission Position	Good Condition	Bad Condition		
In neutral	O	O	X	X
In gear	X	O	X	O

O: Continuity X: Nocontinuity

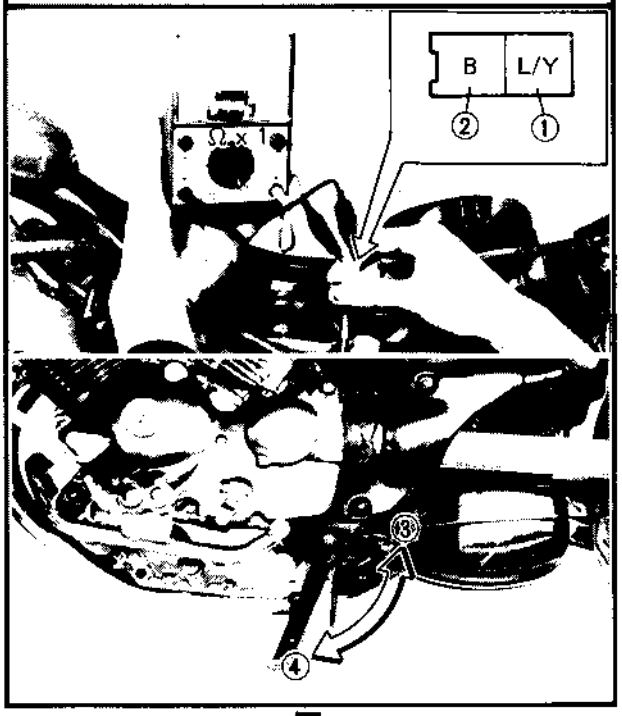


GOOD CONDITION

7. Sidestand switch conduct check
   - Disconnect the sidestand switch coupler (Blue/Yellow ① and Black ②) from the wire harness.
   - Connect the Pocket Tester (YU-03112) to the sidestand switch coupler.
   - Move the sidestand up or down, and check the sidestand switch for continuity.

Sidestand Position	Good Condition	Bad Condition		
Up ③	○	○	X	X
Down ④	X	○	X	○

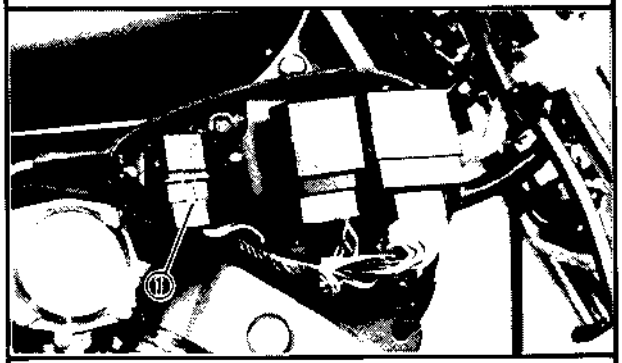
○: Continuity X: Nocontinuity



BAD CONDITION → Sidestand switch is faulty. Replace it.

GOOD CONDITION

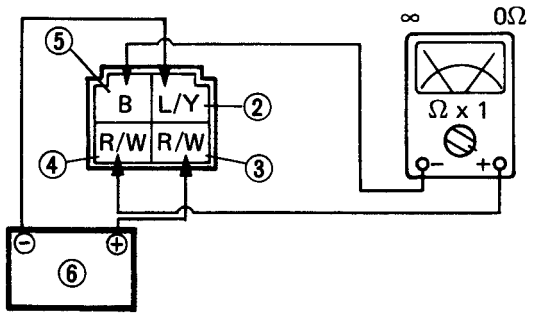
8. Sidestand relay test
   - Disconnect the sidestand relay ① coupler (Red/White, Blue/Yellow, Black and Black/White) from the wire harness.



   - Connect the Pocket Tester (YU-03112) and battery (12V) ⑥ to the relay coupler (Blue/Yellow ② , Red/White ③ , Black/White ④ and Black ⑤).
   - Check the relay for continuity.

	Good Condition	Bad Condition		
Battery Connected	X	○	X	○
Battery Disconnected	○	○	X	X

○: Continuity X: Nocontinuity



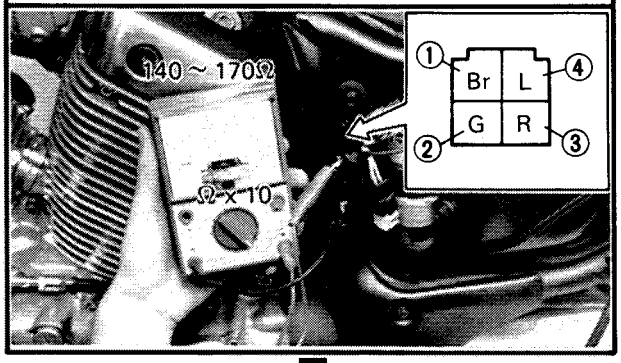
FAULTY → Sidestand relay is faulty. Replace it.

OK

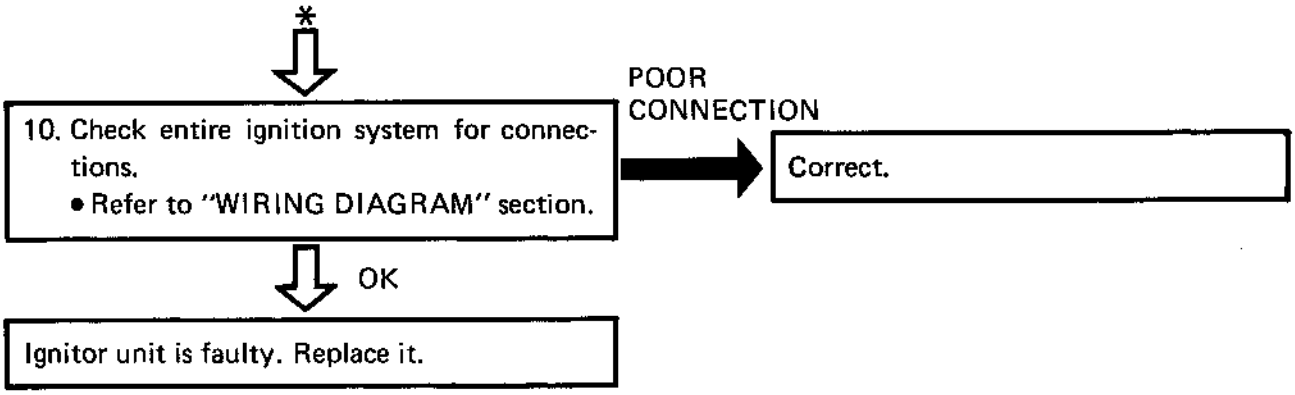
9. Pickup coil resistance test
   - Disconnect the pickup coil coupler (Red ① , Blue ② , Brown ③ and Green ④) from the ignitor unit.
   - Connect the Pocket Tester (YU-03112) to the pickup coil coupler.
   - Measure the pickup coil resistance.

Pickup Coil Resistance
(Brown ① – Green ② ,
Red ③ – Blue ④):
140 ~ 170 Ω at 20°C (68°F)

OUT OF SPECIFICATION → Pickup coil is faulty. Replace it.

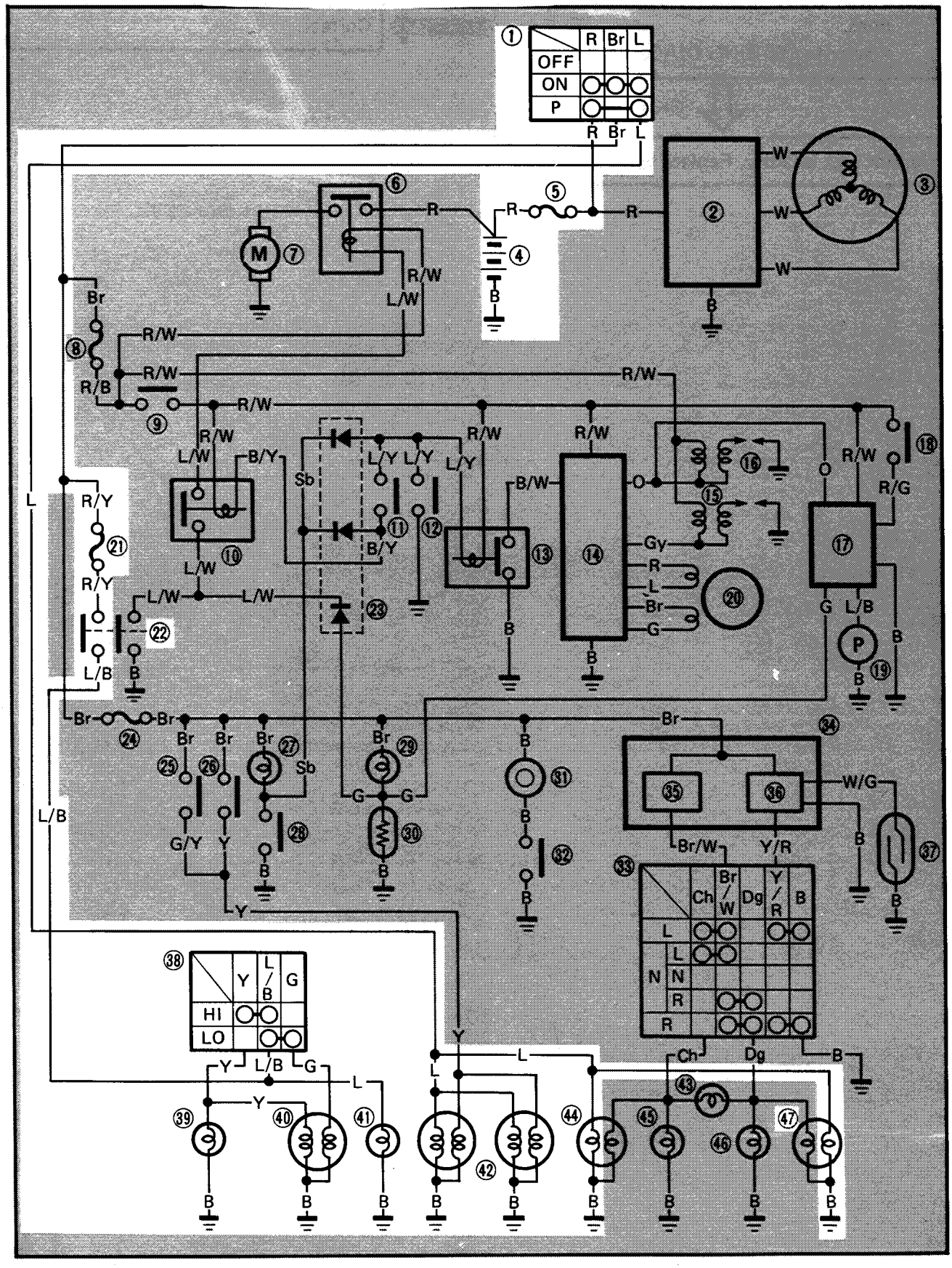


BOTH RESISTANCES MEET SPECIFICATIONS


*
10. Check entire ignition system for connections.
• Refer to "WIRING DIAGRAM" section.
POOR CONNECTION
Correct.
OK
Ignitor unit is faulty. Replace it.

LIGHTING SYSTEM

CIRCUIT DIAGRAM

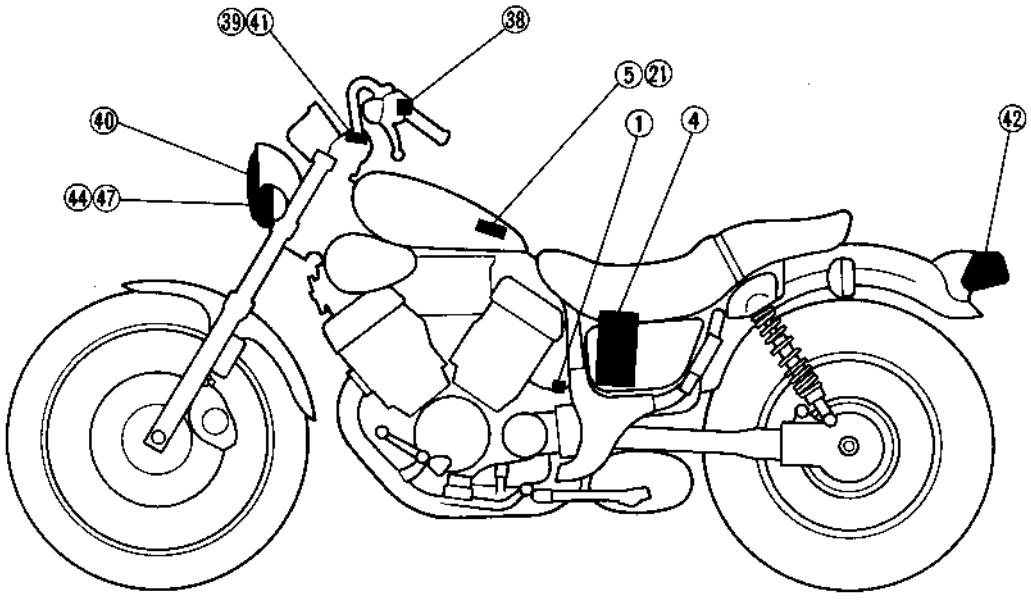


Aforementioned circuit diagram shows lighting circuit in circuit diagram.

NOTE:

For the color codes, see page 6-2.

① Main switch
④ Battery
⑤ Fuse "MAIN"
㉑ Fuse "HEAD"
㉒ "ENGINE STOP" switch
㊳ "LIGHTS" (Dimmer) switch
㊴ "HIGH BEAM" indicator light
㊵ Headlight
㊶ Meter light
㊷ Taillight
㊹ Front position light (Left)
㊼ Front position light (Right)



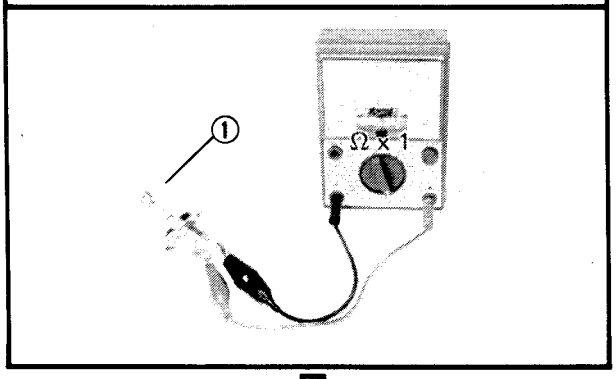
TROUBLESHOOTING

NOTE:

Before this troubleshooting, remove the headlight, top cover and seat.

HEADLIGHT DOES NOT COME ON.

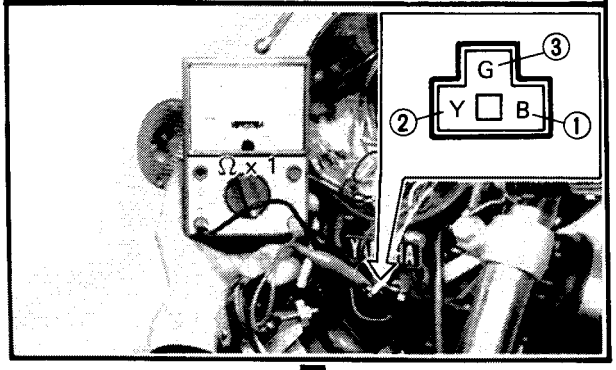
1. Headlight bulb conduct check
   - Remove the headlight bulb ①. Refer to "CHAPTER 2. HEADLIGHT BULB REPLACEMENT" section.
   - Connect the Pocket Tester (YU-03112) to the bulb terminals as shown, and check the bulb for continuity.



CONTINUITY DOES NOT EXIST ON CIRCUIT → Bulb is faulty. Replace it.

CONTINUITY EXISTS ON BOTH CIRCUIT

2. Headlight bulb socket conduct check
   - Install the bulb to the headlight socket.
   - Connect the Pocket Tester (YU-03112) to the headlight coupler (Black ①, Yellow ② and Green ③), and check it for continuity.



CONTINUITY DOES NOT EXIST ON CIRCUIT → Bulb socket is faulty. Replace it.

CONTINUITY EXISTS ON BOTH CIRCUIT

3. Fuse inspection
   - Check the fuse condition. Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

OK

*

*

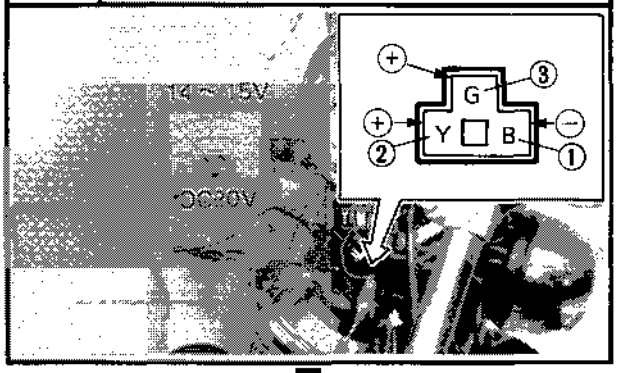
4. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty. Recharge or replace it.

OK

5. Lighting voltage test
   - Connect the Pocket Tester (YU-03112) to the headlight coupler (Black ① Yellow ② and Green ③).
   - Turn the "LIGHTS" (Dimmer) switch to "LO" and "HI" position.
   - Start the engine and accelerate to about 5,000 r/min.
   - Measure the lighting voltage.

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



LIGHTING VOLTAGE MEETS SPECIFICATION → Lighting system (Headlight) is good.

OUT OF SPECIFICATION

6. "LIGHTS" (Dimmer) switch conduct check.
   - Check the "LIGHTS" (Dimmer) switch for continuity. Refer to "SIGNAL SYSTEM" section.

FAULTY → "LIGHTS" (Dimmer) switch is faulty. Replace faulty part(s).

OK

7. Main switch conduct check
   - Check the main switch for continuity. Refer to "SIGNAL SYSTEM" section.

FAULTY → Main switch is faulty. Replace it.

OK

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

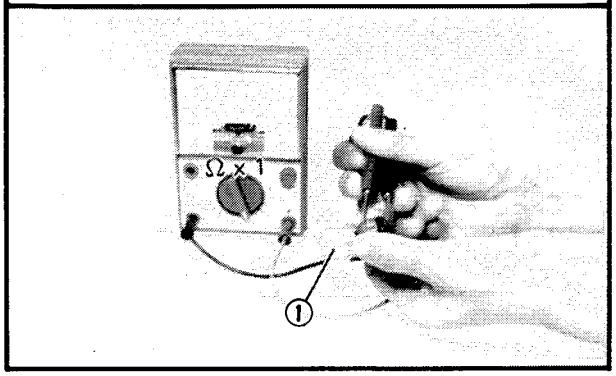
POOR CONNECTION → Correct.

OK

Check the charging system.

TAILLIGHT AND/OR FRONT POSITION LIGHTS DO NOT COME ON.

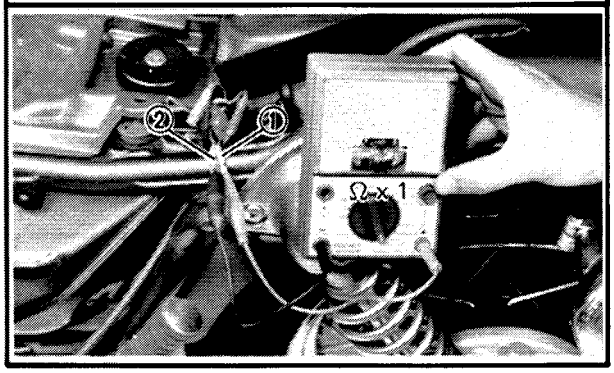
1. Taillight bulb conduct check
   - Remove the taillight lens and bulb ① .
   - Connect the Pocket Tester (YU-03112) to the bulb terminals as shown, and check the bulb for continuity.



NO CONTINUITY → Bulb is faulty. Replace it.

CONTINUITY ⇩

2. Taillight bulb socket conduct check
   - Install the bulb to taillight socket.
   - Disconnect the taillight coupler (Blue ① and Black ②).
   - Connect the Pocket Tester (YU-03112) to the taillight coupler as shown, and check it for continuity.



CONTINUITY DOES NOT EXIST ON CIRCUIT → Bulb socket is faulty. Replace it.

CONTINUITY EXISTS ON BOTH CIRCUIT ⇩

3. Fuse inspection
   - Check the fuse condition.
     Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

OK ⇩

*

NOTE:
The following are the taillight troubleshooting steps, which can also be used for the front position lights troubleshooting.

*

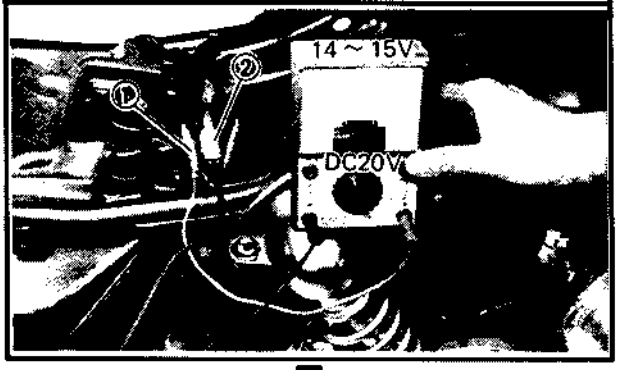
4. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty. Recharge or replace battery.

OK

5. Lighting voltage test
   - Connect the Pocket Tester (YU-03112) to the taillight leads (Blue ① and Black ②).
   - Start the engine and accelerate to about 5,000 r/min.
   - Measure the lighting voltage.

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



LIGHTING VOLTAGE MEETS SPECIFICATION → Lighting system (Taillight) is good.

OUT OF SPECIFICATION

6. Main switch conduct check
   - Check the main switch for continuity. Refer to "SIGNAL SYSTEM" section.

FAULTY → Main switch is faulty. Replace it.

OK

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

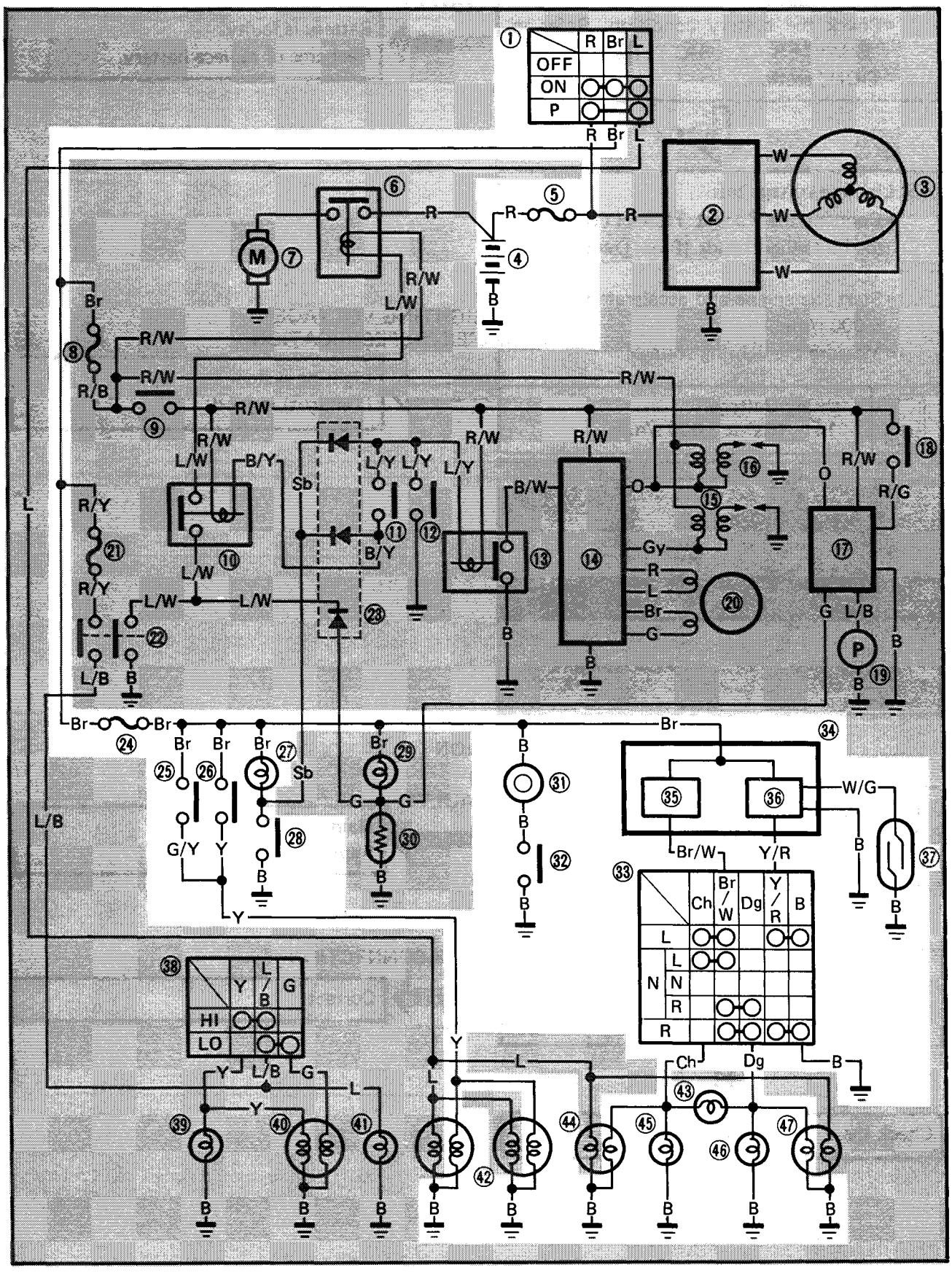
POOR CONNECTION → Correct.

OK

Check the charging system.

SIGNAL SYSTEM

CIRCUIT DIAGRAM

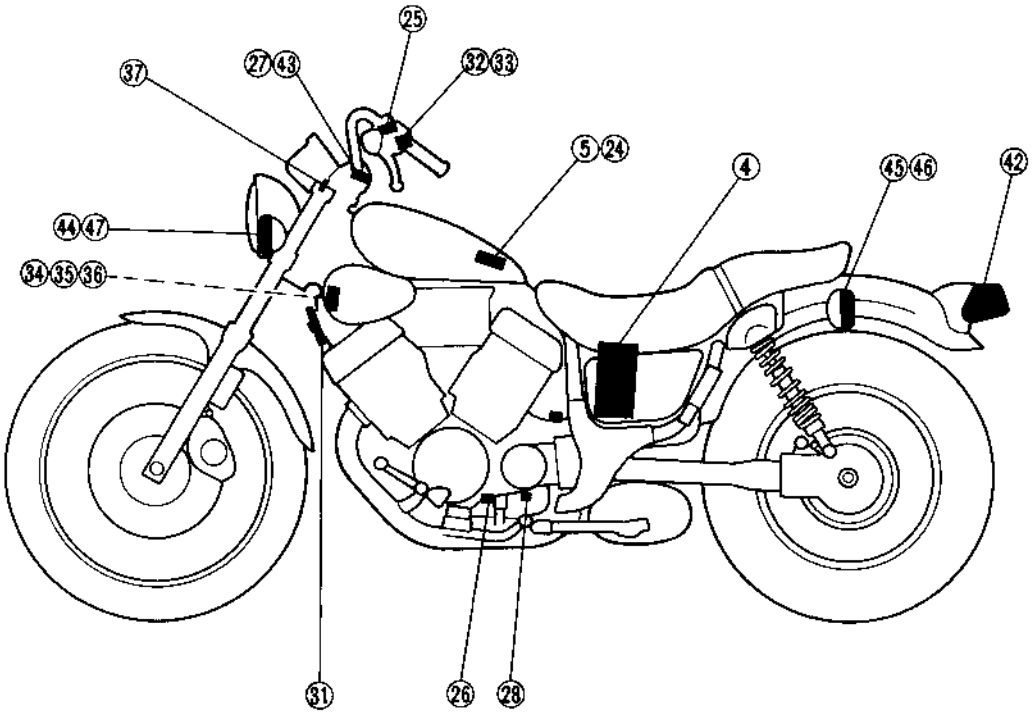


Aforementioned circuit diagram shows signal circuit in circuit diagram.

NOTE:

For the color codes, see page 6-2.

① Main switch
④ Battery
⑤ Fuse "MAIN"
㉔ Fuse "SIGNAL"
㉕ Front brake switch
㉖ Rear brake switch
㉗ "NEUTRAL" indicator light
㉘ Neutral switch
㉛ Horn
㉜ "HORN" switch
㉝ "TURN" switch
㉞ Relay assembly
㉟ Flasher relay
㊱ Cancelling unit
㊲ Reed switch
㊷ Brake light
㊸ "TURN" indicator light
㊹ Front flahser light (Left)
㊺ Rear flasher light (Left)
㊻ Rear flasher light (Right)
㊼ Front flasher light (Right)



TROUBLESHOOTING

NOTE:
Before this troubleshooting, remove the front side cover and seat.

FLASHER LIGHT AND INDICATOR LIGHT DO NOT COME ON.

1. Flasher light and indicator bulbs conduct check
   - Check the flasher light and indicator bulbs condition. Refer to "LIGHTING SYSTEM" section.

FAULTY → Flasher light and/or indicator bulb(s) is faulty. Replace faulty part(s).

OK ↓

2. Flasher light and indicator bulb sockets conduct check
   - Check the flasher light and indicator bulb sockets condition. Refer to "LIGHTING SYSTEM" section.

FAULTY → Flasher light and/or indicator bulb socket(s) is faulty. Replace faulty part(s).

OK ↓

3. Fuse inspection
   - Check the fuse condition. Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

OK ↓

4. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty. Recharge or replace battery.

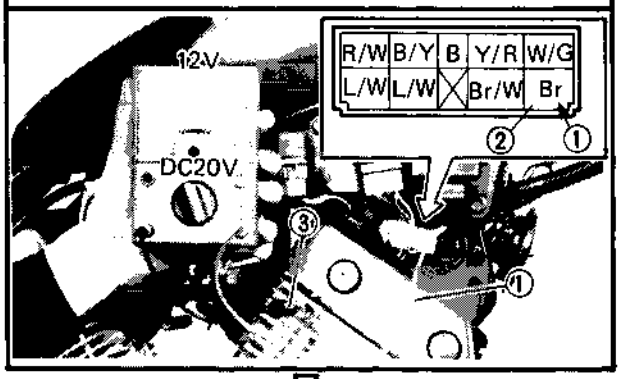
OK ↓

*

*

5. Battery voltage test
   - Disconnect the relay assembly coupler.
   - Connect the positive lead ① of the Pocket Tester (YU-03112) to the relay assembly coupler terminal (Brown ② – Wire harness side).
   - Ground the negative lead ③ of the Pocket Tester to the engine.
   - Turn the main switch to "ON", and measure the battery voltage.

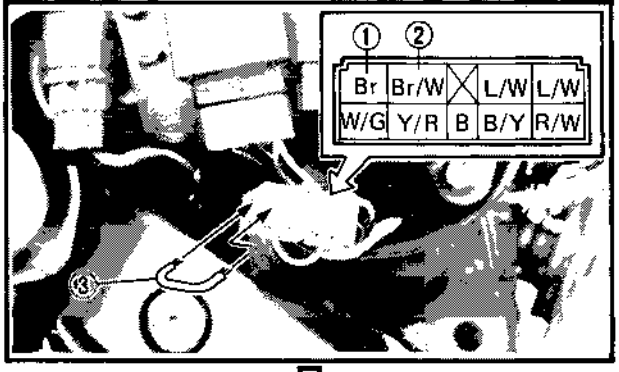
LESS THAN 12V → Check main switch.



MORE THAN 12V

6. Flasher relay test
   - Disconnect the relay assembly coupler.
   - Connect the relay assembly coupler terminals (Brown ① and Brown/White ②) with the jumper lead ③.
   - Turn the main switch to "ON", and turn the "TURN" switch to "L" or "R".
   - Check the flasher light condition.

DOES NOT LIGHT → Check "TURN" switch.



OK

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

FAULTY → Correct.

OK

Replace relay assembly.

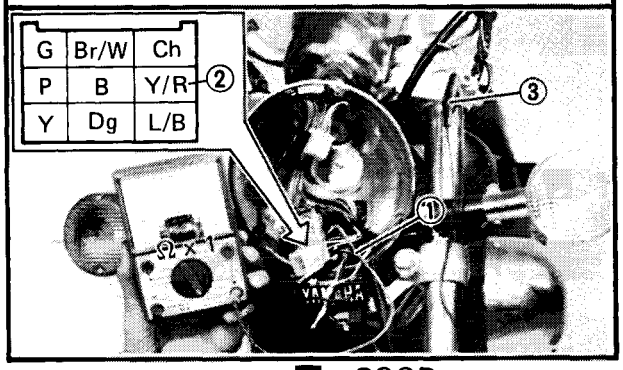
FLASHER LIGHTS DO NOT CANCEL

1. "TURN" switch conduct check
   - Disconnect the handlebar switch (Left) coupler.
   - Connect the positive lead ① of the Pocket Tester (YU-03112) to the handlebar switch coupler terminal (Yellow/Red ②).
   - Ground the negative lead ③ of the Pocket Tester to the frame.
   - Check the following for continuity.
   - Push the "TURN" switch to left or right. Once the switch is released it will return to the center position.
     To cancel the signal, push the switch in after it has returned to the center position.

"TURN" switch Position	Good Condition	Bad Condition		
"L" and "R"	○	○	X	X
"N" (Cancel)	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → "TURN" switch is faulty. Replace it.



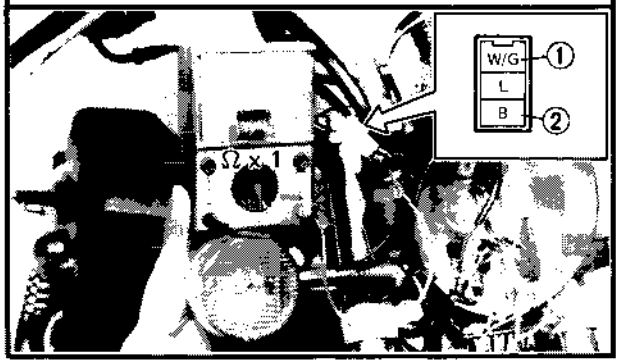
GOOD CONDITION

2. Reed switch test
   - Remove the headlight lens unit, and disconnect the speedometer coupler.
   - Connect the Pocket Tester (YU-03112) leads to the speedometer coupler terminals (White/Green ① and Black ②).
   - Lift the front wheel and rotate the wheel by hand, and measure the reed switch resistance.

WARNING:

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

Reed Switch Resistance:
About 7Ω
Then return back 0Ω or ∞
when wheel is stopped.



OUT OF SPECIFICATION → Reed switch is faulty. Replace it.

BOTH RESISTANCES MEET SPECIFICATIONS ↓

3. Check entire flasher cancelling system for connections.
   • Refer to "WIRING DIAGRAM" section.

FAULTY → Correct.

OK ↓

Replace relay assembly.

BRAKE LIGHT DOES NOT COME ON.

1. Brake light bulb conduct check
   - Remove the taillight lens and bulb.
   - Check the brake light bulb condition. Refer to "LIGHTING SYSTEM" section.

FAULTY → Brake light bulb is faulty. Replace it.

OK ⇩

2. Brake light bulb socket conduct check
   - Check the brake light bulb socket condition. Refer to "LIGHTING SYSTEM" section.

FAULTY → Brake light bulb socket is faulty. Replace it.

OK ⇩

3. Fuse inspection
   - Check the fuse condition. Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

OK ⇩

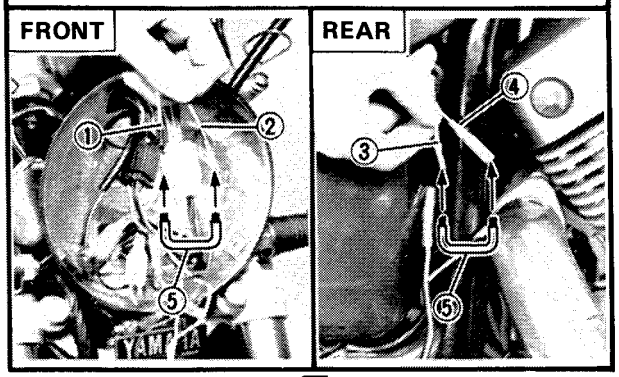
4. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty. Recharge or replace battery.

OK ⇩

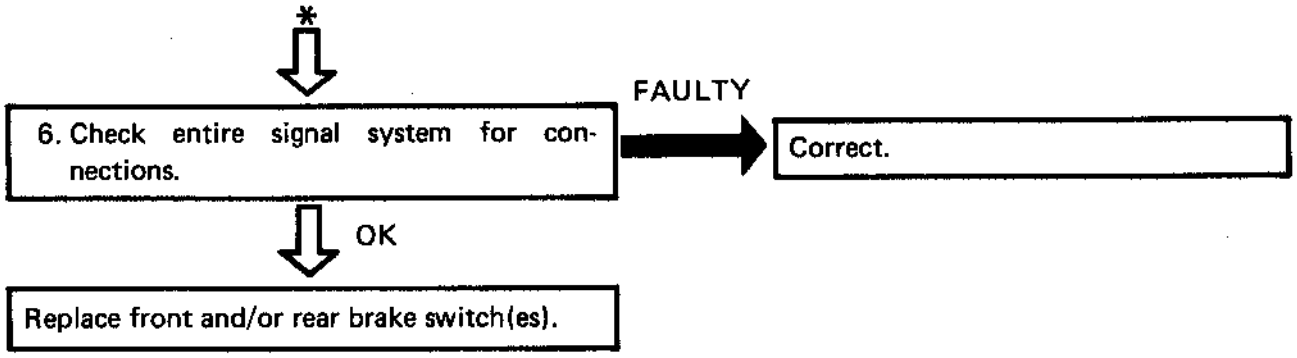
5. Front and rear brake switches test
   - Disconnect the front and rear brake switch couplers.
   - Connect the front brake switch terminals (Brown ① and Green/Yellow ②) and rear brake switch terminals (Brown ③ and Yellow ④) with the jumper leads ⑤ .
   - Turn the main switch to "ON", and check the brake light condition.

DOES NOT LIGHT → Check the main switch.



LIGHTS ⇩

*


*
6. Check entire signal system for connections.
FAULTY
Correct.
OK
Replace front and/or rear brake switch(es).

"NEUTRAL" INDICATOR LIGHT DOES NOT COME ON.

1. "NEUTRAL" indicator light bulb conduct check
   - Check the "NEUTRAL" indicator light bulb condition. Refer to "LIGHTING SYSTEM" section.

FAULTY → "NEUTRAL" indicator light bulb is faulty. Replace it.

OK ↓

2. "NEUTRAL" indicator light bulb socket conduct check
   - Check the "NEUTRAL" indicator light bulb socket condition. Refer to "LIGHTTING SYSTEM" section.

FAULTY → "NEUTRAL" indicator light bulb socket is faulty. Replace it.

OK ↓

3. Fuse inspection
   - Check the fuse condition. Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

OK ↓

4. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty. Recharge or replace battery.

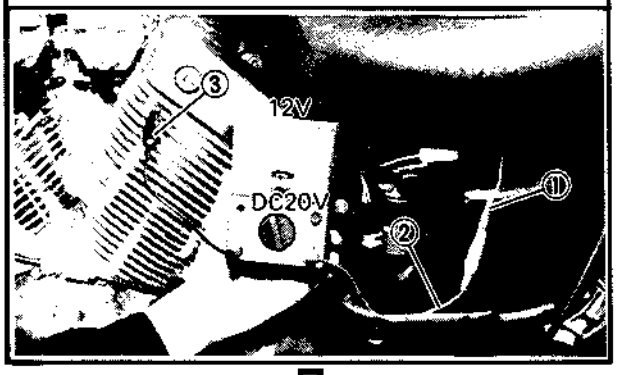
OK ↓

*

*

5. Battery voltage test
   - Disconnect the neutral switch lead (Sky blue ① – Wire harness side).
   - Connect the positive lead ② of the Pocket Tester (YU-03112) to the neutral switch lead.
   - Ground the negative lead ③ of the Pocket Tester to the engine.
   - Turn the main switch to "ON", and measure the battery voltage.

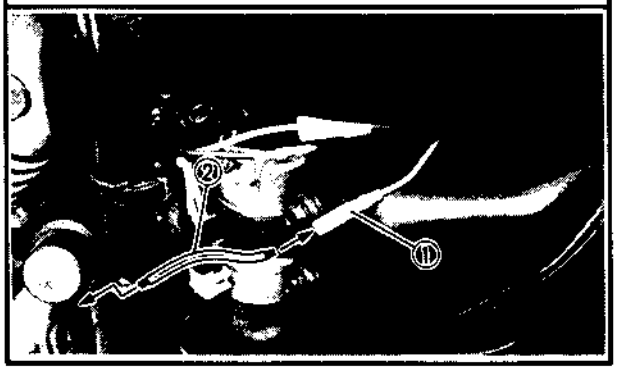
LESS THAN 12V → Check main switch.



MORE THAN 12V

6. Neutral switch test
   - Ground the neutral switch lead (Sky blue ① – Wire harness side) to the engine with the jumper lead ②.
   - Shift the gear in neutral.
   - Turn the main switch to "ON", and check the "NEUTRAL" indicator light condition.

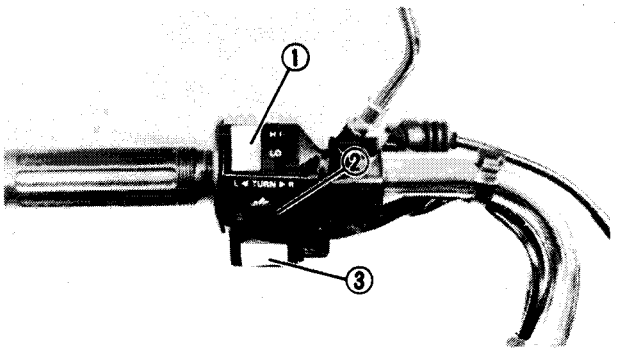
LIGHTS → Neutral switch is faulty. Replace it.

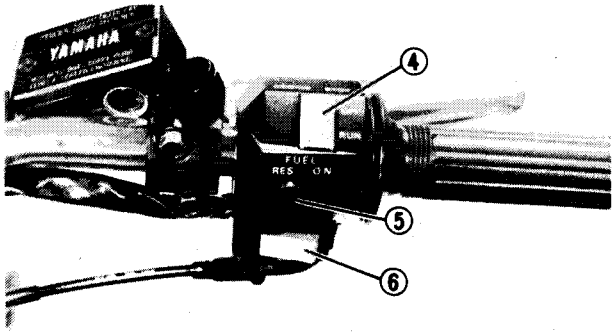


DOES NOT LIGHT

7. Check entire signal system for connection.
   - Refer to "WIRING DIAGRAM" section.

FAULTY → Correct.





SWITCHES TEST

Switches may be checked for continuity with the Pocket Tester (YU-03112) on the "Ohm x 1" position.

①"LIGHTS" (Dimmer) switch
②"TURN" switch
③"HORN" switch
④"ENGINE STOP" switch
⑤"FUEL" (Reserve) switch
⑥"START" switch

Main Switch

Switch Position	Lead Color		
	R	Br	L
ON	○——	○——	○
OFF			
P	○——	○	

"LIGHTS" (Dimmer) switch

Switch Position	Lead Color		
	Y	L/B	G
HI	○——	○	
LO		○——	○

"TURN" Switch

Switch Position		Lead Color				
		Ch	Br/W	Dg	Y/R	B
L		○——	○		○——	○
N	L	○——	○			
	OFF					
	R		○——	○		
R			○——	○	○——	○

"HORN" Switch

Switch Position	Lead Color	
	P	B
OFF		
ON	○———	———○

"ENGINE STOP" Switch

Switch Position	Lead Color	
	R/W	R/B
OFF		
RUN	○———	———○

"FUEL" (Reserve) Switch

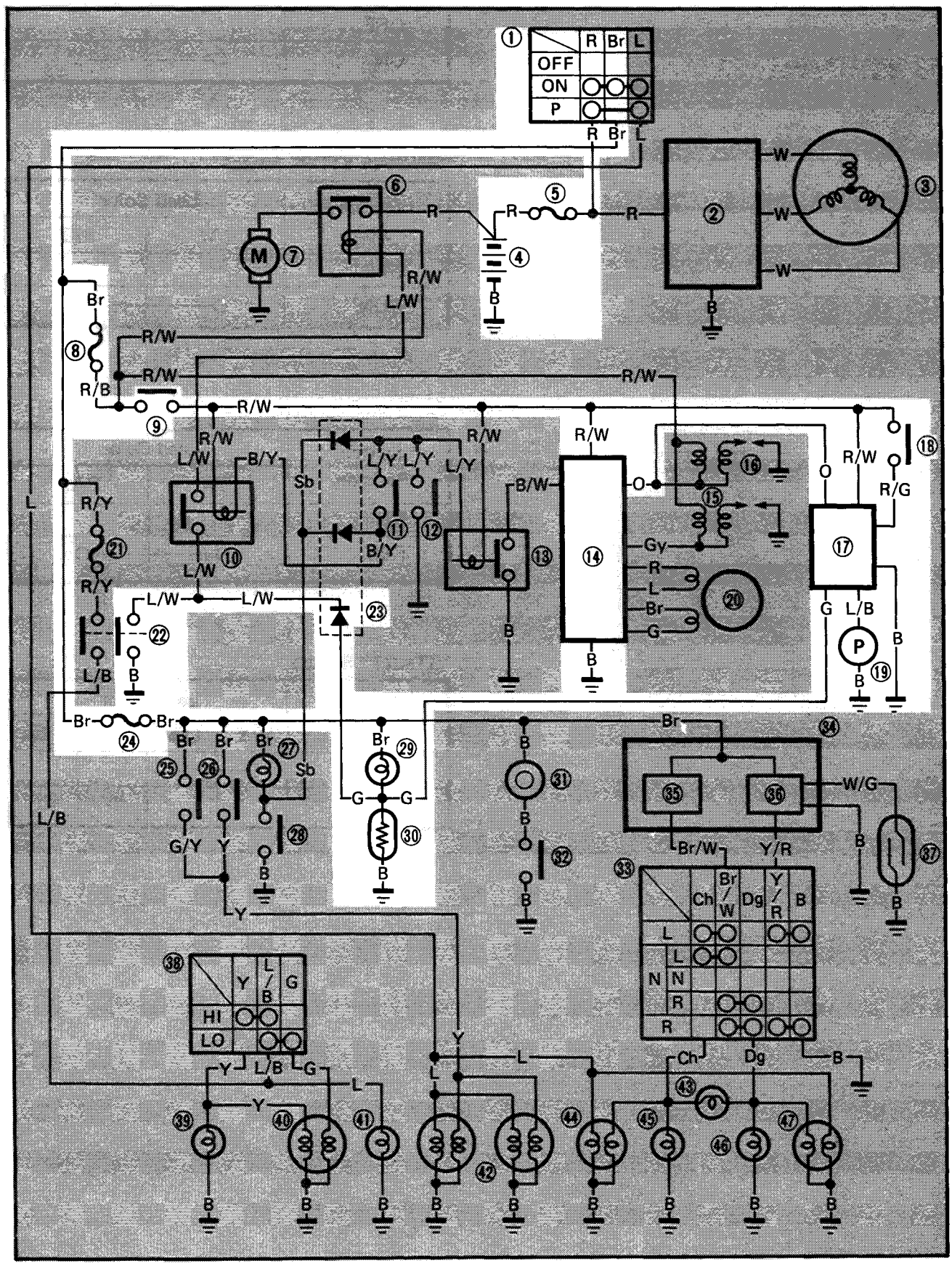
Switch Position	Lead Color	
	R/W	R/G
ON		
RES	○———	———○

"START" Switch

Switch Position	Lead Color			
	R/Y	L/B	L/W	B
OFF	○———	———○		
ON			○———	———○

FUEL SYSTEM

CIRCUIT DIAGRAM

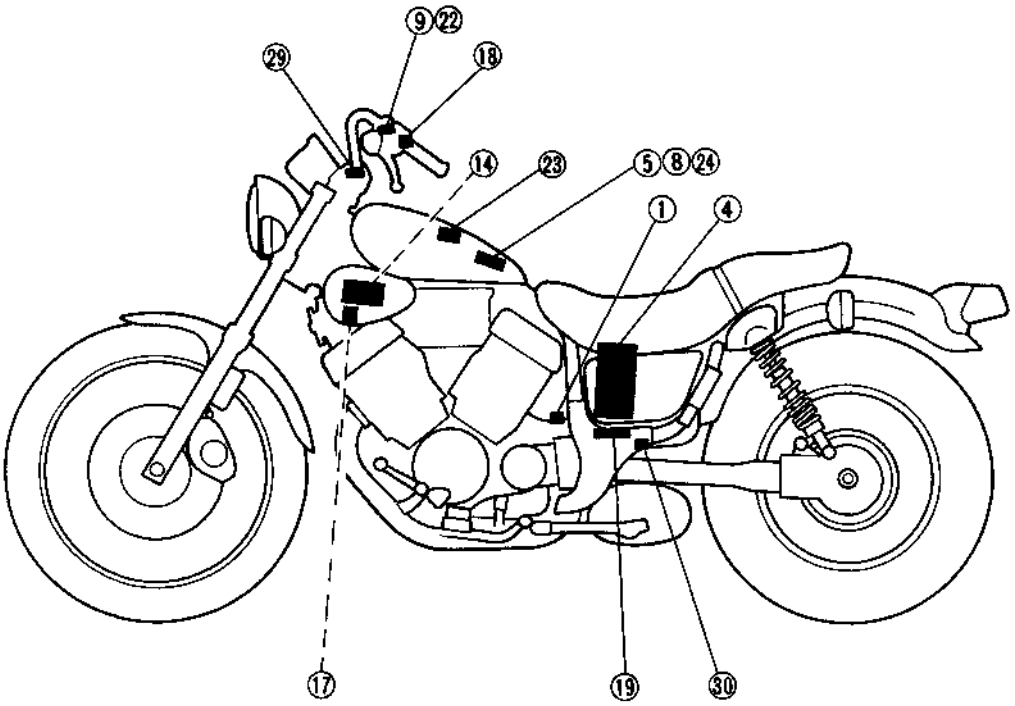


Aforementioned circuit diagram shows fuel circuit in circuit diagram.

NOTE:

For the color codes, see page 6-2.

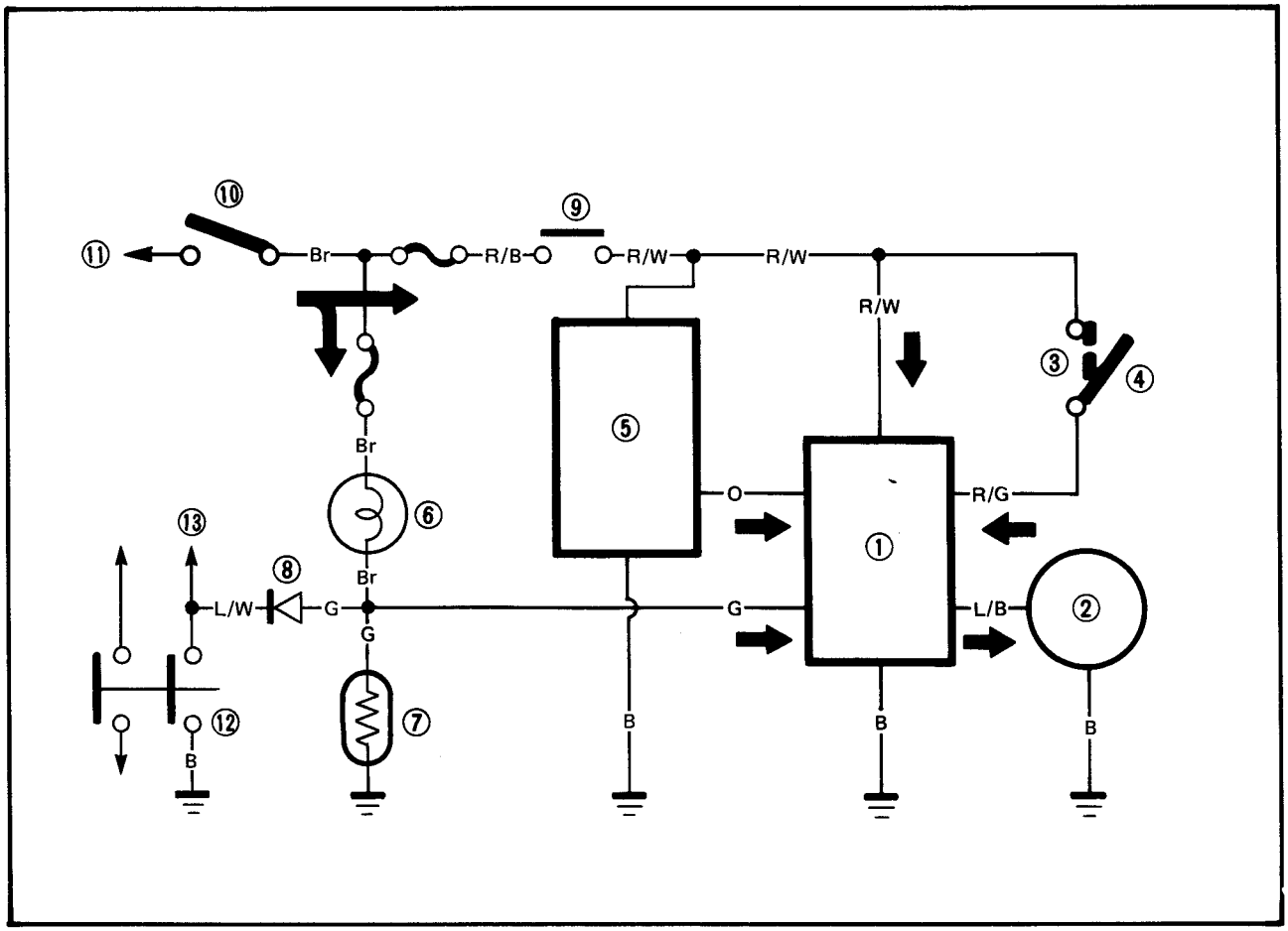
① Main switch
④ Battery
⑤ Fuse "MAIN"
⑧ Fuse "IGNITION"
⑨ "START" switch
⑭ Ignitor unit
⑰ Fuel pump relay
⑱ "FUEL" (Reserve) switch
⑲ Fuel pump
㉒ "ENGINE STOP" switch
㉓ Diode
㉔ Fuse "SIGNAL"
㉙ "FUEL" indicator light
㉚ Fuel sender



FUEL PUMP CIRCUIT OPERATION

The fuel pump circuit consists of the fuel pump relay, fuel pump, and fuel reserve switch.
The fuel pump starts and stops as indicated in the chart below.

① Fuel pump relay
② Fuel pump
③ Fuel reserve switch in "RES" position
④ Fuel reserve switch in "ON" position
⑤ Ignitor unit
⑥ "FUEL" indicator light
⑦ Fuel sender
⑧ Diode
⑨ Engine stop switch
⑩ Main switch
⑪ To main fuse and battery
⑫ "START" switch
⑬ To starting circuit cut-off relay



FUEL PUMP			
START		STOP	
•Main/Engine stop switch turned to "ON" •Fuel reserve switch turned to "RES"	• Engine turned on	•Fuel warning indicator light comes on	•Engine turned off
For about 5 seconds when carburetor fuel level is low	After about 0.1 second	After about 30 seconds	After about 5 seconds

TROUBLESHOOTING

NOTE:
Before this troubleshooting, remove the top cover, front side cover and seat.

FUEL PUMP FAILS TO OPERATE AFTER ENGINE IS STARTED.

1. Fuse inspection
   - Check the fuse condition. Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

OK ↓

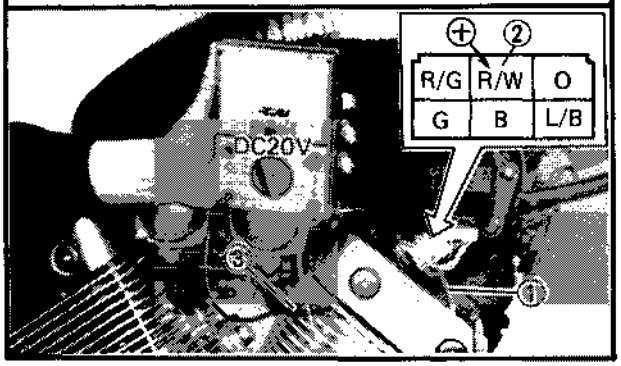
2. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty. Recharge or replace battery.

OK ↓

3. Battery voltage test
   - Disconnect the fuel pump relay coupler.
   - Connect the positive lead ① of the Pocket Tester (YU-03112) to the relay coupler terminal (Red/White ② – Wire-harness side).
   - Ground the negative lead ③ of the Pocket Tester to the engine.
   - Turn the main switch to "ON" and engine stop switch to "RUN", then push the "START" switch.
   - Measure the battery voltage.

LESS THAN 12V → Check main switch.



MORE THAN 12V ↓

*

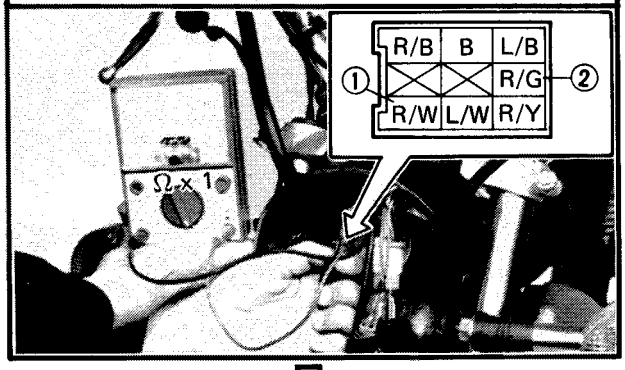
*

4. "FUEL" (Reserve) switch conduct check
   - Disconnect the handlebar switch (Right) coupler.
   - Connect the Pocket Tester (YU-03112) leads to the switch coupler terminals (Red/White ① and Red/Green ②).
   - Push or release the "FUEL" (Reserve) switch, and check the reserve switch for continuity.

"FUEL" (Reserve) Switch Position	Good Condition	Bad Condition		
PUSH	○	○	X	X
RELEASE	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → "FUEL" (Reserve) switch is faulty. Replace it.

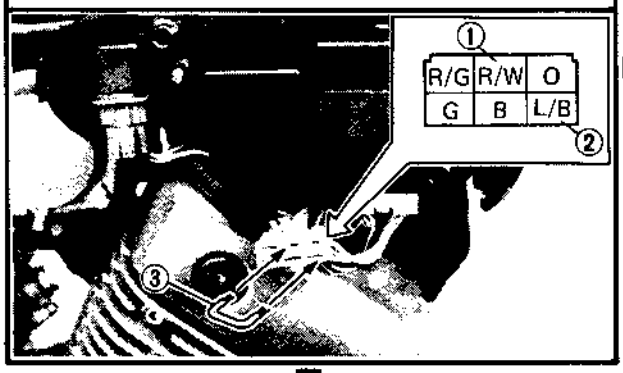


GOOD CONDITION

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5. Fuel pump relay test
   - Disconnect the fuel pump relay coupler (Red/Green, Green, Red/White, Black, Orange and Blue/Black).
   - Connect the relay coupler terminals (Red/White ① and Blue/Black ② – Wireharness side) with the jumper lead ③.
   - Turn the main switch to "ON" and engine stop switch to "RUN", then push the "START" and "FUEL" (Reserve) switches.
   - Check the fuel pump condition.



FAULTY → Fuel pump is faulty. Replace it.

OK

6. Check entire fuel system for connection.
   - Refer to "WIRING DIAGRAM" section.

FAULTY → Correct.

OK

Fuel pump relay is faulty. Replace it.

FUEL PUMP FAILS TO OPERATE FOR A 5 SECOND INTERVAL WHEN CARBURETOR FUEL LEVEL IS LOW AND FUEL INDICATOR DOES NOT COME ON.

1. Fuse inspection
   - Check the fuse condition. Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

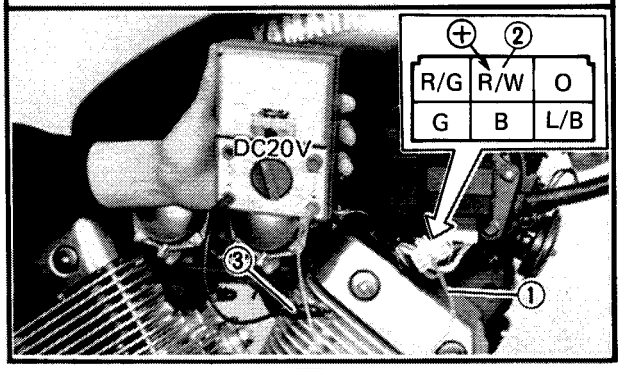
OK ↓

2. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty. Recharge or replace battery.

OK ↓

3. Battery voltage test
   - Disconnect the fuel pump relay coupler.
   - Connect the positive lead ① of the Pocket Tester (YU-03112) to the relay coupler terminal (Red/White ② — Wire-harness side).
   - Ground the negative lead ③ of the Pocket Tester to the engine.
   - Turn the main switch to "ON" and engine stop switch to "RUN", then push the "START" switch.
   - Measure the battery voltage.



LESS THAN 12V → Check main switch.

MORE THAN 12V ↓

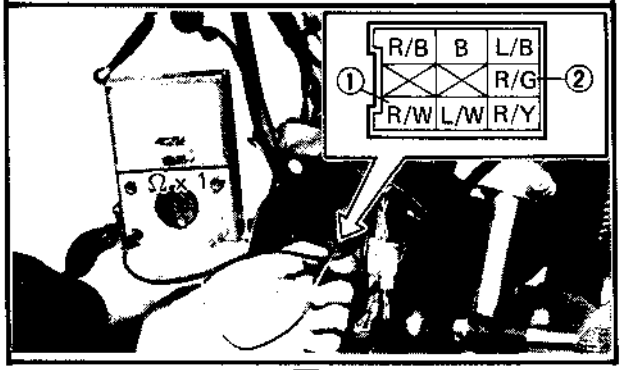
*

*

4. "FUEL" (Reserve) switch conduct check
   - Disconnect the handlebar switch (Right) coupler.
   - Connect the Pocket Tester (YU-03112) leads to the switch coupler terminals (Red/White ① and Red/Green ②).
   - Push or release the "FUEL" (Reserve) switch, and check the reserve switch for continuity.

"FUEL" (Reserve) Switch Position	Good Condition	Bad Condition		
PUSH	○	○	X	X
RELEASE	X	○	X	○

○: Continuity X: Nocontinuity



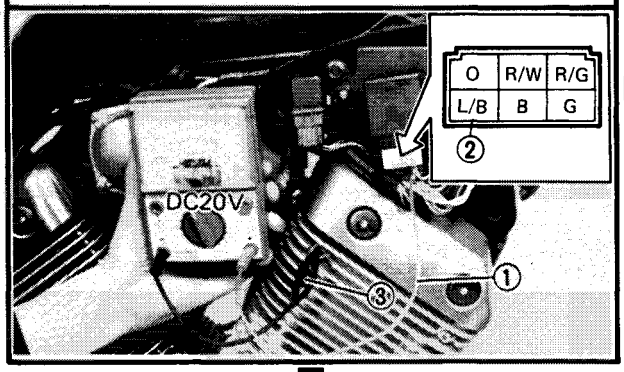
BAD CONDITION → "FUEL" (Reserve) switch is faulty. Replace it.

GOOD CONDITION

*

*

5. Fuel pump input voltage test
   - Connect the positive lead ① of the Pocket Tester (YU-03112) to the pump relay coupler terminal (Blue/Black ②).
   - Ground the negative lead ③ of the Pocket Tester to the engine.
   - Turn the main switch to "ON" and engine stop switch to "RUN", then push the "START" and "FUEL" (Reserve) switches.
   - Measure the fuel pump input voltage.



LESS THAN 11V → Fuel pump relay is faulty. Replace it.

MORE THAN 11V

6. Check entire fuel system for connection.
   - Refer to "WIRING DIAGRAM" section.

FAULTY → Correct.

OK

Fuel pump is faulty. Replace it.

FUEL PUMP FAILS TO OPERATE FOR A 5 SECOND INTERVAL WHEN CARBURETOR FUEL LEVEL IS LOW AND FUEL INDICATOR COMES ON.

1. Fuse inspection
   - Check the fuse condition.
     Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty.
Replace it.

OK ↓

2. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty.
Recharge or replace battery.

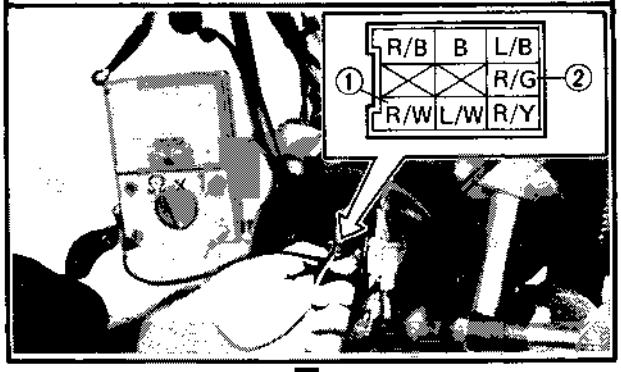
OK ↓

3. "FUEL" (Reserve) switch conduct check
   - Disconnect the handlebar switch (Right) coupler.
   - Connect the Pocket Tester (YU-03112) leads to the switch coupler terminals (Red/White ① and Red/Green ②).
   - Push or release the "FUEL" (Reserve) switch, and check the reserve switch for continuity.

"FUEL" (Reserve) Switch Position	Good Condition	Bad Condition		
PUSH	○	○	X	X
RELEASE	X	○	X	○

○: Continuity X: Nocontinuity

BAD CONDITION → "FUEL" (Reserve) switch is faulty.
Replace it.

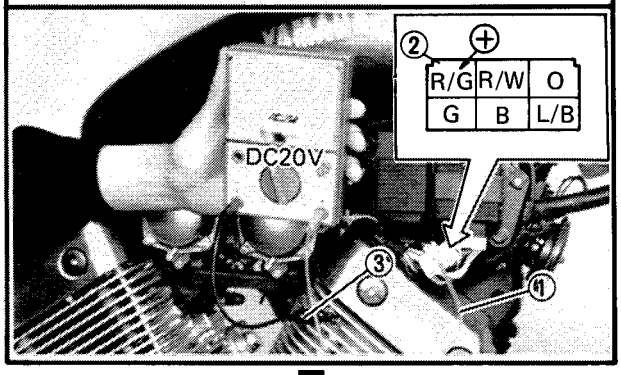


GOOD CONDITION ↓

*

*

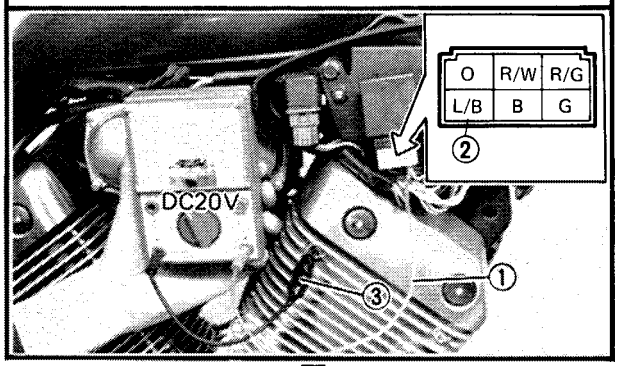
4. Battery voltage test
   - Disconnect the fuel pump relay coupler.
   - Connect the positive lead ① of the Pocket Tester (YU-03112) to the relay coupler terminal (Red/Green ② – Wire-harness side).
   - Ground the negative lead ③ of the Pocket Tester to the engine.
   - Turn the main switch to "ON" and engine stop switch to "RUN", then push the "START" switch.
   - Measure the battery voltage.



LESS THAN 12V → Check main switch.

MOTRE THAN 12V

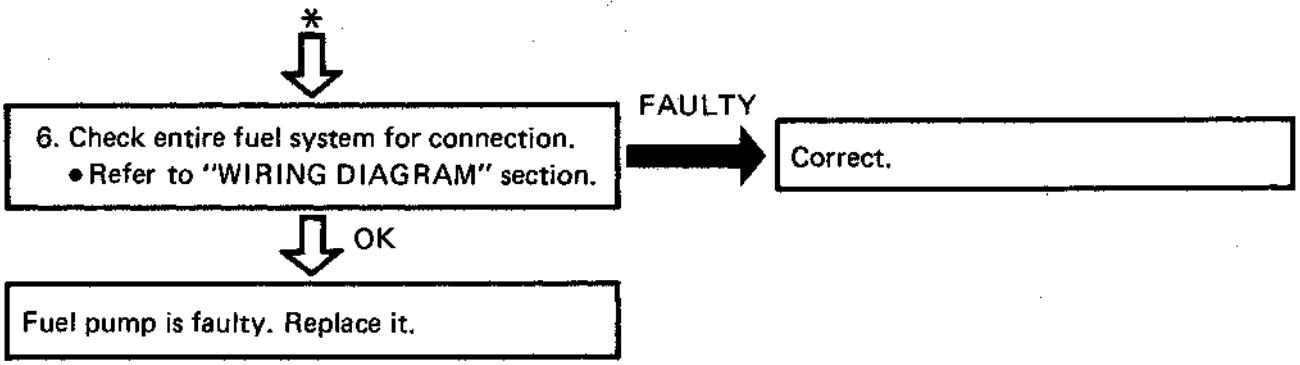
5. Fuel pump input voltage test
   - Connect the positive lead ① of the Pocket Tester (YU-03112) to the pump relay coupler terminal (Blue/Black ②).
   - Ground the negative lead ③ of the Pocket Tester to the engine.
   - Turn the main switch to "ON" and engine stop switch to "RUN", then push the "START" and "FUEL" (Reserve) switches.
   - Measure the fuel pump input voltage.



LESS THAN 11V → Fuel pump relay is faulty. Replace it.

MORE THAN 11V FOR ABOUT 5 SECONDS

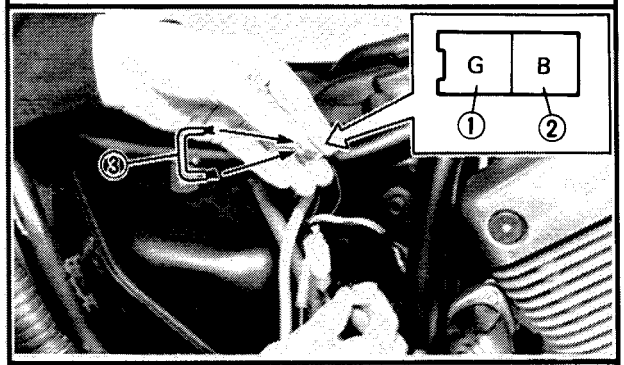
*


*
6. Check entire fuel system for connection.
• Refer to "WIRING DIAGRAM" section.
FAULTY
Correct.
OK
Fuel pump is faulty. Replace it.

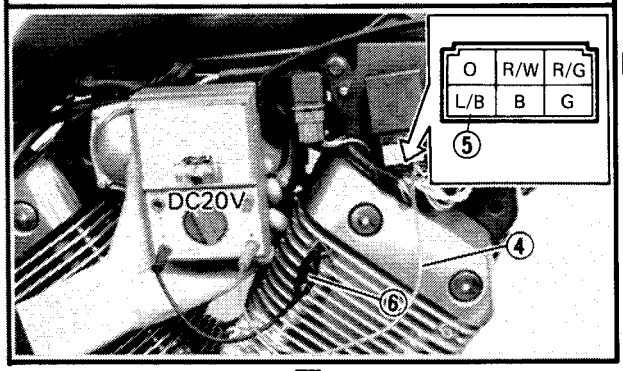
FUEL PUMP DOES NOT STOP AFTER 30 SECONDS WHEN FUEL INDICATOR COMES ON WHILE ENGINE TURNED ON.

1. Fuel pump input voltage and fuel sender test
   - Disconnect the fuel sender coupler from the wireharness.
   - Connect the sender coupler terminals (Green ① and Black ② – Wireharness side) with the jumper lead ③ and hold it.

NOTE:
Go to the next step while holding the jumper lead.

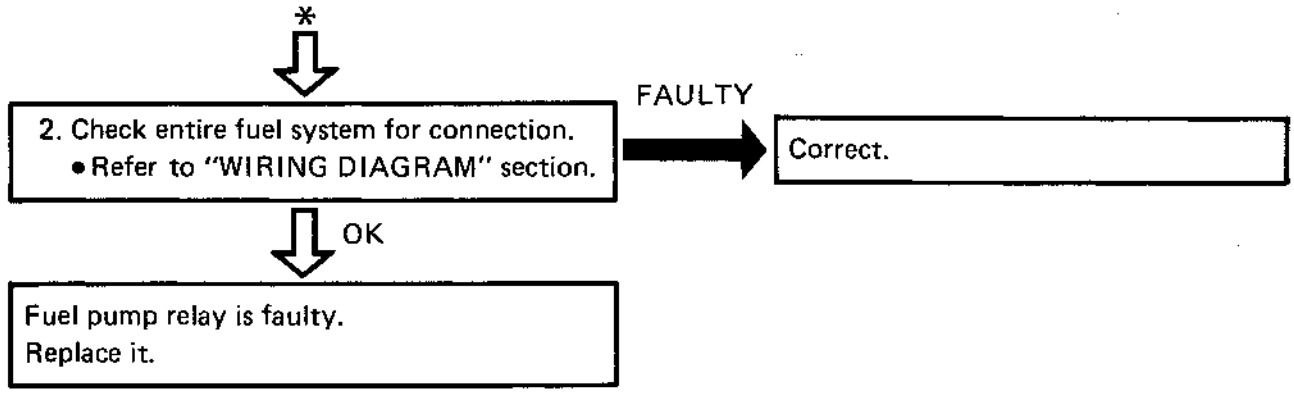


- Connect the positive lead ④ of the Pocket Tester (YU-03112) to the pump relay coupler terminal (Blue/Black ⑤).
- Ground the negative lead ⑥ of the Pocket Tester to the engine.
- Turn the main switch to "ON" and engine stop switch to "RUN", then push the "START" switch.
- Measure the fuel pump input voltage.



0V AFTER ABOUT 30 SECONDS → Fuel fender is faulty. Replace it.

MORE THAN 0V AFTER ABOUT 30 SECONDS ↓


*
2. Check entire fuel system for connection.
• Refer to "WIRING DIAGRAM" section.
FAULTY
Correct.
OK
Fuel pump relay is faulty.
Replace it.

"FUEL" WARNING LIGHT DOES NOT COME ON.

1. "FUEL" warning light bulb conduct check
   - Check the "FUEL" warning light bulb condition. Refer to "LIGHTING SYSTEM" section.

FAULTY → "FUEL" warning light bulb is faulty. Replace it.

OK ↓

2. "FUEL" warning light bulb socket conduct check
   - Check the "FUEL" warning light bulb socket condition. Refer to "LIGHTING SYSTEM" section.

FAULTY → "FUEL" warning light bulb socket is faulty. Replace it.

OK ↓

3. Fuse inspection
   - Check the fuse condition. Refer to "CHAPTER 2. FUSE INSPECTION" section.

FAULTY → Fuse is faulty. Replace it.

OK ↓

4. Battery inspection
   - Check the battery condition. Refer to "CHAPTER 2. BATTERY INSPECTION" section.

FAULTY → Battery is faulty. Replace it.

OK ↓

*

*

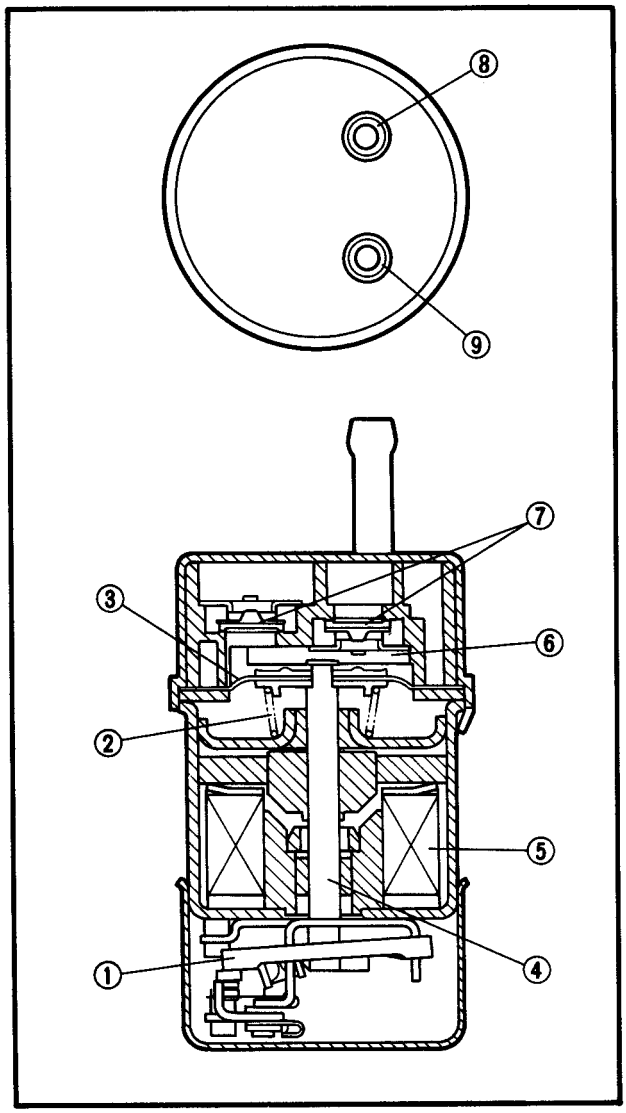
5. Fuel sender test
   - Disconnect the fuel sender coupler from the wireharness.
   - Connect the sender coupler terminals (Green ① and Black ② — Wireharness side) with the jumper lead ③.
   - Turn the main switch to "ON" and engine stop switch to "RUN", then push the "START" switch.
   - Check the "FUEL" warning light condition.

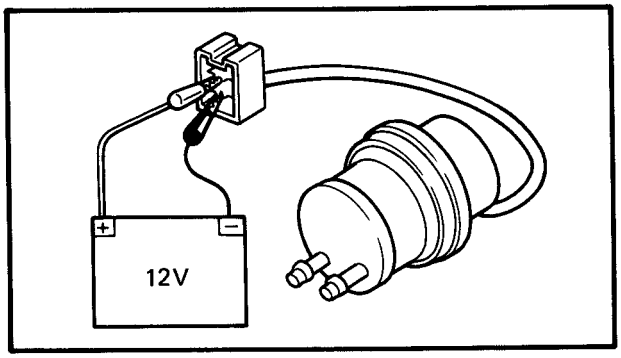
DOES NOT LIGHT → Check the main switch, engine stop switch and "START" switch. Refer to "SIGNAL SYSTEM" section.



LIGHTS ↓

Fuel sender is faulty. Replace it.





FUEL PUMP TEST

Operation

The diaphragm is pulled in by the plunger allowing fuel to be sucked into the fuel chamber. Fuel is pushed out from the pump until carb float chamber is filled with fuel, and then the cut-off switch cuts off the circuit.

When the spring pushes the diaphragm further to the end, the cut-off switch turns on and the solenoid coil pulls tha plunger with the diaphragm forcing fuel into the fuel chamber.

NOTE:

When the main and engine stop switches are ON, the fuel pump relay is activated for five (5) seconds at which time the fuel pump operates.

① Cut-out switch
② Spring
③ Diaphragm
④ Plunger
⑤ Solenoid coil
⑥ Fuel chamber
⑦ Valve
⑧ Outlet
⑨ Inlet

Inspection

1. Connect:
   - Battery (12V)
2. Inspect:
   - Fuel pump
     Cracks/Damage → Replace.
3. Check:
   - Fuel pump operation
     Faulty operation → Replace.

CHAPTER 7.
APPENDICES

SPECIFICATIONS 7-1
GENERAL SPECIFICATIONS 7-1
MAINTENANCE SPECIFICATIONS 7-3

GENERAL TORQUE SPECIFICATIONS 7-17

DEFINITION OF UNITS 7-17

LUBRICATION DIAGRAMS 7-18

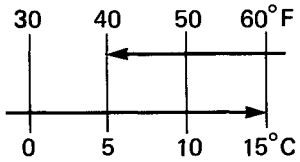
CABLE ROUTING 7-22

WIRING DIAGRAM

APPENDICES

SPECIFICATIONS

GENERAL SPECIFICATIONS

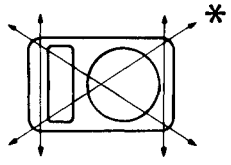
Model	XV535T/TC
Model Code Number Engine Starting Number Vehicle Identification Number	2GV 2GV-000101 XV535T: JYA2GV00 * HA000101 XV535TC: JYA2JU00 * HA000101
Dimensions: Overall Length Overall Width Overall Height Seat Height Wheelbase Minimum Ground Clearance	 2,210 mm (87.0 in) 815 mm (32.1 in) 1,100 mm (43.3 in) 700 mm (27.6 in) 1,511 mm (59.5 in) 145 mm (5.7 in)
Basic Weight: Weight Oil and Full Fuel Tank	 XV535T: 185 kg (408 lb) XV535TC: 186 kg (410 lb)
Minimum Turning Radius:	2,800 mm (110.2 in)
Engine: Engine Type Cylinder Arrangement Displacement Bore x Stroke Compression Ratio Compression Pressure Starting System	 Air cooled 4-stroke gasoline, SOHC V-2 cylinder 535 cm^3 76 x 59 mm (2.992 x 2.323 in) 9.0 : 1 1,000 kPa (10 kg/cm^2 , 142 psi) Electric starter
Lubrication System:	Wep sump
Oil Type or Grade: Engine Oil  Final Gear Oil	 Yamalube 4 or SAE 20W40 type SE motor oil (If temperature does not go below 5°C (40°F)) SAE 10W30 type SE motor oil (If temperature does not go above 15°C (60°F)) SAE 80 API "GL-4" Hypoid gear oil
Oil Capacity: Engine Oil: Periodic Oil Change With Oil Filter Replacement Total Amount Final Gear Case: Total Amount	 2.6 L (2.3 Imp qt, 2.7 US qt) 2.8 L (2.5 Imp qt, 3.0 US qt) 3.2 L (2.8 Imp qt, 3.4 US qt) 0.19 L (0.17 Imp qt, 0.20 US qt)
Air Filter:	Dry type element
Fuel: Type Tank Capacity: Total Reserve	 Regular gasoline 8.6 L (1.9 Imp gal, 2.3 US gal) 2.0 L (0.4 Imp gal, 0.5 US gal)

Model	XV535T/TC
Carburetor:	
Type/Manufacturer	BDS34 x 2/MIKUNI
Spark Plug:	
Type/Manufacturer	BP7ES/NGK, W22EP-U/NIPPONDENSO
Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
Clutch Type:	Wet, multiple-disc
Transmission:	
Primary Reduction System	Spar gear
Primary Reduction Ratio	70/36 (1.944)
Secondary Reduction System	Shaft drive
Secondary Reduction Ratio	19/18 x 32/11 (3.071)
Transmission Type	Constant mesh, 5-speed
Operation	Left foot operation
Gear Ratio:	
1st	38/14 (2.714)
2nd	38/20 (1.900)
3rd	35/24 (1.458)
4th	28/24 (1.166)
5th	29/30 (0.966)
Chassis:	
Frame Type	Pressed backbone
Caster Angle	31°
Trail	122 mm (4.8 in)
Tire:	
Type	With tube
Size (F)	3.00S-19 4PR BRIDGESTONE L303A/DUNLOP F14G
Size (R)	140/90-15 70S BRIDGESTONE G508/DUNLOP K425
Wear Limit	1.0 mm (0.04 in)
Tire Pressure (Cold Tire):	
Basic Weight:	
With Oil and Full Fuel Tank	XV535T: 185 kg (408 lb) XV535TC: 186 kg (410 lb)
Maximum Load*	XV535T: 230 kg (507 lb) XV535TC: 229 kg (505 lb)
Cold Tire Pressure:	FRONT / REAR
Up to 90 kg (198 lb) Load *	200 kPa (2.0 kg/cm², 28 psi) / 230 kPa (2.3 kg/cm², 32 psi)
90 kg (198 lb)*~ Maximum Load *	200 kPa (2.0 kg/cm², 28 psi) / 250 kPa (2.5 kg/cm², 36 psi)
High Speed Riding	200 kPa (2.0 kg/cm², 28 psi) / 250 kPa (2.5 kg/cm², 36 psi)
	* Load is the total weight of cargo, rider, passenger, and accessories.
Brake:	
Front	Single disc brake
Operation	Right hand operation
Rear	Drum brake
Operation	Right foot operation

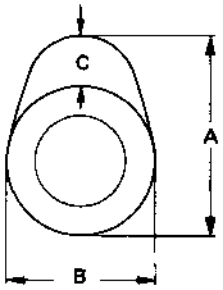
Model	XV535T/TC
Suspension:	
Front Suspension	Telescopic fork
Rear Suspension	Swing arm
Shock Absorber:	
Front Shock Absorber	Coil spring, Oil damper
Rear Shock Absorber	Gas/Coil spring, Oil damper
Wheel Travel:	
Front Wheel Travel	150 mm (5.9 in)
Rear Wheel Travel	85 mm (3.3 in)
Electrical:	
Ignition System	T.C.I.
Generator System	A.C. magneto generator
Battery Type or Model	GM12AZ-3A
Battery Capacity	12V 12AH
Headlight Type:	Bulb type
Bulb Wattage x Quantity:	
Headlight	12V, 60W/55W x 1
Tail/Brake Light	12V, 8W/27W x 2
Rear Flasher Light	12V, 27W x 2
Front Position Light/Front Flasher Light	12V, 8W/27W x 2
Indicator Light:	
"NEUTRAL"	12V, 3.4W x 1
"HIGH BEAM"	12V, 1.7W x 1
"TURN"	12V, 3.4W x 1
"FUEL"	12V, 3.4W x 1
Meter Light	12V, 3.4W x 1

MAINTENANCE SPECIFICATIONS

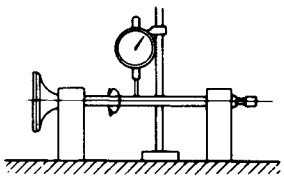
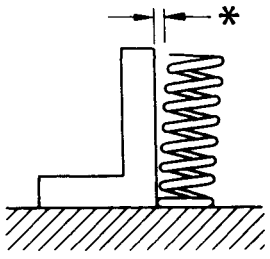
Engine

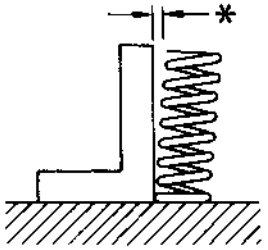
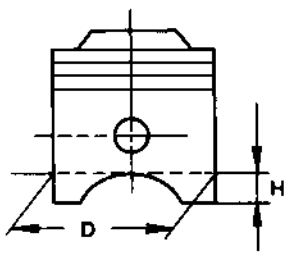
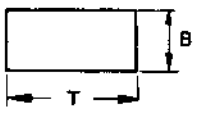
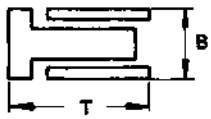
Model	XV535T/TC
Cylinder Head:	
Warp Limit* 	< 0.03 mm (0.0012 in) > * Lines indicate straight edge measurement.
Cylinder:	
Bore Size	75.98 ~ 76.02 mm (2.991 ~ 2.993 in)
Taper Limit	< 0.05 mm (0.002 in) >
Out of Round Limit	< 0.05 mm (0.002 in) >

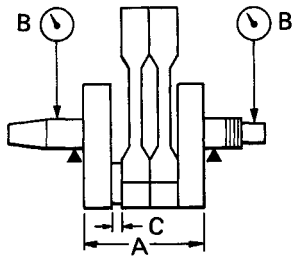
Model		XV535T/TC
Camshaft:		
Drive Method		Chain drive (Left and right)
Cam Cap Inside Dia.		28.00 ~ 28.02 mm (1.102 ~ 1.103 in)
Camshaft Outside Dia.		27.96 ~ 27.98 mm (1.100 ~ 1.102 in)
Shaft-to-Cap Clearance		0.020 ~ 0.061 mm (0.0008 ~ 0.0024 in)
Cam Dimensions:		
Intake:		
"A"		39.73 mm (1.564 in)
< Limit >		< 39.63 mm (1.560 in) >
"B"		32.22 mm (1.269 in)
< Limit >		< 31.22 mm (1.229 in) >
"C"		7.73 mm (0.304 in)
Exhaust:		
"A"		39.77 mm (1.566 in)
< Limit >		< 39.67 mm (1.562 in) >
"B"		32.30 mm (1.272 in)
< Limit >		< 31.30 mm (1.232 in) >
"C"		7.77 mm (0.306 in)
Camshaft Runout Limit		< 0.03 mm (0.0012 in) >
Rocker Arm and Rocker Arm Shaft:		
Rocker Arm Inside Diameter		14.000 ~ 14.018 mm (0.5512 ~ 0.5519 in)
< Limit >		< 14.078 mm (0.5543 in) >
Shaft Outside Diameter		13.980 ~ 13.991 mm (0.5504 ~ 0.5508 in)
< Limit >		< 13.950 mm (0.5492 in) >
Arm-to-Shaft Clearance		0.009 ~ 0.038 mm (0.0004 ~ 0.0015 in)
< Limit >		< 0.08 mm (0.0032 in) >
Cam Chain:		
Cam Chain Type/No. of Links		SILENT CHAIN/118
Cam Chain Adjustment Method		Automatic
Valve, Valve Seat, Valve Guide:		
Valve Clearance (Cold):	IN.	0.07 ~ 0.12 mm (0.003 ~ 0.005 in)
	EX.	0.12 ~ 0.17 mm (0.005 ~ 0.007 in)
Valve Dimensions:		
"A" Head Dia.	IN.	36.9 ~ 37.1 mm (1.453 ~ 1.461 in)
	EX.	31.9 ~ 32.1 mm (1.256 ~ 1.264 in)
"B" Face Width	IN.	2.3 mm (0.09 in)
	EX.	2.3 mm (0.09 in)
"C" Seat Width	IN.	1.0 ~ 1.2 mm (0.04 ~ 0.05 in)
	EX.	1.0 ~ 1.2 mm (0.04 ~ 0.05 in)
< Limit >	IN.	< 1.4 mm (0.055 in) >
	EX.	< 1.4 mm (0.055 in) >





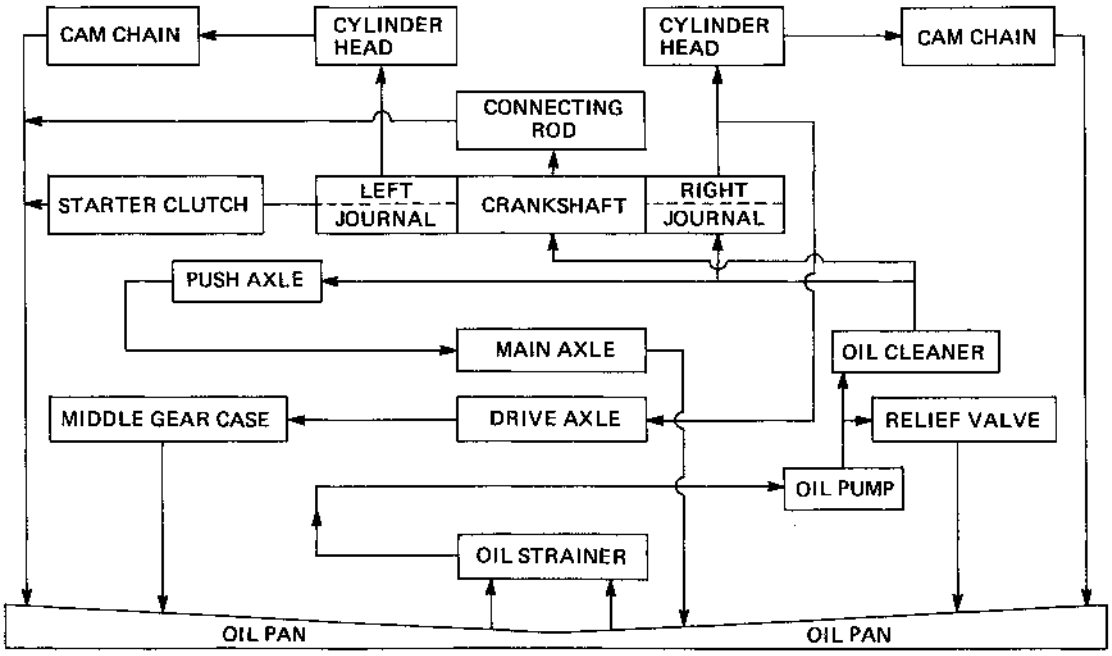
Model		XV535T/TC
"D" Margin Thickness	IN.	1.0 ~ 1.4 mm (0.04 ~ 0.06 in)
	EX.	1.0 ~ 1.4 mm (0.04 ~ 0.06 in)
< Limit >	IN.	< 0.7 mm (0.028 in) >
	EX.	< 0.7 mm (0.028 in) >
Stem Outside Dia.	IN.	6.975 ~ 6.990 mm (0.274 ~ 0.275 in)
	EX.	6.960 ~ 6.975 mm (0.273 ~ 0.274 in)
< Limit >	IN.	< 6.945 mm (0.273 in) >
	EX.	< 6.920 mm (0.272 in) >
Guide Inside Dia.	IN.	7.000 ~ 7.012 mm (0.275 ~ 0.276 in)
	EX.	7.000 ~ 7.012 mm (0.275 ~ 0.276 in)
< Limit >	IN.	< 7.05 mm (0.278 in) >
	EX.	< 7.05 mm (0.278 in) >
Stem-to-Guide Clearance	IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
	EX.	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
< Limit >	IN.	< 0.08 mm (0.0031 in) >
	EX.	< 0.10 mm (0.0039 in) >
Stem Runout Limit		< 0.03 mm (0.0012 in) >
		
Valve Spring:		
Inner Spring:		
Free Length	IN.	39.9 mm (1.571 in)
	EX.	39.9 mm (1.571 in)
< Limit >	IN.	< 37.7 mm (1.48 in) >
	EX.	< 37.7 mm (1.48 in) >
Set Length (Valve Closed)	IN.	34.1 mm (1.343 in)
	EX.	34.1 mm (1.343 in)
Compressed Pressure (Installed)	IN.	9.5 ~ 11.1 kg (21.0 ~ 24.5 lb)
	EX.	9.5 ~ 11.1 kg (21.0 ~ 24.5 lb)
Tilt Limit *	IN.	< 2.5°/1.7 mm (0.067 in) >
	EX.	< 2.5°/1.7 mm (0.067 in) >
		
Direction of Winding	IN.	Left
	EX.	Left
Outer Spring:		
Free Length	IN.	43.6 mm (1.717 in)
	EX.	43.6 mm (1.717 in)
< Limit >	IN.	< 41.4 mm (1.630 in) >
	EX.	< 41.4 mm (1.630 in) >
Set Length (Valve Closed)	IN.	37.1 mm (1.46 in)
	EX.	37.1 mm (1.46 in)

Model		XV535T/TC
Compressed Pressure (Installed)	IN.	18.7 ~ 21.9 kg (41.2 ~ 48.3 lb)
	EX.	18.7 ~ 21.9 kg (41.2 ~ 48.3 lb)
Tilt Limit *	IN.	< 2.5°/1.9 mm (0.075 in) >
	EX.	< 2.5°/1.9 mm (0.075 in) >
Direction of Winding	IN.	Right
	EX.	Right
Piston:		
Piston Clearance		0.035 ~ 0.055 mm (0.0014 ~ 0.0022 in)
< Limit >		< 0.1 mm (0.004 in) >
Piston Size "D"		75.92 ~ 75.97 mm (2.989 ~ 2.991 in)
Measuring Point "H"		3.5 mm (0.14 in)
		
Oversize:	2nd	76.50 mm (3.012 in)
	4th	77.00 mm (3.031 in)
Piston Ring:		
Top Ring:		
		
Type		Plain
Dimensions (B x T)		1.2 x 2.9 mm (0.05 ~ 0.11 in)
End Gap (Installed)		0.30 ~ 0.45 mm (0.012 ~ 0.018 in)
< Limit >		< 0.7 mm (0.028 in) >
Side Clearance (Installed)		0.03 ~ 0.07 mm (0.001 ~ 0.003 in)
< Limit >		< 0.12 mm (0.005 in) >
2nd Ring:		
		
Type		Taper
Dimensions (B x T)		1.5 x 3.2 mm (0.06 ~ 0.13 in)
End Gap (Installed)		0.30 ~ 0.45 mm (0.012 ~ 0.018 in)
< Limit >		< 0.8 mm (0.031 in) >
Side Clearance		0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
< Limit >		< 0.12 mm (0.005 in) >
Oil Ring:		
		
Dimensions (B x T)		2.5 x 3.1 mm (0.10 ~ 0.12 in)
End Gap (Installed)		0.2 ~ 0.8 mm (0.008 ~ 0.031 in)
Connecting Rod:		
Oil Clearance		0.026 ~ 0.050 mm (0.001 ~ 0.002 in)
Bearing Color Code		1. Blue 2. Black 3. Brown 4. Green

Model		XV535T/TC
Crankshaft:		
		
Crank Width "A"		93.95 ~ 94.00 mm (3.699 ~ 3.701 in)
Runout Limit "B"		< 0.03 mm (0.0012 in) >
Big End Side Clearance "C"		0.27 ~ 0.42 mm (0.011 ~ 0.017 in)
Journal Oil Clearance		0.020 ~ 0.052 mm (0.0008 ~ 0.0020 in)
Bearing Color Code		1. Blue 2. Green
Clutch:		
Friction Plate:	Thickness	2.9 ~ 3.1 mm (0.114 ~ 0.122 in)
	Quantity	6 pcs.
	Wear Limit	< 2.6 mm (0.102 in) >
Clutch Plate:	Thickness	1.5 ~ 1.7 mm (0.060 ~ 0.067 in)
	Quantity	5 pcs.
	Warp Limit	< 0.2 mm (0.008 in) >
Clutch Spring:	Free Length	39.5 mm (1.56 in)
	Quantity	5 pc.
	Minimum Length	< 38.5 mm (1.52 in) >
Push Rod Bending Limit		< 0.5 mm (0.02 in) >
Transmission:		
Main Axle Deflection Limit		< 0.08 mm (0.0031 in) >
Drive Axle Deflection Limit		< 0.08 mm (0.0031 in) >
Shifter:		
Shifter Type		Guide Bar
Guide Bar Bending Limit		< 0.025 mm (0.001 in) >
Carburetor:		
I.D. Mark		2GV00 FOR CALIFORNIA: 2JU00
Main Jet	(M.J.)	#137.5
Main Air Jet	(M.A.J.)	#140
Jet Needle	(J.N.)	FRONT: 5DZ7-1 REAR: 5DZ8-1
Needle Jet	(N.J.)	Y-0
Pilot Jet	(P.J.)	#32.5
Pilot Air Jet	(P.A.J. 1)	#60
	(P.A.J. 2)	#160
Pilot Screw	(P.S.)	Preset
Pilot Outlet	(P.O.)	ϕ0.95
Bypass	(B.P. 1)	ϕ0.8
	(B.P. 2)	ϕ0.8
Valve Seat Size	(V.S.)	ϕ1.5
Starter Jet	(G.S.)	#40
Fuel Level		13.5 ~ 14.5 mm (0.53 ~ 0.57 in)
Engine Idling Speed		1.150 ~ 1.250 r/min
Vacuum Pressure at Idling Speed		Above 30.6 kPa (230 mmHg, 9.06 inHg)
Vacuum Synchronous Difference		Below 1.3 kPa (10 mmHg, 0.39 inHg)

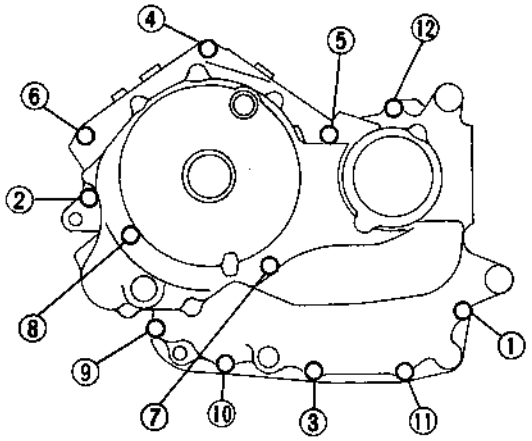
Model	XV535T/TC
Fuel Pump:	
Type	Electrical type
Consumption Amperage (Max.)	0.8A
Out-put Pressure	8.3 ~ 12.6 kPa (0.085 ~ 0.125 kg/cm², 1.21 ~ 1.78 psi)
Lubrication System:	
Oil Filter Type	Paper type
Oil Pump Type:	Trochoid type
Tip Clearance	0 ~ 0.12 mm (0 ~ 0.005 in)
< Limit >	< 0.17 mm (0.007 in) >
Side Clearance	0.03 ~ 0.08 mm (0.001 ~ 0.003 in)
< Limit >	< 0.08 mm (0.003 in) >
Relief Valve Operating Pressure	441 ~ 539 kPa (4.5 ~ 5.5 kg/cm², 64 ~ 78 psi)
Shaft Drive:	
Middle Gear Backlash	0.05 ~ 0.10 mm (0.002 ~ 0.004 in)
Final Gear Backlash	0.1 ~ 0.2 mm (0.004 ~ 0.008 in)

Lubrication Chart:

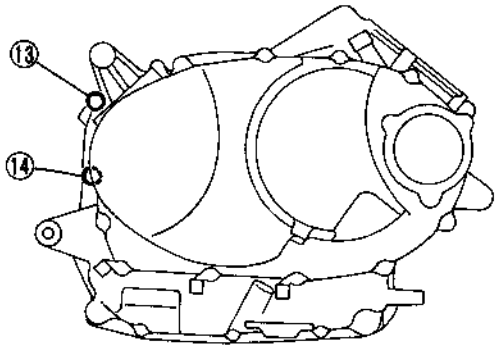


Crankcase Tightening Sequence:

LEFT-CASE



RIGHT-CASE

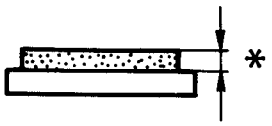


TIGHTENING TORQUE

Parts to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
Cylinder Head	Nut	M10 x 1.25	8	35	3.5	25	
	Flange nut	M8 x 1.25	2	20	2.0	14	
	Bolt	M8 x 1.25	4	20	2.0	14	
	Bolt	M16 x 1.25	4	38	3.8	27	
Cylinder Head (Exhaust pipe)	Stud bolt	M8 x 1.25	4	13	1.3	8.4	
Cylinder Head (Tappet Cover)	Bolt	M6 x 1.0	8	10	1.0	7.2	
Cylinder Head (Side Cover)	Bolt	M6 x 1.0	8	10	1.0	7.2	
Cam Sprocket Cover	Bolt	M6 x 1.0	4	10	1.0	7.2	
Rocker Arm Shaft Stopper	Bolt	M8 x 1.25	4	20	2.0	14	Use lock washer
Spark Plug	—	M14 x 1.25	2	20	2.0	14	
Cylinder	Bolt	M8 x 1.25	2	10	1.0	7.2	
Connecting Rod	Nut	M8 x 0.75	4	36	3.6	25	M
Flywheel	Bolt	M10 x 1.25	1	80	8.0	58	
Valve Adjusting Locknut	Nut	M6 x 1.0	4	14	1.4	10	
Cam Sprocket	Bolt	M10 x 1.25	2	55	5.5	40	
Cam Chain Tensioner	Bolt	M6 x 1.0	4	12	1.2	8.7	
Cam Chain Damper Stopper	Bolt	M6 x 1.0	4	10	1.0	7.2	
Oil Pump	Bolt	M6 x 1.0	3	7	0.7	5.1	
Oil Strainer Cover	Bolt	M6 x 1.0	3	10	1.0	7.2	
Oil Filter Cover	Bolt	M6 x 1.0	3	10	1.0	7.2	
Carburetor Joint	Bolt	M6 x 1.0	4	12	1.2	8.7	
Air Filter Element	Screw	M6 x 1.0	1	7	0.7	5.1	
Front Side Cover	Bolt	M6 x 1.0	2	10	1.0	7.2	
Sidestand	Stud bolt	M19 x 1.25	1	20	2.0	14	
Exhaust pipe	Nut	M8 x 1.25	4	20	2.0	14	
Exhaust pipe (Rear joint)	Bolt	M6 x 1.0	2	10	1.0	7.2	
Crankcase	Stud bolt	M10 x 1.25	8	20	2.0	14	
	Stud bolt	M8 x 1.25	2	13	1.3	9.4	
	Bolt	M8 x 1.25	2	24	2.4	17	
	Bolt	M6 x 1.0	9	10	1.0	7.2	
Bearing Stopper (Drive Axle)	Screw	M8 x 1.25	4	25	2.5	18	Stake S
Crankcase Cover (Left)	Bolt	M6 x 1.0	10	10	1.0	7.2	
Crankcase Cover (Right)	Bolt	M5 x 1.0	11	10	1.0	7.2	
Starter Clutch	Bolt	M8 x 1.25	3	20	2.0	14	Stake S
Primary Drive Gear	Nut	M16 x 1.0	1	70	7.0	50	Use lock washer
Clutch Pressure Plate	Screw	M6 x 1.0	5	8	0.8	5.8	
Clutch Adjuster Locknut	Nut	M6 x 1.0	1	8	0.8	5.8	
Clutch Boss	Nut	M20 x 1.0	1	70	7.0	50	Use lock washer
Clutch Push Lever	Screw	M8 x 1.0	1	12	1.2	8.7	
Middle Drive Gear	Nut	M20 x 1.0	1	120	12.0	85	Stake
Universal Joint	Nut	M14 x 1.5	1	90	9.0	65	S
Bearing Housing (Middle Driven Shaft)	Bolt	M8 x 1.25	4	25	2.5	18	
Cam Shaft Segment	Screw	M5 x 0.8	1	4	0.4	2.9	S
Change Pedal	Bolt	M6 x 1.0	1	10	1.0	7.2	
Bearing Housing (Ring Gear)	Bolt	M10 x 1.25	2	23	2.3	17	
	Bolt	M8 x 1.25	6	23	2.3	17	
Shift Lever	Screw	M8 x 1.25	1	22	2.2	16	Use lock washer S
Muffler Chamber	Bolt	M8 x 1.25	1	20	2.0	14	
	Nut	M8 x 1.25	1	20	2.0	14	
Engine Stay	Nut	M10 x 1.25	8	55	5.5	40	
Stator	Screw	M6 x 1.0	3	7	0.7	5.1	
Pickup Coil	Screw	M6 x 1.0	3	7	0.7	5.1	

Chassis

Model		XV535T/TC
Steering System:		
Steering Bearing Type		Ball bearing
Number/Size of Steel Ball:	Upper	19 pcs./1/4 in
	Lower	19 pcs./1/4 in
Front Suspension:		
Front Fork Travel		150 mm (5.91 in)
Fork Spring Free Length		531.6 mm (20.9 in)
< Limit >		< 526.6 mm (20.7 in) >
Spring Rate:	K1	3.43 N/mm (0.35 kg/mm, 19.6 lb/in)
	K2	5.20 N/mm (0.53 kg/mm, 29.7 lb/in)
Stroke:	K1	0 ~ 65 mm (0 ~ 2.56 in)
	K2	65 ~ 150 mm (2.56 ~ 5.91 in)
Optional Spring		No.
Oil Capacity		228 cm^3 (8.03 Imp oz, 7.71 US oz)
Oil Level		176 mm (6.93 in) From top of fully compressed inner tube without fork spring
Oil Grade		Yamaha fork oil 10wt or equivalent
Rear Suspension:		
Shock Absorber Travel		70 mm (2.76 in)
Spring Free Length		266 mm (10.5 in)
< Limit >		< 261 mm (10.3 in) >
Fitting Length		229 mm (9.01 in)
Spring Rate:	K1	13.7 N/mm (1.4 kg/mm, 78.4 lb/in)
	K2	24.5 N/mm (2.5 kg/mm, 140 lb/in)
Stroke:	K1	0 ~ 34.5 mm (0 ~ 1.36 in)
	K2	34.5 ~ 70.0 mm (1.36 ~ 2.76 in)
Optional Spring		No.
Enclosed Gas Pressure (Standard)		490 kPa (5.0 kg/cm^2, 71 psi)
< Min. ~ Max. >		< 490 ~ 686 kPa (5.0 ~ 7.0 kg/cm^2, 71 ~ 100 psi) >
Swingarm:		
Swingarm Free Play Limit:	End	< 1 mm (0.04 in) >
Front Wheel:		
Type		Spoke wheel
Rim Size		MT1.85 x 19
Rim Material		Steel
Rim Runout Limit:	Vertical	< 2 mm (0.08 in) >
	Lateral	< 2 mm (0.08 in) >
Rear Wheel:		
Type		Spoke wheel
Rim Size		MT3.00 x 15
Rim Material		Steel
Rim Runout Limit:	Vertical	< 2 mm (0.08 in) >
	Lateral	< 2 mm (0.08 in) >

Model	XV535T/TC
Front Disc Brake:	
Type	Single
Disc Outside Diameter x Thickness	298 x 5 mm (11.7 x 0.2 in)
Pad Thickness	6.2 mm (0.26 in)
< Limit > *	< 0.8 mm (0.03 in) >
	
Master Cylinder Inside Diameter	14 mm (0.55 in)
Caliper Cylinder Inside Diameter	45.4 mm (1.79 in)
Brake Fluid Type	DOT #3
Rear Drum Brake:	
Type	Leading and trailing
Drum Inside Diameter	200 mm (7.87 in)
< Limit >	< 201 mm (7.91 in) >
Lining Thickness	4 mm (0.16 in)
< Limit >	< 2 mm (0.08 in) >
Brake Lever and Brake Pedal:	
Brake Lever Free Play	2 ~ 5 mm (0.08 ~ 0.20 in)
Brake Pedal Position	38 mm (1.50 in)
Brake Pedal Free Play	20 ~ 30 mm (0.8 ~ 1.2 in)

TIGHTENING TORQUE:

Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Front Wheel Axle	M14 x 1.5	58	5.8	42	
Front Axle Pinch Bolt	M8 x 1.25	20	2.0	14	
Under Bracket and Inner Tube	M12 x 1.25	38	3.8	27	
Front Fender and Front Fork	M8 x 1.25	10	1.0	7.2	
Front Brake Caliper and Front Fork	M10 x 1.25	35	3.5	25	
Under Bracket and Clamp	M6 x 1.0	7	0.7	5.1	
Headlight Stay and Under Bracket	M6 x 1.0	7	0.7	5.1	
Headlight Stay and Headlight (Lower)	M8 x 1.25	16	1.6	11	
Handle Crown and Inner Tube	M8 x 1.25	20	2.0	14	
Handle Crown and Steering Shaft	M14 x 1.25	54	5.4	39	
Steering Shaft and Ring Nut	M25 x 1.0	38	3.8	27	See NOTE
Handle Crown and Handlebar Holder (Lower)	M8 x 1.25	20	2.0	14	
Handlebar and Handlebar Holder (Upper)	M8 x 1.25	20	2.0	14	
Speedometer and Handle Crown	M6 x 1.0	7	0.7	5.1	
Headlight (Upper) and Meter Stay	M6 x 1.0	7	0.7	5.1	
Headlight Stay and Flasher Light Stay	M12 x 1.25	20	2.0	14	
Front Brake Disc and Hub	M8 x 1.25	20	2.0	14	Use lock washer 5
Front Brake Hose and Caliper	M10 x 1.25	26	2.6	19	
Front Brake Bleed Screw	M8 x 1.25	6	0.6	4.3	
Master Cylinder and Brake Hose	M10 x 1.25	26	2.6	19	
Master Cylinder and Bracket	M6 x 1.0	9	0.9	6.5	
Horn and Frame	M6 x 1.0	7	0.7	5.1	
Cylinder Stud Bolt and Engine Stay (Front)	M10 x 1.25	55	5.5	40	
Engine Stay (Front) and Ignition Coil Stay	M6 x 1.0	7	0.7	5.1	
Ignition Coil and Coil Stay	M6 x 1.0	7	0.7	5.1	
Engine Stay (Front) and Frame	M10 x 1.25	55	5.5	40	
Top Cover and Frame	M6 x 1.0	7	0.7	5.1	
Engine Stay (Rear) and Frame	M10 x 1.25	55	5.5	40	
Engine Mounting (Rear-Top) and Frame	M10 x 1.25	55	5.5	40	
Engine Mounting (Rear-Bottom) and Frame	M12 x 1.25	70	7.0	50	
Main Switch and Frame	M8 x 1.25	20	2.0	14	
Regulator and Frame	M6 x 1.0	7	0.7	5.1	
Rear-Under-Side Cover (Top) and Frame	M6 x 1.0	7	0.7	5.1	
Rear-Under-Side Cover (Bottom) and Frame	M12 x 1.25	20	2.0	14	
Engine and Footrest Bar (Front)	M10 x 1.25	55	5.5	40	
Engine and Footrest Bar (Rear)	M10 x 1.25	55	5.5	40	
Footrest and Footrest Bar	M10 x 1.25	45	4.5	32	
Brake Pedal Adjuster Locknut	M6 x 1.0	7	0.7	5.1	
Sidestand	M10 x 1.25	26	2.6	19	
Rear Footrest and Frame	M10 x 1.25	45	4.5	32	
Pivot Shaft and Swingarm	M16 x 1.5	75	7.5	54	
Tank Bracket and Frame	M6 x 1.0	7	0.7	5.1	
Pump Bracket and Fuel Tank	M6 x 1.0	7	0.7	5.1	
Fuel Tank (Rear-Top) and Frame	M6 x 1.0	9	0.9	6.5	
Battery Box and Frame	M6 x 1.0	7	0.7	5.1	
Rear Stay and Frame	M8 x 1.25	20	2.0	14	
Rear Shock Absorber Cover and Frame	M8 x 1.25	9	0.9	6.5	
Seatlock and Seat	M6 x 1.0	7	0.7	5.1	
Seat and Frame	M6 x 1.0	7	0.7	5.1	

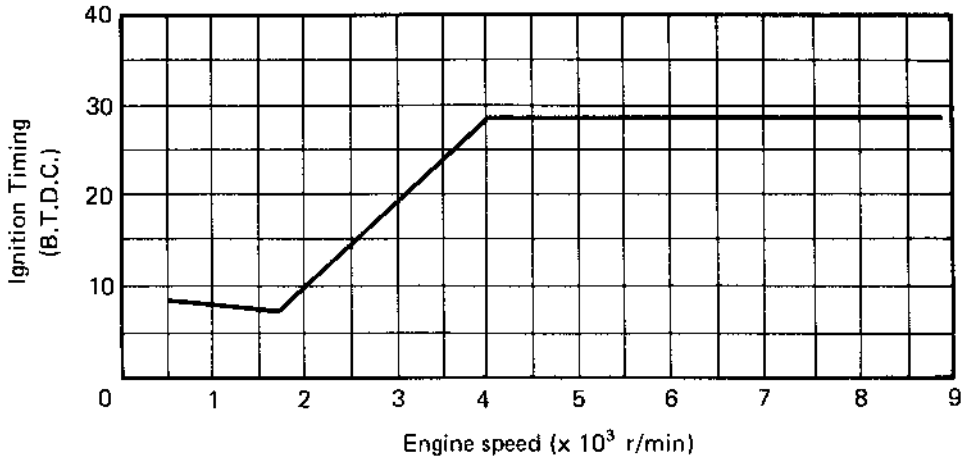
Part to be tightened	Thread size	Tightening torque			Remarks
		Nm	m·kg	ft·lb	
Rear Shock Absorber and Frame	M8 x 1.25	20	2.0	14	
Rear Shock Absorber and Swingarm	M10 x 1.25	30	3.0	22	
Rear Shock Absorber and Shaft Drive Housing	M10 x 1.25	30	3.0	22	
Swingarm and Shaft Drive Housing	M10 x 1.25	42	4.2	30	
Rear Wheel Axle	M14 x 1.5	105	10.5	75	
Rear Wheel Pinch Bolt	M8 x 1.25	16	1.6	11	
Rear Wheel Hub and Clutch Hub	M10 x 1.25	69	6.9	50	
Rear Fender (Front) and Frame	M6 x 1.0	7	0.7	5.1	
Rear Fender (Rear) and Frame	M8 x 1.25	16	1.6	11	
Rear Fender and Flasher Light Stay	M12 x 1.25	20	2.0	14	
Rear Fender and Taillight	M6 x 1.0	7	0.7	5.1	
Rear Fender and Licence Bracket	M6 x 1.0	7	0.7	5.1	
Tension Bar and Swingarm	M8 x 1.25	20	2.0	14	
Tension Bar and Brake Shoe Plate	M8 x 1.25	20	2.0	14	
Drain Plug (Final Gear)	M14 x 1.5	23	2.3	17	
Filler Plug (Final Gear)	M14 x 1.5	23	2.3	17	

NOTE:

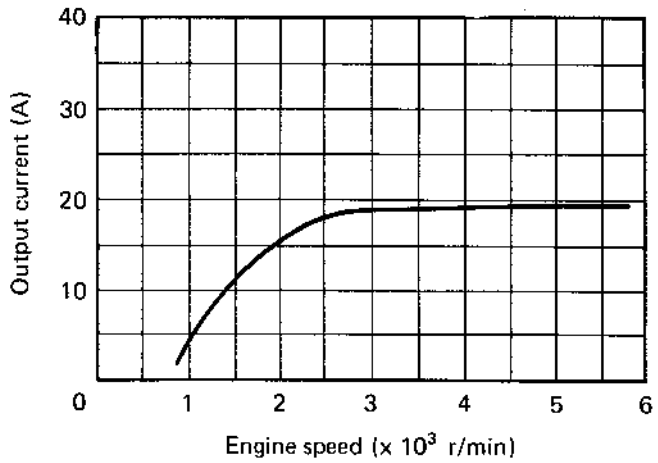
1. First, tighten the ring nut approximately 38 Nm (3.8 m·kg, 27 ft·lb) by using the torque wrench, then loosen the ring nut one turn.
2. Retighten the ring nut 10 Nm (1.0 m·kg, 7.2 ft·lb).

Electrical

Model	XV535T/TC
Voltage:	12V
Ignition System: Ignition Timing (B.T.D.C.) Advanced Timing (B.T.D.C.) Advancer Type	 8° at 1,200 r/min 29° at 4,200 r/min Electrical



T.C.I.: Pickup Coil Resistance (Color) T.C.I. Unit-Model/Manufacturer	 140 ~ 170Ω at 20°C (68°F) (Brown — Green) (Red — Blue) J4T020/MITSUBISHI
Ignition Coil: Model/Manufacturer Primary Winding Resistance Secondary Winding Resistance	 F6T507/MITSUBISHI 3.8 ~ 4.6Ω at 20°C (68°F) 10.6 ~ 15.8 kΩ at 20°C (68°F)
Charging System/Type:	A.C. magneto generator
A.C. Generator: Model/Manufacturer Nominal Output	 F3T438/MITSUBISHI 14V, 20A at 5,000 r/min



Stator Coil Resistance	0.34 ~ 0.42Ω at 20°C (68°F) (White — White)

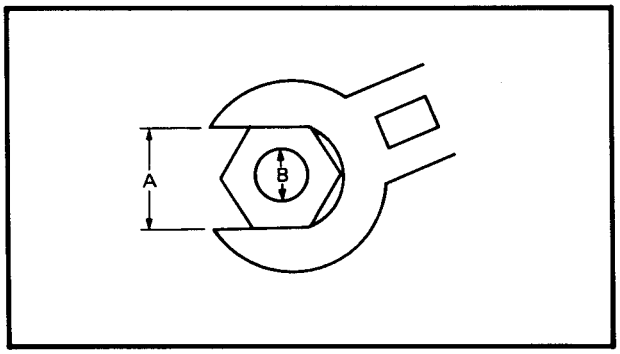
Model	XV535T/TC
Voltage Regulator:	
Type	Short control
Model/Manufacture	SH569/SHINDENGEN
No Load Regulated Voltage	14 ~ 15V
Rectifier:	
Model/Manufacturer	SH569/SHINDENGEN
Capacity	25A
Withstand Voltage	200V
Battery:	
Capacity:	12V, 12AH
Specific Gravity	1.280
Electric Starter System:	
Type	Constant mesh type
Starter Motor:	
Model/Manufacturer	SM-8219/MITSUBA
Output	0.6 kW
Bush:	
Overall Length	12 mm (0.47 in)
< Limit >	< 5.0 mm (0.20 in) >
Spring Pressure	520 ~ 920 g (18.3 ~ 32.4 oz)
Commutator:	
Outside Diameter	28 mm (1.1 in)
< Wear Limit >	< 27 mm (1.06 in) >
Mica Undercut	1.6 mm (0.063 in)
Starter Relay:	
Model/Manufacturer	A104-132/HITACHI
Amperage Rating	100A
Coil Winding Resistance	3.0 ~ 3.7Ω at 20°C (68°F)
Horn:	
Type/Quantity	Plain type x 1
Model/Manufacturer	YF-12/NIKKO
Maximum Amperage	2.5A
Flasher Relay:	
Type	Semi transister type
Model/Manufacturer	FX257N/NIPPONDENSO
Self Cancelling Device	Yes.
Flasher Frequency	75 ~ 95 cycle/min
Wattage	27W x 2 + 3.4W
Self Cancelling Unit:	
Model/Manufacturer	FX257N/NIPPONDENSO
Fuel Gauge:	
Model/Manufacturer	2GV/NIPPONSEIKI
Sender Unit Resistance (Full)	0.7 ~ 1.1 kΩ at 20°C (68°F)
Sidestand Relay:	
Model/Manufacturer	4U8-01/OMRON
Coil Winding Resistance	68 ~ 83Ω at 20°C (68°F)
Diode	No.

Model	XV535T/TC
Starting Circuit Cut-off Relay:	
Model/Manufacturer	FX257N/NIPPONDENSO
Coil Winding Resistance	202 ~ 248Ω at 20°C (68°F)
Diode	No
Fuel Pump Relay:	
Model/Manufacturer	G8D-04Y/OMRON
Circuit Breaker:	
Type	Fuse
Amperage for Individual Circuit x Quantity:	
Main	20A x 1
Headlight	10A x 1
Signal	10A x 1
Ignition	10A x 1
Reserve	20A x 1
	10A x 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 multifastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

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



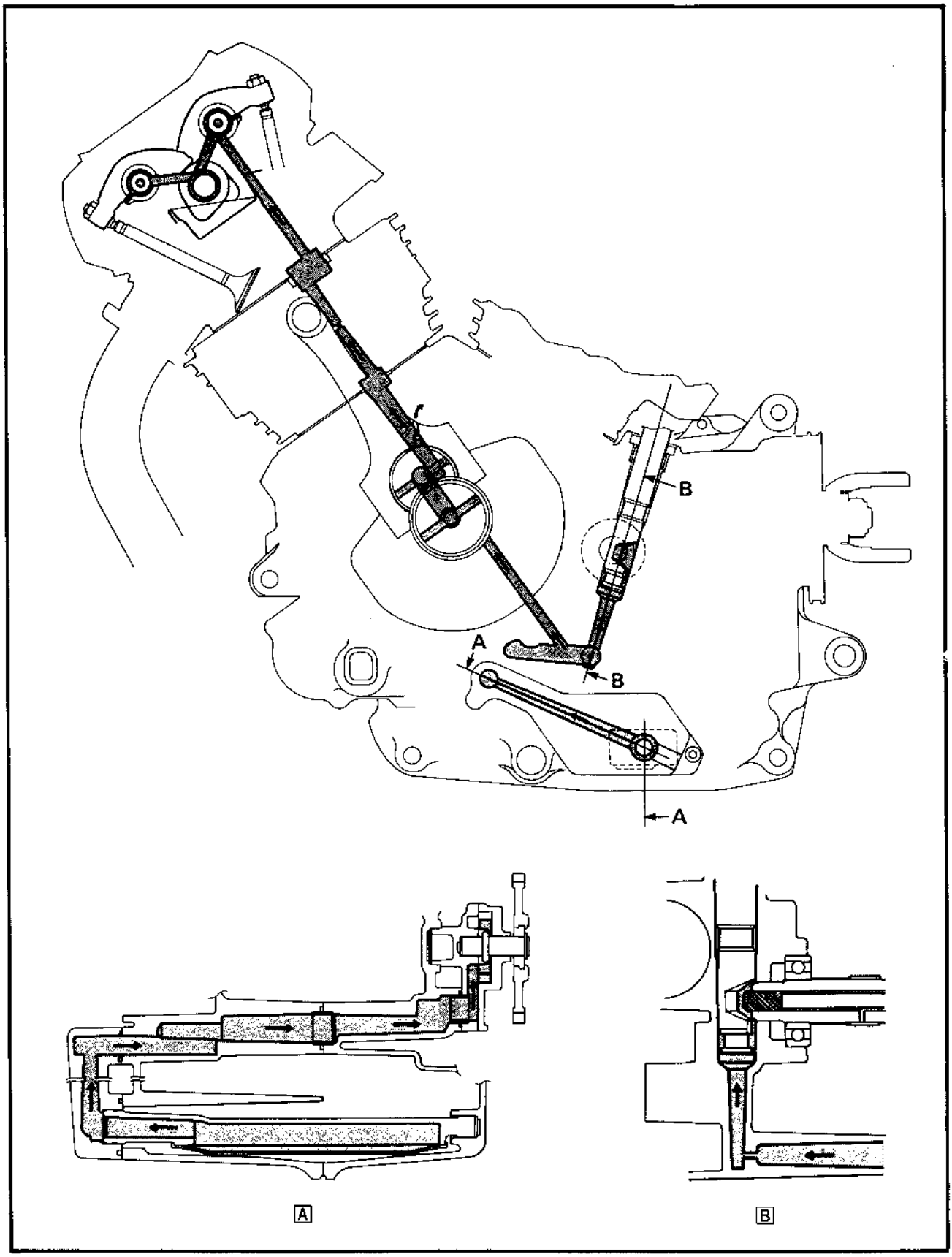
A: Distance across flats
B: Outside thread diameter

DEFINITION OF UNITS

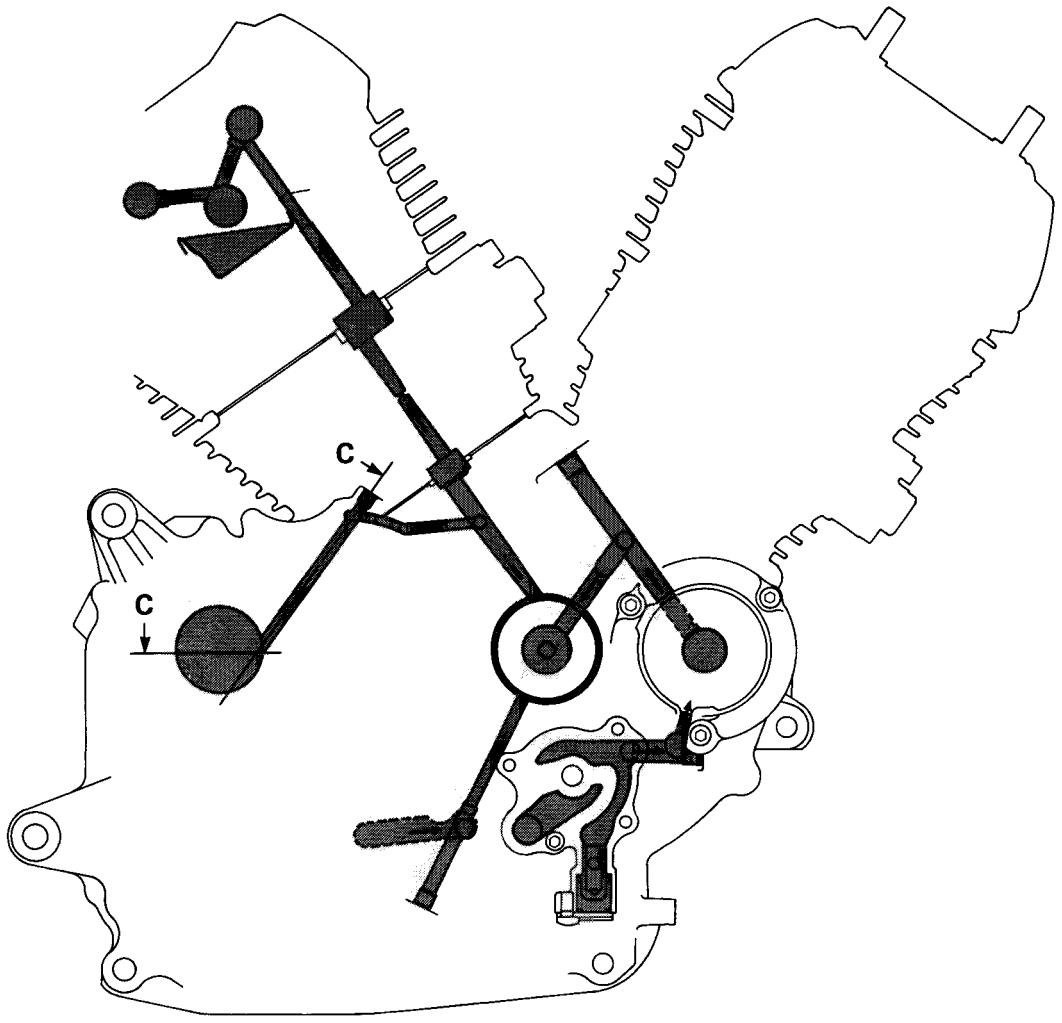
Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1kg x m/sec^2	Force
Nm m·kg	Newton meter Meter kilogram	N x m m x kg	Torque Torque
Pa N/mn	Pascal Newton per millimeter	N/m^2 N/mn	Pressure Spring rate
L cm^3	Liter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

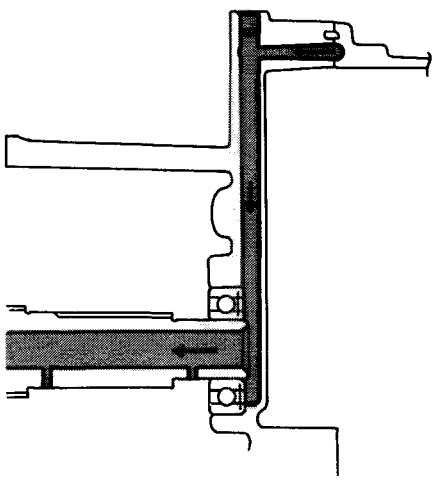
LUBRICATION DIAGRAMS

[A] Section A – A
[B] Section B – B

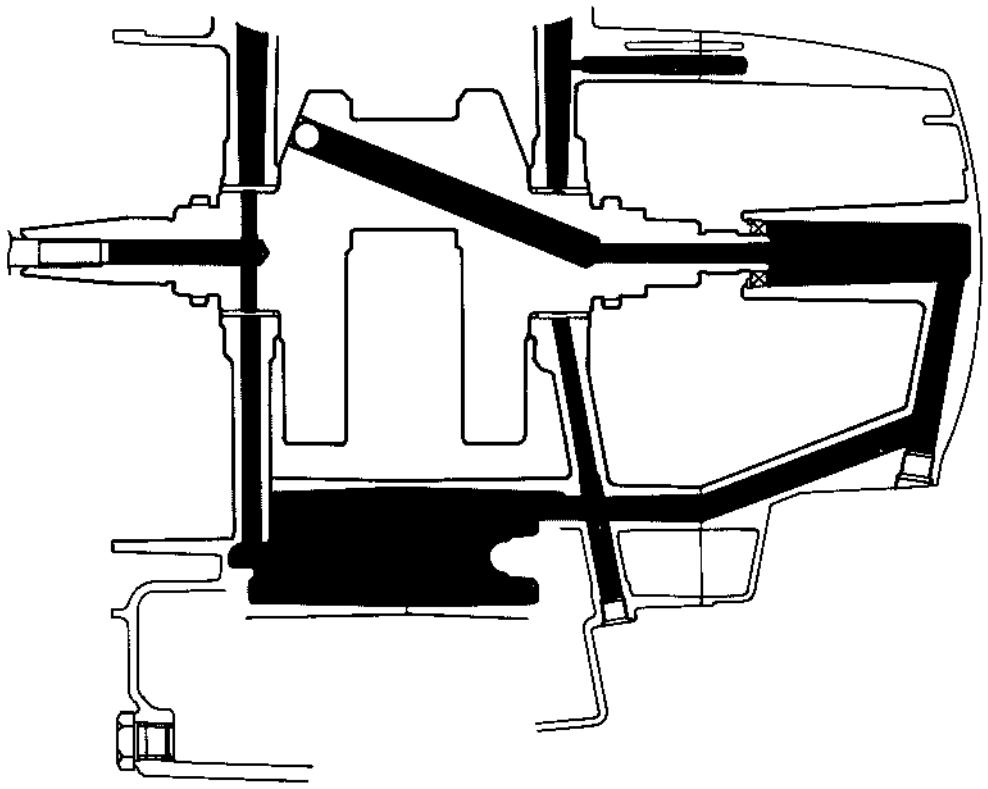


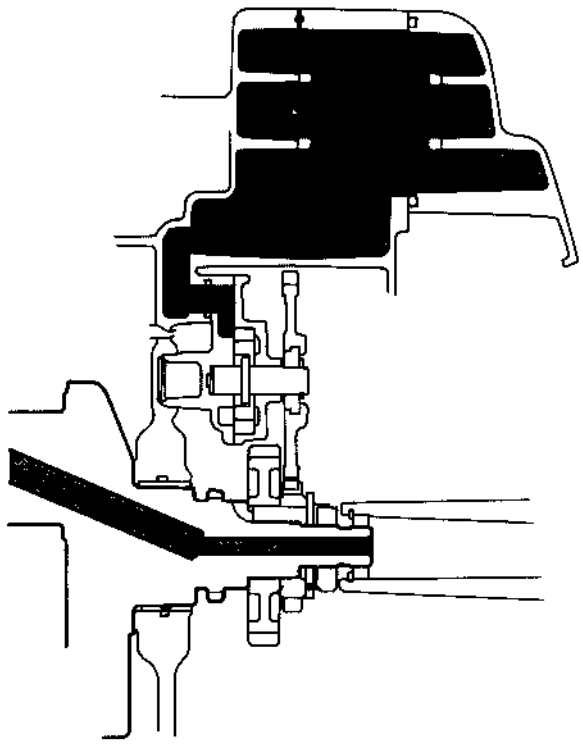
[C] Section C – C

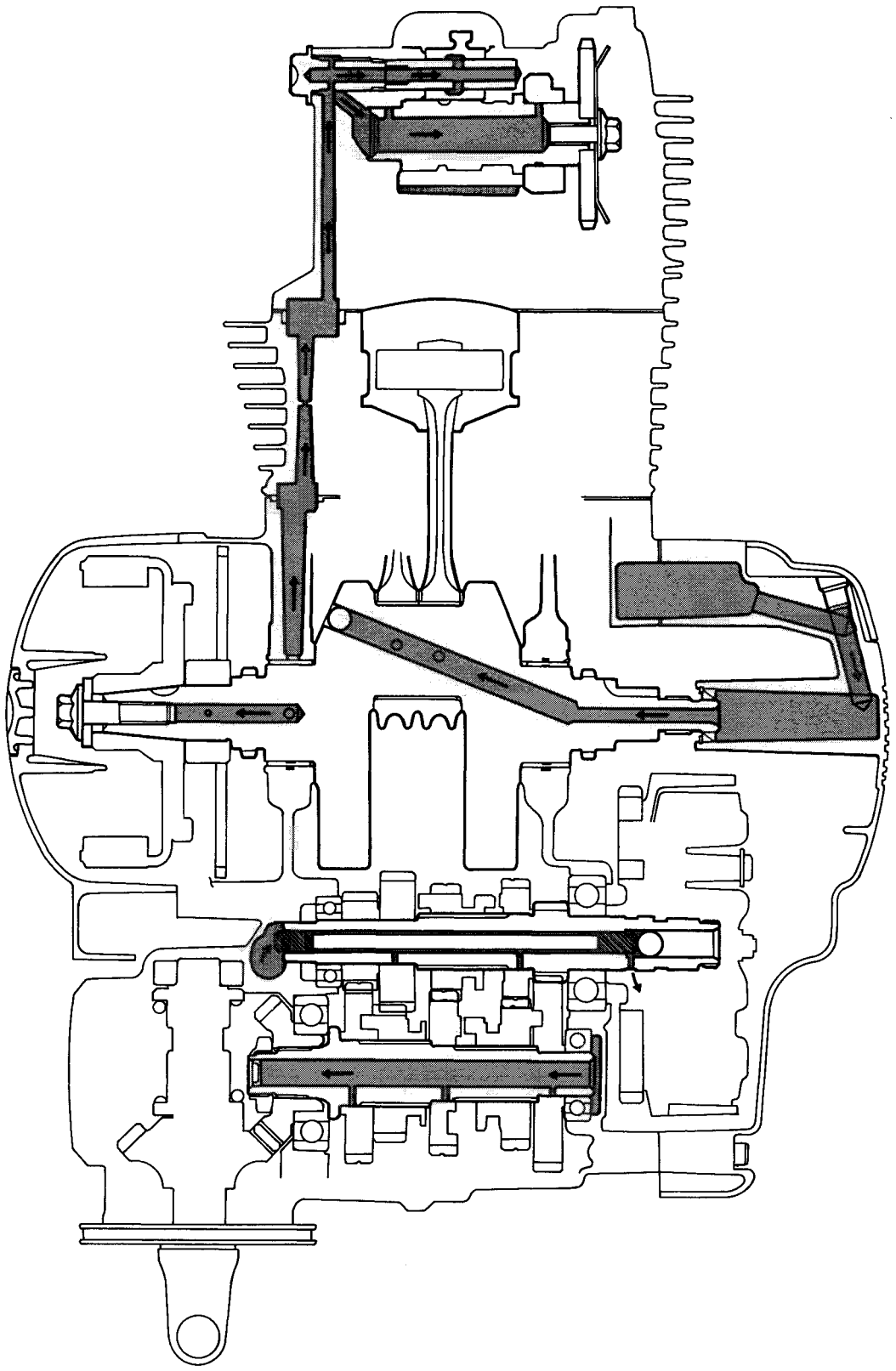




[C]

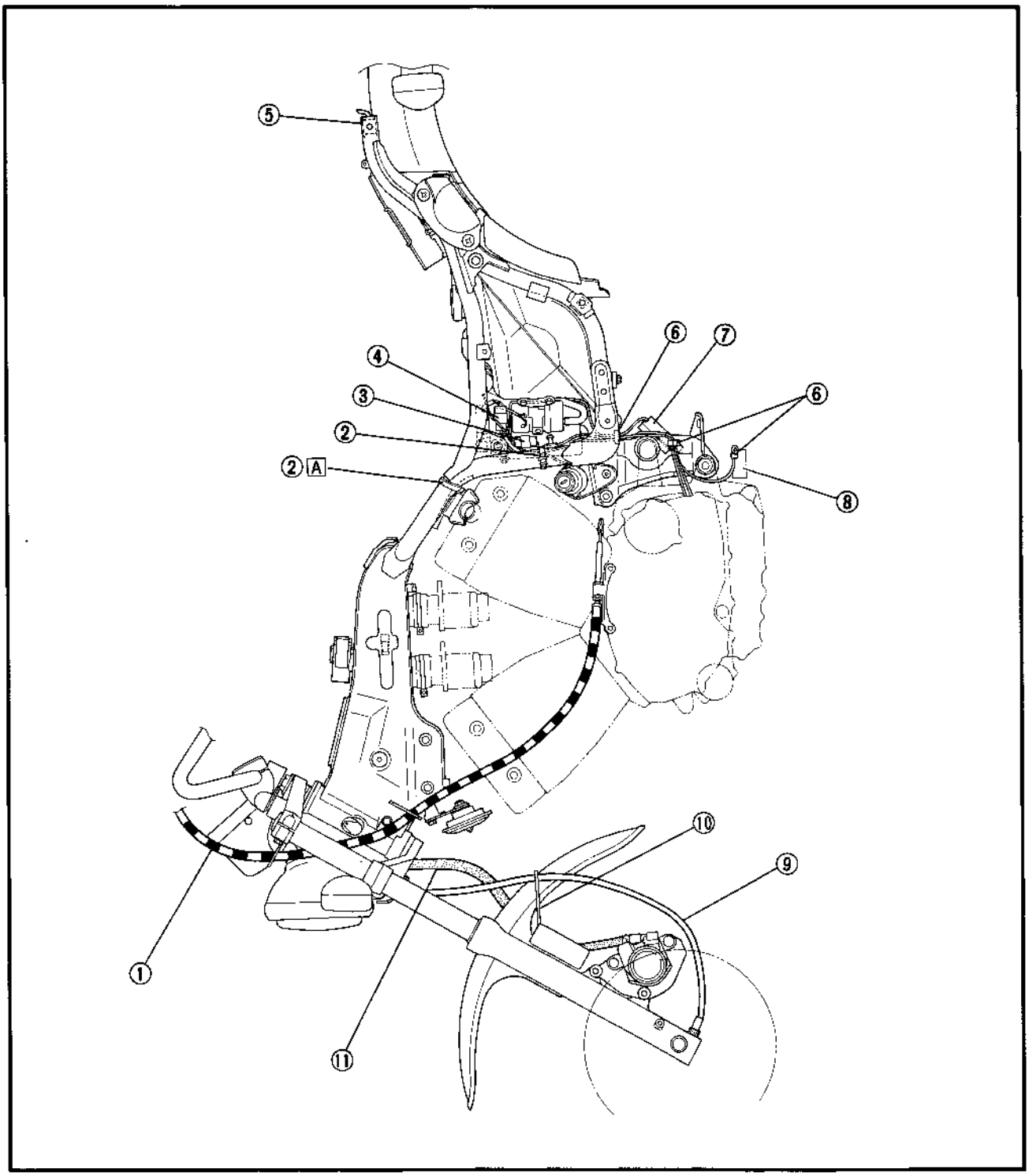






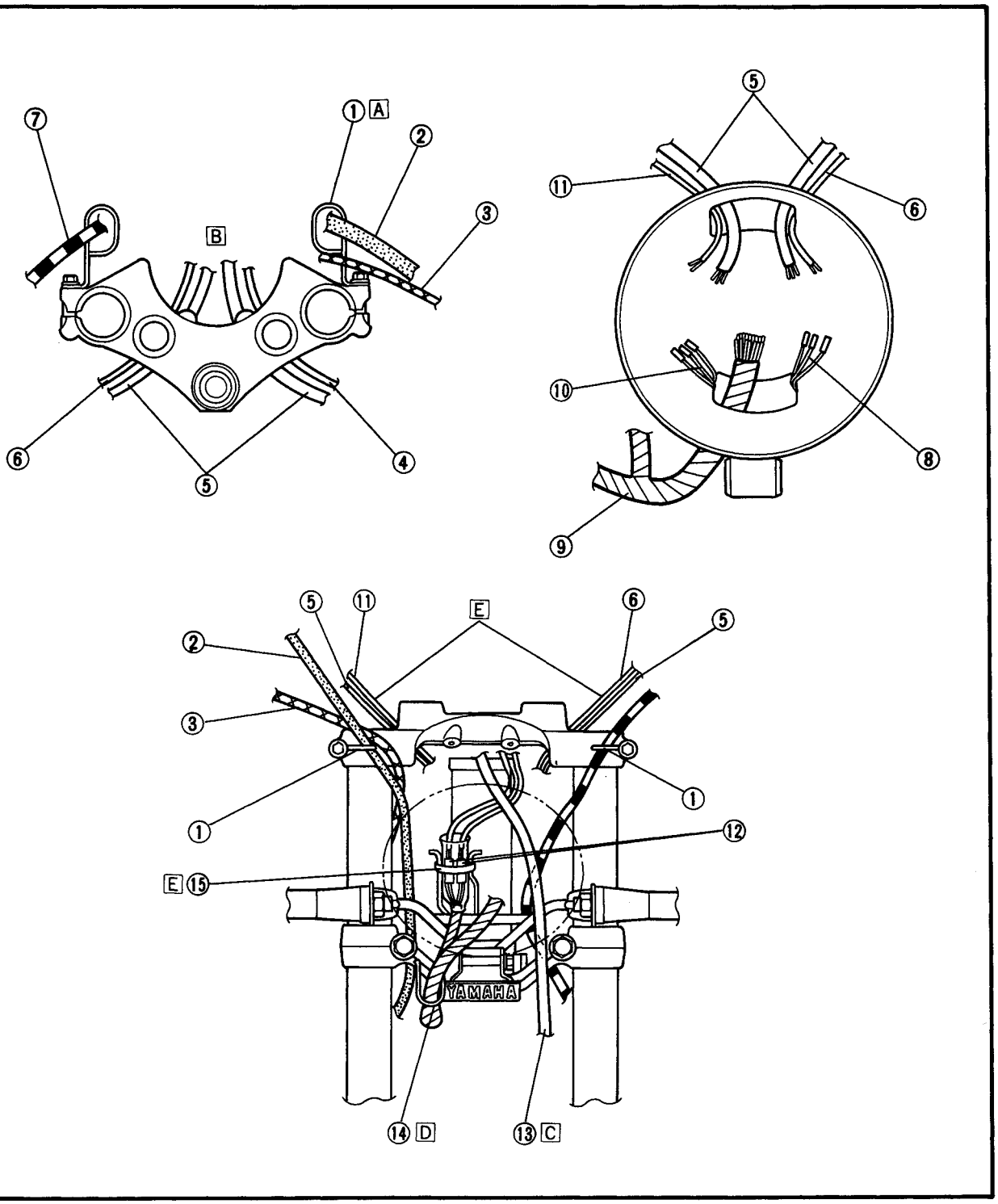
CABLE ROUTING

① Clutch cable
② Band
③ A.C. magneto leads
④ Pickup coil leads
⑤ Cap
⑥ Clamp
⑦ Rectifier with regulator
⑧ Sidestand switch
⑨ Speedometer cable
⑩ Cable guide
⑪ Brake hose
Ⓐ Clamp the fuel hose



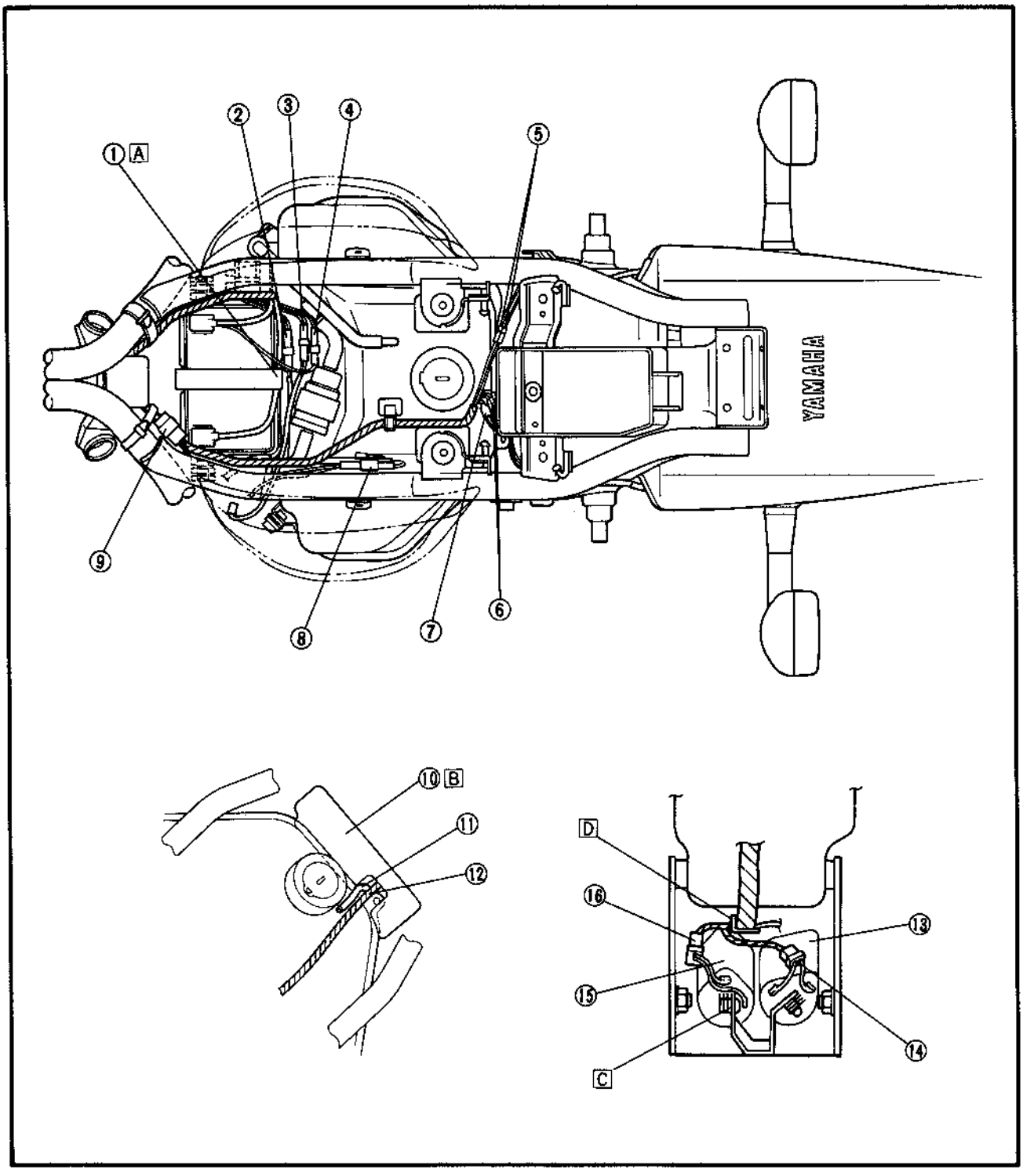
① Cable holder
② Brake hose
③ Throttle cable
④ Brake light switch lead
⑤ Handlebar switch lead
⑥ Clutch switch lead
⑦ Clutch cable
⑧ Front flasher light lead (Left)
⑨ Wireharness
⑩ Front flasher light lead (Right)
⑪ Brake switch lead
⑫ Pilot/Speedometer light lead
⑬ Speedometer cable
⑭ Clamp
⑮ Band

[A] Pass the brake hose only.
[B] To headlight
[C] Pass the speedometer cable in front of under bracket.
[D] Clamp the wireharness.
[E] Clamp the leads.
[F] Pass the leads behind the handlebar crown.



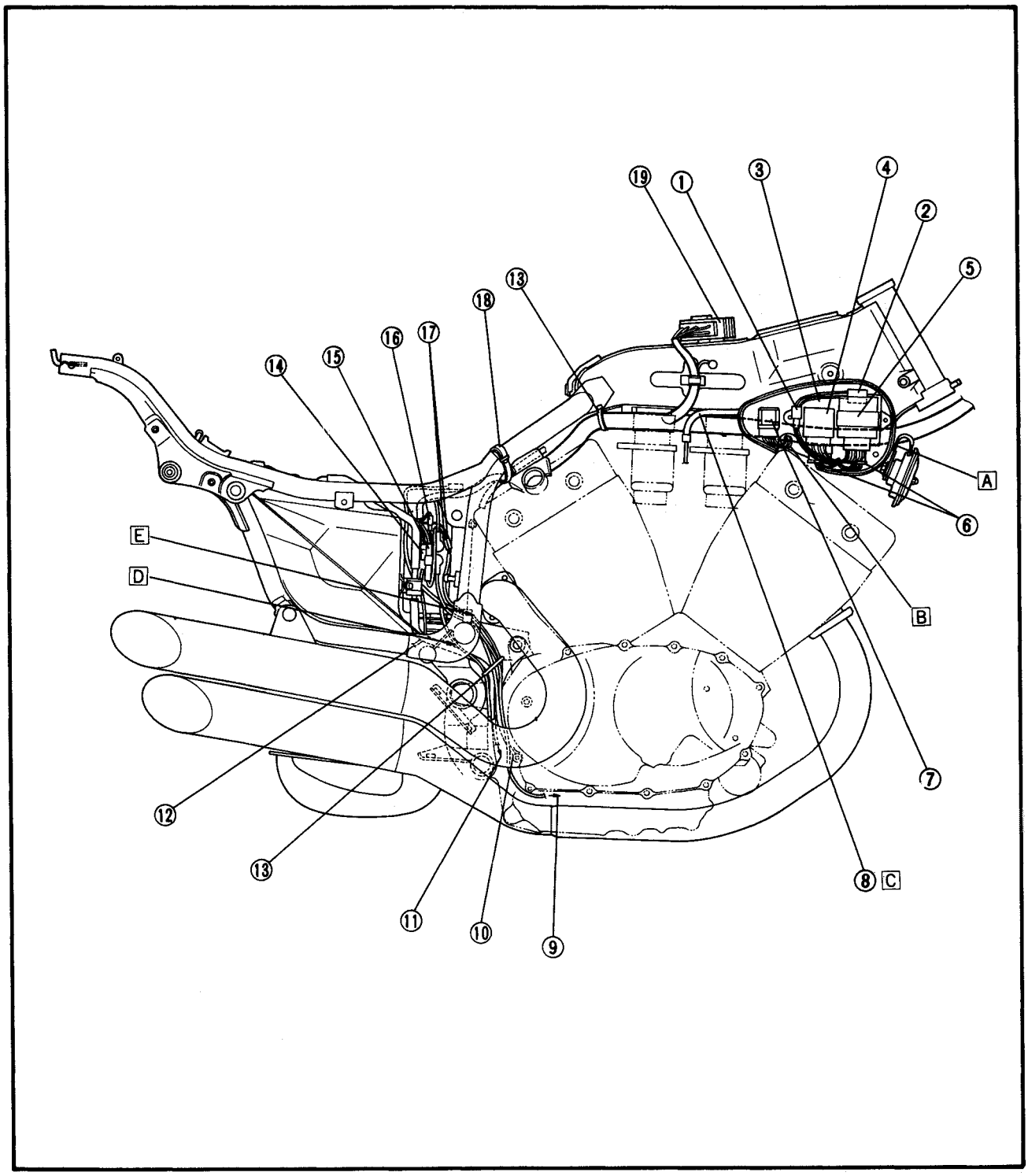
① Band
② Sidestand switch lead
③ Fuel pump lead
④ Battery negative lead
⑤ Rear flasher light lead (Right)
⑥ Taillight lead
⑦ Rear flasher light lead (Left)
⑧ Neutral switch lead
⑨ Main switch lead
⑩ Cover 3
⑪ Drain hose
⑫ Wireharness
⑬ Ignition coil (Rear cylinder)
⑭ Ignition coil lead (Yellow coupler)
⑮ Ignition coil lead (White coupler)
⑯ Ignition coil (Front cylinder)

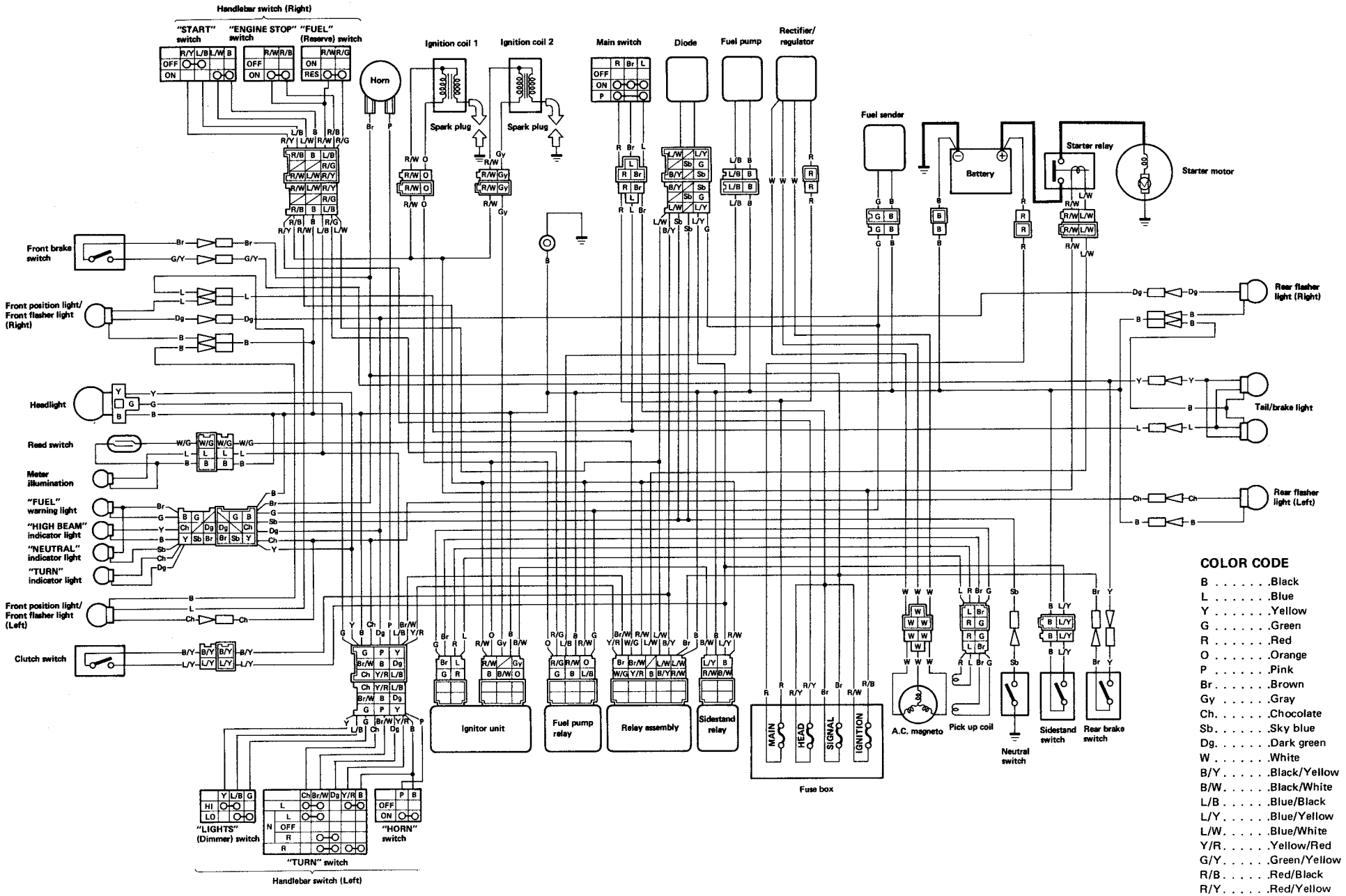
[A] Clamp the battery positive lead.
[B] After connecting the rear flasher light leads and taillight leads, fit the cover on the connectors.
[C] Take care that the ignition coil position is correctly.
[D] Press the wireharness (For ignition coil) to backward and pass the wireharness (For horn) to forward.



① Diode leads
② Diode
③ Ignitor unit
④ Fuel pump control unit
⑤ Relay assembly
⑥ Ignitor leads
⑦ Sidestand relay
⑧ Throttle cable
⑨ To starter motor
⑩ Ground lead
⑪ To rear brake light switch
⑫ To fuel sender
⑬ Clamp
⑭ Fuel sender lead
⑮ Positive lead
⑯ Starter relay lead
⑰ Brake switch lead
⑱ Band
⑲ Fuse

Ⓐ Clamp the wireharness.
Ⓑ Pass the wireharness into the cut on the front side cover.
Ⓒ Pass the throttle cable outside of the wireharness.
Ⓓ Pass the hose between cross tubes.
Ⓔ Pass the leads upper the cross tube.





COLOR CODE

B	Black
L	Blue
Y	Yellow
G	Green
R	Red
O	Orange
P	Pink
Br	Brown
Gy	Gray
Ch	Chocolate
Sb	Sky blue
Dg	Dark green
W	White
B/Y	Black/Yellow
B/W	Black/White
L/B	Blue/Black
L/Y	Blue/Yellow
L/W	Blue/White
Y/R	Yellow/Red
G/Y	Green/Yellow
R/B	Red/Black
R/Y	Red/Yellow
R/G	Red/Green
R/W	Red/White
Br/W	Brown/White
W/G	White/Green



YAMAHA MOTOR CO.,LTD.
IWATA, JAPAN

PRINTED IN U.S.A