# NOTICE

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

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

# HOW TO USE THIS MANUAL

## PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

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

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

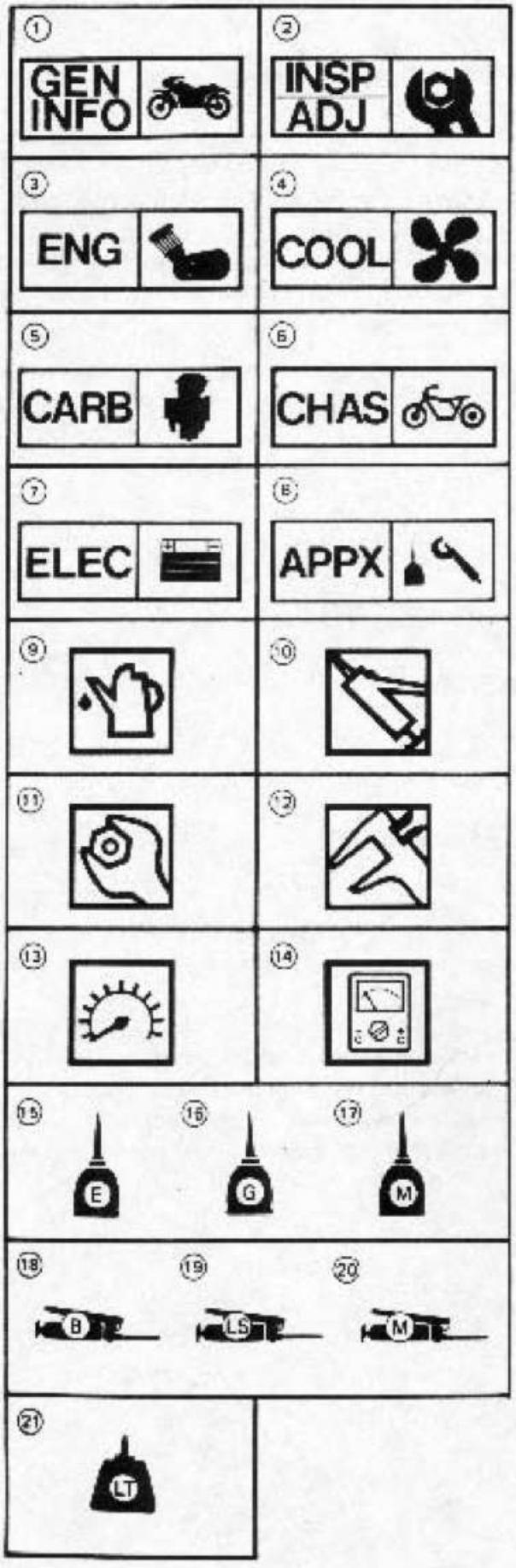
### MANUAL FORMAT

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
  Fitting/Damage → Replace.

### EXPLODED DIAGRAM

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




## ILLUSTRATED SYMBOLS
## (Refer to the illustration)

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

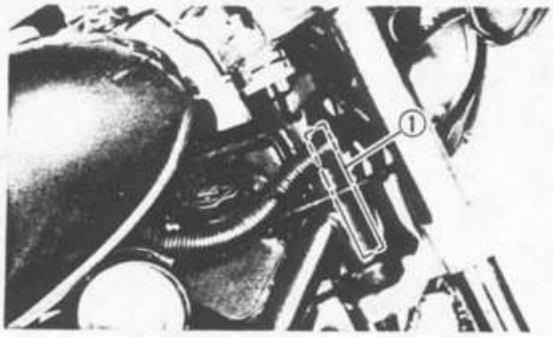
① General information
② Periodic inspection and adjustment
③ Engine
④ Cooling system
⑤ Carburetion
⑥ Chassis
⑦ Electrical
⑧ Appendices

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

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

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

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




# GENERAL INFORMATION

## MOTORCYCLE IDENTIFICATION

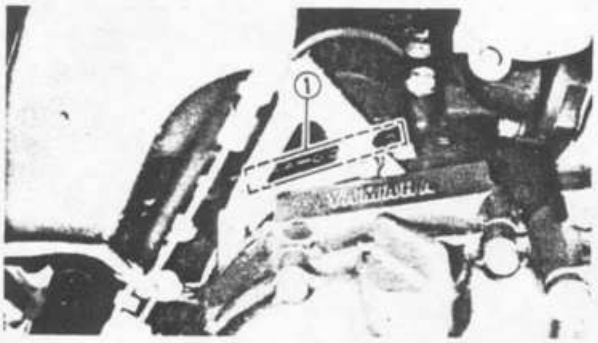
### VEHICLE IDENTIFICATION NUMBER

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

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: |
| --- |
| XJ750XN . . . .JYA1FL00 * FA000101 |




### ENGINE SERIAL NUMBER

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

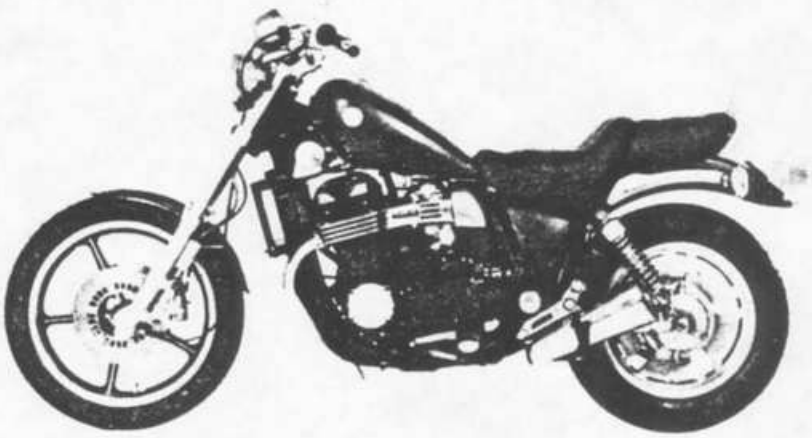
NOTE:

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

| Starting Serial Number: |
| --- |
| XJ750XN . . . .1FL-000101 |

NOTE:

Designs and specifications are subject to change without notice.



# IMPORTANT INFORMATION

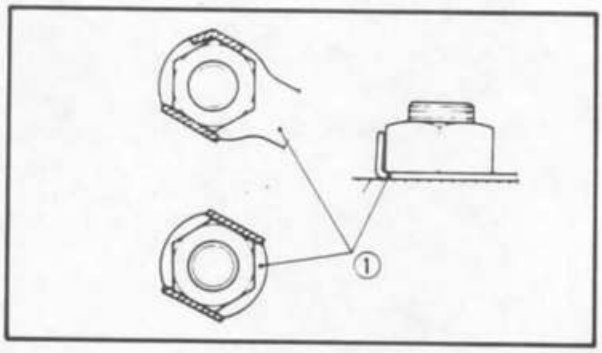
## ALL REPLACEMENT PARTS

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



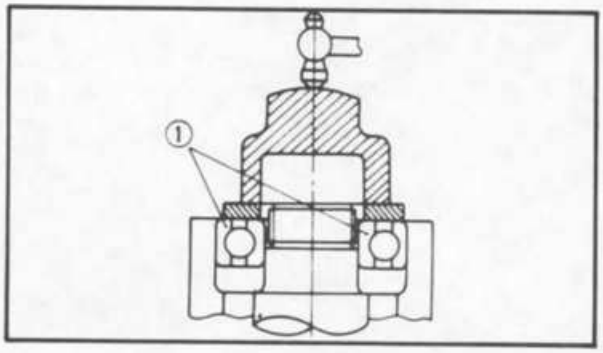
## GASKETS, OIL SEALS, AND O-RINGS

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.



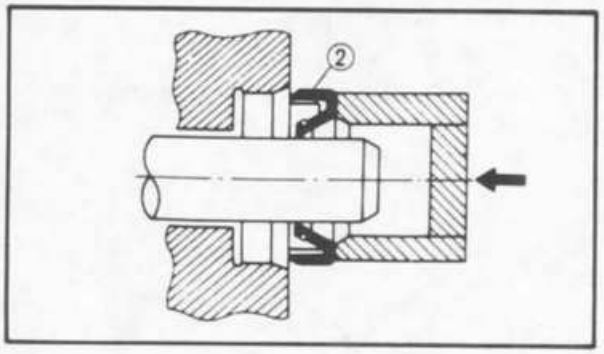

## LOCK WASHERS/PLATES AND COTTER PINS

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.



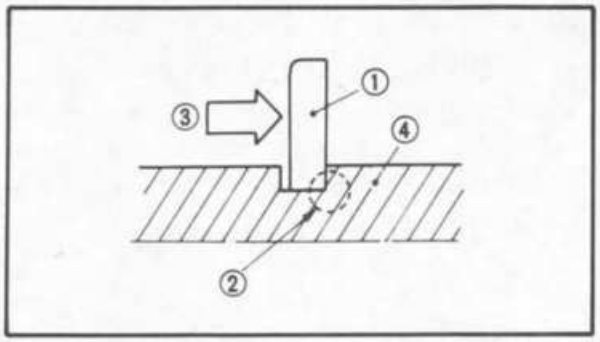

## BEARINGS AND OIL SEALS

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.**



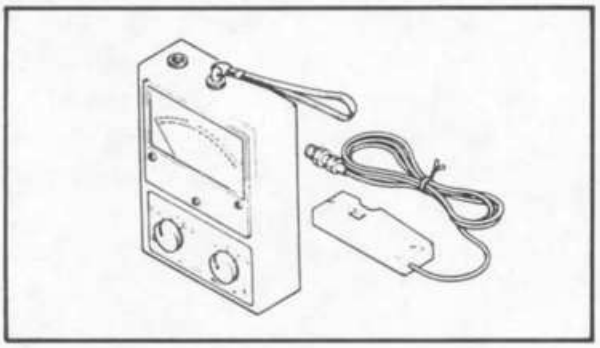

### CIRCLIPS

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

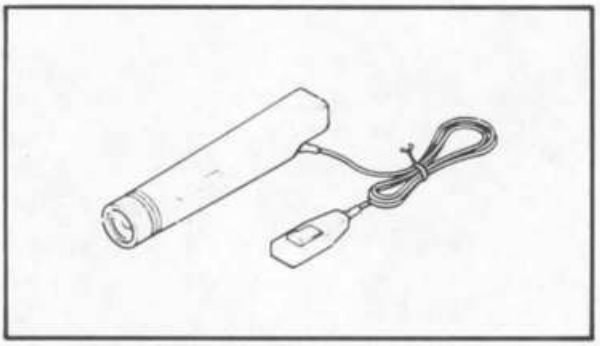
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



### FOR TUNE UP

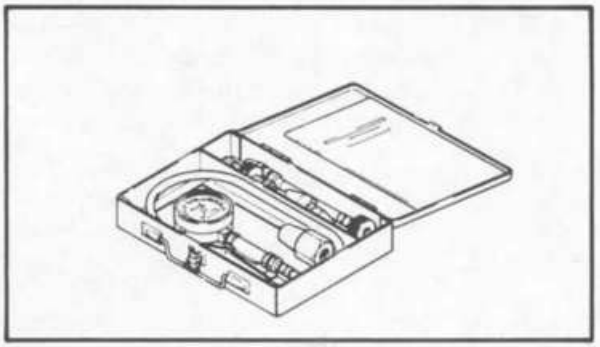
1. Inductive Tachometer
   P/N. 90890-03113

This tool is needed for detecting engine rpm.



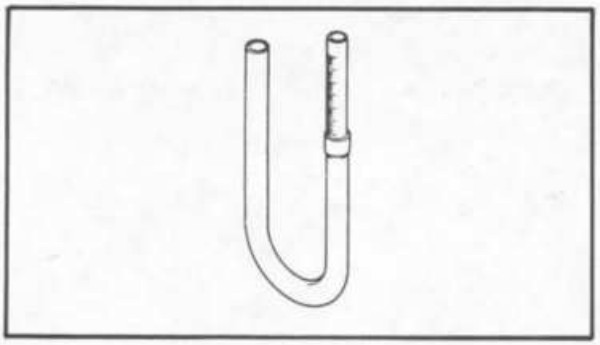
2. Inductive Timing Light
   P/N. 90890-03109

This tool is necessary for checking ignition timing.



3. Compression Gauge
   P/N. 90890-03081

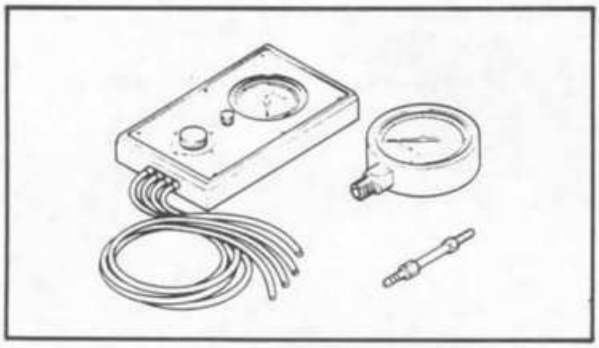
This gauge is used to measure the engine compression.



4. Fuel Level Gauge
   P/N. 90890-01312

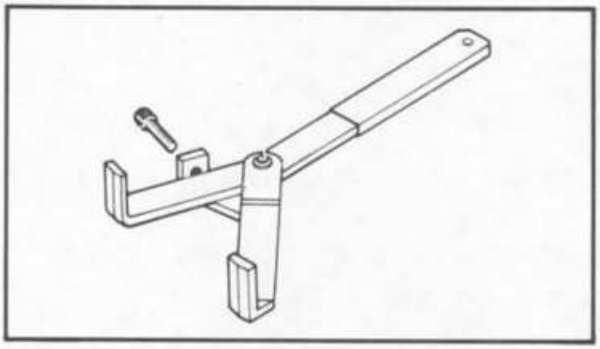
This gauge is used to measure the fuel level in the float chamber.





5. Vacuum gauge
   P/N. 90890-03094

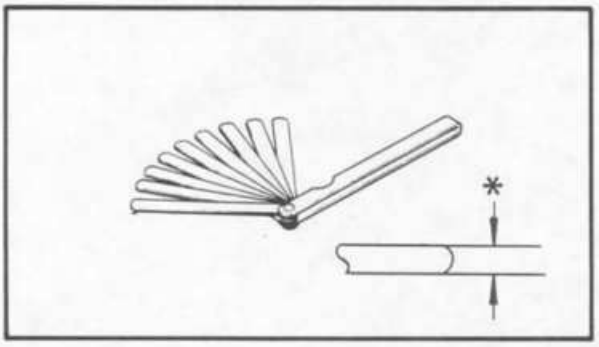
This gauge is needed for carburetor synchronization.



## FOR ENGINE SERVICE

1. Universal Clutch Holder
   P/N. 90890-04086

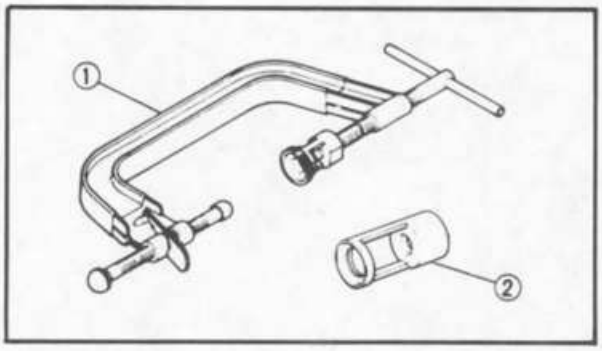
This tool is used to hold the clutch when removing or installing the clutch boss locknut.




2. Thickness Gauge
   P/N. 90890-01399

This gauge is needed for measuring the valve clearance.

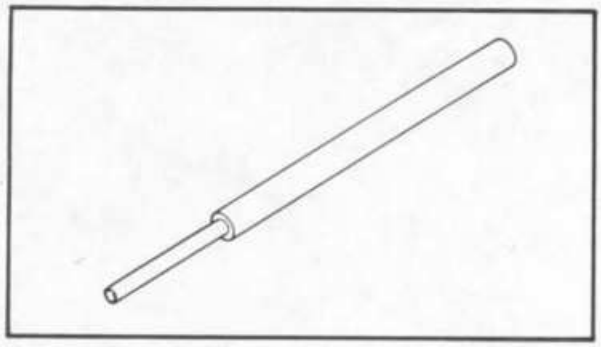
* Less than 8 mm (0.31 in)



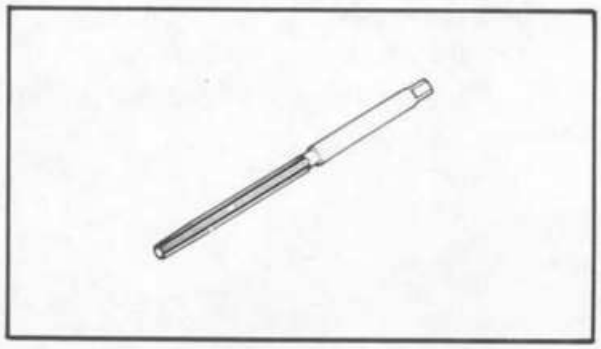

3. Valve Spring Compressor
   P/N. 90890-04019 – ①
   Attachment
   P/N. 90890-04108 – ②

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

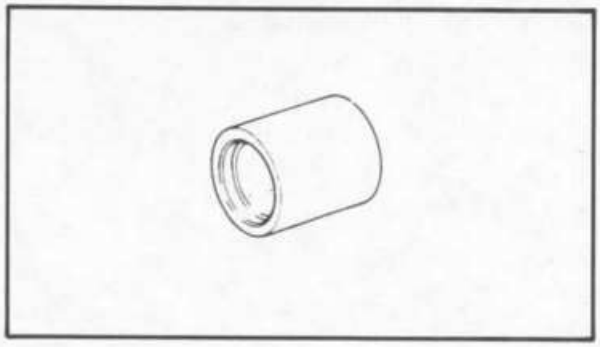
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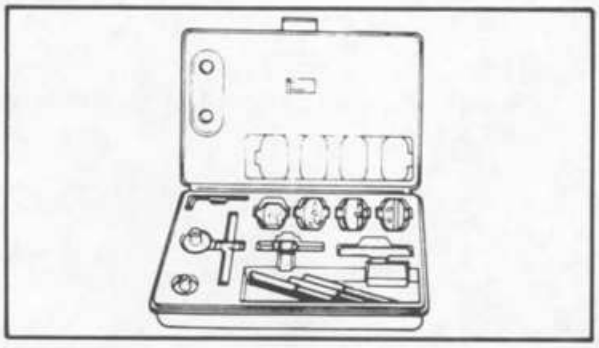
4. Valve Guide Remover (5.0 mm)
P/N. 90890-04097
This tool is used to remove the valve guides.



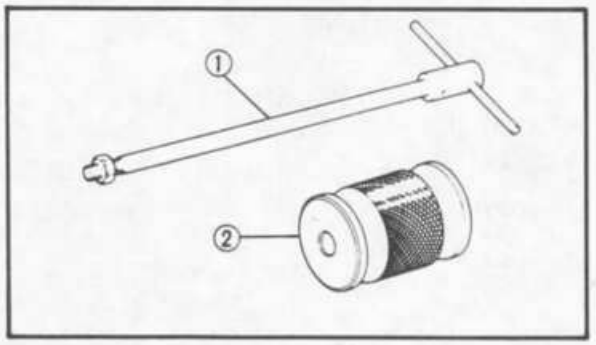
5. Valve Guide Reamer (5.0 mm)
P/N. 90890-04099
This tool is used to rebore the new valve guide.



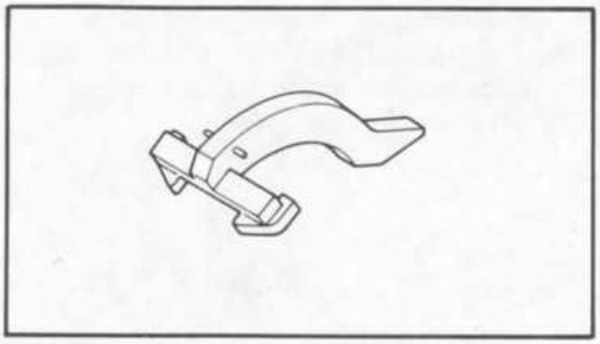
6. Valve Guide Installer
P/N. 90890-04098
This tool is needed to install the valve guides properly.



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

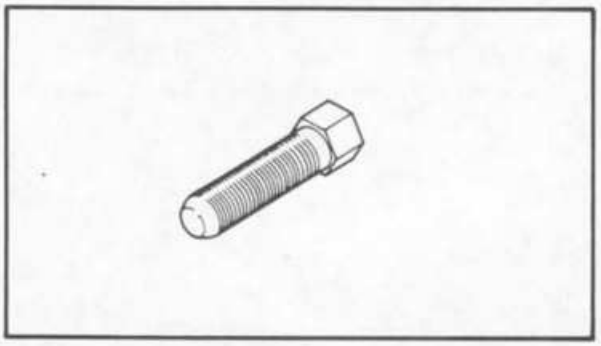



8. Armature Shock Puller
P/N. 90890-01290 – ①
Weight
P/N. 90890-01291 – ②
These tools are used to remove the A.C.G. shaft.



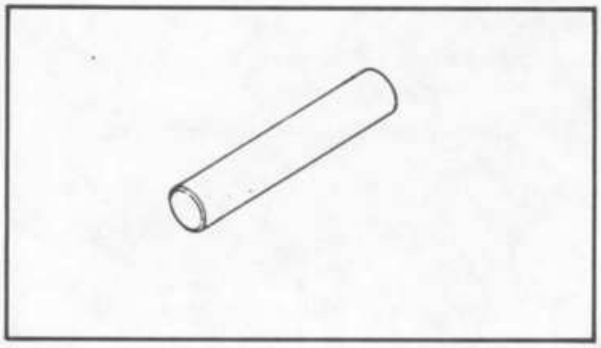
9. Rotor Holding Tool
   P/N. 90890-04043

This tool is used to hold the A.C. Generator rotor during removal and installation.



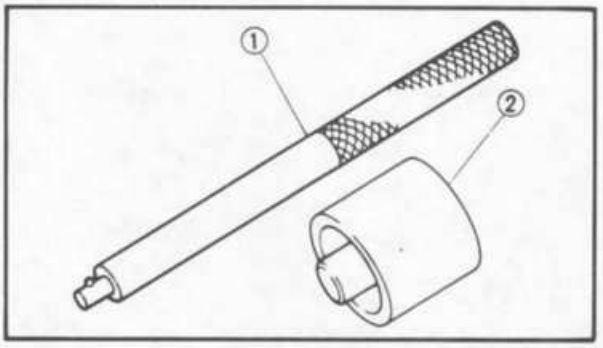
10. Rotor Puller
    P/N. 90890-01080

This tool is needed to remove the A.C. Generator rotor.



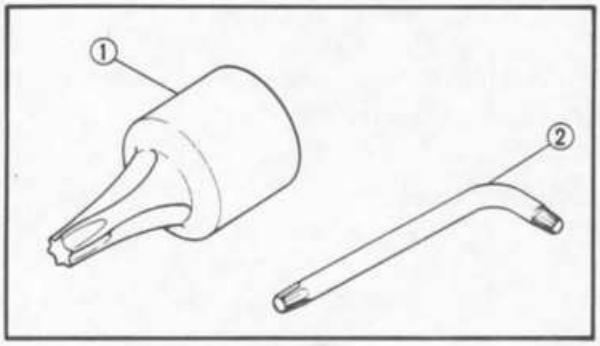
11. Rotor Puller Attachment
    P/N. 90890-04052

This tool is needed when removing the A.C. Generator rotor together with the rotor puller.




12. Water Pump Seal Installer
    Handle
    P/N. 90890-04058 – ①
    Adapter
    P/N. 90890-04078 – ②

This tool is needed for proper installation of the water pump seal.

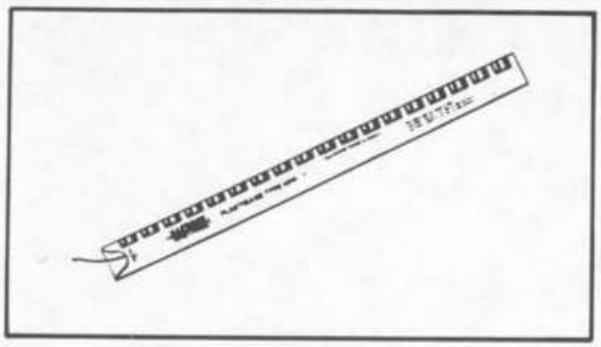



13. Torx Driver
    #40 P/N. 90890-04049 – ①

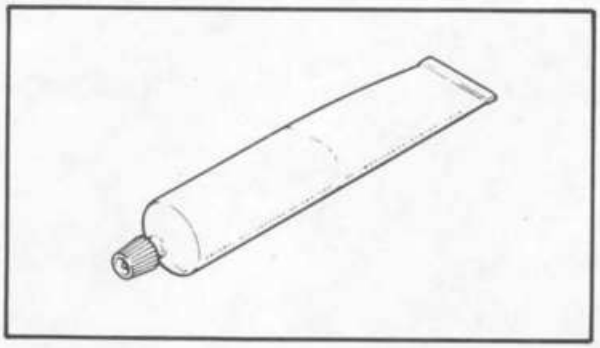
This tool is used to loosen or tighten the middle gear bearing retainer bolt.

    #30 P/N. 90890-05245 – ②

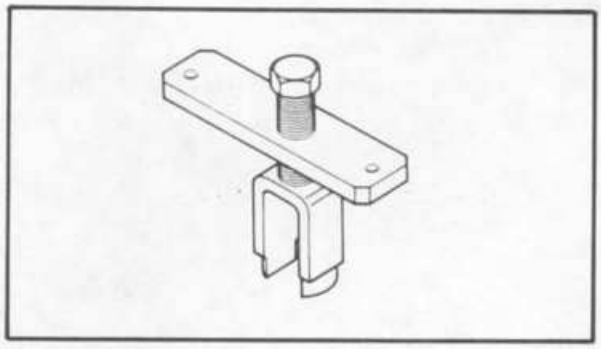
This tool is used to loosen or tighten the A.C.G. shaft cover.



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

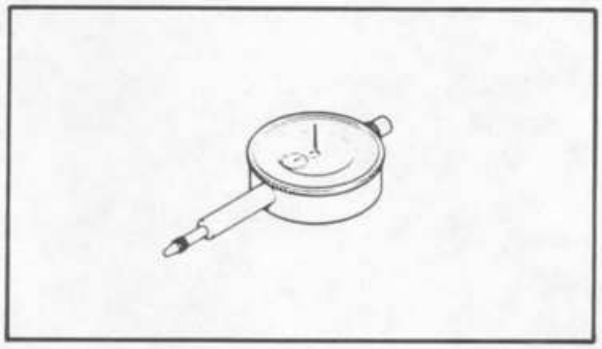


15. Yamaha Bond No. 1215
P/N. 90890-85505
This sealant (bond) is used for crankcase mating surfaces, etc.

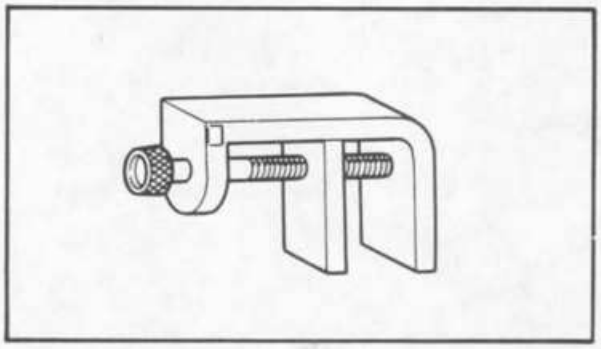


FOR SHAFT DRIVE SERVICE

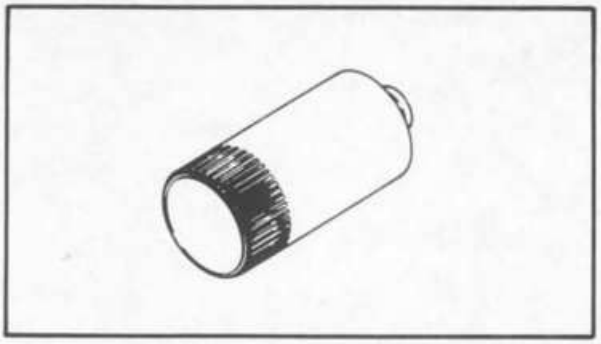
1. Middle Drive Pinion Holder
P/N. 90890-04051
This tool is needed when measuring gear lash.



2. Dial Gauge
P/N. 90890-03097
This gauge is used to measure gear lash.



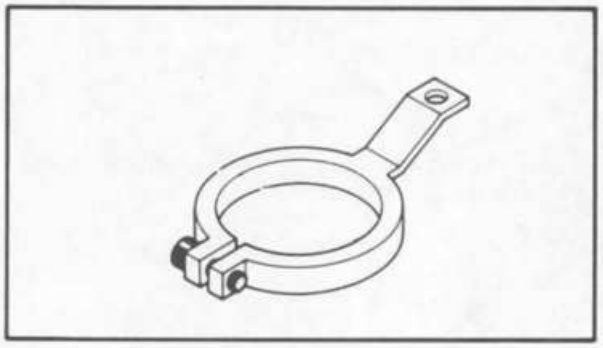
3. Damper Spring Compressor
P/N. 90890-04090
This tool is needed to disassemble and reassemble the middle gear damper.



6. Middle-Drive-Shaft-Bearing-Retainer Wrench
   P/N. 90890-04057

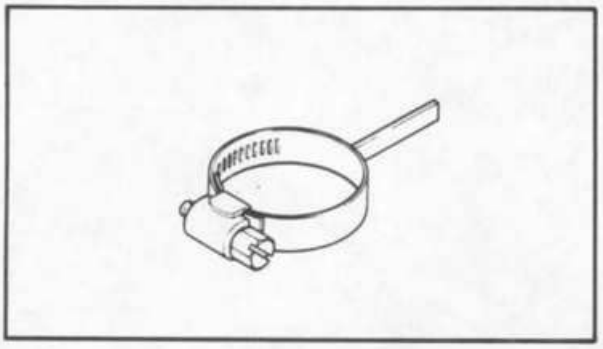
This tool is used to loosen or tighten the bearing retainer.





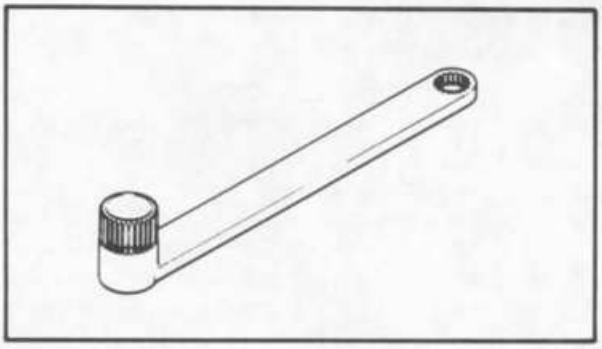
7. Final Gear Holding Tool
   P/N. 90890-01254

This tool is needed when measuring gear lash.



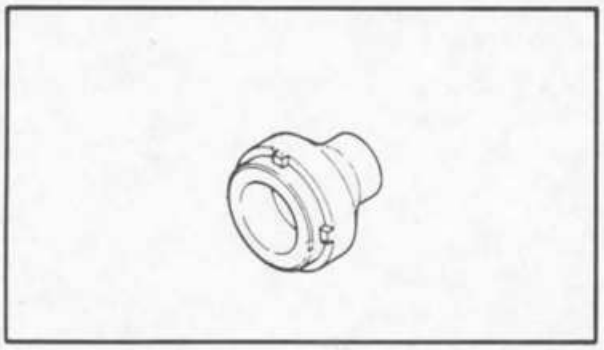
8. Final-Drive Gear Lash Measurement Tool
   P/N. 90890-01230

This tool is used to measure gear lash.



9. Middle and Final Gear Holding Tool
   P/N. 90890-01229

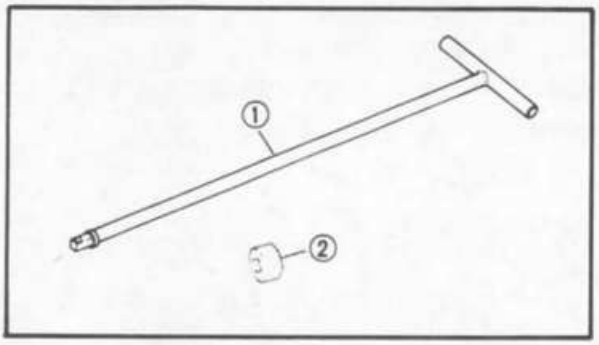
This tool is used when measuring gear lash.



10. Final Drive Shaft Bearing Retainer Wrench
    P/N. 90890-04050

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

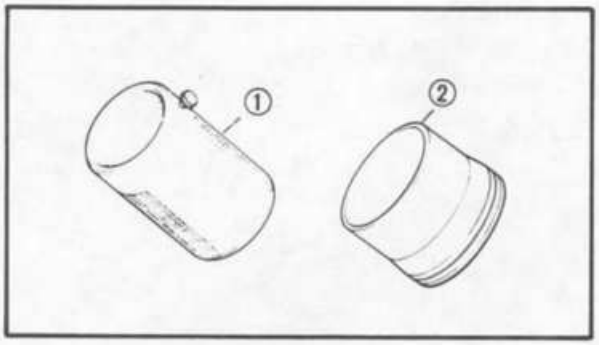
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FOR CHASSIS SERVICE

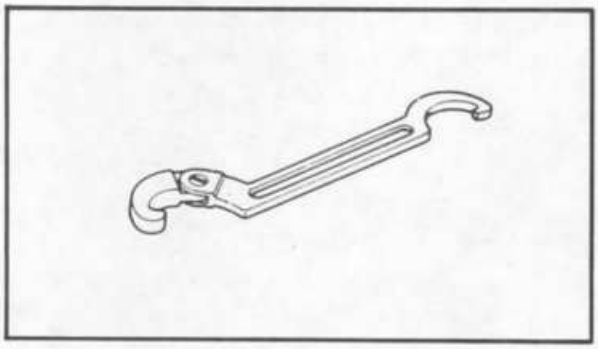
1. T-Handle
   P/N. 90890-01326 – ①
   Damper rod holder 22 mm
   P/N. 90890-01365 – ②

This tool is used to loosen and tighten the front fork cylinder holding bolt.



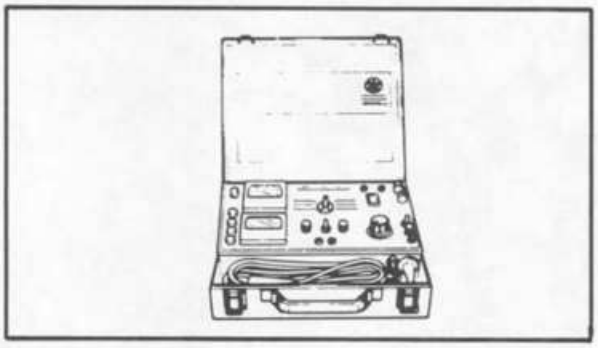

2. Front Fork Seal Driver (weight)
   P/N. 90890-01367 – ①
   Adapter (38 mm)
   P/N. 90890-01372 – ②

These tools are used when installing the fork seal.



3. Ring Nut Wrench
   P/N. 90890-01268

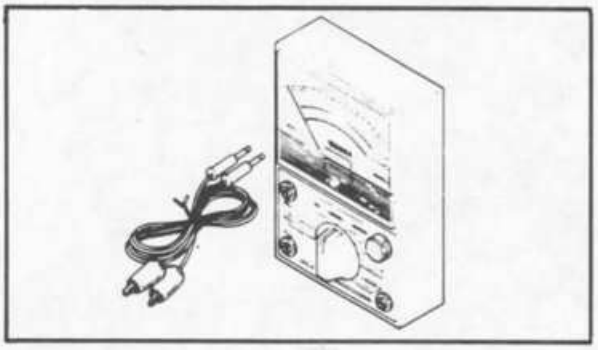
This tool is used to loosen and tighten the steering ring nut.



FOR ELECTRICAL COMPONENTS

1. Electro Tester
   P/N. 90890-03021

This instrument is necessary for checking the ignition system components.



2. Pocket Tester
   P/N. 90890-03112

This instrument is invaluable for checking the electrical system.

# PERIODIC INSPECTIONS AND ADJUSTMENTS

## INTRODUCTION

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

## PERIODIC MAINTENANCE/LUBRICATION INTERVALS

Unit: km (miles)

| Item | Remarks | EVERY | | |
|---|---|---|---|---|
| | | Break-in 1,000 (600) | 6,000 (4,000) or 6 months | 12,000 (8,000) or 12 months |
| Valve(s)* | Check valve clearance. Adjust if necessary. | Every 42,000 km (26,600 mi) | | |
| Spark plug(s) | Check condition. Clean or replace if necessary. | ○ | ○ | ○ |
| Air filter | Clean. Replace if necessary. | | ○ | ○ |
| Carburetor* | Check idle speed/synchronization/starter operation. Adjust if necessary. | ○ | ○ | ○ |
| Fuel line* | Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary. | | ○ | ○ |
| Engine oil | Replace (Warm engine before draining). | ○ | ○ | ○ |
| Engine oil filter* | Replace. | ○ | | ○ |
| Final gear oil | Check oil level/oil leakage. Replace every 24,000 (16,000) or 24 months. | Replace | ○ | ○ |
| Front brake* | Check operation/fluid leakage/See NOTE. Correct if necessary. | | ○ | ○ |
| Rear brake | Check operation. Adjust if necessary. | | ○ | ○ |
| Clutch | Check operation. Adjust if necessary. | | ○ | ○ |
| Rear arm pivot* | Check rear arm assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.** | | | ○ |
| Wheels* | Check balance/damage/runout. Repair if necessary. | | ○ | ○ |
| Wheel bearings* | Check bearings assembly for looseness/damage. Replace if damaged. | | ○ | ○ |
| Steering bearing* | Check bearings assembly for looseness. Correct if necessary. Moderately repack every 24,000 (16,000) or 24 months.** | ○ | | ○ |
| Front forks* | Check operation/oil leakage. Repair if necessary. | | ○ | ○ |
| Rear shock absorber* | Check operation/oil leakage. Repair if necessary. | | ○ | ○ |
| Cooling system | Check coolant leakage. Repair if necessary. Replace coolant every 24,000 (16,000) or 24 months. | | ○ | ○ |




Unit: km (mi)

| Item | Remarks | Break-in 1,000 (600) | EVERY 6,000 (4,000) or 6 months | EVERY 12,000 (8,000) or 12 months |
|---|---|---|---|---|
| Fittings/Fasteners* | Check all chassis fittings and fasterners. Correct if necessary. | ○ | ○ | ○ |
| Center and sidestand* | Check operation. Repair if necessary. | ○ | ○ | ○ |
| Sidestand switch* | Check operation. Clean or replace if necessary. | ○ | ○ | ○ |
| Battery* | Check specific gravity. Check breather pipe for proper operation. Correct if necessary. | | ○ | ○ |
| AC generator* | Replace generator brushes. | | | ○ |

*: It is recommended that these items be serviced by a Yamaha dealer.
**: Medium weight wheel bearing grease.

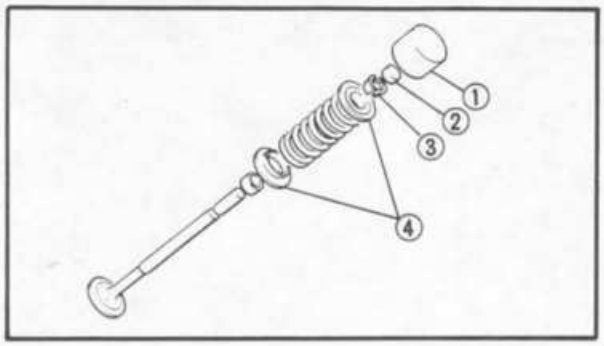
**NOTE:**

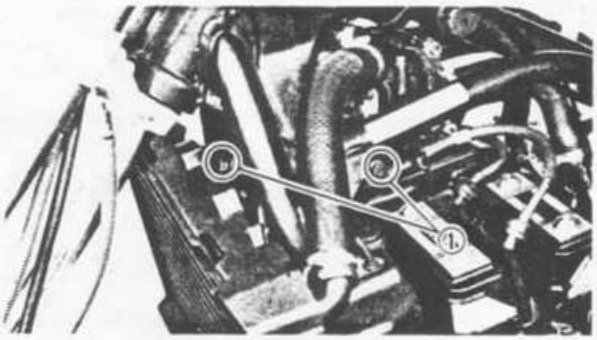
Brake fluid replacement:

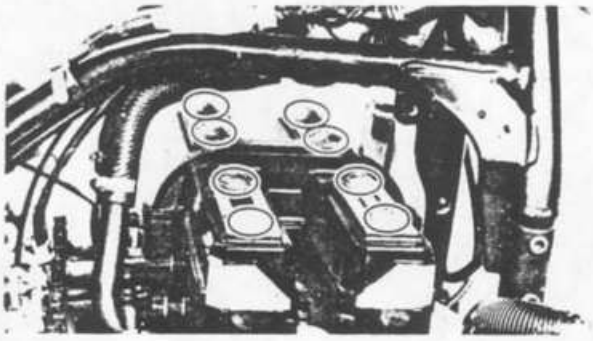
1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. Replace the brake hoses every four years, or if cracked or damaged.

# VALVE CLEARANCE ADJUSTMENT





## ENGINE

### VALVE CLEARANCE ADJUSTMENT

① Valve lifter
② Pad
③ Retainer
④ Spring seat

Valve Clearance (Cold):
Intake: 0.11 ~ 0.20 mm (0.004 ~ 0.008 in)
Exhaust: 0.21 ~ 0.30 mm (0.008 ~ 0.012 in)

**Measurement**

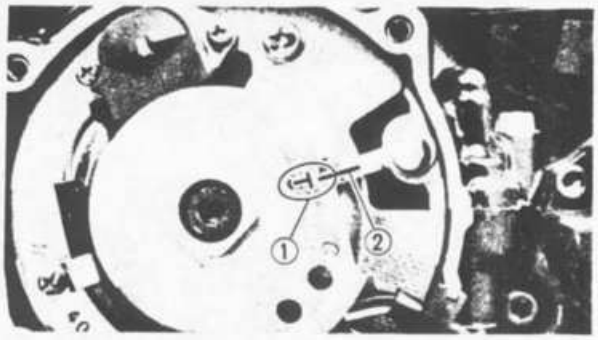
1. Remove:
   - Seat
   - Fuel tank
   - Horns
   - Ignition coil mount bolts ①
2. Disconnect:
   - Spark plug caps
3. Remove:
   - Ignition coils
   - Spark plugs
   - Cylinder head cover
   - Left crankcase cover
4. Measure:
   - Valve clearance

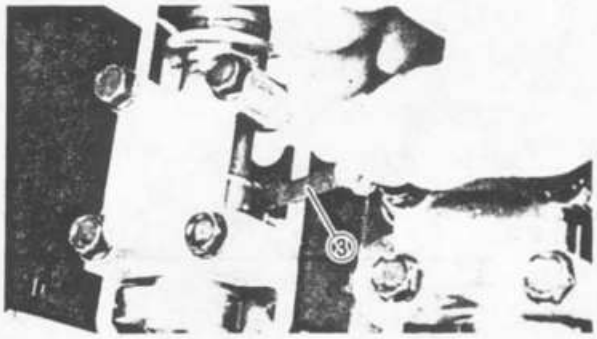
NOTE:
Be sure piston is at Top Dead Center (TDC) on compression stroke when measuring clearance.

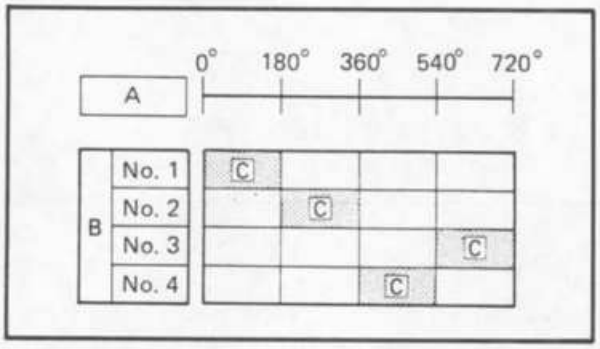
**Valve clearance measurement steps:**

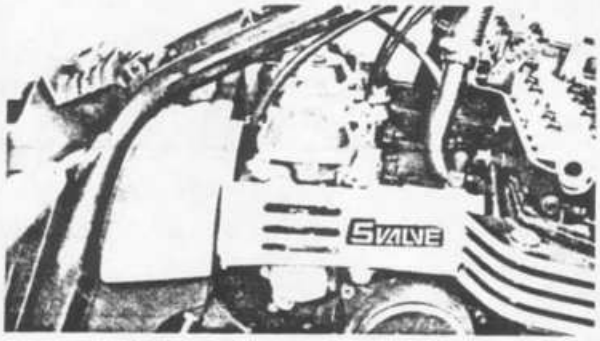
- Turn the crankshaft counterclockwise with a 19 mm (0.75 in) spanner.

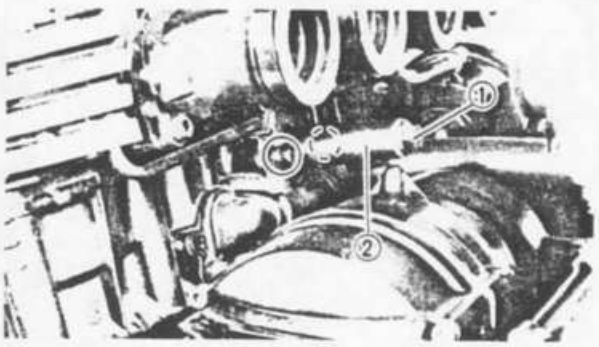
NOTE:
Valve clearance must be measured when the engine is cool to the touch.




- Align the "T" mark ① on the timing plate with the stationary pointer ② . When the "T" mark is aligned with the stationary pointer ② . the piston is at top dead center (TDC). * see Note, below.
- Measure the valve clearance using a Feeler Gauge ③.
- Record the measured amount if the clearance is incorrect.

**Intake Valve (cold):**
**0.11~ 0.20 mm**
**(0.004 ~ 0.008 in)**
**Exhaust Valve (cold):**
**0.21~ 0.30 mm**
**(0.008 ~ 0.012 in)**

- Measure valve clearance, in sequence, for Nos. 2, 4, and No. 3 cylinders.
Out of specification → Adjust clearance.

**Firing Sequence:**
**1 – 2 – 4 – 3**

A Crankshaft counterclockwise turning angle.
B Cylinder
C Combustion

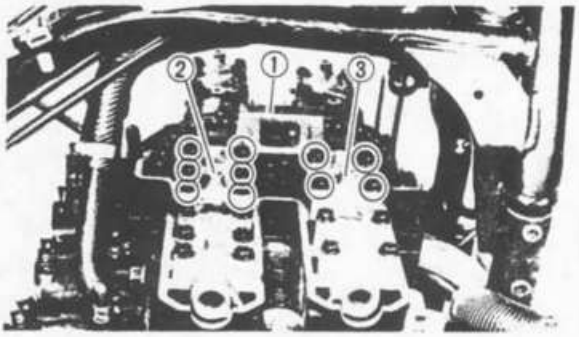
* Note: upper pickup used as pointer on 1986 models. See "Ignition Timing" section for details.

**Adjustment**

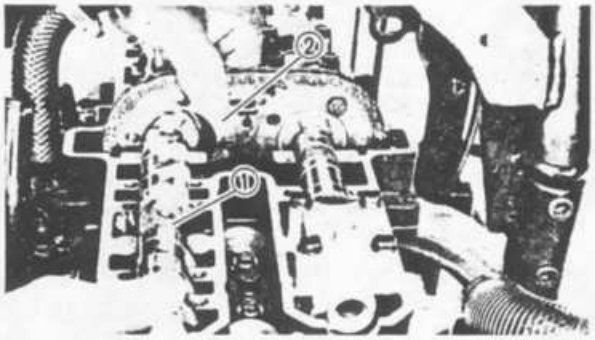
1. Remove:
   - Carburetors
   Refer to CHAPTER 3 "ENGINE REMOVAL".

2. Loosen:
   - Cam chain tensioner end plug ①
3. Remove:
   - Cam chain tensioner ②

# VALVE CLEARANCE ADJUSTMENT

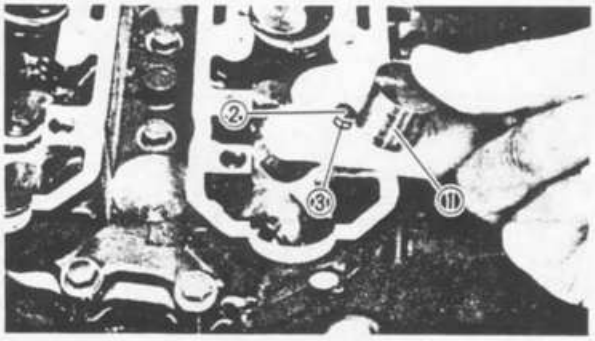



4. Remove:
   - Cam chain guide (Upper) ①
   - Cam cap I3 ②
   - Cam cap E3 ③
   - Dowel pins




5. Remove:
   - Cam chain sprocket bolts
   - Cam caps
   - Dowel pins
   - Cam shafts ①
   - Cam chain sprockets ②

**NOTE:**
Fasten safety wire to the cam chain to prevent it from falling into the crankcase.

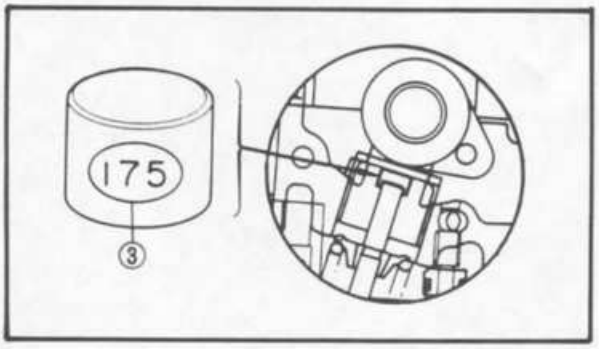



6. Remove:
   - Valve lifter ①
   - Pad ②

   Note the installed pad number ③.
7. Select the proper pad from the chart below:

| Pad range | | Pad Availability: 25 increments |
|---|---|---|
| No. 120 ~ No. 240 | 1.20 mm (0.047 in) ~ 2.40 mm (0.094 in) | Pads stepped in 0.05 mm (0.002 in) increments |

**NOTE:**
Thickness of each pad is marked on the pad side wall.




- Round off the hundredths digit of the installed pad number to the nearest 0.05 mm increment.

| Hundredths digit | Rounded valve |
|---|---|
| 0 or 2 | 0 |
| 5 | (NOT ROUNDED OFF) |
| 8 | 10 |

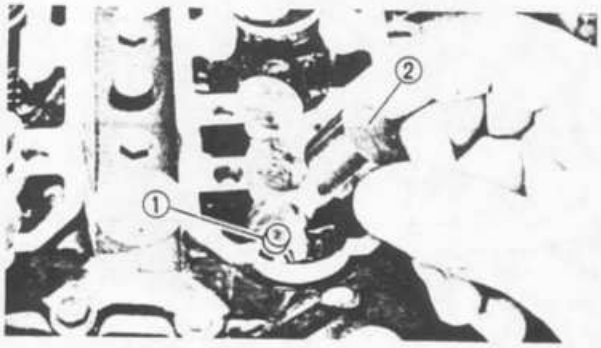
EXAMPLE:
Installed pad number = 175 (1.75 mm)
Rounded off digit = 175

NOTE:
Pads can only be selected in 0.05 mm (0.02 in) increments.

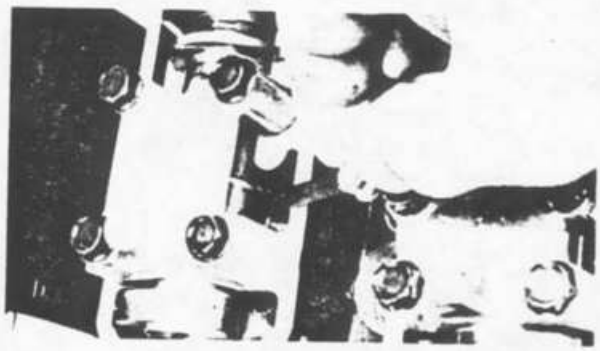
- Locate the "Rounded off Pad Number" on the chart, and then find the measured valve clearance. The point where these coordinates intersect is the new pad number.

NOTE:
Use the new pad number as a guide only as the number must be verified.






8. Install:
   - Pad ①
   - Valve lifter ②
   - Cam shaft
   - Cam chain sprocket
   Refer to CHAPTER 3 "ENGINE ASSEMBLY"



9. Recheck the valve clearance.
   If the clearance is incorrect, repeat all of the clearance adjustment steps until the proper clearance is obtained.

**Assembly**

1. Reverse removal steps.

NOTE:
Inspect the head cover gasket and replace it if damaged.

2. Tighten:
   - Cylinder head cover bolts
   - Fuel tank bolts

| | |
|---|---|
| | **Head Cover Bolt:**<br>**10 Nm (1.0 m·kg, 7.2 ft·lb)**<br>**Fuel Tank Bolt:**<br>**10 Nm (1.0 m·kg, 7.2 ft·lb)** |

# VALVE CLEARANCE ADJUSTMENT

## INTAKE

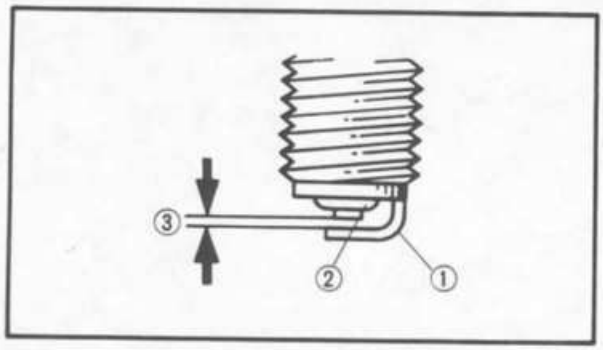
| MEASURED CLEARANCE | INSTALLED PAD NUMBER | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 |
| 0.00 ~ 0.02 | | | | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 |
| 0.03 ~ 0.07 | | | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 |
| 0.08 ~ 0.10 | | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 |
| 0.11 ~ 0.20 | RECOMMENDED CLEARANCE | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.21 ~ 0.22 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | |
| 0.23 ~ 0.27 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | |
| 0.28 ~ 0.32 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | |
| 0.33 ~ 0.37 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | |
| 0.38 ~ 0.42 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | |
| 0.43 ~ 0.47 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | |
| 0.48 ~ 0.52 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | |
| 0.53 ~ 0.57 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | |
| 0.58 ~ 0.62 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | |
| 0.63 ~ 0.67 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | |
| 0.68 ~ 0.72 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | |
| 0.73 ~ 0.77 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | |
| 0.78 ~ 0.82 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | |
| 0.83 ~ 0.87 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | |
| 0.88 ~ 0.92 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | |
| 0.93 ~ 0.97 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | |
| 0.98 ~ 1.02 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | |
| 1.03 ~ 1.07 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | |
| 1.08 ~ 1.12 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | | |
| 1.13 ~ 1.17 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | | | |
| 1.18 ~ 1.22 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | | | | |
| 1.23 ~ 1.27 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | | | | | |
| 1.28 ~ 1.32 | 235 | 240 | | | | | | | | | | | | | | | | | | | | | | | |
| 1.33 ~ 1.37 | 240 | | | | | | | | | | | | | | | | | | | | | | | | |

VALVE CLEARANCE (cold):
0.11 ~ 0.20 mm (0.004 ~ 0.008 in)
Example: Installed is 175
Measured clearance is 0.24 mm (0.009 in)
Replace 175 pad with 185 pad

## EXHAUST

| MEASURED CLEARANCE | INSTALLED PAD NUMBER | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 |
| 0.00 ~ 0.02 | | | | | | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 |
| 0.03 ~ 0.07 | | | | | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 |
| 0.08 ~ 0.12 | | | | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 |
| 0.13 ~ 0.17 | | | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 |
| 0.18 ~ 0.20 | | 120 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 |
| 0.21 ~ 0.30 | RECOMMENDED CLEARANCE | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.31 ~ 0.32 | 125 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | |
| 0.33 ~ 0.37 | 130 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | |
| 0.38 ~ 0.42 | 135 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | |
| 0.43 ~ 0.47 | 140 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | |
| 0.48 ~ 0.52 | 145 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | |
| 0.53 ~ 0.57 | 150 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | |
| 0.58 ~ 0.62 | 155 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | |
| 0.63 ~ 0.67 | 160 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | |
| 0.68 ~ 0.72 | 165 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | |
| 0.73 ~ 0.77 | 170 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | |
| 0.78 ~ 0.82 | 175 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | |
| 0.83 ~ 0.87 | 180 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | |
| 0.88 ~ 0.92 | 185 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | |
| 0.93 ~ 0.97 | 190 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | |
| 0.98 ~ 1.02 | 195 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | |
| 1.03 ~ 1.07 | 200 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | |
| 1.08 ~ 1.12 | 205 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | |
| 1.13 ~ 1.17 | 210 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | |
| 1.18 ~ 1.22 | 215 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | | |
| 1.23 ~ 1.27 | 220 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | | | |
| 1.28 ~ 1.32 | 225 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | | | | |
| 1.33 ~ 1.37 | 230 | 235 | 240 | | | | | | | | | | | | | | | | | | | | | | |
| 1.38 ~ 1.42 | 235 | 240 | | | | | | | | | | | | | | | | | | | | | | | |
| 1.43 ~ 1.47 | 240 | | | | | | | | | | | | | | | | | | | | | | | | |

VALVE CLEARANCE (cold):
0.21 ~ 0.30 mm (0.008 ~ 0.012 in)
Example: Installed is 175
Measured clearance is 0.35 mm (0.014 in)
Replace 175 pad with 185 pad




## SPARK PLUG

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

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

Clean the plug with a spark plug cleaner if necessary.

**Standard Spark Plug:**
**DR8ES-L (NGK)**
**X24ESR-U (NIPPONDENSO)**

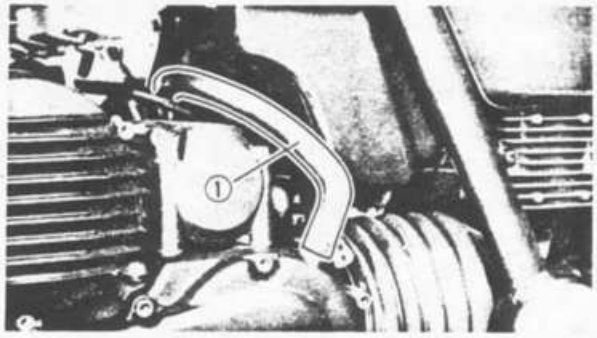
Before installing a spark plug, clean the gasket surface and plug surface.

4. Tighten:
   - Spark plug(s)

**Spark Plug:**
**17.5 Nm (1.75 m·kg, 12.5 ft·lb)**

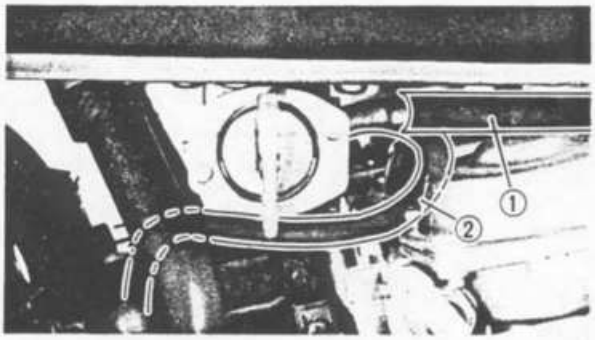
NOTE:
Finger-tighten the spark plug(s) before torquing to specification.

# CRANKCASE VENTILATION SYSTEM/FUEL LINE/ INTAKE MANIFOLD/EXHAUST SYSTEM



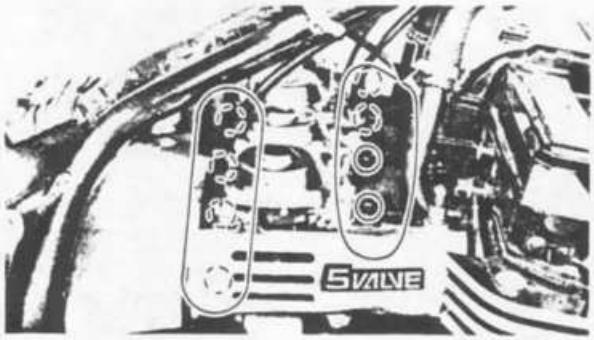

## CRANKCASE VENTILATION SYSTEM

1. Inspect:
   - Crankcase ventilation hose ①
     Cracks/Damage → Replace.



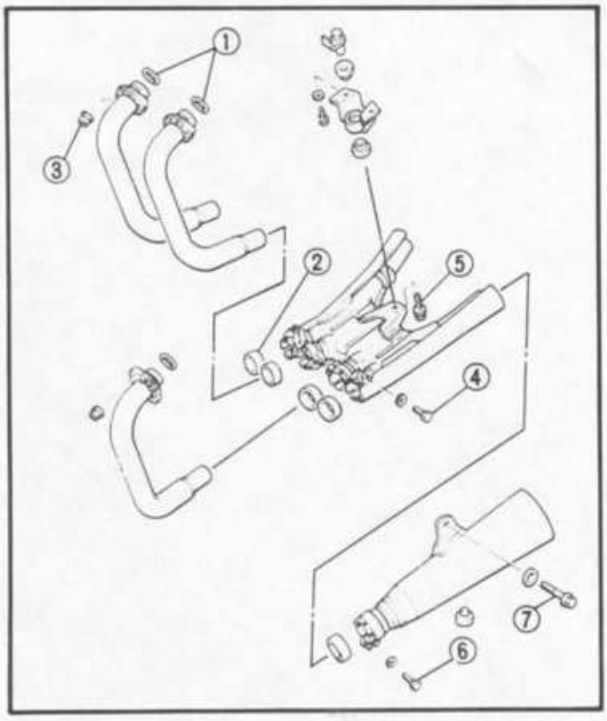

## FUEL LINE

1. Inspect:
   - Fuel hose ①
   - Vacuum hose ②
     Cracks/Damage → Replace.




## INTAKE MANIFOLD

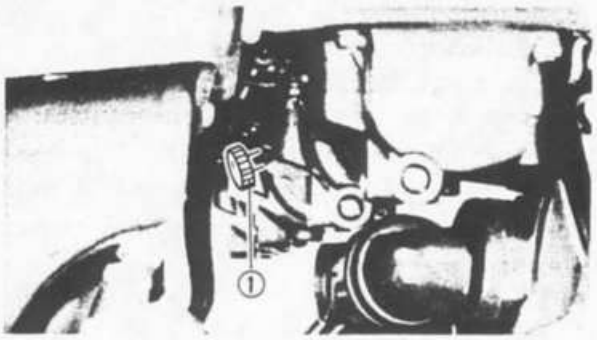
1. Tighten:
   - Carburetor clamps
   - Carburetor joint bolts
2. Inspect:
   - Carburetor joint
   - Gaskets
     Cracks/Damage → Replace.




## EXHAUST SYSTEM

1. Inspect:
   - Exhaust pipe gasket(s) ①
   - Muffler clamp gasket(s) ②
     Damage → Replace.
     Exhaust gas leakage → Repair.
2. Tighten:
   - Exhaust pipe bolts
   - Muffler bolts

**Exhaust Pipe Flange ③ :**
**10 Nm (1.0 m·kg, 7.2 ft·lb)**
**Exhaust Pipe Clamp ④ :**
**20 Nm (2.0 m·kg, 14 ft·lb)**
**Exhaust Chamber Mount ⑤ :**
**25 Nm (2.5 m·kg, 18 ft·lb)**
**Muffler Clamp ⑥ :**
**20 Nm (2.0 m·kg, 14 ft·lb)**
**Muffler Bracket ⑦ :**
**20 Nm (2.0 m·kg, 14 ft·lb)**




## IDLE SPEED

1. Adjust:
   - Idle speed

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

| | |
|---|---|
| | Idle Speed: 1,050 ± 50 r/min |

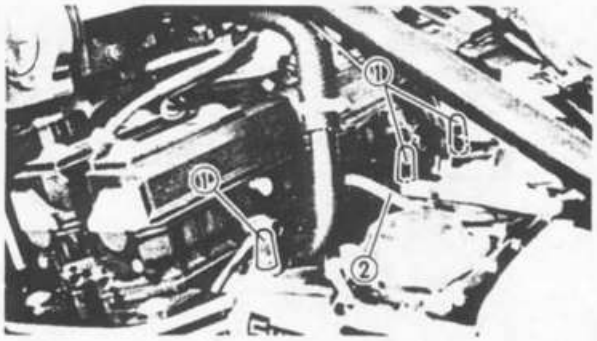
## CARBURETOR SYNCHRONIZATION

### Carburetor Adjustment

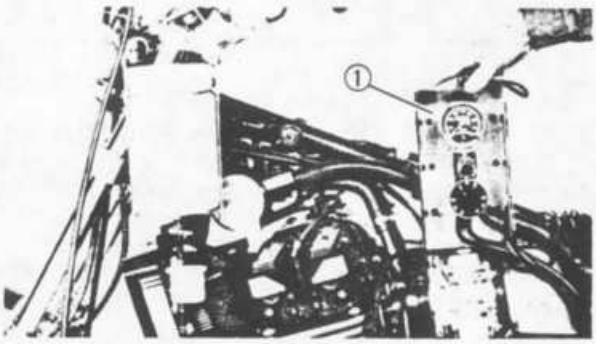
Carburetors must be set properly before synchronizing the carburetors.

**NOTE:**

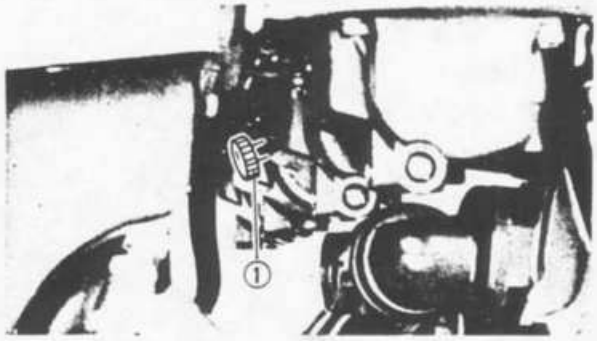
Valve clearance must be set properly before synchronizing the carburetors.




1. Remove:
   - Seat
   - Fuel tank
2. Disconnect:
   - Vacuum plugs ①
   - Vacuum hose ②



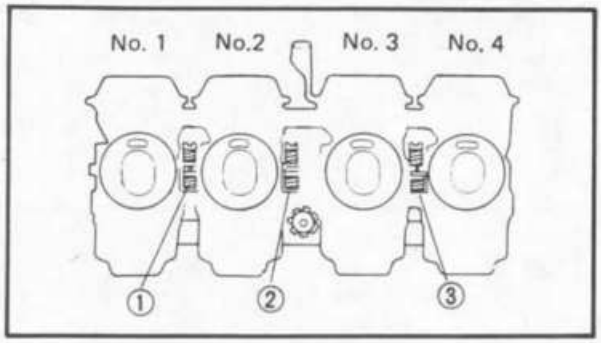

3. Install:
   - Vacuum Gauge (90890-03094) ①
   - Suitable test fuel tank
4. Start the engine and let it warm up.




5. Inspect:
   - Idle speed

   Out of specification → Turn throttle stop screw ① to adjust.

| | |
|---|---|
| | Idle Speed: 1,050 ± 50 r/min |

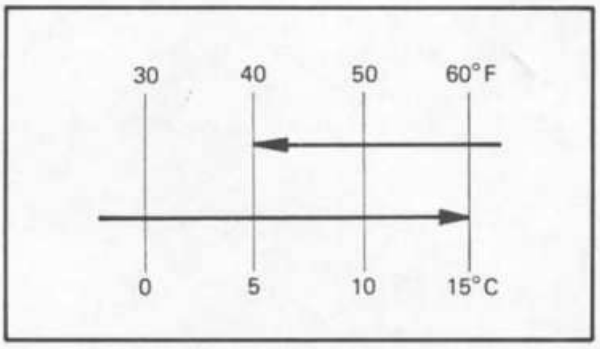



6. Adjust:
   - Carburetor synchronization

**Carburetor synchronization adjustment steps:**
- Synchronize the carburetor No. 1 to the carburetor No. 2 by turning the synchronizing screw "①" until the both gauge readings are the same.
- Rev. the engine for a fraction of a second, two or three times, and check the synchronization again.

**Vacuum Pressure at Idle Speed:**
**24 kPa (180 mm Hg, 7.1 in Hg)**
**Vacuum Synchronous Difference:**
**0.7 kPa (5 mm Hg, 0.2 in Hg)**

- Repeat the above steps to synchronize the carburetor No. 4 to the carburetor No.3 by turning the synchronizing screw "③" until the both gauge readings are the same.
- Repeat the same steps to synchronize No. 3 carburetor to No. 1 carburetor, then turn synchronizing screw "②" until both gauge readings are the same.




## ENGINE OIL

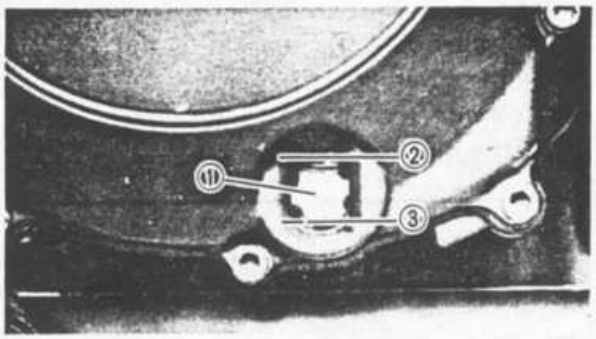
**At 5°C (40°F) or Higher:**
**Yamalube 4-Cycle Oil or**
**SAE 20W40 Type SE Motor Oil**
**At 15°C (60°F) or Lower:**
**SAE 10W30 Type SE Motor Oil**

**NOTE:**
Recommended engine oil classification; API Service "SE", "SF" type or equivalent (e.g. "SF-SE", "SF-SE-CC", "SF-SE-SD" etc.)

**Oil Level Measurement**

1. Check
   - Oil level

   Oil level low → Add sufficient oil.




**Oil level visual inspection steps:**

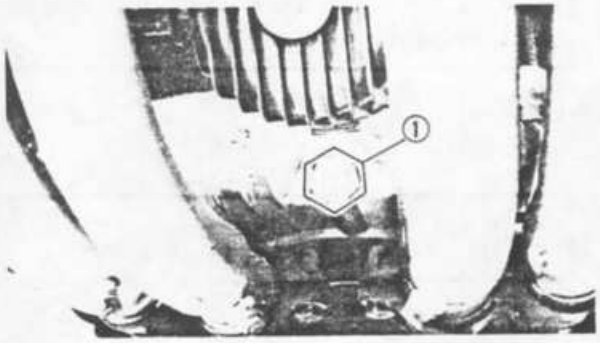
- Place the motorcycle on its centerstand and warm up the engine for several minutes.

**NOTE:**

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

- Stop the engine and visually check the oil level through the level window ① .

② Maximum
③ Minimum




**Oil Change (Without filter)**

1. Warm up the engine for several minutes, then place a receptacle under the engine.
2. Remove:
   - Oil filler cap
3. Remove:
   - Drain plug ①

   Drain the engine oil.
4. Tighten:
   - Drain plug

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

5. Fill:
   - Crankcase

**Engine Oil:**
**2.5 L (2.2 Imp qt, 2.6 US qt)**

**CAUTION:**

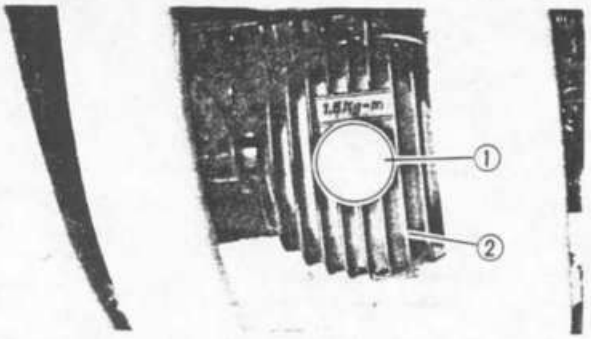
**Do not allow foreign material to enter the crankcase.**

6. Install:
   - Filler cap

**Oil Change (With filter)**

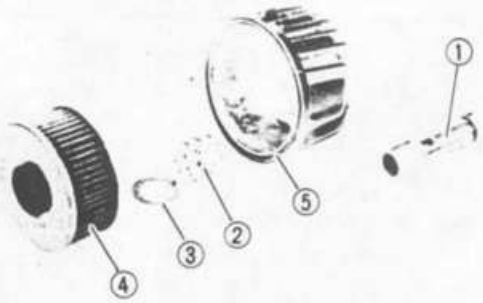
1. Warm up the engine and place a receptacle under the engine.
2. Remove:
   - Oil filler cap
   - Drain plug

   Drain the engine oil.



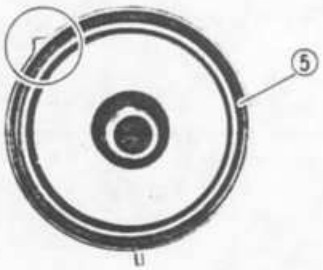

3. Remove:
   - Oil filter bolt ①
   - Filter cover ②
4. Tighten:
   - Drain plug

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




5. Install:
   - Oil filter bolt ①
   - Spring ②
   - Washer ③
   - Oil filter (New) ④
   - O-ring ⑤
   - Oil filter assembly

NOTE:
- Be sure the O-ring ⑤ is positioned properly.
- Fit the filter cover projection into the crankcase cover slot.



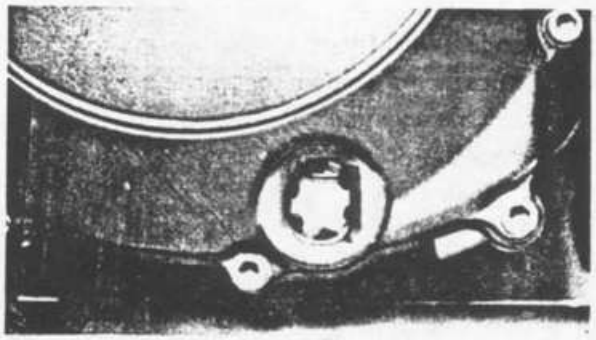

6. Tighten:
   - Oil filter bolt

**Oil Filter Bolt:**
**15 Nm (1.5 m·kg, 11 ft·lb)**

7. Fill:
   - Crankcase

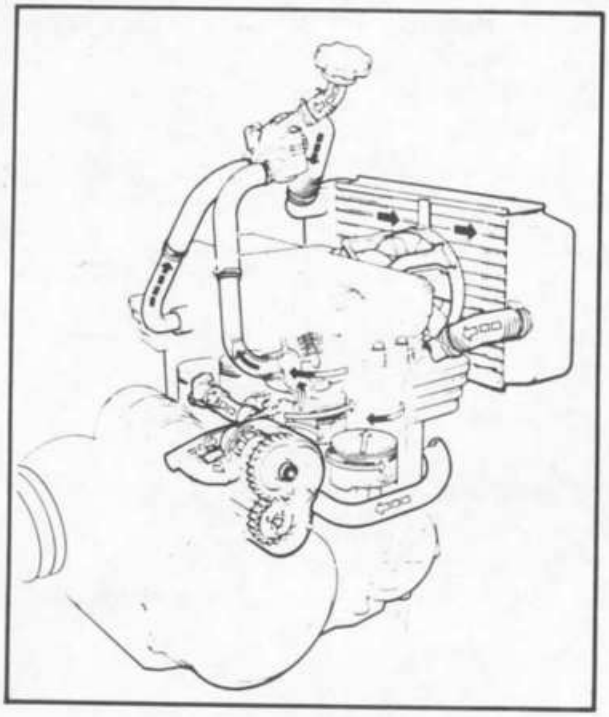
**Engine Oil:**
**2.8 L (2.5 Imp qt, 3.0 US qt)**

8. Install:
   - Oil filler cap



9. Warm up the engine and check for oil leaks. Stop the engine instantly if leaking occurs. Leaks → Check cause.
10. Check:
    - Oil level

    Level low → Add sufficient oil.

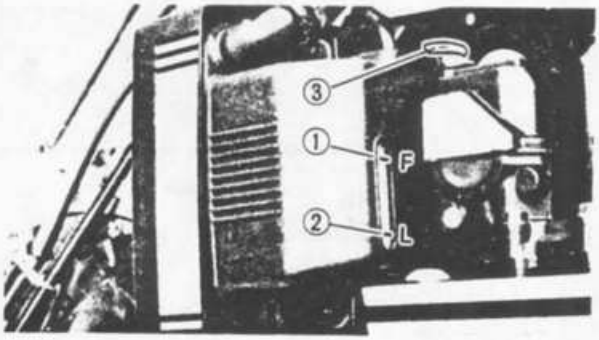


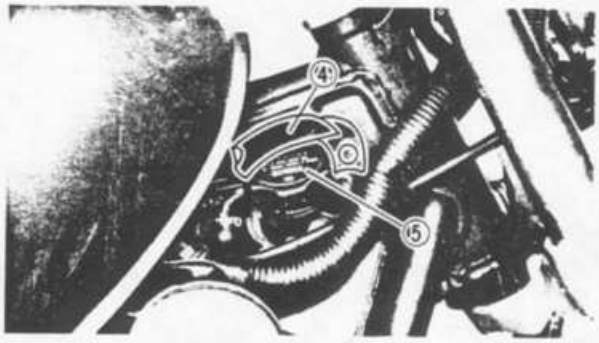
## COOLANT

Recommended Coolant:
High Quality Ethylene Glycol Anti-freeze Containing Anti-corrosion for Aluminum Engine Inhibitors
Coolant and Water Mixed Ratio:
50%/50%
Total amount:
2.4 L (2.11 Imp qt, 2.54 US qt)
Reservoir Tank Capacity:
0.49 L (0.43 Imp qt, 0.52 US qt)
From "LOW" to "FULL" Level:
0.14 L (0.12 Imp qt, 0.15 US qt)

**WARNING:**

Do not remove the radiator cap when the engine and radiator are hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury.
When the engine has cooled, open the radiator can by the following procedure: Place a thick rag, like a towel, over the radiator cap, slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.




### Coolant Level Check

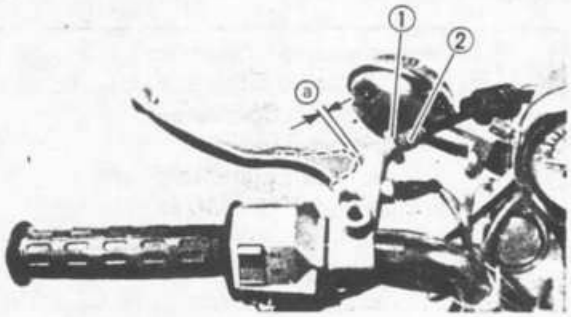
1. Check:
   - Coolant level
     Collant level low → Add sufficient coolant.

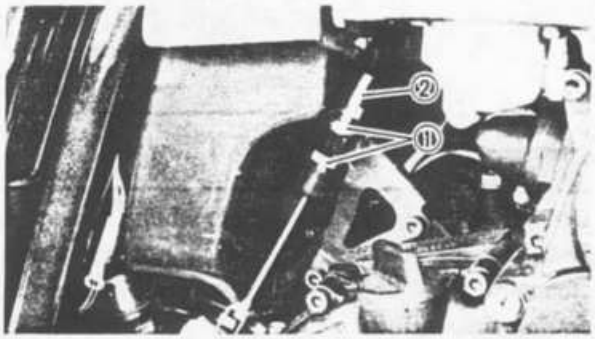
① "FULL" level
② "LOW" level

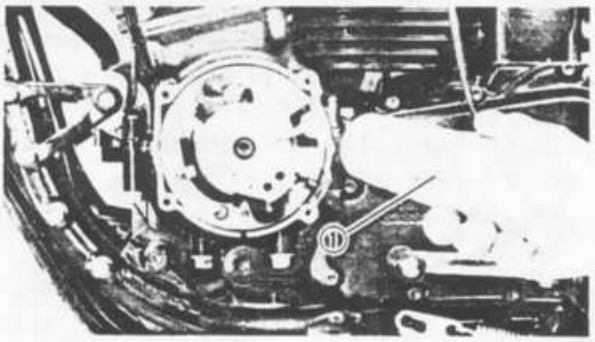
2. Remove:
   - Reservoir tank cap ③
   - Cap retainer ④
   - Radiator cap ⑤
3. Add:
   - Coolant

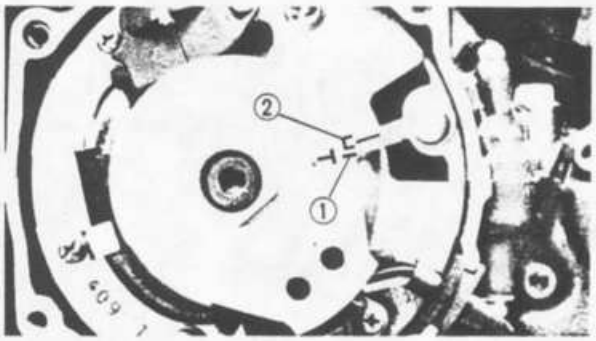
# CLUTCH ADJUSTMENT/IGNITION TIMING CHECK






## CLUTCH ADJUSTMENT

1. Loosen:
   - Adjuster locknut ①
2. Adjust:
   - Clutch lever free play ⓐ
     (by turning adjuster ② in or out)

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

3. If free play can not be adjusted, adjust by clutch cable length adjuster.
4. Loosen:
   - Adjuster locknuts ①
5. Adjust:
   - Clutch lever free play ⓐ
     (by turning clutch cable length adjuster ② .)

## IGNITION TIMING CHECK

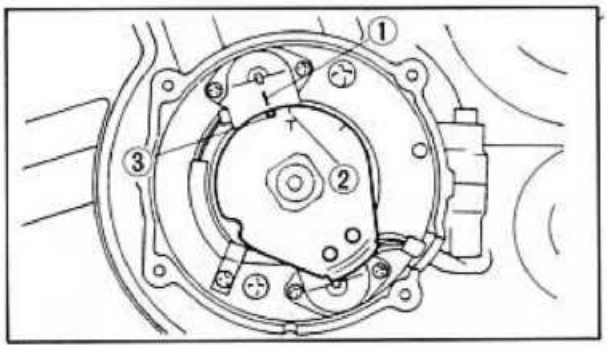
1. Check:
   - Ignition timing

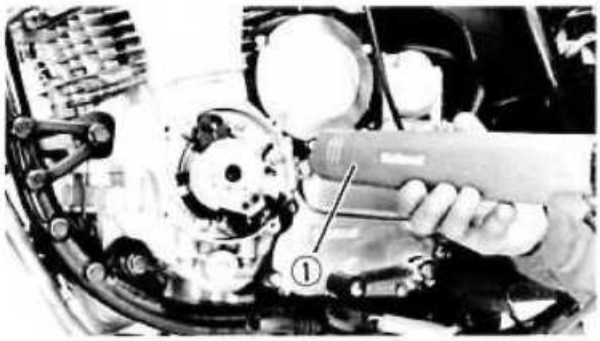
**Ignition timing check steps:**
- Remove the cover.
- Connect Timing Light (90890-03109) ① to No. 1 cylinder spark plug lead.
- Warm up the engine and let it idle at the specified idle speed of 1,050 ± 50 r/min.
- Visually check the stationary pointer in the timing window to verify it is within the required firing range indicated on the flywheel.

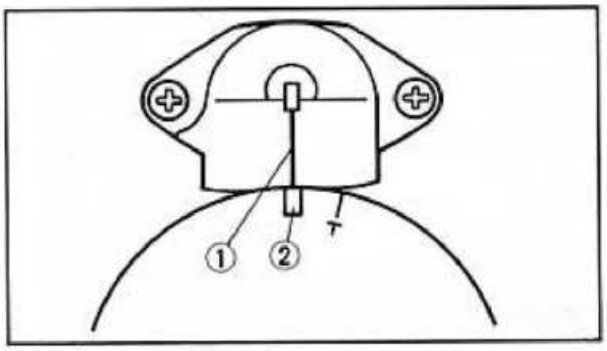
Incorrect firing → Check timing plate and/or pickup assembly (tightness damage). Refer to CHAPTER 7, "ELECTRICAL" for further information.

① TDC for No. 1 cylinder
② Firing range for the No. 1 cylinder

Note: the timing pointer was deleted on the 1986 "S" models and a new rotor substituted. Please see the following page for reference to the new pointer. Air cooled S shown, Maxim X is similar.




## IGNITION TIMING CHECK

Flywheel is marked as follows:

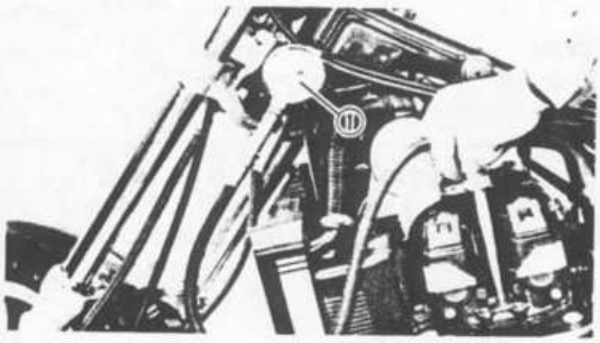
① Pickup coil mark
② TDC for No. 1 cylinder
③ Firing range for the No. 1 cylinder

1. Check:
   - Ignition timing

**Ignition timing check steps:**
- Remove the cover.
- Connect the Timing Light (YU-08037) ① to No. 1 cylinder spark plug lead.
- Warm up the engine and let it idle at the specified idle speed of 1,050 ± 50 r/min.
- Visually check the upper pickup coil mark ① is within the firing range ② indicated on timing plate.

Incorrect firing → Check timing plate and/or pickup assembly (tightness damage)
Refer to CHARTER 6, "ELECTRICAL" for further information.

① Pickup coil mark.
② Firing range for the No. 1 cylinder



## 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 (90890-03081) ① 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 readings with specified levels (See chart).

**Compression Pressure (at sea level):**

**Standard:**
**1,059 kPa (10.8 kg/cm², 154 psi)**
**Minimum:**
**1,098 kPa (11.2 kg/cm², 159 psi)**
**Maximum:**
**1,138 kPa (11.6 kg/cm², 165 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 below the minimum level:

1) Squirt a few drops of oil into the affected cylinder.
2) Measure the compression again.

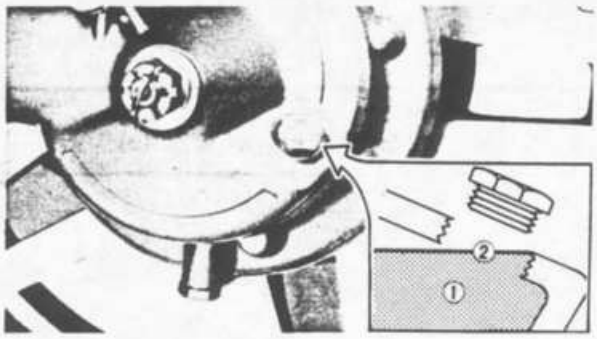
**Compression Pressure (with oil introduced into cylinder)**

| | |
|---|---|
| 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 different between the highest and lowest cylinder compression readings must not vary more than the specified value.

| Difference between Each Cylinder: |
|---|
| Less than 98 kPa (1 kg/cm$^2$, 14 psi) |




## CHASSIS

### FINAL GEAR OIL

**Oil Level Measurement**

1. Place the motorcycle on a level area and place on its centerstand.
2. Remove:
   - Oil filler cap
3. Observe:
   - Oil level ②

   Low level → Add oil.

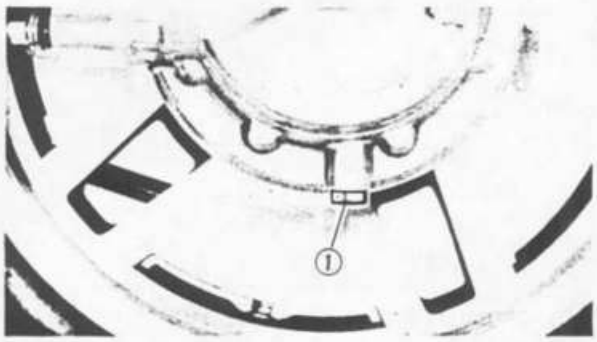
① Oil

**NOTE:**

Oil level must be up to the brim of the filler hole.

**CAUTION:**

**Be sure that no foreign material enters the final gear case.**




**Gear Oil Replacement**

1. Place a receptacle under the final gear case.
2. Remove:
   - Filler cap
   - Drain plug ①

   Drain final gear oil.
3. Install:
   - Drain plug

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

4. Fill
   - Gear case (to specified level.)

**Final Gear Oil:**
**SAE 80 API "GL-4" Hypoid gear oil**
**Oil Capacity:**
**0.20 L (0.18 Imp qt, 0.21 US qt)**

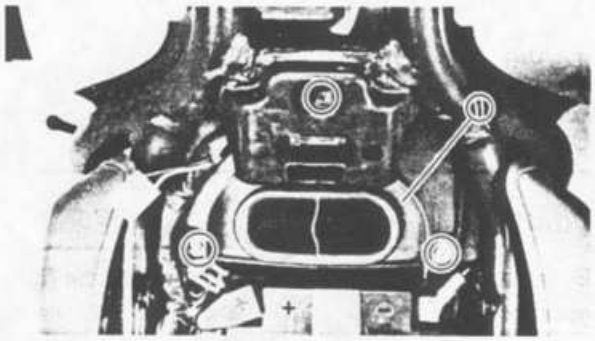
**NOTE:**

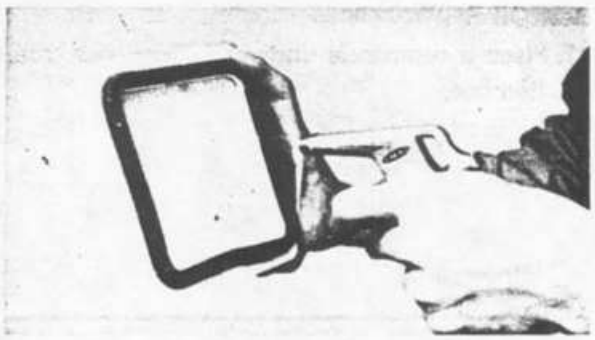
If desired, an SAE 80W90 Hypoid gear oil may be used for all conditions.

5. Install:
   - Filler cap

| | |
|---|---|
| | Filler Cap: 23 Nm (2.3 m·kg, 17 ft·lb) |

2





## AIR FILTER

1. Remove:
   - Seat
   - Fuel tank
   - Rubber cover
2. Remove:
   - Air filter cover ①
3. Eliminate:
   - Dust

   Use compressed air.
4. Inspect:
   - Element

   Damage → Replace.

**CAUTION:**

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

5. Install:
   - Element

**CAUTION:**

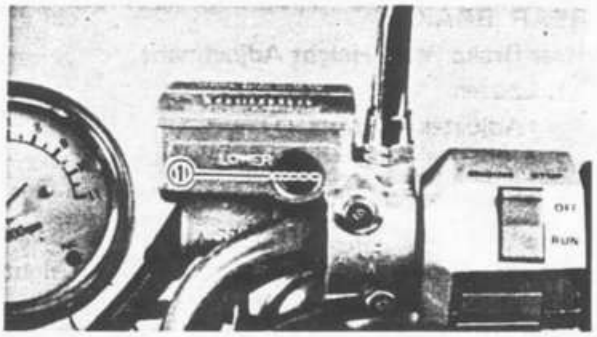
**Make sure the element cover fits into the corresponding filter case edge.**

## FRONT BRAKE

### Brake Fluid Inspection

1. Check:
   - Brake fluid level

   Level low → Replenish.



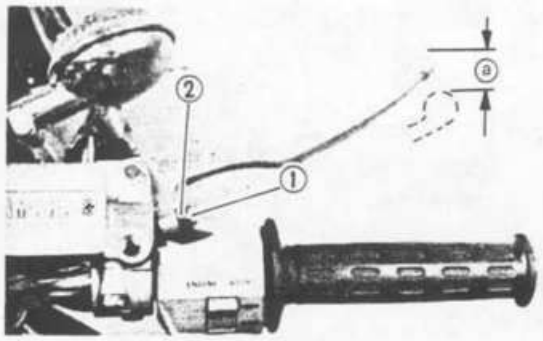

NOTE:
Use only a designated, quality fluid.

Brake Fluid:
DOT NO. 3

NOTE:
Be sure that:
- Water does not enter the master cylinder when refilling.
- Spilled fluid is cleaned up immediately to prevent painted surfaces or plastic parts from eroding.

① Lower level





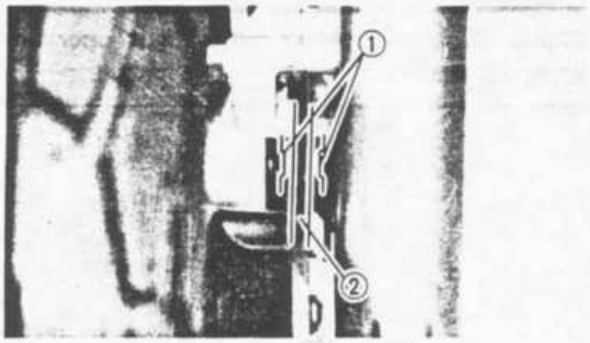

**Front Brake Lever Free Play Adjustment**

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

Brake Lever Free Play ⓐ:
2 ~ 5 mm (0.08 ~ 0.20 in)

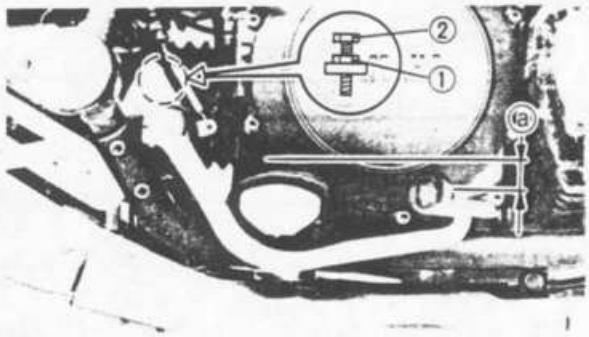
**CAUTION:**
**Proper lever free play is essential to avoid excessive brake drag.**

3. Tighten:
   - Adjuster locknut




**Brake Pad Inspection**

1. Activate the brake lever.
2. Inspect:
   - Wear indicator ①
     Indicator almost contacts disc ② → Replace pads.
     Refer to CHAPTER 6, "CHASSIS."




## REAR BRAKE

### Rear Brake Pedal Height Adjustment

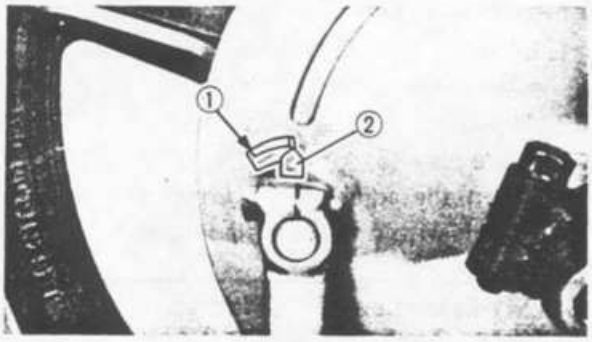
1. Loosen:
   - Adjuster locknuts ①
2. Adjust:
   - Brake pedal height ⓐ

   Turn the adjuster ② until the brake pedal position is at the specified height.

Brake Pedal Height ⓐ:
10 mm (0.4 in)
Below the Top of the Footrest

**WARNING:**

**Adjust pedal height, then adjust brake pedal free play.**




### Rear Brake Shoe Inspection

1. Depress brake pedal.
2. Inspect:
   - Wear indicator ②

   Indicator at wear limit line → Replace brake shoes.

① Wear limit line




### Rear Brake Pedal Free Play Adjustment

1. Rotate:
   - Adjuster nut ①

   Turn it clockwise or counterclockwise until proper brake pedal free play is attained.

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

**WARNING:**

**Check to verify correct brake light operation after adjustment.**




**Brake Light Switch Adjustment**

1. Hold the switch body ① with your hand so that it does not rotate and turn the adjusting nut ② .

## CABLE INSPECTION AND LUBRICATION

**Cable inspection and lubrication steps:**

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

**Yamaha Chain and Cable Luber or SAE 10W30 Motor Oil**

## BRAKE AND SHIFT PEDALS/ BRAKE AND CLUTCH LEVERS

Lubricate pivoting parts of each lever and pedal.

**Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil**

## CENTERSTAND AND SIDESTAND

Lubricate centerstand and sidestand at their pivot points.

**Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil**

2

## FRONT FORK OIL CHANGE

**WARNING:**

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

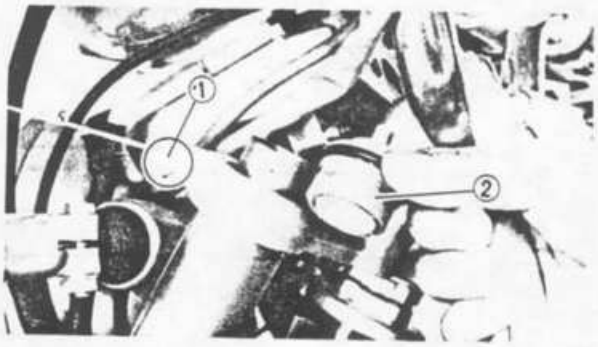
1. Place a suitable stand under the engine to raise the front wheel off the ground.




2. Remove:
   - Air valve cap ①

NOTE:

Keep the valve ② open by pressing it for several seconds so that the air can be let out of the inner tube.




3. Loosen:
   - Inner tube pinch bolt ①
4. Remove:
   - Cap bolt ②

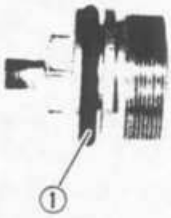



5. Remove:
   - Drain screw ①

   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.**




6. Inspect:
   - O-ring ① (Cap-bolt)
   - Gasket (Drain bolt screw)

   Wear/Damage → Replace.
7. Install:
   - Drain screw
8. Fill:
   - Front fork

**Each Fork:**
**389 cm³ (13.7 Imp oz, 13.2 US oz)**

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

9. Tighten:
   - Cap-bolt
   - Pinch bolt

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





10. Fill:
    - Fork

    (with specified amount of air.)
    Refer to "Front fork adjustment".
11. Install:
    - Fork cap

**Maximum Air Pressure:**
**118 kPa (1.2 kg/cm², 17.1 psi)**
**Do not exceed this amount.**

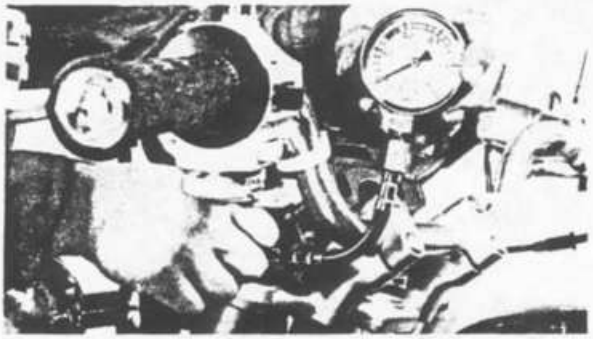
## FRONT FORK ADJUSTMENT

1. Place motorcycle on centerstand, then elevate front wheel.

NOTE:

Be sure there is no weight on the front end of the motorcycle and the fork tube is at room temperature when air pressure is checked and adjusted.

## REAR SHOCK ABSORBER ADJUSTMENT



2. Remove:
   - Fork cap
3. Measure:
   - Air pressure

   Use an air gauge and adjust as needed.

**NOTE:**

Increased air pressure causes stiffer suspension; decreased pressure causes softer suspension.

| Air Pressure Adjustment | |
|---|---|
| To increase air pressure | Use manual air pump or pressurized air supply. |
| To decrease air pressure | Release air by pushing valve pin. |

**Standard Air Pressure:**
**39.2 kPa (0.4 kg/cm², 5.7 psi)**
**Maximum Air Pressure:**
**118 kPa (1.2 kg/cm², 17.1 psi)**
**Minimum Air Pressure: Zero**

**CAUTION:**

**Never exceed maximum pressure or oil seal damage may occur.**

4. Install:
   - Fork cap cap



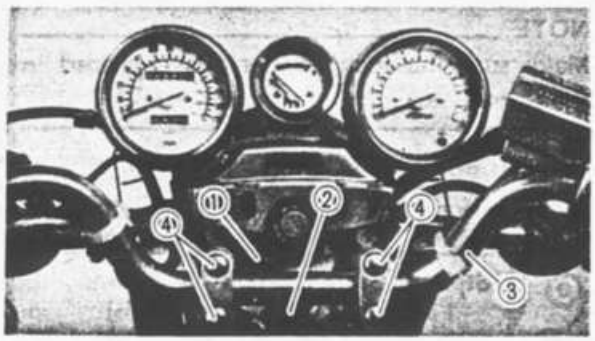

### REAR SHOCK ABSORBER ADJUSTMENT

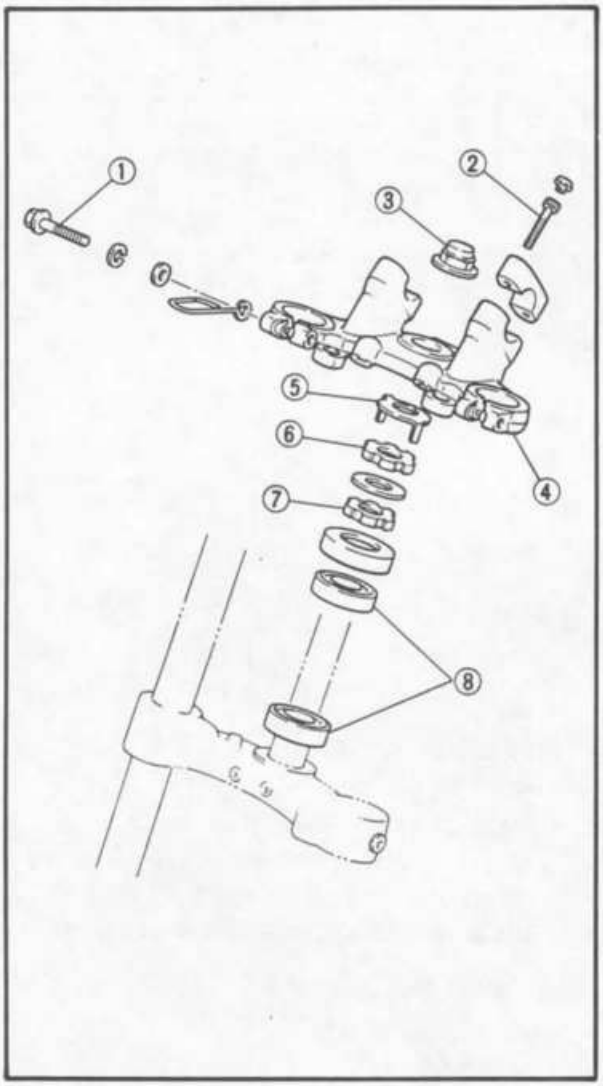
If the spring seat is raised, the spring becomes stiffer, and if lowered, it becomes softer.

**Standard Position: A**
**A. – Softest**
**E. – Stiffest**

**WARNING:**

**Always adjust each shock absorber to the same setting. Uneven adjustment can cause poor handling and loss of stability.**





## STEERING HEAD ADJUSTMENT

### Steering Head Inspection

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

### Adjustment

**Steering head adjustment steps:**

- Loosen the pinch bolts ①.
- Remove the handlebar securing bolts ②.
- Remove the handlebar.
- Remove the steering stem nut ③.
- Remove the steering crown ④.
- Remove the lock washer ⑤.
- Loosen the ring nut ⑥.
- Tighten the ring nut ⑦

**Ring Nut (Lower):**
**50 Nm (5.0 m·kg, 36 ft·lb)**

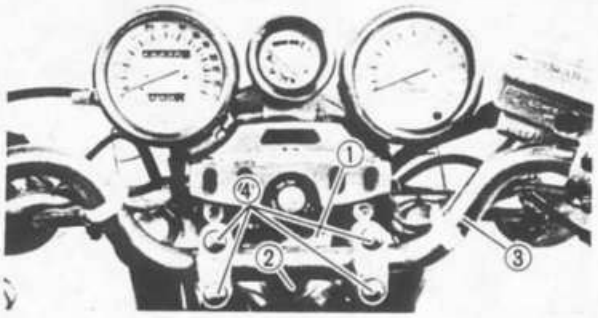
NOTE:
The tapered side of ring nuts must face downward.

- Loosen the ring nut ⑦ completely and retighten it to specification.

**Rint Nut (Lower):**
**6 Nm (0.6 m·kg, 4.3 ft·lb)**

- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering bearings ⑧.
  (See CHAPTER 6, STEERING HEAD for more details.)
- Hand-tighten the ring nut ⑥, then align the slots of both ring nuts. If not aligned, hold the lower ring nut ⑦ and tighten the other until they are aligned.
- Install the lock washer ⑤.

## WHEEL BEARINGS




NOTE:
Make sure the lock washer tab is placed in the slots.

- Install the steering crown ① and tighten the steering stem nut ② to specification.

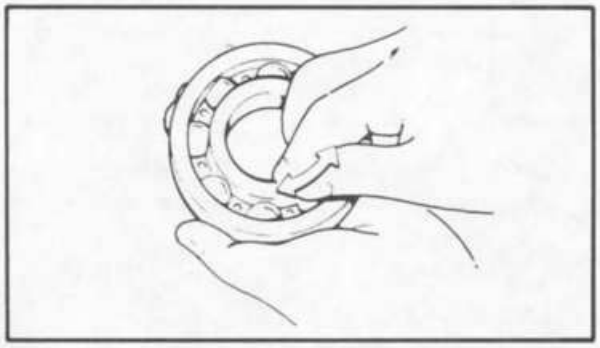
**Steering Stem Nut:**
**110 Nm (11.0 m·kg, 80 ft·lb)**

- Install the handlebar ③ and torque the bolt ④ to specification.

**Pinch Bolt:**
**20 Nm (2.0 m·kg, 14 ft·lb)**
**Handlebar Bolt:**
**20 Nm (2.0 m·kg, 14 ft·lb)**

- Install the fork and bolt caps.





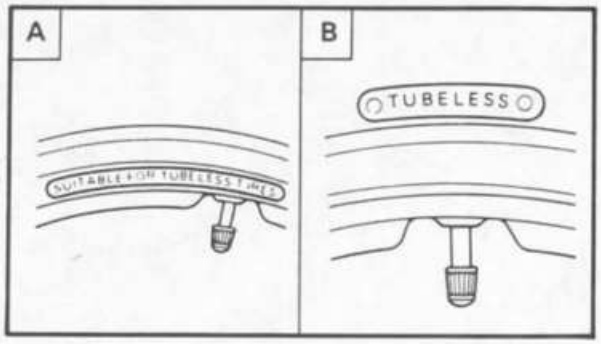
### WHEEL BEARINGS

**Front Wheel Bearings**

1. Raise the front end of the motorcycle, and spin the wheel by hand. Touch the axle or front fork while spinning the wheel.
   Excessive vibration → Replace bearings.

**Rear Wheel Bearings**

1. Remove:
   - Rear wheel
2. Check:
   - Bearing movement
     Rotate with the fingers.
     Roughness/Wear → Replace.



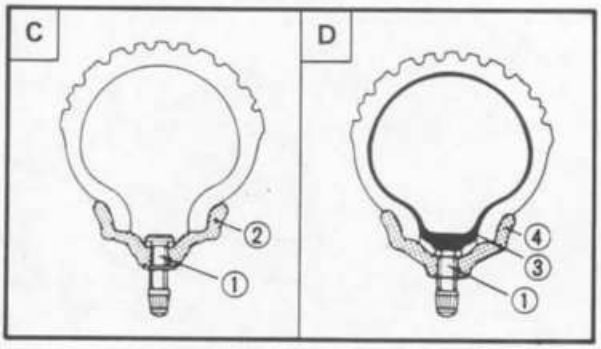

## TUBELESS TIRES AND ALUMINUM WHEELS

**WARNING:**

- Always inspect aluminum wheels before a ride.
- Do not attempt any repairs to the wheel; replace any defective wheel.
- Do not attempt to use tubeless tires on a wheel designed for use with tube-type tire only. Tire failure and subsequent personal injury may result from sudden deflation.

| A Wheel | B Tire |
|---|---|
| Tube type | Tube type only |
| Tubeless | Tube type or tubeless |

- Be sure to install the proper tube when using tube-type tires.
- New tires have a relatively poor adhesion on the road surface so do not allow them to be subjected to high speed load from maximum speed until after a break-in run of approx. 100 km (60 mi).
- Always use the correct tire inflation pressure according to the operating conditions.

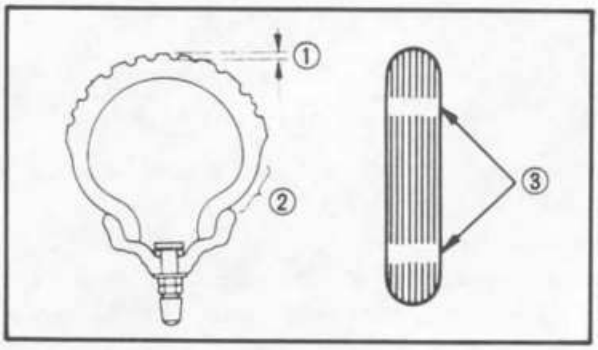



C Tubeless tire
D Tube type tire
① Air valve
② Aluminum wheel (Tubeless type)
③ Tube
④ Aluminum wheel (Tube type)

Always perform the following steps to ensure safe operation, maximum tire performance, and long service.

1. Measure:
   - Tire pressure

   Out of specification → Adjust.




| Basic weight: With oil and full fuel tank | 232 kg (511 lb) | |
|---|---|---|
| Maximum load* | 238 kg (525 lb) load | |
| Cold tire pressure | Front | Rear |
| Up to 90 kg (198 lb) load* | 177 kPa (1.8 kg/cm², 26 psi) | 196 kPa (2.0 kg/cm², 28 psi) |
| 90 kg (198 lb) load ~ 238 kg (525 lb) | 196 kPa (2.0 kg/cm², 28 psi) | 275 kPa (2.8 kg/cm², 40 psi) |
| High speed riding | 206 kPa (2.1 kg/cm², 30 psi) | 226 kPa (2.3 kg/cm², 32 psi) |

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

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

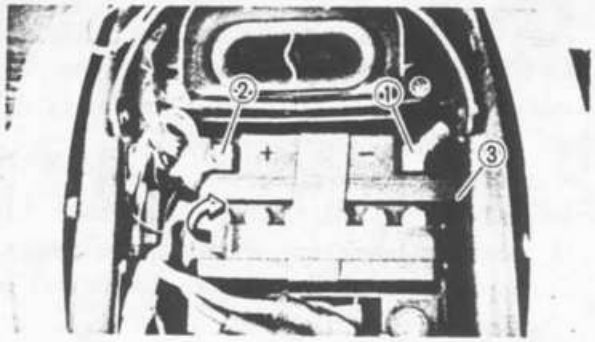
**Minimum Tire Tread Depth:**
**(Front and Rear)**
**1.0 mm (0.04 in)**

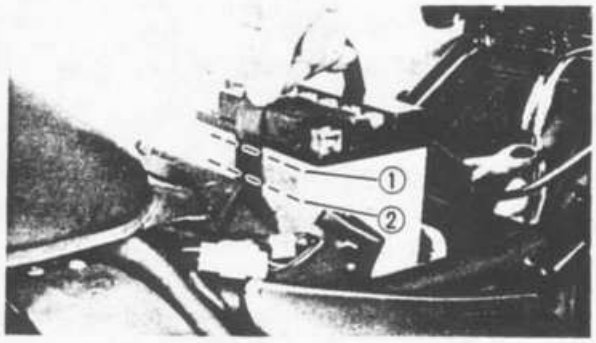
① Tread depth
② Side wall
③ Wear indicator

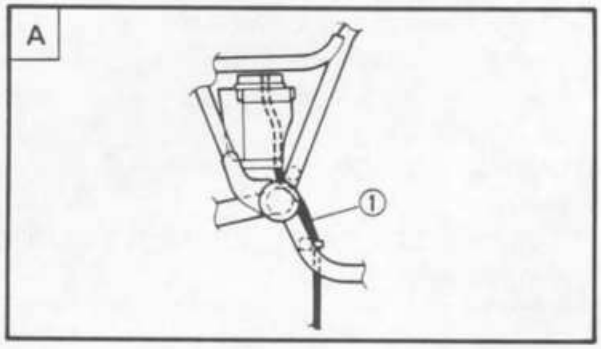
3. Inspect:
   - Aluminum wheels
     Damage/Bends → Replace.
     Never attempt even small repairs to the wheel.

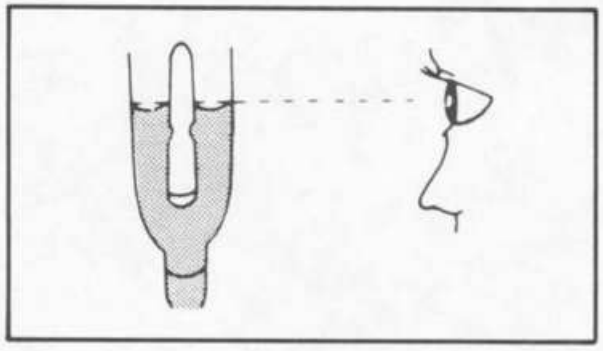
NOTE:
Always balance the wheel when a tire or wheel has been changed or replace.

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



## ELECTRICAL

### BATTERY

1. Disconnect:
   - Negative lead ①
   - Positive lead ②
   - Breather hose ③
2. Remove:
   - Battery
3. Check:
   - Fluid level

   Incorrect → Refill.

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

**CAUTION:**

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

4. Connect:
   - Breather hose ①

   Be sure the hose is properly attached and routed.
5. Inspect:
   - Breather hose ①

   Obstruction → Remove.

   Damage → Replace.

A HOW TO ROUTE BATTERY BREATHER HOSE.

**CAUTION:**

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

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

2

# HEADLIGHT




**WARNING:**

Battery electrolyte is dangerous; it contains sulfuric acid and therefore is poisonous and highly caustic.

Always follow these preventive measure:

- 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.

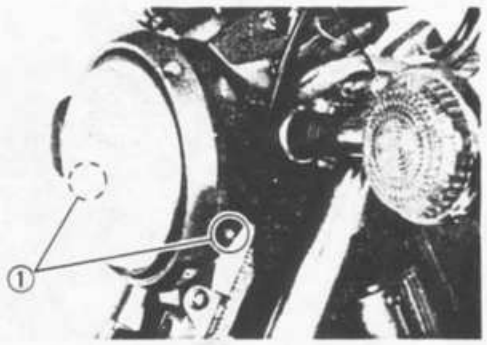
Antidote (INTERNAL):

- 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.

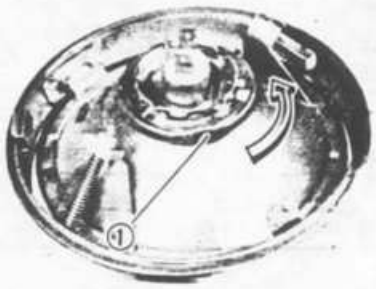
KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.




## HEADLIGHT

### Headlight Bulb Replacement

1. Remove:
   - Securing screws ①
     (from light unit assembly/headlight body.)
2. Disconnect:
   - Headlight lens unit leads




3. Remove:
   - Light unit assembly
4. Rotate:
   - Bulb holder ①
     Turn it counterclockwise.
5. Remove:
   - Defective bulb



6. Install:
   - Bulb (New)
     Secure with bulb holder.

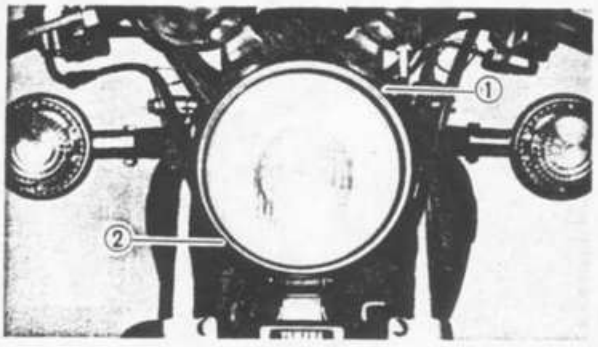
**CAUTION:**

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

**WARNING:**

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

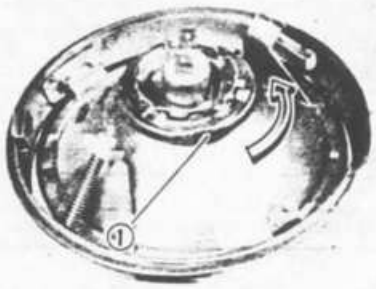
7. Install:
   - Light unit assembly
     (to headlight body.)




**Headlight Beam Adjustment**
**Horizontal adjustment:**

1. Rotate:
   - Horizontal adjusting screw ①

| Horizontal Adjustment of Headlight Beam | |
|---|---|
| Adjusting screw | Beam direction |
| Turn clockwise | → to Right |
| Turn counterclockwise | ← to Left |




3. Remove:
   - Light unit assembly
4. Rotate:
   - Bulb holder ①

   Turn it counterclockwise.
5. Remove:
   - Defective bulb



6. Install:
   - Bulb (New)

   Secure with bulb holder.

**CAUTION:**

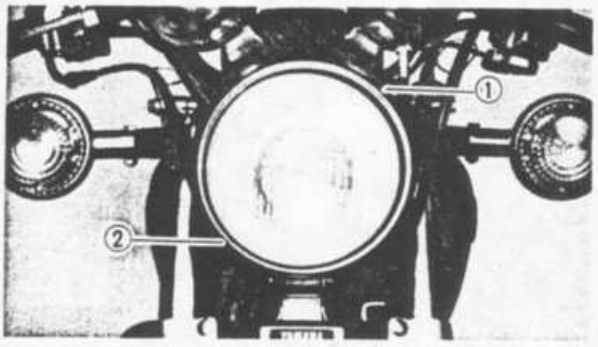
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7. Install:
   - Light unit assembly

   (to headlight body.)




**Headlight Beam Adjustment**

**Horizontal adjustment:**

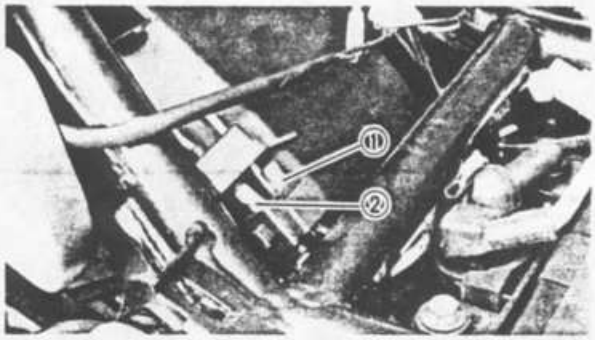
1. Rotate:
   - Horizontal adjusting screw ①

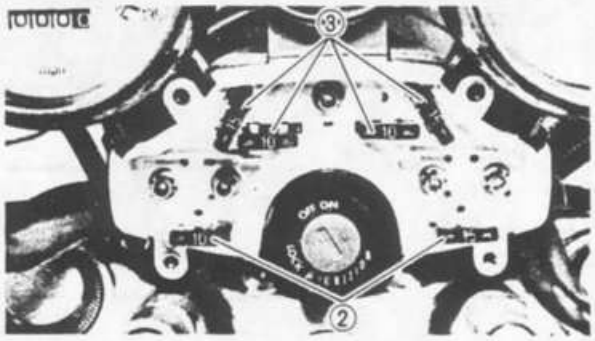
| Horizontal Adjustment of Headlight Beam | |
|---|---|
| Adjusting screw | Beam direction |
| Turn clockwise | → to Right |
| Turn counterclockwise | ← to Left |

**Vertical adjustment:**

1. Rotate:
   - Vertical adjusting screw ②

| Vertical Adjustment of Headlight Beam | |
|---|---|
| Adjusting screw | Beam direction |
| Turn clockwise | ↑ to Raise |
| Turn counterclockwise | ↓ to Lower |




## FUSE

The fuse box is under the indicator light panel. The main fuse is under the seat.

① Main fuse
② Spare fuses
③ Other fuse block

**Blown fuse procedure steps:**

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

**WARNING:**

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

# ENGINE OVERHAUL

## ENGINE REMOVAL

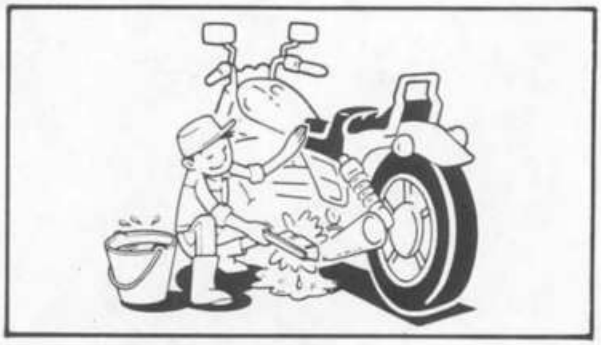
**NOTE:**

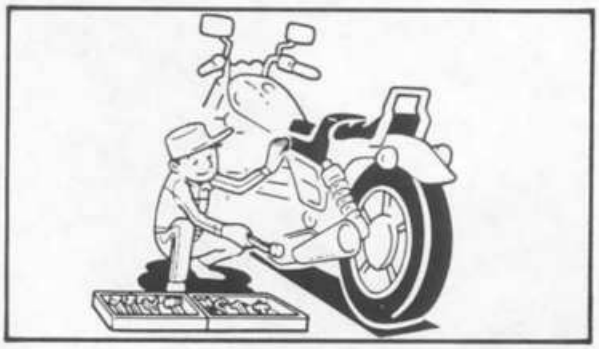
It is not necessary to remove the engine in order to remove the following components:

- Piston
- Clutch
- Carburetor
- Oil pump
- Water pump

### PREPARATION FOR REMOVAL

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





2. Use prper tools and cleaning equipment. Refer to CHAPTER 1, "SPECIAL TOOL."

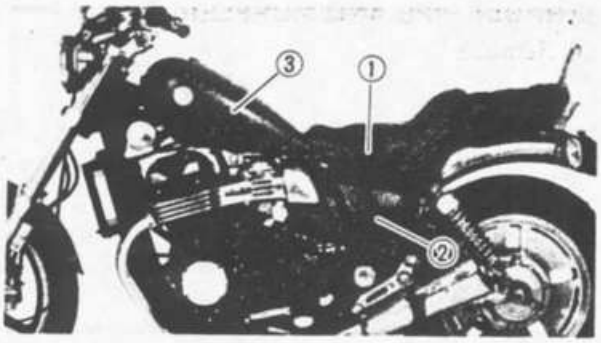


**NOTE:**

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

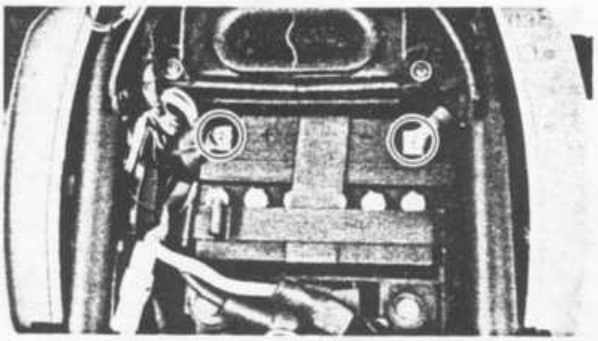


3. During the engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.




### SEAT AND FUEL TANK

1. Remove:
   - Seat ①
   - Side cover ②
   - Fuel tank ③
2. Drain:
   - Engine Oil



### BATTERY

1. Disconnect:
   - Battery leads

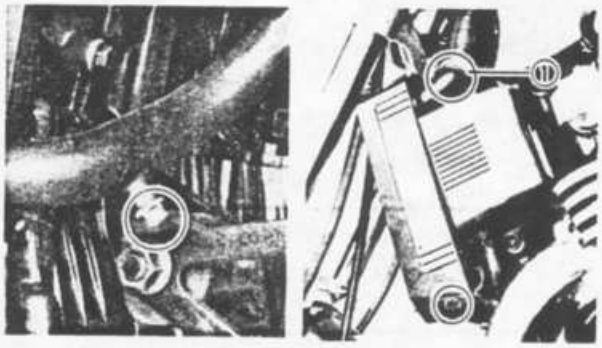
**NOTE:**

Disconnect the negative lead first.




### RADIATOR

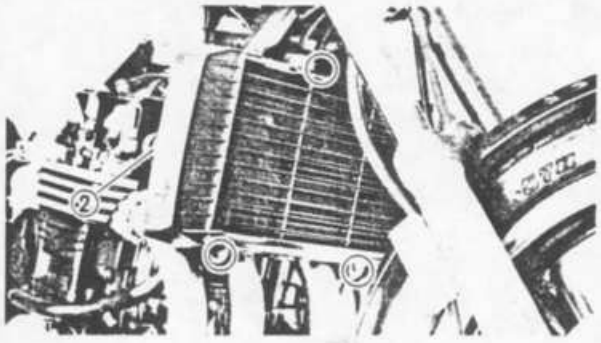
1. Remove:
   - Panel ①
   - Radiator cap cover ②
   - Radiator cap ③
2. Disconnect:
   - Electric fan motor lead ④

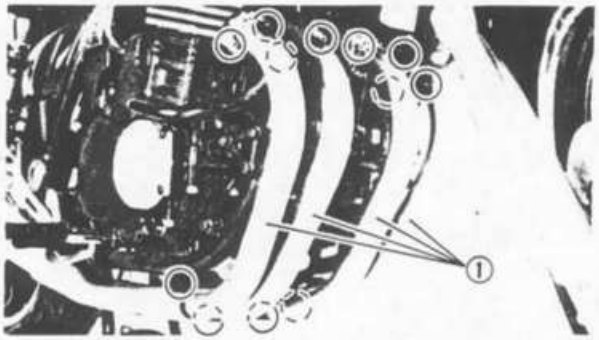



3. Drain:
   - Coolant (in the radiator)
   - Coolant (in the radiator pipe)
4. Disconnect:
   - Radiator hose (Inlet) ①
   - Radiator hose (Outlet) ②
5. Remove:
   - Radiator

**CAUTION:**

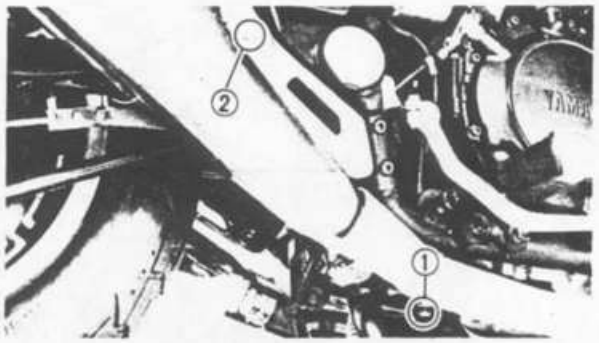
**Do not bend or damage any of the radiator fins when removing the radiator from the motorcycle or when storing it.**





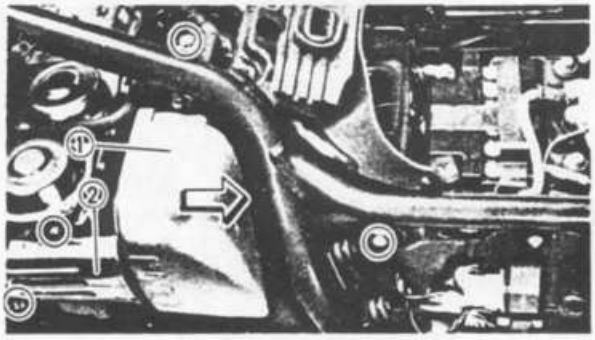

## EXHAUST PIPE AND MUFFLER

1. Remove:
   - Nuts
2. Loosen:
   - Clalmp bolts
3. Remove:
   - Exhaust pipes ①



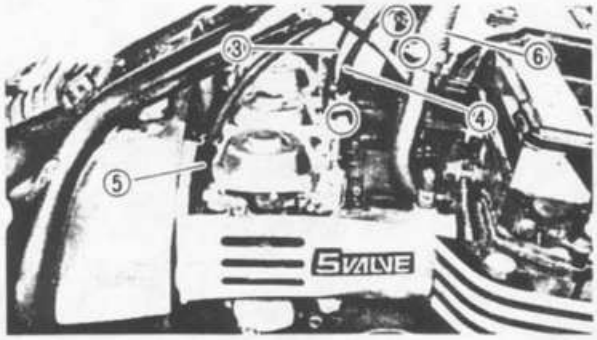

4. Remove:
   - Chamber mount bolt ①
   - Muffler mount bolts ②
   - Mufflers with chamber






## CARBURETOR AND CABLES

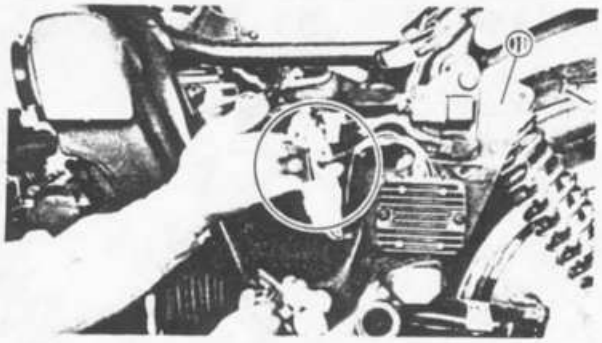
1. Remove:
   - Air cleaner case ① mount bolts.
   - Side cover ②
2. Loosen:
   - Clamp screws
3. Push the air cleaner case toward the rear to disconnect air outlet hoses from carburetors.
4. Disconnect:
   - Choke cable ③
   - Throttle cables ④
   - Clutch cable ⑤
5. Remove:
   - Carburetors




**NOTE:**

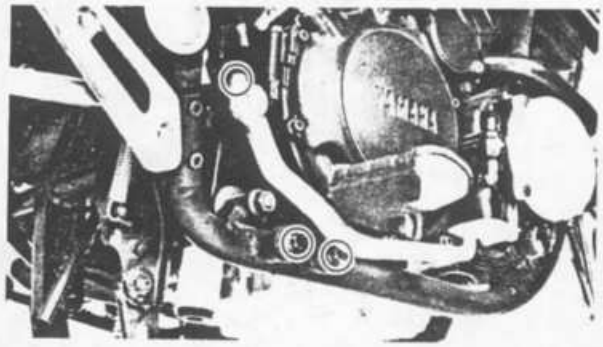
After removing the carburetors, cover the carburetors with a clean cloth to keep dust and dirt out.

6. Disconnect:
   - Radiator hoses ⑥
   - Crankcase ventilation hose



CONNECTOR

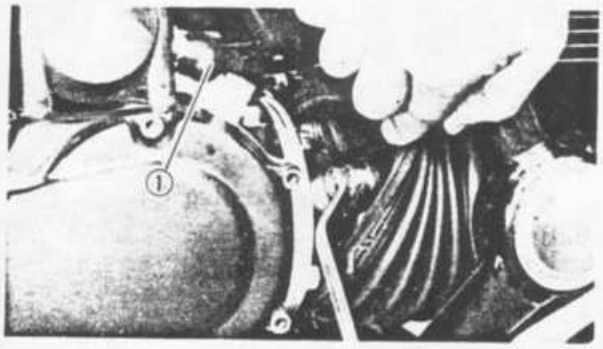
1. Remove:
   - Pannel ①
2. Disconnect:
   - Pickup coil lead
   - Generator lead
   - Neutral switch lead
   - Oil level switch lead



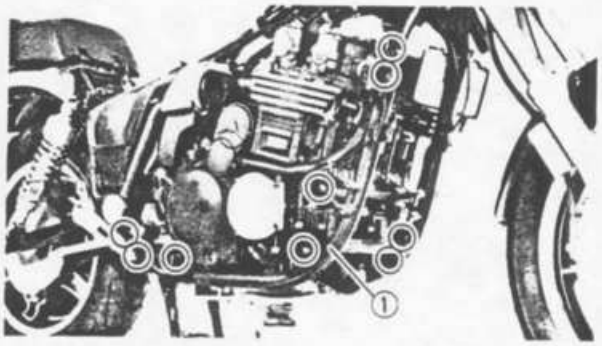
FOOTREST, BRAKE PEDAL, AND DRIVE SHAFT

1. Remove:
   - Brake pedal
   - Footrests (Left and Right)



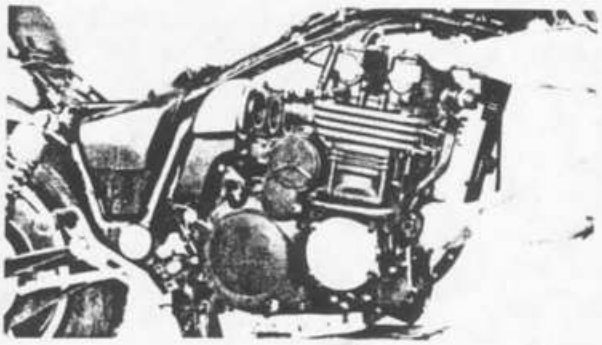


2. Disconnect:
   - Starter motor lead ①
     (from starter motor)
   - Rubber boot
3. Remove:
   - Joint bolts

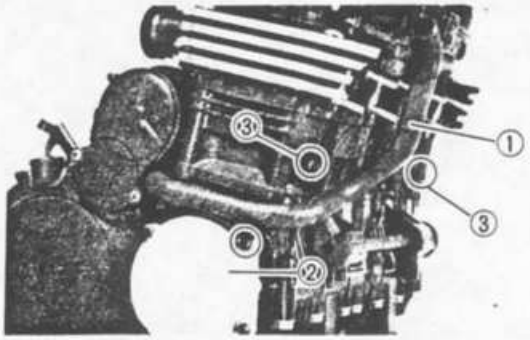


ENGINE REMOVAL

1. Place a suitable stand under the engine.
2. Remove:
   - Downtube frame ①
   - Mount bolts



3. Remove:
   - Engine assembly
     (from chassis right side)

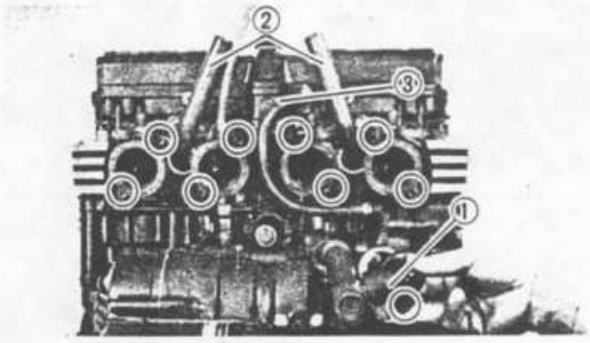



## ENGINE DISASSEMBLY

### RADIATOR PIPES, CARBURETOR JOINT, AND OIL DELIVERY PIPE

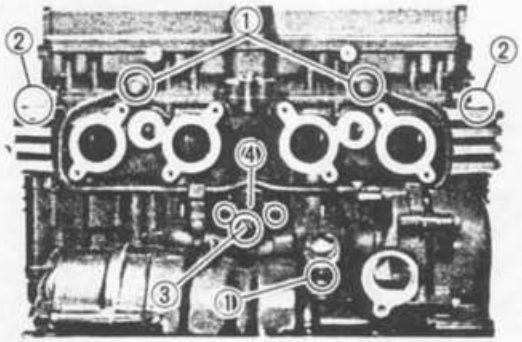
1. Remove:
   - Radiator pipe ①
   - Cover (Right) ②
2. Drain:
   - Coolant (in the cylinder)

③ Drain bolts




3. Remove:
   - Water pump joint ①
   - Radiator pipes ②
   - Carburetor joints
   - Bypass hose ③

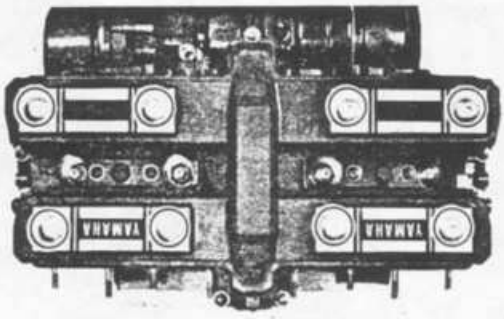


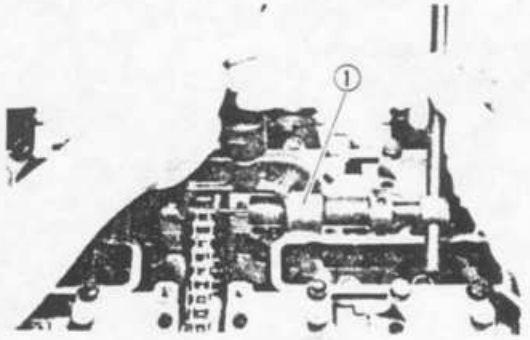



4. Remove:
   - Oil delivery pipe union bolts ①
   - Copper washers
   - Cylinder head side covers ②
5. Loosen:
   - Cam chain tensioner end plug ③
6. Remove:
   - Cam chain tensioner assembly ④

### CYLINDER HEAD AND CYLINDER

1. Remove:
   - Cylinder head cover

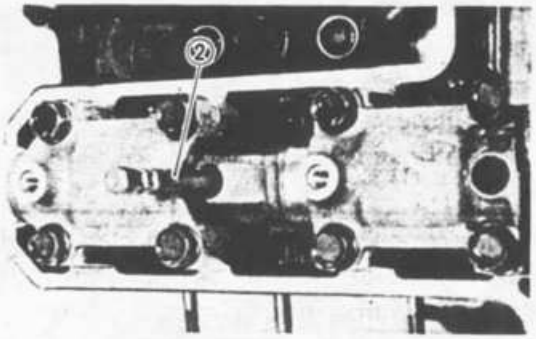


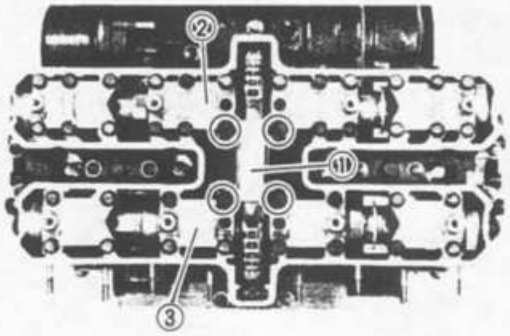

**NOTE:**

Piston and cylinder can be removed, when necessary, without removing the camshaft.
The main steps are as follows.

- Disconnect the cam chain using Cam Chain Cutter ① (90890-01112).

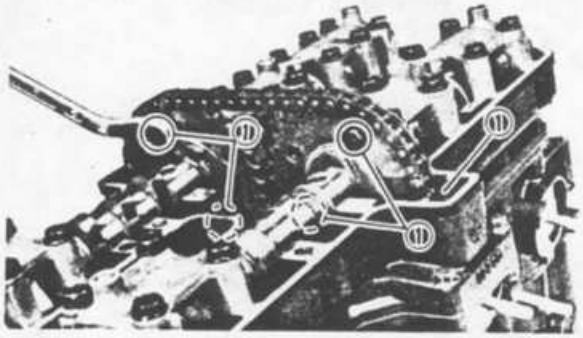


- Remove the cylinder head nuts in the camshaft case using Hexagon Wrench ②.
- Remove the cam shaft, cam shaft case and cylinder head as assembly.

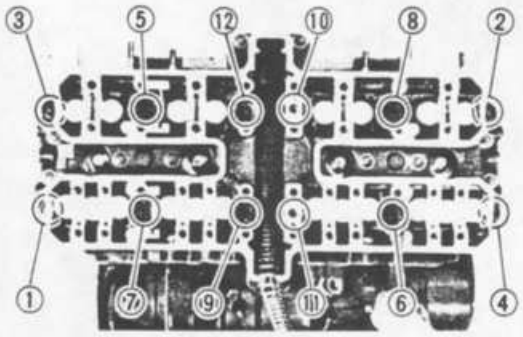


2. Remove:
   - Cam chain guide (Upper) ①
   - Camshaft cap (I3) ②
   - Camshaft cap (E3) ③
   - Dowel pins





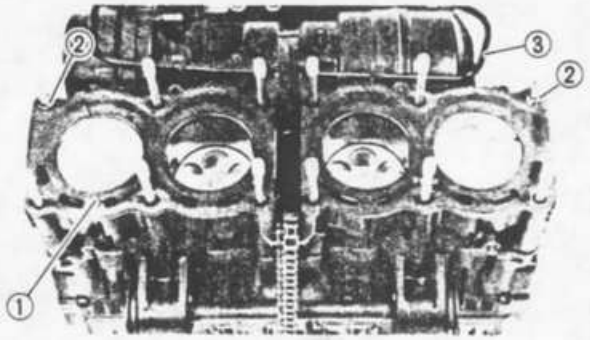
3. Remove:
   - Cam chain sprocket bolts ①
     Use 22 mm (0.88 in) wrench to hold camshaft.
   - Camshaft caps (I1, I2, I4, E1, E2, E4)
   - Dowel pins
   - Camshafts
   - Cam chain guide (Front) ②



4. Remove:
   - Cylinder head nut

**NOTE:**
Follow the numerical order shown in photo, start by loosening each nut 1/4 turn until all are loose.

   - Cylinder head



5. Remove:
   - Cylinder head gasket ①
   - Dowel pins ②
   - Cylinder
   - Oil delibery pipes ③
   - Cylinder base gasket
   - Dowel pins



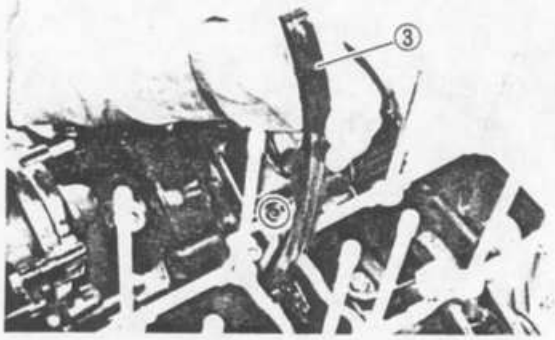

### PISTON AND CAM CHAIN GUIDE

Mark each piston so it can be reinstalled in the appropriate cylinder.

1. Remove:
   - Piston pin clips ①

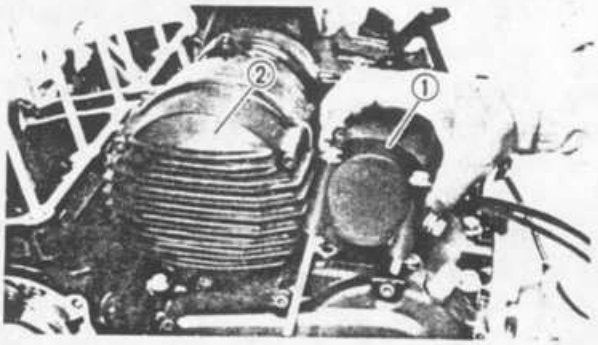
NOTE:

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



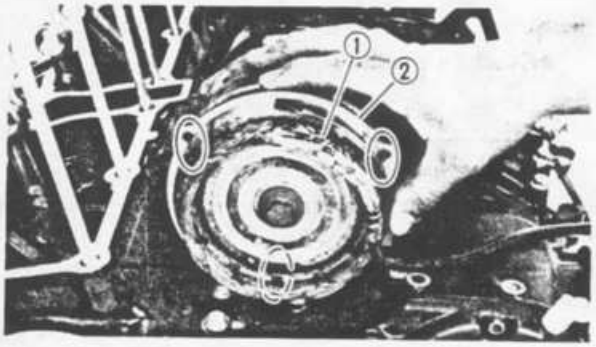

- Piston pins ②
- Pistons
- Cam chain guide (Rear) ③



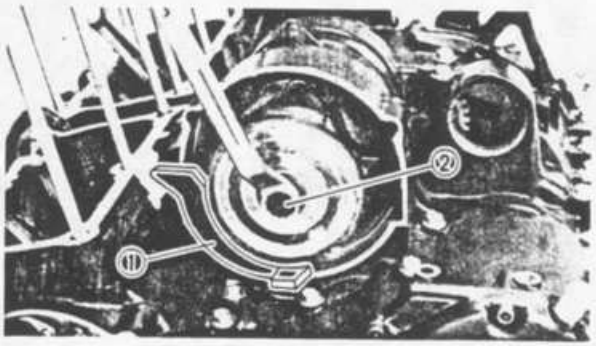



### STARTER MOTOR AND GENERATOR

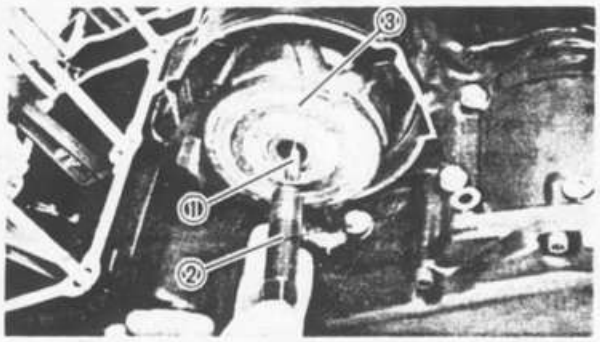
1. Remove:
   - Starter motor bolts
   - Starter motor assembly ①
   - Generator cover ②



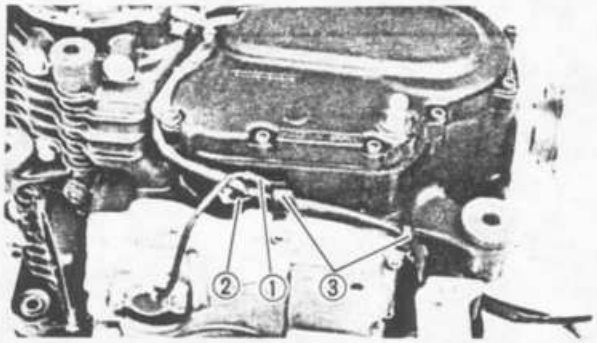

2. Remove:
   - Stator coil ①
   - Gasket ②




3. Attach:
   - Rotor Holding Tool (90890-04043) ①
4. Remove:
   - Rotor holding bolt ②

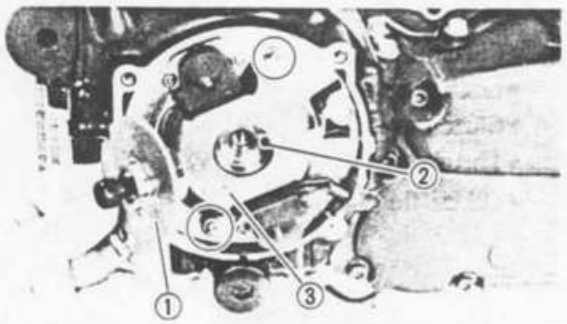



5. Attach:
   - Rotor Puller Adapter (90890-04052) ①
   - Rotor Puller (90890-01080) ②
6. Remove:
   - Rotor ③

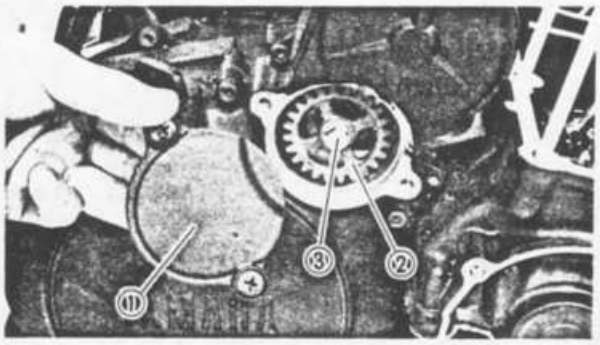



**PICKUP COIL**

1. Disconnect:
   - Oil level switch lead ①
   - Neutral switch lead ②
   - Pickup coil lead (from clamps ③)




2. Remove:
   - Timing plate ①
   - Dowel pin ②
   - Pickup coil assembly ③

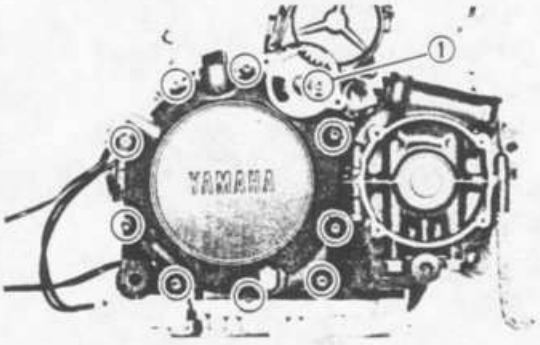



**CLUTCH**

1. Remove:
   - Water pump drive sprocket cover ①
   - Water pump drive sprocket ②

NOTE:
Water pump drive sprocket bolts ③ is locked with LOCTITE®.

   - Spacer

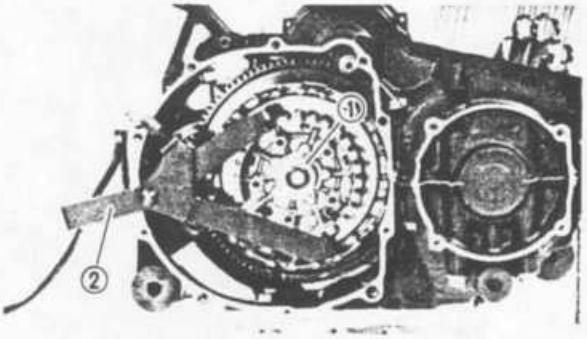



2. Remove:
   - Bearing retaining washer ①
   - Clutch cover
   - Gasket
   - Dowel pins

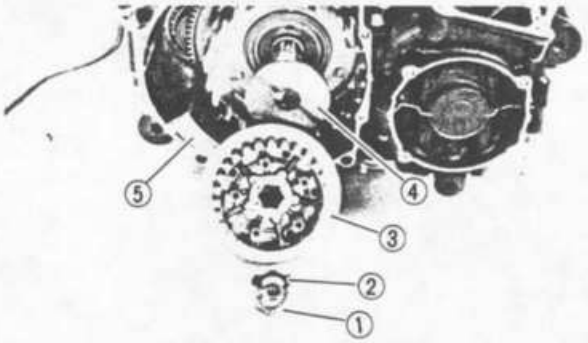



3. Remove:
   - Clutch spring bolts ①
   - Clutch springs
   - Pressure plate ②
   - Friction plates
   - Clutch plates

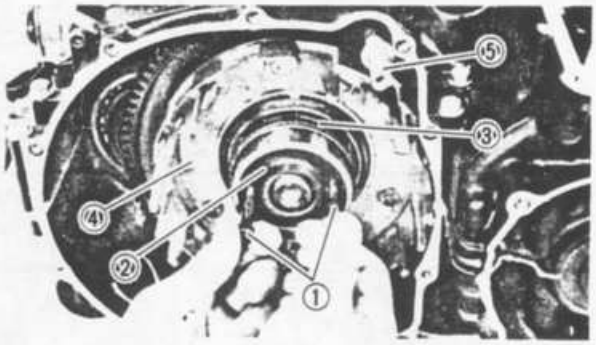
NOTE:
The outermost friction plate has a tab with a V-cut ③ in it. Give some identifying mark to the corresponding dog ④ in the clutch housing. This dog is narrowest.



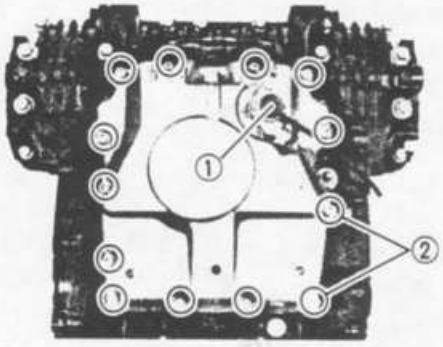

4. Bend:
   - Lock washer tab ①
5. Attach:
   - Universal Clutch Holder (90890-04086) ②




6. Remove:
   - Clutch boss nut ①
   - Lock washer ②
   - Clutch boss ③
   - Thrust washer ④
   - Oil baffle plate ⑤

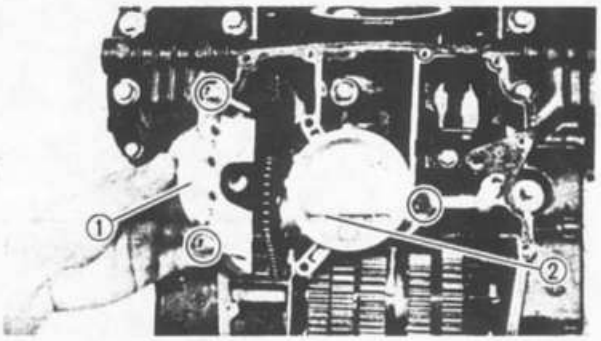



7. Install:
   - Clutch cover bolts ①
     (into clutch housing spacer holes)
8. Remove:
   - Clutch housing spacer ②
   - Bearing ③
   - Clutch housing ④
   - Water pump drive shaft ⑤

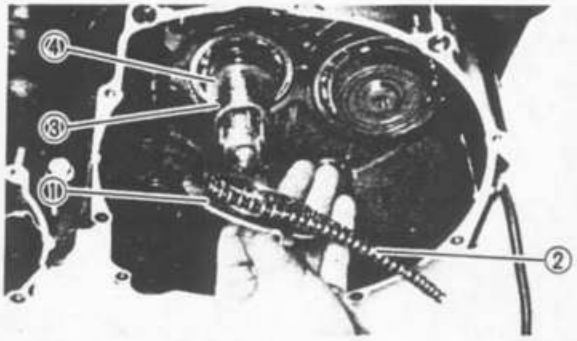



**OIL PUMP**

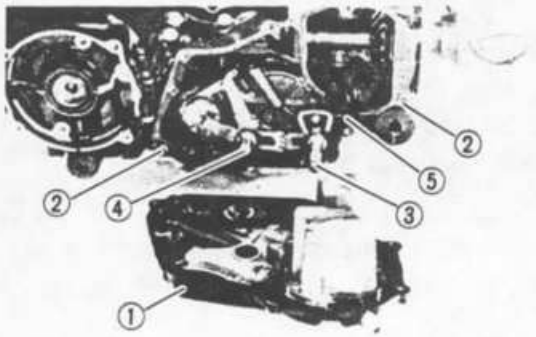
1. Remove:
   - Oil filter
   - Oil level switch ①
   - Oil pan
   - Clamps ②
   - Gasket
   - Dowel pins




2. Remove:
   - Oil pump drive chain cover ①
   - Oil pump assembly ②

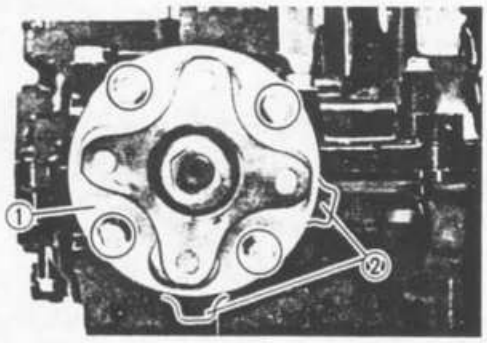



3. Remove:
   - Oil pump drive sprocket ①
   - Chain ②
   - Collar ③
   - Thrust plate ④

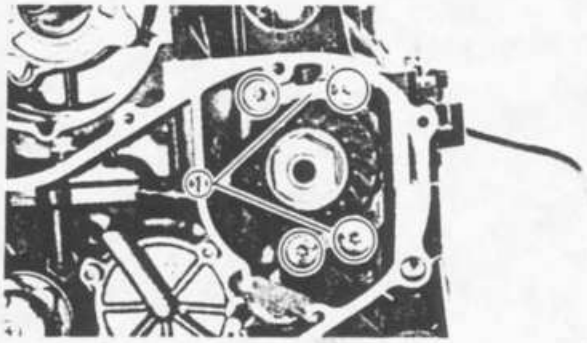



## SHIFTER AND MIDDLE GEAR

1. Remove:
   - Crankcase cover (Left) ①
   - Gasket
   - Dowel pin ②
   - Shift shaft ③
   - Shift lever ④
   - Oil level maintaining plug ⑤



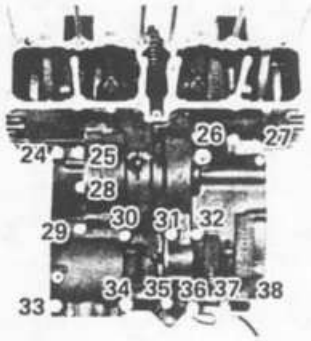

2. Remove:
   - Middle driven gear housing ①
   - Shims ②



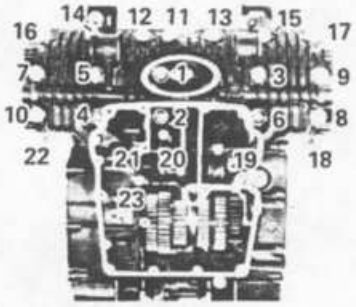

3. Remove:
   - Bearing retainer ①

   Use Torx Driver #40 (90890-04049).

A




B

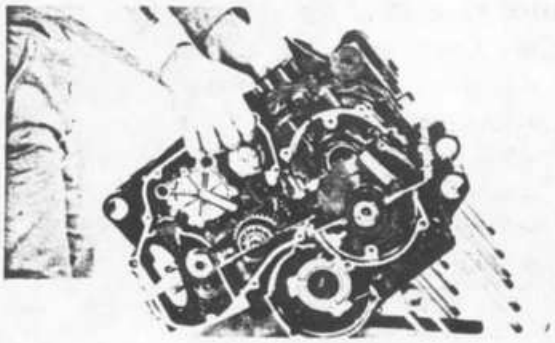



### CRANKCASE

1. Remove:
   - Bolts (Crankcase)
   - Clamps
   - Battery negative lead

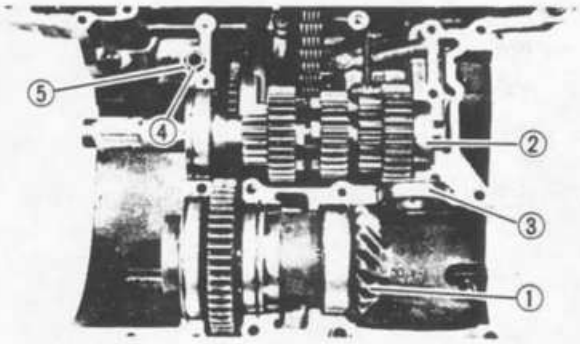
NOTE:
- Remove the bolts starting with the highest numbered one.
- The embossed numbers in the crankcase designate the crankcase tightening sequence.

A Upper crankcase
B Lower crankcase



2. Remove:
   - Lower crankcase
   - Blind plug
     (from crankcase right end)
   - Crankshaft bearings

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



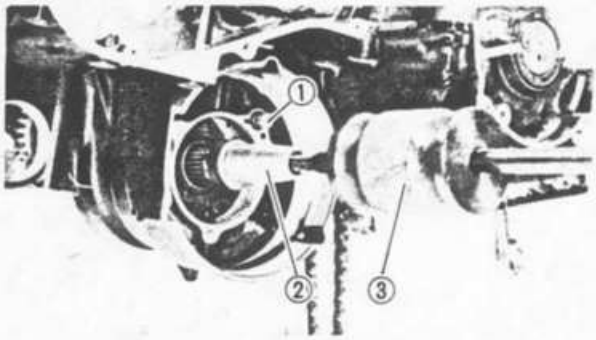

### MAIN AXLE AND MIDDLE DRIVE GEAR

1. Remove:
   - Middle drive gear ①
   - Main axle ②
   - Bearing ③
   - Dowel pins ④
   - O-ring ⑤



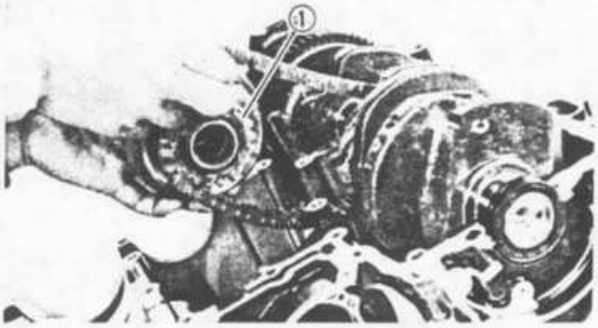
### A.C.G. SHAFT, STARTER DRIVE, AND CRANKSHAFT

1. Remove:
   - Housing
     Use Torx Driver #30 (90890-05245)

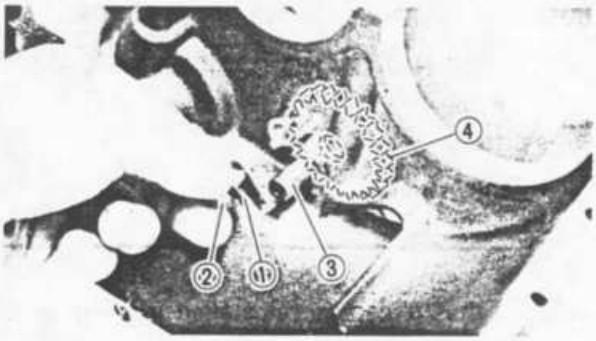



2. Remove:
   - Oil spray nozzle ①
   - A.C.G. shaft ②

   Use Armature Shock Puller (90890-01290) and (90890-01291) ③

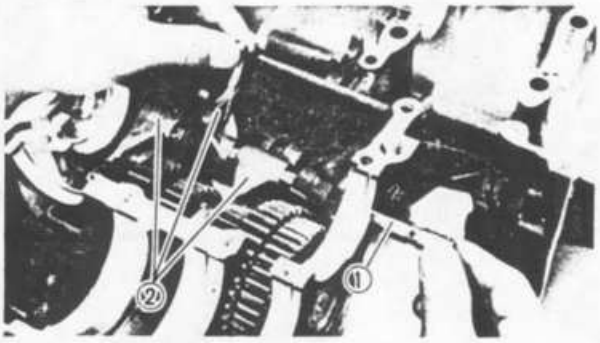



3. Remove:
   - Starter clutch assembly ①
   - Crankshaft

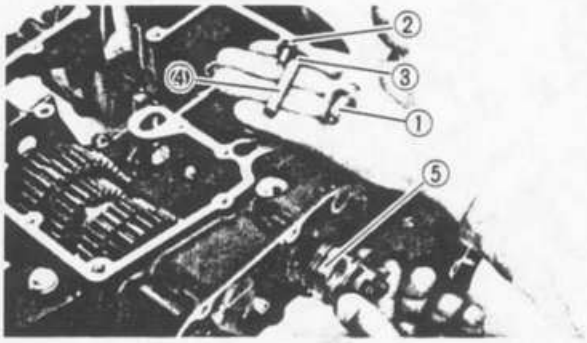



5. Bend:
   - Lock washer tab ①
6. Remove:
   - Starter idle gear shaft bolt ②
   - Lock washer
   - Stopper plate
   - Starter idle gear shaft ③
   - Starter idle gear ④

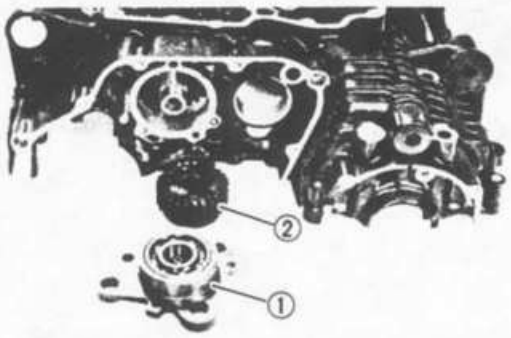
## SHIFT CAM AND DRIVE AXLE



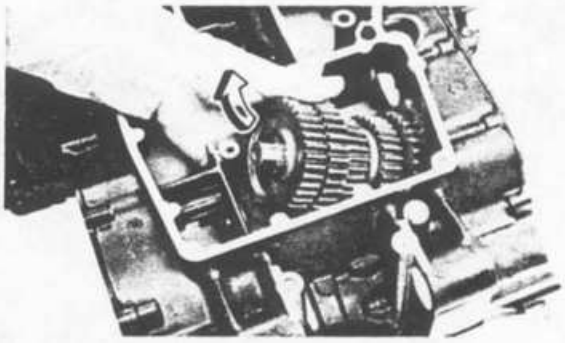

1. Remove:
   - Guide bar ①
   - Shift forks ②




2. Remove:
   - Neutral switch ①
   - Bolts ②
   - Stopper plate ③
   - Shift cam locating pin ④
   - Shift cam ⑤

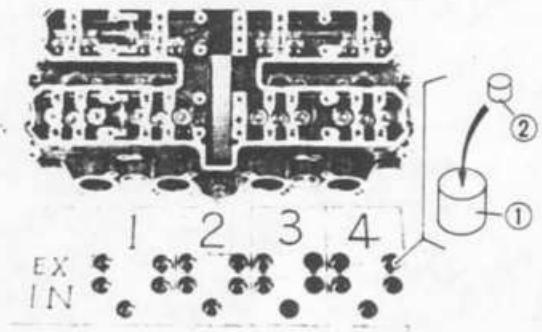



3. Remove:
   - Drive axle bearing cover ①
   - 5th wheel gear ②



4. Remove:
   - Drive axle assembly



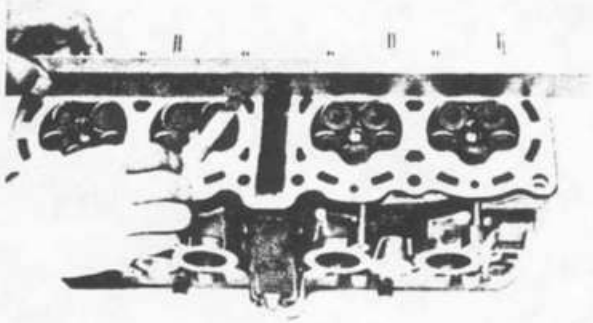



## INSPECTION AND REPAIR

### CYLINDER HEAD AND CAMSHAFT CASE

1. Remove
   - Lifters ①
   - Valve pads ②

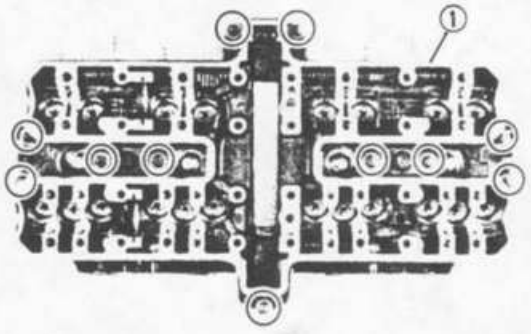
**NOTE:**
Identify each lifter and pad position very carefully so that it can be reinstalled in its original place.



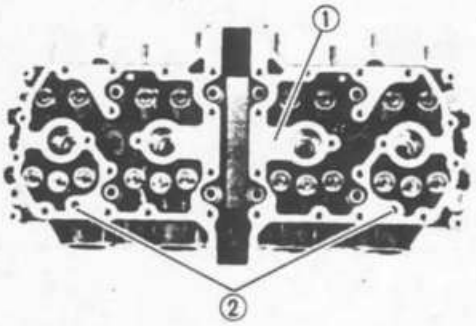
2. Measure:
   - Warpage

   Exceeds allowable limit → Resurface.

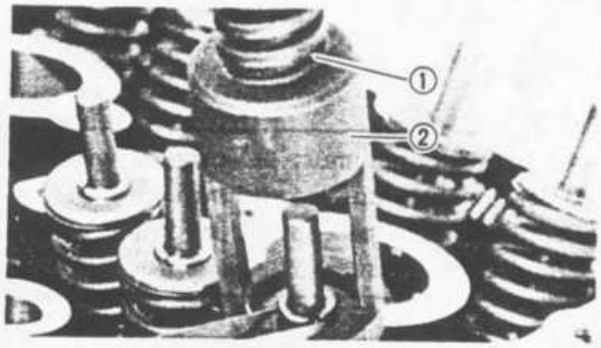
| Cylinder Head Warpage: |
| --- |
| Less than 0.03 mm (0.0012 in) |



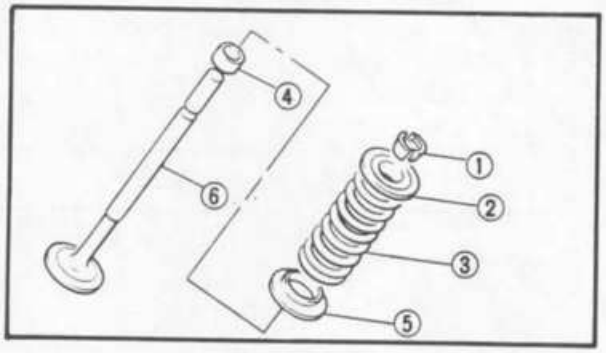

3. Remove:
   - Camshaft case ①



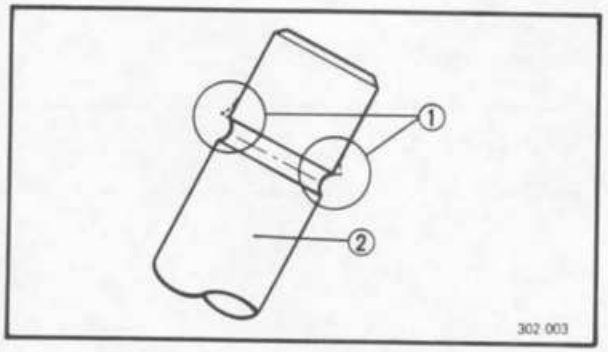

4. Remove:
   - Camshaft case gasket ①
   - Dowels ②
   - Cylinder head nuts
   - Plain washers




5. Attach:
   - Valve Spring Compressor (90890-04019) ①
   - Attachment (90890-04108) ②




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

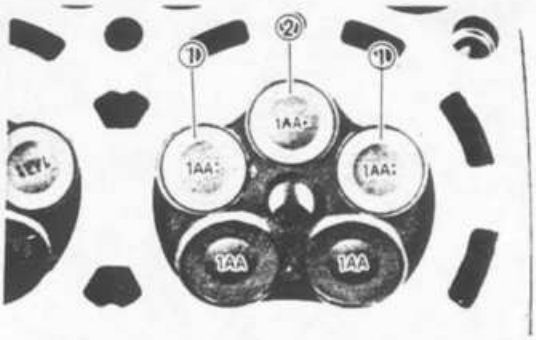



**NOTE:**
Deburr any deformed valve stem end. Use an oil stone to smooth the stem end.

① Deburr
② Valve stem

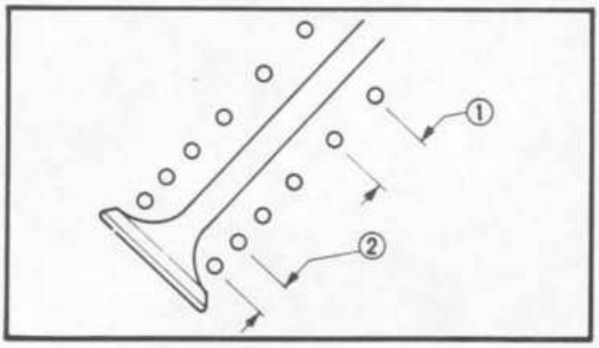
7. Eliminate:
   - Carbon deposit
     (from combustion chamber)
     Use rounded scraper.

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




8. Install:
   - Valves

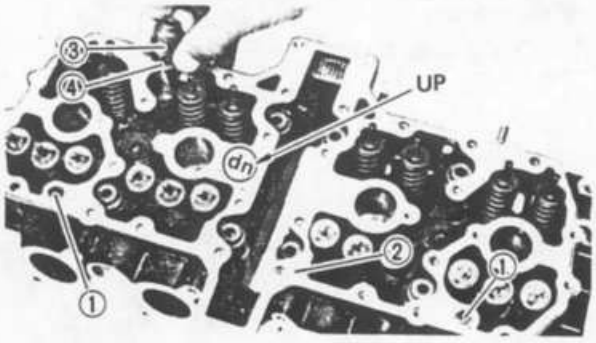
NOTE:
Be sure the "1AA :" mark ① valves are for intak left and right and "1AA •" mark ② for intak center.




9. Install:
   - Valve springs

NOTE:
- All valve springs must be installed with the larger pitch ① upward as shown.
- Be sure the "Blue" spring is for intake and "Red" for exhaust.

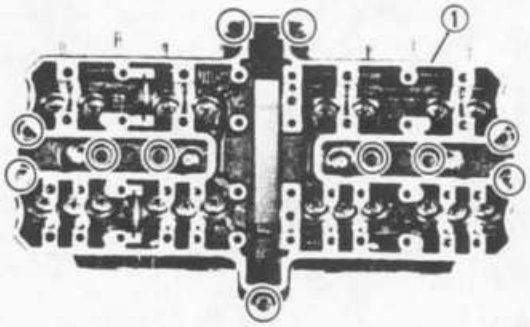
② Smaller pitch




10. Install:
    - Dowels ①
    - Camshaft case gasket ②

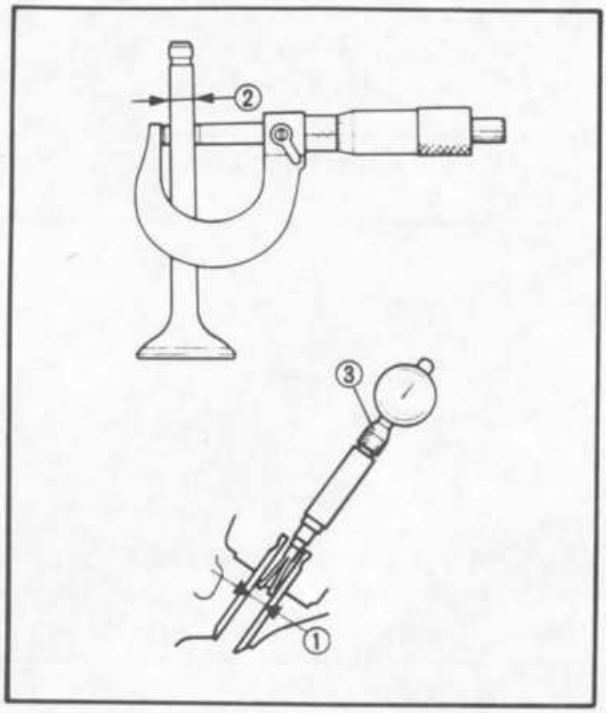
NOTE:
Be sure the "UP" mark face to upward.

    - Plain washers ③
    - Cylinder head nuts ④




11. Install:
    - Camshaft case ①

| | |
|---|---|
| | **Camshaft Case Bolts:**<br>**10 Nm (1.0 m·kg, 7.2 ft·ft)** |




## VALVE, VALVE GUIDE, VALVE SEAT, AND VALVE SPRING

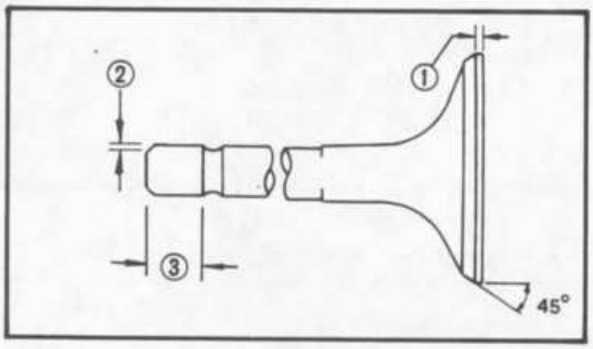
1. Measure:
   - Valve stem clearance

**Valve stem clearance =**
**Valve guide inside diameter ① –**
**Valve stem diameter ②**

Out of specification → Replace valve or guide.

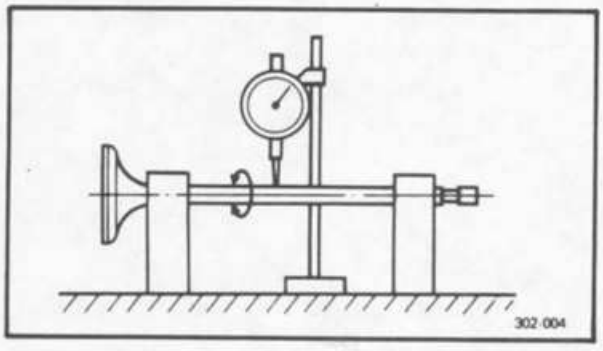
| Valve Stem Clearance Limit: | |
|---|---|
| Intake | 0.08 mm (0.003 in) |
| Exhaust | 0.10 mm (0.004 in) |

③ Bore gauge



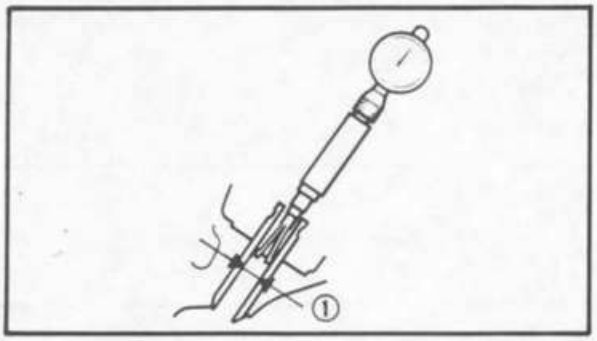

2. Measure:
   - Valve face:
     Pitting/Wear → Regrind.
     Out of specification → Raplace.

**Minimum Thickness (Service limit) ① :**
**0.7 mm (0.028 in)**
**Beveled ② :**
**0.35 mm (0.014 in)**
**Minimum Length (Service limit) ③ :**
**14.5 mm (0.6 in)**




3. Check:
   - Valve stem end
     Mushroom shape or diameter larger than rest or stem → Replace.
   - Runout
     Out of specification → Replace.

**Maximum Valve Stem Runout:**
**0.01 mm (0.0004 in)**



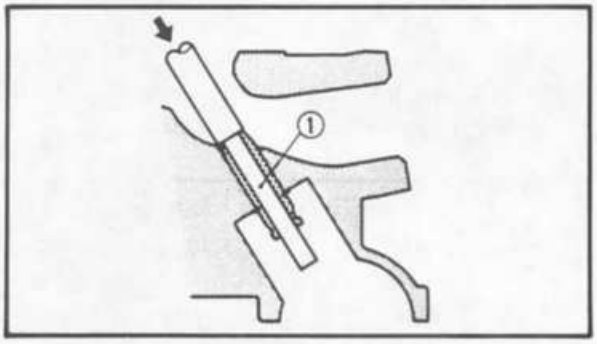

4. Measure:
   • Valve guide (inside diameter) ①
   Out of specification → Replace.

| Valve Guide Inside Diameter Limit: 5.05 mm (0.199 in) |
|---|

5. Inspect:
   • Valve guide
   Wear/Oil leakage → Replace.

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

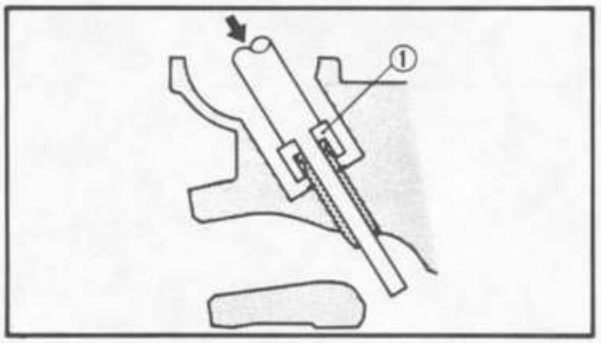
3



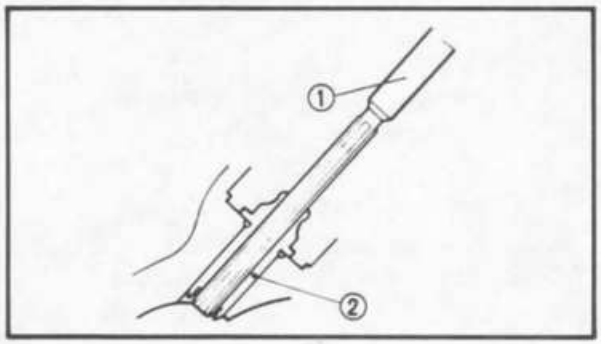

**Valve Guide Replacement**

1. Remove:
   • Valve Guide
   Use Valve Guide remover (90890-04097) ①.

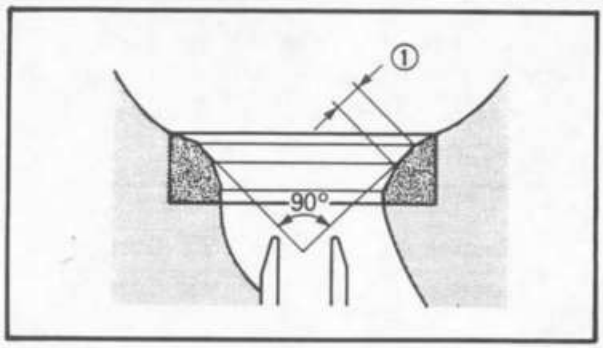
**NOTE:**
- Always replace valve guide if valve is replaced.
- Always replace oil seal if valve is removed.




2. Install:
   • Valve guide (new)
   Use Valve Guide Installer (90890-04098) and Valve Guide Remover (90890-04097).




3. Bore valve guide ② to obtain proper valve stem clearance.
   Use 5.0 mm (0.20 in) Reamer (YM-04099) ①.

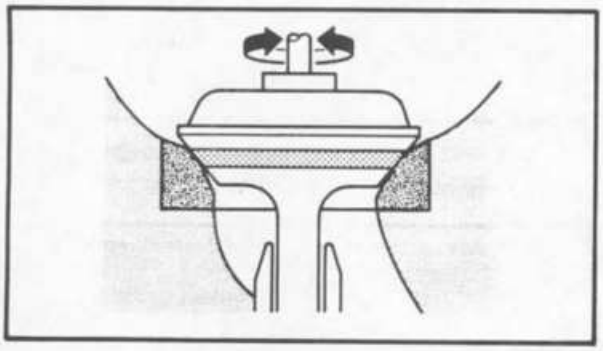



**Valve Seat**

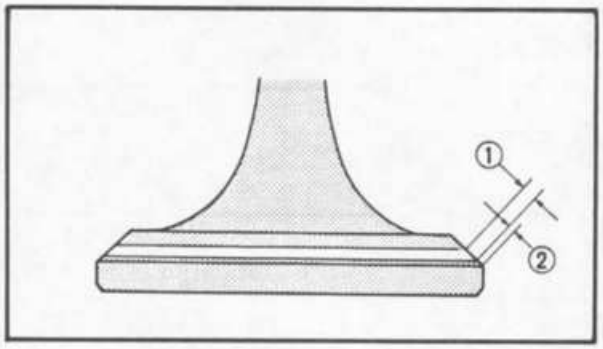
1. Inspect:
   - Valve seat
     Pitting/Wear → Cut.
2. Measure:
   - Valve seat width ①
     Out of specification → Follow next steps.

| | Standard width | Wear limit |
|---|---|---|
| Valve seat width | 1.0 ± 0.1 mm (0.040 ± 0.004 in) | 1.8 mm (0.070 in) |

3. Apply:
   - Mechanic's bluing dye (Dykem)
     (to valve and seat)
   - Fine grinding compound (Small amount)
     (to valve face surface)
4. Position:
   - Valve
     (into cylinder head)

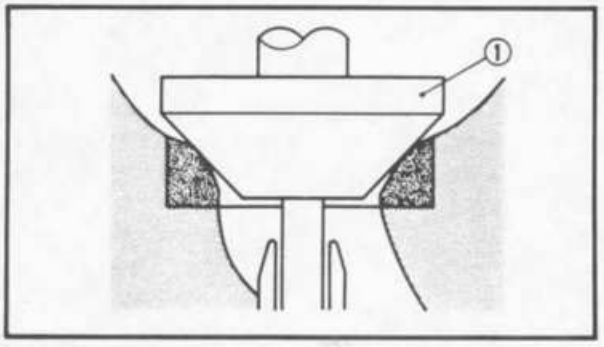


5. Spin it rapidly back and forth, then lift valve and clean off all grinding compound.
6. Inspect:
   - Valve seat surface
     Wherever valve seat and valve face made contact, building will have been removed.




7. Measure:
   - Valve seat width ①/Contacting position ②
     Out of specification → Cut.

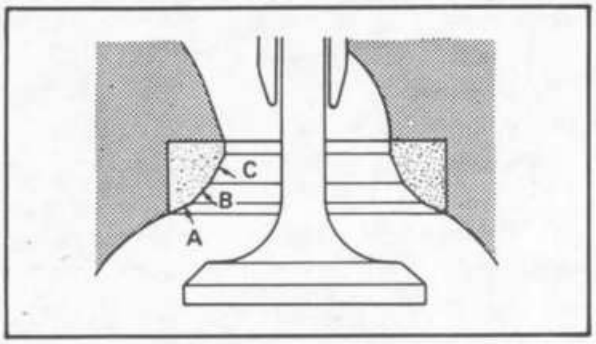
**Width ①:**
**1.0 ± 0.1 mm (0.040 ± 0.004 in)**
**Position ②:**
**0.3 mm (0.012 in)**

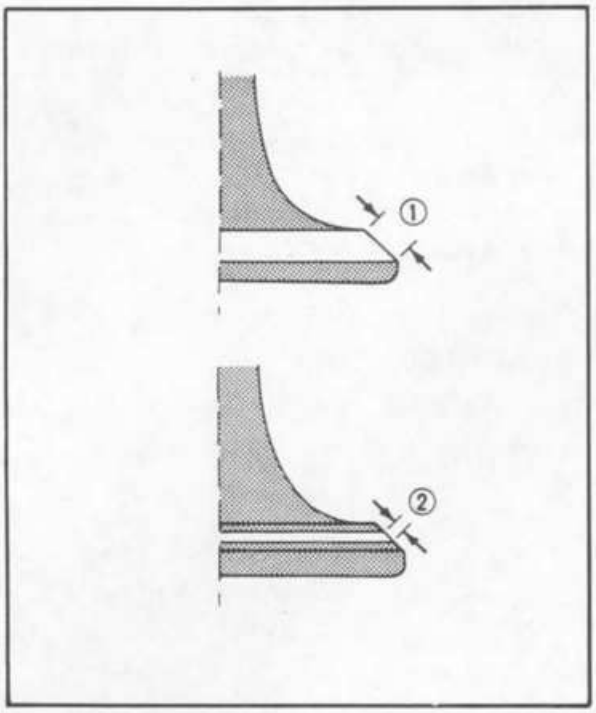


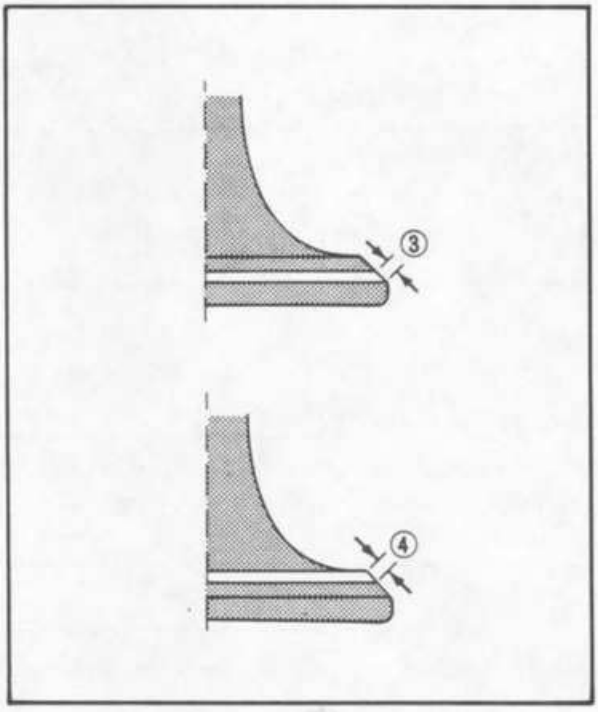

8. Cut valve seat.

NOTE:
Cut valve seat using valve seat cutter ① if valve seat width exceeds limit or if valve seat is pitted or worn.

**CAUTION:**
**When twisting cutter, keep an even downward pressure to prevent chatter marks.**




**Valve seat recutting steps are necessary if:**

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

| Cut valve seat as follows: | |
|---|---|
| Section A | 20° Cutter |
| Section B | 45° Cutter |
| Section C | 60° Cutter |

- Valve face indicates that valve seat is desired position but too wide ①.

| Valve seat cutter set | | Desired result |
|---|---|---|
| Use | 20° Cutter<br>60° Cutter | to reduce valve seat width. |

- Valve seat is desired position but too narrow ②.

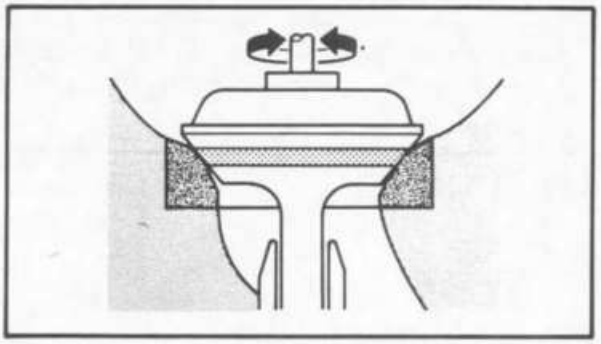
| Valve seat cutter set | | Desired result |
|---|---|---|
| Use | 45° Cutter | to achieve a uniform valve seat width (Standard specifications). |

- Valve seat is too narrow and touching the valve margin ③.

| Valve seat cutter set | | Desired result |
|---|---|---|
| Use | 20° Cutter, first<br>45° Cutter | to obtain correct seat width. |

- Valve seat is too narrow and touching the bottom edge of the valve face ④.

| Valve seat cutter set | | Desired result |
|---|---|---|
| Use | 60° Cutter, first<br>45° Cutter | to obtain correct seat width. |

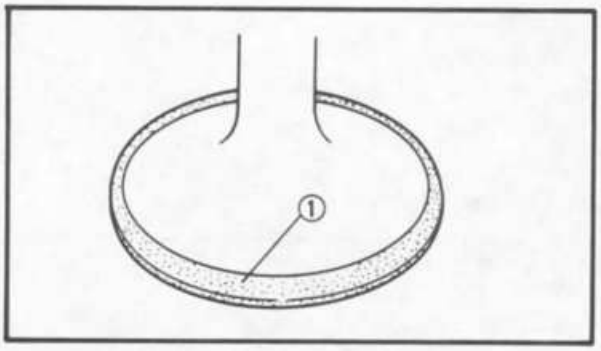


NOTE:
Lap valve/valve seat assembly if:
- Valve face/valve seat are used or severely worn.
- Valve and valve guide has been replaced.
- Valve seat has been cut.

**Valve/Valve Seat Assembly Lapping**

1. Apply:
   - Coarse lapping compound (Small amount)
     (to valve face)
2. Position
   - Valve
     (in cylinder head)

3
3. Rotate:
   - Valve
     Turn until valve and valve seat are evenly polished, then clean off compound.
4. Repeat above steps with fine compound and continue lapping until valve face shows a completely snooth surface uniformly.



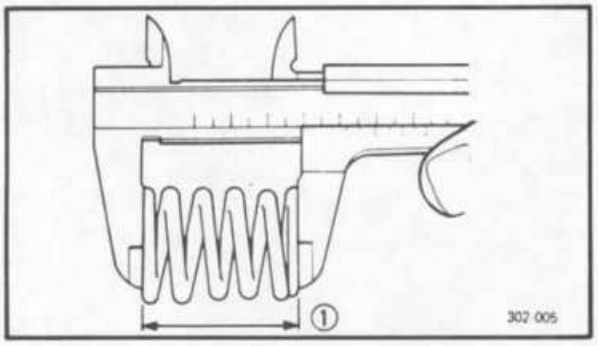

5. Eliminate:
   - Compound
     (from valve face)
6. Apply:
   - Mechanic's bluing dye (Dykem) ①
     (to valve face and seat)

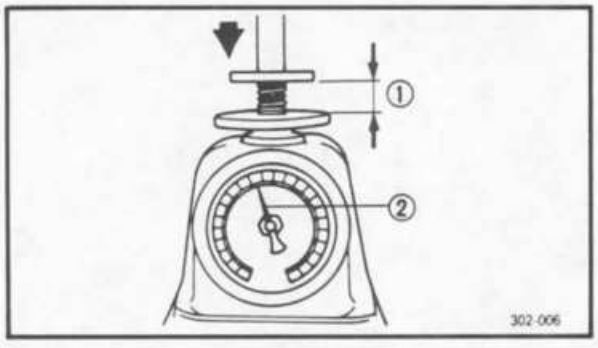
7. Rotate:
   - Valve
     Valve must make full seat contact indicated by grey surface all around valve face where bluing was removed.
8. Apply:
   - Solvent
     (into each intake and exhaust port)
     Leakage past valve seat→Replace valve until seal is complete.

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

**Relapping steps:**
- Reassemble 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 Measurement**

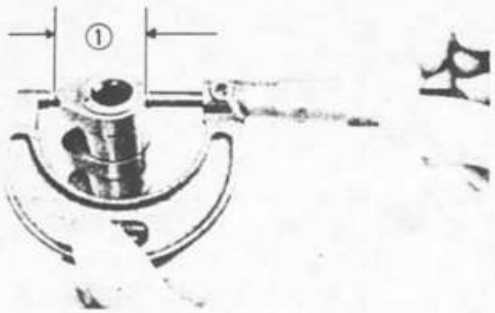
1. Measure:
   - Valve spring free length ①
     Out of specification→Replace.

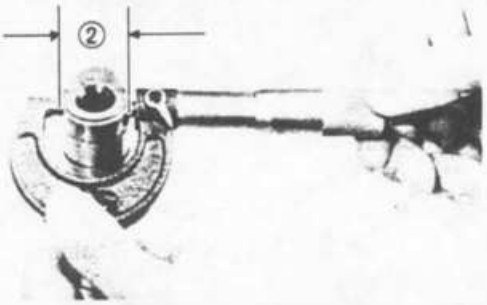
| Valve Spring Free Length (Limit): | |
|---|---|
| Intake Spring | Exhaust Spring |
| 37.76 mm (1.487 in) | 37.96 mm (1.495 in) |

2. Measure:
   - Valve spring installed force ②
     Out of specification→Replace.

① Installed length

| Valve Spring Installed Force: | | | |
|---|---|---|---|
| Intake Spring | | Exhaust Spring | |
| ① | ② | ① | ② |
| 35.0 mm (1.378 in) | 7.3~8.7 kg (16.1~19.2 lb) | 35.0 mm (1.378 in) | 11.0~13.0 kg (24.3~28.7 lb) |



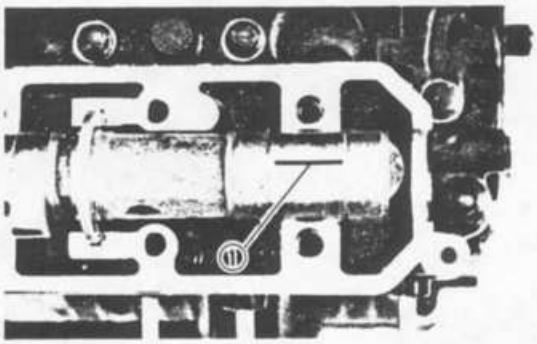

## CAMSHAFT, CAM CHAIN, AND CAM SPROCKET

### Camshaft

1. Measure:
   - Large cam lobe length ①
   - Small cam lobe length ②

   Use a micrometer.
   Out of specification→Replace.

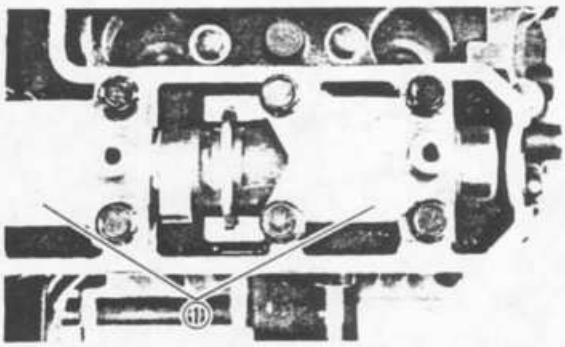
| | Intake [Limit] | Exhaust [Limit] |
|---|---|---|
| 1 | 32.45 mm (1.2776 in) | 32.30 mm (1.2727 in) |
| 2 | 24.85 mm (0.9783 in) | 24.85 mm (0.9783 in) |



### Camshaft/Cap Clearance Measurement

1. Install:
   - Intake camshaft
   - Exhaust camshaft
2. Position:
   - Strip of Plastigage® (YU-33210) ①

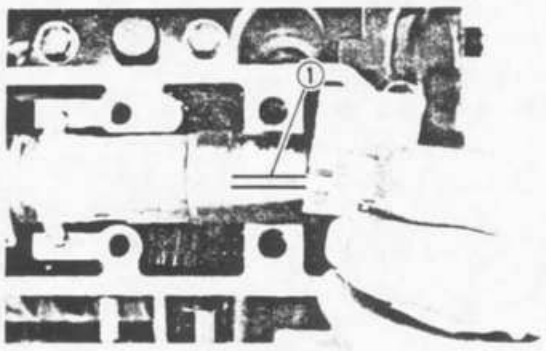
   (onto camshaft)



3. Install:
   - Camshaft caps ①
4. Tighten:
   - Camshaft cap bolts

**Camshaft Cap Bolts:**
**10 Nm (1.0 m·kg, 7.2 ft·ft)**

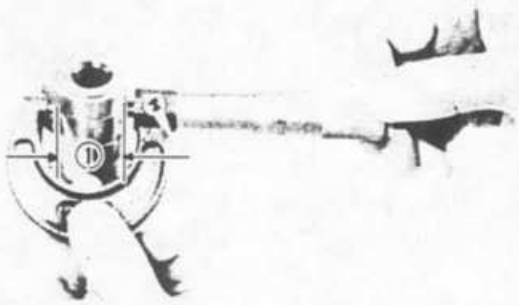
NOTE:
Do not turn the camshaft when measuring clearance with Plastigage.




5. Remove
   - Camshaft caps
6. Measure:
   - Width of Plastigage® ①

   Out of specification → Follow step 7.

**Camshaft-to-cap Clearance:**
**0.050 ~ 0.084 mm**
**(0.0020 ~ 0.0033 in)**

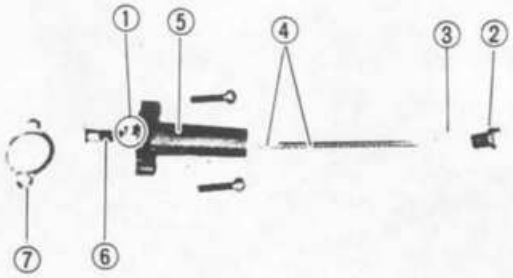


7. Measure
   - Camshaft bearing surface diameter ①
     Use a micrometer.
     Out of specification → Replace camshaft.
     Within specification → Replece cylinder head.

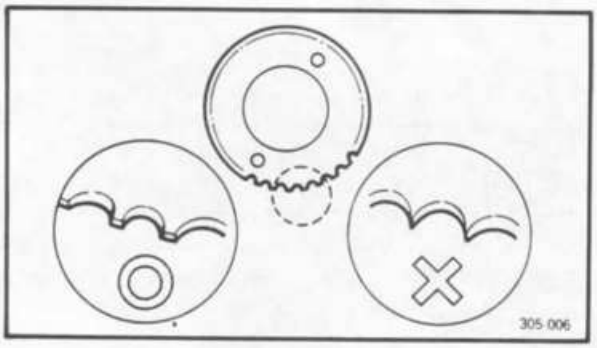
| Camshaft Bearing Surface Diameter: | |
|---|---|
| Standard: | 24.437~24.450 mm (0.9621~0.9626 in) |
| Cam Cap Inside Diameter: | |
| Standard: | 24.500~24.521 mm (0.9646~0.9654 in) |

**Cam Chain Tensioner**

1. Check:
   - One-way cam ① operation
     Unsmooth operation → Replace.
2. Inspect:
   - All parts
     Damage/Wear → Replace.



② End plug
③ Washer
④ Spring
⑤ Tensioner body
⑥ Tensioner rod
⑦ Gasket

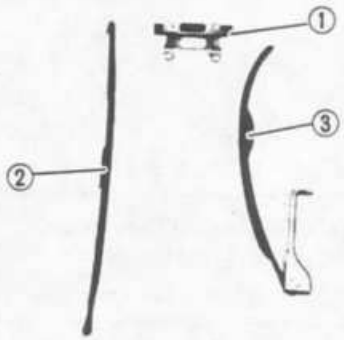



**Cam Chain**

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

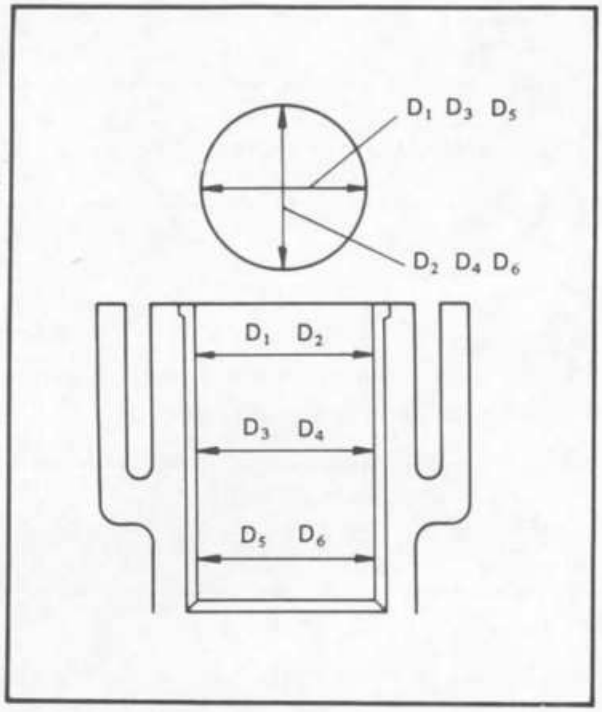
**Cam Sprockets**

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



**Chain Guide**

1. Inspect:
   - Upper chain guide ①
   - Exhaust side chain guide ②
   - Intake side chain guide ③
     Wear → Replace




## CYLINDER

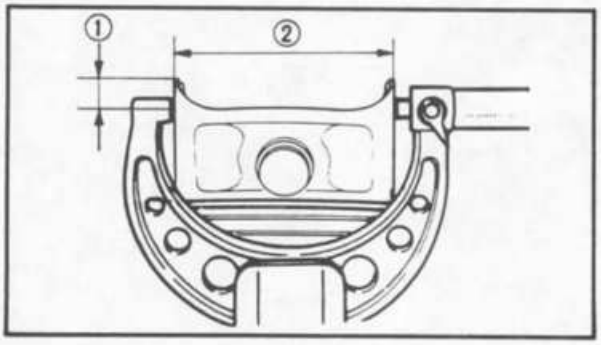
1. Inspect:
   - Cylinder walls
     Vertical scratches → Rebore or Replace cylinder.
2. Measure:
   - Cylinder inside diameter.

NOTE:
Obtain measurements at three depths by placing measuring instrument parallel to and at right angles to crankshaft.

Out of specification → Rebore cylinder, and replace piston and piston rings.

| | Standard | Wear Limit |
|---|---|---|
| Cylinder bore: C | 68.000~68.005 mm) (2.6772 ~ 2.6774 in) | 68.1 mm (2.6811 in) |
| Cylinder taper: T | – | 0.05 mm (0.002 in) |

C = Maximum D
T = Maximum $D_1$, $D_2$-Minimum $D_5$, $D_6$




## PISTON, PISTON RING, AND PISTON PIN

### Piston

1. Measure:
   - Piston skirt diameter "P" ②

NOTE:
Measure the piston skirt diameter where the distance 5.0 mm (0.197 in) ① from the piston bottom edge.

| | Piston Size P |
|---|---|
| Standard | 68.00 mm (2.6772 in) |
| Oversize 2 | 68.50 mm (2.6969 in) |
| Oversize 4 | 69.00 mm (2.7165 in) |

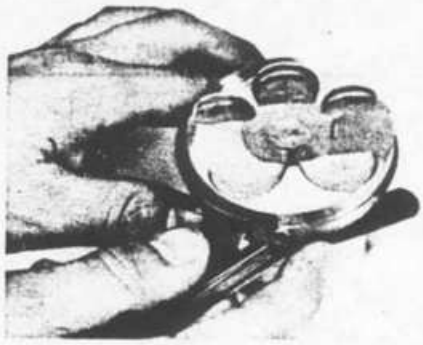
2. Measure:
   • Piston clearance

| Piston Clearance = |
| --- |
| Cylinder inside diameter "C" – Piston skirt diameter "P" |

Out of specification → Rebore cylinder, and replace piston and piston rings.

| Piston Clearance: |
| --- |
| 0.06 ~ 0.08 mm (0.0024 ~ 0.0031 in) |

3



Piston Ring

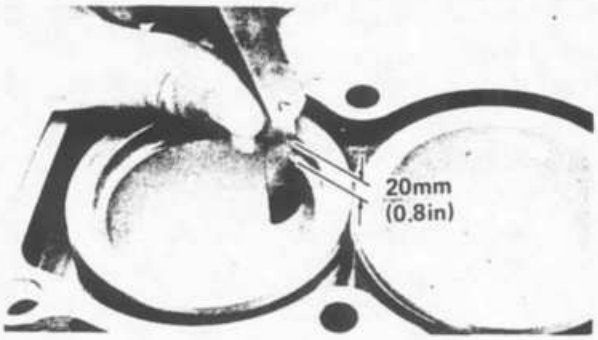
1. Measure:
   • Ring side clearance
   Use a feeler gauge.
   Out of specification → Replace piston.

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

| Piston Ring Side Clearance (Limit): | |
| --- | --- |
| Top Ring | 0.15 mm (0.006 in) |
| 2nd Ring | 0.15 mm (0.006 in) |

2. Position:
   • Piston ring
   (in cylinder)

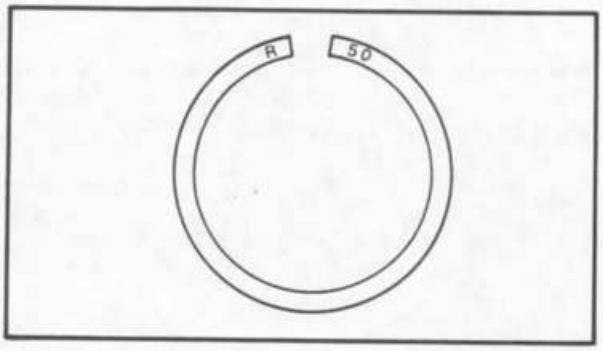
NOTE:
Insert a ring into cylinder, and push it approximately 20 mm (0.8 in) into cylinder. Push ring with piston crown so that ring will be at a right angle to cylinder bore.




3. Measure
   Ring end gap
   • Out of specification → Replace.

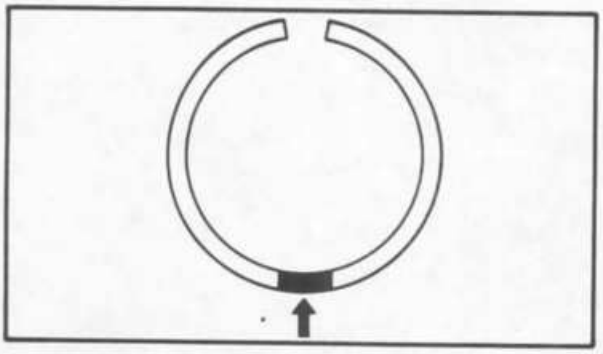
NOTE:
You cannot measure end gap on expander spacer of oil control ring. If oil control ring rails show excessive gap, replace all three rings.

| | End Gap Limit (Installed): |
|---|---|
| Top Ring | 1.0 mm (0.040 in) |
| 2nd Ring | 1.0 mm (0.040 in) |
| Oil Ring | 1.5 mm (0.060 in) |



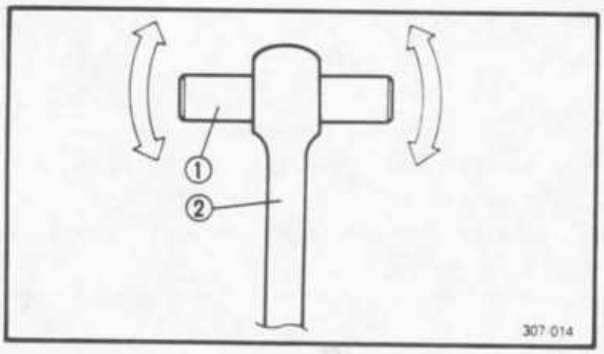

Piston Ring Oversize
• Top and 2nd piston ring
  Oversize top and middle ring sizes are stamped on top of ring.

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

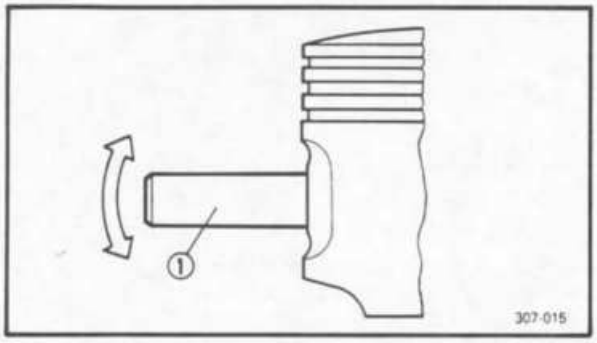


• Oil control ring
  Expander spacer of bottom ring (oil control ring) is color-coded to identify sizes.

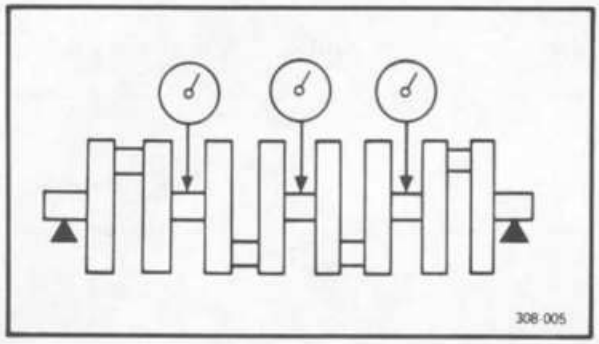
| Size | Color |
|---|---|
| Oversize 2 | Red |
| Oversize 4 | Yellow |




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 for wear.
   Wear → Replace connecting rod and piston pin.




4. Position:
   - Piston pin ①
     (into piston)
5. Check:
   - Free play
     (into piston)
     Free play → Replace piston pin and/or piston.




## CRANKSHAFT AND CONNECTING ROD

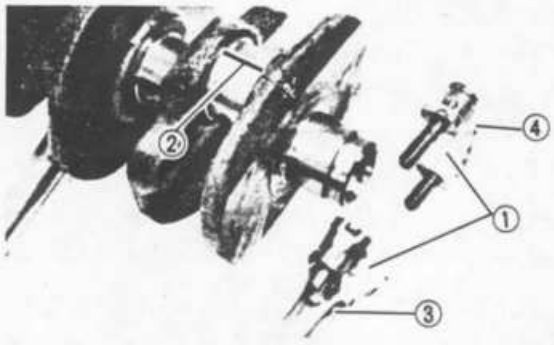
### Crankshaft Runout

1. Place both ends of crankshaft on V-blocks.
2. Rotate:
   - Crankshaft
3. Measure:
   - Crankshaft runout
     (at main journal bearings)
     Use a Dial Guage (90890-03097).

| Maximum Crankshaft Runout: |
|---|
| 0.03 mm (0.0012 in) |

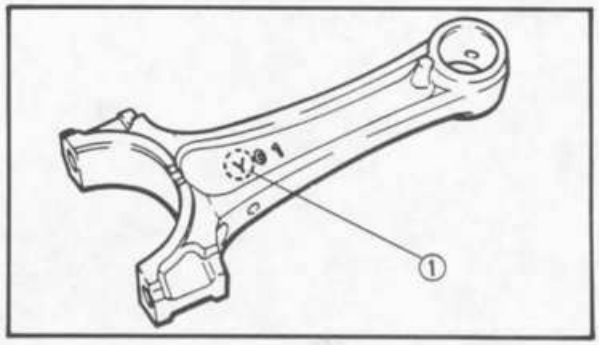
### Connecting Rod Bearings

1. Inspect:
   - Bearings
     Burns/Flaking/Roughness/Scratches → Replace.




### Connecting Rod Bearing Clearance

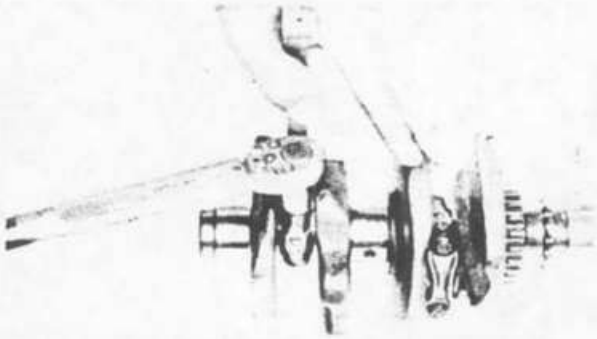
1. Clean all parts thoroughly.
2. Install:
   - Connecting rod bearings ①
     (into connecting rod and cap)
3. Attach:
   - Plastigage® ②
     (onto crankpin)
4. Position:
   - Connecting rod ③
     (onto crankshaft)
   - Connecting rod cap ④



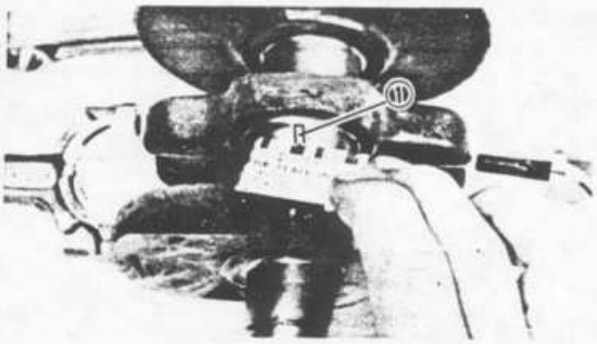

NOTE:
- Be sure the "Y" marks ① on the connecting rods face toward left crankshaft end.
- Be sure the letters on both components align to form a perfect character.

5. Apply:
   Molybdenum desulfide grease
   (to bolt threads)
   Torque both ends of rod cap evenly.

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



**CAUTION:**
**Tighten to full torque specification without pausing. Apply continuous torque between 2.0 and 3.6 m·kg. Once you reach 2.0 m·kg DO NOT STOP TIGHTENING until final torque is reached. If tightening is interrupted between 2.0 and 3.6 m·kg, loosen nut to less than 2.0 m·kg and start again.**



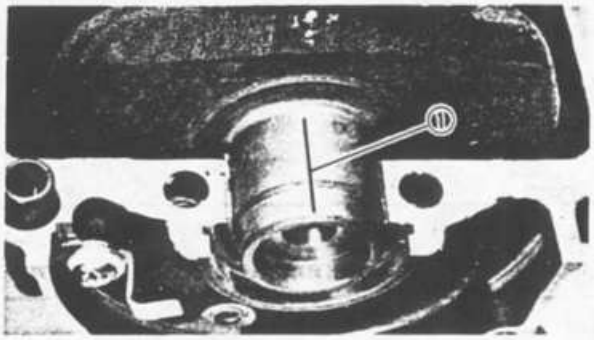
| Connecting Rod Cap: 36 Nm (3.6 m·kg, 26 ft·lb) |
|---|

6. Remove:
   • Connecting rod cap
   Remove carefully.
7. Measure:
   • Plastigage width ①
   Out of specification → Replace connecting rod bearing.

| Connecting Rod Bearing Clearance: 0.032 ~ 0.056 mm (0.0013 ~ 0.0022 in) |
|---|

**Crankshaft Main Bearing Clearance Measurement**

1. Clean all parts.
2. Position:
   • Upper crankcase half
   Place on a bench in an upside down position.

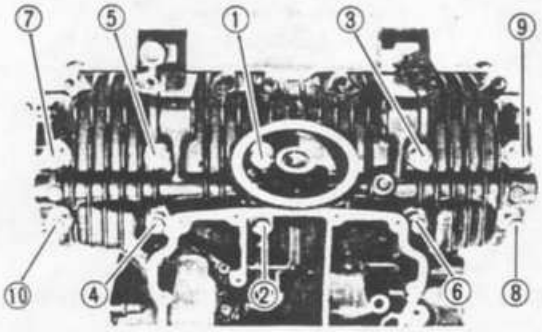


3. Install:
   - Bearings
     (into the upper crankcase)
   - Crankshaft
4. Attach:
   - Plastigage® (YU-33210) ①
     (onto the crankshaft journal surface)

NOTE:
Do not move crankshaft until clearance measurement has been completed)

5. Install:
   - Bearings
     (into lower crankcase)
   - Lower crankcase
6. Tighten:
   - Bolts

**CAUTION:**
**Tighten to full torque in torque sequence cast on the crankcase.**

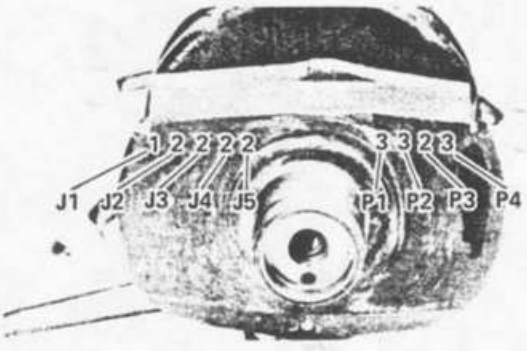



| | |
|---|---|
| | **9 mm (0.36 in) Bolt:**<br>**36 Nm (3.6 m·kg, 25 ft·lb)** |

7. Remove:
   - Bolts
     Reverse assembly order.
   - Lower crankcase
     Use care in removing.
8. Measure:
   - Plastigage width® ①
     Out of specification → Replace bearings: Replace crankshaft if necessary.

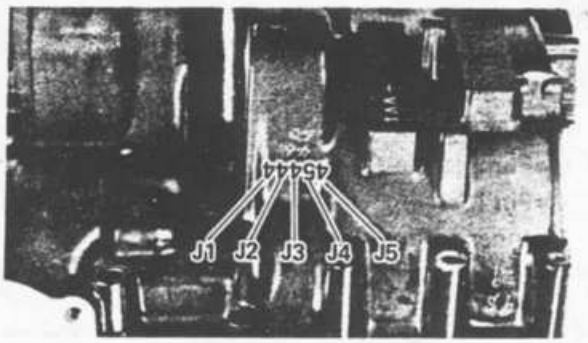


| | |
|---|---|
| | **Main Bearing Oil Clearance:**<br>**0.020 ~ 0.044 mm**<br>**(0.0008 ~ 0.0017 in)** |

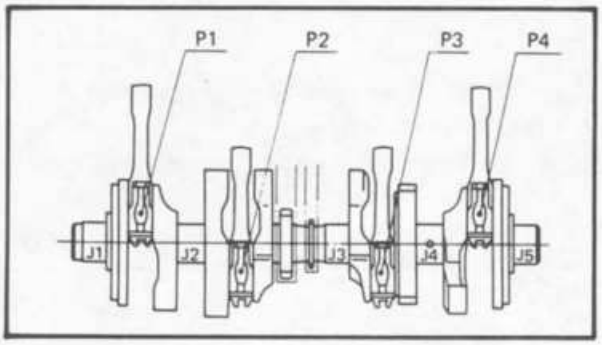


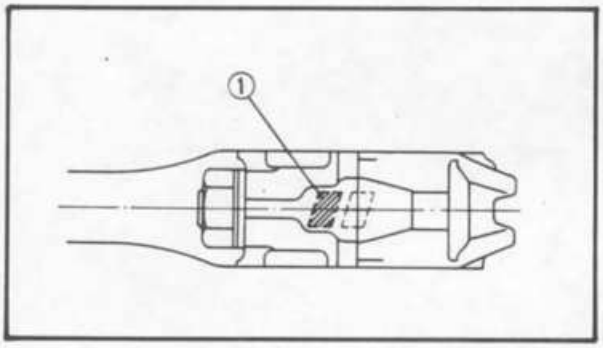

**Crankshaft Main and Connecting Rod Bearing Selection**

- Numbers used to indicate crankshaft journal sizes are stamped on the LH crankweb. The first five are main bearing journal numbers, starting with the left journal. The four rod bearing journal numbers follow in the same sequence.




• The upper crankcase half is numbered J1, J2, J3, J4, and J5 on the rear right bosse as shown.




• The connecting rods are numbered 4 or 5. The numbers are stamped in ink on the rod cap ① .

| Bearing Color Code | |
|---|---|
| No. 1 | Blue |
| No. 2 | Black |
| No. 3 | Brown |
| No. 4 | Green |
| No. 5 | Yellow |

• No. 5 applies only to the crankshaft main bearing selection.

Example 1: Selection of the crankshaft main bearing; If the crankcase J1 and crankshaft J1 sizes are No. 4 and No. 1, respectively, the bearing size No. is:

Bearing size No. =

Crankcase No. – Crankshaft No. =

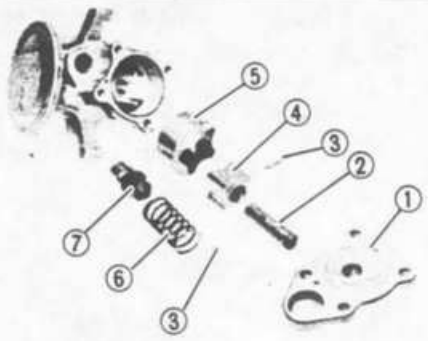
4 – 1 = 3 (Brown)

Example 2: Selection of the connecting rod bearing; If the connecting rod P1 and crankshaft P1 sizes are No. 4 and No. 1, respectively, the bearing size No. is:

Bearing size No. =

Connecting rod No. – Crankshaft No. =

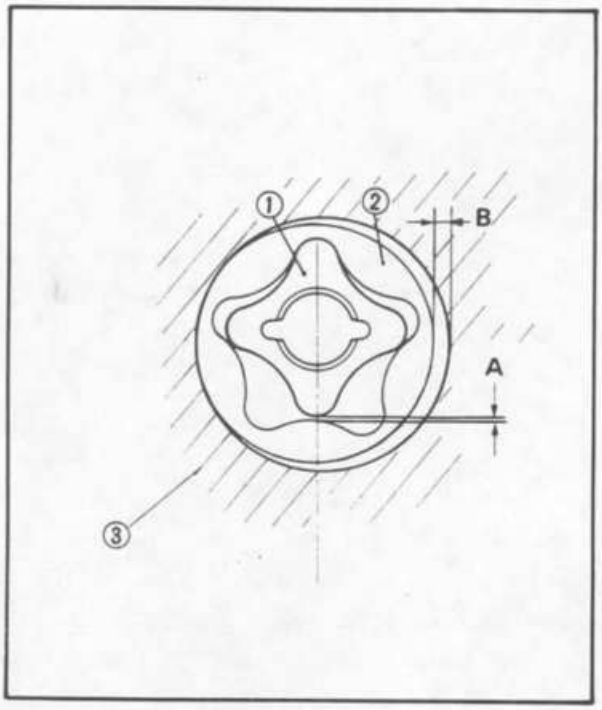
4 – 1 = 3 (Brown)



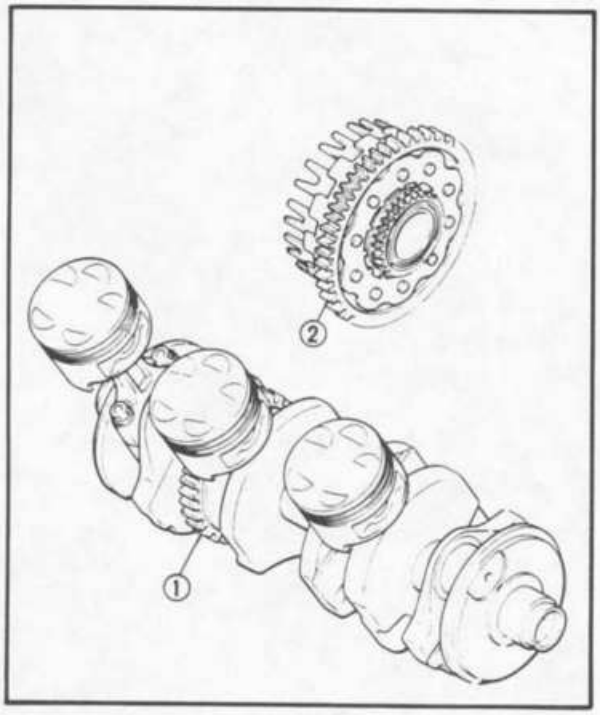

## OIL PUMP

1. Remove:
   - Screw
   - Pump cover ①
   - Pump shaft ②
   - Pin ③
   - Inner rotor ④
   - Outer rotor ⑤
   - Spring ⑥
   - Relief valve ⑦
2. Measure:
   - Clearance "A" (between inner rotor ① and outer rotor ②
   - Clearance "B" (between outer rotor ② and pump housing ③)

   Out of specification → Replace oil pump.




| | Oil Pump Clearance: |
|---|---|
| Clearance A | 0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in) |
| Clearance B | 0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in) |

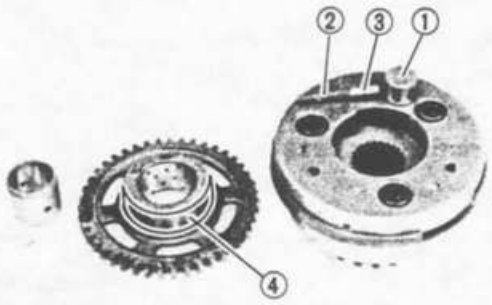


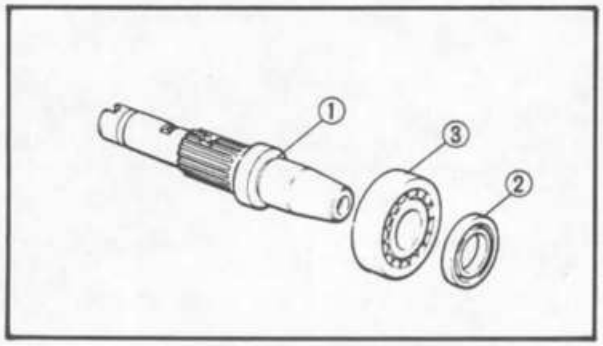

## PRIMARY DRIVE

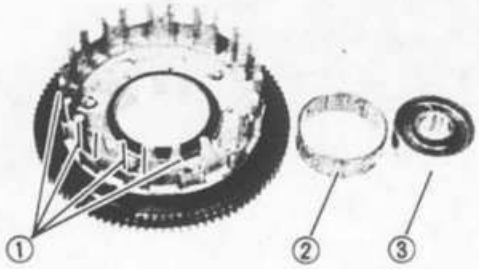
1. Inspect:
   - Primary drive gear ①
   - Primary driven gear ②

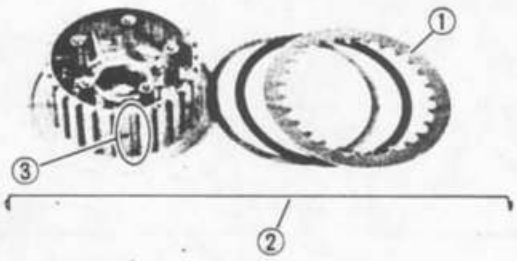
   Wear/Damage → Replace both gears.
   Excessive noises during operation → Replace both gears.

| Primary Reduction Ratio: | | |
|---|---|---|
| No. of teeth | | Ratio |
| Drive | Driven | |
| 58 | 97 | 1.672 |




## STARTER DRIVE

### Electric Starter Clutch

1. Check:
   - Roller ① operation
   - Spring ② operation
   - Spring cap ③ operation

   Unsmooth operation → Replace one-way clutch.
2. Inspect:
   - Surface ④ of the idle gear

   Pitting/Wear/Damage → Replace.

### Starter Clutch Shaft (A.C.G. shaft)

1. Check:
   - Shaft ①
   - Oil seal ②

   Wear/Damage → Replace.
   - Bearing ③

   Unsmooth operation → Replace.

## CLUTCH

1. Inspect:
   - Clutch housing dogs ①

   Cracks/Pitting (edges):
   Moderate → Deburr.
   Severe → Replace clutch housing.
2. Inspect
   - Clutch housing bearing ②
   - Spacer ③

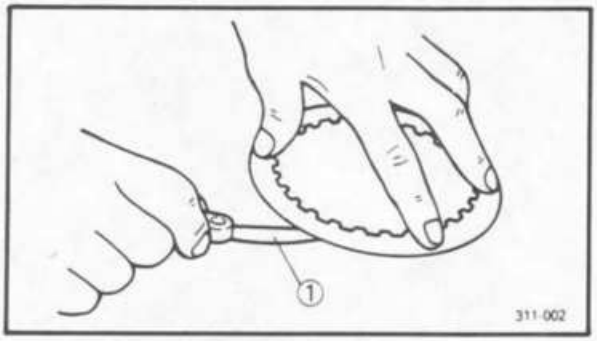
   Damage → Replace.

NOTE:

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

3. Inspect:
   - Clutch boss spline ③

   Pitting:
   Moderate → Deburr.
   Severe → Replace.

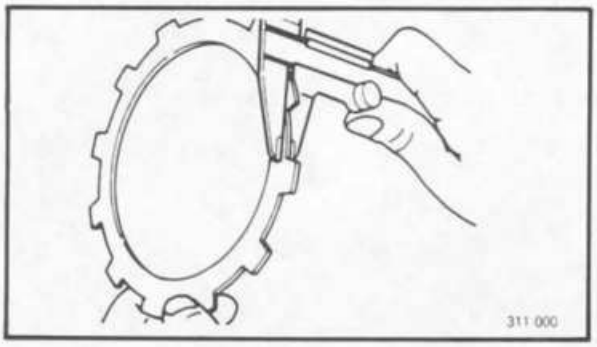



4. Measure:
   - Clutch plate warpage
   - Friction plate thickness

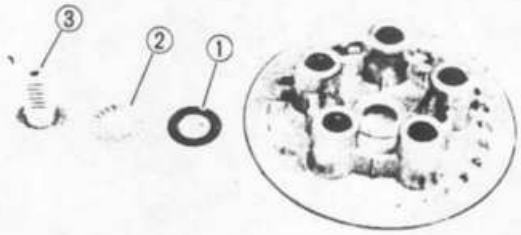
   Out of specification → Replace clutch or friction plate as a set.

① Feeler gauge

| | Standard | Wear Limit |
|---|---|---|
| Friction Plate Thickness | 3.0 mm (0.12 in) | 2.8 mm (0.11 in) |
| Clutch Plate Warp Limit | – | 0.05 mm 0.0020 in) |

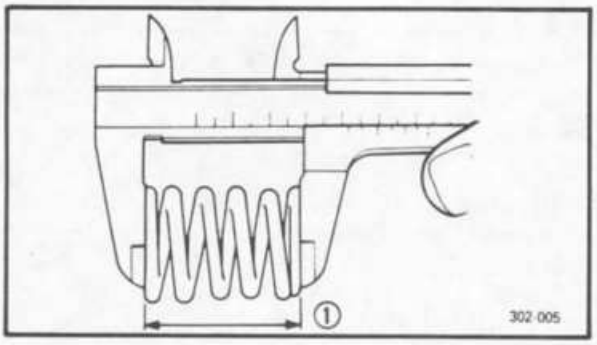





5. Inspect:
   - Pressure plate ①
   - Plate washer ②
   - Thrust bearing ③
   - Pull rod ④

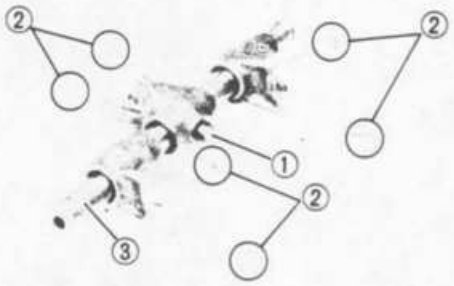
   Damage → Replace.




6. Measure:
   - Clutch spring free length

   Out of specification → Replace spring as a set.

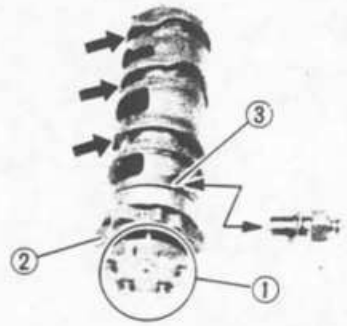
**Clutch Spring Minimum Free Length ①:**
**49.0 mm (1.93 in)**




## TRANSMISSION

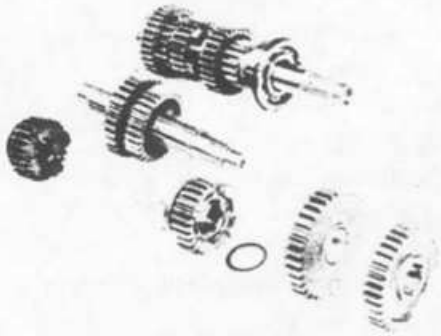
1. Inspect:
   - Shift fork cam follower ①
   - Shift fork pawl ②
   - Guide bar ③

   Scoring/Bends/Wear → Replace.




2. Inspect:
   - Shift cam groove
   - Shift cam dowel and side plate ①
   - Shift cam stopper plate ②
   - Neutral point ③

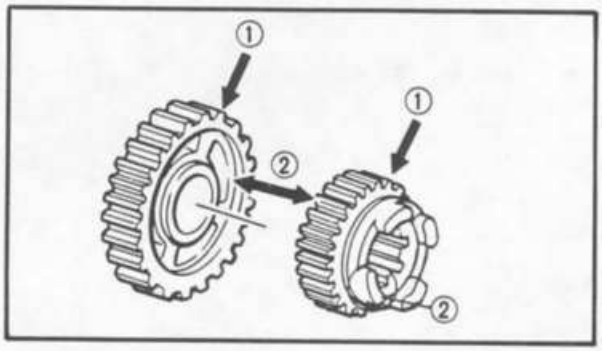
   Wear/Damage → Replace.



3. Measure:
   - Transmission shaft runout

   Use centering device and dial gauge.
   Out of specification → Replace bent shaft.

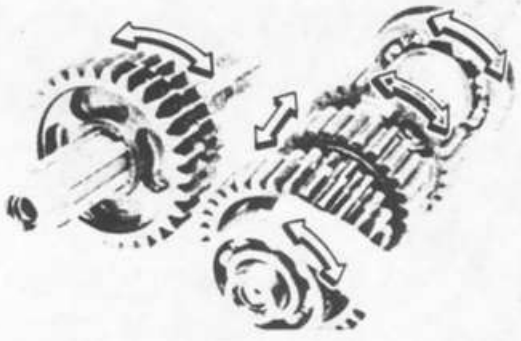
| Maximum Runout: |
| --- |
| 0.08 mm (0.0031 in) |




4. Inspect:
   - Gear teeth ①

   Blue discoloration/Pitting/Wear → Replace.
   - Mated dogs ②

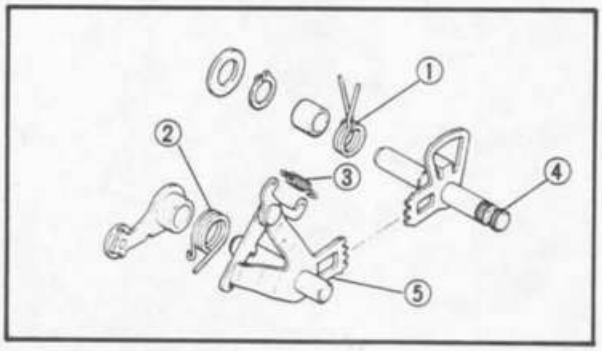
   Rounded edges/Cracks/Missing portions → Replace.



5. Check:
   - Proper gear engagement (Each gear) (to its counter part)

   Incorrect → Reassemble.
   - Gear and bearing movement

   Roughness → Replace.




**SHIFTER**

1. Inspect:
   - Shift return spring ①
   - Stopper lever spring ②
   - Shift lever spring ③

   Damage → Replace.
   - Shift shaft ④/Shift lever ⑤

   Damage/Bends/Wear → Replace.

### CRANKCASE

1. Inspect:
   - Case halves
   - Bearing seat
   - Fitting

   Damage → Replace.

### BEARINGS AND OIL SEALS

1. Inspect:
   - Bearing

   Clean and lubricate, then rotate inner race with finger.
   Routhness → Replace bearing (see Removal).
2. Inspect:
   - Oil seals

   Damage/Wear → Replace (see Removal).

### CIRCLIPS AND WASHERS

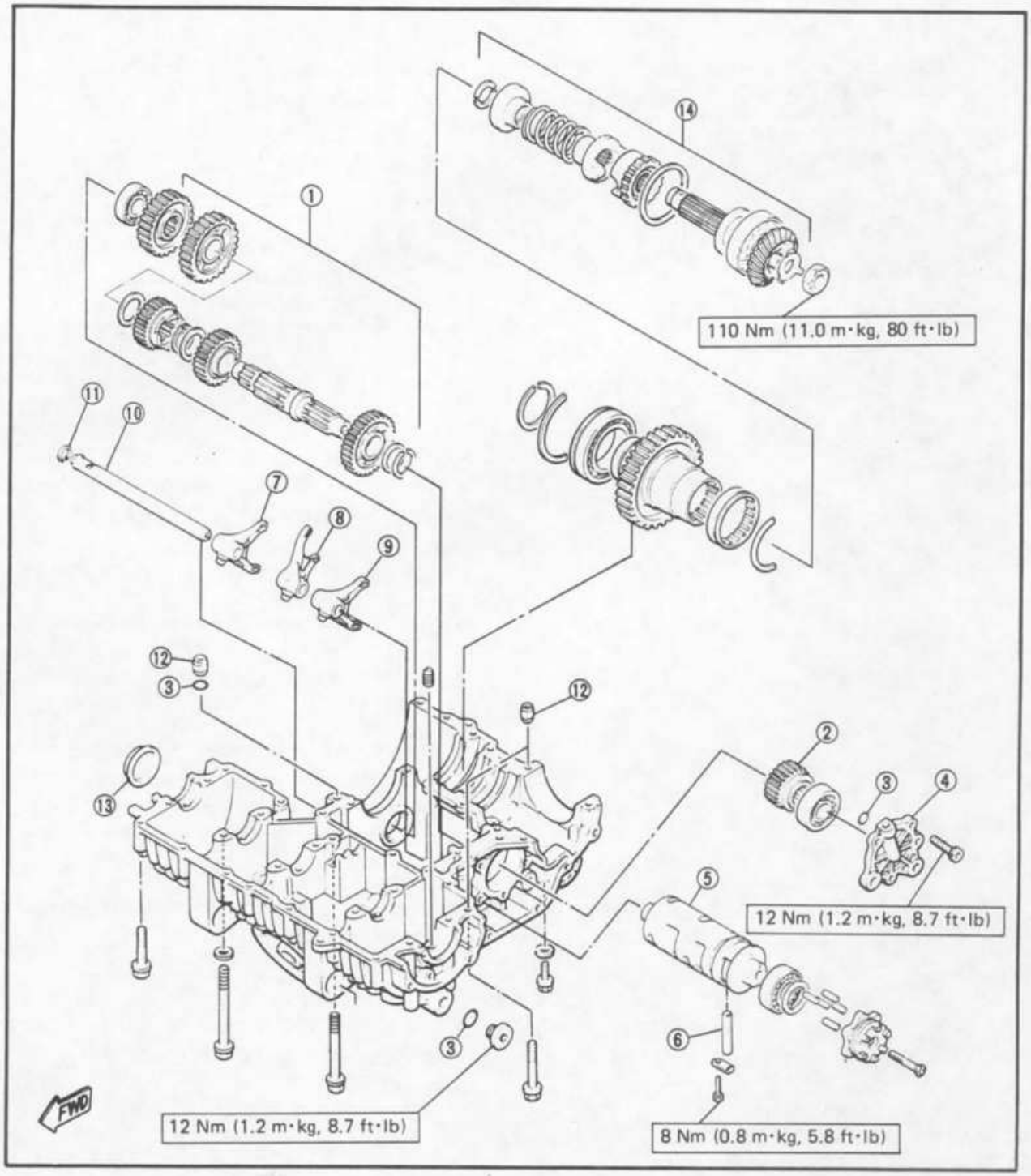
1. Inspect:
   - Circlips
   - Washers

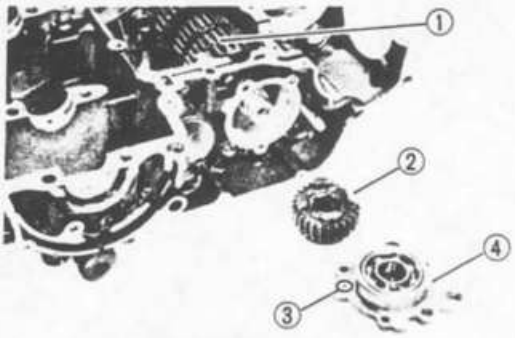
   Damage/Looseness/Bends → Replace.

# ENGINE ASSEMBLY AND ADJUSTMENT

## LOWER CRANKCASE

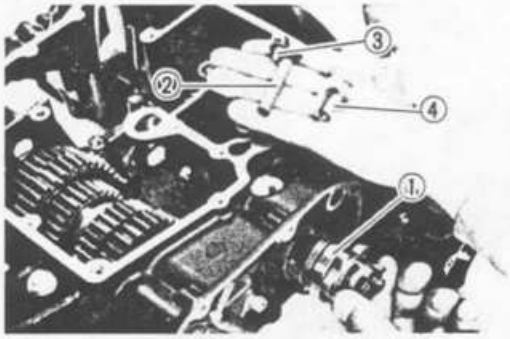
① Drive axle assembly
② 5th wheel gear
③ O-ring
④ Housing
⑤ Shift cam
⑥ Shift cam locating pin
⑦ Shift fork 3
⑧ Shift fork 2
⑨ Shift fork 1
⑩ Shift fork guide bar
⑪ Circlip
⑫ Dowel pin
⑬ Blind plug
⑭ Middle drive gear assembly





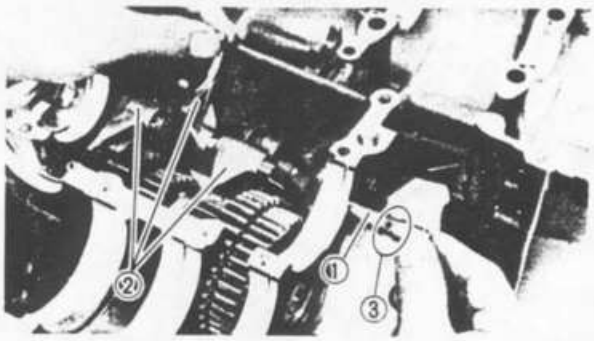

1. Install:
   - Drive axle assembly ①
   - 5th wheel gear ②
   - O-ring (New) ③
     (onto the housing ④ )
   - Drive axle bearing housing ④

**Drive Axle Bearing Housing:**
**12 Nm (1.2 m·kg, 8.7 ft·lb)**




2. Install:
   - Shift cam ①
   - Shift cam locating pin ②
   - Stopper plate ③
   - Bolt
   - Neutral switch ④

**Shift Cam Locating Pin:**
**8 Nm (0.8 m·kg, 5.8 ft·lb)**
**Neutral Switch:**
**20 Nm (2.0 m·kg, 14 ft·lb)**




3. Install:
   - Shift forks ①
   - Guide bar ②

NOTE:
- All shift fork numbers should face the left side and be in sequence (1, 2, 3), starting from the left.
- The guide bar groove ③ should face the right side.

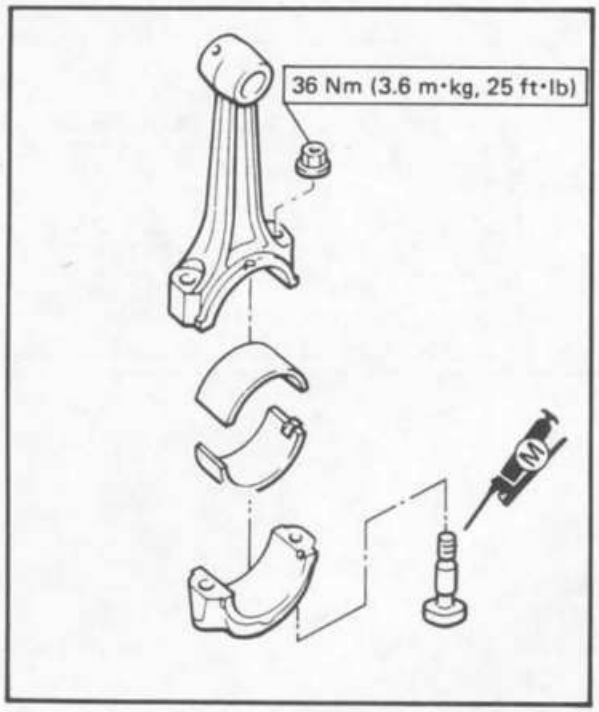
4. Place the shift cam and transmission gears in NEUTRAL position.

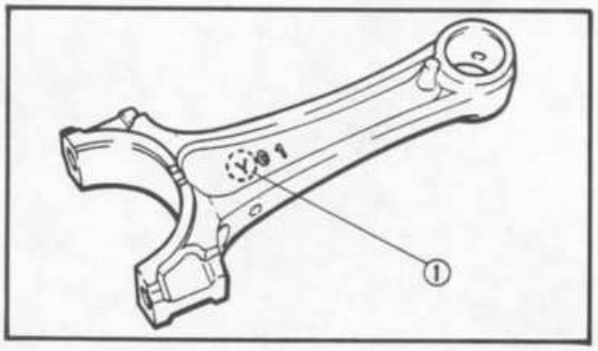
**CAUTION:**

**Be sure the gear shifts correctly while hand-turning the shift cam.**

5. Clean the crankcase counterbore where the main bearing is fitted.
6. Install:
   - Crankshaft bearings ①

   See page 3-29 for crankshaft bearing selection.




## CRANKSHAFT

1. Clean:
   - Crankshaft
   - Connecting rods
2. Install:
   - Connecting rod bearings (into connecting rod and cap)
3. Lubricate:
   - Connecting rod bolt threads

| | |
|---|---|
| | Molybdenum Disulfide Grease |

4. Apply engine oil to the crankshaft pins.

5. Install:
   - Connecting rods
   - Rod caps

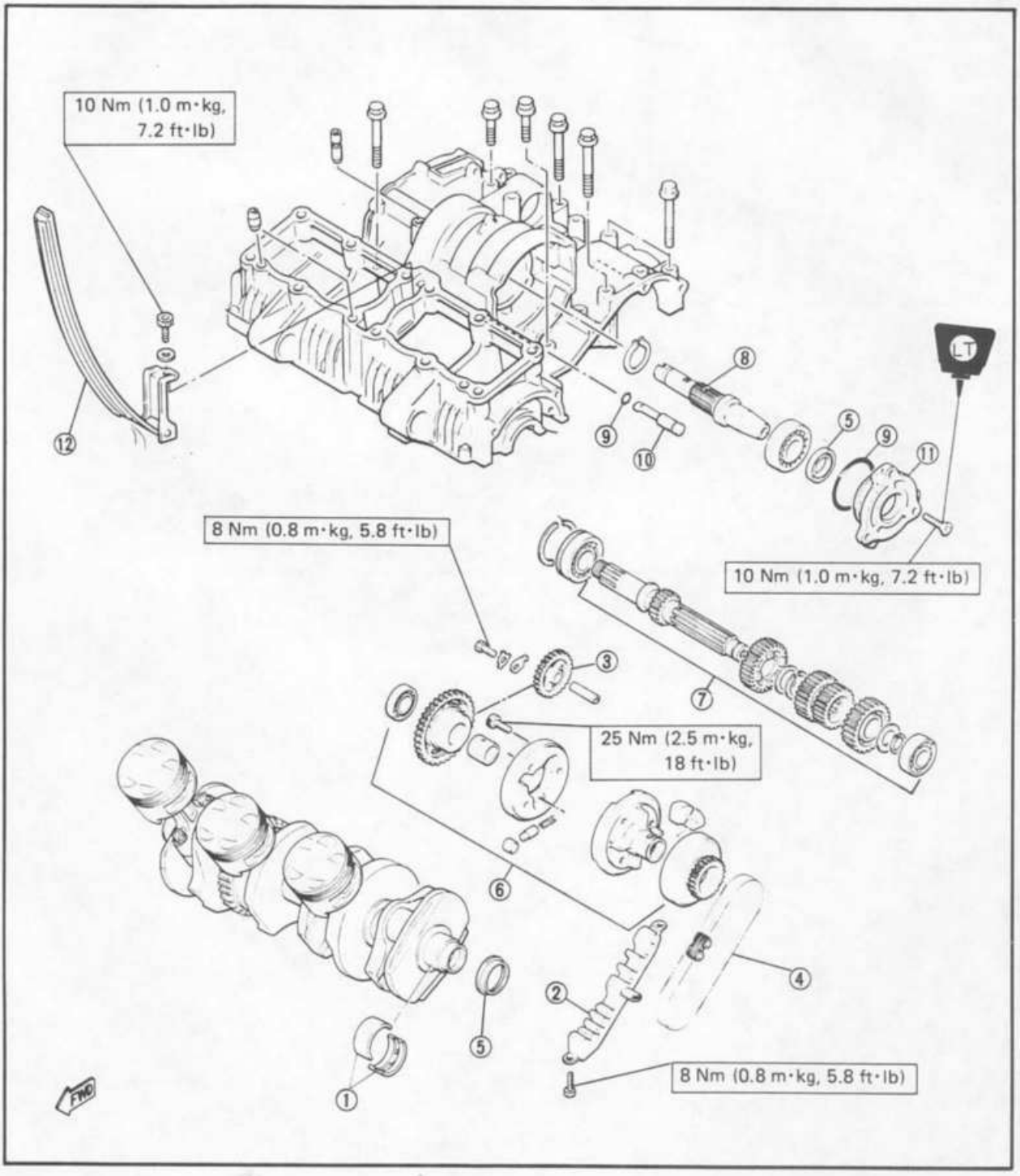
NOTE:
- Be sure the letter on both components align to form a perfect character.
- The stamped "Y" mark on the connecting rods ① should face towards the left side of the crankcase.

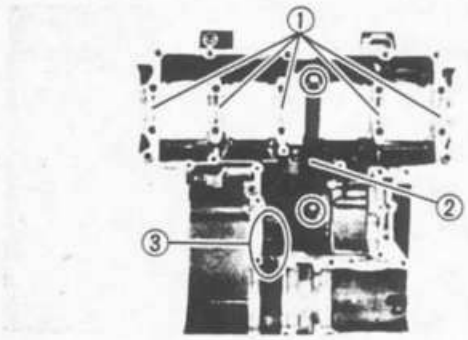
3

## UPPER CRANKCASE

① Crankshaft bearing
② Drive chain guide
③ Starter idle gear
④ A.C.G. drive chain
⑤ Oil seal
⑥ Starter clutch assembly
⑦ Main axle assembly
⑧ A.C.G. shaft
⑨ O-ring
⑩ Oil spray nozzle
⑪ Housing
⑫ Cam chain guide

| CONNECTING ROD BEARING SELECTION:<br>CONNECTING ROD BEARING =<br>CONNECTING ROD NO. – CRANKSHAFT NO. | |
|---|---|
| CALCULATED NO. | COLOR CODE |
| 1 | BLUE |
| 2 | BLACK |
| 3 | BROWN |
| 4 | GREEN |

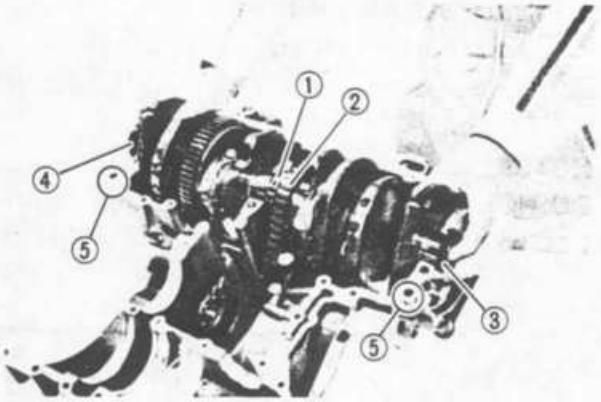





1. Install:
   - Crankshaft bearings ①
   - Drive chain guide ②
   - Starter idle gear ③

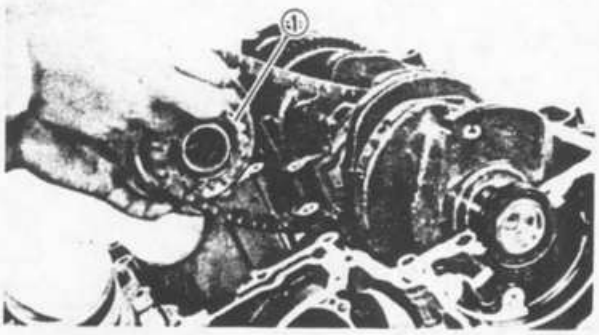
**Drive Chain Guide:**
**8 Nm (0.8 m·kg, 5.8 ft·lb)**
**Starter Idle Gear:**
**8 Nm (0.8 m·kg, 5.8 ft·lb)**

2. Apply engine oil to the bearings.
3. Place the cam chain ① , drive chain ② , and oil seal ③ onto the crankshaft.
4. Install:
   - Crankshaft
     (onto the upper crankcase)

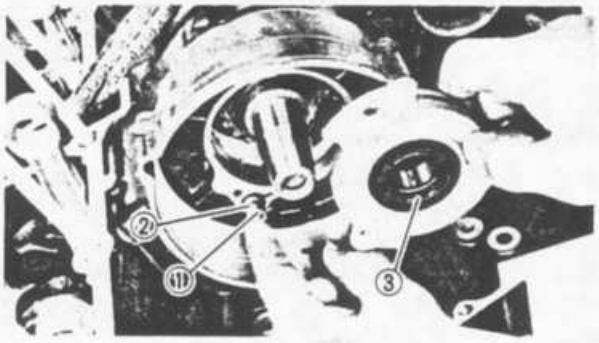



NOTE:
- Insert the oil seal flange completely into the crankcase positioning groove.
- Be careful not to damage the oil seal during installation.

- Blind plug ④
- Dowel pins ⑤



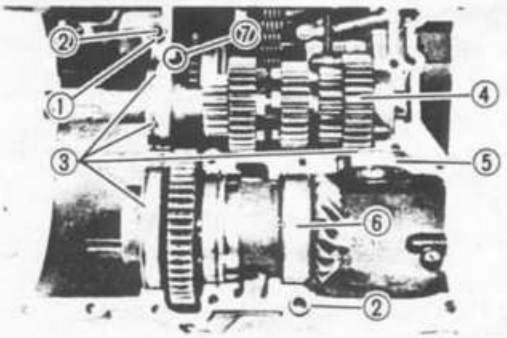

5. Place the drive chain on the starter clutch assembly.
6. Install
   - Starter clutch assembly ①
     (onto the upper crankcase)
   - A.C.G. shaft



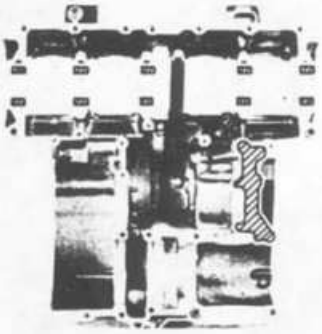

7. Install:
   - Oil spray nozzle ① (with new O-ring ② )
   - Housing (with new oil seal ③ )

NOTE:
Lightly apply grease to the oil seal lips.

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




8. Install:
   - O-ring (New) ①
   - Dowel pins ②
   - Half clips ③
   - Main axle assembly ④
   - Bearing ⑤
   - Middle drive shaft assembly ⑥
9. Position the bearing pin (left bearing) as shown ⑦ .

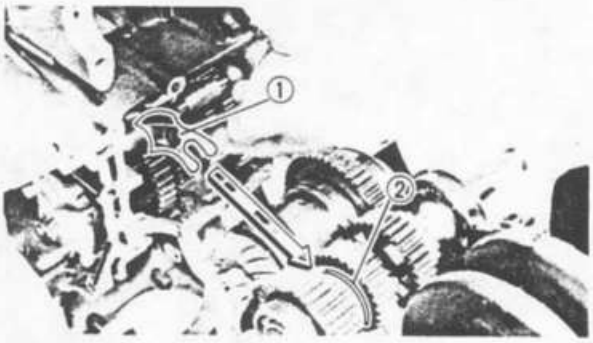


### CRANKCASE ASSEMBLY

1. Attach a length of wire to the cam chain.
2. Apply Yamaha bond No. 1215 (90890-85505).

**NOTE:**

DO NOT ALLOW any sealant to come in contact with the oil galley O-ring, or crankshaft bearings. Do not apply sealant to within 2 ~ 3 mm (0.08 ~ 0.12 in) of the bearings.

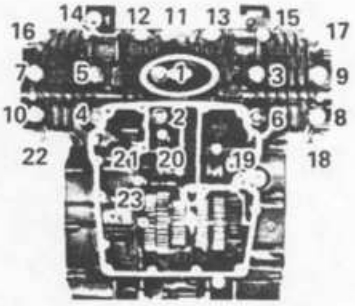



3. Install the lower crankcase onto the upper crankcase.

**NOTE:**

- Be sure the shift fork No. 2 ① engages the groove ② in the 2nd pinion gear on the main axle.
- Insert the oil seal and blind seal flanges completely into the crankcase positioning grooves.
- Be careful not to damage the seals during installation.

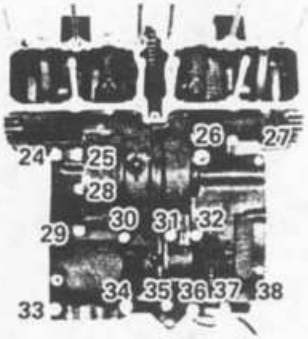
A




4. Install:
   - Bolts
   - Washers
   - Clamps
   - Battery negative lead
5. Tighten:
   - Crankcase bolts

**Crankcase:**
**6 mm bolt:**
**12 Nm (1.2 m·kg, 8.7 ft·kg)**
**8 mm bolt:**
**24 Nm (2.4 m·kg, 17 fy·lb)**

B



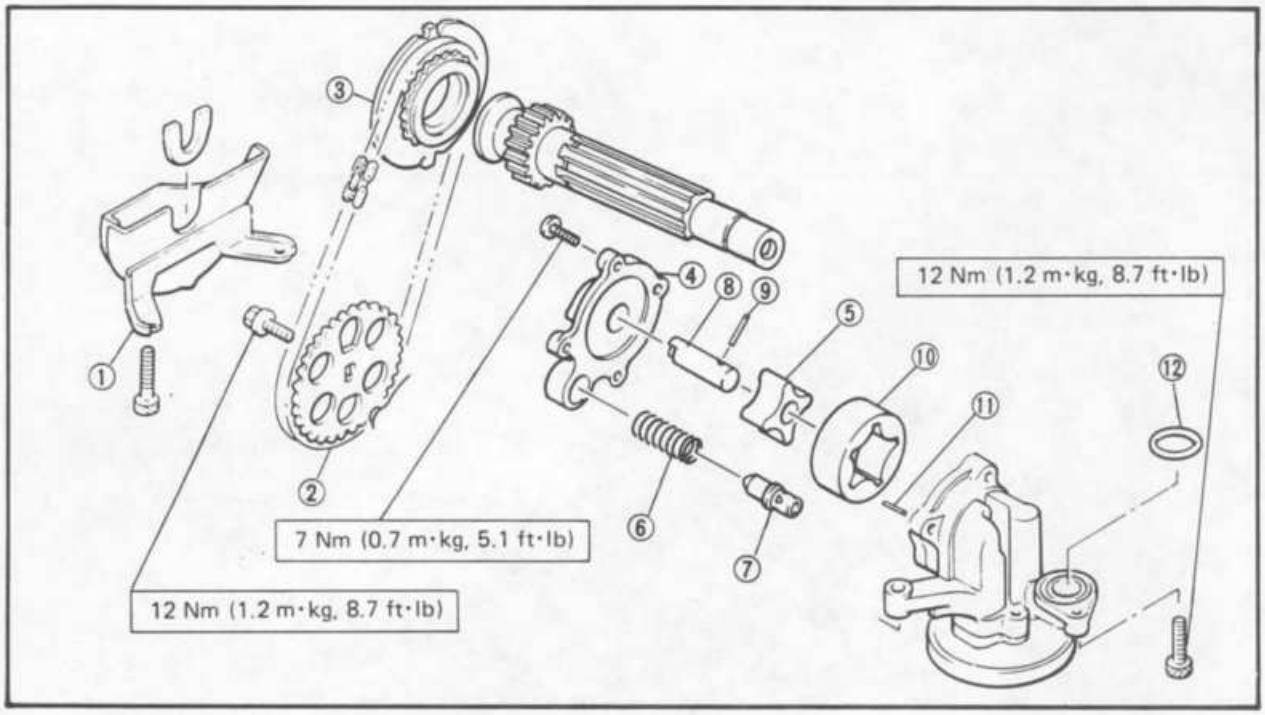

**NOTE:**

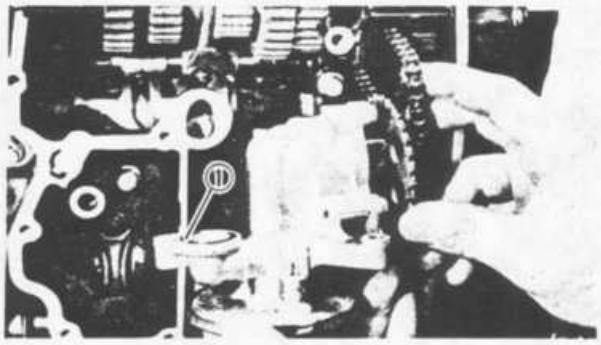
The embossed numbers in the crankcase designate the crankcase tightening sequence.

A LOWER CRANKCASE
B UPPER CRANKCASE

## OIL PUMP AND OIL PAN

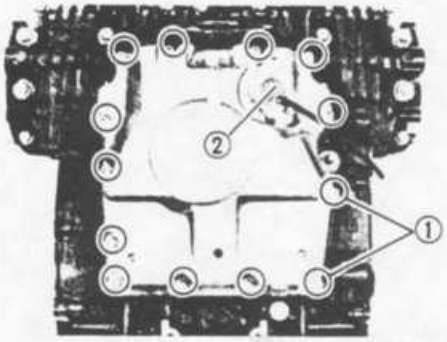
① Chain cover
② Oil pump sprocket
③ Oil pump drive sprocket
④ Oil pump cover
⑤ Inner rotor
⑥ Spring
⑦ Relief valve
⑧ Shaft
⑨ Dowel pin
⑩ Outer rotor
⑪ Dowel pin
⑫ O-ring



1. Install:
   - O-ring ①
     (onto the oil pump assembly)
   - Chain
   - Oil pump assembly
   - Chain cover

| | |
|---|---|
| | **Oil Pump:**<br>**12 Nm (1.2 m·kg, 8.7 ft·lb)** |



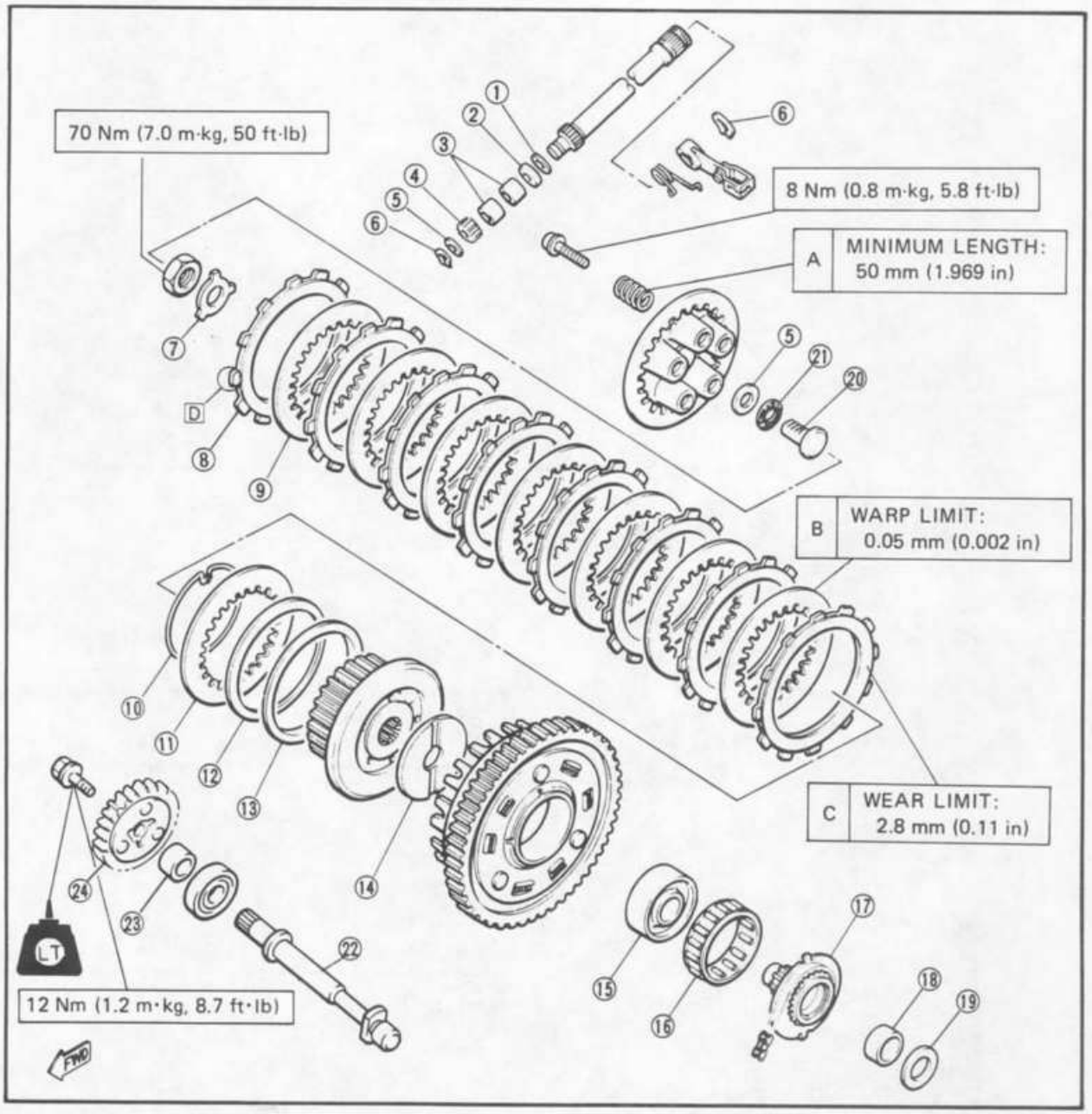
2. Install:
   - Oil pan
   - Wire clamps ①
   - Bolts
   - Oil level switch ②

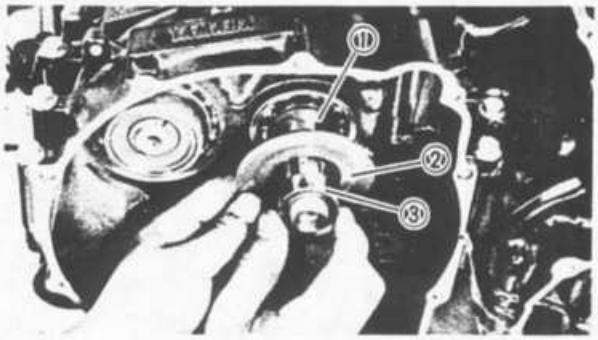
| | |
|---|---|
| | **Oil Pan:**<br>**12 Nm (1.2 m·kg, 8.7 ft·lb)**<br>**Oil Level Switch:**<br>**8 Nm (0.8 m·kg, 5.8 ft·lb)** |

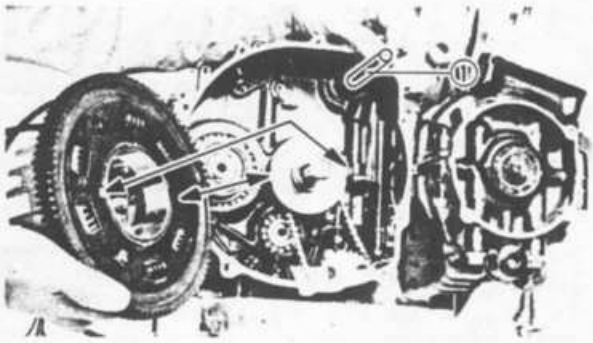
## CLUTCH

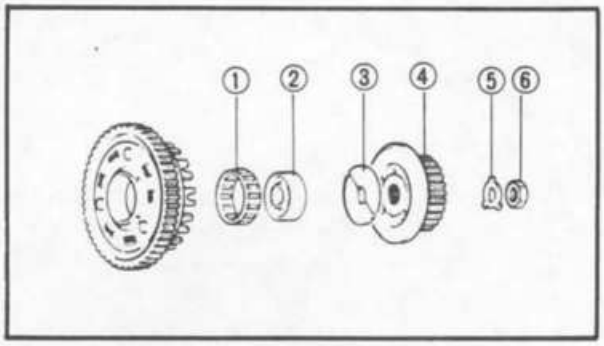
① Plate washer
② Oil seal
③ Bearing
④ Pinion gear
⑤ Plate washer
⑥ Circlip
⑦ Lock washer
⑧ Friction plate
⑨ Clutch plate
⑩ Wire clip
⑪ Clutch plate
⑫ Clutch boss spring
⑬ Spring seat
⑭ Thrust plate
⑮ Spacer
⑯ Bearing (15 – 28)
⑰ Oil pump drive sprocket
⑱ Collar
⑲ Thrust plate
⑳ Pull rod
㉑ Bearing
㉒ Water pump drive shaft
㉓ Spacer
㉔ Water pump drive gear

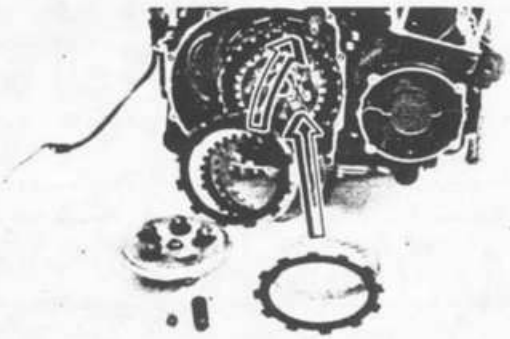
| | |
|---|---|
| D | The outermost friction plate has a V-cut in it. Give some identifying mark to the corresponding dog in the clutch housing. |

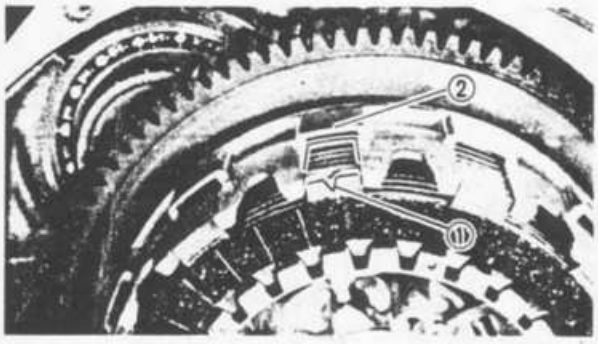







### CLUTCH AND OIL PUMP DRIVE SPROCKET

1. Install:
   - Thrust plate ①
   - Oil pump drive sprocket ②

| | |
|---|---|
| | **12 Nm (1.2 m·kg, 8.7 ft·lb)** |

2. Hook the drive chain on the drive sprocket.
3. Install:
   - Collar ③
4. Install:
   - Water pump drive shaft ①
   - Clutch housing

**CAUTION:**

**Be sure that the oil pump drive gear tabs engage the clutch housing grooves on its back or the tabs will be damaged when tightening the clutch boss securing nut.**

5. Install:
   - Bearing ①
   - Spacer ②
   - Thrust plate ③
   - Clutch boss ④
   - Lock washer (New) ⑤
   - Nut ⑥

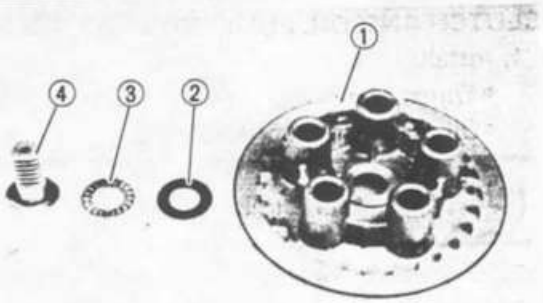
| | |
|---|---|
| | **Clutch Boss: 70 Nm (7.0 m·kg, 50 ft·lb)** |

6. Bend lock washer tabs against the nut flats.
7. Install:
   - Friction plates
   - Clutch plates

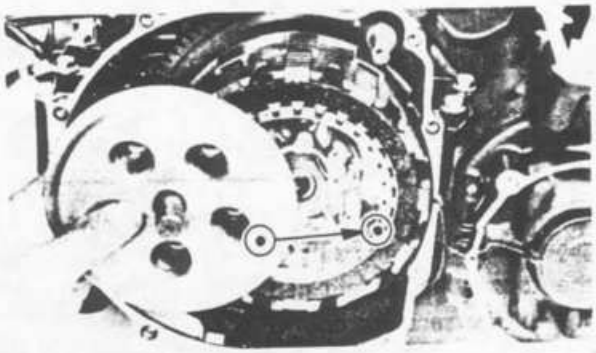
8. Install:
   - Friction plate (with V-cut ① in tab)

**NOTE:**

Install the friction plate so that the V-cut tab is in the identified dog ② .
If you forget to identify the position with a mark, measure the width of each dog.
13.8 mm (0.543 in) width is for that position.
The other width are 14 mm (0.551 in).




9. Install:
   - Plate washer ②
   - Thrust bearing ③
     (onto the pull rod ④)
   - Pull rod ④
     (into the pressure plate ①)

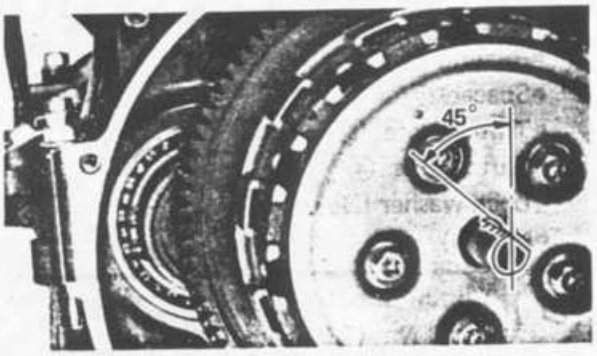


10. Install:
    - Pressure plate

**NOTE:**
Align a dot on the clutch boss with a dot on the pressure plate.

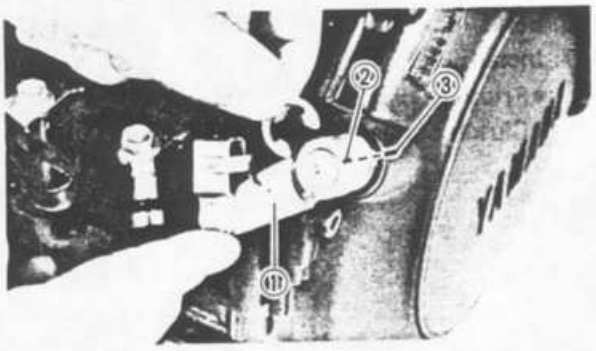
- Clutch springs

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

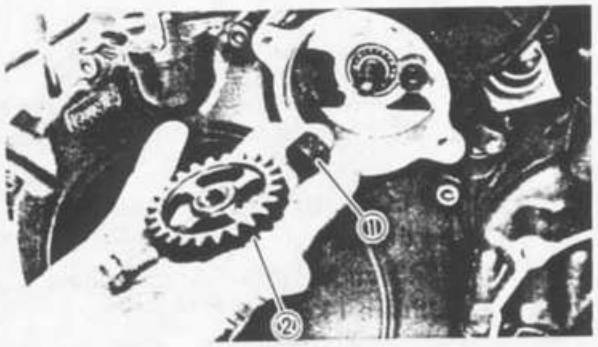



11. Install:
    - Oil baffle plate
    - Dowel pins
    - Gasket
    - Clutch cover

**NOTE:**
- Set the gear of the clutch pull rod facing approximately 45° from horizontal toward the rear.
- Set the clutch lever ① on the right crankcase cover parallel to the gasket surface.
- Make sure that the punch mark on the lever ② align with the mark on the crankcase cover ③ when pushing the lever towards the front by hand.

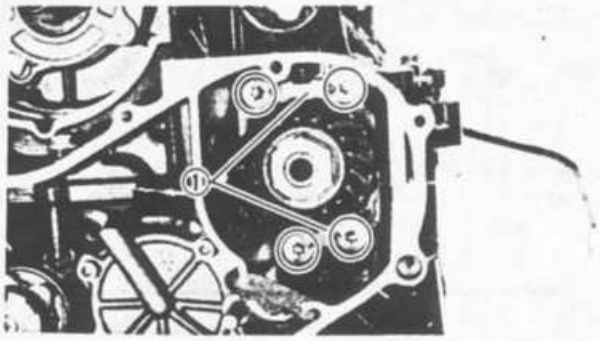



**Clutch Cover:**
**12 Nm (1.2 m·kg, 8.7 ft·lb)**




12. Install:
    - Spacer ①
    - Water pump drive gear ②
    - Water pump drive gear cover.

**Water Pump Drive Gear:**
**12 Nm (1.2 m·kg, 8.7 ft·lb)**
**LOCTITE®**
**Cover:**
**8 Nm (0.8 m·kg, 5.8 ft·lb)**

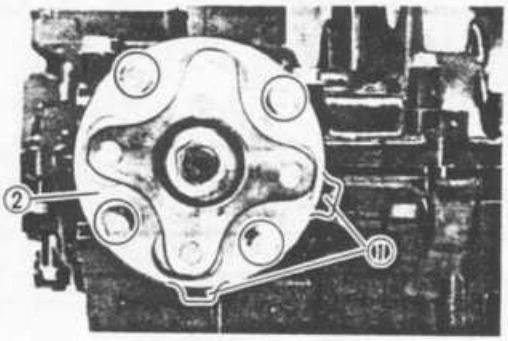


### MIDDLE GEAR

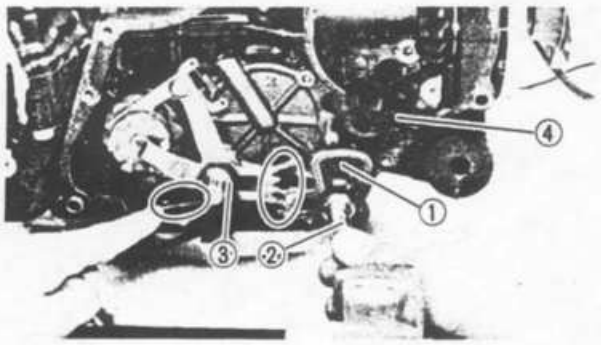
1. Install:
   - Bearing retainers ①
   - TORX screws (New)
   - Oil level maintaining plug

| Bearing Retainer: 25 Nm (2.5 m·kg, 18 ft·lb) |
|---|

2. Stake the screw heads to the dents on the bearing retainers with a center punch.
3. Install:
   - Shims ①
   - Middle driven gear housing ②
   - Bolt

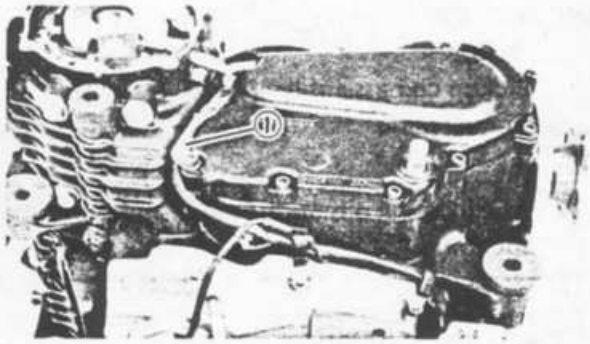


| Middle Driven Gear Housing: 25 Nm (2.5 m·kg, 18 ft·lb) LOCTITE® |
|---|



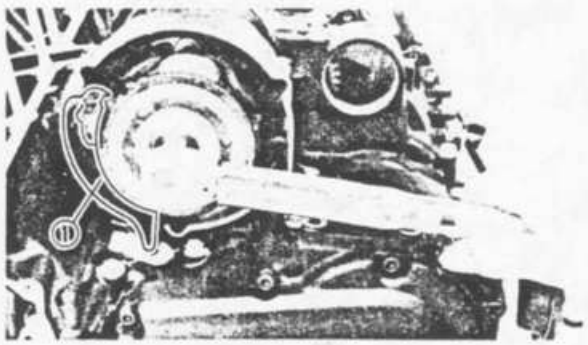
### SHIFTER

1. Install:
   - Washer ①
   - Shift shaft ②
   - Shift lever ③
   - Oil level maintaining plug ④
   - Gasket



2. Install:
   - Crankcase cover
   - Wire harness clip ①
   - Bolts

| Crankcase Cover: 12 Nm (1.2 m·kg, 8.4 ft·lb) |
|---|

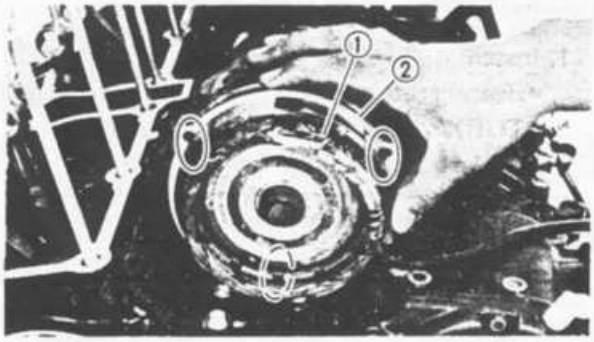


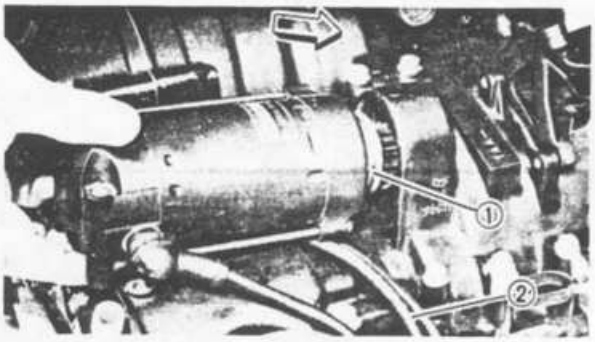
### GENERATOR AND STARTER

1. Install:
   - Rotor

   Use Rotor Holding Tool (90890-04043) ①.

| Rotor: 55 Nm (5.5 m·kg, 40 ft·lb) |
|---|




2. Install:
   - Stator coil ①

NOTE:
Align the grooves on the stator coil core with the bolt holes on the crankcase.

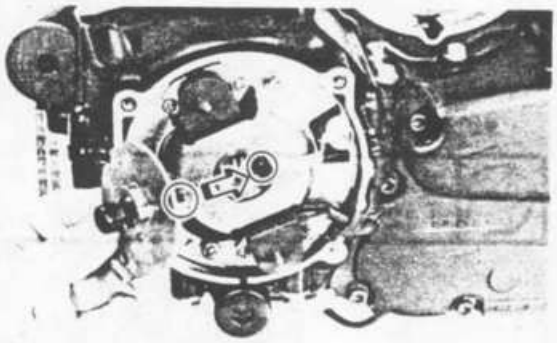
   - Gasket ②
   - A.C.G. cover

| A.C.G. Cover: 12 Nm (1.2 m·kg, 8.4 ft·lb) |
|---|

3. Install:
   - Starter motor
   - Bolts

| Starter Motor: 7 Nm (0.7 m·kg, 5.1 ft·lb) |
|---|

NOTE:
- Be careful the O-ring ① is not damaged when installing the starter motor.
- Route the A.C.G. lead wires ② as shown.



PICKUP COIL

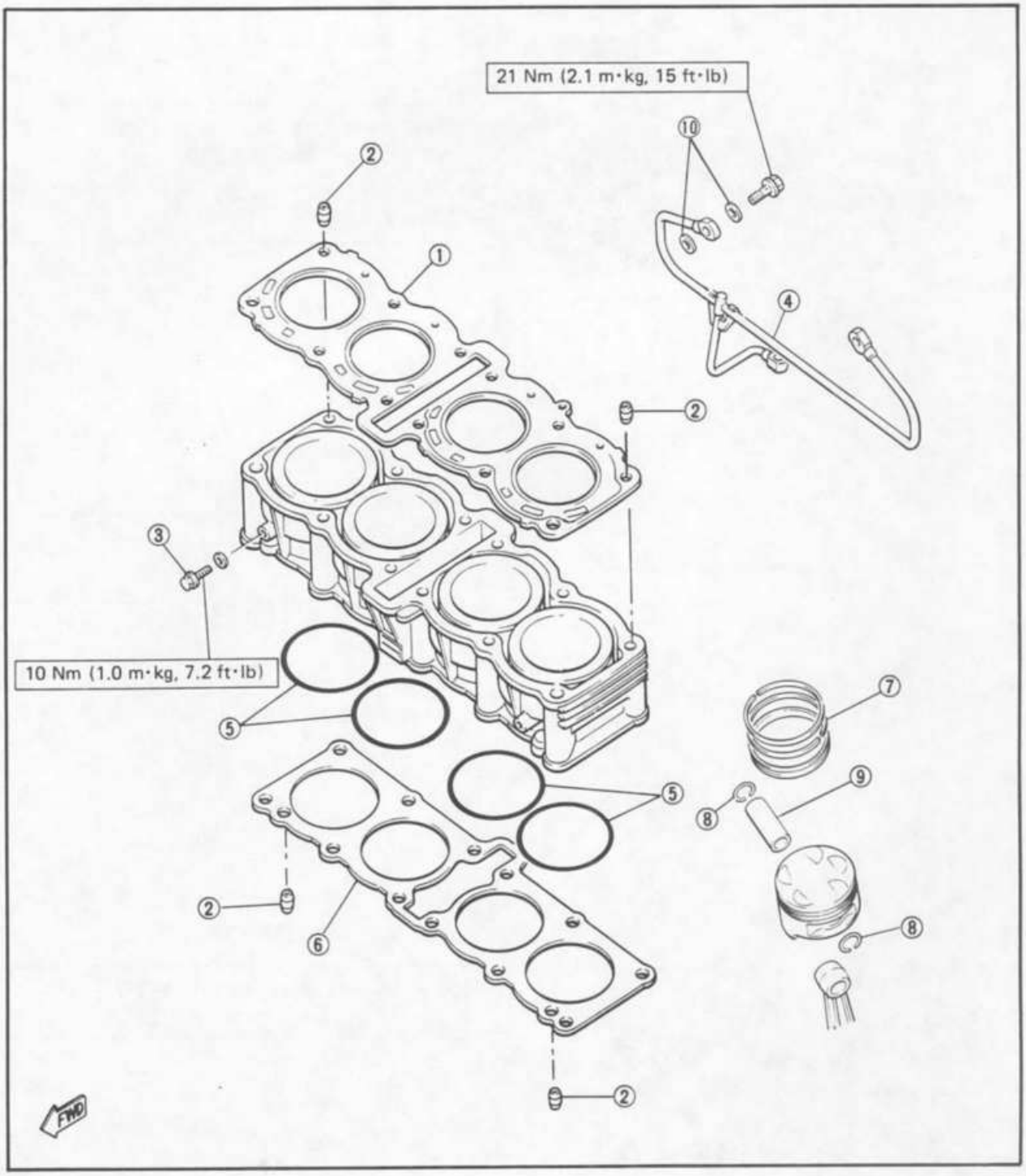
1. Install:
   - Pickup coil assembly
   - Timing plate

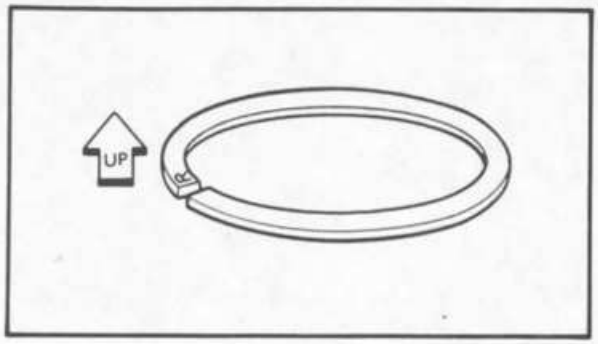
NOTE:
Align the locating pin on the crankshaft with the corresponding slot in the timing plate.

| Pickup Bose: 8 Nm (0.8 m·kg, 5.8 ft·lb)<br>Timing Plate: 24 Nm (2.4 m·kg, 17 ft·lb) |
|---|

## PISTON AND CYLINDER

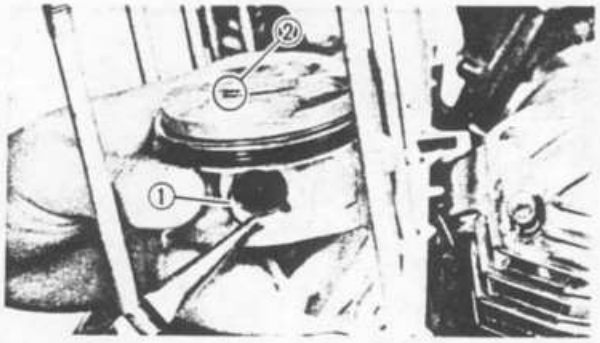
① Cylinder head gasket
② Dowel pin
③ Drain bolt
④ Oil delivery pipe
⑤ O-ring
⑥ Cylinder base gasket
⑦ Piston ring
⑧ Piston pin clip
⑨ Piston pin
⑩ Copper washer





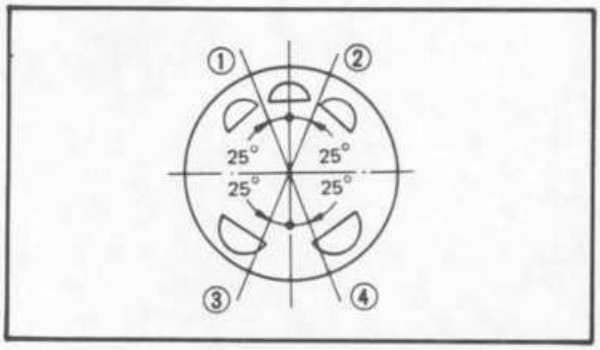

1. Install:
   - Piston rings
     (onto the pistons)

**NOTE:**
Be sure to install the rings so that Manufacturer's marks or numbers are located on the top side of the rings. Oil the pistons and rings liberally.




2. Install:
   - Pistons

**NOTE:**
- Be sure the piston is positioned correctly.
- Always install new piston pin clips ①.
- The "EX" mark ② on the piston should face toward the front (Exhaust side).




3. Oil liberally:
   - Pistons
   - Rings
   - Cylinders
4. Set:
   - Piston ring ends

**CAUTION:**
**Make sure the ends of the oil ring expanders do not overlap.**

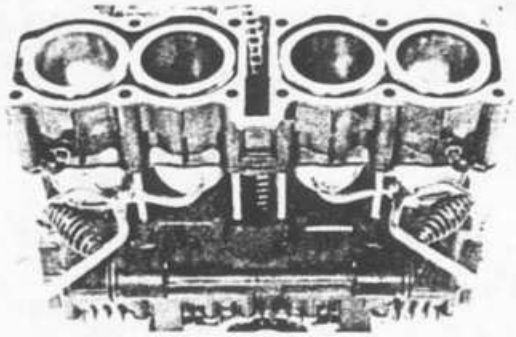
① TOP
② OIL RING (LOWER RAIL)
③ OIL RING (UPPER RAIL)
④ 2ND

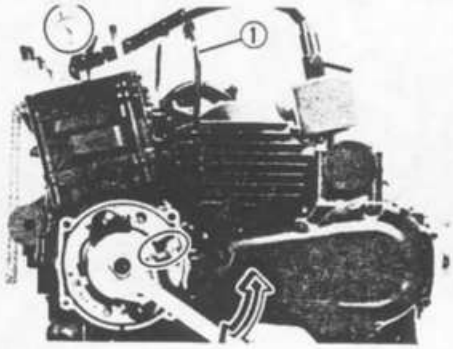



5. Install:
   - Cam chain guide (Rear) ①

| | |
|---|---|
| | **Cam Chain Guide (Rear): 10 Nm (1.0 m·kg, 7.2 ft·lb)** |

6. Check:
   - Guide movement
     Unsmooth operation → Reassemble.






7. Install:
   - Dowel pins
   - Gasket (New)
   - Cylinder

**CAUTION:**

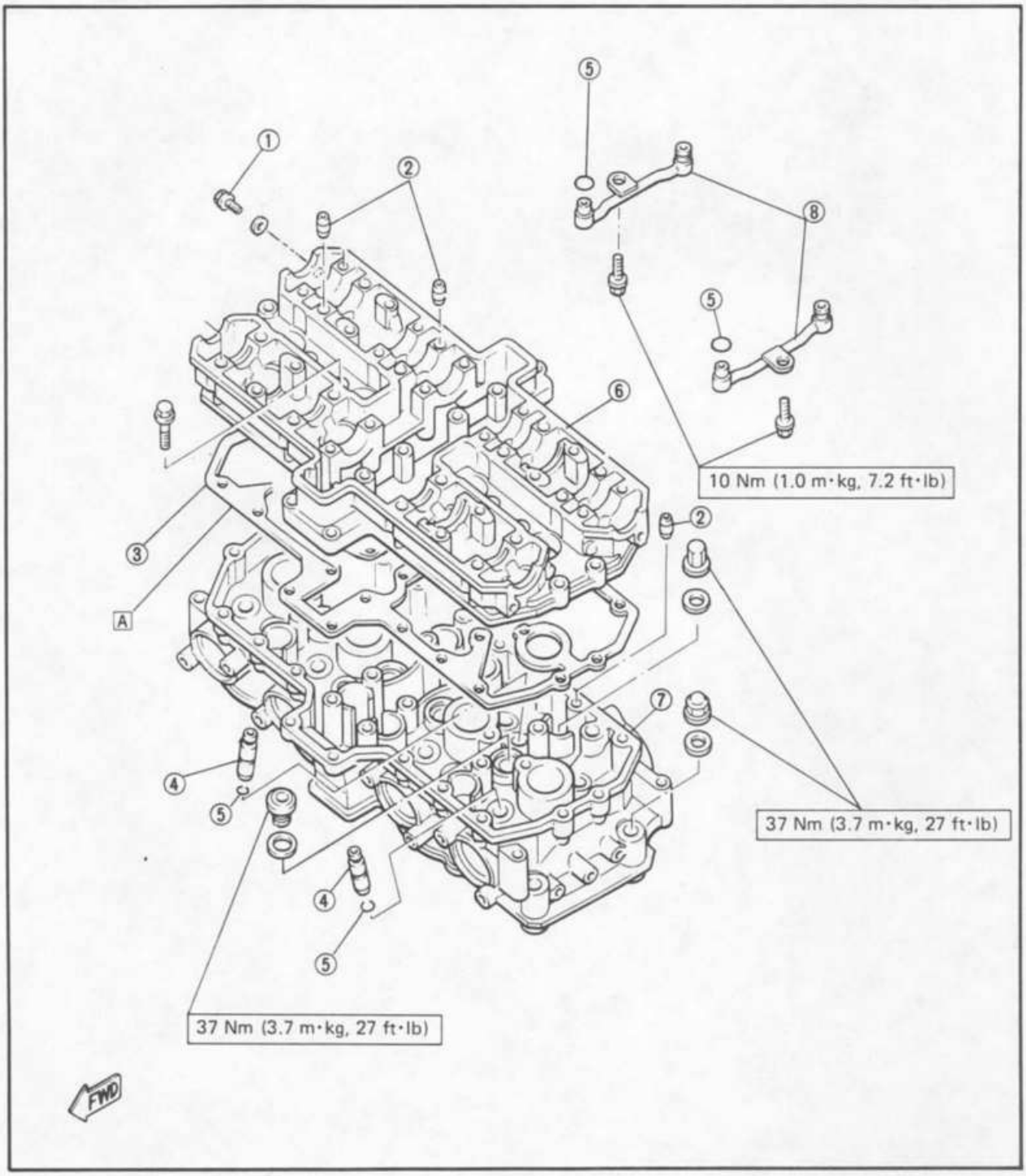
- **Be careful not to damage the cam chain guide during insvallation.**
- **Pass the cam chain throught the cam chain cavity.**

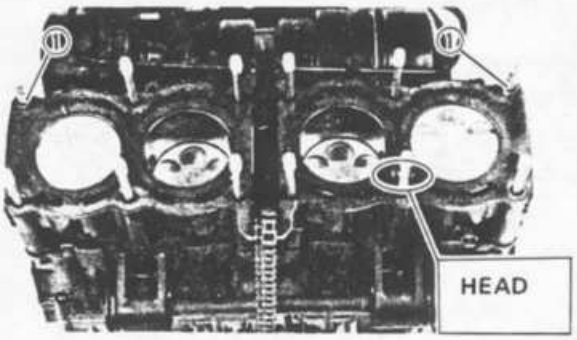
8. Position:
   - Oil delivery pipe ①
9. Set the dial gauge on the No. 1 piston head center as shown to find the No. 1 piston top dead center and check whether the "T" mark on the timing plate and stationary pointer are aligned or not. If not, loosen the pointer securing screw and adjust.

## CYLINDER HEAD

① Check bolt
② Dowel pin
③ Camshaft case gasket
④ Valve guide
⑤ O-ring
⑥ Camshaft case
⑦ Cylinder head
⑧ Oil pipe

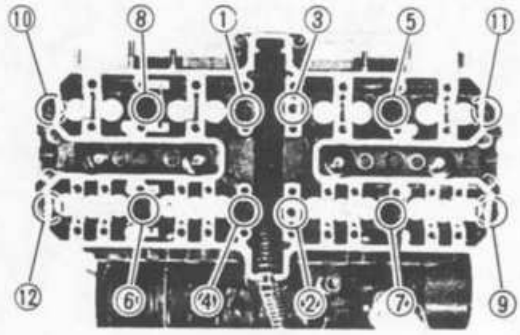
Ⓐ Be sure the "UP" mark face to upward.






1. Install:
   - Dowel pins ①
   - Cylinder head gasket (New)
   - Cylinder head

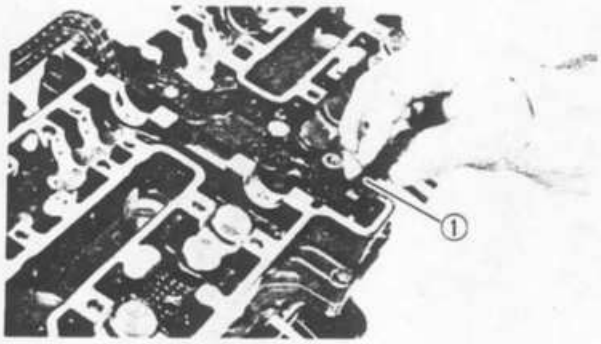
**NOTE:**
- Be careful not to damage the cam chain guide during installation.
- Pass the cam chain through the cam chain cavity.




2. Tighten:
   - Nuts

   In sequence as shown and torque the nut in two stages.

| | |
|---|---|
| | **Cylinder Head: [10 mm (0.39 in)]**<br>**37 Nm (3.7 m·kg, 27 ft·lb)** |




3. Install:
   - Cam chain guide (Front) ①

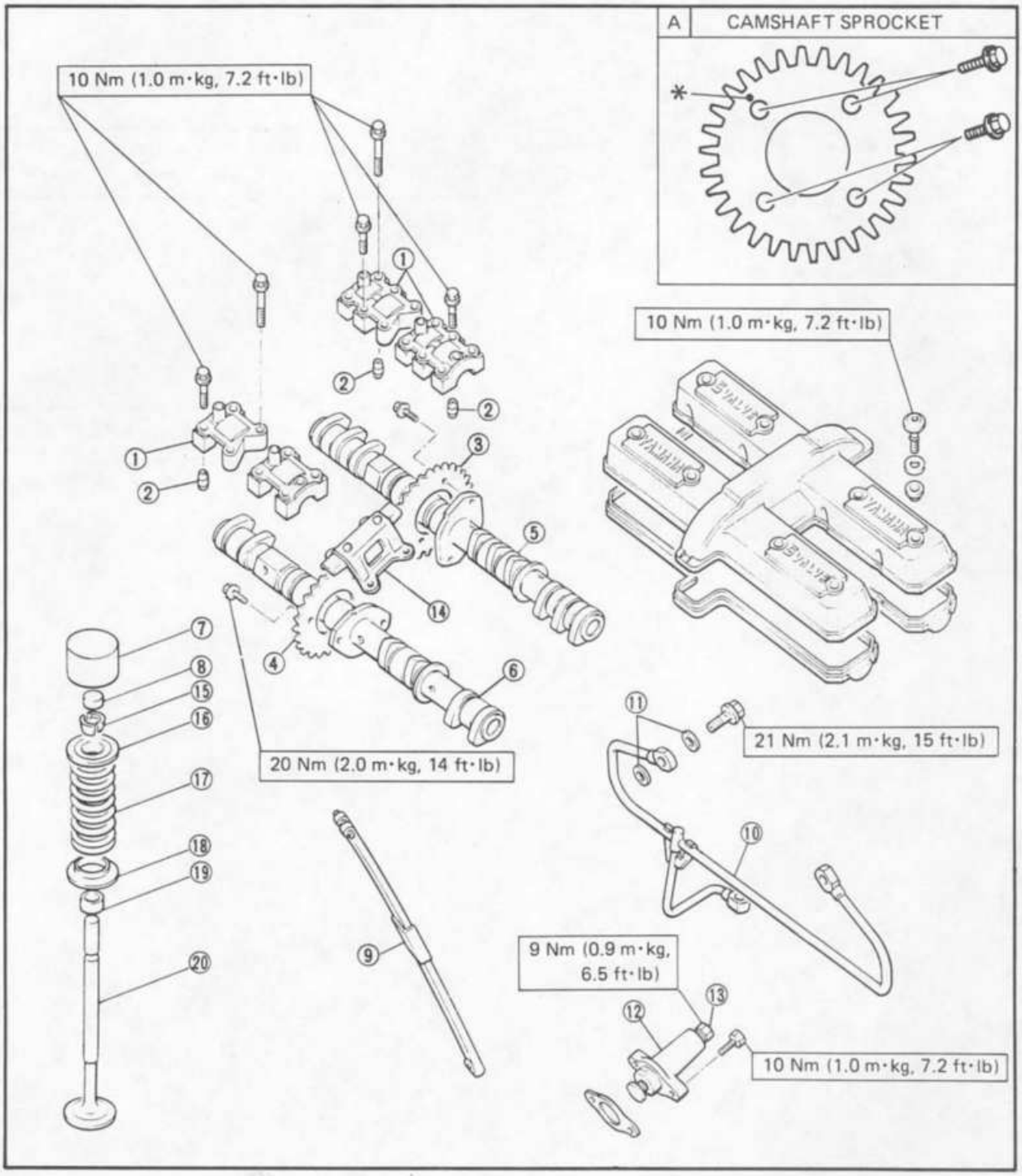
**NOTE:**
The lower end of chain guide must rest in the cam chain guide slot in the crankcase.

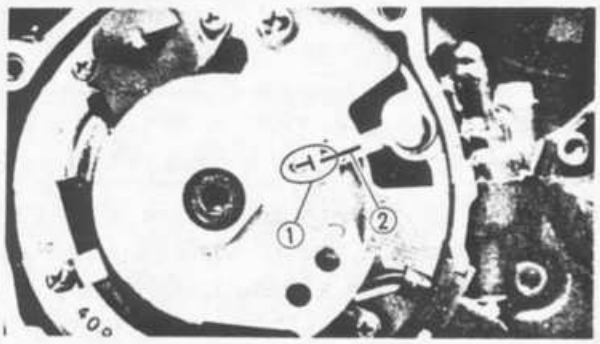
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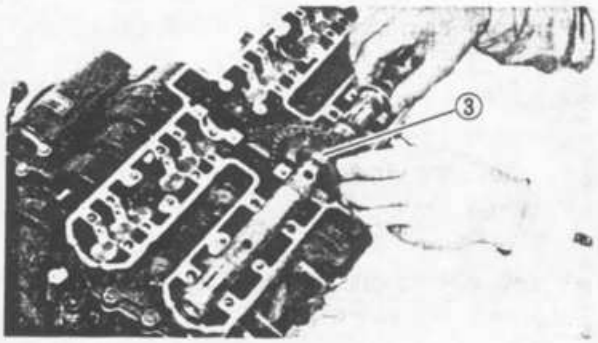
## CAMSHAFT

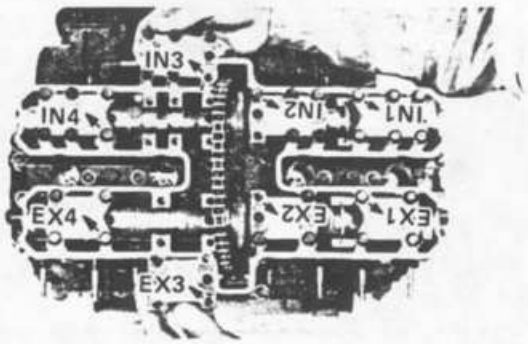
① Cam cap
② Dowel pin
③ Cam chain sprocket (IN)
④ Cam chain sprocket (EX)
⑤ Camshaft (IN)
⑥ Camshaft (EX)
⑦ Lifter
⑧ Adjusting pad
⑨ Cam chain guide (Front)
⑩ Oil delivery pipe
⑪ Copper washer
⑫ Camchain tensioner
⑬ Camchain tensioner end cap bolt
⑭ Camchain guide (Upper)
⑮ Valve retainer
⑯ Spring seat
⑰ Valve spring
⑱ Spring seat
⑲ Oil seal
⑳ Valve

✱ When installing the sprocket, use holes except for the one with a punch mark.






1. Install:
   - Camshafts

**Camshaft installing steps:**
- Align the "T" mark on the timing plate ① with the stationary pointer ② . Do not turn the crankshaft during the camshafts installation.
- Install the cam chain sprockets onto the camshafts.
- Apply engine oil to the camshaft bearing surface.
- Turn the camshafts by hand so that the timing marks ③ (o: small hole) on the camshafts face upward.
- Install the dowel pins into the cam caps.
- Install the caps (without IN3 and EX3 onto the camshafts and tighten the cap bolts.

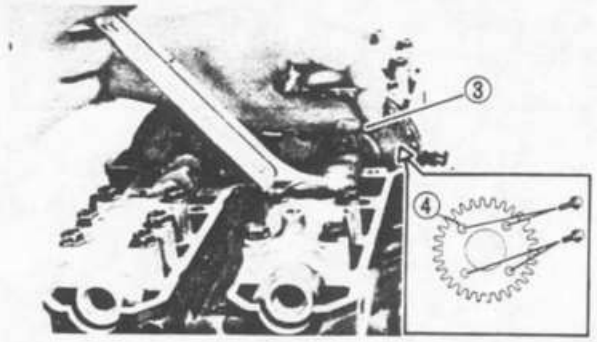
**NOTE:**
- The arrow mark on the caps should face toward the out side.
- The numbers are punched on the camshaft caps in increments from left to right.

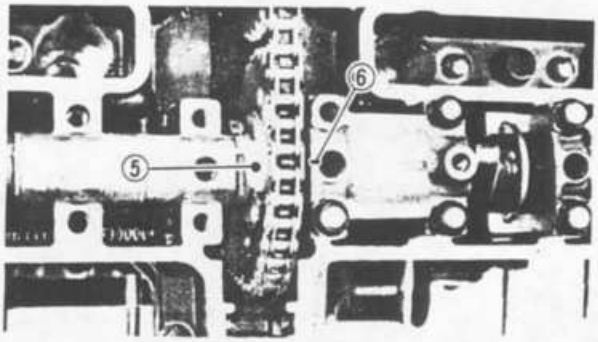
**Cam Cap:**
**10 Nm (1.0 m·kg, 7.2 ft·lb)**

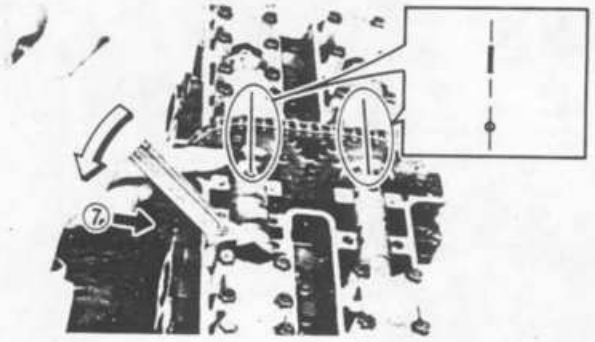



2. Install:
   - Cam chain sprockets

**Cam chain sprockets installing steps:**
- Align the "T" mark on the timing plate ① with the stationary pointer on the pickup coil ② . **Do not turn the crankshaft when installing the sprockets.**
- Place the cam chain onto the exhaust sprocket.



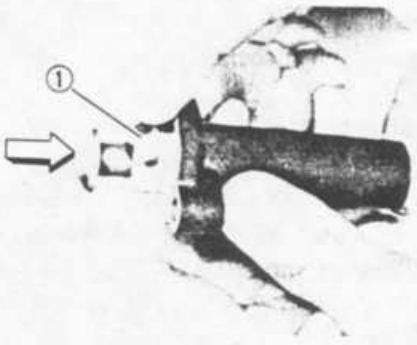




- Install the sprockets and finger tighten the sprocket bolts ③.

**NOTE:**

When installing the sprocket, use holes except for the one with a punch mark ④.

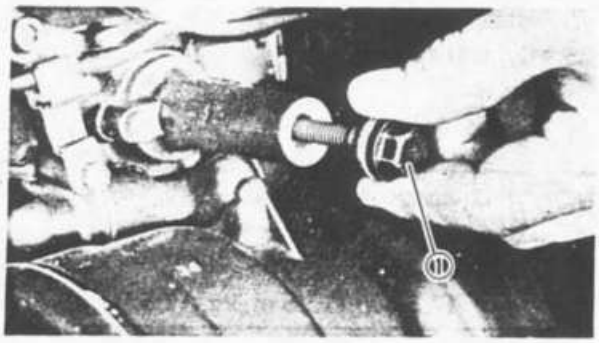
- Rotate the exhaust camshaft to align the punched mark on the camshaft ⑤ with the "–" mark on the EX2 cam cap ⑥.
- Force the exhaust camshaft clockwise to remove the cam chain slack.
- Place the cam chain onto the intake sprocket.
- Install the sprocket and finger tighten the sprocket bolt.
- Rotate the intake camshaft to align the punched mark on the camshaft with the "–" mark on the IN2 cam cap.
- Force the intake camshaft clockwise to remove all the cam chain slack.
- Insert your finger into the cam chain tensioner hole, and push the cam chain guide inward ⑦.
- While pushing the cam chain guide, be sure camshaft timing marks align with the cap marks.
- Remove the intake sprocket if marks do not align.
- Change the meshing position of sprocket and cam chain.

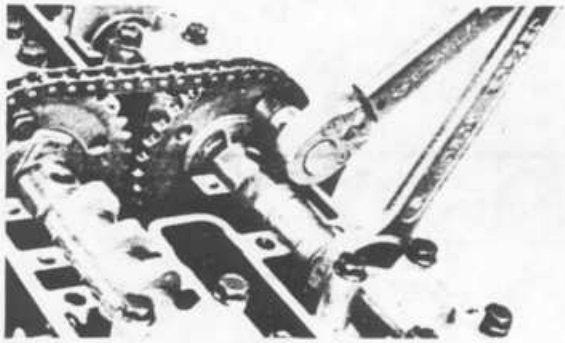



3. Install:
   - Cam chain tensioner

**Cam chain tensioner installation steps:**

- Remove the tensioner end cap bolt and spring.
- Release the cam chain tensioner one-way cam ① and push the tensioner rod into the tensioner body.



- Install the tensioner with a new gasket onto the cylinder.

**Tensioner Body:**
**10 Nm (1.0 m·kg, 7.2 ft·lb)**

- Install the tensioner springs and end cap bolt ① . Tighten the bolt.

**Tensioner End Cap Bolt:**
**9 Nm (0.9 m·kg, 6.5 ft·lb)**

- Turn the crankshaft and install the sprocket securing bolts.
- Tighten the sprocket bolts.

**Sprocket:**
**20 Nm (2.0 m·kg, 14 ft·lb)**

**CAUTION:**

**Be sure to attain the specified torque value to avoid the possibility of these bolts coming loose and causing damage to the engine.**

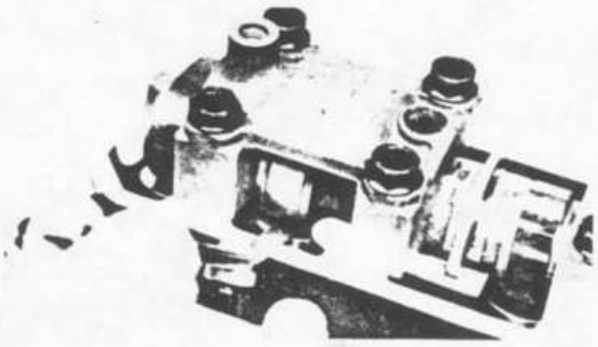
Install the caps (IN3 and EX3) and camchain guide (Upper).

4. Apply engine oil to the cam chain, sprockets, camshafts, and valves.

5. Turn the crankshaft counterclockwise a few turns to ensure that it turns smoothly.

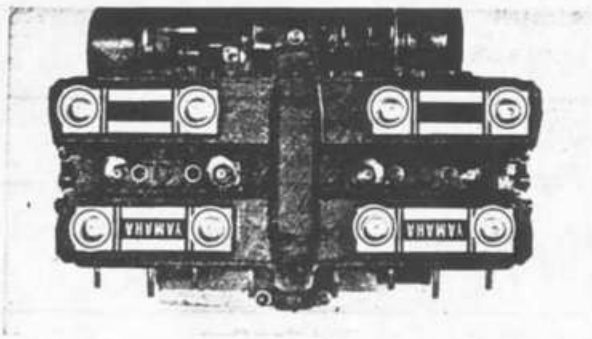
**CAUTION:**

**Be sure the exhaust and intake camshaft marks are aligned with the cam cap marks.**



6. Measure:
   Valve clearance
   Out of specification → Adjust.

**IN: 0.11 ~ 0.20 mm**
**(0.004 ~ 0.008 in)**
**EX: 0.21 ~ 0.30 mm**
**(0.008 ~ 0.012 in)**



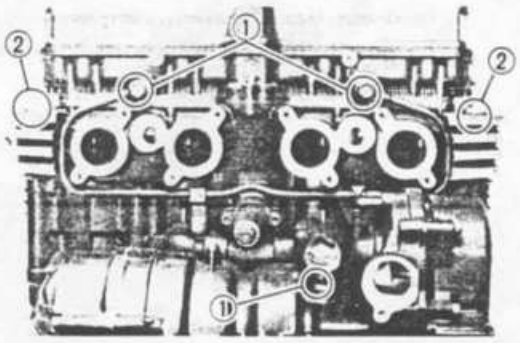
7. Install:
   - Cylinder head cover
   - Bolts
   - Spark plugs

**Cylinder Head Cover:**
**10 Nm (1.0 m·kg, 7.2 ft·lb)**
**Spark Plug:**
**17.5 Nm (1.75 m·kg, 12.5 ft·lb)**

8. Install:
   - Gasket
   - Crankshaft end cover (Left)
   - Screw

**Crankshaft End Cover (Left):**
**7 Nm (0.7 m·kg, 5.1 ft·lb)**

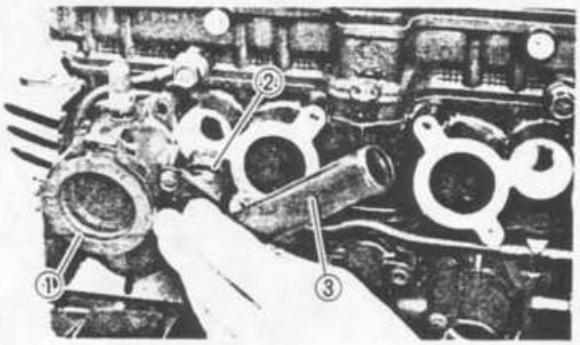
3




## RADIATOR PIPES, CARBURETOR JOINT, AND OIL DELIVERY PIPE

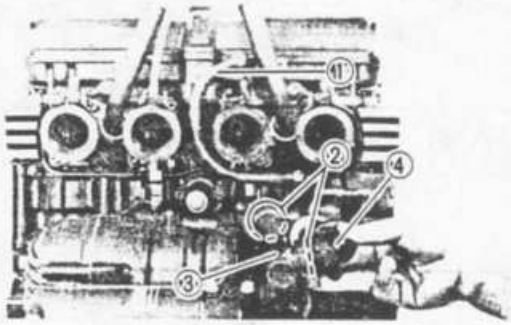
1. Install:
   - Union bolt with copper washer ①
   - Cylinder head side cover ②

**Oil Delivery Pipe**
**21 Nm (2.1 m·kg, 15 ft·lb)**



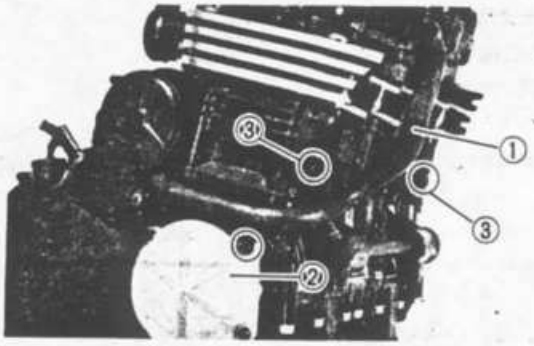

2. Install:
   - Carburetor joints ①
   - Radiator pipes (with O-ring ② ) ③

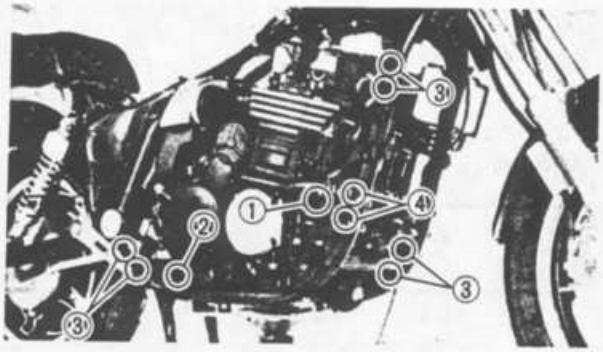
**Carburetor Joint:**
**12 Nm (12 m·kg, 8.7 ft·lb)**




3. Install:
   - Bypass hose ①
   - O-rings ②
   - Radiator pipe ③
   - Water pump joint ④

**Water Pump Joint:**
**10 Nm (1.0 m·kg, 7.2 ft·lb)**




4. Install:
   - Radiator pipe ①
   - Cover (Right) ②

**Radiator Pipe:**
**8 Nm (0.8 m·kg, 5.8 ft·lb)**
**Cover:**
**8 Nm (0.8 m·kg, 5.8 ft·lb)**

③ Drain bolts

## REMOUNTING ENGINE

1. Refer to engine removal. Reverse those removal steps that apply.
2. Tighten:
   - Engine mount bolts

**Engine Mounting Bolt:**
**Front ① :**
**42 Nm (4.2 m·kg, 30 ft·lb)**
**Rear ② :**
**90 Nm (9.0 m·kg, 65 ft·lb)**
**Down Tube ③ , Bracket ④ :**
**33 Nm (3.3 m·kg, 24 ft·lb)**

3. Connect:
   - Pickup coil lead
   - Generator lead
   - Neutral switch lead
   - Oil level switch lead
   - Starter motor lead
   - Crankcase ventilation hose
   - Battery leads

**NOTE:**
- See CHAPTER 8 "Cable Routing" for proper cable, lead, and hose routing.
- Connect the battery positive lead first.
- Make sure that the cables are not twisted.
- Be careful not to pinch the leads.

4. Install:
   - Carburetors
5. Connect:
   - Throttle cable
   - Starter cable
6. Tighten:
   - Air cleaner case mount bolts



**Air Cleaner Case:**
**10 Nm (1.0 m·kg, 7.2 ft·lb)**

7. Install:
   - Fuel tank
   - Seat
8. Add:
   - Engine oil



**Engine Oil:**
**3.5 L (3.1 Imp qt, 3.7 US qt)**

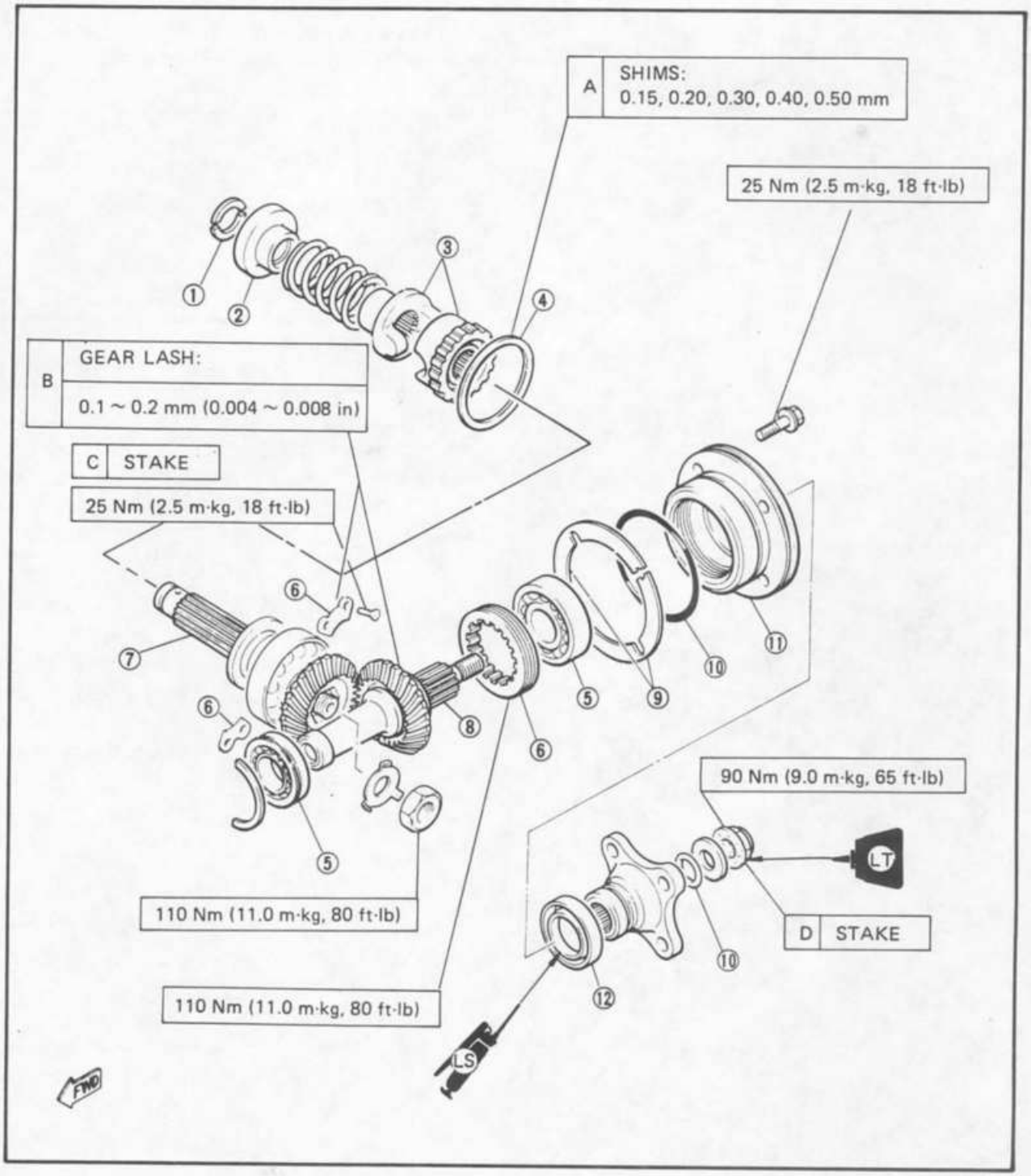
- Coolant

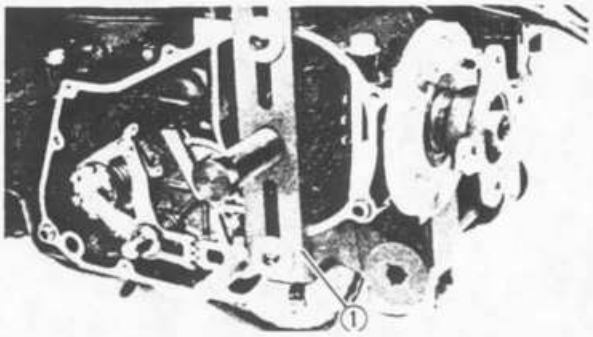


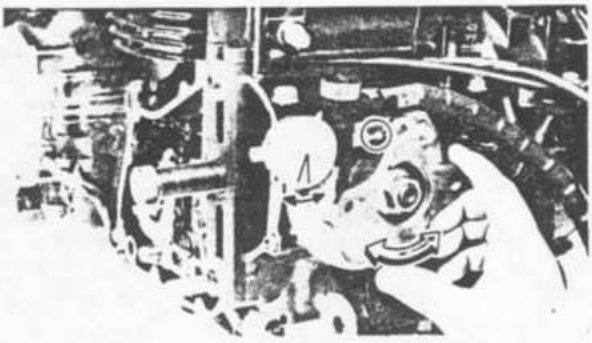
**Recommended Coolant:**
**High Quality Ethylene Glycol Anti-freeze Containing Anti-corrosion for Aluminum Engine Inhibitors**
**Coolant and Water Mixed Ratio:**
**50%/50%**
**Total amount:**
**2.4 L (2.11 Imp qt, 2.54 US qt)**
**Reservoir Tank Capacity:**
**0.49 L (0.43 Imp qt, 0.52 US qt)**
**From "LOW" to "FULL" Level:**
**0.14 L (0.12 Imp qt, 0.15 US qt)**

# MIDDLE GEAR SERVICE

① Spring retainers
② Spring seat
③ Damper cams
④ Midde drive gear shim
⑤ Bearing
⑥ Bearing retainer
⑦ Middle drive shaft
⑧ Middle driven shaft
⑨ Shim
⑩ O-ring
⑪ Bearing housing
⑫ Oil seal (35 x 50 x 6)





## GEAR LASH MEASUREMENT

NOTE:
The middle gear lash can be checked only when the gears are installed in the crankcase.

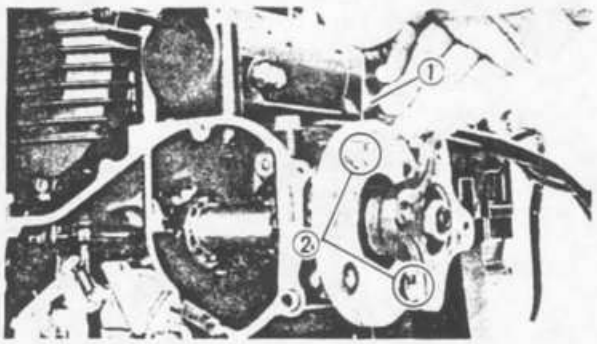
1. Attach:
   - Middle Drive Pinion Holder (90890-04051) ①.

NOTE:
Before installing the tool, loosen the holder bolt all the way out and after installation tighten this bolt as tight as necessary (finger tight is generally sufficient).

2. Attach:
   - Dial gauge
     (to the middle drive flange as shown)
3. Measure:
   - Middle gear lash
     Out of specification → Adjust.

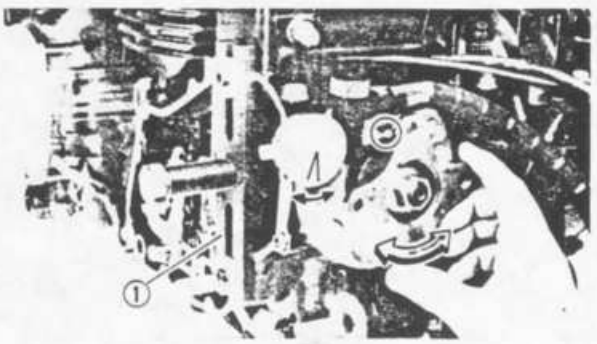
**Middle Gear Lash:**
**0.1 ~ 0.2 mm (0.004 ~ 0.008 in)**

NOTE:
Check this engagement at 4 points. If the gear lash exceeds the specified limit and adjustment is necessary, the engine or swing arm should be removed from the motorcycle.




## GEAR LASH ADJUSTMENT

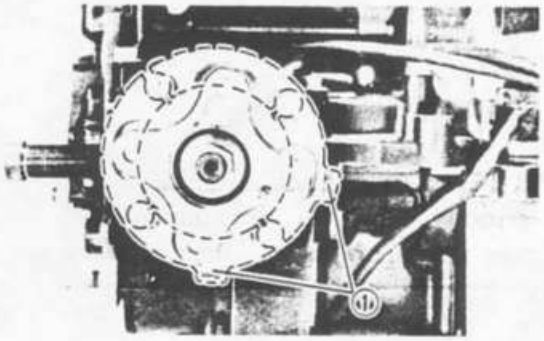
1. Install the driven gear housing assembly into the crankcase leaving about a 2 mm (0.080 in) gap ① between the housing and crankcase and install the two bolts ② to the bearing housing 180° opposite to each other.




2. Attach:
   - Middle Drive Pinion Holder (90890-04051) ①.
   - Dial gauge
3. Slowly tighten the bolts alternately until the dial gauge lash measurement reaches 0.2 mm (0.008 in).



4. Measure:
   Bearing Housing → Crankcase clearance
   This clearance is the shim size required.



5. Install:
   • Proper sized shim (s) ①
6. Tighten:
   • Bearing housing

| | |
|---|---|
| | **Bearing Housing**<br>**25 Nm (2.5 m·kg, 18 ft·lb)** |

7. Measure:
   • Middle gear lash
   Out of specification → Readjust.

3

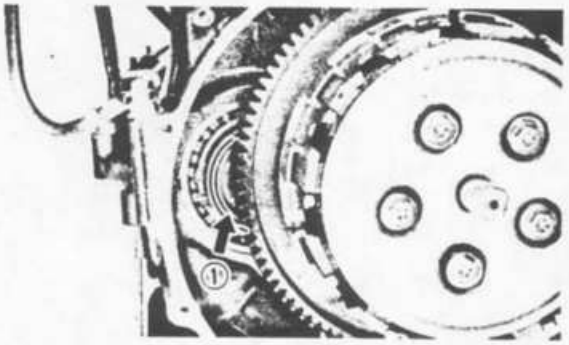
## REMOVAL

**Middle Drive Gear**

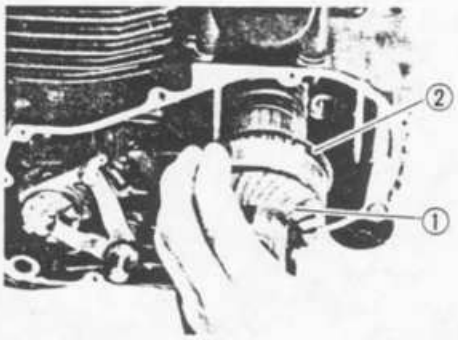
**NOTE:**

Middle drive gear and its shims can be removed without separating the engine.

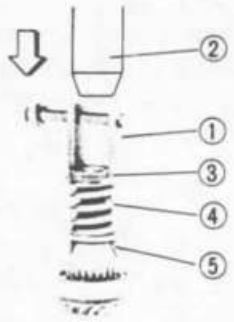
1. Remove:
   • Clutch cover
   Refer to CHAPTER 3 "ENGINE DISASSEMBLY."



2. Strike the middle drive shaft out ①



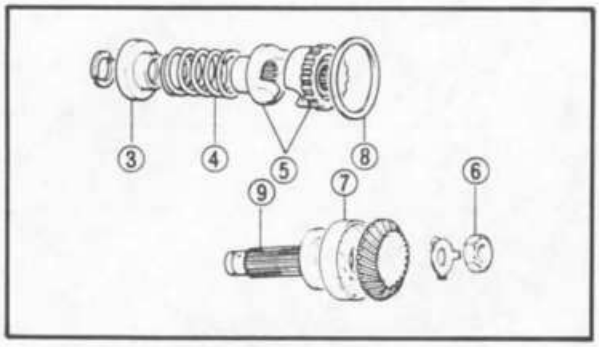
3. Remove
   • Middle drive shaft ①
   • Shims ②




## DISASSEMBLY

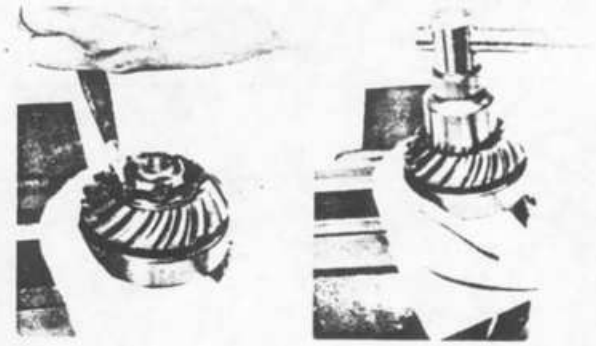
### Middle Drive Gear

1. Remove:
   - Spring retainer
     Use Damper Compressor (90890-04090) ① with hydraulic press ② .
   - Spring seat ③
   - Spring ④
   - Damper cam ⑤

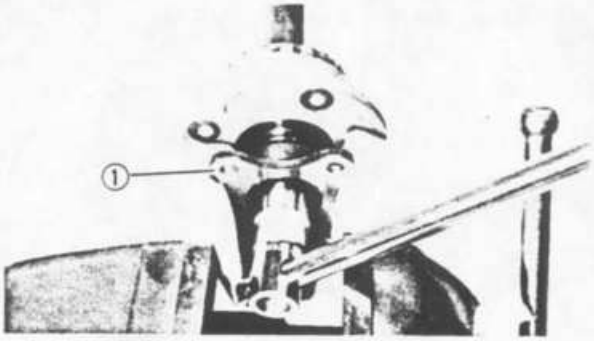



⑥ Middle drive shaft nut
⑦ Bearing
⑧ Shim
⑨ Middle drive shaft

**NOTE:**
Perform following steps only if middle-drive-shaft bearing or gear must be replaced.

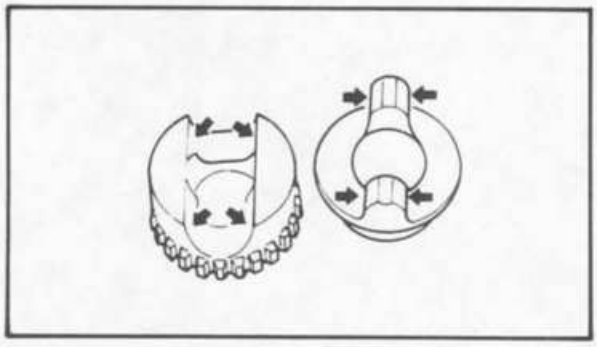


2. Secure middle drive shaft in a vise.
3. Flatten the locking collar of the nut with a center punch.
4. Remove:
   - Middle drive shaft nut
   - Bearing
   - Middle drive pinion




### Middle Driven Gear

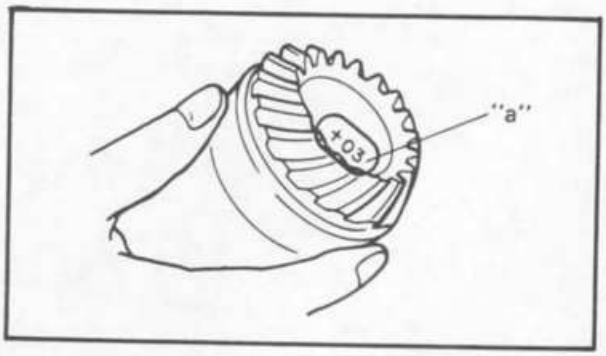
1. Support the drive flange in a vise securely.
2. Remove:
   - Flange holding nut
   - Flange ①

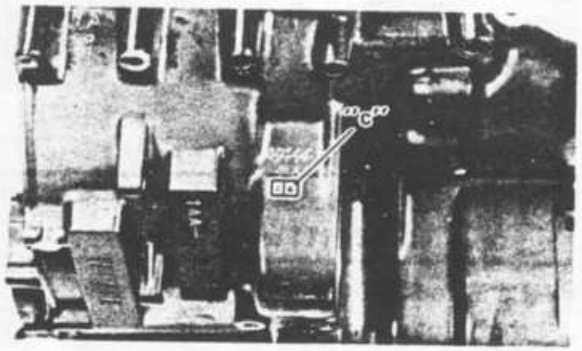


## INSPECTION

1. Check:
   - Teeth of middle gear
     Discoloration/Pitting/Wear → Replace all middle gears as a set.
   - Damper cam surfaces
     Wear/Unsmooth action → Replace.

2. Check:
   - Bearing movement
     Rotate the race by finger.
     Roughness → Replace.



## ASSEMBLY AND ADJUSTMENT

1. Select proper middle-drive-gear shim.

**NOTE:**
Select proper middle-drive-gear shim whenever crankcase and/or middle gears are replaced.

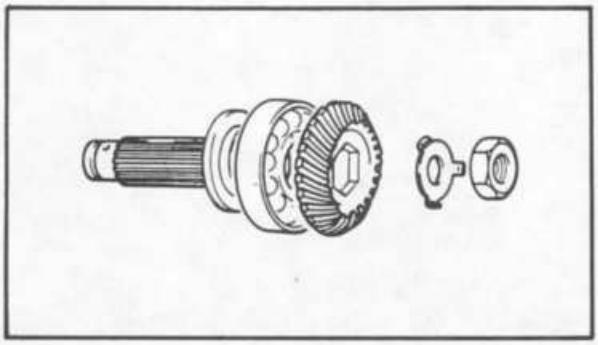
| **Shim thickness calculation:**<br>• Calculate shim thickness using formula below: |
|---|
| Shim thickness (A) = c – a – b |
| a = 43 plus or minus the number printed on end of middle drive shaft.<br>b = a bearing thickness. (Considered constand)<br>c = 60 plus the number found on the upper crankcase half near the main bearing selection numbers: |
| • For example<br>If middle drive shaft is marked "+03" and crankcase is tamped "45".<br>a = 43 + 0.03 = 43.03 mm<br>c = 63 + 0.45 = 60.45 mm<br>b = 16.94 mm (Constant)<br>A = 60.45 – 43.03 – 16.94 = 0.48<br>Calculated shim thickness is 0.48 mm. |
| Shim thickness: |
| 0.15 mm, 0.30 mm, 0.40 mm, 0.50 mm |
| Because shim can only be selected in 0.05 mm increments, use following chart to round off the hundredths digit of calculated thickness, and select appropriate shim. |

3

| Hundredths digit | Rounded value |
|---|---|
| 0, 1, 2 | 0 |
| 3, 4, 5, 6 | 5 |
| 7, 8, 9 | 10 |

In above example, calculated shim thickness is 0.48 mm. The chart instructs you, however, to round off the 8 to 10. Thus you should use two 0.50 mm shim.

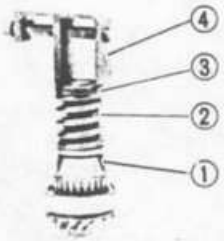
3



2. Install:
   - Middle drive shaft bearing.
   - Middle drive pinion
   - Lock washer (New)
   - Nut
3. Tighten:
   - Nut

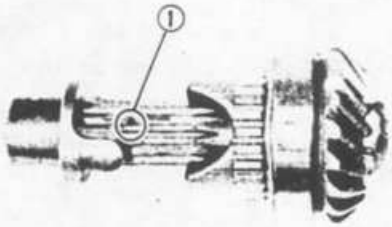
**Middle Drive Shaft Nut:**
**110 Nm (11 m·kg, 80 ft·lb)**

4. Bend lock washer of nut into middle drive shaft slot using a center punch.



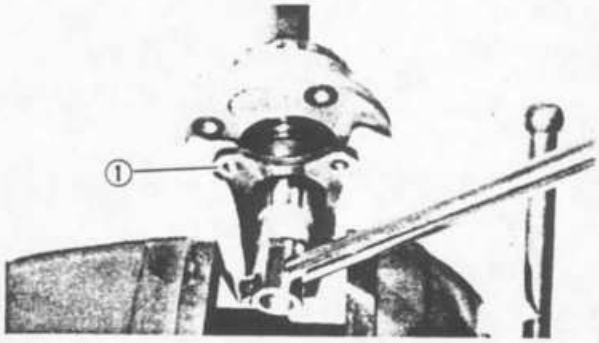

5. Assemble:
   - Damper cam ①
   - Spring ②
   - Spring seat ③
   - Spring retainer

   Use a Press and Damper Compressor (90890-04090) ④.




**NOTE:**
Install the driven damper cam onto the drive pinion shaft with the cam lobes positioned 90° from the row of shaft oil holes ①. Positioning tolerance is ±1 spline (15°) from the 90° position.

6. Install:
   - Bearing housing
     (onto the drive pinion shaft)
   - Flange
   - O-ring (New)
     (onto the drive pinion shaft)




7. Tighten:
   - Flange holding nut

**Flange Holding Nut:**
**90 Nm (9.0 m·kg, 65 ft·lb)**
**LOCTITE®**



8. Lock the thread on the holding nut with a center punch.

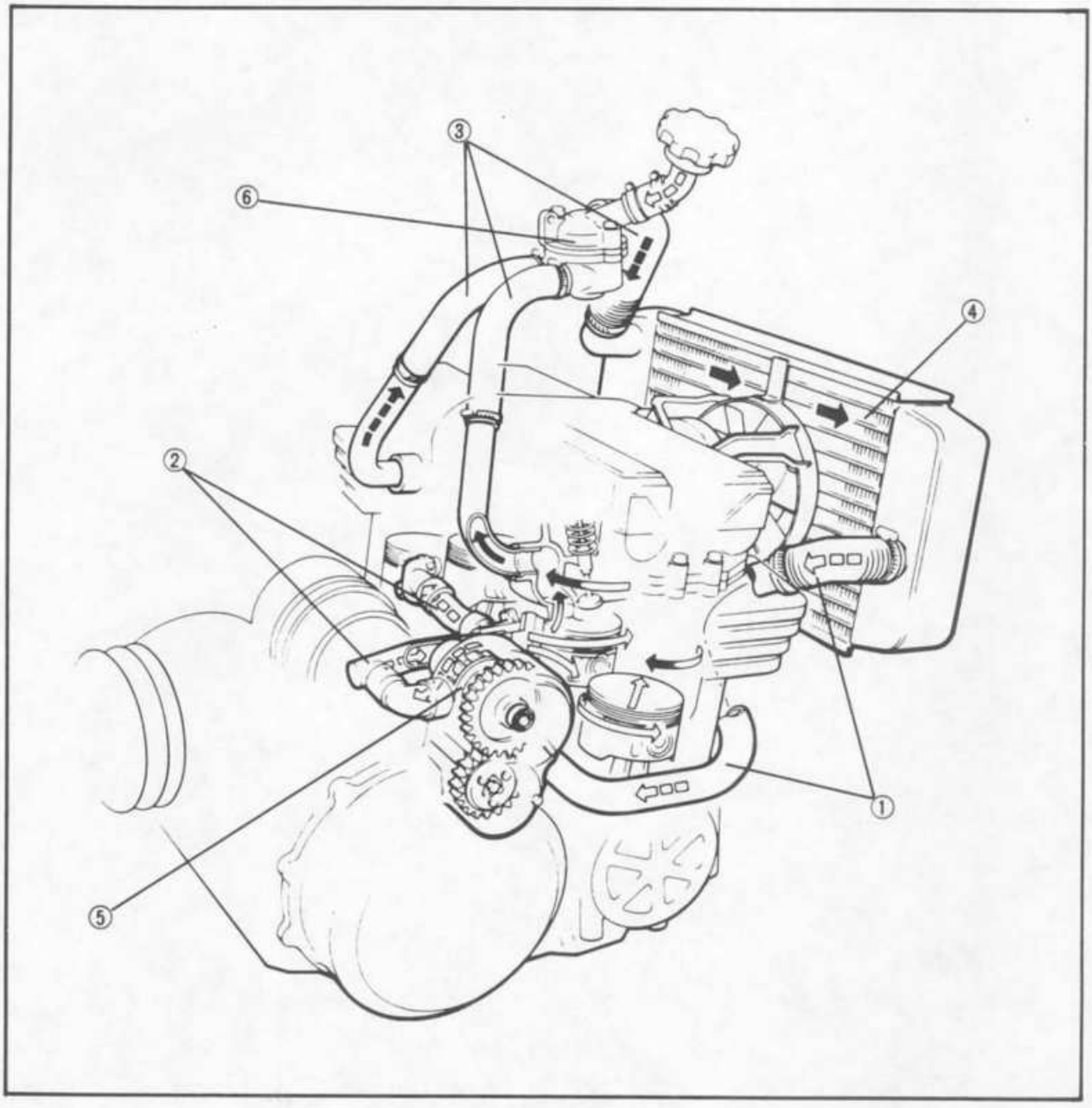
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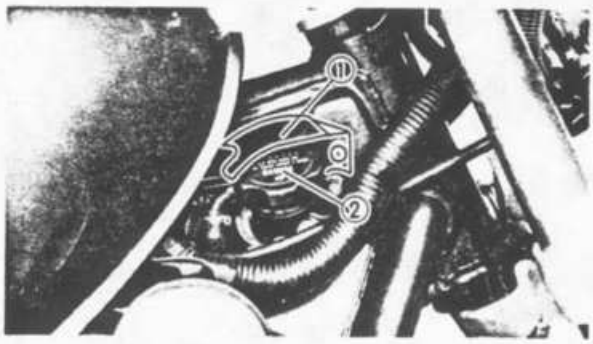
# COOLING SYSTEM

## COOLANT FLOW

The coolant is circulated by an impeller type pump mounted on the right-hand crankcase and driven by a gear. The coolant is drawn by the pump from the bottom tank of the radiator, through the pipe ①, and discharged into the cylinder head and cylinder through the pipe ②. The coolant passes from the cylinder head through coolant ways and after circulating around combustion chamber jacketing enters the radiator upper tank via inlet pipe ③. The heated coolant from the engine then passes down through the finned tubes to the bottom tank of the radiator. These finned tubes present a large surface area to the air and dissipate the heat.

④ Radiator
⑤ Water pump
⑥ Thermostatic valve





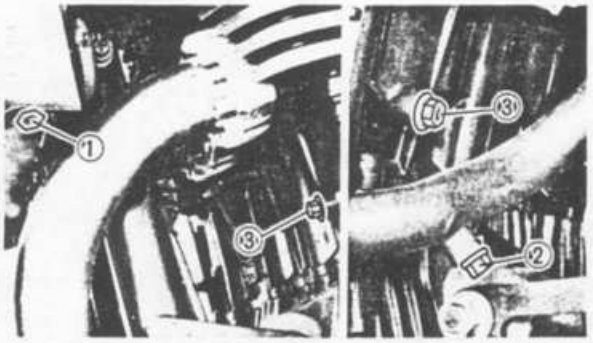

## COOLANT DRAINING

**WARNING:**

**Do not remove the radiator cap when the engine and radiator are hot.**

1. Remove:
   - Cap retainer ①
   - Radiator cap ②
2. Place an open container under the engine.
3. Remove:
   - Drain bolts ①, ②, ③

   Drain the coolant.



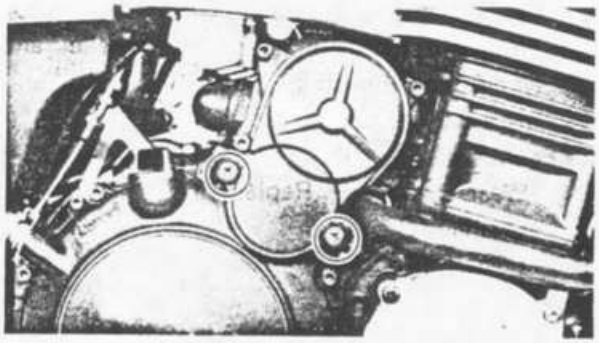

① Drain bolt (Radiator)
② Drain bolt (Radiator pipe)
③ Drain bolt (Cylinder)

## WATER PUMP

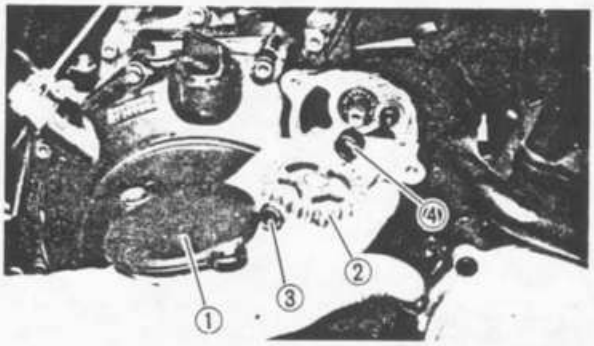
### REMOVAL AND DISASSEMBLY

NOTE:

Be sure to drain the coolant before disassembly of the cooling system components.



1. Drain:
   - Engine oil

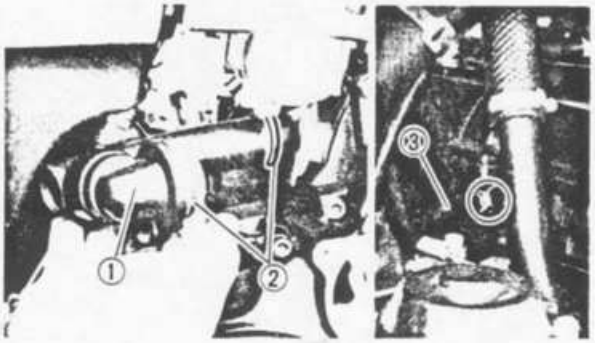



2. Remove:
   - Water pump drive gear cover ①
   - Water pump drive gear ②

NOTE:

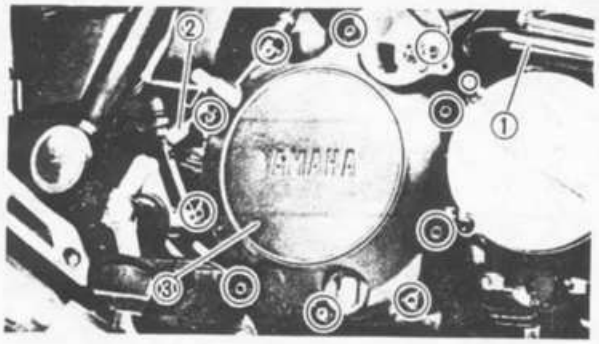
Water pump drive gear bolt ③ is locked with LOCTITE®.

- Spacer ④

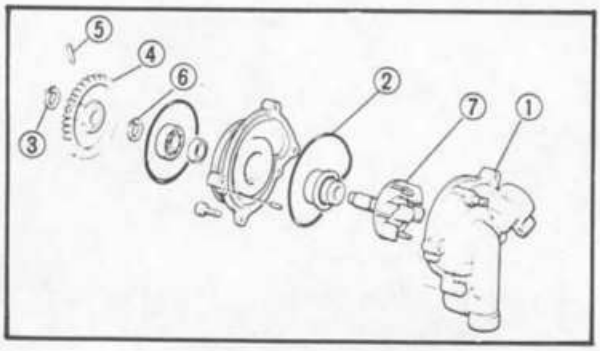



3. Remove:
   - Water pump joint ①
   - O-rings ②
4. Disconnect:
   - Bypass hose ③

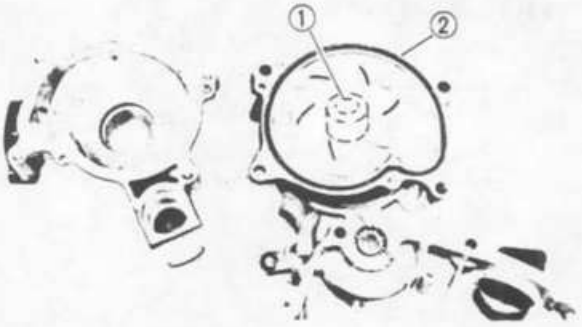
4




5. Remove:
   - Radiator pipe ①
   - Clutch cam shaft lever ②
   - Clutch cover ③

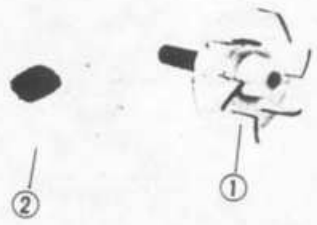



5. Remove:
   - Water pump cover ①
   - O-ring ②
   - Circlip ③
   - Driven gear ④
   - Dowel pins ⑤
   - Circlip ⑥
   - Impeller shaft ⑦




## INSPECTION

1. Eliminate deposits from the impeller and water pump housing.
2. Inspect:
   - Oil seal ①
     Wear/Damage → Replace.
   - O-ring ②
     Wear/Damage → Replace.




3. Inspect:
   - Impeller ①
   - Driven gear ②
     Cracks/Wear/Damage → Replace.




## ASSEMBLY AND INSTALLATION

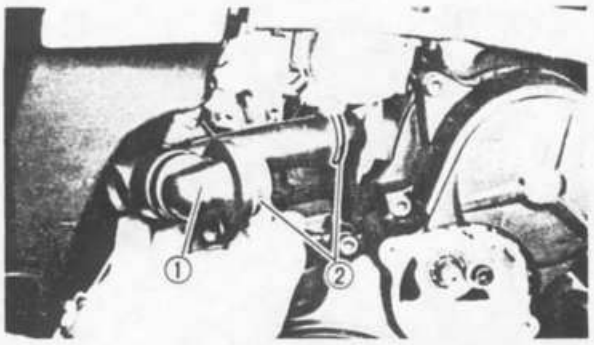
1. Install:
   - Oil seal (Mechanical seal) ①
     Use Water Pump Seal Installer (90890-04078) ② and Handle (90890-04058).



2. Assembly:
   - Water pump

   Reverse the disassembly procedures.

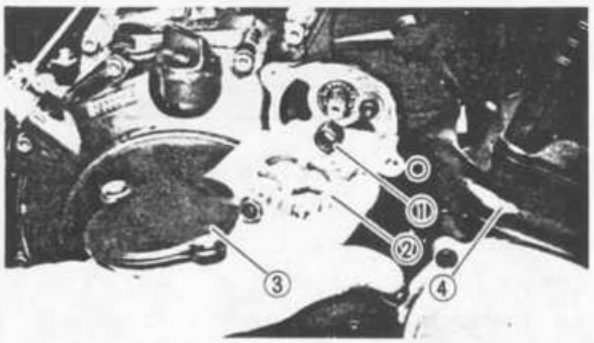
| Water Pump Cover: 10 Nm (1.0 m·kg, 7.2 ft·lb) |
|---|




3. Install:
   - Clutch cover

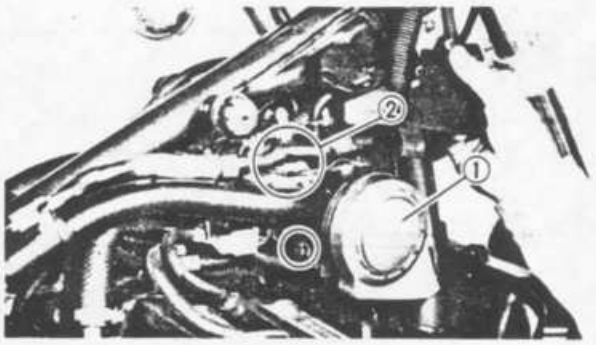
   Refer to CHAPTER 3 "ENGINE ASSEMBLY AND ADJUSTMENT"
   - Water pump joint ① (With new O-rings ② )

| Water Pump Joint: 10 Nm (1.0 m·kg, 7.2 ft·lb) |
|---|




4. Connect:
   - Bypass hose
5. Install:
   - Spacer ①
   - Water pump drive gear ②
   - Water pump drive gear cover ③
   - Radiator pipe ④ (With new O-ring)

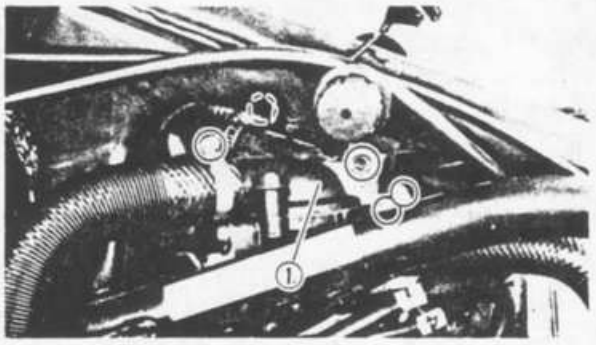
| Water Pump Drive Gear: 12Nm (1.2 m·kg, 8.7 ft·lb) LOCTITE® |
|---|
| Water Pump Drive Gear Cover: 8 Nm (0.8 m·kg, 5.8 ft·lb) |



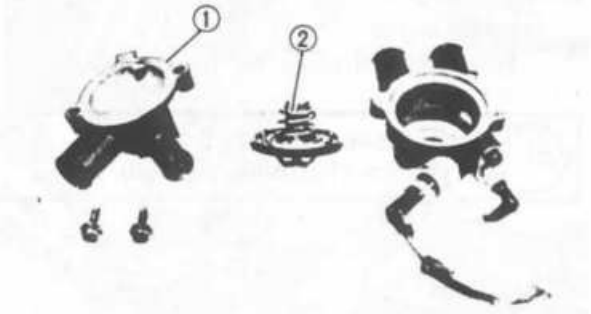

## THERMOSTATIC VALVE

### REMOVAL AND DISASSEMBLY

1. Drain:
   - Coolant
2. Remove:
   - Horns ①
3. Disconnect:
   - Electrical leads ②



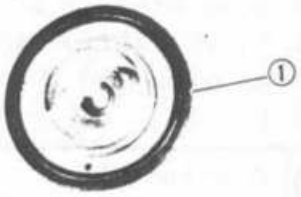

4. Disconnect:
   - Coolant hoses
5. Remove:
   - Thermostat housing ①

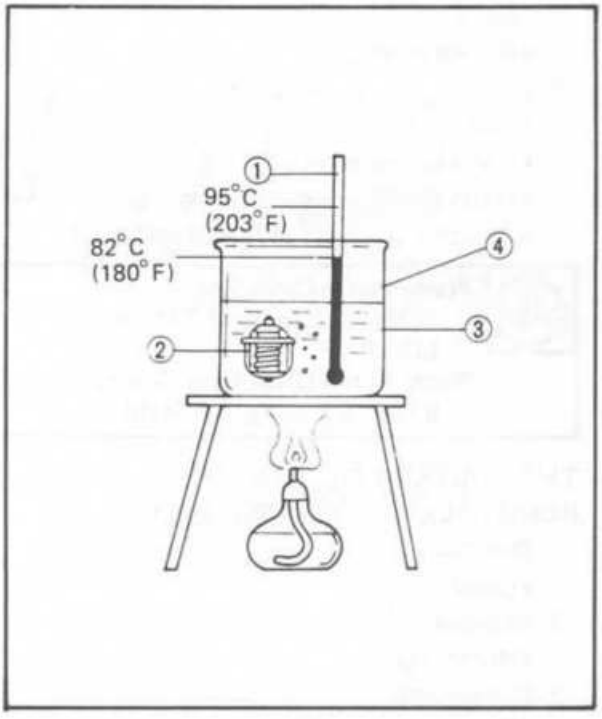



6. Remove:
   - Thermostat cover ①
   - Thermostatic valve ②

## INSPECTION

1. Inspect:
   - O-ring ①
     Wear/Damage → Replace.



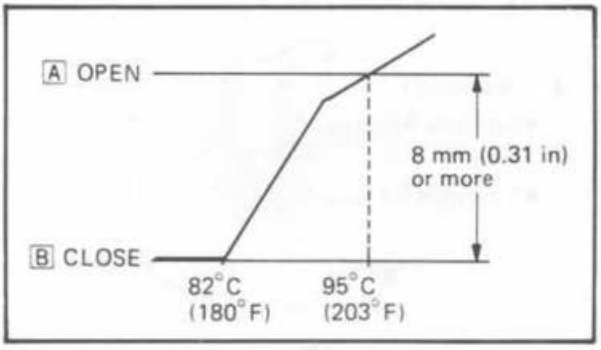




2. Check:
   - Thermostatic valve
     Out of specification → Replace.

**Inspection steps:**
- Suspend thermostatic valve in a vessel of water.
- Place reliable thermometer in water.
- Heat water slowly.
- Observe thermometer, while stirring water continually.

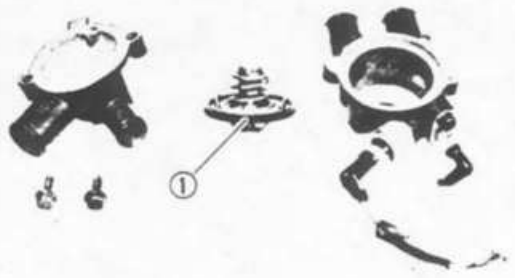
**Thermostatic Valve:**
**Opening Temperature:**
**82°C (180°F)**
**Full Open Temperature/Lift:**
**95°C (203°F)/8 mm (0.31 in) or more**

① Thermometer
② Thermostatic valve
③ Water
④ Vessel




**NOTE:**

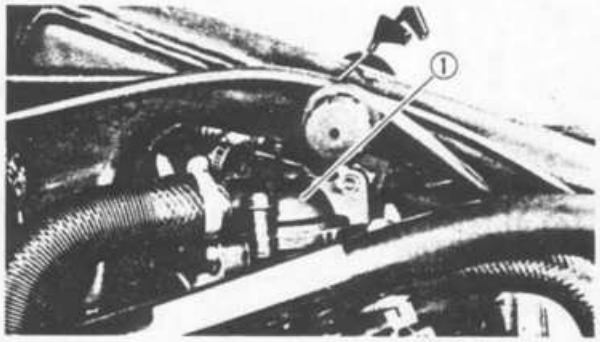
Thermostat is sealed and its setting is specialized work. If its accuracy is in doubt, always replace it. A faulty unit could cause serious overheating or overcooling.




### ASSEMBLY AND INSTALLATION

1. Install:
   - Thermostatic valve ①
   - Thermostat cover

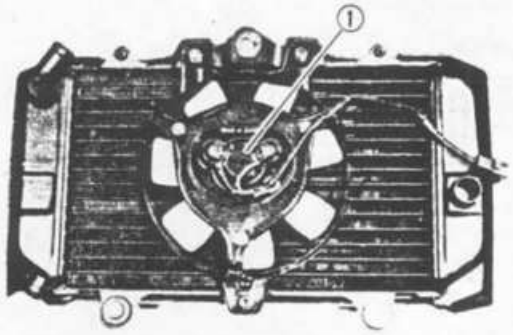
**NOTE:**
Install the thermostatic valve so that the breather hole is forward.



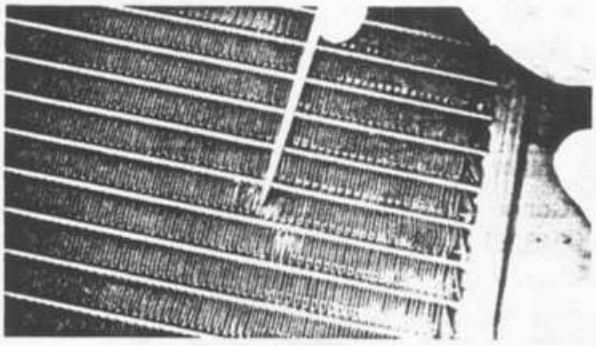

2. Install:
   - Thermostat housing ①
3. Connect:
   - Radiator hoses
   - Electrical leads
4. Install:
   - Horns

## RADIATOR

### REMOVAL




1. Drain:
   - Coolant
2. Remove:
   - Radiator assembly
     Refer to CHAPTER 3 "ENGINE REMOVAL".
   - Fan motor assembly ①



### INSPECTION

1. Inspect:
   - Radiator fins
     Obstruction → Blow out with compressed air through rear of radiator.
     Flattened → Repair.
   - Coolant hoses
     Cracks/Damage → Replace.

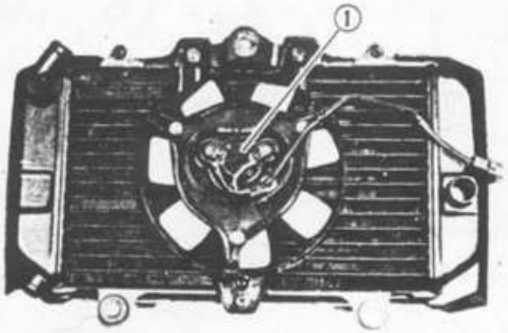



2. Measure:
   - Valve opening pressure (Radiator cap ①)
     Use the Cooling System Tester (90890-01325).
     Out of specification → Replace.

| Valve Opening Pressure: |
| --- |
| 78 ~ 98 kPa (0.8 ~ 1.0 kg/cm², 11.4 ~ 14.2 lb/in²) |



3. Check:
   - Valve (Radiator cap)
     Weak spring/Defective seating → Replace radiator cap.



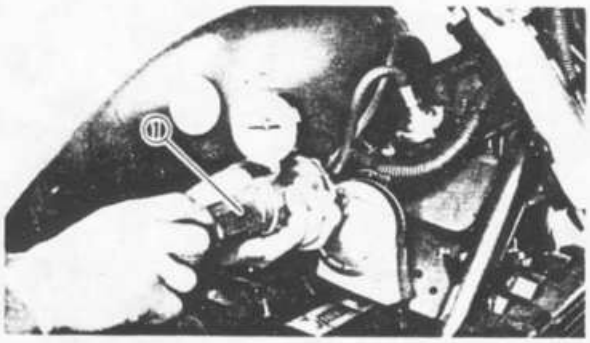

## INSTALLATION

1. Install:
   - Fan motor assembly ①
2. Tighten:
   - Bolts

| | |
|---|---|
| | **Fan Motor:** 7 Nm (0.7 m·kg, 5.1 ft·lb) |

3. Install:
   - Radiator assembly
4. Tighten:
   - Bolts

| | |
|---|---|
| | **Radiator:** 7 Nm (0.7 m·kg, 5.1 ft·lb) |




5. Add:
   - Coolant
6. Check:
   - Cooling system

**Inspection steps:**
- Connect the Cooling System Tester (90890-01325) ① .
- Apply 98 kPa (1.0 kg/cm², 14 psi) pressure.
- Measure pressure with gauge.

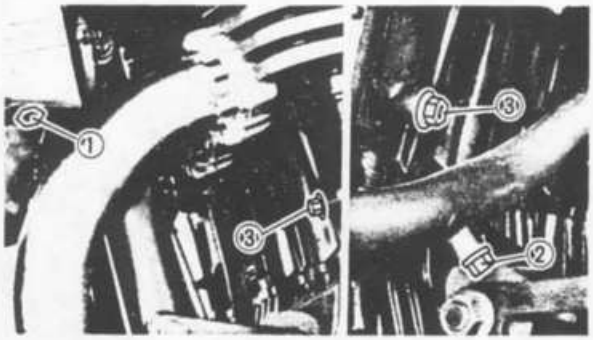
Decrease of pressure (leaks) → Repair as required.

Coolant:
High-Quality Ethylene Glycol Anti-Freeze Containing Anti-Corrosion Inhibitors for Aluminum Engines.
Coolant and Soft Water Mix Ratio:
50%/50%
Totam Amount:
2.40 L (2.11 Imp qt, 2.54 US qt)
Reservoir Tank Capacity:
0.49 L (0.43 Imp qt, 0.52 US qt)
From LOW to FULL Level:
0.14 L (0.12 Imp qt, 0.15 US qt)

**CAUTION:**

Hard water or salt water is harmful to the engine parts. You may use boiled water or distilled water if no soft water is available.






## COOLANT FILLING

1. Tighten:
   - Coolant drain bolts ①, ②, ③

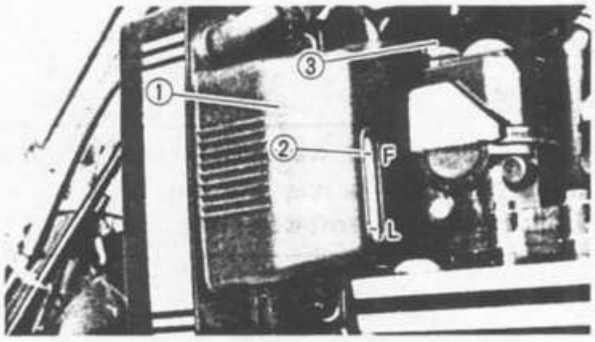
Drain Bolt:
16 Nm (1.6 m·kg, 11 ft·lb)

2. Fill:
   - Radiator

**Coolant filling steps:**
- Remove the radiator cap.
- Pour coolant into the radiator to specified level.
- Start the engine (Coolant level decreases).
- Add coolant while the engine is running.
- Stop the engine when coolant level stabilizes.
- Add coolant again to specified level.
- Install the radiator cap.

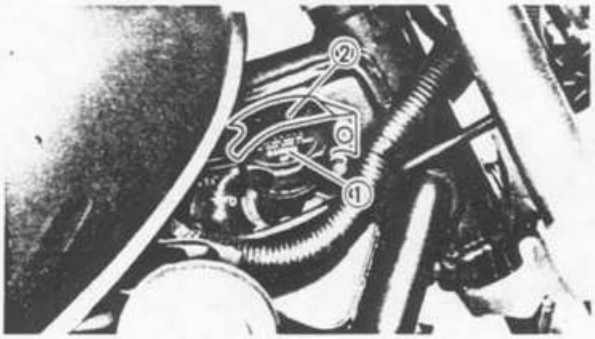
**CAUTION:**

Always check coolant level, and check for coolant leakage before starting the engine.




3. Fill:
   - Reservoir tank ①

   Add coolant until liquide reaches "FULL" level mark ② .
4. Install:
   - Reservoir tank cap ③




5. Install:
   - Radiator cap ①
   - Cap retainer ②

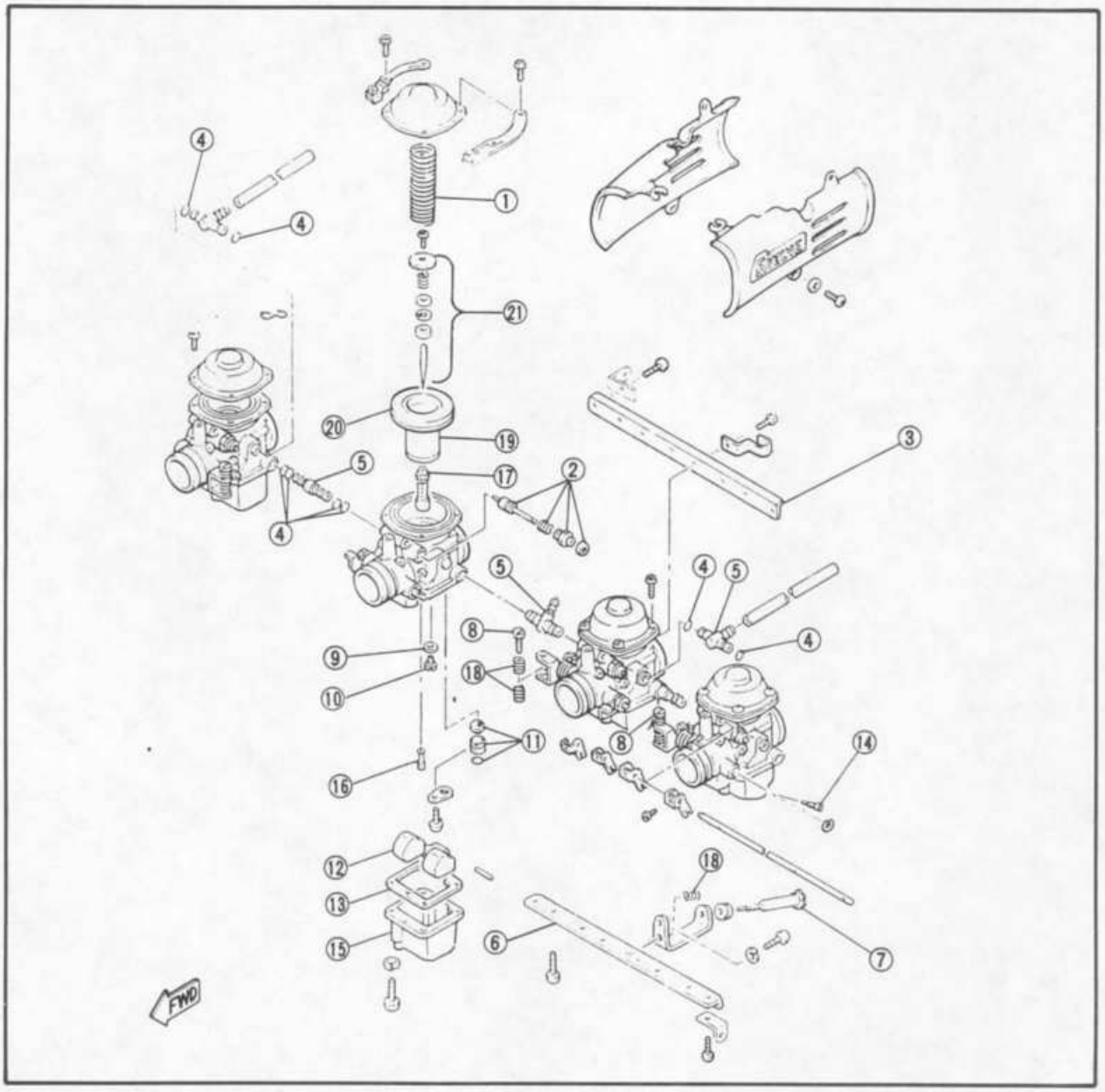
4

# CARBURETION

## CARBURETOR

① Piston valve spring
② Starter plunger assembly
③ Upper bracket
④ O-ring
⑤ Joint
⑥ Lower bracket
⑦ Throttle stop screw
⑧ Synchronizing screw
⑨ Washer
⑩ Main jet
⑪ Valve seat assembly
⑫ Float
⑬ Gasket
⑭ Drain screw
⑮ Float chamber
⑯ Pilot jet
⑰ Needle jet
⑱ Spring
⑲ Piston valve
⑳ Diaphragm
㉑ Jet needle assembly

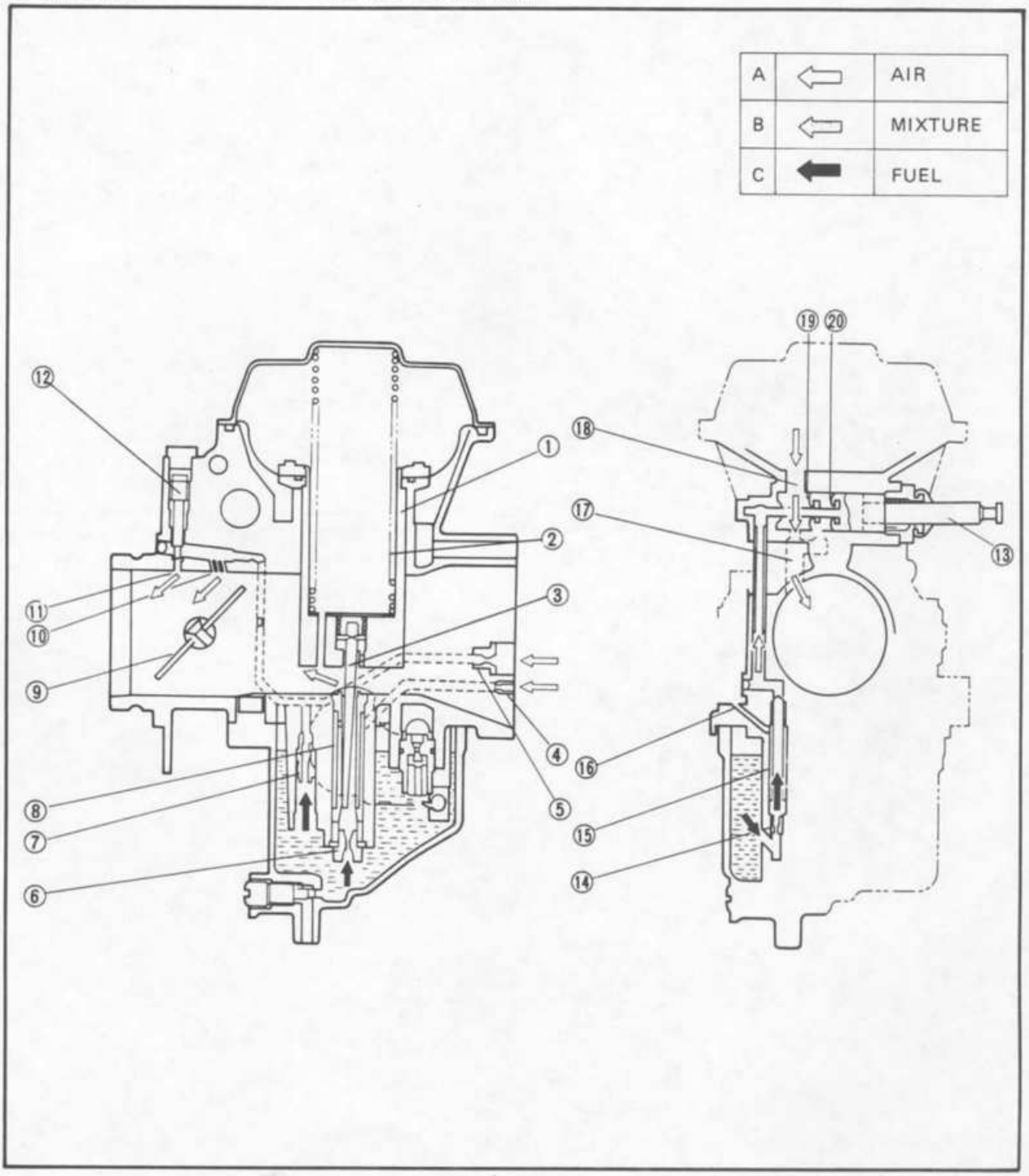
| SPECIFICATIONS | |
|---|---|
| Main jet | #105 |
| Main air jet | #120 |
| Jet needle | 5FZ83 |
| Needle jet | Y-2 |
| Pilot jet | #37.5 |
| Pilot air jet | #140 |
| Fuel level | 3.0 ± 1.0 mm (0.12 ± 0.04 in) |
| Float height | 17.5 ± 1.0 mm (0.69 ± 0.04 in) |
| Pilot screw | 2-1/2 ± 1/2 (turns out) |
| Float valve seat | ϕ 2.3 |
| Engine idle speed | 1,050 ± 50 r/min |

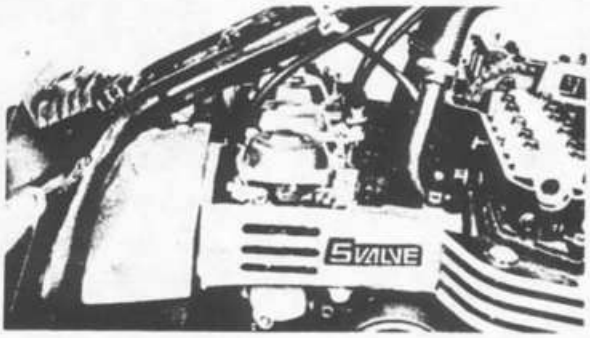



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## SECTION VIEW

① Piston valve
② Spring
③ Jet needle
④ Main air jet
⑤ Pilot air jet
⑥ Main jet
⑦ Pilot jet
⑧ Needle jet
⑨ Throttle valve
⑩ Bypass hole
⑪ Pilot outlet
⑫ Pilot screw
⑬ Starter plunger
⑭ Starter jet
⑮ Starter bleed pipe
⑯ Starter air bleed
⑰ Mixture outlet
⑱ Air inlet
⑲ Starter half position
⑳ Starter full position





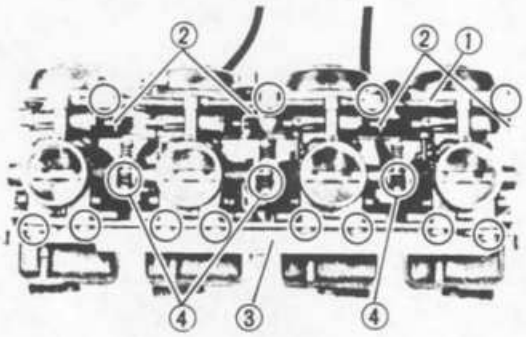

## CARBURETOR OVERHAUL

### REMOVAL

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

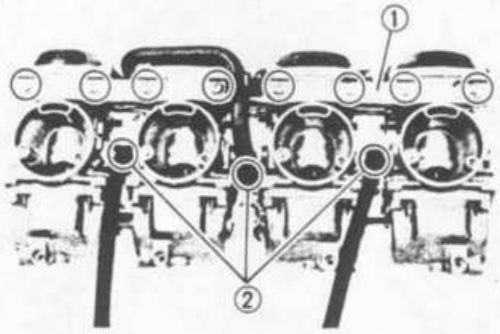
NOTE:
The following parts can be cleaned and inspected without disassembly.
- Piston valve
- Jet needle

2. Disconnect:
   - Drain hoses
   - Fuel hoses
   - Throttle cable
3. Number each carburetor before removing it from carburetor brackets.



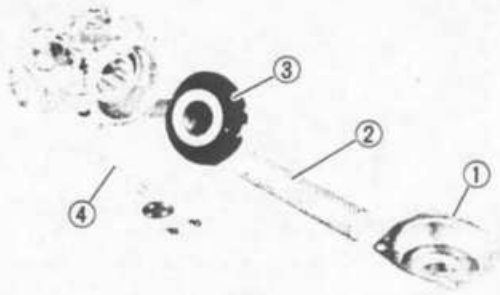

4. Loosen:
   - Starter lever screws
5. Remove:
   - Starter lever shaft ①
   - Starter levers ②
   - Lower bracket ③

NOTE:
When separating the carburetors be sure not to lose the small spring ④ that may fall out. This spring connects the throttle levers.



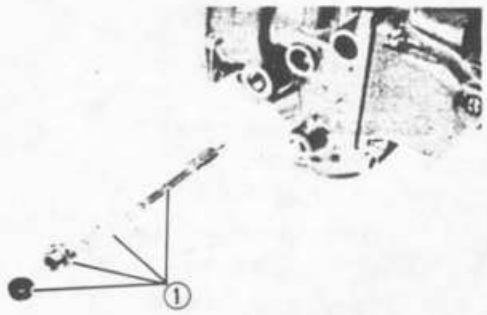

6. Remove:
   - Upper bracket ①
   - Carburetor joint ②
   - Carburetors

5

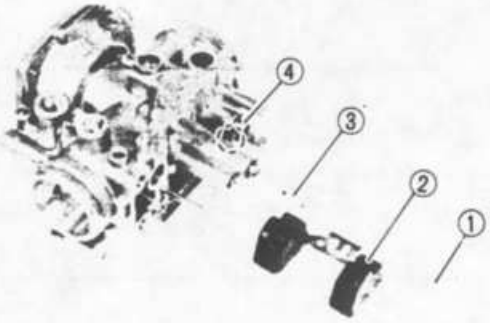



## DISASSEMBLY

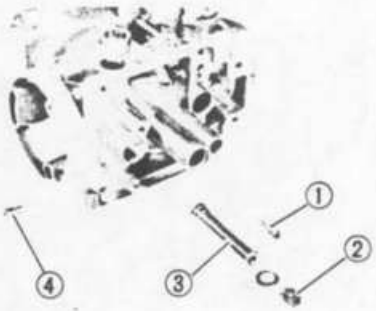
1. Remove:
   - Vacuum chamber cover ①
   - Spring ②
   - Vacuum piston ③
   - Jet needle ④




2. Remove:
   - Starter plungers ①



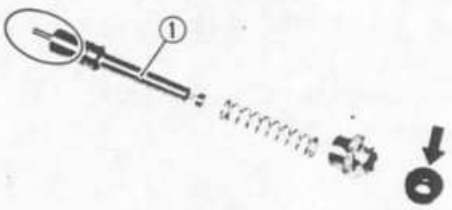

3. Remove:
   - Float chamber cover
   - Float pin ①
   - Float ②
   - Needle valve ③
   - Valve seat ④

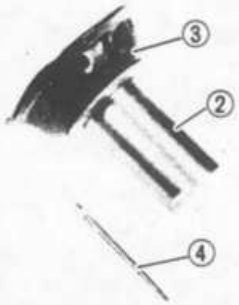


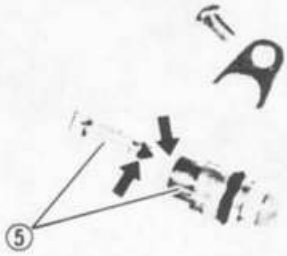

4. Remove:
   - Pilot jet ①
   - Main jet ②
   - Needle jet ③
   - Pilot air jet ④

**NOTE:**
Remove the needle jet toward the vacuum piston.

5



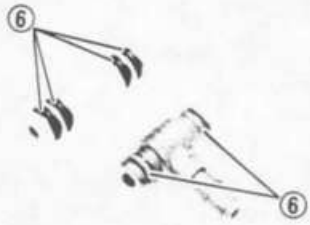




## INSPECTION

1. Inspect:
   - Starter plunger ①
     Damage/Wear → Replace.
   - Vacuum piston ②
     Scratches/Wear → Replace.
   - Throttle valve diaphragm ③
     Damage/Torn → Replace.
   - Jet needle ④
     Bends/Wear → Replace.
   - Needle valve and valve seat ⑤
     Wear → Replace.
   - Float
     Damage/Torn → Replace.
   - Carburetor body
   - Fuel passage
     Contamination → Clean.
   - Jets
     Contamination → Clean.
   - O-rings (Carburetor joint) ⑥
     Wear/Damage → Replace.

**NOTE:**

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





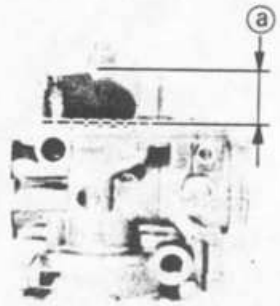


## ASSEMBLY:

1. Assemble:
   - Carburetors

**NOTE:**

To assemble the carburetors, reverse the disassembly procedures. Pay close attention to the installation of the vacuum piston diaphragm and the location of each jet.




## FLOAT HEIGHT ADJUSTMENT

1. Measure:
   - Float height ⓐ

   Out of specification → Adjust.

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

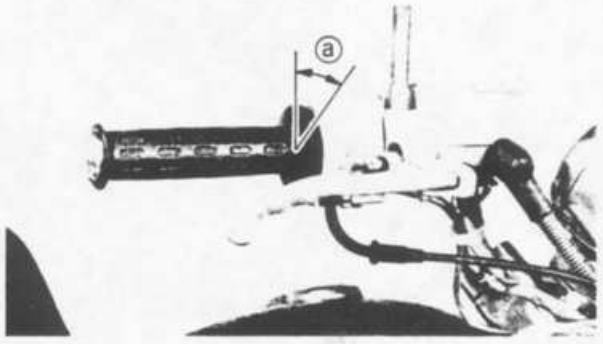
NOTE:
The float should be just resting on, but not depressing, the spring loaded inlet needle.

**Float Height:**
**17.5 ± 1.0 mm (0.69 ± 0.04 in)**




**Float height adjustment steps:**
- Remove the float.
- Adjust float height by bending the float tang ① slightly.
- Repeat the procedure for other carburetors.

5

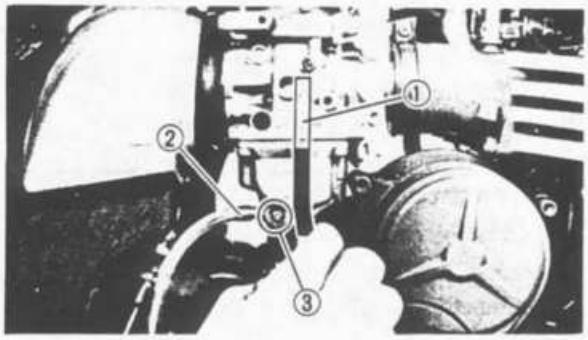


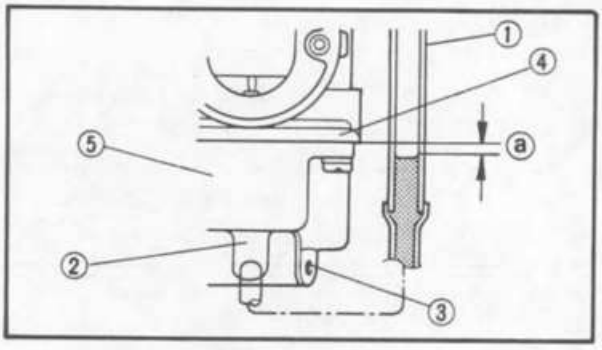

## INSTALLATION

1. Install:
   - Carburetors

   Reverse the removal steps.

**Throttle Cable Free Play ⓐ:**
**2 ~ 5 mm (0.08 ~ 0.20 in)**







## FUEL LEVEL ADJUSTMENT

1. Measure:
   - Fuel level

   Out of specification → Adjust.

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

**Fuel Level ⓐ :**
**Below the carburetor body**
**3.0 ± 1.0 mm (0.12 ± 0.04 in)**

④ Carburetor body
⑤ Float chamber

2. Adjust:
   - Fuel level

   If necessary

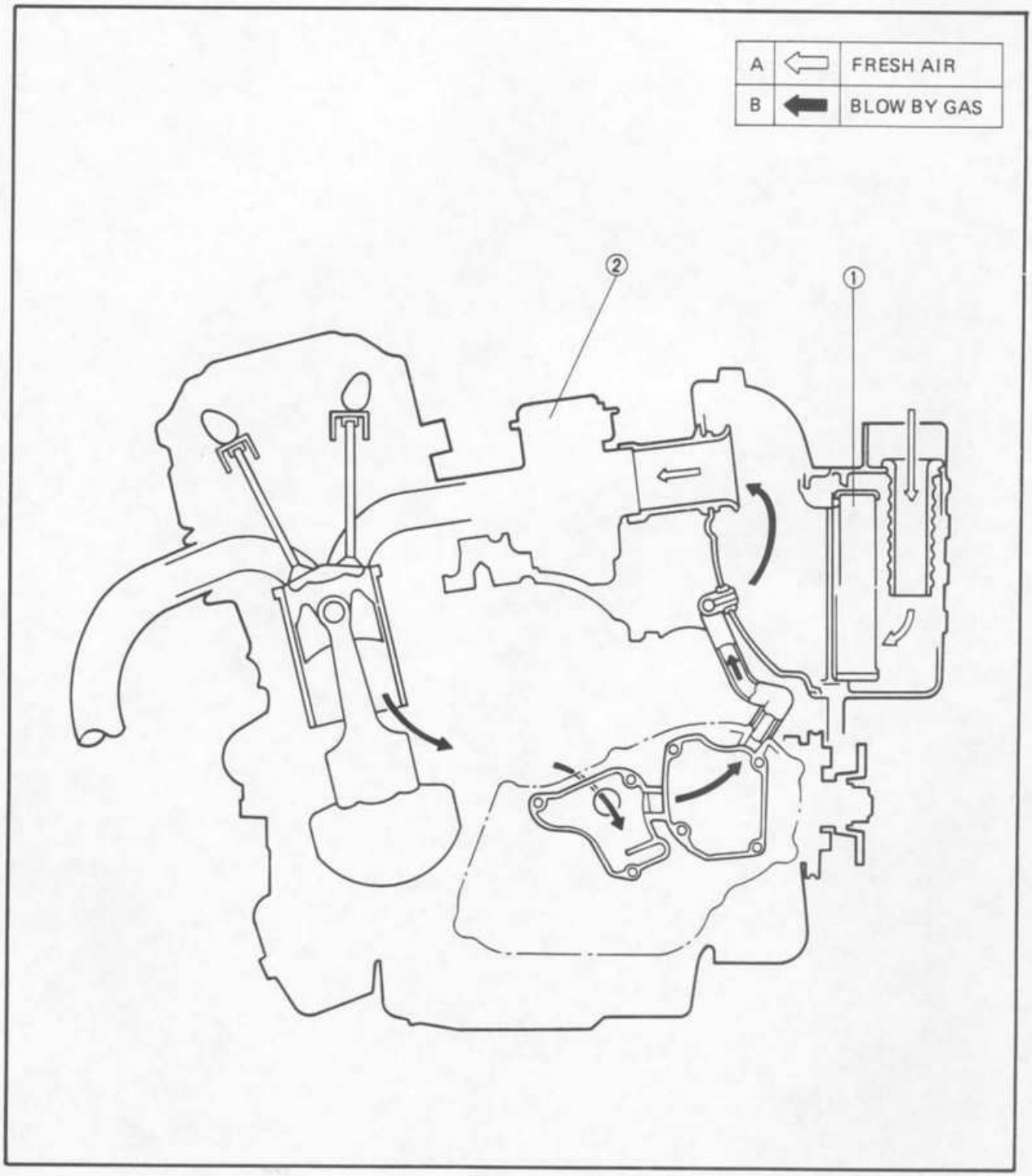
**Adjustment steps:**
- Remove the carburetors.
- Adjust float level by bending the float tang ① slightly.
- Repeat the procedure for the other carburetors.

5

## AIR CLEANER AND CRANKCASE VENTILATIONS SYSTEM

Refer to "CHAPTER 2" for air cleaner maintenance.

① Air cleaner
② Carburetor



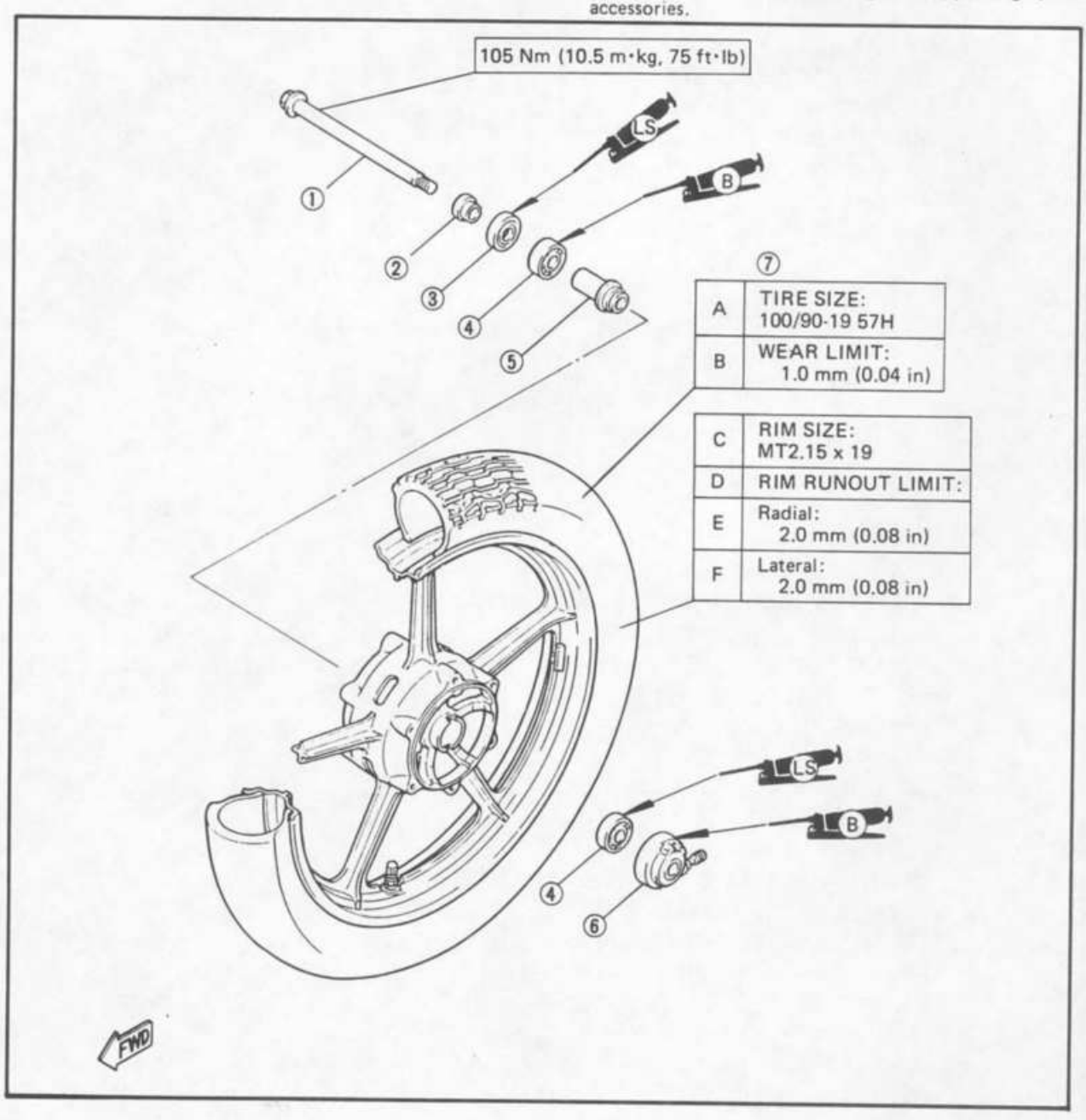
# CHASSIS

## FRONT WHEEL

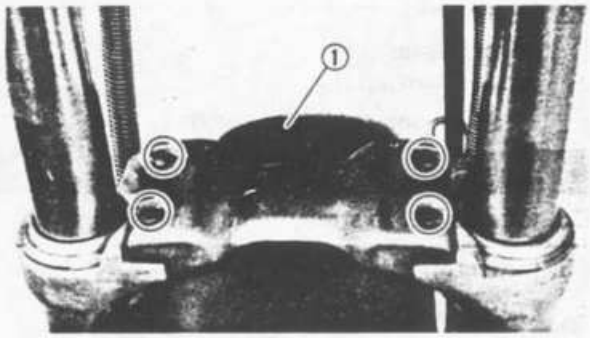
① Wheel axle
② Collar
③ Oil seal
④ Bearing
⑤ Spacer
⑥ Speedometer gear unit
⑦ Tire

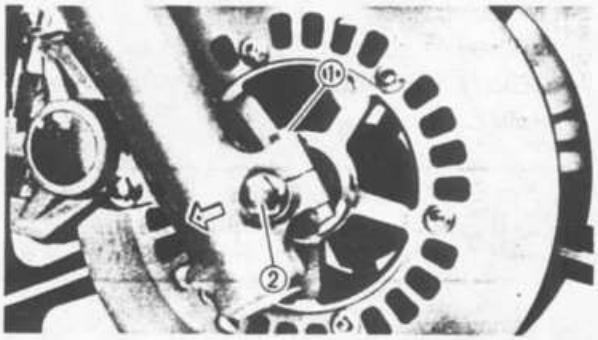
| | | |
|---|---|---|
| Basic weight: With oil and full fuel tank | 232 kg (511 lb) | |
| Maximum load*: | 238 kg (525 lb) | |
| Cold tire pressure: | Front | Rear |
| Up to 90 kg (198 lb) load* | 177 kPa (1.8 kg/cm², 26 psi) | 196 kPa (2.0 kg/cm², 28 psi) |
| 90 kg (198 lb) load ~ 238 kg (525 lb) load* | 196 kPa (2.0 kg/cm², 28 psi) | 275 kPa (2.8 kg/cm², 40 psi) |
| High speed riding | 206 kPa (2.1 kg/cm², 30 psi) | 226 kPa (2.3 kg/cm², 32 psi) |

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

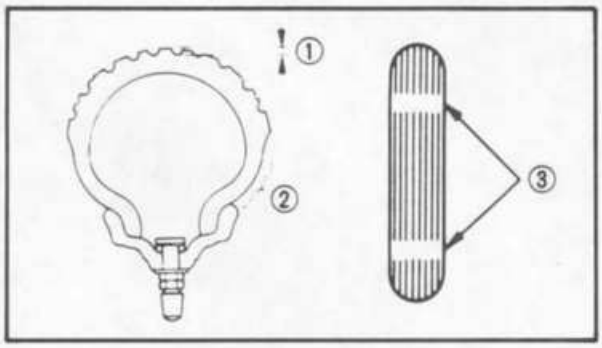



6






## REMOVAL

**CAUTION:**

**Make sure the motorcycle is properly supported.**

1. Place the motorcycle on its centerstand and a garage jack under the engine.
2. Remove:
   - Speedometer cable
   - Fork brace ①
3. Loosen:
   - Pinch bolt ①
4. Remove:
   - Axle ②

**NOTE:**

Do not depress the brake lever when the wheel is off the motorcycle otherwise the brake pads will be forced shut.

5. Remove:
   - Front wheel

**NOTE:**

Lower the wheel until the discs come off the calipers. Turn the calipers outward so they do not obstruct the wheel.

## INSPECTION

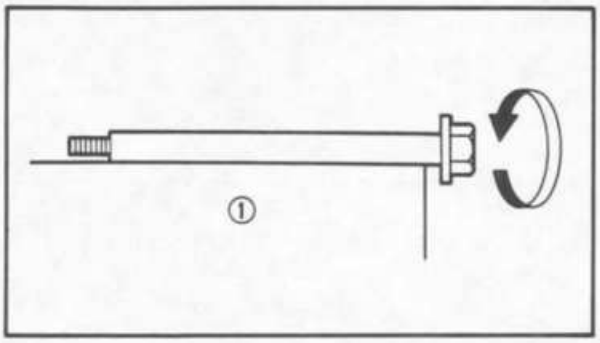
1. Inspect:
   - Tire

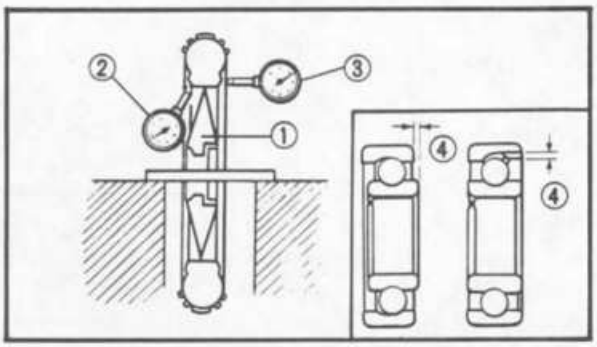
   Tire tread shows crosswise lines (minimum tread depth)/Cracks → Replace.

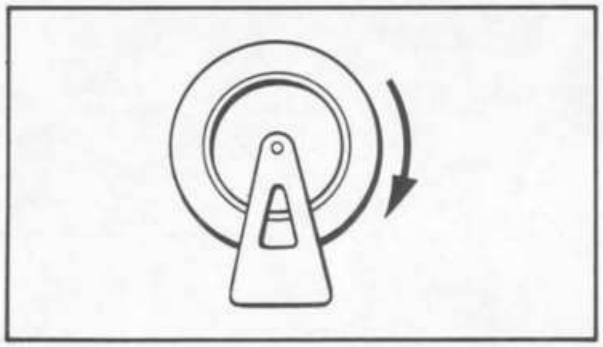
**Minimum Tire Tread Depth**
**1.0 mm (0.04 in)**

① Tread depth
② Sidewall
③ Wear indicator

6



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:
   - Front wheel
     Cracks/Bends/Warpage → Replace.
4. Measure:
   - Wheel ① runout
     Out of specification → Replace wheel or check bearings.

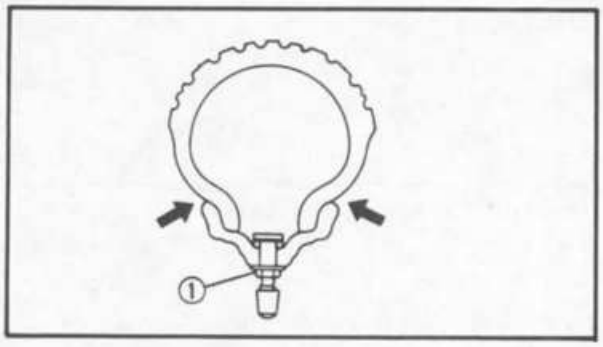
**Rim Run-Out Limits:**
**Radial ② : 2 mm (0.08 in)**
**Lateral ③ : 2 mm (0.08 in)**

④ Bearing play

5. Check:
   - Wheel balance
     Wheel is not statically balanced if it comes to rest at the same point after several light rotations.
     Out of balance → Install appropriate balance weight at lightest point (on top).

NOTE:
Balance wheel with brake disc installed.

6




**WARNING:**

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

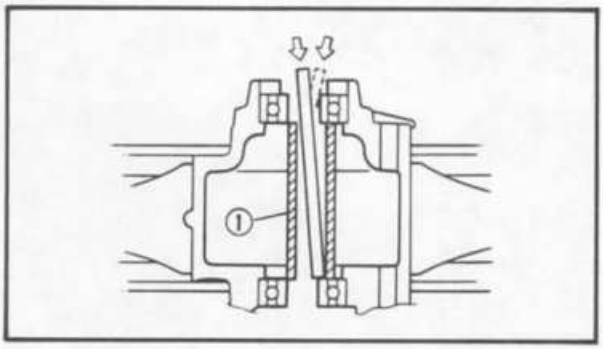
**Valve-Stem Locknut:**
**1.5 Nm (0.15 m·lg, 1.1 ft·lb)**

## WHEEL BEARING REPLACEMENT

1. Inspect:
   - Wheel bearings
     Wheel hub play/wheel turns roughly → Replace.

**Wheel bearing replacement steps:**

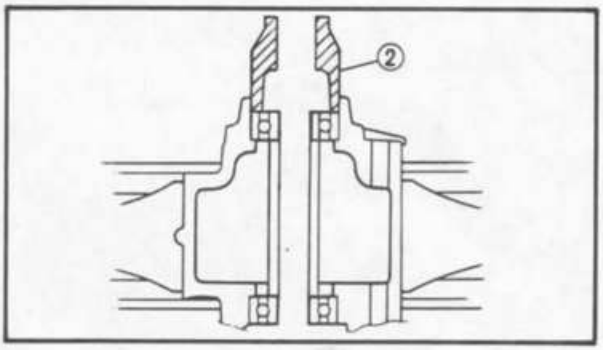
- Clean wheel hub exterior.
- Drive bearing out by pushing spacer aside and tapping around perimeter of bearing inner race. Use soft metal drift punch and hammer. The spacer ① "floats" between bearings. Remove both bearings as described.




**WARNING:**

**Eye protection is recommended when using striking tools.**

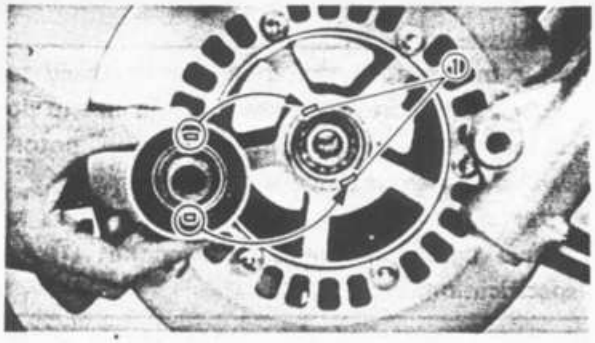
- To install the wheel bearing, reverse the above sequence. Use a socket ② that matches outside diameter of bearing outer race to drive in bearing.




**CAUTION:**

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

6






## INSTALLATION

1. Install
   - Front wheel

   Reverse removal procedure.

**Note the following installation points:**

- Lightly grease the front wheel oil seal lips and the gear teeth of the speedometer drive and driven gears.
  (Use lightweight, lithium base grease.)
- Be sure that the two projections ① inside the wheel hub mesh with the two slots in the speedometer clutch assembly.
- Be sure that the projeting portion ② (torque stopper) or the speedometer housing is positioned correctly.
- Compress the front forks serveral times to confirm proper fork operation before tightening the pinch bolt.

- Tighten the axle.

**Axle:**
**105 Nm (10.5 m·kg, 75 ft·lb)**

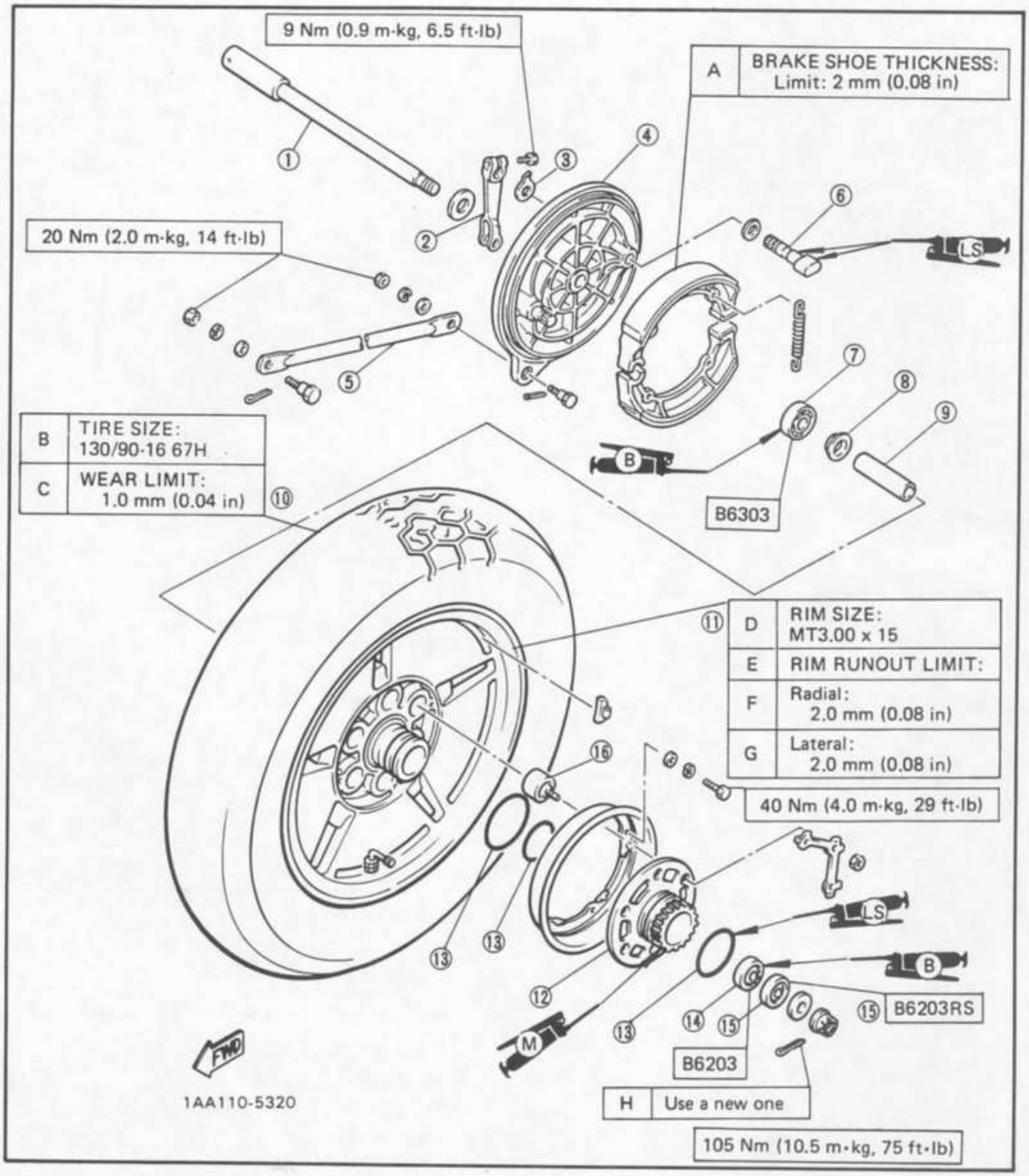
- Tighten the axle pinch bolt.

**Axle Pinch Bolt:**
**20 Nm (2.0 m·kg, 14 ft·lb)**

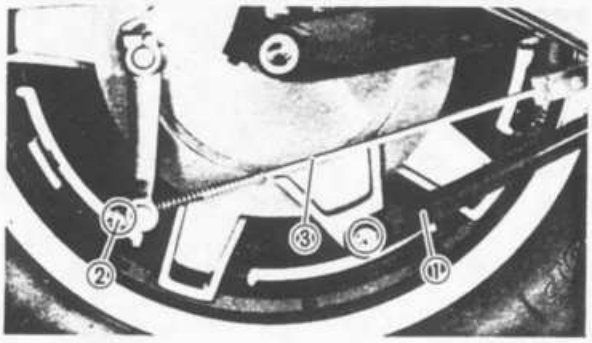
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## REAR WHEEL

① Axle
② Rear brake camshaft lever
③ Wear indicator
④ Brake plate
⑤ Tension bar
⑥ Rear brake camshaft
⑦ Bearing
⑧ Spacer flange
⑨ Spacer
⑩ Tire
⑪ Wheel
⑫ Clutch hub
⑬ O-ring
⑭ Bearing
⑮ Bearing
⑯ Damper

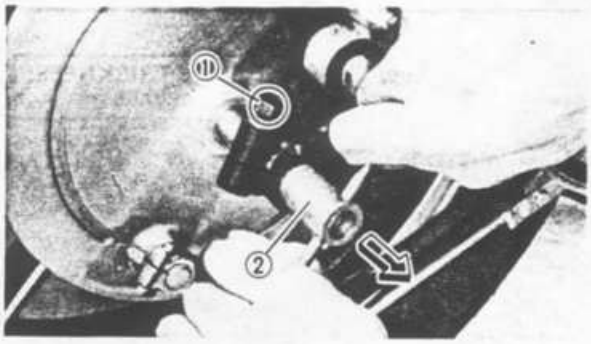



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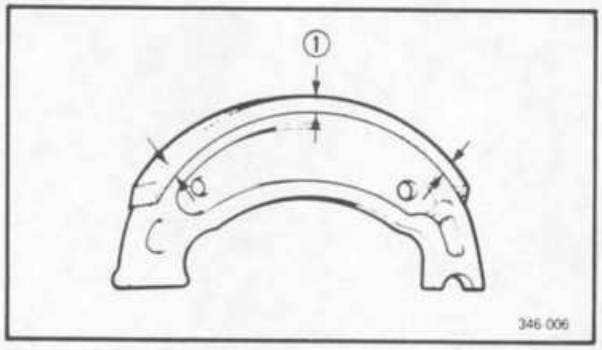

## REMOVAL

1. Place the motorcycle on its centerstand.
2. Remove:
   - Cotter pin
   - Axle nut
   - Tension bar ①
   - Brake rod adjuster ②
   - Brake rod ③




3. Loosen:
   - Rear axle pinch bolt ①
4. Remove:
   - Rear axle ②
   - Rear wheel

   Move the wheel towards the right side to separate it from final gear case.




## INSPECTION

### Brake Shoe

1. Measure:
   - Brake shoes (Thickness)

   Use slide calipers.

   Out of specification → Replace.

① Measuring point

**Brake Shoe Thickness**
**4 mm (0.16 in)**
**Replacement Limit:**
**2 mm (0.08 in)**

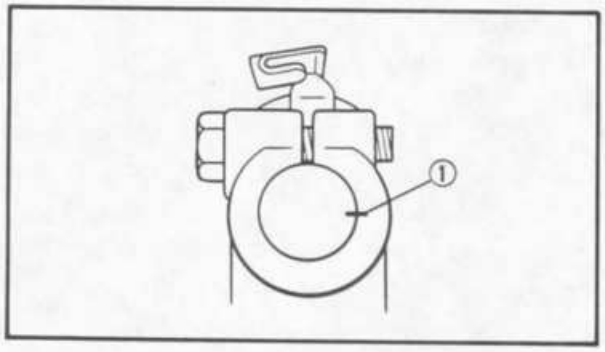
2. Inspect:
   - Brake shoes

   Glazed parts → Sand with coarse sandpaper.

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**Brake Drum**

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




**Brake Shoe Plate**

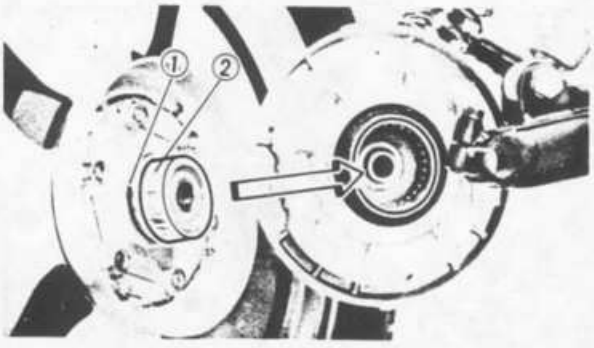
1. Remove:
   - Camshaft
2. Inspect:
   - Cam face
     Wear → Replace camshaft.
     Condition OK → Grease camshaft.

**NOTE:**

Place alignment marks ① on the cam lever and camshaft when assembly.

**Rear Axle, Wheel and Wheel Bearing Replacement**

Refer to "Front Wheel Inspection".



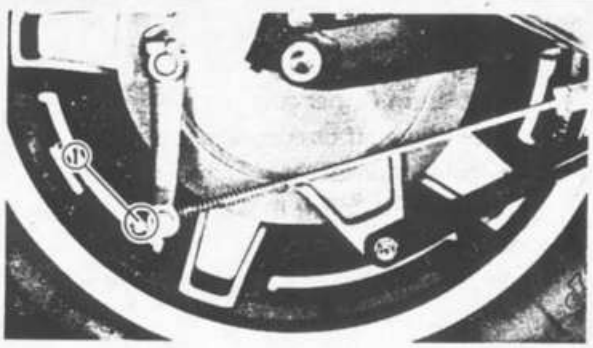

## INSTALLATION

1. Install:
   - Rear wheel
     Reverse removal steps.

**Rear wheel installation points:**
- Lightly grease O-ring ① and hub splines ② .
- Install wheel assembly and axle.

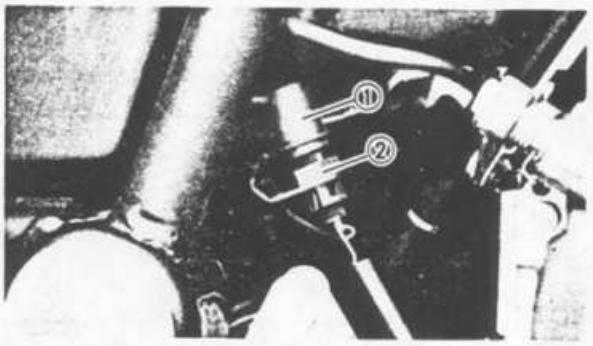
**Axle Nut:**
**105 Nm (10.5 m, 75 ft·lb)**
**Axle Pinch Bolt:**
**20 Nm (2.0 m·kg, 14 ft·lb)**

Always use a new cotter pin on the axle nut.



2. Adjust:
   - Rear brake free play.
     Turn adjuster ① as needed.

| Adjuster | Rear Brake Free Play |
|---|---|
| Turn clockwise | to reduce |
| Turn counterclockwise | to increase |



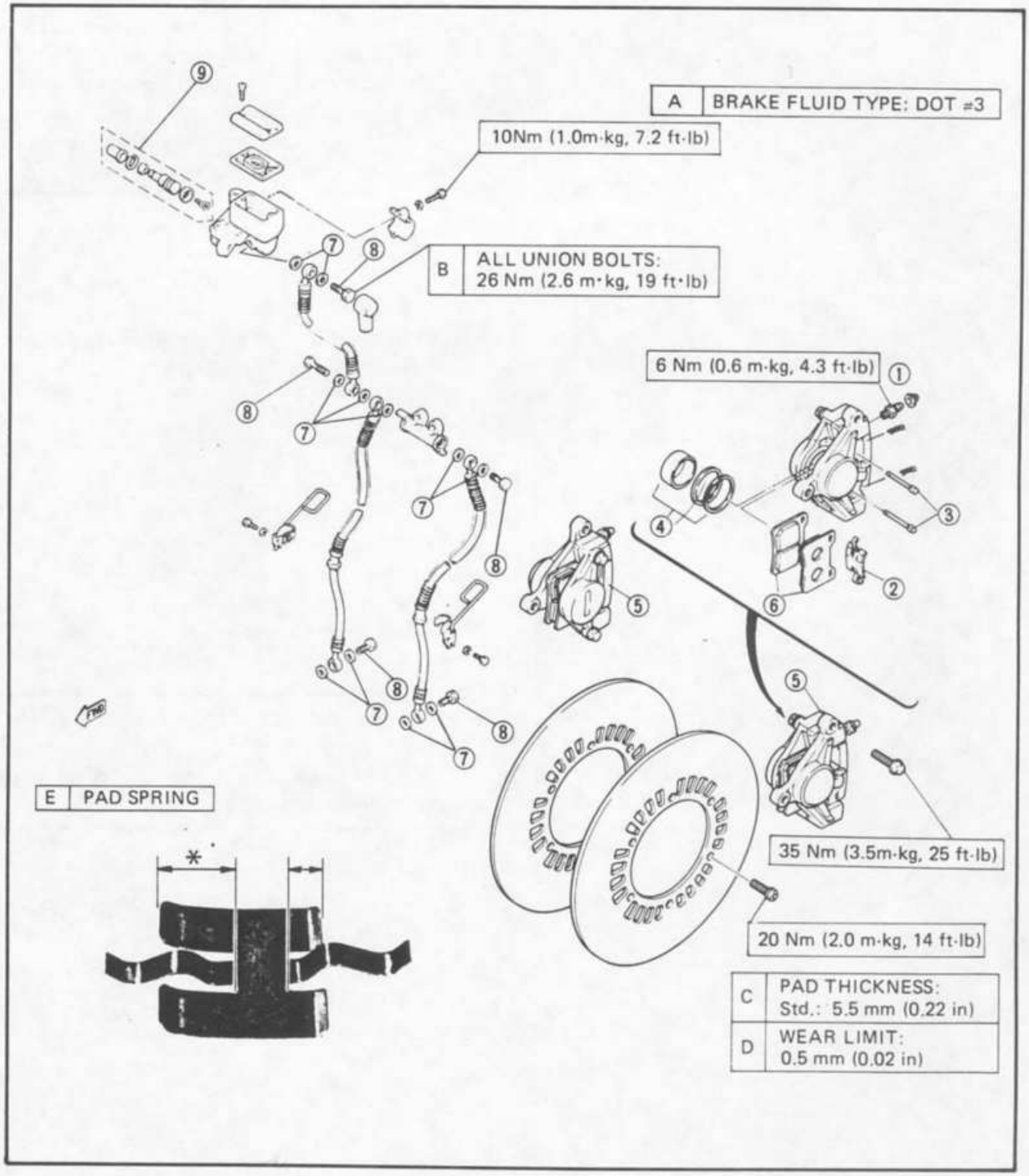
3. Adjust:
   - Rear brake light switch

① Switch body
② Adjusting nut

## FRONT BRAKE

① Bleed screw
② Pad spring
③ Pad retaining pin
④ Caliper piston assembly (Replace as a set)
⑤ Caliper
⑥ Brake pads (Replace as a set)
⑦ Copper washer
⑧ Union bolt
⑨ Master cylinder kit (Replace as a set)

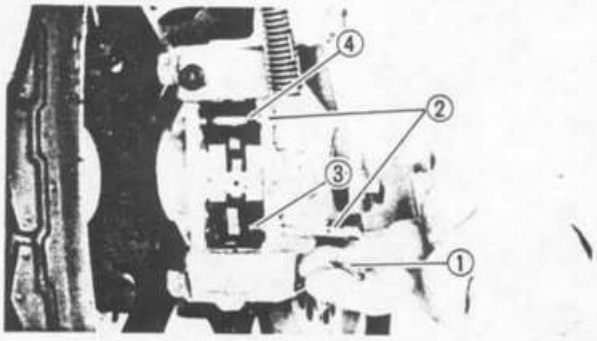
* Install the pad spring with its longer tangs facing upwards.

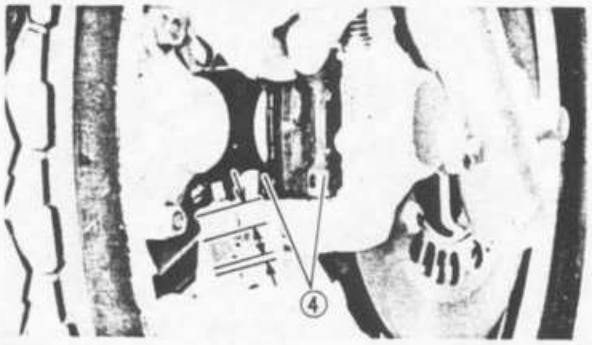


**CAUTION:**

Disc brake components rarely require disassembly. Do not:

- Disassemble components unless absolutely necessary.
- Use solvents on internal brake component.
- Use contaminated brake fluid for cleaning. Use only clean brake fluid.
- Allow brake fluid to come in contact with the eyes otherwise eye injury may occur.
- Allow brake fluid to contact painted surfaces or plastic parts otherwise damage may occur.
- Disconnect any hydraulic connection otherwise the entire system must be disassembled, drained, cleaned, and then properly filled and bled after reassembly.




## BRAKE PAD REPLACEMENT

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

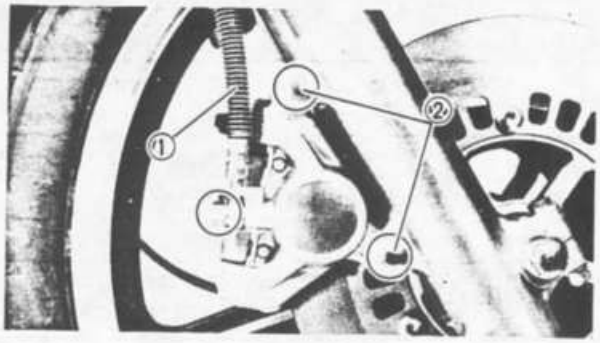
1. Remove:
   - Cover
   - Circlips ①
   - Pad retaining pins ②
   - Pad spring ③
   - Pads ④
2. Install:
   - Pads

   Reverse removal steps.

NOTE:

- Install the pad spring with its longer tangs facing upwards.
- Replace pads as a set if either is found to be worn to the wear limit.

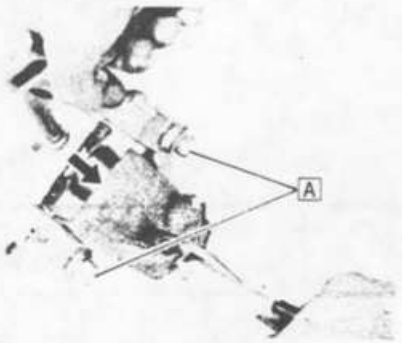
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## CALIPER DISASSEMBLY

1. Remove:
   - Brake hose ①
   - Caliper securing bolts ②
   - Brake pads
2. Remove:
   - Caliper piston assembly

   Use compressed air and proceed carefully.

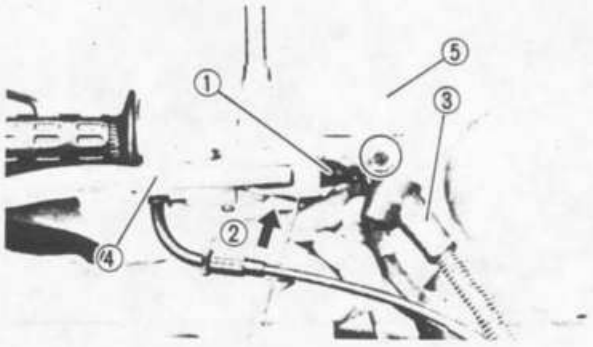



**Caliper piston removal steps:**
- Using a rag, lock the right side piston.
- Blow compressed air into the hose joint opening to force out the left side piston from the caliper body.
- Remove the dust and piston seals and reinstall the piston.
- Repeat previous step to force out the right side piston from the caliper body.

A DO NOT LOOSEN

**WARNING:**

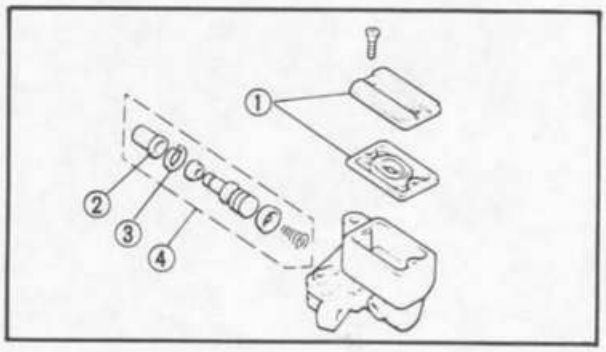
- **Cover piston with rag and use entreme caution when expelling piston from cylinder.**
- **Never attempt to pry out piston.**




## MASTER CYLINDER DISASSEMBLY

1. Remove:
   - Brake light switch ①

     Push ② the brake light switch stopper.
   - Brake hose ③
   - Brake lever ④ and spring
   - Master cylinder assembly ⑤




2. Remove:
   - Cap ①

     Drain remaining fluid.
   - Master cylinder dust boot ②
   - Circlip ③
   - Master cylinder cup assembly

NOTE:

Be sure to reinstall the larger diameter lips of the cylinder cups first.

④ Master cylinder kit

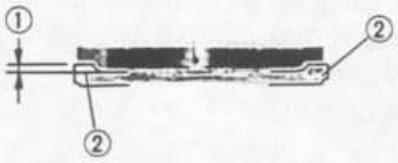
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## INSPECTION AND REPAIR

| Recommended Brake Component Replacement Schedule | |
|---|---|
| Brake pads | As required |
| Piston seal, dust seal | Every 2 years |
| Brake hoses | Every 4 years |
| Brake fluid | Replace only when brakes disassembled |

1. Inspect:
   - Caliper piston assembly
     Damage/Scratches → Replace.
   - Brake pad
     Over wear limit ① → Replace as a set.

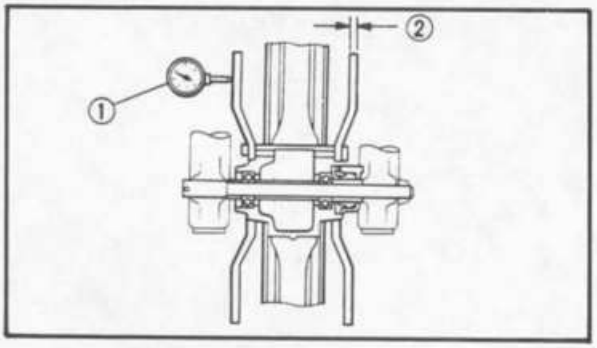
**Brake Pad Wear Limit:**
**0.5 mm (0.02 in)**




② Wear indicator

2. Inspect:
   - Master cylinder body
   - Caliper body
     Scratches → Replace.
     Clean all passages with new brake fluid.
   - Brake hoses
     Cracks/Frayed/Damage/Over four years old → Replace.

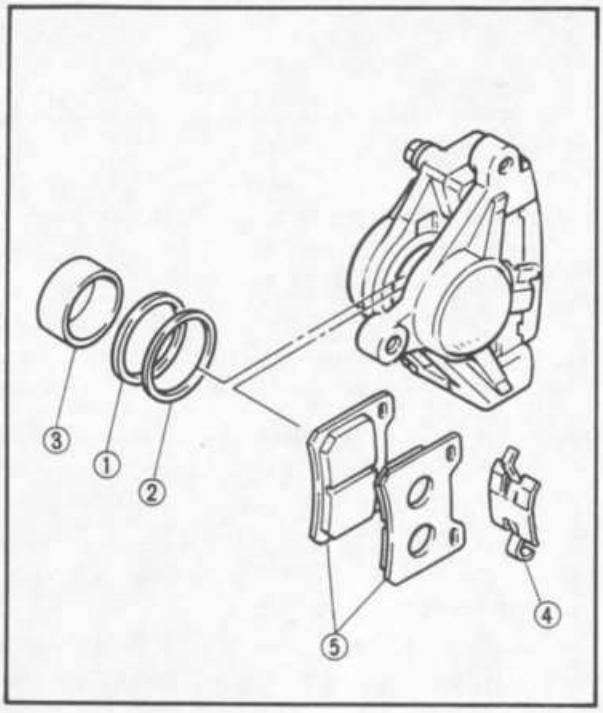


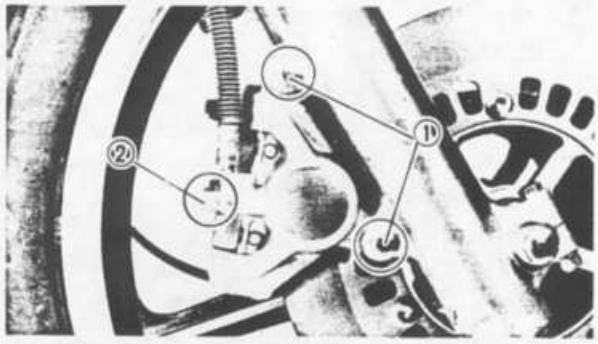


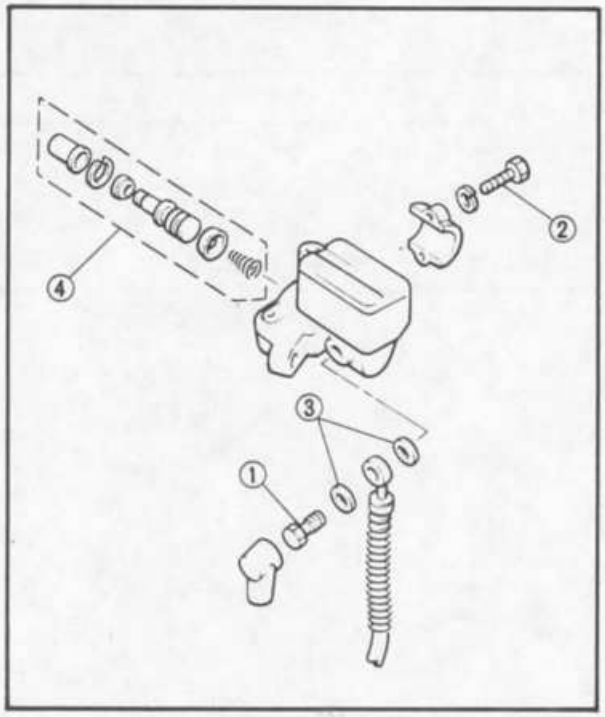

3. Measure:
   - Deflection ①
   - Thickness ②
     Out of specification → Replace.

**Maximum Deflection:**
**0.15 mm (0.006 in)**
**Minimum Disc Thickness:**
**4.5 mm (0.2 in)**

6




## ASSEMBLY

### Caliper

NOTE:
- All internal parts should be cleaned in new brake fluid only.
- Internal parts should be lubricated with brake fluid when installed.
- Replace the piston and dust seals whenever the caliper is disassembled.

1. Install:
   - Piston seal ①
   - Dust seal ②
   - Piston ③
   - Pad spring ④
   - Brake pads ⑤
   - Caliper assembly

2. Tighten:
   - Caliper securing bolts ①

**Caliper:**
**35 Nm (3.5 m·kg, 25 ft·lb)**

- Brake hose uniton bolt ②

**Brake Hose:**
**26 Nm (2.6 m·kg, 19 ft·lb)**

3. Bleed the air completely.

### Master Cylinder

1. Assemble:
   - Master cylinder

**Union Bolt ① :**
**26 Nm (2.6 m·kg, 19 ft·lb)**
**Master Cylinder Holding Bolt ② :**
**10 Nm (1.0 m·kg, 7.2 ft·lb)**

2. Bleed the air completely.

③ Copper washer
④ Master cylinder kit

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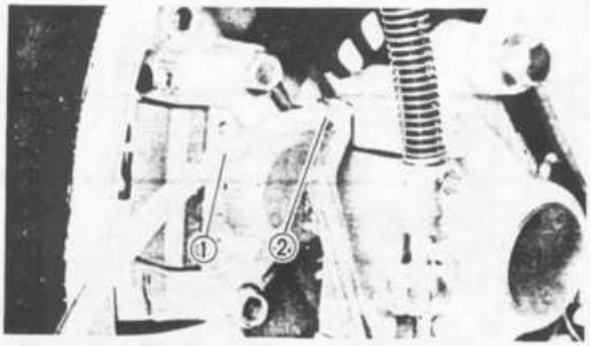
## AIR BLEEDING

**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.**




**Air bleeding steps:**

a. Add proper brake fluid to the reservoir.
b. Install diaphragm.
   Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect the clear plastic tube ① (4.5 mm, 3/16 in inside dia.) tightly to the caliper bleed screw ② .
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.
i. Repeat steps e to h until of the air bubbles have been removed from the system.

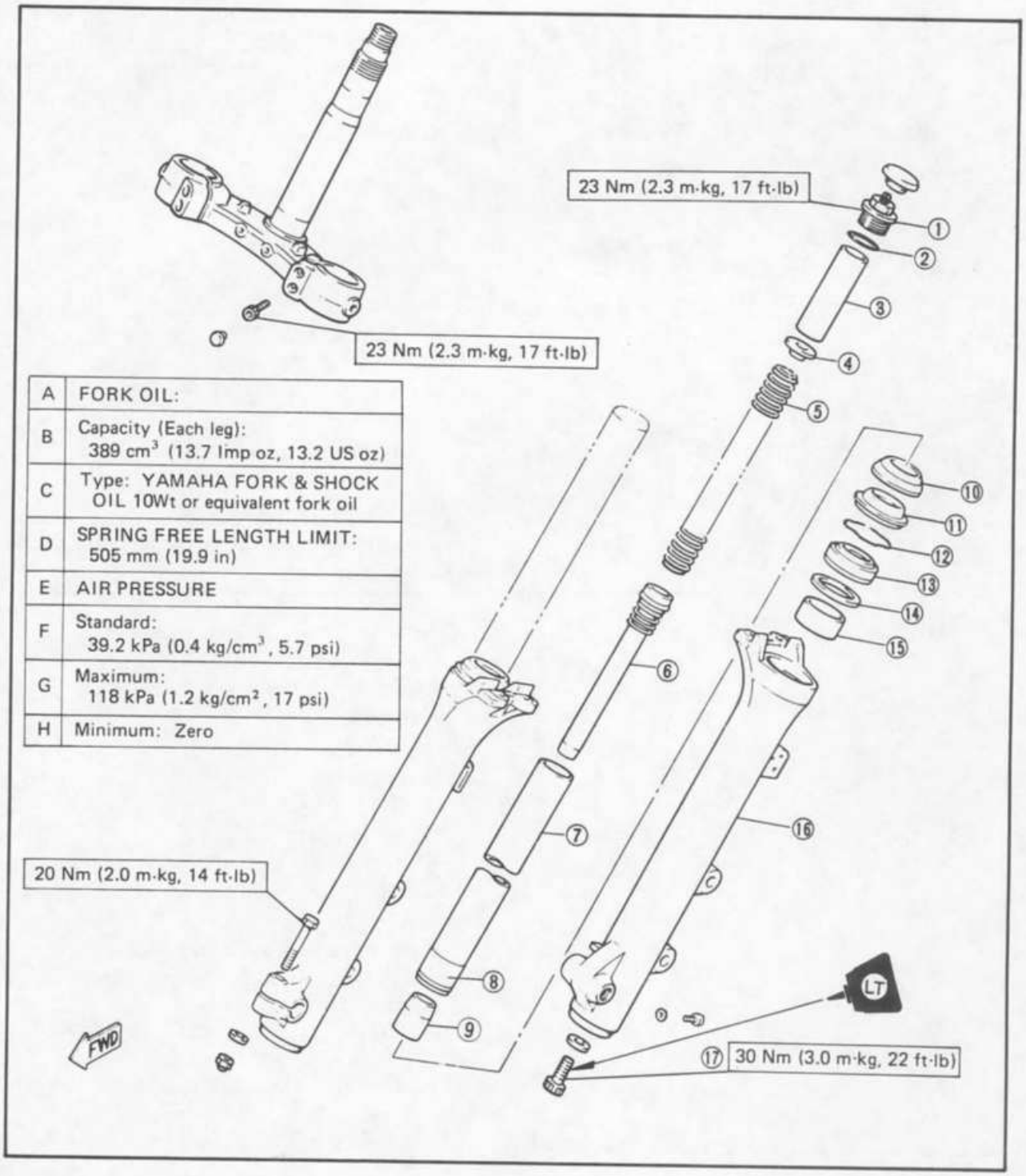
**NOTE:**

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 system have disappeared.

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## FRONT FORK

① Cap bolt
② O-ring
③ Spacer
④ Spring seat
⑤ Fork spring
⑥ Damper rod
⑦ Inner fork tube
⑧ Slide bushing
⑨ Taper spindle
⑩ Dust seal cover
⑪ Dust seal
⑫ Circlip
⑬ Fork seal
⑭ Washer
⑮ Guide bushing
⑯ Outer fork tube
⑰ Damper rod securing bolt




| | |
|---|---|
| A | FORK OIL: |
| B | Capacity (Each leg): 389 cm³ (13.7 Imp oz, 13.2 US oz) |
| C | Type: YAMAHA FORK & SHOCK OIL 10Wt or equivalent fork oil |
| D | SPRING FREE LENGTH LIMIT: 505 mm (19.9 in) |
| E | AIR PRESSURE |
| F | Standard: 39.2 kPa (0.4 kg/cm², 5.7 psi) |
| G | Maximum: 118 kPa (1.2 kg/cm², 17 psi) |
| H | Minimum: Zero |

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## REMOVAL AND DISASSEMBLY

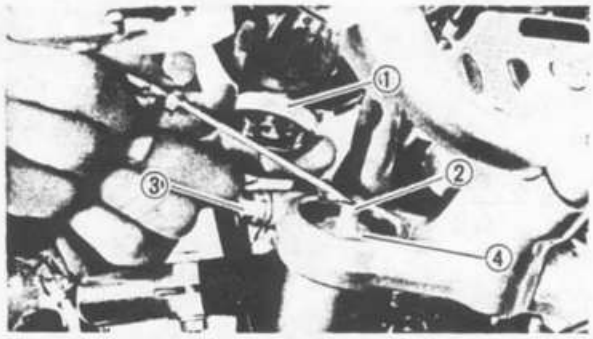
**WARNING:**

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

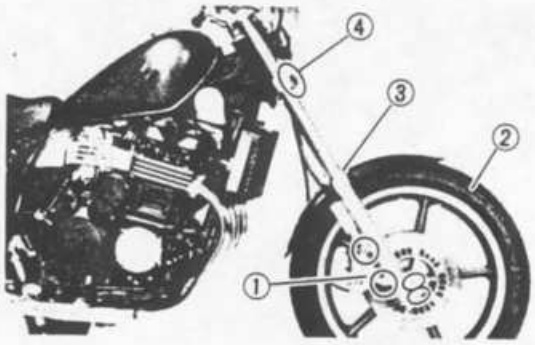
1. Remove:
   - Air valve cap ①

NOTE:

Keep the valve ② open by pressing it for several seconds so that the air can be let out of the inner tube.



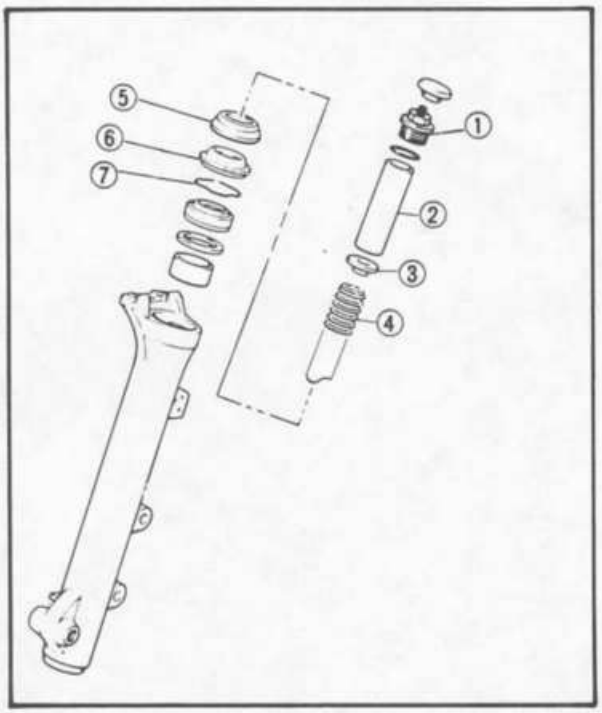

2. Loosen:
   - Inner tube pinch bolt ③
   - Cap bolt ④




3. Remove:
   - Brake caliper ①
   - Front wheel ②
   - Fork brace ③
4. Loosen:
   - Lower front fork pinch bolts ④

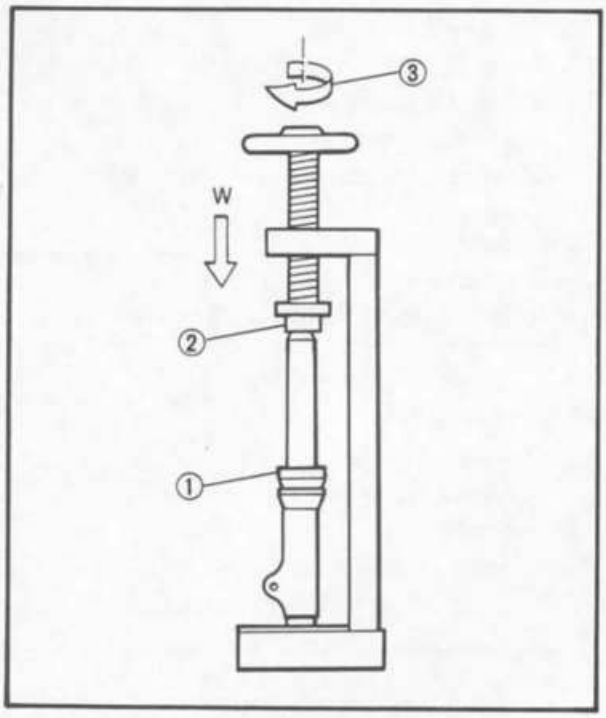
**CAUTION:**

**Support the fork before loosening the pinch bolts.**




5. Remove:
   - Front fork assembly (from the underbracket)
   - Cap bolt ①
   - Spacer ②
   - Spring seat ③
   - Fork spring ④
   - Dust seal cover ⑤
   - Dust seal ⑥
   - Circlip ⑦
6. Fill:
   - Fork inner tube (with fork oil)
     Stretch the inner tube before filling.
7. Install:
   - Cap bolt ①

6



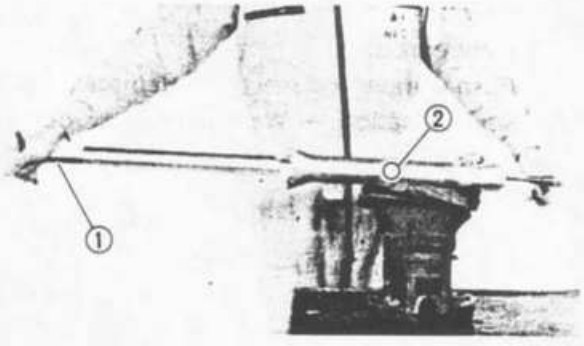

8. Remove:
   - Oil seal
     (from outer tube)
     Press the inner tube to facilitate removal.

**CAUTION:**

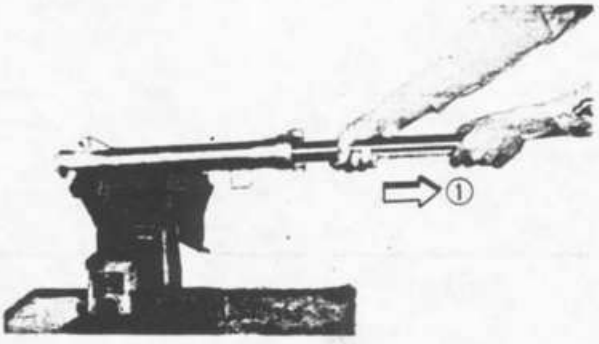
- **If air enters the inner tube or it is compressed abruptly oil may spurt out or the coil seal may be ejected.**
- **Never touch the inner tube during a disassembly operation.**
- **Be sure to wrap the oil seal with a rag for safety.**

① Wrap with rag
② Socket wrench (suitable socket)
③ Turn slowly

9. Remove:
   - Oil seal
   - Washer
   - Cap bolt
   - Fork spring
10. Drain:
    - Fork

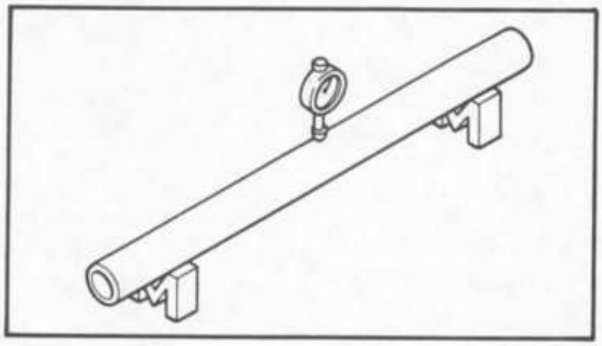


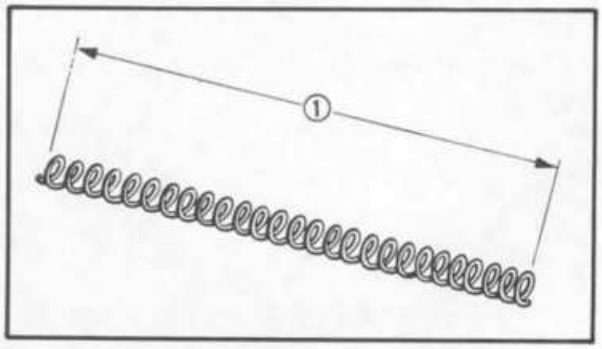

11. Remove:
    - Damper rod securing bolt
      Use T-handle (90890-01326) ① and Damper Rod Holder (90890-01365) ② to remove the damper rod.




12. Remove:
    - Damper rod
    - Damper rod spring
    - Inner fork tube
    - Guide bushing
      (from outer tube)
    - Slide bushing
    - Taper spindle

① Pull inner tube from outer tube.






## INSPECTION

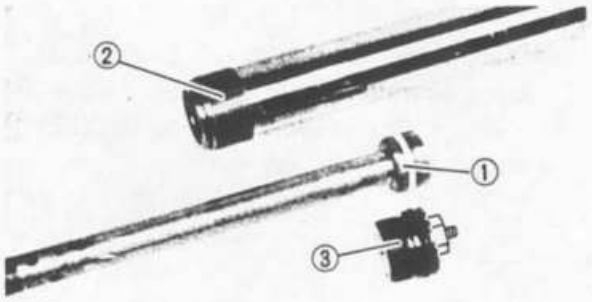
1. Inspect:
   - Inner fork tube
     Severe scratches/Bends → Replace.
     Damaged oil lock valve → Replace.

**WARNING:**

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

2. Inspect:
   - Outer fork tube
     Bends → Replace.
     Damaged fork seal seat → Replace.
3. Inspect:
   - Spring (Free length) ①
     Out of specification → Replace.

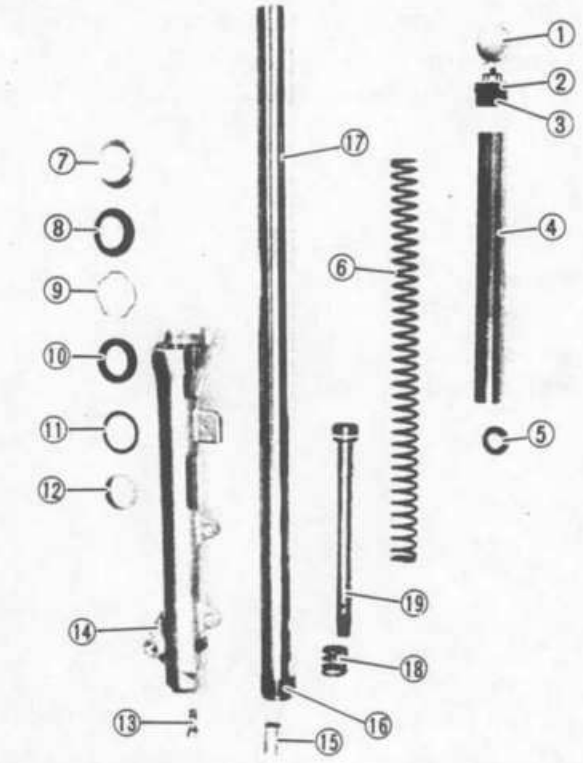
**Fork Spring Free Length Limit:**
**505 mm (19.9 in)**




4. Inspect:
   - Damper rod
     Worn damper rod seal ① → Replace.
     Contamination → Wash and blow out all passages.
   - Slide bushing ②
     Wear → Replace.
   - Cap bolt O-ring ③
     Damage → Replace.

## ASSEMBLY

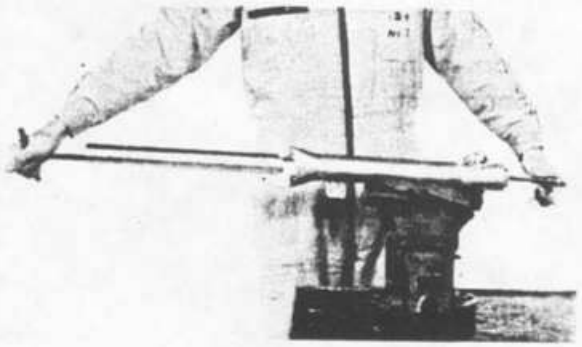
NOTE:
- Be sure all components are clean before assembly.
- Always install the new oil seal, bushings, and the dust seal. Do not reuse them.



① Cap
② O-ring
③ Cap bolt
④ Spacer
⑤ Spring seat
⑥ Fork spring
⑦ Dust seal cover
⑧ Dust seal
⑨ Circlip
⑩ Fork oil seal
⑪ Washer
⑫ Guide bushing
⑬ Damper rod securing bolt
⑭ Outer fork tube
⑮ Taper spindle
⑯ Slide bushing
⑰ Inner fork tube
⑱ Damper rod spring
⑲ Damper rod

1. Install:
   - Damper rod spring
   - Damper rod

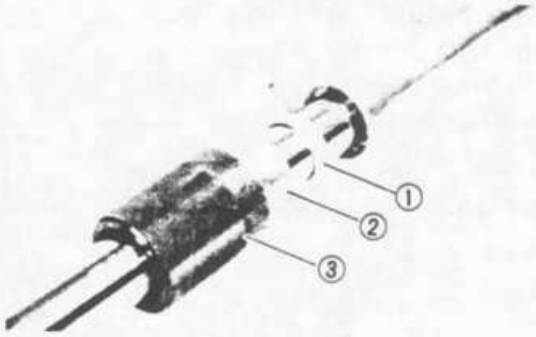
   Allow rod to slide slowly down the inner fork tube until it protrudes from the bottom.
   - Taper spindle
   - Inner fork tube



2. Install:
   - Damper rod securing bolt

   Hold damper rod with Damper Rod Holder (90890-01365) and T-handle (90890-01326).

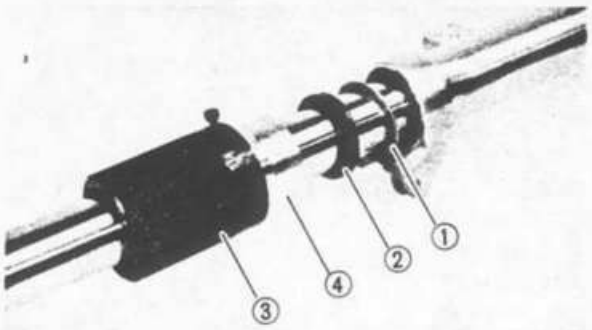
**Damper Rod Securing Bolt:**
**30 Nm (3.0 m·kg, 22 ft·lb)**
**LOCTITE® Stud N'Bearing Mount (red)**



3. Install:
   - Guide bushing ①

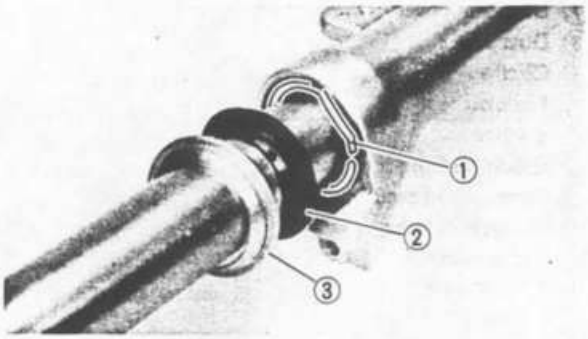
   Press guide bushing into the outer fork tube with Fork Seal Driver (90890-01367) ② and Adapter (90890-01372) ③.

6




4. Install:
   - Washer ①
   - Fork oil seal (New) ②

   Press fork oil seal into the outer fork tube with Fork Seal Driver (90890-01367) ③ and Adapter (90890-01372) ④.




5. Install:
   - Circlip ①
   - Dust seal ②
   - Dust seal cover ③

6. Fill:
   - Front fork
     (with fork oil)

**Capacity:**
**389 cm³**
**(13.7 Imp oz, 13.2 US oz))**
**Type:**
**Yamaha Fork & Shock Oil**
**10Wt or equivalent fork oil**

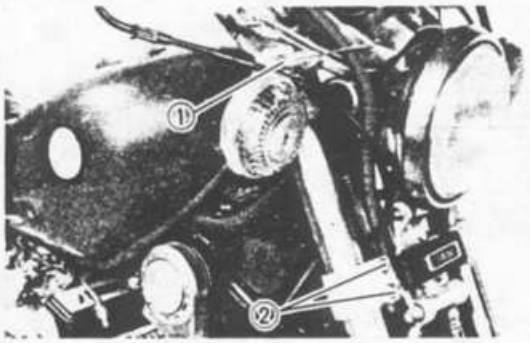
7. Install:
   - Fork spring
   - Spring seat
   - Spacer
   - Cap bolt
     (into the inner fork)

8. Install:
   - Front fork assembly
     (into the underbracket)
9. Tighten:
   - Front fork pinch bolts (Lower)
   - Cap bolt

**Cap Bolt:**
**23 Nm (2.3 m·kg, 17 ft·lb)**

10. Loosen:
    - Lower front fork pinch bolts
11. Install:
    - Front fork
      (into the steering crown)

NOTE:
Be sure the inner fork tube end is flush with the top of the steering crown.




12. Tighten:
    - Front fork pinch bolt (Upper) ①
    - Front fork pinch bolts (Lower) ②

**Upper Pinch Bolt:**
**20 Nm (2.0 m·kg, 14 ft·lb)**
**Lower Pinch Bolts:**
**23 Nm (2.3 m·kg, 17 ft·lb)**

13. Continue assembly by reversing of Removal and Disassembly sequence.
    Install and torque tighten each component as specified.

**Disc Brake Caliper:**
**35 Nm (3.5 m·kg, 25 ft·lb)**
**Front Wheel Axle:**
**105 Nm (10.5 m·kg, 75 ft·lb)**
**Wheel Axle Pinch Bolt:**
**20 Nm (2.0 m·kg, 14 ft·lb)**

6



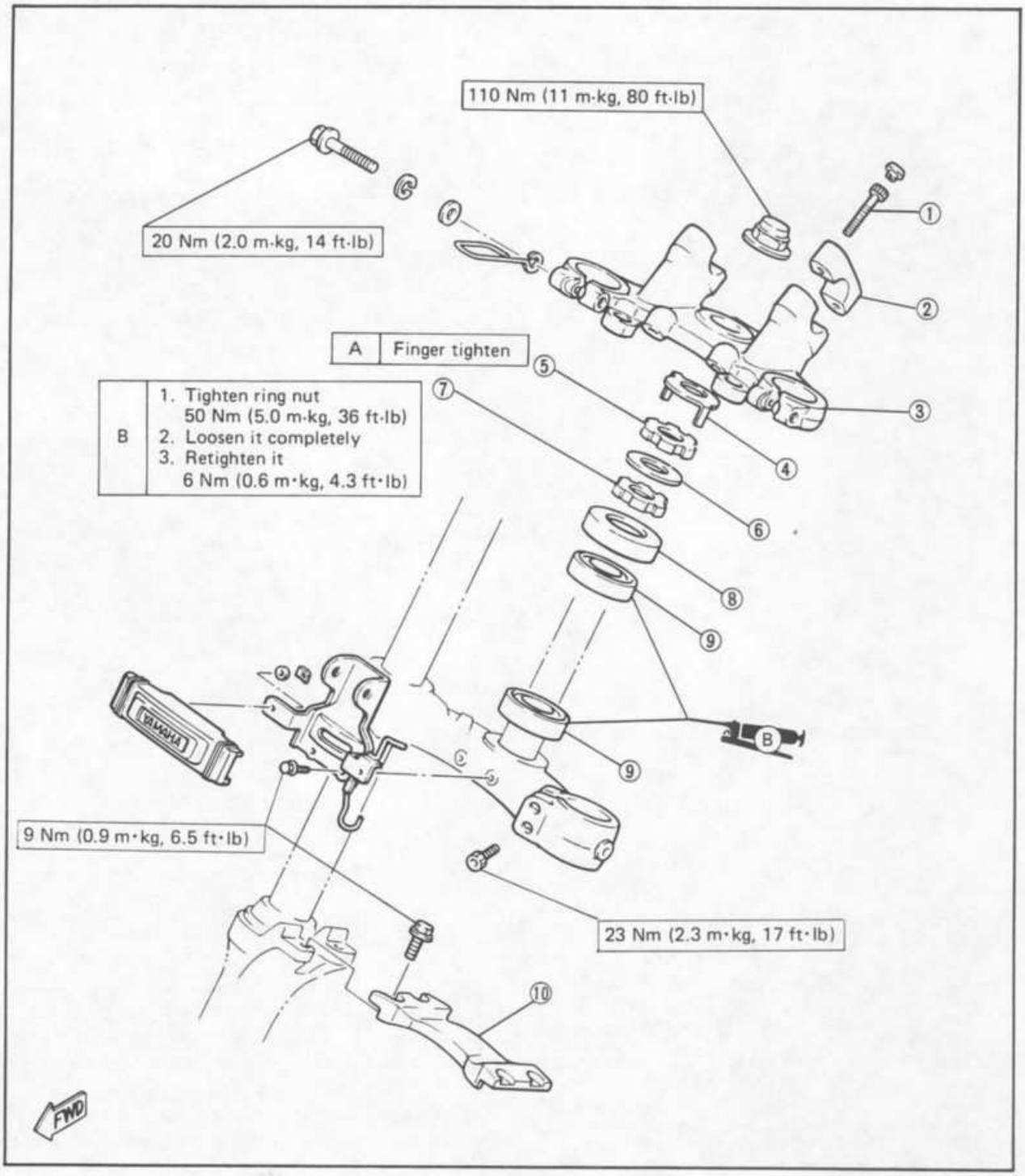
14. Fill:
    - Front fork
      (with air)

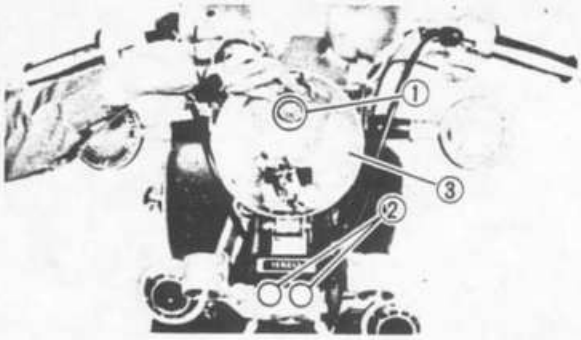
**Standard Air Pressure:**
**39.2 kPa (0.4 kg/cm², 5.7 psi)**

15. Install
    - Air valve cap

## STEERING HEAD

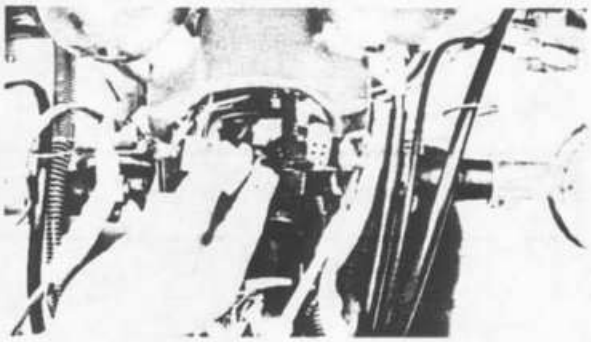
① Handlebar bolt
② Handlebar upper bracket
③ Steering crown
④ Special washer
⑤ Upper ring nut
⑥ Washer
⑦ Lower ring nut
⑧ Bearing cover
⑨ Bearing
⑩ Fork brace



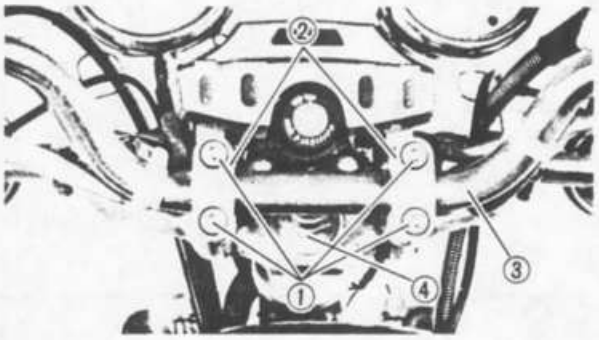



## REMOVAL

1. Remove:
   - Front wheel
   - Front forks
2. Remove:
   - Headlight lens unit
3. Disconnect:
   - Wire connectors
     (in the headlight shell)
4. Remove:
   - Headlight shell securing bolt ①
   - Brake hose joint securing bolts ②
   - Headlight shell ③



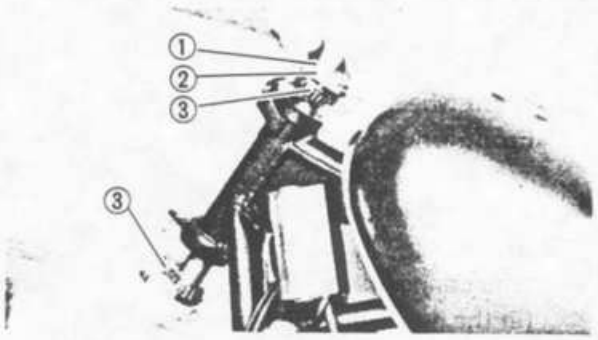
5. Disconnect:
   - Meter panel wiring connectors



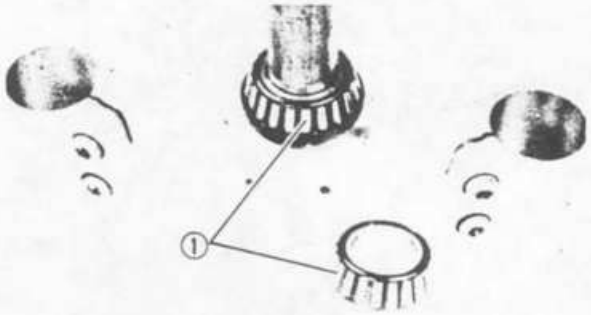

6. Remove:
   - Covers
   - Handlebar bolts ①
   - Handlebar upper brackets ②
   - Handlebar assembly ③
   - Steering stem nut ④
   - Steering crown and meter panel assembly




7. Remove:
   - Special washer ①
8. Loosen:
   - Upper and lower ring nut
     Use Steering Ring Nut Wrench (90890-01268) ② .




9. Remove:
   - Upper ring nut
   - Washer
   - Lower ring nut ①
   - Bearing cover ②
   - Bearing ③
   - Steering stem




## INSPECTION

1. Check:
   - Bearings ①

   Pitting/Damage → Replace races and bearing.



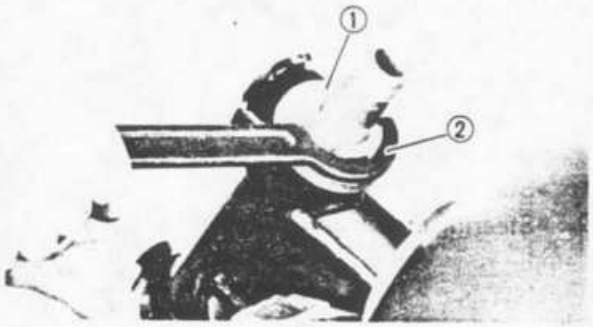
## ASSEMBLY

1. Lubricate:
   - Bearings

| | |
|---|---|
| | **Wheel Bearing Grease** |

2. Install:
   - Bearing (onto steering stem)
   - Steering stem
   - Bearing cover
   - Lower ring nut ①
3. Tighten:
   - Lower ring nut ①

   Use Steering Nut Wrench (90890-01268) ②.




| | |
|---|---|
| | **Lower Ring Nut (Initial): 50 Nm (5.0 m·kg, 36 ft·lb)** |

4. Loosen:
   - Lower ring nut

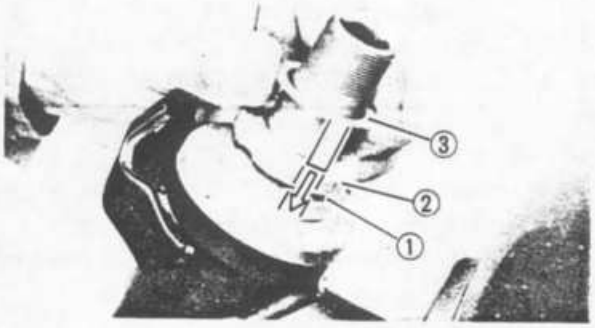
   Loosen completely.

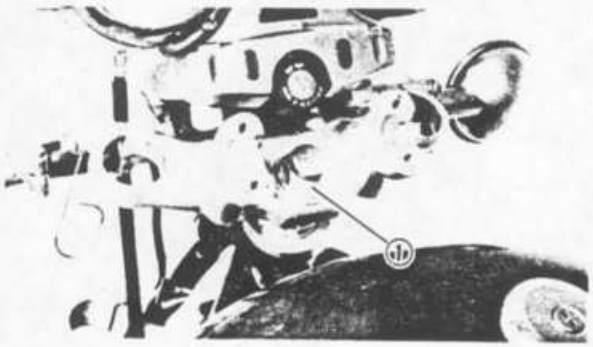
6

5. Retighten:
   - Ring nut

| Lower Ring Nut (Final): 6 Nm (0.6 m·kg, 4.3 ft·lb) |
|---|

6. Install:
   - Washer ①
   - Upper ring nut ②
7. Tighetn:
   - Upper ring nut ②
     (with finger)
8. Install:
   - Special washer ③




9. Install:
   - Steering crown and meter panel assembly
   - Steering stem nut ①
10. Check:
    - Steering head operation
      Turn it from lock to lock
      Looseness/Binding → Readjust.

11. Position:
    - Front fork
      (into steering crown)
      This will facilitate alignment of under-bracket holes with steering crown holes.
12. Tighten:
    - Steering stem nut

| Steering Stem Nut: 110 Nm (11 m·kg, 80 ft·lb) |
|---|

13. Continue assembly by reversing removal sequence.

6

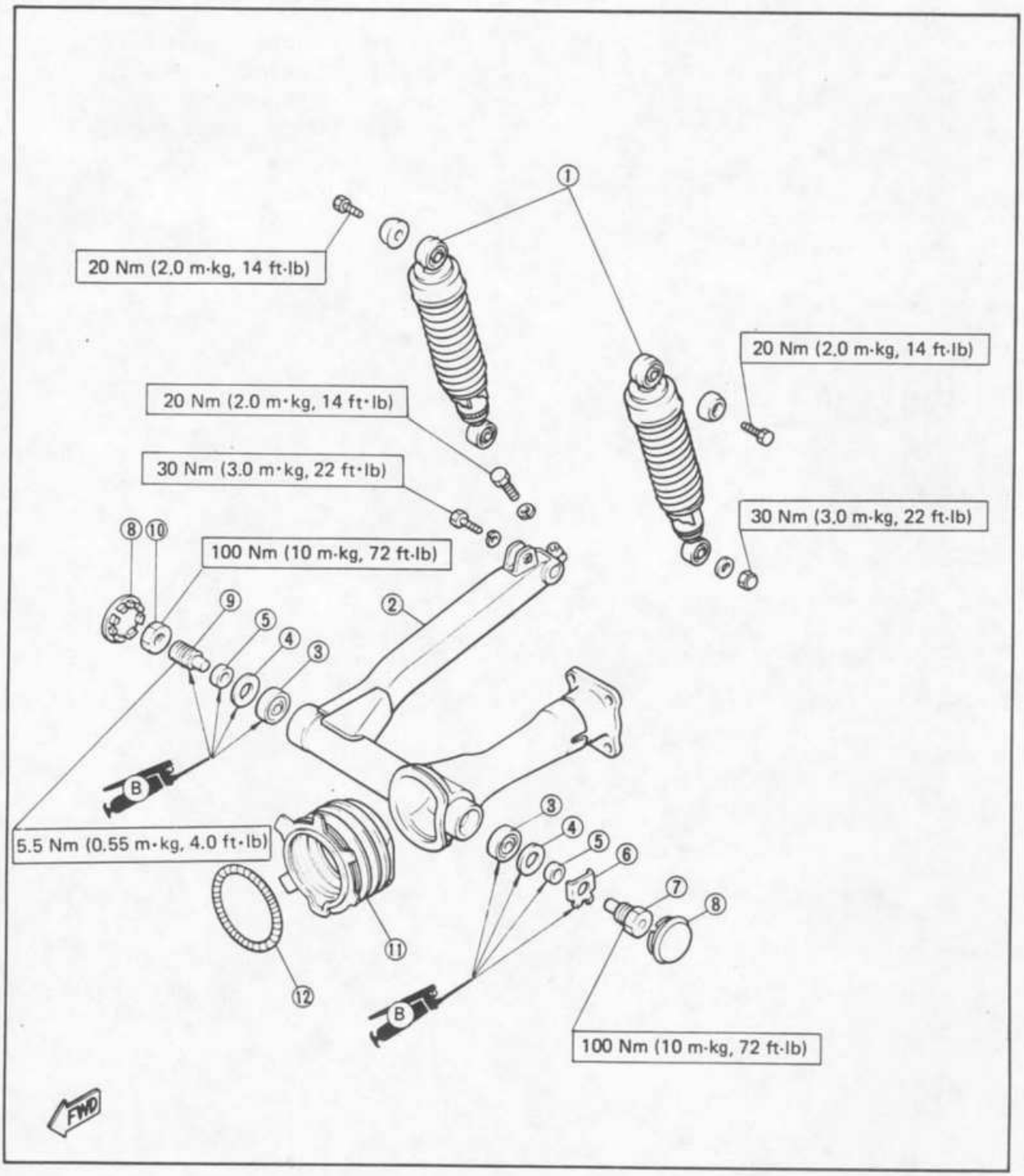


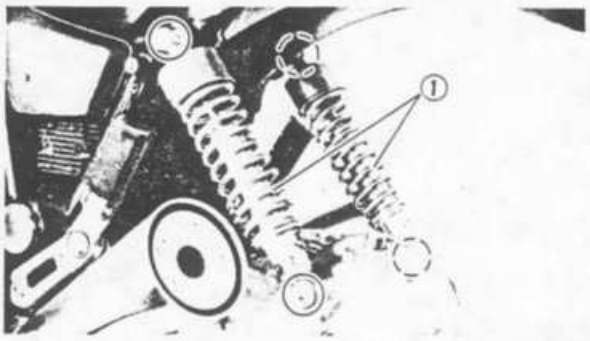
Fork Pinch Bolt (Upper):
20 Nm (2.0 m·kg, 14 ft·lb)
Fork Pinch Bolt (Lower):
23 Nm (2.3 m·kg, 17 ft·lb)
Brake Hose Joint:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Fork Brace:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)
Axle:
105 Nm (10.5 m·kg, 75 ft·lb)
Axle Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)

14. Check:
- Steering head operation
  Turnit from lock to lock.
  Looseness/Binding → Readjust tightness of steering stem.

## SWINGARM AND REAR SHOCK ABSORBER

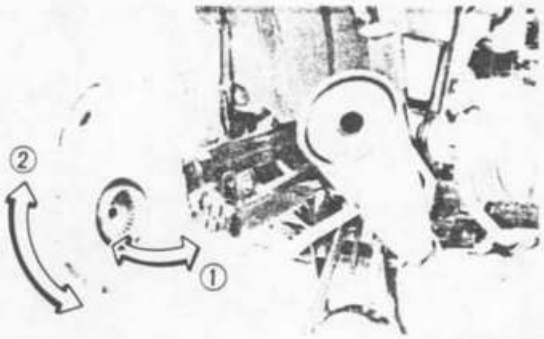
① Rear shock absorber
② Swingarm
③ Bearing
④ Oil seal
⑤ Collar
⑥ Lock washer
⑦ Left pivot shaft
⑧ Pivot cover
⑨ Right pivot shaft
⑩ Nut
⑪ Rubber boot
⑫ Spring band



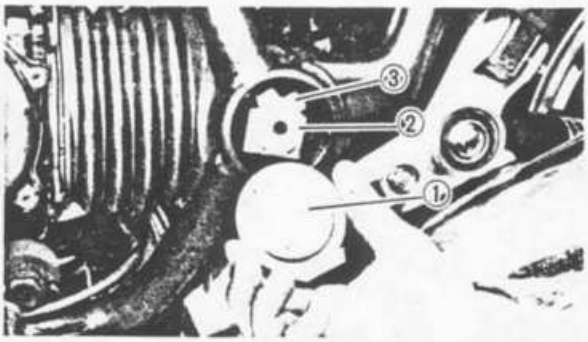



## SWINGARM FREE PLAY INSPECTION

1. Remove:
   - Rear wheel
   - Rear shock absorbers ①

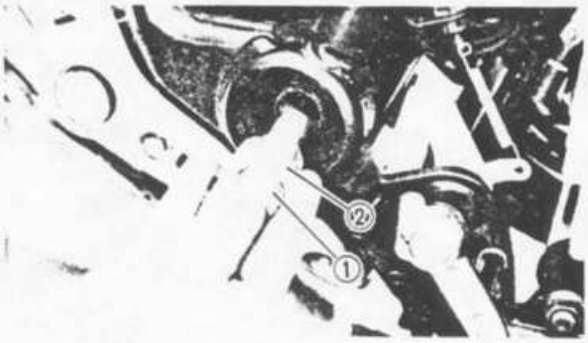


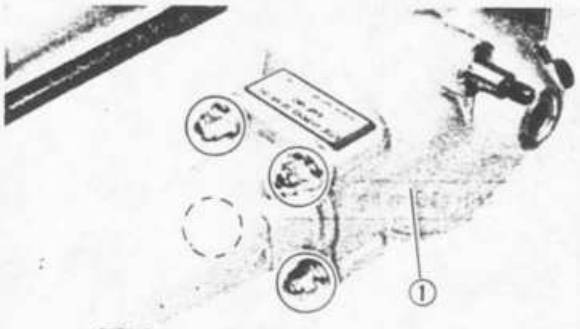

2. Check
   - Swingarm side play ①
     Grasp and move from side to side.
     Side play → Check and adjust bearing.
   - Swingarm vertical movement ②
     Tightness/Binding/Rough spots → Check and adjust bearing.
     Damage → Replace bearing.




## REMOVAL

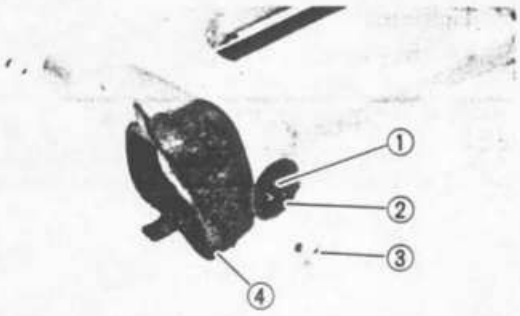
1. Remove:
   - Rear wheel
   - Rear shock absorbers
   - Pivot covers ①
2. Flatten the lock washer tab on the left pivot shaft.
3. Remove:
   - Left pivot shaft ②
   - Lock washer ③
4. Remove:
   - Right pivot shaft ①
   - Locknut ②




5. Remove:
   - Swingarm assembly
   - Final gear case assembly ①

6

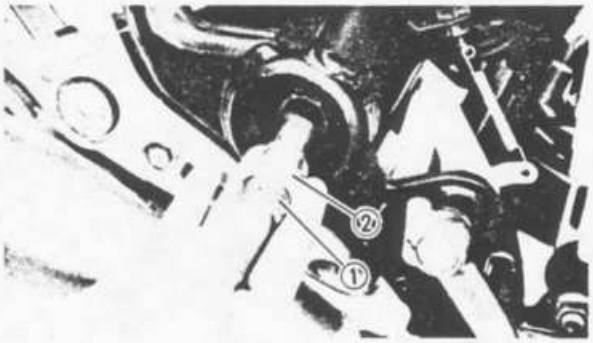



## INSPECTION AND LUBRICATION

1. Inspect:
   - Bearings ①
   - Oil seals ②
   - Collars ③
   - Rubber boot ④

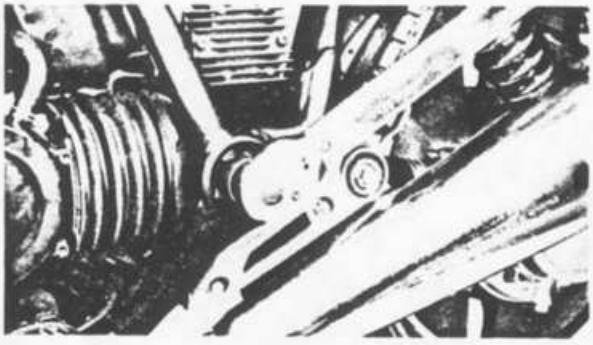
   Damage → Replace.
2. Lubricate:
   - Bearings and oil seal

| | |
|---|---|
| | Waterproof Wheel Bearing Grease |




## ASSEMBLY

1. Install:
   - Swingarm assembly
   - Lock washer
   - Left pivot shaft
   - Right pivot shaft ①
   - Locknut ②

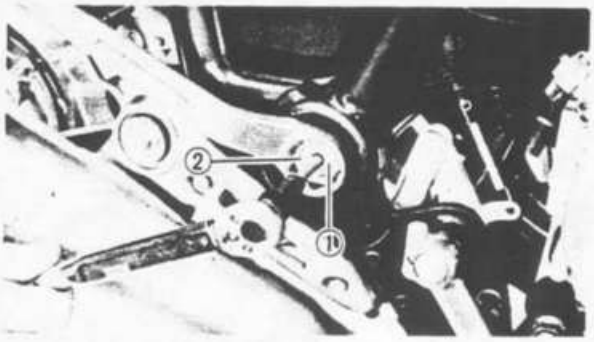


2. Tighten:
   - Left pivot shaft

| | |
|---|---|
| | Left Pivot Shaft:<br>100 Nm (10 m·kg, 72 ft·lb) |

3. Bend lock washer tab.

6




4. Tighten:
   - Right pivot shaft ①

| Right Pivot Shaft: 5.5 Nm (0.55 m·kg, 4.0 ft·lb) |
|---|

5. Tighten:
   - Right pivot shaft nut ②

| Right Pivot Shaft Nut: 100 Nm (10 m·kg, 72 ft·lb) |
|---|

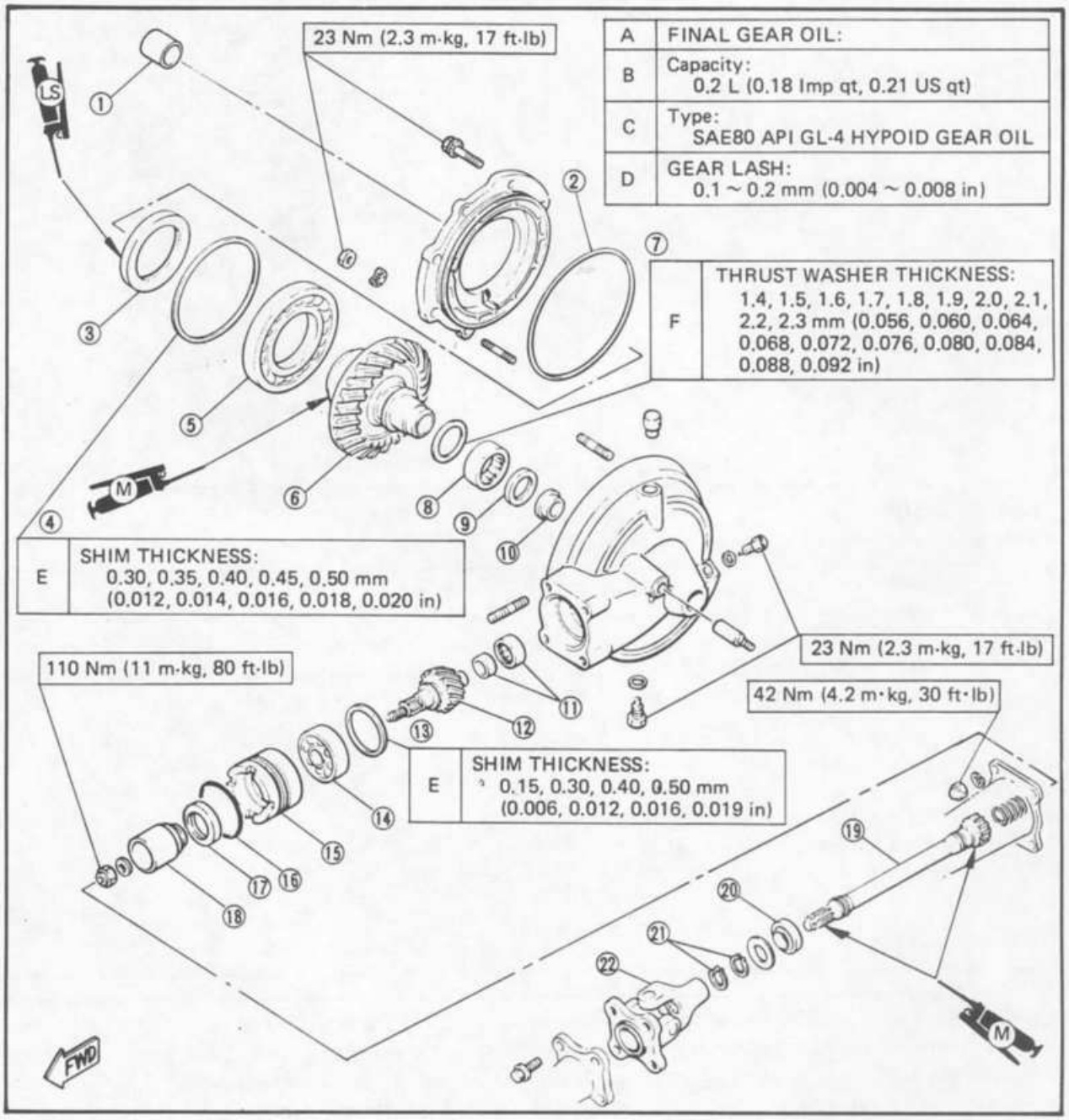
6. Install:
   - Pivot cover
7. Continue assembly by reversing of removal sequence.

| Final Gear Case Securing Nut: 42 Nm (4.2 m·kg, 30 ft·lb) |
|---|

6

## SHAFT DRIVE

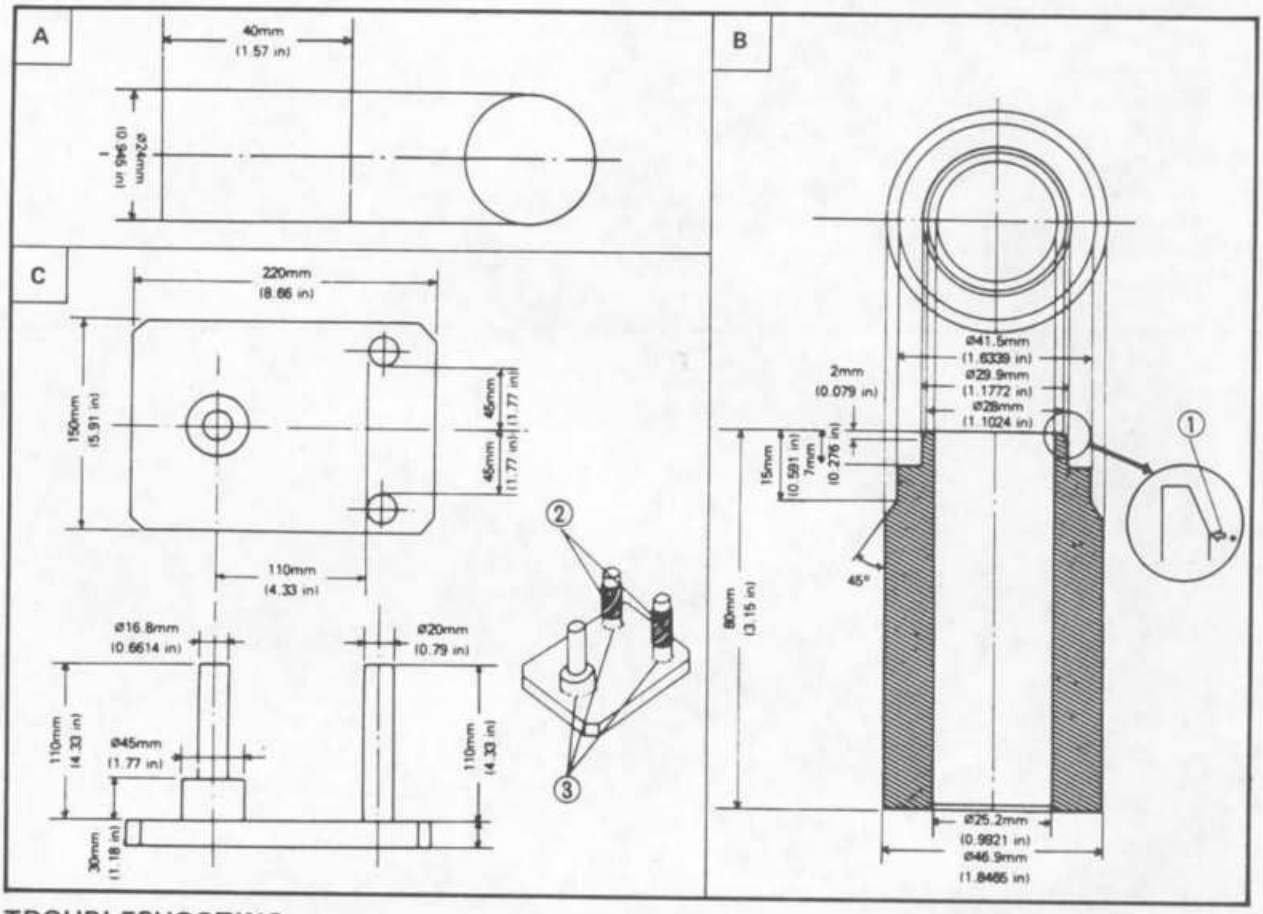
① Collar
② O-ring
③ Oil seal
④ Shim(s)
⑤ Bearing ($B16014C_2$)
⑥ Ring gear
⑦ Thrust washer
⑧ Bearing (Needle NQ37/20D)
⑨ Oil seal
⑩ Guide collar
⑪ Bearing (Needle 22BTM3018)
⑫ Final drive shaft
⑬ Shim(s)
⑭ Bearing (B6305RBI special)
⑮ Bearing retainer
⑯ O-ring
⑰ Oil seal
⑱ Gear coupling
⑲ Drive shaft
⑳ Oil seal
㉑ Circlip (New)
㉒ Universal joint



Refer to "Chapter 3." for middle gear service. The following special tools are not available but can be constructed for final gear disassembly and assembly:

[A] PRESS TOOL No. 1
[B] PRESS TOOL No. 2
[C] GEAR CASE HOLDING TOOL

① Should be free of burrs.
② Tape vinyl tubes to prevent housing damage.
③ Welded or screw secured.




## TROUBLESHOOTING

The following conditions may indicate damaged shaft drive components:

| Symptoms | Diagnosis |
|---|---|
| 1. A pronounced hesitation or "jerky" movement during acceleration, deceleration, or sustained speed. (This must not be confused with engine surging or transmission characteristics). | A. Bearing damage<br>B. Improper gear lash<br>C. Gear tooth damage |
| 2. A "rolling rumble" noticeable at low speed; a high-pitched whine; a "clunk" coming from the shaft drive area. | |
| 3. A locked-up condition of the shaft drive mechanism; no power transmitted from engine to rear wheel. | D. Broken drive-shaft<br>E. Broken gear teeth<br>F. Seizure due to lack of lubrication<br>G. A small foreign object may be lodged between the moving parts. |

**NOTE:**

Damage areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from the normal motorcycle operating noise. If there is reason to believe these components are damaged, remove the components for specific inspection.

**Inspection Notes**

1. Investigate any unusual noises.

**The following "noises" may indicate a mechanical defect:**

1. 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.
2. A "whining" noise that varies with acceleration.
   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.**

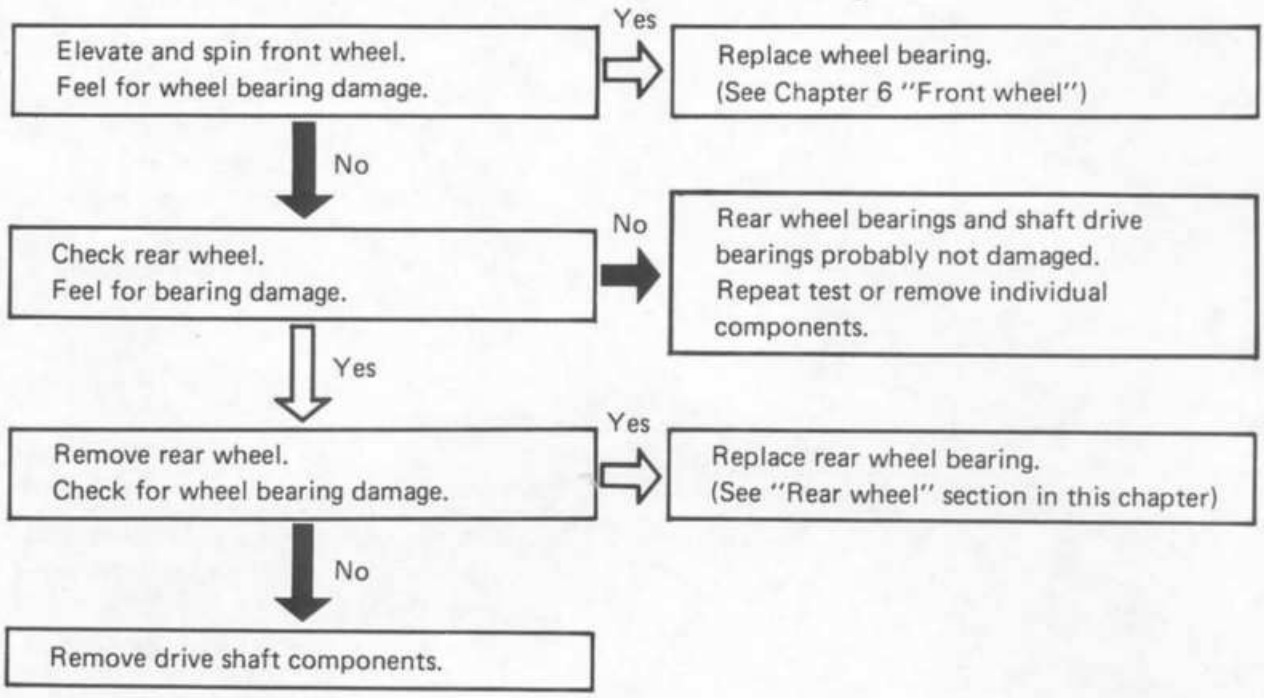
3. A slight "thunk" evident at low speed operation. This noises must be distinguished from normal motorcycle operation.
   Diagnosis: Possible broken gear teeth.

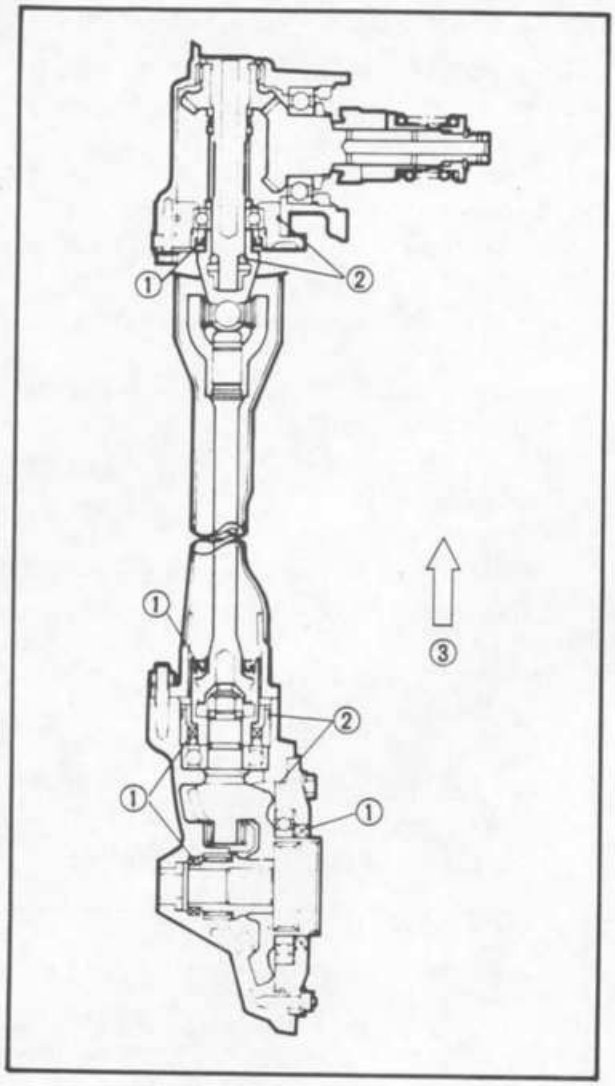
**WARNING:**

**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 bike and possible injury to the rider.**

**Troubleshooting chart**

Where basic conditions "1" and "2" above exist, refer to the following chart:






2. Inspect:
   - Shaft drive (leakage)

**Oil leak inspection steps:**
- Clean the entire motorcycle thoroughly, then dry it.
- Apply a leak-localizing compound or dry power 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.

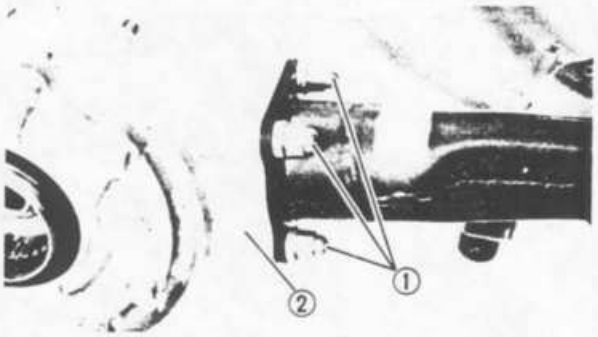
**NOTE:**
- An apparent oil leak on a new or nearly new motorcycle may be the result of a rust-preventive coating or excessive seal lubrication.
- Always clean the motorcycle and recheck the suspected location of an apparent leakage.

① Oil seal
② O-ring
③ Forward

3. Inspect:
   - Drained oil

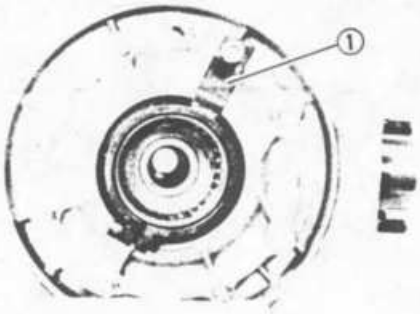
   Metal particles on drain plug or in oil → Check for bearing seizure or other problem in middle or final gear assemblies.

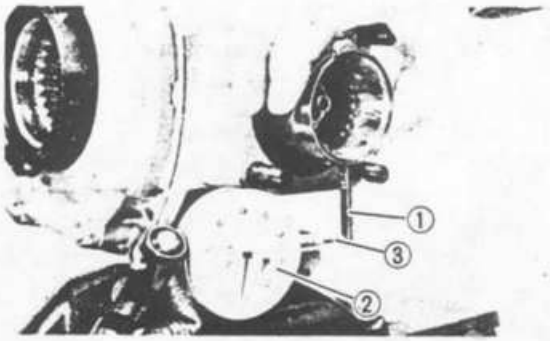
**NOTE:**
Small amount of metal particles in oil is normal.

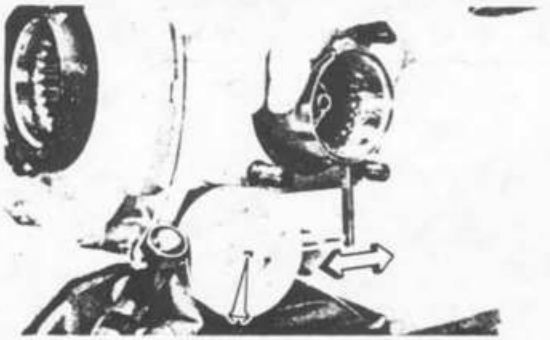


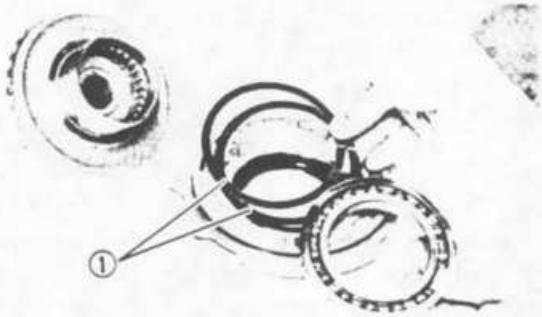

### FINAL GEAR REMOVAL

1. Remove:
   - Rear axle
   - Rear wheel
   - Left shock absorber
   - Nut ①
   - Final gear assembly ②






## GEAR LASH CHECK AND ADJUSTMENT

1. Secure gear case in vise or other support.
2. Remove:
   - Final gear case stud nut
     (from final gear case)
3. Attach:
   - Final Gear Holding Tool (90890-01254) ①.
     (Over ring gear surface and stud)
     Tighten holding tool stud nut.
4. Attach:
   - Final Gear Lash Measurement Tool (90890-01230) ①
     (onto gear coupling)
   - Dial Gauge ②
     (against lash measurement tool)
     Position gauge rod at scribed mark ③ (60 mm (2.36 in) from center of shaft).
5. Rotate:
   - Gear coupling
     Turn gently back and forth.
     Note lash measurement on the dial gauge.

**Final Gear Lash:**
**0.25 ~ 0.50 mm (0.010 ~ 0.020 in):**
**When using the measurement tool.**
**0.1 ~ 0.2 mm (0.004 ~ 0.008 in):**
**Actual gear lash on the final gear teeth.**

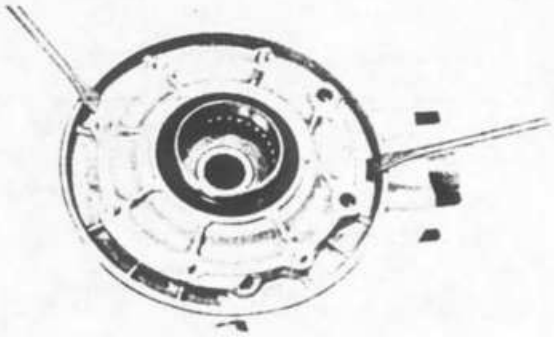
Out of specification → Adjust.

| Gear Lash | Ring Gear Shim ① |
|---|---|
| to reduce | Increase |
| to increase | Reduce |

**NOTE:**

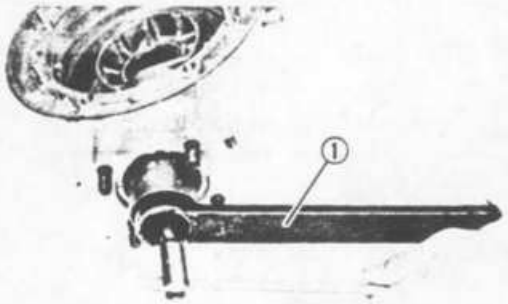
If it is necessary to increase ring gear shim by more than 0.1 mm, reduce thrust washer thickness by 0.1 mm for each 0.1 mm of ring gear shim increase. If it is necessary to reduce shim by more than 0.1 mm, reverse above step.

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## FINAL GEAR DISASSEMBLY

1. Remove:
   - Nuts and bolts
     (from Bearing housing)
   - Ring gear assembly
     (from Final gear case)
   - Thrust washer
     (from Final gear case)



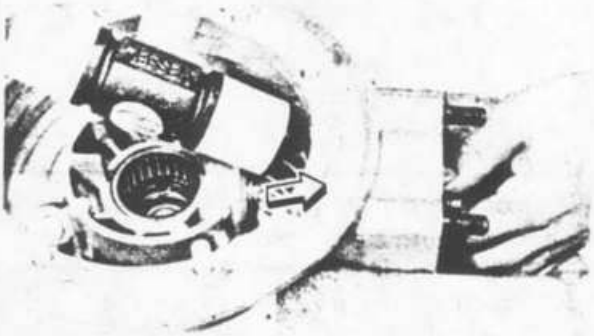

2. Remove:
   - Self-lock nut
     (from Final drive shaft)
     Use Middle and Final Gear Holding Tool (90890-01229) ①.
   - Coupling




3. Remove:
   - Final drive shaft bearing retainer
     Using Final Drive Shaft Bearing Retainer Wrench (90890-04050) ①.

**CAUTION:**

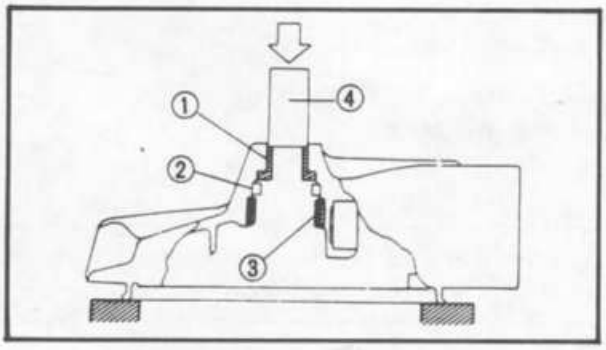
**Final-drive-shaft-bearing-retainer nut has left-hand threads. Turn retainer nut clockwise to loosen it.**



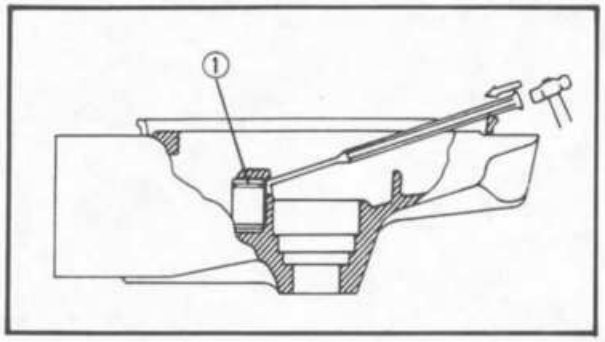
4. Remove:
   - Final drive shaft

**CAUTION:**

**Final drive shaft removal should be performed only if gearing replacement is necessary. Do not reuse bearings or races after removal.**



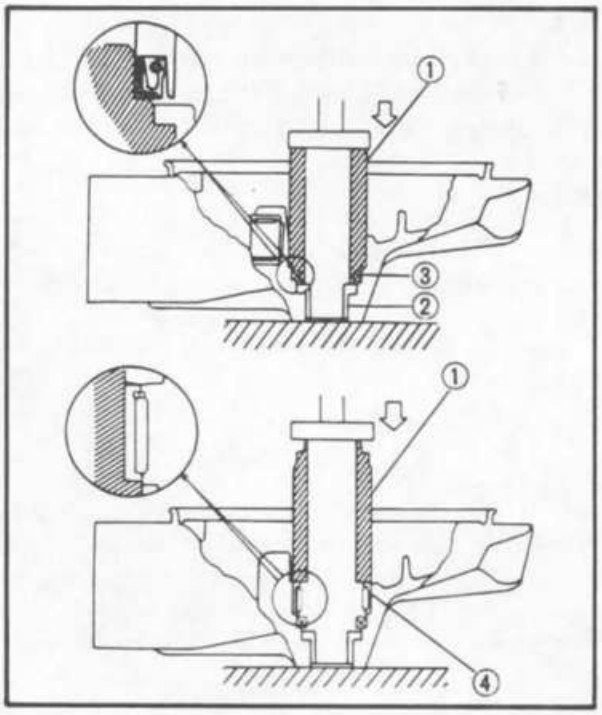

5. Remove:
   - Guide collar ①
   - Oil seal ②
     Do not reuse the oil seal.
   - Roller bearing ③
     Use Press tool No. 1 ④ and an appropriate supprot for the main housing.
6. Inspect:
   - Roller bearing
     Damage → Replace.




7. Remove:
   - Final drive shaft roller bearing

**Final drive shaft roller bearing removal steps:**
- Heat the bearing housing to 150°C (302°F).
- Remove the roller bearing outer race ① with an appropriately shaped punch.
- Remove the inner race from the final drive shaft.

NOTE:
The removal of the final drive shaft roller bearing is difficult and seldom necessary.




## FINAL GEAR ASSEMBLY

1. Assembly of final drive shaft roller bearing is as follows:
   - Install a new final drive shaft roller bearing.
   - Heat bearing housing to 150°C (302°F)
   - Install roller bearing outer race using an appropriate adapter.
   - Install inner race onto final drive shaft.
2. Install in sequence:
   - Guide collar ②
   - Oil seal (New) ③
   - Roller bearing ④

   Use Press tool No. 2 ① and a press.

NOTE:
We recommend that any removed roller bearing be replaced with a new one.

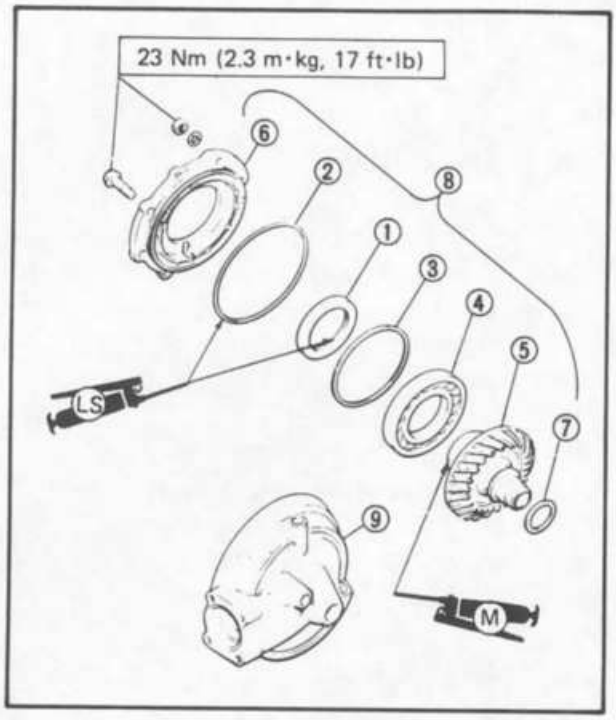


3. Install:
   - Shims (Proper size as calculated)
   - Final drive shaft gear
   - Bearing retainer nut
   - Coupling

NOTE:
The bearing retainer nut has left-hand threads; turn nut counterclockwise to tighten it.

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**Bearing Retainer Nut:**
**110 Nm (11 m·kg, 80 ft·lb)**
**Coupling:**
**110 Nm (11 m·kg, 80 ft·lb)**




4. Install:
   - Oil seal ①
   - O-ring ②
   - Shims (Proper size as calculated) ③
   - Bearing ④
   - Ring gear ⑤
     (into bearing housing ⑥)
   - Thrust washer ⑦
     (onto ring gear ⑤)
   - Ring gear assembly (Proper size as measured) ⑧
     (into final gear case ⑨)
5. Tighten:
   - Bearing housing ⑥

**Bearing Housing:**
**23 Nm (2.3 m·kg, 17 ft·lb)**

6. Adjust:
   - Gear lash
     Refer to "GEAR LASH CHECK AND ADJUSTMENT".

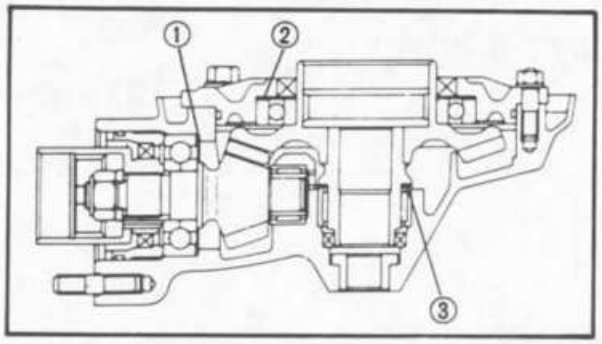
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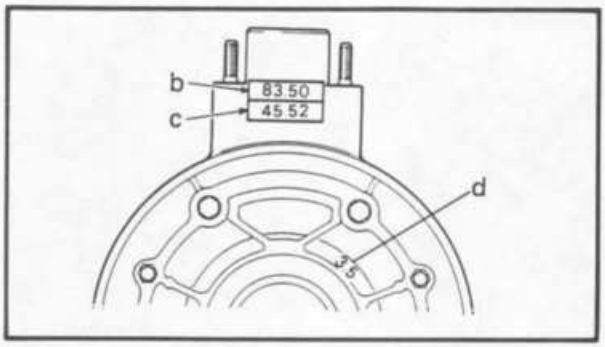
## FINAL DRIVE/RING GEAR POSITIONING

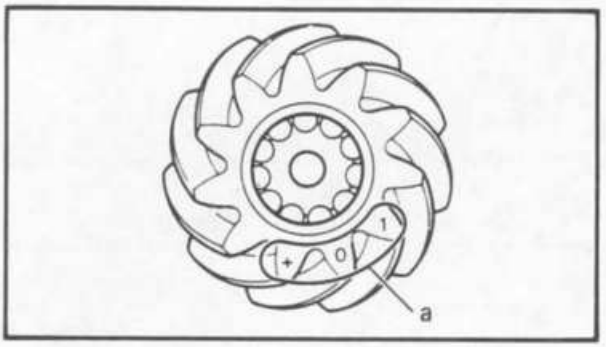
**NOTE:**

Gear positioning is necessary when any of the following parts are replaced.

- Final gear case
- Ring gear bearing housing
- Bearing(s)




**Final drive/ring gear shim selection formulas:**

- Position final drive shaft gear and ring gear by using shims ① and ② with their respective thickness calculated from information marked on final gear case and drive gear end.

① Shim thickness "A"
② Shim thickness "B"
③ Thrust washer

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

$A = a - b$

Where:

a = a numeral (usually a decimal number) on the gear is either added to or subtracted from "84".

b = a numeral on the gear case (i.e. 83.50).

Example:

1. If final drive shaft gear is markd "+01" . . . "a" is 84.01.
2. If the gear case is marked "83.05" . . . "b" is 83.50.

$A = 84.01 - 83.50$
$= 0.51$

3. Therefore, shim thickness is 0.51 mm. Shim sizes are supplied in following thickness:

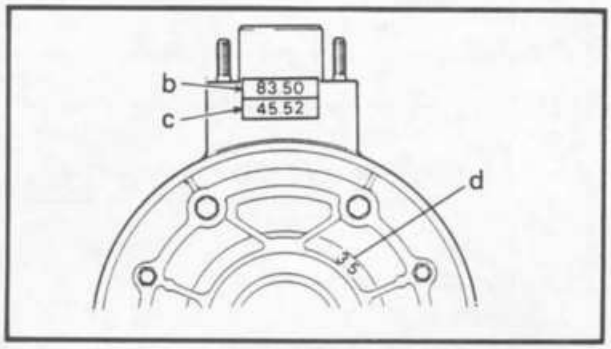
0.15 mm, 0.30 mm, 0.40 mm,
0.50 mm, 0.60 mm

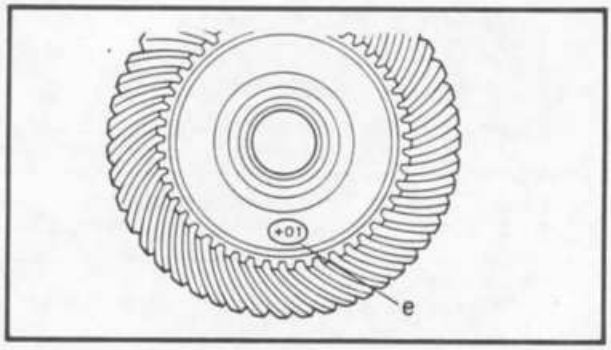
Because shims can only be selected in 0.05 mm increments, round off hundredths digit and select appropriate shim (s).

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

6

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:

$B = c + d - (e + f)$

Where:

c = numeral on gear case (i.e. 45.52)

d = numeral (usually a decimal number) on outside of ring gear bearing housing and added to 3.

e = numeral (usually a decimal number) on inside of ring gear either added to or subtracted from 35.40.

f = bearing thickness (considered constant).

Bearing Thickness "f" = 13.00 mm

Example:

1. If gear case is marked "45.52" ... "c" is 45.52.
2. If ring gear bearing housing is marked "35" ... "d" is 0.35 + 3 = 3.35.
3. If ring gear is marked "+01" ... "e" is 35.40 + 0.01 = 35.41.
4. Therefore, "f" is 13.00.

$B = c + d - (e + f)$

$= 45.52 + 3.35 - (35.41 + 13.00)$

$= 48.87 - (48.41)$

$= 0.46$

5. Therefore shim thickness is 0.46 mm.

**NOTE:**

Use chart for final-drive-shaft shim to select ring gear shim size.

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**Thrust washer selection formulas:**

1. Place four pieces of Plastigage® between originally fitted thrust washer and ring gear.
2. Install:
   - Gear case (onto ring gear assembly)
   - Bolts and nuts

**Bolt/Nut:**
**23 Nm (2.3 m·kg, 17 ft·lb)**

NOTE:
Do not turn drive pinion/ring gear when measuring clearance with Plastigage®.

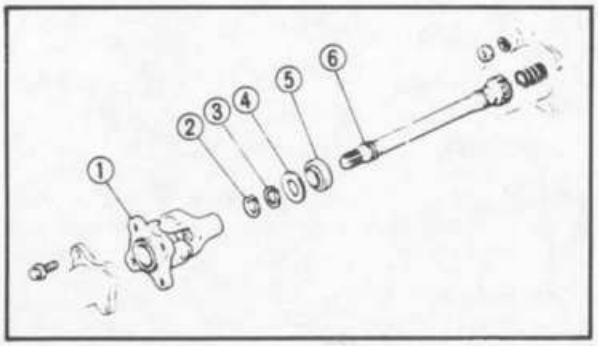
3. Remove:
   - Ring gear assembly
4. Measure:
   - Ring gear thrust clearance
     Calculate width of flattened Plastigage® ①.
     Out of specification → Replace thrust washer to obtain correct clearance.




**Ring Gear Thrust Clearance:**
**0.1 ~ 0.2 mm (0.004 ~ 0.008 in)**

If clearance is below 0 mm, replace thrust washer for thinner one and remeasure.

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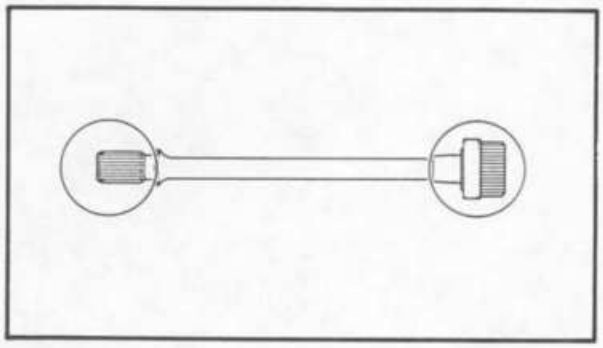



## DRIVE SHAFT

① Universal joint
② Circlip
③ Circlip
④ Plate washer
⑤ Oil seal
⑥ Drive shaft

**Removal**

1. Remove:
   - Refer wheel
     Refer to "REAR WHEEL" in this chapter.
   - Final gear case assembly
     Refer to "SHAFT DRIVE" in this chapter.
   - Drive shaft
     Refer to "SWINGARM" in this chapter.



**Inspection**

1. Inspect:
   - Drive shaft (Splines)
     Excessive wear or damage → Replace.

**NOTE:**

When installing drive shaft, lubricate splines with molybdenum disulfide grease.

**Installation**

When installing drive shaft, reverse removal steps.

**NOTE:**

- Lubricate shaft splines with molybdenum disulfide grease.
- Torque final gear case nuts to specification.

| | |
|---|---|
| | Nuts: 42 Nm (4.2 m·kg, 30 ft·lb) |

6

## CABLES AND FITTINGS

### CABLE MAINTENANCE

**NOTE:**

See "Maintanance and Lubrication" intervals charts. Cable maintenance is primarily concerned with preventing deterioration and providing proper lubrication to allow the cable to move freely within its housing. Cable removal is

straightforward and uncomplicated. Removal is not discussed within this section.

**WARNING:**

**Cable routing is very important. For details of cable routing, see cable routing diagrams at end of this manual. Improperly routed or adjusted cables may make motorcycle operation unsafe.**

1. Remove:
   - Cable
2. Inspect:
   - Cable

   Obstructed movement → Inspect for kinking and/or frayed strands.
   Damage → Replace.

**Cable Lubrication Steps:**
- Hold the cable in a vertical position.
- Apply lubricant to the uppermost end of the cable.
- Leave in a vertical position until the lubricant appears at the bottom.
- Allow excess to drain, then reinstall the cable.

**NOTE:**

Choice of lubricant depends upon conditions and preferences; however, a semi-drying chain and cable lubricant will perform adequately under most conditions.

### THROTTLE MAINTENANCE

1. Remove:
   - •Phillips head screws
     (from throttle housling assembly)
     Separate the housing halves.
2. Disconnect:
   - •Cable
     (from throttle grip assembly)
3. Remove:
   - •Throttle grip assembly
4. Clean:
   - •All parts
     Use mild solvent.
   - •Right-hand end of handlebar
5. Inspect:
   - •Contact surfaces
     Burrs/Damage → Deburr or replace.
   - •Right-hand end of handlebar
6. Lubricate all contact surfaces with a light coat of lithium-soap base grease and re-assembly.

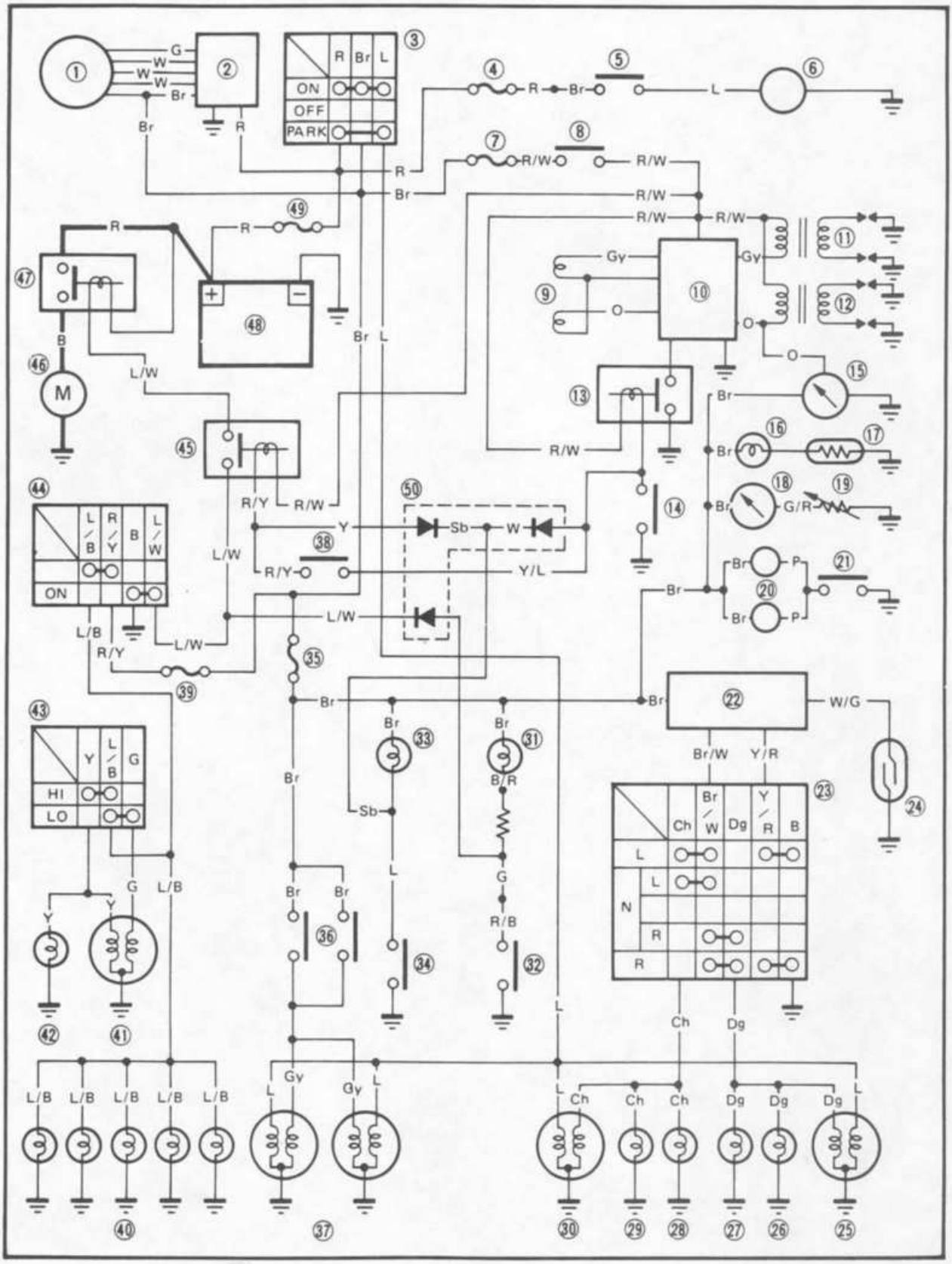
**NOTE:**

Tighten the housing screws evenly to maintain an even gap between housing halves.

7. Check:
   - •Throttle (For smooth operation)
     Un smooth operation → Lubricate
   - •Spring (For quick return)
     Sluggish operation → Replace
   - •Housing (For tightness)
     Looseness → Replace

# ELECTRICAL

## XJ750XN CIRCUIT DIAGRAM



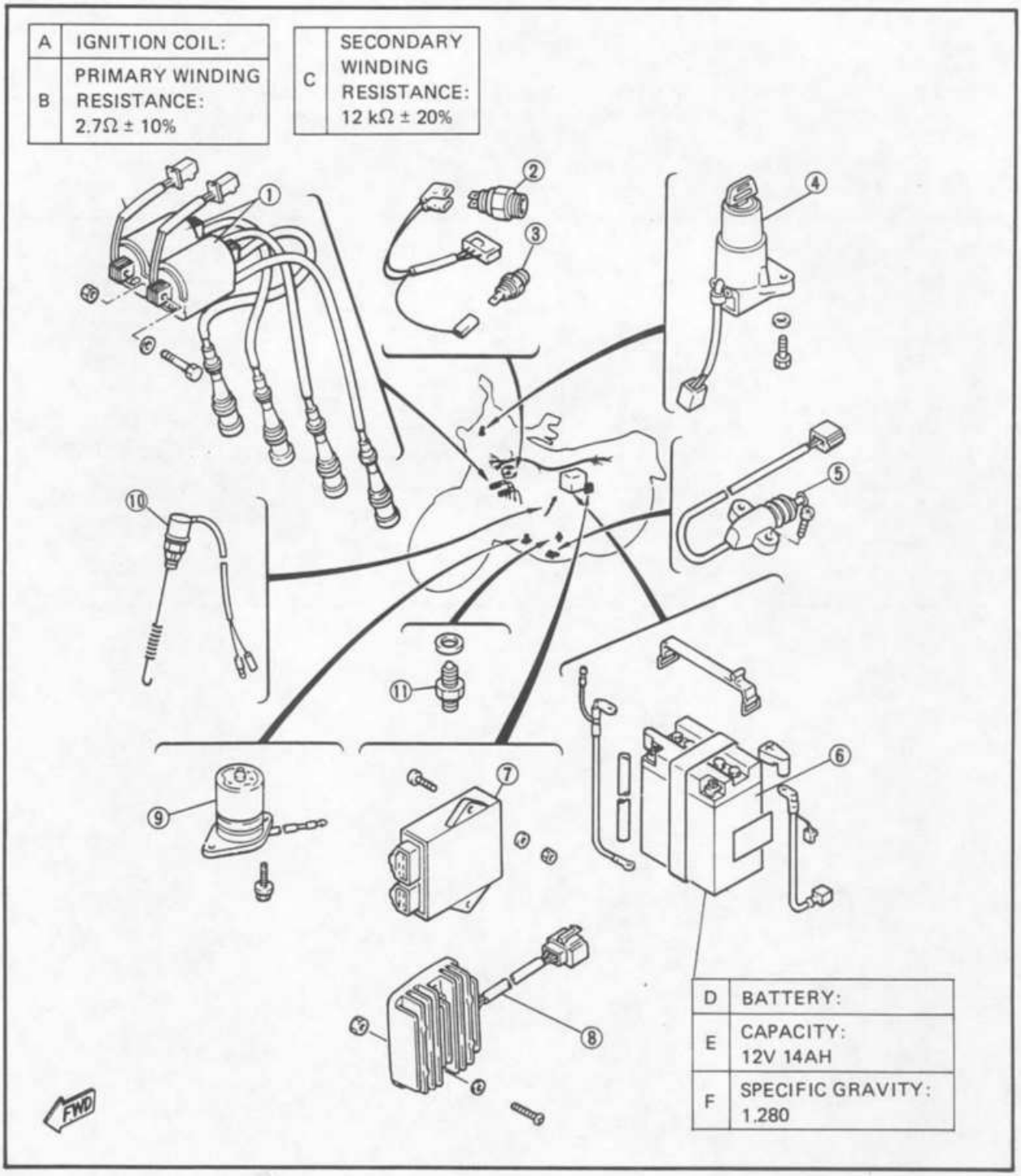
① A.C. Generator
② Rectifier/Regulator
③ Main switch
④ Fuse "FAN" (10A)
⑤ Thermo switch
⑥ Fan motor
⑦ Fuse "IGNITION" (10A)
⑧ "ENGINE STOP" switch
⑨ Pickup coil
⑩ T.C.I. unit
⑪ Ignition coil ( #2, #3)
⑫ Ignition coil (# 1, #4)
⑬ Sidestand relay
⑭ Sidestand switch
⑮ Tachometer
⑯ "FUEL" warning light
⑰ Fuel sender
⑱ Temperature meter
⑲ Thermo unit
⑳ Horn
㉑ "HORN" switch
㉒ Flasher relay (Relay assembly)
㉓ Flasher switch
㉔ Reed switch
㉕ Flasher light (Front, Right)
㉖ Flasher light (Rear, Right)
㉗ "TURN" indicator light (Right)
㉘ "TURN" indicator light (Left)
㉙ Flasher light (Rear, Left)
㉚ Flasher light (Front, Left)
㉛ "OIL LEVEL" indicator light
㉜ Oil level switch
㉝ "NEUTRAL" indicator light
㉞ Neutral switch
㉟ Fuse "SIGNAL" (15A)
㊱ Brake switch
㊲ Tail/Brake light
㊳ Clutch switch
㊴ Fuse "HEAD" (15A)
㊵ Meter light
㊶ Head light
㊷ "HIGH BEAM" indicator light
㊸ "LIGHTS" (Dimmer) switch
㊹ "START" switch
㊺ Starting circuit cut-off relay (Relay assembly)
㊻ Starter motor
㊼ Starter relay
㊽ Battery
㊾ Fuse "MAIN" (30A)
㊿ Diode assembly

## COLOR CODE

| | | | | | |
|---|---|---|---|---|---|
| O | Orange | Lg | Light green | B/Y | Black/Yellow |
| R | Red | Y/G | Yellow/Green | L/W | Blue/White |
| L | Blue | Y/R | Yellow/Red | L/G | Blue/Green |
| Br | Brown | Y/B | Yellow/Black | L/R | Blue/Red |
| B | Black | Y/L | Yellow/Blue | L/B | Blue/Black |
| Y | Yellow | Br/W | Brown/White | G/L | Green/Blue |
| W | White | R/B | Red/Black | G/R | Green/Red |
| G | Green | R/L | Red/Blue | G/Y | Green/Yellow |
| P | Pink | R/W | Red/White | G/W | Green/White |
| Dg | Dark green | R/Y | Red/Yellow | W/R | White/Red |
| Ch | Chocolate | B/R | Black/Red | W/B | White/Black |
| Gy | Gray | B/W | Black/White | W/G | White/Green |
| Sb | Sky blue | | | | |

## ELECTRICAL COMPONENTS 1

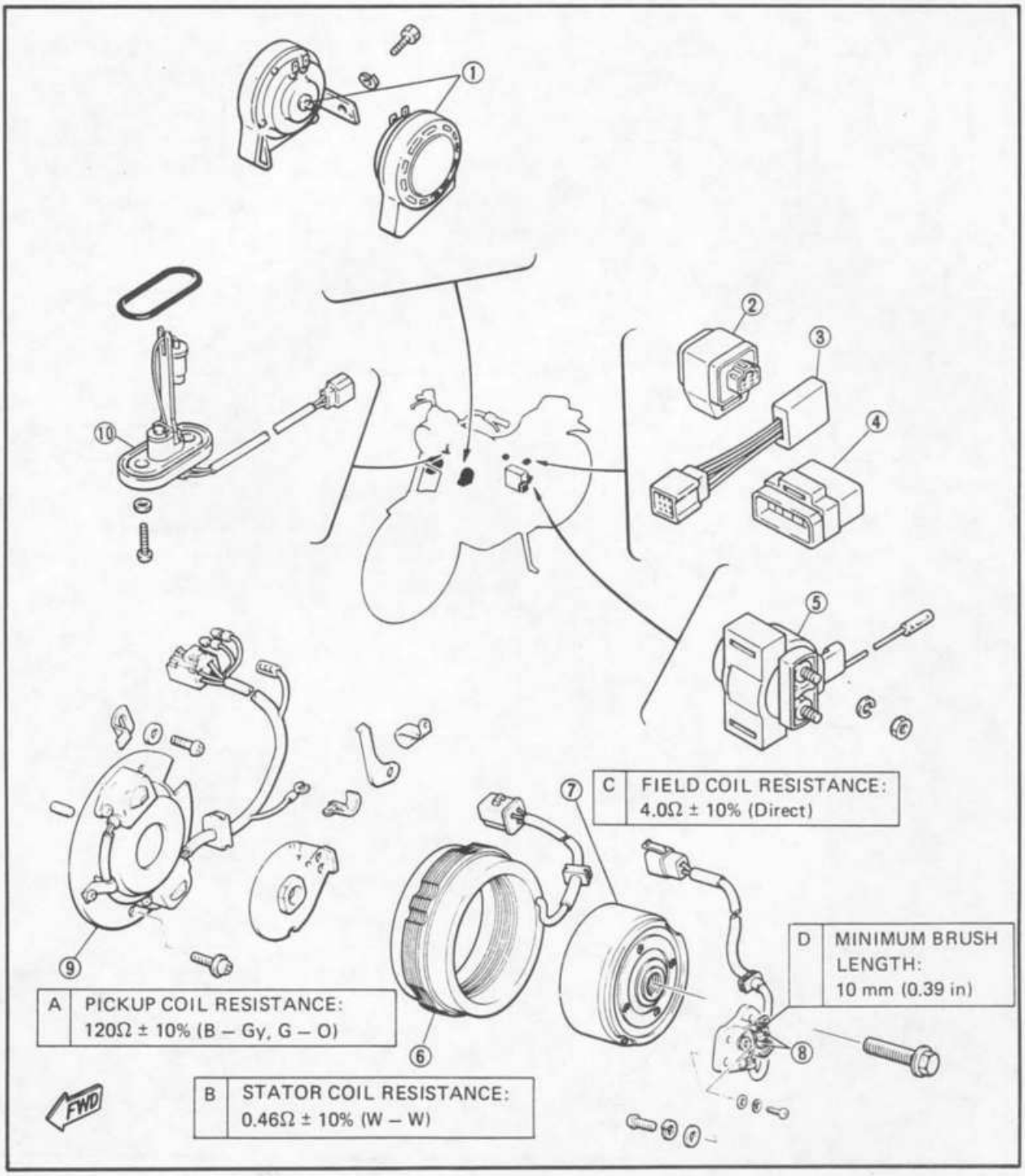
① Ignition coil
② Thermo switch
③ Thermo unit
④ Main switch
⑤ Sidestand switch
⑥ Battery
⑦ T.C.I. unit
⑧ Rectifier/Regulator
⑨ Oil level switch
⑩ Rear brake switch
⑪ Neutral switch



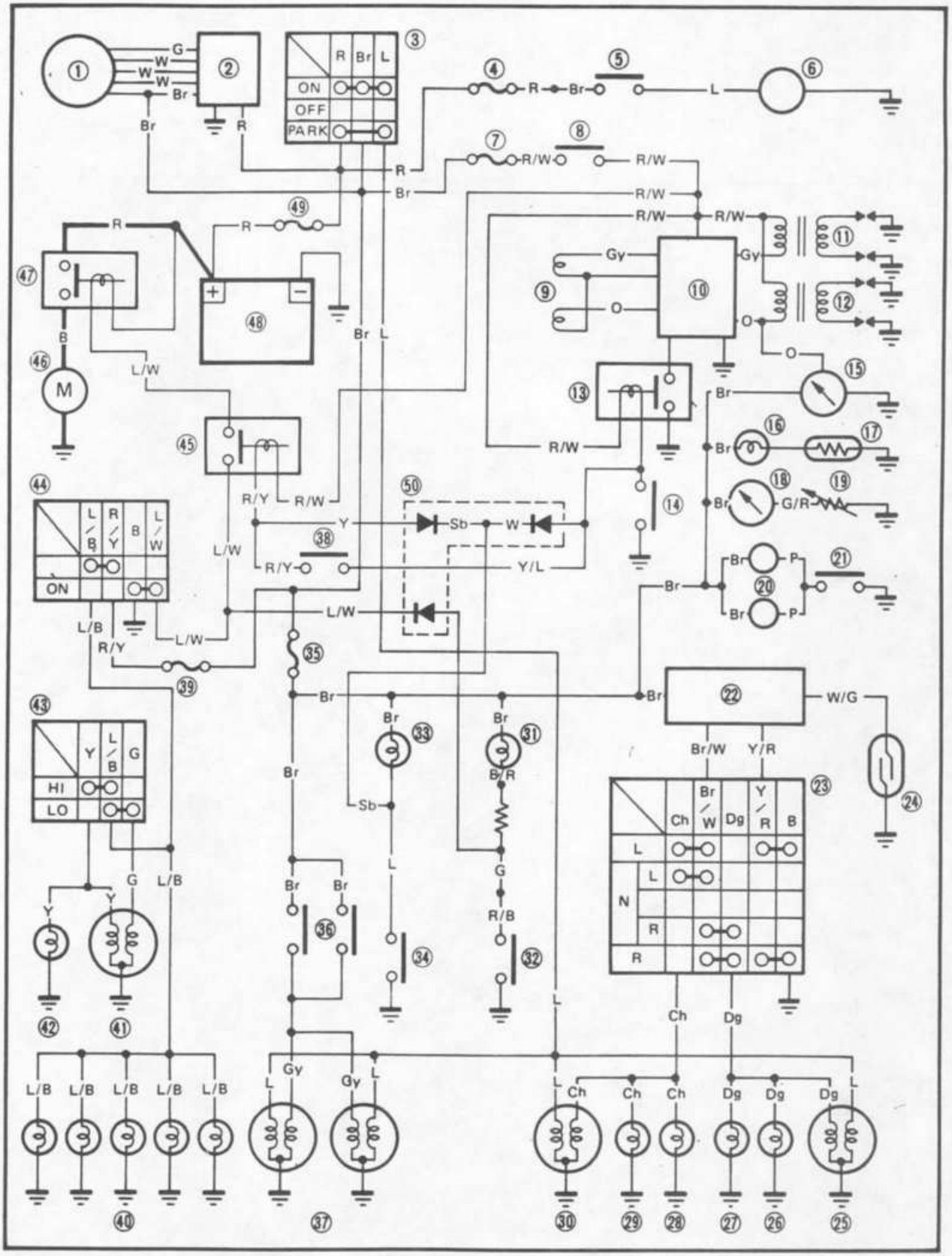

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## ELECTRICAL COMPONENTS 2

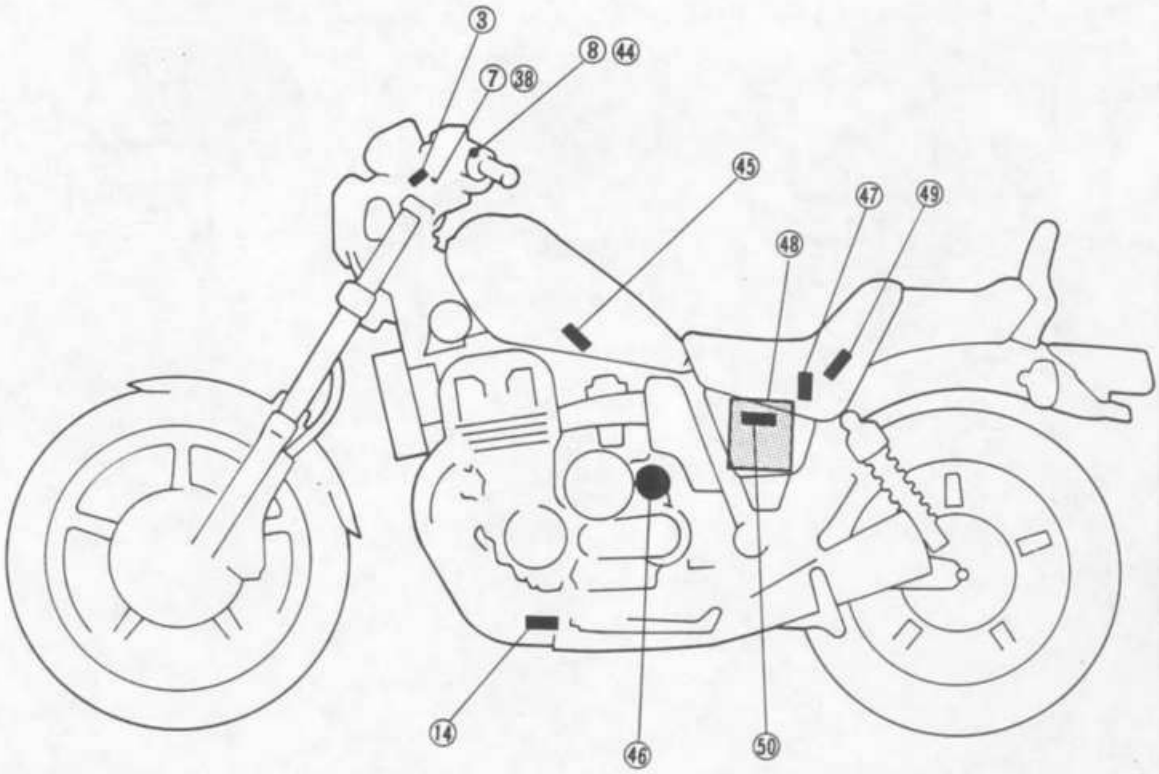
① Horn
② Sidestand relay
③ Diode assembly
④ Relay assembly (Flasher relay, Starting circuit cut-off relay)
⑤ Starter switch
⑥ Stator coil
⑦ Field coil (Rotor)
⑧ Brush
⑨ Pickup coil assembly
⑩ Fuel sender



## ELECTRIC STARTING SYSTEM



③ Main switch
⑦ Fuse "IGNITION" (10A)
⑧ "ENGINE STOP" switch
⑭ Sidestand switch
㊳ Fuse "HEAD" (15A)
㊹ "START" switch
㊺ Starting circuit cut-off relay (Relay assembly)
㊻ Starter motor
㊼ Starter relay
㊽ Battery
㊾ Fuse "MAIN" (30A)
㊿ Diode assembly



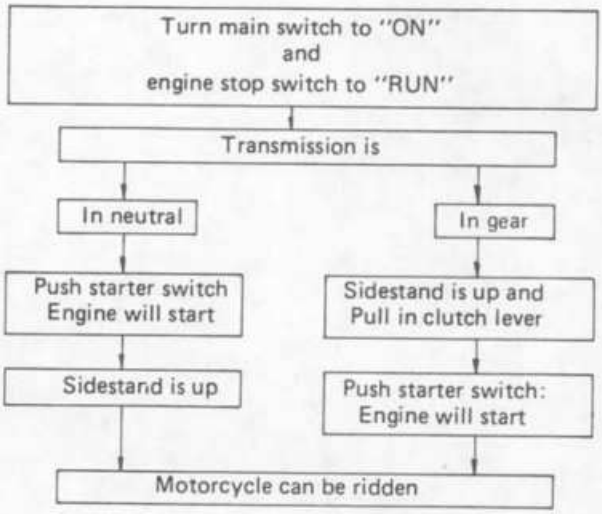

7

# ELECTRIC STARTING SYSTEM

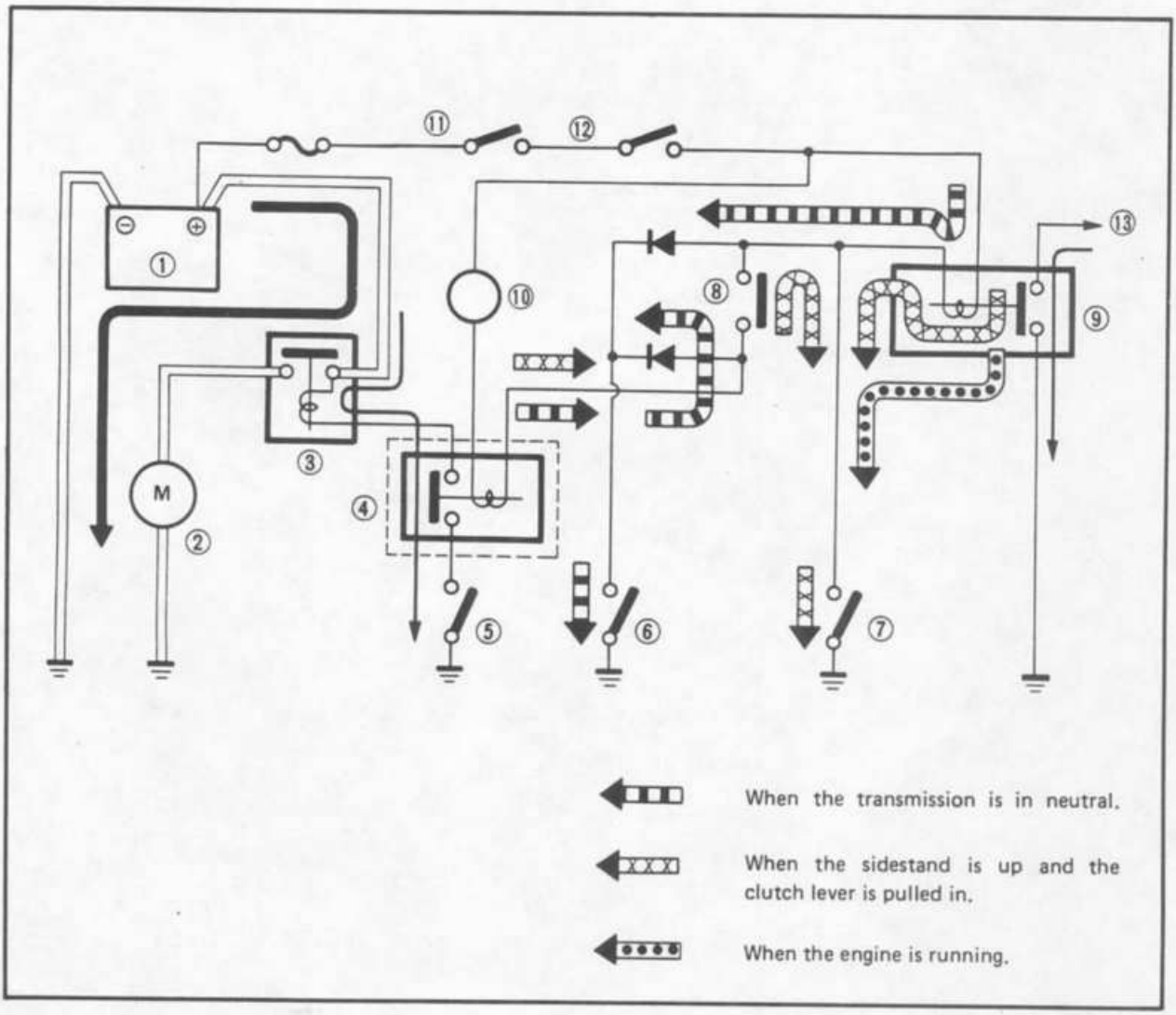
## STARTING CIRCUIT OPERATION

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

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




① Battery
② Starter motor
③ Starter relay
④ Starting circuit cut-off relay
⑤ Starter switch
⑥ Neutral switch
⑦ Sidestand switch
⑧ Clutch switch
⑨ Sidestand relay
⑩ Tachometer
⑪ Main switch
⑫ Engine stop switch
⑬ To ignitor unit

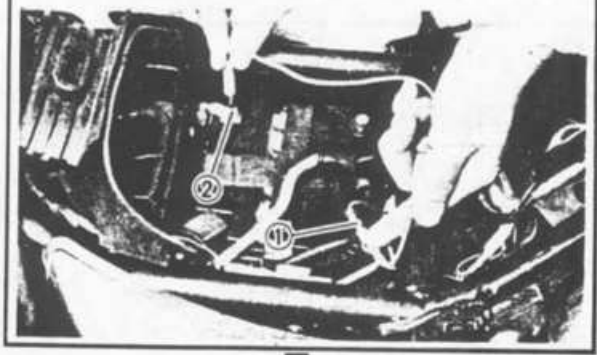



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## TROUBLESHOOTING CHART

THE STARTER MOTOR DOES NOT OPERATE.

Connect "L/W" lead from the starter relay ① to the battery negative (–) terminal ② ; use a jumper lead.




→ The engine does not rev smoothly.

Recharge or replace the battery.

→ The engine does not operate.

Check the battery voltage (12V) on the "L/W" lead from the starter relay.

If the starter relay does not click, check the starter relay and starter motor.

The engine operates.

Main and engine stop switches are turned to "ON".

Connect "B/Y" lead to "ground" on the frame; use a jumper lead ① .

| W/G | Y/R | B | B/Y | R/W |
|---|---|---|---|---|
| Br | Br/W | | L/W | L/W |




→ If the relay unit does not click, check the battery voltage (12V) on the "R/W" lead.

| W/G | Y/R | B | B/Y | R/W |
|---|---|---|---|---|
| Br | Br/W | | L/W | L/W |

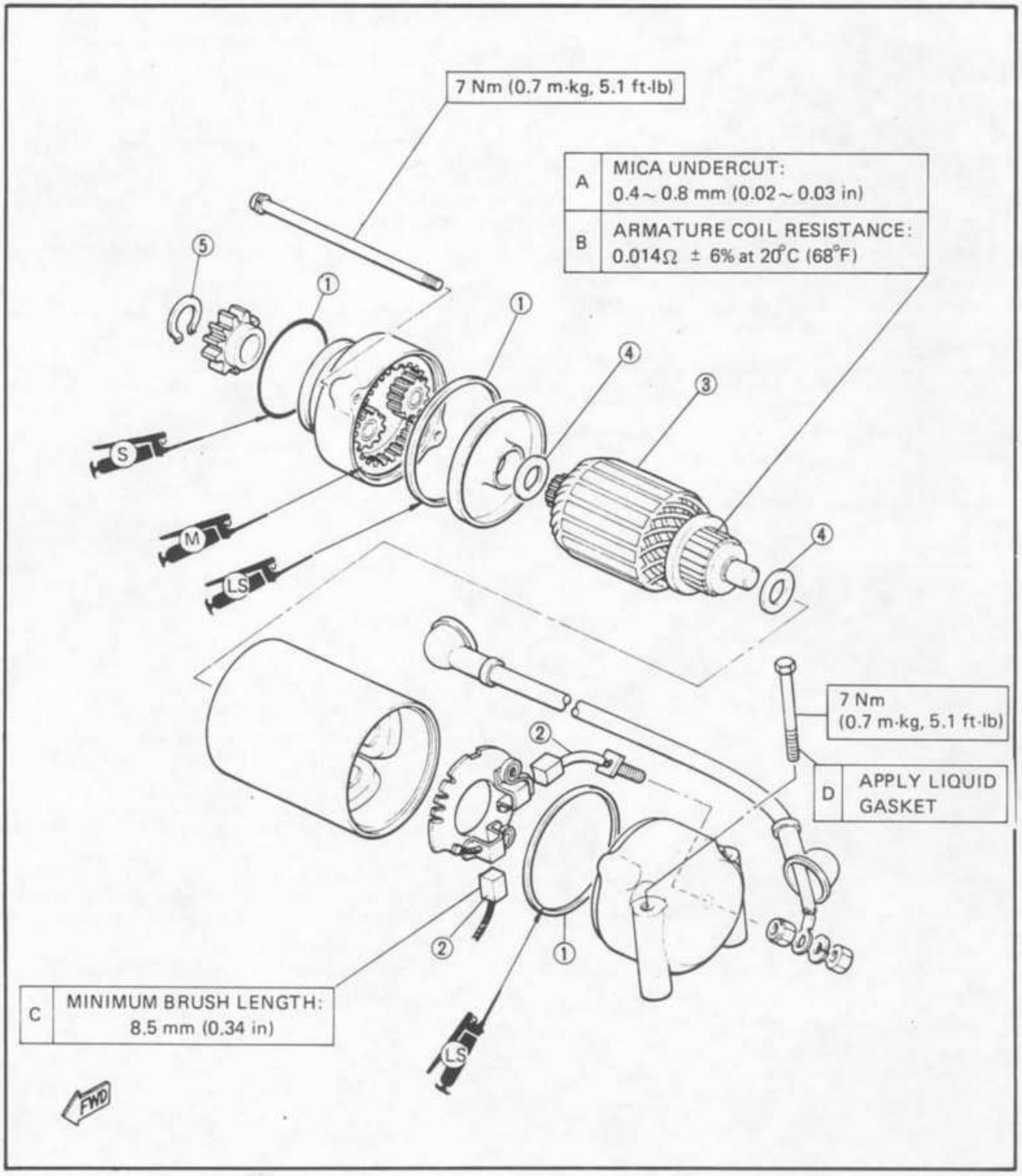
Check for an open or poor connection between the main switch and relay unit.

If the relay unit clicks, check the starter, sidestand, clutch and neutral switches. Replace switch(es) if necessary.

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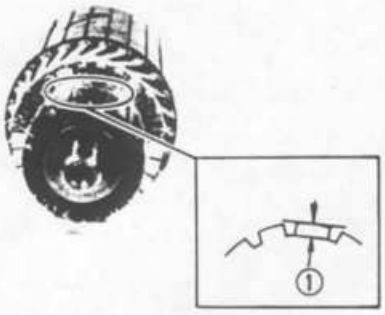
## STARTER MOTOR

① O-ring
② Brush
③ Armature
④ Washer
⑤ Circlip



**Removal**

Refer Chapter 3. "ENGINE DISASSEMBLY".



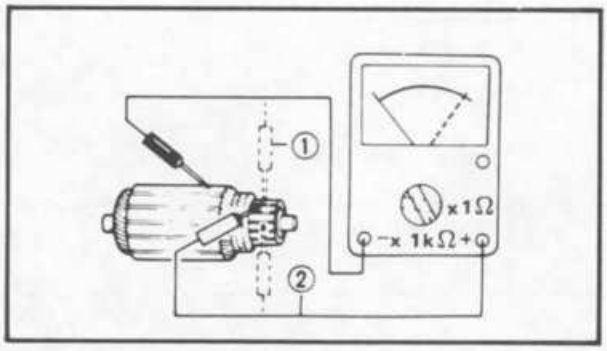

**Inspection**

1. Inspect:
   - Commutator (outer surface)
     Dirty → Clean with # 600 grit sandpaper.
   - Mica insulation
     (between commutator segments)
     Out of specification → Scrape mica to proper limits.
     Use a hacksaw blade that is ground to fit.

| | |
|---|---|
| | **Mica Undercut ① :**<br>**0.4 ~ 0.8 mm (0.02 ~ 0.03 in)** |

**NOTE:**

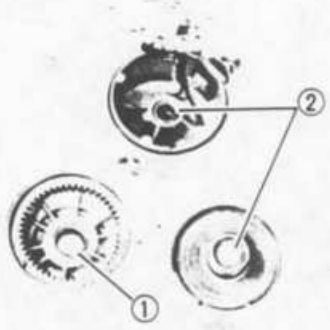
The mica insulation of commutator must be under-cut to ensure proper operation of commutator.




2. Measure:
   - Armature coil continuity ①
     No continuity → Replace starter motor.

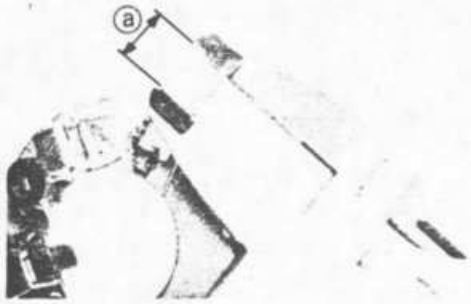
| | |
|---|---|
| | **Armature Coil:**<br>**0.014Ω ± 6% at 20°C (68°F)** |

   - Armature coil insulation ②
     Short circuit → Replace starter motor.




3. Inspect:
   - Front cover bearing ①
   - Center and rear covers bushings ②
     Damage → Replace.

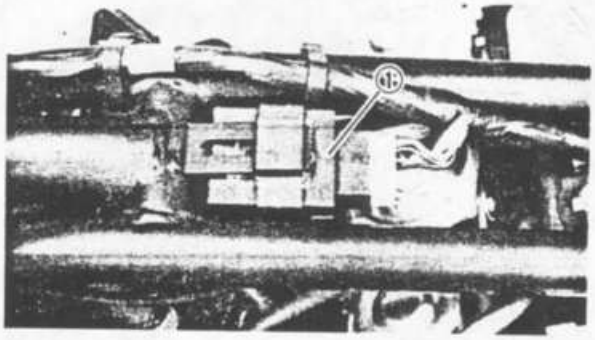
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4. Measure:
   - Brush length (each) ⓐ
     Out of specification → Replace.

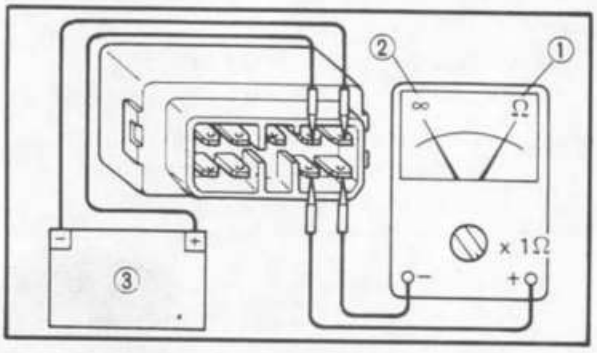
| Minimum Brush Length: 8.5 mm (0.34 in) |
|---|

5. Check:
   - Brush spring pressure
     Compare with new spring.
     Weak pressure → Replace spring.




### STARTING CIRCUIT CUT-OFF RELAY
**(Relay Assembly)**

1. Remove:
   - Seat
   - Fuel tank
   - Relay assembly ①



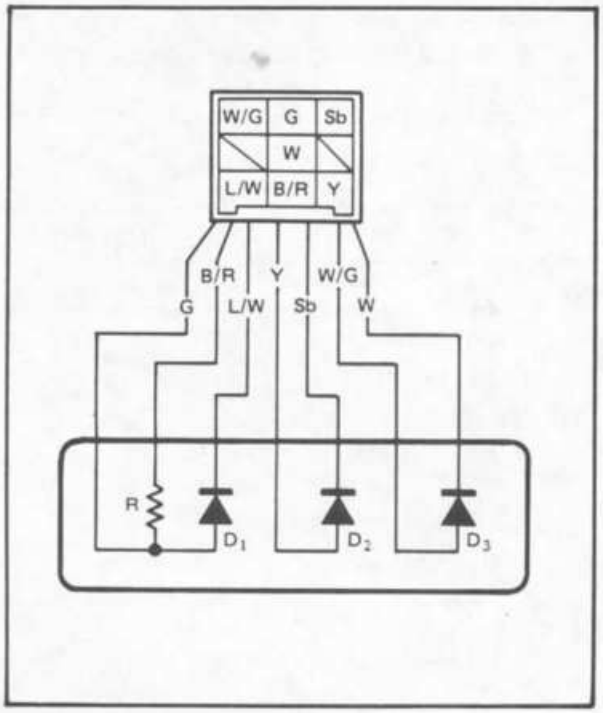

2. Check:
   - Relay contacts
     Use 12V battery ③ and Pocket Tester (90890-03112).
     Out of specification → Replace relay.

| Battery Connected: 0 Ω ①<br>Battery Disconnected: ∞ ② |
|---|




### DIODE

1. Remove:
   - Left side cover
   - Diode ①

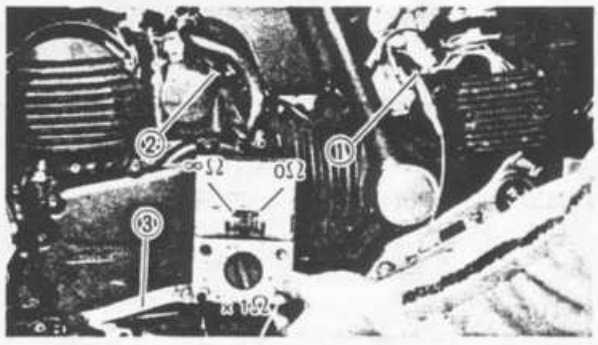



2. Check:
   - Diode continuity/discontinuity
     Defective element(s) → Replace the unit.

| Checking element | Pocket tester connecting point | | Good |
|---|---|---|---|
| | (+) (red) | (−) (black) | |
| $D_1$ | G | L/W | ○ |
| | L/W | G | X |
| $D_2$ | Y | Sb | ○ |
| | Sb | Y | x |
| $D_3$ | W/G | W | ○ |
| | W | W/G | x |
| R | G | B/R | 8.2Ω |

○ : Continuity (0Ω) (Scale Ω x 1k)
x : Discontinuity (∞) (Scale Ω x 1)

**NOTE:**
The results "○" or "x" should be reversed according to the pocket tester polarity.



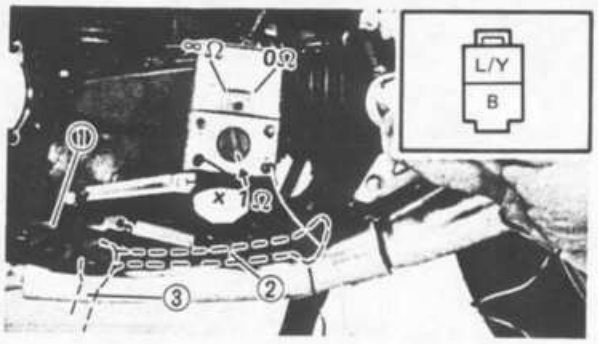

### NEUTRAL SWITCH

1. Remove:
   - Left side cover
   - Pannel
2. Check:
   - Neutral switch contact
     Out of specification → Replace switch.

| Shift pedal ③ | In neutral | In gear |
|---|---|---|
| Tester | 0 Ω | ∞ Ω |

① Blue lead
② Ground

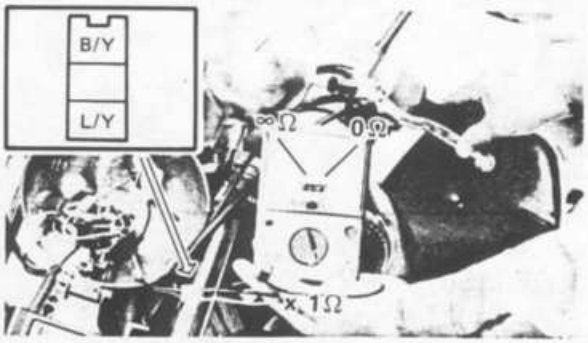
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### SIDESTAND SWITCH

1. Refer to neutral switch removal steps.
2. Check:
   - Sidestand switch ① contact
     Out of specification → Replace switch.

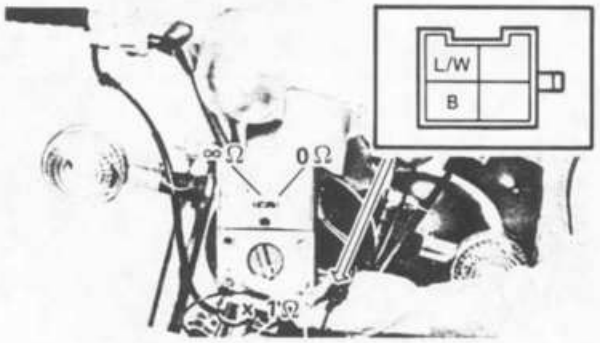
| Sidestand | Up ② | Down ③ |
|---|---|---|
| Tester | 0 Ω | ∞ Ω |




### CLUTCH SWITCH

1. Remove:
   - Headlight unit
2. Check:
   - Clutch switch contact
     Out of specification → Replace switch.

| Clutch lever | Pull in | Not pull in |
|---|---|---|
| Tester | 0 Ω | ∞ Ω |




### STARTER SWITCH

1. Remove:
   - Headlight unit
2. Check:
   - Starter switch contact
     Out of specification → Replace switch.

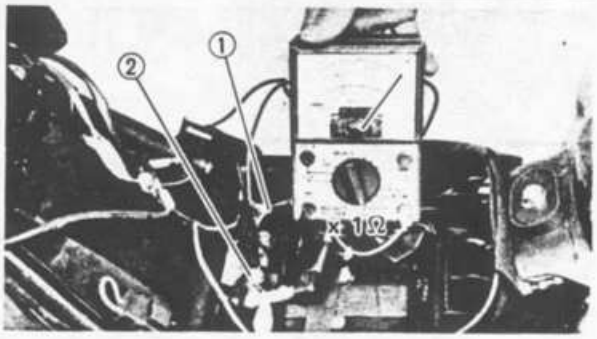
| Starter switch | ON | OFF |
|---|---|---|
| Tester | 0 Ω | ∞ Ω |

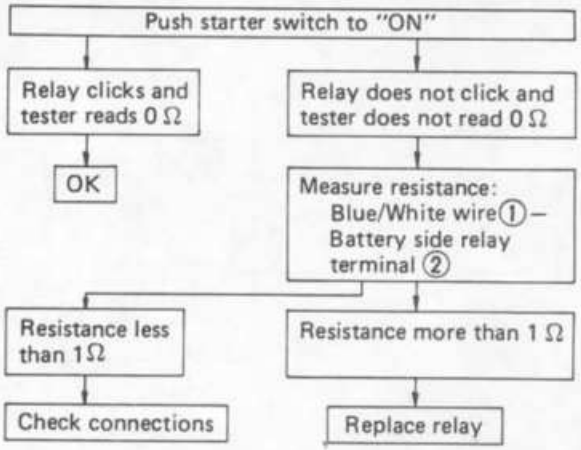


### STARTER RELAY

**Inspection**

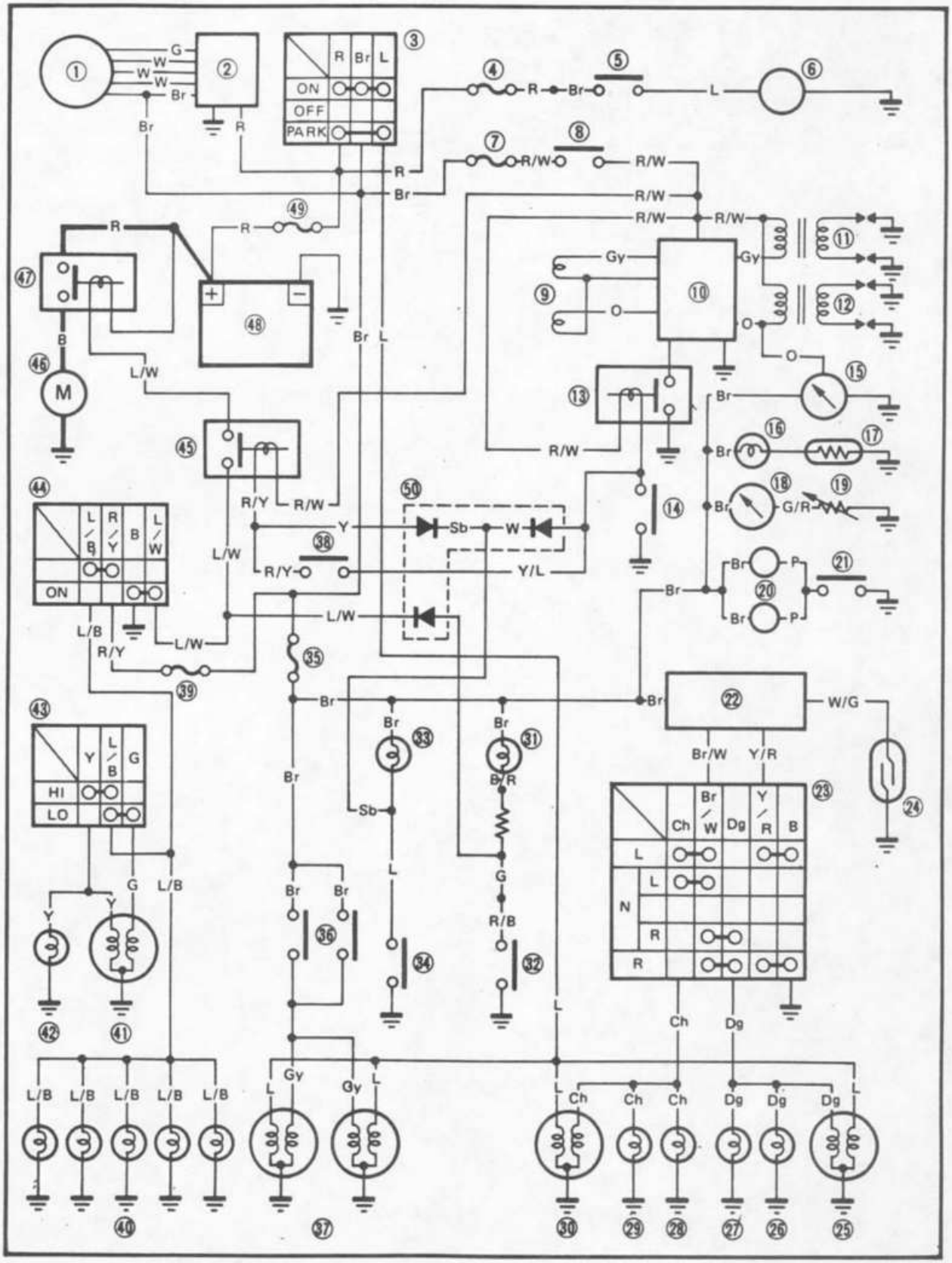
**Preparation steps:**
- Disconnect starter motor red lead.
- Connect Pocket Tester leads to relay terminals.
- Turn main switch to "ON".
- Turn engine stop switch to "RUN".
- Move shift pedal to "NEUTRAL"


①
②
x 1Ω

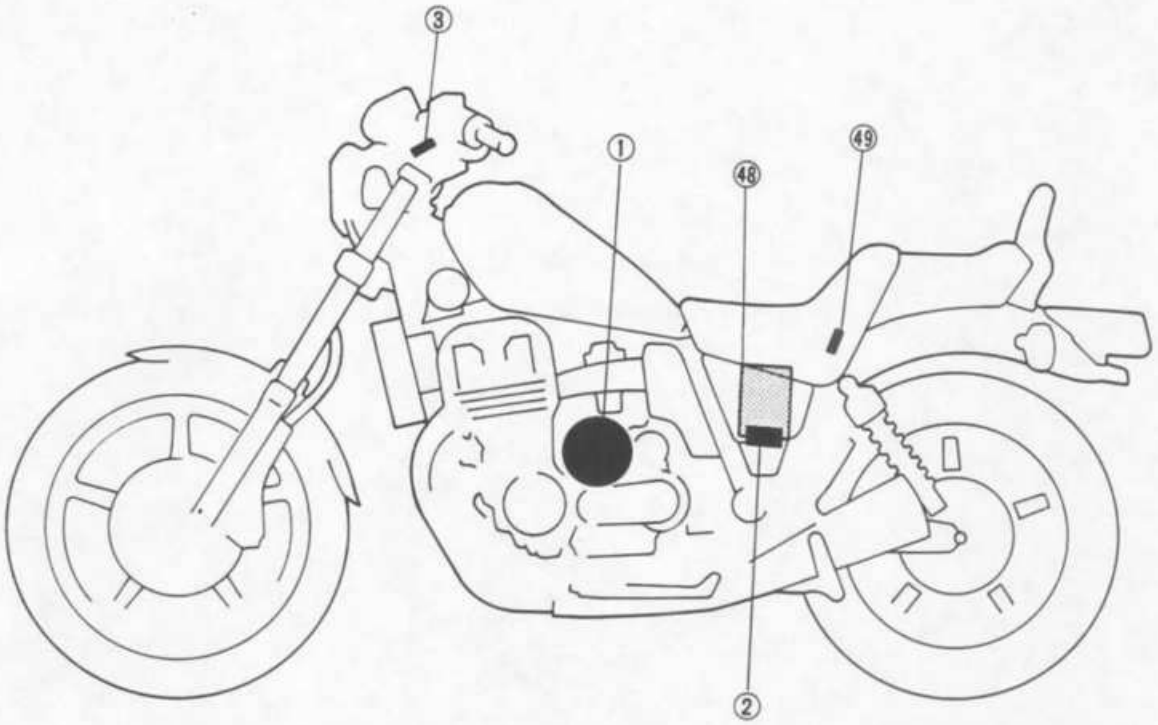

Push starter switch to "ON"
Relay clicks and tester reads 0 Ω
Relay does not click and tester does not read 0 Ω
OK
Measure resistance: Blue/White wire① – Battery side relay terminal ②
Resistance less than 1Ω
Resistance more than 1 Ω
Check connections
Replace relay

7

## CHARGING SYSTEM



① A.C. Generator
② Rectifier/Regulator
③ Main switch
㊽ Battery
㊾ Fuse "MAIN" (30A)





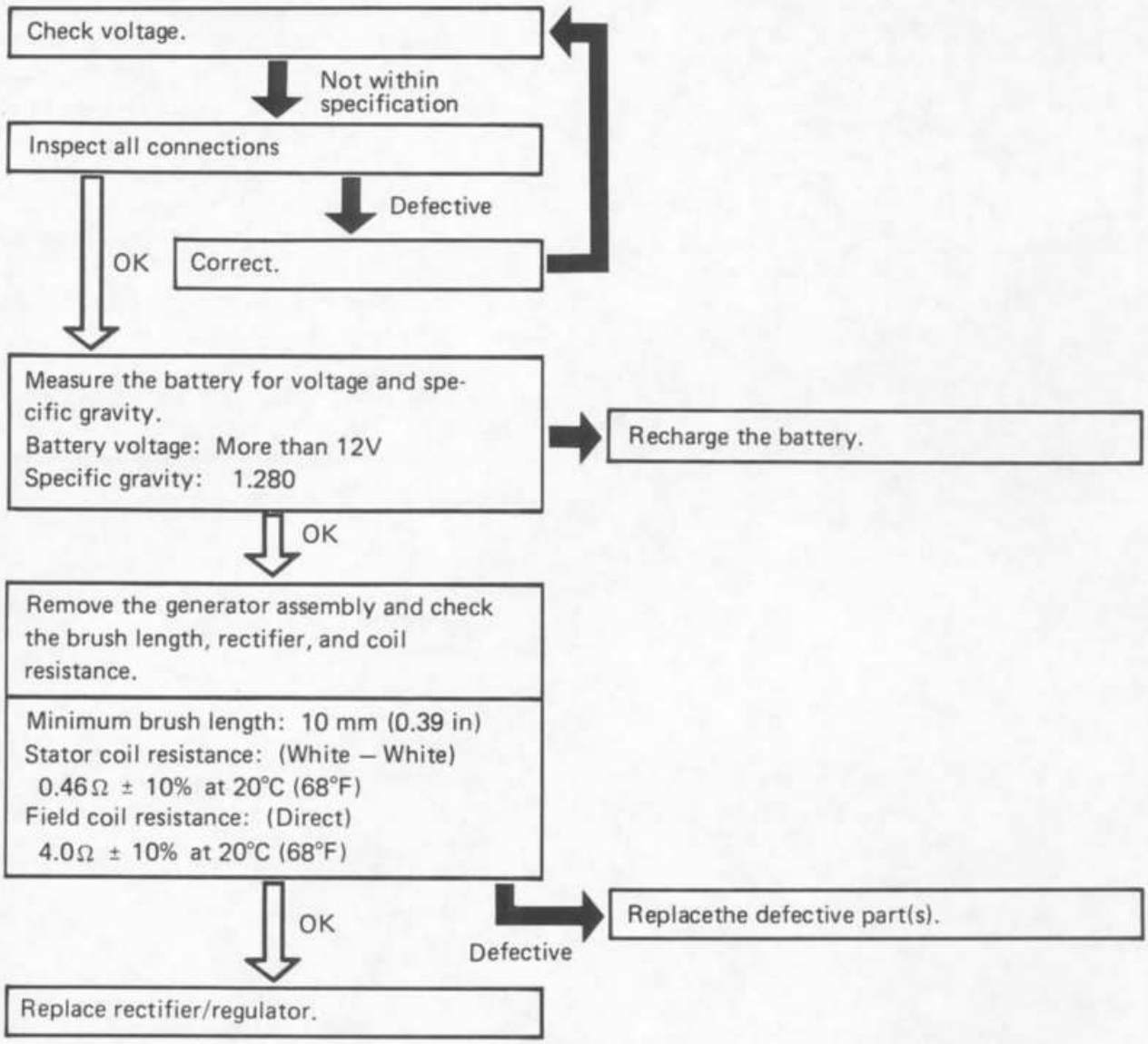

## CHARGING VOLTAGE INSPECTION

1. Remove:
   - Seat
2. Connect:
   - Pocket Tester leads
     (to each battery terminal)
3. Start the engine.
4. Measure:
   - Charging voltage
     Rev engine to approximately 3,000 r/min or more.
     Out of specification → See troubleshooting chart below.

| | |
|---|---|
| | **Charging Voltage:**<br>14.2 ~ 14.8 V |

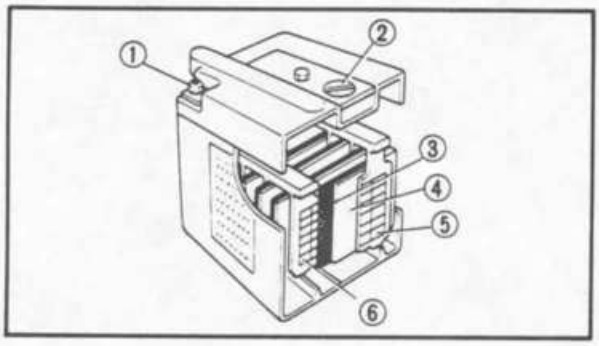
7

## TROUBLESHOOTING




**CAUTION:**

**Never disconnect battery cables while generator is operating or regulator/rectifier will be damaged.**




## BATTERY

**NOTE:**

Replace the battery if:

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

① Terminal
② Cap
③ Insulator
④ Separation plate
⑤ Negative electrode
⑥ Positive electrode

1. Inspect:
   - Battery terminals
   - Battery couplers

   Looseness → Tighten.
2. Measure:
   - Specific gravity of battery fluid

   Less than 1.280 → Remove and recharge battery.

**CAUTION:**

**To insure maximum battery performance be sure to:**

- **Charge a new battery before use.**
- **Maintain proper electrolyte level.**
- **Charge at proper current; 1.4 amps/10 hrs. or until the specific gravity reaches 1.280 at 20°C (68°F).**

**Failure to observe these points will result in a shortened battery life.**

7




**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.
- Drink large quantities of water or milk and 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.

### Battery Service Life

The service life of a battery is usually two to three years. Battery life may be shortened by poor maintenance.

**Preparation steps:**

- Keep battery topped off with distilled water.
- Keep battery charged.
- Do not overcharge battery.
- Do not allow battery freeze.
- Do not fill with tap water or sulfuric acid
- containing impurities.
- Do not charge new battery using improper voltage or current.

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### Battery Storage

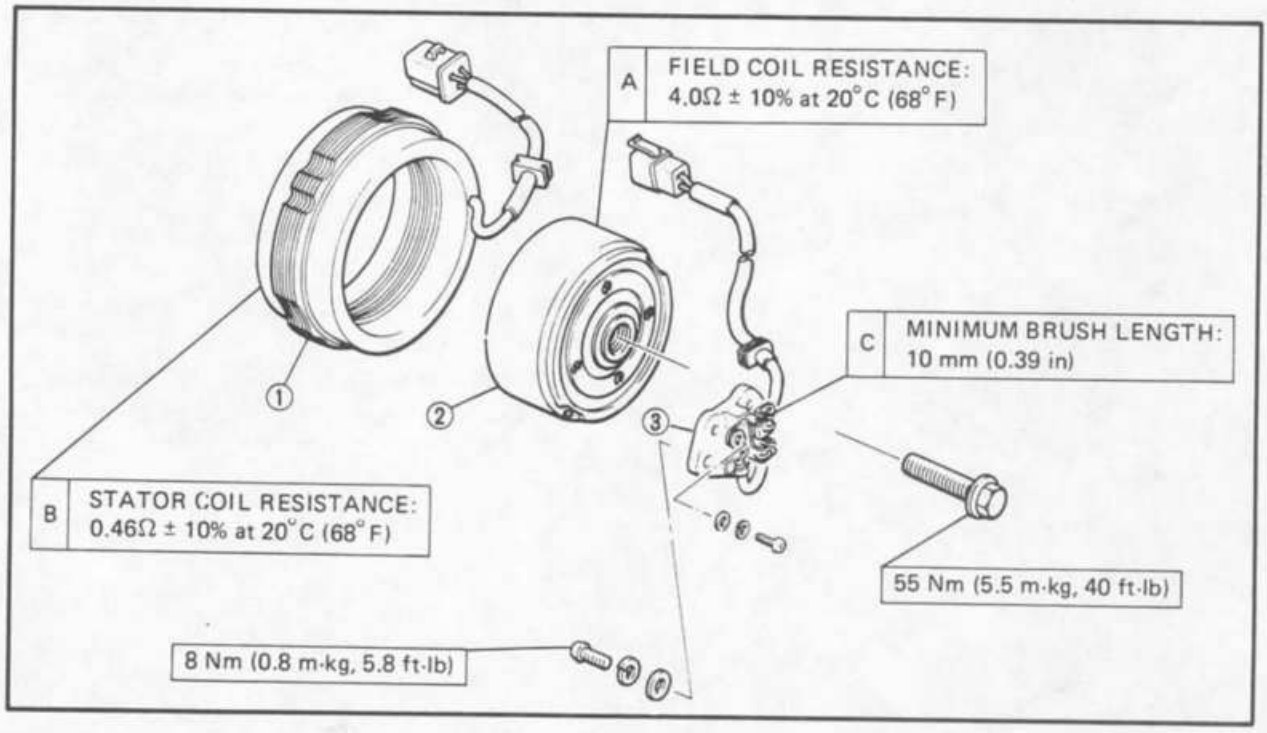
The battery should be stored if the motorcycles is not to be used for a long period.

1. Remove:
   - Battery

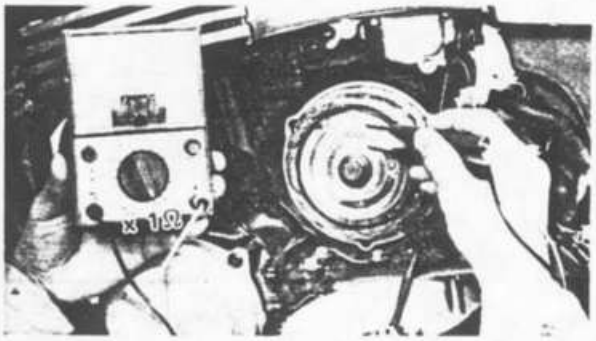
**Battery storage and maintenance tips:**
- Recharge the battery periodically.
- Store the battery in a cool, dry place.
- Recharge the battery before reinstalling.

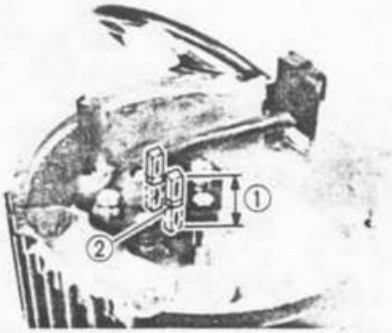
| Battery | YB14L |
|---|---|
| Electrolyte | Specific gravity: 1.280 |
| Initial charging rate | 1.4 amp for 10 hours (new battery) |
| Recharging rate | 10 hours (or until specific gravity reaches 1.280) |
| Refill fluid | Distilled water (to maximum level line) |
| Refill period | Check once per month (or more often as required) |

① Field coil
② Stator
③ Brush






## GENERATOR ASSEMBLY

1. Remove:
   - Left side cover
   - Pannel
2. Measure:
   - Stator coil resistance

   Out of specification → Replace.

**Stator Coil Resistance:**
**0.46Ω ± 10% at 20°C (68°F)**
**(W – W)**

3. Remove:
   - A.C.G. cover
4. Measure:
   - Field coil resistance

   Out of specification → Replace.

**Field Coil Resistance:**
**4.0Ω ± 10% at 20°C (68°F)**

5. Inspect:
   - Brush contact areas

   Dirty → Clean with = 600 grit sandpaper.
6. Measure:
   - Brush length (Each) ①

   Out of specification → Replace.

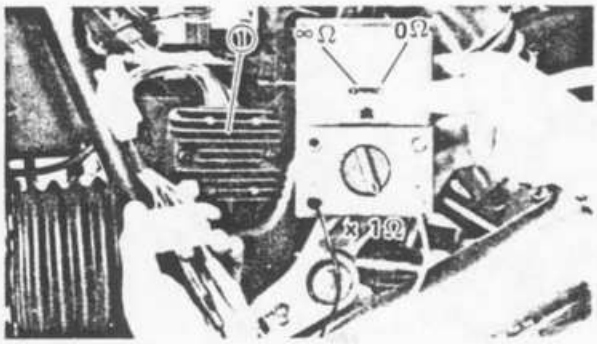
**Minimum Brush Length:**
**10 mm (0.39 in)**

② Wear indicator

7. Inspect:
   - Brush springs

   Compare with new spring.

   Weaker/Damage → Replace.

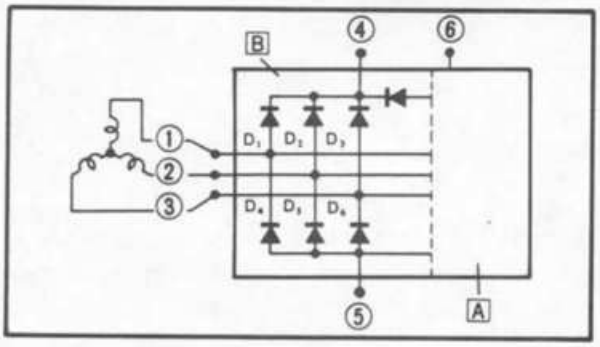



## RECTIFIER/REGULATOR

1. Remove:
   - Left side cover
   - Pannel
2. Check:
   - Rectifier/Regulator ① diodes

   Refer to the following table.

   Defective element → Replace rectifier.




| Checking element | Pocket tester Connecting point (+) (red) | (−) (black) | Good |
|---|---|---|---|
| $D_1$ | ④ | ① | ○ |
| | ① | ④ | x |
| $D_2$ | ④ | ② | ○ |
| | ② | ④ | x |
| $D_3$ | ④ | ③ | ○ |
| | ③ | ④ | x |
| $D_4$ | ① | ⑤ | ○ |
| | ⑤ | ① | x |
| $D_5$ | ② | ⑤ | ○ |
| | ⑤ | ② | x |
| $D_6$ | ③ | ⑤ | ○ |
| | ⑤ | ③ | x |

○ : Continuity X : Discontinuity (∞)

① White
② White
③ White
④ Red
⑤ Ground
⑥ Brown
A Regulator
B Rectifier

**CAUTION:**

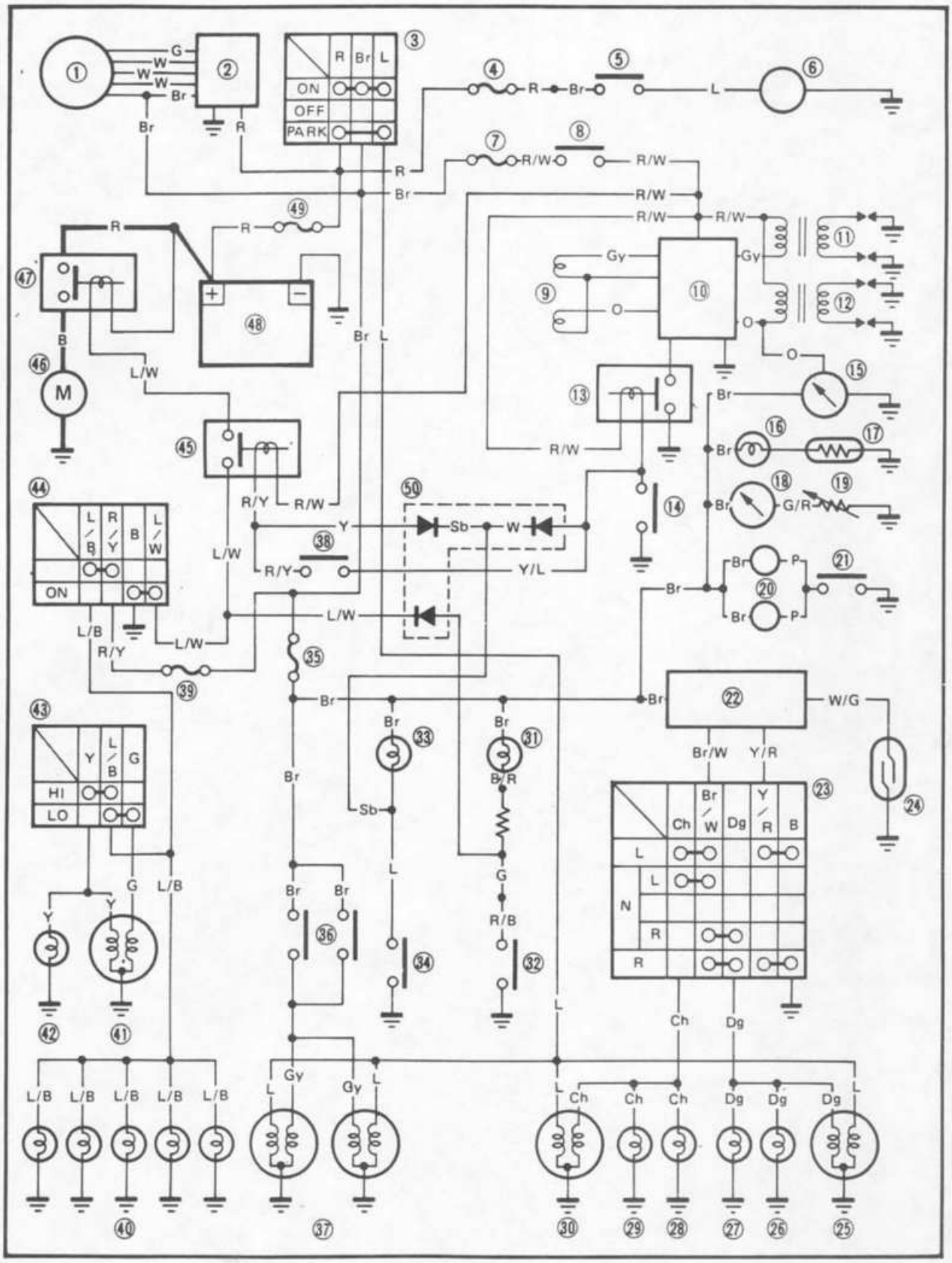
**Do not overcharge rectifier or damage may result.**
**Avoid:**
- **A short circuit**
- **Inverting + and − battery leads**
- **Direct connection of rectifier to battery**

**NOTE:**

The results "○" or "x" should be reversed according to the pocket tester polarity.

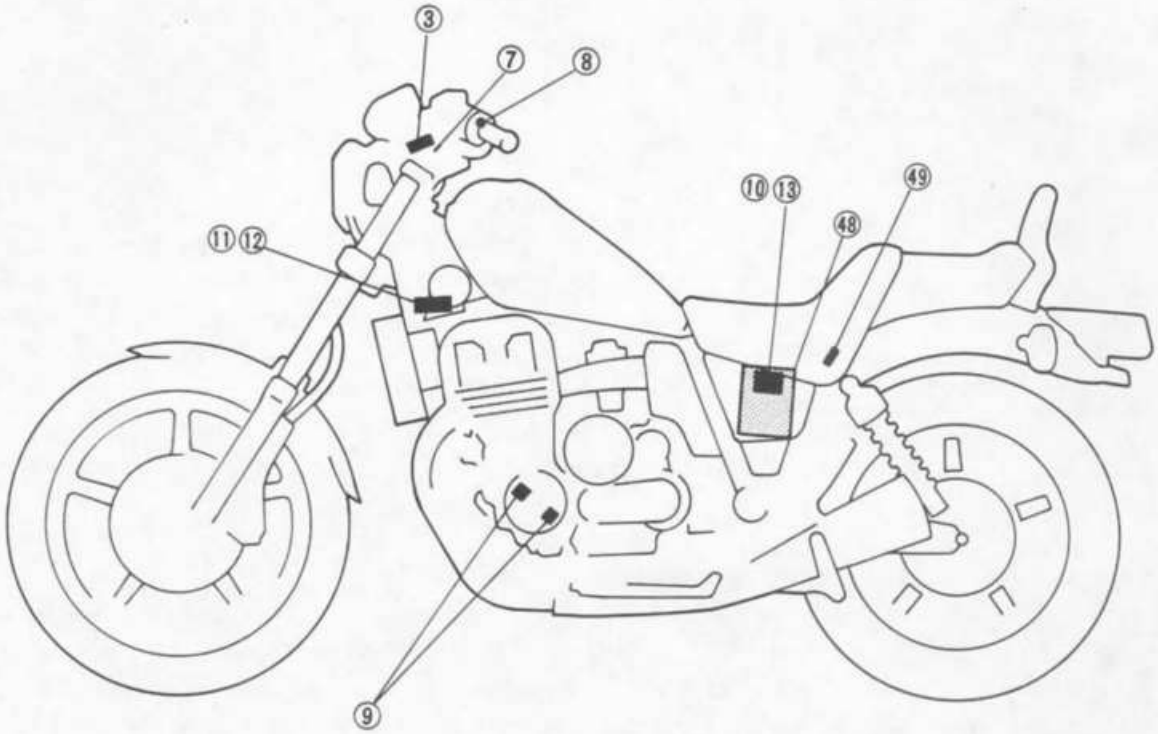
7

# IGNITION SYSTEM




7

③ Main switch
⑦ Fuse "IGNITION" (10A)
⑧ Engine stop switch
⑨ Pickup coil
⑩ T.C.I. unit
⑪ Ignition coil (#2,#3)
⑫ Ignition coil (#1,#4)
⑬ Sidestand relay
㊽ Battery
㊾ Fuse "MAIN" (30A)



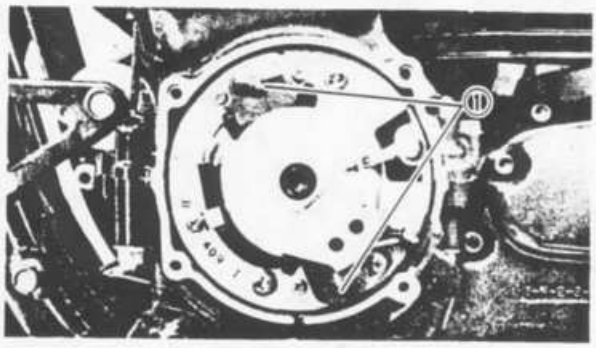
## DESCRIPTION

This model is equipped with a battery operated, fully transistorized, breakerless ignition system. By using magnetic pickup coils, the need for contact breaker points is eliminated. This adds to the dependability of the system by eliminating frequent cleaning and adjustment of points and ignition timing. The TCI (Transistor Control Ignition) unit incorporates an automatic advance circuit controlled by signals generated by the pickup coil. This adds to the dependability of the system by eliminating the mechanical advancer. This TCI system consists of two units; a pickup unit and an ignitor unit.

## OPERATION

The TCI functions on the same principle as a conventional DC ignition system with the exception of using magnetic pickup coils and a transistor control box (TCI) in place of contact breaker points.

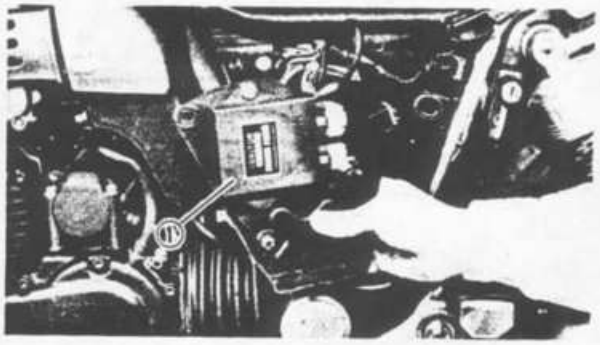
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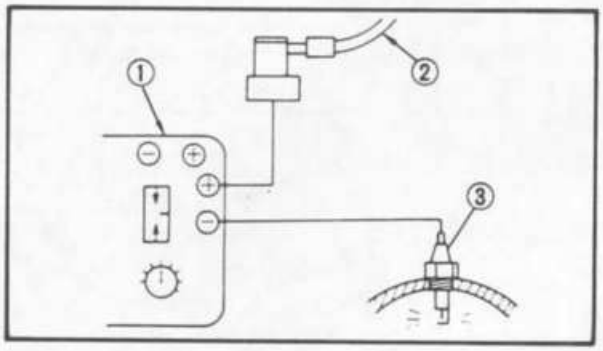


### Pickup Unit

The pickup unit consists of two pickup coils and a flywheel mounted onto the crankshaft. When the projection on the flywheel passes a pickup coil, a signal is generated and transmitted to the ignitor unit. The width of the projection on the flywheel determines the ignition advance.

① Pickup coiles






**Ignitor Unit**

This unit controls wave form, duty control, switching, electronic ignition advance, etc. The duty control circuit reduces electrical consumption by controlling the duration of the primary ignition current.

The ignitor unit ① also has a protective circuit for the ignition coil. If the ignition switch is on and the crankshaft is not turning, the protective circuit interrupts the current flow to the primary coil after a few seconds. When the crankshaft is turning, however, the ignitor unit sends current to the primary coil.

1. Remove:
   - Seat
   - Left side cover
   - Pannel
   - Ignitor unit ①

## TROUBLESHOOTING

1. Start engine and warm-up a while, then turn it off.
2. Connect:
   - Electro Tester (90890-03021) ①

② Spark plug wire
③ Spark plug

3. Start engine and increase spark gap until misfire occurs (Test at various rpm between idle and red line.)

**CAUTION:**

**Do not run the engine in neutral above 6,000 rpm for more than 1 or 2 seconds.**

**Minimum Spark Gap:**
**6 mm (0.24 in)**

4. If ignition system becomes inoperative or engine misfires see the troubleshooting chart below:

7

**Troubleshooting Chart**

Check entire ignition connections.
→ Poor connection → Correct.
↓ OK

Check battery voltage and specific gravity.
→ Low voltage/specific gravity → Recharge battery.
↓ OK

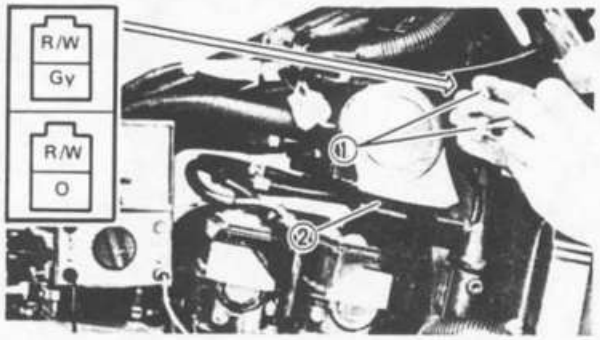
Check fuse and fuse connections.
→ Weak connection or open circuit → Correct connection or replace fuse.
↓ OK

Check ignition coil resistance (primary and secondary).
Primary: 2.7Ω ± 10% at 20°C (68°F)
Secondary: 12 kΩ ± 20% at 20°C (68°F)
→ If other than specified → Replace ignition coil.
↓ OK

Check pickup coil resistance.
Pickup coil: 120Ω ± 10% at 20°C (68°F)
→ If other than specified → Replace pickup coil assembly.
↓ OK

Check operation of sidestand switch and relay.
→ Faulty → Check sidestand relay sidestand switch, diode and neutral switch.
↓ OK

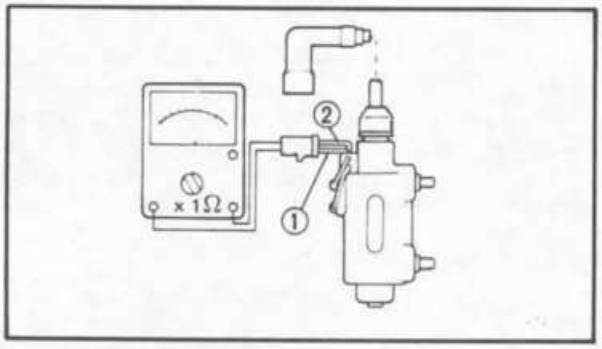
TCI unit is faulty, replace unit.




## IGNITION COIL

1. Remove:
   - Fuel tank
2. Disconnect:
   - Ignition coil leads ①

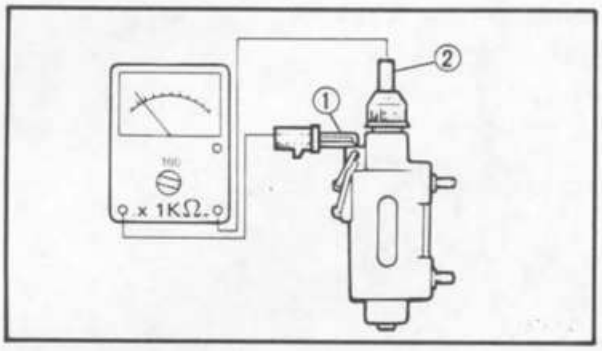
② No. 2 and No. 3 cylinder ignition coil




3. Measure:
   - Primary coil resistance

   Out of specification → Replace.

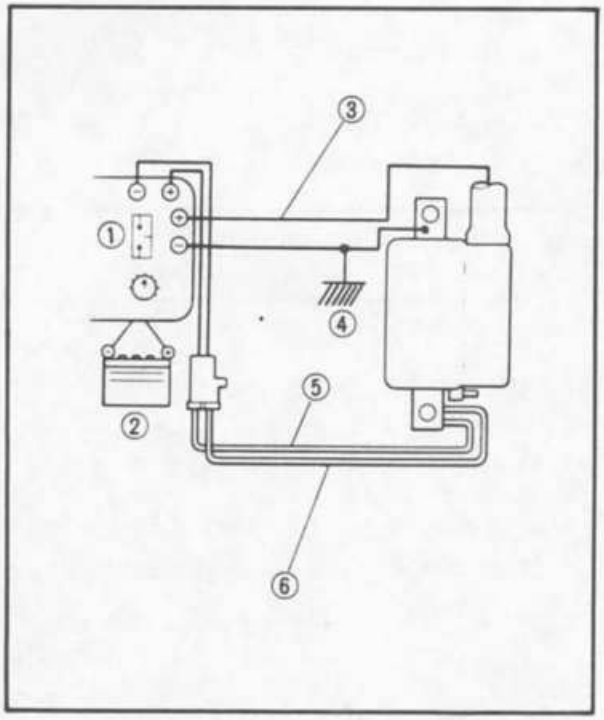
**Primary Coil Resistance:**
**O ① – R/W ② lead connector**
**Gy ① – R/W ② lead connector**
**2.7Ω ± 10% at 20°C (68°F)**




4. Measure:
   - Secondary coil resistance

   Out of specification → Replace.

**Secondary Coil Resistance:**
**R/W lead connector ① –**
**No. 1 cylinder high tension cord ②**
**12kΩ ± 20% at 20°C (68°F)**




5. Connect:
   - Electro tester ①
   - Fully charged battery ②

   (to ignition oil leads)

③ No. 1 (Rear) cylinder high tension cord
④ Ground
⑤ R/W lead
⑥ O lead

6. Measure:
   - Ignition coil minimum spark gap

   Turn the spark gap adjuster and increase the gap to the maximum limit unless misfire occurs first.

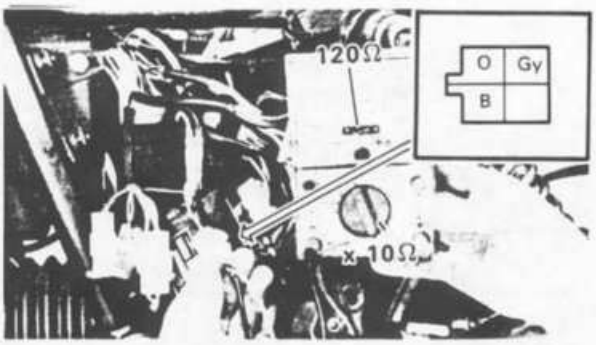
   Out of specification → Replace.

**Minimum Spark Gap:**
**6 mm (0.24 in)**

7

## PICKUP COIL

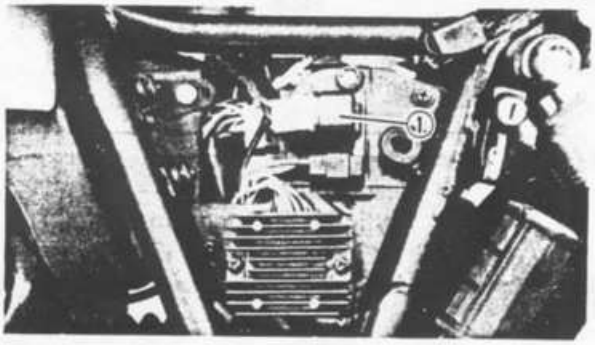
1. Remove:
   - Left side cover
   - Pannel
2. Disconnect:
   - Pickup coil wires
     (from TCI unit wires)
3. Measure:
   - Pickup coil resistance
     Use pocket tester.
     Out of specification → Replace pickup coil.



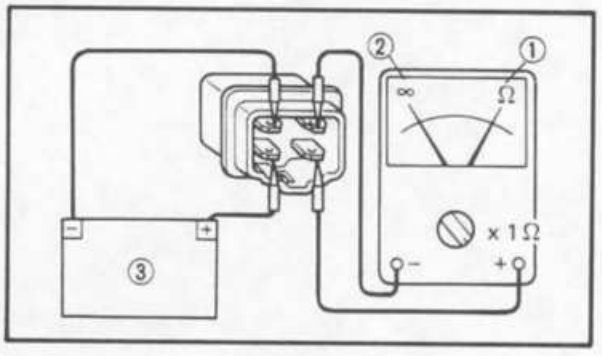

**Pickup Coil Resistance:**
**No. 1 and No. 4 cylinder (O – B)**
**No. 2 and No. 3 cylinder (Gy – B)**
**120Ω ± 10% at 20°C (68°F)**

## SIDESTAND RELAY

1. Remove:
   - Left side cover
   - Sidestand relay ①




2. Check.
   - Relay contacts
     Use 12V battery ③ and Pocket Tester (90890-03112).
     Out of specification → Replace relay.




**Battery Connected: ∞ ②**
**Battery Disconnected: 0Ω ①**

## SPARK PLUG

1. Check:
   - Condition
     Burned/Fouled → Replace.
   - Electrode gap
     Out of specification → Clean off carbon and regap.

**CAUTION:**

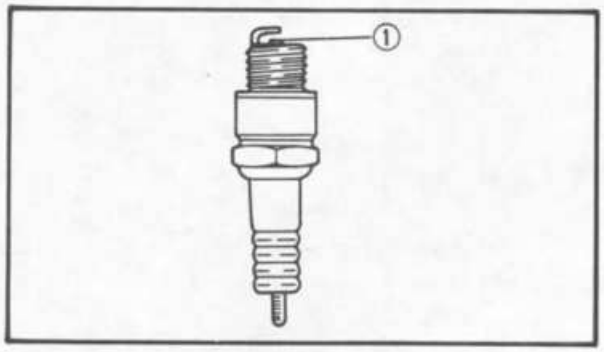
**Be sure to use plugs of:**

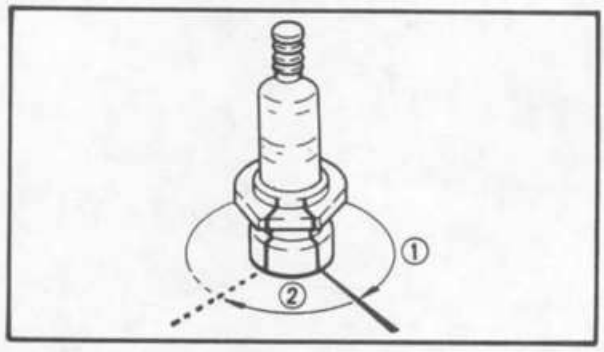
- Proper type

| |
|---|
| DR8ES-L (NGK)<br>X24ESR-U (NIPPONDENSO) |

- Proper gap

| |
|---|
| Electrode Gap ① :<br>0.6 ~ 0.7 mm (0.024 ~ 0.028 in) |



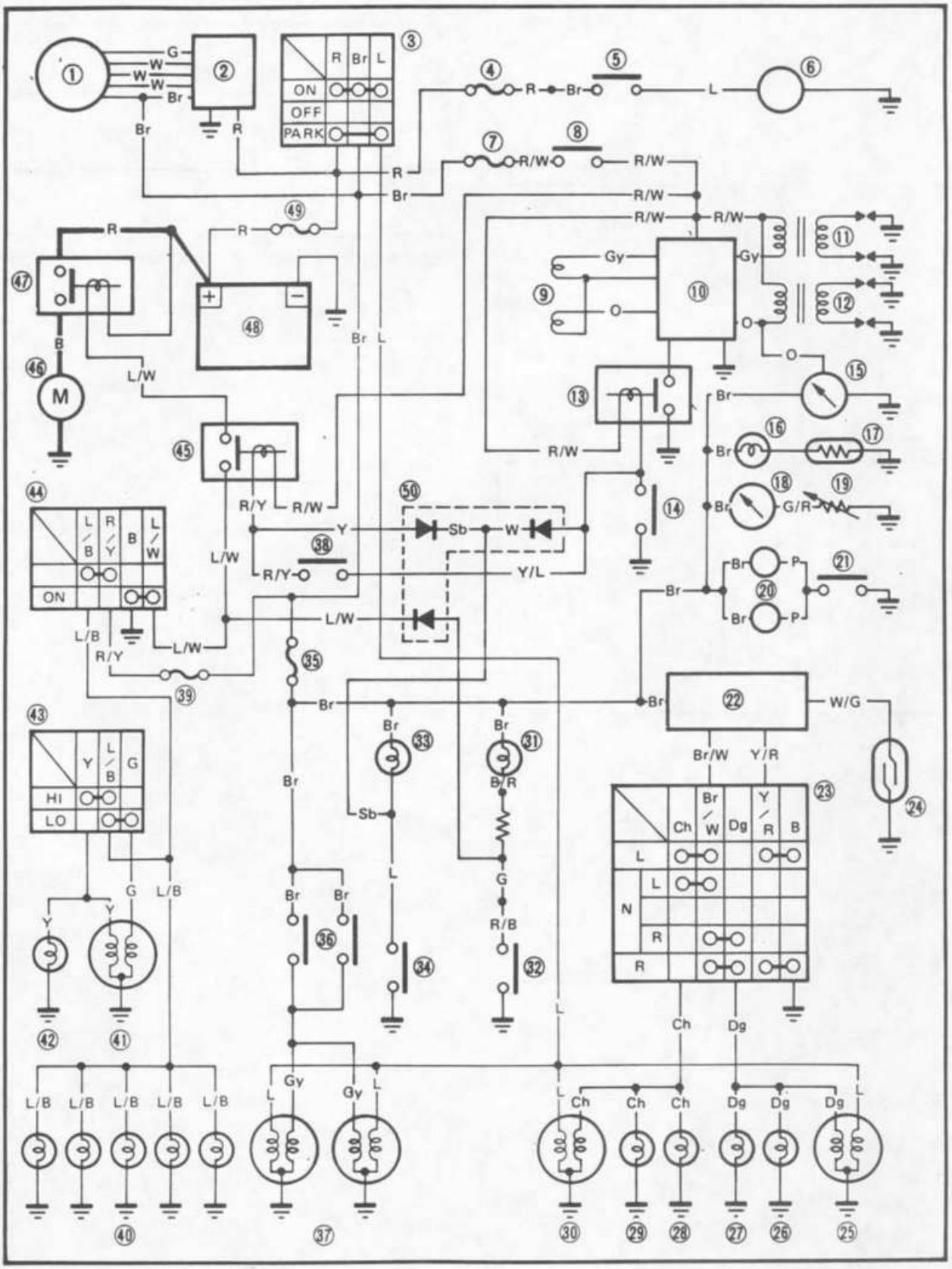

2. Install:
   - Spark plug

| |
|---|
| Spark Plug:<br>17.5 Nm (1.75 m·kg, 12.5 ft·lb) |

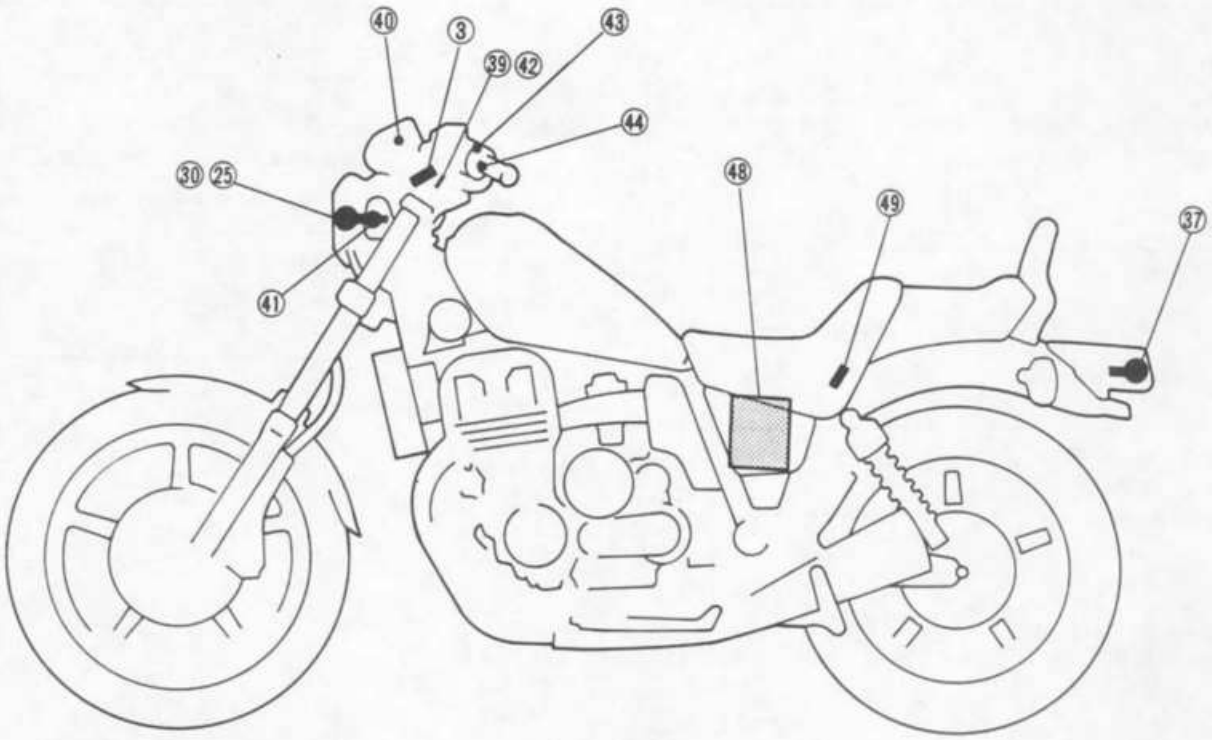
① Finger tighten
② Plug wrench tighten

7

## LIGHTING SYSTEM



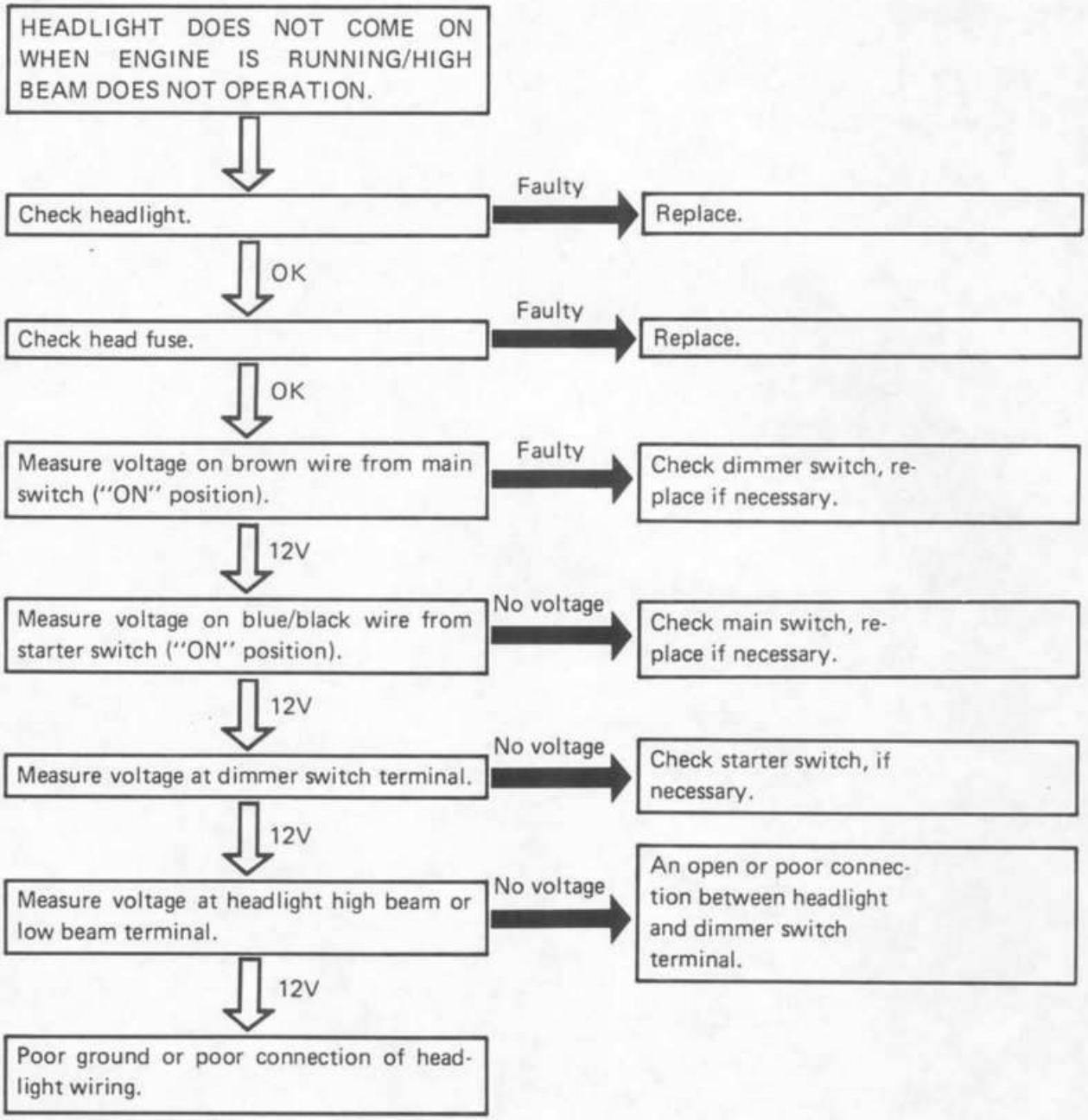
③ Main switch
㉕ Flasher light (Front, Right)
㉚ Flasher light (Front, Left)
㊲ Tail/Brake light
㊴ Fuse "HEAD" (15A)
㊵ Meter light
㊶ Headlight
㊷ "HIGH BEAM" indicator light
㊸ "LIGHTS" (Dimmer) switch
㊹ Starter switch
㊽ Battery
㊾ Fuse "MAIN" (30A)



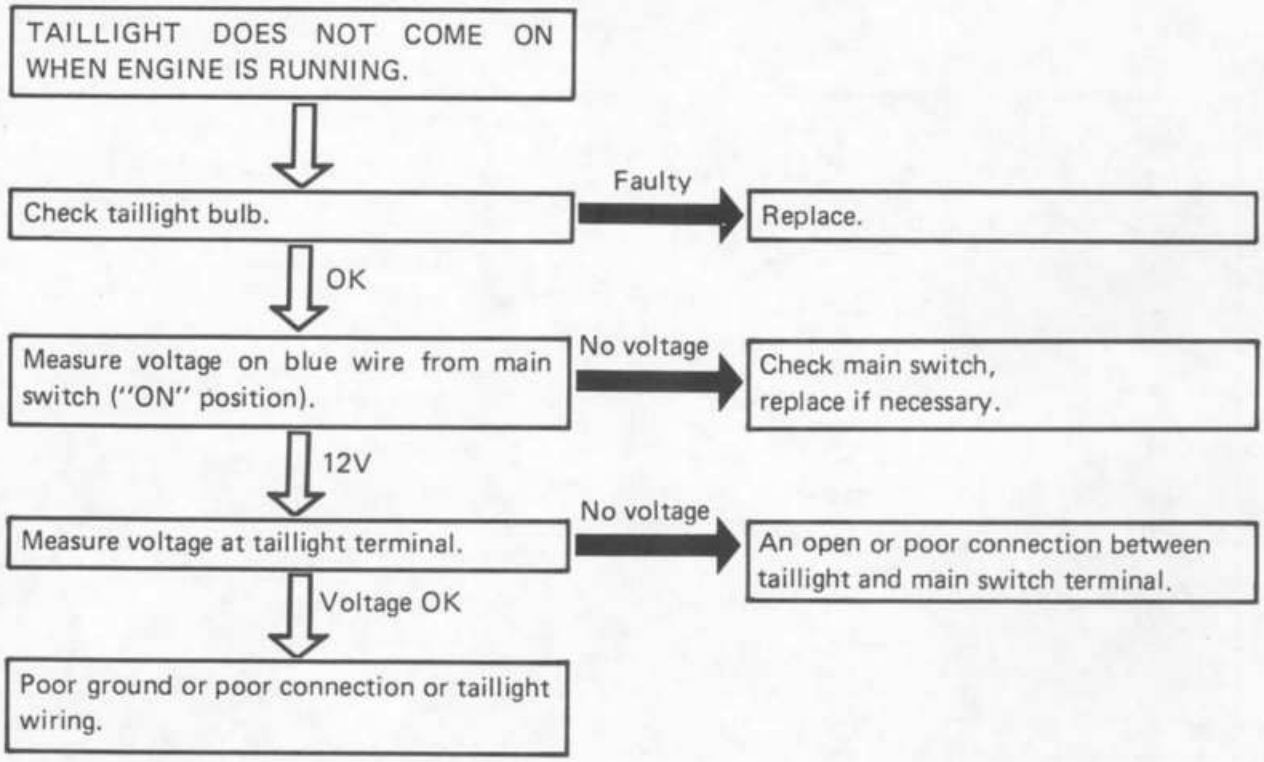

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## TESTS AND CHECKS

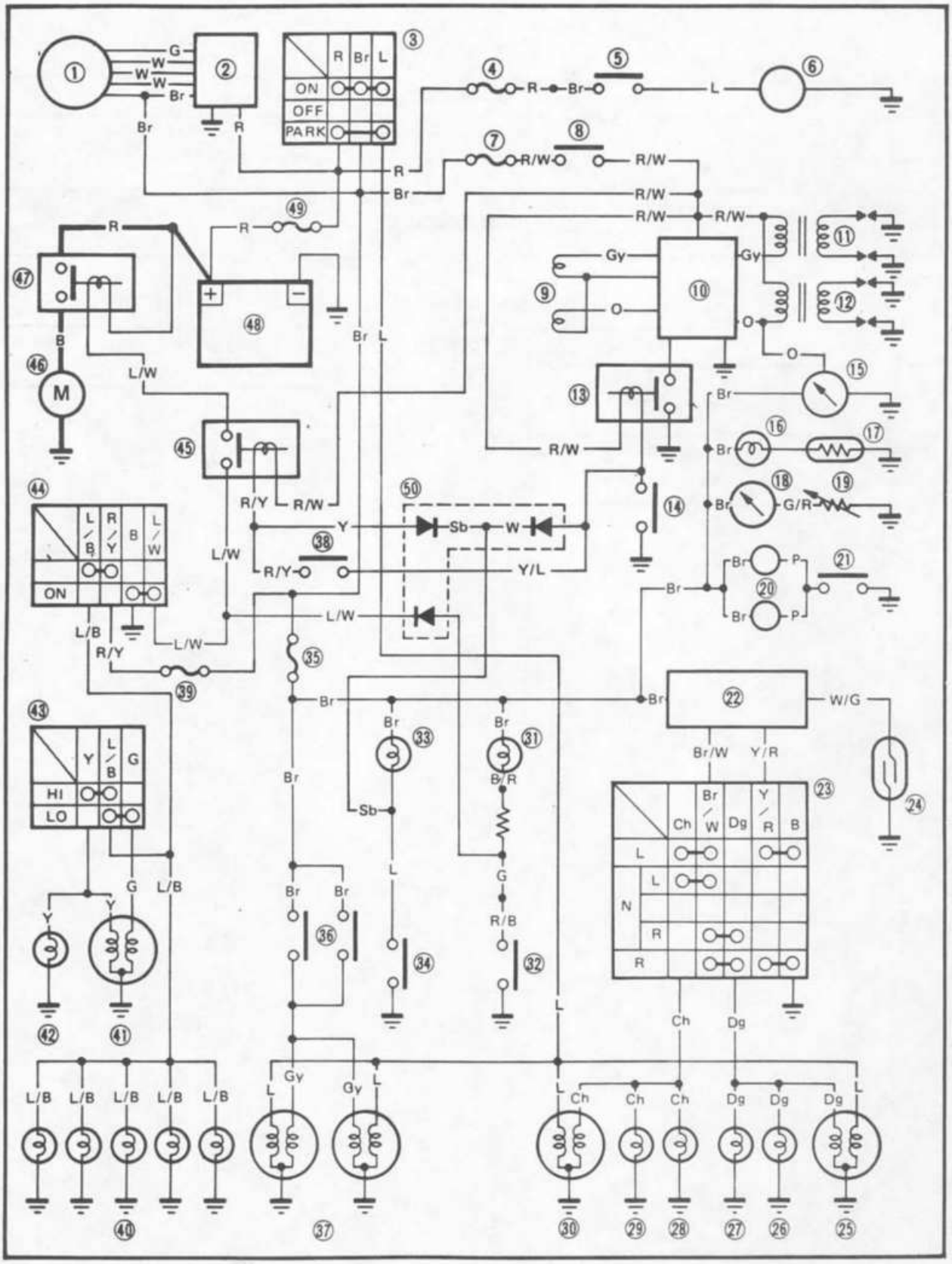
### Headlight Troubleshooting



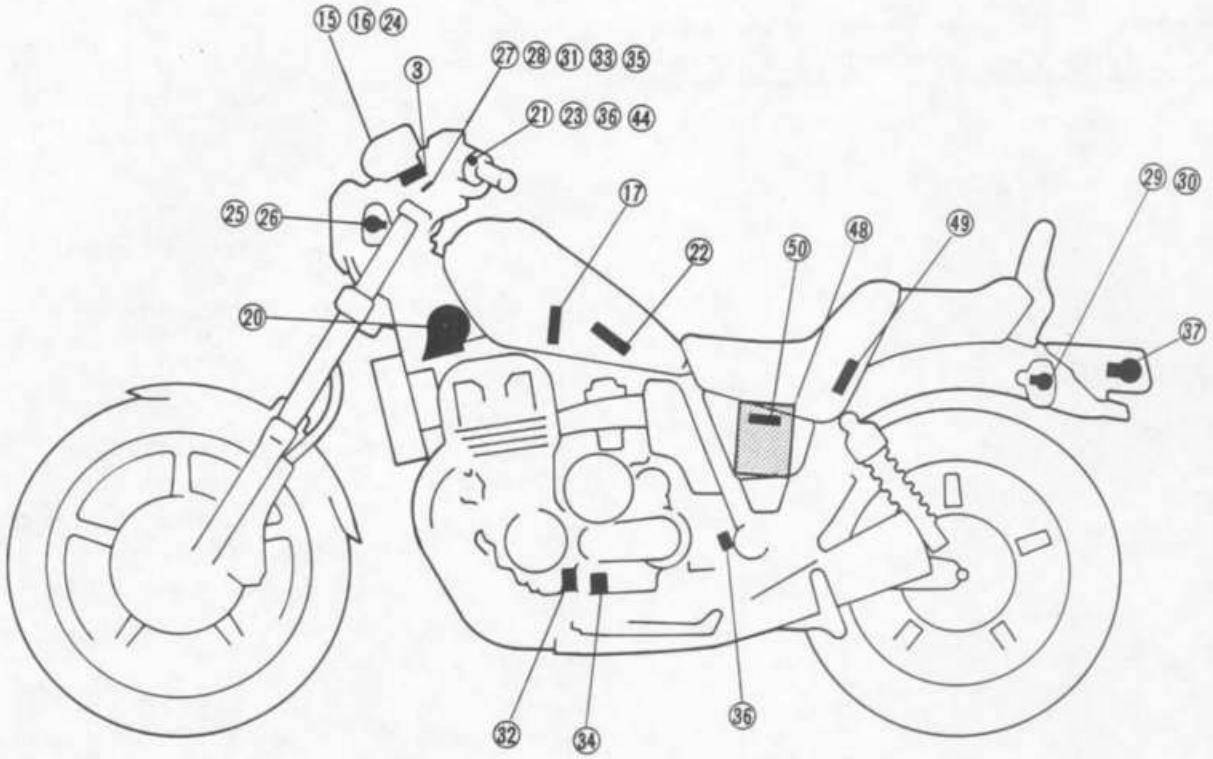
**Taillight Troubleshooting**



## SIGNAL SYSTEM



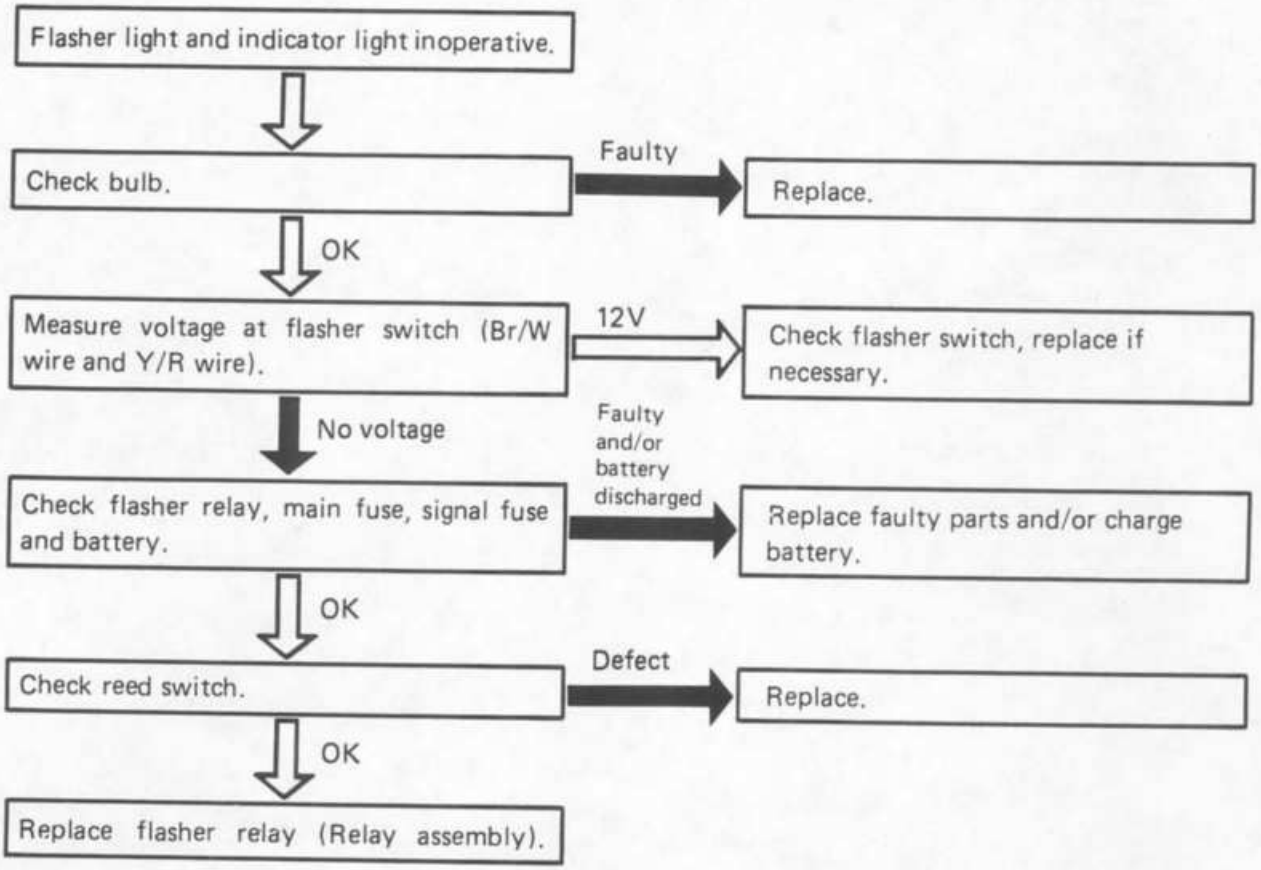
③ Main switch
⑮ Tachometer
⑯ "FUEL" warning light
⑰ Fuel sender
⑳ Horn
㉑ "HORN" switch
㉒ Flasher relay (Relay assembly)
㉓ Flasher switch
㉔ Reed switch
㉕ Flasher light (Front, Right)
㉖ Flasher light (Rear, Right)
㉗ "TURN" indicator light
㉘ "TURN" indicator light
㉙ Flasher light (Rear, Left)
㉚ Flasher light (Front, Left)
㉛ "OIL LEVEL" indicator light
㉜ Oil level switch
㉝ "NEUTRAL" indicator light
㉞ Neutral switch
㉟ Fuse "SIGNAL" (15A)
㊱ Brake switch
㊲ Tail/Brake light
㊹ "START" switch
㊽ Battery
㊾ Fuse "MAIN" (30A)
㊿ Diode assembly




7

## FLASHER LIGHT

**Troubleshooting**




### FLASHER RELAY (Relay Assembly)

**NOTE:**

Flasher relay and self cancelling unit are included with relay assembly.

The flasher relay turns off the flashers. Generally the signal will cancel after either 10 seconds of operation or after the motorcycle has traveled 150 meters (490 feet), whichever is greater. At low speed, the cancelling is a function of distance; at high speeds, it's a function of both time and distance.

The flasher switch has three positions: L (left), OFF, and R (right). The switch lever will return to the "OFF" position after being pushed to L or R, but the signal will function. By pushing the lever in, the signal may be cancelled manually.

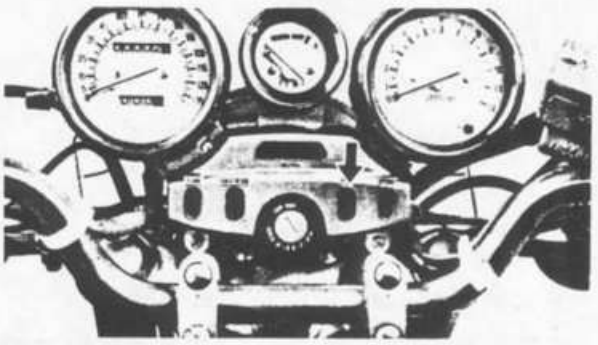
## REED SWITCH

1. Remove:
   - Headlight unit
   - Headlight body
2. Disconnect:
   - Coupler
3. Connect:
   - Pocket tester
4. Lift the front wheel and rotate the wheel by hand.
5. Measure:
   - Reed switch resistance

   Out of specification → Replace.



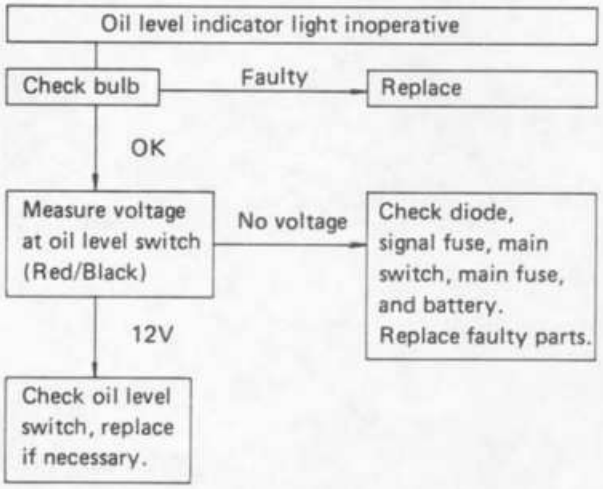

**Reed Switch Resistance:**
**About 7Ω**
**Then return back 0Ω or ∞Ω**
**when wheel is stopped**





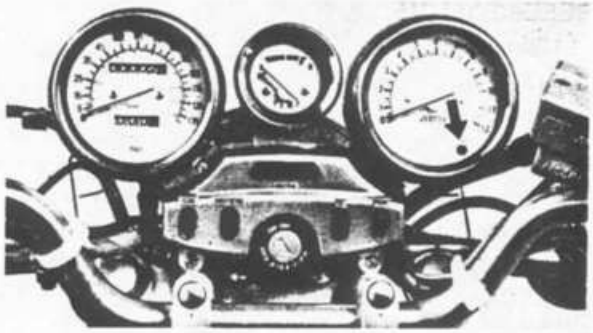

## OIL LEVEL INDICATOR LIGHT

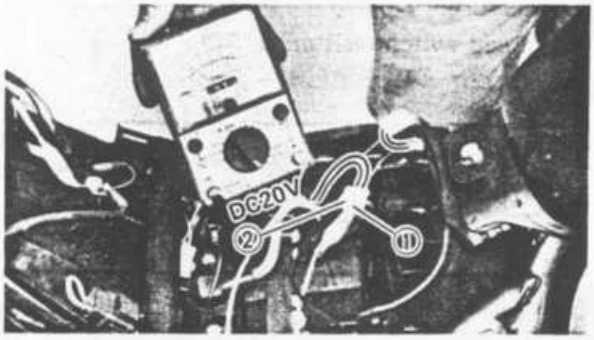
1. Troubleshooting




① Red/Black lead
② Ground

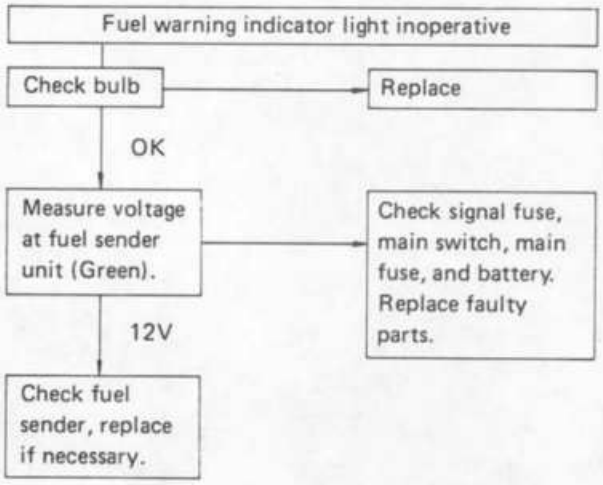
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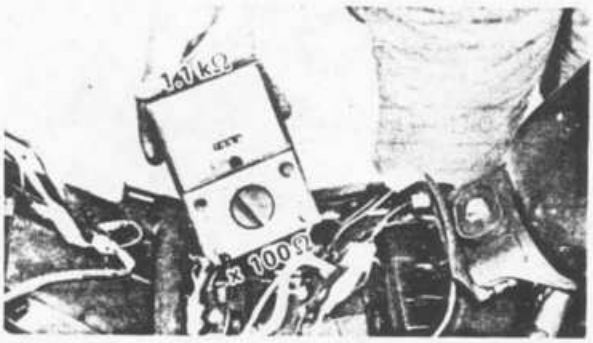



## FUEL WARNING INDICATOR LIGHT

1. Troubleshooting




① Green
② Black

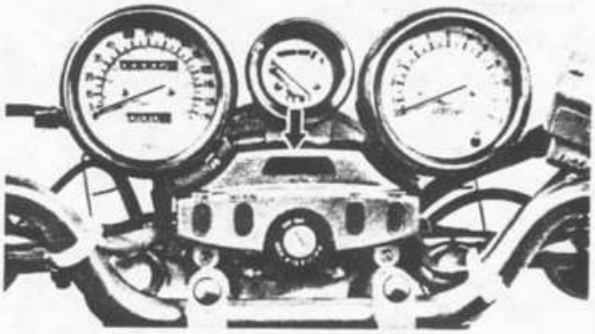


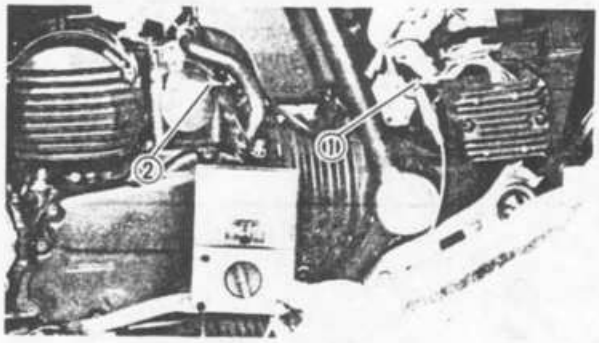

## FUEL SENDER UNIT

1. Remove:
   - Seat
2. Fill
   - Fuel tank
     (with gasoline)
3. Measure:
   - Fuel sender unit resistance.
     Out of specification → Replace.

| | |
|---|---|
| | **Fuel Sender Unit Resistance:**<br>**1.1 ± 0.2 kΩ at 20°C (68°F)** |

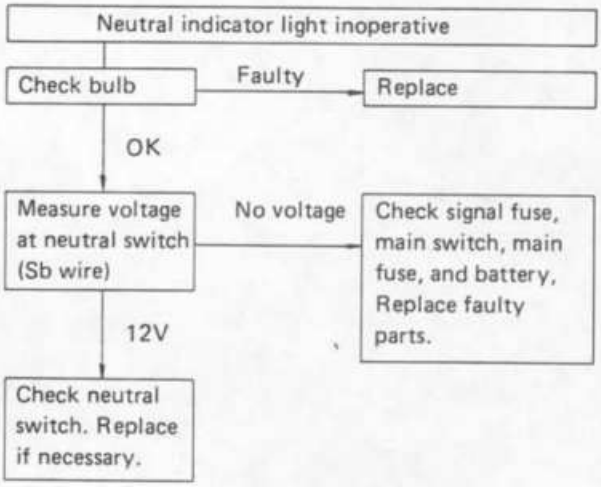
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## NEUTRAL INDICATOR LIGHT

1. Troubleshooting




① Blue lead ② Ground

## HORN

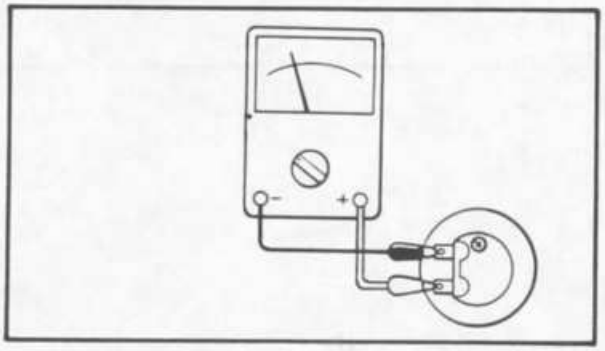
1. Check:

| | |
|---|---|
| Check for: | Horn inoperative |
| | 12V on brown lead to horn |
| | Good ground (horn/pink wire) when horn button is pressed |
| | Faulty |

Defective components → Replace.

**NOTE:**

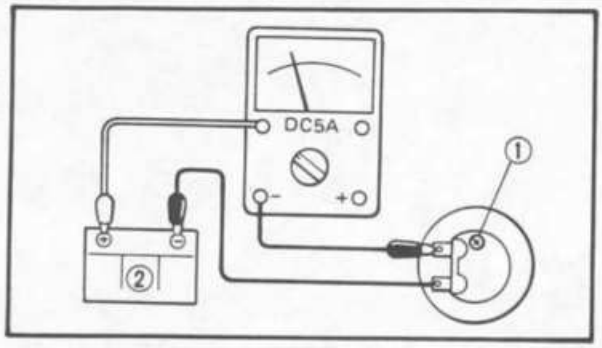
There are individual fuses for various circuits (See Complete Circuit Diagram)




2. Measure:
   Horn resistance
   Out of specification → Replace.

| | |
|---|---|
| | **Horn Resistance:** **1.05Ω ± 10%** |

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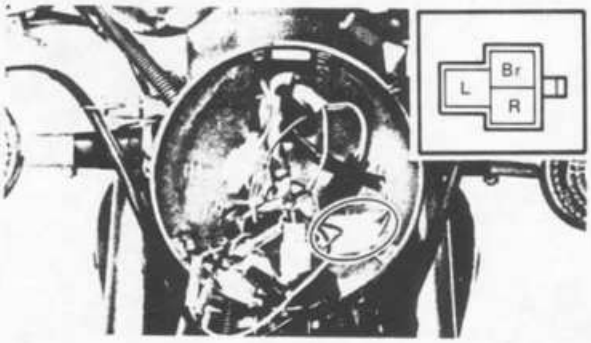

3. Adjust:
   • Volume
   Turn the adjuster ① in and out so that the volume is maximum at the maximum amperage.

②Battery (12V)

| Tester's lead wire | | Maximum Amperage | Tester's range |
|---|---|---|---|
| Red lead | Black lead | | |
| Battery (+) lead | Horn lead and Battery (–) lead | 2.0A | DC5A |

## BRAKE LIGHT

| | |
|---|---|
| Check for: | Brake light inoperative |
| | Defective bulb |
| | 12V on yellow lead to brake light |
| | 12V on brown lead to each brake light switch (Front and rear brake switch) |

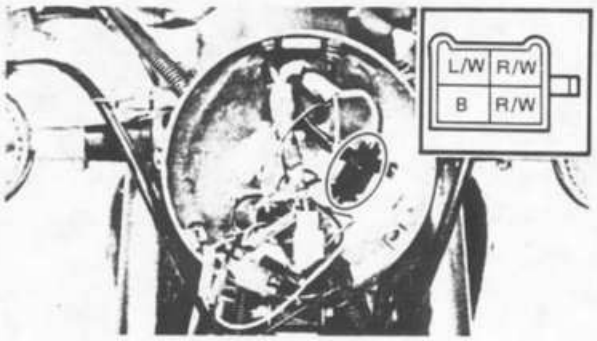



## SWITCHES

Use Pocket Tester (90890-03112) on "Ohm x 1" scale to check the switches.
Replace any "shorted" or opened element.

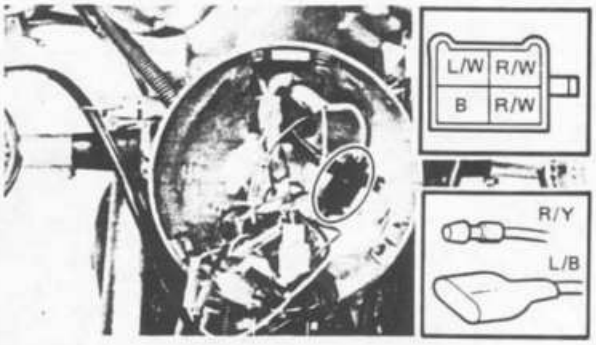
### Main Switch

| Switch position | Lead color | | |
|---|---|---|---|
| | R | Br | L |
| ON | ○ | ○ | ○ |
| OFF | | | |
| P | ○ | | ○ |



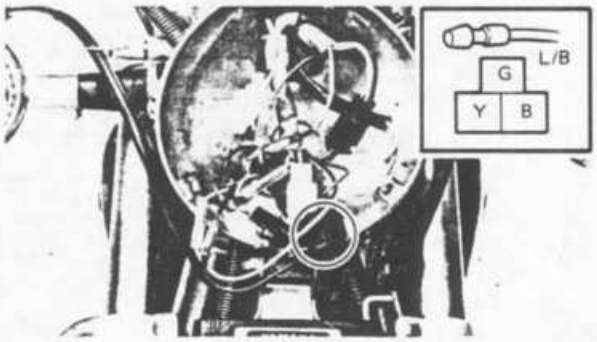

### "ENGINE STOP" Switch

| Switch position | Lead color | |
|---|---|---|
| | R/W | R/W |
| RUN | ○—— | ——○ |
| OFF | | |




### "START" Switch

| Switch position | Lead color | | | |
|---|---|---|---|---|
| | L/W | B | R/Y | L/B |
| OFF | | | ○—— | ——○ |
| ON | ○—— | ——○ | | |



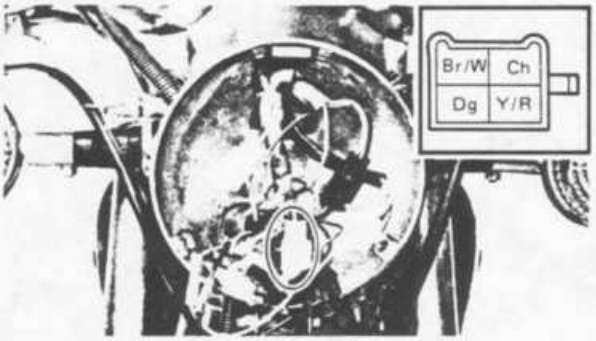

### "LIGHTS" (Dimmer) Switch

| Switch position | Lead color | | |
|---|---|---|---|
| | Y | L/B | G |
| HI | ○—— | ——○ | |
| LO | | ○—— | ——○ |




### "HORN" Switch

| Switch position | Lead color | |
|---|---|---|
| | P | Ground or B |
| PUSH | ○—— | ——○ |
| OFF | | |



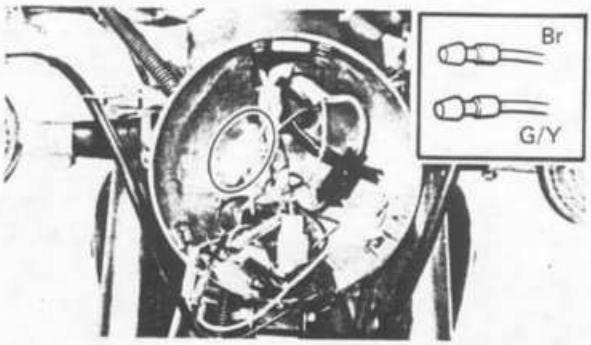

### "TURN" Switch

| Switch position | | Lead color | | | | |
|---|---|---|---|---|---|---|
| | | Dg | Br/W | Ch | Y/R | B |
| R | | ○—— | ——○ | | ○—— | ——○ |
| N | R | ○—— | ——○ | | | |
| | N | | | | | |
| | L | | ○—— | ——○ | | |
| L | | | ○—— | ——○ | ○—— | ——○ |



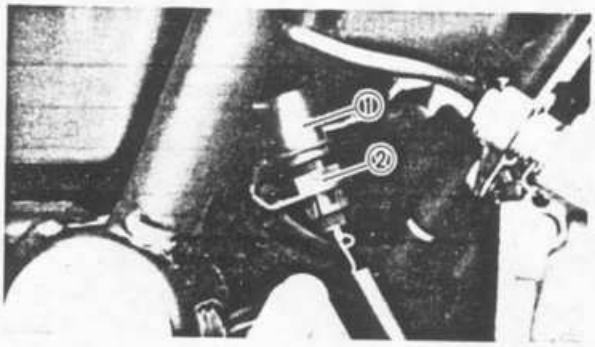

### Oil Level Switch

| Switch position | Lead color | |
|---|---|---|
| | R/B | Ground |
| ON | ○ | ○ |
| OFF | | |




### Front Brake Switch

| Switch position | Lead color | |
|---|---|---|
| | Br | G/Y |
| ON | ○ | ○ |
| OFF | | |



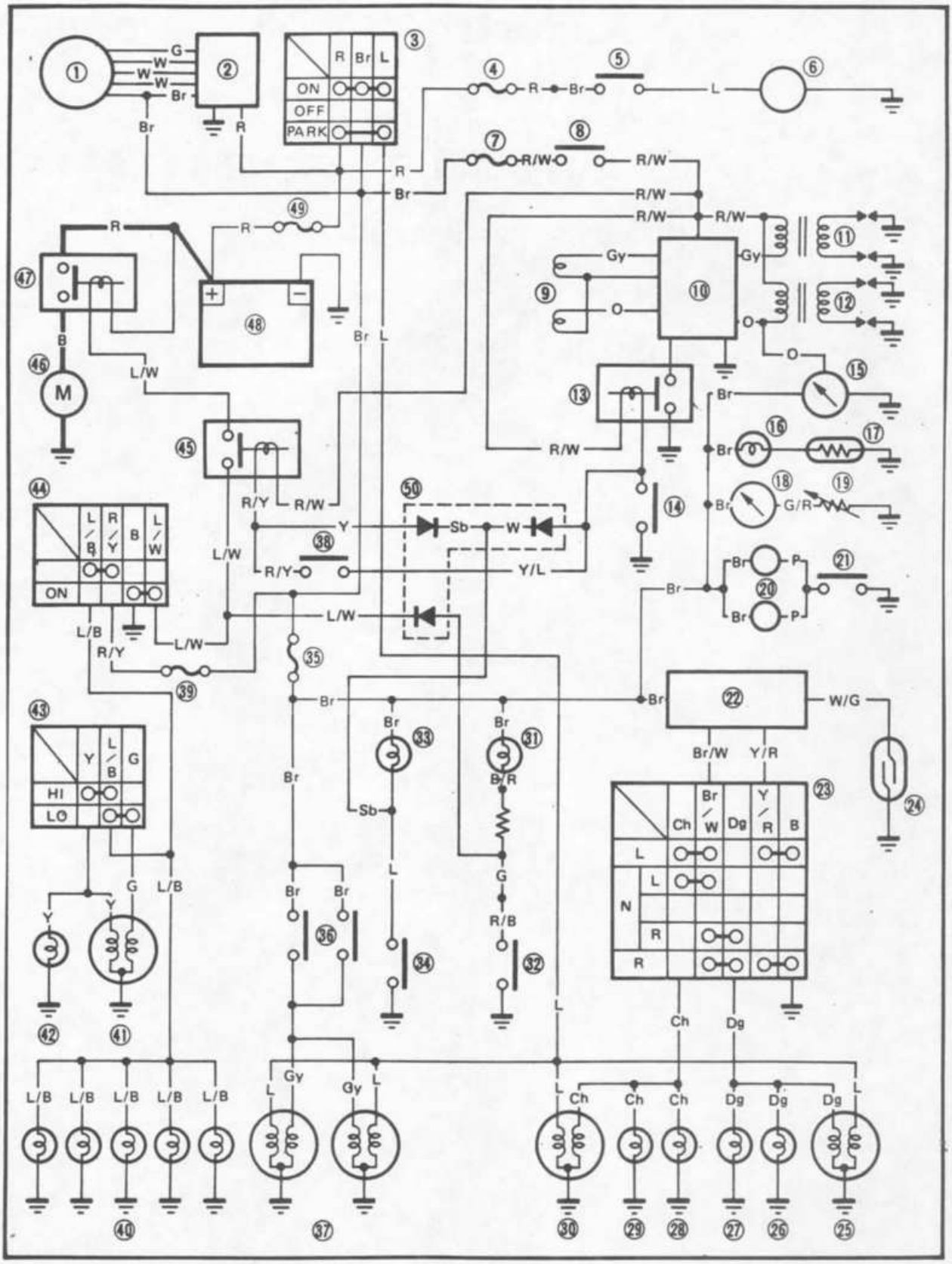

### Rear Brake Switch

| Switch position | Lead color | |
|---|---|---|
| | Y | Y |
| ON | ○ | ○ |
| OFF | | |

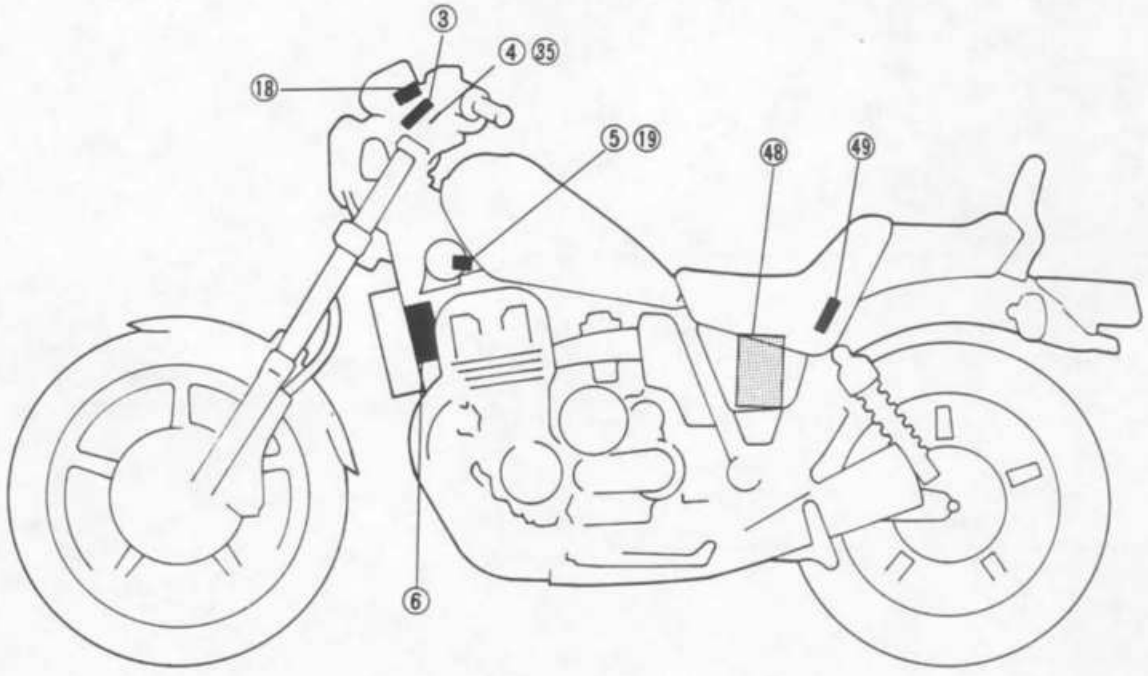
① Switch body
② Adjusting nut

7

## COOLING SYSTEM



③ Main switch
④ Fuse "FAN" (10A)
⑤ Thermo switch
⑥ Fan motor
⑱ Temperature meter
⑲ Thermo unit
㉟ Fuse "SIGNAL" (15A)
㊽ Battery
㊾ Fuse "MAIN" (30A)




7

## TROUBLESHOOTING CHART (1)

**TEMPERATURE GAUGE DOES NOT OPERATE.**

⇩

Remove the fuel tank.

⇩

Turn the main switch "ON".

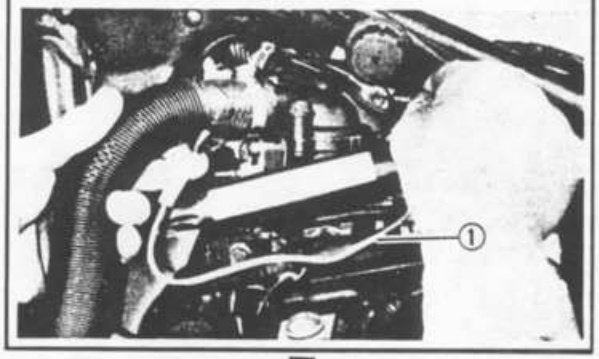
⇩

Disconnect the thermo unit connector. Check the battery voltage (12V) on Green/Red lead from the wire harness.

No → Check for an open or poor connection between the fuse "SIGNAL" and thermo unit connector.

⇩ Yes

Disconnect the thermo unit connector. Connect the Green/Red lead from the wire harness to "ground" on the frame; use a jumper lead ① .




⇩

The temperature gauge needle will swing from "C" to "H".

No → Replace the temperature gauge.

⇩ Yes

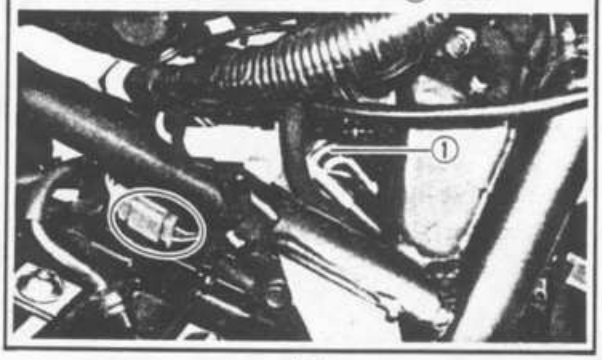
Replace the thermo unit.

TROUBLESHOOTING CHART (2)

ELECTRIC FAN MOTOR DOES NOT OPERATE.

⇩

Disconnect the thermo switch ① lead.




⇩

Check for the battery voltage (12V) on Brown lead from the wire harness.

No → Check for an open or poor connection between the fuse "FAN" and thermo switch connector.

⇩ Yes

Connect the Brown lead and Blue lead; use a jump lead ① .




⇩

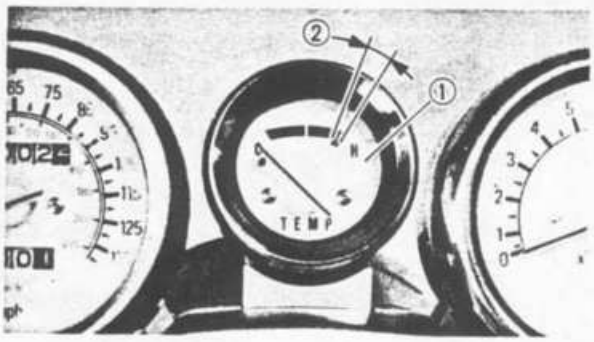
The fan motor operates.

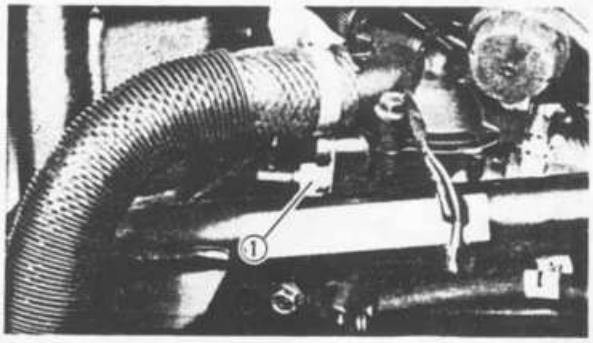
No → Replace the fan motor.

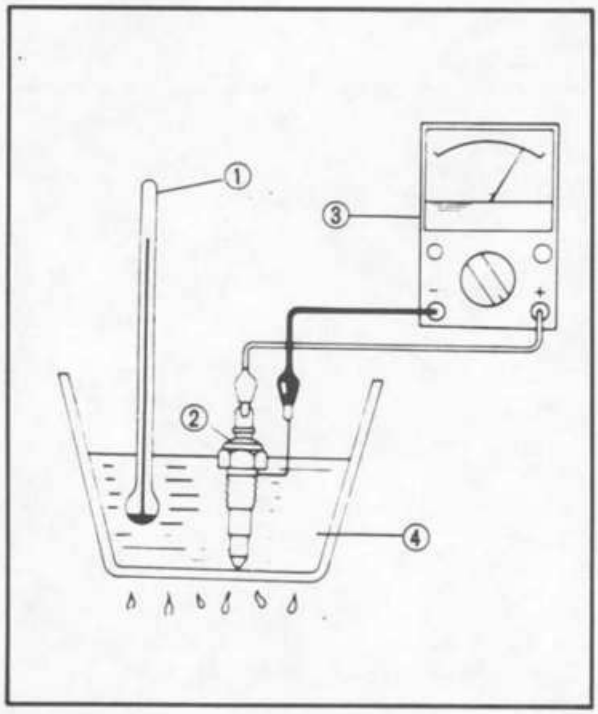
⇩ Yes

Replace the thermo switch.

7







## THERMO UNIT AND THERMOMETER

### Operation

The thermo unit has less resistance at higher temperatures and thus allows more current to pass through. When more current flows to the coil in the temperature gauge; the armature to which the needle is attracted by the increased magnetic field. In this way, the needle indicates the temperature.

① Temperature gauge
② Red zone

### Thermo Unit Inspection

1. Remove:
   • Thermo unit ①

**CAUTION:**

**Handle the thermo unit with special care. Never subject it to strong shock or allow it to be dropped. Should it be dropped, it must be replaced.**

2. Check:
   • Thermo unit operation
   Out of specification → Replace.

**Thermo unit inspection steps:**
- Immerse thermo-unit in water.
- Check continuity at indicated temperatures. Note temperatures while heating the water.

① Temperature gauge
② Thermo unit
③ Pocket tester
④ Water

| Water Temperature | 50°C (122°F) | 100°C (212°F) | 120°C (248°F) |
|---|---|---|---|
| Resistance | 156 Ω | 28.4 Ω | 17 Ω |

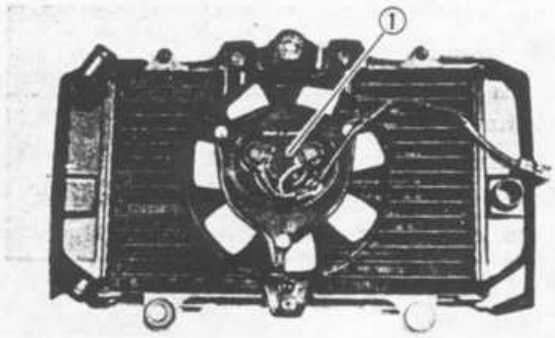
3. Install:
   • Thermo unit ②
4. Tighten:
   • Thermo unit

**Thermo Unit ② :**
**15 Nm (1.5 m·kg, 11 ft·lb)**

7

**CAUTION:**

**After replacing the thermo unit, check the coolant level in the radiator and also check for any leakage.**




## ELECTRIC FAN AND THERMO SWITCH

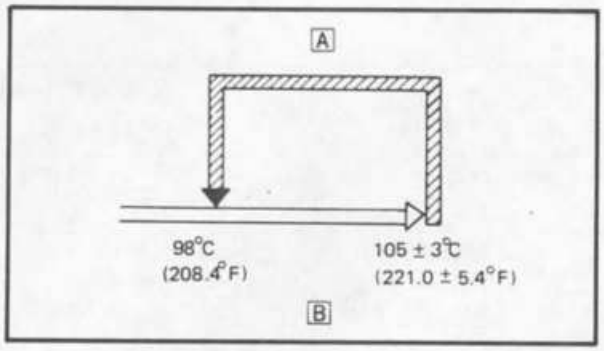
### Operation

The electric fan will be switched ON or OFF according to the coolant temperature in the radiator.

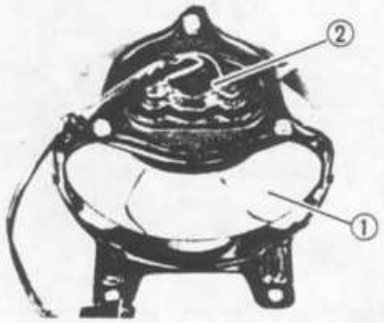
① Electric fan motor

NOTE:

The electric fan is controlled by the thermo switch when the main switch is "ON". Thus, under certain operating conditions, this fan may continue to run until the engine temperature has cooled down to about 98°C (208.4°F).



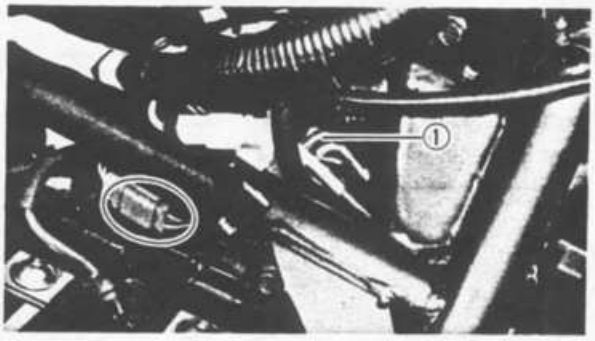

A THERMO SWITCH "ON"
B COOLANT TEMPERATURE

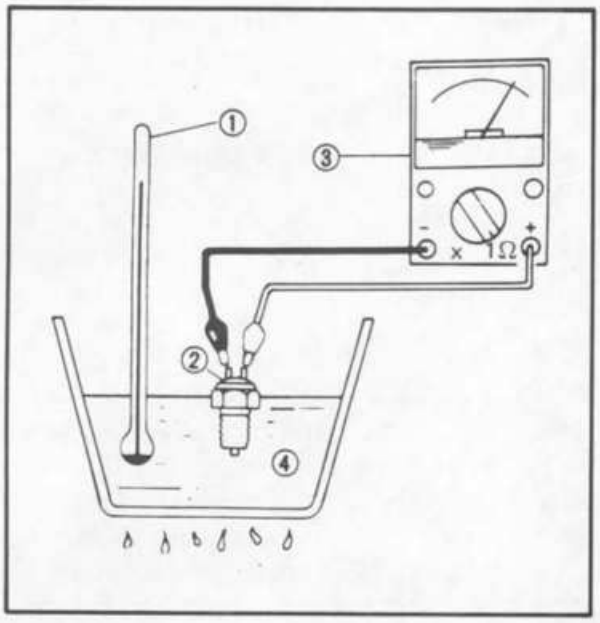



| The following problems may require repair or replacement of components | |
|---|---|
| Component | Condition |
| Fan motor | Unsmooth operation<br>Excessive vibration |
| Fan motor bracket<br>Fan blades | Cracks |
| Securing bolts | Looseness |

① Fan
② Electric fan motor

7







**Thermo Switch Inspection**

1. Remove:
   - Thermo switch ①

**CAUTION:**

**Handle the thermo switch very carefully. Never subject it to strong shock or allow it to be dropped. Should it be dropped, it must be replaced.**

2. Inspect:
   - Thermo switch operation

**Thermo switch inspection steps:**
- Immerse thermo switch in oil.
- Check continuity as indicated temperatures. Note temperatures while heating the oil.

① Temperature gauge
② Thermo switch
③ Pocket Tester
④ Oil

| Test step | Oil temperature | Pocket Tester (Ω x 1) |
|---|---|---|
| 1 | 0 ~ 98°C (32 ~ 208.4°F) | Discontinuity |
| 2 | More than 105° ± 3°C (more than 221.0 ± 5.4° F) | Continuity |
| 3* | 105 to 98°C (221.0 ~ 208.4° F) | Continuity |
| 4* | less than 98°C (less than 208.4°F) | Discontinuity |

Test 1 & 2: Heat-up tests
Test 3* & 4*: Cool-down tests

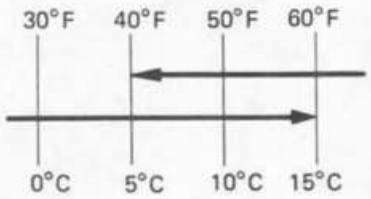
3. Install:
   - Thermo switch ②

**Thermo Switch ② :**
**23 Nm (2.3 m·kg, 27 ft·lb)**

**CAUTION:**

**After replacing ther thermo switch, check the coolant level in the radiator and also check for any leakage.**

## SPECIFICATIONS
## GENERAL SPECIFICATIONS

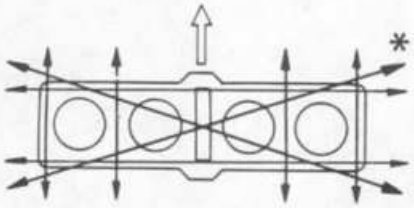
| Item \ Model | XJ750XN |
|---|---|
| Model Code Number<br>Federal V.I.N. Number<br>Engine Starting Number | 1FL<br>JYA1FL00 * FA000101<br>1FL-000101 |
| Dimensions:<br>Overall Length<br>Overall Width<br>Overall Height<br>Seat Height<br>Wheelbase<br>Minimum Ground Clearance | <br>2,235 mm (88.0 in)<br>775 mm (30.5 in)<br>1,160 mm (45.7 in)<br>760 mm (29.9 in)<br>1,520 mm (59.8 in)<br>145 mm ( 5.7 in) |
| Basic Weight:<br>With Oil and Full Fuel Tank | <br>232 kg (511 lb) |
| Minimum Turning Radius: | 2,800 mm (110.2 in) |
| Engine:<br>Engine Type<br>Cylinder Arrangement<br>Displacement<br>Bore x Stroke<br>Compression Ratio<br>Compression Pressure<br>Starting System | <br>Liquid cooled 4-stroke, gasoline, DOHC<br>4-cylinder parallel<br>749 $cm^3$ (45.69 cu.in)<br>68.0 x 51.6 mm (2.677 x 2.032 in)<br>11.2 : 1<br>1,098 kPa (11.2 $kg/cm^2$ , 159 psi) at 300 r/min<br>Electric starter |
| Lubrication System: | Pressure lubricated, wet sump |
| Oil Type of Grade:<br>Engine Oil<br><br><br>Final Gear Oil | <br>Yamalube 4-cycle oil or SAE 20W40 type SE motor oil<br>(If temperature does not go below 5°C (40°F).)<br><br>SAE 10W30 type SE motor oil<br>(If temperature does not go above 15°C (60°F).)<br>SAE 80API "GL-4" Hypoid gear oil |
| Oil Capacity:<br>Engine Oil:<br>Periodic Oil Change<br>With Oil Filter Replacement<br>Total Amount<br>Final Gear Case Oil Amount | <br><br>2.5 L (2.2 Imp qt, 2.6 US qt)<br>2.8 L (2.5 Imp qt, 3.0 US qt)<br>3.5 L (3.1 Imp qt, 3.7 US qt)<br>0.2 L (0.18 Imp qt, 0.21 US qt) |
| Radiator Capacity:<br>(Includingall routes) | <br>2.4 L (2.1 Imp qt, 2.5 US qt) |
| Air Filter: | Dry type element |
| Fuel:<br>Type<br>Tank Capacity<br>Reserve Amount | <br>Regular gasoline<br>13 L (2.9 Imp gal, 3.4 US gal)<br>3 L (0.7 Imp gal, 0.8 US gal) |
| Carburetor:<br>Type<br>Manufacturer | <br>BS33 x 4, Constant velocity<br>MIKUNI |

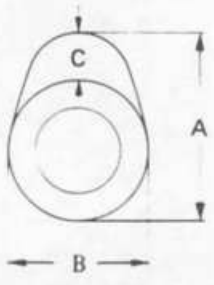
| Item \ Model | XJ750XN | |
|---|---|---|
| Spark Plug: | | |
| Type/Manufacturer | DR8ES-L/NGK or X24ESR-U/NIPPONDENSO | |
| Gap | 0.6 ~ 0.7 mm (0.024 ~ 0.028 in) | |
| Clutch Type: | Wet, multiple-disc | |
| Transmission: | | |
| Primary Reduction System | Spur gear | |
| Primary Reduction Ratio | 97/58 (1.672) | |
| Secondary Reduction System | Shaft drive | |
| Secondary Reduction Ratio | 49/36 x 19/18 x 32/11 (4.179) | |
| Transmission Type | Constant-mesh, 5-speed | |
| Operation | Left foot operation | |
| Gear Ratio 1st | 35/16 (2.187) | |
| 2nd | 30/20 (1.500) | |
| 3rd | 30/26 (1.153) | |
| 4th | 28/30 (0.933) | |
| 5th | 26/32 (0.812) | |
| Chassis: | | |
| Frame Type | Tubular steel, double cradle | |
| Caster Angle | 31.5° | |
| Trail | 120 mm (4.72 in) | |
| Tire: | | |
| Type | Tubeless | |
| Size (F) | 100/90-19 57H | |
| Size (R) | 130/90-16 67H | |
| Tire Pressurer (Cold Tire): | FRONT | REAR |
| Up to 90 kg (198 lb) load* | 177 kPa (1.8 kg/cm², 26 psi) | 196 kPa (2,0 kg/cm², 28 psi) |
| 90 kg (198 lb) load ~ 238 kg (525 lb) load* | 196 kPa (2.0 kg/cm², 28 psi) | 275 kPa (2.8 kg/cm², 40 psi) |
| High Speed Riding | 206 kPa (2.1 kg/cm², 30 psi) | 226 kPa (2.3 kg/cm², 32 psi) |
| | *Load is the total weight of cargo, rider, passenger, and accessories. | |
| Brake: | | |
| Front Brake Type | Dual disc brake | |
| Operation | Right hand operation | |
| Rear Brake Type | Drum brake | |
| Operation | Right foot operation | |
| Suspension: | | |
| Front Suspension | Telescopic fork | |
| Rear Suspension | Swingarm | |
| Shock Absorber: | | |
| Front Shock Absorber | Coil-Air spring, oil damper | |
| Rear Shock Absorber | Coil spring, oil damper | |
| Wheel Travel: | | |
| Front Wheel Travel | 150 mm (5.9 in) | |
| Rear Wheel Travel | 99 mm (3.9 in) | |
| Electrical: | | |
| Ignition System | T.C.I. | |
| Generator System | A.C. Generator | |
| Battery Type or Model | YB14L | |
| Battery Capacity | 12V 14AH | |

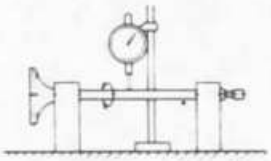
| Item \ Model | XJ750XN |
|---|---|
| Headlight Type: | Semi-sealed beam (Quartz bulb) |
| Bulb Wattage x Quantity: | |
| Headlight | 12V, 60W/55W |
| Tail/Brake Light | 12V, 8W/27W x 2 |
| Flasher Light | 12V, 27W x 4 |
| Indicator Light: | |
| Meter Light | 12V, 3W x 4 |
| Wattage x Quantity: "NEUTRAL" | 12V, 3W x 1 |
| "HIGH BEAM" | 12V, 3W x 1 |
| "TURN" | 12V, 3W x 2 |
| "OIL LEVEL" | 12V, 3W x 1 |
| "FUEL" | 12V, 3W x 1 |

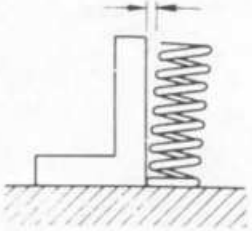
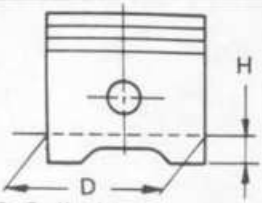
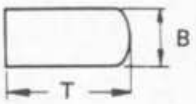
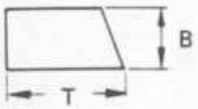
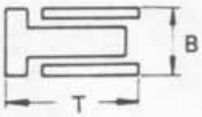
## MAINTENANCE SPECIFICATIONS

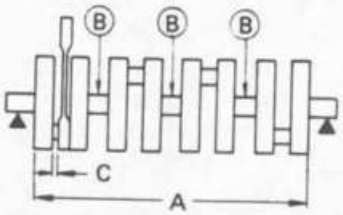
### Engine

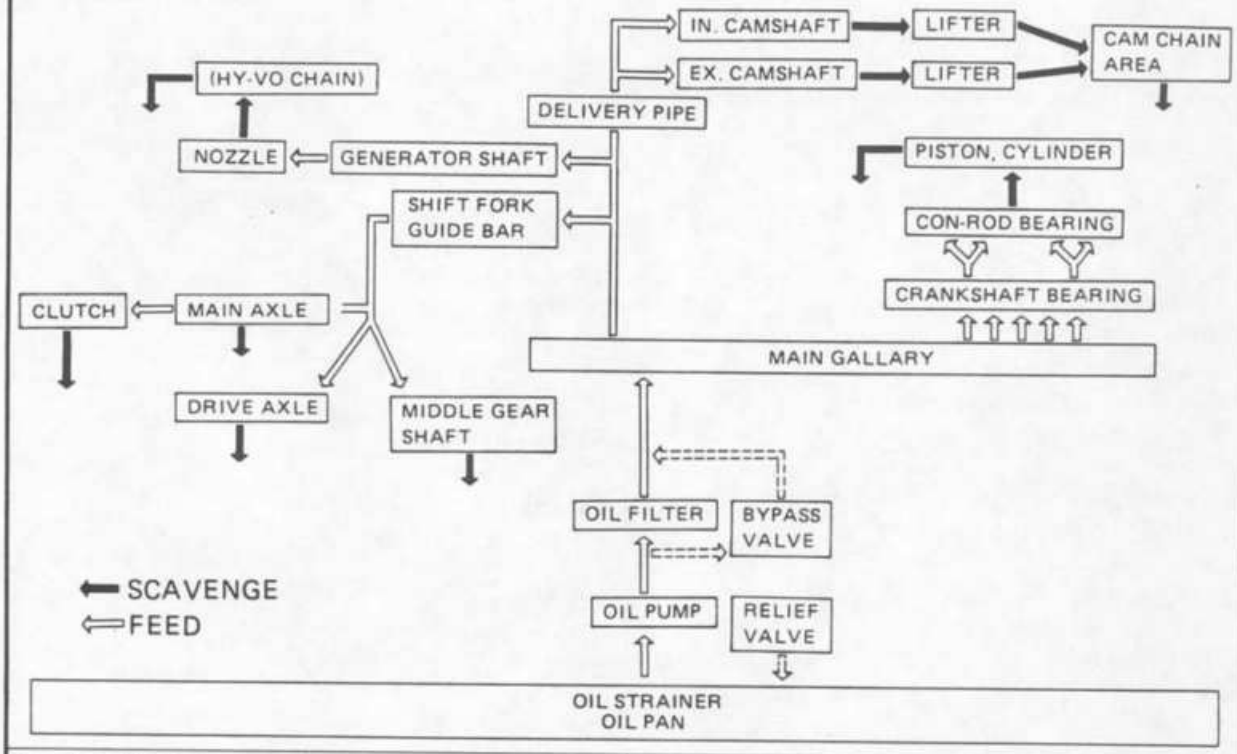
| Item \ Model | XJ750XN |
|---|---|
| Cylinder Head: | |
| Warp Limit | 0.03 mm (0.0012 in)<br>*Lines indicate straightedge measurement. |
|  | |
| Cylinder: | |
| Bore Size | 68.000 ~ 68.005 mm (2.6772 ~ 2.6774 in) |
| Taper Limit | 0.05 mm (0.002 in) |
| Out-of Round Limit | 0.05 mm (0.002 in) |
| Camshaft: | |
| Drive Method | Chain drive (Center) |
| Cam Cap Inside Diameter | $24.5^{+0.021}_{0}$ mm ($0.9646^{+0.0008}_{0}$ in) |
| Camshaft Outside Diameter | $24.5^{-0.050}_{-0.063}$ mm ($0.9646^{-0.0020}_{-0.0025}$ in) |
| Shaft to Cap Clearance | 0.050 ~ 0.084 mm (0.0020 ~ 0.0033 in) |
| Cam Dimensions: | |
| Intake "A" | 32.55 ~ 32.65 mm (1.2815 ~ 1.2854 in) |
| <Limit> | 32.45 mm (1.2776 in) |
| "B" | 24.95 ~ 25.05 mm (0.9823 ~ 0.9862 in) |
| <Limit> | 24.85 mm (0.9783 in) |
| "C" | 7.5 ~ 7.7 mm (0.2953 ~ 0.3031 in) |
| Exhaust "A" | 32.40 ~ 32.50 mm (1.2756 ~ 1.2795 in) |
| <Limit> | 32.30 mm (1.2717 in) |
| "B" | 24.95 ~ 25.05 mm (0.9823 ~ 0.9862 in) |
| <Limit> | 24.85 mm (0.9783 in) |
| "C" | 7.35 ~ 7.55 mm (0.2894 ~ 0.2972 in) |

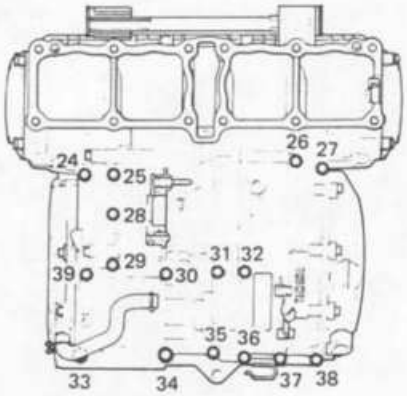
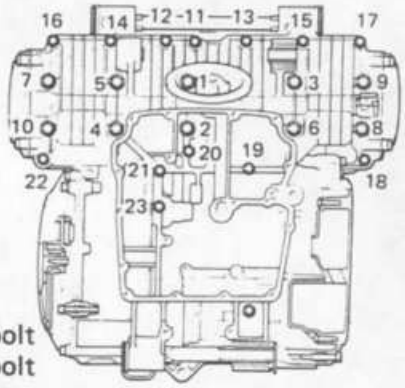


| Item | | Model XJ750XN |
|---|---|---|
| Camshaft Runout Limit | | 0.03 mm (0.0012 in) |
| Cam Chain Type/Number of Links | | Bush chain/112 |
| Cam Chain Adjustment Method | | Automatic |
| Valve, Valve Seat, Valve Guide: | | |
| Valve Clearance (Cold) | IN. | 0.11 ~ 0.20 mm (0.004 ~ 0.008 in) |
| | EX. | 0.21 ~ 0.30 mm (0.008 ~ 0.012 in) |
| Valve Dimensions | | |
|  | | |
| "A" Head Dia. | IN. | 21 ± 0.1 mm (0.827 ± 0.004 in) |
| | EX. | 23 ± 0.1 mm (0.906 ± 0.004 in) |
| "B" Face Width | IN. | 1.98 ~ 2.55 mm (0.080 ~ 0.100 in) |
| | EX. | 1.98 ~ 2.55 mm (0.080 ~ 0.100 in) |
| "C" Seat Width | IN. | 1.0 ± 0.1 mm (0.040 ± 0.004 in) |
| | EX. | 1.0 ± 0.1 mm (0.040 ± 0.004 in) |
| "D" Margin Thickness | IN. | 0.7 ± 0.1 mm (0.028 ± 0.004 in) |
| | EX. | 0.7 ± 0.1 mm (0.028 ± 0.004 in) |
| Stem Outside Diameter | IN. | $5^{-0.010}_{-0.025}$ mm ($0.1969^{-0.0004}_{-0.0010}$ in) |
| | EX. | $5^{-0.025}_{-0.040}$ mm ($0.1969^{-0.0010}_{-0.0016}$ in) |
| <Limit> | IN. | 4.945 mm (0.1947 in) |
| | EX. | 4.930 mm (0.1941 in) |
| Guide Inside Diameter | IN. | $5^{+0.012}_{0}$ mm ($0.1969^{+0.0005}_{0}$ in) |
| | EX. | $5^{+0.012}_{0}$ mm ($0.1969^{+0.0005}_{0}$ in) |
| <Limit> | IN. | 5.05 mm (0.199 in) |
| | EX. | 5.05 mm (0.199 in) |
| Stem-to Guide Clearance | IN. | 0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in) |
| | EX. | 0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in) |
| <Limit> | IN. | 0.08 mm (0.003 in) |
| | EX. | 0.10 mm (0.004 in) |
| Stem-Runout Limit | | 0.01 mm (0.0004 in) |
|  | | |
| Valve Spring: | | |
| Free Length | IN. | 39.76 mm (1.565 in) |
| | EX. | 39.96 mm (1.573 in) |
| Installed Length (Valve Closes) | IN. | 35.0 mm (1.378 in) |
| | EX. | 35.0 mm (1.378 in) |

| Item | Model | XJ750N |
|---|---|---|
| Tilt Limit | | |
| Inner Spring | IN. & EX. | 2.5° or 1.7 mm (0.067 in) |
| Outer Spring | IN. & EX. | 2.5° or 1.7 mm (0.067 in) |
|  | | |
| Direction of Winding | IN. | Right |
| | EX. | Right |
| Piston: | | |
| Piston Size "D"/ |  | $68.00^{-0.060}_{-0.075}$ mm ($2.672^{-0.0024}_{-0.0030}$ in) |
| Measuring Point "H" | | 5 mm (0.20 in) (From bottom line of piston skirt) |
| Clearance Between Piston & Cylinder | | 0.06 ~ 0.08 mm (0.0024 ~ 0.0031 in) |
| | <Limit> | 0.1 mm (0.004 in) |
| Oversize: | 2nd | 68.50 mm (2.697 in) |
| | 4th | 69.00 mm (2.717 in) |
| Piston Ring: | | |
| Sectional Sketch | | |
|  | Top Ring | Barrel<br>B = 1.0 mm (0.039 in)<br>T = 2.6 mm (0.102 in) |
|  | 2nd Ring | Taper<br>B = 1.2 mm (0.042 in)<br>T = 2.7 mm (0.106 in) |
|  | Oil Ring | Expander<br>B = 2.0 mm (0.079 in)<br>T = 2.5 mm (0.098 in) |
| End Gap (Installed): | Top Ring | 0.30 ~ 0.45 mm (0.012 ~ 0.018 in) |
| | <Limit> | 1.0 mm (0.040 in) |
| | 2nd Ring | 0.20 ~ 0.35 mm (0.008 ~ 0.014 in) |
| | <Limit> | 1.0 mm (0.040 in) |
| | Oil Ring | 0.20 ~ 0.7 mm (0.008 ~ 0.028 in) |
| | <Limit> | 1.5 mm (0.060 in) |
| Side Clearance: | Top Ring | 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) |
| | <Limit> | 0.15 mm (0.006 in) |
| | 2nd Ring | 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) |
| | <Limit> | 0.15 mm (0.006 in) |

| Item \ Model | XJ750XN |
|---|---|
| Connecting Rod: | |
| Oil Clearance | 0.032 ~ 0.056 mm (0.0013 ~ 0.0022 in) |
| Crankshaft: |  |
| Crank Width "A" | 341.4 ± 0.6 mm (13.441 ± 0.024 in) |
| Runout Limit "B" | 0.03 mm (0.0012 in) |
| Big End Side Clearance "C" | 0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in) |
| Journal Clearance | 0.020 ~ 0.044 mm (0.0008 ~ 0.0017 in) |
| Bearing: | |
| Color Code (Corresponding Size) | 1. Blue $1.5\ ^{+0.006}_{+0.002}$ mm ($0.0591\ ^{+0.00024}_{+0.00007}$ in)<br>2. Black $1.5\ ^{+0.002}_{-0.002}$ mm ($0.0591\ ^{+0.00007}_{-0.00007}$ in)<br>3. Brown $1.5\ ^{-0.002}_{-0.006}$ mm ($0.0591\ ^{-0.00007}_{-0.00024}$ in)<br>4. Green $1.5\ ^{-0.006}_{-0.010}$ mm ($0.0591\ ^{-0.00024}_{-0.00039}$ in)<br>5. Yellow $1.5\ ^{-0.010}_{-0.014}$ mm ($0.0591\ ^{-0.00039}_{-0.00055}$ in) |
| Clutch: | |
| Friction Plate Thickness x Quantity | 3.0 mm (0.12 in) x 8 |
| Wear Limit | 2.8 mm (0.11 in) |
| Clutch Plate Thickness x Quantity | 2.0 mm (0.079 in) x 7 |
| Warp Limit | 0.05 mm (0.0020 in) |
| Clutch Spring Free Length x Quantity | 50.5 mm (2.031 in) x 6 |
| Clutch Spring Minimum Length | 49.0 mm (1.93 in) |
| Clutch Release Method | Outer Pull |
| 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 | 0.1 mm (0.004 in) |
| Carburetor: | |
| Type/Manufacturer/Quantity | BS33/MIKUNI/4 |
| I.D. Mark | 1FL 00 |
| Main Jet (M.J.) | #105 |
| Main Air Jet (M.A.J.) | #120 |
| Jet Needle-clip Position (J.N.) | 5FZ83 |
| Needle Jet (N.J.) | Y-2 |
| Throttle Valve (Th.V) | #130 |
| Pilot Jet (P.J.) | #37.5 |
| Pilot Outlet Size (P.O.) | φ0.8 |
| Pilot Air Jet (P.A.J.) | #140 |

| Item | | Model XJ750XN |
|---|---|---|
| Pilot Screw | (P.S.) | 2-1/2 ± 1/2 |
| Valve Seat Size | (V.S.) | ϕ2.3 |
| Starter Jet | (G.S.) | #35 |
| Bypath Size | (B.P.) | ϕ0.9 |
| Fuel Level | (F.L.) | 3.0 ± 1.0 mm (0.12 ± 0.04 in) below from the carburetor mixing chamber body edge. |
| Float Height | (F.H.) | 17.5 ± 1.0 mm (0.69 ± 0.04 in) |
| Engine Idling Speed | | 1,050 ± 50 r/min |
| Vacuum Pressure at Idling Speed | | 24 ± 1.3 kPa (180 ± 5 mmHg, 7.1 ± 0.2 inHg) |
| Vacuum Synchronous Difference | | Below 0.7 kPa (5 mmHg, 0.2 inHg) |
| Lubrication System: | | |
| Oil Filter Type | | Paper |
| Oil Pump Type | | Trochoid pump |
| Tip Clearance | | 0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in) |
| Side Clearance | | 0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in) |
| Bypass Valve Setting Pressure | | 98.0 ± 20 kPa (1.0 ± 0.2 kg/cm², 14.2 ± 2.8 psi) |
| Relief Valve Operating Pressure | | 490 ± 49 kPa (5.0 ± 0.5 kg/cm², 71 ± 7.1 psi) |
| Lubrication Chart | |  |
| Cooling System: | | |
| Radiator Core Size | Width | 300 mm (11.8 in) |
| | Height | 185 mm (7.28 in) |
| | Thickness | 32 mm (1.26 in) |
| Radiator Cap Opening Pressure | | 78 ~ 98 kPa (0.8 ~ 1.0 kg/cm², 11.4 ~ 14.2 psi) |
| Coolant: | | |
| Total Amount | | 24.0 L (2.11 Imp qt, 2.54 US qt) |
| Reservoir Tank Capacity | | 0.49 L (0.43 Imp qt, 0.52 US qt) |
| <From Low to FULL Level> | | 0.14 L (0.12 Imp qt, 0.15 US qt) |

| Item \ Model | XJ750XN |
|---|---|
| Water Pump:<br>Type | Single Suction Centrifugal Pump |
| Thermostat:<br>Opening Temperature<br>Full Open Temperature/Lift | 82°C (180°F)<br>95°C (203°F)/8 mm (0.31 in) |
| Shaft Drive:<br>Middle Gear Backlash:<br>Final Gear Backlash: | 0.1 ~ 0.2 mm (0.004 ~ 0.008 in)<br>0.1 ~ 0.2 mm (0.004 ~ 0.008 in) |
| Crankcase Tightening Sequence:<br>Upper case<br><br> | Lower case<br><br><br>⊕ 8 mm bolt<br>○ 6 mm bolt |

| Part to be tightened | Part name | Thread size | Q'ty | Tightening torque | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | Nm | m·kg | ft·lb | |
| Spark plug | – | M12 P1.25 | 4 | 17.5 | 1.75 | 12.5 | |
| Cylinder head | Nut | M9 P1.25 | 8 | 37 | 3.7 | 27 | ◀G |
| Cylinder head cover | Bolt | M6 P1.0 | 8 | 10 | 1.0 | 7.2 | |
| Cam cap | Bolt | M6 P1.0 | 40 | 10 | 1.0 | 7.2 | |
| Cam sprocket | Bolt | M7 P1.0 | 4 | 20 | 2.0 | 14 | |
| Cam case-Cylinder head | Bolt | M6 P1.0 | 11 | 10 | 1.0 | 7.2 | |
| Oil check bolt | Bolt | M6 P1.0 | 1 | 10 | 1.0 | 7.2 | |
| Cover (cylinder head) | Bolt | M6 P1.0 | 4 | 10 | 1.0 | 7.2 | |
| Drain bolt (cylinder) | Bolt | M6 P1.0 | 2 | 10 | 1.0 | 7.2 | |
| Cam chain tensioner end plug | Bolt | M8 P1.25 | 1 | 9 | 0.9 | 6.5 | |
| Cam chain tensioner | Bolt | M6 P1.0 | 2 | 10 | 1.0 | 7.2 | |
| Cam chain guide | Bolt | M6 P1.0 | 1 | 10 | 1.0 | 7.2 | |
| Connecting rod | Nut | M8 P0.75 | 8 | 36 | 3.6 | 25 | ◀M |
| Carburetor cover | Screw | M5 P0.8 | 4 | 5 | 0.5 | 3.6 | |
| Carburetor joint | Bolt | M6 P1.0 | 8 | 12 | 1.2 | 8.7 | |
| Air cleaner case cap | Screw | M5 P1.0 | 3 | 5 | 0.5 | 3.6 | |
| Air cleaner case | Bolt | M6 P1.0 | 2 | 7 | 0.7 | 5.1 | |
| Exhaust pipe-Engine | Nut | M6 P1.0 | 8 | 10 | 1.0 | 7.2 | |
| Exhaust pipe-Chamber | Bolt | M8 P1.25 | 4 | 20 | 2.0 | 14 | |
| Chamber | Bolt | M8 P1.25 | 1 | 25 | 2.5 | 18 | |
| Chamber-Muffler | Bolt | M8 P1.25 | 2 | 25 | 2.5 | 18 | |
| Muffler stay | Bolt | M8 P1.25 | 2 | 20 | 2.0 | 14 | |
| Muffler | Bolt | M8 P1.25 | 2 | 20 | 2.0 | 14 | |

| Part to be tightened | Part name | Thread size | Q'ty | Tightening torque | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | Nm | m·kg | ft·lb | |
| Oil filter | Bolt | M20 P1.5 | 1 | 15 | 1.5 | 11 | |
| Drain bolt | Bolt | M14 P1.5 | 1 | 43 | 4.3 | 31 | |
| Oil pan | Bolt | M6 P1.0 | 13 | 12 | 1.2 | 8.7 | |
| Oil pump sprocket | Bolt | M6 P1.0 | 1 | 12 | 1.2 | 8.7 | |
| Oil pump | Bolt | M6 P1.0 | 3 | 12 | 1.2 | 8.7 | |
| Oil pump cover | Screw | M6 P1.0 | 4 | 7 | 0.7 | 5.1 | |
| Oil delibely pipe | Bolt | M10 P1.25 | 3 | 21 | 2.1 | 15 | |
| Conduit | Bolt | M6 P1.0 | 2 | 7 | 0.7 | 5.1 | |
| Thermostatic valve | Bolt | M6 P1.0 | 1 | 10 | 1.0 | 7.2 | |
| Air bleed screw | Bolt | M6 P1.0 | 1 | 10 | 1.0 | 7.2 | |
| Thermostatic valve cover | Bolt | M6 P1.0 | 2 | 10 | 1.0 | 7.2 | |
| Radiator | Bolt | M6 P1.0 | 3 | 7 | 0.7 | 5.1 | |
| Drain bolt (radiator pipe) | Bolt | M6 P1.0 | 1 | 7 | 0.7 | 5.1 | |
| Drain bolt (radiator) | Bolt | M8 P1.25 | 1 | 30 | 3.0 | 22 | |
| Water pump drive gear cover | Screw | M6 P1.0 | 2 | 8 | 0.8 | 5.8 | |
| Water pump drive gear | Bolt | M6 P1.0 | 1 | 12 | 1.2 | 8.7 | ⑤ |
| Water pump joint | Bolt | M6 P1.0 | 1 | 10 | 1.0 | 7.2 | |
| Joint (cylinder) | Bolt | M6 P1.0 | 4 | 10 | 1.0 | 7.2 | |
| Crankcase | Bolt | M8 P1.25 | 19 | 24 | 2.4 | 17 | ① |
| | Bolt | M6 P1.0 | 20 | 12 | 1.2 | 8.7 | ① |
| Main gallary | Plug | M20 P1.5 | 2 | 12 | 1.2 | 8.7 | ④ |
| A.C.G. cover | Bolt | M6 P1.0 | 3 | 12 | 1.2 | 8.7 | |
| Brush | Screw | M6 P1.0 | 2 | 8 | 0.8 | 5.8 | |
| A.C. Generator | Bolt | M10 P1.25 | 1 | 55 | 5.5 | 40 | |
| A.C.G. bearing housing | TORX screw | M6 P1.0 | 3 | 10 | 1.0 | 7.2 | ⑤ |
| Starter motor | Bolt | M6 P1.0 | 2 | 7 | 0.7 | 5.1 | |
| Timing plate | Bolt | M8 P1.25 | 1 | 24 | 2.4 | 17 | |
| Stationaly pointer | Screw | M6 P1.0 | 1 | 8 | 0.8 | 5.8 | |
| Pickup coil | Screw | M6 P1.0 | 2 | 8 | 0.8 | 5.8 | |
| Clutch cover | Bolt | M6 P1.0 | 10 | 12 | 1.2 | 8.7 | |
| Clutch cable holder | Bolt | M6 P1.0 | 2 | 12 | 1.2 | 8.7 | |
| Pressure plate | Bolt | M6 P1.0 | 6 | 8 | 0.8 | 5.8 | |
| Clutch boss | Nut | M20 P1.0 | 1 | 70 | 7.0 | 50 | |
| Shift pedal | Bolt | M6 P1.0 | 1 | 8 | 0.8 | 5.8 | |
| Shift cover | Bolt | M6 P1.0 | 10 | 12 | 1.2 | 8.7 | |
| Drive axle bearing housing | Bolt | M6 P1.0 | 3 | 12 | 1.2 | 8.7 | |
| Starter clutch outer | Bolt | M8 P1.25 | 3 | 25 | 2.5 | 18 | Stake ⑦ |
| Stopper plate (starter idle gear shaft) | Bolt | M6 P1.0 | 1 | 8 | 0.8 | 5.8 | |
| Drive chain guide (starter) | Bolt | M6 P1.0 | 2 | 8 | 0.8 | 5.8 | |
| Middle gear: Bearing housing | Bolt | M8 P1.25 | 4 | 25 | 2.5 | 18 | ⑤ |
| Bearing stopper plate | TORX screw | M8 P1.25 | 4 | 25 | 2.5 | 18 | |
| Drive shaft bearing | Nut | M34 P1.0 | 1 | 110 | 11 | 80 | Stake |
| Driven shaft bearing | Nut | M65 P1.5 | 1 | 110 | 11 | 80 | |
| Middle gear flange | Nut | M14 P1.5 | 1 | 90 | 9.0 | 65 | Stake ⑦ |

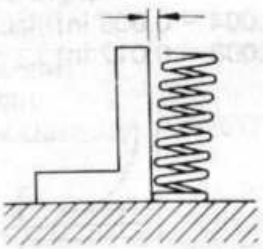
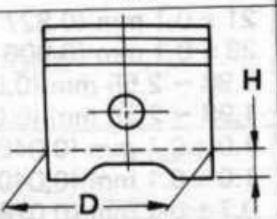
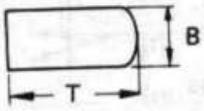
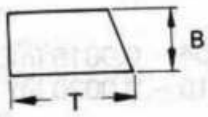
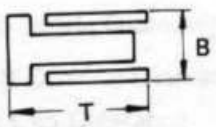
## ENGINE

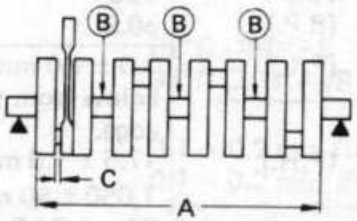
| Item \ Model | XJ700XN/XNC |
|---|---|
| Headlight Type: | Semi-sealed beam (Quartz bulb) |
| Bulb Wattage x Quantity: | |
| Headlight | 12V, 60W/55W |
| Tail/Brake Light | 12V, 8W/27W x 2 |
| Flasher Light | 12V, 27W x 4 |
| Indicator Light: | |
| Meter Light | 12V, 3W x 4 |
| Wattage x Quantity: "NEUTRAL" | 12V, 3W x 1 |
| "HIGH BEAM" | 12V, 3W x 1 |
| "TURN" | 12V, 3W x 2 |
| "OIL LEVEL" | 12V, 3W x 1 |
| "FUEL" | 12V, 3W x 1 |

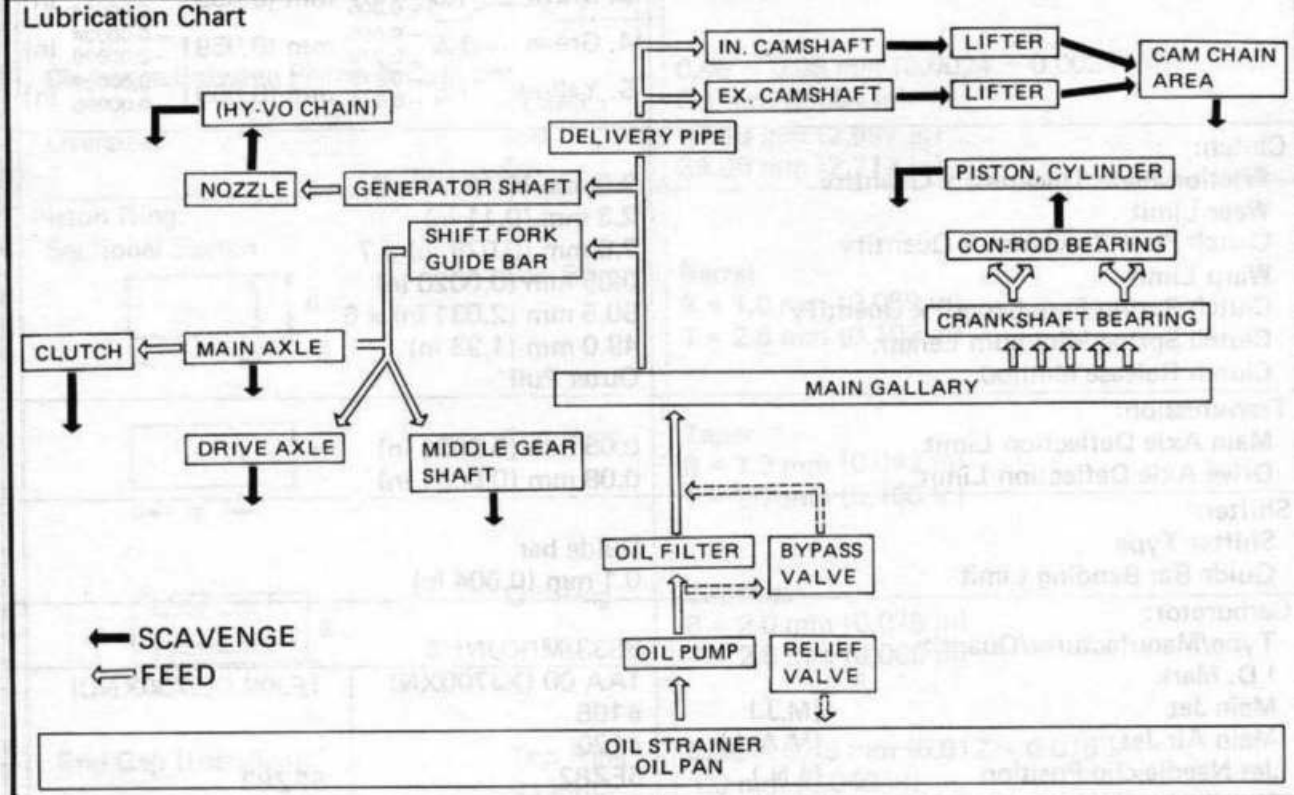
### MAINTENANCE SPECIFICATIONS

### ENGINE

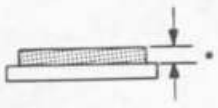
| Item \ Model | XJ700XN/XNC |
|---|---|
| Cylinder Head: | |
| Warp Limit | 0.03 mm (0.0012 in)<br>*Lines indicate straightedge measurement. |
| Cylinder: | |
| Bore Size | 68.000 ~ 68.005 mm (2.6772 ~ 2.6774 in) |
| Taper Limit | 0.05 mm (0.002 in) |
| Out-of Round Limit | 0.05 mm (0.002 in) |
| Camshaft: | |
| Drive Method | Chain drive (Center) |
| Cam Cap Inside Diameter | $24.5^{+0.021}_{0}$ mm ($0.9646^{+0.0008}_{0}$ in) |
| Camshaft Outside Diameter | $24.5^{-0.050}_{-0.063}$ mm ($0.9646^{-0.0020}_{-0.0025}$ in) |
| Shaft to Cap Clearance | 0.050 ~ 0.084 mm (0.0020 ~ 0.0033 in) |
| Cam Dimensions: | |
| Intake "A" | 32.55 ~ 32.65 mm (1.2815 ~ 1.2854 in) |
| <Limit> | 32.45 mm (1.2776 in) |
| "B" | 24.95 ~ 25.05 mm (0.9823 ~ 0.9862 in) |
| <Limit> | 24.85 mm (0.9783 in) |
| "C" | 7.5 ~ 7.7 mm (0.2953 ~ 0.3031 in) |
| Exhaust "A" | 32.40 ~ 32.50 mm (1.2756 ~ 1.2795 in) |
| <Limit> | 32.30 mm (1.2717 in) |
| "B" | 24.95 ~ 25.05 mm (0.9823 ~ 0.9862 in) |
| <Limit> | 24.85 mm (0.9783 in) |
| "C" | 7.35 ~ 7.55 mm (0.2894 ~ 0.2972 in) |

| Item | Model | XJ700XN/XNC |
|---|---|---|
| Tilt Limit | | |
| Inner Spring | IN. & EX. | 2.5° or 1.7 mm (0.067 in) |
| Outer Spring | IN. & EX. | 2.5° or 1.7 mm (0.067 in) |
|  | | |
| Direction of Winding | IN. | Right |
| | EX. | Right |
| Piston: | | |
| Piston Size "D"/ |  | $68.00^{-0.060}_{-0.075}$ mm ($2.672^{-0.0024}_{-0.0030}$ in) |
| Measuring Point "H" | | 5 mm (0.20 in) (From bottom line of piston skirt) |
| Clearance Between Piston & Cylinder | | 0.06 ~ 0.08 mm (0.0024 ~ 0.0031 in) |
| | <Limit> | 0.1 mm (0.004 in) |
| Oversize: | 2nd | 68.50 mm (2.697 in) |
| | 4th | 69.00 mm (2.717 in) |
| Piston Ring: | | |
| Sectional Sketch | | |
|  | Top Ring | Barrel<br>B = 1.0 mm (0.039 in)<br>T = 2.6 mm (0.102 in) |
|  | 2nd Ring | Taper<br>B = 1.2 mm (0.042 in)<br>T = 2.7 mm (0.106 in) |
|  | Oil Ring | Expander<br>B = 2.0 mm (0.079 in)<br>T = 2.5 mm (0.098 in) |
| End Gap (Installed): | Top Ring | 0.30 ~ 0.45 mm (0.012 ~ 0.018 in) |
| | <Limit> | 1.0 mm (0.040 in) |
| | 2nd Ring | 0.20 ~ 0.35 mm (0.008 ~ 0.014 in) |
| | <Limit> | 1.0 mm (0.040 in) |
| | Oil Ring | 0.20 ~ 0.7 mm (0.008 ~ 0.028 in) |
| | <Limit> | 1.5 mm (0.060 in) |
| Side Clearance: | Top Ring | 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) |
| | <Limit> | 0.15 mm (0.006 in) |
| | 2nd Ring | 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) |
| | <Limit> | 0.15 mm (0.006 in) |

| Item \ Model | XJ700XN/XNC | |
|---|---|---|
| Connecting Rod: | | |
| Oil Clearance | 0.032 ~ 0.056 mm (0.0013 ~ 0.0022 in) | |
| Crankshaft: |   | |
| Crank Width "A" | 341.4 ± 0.6 mm (13.441 ± 0.024 in) | |
| Runout Limit "B" | 0.03 mm (0.0012 in) | |
| Big End Side Clearance "C" | 0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in) | |
| Journal Clearance | 0.020 ~ 0.044 mm (0.0008 ~ 0.0017 in) | |
| Bearing: | | |
| Color Code (Corresponding Size) | 1. Blue $1.5\ ^{+0.006}_{+0.002}$ mm ($0.0591\ ^{+0.00024}_{+0.00007}$ in) | |
| | 2. Black $1.5\ ^{+0.002}_{-0.002}$ mm ($0.0591\ ^{+0.00007}_{-0.00007}$ in) | |
| | 3. Brown $1.5\ ^{-0.002}_{-0.006}$ mm ($0.0591\ ^{-0.00007}_{-0.00024}$ in) | |
| | 4. Green $1.5\ ^{-0.006}_{-0.010}$ mm ($0.0591\ ^{-0.00024}_{-0.00039}$ in) | |
| | 5. Yellow $1.5\ ^{-0.010}_{-0.014}$ mm ($0.0591\ ^{-0.00039}_{-0.00055}$ in) | |
| Clutch: | | |
| Friction Plate Thickness x Quantity | 3.0 mm (0.12 in) x 8 | |
| Wear Limit | 2.8 mm (0.11 in) | |
| Clutch Plate Thickness x Quantity | 2.0 mm (0.079 in) x 7 | |
| Warp Limit | 0.05 mm (0.0020 in) | |
| Clutch Spring Free Length x Quantity | 50.5 mm (2.031 in) x 6 | |
| Clutch Spring Minimum Length | 49.0 mm (1.93 in) | |
| Clutch Release Method | Outer Pull | |
| 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 | 0.1 mm (0.004 in) | |
| Carburetor: | | |
| Type/Manufacturer/Quantity | BS33/MIKUNI/4 | |
| I.D. Mark | 1AA 00 (XJ700XN) | 1FJ00 (XJ700XNC) |
| Main Jet (M.J.) | #105 | ← |
| Main Air Jet (M.A.J.) | #120 | ← |
| Jet Needle-clip Position (J.N.) | 5FZ82 | 5FZ83 |
| Needle Jet (N.J.) | Y-2 | ← |
| Throttle Valve (Th.V) | #130 | ← |
| Pilot Jet (P.J.) | #35 | ← |
| Pilot Outlet Size (P.O.) | ϕ0.85 | ← |
| Pilot Air Jet (P.A.J.) | #140 | ← |

| Item | Model | XJ700XN/XNC | |
|---|---|---|---|
| Pilot Screw | (P.S.) | Preset | ← |
| Valve Seat Size | (V.S.) | φ2.3 | ← |
| Starter Jet | (G.S.) | #35 | ← |
| Bypath Size | (B.P.) | φ0.9 | ← |
| Fuel Level | (F.L.) | 3.0 ± 1.0 mm (0.12 ± 0.04 in) below from the carburetor mixing chamber body edge. | |
| Float Height | (F.H.) | 17.5 ± 1.0 mm (0.69 ± 0.04 in) | |
| Engine Idling Speed | | 1,050 ± 50 r/min | |
| Vacuum Pressure at Idling Speed | | 24 ± 1.3 kPa (180 ± 5 mmHg, 7.1 ± 0.2 inHg) | |
| Vacuum Synchronous Difference | | Below 0.7 kPa (5 mmHg, 0.2 inHg) | |
| Lubrication System: | | | |
| Oil Filter Type | | Paper | |
| Oil Pump Type | | Trochoid pump | |
| Tip Clearance | | 0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in) | |
| Side Clearance | | 0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in) | |
| Bypass Valve Setting Pressure | | 98.0 ± 20 kPa (1.0 ± 0.2 kg/cm², 14.2 ± 2.8 psi) | |
| Relief Valve Operating Pressure | | 490 ± 49 kPa (5.0 ± 0.5 kg/cm², 71 ± 7.1 psi) | |
| Lubrication Chart | |  | |
| Cooling System: | | | |
| Radiator Core Size | Width | 300 mm (11.8 in) | |
| | Height | 185 mm (7.28 in) | |
| | Thickness | 32 mm (1.26 in) | |
| Radiator Cap Opening Pressure | | 78 ~ 98 kPa (0.8 ~ 1.0 kg/cm², 11.4 ~ 14.2 psi) | |
| Coolant: | | | |
| Total Amount | | 2.40 L (2.11 Imp qt, 2.54 US qt) | |
| Reservoir Tank Capacity | | 0.49 L (0.43 Imp. qt, 0.52 US qt) | |
| <From Low to FULL Level> | | 0.14 L (0.12 Imp. qt, 0.15 US qt) | |

**Chassis**

| Item \ Model | | XJ750XN |
|---|---|---|
| Steering System: | | |
| Steering Bearing Type | | Taper Roller Bearing |
| Front Suspension: (Each) | | |
| Front Fork Travel | | 150 mm (5.9 in) |
| Fork Spring Free Length | | 511 mm (20.1 in) |
| < Limit > | | < 505 mm (19.9 in) > |
| Spring Rate/Stroke | | $K_1$ = 3.92 N/mm (0.40 kg/mm, 22.4 lb/in)<br>0 ~ 100 mm (0 ~ 3.94 in)<br>$K_2$ = 4.90 N/mm (0.50 kg/mm, 28 lb/in)<br>100 ~ 150 mm (3.94 ~ 5.90 in) |
| Optional Spring | | No. |
| Oil Capacity | | 389 cm³ (13.7 Imp oz, 13.2 US oz) |
| Oil Grade | | YAMAHA Fork & Shock Oil 10wt or equivalent fork oil |
| Enclosed Air Pressure: | | |
| Standard | | 39.2 kPa (0.4 kg/cm², 5.7 psi) |
| Minimum ~ Maximum | | Zero ~ 118 kPa<br>(Zero ~ 1.2 kg/cm², Zero ~ 17.1 psi) |
| Rear Suspension: (Each) | | |
| Shock Absorber Travel | | 70 mm (2.76 in) |
| Spring Free Length | | 243.5 mm (9.59 in) |
| Spring Fitting Length | | 217.5 mm (8.56 in) |
| Spring Rate/Stroke | | $K_1$ = 21.6 N/mm (2.2 kg/mm, 123.2 lb/in)<br>0 ~ 44 mm (0 ~ 1.73 in)<br>$K_2$ = 28.4 N/mm (2.9 kg/mm, 162.3 lb/in)<br>44 ~ 70 mm (1.73 ~ 2.76 in) |
| Rear Arm: | | |
| Swingarm Free Play Limit: | End | 1.0 mm (0.04 in) |
| | Side | 1.0 mm (0.04 in) |
| Wheel: | | |
| Front Wheel Type | | Cast Wheel |
| Rear Wheel Type | | Cast Wheel |
| Front Rim Size/Material | | MT2.15 x 19/Aluminum |
| Rear Rim Size/Material | | MT3.00 x 16/Aluminum |
| Rim Runout Limit: | Vertical | 2.0 mm (0.08 in) |
| | Lateral | 2.0 mm (0.08 in) |
| Disc Brake: | | |
| Type | Front | Dual disc |
| Outside Dia. x Thickness | | 267 x 5 mm (10.5 x 0.2 in) |
| Pad Thickness:  | Inner | 5.5 mm (0.22 in) |
| | <Limit>* | 0.5 mm (0.02 in) |
| | Outer | 5.5 mm (0.22 in) |
| | <Limit>* | 0.5 mm (0.02 in) |
| Master Cylinder Inside Dia. | | 15.87 mm (0.62 in) |
| Caliper Cylinder Inside Dia. | | 38.18 mm (1.50 in) |
| Brake Fluid Type | | DOT #3 |

| Item \ Model | | XJ750XN |
|---|---|---|
| Drum Brake: | | |
| Type | Rear | Leading trailing |
| Drum Inside Dia. | | 200 mm (7.87 in) |
| | <Limit> | 201 mm (7.91 in) |
| Lining Thickness | | 4 mm (0.16 in) |
| | <Limit> | 2 mm (0.08 in) |
| Shoe Spring Free Length | | 68 mm (2.7 in) |
| Brake Lever & Brake Pedal: | | |
| Brake Lever Free Play | | 2 ~ 5 mm (0.08 ~ 0.20 in)/at lever end |
| Brake Pedal Position | | 10 mm (0.4 in) below the top of the footrest |
| Brake Pedal Free Play | | 20 ~ 30 mm (0.8 ~ 0.12 in) |
| Clutch Lever Free Play: | | 2 ~ 3 mm (0.08 ~ 0.12 in)/at lever pivot |

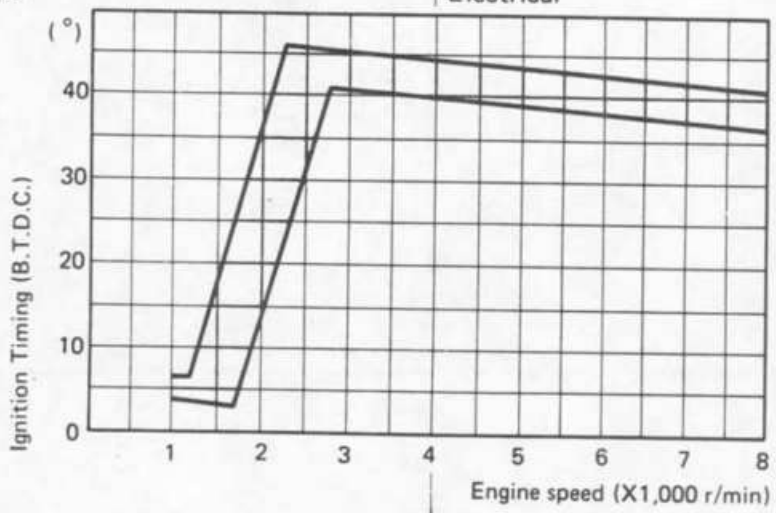
**Tightening torque**

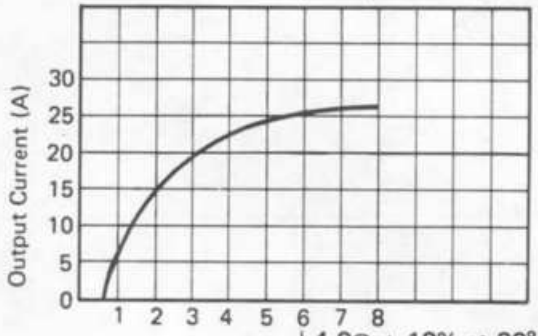
| Part to be tightened | Part name | Thread size | Q'ty | Tightening torque | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | Nm | m·kg | ft·lb | |
| Engine mounting bolt: Front Upper | Nut | M10 P1.25 | 1 | 42 | 4.2 | 30 | |
| Front Lower | Nut | M10 P1.25 | 2 | 42 | 4.2 | 30 | |
| Rear | Nut | M12 P1.25 | 2 | 90 | 9.0 | 65 | |
| Engine mounting stay | Nut | M8 P1.25 | 4 | 33 | 3.3 | 24 | |
| Downtube | Bolt | M8 P1.25 | 4 | 33 | 3.3 | 24 | |
| Downtube & Cross pipe | Nut | M8 P1.25 | 2 | 33 | 3.3 | 24 | |
| Handle crown & Steering shaft | Nut | M20 P1.0 | 1 | 110 | 11 | 80 | |
| Ring nut (Lower) | Nut | M22 P1.0 | 1 | 6 | 0.6 | 4.3 | See page 6-25 |
| Handle crown & Inner tube | Nut | M8 P1.25 | 2 | 20 | 2.0 | 14 | |
| Handle crown & Handlebar holder | Bolt | M8 P1.25 | 4 | 20 | 2.0 | 14 | |
| Under bracket & Inner tube | Bolt | M8 P1.25 | 4 | 23 | 2.3 | 17 | |
| Front wheel axle | Nut castle | M14 P1.5 | 1 | 105 | 10.5 | 75 | |
| Front wheel axle pinch bolt | Nut salf locking | M8 P1.25 | 1 | 20 | 2.0 | 14 | |
| Pivot shaft (Right) | Bolt | M22 P1.5 | 1 | 5.5 | 0.55 | 4.0 | Taper roller bearing |
| Pivot shaft (Left and Right) | Bolt/Nut | M22 P1.5 | 1 | 100 | 10.0 | 72 | |
| Rear wheel axle | Nut castle | M14 P1.5 | 1 | 105 | 10.5 | 75 | |
| Rear wheel axle pinch bolt | Bolt | M8 P1.25 | 1 | 20 | 2.0 | 14 | |
| Rear shock abosrber (Upper) | Nut cap | M8 P1.25 | 2 | 20 | 2.0 | 14 | |
| Rear shock absorber (Lower) | L Nut cap R Bolt | M10 P1.25 | 2 | 30 | 3.0 | 22 | |
| Footrest | Bolt | M8 P1.25 | 4 | 29 | 2.9 | 21 | |
| Tension bar & Brake plate | Bolt | M8 P1.25 | 1 | 20 | 2.0 | 14 | |
| Tension bar & Rear arm | Bolt | M8 P1.25 | 1 | 20 | 2.0 | 14 | |
| Camshaft lever & Camshaft | Bolt | M6 P1.0 | 1 | 9 | 0.9 | 6.5 | |
| Disc brake section: Brake disc & Hub (Front) | Bolt | M8 P1.25 | 12 | 20 | 2.0 | 14 | |
| Master cylinder & Brake hose (Front) | Bolt union | M10 P1.25 | 1 | 26 | 2.6 | 19 | |
| Brake hose & Joint | Bolt union | M10 P1.25 | 1 | 26 | 2.6 | 19 | |
| Caliper & Brake hose | Bolt union | M10 P1.25 | 2 | 26 | 2.6 | 19 | |
| Caliper & Front fork (Front) | | M10 P1.25 | 4 | 35 | 3.5 | 25 | |
| Caliper bleed screw (Ftont) | | M8 P1.25 | 2 | 6 | 0.6 | 4.3 | |
| Front fender | Bolt | M6 P1.0 | 4 | 9 | 0.9 | 6.5 | |

| Part to be tightened | Part name | Thread size | Q'ty | Tightening torque | | | Remarks |
|---|---|---|---|---|---|---|---|
| | | | | Nm | m·kg | ft·lb | |
| Final gear & Rear arm | Nut | M10 P1.25 | 4 | 42 | 4.2 | 30 | |
| Final gear: | | | | | | | |
| Drive shaft | Nut | M14 P1.5 | 1 | 110 | 11 | 80 | ◀ |
| Bearing housing | Flange bolt | M8 P1.25 | 4 | 25 | 25 | 18 | |
| Bearing housing | Nut | M8 P1.25 | 6 | 23 | 2.3 | 17 | |
| Oil filler cap | Plug | M14 P1.5 | 1 | 23 | 2.3 | 17 | |
| Oil drain screw | Plug | M14 P1.5 | 1 | 23 | 2.3 | 17 | |
| Bearing retainer | – | M65 P1.5 | 1 | 110 | 11 | 80 | Left-hand thread |
| Cross joint | Hexagon bolt with washer | M8 P1.25 | 4 | 44 | 4.4 | 32 | |
| Muffler bracket & Frame | Bolt | M8 P1.25 | 3 | 23 | 2.3 | 17 | |
| Rear fender | Bolt | M10 P1.25 | 2 | 32 | 3.2 | 23 | |
| Muffler bracket & Muffler | Bolt | M10 P1.25 | 2 | 25 | 2.5 | 18 | |

## Electrical

| Item \ Model | XJ750XN |
|---|---|
| Voltage: | 12V |
| Ignition System: | |
| Ignition Timing (B.T.D.C.) | 5° at 1,100 r/min |
| Advanced Timing (B.T.D.C.) | 43° at 3,500 r/min |
| Advancer Type | Electrical |



| Item \ Model | XJ750XN |
|---|---|
| T.C.I.: | |
| Pickup Coil Resistance (Color) | 120Ω ± 10% at 20°C (68°F) (Black – Gray)<br>(Black – Orange) |
| T.C.I. Unit – Model/Manufacturer | TID14-35/HITACHI |
| Ignition Coil: | |
| Model/Manufacturer | CM12-25/HITACHI |
| Minimum Spark Gap | 6 mm (0.24 in) or more at 500 r/min |
| Primary Winding Resistance | 2.7Ω ± 10% at 20°C (68°F) |
| Secondary Winding Resistance | 12 kΩ ± 20% at 20°C (68°F) |
| Charging System: | |
| Type | A.C. Generator |
| A.C. Generator: | |
| Model/Manufacturer | LD119-19/HITACHI |
| Nominal Output | 14V, 26A at 5,000 r/min |
| |  |
| Field Coil Resistance | 4.0Ω ± 10% at 20°C (68°F) (Direct) |
| Stator Coil Resistance | 0.46Ω ± 10% at 20°C (68°F) (White – White) |
| Brush Overall Length | 17 mm (0.67 in) |
| <Limit> | 10 mm (0.39 in) |
| Brush Spring Pressure | 190 ~ 360 g (6.7 ~ 12.7 oz) |
| Voltage Regulator : | |
| Type | Semi conductor, Field control |
| Model/Manufacturer | SH233-12/SHINDENGEN |
| No Load Regulated Voltage | 14.5 ± 0.3V |
| Rectifier: | |
| Model/Manufacturer | SH233-12/SHINDENGEN |
| Capacity | 35A |
| Battery: | |
| Capacity | 12V 14AH |
| Specific Gravity | 1.280 |

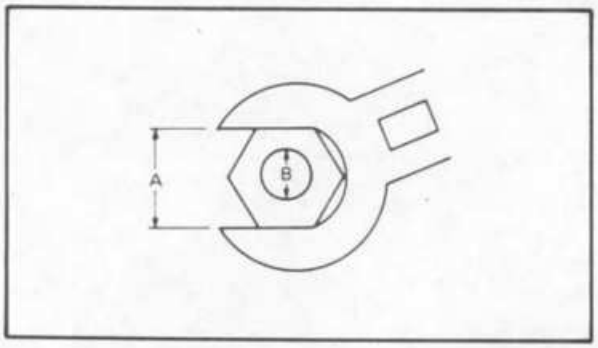
| Item \ Model | XJ750XN |
|---|---|
| Electric Starter System: | |
| Type | Constant-mesh type |
| Starter Motor: | |
| Model/Manufacturer | ADB4D2/NIPPONDENSO |
| Output | 0.6 kW |
| Armature Coil Resistance | 0.014Ω ± 6% at 20°C (68°F) |
| Brush: | |
| Overall Length | 12 mm (0.47 in) |
| <Limit> | 8.5 mm (0.34 in) |
| Spring Pressure | 800 ± 150 g (28.22 ± 5.29 oz) |
| Commutator Diameter: | 28 mm (1.10 in) |
| Wear Limit | 27 mm (1.06 in) |
| Mic Undercut | 0.4 ~ 0.8 mm (0.02 ~ 0.03 in) |
| Starter Relay: | |
| Amperage Rating | 150A |
| Horn: | |
| Type x Quantity | Plain type x 2 |
| Model/Manufacturer | CF12/NIKKO |
| Maximum Amperage | 2.5A |
| Relay Assembly: | |
| Model/Manufacturer | FX257N2/NIPPONDENSO |
| Flasher Relay: | |
| Type | Semi Transistor Type |
| Self Cancelling Device | Yes |
| Flasher Frequency | 60 ~ 120 cycle/min |
| Wattage | 27W x 2 pcs + 3W |
| Starting-Circuit Cut-off Relay: | |
| Color Code | No. |
| Sidestand Relay: | |
| Model/Manufacturer | G2MW-D-3636/TATEISHI |
| Color Code | Blue |
| Oil Level Switch: | |
| Model/Manufacutrer | 4H7/NIPPONDENSO |
| Fuel Level Sender: | |
| Winding Coil Resistance | 1.1 ± 0.2 kΩ at 20°C (68°F) |
| Circuit Breaker: | |
| Type | Fuse |
| Amperage for Individual Circuit x Quantity: | |
| MAIN | 30A x 1 |
| HEADLIGHT | 15A x 1 |
| SIGNAL | 15A x 1 |
| IGNITION | 10A x 1 |
| FAN | 10A x 1 |
| RESERVE | 30A x 1 |
| | 15A x 1 |
| | 10A x 1 |

# GENERAL TORQUE SPECIFICATIONS DEFINITION OF UNITS

## GENERAL TORQUE SPECIFICATIONS

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

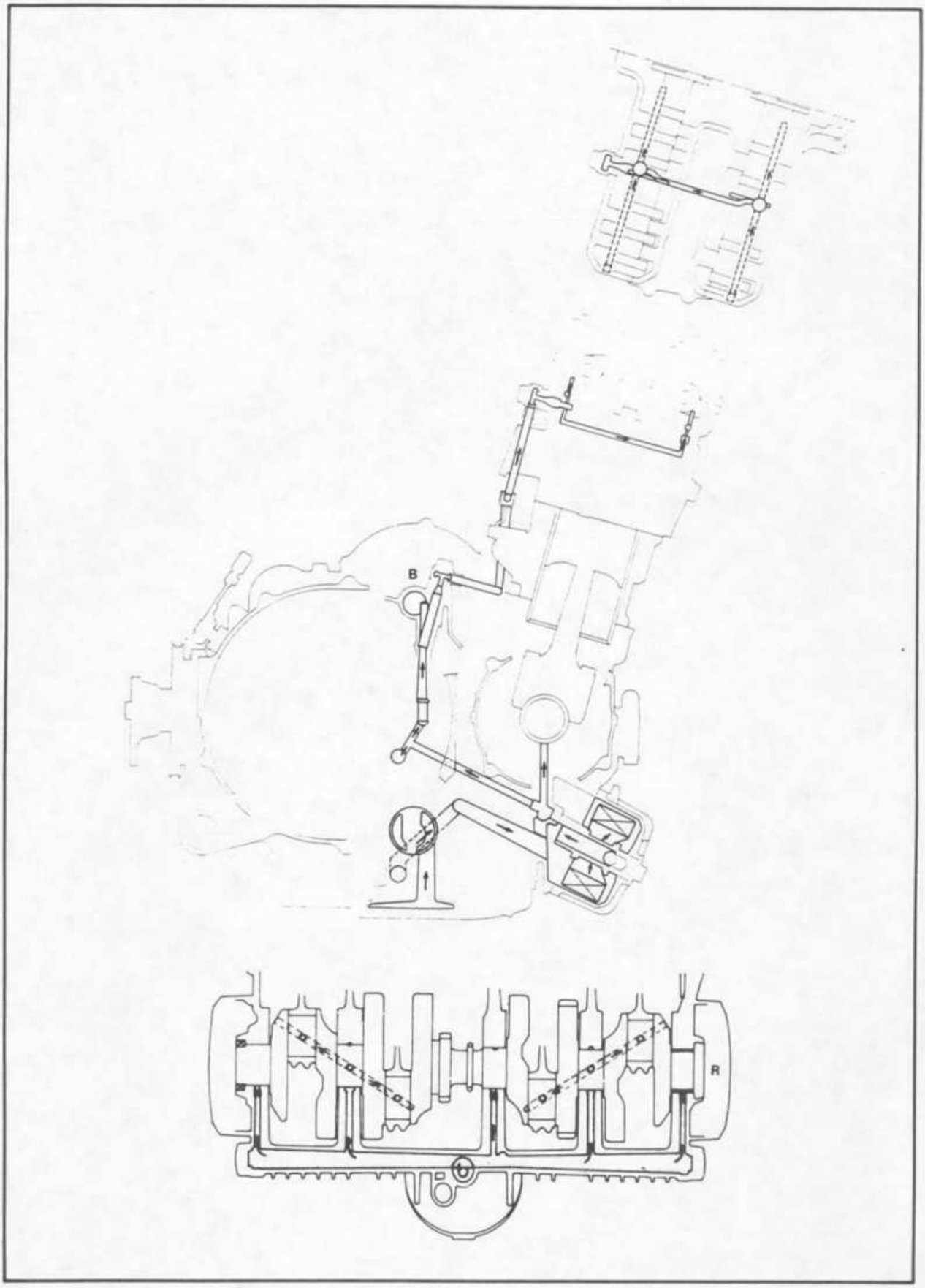
| A (Nut) | B (Bolt) | General torque specifications | | |
|---|---|---|---|---|
| | | Nm | m·kg | ft·lb |
| 10 mm | 6 mm | 6 | 0.6 | 4.3 |
| 12 mm | 8 mm | 15 | 1.5 | 11 |
| 14 mm | 10 mm | 30 | 3.0 | 22 |
| 17 mm | 12 mm | 55 | 5.5 | 40 |
| 19 mm | 14 mm | 85 | 8.5 | 61 |
| 22 mm | 16 mm | 130 | 13.0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



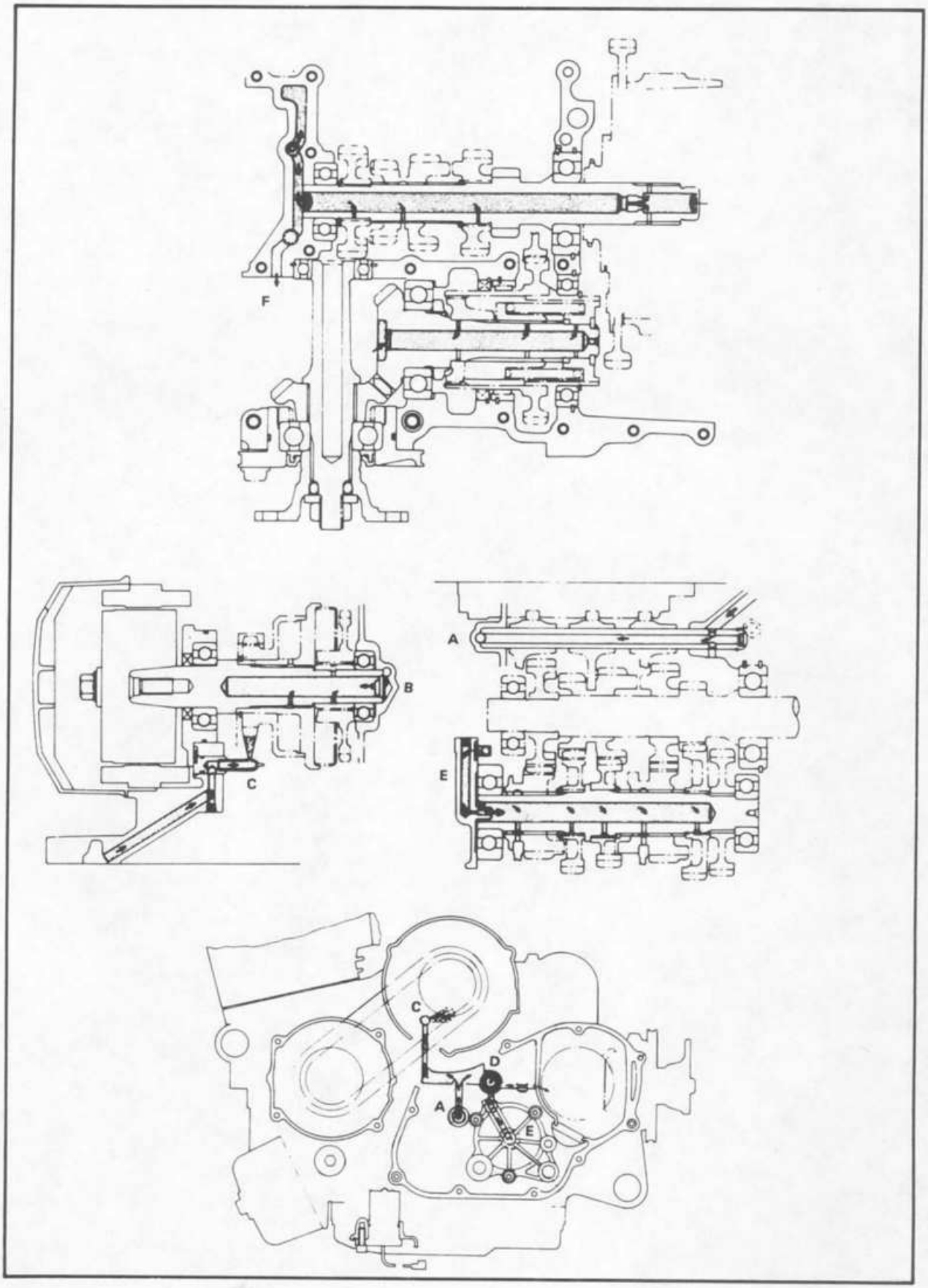

## DEFINITION OF UNITS

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

## LUBRICATION DIAGRAM



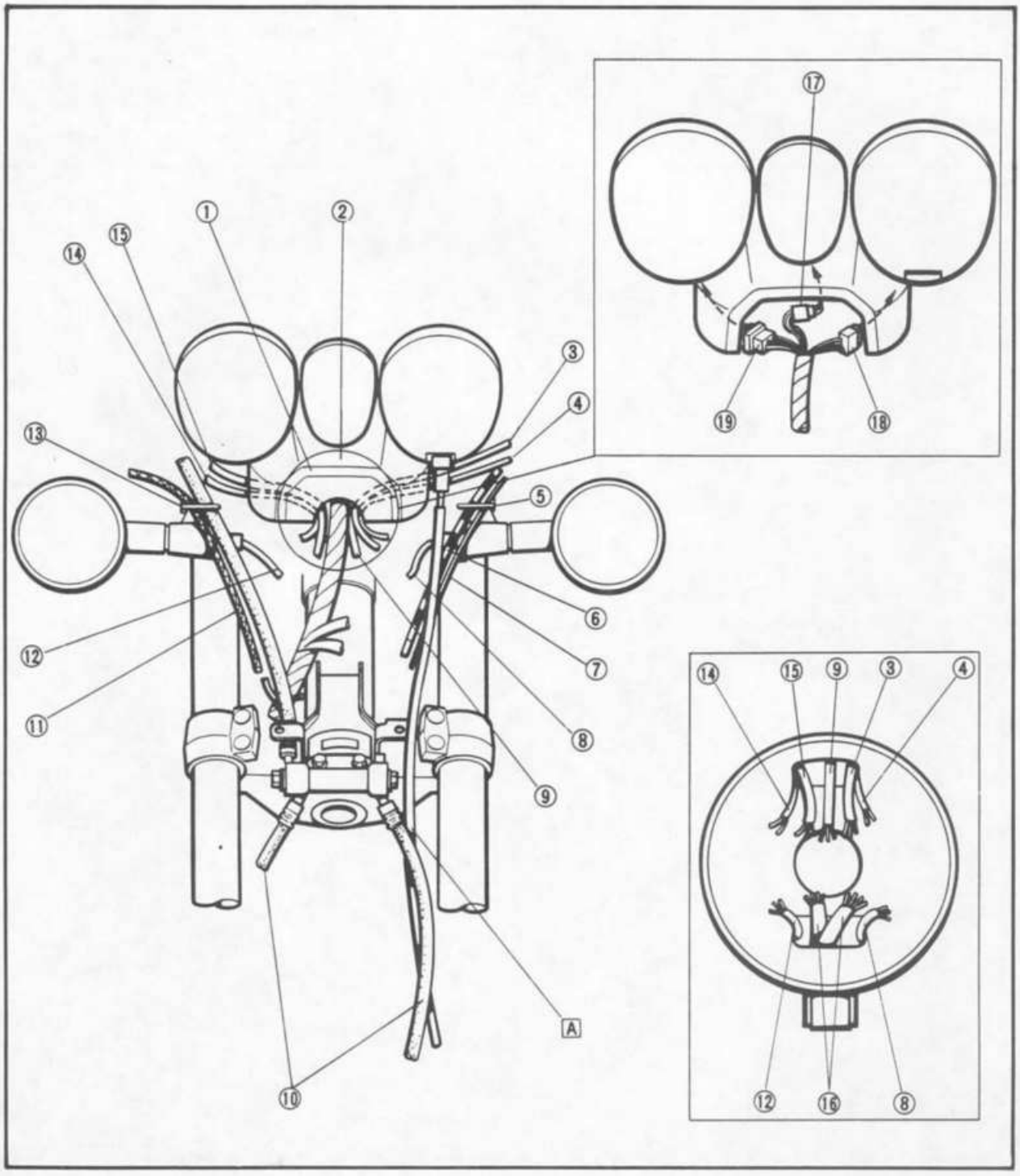
# LUBRICATION DIAGRAM



## CABLE ROUTING (1)

① Cover
② Meter
③ Handlebar swith (Left) lead
④ Clutch switch lead
⑤ Cable guide
⑥ Clutch cable
⑦ Starter cable
⑧ Front flasher light (Left) lead
⑨ Main switch lead
⑩ Front brake hose
⑪ Throttle cable
⑫ Front flasher light (Right) lead
⑬ Cable guide
⑭ Front brake switch lead
⑮ Handlebar switch (Right) lead
⑯ Wireharness
⑰ Black coupler
⑱ Red coupler
⑲ Brown coupler

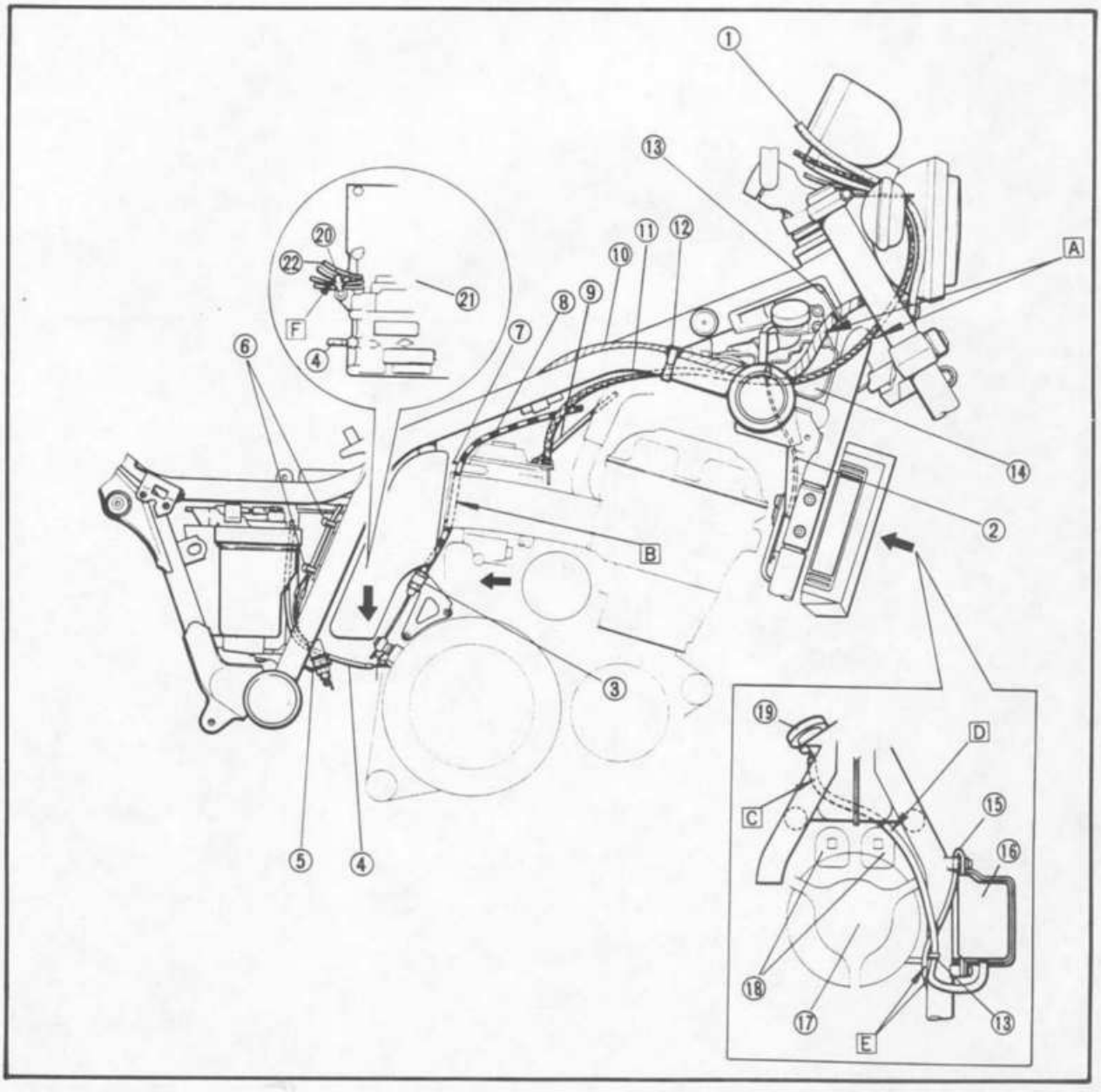
[A] Pass the speedometer cable between under bracket and outer cover.



## CABLE ROUTING (2)

① Front brake hose
② Radiator fan motor lead
③ Clutch cable holder
④ Battery negative (–) lead
⑤ Rear brake switch
⑥ Clamp
⑦ Clamp
⑧ Clutch cable
⑨ Starter cable
⑩ Wireharness
⑪ Throttle cable
⑫ Band
⑬ Clamp
⑭ Cover
⑮ Reservoir tank breather pipe
⑯ Reservoir tank
⑰ Radiator fan
⑱ Ignition coil
⑲ Radiator cap
⑳ Band
㉑ Crankcase
㉒ Starter lead

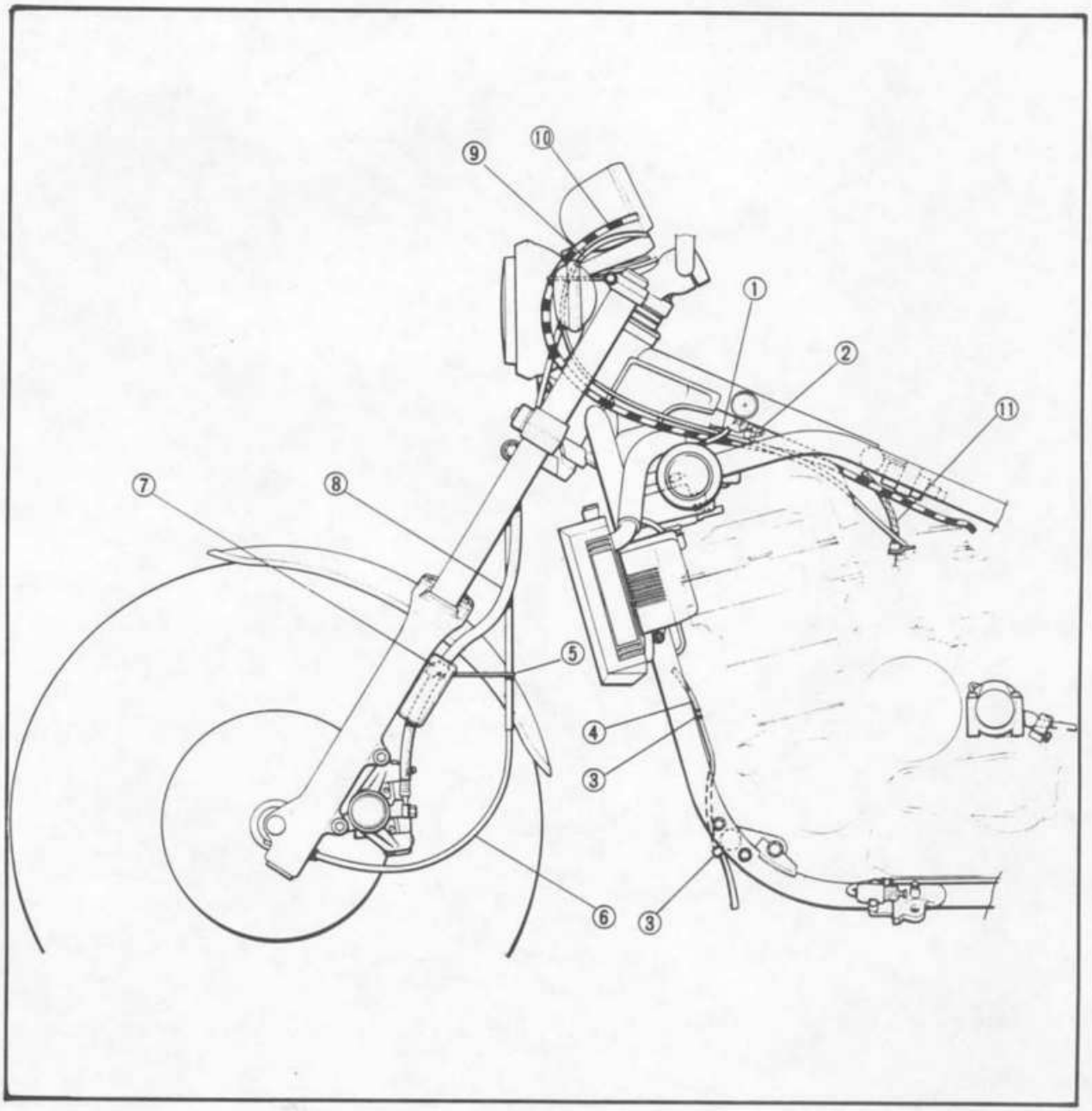
[A] Pass the wireharness and throttle cable outside the cover 1.
[B] Pass the clutch cable between the air cleaner joint #3 and #4.
[C] Pass the hose between the radiator hose and cover 1.
[D] Pass the hose between the ignition coil and down tube
[E] Pass the hoses between the down tube and radiator
[F] Clamp the pick up coil lead and A.C. generator lead




8

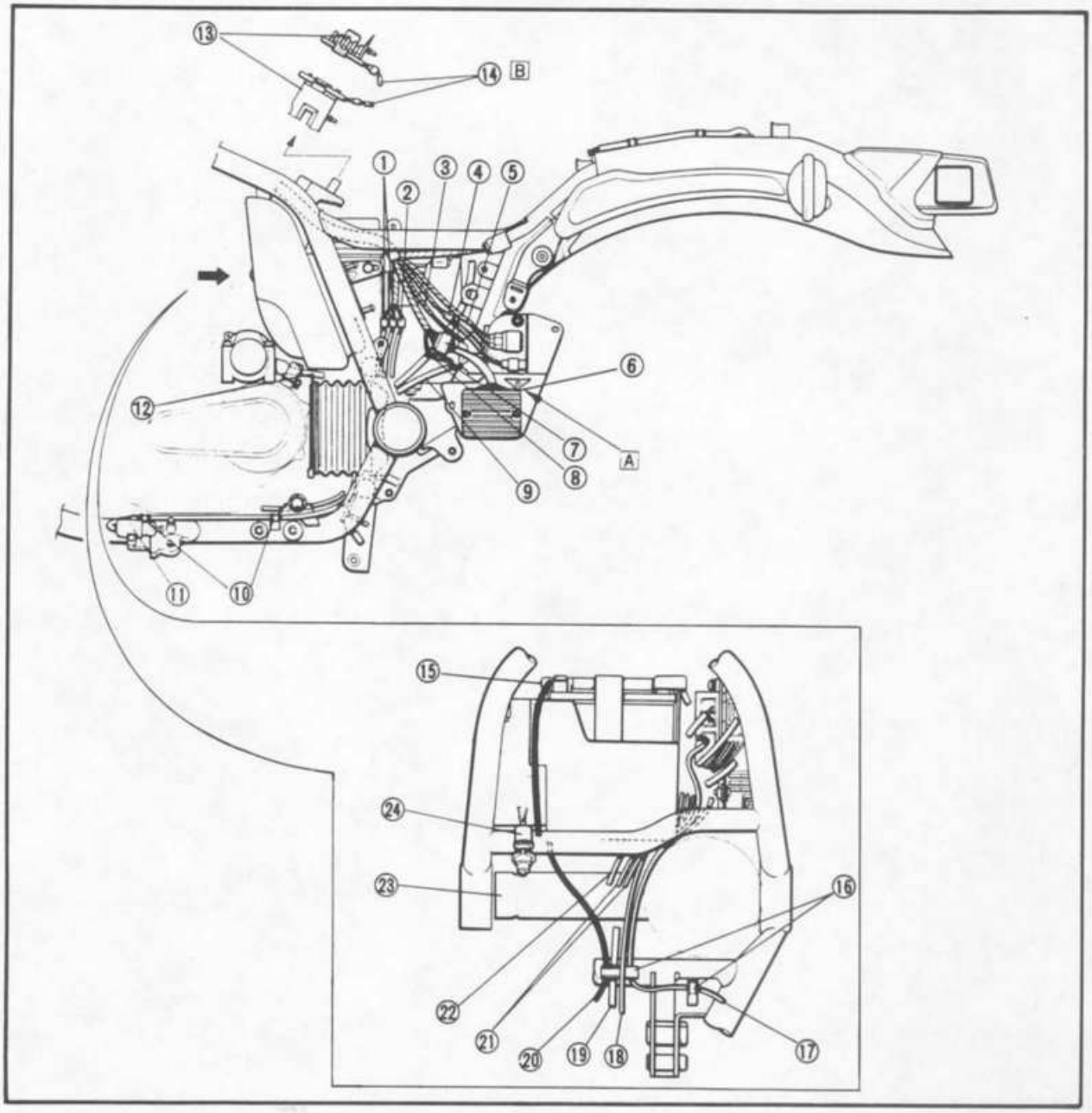
## CABLE ROUTING (3)

① Horn lead (Left)
② Ground lead
③ Clamp
④ Reservoir tank breather hose
⑤ Cable holder
⑥ Speedometer cable
⑦ Clamp
⑧ Front brake hose
⑨ Starter cable
⑩ Clutch cable
⑪ Throttle cable



## CABLE ROUTING (4)

① A.C. generator lead
② Sidestand switch lead
③ Igniter lead
④ Diode assembly
⑤ Sidestand relay lead
⑥ Rectifier-regulator assembly
⑦ Neutral switch lead
⑧ Oil level switch lead
⑨ Pickup coil lead
⑩ Clamp
⑪ Sidestand switch assembly
⑫ Starter motor lead
⑬ Locating damper
⑭ Fuel sender
⑮ Battery negative (–) lead
⑯ Clamp
⑰ Sidestand switch lead
⑱ Pickup coil lead
⑲ Air cleaner drain hose
⑳ Battery breather hose
㉑ A.G. generator lead
㉒ Starter motor lead
㉓ Rear arm
㉔ Rear brake switch
[A] Insert the lead inside the bridge plate
[B] Push the fuel sender lead into the locating damper



## CABLE ROUTING (5)

① Ignition coil leads
② Radiator fan motor lead
③ Thermostat lead
④ Horn lead (Right)
⑤ Earth lead
⑥ Wireharness
⑦ Band
⑧ Rear brake switch lead
⑨ Battery negative (–) lead
⑩ Starter switch lead
⑪ Fuse holder assembly
⑫ Rear flasher light lead (Right)
⑬ Clamp
⑭ Taillight lead
⑮ Rear flasher light lead (Left)
⑯ Ignition coil lead (Left)
⑰ Starter lead (Starter motor – Starter relay)
⑱ Battery positive (+) lead
⑲ Starter lead (Battery (+) – Starter relay)
⑳ To fuel sender
㉑ Relay assembly
㉒ Horn lead
㉓ Thermostat unit
㉔ Ignition coil (Right)
㉕ Ignition coil (Left)
㉖ "1" mark → #1 cylinder
㉗ "2" mark → #2 cylinder
㉘ "3" mark → #3 cylinder
㉙ "4" mark → #4 cylinder

[A] Align the white tape on wireharness with the cross tube.
[B] When installing the seat, be careful not to pinch the leads.

