YAMAHA

FJ1100L
FJ1100LC

Service Manual

LIT-11616-04-08

FJ1100L/FJ1100LC
SERVICE MANUAL
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YAMAHA MOTOR CORPORATION, U.S.A.
CYPRESS, CALIFORNIA 90630
LIT-11616-04-08

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.

NOTE:

This Service Manual contains information regarding periodic maintenance to the emission control system for the FJ1100L/FJ1100LC. Please read this material carefully.

OVERSEAS SERVICE
OVERSEAS OPERATIONS
YAMAHA MOTOR CO., LTD.

HOW TO USE THIS MANUAL

PARTICULARLY IMPORTANT INFORMATION

This material is distinguished by the following notation.

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

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

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

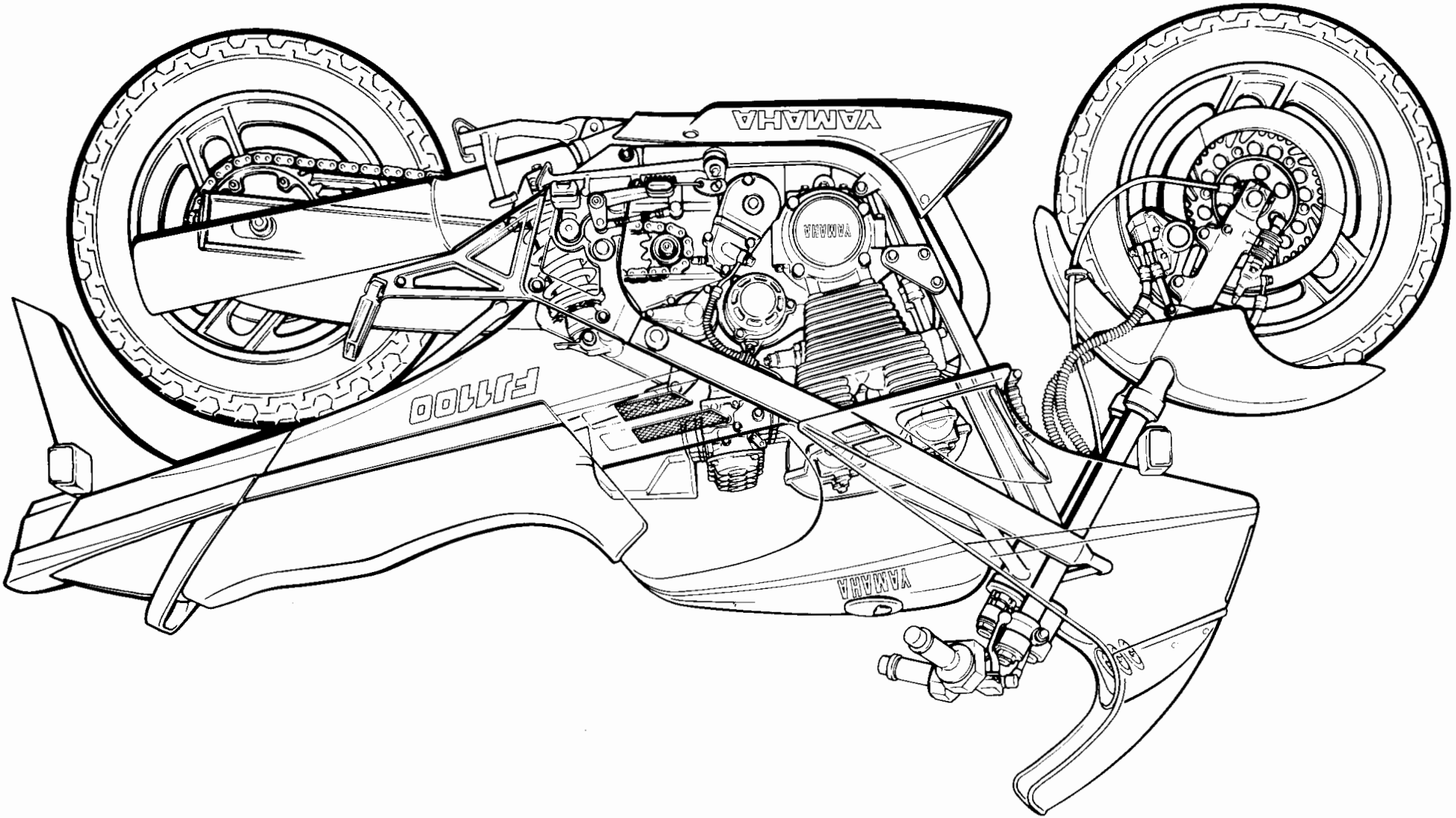
MANUAL FORMAT

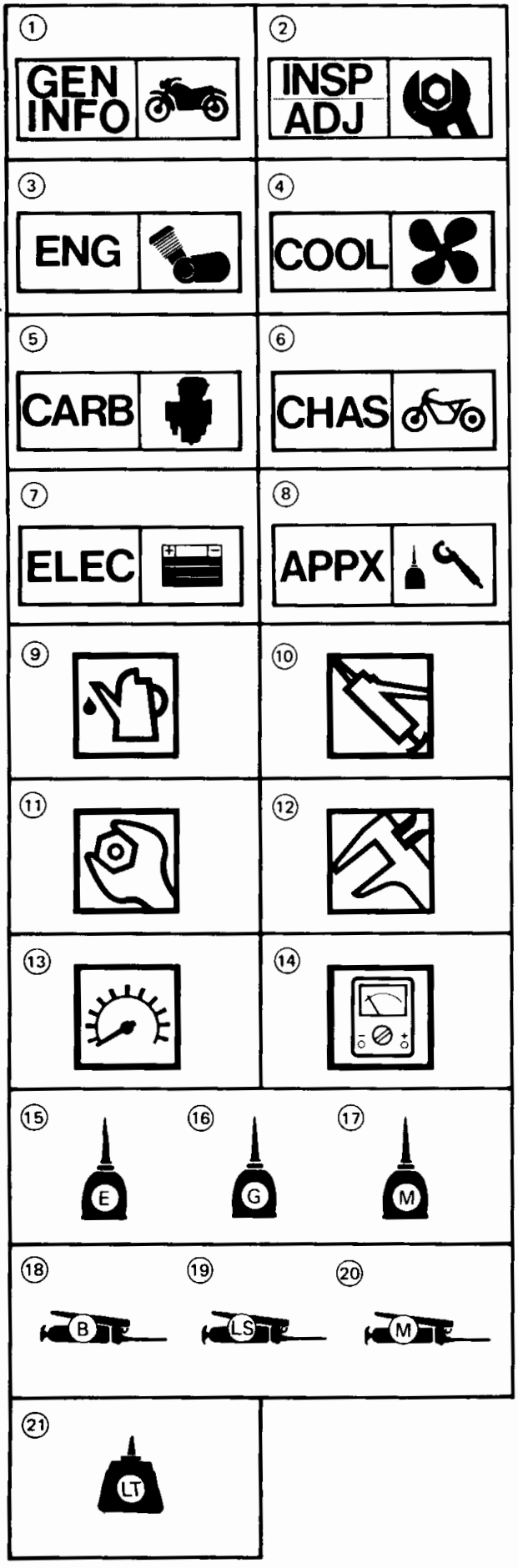
All of the procedures in this manual are organized in a sequential, step-by-step format. The information has been compiled to provide the mechanic with an easy to read, handy reference that contains comprehensive explanations of all disassembly, repair, assembly, and inspection operations.
In this revised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

- Bearings
  Pitting/Damage → Replace.

EXPLODED DIAGRAM

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


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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®)

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CARBURETION — CARB 4

CHASSIS — CHAS 5

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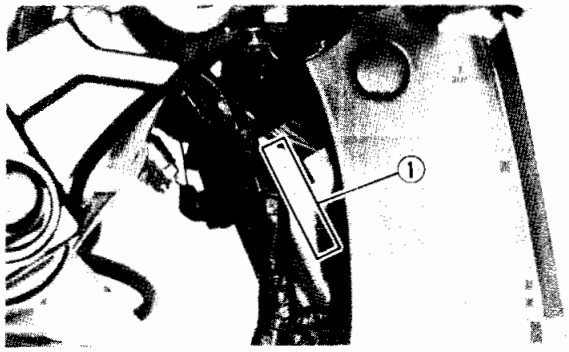
APPENDICES — APPX 7

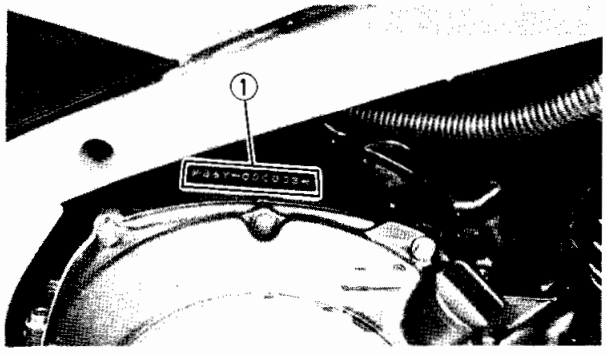
CHAPTER 1.
GENERAL INFORMATION

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ENGINE SERIAL NUMBER 1-1

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GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER

The vehicle identification number ① is stamped into the 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:
FJ1100L (Except for California):
JYA50H00*EA000101
FJ1100LC (For California):
JYA47M00*EA000101

ENGINE SERIAL NUMBER

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

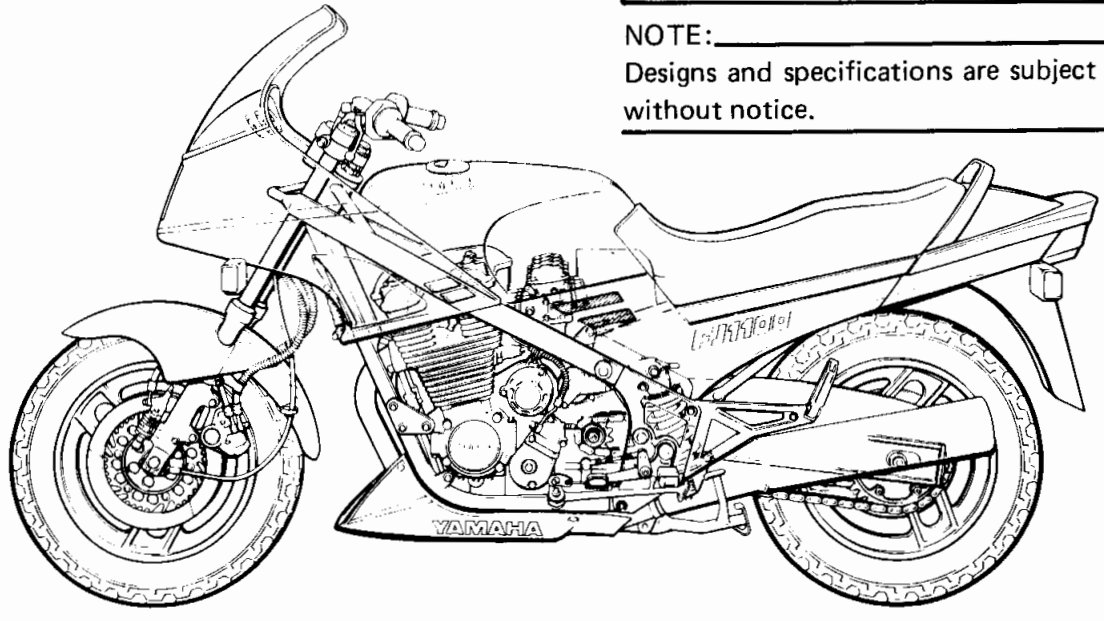
NOTE:

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

Starting Serial Number:
FJ1100L (Except for California)
.....50H-000101
FJ1100LC (For California)
.....47M-000101

NOTE:

Designs and specifications are subject to change without notice.



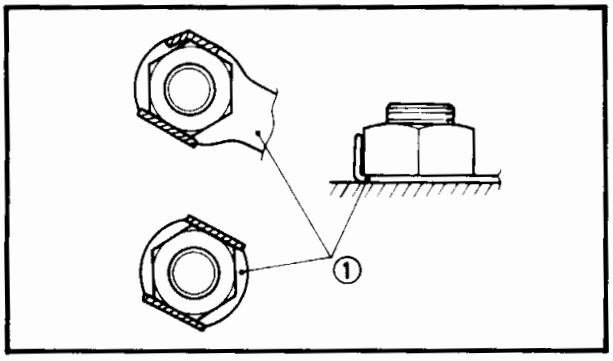
IMPORTANT INFORMATION

ALL REPLACEMENT PARTS

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

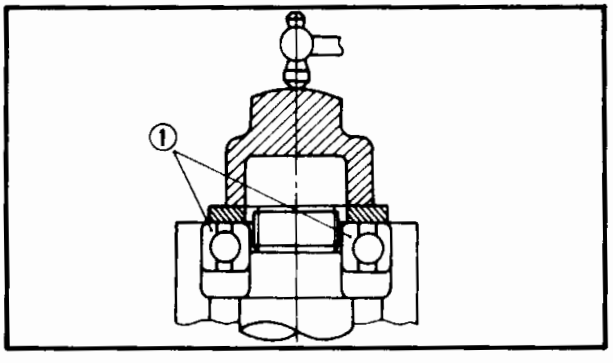
GASKETS, OIL SEALS, AND O-RINGS

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



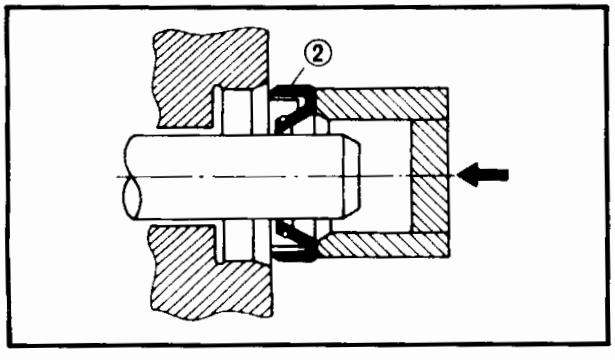
LOCK WASHERS/PLATES AND COTTER PINS

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



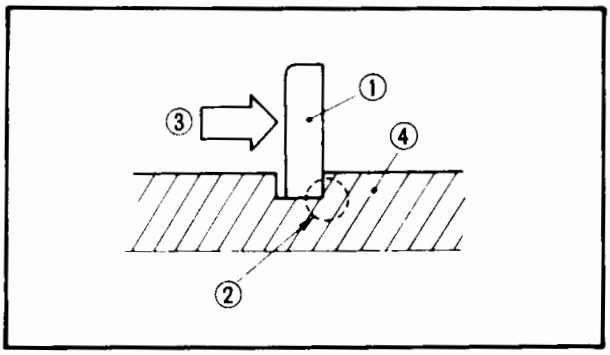
BEARINGS AND OIL SEALS

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



CAUTION:

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



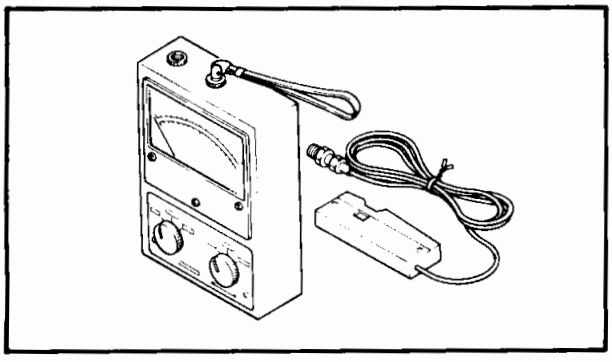
CIRCLIPS

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

④ Shaft

SPECIAL TOOLS

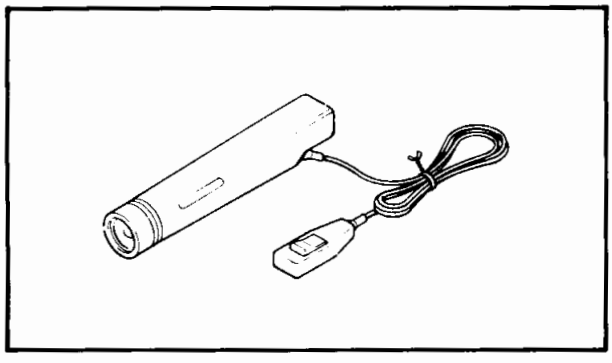
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

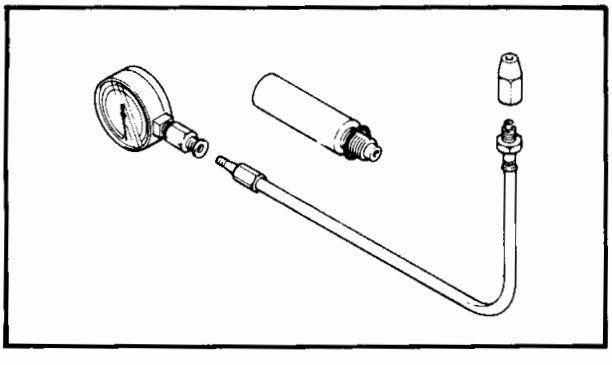
1. Inductive Tachometer
   P/N YU-08036

This tool is needed for detecting engine rpm.



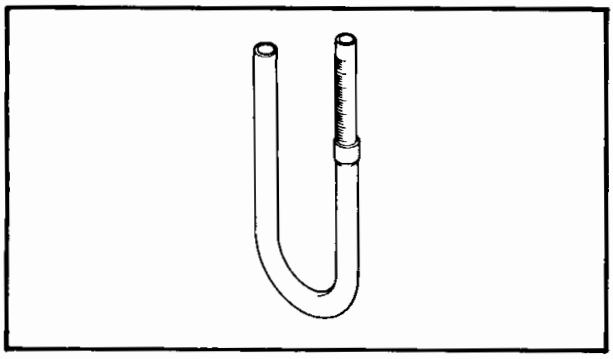
2. Inductive Timing Light
   P/N YM-33277

This tool is necessary for checking ignition timing.



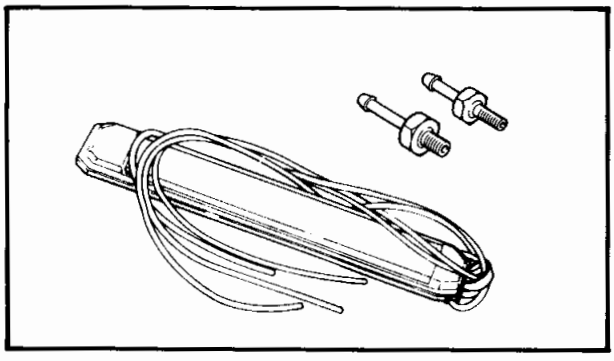
3. Compression Gauge
   P/N YU-33223

This gauge is used to measure the engine compression.



4. Fuel Level Gauge
   P/N YM-01312

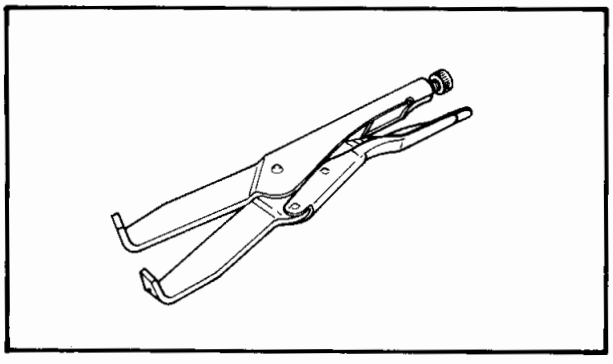
This gauge is used to measure the fuel level in the float chamber.



5. Vacuum gauge
   P/N YU-08030

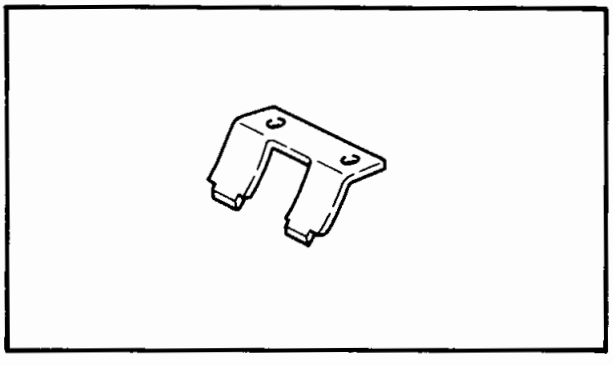
This gauge is needed for carburetor synchronization.

FOR ENGINE SERVICE



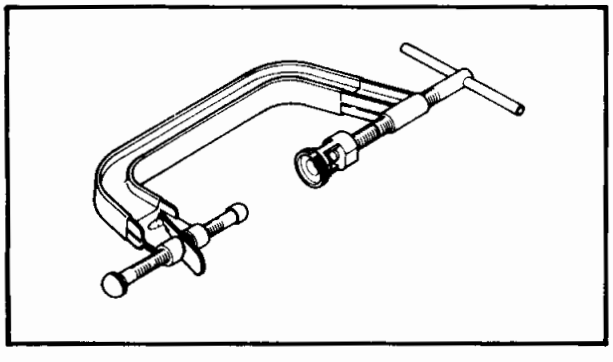
1. Universal Clutch Holder
   P/N YM-91042

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



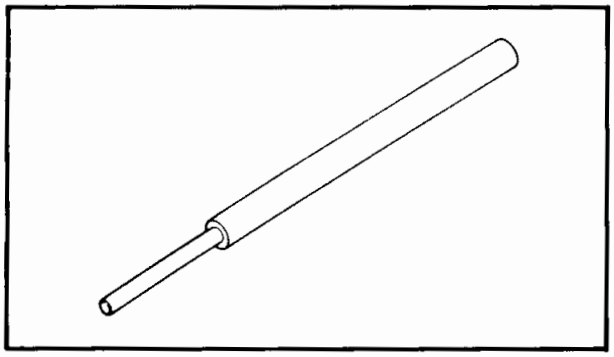
2. Tappet Adjusting Tool
   P/N YM-33966

This tool is necessary to replace valve adjusting pads.



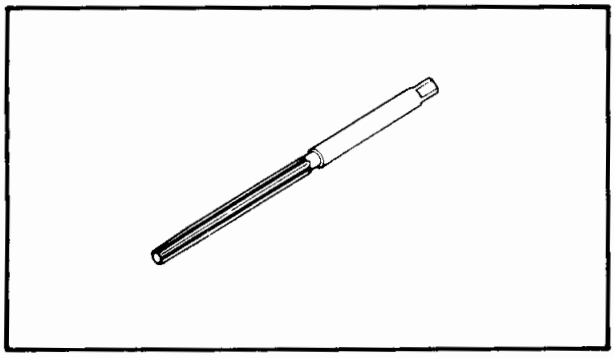
3. Valve Spring Compressor
   P/N YM-04019

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



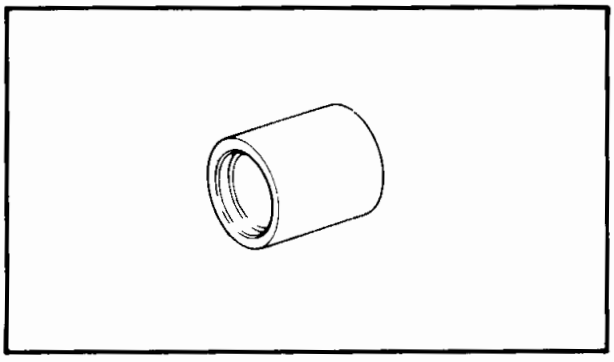
4. Valve Guide Remover (5.5 mm)
   P/N YM-01122

This tool is used to remove the valve guides.



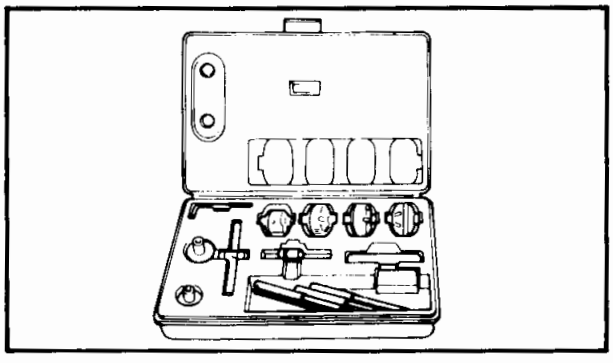
5. Valve Guide Reamer (5.5 mm)
   P/N YM-01196

This tool is used to rebore the new valve guide.



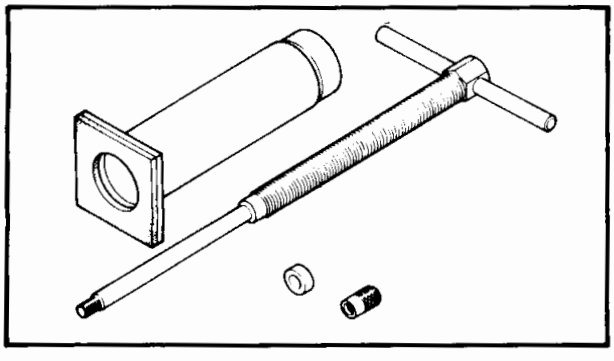
6. Valve Guide Installer
   P/N YM-01129

This tool is needed to install the valve guides properly.



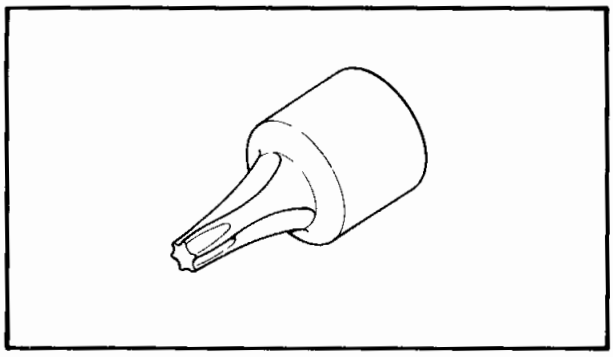
7. Valve Seat Cutter Set
   P/N YM-91043

This tool is needed to resurface the valve seat.



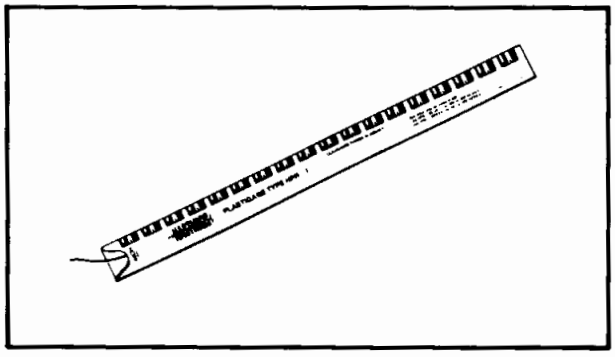
8. Piston Pin Puller
   P/N YU-01304

This tool is used to remove the piston pin.



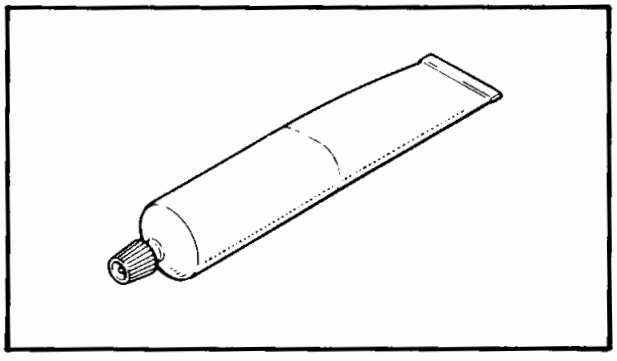
9. #30 Torx Driver
   P/N YU-20943-6

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



10. Plastigage® Set "Green"
    P/N YU-33210

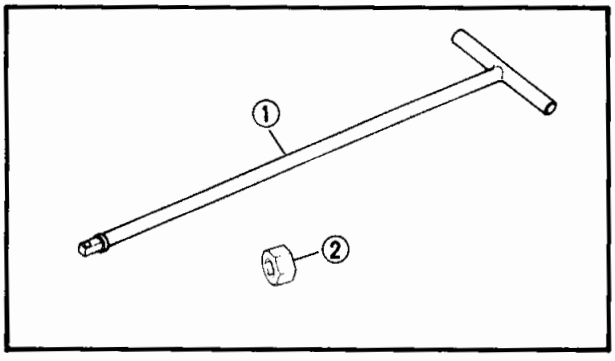
This gauge is needed to measure the clearance for the connecting rod bearing.



11. Sealant (Quick Gasket®)
    P/N ACC-11001-05-01

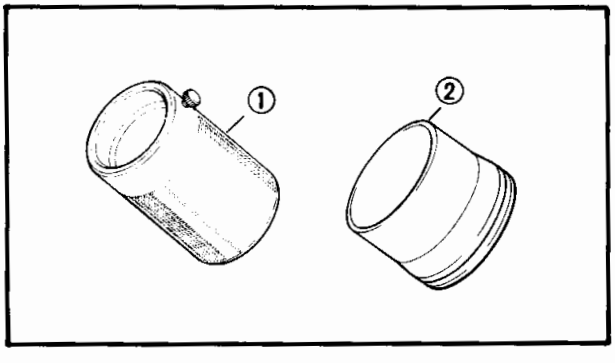
This sealant (bond) is used for crankcase mating surfaces, etc.

FOR CHASSIS SERVICE



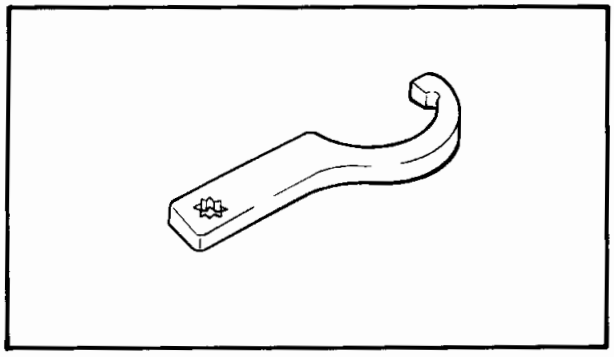
1. T-Handle
   P/N YM-01326 – ①
   Damper rod holder 27 mm
   P/N YM-01388 – ②

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



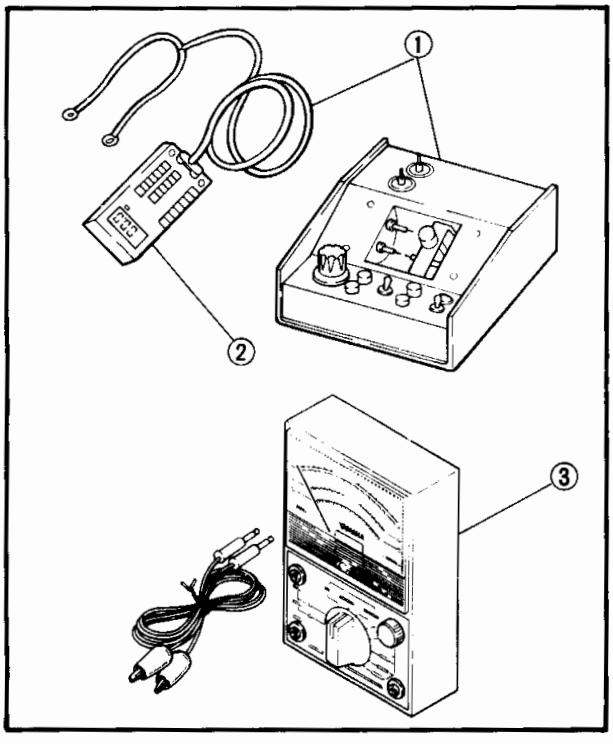
2. Front Fork Seal Driver (weight)
   P/N YM-33963 – ①
   Adapter (41 mm)
   P/N YM-33968 – ②

These tools are used when installing the fork seat.



3. Ring Nut Wrench
   P/N YU-33975

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



FOR ELECTRICAL COMPONENTS

1. Electro Tester
   P/N YU-33260 – ①

This instrument is necessary for checking the ignition system components.

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

This instrument is invaluable for checking the electrical system.

CHAPTER 2.
PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION 2-1

MAINTENANCE INTERVALS CHARTS 2-1

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PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

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

MAINTENANCE INTERVALS CHARTS

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

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

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

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

GENERAL MAINTENANCE/LUBRICATION

No.	Item	Remarks	Type	Initial	Odometer readings				
				1,000 km (600 mi) or 1 month	**1 7,000 km (4,400 mi) or 7 months	**2 13,000 km (8,200 mi) or 13 months	**3 19,000 km (12,000 mi) or 19 months	25,000 km (15,800 mi) or 25 months	31,000 km (19,600 mi) or 31 months
1	Engine oil	Warm-up engine before draining.	See Chapter 2	O	O	O	O	O	O
2	Oil filter	Replace.	–	O		O		O	
3*	Air filter	Colean with compressed air. Replace if necessary.	–		O	O	O	O	O
4*	Brake system	Adjust free play. Replace pads if necessary.	–	O	O	O	O	O	O

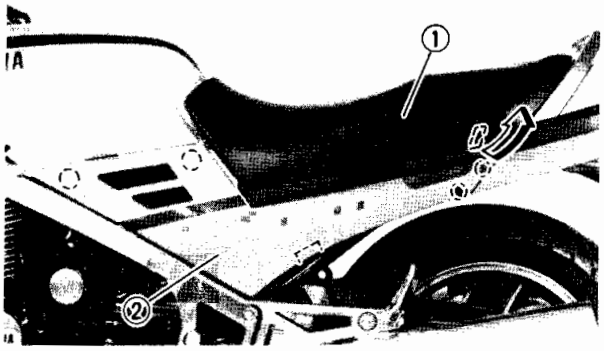


No.	Item	Remarks	Type	Initial	Odometer readings				
				1,000 km (600 mi) or 1 month	**1 7,000 km (4,400 mi) or 7 months	**2 13,000 km (8,200 mi) or 13 months	**3 19,000 km (12,000 mi) or 19 months	25,000 km (15,800 mi) or 25 months	31,000 km (19,600 mi) or 31 months
5	Drive chain	Check chain condition. Adjust and lubricate chain thoroughly.	SAE 30W-50W motor oil.	Every 500 km (300 mi)					
6*	Control and meter cable	Apply chain lube thoroughtly.	Yamaha chain cable lube or SAE 10W30 motor oil.	○	○	○	○	○	○
7*	Rear suspension adjusting chain	Check chain condition. Adjust and lubricate if necessary.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
8*	Rear arm pivot shaft and suspension link pivots	Apply grease lightly.	Lithium soap base grease.				○		
9	Brake/Clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
10	Brake pedal and change pedal shaft	Lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
11*	Center/Side stand pivots	Check operation and lubricate. Apply chain.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
12*	Front fork oil	Check operation and leakage.	–		○	○	○	○	○
13*	Steering bearings	Check bearing assembly for looseness. Moderately repack every 24,000 km (15,200 mi)	Medium weight wheel bearing grease.		○	○	○	○	○
14*	Wheel bearings	Check bearings for smooth rotation.	–		○	○	Repack	○	○
15	Battery	Check specific gravity and breather pipe for proper operation.	–		○	○	○	○	○
16*	A.C. Generator	Replace generator brushes every 100,000 km (62,000 mi)	–						
17*	Sidestand switch	Check and clean or replace if necessary.	–	○	○	○	○	○	○

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

NOTE:

For farther odometer reading, repeat the above maintenance at the period established, **1. Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi) and **3: Every 18,000 km (11,400 mi) intervals.

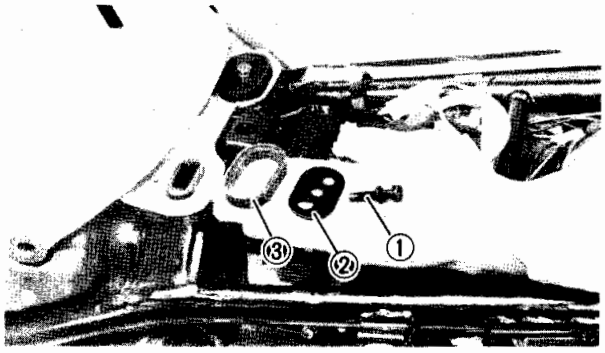


COWLING

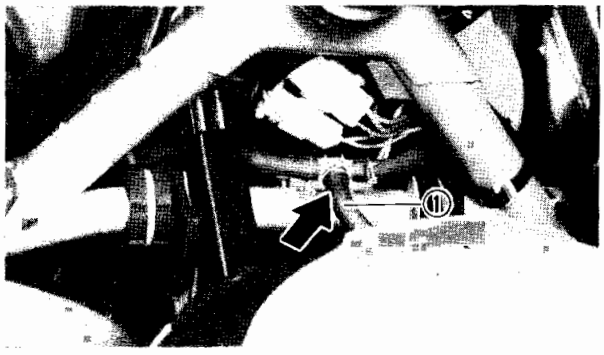
UPPER COWLING

Removal

1. Remove:
   - Seat ①
   - Side covers ②

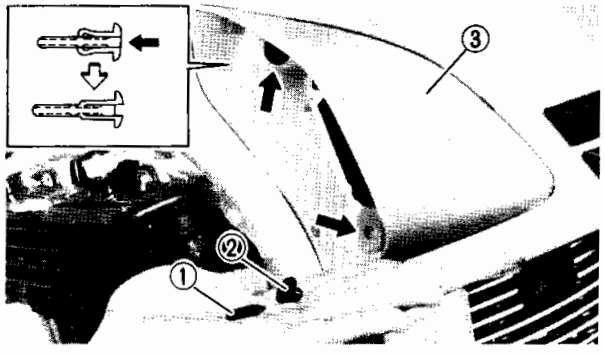


2. Remove:
   - Fuel tank securing bolts ①
   - Washers ②
   - Rubber washers ③
3. Disconnect:
   - Fuel and vacuum hoses.
   - Speedometer cable (from front wheel)



(For California only)

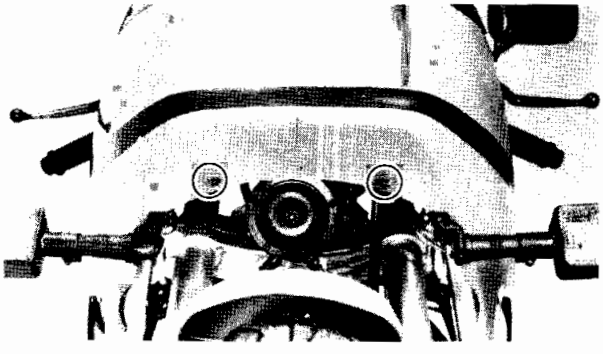
4. Disconnect:
   - Canister hose ①



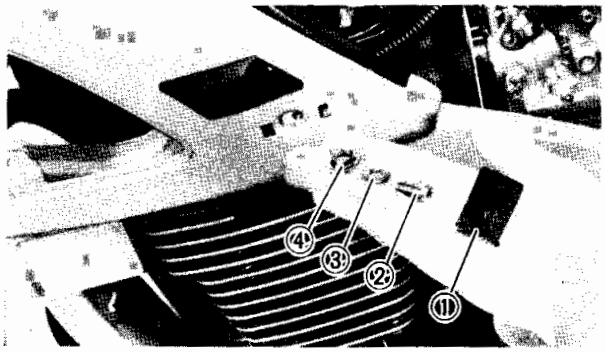
5. Remove:
   - Air duct

Air duct removal steps:

- Push in the retainer pin ① about 3 mm (0.12 in) from retainer flange ② top, using screwdriver so that the retainers are unlocked together with upper cowling.
- Pull air duct ③ out toward front to unhook it together with upper cowling.
- Remove air duct and retainers.

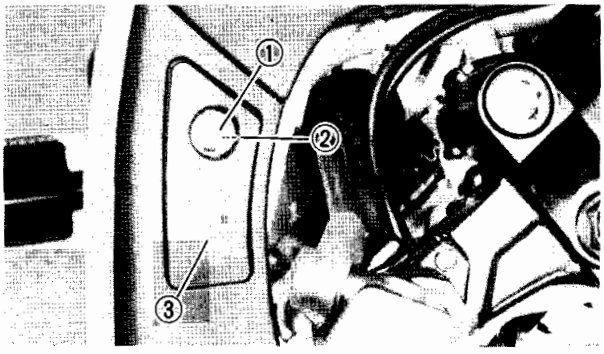


6. Remove:
   - Mounting screws (Front)

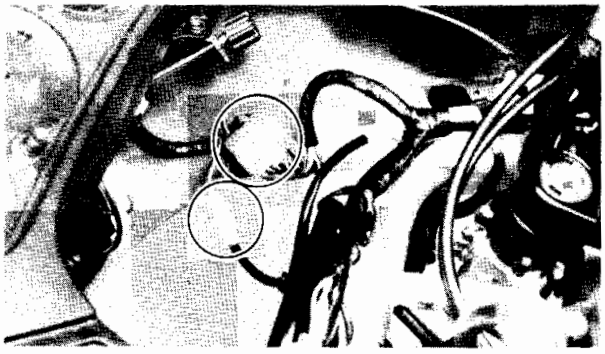


7. Remove:
   - Rear mounting screw caps ①
   - Mounting screws ②

NOTE:
Do not lose washers ③ and collars ④.

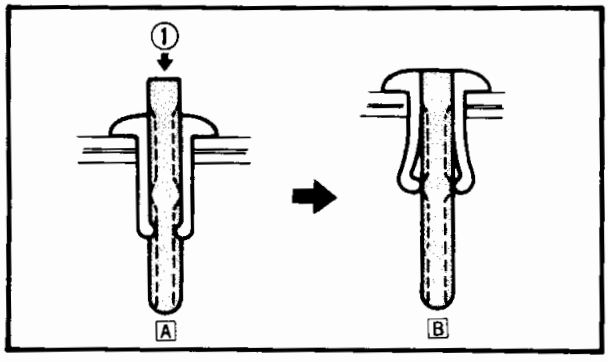


8. Remove:
   - Mounting screws (Upper) ①
   - Grommets ②
   - Fuse cover ③
9. Slowly pull out cowling.
10. Disconnect:
    - Connectors
11. Remove cowling.



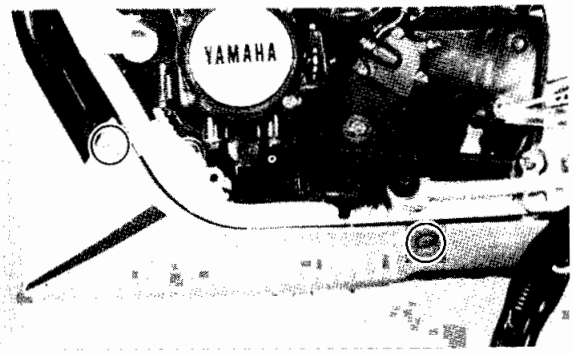
Installation

1. Connect:
   - Connectors
     Hold the cowling.
2. Install:
   - Fuse cover
   - Grommets
   - Mounting screws/Caps
     Tighten screws evenly.
3. Connect:
   - Speedometer cable
4. Install:
   - Air ducts



Air duct installation steps:
- Install air ducts; hook the tab of air duct onto cowling.
- Install retainers into the air duct as shown A
- Push in the retainer pins ① so that it is flush with retainer flange top B.

5. Install:
   - Fuel tank
6. Connect;
   - Fuel and vacuum hoses
   - Canister hose **(For California only)**
7. Install:
   - Side covers
   - Seat



LOWER COWLING

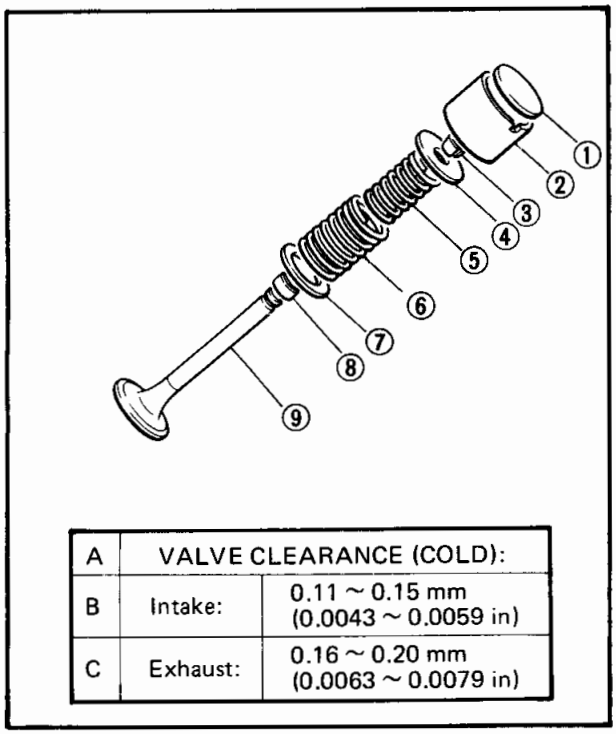
Removal

1. Remove:
   - Mounting screws
   - Lower cowling

Installation

1. Install:
   - Lower cowling
   - Mounting screws

   Tighten screws evenly.

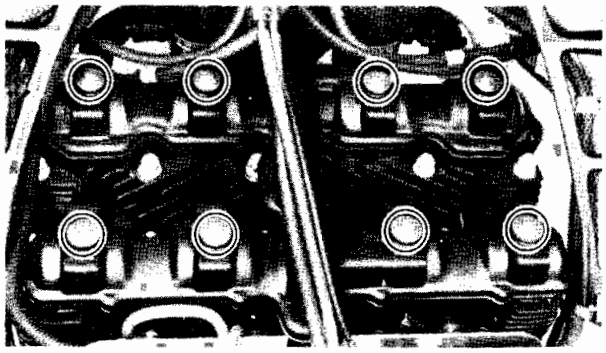


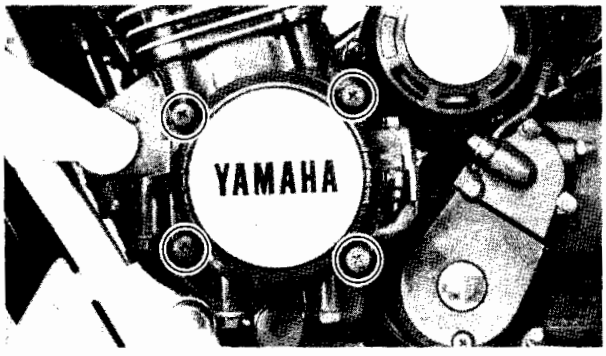
A	VALVE CLEARANCE (COLD):	
B	Intake:	0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in)
C	Exhaust:	0.16 ~ 0.20 mm (0.0063 ~ 0.0079 in)

ENGINE

VALVE CLEARANCE ADJUSTMENT

① Pad
② Valve lifter
③ Valve retainer
④ Spring seat
⑤ Inner spring
⑥ Outer spring
⑦ Spring seat
⑧ Oil seal
⑨ Valve





Removal

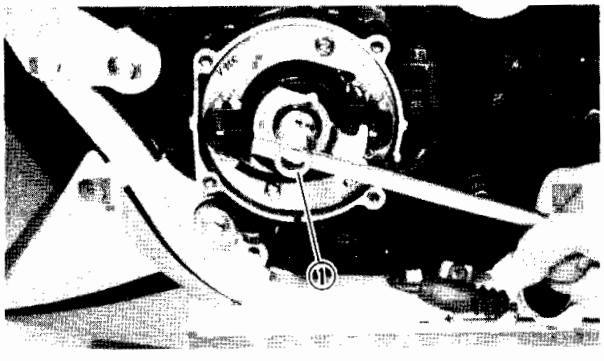
1. Remove:
   - Seat
   - Side covers
   - Fuel tank
   - Air ducts

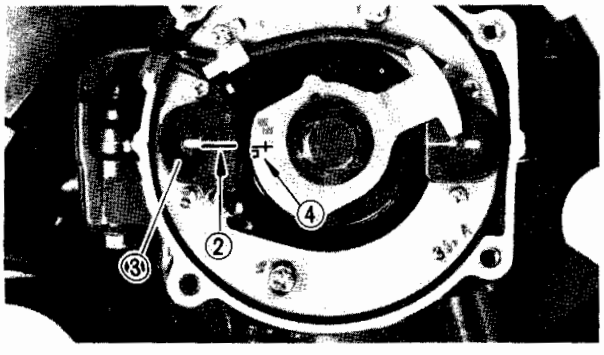
   See "UPPER COWLING, Removal."
2. Disconnect:
   - Spark plug caps
3. Remove:
   - Spark plugs
   - Cylinder head cover
4. Remove:
   - Emblem plate (Left)

Inspection and Adjustment

1. 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 17 mm (0.67 in) socket wrench ①

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

- Align the "T" mark (for the No. 1 or No. 4 cylinder) on the timing plate with the stationary pointer ② on the pickup coil ③ When the "T" mark is aligned with the stationary pointer ②, the piston is at top dead center TDC.

④ Firing range for No. 1 cylinder

VALVE CLEARANCE ADJUSTMENT

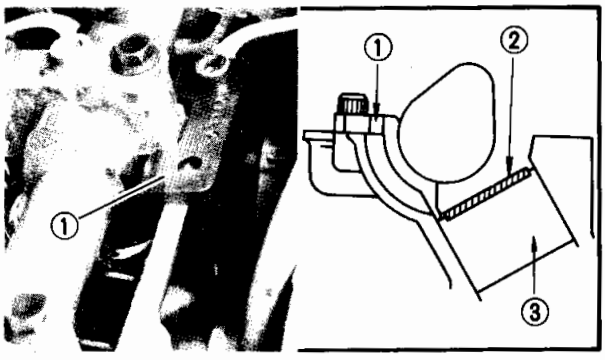


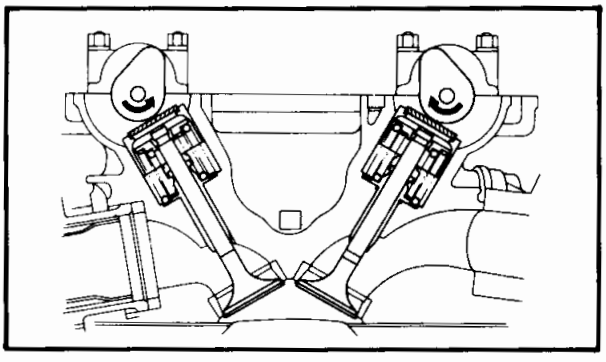
- Measure the valve clearance using a Feeler Gauge ⑤.
- Record the measured amount if the clearance is incorrect.

Intake Valve (cold):
0.11 ~ 0.15 mm
(0.0043 ~ 0.0059 in)
Exhaust Valve (cold):
0.16 ~ 0.20 mm
(0.0063 ~ 0.0079 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





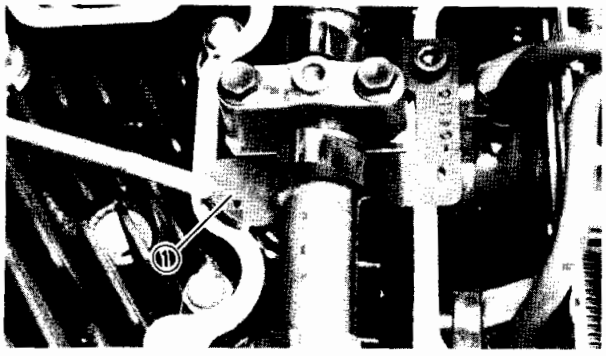
2. Adjust:
   - Valve clearance

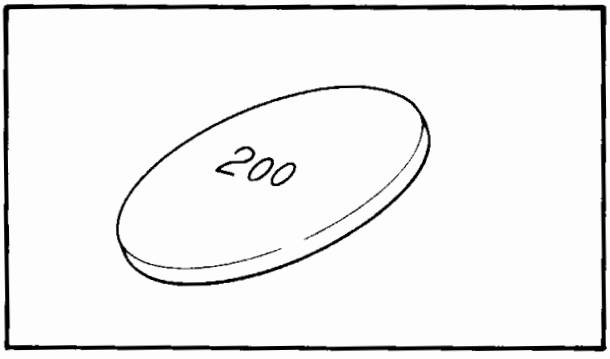
Valve clearance adjustment steps:
- Position the valve lifter slots (intake and exhaust) opposite each other.
- Turn the camshaft until the lobe fully depresses the valve lifter and opens the valve.
- Attach the Tappet Adjusting Tool ① (YM-33966) onto the cylinder head.

NOTE:
Make sure that the tool contacts the lifter ③ only, and not the pad ②.

- Carefully rotate the camshft so that the pads can be removed. To avoid cam touching the adjusting tool, turn cams as shown.

Intake: Carefully rotate CLOCKWISE.
Exhaust: Carefully rotate COUNTER-CLOCKWISE.





- Remove the pads ① from the lifters. Use a small screwdriver and a magnetic rod for removal.
  Note pad numbers.
- Select the proper valve adjusting pad from the chart below:

Pad range		Pad Availability: 25 increments
No. 200 ~ No. 320	200mm (0.079 in) 320 mm (0.130 in)	Pads stepped in 0.05 mm (0.002 in) increments

NOTE:
Thickness of each pad is marked on the pad face that contacts the valve lifter (not the cam).

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

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

EXAMPLE:
Original pad number = 258 (2.58 mm)
Rounded off digit = 260

NOTE:
Pads can only be selected in 0.05 mm (0.002 in) increments.

- Locate the "Installed 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.

VALVE CLEARANCE ADJUSTMENT

INTAKE

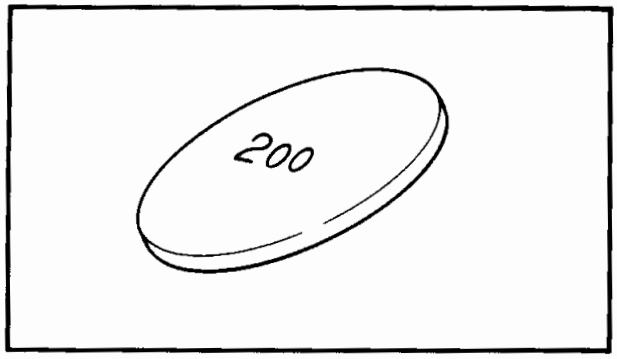
Ⓑ MEASURED CLEARANCE	Ⓐ INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00~0.05			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.06~0.10		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.11~0.15																									
0.16~0.20	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.21~0.25	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.26~0.30	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.31~0.35	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.36~0.40	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.41~0.45	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.46~0.50	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.51~0.55	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.56~0.60	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.61~0.65	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.66~0.70	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.71~0.75	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.76~0.80	265	270	275	280	285	290	295	300	305	310	315	320													
0.81~0.85	270	275	280	285	290	295	300	305	310	315	320														
0.86~0.90	275	280	285	290	295	300	305	310	315	320															
0.91~0.95	280	285	290	295	300	305	310	315	320																
0.96~1.00	285	290	295	300	305	310	315	320																	
1.10~1.05	290	295	300	305	310	315	320																		
1.06~1.10	295	300	305	310	315	320																			
1.11~1.15	300	305	310	315	320																				
1.16~1.20	305	310	315	320																					
1.21~1.25	310	315	320																						
1.26~1.30	315	320																							
1.31~1.35	320																								

VALVE CLEARANCE (cold):
0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in)
Example: Installed is 250
Measured clearance is 0.32 mm (0.013 in)
Replace 250 pad with 270 pad
*Pad number: (example)
Pad No. 250 = 2.50 mm (0.098 in)
Pad No. 255 = 2.55 mm (0.100 in)
Always install pad with number down.

EXHAUST

Ⓑ MEASURED CLEARANCE	Ⓐ INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00~0.05				200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305
0.06~0.10			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.11~0.15		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.16~0.20																									
0.21~0.25	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.26~0.30	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.31~0.35	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.36~0.40	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.41~0.45	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.46~0.50	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.51~0.55	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.56~0.60	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.61~0.65	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.66~0.70	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.71~0.75	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.76~0.80	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.81~0.85	265	270	275	280	285	290	295	300	305	310	315	320													
0.86~0.90	270	275	280	285	290	295	300	305	310	315	320														
0.91~0.95	275	280	285	290	295	300	305	310	315	320															
0.96~1.00	280	285	290	295	300	305	310	315	320																
1.10~1.05	285	290	295	300	305	310	315	320																	
1.06~1.10	290	295	300	305	310	315	320																		
1.11~1.15	295	300	305	310	315	320																			
1.16~1.20	300	305	310	315	320																				
1.21~1.25	305	310	315	320																					
1.26~1.30	310	315	320																						
1.31~1.35	315	320																							
1.36~1.40	320																								

VALVE CLEARANCE (cold):
0.16 ~ 0.20 mm (0.0062 ~ 0.0079 in)
Example: Installed is 250
Measured clearance is 0.32 mm (0.013 in)
Replace 250 pad with 265 pad
*Pad number: (example)
Pad No. 250 = 2.50 mm (0.098 in)
Pad No. 255 = 2.55 mm (0.100 in)
Always install pad with number down.



Pad number verification steps:
- Install the new pad with the number down.
- Remove the adjusting tool.
- Recheck the valve clearance.
- If the clearance is incorrect, repeat all of the clearance adjustment steps until the proper clearance is obtained.

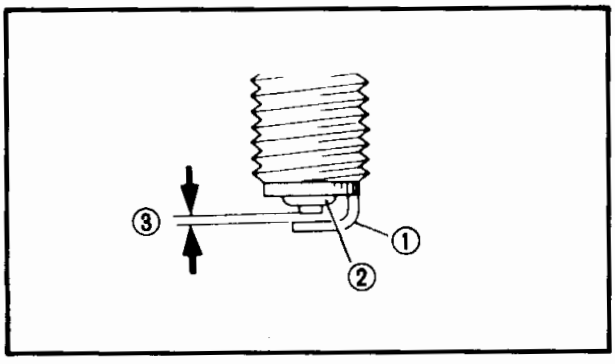
Assembly

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:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Fuel Tank Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)



SPARK PLUG

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

Spark Plug Cap:
0.8 ~ 0.9 mm (0.031 ~ 0.035 in)

Clean the plug with a spark plug cleaner if necessary.

Standard Spark Plug:
DP8EA-9 (NGK)
X24EP-U9 (NIPPONDENSO)

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

4. Tighten:
   - Spark plug(s)

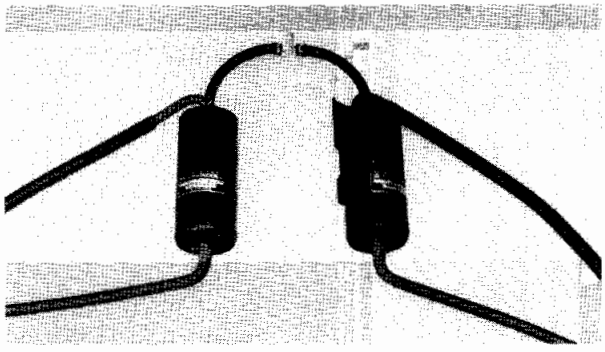
Spark Plug
17.5 Nm (1.75 m·kg, 12.5 ft·lb)

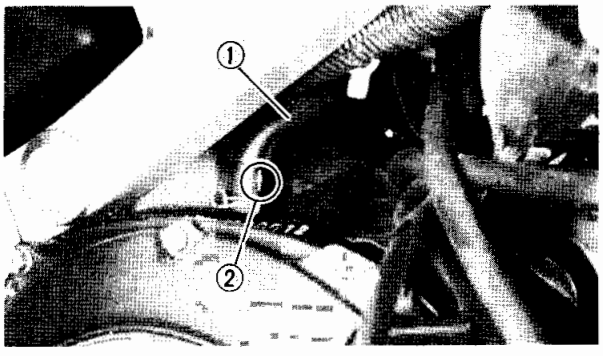
NOTE:
Finger-tighten the spark plug(s) before torquing to specification.

5. Install:
   - Air ducts

CANISTER (For California only)

1. Remove:
   - Side covers
   - Seat
   - Fuel tank
2. Inspect:
   - Canister hoses
     Cracks/Damage → Replace.

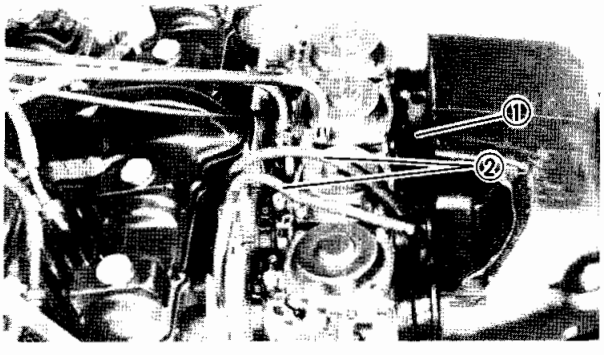




CRANKCASE VENTILATION SYSTEM

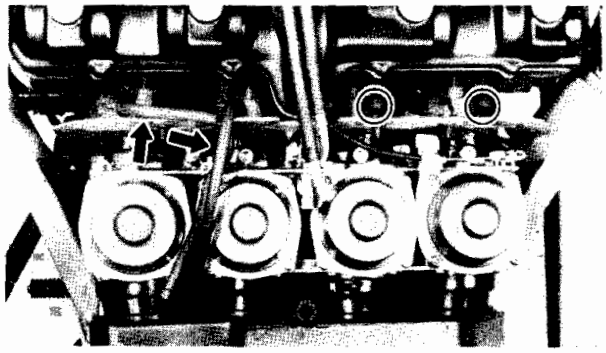
1. Remove:
   - Side cover (R:ght)
2. Inspect:
   - Crankcase ventilation hose ①
     Cracks/Damage → Replace.

NOTE:
White paint mark ② on the hose should be connected forward.



FUEL LINE

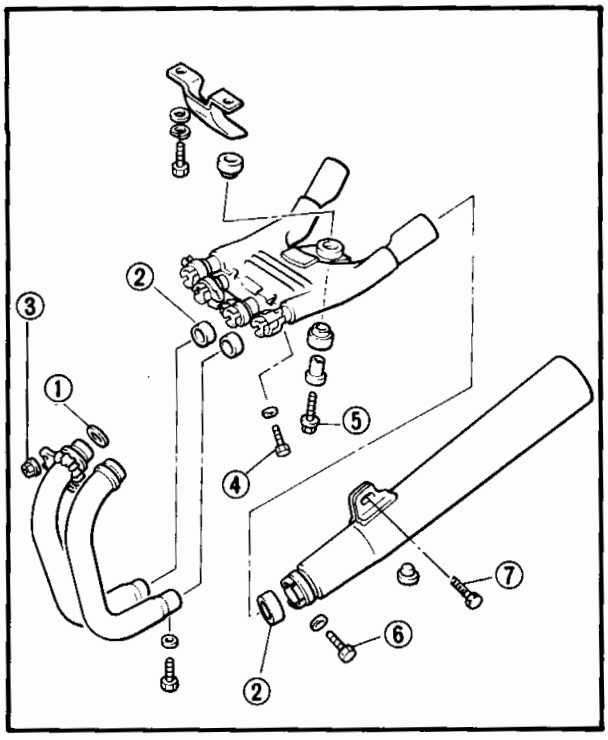
1. Inspect:
   - Fuel hoses ①
   - Vacuum lines ②
     Cracks/Damage → Replace.



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 :
20 Nm (2.0 m·kg, 14 ft·lb)
Exhaust Pipe Clamp ④ :
20 Nm (2.0 m·kg, 14 ft·lb)
Exhaust Chamber Mount ⑤ :
23 Nm (2.3 m·kg, 17 ft·lb)
Muffler Clamp ⑥ :
20 Nm (2.0 m·kg, 14 ft·lb)
Muffler Bracket ⑦ :
25 Nm (2.5 m·kg, 18 ft·lb)

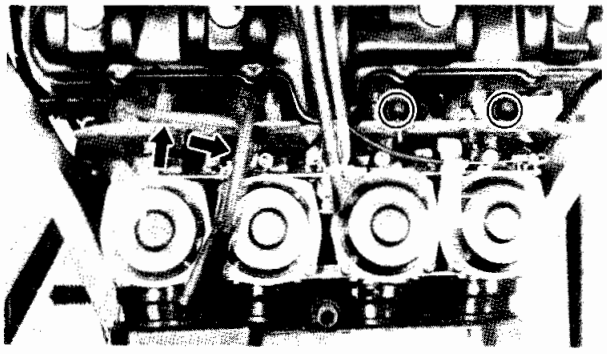
CARBURETOR SYNCHRONIZATION

Carbretor Adjustment.

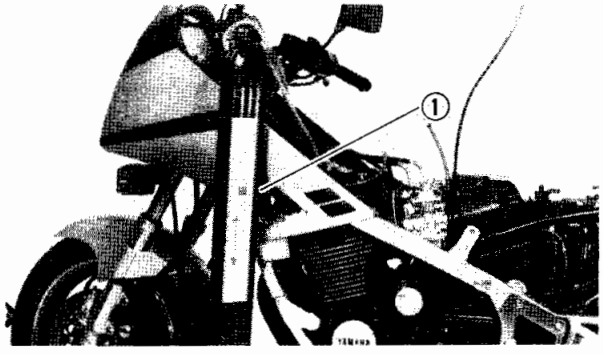
Carburetors must be adjusted to open and close simultaneously.

NOTE:
Valve clearance must be set properly before synchronizing the carburetors.

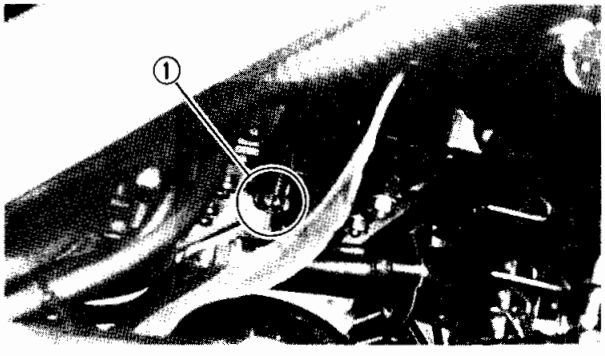
CARBURETOR SYNCHRONIZATION



1. Remove:
   - Seat
   - Side covers
   - Fuel tank
2. Disconnect:
   - Vacuum plugs
   - Vacuum hoses



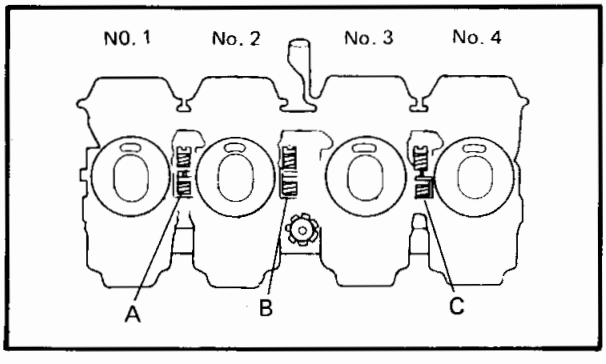
3. Install:
   - Vacuum Gauge (YU-08030) ①
   - Suitable test fuel tank
4. Start the engine and let it warm up.



5. Inspect:
   - Idle speed

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

	Engine Idle Speed: **1,000 ± 50 r/min**

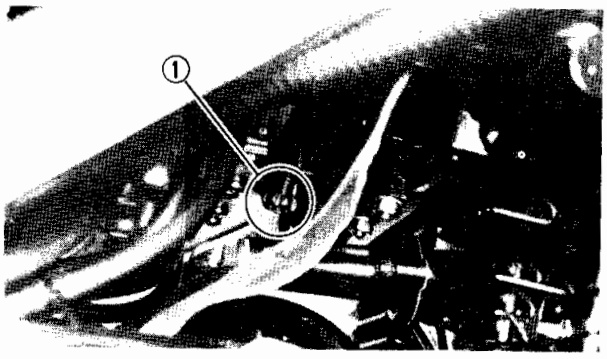


6. Adjust:
   - Carburetor synchronization

Carburetor synchronization adjustment steps:
- Synchronize the carburetor No. 1 to the carburetor No. 2 by turning the synchronizing screw "A" until the both gauges read 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:
33.25 kPa (250 mm Hg, 9.84 in Hg)
Vacuum Synchronous Difference:
1.33 kPa (10 mm Hg, 0.39 in Hg)

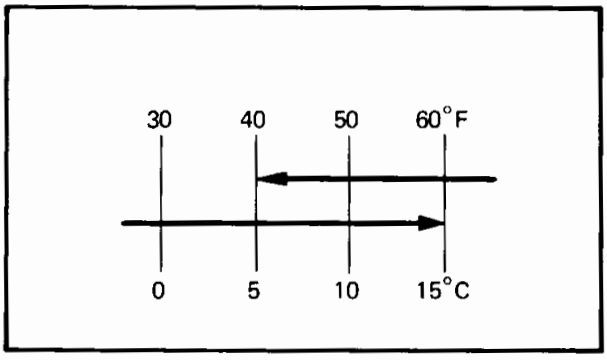
- Repeat the above steps to synchronize the carburetor No. 4 to the carburetor No. 3 by turning the synchronizing screw "C" until the both gauges read the same.
- Repeat the same steps to synchronize No. 3 carburetor to No. 1 carburetor, then turn synchronizing screw "B" until both gauges read the same.



IDLE SPEED

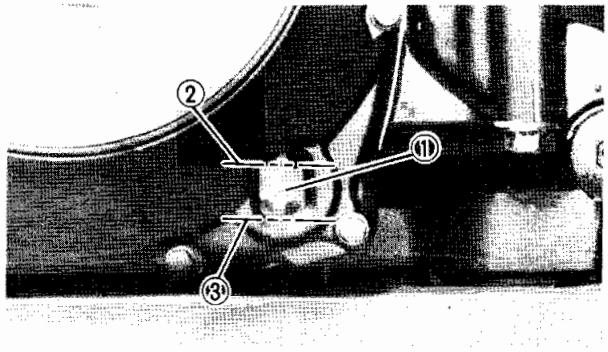
1. Adjust
   - Idle speed
     Warm up the engine and turn the throttle stop screw ① to adjust.

Engine Idle Speed:
1,000 ± 50 r/min



ENGINE OIL

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



Oil Level Measurement

1. Check
   - Oil level
     Oil level low → Add sufficient oil.

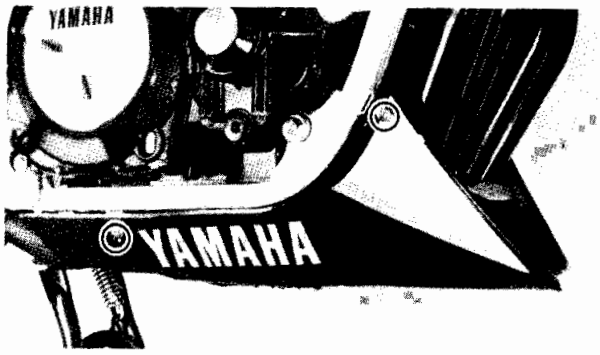
Oil level visual inspection steps:

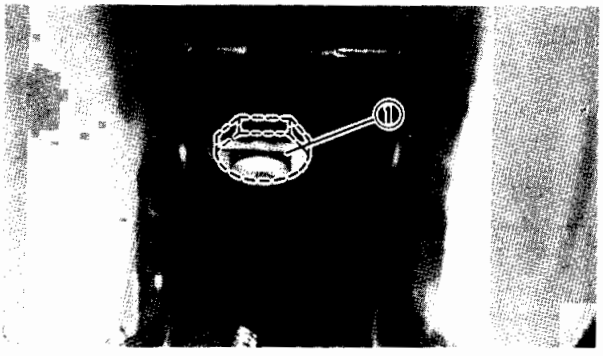
- Place the motorcycle on its centerstand and warm up the engine for several minutes.

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:
   - Lower cowling
   - Oil filler cap
3. Remove:
   - Drain plug ①

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

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

5. Fill:
   - Crankcase

Engine Oil 3.0 L (2.6 Imp qt, 3.2 US qt)

CAUTION:

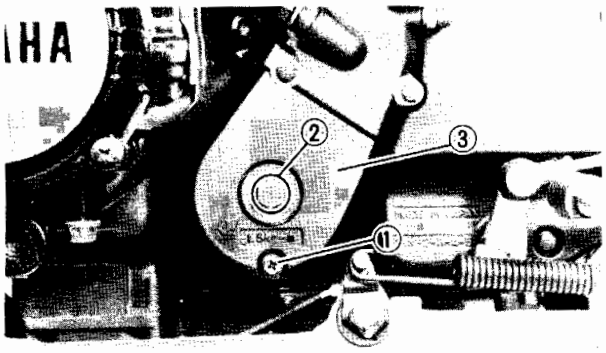
Do not allow foreign material to enter the crankcase.

6. Install:
   - Filler cap
   - Lower cowling

Oil Change (With filter)

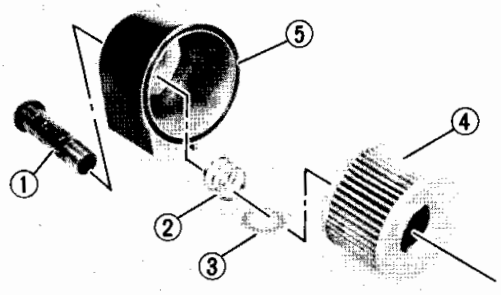
1. Warm up the engine and place a receptacle under the engine.
2. Remove:
   - Lower cowling
   - Oil filler cap
   - Drain plug

   Drain the engine oil.

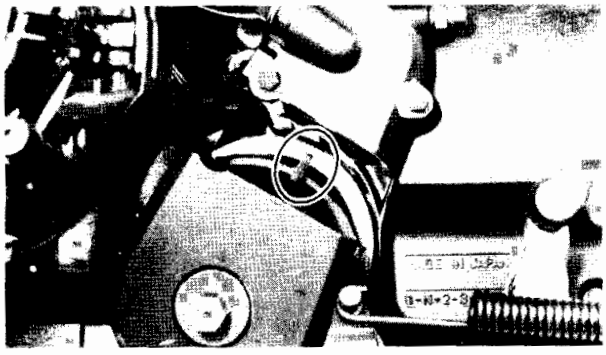


3. Remove:
   - Oil filter drain bolt ①
     Drain the engine oil
   - Oil filter bolt ②
   - Filter cover ③
4. Tighten:
   - Drain plug
   - Oil filter drain bolt

Drain Plug:
43 Nm (4.3 m·kg, 31 ft·lb)
Oil Filter Drain Bolt:
7 Nm (0.7 m·kg, 5.1 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

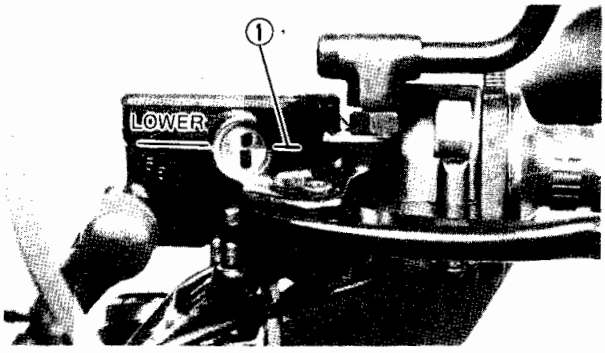
Oil Filter:
15 Nm (1.5 m·kg, 11 ft·lb)

7. Fill:
   - Crankcase

Engine Oil:
3.35 L (2.9 Imp qt, 3.5 US qt)

8. Install:
   - Oil filler cap
   - Lower cowling

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



CLUTCH

This motorcycle has a hydraulic clutch. There are no adjustments to perform, but the clutch system must be inspected periodically for fluid level and leakage.

Clutch Fluid

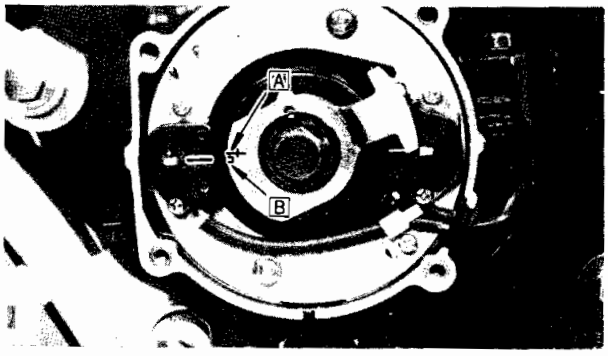
1. Check:
   - Fluid level ①
     Level low → Replenish.

NOTE:
Use only a designated, quality fluid.

Clutch Fluid:
Dot No. 3

① Lower level

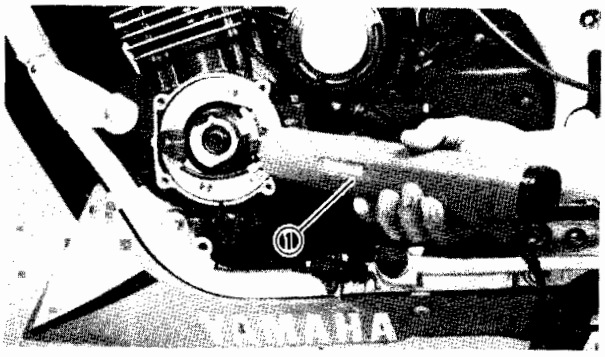
NOTE:
Be sure that:
- Water does not enter the master cylinder when refilling.
- Spilled fluid is cleaned up immediately to prevent painted surfaces or plastic parts from eroding.

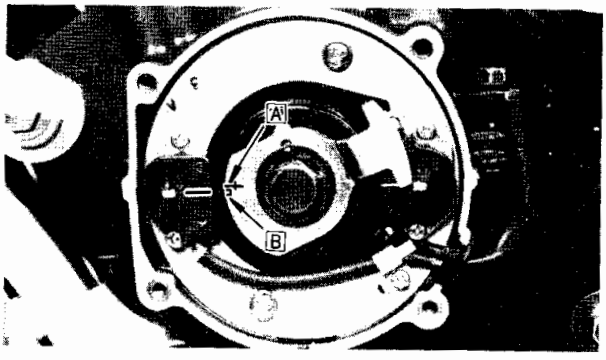


IGNITION TIMING CHECK

Flywheel is marked as follows:

[A] TDC for No.1 cylinder
[B] Firing range for the No.1 cylinder





1. Check:
   - Ignition timing

Ignition timing check steps:
- Remove the cover.
- Connect the Timing Light (YM-33277) ① to No. 1 cylinder spark plug lead.
- Warm up the engine and let it idle at the specified idle speed of 1,000 ±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 range → Check timing plate and/or pickup assembly (tightness damage)
Refer to CHAPTER 6, "ELECTRICAL" for further information.

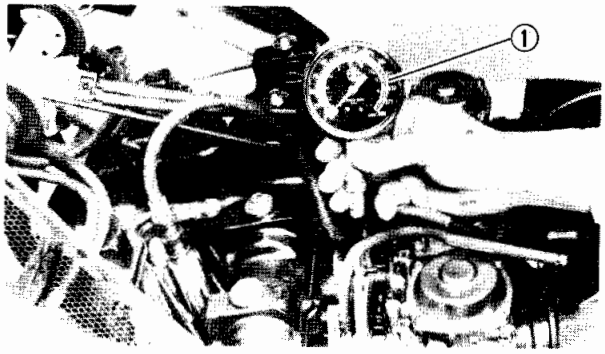
[A] TDC for No.1 cylinder
[B] Firing range for the No.1 cylinder

COMPRESSION PRESSURE MEASUREMENT

NOTE:
Insufficient compression pressure will result in performance loss.

1. Remove:
   - Seat
   - Side covers
   - Fuel tank
   - Air ducts
2. Measure:
   - Valve clearance
     Out of specification → Adjust.
   Warm up the engine.
3. Remove:
   - Spark plugs

COMPRESSION PRESSURE MEASUREMENT



Compression pressure measurement steps:

- Install the Compression Gauge (YU-33223) 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:
980 kPa (10 kg/cm², 142 psi)

Minimum:
882 kPa (9 kg/cm², 128 psi)

Maximum:
1,176.8 kPa (12 kg/cm², 171 psi)

WARNING:

When cranking the engine, ground the all 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)

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

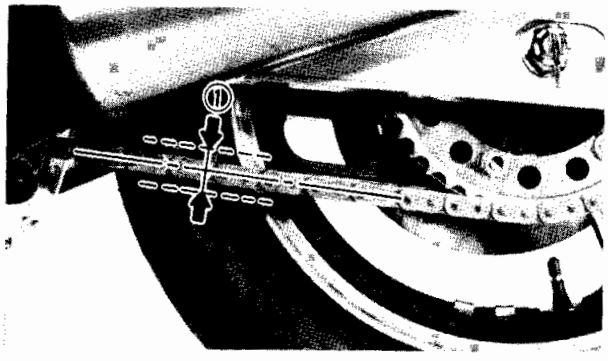
NOTE:
The difference between the highest and lowest cylinder compression readings must not vary more than the specified value.

Difference Between Each Cylinder:
Less than 98 kPa (1 kg/cm², 14 psi)

CHASSIS

DRIVE CHAIN

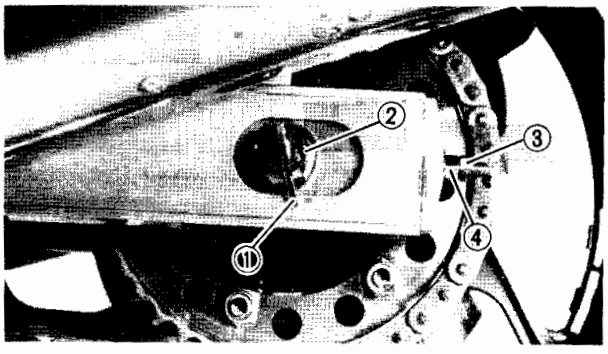
1. Measure:
   - Drive chain slack
     Motorcycle is on the centerstand.
     Out of specification → Adjust.



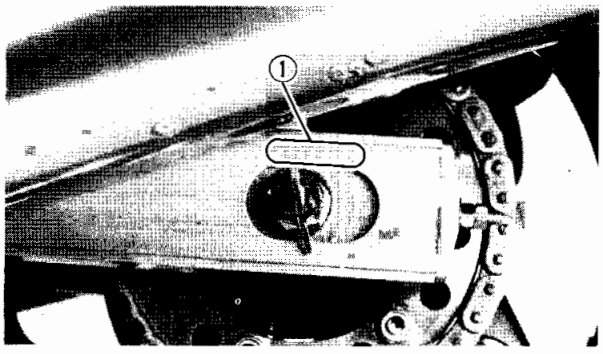
Drive chain slack measurement steps:
- Turn the rear wheel several times.
- Check the chain slack several times to find the point where the chain is the tightest.
- Check the chain slack where the wheel is in this "tight chain" position.

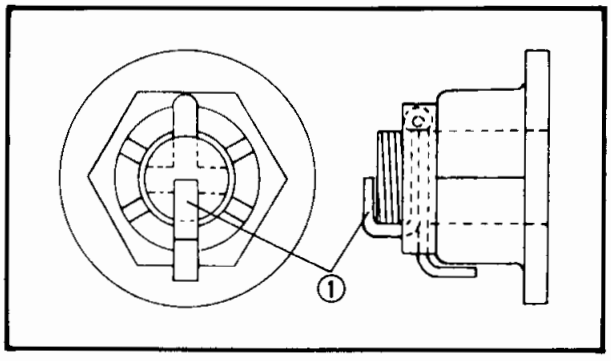
Drive Chain Slack ①:
15 ~ 20 mm (0.6 ~ 0.8 in)

- If the chain slack exceeds 20 mm (0.8 in), adjust the chain slack.



Drive chain slack adjustment steps:
- Remove the cotter pin ①
- Loosen the axle nut ②
- Loosen the locknuts ③
- Adjust chain slack by turning the adjuster unit ④.





To Tighten → Turn adjuster nut clockwise.
To Loosen → Turn adjuster nut counterclockwise and push wheel forward.

- Turn each nut exactly the same amount to maintain correct axle alignment.

CAUTION:

Excessive chain tension will overload the engine and other vital parts; keep the tension within the specified limits.

(There are marks on each side of the swing arm ① and on each chain puller alignment.)

- Tighten the axle nut and locknuts.

Axle Nut:
150 Nm (15 m·kg, 110 ft·lb)
Locknut:
15 Nm (1.5 m·kg, 11 ft·lb)

- Install a new cotter pin ① into the axle nut and bend the end of cotter pin as shown.

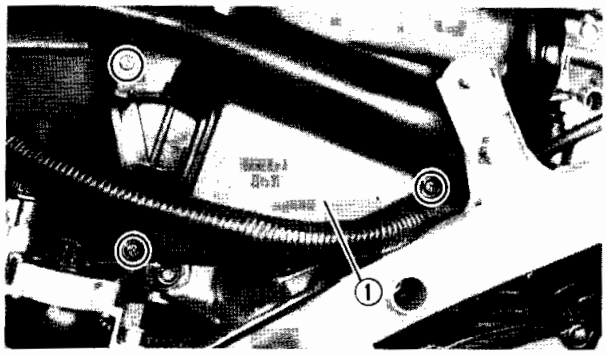
WARNING:

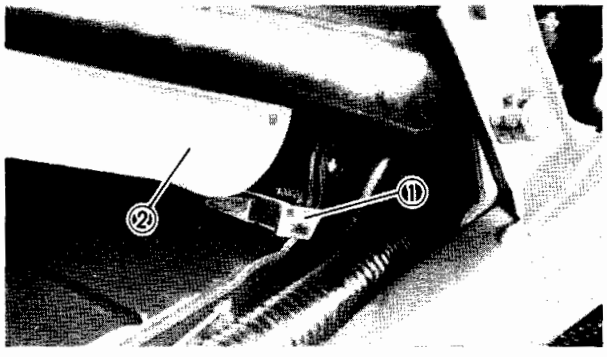
Always use a new cotter pin on the axle nut.

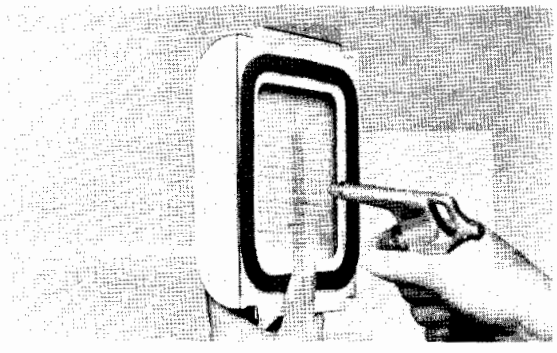
Drive Chain Lubrication

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

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







AIR FILTER

1. Remove:
   - Seat
   - Side cover (Right)
2. Remove:
   - Cover (Air filter) ①
3. Remove:
   - Retainers ①
   - Element ②
4. Eliminate:
   - Dust

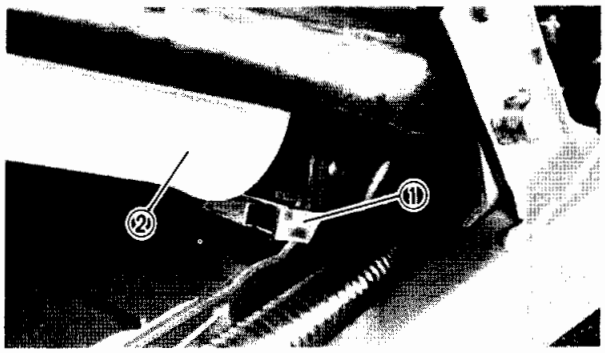
   Use compressed air
5. Inspect:
   - Element

   Damage → Replace.

CAUTION:

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

BRAKE FLUID INSPECTION

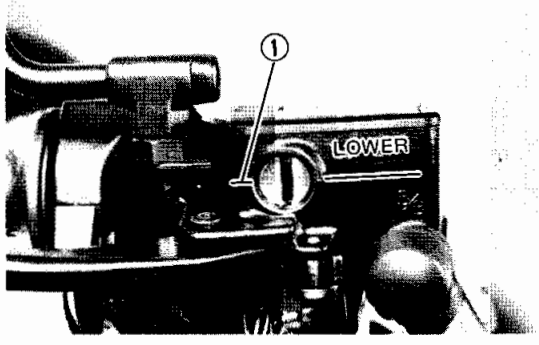


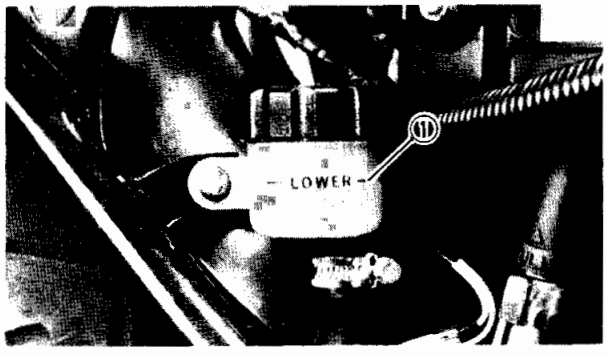
6. Install:
   - Element ②

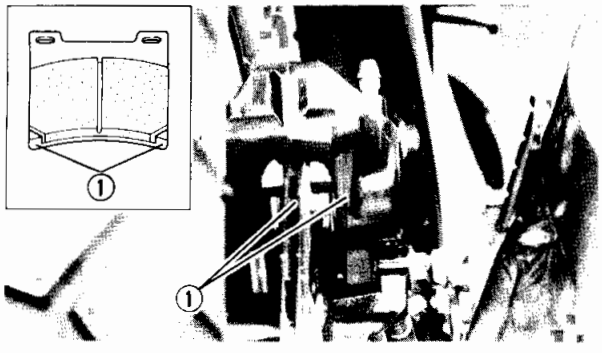
CAUTION:

Make sure the element edge fits into the corresponding filter case groove.

   - Retainers ①
   - Cover







BRAKE FLUID INSPECTION

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

NOTE:

Use only a designated, quality fluid.

	Brake Fluid: **DOT NO. 3**

NOTE:

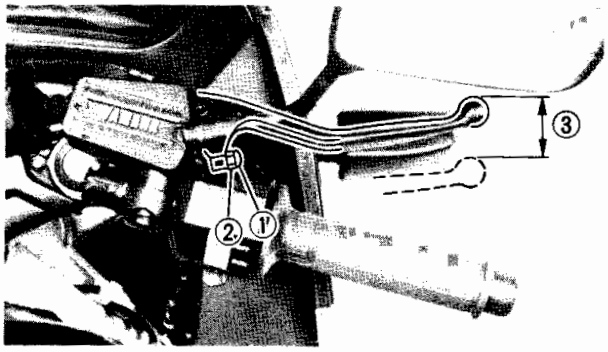
Be sure that:

- 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 AND REAR BRAKE PAD INSPECTION

1. Activate the brake lever or brake pedal.
2. Inspect:
   - Wear indicator ①
     Indicator almost contacts disc → Replace pads.
     Refer to CHAPTER 5, "CHASSIS."



FRONT BRAKE

Front Brake Lever Free Play Adjustment

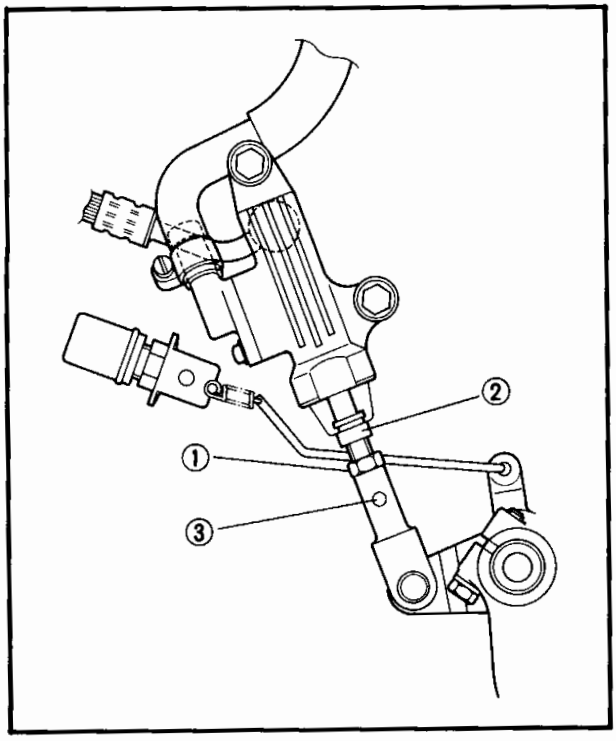
1. Loosen:
   - Adjuster locknut ①
2. Adjust:
   - Free play
     Turn the adjuster ② until the free play ③ is within the specified limits.

Brake Lever Free Play:
5 ~ 8 mm (0.2 ~ 0.3 in)

CAUTION:

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

3. Tighten:
   - Adjuster locknut



REAR BRAKE

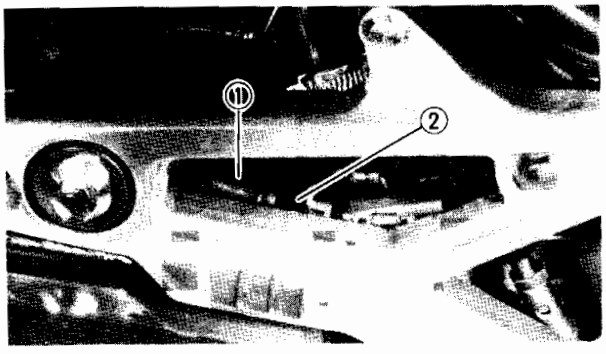
Rear Brake Pedal Height Adjustment

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

Brake Pedal Height:
30 mm (1.2 in)
Below the Top of the Footrest

WARNING:

After adjusting the brake pedal height, visually check the adjust end through the hole ③ of joint the holder. The adjuster end must appear within this hole.



Brake Light Switch Adjustment

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

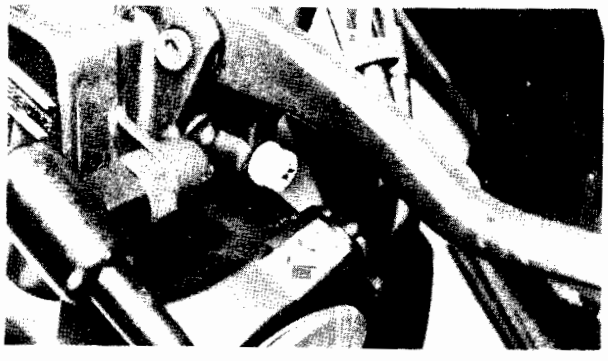
CABLE INSPECTION AND LUBRICATION/ PEDALS AND LEVERS/CENTERSTAND AND SIDESTAND

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 Lube or SAE 10W30 Motor Oil



BRAKE AND CHANGE PEDALS/BRAKE CLUTCH LEVERS

Lubricate pivoting parts of each lever and pedal.

Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil

CENTERSTAND AND SIDESTAND

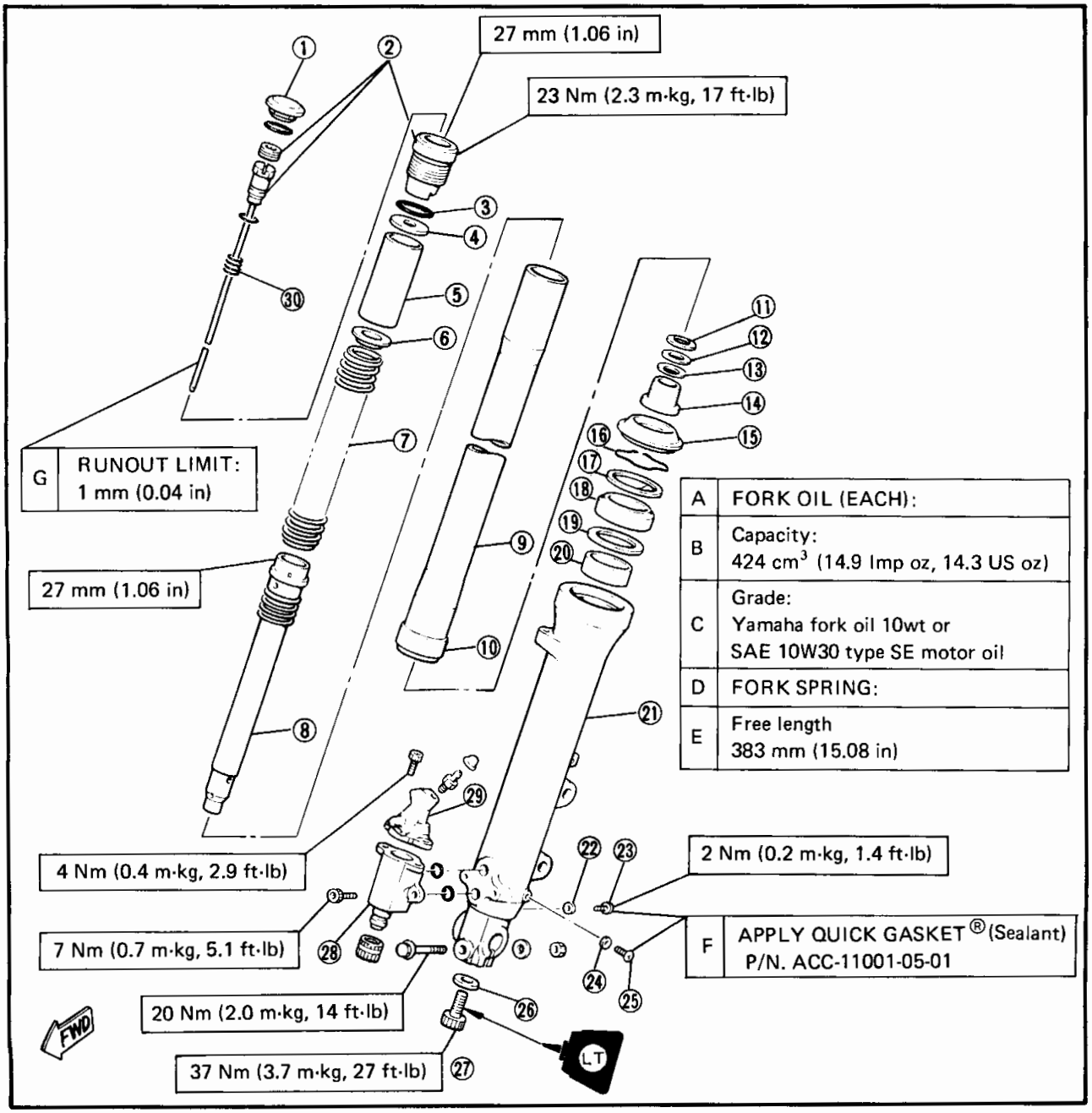
Lubricate centerstand and sidestand at their pivot points.

Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil

FRONT FORK OIL CHANGE

1. Fork cap
2. Cap bolt assembly
3. O-ring
4. Washer
5. Collar
6. Spring seat
7. Fork spring
8. Damper rod
9. Inner fork tube
10. Slide bush
11. Wave washer
12. Washer
13. Wave washer
14. Taper spindle
15. Dust seal
16. Circlip
17. Washer
18. Oil seal
19. Washer
20. Guide bush
21. Outer fork tube
22. Gasket
23. Stopper screw
24. Gasket
25. Drain screw
26. Copper washer
27. Damper rod assembly bolt
28. Anti dive
29. Plunger case
30. Spring

T-HANDLE: P/N. YM-01326 DAMPER ROD HOLDER (#27 mm) P/N. YM-01388

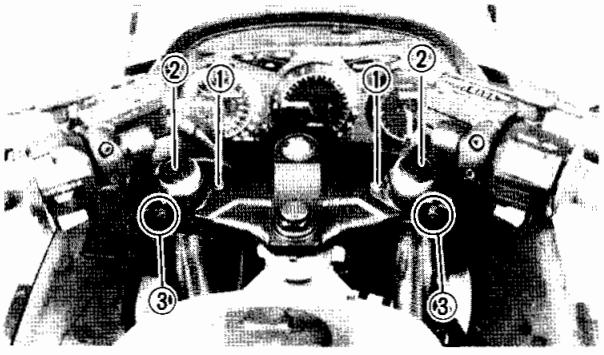


FRONT FORK OIL CHANGE

WARNING:

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

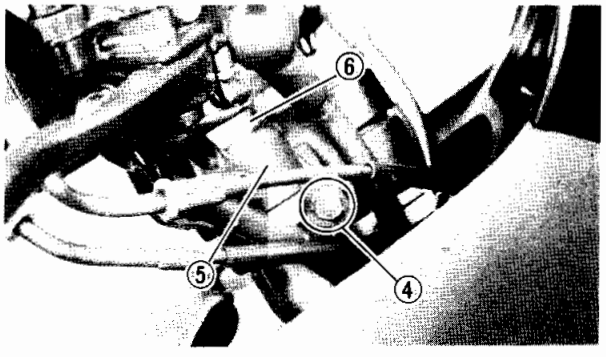
1. Remove:
   - Lower cowling
2. Place a suitable stand under the engine to raise the front wheel off the ground.



3. Remove:
   - Bolt caps ①
   - Fork caps ②
4. Loosen:
   - Pinch bolts (Handlebar) ③
5. - Pinch bolts (steering crown) ④

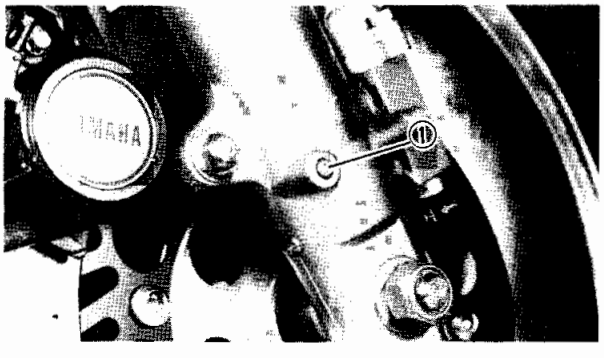
   Remove:
   - Handlebar bolts
   - Handlebars ⑤
   - Cap-bolt assembly ⑥

     Use the Damper Rod Holder (YM-01388).



WARNING:

The cap-bolt assembly is furnished with a damping adjustment knob. When removing and reinstalling the cap-bolt assembly, take care not to bend or otherwise damage the adjusting rod; otherwise, it may cause faulty front fork operation.

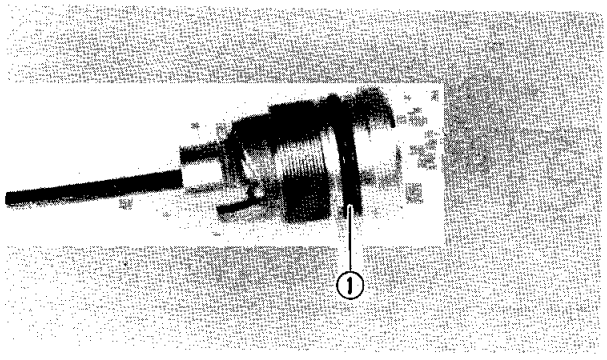


6. Remove:
   - Drain screws ⑪

     Drain the fork oil.

WARNING:

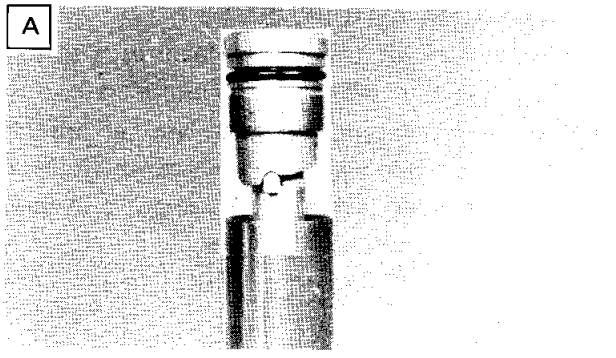
Do not allow any oil to contact the disc brake components. If oil is discovered, be sure to remove it, otherwise diminished braking capacity and damage to the rubber components of the brake assembly will occur.

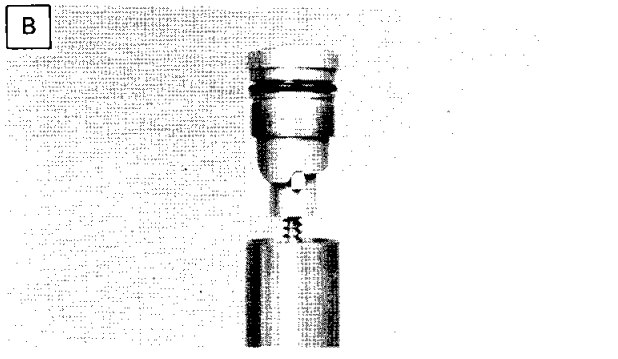


7. Inspect:
   - O-ring ① (Cap-bolt assembly)
   - Gasket (Drain bolt screw)
   Wear/Damage → Replace.
8. Install:
   - Drain screws
9. Fill:
   - Front forks

Each Fork:
424 cm³ (14.9 Imp oz, 14.3 US oz)
Yamaha Fork Oil 10wt or
SAE 10W30 Type SE Motor Oil

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





10. Install:
    - Cap-bolt assembly

CAUTION:

To tighten the cap-bolt assembly, first make sure the damper adjusting rod fits correctly (as shown) in the semicircular hole in the top of the damper rod. If incorrect [B] turn the damper adjuster in capbolt assembly with a screwdriver until it falls, then you will be able to screw the cap-bolt assembly on. Do not force the cap-bolt assembly, you may damage the adjusting rod and ruin the unit.

[A] CORRECT
[B] INCORRECT

11. Tighten:
    - Cap-bolt assembly
    Use the Damper Rod Holder (YM-01388).

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

12. Install:
    - Handlebars

13. Tighten:
    - Pinch bolts
    - Handlebar bolts

Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)
Handlebar Bolt:
9 Nm (0.9 m·kg, 6.5 ft·lb)

14. Install:
    - Fork caps
    - Bolt caps
15. Adjust:
    - Front fork

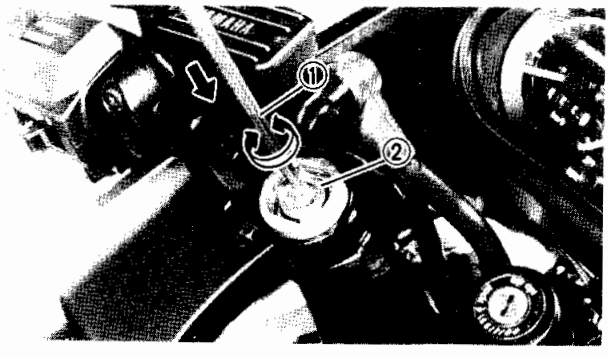
FRONT FORK ADJUSTMENT

The front fork of this model features a spring preload adjuster which is a combined spring preload and damping adjuster. Normal adjustment can be made by turning this spring preload adjuster, whereas damping adjustment only can be made by the damping adjuster.

1. Adjust:
    - Spring preload
    - Damping

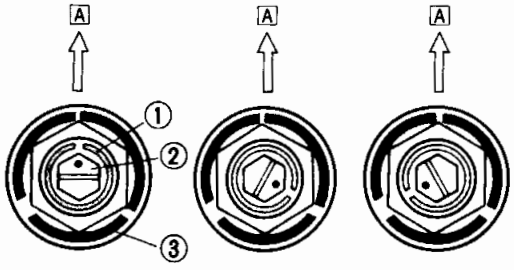
WARNING:

Always adjust each fork preload and damping to the same setting. Uneven adjustment can cause poor handling and loss of stability.



Spring preload adjustment steps:

1. Remove the fork caps.
2. Place a screwdriver ① in to the slot of the damping adjuster ② , and turn it while pushing downward so the damping adjuster turns with the spring preload adjuster.



Hard → Turn the adjuster clockwise.
Soft → Turn the adjuster counterclockwise.

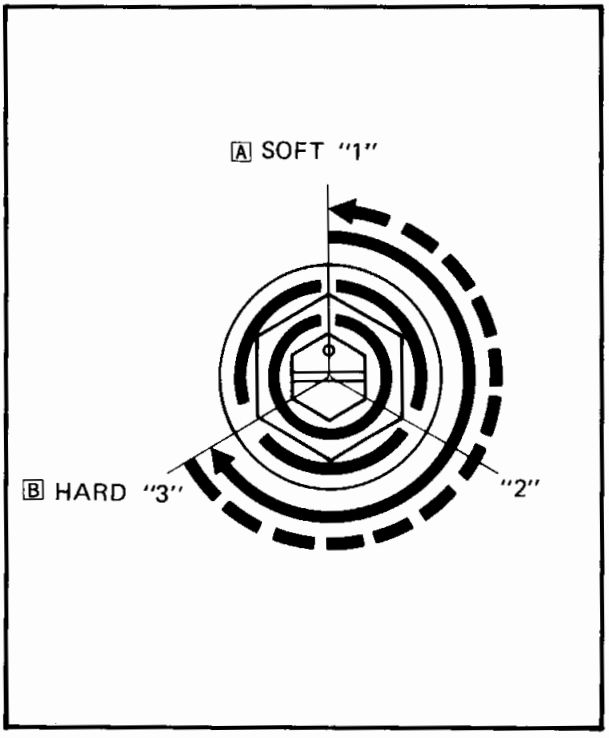
Standard Position: "1"
Minimum Position: "2"
Maximum Position: "3"

A FRONT
1 Spring preload adjuster
2 Damping adjuster
3 Inner fork tube (mark)

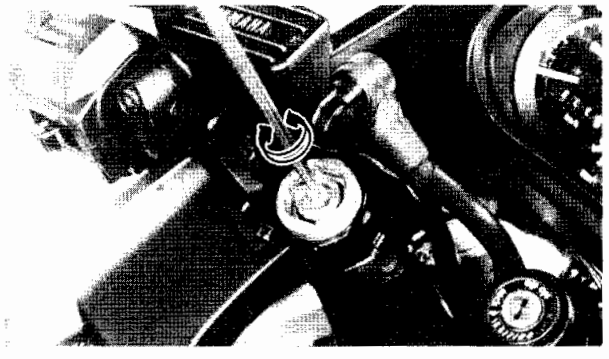
CAUTION:

- **Turn the spring preload adjuster from 1 to 3, or 3 to 1 in progressive steps (1, 2, 3). Never turn adjuster directly from 1 to 3, or 3 to 1.**
- **The spring adjuster mark 1 should be aligned with any one of the inner marks 3. Never position it between the outer tube marks.**

3. Adjust the damping.



A SOFT
B HARD



Damping adjustment steps:
1. Place a screwdriver in to the slot of the damping adjuster, and turn it so the adjuster alone turns.

Hard → Turn the adjuster clockwise.
Softer → Turn the adjuster counterclockwise.

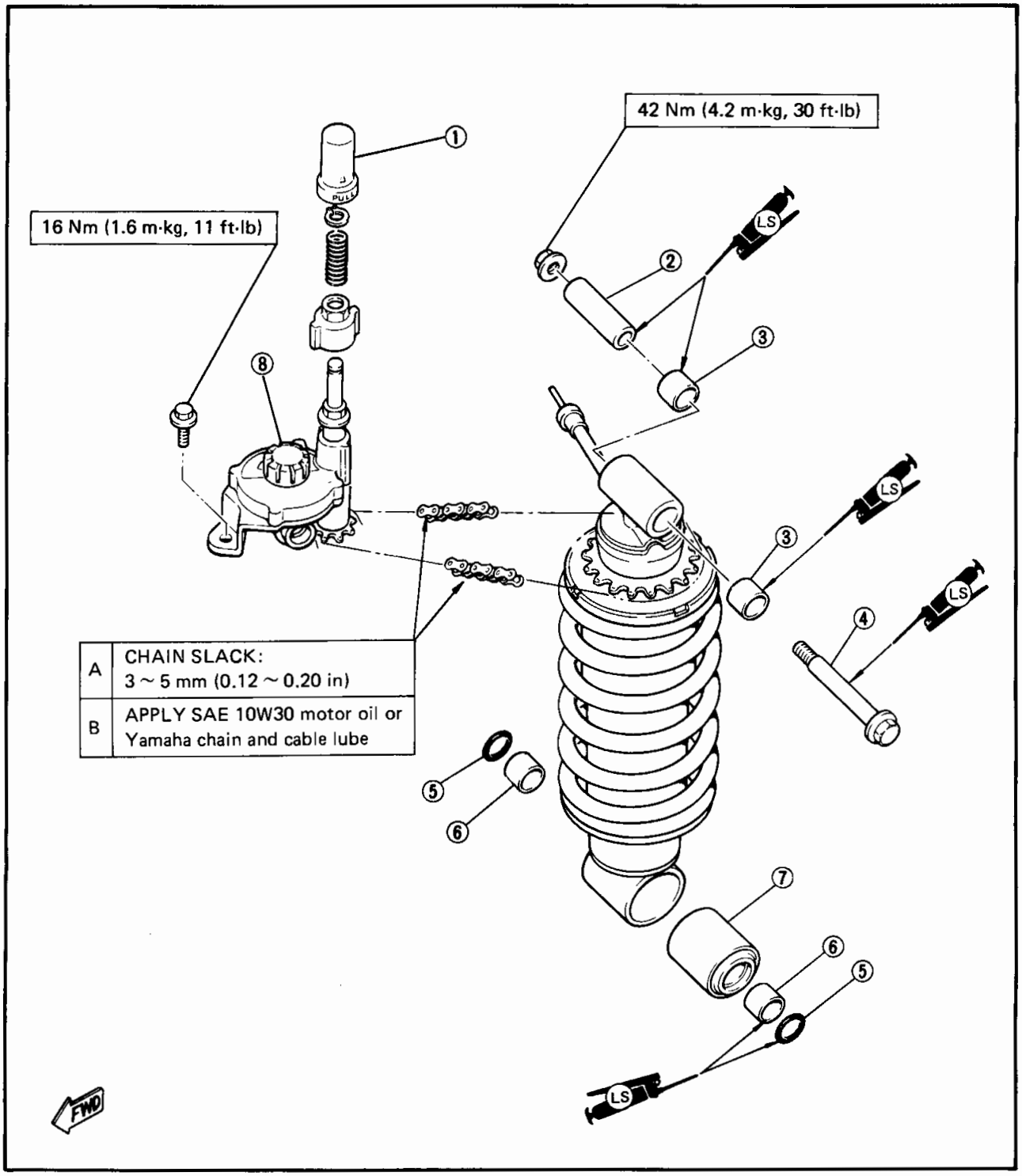
Standard Position: 1
Maximum Position: 3

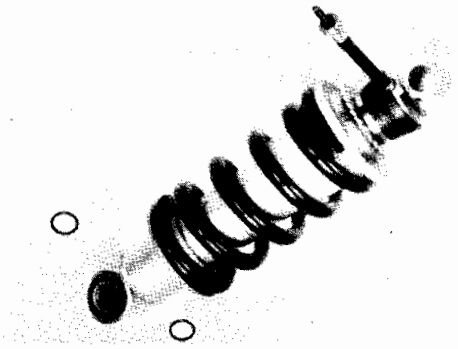
2. Install the fork caps.

REAR SHOCK ABSORBER ADJUSTMENT

(New Monocross Suspension with Programmed Damping/Preload Adjustment and "De Carbon" System)

1. Rubber cap
2. Collar
3. Bushing
4. Pivot bolt
5. O-ring
6. Collar
7. Bushing
8. Remote control unit



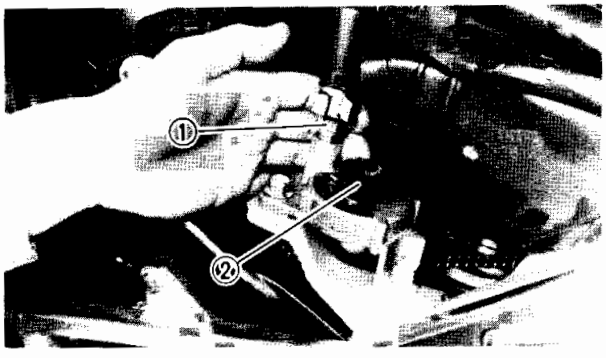


Rear Shock Absorber
(Monocross suspension "De Carbon" system)

WARNING:

This shock absorber contains highly pressurized nitrogen gas.
Read and understand the following information before handling the shock absorber. The manufacturer cannot be held responsible for property damage or personal injury that may result from improper handling.

1. **Do not tamper with or attempt to open the cylinder assembly.**
2. **Do not subject shock absorber to an open flame or other high heat source. This may cause the unit to explode due to excessive gas pressure.**
3. **Do not deform or damage the cylinder in any way. Cylinder damage will result in poor damping performance.**



Rear Shock Absorber Adjustment

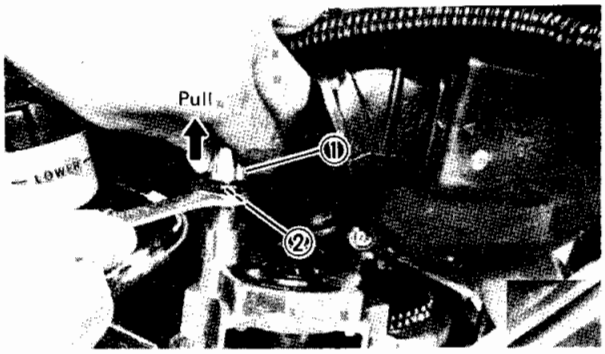
1. Adjust:
   - Spring preload ①
   - Damping ②

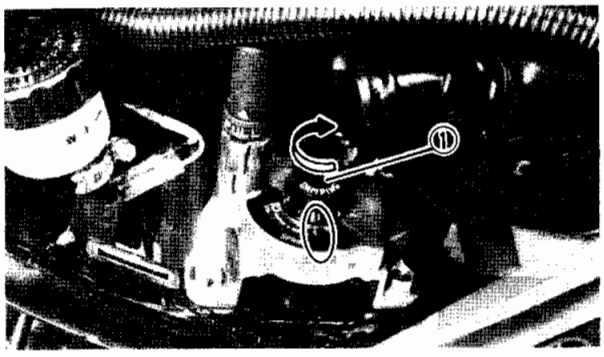
The rear shock absorber of this model features a spring preload adjuster which is a combined spring preload and damping adjuster. Normal adjustment can be made by turning this spring preload adjuster, whereas damping adjustment can only be made by the damping adjuster.

CAUTION:

Turn spring preload adjuster and damping adjuster from 1 to 5, or 5 to 1 in progressive steps (1, 2, 3, 4, 5). Never turn adjuster directly from 1 to 5, or 5 to 1.

REAR SHOCK ABSORBER ADJUSTMENT





Spring preload adjustment steps:

1. Elevate the wheel by placing the motorcycle on the centerstand.
2. Lift up the adjuster cover ①, and turn the spring preload adjuster ② so that the damping adjuster turns with it.

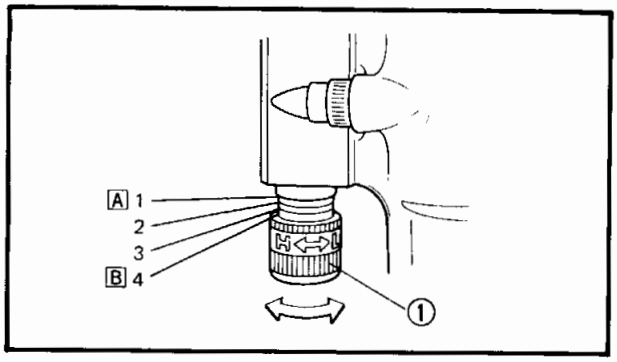
Hard → Turn the adjuster clockwise.
Soft → Turn the adjuster counterclockwise.

Damping adjustment steps:

Soft → Turn the adjuster ① clockwise.
Hard → Turn the adjuster counterclockwise.
Standard Position: "2"
Minimum Position: "5"
Maximum Position: "1"

Recommended combinations of the front fork and the rear shock absorber settings:
Use this table as a guide for specific riding and motorcycle load conditions.

Front fork		Rear sock absorber		Loading condition			
Spring preload adjuster	Damping adjuster	Spring preload adjuster	Damping adjuster	Solo rider	With passenger	With accessories and equipment	With accessories, equipment, and passenger
1	1	1, 2	1, 2	○			
2	2	2, 3	2, 3		○		
2	2	2, 3	2, 3			○	
3	3	4, 5	4, 5				○



ANTI-DIVE ADJUSTMENT

This anti-dive is adjustable in four stages depending on loading conditions.

WARNING:

Always adjust each anti-dive to the same setting. Uneven adjustment can cause poor handling and loss of stability.

Hard → Turn the adjuster ① counterclockwise.
Soft → Turn the adjuster clockwise.
Standard Position: "1"
Maximum Position: "4"

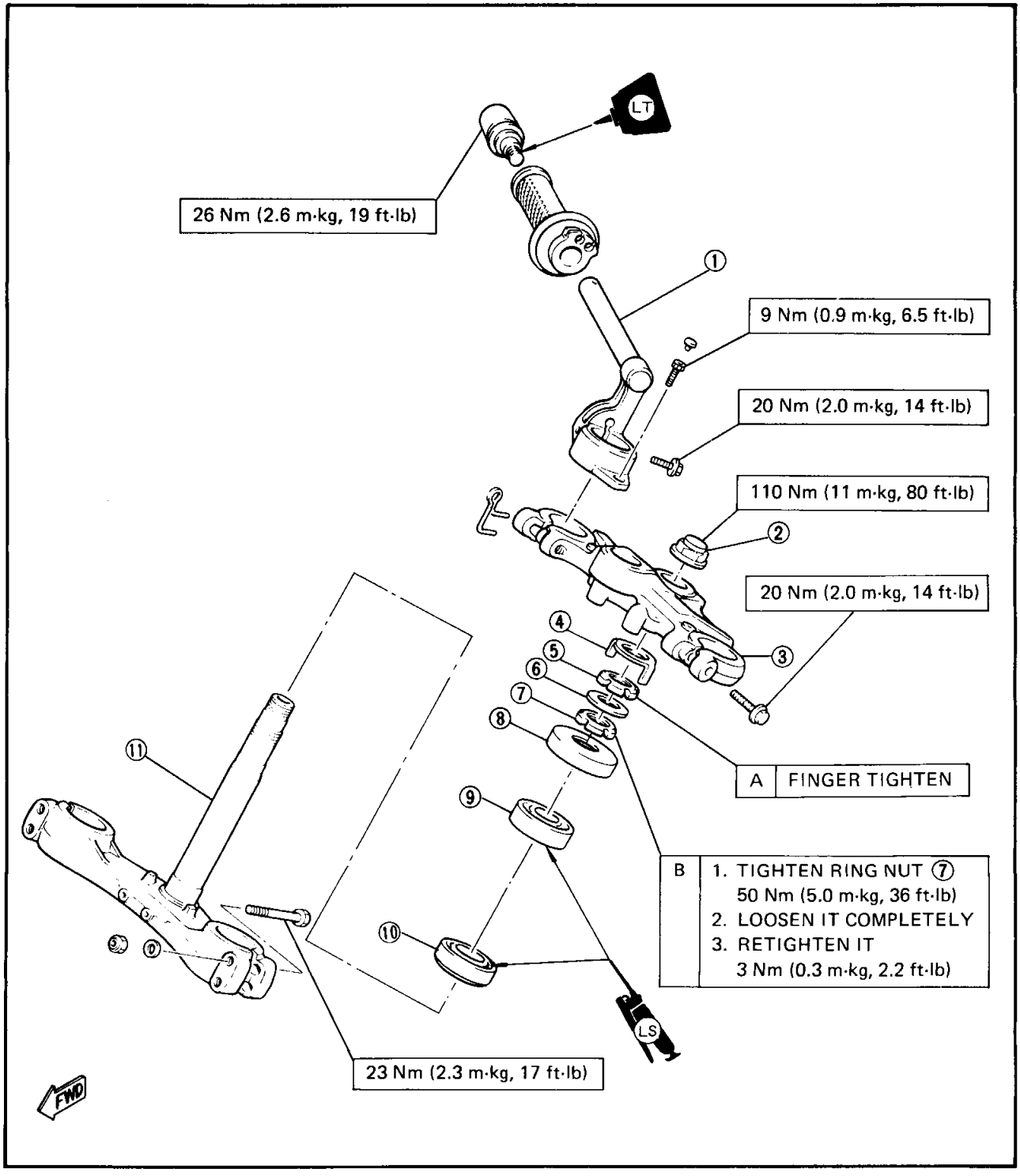
A Minimum
B Maximum

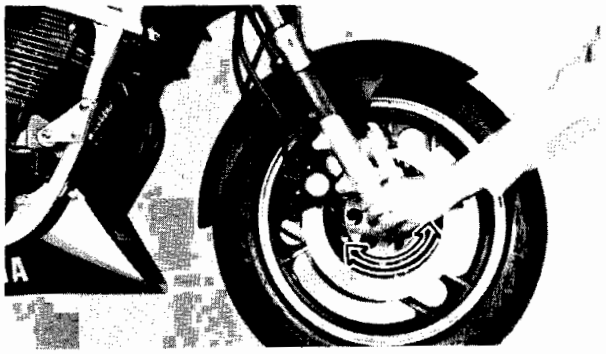
Adjusting bolt position	Loading condition		
	Solo rider	With accessory equipment or passenger	With accessory equipment and passenger
1	○		
2	○	○	
3		○	○
4			○

STEERING HEAD ADJUSTMENT

1. Handlebar
2. Nut
3. Steering crown
4. Lock washer
5. Ring nut (Upper)
6. Rubber washer
7. Ring nut (Lower)
8. Bearing cover
9. Bearing (Upper)
10. Bearing (Lower)
11. Steering stem

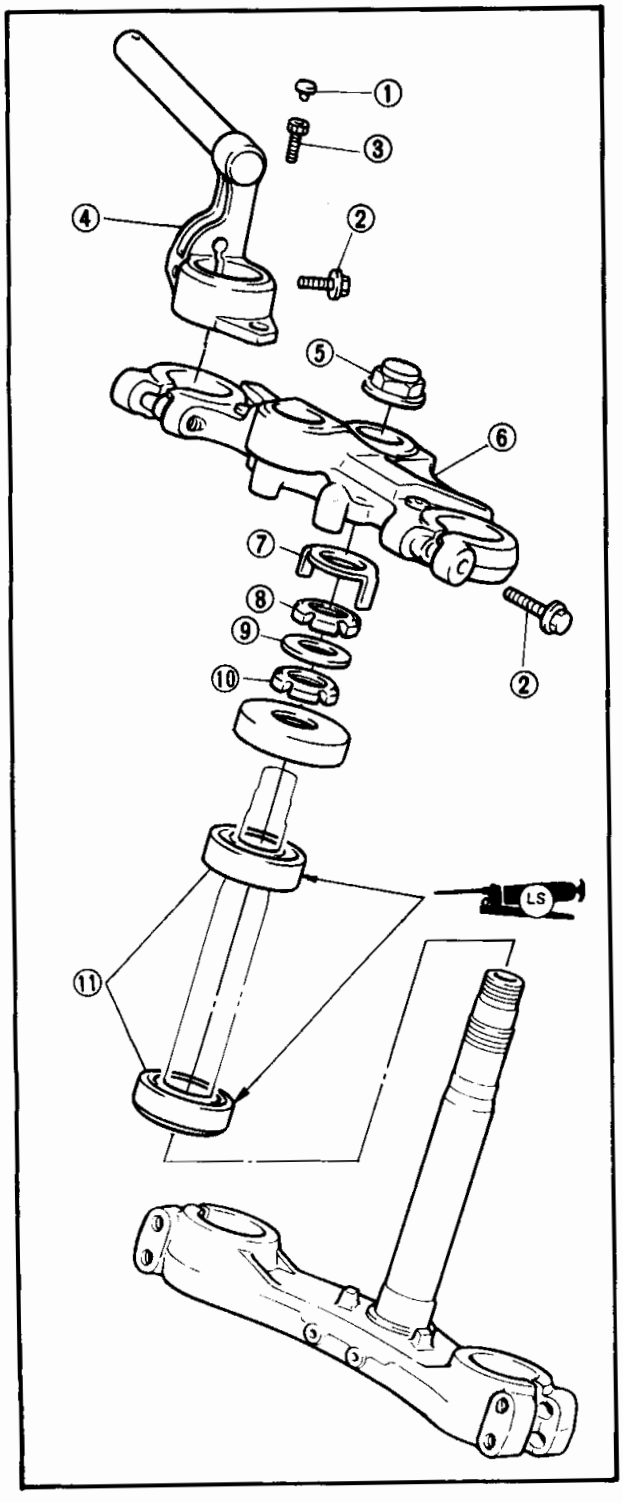
RING NUT WRENCH:
P/N. YU-33975





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:

- Remove the fork and bolt caps ①.
- Loosen the pinch bolts ②.
- Remove the handlebar securing bolts ③.
- Remove the handlebars ④.
- Remove the steering stem nut ⑤.
- Remove the steering crown ⑥.
- Remove the lock washer ⑦.
- Loosen the ring nut ⑧ and washer ⑨.
- Tighten the ring nut ⑩.
  Use the Ring Nut Wrench (YU-33975).

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 ⑩ completely and retighten it to specification.
  Use the Ring Nut Wrench (YU-33975).

Ring Nut (Lower):
3 Nm (0.3 m·kg, 2.2 ft·lb)

- Check the steering stem by turning it lock to lock. If there is any binding, remove the steering stem assembly and inspect the steering bearings ⑪.
  (See CHAPTER 5, STEERING HEAD for more detailes.)

- Install the washer ⑨.
- Install the ring nut ⑧ and hand-tighten, then align the slots of both ring nuts. If not aligned, hold the lower ring nut ⑩ and tighten the other until they are aligned.
- Install the lock washer ⑦.

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

- Install the steering crown ⑥ and tighten the steering stem nut ⑤ to specification.



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

- Install the handlebars ④ and torque the bolts ③ to specification.



Pinch Bolt :
20 Nm (2.0 m·kg, 14 ft·lb)
Handlebar Bolt :
9 Nm (0.9 m·kg, 6.5 ft·lb)

- Install the fork and bolt caps ①.

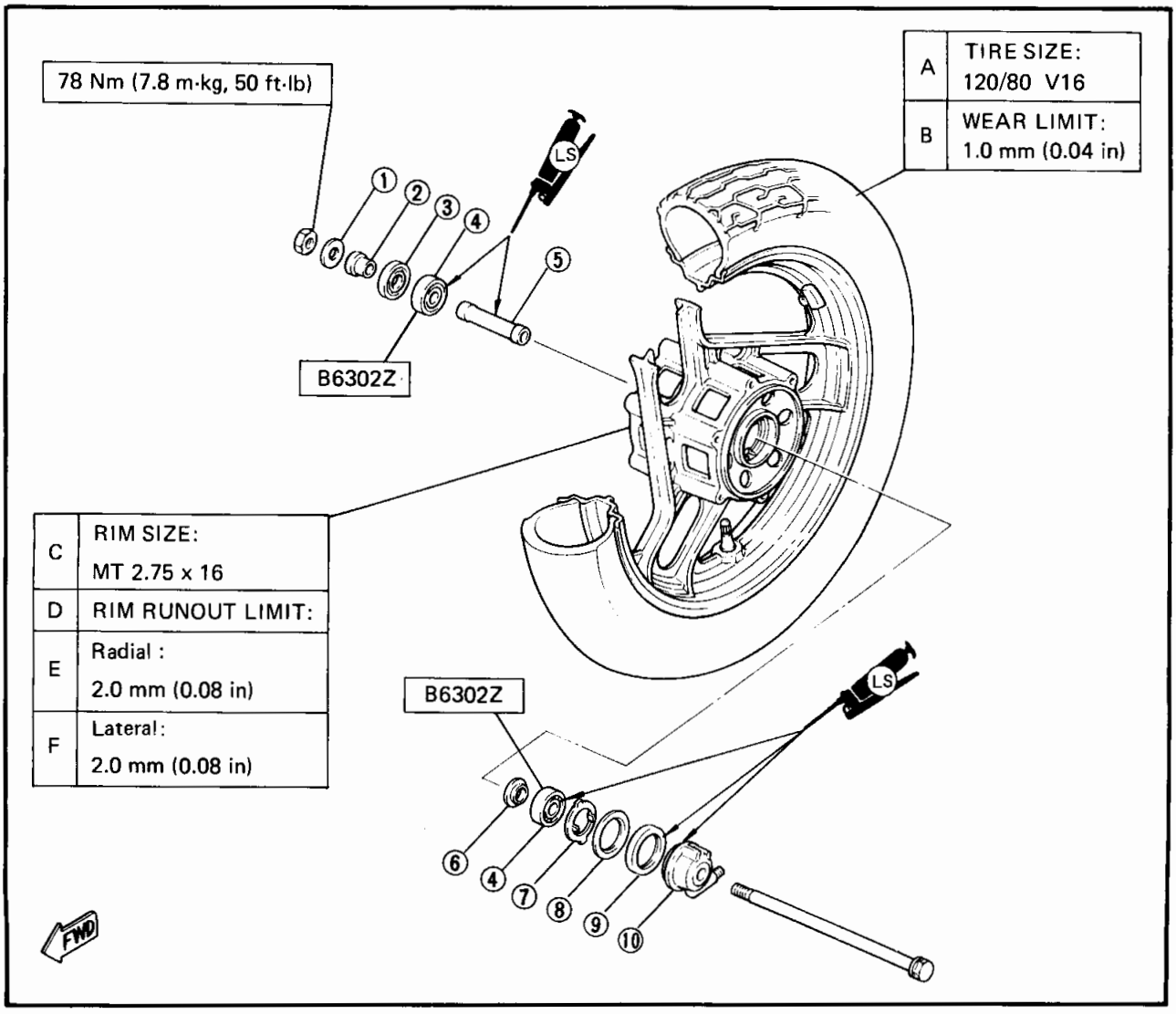
WHEEL BEARINGS

Front Wheel

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

Basic weight: With oil and full fuel tank	Except for California: 252 kg (556 lb) For California: 253 kg (558 lb)	
Maximum load*	198 kg (437 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	226 kPa (2.3 kg/cm², 32 psi)	245 kPa (2.5 kg/cm², 36 psi)
90 kg (198 lb) ~ Maximum load*	245 kPa (2.5 kg/cm², 36 psi)	284 kPa (2.9 kg/cm², 42 psi)
High speed riding	245 kPa (2.5 kg/cm², 36 psi)	284 kPa (2.9 kg/cm², 42 psi)

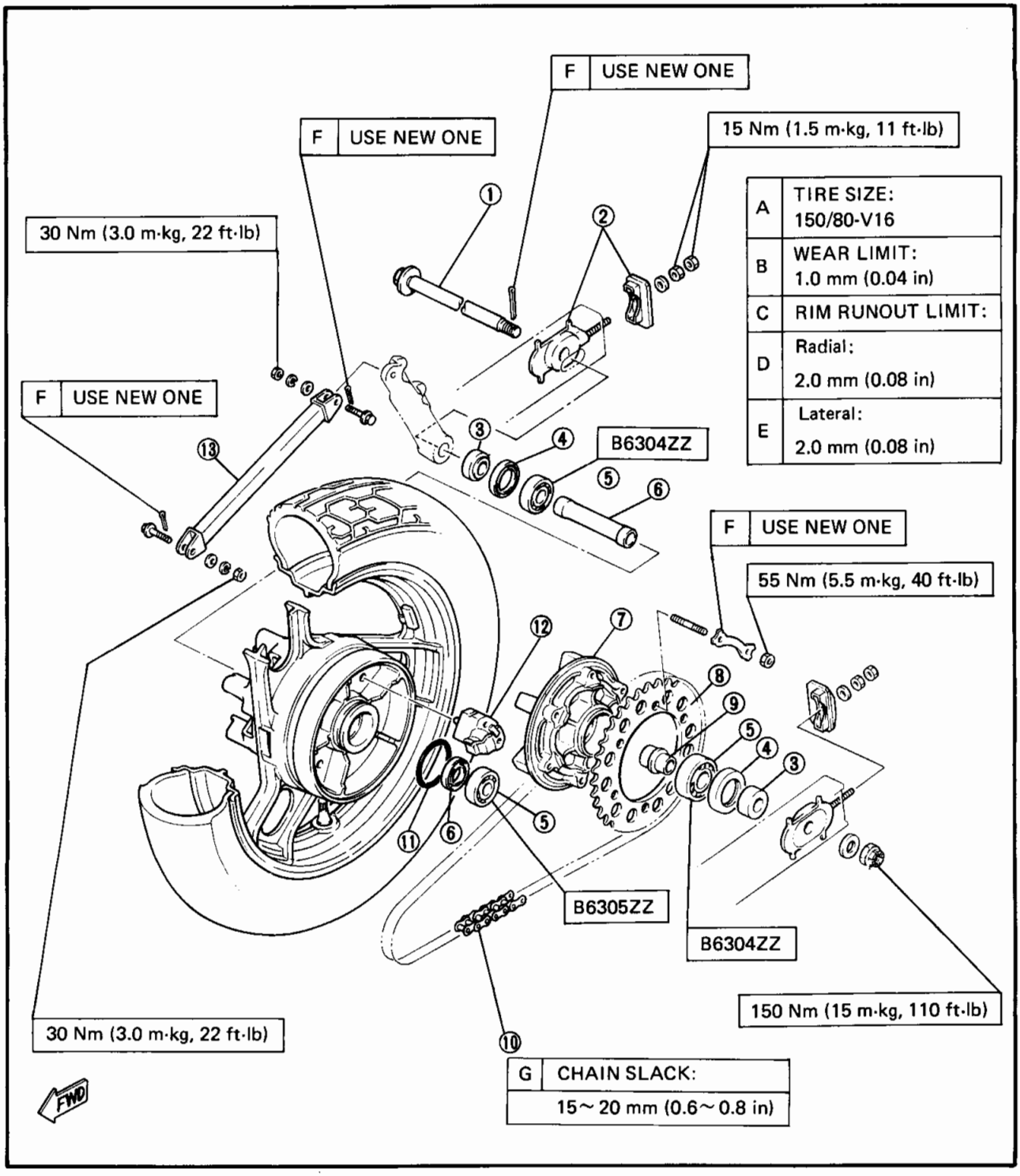
*Load is the total weight of cargo, rider, passenger, and accessories.

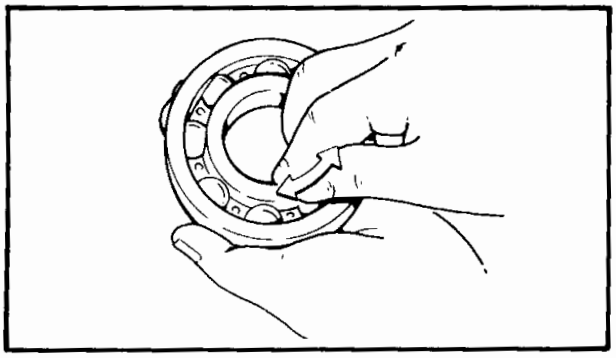


WHEEL BEARINGS

Rear Wheel

1. Rear axle
2. Drive chain puller
3. Collar
4. Oil seal
5. Bearing
6. Spacer
7. Clutch hub
8. Driven sprocket (41T)
9. Collar
10. Drive chain
11. O-ring
12. Damper
13. Tension bar



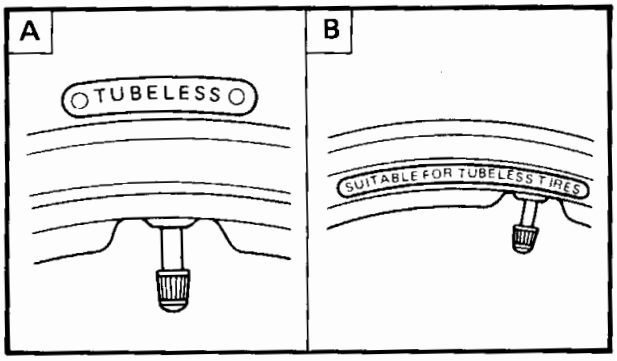


Front Wheel Bearings

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:

Do not attempt to use tubeless tires on a wheel designed for tube type tires only. Tire failure and personal injury may result from sudden deflation.

Wheel	Tire
Tube type	Tube type only
Tubeless	Tube type or tubeless

Be sure to install the correct tube when using tube type tires.

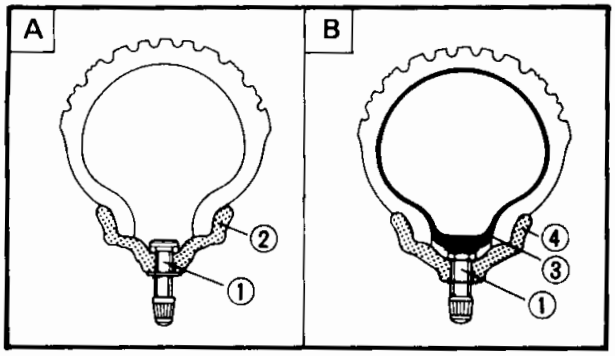
[A] Tire
[B] Wheel

WARNUNG:

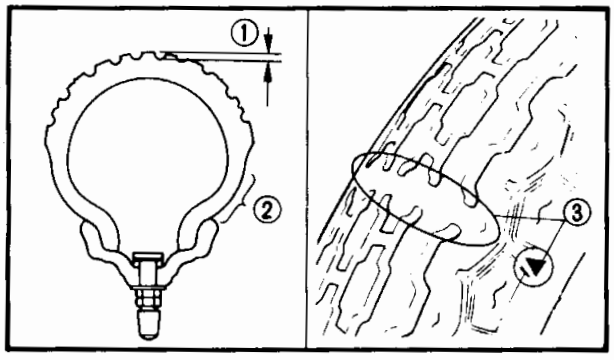
This motorcycle is fitted with "V" range tires (for super high speed running). The following points must be observed in order for you to make fully effective use of these tires.

1. **Never fail to use "V" range tires in tire replacement. "S" or "H" tires may have a danger of bursting at super high-speeds.**

TUBELESS TIRES AND ALUMINUM WHEEL



C	Basic weight: With oil and full fuel tank	Except for California: 252 kg (556 lb) For California: 253 kg (558 lb)	
D	Maximum load *	198 kg (437 lb)	
E	Cold tire pressure	Front	Rear
F	Up to 90 kg (198 lb) load *	226 kPa (2.3 kg/cm², 32 psi)	245 kPa (2.5 kg/cm², 36 psi)
G	90 kg (198 lb) ~ Maximum load *	245 kPa (2.5 kg/cm², 36 psi)	284 kPa (2.9 kg/cm², 42 psi)
H	High speed riding	245 kPa (2.5 kg/cm², 36 psi)	284 kPa (2.9 kg/cm², 42 psi)



2. **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).**
3. **Before any high-speed runs, remember to allow a sufficient warm-up time for the tires.**
4. **Always use the correct tire inflation pressure according to the operating conditions.**

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

1. Measure:
   - Tire pressure
     Out of specification → Adjust.

Ⓐ Tubeless tire Ⓑ Tube type tire

① Air valve
② Aluminum wheel (tubeless type)
③ Tube
④ Aluminum wheel (tube type)

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

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

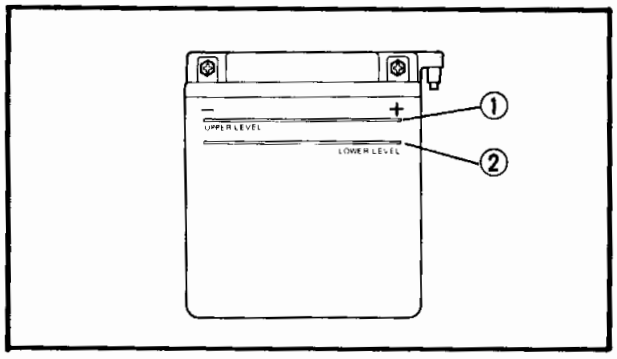
Minimum Tire Tread Depth:
(Front and Rear)
1.0 mm (0.04 in)

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 replaced.

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



ELECTRICAL

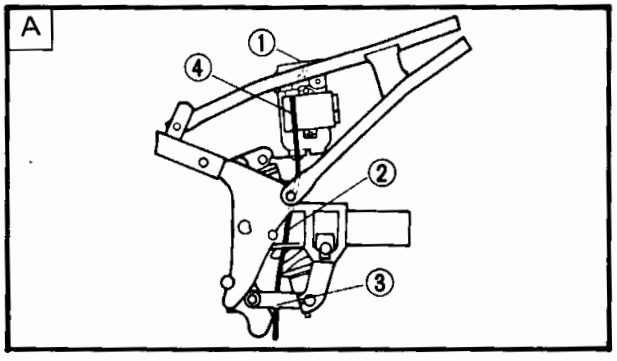
BATTERY

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

① Upper level
② Lower level

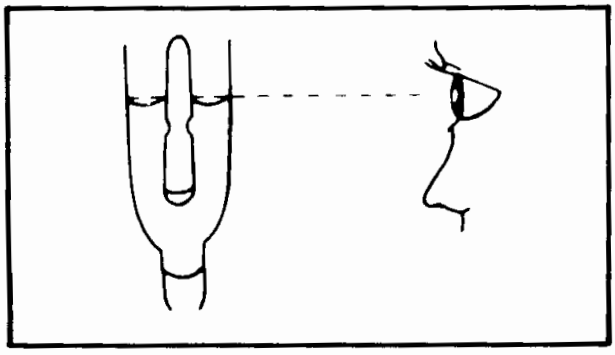
CAUTION:

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



2. Connect:
   - Bearing hose
     Be sure the hose is properly attached and routed.
3. Inspect:
   - Breather hose
     Obstruction → Remove.
     Damage → Replace.

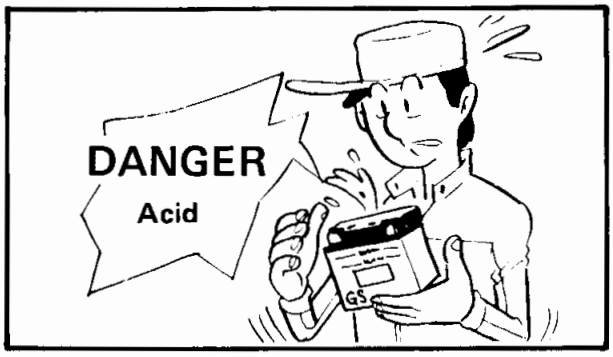
A HOW TO ROUTE BATTERY BREATHER PIPE.
① Battery
② Route inside the swing arm.
③ Route through the front hole made on link.
④ Route inside the battery box.



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)



WARNING:

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

Always follow these preventive measures:

- Avoid bodily contact with electrolyte as it can cause servere burns or permanent eye injury.
- Wear protective eye gear when handling or working near batteries.

Antidote (EXTERNAL):

- SKIN – Flush with water.
- EYES – Flush with water for 15 minutes and get immediate medical attention.

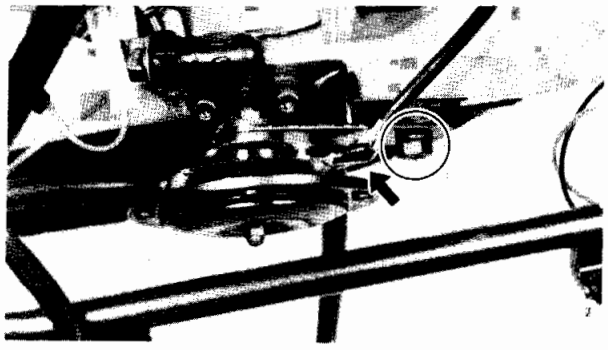
Antidote (INTERNAL):

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

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.

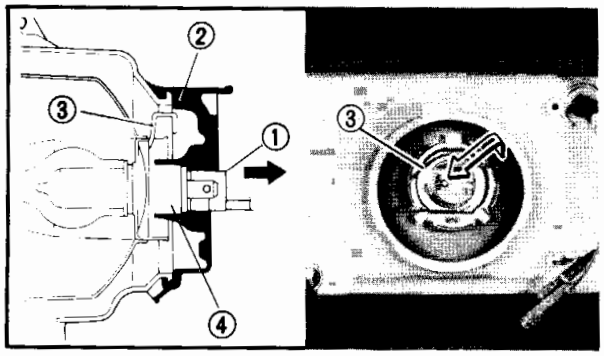
KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.

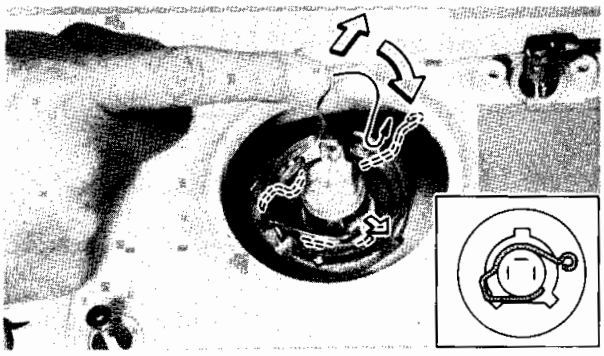


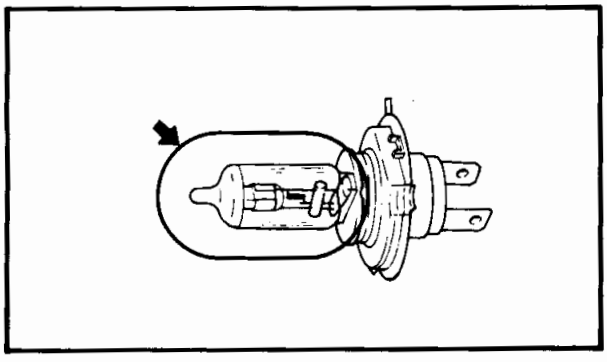
HEADLIGHT

Headlight Bulb Replacement

1. Remove:
   - Horn







2. Disconnect:
   - Headlight connector ①
3. Remove:
   - Rubber cover ②
   - Bulb holding spring ③
   - Bulb ④

WARNING:

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

4. Install:
   - Bulb (new)
   - Bulb holding spring

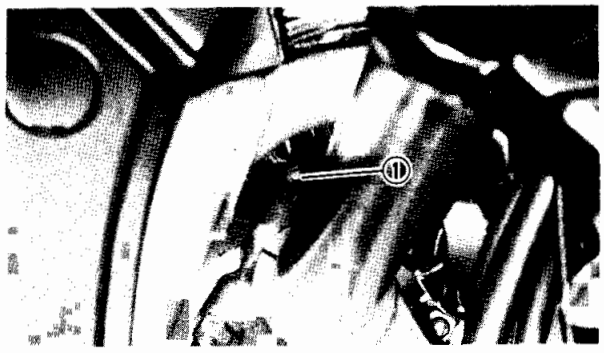
NOTE:

Fit the bulb holding spring while pushing it upward.

CAUTION:

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

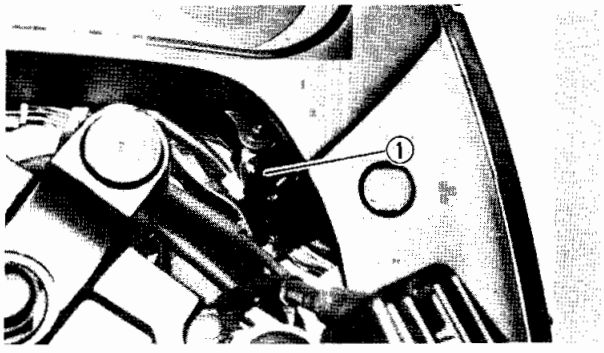
5. Install:
   - Rubber cover
6. Connect:
   - Headlight connector
7. Adjust:
   - Headlight.



Headlight Adjustment

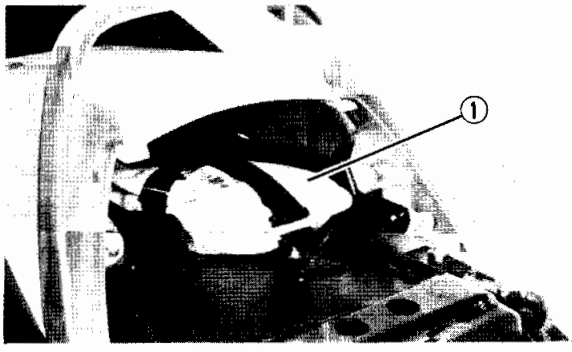
1. Adjust:
   - Headlight
     (Horizontally)

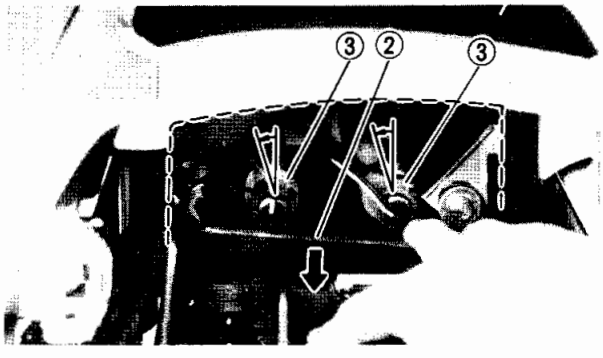
Horizontal Adjustment	
Right	Turn adjusting screw ① counterclockwise
Left	Turn adjusting screw ① clockwise



2. Adjust:
   - Headlight
     (Vertically)

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

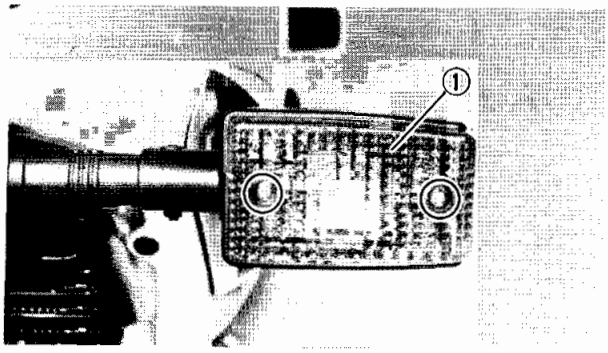




TAILLIGHT

Taillight Bulb(s) Replacement

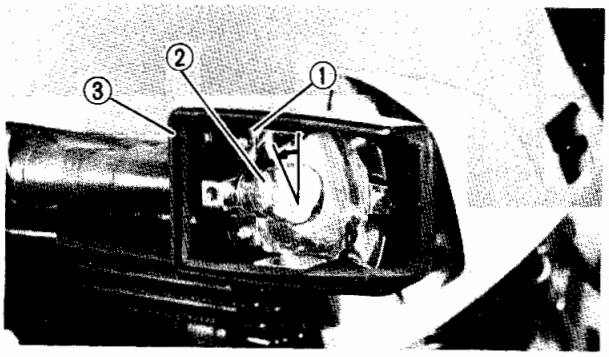
1. Remove:
   - Seat
   - Tool kit ①
2. Pull the lid toward ② the front.
3. Remove:
   - Taillight connectors ③
     Turn it approximately 30° counterclockwise.
   - Bulbs
     Turn the bulb counterclockwise and remove the bulb.
4. Install:
   - Bulbs (New)
5. Connect:
   - Taillight connectors
6. Install:
   - Lid
   - Seat



FLASHER LIGHT

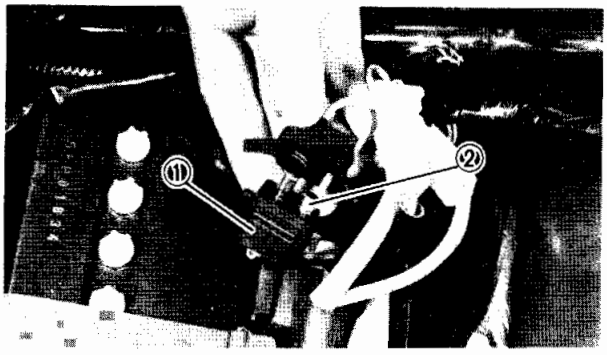
Flasher Light Bulb(s) Replacement

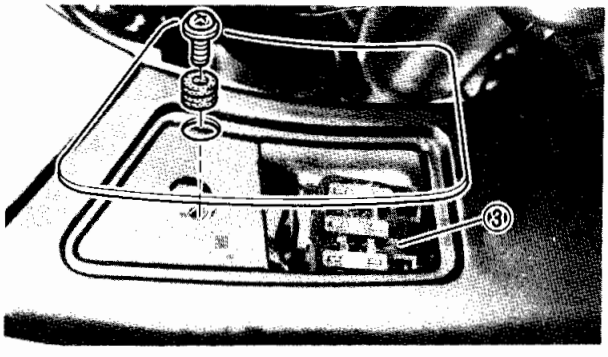
1. Remove:
   - Screws
   - Lens ①



2. Push in the flasher bulb and turn it about 30° to remove the bulb ②.
3. For installation, reverse the removal procedure.

NOTE:
Make sure the gasket ③ is positioned properly.





FUSE

There are two fuse blocks on this motorcycle. The main fuse block ① is located under the seat.
The other fuse block ③ is located in the left side cowling.

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

NOTE:
Install new fuses of proper amperage.

Description	Amperage	Quantity
Main	30A	1
Headlight	15A	1
Signal	15A	1
Ignition	15A	1
Reserve	30A 15A	1 1

② Spare fuse

CHAPTER 3.
ENGINE OVERHAUL

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- SEAT AND FUEL TANK 3-2
- BATTERY 3-2
- COWLING 3-2
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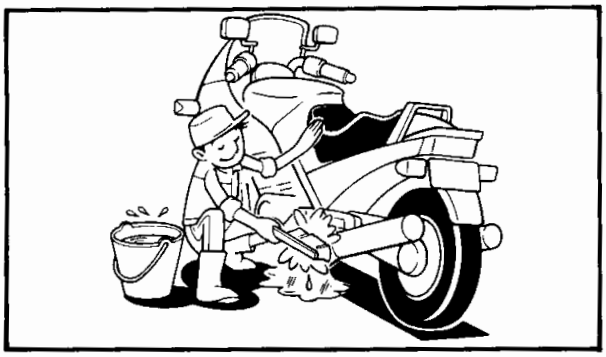
ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

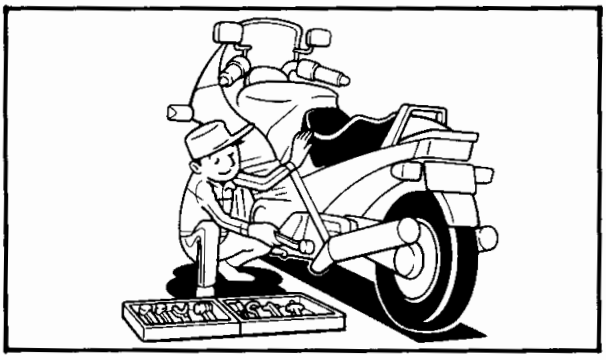
It is not necessary to remove the engine in order to remove the following components:

- Piston
- Clutch
- Carburetor
- Oil pump



PREPARATION FOR REMOVAL

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

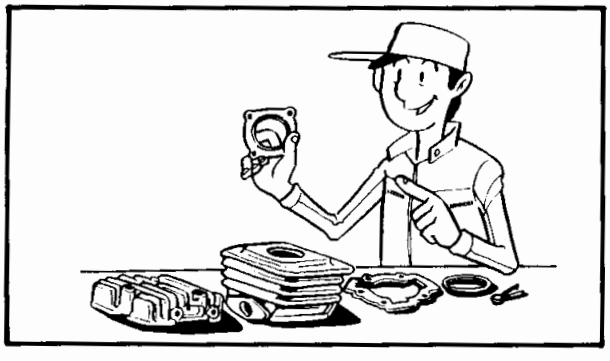


2. Use proper tools and cleaning equipment. Refer to CHAPTER 1, "SPECIAL TOOL."

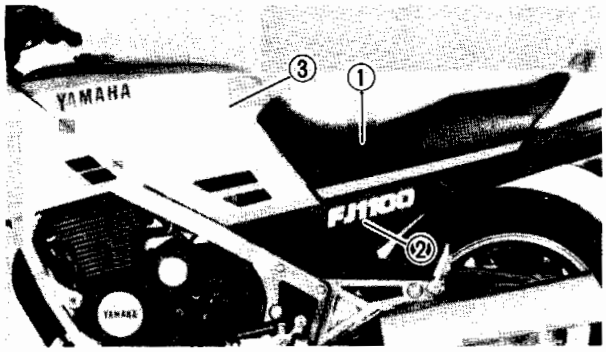


NOTE:

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

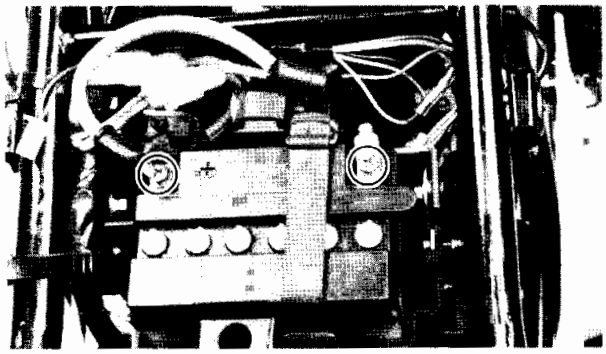


3. During the engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.



SEAT AND FUEL TANK

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



BATTERY

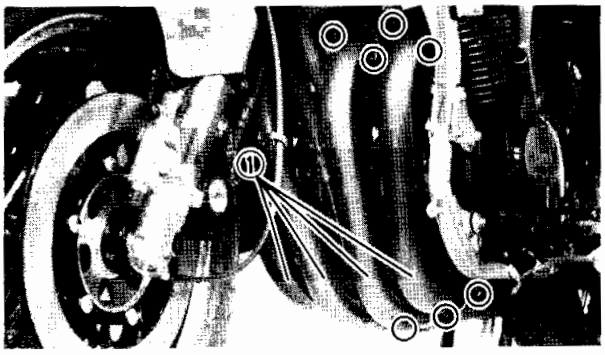
1. Disconnect:
   - Battery leads

NOTE:
Disconnect the negative lead first.

COWLING

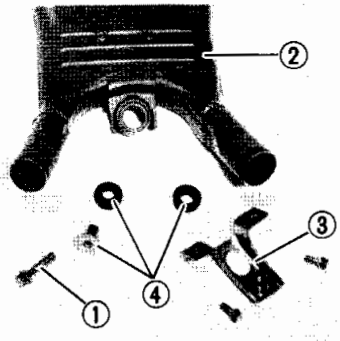
1. Remove:
   - Cowling (Lower)

   Refer to CHAPTER 2, "COWLING."

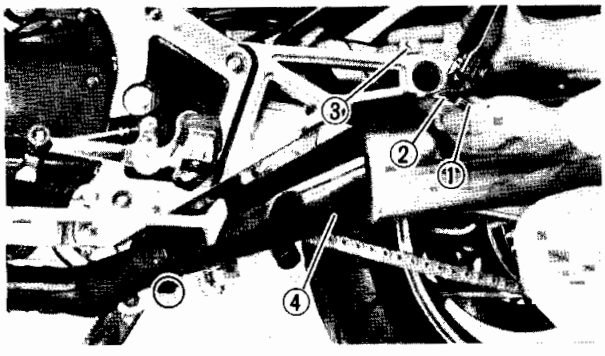


EXHAUST PIPE AND MUFFLER

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



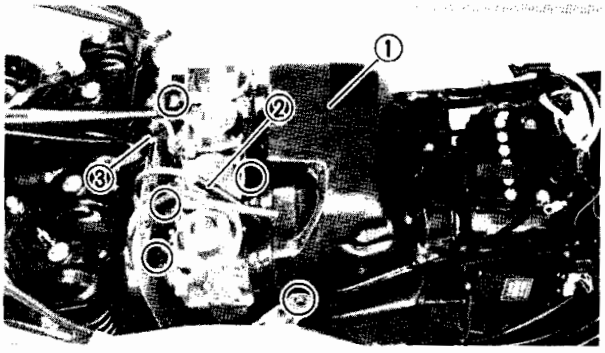
4. Loosen:
   - Clamp bolts
5. Remove:
   - Chamber mount bolt ①
   - Chamber assembly ②
   - Stay ③
   - Rubber dampers ④

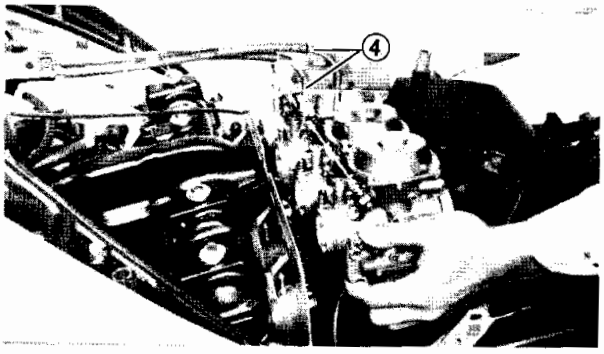


6. Remove:
   - Muffler mount bolts ①
   - Mufflers ④

NOTE:
Do not loose the washers ② and special nuts ③.

ENGINE REMOVAL

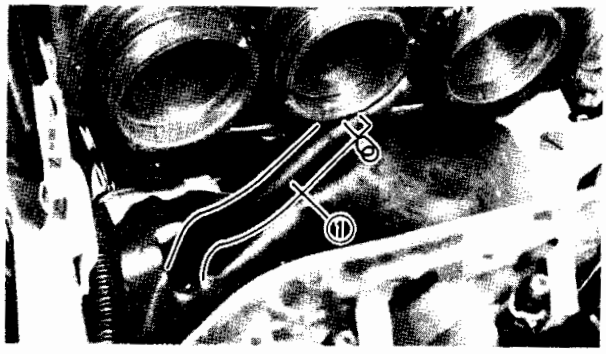




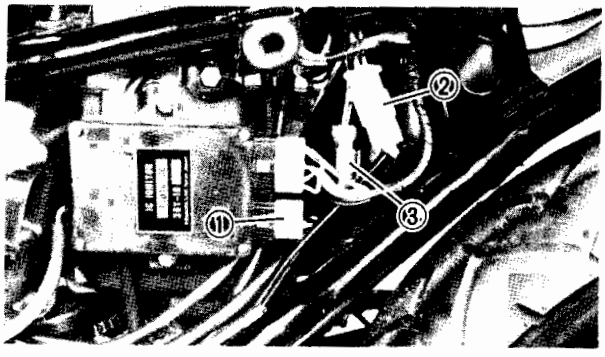
CARBURETOR

1. Loosen:
   - Clamp screws
2. Remove:
   - Air cleaner case ① mount bolts
3. Push the air cleaner case toward the rear to disconnect air outlet hoses from carburetors.
4. Disconnect:
   - Boost control hose ②
     (from No. 2 carburetor joint)
   - Choke cable ③
5. Remove:
   - Carburetors
6. Disconnect:
   - Throttle cables ④

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



7. Disconnect:
   - Crankcase ventilation hose ①
     (from crankcase)

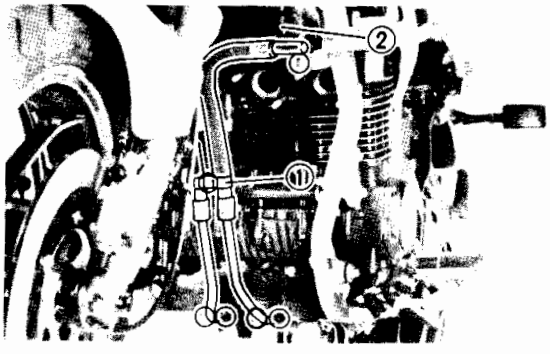


CONNECTOR

1. Disconnect:
   - Pickup coil lead ①
   - Generator lead ②
   - Neutral switch lead ③
   - Oil level switch lead ③
   - Starter motor lead
     (from starter motor)
   - Sidestand switch head

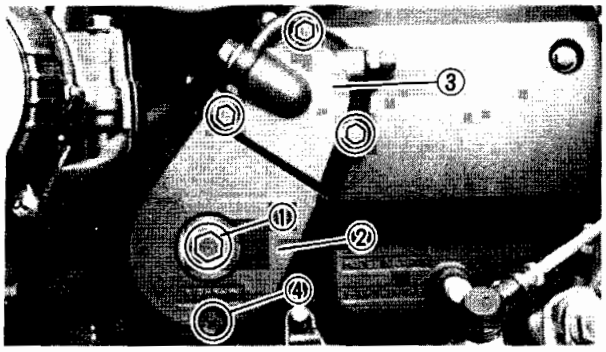
OIL COOLER ASSEMBLY

1. Remove:
   - Hose securing bolts
   - Clamp bolt
   - Half clamp ①



NOTE:
Do not loose the clamp collar

- Cooler securing bolts
- Oil cooler assembly ②
- Canisters **(For California only)**

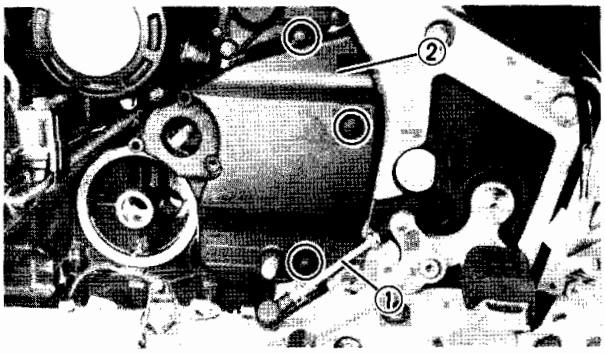


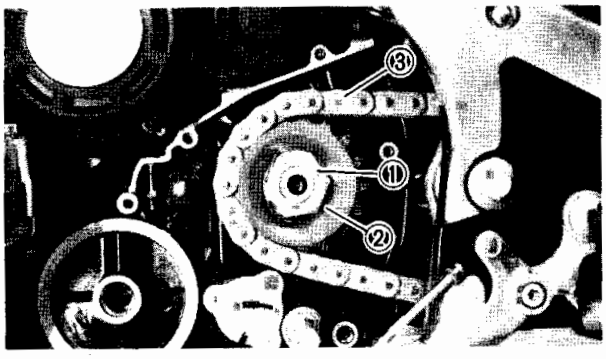
OIL FILTER AND CLUTCH RELEASE ASSEMBLY

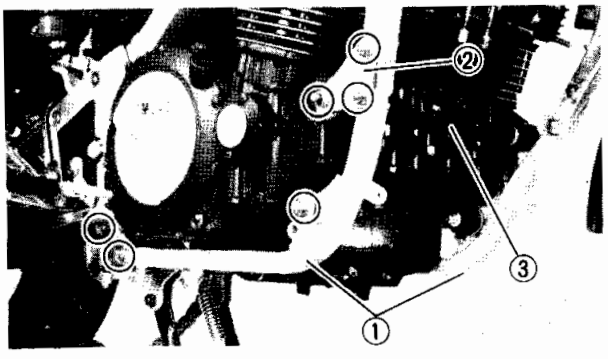
1. Drain:
   - Engine oil
     (from oil filter case)
2. Remove:
   - Oil filter securing bolt ①
   - Oil filter case assembly ②
   - Clutch release assembly ③

NOTE:
Do not depress the clutch lever when the clutch release off the motorcycle; the clutch release piston will come out.

④ Drain bolt







LEFT CRANKCASE COVER AND DRIVE CHAIN

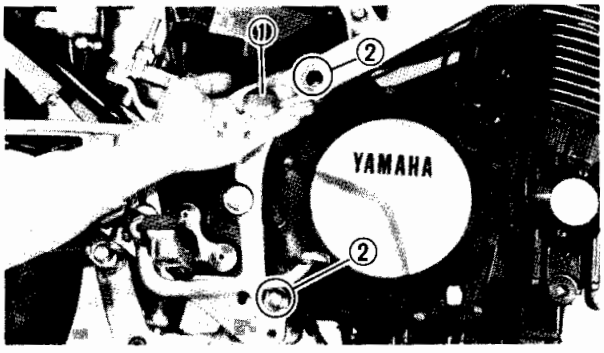
1. Remove:
   - Change pedal arm securing bolt
2. Disconnect:
   - Change pedal arm ①
3. Remove:
   - Crankcase cover (Left) ②
   - Gaskets
   - Dowel pins
4. Bend:
   - Lock washer tab
5. Remove:
   - Drive sprocket securing nut ①
   - Lock washer
   - Drive sprocket ② with drive chain ③

NOTE:
If difficult to remove the drive sprocket, loosen the axle nut and chain slack adjusting bolts, then push rear wheel toward the front.

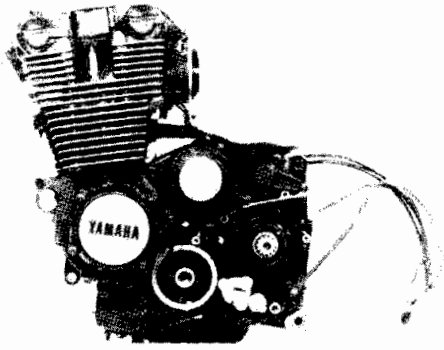
ENGINE REMOVAL

1. Remove:
   - Downtube frames ①
   - Mount stays ②
   - Collar ③

2. Place the engine on a block or other suitable stand under the engine.



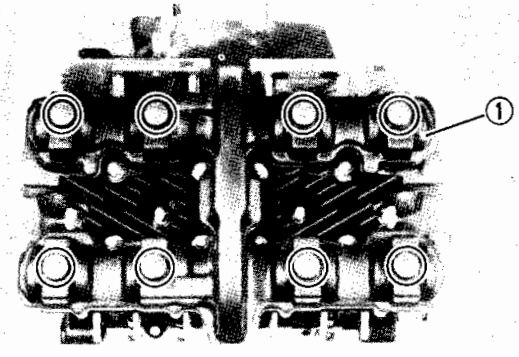
3. Remove:
   - Mounting bolt blind plugs ①
   - Mounting bolts (Engine rear) ②
   - Engine assembly
   - Engine mount collar



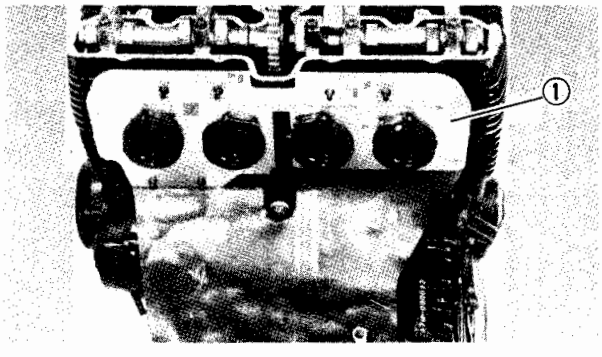
ENGINE DISASSEMBLY

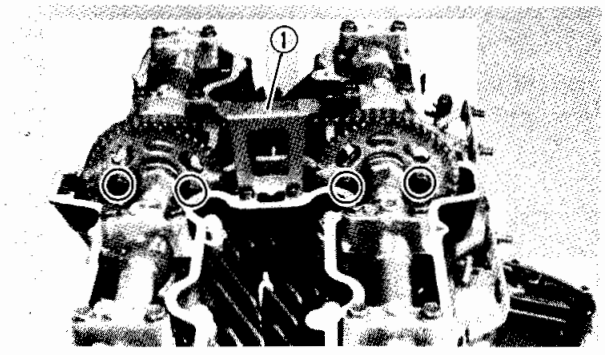
CYLINDER HEAD

1. Remove:
   - Cylinder head cover bolts
   - Cylinder head cover ①



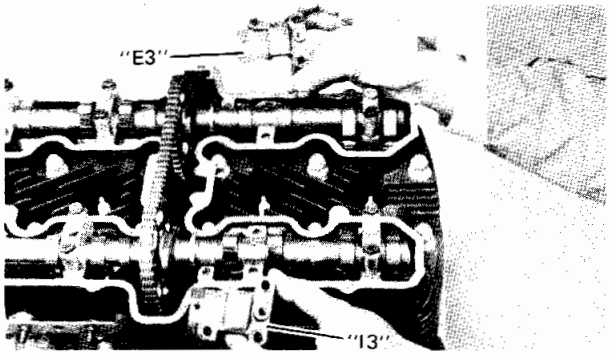
2. Remove:
   - Air baffle plate ①





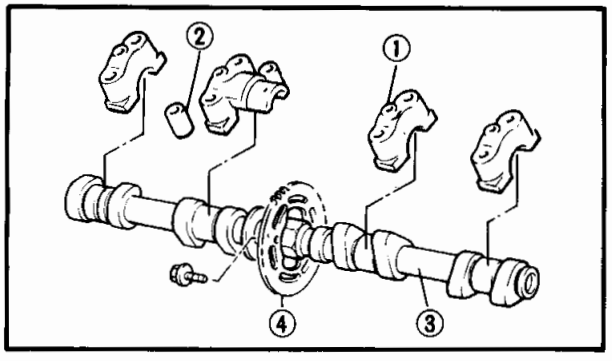
3. Loosen:
   - Cam chain sprocket bolts
   - Cam chain tensioner end plug

NOTE:
Do not remove the sprocket bolts and tensioner end plug at this time.

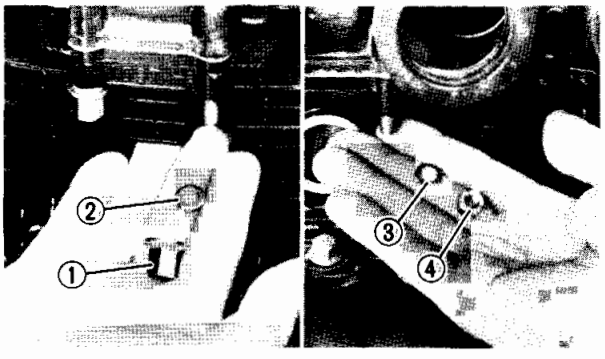


4. Remove:
   - Cam chain tensioner assembly
   - Gasket
   - Cam chain sprocket bolts
     Use 22 mm wrench to hold cam shaft
   - Cam chain guide (upper) ①
5. Remove:
   - Camshaft cap bolts

CAUTION:
Remove the "I3" and "E3" cam shaft caps first, before any one is loosened.

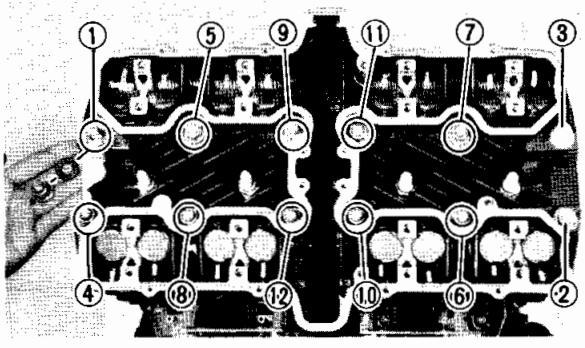


- Cam shaft caps ①
- Dowel pins ②
- Camshafts ③
- Cam chain sprockets ④
- Cam chain damper (Front)

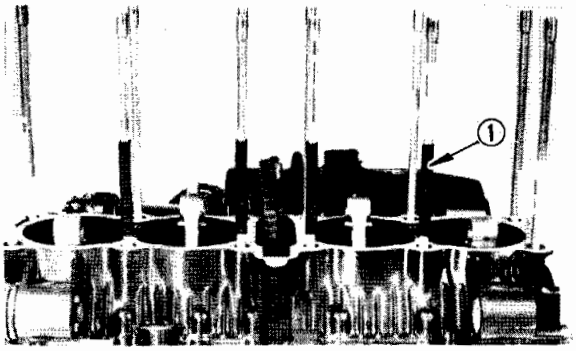


6. Remove:
   - Cylinder head nuts (Front) ①
   - Washers ②
   - Cylinder nut (Rear) ③
   - Washer ④
7. Remove:
   - Cylinder head nuts

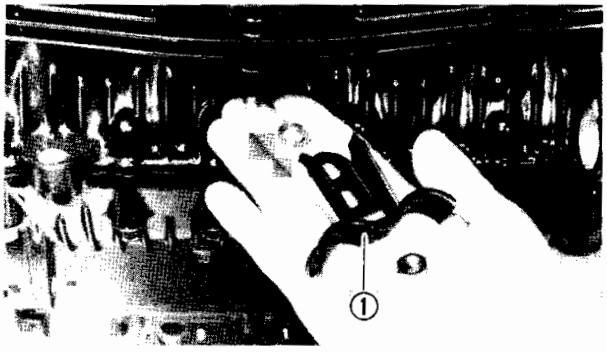
NOTE:
Follow numerical number shown in photo. Start by loosening each nut 1/2 turn until all are loose.



- Washers
- Cylinder head
- Cylinder head gasket
- Dowel pins
- O-rings

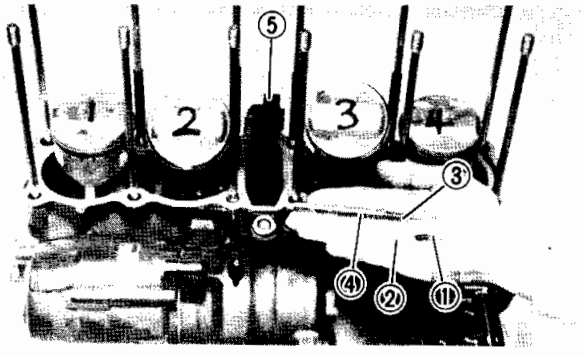


NOTE:
Do not remove the rubber sleeves ① from the four cylinder studs on the cylinder.



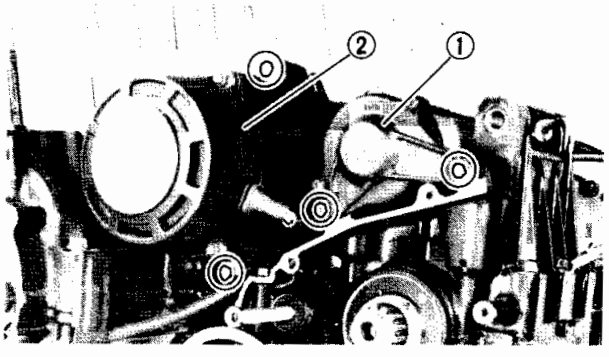
CYLINDER AND PISTON

1. Remove:
   - Oil hose half clamp ①
   - Cylinder
   - Dowel pins
2. Remove:
   - Cam-chain-damper-push-rod bolt ①
   - Washer ②
   - Spring ③
   - Push rod ④
   - Cam chain guide (Rear) ⑤
3. Mark each piston so it can be reinstalled in the appropriate cylinder.
4. Remove:
   - Piston pin clips



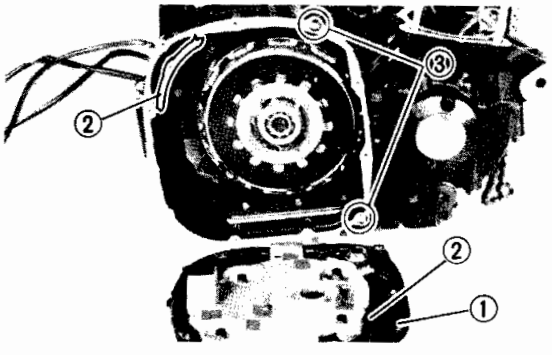
NOTE:
Before removing the piston pin clip, cover the crankcase with a clean rag so you will not accidentally drop the clip into the crankcase.

- Piston pins



STARTER MOTOR AND GENERATOR

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

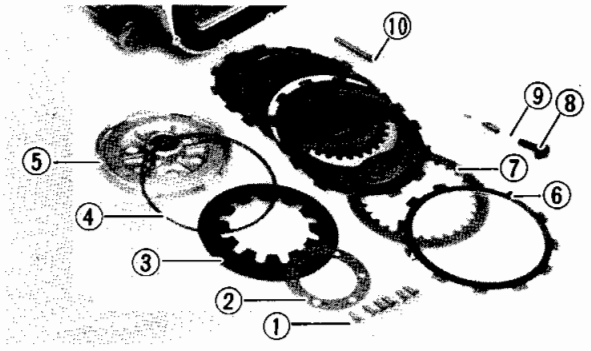


CLUTCH AND OIL PUMP

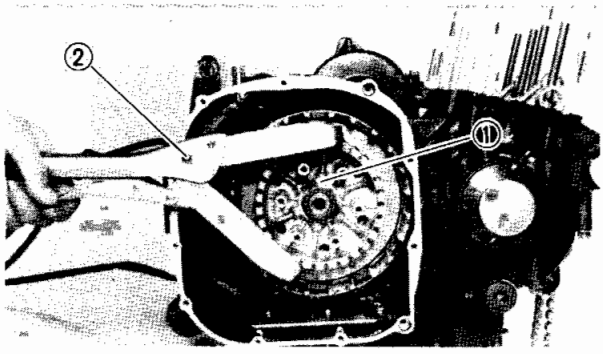
1. Remove:
   - Crankcase cover (Right) ①

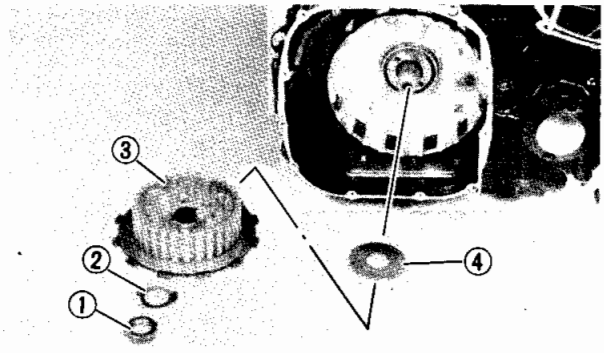
NOTE:
If the upper crankcase and/or crankcase cover have to be replaced, remove the rubber seals; otherwise, the removal of the rubber seal is unnecessary. When installing them apply the Quick Gasket® (Sealant) to the rubber seals ②.

- Gasket
- Dowel pins ③

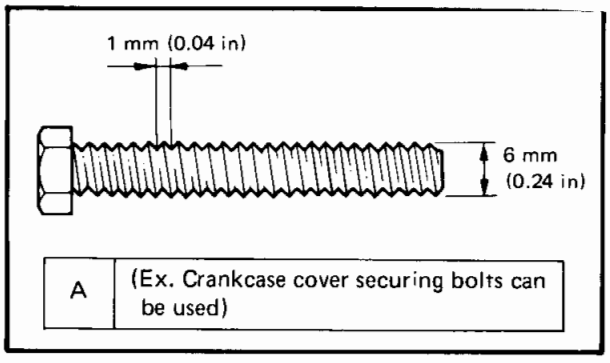


2. Remove:
   - Clutch spring bolts ①
   - Plate washer ②
   - Diaphragm spring ③
   - Spring seat ④
   - Pressure plate ⑤
   - Friction plates ⑥
   - Clutch plates ⑦
   - Push rod No. 1 ⑧
   - Ball ⑨
   - Push rod No. 2 ⑩
3. Bend:
   - Lock washer tab ①
4. Attach:
   - Universal Clutch Holder (YM-91042) ②

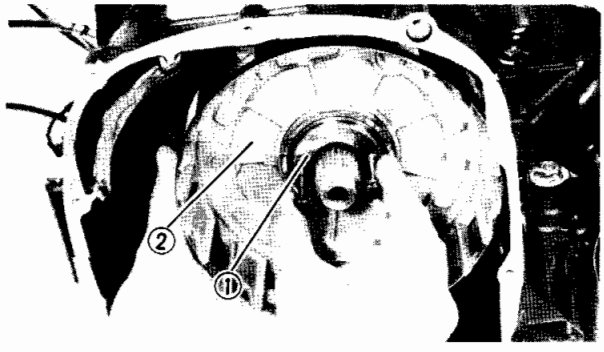




5. Remove:
   - Clutch boss nut ①
   - Lock washer ②
   - Clutch boss ③
   - Thrust washer ④



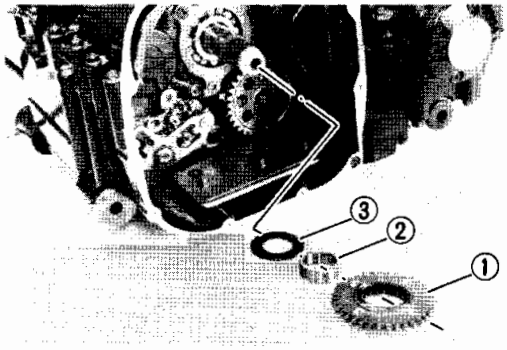
6. Install:
   - Specified size of bolts (into clutch housing collar holes)



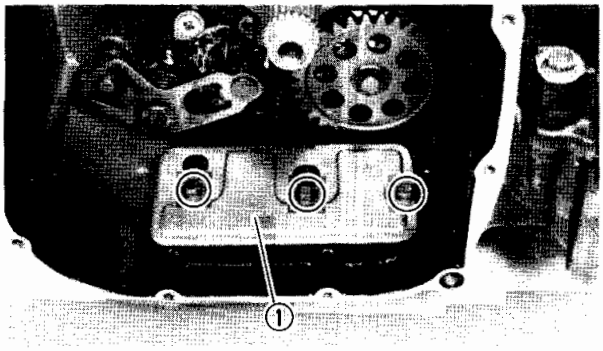
7. Pull out the bolts to remove clutch housing collar ① while holding clutch housing ② with your left hand.

CAUTION:

If the clutch housing is not held during collar removal, the bearing in the clutch housing will be damaged.

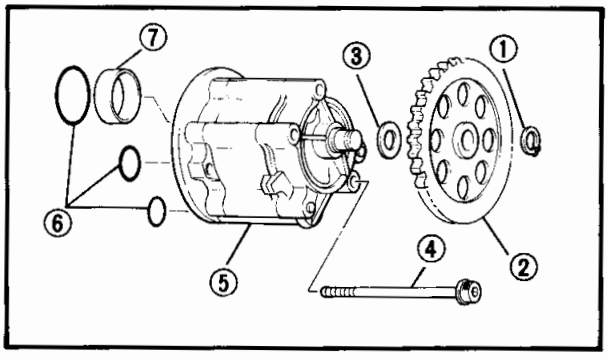


8. Remove:
   - Drive gear (Oil pump) ①
   - Collar ②
   - Thrust washer ③

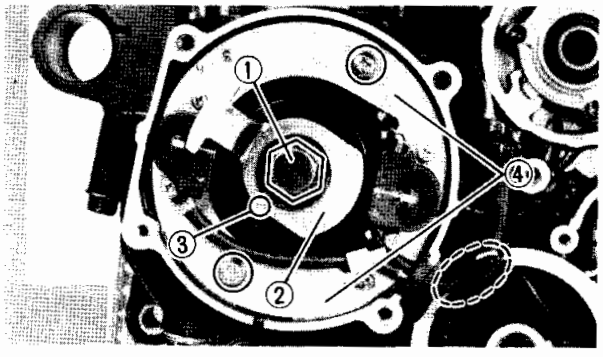


9. Remove:
   - Oil baffle plate ①

NOTE:
If the crankcase and or oil baffle plate haue to be replaced, remove the oil baffle plate; otherwise, the removal of the oil baffle plate is unnecessary.

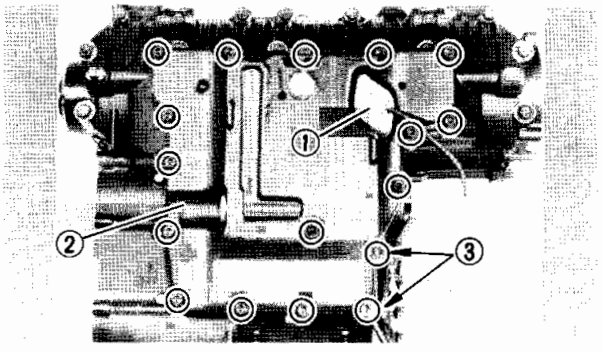


10. Remove:
    - Circlip ①
    - Driven gear ②
    - Washer ③
    - Bolts ④
    - Oil pump assembly ⑤
    - O-rings ⑥
    - Dowel pin ⑦



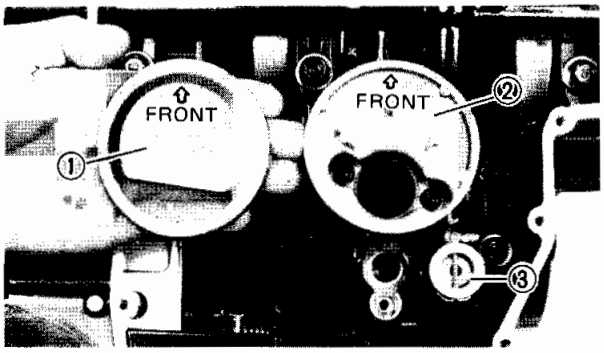
PICKUP COIL BASE AND CRANKSHAFT END COVER

1. Remove:
   - Cover (Left)
   - Bolt ①
   - Timing plate ②
   - Dowel pin ③
   - Screws
   - Pickup coil base ④
   - Cover (Right)

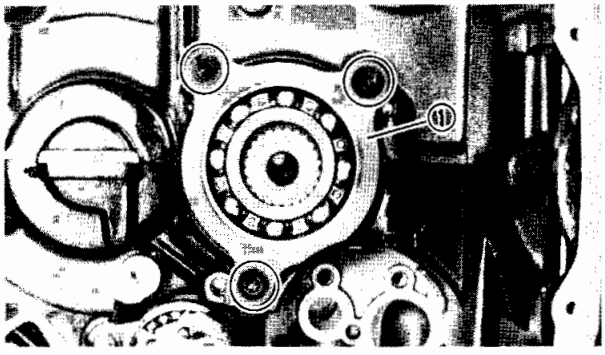


OIL PAN

1. Remove:
   - Oil level switch ①
   - Bolts
   - Oil pan ②
   - Clamps ③
   - Gasket
   - Dowel pins
   - Relief valve

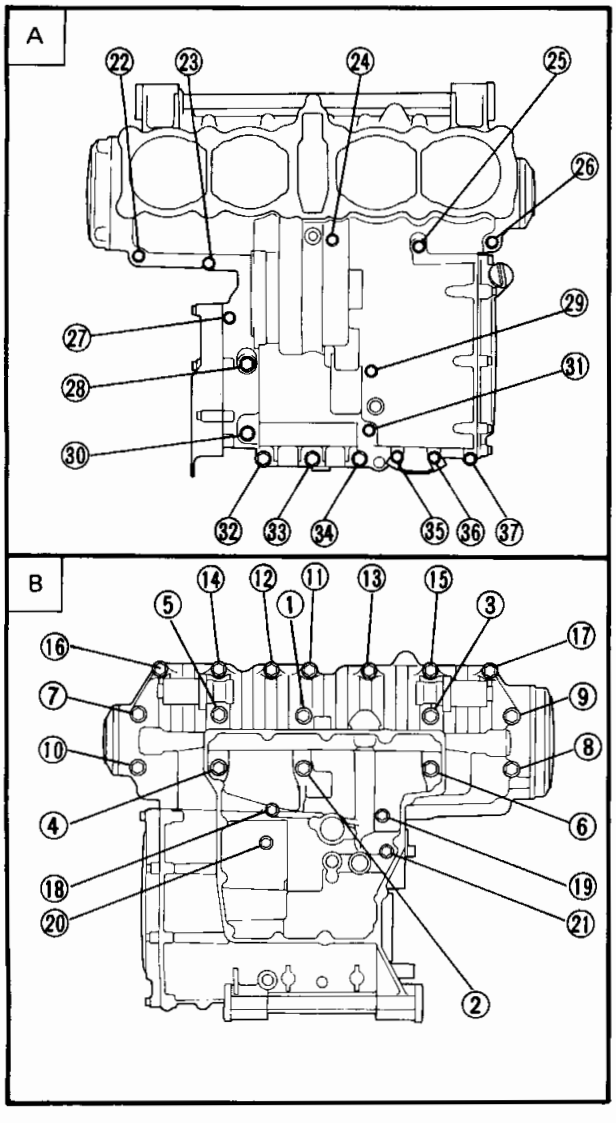


2. Remove:
   - Oil strainer element ①
   - Bolts
   - Housing ②
   - Gasket
   - Relief valve ③



CRANKCASE (Upper and lower)

1. Remove:
   - Bearing retainer (Main axle) ①
     Use Torx Driver #30 (YU-20943-6)



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

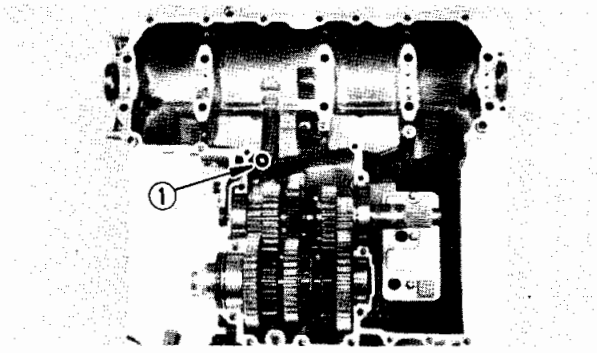
NOTE:
- Remove the bolts starting with the highest numberd one.
- The embossed numbers in the crankcase designate the crankcase tightening sequence.

3. Remove:
   - Upper crankcase

NOTE:
Pull out the upper crankcase while pulling up the cam chain.

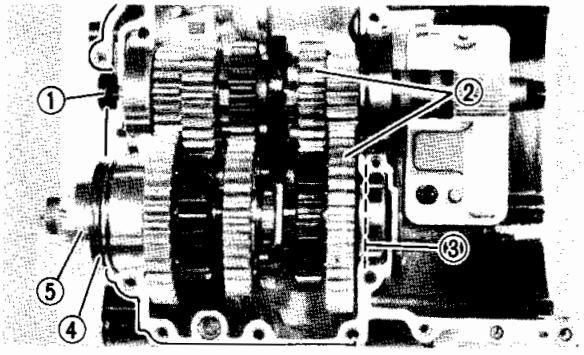
   - Blind plug
     (from crankcase right end)
   - Dowel pins

[A] Upper crankcase
[B] Lower crankcase



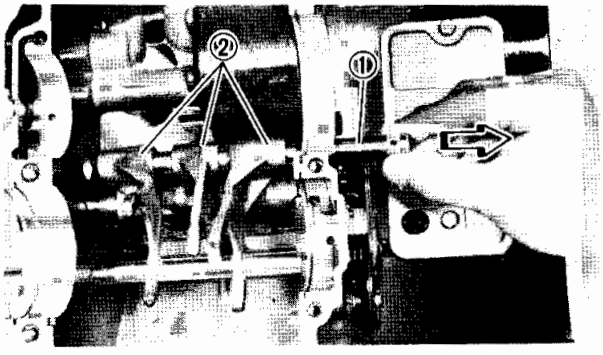
4. Remove:
   - O-ring (Orange color) ①
   - Crankshaft bearings

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



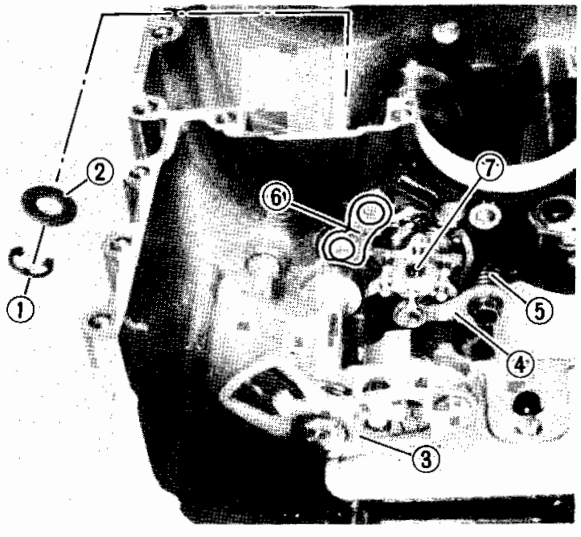
TRANSMISSION

1. Remove:
   - Oil seal (For clutch push rod No. 2) ①
   - Sub assemblies ②
   - Half clip ③
   - Oil seal ④
   - Collar ⑤

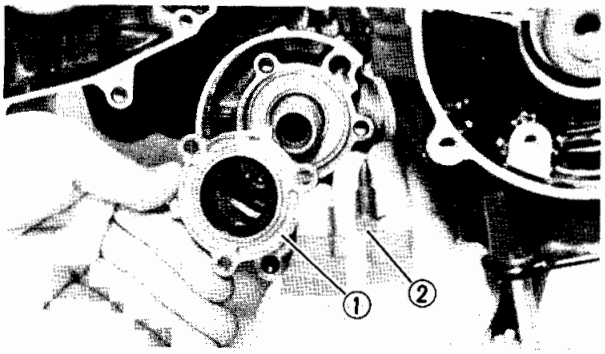


SHIFT FORK AND SHIFT CAM

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

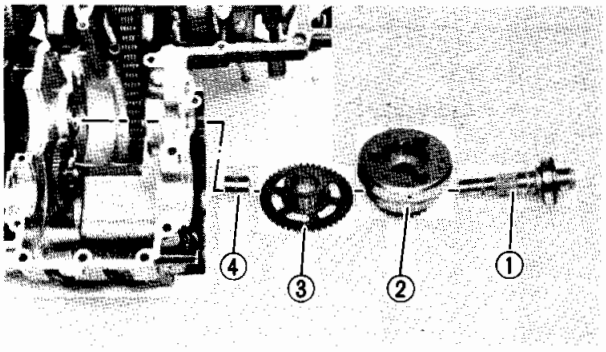


2. Remove:
   - Circlip ①
   - Washer ②
   - Change shaft ③
   - Shift cam stopper lever ④
   - Stopper lever spring ⑤
   - Screws
   - Bearing retainer ⑥
   - Shift cam ⑦



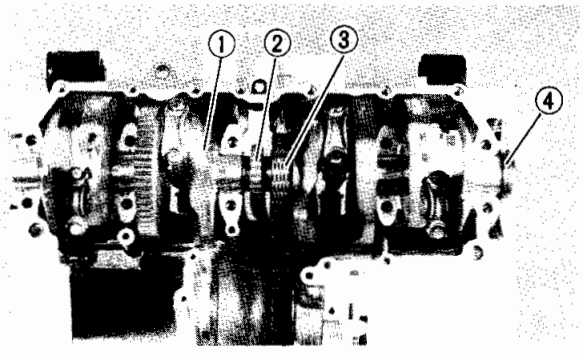
STARTER IDLE GEARS AND CRANKSHAFT

1. Remove:
   - Housing ① (For generator drive shaft bearing)
   - Oil jet nozzle ②

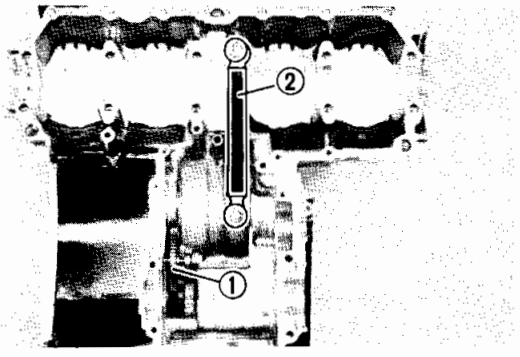


2. Remove:
   - Generator drive shaft ①
   - Starter clutch assembly ②
   - Idle gear No. 2 ③
   - Collar ④

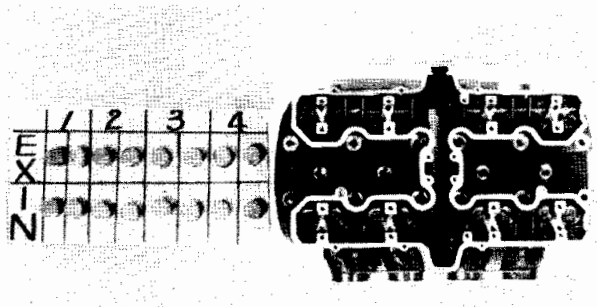
NOTE:
Pull out the generator drive shaft ① while holding starter clutch assembly ② with your left hand.



3. Remove:
   - Crankshaft ①
   - Cam chain ②
   - Starter drive chain ③
   - Oil seal ④
     (from crankshaft left end)



4. Remove:
   - Shaft retainer
   - Shaft
   - Idle gear No. 1 ①
   - Damper ② (For starter drive chain)

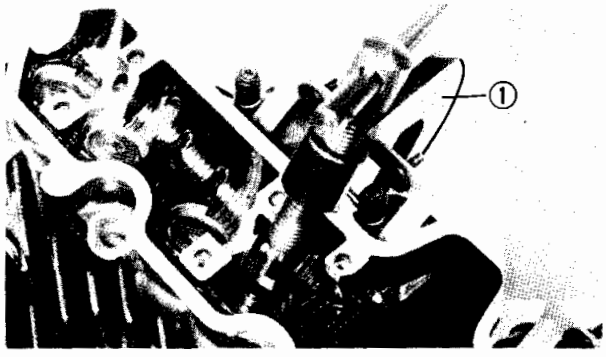


INSPECTION AND REPAIR

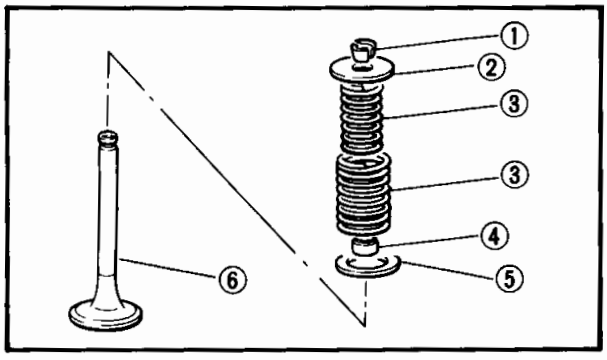
CYLINDER HEAD

1. Remove:
   - Valve pads
   - Lifters
   - Spark plugs

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

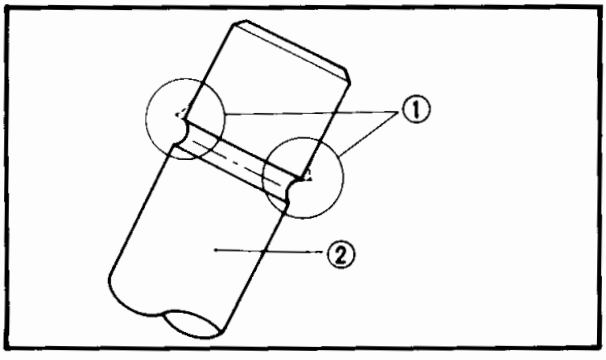


2. Attach:
   - Valve Spring Compressor (YM-04019) ①



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

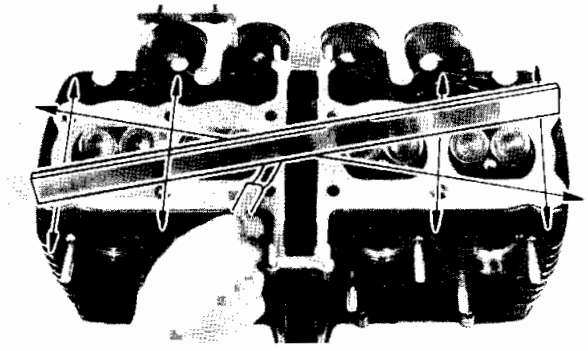
NOTE:
Deburr any deformed valve stem end. Use an oil stone to smooth the stem end.



① Deburr
② Valve stem

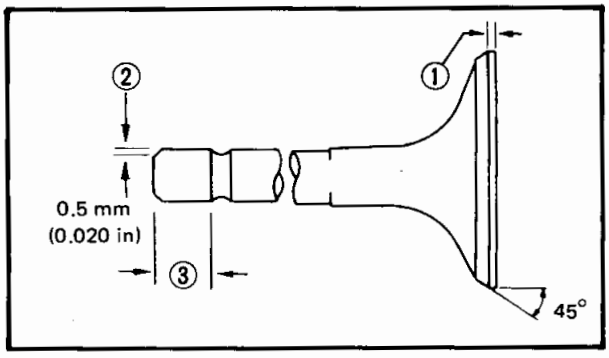
4. Eliminate:
   - Carbon deposit
     Use rouded scraper.

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



5. Measure:
   - Cylinder head warpage
     Out of specification → Resurface/Replace.

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

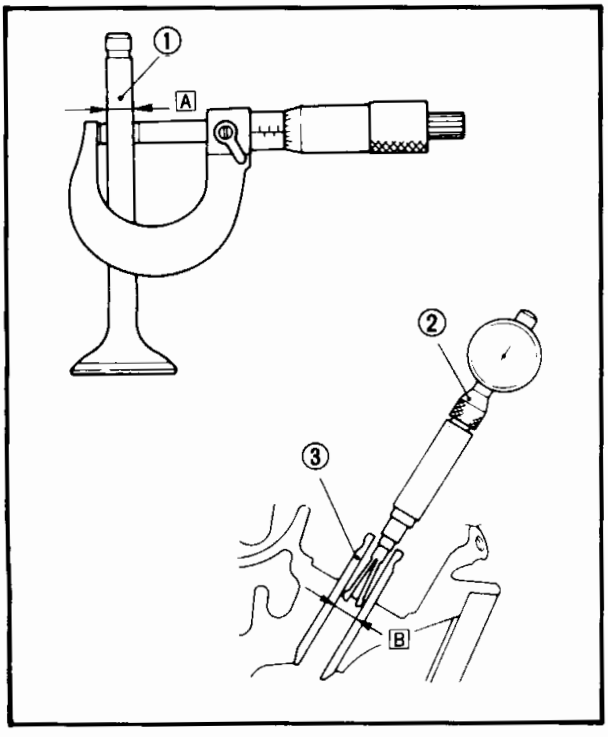


VALVE, VALVE GUIDE, AND VALVE SEAT

Intake and Exhaust Valve

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

Minimum Thickness (Service limit) ①:
0.5 mm (0.020 in)
Beveled ②: 0.5 mm (0.020 in)
Minimum Length (Service limit) ③.
4.0 mm (0.157 in)

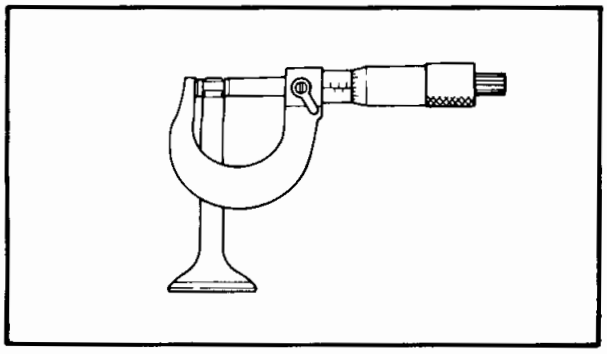


2. Measure:
   - Valve stem clearance
     Use Micrometer and bore gauge.
     Out of specification → Replace either valve and/or guide.

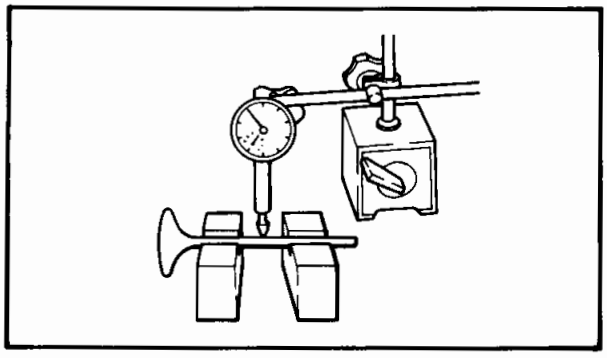
Valve Stem Clearance = B − A

Valve Stem. Clearance		Maximum
Intake	0.010 ~ 0.037 mm (0.004 ~ 0.0015 in)	0.08 mm (0.0031 in)
Exhaust	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	0.10 mm (0.0039 in)

① Valve
② Bore gauge
③ Valve guide
A Valve stem outside diameter
B Valve guide inside diameter



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



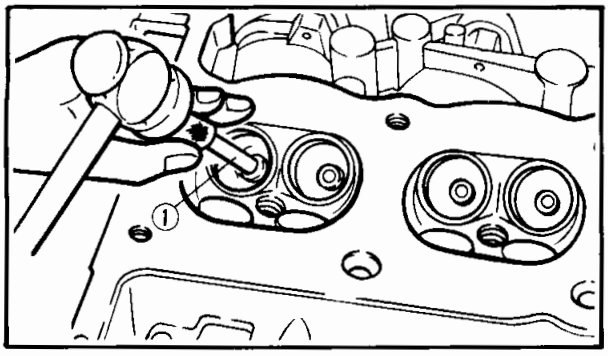
4. Measure:
   - Valve stem runout
     Out of specification → Replace.

Maximum Runout:
0.01 mm (0.0004 in)

Valve Guide

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

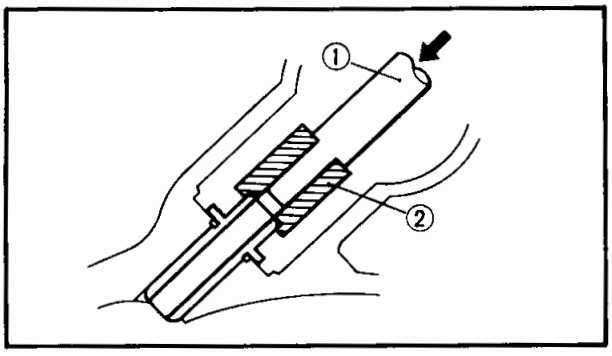
1. Inspect:
   - Valve guides
     Wear/Oil leakage into cylinder → Replace.



Valve Guide Removal

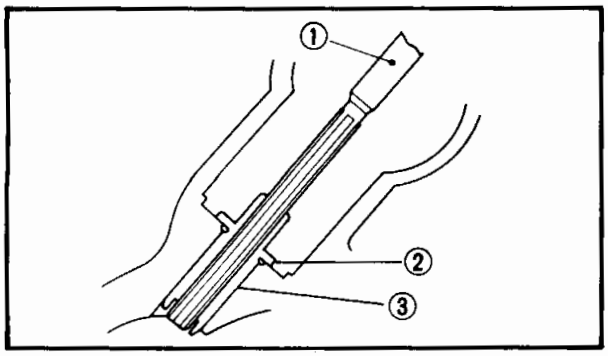
NOTE:
Heat the head in an oven to 100°C (212°F) to ease guide removal and installation .and to maintain correct interference fit.

1. Remove:
   - Valve guide
     Use the Valve Guide Remover (YM-01122) ①.



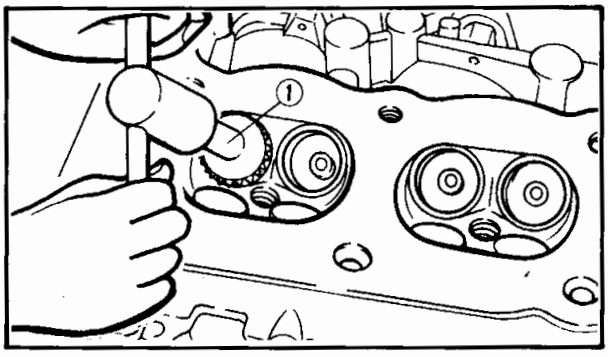
Valve Guide Installation

1. Install:
   - Circlip (New)
   - Valve guide (Oversize)
     Use the Valve Guide Remover (YM-01122) ① with the Valve Guide Installer (YM-01129) ②.



NOTE:
After installing valve guide:
- Use the 5.5 mm Valve Guide Reamer (YM-01196) ① to obtain proper valve guide/valve stem clearance.
- Recut the valve seat.

② Circlip
③ Valve guide

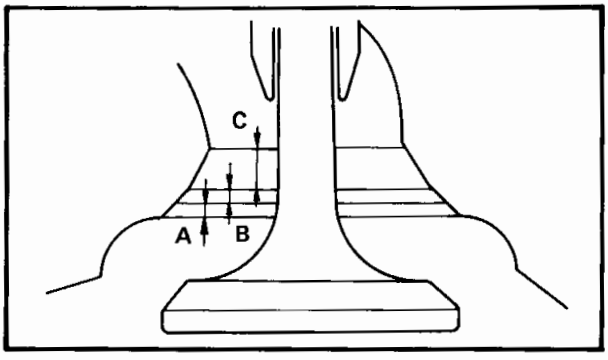


Valve Seat

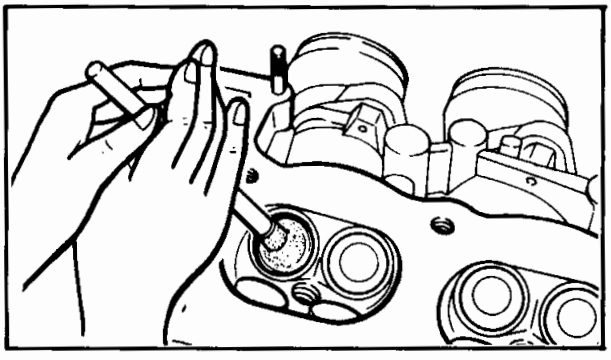
1. Inspect:
   - Valve seats
     Wear/Pitting/Valve replacement → Resurface seat at 45° angle.

CAUTION:

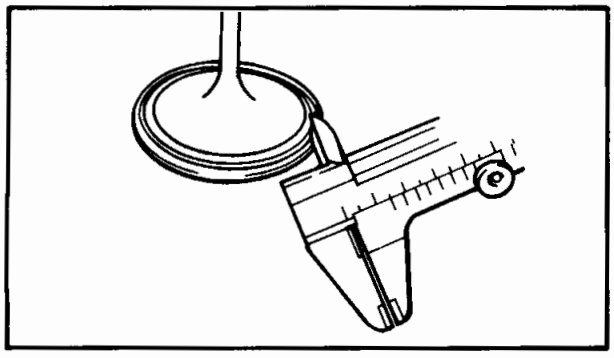
Clean valve seat if pitted or worn using the 45° Valve Seat Cutter (YM-91043) ① . When twisting cutter, keep an even downward pressure to prevent chatter marks.

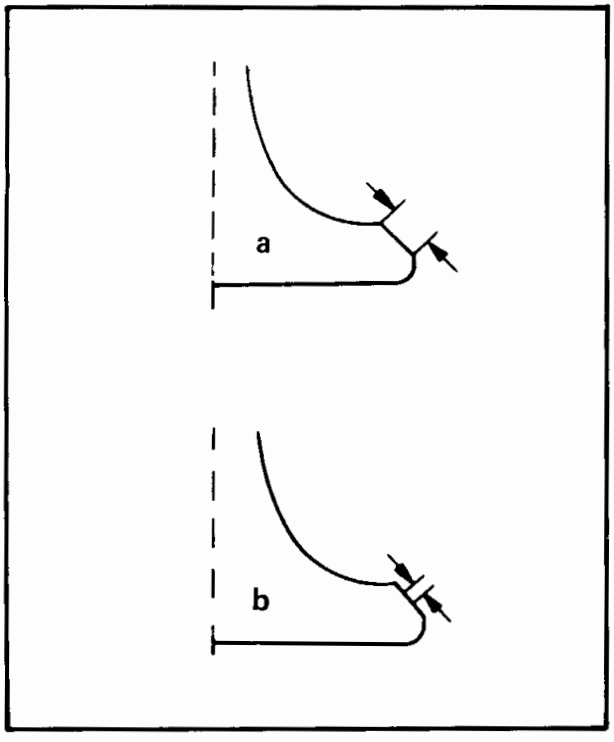


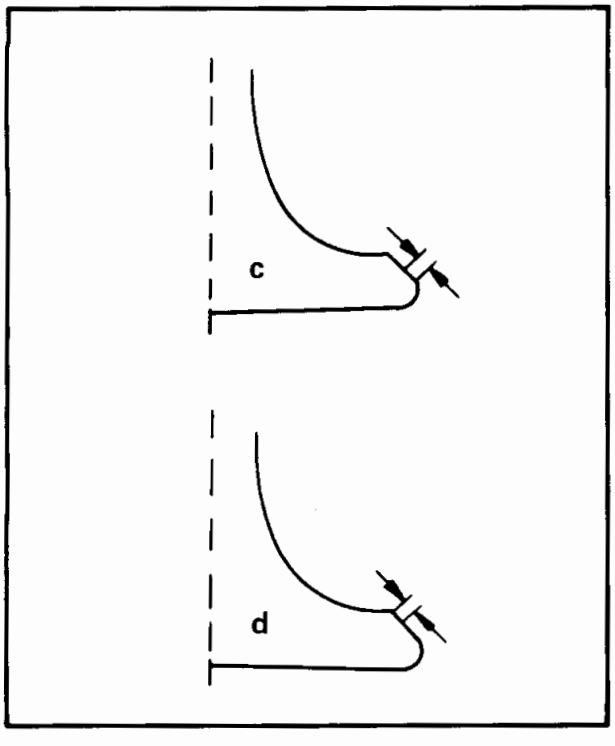
Cut sections as follows	
Section	Cutter
A	30°
B	45°
C	60°



2. Measure:
   - Valve seat width
3. Apply:
   - Mechanics bluing dye (Dykem)
     (to valve and seat)
   - Fine grinding compound (Small amount)
     (ground surface of valve face)
4. Position:
   - Valves
     (into cylinder head)
     Spin it rapidly back and forth, then lift the valve and clean off all grinding compound.







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

CAUTION:

Remove just enough material to achieve satisfactory seat.

Seat Width:
Std: 1.0 ± 0.1 mm
(0.039 ± 0.039 in)
Wear limit: 1.4 mm (0.055 in)

Valve seat recutting steps are necessary if:

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

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

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

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

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

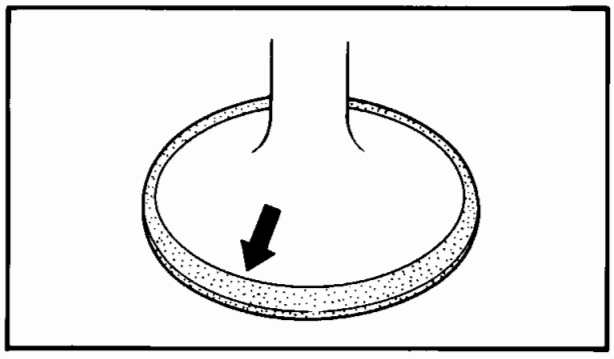
Valve Seat Cutter Set		Desired Result
Use	45° cutter	To achieve a uniform valve seat width of 1.0 mm (0.039 in)

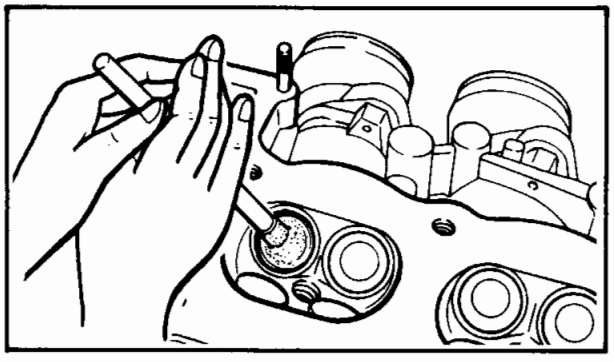
- Valve seat is too narrow and right up near valve margin (see "c" diagram).

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

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

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





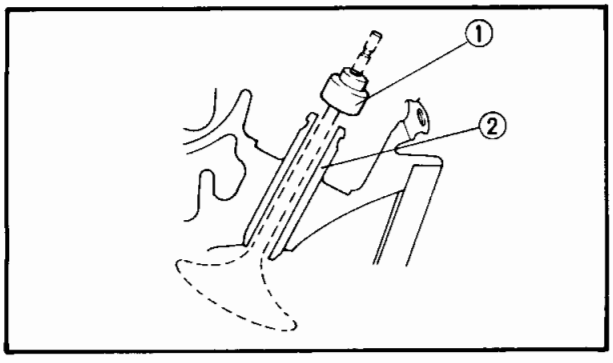
Valve/Valve Seat Assembly Lapping

1. Apply:
   - Coarse lapping compound (small amount)
     (to valve face)
   - Molybdenum disulfide oil
     (to valve stem)
2. Position:
   - Valves
     (in cylinder head)
3. Rotate:
   - Valve
     Turn until valve and valve seat are evenly polished, then clean off all compound.
4. Apply:
   - Fine lapping compound (small amount)
     (to valve face)
5. Repeat steps 2 and 3.

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

6. Inspect:
   - Valve face
     Not yet uniformly smooth → Repeat procedure from step 1.
7. Apply:
   - Mechanics bluing dye (Dykem)
     (to valve face and seat)
8. Rotate:
   - Valve
9. Inspect:
   - Valve face
     Valve must make full seat contact indicated by grey surface all around. The valve face where bluing was removed.
     Faulty contact → Replace.
     (See procedure below)
10. Apply:
    - Solvent
      (into each intake and exhaust port)

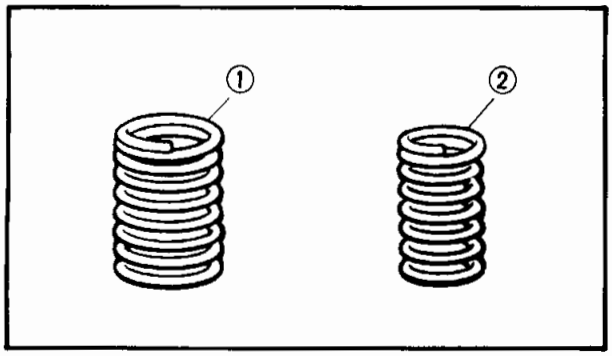
NOTE:
Pour solvent into intake and exhaust ports only after completion of all valve work and assembly of all head parts.



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

② Valve guide

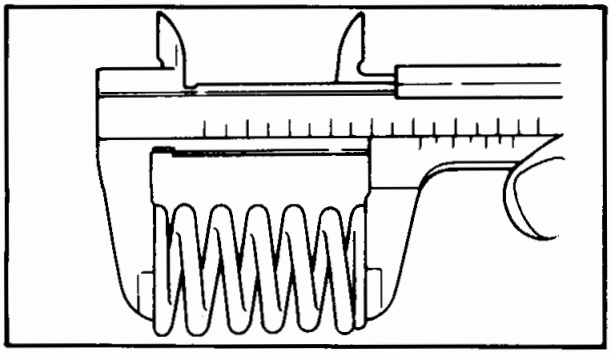
Relapping steps:
- Disassemble head parts.
- Repeat lapping steps using fine lapping compound.
- Clean all parts thoroughly.
- Reassemble and check for leakage again using solvent.
- Repeat steps as often as necessary to effect a satisfactory seal.



Valve Spring

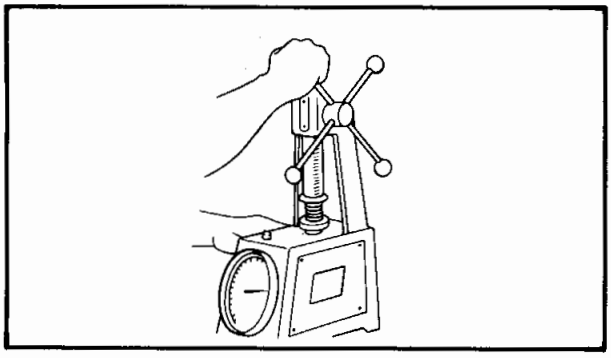
This engine uses two springs of different sizes to prevent valve float or surging. Valve spring specifications show the basic value characteristics.

① Outer spring
② Inner spring



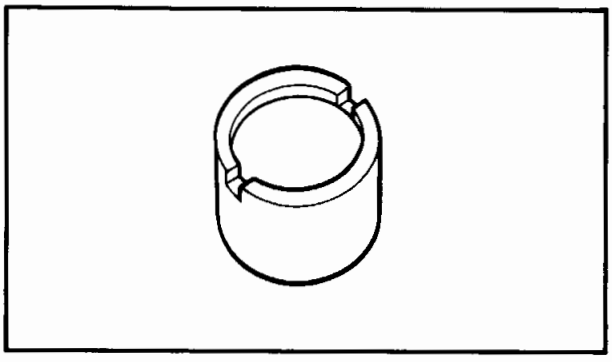
1. Measure:
   - Spring free length
     Out of specification → Replace.

Minimum Free Length:
Outer: 39.00 mm (1.53 in)
Inner: 37.65 mm (1.48 in)



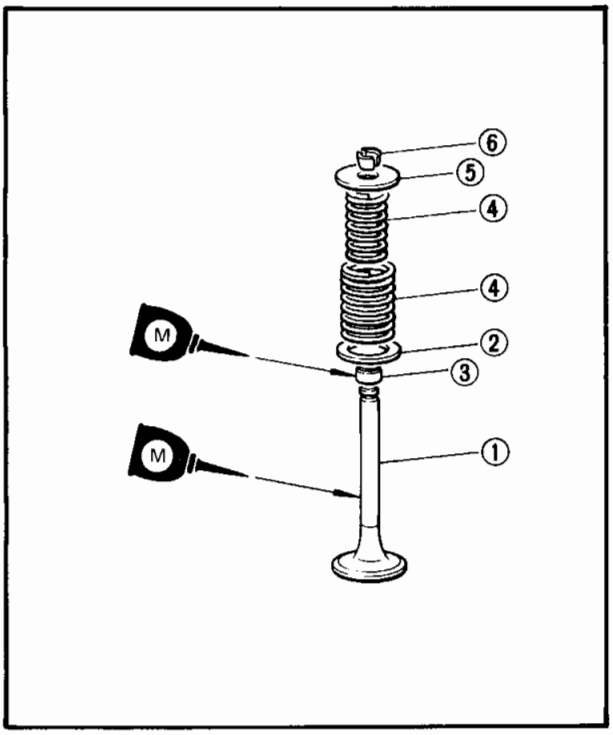
2. Measure:
   - Spring force (Installed length)
     Out of specification → Replace.

Valve Compressed Foce:
Outer: 13.30 ~ 15.70 kg (29.33 ~ 34.62 lb) at 34.8 mm (1.37 in)
Inner: 6.29 ~ 7.39 kg (13.87 ~ 16.29 lb) at 32.8 mm (1.29 in)



Valve Lifter

1. Inspect:
   - Valve lifter wall
     Scratches/Damage → Replace both lifter and cylinder head.

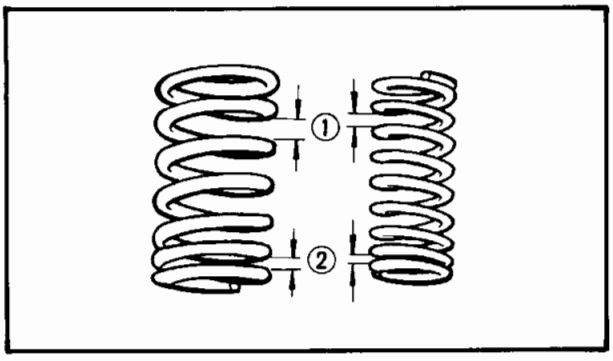


Valve Installation

1. Lubricate
   - Valve stem
   - Oil seal

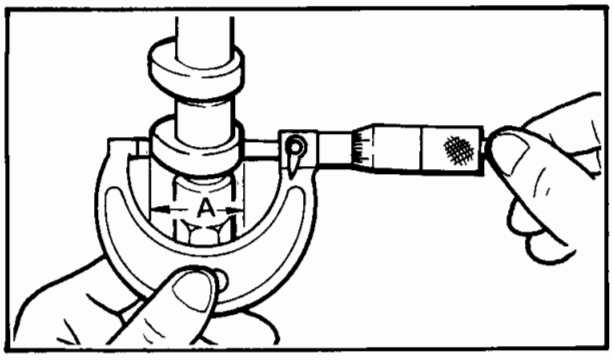
High-Quality Molybdenum Disulfide Motor Oil or Molybdenum Disulfide Grease.

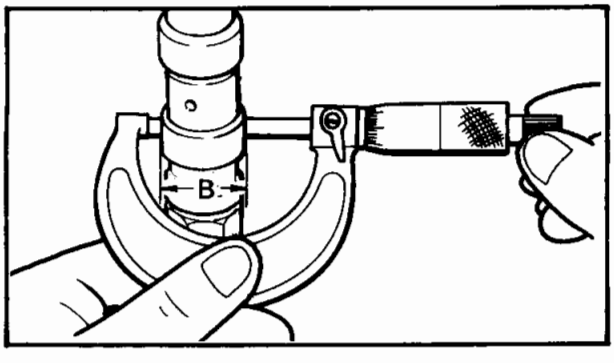
2. Install:
   - Valve ①
   - Valve spring seat ②
   - Oil seal ③
   - Valve springs ④
   - Valve spring seat ⑤
   - Valve retainers ⑥



NOTE:
Install springs with wider-gapped coils facing upwards, as shown.

① Larger pitch
② Smaller pitch

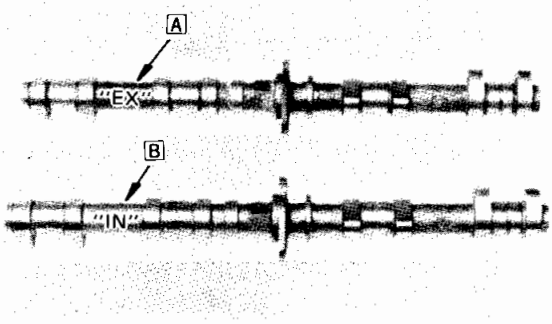


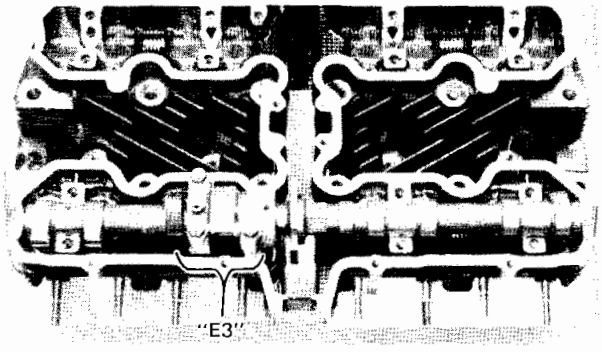


CAMSHAFT, CAM CHAIN, AND CAM SPROCKET

1. Inspect:
   - Cam lobes
     Pitting/Scratches/Blue discoloration → Replace.
2. Measure:
   - Cam lobes
     Use Micrometer
     Out of specification → Replace.

	Cam Lobe "A"	Cam Lobe "B"
Intake	35.85 mm (1.41 in)	28.15 mm (1.10 in)
Exhaust	35.85 mm (1.41 in)	28.15 mm (1.10 in)





Camshaft/Cap Clearance Measurement

1. Install:
   - Camshaft
2. Attach:
   - Plastigage® (YU-33210) (onto camshaft)

A For Exhaust
B For Intake

3. Attach:
   - Camshaft cap ("I" 3 or "E 3")
4. Install:
   - Camshaft caps (others)
5. Tighten:

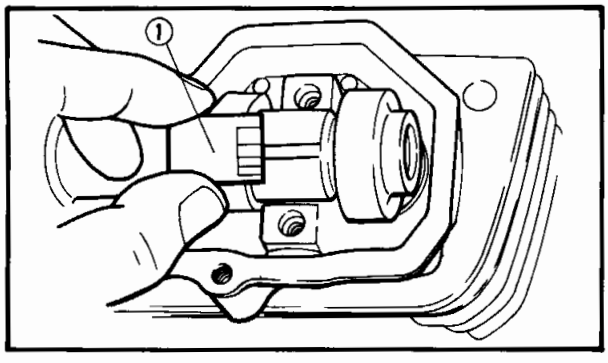
CAUTION:

First Tighten the Nos, ② , ④ , and ① cap bolts in that order, then the No. 3 cap bolts; otherwise, the No. 3 caps may be damaged or belt.

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

NOTE:

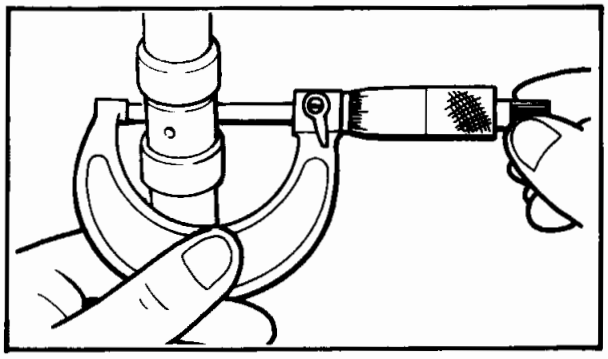
Do not turn the camshaft when measuring clearance with Plastigage.



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

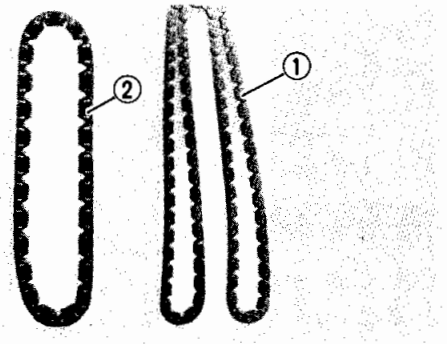
   Out of specification → Follow step 8.

Camshaft-to-cap Clearance:
Standard: 0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)
Maximum: 0.160 mm (0.006 in)



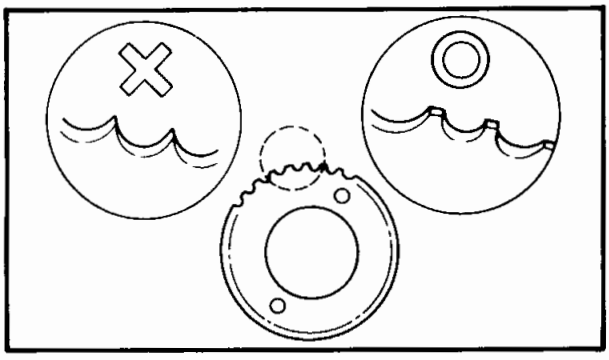
7. Measure:
   - Camshaft bearing surface diameter
     Use a micrometer.
     Out of specification → Replace camshaft.
     Within specification → Replace cylinder head.

Camshaft Bearing Surface Diameter:
Standard: 24.967 ~ 24.980 mm (0.9830 ~ 0.9835 in)
Cam Cap Inside Diameter:
Standard: 25.00 ~ 25.02 mm (0.9843 ~ 0.9851 in)



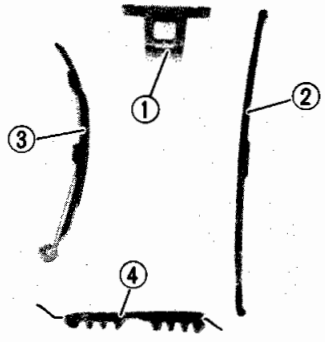
Cam Chain And Drive Chain

1. Inspect:
   - Cam chain ①
     Chain stretch/Cracks → Replace.
   - Drive chain ②
     Chain stretch/clacks → Replace



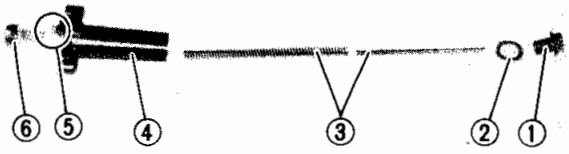
Cam Sprockets

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



Chain Dampers

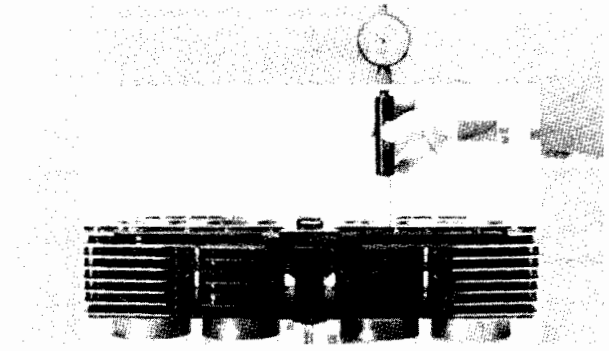
1. Inspect:
   - Upper damper ①
   - Front damper ②
   - Rear damper ③
     Wear → Replace.
   - Drive chain damper ④

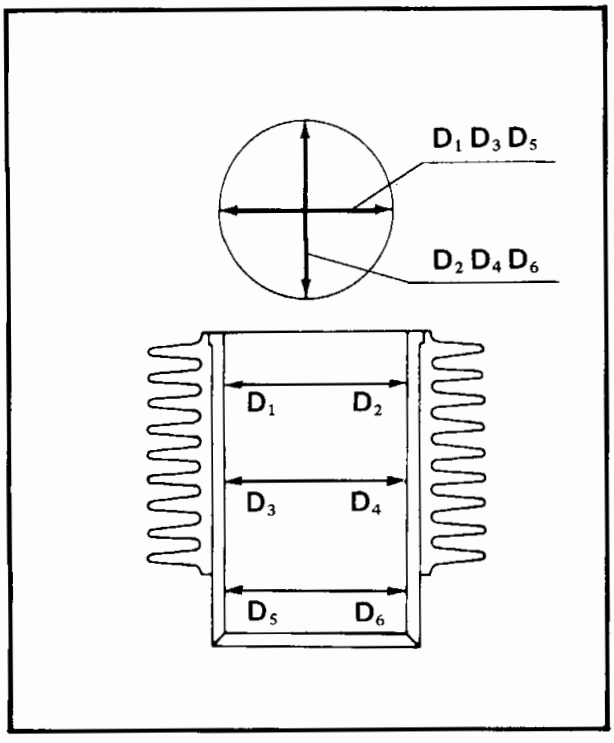


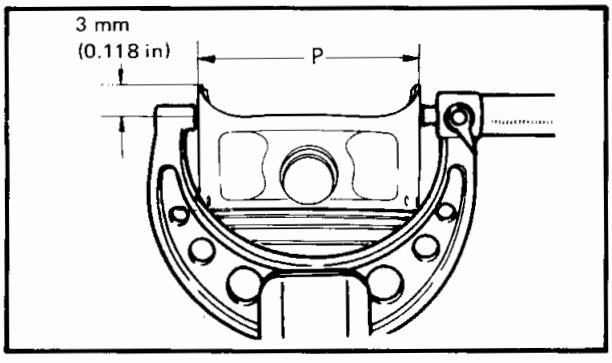
Cam Chain Tensioner

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

① End plug
② Washer
③ Spring
④ Tensioner body
⑤ One way cam
⑥ Tensioner rod







CYLINDER

1. Inspect:
   - Cylinder wall
     Wear/Scratches → Rebore or replace.
2. Measure:
   - Cylinder bore "C"
     Use Cylinder Bore Gauge
     Out of specification → Rebore.

	Standard	Wear limit
Cylinder Bore C:	73.97 ~ 74.03 mm (2.912 ~ 2.915 in)	74.1 mm (2.917 in)
Cylinder Taper T:	—	0.05 mm (0.002 in)

C = Maximum D
T = Maximum (D_1 or D_2)
— Minimum (D_5 or D_6)

PISTON, PISTON RING, AND PISTON PIN

Piston

1. Inspect:
   - Piston wall
     Wear/Scratches/Damage → Replace.
2. Measure:
   - Piston outside diameter "P"
     Use a micrometer.
     Out of specification → Replace.

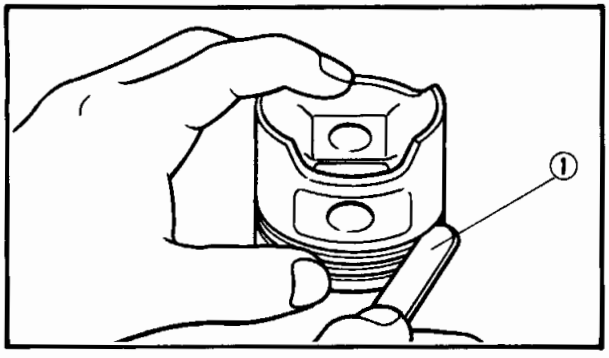
NOTE:
Measurement should be made at a point 3.0 mm (0.118 in) above the bottom edge of the piston.

	Size A
Standard	73.93 ~ 73.99 mm (2.9106 ~ 2.9130 in)
Oversize 2	74.50 mm (2.933 in)
Oversize 4	75.00 mm (2.953 in)

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

Piston Clearance = C – P:
0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)

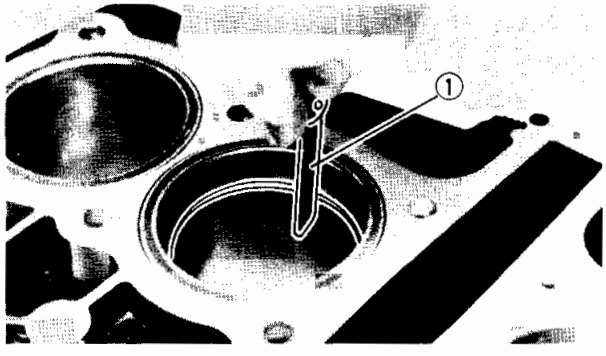
C: Cylinder bore P: Piston outside diameter



Piston Ring

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

Side Clearance	Top	Standard: 0.04 ~ 0.08 mm (0.0016 ~ 0.0031 in) Limit: 0.10 mm (0.0039 in)
	2nd	Standard: 0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) Limit: 0.11 mm (0.0043 in)



2. Position:
   - Piston ring
     (into cylinder)
     Push the ring with the piston crown.
3. Measure:
   - End gap
     Use feeler gauge ①.
     Out of specification → Replace rings as set.

	Standard	Limit
Top Ring	0.20 ~ 0.35 mm (0.008 ~ 0.014 in)	0.60 mm 0.024 in)
2nd Ring	0.20 ~ 0.35 mm (0.008 ~ 0.014 in)	0.60 mm (0.024 in)
Oil Control (Rails)	0.30 ~ 0.90 mm (0.0118 ~ 0.0354 in)	–

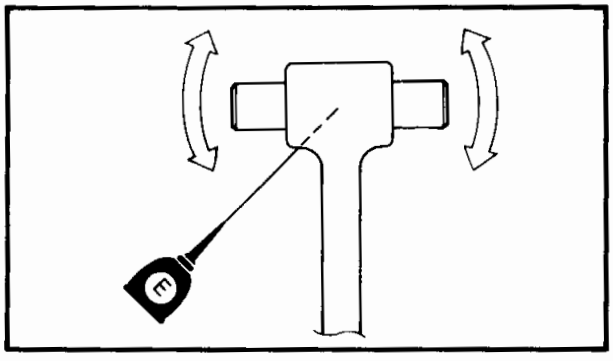
Oversize Piston Rings

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

Oversize 2	0.50 mm (0.0197 in)
Oversize 4	1.00 mm (0.0393 in)

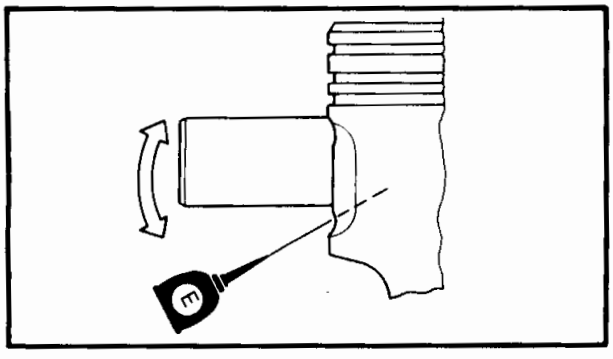
- The expander spacer of the bottom ring (oil control ring) is color-coded to identify sizes. The color mark is painted on the expander spacer.

Size	Color
Oversize 1	Blue
Oversize 2	Yellow

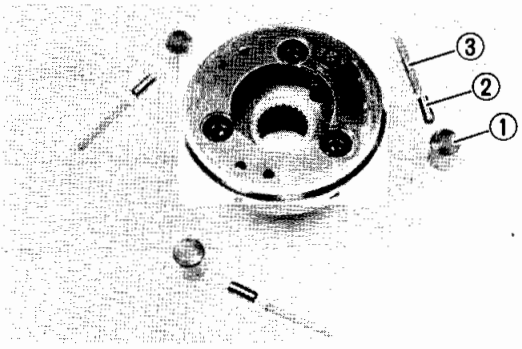


Piston Pin

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



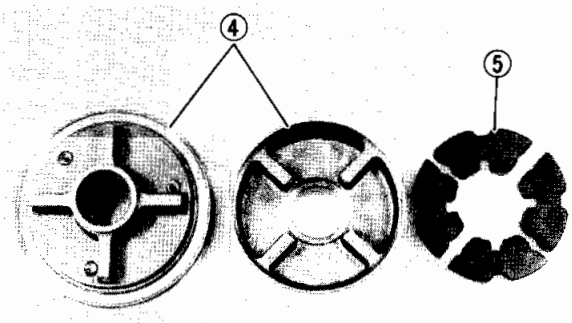
4. Position:
   - Piston pin
     (into piston)
5. Check:
   - Free play
     When pin is in place in piston
     Free play → Replace piston pin and/or piston.



STARTER DRIVES

Electric Starter Clutch

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

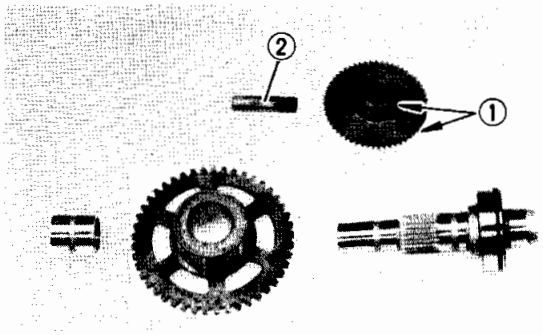


2. Check:
   - Damper housing ④
   - Rubber Dampers ⑤
     Cracks/Wear/Damage → Replace.

Installation

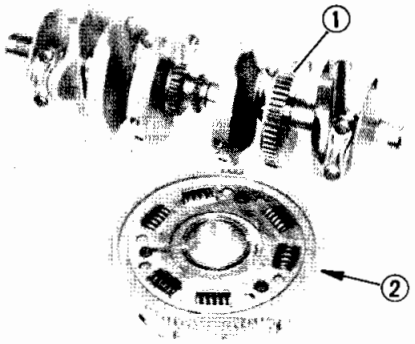
1. Position:
   - Rubber damper
   - Damper housing
   - One way clutch
2. Tighten:
   - Bolts

Starter Oneway Clutch:
25 Nm (2.5 m·kg, 18 ft·lb)
LOCTITE®
Stake over the end of the bolt



Starter Gears

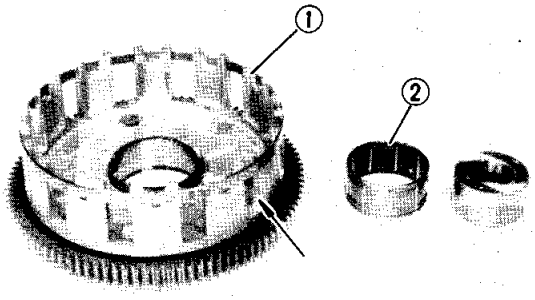
1. Inspect:
   - Idle gear surfaces ①
   - Idle gear shafts ②
     Pitting/Wear/Damage → Replace.



PRIMARY GEARS

The drive gear is mounted on the crankshaft; the driven gear is mounted on the transmission and is intergrated with the clutch assembly.

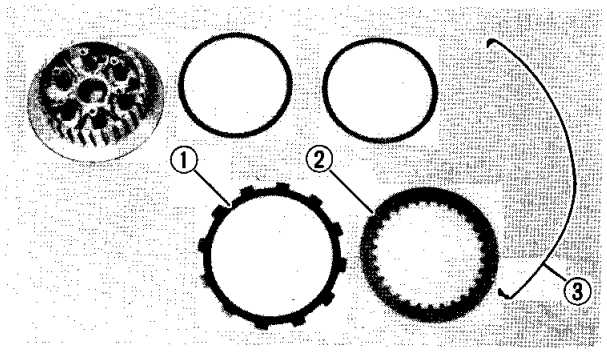
1. Inspect:
   - Drive gear ①
     Scratches/Wear/Damage → Replace crankshaft.
   - Driven gear ②
     Scratches/Wear/Damage → Replace clutch housing assembly.



CLUTCH

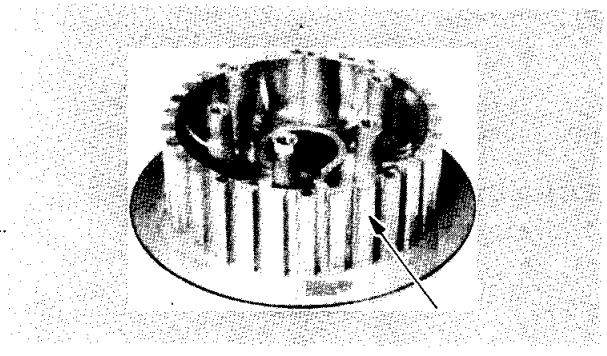
Clutch Housing

1. Inspect:
   - Dogs on the housing ①
     Cracks/Wear/Damage → Deburr or replace.
   - Clutch housing bearing ②
     Chafing/Wear/Damage → Replace.



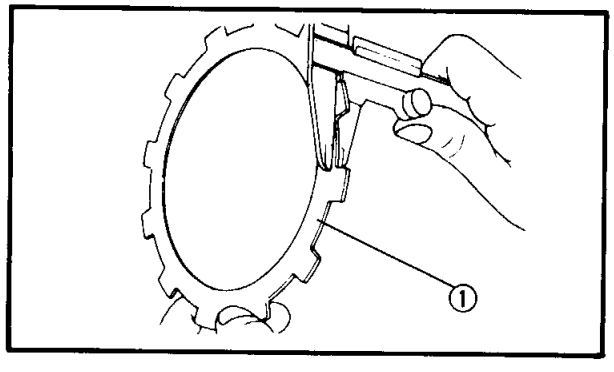
Clutch Boss

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



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

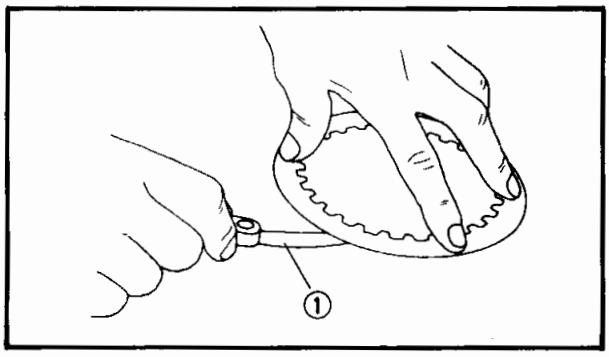
NOTE:
Scoring on the clutch plate splines will cause erratic operation.



Friction Plates

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

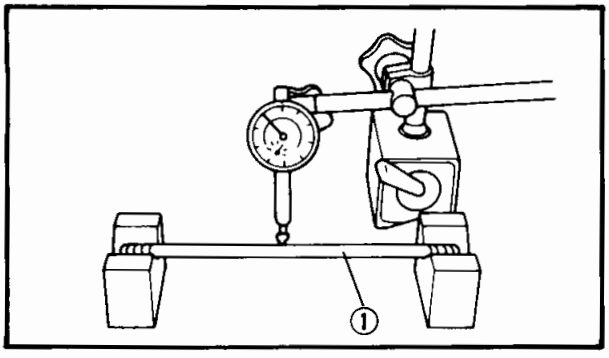
Wear Limit:
2.8 mm (0.11 in)



Clutch Plates

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

Warp Limit:
0.1 mm (0.004 in)



Push Rod

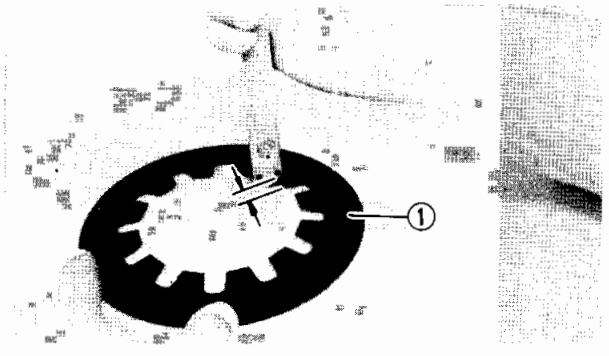
1. Measure:
   - Push rod runout (long rod) ①
     Use V-Blocks and Dial Gauge (YU-03097).
     Out of specification → Replace.

Bending Limit:
0.3 mm (0.012 in)

2. Inspect:
   - O-ring
     (on short rod)
     Wear/Cracks/Damage → Replace.

Clutch Bearing

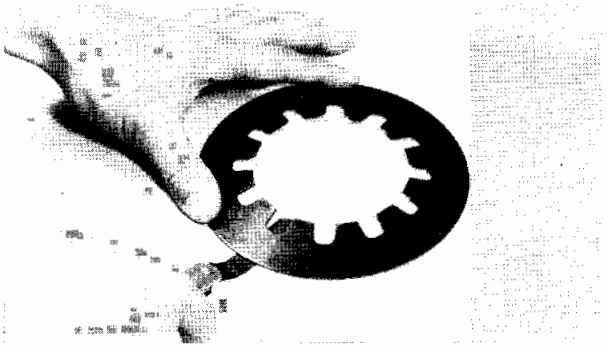
1. Inspect:
   - Bearing
     Pitting/Damage → Replace.



Clutch Spring

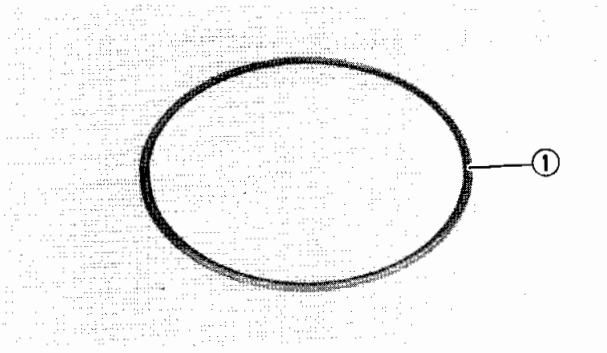
1. Inspect:
   - Clutch spring ①
     Wear/Bends/Cracks → Replace.
2. Measure:
   - Clutch spring free height
     Out of specification → Replace springs as a set.

Clutch Spring Minimum Height:
6.0 mm (0.24 in)



3. Measure:
   - Clutch spring warpage
     Use a surface plate and Feeler Gauge.
     Out of specification → Replace.

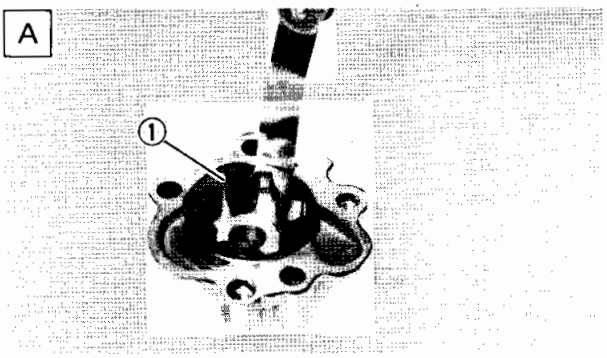
Warp Limit:
0.1 mm (0.004 in)



Clutch Spring Washer

1. Inspect:
   - Clutch spring washer ①
     Wear/Bends/Damage → Replace.

A

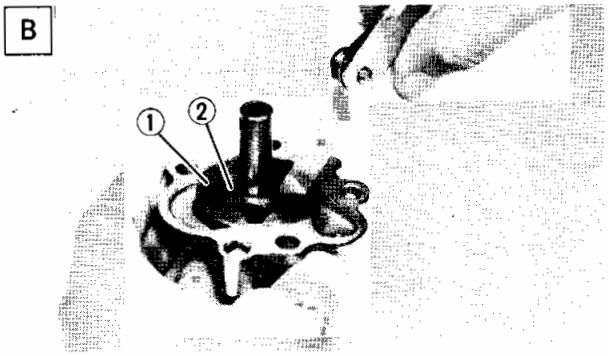


OIL PUMP

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

Standard Clearance "A":
0.03 ~ 0.08 mm
(0.0012 ~ 0.0031 in)

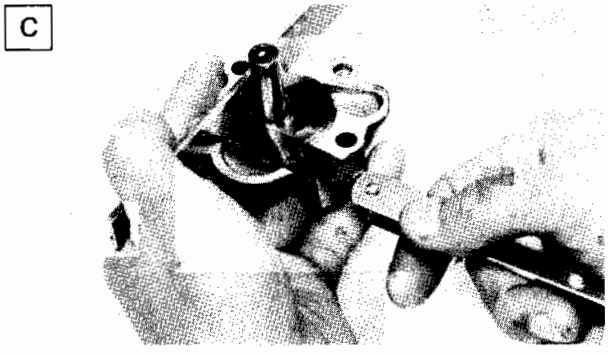
B



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

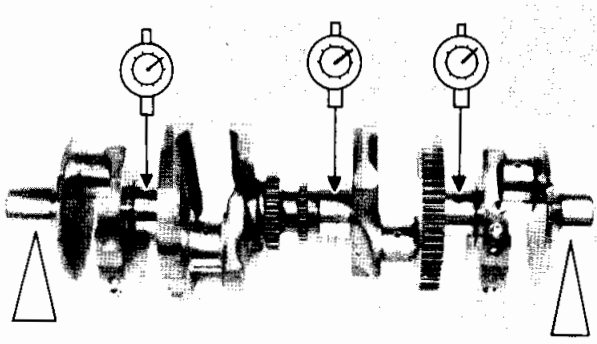
Inner-Outer Clearance "B":
0.12 ~ 0.17 mm (0.0047 ~ 0.0067 in)

C



3. Measure:
   - Rotor/Housing clearance
     Use a Feeler Gauge and straight edge.
     Out of specification → Replace oil pump assembly.

Standard Clearance "C":
0.03 ~ 0.08 mm
(0.0012 ~ 0.0031 in)

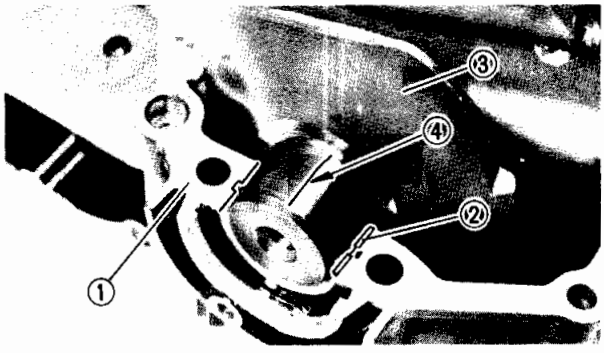


CRANKSHAFT

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

Runout Limit:
0.03 mm (0.0012 in)

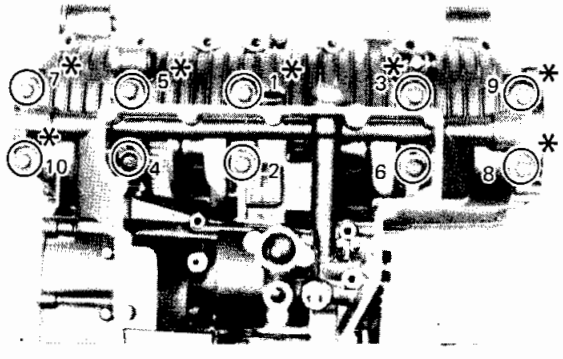
2. Inspect:
   - Crankshaft bearing surfaces
     Wear/Scratches → Replace.



Crankshaft Main Bearing Clearance Measurement

1. Clean all parts.
2. Position:
   - Lower crankcase half ①
3. Install:
   - Bearings ②
     (into the lower crankcase)
   - Crankshaft ③
4. Attach:
   - Plastigage® (YU-33210) ④
     (onto the crankshaft journal surface)

NOTE:
Do not turn the crankshaft until clearance measurement has been completed.

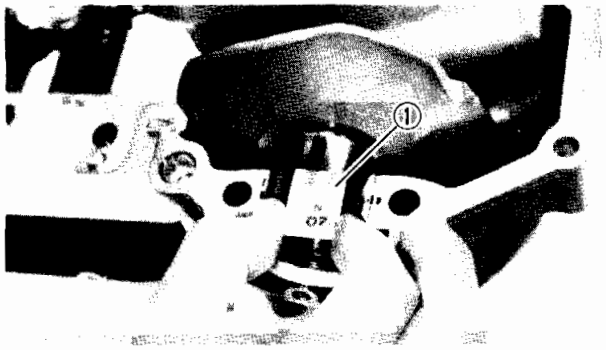


5. Install:
   - Bearings
     (into upper crankcase)
6. Tighten:
   - Bolts

CAUTION:
Tighten to full torque in torque sequence as shown.

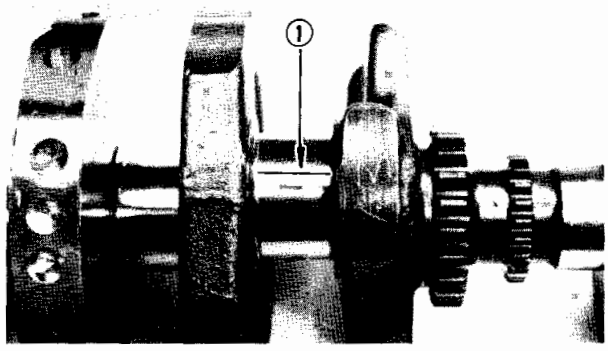
24 Nm (2.4 m·kg, 17 ft·lb)

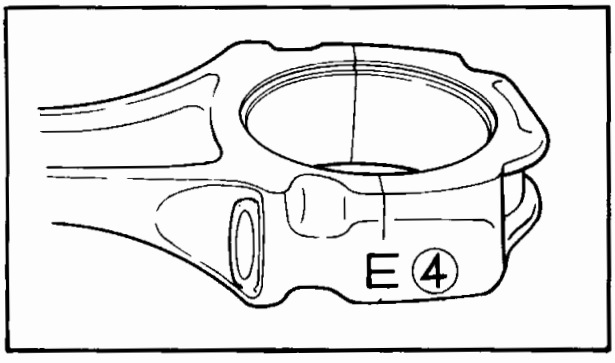
* Tighten the bolt with a washer



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

Main Bearing Oil Clearance:
0.02 ~ 0.044 mm
(0.0008 ~ 0.0017 in)





Connecting Rod Bearing Clearance Measurement

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

NOTE:
Be sure the letter on both conponents align to form a parfect charactor.

5. Lubricate:
   - Connecting rod bolt threads

Molybdenum Disulfide Grease

6. Tighten:
   - Connecting rod cap nuts.

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

CAUTION:

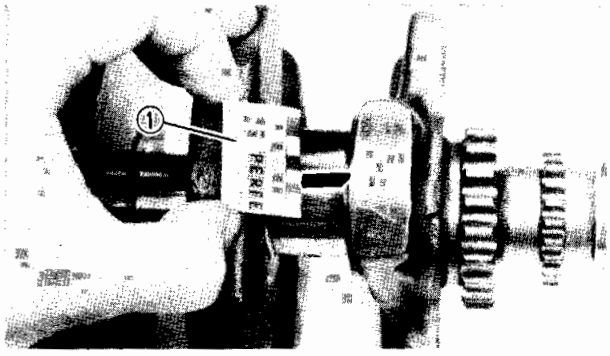
Tighten to full torque specification without pausing. Apply continuous torque between 3.0 and 3.8 m·kg. Once you reach 3.0 m·kg, DO NOT STOP TIGHTENING until final torque is reached. If tightening is interrupted between 3.0 and 3.8 m·kg, loosen nut to less than 3.0 m·kg and start again.

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

7. Remove:
   - Connecting rod cap
     Use care in removing.

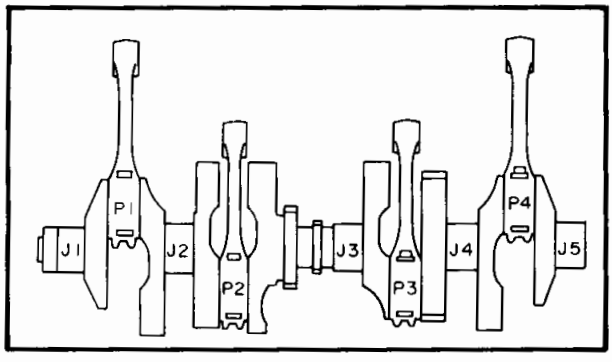
CAUTION:

Remove the "I 3" and "E 3" caps first, before any one is loosened.



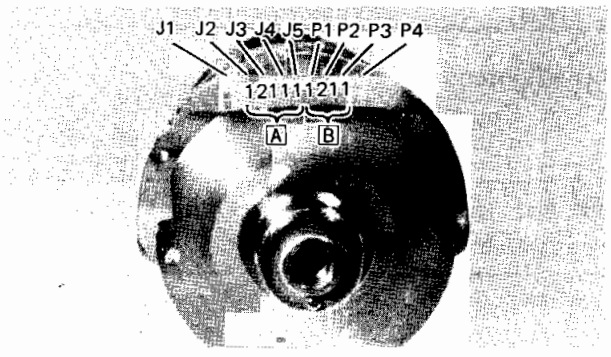
8. Measure:
   - Width of Plastigage® ①
     Out of specification → Replace bearings and/or replace crankshaft if necessary.

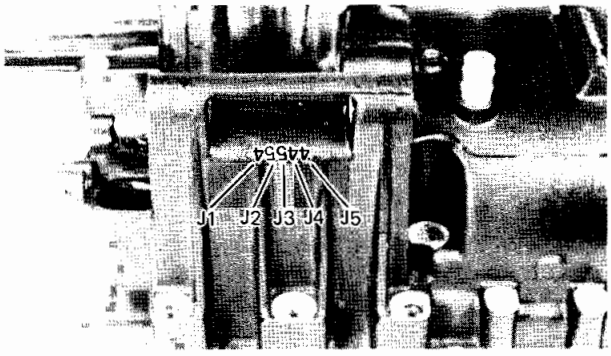
Connecting Rod Bearing Clearance:
0.160 ~ 0.262 mm
(0.0063 ~ 0.0103 in)



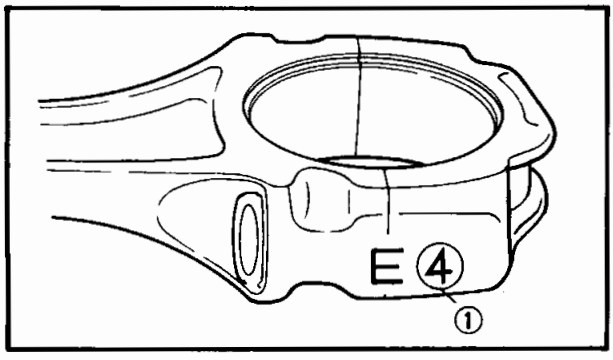
Crankshaft Main and Connecting Rod Bearing Selection

- Numbers used to indicate crankshaft journal sizes are stamped on the crankweb. The first five (5) Ⓐ are rod bearing journal numbers, starting with the left journal. The four (4) Ⓑ main bearing journal numbers follow in the same sequence.





- The upper crankcase half is numbered J1, J2, J3, J4, and J5 on the rear boss as shown..



- The connecting rods are numbered 3 or 4. The numbers are stamped in ink on the rod ①.

Example 1: Selection of the crankshaft main bearings;

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)

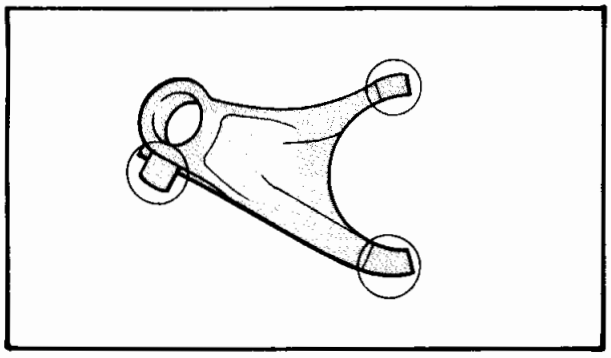
BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green
No. 5	Yellow

Example 2: Selection of the connecting rod bearing;

If the connecting rod P1 and crankshaft P1 sizes are No. 4 and No. 1, repectively, the bearing size No. is:

Bearing size No. =
Connecting rod No. – Crankshaft No. =
4 – 1 = 3 (Brown)

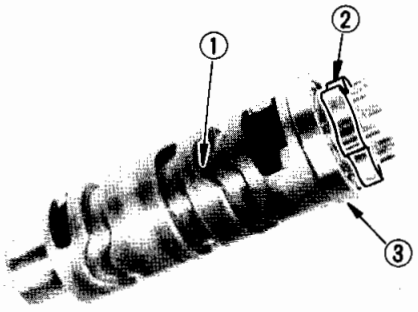
BEARING COLOR CODE	
0	Pink
1	Blue
2	Black
3	Brown



TRANSMISSION

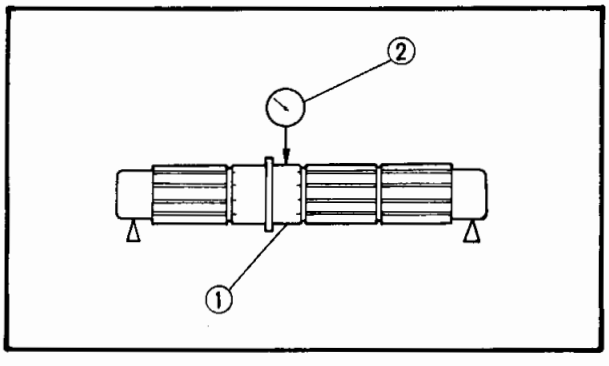
Shift Fork

1. Inspect:
   - Shift forks
     (on the gear and shift cam contact surfaces)
     Wear/Chafing/Bends/Damage → Replace.
2. Check:
   - Shift fork movement
     (on its guide bar)
     Unsmooth operation → Replace fork and/or guide bar.



Shift Cam

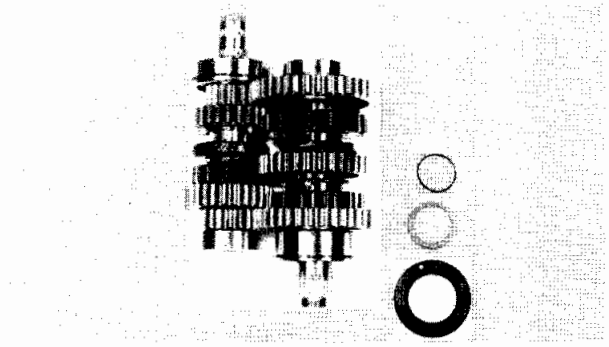
1. Inspect:
   - Shift cam grooves ①
     Wear/Damage/Scratches → Replace.
   - Shift cam segment ②
     Damage/Wear → Replace.
   - Shift cam bearing ③
     Pitting/Damage → Replace

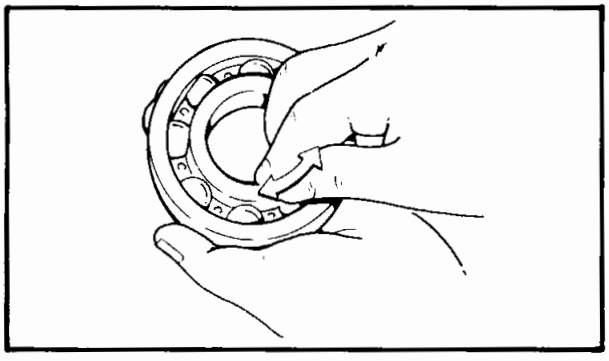


Main and Drive Axles

1. Measure:
   - Axle runout ①
     Use centering device and Dial Gauge (YU-03097) ② .
     Out of specification → Replace.

	Runout Limit: 0.08 mm (0.0031 in)





Gears

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

BEARINGS

1. Inspect:
   - Axle bearings
   - Shift cam bearing
     Pitting/Damage → Replace.

CIRCLIPS AND WASHERS

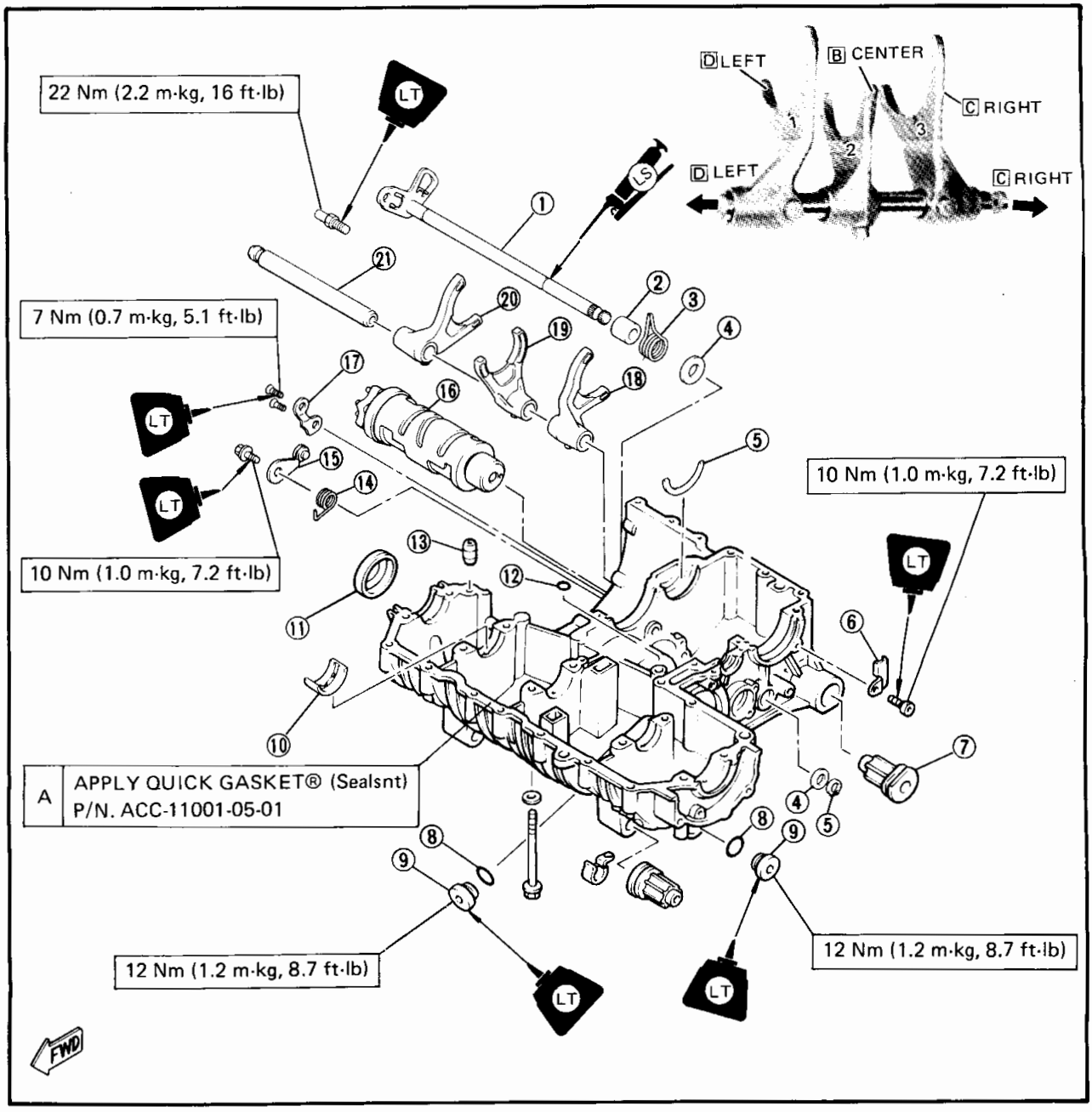
1. Inspect:
   - Circlips
   - Washers
     Damage/Looseness/Bends → Replace.

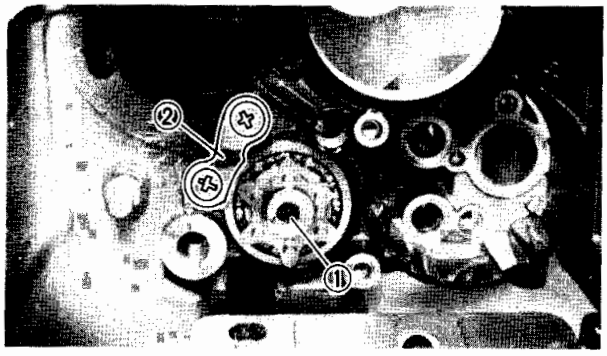
ENGINE ASSEMBLY AND ADJUSTMENT

LOWER CRANKCASE

1. Change lever
2. Collar
3. Spring
4. Washer
5. Circlip
6. Clamp
7. Engine damper
8. O-ring
9. Blind plug
10. Crankshaft bearing
11. Blind seal
12. O-ring (Rod color)
13. Dowel pin
14. Spring
15. Stopper lever
16. Shift cam
17. Retainer
18. Shift fork (No. 1)
19. Shift fork (No. 2)
20. Shift fork (No. 3)
21. Guide bar

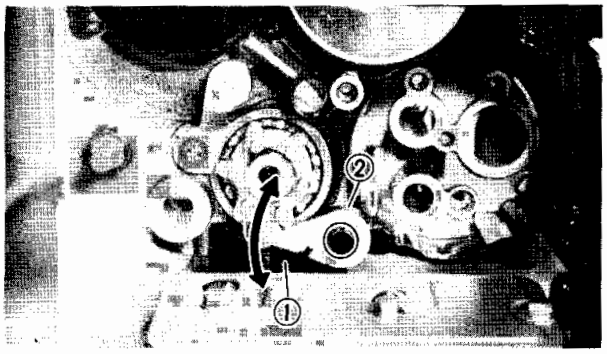
BEARING SELECTION: CRANKSHAFT BEARING NO. = CRANKCASE NO. – CRANKSHAFT NO.	
CALCULATED NO.	COLOR CODE
1	BLUE
2	BLACK
3	BROWN
4	GREEN
5	YELLOW





1. Install:
   - Shift cam ①
   - Retainer ②
   - Neutral switch
2. Tighten:
   - Retainer screws

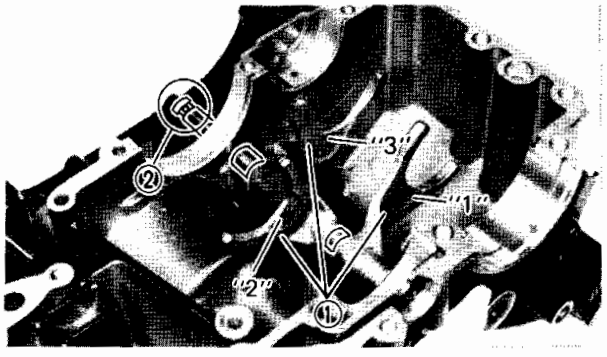
Retainer Screws:
7 Nm (0.7 m·kg, 5.1 ft·lb)
LOCTITE®



3. Install:
   - Shift cam stopper lever ② with the return spring ①
4. Tighten:
   - Bolt (Shift cam stopper lever)

Stopper Lever:
10 Nm (1.0 m·kg, 7.2 ft·lb)
LOCTITE®

NOTE:
Check for the smooth moving after tightening the stopper lever.

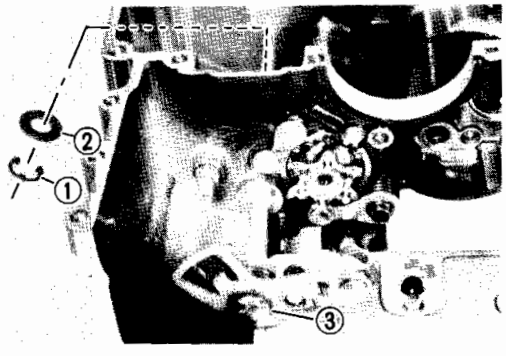


5. Install:
   - Shift forks ①
   - Guide bar ②

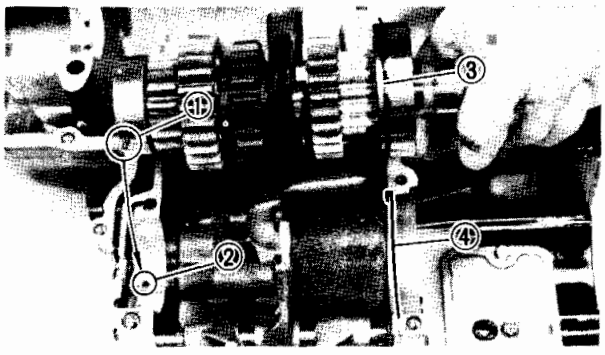
NOTE:
- All shift fork numbers should face the left side and be in sequence (1, 2, 3), starting from the left.
- The guide bar groove should face the right side.

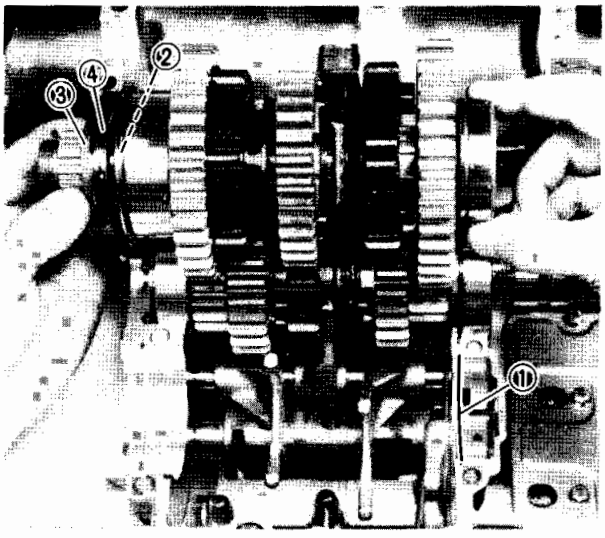
6. Place the shift cam and transmission gears in NEUTRAL position.

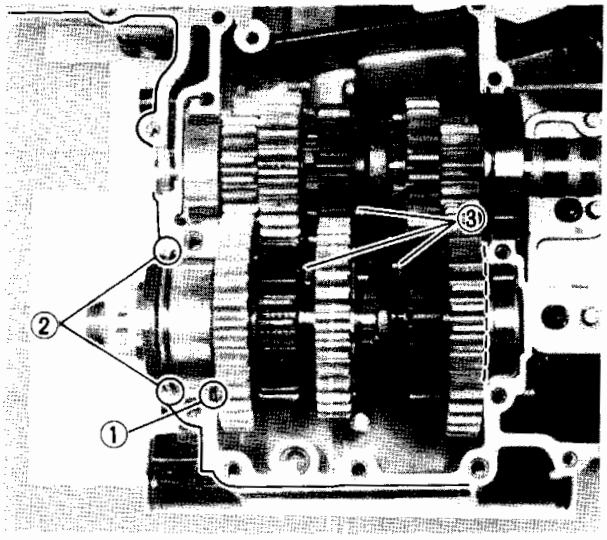
CAUTION:
Be sure the gear shifts correctly while hand-turning the shift cam.



7. Install:
   - Change lever ③
   - Washer ②
   - Circlip ①







8. Install:
   - Main axle sub assembly

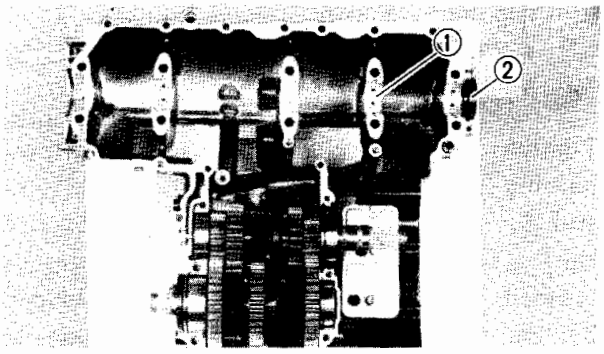
NOTE:
- Insert bearing pin ① (left bearing) into the crankcase hole ②.
- Insert the bearing clip ③ (right bearing) completely into the crankcase positioning groove ④.
- Be careful not to damage the crankcase during installation.

9. Install:
   - Half clip ①
     (into the crankcase)
10. Install:
   - O-ring ②
   - Collar ③
   - Oil seal ④
     (onto the drive axle)

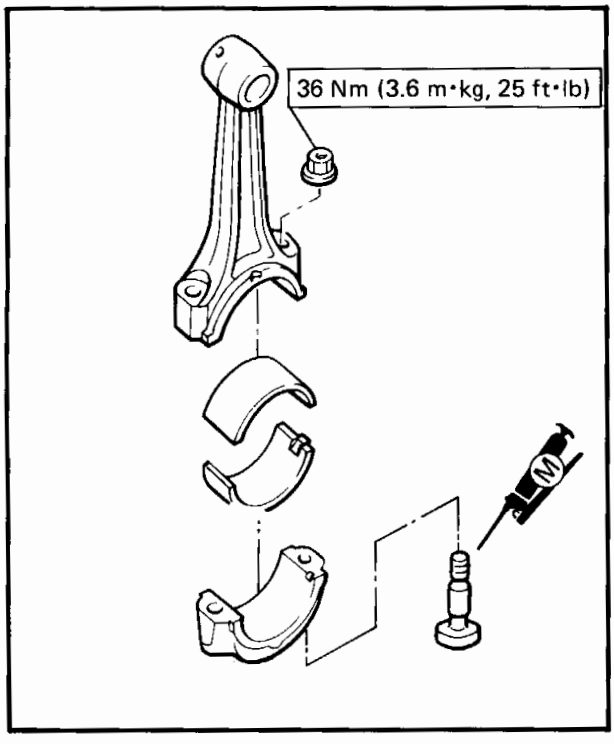
NOTE:
- The collar should be installed with the beveled side facing outward.
- Lightly apply grease to the oil seal lips.

11. Install:
   - Drive axle sub assembly

NOTE:
- Position the bearing pin (left bearng) as shown ①.
- Insert the oil seal flange completely into the crankcase positioning groove ②.
- Carefully guide shift fork ③ so that they mesh smoothly with transmission gear.
- Be careful not to damage the oil seal during installation.



12. Clean the crankcase counterbore where the main bearing is fitted.
13. Install:
    - Crankshaft bearings ①
      (See page 3-33 for crankshaft bearing selection)
14. Insert the blind plug ② flange completely into the crankcase positioning groove.

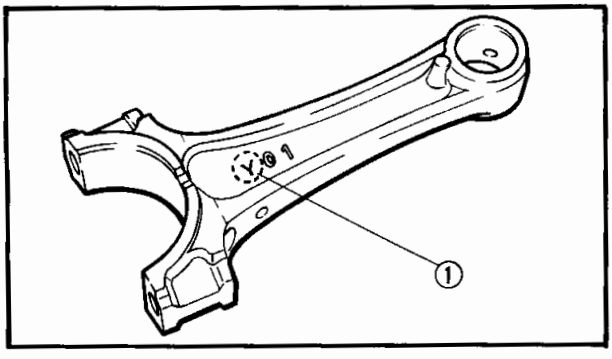


CRANKSHAFT

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

Connecting Rod Bolt:
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.

6. Tighten:
   - Connecting rod cap nuts

CAUTION:

Tighten to full torque specification without pausing . Apply continuous torque between 3.0 and 3.8 m·kg. Once you reach 3.0 m·kg, DO NOT STOP TIGHTENING until final torque is reached. If tightening is interrupted between 3.0 and 3.6 m·kg, loosen nut to less than 3.0 m·kg and start again.



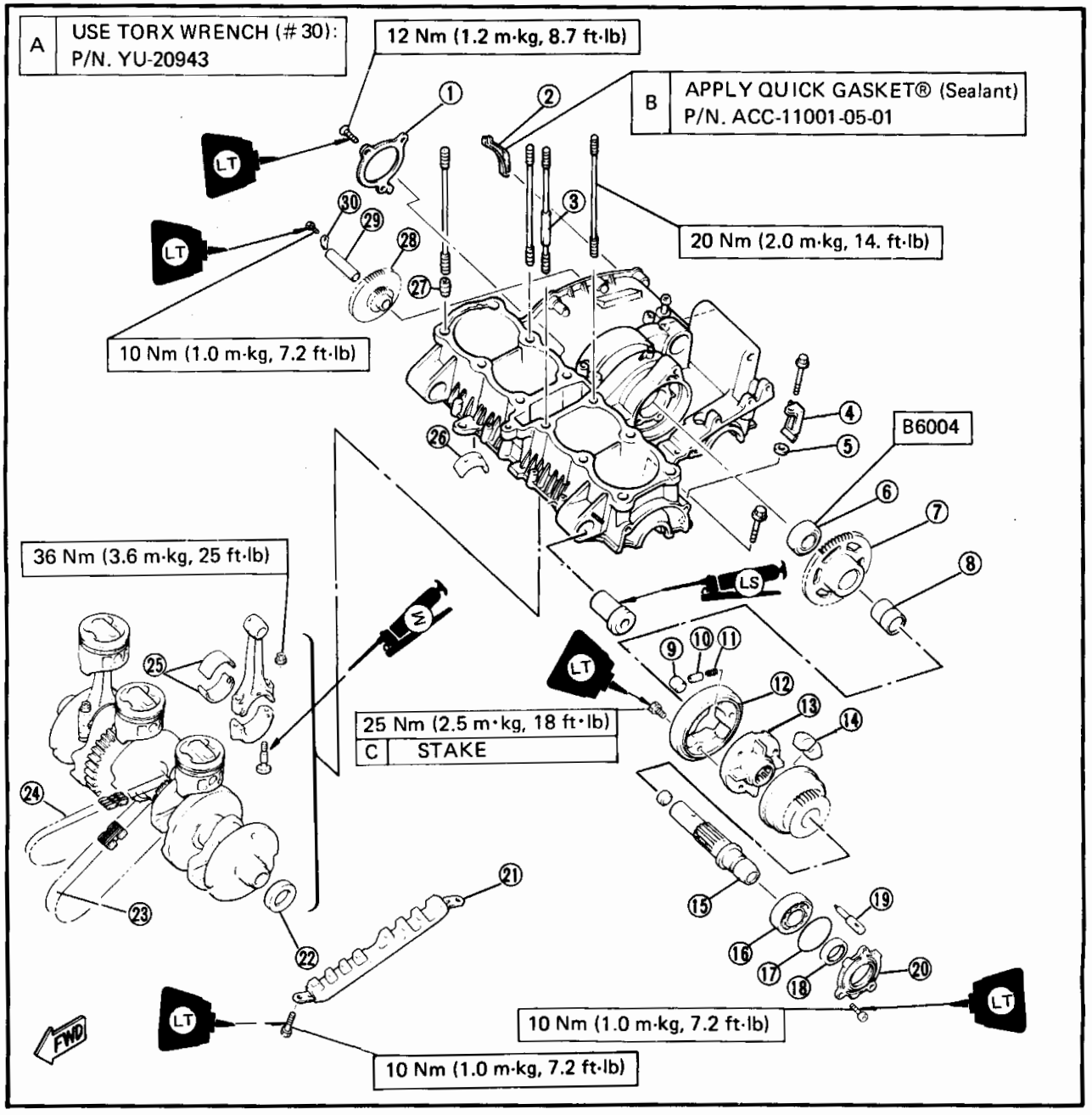
Connecting Rod Cap:
36 Nm (3.6 m·kg, 25 ft·lb)

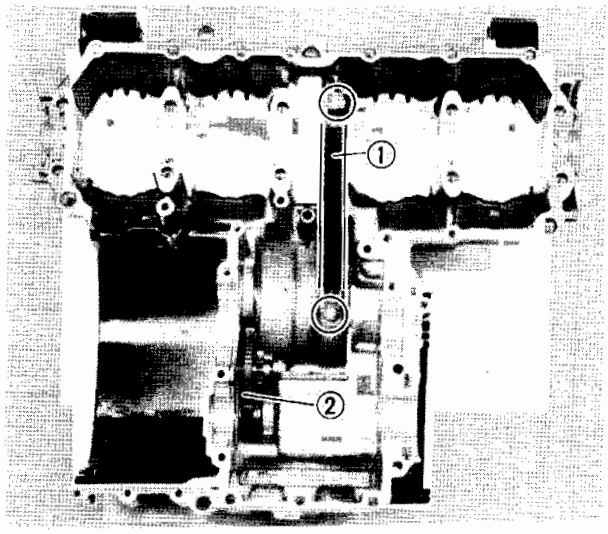
UPPER CRANKCASE

1. Main axle bearing retainer
2. Rubber seal
3. Rubber sleeve (Do not remove)
4. Clamp
5. Washer
6. Bearing
7. Idle gear No. 2
8. Collar
9. Ball
10. Collar
11. Spring
12. Starter oneway clutch
13. Starter damper housing
14. Damper rubber
15. Drive shaft
16. Bearing
17. O-ring
18. Oil seal
19. Oil jet
20. Drive shaft bearing housing
21. Drive chain guide
22. Crankshaft oil seal
23. Drive chain
24. Cam chain
25. Connecting rod bearing
26. Crankshaft bearing
27. Dowel pin
28. Idle gear No. 1
29. Idle gear shaft
30. Shaft retainer

BEARING SELECTION:
CONNECTING ROD BEARING =
CONNECTING ROD NO. – CRANKSHAFT NO.

CALCULATED NO.	COLOR CODE
0	PINK
1	BLUE
2	BLACK
3	BROWN



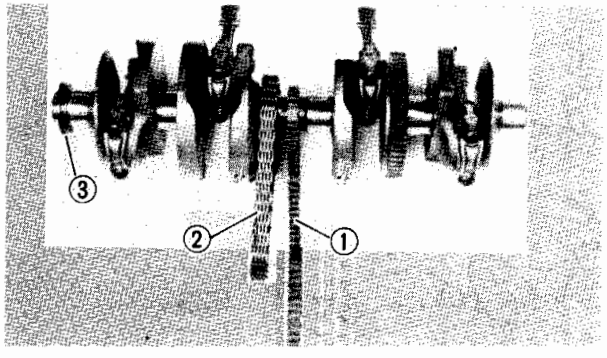


1. Install:
   - Drive chain guide ①
2. Tighten:
   - Bolts

Damper Bolt:
10 Nm (10 m·kg, 7.2 ft·lb)
LOCTITE®

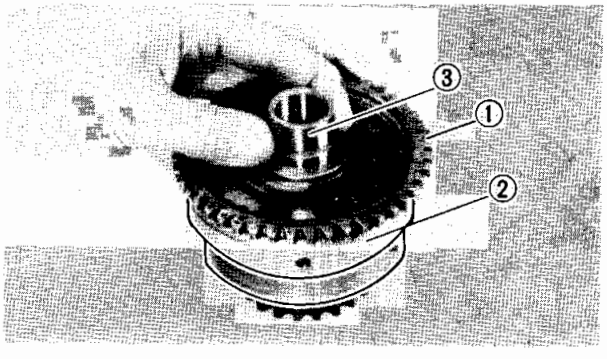
3. Install:
   - Idle gear No. 1 ②
   - Shaft
   - Retainer
4. Tighten:
   - Bolt

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

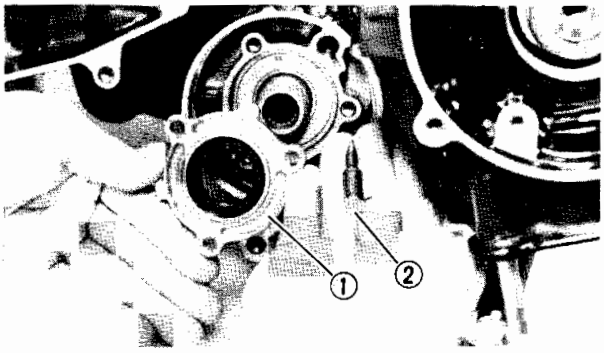


5. Apply engine oil to the main bearings.
6. Place the cam chain ①, drive chain ②, and oil seal ③ onto the crankshaft.
7. Install:
   - Crankshaft
     (onto the upper crankcase)

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



8. Install:
   - Idle gear No. 2 ①
     (into the starter clutch ②)
   - Collar ③
     (into the idle gear No. 2)
9. Install:
   - Bearing
     (onto the drive shaft)
10. Place the drive chain on the starter clutch assembly.
11. Insert the drive shaft further into the crankcase until the starter clutch is secured.

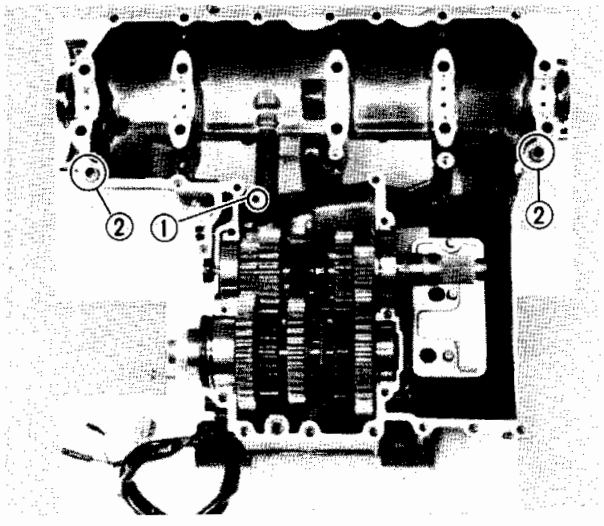


12. Install:
    - Oil jet nozzle ②
    - Housing (with new oil seal) ①

NOTE:
Lightly apply grease to the oil seal lips.

13. Tighten:
    - Bolts

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



CRANKCASE ASSEMBLY

1. Install:
    - O-ring (New) ①
    - Dowel pins ②
2. Attach a length of wire to the cam chain.
3. Apply Quick Gasket® (ACC-11001-05-01) to crankcase matching surfaces.

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.

4. While holding the upper crankcase and cam chain, install the upper crankcase onto the lower crankcase.

NOTE:
- Insert the oil seal and blind seal flanges completely into the crankcase positioning grooves.
- Be careful not to damage the seals during installation.

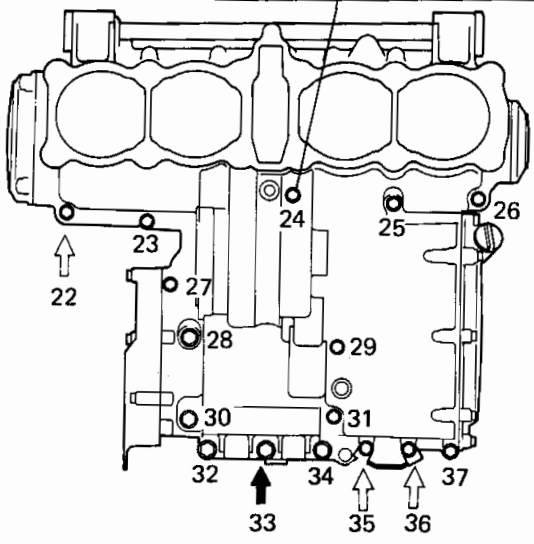
5. Install:
    - Bolts
    - Washers
    - Clamps
    - Battery negative lead

6. Tighten:
   - Bolts

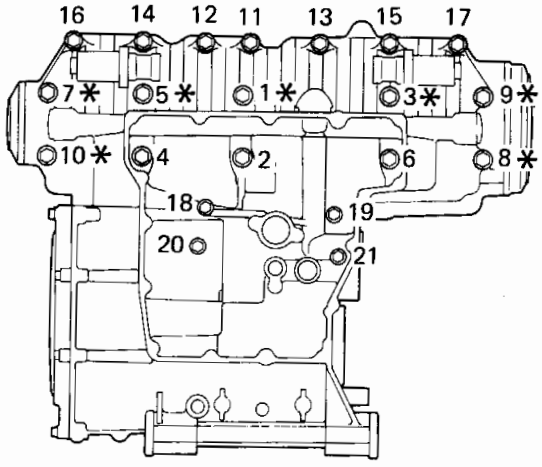
NOTE:
The embossed numbers in the crankcase designate the crankcase tightening sequence.

A UPPER CRANKCASE

C "10" on the bolt head



B LOWER CRANKCASE



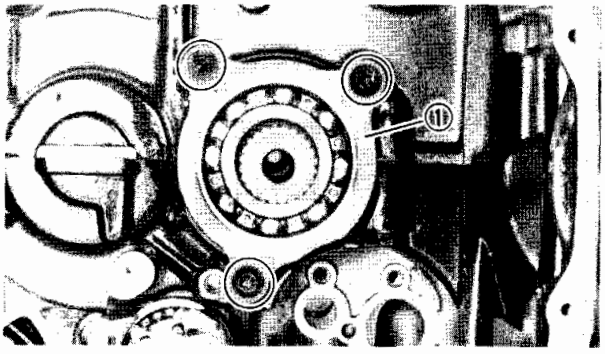
I	*	With washer	K	⬅	With battery lead
J	⇦	With clamp			

A UPPER CRANKCASE

D Bolt Size	E Bolt Length	F Q'ty	G Bolt Number	H Tightening Torque
8 mm (0.31 in)	55 mm (2.17 in)	5	28, 30, 32, 33, 34	24 Nm (2.4 m·kg, 17 ft·lb)
6 mm (0.24 in)	**125 mm (4.92 in)**	**1**	**24** C	**9 Nm (0.9 m·kg, 5.5 ft·lb)**
6 mm (0.24 in)	125 mm (4.92 in)	1	29	12 Nm (1.2 m·kg, 8.7 ft·lb)
6 mm (0.24 in)	70 mm (2.76 in)	1	31	"
6 mm (0.24 in)	65 mm (2.56 in)	2	25, 37	"
6 mm (0.24 in)	55 mm (2.17 in)	2	35, 36	"
6 mm (0.24 in)	50 mm (1.97 in)	2	22, 26	"
6 mm (0.24 in)	40 mm (1.57 in)	1	23	"
6 mm (0.24 in)	30 mm (1.18 in)	1	27	"

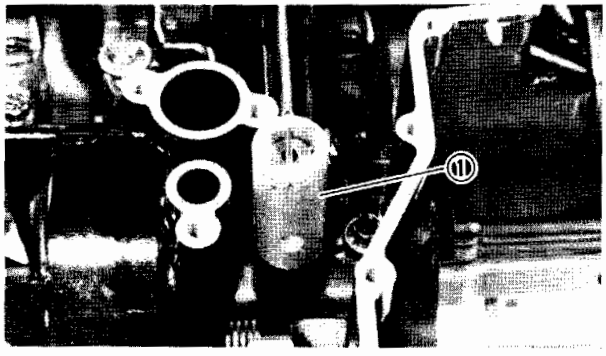
B LOWER CRANKCASE

D Bolt Size	E Bolt Length	F Q'ty	G Bolt Number	H Tightening Torque
8 mm (0.31 in)	100 mm (3.94 in)	10	1 – 10	24 Nm (2.4 m·kg, 17 ft·lb)
8 mm (0.31 in)	45 mm (1.77 in)	7	11 – 17	"
6 mm (0.24 in)	110 mm (4.33 in)	1	18	12 Nm (1.2 m·kg, 8.7 ft·lb)
6 mm (0.24 in)	95 mm (3.74 in)	2	19, 21	"
6 mm (0.24 in)	40 mm (1.57 in)	1	20	"



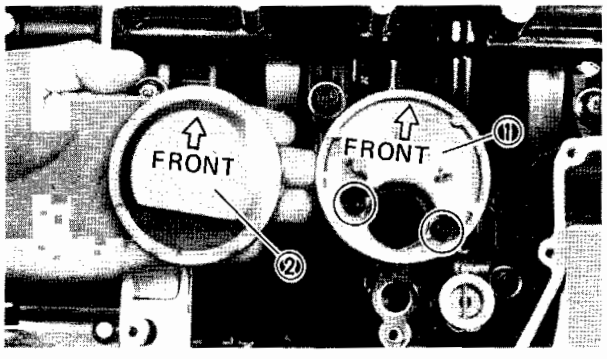
7. Install:
   - Main axle bearing retainer ①
     Use the Torx Driver (YU-20943).

Bearing Retainer:
12 Nm (1.2 m·kg, 8.7 ft·lb)
LOCTITE®



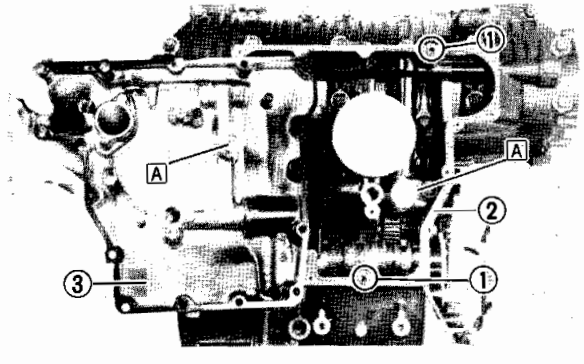
Oil Pan

1. Install:
   - Relief valves (with new O-rings) ①
     (into the crankcase and oil pan)



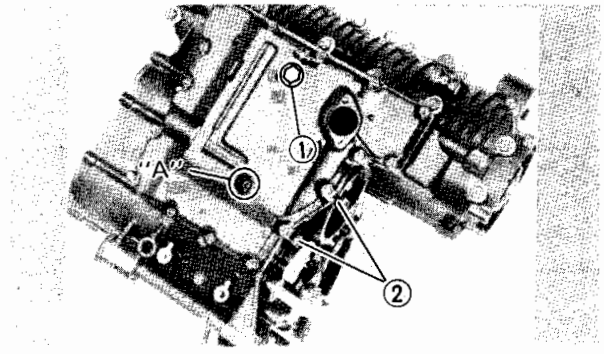
2. Install:
   - Gasket (New)
   - Oil strainer housing ①
   - Oil strainer element ②

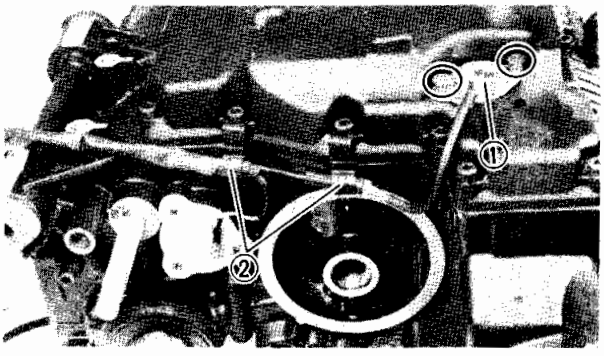
NOTE:
The arrow marks on the housing and the strainer element should face toward the front.

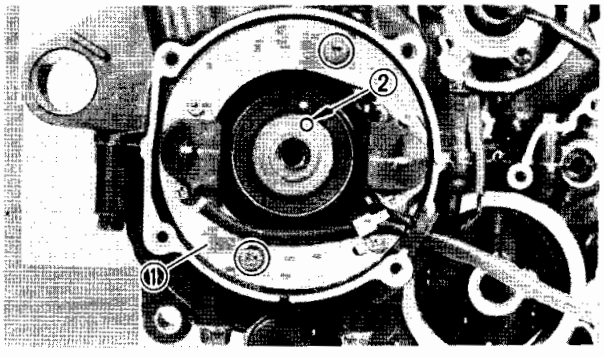


3. Install:
   - Dowel pins ①
   - Gasket (New) ②
   - Oil pan ③
   - Clamps
   - Drain plug

[A] Relief valves







4. Tighten
   - Bolts
   - Drain plug ①

Oil Pan:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Drain Plug:
43 Nm (4.3 m·kg, 315 ft·lb)

NOTE:
Bolt "A":
- Apply Quick Gasket® (ACC-11001-05-01)
- Tighten it with a copper washer.

② Clamp

5. Install:
   - Oil level switch ① (with new O-ring)
6. Tighten:
   - Bolt

Oil Level Switch:
10 Nm (1.0 m·kg, 7.2 ft·lb)

② Clamp

Pickup Coil Base and Crankshaft End Cover

1. Install:
   - Pickup coil base ①
   - Crankshaft dowel pin ②
2. Tighten:
   - Screws

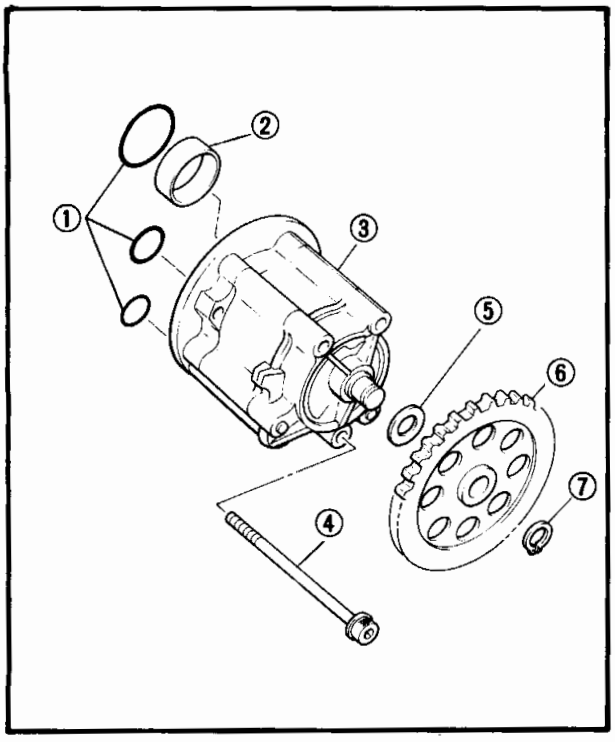
Pickup Coil Base:
6 Nm (0.6 m·kg, 4.3 ft·lb)
Quick Gasket® (Sealant)

3. Install:
   - Timing plate
4. Tighten:
   - Bolt

Timing Plate:
50 Nm (5.0 m·kg, 36 ft·lb)

5. Install:
   - Cover (Right)
6. Tight:
   - Screws

Crankshaft End Cover (Right):
4 Nm (0.4 m·kg, 2.9 ft·lb)
Quick Gasket® (Sealant)



OIL PUMP ASSEMBLY AND OIL PUMP DRIVEN GEAR

1. Install:
   - O-rings ①
   - Dowel pin ②
   - Oil pump assembly ③

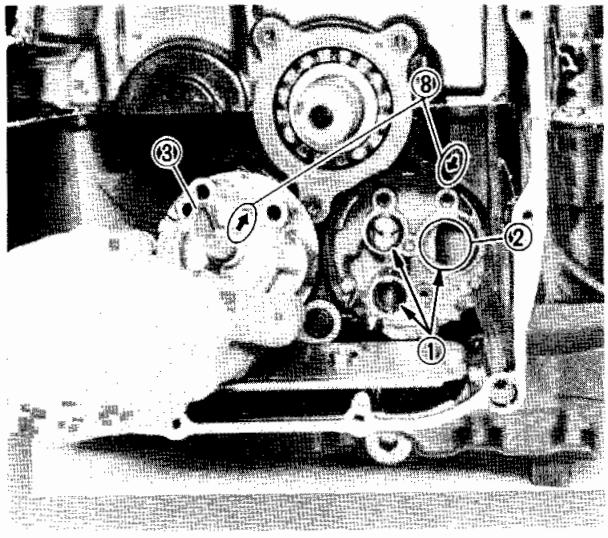
NOTE:

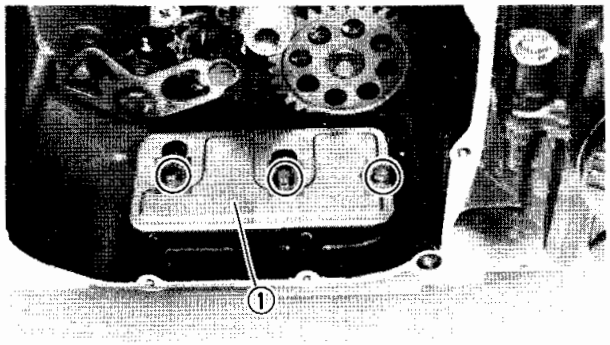
When installing the oil pump assembly, align the arrow marks ⑧ of the crankcase and the oil pump housing.

2. Tighten:
   - Bolts

Oil Pump Assembly:
10 Nm (1.0 m·kg, 7.2 ft·lb)

3. Install:
   - Washer ⑤
   - Driven gear ⑥
   - Circlip ⑦



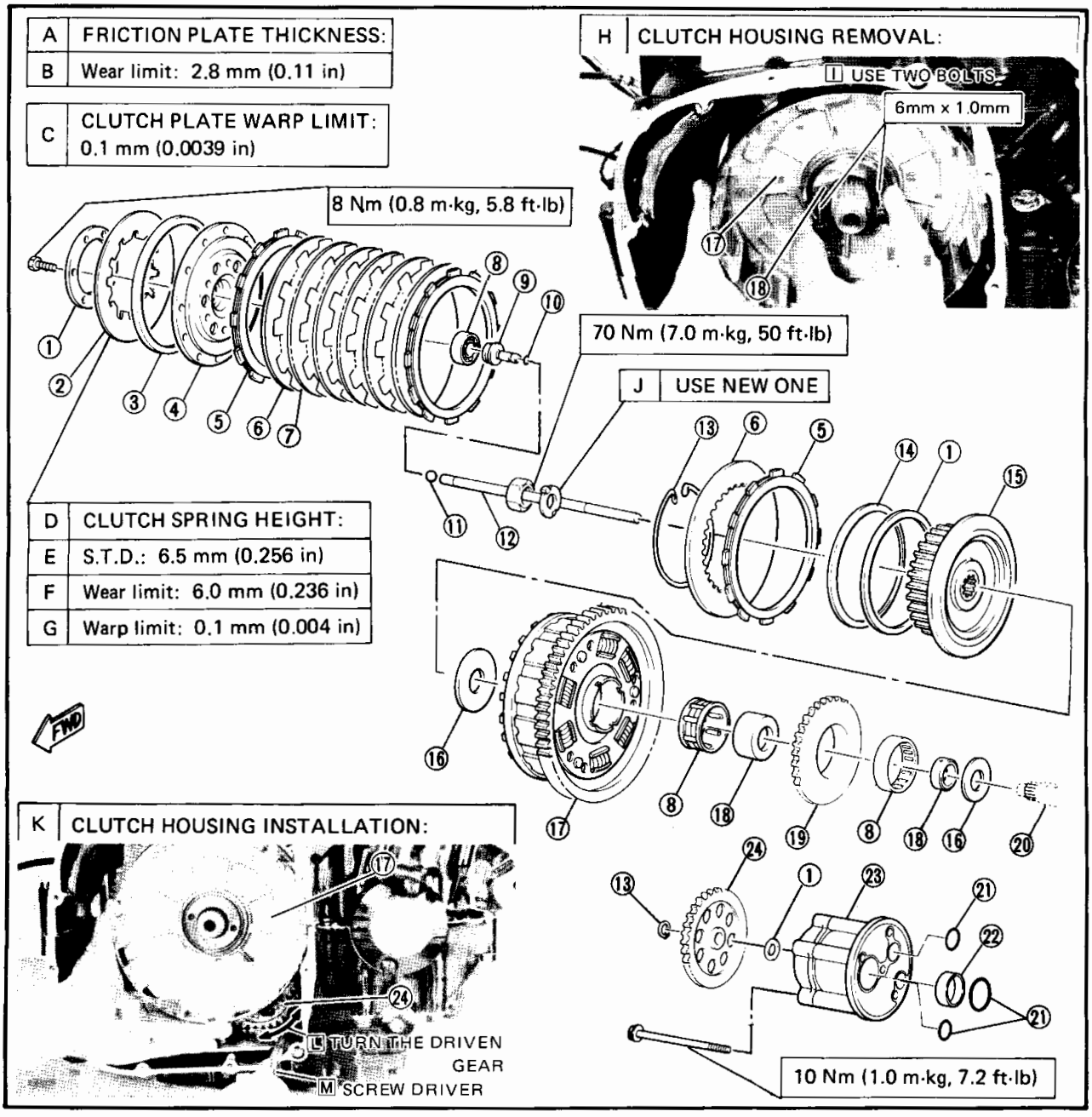


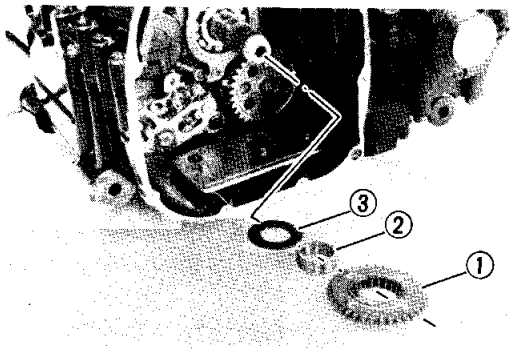
4. Install:
   - Oil baffle plate ①
5. Tighten:
   - Bolts

Oil Baffle Plate:
4 Nm (0.4 m·kg, 2.9 ft·lb)
LOCTITE®

CLUTCH AND OIL PUMP DRIVE GEAR

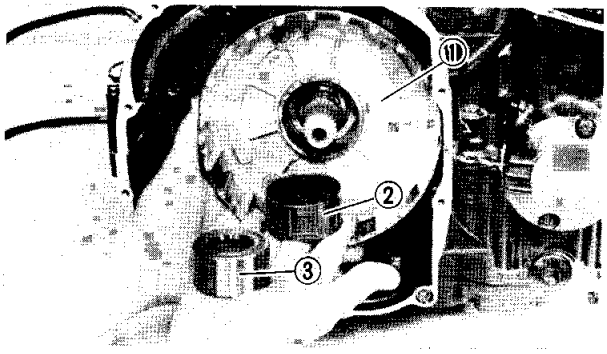
1. Washer
2. Clutch spring
3. Spring seat
4. Pressure plate
5. Friction plate (2 pcs)
6. Clutch plate (7 pcs)
7. Friction plate (6 pcs)
8. Bearing
9. Push rod (No. 1)
10. O-ring
11. Ball
12. Push rod (No. 2)
13. Circlip
14. Spring washer
15. Clutch boss
16. Thrust washer
17. Clutch housing
18. Collar
19. Oil pump drive gear (36T)
20. Main axle
21. O-ring
22. Dowel pin
23. Oil pump
24. Oil pump driven gear (32T)





Oil Pump Drive Gear

1. Install:
   - Thrust washer ③
   - Collar ②
   - Oil pump drive gear ①

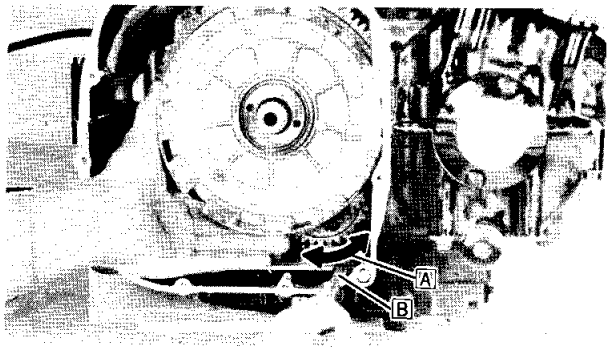


Clutch Assembly

1. Install:
   - Clutch housing ①
   - Bearing ②
   - Collar ③

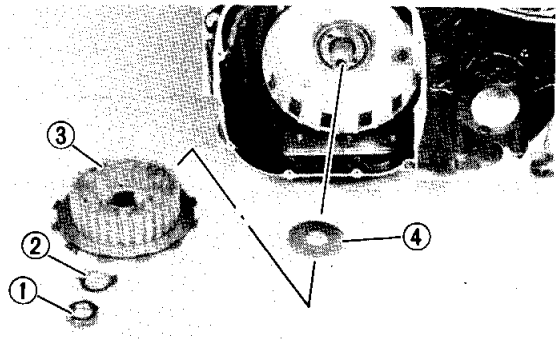
CAUTION:

While pushing the clutch housing by your left hand and turning the oil pump driven gear with a screwdriver in your right hand, fit the oil pump drive gear projections into the clutch housing receptacles.



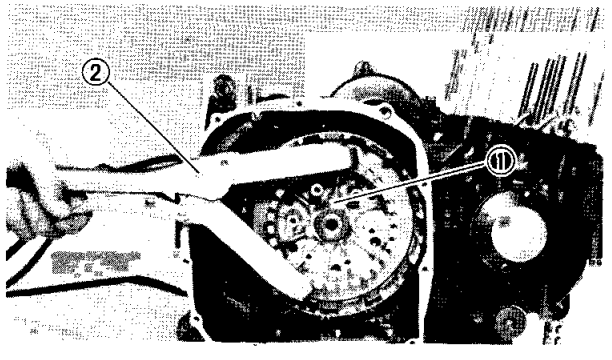
A TURN THE DRIVEN GEAR
B SCREW DRIVER

2. Install:
   - Thrust washer ④
   - Clutch boss ③
   - Lock washer (New) ②
   - Nut ①
   - Oil seal (For push rod No. 2)

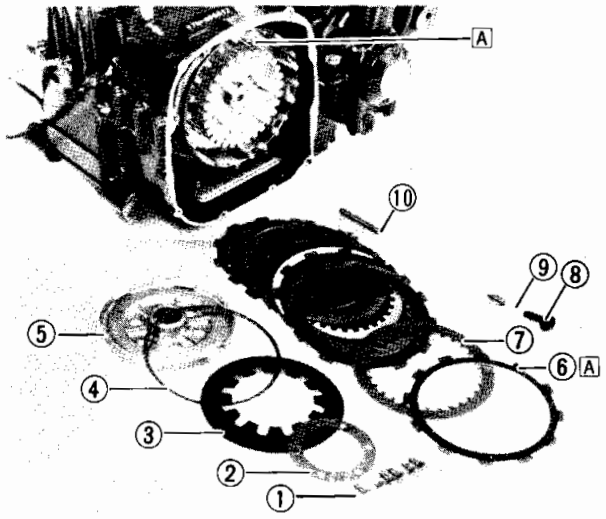


3. Tighten:
   - Nut ①
     Use the Universal Clutch Holder (YM-91402) ② .

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



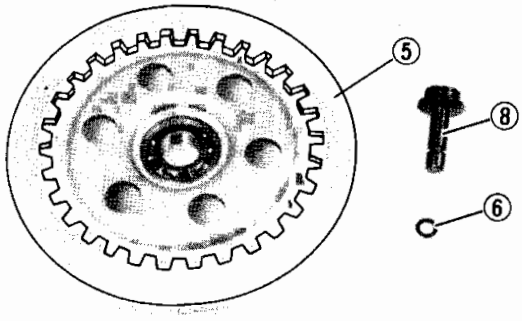
4. Bend the lock washer tab against a nut flat.



5. Install:
   - Friction plates ⑥

NOTE:
When installing the friction plates, pay careful attention to the inside diameter. The friction plate with the larger of the inside diameters must be installed in the first (in the clutch boss) and last A places.

   - Clutch plates ⑦
   - Push rod No. 2 ⑩
   - Ball ⑨
   - Push rod No. 1 ⑧ (with new O-ring)



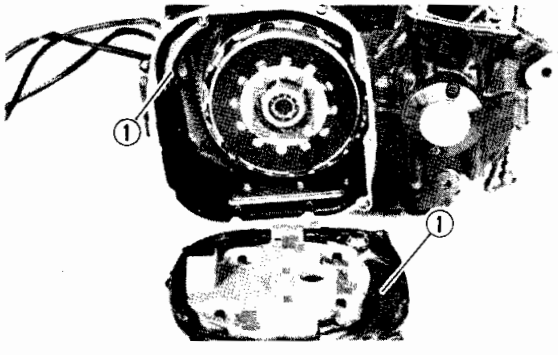
6. Install:
   - Pressure plate ⑤

NOTE:
Fit the clutch boss splines into the pressure plate splines.

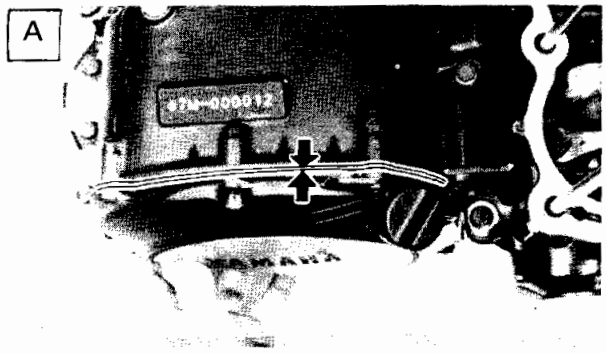
   - Spring seat ④
   - Clutch spring ③
   - Plate washer ②
   - Bolts ①

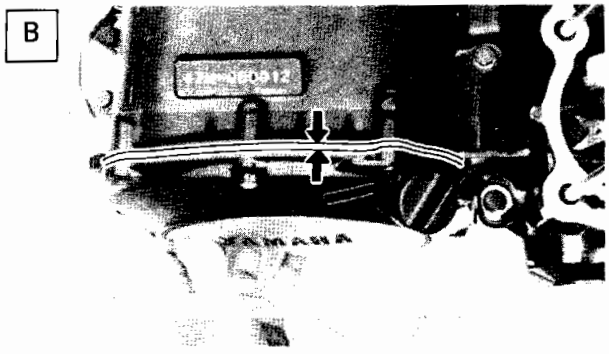
7. Tighten:
   - Bolts

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



8. Install:
   - Rubber seal ①
     Apply Quick Gasket® (ACC-11001-05-01).

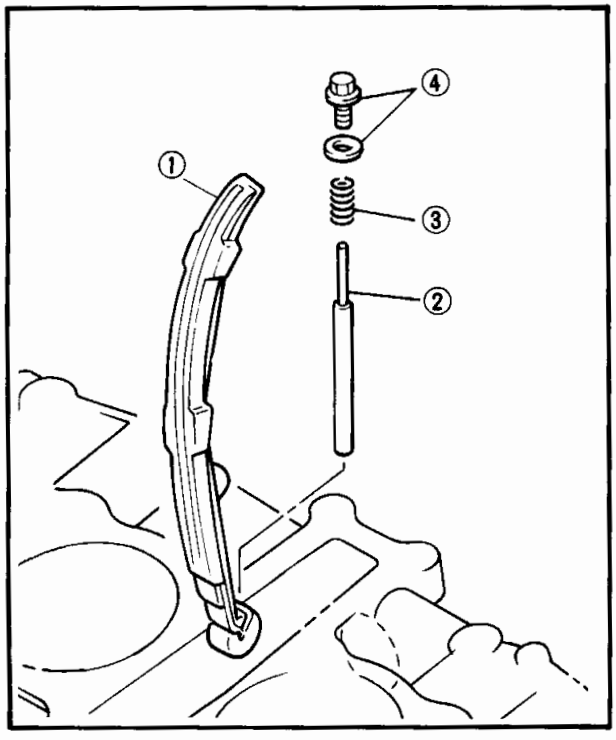




9. Install:
   - Dowel pins
   - Gasket (New)
   - Crankcase cover (Right)
10. Tighten:
    - Bolts

NOTE:
Make sure that the crankcase cover is installed correctly onto the crankcase: While pushing the cover, check the clearance between the cover and the crankcase. If the clearance is about 1 mm (0.04 in), the cover is in place. Do not tighten the cover with a 6 mm (0.24 in) clearance; otherwise, it may damage the crankcase.

A CORRECT
B INCORRECT

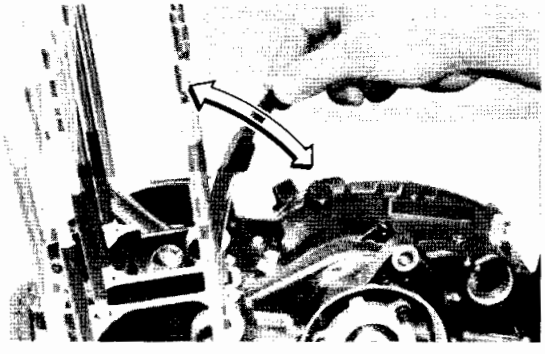


11. Install:
    - Cam chain guide (Rear) ①
    - Push rod ②
    - Spring ③
    - Bolt (with copper washer) ④

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

12. Tighten:
    - Bolt

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



13. Check:
    - Guide movement

    Unsmooth operation → Reassemble.

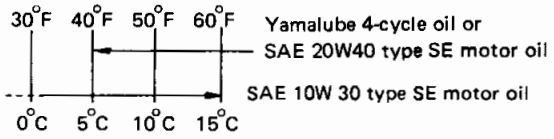
ENGINE ASSEMBLY AND ADJUSTMENT

PISTON AND CYLINDER

1. Top ring
2. 2nd ring
3. Oil ring
4. Piston pin
5. Circlip
6. Dowel pin
7. O-ring
8. Gasket

ENGINE OIL:

Recommended oil:



Oil capacity:

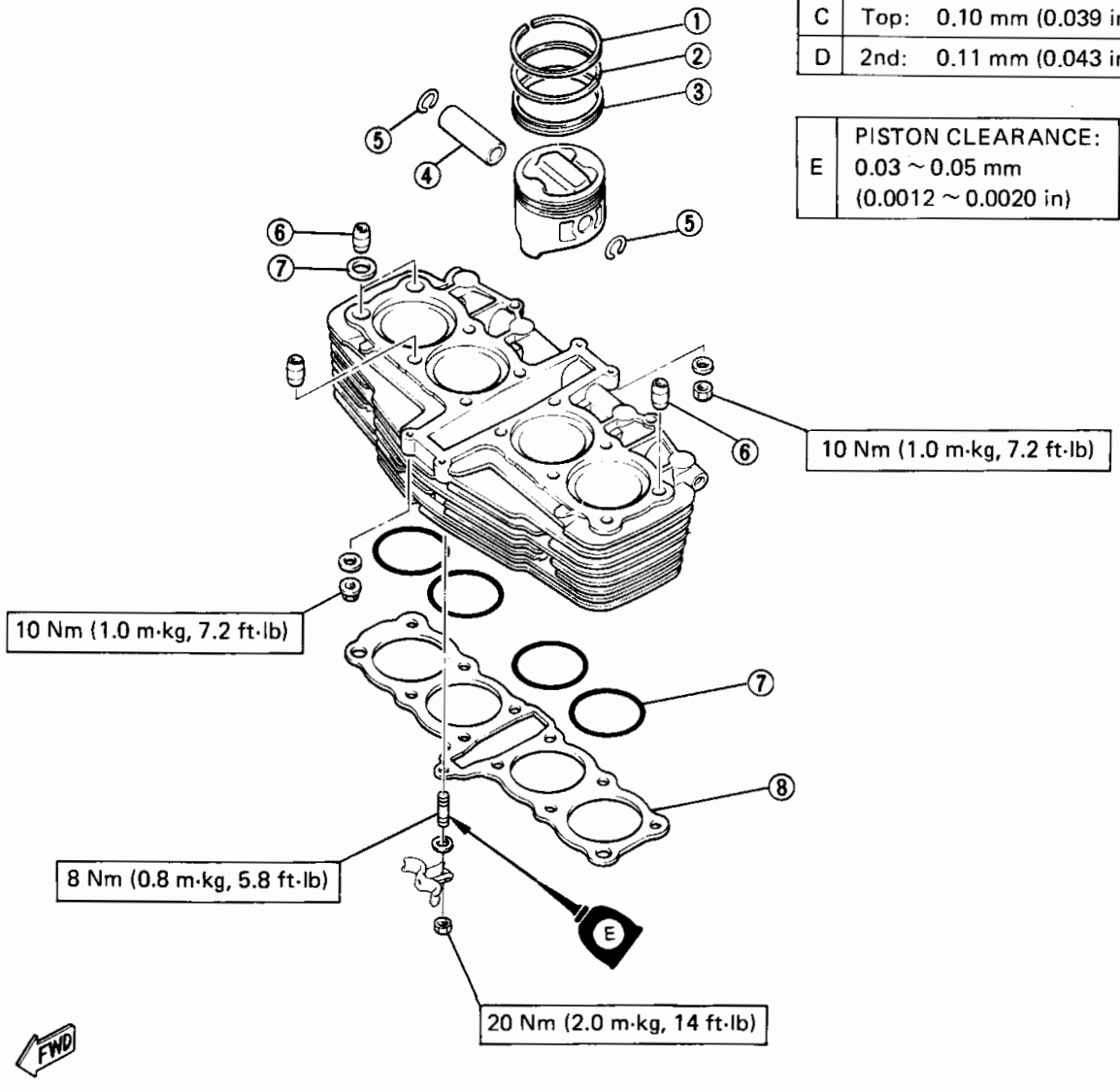
Total:
4.2 L (3.7 Imp qt, 4.4 US qt)

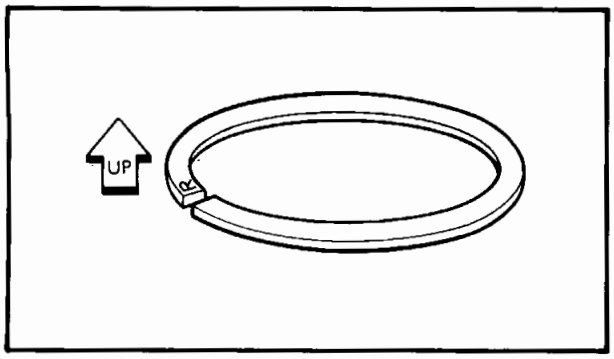
Periodic oil change:
3.0 L (2.6 Imp qt, 3.2 US qt)

With oil filter replacement:
3.35 L (2.9 Imp qt, 3.5 US qt)

A	END GAP LIMIT: TOP/2ND: 0.60 mm (0.024 in)
B	SIDE CLEARANCE LIMIT:
C	Top: 0.10 mm (0.039 in)
D	2nd: 0.11 mm (0.043 in)

E	PISTON CLEARANCE: 0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)



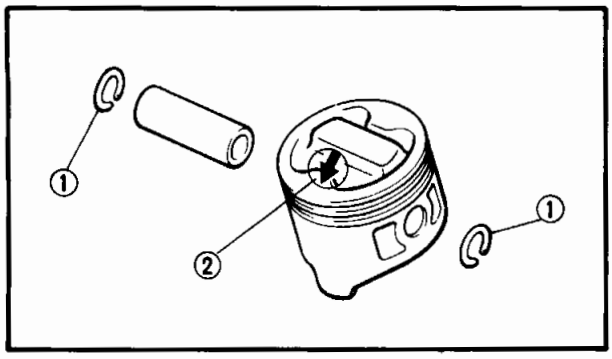


Piston

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

NOTE:

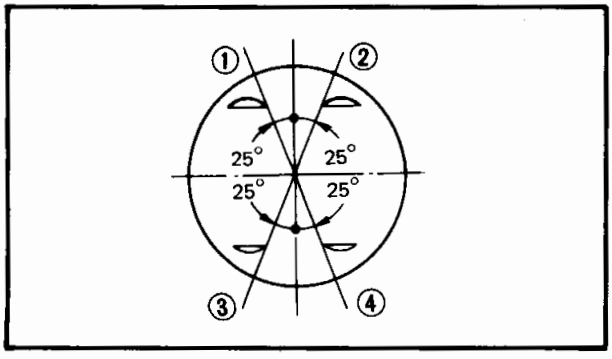
Be sure to install the rings so that Manufacturer's marks or numbers are located on the top side of the rings. Oil the pistons and rings liberally.



2. Install:
   - Pistons

NOTE:

- Be sure the piston is positioned correctly.
- Always install new piston pin clips ①.
- The arrow 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

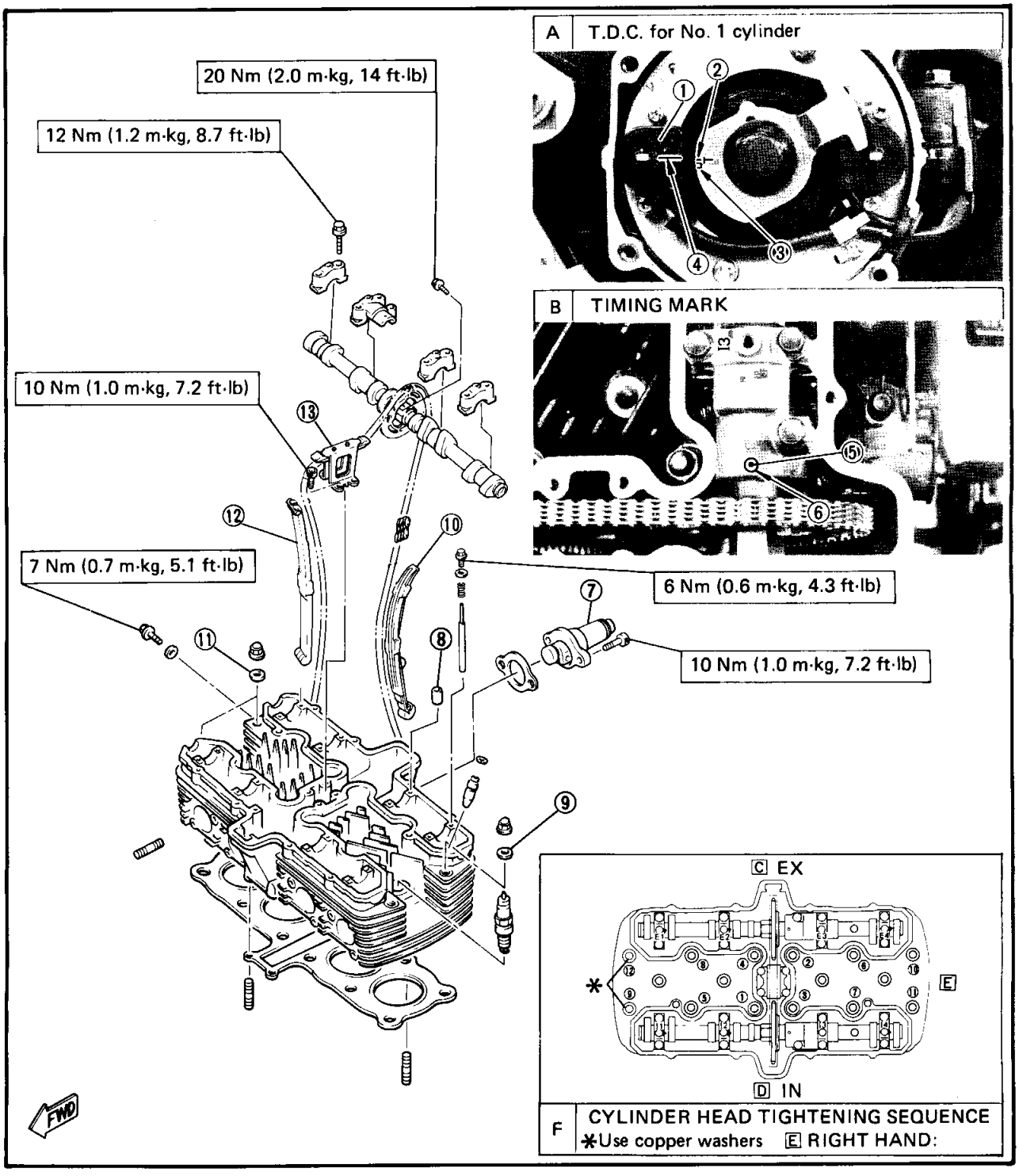
5. Install:
   - Dowel pins
   - Gasket (New)
   - Cylinder (with new O-rings)

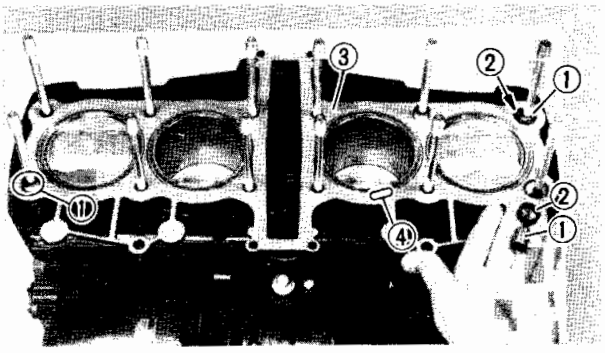
CAUTION:

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

CYLINDER HEAD AND CAMSHAFT

1. Pickup coil
2. T.D.C. mark for No. 1 cylinder
3. Firing rante for No. 1 cylinder
4. Stationary pointer
5. Camshaft timing mark
6. Cam cap ("I3", "E3") timing hole
7. Cam chain tensioner
8. Dowel pin
9. Copper washer
10. Cam chain guide (Rear)
11. Plate washer
12. Cam chain guide (Front)
13. Cam chain guide (Upper)





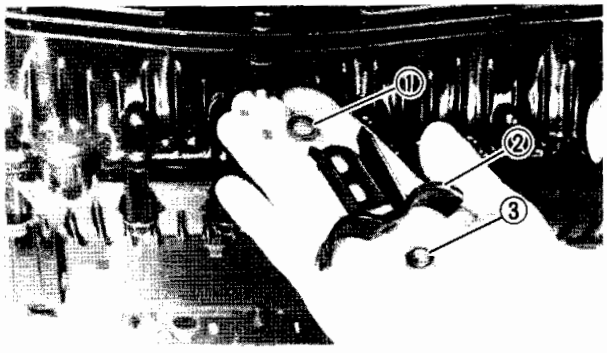
1. Install:
   - Dowel pins ①
   - O-rings (New) ②
   - Cylinder head gasket (New) ③

NOTE:
The gasket "HEAD" mark ④ should face upward.

2. Install:
   - Cylinder head

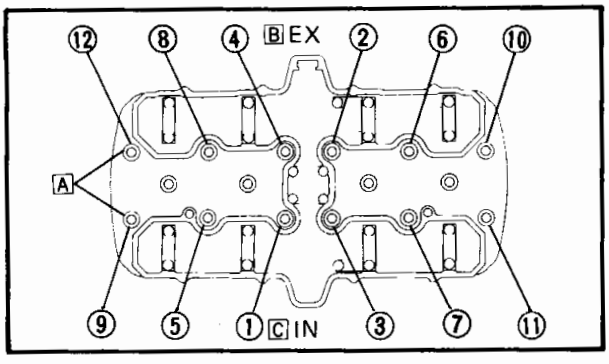
NOTE:
- Be careful not to damage the cam chain guide during installation.
- Pass the cam chain through the cam chain cavity.

- All nuts and washers
  (For cylinder head)



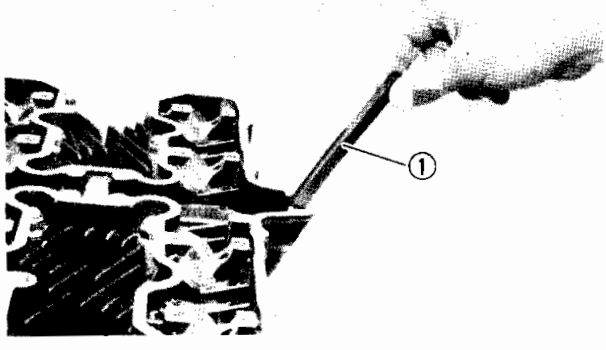
NOTE:
Lubricate the nut [10 mm (0.39 in)] threads with engine oil.

- Washer ①
- Clamp ②
- Nut ③
  (For cylinder)



3. Tighten:
   - Nuts
     In sequence as shown and torque the nut in two stages.

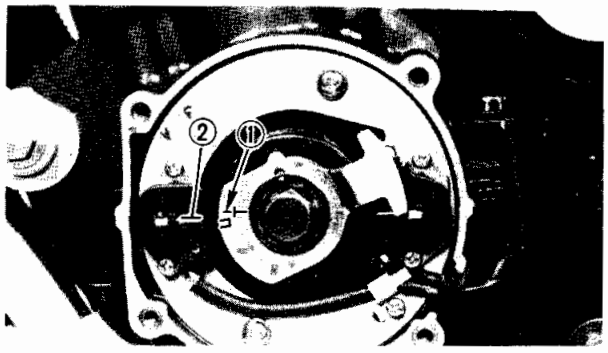
Cylinder Head: [10 mm (0.39 in)]
35 Nm (3.5 m·kg, 25 ft·lb)
Cylinder Head: [6 mm (0.24 in)]
10 Nm (1.0 m·kg, 7.2 ft·lb)
Cylinder: [8 mm (0.31 in)]
20 Nm (2.0 m·kg, 14 ft·lb)

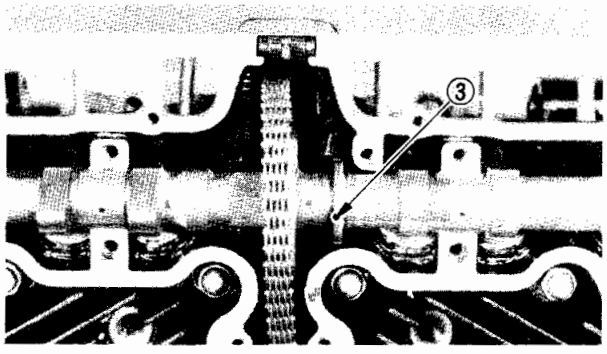


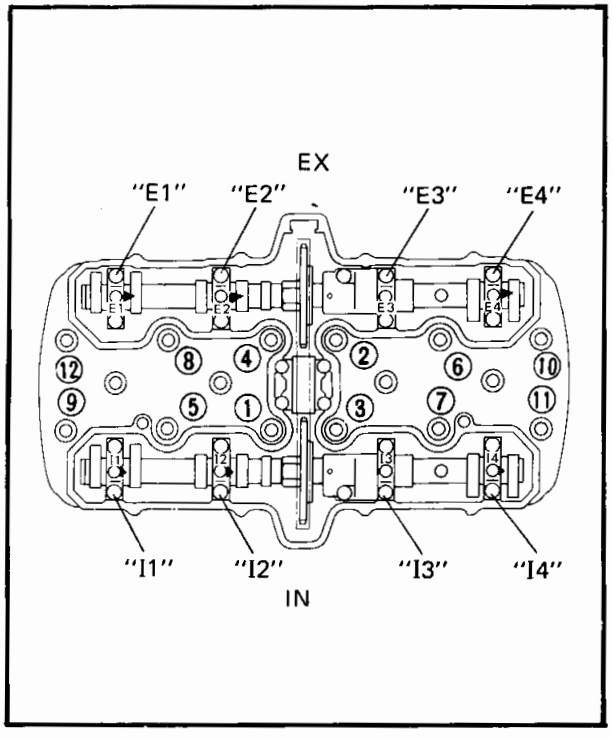
A Copper washer
B Exhaust
C Intake

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

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







Camshaft

1. Install:
   - Camshafts

Camshaft 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 during the camshafts installation.
- Install the cam chain sprockets onto the camshafts. The "EX" and "IN" marks on the sprocket should face toward the left side.
- Apply engine oil to the camshaft bearing surfaces.
- Install the "IN" marked camshaft onto the intake side and "EX" marked camshaft onto the exhaust side.
- 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 "I3" and "E3" caps onto the camshaft. **Do not tighten cap bolts at this stage.**
- Install the remaining caps onto the camshafts and tighten the cap bolts.

CAUTION:

First tighten the Nos. 2, 4 and 1 cap bolts in that order, then the No. 3 cap bolts; otherwise, No. 3 caps may be damaged or bent.

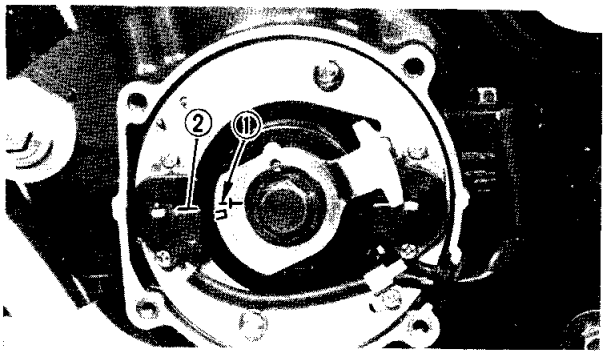
NOTE:

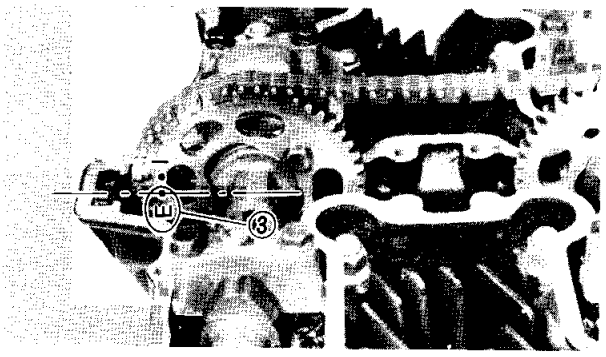
- The arrow mark on the caps should face toward the right side.
- The "I" mark on the caps should be installed onto the intake camshaft.
- The numbers are punched on the camshaft caps in increments from left to right.

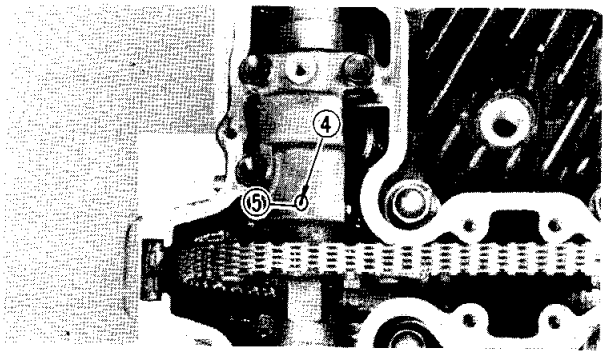
Camshaft Cap Bolts:
12 Nm (1.2 m·kg, 8.7 ft·lb)

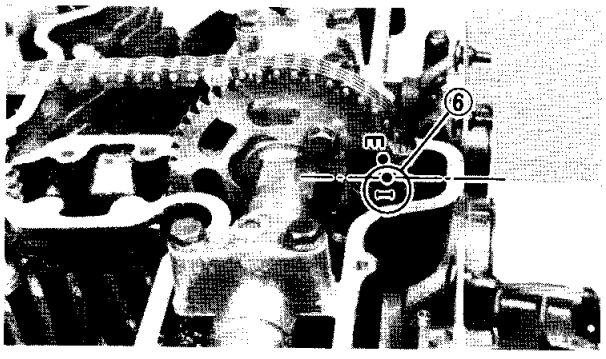
- Tighten the "I3" and "E3" cap bolts.

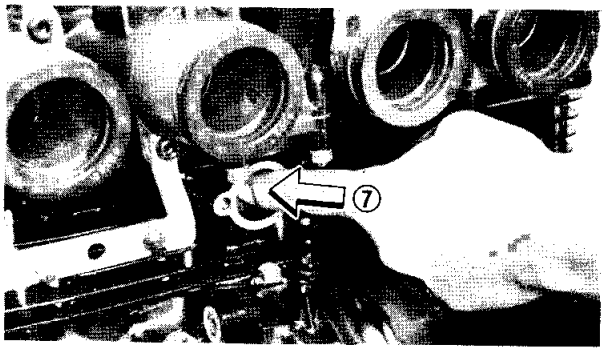
Camshaft Cap Bolts:
12 Nm (1.2 m·kg, 8.7 ft·lb)









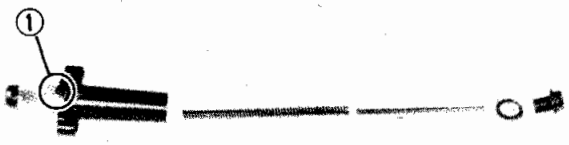


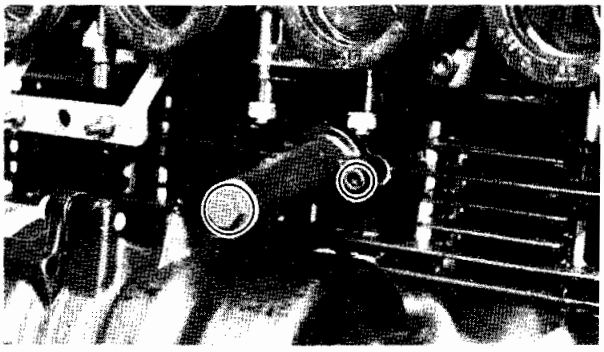
Cam Chain Sprockets and Cam Chain Tensioner

1. Install:
   - Cam chain sprockets
   - Cam chain tensioner

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 during the sprockets in stallation.**
- Place the cam chain onto the exhaust sprocket.
- Install the sprockets with the punched marks "E" facing outward ③ and finger tighten the sprocket bolt.
- Rotate the exhaust camshaft to align the punched mark on the camshaft ④ with a hole in the camshaft cap ("E3") ⑤ .
- Force the exhaust camshaft clockwise to remove the camchain slack.
- Place the cam chain onto the intake sprocket.
- Install the sprocket with the punched mark "I" facing outward ⑥ and finger tighten the sprocket bolt.
- Rotate the intake camshaft to align the punched mark on the camshaft with a hole in the camshaft cap ("I3").
- Force the intake camshaft clockwise to remove the all 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 holes.
- Remove the intake sprocket, if marks do not align.
- Change the meshing position of sprocket and cam chain.





Cam chain tensioner installation steps:

1. Remove the tensioner end cap bolt and spring.
2. Release the cam chain tensioner one-way cam.
3. Set the tensioner rod length as shown. (For initial preload)

Tensioner Rod Length:
35.5 mm (1.4 in)

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

CAUTION:

The one-way cam ① should be placed downward.

5. Tighten the bolts.

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

6. Install the tensioner springs and end cap bolt. Tighten the bolt.

Tensioner End Cap Bolt:
6 Nm (0.6 m·kg, 4.3 ft·lb)

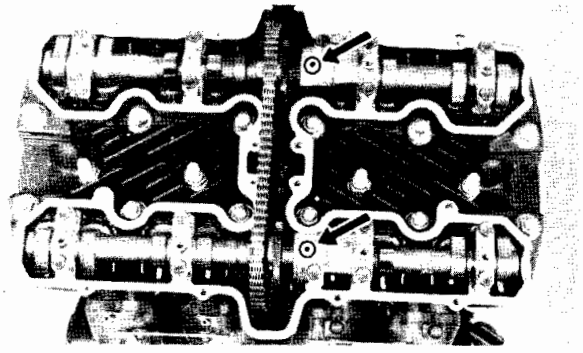
2. Turn the crankshaft and install the sprock ets securing bolts.
3. Tighten:
   - Sprocket bolts

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.

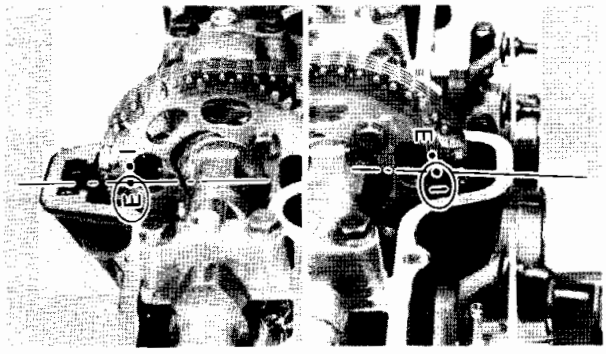
4. Apply engine oil to the cam chain, sprockets, camshafts, and valves.

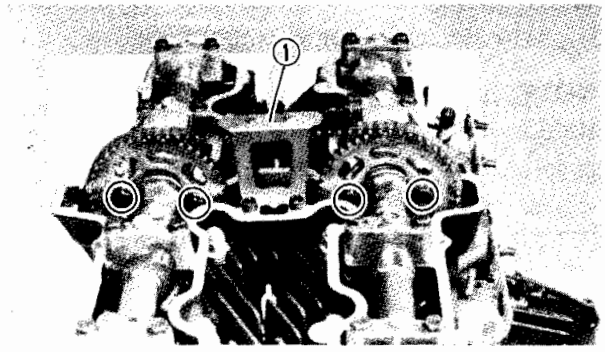


5. Turn the crankshaft counterclockwise a few turns to check that it turns smoothly.

CAUTION:

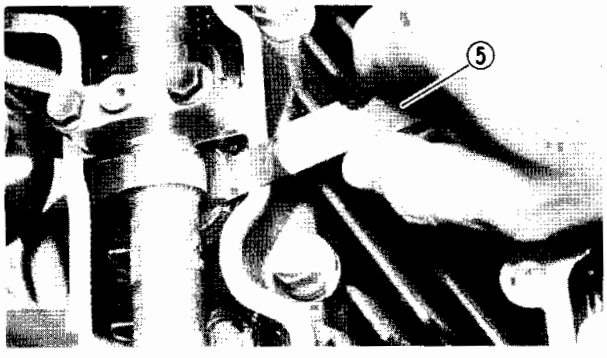
Be sure the exhaust and intake camshaft marks are aligned with the cam cap holes.





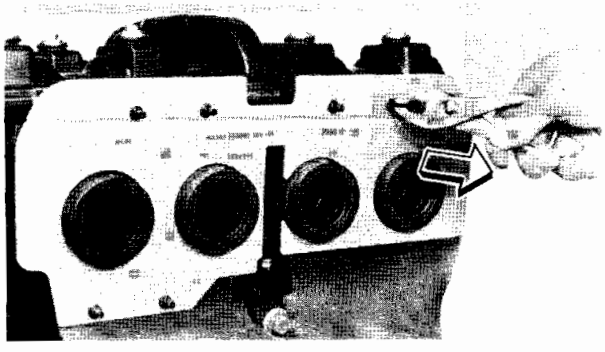
6. Install:
   - Cam chain guide (Upper) ①
7. Tighten:
   - Bolts

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



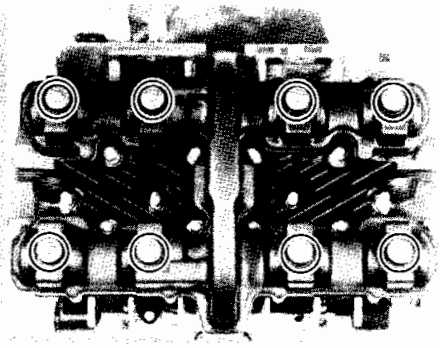
8. Measure:
   - Valve clearance
     Out of specification → Adjust.

IN: 0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in) EX: 0.16 ~ 0.20 mm (0.0063 ~ 0.0079 in)



Head Cover and Spark Plugs

1. Install:
   - Air baffle plate
   - Head cover (with new gasket)
   - Spark plugs



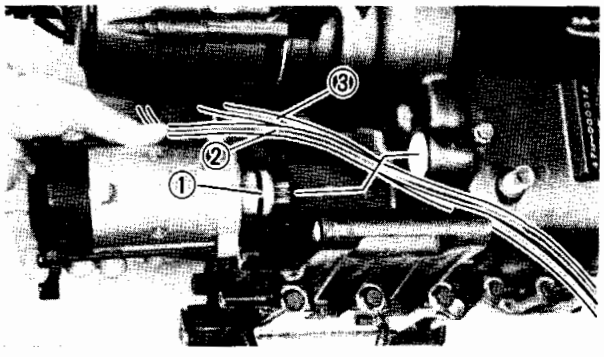
2. Tighten:
   - Bolts
   - Spark plugs

	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)**

Generator and Starter Motor

1. Apply grease to the O-ring and insert the generator assembly.
2. Tighten:
   - Bolts

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

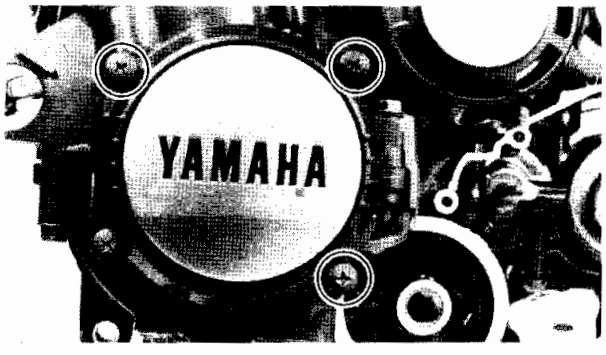


3. Apply grease to the O-ring ① and insert the starter motor assembly.

NOTE:
Before installing the starter motor, route the generator ② and pickup coil ③ leads under the starter motor.

4. Tighten:
   - Bolts

	Starter Motor: **10 Nm (10 m·kg, 7.2 ft·lb)**



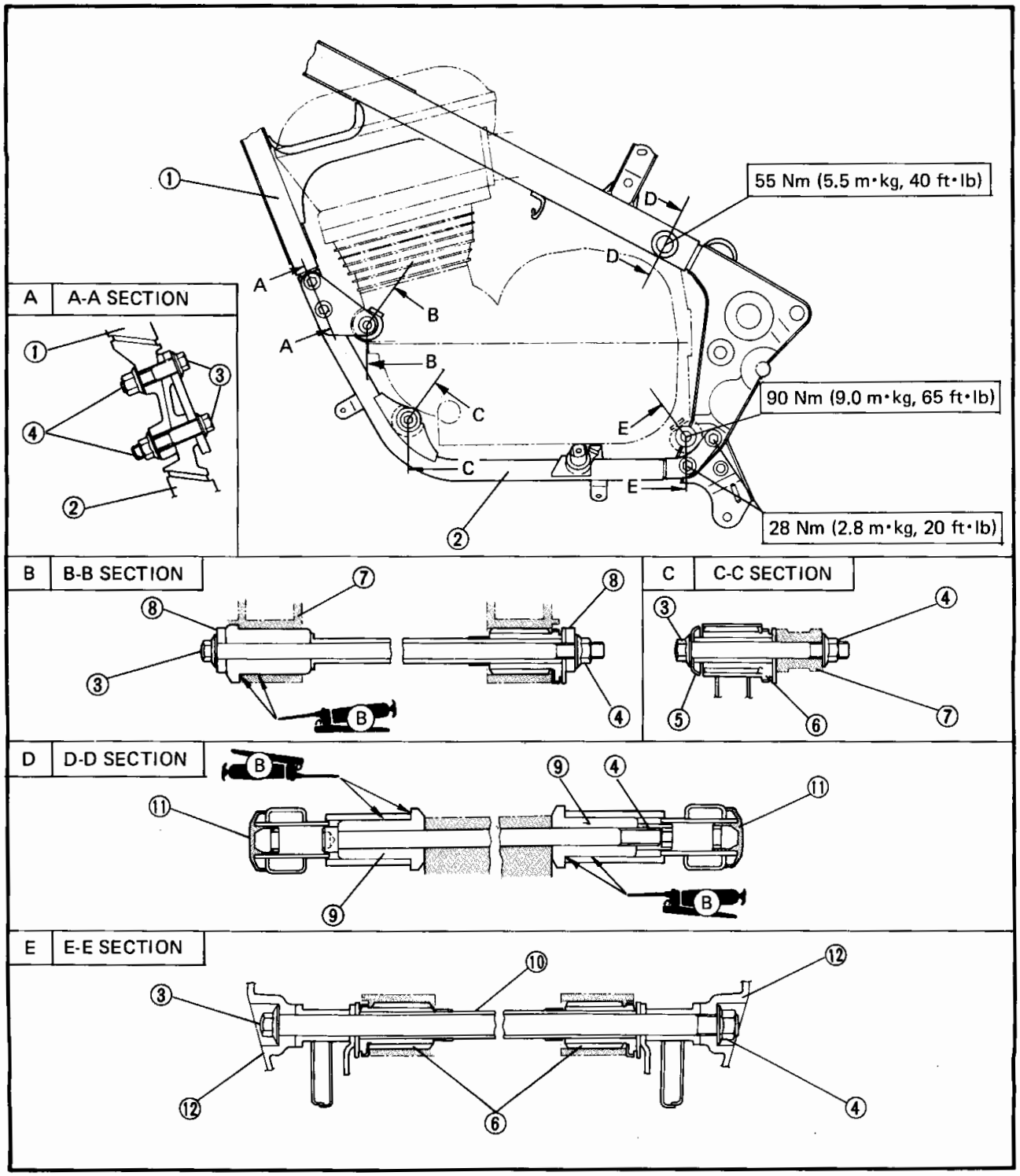
5. Install:
   - Crankshaft end cover (Left)
6. Tighten:
   - Screws

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

REMOUNTING ENGINE

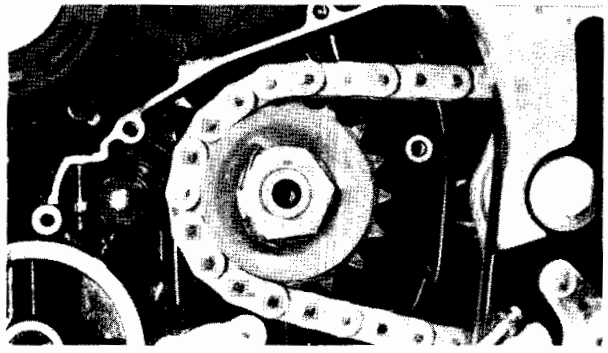
1. Refer to engine removal. Reverse those *removal* steps that apply.

1. Frame
2. Downtube frame
3. Flange bolt
4. Nut
5. Washer
6. Damper
7. Crankcase
8. Engine stay
9. Collar
10. Spacer
11. Cap
12. Muffler bracket



2. Tighten:
   - Engine mount bolts

Engine Front Upper:
55 Nm (5.5 m·kg, 40 ft·lb)
Engine Front Under:
55 Nm (5.5 m·kg, 40 ft·lb)
Engine Rear Upper:
55 Nm (5.5 m·kg, 40 ft·lb)
Engine Rear Under:
90 Nm (9.0 m·kg, 65 ft·lb)

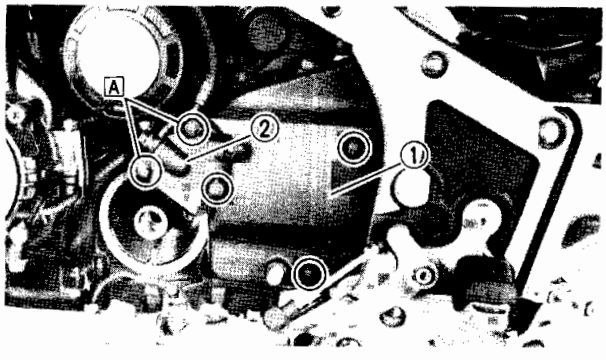


3. Install:
   - Drive sprocket (with drive chain)
   - Lock washer (New)
   - Sprocket securing nut
4. Tighten:
   - Nut

Drive Sprocket:
85 Nm (8.5 m·kg, 61 ft·lb)

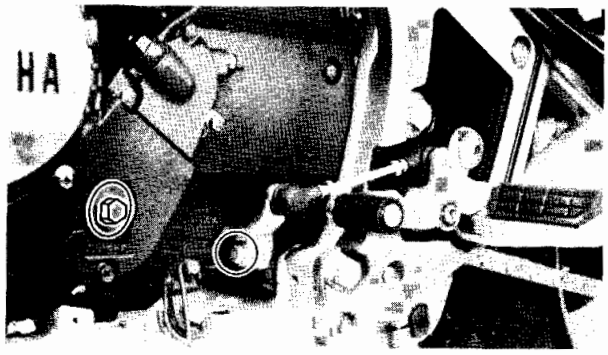
5. Adjust:
   - Drive chain slack

Drive Chain Slack:
15 ~ 20 mm (0.6 ~ 0.8 in)



6. Install:
   - Dowel pins
   - Gasket (New)
   - Crankcase cover (Left) ①
   - Clutch release ②
     Apply Quick Gasket® (ACC-11001-05-01) to the bolts A.
7. Tighten:
   - Crankcase cover (Left)
   - Clutch release

Crankcase Cover:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Clutch Release:
10 Nm (1.0 m·kg, 7.2 ft·lb)
A Quick Gasket® (Sealant)

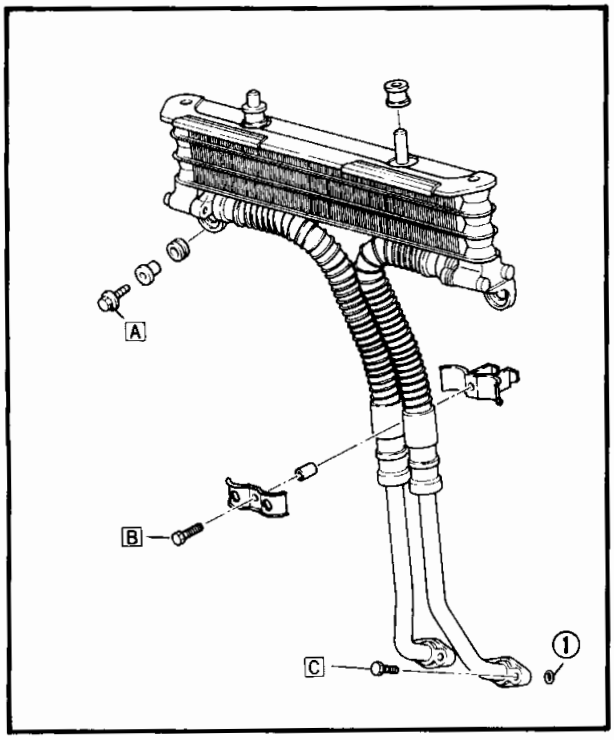


8. Install:
   - Oil filter case assembly
9. Tighten:
   - Oil filter cover bolt

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

10. Install:
    - Shift arm
11. Tighten:
    - Shift arm

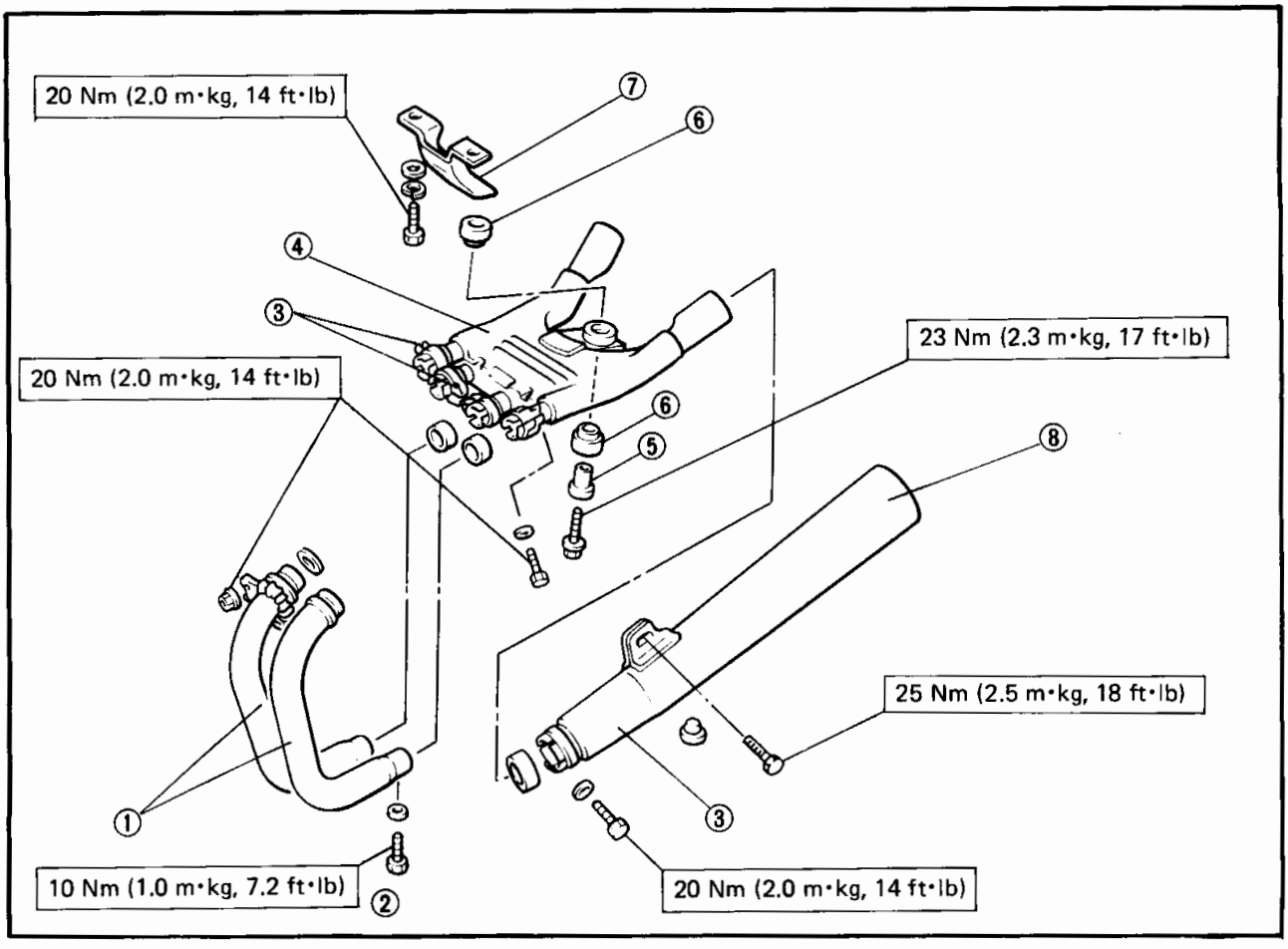
Shift Arm:
10 Nm (1.0 m·kg, 7.2 ft·lb)



12. Install:
    - Canisters (**For California only**)
    - Oil cooler assembly (with new O-rings ①)
13. Tighten:
    - Oil cooler bolts

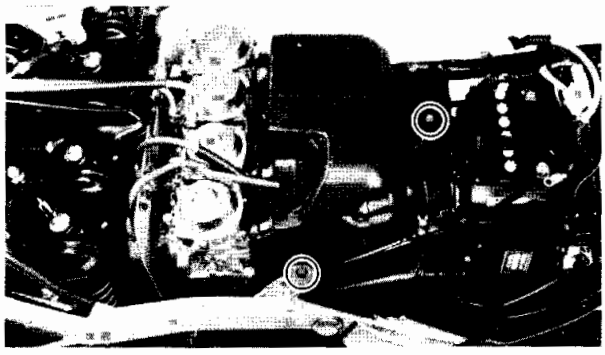
Oil Cooler Mount [A]:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Oil Cooler Hose [B]:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Oil Hose Clamp [C]:
10 Nm (1.0 m·kg, 7.2 ft·lb)

14. Install:
    - Exhaust chamber stay
    - Exhaust chamber
    - Mufflers
    - Exhaust pipes
15. Tighten:
    - Bolts



① Exhaust pipe
② Blind plug
③ Clamp
④ Exhaust chamber
⑤ Collar
⑥ Rubber damper
⑦ Exhaust chamber stay
⑧ Muffler

16. Connect:
    - Throttle cable
17. Install:
    - Carburetors
    - Air cleaner case



18. Tighten
    - Screws
    - Bolts

	Air Cleaner Case: **7 Nm (0.7 m·kg, 5.1 ft·lb)**

19. Connect:
    - Choke cable
    - Pickup coil lead
    - Generator lead
    - Neutral switch lead
    - Oil level switch lead
    - Starter motor lead
    - Crankcase ventilation hose
    - Boost control hose
    - Battery leads
    - Sidestand switch lead

NOTE:
- See CHAPTER 7 "Cable Routing" for proper cable, lead, and hose routing.
- The white paint mark on the crankcase ventilation hose should face toward the front.
- Connect the battery positive lead first.
- Make sure that the cables are not twisted.
- Be careful not to pinch the leads.

20. Install:
    - Fuel tank
    - Seat
    - Side covers
    - Lower cowling
21. Add:
    - Engine oil

	Engine Oil: **4.2 L (3.7 Imp qt, 4.4 US qt)**

CHAPTER 4.
CARBURETION

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SECTION VIEW 4-2

CARBURETOR OVERHAUL 4-5
REMOVAL 4-5
DISASSEMBLY 4-6
INSPECTION 4-7
ASSEMBLY 4-7
FLOAT HEIGHT ADJUSTMENT 4-8
INSTALLATION 4-8
FUEL LEVEL ADJUSTMENT 4-9

AIR CLEANER AND CRANKCASE VENTILATIONS SYSTEM 4-10

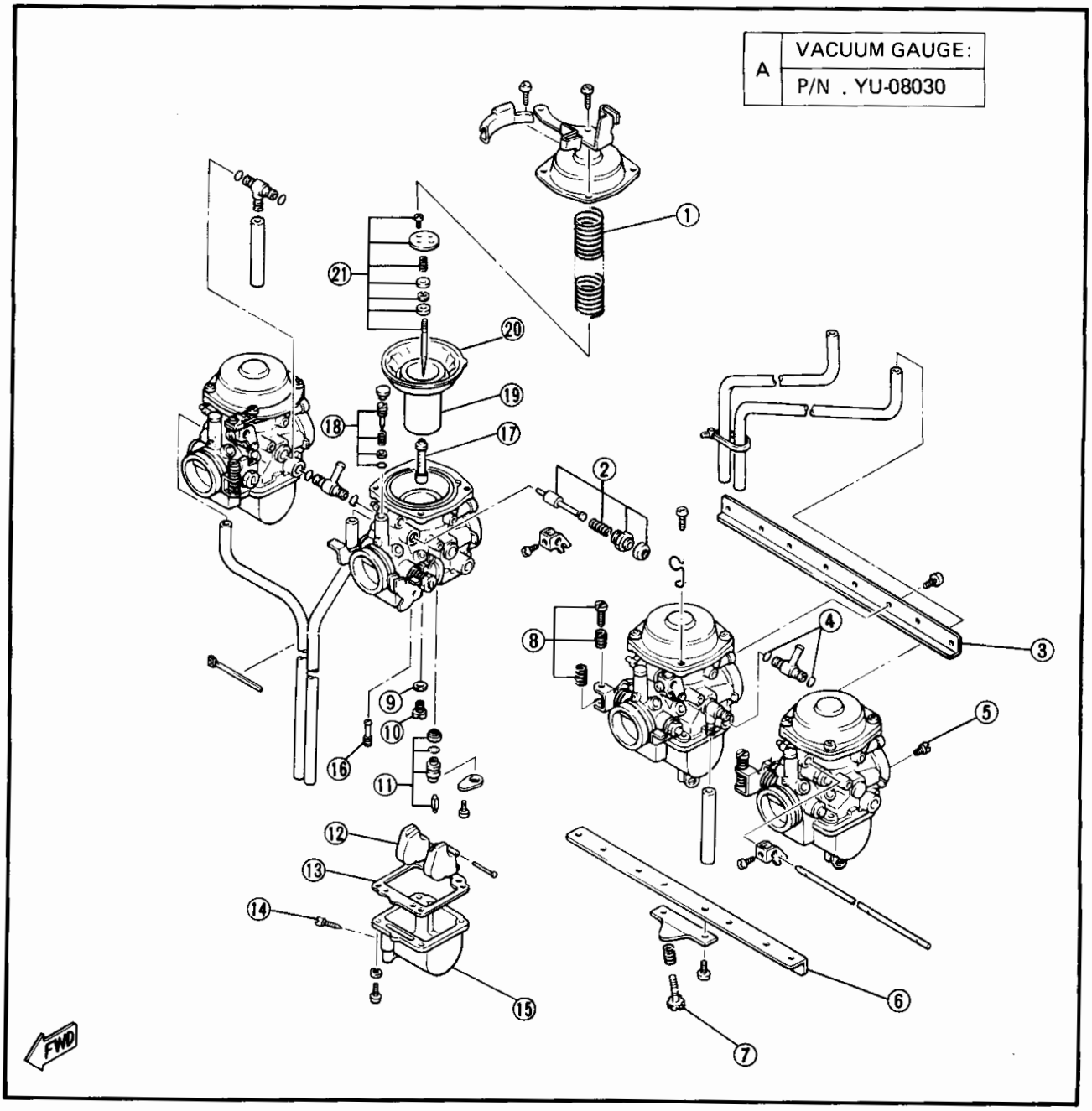
CARBURETION

CARBURETOR

1. Piston valve spring
2. Starter plunger assembly
3. Upper bracket
4. O-ring
5. Pilot air jet
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. Pilot screw assembly
19. Piston valve
20. Diaphragm
21. Jet needle assembly

SPECIFICATIONS	
Main jet	#112.5
Main air jet	#45
Jet needle	5FZ63-3
Needle jet	Y-0
Pilot jet	#37.5
Pilot air jet	#160
Fuel level	3.0 ± 1.0 mm (0.12 ± 0.04 in)
Float height	22.3 ± 1.0 mm (0.88 ± 0.04 in)
Pilot screw	Preset
Float valve seat	ϕ 2.3
Engine idle speed	1,000 ± 50 r/min

A	VACUUM GAUGE:
	P/N . YU-08030

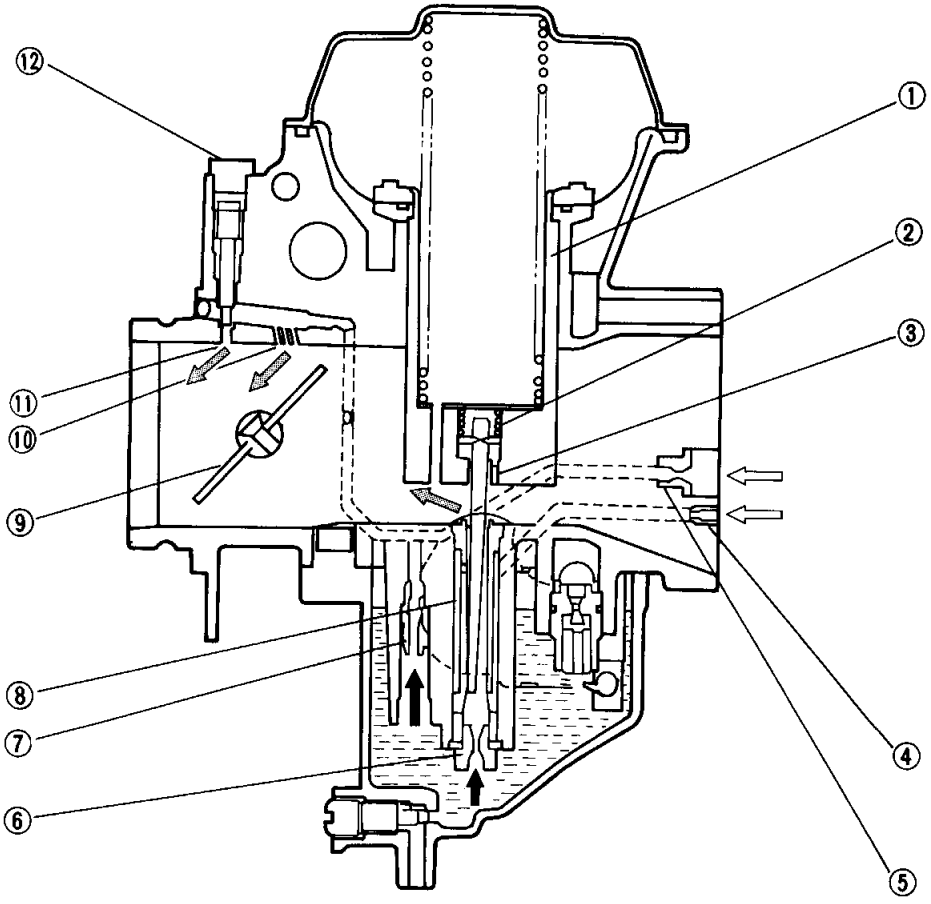


SECTION VIEW 1.

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 screws

A	⇦	AIR
B	⇦	MIXTURE
C	⇦	FUEL

[D] MAIN METERING SYSTEM

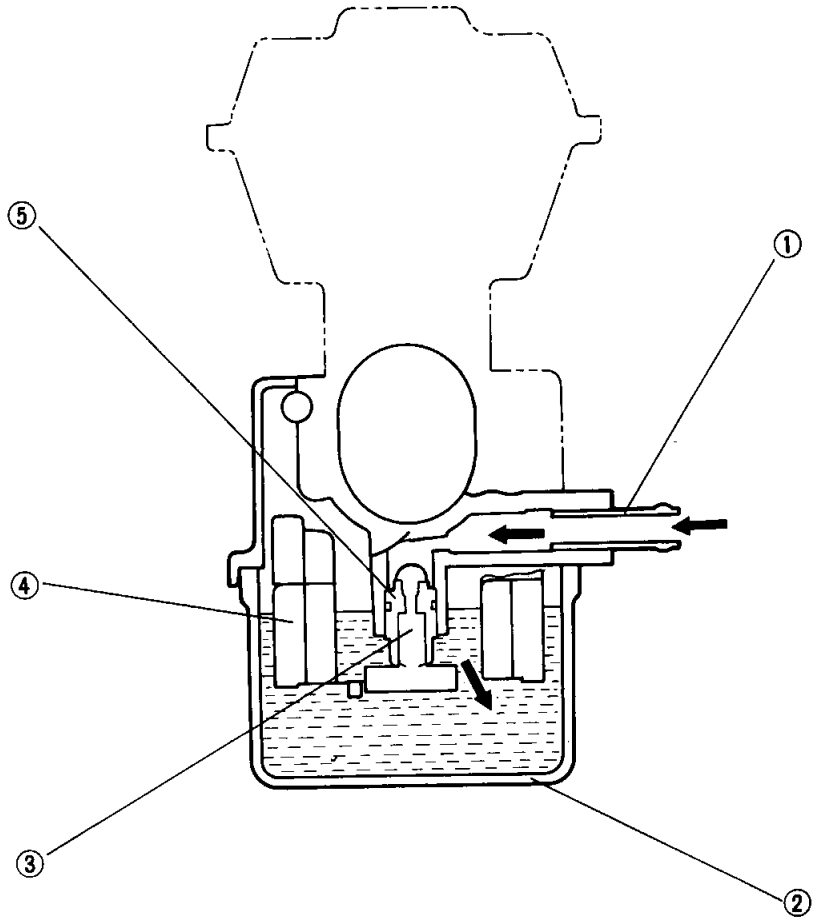


SECTION VIEW 2.

1. Fuel inlet
2. Float chamber cover
3. Needle valve
4. Float
5. Valve seat

A	⇦	AIR
B	⇦	MIXTURE
C	⇦	FUEL

[D] FLOAT SYSTEM

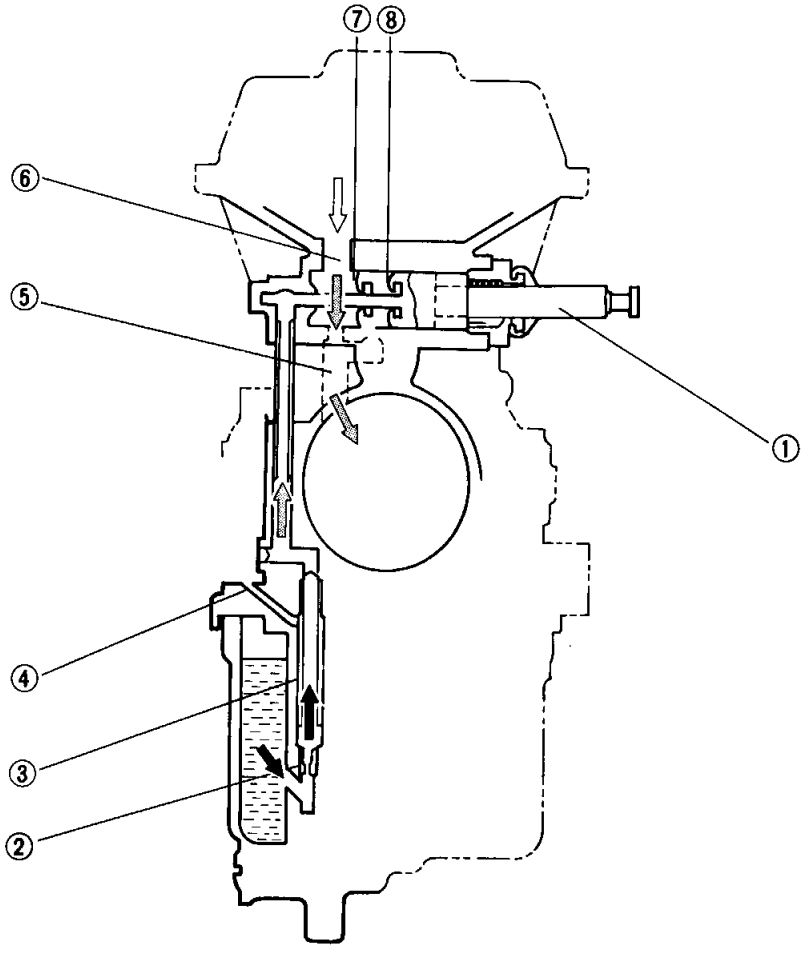


SECTION VIEW 3.

1. Starter plunger
2. Starter jet
3. Starter bleed pipe
4. Starter air bleed
5. Mixture outlet
6. Air inlet
7. Starter half position
8. Starter full position

A	⇦	AIR
B	⇦	MIXTURE
C	⇦	FUEL

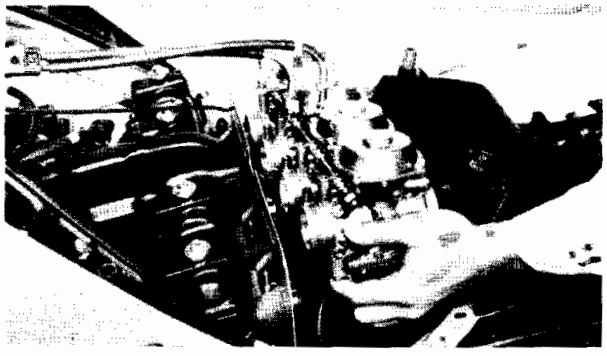
[D] STARTER SYSTEM



CARBURETOR OVERHAUL

WARNING:

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



REMOVAL

1. Remove:
   - Carburetor assembly

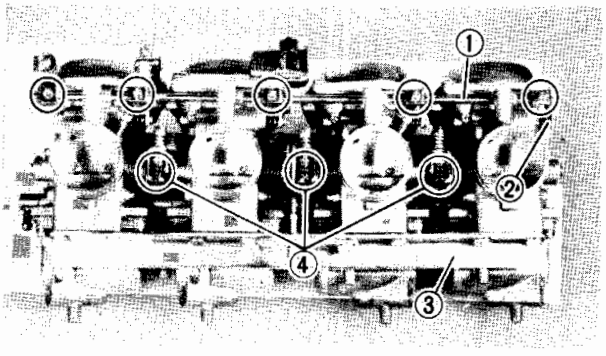
   Refer to engine removal section.

NOTE:

The following parts can be cleaned and inspected without disassembly.

- Piston valve
- Jet needle

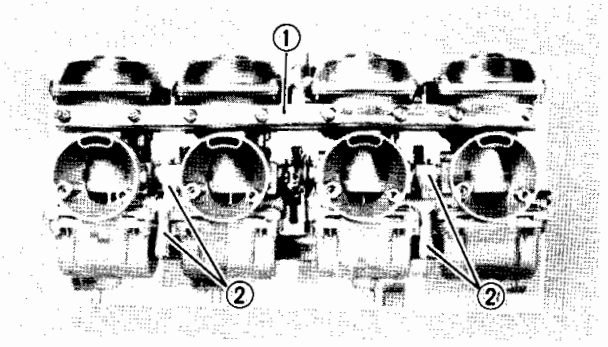
2. Disconnect:
   - Drain hoses
   - Fuel hoses
   - Throttle cables
3. Number each carburetor before removing it from carburetor brackets.



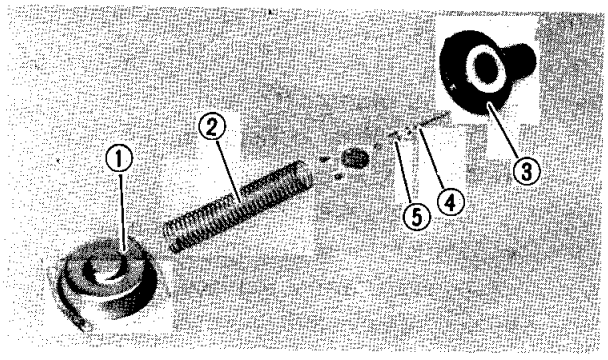
4. Loosen:
   - Starter lever screws
5. Remove:
   - Starter lever shaft ①
   - Starter levers ②
   - Lower bracket ③

NOTE:

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



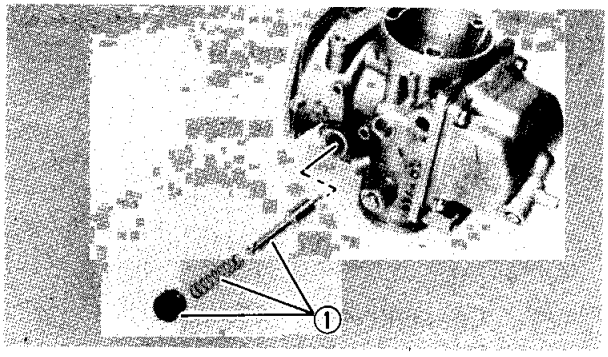
6. Remove:
   - Upper bracket ①
   - Carburetors
   - Carburetor joints ②



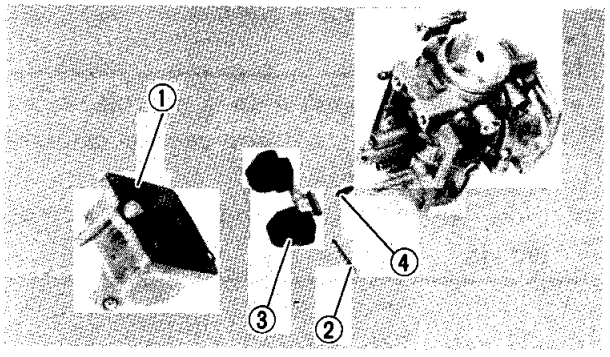
DISASSEMBLY

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

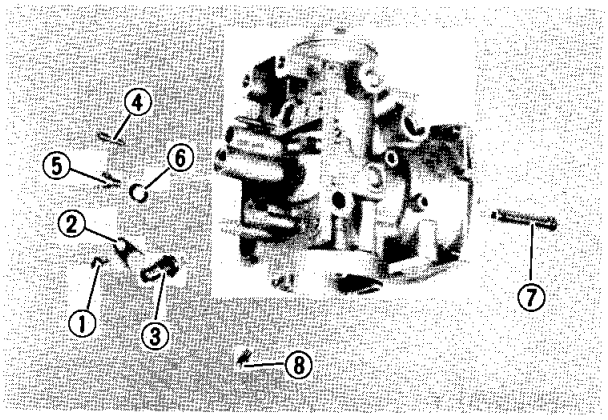
NOTE:
When removing the jet needle be sure not to loose the small spring ⑤ that may fall out. This spring holds the jet needle.



2. Remove:
   - Starter plungers ①

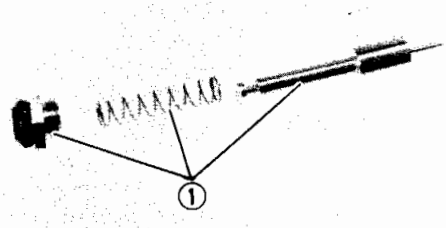


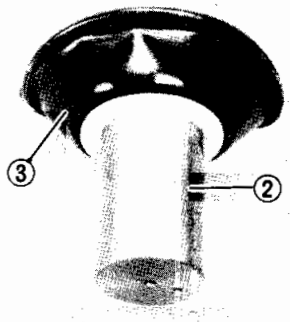
3. Remove:
   - Float chamber cover ①
   - Float pin ②
   - Float ③
   - Needle valve ④

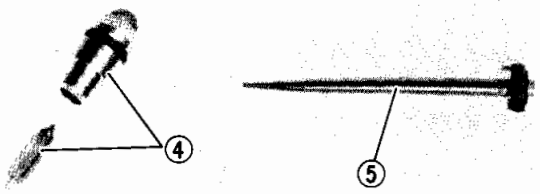


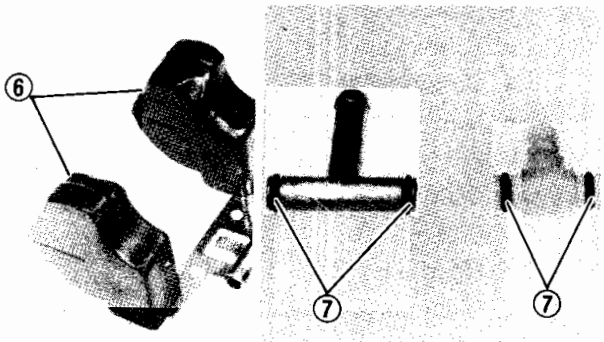
4. Remove:
   - Screw ①
   - Retainer ②
   - Valve seat ③
   - Pilot jet ④
   - Main jet ⑤
   - Washer ⑥
   - Needle jet ⑦
   - Main air jet ⑧

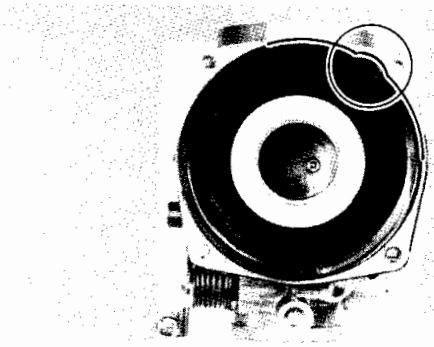
NOTE:
Remove the needle jet toward the vacuum piston.











INSPECTION

1. Inspect:
   - Starter plunger ①
     Damage/Wear → Replace.
   - Vacuum piston ②
     Scratches/Wear → Replace.
   - Throttle valve diaphragm ③
     Damage/Torn → Replace.
   - Needle valve and valve seat ④
     Wear → Replace.
   - Jet needle ⑤
     Bends/Wear → Replace.
   - Float ⑥
     Damage/Torn → Replace.
   - Carburetor body
   - Fuel passage
     Contamination → Clean.
   - Jets
     Contamination → Clean.
   - O-rings (Carburetor joint) ⑦
     Wear/Damage → Replace.

NOTE:

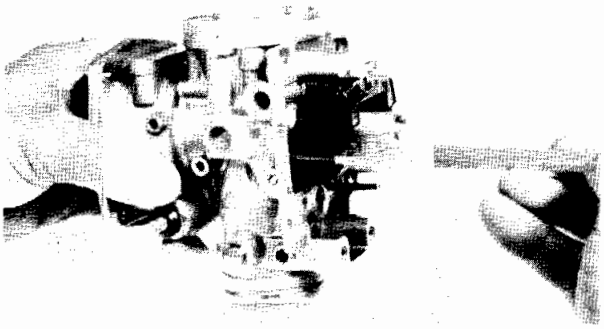
- Wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solutions.
- Blow out all passages and jets with compressed air.

ASSEMBLY

1. Assembly:
   - 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.



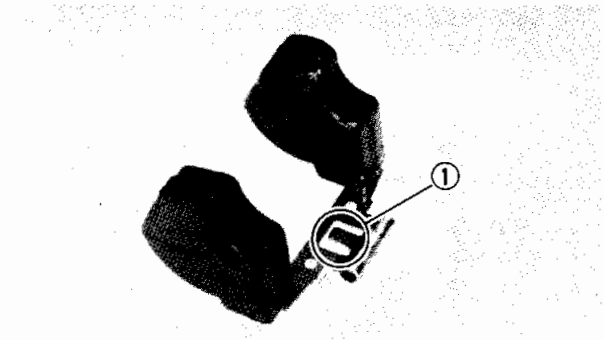
FLOAT HEIGHT ADJUSTMENT

1. Measure:
   - Float height
     Out of specification → Adjust.

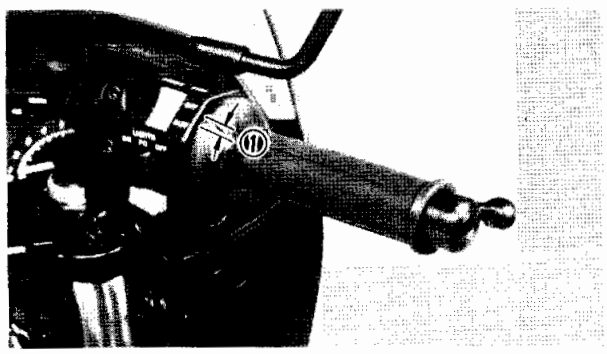
Float height measurement steps:
- Hold the carburetor in an upside down position.
- Incline the carburetor at 60 ~ 70° (so that the end of the float valve does not hang down as a result of float weight).
- Measure the distance from the mating surface of the float chamber (gasket removed) to the top of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

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

Float Height:
22.3 ± 1 mm (0.88 ± 0.04 in)



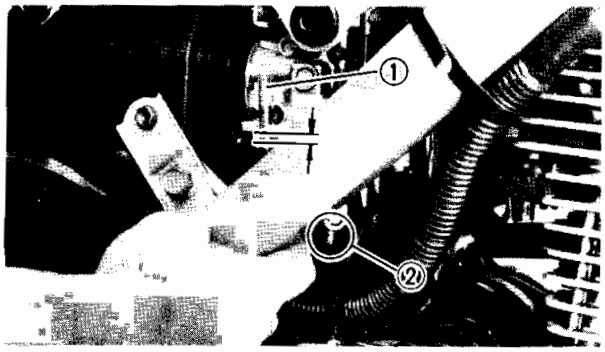
Float height adjustment step:
- Remove the float.
- Adjust float height by bending the float tang ① slightly.
- Repeat the procedure for other carburetors.

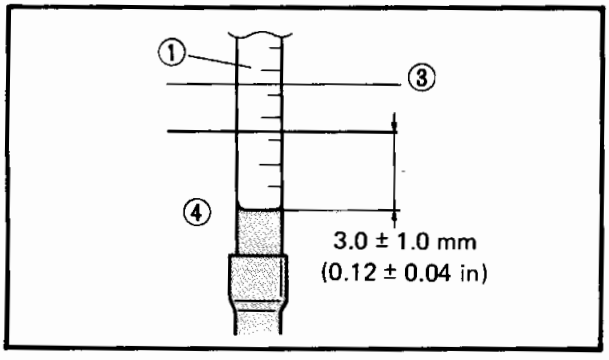


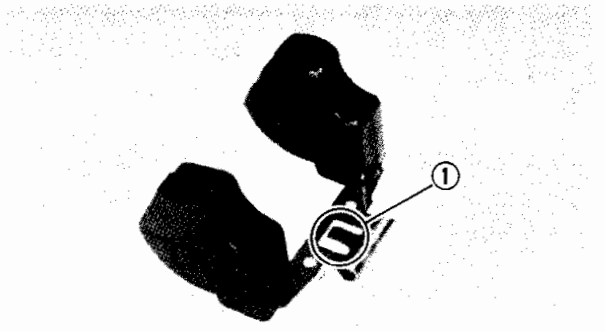
INSTALLATION

1. Install:
   - Carburetors
     Reverse the removal steps.

Throttle Cable Free Play ① :
5 mm (0.2 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 (YM-01312) to the drain nozzle ②.
- Loosen the drain screw 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)

③ Carburetor body
④ Float chamber

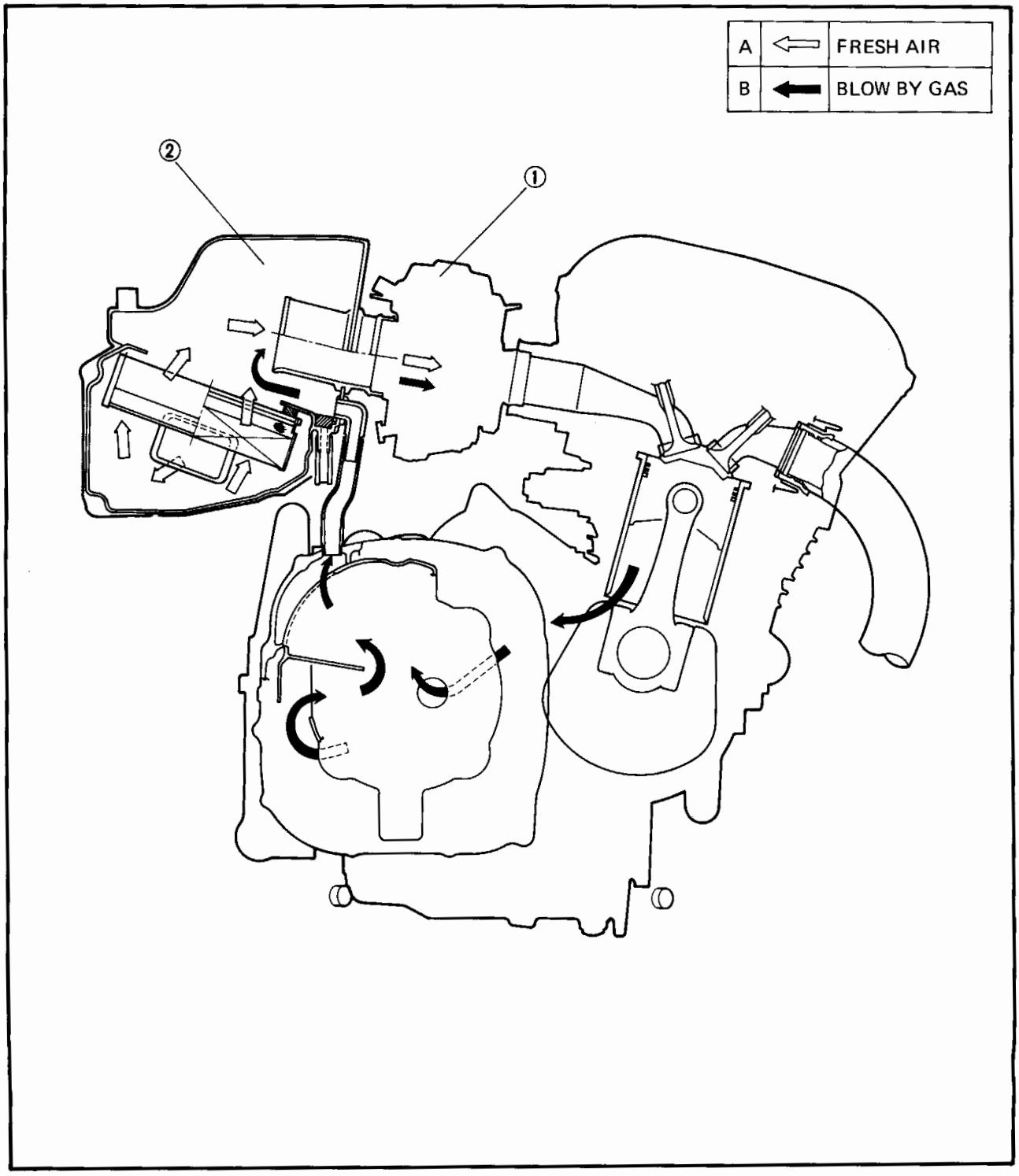
2. Adjust:
   - Fuel level
     If necessary

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

AIR CLEANER AND CRANKCASE VENTILATIONS SYSTEM

Refer to "CHAPTER 2" for air cleaner maintenance.

1. Air cleaner
2. Carburetor



CHAPTER 5.
CHASSIS

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- TUBELESS TIRES AND CAST WHEELS 5-2
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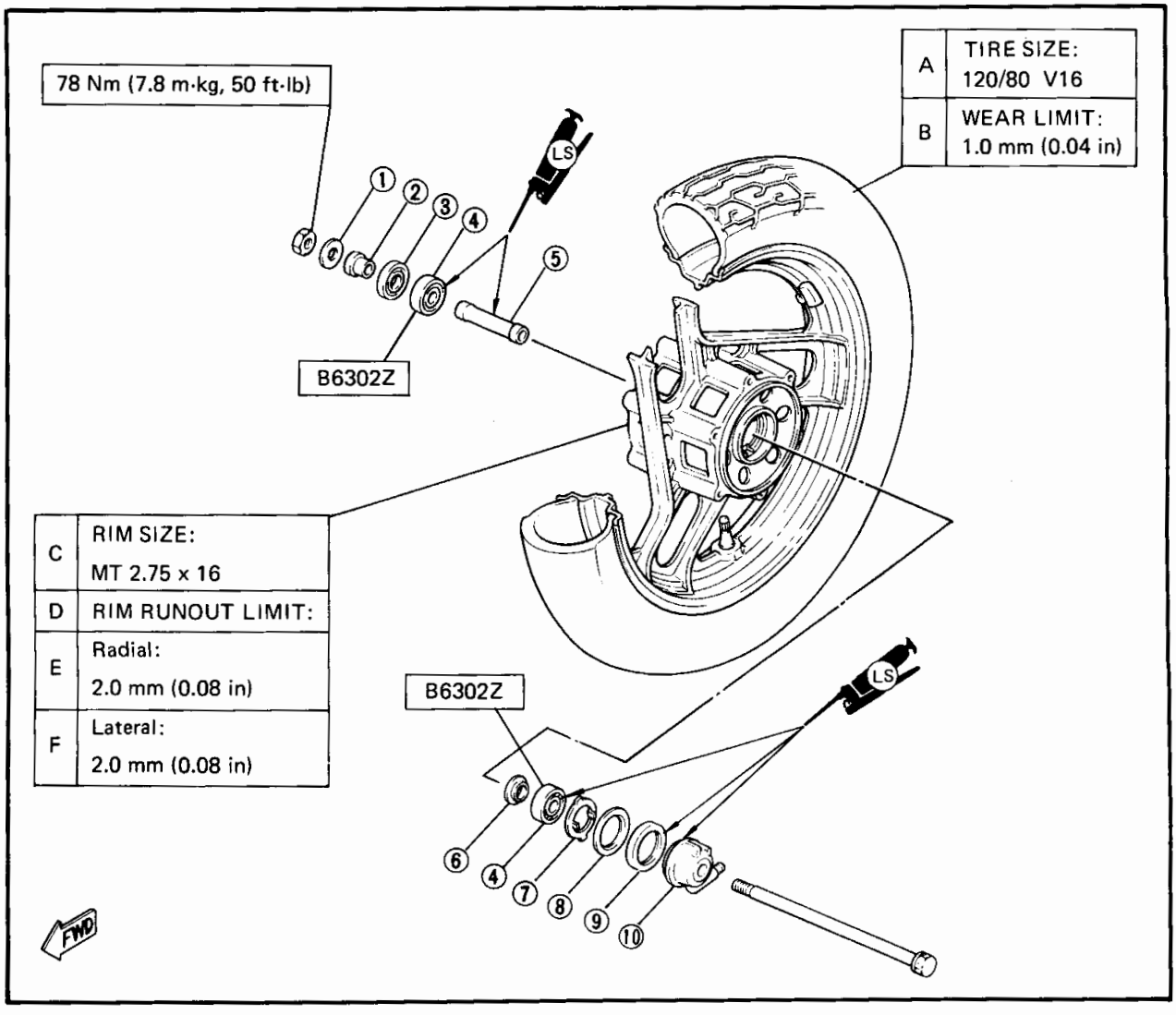
CHASSIS

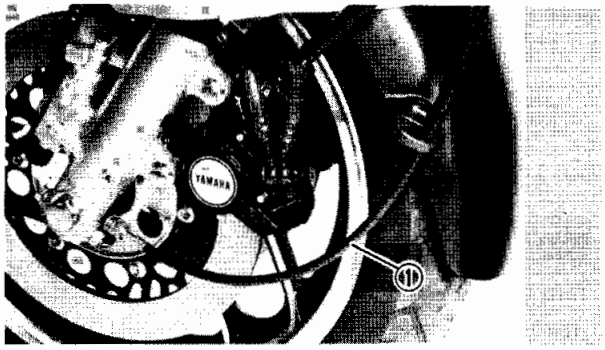
FRONT WHEEL

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

Basic weight: With oil and full fuel tank	Except for California: 252 kg (556 lb) For California: 253 kg (558 lb)	
Maximum load*	198 kg (437 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	226 kPa (2.3 kg/cm², 32 psi)	245 kPa (2.5 kg/cm², 36 psi)
90 kg (198 lb) ~ Maximum load*	245 kPa (2.5 kg/cm², 36 psi)	284 kPa (2.9 kg/cm², 42 psi)
High speed riding	245 kPa (2.5 kg/cm², 36 psi)	284 kPa (2.9 kg/cm², 42 psi)

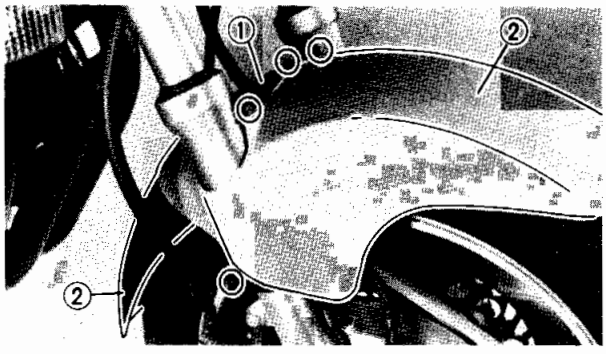
*Load is the total weight of cargo, rider, passenger, and accessories.





REMOVAL

1. Place the motorcycle on its centerstand.
2. Remove:
   - Speedometer cable ①

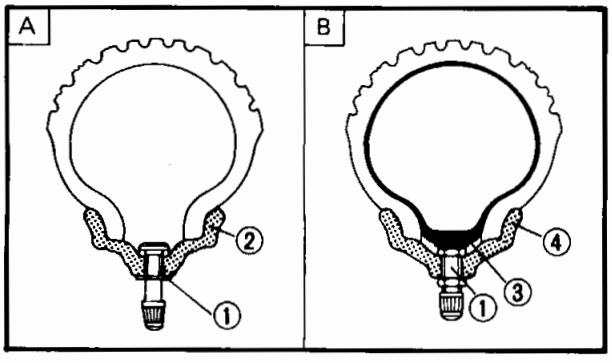


3. Remove:
   - Fork brace ①
   - Front fenders ②
   - Brake caliper (one side only)

NOTE:

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

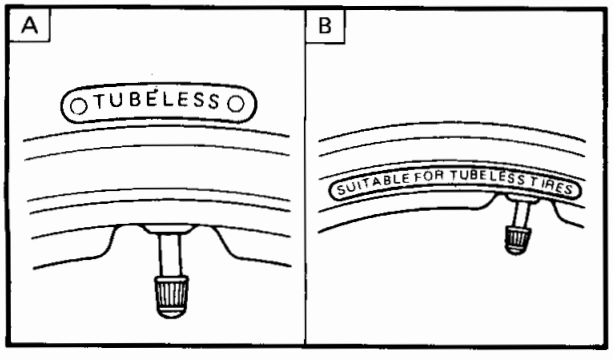
4. Remove:
   - Axle nut
5. Loosen:
   - Axle pinch bolts
6. Remove:
   - Front axle
   - Front wheel



TUBELESS TIRES AND CAST WHEELS

This motorcycle is equipped with cast wheels designed for either tube or tubeless tires.
Tubeless tires are installed as standard equipment.

① Air valve
② Cast wheel (Tubeless wheel)
③ Tube
④ Cast wheel
Ⓐ **TUBELESS-TYPE TIRE**
Ⓑ **TUBE-TYPE TIRE**



WARNING:

Do not attempt to use tubeless tires on wheels designed for tube-type tires only. Sudden tire deflation and loss of control may occur causing possible injury.
Be sure to install the proper tube when using tube-type tires.

Ⓐ TIRE
Ⓑ WHEEL

A	FRONT:	C	STANDARD TYPE		
D	Manufacture	E	Size	F	Type
	Bridgestone		120/80V16		G517
	Dunlop		120/80V16		F19

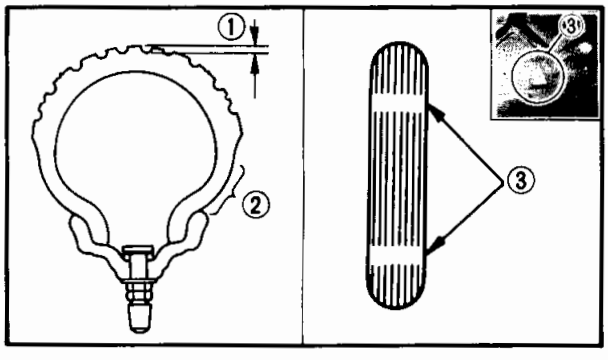
B	REAR:	C	STANDARD TIRE	
	Bridgestone		150/80V16	G516
	Dunlop		150/80V16	K727

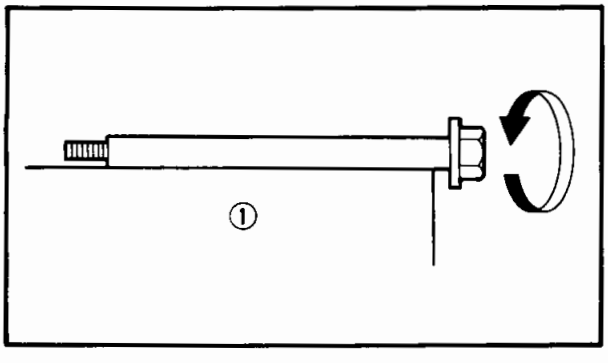
Tube-type Wheel	→ Tube-Type Tires only
Tubeless-type Wheel	→ Tube-type or Tubless tires

WARNING:

This motorcycle is fitted with "V" range tires (for super high speed running). The following points must be observed in order for you to make fully effective use of these tires.

- **Never fail to use "V" range tires in tire replacement. "S" or "H" tires may be in danger of bursting at super high-speeds.**
- **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).**
- **Before any high-speed runs, remember to allow a sufficient warm-up time for the tires.**
- **Always use the correct tire inflation pressure according to the operating conditions.**





INSPECTION

1. Inspect:
   - Tire
     Tire tread shows crosswise lines (minimum tread depth)/Cracks → Replace.

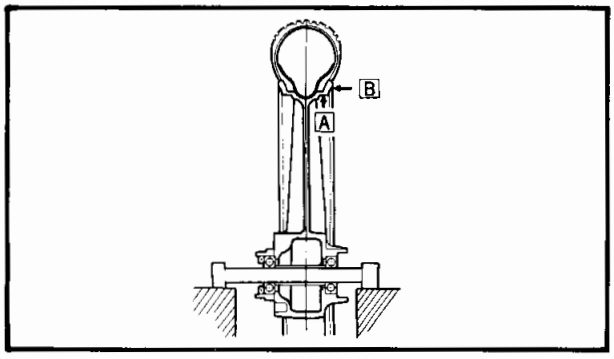
Minimum Tire Tread Depth
1.0 mm (0.04 in)

① Tread depth
② Sidewall
③ Wear indicator

2. Inspect:
   - Front axle
     Roll the axle on a Flat Surface ①.
     Bends → Replace.

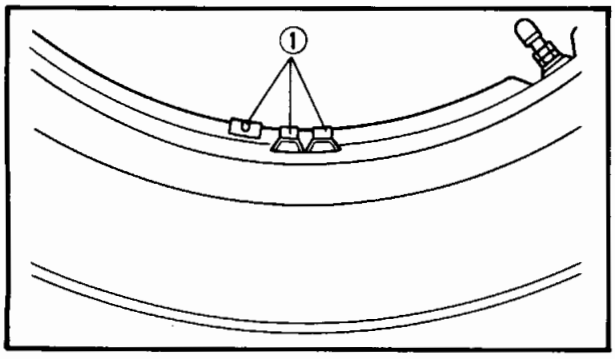
WARNING:

Do not attempt to straighten a bent axle.



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

Rim Runout Limits:
Radial A 2.0 mm (0.079 in)
Lateral B 2.0 mm (0.079 in)



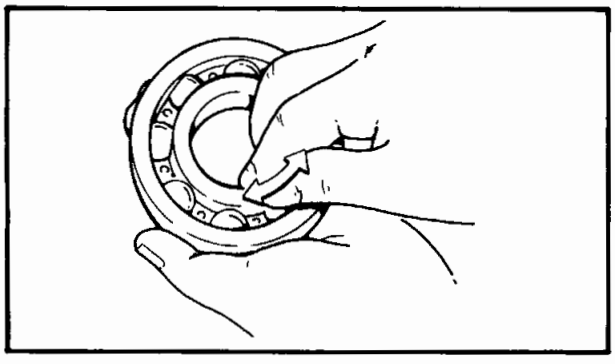
5. Check:
   - Wheel balance
     Out of balance → Adjust.

NOTE:
Balance wheels with the brake discs installed.

① Balancer weight

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

CAUTION:
Be sure the valve stem locknut is tightened securely after repairing or replacing a tire and/or wheel.



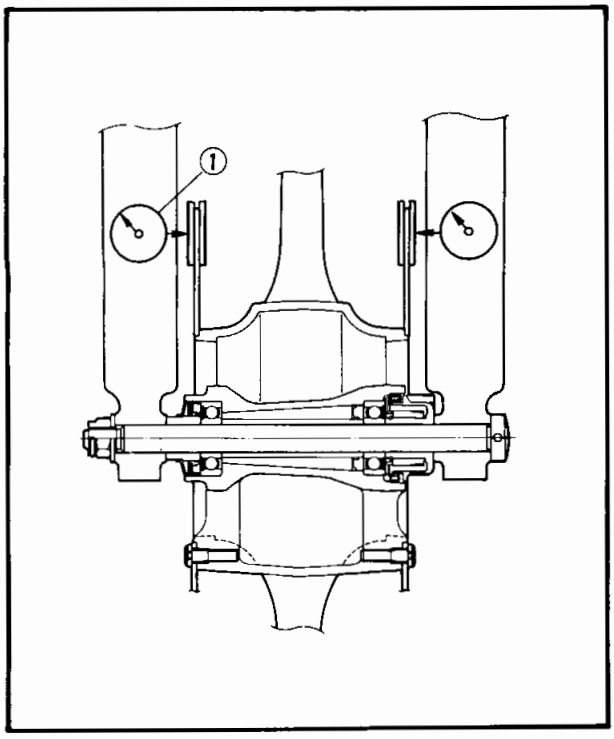
6. Inspect:
   - Wheel bearings
     Bearings allow play in the wheel hub or wheel turns roughly → Replace.

Wheel bearing replacement steps:
- Clean the outside of the wheel hub.
- Drive out the bearing.

WARNING:
Eye protection is recommended when using striking tools.

- Install the new bearing by reversing the previous steps.

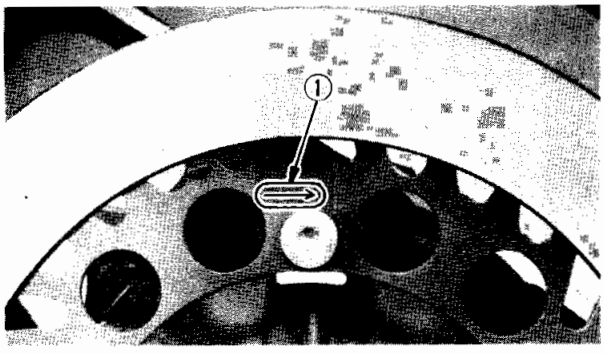
CAUTION:
Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.

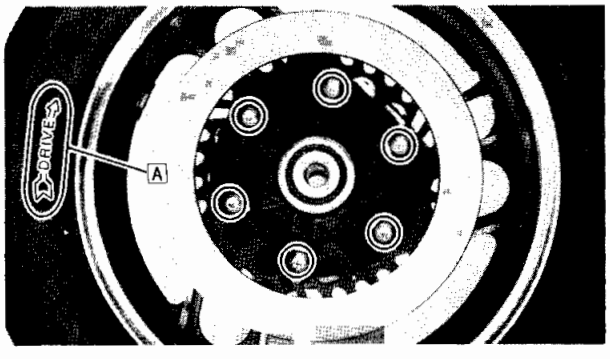


7. Inspect:
   - Brake disc
     Out of specification → Replace.

Maximum Deflection (Front and Rear):
0.15 mm (0.006 in)
Minimum Disc Thickness (Front and Rear):
6.5 mm (0.26 in)

① Dial gauge





INSTALLATION

1. Install:
   - Brake discs

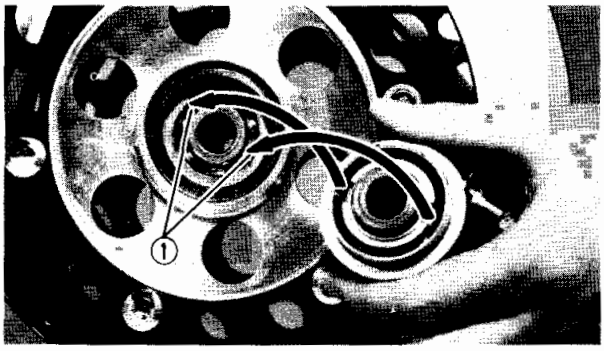
NOTE:
The arrow mark ① on the disc must point toward the rotating direction of the wheel.

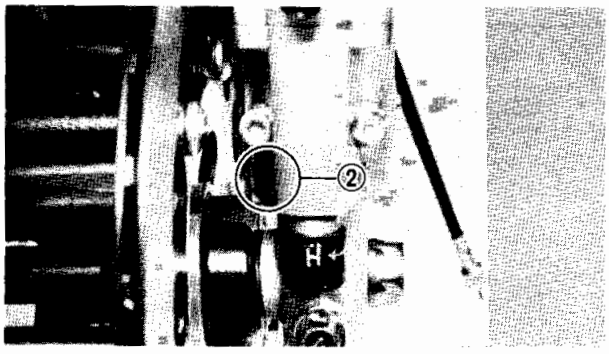
A DRIVE

2. Tighten:
   - Bolts

Brake Disc:
20 Nm (2.0m·kg, 14 ft·lb)
LOCTITE®

3. Install:
   - Front wheel
     Reverse removal steps.





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 projecting portion ② (torque stopper) of the speedometer housing is positioned correctly.
- Compress the front forks several times to confirm proper fork operation before tightening the pinch bolt.

4. Tighten:
   - Axle nut

Front Axle:
78 Nm (7.8 m·kg, 50 ft·lb)

5. Tighten:
   - Pinch bolts

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

6. Install:
   - Fork brace
   - Front fender

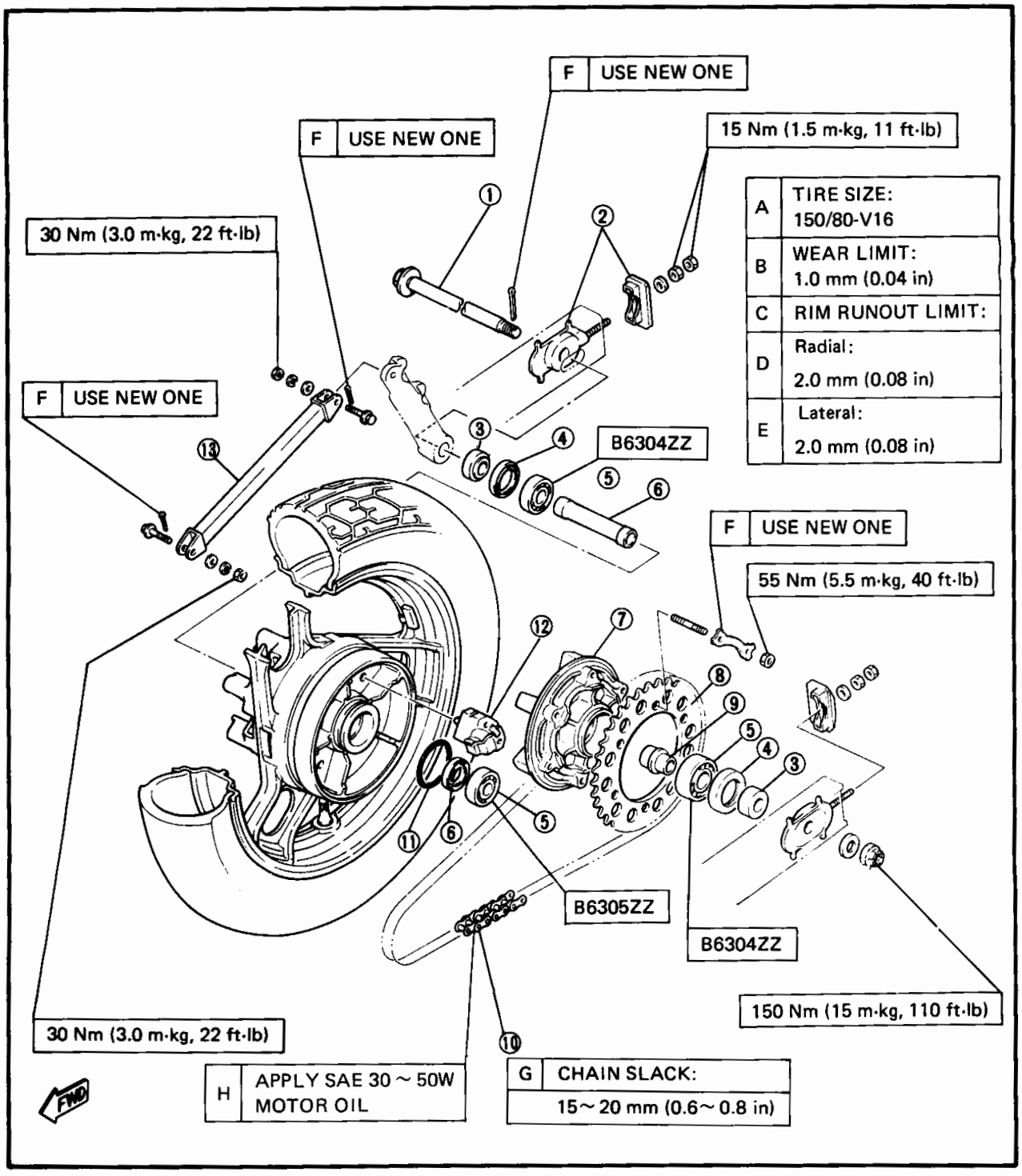
Front Fender:
9 Nm (0.9 m·kg, 6.5 ft·lb)

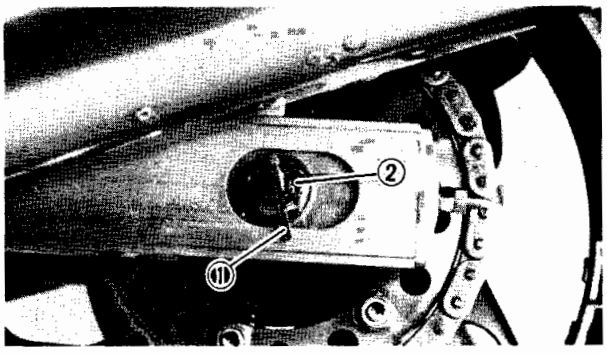
7. Install:
   - Brake calipers

35 Nm (3.5 m·kg, 25 ft·lb)

REAR WHEEL

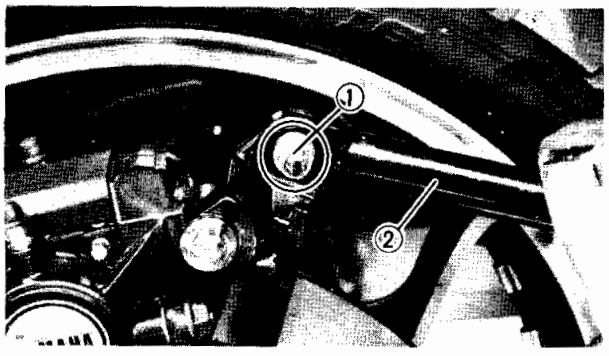
1. Rear axle
2. Drive chain puller
3. Collar
4. Oil seal
5. Bearing
6. Spacer
7. *Clutch hub*
8. Driven sprocket (41T)
9. Collar
10. Drive chain
11. O-ring
12. Damper
13. Tension bar



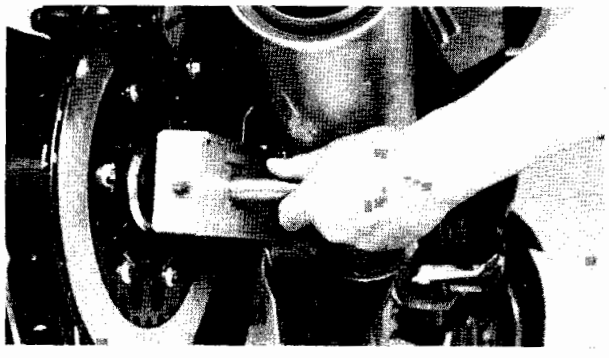


REMOVAL

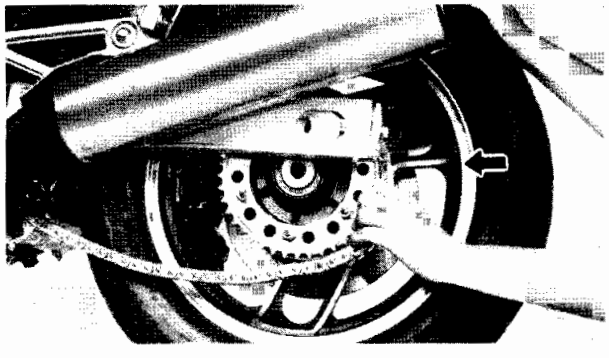
1. Place the motorcycle on its centerstand.
2. Remove:
   - Cotter pin ①
   - Axle nut ②



3. Remove:
   - Cotter pin ①
   - Tension bar ②



4. Remove:
   - Rear axle shaft
   - Rear wheel



5. Push the wheel forward and remove the drive chain.
6. Remove:
   - Rear wheel

NOTE:

Do not depress the brake pedal when the wheel is off the motorcycle as the brake pads will be forced.

INSPECTION

Rear Axle Inspection
(See Front wheel, Axle Inspection Procedures)

Rear Wheel Bearing Replacement
(Similar to front wheel bearing replacement procedures)

Rear Wheel Inspection
(See Front Wheel, Inspection Procedures)

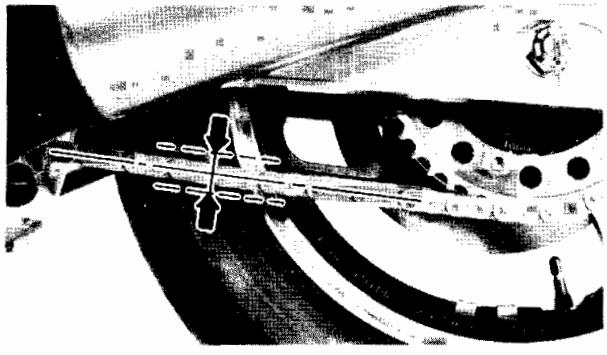
Disc Inspection
(See Front Wheel, Disc Inspection Procedure)

INSTALLATION

1. Install:
   - Rear wheel
   - Wheel axle

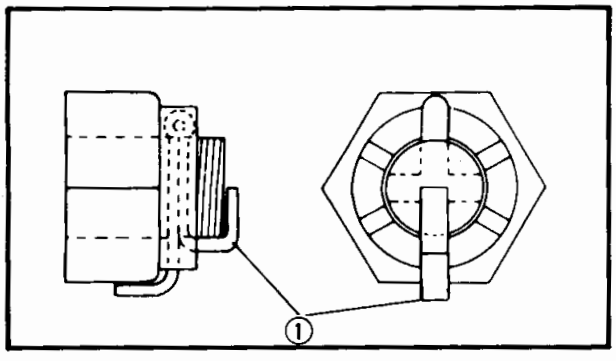
   Reverse the removal procedure.
2. Adjust:
   - Drive chain slack

   Refer to CHAPTER 2 for Drive Chain Slack Adjustment.



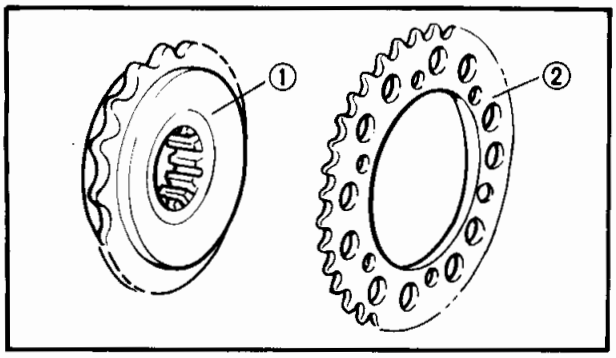
Drive Chain Slack:
15 ~ 20 mm (0.6 ~ 0.8 in)

3. Tighten:
   - Axle nut
   - Tension bar nut
4. Install:
   - Cotter pins (New) ①



Rear Axle:
150 Nm (15.0 m·kg, 110 ft·lb)
Tension Bar:
30 Nm (3.0 m·kg, 2.2 ft·lb)

CAUTION:
Always use new cotter pins on the rear axle nut and tension bar bolts.

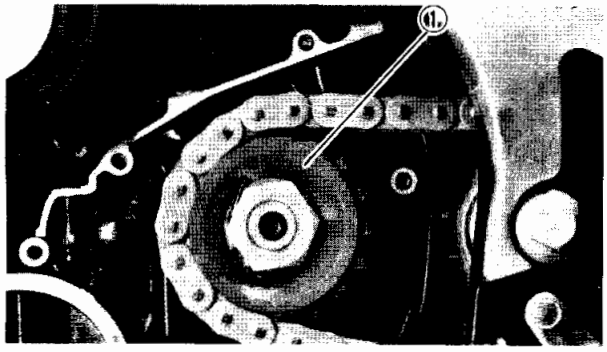


DRIVE AND DRIVEN CHAIN SPROCKET

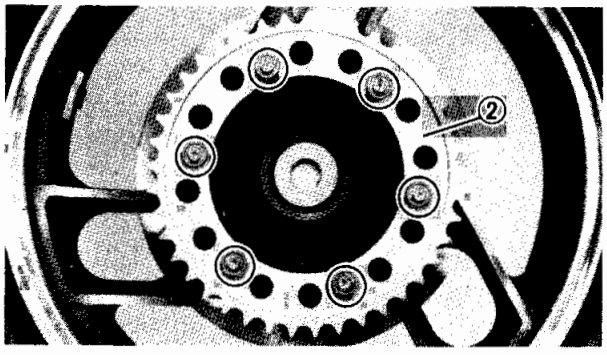
1. Inspect:
   - Sprocket teeth
     Wear/Bends/Damage → Replace.

NOTE:
Replace the sprockets and drive chain as a set.

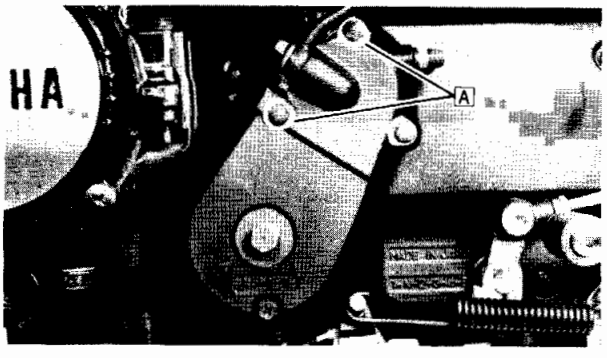
① Drive sprocket
② Driven sprocket

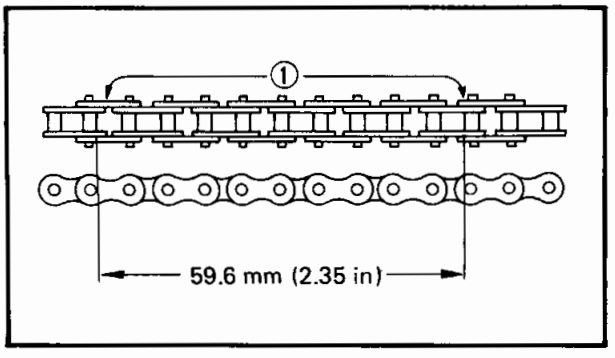


2. Remove:
   - Drive sprocket
   - Driven sprocket
3. Install:
   - Drive sprocket (with a new lock washer)
   - Driven sprocket (with *new* lock washers)
4. Tighten:
   - All bolts and nuts



Drive Chain Sprocket:	**85 Nm (8.5 m·kg, 61 ft·lb)**
Sprocket Cover:	**10 Nm (1.0 m·kg, 7.2 ft·lb)**
Clutch Release Assembly:	**10 Nm (1.0 m·kg, 7.2 ft·lb)**
	A Quick Gasket® (Sealant)
Driven Chain Sprocket:	**55 Nm (5.5 m·kg, 40 ft·lb)**
Rear Axle:	**150 Nm (15 m·kg, 110 ft·lb)**





DRIVE CHAIN

1. Measure
   - Length (10 links) ①
     Out of specification → Replace.

Drive Chain Length (10 links) Limit:	**59.6 mm (2.35 in)**

Drive Chain Lubrication

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

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

FRONT AND REAR BRAKE

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:

- Add proper brake fluid to the reservoir.
- Install the master cylinder cap. Be careful not to spill any fluid or allow the reservoir to overflow.