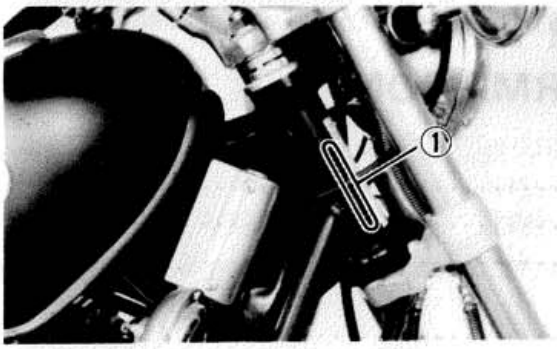
YAMAHA

XJ700N/NC

Service Manual

LIT-11616-04-85



GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

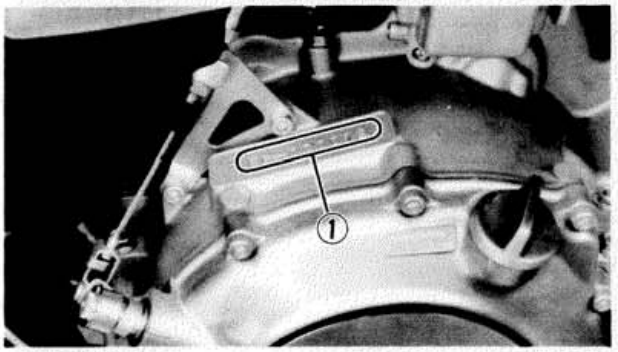
VEHICLE IDENTIFICATION NUMBER

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

NOTE:

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

Vehicle Identification Number:
XJ700N (Except for California):
JYA1FG00*EA000101
XJ700NC (For California):
JYA1JJ00*EA000101



ENGINE SERIAL NUMBER

The engine serial number ① is stamped into the elevated part of the left rear section 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:
XJ700N (Except for California)
..... **1FJ-000101**
XJ700NC (For California)
..... **1JJ-000101**

NOTE:

Designs and specifications are subject to change without notice.

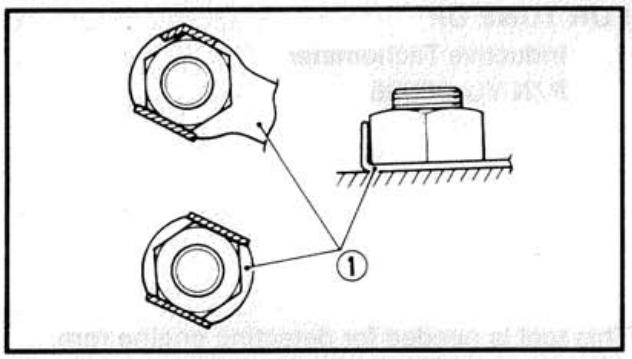
IMPORTANT INFORMATION

ALL REPLACEMENT PARTS

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

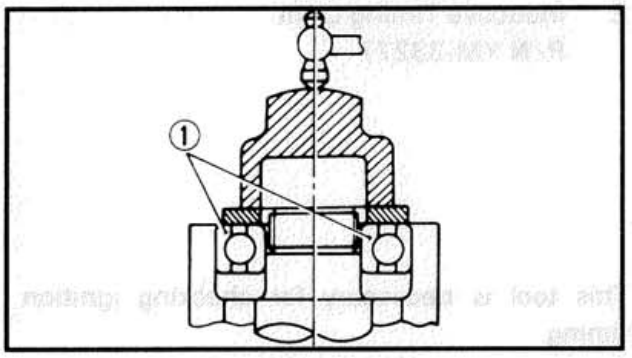
GASKETS, OIL SEALS, AND O-RINGS

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.



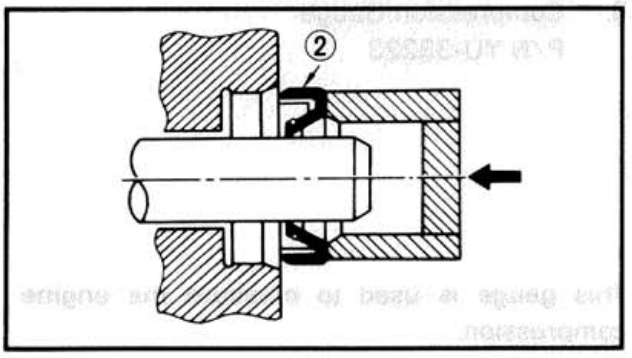
LOCK WASHERS/PLATES AND COTTER PINS

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.

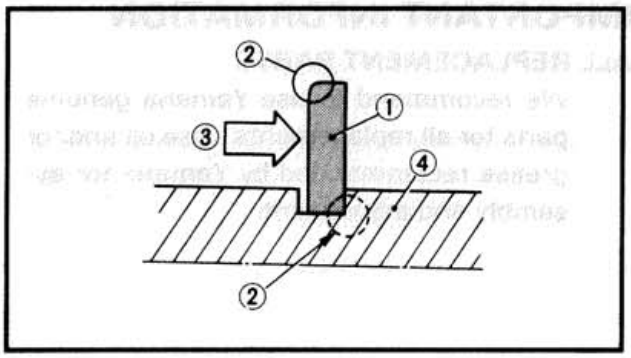


BEARINGS AND OIL SEALS

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.



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



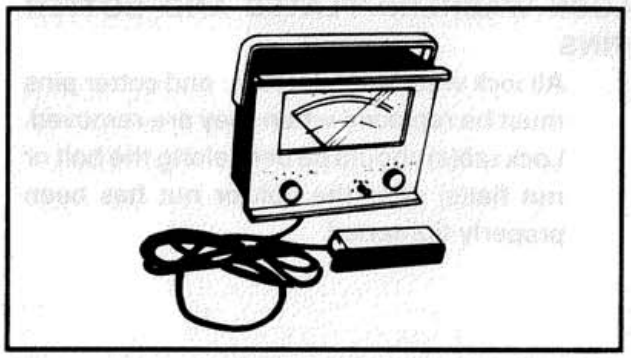
CIRCLIPS

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

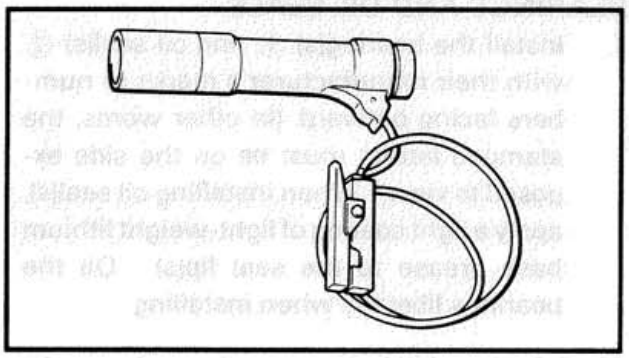
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help prevent damage caused by the use of improper tools or improvised techniques.



FOR TUNE UP

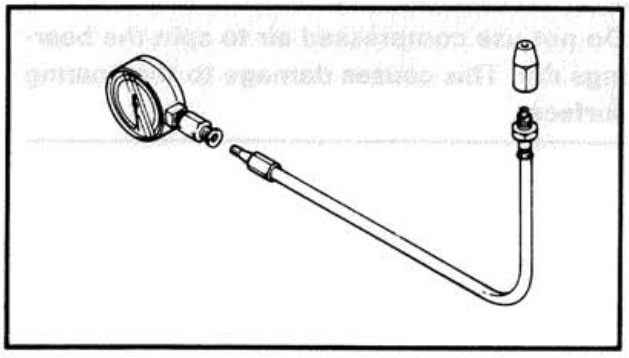
1. Inductive Tachometer
   P/N YU-08036

This tool is needed for detecting engine rpm.



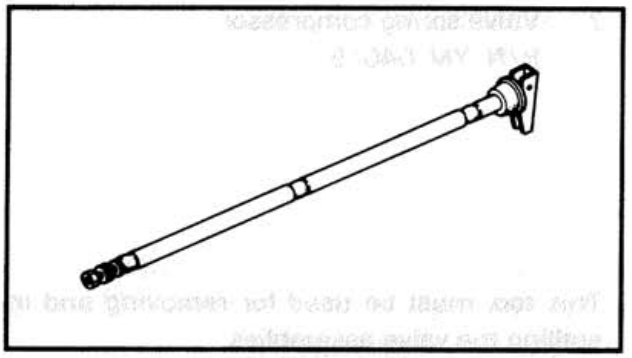
2. Inductive Timing Light
   P/N YM-33277

This tool is necessary for checking ignition timing.



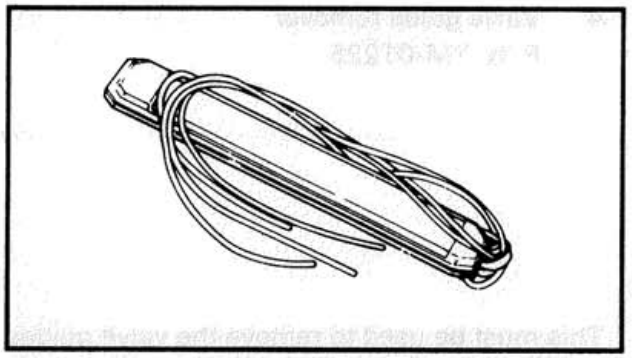
3. Compression Gauge
   P/N YU-33223

This gauge is used to measure the engine compression.



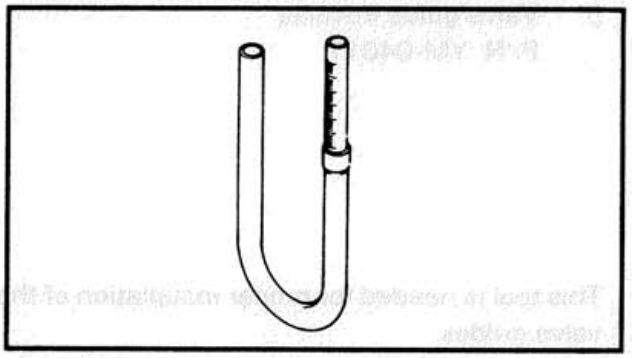
4. Y.I.C.S. Shutoff Tool
   P/N. YM-08025

This tool is needed to measure the carburetor fuel level.



5. Vacuum gauge
   P/N. YU-08030

This gauge is needed for carburetor synchronization.

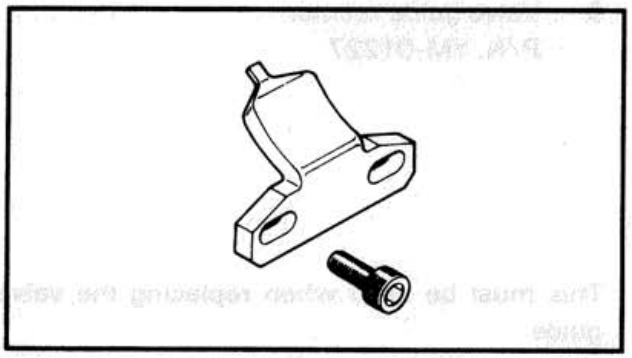


6. Fuel level gauge
   P/N. YM-01312

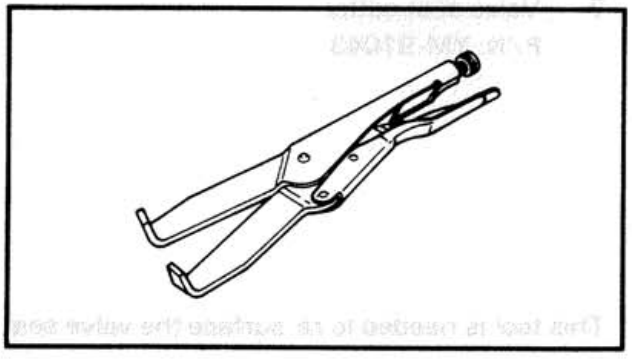
This tool is needed to measure the carburetor fuel level.

FOR ENGINE SERVICE

1. Tappet adjusting tool
   P/N. YM-01245



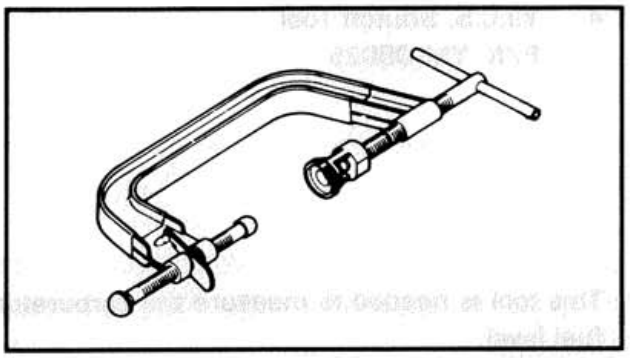
This tool is necessary to replace valve adjusting pads.



2. Universal Clutch Holder
   P/N. YM-91042

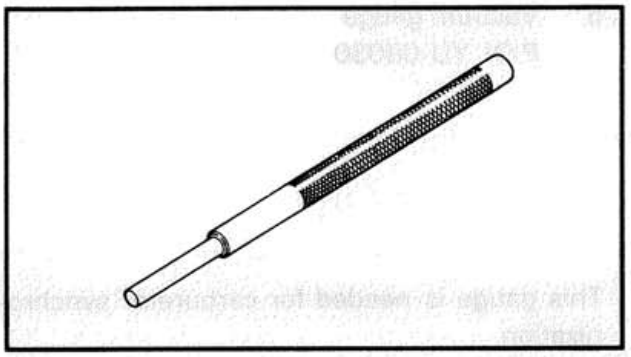
This tool is used to hold the clutch when removing or installing the clutch boss lock nut.

SPECIAL TOOLS



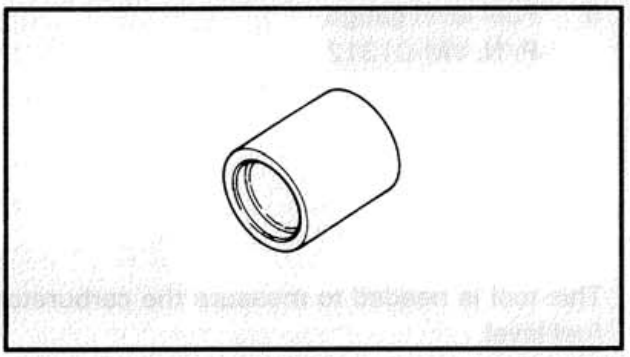
3. Valve spring compressor
   P/N. YM-04019

This tool must be used for removing and installing the valve assemblies.



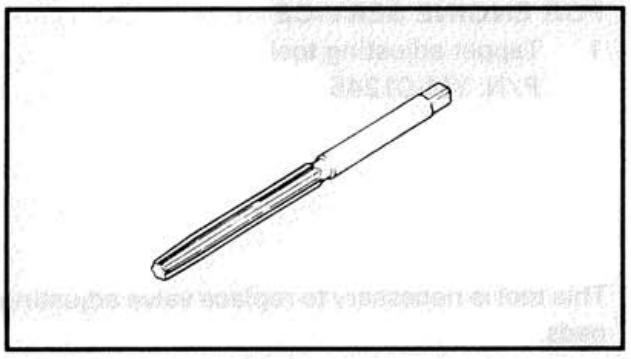
4. Valve guide remover
   P/N. YM-01225

This must be used to remove the valve guides.



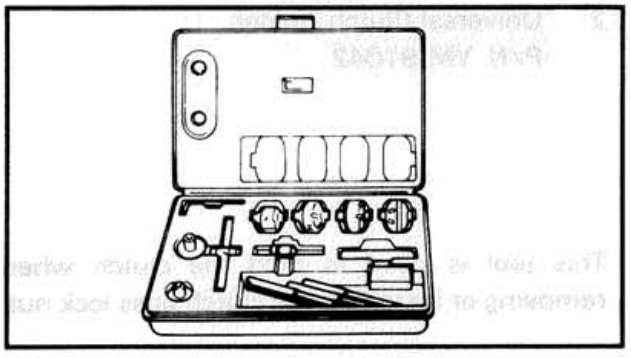
5. Valve guide installer
   P/N. YM-04017

This tool is needed for proper installation of the valve guides.



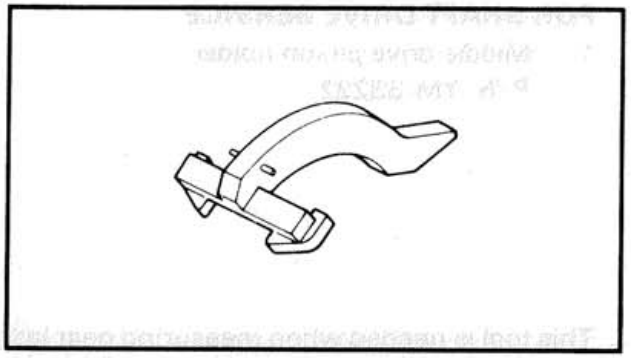
6. Valve guide reamer
   P/N. YM-01227

This must be used when replacing the valve guide.



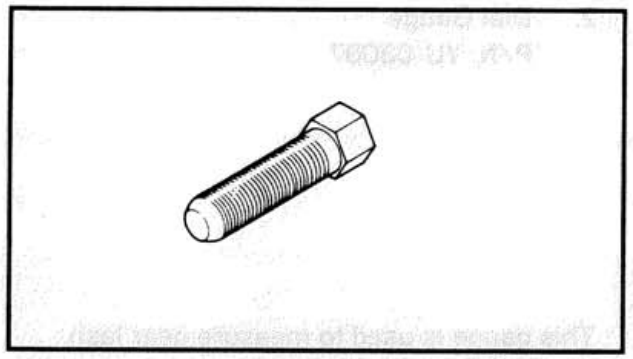
7. Valve seat cutter
   P/N. YM-91043

This tool is needed to re-surface the valve seat.



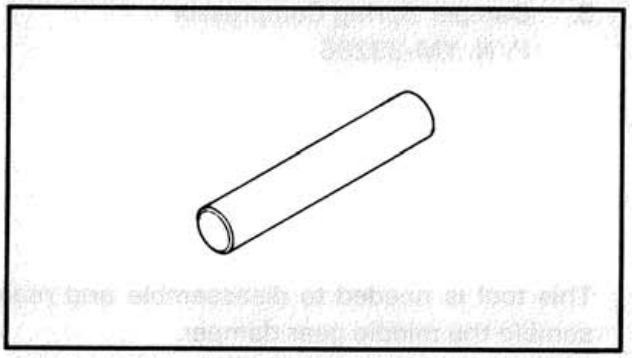
8. Rotor holding tool
   P/N. YM-04043

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



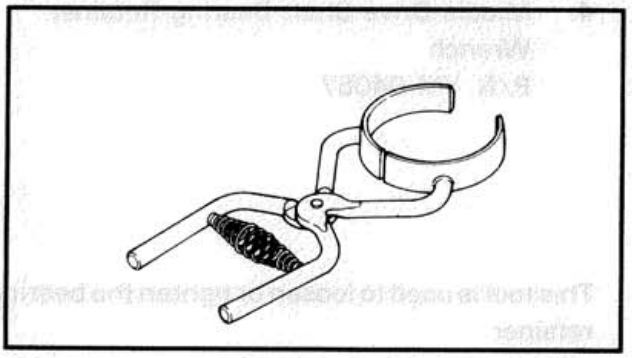
9. Rotor puller
   P/N. YM-01080

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



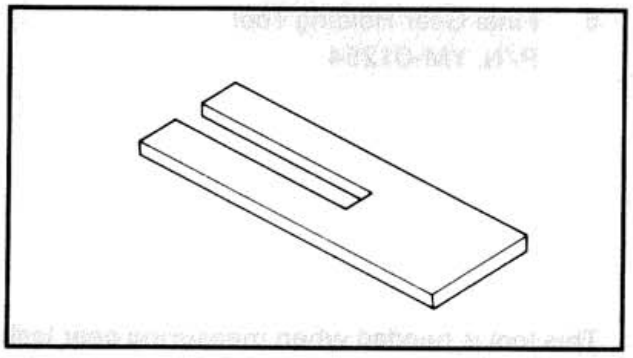
10. Rotor puller attachment
    P/N. YM-04052

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



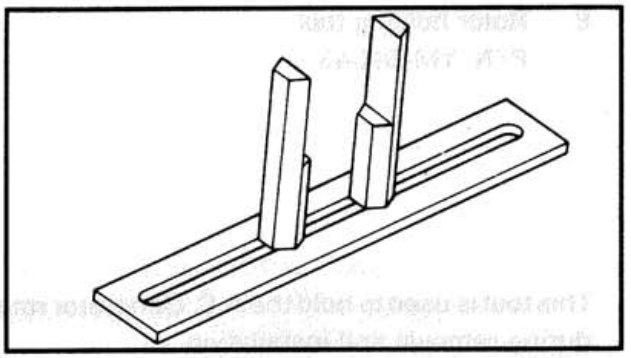
11. Piston ring compressor
    P/N. YM-04044

This is used to compress piston rings when installing the cylinder.



12. Piston base
    P/N. YM-01067

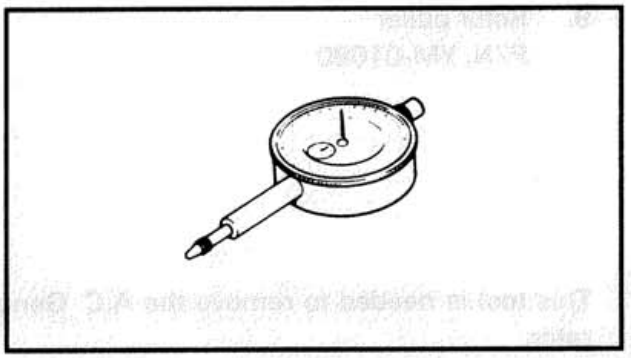
Use 4 of these to hold the pistons during cylinder installation.



FOR SHAFT DRIVE SERVICE

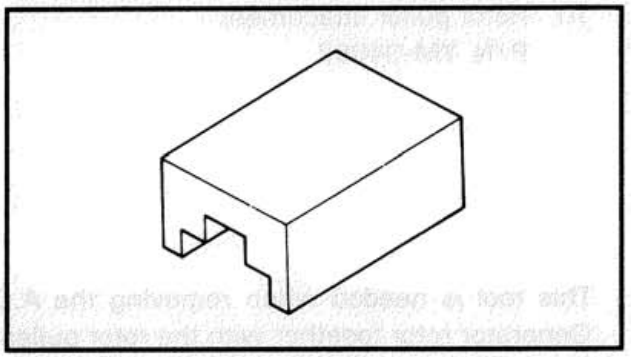
1. Middle drive pinion holder
   P/N. YM-33222

This tool is needed when measuring gear lash.



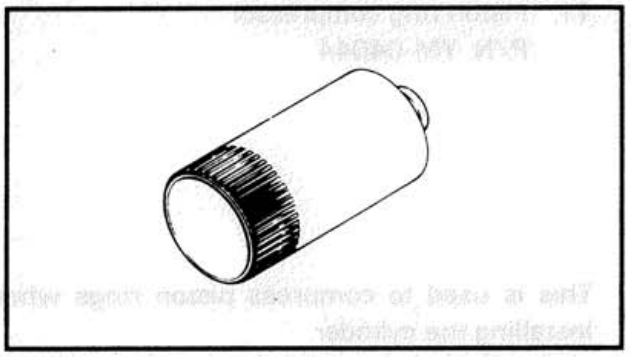
2. Dial Gauge
   P/N. YU-03097

This gauge is used to measure gear lash.



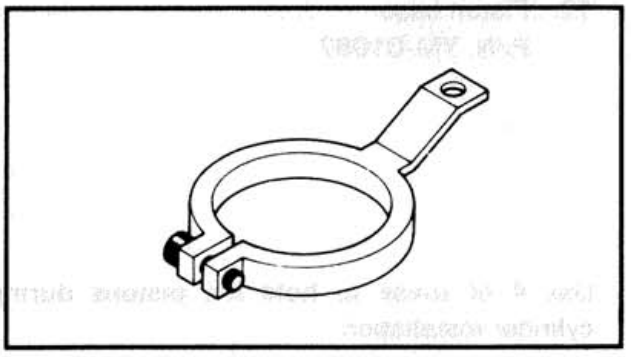
3. Damper Spring Compressor
   P/N. YM-33286

This tool is needed to disassemble and reassemble the middle gear damper.



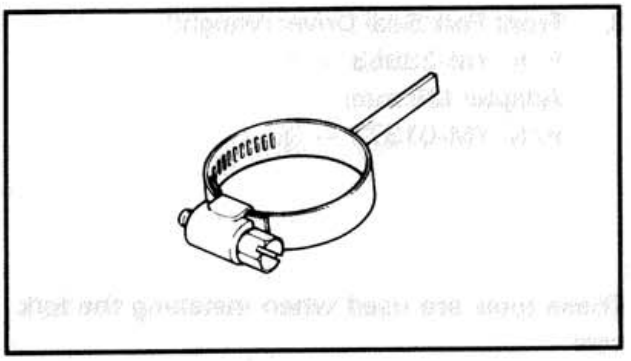
4. Middle-Drive-Shaft-Bearing-Retainer Wrench
   P/N. YM-04057

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



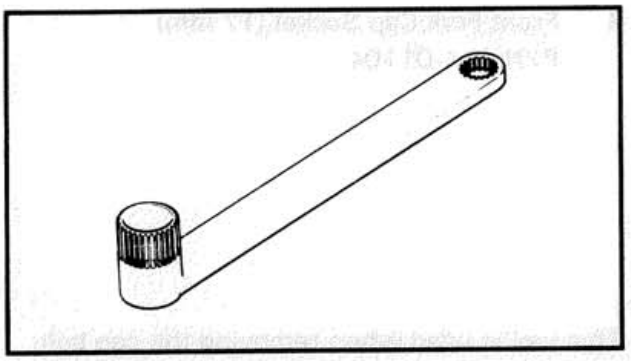
5. Final Gear Holding Tool
   P/N. YM-01254

This tool is needed when measuring gear lash.



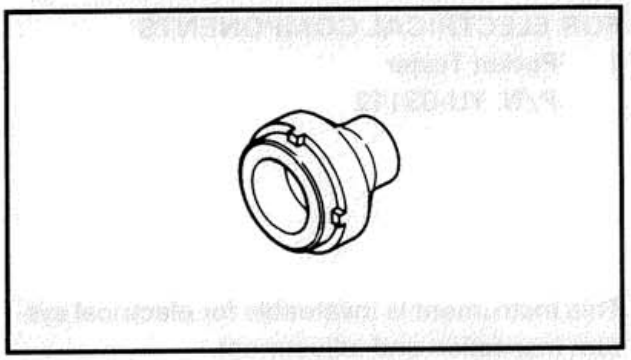
6. Final-Drive Gear Lash Measurement Tool
   P/N. YM-01230

This tool is used to measure gear lash.



7. Middle and Final Gear Holding Tool
   P/N. YM-01229

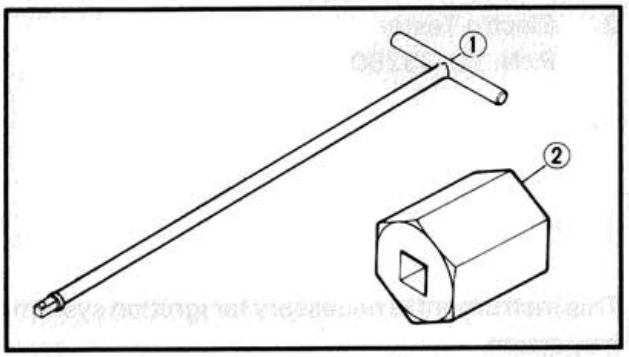
This tool is used when measuring gear lash.



8. Final Drive Shaft Bearing Retainer Wrench
   P/N. YM-40450

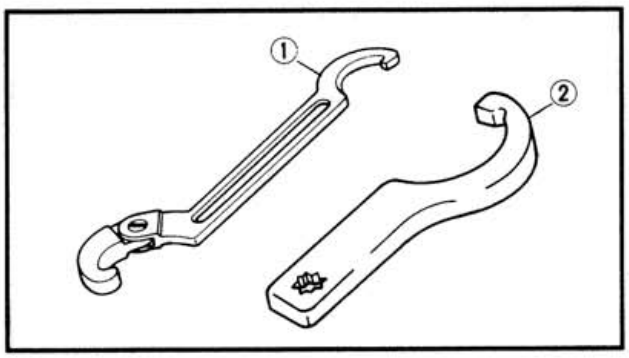
This tool is used to remove and install the bearing retainer.

FOR CHASSIS SERVICE



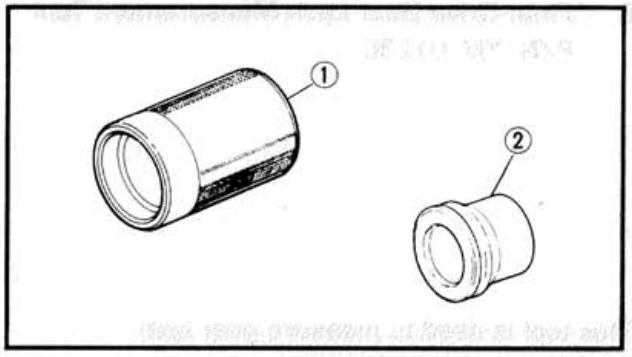
1. T-Handle
   P/N. YM-01326 — ①
   Fork Damper Rod Holder
   P/N. YM-33298 — ②

These tools are used to loosen and tighten the front fork cylinder holding bolt.



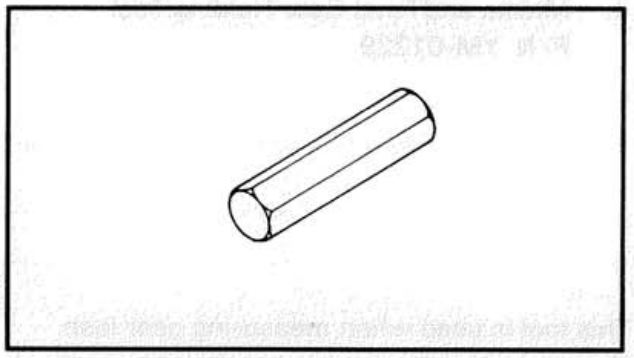
2. Ring Nut Wrench
   P/N. YU-01268 — ①
   YU-33975 — ②

These tools are used to loosen and tighten the steering ring nut.



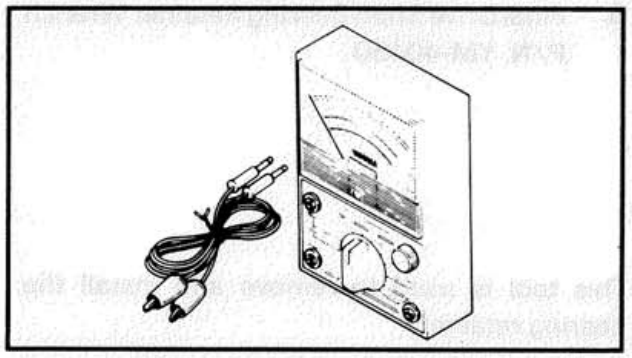
3. Front Fork Seal Driver (weight)
   P/N. YM-33963 — ①
   Adapter (38 mm)
   P/N. YM-01372 — ②

These tools are used when installing the fork seal.



4. Front Fork Cap Socket (17 mm)
   P/N. YM-01104

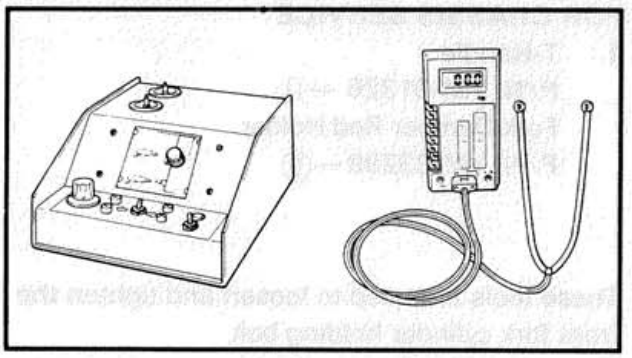
This tool is used when removing the cap bolt.



FOR ELECTRICAL COMPONENTS

1. Pocket Tester
   P/N. YU-03112

This instrument is invaluable for electrical system inspection and adjustment.



2. Electro Tester
   P/N. YU-33260

This instrument is necessary for ignition system inspection.

PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perfrom 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

ITEM	REMARKS	INITIAL	ODOMETER READING				
		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
Valve clearance	Check and adjust valve clearance when engine is cold.					○	
Spark plug	Check condition. Adjust gap and clean. Replace at 13,000 km (or 13 months) and thereafter every 12,000 km (or 12 months).		○	Replace	○	Replace	○
Crankcase ventilation system	Check ventilation hose for cracks or damage. Replace if necessary.		○		○		○
Fuel line	Check fuel hose and vacuum pipe for cracks or damage. Replace if necessary.		○	○	○	○	○
Exhaust system	Check for leakage. Retighten if necessary. Replace gasket(s) if necessary.		○	○	○	○	○
Idle speed	Check and adjust engine idle speed. Adjust cable free play.		○	○	○	○	○
Carburetor synchronization	Adjust synchronization of carburetors.	○	○	○	○	○	○

* 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 establish; **1: Every 6,000 km (3,800 mi) **2: Every 12,000 km (7,600 mi) intervals.

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	**4 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 page 12	○	○	○	○	○	○
2	Oil filter	Replace.	—	○		○		○	
3*	Air filter	Clean with compressed air. Replace if necessary.	—		○	○	○	○	○
4*	Brake system	Adjust free play. Replace pads if necessary. (Front) Replace shoes if necessary (Rear)	—	○	○	○	○	○	○
5*	Clutch	Adjust free play.	—	○	○	○	○	○	○
6	Final gear oil	Check oil level and leakage. Replace every 24,000 km (15,000 mi) or 24 months.	SAE80 API GL-4 hypoid gear oil	Replace		○		Replace	
7*	Control and meter cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W30 motor oil.	○	○	○	○	○	○
8*	Rear arm pivot shaft	Check bearings assembly for looseness. Moderately repack every 24,000 km (15,200 mi)	Medium weight wheel bearing 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 stant pivots	Check operation and lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
12*	Front fork oil	Check operation and leakage.	—		○	○	○	○	○

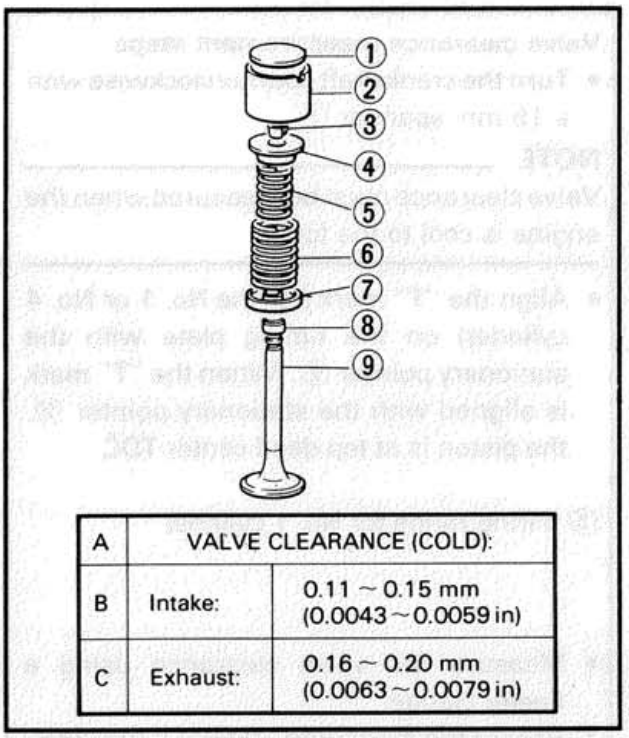
GENERAL MAINTENANCE/LUBRICATION

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	**4 25,000 km (15,800 mi) or 25 months	31,000 km (19,600 mi) or 31 months
13*	Steering bearings	Check bearings assembly for looseness. Moderately repack every 24,000 km (15,000 mi)	Medium weight wheel bearing grease		○	○	○	○	○
14*	Wheel bearings	Check bearings for smooth rotation.	—		○	○	○	○	○
15	Battery	Check specific gravity and breather pipe for proper operation.	—		○	○	○	○	○
16*	A.C. Generator	Replace generator brushes.	—			○		○	
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), **3: Every 18,000 km (11,400 mi), **4: Every, 24,000 km (15,200 mi) intervals.



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)

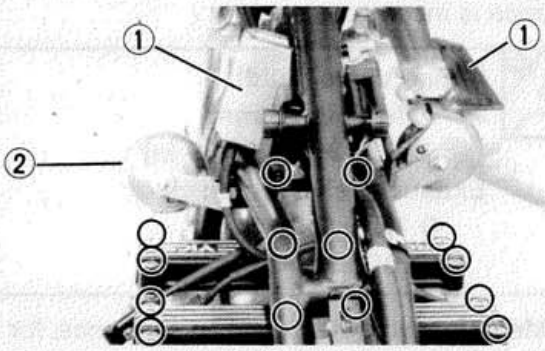
ENGINE

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
   - Fuel tank
   - Ignition coil covers ①
   - Horns with stay ②
2. Disconnect:
   - Spark plug caps



3. Remove:
   - Spark plugs
   - Cylinder head cover
4. Remove:
   - Emblem plate (Left)

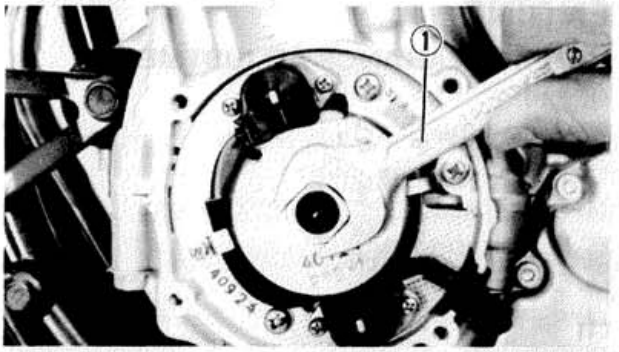
Inspection and Adjustment

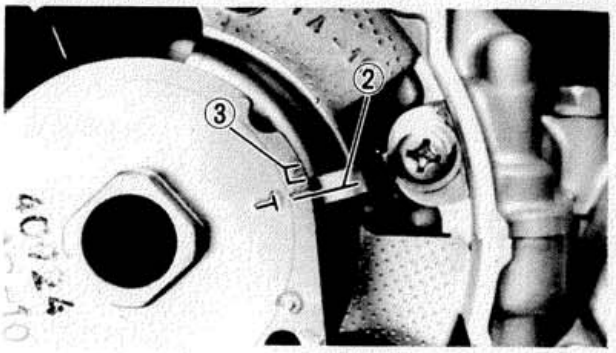
1. Measure:
   - Valve clearance

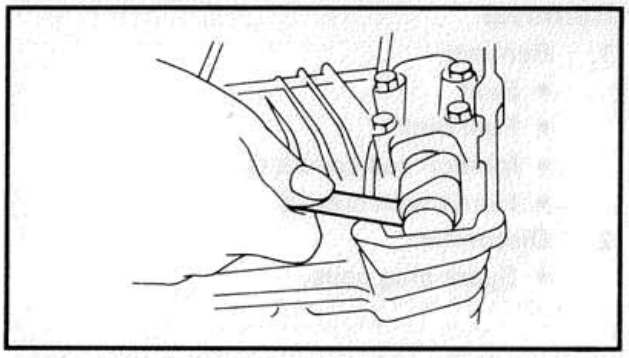
NOTE:

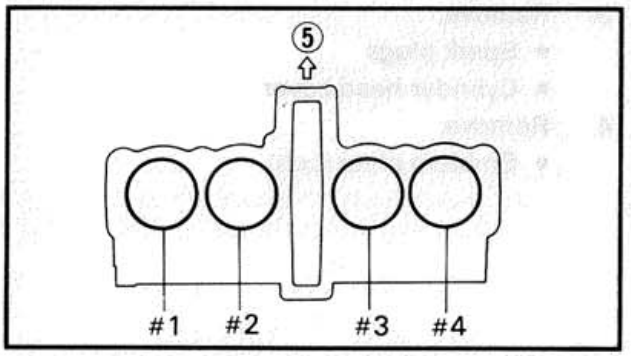
Be sure piston is at Top Dead Center (TDC) on compression stroke when measuring clearance.

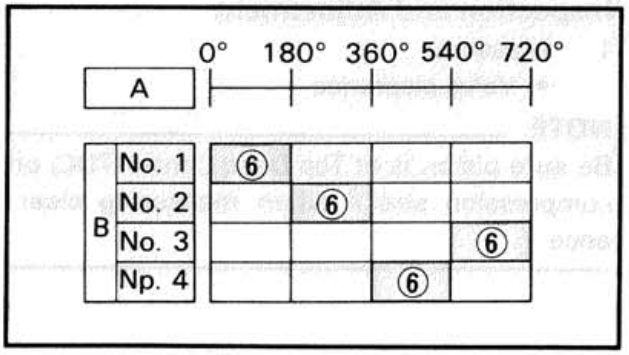
VALVE CLEARANCE ADJUSTMENT











Valve clearance measurement steps:

- Turn the crankshaft counterclockwise with a 19 mm spanner 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. When the "T" mark is aligned with the stationary pointer ②, the piston is at top dead center TDC.

③ Firing range for No. 1 cylinder

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

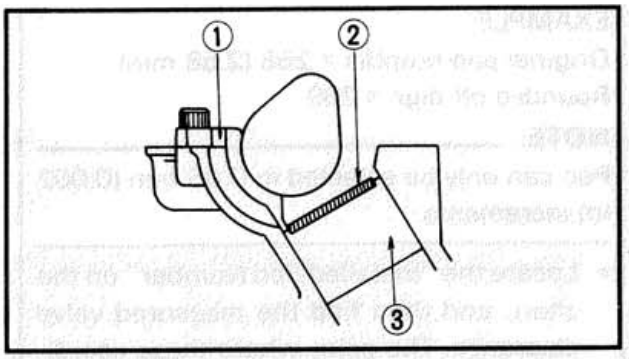
Intake Valve (cold):
0.11 ~ 0.15 mm
(0.0043 ~ 0.0059 in)
Exhaust Valve (cold):
0.16 ~ 0.20 mm
(0.0063 ~ 0.0079 in)

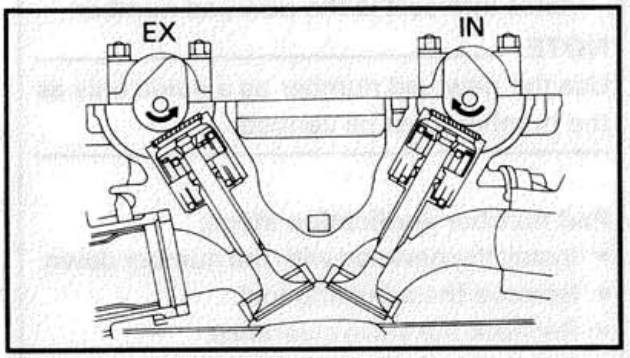
- Measure valve clearance, in sequence, for Nos. 2, 4, and No. 3 cylinders.
  Out of specification → Adjust clearance.

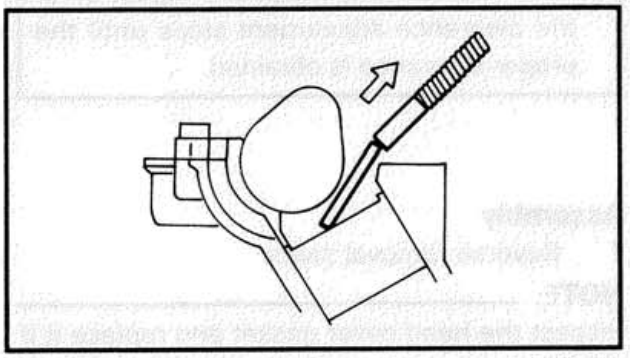
Firing Sequence:
1 — 2 — 4 — 3

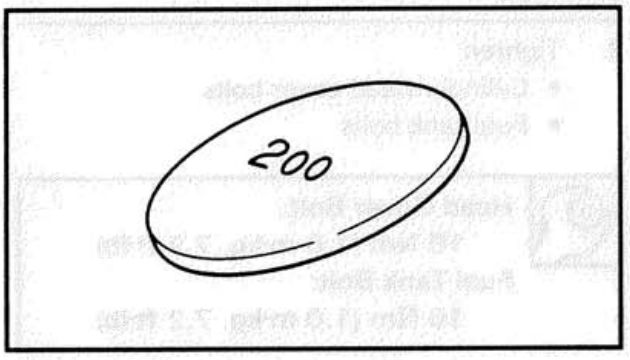
⑤ Front

A Crankshaft counterclockwise turning angle.
B Cylinder
⑥ Combustion









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-01245) onto the cylinder head.

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

- Carefully rotate the camshaft 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	2.00mm (0.079 in) 3.20 mm (0.130 in)	Pad 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

VALVE CLEARANCE ADJUSTMENT

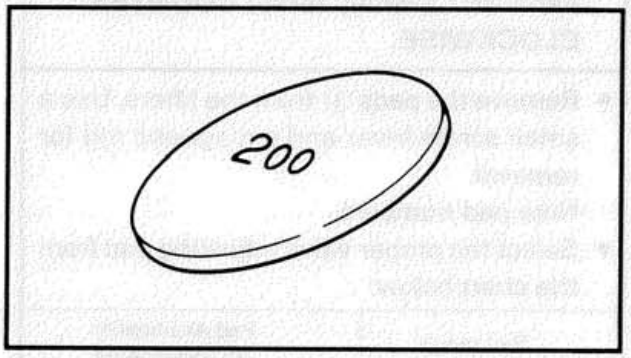
EXAMPLE:
Original pad number = 258 (2.58 mm)
Rounded off digit = 260

NOTE:
Pad 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.

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)

INTAKE

B MEASURED CLEARANCE	A 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 (0.004 ~ 0.006 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

B MEASURED CLEARANCE	A 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																								

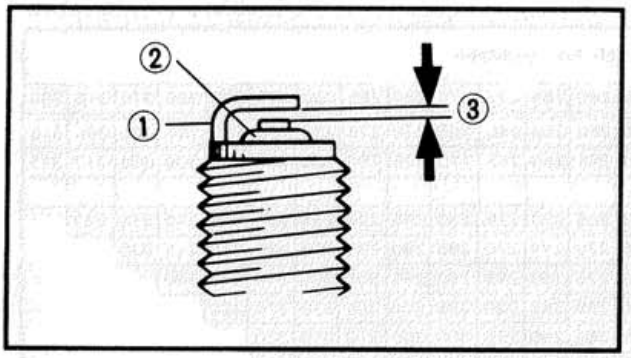
VALVE CLEARANCE (cold):
0.16 ~ 0.20 mm (0.006 ~ 0.008 in)

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.

SPARK PLUG/CANISTER



SPARK PLUG

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

0.7 ~ 0.8 mm (0.028 ~ 0.31 in)

Clean the plug with a spark plug cleaner if necessary.

Standard Spark Plug:
BP8 ES (NGK)
W24EP-U (NIPPONDENSO)

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

4. Tighten:
   - Spark plug(s)

20 Nm (2.0 m·kg, 14 ft·lb)

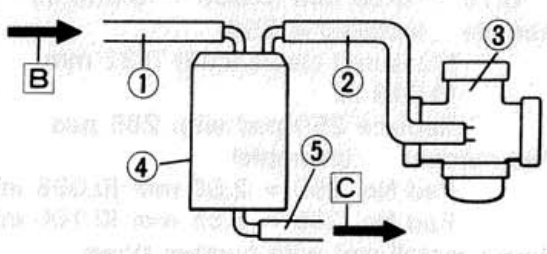
NOTE:
Finger-tighten the spark plug(s) before torquing to specification.

CANISTER (For California Only)

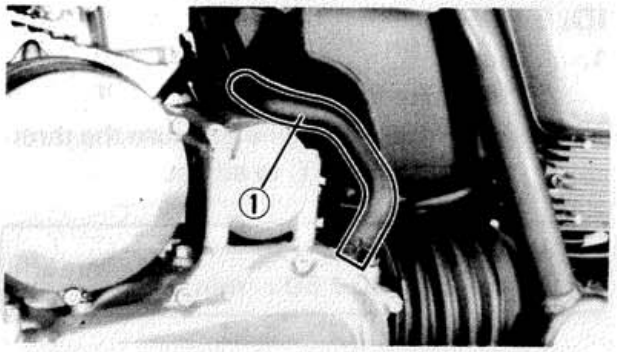
This model is equipped with a canister to prevent the discharging of fuel vapor into the atmosphere.

1. Inspect:
   - Hoses ① ② ⑤
     Cracks/Damage → Replace.
     Clog → Clean.
   - Canister ④
     Cracks/Damage → Replace.

A EMISSION HOSE ROUTING

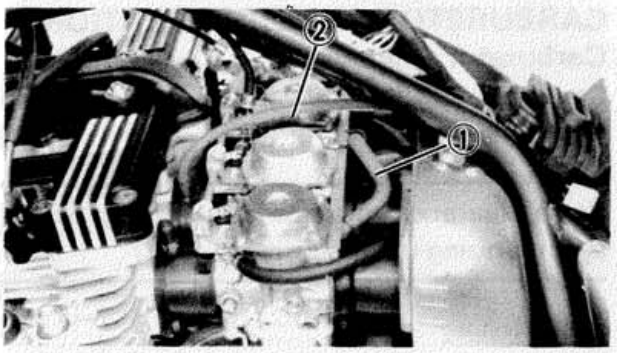


③ Carburetor
B From fuel tank
C To atmosphere



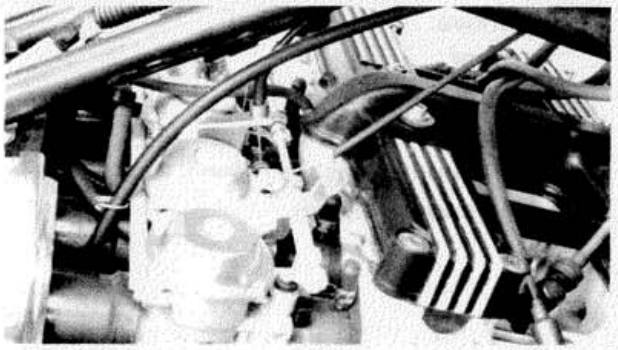
CRANKCASE VENTILATION SYSTEM

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



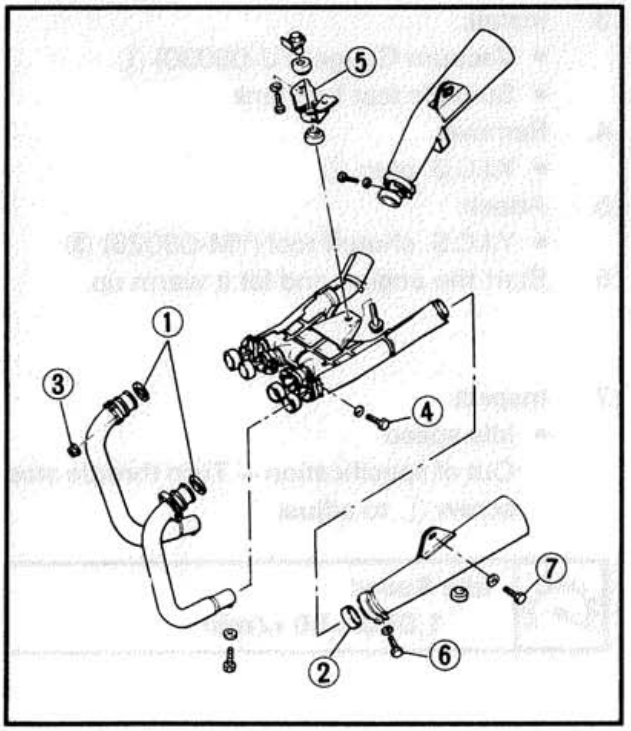
FUEL LINE

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



INTAKE MANIFOLD

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

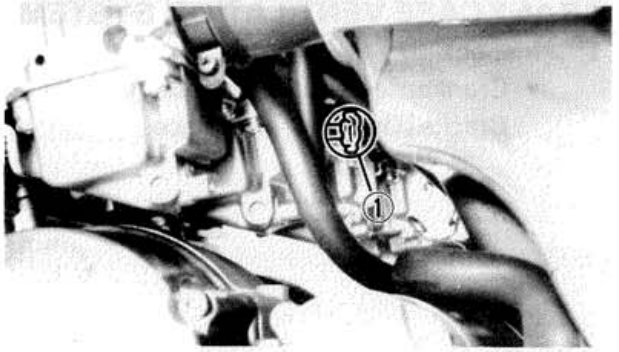


EXHAUST SYSTEM

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

Exhaust Pipe Flange ③ :
10 Nm (1.0 m·kg, 7.2 ft·lb)
Exhaust Pipe Clamp ④ :
20 Nm (2.0 m·kg, 14 ft·lb)
Exhaust Chamber Mount ⑤ :
20 Nm (2.0 m·kg, 14 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)

IDLE SPEED/CARBURETOR SYNCHRONIZATION



IDLE SPEED

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

Idle Speed
1,050 ± 50 r/min

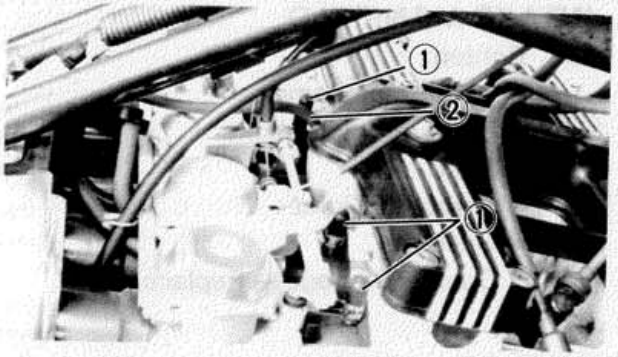
CARBURETOR SYNCHRONIZATION

Carburetor Adjustment.

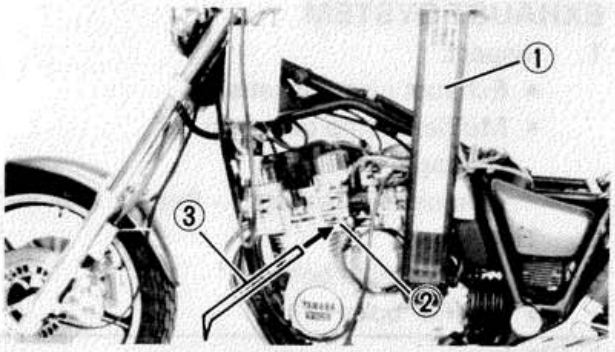
Carburetors must be adjusted to open and close simultaneously.

NOTE:

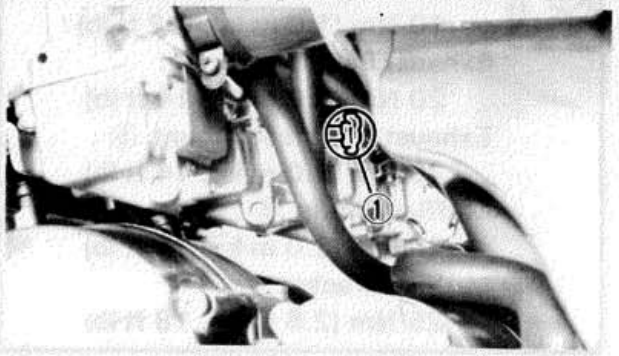
Valve clearance must be set properly before synchronizing the carburetors.



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

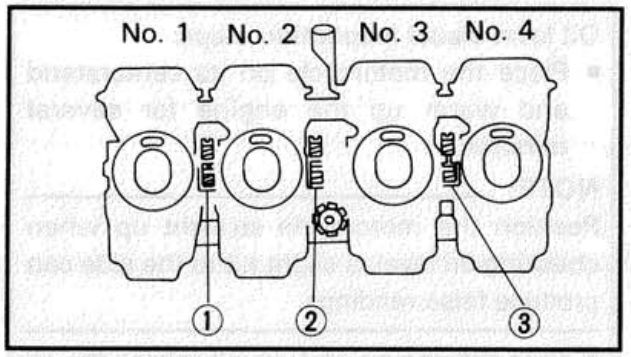


3. Install:
   - Vacuum Gauge (YU-08030) ①
   - Suitable test fuel tank
4. Remove:
   - Y.I.C.S. plug ②
5. Attach:
   - Y.I.C.S. shutoff tool (YM-08025) ③
6. Start the engine and let it warm up.



7. Inspect:
   - Idle speed
     Out of specification → Turn throttle stop screw ① to adjust.

Idle Speed
1,050 ± 50 r/min

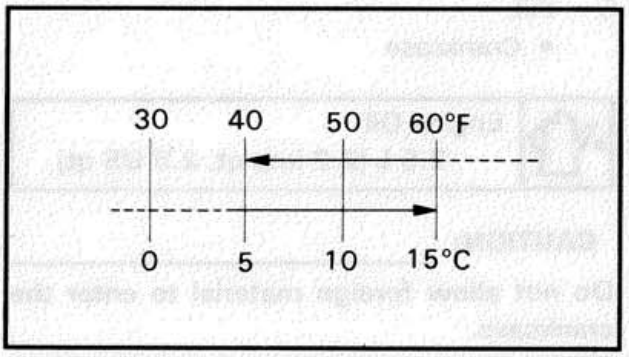


8. **Adjust:**
   - Carburetor synchronization

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

Vacuum Pressure at Idle Speed:
23.99 kPa (180 mm Hg, 7.09 in Hg)
Vacuum Synchronous Difference:
0.67 kPa (5 mm Hg, 0.2 in Hg)

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



ENGINE OIL

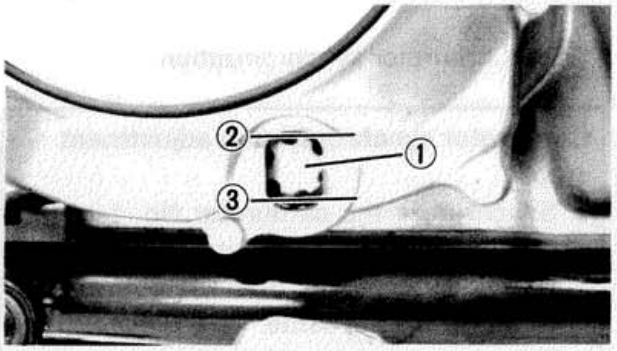
At 5°C (40°F) or Higher:
SAE 20W40 Type SE Motor Oil
At 15°C (60°F) or Lower:
SEA 10W30 Type SE Motor Oil

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

Oil Level Measurement

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

ENGINE OIL



Oil level visual inspection steps:

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

NOTE:

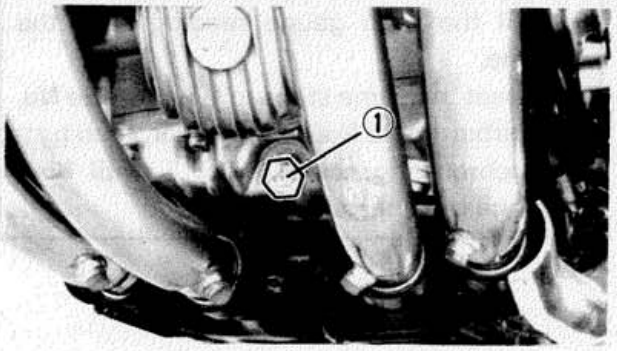
Position the motorcycle straight up when checking oil level, a slight tilt to the side can produce false readings.

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

② Maximum
③ Minimum

Oil Change (Without filter)

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



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

5. Fill:
   - Crankcase

Engine Oil
2.5 L (2.2 imp qt, 2.6 US qt)

CAUTION:

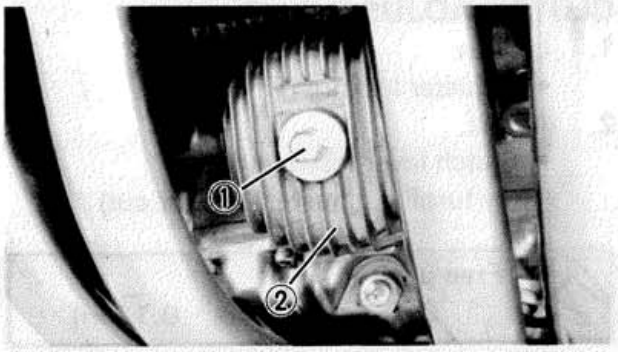
Do not allow foreign material to enter the crankcase.

6. Install:
   - Filler cap

Oil Change (With filter)

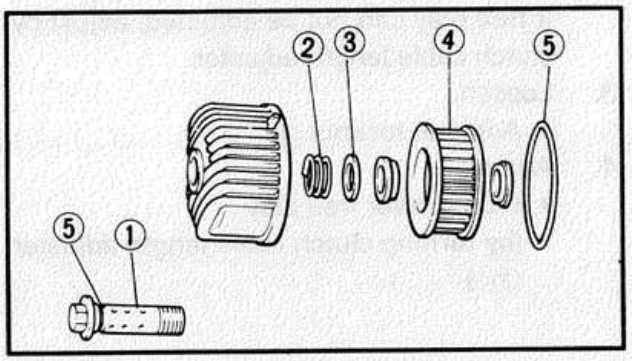
1. Warm up the engine and place a receptacle under the engine.
2. Remove:
   - Oil filler cap
   - Drain plug

   Drain the engine oil.

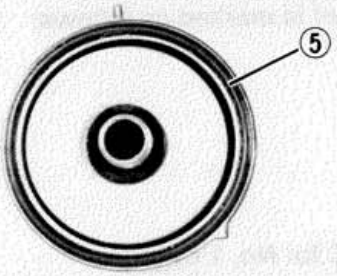


3. Remove:
   - Oil filter bolt ①
   - Filter cover ②
4. Tighten:
   - Drain plug

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



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



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

6. Tighten:
   - Oil filter bolt

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

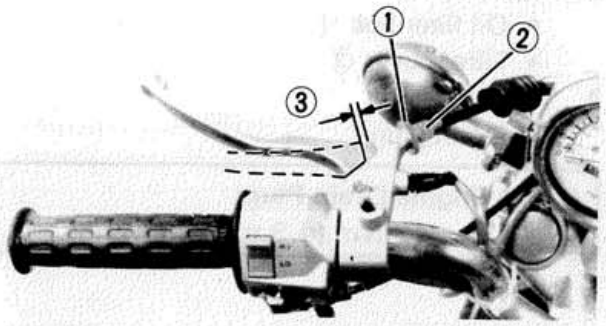
7. Fill:
   - Crankcase

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

8. Install:
   - Oil filler cap

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

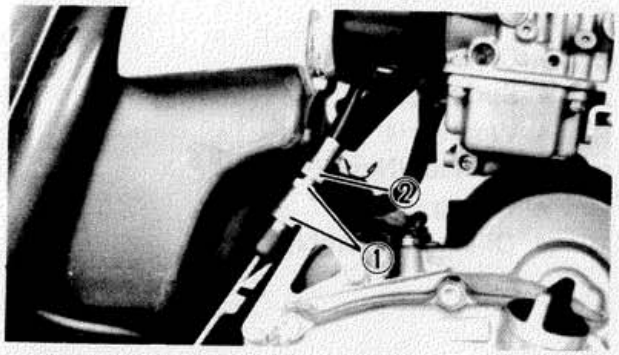
CLUTCH ADJUSTMENT/IGNITION TIMING CHECK



CLUTCH ADJUSTMENT

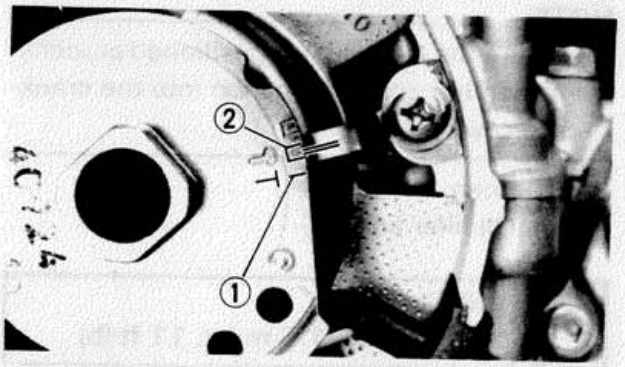
1. Loosen:
   - Adjuster locknut ①
2. Adjust:
   - Clutch lever free play ③
     (by turning adjuster ② in or out)

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



If free play can not be adjusted, adjust by clutch cable length adjuster.

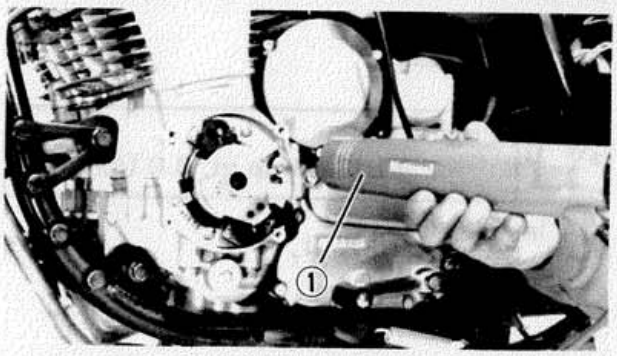
3. Loosen:
   - Adjuster locknut ①
4. Adjust:
   - Clutch lever free play
     (by turning clutch cable length adjuster ② .)



IGNITION TIMING CHECK

Flywheel is marked as follows:

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

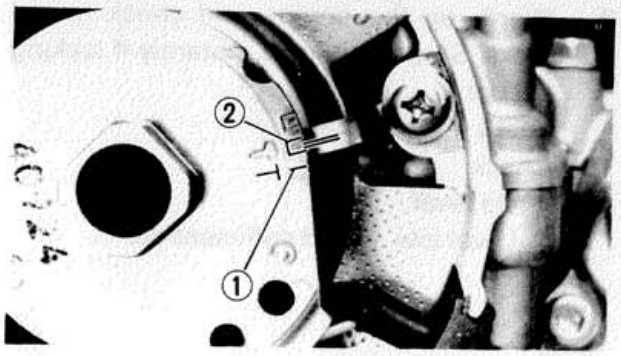


1. Check:
   - Ignition timing

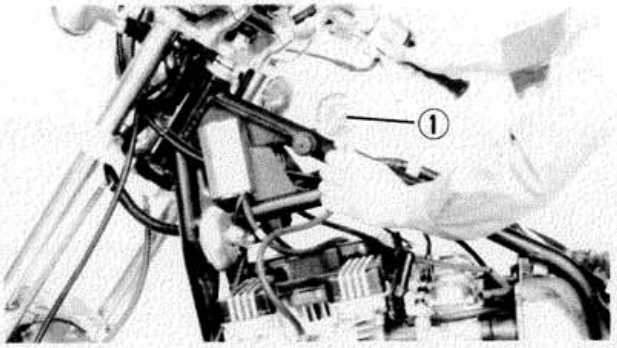
Ignition timing check steps:
- Remove the cover.
- Connect the Timing Light (YM-33277) ① to No. 1 cylinder spark plug lead.
- Warm up the engine and let it idle at the specified idle speed of 1,050 ± 50 r/min.
- Visually check the stationary pointer in the timing window to verify it is within the required firing range indicated on the flywheel.

Incorrect firing → Check timing plate and/or pickup assembly (tightness damage)

Refer to CHAPTER 6, "ELECTRICAL" for further information.



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



COMPRESSION PRESSURE MEASUREMENT

NOTE:

Insufficient compression pressure will result in performance loss.

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

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:
1,078 kPa (11 kg/cm², 156 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 all of the spark plug leads to prevent sparking.

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

Compression Pressure (with oil introduced into cylinder)

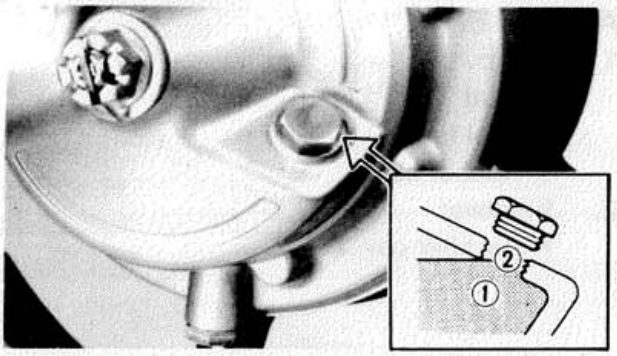
Higher than without oil	Worn or damaged pistons
Same as without oil	Defective ring(s), valves, cylinder head gasket or piston is possible.
Above maximum level	Inspect cylinder head, valve surfaces, or piston crown for carbon deposits.

COMPRESSION PRESSURE MEASUREMENT

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 (1kg/cm², 14 psi)



CHASSIS

FINAL GEAR OIL

Oil Level Measurement

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

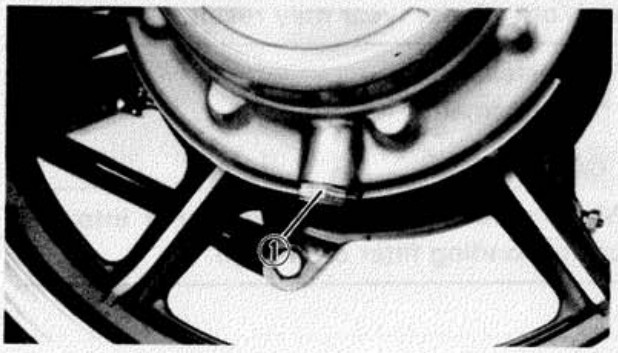
① Oil

NOTE:

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

CAUTION:

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



Gear Oil Replacement

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

23 Nm (2.3 m·kg, 17 ft·lb)

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

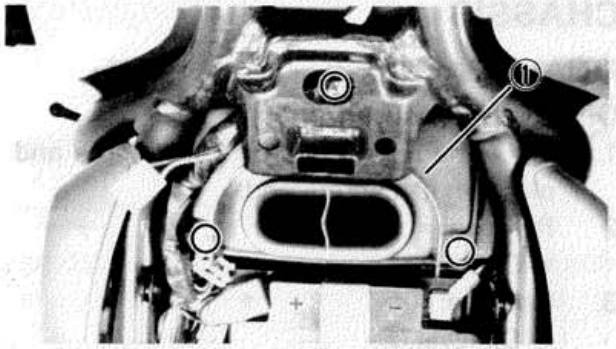
Final Gear oil:
SAE80 API "GL-4" Hypoid gear oil
Oil Capacity:
0.20 / (0.18 imp qt, 0.21 qt)

NOTE:

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

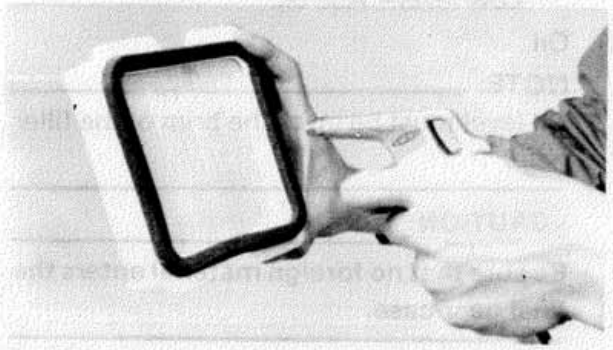
5. Install:
   - Filler cap

23 Nm (2.3 m·kg, 17 ft·lb)



AIR FILTER

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



3. Eliminate:
   - Dust
     Use compressed air
4. Inspect:
   - Element
     Damage → Replace.

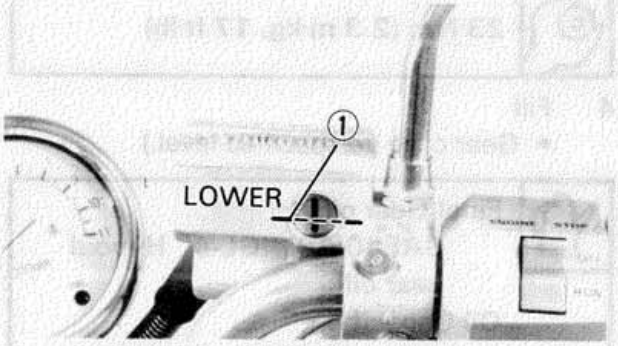
CAUTION:

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

5. Install:
   - Element

CAUTION:

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



FRONT BRAKE

Brake Fluid Inspection

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

NOTE:

Use only a designated, quality fluid.

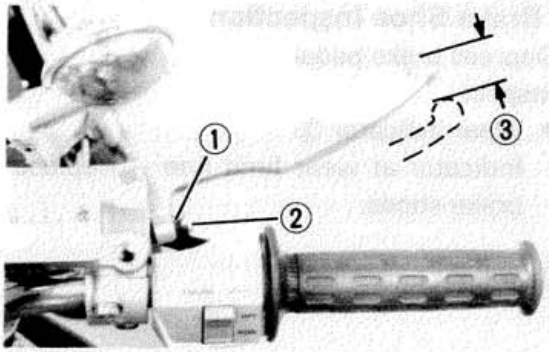
	DOT NO. 3

NOTE:

Be sure that:

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

① Lower level



Front Brake Lever Free Play Adjustment

1. Loosen:
   - Adjuster locknut ①
2. Adjust:
   - Free play ③

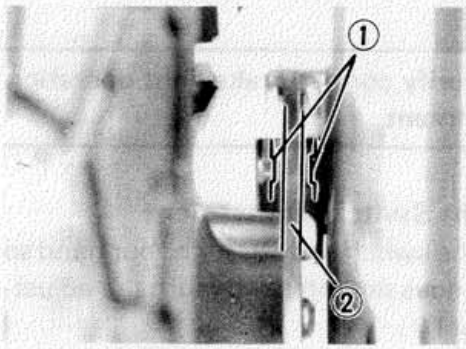
   Turn the adjuster ② until the free play ③ is within the specified limits.

Brake Lever Free Play:
2 ~ 5 mm (0.08 ~ 0.2 in)

CAUTION:

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

3. Tighten:
   - Adjuster locknut

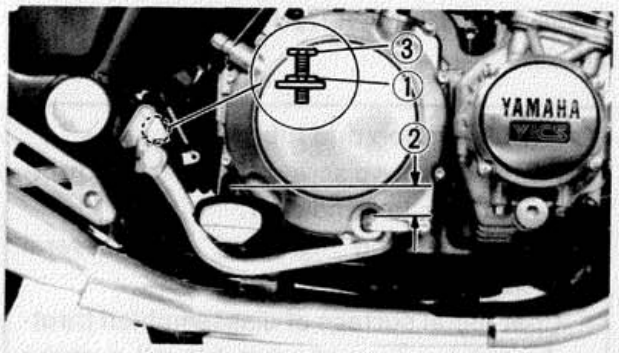


Brake Pad Inspection

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

   Indicator almost contacts disc ② → Replace pads.

   Refer to CHAPTER 5, "CHASSIS."



REAR BRAKE

Rear Brake Pedal Height Adjustment

1. Loosen:
   - Adjust locknut ① .
2. Adjust:
   - Brake pedal height ②.

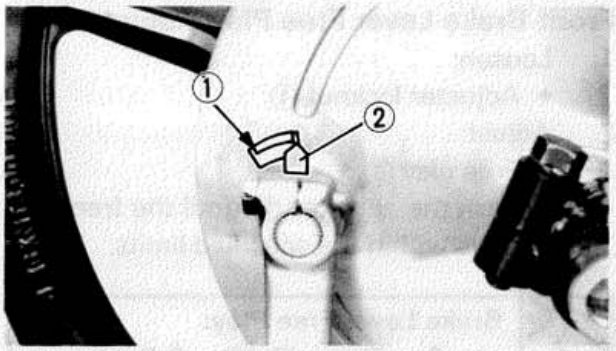
   Turn the adjuster ③ until the brake pedal position is at the specified height.

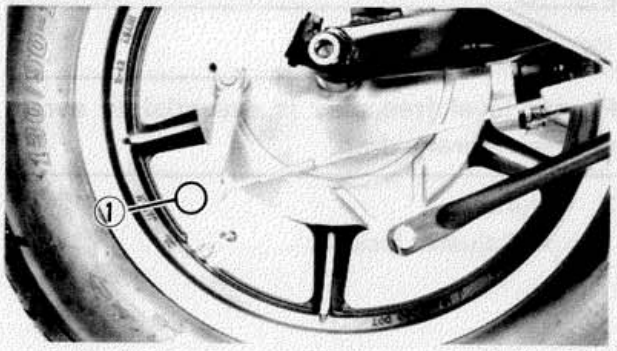
Brake Pedal Height:
10 mm (0.4 in)
Below the Top of the Footrest

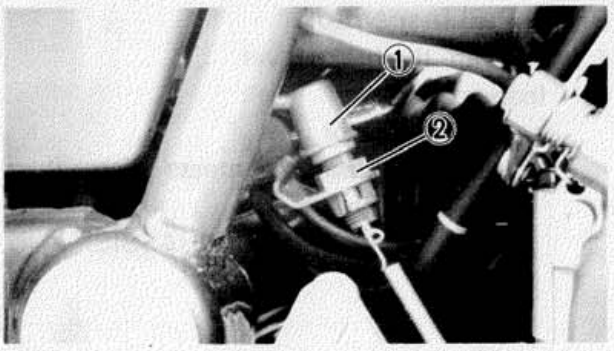
WARNING:

Adjust pedal height, then adjust brake pedal free play.

REAR BRAKE/ CABLE INSPECTION AND LUBRICATION







Rear Brake Shoe Inspection

1. Depress brake pedal
2. Inspect:
   - Wear indicator ②
     Indicator at wear limit line → Replace brake shoes.

① Wear limit line

Rear Brake Pedal Free Play Adjustment

1. Rotate:
   - Adjuster nut ①
     Turn it clockwise or counterclockwise until proper brake pedal free play is attained.

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

WARNING:

Check to verify correct brake light operation after adjustment.

Brake Light Switch Adjustment

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

CABLE INSPECTION AND LUBRICATION

Cable inspection and lubrication steps:

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

SAE 10W30 Motor Oil

BRAKE AND CHANGE PEDALS/ BRAKE CLUTCH LEVERS

Lubricate pivoting parts of each lever and pedal.

	SAE10W30 Motor Oil

CENTERSTAND AND SIDESTAND

Lubricate centerstand and sidestand at their pivot points.

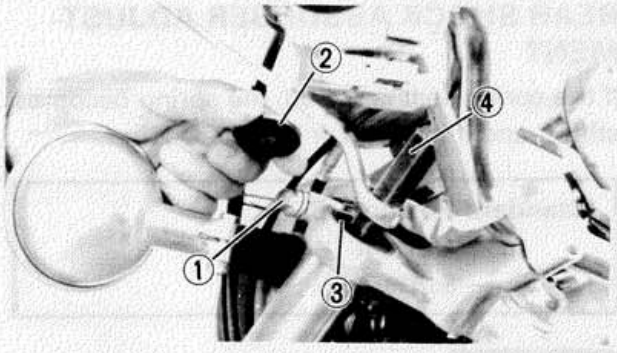
	SAE 10W30 Motor Oil

FRONT FORK OIL CHANGE

WARNING:

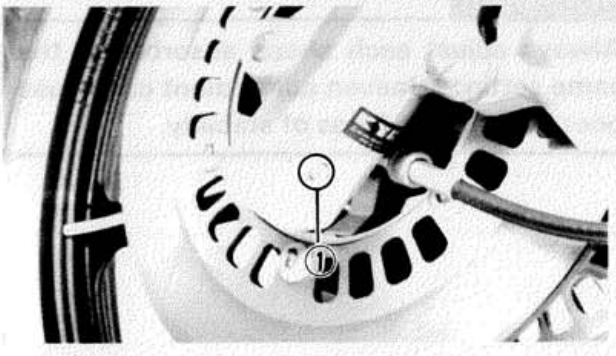
Securely support the motorcycle so there is no danger of it falling over.

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



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

   Use the Front Fork Cap Socket (YM-01104) ④

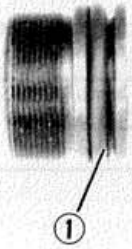


4. Remove:
   - Drain screw ①

   Drain the fork oil.

WARNING:

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



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

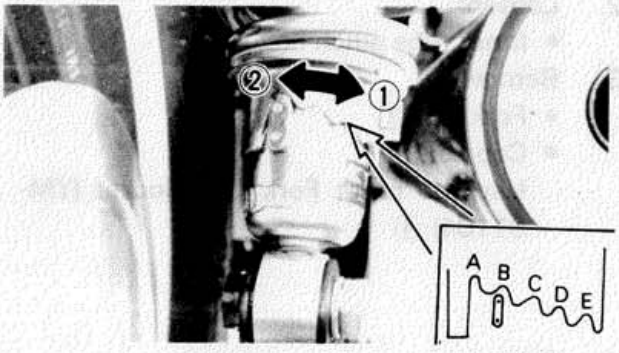
Each Fork:
383 cm³ (13.51 imp oz, 12.95 US oz)

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

10. Tighten:
    - Cap-bolt
    - Pinch bolt

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

11. Install:
    - Fork cap



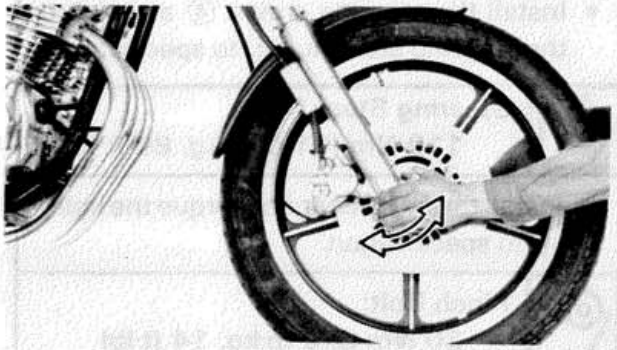
REAR SHOCK ABSORBER ADJUSTMENT

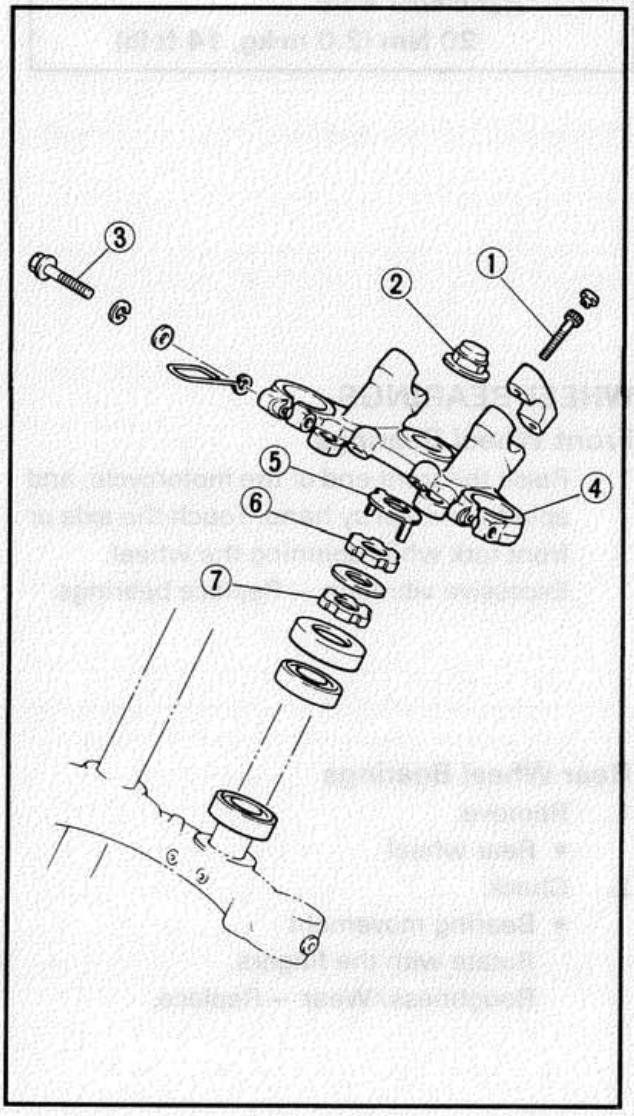
If the spring seat is raised, the spring becomes stiffer, and if lowered, it becomes softer.

Standard Position: B
A. — Softest ①
E. — Stiffest ②

WARNING:

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





STEERING HEAD ADJUSTMENT

Steering Head Inspection

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

Adjustment

Steering head adjustment steps:

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

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

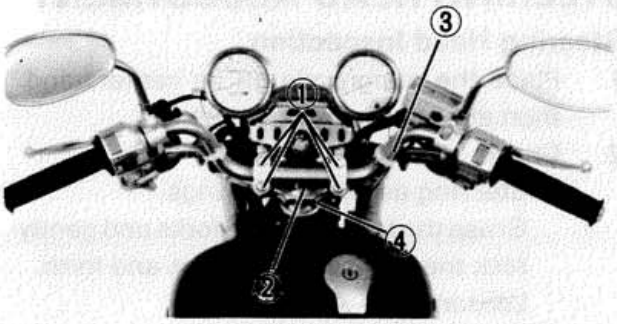
NOTE:
The tapered side of ring nuts must face downward.

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

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

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

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

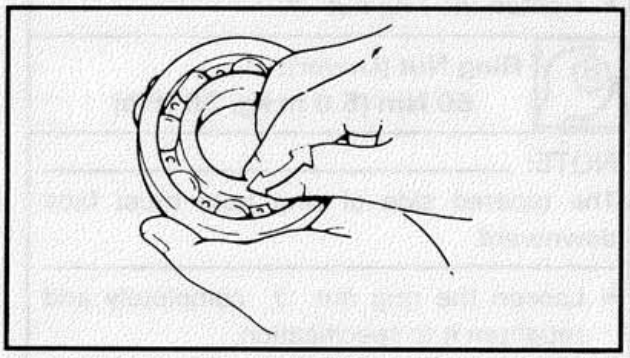


- Install the steering crown ④ and tighten the steering stem nut ② to specification.

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

- Install the handlebar and torque the bolt ① to specification.

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



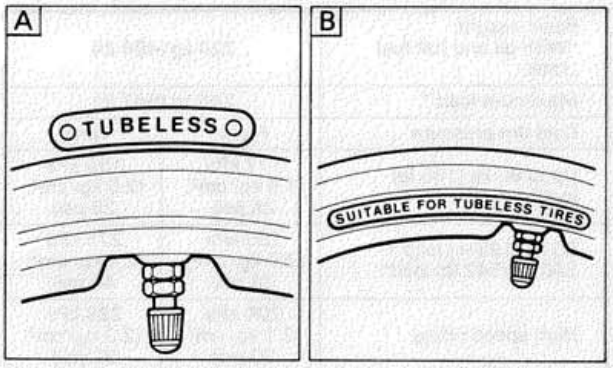
WHEEL BEARINGS

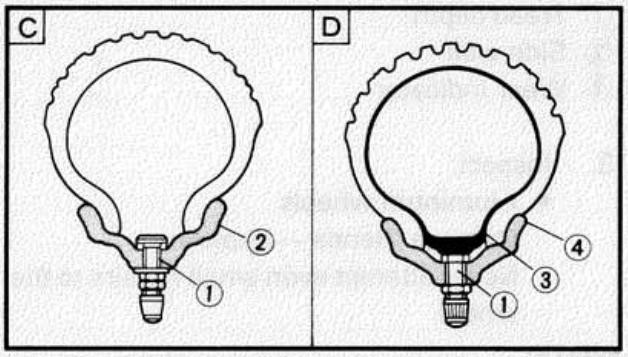
Front Wheel Bearings

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

Rear Wheel Bearings

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





TUBELESS TIRES AND ALUMINUM WHEELS

WARNING:

- **Always inspect aluminum wheels before a ride.**
- **Place the motorcycle on its centerstand and check for cracks, bends, or warpage of the wheels.**
- **Do not attempt any repairs to the wheel; replace any defective wheel.**
- **Do not attempt to use tubeless tires on a wheel designed for use with tube-type tire only. Tire failure and subsequent personal injury may result from sudden deflation.**
- **Be sure to install the proper tube when using tube-type tires.**
- **New tires have a relatively poor adhesion on the road surface so do not allow them to be subjected to high speed load from maximum speed until after a break-in run of approx. 100 km (60 mi).**
- **Always use the correct tire inflation pressure acording to the operating conditions.**

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

A Tire
B Wheel
C Tubeless tire
D Tube type tire
① Air valve
② Aluminum wheel (Tubeless type)
③ Tube
④ Aluminum wheel (tube type)

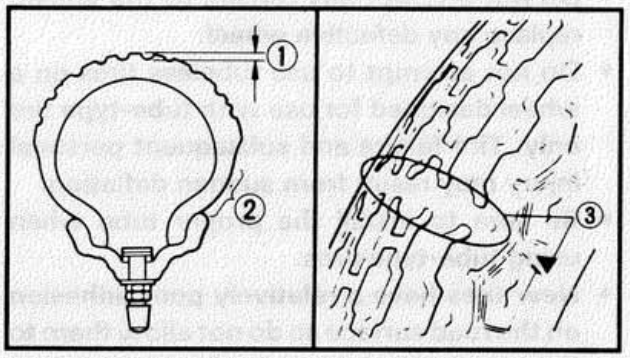
Always perform the following steps to ensure safe operation, maximum tire performance, and long service.

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

TUBELESS TIRES AND ALUMINUM WHEEL

Basic weight: With oil and full fuel tank	224 kg (494 lb)	
Maximum load *	246 kg (542 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	177 kPa (1.8 kg/cm², 26 psi)	196 kPa (2.0 kg/cm², 28 psi)
90 kg (198 lb) load ~ 246 kg (542 lb) load*	196 kPa (2.0 kg/cm², 28 psi)	275 kPa (2.8 kg/cm², 40 psi)
High speed riding	206 kPa (2.1 kg/cm² 30 psi)	225 kPa (2.3 kg/cm² 32 psi)

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



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

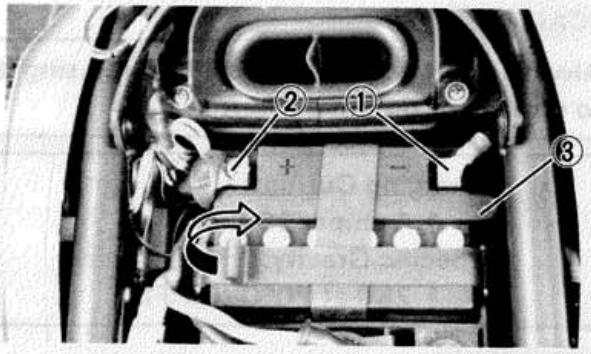
Minimum Tire Tread Depth:
(Front and Rear)
1.0 mm (0.04 in)

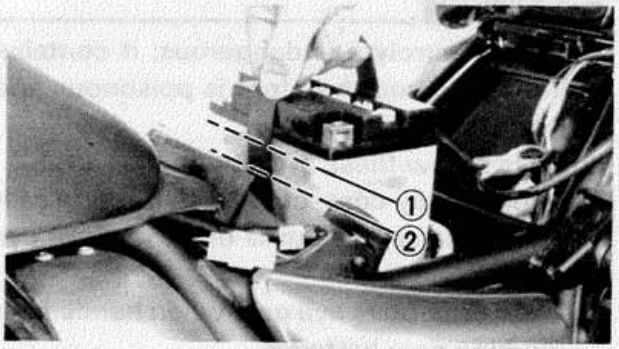
① Tread depth
② Side wall
③ Wear indicator

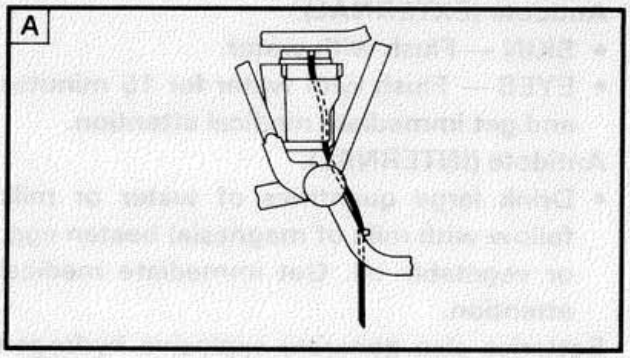
3. Inspect:
   - Aluminum wheels
     Damage/Bends → Replace.
     Never attempt even small repairs to the wheel.

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

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







ELECTRICAL

BATTERY

1. Disconnect:
   - Negative lead ①
   - Positive lead ②
   - Breather hose ③
2. Pull:
   - Battery

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

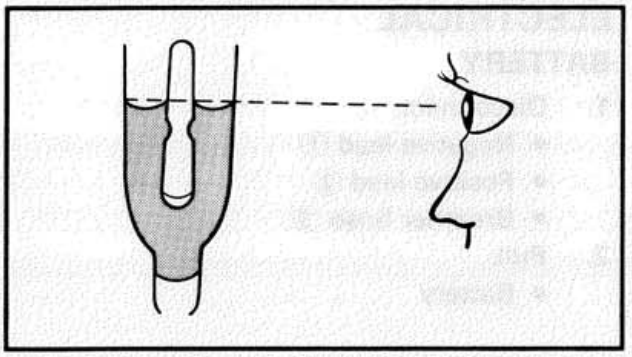
CAUTION:

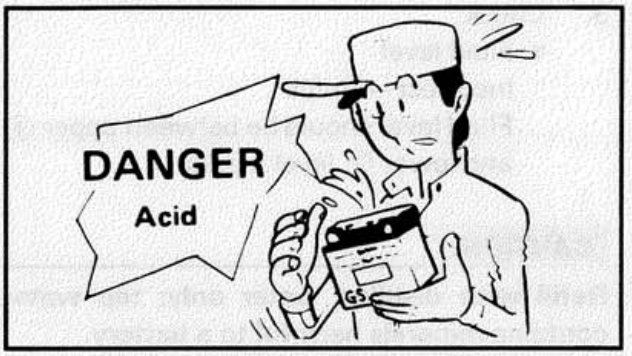
Refill with distilled water only; tap water contains minerals harmful to a battery.

2. Connect:
   - Breather 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.

HEADLIGHT





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 measure:

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

Antidote (EXTERNAL):

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

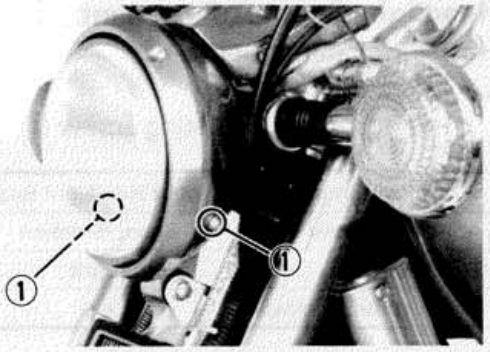
Antidote (INTERNAL):

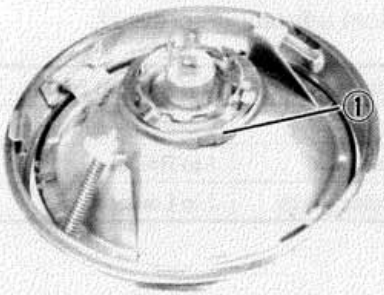
- **Drink large quantities of water or milk follow with milk of magnesia) beaten egg, or vegetable oil. Get immediate medical attention.**

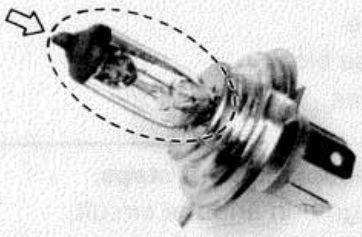
Batteries also generate explosive hydrogen gas, therefore, you should always follow these preventive measures:

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

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.







HEADLIGHT

Headlight Bulb Replacement

1. Remove:
   - Securing screws ①
     (from light unit assembly/headlight body.)
2. Disconnect:
   - Lead wire
3. Remove:
   - Light unit assembly
4. Rotate:
   - Bulb holder ①
     Turn it counterclockwise.
5. Remove:
   - Defective bulb
6. Install:
   - Bulb (New)
     Secure with bulb holder.

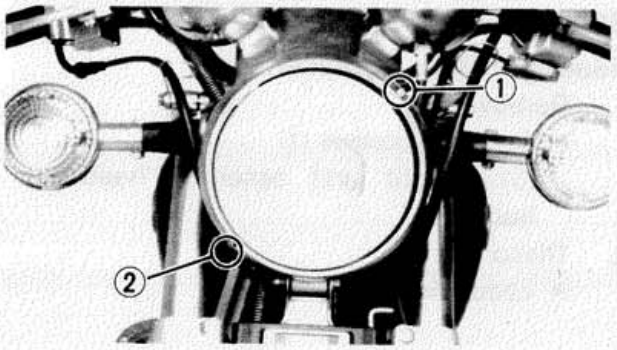
CAUTION:

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

WARNING:

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

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



Headlight Beam Adjustment

Horizontal adjustment:

1. Rotate:
   - Horizontal adjusting screw ①

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

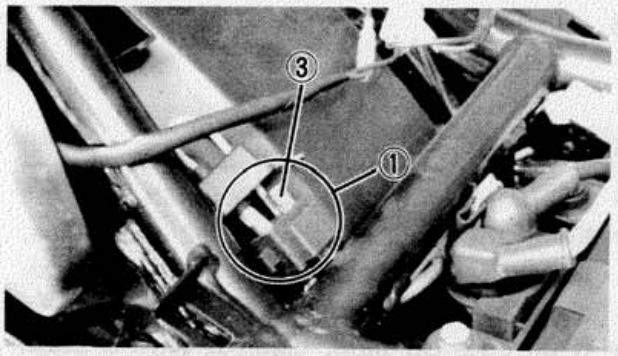
Vertical adjustment:

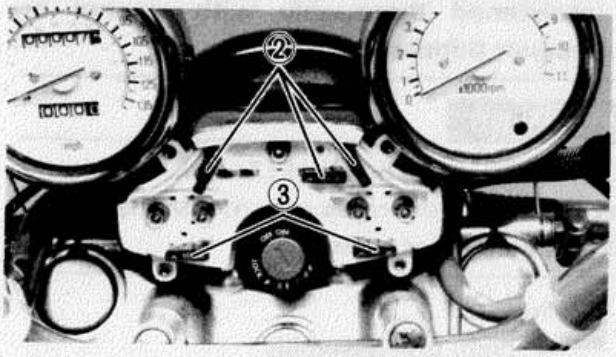
1. Rotate:
   - Vertical adjusting screw ②

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

FUSE

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





① Main fuse
② Other fuse block
③ Spair fuses

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

WARNING:

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

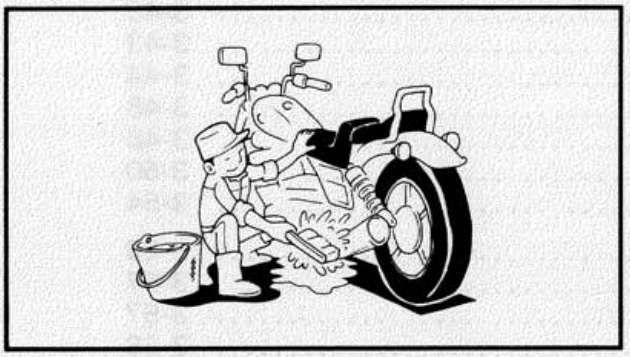
ENGINE OVERHAUL

ENGINE REMOVAL

NOTE:

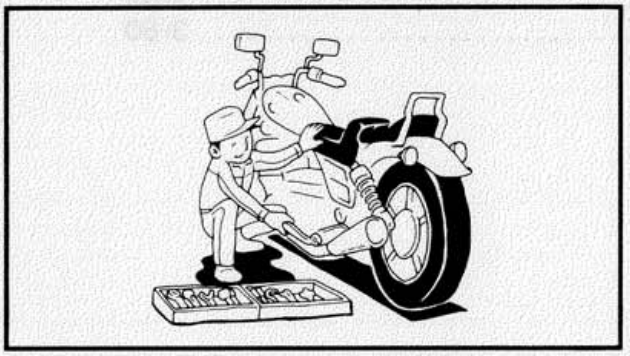
It is not necessary to remove the engine in order to remove the following components:

- Piston
- Clutch
- Carburetor
- Oil pump



PREPARATION FOR REMOVAL

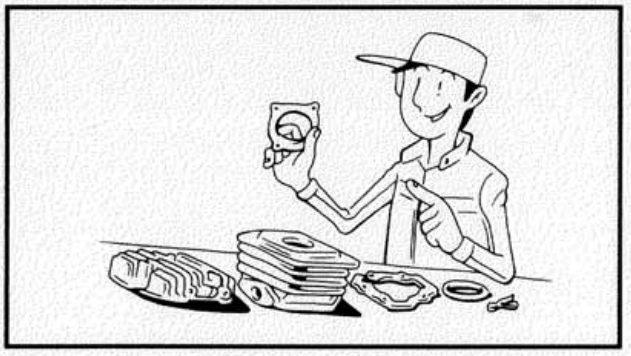
1. Remove all dirt, mud, dust, and foreign material before removal and disassembly.



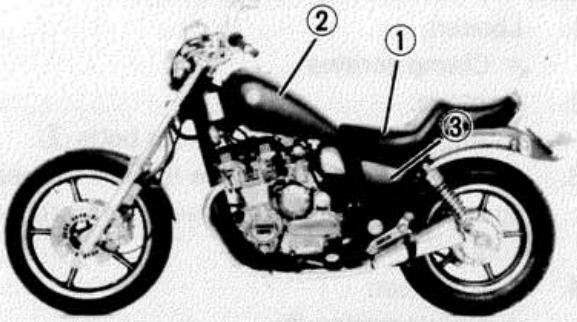
2. Use proper tools and cleaning equipment. Refer to CHAPTER 1, "SPECIAL TOOL."

NOTE:

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

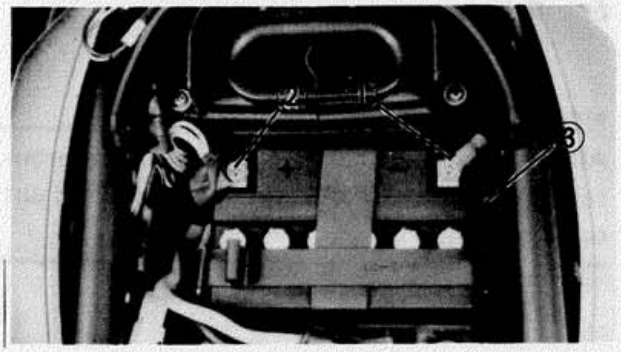


3. During the engine disassembly, clean all parts and place them in trays in the order of disassembly. This will speed up assembly time and help assure that all parts are correctly reinstalled in the engine.



SEAT AND FUEL TANK

1. Remove:
   - Seat ①
   - Fuel tank ②
   - Left side cover ③
2. Drain:
   - Engine oil

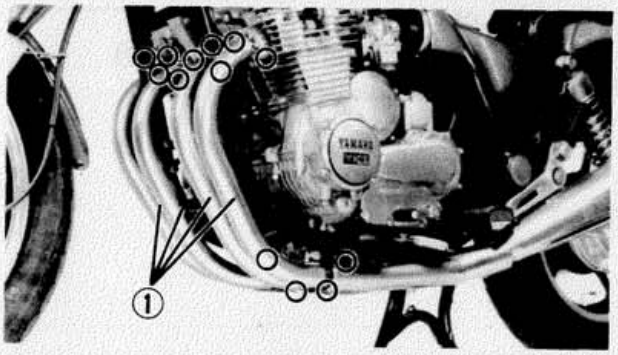


BATTERY

1. Disconnect:
   - Battery leads ①, ②
   - Breather hose ③

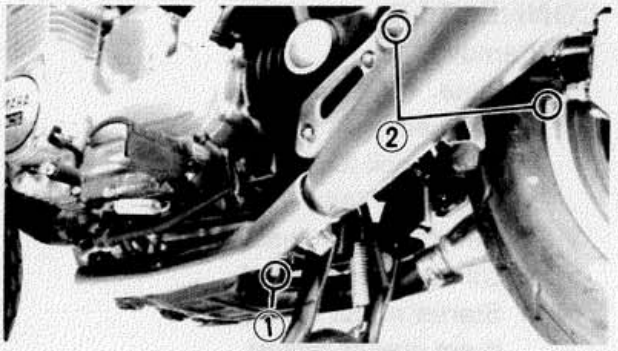
NOTE:

Disconnect the negative lead ① first.

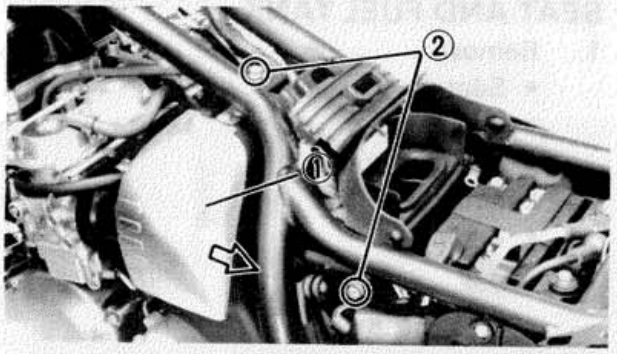


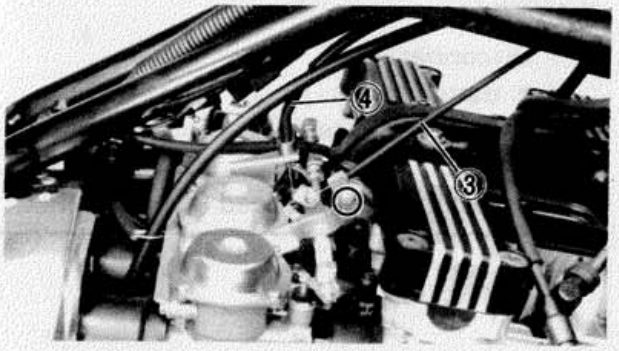
EXHAUST PIPE AND MUFFLER

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



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



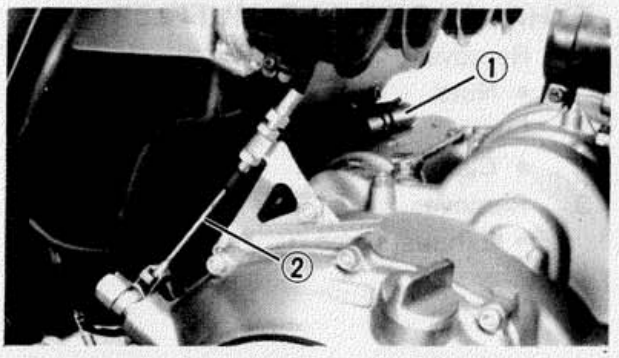


CARBURETOR AND CABLES

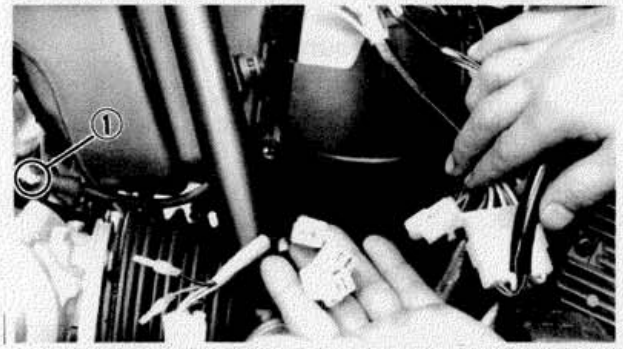
1. Loosen:
   - Clamp screws
2. Remove:
   - Air cleaner case ① mount bolts ②
3. Push the air cleaner case toward the rear to disconnect air outlet hoses from carburetors.
4. Disconnect:
   - Choke cables ③
5. Remove:
   - Carburetors
   - Throttle cable ④

NOTE:

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

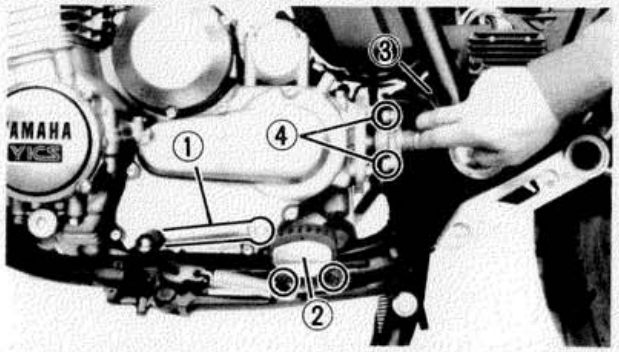


7. Disconnect:
   - Crankcase ventilation hose ① (from crankcase)
   - Clutch cable ②



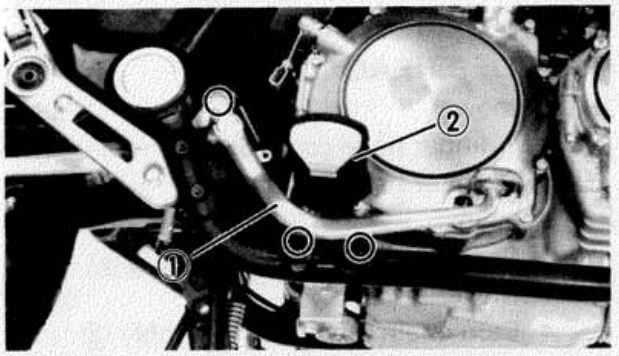
CONNECTOR

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

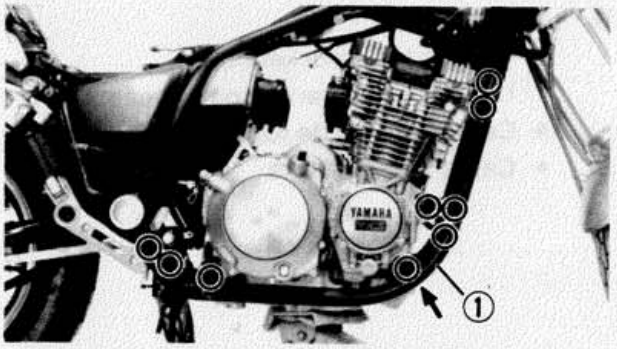


SHIFT PEDAL, BRAKE PEDAL, FOOTREST AND DRIVE SHAFT

1. Remove:
   - Shift pedal ①
   - Left footrest ②
2. Disconnect:
   - Rubber boot ③
3. Remove:
   - Joint bolts ④

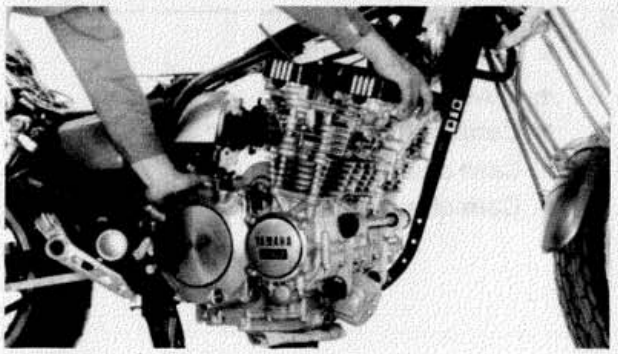


4. Remove:
   - Brake pedal ①
   - Right footrest ②

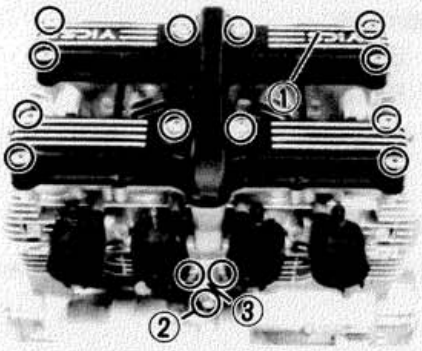


ENGINE REMOVAL

1. Place a suitable stand under the engine.
2. Remove:
   - Mounting bolts
   - Donwtube frame ①



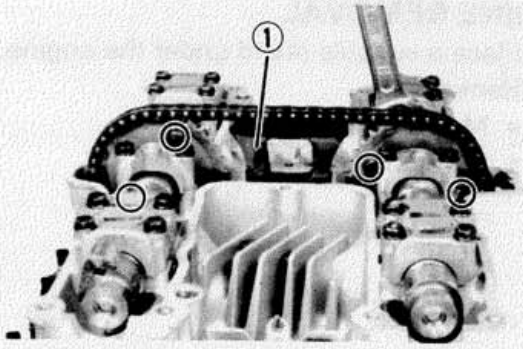
3. Remove:
   - Engine assembly
     (from chassis right side)



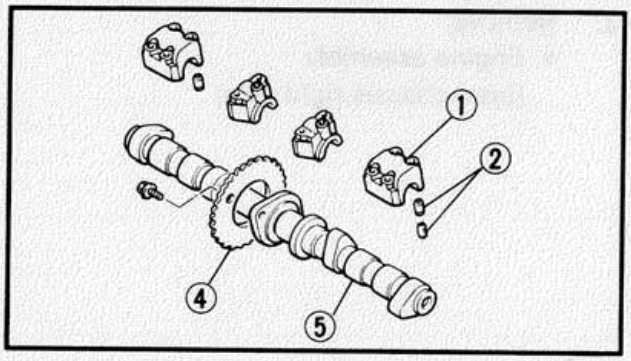
ENGINE DISASSEMBLY

CYLINDER HEAD

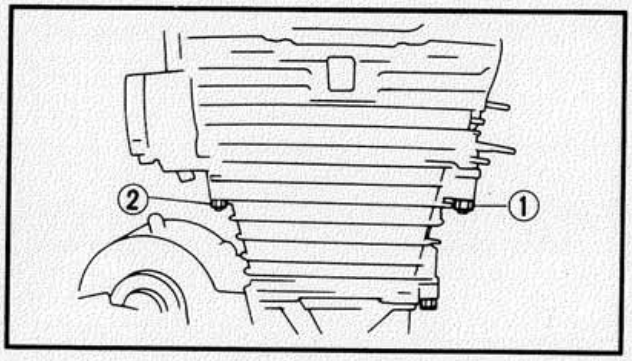
1. Remove:
   - Cylinder head cover bolts
   - Cylinder head cover ①
2. Loosen:
   - Cam chain tensioner end plug ②
3. Remove:
   - Cam chain tensioner assembly ③



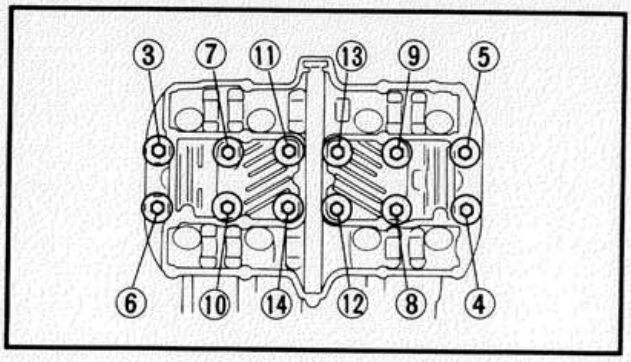
4. Remove:
   - Cam chain sprocket bolts
     Use 22 mm wrench to hold camshaft.
   - Cam chain guide (Upper) ①
   - Camshaft cap bolts



5. Remove:
   - Cam shaft caps ①
   - Dowel pins ②
   - Camshafts ③
   - Cam chain sprockets ④
   - Cam chain guide (Front)



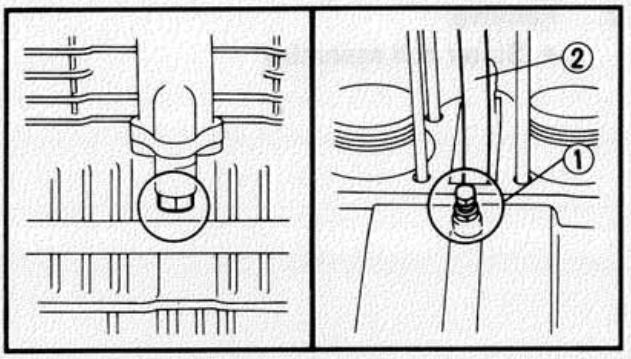
6. Remove:
   - Cylinder head nuts (Front) ①
   - Cylinder nut (Rear) ②



7. Remove:
   - Cylinder head nuts

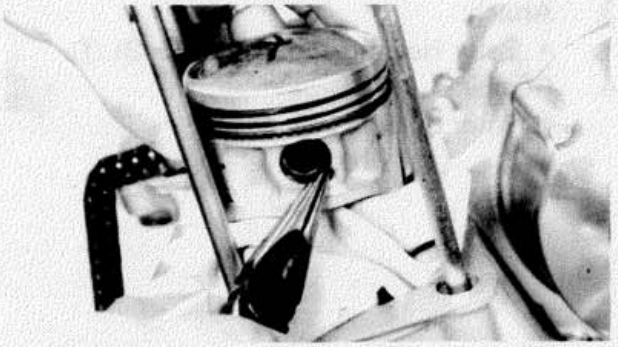
NOTE:
Follow numerical order shown in photo. Start by loosening each nut 1/2 turn until all are loose.

   - Cylinder head



CYLINDER AND PISTON

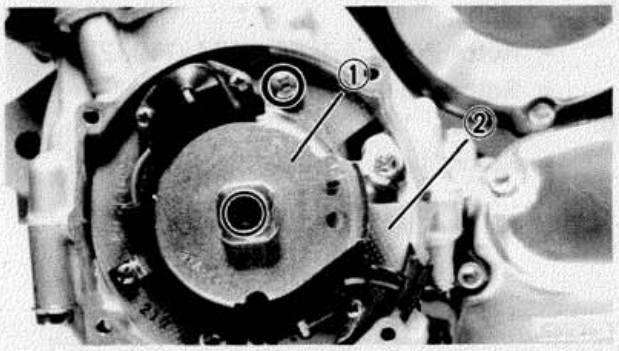
1. Remove:
   - Front cylinder holding nut
   - Cylinder
2. Loosen:
   - Cam chain guide holding bolt ①
3. Remove:
   - Cam chain guide ②



4. Mark each piston so it can be reinstalled in the appropriate cylinder.
5. Remove:
   - Piston pin clips
   - Piston pin

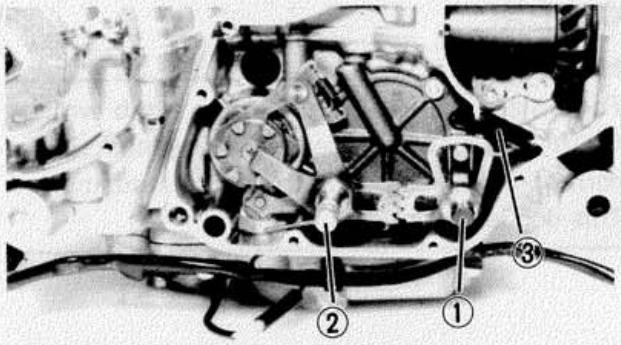
NOTE:

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



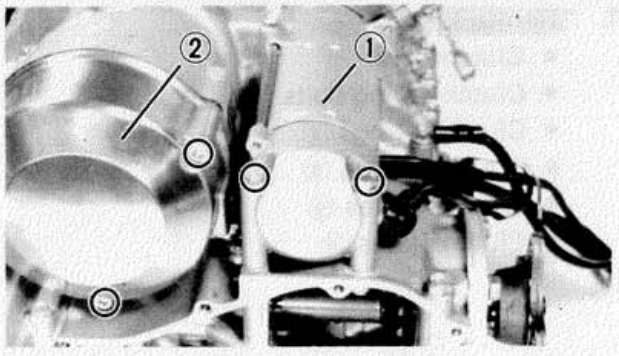
PICKUP COIL

1. Remove:
   - Timing plate ①
   - Pickup coil assembly ②



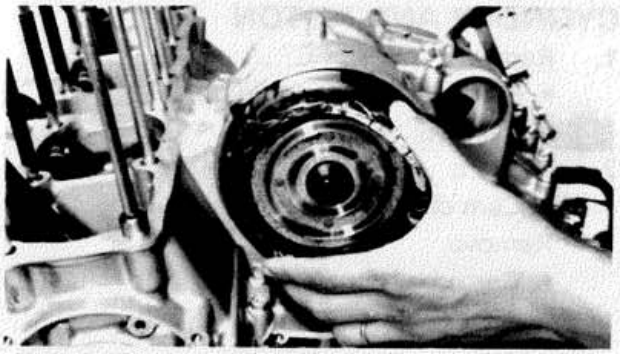
SHIFTER

1. Remove:
   - Left crankcase cover
   - Shift shaft ①
   - Shift lever ②
   - Washer
   - Oil level maintaining plug ③

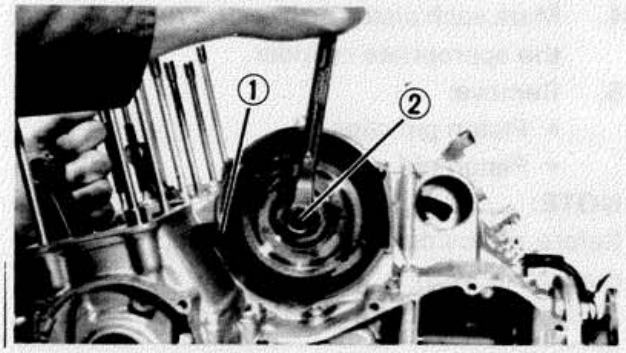


STARTER MOTOR AND GENERATOR

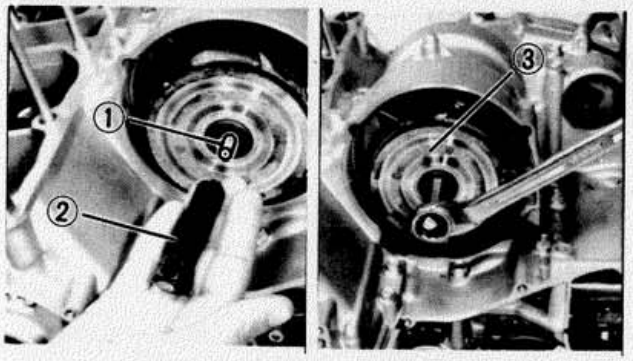
1. Remove:
   - Starter motor ①
   - Generator cover ②



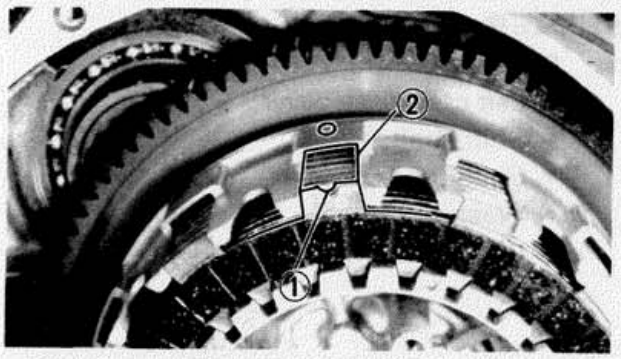
2. Remove:
   - Stater coil assembly



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



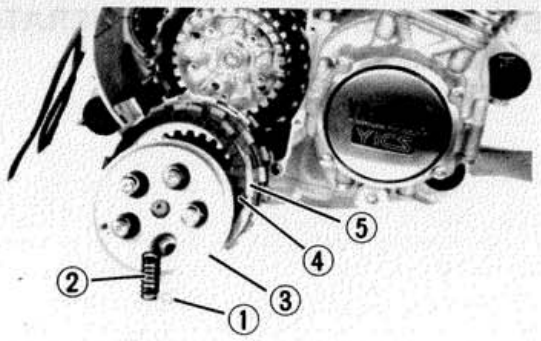
5. Attach:
   - Rotor Puller Adapter (YM-04052) ①
   - Rotor Puller (YM-01080) ②
6. Remove:
   - Rotor ③



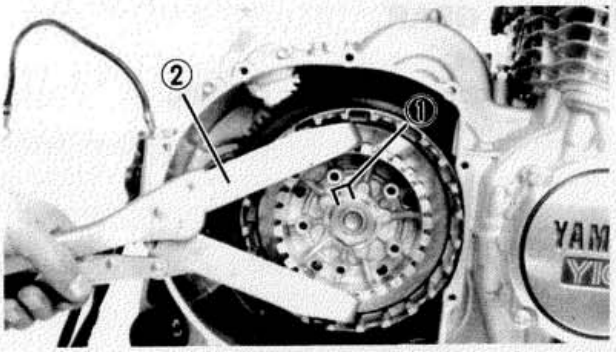
CLUTCH

NOTE:

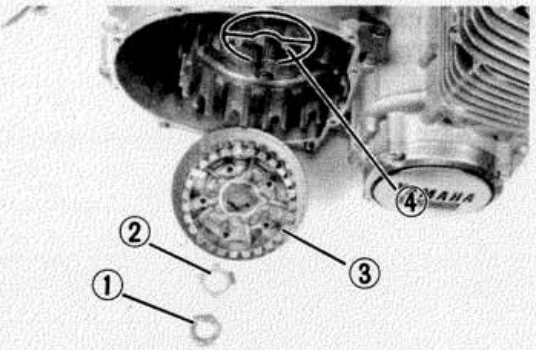
The outermost friction plate has a tab with a V-cut ① in it. Give some identifying mark to the corresponding dog ② in the clutch housing. This dog is narrowest.



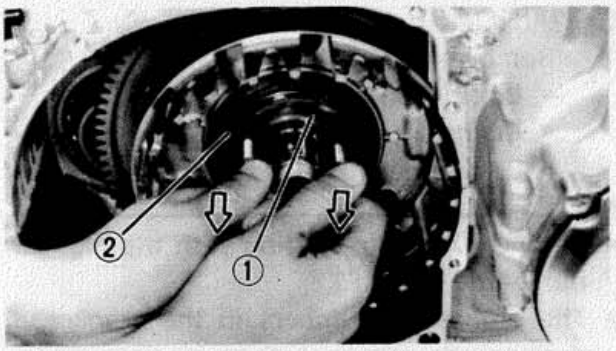
1. Remove:
   - Clutch cover
   - Clutch spring bolts ①
   - Clutch springs ②
   - Pressure plate ③
   - Friction plates ④
   - Clutch plates ⑤



2. Bend:
   - Lock washer tab ①
3. Attach:
   - Universal Clutch Holder (YM-91042) ②

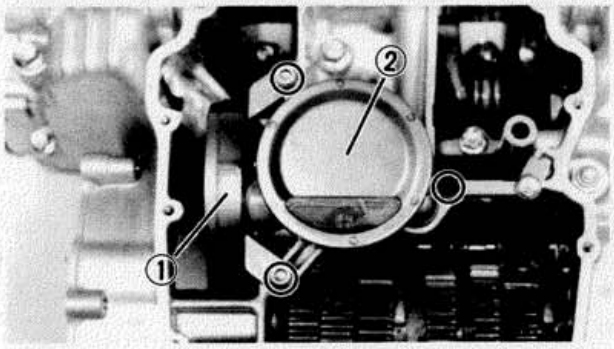


4. Remove:
   - Clutch boss nut ①
   - Lock washer ②
   - Clutch boss ③
   - Thrust washer ④

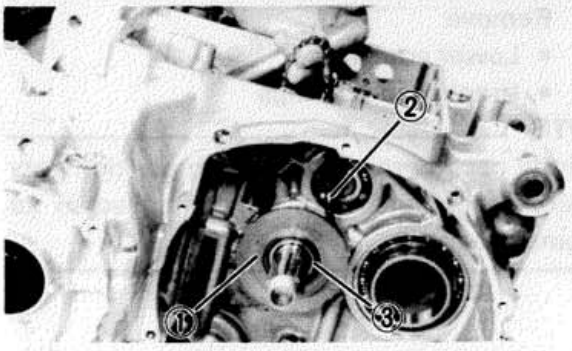


5. Install:
   - Clutch cover bolts
     (into clutch housing collar holes)
6. Remove:
   - Collar ①
   - Bearing ②
   - Clutch housing

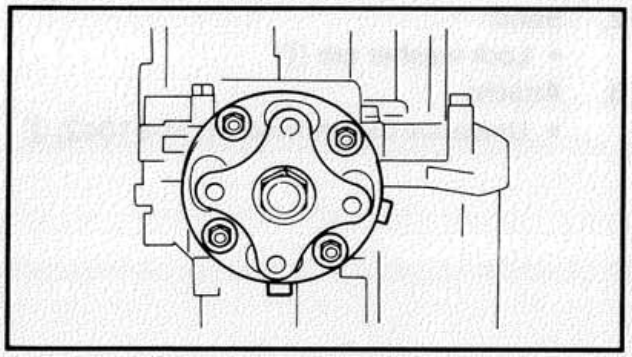
OIL PUMP



1. Remove:
   - Oil pan
   - Oil pump securing bolts
   - Sprocket cover ①
   - Oil pump assembly ②

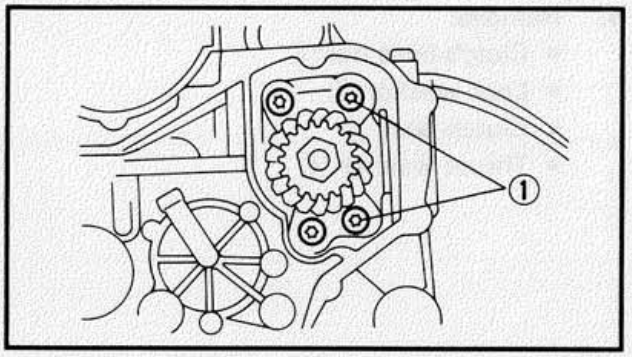


2. Remove
   - Oil pump drive sprocket ①
   - Chain ②
   - Collar ③
   - Thrust plate

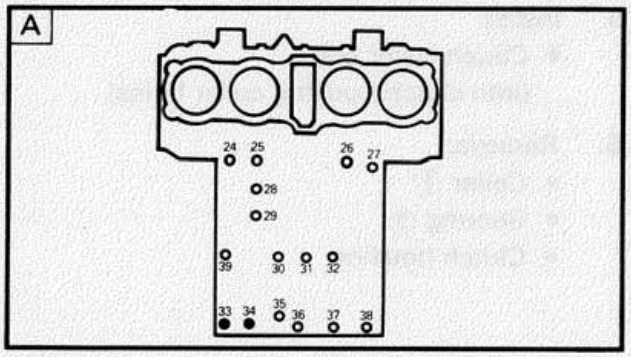


MIDDLE GEAR

1. Remove:
   - Middle driven gear housing
   - Shim (s)



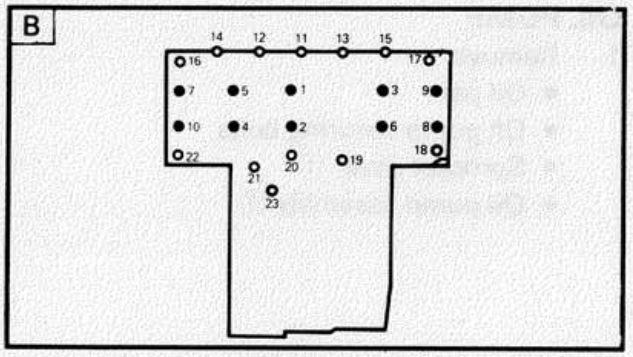
2. Remove:
   - "TORX" screws
   - Bearing retainers ①



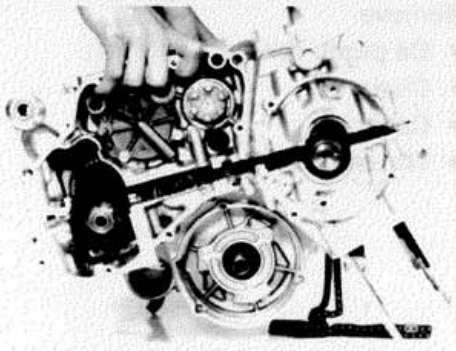
CRANKCASE

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

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

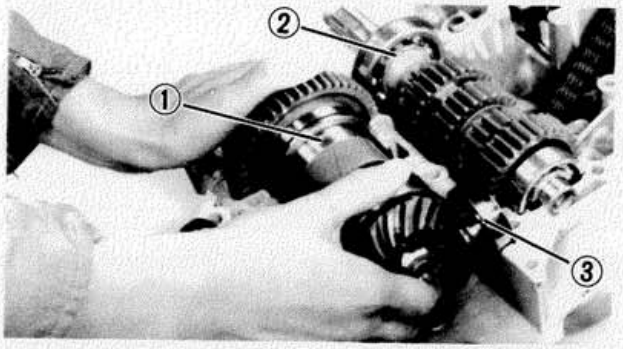


A Upper crankcase
B Lower crankcase
- 8 mm bolts
○ 6 mm bolts



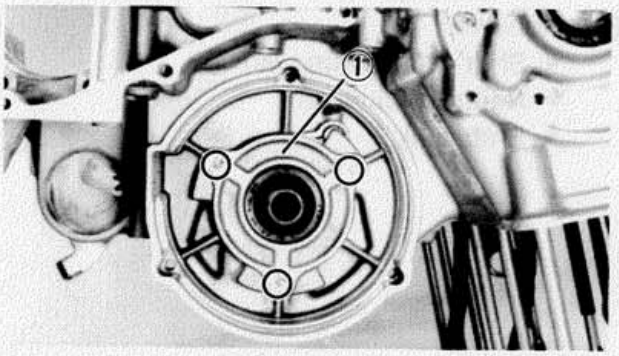
2. Remove:
   - Lower crankcase
   - Crankshaft bearings

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

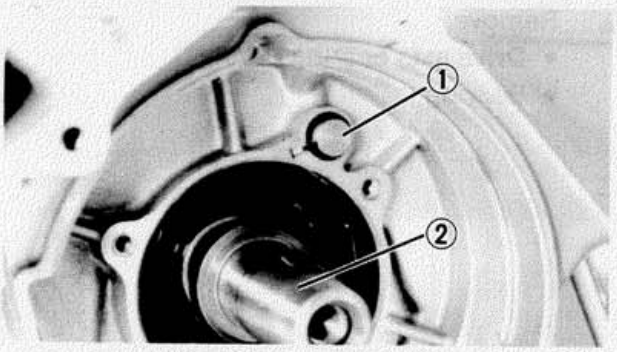


TRANSMISSION

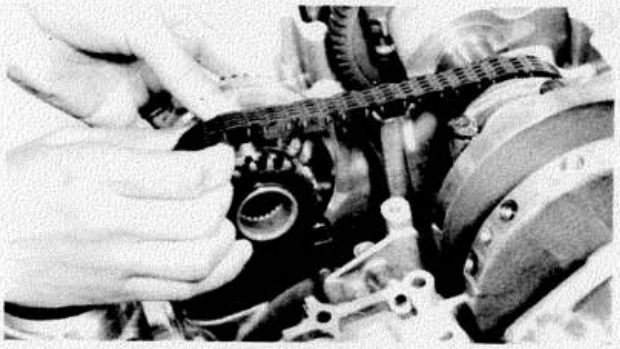
1. Remove:
   - Middle drive gear assembly ①
   - Main axle assembly ②
   - Bearing ③



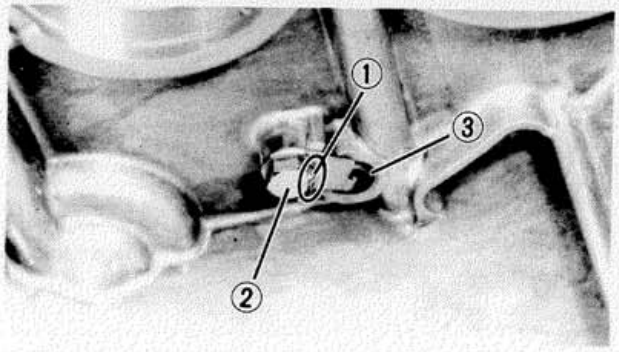
2. Remove:
   - A.C.G. shaft cover ①



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

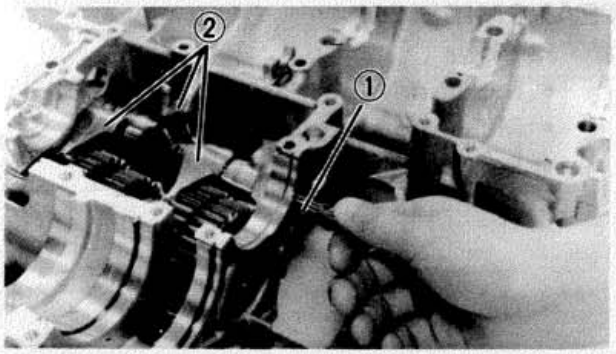


4. Remove:
   - Starter clutch
   - Crankshaft

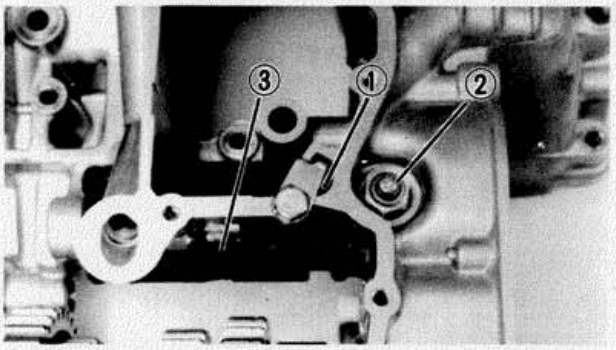


5. Bend:
   - Lock washer tab ①
6. Remove:
   - Starter idle gear shaft bolt ②
   - Starter idle gear shaft ③
   - Starter idle gear

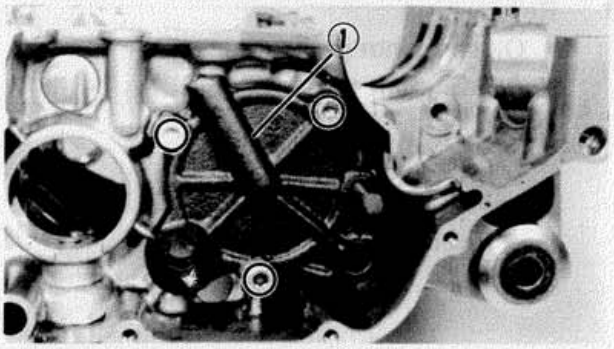
ENGINE DISASSEMBLY



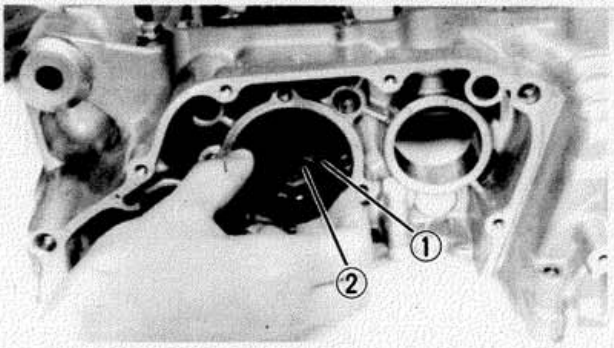
7. Remove:
   - Guide bar ①
   - Shift forks ②



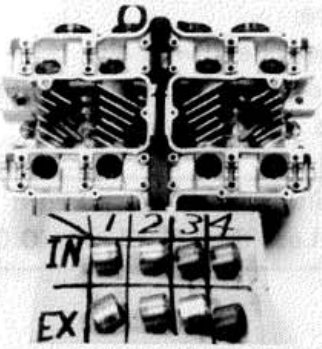
8. Remove:
   - Shift cam locating pin ①
   - Neutral switch ②
   - Shift cam ③



9. Remove:
   - Drive axle bearing cover ①
   - Bearing



10. Remove:
    - 5th wheel gear ①
    - Drive axle assembly ②

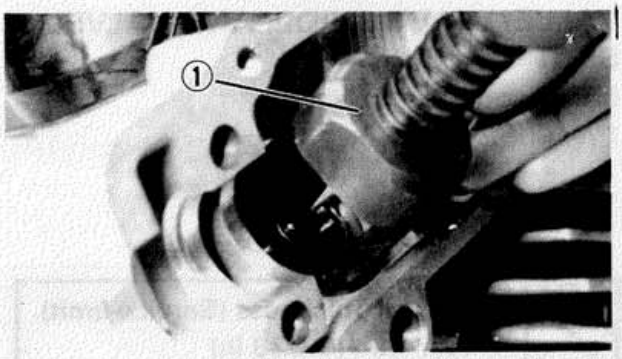


INSPECTION AND REPAIR

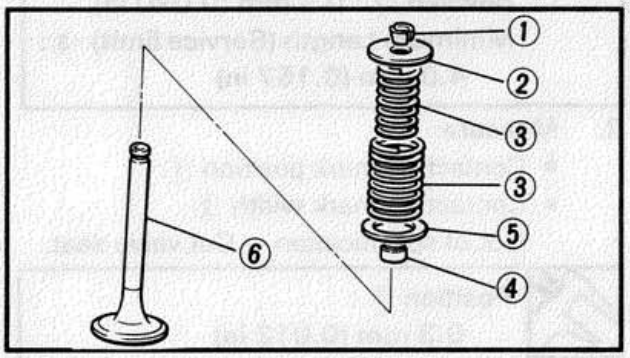
CYLINDER HEAD

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

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

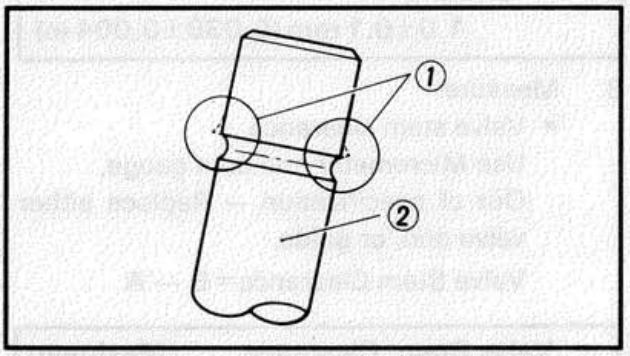


2. Attach:
   - Valve spring compressor (YM-04019) ①



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

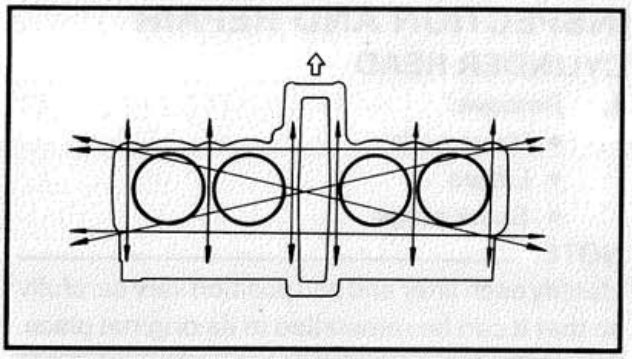
NOTE:
Deburr any deformed valve stem end. Use an oil stone to smooth the stem end.

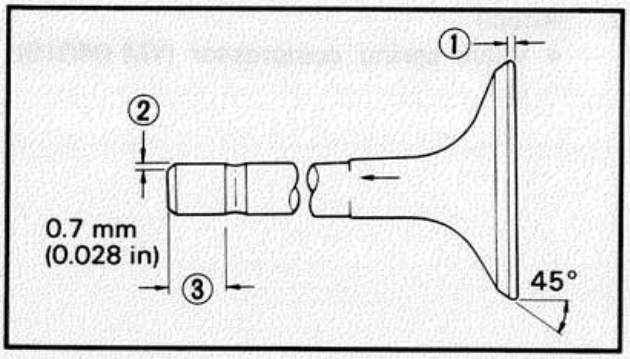


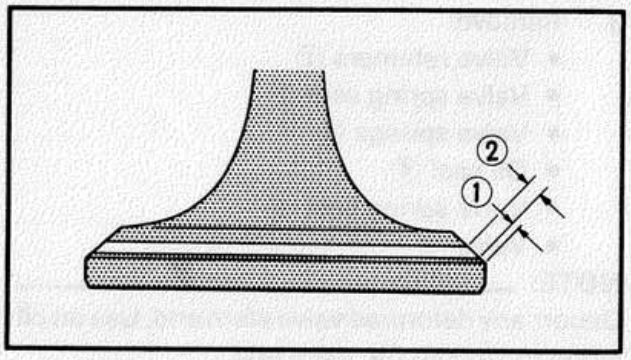
① Deburr
② Valve stem

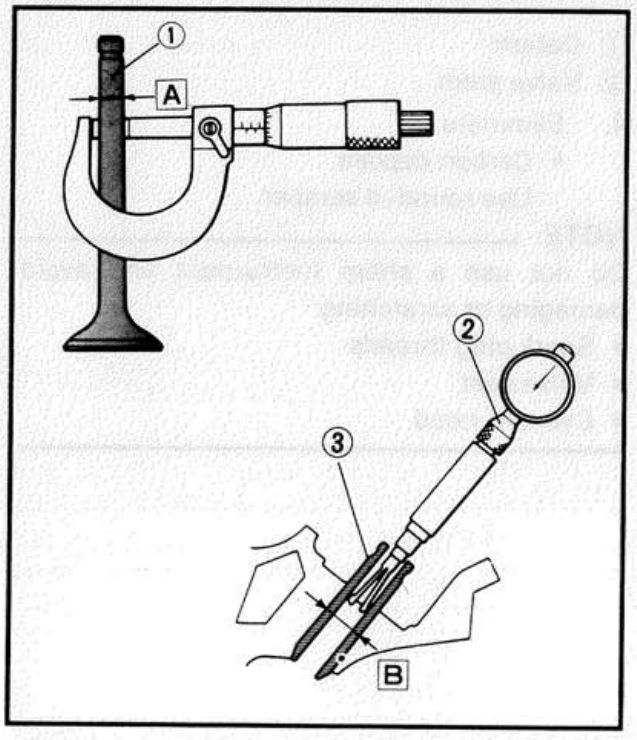
4. Eliminate:
   - Carbon deposit
     Use rounded scraper.

NOTE:
Do not use 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 → Replace.

Minimum Thickness (Service limit)
① :0.7 mm (0.028 in)
Beveled ②: 0.5 mm (0.020 in)
Minimum Length (Service limit) ③:
4.0 mm (0.157 in)

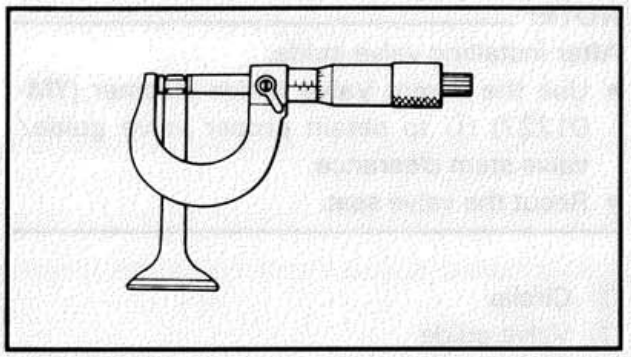
2. Measure:
   - Contacting mark position ①
   - Contacting mark width ②
     Out of specification → Cut valve seat.

Position ① :
0.3 mm (0.012 in)
Width ② :
1.0 ± 0.1 mm (0.039 ± 0.004 in)

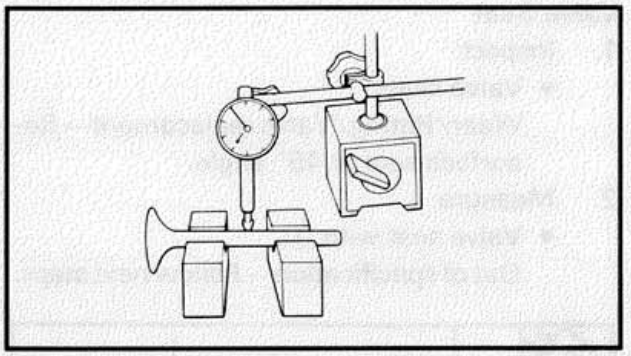
3. Measure:
   - Valve stem clearance
     Use Micrometer and bore gauge.
     Out of specification → Replace either valve and/or guide.
     Valve Stem Clearance = B — A

Valve Stem. Clearance		Maximum
Intake	0.010~0.037 mm (0.0004~0.0015 in)	0.10 mm (0.004 in)
Exhaust	0.025~0.052 mm (0.0010~0.0020 in)	0.12 mm (0.005 in)

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



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



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

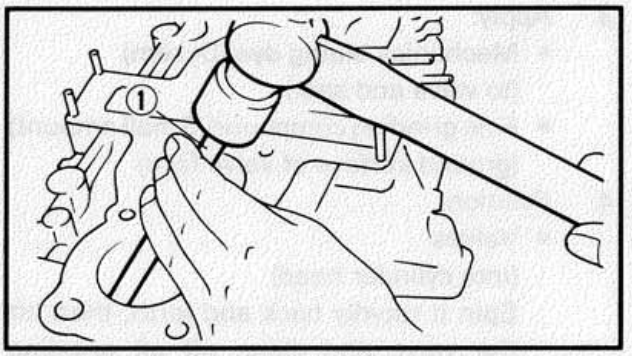
Maximum Runout:
0.03 mm (0.0012 in)

Valve Guide

NOTE:

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

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

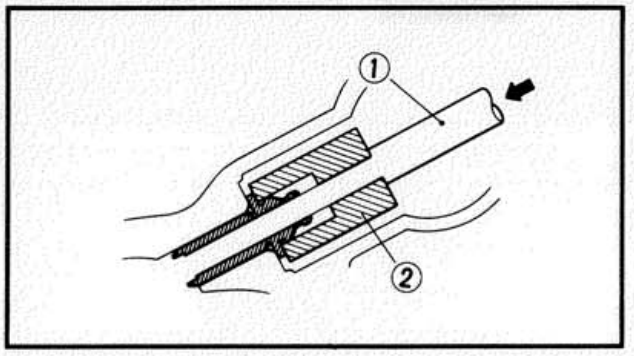


Valve Guide Removal

NOTE:

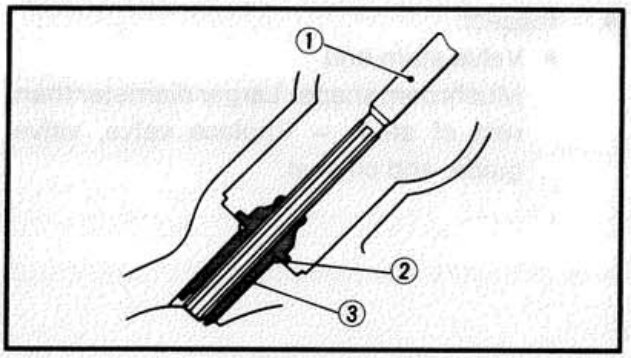
Heat the head in an oven to 100°C (212°F) to ease guide removal and installation and to maintain correct interference fit.

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



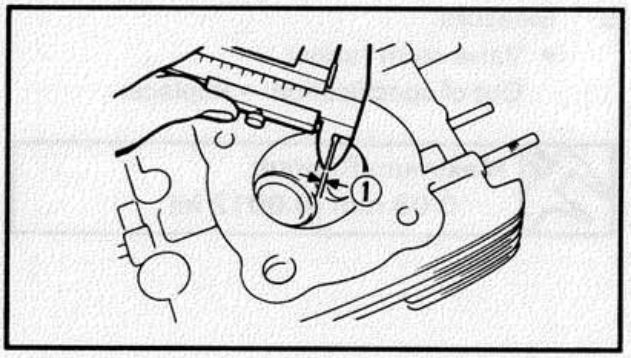
Valve Guide Installation

1. Install:
   - Circlip (New)
   - Valve guide (Oversize)
     Use Valve Guide Remover (YM-01225) ① with Valve Guide Installer (YM-04017) ②.



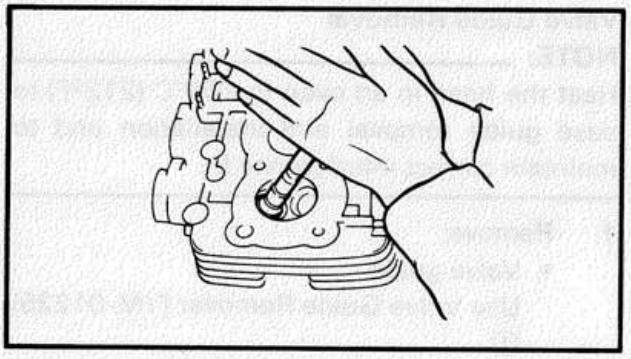
NOTE:
After installing valve guide:
- Use the 7 mm Valve Guide Reamer (YM-01227) ① to obtain proper valve guide/valve stem clearance.
- Recut the valve seat.

② Circlip
③ Valve guide

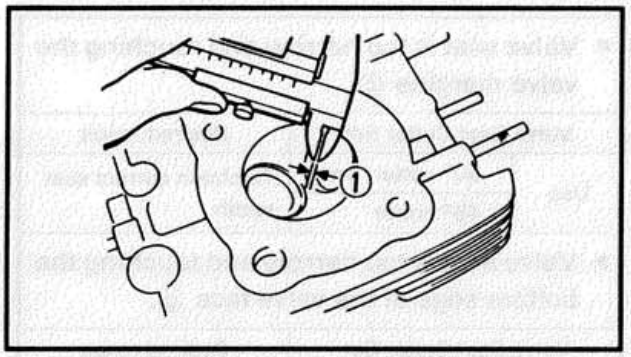


Valve Seat
1. Inspect:
   - Valve seats
     Wear/Pitting/Valve replacement → Resurface seat at 45° angle.
2. Measure:
   - Valve seat with ①
     Out of specification → Follow next steps.

	Standard Width	Wear Limit
Valve Seat Width	1.0 ± 0.1 mm (0.039 ± 0.004 in)	1.4 mm (0.055 in)



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.

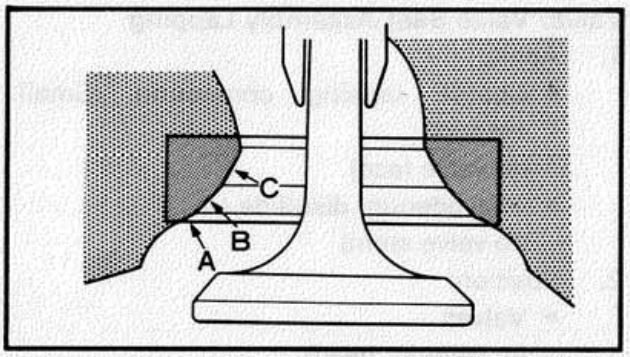


5. Inspect:
   - Valve seat surface
     Wherever valve seat and valve face made contact, bluing will have been removed.
6. Measure:
   - Valve seat width "①"
     Out of specification/Pitting/Variation of valve seat width → Cut valve seat further.

CAUTION:

Remove just enough material to achieve satisfactory seat.

Seat Width:
Std: 1.0 ± 0.1 mm
(0.039 ± 0.0039 in)
Wear limit: 1.4 mm (0.055 in)



7. Cut valve seat.

Valve seat recutting steps are necessary if:
- Valve seat is uniform around perimeter of valve face but too wide or too narrow or not desired position on valve face.

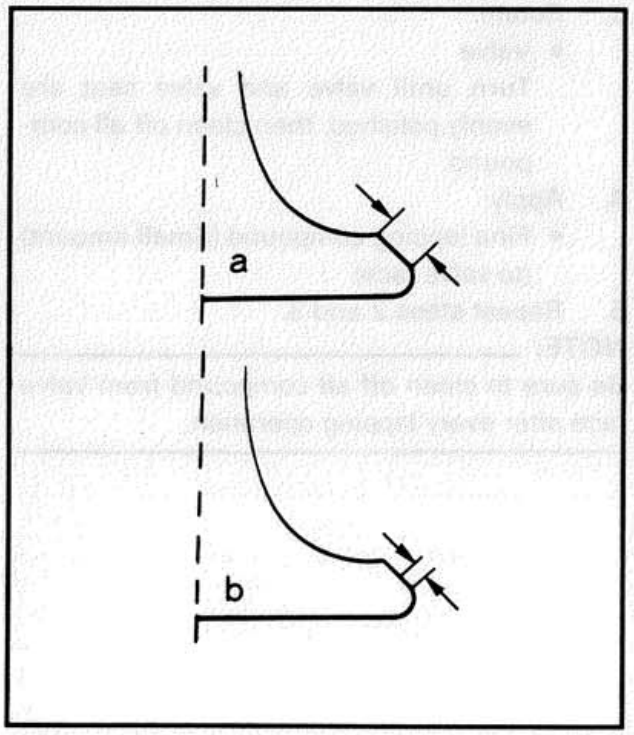
Cut valve seat as follows:	
Section A	30° Cutter
Seciton B	45° Cutter
Section C	60° Cutter

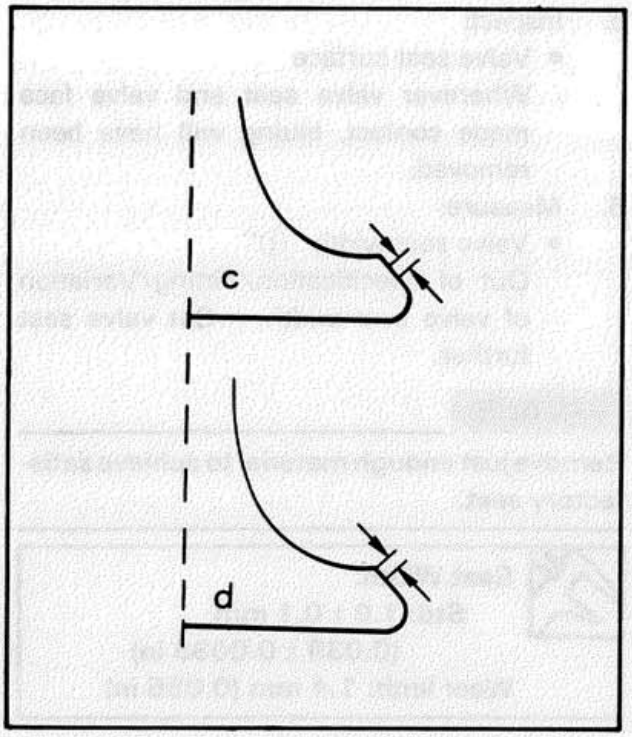
- Valve face indicates that valve seat is desired position but too wide ⓐ.

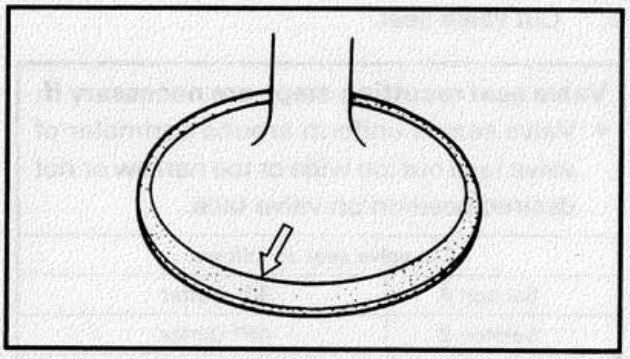
Valve Seat Cutter Set		Desired result
Use lightly	30° cutter	To reduce valve seat width to 1.0 mm (0.039 in)
	60° cutter	

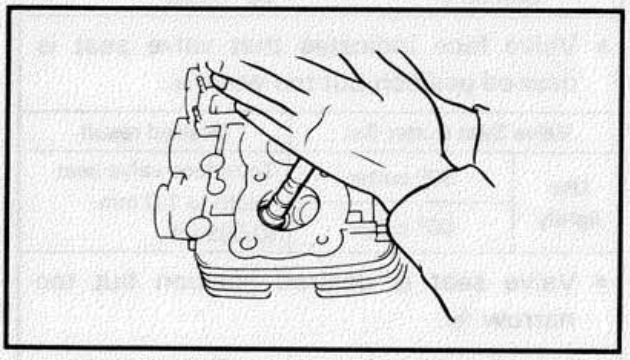
- Valve seat is desired position but too narrow ⓑ.

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 rouching the valve margine ⓒ.

Valve Seat Cutter Set		Desired result
Use	30° cutter, first	To obtain correct seat width.
	45° cutter	

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

Valve Seat Cutter Set		Desired result
Use	60° cutter, first	To obtain correct seat width
	45° cutter	

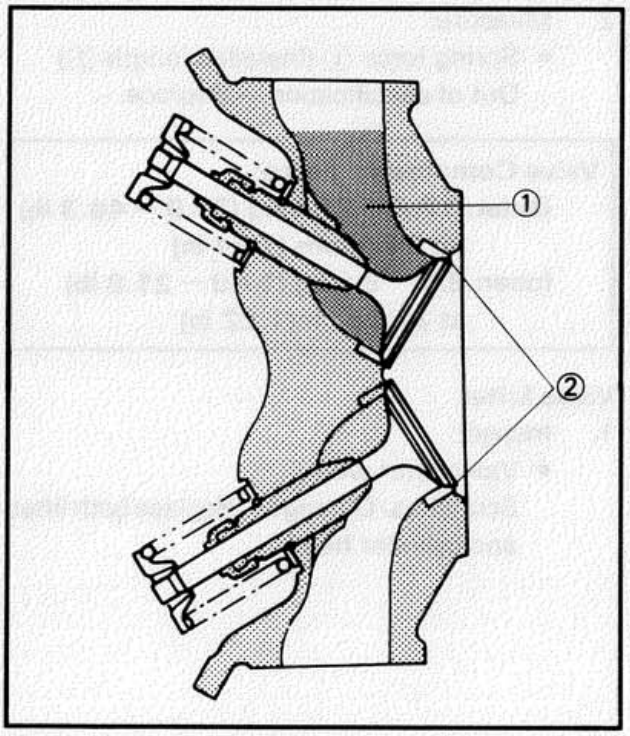
Valve/Valve Seat Assembly Lapping

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)

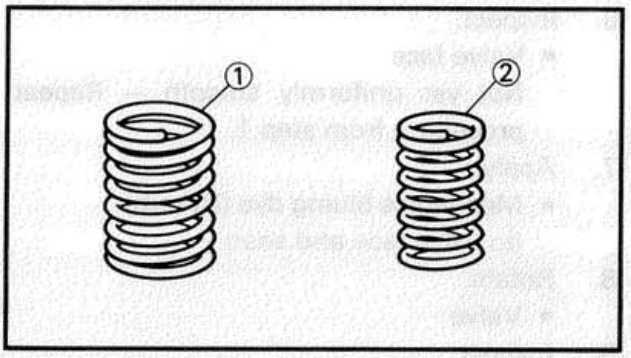


10. Apply:
    - Solvent
      (into each intake and exhaust port)

NOTE:
Pour solvent ① into intake and exhaust ports only after completion of all valve work and assembly of all head parts.

Leakage past valve seat ② → Replace valve. (See procedure below)

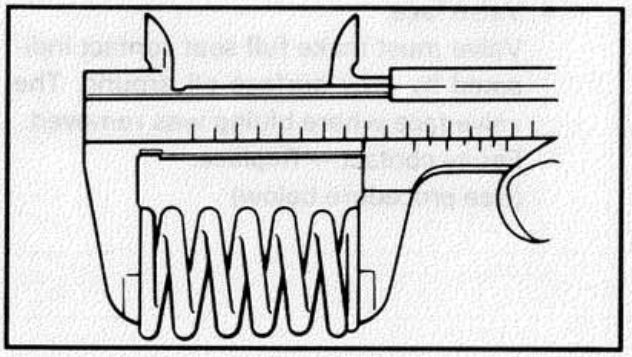
Relapping steps:
- Disassemble head parts.
- Repeat lapping steps using fine lapping compound.
- Clean all parts thoroughly.
- Reassemble and check for leakage again using solvent.
- Repeat steps as often as necessary to effect a satisfactory seal.



Valve Spring

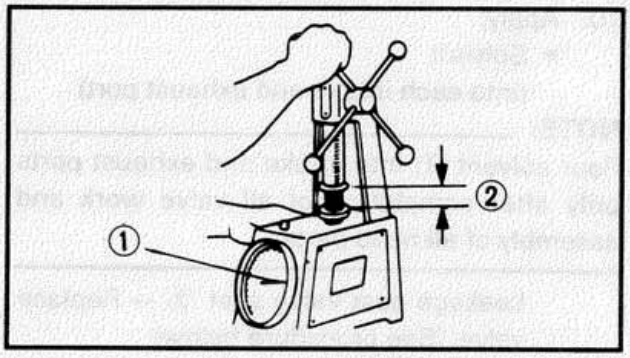
This engine uses two springs of different sizes to prevent valve float or surging. Valve spring specifications show the basic value characteristics.

① Outer spring
② Inner spring



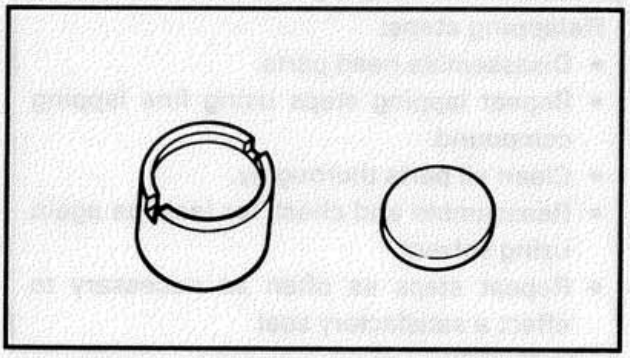
1. Measure:
   - Spring free length
     Out of specification → Replace.

Minimum Free Length:
Outer: 37.0 mm (1.457 in)
Inner: 33.5 mm (1.319 in)



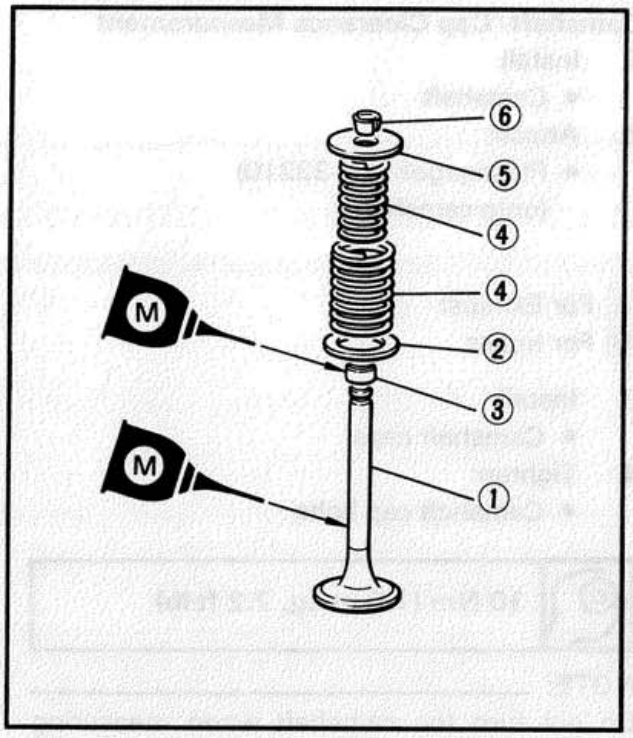
2. Measure:
   - Spring force ① (Installed length ②)
     Out of specification → Replace.

Valve Compressed Force:
Outer: 17.2 ~ 21.0 kg (37.9 ~ 46.3 lb)
at 34.0 mm (1.34 in)
Inner: 8.1 ~ 9.9 kg (17.9 ~ 21.8 lb)
at 31.0 mm (1.22 in)



Valve Lifter

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

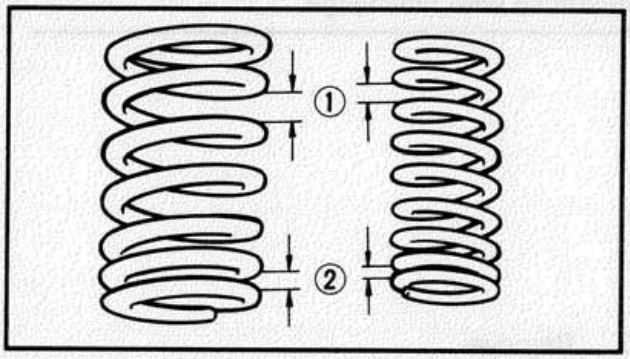


Valve Installation

1. Lubricate
   - Valve stem
   - Oil seal

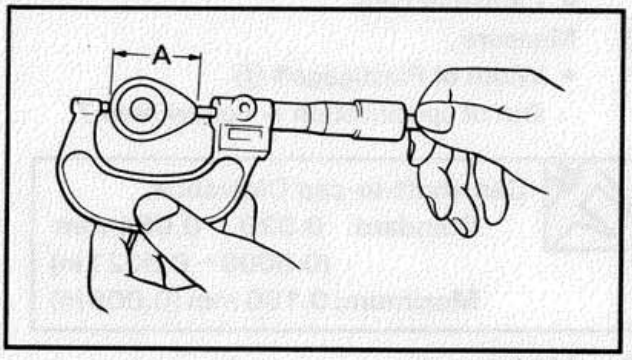
High-Quality Molybdenum Disulfide Motor Oil or Molybdenum Disulfide Grease.

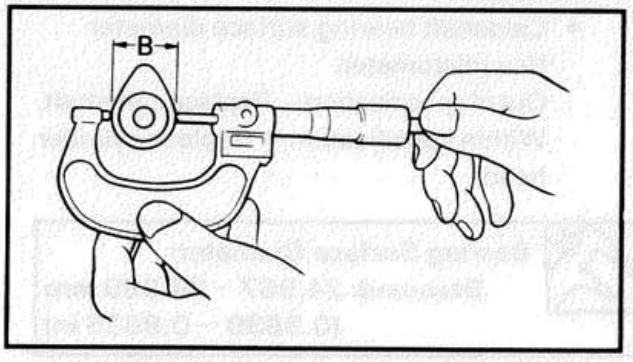
2. Install:
   - Valve ①
   - Valve spring seat ②
   - Oil seal ③
   - Valve springs ④
   - Valve spring seat ⑤
   - Valve retainers ⑥



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

① Larger pitch
② Smaller pitch

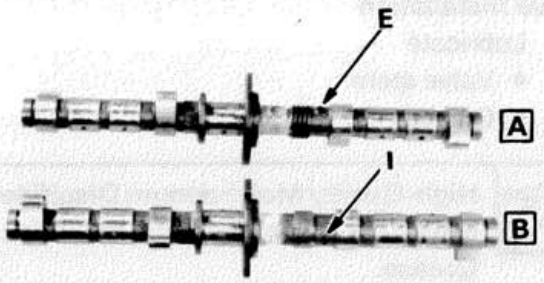


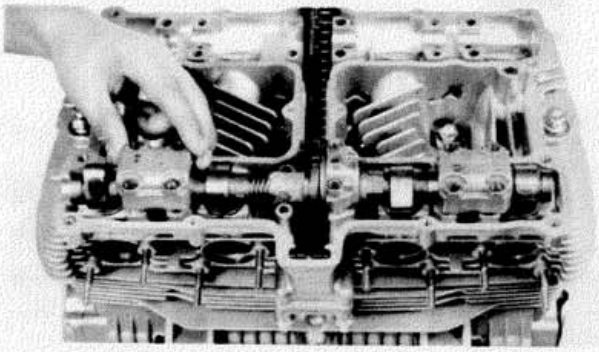


CAMSHAFT, CAM CHAIN, AND CAM SPROCKET

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	36.80 mm (1.449 in)	28.10 mm (1.106 in)
Exhaust	36.30 mm (1.429 in)	28.06 mm (1.105 in)





Camshaft/Cap Clearance Measurement

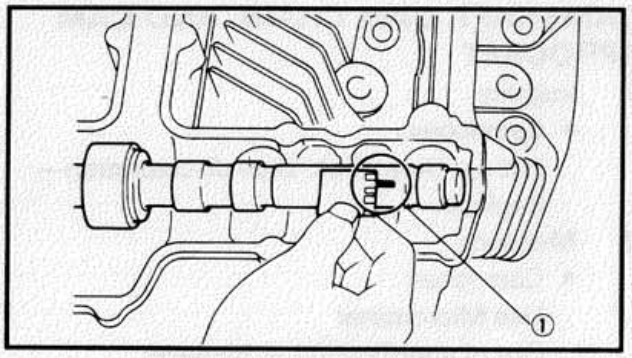
1. Install:
   - Camshaft
2. Attach:
   - Plastigage® (YU-33210) (onto camshaft)

A For Exhaust
B For Intake

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

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 7.

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

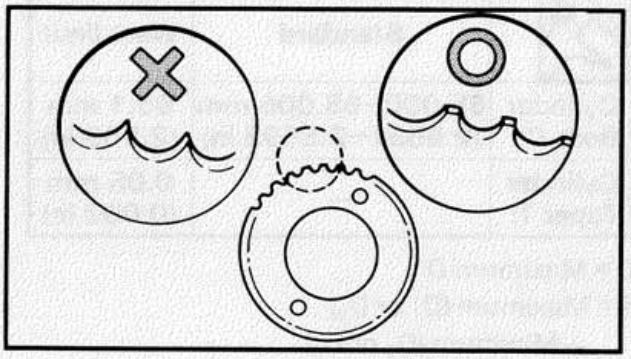
7. Measure:
   - Camshaft bearing surface diameter
     Use micrometer.
     Out of specification → Replace camshaft.
     Within specification → Replace cylinder head.

Bearing Surface Diameter:
Standard: 24.967 ~ 24.980 mm (0.9830 ~ 0.9835 in)

Cam Chain And Primary Drive Chain

1. Inspect:
   - Cam chain
   - Primary drive chain

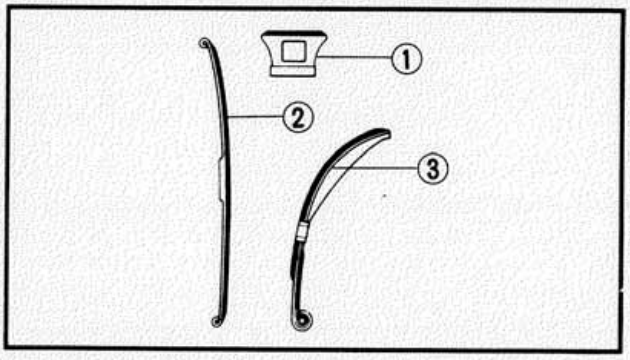
   Chain stretch/Cracks → Replace



Cam Sprockets

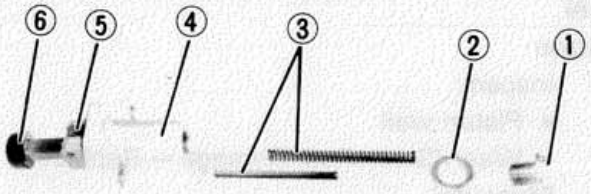
1. Inspect:
   - Cam sprockets

   Wear/Damage → Replace.



Chain Guide

1. Inspect:
   - Upper guide ①
   - Front guide ②
   - Rear guide ③



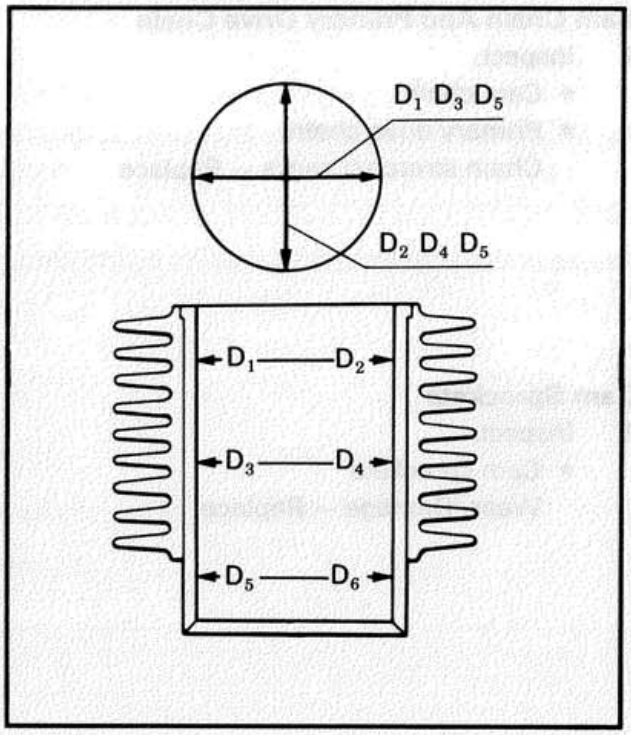
Cam Chain Tensioner

1. Check:
   - One-way cam operation

   Unsmooth operation → Replace.
2. Inspect:
   - All parts

   Damage/Wear → Replace.

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

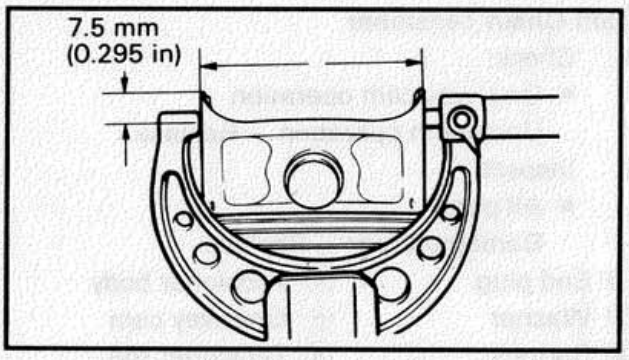


CYLINDER

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:	65.000~65.005 mm (2.5591~2.5592 in)	65.1 mm (2.563 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.

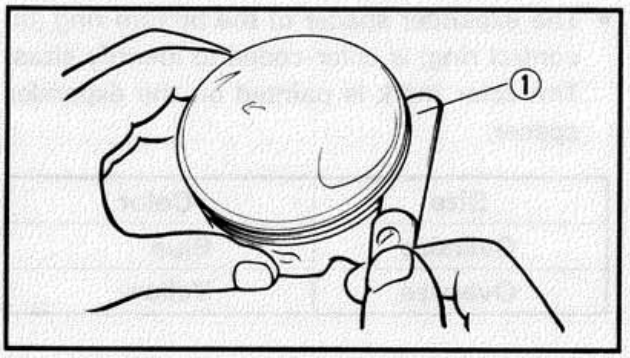
NOTE:
Measurement should be made at a point 7.5 mm (0.295 in) above the bottom edge of the piston.

	Size P
Standard	64.955 ~ 64.970 mm (2.5573 ~ 2.5579 in)
Oversize 2	65.50 mm (2.58 in)
Oversize 4	66.00 mm (2.60 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)
Limit: 0.1 mm (0.004 in)

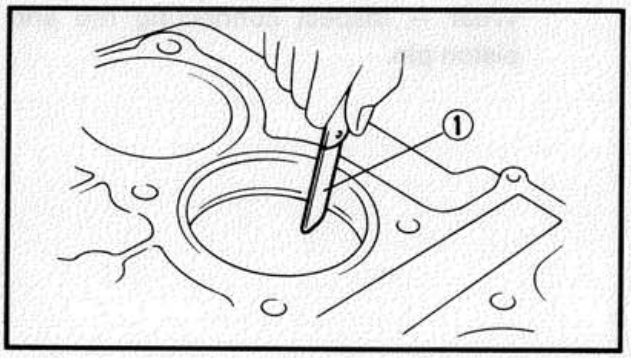
C: Cylinder bore P: Piston outside diameter



Piston Ring

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

Side Clearance	Top	Standard: 0.03 ~ 0.07 mm (0.0012~0.0029 in) Limit: 0.15 mm (0.0059 in)
	2nd	Standard: 0.02 ~ 0.06 mm (0.0008~0.0024 in) Limit: 0.15 mm (0.0059 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	0.15 ~ 0.30 mm (0.0059~0.0118 in)	1.0 mm (0.04 in)
2nd Ring	0.15 ~ 0.30 mm (0.0059~0.0118 in)	1.0 mm (0.04 in)
Oil Control (Rails)	0.20 ~ 0.70 mm (0.008 ~ 0.028 in)	—

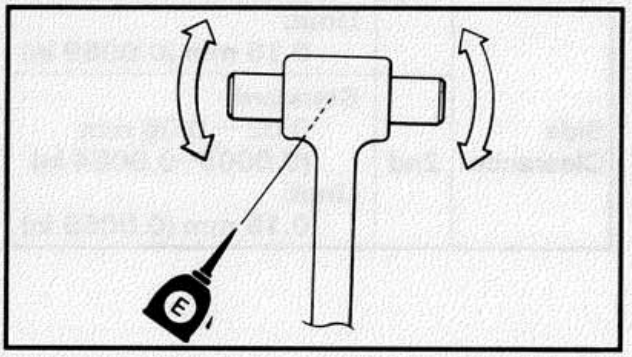
Oversize Piston Rings

- 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)

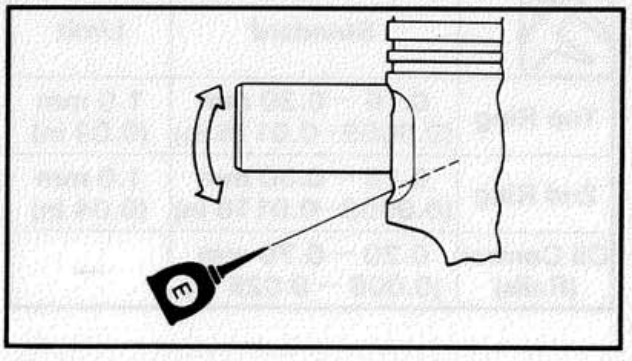
- The expander spacer of the bottom ring (oil control ring) is color-coded to identify sizes. The color mark is painted on the expander spacer.

Size	Color
Oversize	Blue
Oversize	Yellow

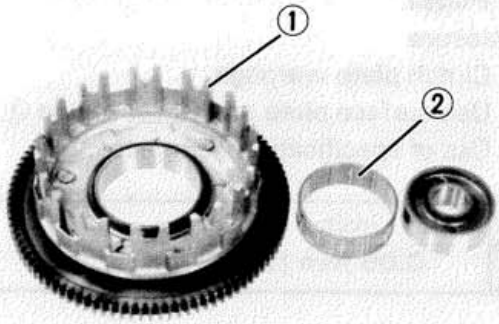


Piston Pin

1. Lubricate:
   - Piston ping (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.



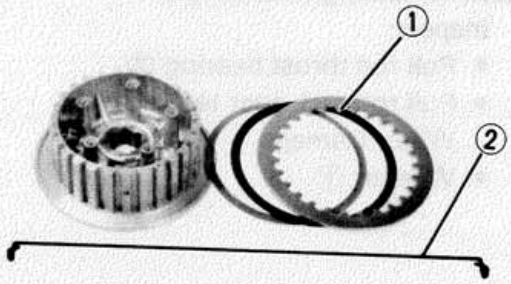
4. Position:
   - Piston pin
     (into piston)
5. Check:
   - Free play
     (when pin is in place in piston)
     Free play → Replace piston pin and/or piston.



CLUTCH

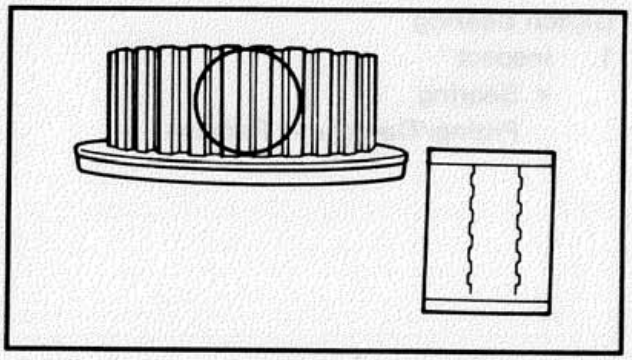
Clutch Housing

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



Clutch Boss

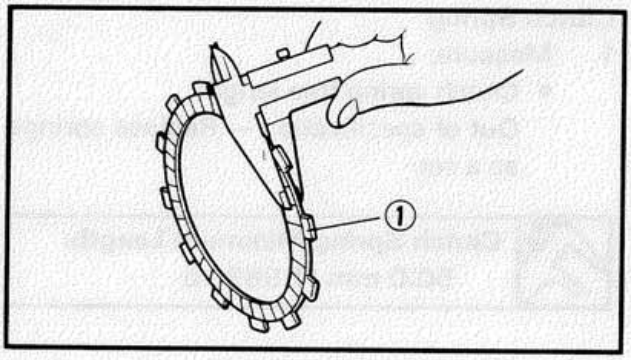
The clutch boss contains a built-in damper beneath the first clutch friction plate (clutch plate ①). It is not necessary to remove the wire circlip ② and disassemble the built-in damper unless there is serious clutch chattering.



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

NOTE:

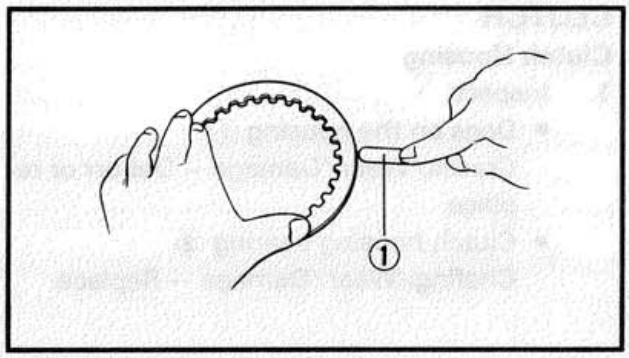
Scoring on the clutch plate splines will cause erratic operation.



Friction Plates

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

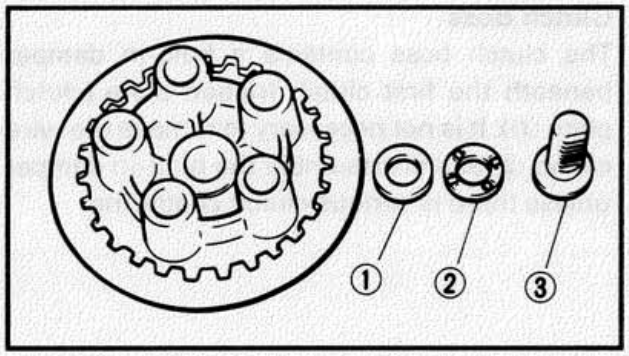
Wear Limit:
2.8 mm (0.11 in)



Clutch Plates

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

Warp Limit:
0.05 mm (0.002 in)

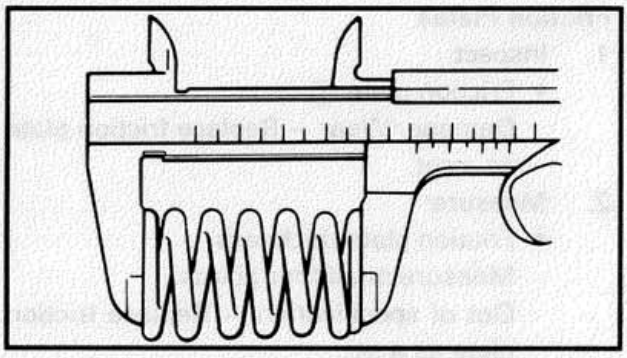


Clutch Actuating Mechanism

1. Inspect:
   - Pull rod thrust bearing ②
   - Pull rod rack gear teeth ③
     Wear/Damage → Replace.
   - Washer ①

Clutch Bearing

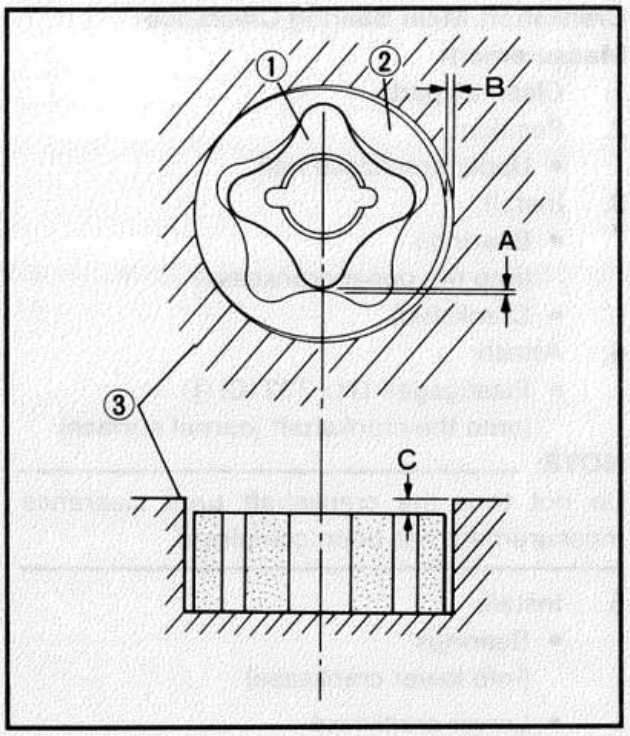
1. Inspect:
   - Bearing
     Pitting/Damage → Replace.



Clutch Spring

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

Clutch Spring Minimum Length:
50.0 mm (1.969 in)



OIL PUMP

1. Measure:
   - Housing ③/Outer rotor ② clearance B
     Use feeler gauge.
     Out of specification → Replace oil pump assembly.

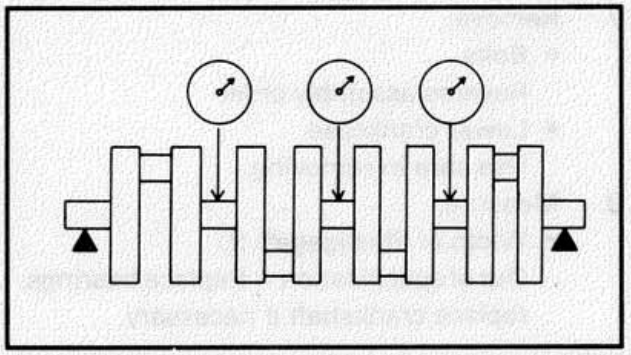
Standard clearance "B":
0.03 ~ 0.08 mm
(0.0012 ~ 0.0031 in)

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

Inner-Outer Clearance "A":
0.03 ~ 0.09 mm
(0.0012 ~ 0.0035 in)

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)

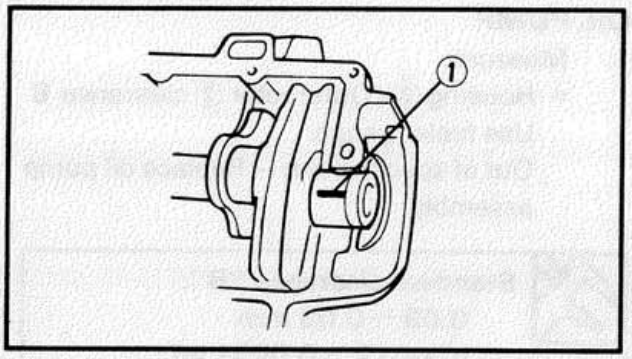


CRANKSHAFT

1. Measure:
   - Runout
     Use V-Blocks and dial gauge (YU-03090).
     Out of specification → Replace.

Runout Limit:
0.03 mm (0.0012 in)

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



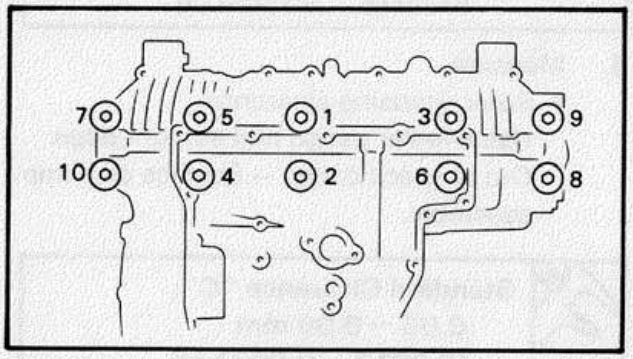
Crankshaft Main Bearing Clearance Measurement

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

NOTE:

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

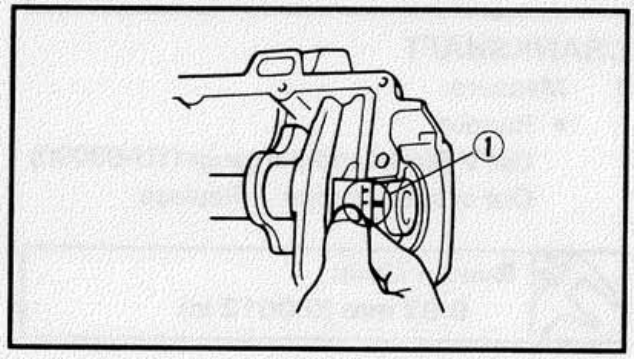
5. Install:
   - Bearings
     (into lower crankcase)
   - Lower crankcase
6. Tighten:
   - Bolts



CAUTION:

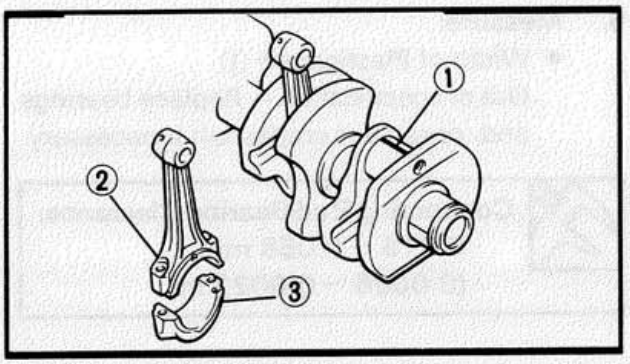
Tighten to full torque in torque sequence cast on crankcase.

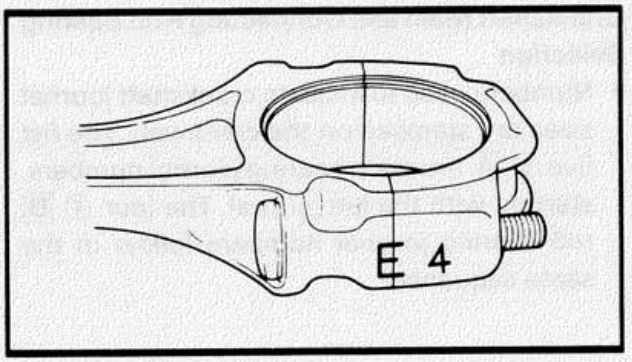
24 Nm (2.4 m·kg, 17 ft·lb)



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:
0.020 ~ 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 ② and cap ③)
3. Attach;
   - Plastigage® (YU-33210) ① (onto the crank pin)
4. Install:
   - Connecting rod
   - Connecting rod cap

NOTE:

Be sure the letter on both components align to from perfect character.

5. Lubricate:
   - Connecting rod bolt threads

Molybdenum Disulfide Grease

6. Tighten:
   - Connecting rod cap nuts.

NOTE:

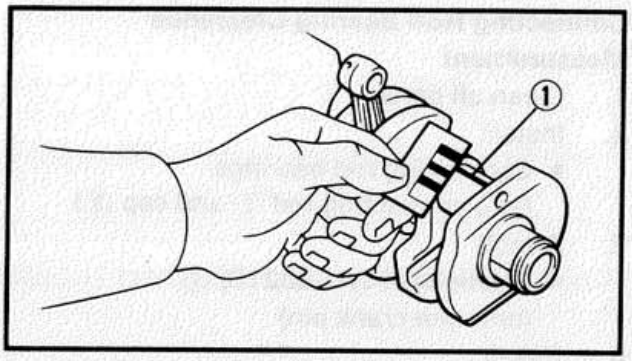
Do not turn connecting rod until clearance measurement has been completed.

CAUTION:

Tighten to full torque specification without pausing. Apply continuous torque between 2.0 and 2.5 m·kg. Once ou reach 2.0 m·kg, DO NOT STOP TIGHTENING until final torque is reached. If tightening is interrupted between 2.0 and 2.5 m·kg, loosen nut to less than 2.0 m·kg and start again.

Connecting Rod Cap: 25 Nm (2.5 m·kg, 18 ft·lb)

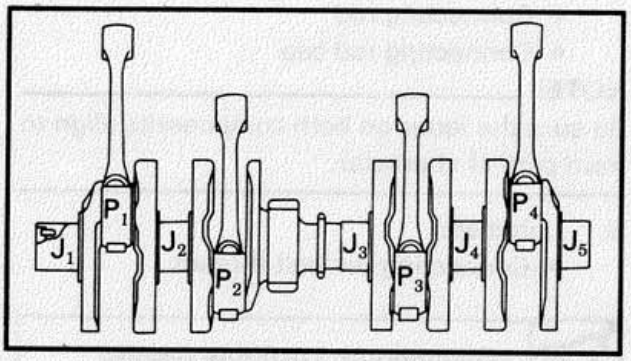
7. Remove:
   - Connecting rod cap
     Use care in removing.



8. Measure:
   - Width of Plastigage® ①

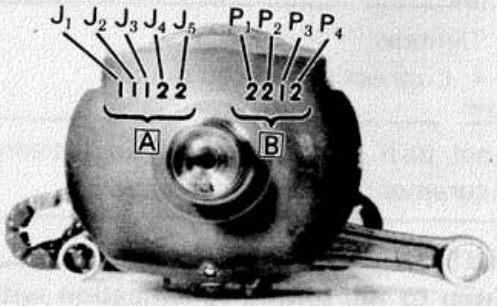
   Out of specification → Replace bearings and/or replace crankshaft if necessary.

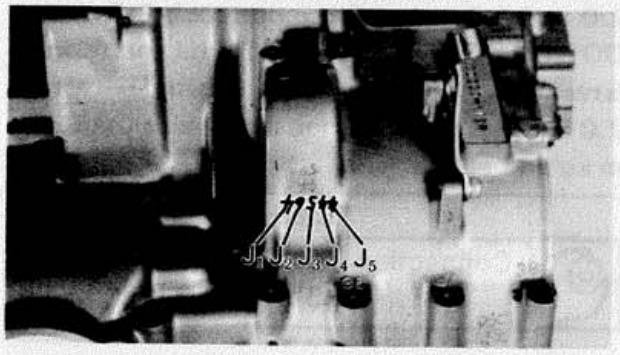
Connecting Rod Bearing Clearance:
0.016 ~ 0.058 mm
(0.0006 ~ 0.0023 in)



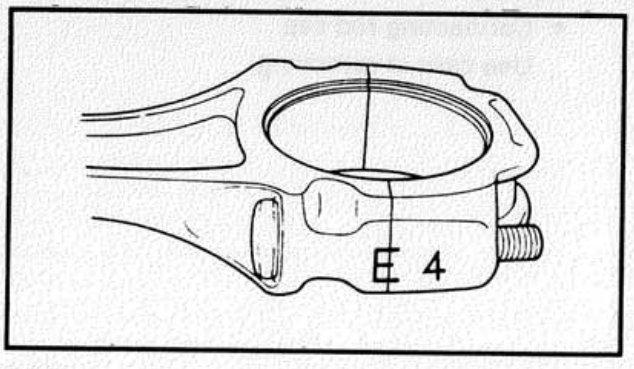
Crankshaft Main and Connecting Rod Bearing Selection

- Numbers used to indicate crankshaft journal sizes are stamped on the crankweb. The fist five ⑤ [A] are main bearing journal numbers, starting with the left journal. The four ④ [B] rod 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.

Example 1: Selection of the crankshaft main bearings;

If the crankcase J1 and crankshaft J2 sizes are No. 4 and No. 1, respectively, the bearing size No. is:

Bearing size No. =
Crankcase no. − Crankshaft No. =
4 − 1 = 3 (Brown)

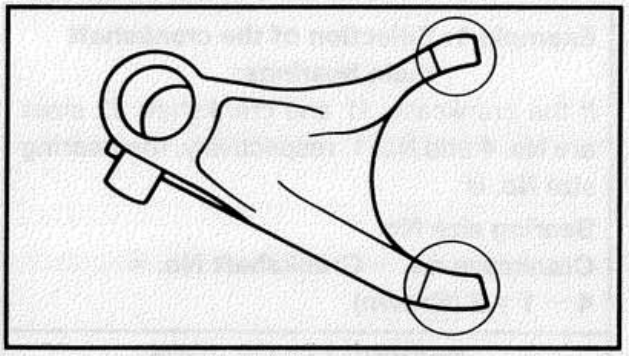
BEARING COLOR CODE	
No. 1	Blue
No. 2	Black
No. 3	Brown
No. 4	Green
No. 5	Yellow

Example 2: Selection of the connecting rod bearing;

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

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

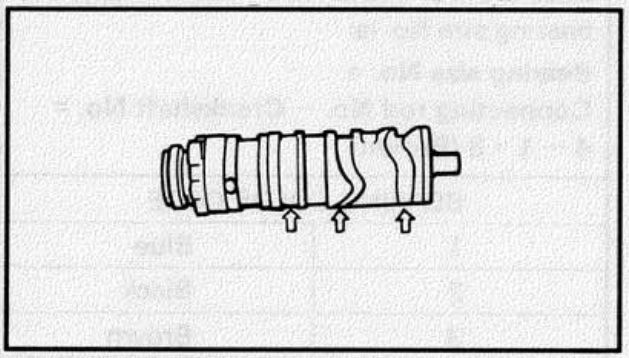
BEARING COLOR CODE	
1	Blue
2	Black
3	Brown
4	Green



TRANSMISSION

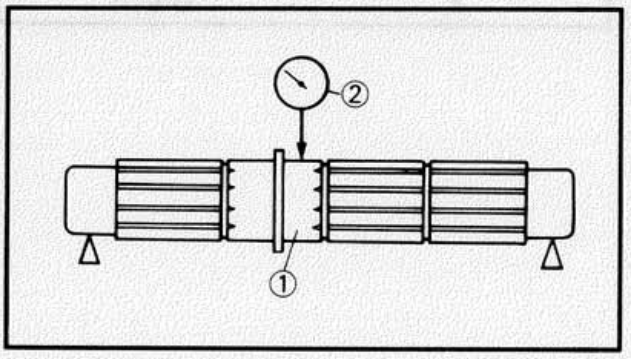
Shift Fork

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



Shift Cam

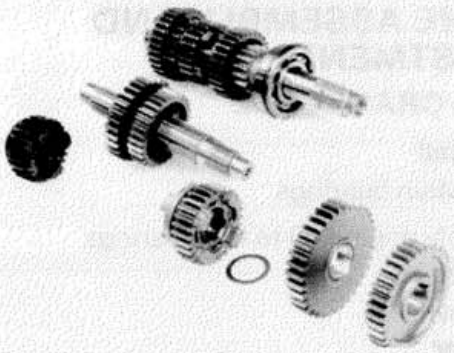
1. Inspect:
   - Shift cam grooves
     Wear/Damage/Scratches → Replace.
   - Shift cam segment
     Damage/Wear → Replace.
   - Shift cam bearing
     Pitting/Damage → Replace.

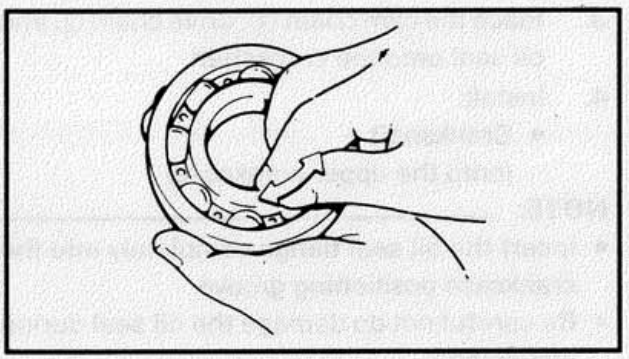


Main and Drive Axles

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

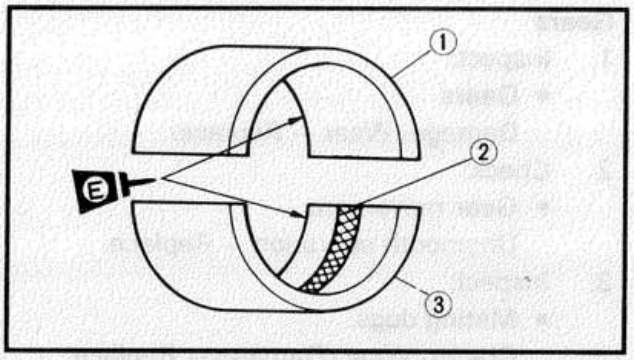
1. Inspect:
   - Gears
     Damage/Wear → Replace.
2. Check:
   - Gear movement
     Unsmooth operation → Replace.
3. Inspect:
   - Mating dogs
     Cracks/Wear/Damage → Replace.

BEARINGS

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

CIRCLIPS AND WASHERS

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

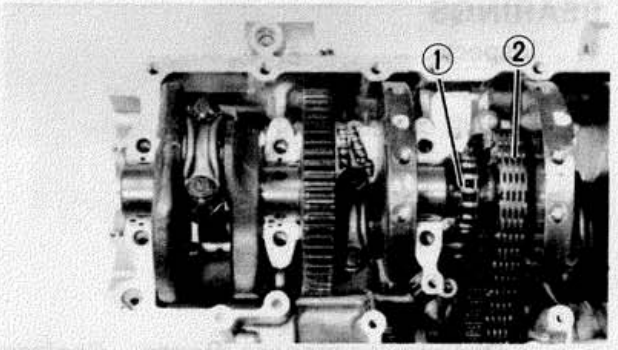


ENGINE ASSEMBLY AND ADJUSTMENT

UPPER CRANKCASE

1. Install:
   - Main bearings
2. Apply engine oil to the bearings.

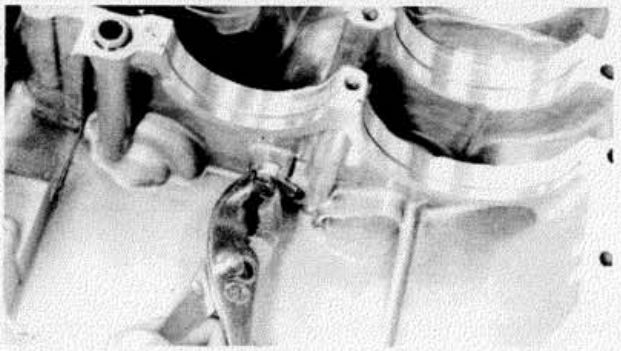
① Upper
② Groove
③ Lower



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

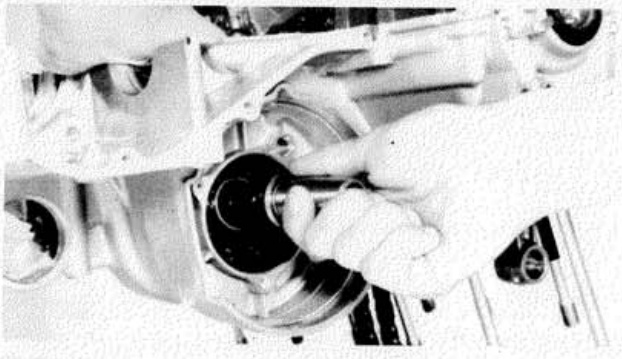
NOTE:

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

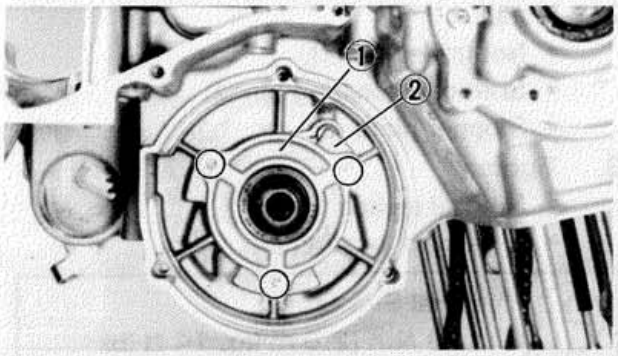


5. Install:
   - Starter idle gear
   - Starter idle gear shaft
   - Stopper plate
   - Lock washer
   - Bolt
6. Tighten:
   - Bolt

Starter Idle Gear Shaft Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)



7. Place the drive chain on the starter clutch assembly.
8. Insert the A.C.G. shaft further into the crankcase until the starter clutch is secured.

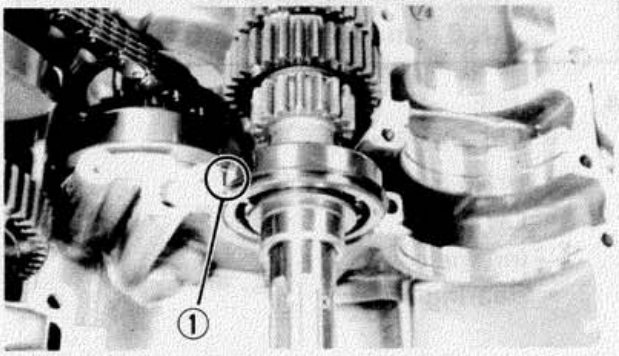


9. Install:
   - Oil jet nozzle (with new O-ring) ②
   - Housing (With new oil seal) ①

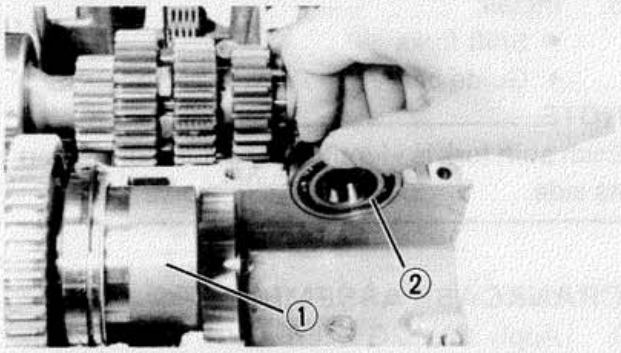
NOTE:
Lightly apply grease to the oil seal lips.

10. Tighten:
    - Bolts

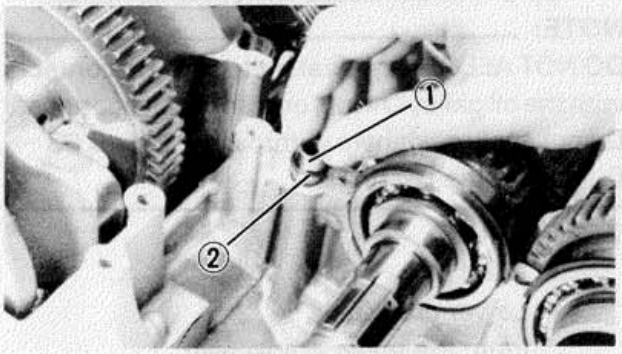
Housing Bolt:
10 Nm (1.0 m·kg, 7.2 ft·lb)
LOCTITE®



11. Install:
    - Main axle assembly
12. Point the bearing locating pin ① toward the crankshaft and lay it on the case.

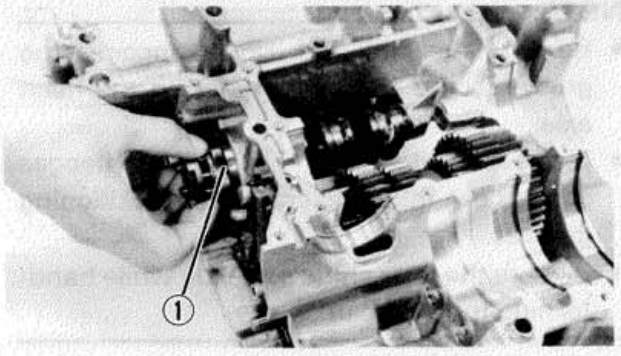


13. Install:
    - Middle drive gear ①
    - Bearing ②

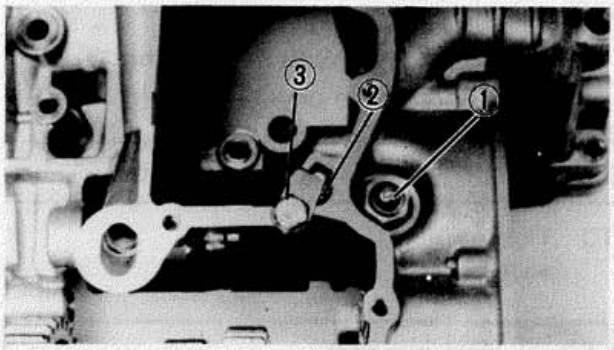


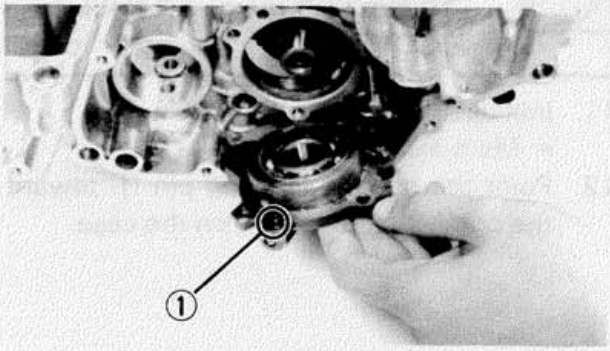
14. Install:
    - Dowel pin ①
    - O-ring ②

LOWER CRANKCASE



1. Install:
   - Shift cam ①

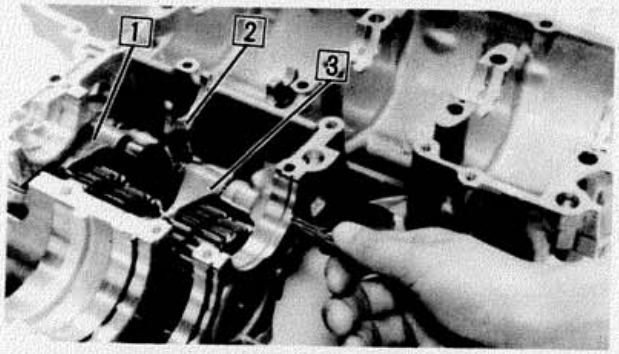




2. Install:
   - Neutral switch ①
   - Shift cam locating pin ②
   - Stopper plate ③
3. Tighten:
   - Neutral switch
   - Shift cam locating pin

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

4. Install:
   - 5th wheel gear
   - Drive axle assembly
   - O-ring ①
     (on the cover)
   - Bearing cover



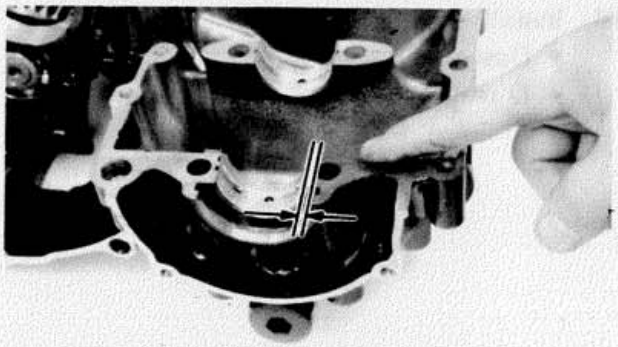
5. Install:
   - Shift forks
   - Guide bar

NOTE:
Each shift fork is identified by a number cast on its side.

CRANKCASE ASSEMBLY

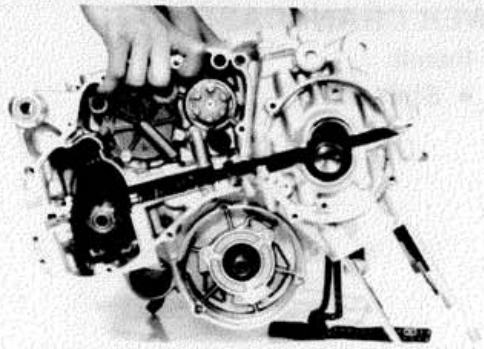
1. Apply Quick Gasket® (P/N. ACC-11001-05-01) to crankcase matching surfaces.

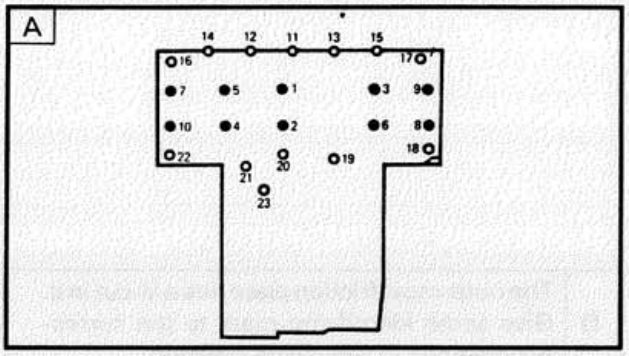
NOTE:
DO NOT ALLOW any sealant to come in contact with the oil galley O-ring, or crankshaft bearings. Do not apply sealant to within 2 ~ 3 mm (0.08 ~ 0.12 in) of the bearings.

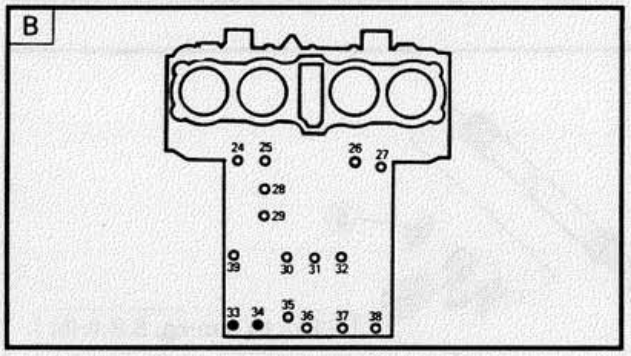


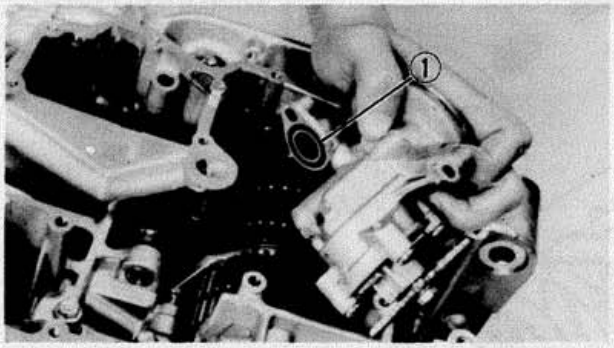
2. Install:
   - Blind plug
   - Lower crankcase
     (onto the upper crankcase)

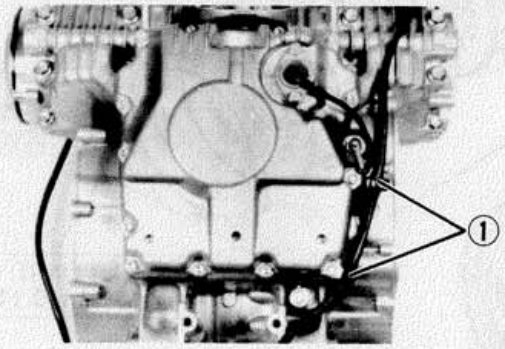
NOTE:
- Be sure the shift fork No. 2 engages the groove in the 2nd pinion gear on the main axle.
- Insert the oil seal and blind plug flanges completely into the crankcase positioning grooves.
- Be sure the gear shifts correctly while hand-turning the shift cam.











3. Tighten:
   - Bolts

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

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

A LOWER CRANKCASE
B UPPER CRANKCASE

OIL PUMP AND OIL PAN

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

Oil Pump:
12 Nm (1.2 m·kg, 8.7 ft·lb)

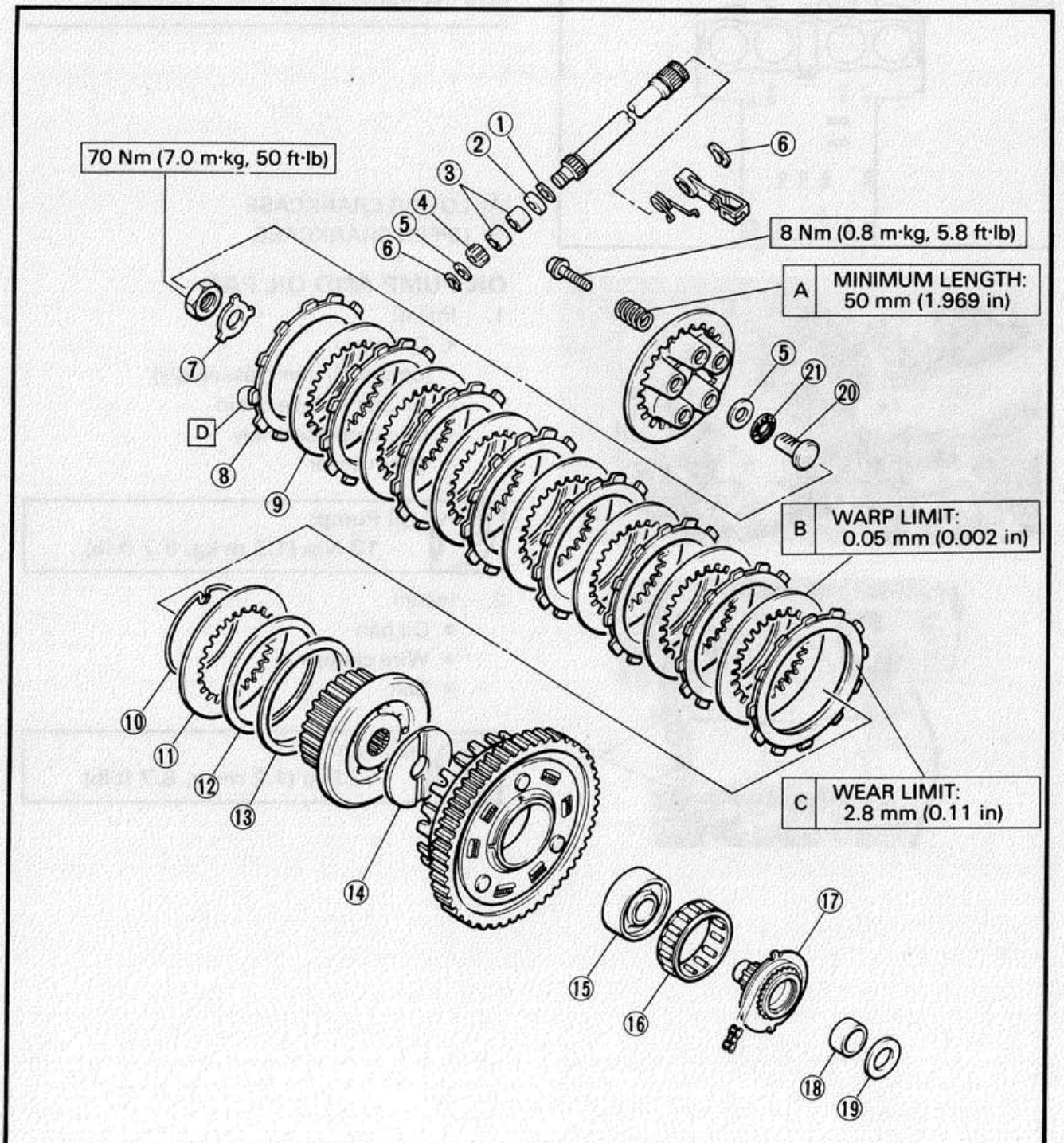
2. Install:
   - Oil pan
   - Wire clamps ①
   - Bolt

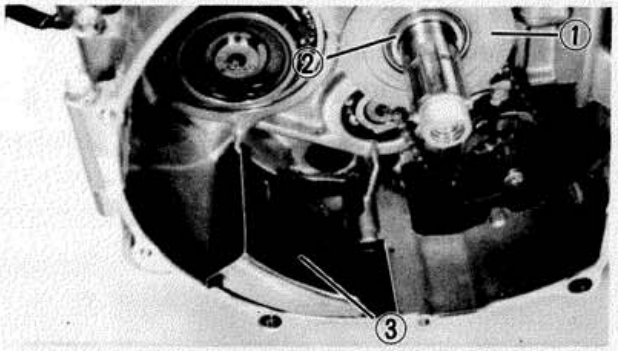
Oil Pan:
12 Nm (1.2 m·kg, 8.7 ft·lb)

CLUTCH

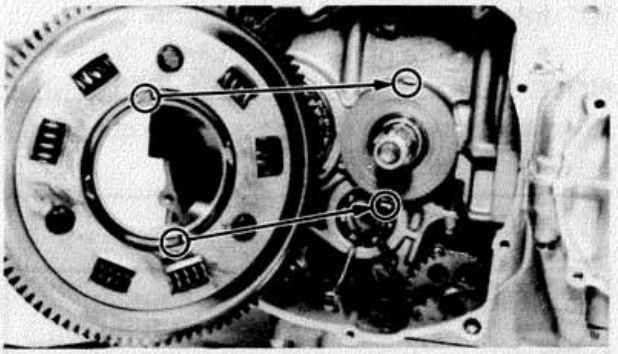
① Plate washer
② Oil seal
③ Bearing
④ Pinion gear
⑤ Plate washer
⑥ Circlip
⑦ Lock washer
⑧ Friction plate
⑨ Clutch plate
⑩ Wire clip
⑪ Clutch plate
⑫ Clutch boss spring
⑬ Spring seat
⑭ Thrust plate
⑮ Spacer
⑯ Bearing (15 — 28)
⑰ Oil pump drive sprocket
⑱ Collar
⑲ Thrust plate
⑳ Pull rod
㉑ Bearing

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





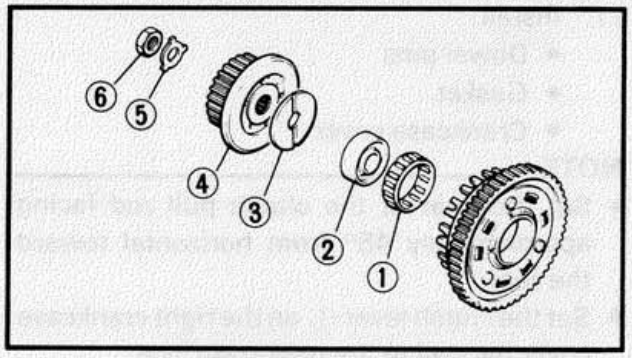
1. Install:
   - Thrust plate
   - Oil pump drive sprocket ①
2. Hook the drive chain on the drive sprocket.
3. Install:
   - Bearing
   - Collar ②
   - Oil bafful plate ③



4. Install:
   - Clutch housing

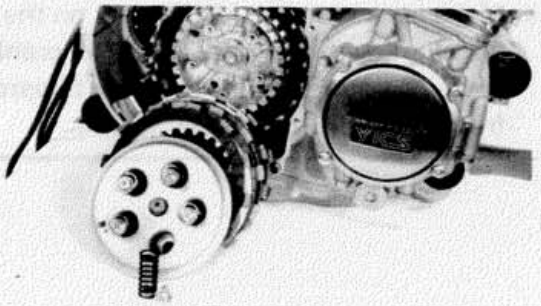
CAUTION:

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

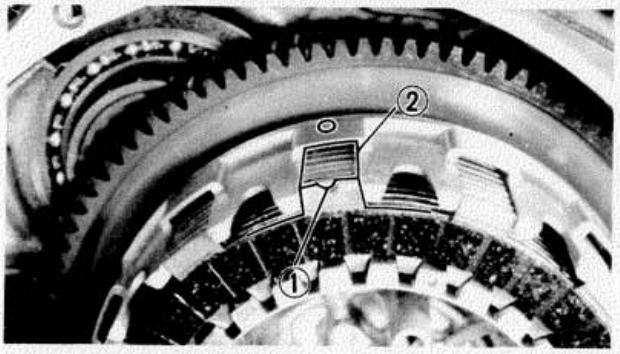


5. Install:
   - Bearing ①
   - Collar ②
   - Thrust plate ③
   - Clutch boss ④
   - Lock washer (New) ⑤
   - Nut ⑥

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



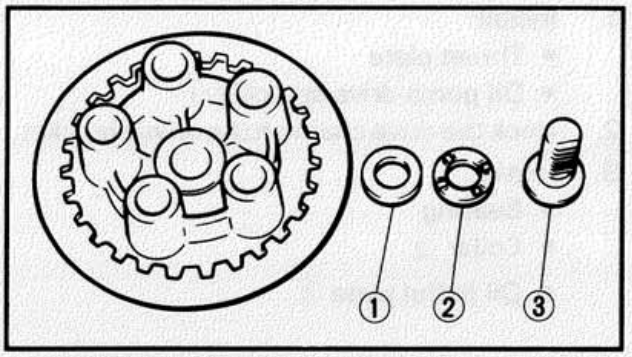
6. Bend the lock washer tabs against the nut flats.
7. Install:
   - Friction plates (without V-cut in tab) (7 pieces)
   - Clutch plates (7 pieces)



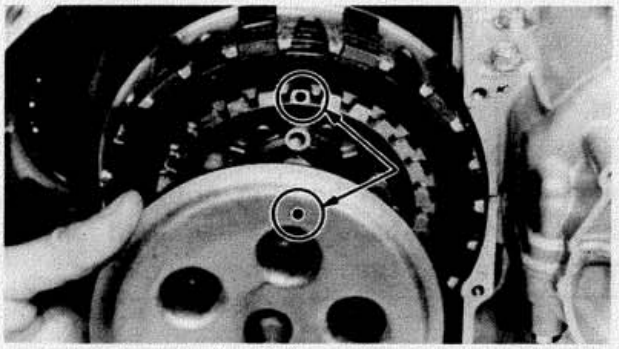
8. Install:
   - Friction plate (with V-cut ① in tab)

NOTE:

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



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

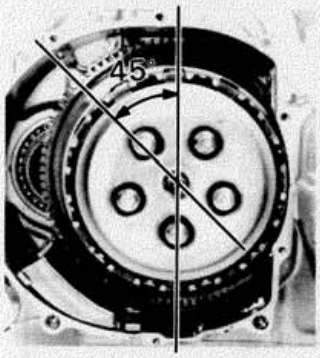


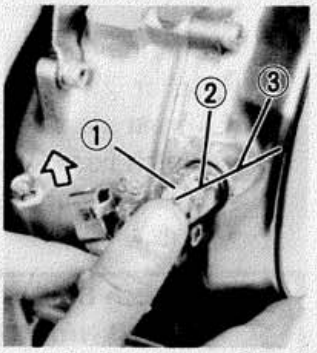
10. Install:
    - Pressure plate

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

    - Clutch springs

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



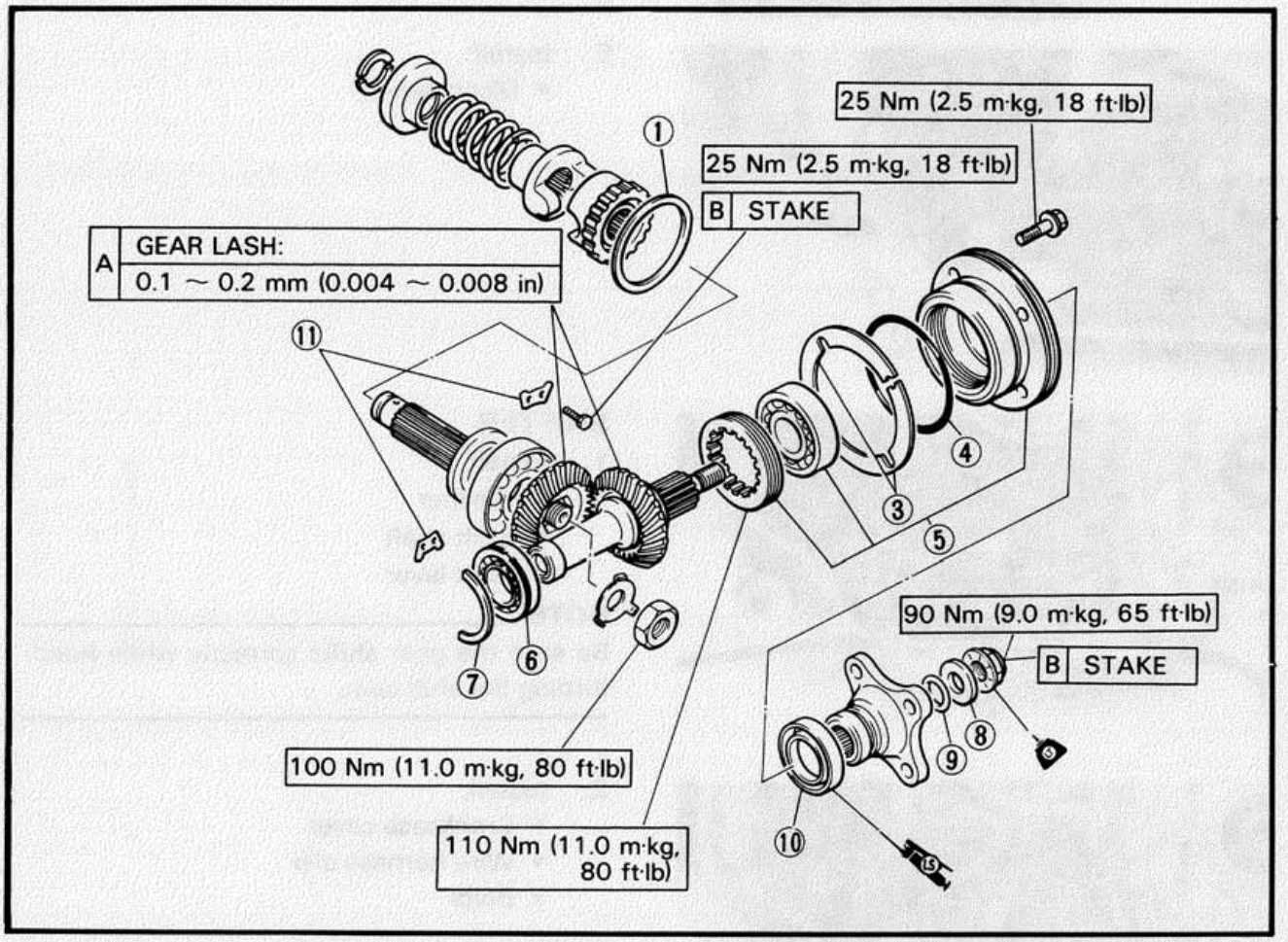


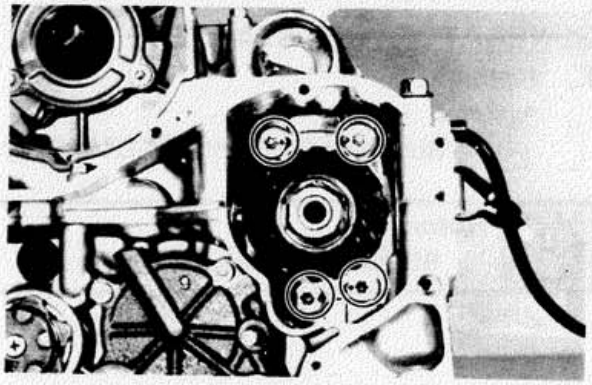
11. Install:
    - Dowel pins
    - Gasket
    - Crankcase cover

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

MIDDLE GEAR

① Shim
0.15, 0.20, 0.30, 0.40, 0.50 mm
② Bearing (B6207)
③ Shim
0.10, 0.15, 0.20, 0.30, 0.40, 0.50 mm
④ O-ring
⑤ Bearing housing comp.
⑥ Bearing (B6005)
⑦ Clip
⑧ Plate washer
⑨ O-ring
⑩ Oil seal
⑪ Bearing retainers

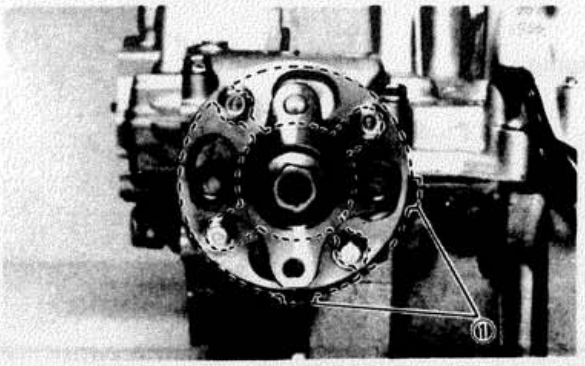




1. Install:
   - Bearing retainers
   - TORX screws (New)

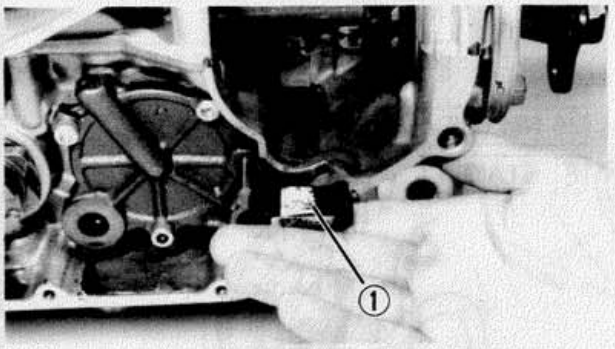
Bearing Retainer:
2.5 Nm (2.5 m·kg, 18 ft·lb)

2. Stake the screw heads to the dents on the bearing retainers with a center punch.

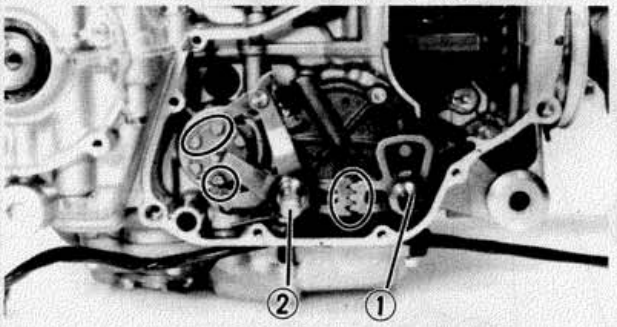


4. Install:
   - Shims ①
   - Middle driven gear
   - Middle driven gear housing
   - Bolt

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



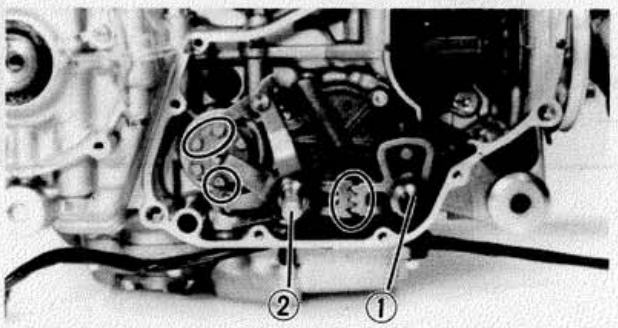
5. Install:
   - Moon seal ①



SHIFTER

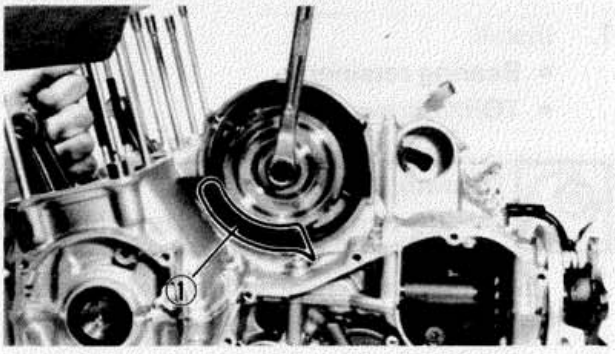
1. Install:
   - Washer
   - Shift shaft
   - Shift lever

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



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

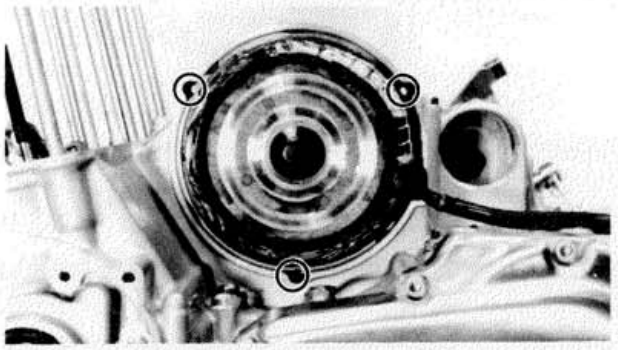
Crankcase Cover:
12 Nm (1.2 m·kg, 8.4 ft·lb)



GENERATOR AND STARTER

1. Install:
   - Rotor
     Use Rotor Holding Tool (YM-04043) ①

Rotor:
55 Nm (5.5 m·kg, 40 ft·lb)

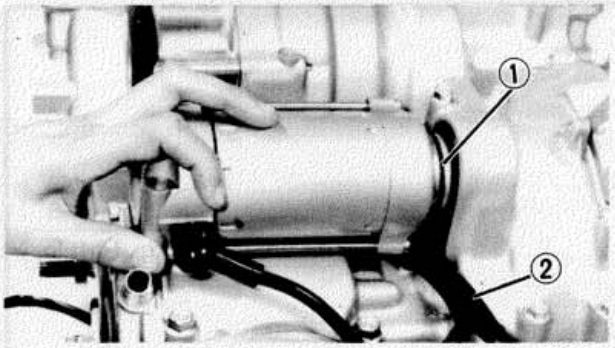


2. Install:
   - Stator coil

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

   - Gasket
   - A.C.G. cover

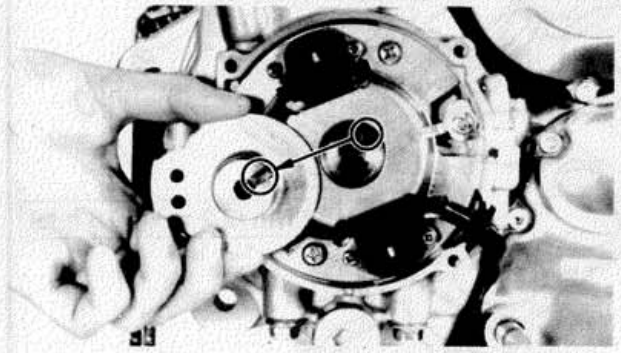
A.C.G. Cover:
12 Nm (1.2 m·kg, 8.4 ft·lb)



3. Install:
   - Starter motor
   - Bolts

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

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



PICKUP COIL

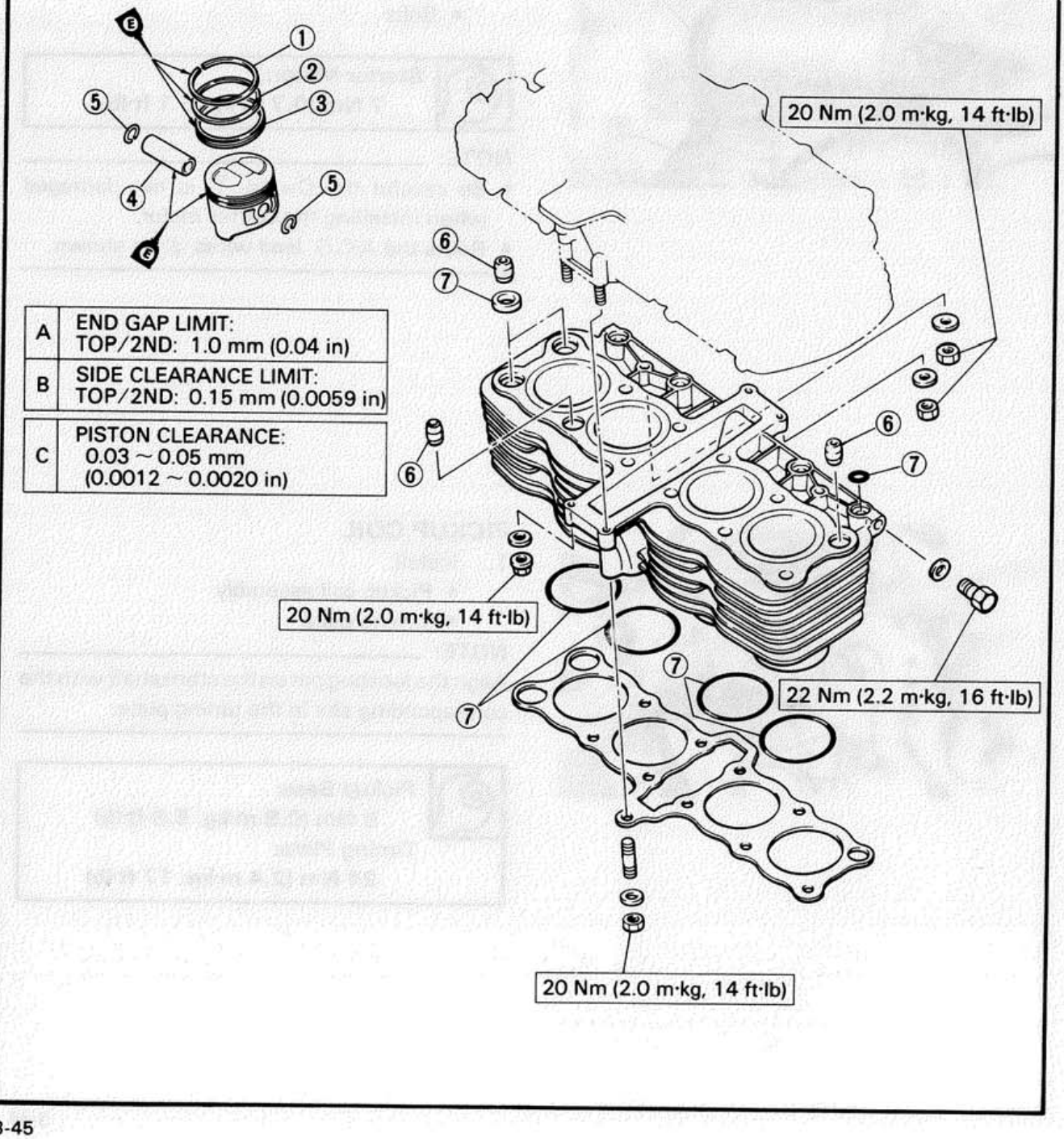
1. Install:
   - Pickup coil assembly
   - Timing plate

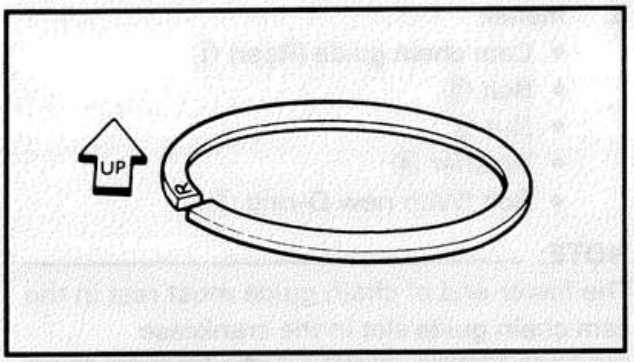
NOTE:
Align the locating pin on the crankshaft with the corresponding slot in the timing plate.

Pickup Base:
8 Nm (0.8 m·kg, 5.8 ft·lb)
Timing Plate:
24 Nm (2.4 m·kg, 17 ft·lb)

PISTON AND CYLINDER

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

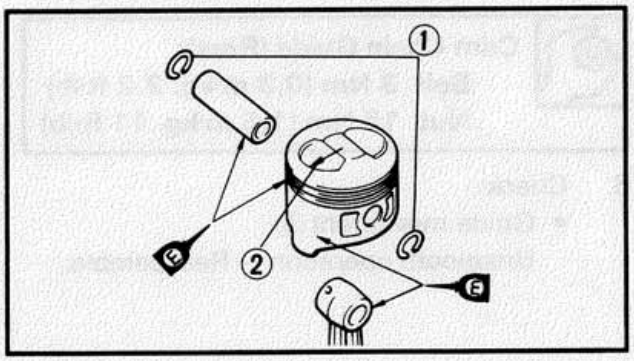




1. Install:
   - Piston rings
     (onto the pistons)

NOTE:

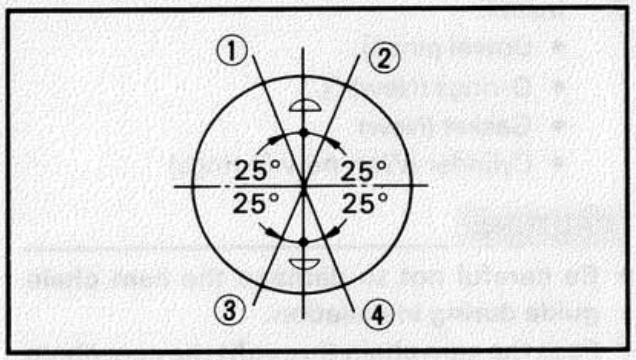
Be sure to install the rings so that Manufacturer's marks or numbers are located on the top side of the rings. Oil the pistons and rings liberally.



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)

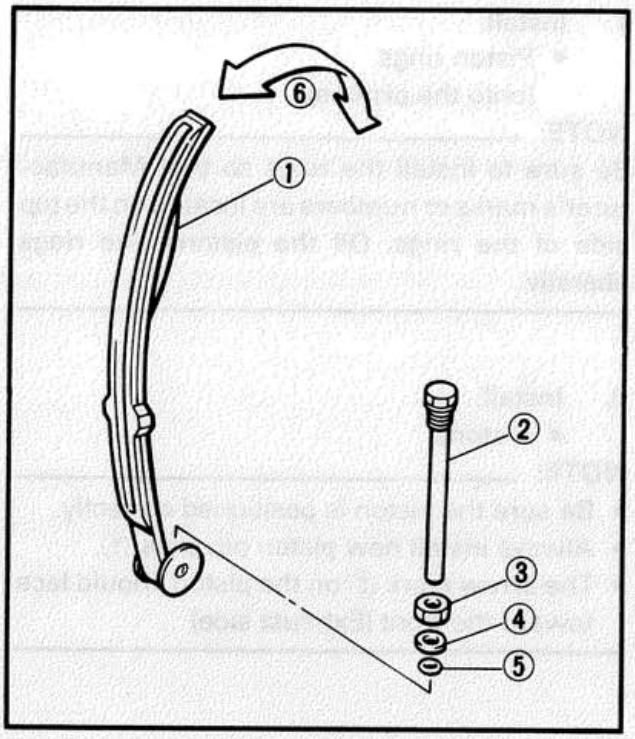


3. Oil liberally:
   - Pistons
   - Rings
   - Cylinders
4. Set:
   - Piston ring ends

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

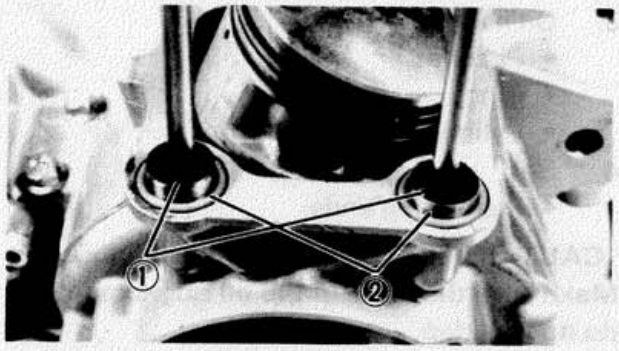


5. Install:
   - Cam chain guide (Rear) ①
   - Bolt ②
   - Nut ③
   - Washer ④
   - Bolt (With new O-ring ⑤)

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

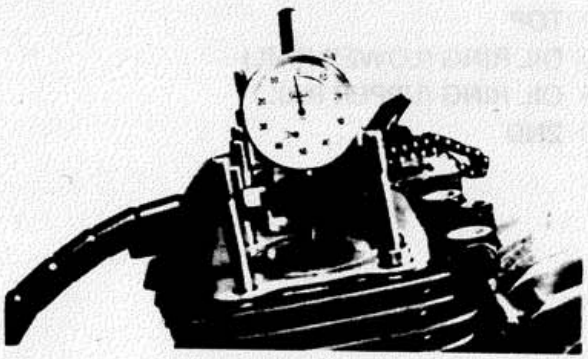
Cam Chain Guide (Rear):
Bolt 3 Nm (0.3 m·kg, 2.2 ft·lb)
Nut 15 Nm (1.5 m·kg, 11 ft·lb)

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



7. Install:
   - Dowel pins ①
   - O-rings (New) ②
   - Gasket (New)
   - Cylinder (With new O-rings)

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



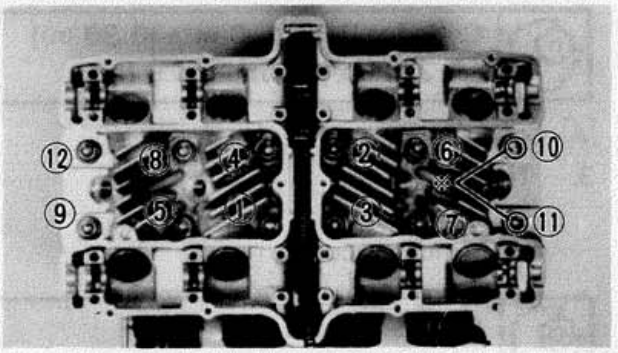
8. Set the dial gauge on the No. 1 piston head center as shown to find the No. 1 piston top dead center and check whether the "T" mark on the timing plate and stationary pointer are aligned or not. If not, loosen the pointer securing screw and adjust.

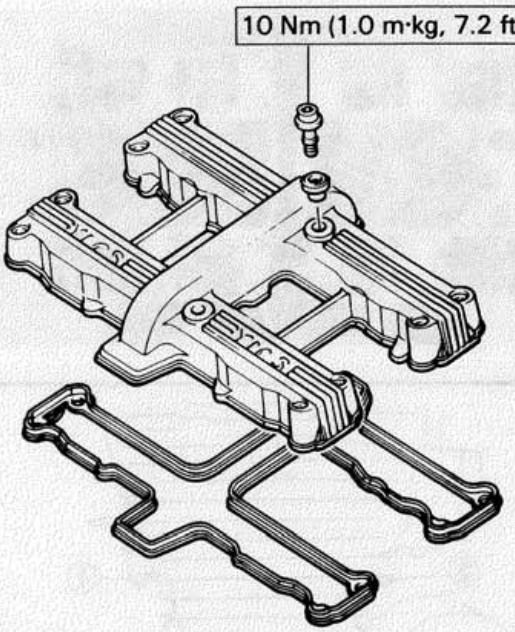
CYLINDER HEAD

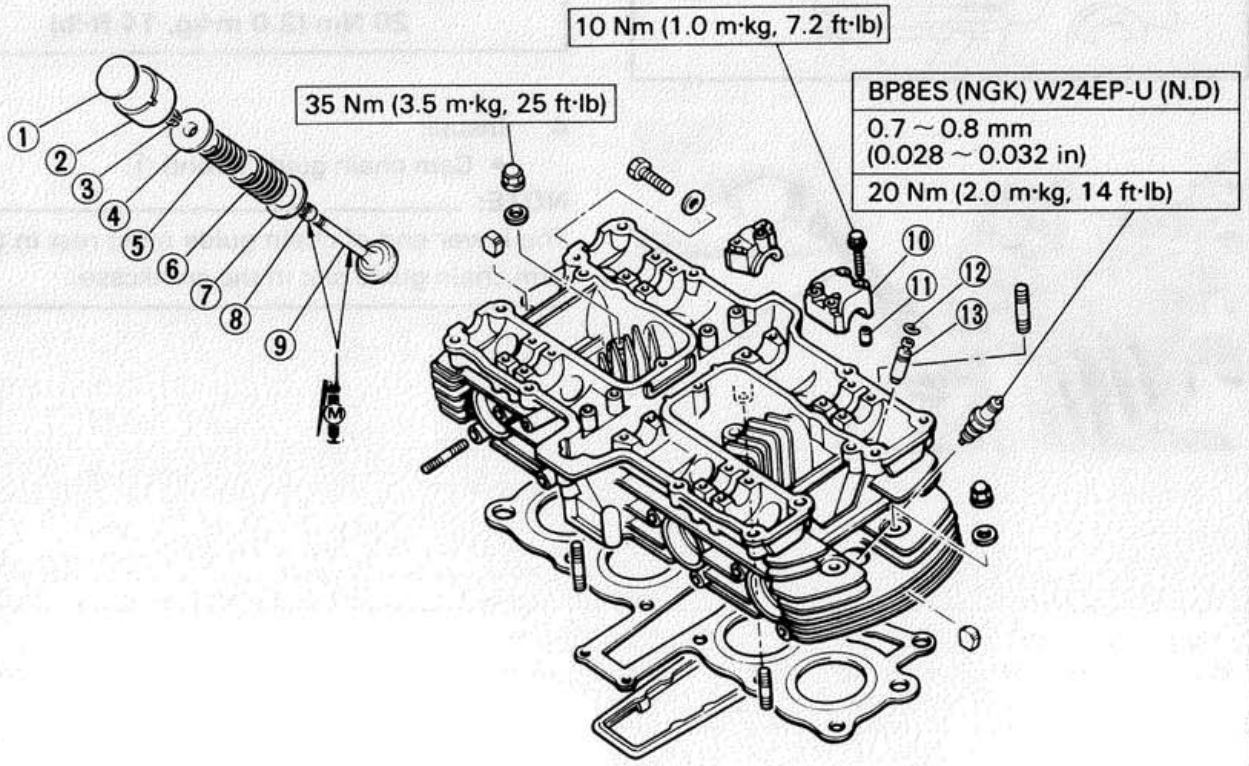
① Pad
② Valve lifter
③ Valve retainer
④ Spring seat
⑤ Inner spring
⑥ Outer spring
⑦ Spring seat
⑧ Oil seal
⑨ Valve
⑩ Cam cap
⑪ Dowel pin
⑫ Circlip
⑬ Valve guide

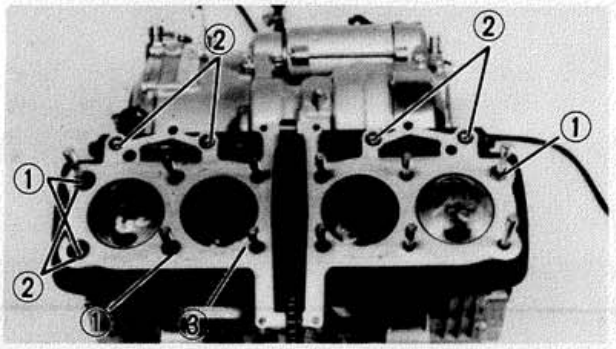
A	VALVE CLEARANCE (COLD):	
B	Intake:	0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in)
C	Exhaust:	0.16 ~ 0.20 mm (0.0063 ~ 0.0079 in)

D	CYLINDER HEAD TIGHTENING SEQUENCE: *Use copper washers



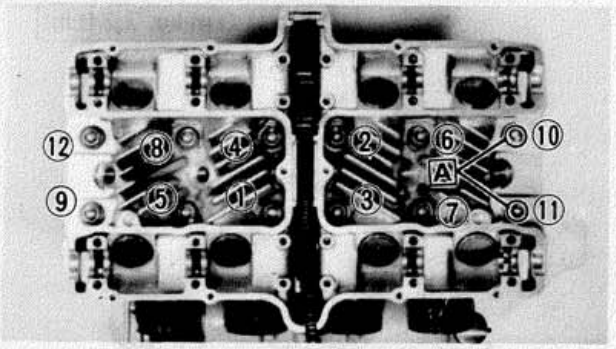






1. Install:
   - Dowel pins ①
   - O-rings (New) ②
   - Cylinder head gasket (New) ③
   - Cylinder head

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



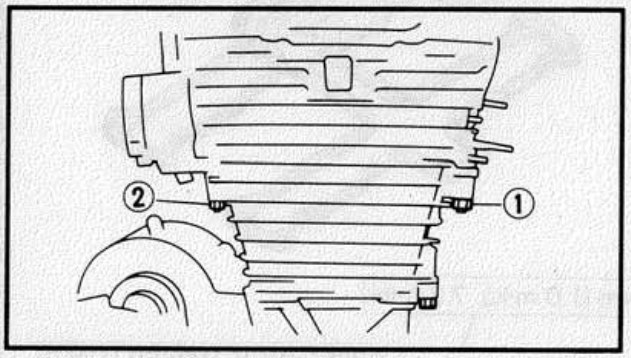
   - All nuts and washers (For cylinder head)
2. Tighten:
   - Nuts

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

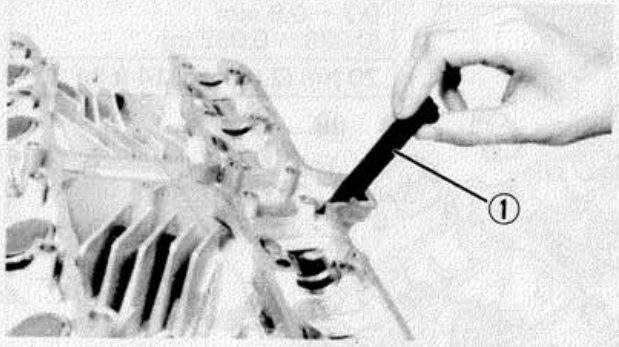
	Cylinder Head: [10 mm (0.39 in)] **35 Nm (3.5 m·kg, 25 ft·lb)**

A Copper washer

3. Tighten:
   - Lower nuts ①
   - Cylinder securing nut ②



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



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

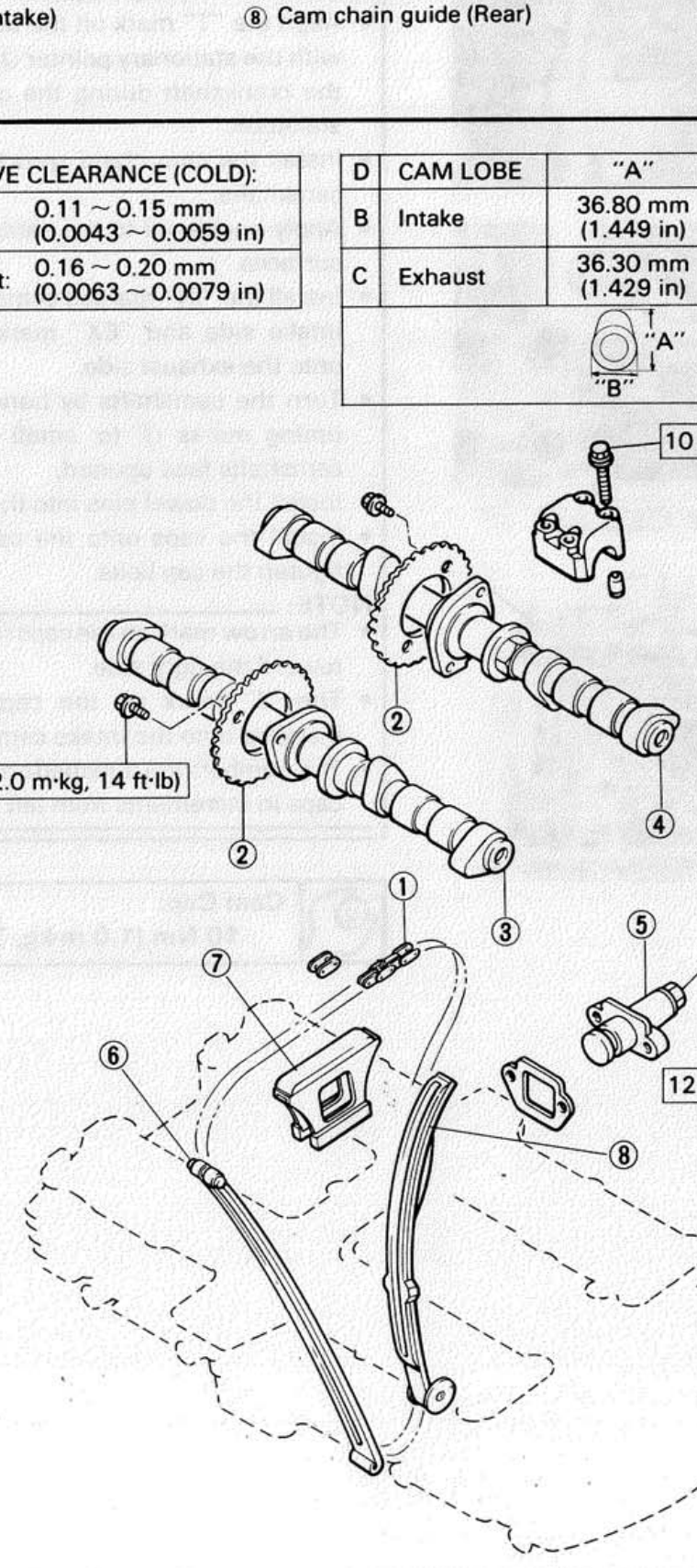
NOTE:
The lower end of chain guide must rest in the cam chain guide slot in the crankcase.

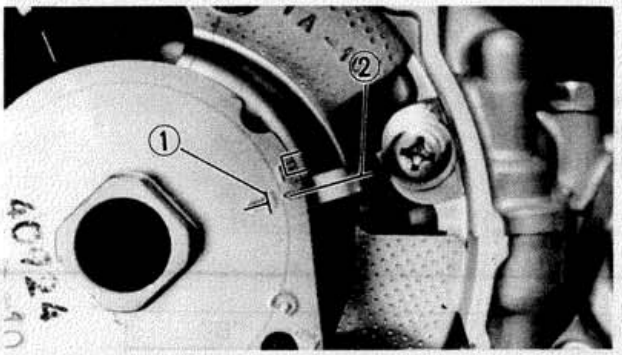
CAMSHAFT

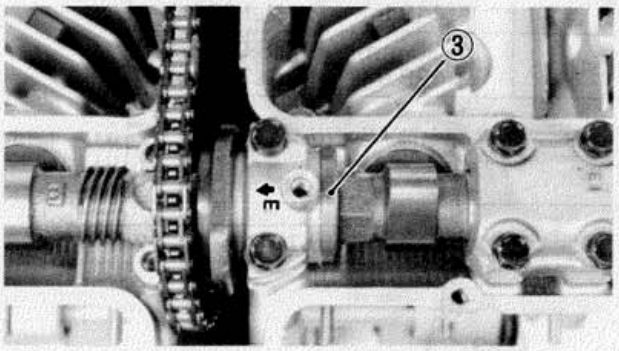
① Cam chain
② Cam sprocket
③ Camshaft (Exhaust)
④ Camshaft (Intake)
⑤ Chain tensioner
⑥ Cam chain guide (Front)
⑦ Cam chain guide (Upper)
⑧ Cam chain guide (Rear)

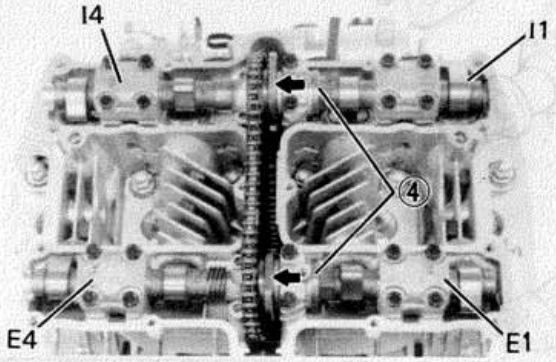
A	VALVE CLEARANCE (COLD):	
B	Intake:	0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in)
C	Exhaust:	0.16 ~ 0.20 mm (0.0063 ~ 0.0079 in)

D	CAM LOBE	"A"	"B"
B	Intake	36.80 mm (1.449 in)	28.10 mm (1.106 in)
C	Exhaust	36.30 mm (1.429 in)	28.06 mm (1.105 in)







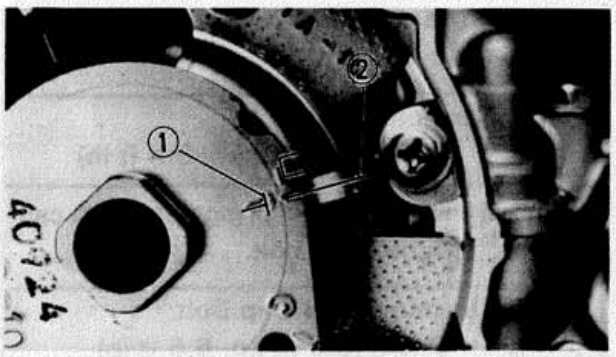


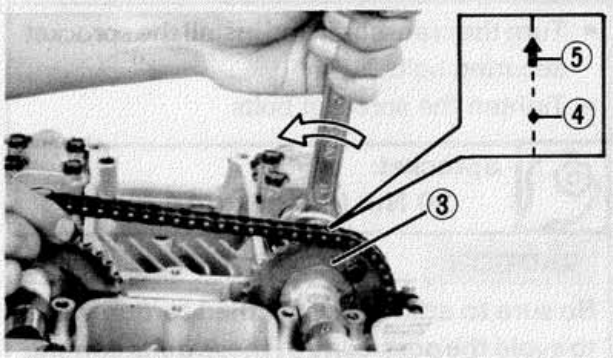
1. Install:
   - Camshafts

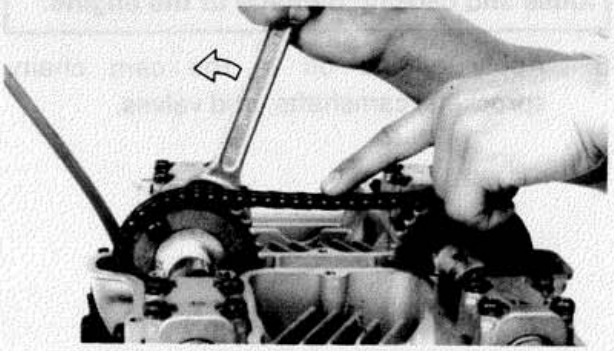
Camshaft installing steps:
- Align the "T" mark on the timing plate ① with the stationary pointer ②. Do not turn the crankshaft during the camshafts installation.
- Install the cam chain sprockets onto the camshafts.
- Apply engine oil to the camshaft bearing surfaces.
- Install the "IN" marked camshaft 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 caps onto the camshafts and tighten the cap bolts.

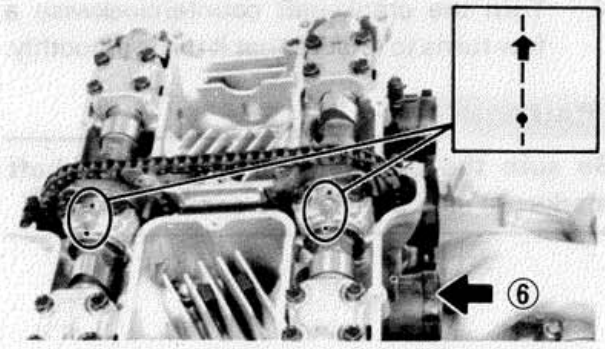
NOTE:
- The arrow mark on the caps ④ should face toward the right side.
- The "I" mark on the caps should be installed onto the intake camshaft.
- The numbers are punched on the camshaft caps in increments from left to right.

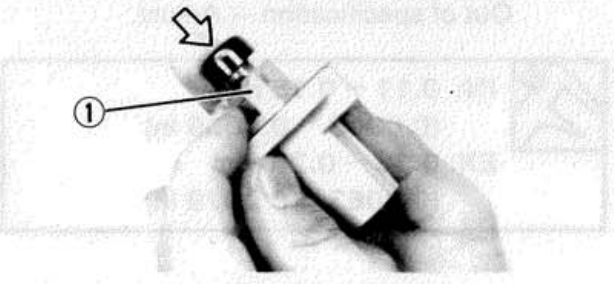
Cam Cap:
10 Nm (1.0 m·kg, 7.2 ft·lb)











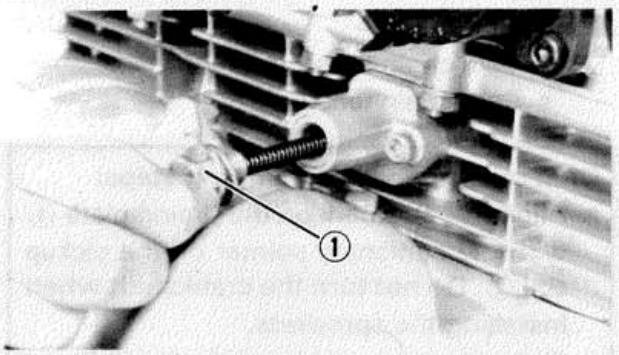
2. Install:
   - Cam chain sprockets
   - Cam chain tensioner

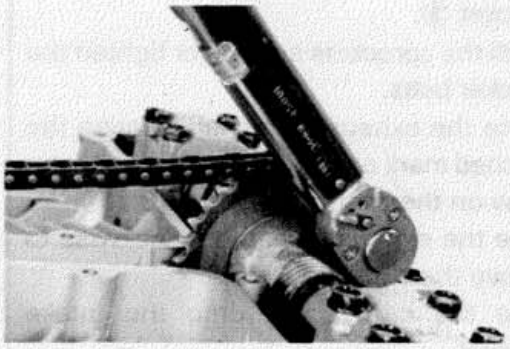
Cam chain sprockets installing steps:

- Align the "T" mark on the timing plate ① with the stationary pointer on the pickup coil ②. **Do not turn the crankshaft when installing the sprockets.**
- Place the cam chain onto the exhaust sprocket ③.
- Install the sprockets and finger tighten the sprocket bolts.
- Rotate the exhaust camshaft to align the punched mark on the camshaft ④ with the arrow on the center cam cap ⑤.
- Force the exhaust camshaft clockwise to remove the cam chain slack.
- Place the cam chain onto the intake sprocket.
- Install the sprocket and finger tighten the sprocket bolt.
- Rotate the intake camshaft to align the punched mark on the camshaft with the arrow on the center cam cap.
- Force the intake camshaft clockwise to remove all the cam chain slack.
- Insert your finger into the cam chain tensioner hole, and push the cam chain guide inward ⑥.
- 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.
- Install the center cam chain guide.

Cam chain tensioner installation steps:

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





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

Tensioner Body:
12 Nm (1.2 m·kg, 8.4 ft·lb)

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

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

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

Sprocket:
20 Nm (2.0 m·kg, 14 ft·lb)

CAUTION:

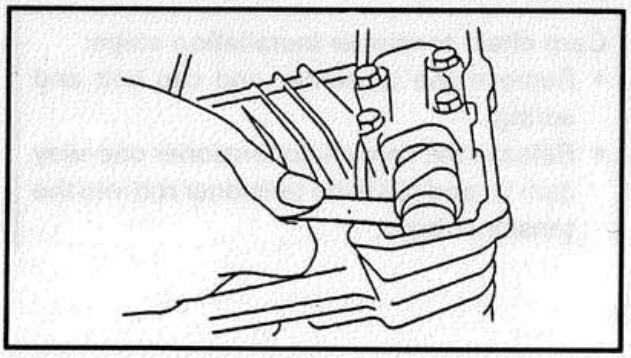
Be sure to attain the specified torque value to avoid the possibility of these bolts coming loose and causing damage to the engine.

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

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

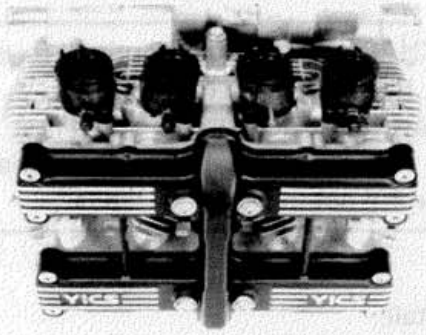
CAUTION:

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



5. 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)

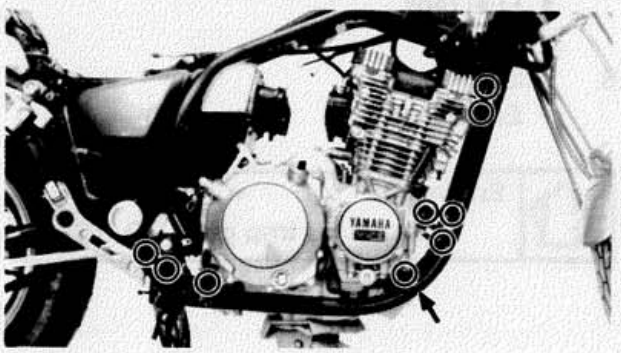


6. Install:
   - Cylinder head cover
   - Bolts
   - Spark plugs

Cylinder Head Cover:
10 Nm (1.0 m·kg, 7.2 ft·lb)
Spark Plug:
20 Nm (2.0 m·kg, 14 ft·lb)

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

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.
2. Tighten:
   - Engine mount bolts

Engine Mounting Bolt:
Front, upper:
42 Nm (4.2 m·kg, 30 ft·lb)
Rear:
90 Nm (9.0 m·kg, 65 ft·lb)
Down tube:
38 Nm (3.8 m·kg, 27 ft·lb)

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

NOTE:
- See CHAPTER 7 "Cable Routing" for proper cable, lead, and hose routing.
- Connect the battery positive lead first.
- Make sure that the cables are not twisted.
- Be careful not to pinch the leads.

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

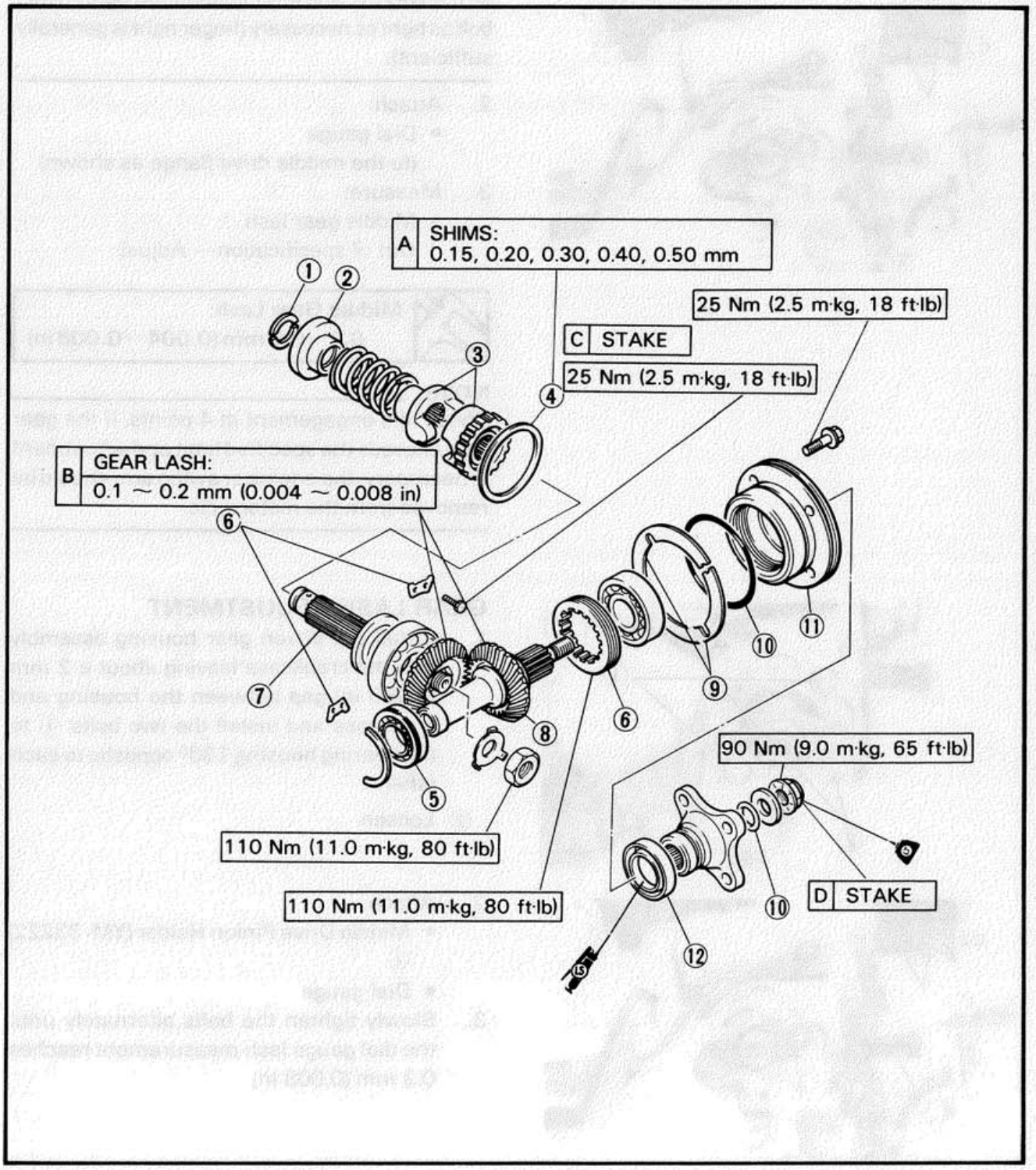
Air Cleaner Case:
10 Nm (1.0 m·kg, 7.2 ft·lb)

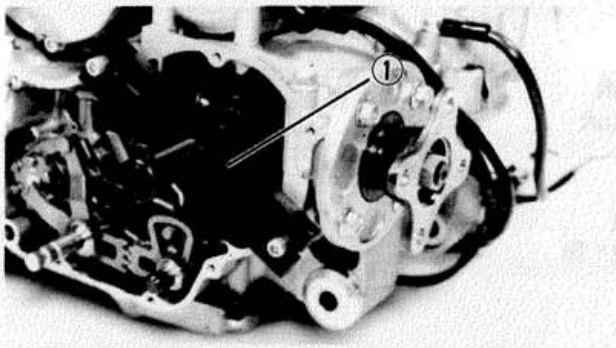
7. Install:
   - Fuel tank
   - Seat
8. Add:
   - Engine oil

Engine Oil:
3.5 L (3.08 Imp qt, 3.70 US qt)

MIDDLE GEAR SERVICE

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





GEAR LASH MEASUREMENT

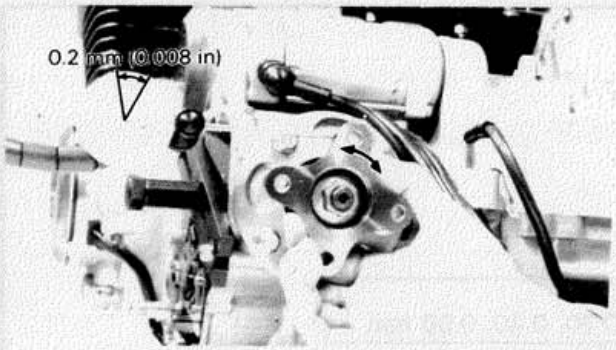
NOTE:

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

1. Attach:
   - Middle Drive Pinion Holder (YM-33222) ①

NOTE:

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



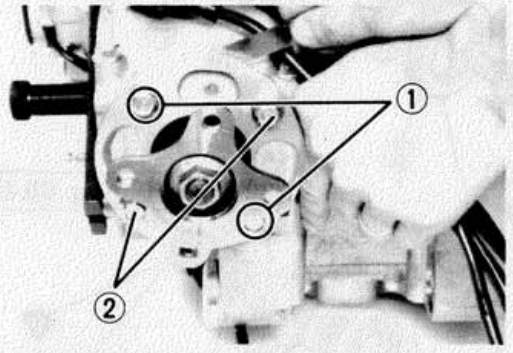
2. Attach:
   - Dial gauge (to the middle drive flange as shown)
3. Measure:
   - Middle gear lash
     Out of specification → Adjust.

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

NOTE:

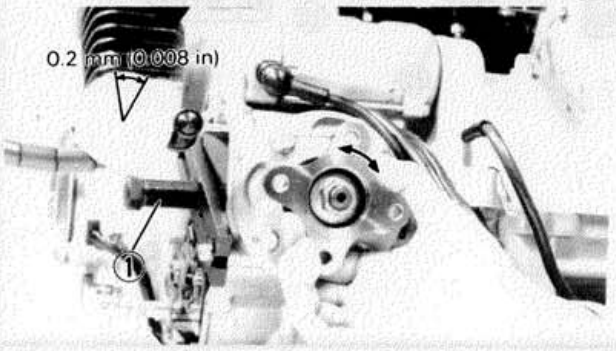
Check this engagement at 4 points. If the gear lash exceeds the specified limit and adjustment is necessary, the engine or swing arm should be removed from the motorcycle.

GEAR LASH ADJUSTMENT

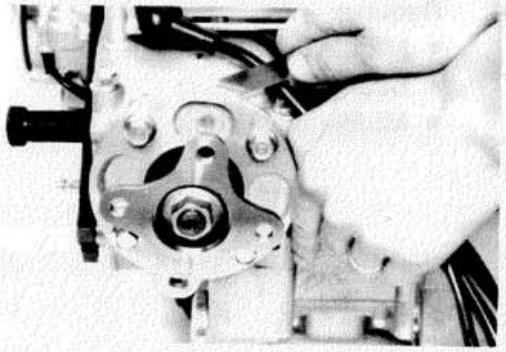


1. Install the driven gear housing assembly into the crankcase leaving about a 2 mm (0.080 in) gap between the housing and crankcase and install the two bolts ① to the bearing housing 180° opposite to each other.

② Loosen



2. Attach:
   - Middle Drive Pinion Holder (YM-33222) ①
   - Dial gauge
3. Slowly tighten the bolts alternately until the dial gauge lash measurement reaches 0.2 mm (0.008 in).



4. Measure:
   - Beaing housing — Crankcase clearance
   This clearance is the shim size required.

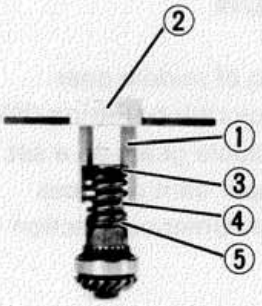
5. Install:
   - Proper sized shim (s)
6. Tighten:
   - Bearing housing

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

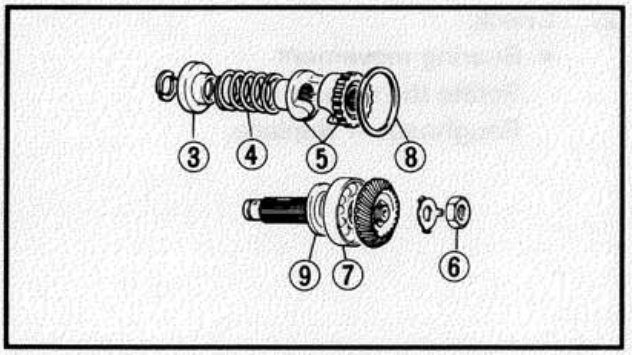
7. Measure:
   - Middle gear lash
   Out of specification → Readjust.

DISASSEMBLY

Middle Drive Gear

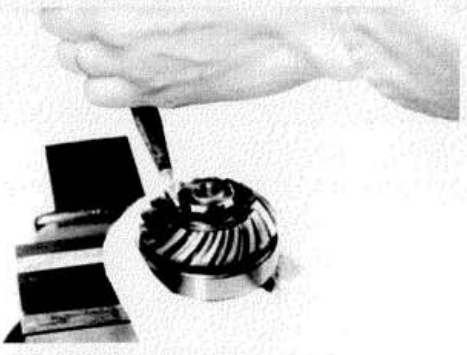


1. Remove:
   - Spring retainer
   Use Middle Drive Pinion Holder (YM-33222) ① and Damper Compressor (YM-33286) ② with hydraulic press.
   - Spring seat ③
   - Spring ④
   - Damper cam ⑤

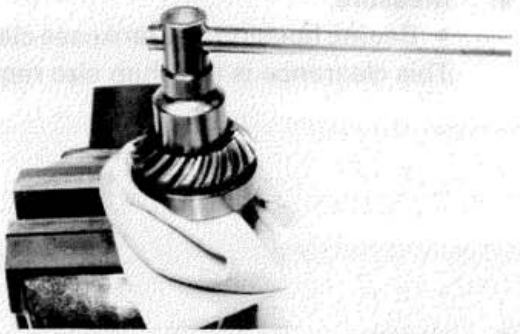


⑥ Middle drive shaft nut
⑦ Bearing
⑧ Shim
⑨ Middle drive shaft

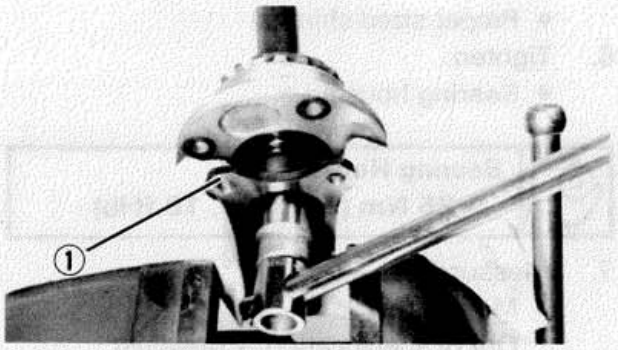
NOTE:
Perform following steps only if middle-drive-shaft bearing or gear must be replaced.



2. Secure middle drive shaft in a vise.
3. Flatten the locking collar of the nut with a center punch.

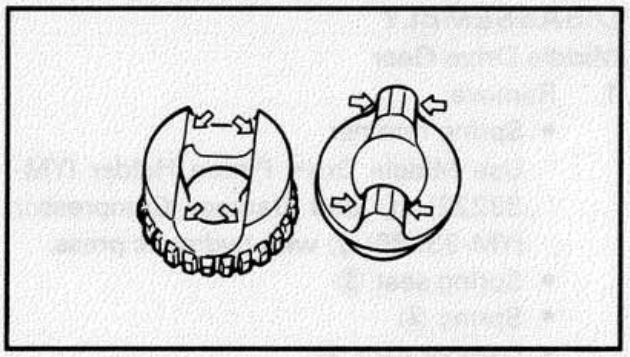


4. Remove:
   - Middle drive shaft nut
   - Bearing
   - Middle drive shaft



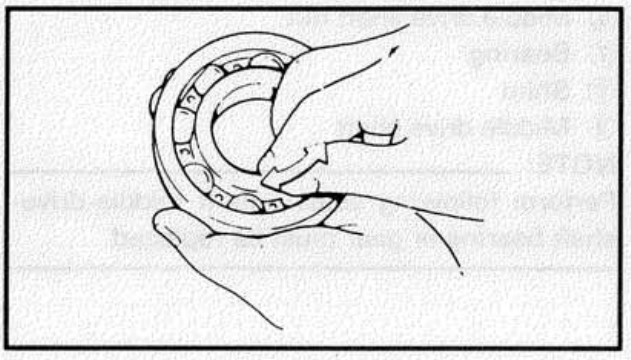
Middle Driven Gear

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

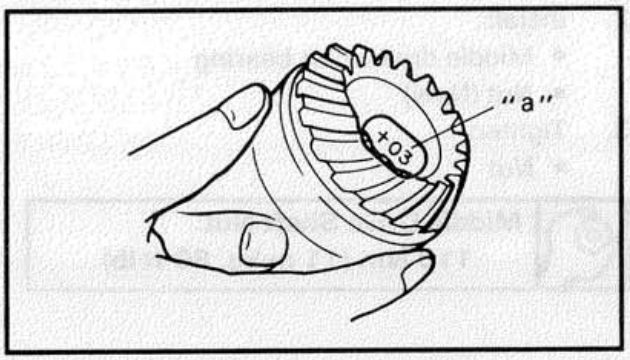


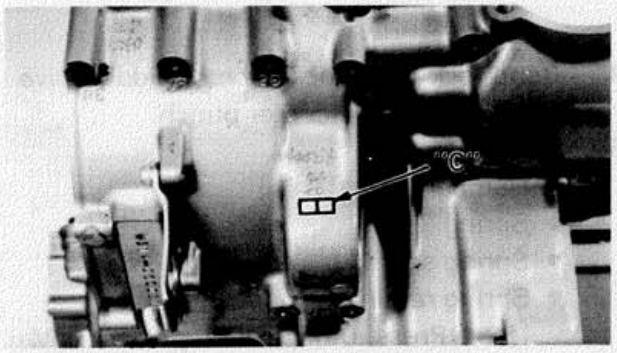
INSPECTION

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



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





ASSEMBLY AND ADJUSTMENT

1. Select proper middle-drive-gear shim.

NOTE:

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

Shim thickness calculation:

- Calculate shim thickness using formula below:

Shim thickness (A) = c − a − b

a = 43 plus or minus the number printed on end of middle drive shaft.

b = a bearing thickness. (Considered constant)

c = 60 plus the number found on the upper crankcase half near the main bearing selection numbers.

- For example
  If middle drive shaft is marked "+03" and crankcase is tamped "45".
  a = 43 + 0.03 = 43.03 mm
  c = 60 + 0.45 = 60.45 mm
  b = 16.94 mm (Constant)

A = 60.45 − 43.03 − 16.94 = 0.48
Calculated shim thickness is 0.48 mm.

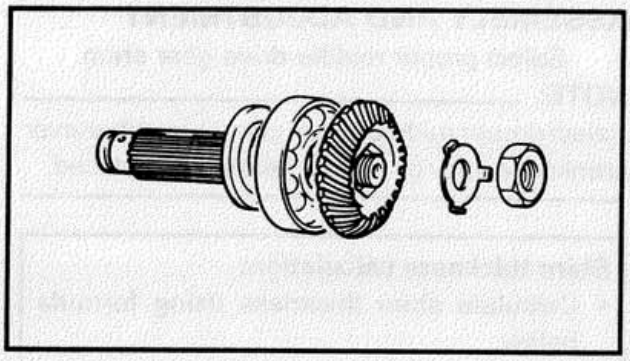
Shim thickness:

0.15 mm, 0.30 mm, 0.40 mm, 0.50 mm

Because shims can only be selected in 0.05 mm increments, use following chart to round off the hundredths digit of calculated thickness, and select appropriate shim.

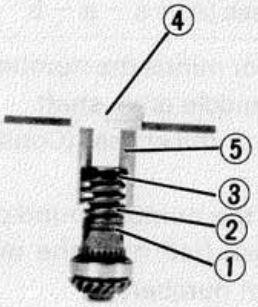
Hundredths digit	Rounded value
0, 1, 2	0
3, 4, 5, 6	5
7, 8, 9	10

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



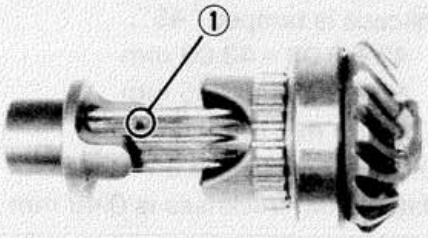
2. Install:
   - Middle drive shaft bearing
   - Nut (New)
3. Tighten:
   - Nut

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



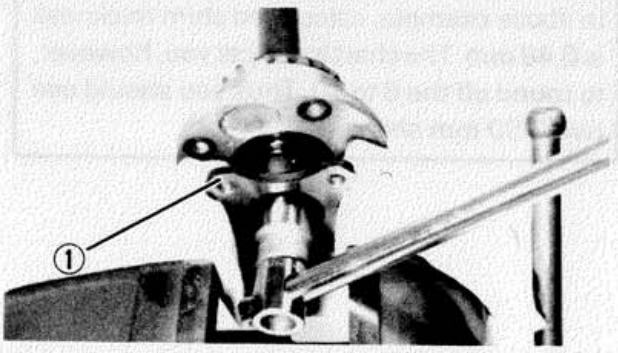
4. Bend lock collar of nut into middle drive shaft slot using a center punch.
5. Assemble:
   - Damper cam ①
   - Spring ②
   - Spring seat ③
   - Spring retainer

   Use a Press, Damper Compressor (YM-33286) ④ and Middle Drive Pinion Holder (YM-33222) ⑤.



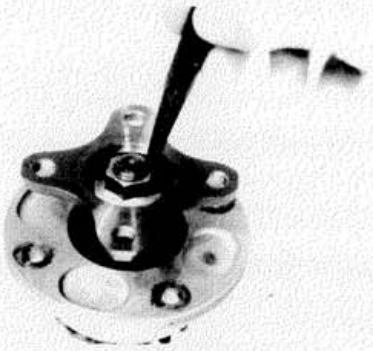
NOTE:
Install the driven damper cam onto the drive pinion shaft with the cam lobes positioned 90° from the row of shaft oil holes ①. Positioning tolerance is ±1 spline (15°) from the 90° position.

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



7. Apply LOCTITE® to the shaft threads.
8. Tighten:
   - Flange holding nut

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



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

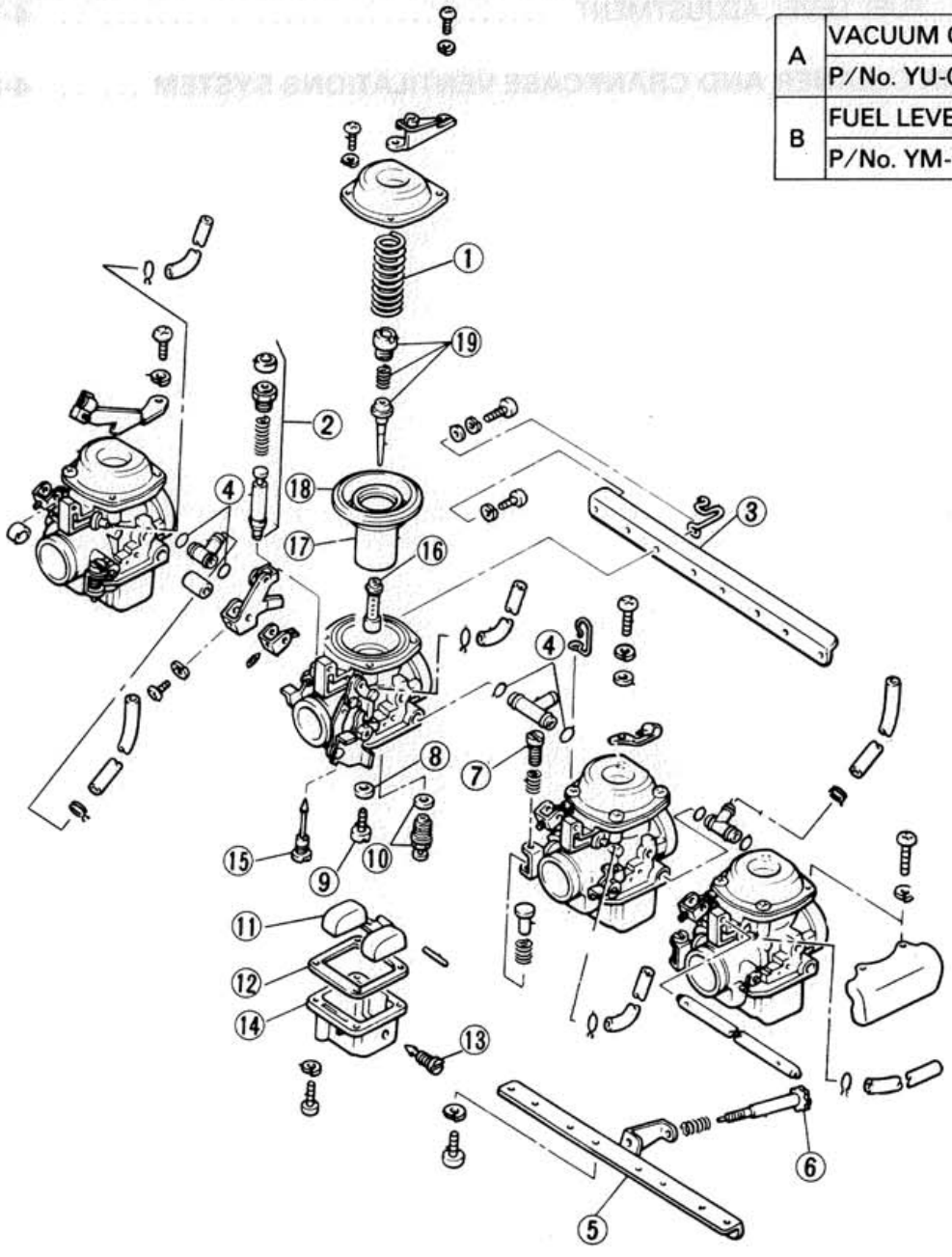
CARBURETION

CARBURETOR

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

SPECIFICATIONS	
Main jet	# 107
Main air jet	# 70
Jet needle	Y-20
Needle jet	ϕ3.22
Pilot jet	# 36.5
Pilot air jet	# 210
Fuel level	1.0 ± 1.0 mm (0.039 ± 0.039 in)
Float height	16.0 ± 1.0 mm (0.630 ± 0.039 in)
Pilot screw	Preset
Float valve seat	ϕ2.0
Engine idle speed	1,050 ± 50 rpm

A	VACUUM GAUGE:
	P/No. YU-08030
B	FUEL LEVEL GAUGE:
	P/No. YM-01312

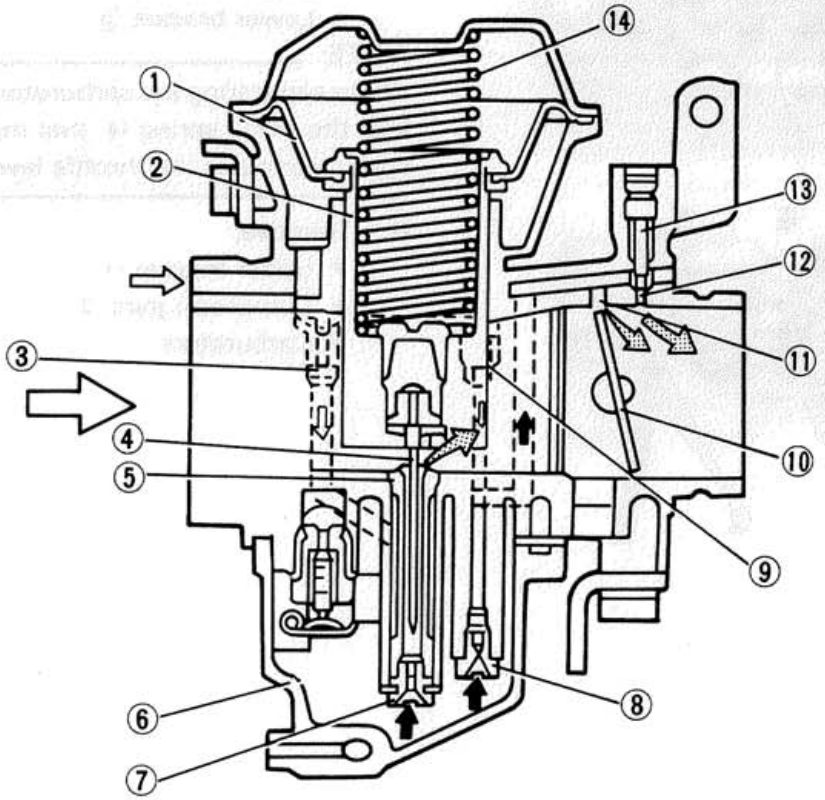


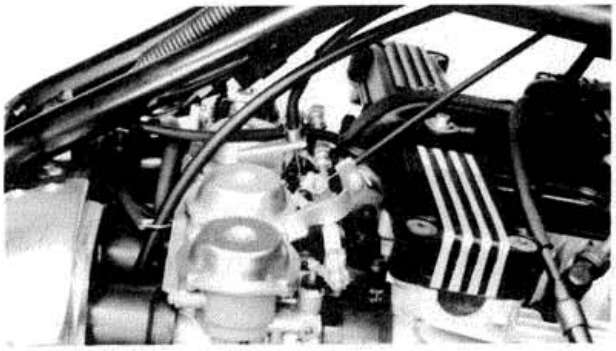
SECTION VIEW

① Diaphragm
② Piston valve
③ Main air jet
④ Jet needle
⑤ Needle jet
⑥ Float chamber
⑦ Main jet
⑧ Pilot jet
⑨ Pilot air jet
⑩ Throttle valve
⑪ By-pass hole
⑫ Pilot outlet
⑬ Pilot screw
⑭ Spring

MAIN METERING SYSTEM

A	⇦	AIR
B	⇦	MIXTURE
C	⇦	FUEL





CARBURETOR OVERHAUL

REMOVAL

1. Remove:
   - Carburetor assembly

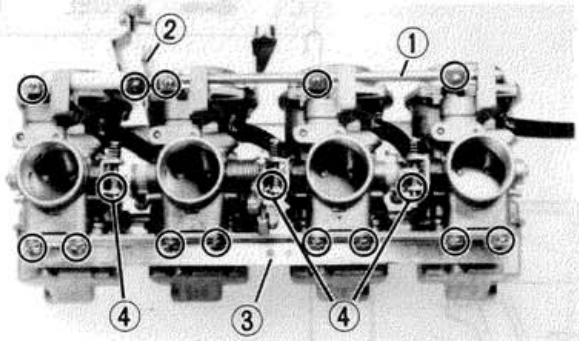
   Refer to engine removal section.

NOTE:

The following parts can be cleaned and inspected without disassembly.

- Piston valve
- Jet needle

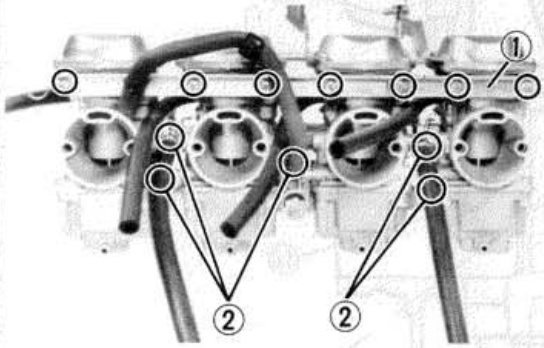
2. Disconnect:
   - Drain hoses
   - Fuel hoses
   - Throttle cable
3. Number each carburetor before removing it from carburetor brackets.



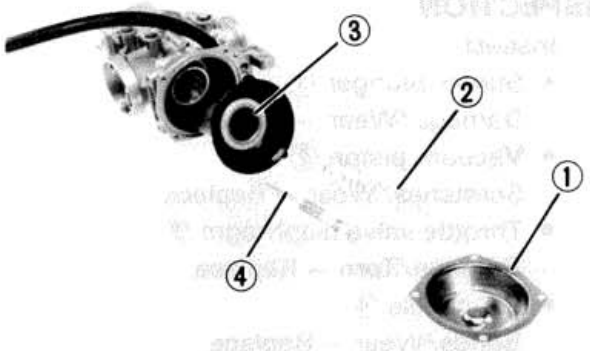
4. Loosen:
   - Starter lever screws
5. Remove:
   - Starter lever shaft ①
   - Starter lever ②
   - Lower bracket ③

NOTE:

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

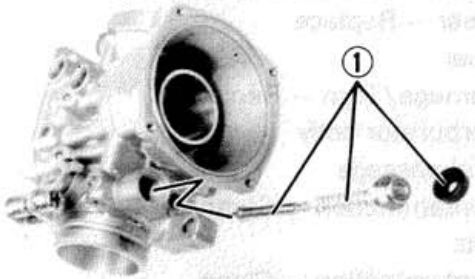


6. Remove:
   - Upper bracket ①
   - Carburetor joint ②
   - Carburetors

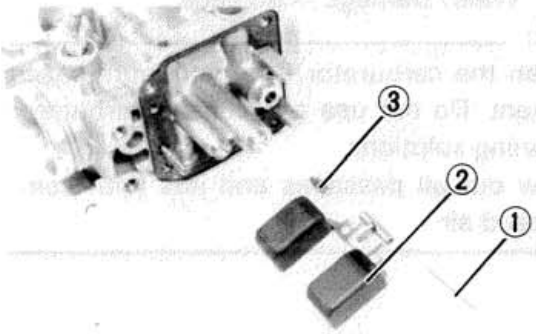


DISASSEMBLY

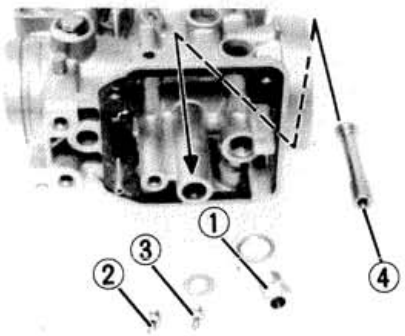
1. Remove:
   - Vacuum chamber cover ①
   - Spring ②
   - Vacuum piston ③
   - Jet needle ④



2. Remove:
   - Starter plungers ①



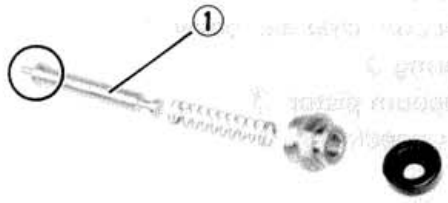
3. Remove:
   - Float chamber cover
   - Float pin ①
   - Float ②
   - Needle valve ③

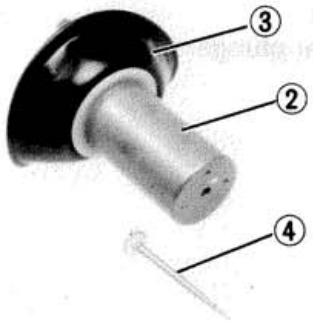


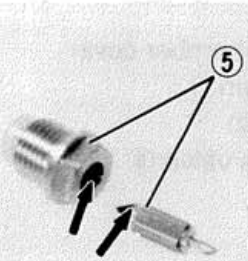
4. Remove:
   - Valve seat ①
   - Pilot jet ②
   - Main jet ③
   - Needle jet ④

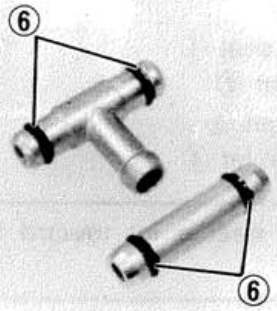
NOTE:

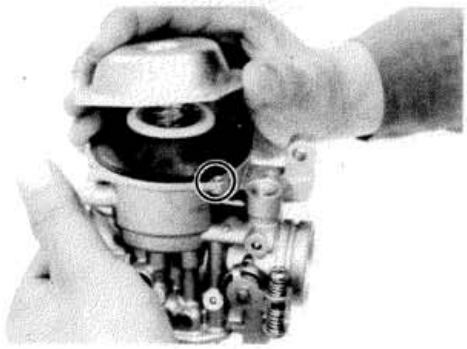
Remove the needle jet toward the vacuum piston.











INSPECTION

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

NOTE:

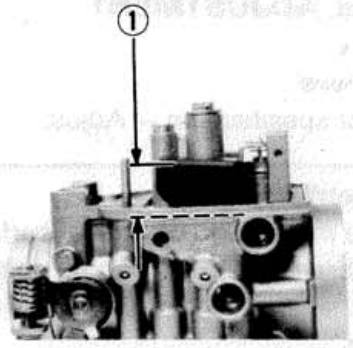
- Wash the carburetor in a petroleum-based solvent. Do not use any caustic carburetor cleaning solutions.
- Blow out all passages and jets with compressed air.

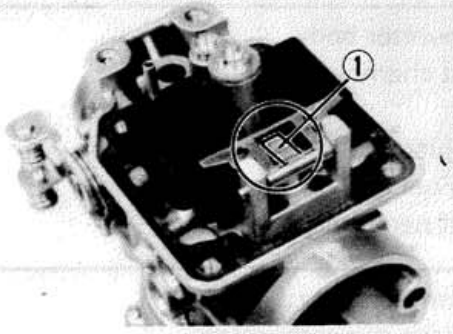
ASSEMBLY

1. Assemble:
   - Carburetors

NOTE:

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





FLOAT HEIGHT ADJUSTMENT

1. Measure:
   - Float height ①
     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.

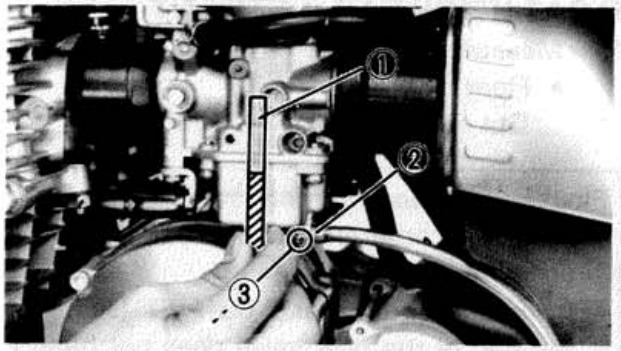
Float Height:
16.0±1.0 mm (0.630±0.039 in)

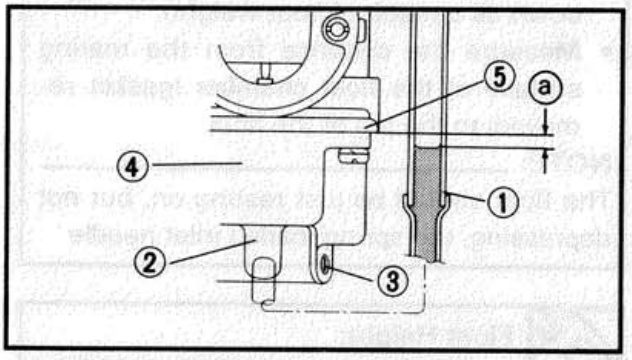
Float height adjustment step:
- Remove the float.
- Adjust float height by bending the float tang ① slightly.
- Repeat the procedure for other carburetors.

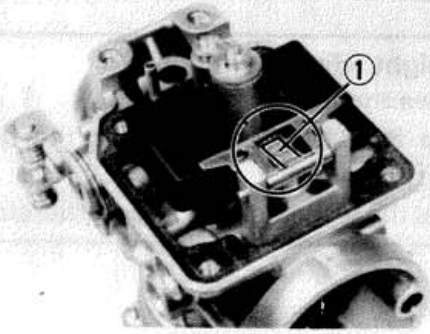
INSTALLATION

1. Install:
   - Carburetors
     Reverse the removal steps.

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







FUEL LEVEL ADJUSTMENT

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

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

Fuel Level: ⓐ
Below the carburetor body
1.0 ± 1.0 mm (0.039 ± 0.039 in)

④ Carburetor body
⑤ Float chamber

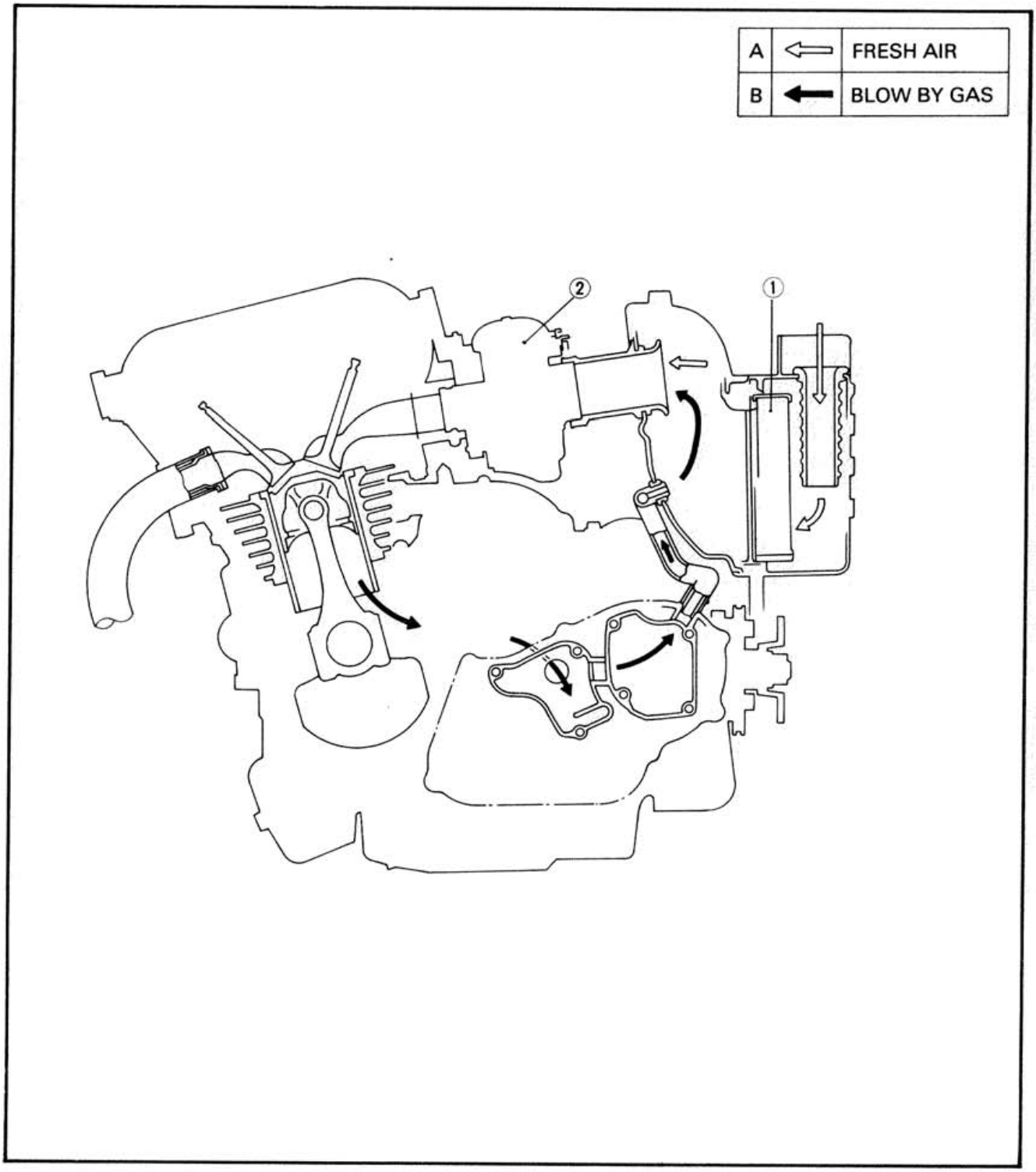
2. Adjust:
   - Fuel level
     If necessary

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

AIR CLEANER AND CRANKCASE VENTILATIONS SYSTEM

Refer to "CHAPTER 2" for air cleaner maintenance.

① Air cleaner
② Carburetor



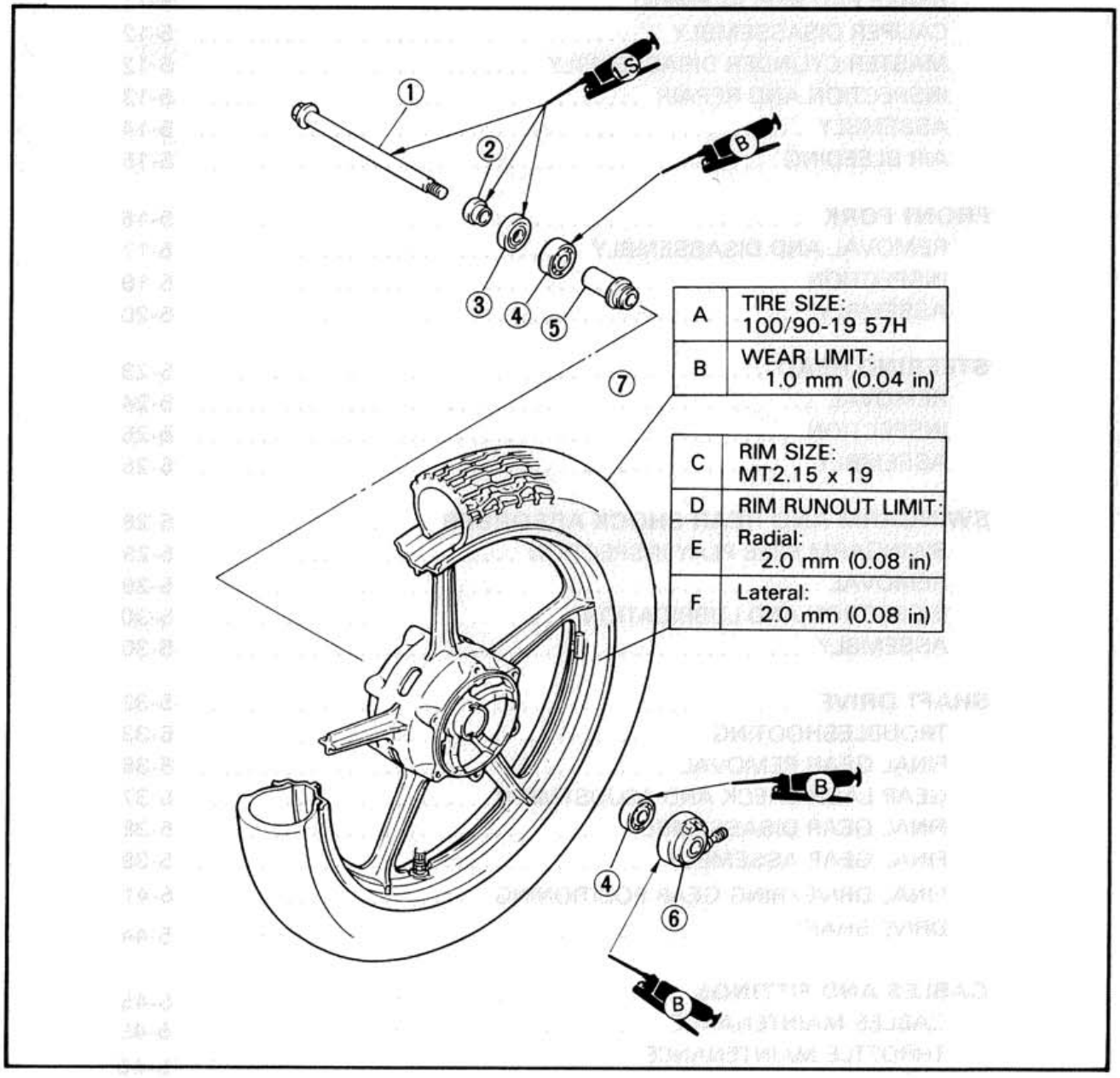
CHASSIS

FRONT WHEEL

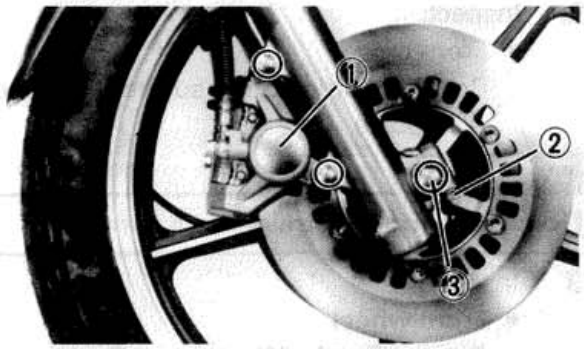
① Wheel axle
② Collar
③ Oil seal
④ Bearing
⑤ Spacer
⑥ Speedometer gear unit
⑦ Tire

Basic weight: With oil and full fuel tank	224 kg (493 lb)	
Maximum load*	246 kg (543 lb)	
Cold tire pressure	Front	Rear
Up to 90 kg (198 lb) load*	177 kPa (1.8 kg/cm², 26 psi)	196 kPa (2.0 kg/cm², 28 psi)
90 kg (198 lb) ~ Maximum load*	196 kPa (2.0 kg/cm², 28 psi)	274 kPa (2.8 kg/cm², 40 psi)
High speed riding	206 kPa (2.1 kg/cm², 30 psi)	225 kPa (2.3 kg/cm², 32 psi)

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



A	TIRE SIZE: 100/90-19 57H
B	WEAR LIMIT: 1.0 mm (0.04 in)
C	RIM SIZE: MT2.15 x 19
D	RIM RUNOUT LIMIT:
E	Radial: 2.0 mm (0.08 in)
F	Lateral: 2.0 mm (0.08 in)



REMOVAL

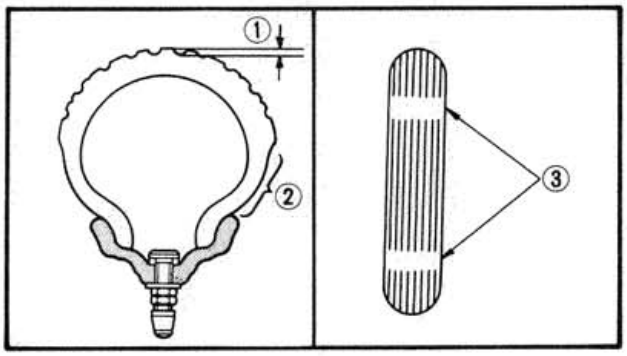
1. Place the motorcycle on its centerstand and a garage jack under the engine.
2. Remove:
   - Speedometer cable
   - Caliper ①
     (from front fork)
3. Loosen:
   - Pinch bolt ②
4. Remove:
   - Axle ③
   - Front wheel

CAUTION:

Make sure the motorcycle is properly supported.

NOTE:

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

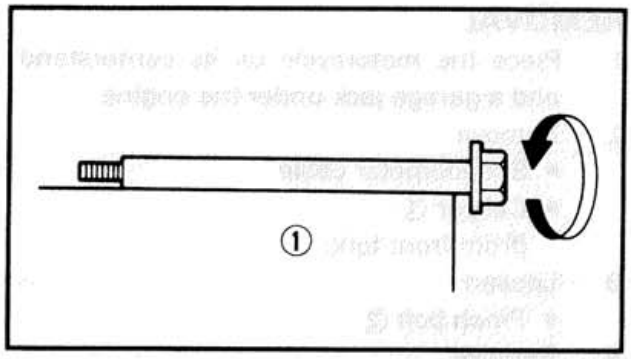


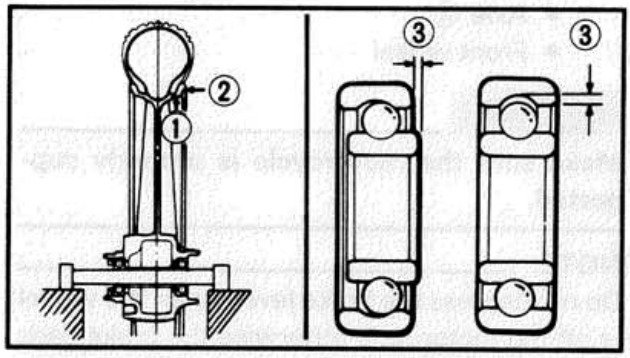
INSPECTION

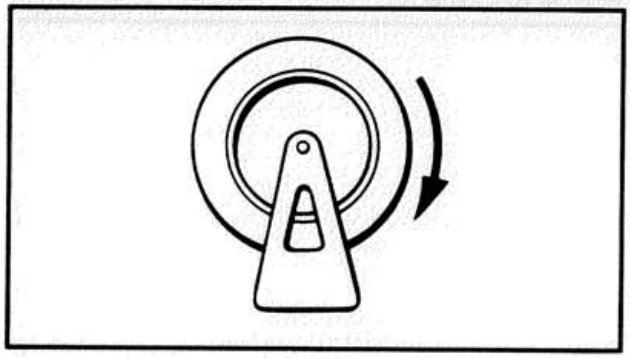
1. Inspect:
   - Tire
     Tire tread shows crosswise lines (minimum tread depth)/Cracks → Replace.

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

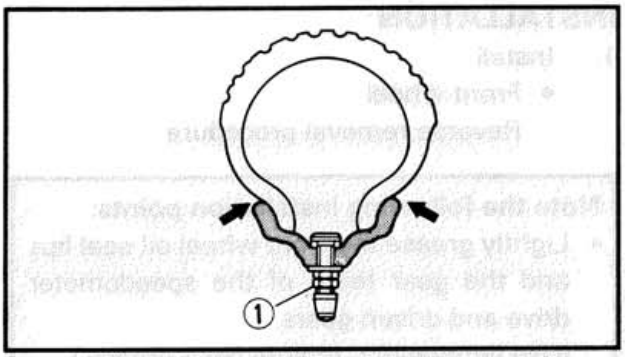
Rim Run-Out Limits:
Radial ① : 2 mm (0.079 in)
Lateral ② : 2 mm (0.079 in)

③ Bearing play

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

NOTE:

- Balance wheel with brake disc installed.



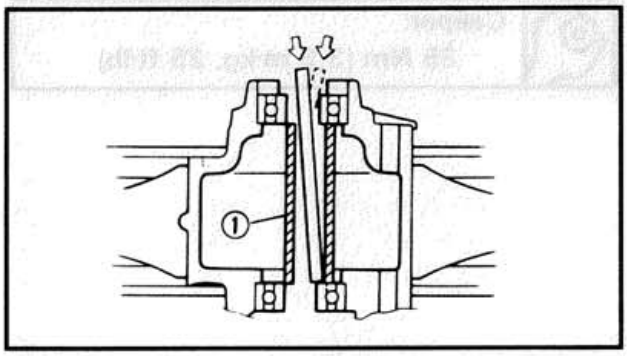
WARNING:

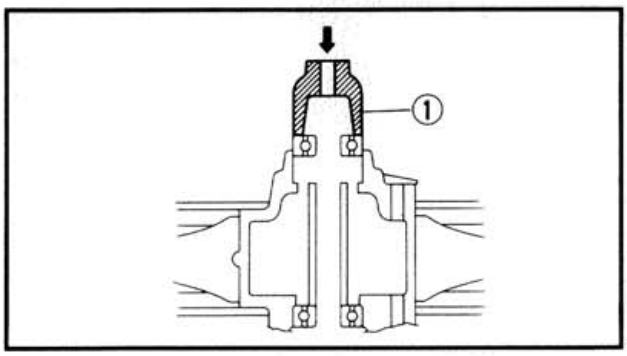
- **After mounting a tire, ride conservatively to allow proper tire to rim seating. Failure to do so may cause an accident resulting in motorcycle damage and possible operator injury.**
- **After a tire repair or replacement, be sure to torque tighten the valve stem locknut ① to specification.**

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

WHEEL BEARING REPLACEMENT

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





Wheel bearing replacement steps:

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

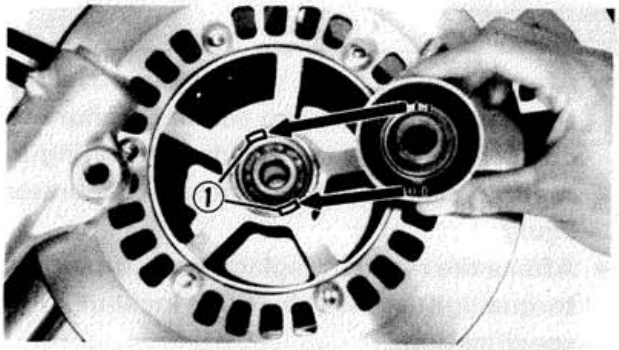
WARNING:

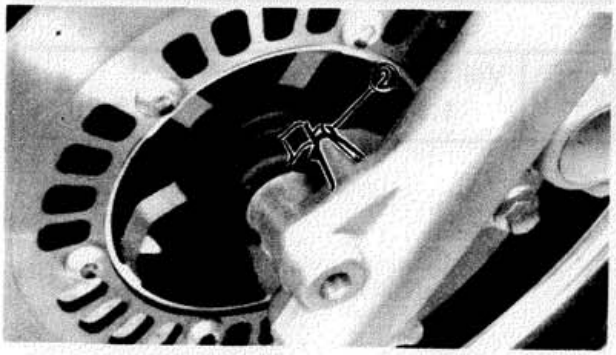
Eye protection is recommended when using striking tools.

- To install the wheel bearing, reverse the above sequence. Use a socket ① that matches outside diameter of bearing outer race to drive in bearing.

CAUTION:

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





INSTALLATION

1. Install
   - Front wheel

   Reverse removal procedure.

Note the following installation points:

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

- Tighten the axle.

Axle:
105 Nm (10.5 m·kg, 75 ft·lb)

- Tighten the axle pinch bolt.

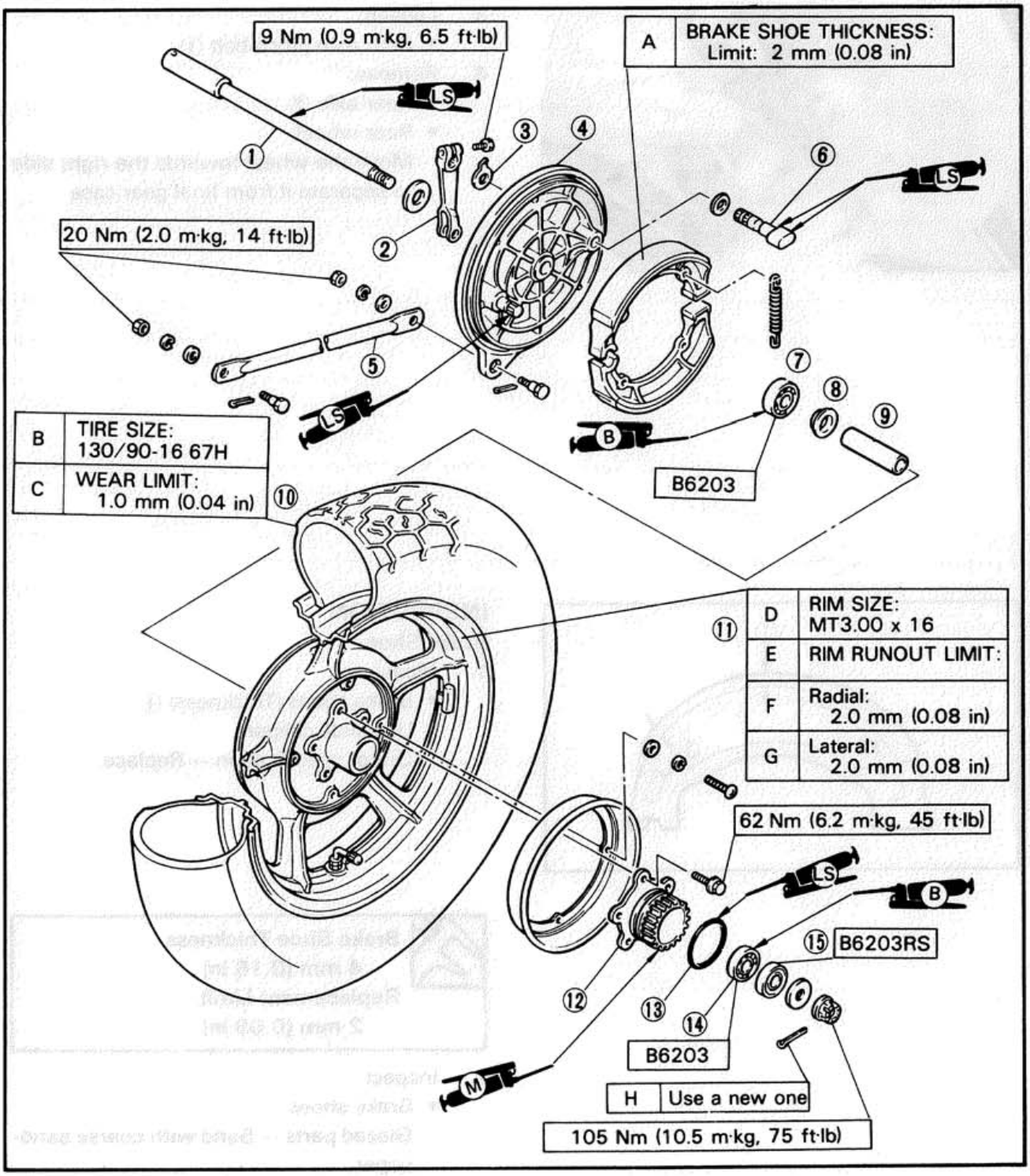
Axle Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)

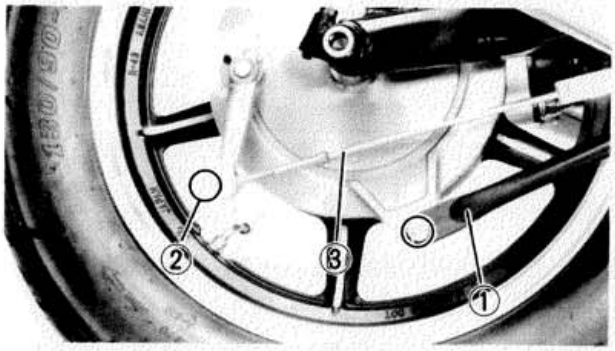
- Tighten the caliper.

Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)

REAR WHEEL

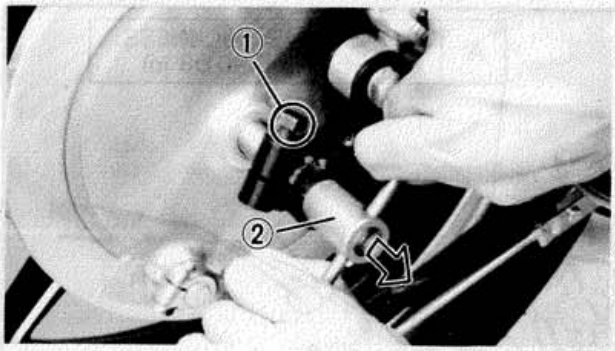
① Axle
② Rear brake camshaft lever
③ Wear indicator
④ Brake plate
⑤ Tension bar
⑥ Rear brake camshaft
⑦ Bearing
⑧ Spacer flange
⑨ Spacer
⑩ Tire
⑪ Wheel
⑫ Clutch hub
⑬ O-ring
⑭ Bearing
⑮ Bearing



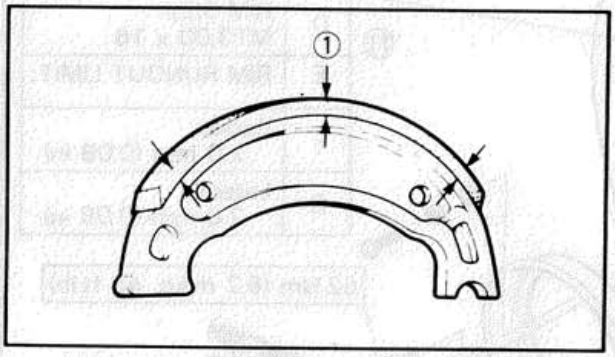


REMOVAL

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



3. Loosen:
   - Rear axle pinch bolt ①
4. Remove:
   - Rear axle ②
   - Rear wheel
     Move the wheel towards the right side to separate it from final gear case.



INSPECTION

Brake Shoe

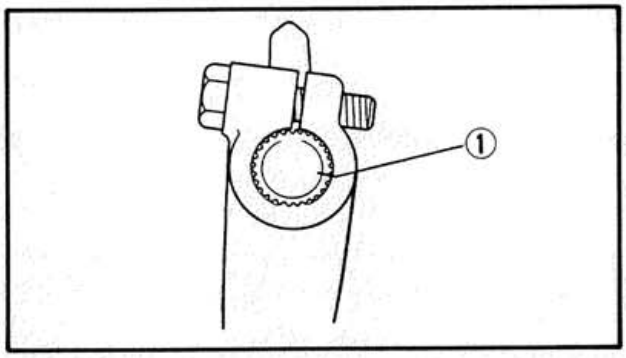
1. Measure:
   - Brake shoes (Thickness) ①
     Use slide calipers.
     Out of specification → Replace.

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

2. Inspect:
   - Brake shoes
     Glazed parts → Sand with coarse sandpaper.

Brake Drum

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



Brake Shoe Plate

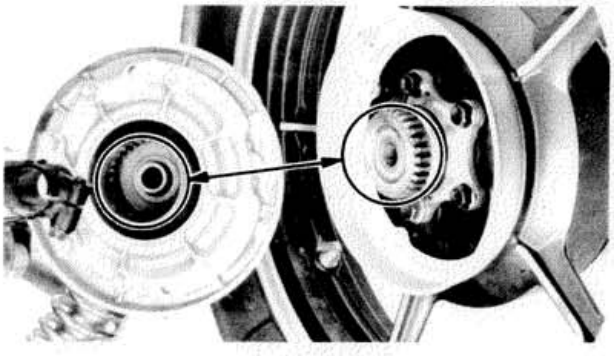
1. Remove:
   - Camshaft
2. Inspect:
   - Cam face
     Wear → Replace camshaft.
     Condition OK → Grease camshaft.

NOTE:

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

Rear Axle, Wheel and Wheel Bearing Replacement

Refer to "Front Wheel Inspection".



INSTALLATION

1. Install:
   - Rear wheel
     Reverse removal steps.

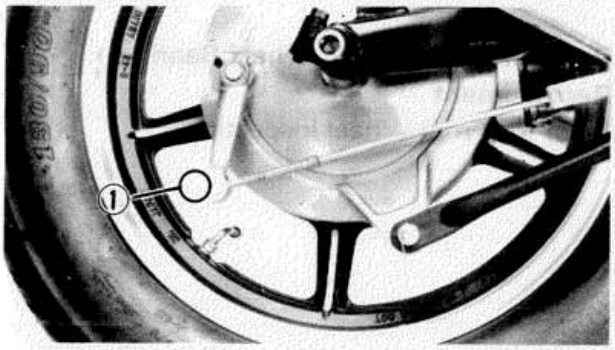
Rear wheel installation points:

- Lightly grease O-ring ① and hub splines ②.

- Install wheel assembly and axle.

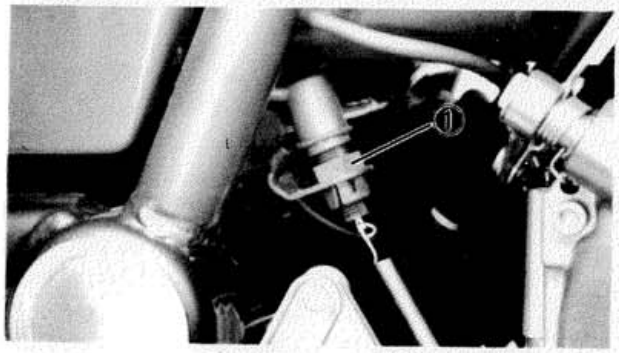
Axle Nut:
105 Nm (10.5 m·kg, 75 ft·lb)
Axle Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)

- Always use a new cotter pin on the axle nut.



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

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

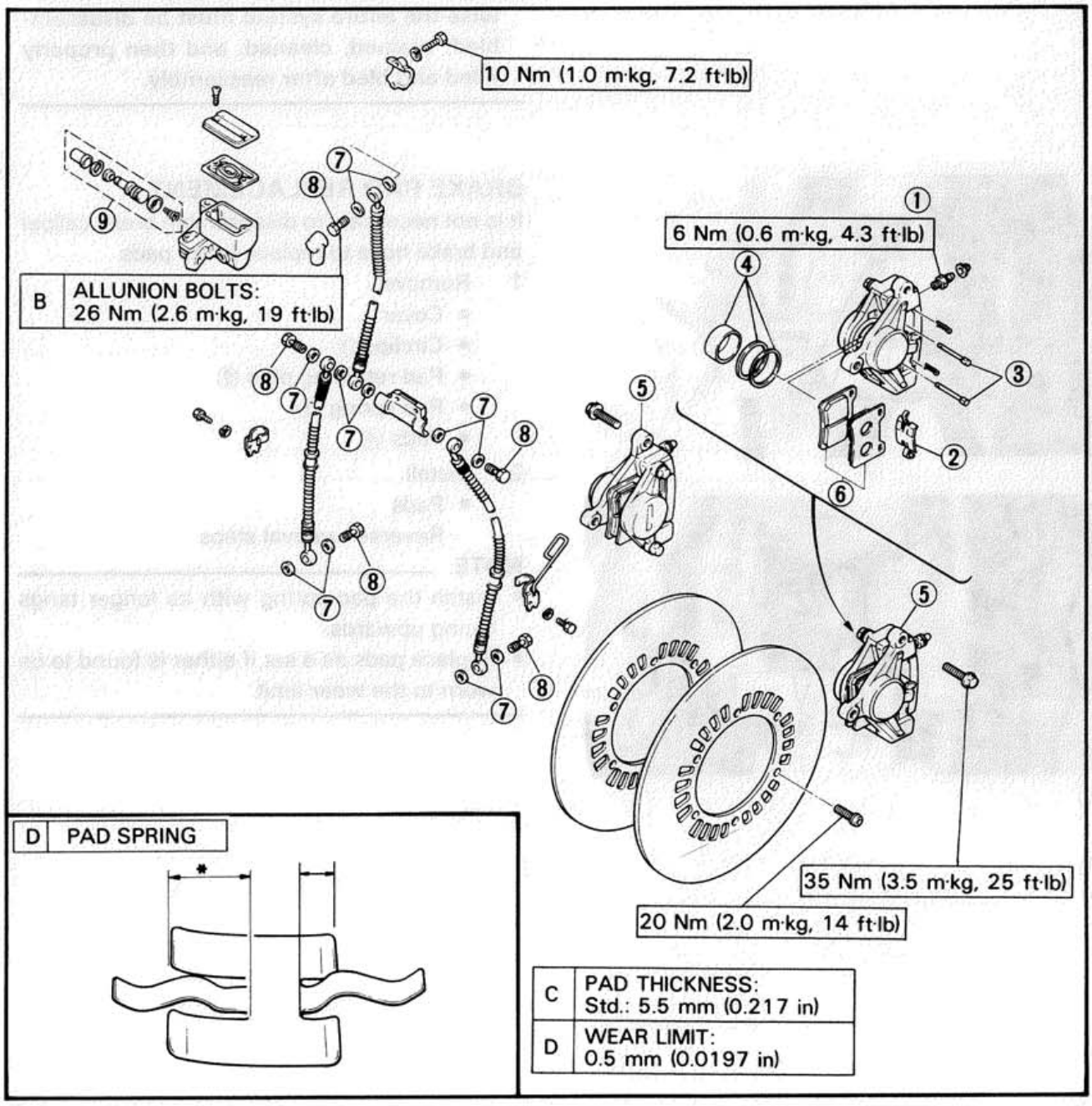


3. Adjust:
   - Rear brake light switch ①

FRONT BRAKE

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

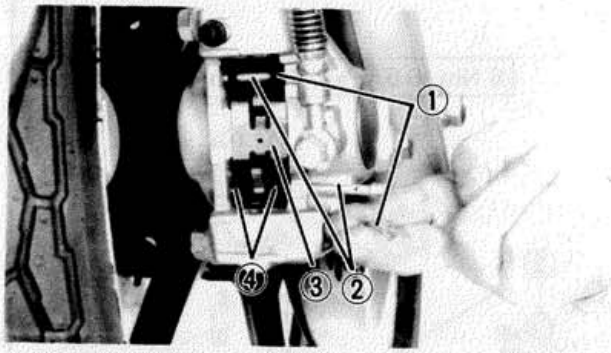
*Install the pad spring with its longer tangs facing upwards.

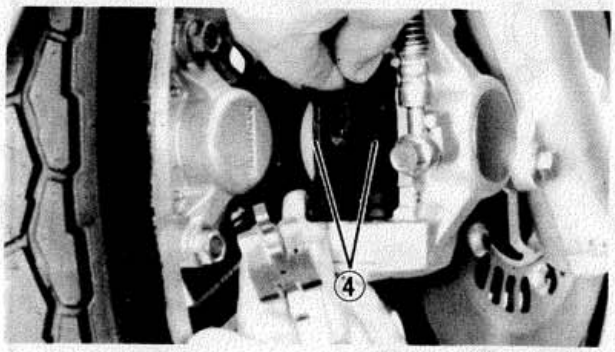


CAUTION:

Disc brake components rarely require disassembly. Do not:

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





BRAKE PAD REPLACEMENT

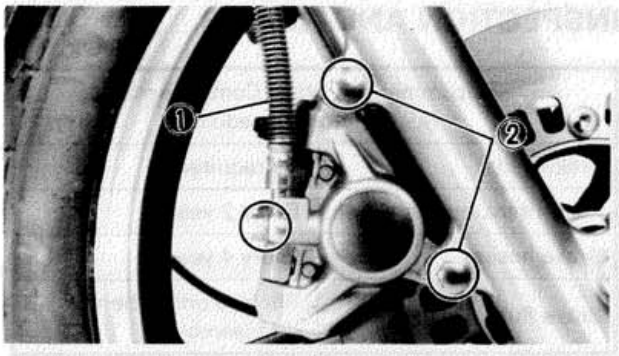
It is not necessary to disassemble brake caliper and brake hose to replace brake pads.

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

   Reverse removal steps.

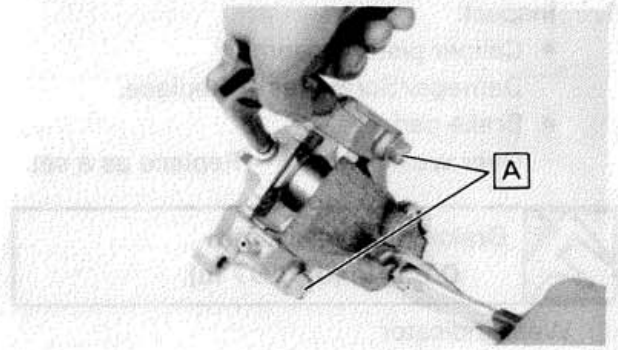
NOTE:

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



CALIPER DISASSEMBLY

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

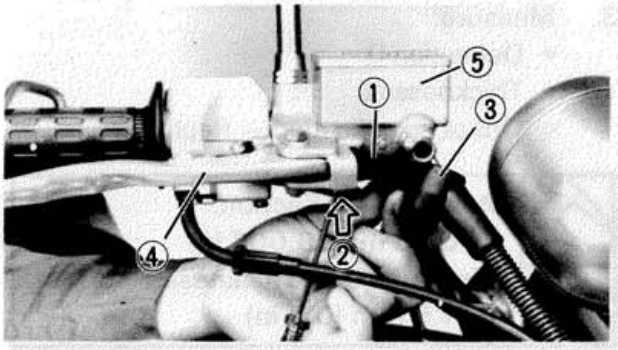


2. Remove:
   - Caliper piston assembly
     Use compressed air and proceed carefully.

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

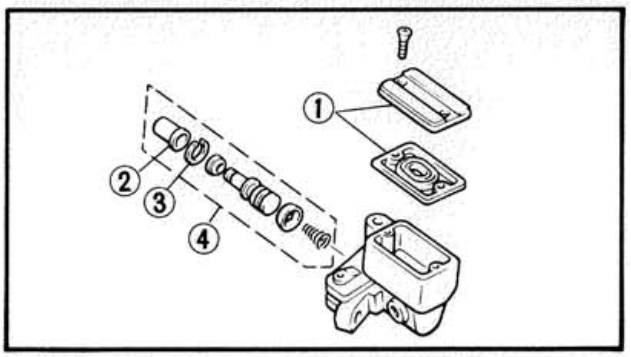
A DO NOT LOOSEN

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



MASTER CYLINDER DISASSEMBLY

1. Remove:
   - Brake light switch ①
     Push ② the brake light switch stopper.
   - Brake hose ③.
   - Brake lever ④ and spring
   - Master cylinder assembly ⑤



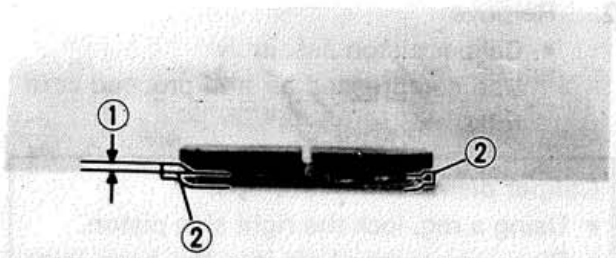
2. Remove:
   - Cap ①
     Drain remaining fluid
   - Master cylinder dust boot ②
   - Circlip ③
   - Master cylinder cup assembly.

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

④ Master cylinder kit

INSPECTION AND REPAIR

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

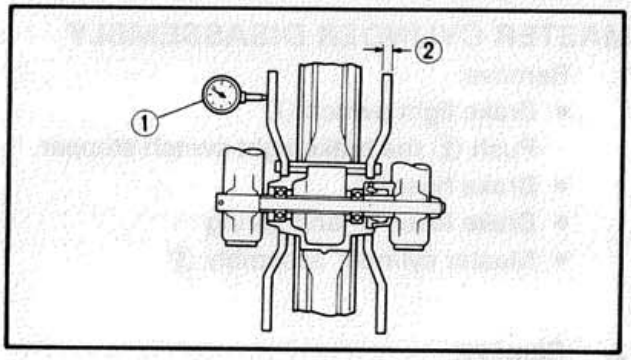


1. Inspect:
   - Caliper piston assembly
     Damage/Scratches → Replace.
   - Brake pad
     Over wear limit ① → Replace as a set.

Brake Pad Wear Limit:
0.5 mm (0.0197 in)

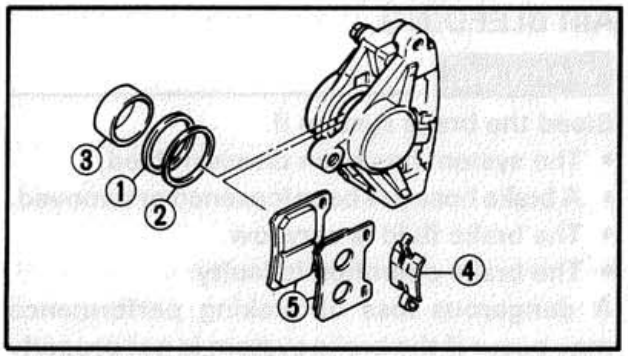
② Wear indicator

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



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

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



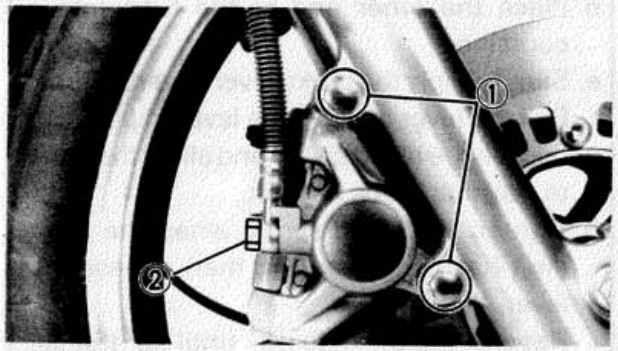
ASSEMBLY

Caliper

NOTE:

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

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



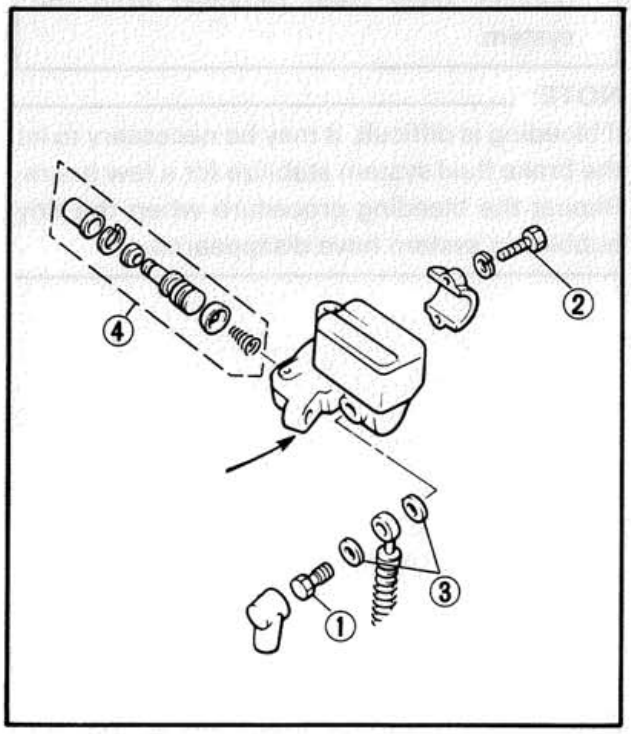
2. Tighten:
   - Caliper securing bolts ①

35 Nm (3.5 m·kg, 25 ft·lb)

   - Brake hose union bolt ②

26 Nm (2.6 m·kg, 19 ft·lb)

3. Bleed the air completely.



Master Cylinder

1. Assemble:
   - Master cylinder

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

2. Bleed the air completely.

③ Copper washer
④ Master cylinder kit

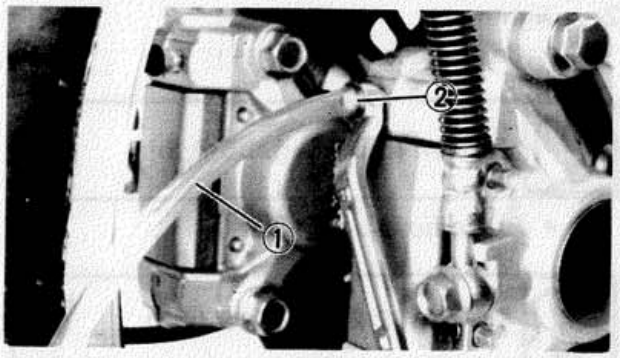
AIR BLEEDING

WARNING:

Bleed the brake system if:

- **The system has been disassembled.**
- **A brake hose has been loosened or removed.**
- **The brake fluid is very low.**
- **The brake operation is faulty.**

A dangerous loss of braking performance may occur if the brake system is not properly bled.



Air bleeding steps:

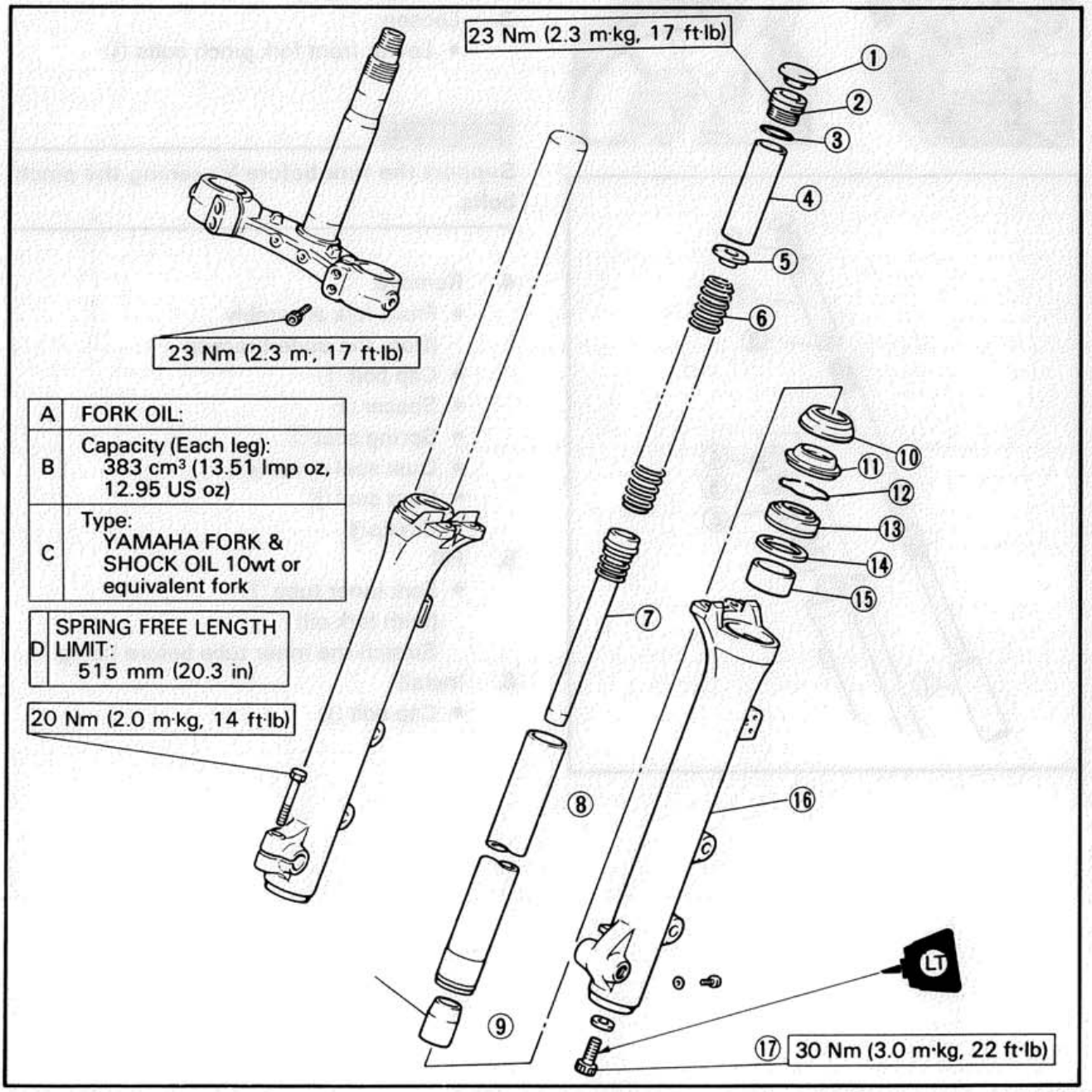
a. Add proper brake fluid to the reservoir.
b. Install diaphragm.
   Be careful not to spill any fluid or allow the reservoir to overflow.
c. Connect the clear plastic tube ① (4.5 mm, 3/16 in inside dia.) tightly to the caliper bleed screw ②.
d. Place the other end of the tube into a container.
e. Slowly apply the brake lever several times.
f. Pull the lever in. Hold the lever in position.
g. Loosen the bleed screw and allow the lever to travel towards its limit.
h. Tighten the bleed screw when the lever limit has been reached; then release the lever.
i. Repeat steps [e] to [h] until of the air bubbles have been removed from the system.

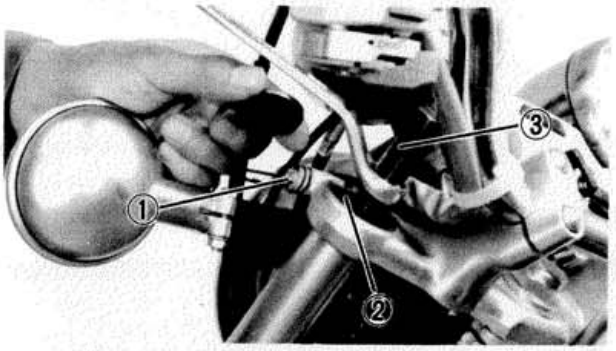
NOTE:

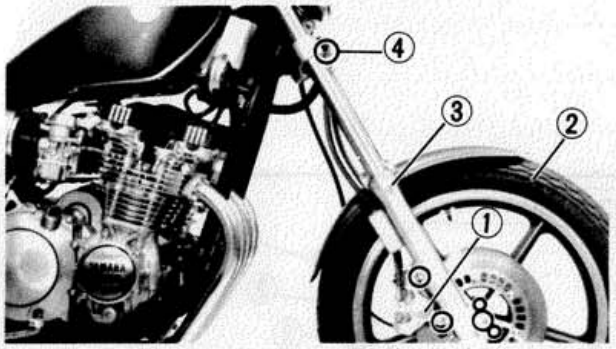
If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in system have disappeared.

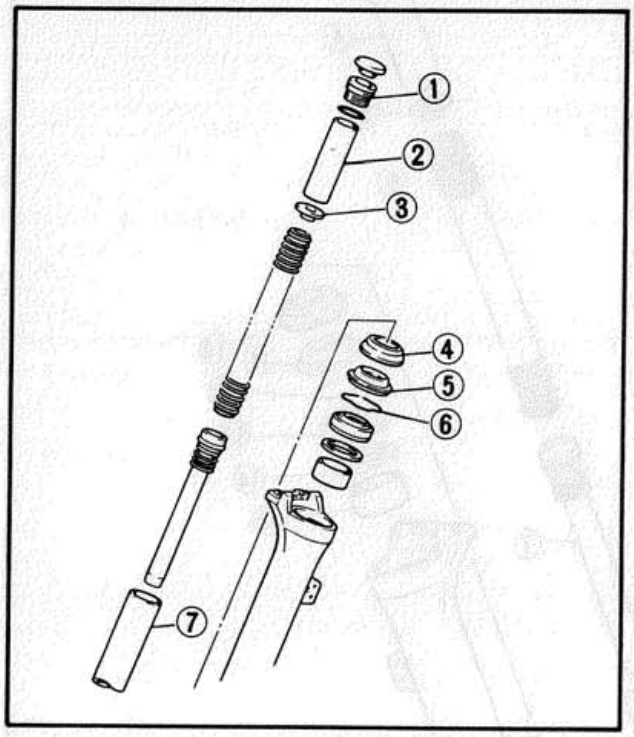
FRONT FORK

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









REMOVAL AND DISASSEMBLY

WARNING:

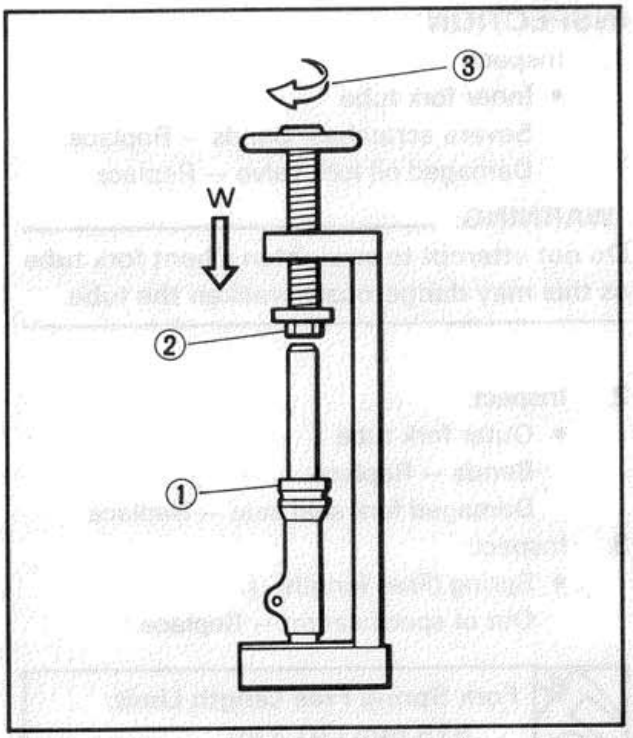
Support the motorcycle securely so there is no damage of it falling over.

1. Loosen:
   - Inner tube pinch bolt ①
   - Cap bolt ②
     Use Front Fork Cap Socket (YM-01104) ③
2. Remove:
   - Brake caliper ①
   - Front wheel ②
   - Fork brace ③
3. Loosen:
   - Lower front fork pinch bolts ④

CAUTION:

Support the fork before loosening the pinch bolts.

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



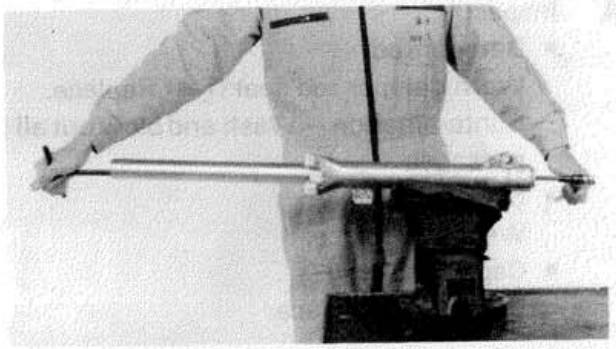
7. Remove:
   - Oil seal
     (from outer tube)
     Press the inner tube to facilitate removal.

CAUTION:

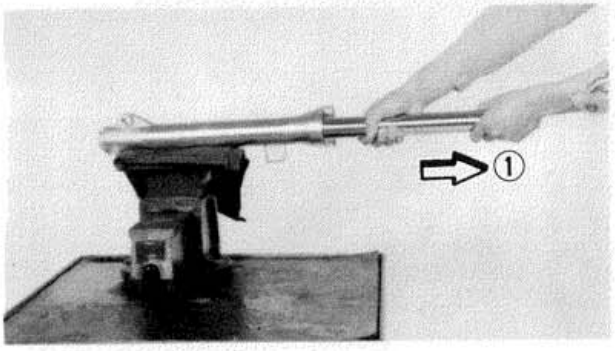
- **If air enters the inner tube or it is compressed abruptly oil may spurt out or the coil seal may be ejected.**
- **Never touch the inner tube during a disassembly operation.**
- **Be sure to wrap the oil seal with a rag for safety.**

① Wrap with rag
② Spacer
③ Turn slowly

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

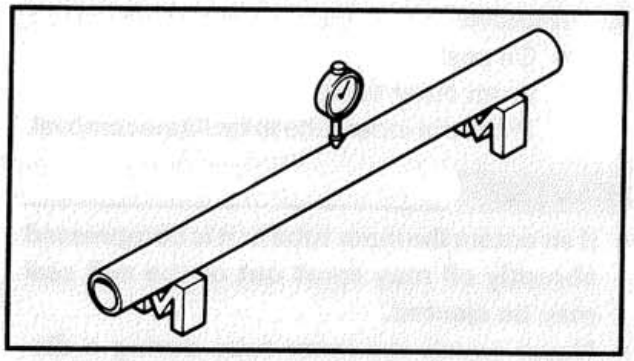


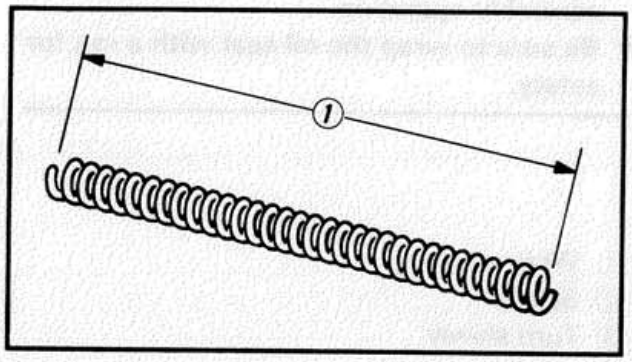
10. Remove:
    - Damper rod securing bolt
      Use T-handle(YM-01326) and Damper Rod Holder (YM-01365) to remove the damper rod.



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

① Pull inner tube from outer tube.





INSPECTION

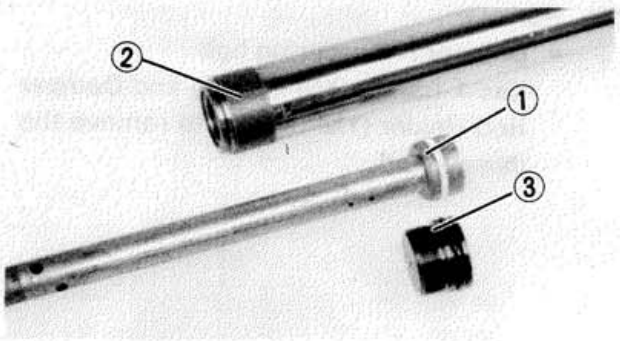
1. Inspect:
   - Inner fork tube
     Severe scratches/Bends → Replace.
     Damaged oil lock valve → Replace.

WARNING:

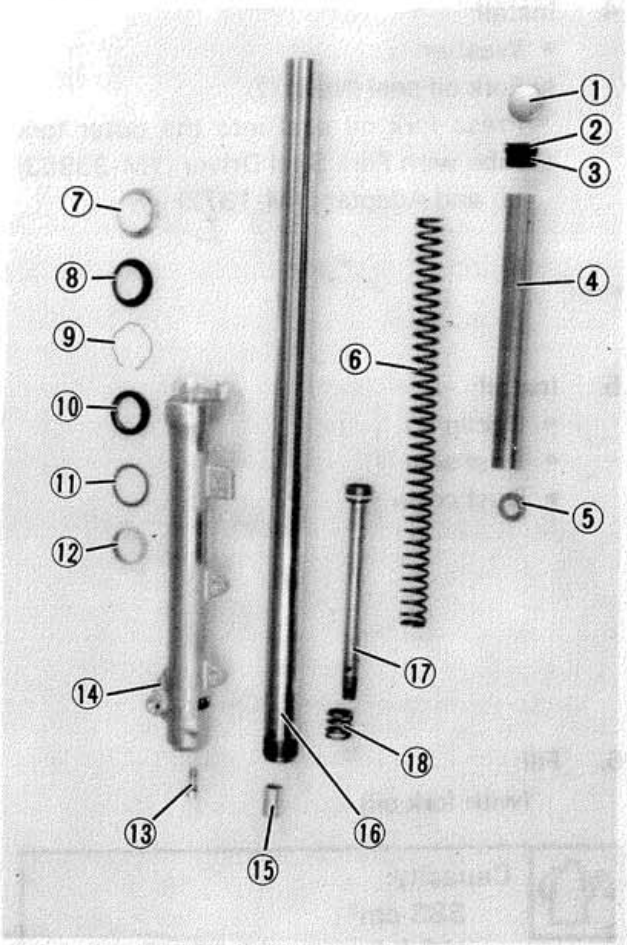
Do not attempt to straighten a bent fork tube as this may dangerously weaken the tube.

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

Fork Spring Free Length Limit:
515 mm (20.3 in)



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



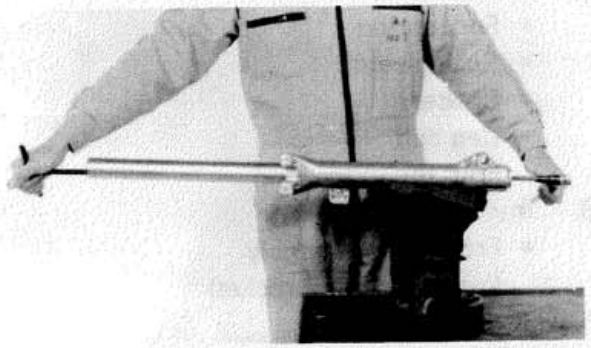
ASSEMBLY

NOTE:

Be sure all components are clean before assembly.

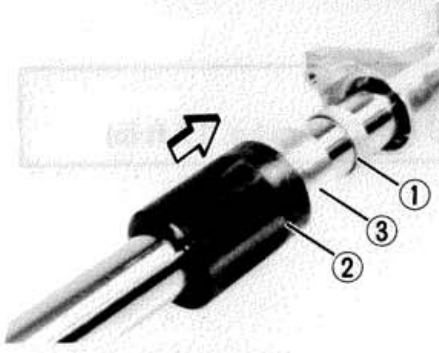
① Cap
② O-ring
③ Cap bolt
④ Spacer
⑤ Spring seat
⑥ Fork spring
⑦ Dust seal cover
⑧ Dust seal
⑨ Circlip
⑩ Fork oil seal
⑪ Washer
⑫ Guide bushing
⑬ Damper rod securing bolt
⑭ Outer fork tube
⑮ Taper spindle
⑯ Inner fork tube
⑰ Damper rod
⑱ Damper rod spring

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

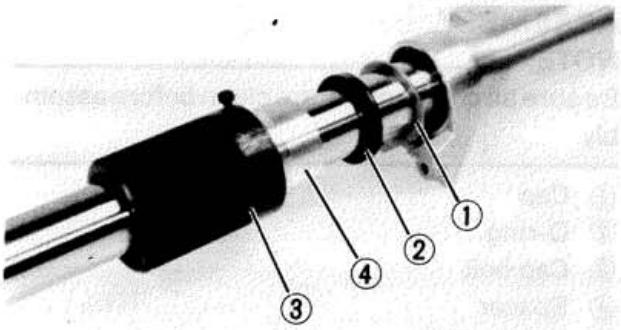


2. Install:
   - Damper rod securing bolt
     Hold damper rod with Damper Rod Holder (YM-01365) and T-handle(YM-01326)

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

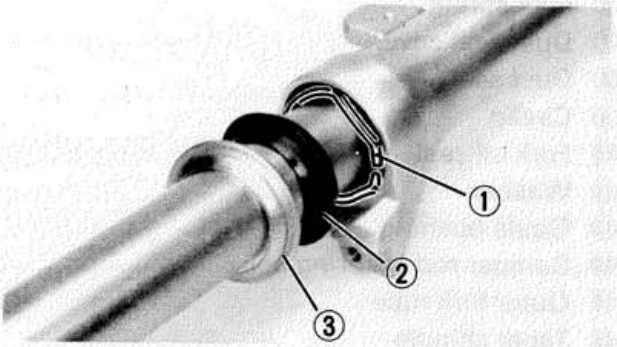


3. Install:
   - Guide bushing ①
     Press guide bushing into the outer fork tube with Fork Seal Driver (YM-33963) ② and Adapter (YM-1372) ③.



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

   Press fork oil seal into the outer fork tube with Fork Seal Driver (YM-33963) ③ and Adapter (YM-1372) ④.



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

6. Fill:
   (with fork oil)

Capacity:
383 cm³
(13.5 Imp oz, 12.95 US oz)
Type:
YAMAHA Fork & Shock Oil
10WT or equivalent fork oil

7. Install:
   - Fork spring
   - Spring seat
   - Spacer
   - Cap bolt

   (into the inner fork)
8. Install:
   - Front fork assembly

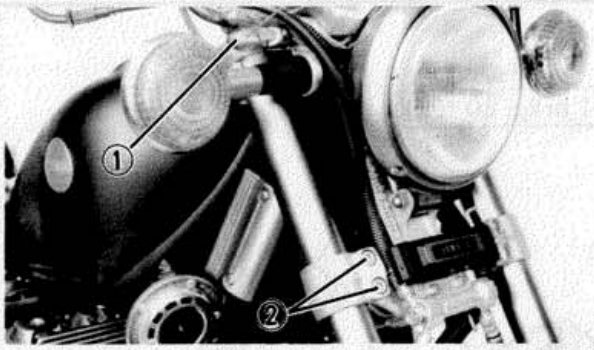
   (into the underbracket)
9. Tighten:
   - Front fork pinch bolts (Lower).
   - Cap bolt

Cap Bolt:
23 Nm (2.3 m·kg, 17 ft·lb)

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

NOTE:
Be sure the inner fork tube end is flush with the top of the steering crown.

12. Tighten:
    - Front fork pinch bolt (Upper) ①
    - Front fork pinch bolts (Lower) ②



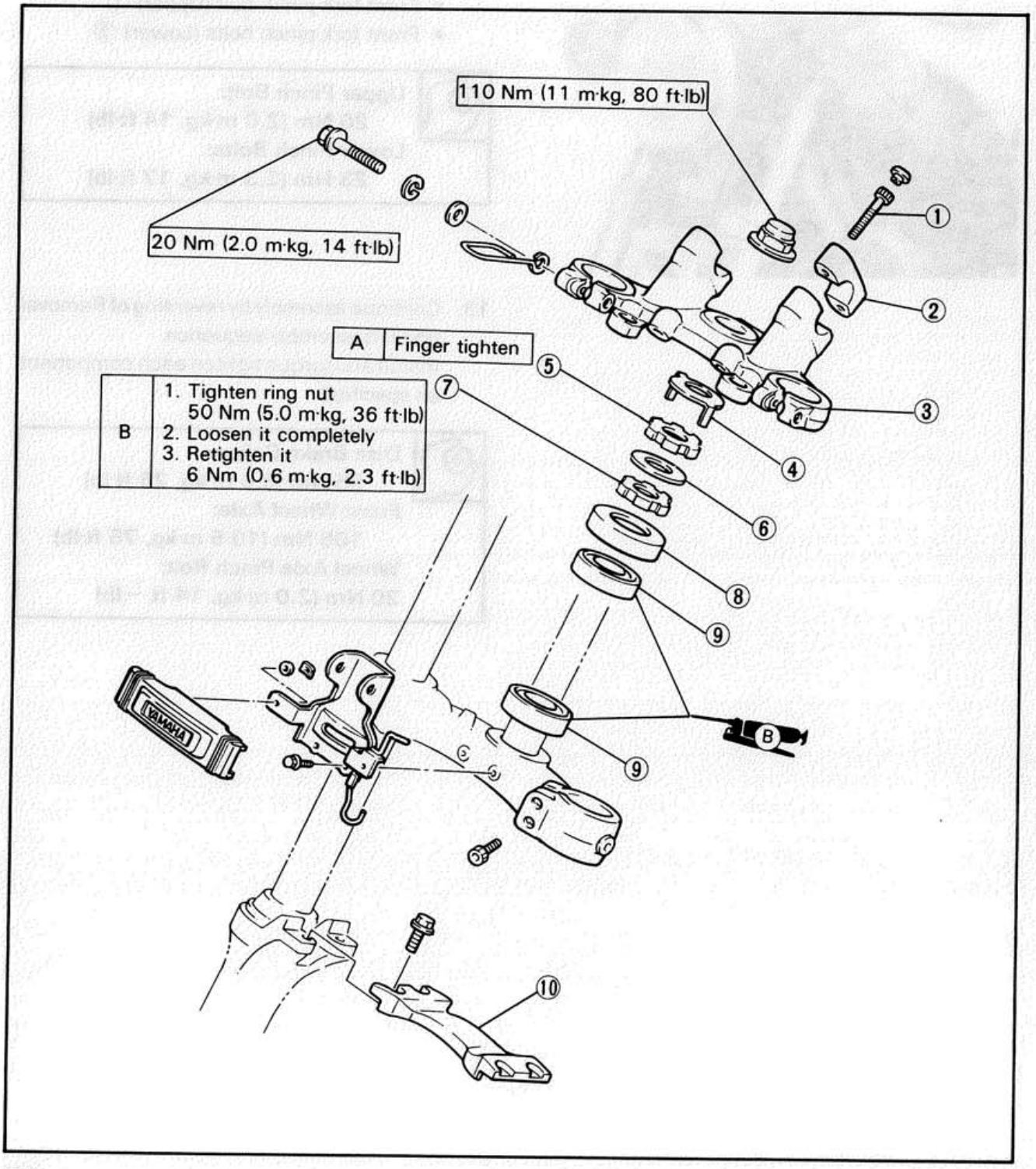
Upper Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)
Lower Pinch Bolts:
23 Nm (2.3 m·kg, 17 ft·lb)

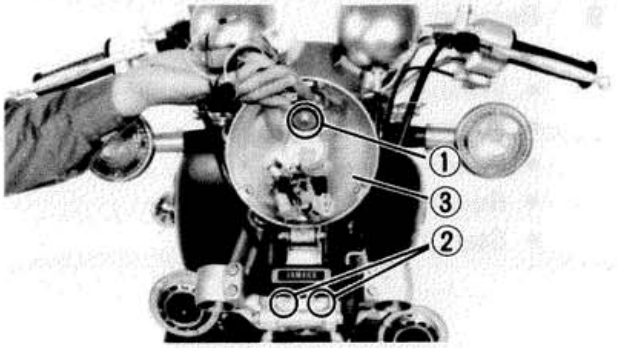
13. Continue assembly by reversing of Removal and Disassembly sequence.
    Install and torque tighten each component as specified.

Disc Brake Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)
Front Wheel Axle:
105 Nm (10.5 m·kg, 75 ft·lb)
Wheel Axle Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft ~ lb)

STEERING HEAD

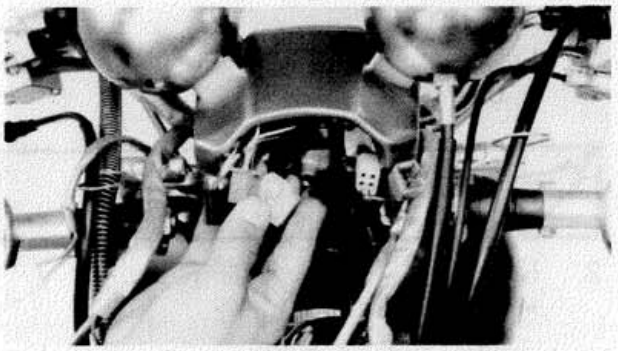
① Handlebar bolt
② Handlebar upper bracket
③ Steering crown
④ Special washer
⑤ Upper ring nut
⑥ Washer
⑦ Lower ring
⑧ Bearing cover
⑨ Bearing
⑩ Fork brace



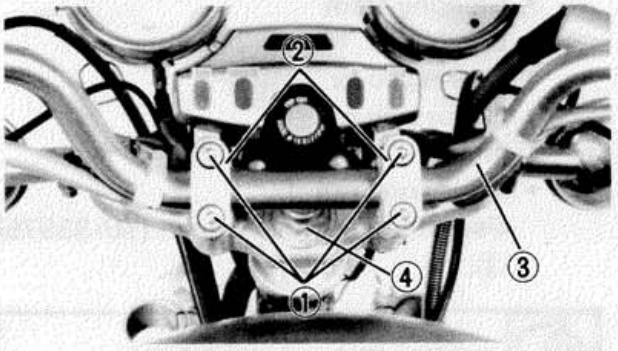


REMOVAL

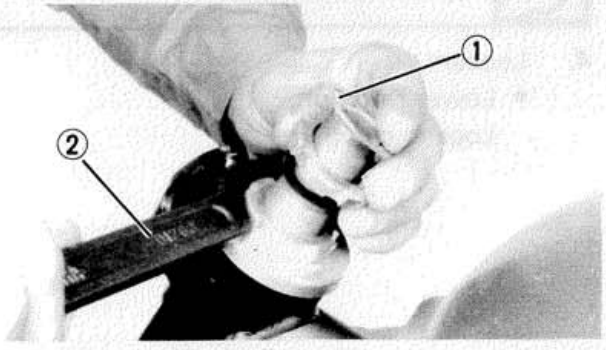
1. Remove:
   - Front wheel
   - Front forks
2. Remove:
   - Headlight lens unit
3. Disconnect:
   - Wire connectors (in the headlight shell)
4. Remove:
   - Headlight shell securing bolt ①
   - Brake hose joint securing bolts ②
   - Headlight shell ③



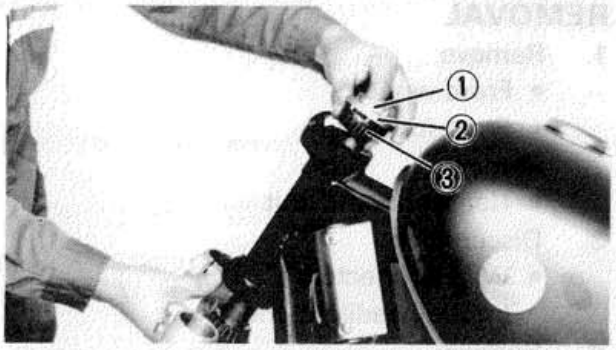
5. Disconnect:
   - Meter panel wiring connectors



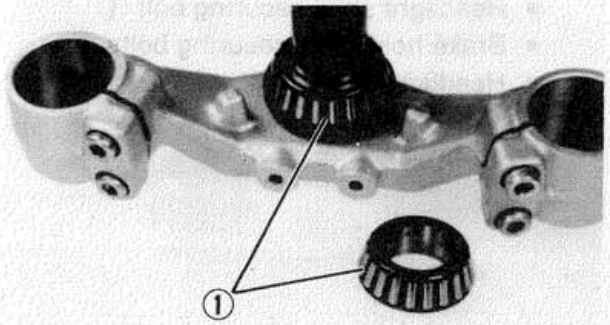
6. Remove:
   - Covers
   - Handlebar bolts ①
   - Handlebar upper brackets ②
   - Handlebar assembly ③
   - Steering stem nut ④
   - Steering crown and meter panel assembly.



7. Remove:
   - Special washer ①
8. Loosen:
   - Upper and lower ring nut
     Use Steering Ring Nut Wrench (YU-01268) ②.

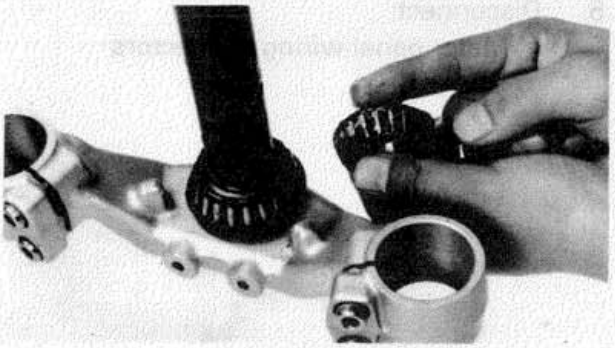


9. Remove:
   - Upper ring nut
   - Washer
   - Lower ring nut ①
   - Bearing cover ②
   - Bearing ③
   - Steering stem



INSPECTION

1. Check:
   - Bearings ①
     Pitting/Damage → Replace races and bearing.

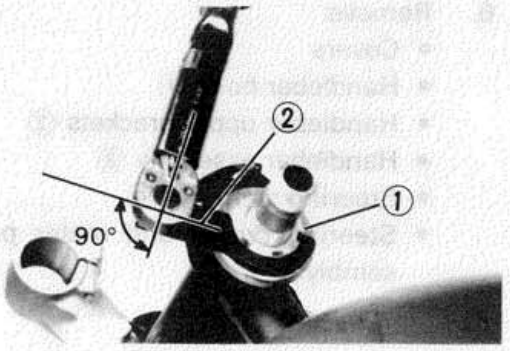


ASSEMBLY

1. Lubricate:
   - Bearings

Wheel Bearing Grease

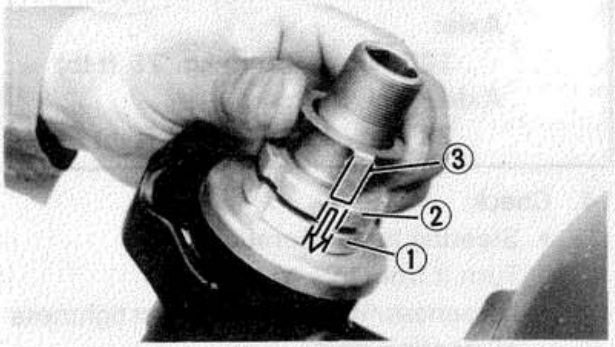
2. Install:
   - Bearing
     (onto steering stem)
   - Steering stem
   - Bearing
   - Bearing cover
   - Lower ring nut ①

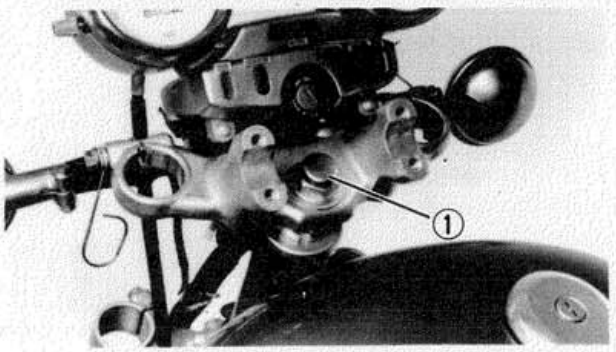


3. Tighten:
   - Lower ring nut ①
     Use Steering Nut Wrench (YU-33975) ②.

50 Nm (5.0 m·kg, 36 ft·lb)

4. Loosen:
   - Lower ring nut
     Loosen completely.





5. Retighten:
   - Ring nut

6 Nm (0.6 m·kg, 4.3 ft·lb)

6. Install:
   - Washer ①
   - Upper ring nut ②
7. Tighten:
   - Upper ring nut ②
     (with finger)
8. Install:
   - Special washer ③

9. Install:
   - Steering crown and meter panel assembly.
   - Steering stem nut ①
10. Check:
    - Steering head operation
      Turn it from lock to lock
      Looseness/Binding → Readjust.

11. Position:
    - Front fork
      (into steering crown)
      This will facilitate alignment of under-bracket holes with steering crown holes.
12. Tighten:
    - Steering stem nut

110 Nm (11 m·kg, 80 ft·lb)

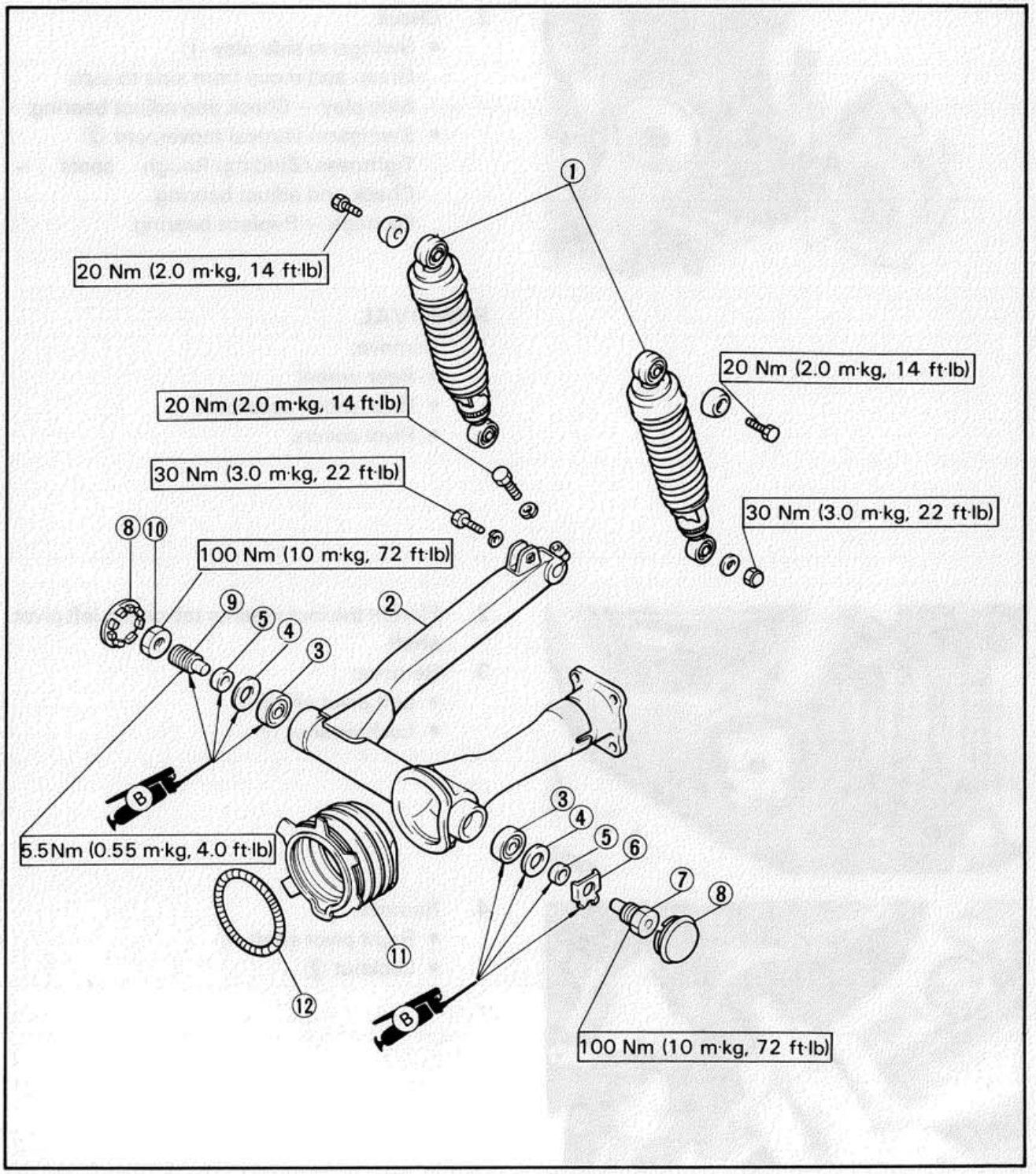
13. Continue assembly by reversing removal sequence.

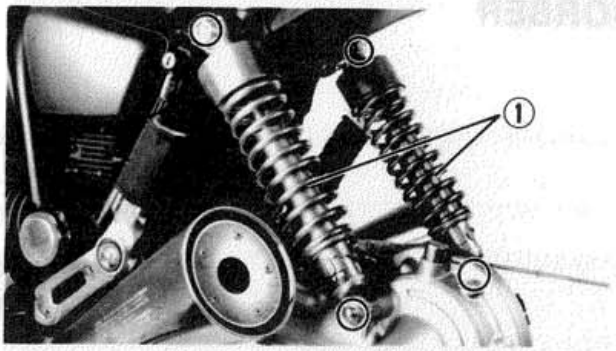
Fork Pinch Bolt (Upper):
20 Nm (2.0 m·kg, 14 ft·lb)
Fork Pinch Bolt (Lower):
23 Nm (2.3 m·kg, 17 ft·lb)
Brake Hose Joint:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Fork Brace:
9 Nm (0.9 m·kg, 6.5 ft·lb)
Caliper:
35 Nm (3.5 m·kg, 25 ft·lb)
Axle:
105 Nm (10.5 m·kg, 75 ft·lb)
Axle Pinch Bolt:
20 Nm (2.0 m·kg, 14 ft·lb)

14. Check:
    - Steering head operation
      Turn it from lock to lock.
      Looseness/Binding → Readjust tightness of steering stem.

SWINGARM AND REAR SHOCK ABSORBER

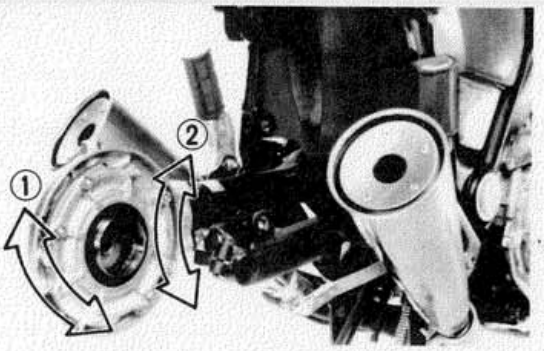
① Rear shock absorber
② Swingarm
③ Bearing
④ Oil seal
⑤ Collar
⑥ Lock washer
⑦ Left pivot shaft
⑧ Pivot cover
⑨ Right pivot shaft
⑩ Nut
⑪ Rubber boot
⑫ Spring band





SWINGARM FREE PLAY INSPECTION

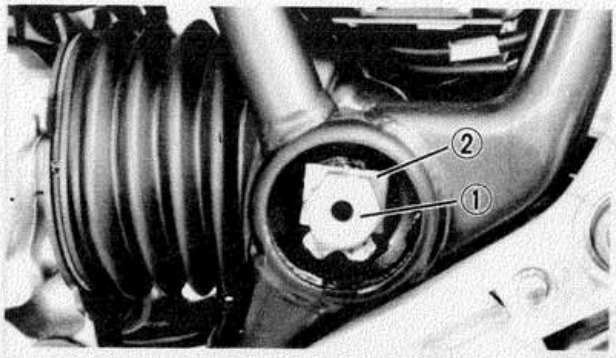
1. Remove:
   - Rear wheel
   - Rear shock absorbers ①



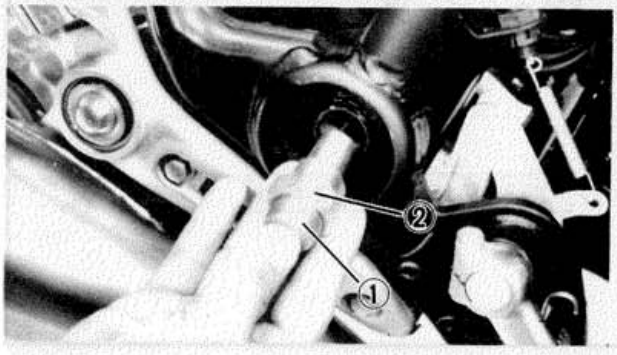
2. Check:
   - Swingarm side play ①
     Grasp and move from side to side.
     Side play → Check and adjust bearing.
   - Swingarm vertical movement ②
     Tightness/Binding/Rough spots → Check and adjust bearing.
     Damage → Replace bearing.

REMOVAL

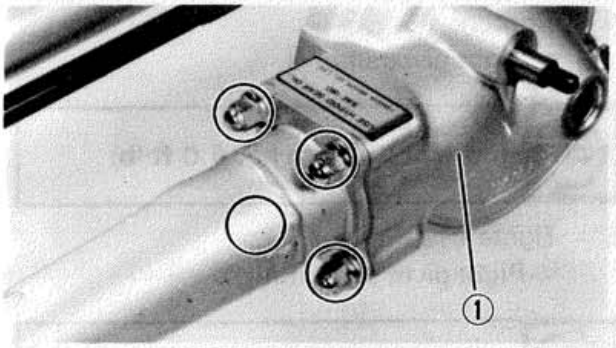
1. Remove:
   - Rear wheel
   - Rear shock absorbers
   - Pivot covers



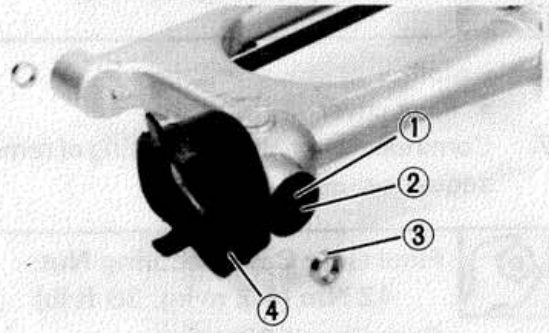
2. Flatten the lock washer tab on the left pivot shaft.
3. Remove:
   - Left pivot shaft ①
   - Lock washer ②



4. Remove:
   - Right pivot shaft ①
   - Locknut ②



5. Remove:
   - Swingarm assembly
   - Final gear case assembly ①

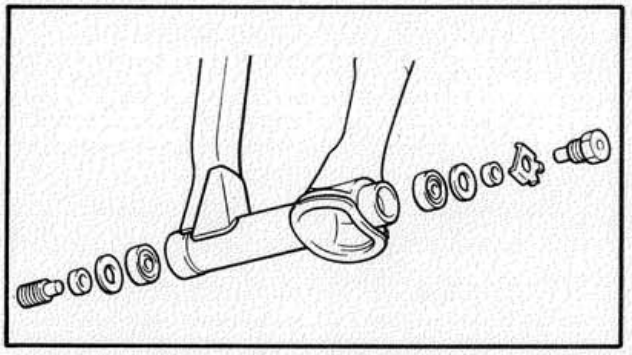


INSPECTION AND LUBRICATION

1. Inspect:
   - Bearings ①
   - Oil seals ②
   - Collars ③
   - Rubber boot ④

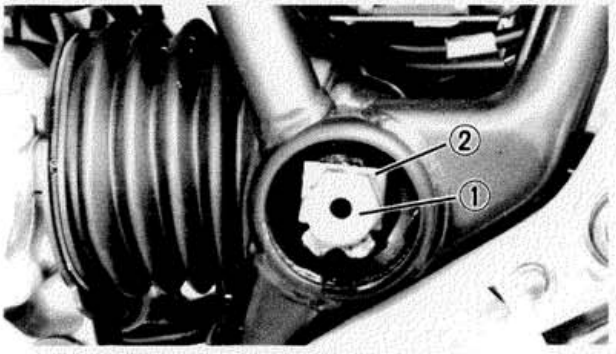
   Damage → Replace.
2. Lubricate:
   - Bearings and oil seal

Waterproof Wheel Bearing Grease



ASSEMBLY

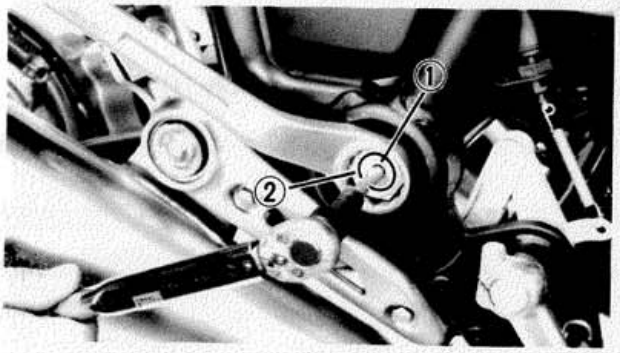
1. Install:
   - Swingarm assembly
   - Lock washer
   - Left pivot shaft
   - Right pivot shaft



2. Tighten:
   - Left pivot shaft ①

100 Nm (10 m·kg, 72 ft·lb)

3. Bend lock washer tab ②.



4. Tighten:
   - Right pivot shaft ①

5.5 Nm (0.55 m·kg, 4.0 ft·lb)

5. Tighten:
   - Right pivot shaft nut ②

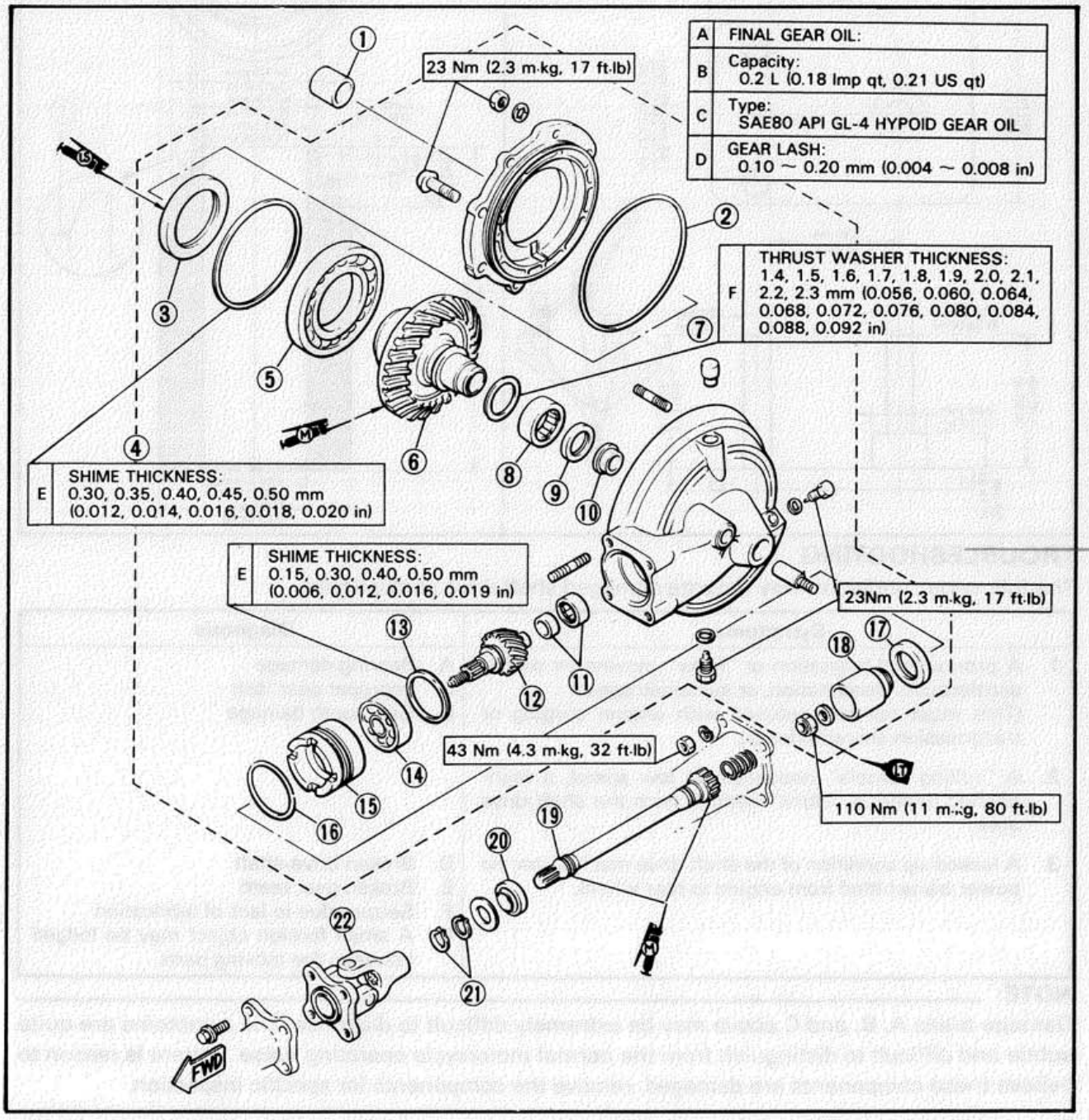
100 Nm (10 m·kg, 72 ft·lb)

6. Install:
   - Pivot cover
7. Continue assembly by reversing of removal sequence.

Final Gear Case Securing Nut:
42 Nm (4.2 m·kg, 30 ft·lb)
Rear Shock Absorber:
Upper: 20Nm(2.0m·kg, 14ft·lb)
Lower: 30Nm(3.0m·kg, 22ft·lb)

SHAFT DRIVE

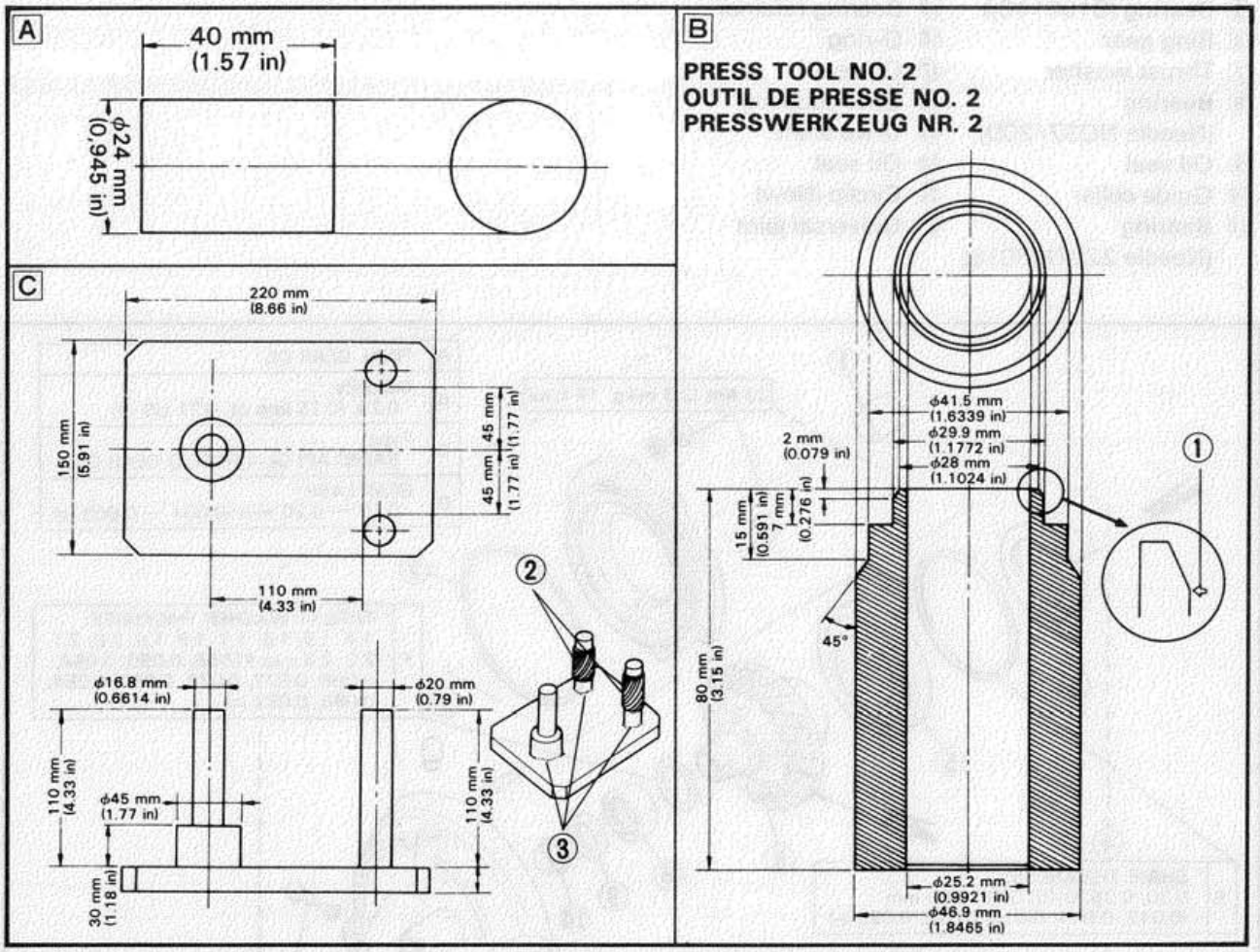
① Colloar
② O-ring
③ Oil seal
④ Shim(s)
⑤ Bearing ($B16014C_2$)
⑥ Ring gear
⑦ Thrust washer
⑧ Bearing (Needle NQ37/20D)
⑨ Oil seal
⑩ Guide collar
⑪ Bearing (Needle 22BTM3018)
⑫ Final drive shaft
⑬ Shim(s)
⑭ Bearing (B6305RBI special)
⑮ Bearing retainer
⑯ O-ring
⑰ Oil seal
⑱ Gear coupling
⑲ Drive shaft
⑳ Oil seal
㉑ Circlip (New)
㉒ Universal joint



Refer to "Chapter 3." for middle gear service. The following special tools are not available but can be constructed for final gear disassembly and assembly:

A PRESS TOOL No. 1
B PRESS TOOL NO. 2
C GEAR CASE HOLDING TOOL

① Should be free of burns.
② Tape vinyl tubes to prevent housing damage.
③ Welded or screw secured.



TROUBLESHOOTING

The following conditions may indicate damaged shaft drive components:

Symptoms	Diagnosis
1. A pronounced hesitation or "jerky" movement during acceleration, deceleration, or sustained speed. (This must not be confused with engine surging or transmission characteristics).	A. Bearing damage B. Improper gear lash C. Gear tooth damage
2. A "rolling rumble" noticeable at low speed; a high-pitched whine; a "clunk" coming from the shaft drive area.	
3. A locked-up condition of the shaft drive machanism; no power transmitted from engine to rear wheel.	D. Broken drive-shaft E. Broken gear teeth F. Seizure due to lack of lubrication G. A small foreign object may be lodged between the moving parts.

NOTE:

Damage areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from the normal motorcycle operating noise. If there is reason to believe these components are damaged, remove the components for specific inspection.

Inspection Notes

1. Investigate any unusual noises.

The following "noises" may indicate a mechanical defect:

1. A "rolling rumble" noise during coasting, acceleration, or deceleration. The noise increases with rear wheel speed, but it does not increase with higher engine or transmission speeds.
   Diagnosis: Possible wheel bearing damage.
2. A "whining" noise that varies with acceleration.
   Diagnosis: Possible incorrect reassembly, too-little gear lash.

CAUTION:

Too-little gear lash is extremely destructive to the gear teeth. If a test ride following reassembly indicates this condition stop riding immediately to minimize gear damage.

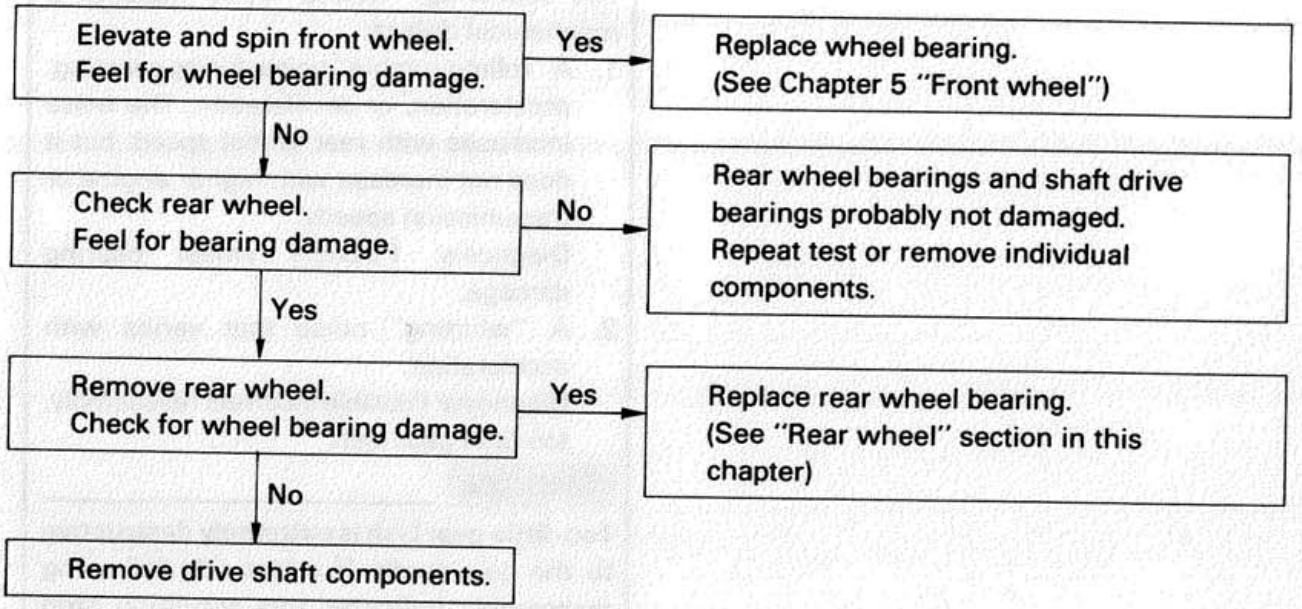
3. A slight "thunk" evident at low speed operation. This noises must be distinguished from normal motorcycle operation.
   Diagnosis: Possible broken gear teeth.

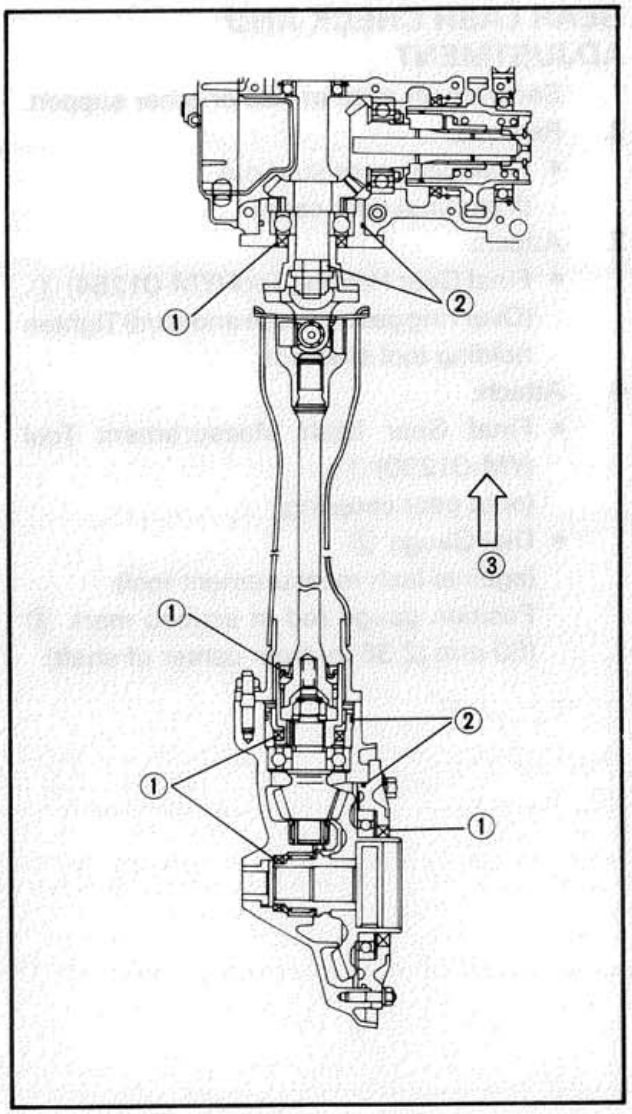
WARNING:

Stop riding immediately if broken gear teeth are suspected. This condition could result in a locking-up of the shaft drive assembly, causing loss of control of the bike and possible injury to the rider.

Troubleshooting chart

Where basic conditons "1" and "2" above exist, refer to the following chart:





2. Inspect:
   - Shaft drive (leakage)

Oil leak inspection steps:
- Clean the entire motorcycle thoroughly, then dry it.
- Apply a leak-localizing compound or dry power spray to the shaft drive.
- Road test the motorcycle for the distance necessary to locate the leak.

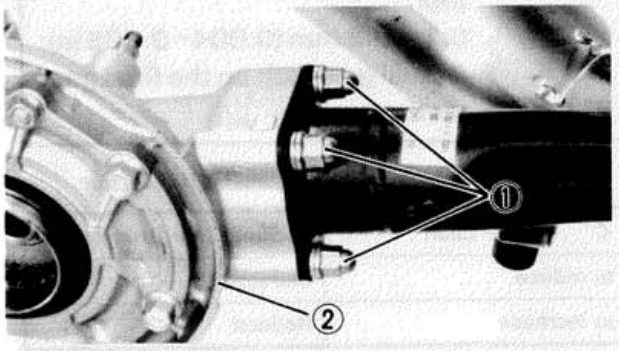
Leakage → Inspect component housing, gasket, and/or seal for damage.
Damage → Replace component.

NOTE:
- An apparent oil leak on a new or nearly new motorcycle may be the result of a rust-preventive coating or excessive seal lubrication.
- Always clean the motorcycle and recheck the suspected location of an apparent leakage.

① Oil seal
② O-ring
③ Forward

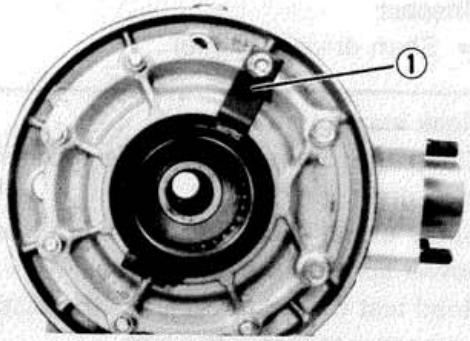
3. Inspect:
   - Drained oil
     Metal particles on drain plug or in oil → Check for bearing seizure or other problem in middle or final gear assemblies.

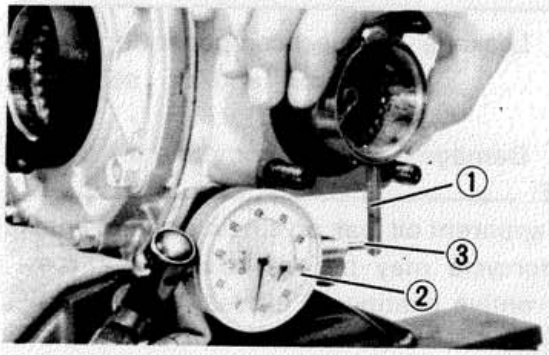
NOTE:
Small amount of metal particles in oil is normal.



FINAL GEAR REMOVAL

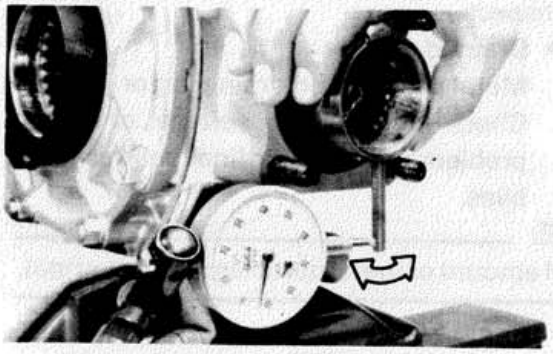
1. Remove:
   - Rear axle
   - Rear wheel
   - Left shock absorber
   - Nuts ①
   - Final gear assembly ②

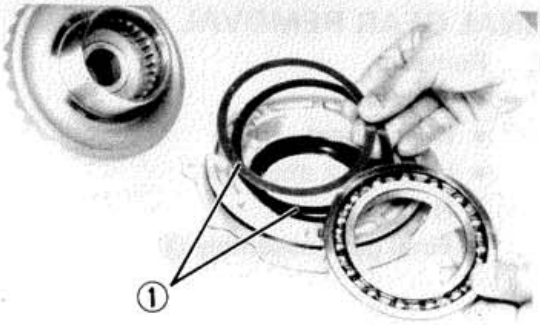




GEAR LASH CHECK AND ADJUSTMENT

1. Secure gear case in vise or other support.
2. Remove:
   - Final gear case stud nut (from final gear case)
3. Attach:
   - Final Gear Holding Tool (YM-01254) ①. (Over ring gear surface and stud) Tighten holding tool stud nut.
4. Attach:
   - Final Gear Lash Measurement Tool (YM-01230) ① (onto gear coupling)
   - Dial Gauge ② (against lash measurement tool) Position gauge rod at scribed mark ③ (60 mm (2.36 in) from center of shaft).





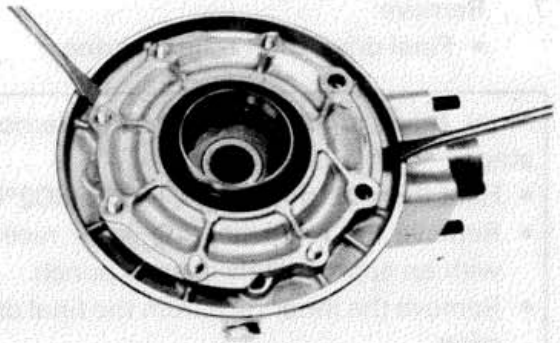
5. Rotate:
   - Gear coupling
     Turn gently back and forth.
     Note lash measurement on the dial gauge.

Final Gear Lash:
0.25 ~ 0.50 mm (0.010 ~ 0.020 in):
When using the measurement tool.
0.1 ~ 0.2 mm (0.004~0.008 in):
Actual gear lash on the final gear teeth.

Out of specification → Adjust.

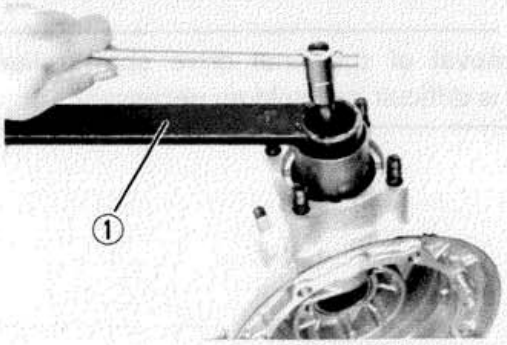
Gear Lash	Ring Gear Shim ①
to reduce	Increase
to increase	Reduce

NOTE:
If it is necessary to increase ring gear shim by more than 0.1 mm, reduce thrust washer thickness by 0.1 mm for each 0.1 mm of ring gear shim increase. If it is necessary to reduce shim by more than 0.1 mm, reverse above step.

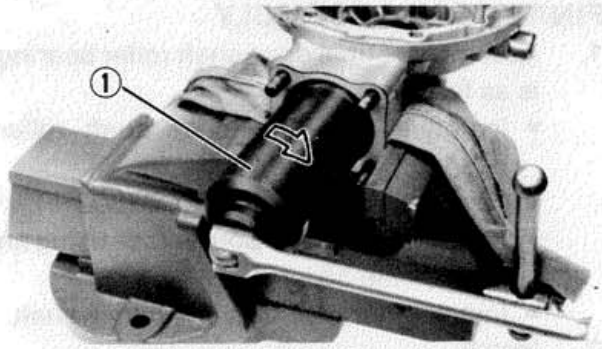


FINAL GEAR DISASSEMBLY

1. Remove:
   - Nuts and bolts (from Bearing housing)
   - Ring gear assembly (from Final gear case)
   - Thrust washer (from Final gear case)

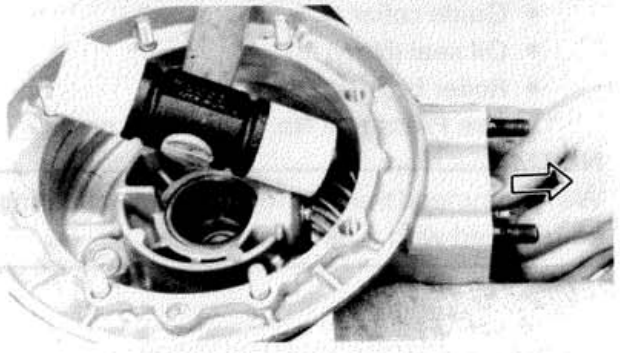


2. Remove:
   - Self-locking nut (from Final drive shaft)
     Use Middle and Final Gear Holding Tool (YM-01229), ①.
   - Coupling



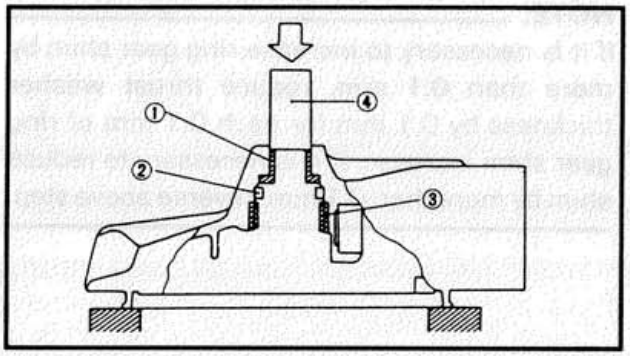
3. Remove:
   - Final drive shaft bearing retainer
     Using Final Drive Shaft Bearing Retainer Wrench (YM-33214) ①.

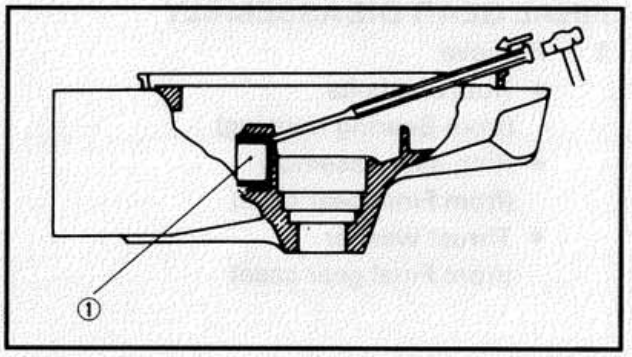
CAUTION:
Final-drive-shaft-bearing-retainer nut has left-hand threads. Turn retainer nut clockwise to loosen it.



4. Remove:
   - Final drive shaft

CAUTION:
Final drive shaft removal should be performed only if gearing replacement is necessary. Do not reuse bearings or races after removal.

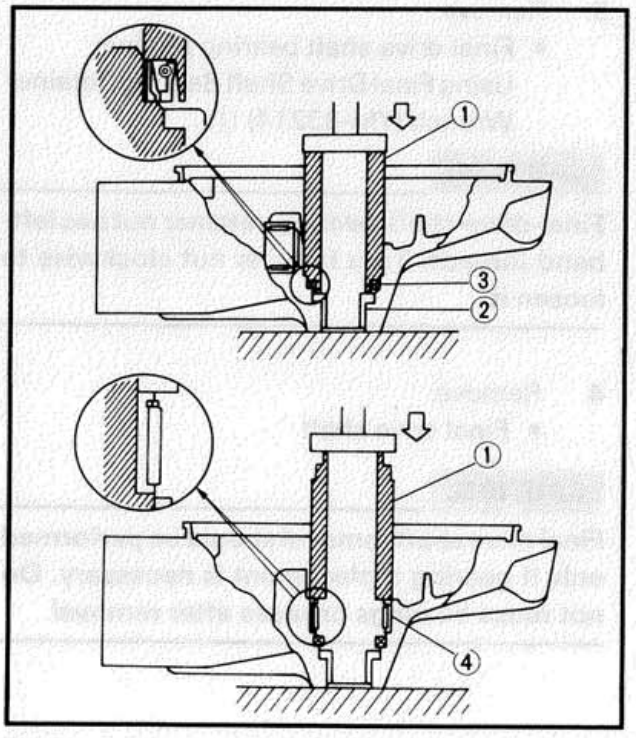




5. Remove:
   - Guide collar ①
   - Oil seal ②
     Do not reuse the oil seal.
   - Roller bearing ③
     Use Press tool No. 1 ④ and an appropriate support for the main housing.
6. Inspect:
   - Roller bearing
     Damage → Replace.
7. Remove:
   - Final drive shaft roller bearing

Final drive shaft roller bearing removal steps:
- Heat the bare housing to 150°C (302°F).
- Remove the roller bearing outer race ① with an appropriately shaped punch.
- Remove the inner race from the final drive shaft.

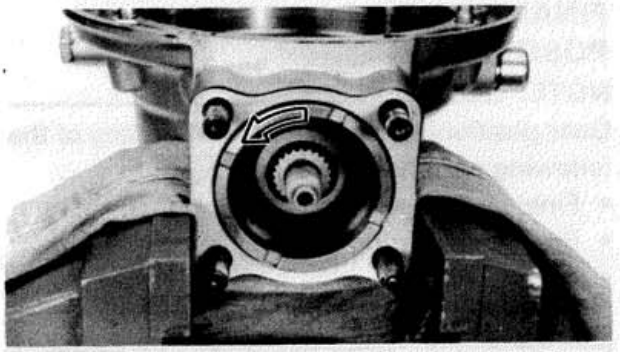
NOTE:
The removal of the final drive shaft roller bearing is difficult and seldom necessary.



FINAL GEAR ASSEMBLY

1. Assembly of final drive shaft roller bearing is as follows:
   - Install a new final drive shaft roller bearing.
   - Heat bare housing to 150°C (302°F)
   - Install roller bearing outer race using an appropriate adapter.
   - Install inner race onto final drive shaft.
2. Install:
   - Guide collar ②
   - Oil seal (New) ③
   - Roller bearing ④
     Use Press tool No. 2 ① and a press.

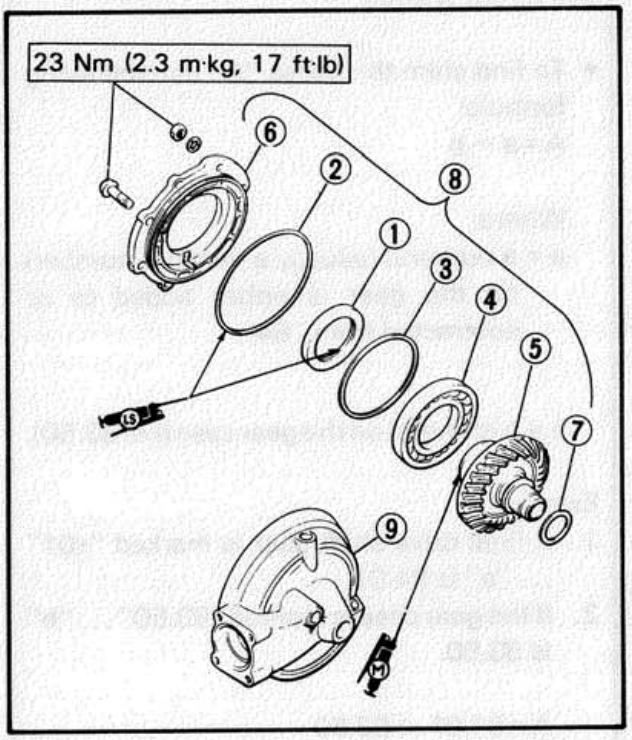
NOTE:
We recommend that any removed roller bearing be replaced with a new one.



3. Install:
   - Shims (Proper size as calculated)
   - Final drive shaft gear
   - Bearing retainer nut
   - Coupling

NOTE:
The bearing retainer nut has left-hand threads; turn nut counterclockwise to tighten it.

Bearing Retainer Nut:
110 Nm (11 m·kg, 80 ft·lb)
Coupling:
110 Nm (11 m·kg, 80 ft·lb)



4. Install:
   - Oil seal ①
   - O-ring ②
   - Shims (Proper size as calculated) ③
   - Bearing ④
   - Ring gear ⑤
     (into bearing housing ⑥)
   - Thrust washer ⑦
     (onto ring gear ⑤)
   - Ring gear assembly (Proper size as measured) ⑧
     (into final gear case ⑨)
5. Tighten:
   - Bearing housing ⑥

Bearing Housing:
23 Nm (2.3 m·kg, 17 ft·lb)

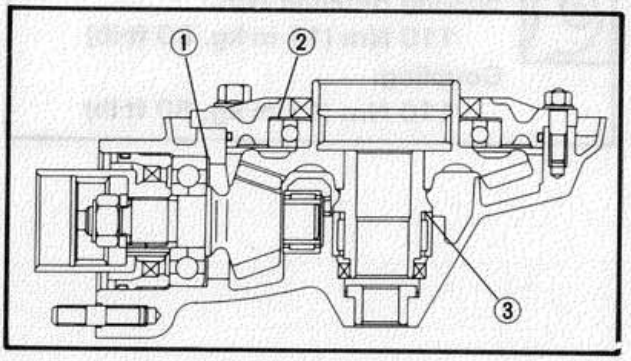
6. Adjust:
   - Gear lash
     Rear to "GEAR LASH CHECK AND ADJUSTMENT"

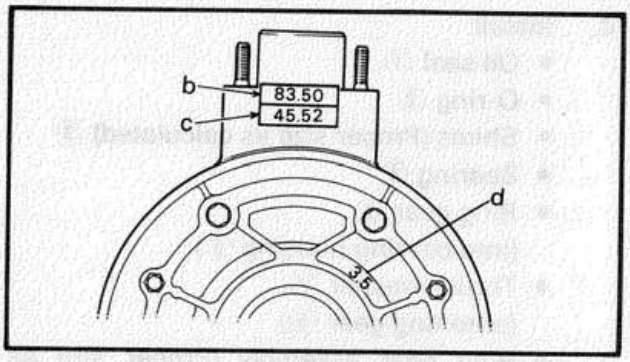
FINAL DRIVE/RING GEAR POSITIONING

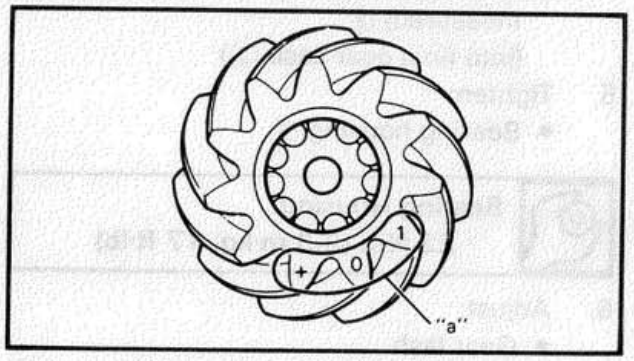
NOTE:

Gear positioning is necessary when any of the following parts are replaced.

- Final gear case
- Ring gear bearing housing
- Bearing (s)







Final drive/ring gear shim selection formulas:

- Position final drive shaft gear and ring gear by using shims ① and ② with their respective thickness calculated from information marked on final gear case and drive gear end.

① Shim thickness "A"
② Shim thickness "B"
③ Thrust washer

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

$A = a - b$

Where:

a = a numeral (usually a decimal number) on the gear is either added to or subtracted from "84".

b = a numeral on the gear case (i.e. 83.50).

Example:

1. If final drive shaft gear is marked "+01" ... "a" is 84.01.
2. If the gear case is marked "83.50" ... "b" is 83.50.

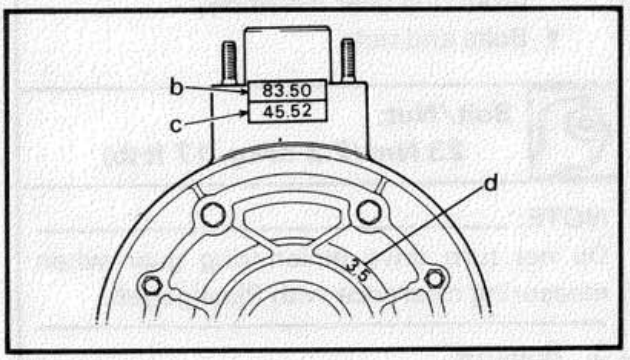
$A = 84.01 - 83.50$
$A = 0.51$

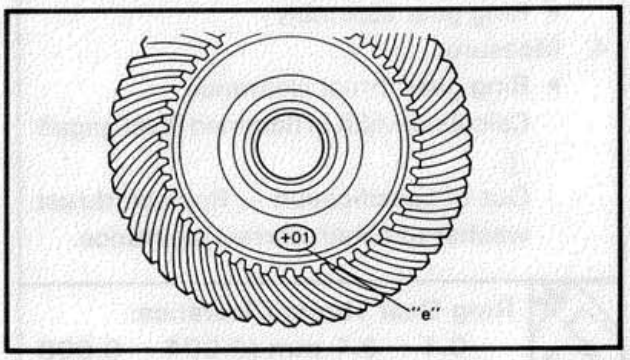
3. Therefore, shim thickness is 0.51 mm. Shim sizes are supplied in following thickness:
   0.15 mm, 0.30 mm, 0.40 mm, 0.50 mm, 0.60 mm

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

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

In the example above, the calculated shim thickness is 0.51 mm. The chart instructs you, however, to round off the 1 to 0. Thus you should use a 0.50 mm shim.





- To find shim thickness "B", use following formula:
  $B = c + d - (e + f)$

  Where:
  - c = numeral on gear case (i.e. 45.52)
  - d = numeral (usually a decimal number) on outside of ring gear bearing housing and added to 3.
  - e = numeral (usually a decimal number) on inside of ring gear either added to or subtracted from 35.40.
  - f = bearing thickness (considered constant).

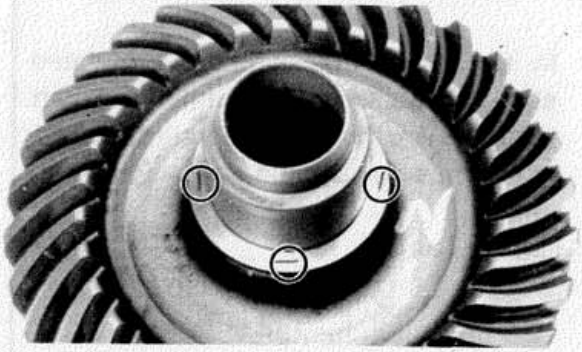
Bearing Thickness "f" = 13.00 mm

Example:

1. If gear case is marked "45.52" ... "c" is 45.52.
2. If ring gear bearing housing is marked "35" ... "d" is 0.35 + 3 = 3.35.
3. If ring gear is marked "+01" ... "e" is 35.40 + 0.01 = 35.41.

4. Therefore, "f" is 13.00.
   B = c + d − (e + f)
   B = 45.52 + 3.35 − (35.41 + 13.00)
   B = 48.87 − (48.41)
   B = 0.46
5. Therefore shim thickness is 0.46 mm.

NOTE:
Use chart for final-drive-shaft shim to select ring gear shim size.

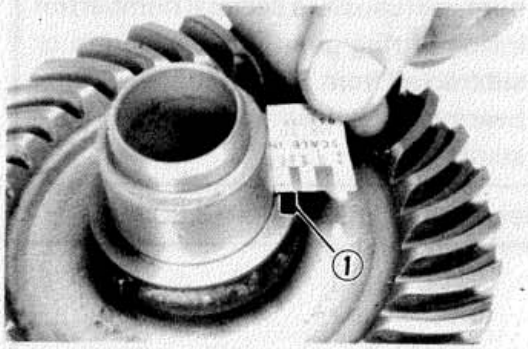


Thrust washer selection formulas:
1. Place four pieces of Plastigage® between originally fitted thrust washer and ring gear.
2. Install:
   - Gear case
     (from ring gear assembly)
   - Bolts and nuts

Bolt/Nut:
23 Nm (2.3 m·kg, 17 ft·lb)

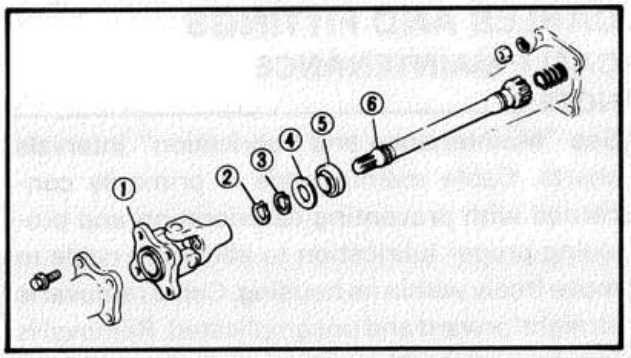
NOTE:
Do not turn drive pinion/ring gear when measuring clearance with Plastigage®.

3. Remove:
   - Ring gear assembly
4. Measure:
   - Ring gear thrust clearance
     Calculate width of flattened Plastigage® ①.
     Out of specification → Replace thrust washer to obtain correct clearance.



Ring Gear Thrust Clearance:
0.1 ~ 0.1 mm (0.004 ~ 0.008 in)

If clearance is below 0 mm, replace thrust washer for thinner one and remeasure.

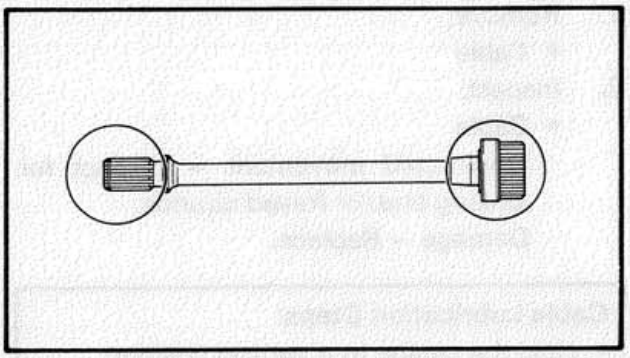


DRIVE SHAFT

① Universal joint
② Circlip
③ Circlip
④ Plate washer
⑤ Oil seal
⑥ Drive shaft

Removal

1. Remove:
   - Rear wheel
     Refer to "REAR WHEEL" in this chapter.
   - Final gear case assembly
     Refer to "SHAFT DRIVE" in this chapter.
   - Drive shaft
     Refer to "SWINGARM" in this chapter.



Inspection

1. Inspect:
   - Drive shaft (Splines)
     Excessive wear or damage → Replace.

NOTE:
When installing drive shaft, lubricate splines with molybdenum disulfide grease.

Installation

When installing drive shaft, reverse removal steps.

NOTE:
- Lubricate shaft splines with molybdenum disulfide grease.
- Torque final gear case nuts and bolts to specification

Bolts/Nuts:
43 Nm (4.3 m·kg, 31 ft·lb)

CABLES AND FITTINGS

CABLE MAINTENANCE

NOTE:

See "Maintenance and Lubrication" intervals charts. Cable maintenance is primarily concerned with preventing deterioration and providing proper lubrication to allow the cable to move freely within its housing. Cable removal is straightforward and uncomplicated. Removal is not discussed within this section.

WARNING:

Cable routing is very important. For details of cable routing, see cable routing diagrams at end of this manual. Improperly routed or adjusted cables may make motorcycle operation unsafe.

1. Remove:
   - Cable
2. Inspect:
   - Cable

   Obstructed movement → Inspect for kinking and/or frayed strands.
   Damage → Replace.

Cable Lubrication Steps:
- Hold the cabine in a vertical position.
- Apply lubricant to the uppermost end of the cable.
- Leave in a vertical position until the lubricant appears at the bottom.
- Allow excess to drain, then reinstall the cable.

NOTE:

Choice of lubricant depends upon conditions and preferences; however, a semi-drying chain and cable lubricant will perform adequately under most conditions.

THROTTLE MAINTENANCE

1. Remove:
   - Phillips head screws
     (from throttle housing assembly)
     Separate the housing halves.
2. Disconnect:
   - Cable
     (from throttle grip assembly)
3. Remove:
   - Throttle grip assembly
4. Clean:
   - All parts
     Use mild solvent.
   - Right-hand end of handlebar
5. Inspect:
   - Contact surfaces
     Burrs/Damage → Deburr or replace.
   - Right-hand end of handlebar
6. Lubricate all contact surfaces with a light coat of lithium-soap base grease and re-assembly.

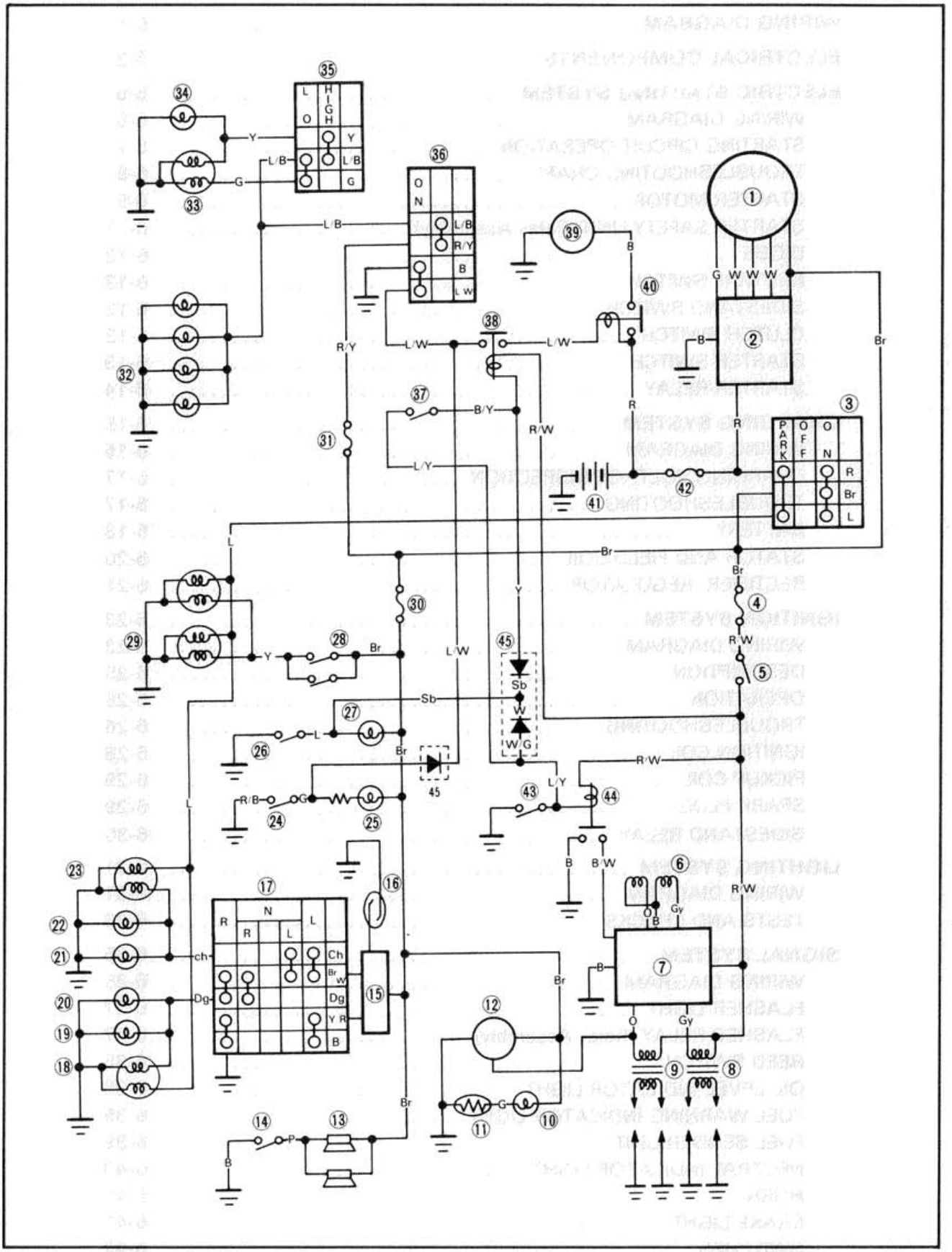
NOTE:

Tighten the housing screws evenly to maintain an even gap between housing halves.

7. Check:
   - Throttle (For smooth operation)
     Un smooth operation → Lubricate
   - Spring (For quick return)
     Sluggish operation → Replace
   - Housing (For tightness)
     Looseness → Replace

ELECTRICAL

XJ700 N/NC WIRING DIAGRAM



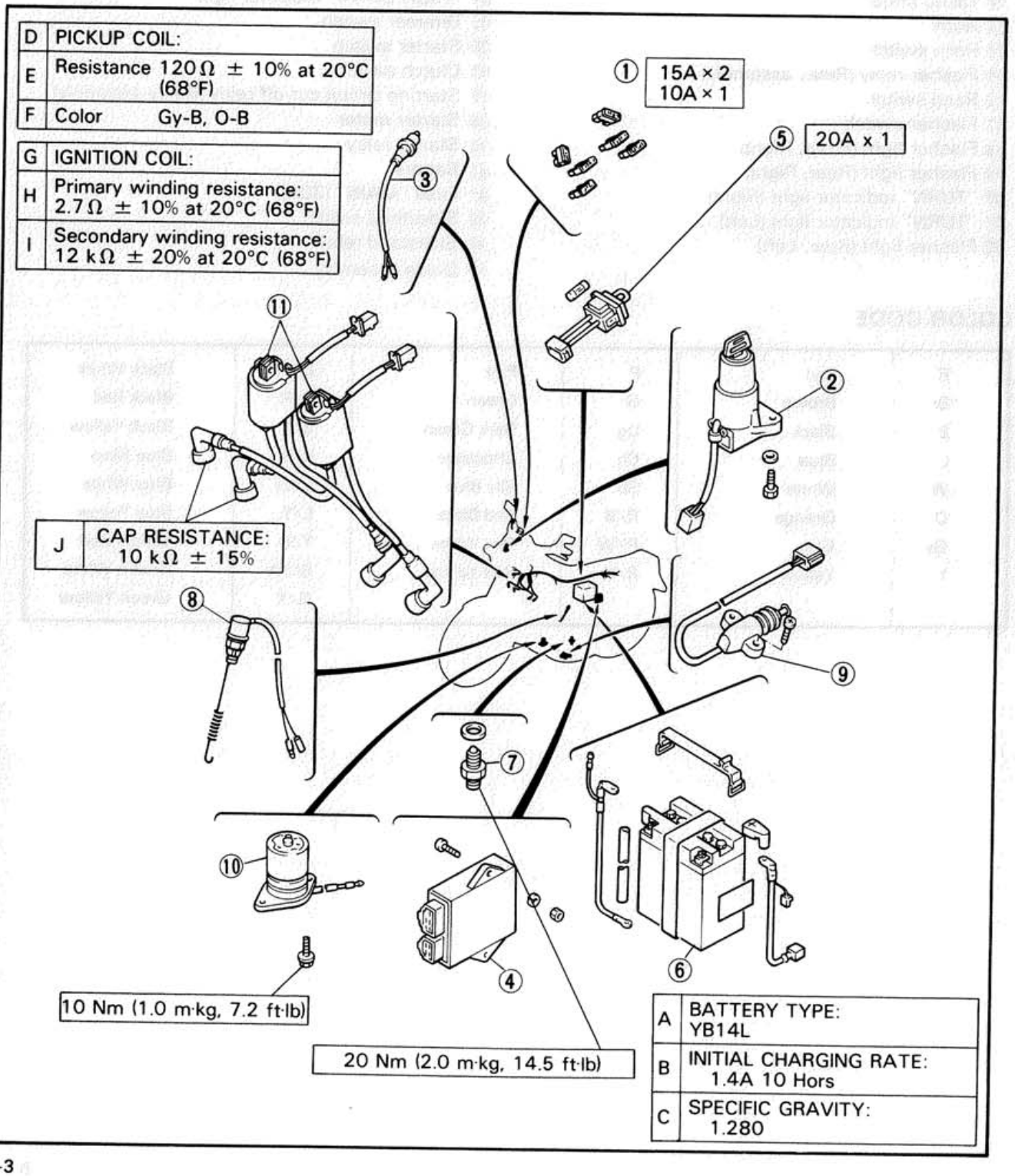
① A.C. Generator
② Rectifier/Regulator
③ Main switch
④ Fuse "IGNITION" (10A)
⑤ Engine stop switch
⑥ Pickup coil
⑦ T.C.I. Unit
⑧ Ignition coil (No. 1, 4)
⑨ Ignition coil (No. 2, 3)
⑩ "FUEL" indicator light
⑪ Fuel sender
⑫ Tacho meter
⑬ Horn
⑭ Horn switch
⑮ Flasher relay (Relay assembly)
⑯ Reed switch
⑰ Flasher switch
⑱ Flasher light (Front, Right)
⑲ Flasher light (Rear, Right)
⑳ "TURN" indicator light (Right)
㉑ "TURN" indicator light (Left)
㉒ Flasher light (Rear, Left)
㉓ Flasher light (Front, Left)
㉔ Oil level switch
㉕ "OIL" indicator light
㉖ Neutral switch
㉗ "NEUTRAL" indicator light
㉘ Brake switch
㉙ Tail/Brake light
㉚ Fuse "SIGNAL" (15A)
㉛ Fuse "HEAD" (15A)
㉜ Meter light
㉝ Head light
㉞ "HIGH BEAM" indicator light
㉟ Dimmer switch
㊱ Starter switch
㊲ Clutch switch
㊳ Starting circuit cut-off relay (Relay assembly)
㊴ Starter motor
㊵ Starter relay
㊶ Battery
㊷ Fuse "MAIN" (30A)
㊸ Sidestand switch
㊹ Sidestand relay
㊺ Diode assembly

COLOR CODE

R	Red	P	Pink	B/W	Black White
Br	Brown	G	Green	B/R	Black Red
B	Black	Dg	Dark Green	B/Y	Black Yellow
L	Blue	Ch	Chocolate	L/B	Blue Black
W	White	Sb	Sky Blue	L/W	Blue White
O	Orange	R/B	Red Black	L/Y	Blue Yellow
Gy	Gray	R/W	Red White	Y/R	Yellow Red
Y	Yellow	R/Y	Red Yellow	Br/W	Brown White
				G/Y	Green Yellow

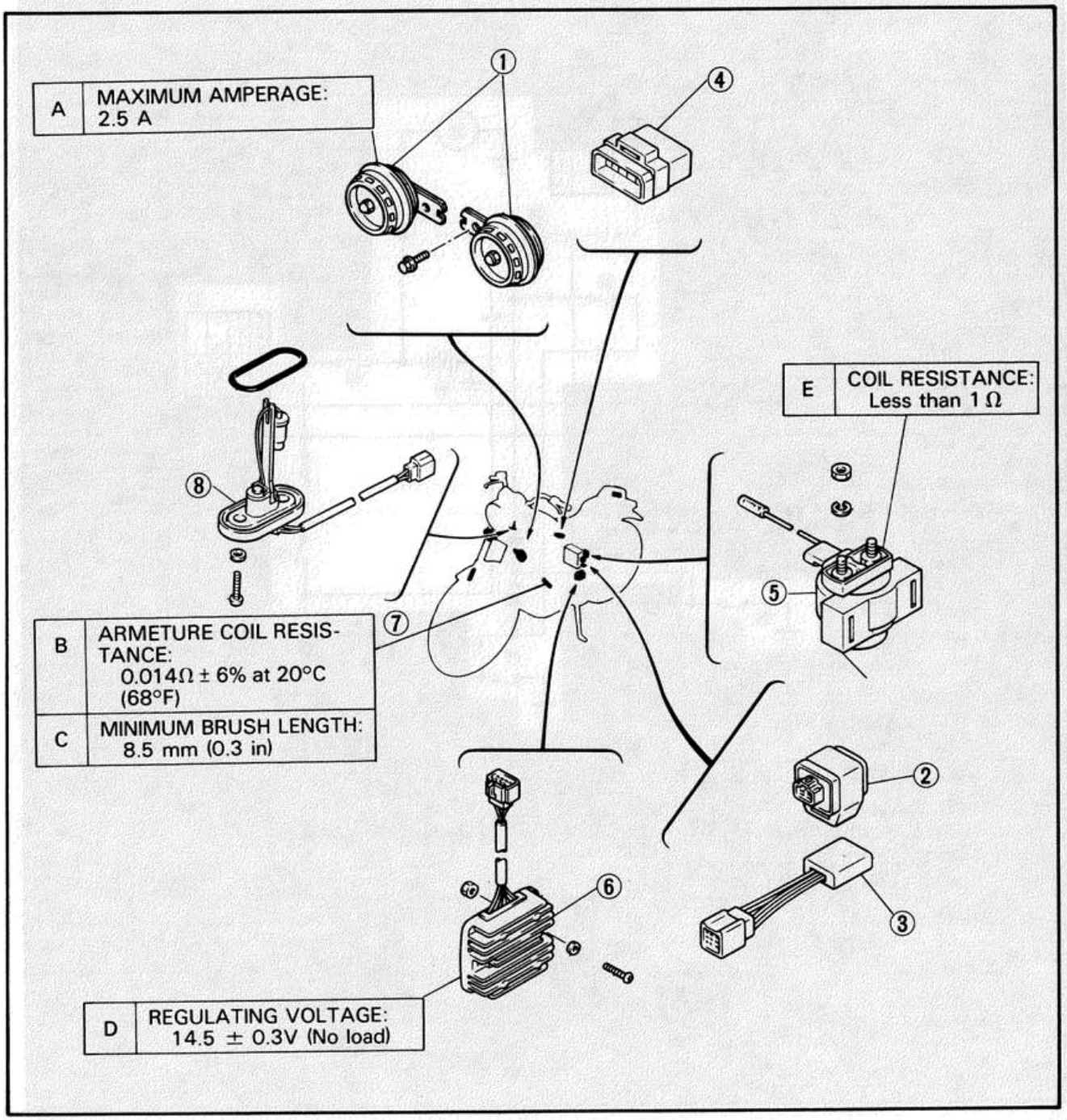
ELECTRICAL COMPONENTS 1

① Fuse
② Main switch
③ Front brake switch
④ TCI unit
⑤ Main fuse
⑥ Battery
⑦ Neutral switch
⑧ Rear brake switch
⑨ Sidestand switch
⑩ Oil level switch
⑪ Ignition coil



ELECTRICAL COMPONENTS 2

① Horn
② Sidestand relay
③ Diode assembly
④ Relay assembly (Starting circuit cut-off relay, flasher relay)
⑤ Starter relay
⑥ Rectifier/Regulator
⑦ Starter motor
⑧ Fuel sender



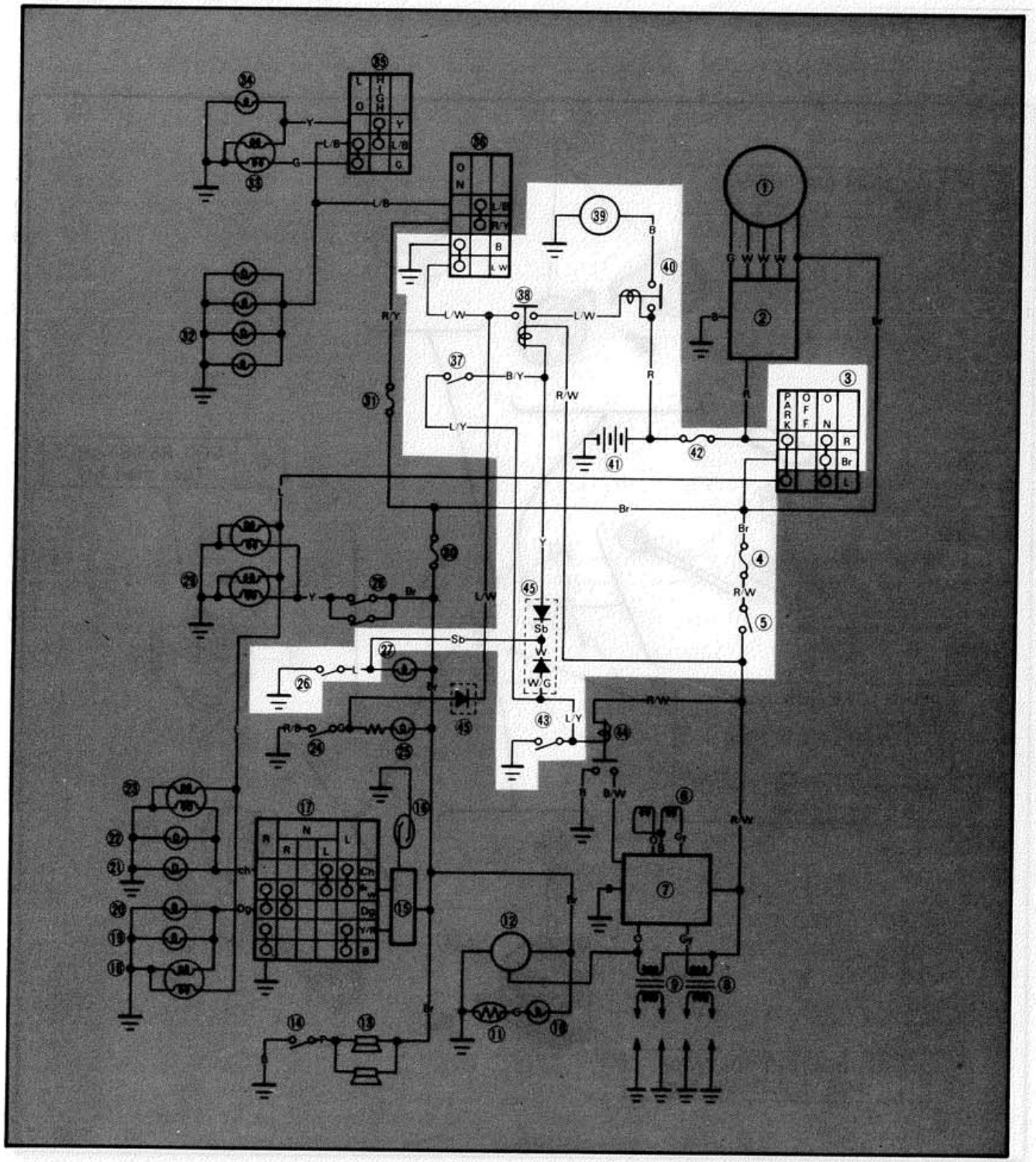
ELECTRIC STARTING SYSTEM

CIRCUIT DIAGRAM

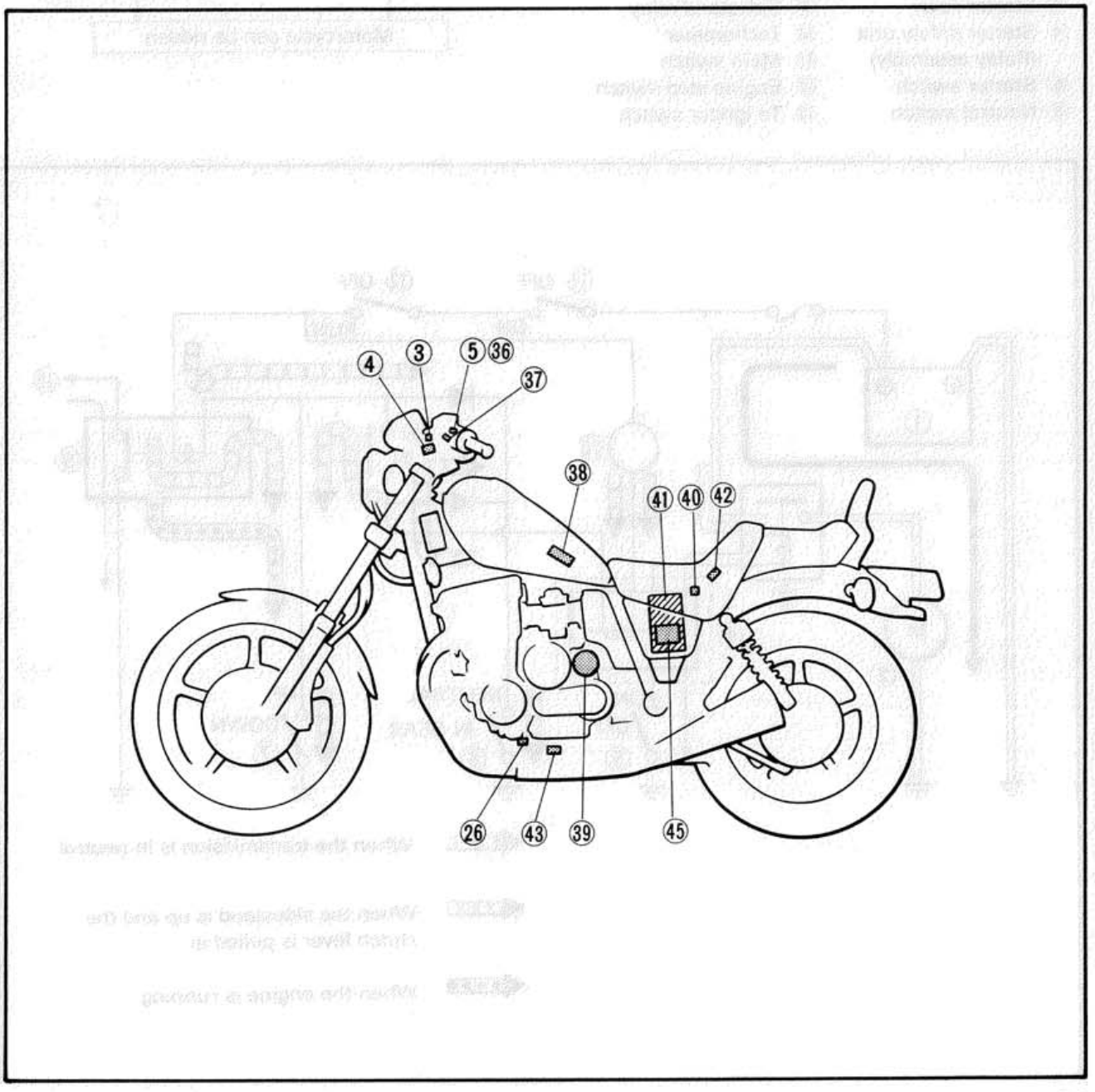
Below circuit diagram shows starter circuit in wiring diagram.

NOTE:

For the encircled numbers and color cords, see page 6-2.



③ Main switch
④ Fuse "IGNITION" (10A)
⑤ Engine stop switch
㉖ Neutral switch
㊱ Starter switch
㊲ Clutch switch
㊳ Starting circuit cut-off relay (Relay assembly)
㊴ Starter motor
㊵ Starter relay
㊶ Battery
㊷ Fuse "MAIN" (30A)
㊸ Sidestand switch
㊺ Diode

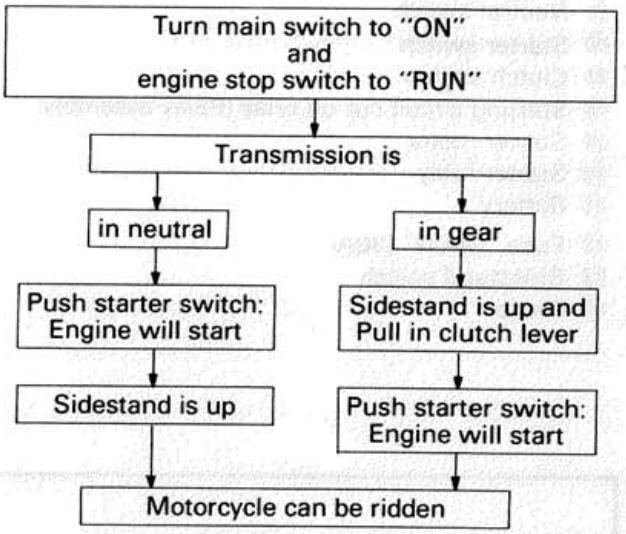


ELECTRIC STARTING SYSTEM

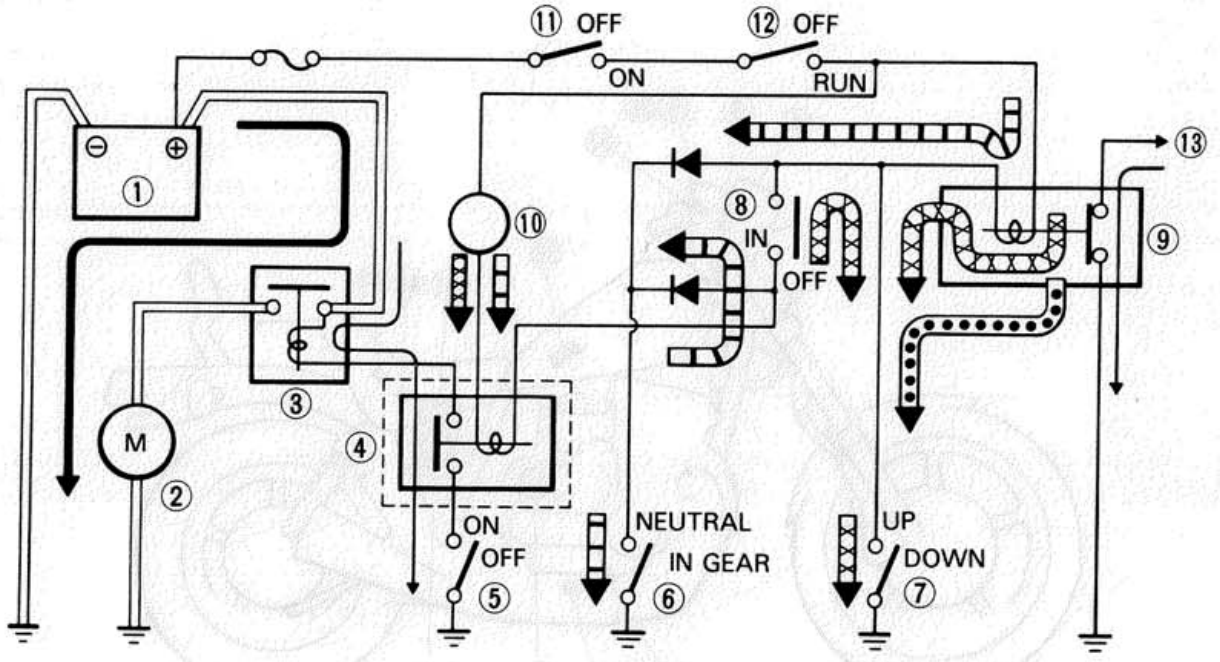
STARTING CIRCUIT OPERATION

The starting circuit on this model consists of the starter motor, starter relay, starter safety unit, and sidestand relay. If the engine stop switch and the main switch are both on, the starter motor can operate only if:

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



① Battery
② Starter motor
③ Starter relay
④ Starter safety unit (Relay assembly)
⑤ Starter switch
⑥ Neutral switch
⑦ Sidestand switch
⑧ Clutch switch
⑨ Sidestand relay
⑩ Tachometer
⑪ Main switch
⑫ Engine stop switch
⑬ To ignitor switch



When the transmission is in neutral.

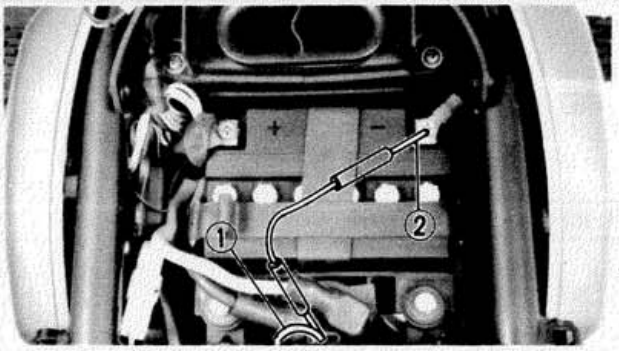
When the sidestand is up and the clutch lever is pulled in.

When the engine is running.

TROUBLESHOOTING CHART

THE STARTER MOTOR DOES NOT OPERATE.

Connect "L/W" lead from the starter relay ① to the battery negative (−) terminal ②; use a jumper lead.



→ The engine does not rev smoothly.

Recharge or replace the battery.

→ The engine does not operate.

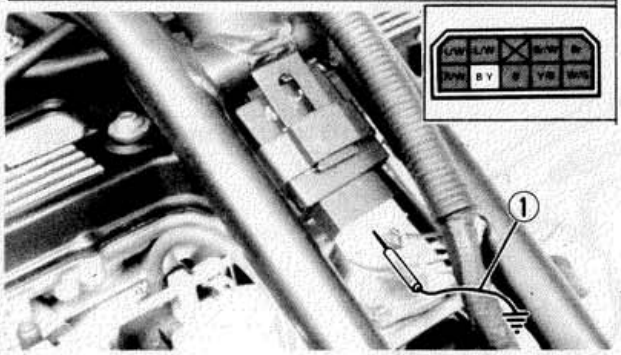
Check the battery voltage (12V) on the "L/W" lead from the starter relay.

If the starter relay does not click, check the starter relay and starter motor.

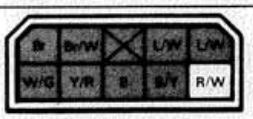
The engine operates.

Main and engine stop switches are turned to "ON".

Connect "B/Y" lead to "ground" on the frame; use a jumper lead ①.



→ If the relay unit does not click, check the battery voltage (12V) on the "R/W" lead.



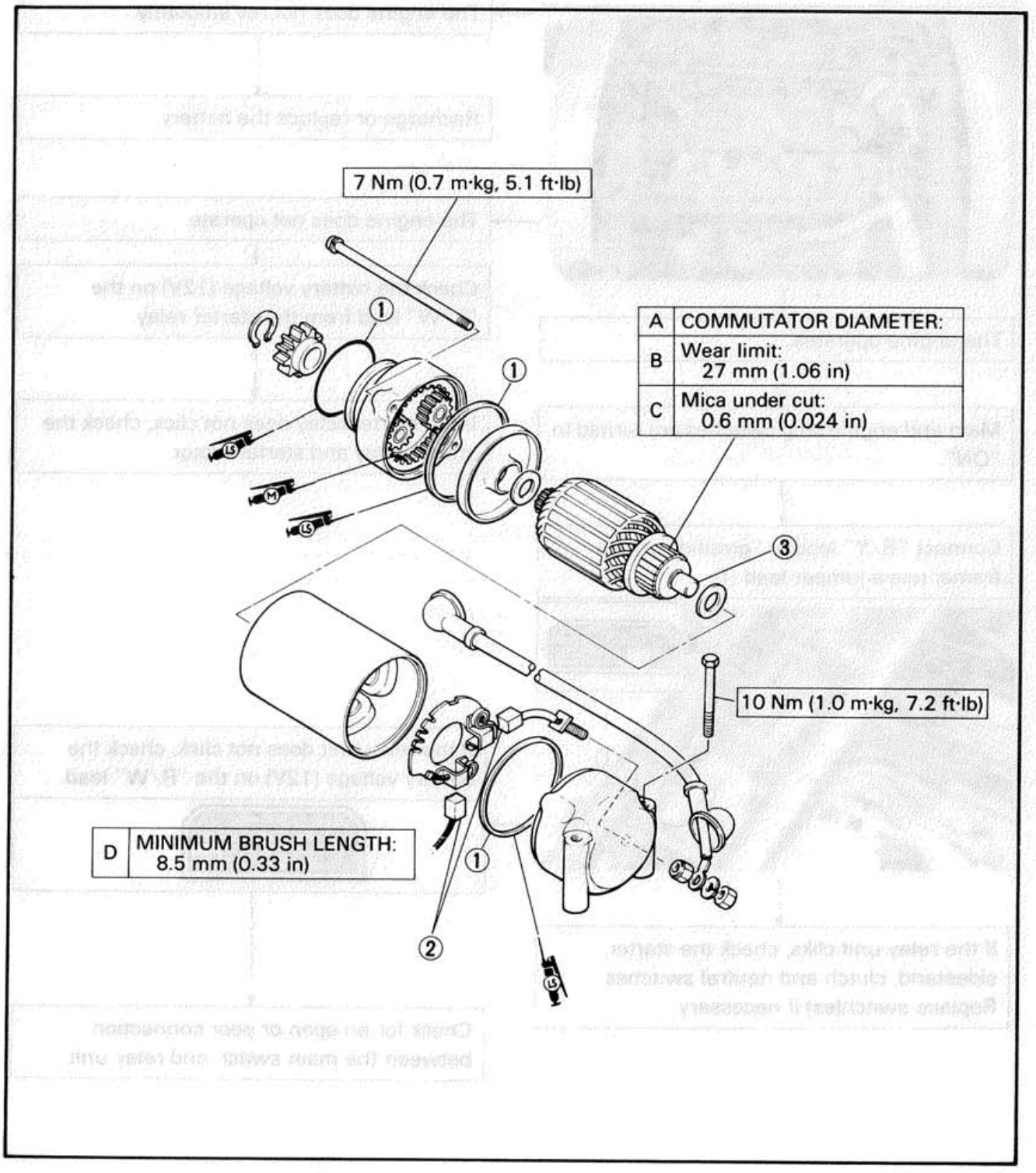
Check for an open or poor connection between the main switch and relay unit.

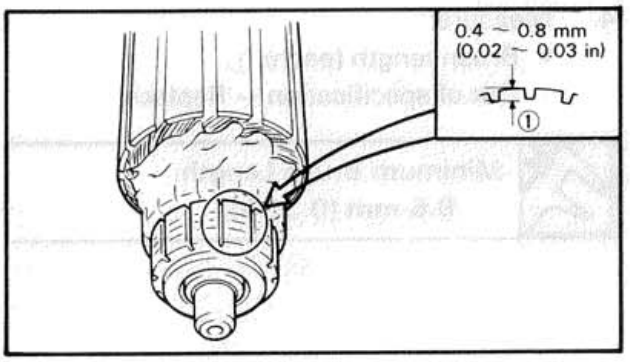
If the relay unit cliks, check the starter, sidestand, clutch and neutral switches. Replace switch(es) if necessary.

STARTER MOTOR

① O-ring
② Brush
③ Armature

Removal
Refer Chapter 3. "ENGINE DISASSEMBLY".



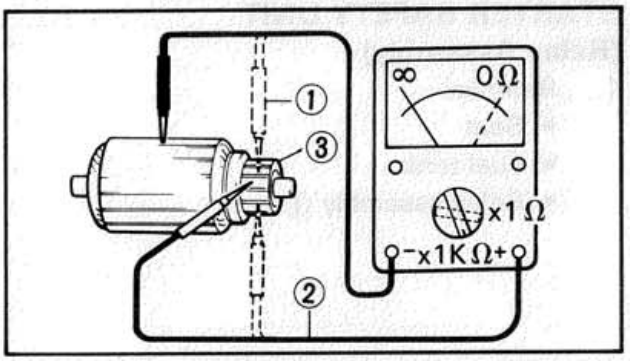


Inspection

1. Inspect:
   - Commutator (outer surface)
     Dirty → Clena with #600 grit sandpaper.
   - Mica insulation
     (between commutator segments)
     Out of specification → Scrape mica to proper limits.
     Use a hacksaw blade that is ground to fit.

Depth of Insulator ① :
0.4 ~ 0.8 mm (0.02 ~ 0.03 in)

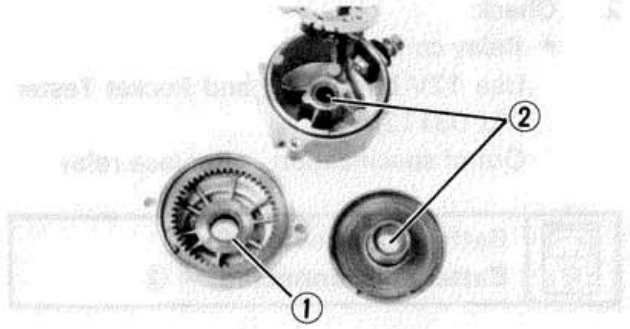
NOTE:
The mica insulation of commutator must be under-cut to ensure proper operation of commutator.



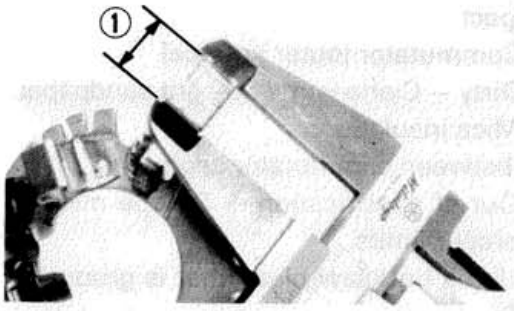
2. Measure:
   - Armature coil continuity ①
     No continuity → Replace starter motor.

Armature Coil:
0.014Ω ± 6% at 20°C (68°F)

   - Armature coil insulation ②
     Short circuit → Replace starter motor.



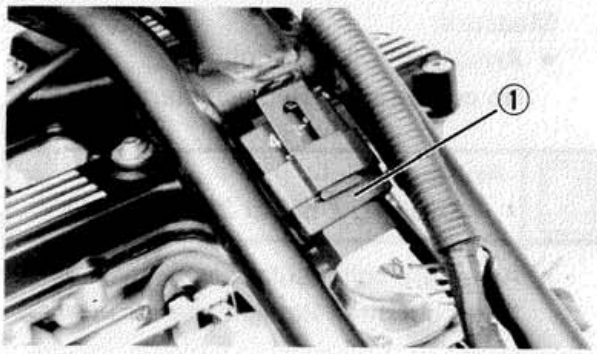
3. Inspect:
   - Front cover bearing ①
   - Center and rear covers bushings ②
     Damage → Replace.



4. Measure:
   - Brush length (each) ①
     Out of specification → Replace.

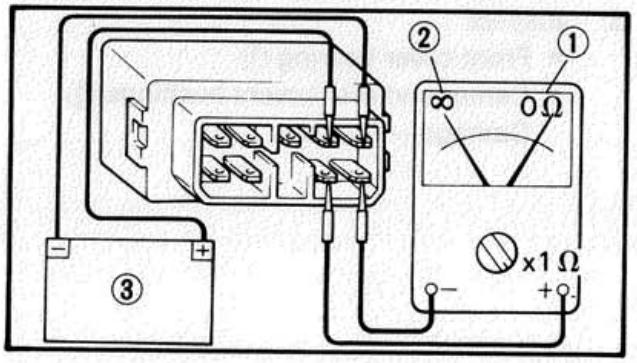
Minimum Brush Length: 8.5 mm (0.33 in)

5. Check:
   - Brush spring pressure
     Compare with new spring.
     Weak pressure → Replace spring.



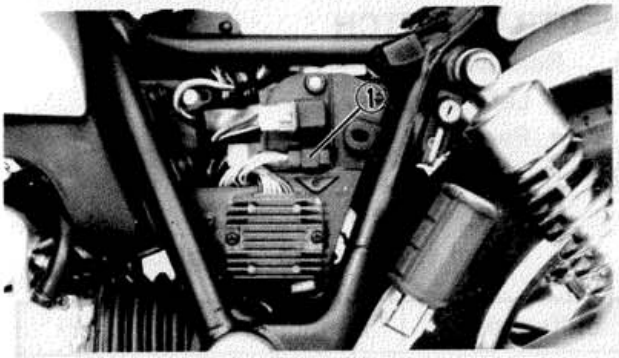
STARTER SAFETY UNIT (Relay Assembly)

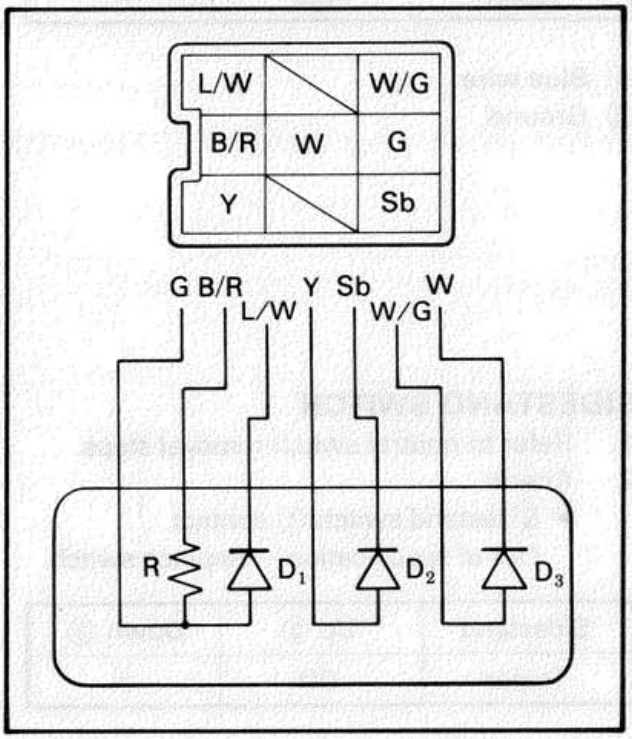
1. Remove:
   - Seat
   - Fuel tank
   - Relay assembly ①



2. Check:
   - Relay contacts
     Use 12V battery ③ and Pocket Tester (YU-03112).
     Out of specification → Replace relay.

Battery Connected: 0Ω ① Battery disconnected: ∞ ②





DIODE

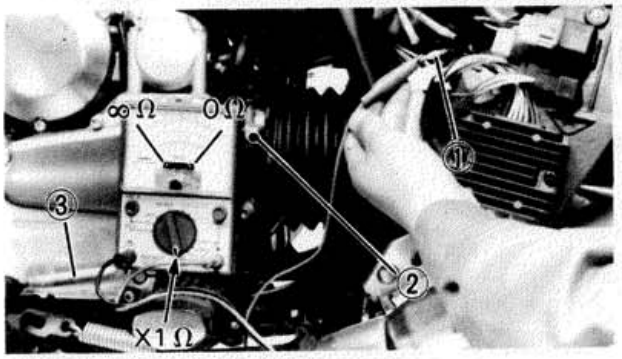
1. Remove:
   - Left side cover
   - Diode ①

2. Check:
   - Diode continuity/discontinuity
     Defective element(s) → Replace the unit.

Checking element	Pocket tester connecting point		Good
	(+) (red)	(−) (black)	
D_1	G	L/W	○
	L/W	G	×
D_2	Y	Sb	○
	Sb	Y	×
D_3	W/G	W	○
	W	W/G	×
R	G	B/R	8.2Ω

○: Continuity (0Ω) (Scale Ω × 1000)
×: Discontinuity (∞) (Scale Ω × 1)

NOTE:
The results "○" or "×" should be reversed according to the pocket tester polarity.

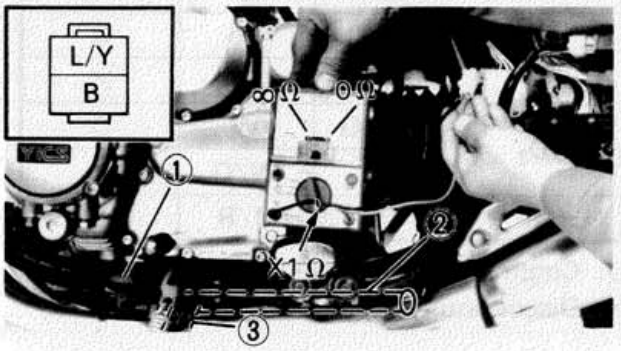


NEUTRAL SWITCH

1. Remove:
   - Left side cover
   - Pannel
2. Check:
   - Neutral switch contact
     Out of specification → Replace switch.

Shift pedal ③	In neutral	In gear
Tester	0Ω	∞

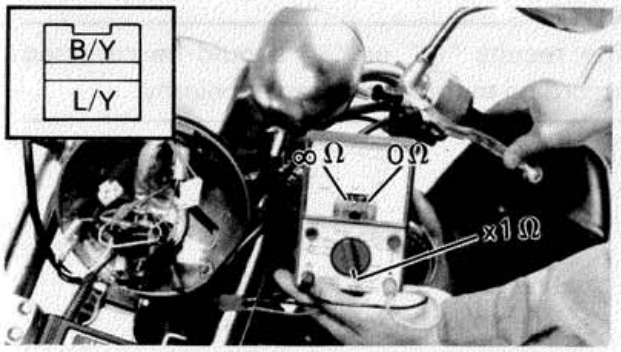
① Blue wire
② Ground



SIDESTAND SWITCH

1. Refer to neutral switch removal steps.
2. Check:
   - Sidestand switch ① contact
     Out of specification → Replace switch.

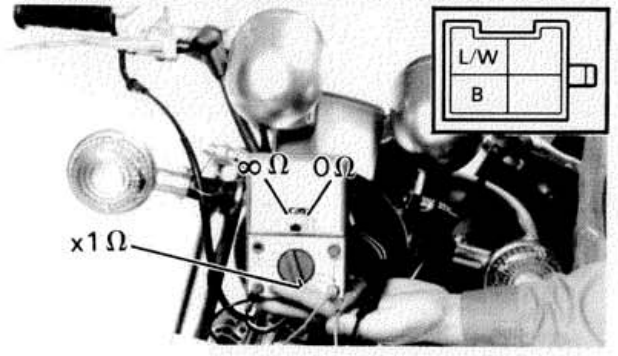
Sidestand	Up ②	Down ③
Tester	0Ω	∞



CLUTCH SWITCH

1. Remove:
   - Headlight unit
2. Check:
   - Clutch switch contact
     Out of specification → Replace switch.

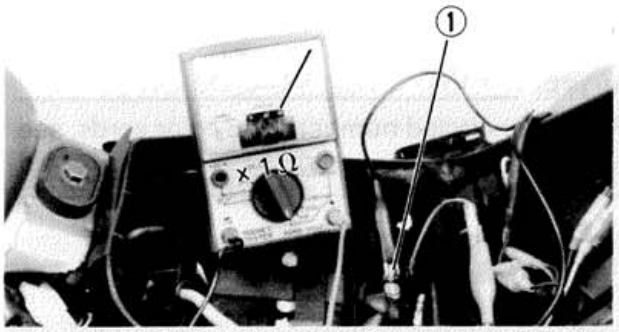
Clutch lever	Pull in	Not pull in
Tester	0Ω	∞



STARTER SWITCH

1. Remove:
   - Headlight unit
2. Check:
   - Starter switch contact
     Out of specification → Replace switch.

Starter switch	ON	OFF
Tester	0Ω	∞

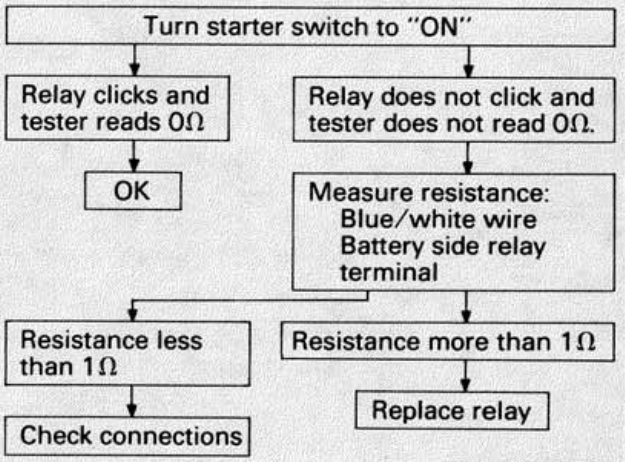


STARTER RELAY

Inspection

Preparation steps:

- Remove relay securing bolts.
- Disconnect starter motor red lead ①.
- Connect Pocket Tester leads to relay terminals.
- Turn main switch to "ON".
- Turn engine stop switch to "RUN".
- Move change pedal to "NEUTRAL".

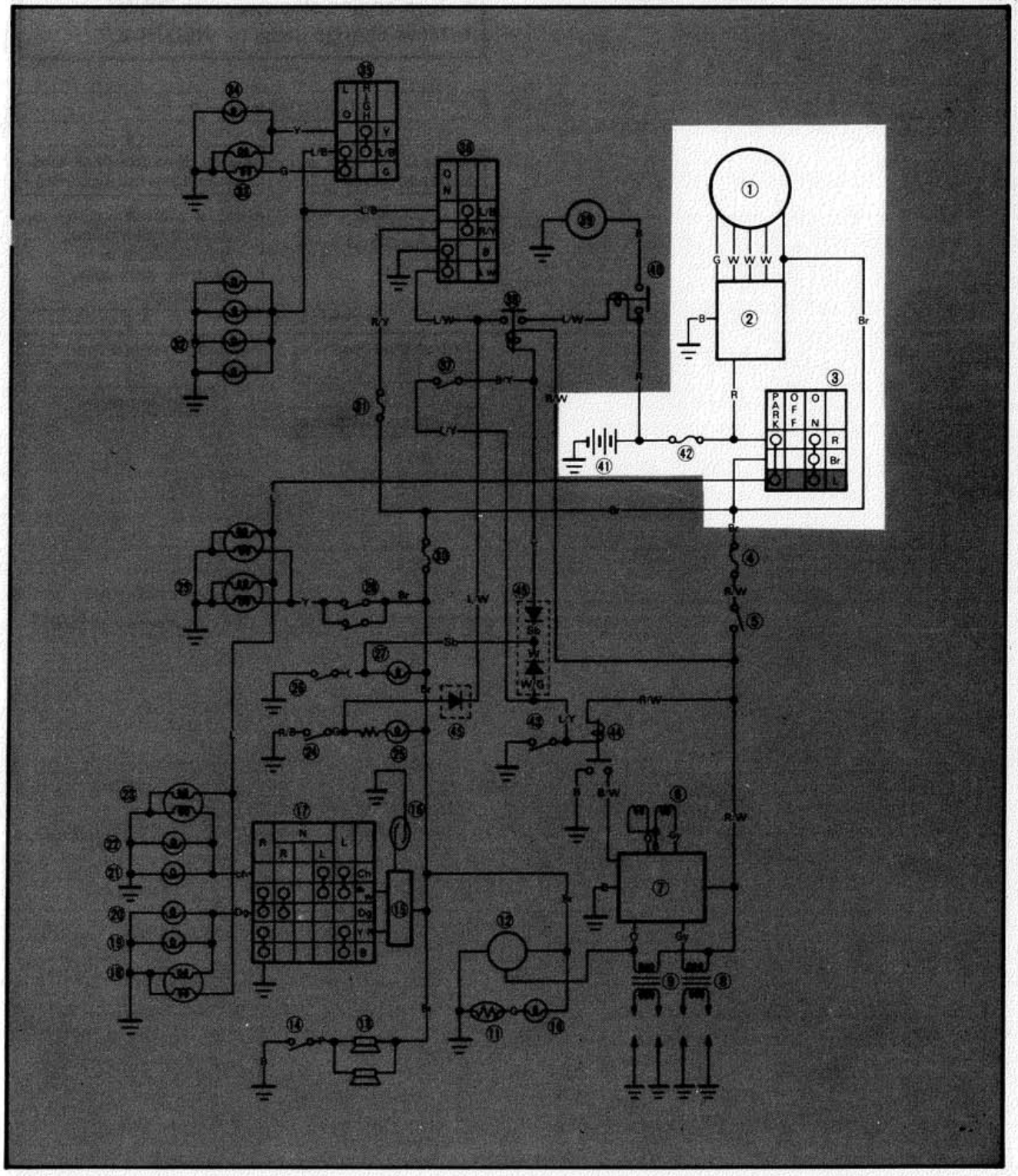


CHARGING SYSTEM

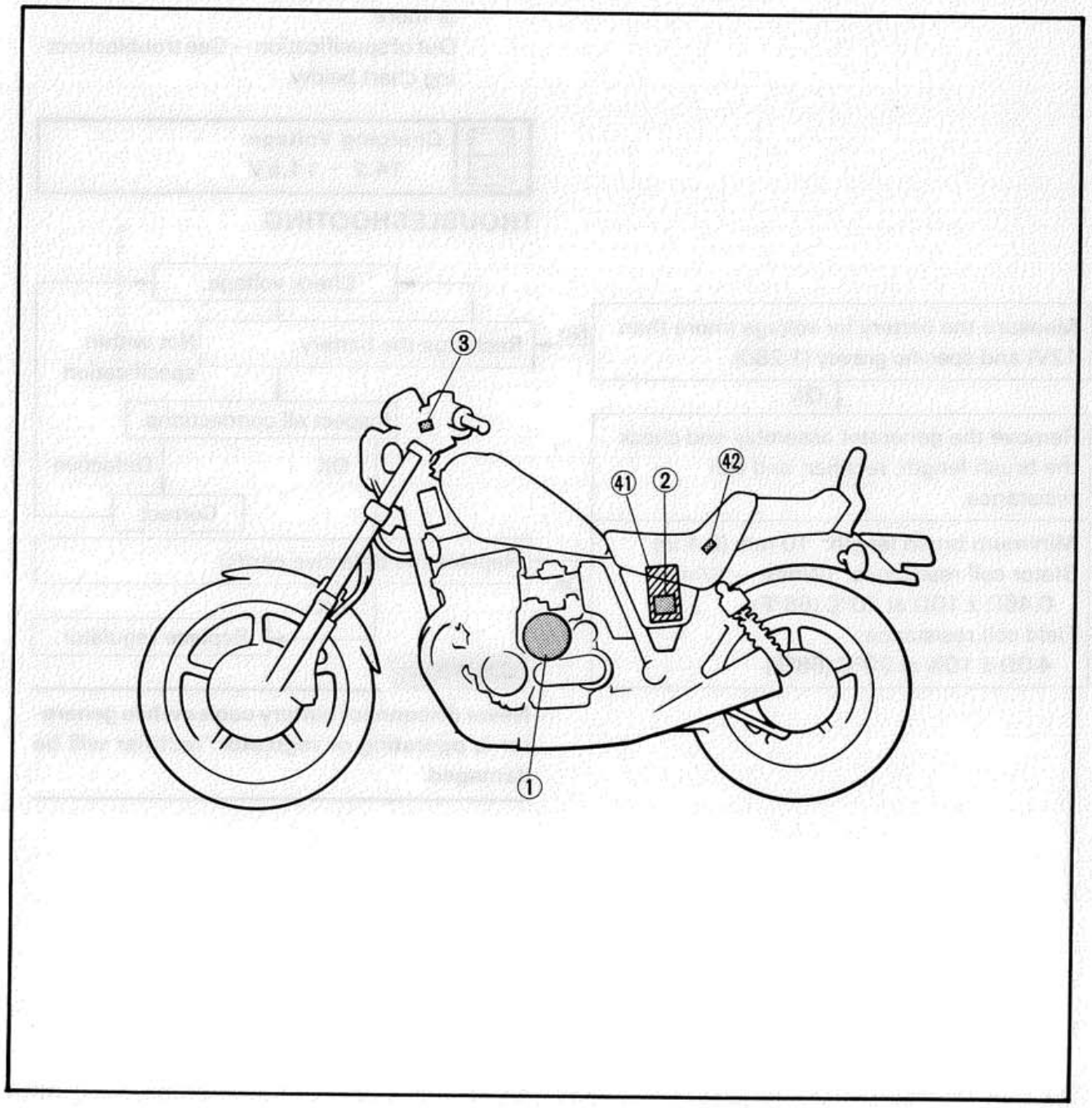
CIRCUIT DIAGRAM

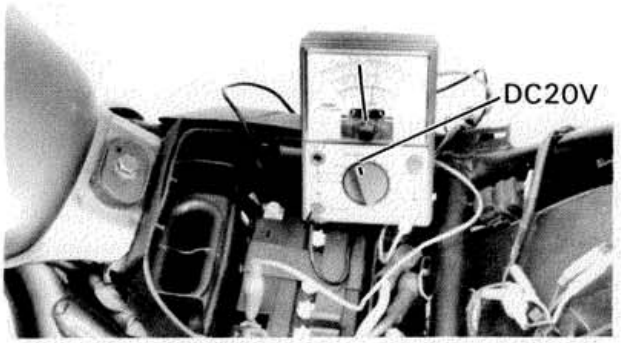
Below circuit diagram shows charging circuit in wiring diagram.

NOTE:
For the encircled numbers and color cords, see page 6-2.



① A.C. Generator
② Rectifier/Regulation
③ Main switch
㊶ Battery
㊷ Fuse "MAIN" (30A)





CHARGING SYSTEM

CHARGING VOLTAGE INSPECTION

1. Remove:
   - Seat
2. Connect:
   - Pocket Tester leads
     (to each battery terminal)

3. Start the engine.
4. Measure:
   - Charging voltage
     Rev engine to approximately 2,000 r/min or more.
     Out of specification → See troubleshooting chart below.

Charging Voltage:
14.2 ~ 14.8V

TROUBLESHOOTING

Measure the battery for voltage (more than 12V) and specific gravity (1.280).
- No → Recharge the battery.
- OK ↓

Remove the generator assembly and check the brush length, rectifier, and coil resistance.

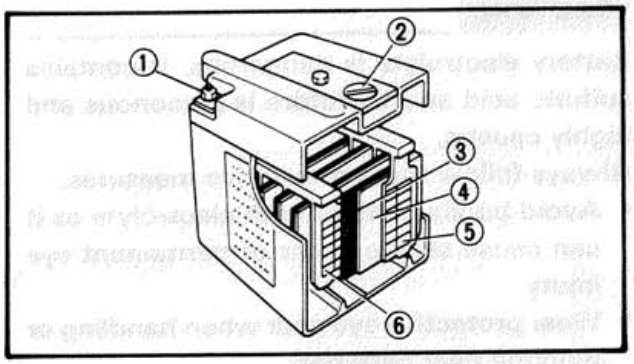
Minimum brush length: 10 mm (0.4 in)
Stator coil resistance: (White — White)
0.46Ω ± 10Ω at 20°C (68°F)
Field coil resistance:
4.0Ω ± 10% at 20°C (68°F)

- OK → Replace the defective part(s).
- OK → Replace regulator.

Check voltage.
- Not within specification → Recharge the battery.
- Inspect all connections.
  - OK
  - Defective → Correct

CAUTION:

Never disconnect battery cables while generator is operating or regulator/rectifier will be damaged.



BATTERY

NOTE:

Replace the battery if:

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

① Terminal
② Cap
③ Insulator
④ Separation plate
⑤ Negative electrode
⑥ Positive electrode

1. Inspect:
   - Battery terminals
   - Battery couplers

   Looseness → Tighten.
2. Measure:
   - Specific gravity of battery fluid

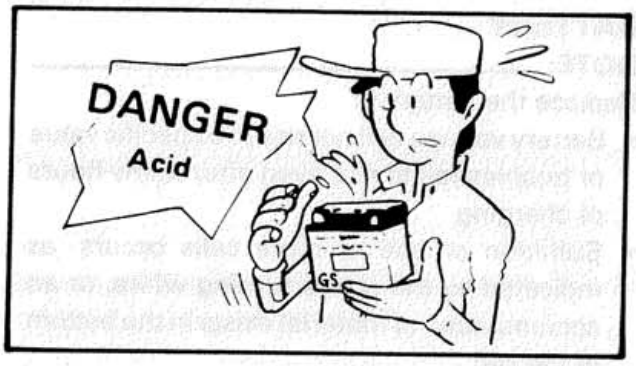
   Less than 1.280 → Remove and recharge battery.

CAUTION:

To insure maximum battery performance be sure to:

- **Charge a new battery before use.**
- **Maintain proper electrolyte level.**
- **Charge at proper current; 1.2 amps/10 hrs. or until the specific gravity reaches 1.280 at 20°C (68°F).**

Failure to observe these points will result in a shortened battery life.



CAUTION:

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

Always follow these preventive measures:

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

Antidote (EXTERNAL):

- **SKIN — Flush with water.**
- **EYES — Flush with water for 15 minutes and get immediate medical attention.**
- **Drink large quantities of water or milk and follow with milk of magnesia, beaten egg, or vegetable oil. Get immediate medical attention.**

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

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

Battery Service Life

The service life of a battery is usually two to three years. Battery life may be shortened by poor maintenance.

Preparation steps:

- Keep battery topped off with distilled water.
- Keep battery charged.
- Do not overcharge battery.
- Do not allow battery freeze.
- Do not fill with tap water or sulfuric acid containing impurities.
- Do not charge new battery using improper voltage or current.

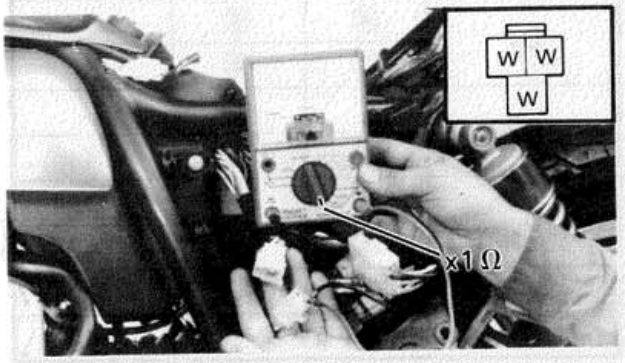
Battery Storage

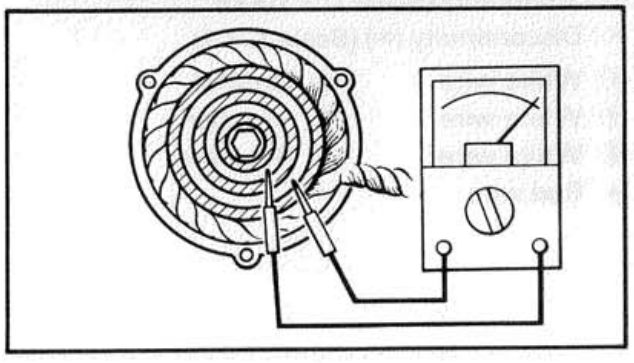
The battery should be stored if the motorcycles is not to be used for a long period.

1. Remove:
   - Battery

Battery storage and maintenance tips:
- Recharge the battery periodically.
- Store the battery in a cool, dry place.
- Recharge the battery before reinstalling.

Battery	YB14L
Electrolyte	Specific gravity: 1.280
Initial charging rate	1.4 amp for 10 hours (new battery)
Recharging rate	10 hours (or until specific gravity reaches 1.280)
Refill fluid	Distilled water (to maximum level line)
Refill period	Check once per month (or more often as required)





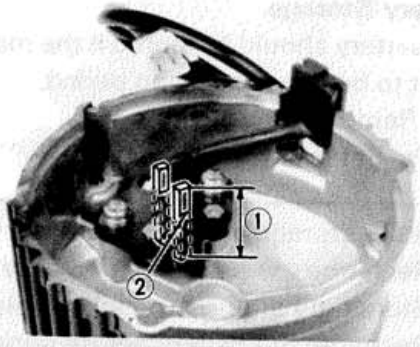
STATOR AND FIELD COIL

1. Remove:
   - Left side cover
   - Pannel
2. Measure:
   - Stator coil resistance
     Out of specification → Replace.

Stator Coil Resistance:
0.46Ω ± 10% at 20°C (68°F)

3. Measure:
   - Field coil resistance
     Out of specification → Replace.

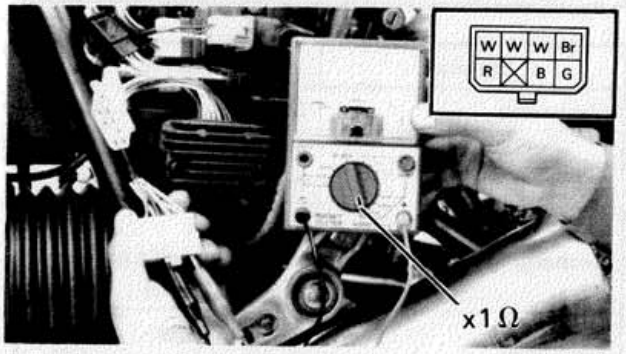
Filed Coil Resistance:
4.0Ω ± 10% at 20° (68°F)



4. Check:
   - Brush length ①
     Out of specification → Replace.

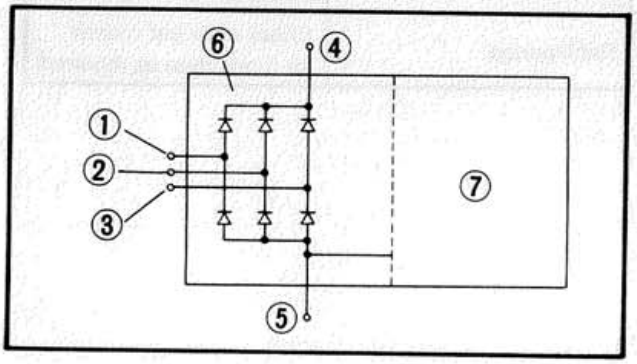
Minimum Brush Length:
10 mm (0.4 in)

② Wear indicator



RECTIFIER/REGULATOR

1. Remove:
   - Left side cover
   - Pannel
2. Check:
   - Rectifier/Regulator ① diodes.
     Refer to the following table.
     Defective element → Replace rectifier.



Checking element	Pocket tester Connecting point (+) (red)	(−) (black)	Good
D_1	④	①	○
	①	④	×
D_2	④	②	○
	②	④	×
D_3	④	③	○
	③	④	×
D_4	①	⑤	○
	⑤	①	×
D_5	②	⑤	○
	⑤	②	×
D_6	③	⑤	○
	⑤	③	×

○ : Continuity (Scale Ω × 1000)
× : Discontinuity (∞) (Scale Ω × 1)

① White wire
② White wire
③ White wire
④ Red wire
⑤ Ground
⑥ Rectifier
⑦ Regulator

CAUTION:

Do not overcharge rectifier or damage may result.
Avoid:

- **A short circuit**
- **Inverting + and −battery leads**
- **Direct connection of rectifier to battery**

NOTE:

The results "○" or "×" should be reversed according to the pocket tester polarity.

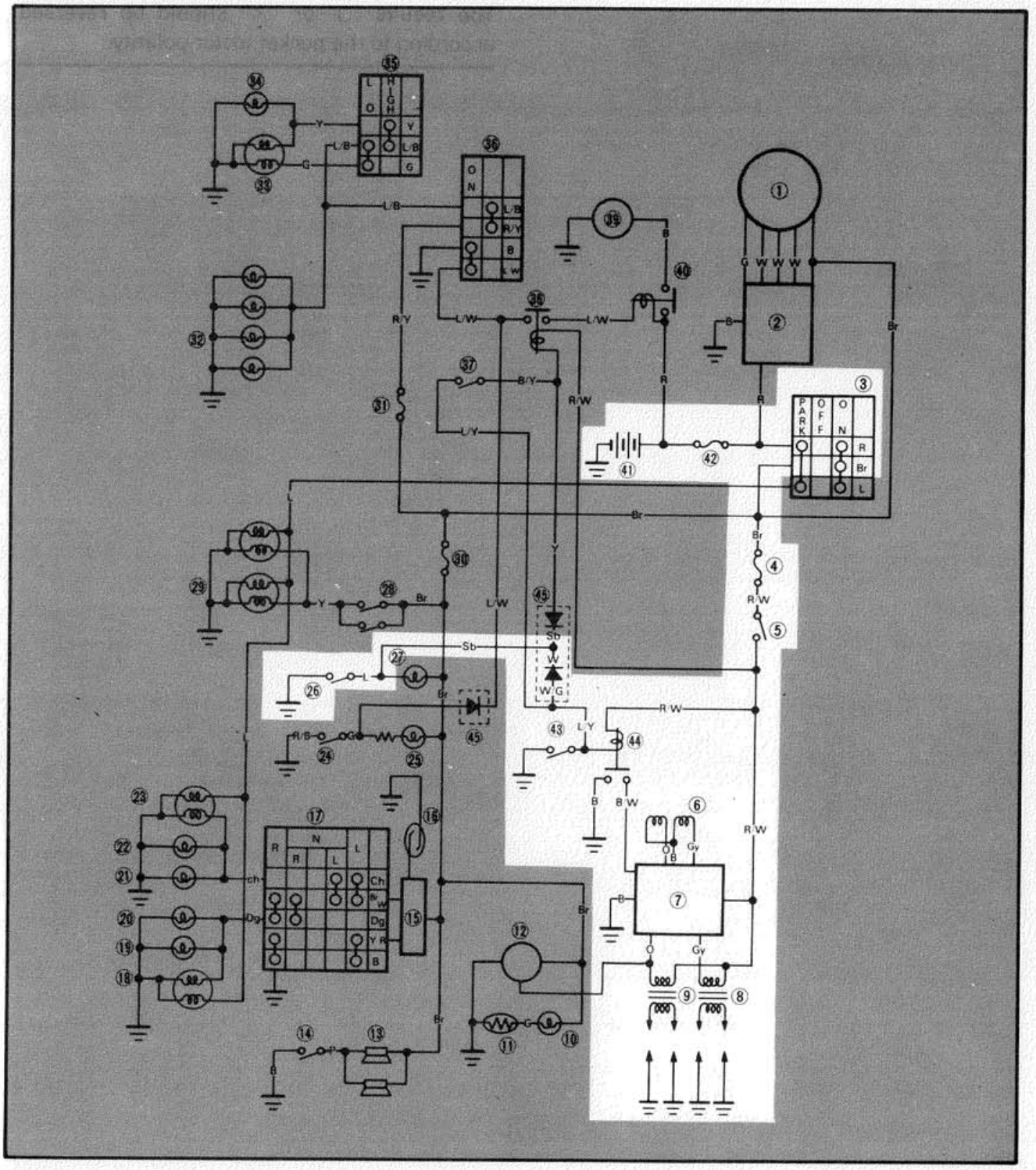
IGNITION SYSTEM

CIRCUIT DIAGRAM

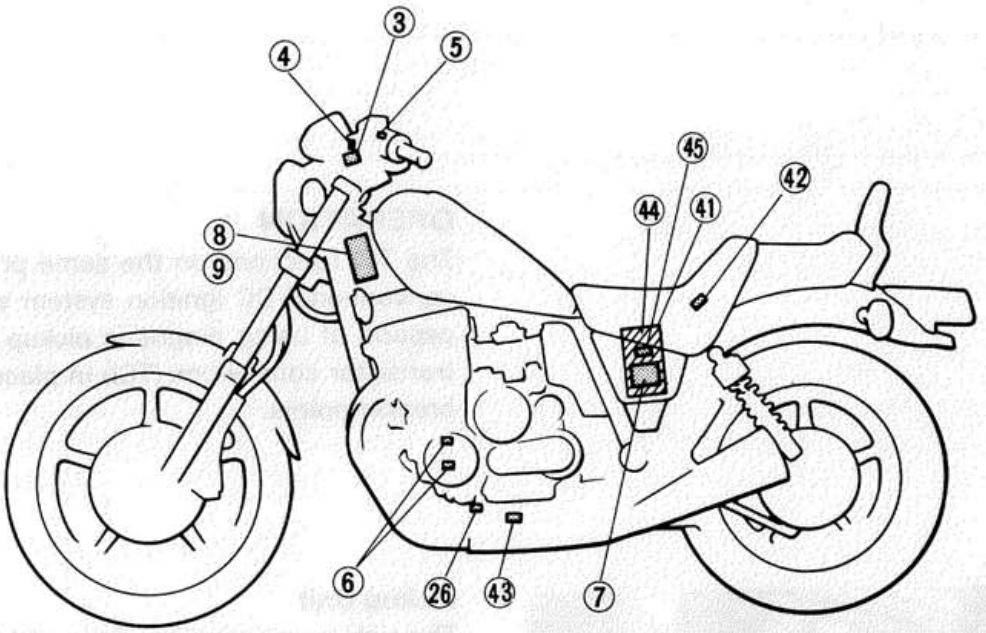
Below circuit diagram shows ignition circuit in wiring diagram.

NOTE:

For the encircled numbers and color cords, see page 6-2.



③ Main switch
④ Fuse "IGNITION" (10A)
⑤ Engine stop switch
⑥ Pickup coil
⑦ T.C.I. Unit
⑧ Ignition coil (No. 1, 4)
⑨ Ignition coil (No. 2, 3)
㉖ Neutral switch
㊶ Battery
㊷ Fuse "MAIN" (30A)
㊸ Sidestand switch
㊹ Sidestand relay
㊺ Diode



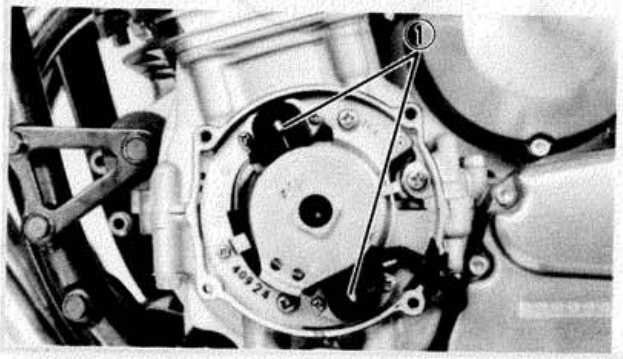
IGNITION SYSTEM

DESCRIPTION

This model is equipped with a battery operated, fully transistorized, breakerless ignition system. By using magnetic pickup coils, the need for contact breaker points is eliminated. This adds to the dependability of the system by eliminating frequent cleaning and adjustment of points and ignition timing. The TCI (Transistor Control Ignition) unit incorporates an automatic advance circuit controlled by signals generated by the pickup coil. This adds to the dependability of the system by eliminating the mechanical advancer. This TCI system consists of two units; a pickup unit and an ignitor unit.

OPERATION

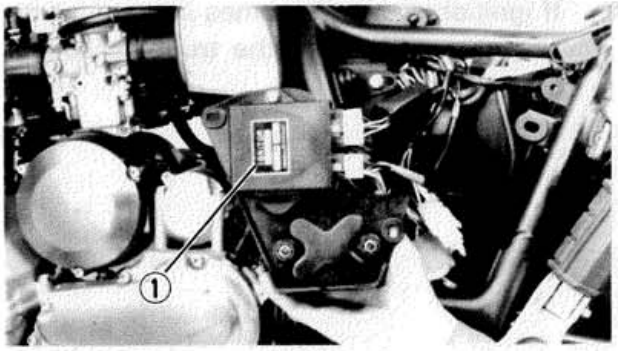
The TCI functions on the same principle as a conventional DC ignition system with the exception of using magnetic pickup coils and a transistor control box (TCI) in place of contact breaker points.



Pickup Unit

The pickup unit consists of two pickup coils and a flywheel mounted onto the crankshaft. When the projection on the flywheel passes a pickup coil, a signal is generated and transmitted to the ignitor unit. The width of the projection on the flywheel determines the ignition advance.

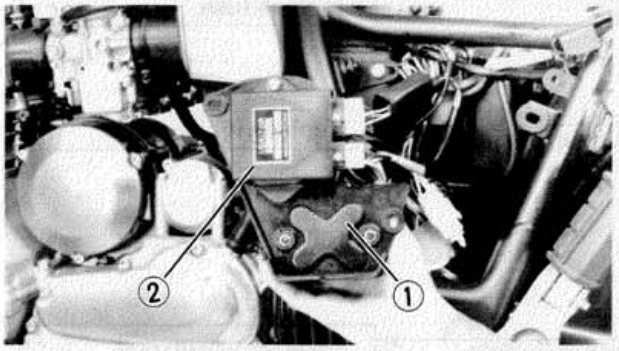
① Pickup coiles



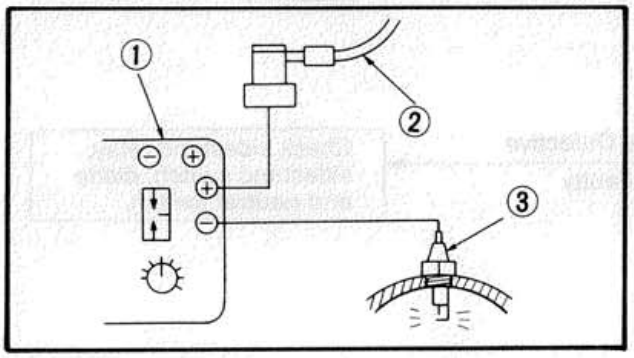
Ignitor Unit

This unit controls wave form, duty control, switching, electronic ignition advance, etc. The duty control circuit reduces electrical consumption by controlling the duration of the primary ignition current.

The ignitor unit ① also has a protective circuit for the ignition coil. If the ignition switch is on and the crankshaft is not turning, the protective circuit interrupts the current flow to the primary coil after a few seconds. When the crankshaft is turning, however, the ignitor unit sends current to the primary coil.



1. Remove:
   - Seat
   - Left side cover
   - Pannel ①
   - Ignitor unit ②



TROUBLESHOOTING

1. Start engine and warm-up awhile, then turn it off.
2. Connect:
   - Electro Tester (YU-33260) ①

② Spark plug wire
③ Spark plug

3. Start engine and increase spark gap until misfire occurs (Test at various rpm between idle and red line.)

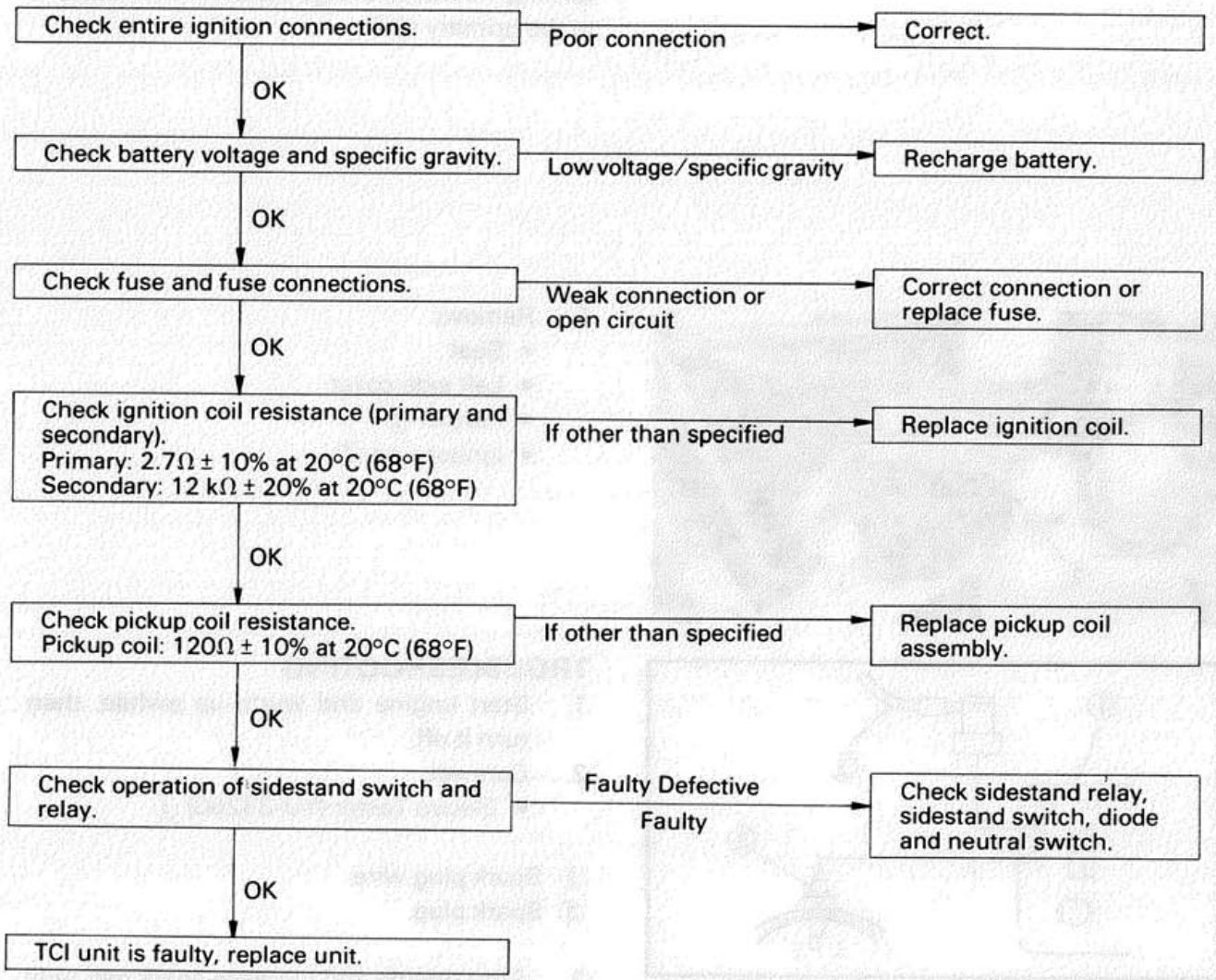
CAUTION:

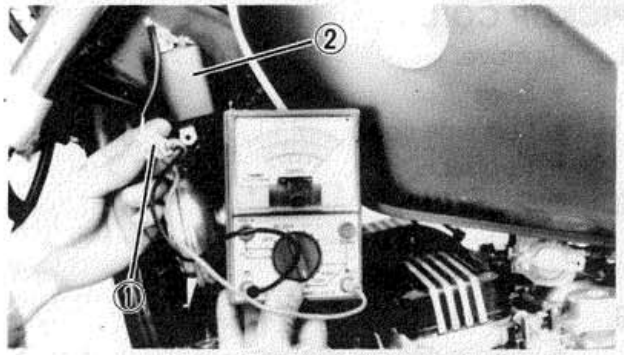
Do not run the engine in neutral above 6,000 rpm for more than 1 or 2 seconds.

Minimum Spark Gap:
6 mm (0.24 in)

4. If ignition system becomes inoperative or engine misfires see the troubleshooting chart below:

Troubleshooting Chart

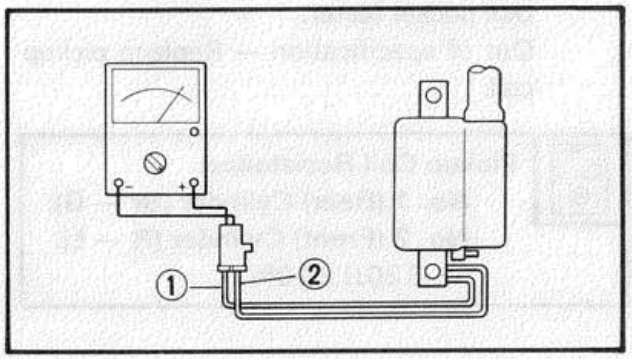




IGNITION COIL

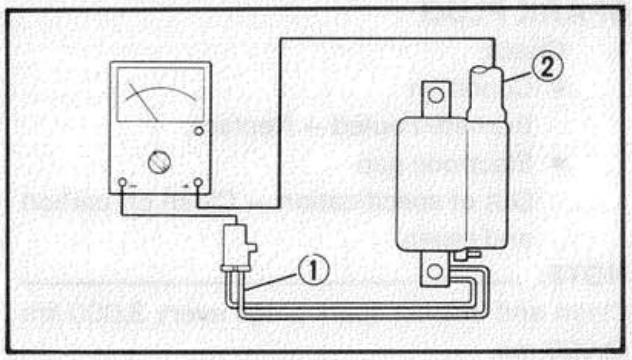
1. Remove:
   - Ignition coil cover
2. Disconnect:
   - Ignition coil lead ①

② No. 1 and No. 4 cylinder ignition coil



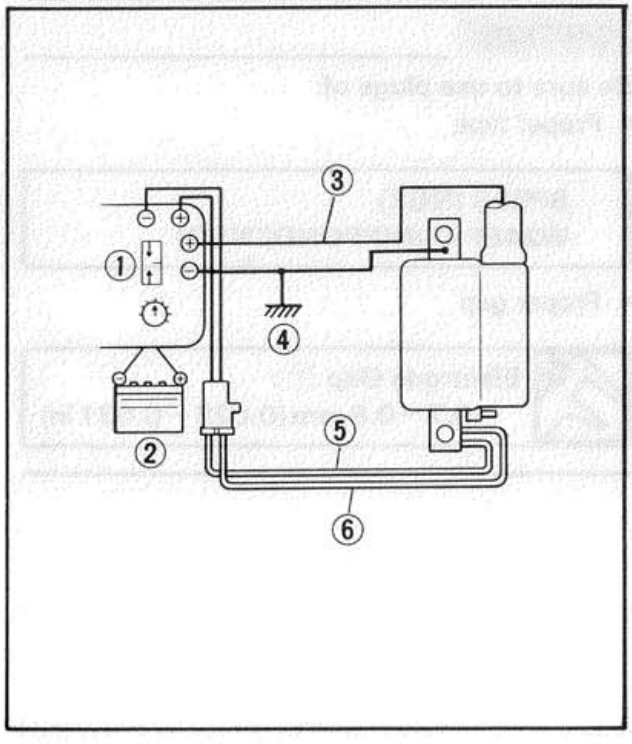
3. Measure:
   - Primary coil resistance
     Out of specification → Replace.

Primary Coil Resistance:
O ① — R/W ② lead connector
Gy — R/W lead connector
2.7Ω ± 10% at 20°C (68°F)



4. Measure:
   - Secondary coil resistance
     Out of specification → Replace.

Secondary Coil Resistance:
R/W lead connector ① —
No. 1 cylinder high tension cord ②
12 kΩ ± 20% at 20°C (68°F)

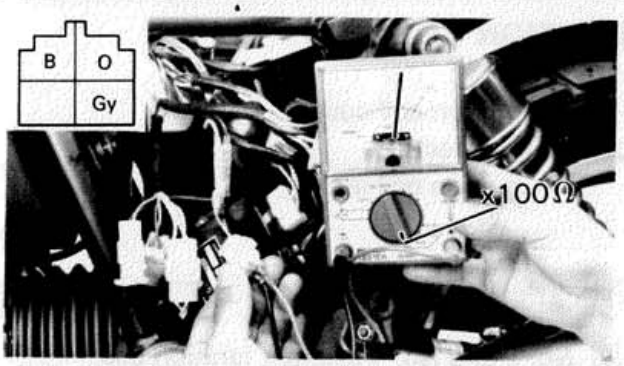


5. Connect:
   - Electro tester ①
   - Fully charged battery ②
     (to ignition coil leads)

③ No. 1 (Rear) cylinder high tension cord
④ Ground
⑤ R/W lead connector
⑥ O lead connector

6. Measure:
   - Ignition coil minimum spark gap
     Turn the spark gap adjuster and increase the gap to the maximum limit unless misfire occurs first.
     Out of specification → Replace.

Minimum Spark Gap:
6 mm (0.24 in)



PICKUP COIL

1. Remove:
   - Seat
   - Left side cover
   - Pannel
2. Disconnect:
   - Pickup coil wires (from TCI unit)
3. Measure:
   - Pickup coil resistance
     Use pocket tester.
     Out of specification → Replace pickup coil.

Pickup Coil Resistance:
No. 1 (Rear) Cylinder (Br — G):
No. 2 (Front) Cylinder (R — L):
120Ω ± 10%

SPARK PLUG

1. Check:
   - Condition
     Burned/Fouled → Replace.
   - Electrode gap
     Out of specification → Clean off carbon and regap.

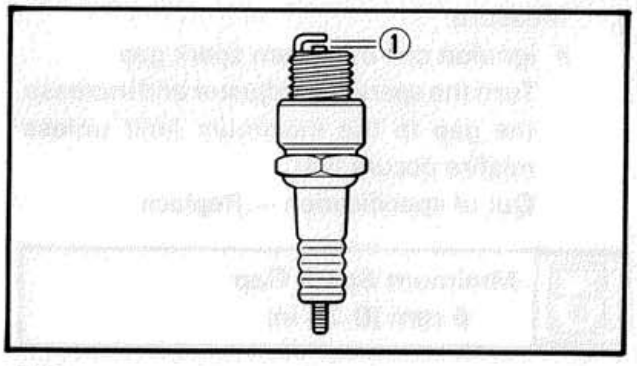
NOTE:
Clean and inspect spark plugs every 3,000 km (2,000 mi).

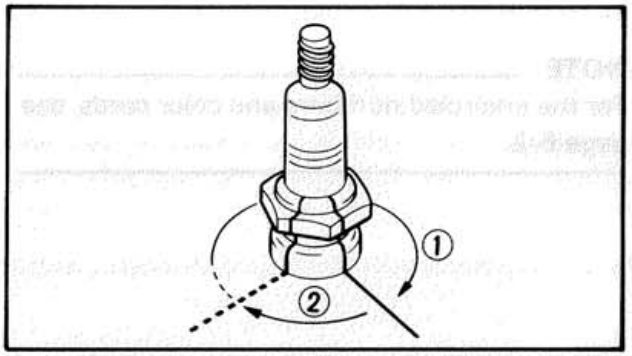
CAUTION:
Be sure to use plugs of:
- Proper type

BP8ES (NGK)
W24EP-U (NIPPONDENSO)

- Proper gap

Electrode Gap ① :
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

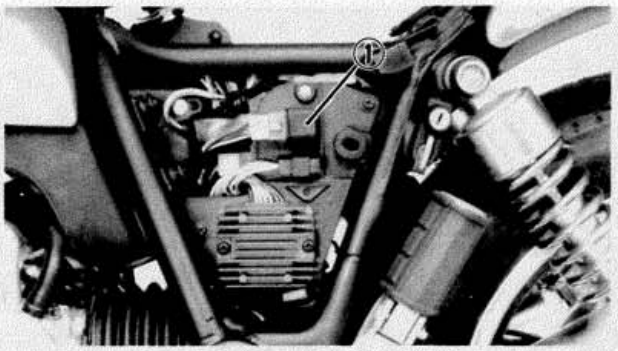




2. Install:
   - Spark plug

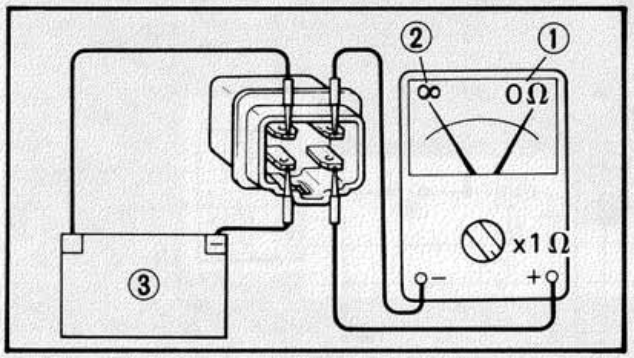
20 Nm (2.0 m·kg, 14 ft·lb)

① Finger tighten
② Plug wrench tighten



SIDESTAND RELAY

1. Remove:
   - Left side cover
   - Sidestand relay ①



2. Check:
   - Relay contacts
     Use 12V battery ③ and Pocket Tester (YU-03112).
     Out of specification → Replace relay.

Battery Connected: ∞ ②
Battery disconnected: 0Ω ①

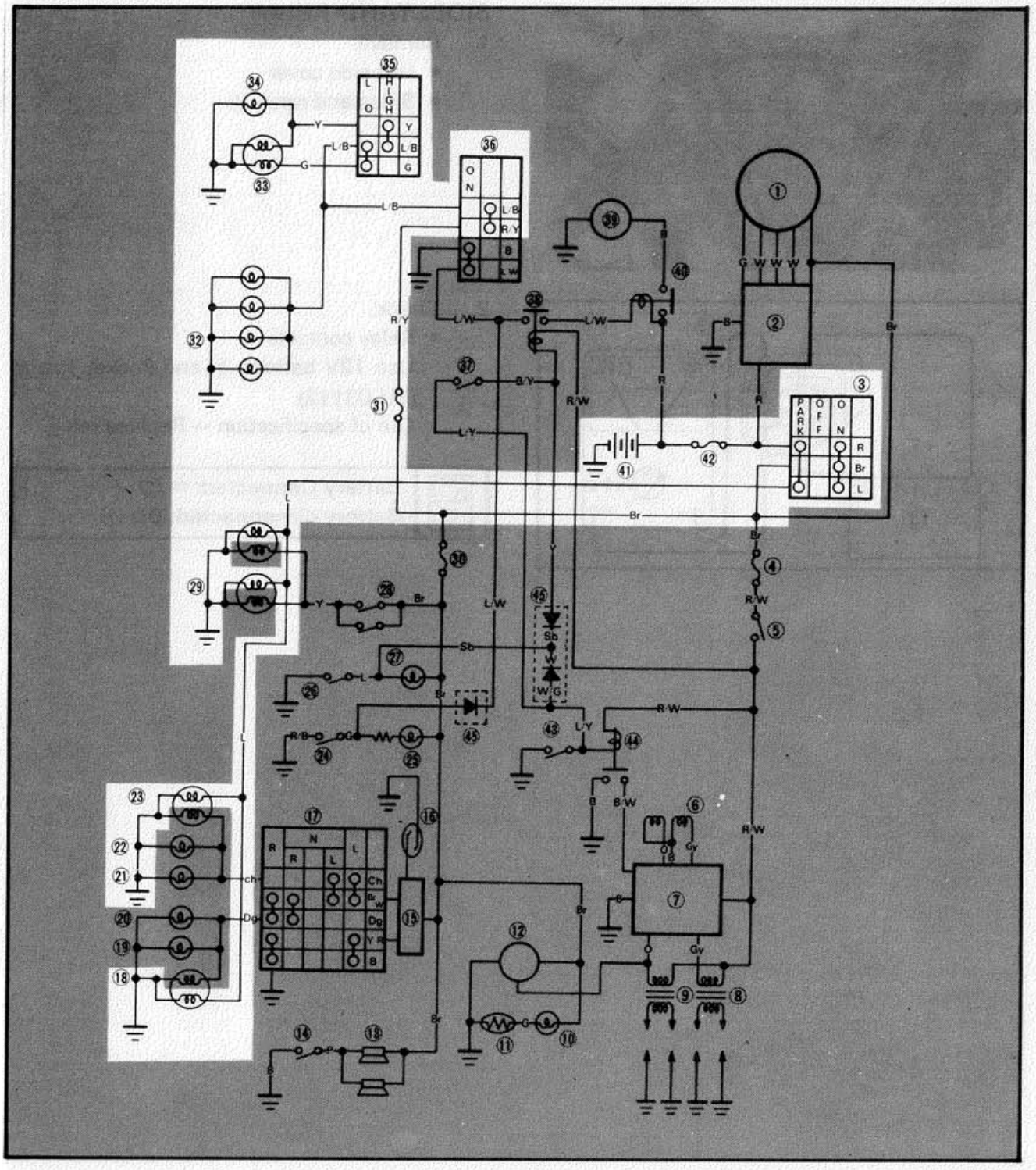
LIGHTING SYSTEM

CIRCUIT DIAGRAM

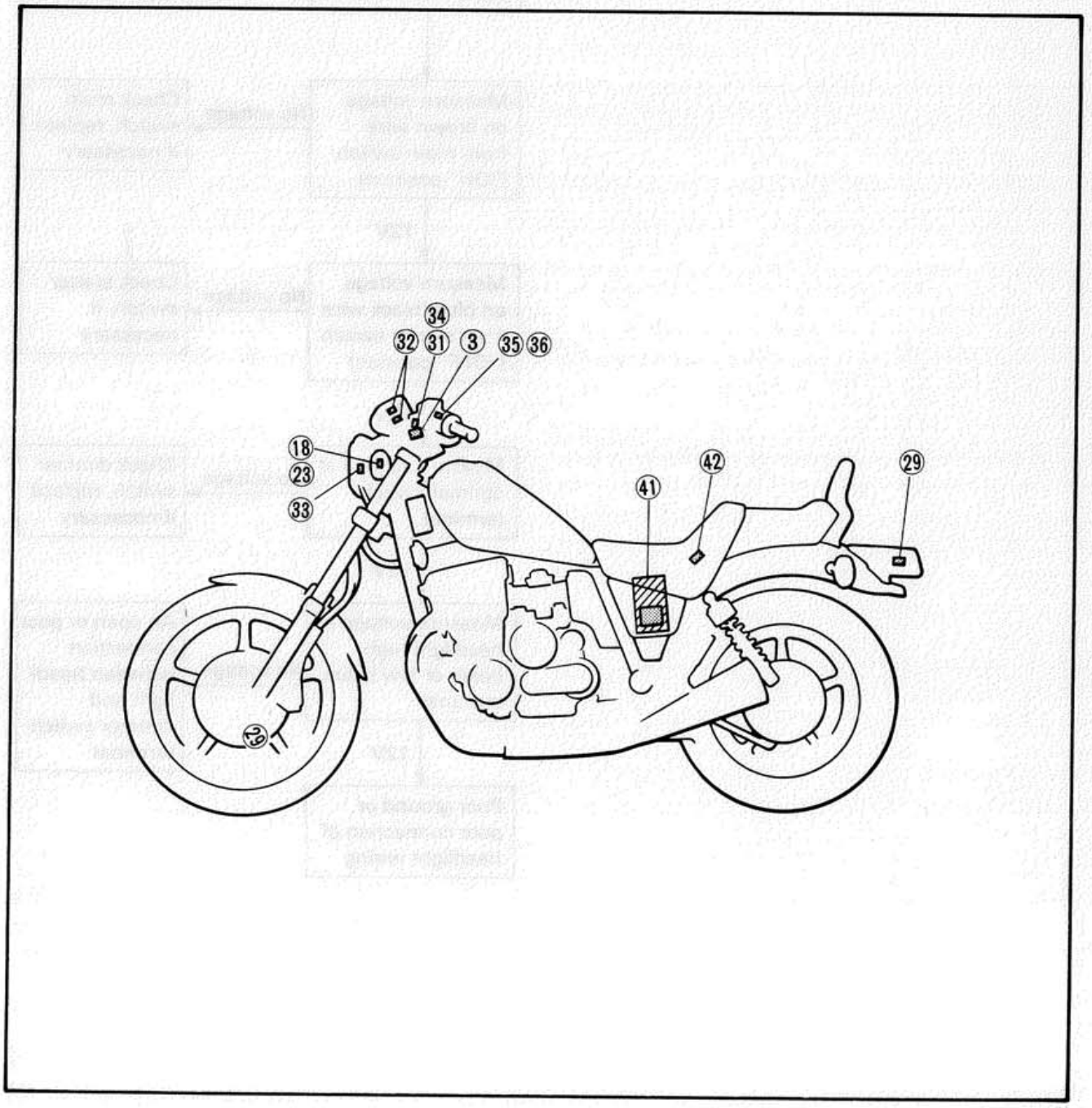
Below circuit diagram shows lighting circuit in wiring diagram.

NOTE:

For the encircled numbers and color cords, see page 6-2.



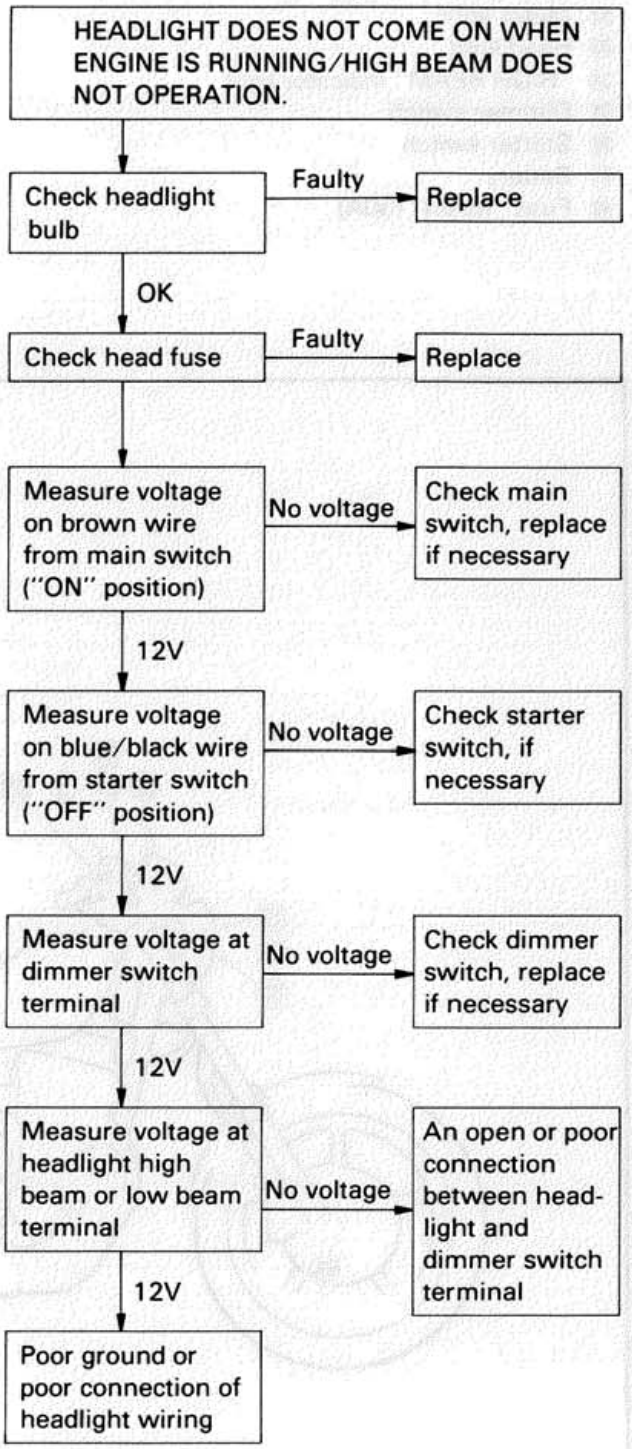
③ Main switch
⑱ Flasher light (Front, Right)
㉓ Flasher light (Front, Left)
㉙ Tail/Brake light
㉛ Fuse "HEAD" (15A)
㉜ Meter light
㉝ Head light
㉞ "HIGH BEAM" indicator light
㉟ Dimmer switch
㊱ Starter switch
㊶ Battery
㊷ Fuse "MAIN" (30A)



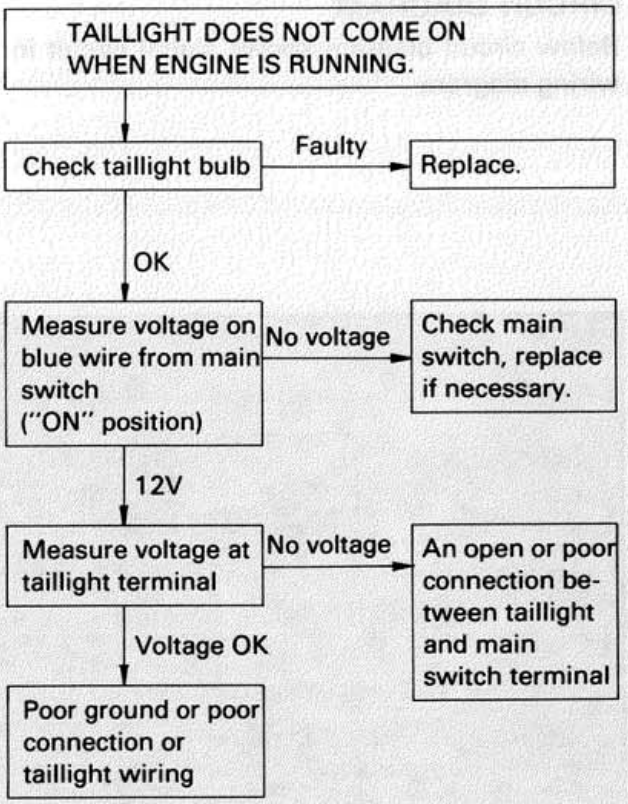
LIGHTING SYSTEM

TESTS AND CHECKS

Headlight Troubleshooting



Taillight Troubleshooting



Meter Light and High Beam Indicator Light

1. Check:
   - Bulb
     Faulty → Replace.
   - Headlight fuse
     Faulty → Replace.

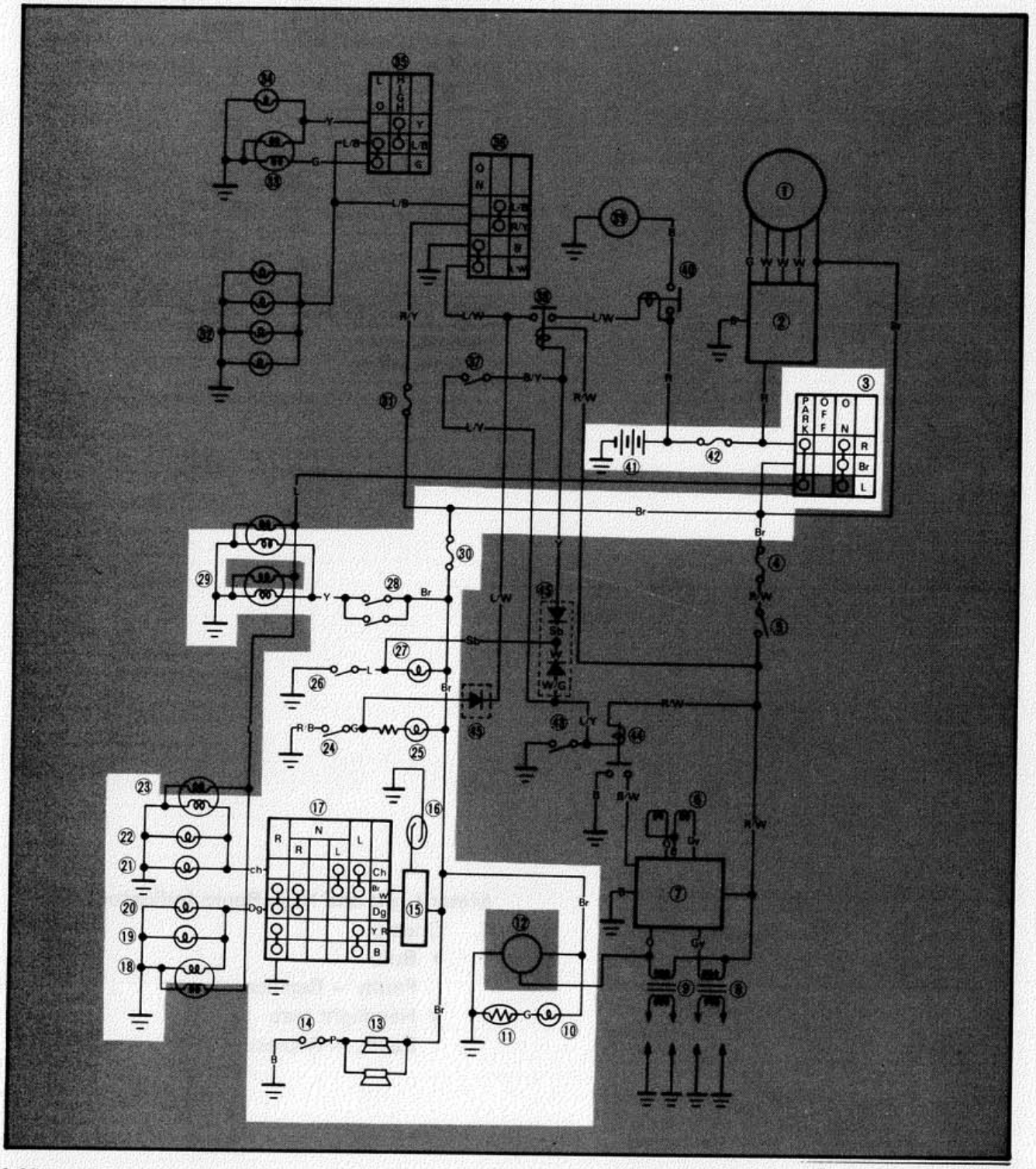
SIGNAL SYSTEM

CIRCUIT DIAGRAM

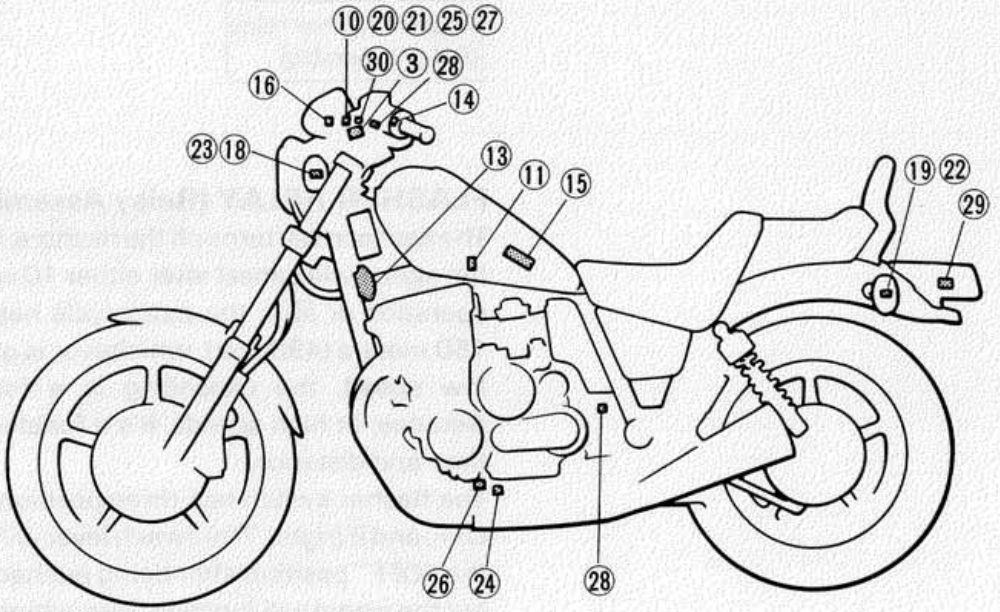
Below circuit diagram shows signal circuit in wiring diagram.

NOTE:

For the encircled numbers and color cords, see page 6-2.



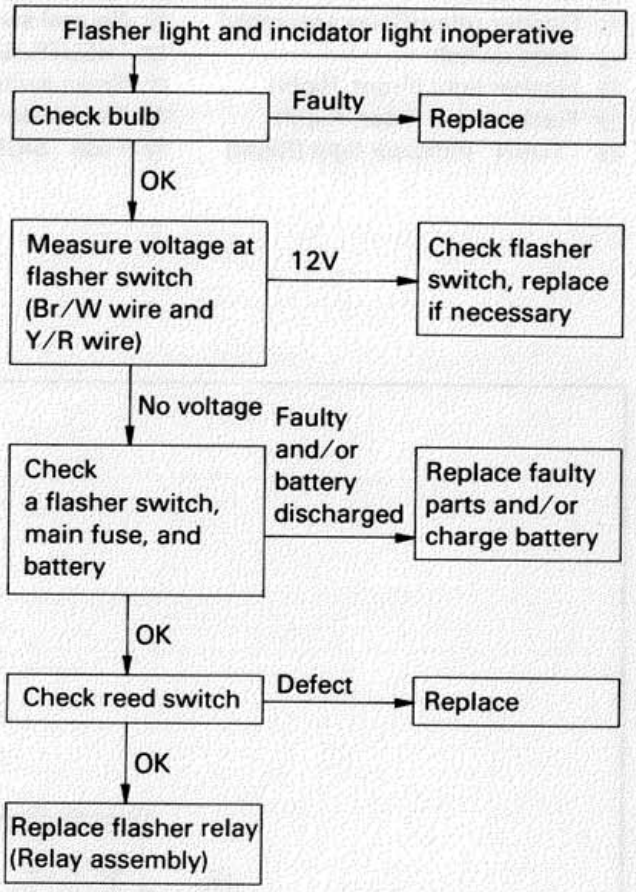
③ Main switch
⑩ "FUEL" indicator light
⑪ Fuel sender
⑬ Horn
⑭ Horn switch
⑮ Flasher relay (Relay assembly)
⑯ Reed switch
⑱ Flasher light (Front, Right)
⑲ Flasher light (Rear, Right)
⑳ "TURN" indicator light (Right)
㉑ "TURN" indicator light (Left)
㉒ Flasher light (Rear, Left)
㉓ Flasher light (Front, Left)
㉔ Oil level switch
㉕ "OIL" indicator light
㉖ Neutral switch
㉗ "NEUTRAL" indicator light
㉘ Brake switch
㉙ Tail/Brake light
㉚ Fuse "SIGNAL" (15A)



SIGNAL SYSTEM

FLASHER LIGHT

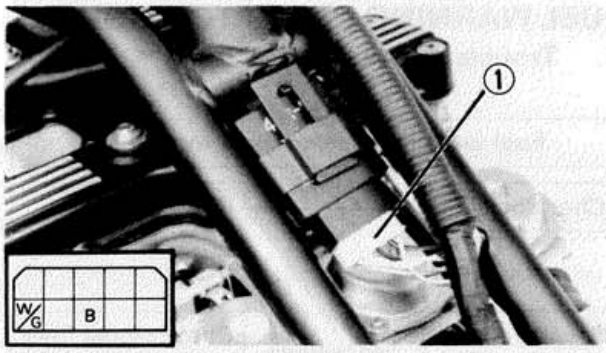
Troubleshooting



FLASHER RELAY (Relay Assembly)

The flasher relay turns off the flashers. Generally the signal will cancel after either 10 seconds of operation or after the motorcycle has traveled 150 meters (490 feet), whichever is greater. At low speed, the cancelling is a function of distance; at high speeds, it's a function of both time and distance.

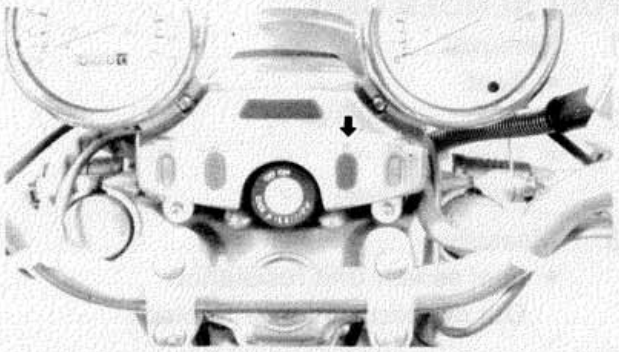
The flasher switch has three positions: L (left), OFF, and R (right). The switch lever will return to the "OFF" position after being pushed to L or R, but the signal will function. By pushing the lever in, the signal may be cancelled manually.



REED SWITCH

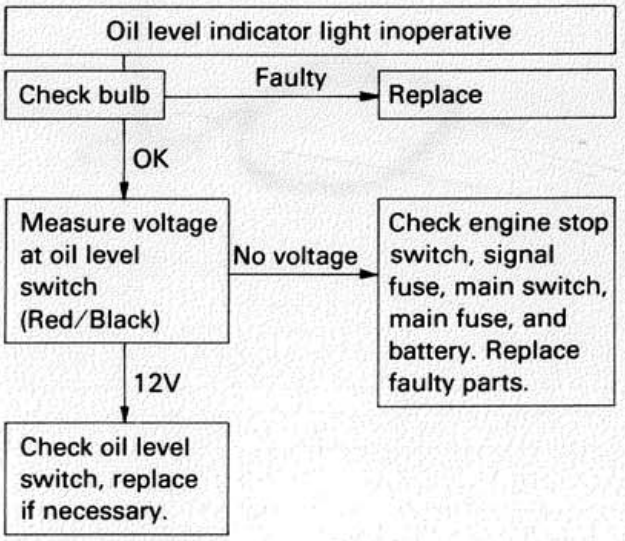
1. Remove:
   - Seat
2. Disconnect:
   - Relay assembly coupler ①
3. Connect:
   - Pocket tester
   - Reed switch lead (White/Green—Black)
4. Lift the front wheel an rotate the wheel by hand.
5. Measure:
   - Reed switch resistance
     Out of specification → Replace.

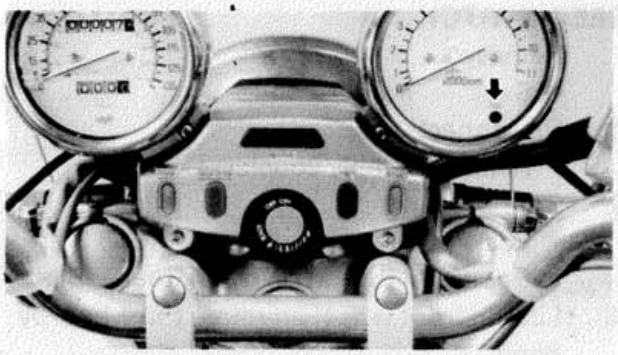
Reed Switch Resistance:
About 7Ω
Then return back 0Ω or ∞Ω
when wheel is stopped
(White/Green — Black)



OIL LEVEL INDICATOR LIGHT

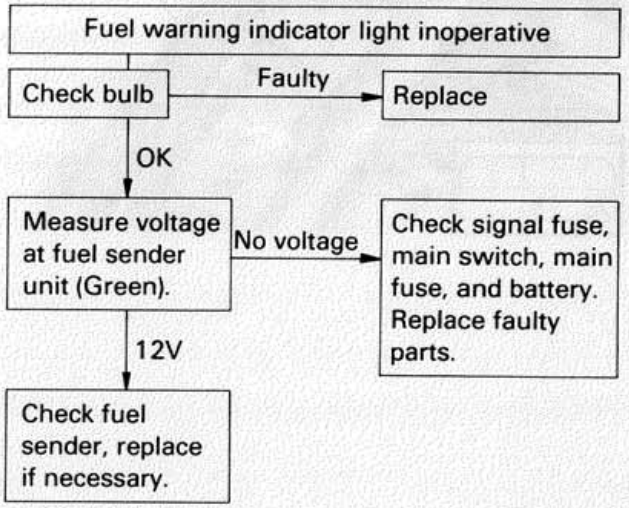
1. Troubleshooting

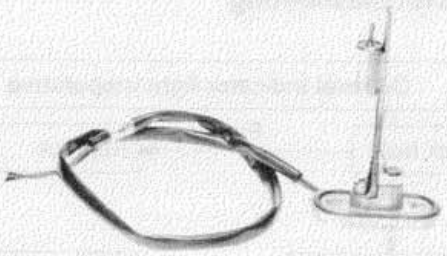




FUEL WARNING INDICATOR LIGHT

1. Troubleshooting

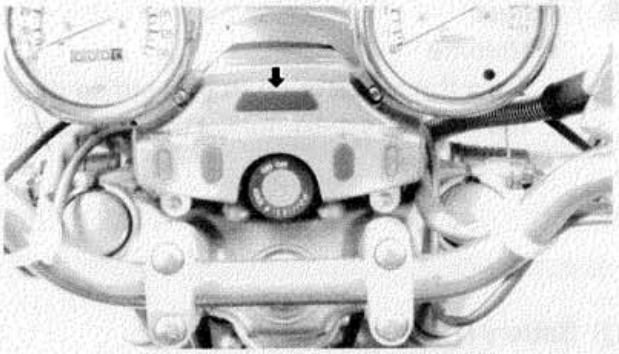


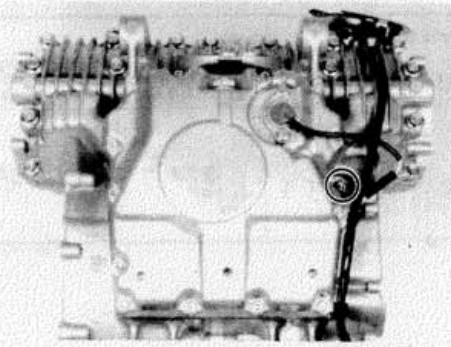


FUEL SENDER UNIT

1. Remove:
   - Seat
2. Fill:
   - Fuel tank
     (with gasoline)
3. Measure:
   - Fuel sender unit resistance.
     Out of specification → Replace.

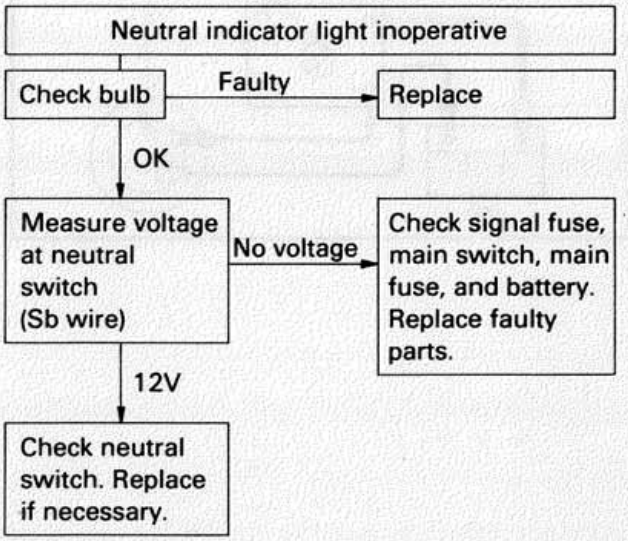
Fuel Sender Unit Resistance:
1.1 ± 0.2 kΩ at 20°C (68°F)





NEUTRAL INDICATOR LIGHT

1. Troubleshooting



HORN

1. Check:

Check for:	Horn inoperative
	12V on brown wire to horn
	Good ground (horn/pink wire) when horn button is pressed
	Faulty fuse

Defective components → Replace.

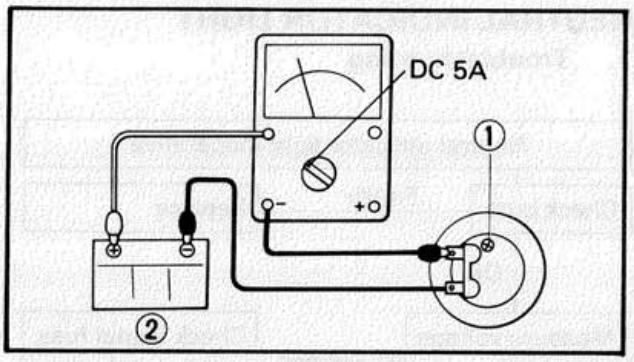
NOTE:

There are individual fuses for various circuits (See Complete Circuit Diagram)

2. Measure:
   - Horn resistance

   Out of specification → Replace.

Tester's lead wire		Standard resistance	Tester's range
Red lead	Black lead		
Brown lead	Pink lead	1.05Ω ± 10%	R × 1



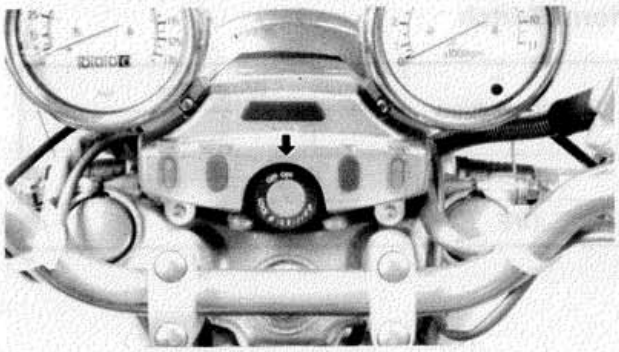
3. Adjust:
   - Volume
     Turn the adjuster ① in and out so that the volume is maximum at the maximum amperage.

② Battery (12V)

Tester's lead wire		Maximum Amperage	Tester's range
Red lead	Black lead		
Battery (+) lead	Horn lead and Battery (−) lead	2.5A	DC 5A

BRAKE LIGHT

Check for:	Brake light inoperative
	Defective bulb
	12V on yellow wire to brake light
	12V on brown wire to each brake light switch (Front and rear brake switch)

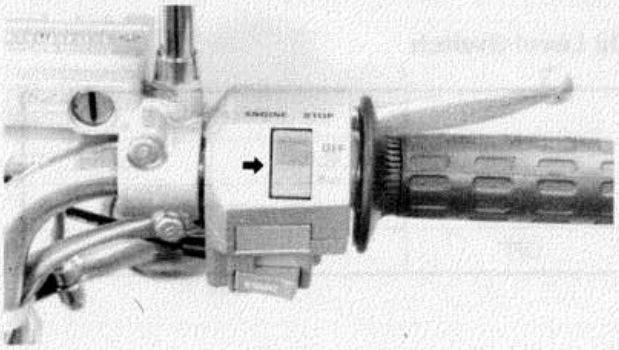


SWITCHES

Use Pocket Tester (YU-03117) on "Ohm × 1" scale to check the switches.
Replace any "shorted" or opened element.

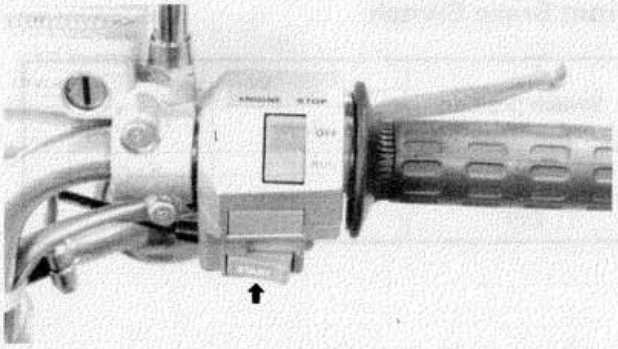
Main Switch

Switch position	Wire color		
	R	Br	L
ON	○	○	○
OFF	○		
P	○		○



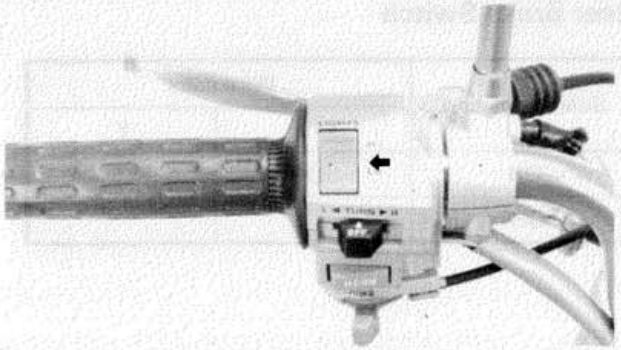
Engine Stop Switch

Switch position	Wire color	
	R/W	R/W
RUN	○	○
OFF		



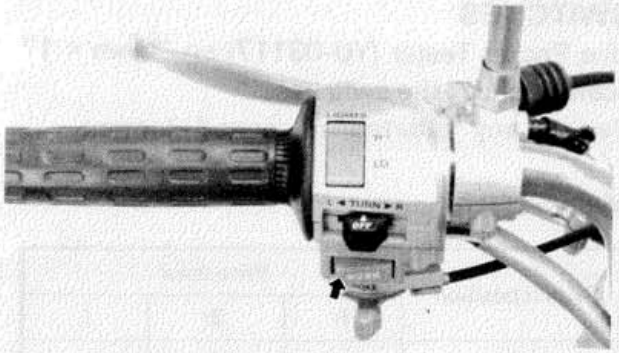
Starter Switch

Switch position	Wire color			
	L/W	B	R/Y	L/B
OFF			○	○
ON	○	○		



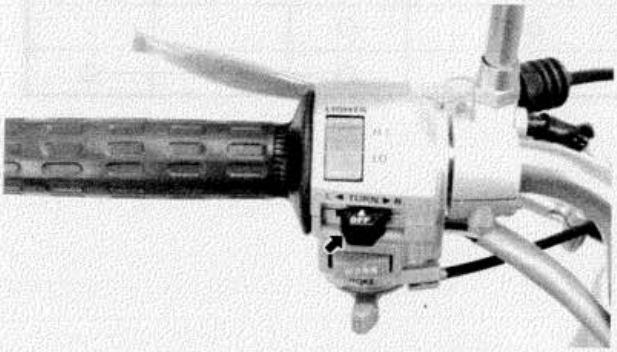
Headlight (dimmer) Switch

Switch position	Wire color		
	Y	L/B	G
HI	○	○	
LO		○	○



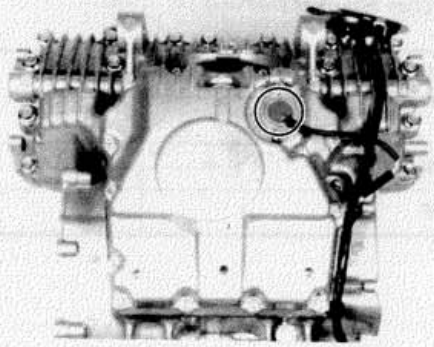
Horn Switch

Switch position	Wire color	
	P	Ground or B
PUSH	○——	——○
OFF		



Flasher Switch

Switch position		Wire color				
		Dg	Br/W	Ch	Y/R	B
R		○——	——○		○——	——○
N	R	○——	——○			
	N					
	L		○——	——○		
L			○——	——○	○——	——○

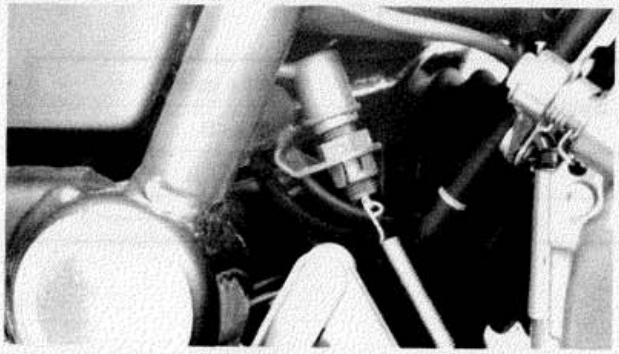


Oil Level Switch

Switch position	Wire color	
	B/W	Ground
ON	○——	——○
OFF		

Front Brake Switch

Switch position	Wire color	
	Br	G/Y
ON	○——	——○
OFF		



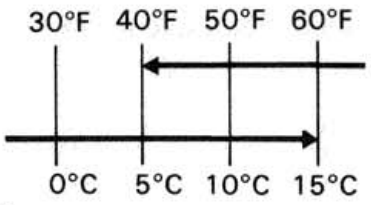
Rear Brake Switch

Switch position	Wire color	
	Y	Y
ON	○——	——○
OFF		

GENERAL SPECIFICATIONS

SPECIFICATIONS

GENERAL SPECIFICATIONS

Item \ Model	XJ700N/NC	
Model:	XJ700N	XJ700NC
Model Code Number	1FG	1JJ
Federal V.I.N. Number	JYA1FG00*FA000101	JYA1JJ00*FA000101
Engine Starting Number	1FG-000101	1JJ-000101
Dimensions:		
Overall Length	2,235 mm (88.0 in)	
Overall Width	775 mm (30.5 in)	
Overall Height	1,160 mm (45.7 in)	
Seat Height	750 mm (29.5 in)	
Wheelbase	1,520 mm (59.8 in)	
Minimum Ground Clearance	145 mm (5.7 in)	
Basic Weight:		
With Oil and Full Fuel Tank	224 kg (494 lb)	
Minimum Turning Radius:	2,800 mm (110.2 in)	
Engine:		
Engine Type	Air cooled 4-stroke, gasoline, DOHC	
Cylinder Arrangement	4-cylinder parallel	
Displacement	696 cm^3 (42.47 cu.in)	
Bore × Stroke	65.0 × 52.4 mm (2.559 × 2.063 in)	
Compression Ratio	9.5 : 1	
Compression Pressure	1,078 kPa (11 kg/cm^2, 156 psi) at 300 r/min	
Starting System	Electric starter	
Lubrication System:	Pressure lubricated, wet sump	
Oil Type or Grade:		
Engine Oil	 Yamalube 4-cycle oil or SAE 20W40 type SE motor oil (If temperature does not go below 5°C (40°F).) SAE 10W30 type SE motor oil (If temperature does not go above 15°C (60°F).)	
Final Gear Oil	SAE 80 API "GL-4" Hypoid gear oil	
Oil Capacity:		
Engine Oil:		
Periodic Oil Change	2.5 L (3.20 Imp qt, 2.64 US qt)	
With Oil Filter Replacement	2.8 L (2.46 Imp qt, 2.96 US qt)	
Total Amount	3.5 L (3.08 Imp qt, 3.70 US qt)	
Final Gear Case Oil Amount	0.2 L (0.18 Imp qt, 0.22 US qt)	
Air Filter:	Dry type element	
Fuel:		
Type	Regular gasoline	
Tank Capacity	13 L (2.86 Imp gal, 3.43 US gal)	
Reserve Amount	3.0 L (0.66 Imp gal, 0.79 US gal)	
Carburetor:		
Type	HSC33 × 4, Constant velocity	
Manufacturer	HITACHI	

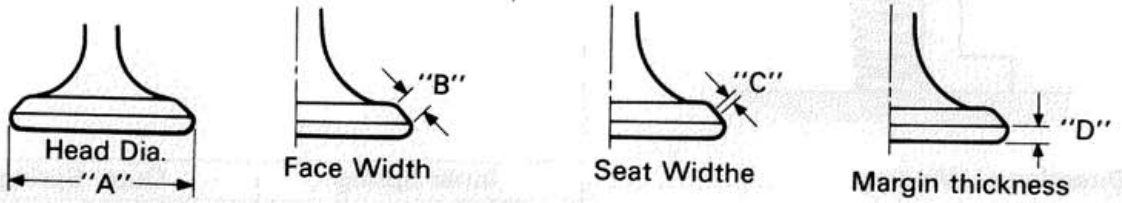
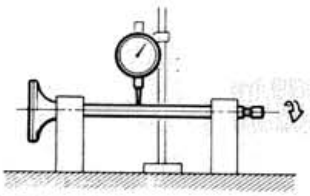
Item \ Model	XJ700N/NC	
Spark Plug:		
Type/Manufacturer	BP8ES/NGK or W24EP-U/NIPPONDENSO	
Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)	
Clutch Type:	Wet, multiple-disc	
Transmission:		
Primary Reduction System	Spur gear	
Primary Reduction Ratio	97/58 (1.672)	
Secondary Reduction System	Shaft drive	
Secondary Reduction Ratio	49/36 × 19/18 × 32/11 (4.179)	
Transmission Type	Constant- mesh, 5-speed	
Operation	Left foot operation	
Gear Ratio 1st	35/16 (2.188)	
2nd	30/20 (1.500)	
3rd	30/26 (1.154)	
4th	28/30 (0.933)	
5th	26/32 (0.813)	
Chassis:		
Frame Type	Tubular steel, double cradle	
Caster Angle	31.5°	
Trail	120 mm (4.72 in)	
Tire:		
Type	Tubeless	
Size (F)	100/90-19 57H	
Size (R)	130/90-16 67H	
Tire Pressurer (Cold Tire):	FRONT	REAR
Up to 90 kg (198 lb) load*	177 kPa (1.8 kg/cm², 26 psi)	196 kPa (2,0 kg/cm², 28 psi)
90 kg (198 lb) load~246 kg (542 lb) load*	196 kPa (2.0 kg/cm², 28 psi)	274 kPa (2.8 kg/cm², 40 psi)
High Speed Riding	206 kPa (2.1 kg/cm², 30 psi)	226 kPa (2.3 kg/cm², 32 psi)
	*Load is the total weight of cargo, rider, passenger, and accessories.	
Brake:		
Front Brake Type	Dual disc brake	
Operation	Right hand operation	
Rear Brake Type	Drum brake	
Operation	Right foot operation	
Suspension:		
Front Suspension	Telescopic fork	
Rear Suspension	Swingarm	
Shock Absorber:		
Front Shock Absorber	Coil spring, oil damper	
Rear Shock Absorber	Coil spring, oil damper	
Wheel Travel:		
Front Wheel Travel	150 mm (5.9 in)	
Rear Wheel Travel	99 m m(3.9 in)	
Electrical:		
Ignition System	T.C.I.	
Generator System	A.C. Generator	
Battery Type or Model	YB14L	
Battery Capacity	12V 14AH	

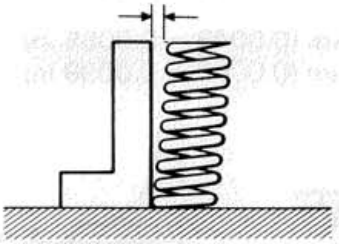
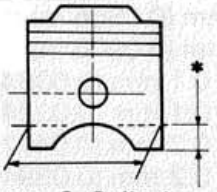
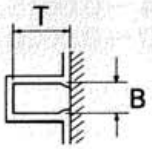
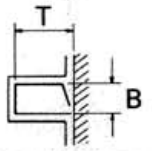
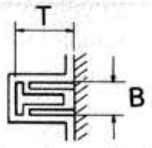
Item \ Model	XJ700N/NC
Headlight Type:	Semi-sealed beam, (Quartz bulb)
Bulb Wattage/Quantity:	
Headlight	60W/55W
Tail/Brake Light	8W/27W × 2
Flasher Light	27W × 4
Indicator Light:	
Meter Light	3W × 4
Wattage/Quantity: "NEUTRAL"	3W × 1
"HIGH BEAM"	3W × 1
"TURN"	3W × 2
"OIL LEVEL"	3W × 1
"FUEL LEVEL"	3W × 1

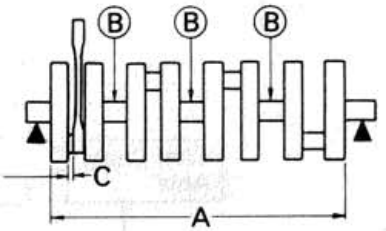
MAINTENANCE SPECIFICATIONS

ENGINE

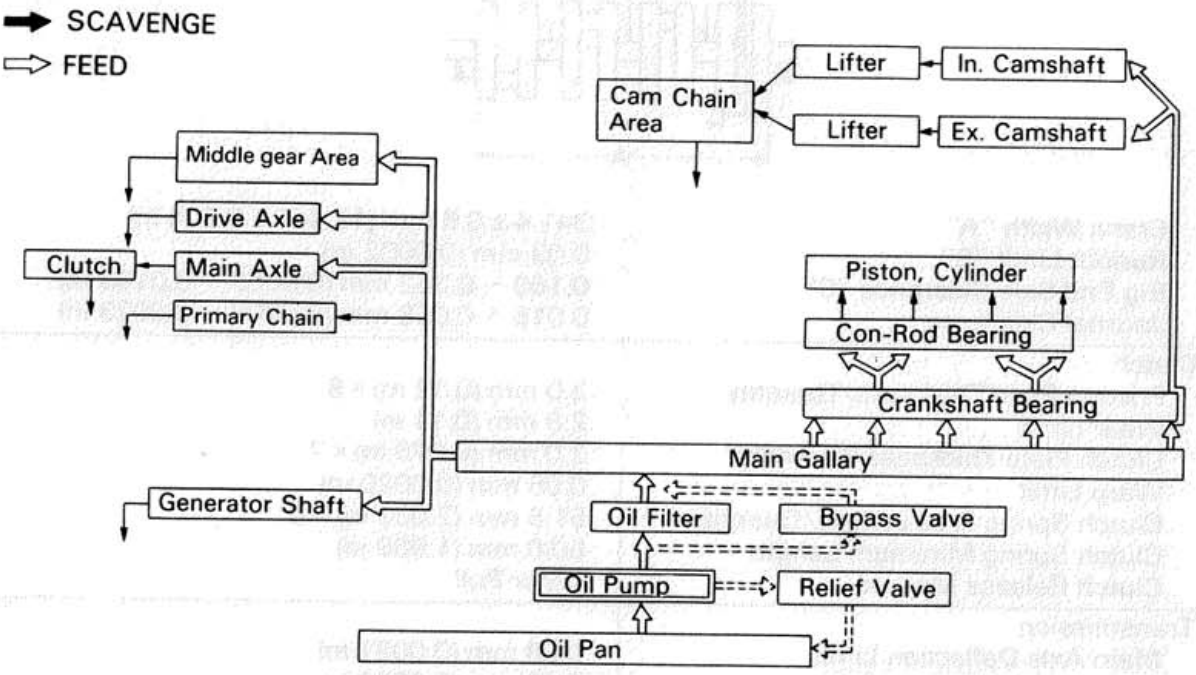
Item \ Model	XJ700N/NC
Cylinder Head:	
Warp Limit	0.03 mm (0.001 in) *Lines indicate straightedge measurement.
Cylinder:	
Bore Size	65.0 mm (2.559 in)
Taper Limit	0.05 mm (0.002 in)
Out-of Round Limit	0.01 mm (0.0004 in)
Camshaft:	
Drive Method	Chain drive (Center)
Cam Cap Inside Diameter	$25^{+0.021}_{0}$ mm ($0.9448^{+0.0008}_{0}$ in)
Camshaft Outside Diameter	$25^{-0.020}_{-0.033}$ mm ($0.9448^{-0.0008}_{-0.0013}$ in)
Shaft to Cap Clearance	0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)
Cam Dimensions:	
Intake "A"	36.80 mm (1.449 in)
<Limit>	36.65 mm (1.443 in)
"B"	28.10 mm (1.106 in)
<Limit>	27.85 mm (1.096 in)
"C"	8.80 mm (0.346 in)
Exhaust "A"	36.30 mm (1.429 in)
<Limit>	35.65 mm (1.404 in)
"B"	28.06 mm (1.105 in)
<Limit>	27.85 mm (1.096 in)
"C"	8.3 mm (0.327 in)

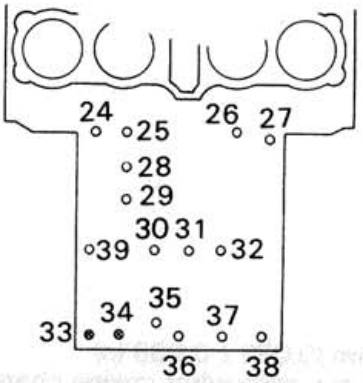
Item \ Model	XJ700N/NC
Camshaft Runout Limit	0.06 mm (0.0024 in)
Cam Chain Type/Number of Links	Bush chain/120
Cam Chain Adjustment Method	Automatic
Valve, Valve Seat, Valve Guide:	
Valve Clearance (Cold) IN.	0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in)
EX.	0.16 ~ 0.20 mm (0.0063 ~ 0.0099 in)
Valve Dimensions	
	
"A" Head Dia. IN.	34 ± 0.1 mm (1.339 ± 0.004 in)
EX.	28 ± 0.1 mm (0.1024 ± 0.004 in)
"B" Face Width IN.	2.3 mm (0.0906 in)
EX.	2.3 mm (0.0906 in)
"C" Seat Width IN.	1.0 ± 0.1 mm (0.0394 ± 0.004 in)
EX.	1.0 ± 0.1 mm (0.0394 ± 0.004 in)
"D" Margin Thickness Limit IN.	1.2 ± 0.2 mm (0.0472 ± 0.008 in)
EX.	1.0 ± 0.2 mm (0.0394 ± 0.008 in)
Stem Outside Diameter IN.	$7^{-0.010}_{-0.025}$ mm ($0.2756^{-0.0004}_{-0.0010}$ in)
EX.	$7^{-0.025}_{-0.040}$ mm ($0.2756^{-0.0010}_{-0.0016}$ in)
Guide Inside Diameter IN.	$7^{+0.012}_{0}$ mm ($0.2756^{+0.0005}_{0}$ in)
EX.	$7^{+0.012}_{0}$ mm ($0.2756^{+0.0005}_{0}$ in)
Stem-to Guide Clearance IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)
EX.	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)
Stem Runout Limit	0.03 mm (0.001 in)
	
Valve Spring:	
Free Length	
Inner Spring IN.	35.9 mm (1.413 in)
EX.	35.9 mm (1.413 in)
Outer Spring IN.	39.5 mm (1.555 in)
EX.	39.5 mm (1.555 in)
Installed Length (Valve Closed)	
Inner Spring IN.	31.0 mm (1.220 in)
EX.	31.0 mm (1.220 in)
Outer Spring IN.	34.0 mm (1.339 in)
EX.	34.0 mm (1.339 in)

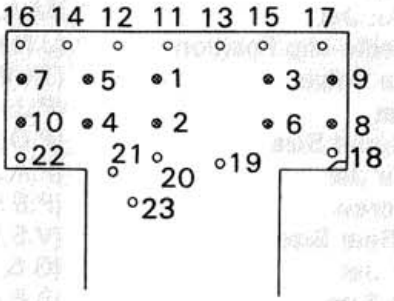
Item	Model	XJ700N/NC
Tilt Limit		
Inner Spring	IN. & EX.	2.5°, 1.6 mm (0.063 in)
Outer Spring	IN. & EX.	2.5°, 1.6 mm (0.063 in)
		
Direction of Winding		Inner Spring: IN Left, EX Left; Outer Spring: IN Right, EX Right
Piston:		
Piston Size/ Measuring Point* 		$65.00^{-0.030}_{-0.045}$ mm ($2.5591^{-0.0012}_{-0.0018}$ in) 7.5 mm (0.295 in) (From bottom line of piston skirt)
Clearance Between Piston & Cylinder		0.030 ~ 0.050 mm (0.0012 ~ 0.0020 in)
	<Limit>	0.1 mm (0.004 in)
Oversize:	2nd	65.50 mm (2.58 in)
	4th	66.00 mm (2.60 in)
Piston Ring:		
Sectional Sketch	Top Ring	Barrel B = 1.0 mm (0.039 in) T = 2.6 mm (0.102 in)
	2nd Ring	Taper B = 1.0 mm (0.039 in) T = 2.6 mm (0.102 in)
	Oil Ring	Expander B = 2.5 mm (0.098 in) T = 2.8 mm (0.110 in)
		
End Gap (Installed):	Top Ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in)
	<Limit>	1.0 mm (0.039 in)
	2nd Ring	0.15 ~ 0.30 mm (0.0059 ~ 0.0118 in)
	<Limit>	1.0 mm (0.039 in)
	Oil Ring	0.2 ~ 0.7 mm (0.008 ~ 0.028 in)
	<Limit>	1.5 mm (0.059 in)
Side Clearance:	Top Ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
	<Limit>	0.15 mm (0.0059 in)
	2nd Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)
	<Limit>	0.15 mm (0.0059 in)
	Oil Ring	0 mm (0 in)

Item \ Model	XJ700N/NC
Connecting Rod:	
Oil Clearance	0.016 ~ 0.058 mm (0.0006 ~ 0.0023 in)
Color Code (Corresponding Size)	1. Blue: $1.5^{+0.006}_{+0.002}$ mm ($0.0591^{+0.00024}_{+0.00007}$ in)
	2. Black: $1.5^{+0.002}_{-0.002}$ mm ($0.0591^{+0.00007}_{-0.00007}$ in)
	3. Brown: $1.5^{-0.002}_{-0.006}$ mm ($0.0591^{-0.00007}_{-0.00024}$ in)
	4. Green: $1.5^{-0.006}_{-0.010}$ mm ($0.0591^{-0.00024}_{-0.00039}$ in)
Crankshaft:	
	
Crank Width "A"	341.4 ± 0.6 mm (13.441 ± 0.024 in)
Runout Limit "B"	0.03 mm (0.0002 in)
Big End Side Clearance "C"	0.160 ~ 0.262 mm (0.0063 ~ 0.0103 in)
Journal Clearance	0.016 ~ 0.058 mm (0.0006 ~ 0.0023 in)
Clutch:	
Friction Plate Thickness/Quantity	3.0 mm (0.12 in) × 8
Wear Limit	2.8 mm (0.11 in)
Clutch Plate Thickness/Quantity	2.0 mm (0.079 in) × 7
Warp Limit	0.05 mm (0.0020 in)
Clutch Spring Free Length/Quantity	51.6 mm (2.031 in) × 6
Clutch Spring Minimum Length	50.0 mm (1.969 in)
Clutch Release Method	Outer Pull
Transmission:	
Main Axle Deflection Limit	0.08 mm (0.0031 in)
Drive Axle Deflection Limit	0.08 mm (0.0031 in)
Shifter:	
Shifter Type	Guide bar
Carburetor:	
Type/Manufacturer/Quantity	HSC33/HITACHI/4
I.D. Mark	1FG-00 (XJ700N) 1JJ-00 (XJ700NC)
Main Jet (M.J.)	# 107
Main Air Jet (M.A.J.)	# 70
Jet Needle-clip Position (J.N.)	Y-20
Throttle Valve (Th.V.)	12.5°
Pilot Jet (P.J.)	# 36.5
Pilot Outlet Size (P.O.)	ϕ0.9
Pilot Air Jet (P.A.J.)	# 210
Pilot Screw (P.S.)	Preset
Valve Seat Size (V.S.)	ϕ2.0
Starter Jet (G.S.)	# 36
Bypath Size (B.P.)	ϕ0.9
Fuel Level (F.L.)	1.0 ± 1.0 mm (0.039 ± 0.039 in) below from the carburetor mixing chamber body edge.

Item \ Model	XJ700N/NC
Engine Idling Speed	1.050 ± 50 r/min
Vacuum Pressure at Idling Speed	24.7 ± 1.3 kPa (180 ± 5 mmHg, 7.09 ± 0.2 inHg)
Vacuum Synchronous Difference	Below 10 kPa (5 mmHg, 0.2 inHg)
Lubrication System:	
Oil Filter Type	Paper
Oil Pump Type	Trochoid pump
Tip Clearance	0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in)
Side Clearance	0.03 ~ 0.08 mm (0.0012 ~ 0.0031 in)
Bypass Valve Setting Pressure	98.0 ± 20 kPa (1.0 ± 0.2 kg/cm², 14.2 ± 2.8 psi)
Relief Valve Operating Pressure	490 ± 49 kPa (5.0 ± 0.5 kg/cm², 71 ± 7.1 psi)
Lubrication Chart	
Middle Gear Backlash:	0.1 ~ 0.2 mm (0.004 ~ 0.008 in)
Final Gear Backlash:	0.1 ~ 0.2 mm (0.004 ~ 0.008 in)
Crankcase Tightening Sequence:	
Upper case	Lower case





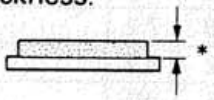


⊗ 8 mm bolt
○ 6 mm bolt

Tightening torque

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m-kg	ft-lb	
Cylinder head	Nut	M10 P1.25	12	35	3.5	25	E
	Nut	M8 P1.25	2	20	2.0	14	
	Nut	M6 P1.0	4	10	1.0	7.2	
Cylinder head cover	Bolt	M6 P1.0	12	10	1.0	7.2	
Spark plug	—	M14 P1.25	4	20	2.0	14	
Cylinder	Nut	M8 P1.25	1	10	1.0	7.2	Cam chain case Front & Rear
Y.I.C.S. Plug	Plug	M12 P1.25	2	22	2.2	16	
Cam shaft cap	Bolt	M6 P1.0	24	10	1.0	7.2	Tighten in 3-stages.
Cam sprocket	Bolt	M7 P1.0	4	20	2.0	14	
Cam chain tensioner body	Bolt	M6 P1.0	2	12	1.2	8.7	
Cam chain tensioner end plug	Bolt	M8 P1.25	1	9	0.9	6.5	
Cam chain guide stopper	Bolt	M8 P1.25	1	3	0.3	2.2	
	Nut	M10 P1.25	1	15	1.5	11	
Connecting rod	Nut	M7 P0.75	8	25	2.5	18	M
Drain plug	Bolt	M14 P1.5	1	43	4.3	31	
		M8 P1.25	1	16	1.6	17	Middle gear case drain
Oil filter	Bolt	M20 P1.5	1	15	1.5	11	
Oil pump	Bolt	M6 P1.0	3	12	1.2	8.7	
Pump cover	Screw	M6 P1.0	4	7	0.7	5.1	
Oil pan	Bolt	M6 P1.0	13	12	1.2	8.7	
Crankcase	Flange bolt	M8 P1.25	19	24	2.4	17	E
		M6 P1.0	20	12	1.2	8.7	
Main gallary plug	Plug	M20 P1.5	2	12	1.2	8.7	
Clutch cable holder	Bolt	M6 P1.0	2	12	1.2	8.7	
Clutch cover	Bolt	M6 P1.0	10	12	1.2	8.7	
Clutch boss	Nut	M20 P1.0	1	70	7.0	50	
Clutch spring screw	Bolt	M6 P1.0	5	8	0.8	5.8	
Shift pedal	Bolt	M6 P1.0	1	8	0.8	5.8	
Stopper plate	Bolt	M6 P1.0	2	8	0.8	5.8	Shift cam„ Starter idle gear
Neutral switch	—	M10 P1.25	1	20	2.0	14	
Exhaust pipe	Nut	M6 P1.0	8	10	1.0	7.2	
Generator cover	Bolt	M6 P1.0	3	12	1.2	8.7	
Generator (rotor)	Bolt	M10 P1.25	1	55	5.5	40	
Generator bearing housing	Screw	M6 P1.0	3	10	1.0	7.2	
Pickup base	Screw	M6 P1.0	2	8	0.8	5.8	
Timing plate	Bolt	M8 P1.25	1	24	2.4	17	
Starter motor	Bolt	M6 P1.0	2	7	0.7	5.1	Apply liquid gasket
Middle gear:							
Drive shaft bearing	Nut	M36 P1.5	1	110	11	80	Stake
Driven shaft bearing	Nut	M65 P1.5	1	110	11	80	
Drive shaft bearing retainer	TORX screw	M8 P1.25	4	25	2.5	18	Stake
Flange	UBS nut	M14 P1.5	1	90	9.0	65	O Stake
Driven-gear housing	Bolt	M8 P1.25	4	25	2.5	18	O

CHASSIS

Item \ Model		XJ700N/NC
Steering System:		
Steering Bearing Type		Taper Roller Bearing
Front Suspension:		
Front Fork Travel		150 mm (5.9 in)
Fork Spring Free Length		521 mm (20.51 in)
Spring Rate/Stroke		K_1 = 3.7 N/mm (0.38 kg/mm, 21.3 lb/in) 0 ~ 100 mm (0 ~ 3.94 in) K_2 = 5.4 N/mm (0.55 kg/mm, 30.8 lb/in) 100 ~ 150 mm (3.94 ~ 5.90 in)
Optional Spring		No
Oil Capacity		383 cm³ (13.51 Imp oz, 12.95 US oz)
Oil Grade		YAMAHA Fork & Shock Oil 10wt or equivalent fork oil
Rear Suspension:		
Shock Absorber Travel		70 mm (2.76 in)
Spring Free Length		243.5 mm (9.59 in)
Spring Fitting Length		220 mm (8.66 in)
Spring Rate/Stroke		K_1 = 21.6 N/mm (2.2 kg/mm, 123.2 lb/in) 0 ~ 46.5 mm (0 ~ 1.83 in) K_2 = 28.4 N/mm (2.9 kg/mm, 162.3 lb/in) 46.5 ~ 70 mm (1.83 ~ 2.76 in)
Rear Arm:		
Swingarm Free Play Limit:	End	1.0 mm (0.04 in)
	Side	1.0 mm (0.04 in)
Wheel:		
Front Wheel Type		Cast Wheel
Rear Wheel Type		Cast Wheel
Front Rim Size/Material		MT2.15 × 19/Aluminum
Rear Rim Size/Material		MT3.00 × 16/Aluminum
Rim Runout Limit:	Vertical	2.0 mm (0.08 in)
	Lateral	2.0 mm (0.08 in)
Disc Brake:		
Type	Front	Dual disc
Outside Dia. × Thickness		267 × 5 mm (10.5 × 0.2 in)
Pad Thickness:	Inner	5.5 mm (0.22 in)
	<Limit>*	0.5 mm (0.02 in)
	Outer	5.5 mm (0.22 in)
	<Limit>*	0.5 mm (0.02 in)
Master Cylinder Inside Dia.		15.87 mm (0.62 in)
Caliper Cylinder Inside Dia.		38.18 mm (1.50 in)
Brake Fluid Type		DOT # 3
Drum Brake:		
Type	Rear	Leading trailing
Drum Inside Dia.		200 mm (7.87 in)
	<Limit>	201 mm (7.91 in)
Lining Thickness		4 mm (0.16 in)
	<Limit>	2 mm (0.08 in)
Shoe Spring Free Length		68 mm (2.7 in)

Item \ Model	XJ700N/NC
Brake Lever & Brake Pedal:	
Brake Lever Free Play	2 ~ 5 mm (0.08 ~ 0.20 in)/at lever end
Brake Pedal Position	10 mm (0.4 in) below the top of the footrest
Brake Pedal Free Play	20 ~ 30 mm (0.8 ~ 0.12 in)
Clutch Lever Free Play:	2 ~ 3 mm (0.08 ~ 0.12 in)/at lever pivot

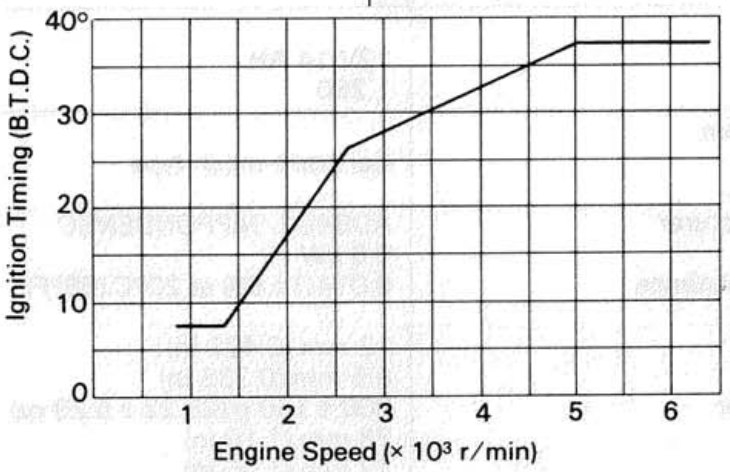
Tightening torque

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m-kg	ft-lb	
Engine mounting bolt: Front, upper	Nut	M10 P1.25	1	42	4.2	30	
Front, lower	Nut	M10 P1.25	2	42	4.2	30	
Rear	Nut	M12 P1.25	2	90	9.0	65	
Engine mounting stay	Nut	M8 P1.25	4	33	3.3	24	
Downtube	Bolt	M8 P1.25	4	38	3.8	27	
Downtube & Cross pipe	Nut	M8 P1.25	2	33	3.3	24	
Handle crown & Steering shaft	Nut	M20 P1.0	1	110	11	80	
Ring nut (Lower)	Nut	M22 P1.0	1	6	0.6	4.3	See page 5-25
Handle crown & Inner tube	Nut	M8 P1.25	2	20	2.0	14	
Handle crown & Handle holder	Bolt	M8 P1.25	4	20	2.0	14	
Front fork:							
Under bracket & Inner tube	Bolt	M8 P1.25	4	23	2.3	17	
Front wheel axle	Nut castle	M14 P1.5	1	105	10.5	75	
Front wheel axle pinch bolt	Nut salf locking	M8 P1.25	1	20	2.0	14	
Pivot shaft (Right)	Bolt	M22 P1.5	1	5.5	0.55	4.0	Taper roller bearing
Pivot shaft (Left and Right)	Bolt	M22 P1.5	1	100	10.0	72	
Rear wheel axle	Nut castle	M14 P1.5	1	105	10.5	75	
Rear wheel axle pinch bolt	Bolt	M8 P1.25	1	20	2.0	14	
Rear shock absorber (Upper)	Nut cap	M8 P1.25	2	20	2.0	14	
Rear shock absorber (Lower)	L Nut cap R Bolt	M10 P1.25	2	30	3.0	22	
Footrest	Bolt	M8 P1.25	4	29	2.9	21	
Tension bar & Brake plate	Bolt	M8 P1.25	1	20	2.0	14	
Tension bar & Rear arm	Bolt	M8 P1.25	1	20	2.0	14	
Camshaft lever & Camshaft	Bolt	M6 P1.0	1	9	0.9	6.5	
Disc brake section:							
Brake disc & Hub (Front)	Bolt	M8 P1.25	12	20	2.0	14	
Master cylinder & Brake hose (Front)	Bolt union	M10 P1.25	1	26	2.6	19	
Brake hose & Joint	Bolt union	M10 P1.25	1	26	2.6	19	
Caliper & Brake hose	Bolt union	M10 P1.25	2	26	2.6	19	
Caliper & Front fork (Front)	Bolt	M10 P1.25	4	35	3.5	25	
Caliper bleed screw (Front)		M8 P1.25	2	6	0.6	4.3	
Front fender	Bolt	M6 P1.0	4	9	0.9	6.5	

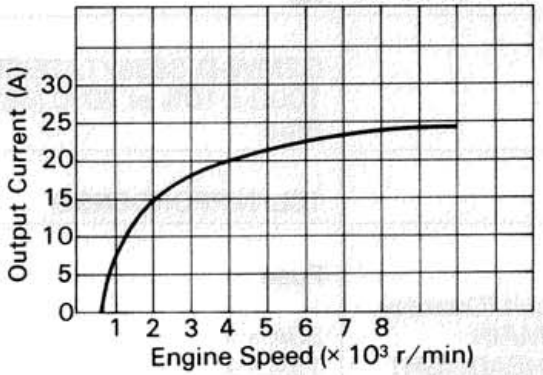
Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m-kg	ft-lb	
Final gear & Rear arm	Nut	M10 P1.25	4	42	4.2	30	
Final gear:							
Drive shaft	Nut	M14 P1.5	1	110	11	80	◎
Bearing housing	Flange bolt	M8 P1.25	4	25	25	18	
Bearing housing	Nut	M8 P1.25	6	23	2.3	17	
Oil filler cap	Plug	M14 P1.5	1	23	2.3	17	
Oil drain screw	Plug	M14 P1.5	1	23	2.3	17	
Bearing retainer	—	M65 P1.5	1	110	11	80	Left-hand screw
Cross joint	Hexagon bolt with washer	M8 P1.25	4	44	4.4	32	
Muffler bracket & Frame	Bolt	M8 P1.25	4	23	2.3	17	
Rear fender	Bolt	M10 P1.25	2	32	3.2	23	
Muffler bracket & Muffler	Bolt	M10 P1.25	2	25	2.5	18	

ELECTRICAL

Item \ Model	XJ700N/NC
Voltage:	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	7° at 1,050 r/min
Advanced Timing (B.T.D.C.)	37.5° at 6,000 r/min
Advancer Type	Electrical



T.C.I.:	
Pickup Coil Resistance (Color)	120Ω ± 10% at 20°C (68°F) (Black — Gray) (Black — Orange)
T.C.I. Unit — Manufacturer	TID14-44/HITACHI
Ignition Coil:	
Model/Manufacturer	CM12-26/HITACHI
Minimum Spark Gap	6 mm (0.24 in) or more at 500 r/min
Primary Winding Resistance	2.7Ω ± 10% at 20°C (68°F)
Secondary Winding Resistance	12 kΩ ± 20% at 20°C (68°F)
Charging System:	
Type	A.C. Generator
A.C. Generator:	
Model/Manufacturer	LD119-08/HITACHI
Nominal Output	14V, 19A at 5,000 r/min



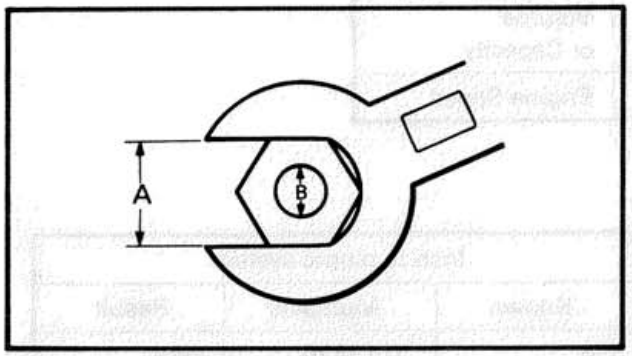
Field Coil Resistance		4.0Ω ± 10% at 20°C (68°F)
Armature Coil Resistance		0.46Ω ± 10% at 20°C (68°F) (White — White)
Brush Overall Length		17 mm (0.67 in)
	<Limit>	10 mm (0.39 in)
Brush Spring Pressure		190 ~ 360 g (6.7 ~ 12.7 oz)

Item \ Model	XJ700N/NC
Voltage Regulator:	
Type	Semi conductor, Field control
Model/Manufacturer	SH233-12/SHINDENGEN
No Load Regulated Voltage	14.5 ± 0.3V
Rectifier:	
Model/Manufacturer	SH233-12/SHINDENGEN
Capacity	35A
Battery:	
Capacity	12V 14 AH
Specific Gravity	1.280
Electric Starter System:	
Type	Constant-mesh type
Starter Motor:	
Model/Manufacturer	ADB4D2/NIPPONDENSO
Output	0.6 kW
Armature Coil Resistance	0.014Ω ± 6% at 20°C (68°F)
Brush:	
Overall Length	12 mm (0.472 in)
<Limit>	8.5 mm (0.335 in)
Spring Pressurer	800 ± 150 g (28.22 ± 5.29 oz)
Commutator Dia.	28 mm (1.10 in)
Wear Limit	27 mm (1.06 in)
Mic Undercut	0.6 ± 0.2 mm (0.024 ± 0.008 in)
Starter Switch:	
Amperage Rating	150A
Horn:	
Type/Quantity	Plane type × 2
Model/Manufacturer	CFL/NIKKO
Maximum Amperage	2.5A
Relay Assembly:	
Model/Manufacturer	FX257NZ/NIPPONDENSO
Flasher Relay	
Type	Semi transistor
Self Cancelling Device	Yes
Flasher Frequency	85 ± 10 cycle/min
Wattage	27W × 2 pcs + 3.4W
Starting-Circuit Cut-off Relay	
Color Code	No.
Sidestand Relay	
Model/Manufacturer	G2MW-D-3636/TATEISHI
Coil Winding Resistance	100Ω ± 10% at 20°C (68°F)
Color Code	Blue
Oil Level Switch:	
Model/Manufacturer	10L/NIPPONDENSO
Circuit Breaker:	
Type	Fuse
Amperage for Individual Circuit/Quantity:	
MAIN	30A × 1
HEADLIGHT	15A × 1
SIGNAL	15A × 1
IGNITION	10A × 1

GENERAL TORQUE SPECIFICATIONS

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

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



APPX DEFINITION OF UNITS/CONVERSION TABLES

DEFINITION OF UNITS

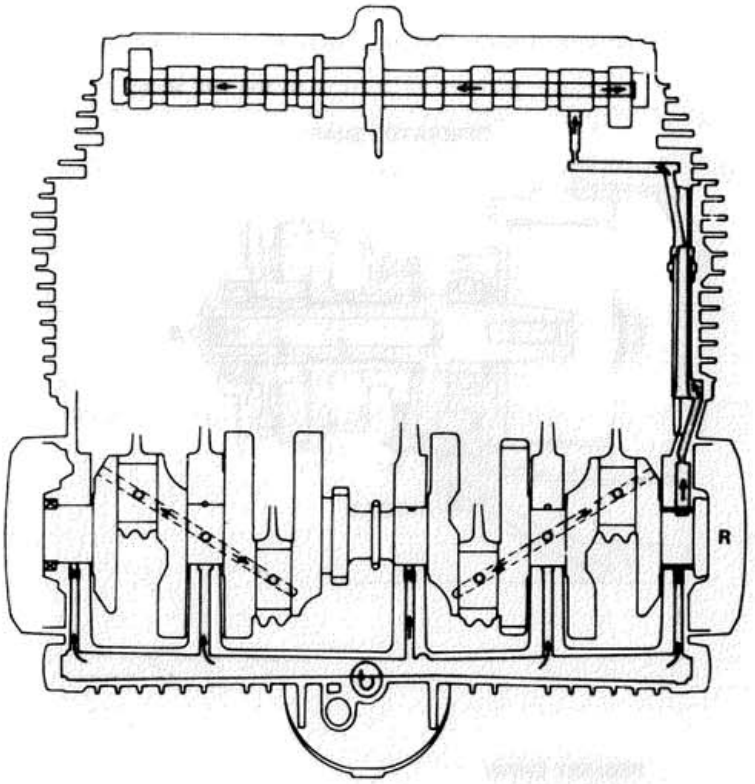
Unit	Read	Definition	Measure
mm cm	millimeter centimeter	10^{-3} meter 10^{-2} meter	Length Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1 kg × m/sec^2	Force
Nm m·kg	Newton meter Meter kilogram	N × m m × kg	Torque Torque
Pa N/mm	Pascal Newton per millimeter	N/m^2 N/mm	Pressure Spring rate
L cm^3	Liter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

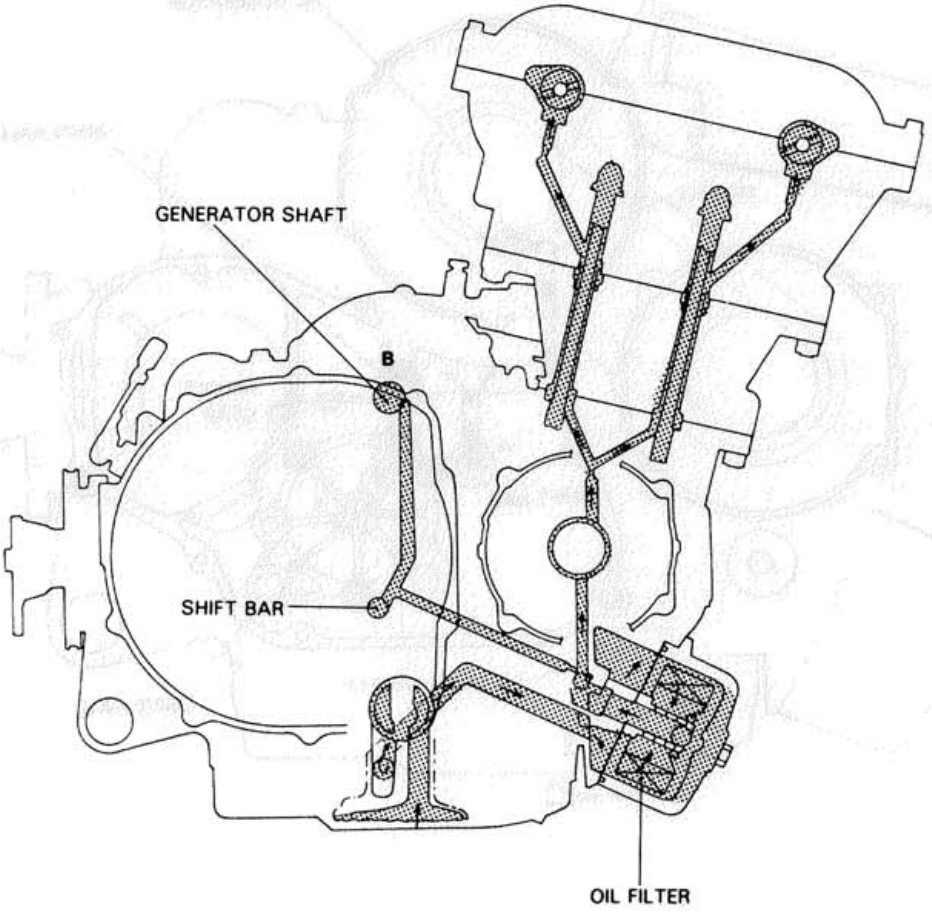
CONVERSION TABLES

Metric to inch system		
Known	Multiplier	Result
m·kg	7.233	ft·lb
m·kg	86.80	in·lb
cm·kg	0.0723	ft·lb
cm·kg	0.8680	in·lb
kg	2.205	lb
g	0.03527	oz
km/lit	2.352	mpg
km/hr	0.6214	mph
km	0.6214	mi
m	3.281	ft
m	1.094	yd
cm	0.3937	in
mm	0.03937	in
cc (cm^3)	0.03382	oz (US liq)
cc (cm^3)	0.06102	cu in
lit (liter)	2.1134	pt (US liq)
lit (liter)	1.057	qt (US liq)
lit (liter)	0.2642	gal (US liq)
kg/mm	56.007	lb/in
kg/cm	14.2234	psi (lb/in)
centigrade (°C)	9/5 (°C) + 32	Fahrenheit (°F)

Inch to metric system		
Known	Multiplier	Result
ft·lb	0.13826	m·kg
in·lb	0.01152	m·kg
ft·lb	13.831	cm·kg
in·lb	1.1521	cm·kg
lb	0.4535	kg
oz	28.352	g
mpg	0.4252	km/lit
mph	1.609	km/hr
mi	1.609	km
ft	0.3048	m
yd	0.9141	m
in	2.54	cm
in	25.4	mm
oz (US liq)	29.57	cc (cm^3)
cu in	16.387	cc (cm^3)
pt (US liq)	0.4732	lit (liter)
qt (US liq)	0.9461	lit (liter)
gal (US liq)	3.785	lit (liter)
lb/in	0.017855	kg/mm
psi (lb/in)	0.07031	kg/cm
Fahrenheit (°C)	5/9 (° – 32)	Centigrade (°F)

LUBRICATION DIAGRAM





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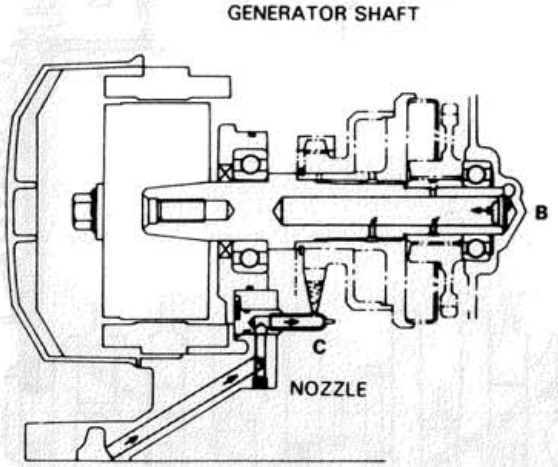

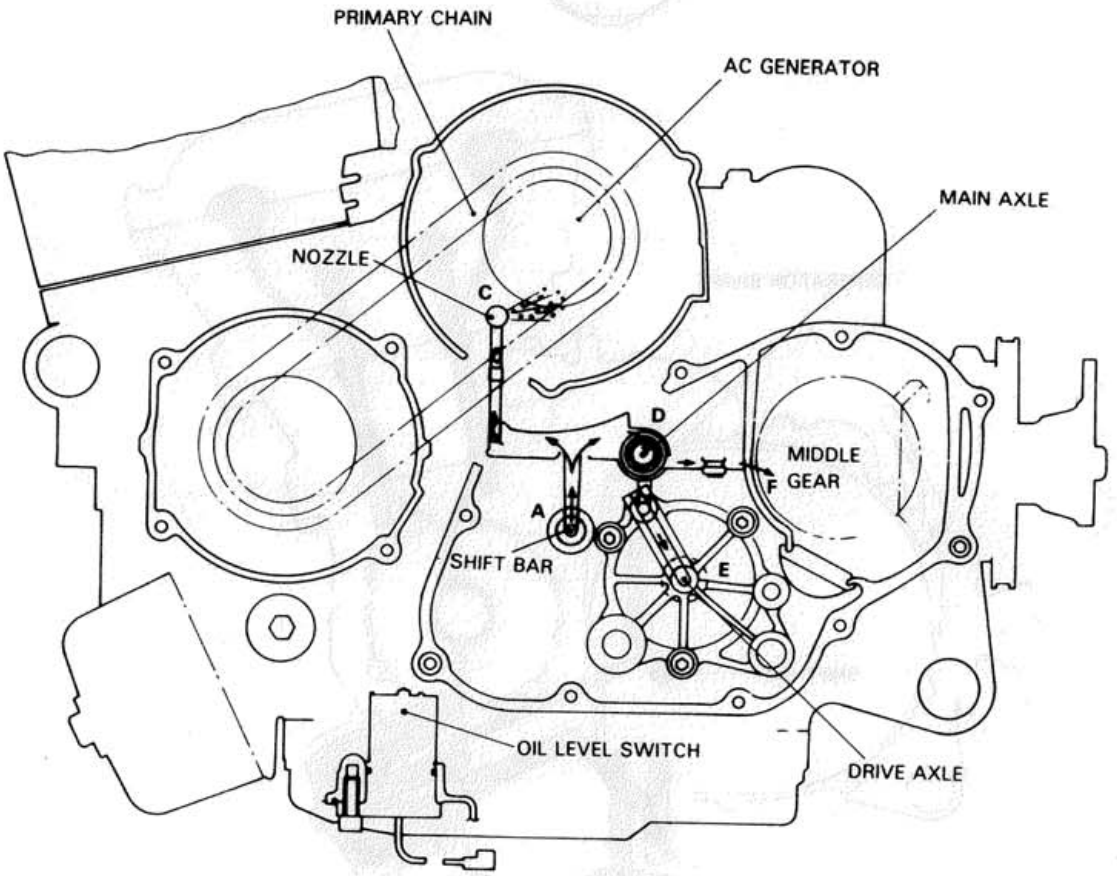

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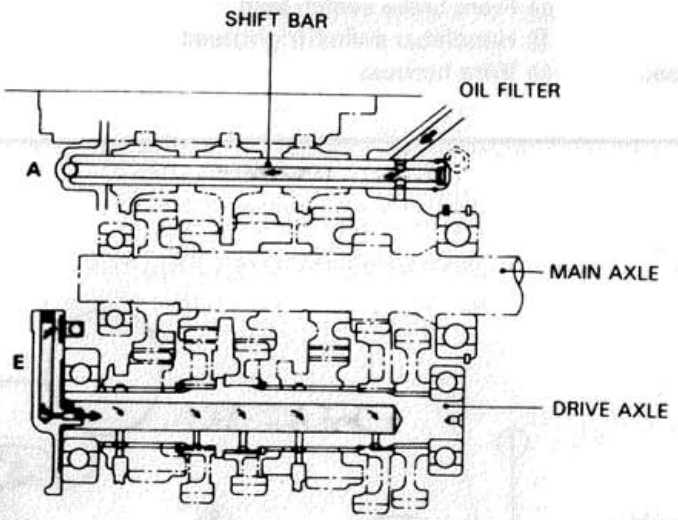
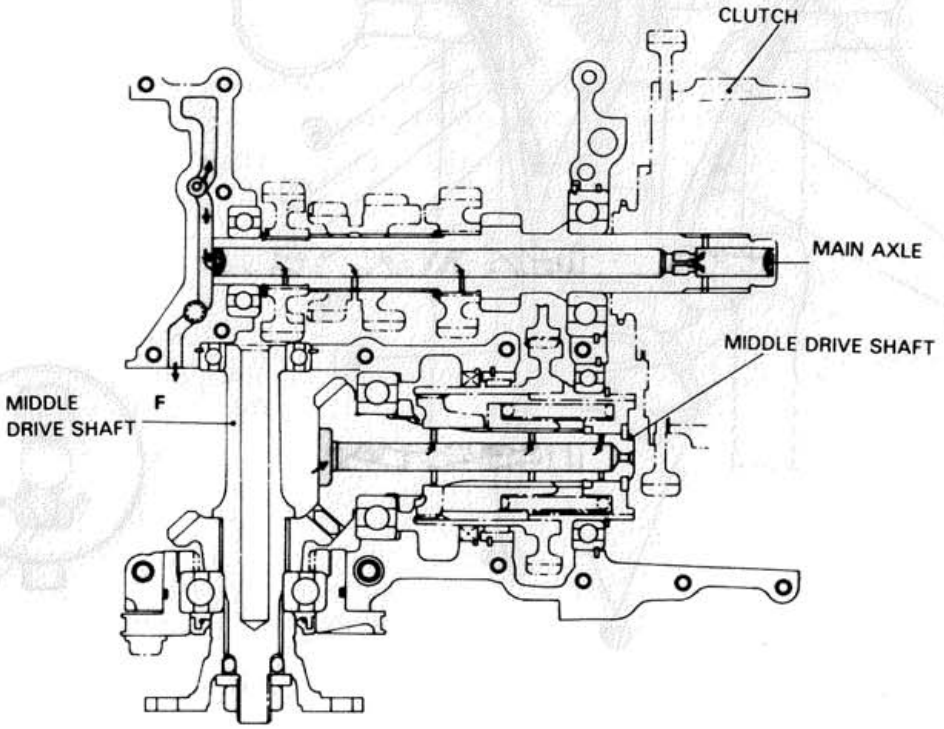
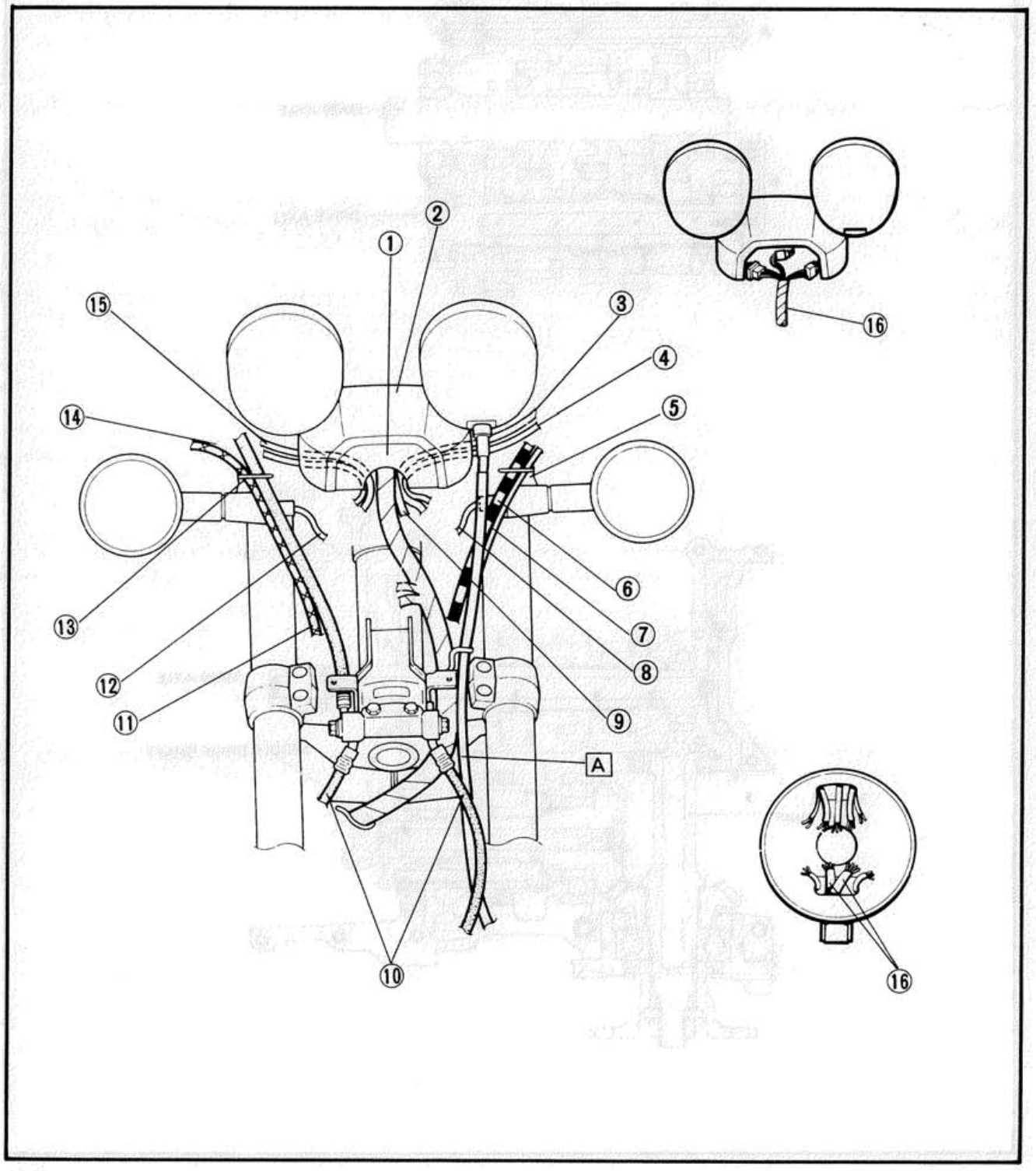




CABLE ROUTING (1)

① Cover
② Meter assembly
③ Handlebar switch (left) lead
④ Clutch switch lead
⑤ Cable guide
⑥ Clutch cable
⑦ Starter cable
⑧ Front flasher light (left) lead
⑨ Main switch lead
⑩ Front brake hose
⑪ Throttle cable
⑫ Front flasher light (right) lead
⑬ Cable guide
⑭ Front brake switch lead
⑮ Handlebar switch (right) lead
⑯ Wire harness

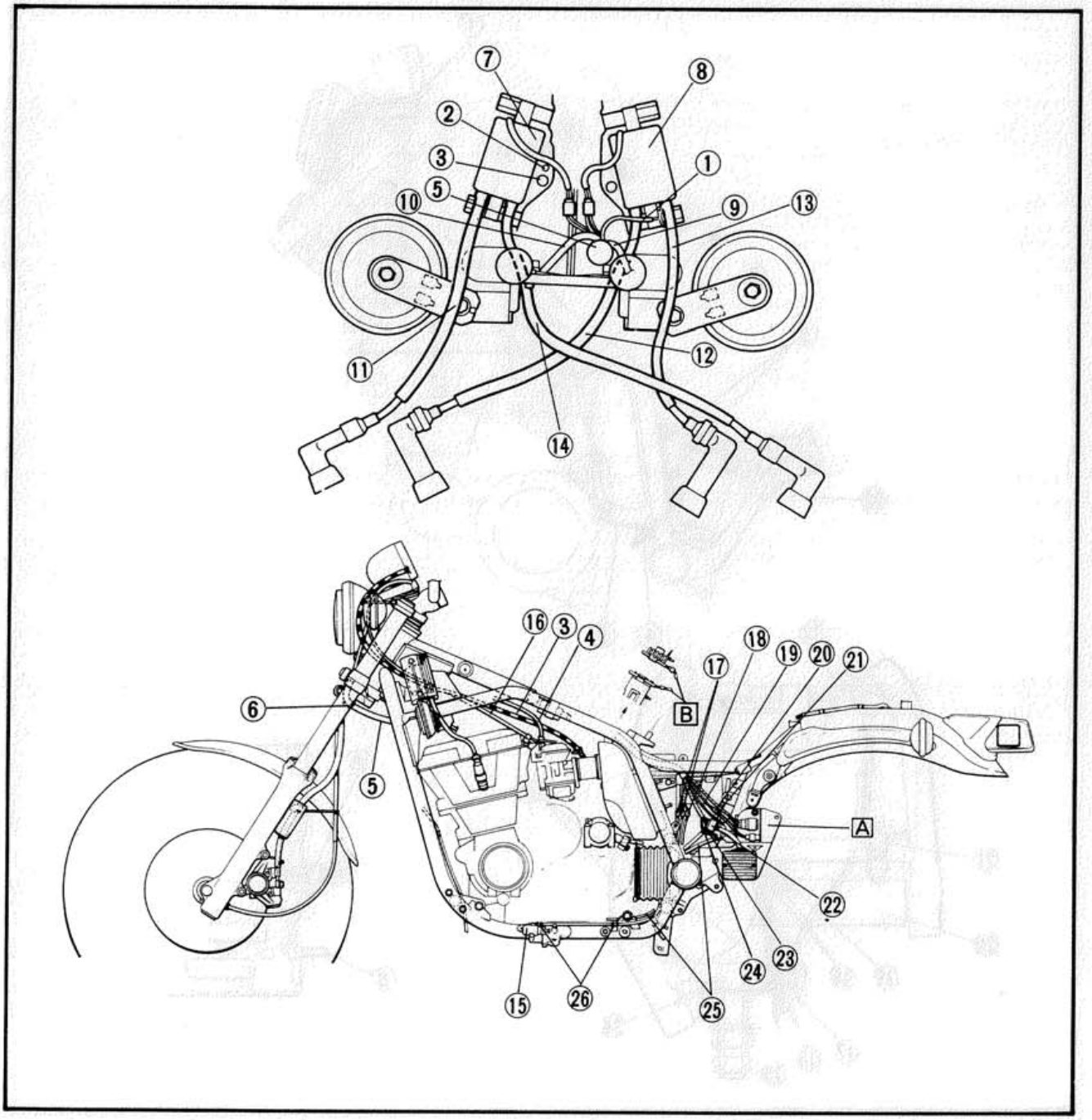
Ⓐ Pass the speedometer cable between under bracket and outer cover.



CABLE ROUTING (2)

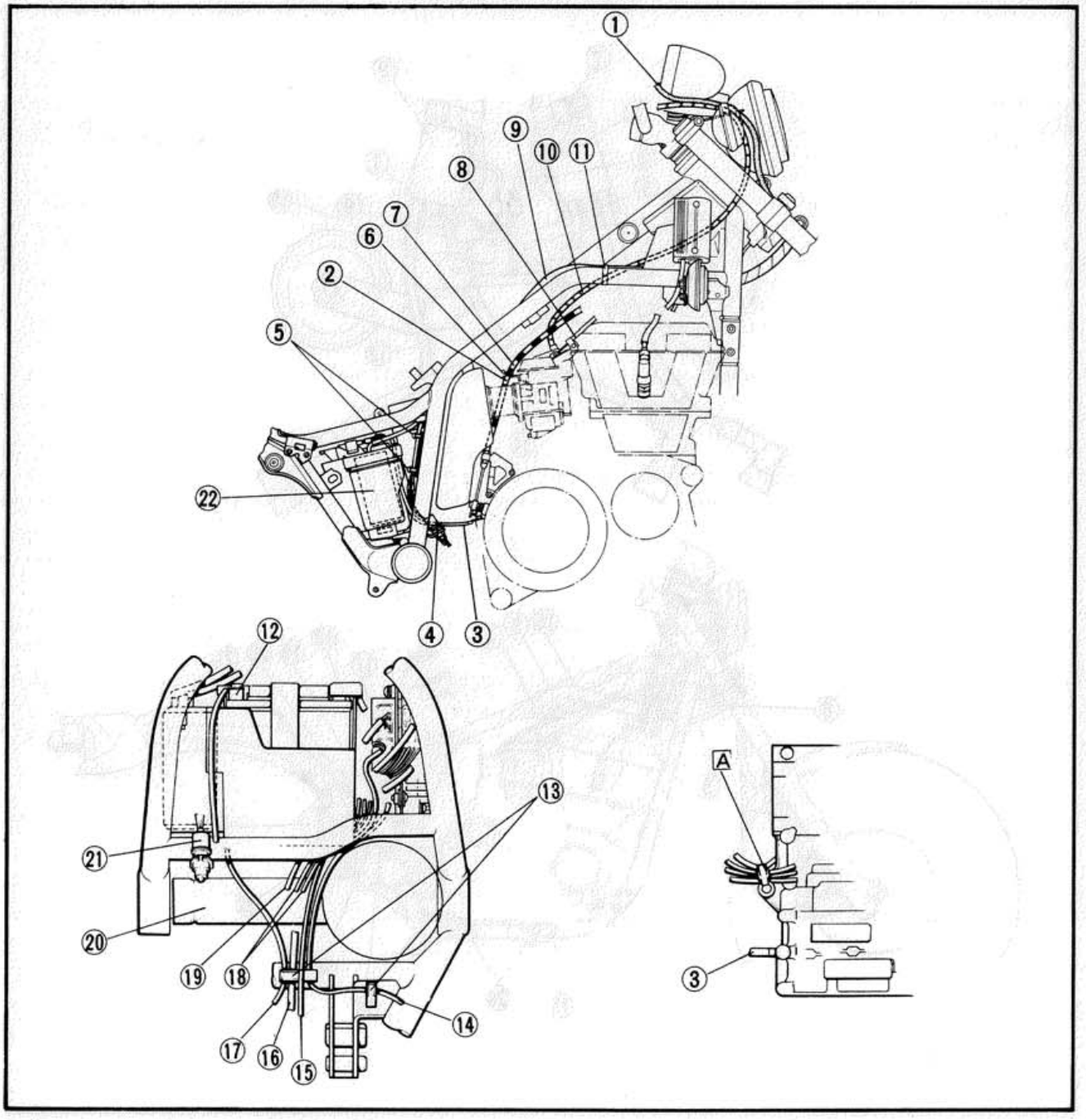
① Earth lead
② Starter cable
③ Clutch cable
④ Throttle cable
⑤ Wire harness
⑥ Guide
⑦ Ignition coil (left)
⑧ Ignition coil (right)
⑨ Horn lead (right)
⑩ Horn lead (left)
⑪ "1" mark → #1 cylinder
⑫ "2" mark → #2 cylinder
⑬ "3" mark → #3 cylinder
⑭ "4" mark → #4 cylinder
⑮ Sidestand switch assembly
⑯ Starter cable
⑰ A.C. generator lead
⑱ Sidestand switch lead
⑲ Igniter lead
⑳ Diode assembly
㉑ Sidestand relay lead
㉒ Rectifier/regulator assembly
㉓ Neutral switch lead
㉔ Oil level switch lead
㉕ Pickup coil lead
㉖ Clamp

[A] Insert the lead inside the bridge plate.
[B] Push the fuel sender lead into the locating damper.



CABLE ROUTING (3)

① Front brake hose
② Clutch cable
③ Battery negative (−) lead
④ Rear brake switch lead
⑤ Clamp
⑥ Clamp
⑦ Clutch cable
⑧ Starter cable
⑨ Wire harness
⑩ Throttle cable
⑪ Band
⑫ Battery negative (−) lead
⑬ Clamp
⑭ Sidestand switch lead
⑮ Pickup coil lead
⑯ Air cleaner drain hose
⑰ Battery breather hose
⑱ A.C. generator lead
⑲ Starter lead
⑳ Rear arm
㉑ Rear brake switch lead
㉒ Canister (California only)
[A] Clamp the pickup coil lead, starter lead and A.C. generator lead.



CABLE ROUTING (4)

① Ignition coil
② Horn lead (right)
③ Earth lead
④ Wire harness
⑤ Band
⑥ Rear brake switch lead
⑦ Battery negative (−) lead
⑧ Starter switch lead
⑨ Fuse holder assembly
⑩ Rear flasher light (right) lead
⑪ Clamp
⑫ Taillight lead
⑬ Rear flasher light lead (left)
⑭ Clamp
⑮ Starter lead (Engine-starter switch)
⑯ Battery positive (+) lead
⑰ Starter lead (battery (+)-starter switch)
⑱ Fuel sender
⑲ Flasher relay
⑳ Horn lead
㉑ Canister (California only)
㉒ Canister hose (California only)

[A] Align the white tape on wire harness with the cross tube
[B] When installing the seat, be careful not to pinch the leads.