CHAPTER 2
PERIODIC INSPECTIONS AND ADJUSTMENTS

PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

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

MAINTENANCE INTERVALS CHART

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

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

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

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

NOTE:

For father odometer reading, repeat the above maintenance at the period established; **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi), and **3: Every 30,000 km (19,000 mi) intervals.

MAINTENANCE INTERVALS CHART

GENERAL MAINTENANCE/LUBRICATION

No.	Item	Remarks	Type	Initial	Odometer readings				
				1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	**3 25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)
1	Engine oil	Warm-up engine before draining	*1) Yamalube 4-cycle oil or SAE 20W40 type "SE" motor oil *2) SAE 10W30 type "SE" motor oil	○	○	○	○	○	○
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	Drive chain	Check chain condition. Adjust and lubricate chain thoroughly.	SAE 30W-50W motor oil.	Every 500 km (300 mi)					
7	Control and meter cable	Apply chain lube thoroughtly.	Yamaha chain and cable lube or SAE 10W30 motor oil.	○	○	○	○	○	○
8*	Rear arm pivot bearing	Check bearing assembly for looseness. Moderately repack every 24,000 km (15,200 mi).	Midium weight wheel bearing grease.					Repack	
9	Brake/ Clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
10	Brake pedal and change pedal shaft	Lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○
11*	Center/ Side stand pivots	Check operation and lubricate. Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W30 motor oil.		○	○	○	○	○

MAINTENANCE INTERVALS CHART

No.	Item	Remarks	Type	Initial	Odometer readings				
				1,000 km or 1 month (600 mi)	**1 7,000 km or 7 months (4,400 mi)	**2 13,000 km or 13 months (8,200 mi)	19,000 km or 19 months (12,000 mi)	**3 25,000 km or 25 months (15,800 mi)	31,000 km or 31 months (19,600 mi)
12*	Front fork oil	Check operation and leakage.	Yamaha Fork Oil 10WT or equivalent		○	○	○	○	○
13*	Steering bearing	Check bearings assembly for looseness. Moderately repack every 24,000 km (15,000 mi).	Medium weight wheel bearing grease.		○	○	○	Repack	○
14*	Wheel bearings	Check bearings for smooth rotation.	Medium weight wheel bearing grease		○	○	○	○	○
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.	—	○	○	○	○	○	○

*1) If ambient temperature does not go below 5°C (41°F).
*2) If ambient temperature does not go below 15°C (59°F).
* It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.

NOTE:

For father odometer reading, repeat the above maintenance at the period established, **1: Every 6,000 km (3,800 mi), **2: Every 12,000 km (7,600 mi) and **3: Every 24,000 km (15,200 mi) intervals.

ENGINE

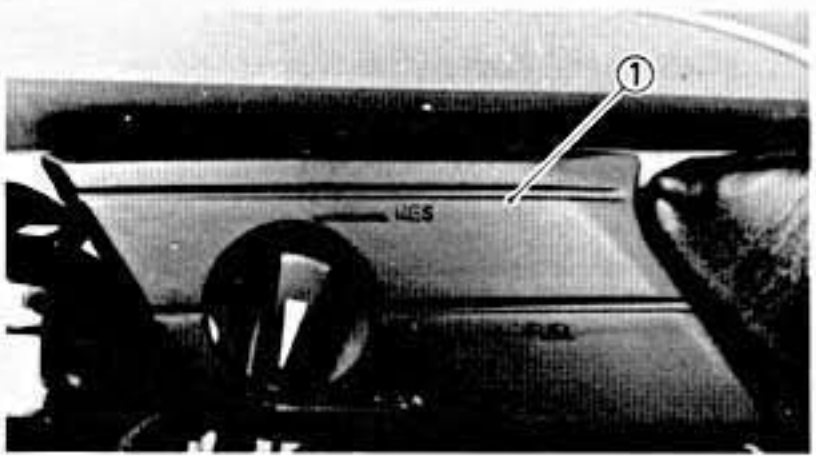
VALVE CLEARANCE ADJUSTMENT

NOTE:

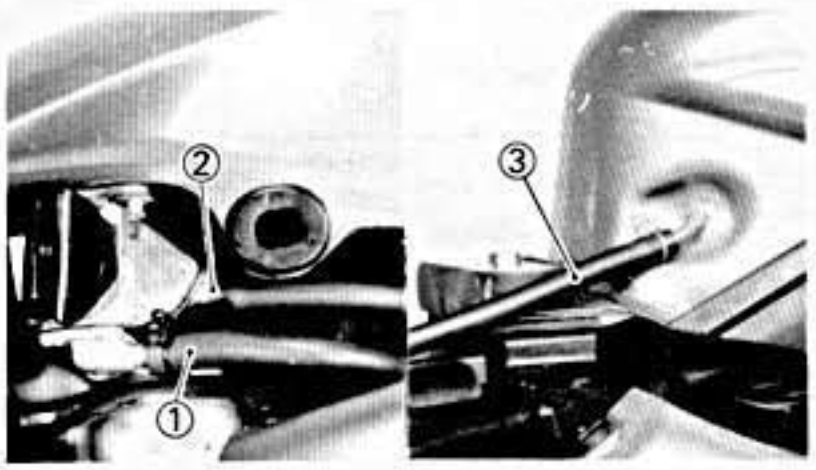
- Valve clearance must be measured and adjusted when the engine is cool to the touch.
- Measure and adjust valve clearance when piston is at TDC on compression stroke.

1. Remove:
   - Seat

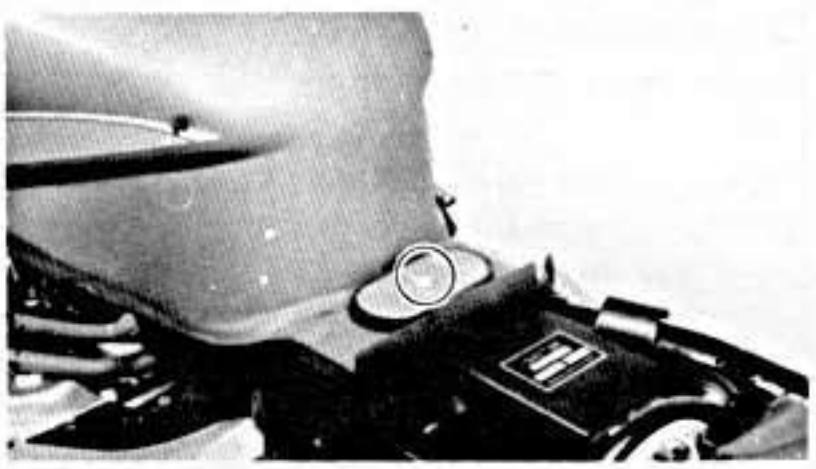
2. Turn the fuel cock to "ON" position.



3. Remove:
   - Cover ①

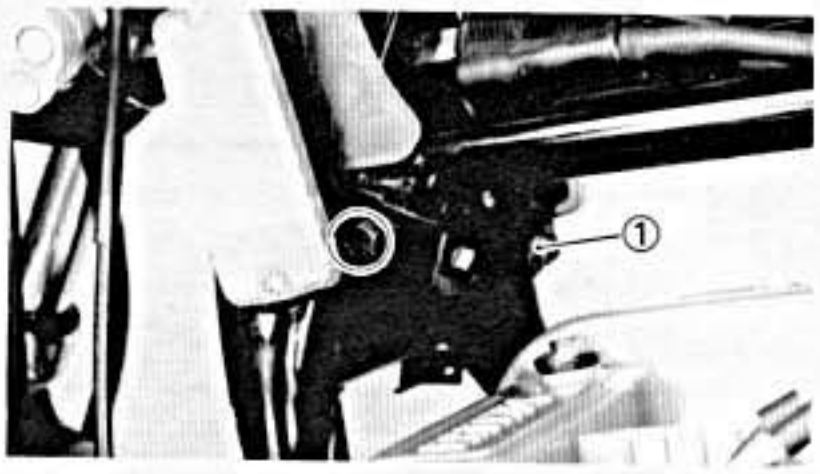


4. Disconnect:
   - Fuel pipe ①
   - Vacuum pipe ②
   - Fuel tank breather pipe ③

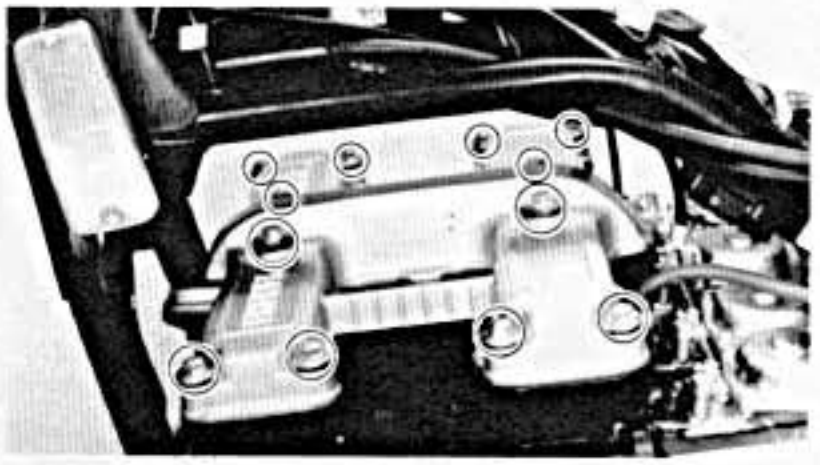


5. Remove:
   - Fuel tank

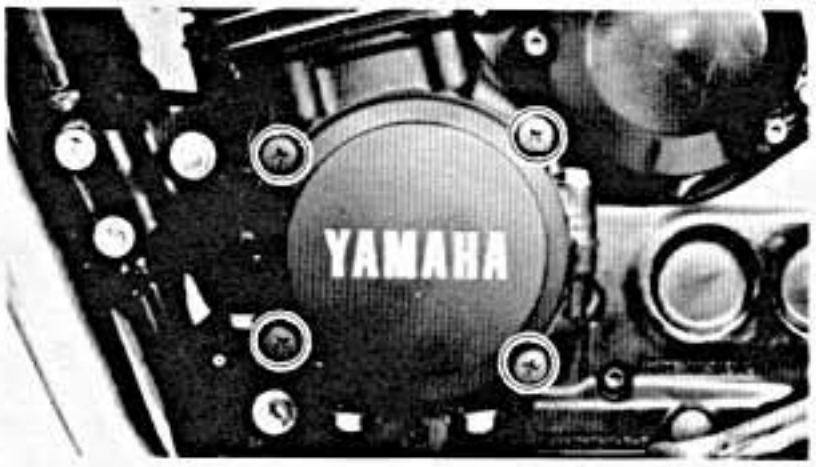
VALVE CLEARANCE ADJUSTMENT



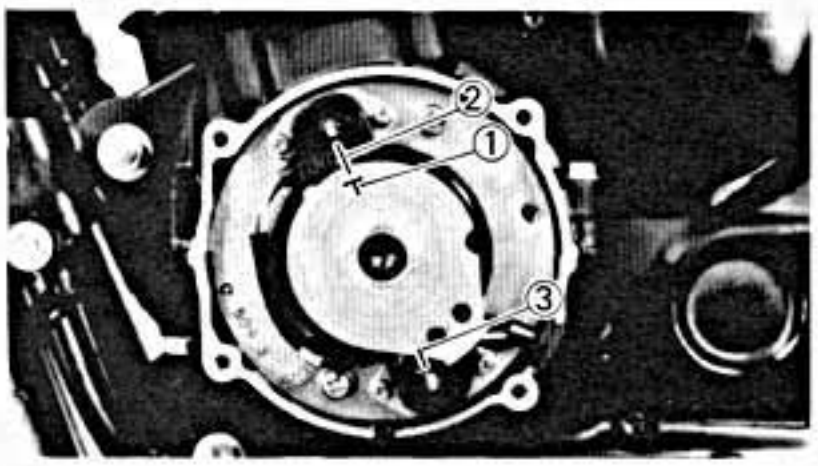
6. Remove:
   - Spark plugs
   - Horn ①



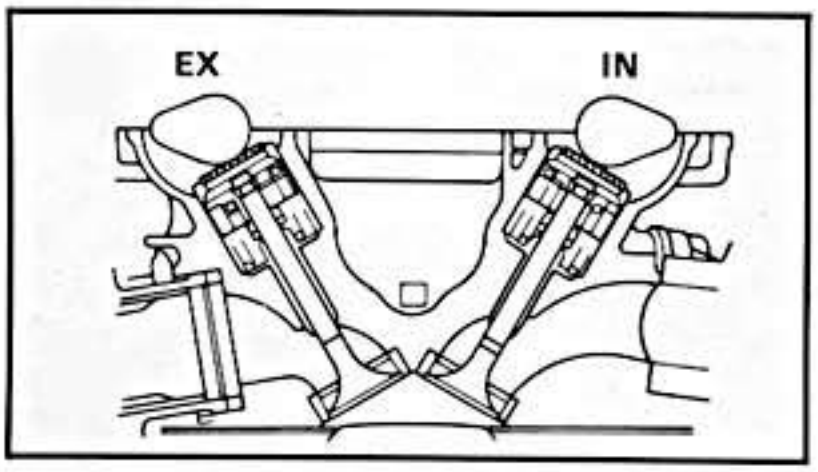
7. Remove:
   - Cylinder head cover



8. Remove:
   - Crankcase cover



9. Measure:
   - Valve clearance

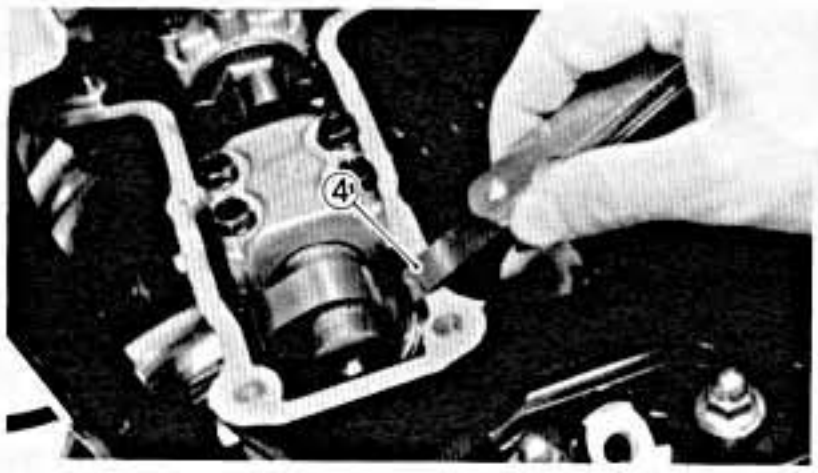


Valve clearance measurement steps:

- Turn the crankshaft counterclockwise.
- Align the "T" mark ① on the timing plate with the pickup coil mark (② or ③) when the piston is at Top Dead Center (T.D.C.) on compression stroke.

NOTE:

- Compression T.D.C. can be found when the cam lobes are apart from each other, as shown.
- Measure the valve clearance by aligning the "T" mark with the upper pickup coil mark ② for the #1 and #4 cylinders and with the lower pickup coil mark ③ for the #2 and #3 cylinders.



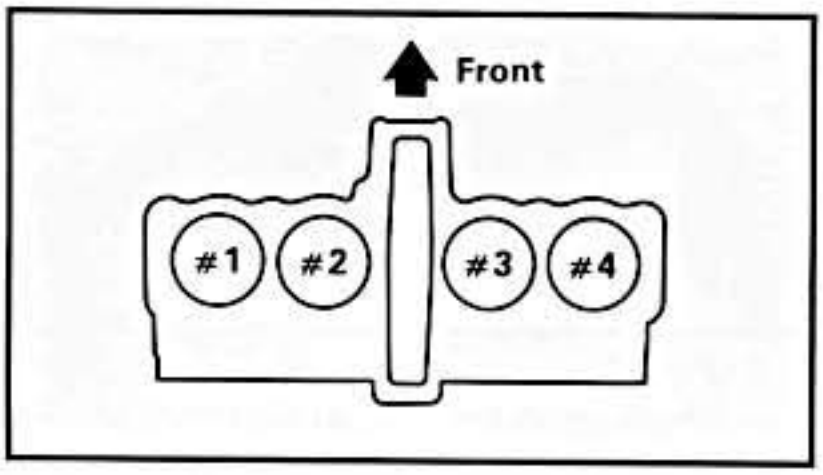
•Measure the valve clearance using feeler gauge ④.
Out of specification→Adjust valve clearance.

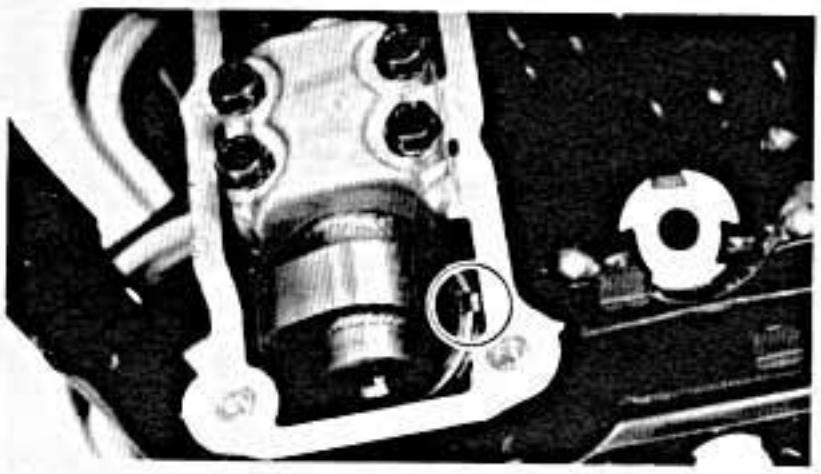
Intake Valve (Cold):
0.11~0.15 mm (0.004~0.006 in)
Exhaust Valve (Cold):
0.16~0.20 mm (0.006~0.008 in)

NOTE:

•Record the measured amount if the clearance is incorrect.
•Measure valve clearance in sequence.

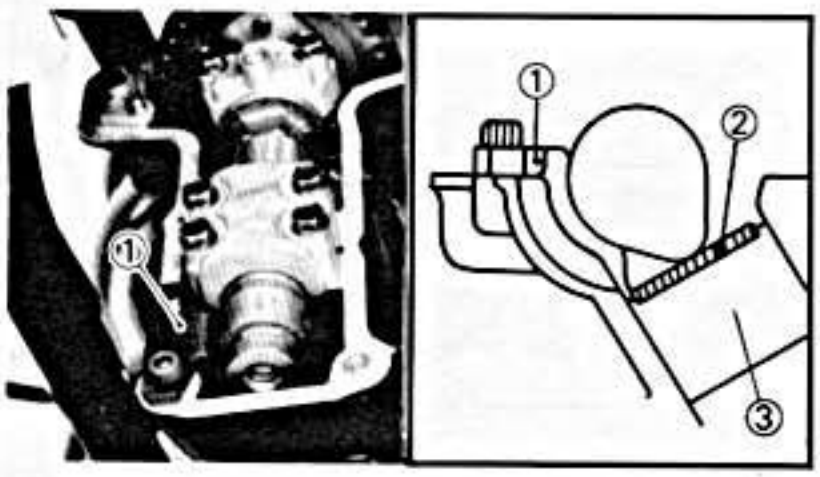
Measuring Sequence:
#1→#2→#4→#3





10. Adjust:
•Valve clearance

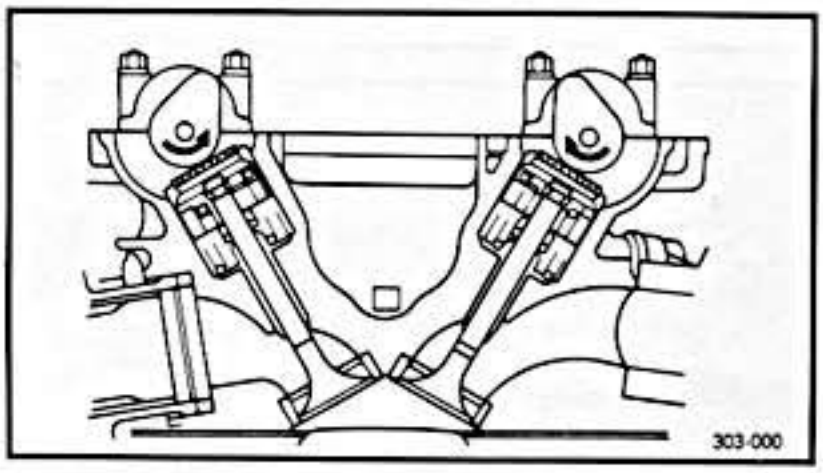
Valve clearance adjustment steps:
•Position the valve lifter slots (intake and exhaust) opposite each other.



•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:

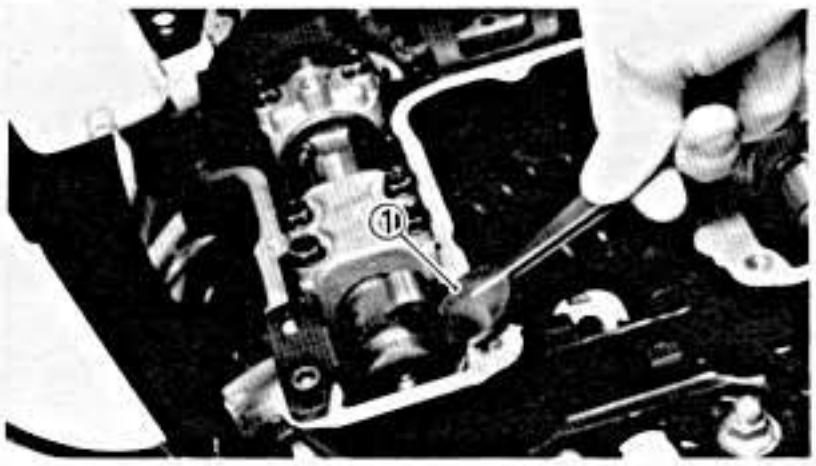
Make sure that the tool contacts the lifter ③ only, and not the pad ②.

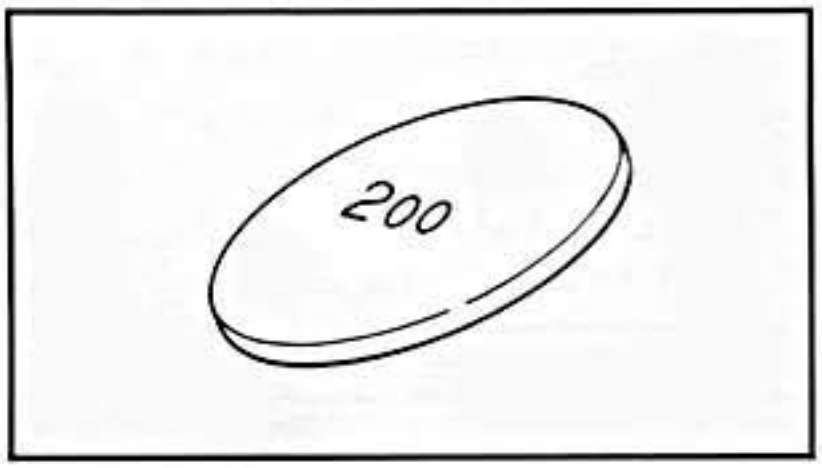


•Carefully rotate the camshaft so that the pads can be removed. To avoid cam touching the adjusting tool, turn cams as shown.

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

VALVE CLEARANCE ADJUSTMENT





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- Remove the pads ① from the lifters. Use a small screwdriver and a pair of tweezers 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	200 mm (0.079 in) 320 mm (0.130 in)	Pads stepped in 0.05 mm (0.002 in) increments

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

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

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

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

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

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

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

VALVE CLEARANCE ADJUSTMENT

INTAKE

[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																	
1.01 ~ 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

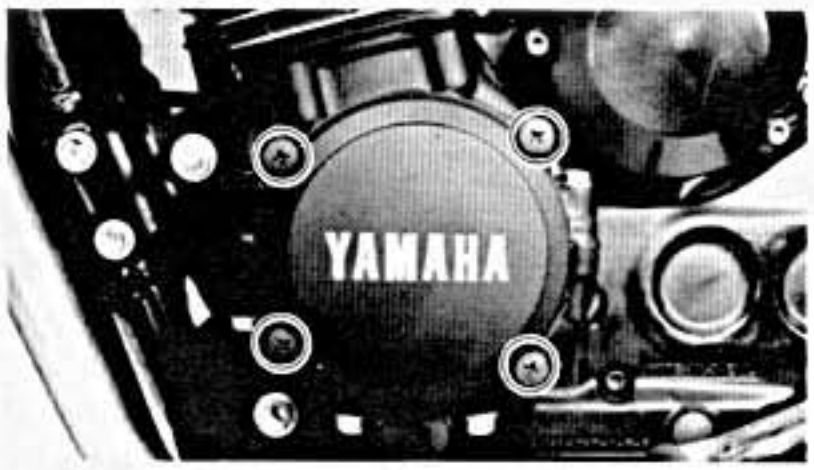
[B] MEASURED CLEARANCE	[A] INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00 ~ 0.05				200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305
0.06 ~ 0.10			200	205	210	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																
1.01 ~ 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																								

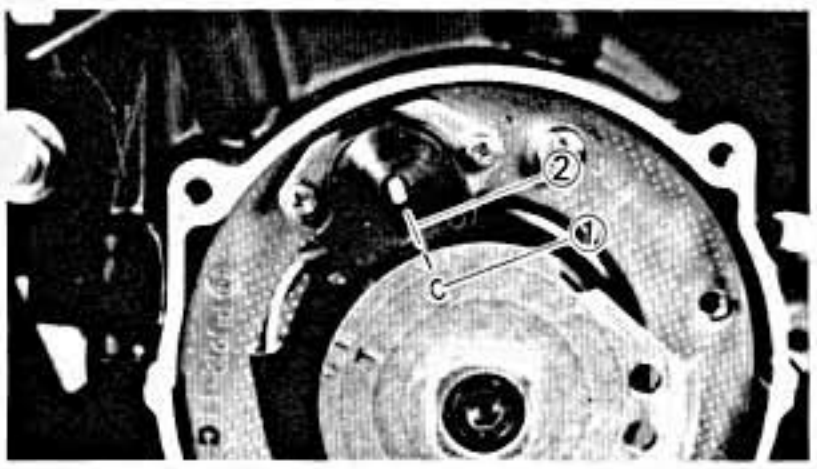
VALVE CLEARANCE (cold):
0.16 ~ 0.20 mm (0.006 ~ 0.008 in)
Example: Installed is 250
Measured clearance is 0.32 mm (0.013 in)
Replace 250 pad with 265 pad
Pad number: (example)
Pad No. 250 = 2.50 mm (0.098 in)
Pad No. 255 = 2.55 mm (0.100 in)
Always install pad with number down.

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.

11. Install:
    Reverse removal steps.
    - Crankcase cover (Left)
    - Cylinder head cover
    - Horn
    - Spark plugs
    - Fuel tank

Screw (Crankcase Cover):
10 Nm (1.0 m•kg, 7.2 ft•lb)
Bolt (Cylinder Head Cover):
10 Nm (1.0 m•kg, 7.2 ft•lb)
Spark Plug:
18 Nm (1.8 m•kg, 13 ft•lb)



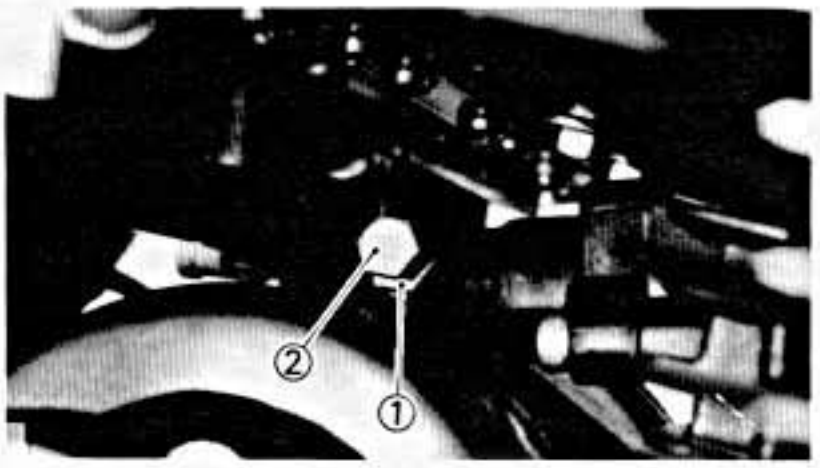


CAM CHAIN ADJUSTMENT

1. Remove:
   - Crankcase cover (Left)

2. Turn crankshaft counterclockwise.

3. Align the timing plate "C" mark ① with the upper pickup coil mark ②.



4. Loosen:
   - Locknut (Chain tensioner) ①
   - Stopper bolt (Chain tensioner) ②

5. Tighten:
   - Locknut (Chain tensioner)
   - Stopper bolt (Chain tensioner)

Locknut:
6 Nm (0.6 m•kg, 4.3 ft•lb)
Stopper Bolt:
9 Nm (0.9 m•kg, 6.5 ft•lb)

6. Install:
   - Crankcase cover (Left)

Screw (Crankcase Cover):
10 Nm (1.0 m•kg, 7.2 ft•lb)

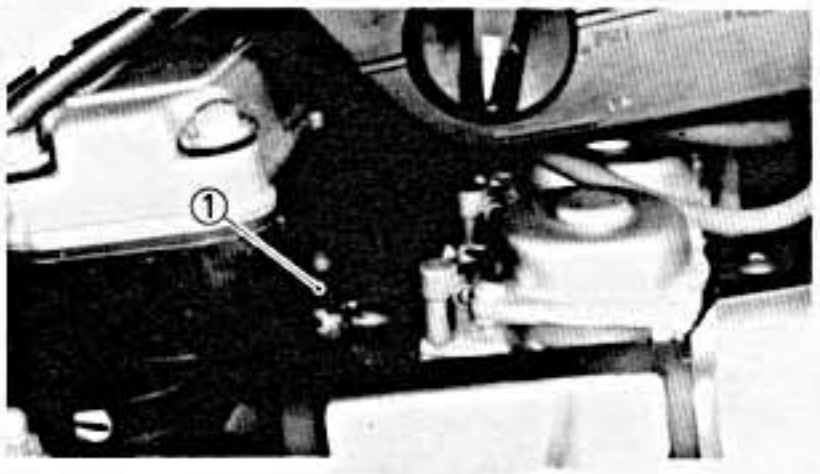
2

CARBURETOR SYNCHRONIZATION

Carburetors must be adjusted to open and close simultaneously.

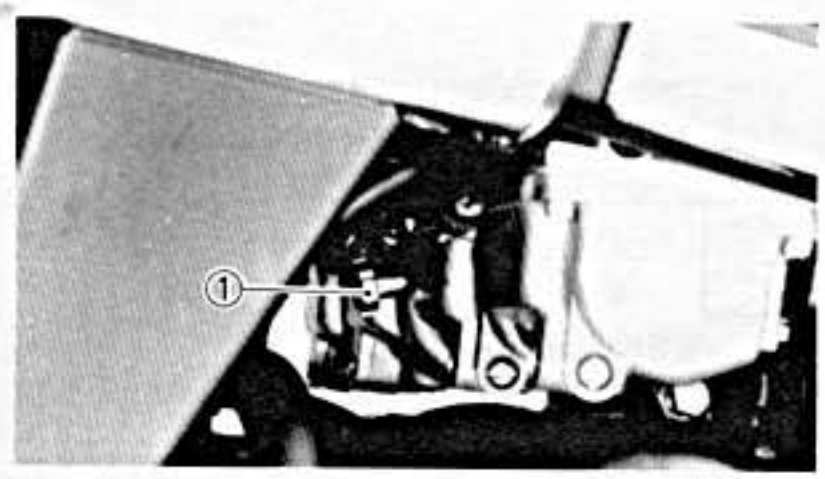
NOTE:

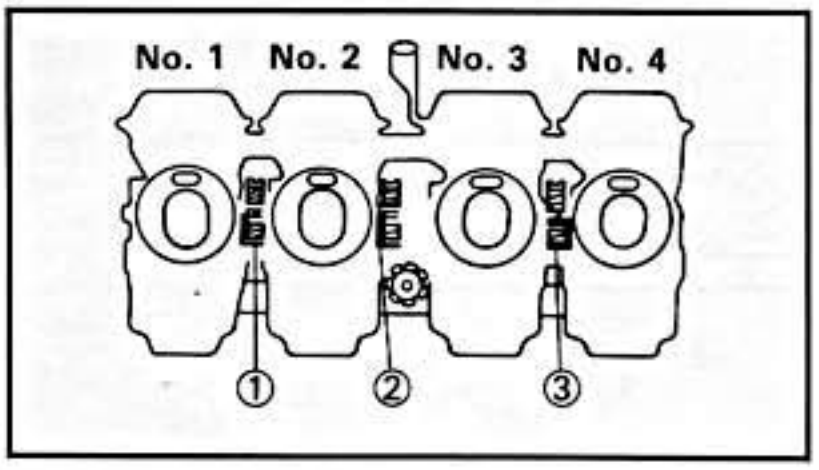
Valve clearance must be set properly before synchronizing the carburetors.

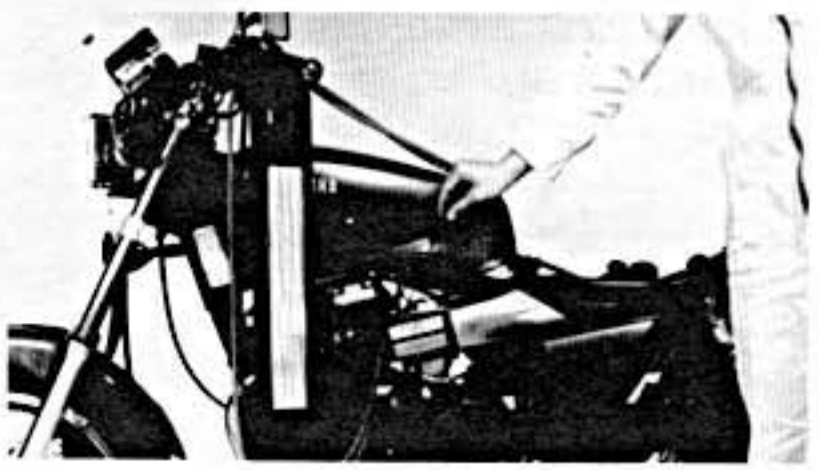


1. Remove:
   - Vacuum plugs ①

CARBURETOR SYNCHRONIZATION







2. Remove:
   - Seat
   - Side covers (Fuel tank)
   - Bolt (Fuel tank)

3. Install:
   - Vacuum Gauge (YU-08030)

4. Start the engine and let it warm up.

5. Adjust:
   - Idle speed

   Turn the throttle stop screw ①.

Turn in	**Engine speed is increased.**
Turn out	**Engine speed is decreased.**

Idle Speed: 1,250 ~ 1,350 r/min

6. Adjust:
   - Carburetors

Carburetor adjustment steps:
- Lift up the rear of fuel tank
- Synchronize carburetor No. 1 to carburetor No. 2 by turning synchronizing screw ① until both gauges read the same.
- Rev the engine for a fraction of a second, two or three times, and check the synchronization again.

Vacuum Pressure at Idle Speed:
22.7 ~ 24.0 kPa
(170 ~ 180 mm Hg, 6.69 ~ 7.09 in Hg)
Vacuum Synchronous Difference:
1.33 kPa (10 mm Hg, 0.4 in Hg)

- Repeat the above steps to synchronize carburetor No. 4 to carburetor No. 3 by turning synchronizing screw ③ until both gauges read the same.
- Repeat the same steps to synchronize No. 2 carburetor to No. 3 carburetor by turning synchronizing screw ② until both gauges read the same.

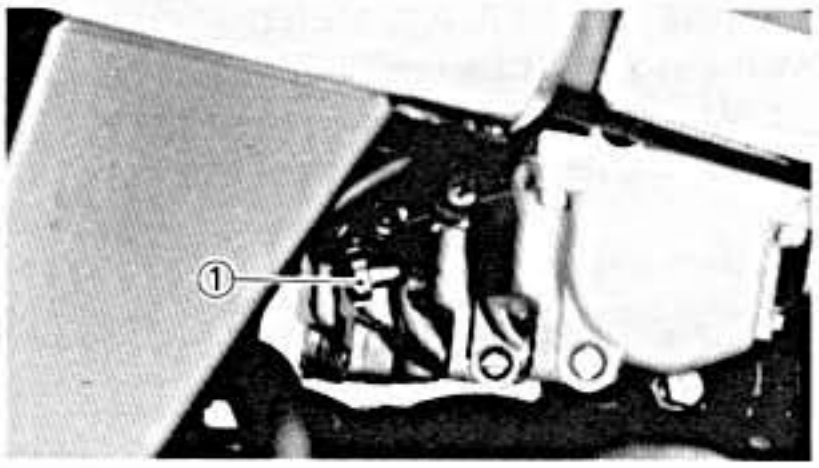
7. Adjust:
   • Idle speed

8. Install:
   • Bolt (Fuel tank)
   • Side covers (Fuel tank)
   • Seat
   • Vacuum plugs

IDLE SPEED ADJUSTMENT

1. Inspect:
   • Idle speed
   Out of specification → Adjust.

	1,250 ~ 1,350 r/min



2. Adjust:
   • Idle speed
   Turn the throttle stop screw ①.

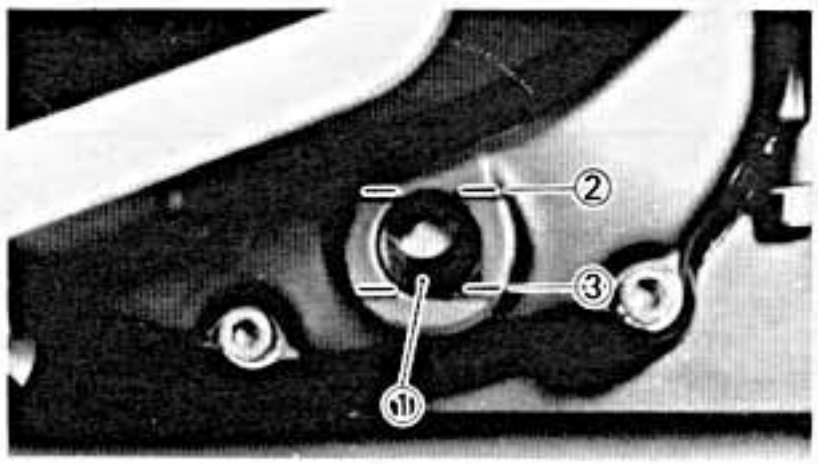
Turn in	**Engine speed is increased.**
Turn out	**Engine speed is decreased.**

ENGINE OIL LEVEL INSPECTION

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

NOTE:

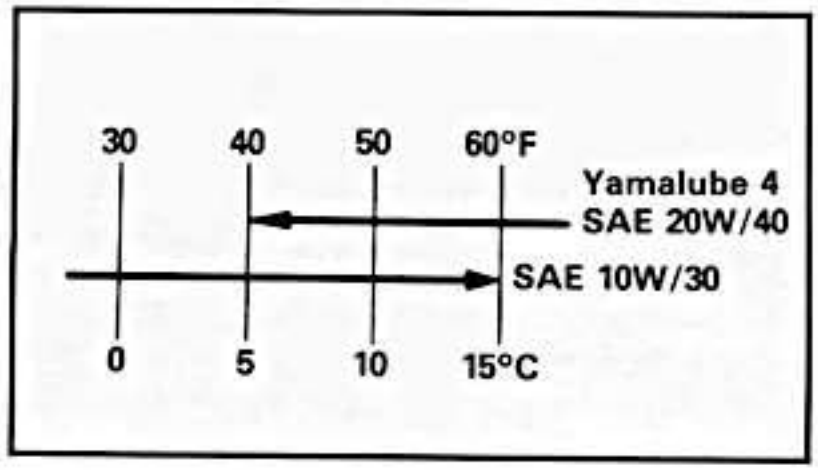
Position motorcycle straight up when checking oil level, a slight tilt to the side can produce false readings.



2. Stop the engine and visually check the oil level throught the level window ①.

3. Inspect:
   • Oil level
   Oil level should be between maximum ② and minimum ③ marks.
   Oil level low → Add oil to proper level.

ENGINE OIL REPLACEMENT



NOTE:

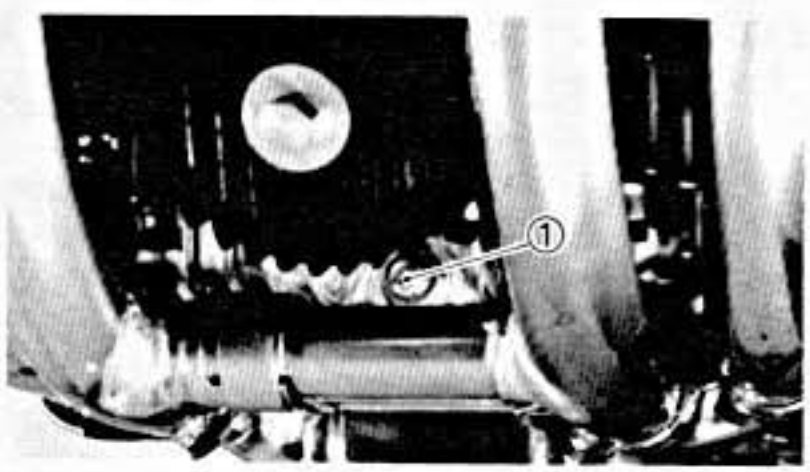
Wait a few minutes until level settles before inspecting.

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

ENGINE OIL REPLACEMENT

Without Filter Change

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



3. Remove:
   - Drain plug ①

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

43 Nm (4.3 m•kg, 31 ft•lb)

5. Fill:
   - Crankcase

2.2 L (1.9 Imp qt, 2.3 US qt)

CAUTION:

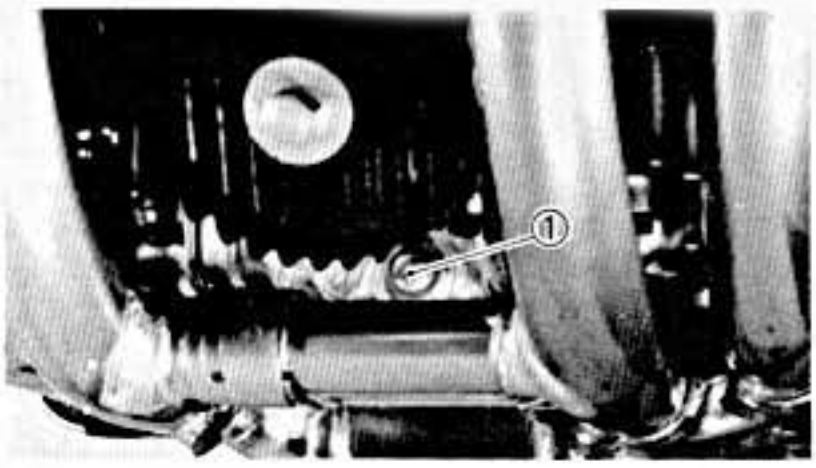
Do not allow foreign material to enter the crankcase.

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

6. Install:
   - Oil filler cap

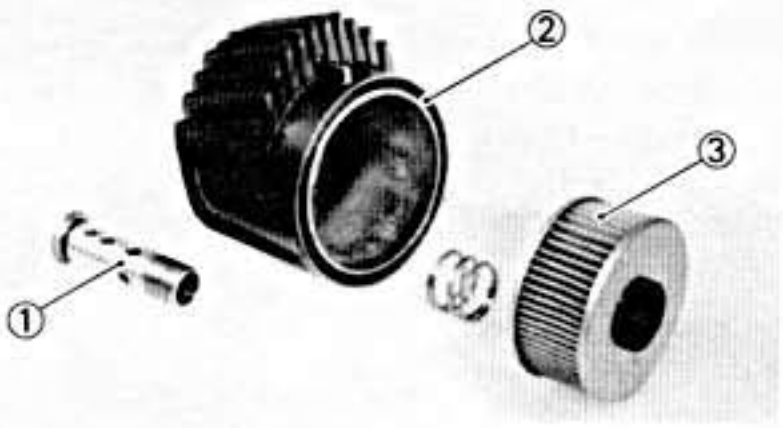
With Filter Change

1. Warm up the engine for several minutes, then place a receptacle under the engine.

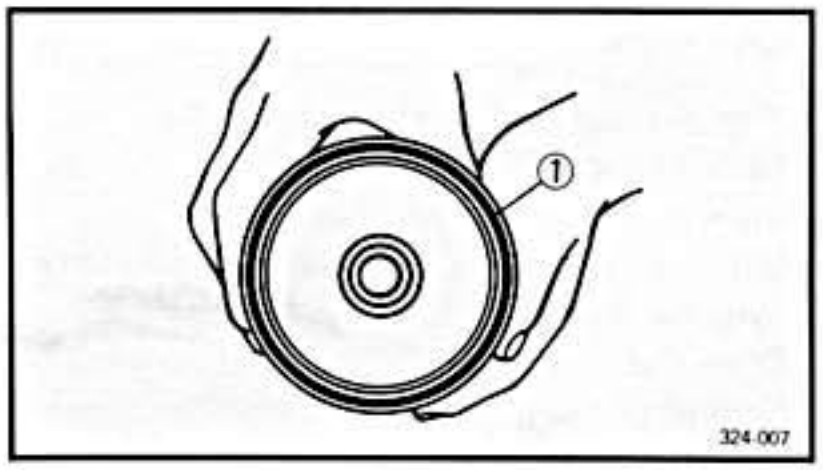


2. Remove:
   - Oil filler cap
   - Drain plug ①

   Drain the engine oil.



3. Remove:
   - Oil filter bolt ①
   - Filter cover ②
   - Oil filter ③



4. Install:
   - Drain plug
   - Oil filter (New)
   - Plain washer
   - Spring
   - Filter cover
   - Oil filter bolt

NOTE:
Be sure the O-ring ① is positioned properly.

Drain Plug:
43 Nm (4.3 m•kg, 31 ft•lb)
Oil Filter Bolt:
15 Nm (1.5 m•kg, 11 ft•lb)

5. Fill:
   • Crankcase

	2.5 L (2.2 Imp qt, 2.6 US qt)

CAUTION:

Do not allow foreign material to enter the crankcase.

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

6. Install:
   • Oil filler cap

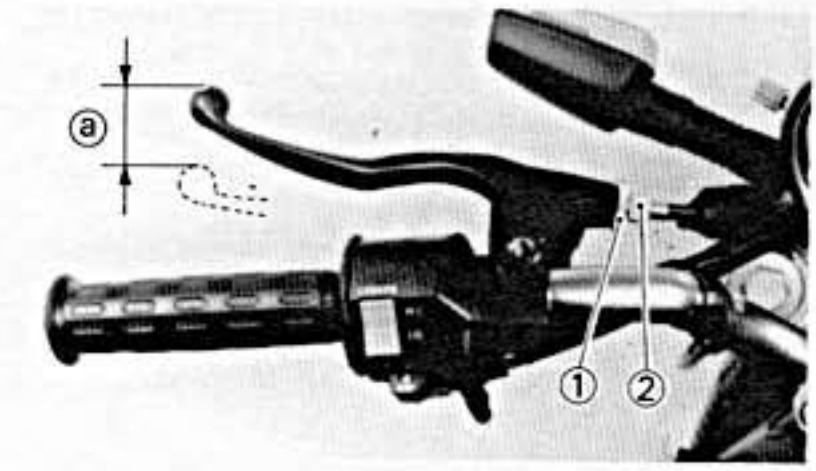
7. Warm up engine and check for oil leaks.
   Stop engine instantly if leaking occurs.
   Leaks → Check cause.

CAUTION:

After replacing the engine oil, be sure to check the oil flow in the following procedures:

- **Slightly loosen the oil gallery bolt ① in the cylinder head.**
- **Start the engine and keep it idling until oil begins to seep from the oil gallery bolt. If no oil comes out after one minute, turn the engine off so it will not seize.**
- **Restart the engine after solving the problem(s), and recheck the oil pressure.**
- **After checking, tighten the oil gallery bolt to specification.**

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



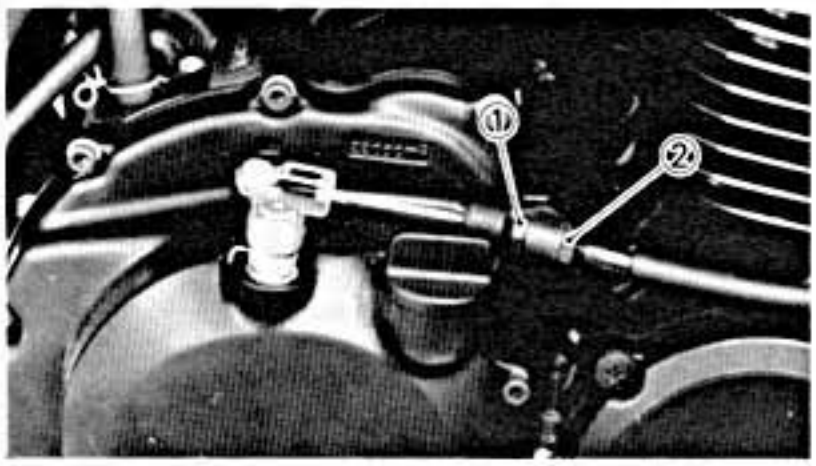
CLUTCH LEVER FREE PLAY ADJUSTMENT

1. Loosen:
   - Locknut ①

2. Adjust:
   - Clutch lever free play ⓐ
     Turn the adjuster ② in or out.

Turn in	**Free play is increased.**
Turn out	**Free play is decreased.**

Free Play:
10 ~ 15 mm (0.4 ~ 0.6 in)



3. If free play can not be adjusted, adjust free play by the adjuster ① at right side of the crankcase.

4. Loosen:
   - Locknut ②

5. Adjust:
   - Clutch lever free play
     Turn the adjuster in or out.

Turn in	**Free play is increased.**
Turn out	**Free play is decreased.**

6. Tighten:
   - Locknut

COMPRESSION PRESSURE MEASUREMENT

NOTE:

Insufficient compression pressure will result in performance loss.

COMPRESSION PRESSURE MEASUREMENT

1. Measure:
   - Valve clearance
     Out of specification → Adjust.
     Refer to "VALVE CLEARANCE ADJUSTMENT" section.

2. Warm up the engine.

3. Remove:
   - Spark plugs

4. Measure:
   - Compression pressure

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:
1,079 kPa (11 kg/cm², 156 psi)
Minimum:
980 kPa (10 kg/cm², 142 psi)
Maximum:
1,128 kPa (11.5 kg/cm², 164 psi)

WARNING:

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

- Repeat the previous steps for the other cylinders.
- If pressure falls bellow the minimum level:

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

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

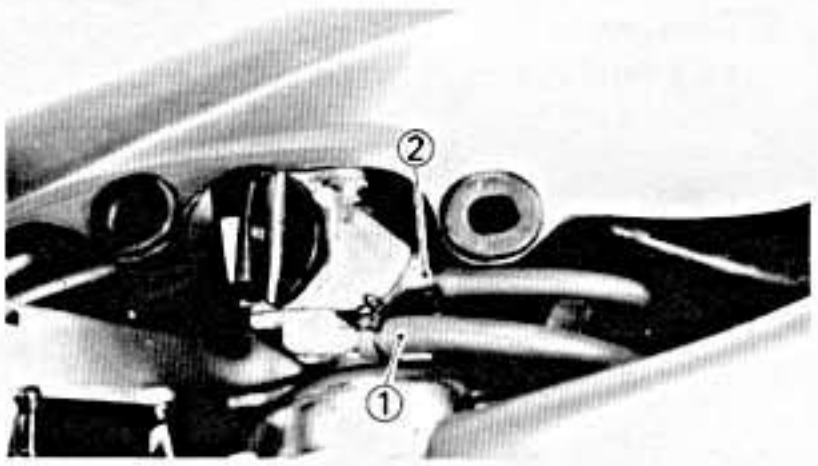
NOTE:

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

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

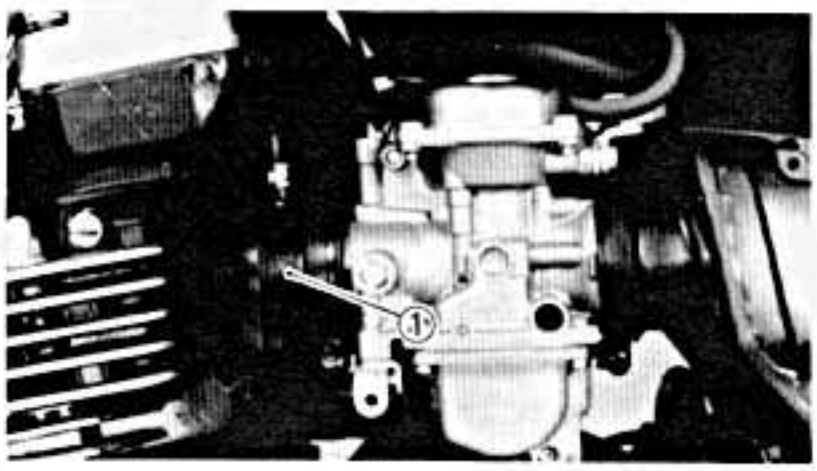
FUEL LINE INSPECTION

1. Remove:
   - Cover ①



2. Inspect:
   - Fuel pipe ①
   - Vacuum pipe ②

   Cracks/Damage → Replace.



CARBURETOR JOINT INSPECTION

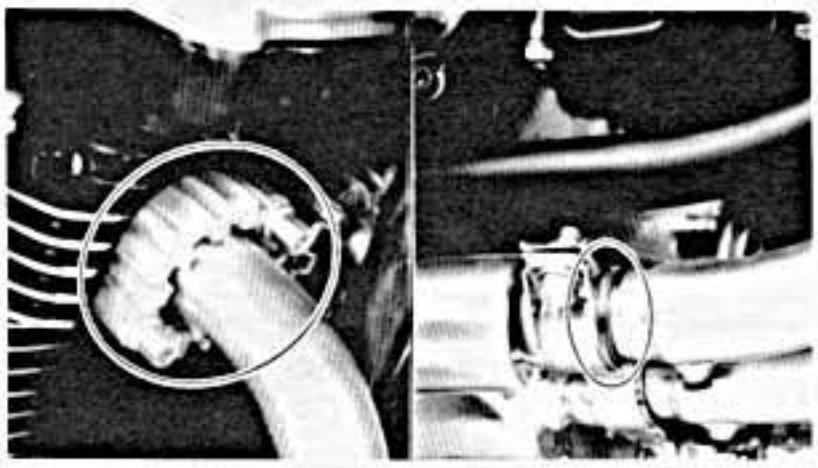
1. Inspect:
   - Carburetor joint ①

   Cracks/Damage → Replace.

CRANKCASE VENTILATION PIPE INSPECTION/ EXHAUST SYSTEM INSPECTION/ AIR FILTER CLEANING

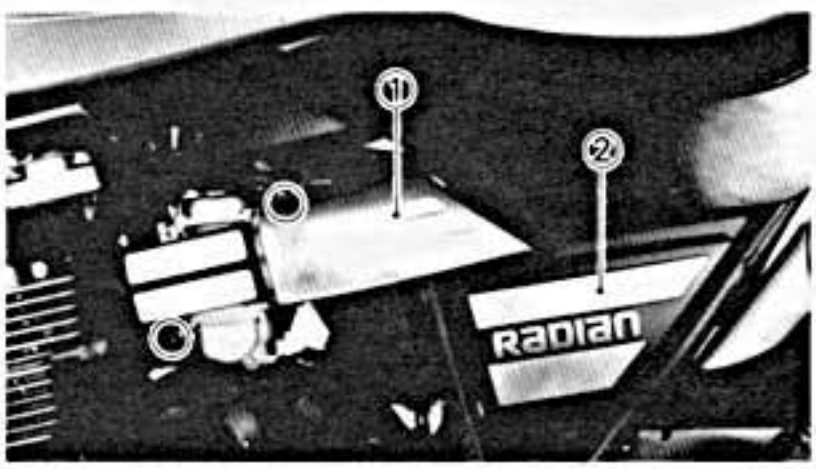
CRANKCASE VENTILATION PIPE INSPECTION

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



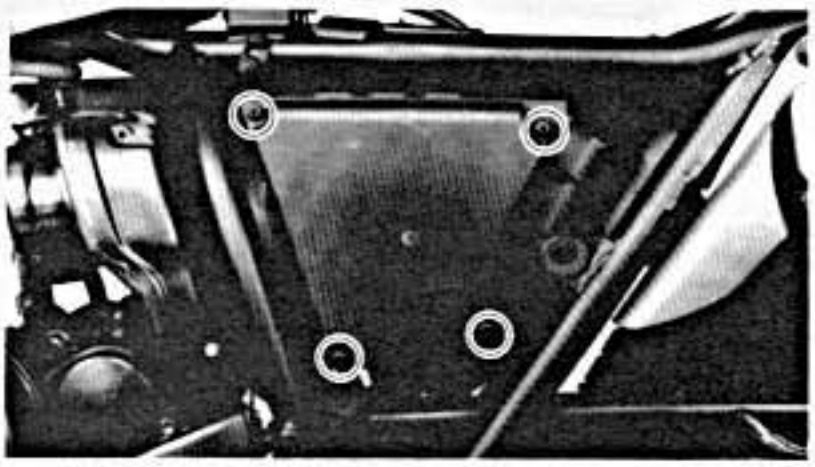
EXHAUST SYSTEM INSPECTION

1. Inspect:
   - Exhaust pipe
   - Muffler
     Cracks/Damage → Replace.
   - Gaskets
     Exhaust gas leaks → Replace.

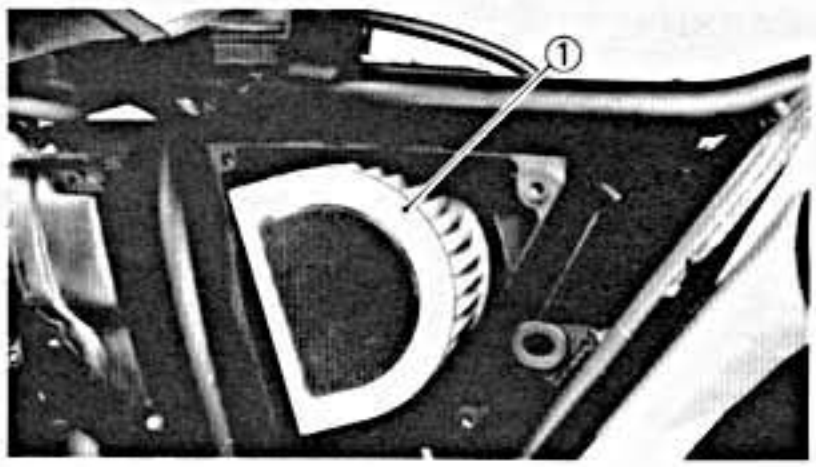


AIR FILTER CLEANING

1. Remove:
   - Cover (Carburetor) ①
   - Side cover (Left) ②



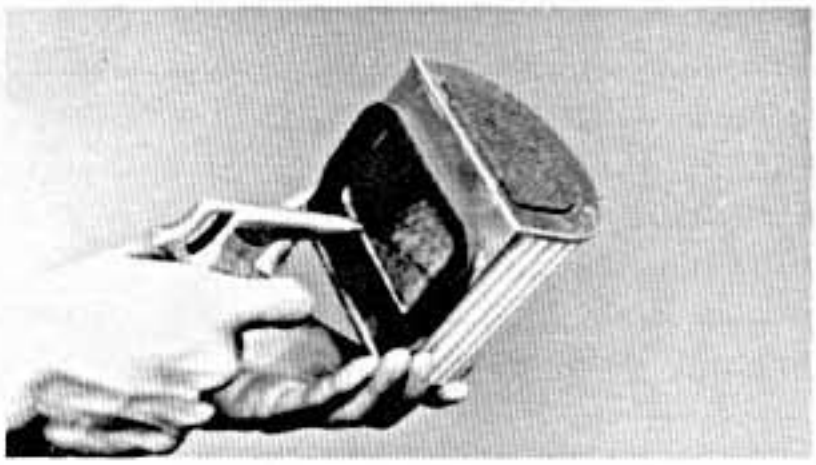
2. Remove:
   - Air filter case cover (Left)



3. Remove:
   - Air filter element ①

CAUTION:

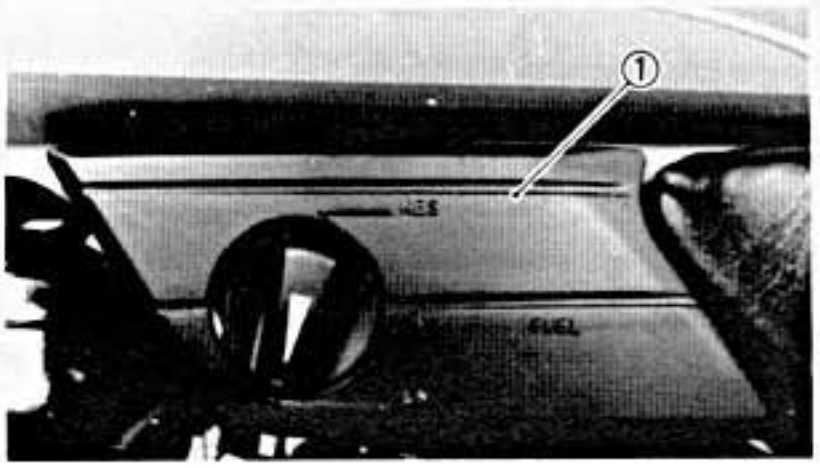
The engine should never be run without the air filter element; excessive piston and cylinder wear may result.



4. Clean:
   - Air filter element
     Blow out dust in the element from the inner surface using compressed air.

5. Inspect:
   - Air filter element
     Damage→Replace.

6. Install:
   - Air filter element
   - Air filter case cover (Left)
   - Side cover (Left)
   - Cover (Carburetor)

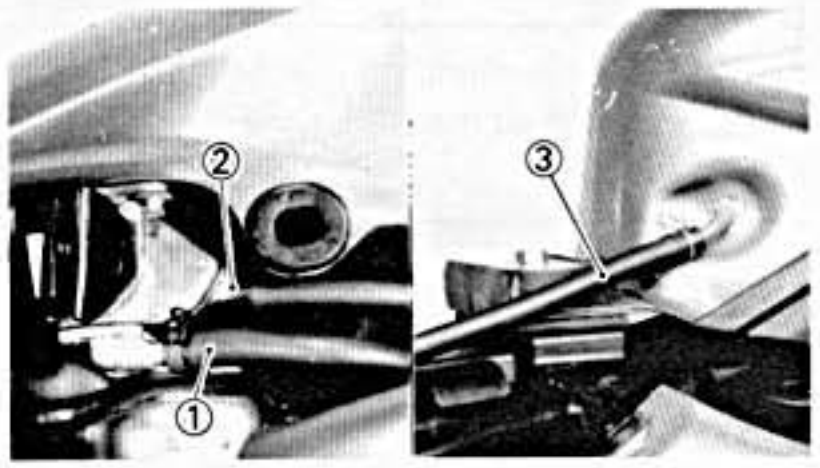


CHASSIS

FUEL COCK CLEANING

1. Turn the fuel cock to "ON" position.

2. Remove:
   - Cover (Fuel tank) ①
   - Seat



3. Disconnect:
   - Fuel pipe ①
   - Vacuum pipe ②
   - Fuel tank breather pipe ③

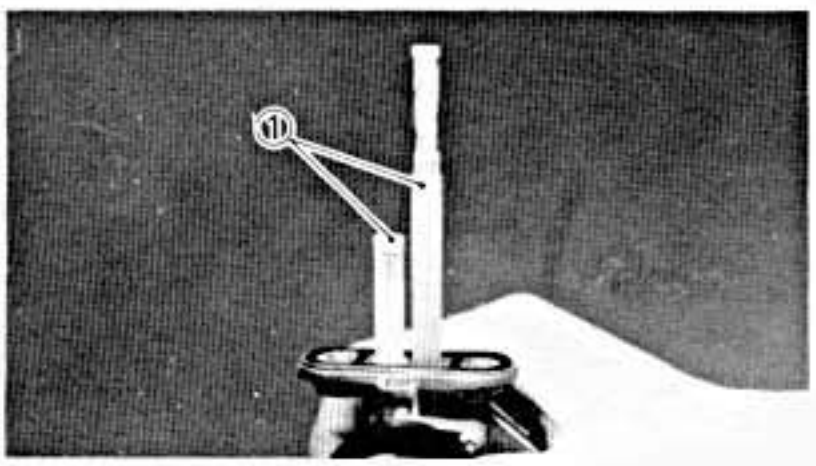
4. Remove:
   - Fuel tank

5. Drain
   - Fuel

FRONT BRAKE FLUID INSPECTION

WARNING:

FUEL IS HIGHLY FLAMMABLE:
- **Always turn off the engine when draining.**
- **Take care not to spill any fuel on the engine or exhaust pipe/muffler when draining.**
- **Never drain fuel while smoking or in the vicinity an open flame.**



6. Remove:
   - Fuel cock

7. Clean:
   - Filter screen ①

   Clean it with solvent.

8. Inspect:
   - Filter screen
   - O-ring

   Damage → Replace.

9. Install:
   - Fuel cock
   - Fuel tank
   - Seat
   - Cover (Fuel tank)

NOTE:

Be careful not to clamp the fuel cock too tightly as this may unseat the O-ring and lead to a fuel leak.

FRONT BRAKE FLUID INSPECTION

1. Inspect:
   - Brake fluid level

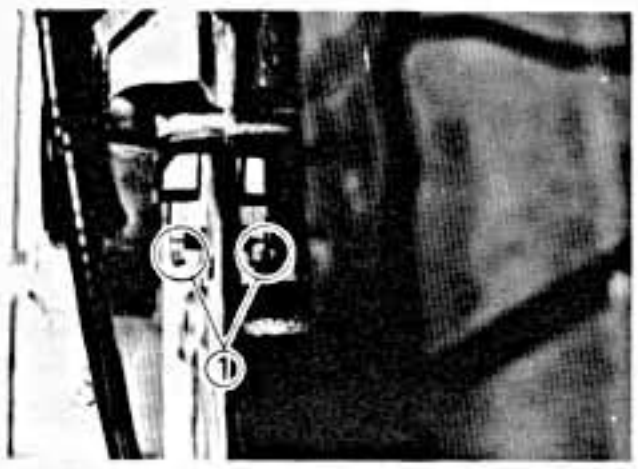
   Fluid at lower level → Replenish.

① Front brake fluid lower level

Brake Fluid: DOT #3

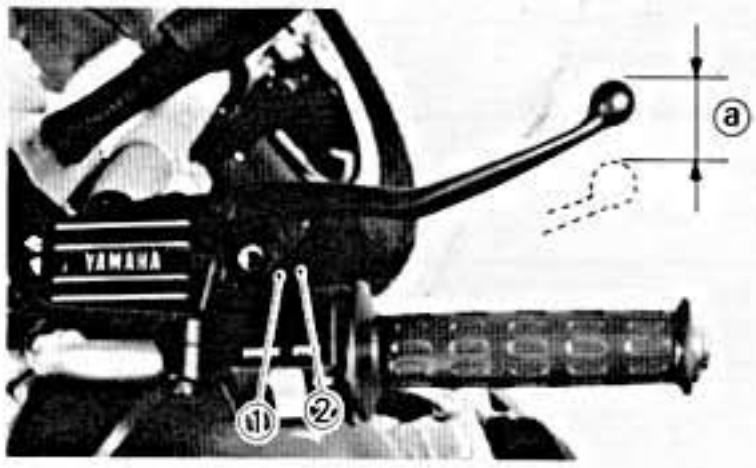
WARNING:

- **Use only designated qualty brake fluid to avoid poor brake performance.**
- **Refill with same type and brand of brake fluid; mixing fluids could result in poor brake performance.**
- **Be sure that water or other contaminants do not enter master cylinder when refilling.**
- **Clean up spilled fluid immediately to avoid erosion of painted surfaces or plastic parts.**



FRONT BRAKE PAD INSPECTION

1. Depress the brake lever.
2. Inspect:
   - Wear indicator ①
     Indicator almost contacts disc → Replace pads.



FRONT BRAKE LEVER FREE PLAY ADJUSTMENT

1. Loosen:
   - Locknut ①

2. Adjust:
   - Free play ⓐ
     Turn the adjuster ② in or out.

Turn in	**Free play is decreased.**
Turn out	**Free play is increased.**

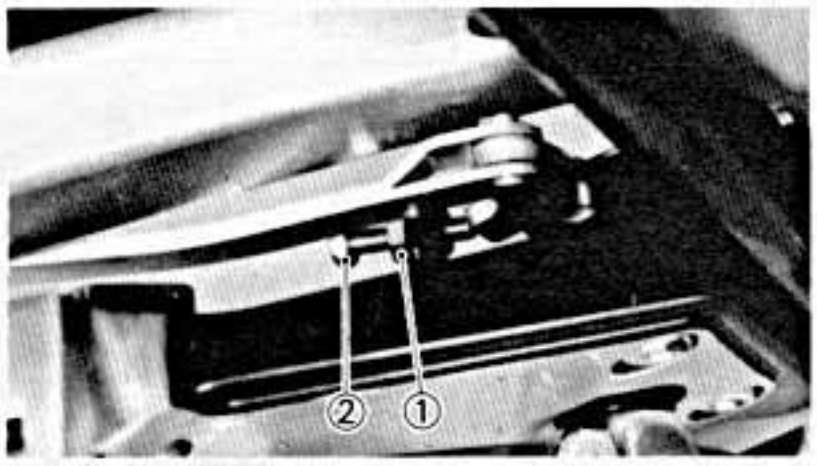
Free Play:
2 ~ 5 mm (0.08 ~ 0.20 in)

CAUTION:

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

REAR BRAKE PEDAL HEIGHT ADJUSTMENT/ BRAKE PEDAL FREE PLAY ADJUSTMENT

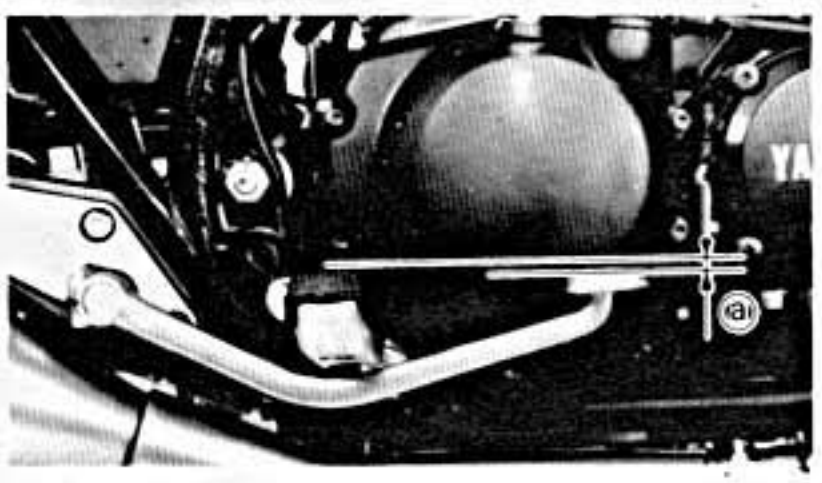
3. Tighten:
   • Locknut



REAR BRAKE PEDAL HEIGHT ADJUSTMENT

1. Loosen:
   • Locknut ①

② Adjuster



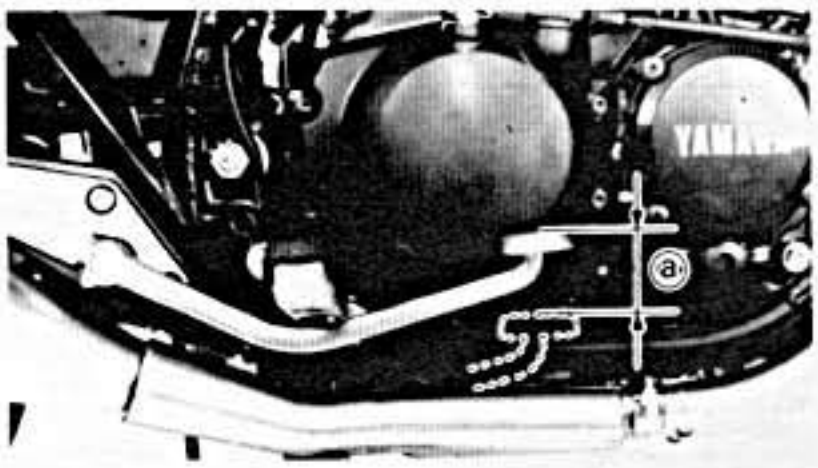
2. Adjust:
   • Brake pedal height ⓐ
   Turn the adjuster in or out.

Turn in	Pedal height is increased.
Turn out	Pedal height is decreased.

Pedal Height:
15 mm (0.6 in)
Below the top of the footrest.

WARNING:

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

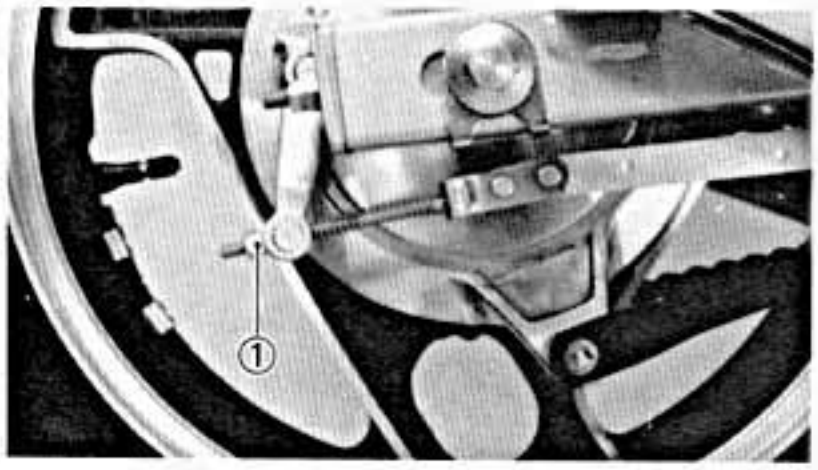


BRAKE PEDAL FREE PLAY ADJUSTMENT

1. Adjust:
   • Free play ⓐ
   Turn the adjuster ① in or out.

Turn in	Free play is decreased.
Turn out	Free play is increased.

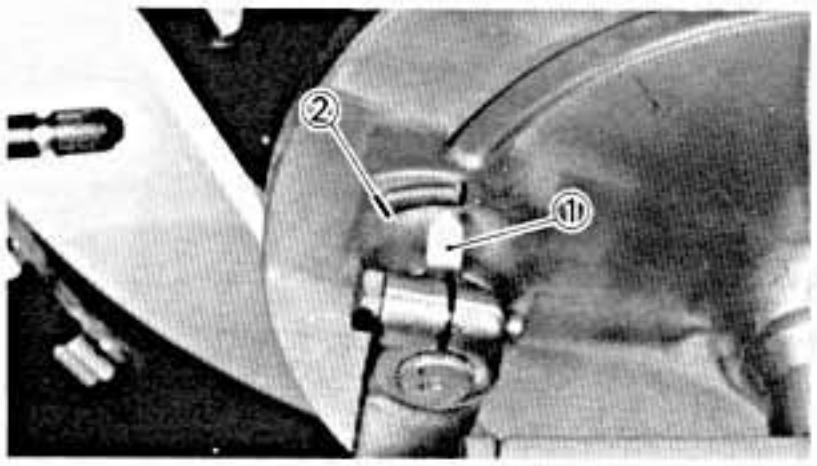
REAR BRAKE LINING INSPECTION/ REAR BRAKE LIGHT SWITCH ADJUSTMENT



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

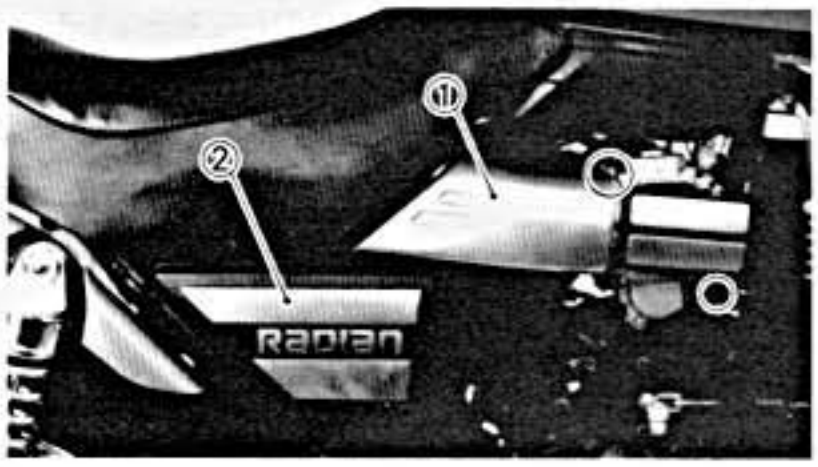
WARNING:

Check the operation of the brake light after adjusting the rear brake.



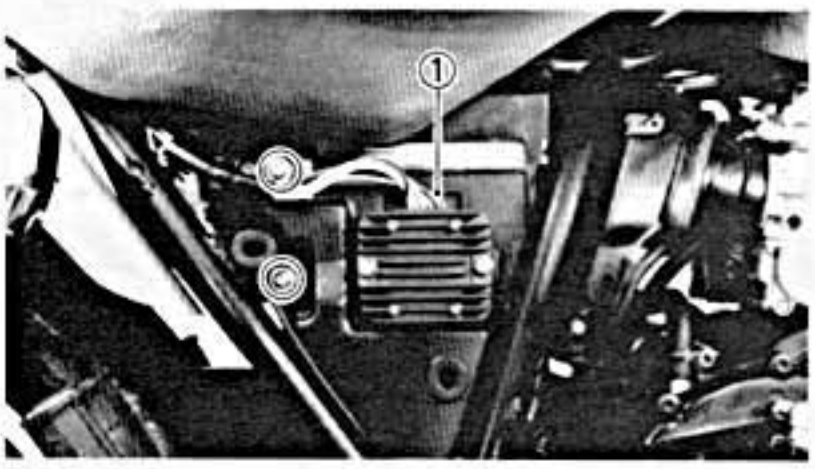
REAR BRAKE LINING INSPECTION

1. Depress the brake pedal.
2. Inspect:
   - War indicator ①
     Indicator reaches the wear limit line ②→ Replace shoes.

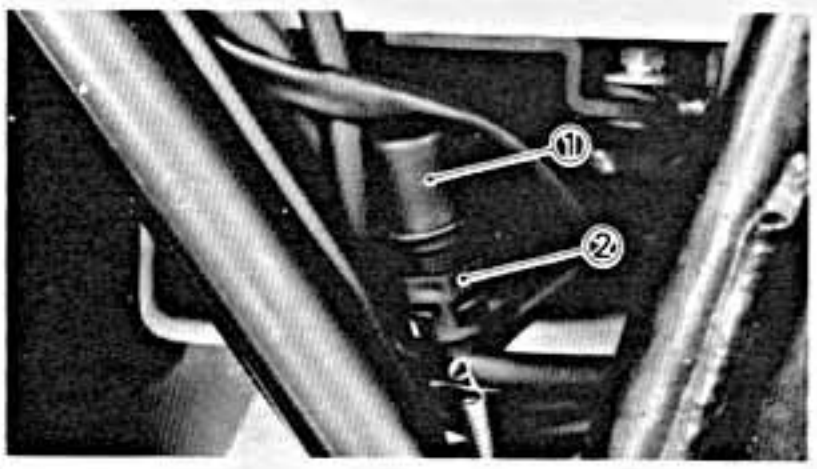


REAR BRAKE LIGHT SWITCH ADJUSTMENT

1. Remove:
   - Cover (Carburetor) ①
   - Side cover (Right) ②



2. Remove:
   - Battery case cover ①



3. Adjust:
   - Rear brake light switch
     Hold the switch body ① with your hand so it does not rotate and turn the adjuster ②.

NOTE:

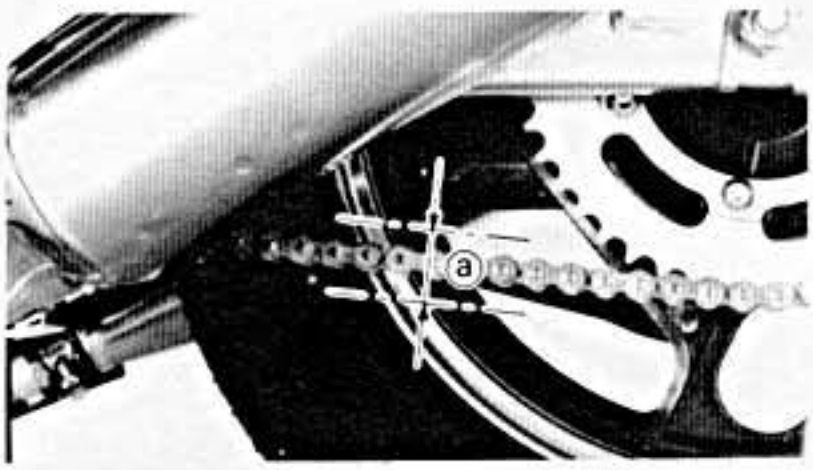
Proper adjustment is achieved when the brake light comes on just before the brake begins to take effect.

DRIVE CHAIN SLACK CHECK
DRIVE CHAIN SLACK ADJUSTMENT

DRIVE CHAIN SLACK CHECK

NOTE:

Before checking and/or adjusting the chain slack, rotate the rear wheel through several revolutions. Check the chain slack several times to find the point where the chain is the tightest. Check and/or adjust the chain slack where the rear wheel is in this "tight chain" position.

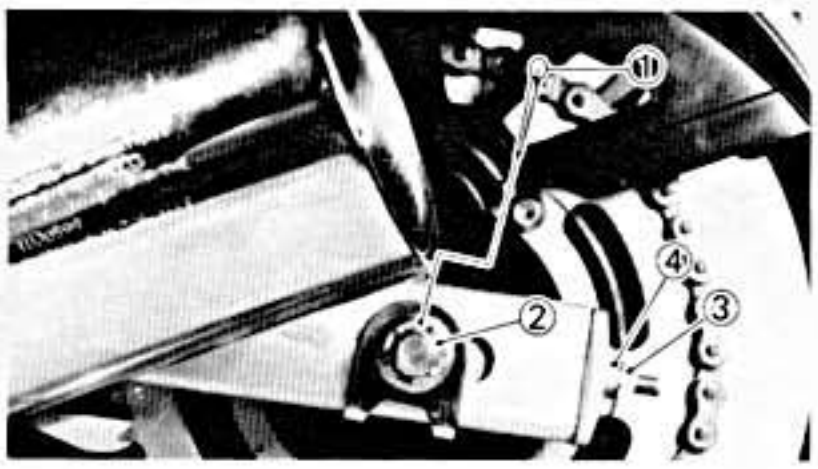


1. Place the motorcycle on the centerstand.

2. Measure:
   - Drive chain slack ⓐ
     Out of specification → Adjust.

Drive Chain Slack:
20 ~ 30 mm (0.8 ~ 1.2 in)

DRIVE CHAIN SLACK ADJUSTMENT



1. Remove:
   - Cotter pin ①

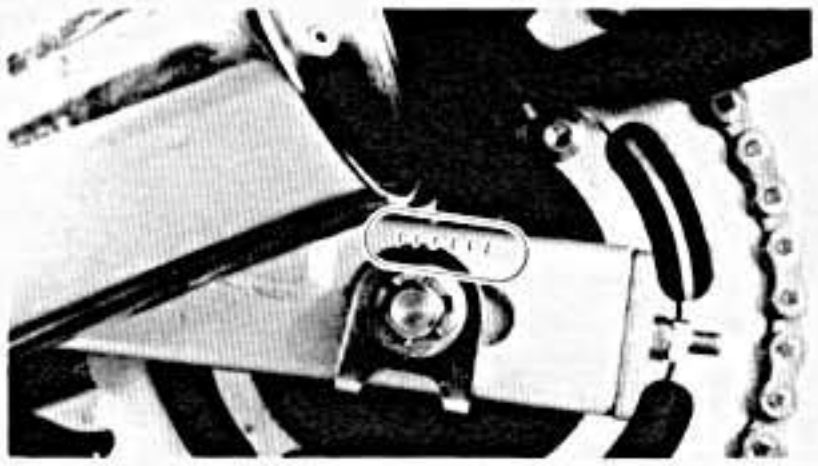
2. Loosen:
   - Nut (Rear axle) ②
   - Locknut ③

3. Adjust:
   - Chain slack
     Turn the adjuster ④ in or out.

Turn in	Chain slack is decreased.
Turn out	Chain slack is increased.

NOTE:

There are marks on each side of rear arm and on each chain puller; use them to check for proper alignment.

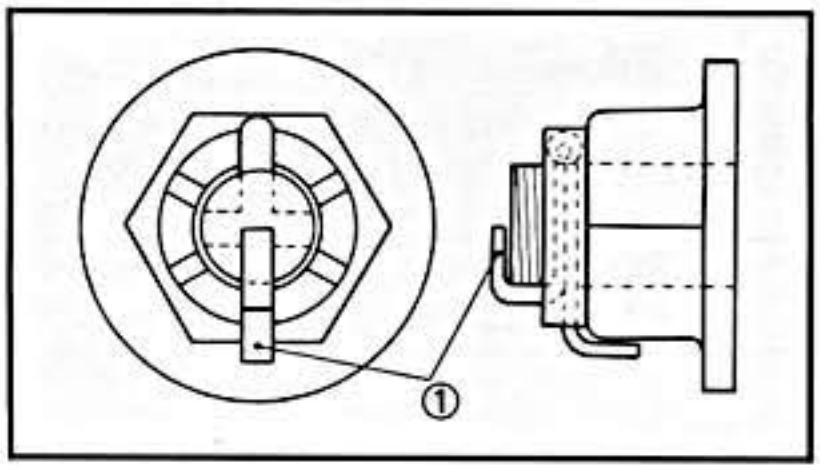


CAUTION:

Too small chain slack will overload the engine and other vital parts; keep the slack within the specified limits.

4. Tighten:
   - Locknut
   - Nut (Rear axle)

Nut (Rear Axle):
105 Nm (10.5 m•kg, 75 ft•lb)



5. Install:
   - Cotter pin ① (New)

NOTE:

Do not loosen the axle nut after torque tightening. If the axle nut groove is not aligned with the wheel shaft cotter pin hole, align groove to hole by tightening up on the axle nut.

DRIVE CHAIN LUBRICATION

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

SAE 10W30 Motor Oil

CABLE INSPECTION AND LUBRICATION

Cable inspection and lubrication steps:
- Hold cable end high and apply several drops of lubricant to cable.
- Coat metal surface of disassembled throttle twist grip with suitable all-purpose grease to minimize friction.
- Check for damage to cable insulation. Replace any corroded or obstructed cables.
- Lubricate any cables that do not operate smoothly.

Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil

LEVER AND PEDAL LUBRICATION/ CENTERSTAND AND SIDESTAND LUBRICATION/ FRONT FORK OIL CHANGE

LEVER AND PEDAL LUBRICATION

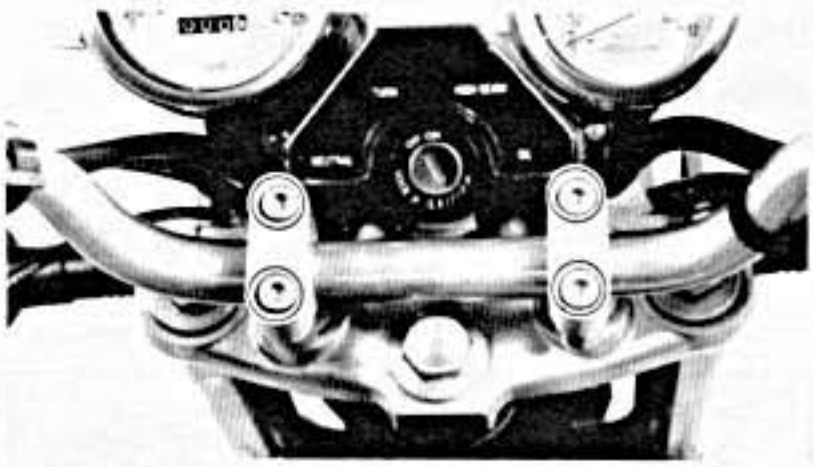
Lubricate pivoting parts of each lever and pedal.

Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil

CENTERSTAND AND SIDESTAND LUBRICATION

Lubricate centerstand and sidestand at their pivot points.

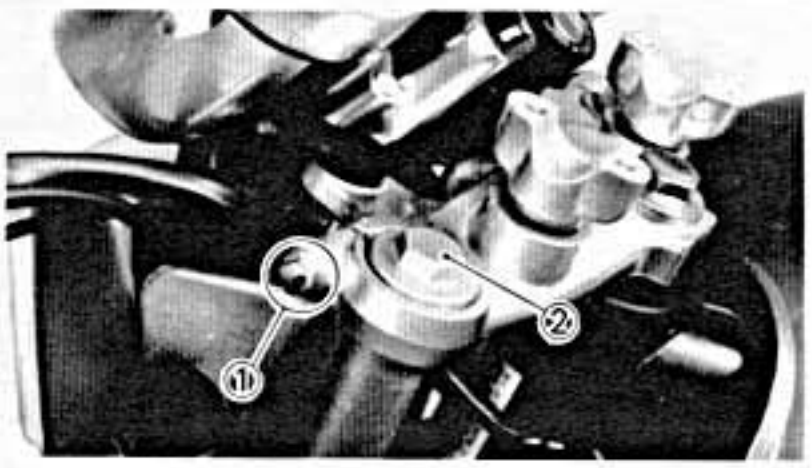
Yamaha Chain and Cable Lube or SAE 10W30 Motor Oil



FRONT FORK OIL CHANGE

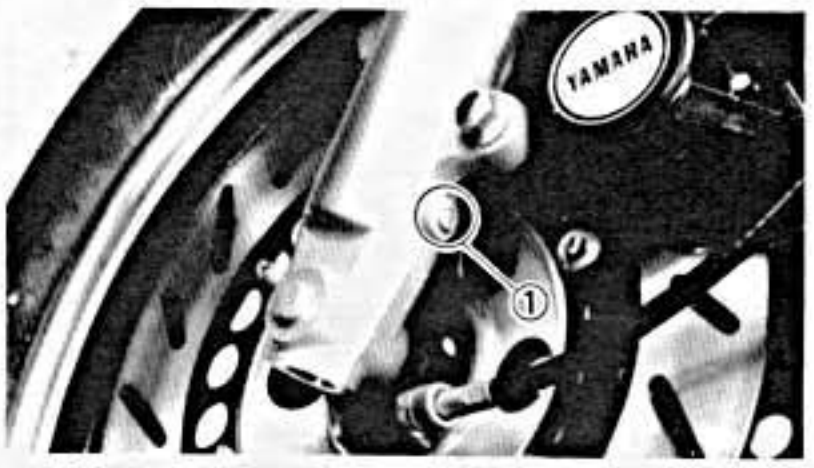
1. Place the motorcycle on the centerstand.

2. Remove:
   - Handlebar



3. Loosen:
   - Bolt ① (Handle crown)

4. Remove:
   - Cap bolt ②



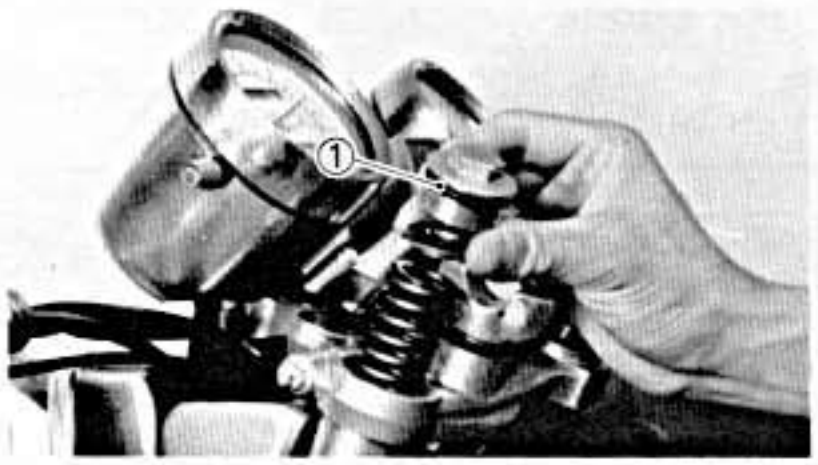
5. Place a receptacle under the drain hole.

6. 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 (Cap bolt) ①
   - Gasket (Drain screw)
   Wear/Damage→Replace.

8. Install:
   - Drain screw
   - Gasket

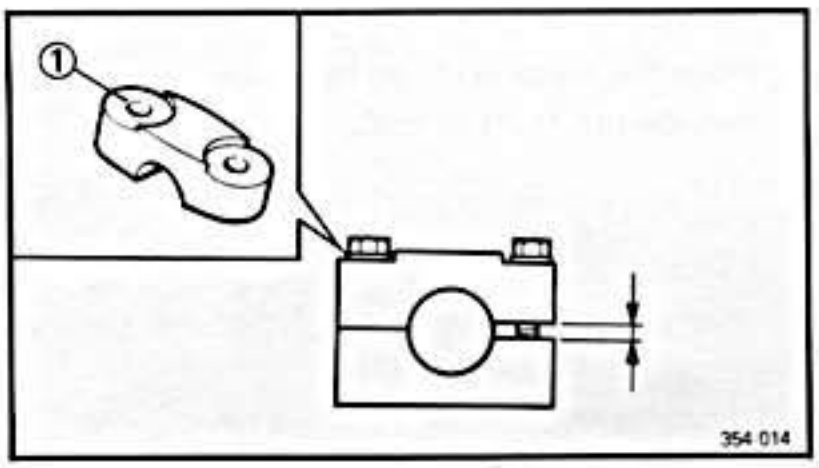
9. Fill:
   - Front fork

Recommended Oil:
Yamaha Fork Oil 10WT or Equivalent
For Oil Capacity (Each Fork):
320 cm³ (11.3 Imp oz, 10.8 US oz)

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

11. Tighten:
   - Cap bolt
   - Bolt (Handle crown)

Cap Bolt:
23 Nm (2.3 m•kg, 17 ft•lb)
Bolt (Handle Crown):
23 Nm (2.3 m•kg, 17 ft•lb)



12. Install:
   - Handlebar

NOTE:

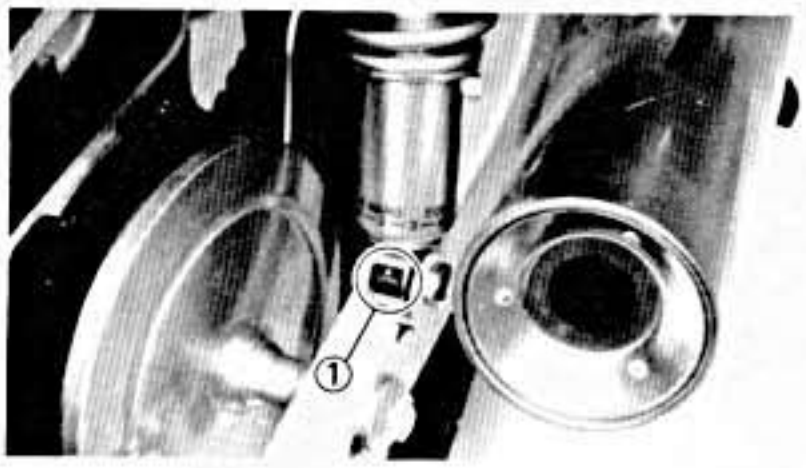
The upper handlebar holder should be installed with the punched mark ① forward.

REAR SHOCK ABSORBER ADJUSTMENT/ STEERING HEAD INSPECTION

CAUTION:

First tighten the bolts on the front side of the handlebar holder, and then tighten the bolts on the rear side.

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



REAR SHOCK ABSORBER ADJUSTMENT

1. Adjust:
   - Shock absorber preload

	←Stiffer			Std.	Softer
Adjusting position	5	4	3	2	1

① Match mark

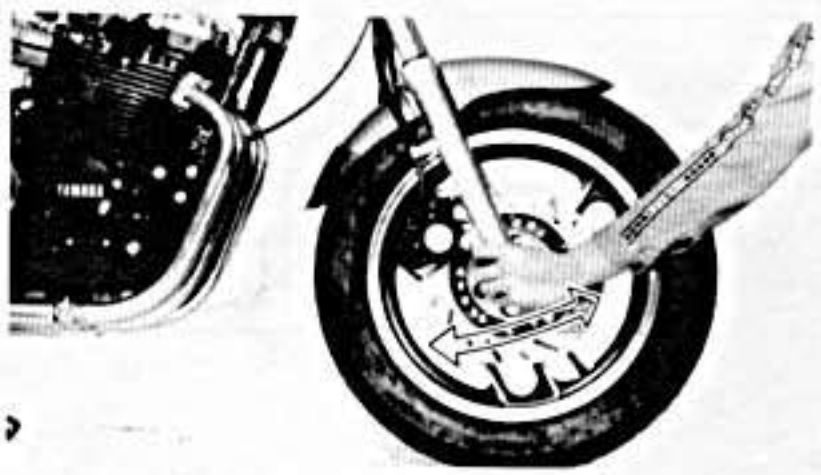
WARNING:

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

Recommended Rear Shock Absorber Settings

Use this table as a guide for specific riding and motorcycle load conditions.

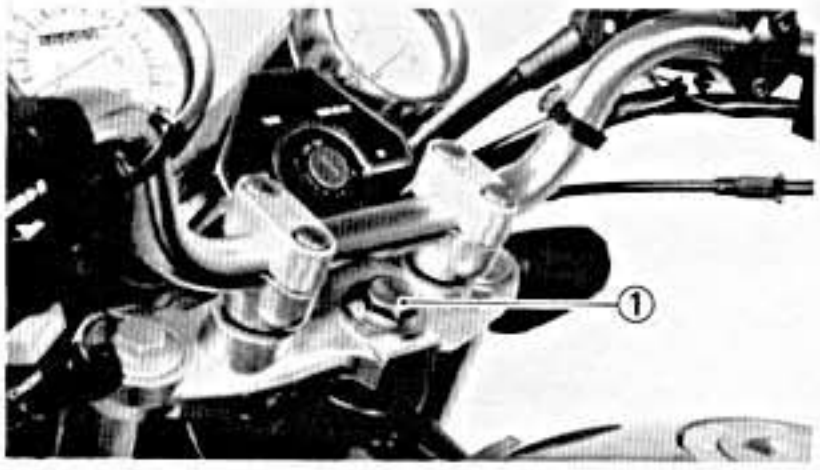
Rear shock absorber	Loading condition			
◀HARD SOFT▶ 1 – 2 – 3 – 4 – 5 ▲ SPRING ADJUSTER	Solo rider	With passenger	With accessories and equipment	With accessories, equipment, and passenger
Position	1~2	3~5	3~5	5



STEERING HEAD INSPECTION

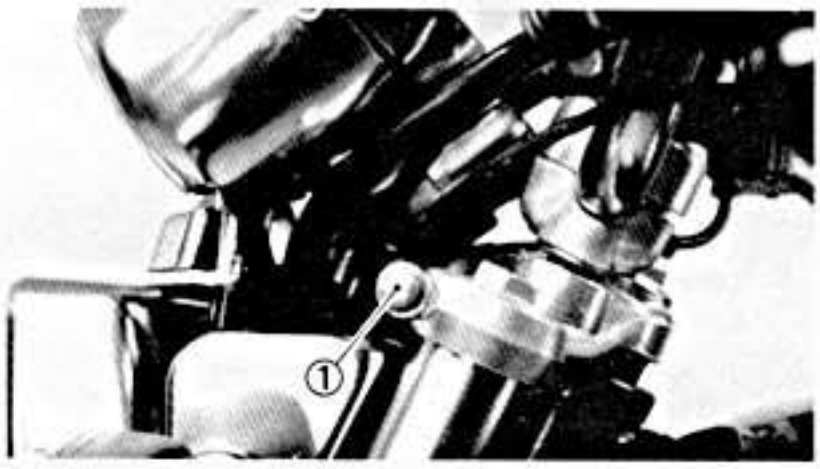
1. Place the motorcycle on its centerstand, then elevate the front wheel.

2. Check:
   - Steering assembly bearings
     Grasp the bottom of the forks and gently rock the fork assembly back and forth.
     Looseness→Adjust steering head.



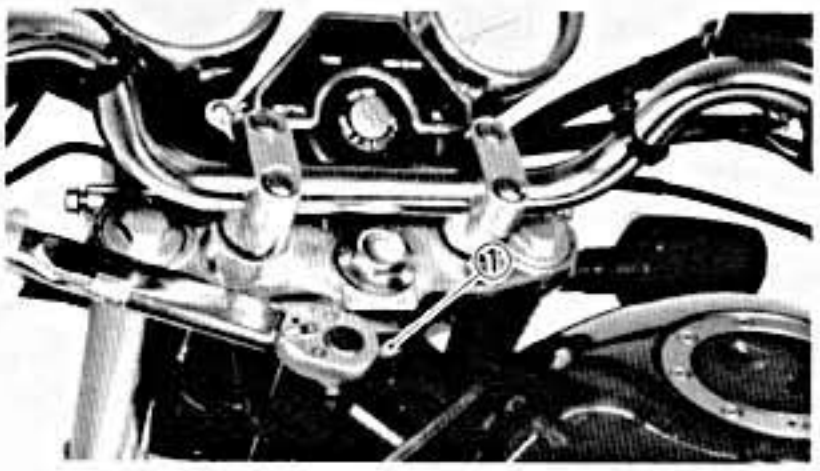
STEERING HEAD ADJUSTMENT

1. Loosen:
   - Bolt (Steering stem) ①



2. Loosen:
   - Bolts (Handle crown) ①

3. Lift the handle crown and handlebar assembly.



4. Tighten:
   - Ring nut

   Use the Ring Nut Wrench ① (YU-33975).

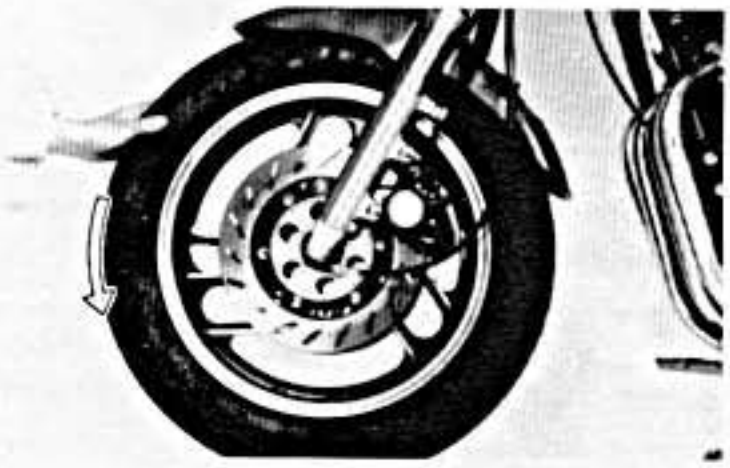
	Ring Nut: **38 Nm (3.8 m•kg, 27 ft•lb)**

NOTE:

If steering is binded, loosen the ring nut so that there is no free play on bearing.

5. Install:
   - Handle crown

	Bolt (Steering Stem): **54 Nm (5.4 m•kg, 39 ft•lb)** **Bolt (Handle Crown):** **20 Nm (2.0 m•kg, 14 ft•lb)**



FRONT WHEEL BEARING INSPECTION

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

REAR WHEEL BEARING INSPECTION/TUBELESS TIRES AND ALUMINUM WHEELS INSPECTION

REAR WHEEL BEARING INSPECTION

1. Remove:
   - Cotter pin
   - Rear wheel

2. Check:
   - Bearing movement
     With the fingers.
     Roughness/Wear→Replace.

3. Install:
   - Rear wheel

4. Adjust:
   - Drive chain slack
     Refer to "DRIVE CHAIN SLACK ADJUSTMENT" section.

5. Tighten:
   - Nut (Rear axle)

	Nut (Rear axle): 105 Nm (10.5 m•kg, 75 ft•lb)

6. Install:
   - Cotter pin (New)

TUBELESS TIRES AND ALUMINUM WHEELS INSPECTION

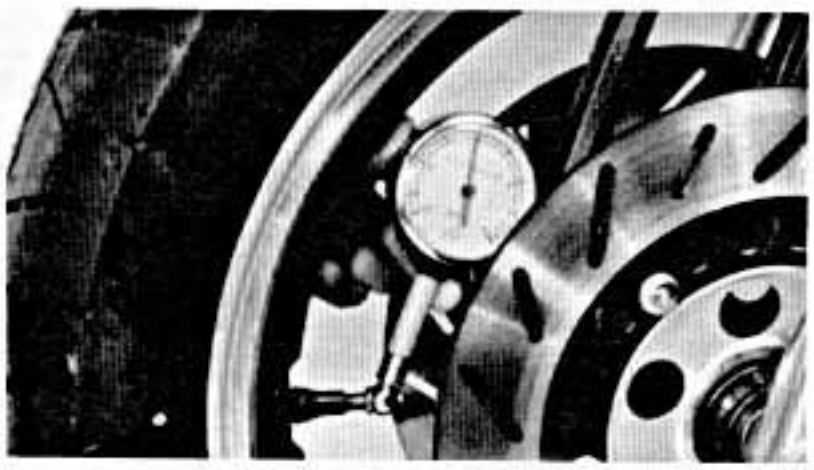
WARNING:

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

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

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

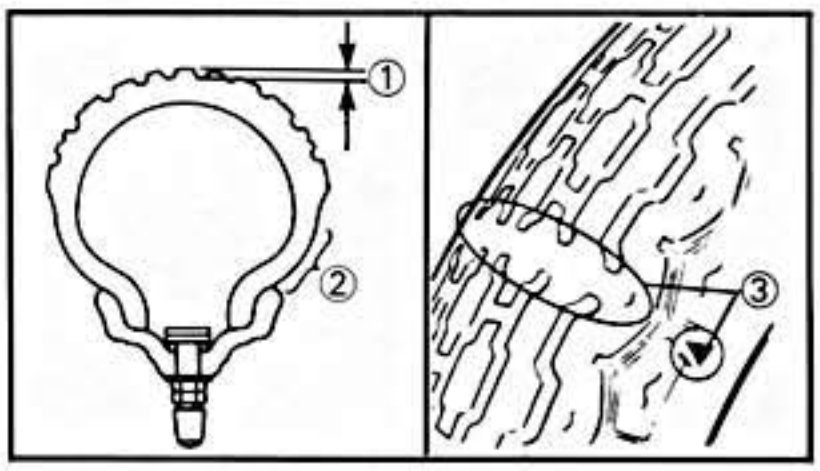
Always perform the following steps to ensure safe operation, maximum tire performance, and long service.



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

Basic weight: With oil and full fuel tank	197 kg (434 lb)	
Maximum load*	258 kg (569 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) ~ 160 kg (353 lb) load*	196 kPa (2.0 kg/cm², 28 psi)	226 kPa (2.3 kg/cm² 32 psi)
160 kg (353 lb) ~ Maximum load*	196 kPa (2.0 kg/cm², 28 psi)	245 kPa (2.5 kg/cm², 36 psi)
High speed riding	196 kPa (2.0 kg/cm², 28 psi)	226 kPa (2.3 kg/cm², 32 psi)

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



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

Minimum Tire Tread Depth:
(Front and Rear)
0.8 mm (0.03 in)

① Tread depth
② Side wall
③ Wear indicator

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

NOTE:

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

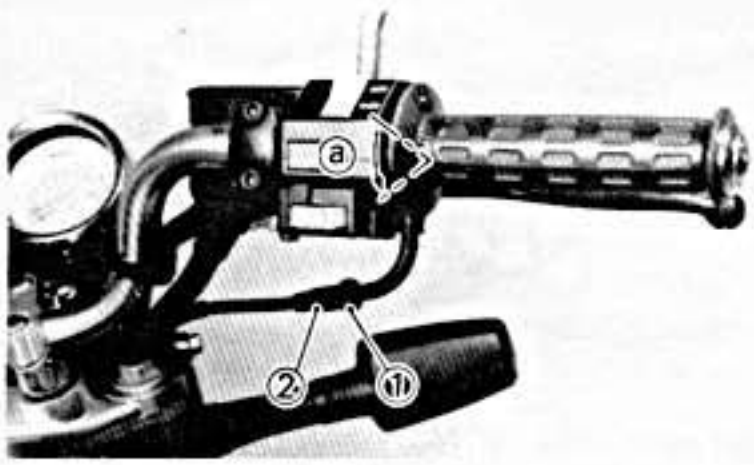
IGNITION TIMING CHECK

4. Tighten:
   • Valve stem locknut

	1.5 Nm (0.15 m•kg, 1.1 ft•lb)

WARNING:

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



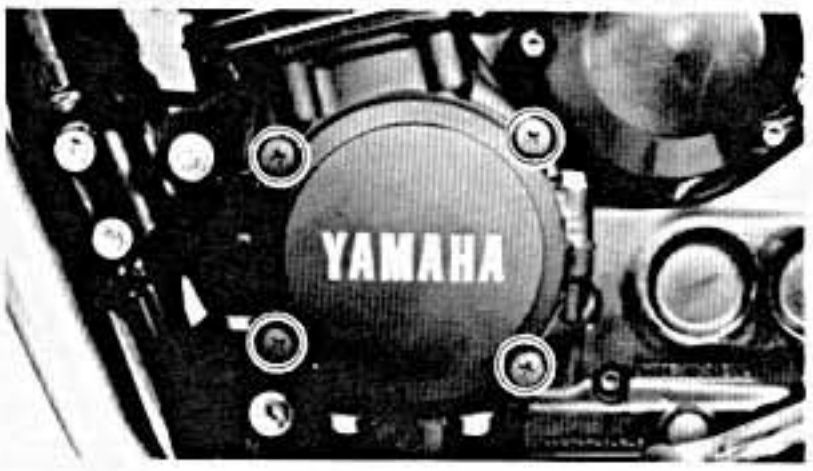
THROTTLE CABLE ADJUSTMENT

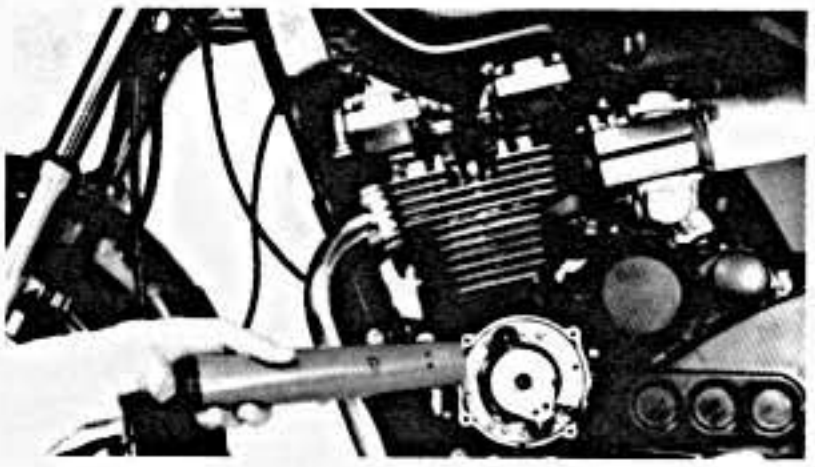
1. Loosen:
   • Lock nut ①

2. Adjust:
   • Throttle cable free play ⓐ
   Turn the adjuster ② in or out.

Turn in	Free play is increased.
Torn out	Free play is decreased.

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





ELECTRICAL

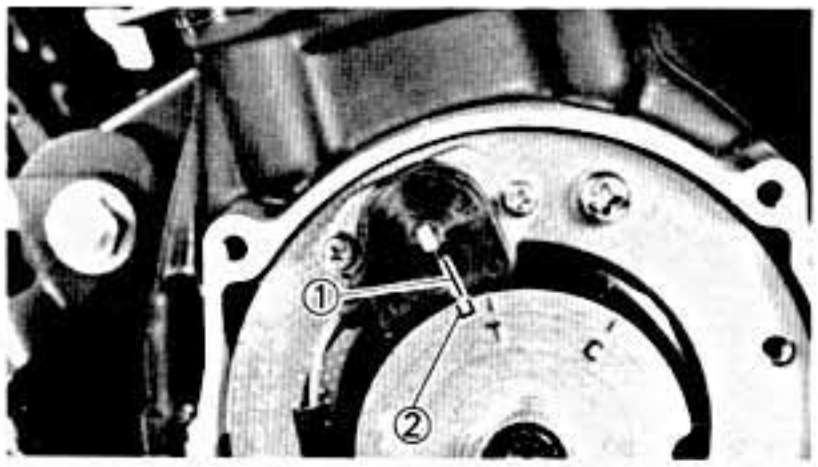
IGNITION TIMING CHECK

1. Remove:
   • Crankcase cover (Left)

2. Connect:
   • Timing light (YM-33277)
   (To the #1 spark plug lead)

3. Warm up the engine and allow it to idle at the specified speed.

	Engine Idle Speed: **1,250 ~ 1,350 r/min**

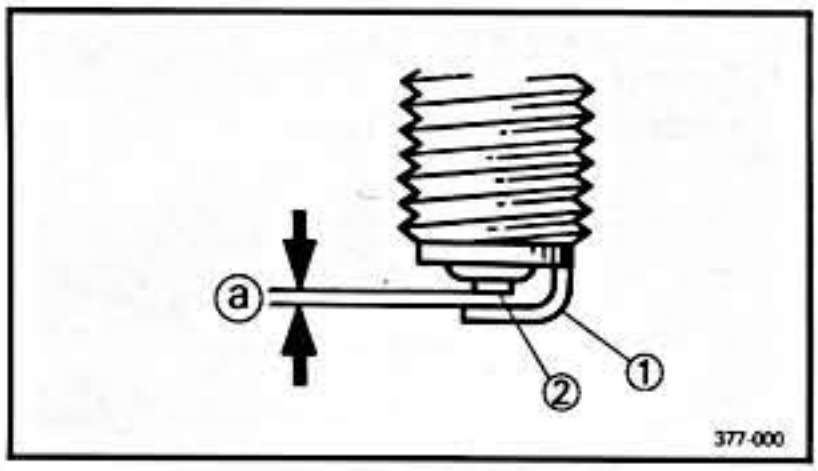


4. Check:
   - Ignition timing

   Visually check the upper pickup coil mark ① is within the firing range ② indicated on timing plate.

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

5. Install:
   - Crankcase cover



SPARK PLUG INSPECTION

1. Inspect:
   - Electrode ①

   Wear/Damage→Replace.
   - Insulator color ②

   Normal condition is a medium to light tan color.

   Distinctly different color→Check the engine condition.

ⓐ Spark plug gap

2. Clean:
   - Spark plug

   Clean the spark plug with a spark plug cleaner or wire brush.

3. Inspect:
   - Spark plug type

   Incorrect→Replace.

Standard Spark Plug:
D8EA (NGK), X24ESU (N.D.)

4. Measure:
   - Spark plug gap

   Out of specification→Regap.

   Use a wire gauge.

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

5. Tighten:
   •Spark plug

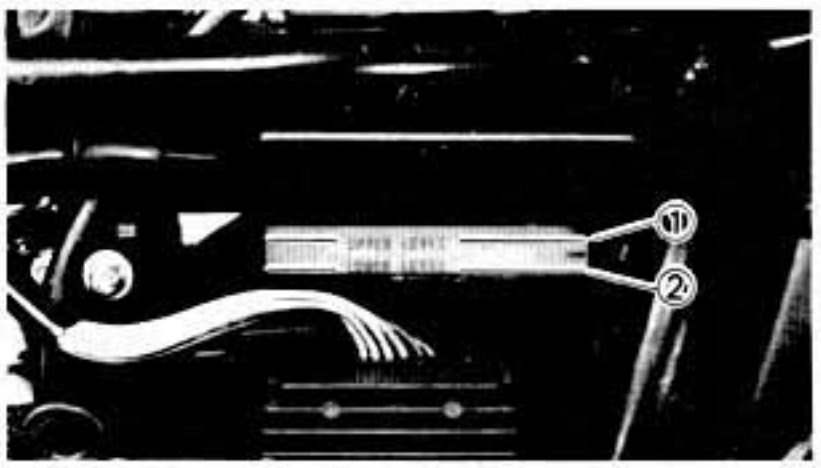
NOTE:

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

Spark Plug:
18 Nm (1.8 m•kg, 13 ft•lb)

NOTE:

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



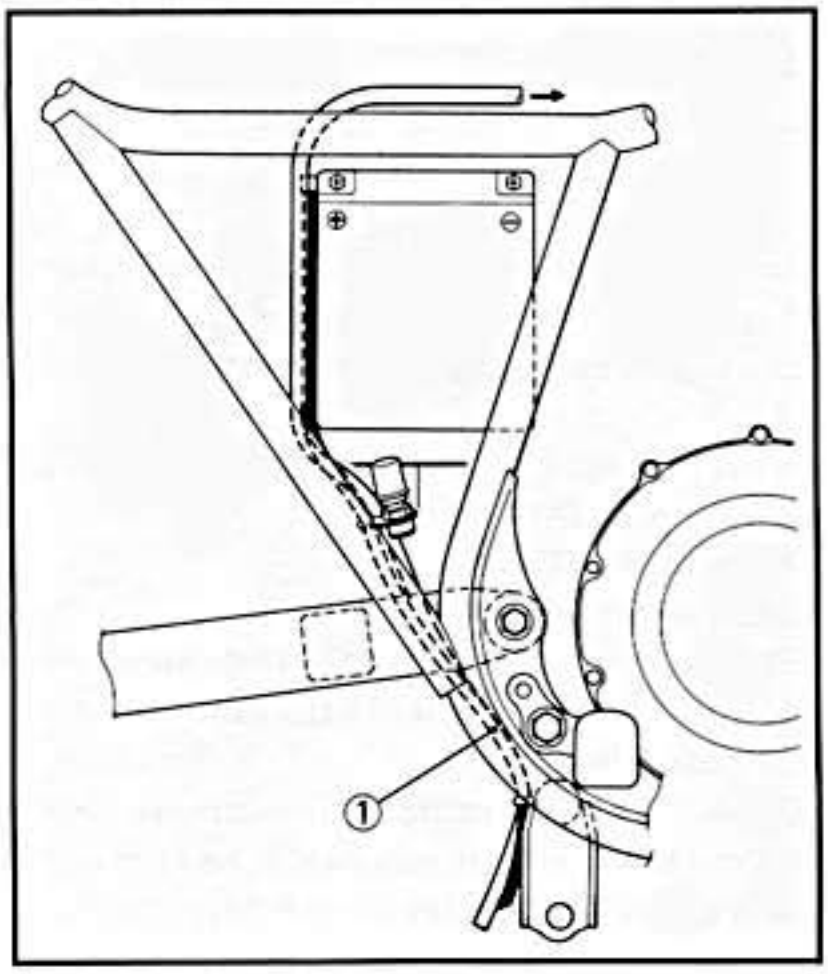
BATTERY INSPECTION

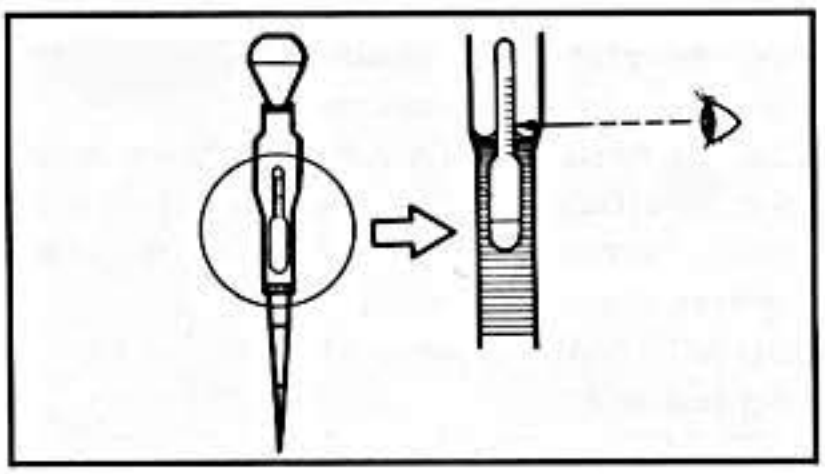
1. Remove:
   •Side cover (Right) ①

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

CAUTION:

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





3. Connect:
   - Breather pipe ①

   Be sure the hose is properly attached and routed.

4. Inspect:
   - Breather pipe

   Obstruction → Remove.
   Damage → Replace.

CAUTION:

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

5. Check:
   - Specific gravity:

   Less than 1.280 → Recharge battery.

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

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.

CAUTION:

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

FUSE INSPECTION

WARNING:

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

Always follow these preventive measures:

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

Antidote (EXTERNAL):

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

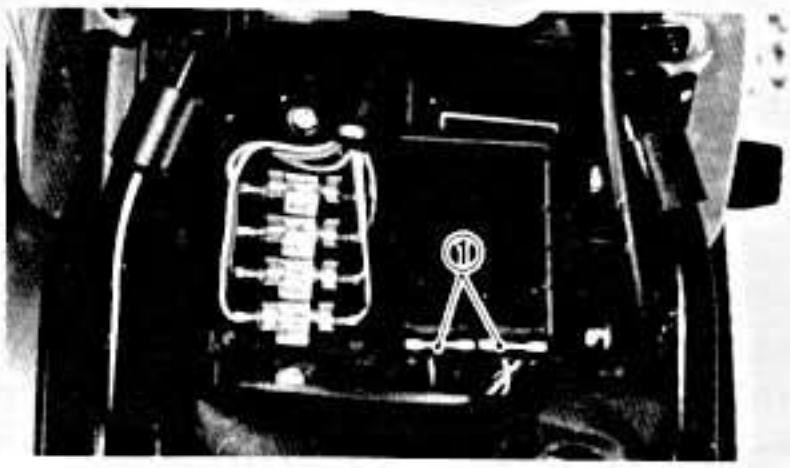
Antidote (INTERNAL):

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

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

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

KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.



FUSE INSPECTION

The fuse panel is located under the seat.

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

NOTE:

Install new fuses of proper amperage.

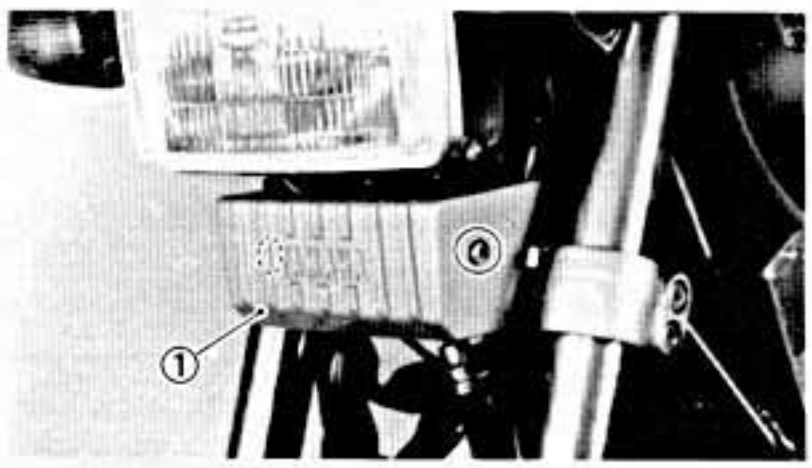
① Spare fuses

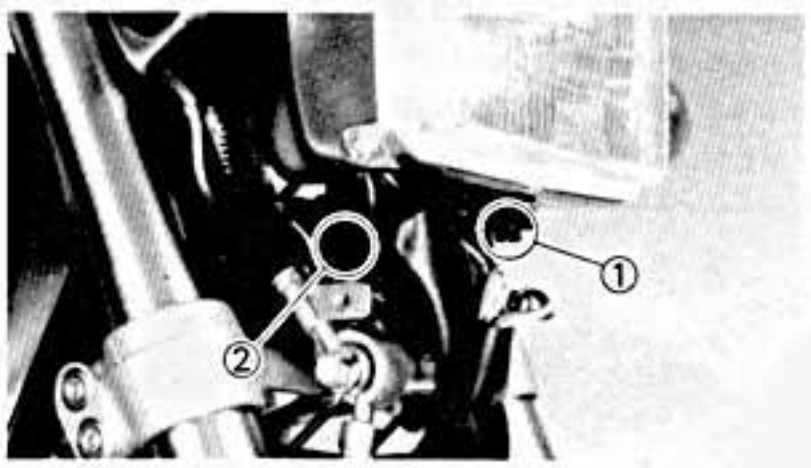
Description	Amperage	Quantilty
Main	20A	1
Headlight	10A	1
Signal	10A	1
Ignition	10A	1
Reserve	10A	1
	20A	1

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.





HEADLIGHT BEAM ADJUSTMENT

1. Remove:
   - Cover ①

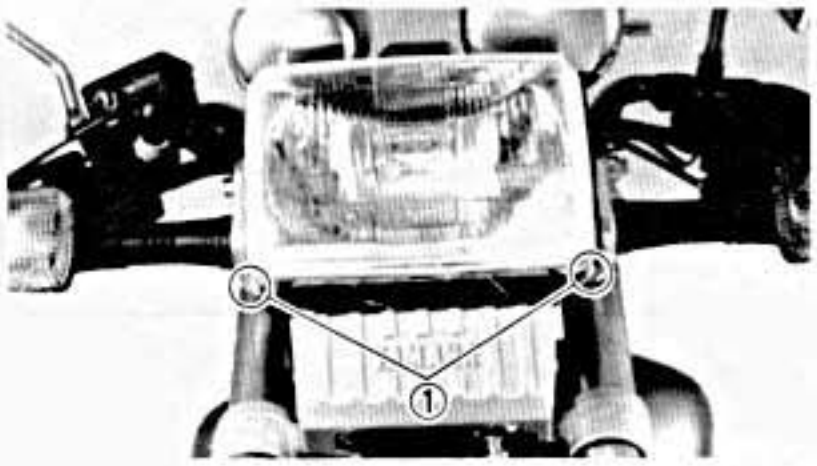
2. Adjust:
   - Horizontal beam direction

   Loosen the adjusting screw ① and move the headlight body right or left.
   When proper adjustment is achieved, retighten the adjusting screw.

HEADLIGHT BULB REPLACEMENT

3. Adjust:
   •Vertical beam direction
   Loosen the adjusting screw ② and move the headlight body up or down.
   When proper adjustment is achieved, retighten the adjusting screw.

4. Install:
   •Cover



HEADLIGHT BULB REPLACEMENT

1. Remove:
   •Screw ①

2. Disconnect:
   •Headlight leads

3. Remove:
   •Bulb
   Turn the bulb holder counterclockwise to release bulb.

WARNING:

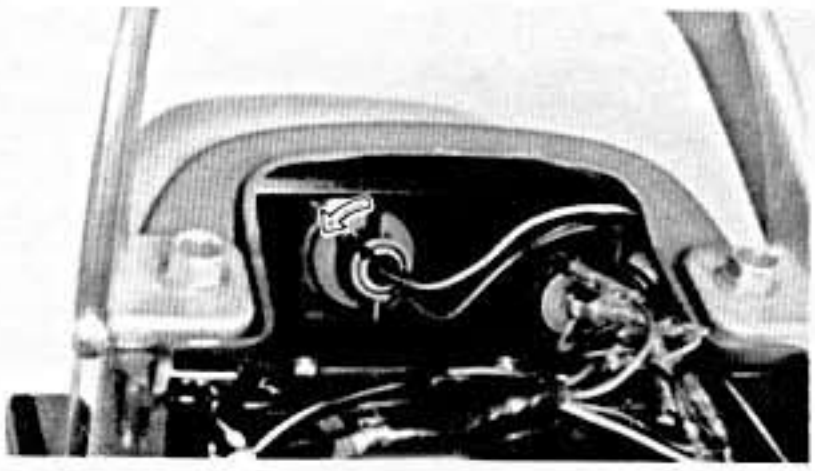
Keep flammable products or your hands away from the bulb while it is on, it will be hot. Do not touch the bulb until it cools down.

4. Install:
   •Bulb (New)
   Secure the new bulb with the bulb holder.

CAUTION:

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

5. Install:
   •Headlight lens unit



TAILLIGHT BULB REPLACEMENT

1. Remove:
   - Seat

2. Remove:
   - Bulb socket

   Turn the bulb socket approximately 30° counterclockwise.

3. Replace:
   - Defective bulb

4. Install:
   - Bulb socket
   - Seat

CARBURETOR AIR VENT SYSTEM INSPECTION (CALIFORNIA ONLY)

1. Inspect:
   - Hoses
   - Air vent control valve

   Refer to "CHAPTER 6-CARBURETOR AIR VENT SYSTEM" section.