YAMAHA

XJ650G

Service Manual G

LIT-11616-01-94

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha motorcycles have a basic understanding of the mechanical concepts and procedures inherent to motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit to use and/or unsafe.

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

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

NOTE:

This Service Manual contains information regarding periodic maintenance to the emission control system for the XJ650G. Please read this material carefully.

Particularly important information is distinguished in this manual by the following notations.

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

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

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

SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR CO., LTD.

CHAPTER 1. GENERAL INFORMATION

MOTORCYCLE IDENTIFICATION

A. Frame Serial Number

The frame serial number is stamped into the right side of the steering head pipe.

B. Engine Serial Number

The engine serial number is stamped into the elevated part of the right 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:

XJ650G 4H7-000101

SPECIAL TOOLS

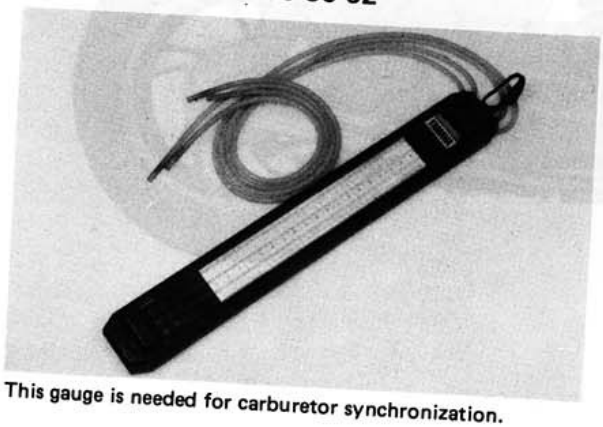
The proper special tools are necessary for complete and accurate tune-up and assembly. Using the correct special tool will help to prevent damage from improper tools or improvised techniques.

A. For Tune-up

1. Compression gauge
2. Timing light
3. Tachometer
4. Tappet adjusting tool
   P/N. 90890-01245-00

This tool is necessary to replace valve adjusting pads. This can also be used for the XS750, XS850 and XS1100.

5. Vacuum gauge
   P/N. TLU-11080-30-02



This gauge is needed for carburetor synchronization.

B. For Engine Service

1. Clutch hub holder
   P/N. TLM-90910-42-00

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

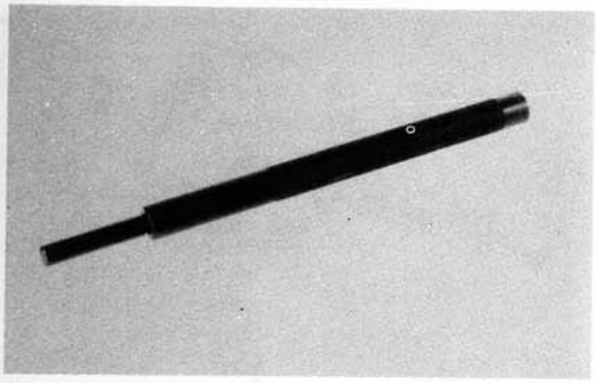
2. Valve guide reamer
   P/N. 90890-01227-00

This must be used when replacing the valve guide.

3. Valve seat cutter
   P/N. TLM-90910-43-20

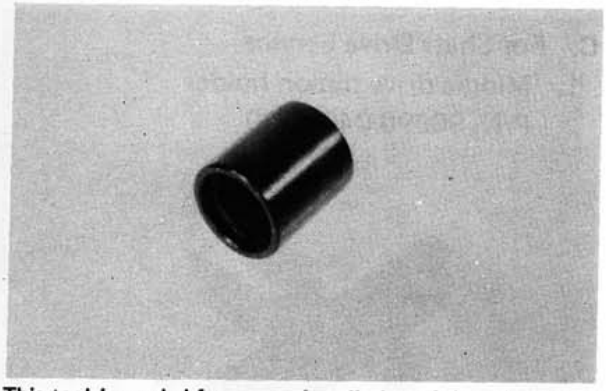
This tool is needed to re-surface the valve seat.

4. Valve guide remover
P/N. 90890-01225-00



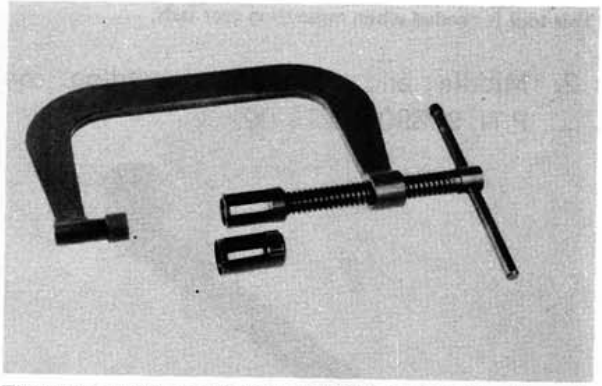
This must be used to remove the valve guides.

5. Valve guide installer
P/N. 90890-04017-00



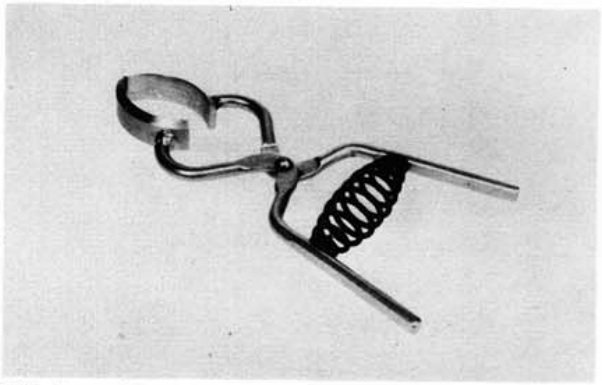
This tool is needed for proper installation of the valve guides.

6. Valve spring compressor
P/N. 90890-01253-00



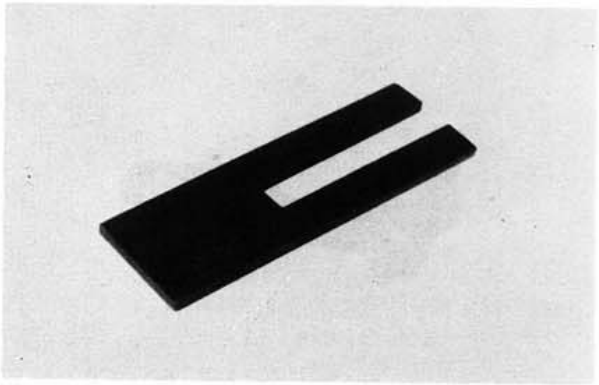
This tool must be used for removing and installing the valve assemblies.

7. Piston ring compressor
P/N. 90890-04044-00



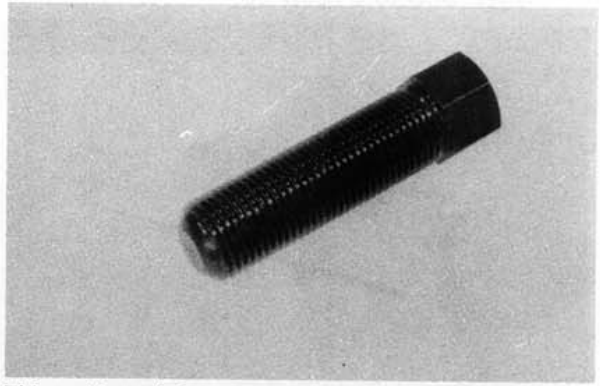
This is used to compress piston rings when installing the cylinder.

8. Piston base
P/N. 90890-01067-00



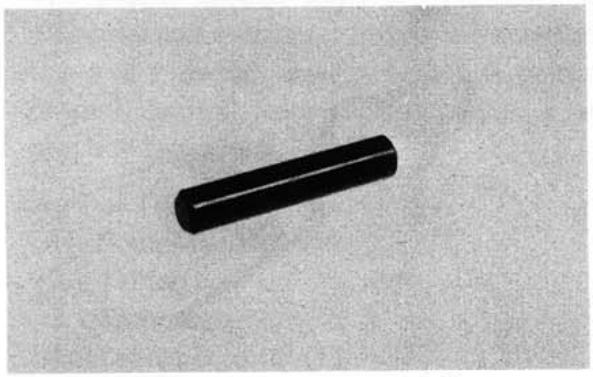
Use 4 of these to hold the pistons during cylinder installation.

9. Rotor puller
P/N. 90890-01080-00



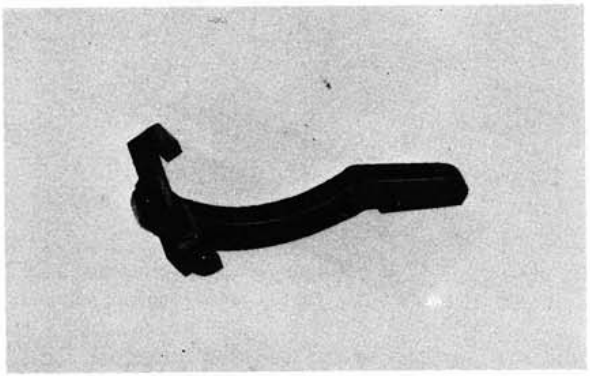
This tool is needed to remove the A.C. Generator rotor.

10. Rotor puller attachment
P/N. 90890-04052-00



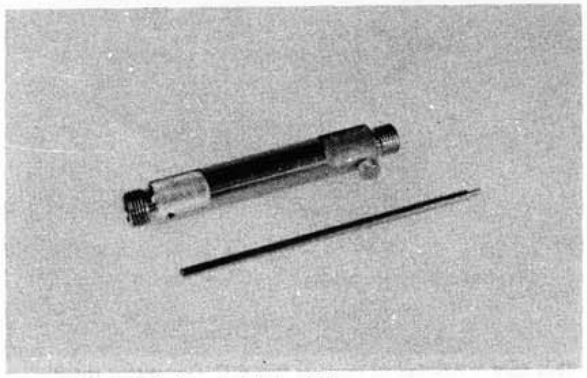
This tool is needed when removing the A.C. Generator rotor together with the rotor puller.

11. Rotor holding tool
P/N. 90890-04043-00



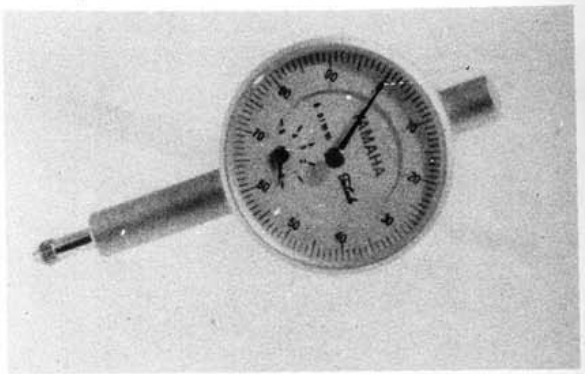
This tool is used to hold the A.C. Generator rotor during removal and installation.

12. Dial gauge stand
P/N. 90890-01258-00



This tool is needed to hold the dial gauge.

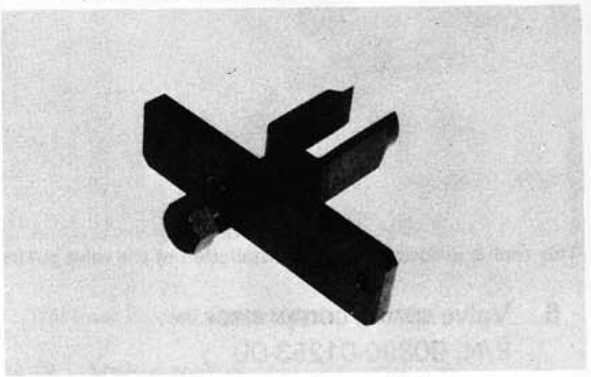
13. Dial gauge
P/N. 90890-03097-00



This dial gauge is used to determine piston position for correct timing.

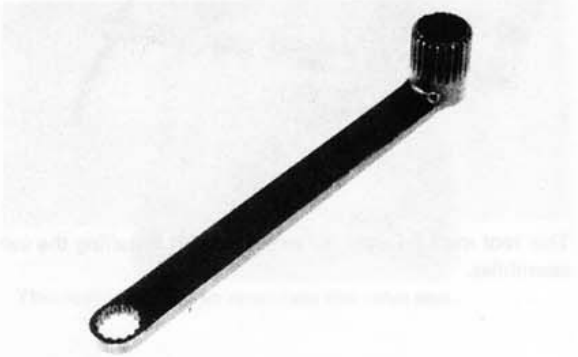
C. For Shaft Drive Service

1. Middle drive pinion holder
P/N. 90890-04051-00



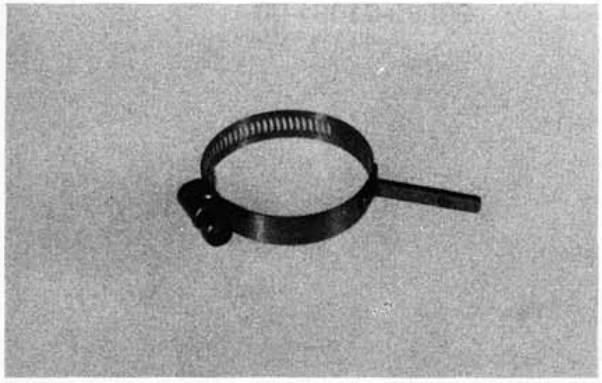
This tool is needed when measuring gear lash.

2. Middle and final gear holding tool
P/N. 90890-01229-00



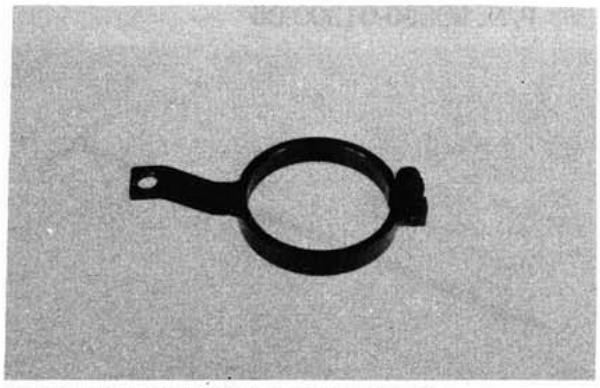
This tool is needed when measuring gear lash.

3. Gear lash measurement tool (Final gear)
P/N. 90890-01230-00



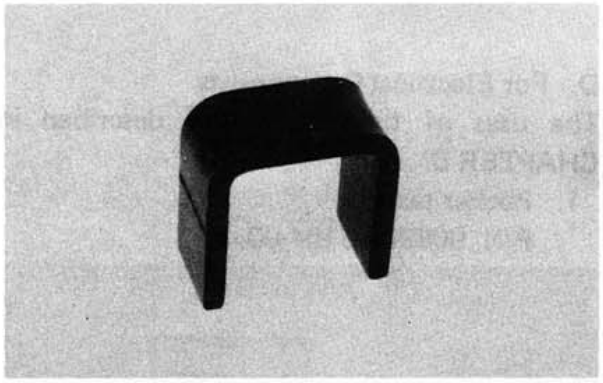
This tool is needed when measuring gear lash for final gear.

4. Final gear holding tool
P/N. 90890-01254-00



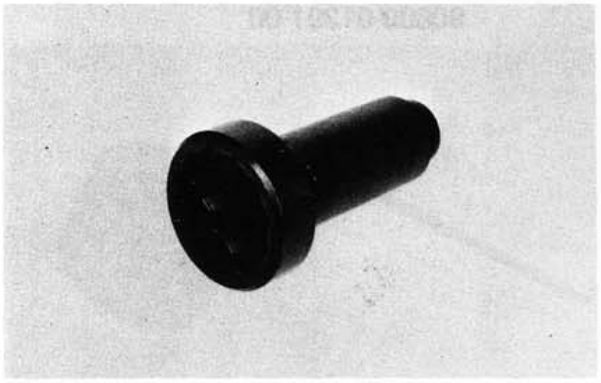
This tool is needed when measuring gear lash.

5. Damper compressor
P/N. 90890-04011-00



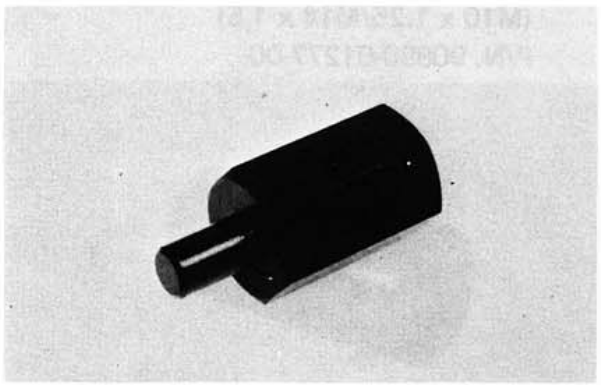
This tool is needed to disassemble and reassemble the middle gear damper.

6. Middle drive shaft nut wrench
P/N. 90890-04045-00



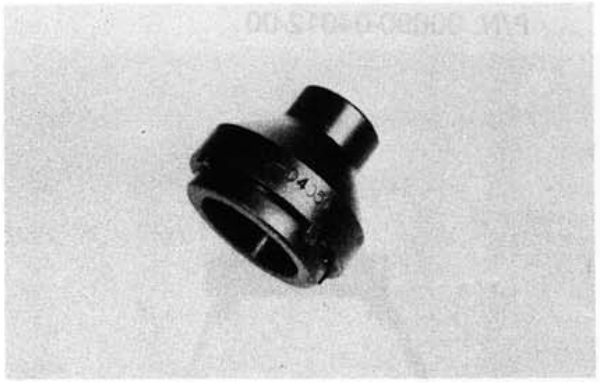
This tool is used to loosen and tighten the drive shaft nut.

7. Middle drive shaft holder
P/N. 90890-04046-00



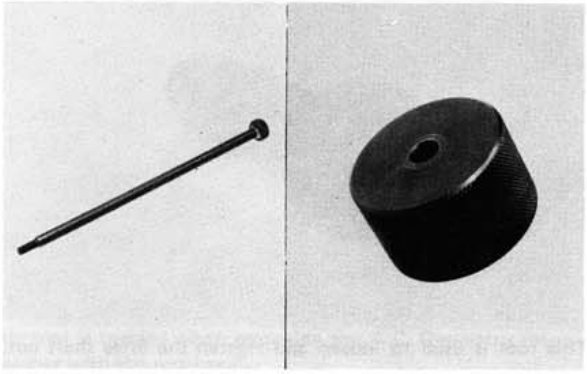
This tool is needed when loosening and tightening the drive shaft nut.

8. Drive pinion bearing retainer remover
P/N. 90890-04050-00



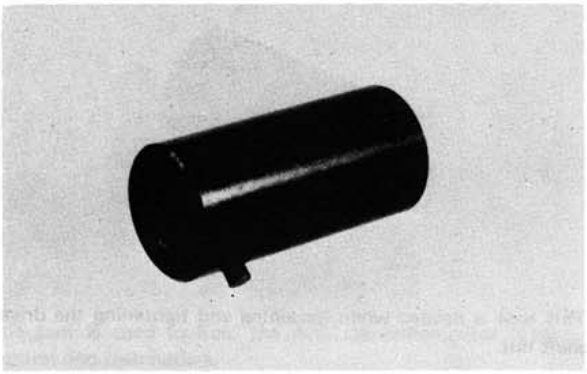
This tool is used to loosen and tighten the final gear drive pinion bearing retainer.

9. Armature shock puller (M10 x 1.25)
P/N. 90890-01290-00,
90890-01291-00



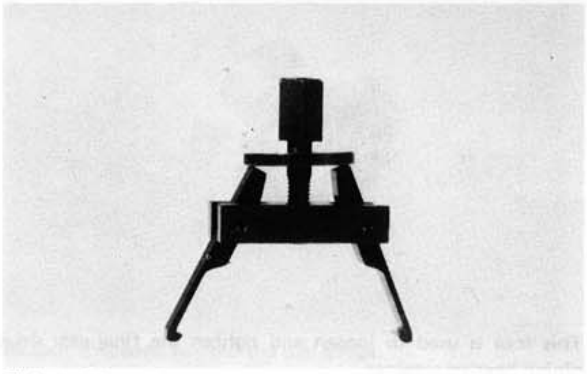
These tools are used to remove the final gear drive pinion.

10. Crank installer adapter
(M10 x 1.25/M14 x 1.5)
P/N. 90890-01277-00



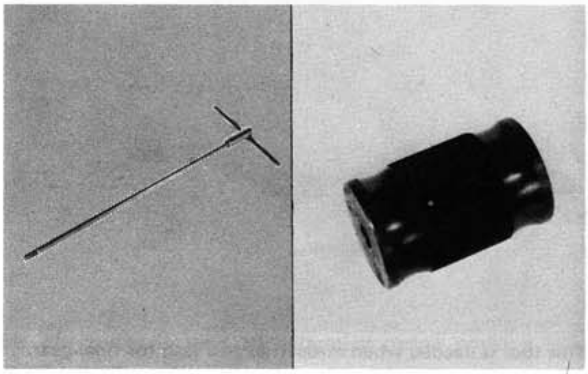
This adapter is needed when using the armature shock puller.

11. Drive shaft puller
P/N. 90890-04012-00



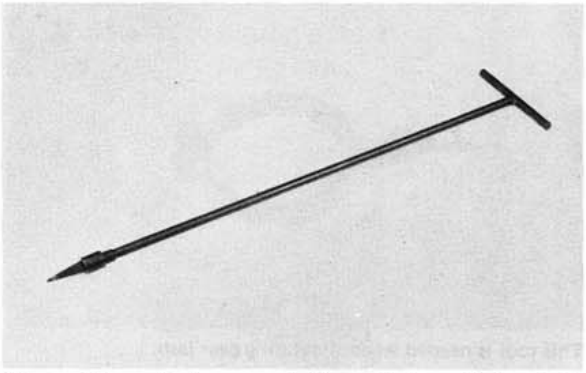
This tool is used to remove the drive shaft.

12. Slide hammer
P/N. 90890-01083-00,
90890-01084-00



These tools are used to remove the drive shaft.

13. Front fork cylinder comp. holder
P/N. 90890-01300-00

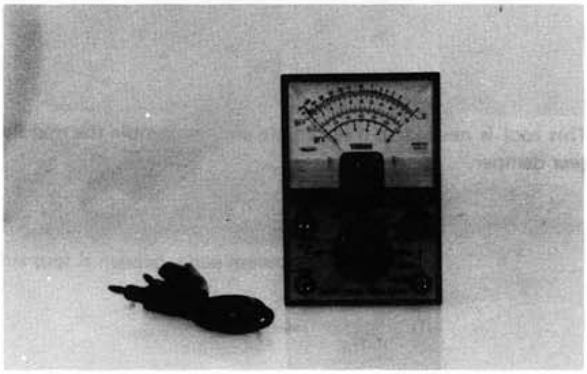


This tool is used to loosen and tighten the front fork cylinder comp. holding bolt.

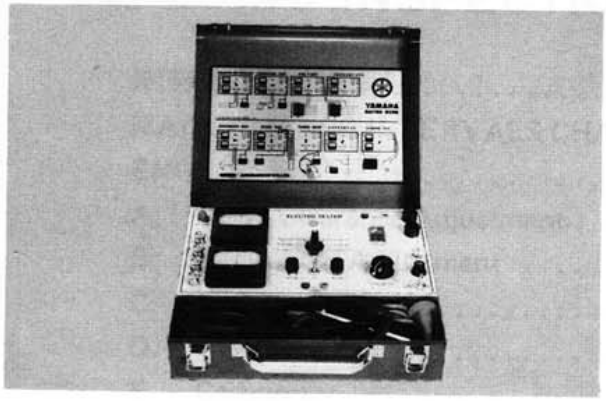
D. For Electrical Components

The uses of these tools are described in CHAPTER 6.

1. Pocket tester
P/N. 90890-03104-00



2. Electro tester
   P/N. 90890-03021-00



CHAPTER 2.
PERIODIC INSPECTIONS AND ADJUSTMENTS

INTRODUCTION

This chapter includes all information necessary to perform recommend inspection and adjustments. These preventative maintenance procedures, if followed, will insure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies not only to vehicles already in service, but also to new vehicles that are being prepared for sale. Any service technician performing preparation work 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 tables of periodic maintenance, the services related to emissions control are grouped separately.

PERIODIC MAINTENANCE EMISSION CONTROL SYSTEM

No.	Item	Remarks	Initial break-in		Thereafter every	
			1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months
1*	Cam chain	Adjust chain tension.	○	○		○
2*	Valve clearance	Check and adjust valve clearance when engine is cold.		○		○
3	Spark plugs	Check condition. Adjust gap/Clean. Replace after initial 13,000 km (8,000 mi) or 18 months and thereafter every 12,000 km (7,500 mi) or 18 months.		○	○	Replace every 12,000 km (7,500 mi) or 18 months
4*	Crankcase ventilation system	Check ventilation hose for cracks or damage. Replace if necessary.		○		○
5*	Fuel line	Check fuel hose for cracks or damage. Replace if necessary.		○		○
6*	Exhaust system	Check for leakage. Retighten as 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 if necessary.		○	○	

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

GENERAL MAINTENANCE/LUBRICATION

No.	Item	Remarks	Type	Initial break-in		Thereafter every		
				1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months	16,000 km (10,000 mi) or 24 months
1	Engine oil	Warm-up engine before draining.	Refer to page 17.	○	○	○		
2	Oil filter	Replace.	–	○	○		○	
3	Final gear oil	Replace.	Refer to page 18.	○			○	
4	Air filter	Clean with compressed air.	–		○		○	
5*	Brake system	Adjust free play. Front: Replace pads if necessary. Rear: Replace shoes if necessary.	–	○	○	○		
6*	Clutch	Adjust free play	–	○	○	○		
7*	Control and meter cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W/30 motor oil	○	○	○		
8*	Rear arm pivot bearings	Check bearing assembly for looseness. Moderately repack every 16,000 km (10,000 mi).	Medium weight wheel bearing grease					Repack
9*	A.C. generator	Replace generator brushes. Replace at initial 13,000 km (8,000 mi) and thereafter every 16,000 km (10,000 mi)	–					Replace
10	Brake/clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or 10W/30 motor oil		○	○		
11	Change/Brake pedal shaft pivot	Apply chain lube lightly.	Yamaha chain and cable lube or 10W/30 motor oil		○	○		
12	Center and side stand pivots	Apply chain lube lightly.	Yamaha chain and cable lube or 10W/30 motor oil		○	○		
13*	Front fork oil	Drain completely. Refill to specification.	Yamaha fork oil 10wt or equivalent					○
14*	Steering Ball Bearing and races	Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi).	Medium weight wheel bearing grease		○	○		Repack
15*	Wheel bearings	Check bearings for smooth rotation, Replace if necessary.	–		○	○		
16	Battery	Check specific gravity. Check breather pipe for proper operation.	–		○	○		

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

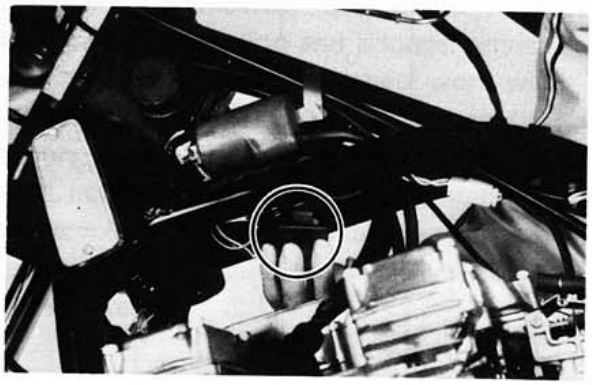
ENGINE

A. Valve Clearance Adjustment

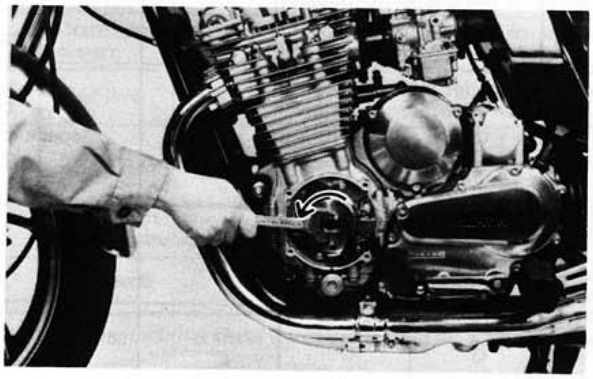
NOTE:

Valve clearance must be measured with the engine and at room temperature.

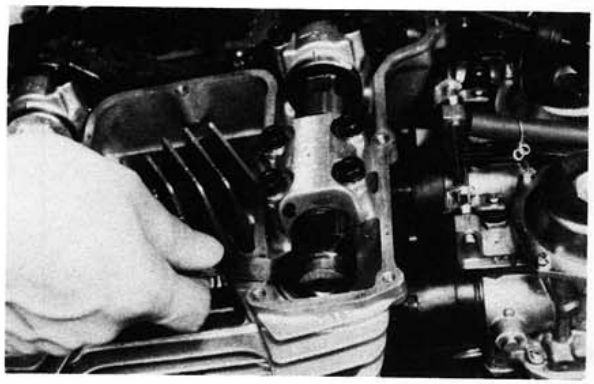
1. Remove the seat and fuel tank.
2. Remove the horn, flasher relay, and spark plug lead wires.



3. Remove the cylinder head cover and left crankcase cover (pick-up base cover). Care should be taken to not scratch or damage the gasket sealing surfaces.
4. Turn the crankshaft with the nut on the left end of the crankshaft to turn the cams. The proper position of the cam when measuring the valve clearance is with the cam lobe directly opposite the valve lifter.



5. Insert a feeler gauge between the valve lifter and the camshaft base circle.



Intake valve clearance (cold):
0.11 ~ 0.15 mm (0.004 ~ 0.006 in)
Exhaust valve clearance (cold):
0.16 ~ 0.20 mm (0.006 ~ 0.008 in)

Adjustment

Valve clearance is adjusted by replacing the adjusting pad on the top of the vale lifter. Adjusting pads are available in 25 thicknesses ranging from No. 200 (2.00 mm) to No. 320 (3.20 mm) in steps of 0.05 mm. The thickness of each pad is marked on the pad face that contacts the valve lifter (not the cam). Adjustment of the valve clearance is accomplished as follows:

1. Determine valve clearance (feeler gauge measurement.)
2. Remove adjusting pad and note number.
3. Select proper pad from appropriate chart (intake or exhaust chart).
4. Install new pad and check installed clearance.

Procedure

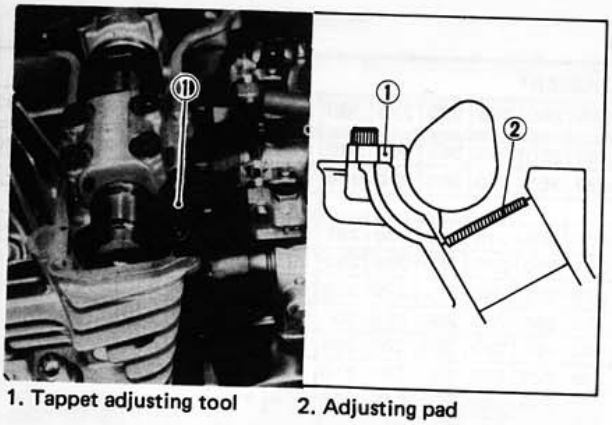
1. Measure valve clearance. If clearance is incorrect, record the measured amount of clearance. This must be measured carefully.
2. There is a slot in the valve lifter. This slot must be positioned opposite the blade of the tappet adjusting tool before the tools is installed.
3. Turn the cam until the lobe fully depresses the valve lifter and opens the valve. Install the tappet adjusting tool as shown to hold the lifter in this depressed position.

NOTE:

The tappet adjusting tool is fastened to the cylinder head securely using an allen screw. Make sure that the tool contacts the lifter only, and not the pad.

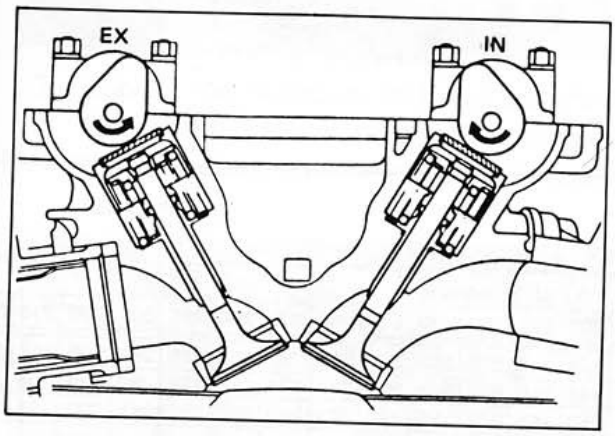
CAUTION:

If the cam lobe touches the tappet adjusting tool, the stress may fracture the cylinder head. DO NOT ALLOW THE CAM LOBE TO CONTACT THE TAPPET ADJUSTING TOOL.

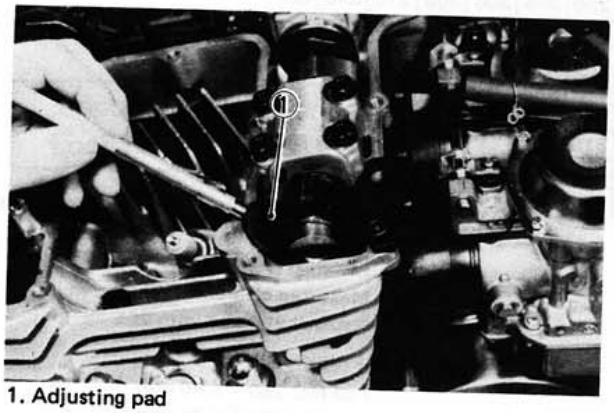


1. Tappet adjusting tool 2. Adjusting pad

4. Carefully rotate the cam so that the pad can be removed. To avoid cam touching the adjusting tool, turn cams as follows: (view from left side of the motorcycle)
   Intake: Carefully rotate CLOCKWISE.
   Exhaust: Carefully rotate COUNTER-CLOCKWISE.



5. Remove the pad from the lifter. There is a slot in the lifter. Use a small screwdriver or other blade and tweezers or a magnetic rod to remove the pad. Note the number on the pad.



1. Adjusting pad

6. Proper pad selection is made as follows: (Use appropriate chart for exhaust or intake valves.)
   a. Find number of original (installed) pad number on chart. Read down on chart.
   b. Find measured valve clearance (from step 1) on chart. Read across.
   c. At the intersection of installed pad number (down) and measured clearance (across) is a new pad number.

EXAMPLE:
Intake valve, installed pad:
No. 250 (read down)
Measured clearance:
0.32 mm (read across)
New pad number: No. 270
(intersection of down & across)

NOTE:
The new pad number is to be used as a guide only. Verify the correctness of this choice in the following step(s).

7. Install the new pad in the lifter. Install the pad with the number down.
8. Remove tappet adjusting tool.
9. Turn crankshaft to rotate cam several rotations. This will set the pad in the lifter.
10. Check valve clearance (step 3). If clearance is incorrect, repeat preceding steps until proper clearance is obtained.
11. Inspect head cover gasket. If bent or torn, replace gasket.
12. Reinstall removed parts in reverse order.

Intake

MEASURED CLEARANCE	INSTALLED PAD NUMBER*																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00 ~ 0.05			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.06 ~ 0.10		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.11 ~ 0.15																									
0.16 ~ 0.20	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.21 ~ 0.25	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.26 ~ 0.30	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.31 ~ 0.85	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 (engine cold) 0.11~ 0.15mm

Example: Installed is 250
Measured clearance is 0.32 mm
Replace 250 pad with 270

*Pad number (example):
Pad No. 250 = 2.50 mm
Pad No. 255 = 2.55 mm

Always install pad with number down.

Exhaust

MEASURED CLEARANCE	INSTALLED PAD NUMBER*																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00 ~ 0.05				200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305
0.06 ~ 0.10			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.11 ~ 0.15		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.16 ~ 0.20																									
0.21 ~ 0.25	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.26 ~ 0.30	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.31 ~ 0.35	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.36 ~ 0.40	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.41 ~ 0.45	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.46 ~ 0.50	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.51 ~ 0.55	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.56 ~ 0.60	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.61 ~ 0.65	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.66 ~ 0.70	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.71 ~ 0.75	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.76 ~ 0.80	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.81 ~ 0.85	265	270	275	280	285	290	295	300	305	310	315	320													
0.86 ~ 0.90	270	275	280	285	290	295	300	305	310	315	320														
0.91 ~ 0.95	275	280	285	290	295	300	305	310	315	320															
0.96 ~ 1.00	280	285	290	295	300	305	310	315	320																
1.01 ~ 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 (engine cold) 10.16 ~0.20 mm

Example: Installed is 250
Measured clearance is 0.32 mm
Replace 250 pad with 265

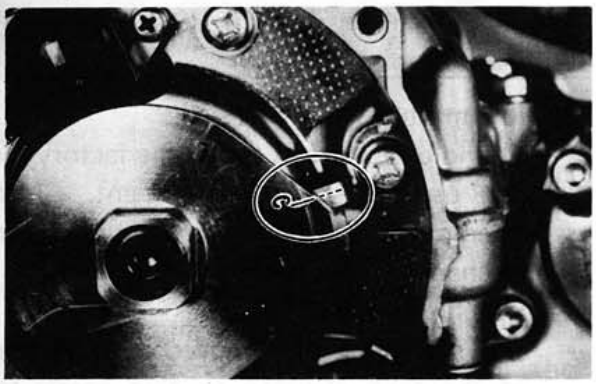
*Pad number (example):
Pad No. 250 = 2.50 mm
Pad No. 255 = 2.55 mm

Always install pad with number down.

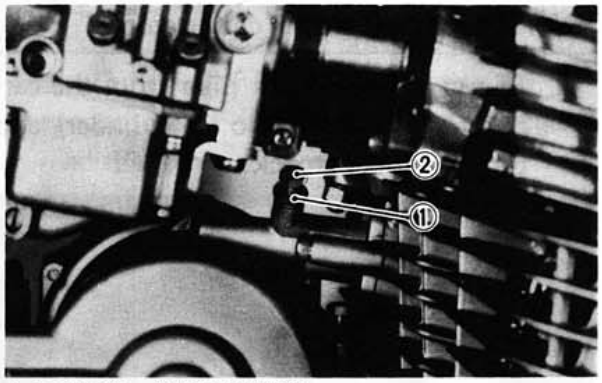
B. Cam Chain Adjustment

The cam chain becomes stretched with use, resulting in improper valve timing and engine noise. To prevent this, the cam chain tensioner must be adjusted regularly.

1. Remove the timing plate cover.
2. Slowly rotate the crankshaft counterclockwise until the "C" mark on the timing plate aligns with the stationary pointer.



3. Loosen the tensioner lock nut and then loosen the stopper bolt. This releases the cam chain tensioner with the proper tension.



1. Lock nut 2. Stopper bolt

4. Tighten the stopper bolt and lock nut.

Stopper bolt torque: 0.6 m-kg (4.3 ft-lb) Lock nut torque: 0.9 m-kg (6.5 ft-lb)

5. Reinstall the timing plate cover.

C. Ignition Timing

1. Ignition timing is checked with a timing light by observing the position of the stationary pointer and the marks stamped on the timing plate.

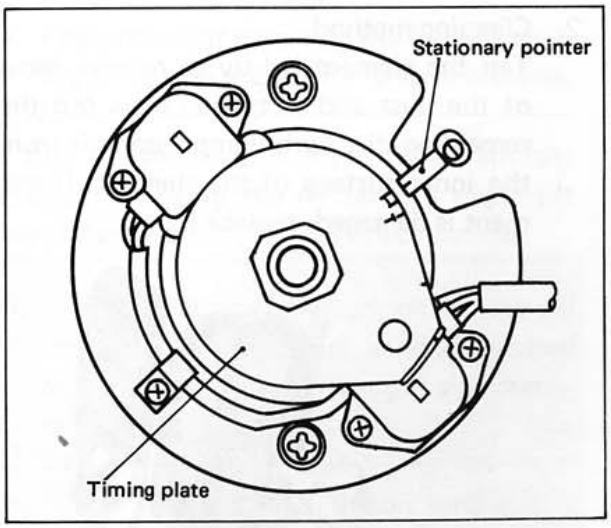
The timing plate is marked as follows: "⊓" ... Firing range for No.1 (L.H.) cylinder "T" ..... Top Dead Center for No. 1 (L.H.) and No. 4 (R.H.) cylinders

2. Connect the timing light to No. 1 (L.H.) spark plug lead wire.
3. Start the engine and keep the engine speed as specified. Use a tachometer to check the engine speed.

Specified engine speed: 1,050 r/min

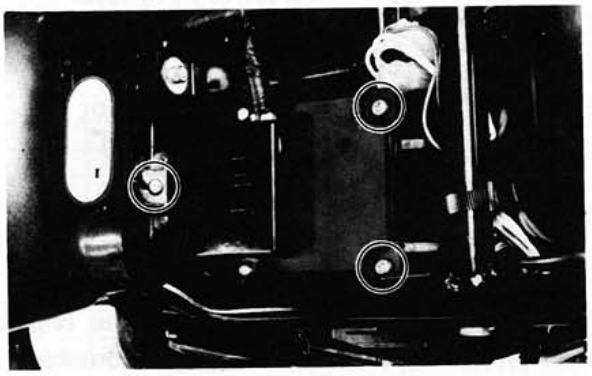
4. The stationary pointer should be within the limits of "⊓" on the timing plate. If it exceeds the limits or does not steady, check the timing plate for tightness and/or ignition system for damage. (See "CHAPTER 6. ELECTRICAL)

CAUTION: **Never bend the stationary pointer.**

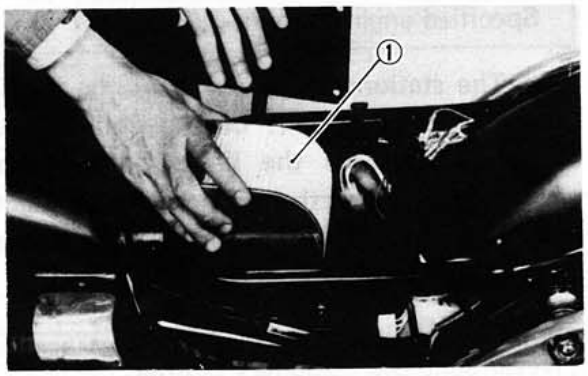


D. Air Cleaner

1. Removal
   a. Remove the seat.
   b. Remove the tool tray.
   c. Remove the air filter case cover by removing the three screws.

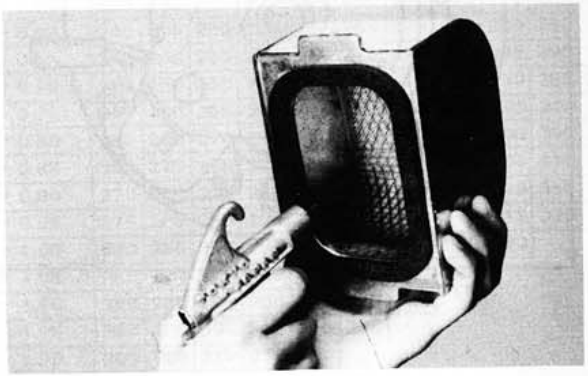


   d. Pull out the element.



1. Air filter element

2. Cleaning method
   Tap the element lightly to remove most of the dust and dirt; then blow out the remaining dirt with compressed air from the inner surface of the element. If element is damaged, replace it.



3. Reassemble by reversing the removal procedure. Check whether the element is seated completely against the case.
4. The air filter element should be cleaned at the specified intervals.

CAUTION:

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

E. Carburetor

NOTE:

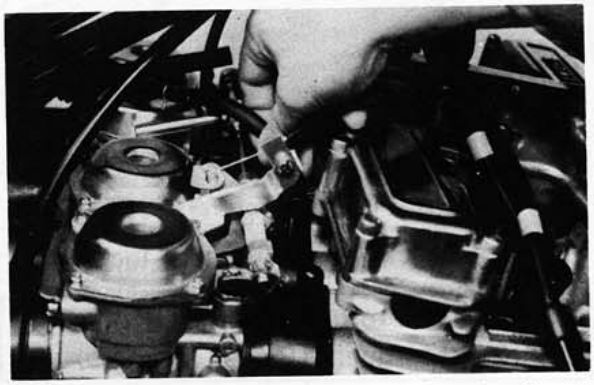
The carburetors are numbered 1, 2, 3, and 4 from the left when viewed from astride the motorcycle.

1. Idle mixture
   The idle mixture is set at the factory by the use of special equipment. Not attempt should be made by the dealer to change this adjustment.
2. Synchronization
   The seat must be removed and the rear of the tank elevated to gain access to the vacuum connections and throttle adjustment screws.

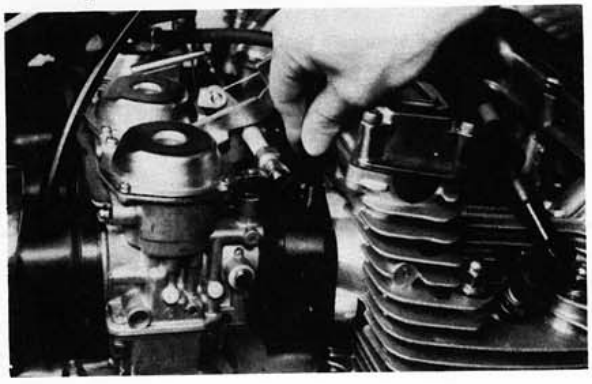
NOTE:

The valve clearances must be set properly before synchronizing the carburetors.

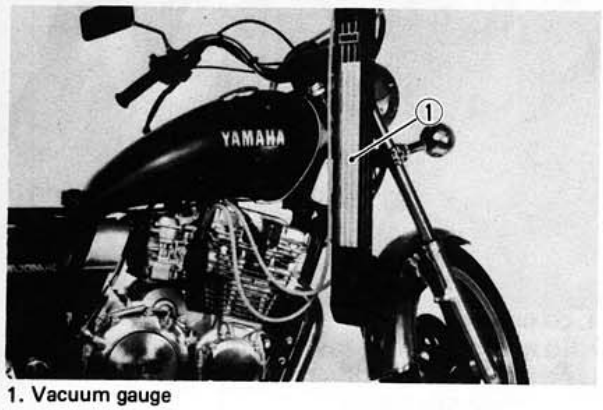
   a. Remove the vacuum pipe from the carburetor manifold (No. 3 cylinder) and turn the fuel petcock to "PRI".



   b. Remove the rubber caps from the No. 1, 2, and 4 carburetor manifolds.

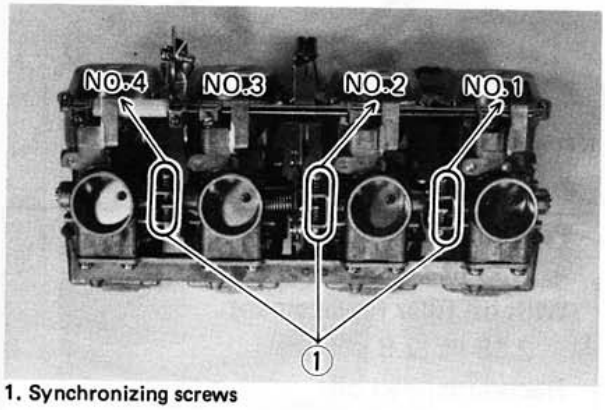


c. Connect the each vacuum gauge hose to its proper carburetor.



1. Vacuum gauge

d. Start the engine and allow it to warm-up for a few minutes. The warm-up is complete when engine responds normally to the throttle opening.
e. Set the engine idle at approximately 1,050 r/min.
f. Each gauge reading will indicate the same if the carburetors are synchronized. The No. 3 carburetor has no synchronizing screw and the other carburetors are to be synchronized to it in order, one at a time.
First, synchronize carburetor No. 1 to carburetor No. 2 by turning the No. 1 synchronizing screw until both gauges read the same.
Second, in the same way synchronize carburetor No. 4 to carburetor No. 3.
Third, by adjusting No. 2 screw to watch No. 3 carburetor reading, No. 1 and No. 2 carburetors will both change to match No. 3 carburetor.



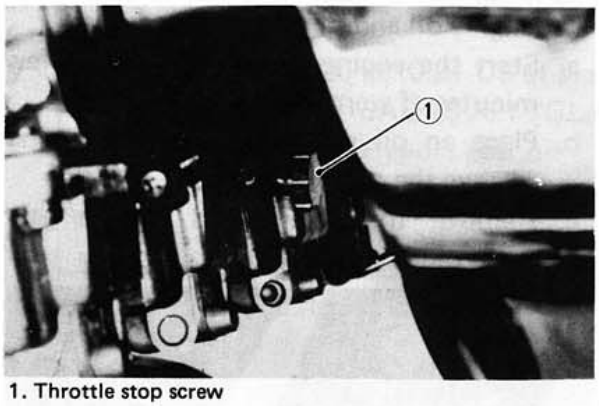
1. Synchronizing screws

3. Idle speed adjustment

NOTE:
Carburetors must be synchronized before setting final idle speed. The idle speed adjustment is made by turning only one throttle stop screw.

a. The engine must be warmed up before setting idle speed.
b. Set the engine idle speed by turning the throttle stop screw in (to increase engine speed) or out (to decrease engine speed).

Standard idle speed: 1,050 ± 50 r/min



1. Throttle stop screw

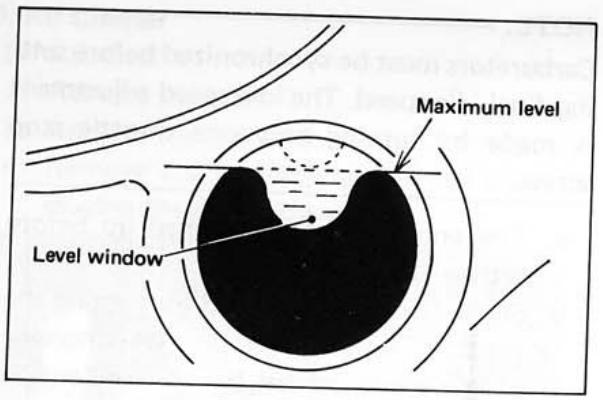
F. Engine Oil

1. Oil level measurement
a. Place the motorcycle on the center stand. Warm up the engine for several minutes.

NOTE:
Be sure the motorcycle is positioned straight up when checking the oil level; a slight tilt toward the side can produce false readings.

b. With the engine stopped, check the oil level through the level window located at the lower part of the right side crankcase cover.

NOTE:
Wait a few minutes until the oil level settles before checking.



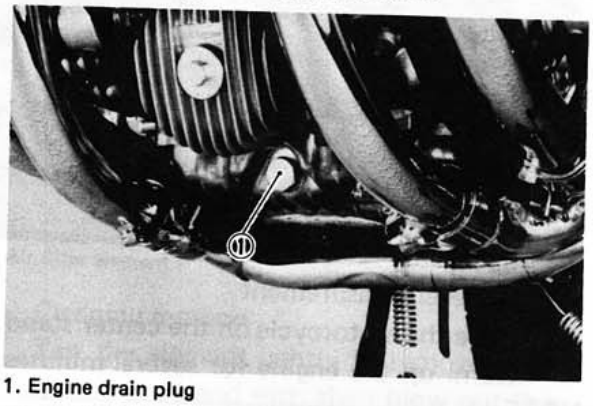
c. The oil level should be maximum level. If the level is lower, add sufficient oil to raise it to the maximum level.

2. Engine oil and oil filter replacement

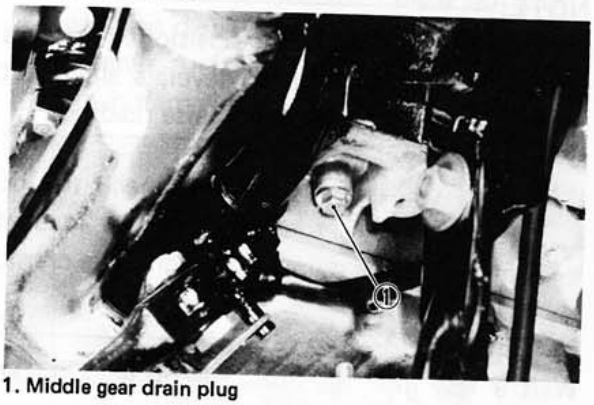
a. Start the engine and stop it after a few minutes of warm-up.

b. Place an oil pan under the engine and remove the oil filler cap.

c. Remove the engine and middle gear drain plugs and drain the oil.

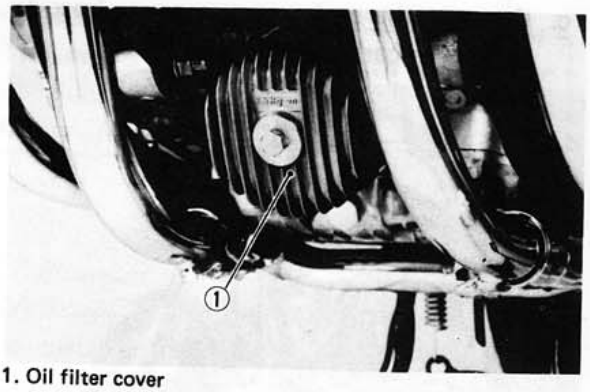


1. Engine drain plug



1. Middle gear drain plug

d. Remove the oil filter bolt and filter element.



1. Oil filter cover

e. Re-install the drain plugs (make sure they are tight).

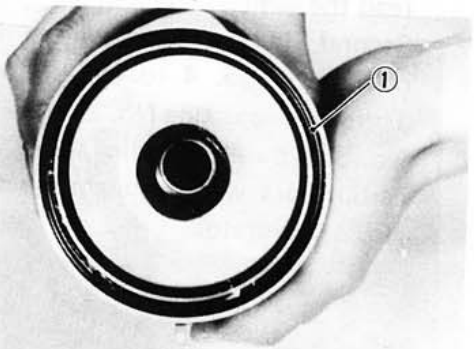
Drain plug torque:	
Middle gear:	1.6 m-kg (11.6 ft-lb)
Engine:	4.3 m-kg (31.0 ft-lb)

f. Install the new oil filter element, new "O-ring" and filter cover, tighten the oil filter bolt.

Oil filter bolt torque:
1.5 m-kg (11.0 ft-lb)

NOTE:

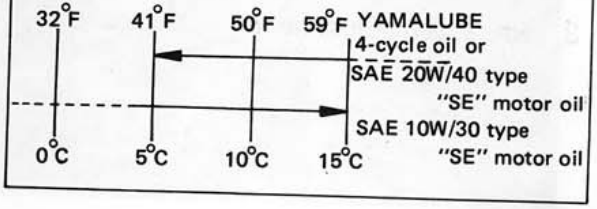
When installing the filter cover, make sure the "O-ring" is positioned properly and insert the locating projection on it into the corresponding guides on the crankcase.

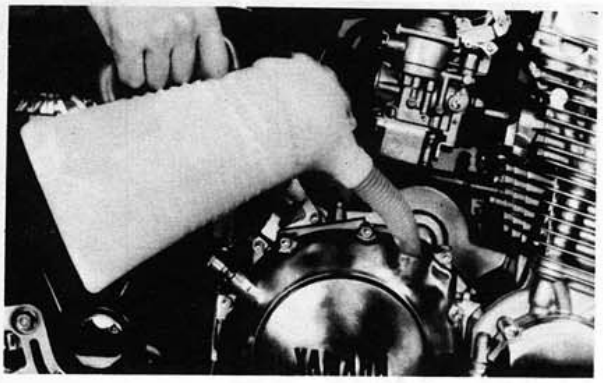


1. Proper O-ring position

g. Add oil through the oil filler hole.

Periodic oil change:
2.35 lit (2.5 US qt.)
With oil filler replacement:
2.65 lit (2.8 US qt.)
Recommended oil:





h. After replacement of the engine oil, and/or oil filter, be sure to check for oil leakage. The oil level indicator light should go off after the oil is filled.

CAUTION:

If the indicator light flickers or remains on, the oil level switch may be damaged. Refer to "CHAPTER 6" for corrective action.

G. Final Gear Oil

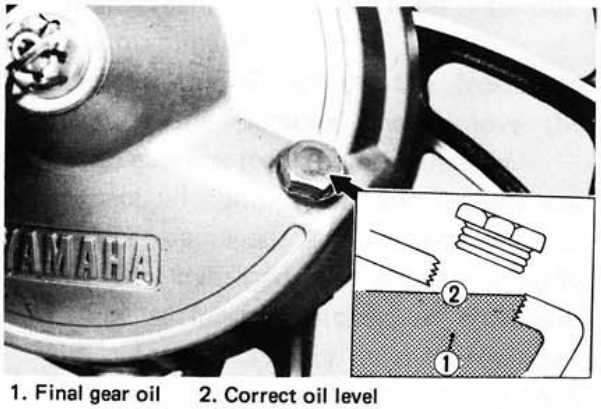
1. Oil level measurement

a. Place the motorcycle on a level place and place it on the center stand. The engine should be cool (at atmospheric temperature).

b. Remove the oil filler cap and check the oil level whether it is to the hole brim. If it is not up to this level, replenish oil.

CAUTION:

Take care not to allow foreign material to enter the final gear case.

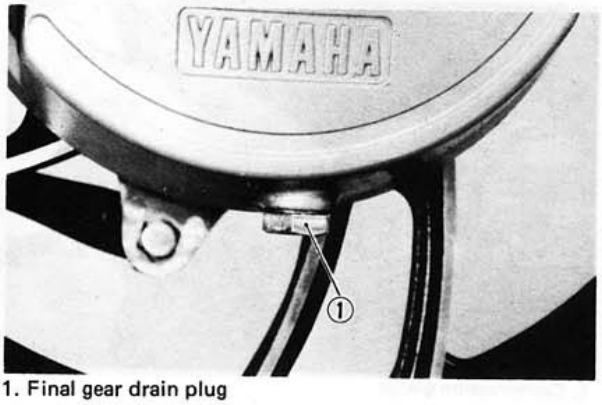


1. Final gear oil 2. Correct oil level

2. Gear oil replacement

a. Place an oil pan under the final gear case.

b. Remove the final gear oil filler cap and the drain plug, and drain the oil.



1. Final gear drain plug

c. Reinstall and tighten the final gear drain plug.

d. Fill the gear case to the specified level.

Oil capacity: 0.20 lit (0.21 US qt.)
Recommended oil: SAE 80 API "GL-4" Hypoid gear oil

If desired, an SAE 80W/90 hypoid gear oil may be used for all conditions.

e. Reinstall the filler cap securely.

H. Compression Pressure Measurement

Insufficient compression pressure will result in performance loss and may indicate leaking valves or worn or damaged piston rings.

Procedure:

1. Make sure the valve clearance is correct.
2. Remove the headlight fuse from the fuse box.
3. Warm up the engine 2 ~ 3 minutes. Stop the engine.
4. Remove the all spark plugs.
5. Install a compression check gauge.
6. Turn over the engine with the electric starter (make sure the battery is fully charged) with the throttle wide open until the pressure indicated on the gauge does not increase further.

Compression pressure (at sea level):
Standard . . . . . 11 kg/cm² (156 psi)
Minimum . . . . . 9 kg/cm² (128 psi)
Maximum . . . . . 12 kg/cm² (171 psi)

WARNING:

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