FOREWORD

This Service Manual has been written to acquaint the mechanic with the disassembly, reassembly, maintenance, and troubleshooting procedures required to provide optimum perforomance and longevity of the unit.
The information enclosed should be closely studied to avoid unnecessary repairs and to provide the owner with a sound, safe, dependable machine. Other information is produced by the U.S. distributor, YAMAHA INTERNATIONAL CORPORATION, and is necessary to provide total techinical coverage regarding the product.

NOTE:

The Research and Engineering Departments of Yamaha are continually striving to further perfect all models. Improvements and modifications are therefore inevitable.
In light of this fact, all specifications within this manual are subject to change without notice. Information regarding significant changes is forwarded to all Authorized Yamaha Dealers as soon as available.

YAMAHA
1976 XS360C
SERVICE MANUAL
1st Edition, March
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YAMAHA MOTOR COMPANY, LTD., JAPAN
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NOTICE

This manual has been written by Yamaha Motor Company for use by Authorized Yamaha Dealers and their qualified mechanics. In light of this purpose it has been assumed that certain basic mechanical precepts and procedures inherent to our product are already known and understood by the reader.

Without such basic knowledge, repairs or service to this model may render the machine unsafe and for this reason we must advise that all repairs and/or service be performed by an Authorized Yamaha Dealer who is in possession of the requisite basic product knowledge.

The Research, Engineering, and Service Departments of Yamaha are continually striving to further improve all models manufactured by the company. Modifications are therefore inevitable 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.

YAMAHA MOTOR CO., LTD.
INTERNATIONAL DIVISION

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CHAPTER 1. GENERAL INFORMATION

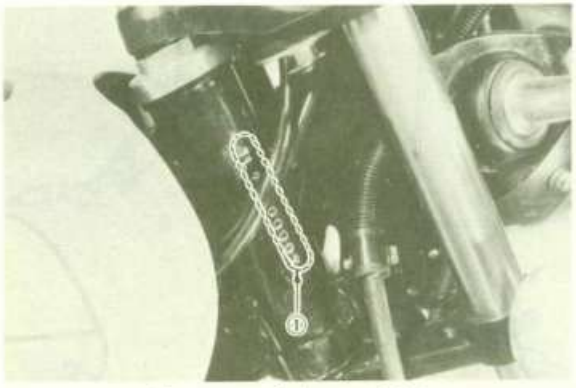
1-1. MACHINE IDENTIFICATION

The frame serial number is located on the right-hand side of the headstock assembly. The first three digits identify the model. This is follwed by a dash. The remaining digits identify the production number of the unit.

The engine serial number is located on a raised boss on the upper rear, right-hand side of the engine. Engine identification follows the same code as frame identification.

Starting Serial Number

XS360C	1L9-000101

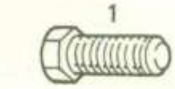


Frame serial number

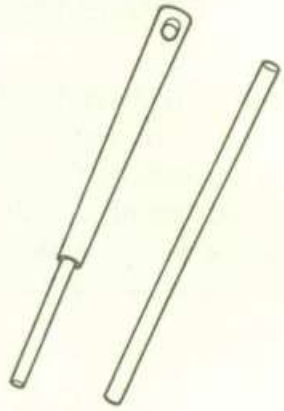


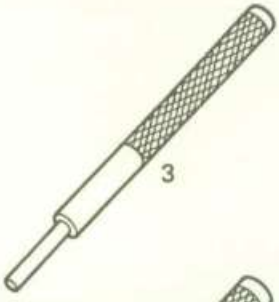
Engine serial number

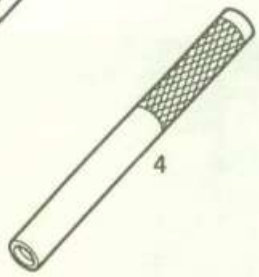
1-2. SPECIAL TOOLS

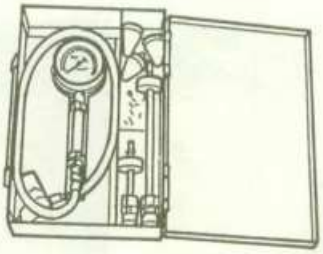

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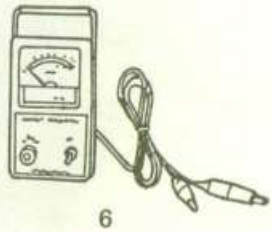



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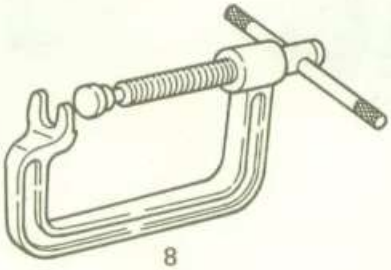

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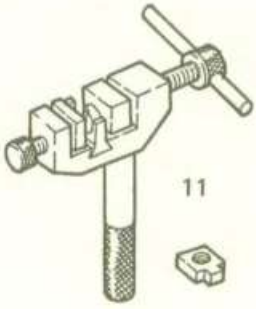

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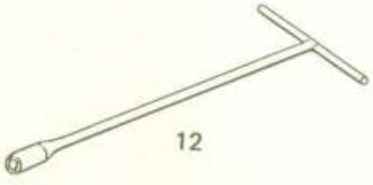

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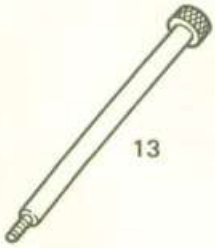

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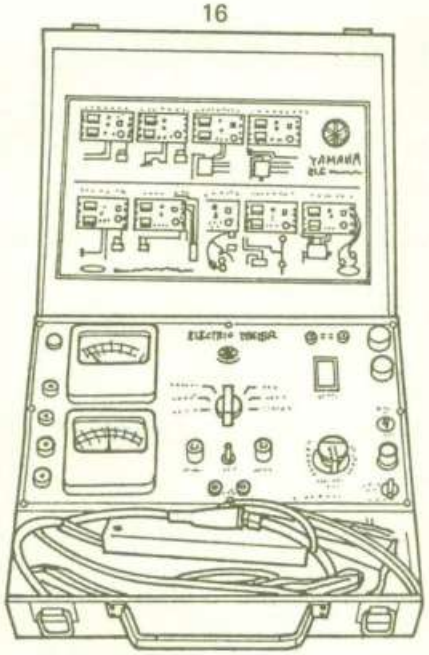

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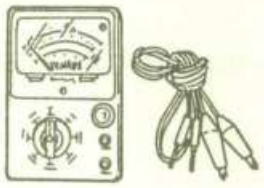

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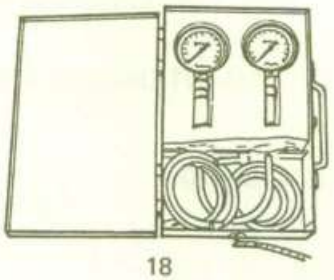

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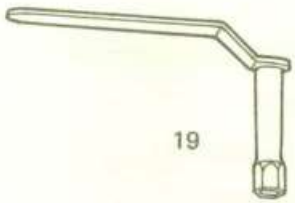




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No.	Description	Tool No.
1.	Armature puller bolt	90890-01111
2.	Valve seat cutter set	90890-01248
3.	Valve guide remover	90890-01225
4.	Valve guide installer	90890-01226
5.	Compression gauge	90890-03081
6.	Point checker	90890-03064
7.	Steering nut wrench	90890-01051
8.	Valve spring compressor	90890-01095
9.	Hand reamer	90890-01211
10.	Cylinder cup installer	90890-01240
11.	Drive chain cutter	90890-01081
12.	Fork spring guide wrench	90890-01212
13.	Shock puller bolt	90890-01083
14.	Shock puller weight	90890-01084
15.	Dial gauge	90890-01173
16.	Electro tester	90890-03021
17.	Pocket tester	90890-03043
18	Vacuum gauge	90890-03048
19	Clutch adjusting tool	90890-01127

CHAPTER 2.
PERIODIC INSPECTIONS AND ADJUSTMENTS

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CHAPTER. 2
PERIODIC INSPECTION AND ADJUSTMENTS

2-1. MAINTENANCE AND LUBRICATION CHART

The following charts should be considered strictly as a guide to general maintenace and lubrication intervals. You must take into consideration that weather, terrain, geographical location and a variety of individual uses all tend to demand that each owner after this time schedule to match his environment. For example, if the motorcycle is continually operated in an area of high humidity, then all parts must be lubricated much more frequently than shown on the chart to avoid damage caused by water to metal parts.

The number in parentheses (1) after an item refers to the recommended lubricant. See list at the end of this chart.

Unit: mile (km)

Page	Item	Period							
		Initial				Thereafter every			As required
		250 (400)	500 (800)	1,000 (1,600)	2,000 (3,200)	1,000 (1,600)	2,000 (3,200)	4,000 (6,400)	
	ENGINE								
14	Change engine oil	x(1)		x			x		
14	Change oil filter	x						x	
30, 55	Clean oil strainer	x						x	
15	Adjust valves	x			x				x
	Check compression	x						x	x
25, 50	Check cylinder head bolt torque	x						x	
14	Adjust clutch	x		x					x
11	Check and adjust carburetors	x		x					x
58	Clean carburetors								x
	Inspect exhaust system	x						x	x
25, 49	Check rotor nut torque	x							x
	Check oil pressure	x						x	
12	Clean air filter	x			x		x		
12	Replace air filter								x
	CHASSIS								
16	Adjust brake (front and rear)	x			x		x		x
73	Check front fork	x			x				x
18	Change fork oil	x(4)						10.000 (16.000)	
76	Check rear shock absorber	x		x			x		
18, 75	Check swing arm	x		x			x		
76	Check and adjust controls and cables	x		x			x		
76	Lubricate cables		x(2)		x		x		
73	Check steering head	x			x		x		
75	Lubricate swing arm pivot				x(3)		x		
	Check rim runout	x			x		x		
69	Check spoke tension	x			x		x		

Unit: mile (km)

Page	Item	Period							As required
		Initial				Thereafter every			
		250 (400)	500 (800)	1,000 (1,600)	2,000 (3,200)	1,000 (1,600)	2,000 (3,200)	4,000 (6,400)	
62	Check wheel bearing				x		x		x
17	Check drive chain tension and alignment		x		x		x		x
17	Clean and lubricate drive chain		x(2)			x			x
70	Replace drive chain								x
15	Clean petcock			x			x		x
	ELECTRICAL								
19	Check breaker points		x				x		
19	Check and adjust ignition timing		x				x		x
	Check wiring connections							x	x
20, 79	Check spark plug	x					x		
20, 79	Replace spark plug				x		x		x

NOTES:

NO. 1 At ambient temperature above 5°C (41°F), use YAMALUBE 4-cycle oil, or SAE 20W-40 type "SE" motor oil.
At ambient temperature below 15°C (59°F), use SAE 10W-30 type "SE" motor oil. Do not use "additives" in oil.

No. 2 Use SAE 10W-30 type "SE" motor oil. (If desired, specialty lubricants of quality manufacture such as YAMAHA CHAIN AND CABLE LUBE, may be used.

No. 3 Use lithium soap base grease.

No. 4 Use YAMAHA FORK OIL or another quality fork oil.

2-2. ENGINE

A. Carburetor

1. Idle mixture
   The idle mixture is set at the factory by the use of special equipment. No attempt should be made to change this adjustment by the dealer.
2. 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 engine idle speed by turning the throttle stop screw in (to increase engine speed) or out (to decrease speed).

NOTE:
To reduce exhaust emissions, the air screw should be tightened or loosened 1/8 turn from the specified position in the following table, and the maximum number of turns is controlled by the idle limiter.

Pilot screw:	
Back out	1½ ± ½ turns
Idle speed:	1,200 ± 50 rpm



1. Pilot screw

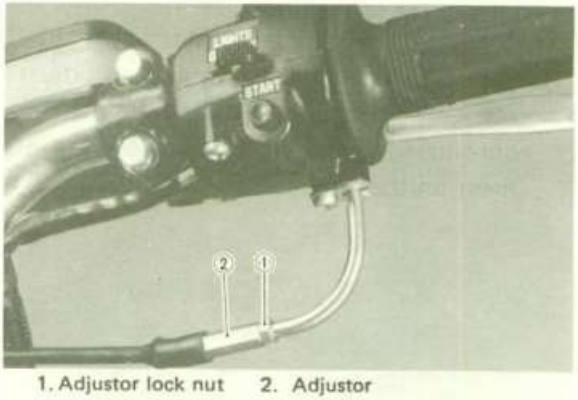

1. Throttle stop screw

2. Throttle cable adjustment

NOTE:
Idle speed should be set before maing this adjustment.

The throttle grip should have a play of 3 – 5 mm (0.12 ~ 0.20 in) in the turning direction at the grip flange. If the play is not this range, take the following steps for adjustment:

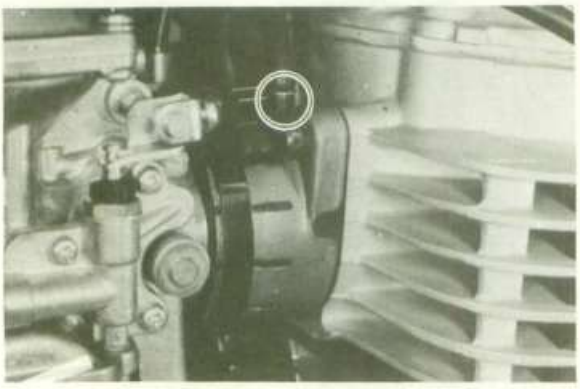
a. Loosen the adjustor lock nut on the throttle cable 1, and turn the adjustor in or out so the play is correct. After the adjustment, tighten the locknut.

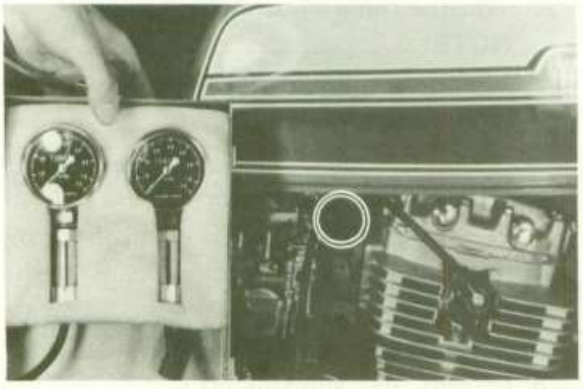


1. Adjustor lock nut 2. Adjustor

3. Synchronizing carburetors
   Both cylinders will not operate evenly unless the carburetion system for each side is identical. If one carburetor slide is higher than the other slide, overall poor engine performance will result.

a. Install the vacuum gauge. To install, remove both right and left vacuum cynchronizing tubes and set the vacuum gauge.

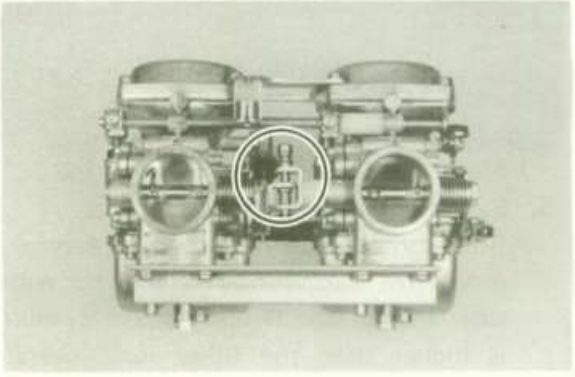




NOTE:

Avoid keeping the rubber damper too tight by screwing in the serration.

b. Remove fuel tank and make an adjustment by loosening or tightening the synchronizing screw of carburetors are almost on the same level.



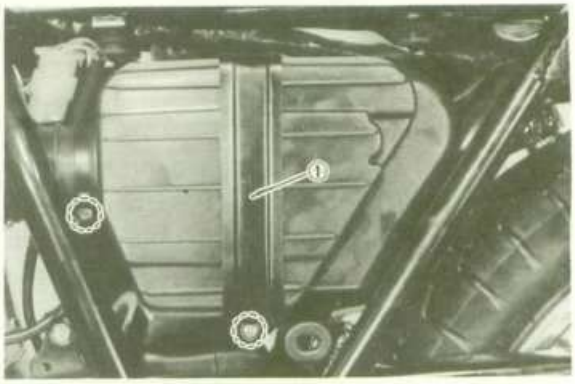
Vacuum reading:
Within 5 cmHg/1,200 rpm

NOTE:

a. If the vacuum gauge needle deflects excessively, make the damper tight by tightening the serration. If the damper is too effective, the gauge readings will be incorrect, showing a rather low value. Both dampers should be so adjusted that both needles show the same degrees of deflection.
b. When both vacuum gauge needles deflect evenly and the readings are the same, they are considered to be synchronized.
c. If the gauge readings are more than 5 cmHg, check the ignition timing, tappet clearance, compression pressure and spark plugs.

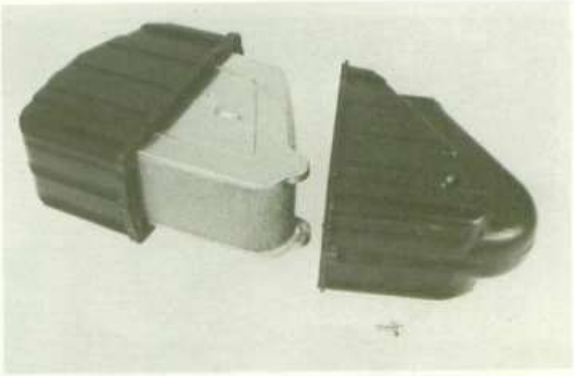
B. Air filter

1. Remove side cover and element case holder.



1. Element case cover

2. Remove bolts and separate the element case.



3. The air cleaner should be cleaned by blowing with compressed air, and/or by lightly tapping so that the dust may be removed.

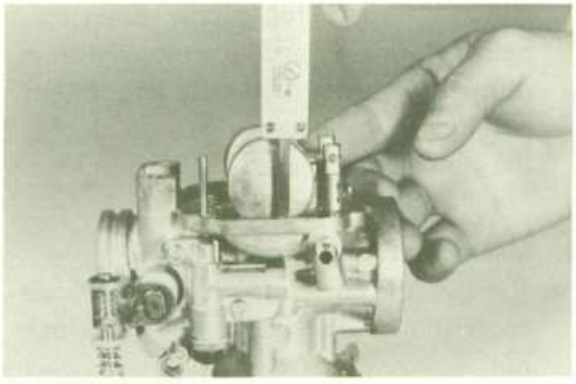
NOTE:
The element is foam rubber and should be kept away from water and oil.

C. **Float Level**

1. Using a vernier caliper, measure the distance of float arm from the top of the float chamber gasket seat (gasket removed) to the float.

Float level :
26.6 ±2.5 mm
(1.047 ±0.098 in)

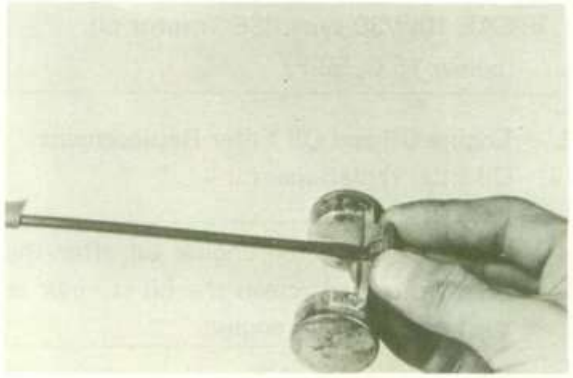
NOTE:
The float should be just resting on, but not depressing, the spring loaded inlet needle.



1. Float level

2. To correct float level, bend the tang a slight amount as required.

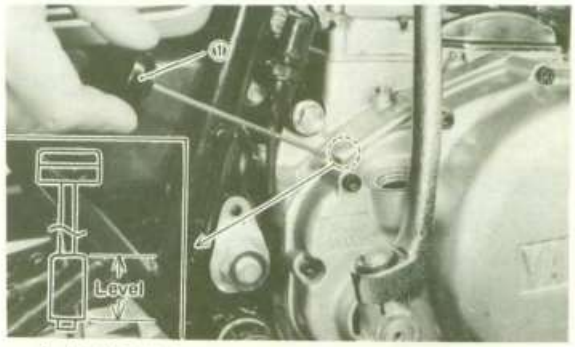
NOTE:
Both the right and left of the float should measure identically. Correct as required by bending float tang.



D. **Engine Oil**

1. Oil level measurement.
   a. Place the machine on a level place and then on the center stand.
   b. Remove the oil filler cap, and check the oil level.

NOTE:
When checking, do not screw the oil level gauge into the crankcase. Insert the gauge gently. For accuracy, check with the machine held upright.



1. Level gauge

   c. If the oil level is between the maximum level lines marked on the oil level gauge, you may start the engine.

Oil Capacity
   a. Regular oil replacement:
      2.0 lit (2.1 US qt)
   b. Oil and oil filter replacement:
      2.3 lit (2.4 US qt)
   c. Engine overhauling:
      2.6 lit (2.7 US qt)

Recommended Oil
   a. Yamalube 4-cycle oil or SAE 20W/40 type "SE" motor oil. (more than 5°C, 41°F)

b. SAE 10W/30 type "SE" motor oil. (below 15°C, 59°F)

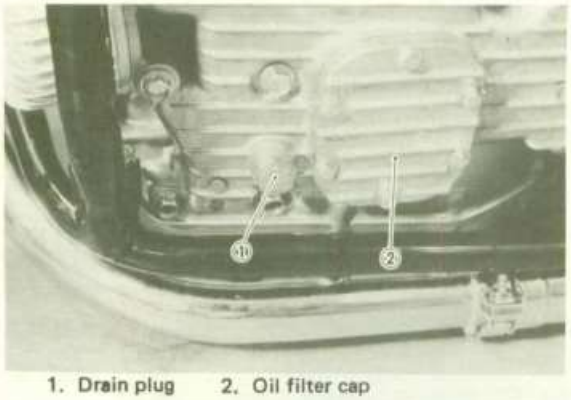
E. Engine Oil and Oil Filter Replacement

1. Oil filter replacement.

NOTE:

When replacing the engine oil after the brake-in period, clean the oil strainer at the bottom of the engine.

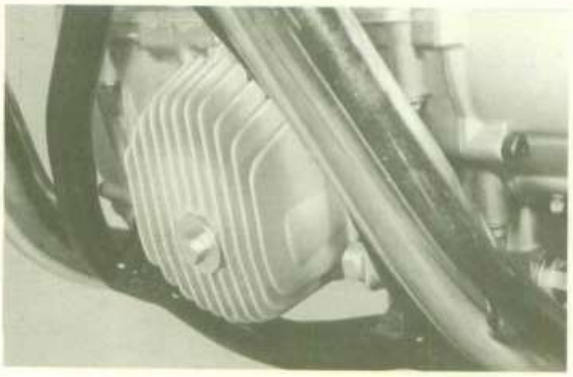
a. Start the engine. After a few minutes of warm-up stop the engine.
b. Remove the oil filler cap and drain plug and drain the engine oil.
c. Remove the oil strainer at the bottom of the engine, and clean.



1. Drain plug 2. Oil filter cap



d. Remove the oil filter cap, and replace the filter element.



e. Install the drain bolt, oil filter, and oil filter cap.
f. Add 2.0 liters (2.1 US.qt) of engine oil. Install the oil filler cap and tighten. Use 20W/40 type "SE" oil.
g. Start the engine and allow a few minutes of warm up. While warming up, check for oil leakage. If oil leaks, stop the engine immediately, and check for the cause.
h. After warm up, stop the engine and check the oil level. (Refer to D-1 "Engine Oil".)

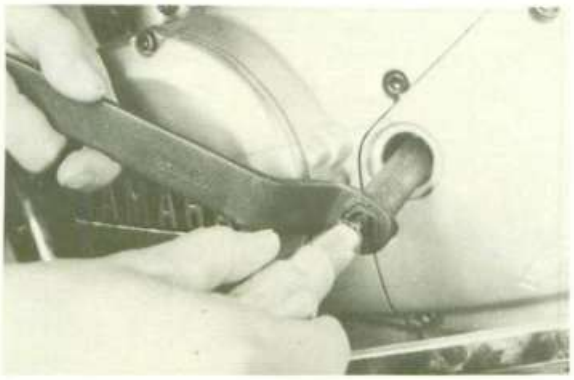
F. Clutch Adjustment

This model has two clutch cable length adjustors and a clutch mechanism adjustor. Cable length adjustors are used to take up slack from cable stretch and to provide sufficient free play for proper clutch operation under various operating conditions. The clutch mechanism adjustor is used to provide the correct amount of clutch "throw" for proper disengagement. Normally, once the mechanism is properly adjusted, the only adjustment required is maintenance of free play at the clutch handle lever.

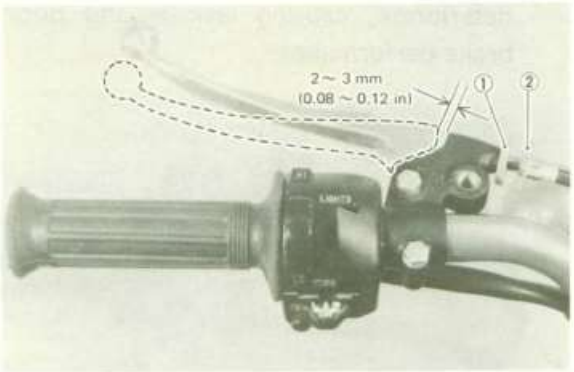
1. Mechanism Adjustment

a. Remove the cover cap on left crankcase cover and loosen the adjusting screw lock nut.

b. Using a Phillips-head screwdriver, slowly screw in the adjusting screw until resistance is felt. That is, the play of the push rod has been removed. From this position, back out the adjusting screw about ¼ turn, and tighten the lock nut.



2. **Freeplay Adjustment**
   Loosen either the handle lever adjustor lock nut or the cable in-line length adjustor lock nut. Next, turn the length adjustor either in or out until porper lever free play is achieved.

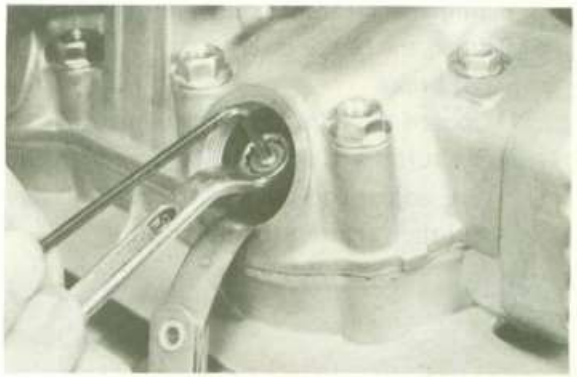


1. Adjustor locknut 2. Adjustor

G. Valve Clearance Adjustment

1. Turn the fuel petcock to "RES" position and disconnect fuel pipe and fuel cock vacuum pipe.
2. Remove fuel tank
3. Remove intake and exhaust tappet covers and left generator cover.
4. At first adjust LEFT side ignition timing. Align the "LT" mark on the rotor with the timing mark on the crankcase.
   This places the piston at top dead center. The valve clearance should be checked and adjusted at T.D.C. on the compression stroke. (When the valve adjusters have clearance.)
5. Use a feeler gauge to determine the clearance.

Valve clearance (cold):	
Intake	0.08 – 0.12 mm (0.003 – 0.005 in)
exhaust	0.16 – 0.20 mm (0.006 – 0.008 in)



6. Loosen the valve adjustor lock nut. Turn the adjustor in or out to obtain the correct clearance. Hold the adjustor to prevent it from moving and thoroughly tighten the lock nut.
   Recheck the clearance after tightening.

NOTE:
Valve clearance check and adjustment should be done when the engine is cold.

H. Cam Chain Adjustment

The cam chain tension is automatically adjusted. Therefore, cam chain adjustment is not required.

2-3 CHASSIS

A. Fuel Petcock

1. First, set the petcock lever to the "RES" position and remove the fuel pipe.
2. Loosen the petcock securing nut and remove the petcock assembly from fuel tank.
3. Clean the attached filter with solvent. Examine the filter and replace if damaged.
4. Inspect the gasket, replace if damaged and install the outlet fitting.

B. Front Brake

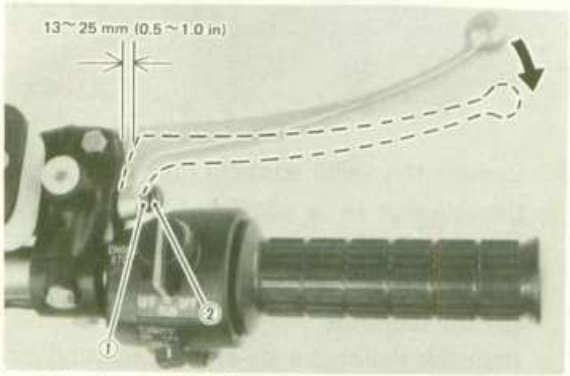
1. Brake adjustment

   The brake can be adjusted by simply adjusting the distance that the brake lever and pedal can travel. (The piston in the caliper moves forward as the brake pad wears out, automatically adjusting the clearance between the brake pad and the brake disc.)

   a. Front brake

      1) Loosen the adjusting screw locknut.

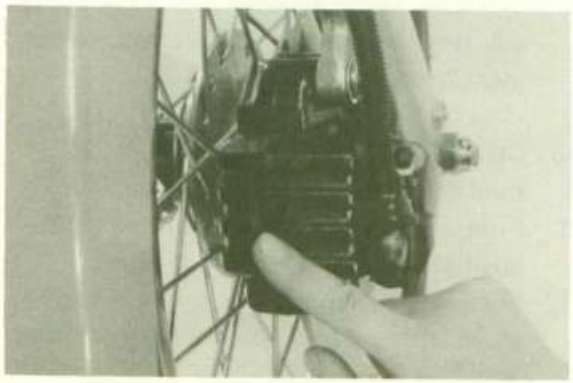
      2) By turning the adjusting screw in or out, adjust the play of the brake lever and then tighten the locknut.



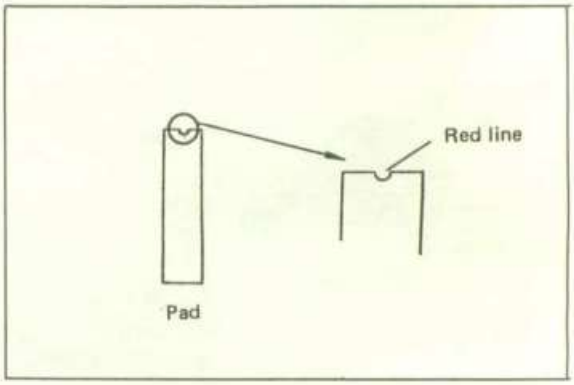
1. Lock nut 2. Adjustor

2. Brake pad check

   The pads are provided with a wear indicator for checking the condition of the brake without the need for disassembly.

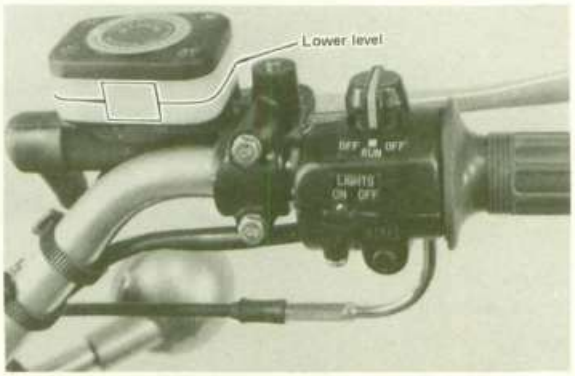


   To check, open the wear indicator cap and if any pad is worn to the red line, replace pads.



enter the brake system, possibly causing the brake to become ineffective. Check the brake fluid level and replanish when necessary and observe these precautions.

a. Use only the designated quality brake fluid; otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.



1. Lower level

Recommended brake fluids:
DOT #3 with 240°C (464°F) boiling point

b. Refill with the same type and brand of brake fluid; mising fluids may result in a harmful chemical reaction and lead to poor performance.

c. Be careful that water or other contamination does not enter the master cylinder when refilling. Water will significantly lower the boiling point and may result in vapor lock.

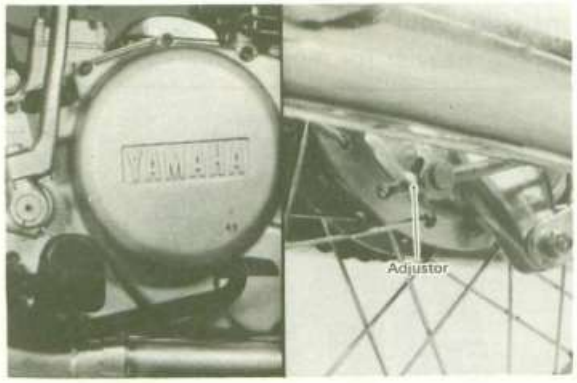
C. Rear Brake

1. Adjust rear brake pedal play to suit, pro-

viding a minimum of 20 – 30 mm (0.8 – 1.2 in) freeplay. Turn the adjustor on the rear brake rod in or out until brake pedal free play is suitable.

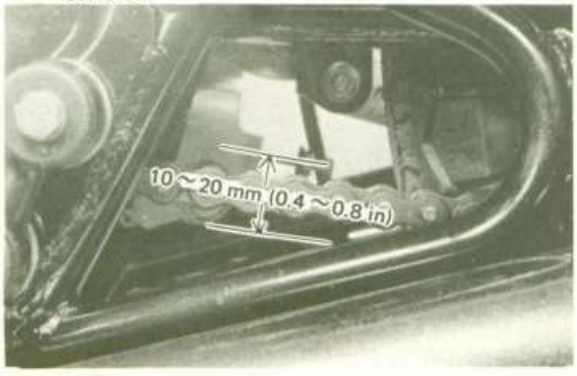
NOTE:

Rear brake pedal adjustment must be checked anytime chain is adjusted or rear wheel is removed and then reinstalled.



D. **Drive Chain Tension Check**

Inspect the drive chain with both tires touching the ground and with rider on the seat. Check the tension at the position shown in the illustration. The normal vertical deflection is approximately 15 mm (0.6 in). If the deflection exceeds 20 mm (0.8 in), adjust the chain tension

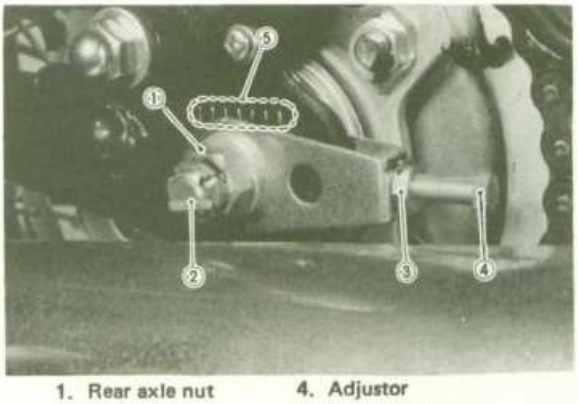


E. **Drive Chain Tension Adjustment**

1. Loosen the rear brake adjustor.
2. Loosen the rear wheel axel nut.
3. Loosen the adjustor lock nuts on each side.
4. To tighten chain turn chain puller adjustor clockwise. To loosen chain turn adjustors counter-clockwise and push wheel forward. Turn each bolt exactly the same amount to maintain correct *axile alignment.*

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

Drive chain slack:
10 ~ 20 mm (0.4 ~ 0.8 in)
Rider on machine
Both wheels on ground



1. Rear axle nut
2. Cotter pin
3. Adjustor lock nut
4. Adjustor
5. Align marks

NOTE:

Before adjusting. rotate rear wheel through several revolutions and check tension several times to find the tightest point. Adjust chain tension with rear wheel in this "right chain" position.

4. After adjusting be sure to tighten the lock nuts and the rear wheel axle nut.
5. In the final step, adjust the play in the brake pedal.

F. **Drive Chain Lubrication**

1. First, remove dirt and mud from the chain with a brush or cloth and then spray the lubricant between both rows of side plates and on all center rollers.
2. To clean the entire chain, first remove

the chain from the motorcycle, dip it in solvent and clean with stiff brush. Then take the chain out of the solvent and dry it. Immediately. lubricate the chain to prevent the formation of rust.

Recommended lubricant:
YAMAHA CHAIN AND CABLE LUBE, or SAE 10W/30 type "SE" motor oil

G. Front Fork Oil Change.

1. Elevate front wheel by placing a suitable stand under the engine.
2. Remove snap rings and fork caps from inner fork tubes.



3. Remove drain screw from each outer tube with open container under each drain hole.



1. Drain screw

4. After most of oil has drained, slowly raise and lower outer tubes to pump out remaining oil.
5. Replace drain screw.

NOTE:

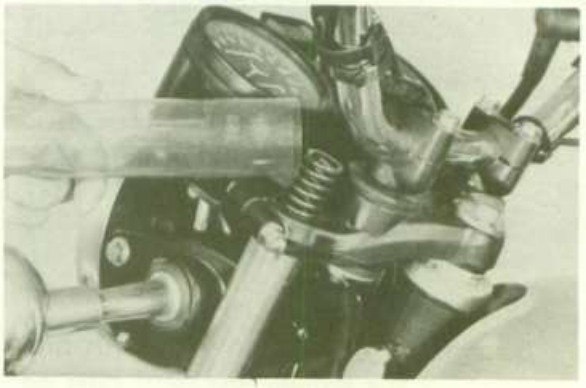
Check gasket, replace if damaged.

6. Measure correct amount of oil and pour each leg.

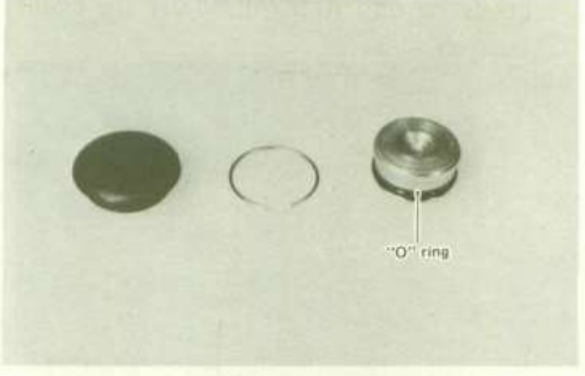
Recommended oil:
20 WT Fork Oil
Quantity per leg:
130 cc (4.4 oz)

NOTE:

Select the weight oil that suits local conditions and your preference (lighter for less damping; heavier for more damping).



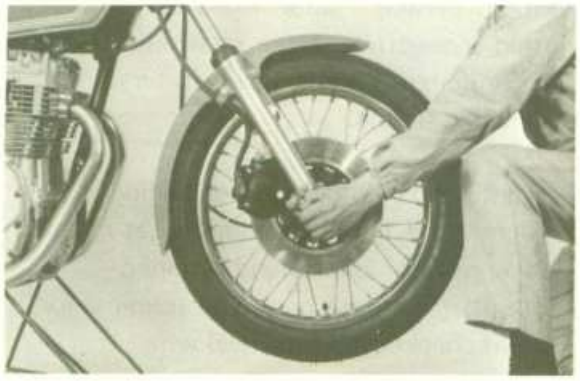
7. After filling, slowly pump the outer tubes up and down to distribute the oil.
8. Inspect O-ring on fork caps and replace if damaged.



H. · Suspension, steering and swing arm

1. Steering head adjustment
   The steering assembly should be checked periodically for losseness.
   Do this as follows:
   a. Block machine up so that front wheel is off the ground.
   b. Grasp bottom of forks and gently rock

fork assembly backward and forward, checking for looseness in the steering assembly bearings.

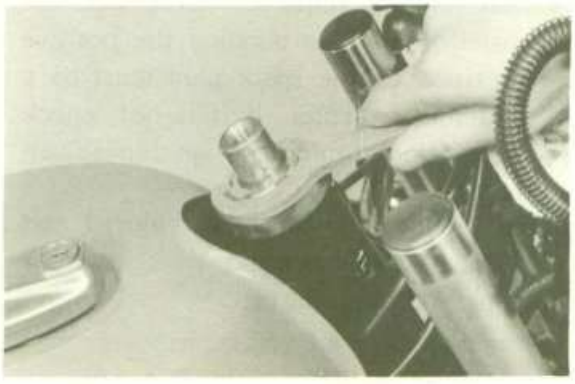


c. If steering head needs adjustment, loosen steering fitting nut.



1. Fitting nut

d. Using steering nut wrench, adjust steering head fitting nut until steering head is tight without binding when forks are turned.



NOTE:

Excessive tightening of this nut will cause rapid wear of ball bearings and races. Re-check for losseness and freedom of movement.

e. Tighten steering fitting bolt and crown pinch bolt in that order.

NOTE:

After completing steering adjustment, make certain forks pivot from stop to stop without binding. If binding is noticed, repeat adjustment.

2. Suspension
   a. Check all suspension components for proper operation.
   b. Check all suspension components for proper tightness.
   c. Check rear shocks (right and left) for identical adjustment.
3. Swing arm
   a. Check for freedom of up and down movement.
   b. Check side to side freeplay.

Swing arm freeplay:
1 mm (0.04 in) at end of swing arm

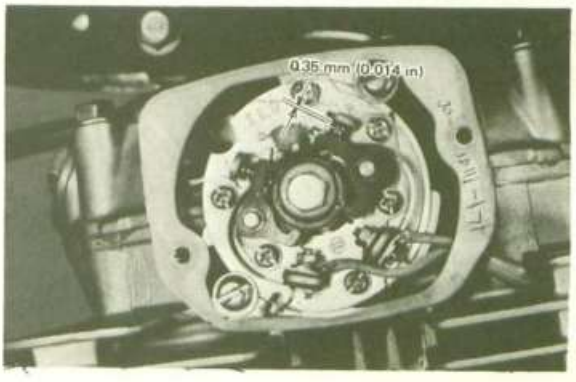
   c. Check all securing bolts for proper tightness.
   d. Grease swing arm periodically.

2-4. ELECTRICAL

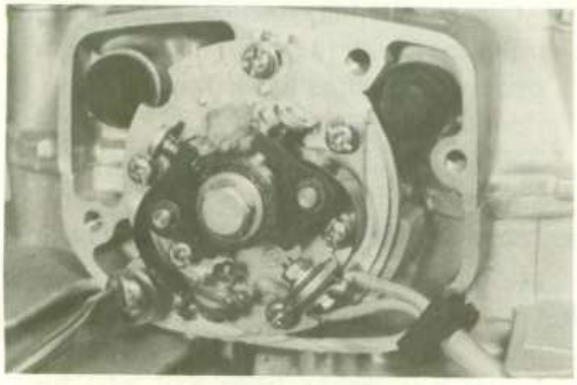
A. Ignition Timing

1. Adjust point gap (at widest opening) by moving the contact breaker assembly.

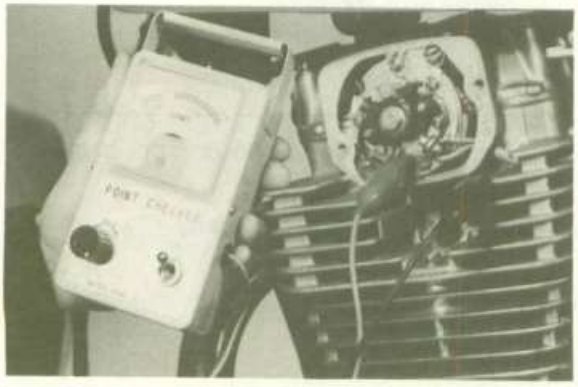
Point gap:
0.3 – 0.4 mm (0.012 - 0.016 in.)



2. Rotate the crankshaft counterclockwise, align "LF" mark on the rotor and match mark on the case cover.



3. Switch on point checker and adjust.
4. Connect point checker terminals to point assembly.
   Positive (Red) lead to orange terminal for left-hand cylinder.
   Negative (Black) lead to a good ground.



5. Rotate breaker plate assembly (L) so that the point checker needle should swing from "CLOSED" to "OPEN" position, indicating the contact breaker has just begun to open.

NOTE:

Adjust ignition points by slightly loosening Philips head screws and carefully rotating contact breaker plate assembly with a slotted screwdriver. Make small adjustment and retighten Philips head screw before rechecking timing.

6. Right hand cylinder ignition timing
   Right hand ignition timing is set in the same manner as left hand cylinder.
   For R.H. side use gray wire terminal for point checker red (positive) wire.

B. **Spark Plug**

The spark plug indicates how the engine is operating. If the engine is operating correctly, and the machine is being ridden properly, the tip of the white insulator around the positive electrode of the spark plug will be a medium tan color. If the insulator is very dark brown or black color, then a plug with a hotter heat range might be required. This situation is quite common during the engine break-in period.

If the insulator tip shows a very light tan or white color or is actually pure white and glazed or if electrodes show signs of melting, then a spark plug with a colder heat range is required. Remember, the insulator area surrounding the positive electrode of the spark plug must be a medium tan color. If it is not, check carburetion, timing and ignition adjustments.

The spark plug must be removed and checked. Check electrode wear, insulator color, and electrode gap.

Spark plug gap:
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

Engine heat and combustion chamber deposits will cause any spark plug to slowly break down and erode. If the electrodes

finally become too worn, or if for any reason you believe the spark plug is not functioning correctly, replace it. When installing the plug, always clean the gasket surface, use a new gasket, wipe off any grime that might be present on the surface of the spark plug, and torque the spark plug properly.

Standard spark plug	Tightening torque
NGK BP-6ES or Champion N-7Y	1.8 - 2.2 m-kg (13 ~ 16 ft-lb)

C. **Battery**

A poorly maintained battery will deteriorate quickly. The battery fluid should be checked at least once a month.

1. The level should be between the upper and lower level marks. Use only distilled water for refilling. Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.
2. Always make sure the connections are correct when installing the battery. The red lead is for the + terminal and the black lead is for the – terminal. Make sure the breather pipe is properly connected and is not damaged or obstructed.



NOTE:

After filling new battery with diluted to sulfuric acid (electrolyte), it is advisable to charge the battery much as possible before using to insure maximum performance. This initial charge will prolong the life of the battery.

Charging current:	1.2A
Chargin time:	10hrs.

D. **Headlight**

1. Headlight beam adjustment

When necessary, adjust the headlight beam as follows.

a. Adjust horizonatally by tightening or loosening the adjust screw.



To adjust to the right:
tighten the screw
To adjust to the left:
loosen the screw

b. Adjust vertically as follows:

1) Remove the anchor screw holding the headlight rim and remove the rim by prying lightly with a screwdriver at the gap provided at the bottom of the headlight.

NOTE:

Take care not to damage the headlight.

2) Slightly loosen the two headlight mounting nuts and refit the rim to the headlight body.



NOTE:

Do not tighten the anchor screw yet.

3) Next, adjust vertically by moving the headlight body. When adjustment is complete, hold the body in place, remove the rim and tighten the two mounting nuts. Then refit the rim to the headlight body.

2. Replacing the headlight bulb

a. Remove bolts and pull the defective unit out of the shell.



b. Slip a new unit into position and install bolts.

c. Adjust headlight beam.

NOTE:

Take care not to damage the headlight. It is very fragile.

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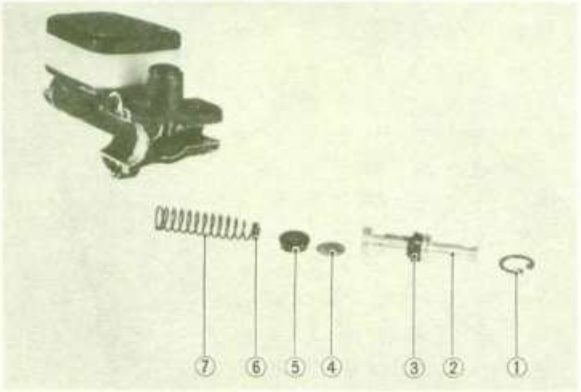
3-5. MOUNTING 55

3

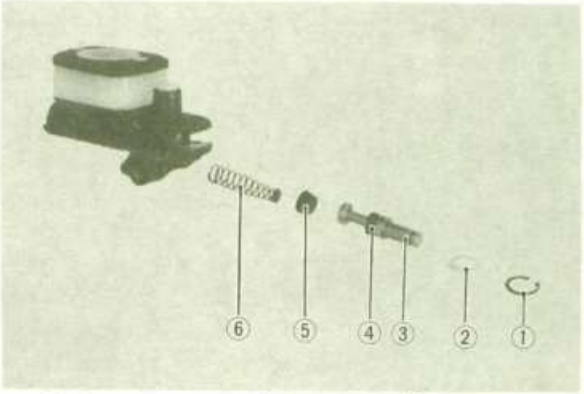
XS360C ERRATA CARD

This is to advise you of the design alterations and typographical errors that we would ask you to put in the XS360C Service Manual in your hand.

P12: Vaccum reading 5 cmHg ➡ 5 mmHg (two errors on the same page)
P16: The brake lever free play is 5 to 8 mm at the lever end.
P30: Bolt (21) is added to the left of bolt (20) in the crankcase illustration.
P31: In the rocker shaft illustration, the position of the O-ring is between the rocker shaft below and the gasket.
P34: The O-ring for the valve guide is discontinued.
P43: No check valve is installed.
P53: There is no O-ring for the rocker shaft.
P66: The photo of the master cylinder inner parts is changed as follows:



1. Snap ring
2. Piston
3. Cylinder cup
4. Shim
5. Cylinder cup 1
6. Piston cup spacer
7. Return spring



1. Snap ring
2. Stopper plate
3. Piston
4. Cylinder cup (2)
5. Cylinder cup(1)
6. Return spring

P67: B. 1. d. Bridge bolts . . . . . Delete the whole paragraph.
P68: d. 2) Install the brake hoses (front and rear) . . . . . Delete the parenthesized words.
Union bolt torque: 2.5 – 3.5 m-kg (18 – 25 ft-lb)➡2.3 – 2.8 m-kg (17 – 20 ft-lb)
3. Master cylinder
c. 2) Delete "front and rear master cylinder".
3) Delete the whole paragraph.
P75: 8. Steering fitting nut ➡bolt
Tightening torque: 3.5 – 4.0 m-kg (25.5 – 29 ft-lb)➡4.2 – 6.5 m-kg (31 – 47 ft-lb)
Delete the whole paragraph regarding "Stem pinch bolt".
9. Upper fork tube bolt torque: 1.4 – 2.2 m-kg (10.0 – 16.0 ft-lb)
➡ 0.9 – 1.4 m-kg (6.5 – 10.0 ft-lb)
10. Delete the whole paragraph regarding "CAUTION".
Torque: 1.4 – 2.2 m-kg (10.0 – 16.0 ft-lb)➡1.6 – 2.2 m-kg (12.0 – 16.0 ft-lb)
5-9. B. 1. No grease nipple is fitted.
P79: "Primary and secondary" are reversed for measurement of the resistance of the coil winding. Please correct it.
P80: 2. a. . . . . every 1,600 km (1,000 mi)➡ 3,200 km (2,000 mi).
P84: Battery capacity: 12V 1.2AH➡12V 12AH
P94: 10. 3) Valve seat width "C" IN 1 0.1 mm ➡1 ± 0.1 mm
EX 1 0.1 mm ➡1 ± 0.1 mm
Valve margin thickness "D" IN 1 0.1 mm ➡1 ± 0.1 mm
EX 1 0.1 mm ➡1 ± 0.1 mm
P97: 20. 2) Cleaner cleaning interval Every 8,000 km (5,000 mi)➡ 3,200 km (2,000 mi)

CHAPTER 3. ENGINE OVERHAUL

ENGINE SECTION TIGHTENING TORQUE CHART

Unit: m-kg (ft-lb)

Tightening point	(mm) Stud dia.	Q'ty	Torque	
Cylinder head	10	8	3.0 – 3.5 (21.7 – 25.32)	Apply engine oil
	6	2	0.8 – 1.2 (6.0 – 8.5)	
Tappet cover	32	4	1.0 – 1.4 (7.0 – 10.0)	
Rocker plug	16	2	1.2 – 2.0 (8.5 – 14.5)	
Spark plug	14	2	1.8 – 2.2 (13.0 – 16.0)	
Con-rod cap	8	4	3.3 – 3.8 (24.0 – 27.5)	Apply molybdenum greese
Valve adj. screw	6	4	1.2 – 1.5 (8.5 – 11.0)	
Cam sprocket bolt	7	2	1.8 – 2.2 (13.0 – 16.0)	
Oil filter cover	20	1	1.3 – 1.7 (9.5 – 12.0)	
Exhaust pipe ring nut	8	4	2.0 – 2.4 (14.5 – 17.0)	
Crankcase	8	7	2.0 – 2.4 (14.5 – 17.0)	
	6	14	0.8 – 1.2 (6.0 – 8.5)	
Oil drain bolt	14	1	3.5 – 4.0 (25.0 – 29.0)	
Spring screw	6	4	0.8 – 1.2 (6.0 – 8.5)	
Primary drive gear	10	1	4.0 – 4.5 (29.0 – 33.0)	
Drive sprocket	18	1	5.0 – 8.0 (36.0 – 58.0)	
Kick crank	8	1	1.5 – 2.5 (11.0 – 18.0)	
Cam stopper screw	8	1	1.2 – 2.0 (9.0 – 14.5)	
Governer	6	1	0.8 – 1.2 (6.0 – 8.5)	
ACG rotor bolt	10	1	3.0 – 3.5 (21.0 – 25.0)	
Oil pressure switch	1/8"	1	1.6 – 1.9 (7.0 – 11.0)	Apply NEJI Lock super # 20
Neutral switch	5	3	0.25 – 0.45 (2.0 – 3.0)	

3-1. REMOVAL

NOTE:

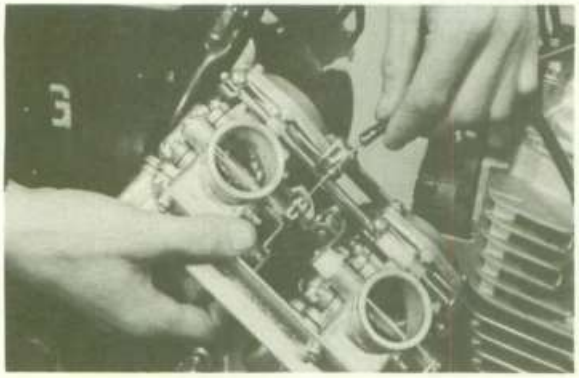
The engine components above the cylinder can be serviced without demounting the engine.

A. Preparation for Removal

1. All dirt, mud, dust and foreign material should be thoroughly removed from the exterior of the engine before removal and disassembly. This will prevent any harmful foreign material from entering the interior of engine assembly.
2. Before engine removal and disassembly, be sure you have proper tools and cleaning equipment so you can perform a clean and efficient job.
3. During disassembly of the engine, clean and place all parts in trays in order of disassembly. This will ease and speed assembly time and help insure correct re-installation of engine parts.
4. Start the engine and warm it for a few minutes; turn off and drain engine oil.
5. Remove fuel tank.
   Disconnect vacuum pipe and fuel pipe.
6. Remove air filter elements and air filter joints.



7. Remove carburetors and disconnect throttle cable.



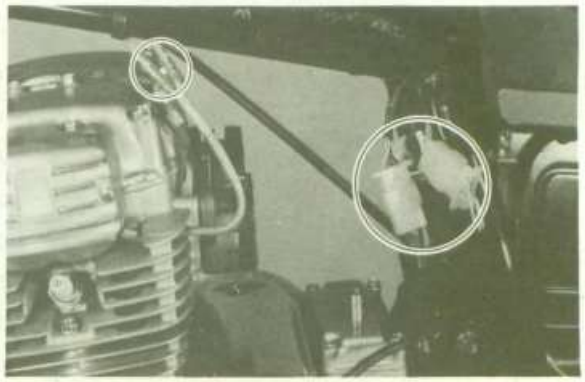
8. Remove the following parts.
   a. Mufflers.
   b. Footrests.
   c. Brake pedal.
   d. Spark plug caps.
   e. Gear change lever.
   f. Tachometer cable.



g. Crankcase cover, clutch cable and oil filter cover.



h. Ignition primary lead and generator lead (couplers).



i. Starter motor lead.



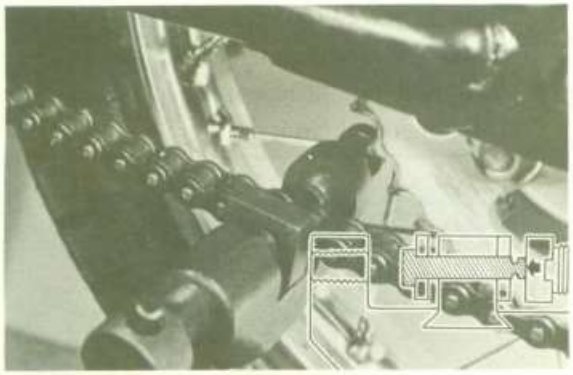
j. Ground lead.

k. Drive sprocket.
   1) Bend down lock tab.
   2) Put transmission in.
   3) Apply rear brake.
   4) Loosen sprocket securing nut.

l. If necessary, disconnect the chain as follows:
   1) Bring master link clip slightly forward on the sprocket wheel and remove the clip.
   2) Set the chain cutter (special tool) on

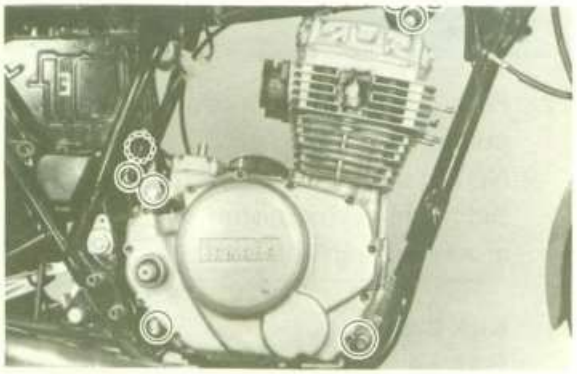
the chain, and remove the chain joint plate.

3) Separate the chain.



B. Removal

1. Remove engine mounting bolts.

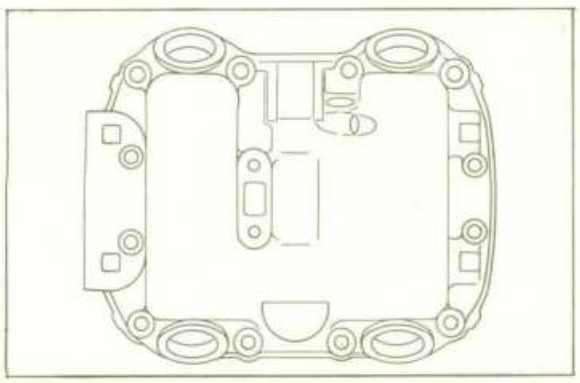


3-2 Disassembly

A. Cylinder Head Cover

1. Remove spark plugs.
2. Remove the cylinder head cover retaining bolts.

NOTE:
Loosen the bolts in the order indicated in the following.

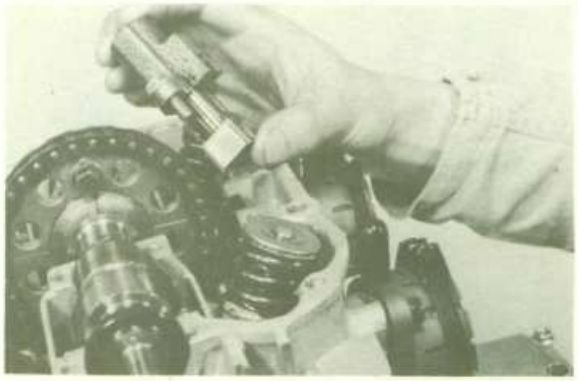


3. Remove the cover.

NOTE:
Tap around the edges with a rubber hammer or give the crankshaft approximately one turn to free the cover if necessary.
Never use a metal head hammer.

B. Cylinder Head

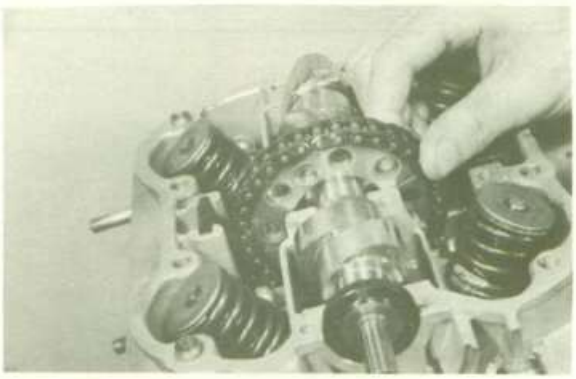
1. Remove the cam chain tensioner assembly. Note the location of each part.



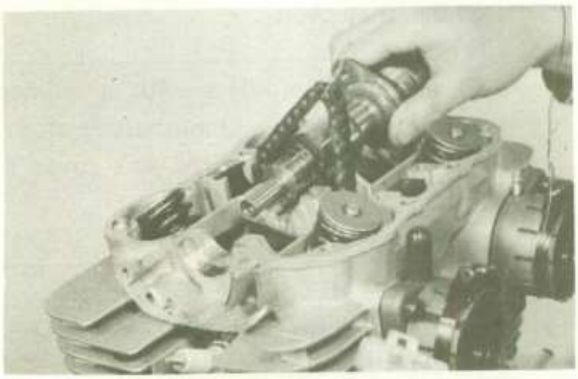
2. Remove the cam sprocket securing bolt and remove the camshaft and sprocket.

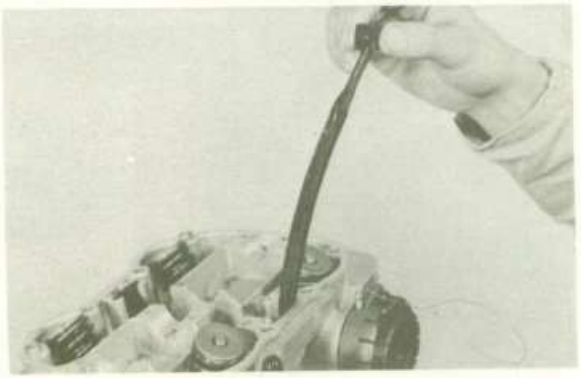
NOTE:

a. When removing the cam sprocket, it is not necessary to separate the cam chain.
b. Attach a wire to a chain link. Do this before removing the cam sprocket to prevent the chain from dropping into the crankcase. After removing the cam sprocket, anchor reatining wire to prevent the chain from dropping down.

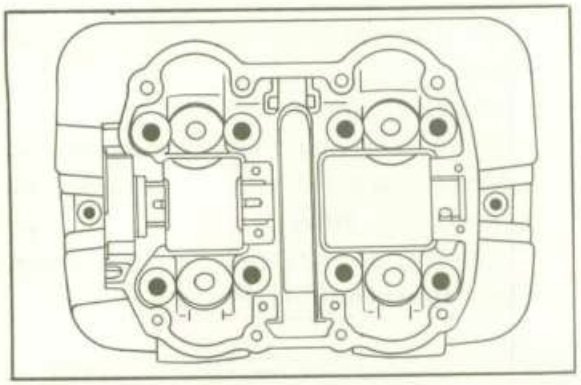


3. Remove the chain guides.



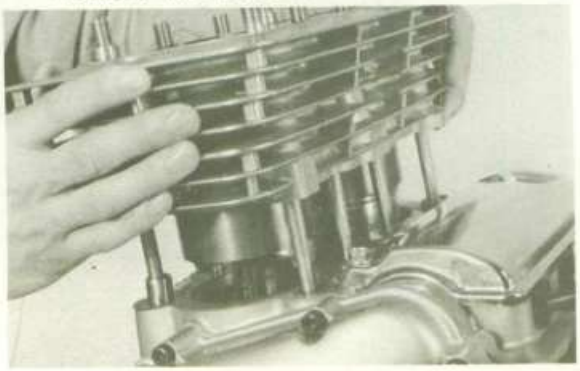


4. Remove the cylinder head holding nuts and bolts and then remove the cylinder head.



C. **Cylinder**

Remove the cylinder.



D. **Piston Pin and Piston**

1. Remove piston pin clip (1) from piston.

NOTE:

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



2. Push piston pin from opposite side. then pull out.

NOTE:

Before removing piston pin, deburr clip groove and pin hole area.

E. **Kick Crank**

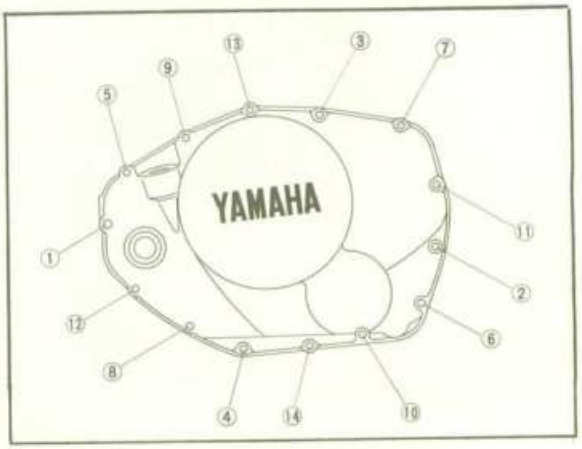
Remove kick crank securing bolt and kick crank.

NOTE:

The bolt must be completely removed from the kick crank.

F. **Crankcase Cover (Right)**

Remove crankcase cover holding bolts and the cover.



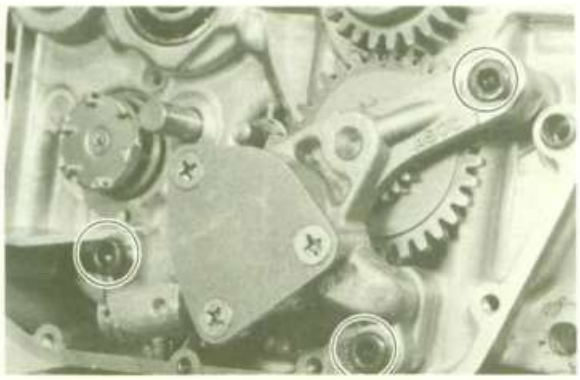
TORQUE 0.8 ~ 1.2 kg-m

G. Clutch Assembly and Drive Gear

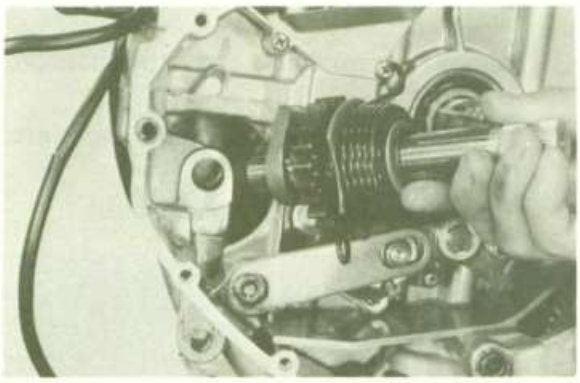
1. Remove spring screws, clutch springs, pressure plate, push rod and circlip.



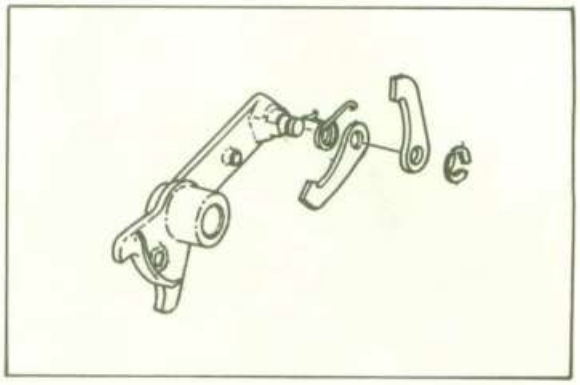
2. Remove clutch housing and clutch boss.
3. Remove oil pump assembly.



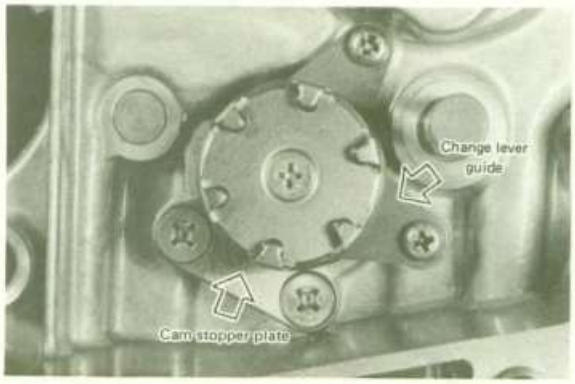
4. Remove the kick axle assembly by pulling toward you.



5. Remove cerclip from left end of change shaft and pull shaft and shift lever 1 out from the right hand side.
6. Remove the change lever 2 and the change lever 3 as an assembly.

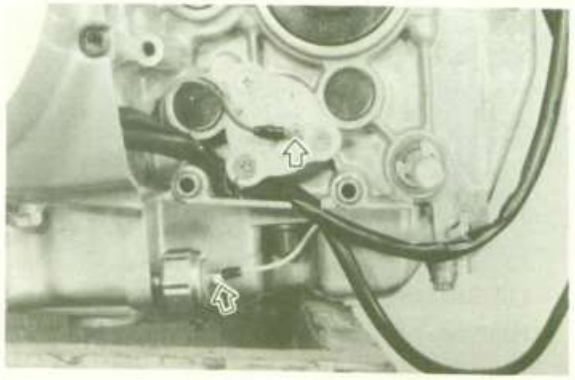


7. Remove cam stopper plate and change lever guide.

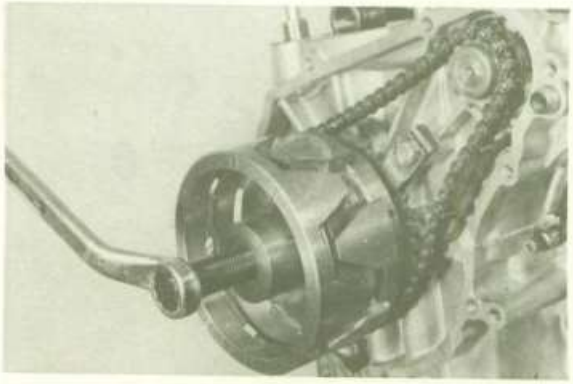


H. Crankcase Cover (L)

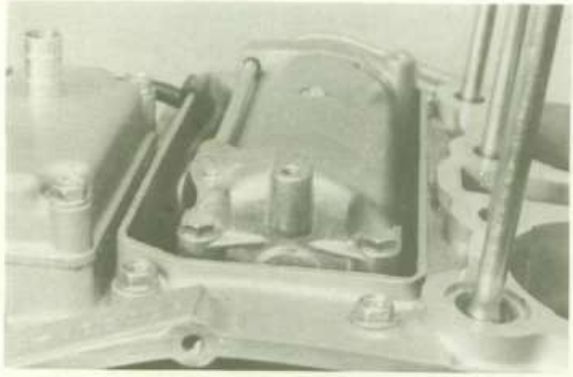
1. Remove generator lead wire holder.
2. Disconnect neutral switch lead and oil pressure switch lead.



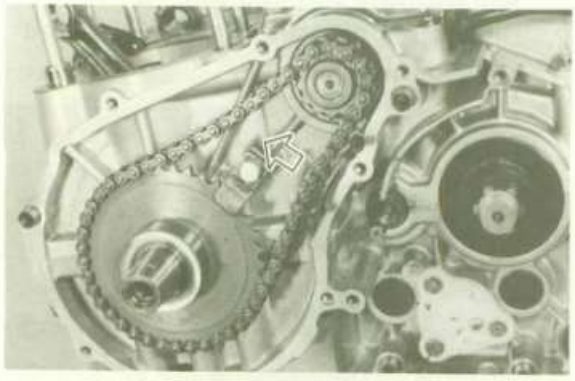
3. Remove crankcase cover (L).
4. Remove rotor and key.



5. Remove starter motor cover, starter motor and breather cover.

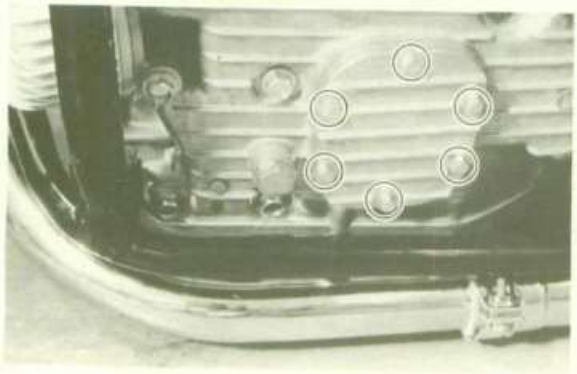


6. Remove sprocket guide, chain guide and starter sprockets.



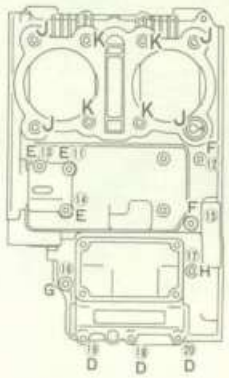
I. Oil Strainer Assembly

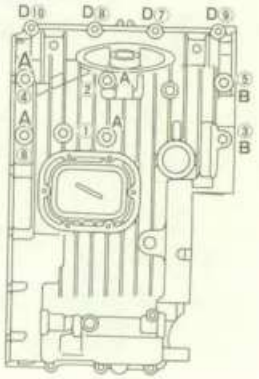
1. Remove oil strainer cover holding bolts.
2. Remove oil strainer.



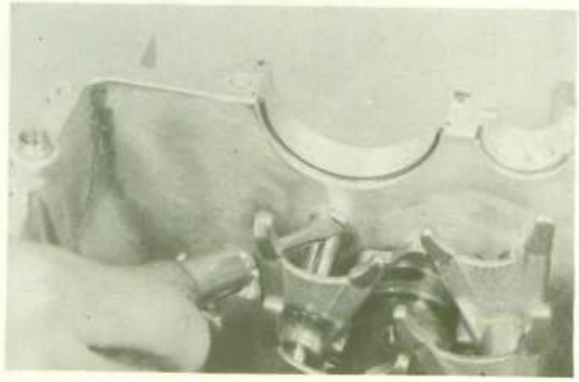
J. Crankcase

1. Remove crankcase holding bolts. Loosen each bolt ¼ turn and proceed to the next. Then follow sequence again; this time completely remove all bolts.

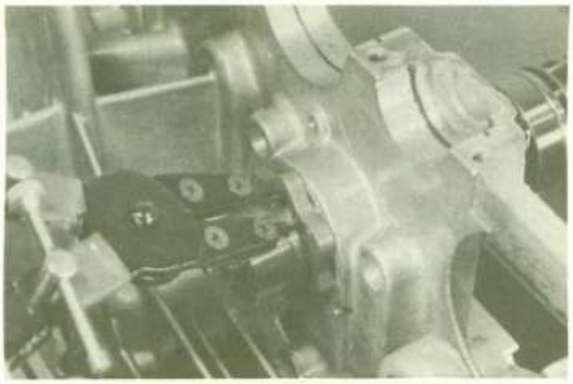




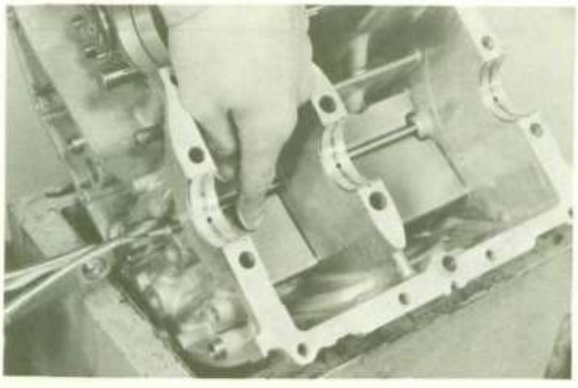
2. Split crank case by lightly striking the front and rear parts of the upper crank case.
3. Remove crankshaft and transmission gears.
4. Remove shift fork bar circlip and shift fork bars.
   (Push the guide bar grommets out.)



5. Remove shift cam stopper plate.



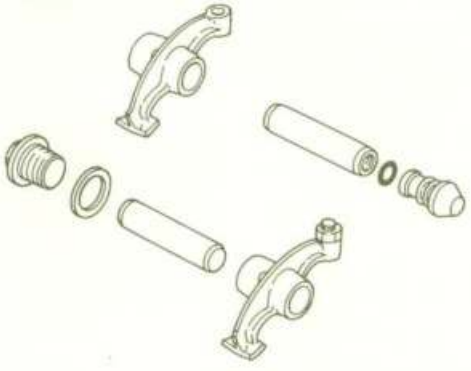
6. Remove baffle plate. (Pull the holding bar out.)



3-3. INSPECTION AND REPAIRING

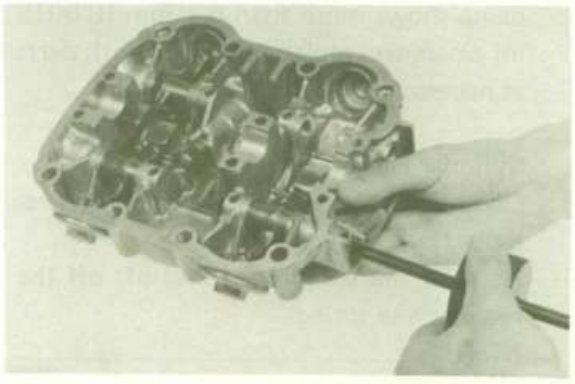
A. Cylinder Head Cover

1. Remove two rocker shaft covers and grommets.



2. Insert a 8 mm screw into the rocker shaft, and withdraw the rocker shaft. It should slide out easily.

NOTE:
If does not slide out easily, use the special tool as shown.



3. Rocker arm and rocker shaft

a. The rocker arm usually wears at two locations: (1) at the rocker shaft hole, (2) at the cam lobe contacting surface.

b. Measure the rocker shaft hole in the rocker arm.

Standard size:
$13\ ^{+0.018}_{0}$ mm
($0.512\ ^{+0.0007}_{0}$ in)

c. The shaft has been hardened and should not wear excessively. If a groove has developed in this surface that can be felt, or if it shows a blue discoloration, then the shaft should be replaced and the lubrication system (pump and passages) checked.

Standard shaft diameter:
$13\ ^{-0.016}_{-0.034}$ mm
($0.512\ ^{-0.00063}_{-0.00141}$ in)

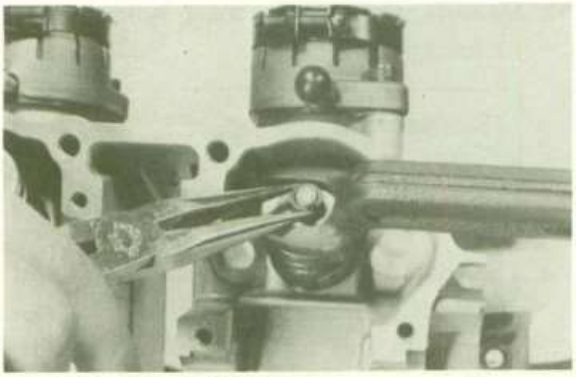


d. Standard clearance between the rocker shaft and hole should be 0.016 – 0.054 mm (0.00063 – 0.00212 in). If measure-

ment shows more than 0.1 mm (0.0015 in) clearance, replace either or both parts as necessary.

B. **Cylinder Head**

1. Compress the valve spring and then remove both retainer locks.
   Remove the compressor and lift off the retainer and springs.
   NOTE:
   The retainer locks might be partially stuck in the retainer. Use a rubber hammer to tap the edge of the retainer a few times to loosen the retainer locks.



1. Valve spring compressor

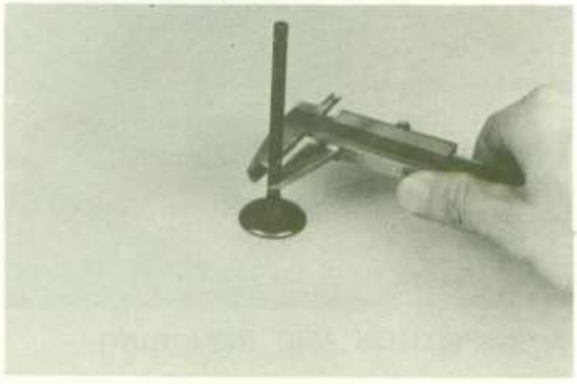
2. Pull the valve out. If the stem tip or retainer lock groove edges are slightly expanded, causing difficult removal, the surface might be damaged. First, use a fine file to remove any lip that exists on the stem and then remove the valve.
   NOTE:
   Be sure to remove the valve stem seal before removing the valve. Otherwise the seal could be damaged.

3. Decarbonization of the head and components:
   Carbon deposits build up in the combustion chambers, on the valves, and in the exhaust ports. Thoroughly clean all parts with a blunt scraper, then wash in solvent and dry with compressed air. The parts can then be examined and measured for wear.

C. **Valves, Valve Springs, Valve Guides and Valve Seats**

1. Check the intake and exhaust valve stems for bending and grooved wear. Check the stem ends for wear. Measurements should be done in three positions, upper, middle, and lower.

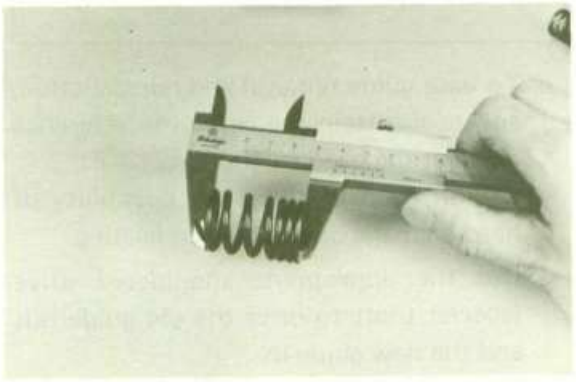
Intake valve stem diameter:
$7\ ^{-0.010}_{-0.025}$ mm
(0.275 $^{-0.0004}_{-0.001}$ in)
Exhaust valve stem diameter:
$7\ ^{-0.030}_{-0.045}$ mm
(0.275 $^{-0.0012}_{-0.0018}$ in)



2. Checking the valve springs.
   a. This engine uses two springs of different sizes to prevent valve float or surging.
   The chart below shows the basic value characteristics.

	Outer (IN & EX)	Inner (IN & EX)
Free length	42.8 mm (1.685 in)	39.3 mm (1.547 in)
Installed length (Valve closed)	37.0 mm (1.457 in)	33.0 mm (1.299 in)
Installed pressure	24.4 ± 1.7 kg (53.8 ± 3.8 lb)	12.1 ± 1.2 kg (26.7 ± 2.6 lb)
Compressed length (Valve open)	29.8 mm (1.17 in)	25.8 mm (1.02 in)
Compressed pressure	63.9 ± 4.5 kg (141 ± 9.9 lb)	29.9 ± 2.2 kg (65.9 ± 4.9 lb)

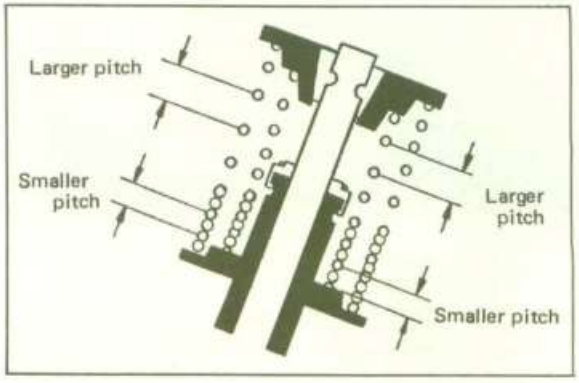
b. Even though the spring is constructed of durable spring steel, it gradually loses some of its tension. This is evidenced one way by a gradual shortening of free length. Use a vernier caliper to measure spring free length. If the free length of any spring has decreased more than 2 mm (0.080 in) from its specification, replace it.



c. Another symptiom of a fatigued spring is insufficient spring pressure when compressed. This can be checked using a valve spring compression rate gauge. Test each spring individually. Place it in the gauge and compress the spring first to the specified compressed length with the valve closed (all spring specifications can be found in previous section, Valve Spring) then to length with the valve open. Note the poundage indicated on the scale at each setting. Use this procedure on the outer springs, then the inner springs.

NOTE:

All valve springs must be installed with greater pitch upward as shown below.

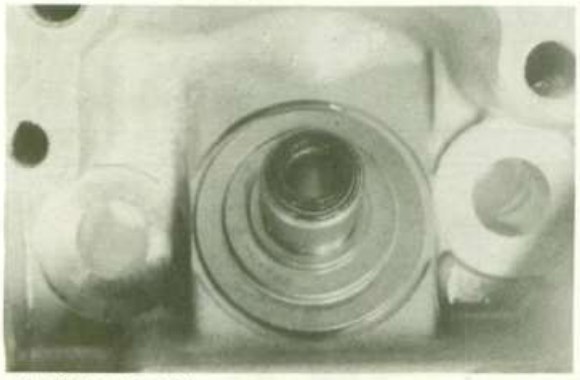




3. Valve Leakage Check

After all work has been performed on the valves and valve seats and all head parts have been assembled, check for proper valve/valve seat sealing by pouring solvent into each of the intake ports, then the exhaust ports. There should be no leakage by the seat. If this fluid leaks, disassemble and continue to lap with fine lapping compound. Clean all parts thoroughly, reassemble and check again with solvent. Repeat this procedure as often as necessary to obtain a satistactory seal.

4. Valve Stem Seal
This seal slips down over the valve stem to prevent excessive amounts of oil from passing down stem and into the combustion chamber. If this seal is cracked, split, or hardened, replace it.



1. Valve stem seal

5. Valve Guide

a. If the valve guide inside diameter is beyond serviceable limits, replace with an oversize valve guide.

	Standard	Limit
Guide diameter (I.D.) (IN & EX)	$7^{+0.012}_{0}$ mm ($0.2756^{+0.00047}_{0}$ in)	7.03 mm (0.2767 in)

b. Measuring the clearance between valve and valve guide.

1) Insert the valve into the valve guide in the cylinder head and measure the clearance in both the X and Y axes, using a small dial gauge.



1. Valve guide installer

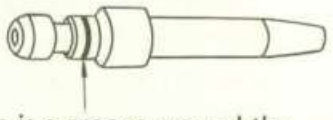
2) If the measured clearance is greater than 0.08 mm (0.003 in) for the inlet valve or 0.1 mm (0.004 in) for the exhaust valve, both the valve and valve guide should be replaced. The replacement valve guide should be one that is oversize.

Standard guide diameter (IN, EX):
12.50 $^{+0.052}_{+0.040}$ mm (0.492 $^{+0.0020}_{+0.0016}$ in)

Valve guide oversize:

Part No.	Size (O.D.)
1L9–11733–12 (IN)	12.50 $^{+0.078}_{+0.090}$ mm)
1L9–11734–12 (EX)	(0.492 $^{+0.0031}_{+0.0035}$ in)

Identification method

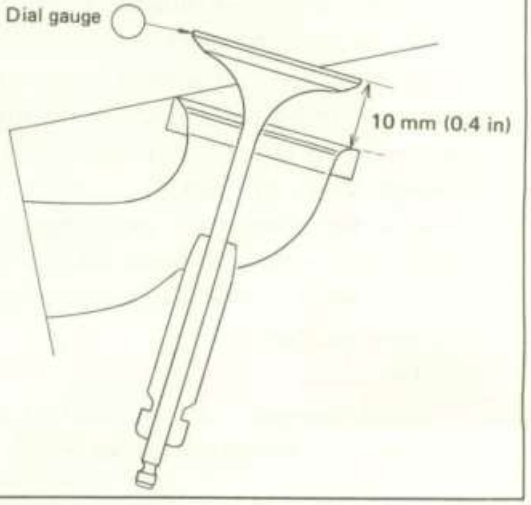


There is a groove around the upper part of the valve guide.

c. To ease guide removal and reinstallation, and to maintain the correct interference fit, heat the head to 100°C (212°F). Use an oven to avoid any possibility of head warpage due to uneven heating.

d. Use the appropriate shouldered drive (special tool) to drive the old guide out and the new guide in.

NOTE:
When a valve guide is replaced, the O-ring should also be replaced.

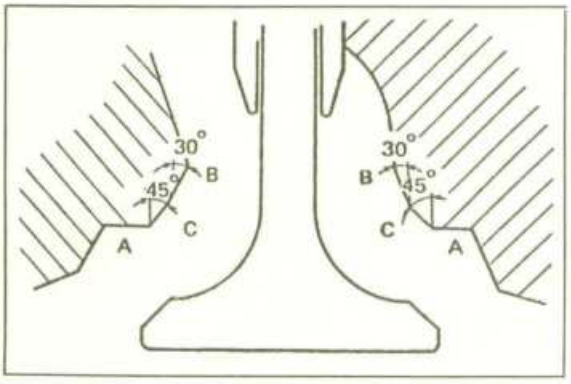


e. After installing the valve guide, use 7mm reamer (special tool) to obtain the proper valve clearance.

f. After fitting the valve guide into the cylinder head, be sure to grind the valve seat, and perform valve lapping. The valve must be replaced by a new one.

6. Grinding the Valve Seat

a. The valve seat is subject to severe wear similar to the valve face. Whenever the valve face is resurfaced, the valve seat should also be resurfaced at a 45° angle. In addition, if a new valve guide has been installed (without any valve repair), the valve seat should be checked to guarantee complete sealing between the valve face and seat.



CAUTION:

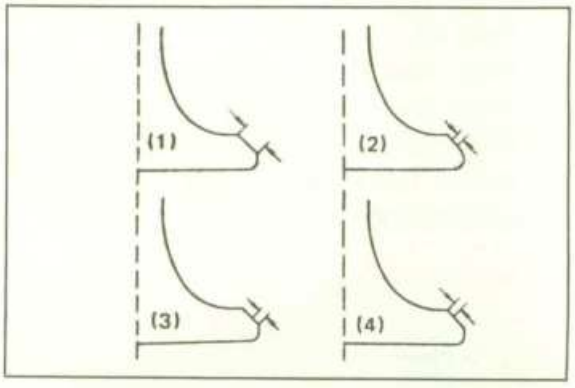
If the valve seat is obviously pitted or worn, it should be cleaned with a valve seat cutter. Use the 45° cutter, and when twisting the cutter, keep an even downward pressure to prevent chatter marks.

If cutting section "A" of the intake valve seat, use "FLAT" cutter (radius cutter).
If cutting section "A" of the exhaust valve seat, use "FLAT" cutter (also radiused).
If cutting section "B", use the 30° cutter.
If cutting section "C", use the 45° cutter.

b. Measure valve seat width. Apply mechanic's bluing dye (such as Dykem) to the valve face, apply a very small amount of fine grinding compound around the surface of the valve seat, insert the valve into position, and spin the valve quickly back and forth. Lift the valve, clean off all grinding compound, and check valve seat width. The valve seat will have removed the blueing wherever it contacted the valve face. Measure the seat width with vernier calipers. It should measure approximately 1.0 mm (0.04 in). Also, the seat should be uniform in comtact area. If valve seat width varies, or if pits still exist, then continue to cut with the 45° cutter. Remove just enough material to achieve a satisfactory seat.

	Standard width	Wear limit
Seat width (IN, EX)	1.0±0.1 mm (0.04±0.004 in)	1.5 mm (0.06 in)

c. If the valve seat is uniform around the perimeter of the valve face, but is too wide or not centerd on the valve face, it must be altered. Use either the "FLAT", 45°, or 30° cutters to correct the improper seat location in the manner described below :



(1) If the valve face shows that the valve seat is centered on the valve face, but too wide, then lightly use both the "FLAT" and the 30° cutters to reduce the seat width to 1.0 mm (0.04 in).

(2) If the seat shows to be in the middle

of the valve face, but too narrow, use the 45° cutter until the width equals 1.0 mm (0.04 in).

(3) If the seat is too narrow, and right up near the valve margin, then first use the "FLAT" cutter and then the 45° cutter to get the correct seat width.

(4) If the seat is too narrow and down near to bottom edge of the valve face, then first use the 30° cutter and then the 45° cutter.

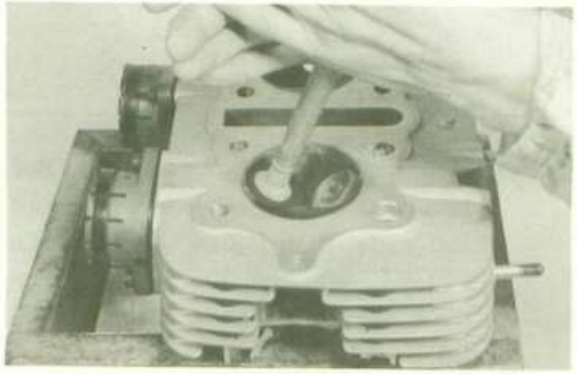
7. Lapping the Valve/Valve Seat Assembly

a. The valve/valve seat assembly should be lapped if, (1) neither the seat nor the valve face are severely worn, or: (2) if the valve face and valve seat have been resurfaced and now require a final light grinding operation for perfect sealing.

b. Apply a small amount of coarse lapping compound to the valve face. Insert the valve into the head. Rotate the valve until there is a burnished spot all the way around the valve face. Clean off the coarse compound, then follow the same procedure with fine compound.

Continue lapping until the valve face shows a complete and smooth surface all the way around. Clean off all compound material.

Apply bluing dye to the valve face and rotate the valve face for full seat contact which is indicated by a shiny surface all around the valve face where the bluing has been rubbed away.



D. **Camshft and Sprocket**

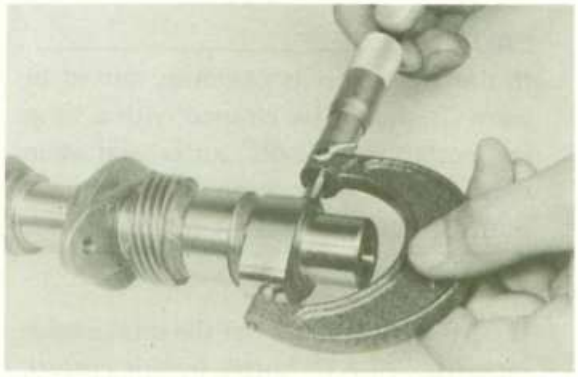
1. Camshaft

a. The cam lobe metal-surface may have a blue discoloration due to excessive friction. The metal surface could also start to flake off or become pitted. This is due to poor lubrication, incorrect clearances, or normal wera.

b. If any of the above wear conditions are readily visible, the camshaft should be replaced.

c. Even though the cam lobe surface appears to be in satisfactory condition, the lobes should be measured with a micrometer. Cam lobe wear can occur without scarring the surface. If this wear exceeds a predetermined amount, valve timing and lift are affected. Replace the camshaft if wear exceeds the limits.

Wear limit	A	B
Intake	38.70 mm (1.523 in)	32.08 mm (1.263 in)
Exhaust	38.74 mm (1.525 in)	31.90 mm (1.256 in)



2. Cam sprocket and cam drive sprocket

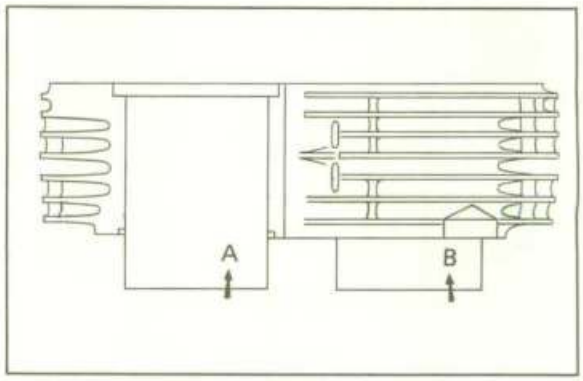
Check the cam sprocket and cam drive sprocket for wear.

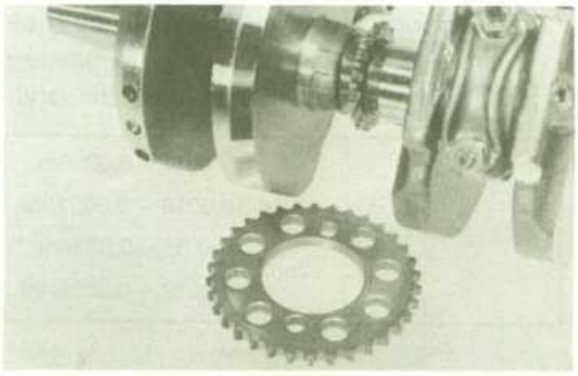


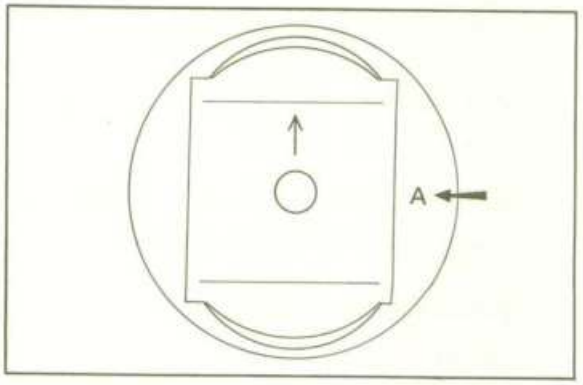
	Piston size		Cylinder size
A	66 $^{-0.020 \text{ or less}}_{-0.031 \text{ or more}}$ (2.598 $^{-0.00079 \text{ or less}}_{-0.00122 \text{ or more}}$)	A	66 $^{+0.020 \text{ or less}}_{+0.011 \text{ or more}}$ (2.598 $^{+0.00079 \text{ or less}}_{+0.00043 \text{ or more}}$)
B	66 $^{-0.030 \text{ or less}}_{-0.040 \text{ or more}}$ (2.598 $^{-0.00118 \text{ or less}}_{-0.00157 \text{ or more}}$)	B	66 $^{+0.010 \text{ or less}}_{0}$ (2.598 $^{+0.00039 \text{ or less}}_{0}$)

E. Cylinder

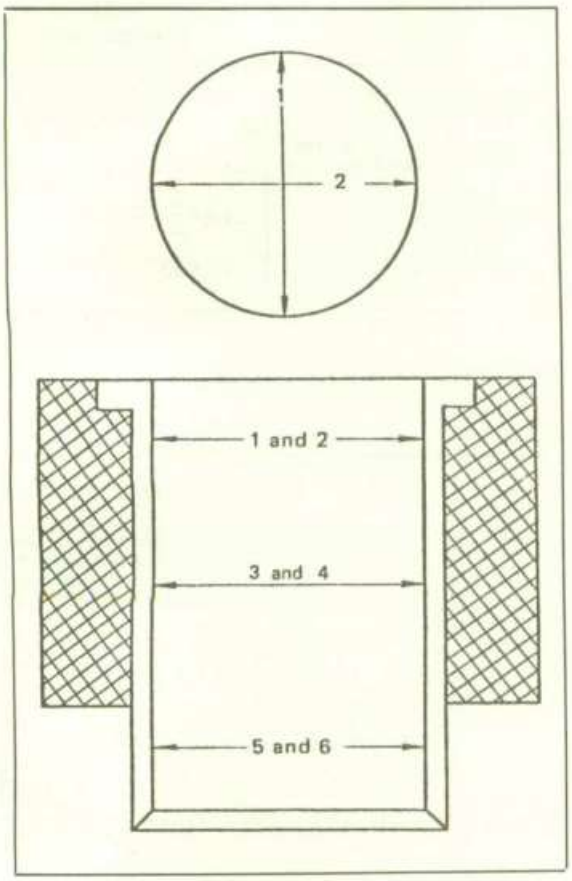
1. Visually check the cylinder walls for scratches. If vertical scratches are evident, the cylinder wall should be rebored or the cylinder should be replaced.
2. Measure cylinder wall wear in the manner as shown. If wear is excessive, compression pressure will decrease, and engine trouble will occur. Rebore the cylinder wall, and replace the piston and piston rings.
   Cylinder wear should be measured at three depths by placing the measuring instrument in parallel to, and at right angles to the carankshaft. (See the illustration.)







3. Types of cylinder
   The cylinder is available in two sizes, having the mark A or B on it. When replacing the cylinder, it is necessary to replace the piston with a new one having the identical mark.



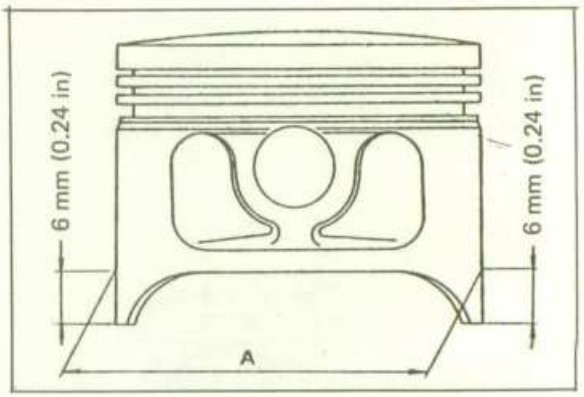
	Standard
Cylinder bore	66.00 ~ 66.02 mm (2.598 ~ 2.599 in)
Cylinder taper	0.05 mm (0.002 in)

If the cylinder wall is worn more than wear limit, it should be rebored.

F. Piston and Piston Rings

1. Piston

a. Using the micrometer, measure the outside diameter of the piston at the piston skirt.
Measurement should be made at a point 15.5 mm (0.61 in) above the bottom edge of the piston by placing the micrometer in parallel to, and at right angles to, the piston pin.



	Size
Standard	66.00 mm
Oversize 1	66.25 mm
Oversize 2	66.50 mm
Oversize 3	66.75 mm
Oversize 4	67.00 mm

Piston clearance:
0.030 ~ 0.050 mm
(0.0012 ~ 0.0020 in)

b. Piston ring/ring groove fit must have correct clearance. If the piston and ring have already been used in the engine, the ring must be removed, the ring groove cleaned of carbon. And then the ring should be reinstalled. Use a feeler, gauge to measure the gap between the ring and the land.

Side clearance	Top	0.04 – 0.08 mm (0.0016 – 0.0031 in)
	2nd	0.03 – 0.07 mm (0.0012 – 0.0028 in)



2. Piston ring

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

	Oversize Dia.	Stamped Mark
Oversize 1	66 + 0.25 mm	25
Oversize 2	66 + 0.50 mm	50
Oversize 3	66 + 0.75 mm	75
Oversize 4	66 + 1.00 mm	100

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

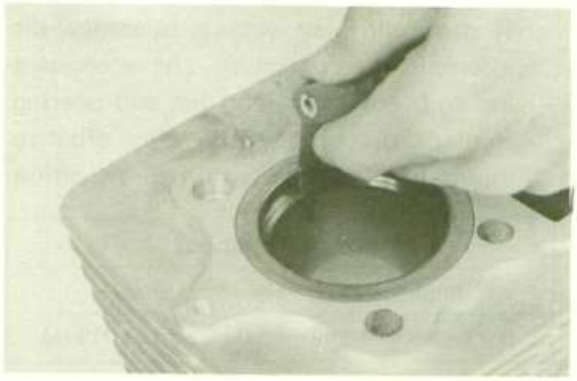
Size	Color
STD	Red
Oversize 1	Brown
Oversize 2	Blue
Oversize 3	Black
Oversize 4	Yellow

c. Push the ring into the bore (with an inverted piston to make sure it is not cocked), check and gap clearance with a feeler gauge.

NOTE:

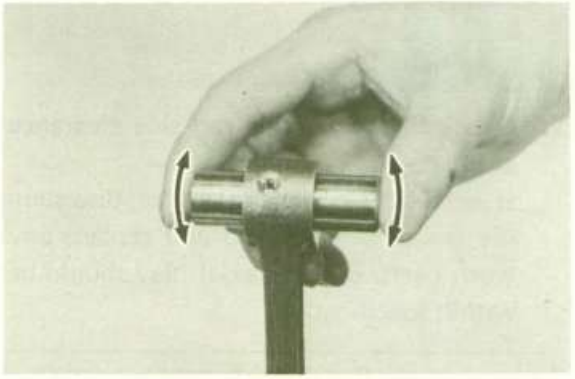
The end gap on the expander spacer of the oil control ring is unmeasureable. If the oil control ring rails show excessive gap all three components should be replaced.

	Standard	Limit
Top/2nd ring	0.2 – 0.4 mm (0.012 – 0.016 in)	0.7 mm (0.025 in)
Oil control (Rails)	0.2 – 0.9 mm (0.008 – 0.035 in)	–



G. **Piston Pin**

1. Apply a light film of oil to pin. Install in connecting rod small end. Check for play. There should be no noticeable vertical play. If play exists, check connecting rod small end for wear. Replace pin and connecting rod as required.



2. The piston pin should have no noticeable freeplay in piston. If the piston pin is loose, replace the pin and/or the piston.

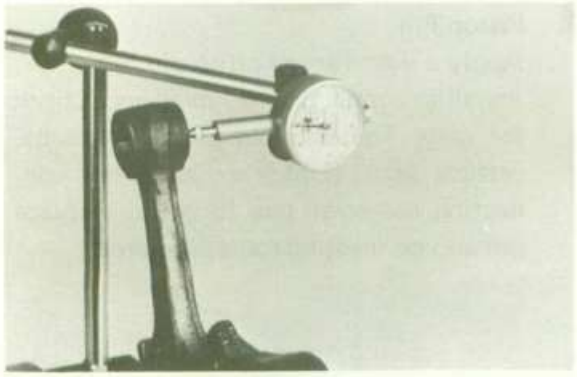


H. **Crankshaft**

1. Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at big end).

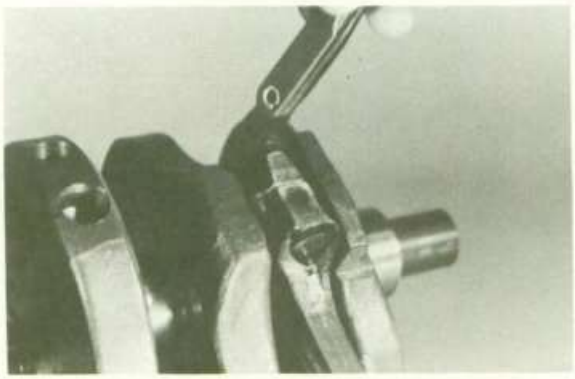
If small end play exceeds tolerance, disassemble the crankshaft, check connecting rod, crank pin and big end bearing. Replace defective parts. Play after reassembly should be within specification.

Rod axial clearance	
Minimum	Maximum
0.30 mm (0.012 in)	0.50 mm (0.019 in)



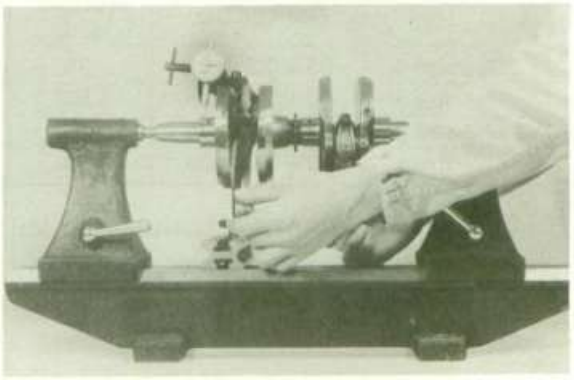
2. Check the connecting rod side clearance at big end.
   If axial play exceeds tolerance, disassemble the connecting rod and replace any worn parts. Big end axial play should be within specification.

Rod side clearance	
Minimum	Maximum
0.160 mm (0.0063 in)	0.264 mm (0.0104 in)



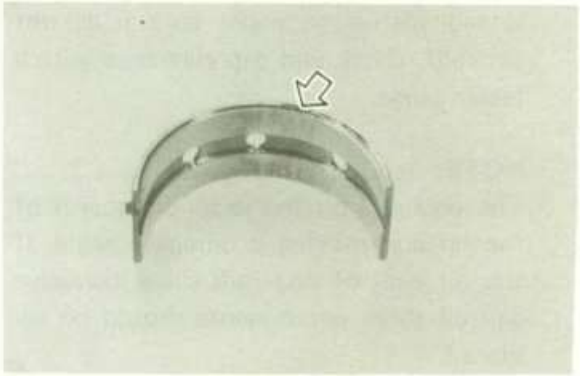
3. Check crankshaft assembly runout.
   Dial gauge readings should be within specifications.

Deflection tolerance : 0.02 mm (0.0008 in)



4. Crankshaft assembly
   a. Assembling the connecting rods.

NOTE:
Use bearings of identical color for assembly. (For both connecting rod and journal bearings)

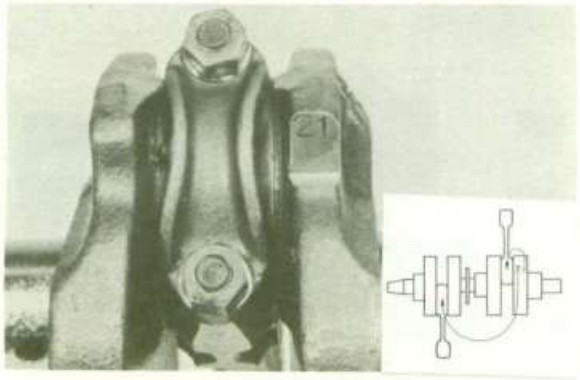


1) Selection of big end bearing inserts.

Con-rod insert No = Con-rod housing No − Crankpin Dia. No

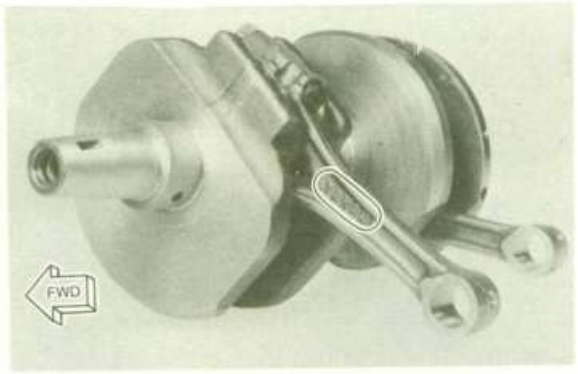
Beg end bearing housing Nos.	Crank pin Dia. Nos.	Con-rod insert Nos. (Color codes)
3	1	1 (Blue)
4	2	2 (Black)
5		3 (Grown)
		4 (Green)

Con-rod housing No.



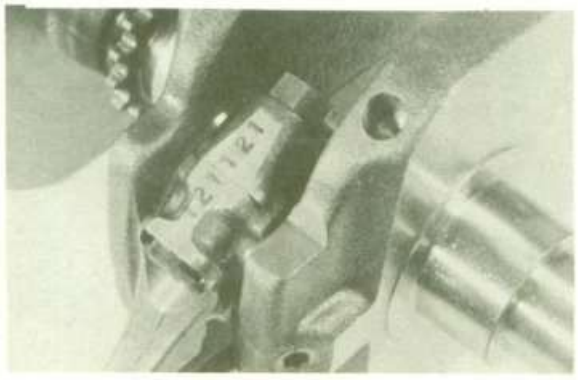
CAUTION:

Install the both connecting rods with the "YAMAHA" mark to the left side.



NOTE:

If both connecting rods are to be replaced, the new ones should have the identical marks.



2) Weight of connecting rod

If either one of connecting rods is to be replaced, the new one must have the same stamped mark.

If both are to be replaced, the difference of weight between the two rods should be 5 gr (0.18 oz) at a maximum.

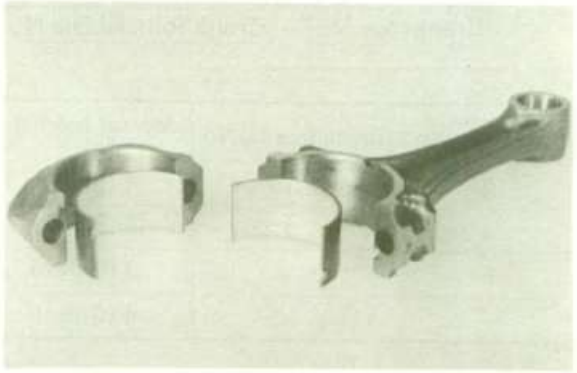
Con-rod cap tightening torque:
3.3 ~ 3.8 m-kg (24 ~ 27.5 ft-lb)

NOTE:

When assembling the con-rod, apply molybdenum disulfide to the threaded portions of bolts, nuts and nut seats.

NOTE:

Install the connecting rod with the bearing protuberance on the rear side. (inlet side)



3) Checking big end bearings

The big end bearings are vitally important parts for the engine.

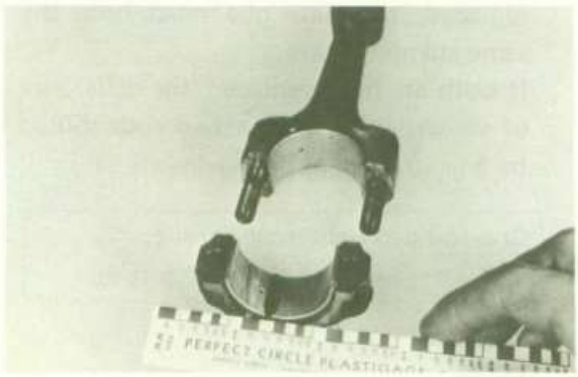
The following parts should be chacked.

- Grooved wear on bearing inserts.
- Scratches resulting from dusts.
- Damage to connecting rods, bolts and nuts.

4) Measuring the oil clearance:

Place plasti gauge in the center of bearing cap and tighten housing with specified torque.

Determine the oil clearance by measuring thickness of flattened plasti gauge.



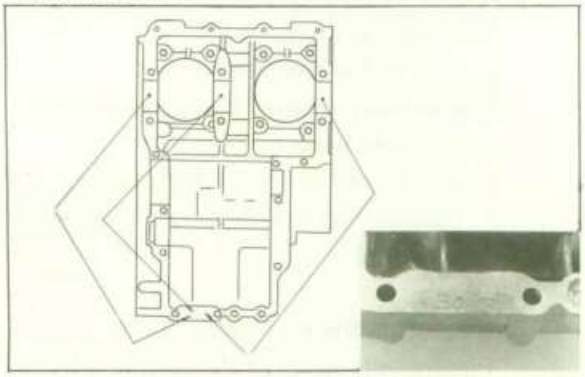
NOTE:
Do not turn con-rod during measurment.

b. Installing the crankshaft.
   1) Check crankshaft journals for damage and grooved wear.
      If necessary, replace inserts.
   2) Selection of journal bearing inserts.

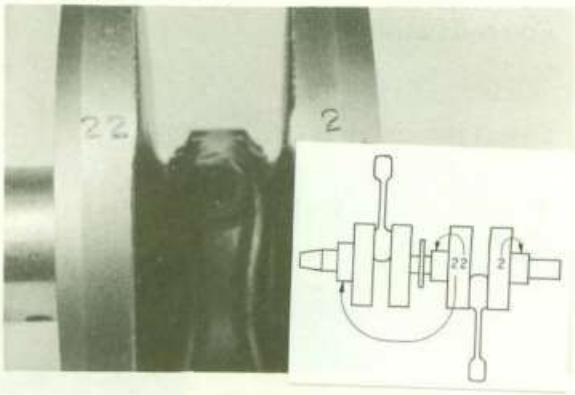
Bearing insert No	=
Crankcase No	– Crank journal Dia No

Crankcase No.	Crank journal No.	Journal bearing No
3	1	1 (Blue)
4	2	2 (Black)
5		3 (Brown)
		4 (Green)

Crankcase No.



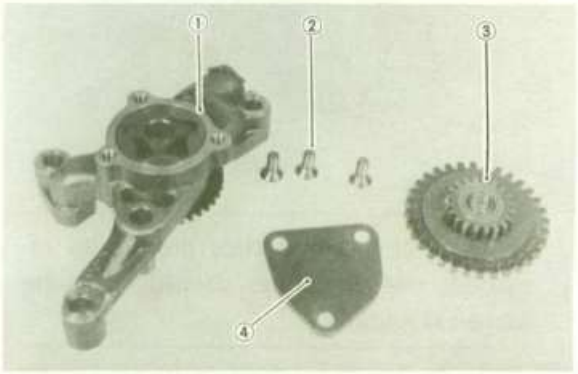
Crank journal No.



NOTE:
This selection procedure is necessary to provide proper oil clearance.

Standard oil clearance:
0.020 ~ 0.044 mm (0.0008~ 0.0017 in)

I. Oil Pump



1. Pump assembly
2. Cover fitting bolt
3. Reduction gear
4. Pump cover

XS 360 Lubrication Diagram

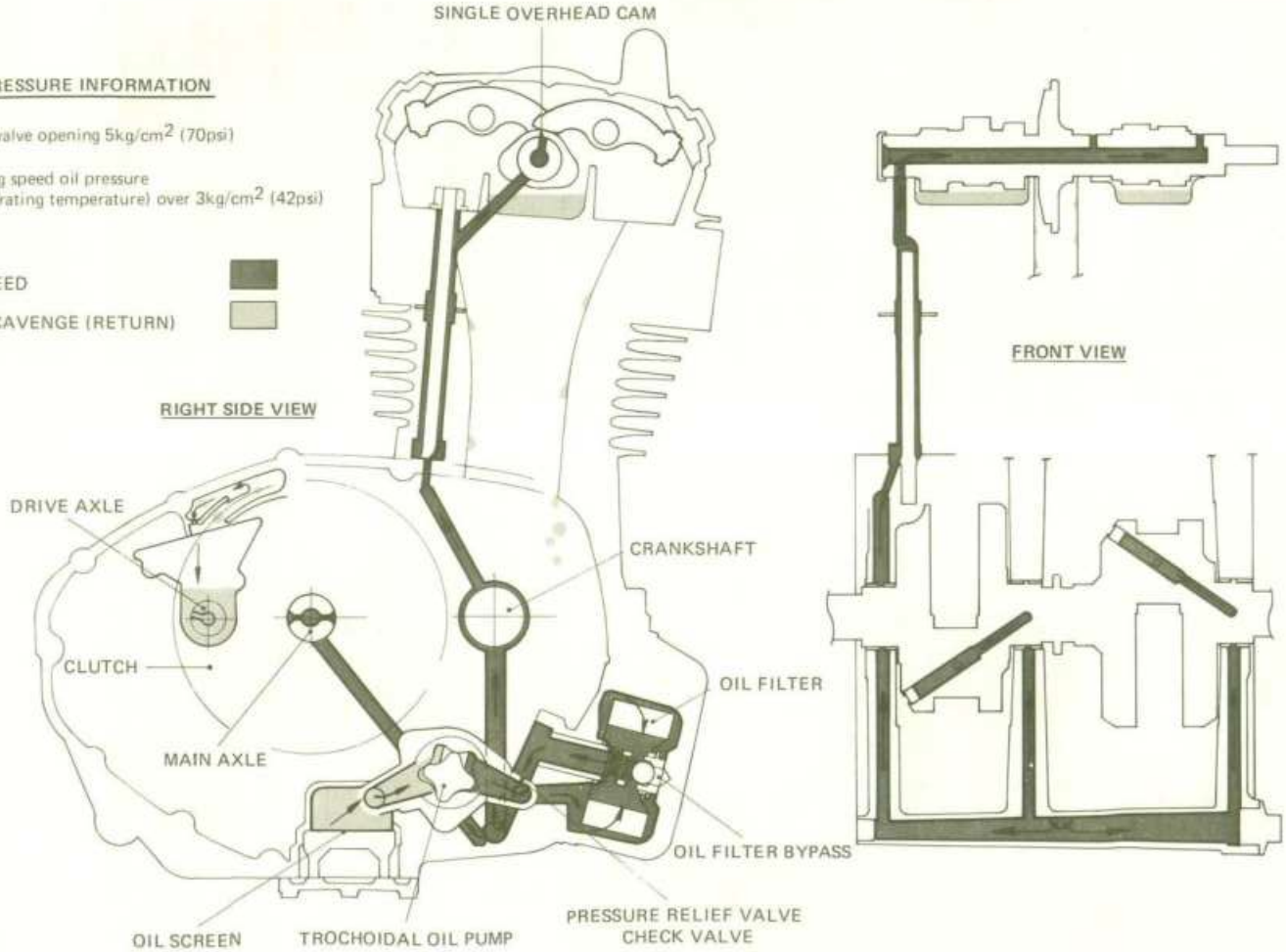
OIL PRESSURE INFORMATION

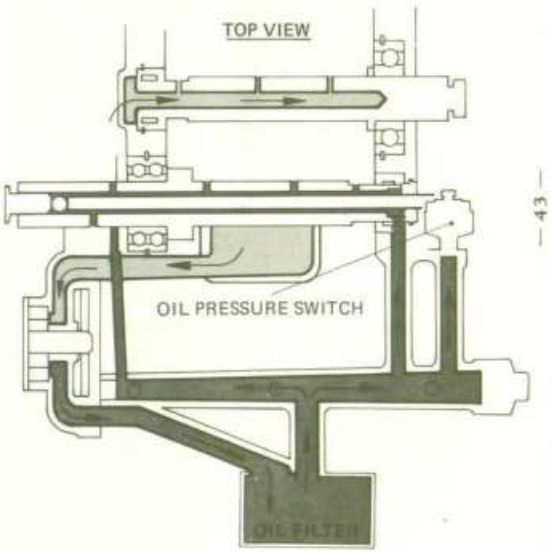
Relief valve opening 5kg/cm^2 (70psi)

Cruising speed oil pressure
(at operating temperature) over 3kg/cm^2 (42psi)

OIL FEED

OIL SCAVENGE (RETURN)



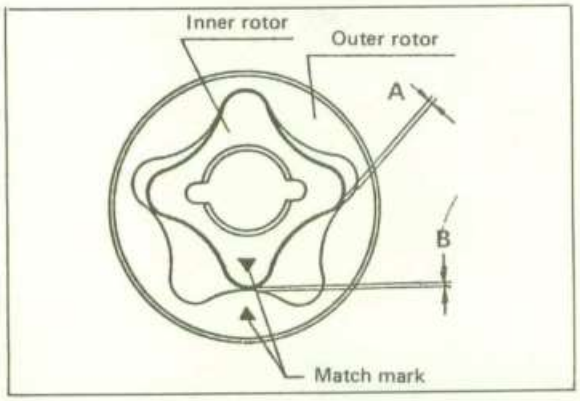


1. Trochoidal Pump Rotor Width

12 mm (0.472 in)

2. Rotor Dimensions-Inner and Outer

Clearance between A and B Standard: 0.03 – 0.09 mm (0.0001 – 0.0002 in)



J. Primary Drive

The drive gear is mounted on the crankshaft and the driven gear is integral with the clutch assembly and mounted on the transmission main shaft.

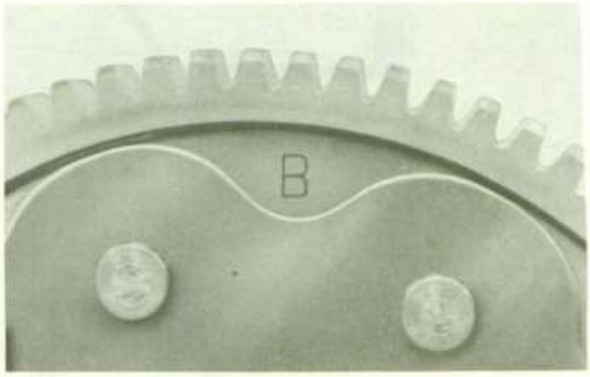
Primary reduction ratio		
No. of teeth		Ratio
Drive	Driven	
24	78	3.25

1. Check the drive gear and driven gear for obvious signs of wear or damage from foreign material within the primary case.
2. If primary drive gears exhibit excessive noise during operation, gear lash may be incorrect.
   Numbers are scribed on the side of each gear. Add these numbers. If their total exceed tolerance, replace with a numbered gear that will bring total within specification.

NOTE:
This procedure is rarely required. However, if a gear must be replaced due to damage, it is always advisable to pay strict attention to the lash numbers during replacement.

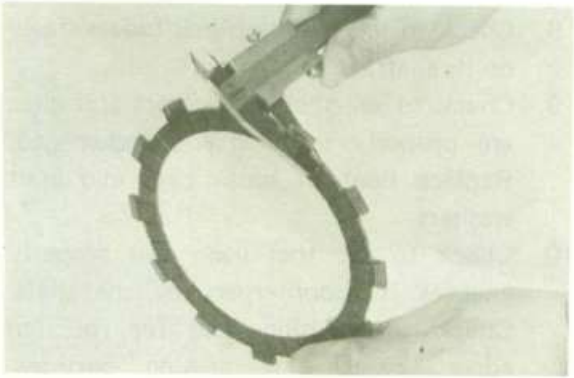
	Lash numbers (symbol)	
Primary drive gear	A – D	
Primary driven gear	C – F	
Lash tolerance	Drive	Driven
	A B C D	C D E F





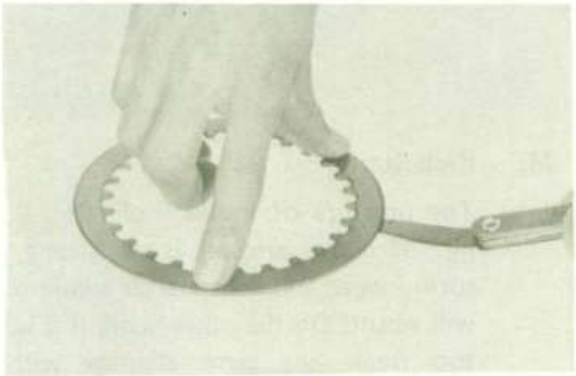
K. Clutch

1. Checking friction plates
   The friction plates are liable to wear. The standard thickness of the friction plate is 3.0 mm (0.12 in). If it is worn more than 0.3 mm (0.012 in) or has uneven wear, it should be replaced.

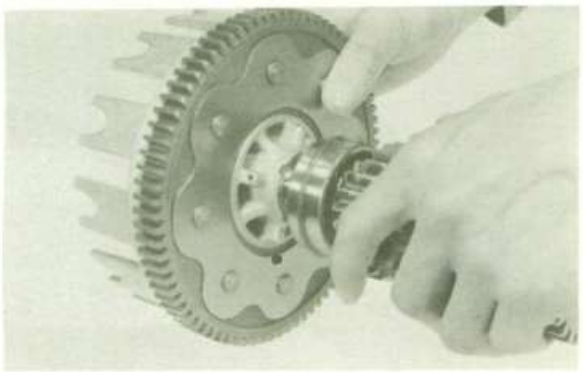


2. Measure clutch plates
   Check clutch plate warpage, and if warpage is more than specified, the clutch plate should be replaced.

Clutch plate warpage limit:
0.05 mm (0.002 in)



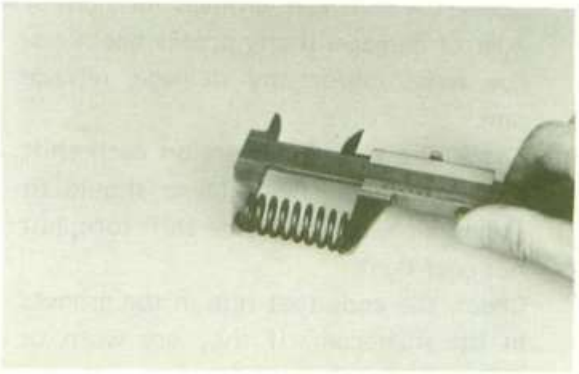
3. Checking the clutch housing assembly
   Insert the main axle into the primary driven gear hub, and check for wear and scratches. If scratches exist, the clutch tends to drag. Smooth out with oil stone or fine grain sandpaper.
   If excessively worn, noise will result, so replacement is necessary.



4. Checking clutch springs
   Using the vernier caliper, measure the free length of each spring. If it measures 1.0 mm (0.04 in) less than specified, it should be replaced.

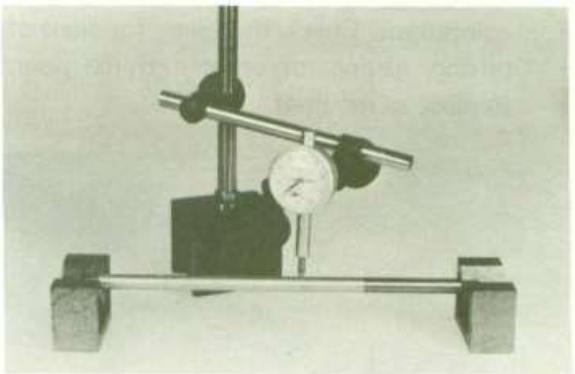
Clutch spring specifications:

Number of springs	4
Free length	34.6 mm (1.36 in)
Spring rate	2.6 kg/mm (145.5 lb/in)



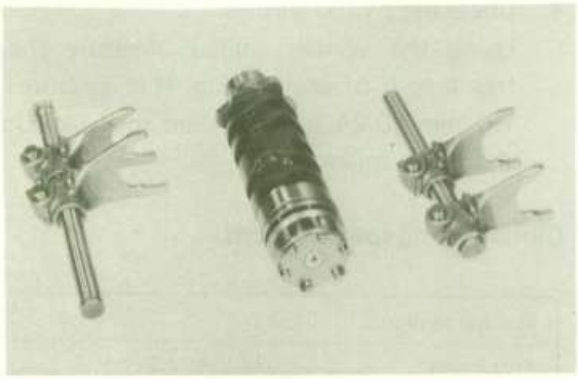
5. Checking the push rod
   Roll the push rod over the "V" block as shown below, and check for bends. If any bend is found, replace the push rod.

Bend Limit:
0.2 mm (0.008 in)



L. Transmission

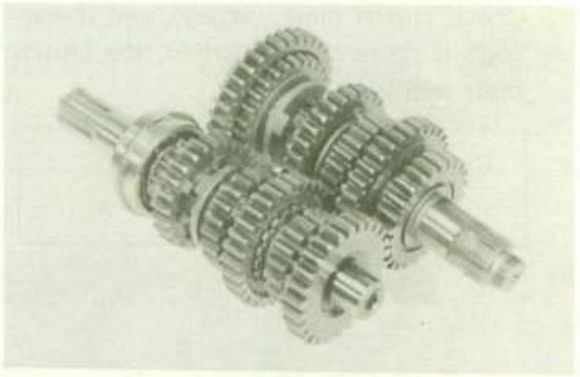
1. Inspect each shift fork for signs of galling on gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.



2. Roll the guide bars across a surface plate. If any bar is bent, replace.
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or any damage, replace cam.
4. Check the cam followers on each shift fork for wear. The follower should fit snugly into its seat in the shift fork, but not over-tight.
   Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace.
5. Check shift cam dowel pins and side plate for looseness, damage, or wear. Repair as required.
6. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent, replace.
7. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the teeth for signs of pitting, galling, or other extreme wear. Replace as required.



8. Check to see that each gear moves freely on its shaft.
9. Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers.
10. Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges, cracks, or missing portions. Replace as required.

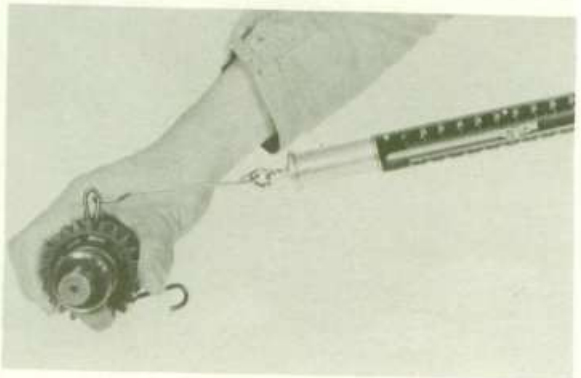


M. **Kick Starter**

a) The pressure of the kick clip is 2.2 kg. If above pressure is too strong, spring wear and kick starter slipping will result. On the other hand, if it is too weak, the same slippage will occur particularly at low temperatures. Do not try to bend the clip.

b) Check the clip for damage and wear, and determine whether or not, it should be replaced taking the above (item 2) into consideration.

Standard tension: 0.8 – 1.3 kg

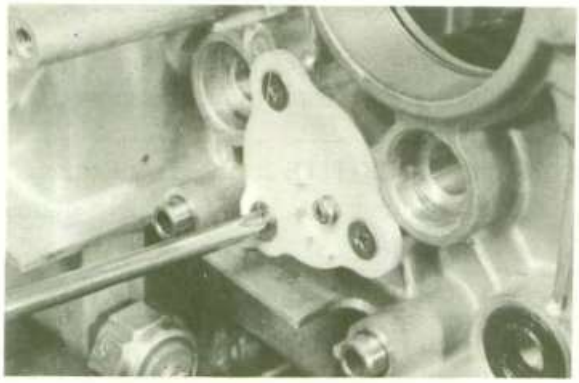


N. **Bearings and Oil Seals**

1. Inspection
   a. After cleaning and lubrication bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing.
   b. Check oil seal lips for damage and wear. Replace as required.
2. Removal
   a. Pry oil seal(s) out of place using a slot head screwdriver.
   Always replace all oil seal when overhauling engine.
   NOTE: _____
   Place a piece of wood under the slot head screwdriver to prevent damage to case.

O. **Neutral Switch**

1. Check O-ring, replace if damaged.
2. Check neutral point for wear. Replace as required.



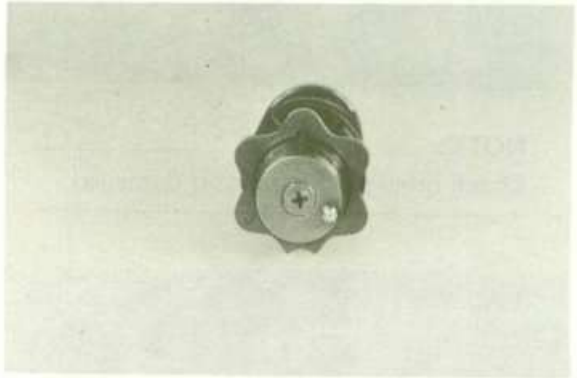
P. **Crankcase**

1. Thoroughly wash the case halves in mild solvent.
2. Clean all gasket mating surfaces and crankcase mating surface throughly.
3. Visually inspect case halves for any cracks, road damage, etc.
4. Check all fittings not previously removed for signs of loosening or damage.
5. Check bearing seats for signs of damage (such as the bearing spinning in the seat, etc.)
6. Check oil delivery passages for signs of blockage.

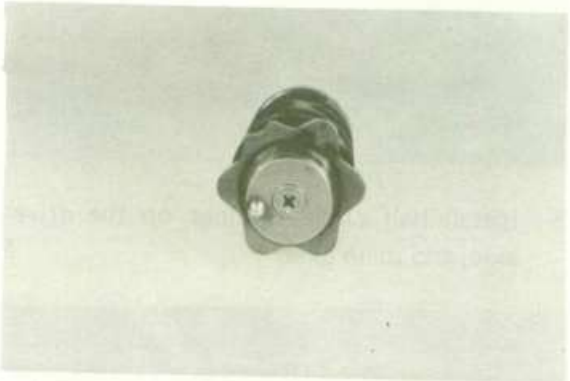
3-4. ENGINE ASSEMBLING AND ADJUSTMENT

A. **Transmission and shifter installation**

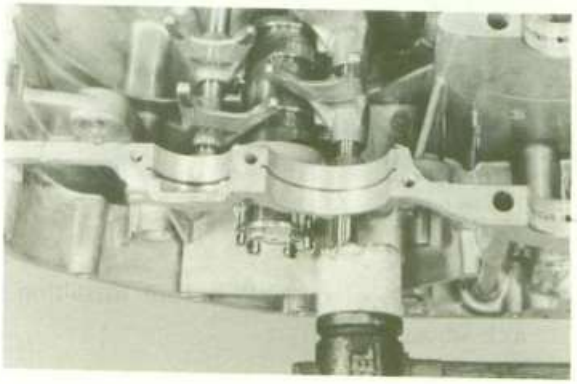
1. Install shift cam and stopper plate.
   NOTE: _____
   1) Position of stopper plate.

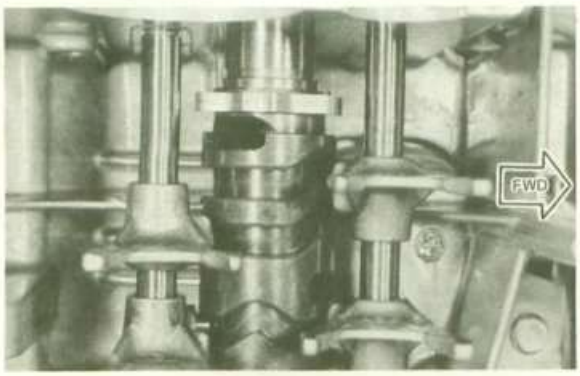


2) Position of stopper plate circlip.

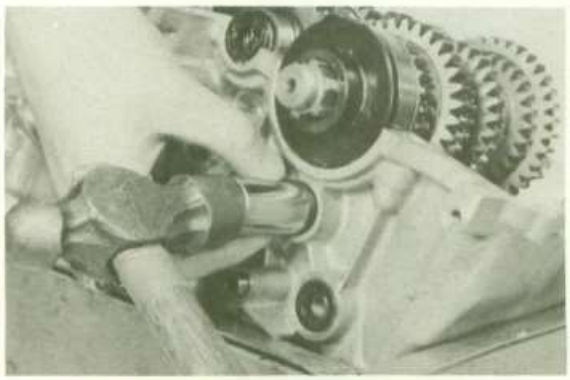


2. Install shift forks, guide bars, circlip and blind plugs.

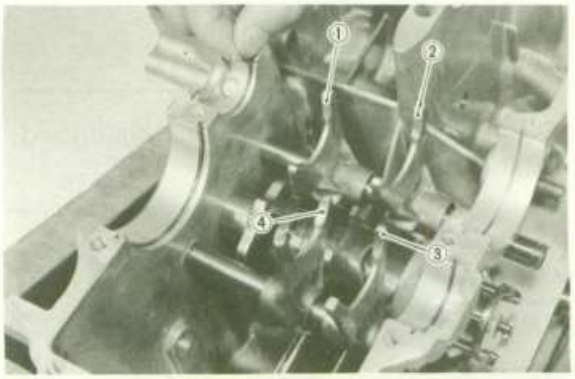




NOTE:
Check blind plug, replace if damaged.



3 Install half circle retainer on the drive axle, and main axle.

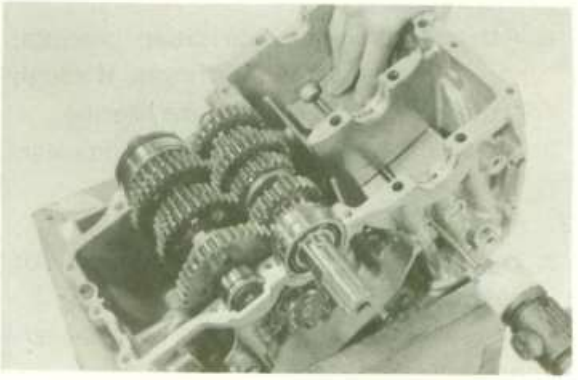


1. Shift fork 1
2. Shift fork 2
3. Shift fork
4. Shift fork 1

4. Install oil seal on axle before installing axle in case.

NOTE:
Exercise care not to damage oil seal lip when installing transmission into case.

5. Install baffle plate.



5. Fit transmission into lower case and install drive sprocket.

NOTE:
1) Be sure axle circlips are fitted to bearings and circlips have been positioned in circlip grooves.
2) Transmission installation is easier if shift cam is rotated to neutral position.

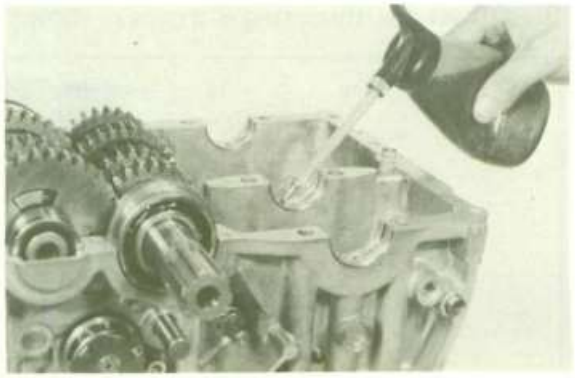
6. Install cam stopper plate, change lever guide and shift cam stopper assembly.

NOTE:
Apply LOCK-TITE to threads of change lever guide and cam stopper plate securing screws.

Cam stopper plate securing screw torque: 0.9 – 1.3 m-kg (6.5 – 9.4 ft-lb)
Change lever guide securing screw torque: 0.3 – 0.4 m-kg (2.2 – 2.9 ft-lb)

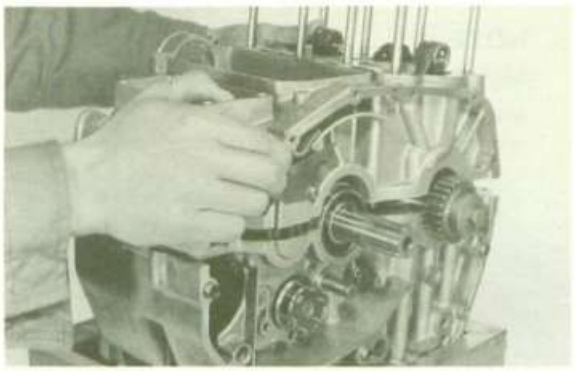
B. Crankshaft installation.

1. Install cam chain to the crankshaft.
2. Installing crankshaft.
Before installing crankshaft, apply a light coat of engine oil to each bearing surfaces.



C. **Crankcase**

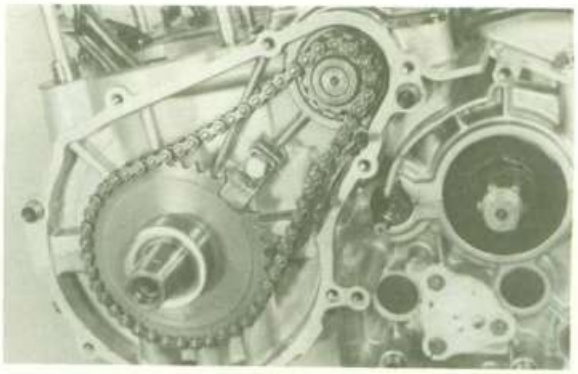
1. Apply YAMAHA BOND #4 to the mating surfaces of both case halves. Apply thoroughly over all mating surfaces.
2. Set the crankcase half onto lower case half. Install the crankcase holding bolts and nuts. Tighten all crankcase holding bolts gradually until proper torque is reached.



3. Check crankshaft and transmission shafts for proper operation and freedom of movement.

D. **Crankcase Cover (L)**

1. Install starter motor.
2. Install the starter wheel assembly and starter chain. Install the rotor key on the crankshaft.



3. Install the rotor assembly by turning starter sprocket. (Starter clutch rollers must be rolled into position.)

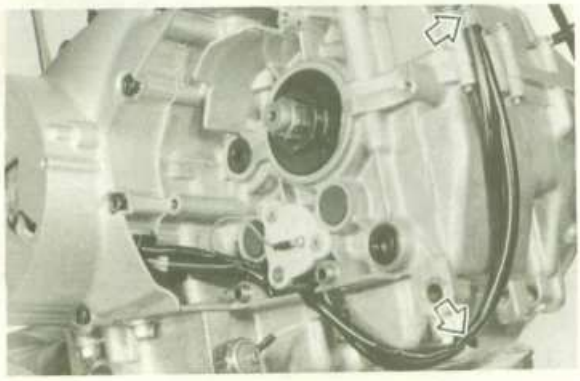


NOTE:

When tightening the rotor bolt, place a rag over the cylinder sealing surface to protect it against scratches. For easy operation, it is advisable to insert an iron rod into the connecting rod small end.

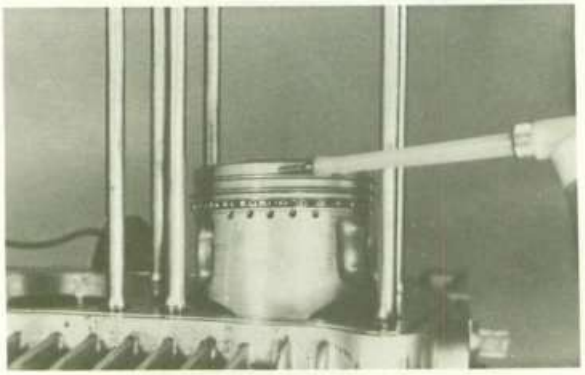
Rotor bolt tightening torque:
3.0 – 3.5 m-kg (22 – 25 ft-lb)

4. Install crankase cover (L) and route generator lead wires and clamp them in place.



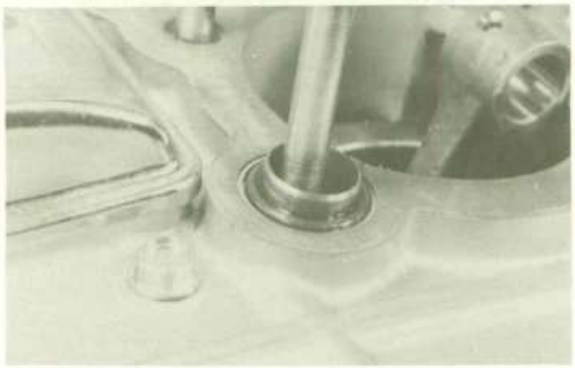
E. Piston

1. Mount the piston (rings installed) onto the connecting rod.
   Be sure the arrow stamped on the piston crown points forward.
2. Install new piston pin clips in their grooves.
3. During reassembly, coat the piston ring grooves, piston skirt areas, piston pin with 4-stroke engine oil.

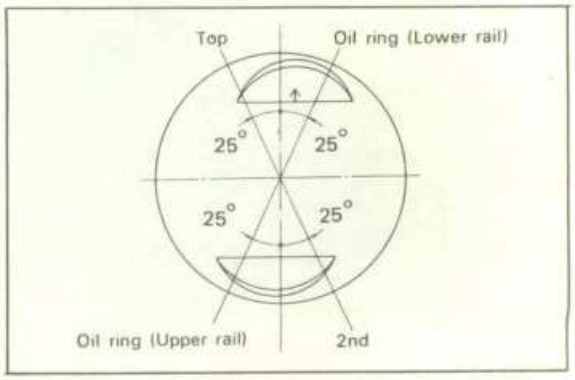


F. Cylinder

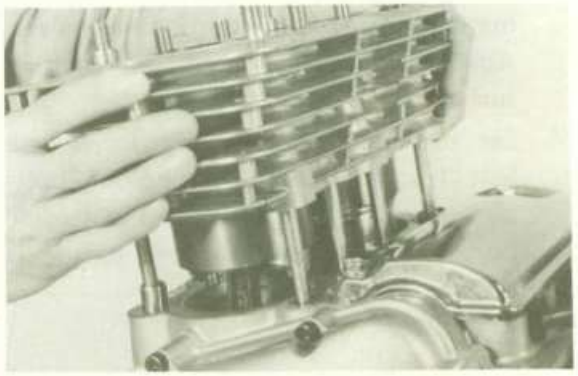
1. Install a new cylinder base gasket.
2. Check the small "O" ring around the oil delivery passage and cylinder sleeve O-ring. Replace if damaged.



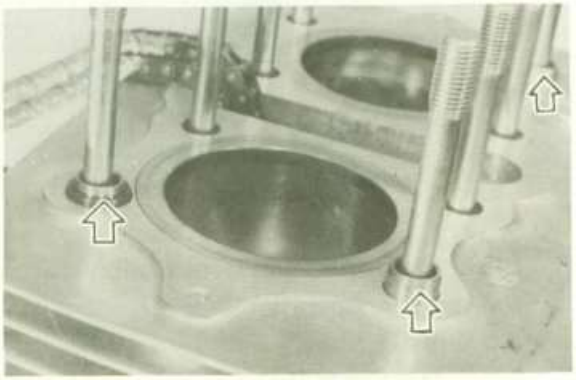
3. Off-set the three ring end gaps as shown.



4. Install the cylinder.

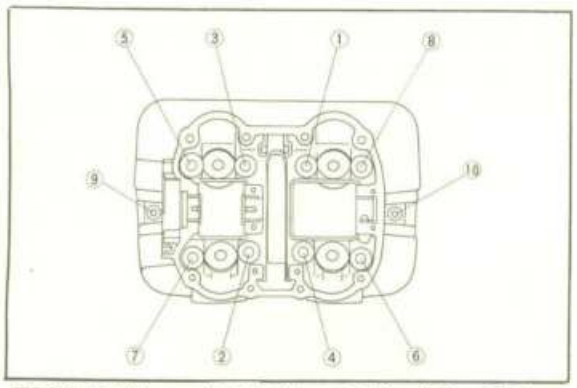


NOTE:
Make sure the "O" ring and knock pin are in place.



G. Cylinder Head

1. Install the cylinder head gasket and cylinder head.
2. Tighten the cylinder head temporarily. (final tightening to follow.)

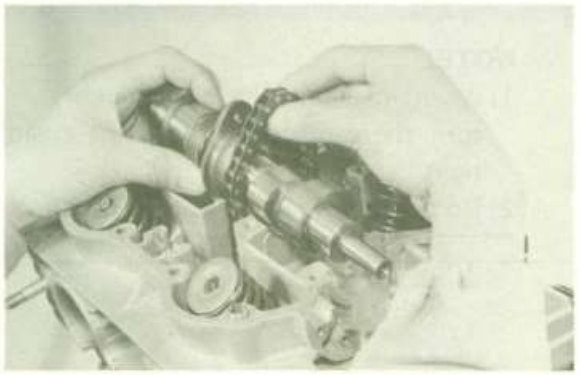


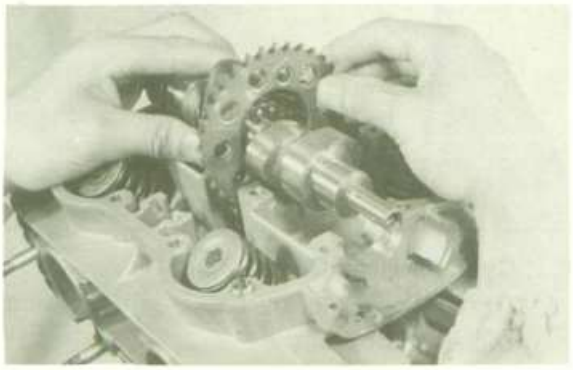
TORQUE M6 – 0.8 ~ 1.2 kg-m M10 – 3.0 ~ 3.5 kg-m



H. Cam shaft and Sprocket

1. Setting the valve timing
   a. Pull cam chain up through cam chain hole in the cylinder and cylinder head.
2. Fit chain sprocket over cam shaft.

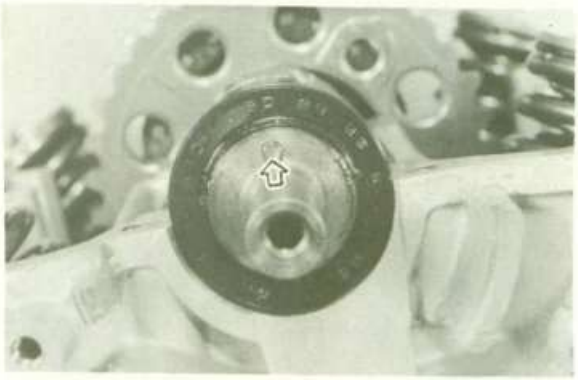




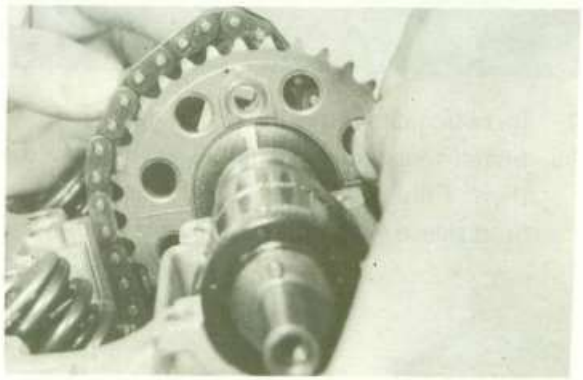
NOTE:

Attach a wire to cam chain to prevent from dropping into case.

3. Set cam shaft on cylinder head. Locating pin should face upward.



4. Align timing mark on cam shaft sprocket with cylinder head surface line.

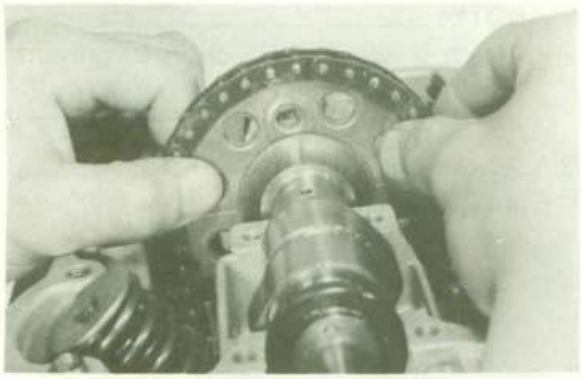


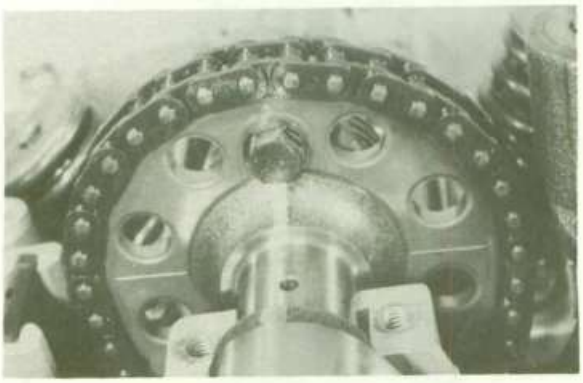
5. Install cam chain onto cam sprocket with fasten chain front side.



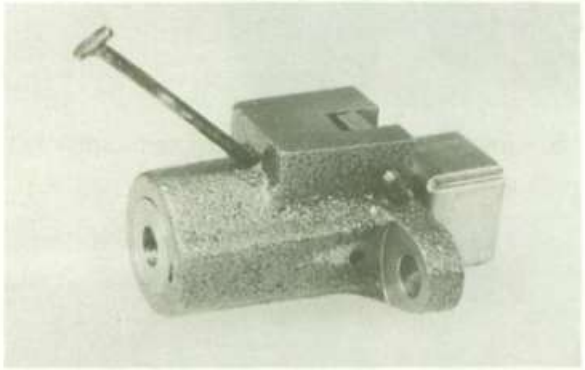
6. Align cam sprocket hole with cam shaft holes and tighten sprocket fitting bolts.

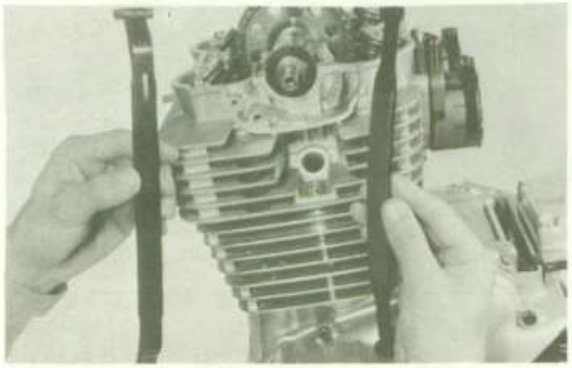
Tightening torque:
1.8 – 2.2 m-kg (13.0 – 16.0 ft-lb)





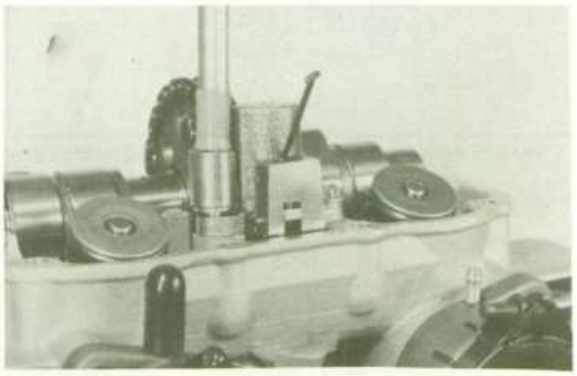
7. Installing chain tensioner and guides
   a. Install tensioner and guides as illustrated then fully compress tensioner spring, hold sleeve with something bolt.

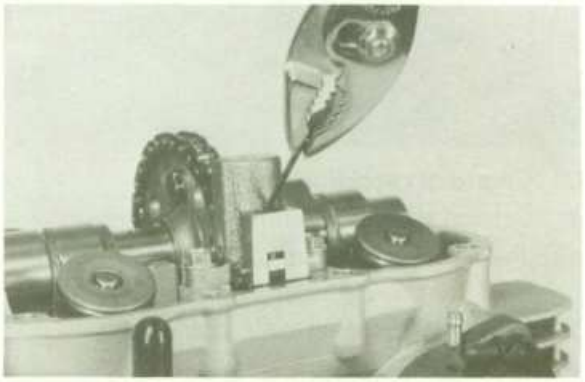




b. Install tensioner assembly and tighten bolts, then remove bolt.

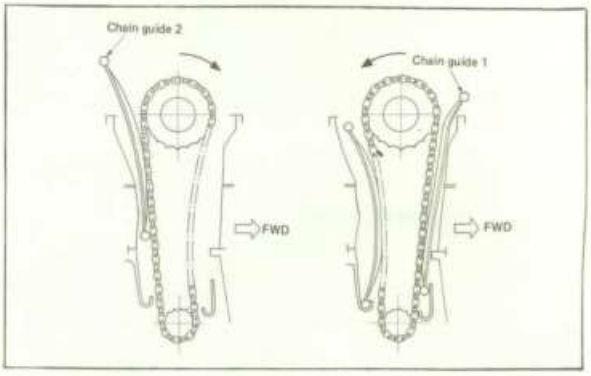
Tightening torque:
0.8 – 1.2 m-kg (6.0 – 8.5 ft-lb)





NOTE:

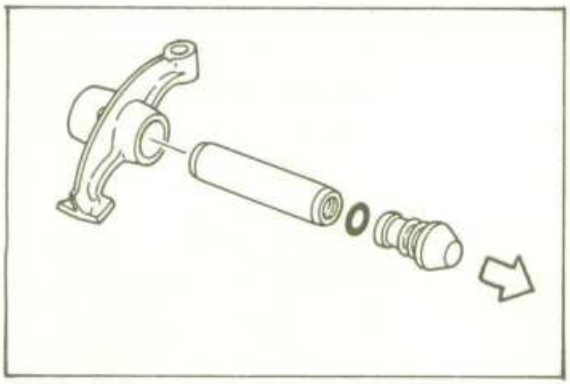
1) When installing the chain guide, turn the camshaft to keep the chain tight.
2) Do not remove BOLT before installing.



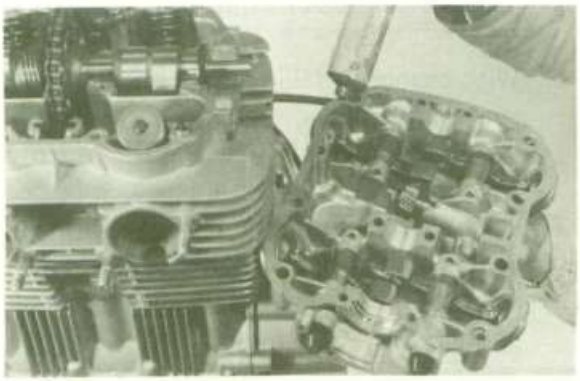
I. **Cylinder Head Cover**

1. Install rocker arm, rocker shafts, and rocker shaft plugs.

NOTE:
When installing rocker arm, be sure to face the thread hole to outward engine.

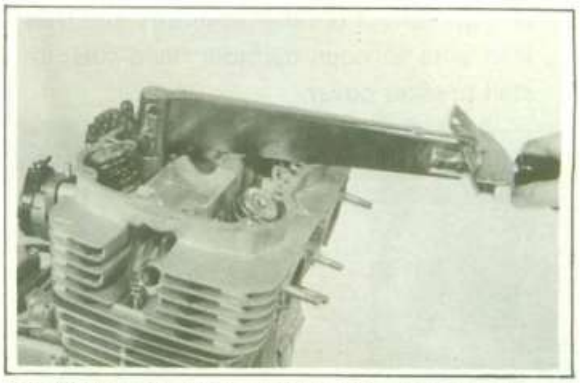


2. Coat the head and cover mating surfaces with a YAMAHA Herme Seal and slip the head cover into position on the head.



3. Install nuts and bolts and tighten to the specified torque. Use a crisscross tightening pattern.

Tightening torque:	
8 mm bolt:	2.0 – 2.4 m-kg (14.5 – 17.0 ft-lb)
6 mm bolt:	0.8 – 1.2 m-kg (6 – 8.5 ft-lb)



TORQUE M6 – 0.8 ~ 1.2 kg-m M8 – 2.0 ~ 2.4 kg-m

4. Install the rocker shaft plugs and tighten.
5. Adjust valve clearance.
6. Install the intake and exhaust tappet covers.

J. Drive Sprocket

Apply a coat of grease to "O" ring and oil seal lip.

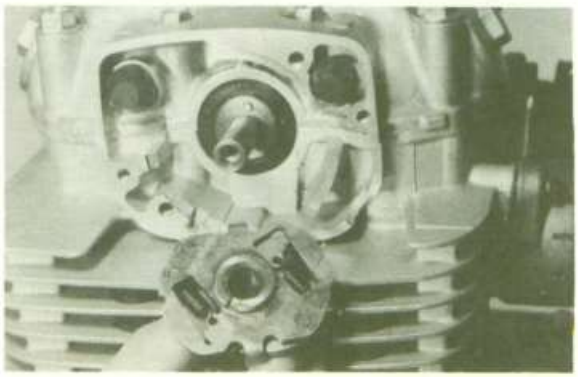
Install the collar, drive sprocket, lock washer and lock nut in that order. Tighten to the specified torque.

Tightening torque:
5.0 – 8.0 m-kg (36 – 58 ft-lb)

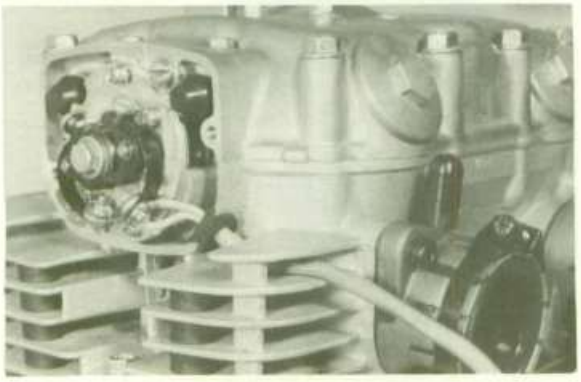
K. Contact Breaker

1. Install governer assembly.
   Align slot in the governer with locating pin.

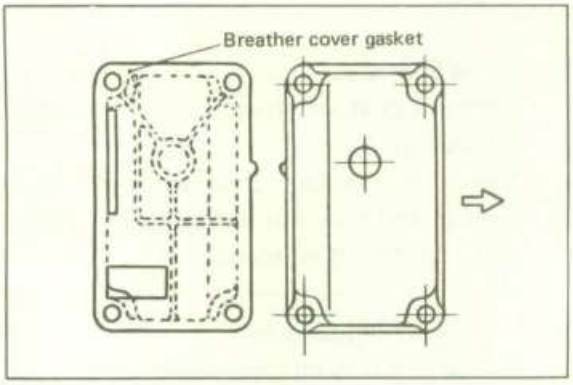
Tightening torque:
0.8 – 1.2 m-kg (6.0 – 8.5 ft-lb)



2. Install contact breaker assembly and pass lead wire through cylinder head fins. install breaker cover.



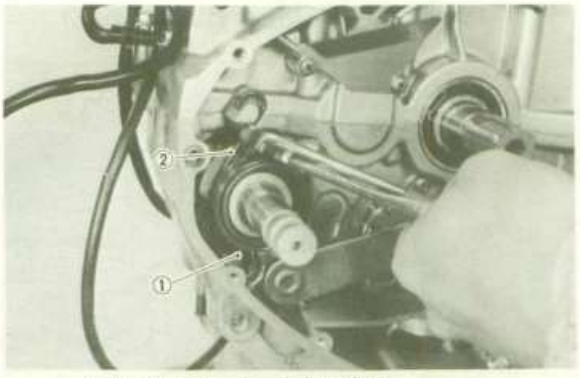
3. Install starter motor cover and breather cover.



L. Kick Starter Assembly

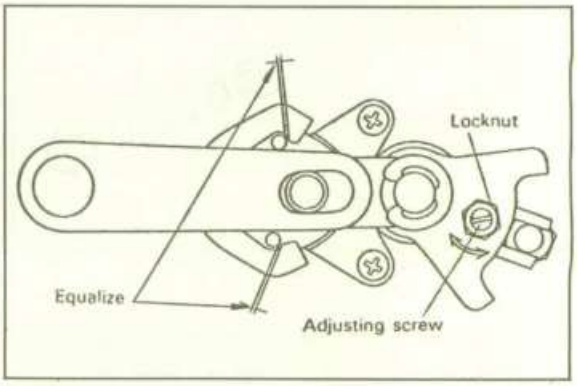
1. Set kick gear clip in groove of crankcase.
2. Rotate kick spring clockwise and hook it on kick spring stopper.

NOTE:
Make sure that kick stopper is stopped at projection of crankcase.



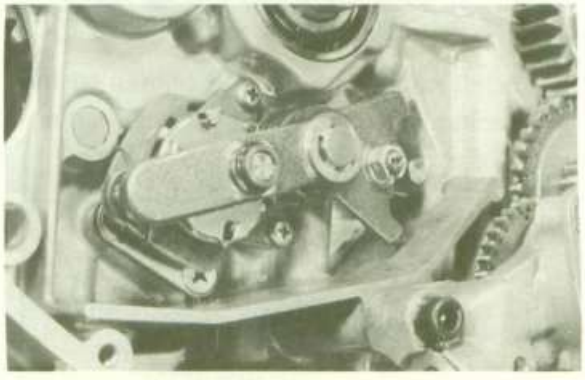
1. Kick gear clip 2. Kick spring

3. Check whether kick starter acts correctly and whether it returns to its home position.
4. Install change lever assembly, and change shaft assembly.
5. In each gear, check for proper centering. Change adjustment on screw as required.



NOTE:
If change lever is adjusted, apply LOCKTITE to threads of adjusting screw.

6. With change pedal in place on the change shaft, push down, then up. There should be no freeplay. If free play is evident, shift return spring is fatigued, replace.
7. Check return spring for change levers (3). If it will not hold change lever (3) firmly against shift cam dowel pins, replace spring.

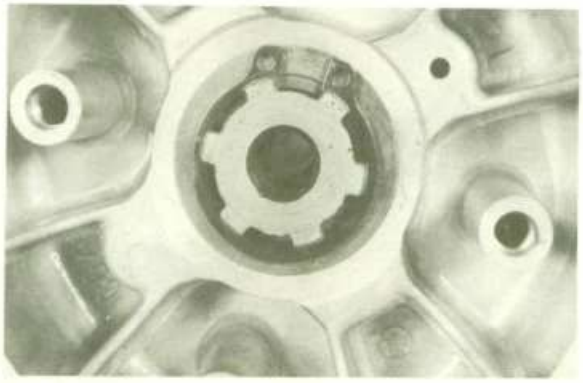


8. Check to see that all parts move freely prior to installing upper case half.
Check for correct transmission operation and make certain that all loose shims are

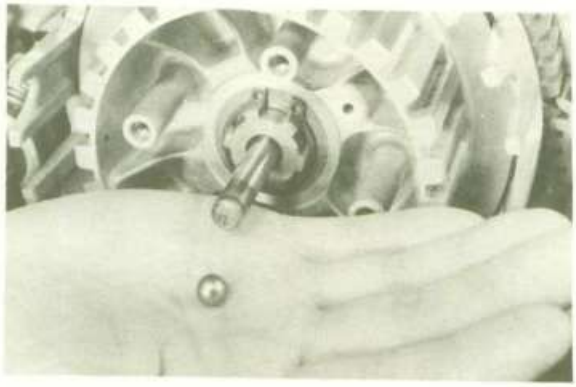
in place. At the same time check for complete engagement of all engaging dogs into appropriate gear slots.

M. Clutch

1. Install clutch housing, thrust plate, clutch boss and hold clutch boss with circlip.

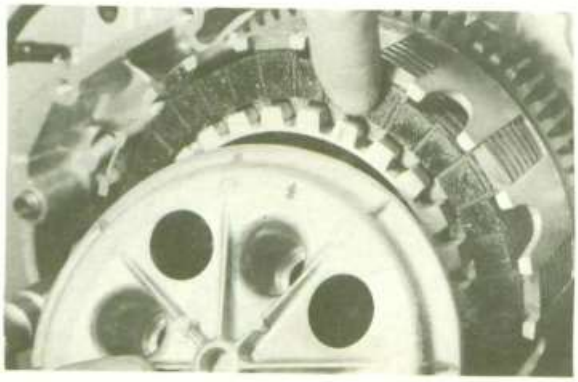


2. Install clutch plates, steel ball, (push (1), pressure plate, clutch springs and spring screws.



NOTE:

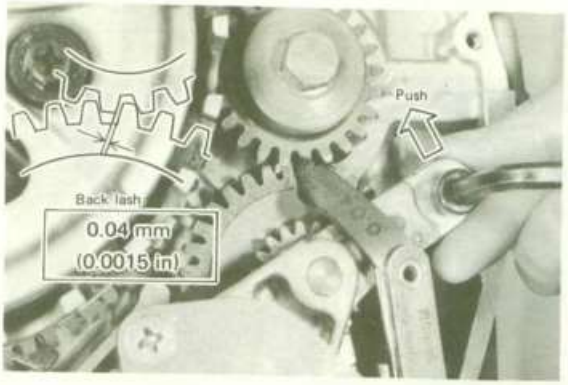
When installing the pressure plate, align "ARROW" mark on the clutch boss and pressure plate.



N. Oil Pump

Backlash adjustment

1. Install oil pump assembly and adjust backlash between primary drive gear and idle gear.
2. Lightly tighten each bolts (A–C) and install thickness plate between primary drive gear and pump idle gear.



O. Crankcase Cover

Install crankcase cover(R) and tighten fitting bolts.

P. Oil Strainer

1. Install oil strainer into the crankcase.
2. Install the oil strainer cover to the crankcase with new gasket.

Tightening Torque: 0.6 – 0.8 m-kg (4.5 – 6.0 ft-lb)

NOTE:

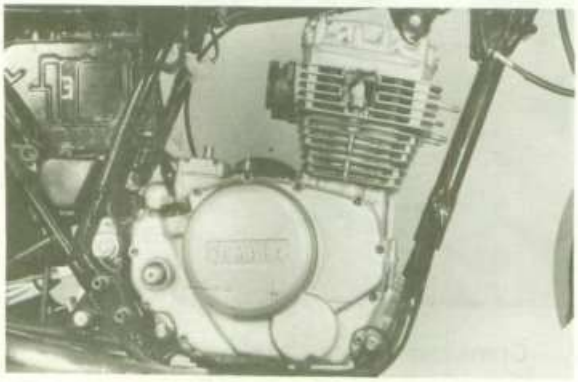
Tighten the bolts using crisscross pattern.

3-5 MOUNTING

Refer to Chapter 3. "Removal" and mount the engine in the frame as follows:

1. Place the engine in the frame from right side.
2. Install engine mounting bolts and nuts with proper tightening torque.

Tightening torque	
Bolt size	Torque
10 mm nut	2.7 – 4.2 m-kg (17.5 – 30 ft-lb)
8 mm nut	1.3 – 2.1 m-kg (9.5 – 21 ft-lb)
8 mm bolt	1.3 – 2.1 m-kg (9.5 – 21 ft-lb)



3. Connect starter motor lead wire.
4. Connect ground lead wire.
5. Connect two couplers from generator to the wire harness.
6. Install oil filter.

Tirghtening torque:
1.3 – 1.7 m-kg (9.5 – 12.0 ft-lb)

7. Install tachometer cable and exhaust pipes.
8. Connect the ignition primary lead wire and plug cap.
9. Install the throttle cable to carburetor then install carburetors.
10. Install fuel tank and connect petcock vacuum pipe and fuel pipe.
11. Install the following parts:
    - footrests.
    - brake pedal
    - drive sprocket
    - drive chain
    - case cover (L)
    - change pedal
    - air filters
    - side covers.
12. Add engine oil and start engine. Check oil leakage.

CHAPTER 4. CARBURETION

4-1. CARBURETOR 58
A. Disassembly and Inspection 58
B. Float level 59

4

4-1. CARBURETOR

A. Disassembly and Inspection

(for replacement or cleaning)

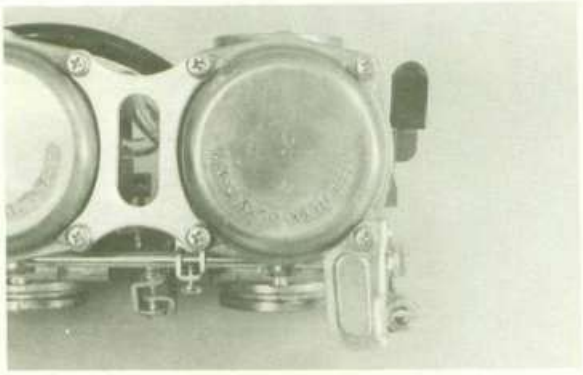
1. The vacuum chamber cover on top is held in place by four screws. Remove these screws and lift off the chamber cover.

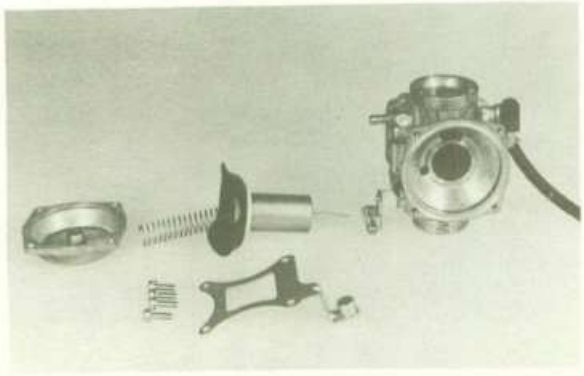
   NOTE: _____

   When installing the set screws, be sure to correctly position the throttle cable anchor bracket.

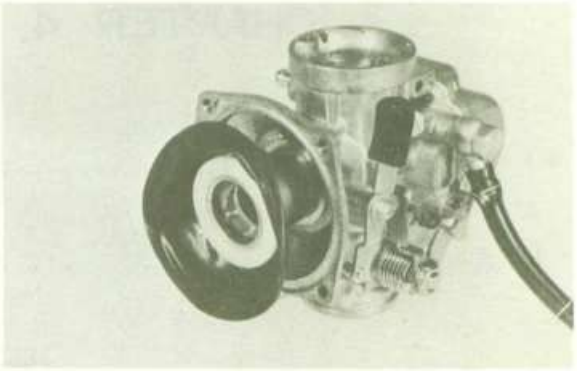
   _____

2. Once the cover has been removed, the spring, jet needle retainer, jet needle, and vacuum piston can be removed.

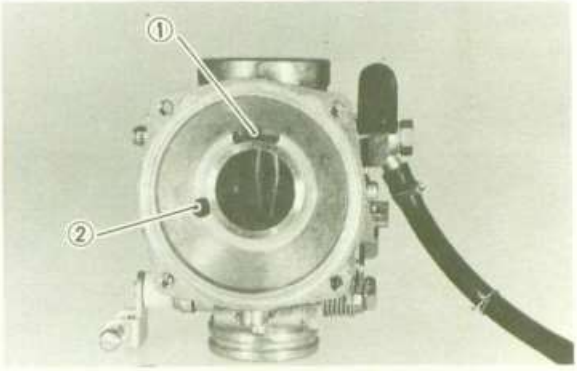




3. Installation of the vacuum piston is accomplished by inserting it into the carburetor body and lining up the small projection on the outer edge of the rubber diaphragm with the corresponding notch in the outer edge of the carburetor top mating surface.

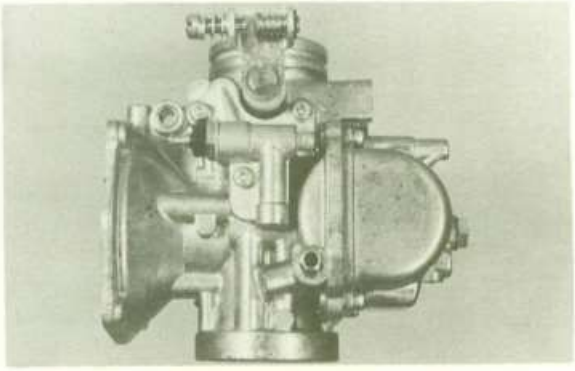


4. With top removed, the inlet passage (#1) and air passage to the starter jet (#2)) are visible.



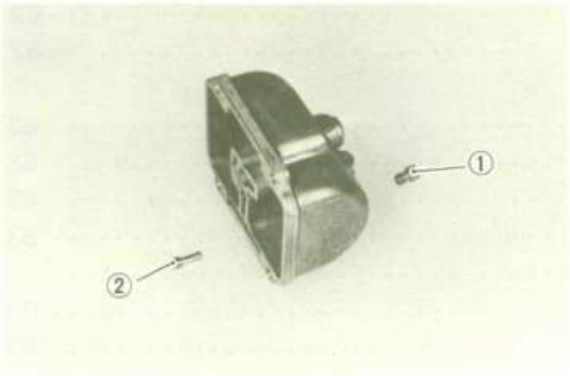
1. Inlet passage 2. Air passage to the starter jet

5. The starter jet housing mounts to the left side of the carburetor. It is held by three screws. A gasket fits between the starter jet housing and main housing.

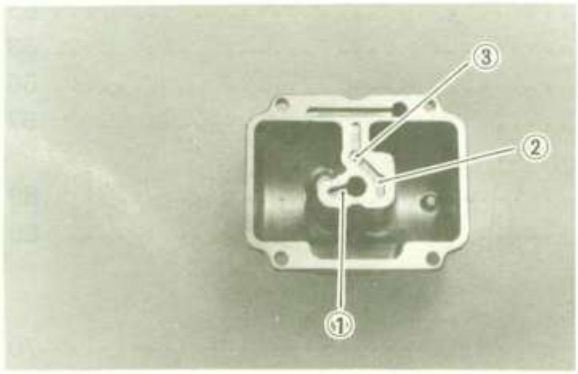


6. The float bowl mounts to the bottom of the main housing. Remove the four retaining screw and then remove the float bowl.

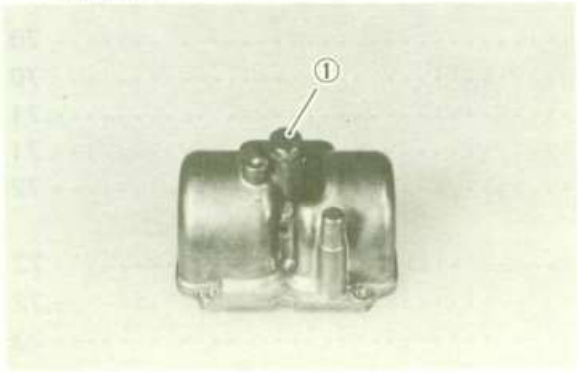
7. Both the pilot jet and the main jet are screwed into orifices in the float bowl. The pilot jet is removed from the inside, the main jet is removed from the bottom, after first removing the cover screw.



1. Main jet 2. Pilot jet



1. Primary air passage to needle jet
2. Pilot air passage to pilot jet
3. Pilot jet

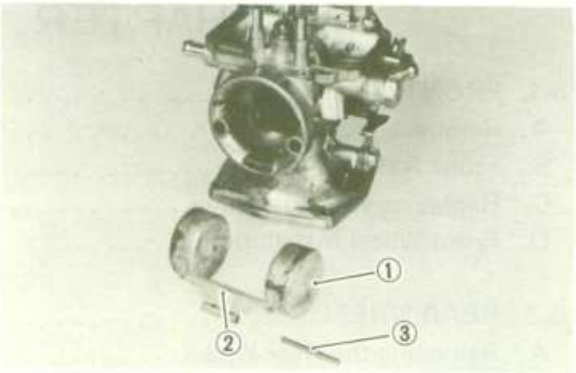


1. Main jet cover

8. Turn the carburetor upside down, pull out the float pivot pin, and remove the float.

CAUTION:

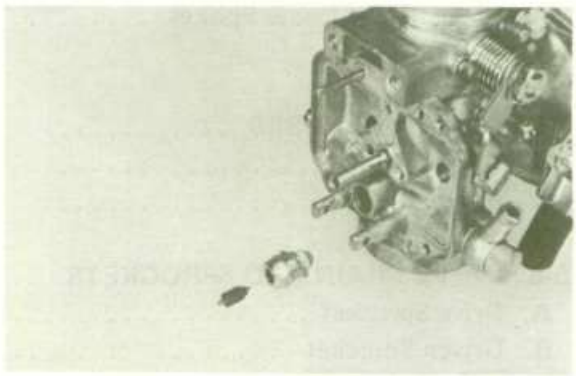
Directly beneath the float adjustment tang is the float valve. Remove this part immediately to prevent its loss.



1. Float bowl
2. Float level adjusting tang
3. Pivot pin

9. The needle jet fits into the main housing from the bottom. If removal *is required*, pull it down and out by hand. Reverse this procedure to install the needle jet.

10. Inspect needle and seat for signs of excessive wear or foreign particles. Replace as required. Always replace inlet needle and valve seat as an assembly.



B. Float Level

Refer to CHAPTER 2. Section 2-2. C for "Float Level" adjustment precedure.

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CHAPTER 5. CHASSIS

5-1. FRONT WHEEL

A. Removal

1. Disconnect the brake cable at the front brake lever.
2. Remove cotter pin from front axle.
3. Remove the front axle nut.
4. Loosen the two axle holder nuts at the bottom of the right-hand fork leg.
5. Remove the front wheel axle by simultaneously twisting and pulling out on the axle. Then remove the wheel assembly.

NOTE: _____

Raise the front of the machine by placing a suitable stand under the engine.

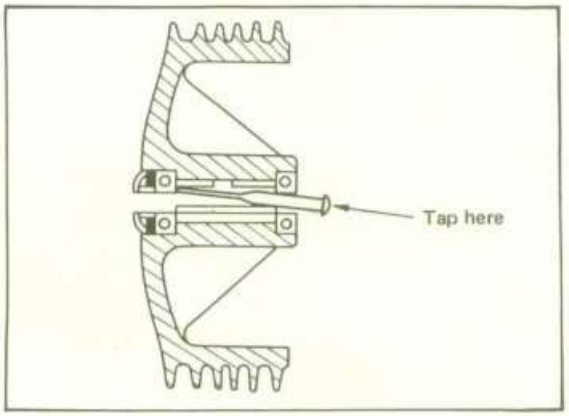
B. Front Axle

Remove any corrosion from axle with emery cloth. Then place it on a surface plate and check for bending. If bent, re place.

C. Replacing Wheel Bearings

If the bearings allow play in the wheel hub or if wheel does not turn smoothly, replace the bearings as follows:

1. First clean the outside of the wheel hub.
2. Drive the bearing out by pushing the spacer aside (the spacer "floats" between the bearings) and tapping around the perimeter of the bearing inner race with a soft metal drift pin and hammer. Either or both bearings can be removed in this manner.



3. To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation. Use a socket that matches the outside race of the bearing as a tool to drive in the bearing.

D. Front Wheel Installation

When installing front wheel, reverse the removal procedure taking care of the following points:

1. Check for proper engagement of the boss on the outer fork tube with the locating slot on the brake shoe plate.
2. Always secure the front wheel axle as follows:

a. Torque the axle nut.

Axle nut torque:
7.0 – 10.0 m-kg
(50.6 – 72.3 ft-lb)

b. Install a new cotter pin; discard old pin.

c. Install the axle holder as shown.
First tighten the nut on the front end of the axle holder, then tighten the nut on the rear end.

Axle holder nut torque:
1.5 – 2.5 m-kg
(11.0 – 18.0 ft-lb)



1. Install with arrow forward.

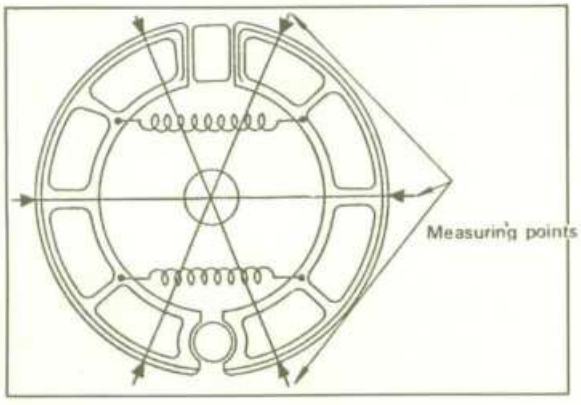
5-2. REAR WHEEL

A. Removing the Rear Wheel

1. Remove the tension bar and the brake rod from the brake shoe plate. The tension bar can be removed by removing the cotter pin and nut from the tension bar bolt. The brake rod can be removed by removing the adjust nut.
2. Loosen the lock nuts of the right and left chain pullers and loosen the adjust bolts.
3. Remove the drive chain.
   To remove, use the chain cutter (special tool). See Chapter 3. "Engine Overhaul", page 25.
   NOTE:
   The chain joint should be replaced each time the chain is cut.
4. Remove the rear wheel axle nut.
5. The rear wheel assembly, the collar, the chain puller(s), etc., can be removed from the motorcycle by pulling the axle.

B. Checking Brake Shoe Wear

1. Measure the outside diameter at the brake shoes with slide calipers.



Rear brake shoe diameter: 160 mm (6.30 in) Replacement limit: 156 mm (6.14 in) min.

2. Remove any glazed areas from brake shoes using coarse sand paper.

C. Brake Drum

Oil or scratches on the inner surface or the brake drum will impair braking performance or result in abnormal noises.
Remove oil by wiping with a rag soaked in lacquer thinner or solvent.
Remove scratches by lightly and evenly polishing with emery cloth.

D. Brake Shoe Plate

Remove the camshaft and grease. If the cam face is worn, replace.
NOTE:
Before removing the cam lever, put a match mark on the cam lever and camshaft to indicate their positions for easy assembly.

E. Replacing Wheel Bearings

See front wheel section, "Replacing Wheel Bearings".

F. Installing Rear Wheel

1. Install wheel and axle.

Axle nut torque: 7 – 10 m-kg (50 – 72 ft-lb)

2. Connect drive chain, brake rod and tension bar.
3. Adjust drive chain.
   (See chapter 2, "Drive chain tension adjustment".)
4. Tighten rear axle nut.
   Install a new cotter pin.
5. Adjust rear brake. (See chaper 2, "Rear brake and wheel".)

5-3. DISC BRAKES

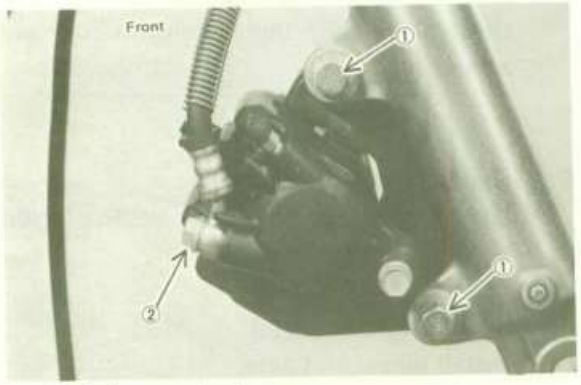
A. Disc Brake Disassembly

Avoid disassembling the disc brake whenever possible. Trouble that has nothing to do with the brake cam and should be fixed without disassembling the brake.

CAUTION:

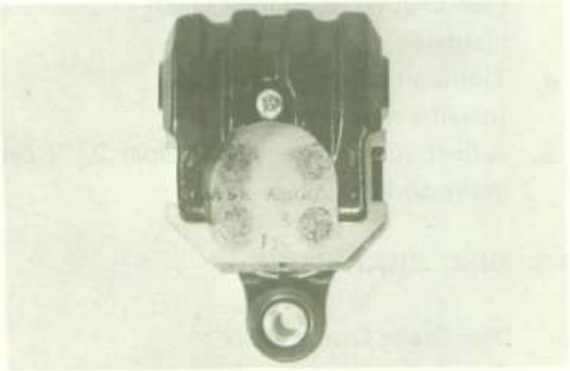
Brake fluid will damage painted and other surfaces. Use caution whenever working with brake fluid.

1. Caliper assembly.
   a. Removing caliper assembly.
      1) Remove brake hoses from caliper.
      2) Wrap up brake hose with clean vinyl sheet or clean cloth.
      3) Keep front brake lever pulled in. This prevents fluid from dripping.
      4) Remove caliper securing bolts and nuts, and remove caliper.



1. Caliper securing bolts
2. Union bolts
3. Support bolt

   b. Removing the pads.
      Remove the pads from the caliper. If difficult to remove, push the piston to the bottom of the cylinder using the piston pushing tool, and remove.



   c. Removing the piston seal.
      1) Remove the support bolts.

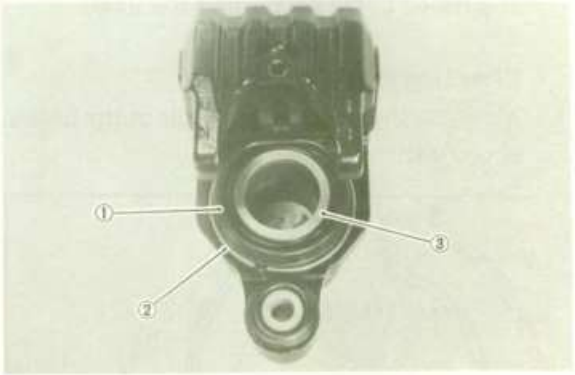


      2) Remove the Phillips head screw and pad spring.

NOTE:

The support bolt and Phillips head screw heads are painted in yellow to keep the user from touching them. The user should be instructed not to attempt turn these bolts and screws.

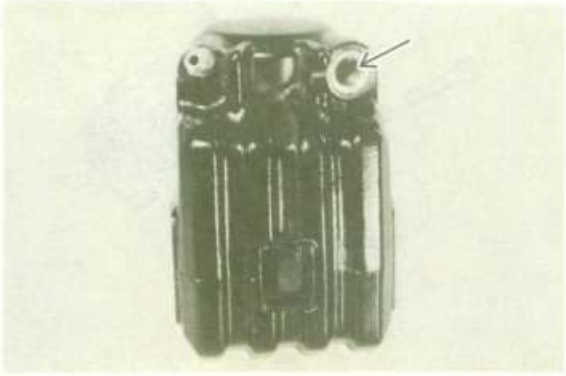
      3) Remove the dust seal and retaining ring.



      4) Feed compressed air into the brake fluid inlet to force out the piston. Never attempt to pry it out with a screwdriver.

CAUTION:

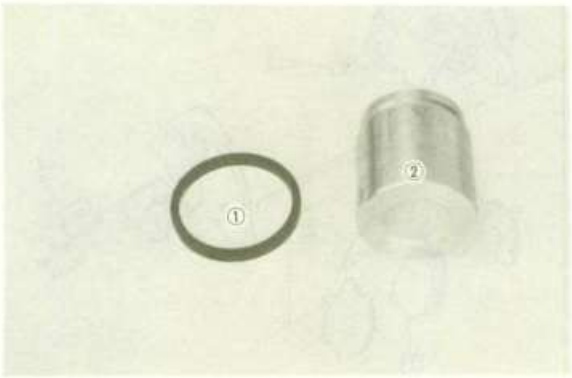
When doing above procedure care should be taken so that piston does not hit your face or body.



5) Remove the piston seal from the caliper body.

CAUTION:

Keep the removed parts free from gasoline, kerosene and engine oil. Otherwise, all seals will swell up and deteriorate. The piston seals and dust seals should be replaced every two years.



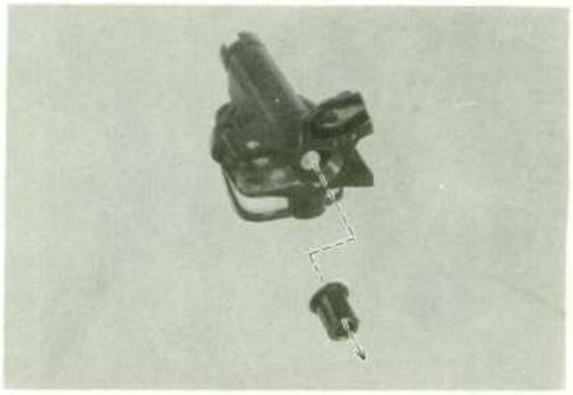
2. Master cylinder.

a. Removing the master cylinder.

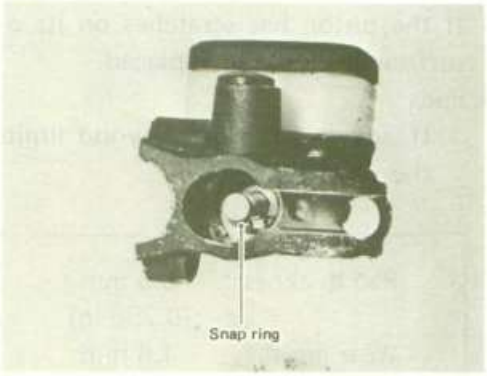
1) Disconnect front stop switch lead wire.
2) Remove the brake lever. (Be careful not to lose the brake lever return spring.)
3) Remove the brake hose.
4) Remove the two bolts securing the master cylinder from the handlebar. Remove the reservoir cap, and remove the brake fluid.

b. Master cylinder disassembly.

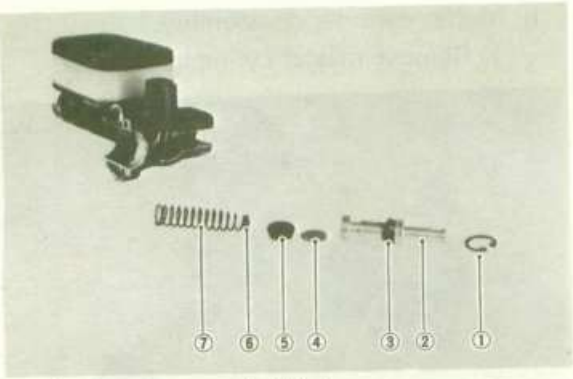
1) Remove master cylinder boot.



2) Remove snap ring using circlip pliers.



3) Remove piston. (Note that spring remains in master cylinder.)
4) Remove return spring and stopper valve.
5) Remove stopper plate.
6) Remove cylinder cup.



1. Snap ring
2. Piston
3. Cylinder cup 2
4. Shim
5. Cylinder cup 1
6. Piston cup spacer
7. Return spring

B. Disc Brake Inspection

1. Caliper

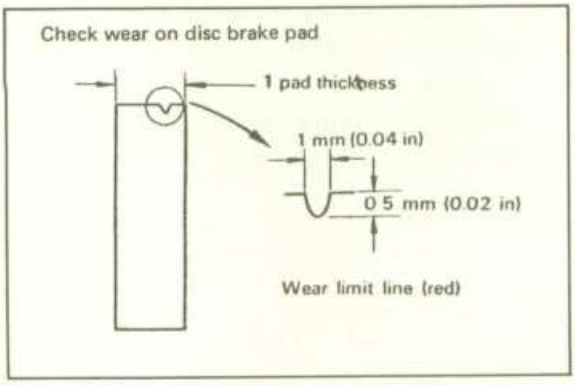
a. Piston

If the piston has scratches on its outer surface, it should be replaced.

b. Pads

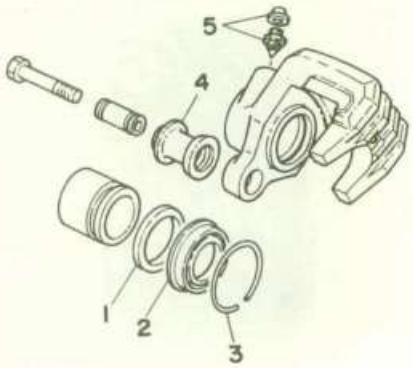
1) If any pad is worn beyond limits, it should be replaced.

Pad thickness:	6.5 mm (0.256 in)
Wear limit:	1.5 mm (0.06 in)



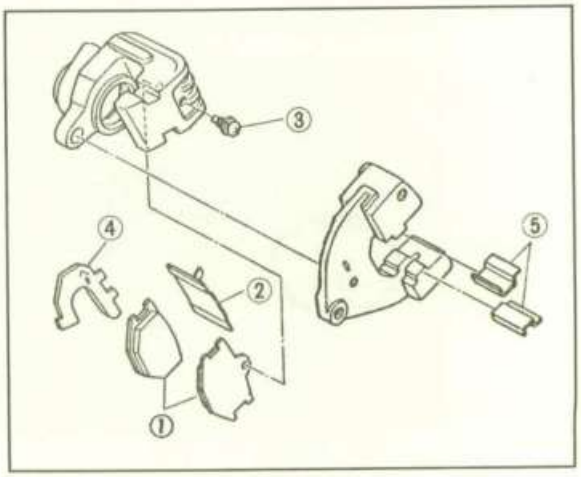
2. When checking the brake pads, be sure to replace the following parts:

a. The following five parts should be replaced as a set:



1) Piston seal
2) Piston boot
3) Dust cover clip
4) Bushing boot
5) Bleeder screw

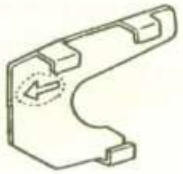
b. When replacing a brake pad, be sure to replace the following five parts as an assembly.



1. Pad
2. Pad spring
3. Pad head and spring washer
4. Shim
5. Retainer

NOTE:

Grease the contact surface of the shim with the pad, and as illustrated, bend each tab of the shim over the brake pad (attached to the piston), and install the shim to the brake pad.



The arrow mark should be directed in the turning direction of the wheel.

c. Piston seal and dust seal
If piston seal or dust seal is scratched or damaged, it should be replaced. Whether or not it is scratched or damaged, it should be replaced every two years.

d. Bridge bolts
Bridge bolts should be replaced every time the caliper is removed, whether damaged or not.

2. Master cylinder

a. Master cylinder body
1) If the master cylinder has scratches or worn spots, replace it.
2) If the outlet edge is scratched or damaged, replace it.
3) Check the port for clogging. Clean as required.
4) Check the cylinder and breather for excessive wear.

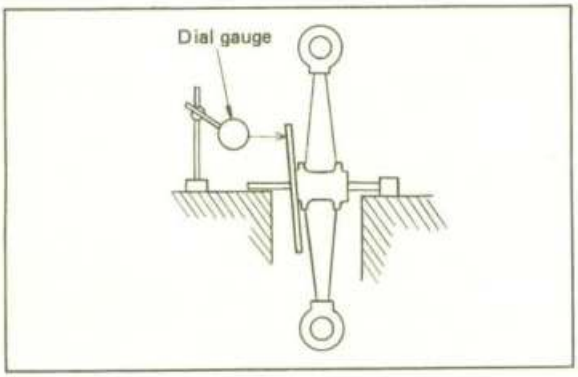
3. Brake hose

a. Check the brake hose, and if damaged or leaky, replace.

c. Replace brake hose every four years.

4. Disc

a. The deflection of the disc assembly should be less than 0.15 mm. If deflection exceeds 0.15 mm, check the deflection of the disc and the wheel bearing.



b. If the disc is worn excessively or damaged, replace it.

Disc thickness:	5.0 mm (0.197 in)
Wear limit:	4.5 mm (0.177 in)

C. Disc Brake Assembly

1. Cleaning
All disaseembled parts should be washed in the following manner before they are assembled.

a. Be sure to use new brake fluid for washing. (Do not use mineral oil; it will cause rubber parts to swell up. Also avoid using alcohol.)

b. If any other mineral oil other than brake fluid is used on rubber parts, they should be replaced. Metallic parts should also be washed in brake fluid.

2. Caliper

a. Installing the piston
1) Fit the piston seal in the groove in the caliper cylinder.
2) Coat at caliper cylinder and piston with new brake fluid.
3) Insert the piston into the caliper cylinder. Take care not to twist the piston.

b. Assembling of caliper and support bracket
1) Fit the dust seals in the piston groove and over the caliper, and install the retaining rings.
2) Install the pad spring, and tighten the Phillips head screw.

Tightening torque:
0.2 – 0.4 m-kg
(1.5 – 3.0 ft-lb)

3) Put together the caliper and support bracket with the support bolts.
NOTE:
Now the brake pads can be installed.

Support bolt tightening torque:
1.5 – 2.0 m-kg
(11 – 15 ft-lb)

Always use new bolts and tighten to specification.

c. Pad installation
1) The pads may be installed when the caliper or bridge bolts are tightened.

2) When the pads alone are to be replaced, it is necessary to push the piston so that the pads can be placed in position. When the piston is pushed back, the brake fluid level in the master cylinder reservoir increases. It may be necessary to loosen the bleed screw to let out some of the brake fluid.

d. Caliper installation

1) The caliper can be installed by reversing the removal procedure. Install caliper (front and rear).

Tightening torque:
3.0 – 4.0 m-kg
(21 – 29 ft-lb)

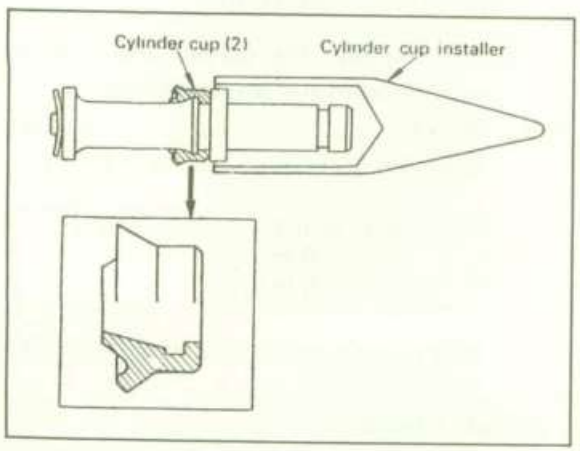
2) Install the brake hoses (front and rear).

Tightening torque:
Union bolt:
2.5 – 3.5 m-kg
(18 – 25 ft-lb)

3. Master cylinder

a. Cylinder cup installation

1) After soaking the cup in new brake fluid, assemble the cup and piston. Take care not to scratch the cup or piston. (Use cylinder cup installer.)
(P/No. 90890-01240)



2) Install the stopper plate.

3) Insert the spring and valve into the master cylinder body.

b. Piston installation

1) Check the outer surface of the piston for scratches. Carefully insert the piston into the cylinder. Take care not to scratch the inner wall of the cylinder. If scratched, fluid leakage may result.

2) Install the snap ring.

3) Firmly fit the boot in the grooves of the master cylinder and piston.

c. Installing the master cylinder on the handlebar

1) Install the master cylinder on the handlebar.

2) Connect brake hose to master cylinder with union bolt.

Tightening torque:
(front and rear master cylinder)
2.3 – 2.8 m-kg (17 – 20 ft-lb)

NOTE:
If gasket is damaged, replace it

3) Connect reservoir hose to rear master cylinder.

4) Fill the reservoir with brake fluid (DOT #3) and air. (Refer to "Air bleeding".)

d. Disc

1) The disc bolts should be tightened to specification.

Tightening torque:
1.7 – 2.2 m-kg
(12 – 16 ft-lb)

2) The deflection of the disc assembly should be within limits.

Deflection limit: 0.15 mm (0.006 in)

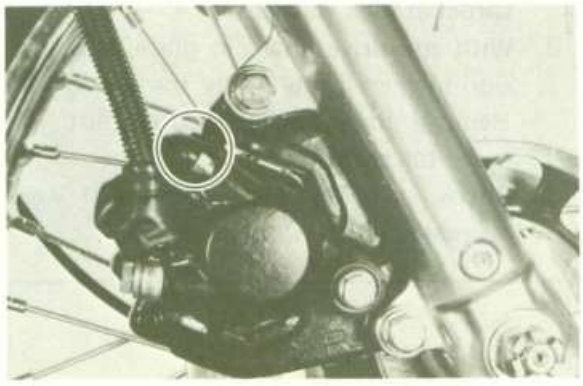
e. Air bleeding

If any of the parts relating to the brake fluid have been removed, air must be bled after reassembly.

1) Add brake fluid (DOT #3) to the

reservoir.

2) Install the diaphragm. Be careful not to loose brake fluid because of overflow.
3) Connect a vinyl tube tightly to the caliper bleed screw.
4) Put the end of the vinyl tube into a container.
5) Apply the brake lever and pedal several times. With the brake lever drawn in, loosen the bleed screw.

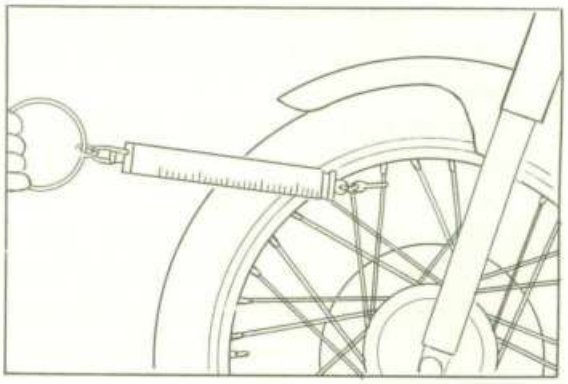


NOTE:
The brake lever should be squeezed gently; otherwise, air will form very small bubbles, and air bleeding will become difficult.

6) When the brake lever and pedal comes in contact with the handlebar grip and foot rest arm, tighten the bleed screw.
7) Continue operations from 5) and 6) until air bubbles disappear completely.

Bleed screw tightening torque:
0.4 – 0.7 m-kg (3 ~ 5 ft-lb)

8) Add brake fluid to the level line on the reservoir.
9) The reservoir is air-tight. When the brake pads are worn, the fluid level will lower, but it is automatically adjusted by the shift of the diaphragm. Therefore, when the brake fluid is added, the diaphragm must be set in its original position.
10) The disc trailing torque should be within the specified amount after it is assembled.



Torque: 1.0 kg or less (7.2 lb)

If torque exceeds this limit, check the disc run-out.

NOTE:
A slight drag on the disc is normal and will not develop into a worse condition.

5-4 RIMS AND SPOKES (FRONT AND REAR WHEELS)

A. Checking for Loose Spokes

Loose spokes can be checked by bracing the machine off the ground so that the wheel can spin freely.

Slowly rotate the wheel and at the same time let the metal shaft of a fairly heavy screwdriver bounce off each spoke. If all the spokes are tightened approximately the same, then the sound given off by the screwdriver hitting the spokes should sound the same. If one spoke makes a dull flat sound, then check it for looseness. (See chapter 2, "Front brake and wheel".)

5-5. TIRES AND TUBES

A. Removal

1. Remove valve cap, core, and valve stem lock nut. Loosen bead spacer(s), (rim locks).
2. When all air is out of tube, separate tire bead from rim (both sides), by stepping on tire with your foot.
3. Use two tire removal irons (with rounded edges) to work the tire bead over the edge of the rim, starting 180° opposite the tube stem. Take care to avoid pinching the tube as you do this.
4. After you have worked one side of the tire completely off the rim, then you can slip the tube out. Be very careful not to damage the stem while pushing it back out of the rim hole.

NOTE:

If you are changing the tire itself, then finish the removal by working the second bead off the rim.

B. Installation

Reinstalling the tire and tube can be accomplished by reversing the disassembly procedure. The only difference in procedure would be right after the tubes has been installed, but before the tire has been completely slipped onto the rim, momentarily inflate the tube. This removes any creases that might exist. Release the air and continue with reassembly. Also, right after the tire has been completely slipped onto the rim, check to make sure that the stem comes out of the hole in the rim at a right angle to the rim.

Finally, inflate the tire and tighten the bead spacer securing nut(s).

Tire Pressure (Normal Riding)	
Front:	1.8 kg/cm² (26 Psi)
Rear:	2.0 kg/cm² (29 Psi)

5-6. DRIVE CHAIN AND SPROCKETS

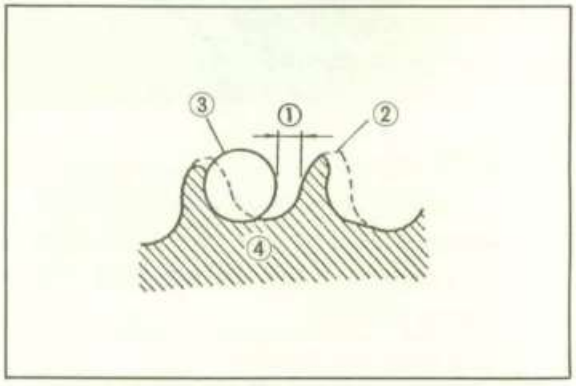
NOTE:

Please refer to Maintenance Intervals and lubrication Intervals charts for additional information.

A. Drive Sprocket

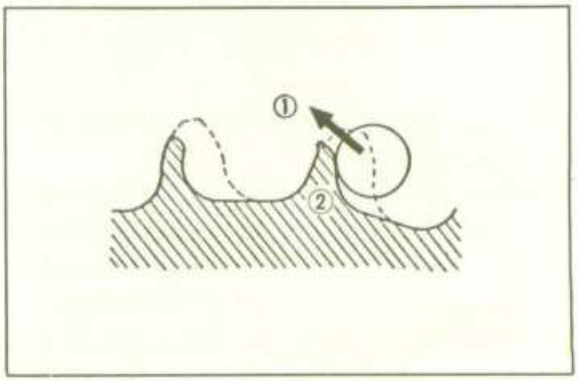
With the left crankcase cover removed, proceed as follows:

1. Using a blunt chisel, flatten the drive sprocket lock washer tab.
2. With the drive chain in place, transmission in gear firmly apply the rear brake. Remove the sprocket securing nut. Remove the sprocket.
3. Check sprocket wear. Replace if wear decreases tooth width as shown.



1. ¼ tooth
2. Correct
3. Roller
4. Sprocket

4. Replace if tooth wear shows a pattern such as that in the illustration, or as precaution and common sense dictate.



1. Slip off
2. Bent teeth

5. During reassembly, make sure the lock washer splines are properly seated on the drive shaft splines. Tighten securing nut throughly to specified torque value. Bend lock washer tab fully against securing nut flats.

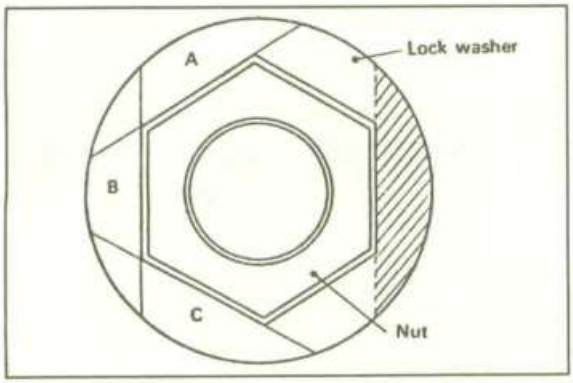
Drive Sprocket Securing Nut Torque:
5.0 – 8.0 m-kg (36 – 58 ft-lb)

B. Driven Sprocket

With the rear wheel removed, proceed as follows:

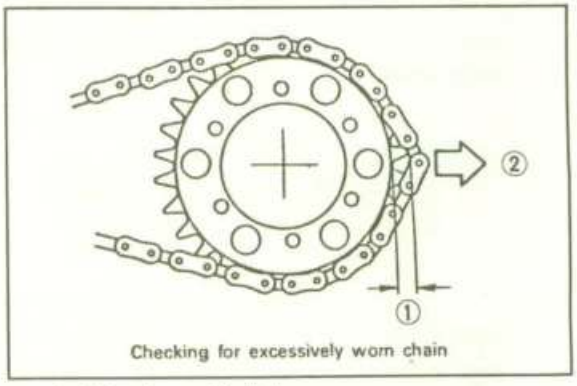
1. Using a blunt chisel, flatten the securing nut lock washer tabs.
   Remove the securing nuts. Remove the lock washers and sprocket.
2. Check the sprocket wear using procedures for the drive sprocket.
3. Check the sprocket to see that it runs true. If bent, replace.
4. During reassembly, make sure that sprocket and sprocket seat are clean.
   Tighten the securing nuts in a crisscross pattern.
   Bend the tabs of the lock washers fully against the securing nut flats.

Driven Sprocekt Securing Nut Torque:
4.0 – 5.0 m-kg (29 – 36 ft-lb)



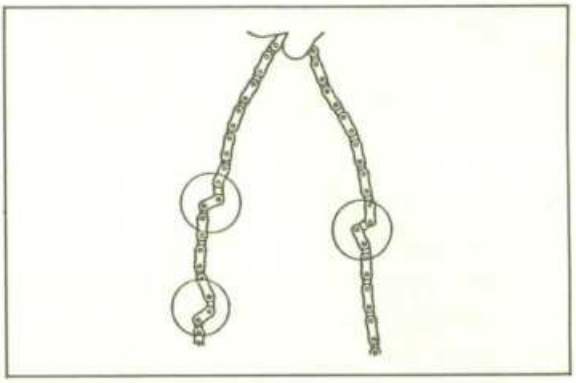
C. Chain Inspection

1. With the chain installed on the machine, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect. (See page 27 for chain removal.)
   If any portion of the chain shows signs of damage, or if either sprocket shows signs of excessive wear, remove and inspect.



Checking for excessively worn chain

1. ½ tooth 2. Pull



2. Check the chain for stiffness. Hold as illustrated. If stiff, soak in solvent solution, clean with wire brush, dry with high pressure air. Oil chain thoroughly and attempt to work out kinks. If still stiff, replace, chain.
3. Check the side plate for damage. Check to see if excessive play exists in pins and rollers. Check for damaged rollers. Replace as required.

D. Chain Maintenance

The chain should be lubricated according to the recommendations given in the Maintenance and Lubrication Intervals charts, or more often if possible. (Preferably after every use.) See "Chassis and Suspension. Swing Arm", for additional information regarding chain guide.

1. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.
2. Apply lubricant between roller and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear. Apply thoroughly. Wipe off excess.

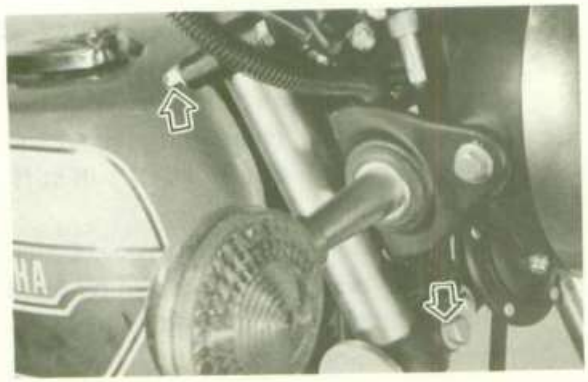
> Recommended lubricant:
> YAMAHA CHAIN AND CABLE LUBE, or SAE 10W/30 type "SE" motor oil.

3. Periodically, remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.
4. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly to make sure lubricant penetrates. Wipe off excess. Reinstall.

5-7. FRONT FORKS

A. Disassembly

1. With the front wheel and front fender removed, the fork legs can be removed from the upper and lower brackets by loosening upper and lower pinch bolts.

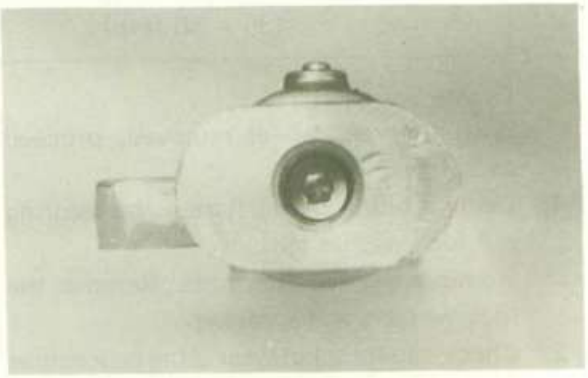


1. Pinch bolt 2. Cap bolt

NOTE:

When removing right fork leg, brake hose and pipe must be removed at front fork and top of caliper.

2. Remove the caps and drain the oil from both fork tubes.
3. Remove the internal hexagonal bolt from bottom of outer tubes using fork spring guide wrench.



4. Remove inner tube and damper assembly from outer tube.
5. Remove clip from bottom of inner tube and pull out fork piston assembly inspect and replace if damaged.





6. To replace fork seal, remove wire clip, and cover washer from outer tubes.
7. Carefully pry out old seal, without damaging fork tube.



8. Insert new seal "open" side down.

B. Assembly

1. When assembling the front fork, reverse the order of disassembly

NOTE:
Fork springs must be installed with great-pitch down.

2. Installing the front forks.
   a. Insert the front fork tubes to the correct position and partially tighten the under-bracket mounting bolt.
   b. Pour specified amount of oil into the inner tube through the upper end opening. Use Yamaha fork oil 10W, 20W, 30W.

NOTE:
Yamaha fork Oil is recommended. Specialty type fork oils of quality manufacture may be used.

Fork oil capacity: 130 cc (4.39 oz) each side
Fork oil level: (below the top of the fork) 450 ±10 mm each side (17.7 ±0.4 in)

   c. Install the inner tube caps.
   d. Tighten all pinch bolts.

Pinch bolt torque:
Upper - 0.9 – 1.4 m-kg (6.5 – 10 ft-lb)
Lower - 3.0 – 4.0 m-kg (22 – 29 ft-lb)

3. Install brake hose and pipe and bleed air. (Refer to 5-3-C-3-f.)

5-8 STEERING HEAD

A. Adjustment

Refer to Chapter 2, Section 2-3, paragraph H for steering head adjustment procedure.

B. Disassembly

1. After removing front forks, remove headlight bracket.
2. Disconnect electrical wires between headlight body and main wiring harness of frame.

NOTE:
Removal of fuel tank will aid in disconnecting wiring.

3. Disconnect any electrical wires between handlebar switches and main wiring harness in headlight body.
4. Disconnect clutch and throttle cables at handlebars.
5. Disconnect tachometer and speedometer cables at instruments.
6. Loosen stem pinch bolt.
7. Remove stem fitting nut and crown washer.



8. Remove handle crown (upper bracket) and instruments, as an assembly.
   NOTE: Hold headlight body to keep it from falling.
9. Remove steering ring nut with steering nut wrench.
   Caution: **Support "under bracket" so that the loose bearings will not fall out.**
10. Still supporting the under bracket, carefully lift off the bearing cover.
11. Lift off the top bearing race and remove all of the ball bearings from the upper bearing assembly.

Ball size/quantity: 1/4 in./19 pcs.

12. Remove under bracket, be very careful not to lose any bearings from the lower assembly.

Ball size/quantity: 1/4 in. / 19 pcs.

13. Remove races from head pipe using drift punch and hammer as shown. Work the race out gradually by tapping lightly around its complete backside diameter.
14. Remove the bearing race from the lower bracket by tapping around its backside diameter with a drift punch and hammer.
15. Remove dust seal.

C. **Inspection**

1. Examine all the balls for pits or partial flatness. If any one is found defective, the entire set (including both races) should be replaced. If either race is pitted, shows rust spots, or is damaged in any way, replace both races and all balls.
2. Examine dust seal under lowest race and replace if damaged.

D. **Installation**

1. If pressed-in races have been removed, tap in new races.
2. Grease the lower ball race of the bottom assembly and arrange the balls around it. Then apply more grease.
3. Grease the lower ball race of the upper assembly and arrange the balls around it. Then apply more grease and set the top race into place.
   NOTE: Use medium-weight wheel bearing grease of quality manufacture, preferably water-proof.
4. Carefully slip the under bracket stem up into the steering head. Hold the top bearing assembly in place so the stem does not knock any balls out of position.
5. Set the upper bearing cover on and install the ring nut. Tighten the ring nut so all free play is taken up, but so the bracket can still pivot freely from lock to lock. Recheck for free play after the entire fork unit has been installed. (Refer to Chapter 2-3-H, for Steering head adjustment.)
6. Install the fork tubes into the under bracket to ease headlight body installation.
7. Install the headlight body and stays onto the fork tubes with rubber and steel spacing washers properly in place.
8. Install the upper fork bracket. Tighten steering fitting nut, then tighten stem pinch bolt. Torque to specifications.

Steering fitting nut: 3.5 – 4.0 m-kg (25.5 – 29.0 ft-lb)
Stem pinch bolt: 1.4 – 2.2 m-kg (10.0 – 16.0 ft-lb)

9. Tighten upper fork tube pinch bolts and torque to specification.

Upper fork tube pinch bolt torque: 1.4 – 2.2 m-kg (10.0 – 16.0 ft-lb)

NOTE:
Make certain that tops of fork tubes are adjusted to the same level. If necessary, loosen under bracket pinch bolts and adjust.

10. Install handlebars and torque to specification.

CAUTION:
Tighten bolts in stages to maintain an equal gap on each side of the handlebar holder.

Handlebar mounting bolt torque: 1.4 – 2.2 m-kg (10.0 – 16.0 ft-lb)

11. Reconnect all electrical wiring and check operation.
12. Install headlight bracket and check headlight operation.
13. Install front wheel.
14. Reconnect speedometer and tachometer cables.
15. Reconnect clutch and throttle cables and check operation and adjustment.

5-9. SWING ARM

A. Swing Arm Inspection

1. With rear wheel and shock absorbers removed, grasp the ends of the arm and move from right to left to check for free play.

Swing arm free play: 1 mm (0.04 in)

2. If free play is excessive, remove swing arm and replace swing arm bushing.

B. Swing Arm Lubrication

1. Apply grease to grease fitting on top of pivot with low pressure hand operated gun. Apply until fresh grease appears at both ends of pivot shaft.

Recommended lubricant: Smooth chassis lube grease

2. Wipe off excess grease.

C. Swing Arm Removal

1. Remove nut on swing arm pivot bolt and tap out bolt with a long aluminum or brass rod.

NOTE:
Carefully remove the arm while noting the location of spacing washers and shims. They must be reinstalled in the same positions.

Pivot bolt torque: 5.0 – 8.0 m-kg (36 – 58 ft-lb)

2. Tap out old bushing from each side of pivot using the long rod.
3. Install new bushings using a press.

NOTE:
Do not tap on bushing. Press in new bushings.

5-10 REAR SHOCK ABSORBER

A. Removal

1. Remove the rear shock absorber from the machine.
2. Push down the spring, remove the spring retainer, and remove the spring.

B. Inspection

1. Check the rod, and if it is bent or damaged, replace the shock absorber.
2. Check for oil leakage. If oil leakage is evident, replace the shock absorber.
3. At proper position, operate shock absorber rod to check damping.
   Slight resistance should be felt on the compression (down) stroke and considerable resistance should be felt on the return (up) stroke.
4. Install the spring, and install the shock absorber on the machine.

Rear shock absorber Tightening torque: 2.3 – 3.7 m-kg (19.6 – 26.8 ft-lb)

5-11.CABLES AND FITTINGS

A. Cable maintenance

NOTE:

See Maintenance and Lubrication intervals charts for additional information. Cable maintenance is primarily concerned with preventing deterioration through rust and weathering and providing for proper lubrication to allow the cable to move freely within its housing. Cable removal is straight-forward and uncomplicated. Removal will not be discussed within this section. For details, see the individual maintenance section for which the cable is an integral part.

WARNING:

Cable routing is very important, for details of cable routing, see the cable routing diagrams of XS360C Assembly Manual. Improperly routed, assembled or adjusted cables may render the vehicle unsafe for operation.

1. Remove the cable.
2. Check for free movement of cable within its housing. If movement is obstructed, check for fraying or kinking of cable strands. If damage is evident, replace the cable assembly.

CHAPTER 6. ELECTRICAL

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6

CHAPTER 6. ELECTRICAL

6-1. IGNITION SYSTEM

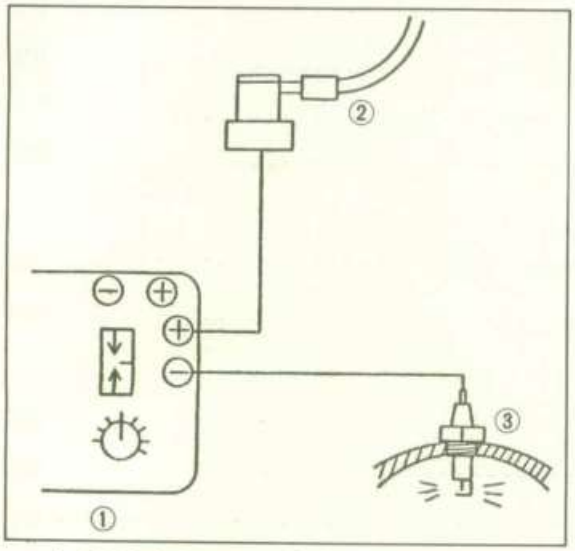
A. Ignition Timing

Refer to Chapter 2-5, B. for ignition timing procedure.

B. Spark Gas Test

The entire ingnition system can be checked for misfire and weak spark using the Electro Tester. If the Ignition system will fire across a sufficient gap, the engine ignition system can be considered good. If not, proceed with individual component tests until the problem is found.

1. Warm up engine thoroughly so that all electrical components are at operation temperature.
2. Stop engine and connect tester as shown.



1. Electro tester
2. Plug wire from coil
3. Spark plug

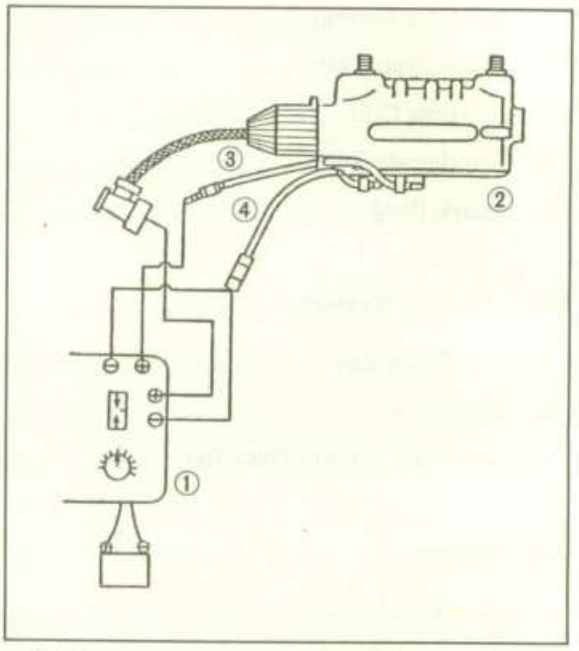
3. Start engine and increase spark gap until misfire occurs. (Test at various rpm's between idle and red line.)

Minumum spark gap:
6 mm (0.24 in)

4. If minimum spark gap cannot be reached without misfire, replace spark plug and repeat test. If the problem persists procede with individual component testing.

C. Ignition Coil

1. Coil spark gap test.
   a. Remove fuel tank and disconnect ignition coil from wire harness and spark plug.
   b. Connect Electro Tester as shown.



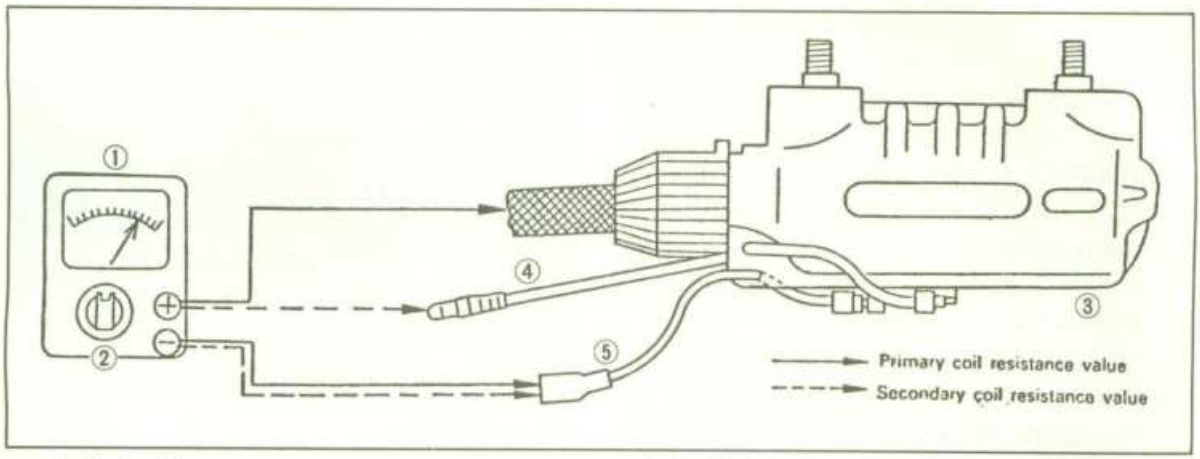
1. Electro tester
2. Ignition coil
3. Red/White
4. Orange

   c. Connect fully charged battery to tester.
   d. Turn on spark gap switch and increase gap until misfire occures.

Minimum spark gap:
6 mm (0.24 in)

2. Direct current resistance test.
   Use a pocket tester or equivalent ohmmeter resistance and continuity of primary and secondary coil windings.

Standard values:
Primary coil resistance:
4.0Ω ±10% at 20°C (68°F)
Secondary coil resistance:
9.5kΩ ±20% at 20°C (68°F)



1. Pocket-Tester
2. Set the tester on the "Resistance" position
3. Ignition coil
4. Red/White
5. Orange (L) Gray (R)

D. Condenser Test

1. Capacitance test

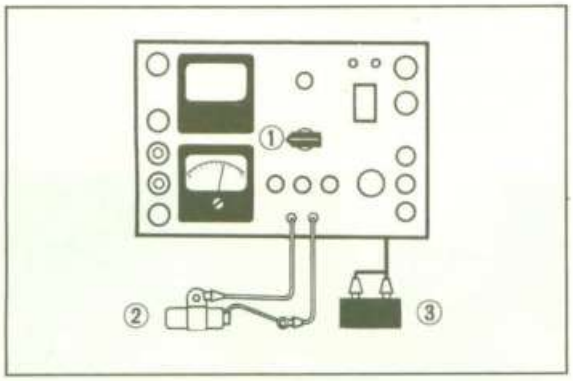
   If the contact points show excessive wear, or the spark is weak (but the ignition coil is in good condition), check the condenser.

   Capacity test (use electro tester).

   a. Calibrate capacity scale.
   b. Connect tester.
   c. Meter needle will deflect and return to center as condenser is charged.

   After needle stops, note reading on "μF" scale.

Condenser capacity: 0.24μF

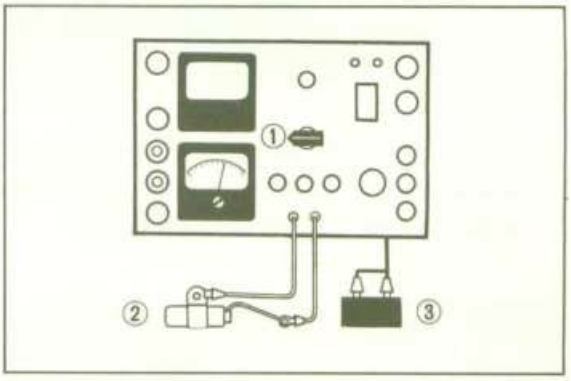


1. Capacity range 2. Condenser 3. Battery

2. Insulation test

   a. Set ohmmeter tc highest resistance scale (Ω. x 1,000 or higher).
   b. Remove condenser from engine and connect ohmmeter as shown right.
   c. Resistance reading should be "Infinity" or very close to it.

Minimum resistance: 3MΩ.



1. Capacity range 2. Condenser 3. Battery

CAUTION:

After this measurement, the condenser should be discharged by connecting the positive and negative sides with a thick wire to prevent shock.

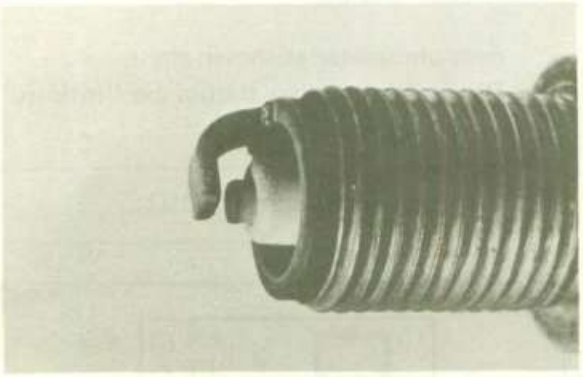
E. Spark Plug

The life of a spark plug and its discoloring vary according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with suitable ones determined by the color and condition of the bad plugs. One machine may be ridden only in urban areas at low speeds;

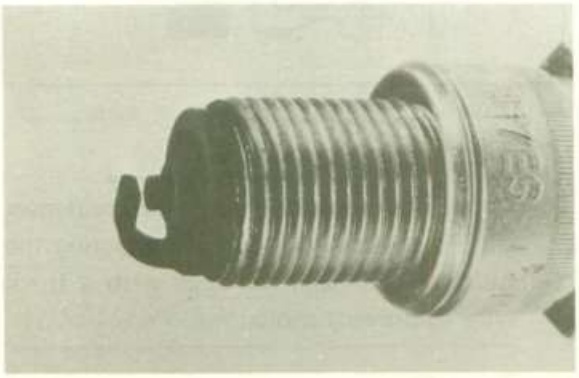
another may be ridden for hours at high speed. Confirm what the present plugs indicate by asking the rider how long and how fast he rides. Recommend a hot, standard, or cold plug type accordingly. It is actually economical to install new plugs often since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

1. How to "read" a spark plug (condition)

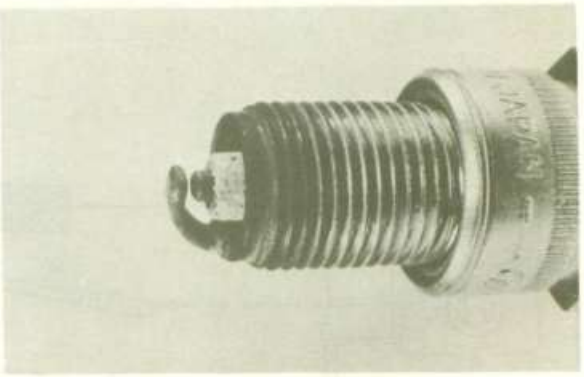
a. Best condition: When the porcelain around the center electrode is a light tan color.



b. If the electrodes and porcelain are black and somewhat oily, replace the plug with a hotter type for low speed riding.



c. If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a colder type for high speed riding.



2. Inspection

Instruct the rider to:

a. Inspect and clean the spark plug at least once per month or every 1,600 km (1,000 mi.).

b. Clean the electrodes of carbon and adjust the electrode gap.

c. Be sure to use the proper reach plug as a replacement to avoid overheating, fouling or piston damage.

Spark plug type: BP-6ES NGK or N-7Y Champion
Spark plug gap: 0.7 – 0.8 mm (0.027 – 0.031 in)

6-2. CHARGING SYSTEM

A. A.C. Generator

1. Checking method

a. Connect D.C. voltmeter to the battery terminals.



b. Start engine.

c. Accelerate engine to approximately 2,000 rpm or more and check generated voltage.

Generated volage: 14.5 ±0.3V

d. If the indicated voltage cannot be reached then perform the tests in step 2.

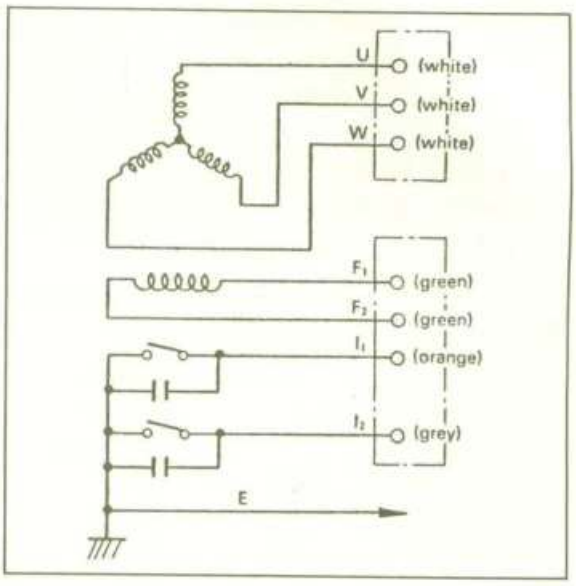
NOTE:

Never disconnect wires from the battery while the generator is in operation. If the battery is disconnected, the voltage across the generator terminals will increase, damaging the semiconductors.

2. Resistance test of field coil and armature coil.

Check the resistance between terminals U-V, V-W, W-U, and F_1-F_2. If resistance is out of specification, coil is broken. Check the coil connections. If the coil connections are good, then the coil is broken inside and it should be replaced.

Field coil resistance: F_1-F_2 4.0Ω ±15% at 20°C (68°F)
Armature coil resistance: (U-V, V-W, W-U) Each 0.72Ω ±10% at 20°C (68°F)

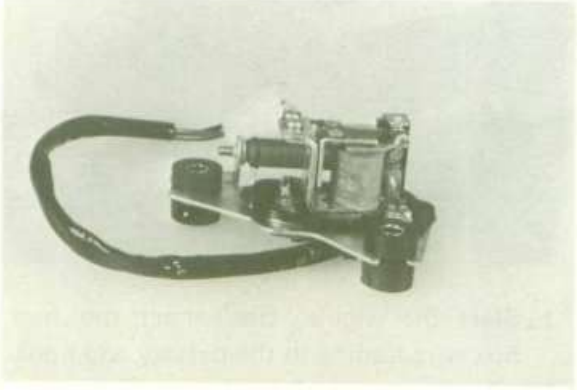


B. Regulator

1. General

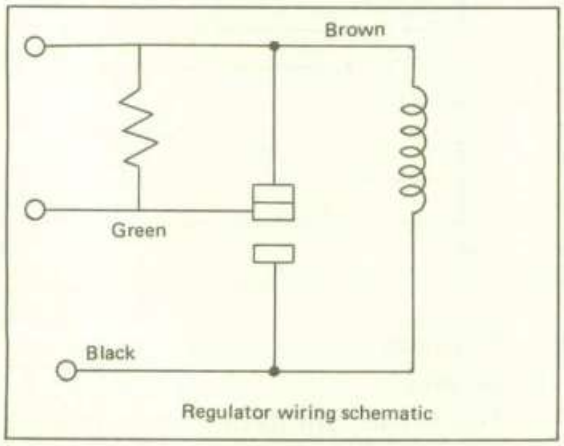
This circuit consists of the battery which first provides voltage to the rotor field windings, regulator, ACG (alternating current generator), rectifier and main switch.

a. The regulator's function is to pass a controlled amount of voltage to the rotor windings which creates a magnetic field that produces charging voltage in the stator.



b. The regulator operates as a magnetic switch. As charging voltage rises, part of this voltage is routed through an electromagnet in the regulator. Rising voltage creates greater regulator magnetism, which in turn pulls the central contact

point through different positions. Different resistors are switched into the circuit as this central contact point moves. These resistors cut down the amount of voltage passing, to the rotor windings, which reduces the charging voltage output.



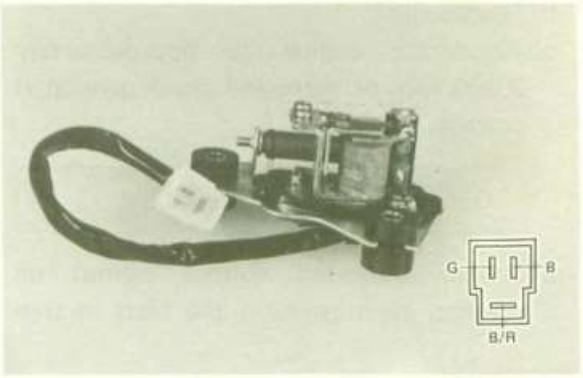
Regulator wiring schematic

2. Adjustment

a. Charging voltage output can be controlled at the regulator. Inside the housing is a screw that pushes against a flat spring steel plate. This is the adjusting screw.



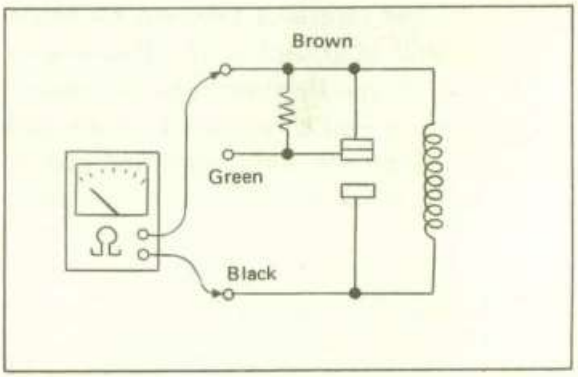
b. Start the engine. Disconnect the fuse box wire leading to the battery and hook up a voltmeter from the fuse box to ground. Accelerate the engine to 2,500 rpm. The voltmeter should read 14.5 – 15 volts DC. If it varies from this amount, twist the adjusting screw in to raise the charging voltage or out to reduce the voltage.



Checking resistance

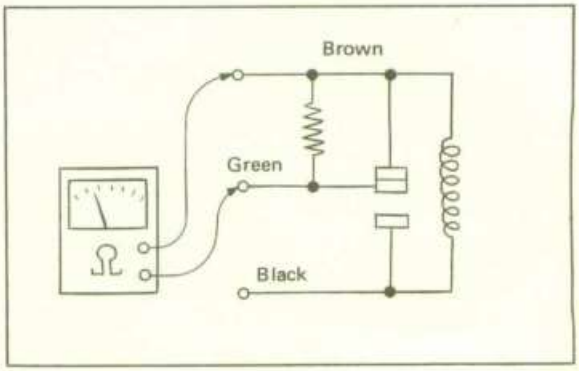
Hook up ohmmeter (0 – 200 ohms). One probe attached to the black wire and one attached to the regulator base.

STANDARD RESISTANCE:
10.5 $^{+1}_{-1}$ Ω at 20°C (68°F)



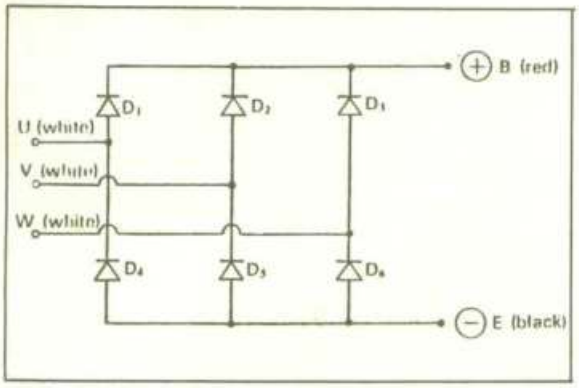
Hook one probe to brown wire and other probe to green wire.

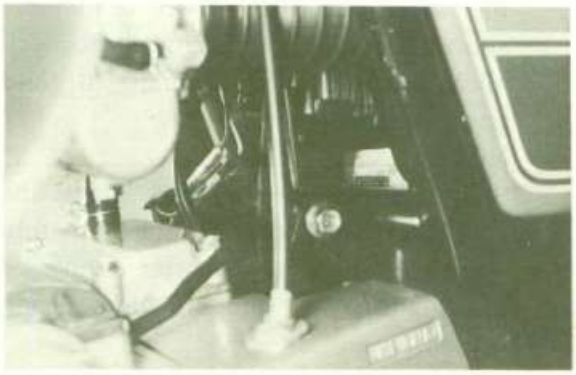
STANDARD RESISTANCE:
140 ± 10 ohm at 20°C (68°F)



C. Checking Silicon Rectifier

1. Check silicon rectifier as specified using Yamaha Pocket Tester.





Checking element	Pocket test connecting point (+) (red)	Pocket test connecting point (−) (black)	Good	Replace element) shorted)	Replace (element open)
D_1	B	U	○	○	×
	U	B	×	○	×
D_2	B	V	○	○	×
	V	B	×	○	×
D_3	B	W	○	○	×
	W	B	×	○	×
D_4	U	E	○	○	×
	E	U	×	○	×
D_5	V	E	○	○	×
	E	V	×	○	×
D_6	W	E	○	○	×
	E	W	×	○	×

○ ..... Continuity × ..... Discontinuity (∞)

Even if one of elements is broken, replace assembly.

CAUTION:

The silicon rectifier can be damaged if subject to overcharging. Special care should be taken to avoid a short circuit and/or incorrect connection of the positive and negative leads at the battery. Never connect the rectifier directly to the battery to make a continuity check.

6-3. BATTERY

A. Checking

1. If battery sulfation (white accumulations) occurs on plates due to lack of battery electrolyte, the battery should be replaced.
2. If the bottoms of the cells are filled with corrosive material falling off the plates, the battery should be replaced.
3. If the battery shows the following defects, it should be replaced:
   a. The voltage will not rise to a specific value even after many hours of charging.
   b. No gas formation occurs in any cell.
   c. The battery requires a charging voltage of more than regulating voltage in order to supply a current of 1.20A for 10 hours.

B. Service Life

The service life of a battery is usually 2 to 3 years, but lack of care as described below will shorten the life of the battery.

1. Negligence in keeping battery topped off with distilled water.
2. Battery being left discharged.
3. Over-charging with heavy charge.
4. Freezing.
5. Filling with water or sulfuric acid containing impurities.
6. Improper charging voltage/current on new battery.

Battery	12V, 1.2 AH
Electrolyte	Specific gravity: 1.28 Quantity: 800 cc
Initial charging current	1.20A/25 hours (new battery)
Recharging current	0.55/10 hours (or until specific gravity reaches 1.28)
Refill fluid	Distilled water (to maximum level line)
Refill period	Check once per month (or more often, as required)

C. Storage

If the motorcycle is not to be used for a long time, remove the battery and have it stored. The following instructions should be observed by shops equipped with changer.

1. Recharge the battery.
2. Store the battery in a cool, and dry place.
3. Recharge the battery before reinstallation.

6-4. Starter motor

A. Servicing and Troubleshooting

1. Armature

a) If the commutator surface is dirty, clean with #600 grit sandpaper as shown in the drawing below.
After sanding, wash thoroughly with electrical contact cleaner and dry with high-pressure air.

b) The mica insulation between commutator segments should be 0.5 – 0.8 mm, below the segment level. If not, scrape to proper limits with appropriately shaped tool, (A hacksaw blade can be ground to fit).

c) Each commutator segment should show zero ohm resistance to the others segments and at least three million ohms resistance to the core. If there is less than 00 ohms resistance to the core, or one of the segments is open, replace the armature.
In addition, the armature can be placed on a "growler" (testing device) and checked magnetically for internal shorts. Follow manufacturer's test recommendations.

d) If the commutator surface shows heavy scoring, it can be turned down on a lathe or commutator turning machine. Check the specification chart for minimum allowable commutator diameter. Recheck mica insulation depth (undercut) and scrape to proper limits.

NOTE:
Shoud turning be required, check the condition of the cover bearings, armature electrical properties starter amperage draw and rpm and, finally, carbon brushes.

Cover bearings.
Replace as necessary.

2. Carbon brushes

a) Check brush length and replace if at or near limits.

b) Check brush spring pressure. Replace if over/under specs.

NOTE:
Spring pressure is measured with a nominal length brush installed. Lift until spring starts to lift off brush and note reading on scale. (Nominal: 800 gr.)

c) Clean the brush holders thoroughly. Use clean solvent, a soft-bristled brush, and dry with high- pressure air.

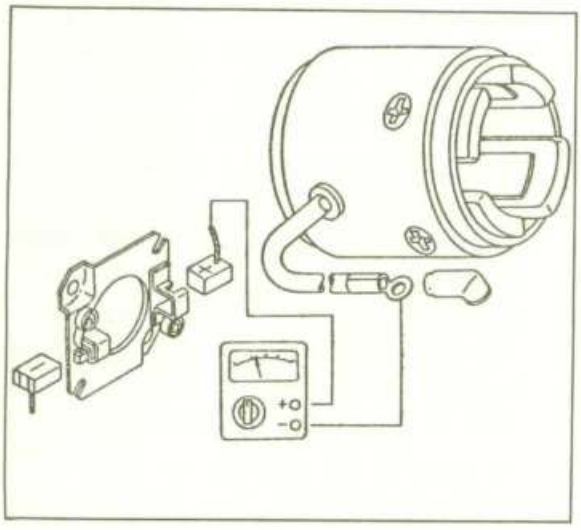
3. Yoke

a) If the yoke area is dirty, clean with clean solvent and dry with high-pressure air.

b) Yoke coil resistance is 0.05 ohm.
If coil resistance is more than 0.055 ohm

or less than 0.045 ohm, replace it.
If the yoke shows leakage to ground (resistance is less than 0.1 million ohms) replace it. (20°C)

NOTE:
Immediately after cleaning, the yoke may show some insulation leakage. Wait for it to thoroughly dry before checking or reinstalling.

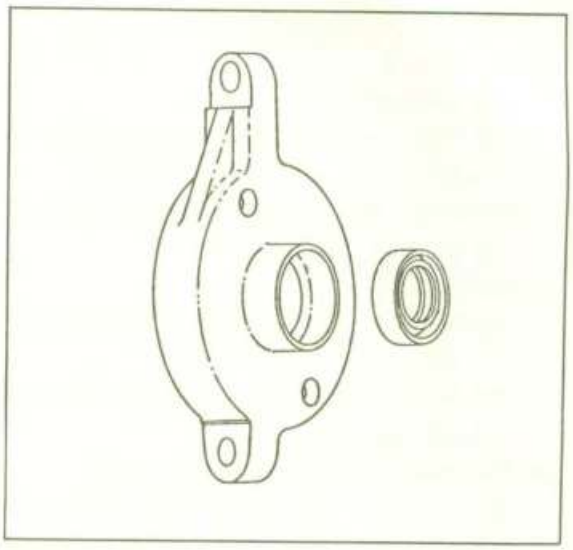


4. Covers
   a) Check oil seals for hardening, cracking, worn lips. Replace as necessary.

   NOTE:
   During reassembly, pre-lube the lips of all seals with "white" grease. (lithium soap base grease)

   b) Clean the bearings thoroughly, lightly oil each and check for hard spots during rotation, cracked or broken balls and/or races, etc.
   Replace as necessary.

   NOTE:
   During reassembly, all non-sealed bearings should be given a light coating of 20W. or 30W. "SD" (MS) motor oil.



6-5. LIGHTING AND SIGNAL SYSTEMS

A. Lighting tests and checks

The battery provides power for operation of the horn, taillight, stoplight neutral light and flasher light. If none of the above operates, always check battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery water, or a defective charging system. See section, 6-2, charging system, for checks of battery and charging system.

1. Horn does not work.
   a. Check for 12V on brown wire to horn.
   b. Check for good grounding of horn (pink wire) when horn button is pressed.
2. Brake light does not work.
   a. Check bulb.
   b. Check for 12V on yellow wire to brake light.
   c. Check for 12V on brown wire to each brake light switch (front brake and rear brake switches).
3. Taillight does not work.
   a. Check bulb.
   b. Check for 12V on blue wire.
   c. Check for ground on black wire to tail/brake light assembly.

4. Flasher light(s) do not work.
   a. Check bulb.
   b. Right circuit:
      1) Check for 12V on dark green wire to light.
      2) Check for ground on black wire to light assembly.
   c. Left circuit:
      1) Check for 12V on dark brown wire to light.
      2) Check for ground on black wire to light assembly.
   d. Right and left circuits do not work:
      1) Check for 12V on brown/white wire to flasher switch on left handlebar.
      2) Check for 12V on brown wire to flasher relay.
      3) Replace flasher relay.
      4) Replace flasher switch.
   e. Check flasher self canceling system. (Refer to flasher self canceling system.)
5. Neutral light does not work.
   a. Check bulb.
   b. Check for 12V on sky blue wire to neutral switch.
   c. Replace neutral switch.
6. Oil caution light does not work.
   a. Place shift lever in neutral to check bulb.
   b. Replace bulb.
   c. Check for 12V on black/red wire to oil level switch.
   d. Replace oil level switch.

B. Flasher Self Canceling System

1. Description

   This system automatically turns the flasher light off after you have changed course or turned corner so you can safely forget about turning off the signal. It is electronically operated depending on the time lapsed or the distance travelled after the handle switch has been applied.

   In other words, the signal is automatically turned off when the vehicle has travelled over a certain distance at low speeds or while the signal light at an intersection is "red", or after a short lapse of time from when you changed course at high speeds.

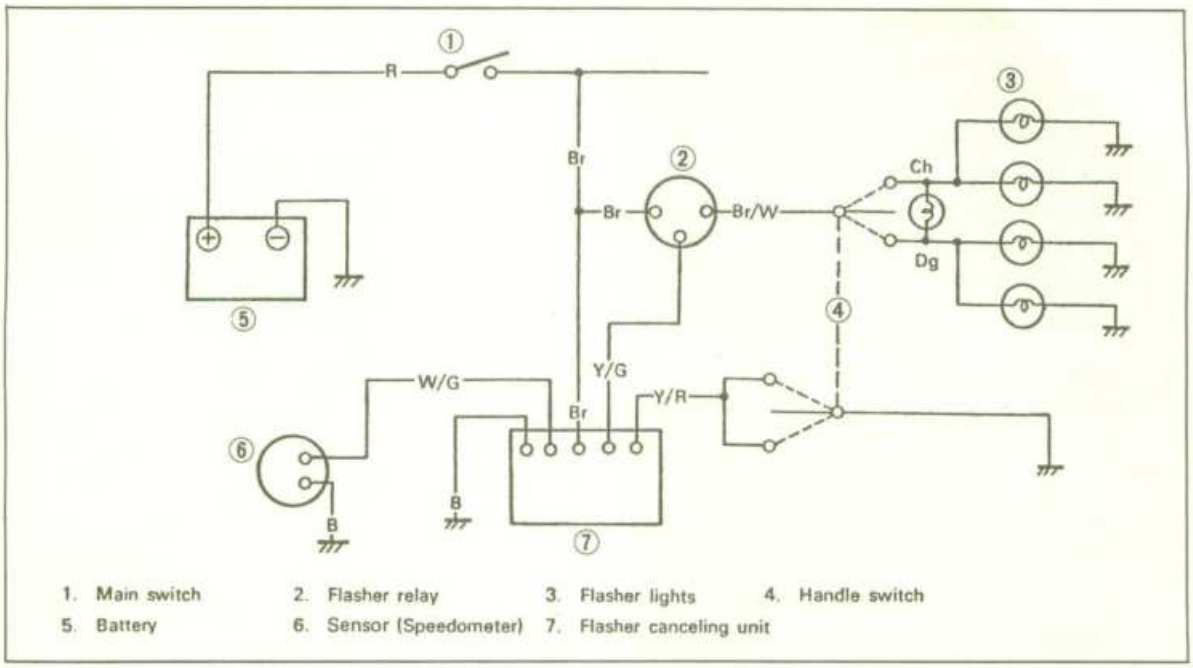
2. Operation

   The handle switch lever has the following three positions; L (left), OFF and R (right). The switch lever is pushed back to its home position by spring force when it is released from your finger, but the signal continues to light up over a certain time or distance as noted already.

   If the switch lever is depressed into OFF, the signal will turn off immediately, independent of the flasher canceling unit. At normal operation, therefore, the switch lever should be pushed into OFF as soon as you have turned a corner or changed course.

   The flasher canceling unit is reset each time the switch lever is turned to R or L and begins to count time or distance. If the turn signal is required to continue turning on more than 100 meters (328 feet) or 10 seconds, the switch lever must be kept in the position to which it is turned or repeatedly turned to the same position.

   In other words, both time and distance are calculated from the moment that the handle switch lever is applied, and therefore, the handle switch can be turned on and off as often as possible.



1. Main switch 2. Flasher relay 3. Flasher lights 4. Handle switch
5. Battery 6. Sensor (Speedometer) 7. Flasher canceling unit

3. Inspection

If the flasher auto canceling system should become inoperative, proceed as follows:

1) Pull off the 6-p connector from the flasher canceling unit, and operate the handle switch.

If the signal operates normally in L, R and OFF:

a) Flasher unit
b) Bulb
c) Lighting circuit
d) Handle switch light circuit

} are in good condition

Therefore, any one of the following is considered to be defective:

a) Flasher canceling unit
b) Handle switch reset circuit
c) Speedometer sensor circuit

2) Pull off the 6-p connector from the flasher canceling unit, and connect a tester (Ω x 100 range) across the white/green and the black lead wires on the wire harness side. Turn the speedometer shaft, and if the tester needle swings back and forth four times between 0 and ∞Ω, the speedometer sensor circuit is in good condition. If not, check the sender and wire-harness, and replace any of these as necessary.

3) Pull off the 6-p connector from the flasher canceling unit, and check if there is continuity between the yellow/red lead wire on the wireharness side and the chassis.

Flasher switch OFF	∞Ω
Flasher switch L or R	0Ω

If the tester needle does not swing as indicated above, check the handle switch circuit and wire harness.



1. Flasher cancelling unit B: Black Br: Brown
W/G: White/Green Y/G: Yellow/Green
Y/R: Yellow/Red

4) If no defect is found with the above three check-ups and the flasher canceling systems is still inoperative, replace the flasher canceling unit.

5) If the signal flashes only when the handle switch lever is turned to L or R and it turns off immediately when the handle switch lever is turned to OFF, replace the flasher canceling unit.

4. Notes on handling

1) The flasher canceling system does not always operate at a proper time, because it is so designed that only when the requirements of both time and distance are met, it functions. It is advisable to make it a habit to turn the handle switch to OFF with your finger each time it is used.

2) Current continues to flow through the flasher relay after the signal is turned off automatically, therefore, it should preferably be turned off manually each time.

3) If the handle switch is turned on with wrong wiring, the system may become inoperative. Check for correct wiring after it is re-connected.

4) The signal can be used with the flasher canceling unit being disconnected. It can be operated manually. Should the system fail to operate, pull off the connector and the turn signal can be operated manually.

CHAPTER 7. APPENDICES

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7

CHAPTER 7. APPENDICES

7-1. TROUBLESHOOTING GUIDE

The following guide is not complete in itself. If a problem is found within an individual component mentioned in the chart, refer to the section or chapter involved for inspection procedures.

1. Will not start or difficult to start

a. Ignition system

Possible cause	Remedy
No spark	1. Check ignition main switch. 2. Check engine stop switch. 3. Check points assembly. 4. Check condenser. 5. Check wiring. 6. Check ignition coil. 7. Check high tension lead. 8. Check spark plug. 9. Check ignition timing.
Weak or Intermittent spark	1. Use Electro Tester, spark gap test 2. Check spark plug. 3. Check high tension lead. 4. Check ignition assembly.

b. Air/Fuel systems

Possible cause	Remedy
No fuel	1. Check fuel tank. 2. Check petcock. 3. Remove fuel pipe, check fuel flow.
Intermittent or poor fuel flow	1. Clean fuel tank, check cap vent. 2. Clean petcock. 3. Remove carburetor, service.
Bad fuel	1. Flush fuel system, complete. 2. Add fresh fuel, proper grade.
Blocked air intake or malfunction	1. Clean and lube filter. 2. Check reed valve assembly.

c. Engine/Exhaust systems.

Possible cause	Remedy
Incorrect compression pressure	1. If compression is too high, check for excessive carbon buildup. 2. No compression or low compression, check: a. Cylinder head gasket. b. Valve clearance. c. Worn valve seat. d. Piston, rings, cylinder.
Blocked exhaust system	1. Check muffler/sbrk arrester silencer. 2. Check exhaust pipe for internal damage.

2. Poor idle and/or low speed performance

a. Ignition system

Possible cause	Remedy
Spark plug fouled or incorrect gap	Clean and gap, or replace if necessary.
Contact points bad	Clean and gap, or replace if necessary.
Incorrect ignition timing	Reset timing.
Weak spark	Check ignition coil and condenser.

b. Air/Fuel systems

Possible cause	Remedy
Tank cap vent plugged.	Clean or repair as necessary.
Fuel petcock plugged	Clean or repair as necessary.
Carburetor slow speed system inoperative	Clean or repair as necessary.
Pilot screw out of adjustment or plugged	Adjust or clean as necessary.
Carburetor float level incorrect	Measure and adjust as required.
Starter lever on	Push lever off.
Air leak	Repair.
Carburetor not level	Level.

c. Engine/Exhaust system. See "No start" section.

3. Poor mid-range and high speed performance

a. Ignition systems

Possible cause	Remedy
Spark plug gap incorrect	Clean and gap or change spark plug if necessary.
Ignition timing incorrect	Reset.
Points set too close	Regap/Reset timing.

b. Air/Fuel systems

Possible cause	Remedy
Dirty air filter element	Clean.
Carburetor float level incorrect	Measure and adjust if required.
Incorrect main jet size	Remove jet and check size.
Incorrect jet needle clip position	Check position of clip in needle.
Carburetor not level	Level.

7-2. SPECIFICATION

A. GENERAL

1. MODEL	
1) Model (I.B.M. No.)	XS360C (1L9)
2) Frame I.D. and Starting Number	1L9-000101
3) Engine I.D. and Starting Number	1L9-000101
2. DIMENSION	
1) Overall Length	2,045 mm (80.5 in)
2) Overall Width	845 mm (33.3 in)
3) Overall Height	1,100 mm (43.3 in)
4) Seat Height	800 mm (31.5 in)
5) Wheelbase	1,340 mm (52.8 in)
6) Minimum Ground Clearance	155 mm (6.1 in)
3. WEIGHT	
1) Net Weight	159 kg (350 lb)
4. PERFORMANCE	
1) Climbing Ability	28°
2) Minimum Turning Radius	2,200 mm (86.6 in)
3) 0 - 400 mm Acceleration Time	15,2 sec.
4) Braking Distance	14 m @ 50 km/h (45.9 ft @ 31 mph)
5) Fuel Consumption	36 km/lit @ 60 km/h (84.7 mi/gal @ 37 mph)

B. ENGINE

1. DESCRIPTION	
1) Engine Type	Air cooled, 4-stroke, SOHC Twin, parallel forward incline
2) Engine Model	1L9
3) Displacement	358 cc (21.85 cu.in)
4) Bore x Stroke	66 x 52.4 mm (2.528 x 2.063 in)
5) Compression Ratio	8.7 : 1
6) Starting System	Kick and electric starter
7) Ignition System	Battery ignition
8) Lubrication System	Wet sump
2. CYLINDER HEAD	
1) Combustion Chamber Volume	23.3 cc (1.189 cu.in) BP6ES
2) Combustion Chamber Type	Dome + Squish
3) Head Gasket Thickness	1.0 mm (0.04 in)
4) Tightening Torque:	
Cylinder Head Holding Nut (M10P1.25)	3.0 - 3.5 m-kg
Bolt (M6P1.0)	0.8 - 1.2 m-kg (6 - 8.5 ft-lb)

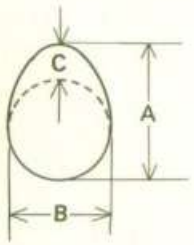
Spark Plug (M14P1.25)	1.8 - 2.2 m-kg (5.8 - 8.7 ft-lb)
3. CYLINDER	
1) Material	Aluminum alloy with cast iron sleeve
2) Bore Size	66 $^{+0.02}_{0}$ mm (2.59 $^{+0.0008}_{0}$ in)
3) Taper Limit	0.05 mm (0.002 in)
4) Out of Round Limit	0.01 mm (0.0004 in)
4. PISTON	
1) Piston Skirt Clearance	0.030 - 0.050 mm (0.0012 - 0.0019 in)
2) Piston Oversize	66.25mm (2.608 in) / 66.50mm (2.618in) / 66.75mm (2.628in) / 67.00mm (2.638in)
3) Piston Pin Outside Diameter x Length	16 $^{0}_{-0.005}$ mm x 54.5 $^{0}_{-0.3}$ mm (0.63 $^{0}_{-0.0002}$ in x 2.146 $^{0}_{-0.0116}$ in)
5. PISTON RING	
1) Piston Ring Design (Top)	Plain Ring (1.5 mm)(0.059 in)
(2nd)	Plain Ring (1.5 mm)(0.059 in)
(Oil ring)	With Expander (2.45 mm)(0.096 in)
2) Ring End Gap (Installed, Top)	0.2 - 0.4 mm (0.008 - 0.016 in)
(Installed, 2nd)	0.2 - 0.4 mm (0.008 - 0.016 in)
(Installed, Oil)	0.2 - 0.9 mm (0.008 - 0.035iin)
3) Ring Groove Side Clearance (Top)	0.04 - 0.08 mm (0.0016 - 0.0032 in)
(2nd)	0.03 - 0.07 mm (0.0012 - 0.0028 in)
(Oil)	—
6. BIG END BEARING	
1) Type	Plain Bearing
2) Oil Clearance	0.021 - 0.045 mm (0.0008 - 0.0018 in)
3) Bearing Size	1.(Blue) 15 $^{+0.004}_{0}$ mm (0.591 $^{+0.00016}_{0}$ in)
	2.(Black) 15 $^{0}_{-0.004}$ mm (0.591 $^{0}_{-0.00016}$ in)
	3.(Brown) 15 $^{-0.004}_{-0.008}$ mm (0.591 $^{-0.00016}_{-0.00031}$ in)
	4.(Green) 15 $^{-0.008}_{-0.012}$ mm (0.591 $^{-0.00031}_{-0.00047}$ in)
7. CAMSHAFT	
1) Cam Drive Type	Chain (Center Side)
2) Number & Type of Bearing	3 Bearings, Cylinder Head Direct Support

3) Bearing Dimensions

	Cap I.D.	Shaft O.D.	Clearance
IN & EX. 1. 2. 3.	23 $^{+0.021}_{0}$ mm (0.906 $^{+0.0082}_{0}$ in)	23 $^{-0.020}_{-0.033}$ mm (0.906 $^{-0.00079}_{-0.00130}$ in)	0.020 - 0.054 mm (0.00079 - 0.00213 in)

4) Cam Dimensions

	Cam Height "A"	Limit	Base Circle "B"	Limit	Lift "C"
IN	38.85 $^{+0.05}_{-}$ mm (1.529 $^{+}_{-0.0019}$ in)	38.70 mm (1.527 in)	32.23 $^{+0.05}_{-}$ mm (1.269 $^{+}_{-0.0019}$ in)	32.08 mm (1.263 in)	6.85 mm (0.269 in)
EX	38.89 $^{+}_{-0.05}$ mm (1.531 $^{+}_{-0.0019}$ in)	38.74 mm (1.525 in)	32.05 $^{+}_{-0.05}$ mm (1.262 $^{+}_{-0.0019}$ in)	31.90 mm (1.256 in)	6.89 mm (0.271in)



5) Valve Timing

	OPEN	CLOSE	DURATION	OVERLAP
IN	BTDC 24°	ABDC 60°	264°	50°
EX	BBDC 58°	ATDC 26°	264°	

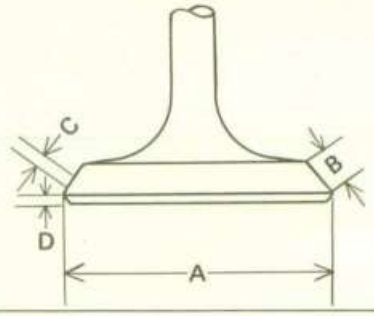
6)	Camshaft Deflection Limit	0.03 mm (0.0012 in)
7)	Cam Chain	
	Type	TSUBAKIMOTO BF05M
	Pitch/Number of Links	7.774 mm (0.3060 in)/ 92L
	Sprocket Ratio (Teeth)	34/17

9. ROCKER ARM & ROCKET SHAFT

1)	Rocker Arm Inner Diameter	13 $^{+0.018}_{0}$ mm (0.512 $^{+0.0007}_{0}$ in)
2)	Rocker Arm Shaft Diameter	13 $^{-0.016}_{-0.034}$ mm (0.512 $^{-0.00063}_{-0.00141}$ in)
3)	Clearance	0.016 - 0.054 mm (0.00063 - 0.00122 in)
4)	Lift Ratio	X : Y = 32.05 : 33.62 mm (1.262 : 1.324 in)

10. VALVE, VALVE SEAT & VALVE GUIDE

1)	Valve Per Cylinder	2 pcs.
2)	Valve Clearance	IN : 0.08 - 0.12 mm (0.0031 - 0.0047 in)
	(In Cold Engine)	EX : 0.16 - 0.20 mm (0.0063 - 0.0078 in)
3)	Dimensions	
	Valve Head Diameter "A"	IN: 35.5 $^{+}_{-0.1}$ mm (1.398 $^{+}_{-0.004}$ in)
		EX: 30 $^{+}_{-0.1}$ mm (1.181 $^{+}_{-0.004}$ in)
	Valve Face With "B"	IN: 2.3 mm (0.091 in)
		EX: 2.3 mm (0.091 in)
	Valve Seat Width "C"	IN: 1 0.1 mm (0.039 ± 0.0039 in)
		EX: 1 0.1 mm (0.039 ± 0.0039 in)
	Valve Margin Thickness "D"	IN:1 0.2 mm (0.039 ± 0.0079 in)
		EX:1 0.2 mm(0.039 ± 0.0079 in)



Valve Stem Diameter	IN: 7 $^{-0.010}_{-0.025}$ mm (0.275 $^{-0.0004}_{-0.0009}$ in)
	EX: 7 $^{-0.030}_{-0.045}$ mm (0.275 $^{-0.0012}_{-0.0018}$ in)
Valve Guide Diameter	IN: 7 $^{+0.012}_{0}$ mm (0.275 $^{+0.0005}_{0}$ in)
	EX: 7 $^{+0.012}_{0}$ mm (0.275 $^{+0.0005}_{0}$ in)
Valve-Stem-to-Stem Clearance	IN: 0.010 - 0.037 mm (0.00039 - 0.00145 in)
	EX: 0.030 - 0.057 mm (0.0012 - 0.0022 in)
4) Valve Face Runout Limit	IN & EX 0.03 mm or less (0.0012 in)
11. VALVE SPRING	
1) Free Length	INNER (IN & EX): 39.3 mm (1.547 in)
	OUTER("): 42.8 mm (1.685 in)
2) Spring Rate (kg/mm)	INNER ("): k_1 = 1.93
	k_2 = 2.47
	OUTER("): k_1 = 4.19
	k_2 = 5.49
3) Installed Length	INNER ("): 33.0 mm (1.299 in)
(Valve Closed)	OUTER("): 37.0 mm (1.457 in)
4) Installed Pressure	INNER ("): 12.1 ± 1.2 kg (26.7 2.6 lb)
(Valve Closed)	OUTER("): 24.4 ± 1.7 kg (53.8 3.8 lb)
5) Compressed Length	INNER ("): 25.8 mm (1.015 in)
(Valve Open)	OUTER("): 29.8 mm (1.173 in)
6) Compressed Pressure	INNER ("): 29.9 ± 2.2 kg (65.9 ± 4.85 lb)
(Valve Open)	OUTER("): 63.9 ± 4.5 kg (141 ± 9.92 lb)
7) Wire Diameter	INNER ("): 3.0 mm (0.118 in)
(Valve Open)	OUTER("): 4.4 mm (0.173 in)
8) Widing O.D.	INNER ("): 22.4 mm (0.882 in)
(Valve Open)	OUTER("): 32.0 mm (1.260 in)
9) Number of Widings	INNER ("): 7.75 turns
(Valve Open)	OUTER("): 6.25 turns
10) Tilt Limit	INNER ("): 1.7 mm, 2.5° (0.067 in)
(Valve Open)	OUTER("): 1.9 mm, 2.5° (0.075 in)
12. CRANKSHAFT	
1) Crankshaft Deflection	0.02 mm (0.0008 in)
2) Con-Rod Large End Clearance	0.160 - 0.264 mm (0.0063 - 0.0104 in)
3) Clearance between Crank & Crankcase	0.05 - 0.25 mm (0.002 - 0.010 in)

13. CONNECTING ROD	
1) Big End I.D.	41 $^{+0}_{0}{}^{.024}$ mm (1.614 $^{+0}_{0}{}^{.0009}$ in)
2) Small End I.D.	16 $\pm^{0}_{0.015}{}^{.028}$ mm (0.630 $\pm^{0}_{0.0028}{}^{.0011}$ in)
3) Difference of Each Rod Weight	5 gr or less
14. CRANK BEARING	
1) Oil Clearance	0.020 - 0.044 mm (0.00079 - 0.00157 in)
2) Bearing Size	1. (Blue) 15 $\pm^{0}_{0.008}{}^{.012}$ mm (0.591 $\pm^{0}_{0.00031}{}^{.00047}$ in)
	2. (Black) 15 $\pm^{0}_{0.004}{}^{.008}$ mm (0.591 $\pm^{0}_{0.00016}{}^{.00031}$ in)
	3. (Brown) 15 $^{+0}_{0}{}^{.004}$ mm (0.591 $^{+0}_{0}{}^{.00016}$ in)
	4. (Green) 15 $^{0}_{-0.004}$ mm (0.591 $^{0}_{-0.00016}$ in)
15. CLUTCH	
1) Clutch Type	Wet, Multiple Type
2) Clutch Operating Mechanism	Inner Push Type, Screw Push System
3) Primary Reduction Ratio and Method	78/24 (3.250), Spar Gear
4) Primary Reduction Gear Backlash Tolerance	A–C, B–D, C–E, D–F
5) Friction Plate - Thickness/Quantity	3 mm (0.12 in) / 7 pcs
- Wear Limit	2.7 mm (0.11 in)
6) Clutch Plate - Thickness/Quantity	1.6 mm (0.063 in) / 6 pcs
- Warp Limit	0.05 mm (0.002 in)
7) Clutch Spring - Free Length/Quantity	34.6 mm (1.362 in) / 4 pcs
- Minimum Length	33.6 mm (1.323 in)
8) Clutch Housing Radial Play (Wear Limit)	0.009 - 0.043 mm (0.00035 - 0.00169 in)
9) Push Lod Bending Limit	0.2 mm (0.008 in)
10) Tightening Torque	
Primary Drive Gear (M10P1.25)	4.0 - 4.5 m-kg (29 - 33 ft-lb)
Clutch Spring Screw(M6P1.0)	0.8 - 1.2 m-kg (6 - 8.5 ft-lb)
16. TRANSMISSION	
1) Type	Constant mesh, 6-speed forward
2) Gear Ratio 1st	35/14 2.500
2nd	32/88 1.777
3rd	29/21 1.380
4th	27/24 1.125
5th	25/26 0.961
6th	26/30 0.866
3) Bearing Type - Main Axle (Left)	Needle Bearing (ϕ 20 - ϕ 30 - 15)

- Main Axle (Right)	Ball Bearing (5205)
- Drive Axle (Left)	Ball Bearing (6305N Special)
- Drive Axle (Right)	Needle Bearing (ϕ 20 - ϕ 33 - 15)
- Drive Axle (Left)	SD-35-62-6
4) Oil Seal Type	
5) Secondary Reduction Ratio and Method	40/16 2.500
6) Tightening Torque - Drive Sprocket	5 - 8 m-kg (36 - 58 ft-lb)
17. SHIFTING MECHANISM	
1) Type	Cam Drum, Return Type
2) Oil Seal Type (Change Lever)	S-12-22-5
3) Tightening Torque - Change Pedal (M6P1.0)	0.8 - 1.2 m-kg (6 - 8.5 ft-lb)
18. KICK STARTER	
1) Type	Bendix Type
2) Oil Seal Type (Kick Axle)	SD-20-30-7
3) Kick Clip Friction Tension	0.8 - 1.2 kg (1.8 - 3.1 lb)
4) Tightening Torque - Kick Crank (M8P1.25)	1.5 - 2.5 m-kg (11 - 18 ft-lb)
19. CRANKCASE	
1) Tightenign Torque	
- (M8P1.25)	2.0 - 2.4 m-kg (14.5 - 17 ft-lb)
- (M6P1.0)	0.8 - 1.2 m-kg (6 - 8.5 ft-lb)
20. INTAKE	
1) Air Cleaner - Type/Quantity	Dry, Foam Rubber / 2 pcs
2) Cleaner Cleaning Interval	Every 8,000 km (5,000 mile)
3) Valve Clearance	See No.10 - 2) Valve, Valve Seat & Valve Guide
21. CARBURETOR	
1) Type and Manufacturer / Quantity	BS34 MIKUNI / 2 pcs
2) I.D. Mark	
3) Main Jet (MJ)	#135
4) Air Jet (AJ)	ϕ 0.6
5) Jet Needle-Clip Position (JN)	4FP21-3
6) Needle Jet (NJ)	X-6
7) Throttle Valve (Th.V)	#145
8) Pilot Jet (PJ)	#17.5

9) Air Screw (Turns Out) (AS)	1-1/2 ± 1/2
10) Starter Jet (GS)	GS_1 : #40, GS_2 : ϕ 0.6, AB_1 : ϕ0.7
11) Fuel Level (FL)	32 ± 1 mm (1.26 ± 0.04 in)
12) Vacuum Synchronization (–)	5 mmHg or less
13) Idling Engine Speed (–)	1,200 ± 50 rpm
22. LUBRICATION	
1) Engine Sump Oil Q'ty (Exchange)	Oil Exchange : 2.0 lit (2.1 qt) Filter & Oil Exchange : 2.3 lit (2.4 qt) Engine Overhaulint : 2.6 lit (2.7 qt)
2) Oil Grade	Shell X-100 or Yamalube 4-cycle
3) Oil Type	SAE 20W/40 (more than 0℃, 32℉) SAE 10W/30 (below 0℃, 32℉)
4) Oil Pump Type	Trochoid Pump
5) Trochoid Pump Specifications	
- Top Clearance	0.10 - 0.18 (0.0039 - 0.0071 in)
- Tip Clearance	0.03 - 0.09 mm (0.0012 - 0.0035 in)
- Side Clearance	0.03 - 0.09 mm (0.0012 - 0.0035 in)
- Oil Pump Volume	1.2 lit/min at 500 rpm
6) Relief Valve Operating Pressure	5 ± 0.5 kg/cm^2 (71 ± 7 psi)
7) Bypass a Valve Setting Pressure	1 ± 0.2 kg/cm^2 (14 ± 3 psi)
8) Lubrication Chart	

C. CHASSIS

1. FRAME	
1) Frame Design	Semi Double Cradle, High Tensil Tube Frame
2) Tightening Torque	
- Engine Mounting Bolt (M8P1.25)	1.3 - 2.1 m-kg (9.5 - 15 ft-lb)
- " (M10P1.25)	2.7 - 4.2 m-kg (19.5 - 30 ft-lb)
2. STEERING SYSTEM	
1) Caster	63°30'
2) Trail	81 mm (3.19 in)
3) Number & Size of Balls in Steering Head	
- Upper Race	19 pcs., 1/4 in
- Lower Race	19 pcs., 1/4 in
4) Steering Lock to Lock	43° each (L and R)
5) Tightening Torque	
- Steering Shaft Fitting Nut (M14P1.25)	4.2 - 6.5 m-kg (30 - 47 ft-lb)
- (M25P1.0)	3.5 - 4.0 m-kg (25 - 29 ft-lb)
- Stem Pinch Bolt (M8P1.25)	0.9 - 1.4 m-kg (6.5 - 10 ft-lb)
Handle Bar Mounting Bolt (M10P1.25)	1.8 - 2.8 m-kg (13 - 20 ft-lb)
3. FRONT SUSPENSION	
1) Type	Telescopic Fork
2) Damper Type	Oil Damper, Coil Spring
3) Front Fork Spring	
- Free Length	484 mm (19.05 in)
- Wire Diameter x Winding Diameter	3.8 mm x 23 mm (0.15 x 0.91 in)
- Spring Constant	k = 0.4 kg/mm (0 - 100 mm)
	k = 0.475 kg/mm (100 - 140 mm)
4) Front Fork Travel	140 mm (5.5 in)
5) Inner Tube O.D.	33 mm (1.30 in)
6) Oil Seal Type	SD 33-46-10.5
7) Front Fork Oil Q'ty & Type	130 cc (4.4 oz) each leg
	Yamaha Fork Oil or SAE10W/30 Motor Oil
8) Tightening Torque	
- Under Bracket and Inner Tube - (M10P1.25)	3.0 - 4.0 m-kg (21 - 29 ft-lb)
- Handle Crown and Inner Tube (M8P1.25)	0.9 - 1.3 m-kg (6.5 - 9.5 ft-lb)
4. REAR SUSPENSION	
1) Type	Swing Arm
2) Damper Type	Oil Damper, Coil Spring

3) Shock Absorber Travel	80 mm (3.15 in)
4) Shock Absorber Spring	
- Set Length	193 mm (7.6 in)
- Free Length	205 mm (8.1 in)
- Wire Diameter x Winding Diameter	7.0 mm (0.27 in) x 56.5 mm (2.22 in)
- Spring Constant	K = 1.6 kg/mm
5) Swing Arm Free Play (Limit)	1 mm (0.04 in)
6) Pivot Shaft - Outside Diameter	16 mm (0.63 in)
7) Tightening Torque:	
- Rear Shock Absorber (Upper) (M10P 1.25)	2.2 - 3.5 m-kg (16 - 25 ft-lb)
- Rear Shock Absorber (Under) (M10P 1.25)	2.2 - 3.5 m-kg (16 - 25 ft-lb)
- Pivot Shaft (M14P 1.5)	5.0 - 8.0 m-kg (36 - 58 ft-lb)
5. FUEL TANK	
1) Capacity	11 liter (2.9 US. gal)
2) Fuel Grade	Regular Gasoline (90 octane)
6. WHEEL	
1) Type (Front and Rear)	Spoke Wheel
2) Tire Size (Front)	3.00S18 - 4PR
(Rear)	3.50S18 - 4PR
3) Tire Pressure (Front) (Normal riding)	1.8 kg/cm^2 (26 psi)
(Rear)	2.0 kg/cm (28 psi)
4) Rim Run Out Limit (Front/Rear):	
- Vertical	2 mm (0.08 in)
- Lateral	2 mm (0.08 in)
5) Rim Size (Front)	1.85 x 18
(Rear)	1.85 x 18
6) Spoke O.D.	
- Length/Q'ty (Front)	Inner 3.5 x 175.5 / 18 pcs Outer 3.5 x 175.0 / 18 pcs
- Length /Q'ty (Rear)	Inner 3.2 - 3.5 x 157.5 / 18 pcs Outer 3.2 - 3.5 x 157.0 / 18 pcs
7) Bearing Type	
- Front Wheel (Left)	6302LU/3A
- Front Wheel (Right)	6302LU/3A
- Rear Wheel (Left)	6304RS
- Rear Wheel (Right)	6303LU C3/3A

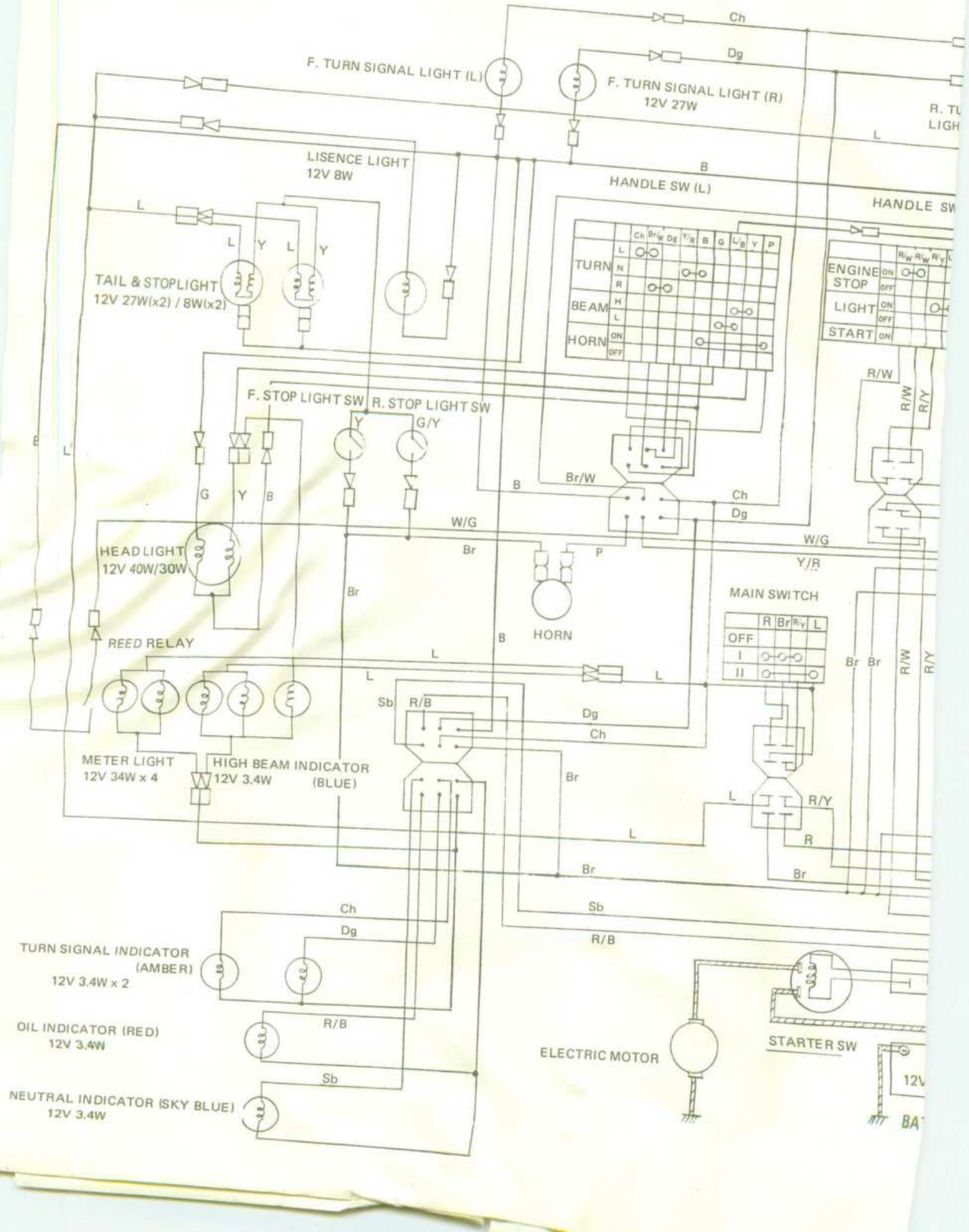
8) Oil Seal Type:	
- Front Wheel (Left)	SDD-45-56-6
- Front Wheel (Right)	SD-22-42-7
- Rear Wheel (Left)	SD-27-52-5
- Rear Wheel (Right)	—
9) Secondary Drive Chain Type:	
— Type	DK530DS
- Number of Links	99L + Joint
- Chain Pitch	15.875 mm (5/8 in)
- Chain Free Play	10 - 20 mm (0.4 - 0.8 in)
10) Tightening Torque:	
- Front Wheel Axle (M14P 1.5)	7.0 - 10 m-kg (50 - 72 ft-lb)
- Front Axle Holder (M8P 1.25)	1.5 - 2.5 m-kg (11 - 18 ft-lb)
- Rear Wheel Axle (M14P 1.5)	7.0 - 10.0 m-kg (50 - 72 ft-lb)
7. BRAKE	
1) Front Brake	
- Type	Hydraulic disc type
- Disc Size (Outside Dia. x Thickness)	267 mm (10.5 in) x 5 mm (0.2 in)
- Disc Wear Limit	4.5 mm (0.18 in)
- Disc Pad Thickness	6.5 mm (0.26 in)
- Pad Wear Limit	4.5 mm (0.18 in)
- Master Cylinder Inside Dia.	14.0 mm (0.55 in)
- Caliper Cylinder Inside Dia.	38.1 mm (1.5 in)
- Brake Fluid Type/Q'ty	DOT#3/30 cc (1.01 oz)
2) Brake Disc & Hub (M8P 1.25)	1.7 - 2.2 mpkg (12 - 16 ft-lb)
- Caliper & Support Bracket (M8P 1.25)	1.5 - 2.0 m-kg (11 - 15 ft-lb)
- Caliper & Pad (M5P 0.8)	0.2 - 0.4 m-kg (1.5 - 3.0 ft-lb)
- Caliper & Bleed Screw (M8P 1.25)	0.4 - 0.7 m-kg (3.0 - 5.0 ft-lb)
- Suppore Bracket & Front Fork (M10P 1.25)	2.5 - 4.0 m-kg (18 - 29 ft-lb)
- Caliper & Brake Hose	2.5 - 3.5 m-kg (18 - 25 ft-lb)
- Master Cylinder & Brake Hose (M10P 1.25)	2.3 - 2.8 (17 - 20 ft-lb)
3) Rear Brake	
- Type	Dram Brake
- Actuating Method	Leading Trailing
- Brake Drum I.D.	160 mm (6.3 in)
- Brake Show Dia. x Width	160 x 30 mm (6.3 x 1.2 in)
- Lining Thickness / Wear Limit	4 mm (0.16 in) / 2 mm (0.08 in)
- Show Spring Free Length	68 mm (2.68 in)

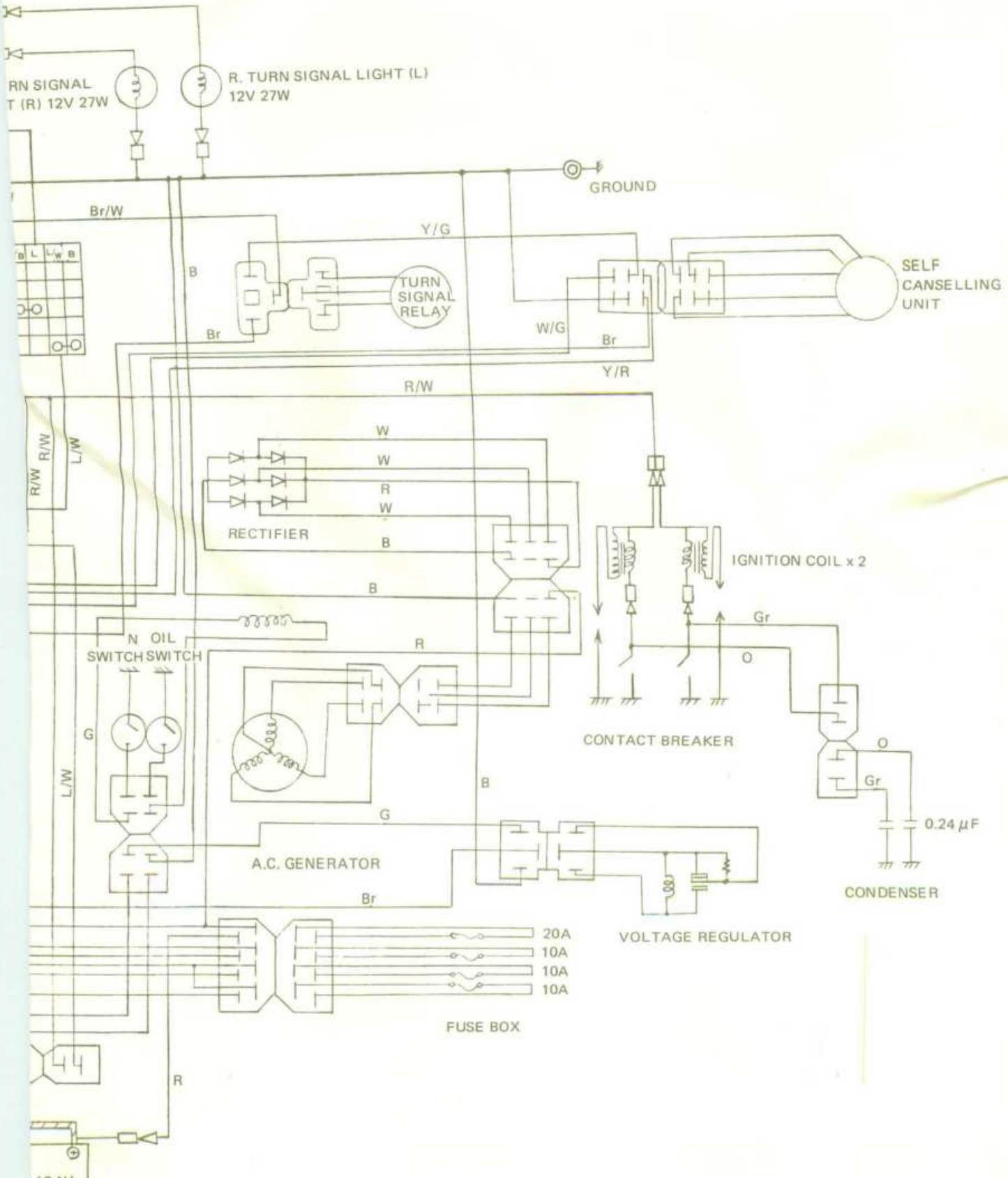
D. ELECTRICAL

1. IGNITION SYSTEM	
1) Battery (AC Generator)	
- Model / Manufacturer	021000 - 5840 / NIPPON DENSO
- Voltage	12V
- Taper Dia. At Large End	25 mm (0.98 in)
- Rotor Tightening Torque (M10P 1.25)	3.0 - 3.5 m-kg (21 - 25 ft-lb)
2) Ignition Timing, STD Ignition Timing (B.T.D.C.)	10°- 36°
3) Ignition Coil	
- Model / Manufacturer	029700-4130 / NIPPON DENSO
- Spark Gap	6 mm or more / 500 rpm
- Primary Winding Resistance	4.0Ω ± 10% at 20℃
- Secondary Winding Resistance	9.5 kΩ ± 20% at 20℃
4) Spark Plug	
- Type / Quantity	NGK BP-6ES / 2 pcs (or CHAMPION N-75)
- Spark Plug Gap	0.7 - 0.8 mm (0.027 - 0.031 in)
5) Contact Breaker	
- Manufacture / Quantity	NIPPON DENSO / 2 pcs.
- Point Gap	0.30 - 0.40 mm (0.012 - 0.016 in)
- Point Spring Pressure	800 ± 100 g
- Cam Closing Angle	105°
6) Condenser	
- Capacity	0.24 μF
- Insulation Resistance	10MΩ (500V megger used)
- Q'ty	2 pcs.
2. CHARGING SYSTEM	
1) AC Generator	
- Charging Output	14.5 V 13A / 5,000 rpm
- Rotor Coil Resistance (Filed coil)	4.04Ω ± 10% at 20℃
- Stator Coil Resistance	0.72Ω 10% at 20℃
2) Rectifier	
- Type	6 - Element Type (Full Wave)
- Model / Manufacturer	DS10TEY - L/MITSUBISHI or DE3804 / STANLEY
- Capacity	12A
- Withstand Voltage	400AV
3) Regulator	
- Type	Tillil Type
- Model / Manufacture	026000 - 2790 / NIPPON DENSO
- Regulating Voltage	14.5 ± 0.5V

4) Voltage Regulator	
- Core Gap	MIN. 0.2 mm (0.008 in)
- Yoke Gap	MIN. 0.1 mm (0.004 in)
- Point Gap	0.25 - 0.5 mm (0.01 - 0.02 in)
- Voltage Coil	10.5 $^{+2}_{-1}$ Ω at 20 C (68 F)
- Resistor	140 ± 10Ω at 20 C (68 F)
5) Battery	
- Model / Manufacture / Q'ty	12N12-4A-1 / F.B. or YUASA / 1 pc.
- Capacity	12V, 12A
- Charging Rate	1.2A 10 hours
- Specific Gravity / Q'ty	1.28/20°C, 800 cc (Total)
3. STARTER	
1) Starter Motor	
- Type	Constant Mesh Type
- Manufacturer	MITSUBA ELEC.
- Model	SM223B
- Output	0.5 KW
- Armature Coil Resistance	0.011Ω ± 10% at 20 C (68 F)
- Field Coil Resistance	0.011Ω ± 10% at 20 C (68 F)
- Brush Size / Q'ty	11 $^{+1.5}_{0}$ mm (0.43 $^{+0.06}_{0}$ in) / 2 pcs.
Wear Limit	6 mm
Spring Pressure	550 ± 55 g
- Commutator O.D. / Wear Limit	28 mm (1.1 in) / 27 mm (1.06 in)
- Mica Undercut	0.7 mm (0.027 in)
- Reduction System / Ratio	Pranetary Gear / 6.45
2) Starter Switch	
- Manufacturer	HITACHI
- Model	A104-70
- Amparage Rating	100A
- Cut-in Voltage	6.5V or less
- Winding Resistance	3.5 Ω ± 10%
4. LIGHTING SYSTEM	
1) Head Light Type	Sealed Beam
2) Bulb Wattage / Q'ty:	
- Head Light Wattage	12V, 40W/30W x 1 pc.
- Tail/Stoplight Wattage	12V, 8W/27W x 2 pcs.
- Licence Light Wattage	12V, 8W x 2 pcs.
- Flasher Light Wattage	12V, 27W x 2 pcs.

- Flasher Pilot Light Wattage	12V, 3W x 2 pcs.
- Meter Light Wattage	12V, 3W x4 pcs.
- High Beam Indicator Light Wattage	12V, 3W x 1 pc.
- Neutral Light Wattage	12V, 3.4W x 1 pc.
- Oil Level Indicator Light Wattage	12V, 3.4W x 1 pc.
- Parking Light (Front)	12V, 3W x 1 pc.
(Rear)	12V, 8W x 2 pcs.
3) Horn	
- Model / Manufacturer	CF3-12 / NIKKO
- Maximum Ameprage	2.5A
4) Flasher Relay	
- Type	Condenser Type
- Model / Manufacturer	061300-4810 6 NIPPON DENSO
- Flasher Frequency	85 ± 10 cycl/min.
- Capacity	27W x 2 + 3.4W
5) Flasher Canceling Unit	
- Model	EVH-AC518
- Voltage	DC9V - 16V
6) Fuse	
- Rating/Q'ty	MAIN (Red) 20A HEAD. L (Red/Yellow) 10A SIGNAL (Brown) 10A IGNITION (Red/White) 10A


F. TURN SIGNAL LIGHT (L)
F. TURN SIGNAL LIGHT (R)
12V 27W
LISENCE LIGHT
12V 8W
HANDLE SW (L)
TAIL & STOPLIGHT
12V 27W(x2) / 8W(x2)
TURN
BEAM
HORN
ENGINE STOP
LIGHT
START
F. STOP LIGHT SW
R. STOP LIGHT SW
HEAD LIGHT
12V 40W/30W
REED RELAY
HORN
MAIN SWITCH
OFF
METER LIGHT
12V 34W x 4
HIGH BEAM INDICATOR
12V 3.4W
(BLUE)
TURN SIGNAL INDICATOR
(AMBER)
12V 3.4W x 2
OIL INDICATOR (RED)
12V 3.4W
NEUTRAL INDICATOR (SKY BLUE)
12V 3.4W
ELECTRIC MOTOR
STARTER SW


RN SIGNAL
T (R) 12V 27W
R. TURN SIGNAL LIGHT (L)
12V 27W
GROUND
Br/W
Y/G
B
Br
TURN SIGNAL RELAY
W/G
Br
Y/R
SELF CANSELLING UNIT
R/W
R/W
R/W
L/W
W
W
R
W
B
RECTIFIER
B
IGNITION COIL x 2
Gr
O
N OIL SWITCH
OIL SWITCH
R
G
L/W
CONTACT BREAKER
O
Gr
0.24 μF
B
G
A.C. GENERATOR
Br
CONDENSER
VOLTAGE REGULATOR
20A
10A
10A
10A
FUSE BOX
R
12AH
TTERY