FOREWORD

This Service Manual has been written to acquaint the mechanic with the disassembly, reassembly, maintenance, and troubleshooting procedures required to provide optimum performance 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. The specifications or procedures in this manual are the most up-to-date at the time of publication, and we reserve the right to make any changes without further notice.

YAMAHA
1975 TT500C
SERVICE MANUAL
1st Edition, November 1975
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YAMAHA MOTOR COMPANY, LTD., JAPAN
PRINTED IN JAPAN
LIT-11616-00-11

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 knowledte.

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.
SERVICE DEPARTMENT

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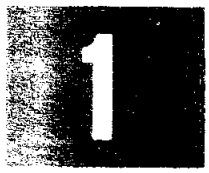
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CHAPTER 1. GENERAL INFORMATION

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CHAPTER 1. GENERAL INFORMATION

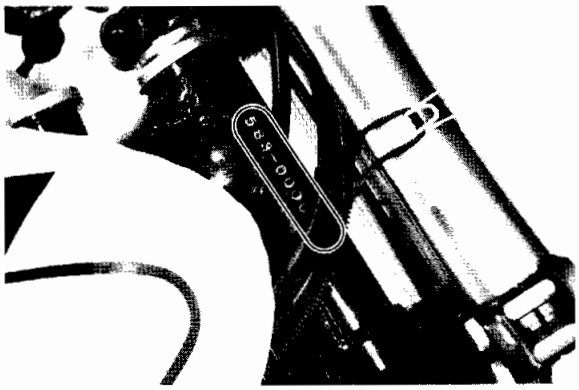
MACHINE IDENTIFICATION

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

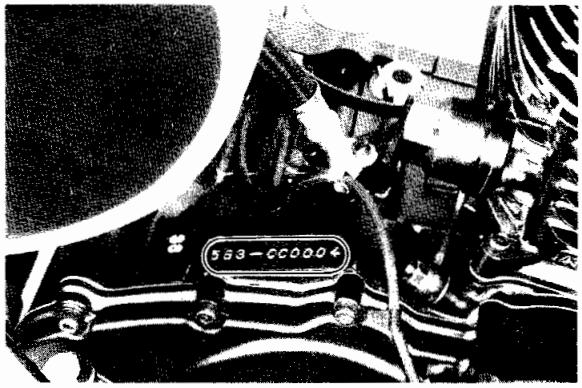
The engine serial number is located on a raised boss on the upper rear, right-hand side of the engine. Engine identification follows the same code as frame identification.

Starting Serial Number

TT500C	583-000101

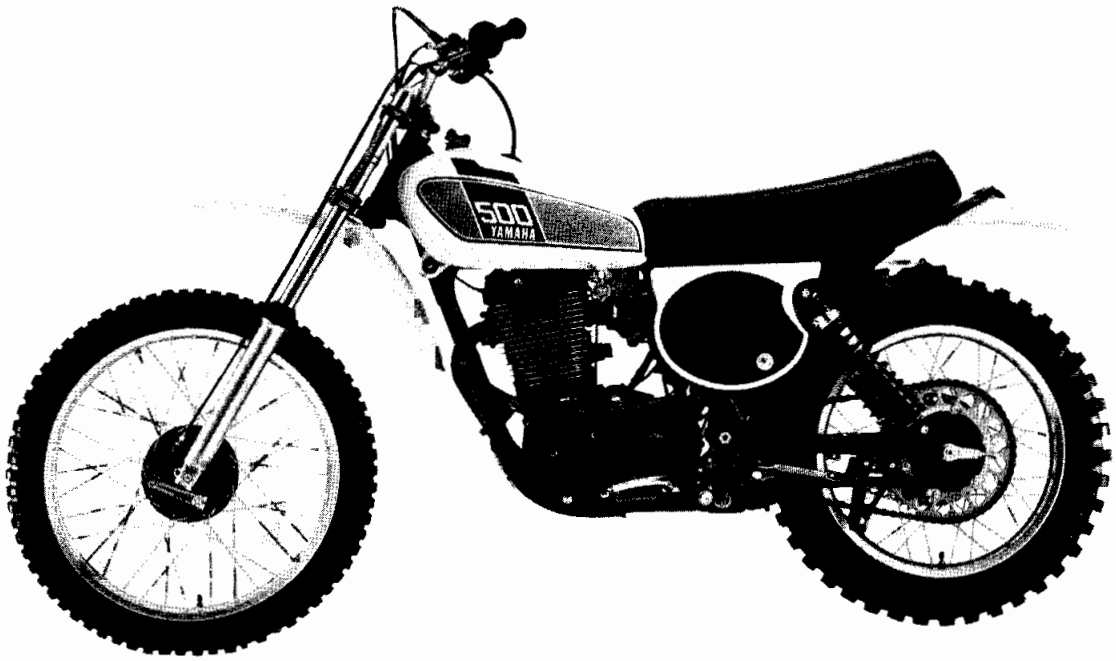


Frame serial number



Engine serial number

EXTERNAL VIEW



SPECIAL TOOLS

1. Point Checker P/NO. 90890-03031
2. Pocket Tester P/NO. 90890-03043
3. Electro Tester P/NO. 90890-03021
4. Dial Gauge P/NO. 90890-03002
5. Flywheel Holding Tool
   P/NO. 90890-01032
6. Flywheel Puller P/NO. 90890-01189
7. Clutch Holding Tool
   P/NO. 90890-01024
8. Crankcase Separating Tool
   P/NO. 90890-01135
9. Spacer P/NO. 90890-01202
10. Crankshaft Setting Pot
    P/NO. 90890-01012
11. Crankshaft Setting Bolt
    P/NO. 90890-01017
12. Ring Nut Wrench P/NO. 90890-01051
13. Spoke Wrench P/NO. 90890-05019
14. Valve Seat Cutter Set
    P/NO. 90890-01203
15. Valve Guide Installer
    P/NO. 90890-01128
16. Valve Guide Remover
    P/NO. 90890-01065
17. Compression Gauge
    P/No. 90890-03081
18. Valve Spring Compresser
    P/NO. 90890-01095
19. Hand Reamer P/NO. 90890-01211
20. Drive Chain Cutter
    P/NO. 90890-01081
21. Drive Chain Cutter Attachment
    P/NO. 90890-01213

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CHAPTER 2.
PERIODIC INSPECTIONS AND ADJUSTMENTS

MAINTENANCE AND LUBRICATION CHART

The following charts should be considered strictly as a guide to general maintenance 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 alter 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.

MAINTENANCE AND LUBRICATION SCHEDULE CHART

Page	Item	Initial	Thereafter every		As required
		500 km (300 miles)	3,000 km (2,000 miles)	6,000 km (4,000 miles)	
	ENGINE				
10	Change engine oil	× (1)	×		
10	Change oil filter	×		×	
31,50	Clean oil strainer	×		×	
13,34	Adjust valve	×	×		×
12	Adjust cam chain	×			×
13	Check compression	×		×	×
32,52	Check cylinder head bolt torque	×		×	
43	Adjust clutch	×	×		×
7	Check and adjust carburetor	×	×		×
7	Clean carburetor				×
	Inspect exhaust system	×		×	×
54	Check flywheel nut torque	×			×
14	Check decomp.	×	×		×
	Check oil pressure	×		×	×
8	Clean and oil air filter	× (5)	× (5)		× (5)
8	Replace air filter				×
	CHASSIS				
14～15	Adjust brake (front and rear)	×	×		×
70	Check front fork	×	×		
17	Change fork oil	× (4)			× (4)
75	Check rear shock absorber	×	×		
18	Check swing arm	×		×	×
76	Check and adjust controls and cables	×	×		
18	Lubricate cables	× (2)	× (2)		× (2)
71	Check steering head	×		×	
18	Lubricate swing arm pivot			× (3)	× (3)
67	Check rim runout	×		×	×

Page	Item	Initial	Thereafter every		As required
		500 km (300 miles)	3,000 km (2,000 miles)	6,000 km (4,000 miles)	
67	Check spoke tension	×		×	×
66	Check wheel bearing	×			×
16	Check drive chain tension and alignment	×	x		×
16	Clean and lubricate drive chain	× (2)	× (2)		× (2)
68	Replace drive chain				×
23	Clean fuel tank				×
14	Clean petcock				×
	ELECTRICAL				
19	Check breaker points	×	×		×
79	Check and adjust ignition timing	×	×		×
79	Check wiring connection	×	×		×
20,79	Check spark plug	×	×		×
80	Replace spark plug				×

NOTES:

No. 1 At ambient temperature above 15°C (59°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.

No. 5 Air filter element must be damp with oil at all times to function properly. Clean and lube every outing. Do not over-oil. Use SAE 30W oil.

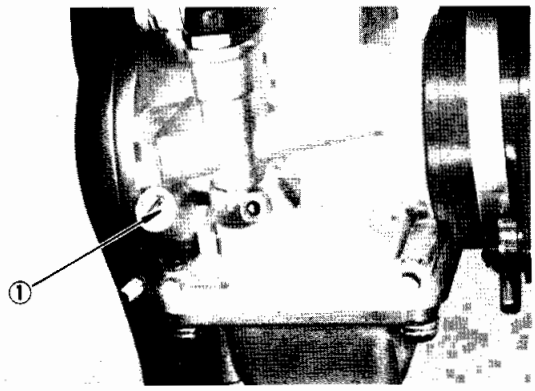
ENGINE

Carburetor

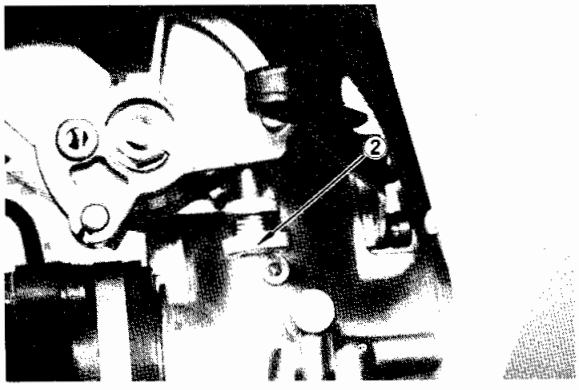
1. Idle mixture and idle speed adjustment.
   a. Turn the pilot screw in until lightly seated.
   b. Back out 1-1/4 turns.
   c. Turn the idle speed adjust screw until idle is at desired rpm.
   d. Turn the pilot screw in or out until speed is at highest rpm.
   e. Turn the idle speed adjust screw in or out until idle speed is at desired rpm.

   NOTE:
   Pilot screw and idle speed adjust screws *should* be adjusted so that engine responds from idle position without hesitation.

Pilot screw: Back out 1-1/4 turns Idle speed: 1,100 rpm.



1. Pilot screw

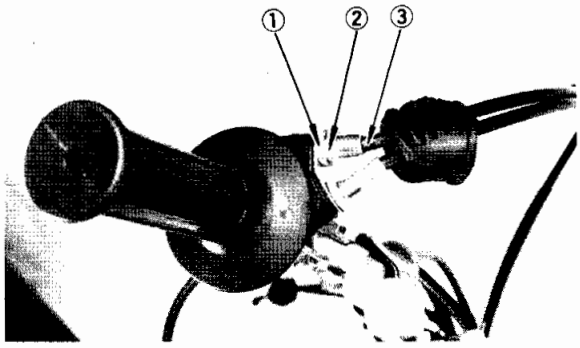


1. Idle speed adjust screw

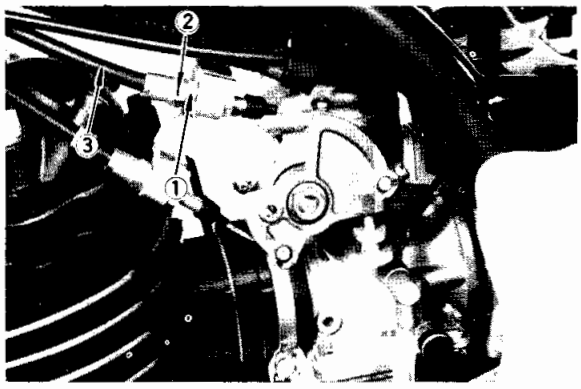
2. Throttle cable adjustment

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

   The throttle grip should have a play of 2 ~ 5 mm (0.08 ~ 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 adjuster lock nut on the carburetor side of throttle cable 1, *and turn* the adjustor in or out so the play is correct. After the adjustment, tighten the locknut.
   b. If the play is still incorrect after the adjustor is loosened 5 mm (0.20 in), remove the rubber cap on the throttle grip side and make an adjustment with the adjustor on the grip side.



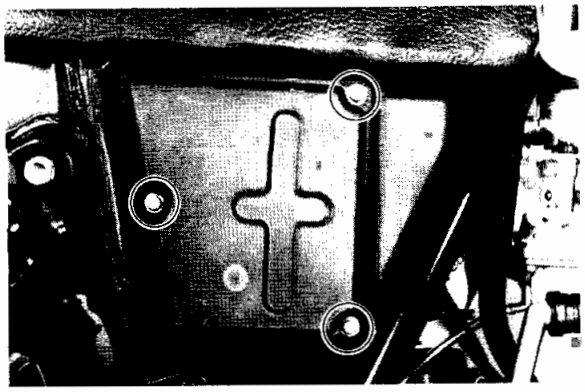
1. Adjuster locknut 2. Adjuster 3. Throttle cable 1



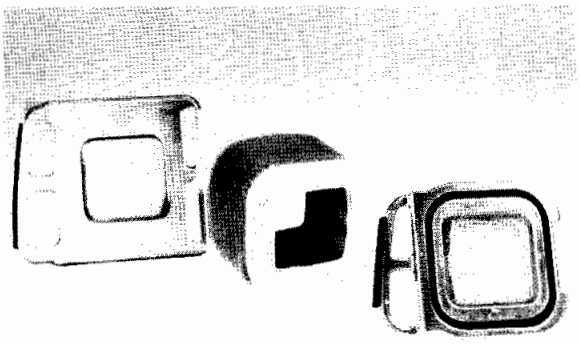
1. Adjuster locknut 2. Adjuster 3. Throttle cable 1

Air Filter

1. Remove the right number plate.
2. Remove the screws from the filter case cover and remove the cover.



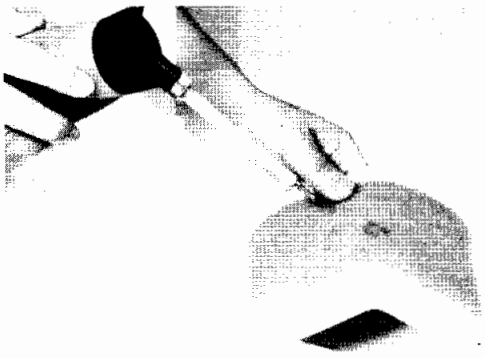
3. Remove the filter element from the filter case.



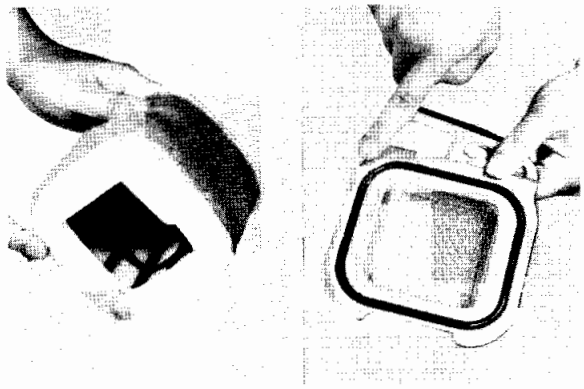
4. Slip the element from the guide.
5. Wash the element gently, but thoroughly, in solvent.
6. Squeeze the excess solvent out of the element and let dry.
7. Pour a small quantity of 30W motor oil onto the filter element and work thoroughly into the porous foam material.

NOTE:

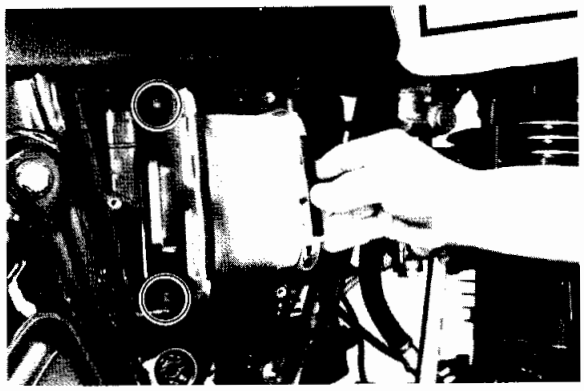
In order to function properly, the element must be damp with oil at all time ... but not "dripping" with oil.



8. Re-insert the wire mesh guide into the element.
9. Coat both edges of the filter with all-purpose grease for an air-tight seal between the filter case cover and filter seat.



10. Install the filter element into the case.



11. Install the case cover and right number plate.

Engine Oil

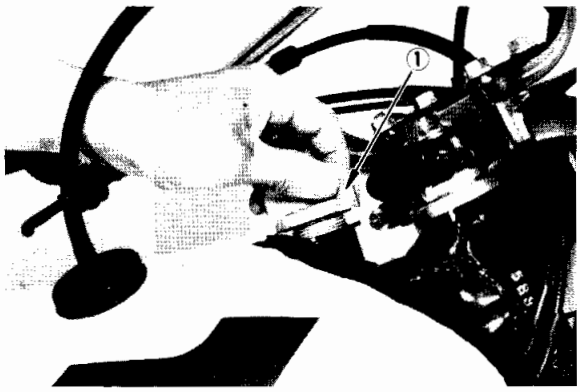
1. *Oil level measurement.*

a. Place the machine on a level place and hold it in an upright position.

b. Remove the oil filler cap, and check the oil level.

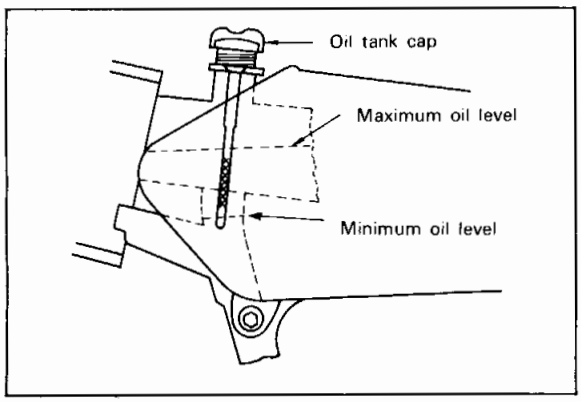
NOTE:

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



1. Oil filler cap

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



d. If there is no oil on the oil level gauge, add oil up to the minimum level. Start the engine and warm up until the oil temperature rises to approximately 50°C (122°F). Stop the engine and check the oil level.
Adjust the oil level so it is between the maximum and minimum level lines.

CAUTION:

When the oil tank is empty, be sure to add oil before starting the engine.

WARNING:

Never attempt to remove the oil tank filler cap just after high speed operation.
The heated oil could spout out, causing injury.
Wait until the oil cools down to approximately 50°C (122°F).

2. Oil capacity

a. Regular oil replacement:
2.0 lit (2.1 US.qt)

b. Oil filter replacement:
2.1 lit (2.2 US.qt)

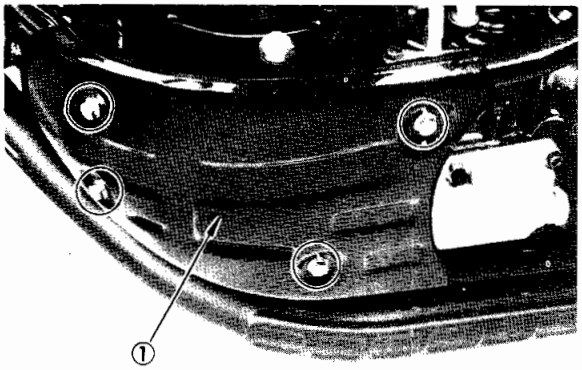
Engine Oil and Oil Filter Replacement

1. Oil filter replacement

NOTE:

When replacing the engine oil after the break-in period, clean the oil stainer at the bottom end of frame downtube and 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 engine under-guard, and place an oil pan under the engine.

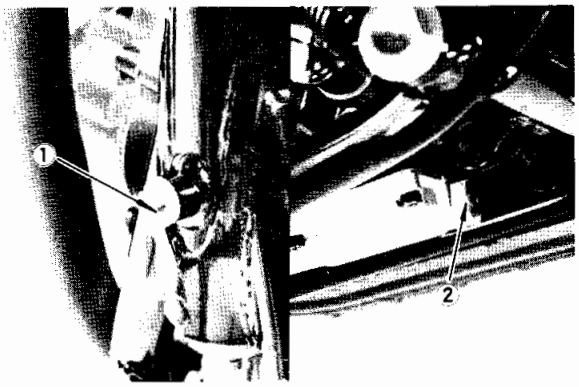


1. Under-guard

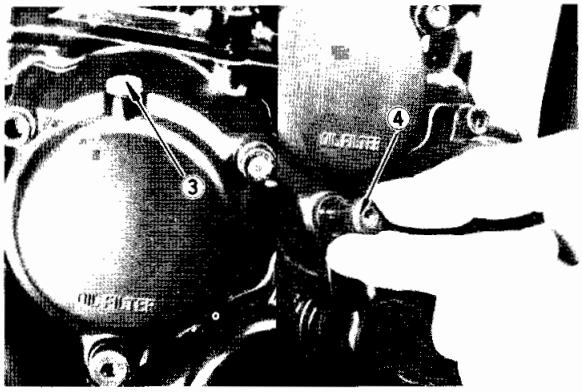
c. Remove the oil tank filter cap, drain plugs (at two places) and air bleeder screw attached to the oil filter cover, and drain the engine oil.

NOTE:

The oil filter cover is secured by three screws. The lower one should be loosened until the threaded portion comes out completely.

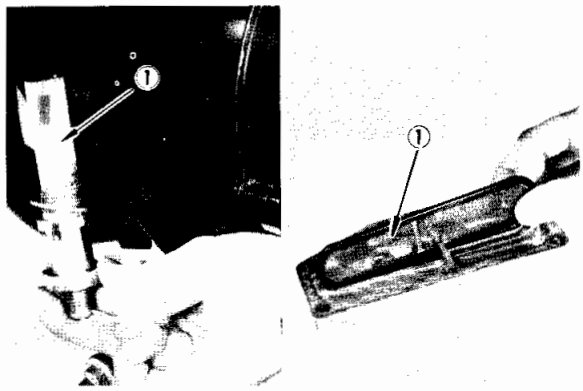


1. Drain plug 2. Drain plug



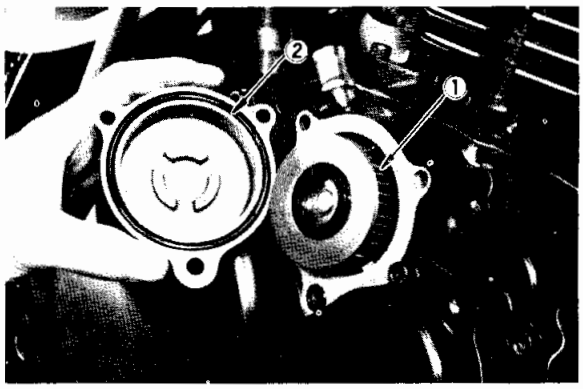
3. Air bleed screw 4. Filter cover screw

d. Remove the oil pipe attached to the frame downtube, and remove the oil strainer. Clean the filter screen. Remove the oil strainer at the bottom of the engine, and clean.



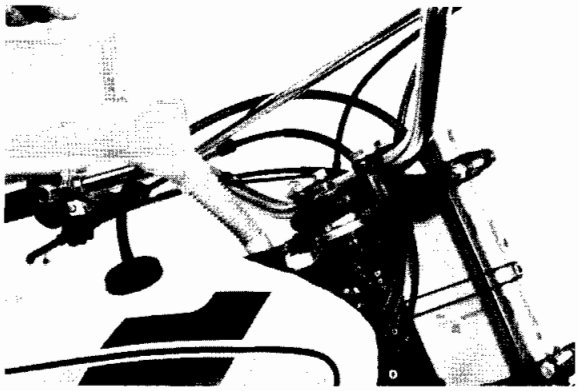
1. Filter screen

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



1. Filter element 2. "O" ring

f. Install the drain bolts, air bleeder screw, oil filter, oil pipes and engine underguard.
h. Add 2.1 liters (2.2 US.qt) of engine oil. Install the oil tank filter cap and tighten. Use 20W/40 type "SE" oil.



i. 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.
j. After warm up, stop the engine and check the oil level. (Refer to page 9, "**Engine Oil**".)

2. Regular oil replacement
(without replacing filter)

a. Start the engine and stop after a few minutes of warm-up.
b. Place an oil receiver under the engine.
c. Remove the oil tank filter cap, drain plugs (at two places), and air bleeder screw attached to the oil filter cover.

NOTE:
The oil filter cover is secured by three screws. The lower one should be loosened until the threaded portion comes out completely.

d. Check each gasket. If damaged replace.
e. Install the drain bolts (at two places) and the bleed screw.
f. Add 2.0 liters (2.1 US.qt) of engine oil. Install the oil tank filter cap and tighten.
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. Stop the engine and check the oil level. (Refer to page 9, "**Engine Oil**".)

CAUTION:
After replacement of engine oil, be sure to check the oil pressure in the following procedure.

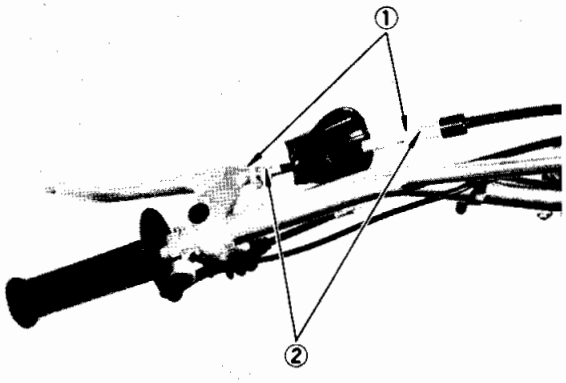
1. **Remove the air bleeder screw from oil filter cover.**
2. **Start the engine and keep it idle running till oil flows out of the bleeder hole.**
If no oil comes out even after a lapse of over one minute, cut the engine immediately for fear of seizure.
Re start the engine after solving the problem(s) and recheck the oil pressure.

Clutch Adjustment

This model has two clutch cable length adjusters and a clutch mechanism adjuster. 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.

Freeplay Adjustment

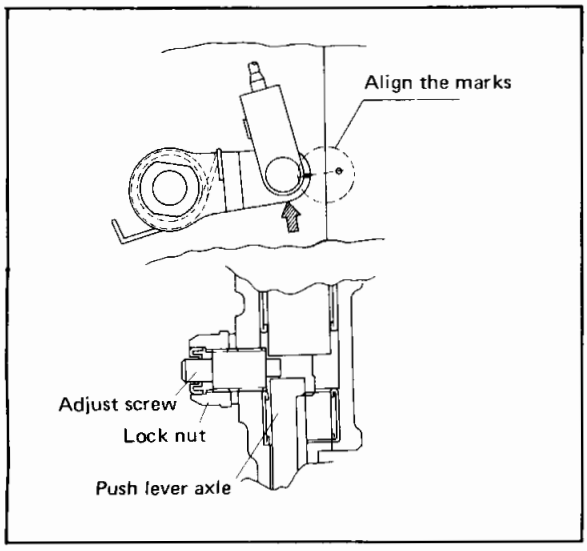
Loosen either the handle lever adjustor lock nut or the cable in-line length adjuster lock nut. Next, turn the length adjustor either in or out until proper lever free play is achieved (see illustration).



1. Adjuster locknut
2. Adjuster

Mechanism Adjustment

1. Remove left side crankcase cover and loosen the adjusting screw lock nut.
2. Turn the adjusting screw in until lightly seated.
3. Push the push lever toward the front with your finger until it stops. With the push lever in this position, back out the adjusting screw and as illustrated, align the mark on the end of the push lever with the mark (protuberance) on the crankcase.

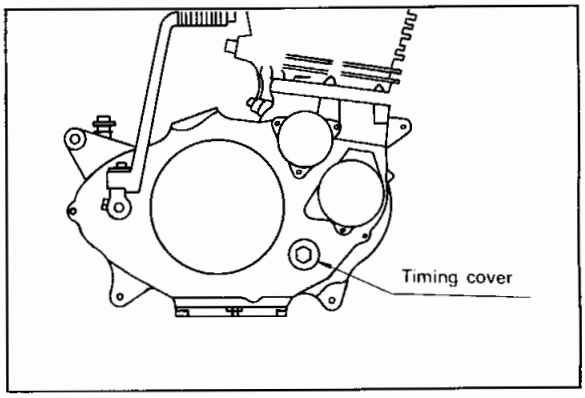


4. Tighten the adjusting screw lock nut and install the left side crandcase cover.

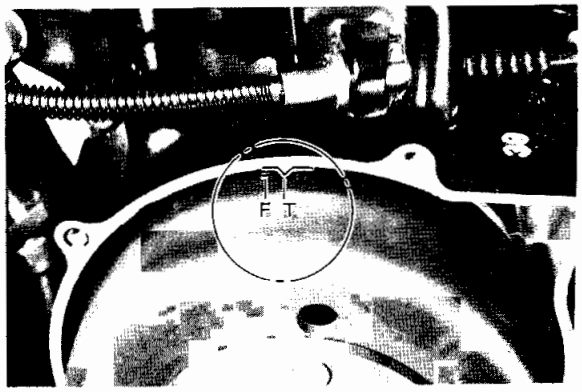
Cam Chain Adjustment

NOTE:

The timing mark can also be seen by removing the timing cover from the right hand crankcase cover.



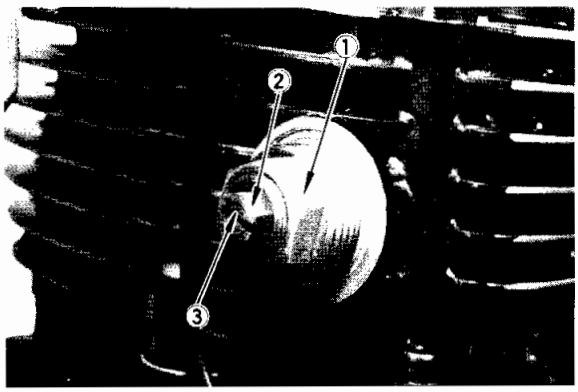
1. Remove the left crankcase cover.
2. Rotate crank shaft in a counterclockwise direction (viewed from the left side of the engine) to place all slack in the area of the chain tensioner.
   Align the "T" mark on the flywheel with the timing mark on the crankcase at the compression stroke.



3. Remove the adjustor cap.
4. Loosen the adjustor lock nut.
5. Turn the adjustor in until the push rod (inside the adjustor) is flush with the end of the adjustor.

NOTE:

Start the engine. While keeping it idling, check the movement of the push rod. If it moves slightly, the adjustment is correct. If it does not moves at all, the adjustor is too tight. Loosen the adjustor so the push rod moves slightly. slightly.



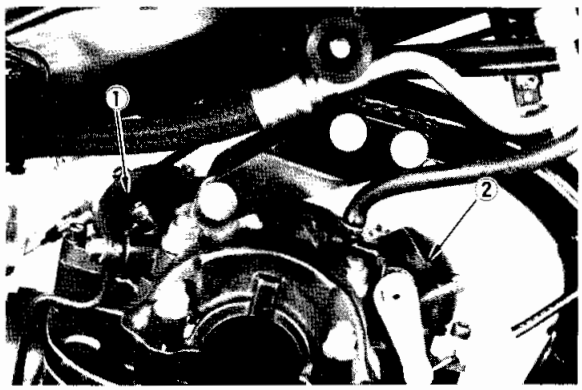
1. Adjuster locknut 2. Adjuster 3. Push rod

6. Tighten the adjustor lock nut.
7. Install the adjustor cap and the left crankcase cover.

Adjustor cap tightening torque:
1.5 ~2.0 m-kg
(10.8 ~ 14.5 ft-lb)

Valve Clearance Adjustment

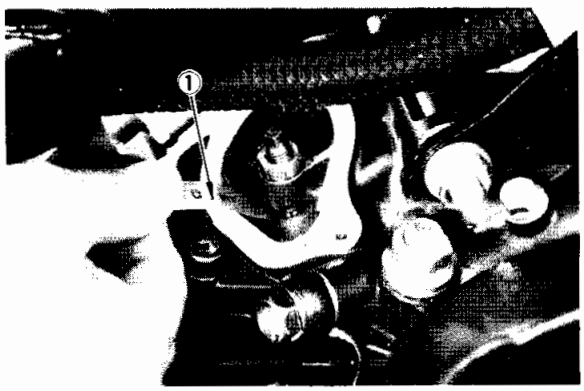
1. Remove the bolts (2) securing the seat to the frame. Remove the seat.
2. Turn the fuel petcock to "OFF" and disconnect the fuel pipe and air breather pipe.
3. Remove the bolts (3) securing the fuel tank to the frame and remove the fuel tank.
4. Remove intake and exhaust tappet covers and left crankcase cover.



1. Intake tappet cover 2. Exhaust tappet cover

5. Align the "T" mark on the flywheel with the timing mark on the crankcase.
   This places the piston at the top dead center and the valve clearance should be checked and adjusted at T.D.C. on the compression stroke by observing when the valve adjustors have clearance.
6. Use a feeler gauge to determine the clearance.

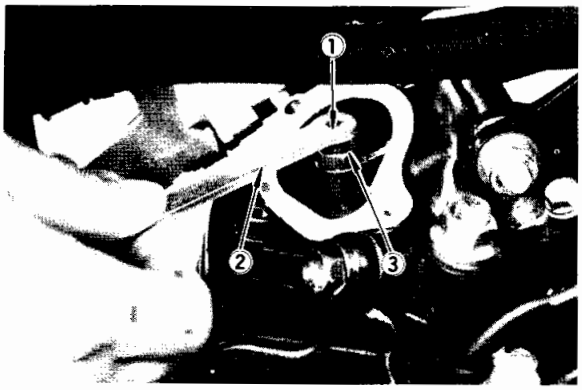
Intake valve (Cold):
0.07 ~ 0.12 mm
(0.003 ~ 0.005 in)
Exhaust valve (Cold):
0.12 ~ 0.17 mm
(0.005 ~ 0.007 in)



1. Feeler gauge

7. 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.



1. Adjuster 2. Valve adjust wrench 3. Adjuster locknut

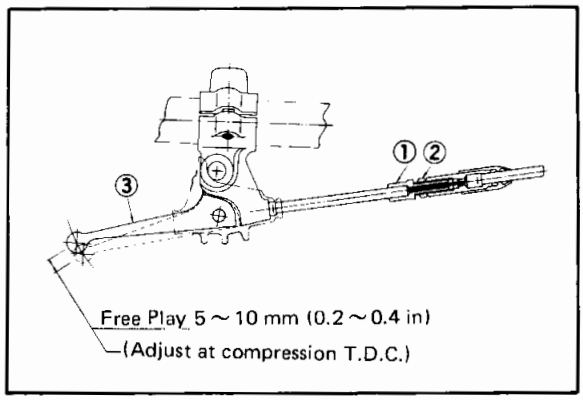
8. Install the intake and exhaust tappet covers and left crankcase cover.
9. Install the fuel tank and seat.
10. Connect the pipes.

Decompression Wire Adjustment

1. Loosen adjuster lock nut.
2. Adjust the play of decompression wire by turning the adjuster.

Decompression wire free play: 5 ~ 10 mm (0.2 ~ 0.4 in) at the end of decompression lever

NOTE:
1. The play of the decompression wire should be adjusted by turning the wire adjuster with the piston positioned at T.D.C. on the compression stroke.
2. Before making this adjustment, keep the handlebars fully turned to the left.



1. Adjuster 2. Locknut 3. Decompression lever

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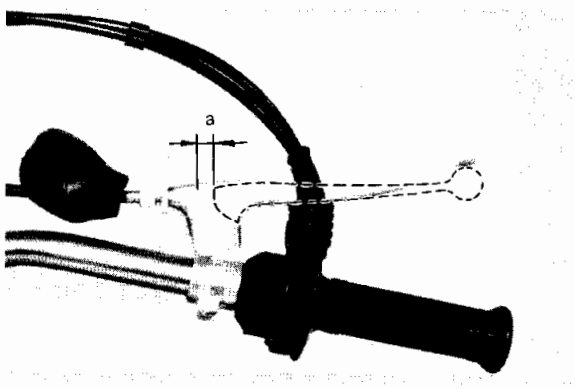
Fuel Petcock

1. First, set the petcock lever to the "OFF" 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.

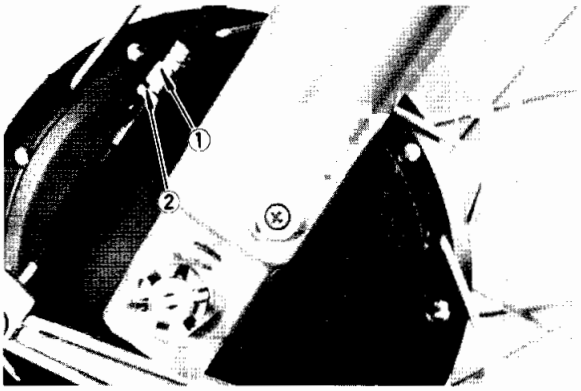
Front Brake and Wheel

Front brake should be adjusted to suit rider preference with a minimum cable slack of 5 ~ 8 mm (0.2 ~ 0.3 in) play at the brake lever pivot point. Adjustment is accomplished at one of two places; either the handle lever holder or the front brake hub.

1. Loosen the adjustor lock nut.
2. Turn the cable length adjustor in or out until adjustment is suitable.



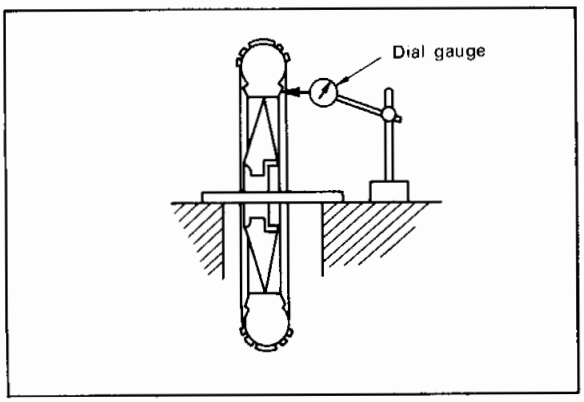
a. 5 ~ 8 mm (0.2 ~ 0.3 in)



1. Adjuster
2. Adjuster locknut

3. Tighten the adjustor lock nut.
4. Spoke adjustment and torque
   a. Raise the wheel off the ground.
   Spin wheel.
   Check rim run out as shown in illustration.

Rim Runout Limits
Vertical: 2 mm (0.08 in)
Lateral: 2 mm (0.08 in)



   b. Check each spoke for tightness.

Spoke Torque
Front Wheel:
0.3 m-kg (2.2 ft-lb)
Rear Wheel:
0.3 m-kg (2.2 ft-lb)

5. Front axle
   a. Check axle nut.

Front Axle Nut Torque:
7.0 ~ 10.0 m-kg
(50.6 ~ 72.3 ft-lb)

   b. Check axle holder nuts (right side).

1.6 ~ 2.2 m-kg
(11.6 ~ 15.9 ft-lb)

CAUTION:
First tighten the nut on the front end of the axle holder, and tighten the nut on the rear end.

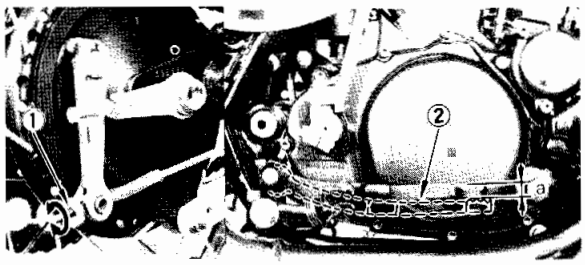
6. Tire pressure

Front Tire Pressure:
(Normal Riding)
0.9 kg/cm² (13 psi)

Rear Brake and Wheel

1. Adjust rear brake pedal play to suit, providing 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.



1. Adjuster
2. Brake pedal

a. 20 ~ 30 mm (0.8 ~ 1.2 in)

2. Brake lining check
   Brake linings can be checked through the inspection hole in the shoe plate. If thickness is less than 2 mm (0.08 in), replace the brake shoes.
3. Spoke adjustment and tension
   Adjust rear wheel spoke tension per front wheel instructions.
4. Rear axle
   Check axle nut.

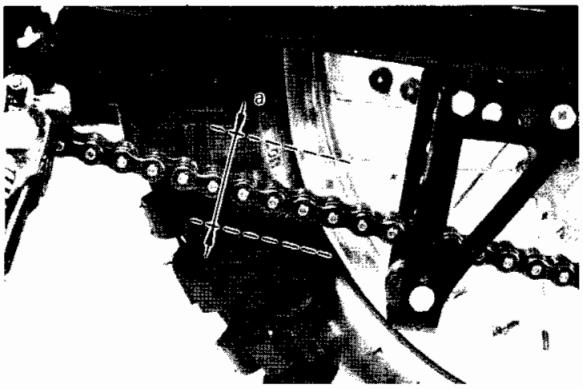
Rear Axle Nut Torque:
6.0 ~ 9.5 m-kg
(43.4 ~ 68.7 ft-lb)

5. Tire pressure

Rear Tire Pressure:
(Normal Riding)
1.1 kg/cm² (15 psi)

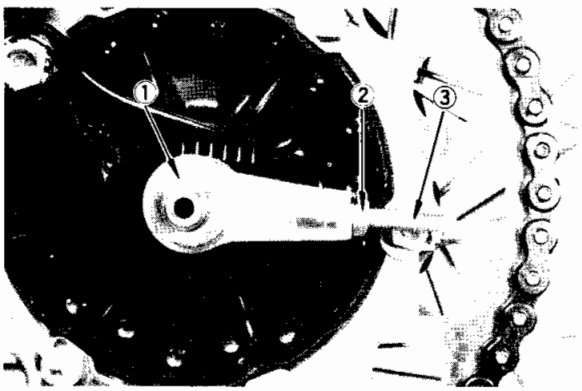
Drive Chain Tension Check

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 25 mm (1 in). If the deflection exceeds 25 mm (1 in), adjust the chain tension.



a. 25 mm (1.0 in)

Drive Chain Tension Adjustment



1. Axle nut 2. Adjuster bolt locknut 3. Adjust bolt

1. Loosen the rear brake adjust nut.
2. Loosen the rear wheel axle nut.
3. Loosen the adjust bolt lock nuts on each side. To tighten chain turn chain puller adjust bolts clockwise. To loosen chain turn adjust bolts counterclockwise and push wheel forward. Turn each bolt exactly the same amount to maintain correct axle 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: 25 mm (1.0 in) (rider in position on machine)

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 "tight 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.

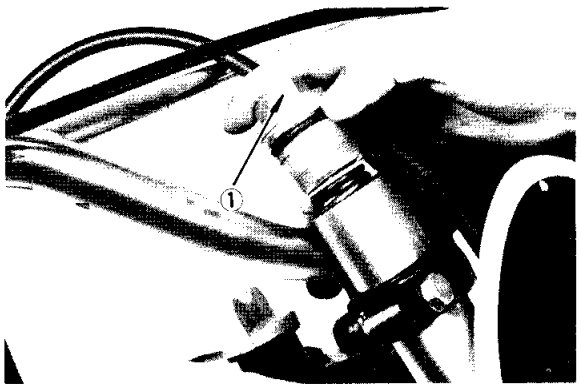
Drive Chain Lubrication

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 out as possible. 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

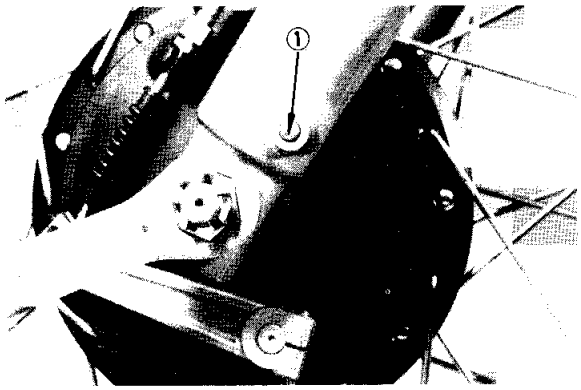
Front Fork Oil Change

1. *Elevate* front wheel by placing a suitable stand under the engine.
2. Remove cap bolts from inner fork tubes.



1. Cap bolt

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.

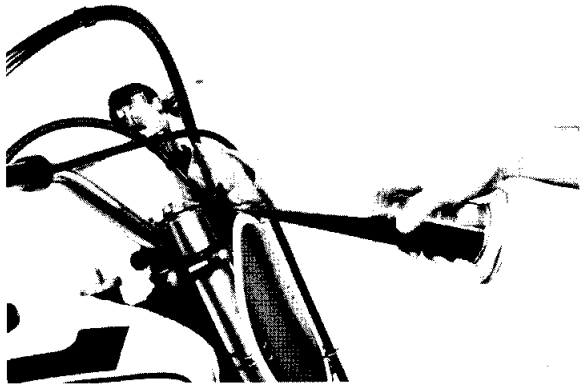
NOTE:
Check gasket, replace if damaged.

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

Recommended oil:
Yamaha fork oil or
10W, 20W, 30W

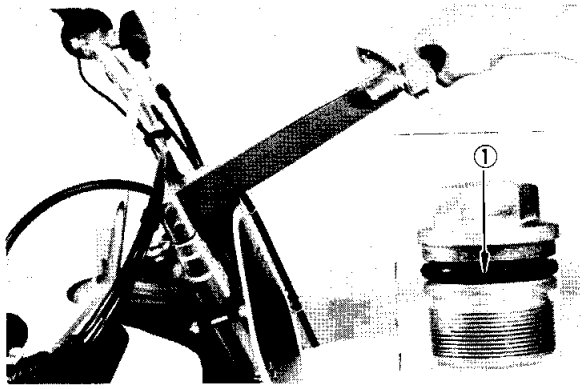
Quantity per leg:
217 ±2 cc
(7.34 ±0.068 oz)

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 bolts and replace if damaged.
9. Replace fork cap bolts and torque to specification.

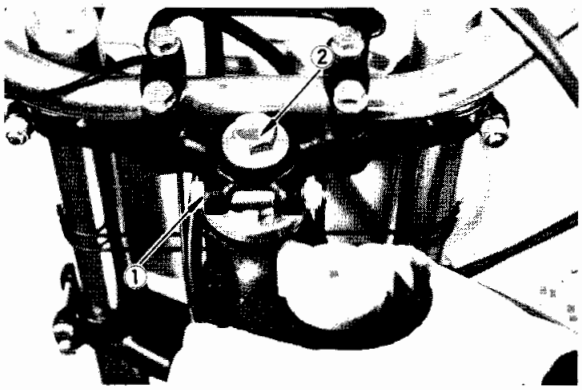
Fork cap bolt torque:
1.5 ~ 2.5 m-kg
(10.8 ~ 18.1 ft-lb)



1. "O" ring

Suspension, Steering and Swing Arm

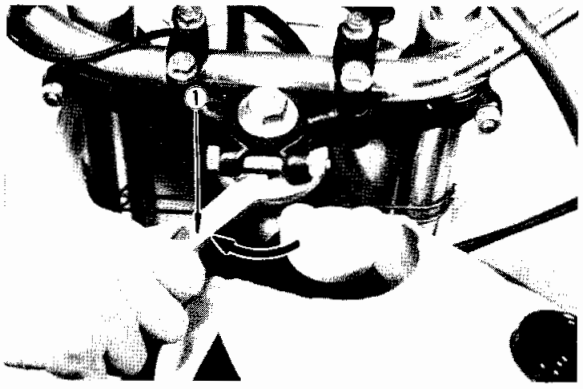
1. Steering head adjustment
a. Block machine up so that front wheel is off the ground.
b. Grasp bottom of forks and gently rock fork assembly backward and forward, checking for any looseness in the steering assembly bearing.
c. If steering head needs adjustment, loosen crown pinch bolt and steering fitting bolt.



1. Crown pinch bolt 2. Steering fitting bolt

d. Using ring 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 looseness and freedom of movement.



1. Ring nut wrench

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 fittings for proper tightness.
c. Check rear shocks (R and L) for identical adjustment.
3. Swing Arm
a. Check for freedom of up and down movement.
b. Check side to side freeplay.

Swing Arm Freeplay:
1.0 mm (0.04 in)
at end of swing arm

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

Rear Shock Absorber

See Chapter 5. "Rear Shock Absorber".

Cable Inspection and Lubrication

1. Damage to the outer housing of the various cables, may cause corrosion and often free movement will be impaired. An unsafe condition may result so replace cables as soon as possible.
2. If the inner cables do not operate smoothly, lubricate or replace them.

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

Throttle Cables and Grip Lubrication

The throttle twist grip assembly should be greased at the time that the cables are lubricated, since the grip must be removed to get at the ends of the throttle cables.
Two screws hold the throttle housing to the handlebar. Once these two screws are removed, the ends of the cables can be held high to pour in several drops of lubricant.
With the throttle grip disassembled, coat the metal surfaces of the grip assembly with a suitable all-purpose grease to cut down friction.

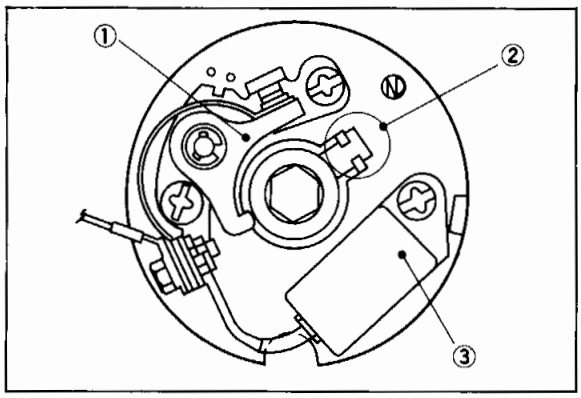
Lubrication of Levers, Pedals, etc.

1. Lubricate the pivoting parts of the decompression lever, brake and clutch levers with motor oil (10W/30).
2. Lubricate the shaft of the brake pedal with lithium soap grease.

ELECTRICAL

Contact Breaker Points

1. Apply a few drops of light-weight machine oil or distributor lubricant to the point cam lubricator.



1. Contact breaker 2. Point cam lubricator 3. Condenser

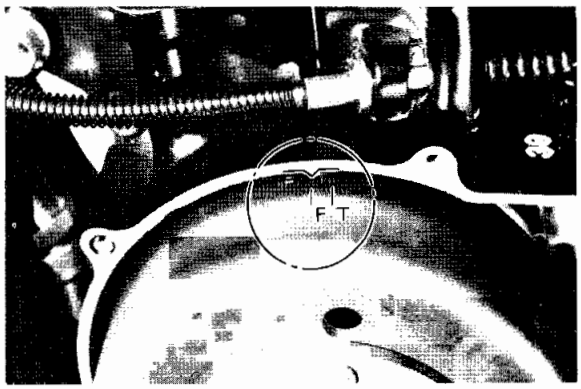
2. The ignition points can be lightly sanded with 400 or 600 grit sandpaper to remove corrosion. Place a piece of clean paper between the points, let them close, and repeatedly remove the paper until no residue shows.
   The paper may be dipped in lacquer thinner or point cleaning fluid to remove oil and sanding residue from point surfaces.
3. Point replacement should only be necessary when point gap exceeds maximum tolerance; when the points are severely pitted; or if the points become shorted or show foulty operation.

NOTE:
New points, when installed, must be cleaned and adjusted.

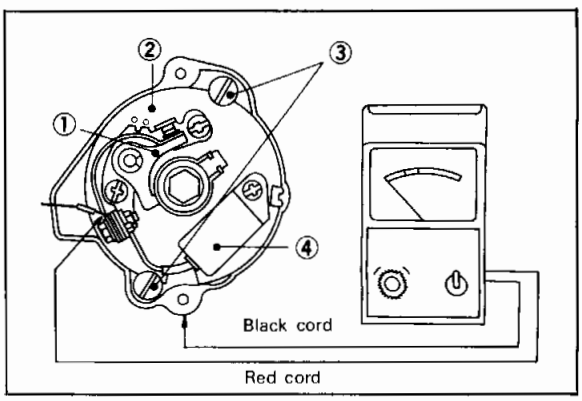
Point gap: 0.35 mm (0.014 in)

Ignition Timing

1. Remove left-hand crankcase cover and align the "F" mark on the flywheel with the timing mark on the crankcase. The ignition points should open as the crank shaft passes this point.



2. Remove contact point cover and connect a Yamaha point checker or an ohmmeter (Ω × 1 scale) as shown.



1. Contact breaker points
2. Base plate
3. Base plate set screw
4. Condenser

3. Loosen base plate set screws and move the base plate assembly to the position where the point checker indicates that the points are just breaking contact (needle will move from zero slightly). Tighten base plate set screws.
4. Check setting by turning flywheel backward (points will close) and the direction of normal rotation. The points should *open as the* "F" mark passes crankcase mark.
5. Repeat steps 1 ~ 4 until the contact points open at the proper time.
6. Check timing with timing light. Check from idle to high speed to verify full advance.

Spark Plug

The spark plug indicates how the engine is operating. If the engine is operating correctly, and the machine is being ridden correctly, then 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 is actually pure white and glazed or if electrodes show signs of melting, then a spark plug with a color 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 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, torque the spark plug properly.

Standard Spark Plug: BP-7ES (NGK)
Tightening torque: 2.5 ~ 3.0 m-kg (18 ~ 22 ft-lb)

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CHAPTER 3.
ENGINE OVERHAUL

REMOVAL

Preparation for Removal

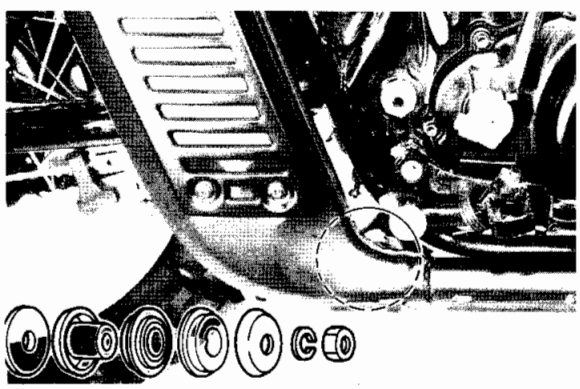
1. All dirt, mud, dust and foreign material should be thoroughly removed from the exterior of the before removal and disassembly. This will prevent any harmful foreign material from entering the interior of engine assembly.
2. Before engine removal and disassembly, be sure you have proper tools and cleaning 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 insure correct reinstallation of all engine parts.
4. Start the engine and warm it for a few minutes; turn off and drain engine oil.

Fuel Tank Assembly

1. Remove the seat and fuel tank.
2. Remove left and right side covers.

Muffler, Footrest and Brake Pedal

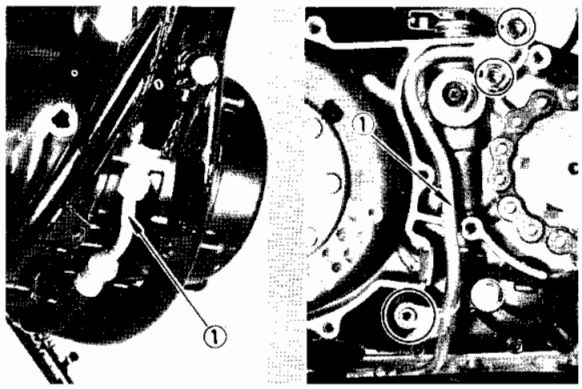
1. Remove spark arrester.
2. Remove the nuts holding the exhaust pipe to the cylinder head.
3. Remove the bolt and damper holding the exhaust pipe to the frame.



4. Remove the exhaust pipe assembly
5. Remove the right side footrest
6. Remove the brake pedal

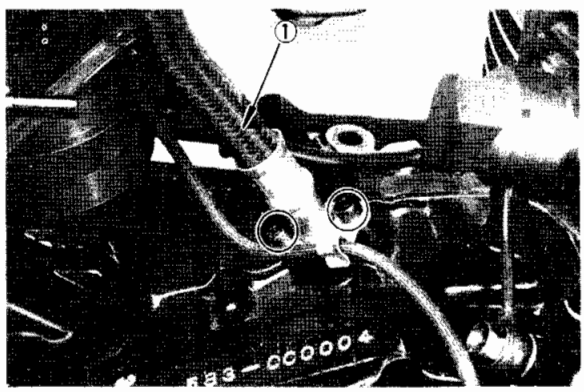
Wiring and Cables

1. Remove spark plug cap.
2. Remove decompression wire.
3. Remove change pedal.
4. Remove left crankcase cover.
5. Remove the oil hose (Inlet).

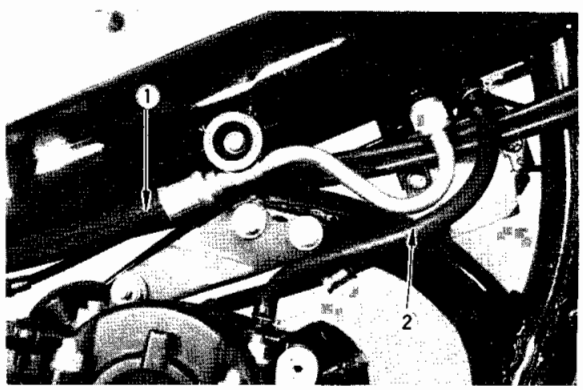


1. Oil hose (inlet)

6. Remove oil hose (Outlet) and ventilation hose.

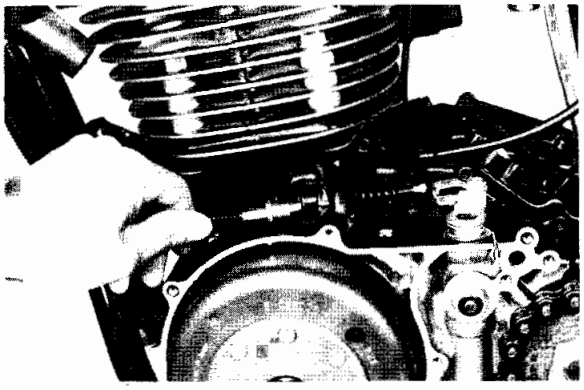


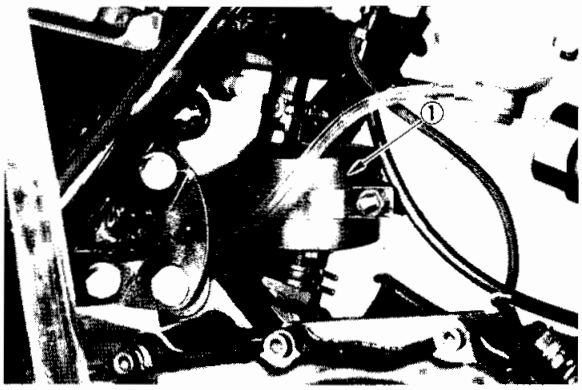
1. Oil hose (outlet)



1. Oil hose (outlet) 2. Ventilation hose

7. Remove clutch wire at handle lever first and then at clutch push lever. Next, remove breather assembly.

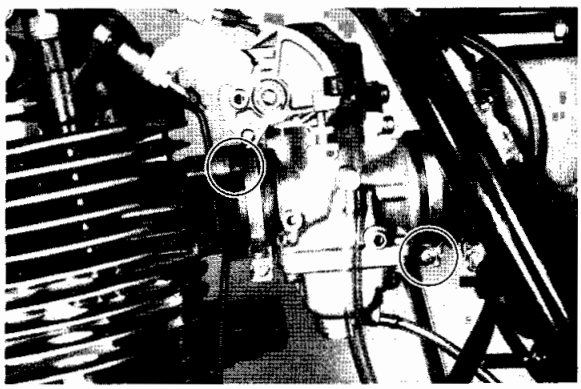




1. Breather assembly

Carburetor

1. Remove carburetor joint holding bolts (2) and loosen carburetor hose clamp (air cleaner side) as shown in the photo.



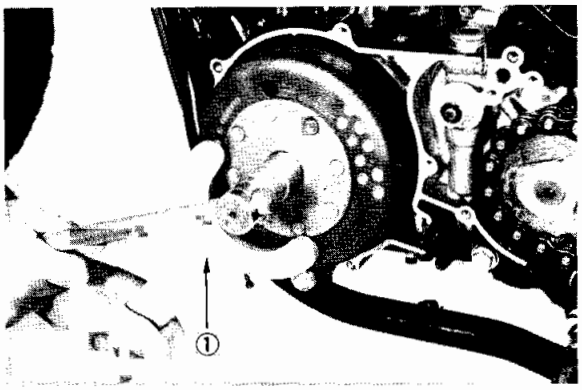
2. Remove carburetor assembly pulling carburetor toward you.

NOTE:

Noting the presence, location and routing of all vent and overflow tubes, remove carburetor.

Flywheel Magneto

1. Remove flywheel securing nut using magneto holder.



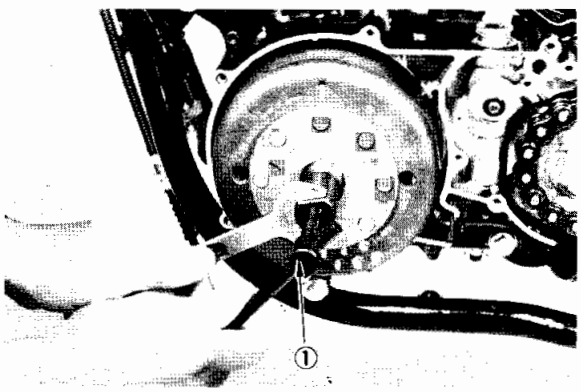
1. Magnet holder

2. Install flywheel puller on flywheel and tighten it.

NOTE:

The puller body has a lefthand thread.

3. While holding puller body, tighten push bolt. This will pull flywheel off the tapered end of the crankshaft.

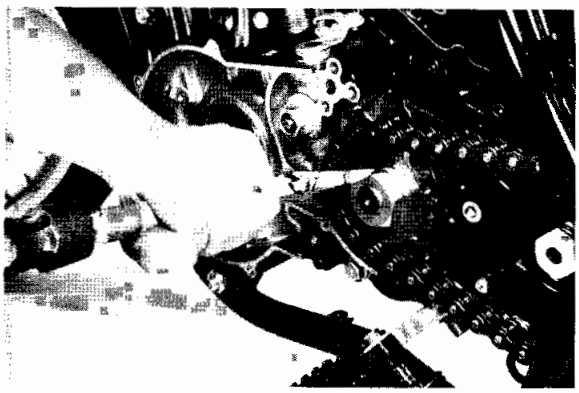


1. Flywheel puller

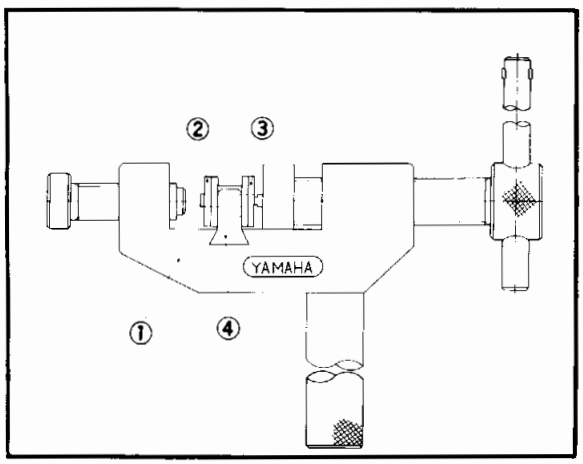
4. Disconnect the magneto lead wire from the engine stop switch lead wire at the rear frame down tube.
5. Remove flywheel backing plate assembly.

Drive Chain

1. Loosen drive sprocket before disconnecting
   a. Bend down lock tab.
   b. Put transmission in gear.
   c. Apply rear brake.
   d. Loosen sprocket securing nut.



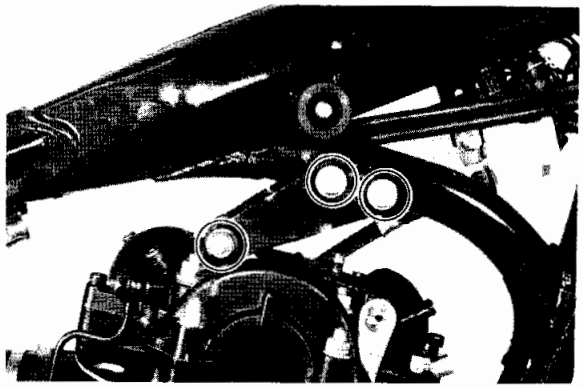
2. Bring master link clip slightly before the sprocket wheel, and remove the clip.
3. Set the chain cutter (special tool) on the chain, and remove the chain joint plate. Then, separate the chain.

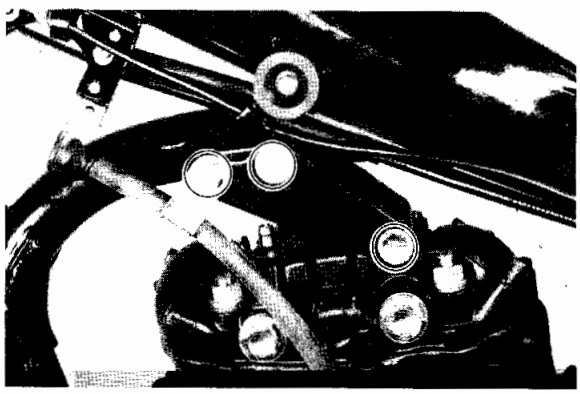


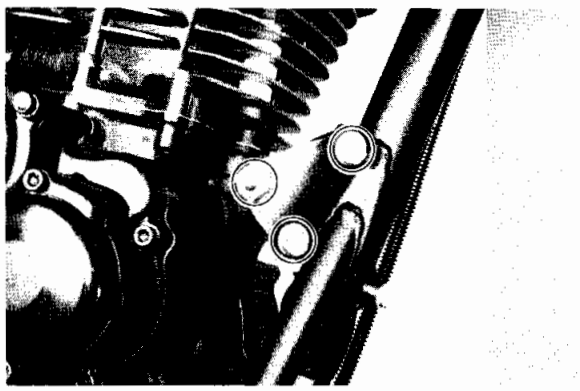
1. Chain cutter
2. Chain joint
3. Side plate
4. Attachment

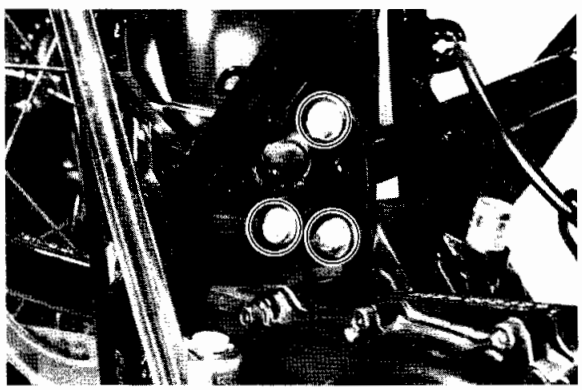
Removal

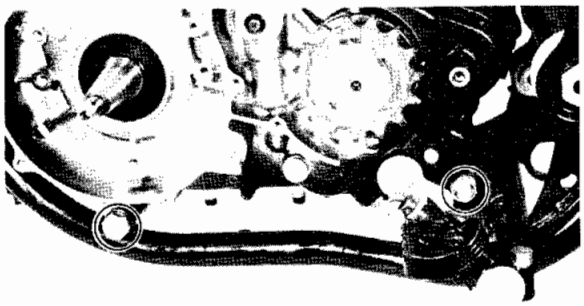
1. Remove engine mounting bolts.









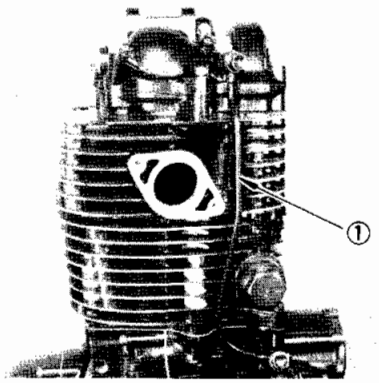


2. Remove engine from right side of frame.

DISASSEMBLY

Cylinder Head Cover

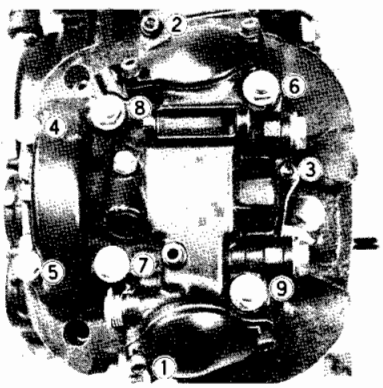
1. Remove the oil delivery pipe.



1. Oil delivery pipe

2. Remove the six head cover retaining nuts and three bolts.

NOTE:
Loosen the bolts and nuts in the order indicated in the following photo.



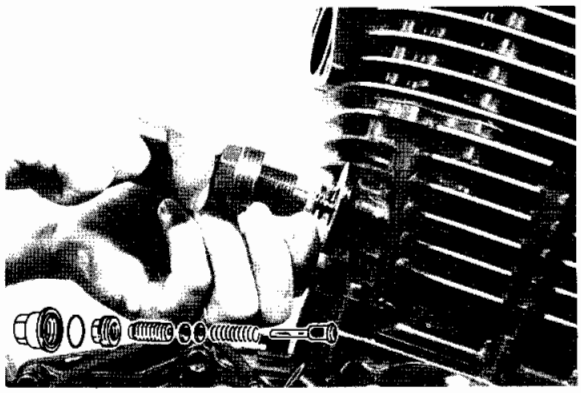
3. Remove the cover.

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

4. Remove the spark plug.

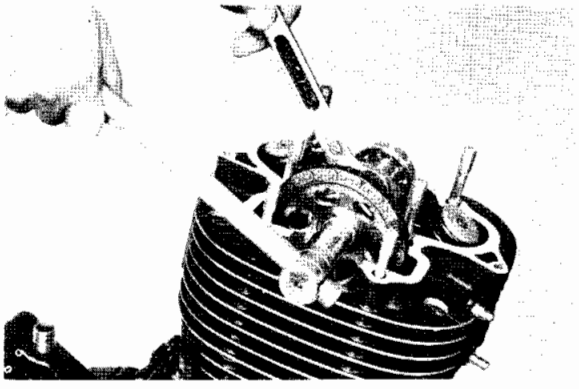
Cylinder head

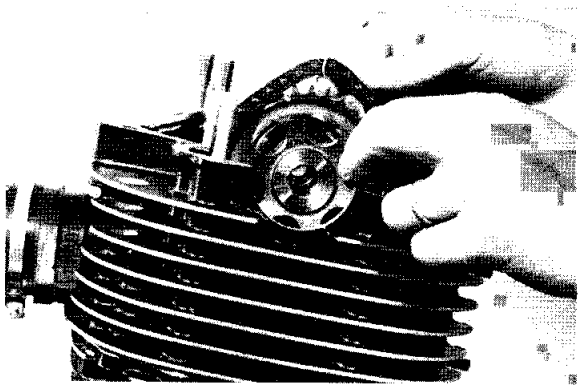
1. Remove the cam chain tensioner cap.
2. Loosen the tensioner lock nut.
3. Remove the chain tensioner assembly. Note the location of each part.



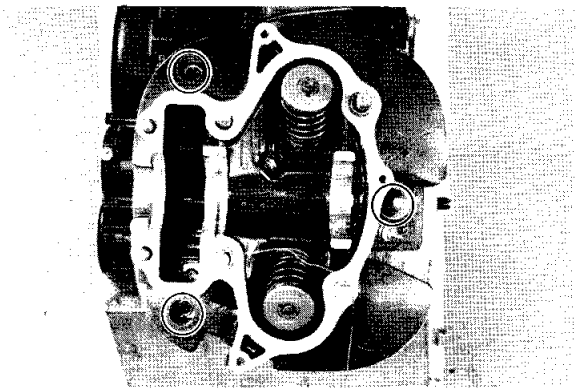
4. Remove the cam sprocket securing bolt and remove the sprocket and chain.

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 retaining wire to prevent the chain from dropping down.



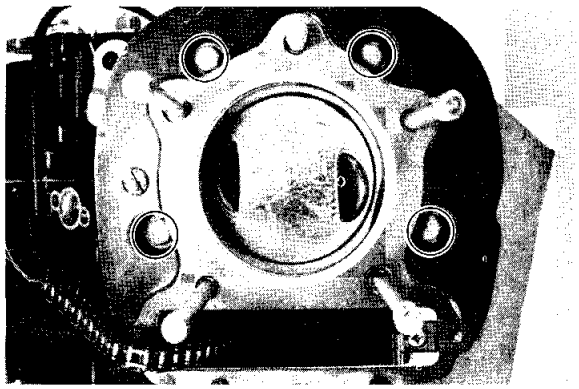


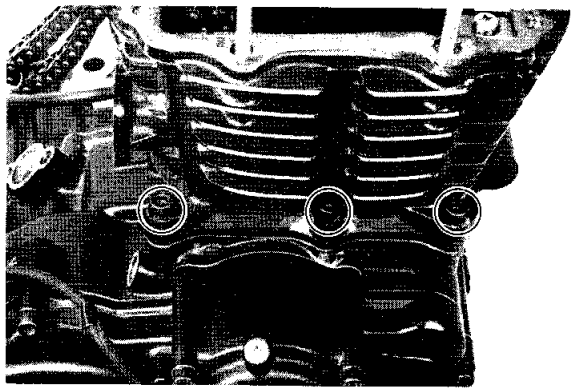
5. Remove cam shaft.
6. Remove the cylinder head holding nut and bolts and then remove the cylinder head.



Cylinder

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

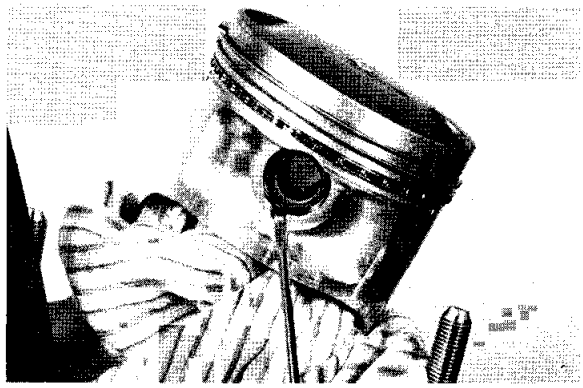




Piston Pin and Piston

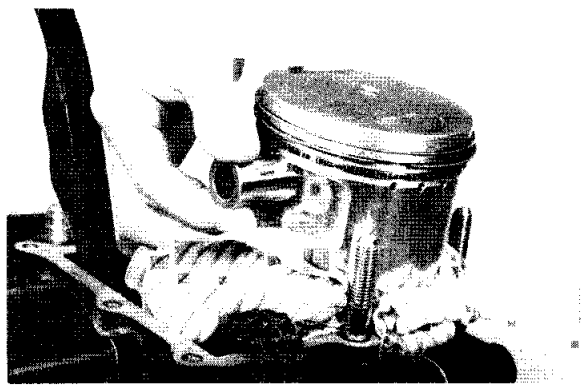
1. Remove piston pin clip (1) from piston.

   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.



Kick Crank

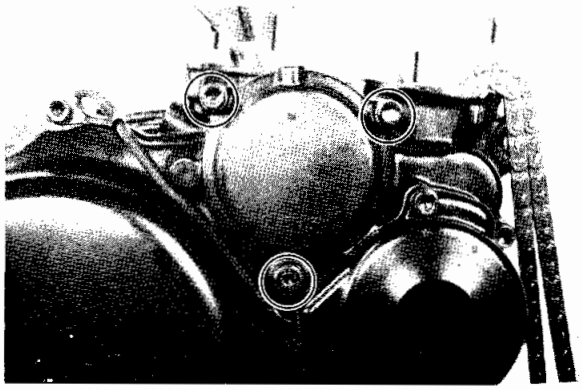
Remove kick crank securing bolt and kick crank.

NOTE:

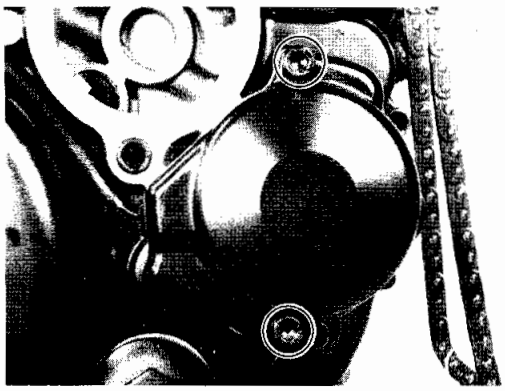
The bolt must be completely removed from the kick crank.

Crankcase Cover (Right)

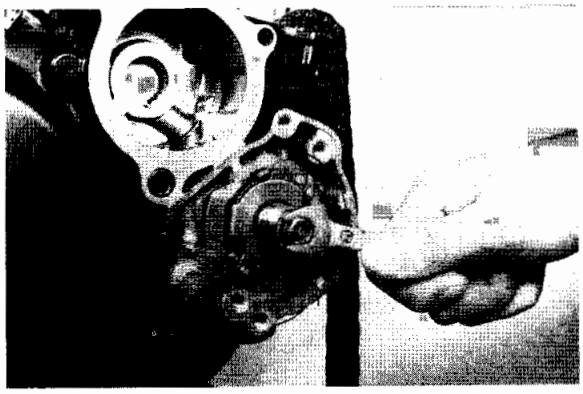
1. Remove oil filter cover holding bolts (3) and the cover.



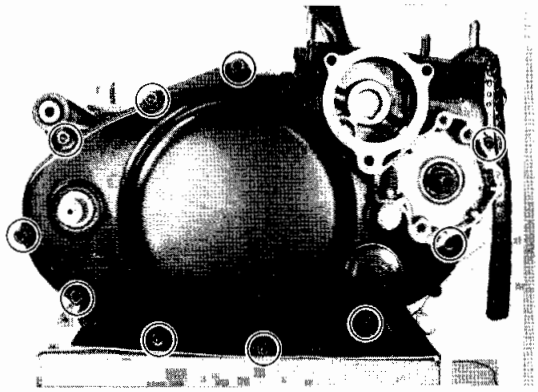
2. Remove oil filter element.
3. Remove breaker cover holding bolts (2) and the cover.



4. Remove contact breaker plate holding screws (2) and the breaker plate assembly.
5. Remove the governor securing bolt and the governor assembly.

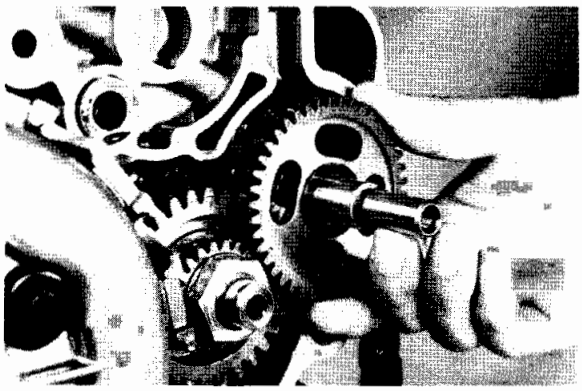


6. Remove crankcase cover holding bolts and the cover

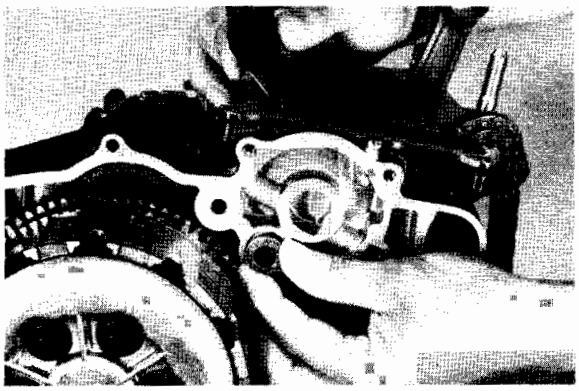


Clutch Assembly and Drive Gear

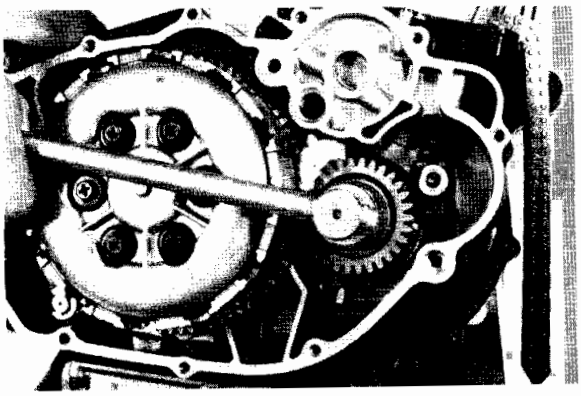
1. Remove the breaker shaft driven gear.



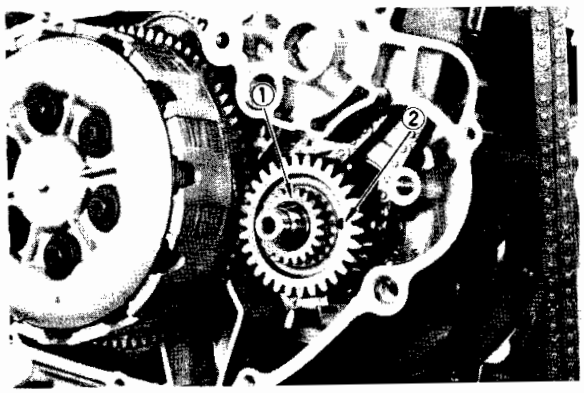
2. Remove the chain tensioner shaft.



3. Loosen primary drive gear by first placing a folded rag between the teeth of the primary gears to lock them as shown in the illustration. Then loosen drive gear nut.
   Remove nut and washer.

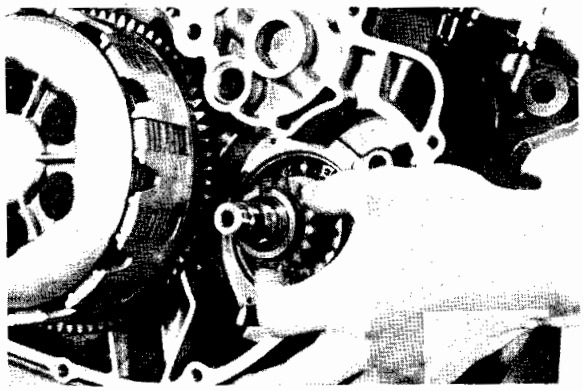


4. Remove the breaker shaft drive gear and primary drive gear.

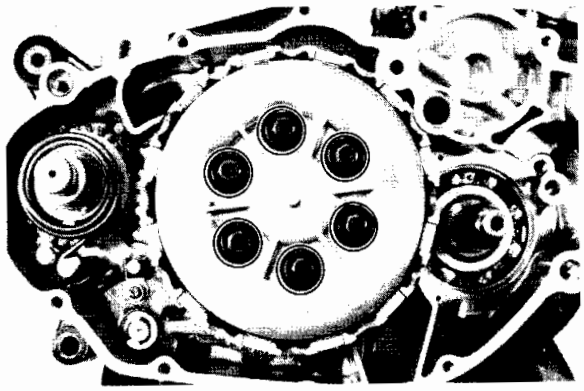


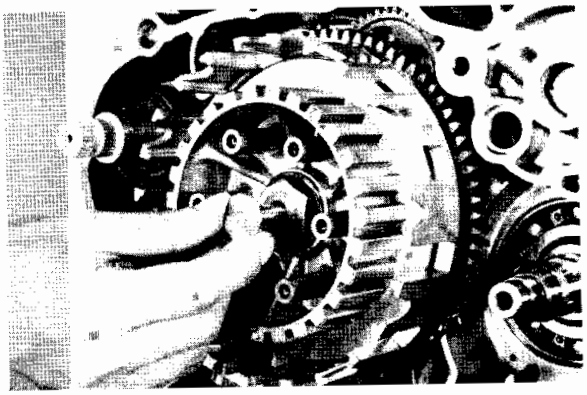
1. Breaker shaft drive gear
2. Primary drive gear

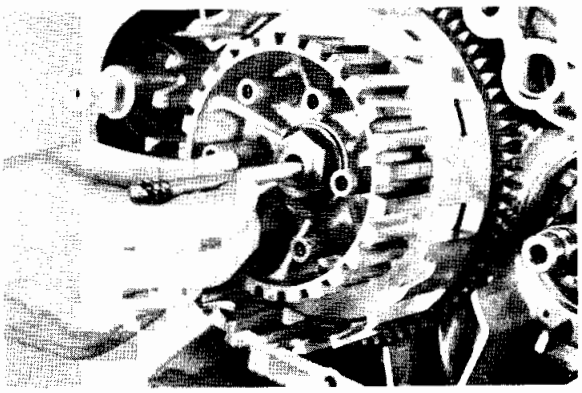
5. Remove the timing plate, straight key and cam chain.
6. Remove the cam chain drive sprocket.



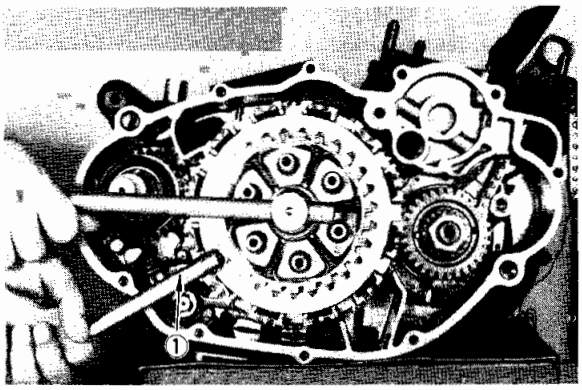
7. Remove six clutch spring holding screws, pressure plates, clutch plates, friction plates, push rod 1 and rod 2.





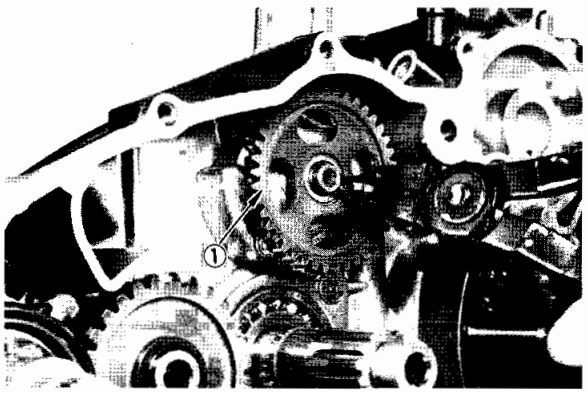


8. Install clutch holding tool on clutch boss. Remove lock nut, washer, clutch boss and housing in that order.

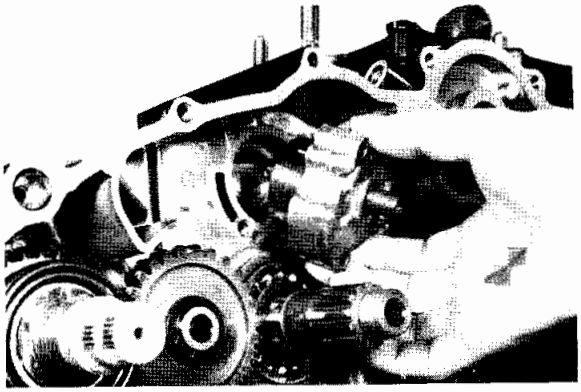


1. Clutch holding tool

9. Remove the pump driven gear clip and then remove the oil pump assembly.

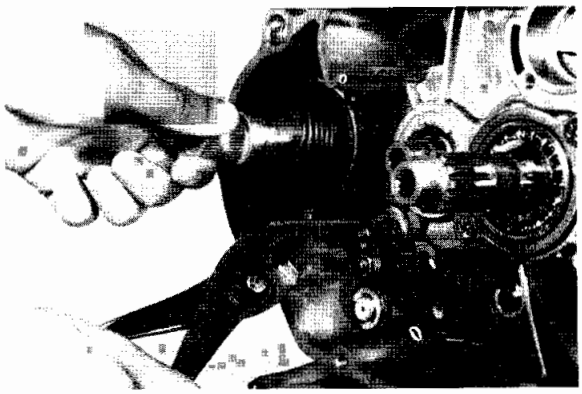


1. Pump driven gear



Kick Axle Assembly

1. Remove the kick idle gear.
2. Remove the kick axle assembly by pulling toward you.

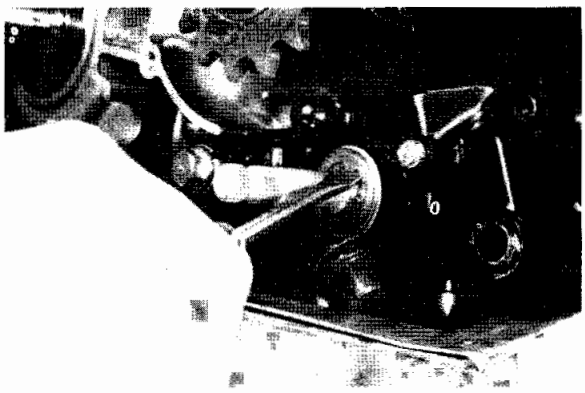


Change Shaft Assembly

Remove circlip from left side of change shaft and pull shaft and shift lever 1 out from the right hand side.

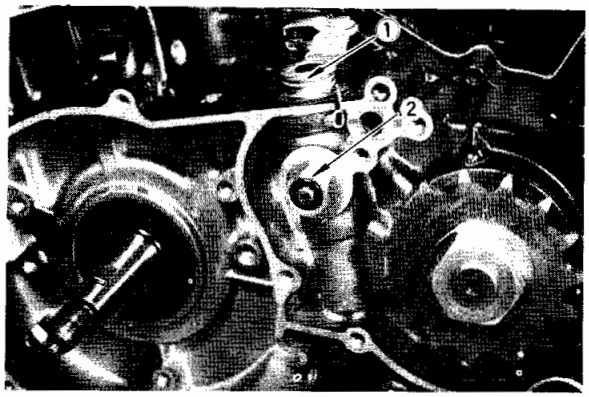
NOTE:

Remove the change lever 2 and the change lever 3 as an assembly.



Clutch Push Lever Axle

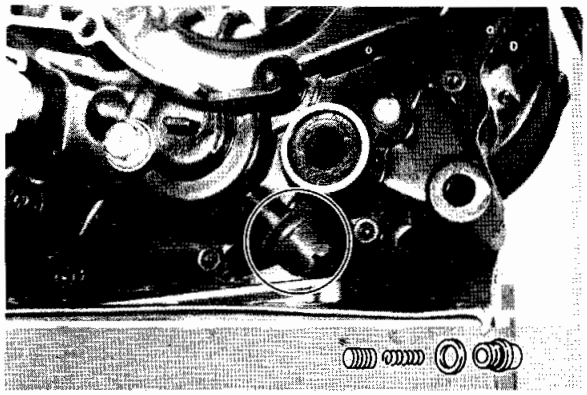
Loosen adjusting screw lock nut and remove adjusting screw.
Pull push lever axle up to remove.



1. Push lever
2. Adjusting screw locknut

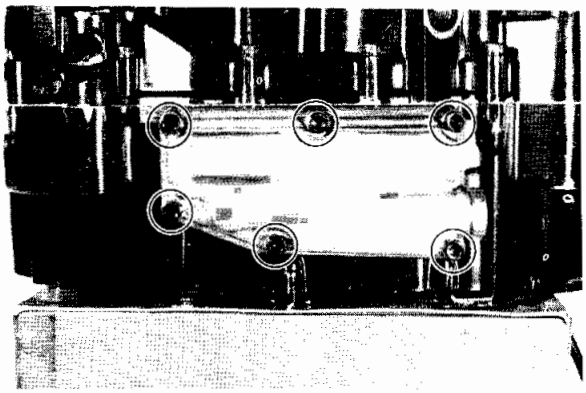
Shift Cam Stopper

Remove the shift cam stopper assembly.



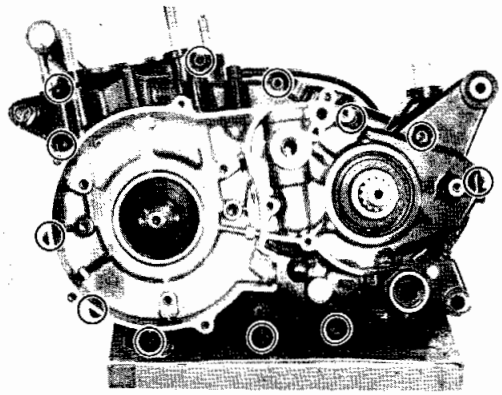
Oil Strainer Assembly

1. Remove oil strainer holding bolts (6).
2. Remove oil strainer assembly.



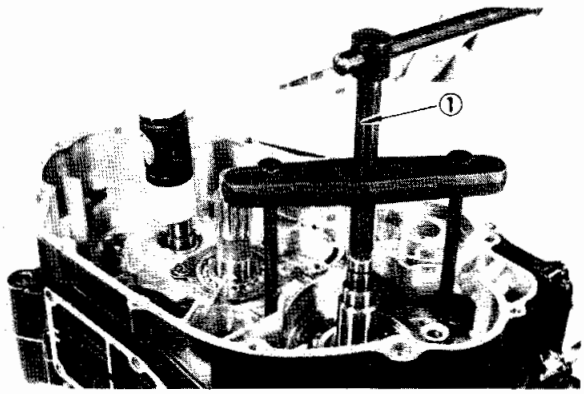
Crankcase

1. Working in a crisscros pattern, loosen 14 hexagon bolts 1/4 turn each. Remove them after all area loosened.



2. Install crankcase separation tools as shown. Use a thick plain washer to protect end of crankshaft.

NOTE:
Fully tighten the tool securing bolts, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.



1. Crankcase separation tool

3. As pressure is applied, alternately tap on the front engine mounting boss, the transmission shafts and the shift drum.

CAUTION:

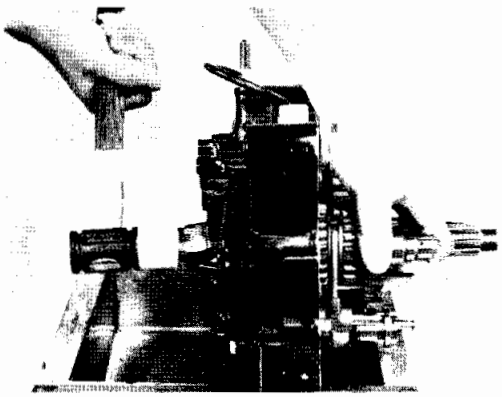
Use soft hammer to tap on the case half. Tap only on reinforced portions of case. Do not tap on gasket mating surface. Work slowly and carefully. Make sure the case halves separate evenly. If one end "hangs up", take pressure off the push screw, realign and start over. If the halves are reluctant to separate, check for a remaining case screw or fitting.
Do not force.

Transmission

Remove the transmission shaft, shift forks and shaft cam. Tap lightly on the transmission drive shaft with a soft hammer to remove.

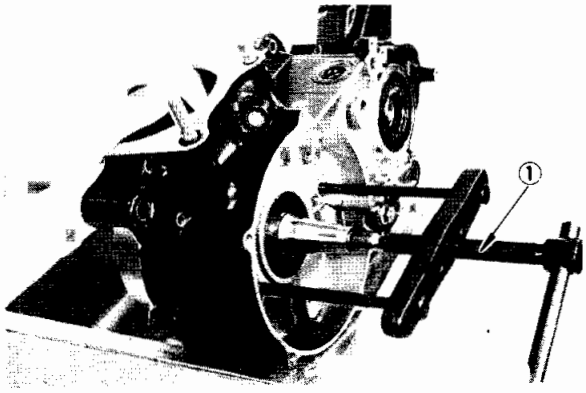
NOTE:

Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.



Crankshaft

Remove crankshaft assembly with the crankcase separation tool (Special tool).

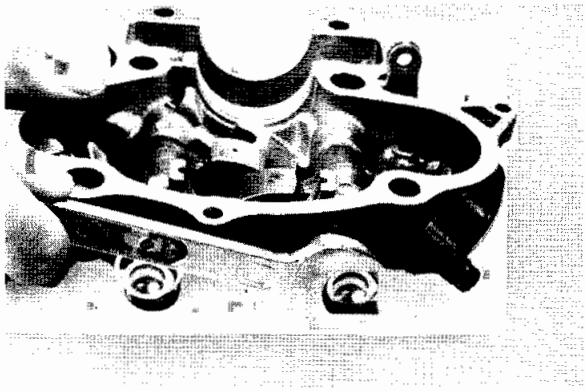


1. Crankcase separation tool

INSPECTION AND REPAIRING

Cylinder Head Cover

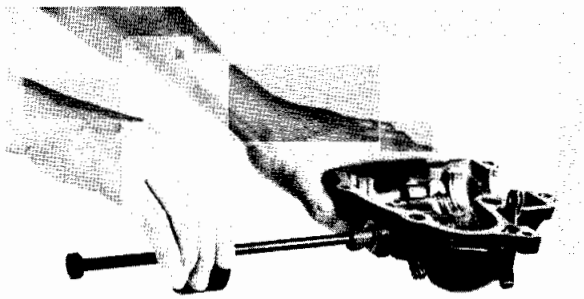
1. Remove two rocker shaft covers.



2. Insert a 6 mm screw into the rocker shaft, and withdraw the rocker shaft. It should be slide out easily.

NOTE:

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

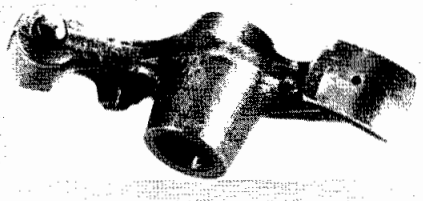


3. Rocker arm and rocker shaft

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:
12.000 ~ 12.018 mm
(0.470 ~ 0.477 in)



c. The shaft has been hardened and it 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.

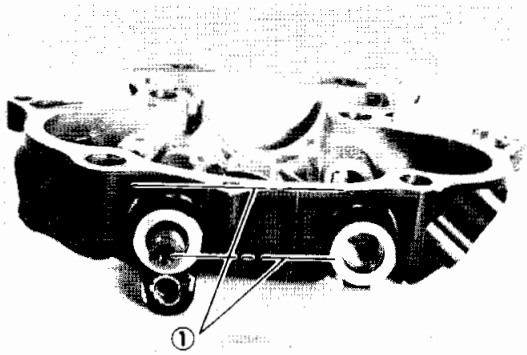
Standard shaft diameter:
11.98 ~ 11.99 mm
(0.4692 ~ 0.4696 in)



d. Standard clearance between the rocker shaft and hole should be 0.010 ~ 0.038 mm (0.0004 ~ 0.0015 in). If measurement shows more than 0.1 mm (0.0015 in) clearance, replace either or both parts as necessary.

Note on rocker shaft installation:

Install rocker shaft with slit in correct direction as shown in the illustration.



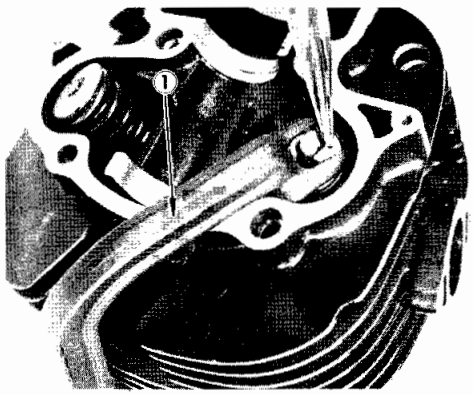
1. Parallel

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.

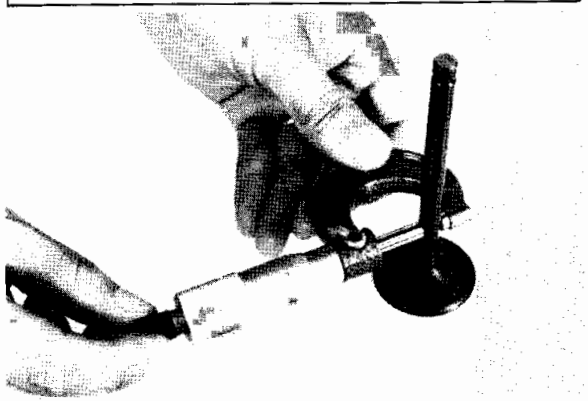
NOTE:
Be sure to remove the valve stem seal before removing the valve. Otherwise the seal could be damaged.

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.

Valves, Valve Springs, Valve Guides and Valve Seats

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

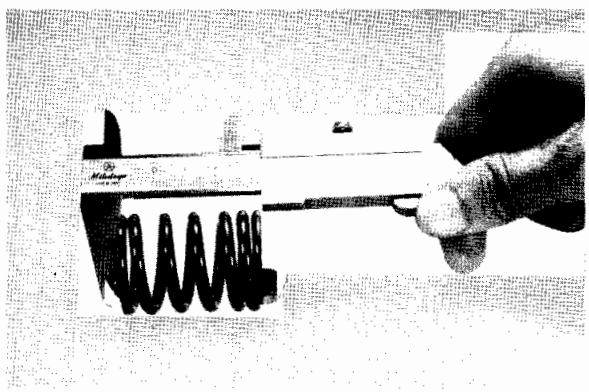
Intake valve stem diameter:
7.975 ~ 7.990 mm
(0.314 ~ 0.3146 in)
Exhaust valve stem diameter:
7.960 ~ 7.975 mm
(0.3134 ~ 0.314 in)



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

	Outer	Inner
Free length	45.15 mm (1.778 in)	45.25 mm (1.781 in)
Installed length (Valve closed)	40.0 mm (1.57 in)	38.0 mm (1.50 in)
Installed pressure	14.0 ~ 16.0 m-kg (30.9 ~ 35.3 ft-lb)	8.4 ~ 10.2 m-kg (18.5 ~ 22.5 ft-lb)
Compressed length (Valve open)	29.5 mm (1.16 in)	27.5 mm (1.08 in)
Compressed pressure	51.4 ~ 59.2 m-kg (113 ~ 131 ft-lb)	25.0 ~ 28.8 m-kg (55.1 ~ 63.5 ft-lb)

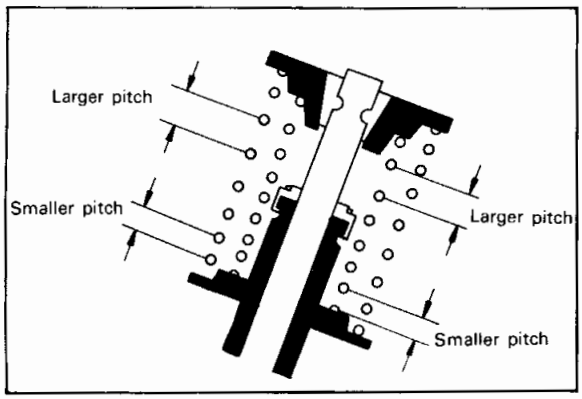
b. Even though the spring is constructed of durable spring steel, it gradually loses some of its tension. This is evidenced one way by a gradual shortening of free length. Use a vernier caliper to measure spring free length. If the free length of any spring has decreased more than 2 mm (0.080 in) from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

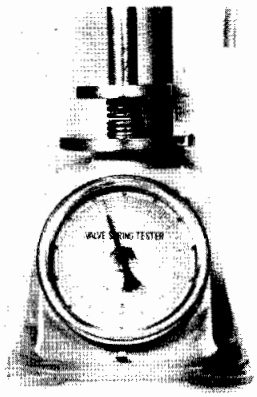


c. Another symptom of a fatigued spring is insufficient spring pressure when compressed. This can be checked using a valve spring compression rate gauge. Test each spring individually. Place it in the gauge and compress the spring first to the specified compressed length with the valve closed (all spring specifications can be found in previous section, Valve Spring) then to the 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.



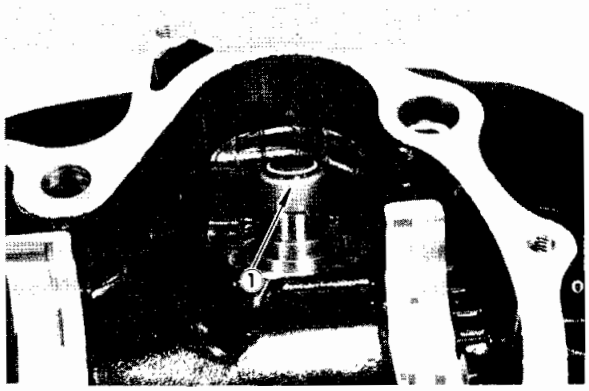


3. Valve Leakage Check

After all work has been performed on the valve and valve seat, 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 tapping compound. Clean all parts thoroughly, reassemble and check again with solvent. Repeat this procedure as often as necessary to obtain a satisfactory 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.)	8.010 ~ 8.019 mm (0.3154 ~ 0.3157 in)	8.05 mm (0.3169 in)

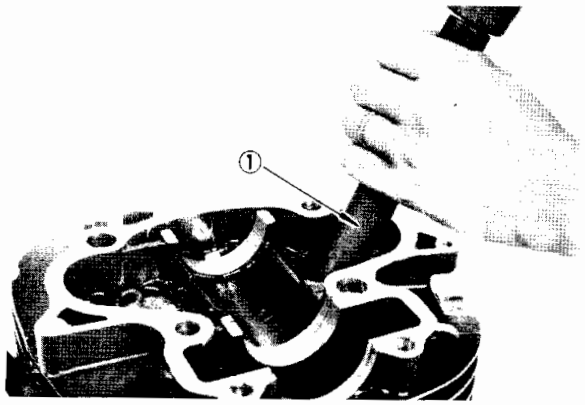
b. To ease guide removal and reinstallation, and to maintain the correct interference fit, heat the head to 100°C (212°F).

If possible, use an oven to avoid any possibility of head warpage due to uneven heating.

c. 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.



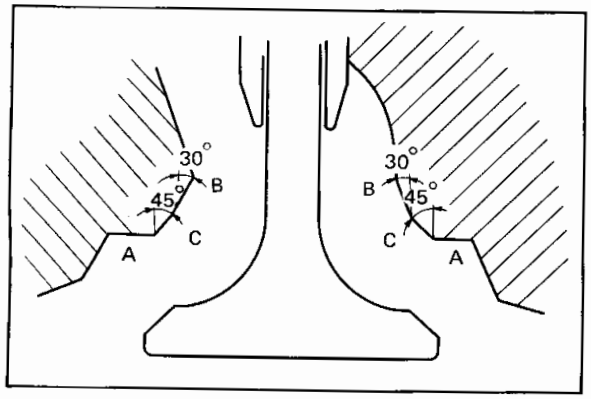
1. Valve guide installer

d. After installing the valve guide, use 8 mm reamer (special tool) to obtain the proper valve clearance.

e. 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:

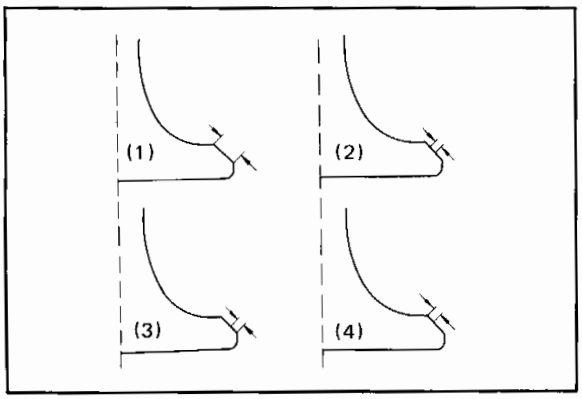
If the valve seat is obviously pitted or worn, it should be cleaned with a valve seat cutter. Use the 45° cutter, and when twisting the cutter, keep an even downward pressure to prevent chatter marks.

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 1.3 mm (0.05 in). Also, the seat should be uniform in contact 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	1.3 mm (0.051 in)	2.0 mm (0.078 in)

c. If the valve seat is uniform around the perimeter of the valve face, but is too wide or not centered 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 1.3 mm (0.05 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 1.3 mm (0.05 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.

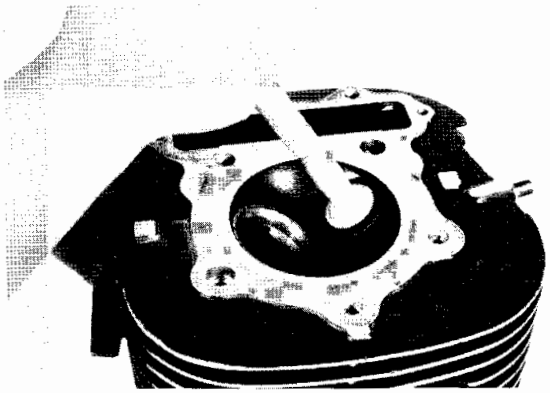
(4) If the seat is too narrow and down near to bottom edge of the valve face, then first use the 30° cutter and then the 45° cutter.

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.



Camshaft and Camshaft Bearing

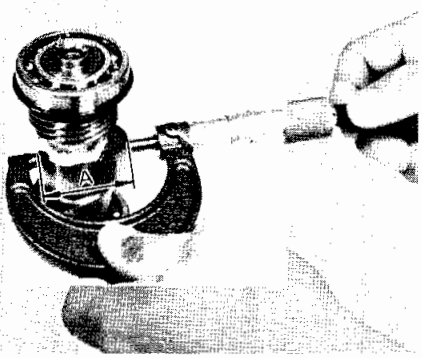
1. Camshaft

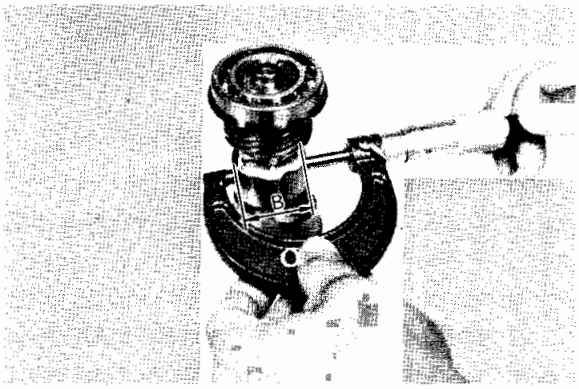
a. The cam lobe metal surface many have a blue discoloration due to excessive friction. The metal surface could also start to flake off or become pitted. This is due to poor lubrication, incorrect clearances, or normal wear.

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.

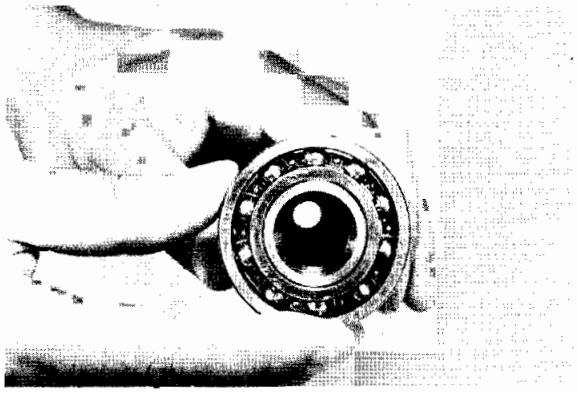
Wear limit	A	B
Intake	39.08 mm (1.539 in)	32.08 mm (1.263 in)
Exhaust	39.10 mm (1.539 in)	32.13 mm (1.265 in)



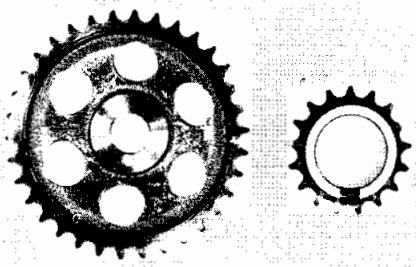


2. Camshaft bearing
   Bearings should be cleaned, dried, and the races visually checked for pits, rust spots or chatter marks where the balls have dragged. If any of these conditions exists the bearings should be replaced.

   NOTE:
   Lubricate the bearings immediately after examining them to prevent rust formation.

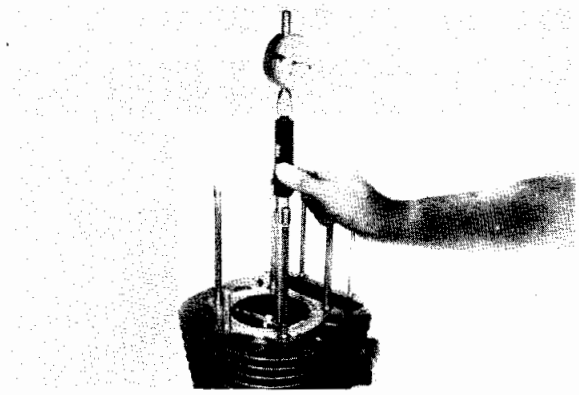


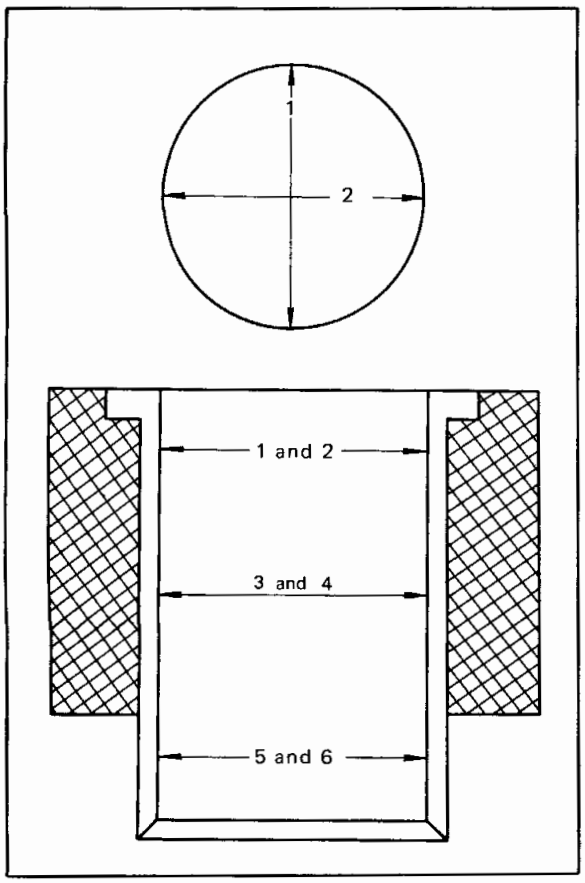
3. Cam sprocket and cam drive sprocket
   Check the cam sprocket and cam drive sprocket for wear.



Cylinder

1. Visually check the cylinder walls for scratches. If vertical scratched 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 crankshaft. (See the illustration.)





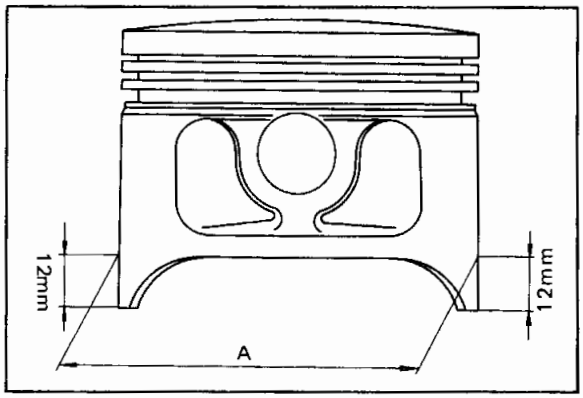
	Standard	Wear limit
Cylinder bore	87.00 ~ 87.02 mm (3.425 ~ 3.426 in)	87.10 mm (3.429 in)
Cylinder taper	—	0.05 mm (0.002 in)

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

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 12 mm (0.47 in) above the bottom edge of the piston by placing the micrometer in parallel to, and at right angles to, the piston pin.

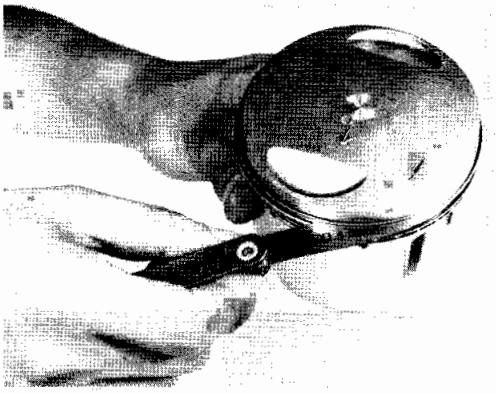


	Size
Standard	87.00 mm
Oversize 1	87.25 mm
Oversize 2	87.50 mm
Oversize 3	87.75 mm
Oversize 4	88.00 mm

Piston clearance:
0.050 ~ 0.055mm
(0.0020 ~ 0.0022 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 1	0.25 mm
Oversize 2	0.50 mm
Oversize 3	0.75 mm
Oversize 4	1.00 mm

   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.

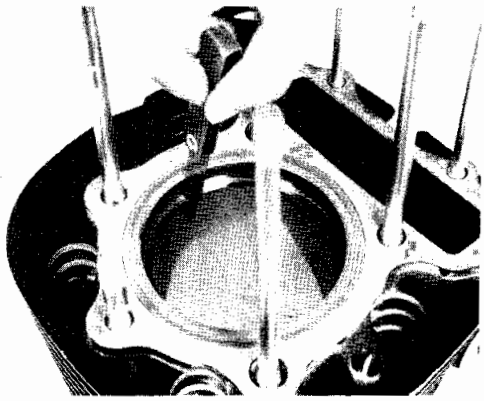
Size	Color
Oversize 1	Brown
Oversize 2	Blue
Oversize 3	Black
Oversize 4	Yellow

   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:

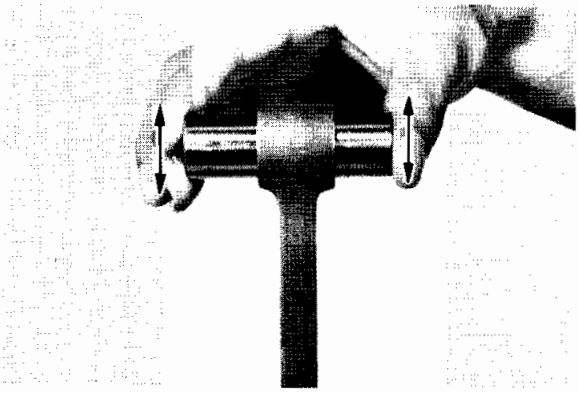
The end gap on the expander spacer of the oil control ring is unmeasureable. If the oil control ring rails show excessive gap all three components should be replaced.

	Standard	Limit
Top/2nd ring	0.3 ~ 0.5 mm (0.012 ~ 0.020 in)	0.80 mm (0.03 in)
Oil control (Rails)	0.2 ~ 0.9 mm (0.008 ~ 0.035 in)	—

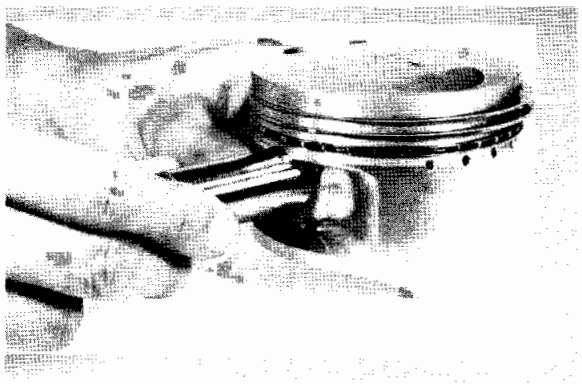


Piston Pin

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.



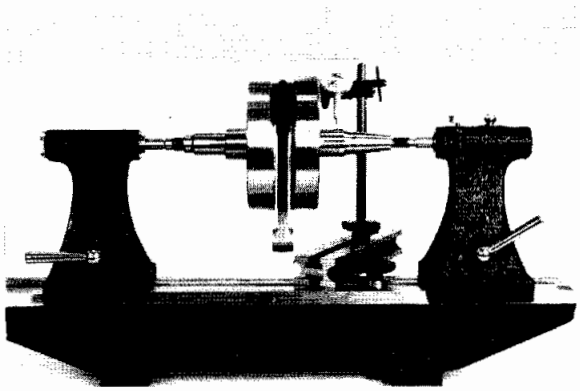
2. The piston pin should have no noticeable freeplay in piston. If the piston pin is loose, replace the pin and/or the piston.

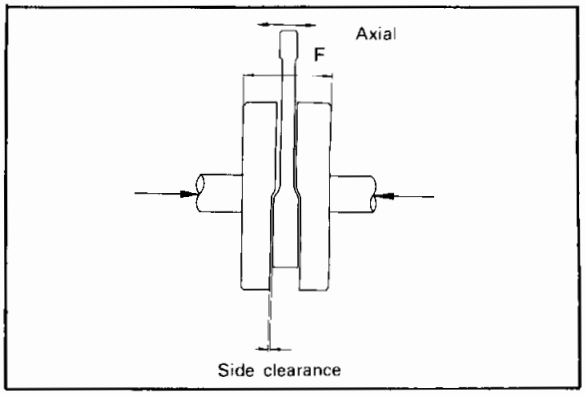


Crankshaft

1. Check crankshaft components per chart.

Check connecting-rod axial play at small end (to determine the amount of wear of crank pin and bearing at big end).	Small end play should not exceed 2 mm (0.08 in).	If small end play exceeds 2 mm (0.08 in) disassemble crankshaft, check connecting rod, crank pin and big end bearing. Replace defective parts. Play after reassembly should be within 0.8 ~ 1.0 mm (0.032 ~ 0.04 in)
Check the connecting rod side clearance at big end.	Move the connecting rod to one side and insert a feeler gauge. Big end axial play should be within 0.35 ~ 0.65 mm (0.014 ~ 0.026 in)	If excessive axial play is present, 0.7 mm (0.028 in) or more, disassemble the crankshaft and replace any worn parts.
Check crankshaft assembly runout. (Misalignment of crankshaft parts.)	Dial gauge readings should be within 0.03 mm (0.0012 in).	Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge.





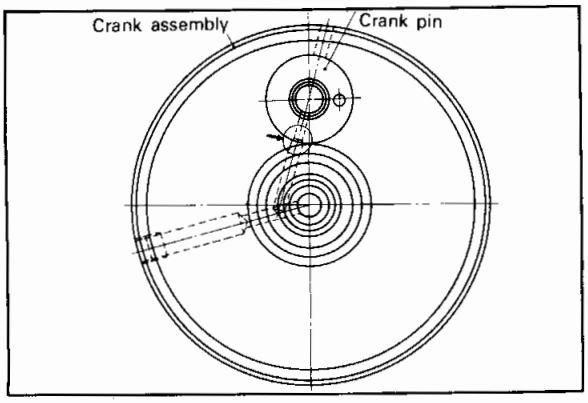
Crankshaft Specifications

Unit: mm (in)

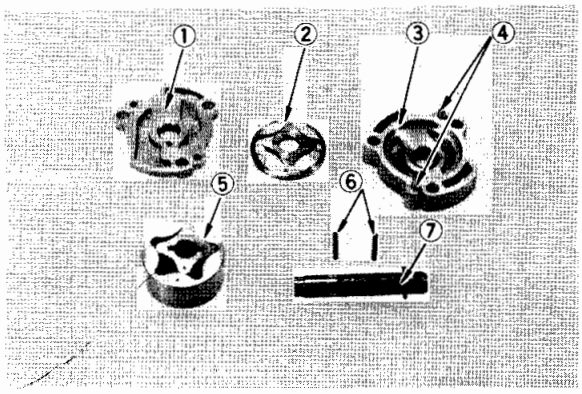
Deflection tolerance		Flywheel width	Rod clearance			
			Axial		Side	
Left side	Right side	F	New	Max.	Min.	Max.
0.03 (0.0012)	0.03 (0.0012)	74.95 ~ 75.00 (2.951~ 2.953)	0.8 ~ 1.0 (0.032 ~ 0.04)	2.0 (0.08)	0.65 (0.026)	0.3 (0.012)

2. In disassembling and reassembling the crank, follow the illustrated below.

NOTE:
Make sure oil passages of crank and crank pin are lined up during assembly.



Oil Pump



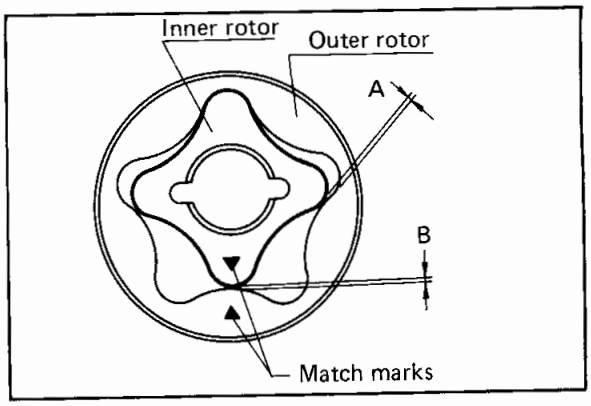
1. Pump cover
2. Feed pump rotor
3. Rotor housing
4. Dowel pin
5. Scaverger pump rotor
6. Dowel pin
7. Pump shaft

1. Trochoidal Pump Rotor Width

Feed pump: 4 mm (0.16 in) Scavenger pump: 18 mm (0.71 in)

2. Rotor Dimensions-Inner and Outer

Clearance between A and B Standard: 0.07 ~ 0.12 mm (0.003 ~ 0.005 in)



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	
30	77	2.566

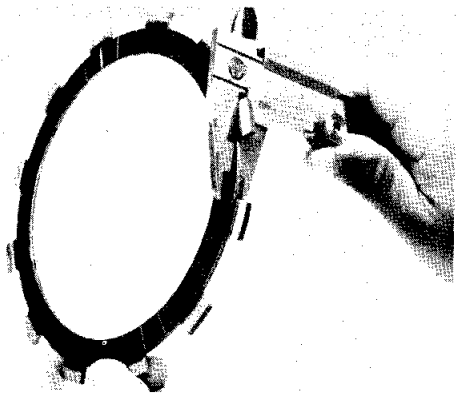
1. Check the drive gear and driven gear for obvious signs of wear or damage from foreign material within the primary case.
2. If primary drive gears exhibit excessive noise during operation, gear lash may be incorrect.
   Numbers are scribed on the side of each gear. Add these numbers. If their total 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
Primary drive gear	75 ~ 79
Primary driven gear	67 ~ 71
Lash tolerance	148 ~ 150

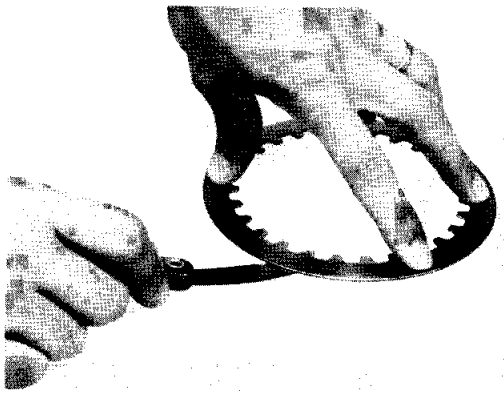
Clutch

1. Checking friction plates
   The friction plates are liable to wear. The standard thickness of the friction plate is 2.8 mm (0.11 in). If it is worn more than 0.3 mm (0.012 in) or has uneven wear, it should be replaced.

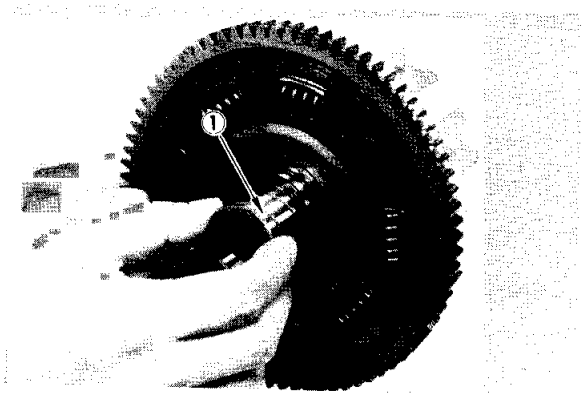


2. Measure clutch plates
   Check clutch plate warpage, and if warpage is more than specified, the clutch plate should be replaced.

Clutch plate warpage limit: 0.05 mm (0.002 in)

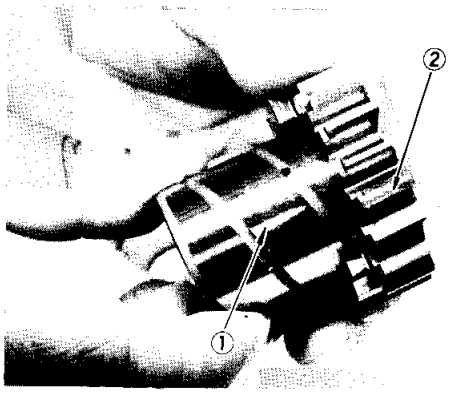


3. Checking the clutch housing assembly
   Insert the spacer into the primary driven gear hub, and check for wear and scratches. If scratches exist, the clutch tends to drag. Smooth out with oil stone or fine grain sandpaper.
   If excessively worn, noise will result, so replacement is necessary.



1. Spacer

4. Checking the spacer
   Slip the spacer in the kick pinion gear, and check for wear. If it is excessively worn or has grooved wear, replacement is required.

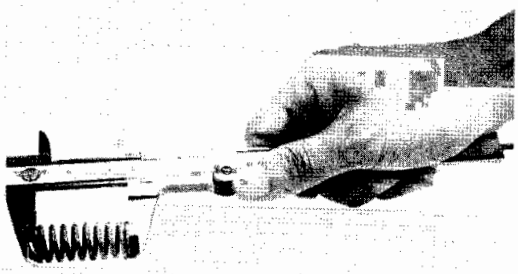


1. Spacer 2. Kick pinion gear

5. 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.

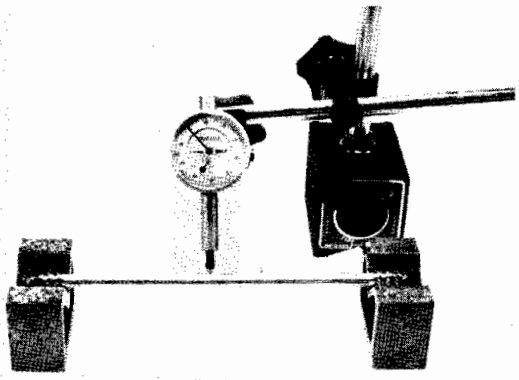
Clutch spring specifications:

Number of springs	6
Free length	41.2 mm (1.622 in)
Spring rate	1.22 kg/mm (17.381 lb/in)



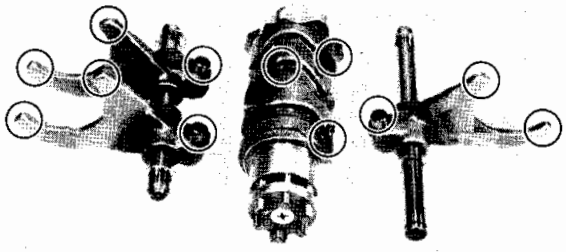
6. Checking the push rod
   By rolling the push rod over the "V" block, and check for bends. If any bend is found, replace the push rod.

Bend Limit: 0.5 mm (0.02 in)



Transmission

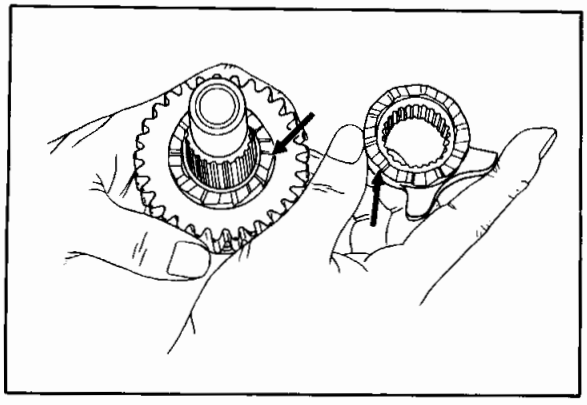
1. Inspect each shift fork for signs of galling on gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.



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 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 sings 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 clip 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.

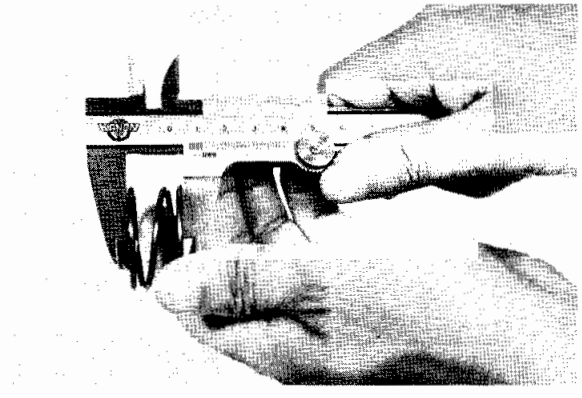
Kick Starter

1. Check the ratchet teeth on the kick gear and ratchet wheel. The mating edges should fit flush against each other. If there is severe rounding off, replace as set.



2. Check to see that the kick gear spins freely on the kick axle. If not, replace either or both as required. Replace if any signs of galling are found.
3. Check to see that the ratchet wheel (splined) slides freely on the kick axle. Check for burrs or other damage. Replace as required.
4. Check axle and wheel splines for wear. The ratchet wheel is a fairly loose fit on splines. However, if wheel is so loose it catches on shaft keeping ratchet wheel spring from forcing it out, replace.
5. Check ratchet wheel spring for fatigue. If free length shows spring has collapsed beyond specification, replace.

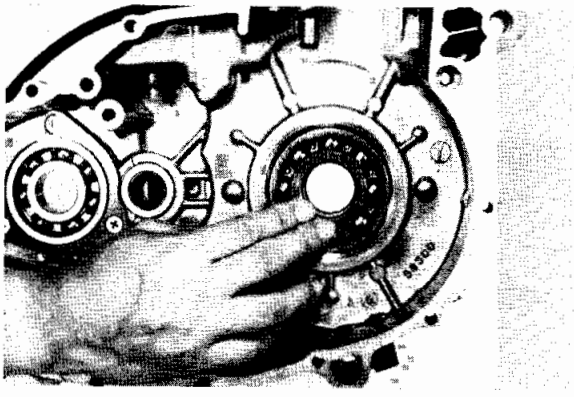
Ratchet wheel spring free length	
Nominal	Minimum
17.2 mm (0.688 in)	15.0 mm (0.600 in)



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

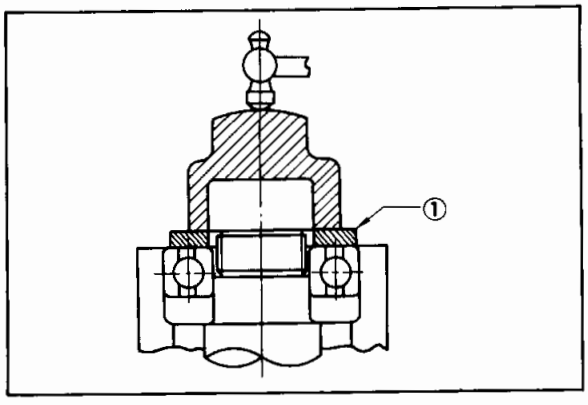
a. Pry oil seal(s) out of place using a slot head screwdriver.
Always replace all oil seals when overhauling engine.

NOTE:
Place a piece of wood under the slot head screwdriver to prevent damage to case.

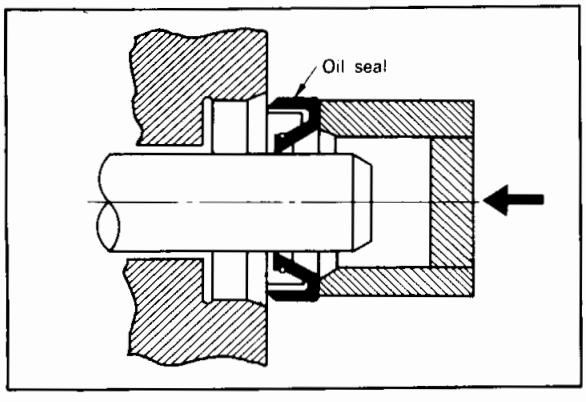
b. Drive out bearing(s) with socket and hammer.

NOTE:
Bearing(s) are most easily removed or installed if the cases are first heated to approximately 95° ~ 125°C (200° ~ 250°F). Bring the case up to proper temperature slowly. Use an oven.

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

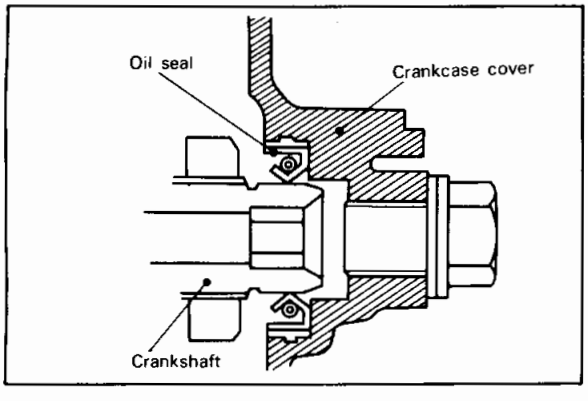


1. Spacer



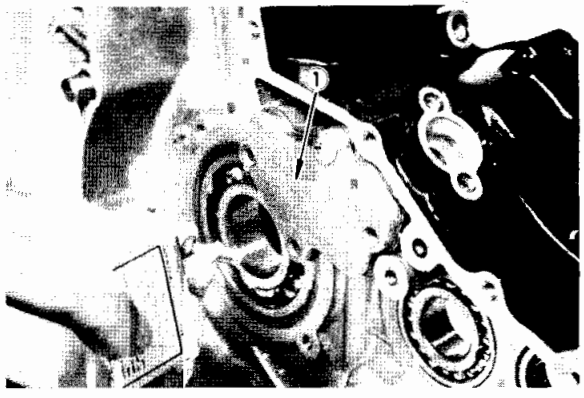
CAUTION:

The crankshaft oil seal (right side) on the crankcase cover right, should be installed in a way reverse to the normal direction as shown.



Crankcase

1. Thoroughly wash the case halves in mild solvent.
2. Clean all gasket mating surfaces and crankcase mating surface thoroughly.
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. If bearings have been removed, check their seats for signs of damage (such as the bearing spinning in the seat, etc.).
6. Check oil delivery passages for signs of blockage.
7. If bearings have not been removed, oil them thoroughly immediately after washing and drying. Rotate the bearing checking for roughness indicating damaged races or balls.
8. Check needle bearing(s) in transmission for damage. Replace as required.
9. Install the oil passage cover to the right crankcase. Apply a holding agent, such as "LOCK-TITE", to threads of phillips screws.



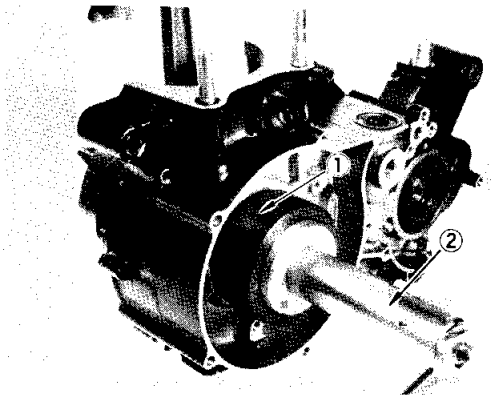
1. Oil passage cover

ENGINE ASSEMBLING AND ADJUSTMENT

Crankshaft Installation

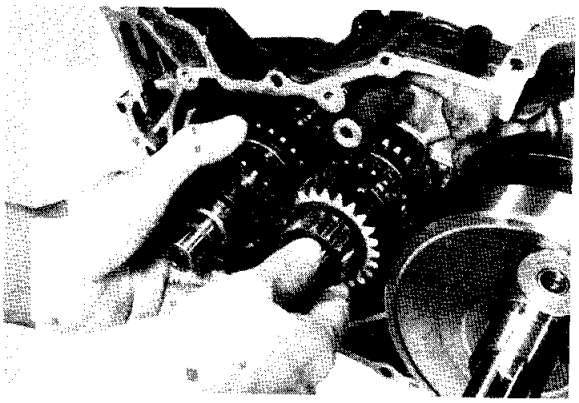
After all Bearings and seals have been installed in both crankcase halves, install crankshaft as follows:

1. Set the crankshaft into left case half and install crankshaft installing tool and spacer (special tool).

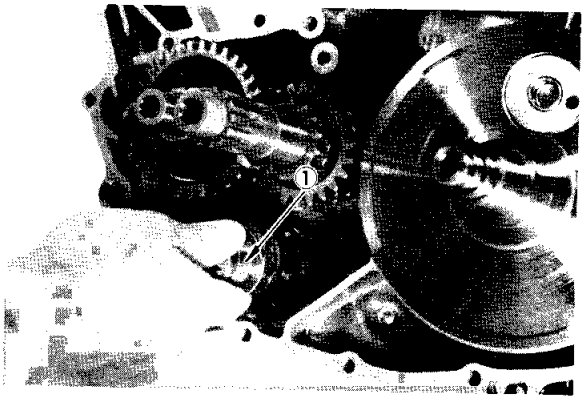


1. Spacer
2. Crankshaft setting tool

2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other. Operate tool until crankshaft bottoms against bearing.
3. Install the drive axle and main axle.

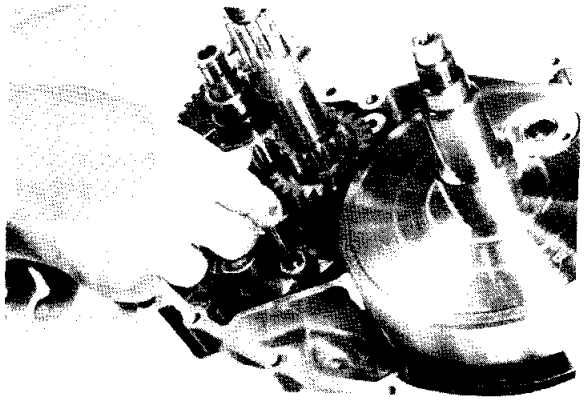


4. Install the shift cam.



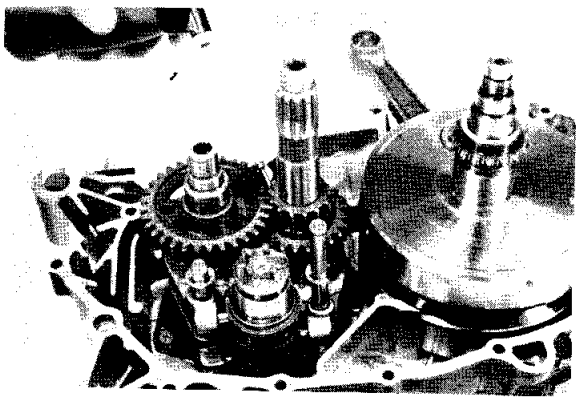
1. Shift cam

5. Install the shift fork 1 and 2.

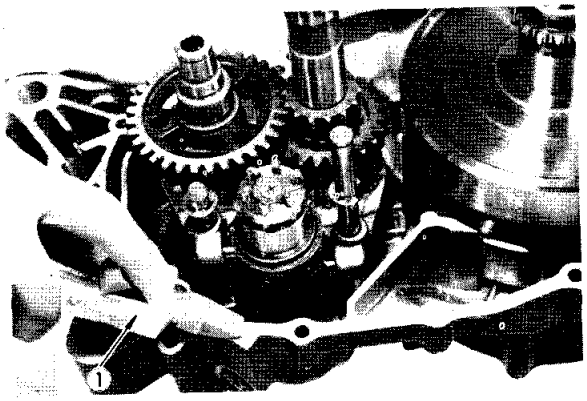


6. Check to see that all parts move freely prior to installing right case half.
   Check for correct transmission operation and make certain that all loose shims are in place.

NOTE:
Oil each gear and bearing throughly.



7. Install the "O"-ring to the inlet oil passage and engine mount spacer.
8. Apply Yamaha Bond No.4 to the mating surfaces of both case halves.
   Apply thoroughly, over all mating surfaces.

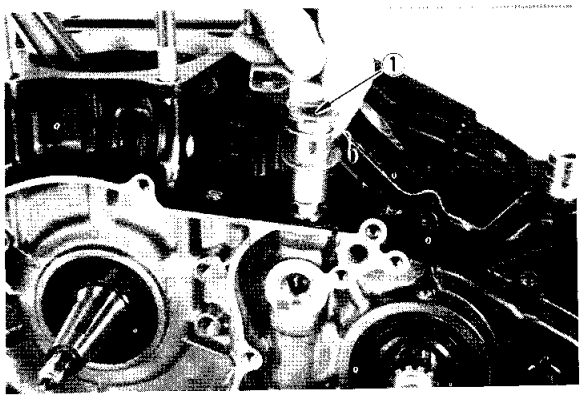


1. Yamaha Bond No. 4

9. Set the crankcase right half onto the shafts and tap lightly on the case with a soft hammer to assemble.

   NOTE:
   Do not tap on machined surface or end of crankshaft.

10. Install all crankcase bolts and tighten in stages, using a crisscross pattern.
11. After reassembly, apply a liberal coating of 4-stroke engine oil to the crank pin and bearing.
12. Install clutch push lever axle and shift cam stopper.



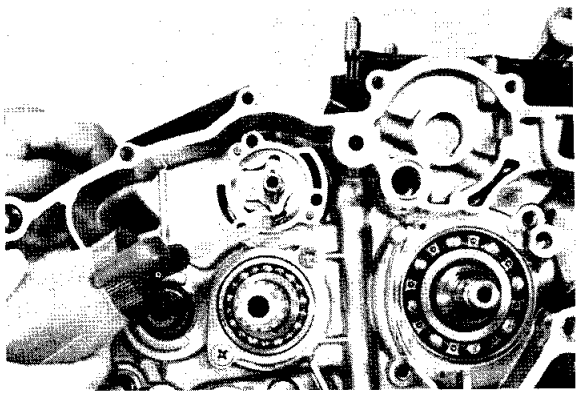
1. Clutch push lever

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

Oil Pump

1. Install the scavenger pump rotor assembly 18 mm (0.71 in) high, with the arrow mark facing upward.
2. Align the marks on the feed pump rotor assembly, and install the rotor assembly in the rotor housing.

   NOTE:
   Apply a liberal coating of 4-stroke engine oil to the both oil pump rotors.



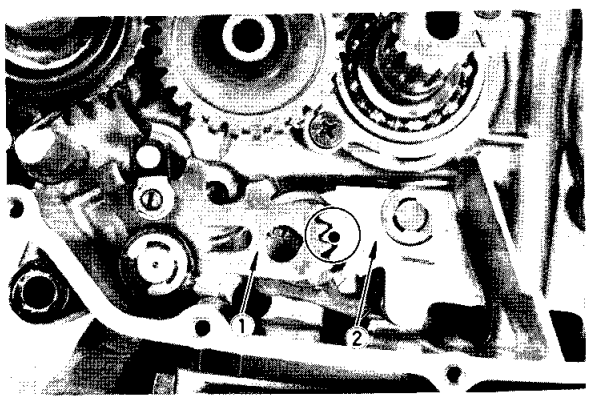
3. Install the pump cover the driven gear.

Kick Starter

1. While pushing the kick starter assembly straight in, rotate kick axle counterclockwise slightly from its home position and engage the stopper to the ratchet wheel guide.
2. Hook the spring to the spring hook.
3. Install the kick idle gear.

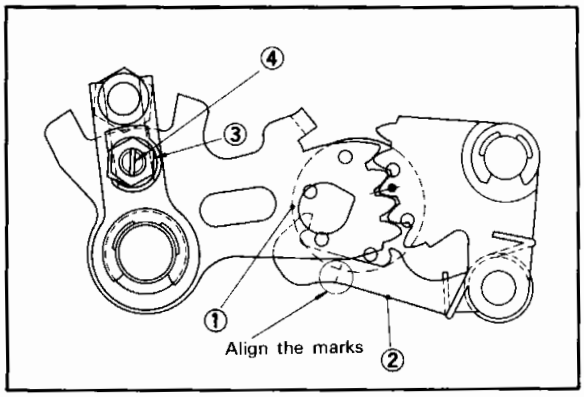
Shifter

1. During installation, note the index mark on change lever 2 and center of change lever 1. Align.



1. Change lever 1
2. Change lever 2

2. Place the shift cam in 2nd gear position.
3. Turn the adjusting bolt on shift lever (1) to make its mark align with the one on the shift cam.



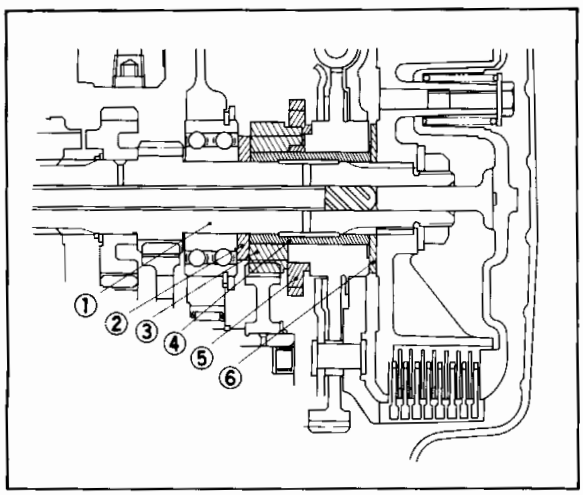
1. Shift cam
2. Shift lever
3. Adjuster locknut
4. Adjuster screw

4. Tighten the lock nut securely after the above procedure.

Clutch

1. Install thrust plate 1, kick pinion gear, pump drive gear, spacer, clutch housing, thrust plate 2 and clutch boss in that order.

NOTE:
Install the pump drive gear in the correct direction as shown.



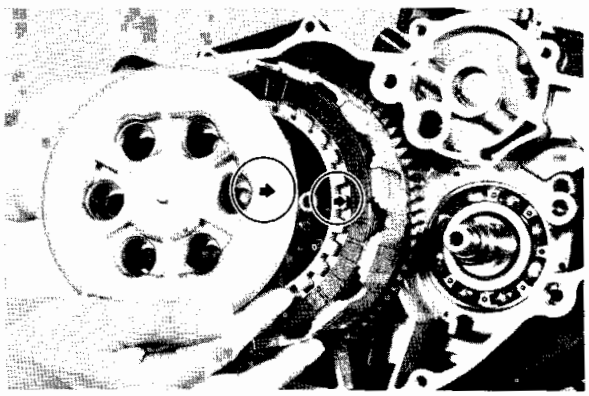
1. Main axle
2. Thrust plate 1
3. Kick pinion gear
4. Spacer
5. Pump drive gear
6. Thrust plate 2

2. Install clutch holding tool on clutch boss and tighten lock nut.

Clutch lock nut torque:
5.0 ~ 7.0 m-kg
(36.2 ~ 50.6 ft-lb)

3. Install push rod 1 and 2 into main axle.
4. Install clutch plate and friction plate.
5. Install clutch pressure plate.
6. Continue installation of clutch and friction plates.

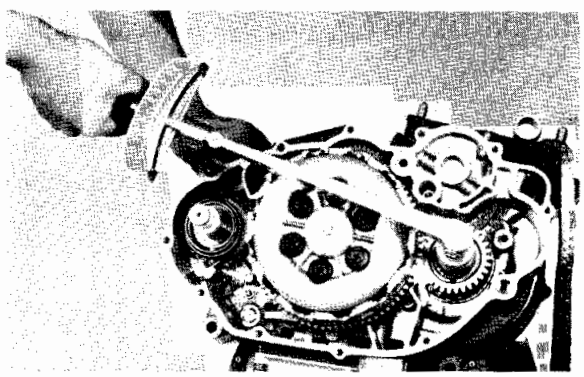
NOTE:
Align arrow mark on clutch boss and pressure plate mark.



Cam Chain, Cam Chain Drive Sprocket, Timing Plate, Primary Drive Gear and Breaker Shaft Drive Gear.

1. Install the cam chain drive sprocket, straight key and cam chain.
2. Install the timing plate primary drive gear and tighten lock nut and breaker shaft drive gear.

Primary drive locknut torque:
5.0 ~ 7.0 m-kg
(36.2 ~ 50.6 ft-lb)

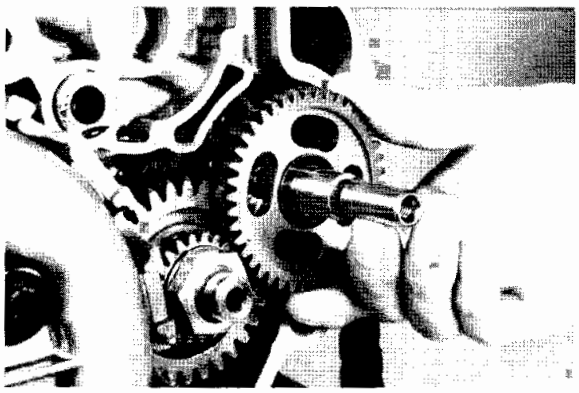


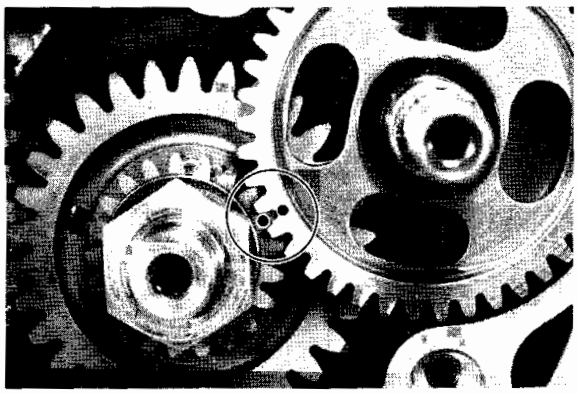
Breaker Shaft Driven Gear

Install the breaker shaft driven gear with washer.

NOTE:

During installation, note the timing mark on breaker shaft drive gear and driven gear. Align these marks.





CAUTION:

Never turn the crankshaft until cam shaft and cam chain are installed.

Crankcase Cover Right

1. Install the crankcase cover.
2. Install the oil filter element and cover.

   NOTE:

   Install the "O" ring before installing the cover.

3. Install the governor assembly and tighten the bolt with specified torque.

Tightening torque:
0.8 ~ 1.2 m-kg
(5.8 ~ 8.7 ft-lb)

4. Install the breaker plate assembly and breaker cover.

Oil Strainer

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

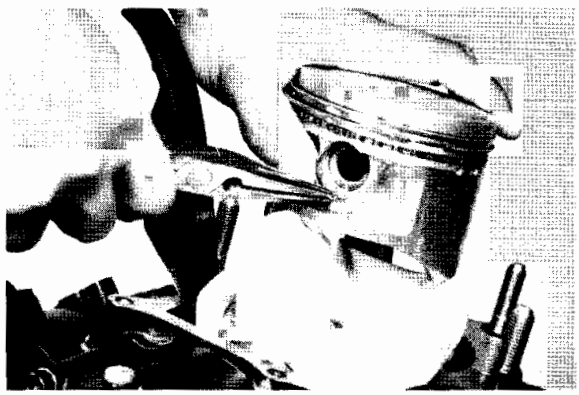
Tightening torque:
0.8 ~ 1.2 m-kg
(5.8 ~ 8.7 ft-lb)

NOTE:

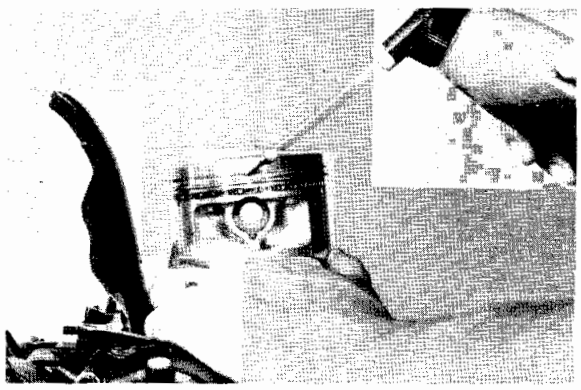
Tighten the bolts using crisscross pattern.

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.

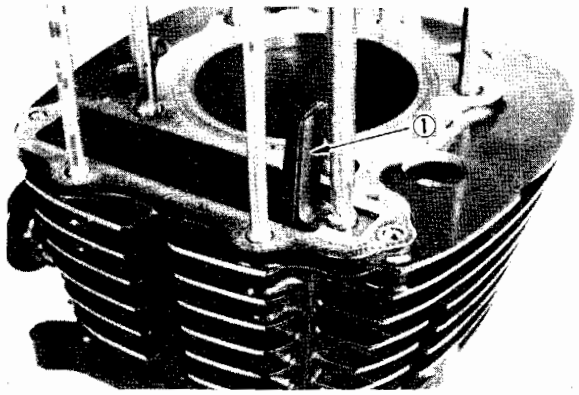


3. During reassembly, coat the piston ring grooves, piston skirt areas, piston pin with 4-stroke engine oil.



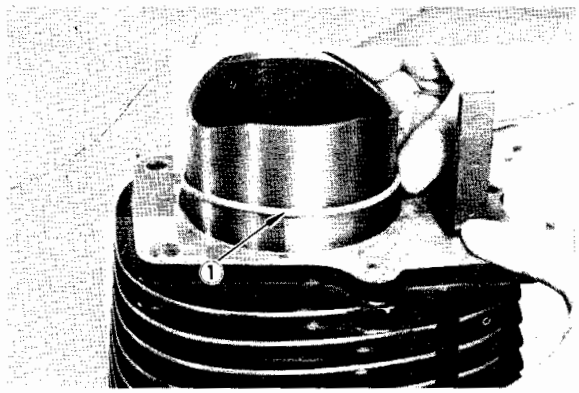
Cylinder

1. Install the cam chain guide to the cylinder.



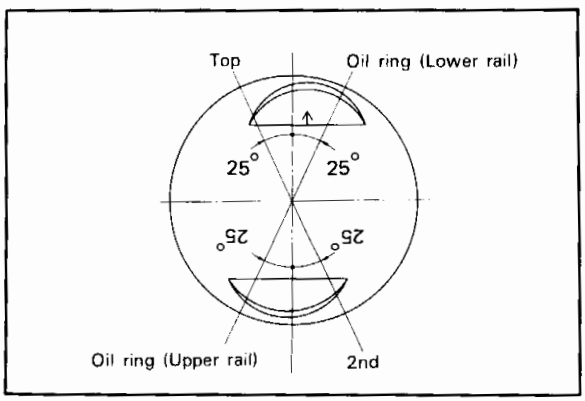
1. Cam chain guide

2. Install the new O-ring and cylinder base gasket.

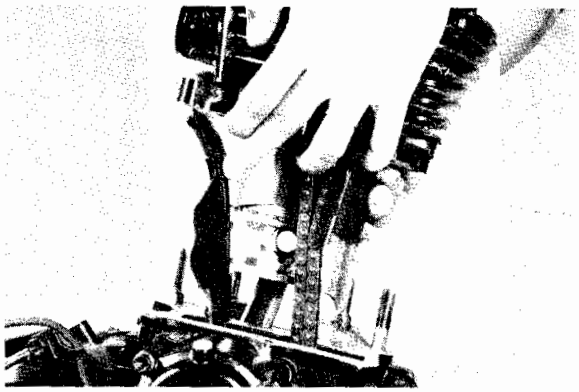


1. O-ring

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



4. Install the cylinder with one hand while compressing piston rings with other hand.

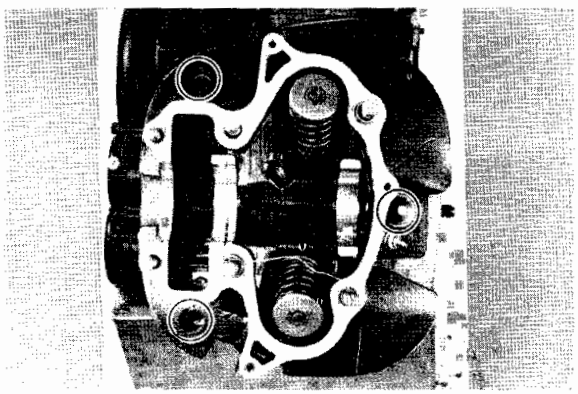


5. Tighten cylinder holding nuts (4) and bolts (3).

Tightening torque:
10 mm nut:
3.5 ~ 4.0 m-kg
(25.3 ~ 28.9 ft-lb)
6 mm bolt:
0.8 ~ 1.2 m-kg
(5.8 ~ 8.7 ft-lb)

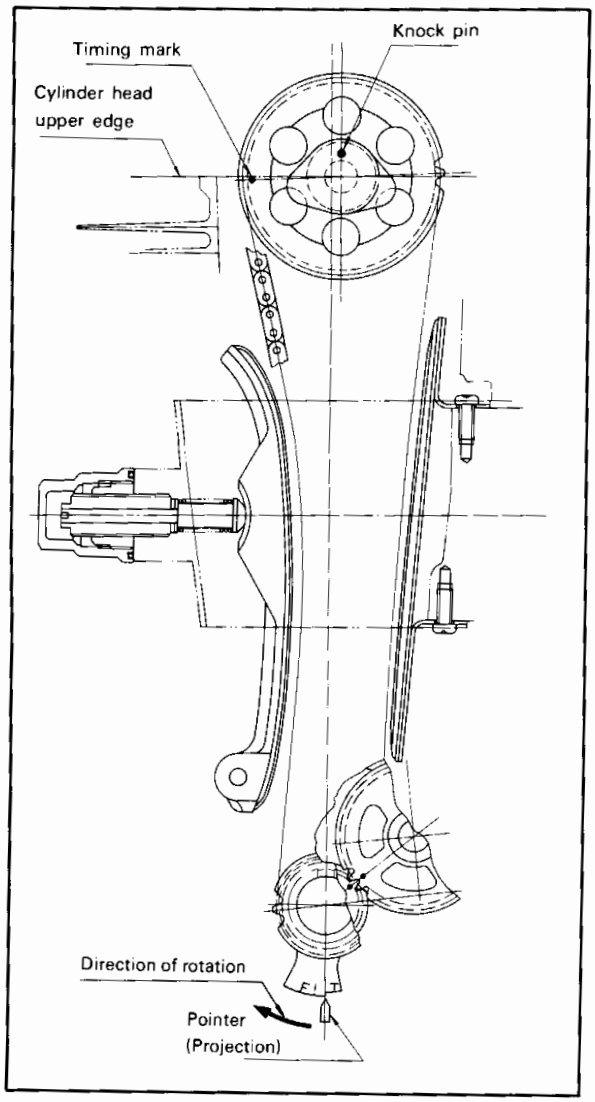
Cylinder Head

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



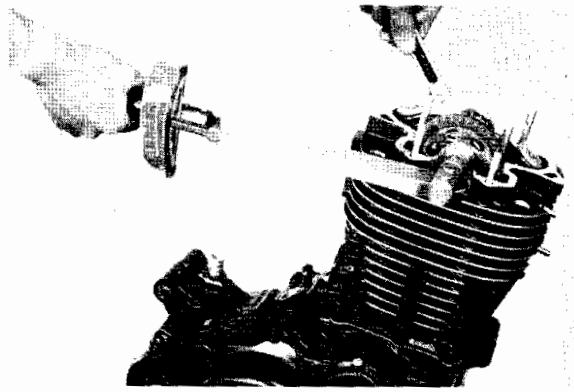
Cam Shaft, Cam Shaft Driven Sprocket

1. Install the cam shaft.
2. Align the marks on the sprocket as shown.

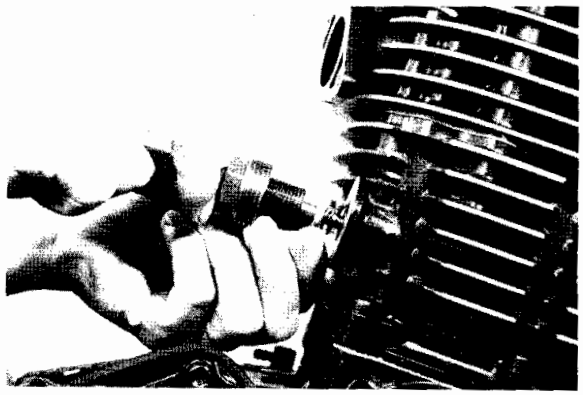


3. Tighten the bolt.

Cam sprocket bolt tightening torque: 4.5 ~ 5.5 m-kg (32.5 ~ 39.8 ft-lb)



4. Install the chain tensioner assembly. Adjust the tensioner. (Refer to the Chapter 2. "Cam chain adjustment".)

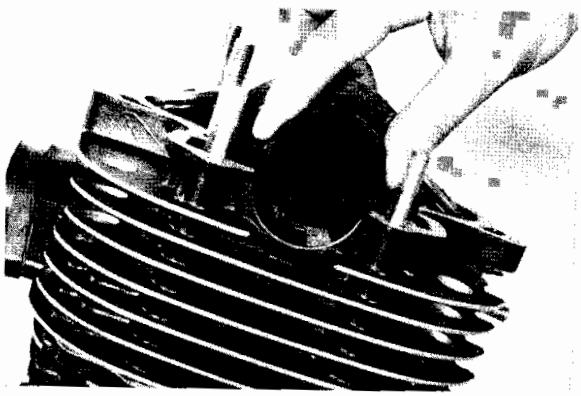


5. Install the adjuster cap and tighten the cap.

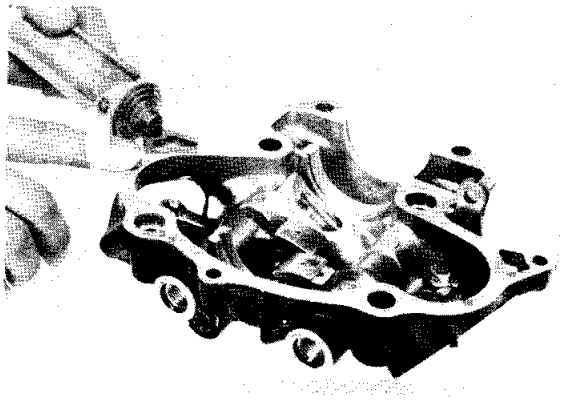
Tightening torque: 1.5 ~ 2.0 m-kg (10.8 ~ 14.5 ft-lb)

Cylinder Head Cover

1. Install the plug on the cylinder head.

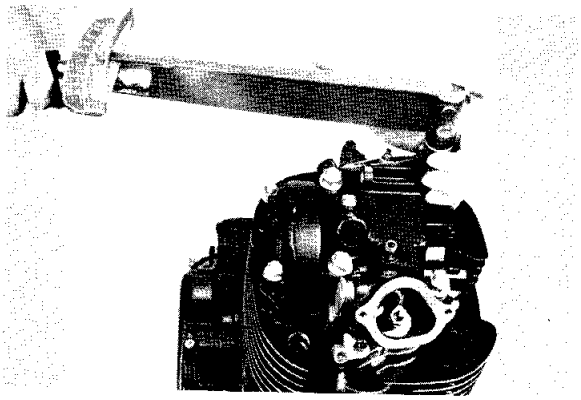


2. Coat the head and cover mating surfaces with a Yamaha Helme Seal SL3 and slip the head cover into position on the head.

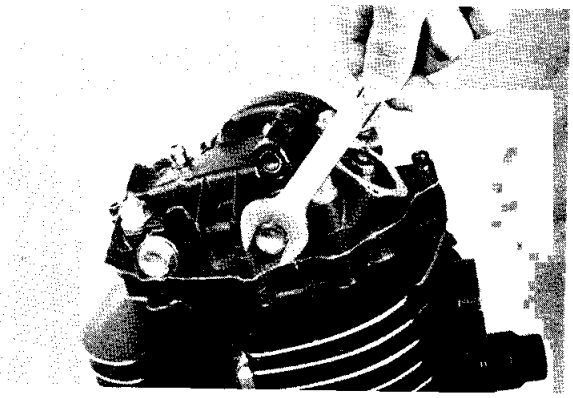


3. Install the nuts and bolts and tighten the specified torque.

Tightening Torque:
10 mm nut:
3.5 ~ 4.0 m-kg
(25.3 ~ 28.9 ft-lb)
6mm nut:
0.8 ~ 1.2 m-kg
(5.8 ~ 8.7 ft-lb)

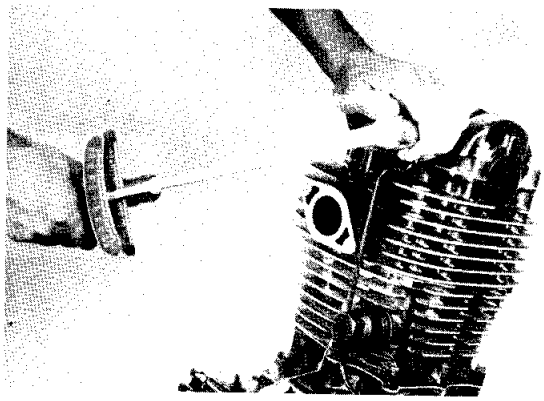


4. Install the rocker shaft covers and tighten.



5. Install the delivery pipe.

Tightening Torque:
1.5 ~ 2.0 m-kg
(10.8 ~ 14.5 ft-lb)



6. Adjust the valve clearance.
   (Refer to Chapter 2 "Valve clearance".)
7. Install the intake and exhaust tappet covers.

Clutch Push Lever Adjustment

(Refer to Chapter 2 "Clutch Adjustment".)

Drive Sprocket

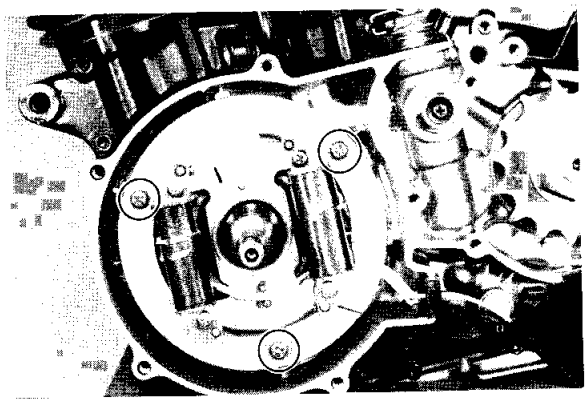
1. Install the O-ring on the drive shaft.
2. Apply a coat of grease to O-ring and oil seal lip.
3. Install the collar, drive sprocket, lock washer andl locknut in that order. Tighten.

Tightening Torque:
5.0 ~ 6.0 m-kg
(36.2 ~ 43.4 ft-lb)

Flywheel Magneto

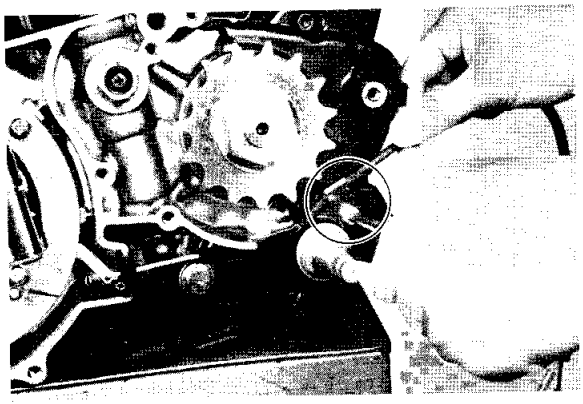
1. Install the flywheel magneto base to left side of crankcase.

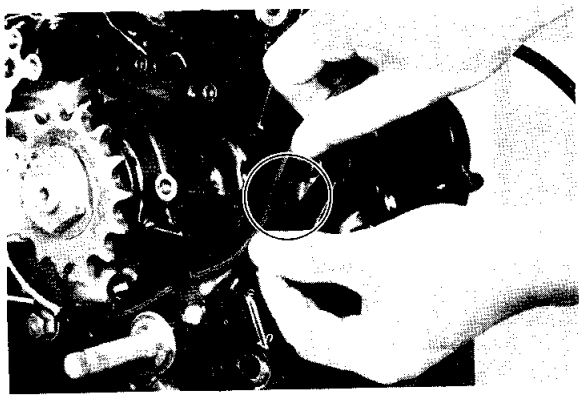
NOTE:
Install the lead wire grommet properly



2. Clamp the lead wire to the crankcase.

NOTE:
Be sure the lead wire will not become loosen.



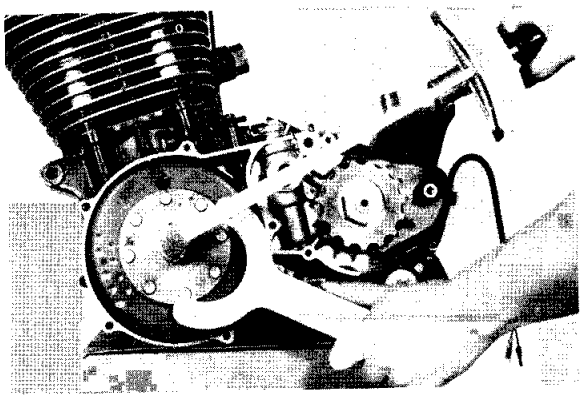


3. Install the flywheel

NOTE:
When installing flywheel, make sure woodruff key is properly seated in key-way of crankshaft. Carefully install flywheel taking care to align with woodruff key.

4. Install plate washer, spring washer and locknut.

Tightening Torque:
7.0 ~ 9.0 m-kg
(50.6 ~ 65.1 ft-lb)



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.

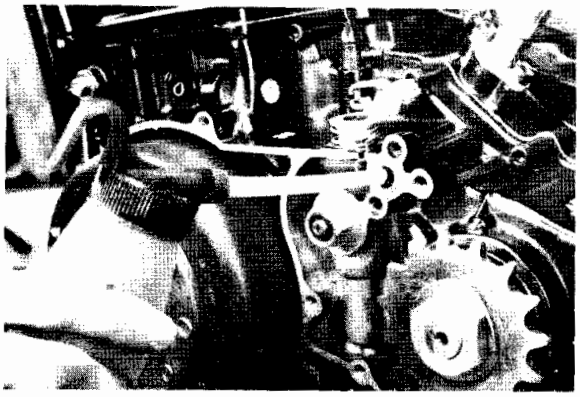
Tightening torque	
Bolt size	Torque
10 mm nut	4.0 ~ 5.5 m-kg (28.9 ~ 39.8 ft-lb)
8 mm nut	2.1 ~ 2.9 m-kg (15.2 ~ 21.0 ft-lb)
8 mm bolt	1.6 ~ 2.2 m-kg (11.6 ~ 15.9 ft-lb)

3. Install the lead wire and plug cap.
4. Install carburetor assembly.

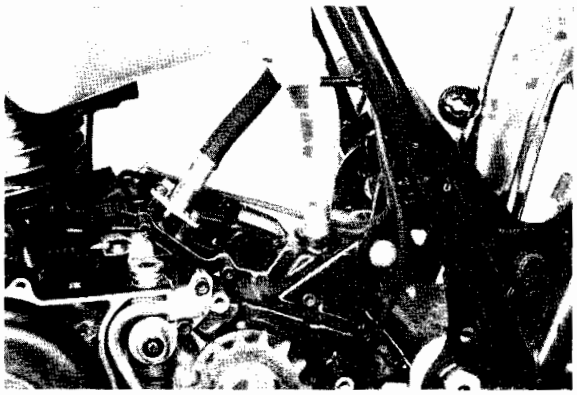
5. Install the inlet and outlet hose.

NOTE:

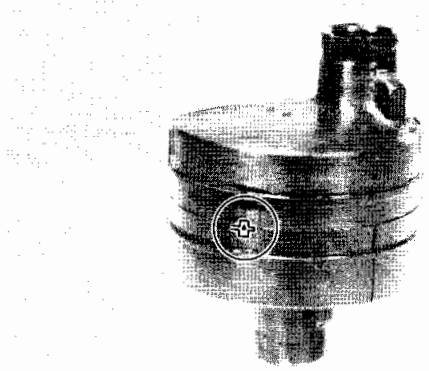
Oil the inlet oil passage before installing the inlet oil hose and install the O-ring to the inlet hose.



6. Add about 1.0 liter (1.1 U.S.qt) of engine oil to the crankcase.



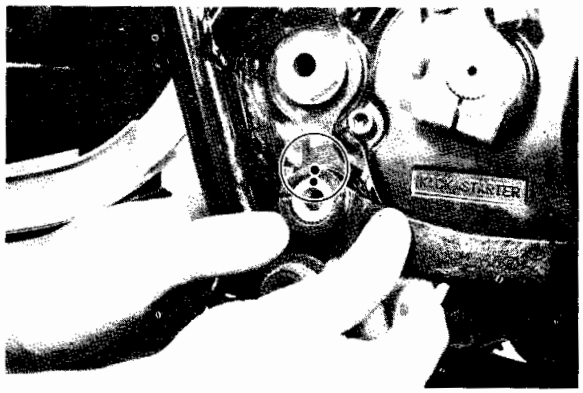
7. Install the crankcase breather assembly.
   a. If the breather is disassembled align the mark of the breather upper and lower as shown and secure with bank.



   b. Install the breather assembly between the crankcase and air cleaner case and secure with clamps.
8. Install the kick crank, brake pedal, right side footrest.

NOTE:

Align the marks on each shaft and pedal/footrests.



9. Install the drive chain with special tool.
10. Install the left crankcase cover and flywheel magneto cover and install the shift lever.
11. Install the engine protector.
12. Install the fuel tank and seat.
13. Install the exhaust pipe assembly.
14. Add about 1.4 liter (1.5 U.S.qt) engine oil to the oil tank.
15. Start the engine and check oil pressure, oil leakage and cam chain adjustment. See Engine oil checking procedure in Chapter 2, "Periodic Inspections and Adjustments".

CHAPTER 4. CARBURETION

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CHAPTER 4. CARBURETION

AIR CLEANER

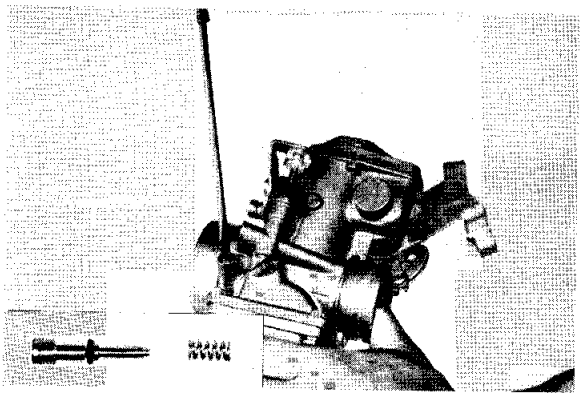
1. The air filter is housed within a case below the seat.
2. The filter is made of polyurethane foam with a stiff bristle covering.
3. For carburetor to function properly, the filter must be in place and it must be damp with oil to provide adequate protection for vital engine parts.
4. For air filter maintenance see Chapter 2. "Air Filter".

CARBURETOR

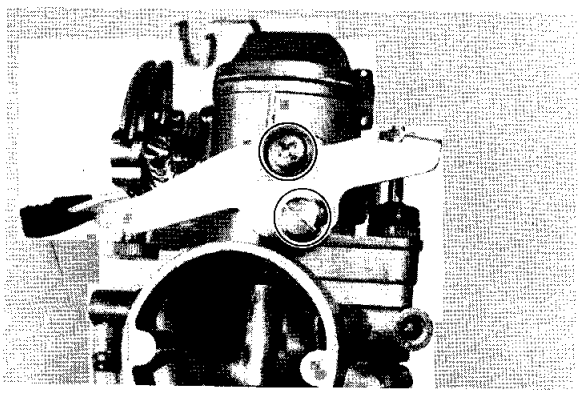
Disassembly

Remove the following parts as shown.

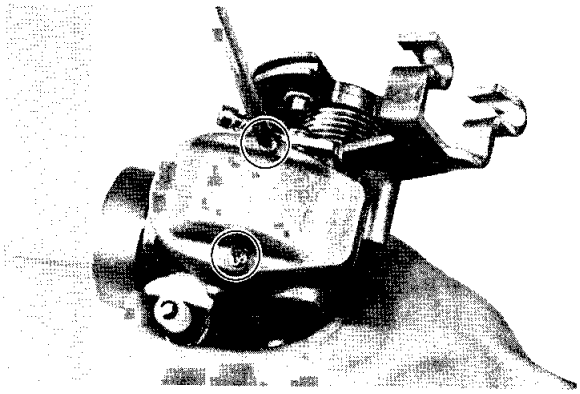
1. Pilot screw



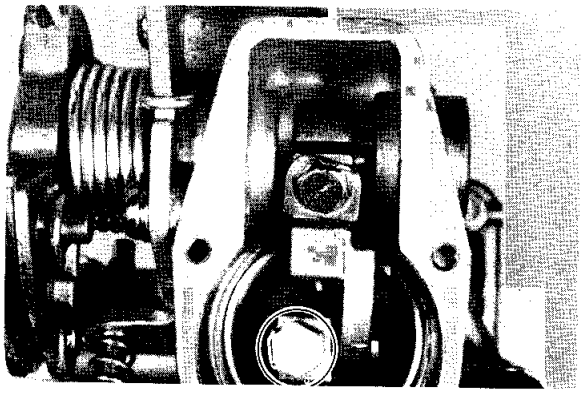
2. Starter (Choke) lever

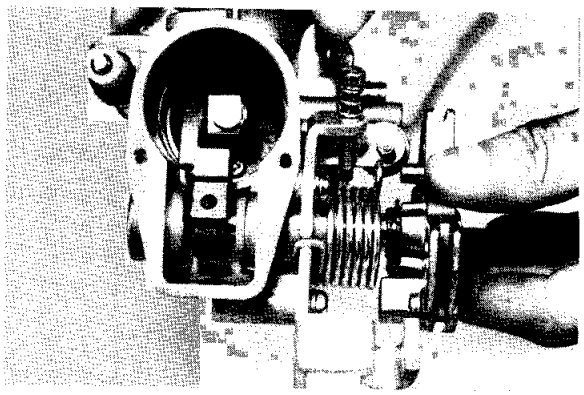


3. Mixing chamber top

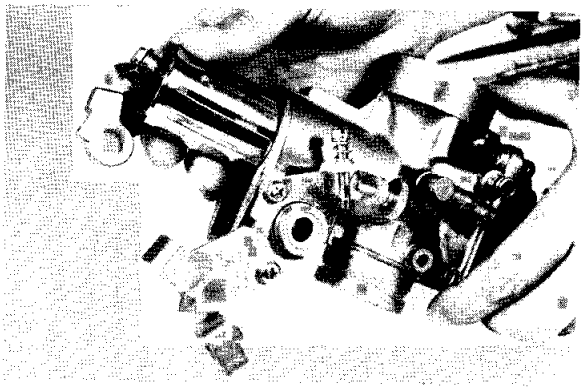


4. Throttle shaft

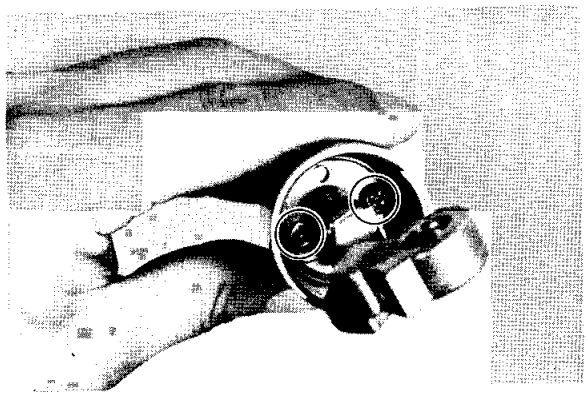




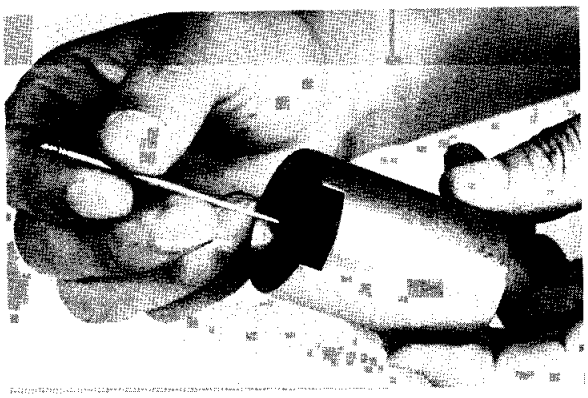
5. Throttle valve



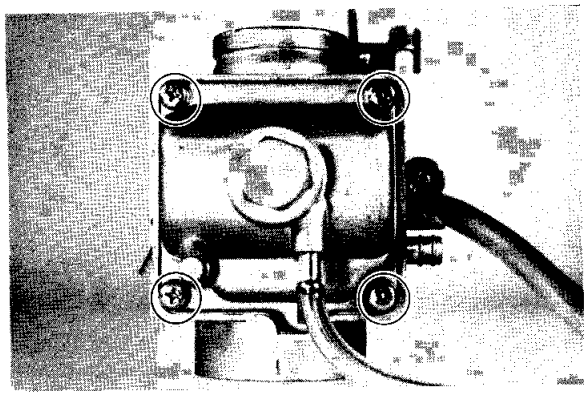
6. Throttle lever assembly



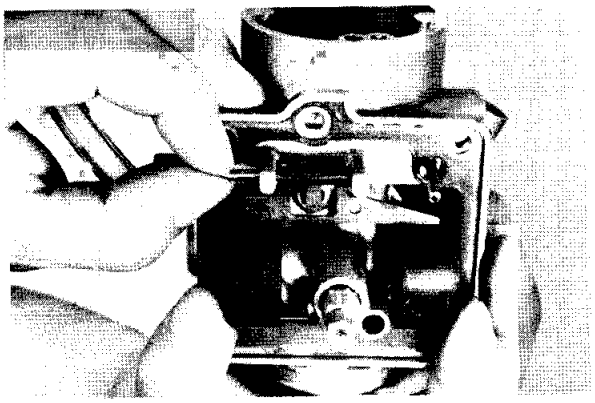
7. Jet needle



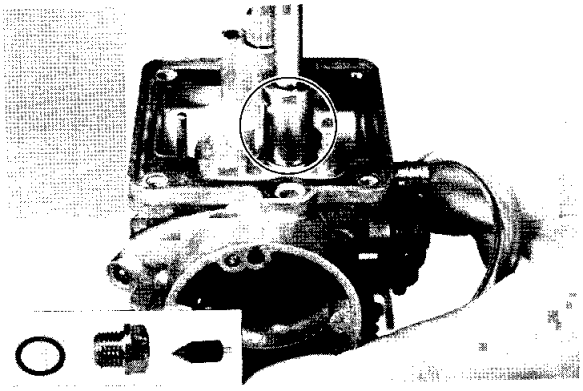
8. Float chamber



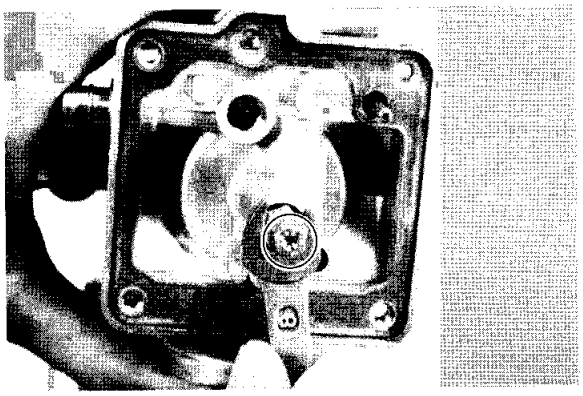
9. Float



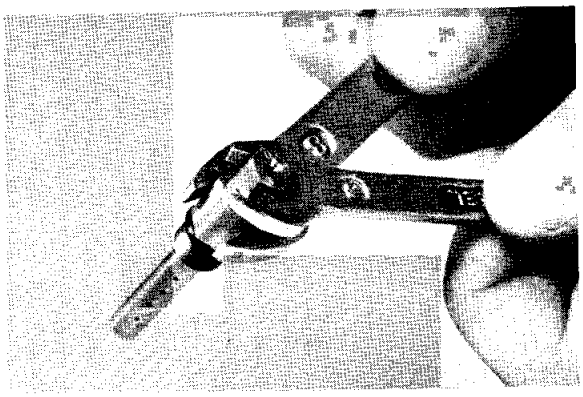
10. Needle valve

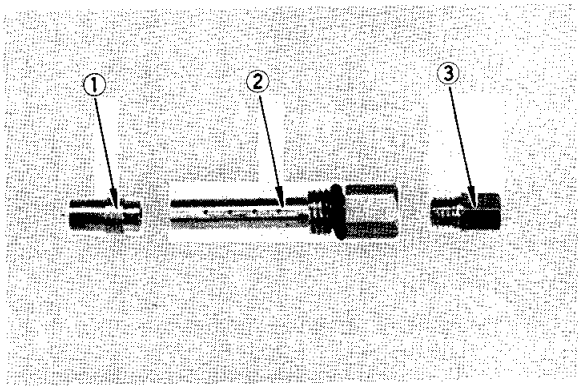


11. Main nozzle



12. Main jet



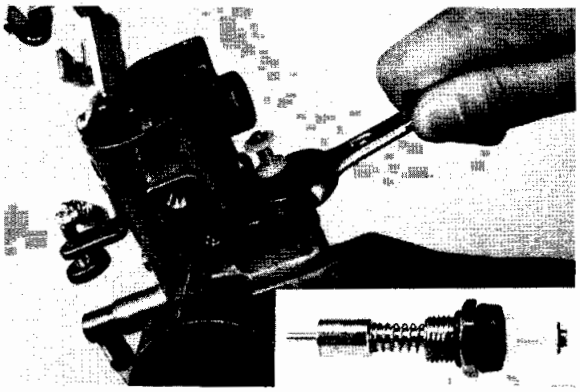


1. Main nozzle 2. Needle jet pipe 3. Main jet

13. Pilot jet



14. Starter plunger



NOTE:

1. Wash the carburetor in petroleum base solvent. Wash all associated parts.
2. Using high pressure air, below out all passages and jets. Never use high pressure air if floats are in place.
3. Inspect the needle and seat for signs of excessive wear or attached foreign particles. Replace as required. Always replace inlet needle and inlet seat as an assembly.
4. Inspect pilot air screw for signs of excessive wear or attached foreign particles. Replace as required.

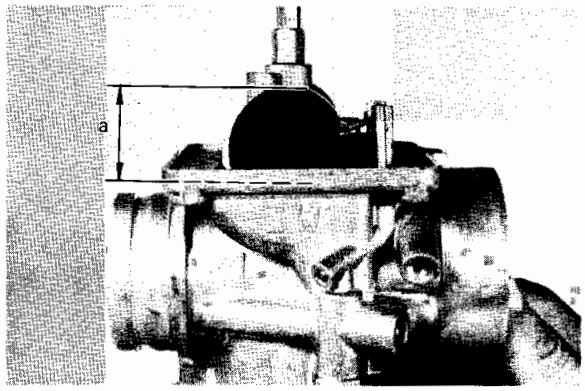
Float Level

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:
22.0 ±2.5 mm
(0.866 ±0.098 in)

NOTE:

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

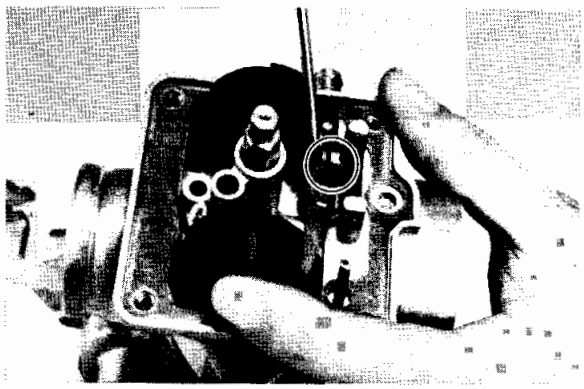


a. Float level

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

NOTE:

Both the right and left sides of the float should measure identically. Correct as required.

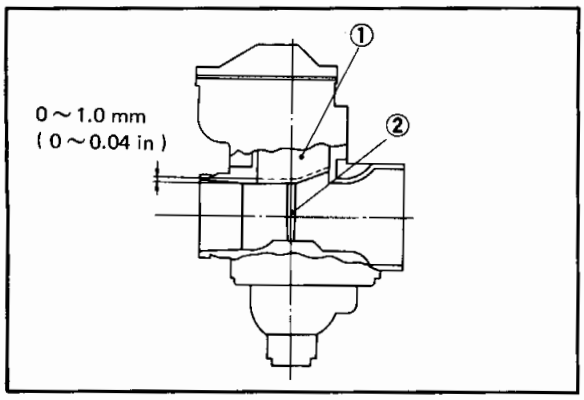


Reassembly and Installation

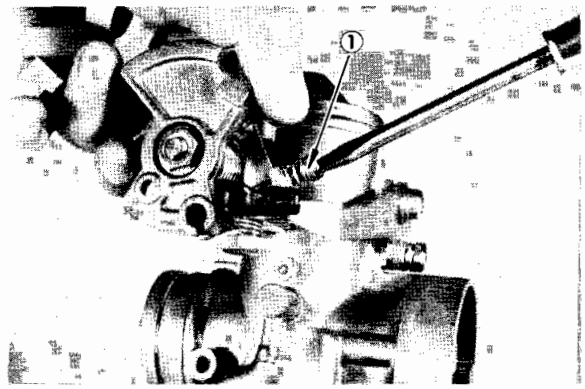
1. Reverse the disassembly procedure for reassembly and installation.

   CAUTION:

   In case the throttle valve is disassembled, adjust the full throttle position as follows. Keep turning the adjusting screw in or out in full throttle condition until the throttle valve bottom end is flush with the main bore upper end as shown in the illustration.



1. Throttle valve 2. Jet needle



1. Full throttle adjusting screw

2. After installation, re-adjust throttle cables, pilot screw and engine idling speed (see Chapter 2. "Carburetor Adjustment").

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5

CHAPTER 5. CHASSIS

FRONT WHEEL

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.

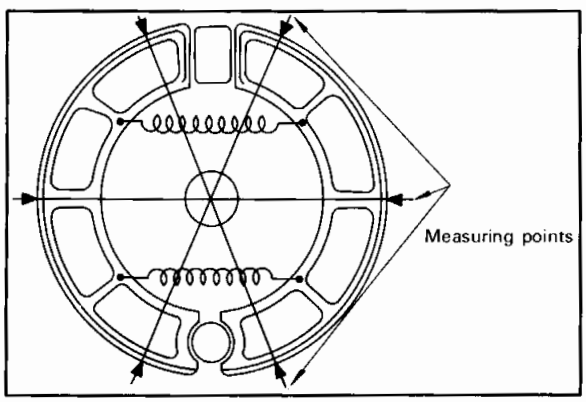
   NOTE:
   Raise the front of the machine by placing a suitable stand under the engine.

Front Axle

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

Checking Brake Shoe Wear

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



Front brake shoe diameter;
130 mm (5.12 in)
Replacement limit;
126 mm (4.96 in)

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

Brake Drum

Oil or scratches on the inner surface or the brake drum will repair 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.

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.

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.

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:

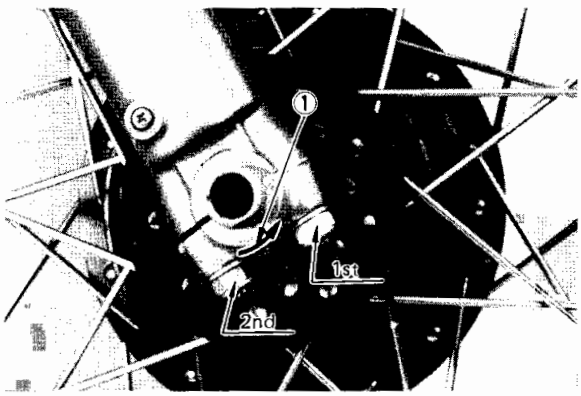
a. Torque the axle nut.

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, and tighten the nut on the rear end.

Axle holder nut torque:
1.6 ~ 2.2 m-kg
(11.6 ~ 15.9 ft-lb)



1. Install with arrow forward

REAR WHEEL

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 using 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.

Checking Brake Shoe Wear

See front wheel section, paragraph

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

Brake Drum

See front wheel section, "Brake Drum".

Replacing Wheel Bearings

See front wheel section, "Replacing Wheel Bearings".

Installing Rear Wheel

1. Install wheel and axle, and tighten axle nut.

Axle nut torque:
6.0 ~ 9.5 m-kg
(43.4 ~ 68.7 ft-lb)

2. Connect drive chain, brake rod and tension bar.
3. Adjust drive chain.
   (See chapter 2, "Drive chain tension adjustment".)
4. Adjust rear brake. (See chapter 2, "Rear brake and wheel".)

RIMS AND SPOKES (FRONT AND REAR WHEELS)

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".)

Checking Rim "Run-Out"

See chapter 2, "Front brake and wheel".

TIRES AND TUBES

Removal

1. Remove valve cap, valve 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.

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: 0.9 kg/cm^2 (13 Psi)
Rear: 1.1 kg/cm^2 (15 Psi)

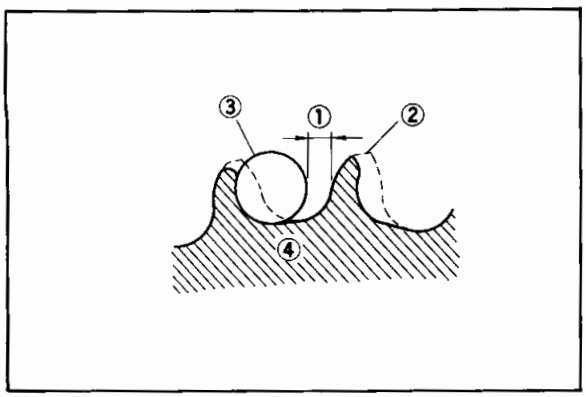
DRIVE CHAIN AND SPROCKETS

NOTE:
Please refer to Maintenance Intervals and Lubrication Intervals charts for additional information.

Drive Sprocket

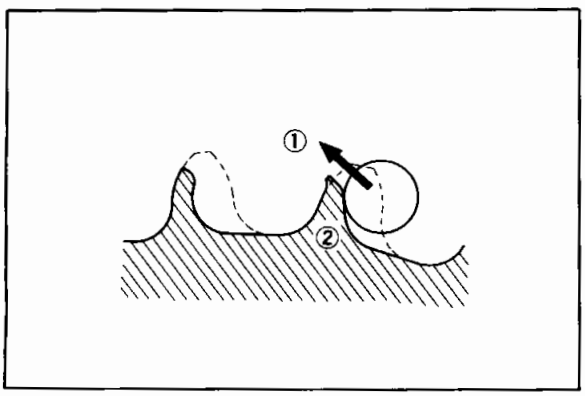
With the left crankcase cover removed, proceed as follows:

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. 1/4 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 thoroughly to specified torque value. Bend lock washer tab fully against securing nut flats.

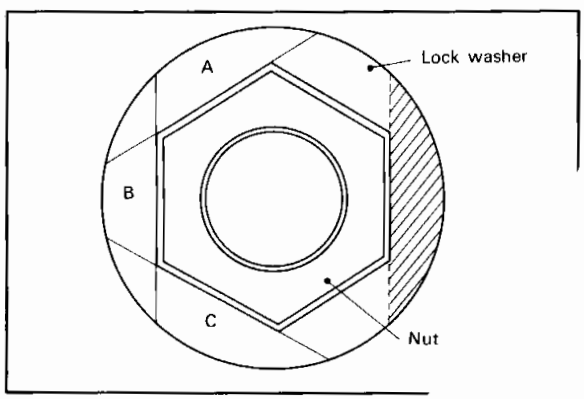
Drive Sprocket Securing Nut Torque: 5.0 ~ 6.0 m-kg (36.2 ~ 43.4 ft-lb)

Driven Sprocket

With the rear wheel removed, proceed as follows:

1. Using a blunt chisel, flatten the securing nuts 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.

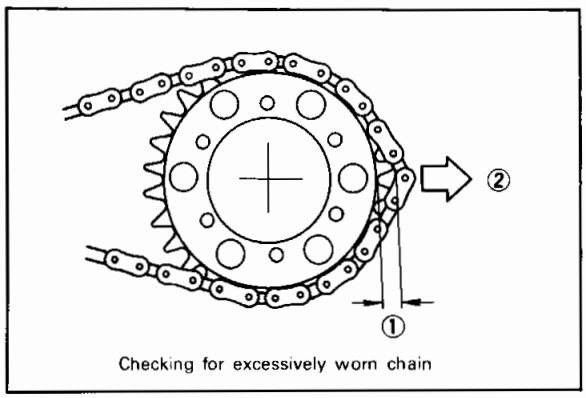
Driven Sprocket Securing Nut Torque: 2.7 ~ 3.3 m-kg (19.5 ~ 23.9 ft-lb)



Chain Inspection

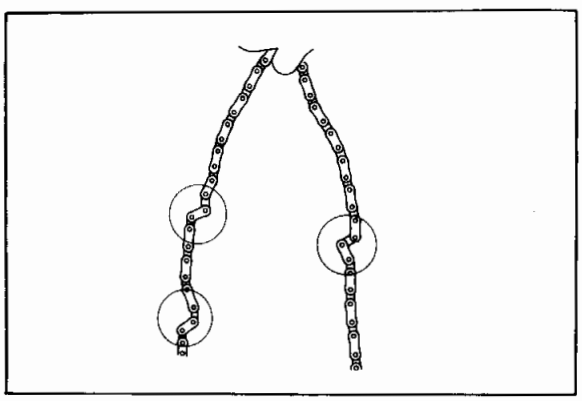
1. With the chain installed on the machine, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect. (See page 25 for chain removal.)

   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. 1/2 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.

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.

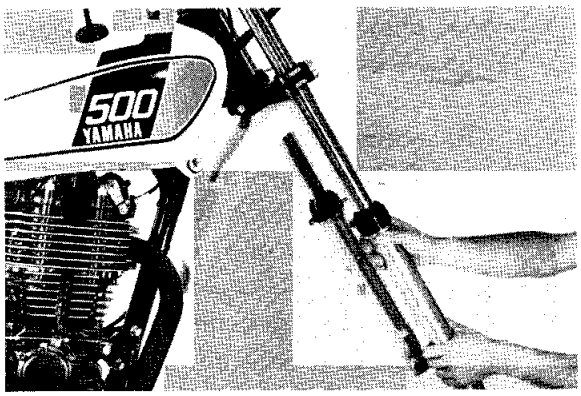
3. Periodically, remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.
4. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly to make sure lubricant penetrates. Wipe off excess. Re-install.

FRONT FORKS

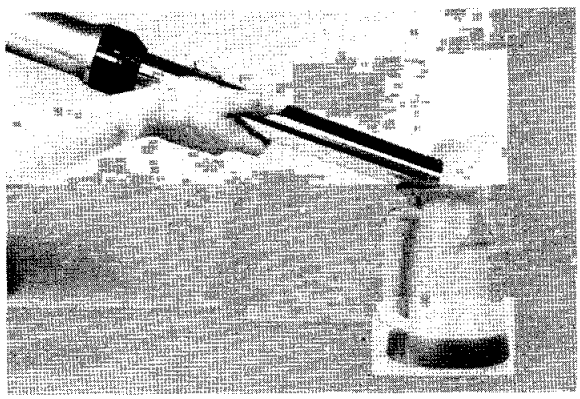
Disassembly

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

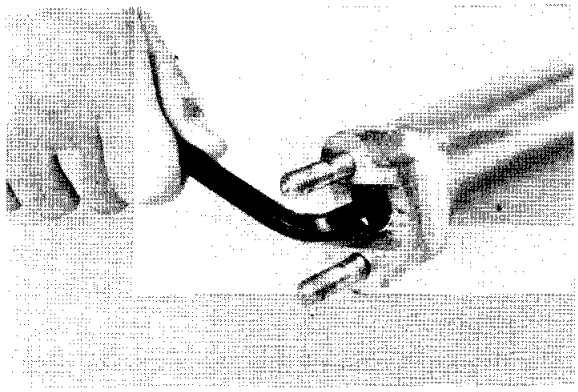
   NOTE:
   Before loosening the upper and lower pench bolts, loosen the front fork cap bolts.



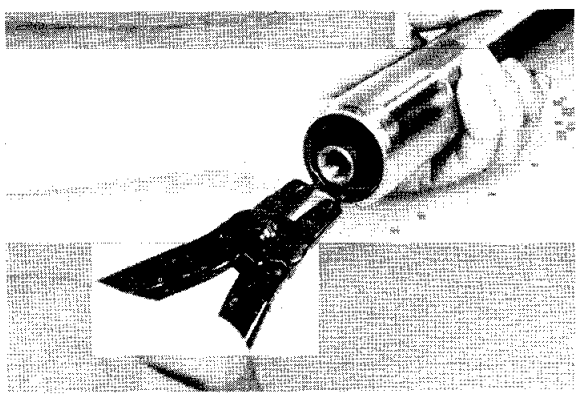
2. Remove the caps and drain the oil from both fork tubes.



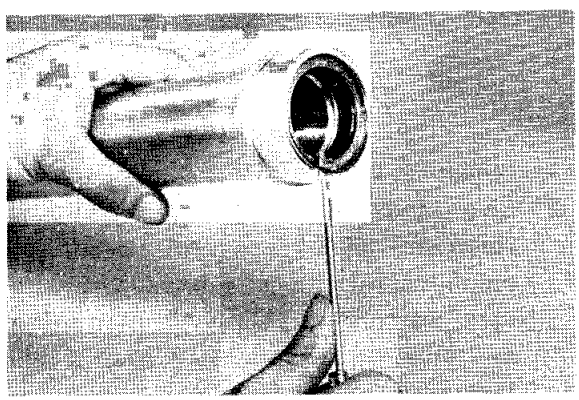
3. Remove the special bolt from bottom of outer tubes.



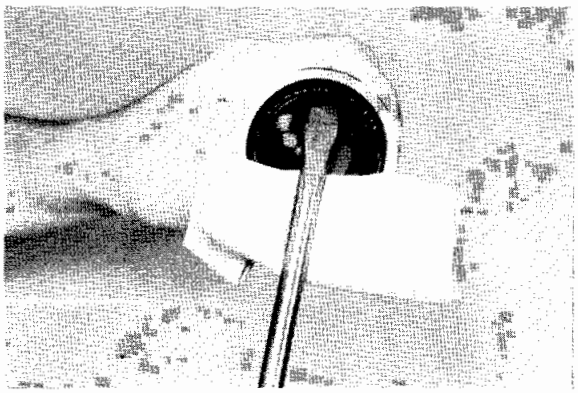
4. Remove inner tube and damper assembly from outer tube.
5. Remove clip from bottom of inner tube and pull out damper assembly. Inspect and replace if damaged.



6. To replace fork seal, remove wire clip, felt ring and cover washer from outer tube.



7. Carefully pry out old seal without damaging fork tube.



8. Insert new seal "open" side down using large socket and steel hammer.

Inspection

Inspect the inner tube for bends or scratches. If the bend is slight, it can be corrected with a press. It is recommended, however, to replace the tube.

Assembly

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

a. Bring up the front fork to the correct position and partially tighten the underbracket mounting bolt.

b. Measure correct amount of oil and pour into each leg.

Recommended oil: Yamaha fork oil or 10W, 20W, 30W

Quantity per leg: 217 ±2 cc (7.34 ±0.068 oz)

NOTE:

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

3. After filling, slowly pump the outer tubes up and down to distribute the oil.
4. Inspect "O" ring on fork cap bolts and replace if damaged.
5. Replace fork cap bolts and torque to specification.

Fork cap bolt torque: 1.5 ~ 2.5 m-kg (10.8 ~ 18.1 ft-lb)

6. Tighten all pinch bolts with specified torque.

Tightening torque: Inner tube to handle crown (upper bracket): 1.8 ~ 2.9 m-kg (13.0 ~ 21.0 ft-lb) Inner tube to under bracket: 2.0 ~ 2.5 m-kg (14.5 ~ 18.1 ft-lb

STEERING HEAD

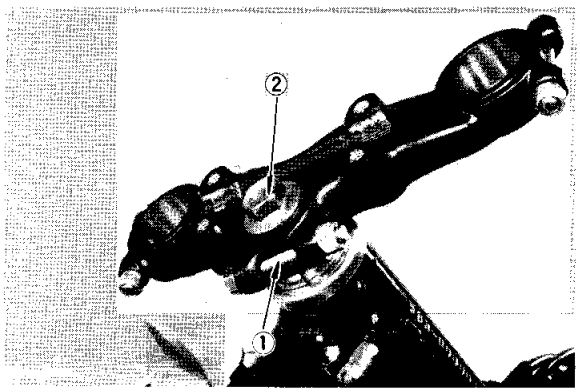
Adjustment

Refer to Chapter 2, Section 2-4, paragraph F for steering head adjustment procedure.

Disassembly

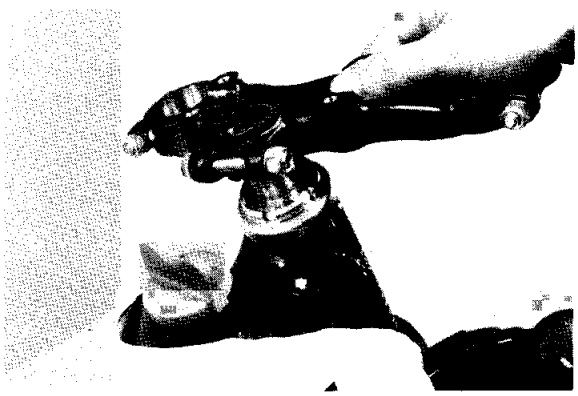
1. Remove front forks.
2. Disconnect engine stop switch lead wire.
3. Disconnect clutch, brake and decomp. cables at handle levers.
4. Remove throttle grip assembly with throttle cables.
5. Remove handlebars and put aside.

6. Loosen stem pinch bolt.



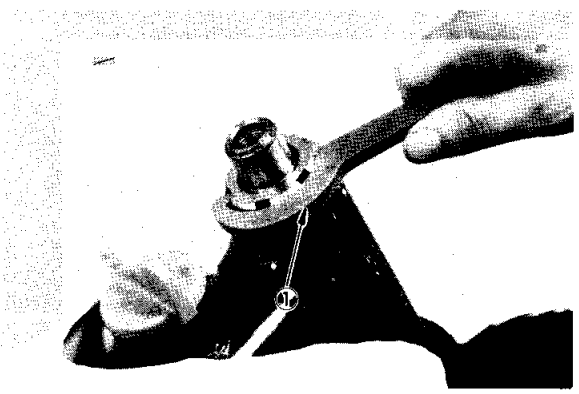
1. Stem pinch bolt
2. Stem fitting bolt

7. Remove stem fitting bolt.
8. Remove handle crown (upper bracket).



9. Remove steering ring nut with steering nut wrench.

NOTE:
Support under bracket with one hand to hold the bracket up into the headstock so that the loose ball bearings will not fall out.



1. Steering nut wrench

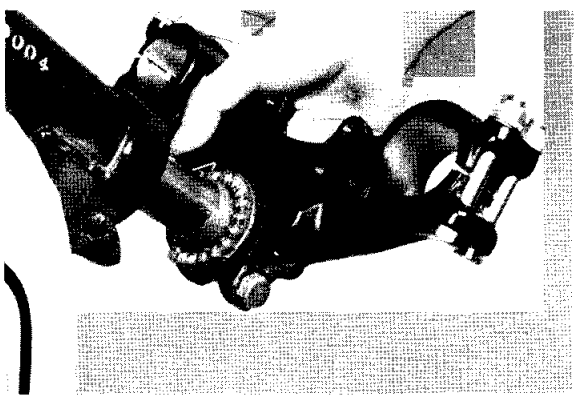
10. While still supporting the under bracket, carefully lift off the upper bearing cover.
11. Lift off the top bearing race and remove all of the ball bearings from the upper bearing assembly.

Ball quantity/size:
22 pcs., 3/16 in

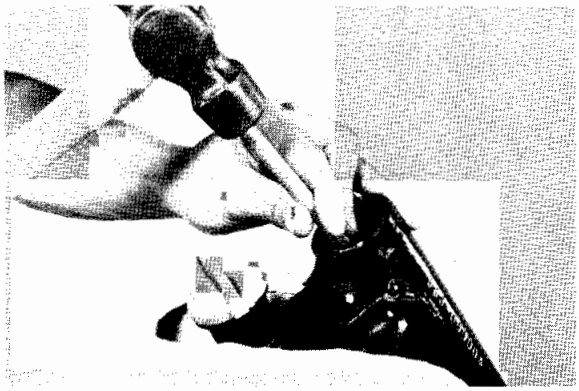


12. Remove bracket while being very careful not to lose any ball bearings from the lower assembly.

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

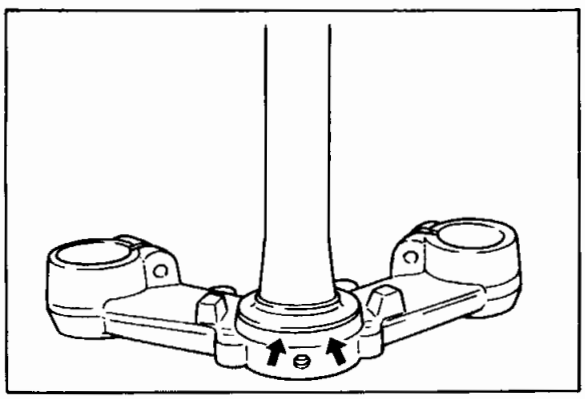


13. Remove races from head pipe using drift punch and hammer as shown. Work the race out gradually by tapping lightly around its complete diameter.



14. Remove the bearing race from the lower bracket by tapping around its diameter with a drift punch and hammer.

NOTE:
Remove dust seal.

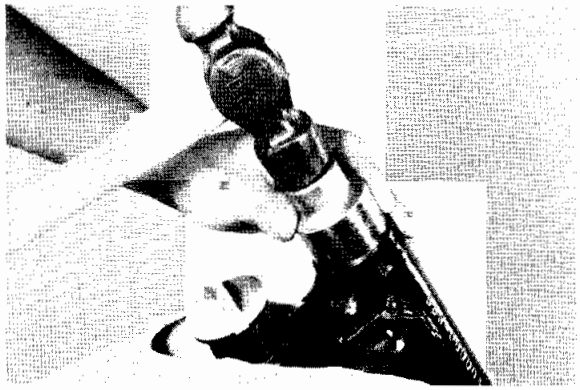


Inspection

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.

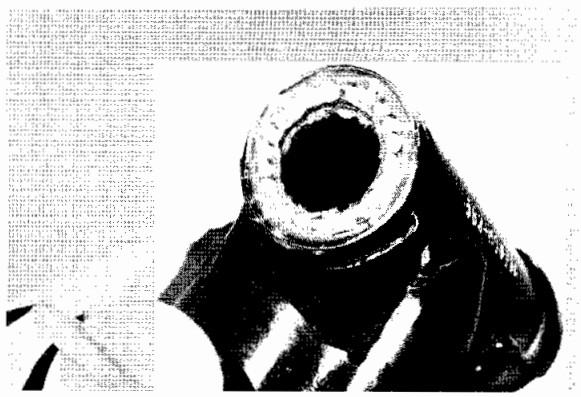
Installation

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 waterproof.



4. Carefully slip the underbracket 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 that all freeplay is taken up, but so the bracket can still pivot freely from lock to lock. Recheck for freeplay after the entire fork unit has been installed. (Refer to Chapter 2. "Steering head adjustment".)
6. Install the fork tubes into the under-bracket.

7. Install the upper fork bracket. Tighten steering fitting bolt, then tighten stem pinch bolt. Torque to specification.

Tightening torque:
Steering fitting bolt;
4.2 ~ 6.5 m-kg
(30.4 ~ 47.0 ft-lb)
Stem pinch bolt;
1.8 ~ 2.9 m-kg
(13.0 ~ 21.0 ft-lb)

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

Upper fork tube pinch bolt torque:
1.8 ~ 2.9 m-kg
(13.0 ~ 21.0 ft-lb)

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

9. Install handlebars and torque to specification.

Handlebar mounting bolt torque:
1.6 ~ 2.2 m-kg
(11.6 ~ 15.9 ft-lb)

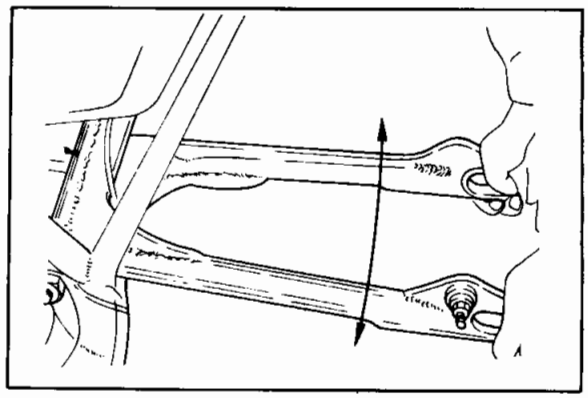
10. Reconnect engine stop switch lead wire.
11. Install front wheel.
12. Reconnect clutch, front brake, decomp cables and throttle grip assembly and check operation.

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 freeplay.

Swing arm freeplay:
1.0 mm (0.04 in)



2. If freeplay is excessive, remove swing arm and replace swing arm bearings.

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.

Removal

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

NOTE:
Carefully remove the arm while noting the location of bearings, oil seals and plate washers.

Pivot shaft torque:
6.0 ~ 9.5 m-kg
(43.4 ~ 68.7 ft-lb)

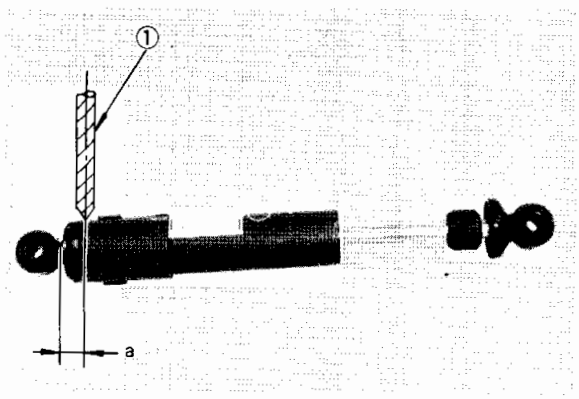
2. Tap out old bearing outer race from each side of pivot using the long rod.
3. Install new bearing using a press.

Rear Shock Absorber

WARNING:

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

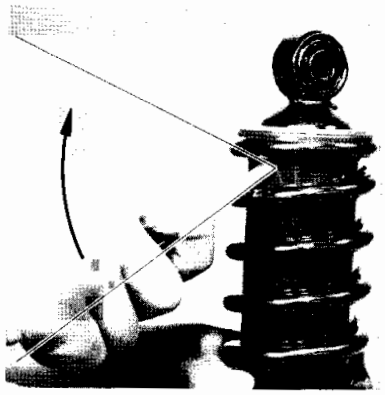
1. **Do not tamper with or attempt to remove the snap ring or bearing at the top of the cylinder.**
2. **Do not subject shock absorber to an open flame or other highheat. This may cause the unit to explode due to excessive gas pressure.**
3. **Do not deform or damage the cylinder in any way.**
   Cylinder damage will result in poor damping performance.
4. **Gas pressure must be released before disposing of the shock absorber. To do so, drill a 2 ~ 3mmϕ hole through the cylinder wall at a point 10 ~ 15 mm above the bottom of the cylinder.**
5. **Wear eye protection to prevent eye damage from escaping gas and/or metal chips.**



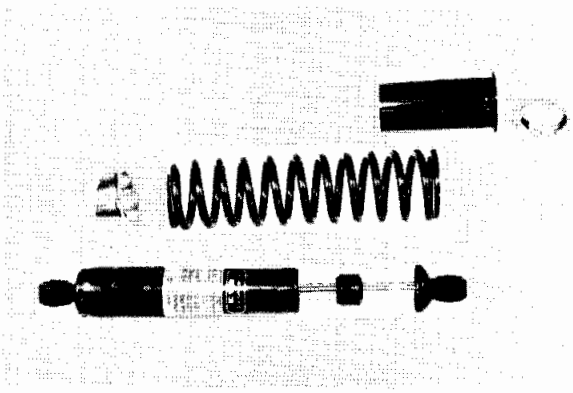
1. Drill 2 ~ 3 mmϕ (0.08 ~ 0.12 inϕ)
a. 10 ~ 15 mm (0.40 ~ 0.60 in)

Inspection

1. Remove the rear shock absorber from the machine.
2. Insert a screwdriver into the hole in the upper part of the plastic cover, and push the damper rubber slightly downward.



3. Push down the spring, remove the spring retainer, and remove the spring.



4. Check the rod, and if it is bent or damaged, replace the shock absorber.
5. Check for oil leakage. If oil leakage is evident, replace the shock absorber.
6. By moving the rod, check to see if it has a proper damping effect. Slight resistance should be felt on the compression (down) stroke and considerable resistance should be felt on the return (up) stroke.
7. Install the spring, and install the shock absorber on the machine.

Rear shock absorber Tightening torque: 2.7 ~ 3.7 m-kg (19.5 ~ 26.8 ft-lb)

CABLES AND FITTINGS

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 straightforward 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.

Cable routing is of paramount importance, however, for details of cable routing, see the cable routing diagrams at the end of this manual.

1. Remove the cable.
2. Check for free movement of cable within its housing. If movement is obstructed, check for fraying or kinking of the cable strands. If damage is evident, replace the cable assembly.
3. To lubricate cable, hold in vertical position. Apply lubricant to uppermost end of cable. Leave in vertical position until lubricant appears at bottom end. Allow excess to drain and re-install.

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

Throttle Maintenance

1. Remove two Phillips head screws from throttle housing assembly and separate two halves of housing.
2. Disconnect cable end from throttle grip assembly and remove grip assembly.
3. Wash all parts in mild solvent and check contact surfaces for burrs or other damage. (Also clean and inspect right-hand end of handlebar.)
4. Lubricate contact surfaces with light coat of lithium soap base grease and reassemble.

   NOTE:

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

5. Check for smooth throttle operation and quick spring return when released and make certain that housing does not rotate on handlebar.

Lubrication of levers, pedals, etc.

1. Lubricate the pivoting parts of the decomp., brake and clutch levers with motor oil (10W/30).
2. Lubricate the shaft of the brake pedal with lithium soap grease.

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CHAPTER 6. ELECTRICAL SYSTEM

IGNITION SYSTEM

Ignition Timing

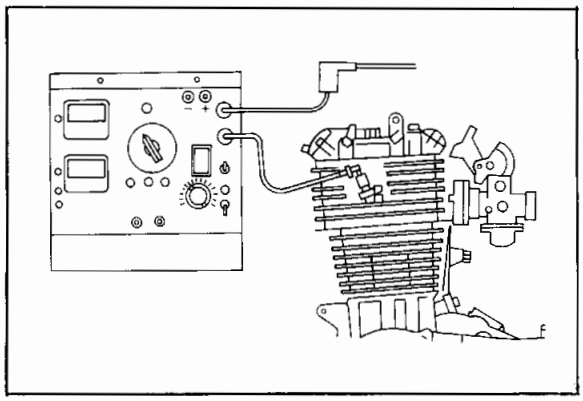
Refer to Chapter 2. "Ignition Timing"

Spark Gap Test

The entire ignition system can be checked for misfire and weak spark using the "Electro Tester".
If the ignition system will fire across a sufficient gap, the entire 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 operating temperature.
2. Stop engine and connect tester as shown.
3. Start engine and increase spark gap until misfire occurs. (Test at various rpm's between idle and red line.)

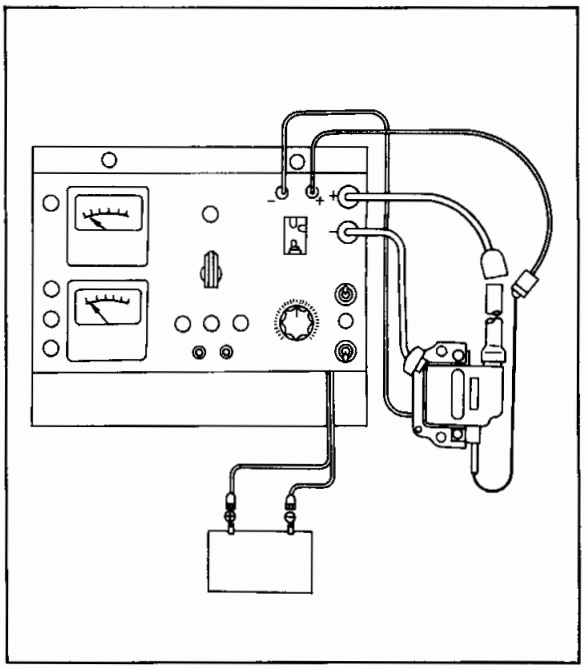
Minimum Spark Gap: 5 mm (0.20 in)



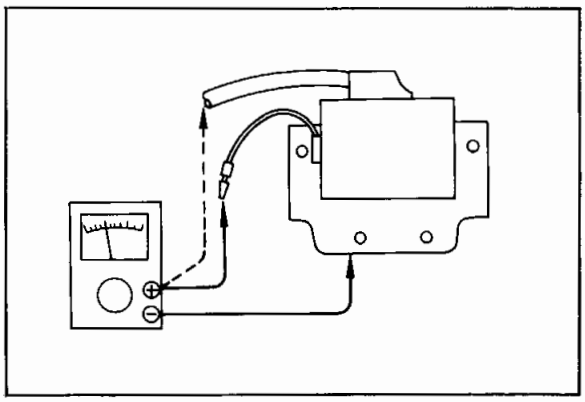
Ignition Coil Test

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.
   c. Connect fully charged 6V battery to tester.
   d. Turn on spark gap switch and increase gap until misfire occurs.

Minimum Spark Gap: 6 mm (0.24 in)



2. Coil winding resistance tests
   Use a pocket tester or equivalent ohmmeter to determine resistance and continuity of primary and secondary coil windings.



Model	Primary Coil resistance Use (Ω × 1) scale	Secondary Coil resistance
TT500C	0.75Ω ±10% at 20°C (68°F)	5.7kΩ ±20% at 20°C (68°F)

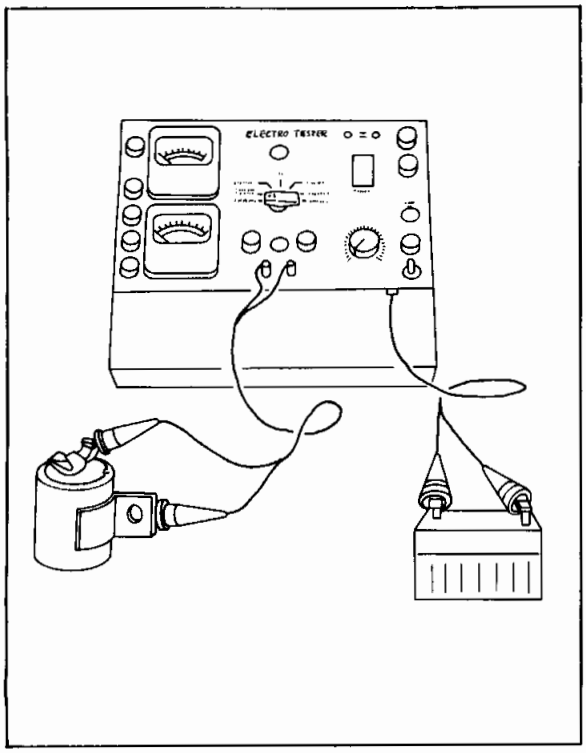
Condenser Test

The condenser is capable of storing a large electrical charge. If it were not for the condenser, an electric arc would jump across the separating contact points, causing them to burn.

Burned contact points greatly affect the flow of current in the primary winding of the ignition coil. If the contact points show excessive wear, or the spark is weak but the ignition coil is in good condition, check the condenser.

1. Condenser insulation test (use ElectroTester)
   a. Set ohmmeter to highest resistance scale ($\Omega \times 1{,}000$ or higher).
   b. Remove condenser from engine and connect ohmmeter as shown below.
   c. Resistance reading should be "Infinity" or very close to it.

Minimum Resistance:
3 MΩ



2. Capacity test (use Electro Tester)
   a. Calibrate capacity scale.
   b. Connect tester (same as insulation test).
   c. Meter needle will deflect and return to center as condenser is charged. After needle stops, note reading on μF scale.

Condenser Cap:
0.22 μF $\pm$10 %

CAUTION:

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

SPARK PLUG

How to "Read" Spark Plug (Condition)

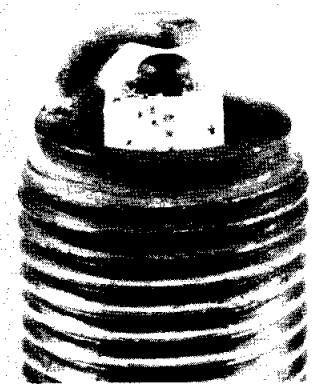
1. Best ... When the porcelain around the center electrode is a light tan color.



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



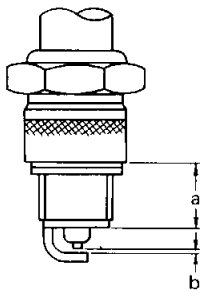
3. If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a colder-type for high speed riding.



Inspection

1. Inspect and clean the spark plug at least once per month.
2. Clean the electrodes of carbon and adjust the electrode gap.
3. Be sure to use the proper reach plug as a replacement to avoid overheating, fouling or piston damage.

Spark Plug Type: BP-7ES (NGK) Gap: 0.7 ~ 0.8 mm (0.028 ~ 0.031 in)



a. 19 mm (0.75 in)
b. 0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

NOTE:

Use only BP spark plugs. Use of conventional spark plug will result in significant power loss.

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CHAPTER 7. APPENDICES

SPECIFICATIONS

General specifications

Model	TT500C
Dimensions:	
Overall length	2,110 mm (83.1 in)
Overall width	935 mm (36.8 in)
Overall height	1,120 mm (44.1 in)
Wheelbase	1,420 mm (55.9 in)
Min. ground clearance	215 mm (8.5 in)
Weight:	
Net	119 kg (262 lbs)
Performance:	
Minimum turning radius	2,100 mm (82.7 in)
Engine:	
Type	4 stroke, single overhead cam, gasoline
Engine model	583
Cylinder	Single cylinder
Bore and stroke	87 mm × 84 mm (3.425 × 3.307 in)
Displacement	499 cc (30.4 cu.in)
Compression ratio	9.0 : 1
Compression pressure	9.5 ~ 10.5 kg/cm^2 (135 ~ 149 lbs/in^2) at kick starting
Valve timing	Intake BTDC 44° (open) ABDC 68° (close) Exhaust BBDC 76° (open) ATDC 36° (close)
Valve clearance (cold)	Intake 0.07 ~ 0.12 mm (0.003 ~ 0.005 in) Exhaust 0.12 ~ 0.17 mm (0.005 ~ 0.007 in)
Lubrication:	
Lubrication system	Pressure lubricated, dry sump
Delivery pump type	Trochoid pump
Sump capacity	2,400 cc (2.5 US qt)
Recommended lubricant	SAE 20W/40 "SE" motor oil (above 15°C (59°F)) SAE 10W/30 "SE" motor oil (below 15°C (59°F))
Carburetor:	
Type	VM34SS
Manufacturer	MIKUNI
Main jet	#210
Needle jet	Q-2
Pilot jet	#35
Starter jet	#60
Jet needle/Clip position	5J10-3
Float level	22.0 ±2.5 mm (0.87 ±0.098 in)
Pilot screw	1-1/4 turns out
Air jet	0.8ϕ
Throttle valve	4.5
Idling engine speed	1,100 rpm
Air cleaner:	Oiled, foam rubber
Clutch:	
Type	Wet, multi-disc
Primary drive:	
Type	Spur gear
Reduction ratio	77/30 (2.566)

Model	TT500C
Transmission:	
Type	Constant mesh, five speed
Reduction ratio, 1st	33/14 (2.357)
2nd	28/18 (1.555)
3rd	25/21 (1.190)
4th	22/24 (0.916)
5th	21/27 (0.777)
Secondary drive:	
Type	Single row chain
No. of links	104L
Size/Manufacturer	DID520T/Daido
Reduction ratio	52/15 (3.466)
Chassis:	
Frame type	Tubular steel semi-double cradle
Fuel tank capacity	8.5 lit (2.2 gal)
Front suspension system	Telescopic fork
Fork travel	195 mm (7.68 in)
Fork oil quantity	217 ±2 cc (7.34 ±0.068 oz) per leg
Fork oil grade	10W, 20W, 30W
Fork dimensions, caster	59°50′
trail	134 mm (5.28 in)
Rear suspension system	Swing arm
Shock absorber travel	100 mm (3.94 in)
Front wheel, rim size	1.60A-21
Tire size	3.00-21-4PR
Inflation pressure	0.9 kg/cm^2 (13 psi)
Rear wheel, rim size	2.15-18
tire size	4.60-18-4PR
inflation pressure	1.1 kg/cm^2 (15 psi)
Braking system:	
Operation system, front	Right hand operation
Brake type	Drum brake
Operation system, rear	Right foot operation
Brake type	Drum brake
Ignition system:	
Type	Magneto ignition
Ignition timing	7 degree Retarded
Breaker point gap	0.35 ±0.05 mm (0.014 ±0.002 in)
Spark plug, manufacturer	NGK
heat range	BP-7ES
Ignition coil, manufacturer	NIPPON DENSO
Lighting coil, voltage output	6.0V or more per 2,500 rpm
Clutch:	
Clutch spring free length	41.2 mm (1.622 in)
Wear limit	40.2 mm (1.582 in)
Spring rate	1.22 kg/mm (68.31 lb/in)
Friction plate, thickness	2.8 mm (0.110 in)
wear limit	2.5 mm (0.0984 in)
Clutch plate, warp limit	0.05 mm (0.00196 in)
Ignition:	
Contact pressure	$800\ ^{+100}_{-100}$ g ($1.764\ ^{+0.22}_{-0.22}$ lb)
Spark plug and gap	0.7 ~ 0.8 mm (0.0276 ~ 0.0315 in)
Condenser capacity	0.22 μF ±10%

Model	TT500C
Ignition coil resistance	2.214Ω ±10% at 20°C
Ignition coil, manufacturer	NIPPON DENSO
model number	029700-3900
primary resistance	0.75Ω ±10% at 20°C
secondary resistance	5.7kΩ ±20% at 20°C

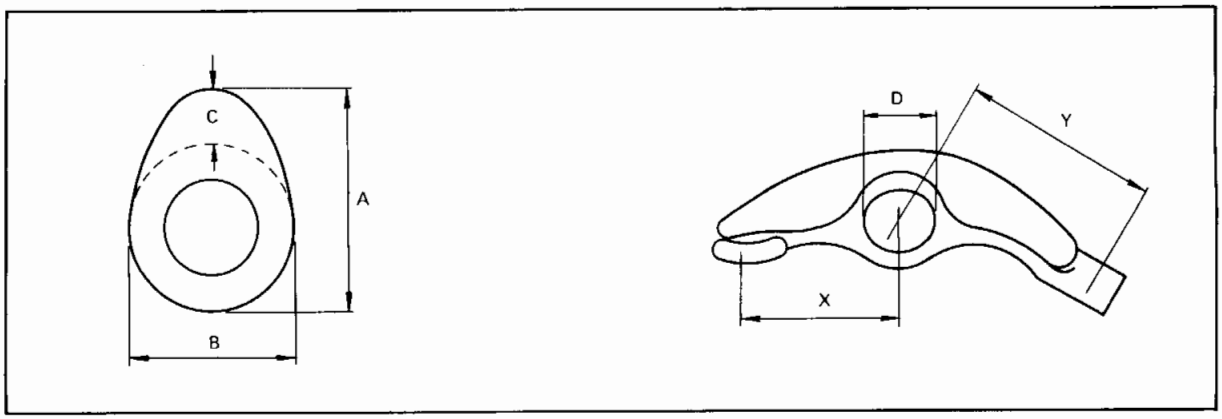
Maintenance specifications

Camshaft

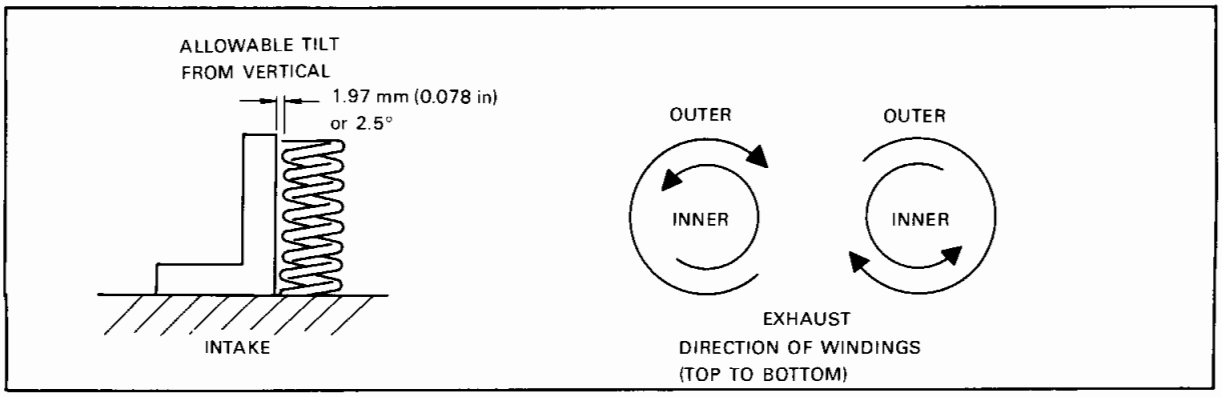
Dimensions		Standard size	Wear limit
Intake	A	39.23 ±0.05 mm (1.544 ±0.002 in)	39.08 mm (1.539 in)
	B	32.23 ±0.05 mm (1.269 ±0.002 in)	32.08 mm (1.263 in)
	C	7.225 mm (0.284 in)	—
Exhaust	A	39.25 ±0.05 mm (1.545 ±0.002 in)	39.10 mm (1.539 in)
	B	32.28 ±0.05 mm (1.27 ±0.002 in)	32.13 mm (1.265 in)
	C	7.253 mm (0.285 in)	—

Rocker arms

Dimensions	Standard size	Wear limit
D_1: Arm I.D.	$12\ ^{+0.018}_{-0}$ mm ($0.472\ ^{+0.0007}_{-0}$ in)	—
D_2: Shaft I.D.	$12\ ^{-0.010}_{-0.20}$ mm ($0.472\ ^{-0.004}_{-0.008}$ in)	—
Clearance	0.010 ~ 0.038 mm (0.004 ~ 0.0015 in)	0.1 mm (0.04 in)
Lift ratio	X : Y = 25 mm : 35 mm (0.98 in : 1.38 in)	

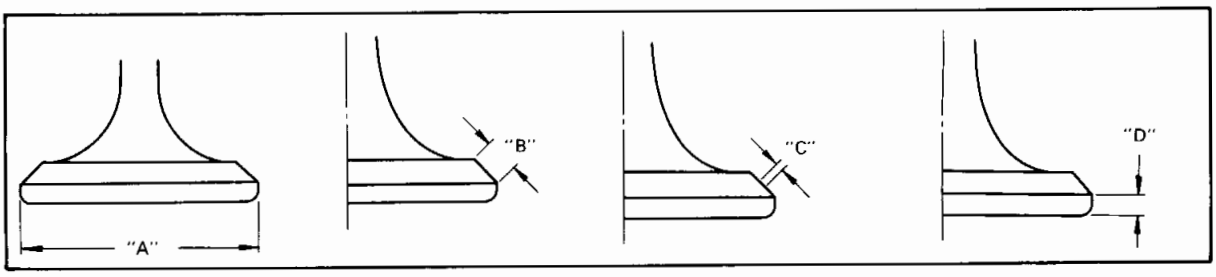


Valve springs



	Inner		Outer	
	Intake	Exhaust	Intake	Exhaust
Free length	45.25 mm (1.781 in)		45.15 mm (1.777 in)	
Spring rate	K_1 = 1.28 kg/mm (71.68 lb/in) K_2 = 1.65 kg/mm (92.39 lb/in)		K_1 = 2.92 kg/mm (163.51 lb/in) K_2 = 3.84 kg/mm (215.03 lb/in)	
Installed length (Valve closed)	38.0 mm (1.50 in)		40.0 mm (1.57 in)	
Installed pressure (Valve closed)	9.3 ±0.9 kg (20.5 ±1.98 lb)		15.0 ±1.0 kg (33.1 ±2.2 lb)	
Compressed length (Valve open)	27.5 mm (1.083 in)		29.5 mm (1.161 in)	
Compressed pressure (Valve open)	26.9 ±1.9 kg (59.3 ±4.19 lb)		55.3 ±3.9 kg (121.91 ±8.60 lb)	
Wire diameter	2.9 mm (0.114 in)		4.2 mm (0.165 in)	
Number of windings	6.75 turns		4.6 turns	
Winding O.D.	23.1 mm (0.909 in)		32.7 mm (1.287 in)	

Valves



Intake

	Dimensions	
	Standard	Wear limit
Clearance (Cold engine)	0.07 ~ 0.12 mm (0.0027 ~ 0.0047 in)	—
"A" head diameter	45.0 $^{+0.2}_{-0}$ mm (1.77 $^{+0.0079}_{-0}$ in)	—
"B" face width	2.12 mm (0.083 in)	—
"C" seat width	1.3 mm (0.052 in)	—
"D" margin thickness	1.3 $^{+0.2}_{-0.2}$ mm (0.052 $^{+0.0079}_{-0.0079}$ in)	—
Stem diameter (O.D.)	8.0 $^{-0.010}_{-0.025}$ mm (0.315 $^{-0.0004}_{-0.0010}$ in)	—
Guide diameter (I.D.)	8.0 $^{+0.019}_{+0.010}$ mm (0.315 $^{+0.00075}_{+0.00039}$ in)	—
Stem-to-guide clearance	0.020 ~ 0.044 mm (0.00079 ~ 0.0017 in)	—

Exhaust

	Dimensions	
	Standard	Wear limit
Clearance (Cold engine)	0.12 ~ 0.17 mm (0.0047 ~ 0.0067 in)	—
"A" head diameter	39.0 $^{+0.2}_{-0}$ mm (1.535 $^{+0.0079}_{-0}$ in)	—
B" face width	2.12 mm (0.0834 in)	—
"C" seat width	1.3 mm (0.051 in)	—
"D" margin thickness	1.3 $^{+0.2}_{-0.2}$ mm (0.051 $^{+0.0079}_{-0.0079}$ in)	—
Stem diameter (O.D.)	8.0 $^{-0.025}_{-0.040}$ mm (0.315 $^{-0.00098}_{-0.00157}$ in)	—
Guide diameter (I.D.)	8.0 $^{+0.019}_{+0.010}$ mm (0.315 $^{+0.00075}_{+0.00039}$ in)	—
Stem-to-guide clearance	0.035 ~ 0.059 mm (0.00138 ~ 0.00232 in)	

Cylinder

Cylinder:	Standard bore size	$87\ ^{+0.02}_{-0}$ mm ($3.425\ ^{+0.0008}_{-0}$ in)
	Wear limit	87.1 mm (3.425 in)
	Taper limit	0.05 mm (0.00196 in)
Piston	Nominal clearance	0.05 ~ 0.055 mm (0.00196 ~ 0.00216 in)
	Wear limit	0.1 mm (0.004 in)

Ring groove width

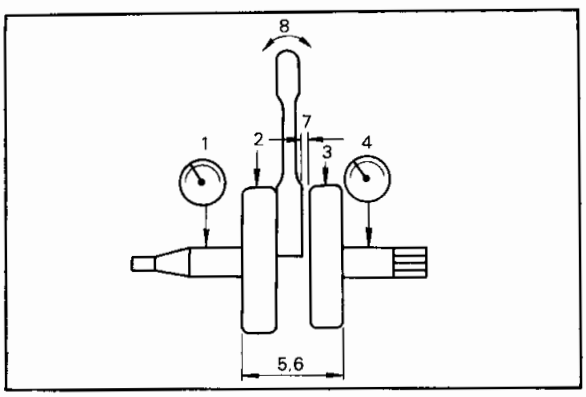
	1st	2nd	3rd
Nominal	$1.2\ ^{+0.05}_{+0.03}$mm ($0.0472\ ^{+0.00196}_{+0.00118}$ in)	$1.5\ ^{+0.04}_{+0.02}$mm ($0.059\ ^{+0.00157}_{+0.00079}$ in)	$2.8\ ^{+0.035}_{+0.010}$ mm ($0.110\ ^{+0.00138}_{+0.000394}$ in)
Wear limit	—	—	—

Piston ring

		1st	2nd	3rd
Ring end gap, installed	Nominal	0.3 ~ 0.5 mm (0.0118 ~ 0.0196 in)	0.3 ~ 0.5 mm (0.0118 ~ 0.0196 in)	0.2 ~ 0.9 mm (0.0079 ~ 0.0354 in)
	Wear limit	—	—	—
Ring end gap, free	Nominal	10.5 mm (0.413 in)	15.5 mm (0.610 in)	1.0 ~ 4.0 mm (0.0394 ~ 0.157 in)
	Wear limit	—	—	—
Side clearance	Nominal	0.04 ~ 0.08 mm (0.00157 ~ 0.00315 in)	0.03 ~ 0.07 mm (0.00118 ~ 0.00276 in)	—
	Wear limit	—	—	—

Crankshaft

Deflection tolerance				Flywheel width		Rod clearance			
						Side (7)		Axial (8)	
1.	2	3.	4.	5.	6.	Max.	Min.	New	Max.
0.03 mm (0.00118 in)	—	—	0.03 mm (0.00118 in)	$75.0\ ^{+0}_{-0.05}$ mm ($2.953\ ^{+0}_{-0.00196}$ in)	—	0.65 mm (0.0256 in)	0.35 mm (0.014 in)	0.8 ~ 1.0 mm (0.0315 ~ 0.0394 in)	2.0 mm (0.0787 in)



Suspension

	Front	Rear
Type	Telescopic fork	Swing arm (Gas cushion)
Travel	195 mm (7.68 in)	100 mm (3.94 in)
Spring length free	491.5 mm (19.35 in)	249 mm (9.80 in)
Spring length installed	461.5 mm (18.17 in)	236 mm (9.29 in)
Spring constant	K_1 = 0.379 kg/mm (21.22 lb/in) K_2 = 0.417 kg/mm (23.35 lb/in)	K_1 = 1.65 kg/mm (92.40 lb/in) K_2 = 2.19 kg/mm (122.63 lb/in)
Spring wear limit (Free)	—	—
Number of coils	62.5 turns	12.25 turns
Diameter of coil	26.3 mm (1.035 in)	66.5 mm (2.62 in)
Diameter of wire	4 mm (0.158 in)	8 mm (0.315 in)
Caster 59°50′	Trail 134 mm (5.28 in)	
Rear swing arm nominal length 418 mm (16.47 in)		

Wheels/Tires

	Front	Rear
Mfr/Size/Tread type	DUNLOP/3.00-21-4PR/Knobby	DUNLOP/4.60-18-4PR/Knobby
Tire pressure	0.9 kg/cm² (13 psi)	1.1 kg/cm² (15 psi)
Rim size/Material/Type	1.60A-21/Aluminum/E section	2.15-18/Aluminum/E section
Spoke diameter	3.5 mm (0.138 in)	3.5 mm (0.138 in) 4.0 mm (0.157 in) Hub side
Spoke length (Inside)	L: 227 mm (8.94 in) 9 pcs. R: 241 mm (9.49 in)	L: 198 mm (7.80 in) 18 pcs. R: 161 mm (6.34 in) 9 pcs.
Spoke length (Outside)	L: 226.5 mm (8.92 in) 9 pcs. R: 243 mm (9.57 in)	L: 00 mm R: 160 mm (6.30 in) 9 pcs.
Runout limit (Vertical)	2.0 mm (0.079 in)	2.0 mm (0.079 in)
Runout limit (Horizontal)	1.0 mm (0.039 in)	1.0 mm (0.039 in)

Brakes

	Front	Rear
Type	Drum brake	Drum brake
Actuating method	Wire	Link rod
Brake drum I.D.	130 mm (5.12 in)	160 mm (6.30 in)
Lining length × width = area	124 mm × 22 mm = 2,728 mm² (4.88 in × 0.866 in = 4.226 in²)	161.4 mm × 25 mm = 4,035 mm² (6.354 in × 0.984 in = 6.252 in²)
Quant.	2 pcs.	2 pcs.
Lining thickness/Wear limit	4.0 mm/2.0 mm (0.157 in/0.0787 in)	4.0 mm/2.0 mm (0.157 in/0.0787 in)

TORQUE SPECIFICATIONS

Part to be tightened	Thread dia. and part name	Tightening torque
Engine:		
Cylinder head and Cylinder head cover	10 mm stud bolt	1.7 ~ 2.3 m-kg (12.3 ~ 16.6 lb)
	10 mm nut	3.5 ~ 4.0 m-kg (25.3 ~ 28.9 ft-lb)
	8 mm stud bolt	1.0 ~ 1.5 m-kg (7.2 ~ 10.8 ft-lb)
	8 mm nut	1.8 ~ 2.2 m-kg (13.0 ~ 15.9 ft-lb)
Cylinder head	10 mm stud bolt	1.5 ~ 2.0 m-kg (10.8 ~ 14.5 ft-lb)
	10 mm nut	3.5 ~ 4.0 m-kg (25.3 ~ 28.9 ft-lb)
	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Cylinder head cover	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Cylinder head cover side 1	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Spark plug	14 mm	2.5 ~ 3.0 m-kg (18.1 ~ 21.7 ft-lb)
Cylinder	10 mm stud bolt	1.7 ~ 2.3 m-kg (12.3 ~ 16.6 lb)
	10 mm nut	3.5 ~ 4.0 m-kg (25.3 ~ 28.9 ft-lb)
	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Flywheel	12 mm nut	7.0 ~ 9.0 m-kg (50.6 ~ 65.1 ft-lb)
Stator coil	6 mm pan head screw	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Governor	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Breaker plate	6 mm sloted pan screw	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Valve clearance adjustment nut	8 mm nut	2.5 ~ 2.9 m-kg (18.1 ~ 21.0 ft-lb)
Cam sprocket	10 mm bolt	4.5 ~ 5.5 m-kg (32.5 ~ 39.8 ft-lb)
Stopper guide 1	6 mm pan head screw	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Decompression cam	6 mm bolt	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Cam chain tensioner adjustment	18 mm nut	3.0 ~ 5.0 m-kg (21.0 ~ 36.2 ft-lb)
Cam chain tensioner cover	30 mm cap	1.5 ~ 2.0 m-kg (10.8 ~ 14.5 lb)
Pump cover	6 mm pan head screw	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Strainer cover	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Drain plug	14 mm bolt	2.0 ~ 4.0 m-kg (14.5 ~ 28.9 ft-lb)
Filter cover	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
	5 mm bleeder screw	0.4 ~ 0.6 m-kg (2.9 ~ 4.3 lb)
Delivery pipe	8 mm union bolt	1.5 ~ 2.0 m-kg (10.8 ~ 14.5 ft-lb)
Oil hose 1 (inlet)	14 mm union nut	3.7 ~ 4.3 m-kg (26.7 ~ 31.1 ft-lb)
	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Oil hose 1 stay	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Oil hose 2	16 mm union nut	4.7 ~ 5.3 m-kg (34.0 ~ 38.3 ft-lb)
	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Manifold	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Air cleaner cap	5 mm screw	0.2 ~ 0.4 m-kg (1.4 ~ 2.9 ft-lb)
Air cleaner case 1 and 2	6 mm bolt	0.2 ~ 0.3 m-kg (1.4 ~ 2.2 ft-lb)
Air cleaner case 1	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Exhaust pipe	8 mm stud bolt	1.0 ~ 1.5 m-kg (7.2 ~ 10.8 ft-lb)
	8 mm bolt	1.7 ~ 2.3 m-kg (12.3 ~ 16.6 ft-lb)
Crankcase 1 and 2	6 mm bolt	1.0 ~ 1.4 m-kg (7.2 ~ 10.1 ft-lb)
Bearing cover plate (Drive axle)	5 mm flat head screw	0.5 ~ 0.9 m-kg (3.6 ~ 6.5 ft-lb)
Bearing cover plate (Main axle)	6 mm flat head screw	0.6 ~ 0.9 m-kg (4.3 ~ 6.5 ft-lb)

Part to be tightened	Thread dia. and part name	Tightening torque
Crankcase cover 1	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Crankcase cover 2	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Ignition timing inspection hole	34 mm bolt	1.0 ~ 1.4 m-kg (7.2 ~ 10.1 ft-lb)
Crankcase cover 3	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Cover	6 mm pan head screw (4 pcs)	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Breaker cover	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Locl crank boss	8 mm bolt	1.5 ~ 2.5 m-kg (10.8 ~ 18.1 ft-lb)
Rachet wheel guide	6 mm bolt	0.8 ~ 1.2 m-kg (5.8 ~ 8.7 ft-lb)
Clutch spring	6 mm screw	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Primary drive gear	16 mm nut	5.0 ~ 7.0 m-kg (36.2 ~ 50.6 ft-lb)
Clutch push lever adjustment	12 mm nut	1.5 ~ 2.0 m-kg (10.8 ~ 14.5 ft-lb)
Drive sprocket	18 mm nut	5.0 ~ 6.0 m-kg (36.2 ~ 43.4 ft-lb)
Side plate (shift cam)	5 mm flat head screw	0.4 ~ 0.5 m-kg (2.9 ~ 3.6 ft-lb)
Cam stopper screw	14 mm screw	1.5 ~ 2.0 m-kg (10.8 ~ 14.5 ft-lb)
Shift lever adjustment	6 mm nut	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Stopper screw	8 mm stopper screw	1.8 ~ 2.2 m-kg (13.0 ~ 15.9 ft-lb)
Change pedal	6 mm bolt	0.6 ~ 1.0 m-kg (4.3 ~ 7.2 ft-lb)
Chassis: Front wheel shaft	14 mm nut	7.0 ~ 10.0 m-kg (50.6 ~ 72.3 ft-lb)
Outer tube and axle holder	8 mm nut	1.6 ~ 2.2 m-kg (11.6 ~ 15.9 ft-lb)
Handle crown and inner tube	8 mm nut	1.8 ~ 2.9 m-kg (13.0 ~ 21.0 ft-lb)
Handle crown and steering shaft	8 mm nut	1.8 ~ 2.9 m-kg (13.0 ~ 21.0 ft-lb)
Handle crown and steering shaft	14 mm bolt	4.2 ~ 6.5 m-kg (30.4 ~ 47.0 ft-lb)
Handle crown and handle holder	8 mm bolt	1.6 ~ 2.2 m-kg (11.6 ~ 15.9 ft-lb)
Under bracket and inner tube	8 mm nut	2.0 ~ 2.5 m-kg (14.5 ~ 18.1 ft-lb)
Under bracket and steering shaft	10 mm nut	1.6 ~ 2.0 m-kg (11.6 ~ 14.5 ft-lb)
Front fork cap bolt	30 mm bolt	1.5 ~ 3.0 m-kg (10.8 ~ 21.7 ft-lb)
Engine mount bolt (Front, upper)	10 mm nut	4.0 ~ 5.5 m-kg (28.9 ~ 39.8 ft-lb)
Engine mounting bolt (Front, under)	10 mm nut	4.0 ~ 5.5 m-kg (28.9 ~ 39.8 ft-lb)
Engine mounting bolt (Rear, upper)	10 mm nut	4.0 ~ 5.5 m-kg (28.9 ~ 39.8 ft-lb)
Engine mounting bolt (Rear, under)	10 mm nut	4.0 ~ 5.5 m-kg (28.9 ~ 39.8 ft-lb)
Engine mounting bolt (Upper)	8 mm nut	2.1 ~ 2.9 m-kg (15.2 ~ 21.0 ft-lb)
Engine mounting stay (Front)	8 mm bolt	1.6 ~ 2.2 m-kg (11.6 ~ 15.9 ft-lb)
Engine mounting stay (Rear)	8 mm bolt	1.6 ~ 2.2 m-kg (11.6 ~ 15.9 ft-lb)
Engine mounting stay (Upper)	8 mm bolt	1.6 ~ 2.2 m-kg (11.6 ~ 15.9 ft-lb)
Pivot shaft	16 mm nut	6.0 ~ 9.5 m-kg (43.4 ~ 68.7 ft-lb)
Rear wheel shaft	16 mm nut	6.0 ~ 9.5 m-kg (43.4 ~ 68.7 ft-lb)
Tension bar and brake plate	8 mm nut	1.8 ~ 2.9 m-kg (13.0 ~ 21.0 ft-lb)

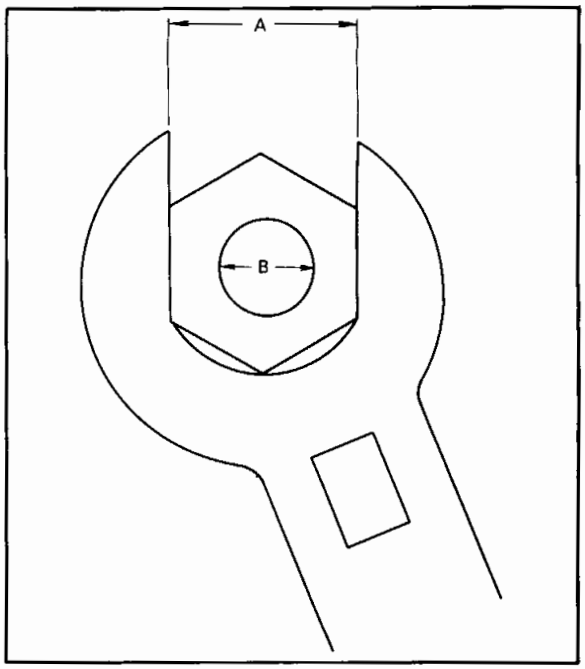
Part to be tightened	Thread dia. and part name	Tightening torque
Tension bar and rear arm	8 mm nut	1.8 ~ 2.9 m-kg (13.0 ~ 21.0 ft-lb)
Rear shock absorber (Upper)	10 mm bolt	2.7 ~ 3.7 m-kg (19.5 ~ 26.8 ft-lb)
Rear shock absorber (Under)	10 mm bolt	2.7 ~ 3.7 m-kg (19.5 ~ 26.8 ft-lb)
Net filter	22 mm	8.0 ~ 10.0 m-kg (57.9 ~ 72.3 ft-lb)
Fuel tank (Front)	6 mm bolt	0.5 ~ 0.8 m-kg (3.6 ~ 5.8 ft-lb)
Cam shaft lever (Both front and rear)	6 mm bolt	0.6 ~ 0.8 m-kg (4.3 ~ 5.8 ft-lb)
Sprocket wheel	8 mm nut	2.7 ~ 3.3 m-kg (19.5 ~ 23.9 ft-lb)
Brake pedal	6 mm bolt	0.6 ~ 0.8 m-kg (4.3 ~ 5.8 ft-lb)
Footrest	8 mm bolt	1.3 ~ 1.8 m-kg (9.4 ~ 13.0 ft-lb)
Footrest	10 mm bolt	3.0 ~ 4.5 m-kg (21.7 ~ 32.5 ft-lb)
Seat	8 mm bolt	1.0 ~ 1.3 m-kg (7.2 ~ 9.4 ft-lb)
Rear fender	6 mm bolt	0.5 ~ 0.8 m-kg (3.6 ~ 5.8 ft-lb)
Mud gard	6 mm bolt	0.5 ~ 0.8 m-kg (3.6 ~ 5.8 ft-lb)
Throttle wire lock nut (Carb. side)	6 mm nut	0.3 ~ 0.5 m-kg (2.2 ~ 3.6 ft-lb)
Front fender	6 mm bolt	0.5 ~ 0.8 m-kg (3.6 ~ 5.8 ft-lb)
Fuel cock	14 mm	1.6 ~ 2.2 m-kg (11.6 ~ 15.9 ft-lb)
Oil tank drain plug	8 mm bolt	1.0 ~ 1.3 m-kg (7.2 ~ 9.4 ft-lb)

Torque specification

The following torque specifications must be adhered to on every machine. When applying torque to multi-secured fastener components, the several studs should be tightened in gradual stages and in a pattern that will avoid warpage to the item being secured. Torque settings are for dry, clean threads. Torquing should always be done to the nut, never the bolt head.

NOTE:

Certain items with other than standard thread pitches may require differing torque. Consult the model Service Manual or distributor if a question arises.



A (Nut)	B (Bolt)	Torque specifications		
		m-kg	ft-lb	in-lb
10 mm	6 mm	1.0	7.2	85
12 mm	8 mm	2.0	15	175
14 mm	10 mm	3.5 ~ 4.0	25 ~ 29	300 ~ 350
17 mm	12 mm	4.0 ~ 4.5	29 ~ 33	350 ~ 400
19 mm	14 mm	4.5 ~ 5.0	33 ~ 36	400 ~ 440
22 mm	16 mm	5.6 ~ 6.5	41 ~ 49	480 ~ 570
24 mm	18 mm	5.8 ~ 7.0	42 ~ 50	504 ~\600
27 mm	20 mm	7.0 ~ 8.3	50 ~ 60	600 ~ 700

CONVERSION TABLE

Metric to Inch System

Known	Multiplier (Rounded off)	Result
Torque		
m-kg	7.233	ft-lbs
m-kg	86.80	in-lbs
cm-kg	0.0723	ft-lbs
cm-kg	0.8680	in-lbs
Wt.		
kg	2.205	lb
g	0.03527	oz
Flow/Distance		
km/l	2.352	mpg
km/hr	0.6214	mph
km	0.6214	mi
m	3.281	ft
m	1.094	yd
cm	0.3937	in
mm	0.03937	in
Vol./Capacity		
cc (cm^3)	0.03382	oz (US liq)
cc (cm^3)	0.06102	cu. in
l (liter)	2.1134	put (US liq)
l (liter)	1.057	qt (US liq)
l (liter)	0.2642	gal (US liq)
Misc.		
kg/mm	56.007	lb/in
kg/cm^2	14.2234	psi (lb/in^2)
Centigrade (°C)	9/5(°C)+32	Fahrenheit(°F)

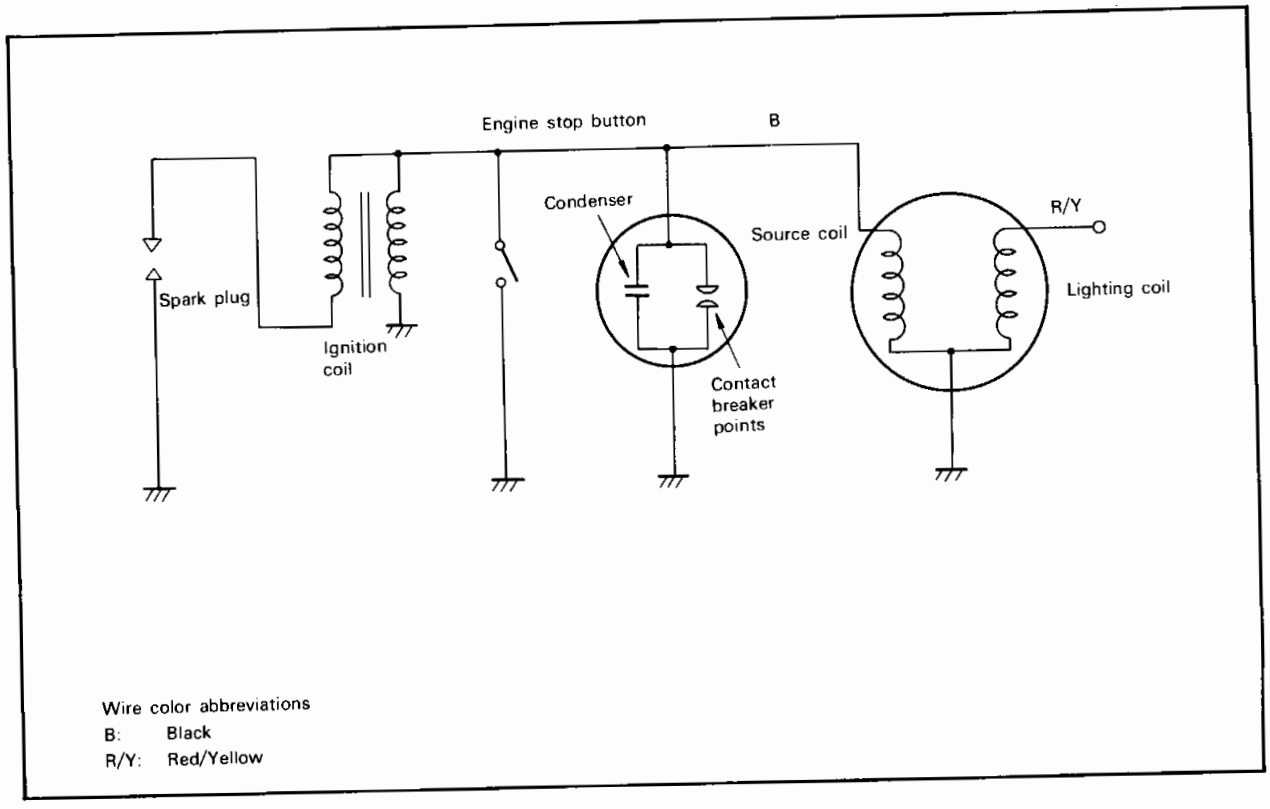
Inch to Metric System

Known	Multiplier (Rounded off)	Result
Torque		
ft-lbs	0.13826	m-kg
in-lbs	0.01152	m-kg
ft-lbs	13.831	cm-kg
in-lbs	1.1521	cm-kg
Wt.		
lb	0.4535	kg
oz	28.352	g
Flow/Distance		
mpg	0.4252	km/l
mph	1.609	km/hr
mi	1.609	km
ft	0.3048	m
yd	0.9141	m
in	2.54	cm
in	25.4	mm
Vol./Capacity		
oz (US liq)	29.57	cc (cm^3)
cu. in	16.387	cc (cm^3)
pt (US liq)	0.4732	l (liter)
qt (US liq)	0.9461	l (liter)
gal (US liq)	3.785	l (liter)
Misc.		
lb/in	0.017855	kg/mm
psi (lb/in^2)	0.07031	kg/cm^2
Fahrenheit(°F)	5/9(°F)−32	Centigrade(°C)

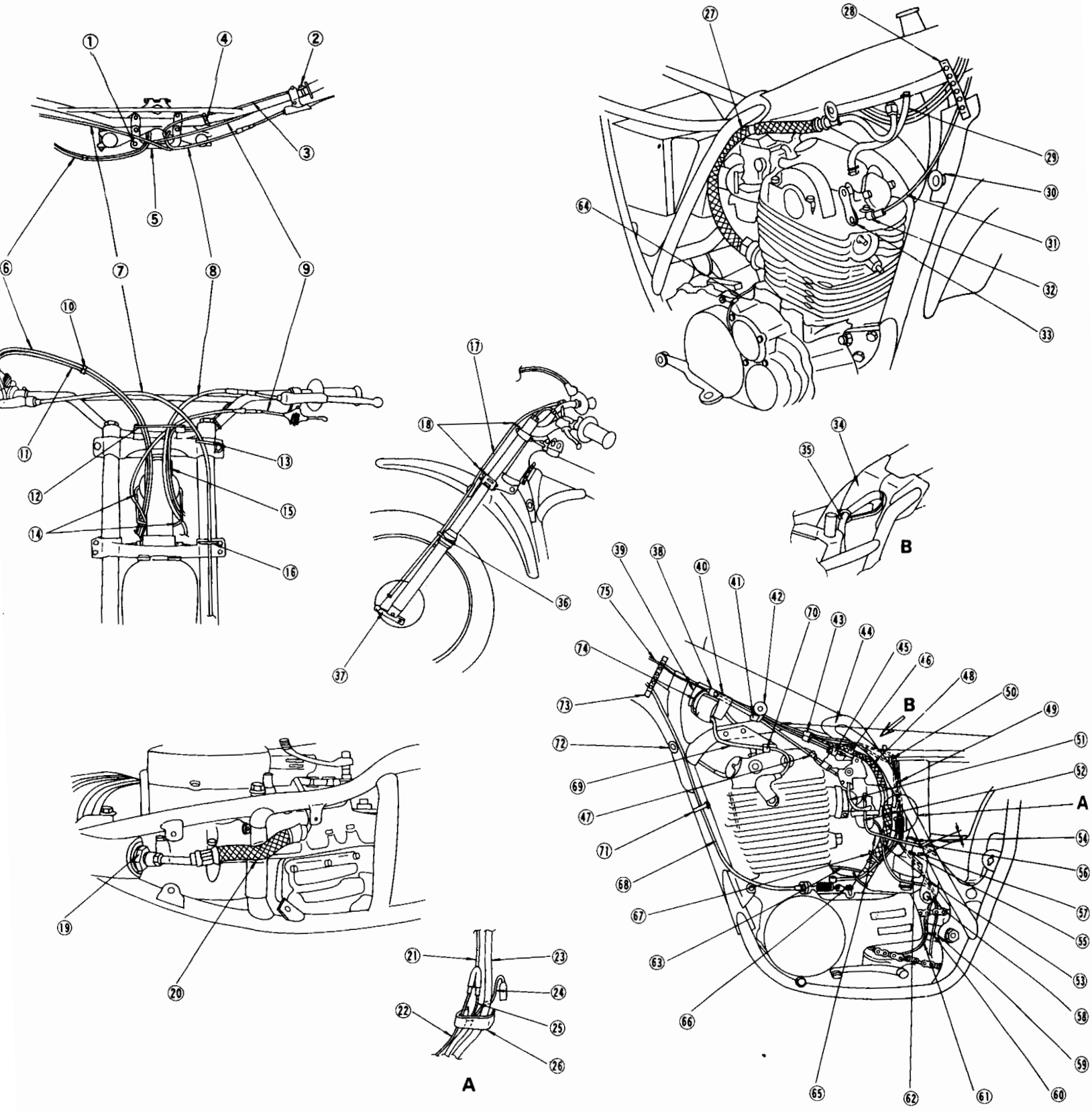
Definition of Terms:

m-kg = Meter-kilograms: Usually torque.
g = Gram(s).
kg = Kilogram(s): 1,000 grams.
km = Kilometer(s).
l = Liter(s).
km/l = Kilometer(s) per liter: Mileage.
cc = Cubic centimer(s) (cm^3): Volume or capacity.
kg/mm = Kilogram(s) per millimeter: Usually spring compression rate.
kg/cm^2 = Kilogram(s) per square centimeter: Pressure.

CIRCUIT DIAGRAM



Wire color abbreviations
B: Black
R/Y: Red/Yellow


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75
A
B
A
B

1. Hole for breather-pipe from the fuel tank
2. Engine stop switch
3. Switch cord
4. Switch cord band
   (437-83936-00)
5. Wire guide
6. Throttle wire
7. Brake wire
8. Clutch wire
9. Decomp. wire
10. Wire clip
11. Throttle wire
    * Be careful not to be twisted two throttle wires.
12. Wire guide
13. Wire guide
14. *Wire guide*
15. Switch cord
16. Wire guide
17. Brake wire
18. Wire guide
19. Filter net
20. Inlet oil hose
21. Sublead wire
22. Braker-lead wire
23. Generator breather pipe
24. Cord for lamp kit
25. Flywheel magnet lead wire
26. Clamp (in a body of air cleaner)
27. Outlet oil pipe
    * Keep oil pipe off from the carburator.
28. Wire guide
29. Breather pipe
30. * Pass above the tank bracket
31. Decomp. wire
32. Decomp. bracket
33. Decomp. lever
34. Main pipe lug
35. *Generator breather pipe*
36. Wire holder
37. Camshaft lever
38. Clamp
    * Cover with vinyl-tube.
    Clamp the connector.
39. Coil bracket
40. Throttle wire
    * Pass through the oil outlet pipe and bracket coil.
41. Clamp
    * Clamp only sublead wire.
42. Rocketing damper
43. Clip
    * Fasten wire-sublead and upside of throttle-wire
    with clip.
44. Lug main pipe
45. Carburator
46. Clamp 2
47. Throttle wire (silver colord tube is attached)
48. Outlet oil pipe
49. Sublead wire
50. Clamp 3
52. Fuel pipe
52. Air ventilation pipe
53. Overflow pipe
54. Clip band
55. Breather assembly
56. Band
57. Side cover hook
58. Upper rear engine M.T.
59. * Pass overflow pipe through the rear arm guide pipe.
60. Guide pipe
61. Flywheel magneto lead for lamp kit
62. Pass the flywheel magneto lead to the right side
    of the breather assembly.
63. Braker lead wire
64. Braker lead wire
65. Air ventilation pipe
    * Be sure not to be loosened.
66. Clutch lever
67. Band
68. Clutch wire
69. High tension cord
70. Clamp
71. Wire band
72. Tank fitting bracket
73. Wire guide
74. Coil lead wire
75. Switch cord