YAMAHA

RD400C

Service Manual

1A1-28197-10

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.
Other information is produced by the U.S. distributor, YAMAHA INTERNATIONAL CORPORATION, and is necessary to provide total technical coverage regarding the product.

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

YAMAHA
1976 RD400C
SERVICE MANUAL
1st Edition, October
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YAMAHA MOTOR COMPANY, LTD., JAPAN
PRINTED IN JAPAN
LIT-11616-00-02



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CHAPTER 1. GENERAL INFORMATION

1-1. MACHINE IDENTIFICATION

The frame serial number is located on the right-hand side of the headstock assembly. The first three digits identify the model. This is followed 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.



1. Frame serial number



2. Engine serial number

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PERIODIC INSPECTION AND ADJUSTMENT

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1-2. SPECIAL TOOLS



No.	Description	Tool No.
1	Armature puller bolt	90890-01111
2	Clutch holding tool	90890-01034
3	Dial gauge stand (2)	90890-01198
4	Dial gauge needle (L = 56 mm (2.24 in))	90890-03042
5	Dial gauge	90890-03002
6	Point checker	90890-03064
7	Steering nut wrench	90890-01063

No.	Description	Tool No.
8	Cylinder cup installer	90890-01111 (Front disc) 90890-01219 (Rear disc)
9	Drive chain cutter	90890-01081
10	Fork spring guide wrench	90890-01212
11	Electro tester	90890-03021
12	Pocket tester	90890-03043

CHAPTER 2.
PERIODIC INSPECTION AND ADJUSTMENT

2-1. INTRODUCTION

This chapter includes all information necessary to perform recommended inspection and adjustments. These preventive maintenance procedures, if followed, will insure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies not only to vehicles already in service, but also to new vehicles that are being prepared for sale. Any service technician performing preparation work should be familiar with this entire chapter.

2-2. MAINTENANCE INTERVALS CHARTS

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 alter this time schedule. 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.

A. Maintenance intervals

Item	Remarks	Period						
		Initial (miles)				Thereafter every (miles)		
		250	500	1,000	2,000	1,000	2,000	8,000
Brake system (Complete)	Check/Adjust as required — Repair as required		○	○		○		
Clutch	Check/Adjust as required		○	○		○		
Battery	Top-off/Check specific gravity as required — Monthly or —	○		○		○		
Spark plug	Inspect/Clean or Replace as required	○	○	○		○		
Wheels and tires	Tire Pressure/Wear/Balance	○	○	○		○		
Fittings and fasteners	Tighten before each ride and/or —	○	○	○		○		
Autolube	Cable operation/Adjustment	○	○	○			○	
Drive chain	Tension/Alignment	○	○	○		○	○	
Oil level check	Includes Transmission, Autolube (See Service Note No. 1) and Brake Fluid (See Service Note No. 10)	○	○	○		○		
Air filter	Paper type (See Service Notes No. 2)	○	○	○		○		
Fuel petcock	Clean/Flush tank as required	○		○			○	
Ignition timing	Adjust/Clean or Replace parts as required		○	○			○	
Carburetor Adjustment	Check Operation/Adjustment/ Fittings		○	○			○	
Decarbonize Engine	Includes exhaust system (See Engine Overhaul — Chapter 3)			○			○	

Service Notes:

No. 1 Check Autolube tank level before each ride.

No. 2 Clean the filter element with compressed air. The element is made of filter paper and should be kept free of water and oil. Remove and clean filter at least once per month or every 250 ~ 500 miles (400 ~ 800 km).

No. 3 For additional information regarding drive chain maintenance, engine oil level etc., see "Lubrication intervals".

B. Lubrication Intervals

Item	Remarks	Lubricant (See list)	Period							
			Initial (miles)				Thereafter (miles)			
			250	500	1,000	3,000	1,000	2,000	4,000	8,000
Autolube	See "Service Notes"	No. 1								
Transmission oil	Warm engine before draining	No. 2	CHK	○	○		CHK	○		
Drive chain	Lube/Adjust as required	No. 4	See service notes #4							
	Remove/Clean → Lube/Adjust	No. 4			○		○			
Control and meter cables	Oil → apply thoroughly	No. 4			○	○		○		
Throttle grip and housing	Light application	No. 5				○		○		
Speedometer gear housing	Light application	No. 5				○			○	
Rear arm pivot shaft	Apply until grease shows	No. 6			○		○			
Brake pedal shaft	Light application	No. 5			○			○		
Stand shaft pivot	Light application	No. 5			○			○		
Front forks	Drain completely/ Check Specs.	No. 3		CHK		○	CHK	○		
Steering ball races	See "Chassis Overhaul" Chapt. 6	No. 7				○		CHK	○	
Point cam lubricating wick	Very light application	No. 8							CHK	
Wheel bearings	See "Chassis Overhaul" Chapt. 6	No. 7				○	CHK	○		

Recommended lubricant type

No. 1 Check Autolube tank level before each ride. Top off before any prolonged use. Use the following lubricants (in order of preference):

a. Yamalube 2-cycle
b. 2-cycle oil with "BIA certified for service TC-W"
c. 2-cycle oil for air-cooled engines
d. 10W/30 Automotive oil with the "SE" rating

CAUTION:
Use this last oil only in an emergency situation when 2-cycle oils are not available.

NOTE:
Oil types should not be mixed. This is particularly true of synthetic-base and petroleum-base oils. Mixing of these types will cause a chemical reaction and often curdle the oils, seriously altering their lubricating qualities.

No. 2 At ambient temperatures of 0 ~ 30° C (32 ~ 86° F), use "Yamalube 4-cycle". Do not use "additives" in oil.
No. 3 Use Yamaha fork oil.
No. 4 Use 10W/30 "SE" motor oil. (If desired, specialty lubricants of quality manufacture may be used.)
Drive chains — Lube every 150 ~ 200 miles (250 ~ 350 km). In severe conditions every 50 ~ 100 miles (80 ~ 150 km).
No. 5 Use cable/chain lubricant (specialty types available — use name-brand of quality manufacture).
No. 6 Use a soft chassis lube grease.
No. 7 Medium-weight wheel bearing grease of quality manufacture (preferably waterproof).
No. 8 Lightweight machine oil.

2-3. ENGINE

A. Carburetor

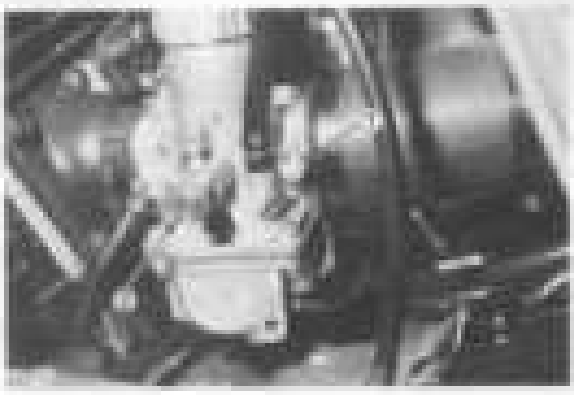
1. Make certain that throttle cable free play and carburetors synchronization is correct.
2. Pilot air screw
Turn air adjusting screw until it lightly seats, then back its out to specification. This adjustment can be made with engine stopped.

Air screw (Turns out)
1-1/2 left and right

NOTE:
Right-hand carburetor pilot air screw located on inboard side of right carburetor.

3. Start the engine and let it warm up.
4. Idle speed screw
Turn throttle stop screw in or out to achieve smooth engine operation at specified idle speed.
Left-hand and right-hand throttle stop screws must be set so that both cylinders are working together.

Idling speed
1,100 ~ 1,200 rpm



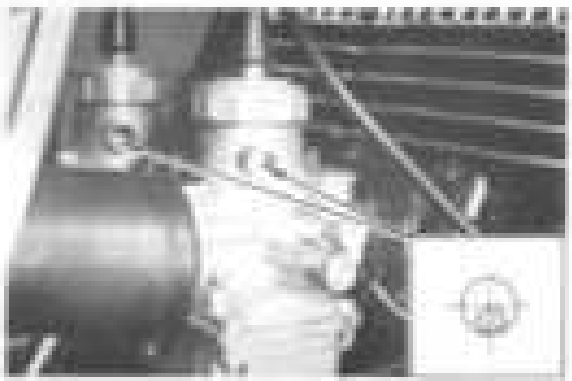
1. Pilot air screw 2. Idle speed screw

NOTE:
The pilot air and idle speed screws are separate adjustments but they must be adjusted at the same time to achieve optimum operating condition at engine idle speeds.

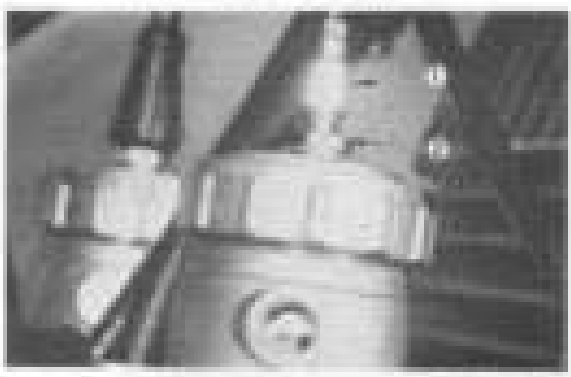
5. Synchronizing carburetors
Both cylinders will not operate evenly unless the carburetion system for each pot is identical. If one carburetor slide is higher than the other slide, overall poor engine performance will result.

a. Remove the bolts from the throttle opening adjusting parts of both right and left carburetors, and fully turn the throttle grip out.

b. Adjust the marks on the throttle slides in both carburetors to the positions as illustrated.



1) Loosen the locknuts.
2) By turning the adjusters in or out, adjust the throttle slides to the same position.
3) Tighten the locknuts.



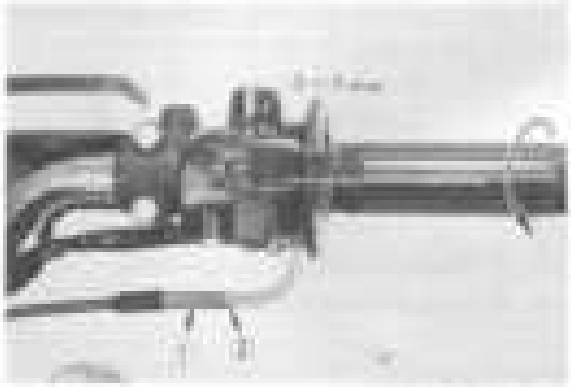
1. Adjuster 2. Locknut

c. Turn the throttle grip in once, and fully open it again. With the throttle grip in this position, check the position of both throttle slides.

d. Install the bolts and tighten.

NOTE:
During this operation, take care so that no dust enters the carburetor.

6. Throttle cable
After engine idle speed and carburetors synchronization are set, check play in turning direction of throttle grip. The play should be 3 — 7 mm (0.12 — 0.28 in) at grip flange. Loosen the locknut and turn the wire adjuster to make the necessary adjustment. After adjusting, be sure to tighten the locknut properly.



1. Adjuster 2. Locknut

B. Air cleaner

1. Remove the air cleaner element assembly.

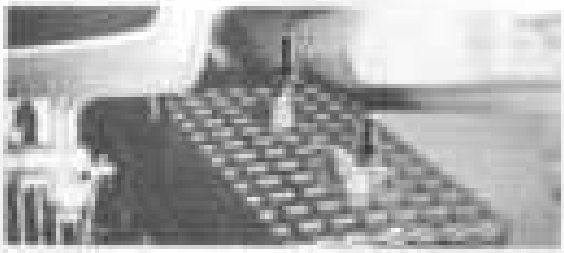
a. Turn the fuel cock lever to "OFF" position, and remove the fuel pipe.

b. Lift the seat and remove the bolts (2) holding the fuel tank. Lift the tank.



NOTE:
In this step take care that the fuel level pipe (front end of fuel tank) is not disconnected.

c. Remove the air filter case cap by removing the wing nuts (2). Pull out the element.



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

NOTE:

The element is made of paper and should be kept away from water and oil.

CAUTION:

Never operate the engine with the air cleaner element removed. This will allow unfiltered air to enter, causing rapid wear and possible engine damage. Additionally, operation without the cleaner element will affect carburetor tuning with subsequent poor performance and possible engine overheating.

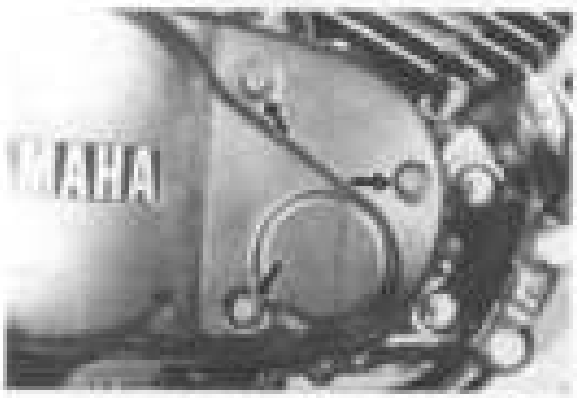
C. Autolube pump

1. Cable adjustment

NOTE:

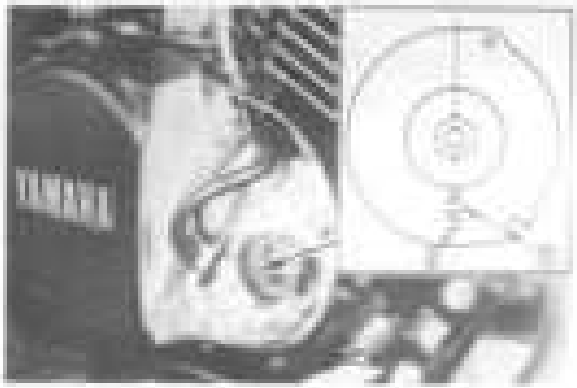
Prior to this adjustment, make sure that the throttle valve can be opened to the full-open position.

a. Remove Autolube pump cover, which is located on forward portion of the right-hand crankcase cover.



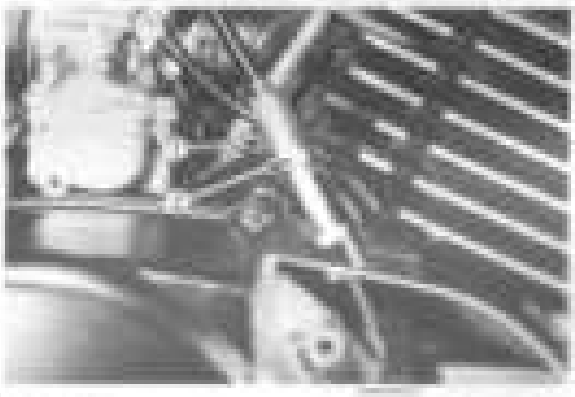
b. Fully open the throttle grip. Hold this position.

c. Check to see that Autolube pump plunger pin is aligned with the mark on the Autolube pump pulley.



1. Punch mark 2. Pin

d. If the mark and pin are not in alignment, loosen cable length adjuster lock nut on top of crankcase cover and adjust cable length until alignment is achieved.



1. Adjuster 2. Locknut

e. Apply grease on pump pulley.

f. Tighten adjuster locknut.

NOTE:

Before adjusting Autolube cable always set carburetors synchronization and throttle cable free play first. (Refer to page 10.)

2. Pump stroke adjustment

a. With throttle closed, rotate starter plate until the pump plunger moves fully out and away from the pump body to its outermost limit.

b. Measure gap with thickness gauge between raised boss on pump adjustment pulley and adjustment plate. If clearance is not correct, remove adjustment plate locknut and adjustment plate.



Minimum pump stroke
0.20 – 0.25 mm
(0.008 – 0.010 in)

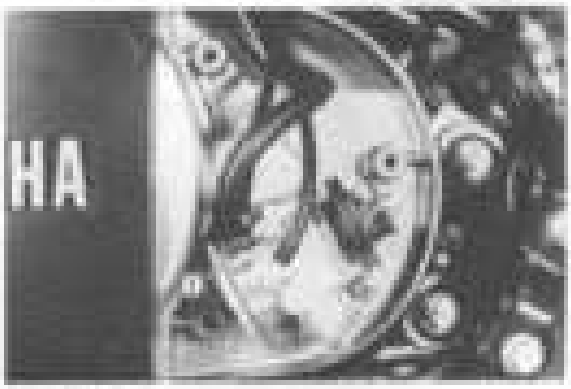
c. Remove or add an adjustment shim as required.



d. Re-install adjustment plate and locknut. Tighten the locknut. Re-measure gap. Repeat procedure as required.

3. Bleeding the pump
The Autolube pump and delivery lines must be bled on the following occasions:
   1) Setting up a new machine out of the crate.
   2) Whenever the Autolube tank has run dry.
   3) Whenever any portion of the Autolube system is disconnected.

a. Remove the pump cover.
b. Remove the pump bleed screw. Allow 3 to 5 minutes, from the time you fill Autolube tank, for oil to fill pump and begin to drain from bleed screw hole.

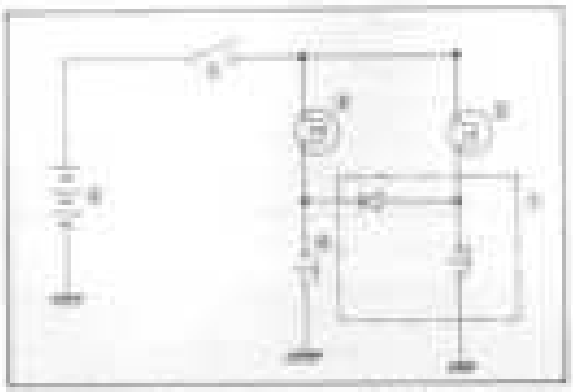


1. Bleed screw

c. Turn the throttle to the full open position.
d. Rotate the starter plate until a steady flow of oil, with no air bubbles, comes out.
e. Re-install bleed screw and pump cover.

B. Engine and transmission oil
1. Engine
a. Autolube oil
We recommend that your first choice be Yamalube 2-cycle. If for any reason you should use another type, the oil should have the BIA certification "for service TC-W". Check container top or label for service specification. If the above oils not available, use a 30W or 40W 2-stroke oil for air-cooled engines.
b. Autolube tank
Always check Autolube tank oil level before operating machine. If oil caution light comes on, remove filler cap and top off tank.

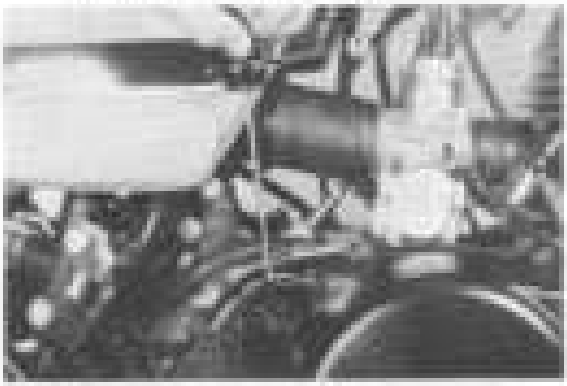
NOTE:
The oil caution light has been designed to come on when the transmission is in the neutral position. This will allow you to frequently check the condition of the bulb. If the caution light does not come on while the machine is in neutral, check the condition of the bulb.



1. Oil level switch assembly
2. Oil caution light
3. Neutral light
4. Neutral switch
5. Main switch
6. Battery

2. Transmission

a. The dip stick is located above and slightly in front of the kick crank. To check level, start the engine and let it run for several minutes to warm and distribute oil with the engine stopped, unscrew the dipstick and clean. Set it on the case threads in a level position. Remove and check level.



1. Dip stick

NOTE:

Be sure the machine is level and on both wheels.

b. The stick has Minimum and Maximum marks. The oil level should be between the two. Top off as required.

Recommended oil:
Yamalube 4-cycle oil or SAE 10W/30 automotive oil with "SE" rating

c. A drain plug is located on the bottom of the crankcase. With the engine warm, remove the plug and drain oil. Re-install plug and add fresh oil.



1. Drain plug

Transmission drain plug torque:
1.5 – 2.1 m-kg (10.8 – 15.2 ft-lb)

Transmission oil quantity:
Total: 1.700 cc (1.8 US qt)
Exchange: 1.500 cc (1.6 US qt)

NOTE:

Transmission oil should be replaced several times during the break-in period.

CAUTION:

Under no circumstances should any additives be included with the transmission oil. This oil also lubricates and cools the clutch. Additives may cause clutch slippage.

6. Clutch

Proper clutch adjustment requires two separate procedures.

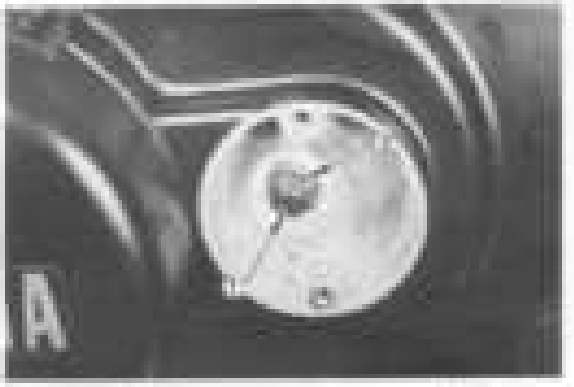
1. Loosen cable adjustor locknut.
2. Turn clutch cable adjustor (at lever) all the way into the lever holder.

NOTE:

The above procedure provides for maximum cable free play to allow for proper clutch actuating mechanism adjustment.

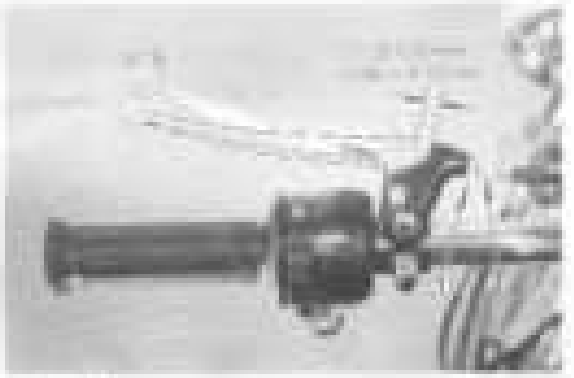
3. Remove the clutch adjusting cover.

4. Loosen the adjusting screw locknut, and slowly tighten the adjusting screw until resistance is felt.
   This means that the play of the push rod is removed; back off adjusting screw 1/4 turn.



1. Adjusting screw 2. Locknut

5. Tighten locknut and replace the cover.
6. At clutch lever assembly, turn cable length adjuster in or out until proper lever free play is obtained.



1. Locknut 2. Adjuster

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

7. Tighten clutch lever adjuster locknut.

F. Cylinder head

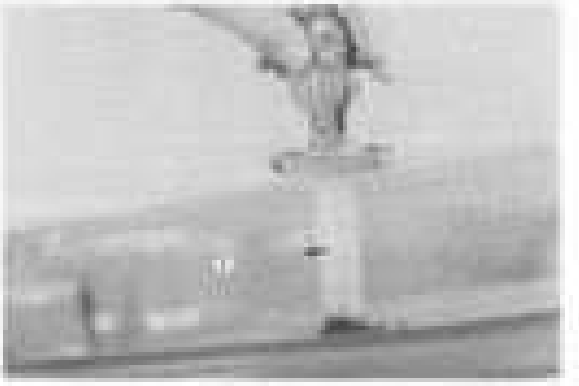
Check torque of cylinder head holding nuts. If loose, tighten in a crisscross pattern until proper torque is achieved.

Cylinder head nut torque
1.9 ~ 2.1 m-kg
(13.7 ~ 15.2 ft-lb)

2-4. CHASSIS

A. Fuel petcock

1. Clean fuel filter
   a. Drain the fuel into the fuel tank.
   b. Remove the Philips head screw on fuel petcock and remove the fuel petcock assembly.



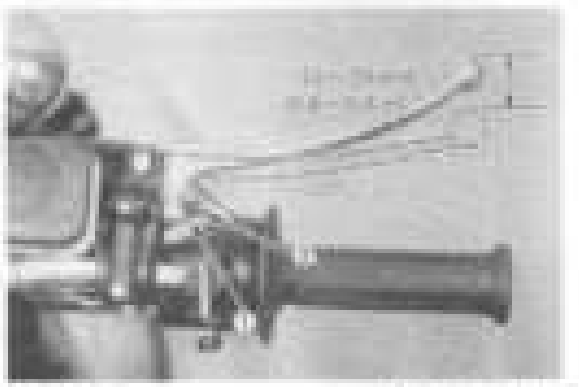
1. Filter screen

   c. Clean the filter.

NOTE:
If filter is damaged, replace its assembly.

B. Brakes and wheels

1. Brake adjustment
   The brake can be adjusted by simply adjusting the distance that the brake lever and pedal can travel. (The piston in the caliper moves forward as the brake pad wears out, automatically adjusting the clearance between the brake pad and the brake disc.)
   a. Front disc
      1) Loosen the adjusting screw locknut.
      2) By turning the adjusting screw in or out, adjust the play of the brake lever and then tighten the locknut.

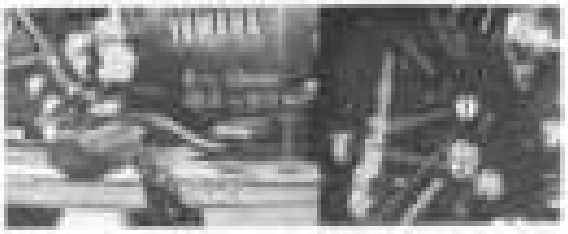


1. Locknut 2. Adjusting screw

Freeplay:
10 – 20 mm
(0.4 – 0.8 in)

NOTE:
Check freedom of adjusting screw and switch case.

a. Rear disc
1) Loosen the adjuster locknut at the push rod.
2) By turning the adjuster in or out, adjust the play of the brake pedal and then tighten the locknut.

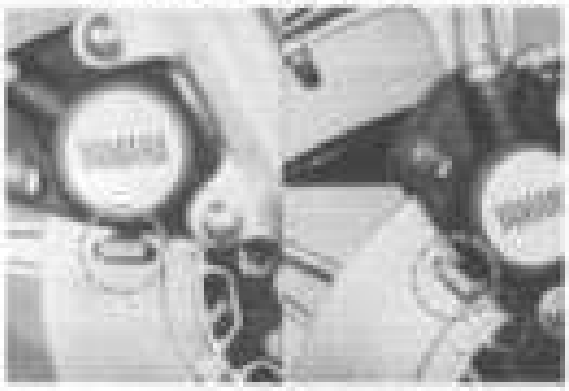


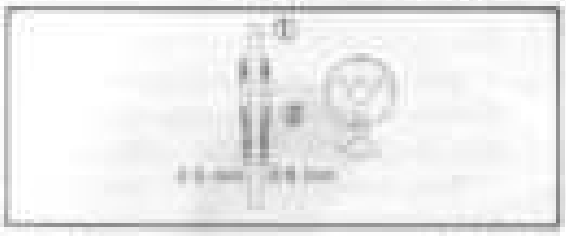
1. Adjuster 2. Locknut

Free play:
5 – 10 mm
(0.2 – 0.4 in)

NOTE:
Check brake rod whether it is free play.

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

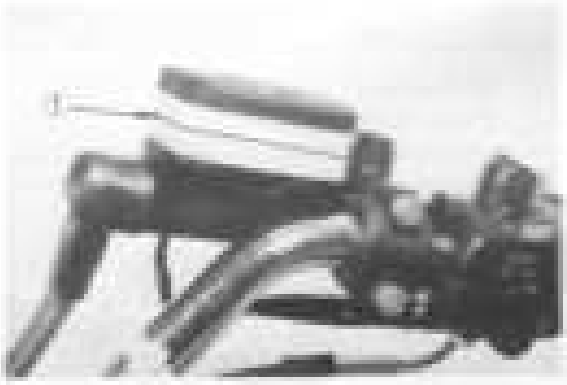




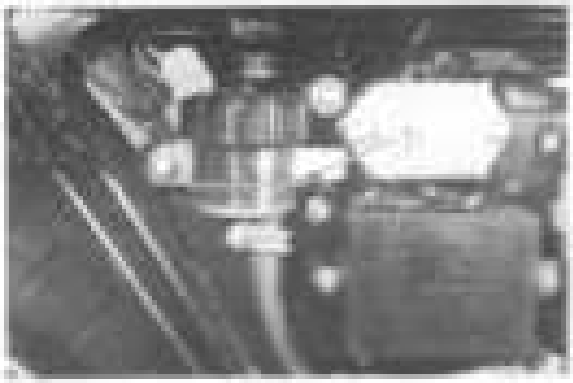
1. Brake disc 2. Indicator

3. Check the brake fluid level.
Insufficient brake fluid may allow air to enter the brake system, possibly causing the brake to become ineffective. Check the brake fluid level and replenish when necessary and observe these precautions.

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



1. Lower level



1. Lower level

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

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

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

4. Checking the aluminum wheels
a. Check for cracks, bends or warpage of the wheels. If a wheel is deformed or cracked, it must be replaced.

NOTE:
These aluminum wheels are not designed for use with tubeless tires.

b. Raise the wheel off the ground. Spin.

Rim runout limits:
Vertical — 2 mm (0.08 in)
Lateral — 1 mm (0.04 in)

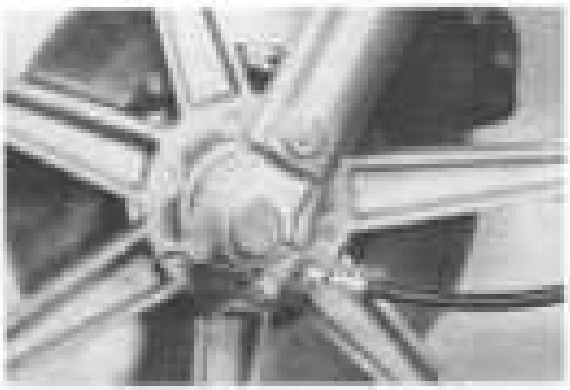
5. Front axle
a. Check axle nuts.

Front axle nut torque:
8.3 ~ 13 m-kg
(60 ~ 94 ft-lb)
Rear axle nut torque:
12 ~ 18 m-kg
(87 ~ 130 ft-lb)

b. Check axle holder nuts (right side).

Front axle holder nut torque:
1.1 ~ 1.8 m-kg
(8.0 ~ 13.0 ft-lb)

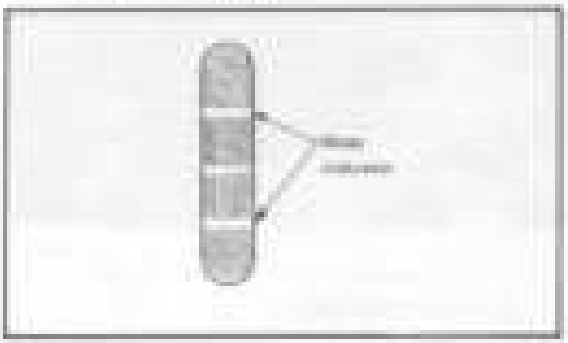
CAUTION:
First tighten the nut on the front end of the axle holder, and tighten the nut on the rear end.



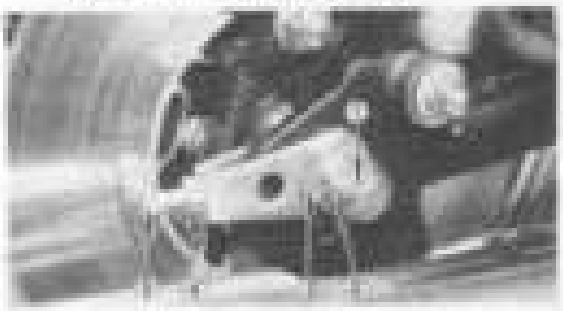
6. Tires
a. Tire pressure

	Front tire	Rear tire
Normal riding	1.8 kg/cm² (26 lb/in²)	2.0 kg/cm² (28 lb/in²)
Continuous high speed riding or with passenger	2.0 kg/cm² (28 lb/in²)	2.3 kg/cm² (33 lb/in²)

b. Check the tire wear.
If a tire tread shows cross wise lines, it means that the tire is worn to its limit. Replace the tire.



C. Drive chain
1. Drive chain adjustment
To adjust drive chain, proceed as follows.
a. Remove rear axle cotter pin.
b. Loosen rear axle securing nut and caliper bracket shaft nut.
c. Remove tension bar bolt cotter pin and loosen tension bar lock nut.



1. Cotter pin
2. Axle nut
3. Caliper bracket shaft nut
4. Locknut
5. Adjusting bolt

d. With rider in position on machine both wheels on ground, set axle adjusters until there is specified freeplay in the drive chain at the bottom of the chain a point midway between the drive and driven sprockets.



Chain freeplay:
20 ~ 30 mm (0.8 ~ 1.2 in)

e. Turn chain puller bolts until both ends of the axle are positioned evenly. This can be checked by utilizing the marks on the very end of the swing arm, just above the rear axle.
Tighten caliper bracket shaft nut, rear axle securing nut and tension bar locknut.

Caliper bracket shaft nut torque:
5 ~ 8 m-kg (36 ~ 58 ft-lb)
Rear axle securing nut torque:
12 ~ 18 m-kg (87 ~ 130 ft-lb)
Tension bar locknut torque:
1.4 ~ 2.2 m-kg (10 ~ 16 ft-lb)

f. Install new cotter pins at rear axle and tension bar bolt, and bend the end over.

NOTE:
Tighten bolt locknuts thoroughly.

2. Drive chain maintenance
The chain should be lubricated according the recommendations given in the Maintenance and Lubrication Interval Charts. Lubrication should be performed more often if possible and preferably after every use.

a. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.

b. 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.

NOTE:
Choice of lubricant is determined by use and terrain. SAE 20W or 30W motor oil may be used, but several specialty lubricants offered by accessory manufacturers offer more penetration and corrosion resistance for roller protection. In certain areas, semi-drying lubricants are preferable. These will resist picking up sand particles, dust, etc.

c. Periodically, remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.

d. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly while off machine. Work each roller thoroughly to make sure lubricant penetrates. Wipe off excess. Re-install.

D. Front fork oil change

1. With the front wheel removed or raised off the floor with a suitable frame stand, loosen pinch bolt at the top of each inner fork tubes.

2. Remove cap bolts from inner fork tubes.



1. Pinch bolt 2. Cap bolt

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



1. Drain screw

4. After most 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. Pour specified amount of oil into the inner tube through the upper end opening.

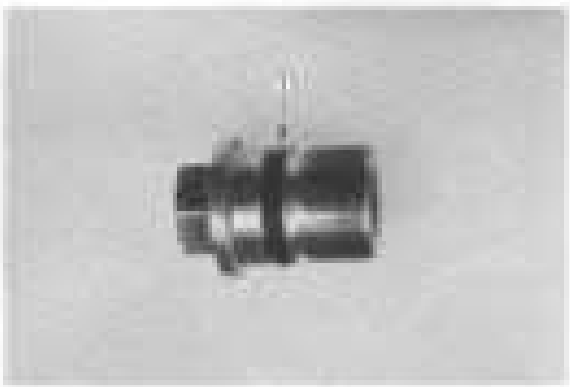
Front fork oil:
Yamaha fork oil 10W, 20W, 30W

NOTE:
Specialty fork oils of quality manufacture may be used. Select the weight oil that suits local conditions and your preference (lighter for less damping; heavier for more damping).

Front fork oil capacity:
144 ±4 cc (4.87 oz) each side

Front fork oil level: (Below the top of the fork)
389 ±10 mm each side (15.3 ±0.4 in)

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



1. O-ring

9. Replace fork cap bolts and torque to specification.

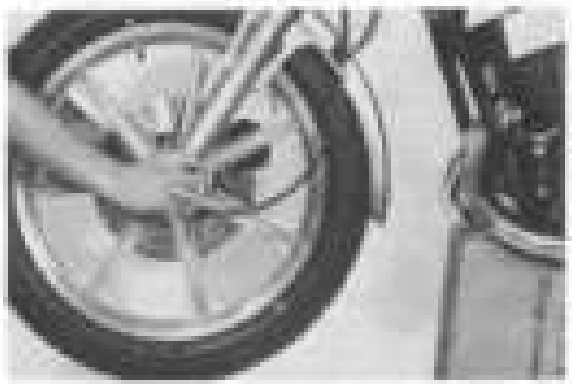
Fork cap torque:
1.5 ~ 3.0 m-kg
(11 ~ 22 ft-lb)

10. Tighten pinch bolts at fork crown and torque to specification.

Fork tube pinch bolt torque:
1.4 ~ 2.2 m-kg (10 ~ 16 ft-lb)

E. Suspension, steering and swing arm

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



c. If steering head needs adjustment, loosen crown pinch-bolt and steering fitting nut.



1. Pinch bolt
2. Fitting nut

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



1. Steering nut wrench

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

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

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

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

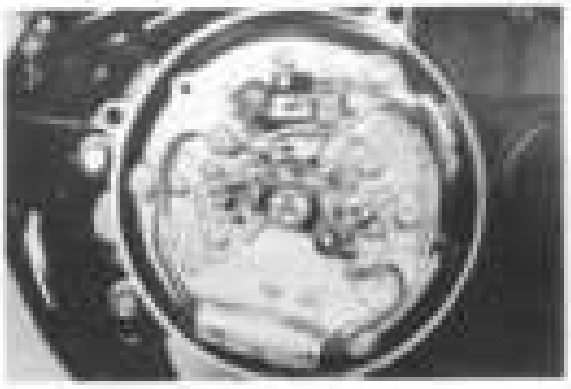
Swing arm freeplay: 1 mm (0.04 in) at end of swing arm

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

2-5. ELECTRICAL

A. Contact breaker points

1. Apply a few drops of light-weight machine oil or distributor lubricant to the point cam lubricator.
2. The ignition points can be lightly sanded with oil stone to remove corrosion. Place a piece of clean paper between the points, let them close, and remove the paper. Repeat 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 faulty operation.

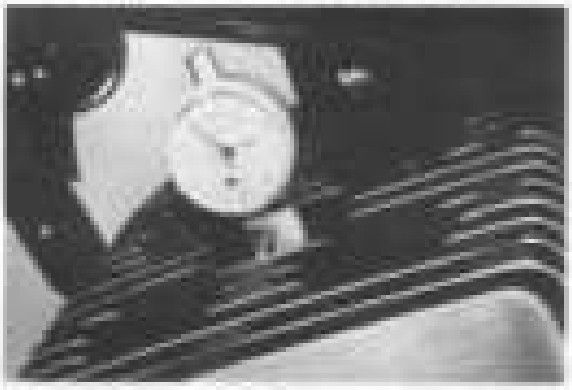
NOTE:
New points, when installed, must be cleaned and adjusted.

B. Ignition timing

Ignition timing must be set with dial gauge and point checker.

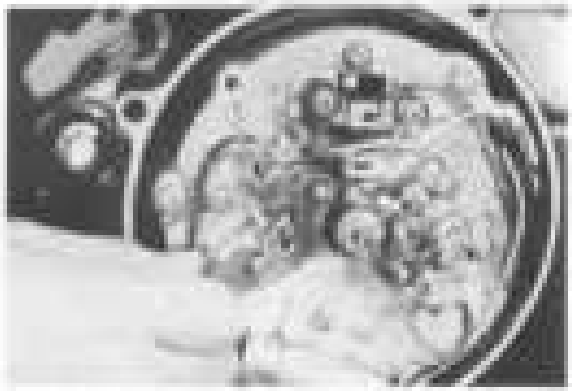
Proceed as follows.

1. Put machine in neutral.
2. Remove spark plug and screw dial gauge stand in to spark plug hole.



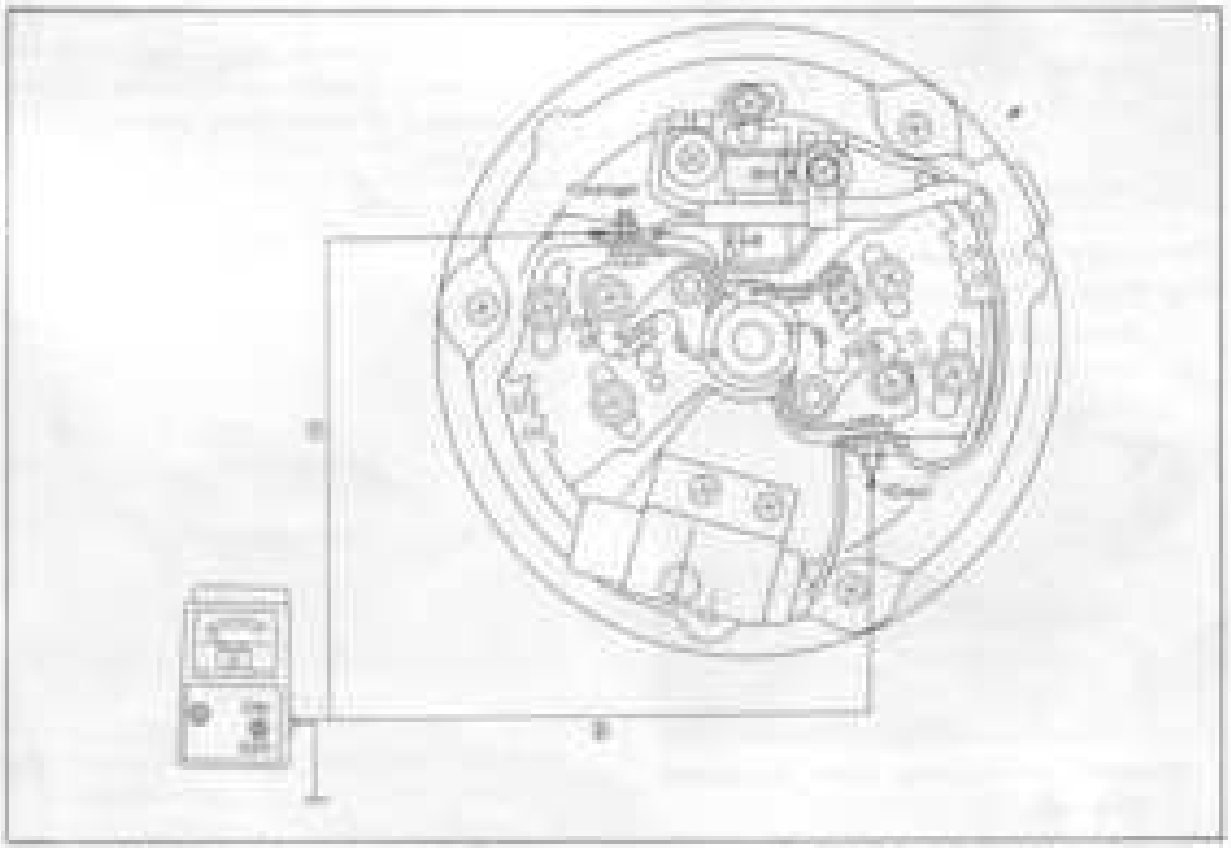
3. Insert dial gauge into stand.
4. Remove generator cover.
5. Adjust ignition points.
   a. Rotate crankshaft counterclockwise and insert a thickness gauge of 0.35 mm (0.014 in) with the point gap at maximum. The gap is satisfactory if the thickness gauge can be inserted.
   b. If the gap is not proper, adjust by moving the contact point assembly.
   Repeat this procedure for each set of points.

Point gap:
0.30 ~ 0.40 mm (0.012 ~ 0.016 in)



1 Adjusting screw

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



1 Right-hand cylinder ignition timing connection

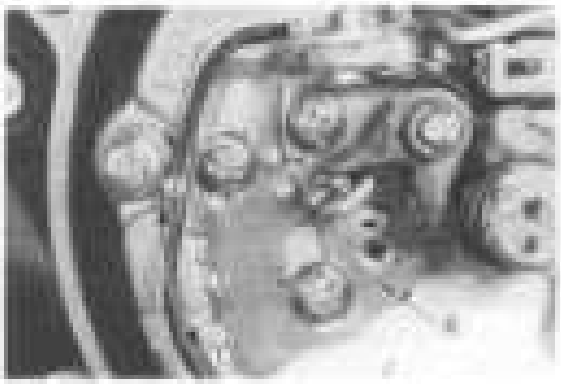
2 Left-hand cylinder ignition timing connection

8. Rotate crankshaft until piston is at top-dead-center (T.D.C.). Set the zero on dial gauge face to line up exactly with dial gauge needle. Tighten set screw on dial gauge stand to secure dial gauge assembly. Rotate crankshaft back and forth to be sure that indicator needle does not go past zero.
9. Starting at T.D.C., rotate crankshaft clockwise until dial gauge reads approximately 4 needle revolutions before top-dead-center (B.T.D.C.).
10. Slowly turn crankshaft until dial gauge reads ignition advance setting listed in specifications. At this time the point checker needle should swing from "CLOSED" to "OPEN" position, indicating the contact breaker ignition points have just begun to open.



Ignition timing specifications (B.T.D.C.):
2.3 ±0.15 mm (0.09 ±0.006 in)

11. Repeat steps 9. and 10. to verify point opening position. If points do not open within specified tolerance, they must be adjusted.
12. Adjust ignition points by slightly loosening Philips head screws and carefully rotating contact breaker plate assembly with a slotted screwdriver. Make small adjustment and retighten Philips head screw before rechecking timing. Recheck timing by repeating steps 9. and 10.



1. Retard
2. Advance
3. Screw
4. Breaker plate

13. Repeat procedure for opposite cylinder.
14. Remove dial gauge assembly and stand. Re-install spark plugs. Disconnect point checker. Replace generator cover.

C. Spark plug

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

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

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

Spark plug gap:
0.6 ~ 0.7 mm (0.02 ~ 0.03 in)

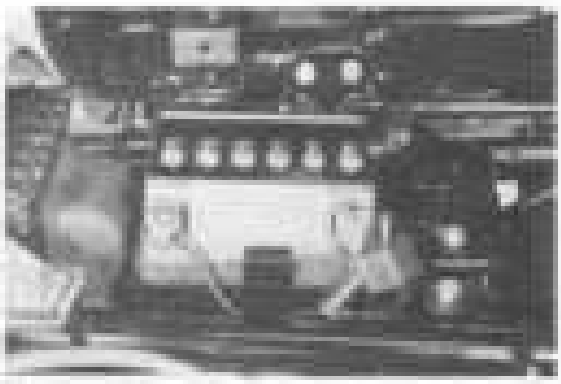
Engine heat and combustion chamber deposits will cause any spark plug to slowly break down and erode. If the electrodes finally become too worn, or if for any reason you believe the spark plug is not functioning correctly, replace it. When installing the plug, always clean the gasket surface, use a new gasket, wipe off any grime that might be present on the surface of the spark plug, and torque the spark plug properly.

Standard spark plug	Tightening torque
NGK B-6ES	1.5 ~ 2.5 m-kg (10.8 ~ 18.1 ft-lb)

D. Battery

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

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



NOTE:

When filled with dilute sulfuric acid (electrolyte), this battery can be put into use immediately. That is, it is a dry-charged battery. It is advisable, however, that the battery be charged as much as possible before using to insure maximum performance. This initial charge will prolong the life of the battery.

Charging current:	0.55 A
Charging hours:	10 hrs

E. Headlight

1. Headlight beam adjustment
   When necessary, adjust the headlight beam as follows.
   a. Adjust horizontally by tightening or loosening the adjust screw.



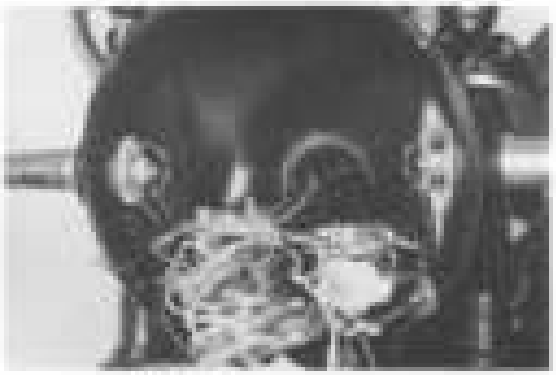
To adjust to the right:
tighten the screw
To adjust to the left:
loosen the screw

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

NOTE:

Take care not to damage the headlight.

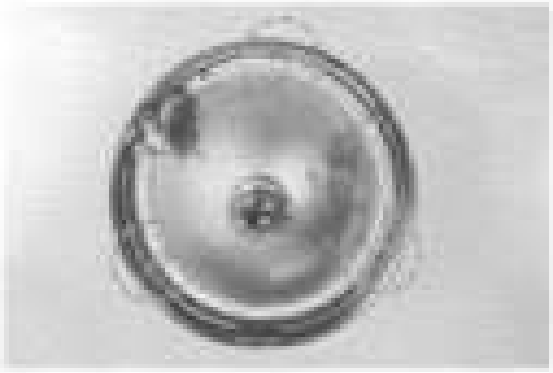
      2) Slightly loosen the two headlight mounting nuts and refit the rim to the headlight body.



NOTE:
Do not tighten the anchor screw yet.

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

2. Replacing the headlight bulb
a. Unhook spring and pull the defective unit out of the shell.



b. Slip a new unit into position and install springs.
c. Adjust headlight beam.

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

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3

CHAPTER 3.
ENGINE OVERHAUL

3-1. REMOVAL

A. Preparation for removal

1. All dirt, mud, dust and foreign material should be throughly removed from the exterior of the engine before removal and disassembly. This will prevent any harmful foreign material from entering the engine.
2. Before engine removal and disassembly, be sure that you have the proper tools and cleaning equipment so that 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 speed assembly time and help insure correct re-installation of all engine parts.
4. Start the engine and warm it for a few minutes. Stop engine, remove drain plug and drain transmission oil.

B. Fuel tank assembly

1. Turn fuel petcock to the "OFF" position and disconnect fuel pipes.
2. Remove bolt holding rear of fuel tank.



3. Disconnect and plug cross over pipe.
4. Lift up rear of tank and slide back. Remove tank (lift rear of tank and slide back).

NOTE:

Be careful not to lose rubber dampers at front of tank.

C. Exhaust

1. Remove nuts holding exhaust pipe to cylinder.



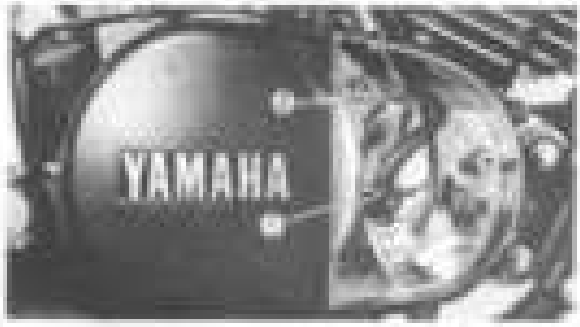
2. Remove exhaust pipe assembly.

D. Gear change pedal

Completely remove bolt securing gear change pedal. Remove pedal.

E. Wiring and cables

1. Remove spark plug cap.
2. Remove oil pump cover.
3. Remove oil pipe at oil tank. Remove delivery pipes at carburetors.



1. Oil pipe 2. Oil delivery pipe

NOTE:

Plug the oil tank so oil will not run out of oil tank.

4. Rotate pump pulley to full throttle position and remove return spring and end wire end from pulley seat.
5. Loosen wire adjuster lock nut and remove adjuster and wire.
6. Remove tachometer cable.
7. Remove left crankcase cover.



8. Remove clutch wire from handle lever first, then from clutch push lever.

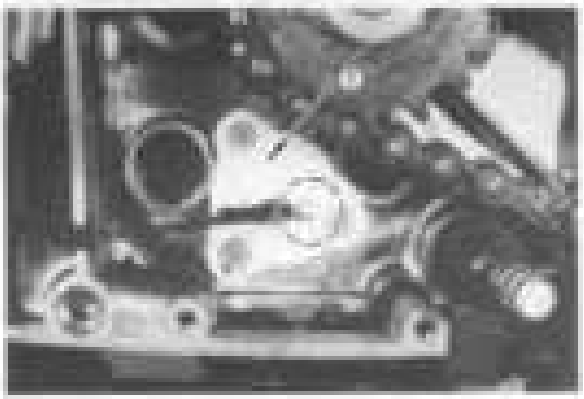


F. Carburetor

1. Remove air vent pipes at cleaner box.
2. Loosen carburetor hose clamps.
3. Remove carburetor top and throttle valve assembly.
4. Push air cleaner joint off the carburetor inlet and carefully remove carburetor.

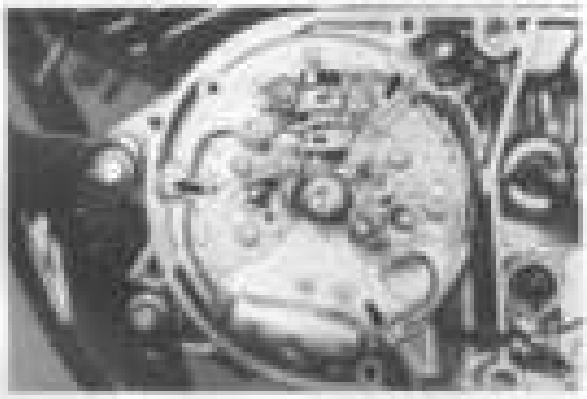
G. Generator

1. Remove generator wiring and neutral switch wire.

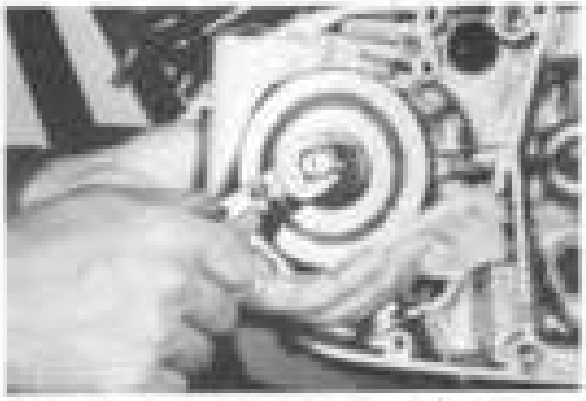


1. Neutral switch

2. Remove yoke mounting bolts and remove yoke assembly.



3. Remove rotor bolt and cam.



4. Remove rotor using armature puller bolt.

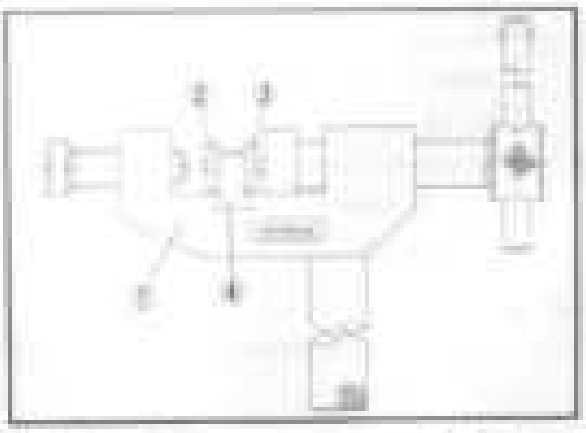


1. Armature puller bolt

5. Remove woodruff key.

H. Drive chain

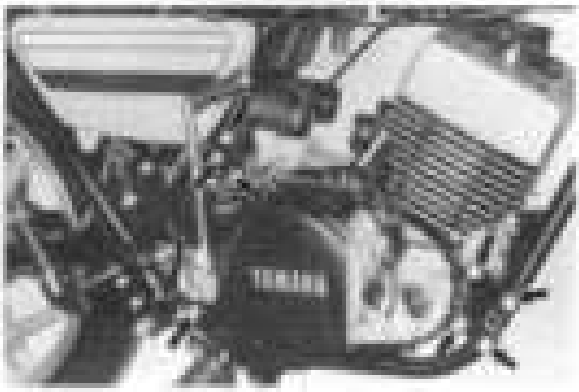
1. Loosen drive sprocket before disconnecting chain.
   a. Bend down lock tab.
   b. Put transmission in gear.
   c. Apply rear brake.
   d. Loosen sprocket securing nut.
2. Remove master link using drive chain cutter. Remove drive chain.



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

1. Removal

1. Remove engine mounting bolts and mounting plates.

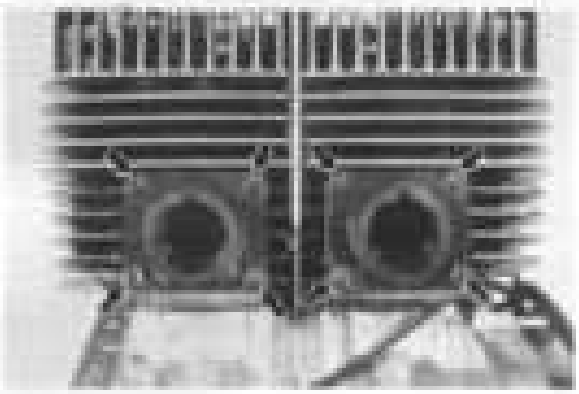


2. Remove engine from right side of frame.

3-2. DISASSEMBLY

A. Reed valve assembly

Remove reed valve assembly holding bolts, carburetor joint and reed valve assembly.



B. Cylinder head

Remove cylinder head holding nuts and cylinder head.

NOTE:

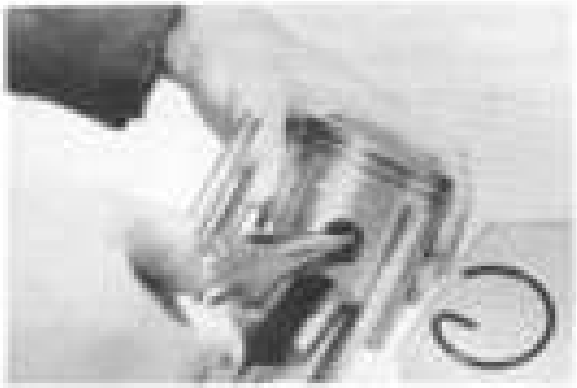
Loosen spark plug before loosening cylinder head.

C. Cylinder

Remove cylinders.

D. Piston pin and piston

1. Remove piston pin clip 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.
Protect pin with rag as shown.



NOTE:

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

E. Kick crank

Remove kick crank securing bolt and kick crank.

NOTE:

The bolt must be completely removed from the kick crank.

F. Crankcase cover, right

Remove right-hand crankcase cover holding screws and the cover.

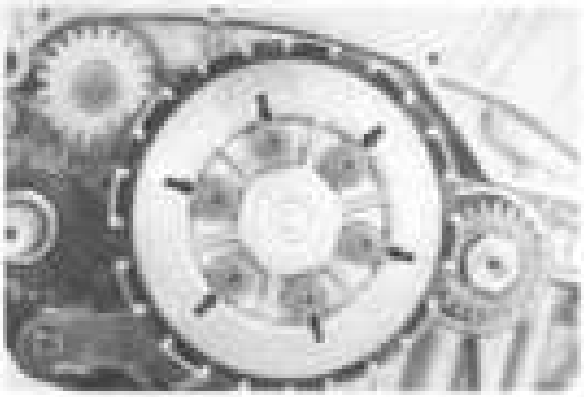


NOTE:

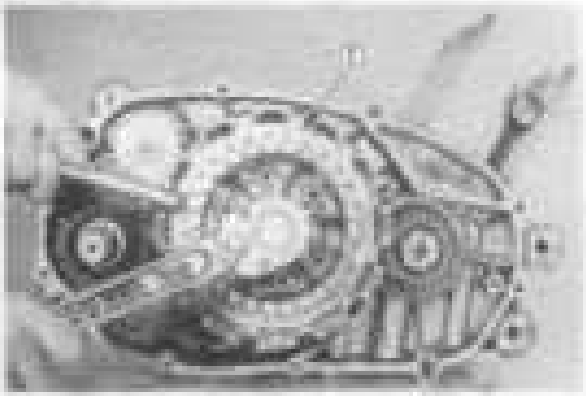
Crankcase cover can be removed without removing Autolube pump. (See Autolube pump section.)

G. Clutch assembly and primary drive gear

1. Remove clutch spring holding screws, pressure plate, clutch plates, friction plates, cushion rings, push rod and ball.

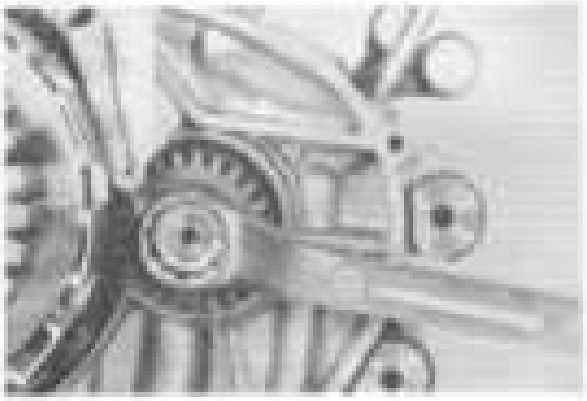


2. Install clutch holding tool on clutch boss. Remove lockout and belleville spring washer.

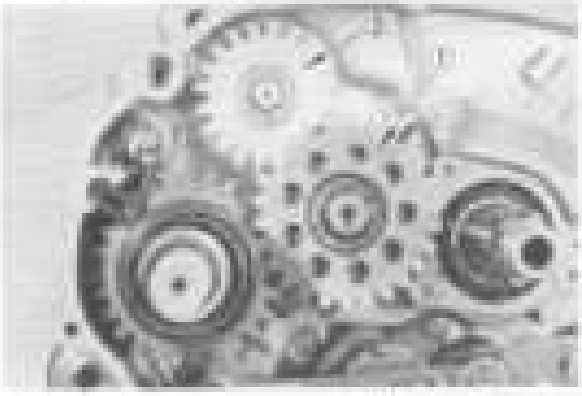


1. Clutch holding tool

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



4. Remove driven gear assembly and primary drive gear assembly. Kick idel gear assembly and tachometer drive gear assembly.



1. Kick idle gear 2. Tachometer drive gear

H. Kick axle assembly

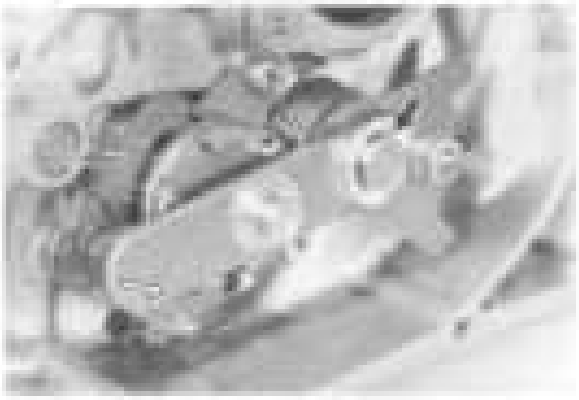
Remove kick axle assembly.

I. Change shaft assembly

1. Remove sealing boot, change shaft circlip and washer from left side of change shaft and pull shaft assembly out from right-hand side.



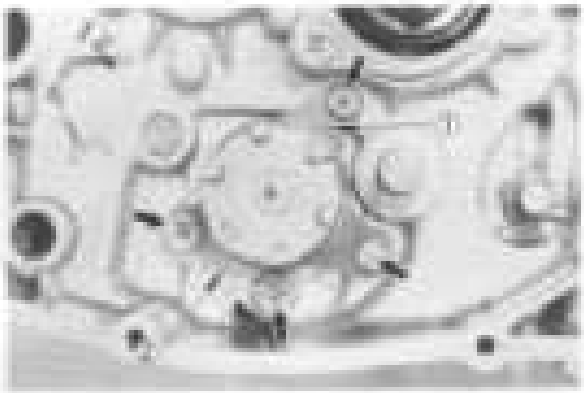
2. Remove circlip and pull change lever assembly.



NOTE:
Remove change lever 3, bracket, spring and shift return spring as an assembly.

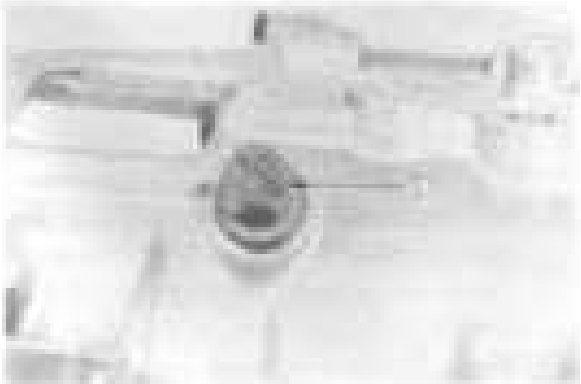
J. Clutch push rod
Remove clutch push rod from left side crankcase.

K. Change lever guide and stopper plate
Remove change lever guide and cam stopper plate.



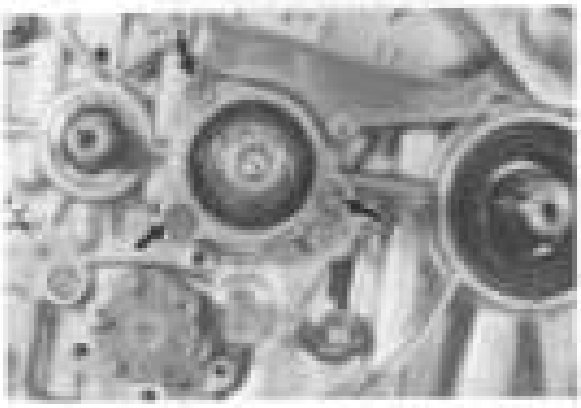
1. Change lever guide 2. Cam stopper plate

L. Shift cam stopper
Remove bolt, spring and stopper.

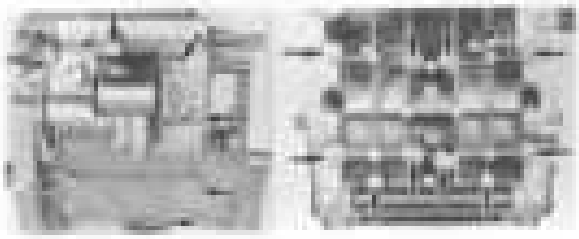


1. Shift cam stopper

M. Bearing stopper plate
Remove bearing stopper plate.

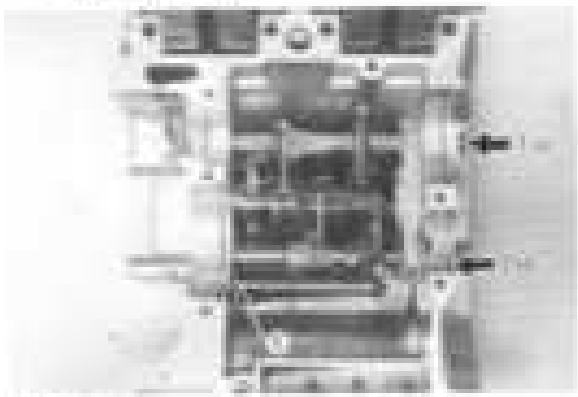


N. Crankcase
1. Remove crankcase holding bolts. Each bolt position is numbered. Start with the highest number for disassembly. Loosen each bolt 1/4 turn and proceed to the next.



2. Split crankcase by lightly striking the front and rear parts of the upper crankcase.

O. Transmission
1. Remove transmission by tapping it with a soft-faced hammer or the hands.
2. Remove circlip, guide bars, bind plugs and shift forks.



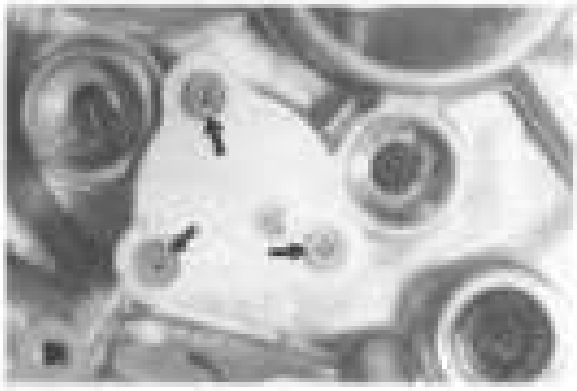
1. Circlip

2. Remove stopper plate and shift cam.

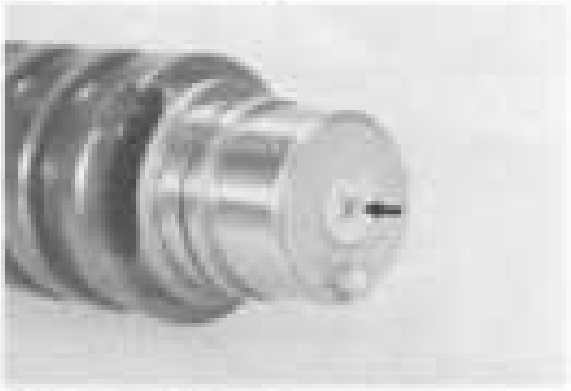


P. Neutral switch

1. Remove shiftcam side plate holding and remove neutral switch, and O-ring.

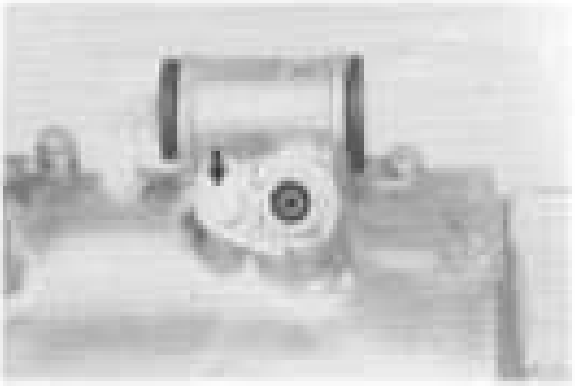


2. Remove shiftcam side plate holding screw, and remove side plate, neutral point and spring.



Q. Tachometer gear

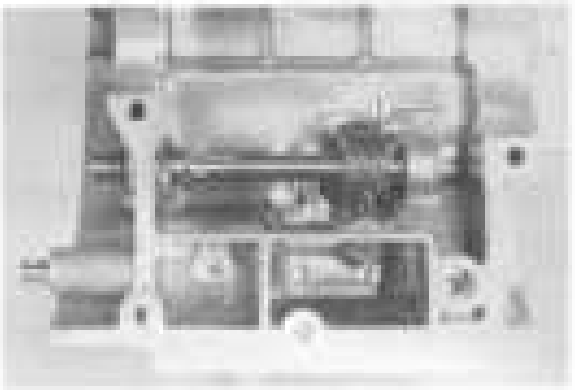
1. Remove driven gear assembly.



2. Remove drive gear axle stopper plate.



3. Remove tachometer drive gear and drive gear axle.



1. Remove screws 2. Drive gear 3. Drive gear axle

R. Crankshaft

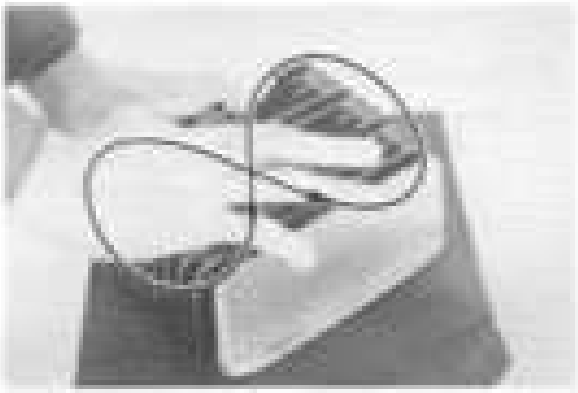
Remove crankshaft by sliding the shaft with hands.

3-3. INSPECTION AND REPAIR

A. Cylinder head

1. Remove spark plug.
2. Using a rounded scraper, remove carbon deposits from combustion chamber. Take care to avoid damaging spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.

3. Place on a surface plate. There should be no warpage. Correct by re-surfacing as follows:
   Place 400 — 600 grit wet sandpaper on surface plate and re-surface head using a figure-eight sanding pattern. Rotate head several times to avoid removing too much material from one side.

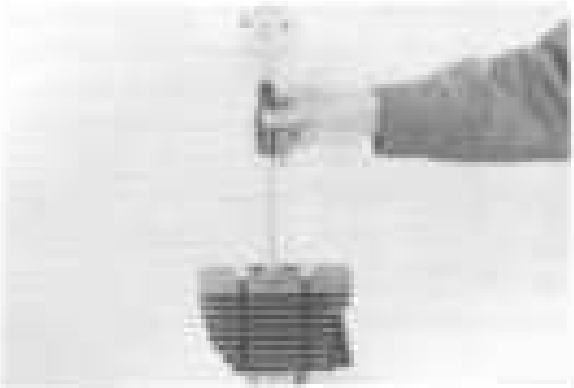


B. Cylinder

1. Remove any deposits from cylinder exhaust port and decompression passages.



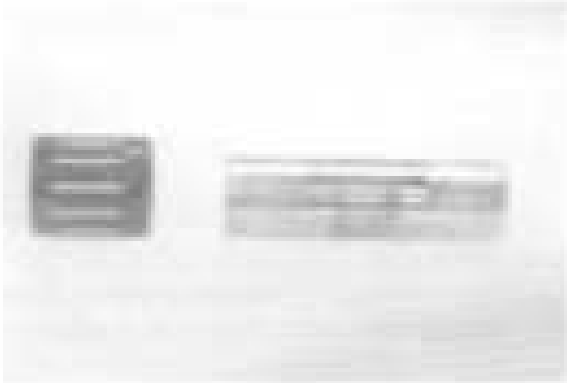
2. Hone cylinder bore using a hone with fine stones. Hone no more than required to remove all wear marks.
3. Using a cylinder gauge set to standard bore size, measure the cylinder. Measure front-to-rear and side-to-side at top, center and bottom just above exhaust port. Take minimum and maximum measurements. If over tolerance and not correctable by honing, rebore to next over size.



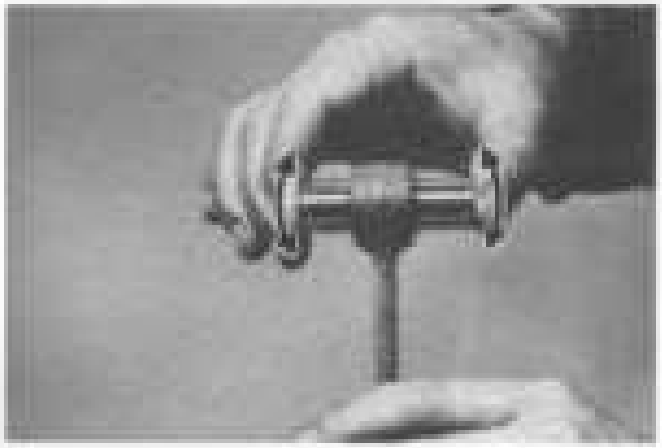
Maximum allowable taper: 0.05 mm (0.002 in)
Maximum allowable out-of-round: 0.01 mm (0.0004 in)
Piston over size: 64.25 mm (2.530 in) 64.50 mm (2.539 in) 64.75 mm (2.549 in) 65.00 mm (2.559 in)

C. Piston pin and bearing

1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.
2. Check the pin and bearing for signs of heat discoloration. If excessive (indentation on pin, etc.), replace pin and bearing.
3. Check the bearing cage for excessive wear or damage. Check the rollers for signs of flat spots. If such wear is found, replace pin and bearing.



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

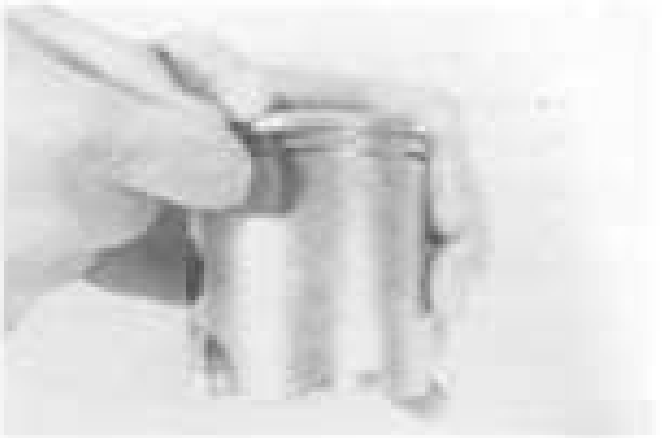


5. The piston pin should have no noticeable free play in the piston. If the piston pin is loose, replace the pin and/or piston.

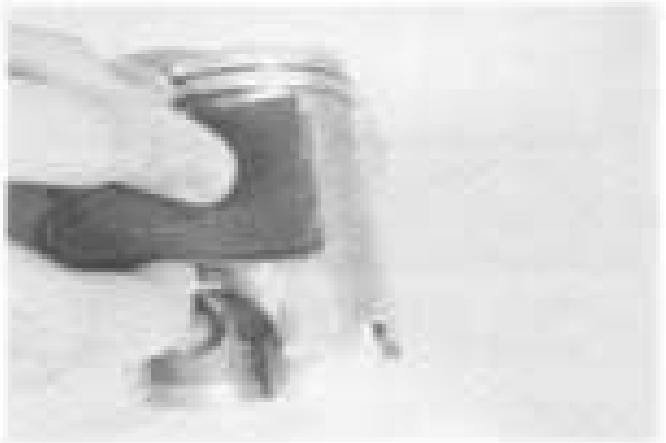


D. Piston

1. Remove piston rings and expander (2nd ring).
2. Remove carbon deposits from piston crown.
3. Carefully remove carbon deposits from ring grooves with filed end of ring.

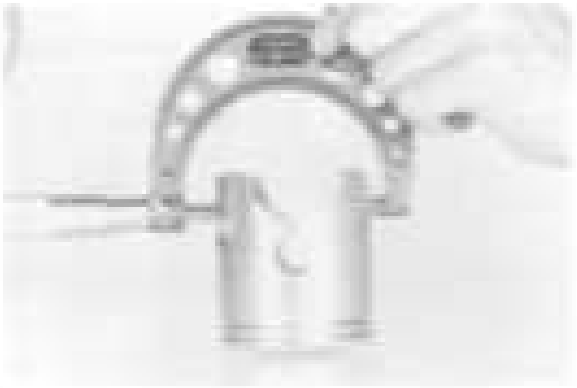


4. Remove score marks and lacquer deposits from sides of piston using 600 – 800 grit wet sandpaper. Sand in a crosscross pattern. Do not sand excessively.



5. Wash piston in solvent and wipe dry.
6. Using an outside micrometer, measure piston diameter. The piston is cam-ground and tapered. The only true measuring point is at right angles to the piston pin holes, about 10 mm (0.4 in) from bottom of piston. Compare piston diameter to cylinder bore measurements.

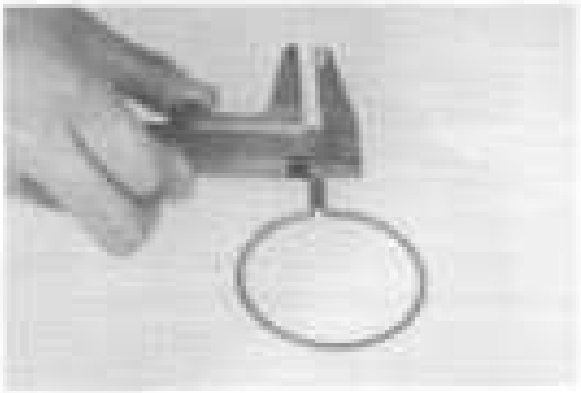
Piston maximum diameter subtracted from minimum cylinder diameter gives piston clearance. If beyond tolerance, hone cylinder to tolerance or bore to next oversize and fit oversize piston.



Piston clearance
Maximum 0.035 mm (0.0014 in)
Minimum 0.030 mm (0.0012 in)

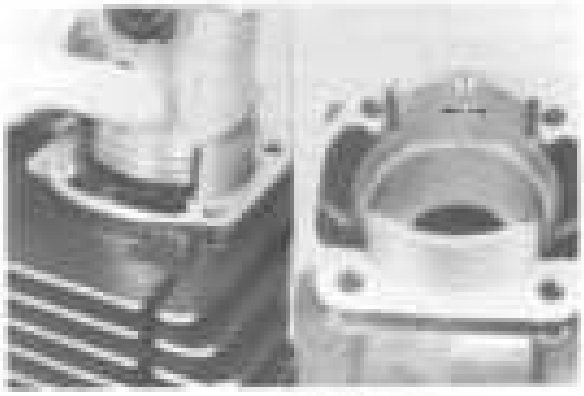
E. Piston rings

1. Check rings for scoring. If any severe scratches are noticed, replace ring set.
2. Measure ring end gap in free position. If beyond tolerance, replace ring set.



Ring end gap: free
Top 6.5 mm (0.26 in)
Second 6.5 mm (0.26 in)

3. Insert each ring into cylinder. Push down approximately 20 mm (0.8 in) using piston crown to position ring at right angle to bore. Measure installed end gap. If beyond tolerance, replace ring set.



1. Ring end gap

Ring end gap: installed		
	Minimum	Maximum
Top	0.3 mm (0.012 in)	0.5 mm (0.020 in)
Second	0.3 mm (0.012 in)	0.5 mm (0.020 in)

4. With ring installed in groove, insert feeler gauge between ring side and groove. If beyond tolerance, replace ring and/or piston as required.

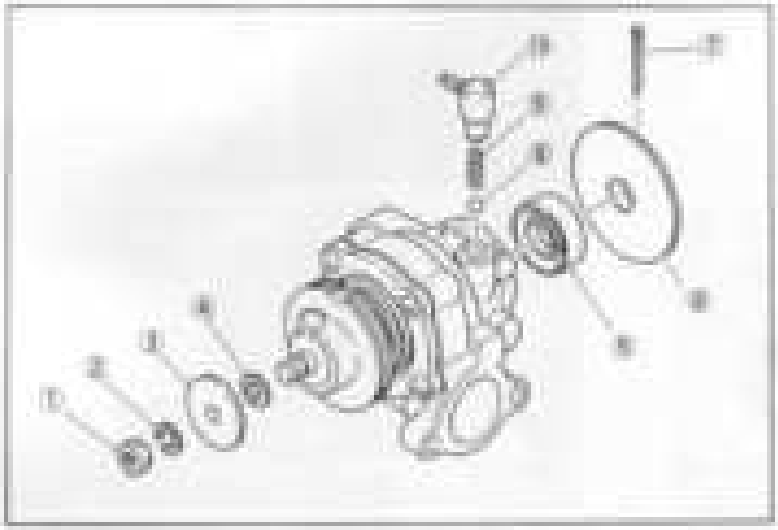
2nd ring groove clearance	
Minimum	Maximum
0.03 mm (0.0012 in)	0.05 mm (0.0020 in)



5. Check ring expander. If worn excessively or broken, replace ring set.

F. Autolube pump

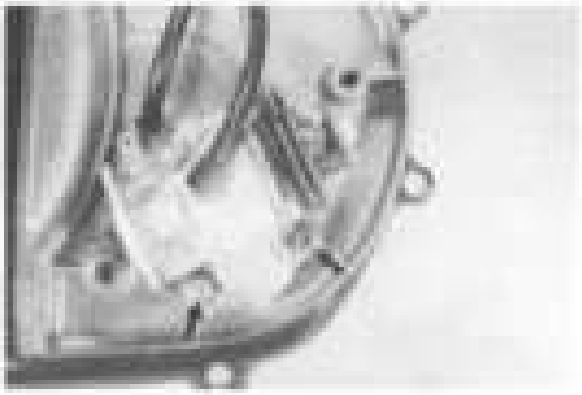
The Yamaha Autolube pump is a sealed unit. Its output has been checked and adjusted at the factory. Except for the components shown in the illustration, no further disassembly of the pump should be attempted. The adjustments and servicing of the Autolube pump are covered on page 11.



1. Nut
2. Spring washer
3. Adjusting plate
4. Plunger shim
5. Oil seal
6. Scarer plate
7. Outlet pin
8. Bolt
9. Compression spring
10. Nozzle

1. Removal

a. Remove (two) Philips screws securing pump to crankcase cover. Remove pump.



2. Troubleshooting and repair

a. Wear or an internal malfunction may cause pump output to vary from the factory setting. This situation is, however, extremely rare. If improper output is suspected, check the following:
   1) Obstructions in delivery line to pump or from pump to carburetors.
   2) Worn or damaged pump body seal or crankcase cover seal.
   3) Missing or improperly installed check ball or spring.
   4) Improperly installed or routed oil delivery line(s).
   5) Loose fitting(s) allowing air to enter pump and/or engine.

b. If all inspections show no obvious problems and improper output is still suspected, connect a delivery line from the pump to a container graduated in cubic centimeters (cc's). Keep the delivery line short.
   Rotate the pump bleed wheel while counting pump plunger strokes.

	Maximum throttle	Minimum throttle
Pump output at 200 strokes	6.1 – 6.7 cc	0.5 – 0.6 cc

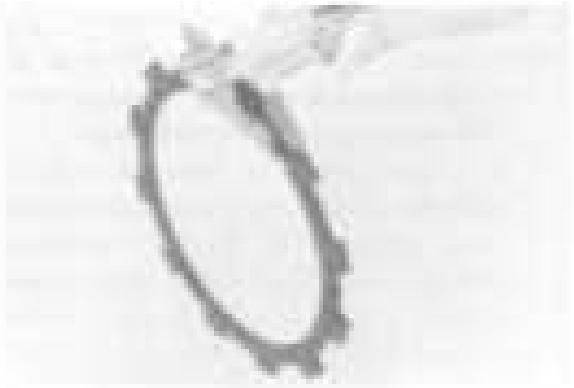
3. Reassembly

Always install a new pump case gasket.

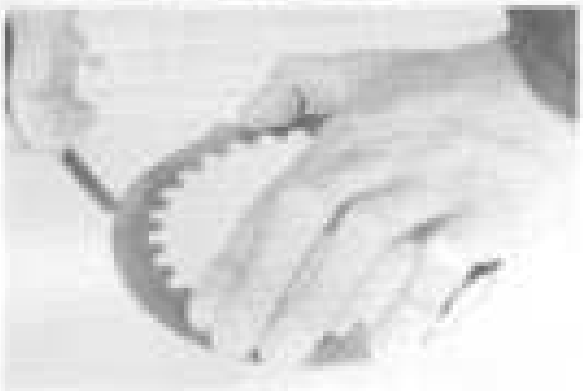
G. Clutch

1. Measure the friction plates at three or four points. If their minimum thickness is less than the indicated limit replace.

	New	Wear limit
Friction plate thickness	3.0 mm (0.12 in)	2.7 mm (0.11 in)



2. Check the friction plates for signs of warpage and heat damage. Replace as required.
3. Check each clutch plate for signs of heat damage and warpage. Place on surface plate (plate glass is acceptable) and use feeler gauge as illustrated. If warpage exceeds tolerance, replace.

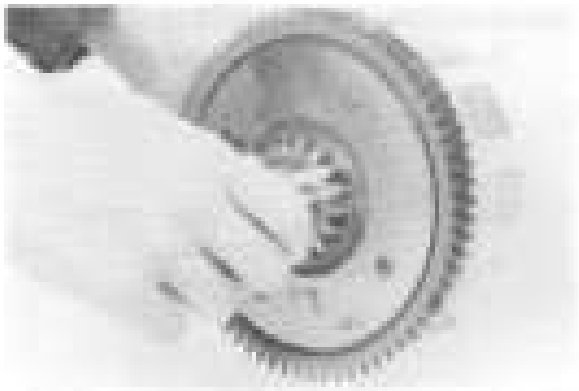


Clutch plate warpage allowance
0.05 mm (0.002 in)

NOTE:

For optimum performance, if any friction or clutch plate requires replacement, it is advisable to replace the entire set.

4. Thoroughly clean the primary driven gear assembly and spacer. Apply a light film of oil on the bushing surface and spacer. Fit the spacer into the bushing. It should be a smooth, thumb-press fit. The spacer should rotate smoothly within the bushing.



5. Check the bushing, spacer and main shaft for signs of galling, heat damage, etc. If damage is severe, replace as required.
6. Apply a thin film of oil to transmission main shaft and inside surface of bushing spacer. Slip spacer over main shaft. Spacer should fit with approximately same "feel" as in clutch housing. Replace as required.
7. Check dogs on driven gear (clutch housing).
   Look for cracks and signs of galling on edges. If damage is moderate, deburr. If severe, replace.
8. Check splines on clutch boss for signs of galling. If damage moderate, deburr. If severe, replace.

NOTE:

Galling on either the friction plate dogs of the clutch housing or clutch plate splines of the clutch boss will cause erratic clutch operation.

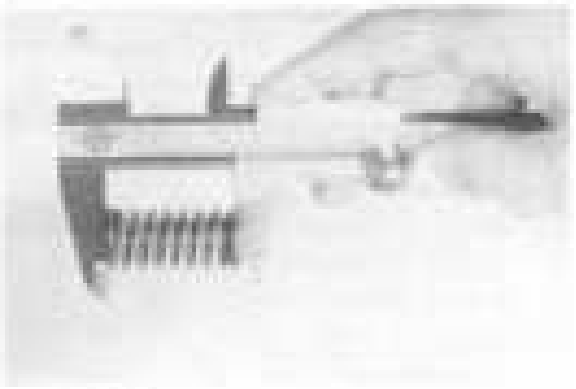


9. Check for circumferential play by hand. If excess play exists, replace it.



10. Measure each clutch spring. If beyond tolerance, replace.

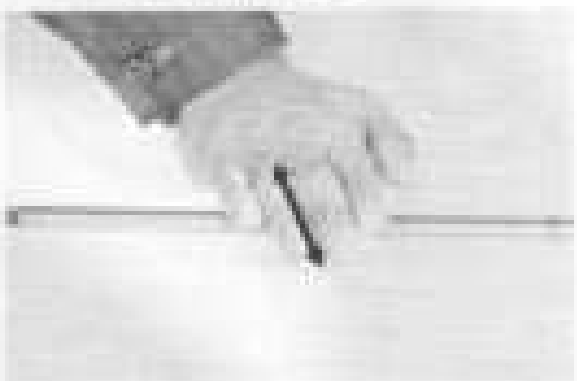
	New	Minimum
Clutch spring free length	38.6 mm (1.433 in)	35.6 mm (1.394 in)



NOTE:

For optimum clutch operation it is advisable to replace the clutch springs as a set if one or more are faulty.

11. Roll the push rod across a surface plate. If rod is bent, replace.



H. Primary drive

1. Check the drive gear and driven gear for obvious signs of wear or damage from material within the primary case.
2. If a gear must be replaced due to damage, it is always advisable to pay strict attention to the lash numbers (mark) during replacement. Marks are scribed on the side of each gear. Match these marks.

Primary driven gear		Primary driven gear		Lash tolerance
Lash number	Indicated mark	Lash number	Indicated mark	
89 90	I	92 93	II	131 (1)
91	II	94	I	
88 89	II	93 94	II	

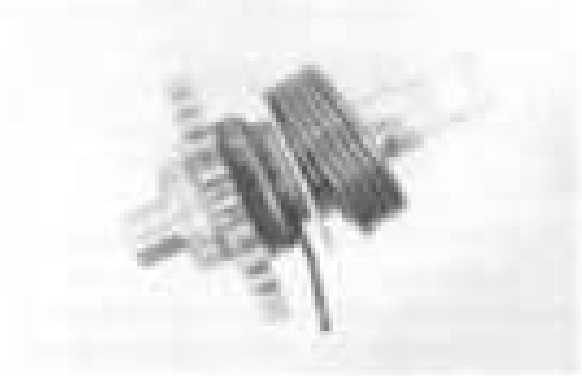
3. Check the shoulder on the primary drive gear where the crankshaft seal rides. It should not be severely worn or galled. If so, replace gear and seal.



I. Kick starter

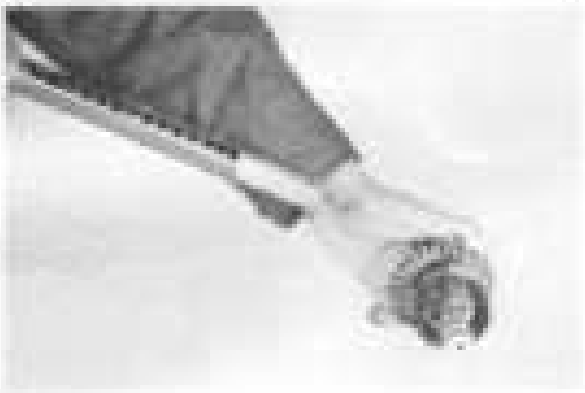
1. Check the ratchet teeth on the kick gear and ratchet wheel. The mating edges should fit flush against each other. If there is severe rounding off, replace as a set.

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.



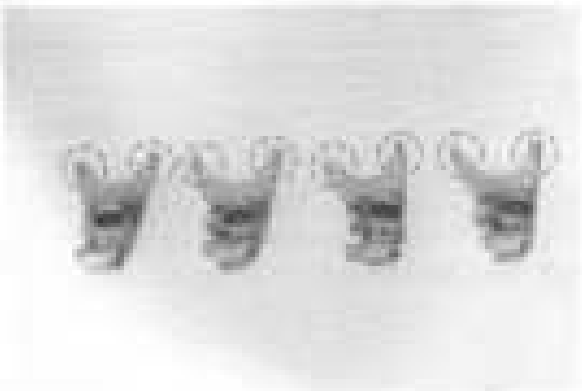
3. The kick gear clip is built into the ratchet wheel. The force of the clip is measured by a spring balance.

Standard tension:
0.8 ~ 1.3 kg (1.8 ~ 2.9 lb)



J. Transmission

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



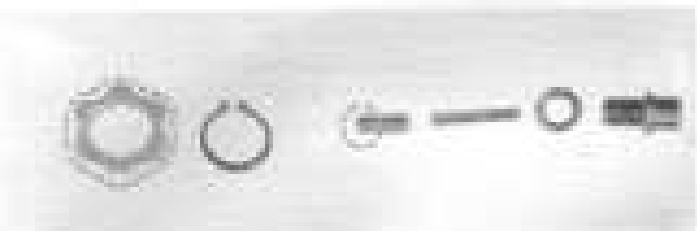
2. Roll the guide bars across a surface plate. If any bar is bent, replace.



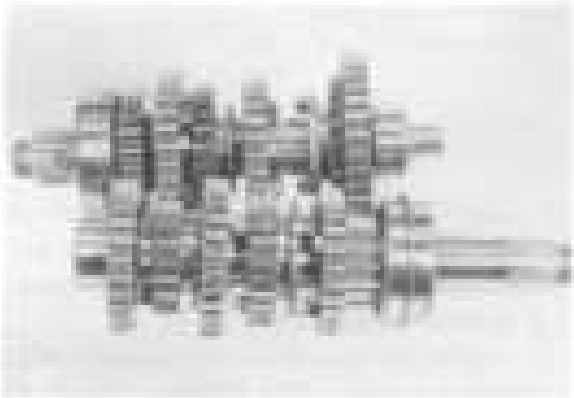
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or any damage, replace cam.
4. Check the cam followers on each shift fork for wear. The follower should fit snugly into its seat in the shift fork, but should not be overly tight. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace followers.
5. Check shift cam dowel pins and side plate for looseness, damage, or wear. Repair as required.



6. Check the shift cam stopper plate and circlip and stopper for wear. Replace as required.



7. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent, replace.
8. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galling, or other extreme wear. Replace as required.

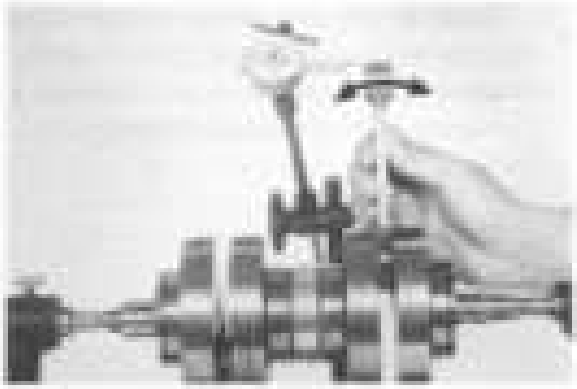


9. Check to see that each gear moves freely on its shaft.
10. Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers.
11. Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges,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

8. Crankshaft

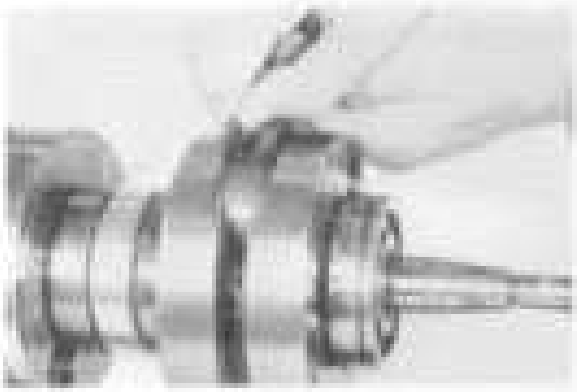
1. Check connecting rod axial play at small end to determine the amount of wear of crank pin and bearing at big end.
   If small end play exceeds tolerance, disassemble the crankshaft, check connecting rod, crank pin and big end bearing.
   Replace defective parts. Play after reassembly should be within specification.

Rod axial clearance	
Minimum	Maximum
0.39 mm (0.014 in)	0.68 mm (0.026 in)



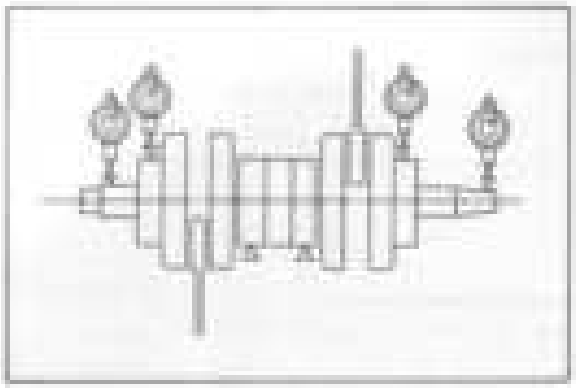
2. Check the connecting rod side clearance at big end.
   If axial play exceeds tolerance, disassemble the crankshaft and replace any worn parts. Big end axial play should be within specification.

Rod side clearance	
Minimum	Maximum
0.25 mm (0.010 in)	0.75 mm (0.030 in)



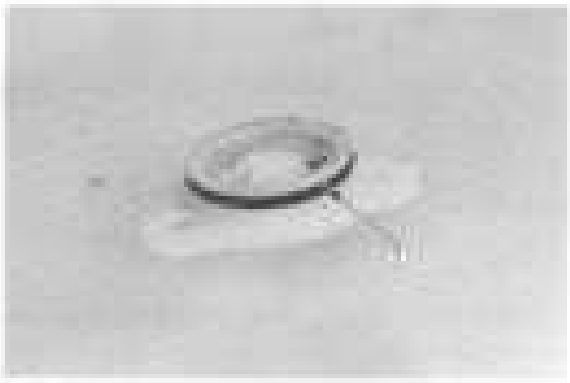
3. Check crankshaft assembly runout (misalignment of crankshaft parts).
   Dial gauge readings should be within specification.
   Correct any misalignment by tapping the flywheel with a brass hammer and/or by using a wedge.

Deflection tolerance			
Left side	Center (left)	Center (right)	Right side
0.05 mm (0.0020 in)	0.05 mm (0.0020 in)	0.05 mm (0.0020 in)	0.05 mm (0.0020 in)



L. Neutral switch

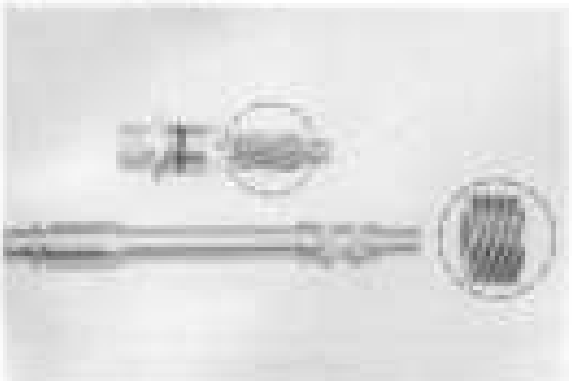
1. Check O-ring; replace if damaged.
2. Check neutral point for wear. Replace as required.



1. O-ring

M. Tachometer gear

Check driven gear and drive gear for any signs of galling. Replace as required.



N. Bearings and oil seals

1. After cleaning and lubricating bearings, rotate outer race with a finger. If rough spots are noticed, replace the bearing.



2. Check oil seal lips for damage and wear. Replace as required.



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

O. Crankcase

1. Thoroughly wash the case halves in mild solvent.
2. Clean all gasket mating surfaces and crankcase mating surfaces thoroughly.
3. Visually inspect case halves for any cracks, mad damage, etc.
4. Check all fittings not previously removed for signs of loosening or damage.
5. Check oil delivery passages in transfer ports for signs of blockage.

3-4. ENGINE ASSEMBLY AND ADJUSTMENT

A. Crankshaft installation

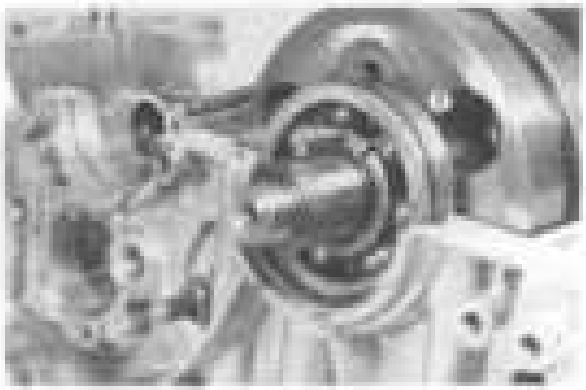
1. Install the circlip half on the bearing (on the clutch side).



1. Circlip

2. Install crankshaft seal.

NOTE:
Check seal, replace if damaged.

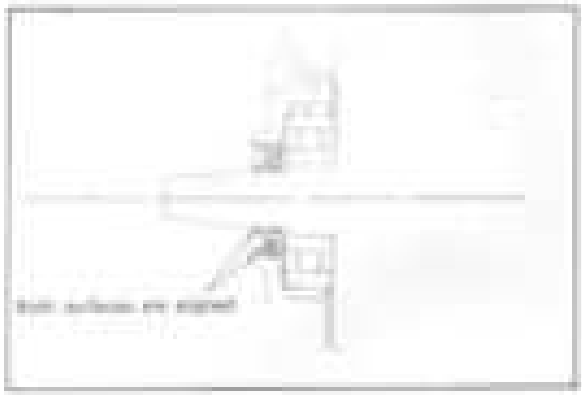


1. Crankshaft seal

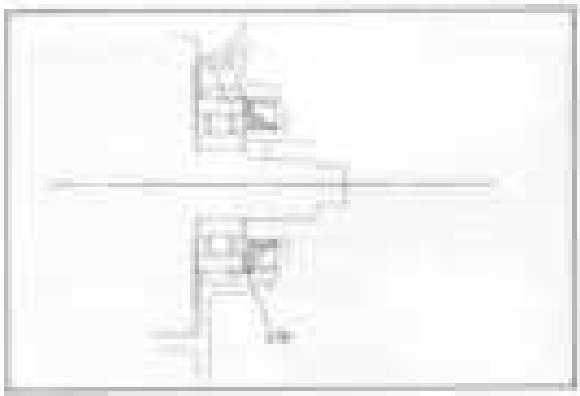
3. Install the crankshaft oil seal.

a. Oil seal (L) — generator side
Install the oil seal in the crankcase boss so that the seal will be even with the boss end surface.

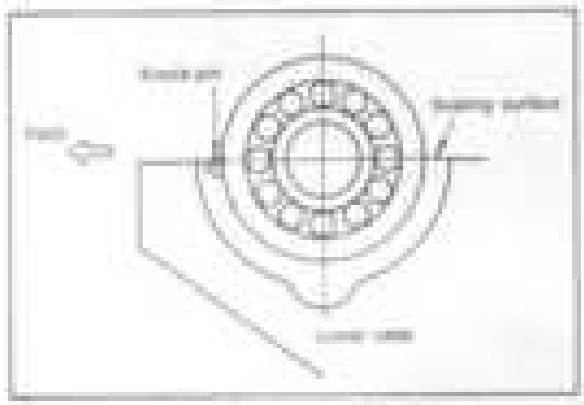
NOTE:
In this case, the oil seal will not touch the bearing.

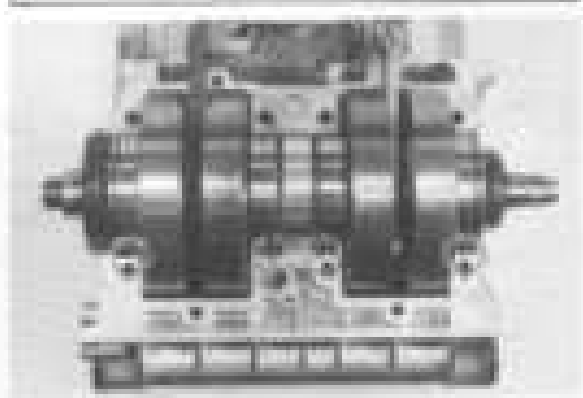


b. Oil seal (R) — clutch side
The lip on the side of oil seal should connect the outer race of the bearing.



4. Install the crankshaft assembly, align the bearing knock pin with the pin slot in the crankcase lower half.





B. Tachometer gear

1. Install tachometer drive gear, drive gear axle and stopper plate.

Stopper plate securing screw torque:
0.3 ~ 0.4 m-kg
(2.2 ~ 2.9 ft-lb)

NOTE:
Apply LOCK-TITE to threads of the screw.

2. Install driven gear assembly.

C. Neutral switch

1. Install neutral point, spring and side plate.

NOTE:
Apply LOCK-TITE to threads of the screw.

2. Apply a grease to neutral switch cap and install O-ring and neutral switch.

D. Transmission and shifter installation

1. Install shift cam and stopper plate.

NOTE:
1) Position of stopper plate



2) Position of stopper plate circlip

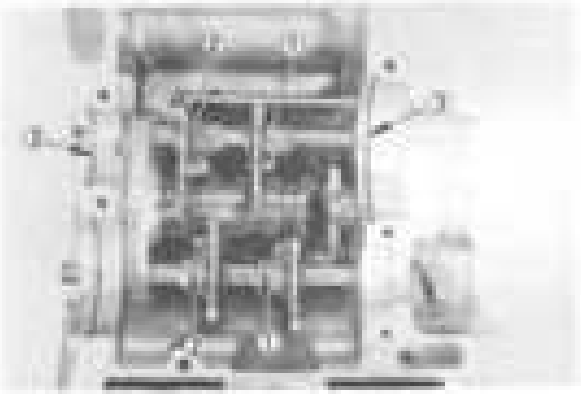


1. Circlip

2. Install shift forks, guide bars.

NOTE:
Check blind plug, replace if damaged.

3. Install circlips half on drive axle.



1. Shift fork 1 2. Shift fork 2 3. Circlip

4. Install oil seal on axle beforehand.

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

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

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

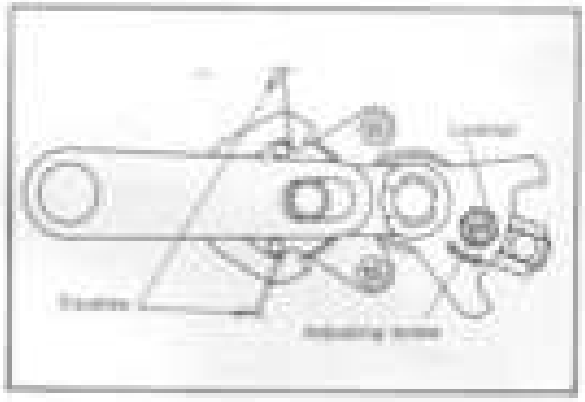
6. Install cam stopper plate, change lever guide and shift cam stopper assembly.

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

Cam stopper plate securing screw torque:
0.9 ~ 1.3 m-kg
(6.5 ~ 9.4 ft-lb)

Change lever guide securing screw torque:
0.3 ~ 0.4 m-kg
(2.2 ~ 2.9 ft-lb)

7. Install change lever assembly and change shaft assembly.
8. In each gear, check for proper centering. Change adjustment screw as required.



NOTE:
If change lever is adjusted, apply LOCK-TITE to threads of adjusting screw.

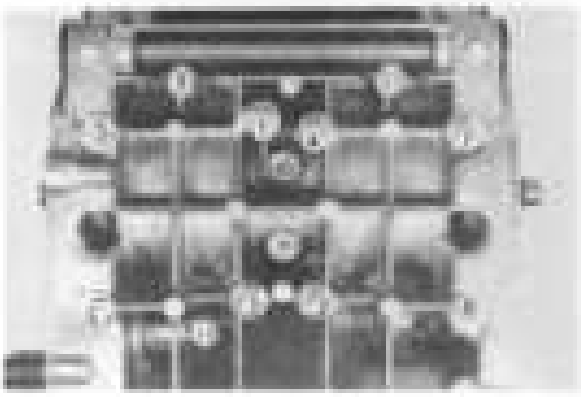
9. With change pedal in place on the change shaft, push down, then up. There should be no freeplay. If free play is evident, shift return spring is fatigued, replace.
10. Check return spring for change levers (3). If it will not hold change lever (3) firmly against shift cam dowel pins, replace spring.

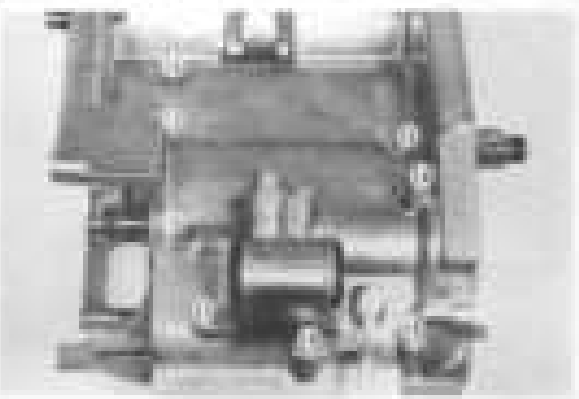


11. Check to see that all parts move freely prior to installing upper case half. Check for correct transmission operation and make certain that all loose shims are in place. At the same time check for complete engagement of all engaging dogs into appropriate gear slots.

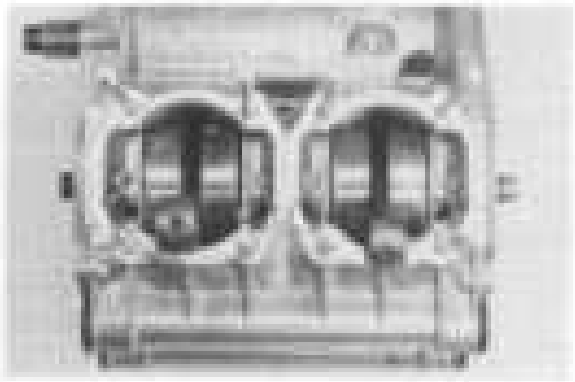
E. Crankcase
1. Apply YAMAHA BOND #4 to the mating surfaces of both case halves. Apply thoroughly over all mating surfaces.
2. Set the crankcase half onto lower case half. Install the crankcase holding bolts and nuts. Each bolt and nut position is numbered. Tighten all crankcase holding bolts and nuts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

	Bolt size	Crankcase number	Tightening torque
(1)	6 mm bolt	(12) – (19)	0.5 m-kg (3.6 ft-lb)
(2)	6 mm nut	(1) – (8)	1.0 m-kg (7.2 ft-lb)
(3)	6 mm bolt	(9) – (11)	0.5 m-kg (3.6 ft-lb)
(4)	8 mm nut	(1) – (8)	2.0 m-kg (14.5 ft-lb)
(5)	6 mm bolt	(9) – (11)	1.0 m-kg (7.2 ft-lb)
(6)	6 mm bolt	(12) – (19)	1.0 m-kg (7.2 ft-lb)





3. After reassembly, apply a liberal coating of two-stroke oil to the crank pin and bearing and into each crankshaft bearing oil delivery hole.



4. Install bearing stopper plate.

Bearing stopper plate securing screw torque:
0.7 ~ 1.0 m-kg
(5.1 ~ 7.2 ft-lb)

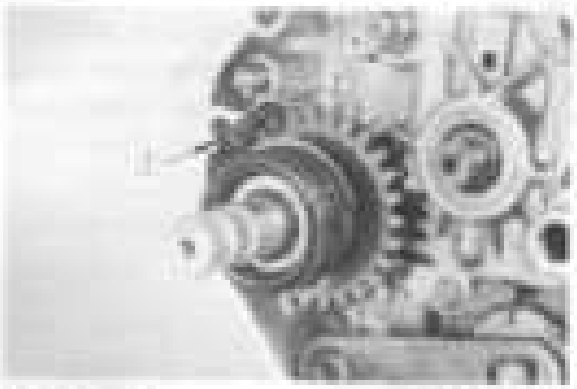
5. Check crankshaft and transmission shafts for proper operation and freedom of movement.

F. Kick starter assembly

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

NOTE:

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



1. Kick gear clip 2. Kick spring

3. Check whether kick starter acts correctly and whether it returns to its home position.

G. Kick idle, tachometer drive and primary drive gears

Install kick idle gear, tachometer drive gear and primary drive gear.

NOTE:

Tighten primary drive gear securing nut after clutch assembly is installed.

H. Clutch

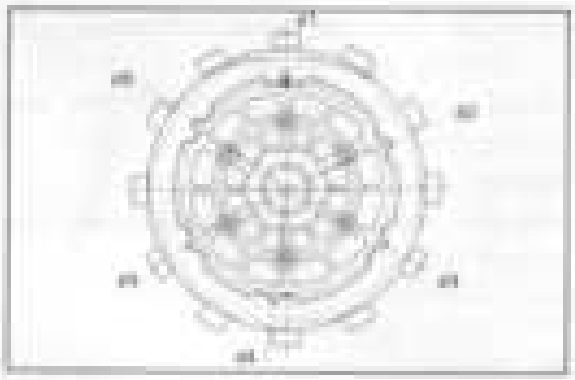
1. Install thrust plates, spacer, primary driven gear and clutch boss.
2. Install clutch holding tool on clutch boss and tighten locknut.

Clutch locknut torque
5.0 ~ 8.0 m-kg
(36 ~ 58 ft-lb)

3. Install clutch plates, friction plates and cushion rings.

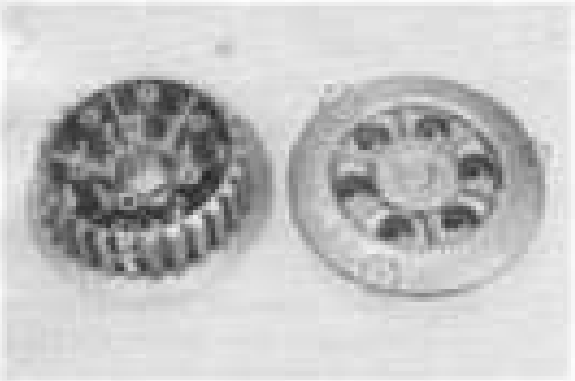
NOTE:

1) Install all parts with a coat of 10W/30 motor oil on their mating surfaces.
2) Check whether cushion rings are in plane and not twisted.
3) In order to reduce noise caused by the clutch plates and clutch boss, each clutch plate is cut away at part of the edge (#1). This permits the clutch plate to move outward due to centrifugal force.
   Align one of the plate cutaways so that it is positioned as shown at #2.
   Install a friction plate. Next install a clutch plate with cutaway offset approximately 60° from previous plate cutaway.
   Continue this procedure in a clockwise direction until all clutch plates are installed.



4. Install steel ball and push rod into main axle.
5. Install clutch pressure plate.

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



Clutch spring holding screw torque:
0.7 ~ 1.0 m-kg
(5.1 ~ 7.2 ft-lb)

CAUTION:
Tighten primary drive gear nut at this time.

Primary drive gear nut torque:
5.0 ~ 8.0 m-kg
(36 ~ 58 ft-lb)

I. Right-hand crankcase cover

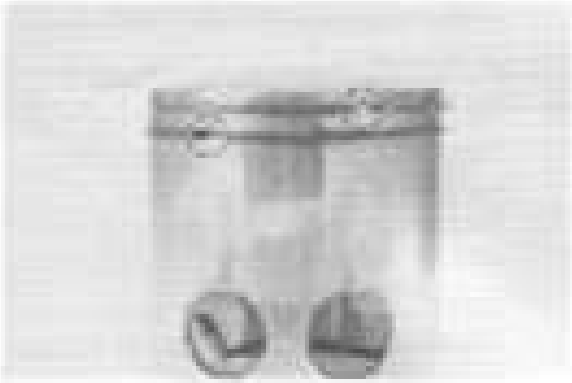
While properly engaging crankshaft and oil pump gear, install new case cover gasket and right-hand crankcase cover. Tighten holding screws gradually until proper torque is reached.

Crankcase cover holding screw torque:
0.7 ~ 1.0 m-kg (5.1 ~ 7.2 ft-lb)

J. Piston

1. During reassembly, coat the piston ring grooves, piston skirt areas, piston pin, and bearing with two-stroke oil.
2. Install new piston pin clips and make sure they are fully seated in their grooves.

NOTE:
Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed. Be sure the arrow stamped on the piston crown points forward. Also make sure that the left piston (already marked during removal) is fitted to the left-hand connecting rod. This guarantees that all previous clearances remain unchanged unless new parts are installed or cylinder work is done.



K. Cylinder

1. Install a new cylinder base gasket.
2. Install cylinder with one hand while compressing piston rings with other hand.

NOTE:
Make sure the rings are properly positioned.

L. Cylinder head

Install cylinder head gasket and cylinder head. Tighten nuts in two steps, using a crisscross pattern.

Head nut torque:
1.9 ~ 2.1 m-kg (13.7 ~ 15.2 ft-lb)

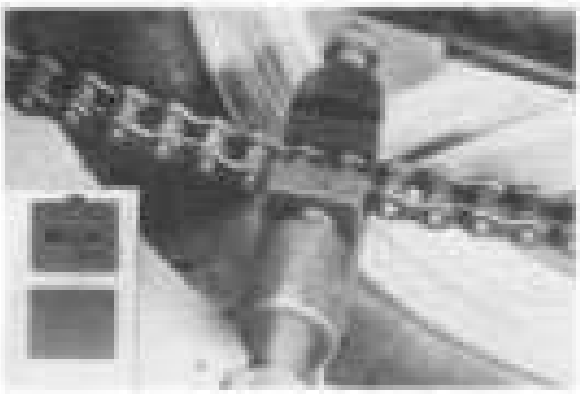
3-5. MOUNTING

Refer to sections 3-2, and mount the engine in the frame as follows:

1. Place the engine in the frame.
2. Install engine mounting bolts with proper tightening torque. (Refer to 3-1-I.)

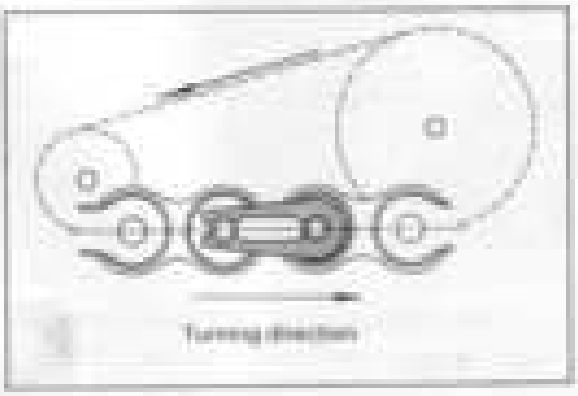
Tightening torque:	
8 mm bolt	1.4 ~ 2.2 m-kg (10.1 ~ 15.9 in-lb)
10 mm bolt	2.7 ~ 3.4 m-kg (19.5 ~ 24.6 in-lb)

3. Install drive chain using drive chain cutter (installing adapter used).



NOTE:

Install chain joint in proper direction.



4. Tighten drive sprocket to proper torque. (Refer to 3-1-H.)

Drive sprocket nut torque:
5 ~ 8 m-kg (36 ~ 58 ft-lb)

5. Install generator assembly and connect wires.

NOTE:

When installing rotor, make sure woodruff key is properly seated in keyway of crankshaft. Apply a light coating of lithium soap base grease to tapered portion of crankshaft end. Carefully install flywheel taking care to align for woodruff key. Install belleville washer, lockwasher and locknut. Tighten carefully to recommended torque value.

Rotor bolt torque:
1.5 ~ 2.5 m-kg (10.8 ~ 18.1 ft-lb)
Yoke mounting bolt torque:
0.7 ~ 1.0 m-kg (5.1 ~ 7.2 ft-lb)

Whenever generator is removed, ignition timing must be re-set. (Refer to 3-1-G.)

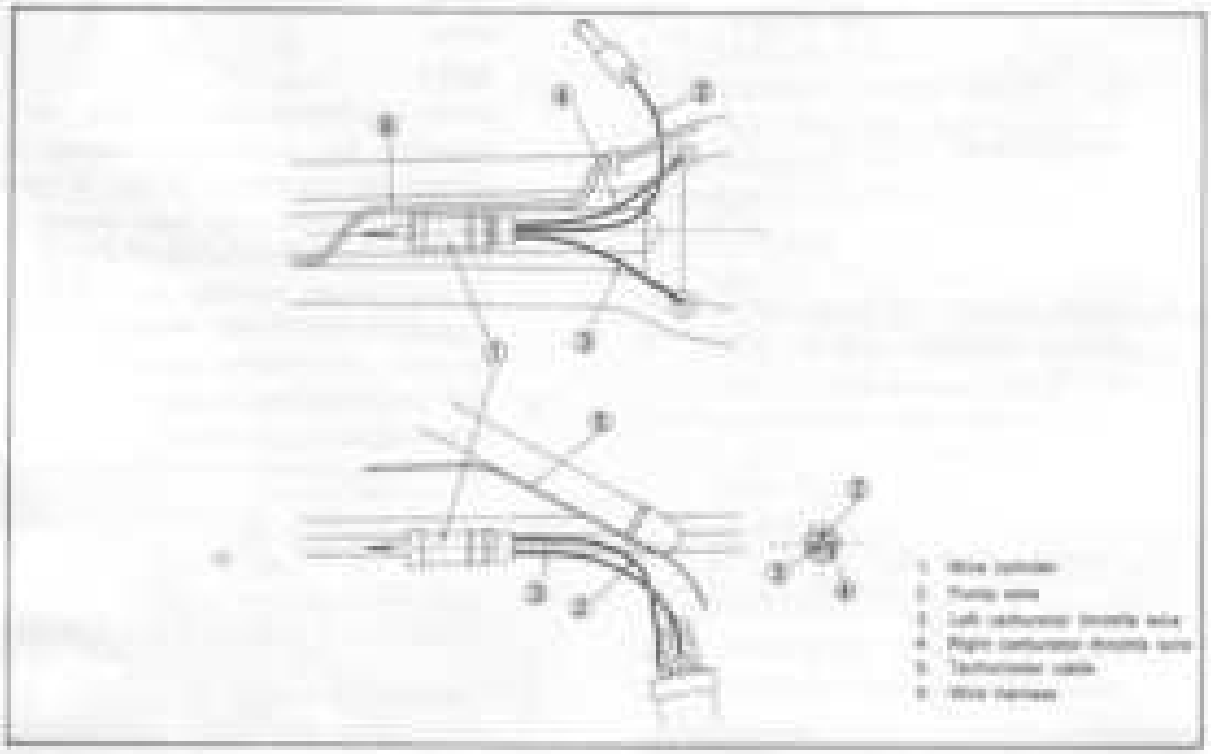
6. Adjust ignition timing. (Refer to 2-5-C.)
7. Install clutch wire and left crankcase cover and adjust.
8. Install gear change pedal.
9. Install tachometer cable.
10. Install carburetor assembly and adjust. (Refer to 3-1-F.)
11. Install exhaust pipe.

12. Install oil pump wire and adjust. (Refer to 2-1-F)

NOTE:

Check wire cylinder position.

13. Install fuel tank.



CHAPTER 4. CARBURETION

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4-2. Reed valve assembly 52

A. Removal and troubleshooting 52

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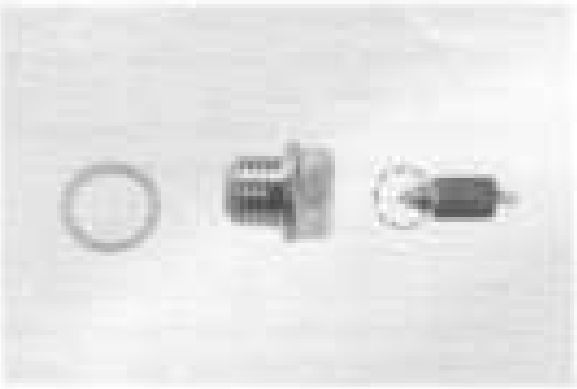
CHAPTER 4. CARBURETION

4-1. CARBURETOR

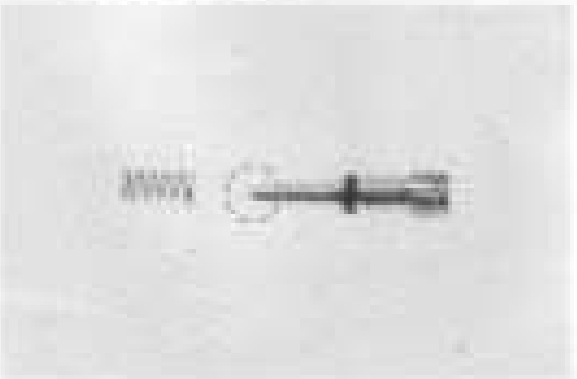
A. Inspection and repairing

1. Remove following parts
   a) Pilot air screw
   b) Idle speed screw
   c) Float chamber
   d) Float
   e) Needle valve
   f) Valve seat
   g) Main jet
   h) Main nozzle
   i) Pilot jet

2. Wash carburetor in petroleum base solvent. Wash all associated parts.
3. Using high pressure air, blow out all passages and jet's.
4. Inspect needle and seat for signs of excessive wear or foreign particles. Replace as required. Always replace inlet needle and valve seat as an assembly.



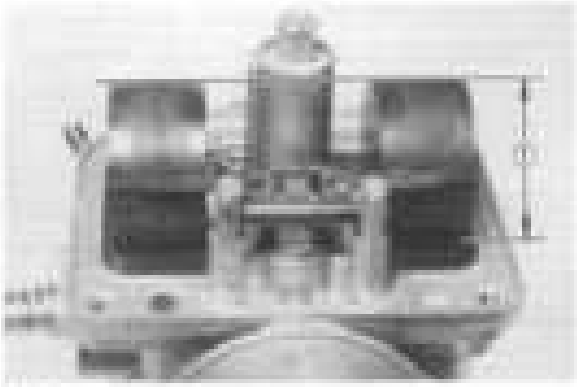
5. Inspect pilot air screw for signs of excessive wear or foreign particles. Replace as required.



6. Float level
   a. Re-install components, with exception of float chamber.

Tightening torque:
Pilot jet: 0.08 m-kg (0.6 ft-lb)
Main jet: 0.2 m-kg (1.4 ft-lb)
Valve seat: 0.4 m-kg (2.9 ft-lb)

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

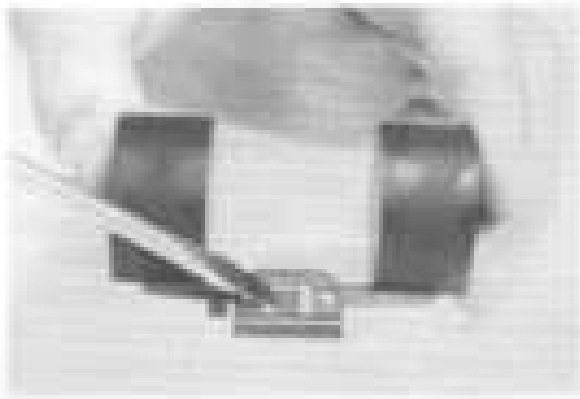


1. Float level

Float level:
23 ±2.5 mm
(0.91 ±0.10 in)

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

   c. To correct float level, remove float assembly and bend tang a slight amount as required. Both right and left sides of float should measure identically.



7. Install float chamber.

Tightening torque:
0.2 m-kg (1.4 ft-lb)

8. Remove needle out of seat in throttle valve (slide). Inspect for signs of bending scratches or wear. Replace as required.
9. Check throttle valve (slide) for signs of wear. Insert into carburetor body and check for free movement. If slide or body is out of round causing slide to stick, replace.
10. Install throttle valve and needle assembly in carburetor mixing chamber.

Jet needle holding plate torque:
0.1 m-kg (0.7 ft-lb)

11. Tighten mixing chamber top as tight as possible by hand. Do not use pliers or vice-grips.
12. Install mixing chamber top cover, and all overflow and vent tubes. Re-install carburetor. Check position and routing of all tubes. Check tightness of all fittings. Make sure carburetor is mounted in a level position. (Refer to CABLE ROUTING DIAGRAM).
13. After installation, readjust throttle cable and Autolube pump cable, see direction in Chapter 2, Section 2-3-A and 2-3-C.

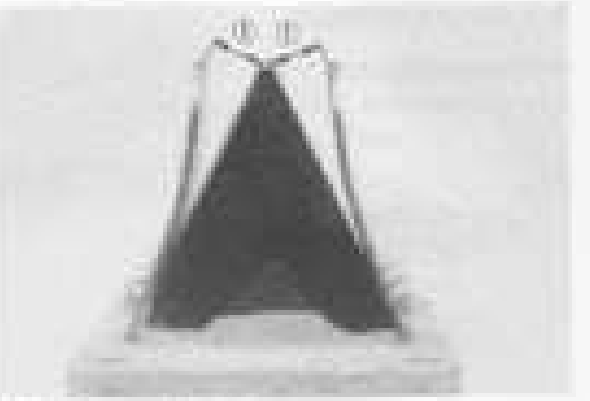
4-2. REED VALVE ASSEMBLY

A. Removal and troubleshooting

With carburetor removed, proceed as follows:

1. Remove the bolts holding the carburetor joint and reed valve assembly to cylinder. Remove assembly.
2. Inspect rubber carburetor joint for signs of weathering, checking or other deterioration.
3. Inspect reed petals for signs of fatigue cracks. Reed petals should fit flush or nearly flush against neoprene seats. If in doubt as to sealing ability, apply suction to carburetor side of assembly. Leakage should be slight to moderate.
4. Check valve stopper clearance. If beyond tolerance, adjust stopper or replace as required.

Valve stopper clearance:
9 ±0.3 mm (0.35 ±0.012 in)

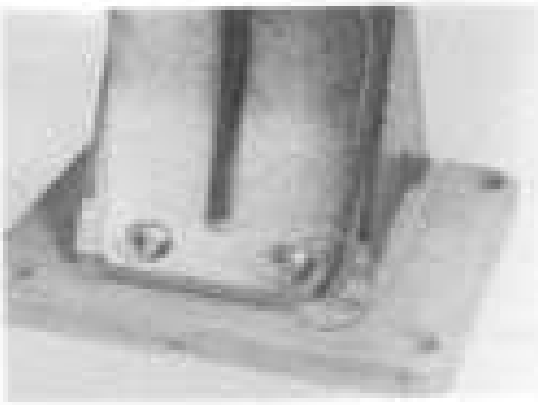


1. Valve stopper clearance

5. If disassembly of the reed valve assembly is required, proceed as follows:
   a. Remove Phillips screws securing stopper plate and reed to reed block. Handle reed carefully. Avoid scratches and do not bend. Note form which side of the reed block the reed and stopper plate were removed. Re-install on same side.
   b. During reassembly, clean block, reed and stopper plate thoroughly. Apply a holding agent, such as "Loc-Tite", to threads of Phillips screws. Tighten each screw gradually to avoid warping.

Torque: 0.08 m-kg (0.6 m-lb)

NOTE:
During reassembly, note the cut in the lower corner of the reed and stopper plate. Use as aid to direction of reed installation.



6. During reassembly of the reed valve assembly and manifold, install new gaskets and torque the securing bolts gradually and in pattern to the proper torque.

Reed valve securing bolt torque:
0.7 ~ 1.0 m-kg
(5.1 ~ 7.2 ft-lb)

CHAPTER 5. CHASSIS

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CHAPTER 5. CHASSIS

5-1. FRONT WHEEL

A. Removal

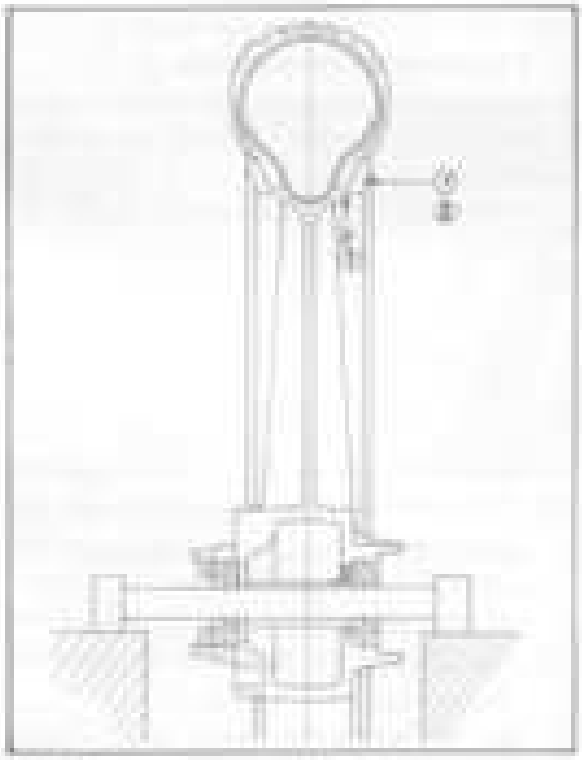
1. Remove cotter pin from front axle nut.
2. Remove the front axle nut.
3. Loosen the two axle nut holder nuts at the bottom of the fork leg.
4. Raise the front wheel of the machine by placing a suitable stand under the engine.
5. Remove the front wheel axle by simultaneously twisting and pulling out on the axle. Then remove the wheel assembly. In this case, the speedometer gear unit housing must be removed.

B. Front axle

Remove any corrosion from axle with emery cloth. Place the axle on a surface plate and check for bends. If bent, replace.

C. Front wheel inspection

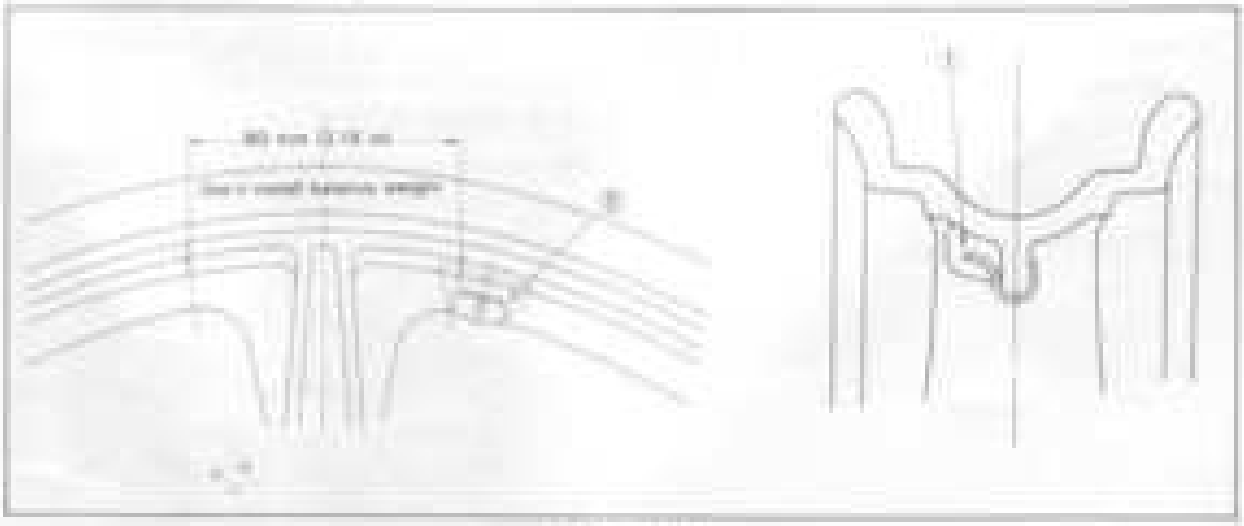
1. Check for cracks, bends or warpage of wheels. If a wheel is deformed or cracked, it must be replaced.
2. Check wheel run-out.
   If deflection exceeds tolerance, check wheel bearing or replace wheel as required.



1. Vertical 2. Lateral

Rim run-out limits:	
Vertical	2 mm (0.08 in)
Lateral	1 mm (0.04 in)

3. Check wheel balance.
   Rotate wheel lightly several times and observe resting position.
   If wheel is not statically balanced, wheel will come to rest at the same position. Install balance weight at lighter position (at top) as illustrated.



1. Balance weight

NOTE:
The wheel should be balanced with brake disc installed.

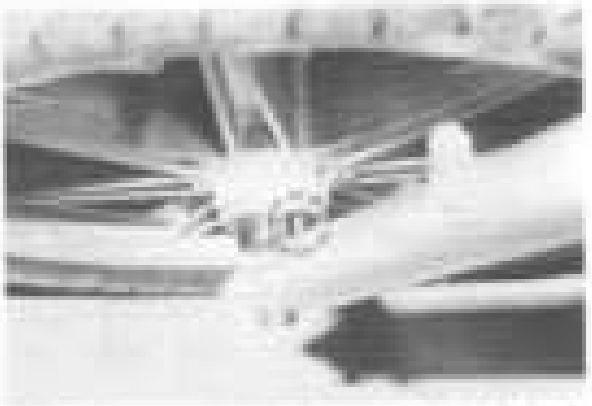
D. Replacing wheel bearings
If the bearings allow play in the wheel hub or if wheel does not turn smoothly, replace the bearings as follows:

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. 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.

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

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

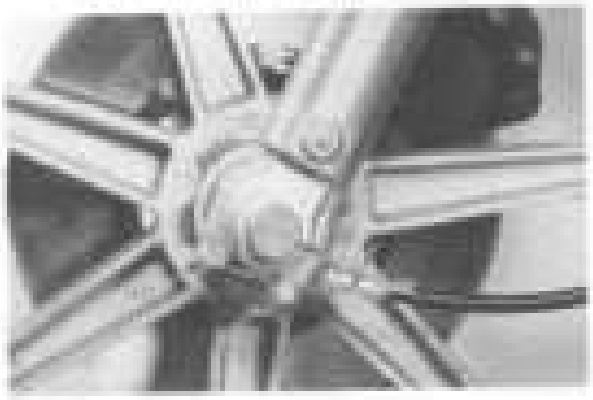
1. Lightly grease lips of front wheel oil seals and gear teeth of speedometer drive and driven gears. Use light-weight lithium soap base grease.
2. Make sure there is an enough gap between disc pads.
3. Check for proper engagement of the lugs on the outer fork tube with the locating slot on speedometer gear unit housing.



4. Always secure the front wheel axle as follows:
a. Torque the front axle nut.

Axle nut torque:
8.3 ~ 13 m-kg (60 ~ 94 ft-lb)

b. Torque axle holder nuts. First tighten nut on front end of axle holder, and tighten nut on rear end.



Holder nut torque:
1.1 ~ 1.8 m-kg
(8.0 ~ 13.0 ft-lb)

c. Install a new cotter pin.

5-2. REAR WHEEL

A. Removal
1. Place machine on center stand.
2. Disconnect the drive chain. (Refer to 3-1-R.)
3. Remove cotter pin from rear axle.
4. Remove the rear axle nut.
5. Remove the rear axle by simultaneously twisting and pulling out.
6. Remove the rear wheel assembly.

B. Rear axle

See front wheel section, paragraph "Front axle".

C. Replacing wheel bearings

See front wheel section, paragraph "Replacing wheel bearings".

D. Rear wheel inspection

See front wheel section, paragraph "Front wheel inspection".

E. Installing rear wheel

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

1. Lightly grease lip of rear wheel oil seals.
2. Make sure there is an enough gap between disc pads.
3. Install wheel assembly and axle.
4. Connect drive chain. (Refer to 3-5.)
5. Adjust drive chain. (Refer to 2-4-C.)

5-3. DISC BRAKES (Front and rear)

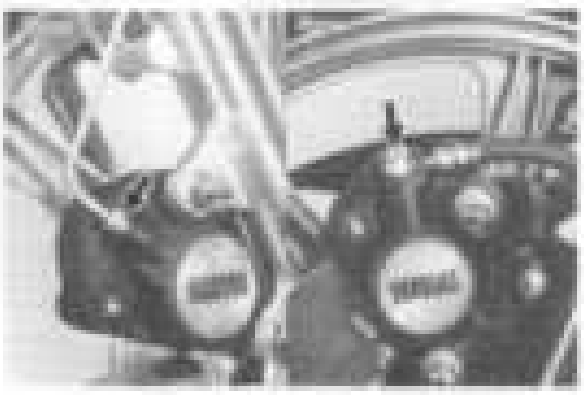
A. Front and rear disc brake disassembly

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

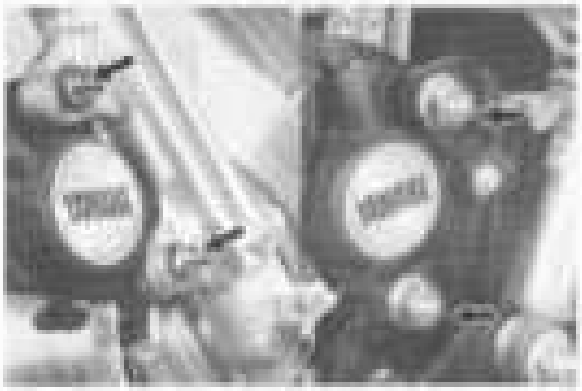
CAUTION:

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

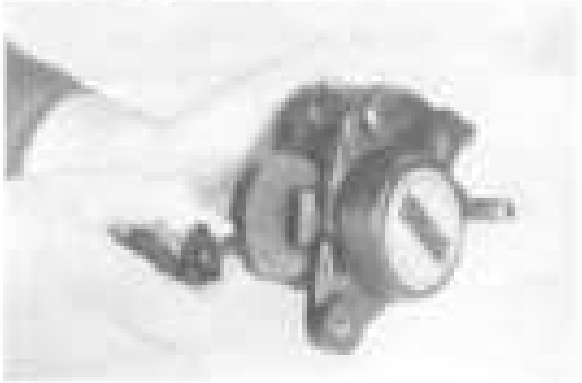
1. Caliper assembly
   a. Removing caliper assembly
      1) Remove brake pipe and hose from caliper.



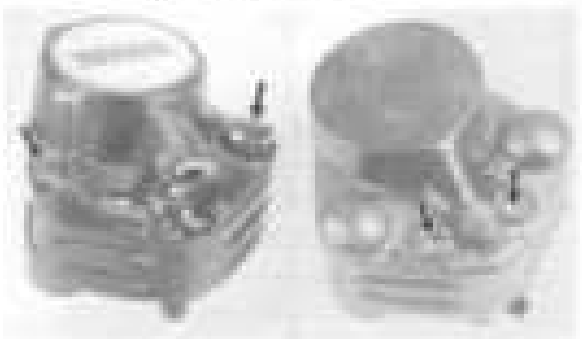
2) Wrap up brake pipe with clean vinyl sheet or clean cloth.
3) Keep from brake lever pulled in. This prevents fluid from dripping.
4) Remove caliper securing bolts and nuts, and remove caliper.



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



   c. Removing the piston seal
      1) Remove the two bridge bolts and two hexagon bolts.



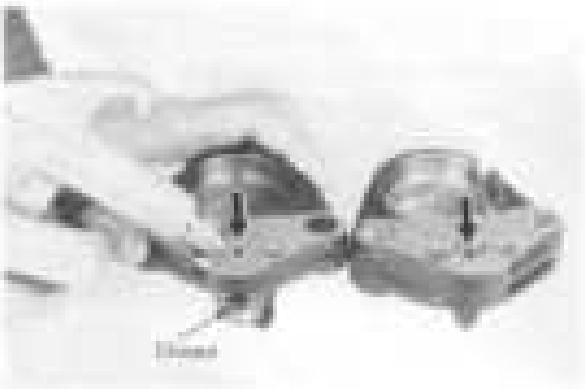
2) Remove the caliper seal.



1. Caliper seal

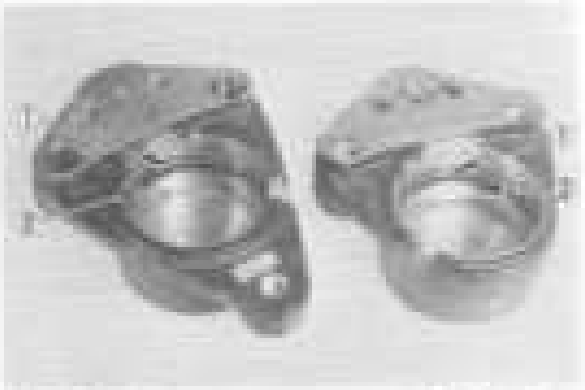
NOTE:
The bridge bolts and hexagon bolts should be replaced every two years.

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



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

4) Remove the piston seal and dust seal from the caliper body.



1. Dust seal 2. Piston seal

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

2. Master cylinder
a. Master cylinder disassembly
1) Disconnect front stop switch lead wire.
2) Remove the brake lever. (Be careful not to lose the brake lever return spring.)
3) Remove the brake hose.



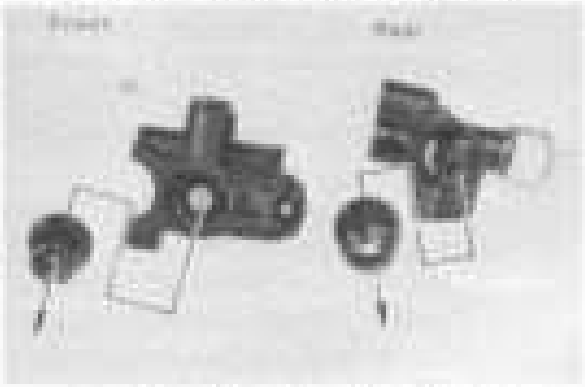
4) Remove the two bolts securing the master cylinder, and remove the master cylinder from the handlebar. Remove the reservoir cap, and remove the diaphragm. Drain the brake fluid.

b. Removing rear brake master cylinder
1) Disconnect rear stop switch lead wire.

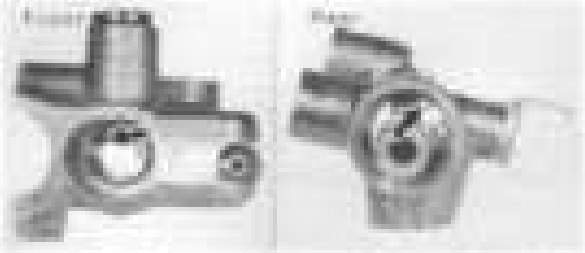
2) Remove brake hose.
3) Remove two bolts securing master cylinder. Remove reservoir hose. Drain off brake fluid.



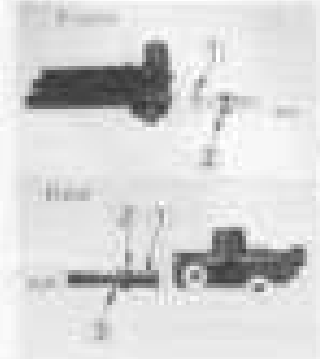
c. Mastercylinder (front and rear brakes) disassembly
1) Remove master cylinder boot.



2) Remove snap ring using circlip pliers.

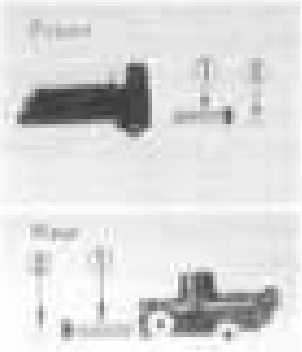


3) Remove piston. (Note that spring remains in master cylinder.)



1. Piston
2. Cylinder cup
3. Piston holder

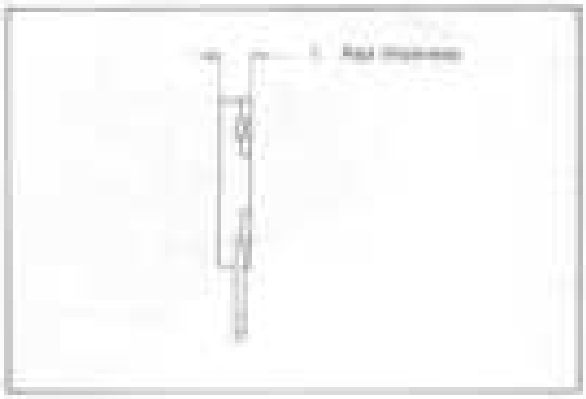
4) Remove return spring and stopper valve.



1. Return spring
2. Valve

5) Remove stopper plate.
6) Remove cylinder cup.

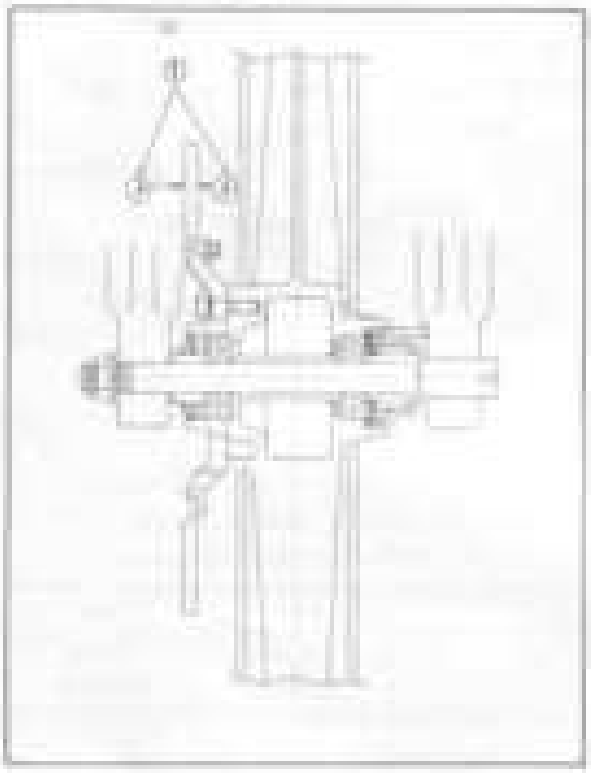
II. Disc brake inspection
1. Caliper
a. Piston
If the piston has scratches on its outer surface, it should be replaced.
b. Pads
If any pad is worn beyond limits, it should be replaced.



	Front	Rear
Wear limit	0.5 mm (0.18 in)	0.5 mm (0.18 in)

c. Piston seal and dust seal
If piston seal or dust seal is scratched or damaged, it should be replaced. Whether or not it is scratched or damaged, it should be replaced every two years.
d. Bridge bolts
Bridge bolts should be replaced every time the caliper is removed, whether damaged or not.

2. Master cylinder
a. Master cylinder body
1) If the master cylinder has scratches or worn spots, replace it.
2) If the outlet edge is scratched or damaged, replace it.
3) Check the port for clogging. Clean as required.
4) Check the cylinder and breather for excessive wear.
3. Brake hose and brake pipe
a. Check the brake hose and brake pipe and if damaged or leaky, replace.
b. Replace brake hose and brake pipe every four years.
4. Disc
a. The deflection of the disc assembly should be less than 0.15 mm (0.006 in). If deflection exceeds 0.15 mm, check the deflection of the disc and the wheel bearing.



1. Dial gauge

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

	Front	Rear
Standard	1.0 mm (0.04 in)	7.0 mm (0.28 in)
Wear limits	6.5 mm (0.26 in)	6.5 mm (0.26 in)

C. Disc brake assembly
1. Cleaning
All disassembled parts should be washed in the following manner before they are assembled.
a. Be sure to use new brake fluid for washing. (Do not use mineral oil; it will cause rubber parts to swell up. Also avoid using alcohol.)
b. If any other mineral oil other than brake fluid is used on rubber parts, they should be replaced. Metallic parts should also be washed in brake fluid.
2. Caliper
a. Installing the piston
1) Fit the piston seal and dust seal in the groove in the caliper cylinder.
2) Coat the caliper cylinder and piston with new brake fluid.
3) Insert the piston into the caliper cylinder. Take care not to twist the piston.
b. Outer caliper and inner caliper installation
1) Fit the caliper seal in the caliper seal groove.
2) Put the outer and inner caliper together. (Make sure that the sealing surfaces are free from dust and scratches.)
3) Tighten the two hexagon head bolts. (The bridge bolts are installed later.)
Always use new bolts and tighten to specification.

Tightening torque:	
Front caliper	1.8 ~ 2.6 m·kg (13.1 ~ 18.8 ft·lb)
Rear caliper	1.8 ~ 2.6 m·kg (13.1 ~ 18.8 ft·lb)

4) Replace the two bridge bolts with new ones and tighten. The bridge bolts are important safety parts and should be tightened to specification.

Tightening torque (front and rear):
7.5 ~ 9.5 m·kg (54.2 ~ 68.7 ft·lb)

c. Pad installation
   1) The pads may be installed when the caliper or bridge bolts are tightened.
   2) When the pads alone are to be replaced, it is necessary to push the piston in so that the pads can be placed in position. When the piston is pushed back, the brake fluid level in the master cylinder reservoir increases. It may be necessary to loosen the bleed screw to let out some of the brake fluid.

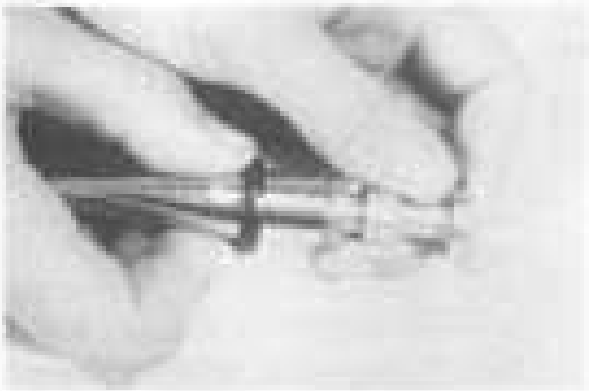
d. Caliper installation
   1) The caliper can be installed by reversing the removal procedure. Install caliper (front and rear).

Tightening torque:
4.5 ~ 5.0 cm-kg
(28.9 ~ 36.2 in-lb)

   2) Install the brake pipe (front) and brake hose (rear).

Tightening torque:
Front caliper — 1.4 ~ 2.3 m-kg (10.1 ~ 16.6 ft-lb)
Rear caliper — 3.0 ~ 4.8 m-kg (21.7 ~ 34.7 ft-lb)

3. Master cylinder
a. Cylinder cup installation
   1) After soaking the cup in new brake fluid, assemble the cup and piston. Take care not to scratch the cup or piston. (Use cylinder cup installer.)



   2) Install the stopper plate.
   3) Insert the spring and valve into the master cylinder body.

b. Piston installation
   1) Check the outer surface of the piston for scratches. Carefully insert the piston into the cylinder. Take care not to scratch the inner wall of the cylinder. If scratched, fluid leakage may result.
   2) Install the snap ring.
   3) Firmly fit the boot in the grooves of the master cylinder and piston.

c. Installing the master cylinder on the handlebar
   1) Install the master cylinder on the handlebar.
   2) Connect brake hose to master cylinder with union bolt.

Tightening torque: (front and rear master cylinder)
3.0 ~ 4.8 m-kg
(21.7 ~ 34.7 ft-lb)

NOTE:
If gasket is damaged, replace it.

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

d. Front brake hose and brake pipe
Both brake hose and brake pipe should be tightened.

Tightening torque:
1.4 ~ 2.3 m-kg
(10.1 ~ 16.6 ft-lb)

e. Disc
   1) The disc bolts should be tightened to specification.

Tightening torque:
1.7 ~ 2.2 cm-kg
(12.3 ~ 16.0 in-lb)

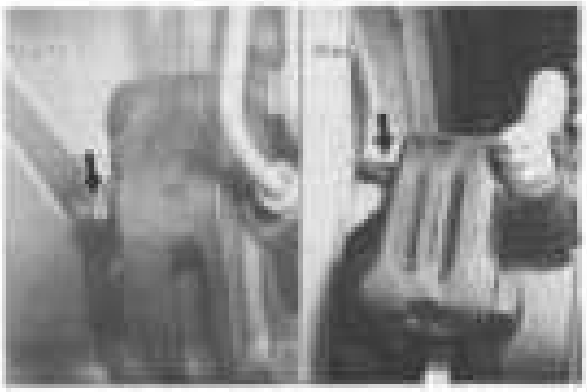
   2) The deflection of the disc assembly should be within limits.

Deflection limit:
0.15 mm (0.006 in)

f. Air bleeding

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

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



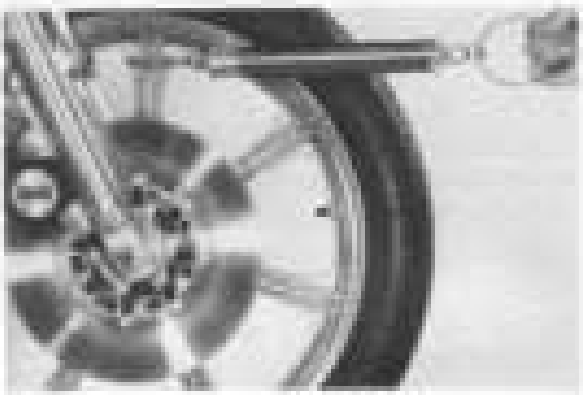
NOTE:

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

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

Bleed screw tightening torque:
0.6 — 0.9 m-kg
(4.3 — 6.5 in-lb)

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



Torque:
1.0 kg or less (2.2 lb)

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

NOTE:

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

5-4. TIRES AND TUBES

A. Removal

1. Remove valve cap, valve core, and valve stem locknut.
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 irons (with rounded edges) to work the tire bead over the edge of the rim, starting 180° opposite the tube stem. Be careful not to pinch the tube as you do this.
4. After you have worked one side of the tire completely off the rim, slip the tube out. Be very careful not to damage the stem while pushing it back out of the rim hole.

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

B. Installation
Reinstall the tire and tube by reversing the disassembly procedure. After the tube has been installed, but before the tire has been completely slipped onto the rim, inflate the tube. This removes any creases that might exist. Release the air and continue with reassembly. After the tire has been completely slipped onto the rim, make sure the stem comes out of the hole in the rim at a right angle to the rim. Finally, inflate the tire.

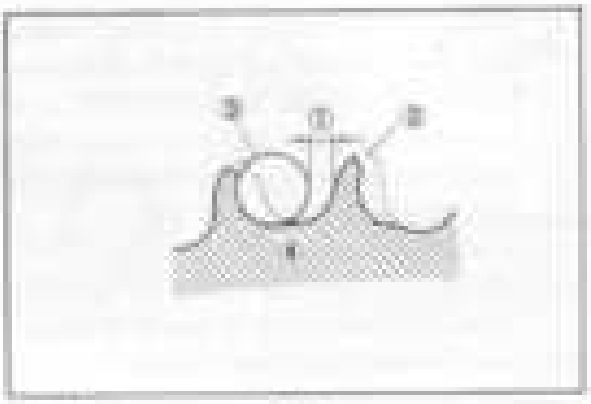
	Front tire	Rear tire
Normal riding	1.8 kg/cm² (26 lb/in²)	2.0 kg/cm² (28 lb/in²)
Continuous high speed riding or with passenger	2.0 kg/cm² (28 lb/in²)	2.3 kg/cm² (32 lb/in²)

NOTE:
Make sure the wheel is balance every time the tire replaced. (Refer to 5-1-C.)

5-5. DRIVE CHAIN AND SPROCKETS

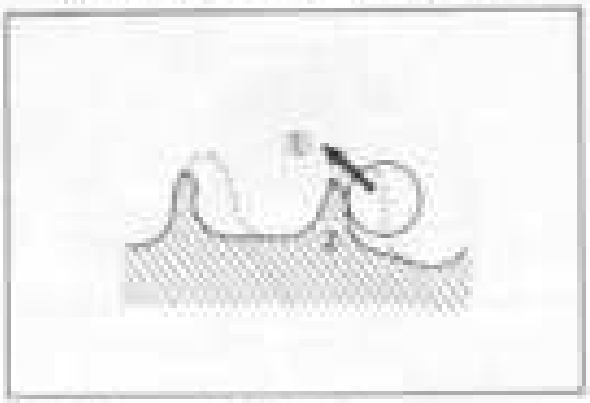
NOTE:
Please refer to Maintenance intervals and Lubrication intervals charts for additional information.

A. Drive sprocket
With the left crankcase cover removed, proceed as follows:
1. Using a blunt chisel, flatten the drive sprocket lock washer tab.
2. With the drive chain in place and transmission in gear, firmly apply the rear brake. Remove the sprocket securing nut. Remove the sprocket.
3. Check sprocket wear. Replace if tooth width has decreased as shown.



1. C.R. teeth
2. Correct
3. Roller
4. Sprocket

4. Replace if tooth wear shows a pattern resembling that in the illustration.



1. Slip off
2. Bend teeth

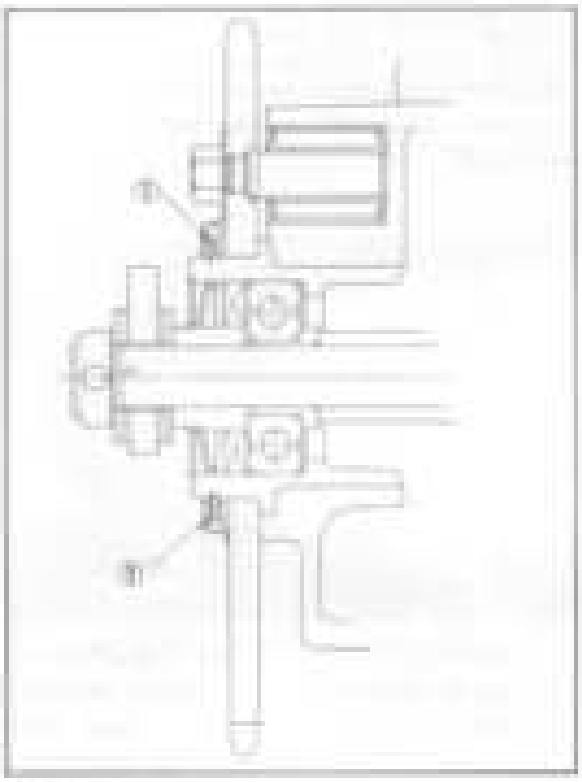
5. During reassembly, make sure the lock washer splines are properly engaged on the drive shaft splines. Tighten securing nut to specified torque. Bend lock washer tab against securing nut flats.

Drive sprocket securing nut torque:
5.0 ~ 8.0 m-kg (36 ~ 58 in-lb)

B. Driven sprocket
With the rear wheel assembly removed, proceed as follows:
1. Using a blunt chisel, flatten the securing bolt lock tabs.
   Remove the securing bolts. Remove the lock washers, sprocket cir-clip, plate washer and sprocket.
2. Check sprocket wear per procedures for the drive sprocket.
3. Check the sprocket to see that it runs true. If bent, replace.

4. During reassembly as illustrated, make sure that sprocket and sprocket seat are clean. Tighten the securing bolts in a crisscross pattern. Apply a grease and bend the tabs of the lock washers fully against the securing bolt flats.

NOTE:
Make sure the circlip is proper position.

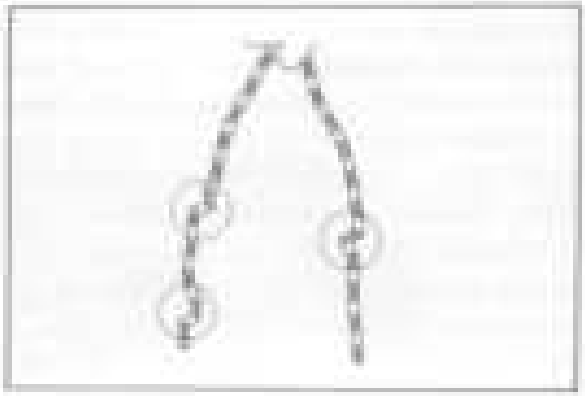


1. Circlip

Driven sprocket securing bolt torque: 4.2 ~ 6.8 m-kg (43 ~ 54 ft-lb)

C. Chain inspection

1. With the chain installed on the machine, excessive wear may be checked for by taking up chain freeplay and pulling 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 the chain. If any portion of the chain shows signs of damage, or if either sprocket shows signs of excessive wear, remove and replace.
2. Check the chain for stiffness. Hold as illustrated. If stiff, soak in solvent solution; clean with wire brush and dry with high pressure air. Oil chain thoroughly and attempt to work out kinks. If still stiff, replace.



3. Check the side plate for damage. Check to see if excessive play exists in pins and rollers. Check for damaged rollers. Replace as required.

D. Chain maintenance

The chain should be lubricated according to the recommendations given in the Maintenance and Lubrication intervals charts.

More often if possible. Preferable 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 wipe with rag.
2. Apply lubricant between rollers and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear. Apply thoroughly and wipe off excess.

NOTE:
Chain and lubricant should be at room temperature to assure penetration of lubricant into rollers.

Choice of lubricant is determined by use and terrain. SAE 20W or 30W oil may be used, but several specialty types by accessory manufacturers offer more penetration and corrosion resistance for roller protection. In certain areas, semi-drying lubricants are preferable. These

will resist picking up sand particles dust and dirt.

3. Periodically remove the chain and blow off with high pressure air.
4. Brush off dirt and soak chain in solvent. Dry with high pressure air. Lubricate thoroughly while off machine. Work each roller thoroughly to make sure lubricate penetrates. Wipe off excess. Re-install.

5-6. FRONT FORKS

A. Disassembly

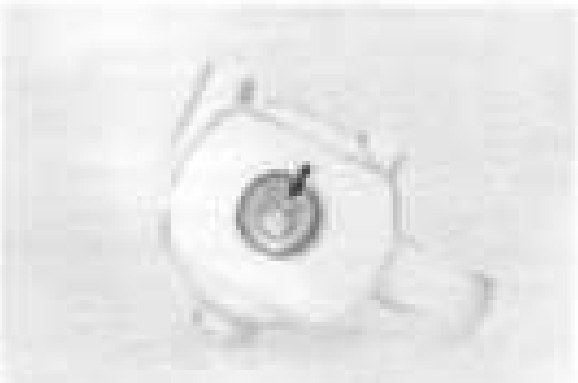
1. With the front wheel and front fender removed, the fork legs can be removed from the upper and lower brackets by loosening upper and lower pinch bolts.



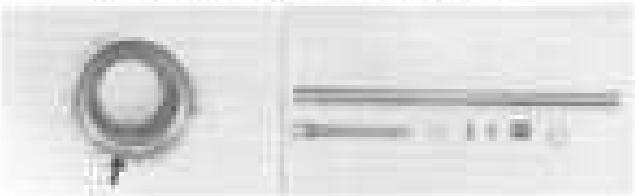
1. Pinch bolt 2. Cap bolt

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

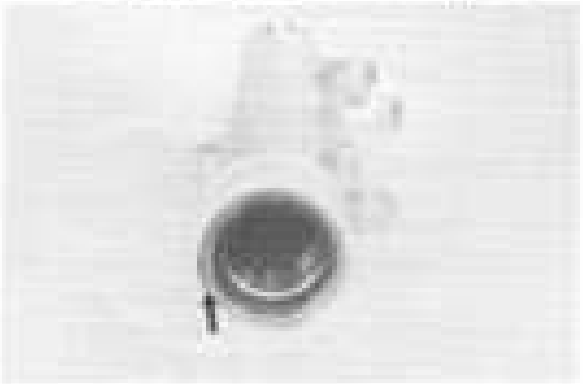
2. Remove the caps and drain the oil from both fork tubes.
3. Remove the internal hexagonal bolt from bottom of outer tubes using fork spring guide wrench.



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



6. To replace fork seal, remove wire clip and cover washer from outer tubes.



7. Carefully pry out old seal without damaging fork tube.
8. Insert new seal "open" side down.

B. Assembly

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

NOTE:
Fork springs must be installed with greater pitch.

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

NOTE:
Specialty type fork oils of quality manufacture may be used.

Fork oil capacity
144 ±4 cc (4.87 oz) each side
Fork oil level (below the top of the fork)
329 ±10 mm each side (15.3 ±0.4 in)

c. Install the inner tube caps.

Inner tube cap torque
1.5 ~ 3.0 m-kg (11 ~ 22 ft-lb)

d. Tighten all pinch bolts.

Pinch bolt torque	
Upper	1.4 ~ 2.2 m-kg (10 ~ 16 ft-lb)
Lower	3.0 ~ 4.5 m-kg (22 ~ 33 ft-lb)

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

5-7. STEERING HEAD

A. Adjustment

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

B. Disassembly

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

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

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

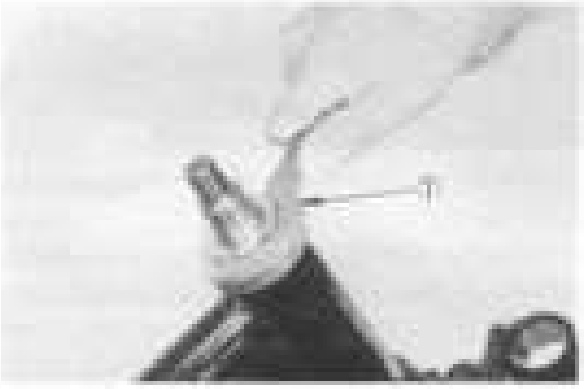


1. Pinch bolt 2. Fitting nut

9. Remove handle crown (upper bracket) and instruments, as an assembly.

NOTE:
Hold headlight body to keep it from falling.

10. Remove steering ring nut with steering nut wrench.



1. Steering nut wrench

CAUTION:
Support "under bracket" so that the loose bearings will not fall out.

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

Ball quantity/size:
19/1/4 in

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

Ball quantity/size:
19/1/4 in

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

C. Inspection

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

D. Installation

1. If pressed-in races have been removed, tap in new races.
2. Grease the lower ball race of the bottom assembly and arrange the balls around it. Then apply more grease.
3. Grease the lower ball race of the upper assembly and arrange the balls around it. Then apply more grease and set the top race into place.

NOTE:

Use medium-weight wheel bearing grease of quality manufacturer, preferably waterproof.

4. Carefully slip the under bracket stem up into the steering head. Hold the top bearing assembly in place so the stem does not knock any balls out of position.
5. Set the upper bearing cover on and install the ring nut. Tighten the ring nut so all free play is taken up, but so the bracket can still pivot freely from lock to lock. Recheck for free play after the entire fork unit has been installed. (Refer to Chapter 2-4-E, for Steering head adjustment.)
6. Install the fork tubes into the under bracket to ease headlight body installation.
7. Install the headlight body and stays onto the fork tubes with rubber and steel spacing washers properly in place.
8. Install the upper fork bracket. Tighten steering fitting nut, then tighten stem pinch bolt. Torque to specifications.

Steering fitting nut:
4.2 ~ 5.2 m-kg
(30.4 ~ 37.6 ft-lb)

Stem pinch bolt:
1.4 ~ 2.2 m-kg
(10.1 ~ 15.9 ft-lb)

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

Upper fork tube pinch bolt torque:
1.4 ~ 2.2 m-kg
(10.1 ~ 15.9 ft-lb)

NOTE:

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

10. Install handlebars and torque to specification.

CAUTION:

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

Handlebar mounting bolt torque:
1.4 ~ 2.2 m-kg
(10.1 ~ 15.9 ft-lb)

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

5-8. SWING ARM

A. Swing arm inspection

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

Swing arm free play:
1 mm (0.04 in)

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

B. Swing arm lubrication

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

Recommended lubricant:
Smooth chassis lube grease

2. Wipe off excess grease.

C. Swing arm removal

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

NOTE:

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

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

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

NOTE:

Do not tap on bushing. Press in new bushings.

5-9. REAR SHOCK ABSORBER

A. Removal

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

B. Inspection

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

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

5-10. CABLES AND FITTINGS

A. Cable maintenance

NOTE:

See Maintenance and Lubrication intervals charts for additional information. Cable maintenance is primarily concerned with preventing deterioration through rust and weathering and providing for proper lubrication to allow the cable to move freely within its housing. Cable removal is 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.

WARNING:

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

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

3. To lubricate cable, hold in vertical position. Apply lubricant to uppermost end of cable. Leave in vertical position until lubricant appears at bottom. Allow excess to drain and re-install.

NOTE:
Choice of lubricant depends upon conditions and preference. However, a semi-drying chain and cable lubricant will probably perform adequately under most conditions.

B. Throttle maintenance

1. Remove Philips 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.

C. Cable junction maintenance

The throttle cable cylinder (junction point for Autolube control cable) must be periodically maintained.

1. Remove throttle cable (1) from handlebar housing.
2. Remove throttle cable (2) from carburetor mixing chamber top.
3. Remove Autolube pump cable from pump pulley. Remove cable adjustor.
4. Remove seat and fuel tank.
5. Remove the cable/cylinder assembly.
6. Remove cylinder cap, throttle cable (2) and Autolube pump cable.
7. Wash assembly thoroughly in solvent.
8. Lubricate all cables.
9. Apply a thin coating of lubricant to cylinder walls.

NOTE:
A small amount of lithium soap base grease may be used in lieu of cable lubricant. However, if machine is to be used in extreme cold, use cable lubricant.

10. Reassemble all cables. Seal cylinder to keep from damage due to adverse weather and riding conditions. Re-install cables using routing diagrams in back of book. See Mechanical adjustments chapter for correct cable adjustment.

CHAPTER 6. ELECTRICAL

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6

CHAPTER 6. ELECTRICAL

6-1. IGNITION SYSTEM

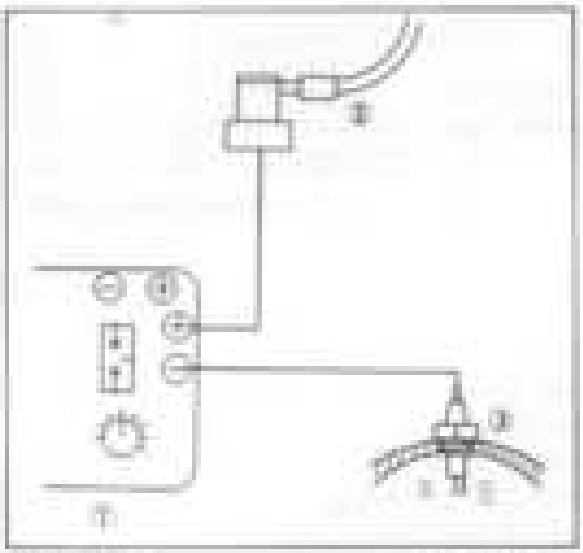
A. Ignition timing

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

B. Spark 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 engine ignition system can be considered good. If not, proceed with individual component tests until the problem is found.

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



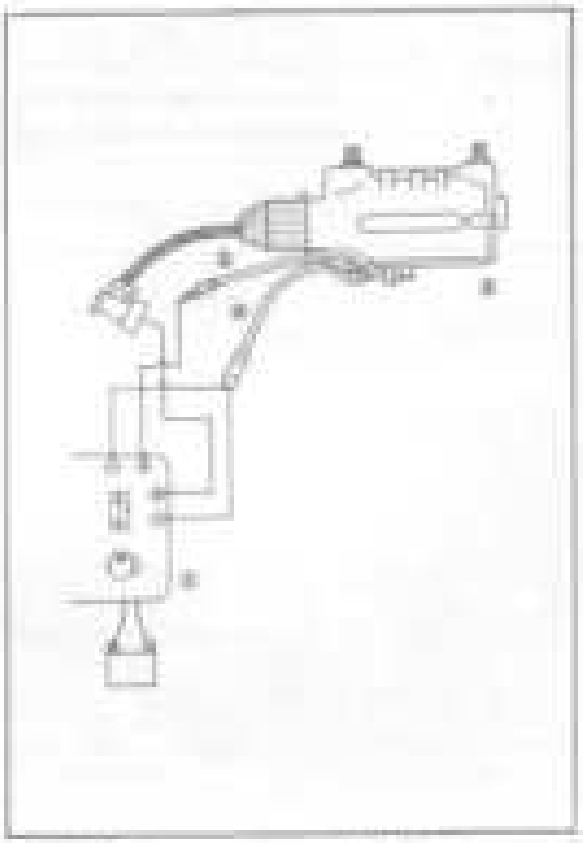
1. Electro Tester
2. Plug wire from coil
3. Spark plug

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

Minimum spark gap:
8 mm (0.24 in)

C. Ignition coil

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



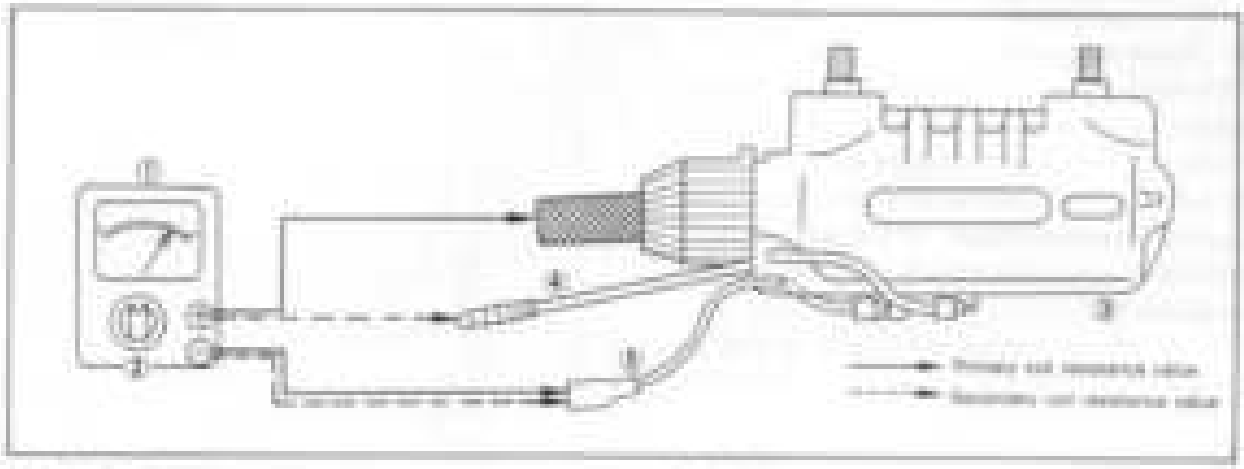
1. Electro-Tester
2. Ignition coil
3. Red/White
4. Chassis

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

Minimum spark gap:
8 mm (0.24 in)

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

Standard values:
Primary coil resistance:
1.4Ω ±10% at 20°C (68°F)
Secondary coil resistance:
6.6kΩ ±20% at 20°C (68°F)



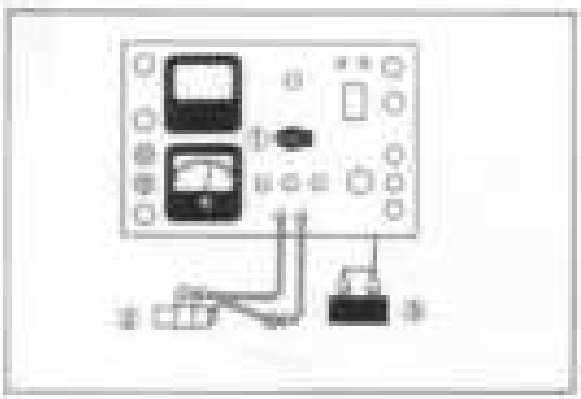
1. Pocket Tester
2. Set the tester on the "Resistance" position
3. Ignition coil
4. Red Wires
5. Orange

D. Condenser test

If the contact points show excessive wear, or the spark is weak (but the ignition coil is in good condition), check the condenser.
Capacity test (use electro tester):

a. Calibrate capacity scale.
b. Connect tester.
c. Meter needle will deflect and return to center as condenser is charged.
After needle stops, note reading on "μF" scale.

Condenser capacity: 0.22μF



1. Capacity
2. Condenser
3. Battery

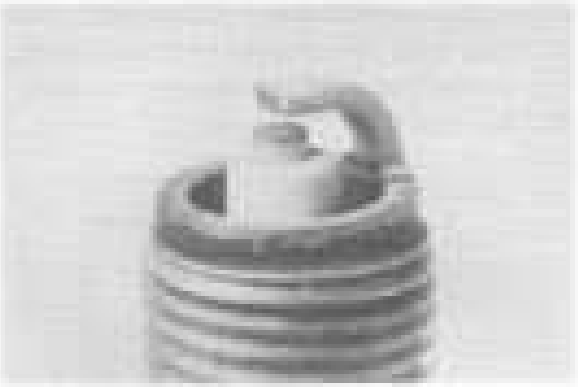
CAUTION:

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

E. Spark plug

The life of a spark plug and its discoloring vary according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with suitable ones determined by the color and condition of the bad plugs. One machine may be ridden only in urban areas at low speeds; another may be ridden for hours at high speed. Confirm what the present plugs indicate by asking the rider how long and how fast he rides. Recommend a hot, standard, or cold plug type accordingly. It is actually economical to install new plugs often since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

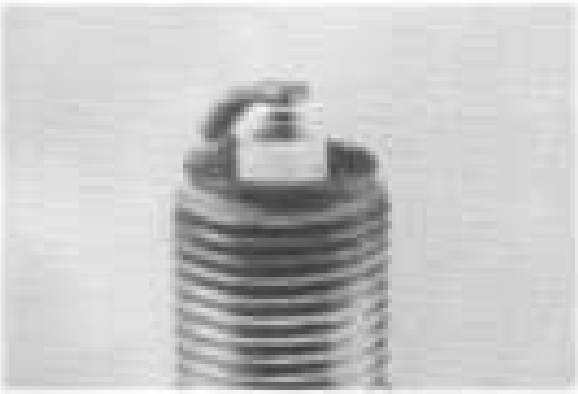
1. How to "read" a spark plug (condition)
a. Best condition: When the porcelain around the center electrode is a light tan color.



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



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



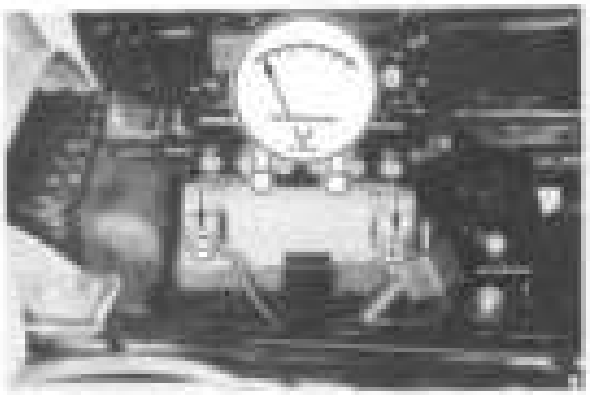
2. Inspection
Instruct the rider to
a. Inspect and clean the spark plug at least once per month or every 1,600 km (1,000 mi.).
b. Clean the electrodes of carbon and adjust the electrode gap.
c. Be sure to use the proper reach plug as a replacement to avoid overheating, fouling or piston damage.

Spark plug type: B-8ES NGK
Spark plug gap: 0.6 ~ 0.7 mm (0.02 ~ 0.03 in)

6-2. CHARGING SYSTEM

A. A.C. generator

1. Checking method
a. Connect D.C. voltmeter to the battery terminales.



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

Generated voltage: 14.5 ±0.3V

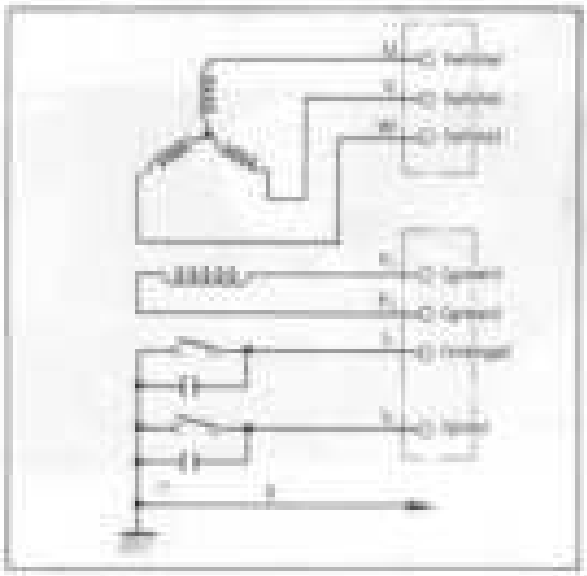
d. If the indicated voltage cannot be reached then perform the tests in step 2.

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

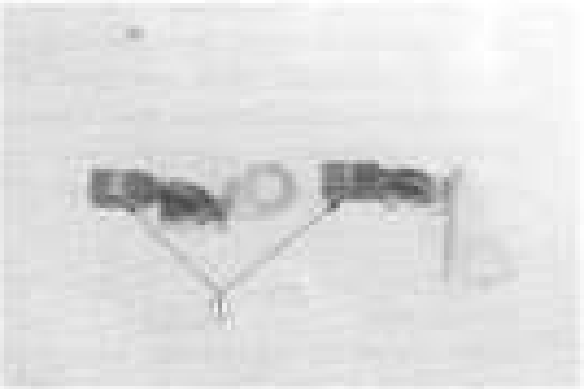
2. Resistance test of field coil and armature coil.
Check the resistance between terminals U-V, V-W, W-U, and $F_1 - F_2$. If resistance is out of specification, coil is broken. Check the coil connections. If the coil connections are good, then the coil is broken inside and it should be replaced.

Field coil resistance: $F_1 - F_2$
5.5Ω ±15% at 20°C (68°F)

Armature coil resistance:
(U-V, V-W, W-U)
Each 0.46Ω ±10%
at 20°C (68°F)

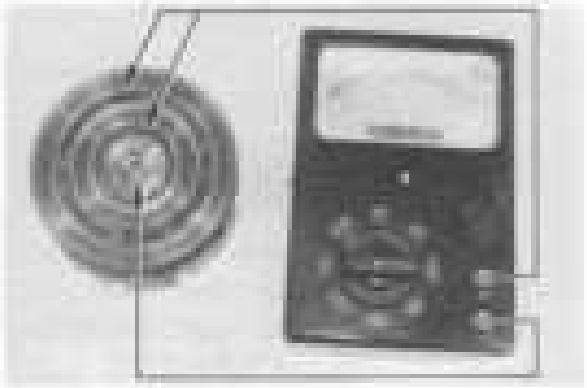


3. Checking brushes
a. If carbon brushes do not function correctly, electricity cannot pass to rotor field windings. This reduces alternator output.
b. Visually inspect carbon brush holder and brushes for obvious breakage or wear. If either brush is worn past minimum length mark, replace both brushes.



1. Minimum length mark

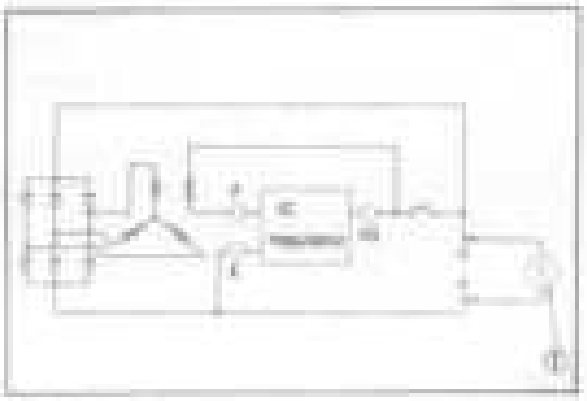
3. Checking rotor
a. Clean both slip rings.
b. Measure insulation between each slip ring and rotor core. This must show infinite resistance. If resistance measurements differ greatly from this specified, winding is either broken, shorted to itself or shorted to core. Replace it.



B. I.C. voltage regulator

1. Inspection
Since IC regulator is sealed with a resin, it is impossible to check or replace any of inner parts. If the regulator is found to be defective, it must be replace with a new one.

2. Checking method
a. Connect D.C. voltmeter to the battery terminales.



1. D.C. voltmeter

b. Start engine.
c. Accelerate engine to approximately 2,000 rpm or more and check regulated voltage.

Regulated voltage: 14.5 ±0.3V

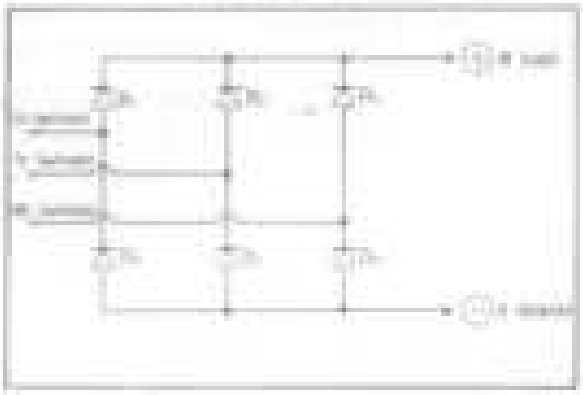
d. If voltage is off, check battery, generator and rectifier. If generator and rectifier are good, then IC regulator is broken and it should be replaced.

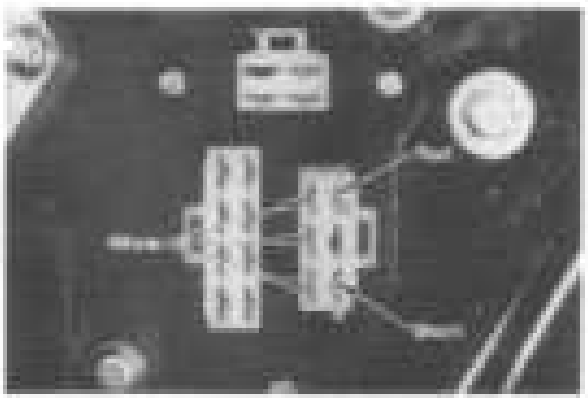
NOTE:

1) Never disconnect wires from the battery while the generator is in operation. If the battery is disconnected, the voltage across the generator terminals will increase, damaging the semiconductors.
2) When checking the regulator being installed on a machine, the battery should not be removed, and it should be fully charged.
3) Never use a high voltage insulation ohmmeter such as a megohmmeter for such a test. If high voltage is applied to the regulator terminals, the regulator will be damaged.

C. Checking silicon rectifier

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





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

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

Even if one of elements is broken, replace assembly.

CAUTION:

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

6-3. BATTERY

A. Checking

1. If battery sulfation (white accumulations) occurs on plates due to lack of battery electrolyte, the battery should be replaced.
2. If the bottoms of the cells are filled with corrosive material falling off the plates, the battery should be replaced.
3. If the battery shows the following defects, it should be replaced.
   a. The voltage will not rise to a specific value even after many hours of charging.
   b. No gassing occurs in any cell.
   c. The battery requires a charging voltage of more than regulating voltage in order to supply a current of 0.55A for 10 hours.

B. Service life

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

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

Battery	12V 9.5Ah
Electrolyte	Specific gravity 1.28 Quantity 480 cc
Initial charging current	0.95A/5h (new battery)
Recharging current	0.95A/ 10 hours (or until specific gravity reaches 1.28)
Refill fluid	Distilled water (to maximum level line)
Refill period	Check once per month (or more often, as required)

C. Storage

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

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

8-4. LIGHTING AND SIGNAL SYSTEMS

A. Lighting tests and checks

The battery provides power for operation of the horn, taillight, stoplight neutral light and flasher light. If none of the above operates, always check battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery water, or a defective charging system. See section 8-3. charging system, for checks of battery and charging system.

1. Horn does not work.
   a. Check for 12V on brown wire to horn.
   b. Check for good grounding of horn (pink wire) when horn button is pressed.
2. Brake light does not work.
   a. Check bulb.
   b. Check for 12V on yellow wire to brake light.
   c. Check for 12V on brown wire to each brake light switch (front brake and rear brake switches).
3. Taillight does not work.
   a. Check bulb.
   b. Check for 12V on blue wire.
   c. Check for ground on black wire to tail/brake light assembly.
4. Flasher light(s) do not work.
   a. Check bulb.
   b. Right circuit.
      1) Check for 12V on dark green wire to light.
      2) Check for ground on black wire to light assembly.
   c. Left circuit.
      1) Check for 12V on dark brown wire to light.
      2) Check for ground on black wire to light assembly.
   d. Right and left circuits do not work.
      1) Check for 12V on brown/white wire to flasher switch on left handlebar.
      2) Check for 12V on brown wire to flasher relay.
      3) Replace flasher relay.
      4) Replace flasher switch.
   e. Check flasher self canceling system. (Refer to flasher self canceling system.)
5. Neutral light does not work.
   a. Check bulb.
   b. Check for 12V on sky blue wire to neutral switch.
   c. Replace neutral switch.
6. Oil caution light does not work.
   a. Place shift lever in neutral gear to check bulb.
   b. Replace bulb.
   c. Check for 12V on black/red wire to oil level switch.
   d. Replace oil level switch.

8. Flasher self canceling system

1. Description

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

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

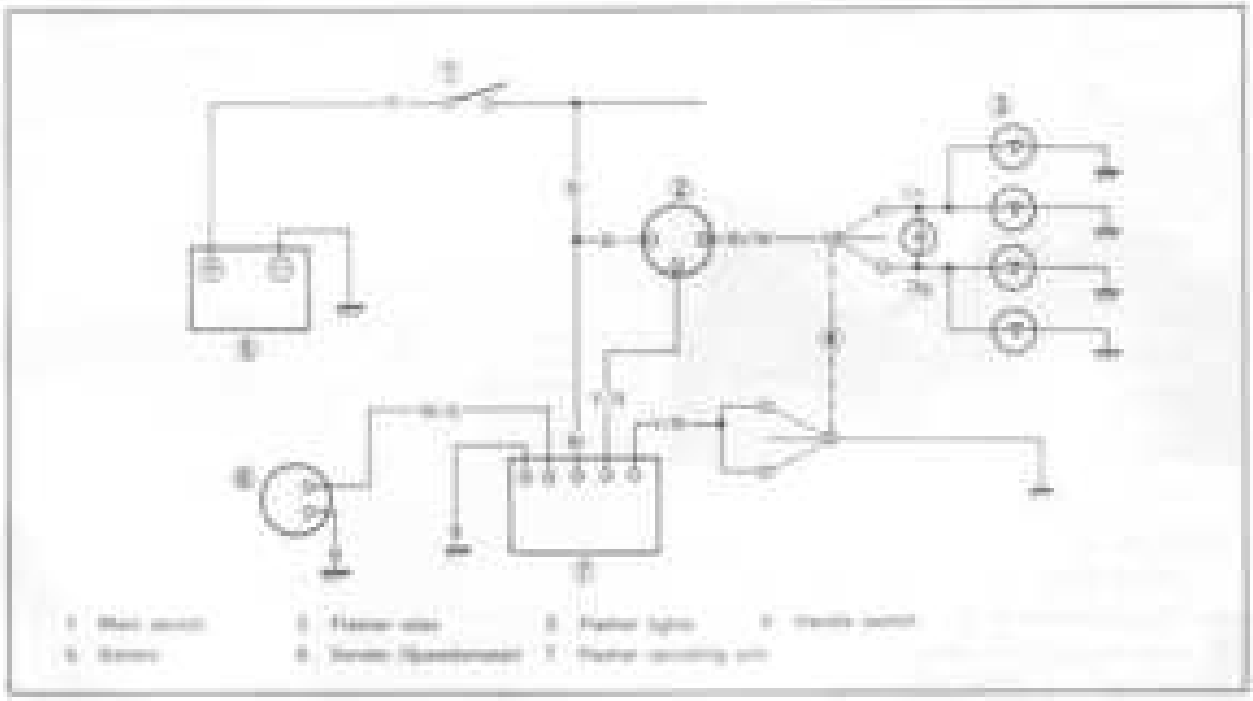
2. Operation

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

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

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

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



3. Inspection

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

1) Pull off the 6-p connector from the flasher canceling unit, and operate the handle switch.
   If the signal operates normally in L, R and OFF:

a) Flasher unit b) Bulb c) Lighting circuit d) Handle switch light circuit	are in good condition

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

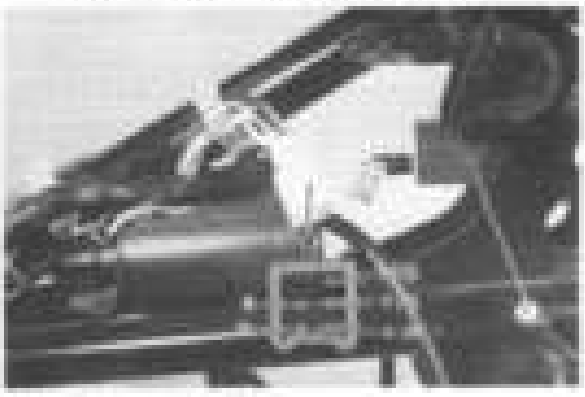
a) Flasher canceling unit
b) Handle switch reset circuit
c) Speedometer sensor circuit

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

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

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

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



1. Flasher canceling unit

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

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

4. Notes on handling

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

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

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

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

B Black
Br Brown
W/G White/Green
Y/R Yellow/Green
Y/R Yellow/Red

CHAPTER 7. APPENDICES

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Circuit diagram
Cable routing diagram

CHAPTER 7. APPENDICES

7-1. Troubleshooting guide

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

1. Will not start or difficult to start

a. Ignition system

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

b. Air/Fuel systems

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

c. Engine/Exhaust systems

Possible cause	Remedy
Incorrect compression pressure	1. If compression is too high, check for excessive carbon buildup 2. No compression or low compression, check: a. Cylinder head gasket b. Cylinder base gasket c. Piston, rings, cylinder
Poor bottom end compression	Check crankcase seals, left and right
Blocked exhaust system	1. Check muffler, spark arrester 2. Check exhaust port carbon formation 3. Check exhaust pipe for internal damage

2. Poor idle and/or low speed performance

a. Ignition system

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

b. Air/Fuel systems

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

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

3. Poor mid-range and high speed performance

a. Ignition systems

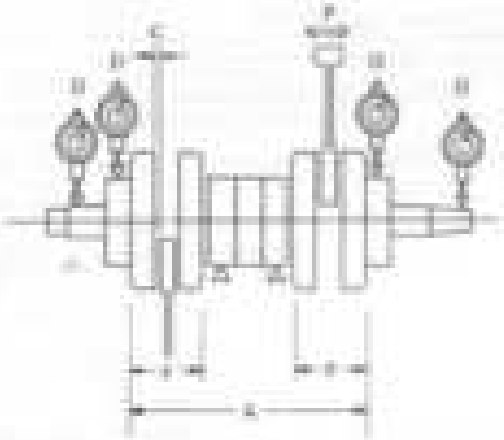
Possible cause	Remedy
Spark plug gap incorrect	Clean and gap or change spark plug if necessary
Ignition timing incorrect	Reset
Points set too close	Regap/ Reset timing

b. Air/Fuel systems

Possible cause	Remedy
Dirty air filter element	Clean
Carburetor float level incorrect	Measure and adjust if required
Incorrect main jet size	Remove jet and check size
Incorrect jet needle clip position	Check position of clip in needle
Cracked or leaking needs	Remove and repair as necessary
Carburetor not level	Level

7-2. SPECIFICATION

A. GENERAL	
1. MODEL	
1) Model (U.S.M. No.)	RD400C (1A1)
2) Frame I.D. and Starting Number	1A1-000101
3) Engine I.D. and Starting Number	1A1-000101
2. DIMENSION	
1) Overall Length	2,039 mm (80.1 in)
2) Overall Width (standard)	830 mm (32.7 in)
3) Overall Height (standard)	1,060 mm (42.9 in)
4) Seat Height	810 mm (31.9 in)
5) Wheelbase	1,315 mm (51.8 in)
6) Minimum Ground Clearance	155 mm (6.1 in)
3. WEIGHT	
1) Net Weight	156 kg (342 lb)
4. PERFORMANCE (For CA)	
* 1) Maximum Speed	160 km/h (99 mph) or more
2) Climbing Ability	28°
3) Minimum Turning Radius	2,310 mm (90.9 in)
* 4) 0 – 400 m Acceleration Time	14.0 sec
5) Braking Distance	14 m @50 km/h (46.0 ft @31 mph)
6) Fuel Consumption	32 km/liter @60 km/h (76 mi/gal @37 mph)
B. ENGINE	
1. DESCRIPTION	
1) Engine Type	Air cooled, 2-stroke, forward inclined, twin, torque induction system
2) Engine Model	1A1
3) Displacement	398 cc (24.29 cu.in)
4) Bore × Stroke	64 mm × 62 mm (2.520 in × 2.441 in)
5) Compression Ratio	6.2 : 1
6) Starting System	Primary kick starter
7) Ignition System	Battery ignition
8) Lubrication System	Separate lubricant (Yamaha Autolube)
2. CYLINDER HEAD	
1) Combustion Chamber Volume	38.3 ±0.4 cc (B-BES)
2) Combustion Chamber Type	Dome + Squish
3) Head Gasket Thickness	[illegible] (0.02 in)
4) Tightening Torque:	
Cylinder Head Nut (M8 P1.25)	1.9 ~ 2.1 m-kg (13.7 ~ 15.2 ft-lb)
Spark Plug (M14 P1.25)	1.9 ~ 2.5 m-kg (10.6 ~ 18.1 ft-lb)
3. CYLINDER	
1) Material	Aluminum alloy with cast iron sleeve
2) Bore Size	64 $^{+0.03}_{0}$ mm (2.52 $^{+0.0008}_{0}$ in)
3) Taper Limit	0.06 mm (0.002 in)
4) Out-of Round Limit	0.01 mm (0.0004 in)
4. PISTON	
1) Piston Skirt Clearance	0.030 ~ 0.035 mm (0.0012 ~ 0.0014 in)
2) Piston Over Size	64.25 mm, 64.50 mm, 64.75 mm, 65.00mm (2.530 in) (2.539 in) (2.549 in) (2.559 in)
3) Piston Pin Outside Diameter × Length	18 $^{0}_{-0.009}$ mm × 54 mm (0.83 $^{0}_{-0.0004}$ in × 2.13 in)
5. PISTON RING	
1) Piston Ring Design (Top)	Keystone ring (1.2 mm)
Piston Ring Design (2nd)	Plain ring (1.5 mm)

2) Ring End Gap (Installed) (Top) Ring End Gap (Installed) (2nd) 3) Ring Groove Side Clearance (Top) Ring Groove Side Clearance (2nd)	0.3 ~ 0.5 mm (0.012 ~ 0.020 in) 0.3 ~ 0.5 mm (0.012 ~ 0.020 in) ——— 0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in)
6. SMALL END BEARING 1) Type	Needle bearing
7. BIG END BEARING 1) Type	Needle bearing
8. CRANKSHAFT 1) Crankshaft Assembly Width (A) Crankshaft Assembly Width (F) 2) Crankshaft Deflection (D) 3) Connecting Rod Large End Side Clearance (C) 4) Connecting Rod Small End Deflection (P)	$154^{+0.05}_{-0.10}$ mm ($6.06^{+0.002}_{-0.004}$ in) $52^{0}_{-0.05}$ mm ($2.05^{0}_{-0.002}$ in) 0.05 mm (0.0020 in) 0.25 ~ 0.75 mm (0.010 ~ 0.030 in) 0.36 ~ 0.95 mm (0.014 ~ 0.039 in)
 5) Crank Pin Outside Diameter × Length 6) Crank Pin Type 7) Crank Bearing Type (Left) × Q'ty Crank Bearing Type (Center) × Q'ty Crank Bearing Type (Right) × Q'ty 8) Crank Oil Seal Type (Left) × Q'ty Crank Oil Seal Type (Center) × Q'ty Crank Oil Seal Type (Right) × Q'ty	ø32 × 61 mm (ø1.97 × 2.01 in) Hollow type 6305C3 special × 1 pc. 6206C3 special × 2 pcs. 6305C3 special × 1 pc. SW-20-40-10 special × 1 pc. Labyrinth seal × 1 pc. SW-40-62-10 special × 1 pc.
9. CLUTCH 1) Clutch Type 2) Clutch Operating Mechanism 3) Primary Reduction Ratio and Method 4) Primary Reduction Gear Back Lash Tolerance Primary Drive Gear Back Lash Number Primary Driven Gear Back Lash Number 5) Friction Plate – Thickness/Quantity – Wear Limit 6) Clutch Plate – Thickness/Quantity – Warp Limit 7) Clutch Spring – Free Length/Quantity – Minimum Length 8) Clutch Housing Axial Play (Wear Limit) 9) Push Rod Bending Limit 10) Oil Seal Type – Push Rod 11) Tightening Torque Primary Drive Gear Securing Nut (M16 P1.0) Clutch Boss Securing Nut (M18 P1.0) Clutch Spring Screw (M6 P1.0)	Wet, multiple disc type Inner push type, screw push system 66/23 (2.869), helical gear "3" ; 1.08 ~ 8, C ~ C, D ~ D: D (69, 68), C (67), B (66, 65) D (62, 63), C (64), B (65, 66) 3 mm (0.12 in) × 7 pcs. 2.7 mm (0.11 in) 1.2 mm (0.05 in) × 6 pcs. 0.05 mm (0.002 in) 38.4 mm (1.453 in) × 6 pcs. 35.4 mm (1.394 in) 0.07 ~ 0.14 mm (0.003 ~ 0.006 in) 0.2 mm (0.008 in) SDO-8.8-22-8 8.0 ~ 8.0 m-kg (58 ~ 58 ft-lb) 8.0 ~ 8.0 m-kg (58 ~ 58 ft-lb) 0.7 ~ 1.0 m-kg (5.1 ~ 7.2 ft-lb)

10. TRANSMISSION	
1) Type	Constant mesh, 6-speed forward
2) Gear Ratio 1st (Teeth) (Ratio)	36/14 2.571
2nd	32/18 1.777
3rd	29/22 1.318
4th	26/24 1.083
5th	25/26 0.961
6th	24/27 0.888
3) Transmission Gear Oil Quantity and Type	1,450 ~ 1,550 cc (Oil change) YAMALUBE-4 cycle 1,700 cc (Total)
4) Bearing Type – Main Axle (Left)	Needle bearing (ø30 – ø36 – 19)
– Main Axle (Right)	6205
– Drive Axle (Left)	6305N special
– Drive Axle (Right)	Needle bearing (ø20 – ø33 – 18)
5) Oil Seal Type – Drive Axle (Left)	0D-35-52-8
6) Secondary Reduction Ratio and Method	38/17 2.235 chain
7) Tightening Torque	
Drive Sprocket Securing Nut (M18 P1.0)	5 ~ 8 m-kg (36 ~ 58 ft-lb)
11. SHIFTING MECHANISM	
1) Type	Cam drum, return type
2) Oil Seal Type – Change Lever	8-12-22-5
3) Tightening Torque – Change Pedal (M8 P1.0)	0.8 ~ 1.3 m-kg (5.5 ~ 9.4 ft-lb)
12. KICK STARTER	
1) Type	Ratchet type
2) Oil Seal Type	0D-20-30-4B
3) Kick Clip Friction Tension	0.8 ~ 1.3 kg (1.8 ~ 2.9 lb)
4) Tightening Torque – Kick Crank (M8 P1.25)	2.0 ~ 2.5 m-kg (14.5 ~ 18.1 ft-lb)
13. CRANKCASE	
1) Tightening Torque (M8 P1.25)	1.8 ~ 2.1 m-kg (13.7 ~ 15.2 ft-lb)
(M6 P1.0)	0.8 ~ 1.1 m-kg (5.5 ~ 7.2 ft-lb)
14. INTAKE	
1) Air Cleaner – Type/Quantity	Dry paper filter/1 pc
2) Induction System	Torque Induction System
3) Reed Valve	
Type	"V" type
Bending Limit	0.3 mm (0.012 in) or less
Valve Lift	9 ±0.3 mm (0.35 ±0.012 in)
Tightening Torque	0.08 m-kg (0.6 ft-lb)
15. CARBURETOR	
1) Type and Manufacturer/Quantity	VM28SC MIKUNI/2 pcs
2) I.D. Mark	14100
3) Main Jet (M.J.)	#110
4) Air Jet (A.J.)	0.5
5) Jet Needle-clip Position (J.N.)	5LI-3
6) Needle Jet (N.J.)	P-2
7) Cutaway (C.A.)	2.5
8) Pilot Jet (P.J.)	#35
9) Air Screw (turns out) (A.S.)	1-1/2
10) Starter Jet (G.S.)	#70
11) Fuel Level (F.L.)	30 ±1 mm (1.18 ±0.04 in)
12) Float Height (F.H.)	23 ±2.5 mm (0.91 ±0.10 in)
13) Idling Engine Speed	1,100 ~ 1,300 rpm
16. LUBRICATION	
1) Autolube Pump – Color Code	Sky blue
2) Autolube Pump – Minimum Stroke	0.20 ~ 0.25 mm (0.008 ~ 0.010 in)
3) Autolube Pump – Maximum Stroke	2.05 ~ 2.27 mm (0.081 ~ 0.090 in)

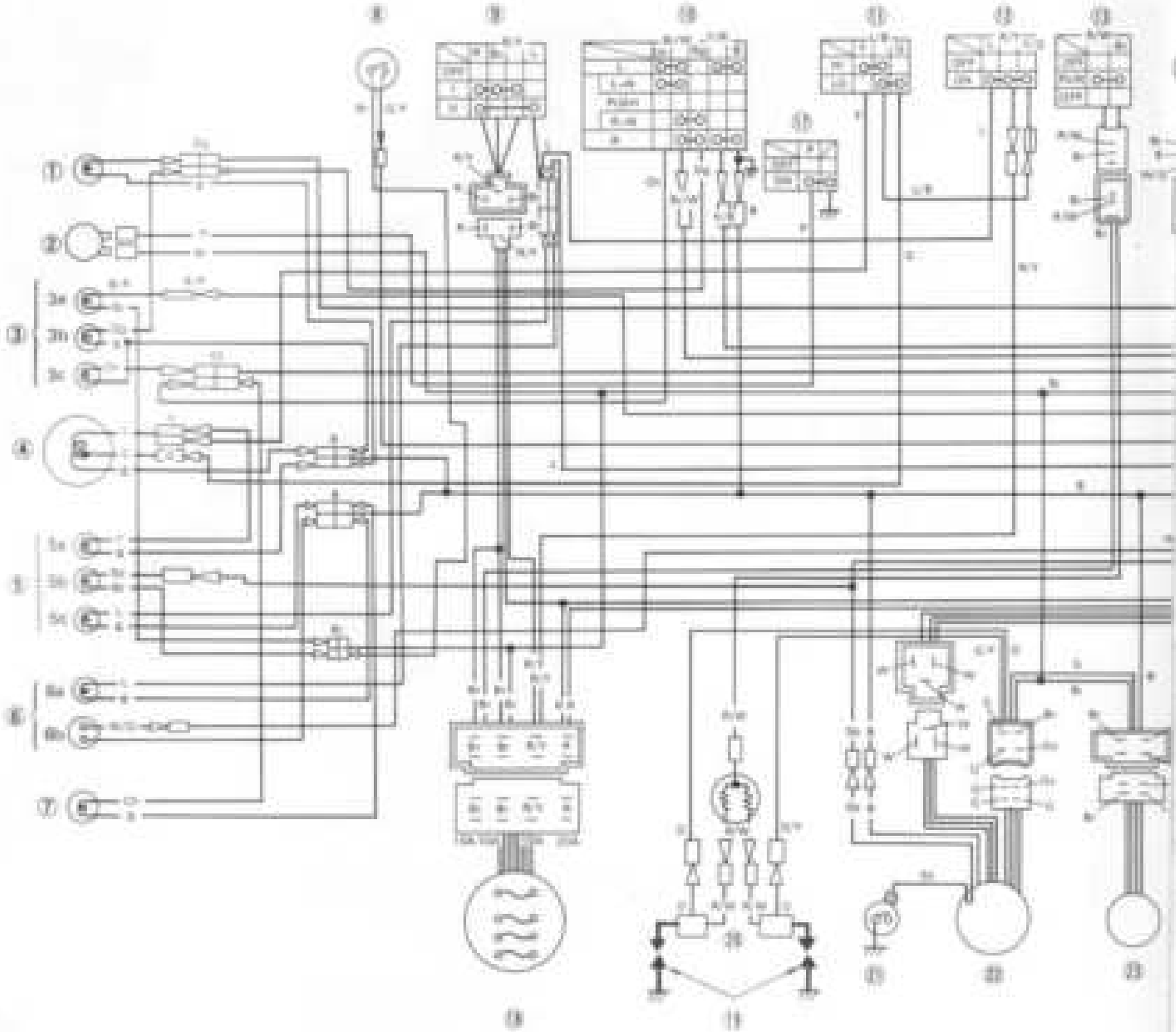
4) Autolube Pump – Reduction Ratio	21/33 × 55/1 = 50.2
5) Autolube Pump – Minimum Output/ 200 Strokes	0.5 – 0.6 cc
6) Autolube Pump – Maximum Output/ 200 Strokes	5.1 – 5.7 cc
7) Throttle Position (Adjusting Mark)	At full open (C)
8) Oil Tank Capacity	1.8 liter (1.9 US qt)
9) Oil Grade	YAMALUBE 2-cycle
C. CHASSIS	
1. FRAME	
1) Frame Design	Double cradle type, high tensil tube frame
2) Tightening Torque:	
Engine Mounting Bolt (M8 P1.25)	1.4 – 2.2 m·kg (10.1 – 15.9 ft·lb)
Engine Mounting Bolt (M10 P1.25)	2.7 – 3.4 m·kg (19.5 – 24.6 ft·lb)
2. STEERING SYSTEM	
1) Caster	62.5°
2) Trail	109 mm (4.33 in)
3) Number and Size of Balls in Steering Head:	
Upper Race	19 pcs., 1/4 in
Lower Race	19 pcs., 1/4 in
4) Tightening Torque:	
Steering Shaft Fitting Nut (M15 P1.5)	6.0 – 9.5 m·kg (43.4 – 68.7 ft·lb)
Stem Pinch Bolt (M8 P1.25)	1.4 – 2.2 m·kg (10.1 – 15.9 ft·lb)
Handlebar Mounting Bolt (M8 P1.25)	1.4 – 2.2 m·kg (10.1 – 15.9 ft·lb)
3. FRONT SUSPENSION	
1) Type	Telescopic fork
2) Damper Type	Oil damper, coil spring
3) Front Fork Cushion Travel	120 mm (4.72 in)
4) Front Fork Spring:	
Free Length	422.8 mm (16.6 in)
Wire Diameter × Winding Diameter	3.6 mm (0.15 in) × 24.5 mm (0.96 in)
Spring Constant	K_1 = 0.38 kg/mm (0 – 80 mm) K_2 = 0.7625 kg/mm (80 – 120 mm)
5) Inner Tube Outside Diameter	34 mm (1.34 in)
6) Oil Seal Type	9034-46-10.5
7) Front Fork Oil Quantity and Type	144 ±4 cc (4.87 oz) YAMAHA FORK OIL
8) Tightening Torque:	
Front Fork Cap Bolt	3.0 – 4.0 m·kg (22 – 29 ft·lb)
Under Bracket and Inner Tube	3.0 – 4.5 m·kg (22 – 33 ft·lb)
Handle Crown and Inner Tube	1.4 – 2.2 m·kg (10 – 16 ft·lb)
4. REAR SUSPENSION	
1) Type	Swing arm
2) Damper Type	Oil damper, coil spring
3) Rear Shock Absorber Travel	80 mm (3.15 in)
Set Length	322 mm (12.7 in)
4) Rear Shock Absorber Spring:	
Set Length	198 mm (7.82 in)
Free Length	220 mm (8.66 in)
Wire Diameter × Winding Diameter	6.5 mm (0.26 in) × 53.5 mm (2.11 in)
Spring constant	K_1 = 1.5 kg/mm (0 – 80 mm) K_2 = 2.175 kg/mm (80 – 90 mm)
5) Swing Arm Free Play (Limit)	1 mm (0.04 in)
6) Pivot Shaft – Outside Diameter	16 mm (0.63 in)
7) Tightening Torque:	
Rear Shock Absorber (Upper)	2.3 – 3.7 m·kg (16.6 – 26.8 ft·lb)
Rear Shock Absorber (Under)	2.3 – 3.7 m·kg (16.6 – 26.8 ft·lb)
Pivot Shaft	5.0 – 8.0 m·kg (36 – 58 ft·lb)

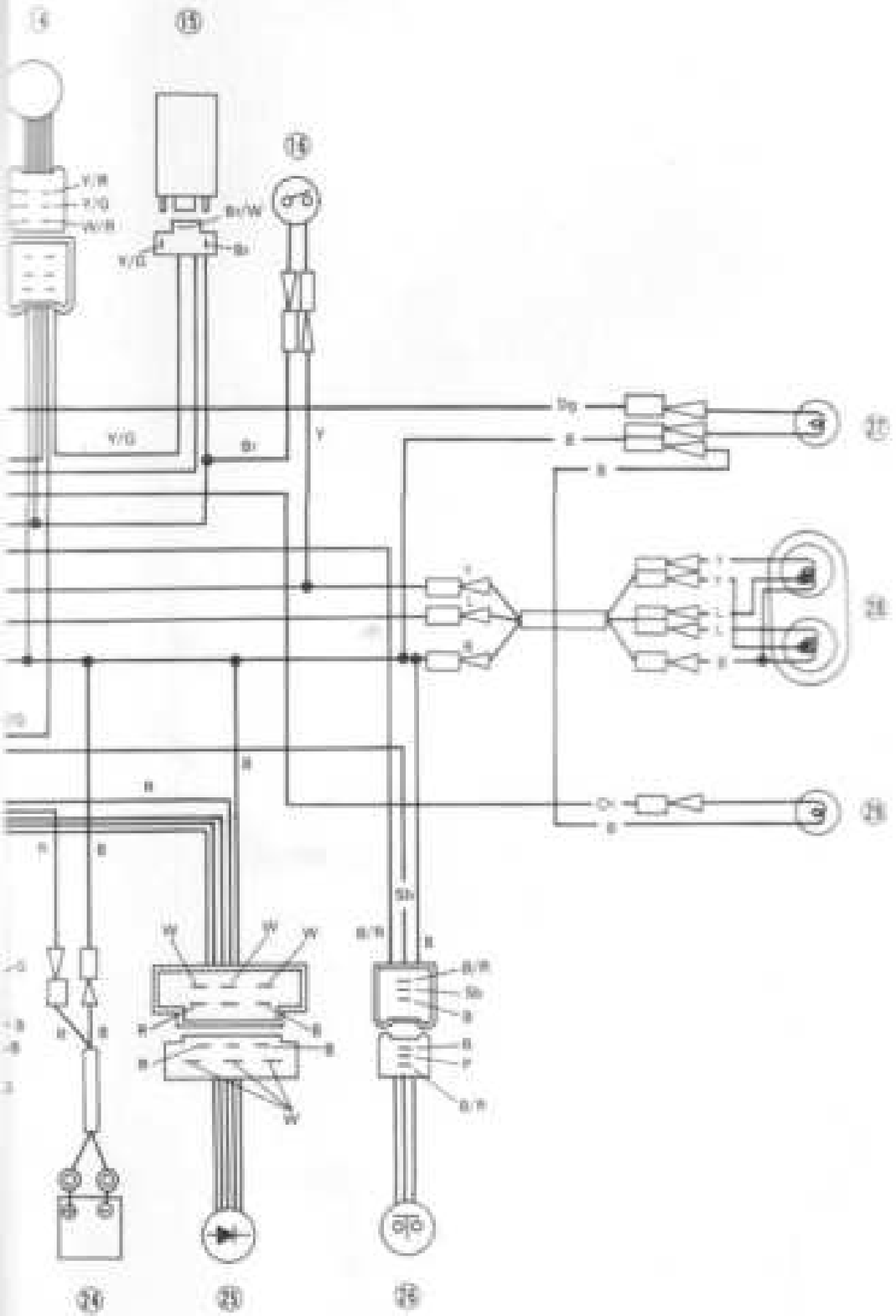
6. FUEL TANK	
1) Capacity	13 liter (3.4 US gal)
2) Fuel Grade	Regular gasoline (90 octane)
8. WHEEL	
1) Type (Front and Rear)	Aluminum cast wheel
2) Tire Size (Front)	[redacted] - 4PR
(Rear)	[redacted] - 4PR
3) Tire Pressure (Front)	[redacted] kg/cm² ([redacted] lb/in²)
(Normal riding)	
(Rear)	[redacted] kg/cm² ([redacted] lb/in²)
4) Rim Run Out Limit (Front/Rear)	
Vertical	2 mm (0.08 in)
Lateral	1 mm (0.04 in)
5) Bearing Type	
Front Wheel (Left)	6303ZZ/3A
Front Wheel (Right)	6303Z
Rear Wheel (Left)	6304ZZ/3A
Rear Wheel (Right)	6303Z
6) Oil Seal Type	
Front Wheel (Left)	SDO-49-56-8
Front Wheel (Right)	SD-28-47-7
Rear Wheel (Left)	SD-28-52-8
Rear Wheel (Right)	SD-28-47-7
7) Secondary Drive Chain Type	
Type	DID630S
Number of Links	[redacted]
Chain Pitch	15.875 mm (5/8 in)
Chain Free Play	20 ~ 30 mm (0.8 ~ 1.2 in)
8) Tightening Torque	
Front Wheel Axle	8.3 ~ 13 m-kg (60 ~ 94 ft-lb)
Front Axle Holder	1.1 ~ 1.8 m-kg (8.0 ~ 13.0 ft-lb)
Rear Wheel Axle	13 ~ 18 m-kg (97 ~ 130 ft-lb)
9. BRAKE	
1) Disc Brake (Front and Rear)	
Type	Hydraulic disc type
Disc Size (Outside Dia. × Thickness)	298 mm (11.7 in) × 7 mm (0.28 in)
Disc Wear Limit	6.5 mm (0.26 in)
Disc Pad Size	9.0 mm (0.35 in)
Pad Wear Limit	4.5 mm (0.18 in)
Master Cylinder Inside Dia. (Front/Rear)	19.879 mm (0.825 in)/ 14.0 mm (0.55 in)
Caliper Cylinder Inside Dia. (Front/Rear)	48 mm (2.13 in)
Brake Fluid Type	[redacted]
Tightening Torque	
Outer caliper and inner caliper	
Hexagon bolt (Front/Rear)	1.8 ~ 2.6 m-kg (13.1 ~ 18.8 ft-lb)
Bridge bolt (Front/Rear)	7.5 ~ 9.5 m-kg (54.2 ~ 68.7 ft-lb)
Caliper securing bolt and nut (Front/Rear)	4.0 ~ 5.0 m-kg (28.9 ~ 36.2 ft-lb)
Caliper and brake pipe (Front)	1.4 ~ 2.3 m-kg (10.1 ~ 16.6 ft-lb)
Caliper and brake hose (Rear)	3.0 ~ 4.8 m-kg (21.7 ~ 34.7 ft-lb)
Master cylinder and brake hose (Front/ Rear)	3.0 ~ 4.5 m-kg (21.7 ~ 34.7 ft-lb)
Brake hose and pipe (Front)	1.4 ~ 2.3 m-kg (10.1 ~ 16.6 ft-lb)
Disc mounting bolt (Front/Rear)	1.7 ~ 2.3 m-kg (12.3 ~ 16.6 ft-lb)
D. ELECTRICAL	
1. IGNITION SYSTEM	
1) Battery (AC Generator)	
Model/Manufacturer	A2310Y/MITSUBISHI
Voltage	12V

Rotor Coil Thread Size	M7 P1.0
Tightening Torque (Rotor)	1.5 ~ 2.5 m-kg (10.8 ~ 18.1 ft-lb)
Tightening Torque (Stator)	0.7 ~ 1.0 m-kg (5.1 ~ 7.2 ft-lb)
2) Ignition Timing: mm (B.T.D.C.)	[redacted] 0.08 ±0.006 in)
3) Ignition Coil	
Model/Manufacturer	CM11-83/HITACHI (or F-FW)
Spark Gap	6 mm or more/500 rpm
Primary Winding Resistance	1.4Ω ±10% at 20°C
Secondary Winding Resistance	8.8kΩ ±20% at 20°C
4) Spark Plug	
Type/Quantity	[redacted] 2 pcs.
Spark Plug Gap	0.6 ~ 0.7 mm (0.02 ~ 0.03 in)
5) Resistor	
Resistance	1.8Ω
6) Contact Breaker	
Manufacture/Quantity	MITSUBISHI/2 pcs.
Point Gap	0.30 ~ 0.40 mm (0.012 ~ 0.016 in)
Point Spring Pressure	700 ±50 g
7) Condenser	
Capacity	0.22μF
Insulation Resistance	5MΩ (500V megger used)
Q'ty	2 pcs.
2. CHARGING SYSTEM	
1) AC Generator	
Charing Output	14V, 0A/950 rpm or less
	14V 16A or more/2,000 rpm
	14V 20A or more/5,000 rpm
Rotor Coil Resistance	6.5Ω ±18%/20°C
(Field coil)	
Stator coil Resistance	0.48Ω ±10%/20°C
(Armature coil)	
Brush Size/Q'ty	11 mm (0.43 in)/2 pcs.
Brush Wear Limit	8 mm (0.24 in)
Brush Spring Pressure	540 g ±15%
2) Rectifier	
Type	6-element type (Full wave)
Model/Manufacturer	D810T6Y-L/MITSUBISHI or
	DE3804/STANLEY
Capacity	12A
Withstand Voltage	400V
3) Regulator	
Type	I.C. regulator
Model/Manufacture	RFT12M$_2$/MITSUBISHI
Regulating Voltage	14.5 ±0.3V
4) Battery	
Model/Manufacture/Q'ty	ATT2-12/7.8 or YUASA/1 pc.
Capacity	12V, 8.8A
Charging Rate	0.88A 10 hours
Specific Gravity	1.28/20°C
3. LIGHTING SYSTEM	
1) Head Light Type	Sealed beam
2) Bulb Wattage/Q'ty	
Head Light Wattage	12V, 40W/30W × 1 pc.
Tail/Stoplight Wattage	12V, 8W/27W × 2 pcs.
Flasher Light Wattage	12V, 27W × 4 pcs.
Flasher Pilot Light Wattage	12V, 3.4W × 2 pcs.
Meter Light Wattage	12V, 3.4W × 6 pcs.
High Beam Indicator Light Wattage	12V, 3.4W × 1 pc.

Neutral Light Wattage	12V, 3.4W × 1 pc.
Oil Level Indicator Light Wattage	12V, 3.4W × 1 pc.
3) Horn	
Model/Manufacturer	CF3-12/90EKD
Maximum Amperage	3.5A
4) Flasher Relay	
Type	Condenser type
Model/Manufacturer	081300-4810/NIPPON DENSO
Flasher frequency	89 cycl/min.
Capacity	27W × 2 = 3.4W
5) Flasher Canceling Unit	
Model	0YH-AC618
Voltage	DC 8V — 16V
6) Fuse	
Rating/Q'ty	MAIN (Red) 20A
	HEAD L (Red/Yellow) 10A
	SIGNAL (Brown) 10A
	IGNITION (Red/White) 10A
4. MISCELLANEOUS	
1) Oil Lever Switch	
Manufacturer	STANLEY
Stroke	8.0 mm

RD400C CIRCUIT DIAGRAM

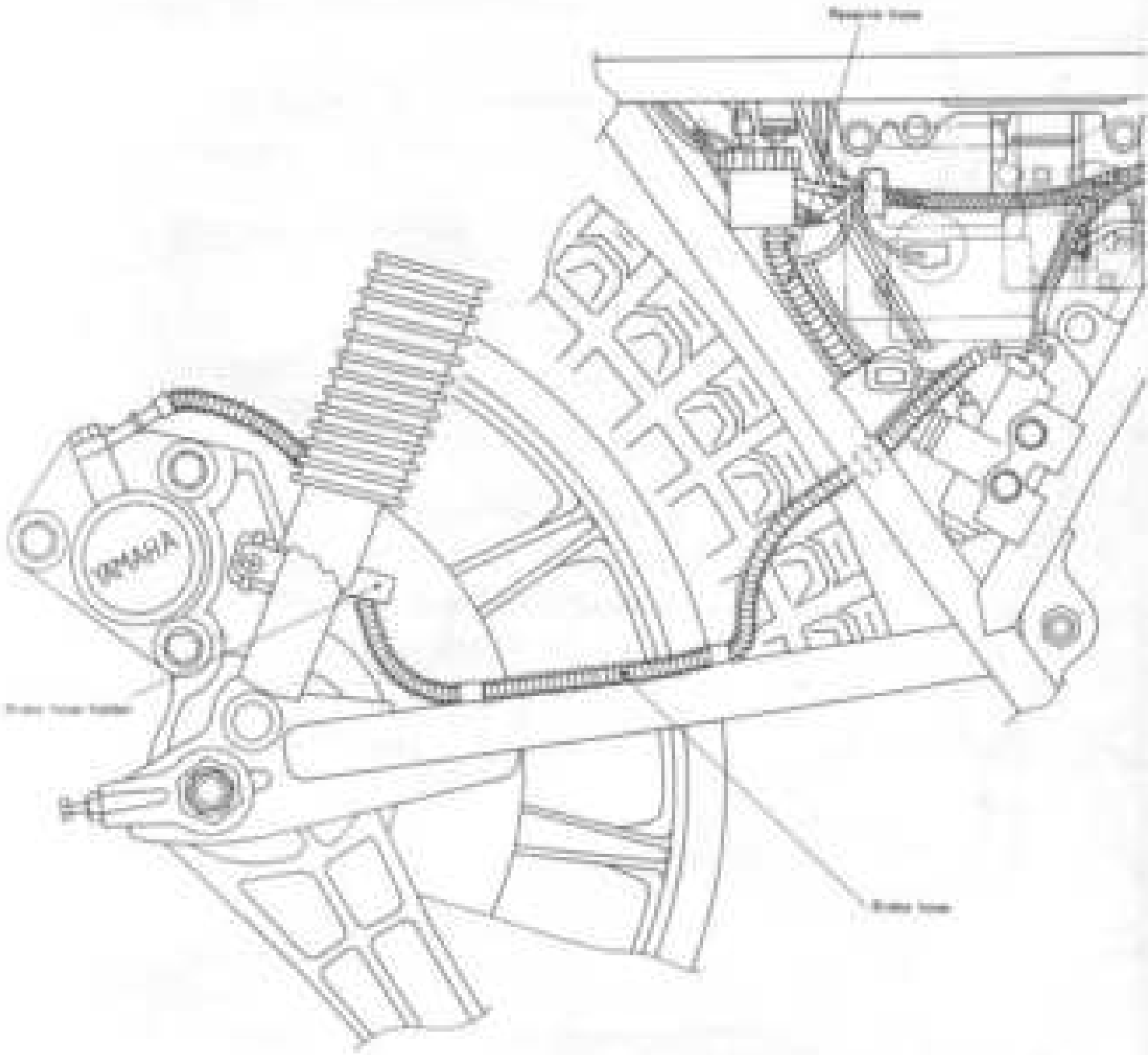


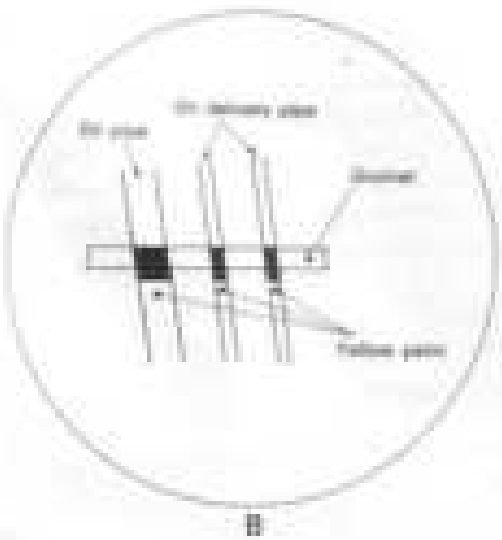


1. Front flasher light (R)
2. Horn
3. Pilot lamp
3a. Oil
3b. Flasher (R)
3c. Flasher (L)
4. Headlight
5. Tachometer
5a. Highbeam
5b. Neutral
5c. Lighting (+ 2)
6. Speedometer
6a. Lighting (+ 2)
6b. Sender
7. Front flasher light (L)
8. Front stop switch
9. Main switch
10. Flasher switch
11. Dimmer switch
12. Light switch
13. Engine stop switch
14. Canceling unit
15. Flasher relay
16. Rear stop switch
17. Horn button
18. Fuse box
19. Spark plug
20. Ignition coil
21. Neutral switch
22. AC generator
23. Regulator
24. Battery
25. Rectifier
26. Oil level switch
27. Rear flasher light (R)
28. Tail/Stoplight
29. Rear flasher light (L)

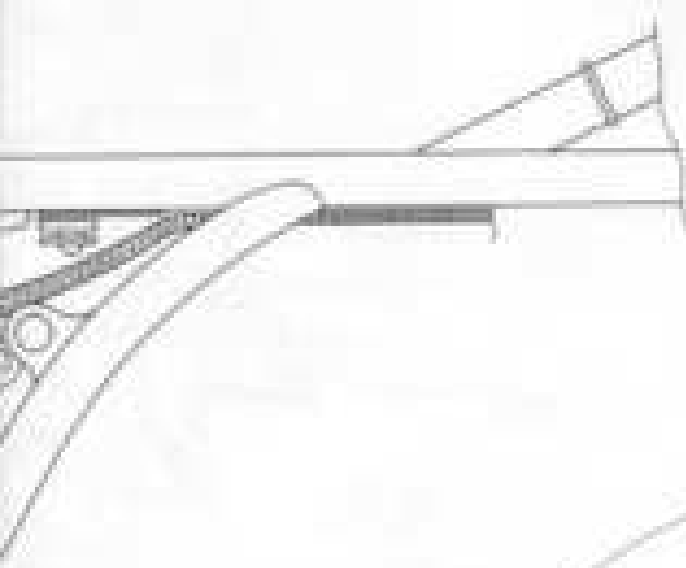
Color cord

R	Red
Br	Brown
L	Blue
Dg	Dark green
B	Black
P	Pink
Y	Yellow
G	Green
Ch	Dark brown (Chocolate)
Sb	Sky blue
O	Orange
Gy	Grey
W	White
R/Y	Red/Yellow
G/Y	Green/Yellow
B/R	Black/Red
W/G	White/Green
R/W	Red/White
Br/W	Brown/White
Y/G	Yellow/Green
W/R	White/Red
Y/G	Yellow/Red
L/B	Blue/Black



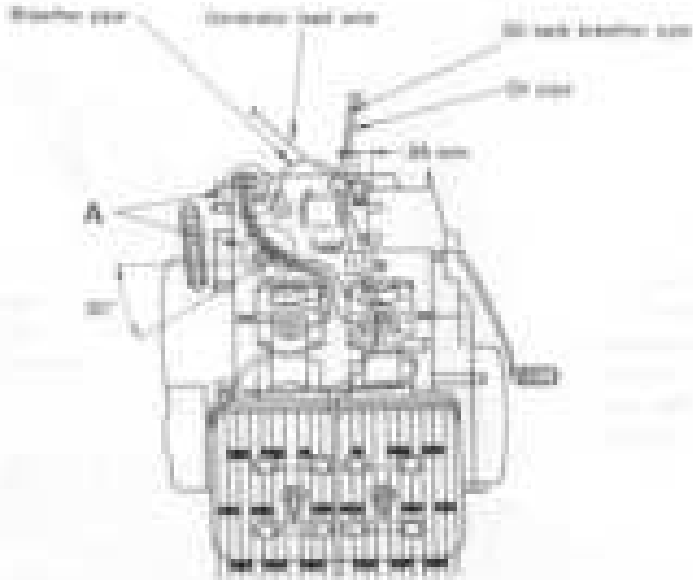

B


B

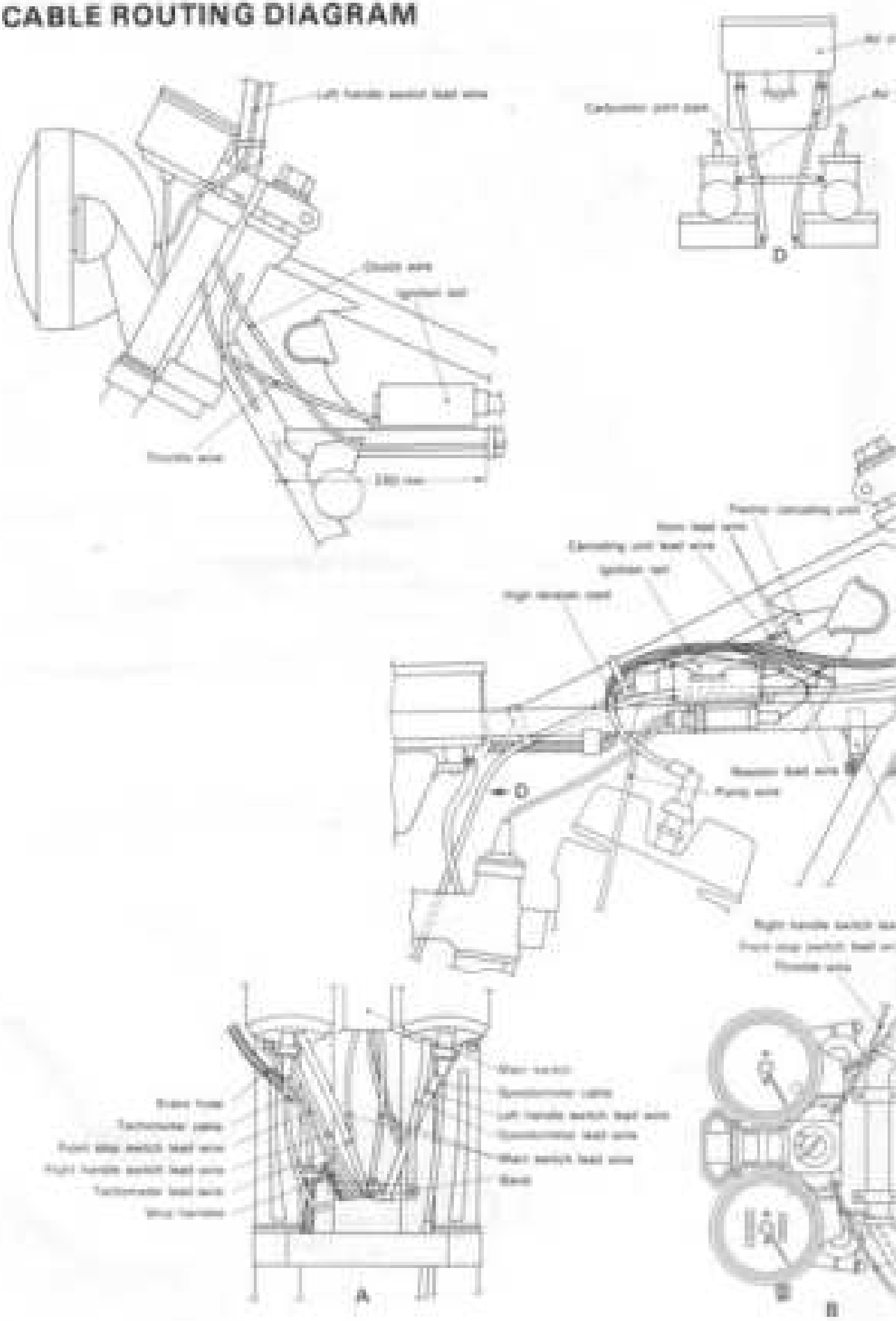


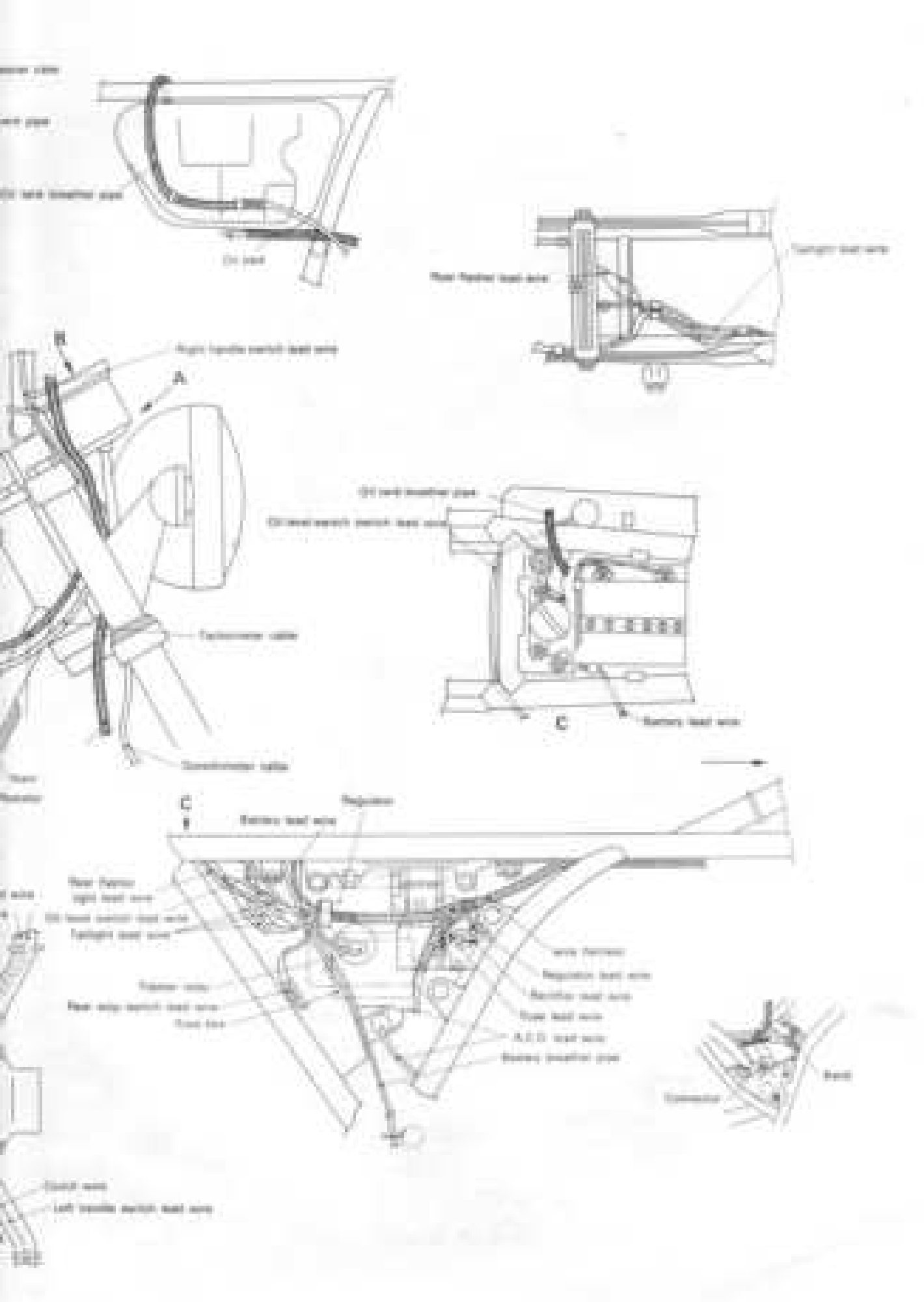


A



CABLE ROUTING DIAGRAM





YAMAHA MOTOR CO., LTD.

IWATA, JAPAN

LIT-11616-00-02