YAMAHA

SR185H

Service Manual

LIT-11616-02-22

5H0-28197-10

SR185H
SERVICE MANUAL
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NOTICE

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

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

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

This Service Manual contains information regarding periodic maintenance to the emission control system for the SR185H. Please read this material carefully.

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

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

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

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

SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR CO., LTD

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CHAPTER 1.
GENERAL INFORMATION

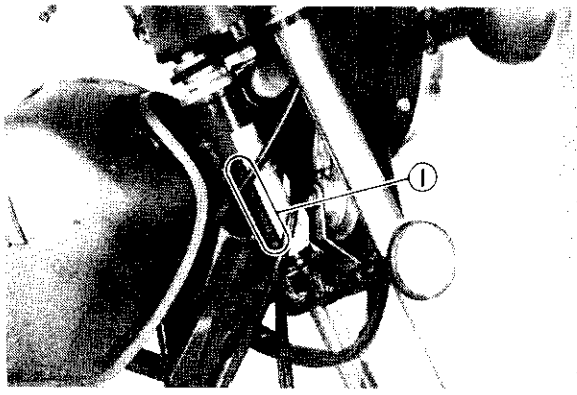
MOTORCYCLE IDENTIFICATION

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

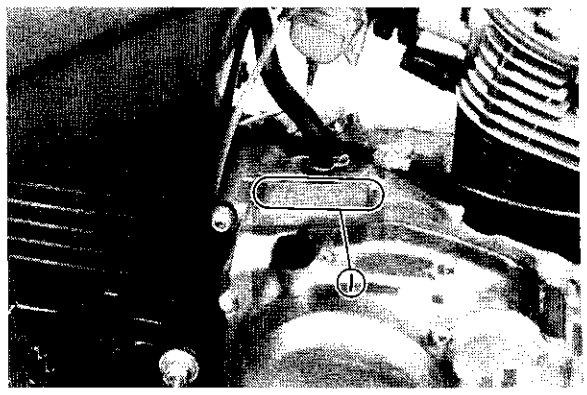
The engine serial number is located on a raised boss on the upper rear, right-hand side of the engine. Engine identification follows the same code as frame identification.

Starting Serial Number

SR185H	5H0-000101



1. Frame serial number



1. Engine serial number

LOCATION OF THE "CAUTION AND SPECIFICATION LABELS"

VEHICLE EMISSION
CONTROL INFORMATION LABEL

VEHICLE EMISSION CONTROL INFORMATION

ENGINE FAMILY: BYA018541A5 DISPALCEMENT: 185cc

VEHICLE MODEL: SR185

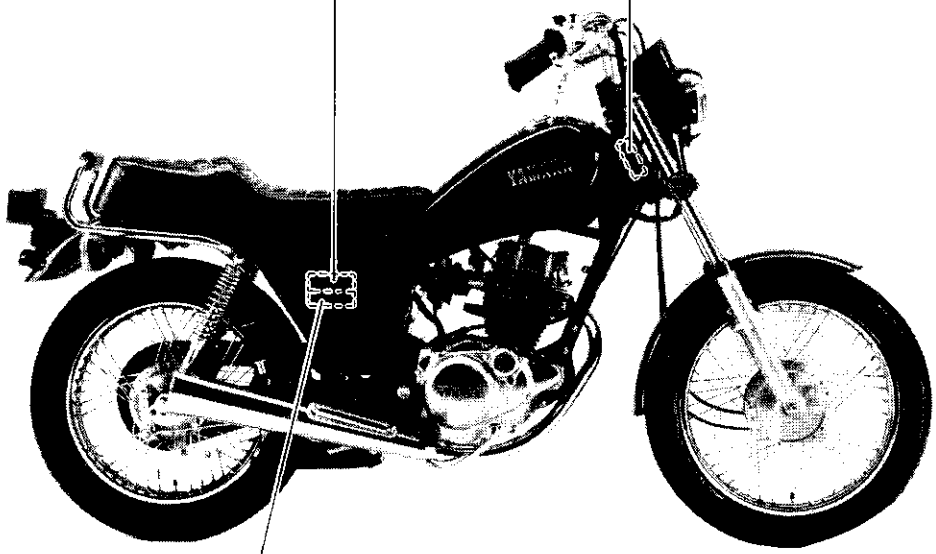
IDEL SPEED (RPM: TRANSMISSION IN NEUTRAL) 1200
IGNITION TIMING: (°BTDC AT IDLE SPEED) 9°
GASOLINE GRADE: REGULAR (LEADED)
RESEARCH OCTANE: 91 MIN.
ENGINE OIL: SAE 20W/40 TYPE "SE"

THIS VEHICLE CONFORMS TO U.S. EPA REGULATION APPLICABLE TO 1981 MODEL YEAR NEW MOTORCYCLES.

YAMAHA MOTOR CO., LTD.

SC PLATE

MFD. BY YAMAHA MOTOR CO., LTD GVWR 590 LBS.
GAWR FRONT—185LBS. WITH 3.00—17(B) TIRE, 17 × 1.60 RIM, AT 25 PSI COLD. REAR-425 LBS. WITH 3.50-16(B) TIRE,
THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.
VEHICLE ID NO.
TYPE CLASSIFICATION....MOTORCYCLE.



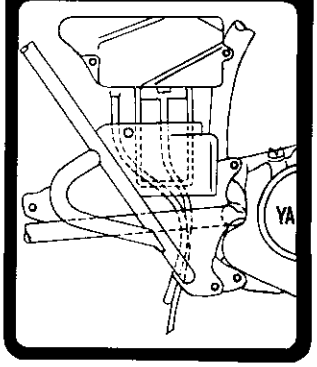
BATTERY CAUTION LABEL

CAUTION

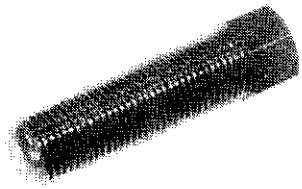
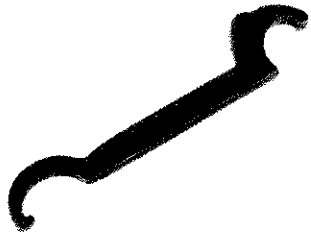
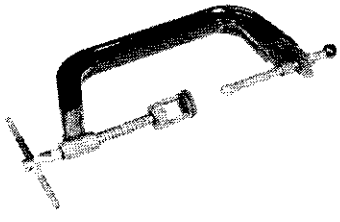
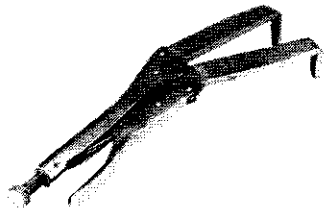
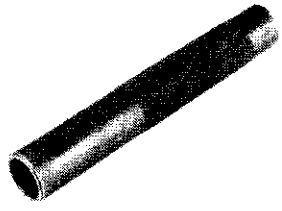
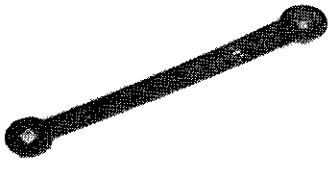
(BATTERY REMOVAL AND INSTALLATION)

1. Be careful not to splash the electrolyte to the drive chain.
2. Remove the breather pipe before demounting the battery.
3. After installing the battery, be sure to connect the breather pipe into place.

How to lay out
Battery breather pipe



SPECIAL TOOLS

		
L-type wrench P/No. 90890-05245	Rotor puller P/No. 90890-01080	Hand reamer (6 mm, 0.236 in) P/No. 90890-04066
		
Shock puller P/No. 90890-01290	Shock puller weight P/No. 90890-01291	Ring nut wrench P/No. 90890-01268
		
Valve spring compressor P/No. 90890-04019	Clutch hub holder P/No. TLM-90910-42-00	Valve guide installer P/No. 90890-04065
		
Valve adjusting tool P/No. TLM-11080-35-01	Valve guide remover P/No. 90890-04064	

TESTERS AND GAUGES

1. Micro meter
2. Vernier cariper
3. Ignition timing tester
4. Dial gauge

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PERIODIC INSPECTIONS AND ADJUSTMENTS

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CHAPTER 2.
PERIODIC INSPECTIONS AND ADJUSTMENTS

MAINTENANCE AND LUBRICATION CHART

Introduction

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

Maintenance Intervals Charts

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

Periodic Maintenance Emission Control System

No.	Item	Remarks	Initial break-in		Thereafter every	
			1,000 km (600 mi) or 1 month	4,000 km (2,500 mi) or 7 months	3,000 km (2,000 mi) or 6 months	6,000 km (4,000 mi) or 12 months
1*	Cam chain	Check and adjust chain tension.	O	O	O	
2*	Valve clearance	Check and adjust valve clearance when engine is cold.	O	O	O	
3	Spark plug	Check condition. Adjust gap/clean. Replace after initial 7,000 km (4,500 mi).		O	O	Replace
4*	Crankcase ventilation system	Check ventilation hose for cracks or damage. Replace if necessary.		O		O
5*	Fuel line	Check fuel hose for cracks or damage. Replace if necessary.		O		O
6*	Exhaust system	Check for leakage. Retighten as necessary. Replace gasket if necessary.		O	O	
7*	Idle speed	Check and adjust engine idle speed. Adjust cable free play if necessary.		O	O	

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

No.	Item	Remarks	Type	Initial break-in			Thereafter every	
				1,000 km (600 mi) or 1 month	4,000 km (2,500 mi) or 7 months	3,000 km (2,000 mi) or 6 months	6,000 km (4,000 mi) or 12 months	15,000 km (9,500 mi) or 24 months
1	Engine oil	Warm-up engine before draining.	Yamalube 4-cycle oil or SAE 20W/40 type "SE" motor oil	○	○		○	
2	Oil filter/ Oil strainer	Replace filter element and clean oil strainer.	–	○	○		○	
3*	Air filter	Wet-type filter must be washed and damped with oil.	Yamalube 2-cycle oil or SAE 10W/30 motor oil	○	○	○		
4*	Brake system	Adjust free play. Replace shoes if necessary.	–	○	○	○		
5*	Clutch	Adjust free play.	–	○	○	○		
6	Drive chain	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W/30 motor oil	Check chain tension and lube every 500 km (300 mi)				
7	Control and meter cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W/30 motor oil	○	○	○		
8	Brake pedal shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		
9	Brake/clutch lever pivot shafts	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		
10	Center stand pilot	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		
11*	Front fork oil	Drain completely. Refill to specification.	Yamaha fork oil 10Wt or equivalent					○
12*	Steering ball bearing and races	Check bearings assembly for looseness. Moderately repack every 15,000 km (9,500 mi).	Medium weight wheel bearing grease		○	○		Repack
13*	Wheel bearings	Check bearings for smooth rotation. Replace if necessary.	–		○	○		
14	Battery	Check specific gravity. Check breather pipe for proper operation.	–		○	○		

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

NOTE:

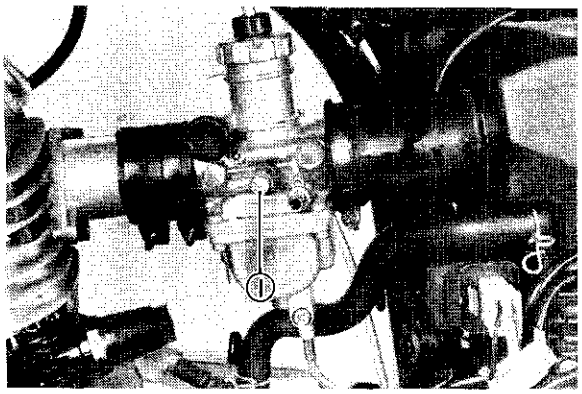
The air filter should be cleaned more often than specified intervals if the motorcycle is operated in extremely dusty area.

ENGINE

Carburetor

1. Idle speed
   Start the engine and warm it up for a few minutes. Set the engine idle speed to specified r/min. by turning the throttle stop screw in or out.
   Use a tachometer for checking and adjusting the engine speed.

Idle speed: 1,200 r/min

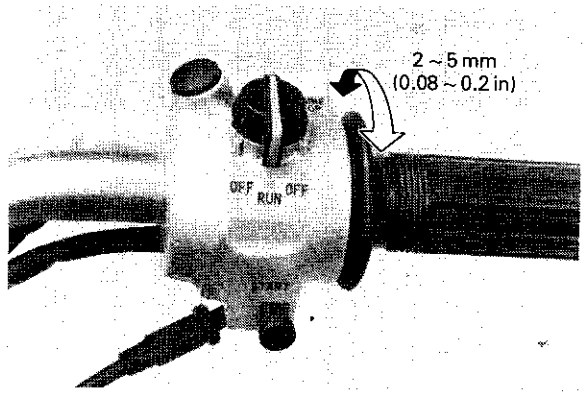


1. Throttle stop screw

2. Idle mixture
   The idle mixture is set at the factory by the use of special equipment. Not attempt should be made by the dealer to change this adjustment.
3. Throttle cable adjustment.

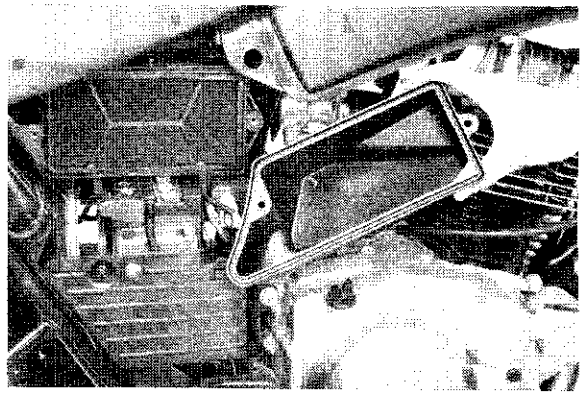
NOTE:
Idle speed should be set before making this adjustment.

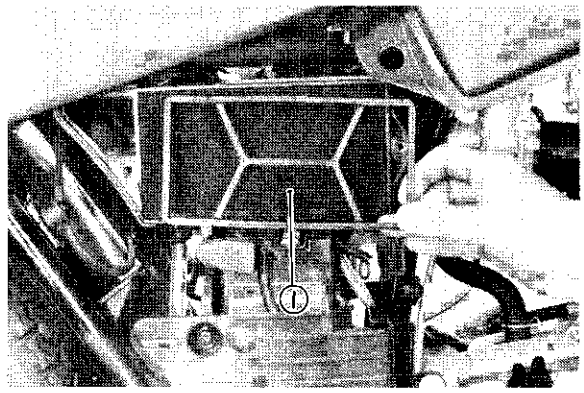
The throttle grip should have a play of 2 ~ 5 mm (0.08 ~ 0.2 in) in the turning direction at the grip flange.
Loosen the adjuster lock nut on the throttle cable, and turn the adjuster in or out so the play is correct. After the adjustment, tighten the lock nut.



Air Filter

1. Remove the side cover (right).
2. Clean the element with solvent. After cleaning, remove the remaining solvent by squeezing the element.





1. Air filter element

3. Then apply Yamalube 2-cycle oil to the entire surface and squeeze out the excess oil.

   The air filter element should be cleaned at the specified intervals. It should be cleaned more often if the motorcycle is operated in dustry or wet areas.

CAUTION:

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

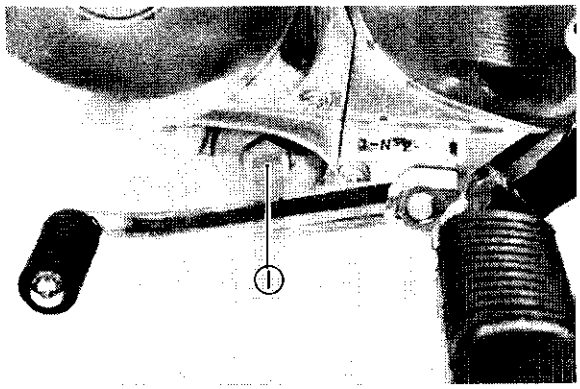
Engine Oil and Oil Filter Replacement

1. Oil filter replacement

NOTE:

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

a. Start the engine. After a few minutes of warm-up stop the engine.
b. Place an oil pan under the engine.

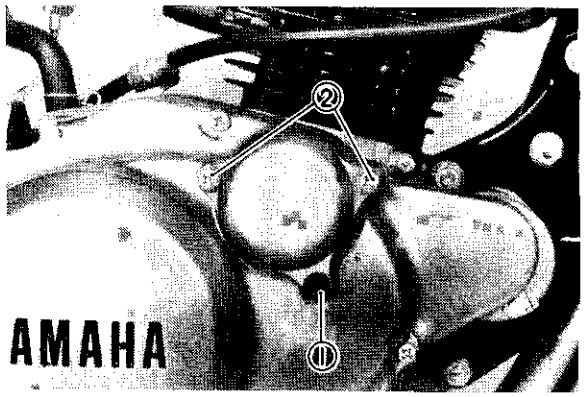


1. Drain plug

c. Remove the oil filler cap, drain plug and drain screw attached to the oil filter cover, and drain the engine oil.

NOTE:

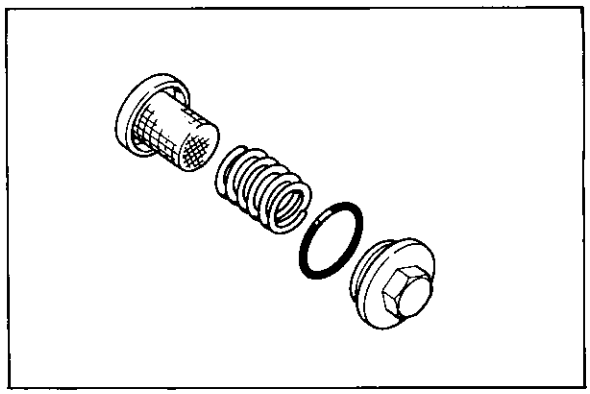
The oil filter cover is secured by three screws. The lower one should be loosened until the threaded portion comes out completely.



1. Drain screw 2. Filter cover screw

CAUTION:

When removing the drain plug, the compression spring, oil strainer and O-ring will fall off. Take care not to lose these parts.



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

CAUTION:

Before reinstalling the drain plug, do not forget to fit the O-ring, compression spring and oil strainer.

Drain plug torque:
4.3 Nm (0.43 m-kg, 3.11 ft-lb)
Oil quantity: 1.0L (0.22 Imp gal, 0.26 US gal)
Oil grade: SAE 20W/40 "SE" motor oil or Yamalube 4-cycle

e. Start the engine and allow a few minutes of running. While running check for oil leakage. If oil leaks, stop the engine immediately, and check for the cause.

2. Regular oil replacement (without replacing filter)
   a. Start the engine and stop after a few minutes of warm-up.
   b. Place an oil receiver under the engine.
   c. Remove the oil filler cap, drain plug and drain screw attached to the oil filter cover.

NOTE:

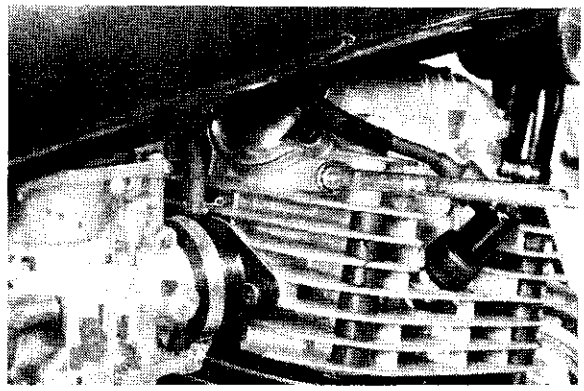
The oil filter cover is secured by three screws. The lower one should be removed so that the filter cavity will drain.

   d. Check each O-ring. If damaged replace.
   e. Install the drain bolt and the drain screw.

CAUTION:

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

1. **Place an oil pan under the engine.**
2. **Remove the drain screw from oil filter cover, and loosen the check bolt in the cylinder head.**
3. **Start the engine and keep it idle running till oil flows out of the bleed hole, and at the check bolt (see the following photo).**
   If no oil comes out even after a lapse of over one minute, cut the engine immediately for fear of seizure.
   Restart the engine after solving the problem(s) and recheck the oil pressure.

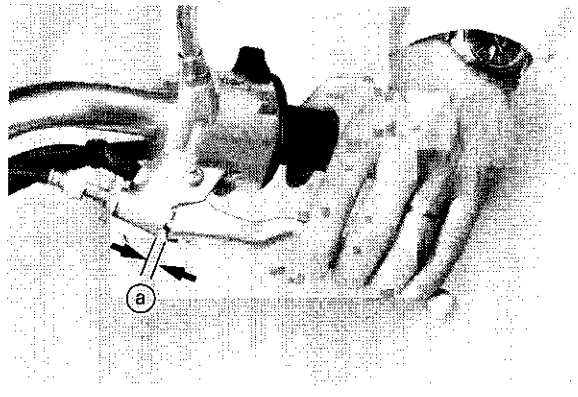


Clutch Adjustment

This model has two clutch cable length adjusters and a clutch mechanism adjuster. Cable length adjusters are used to take up slack from cable stretch and to provide sufficient free play for proper clutch operation. The clutch mechanism adjuster is used to provide the correct push lever angle. Normally, once the mechanism is properly adjusted, the only adjustment required is maintenance of free play at the clutch handlebar lever.

Free Play Adjustment

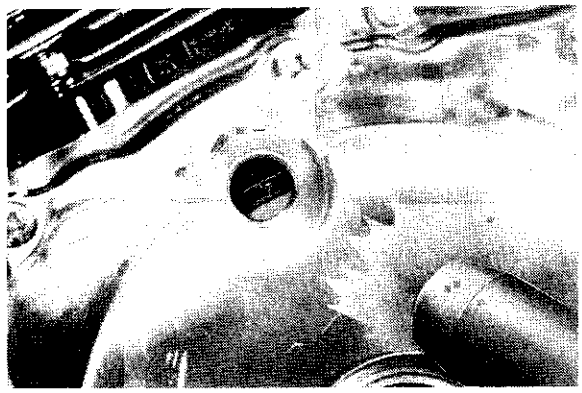
Loosen the handlebar lever adjuster lock nut. Next, turn the length adjuster either in or out until proper lever free play is achieved.



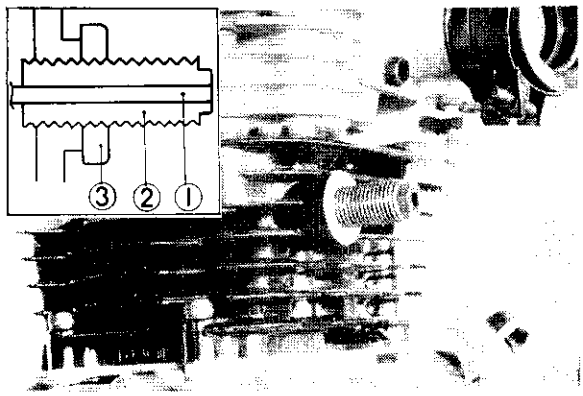
a = 2 ~ 3 mm
(0.08 ~ 0.12 in)

Cam Chain Adjustment

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



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



1. Push rod 2. Tensioner 3. Lock nut

NOTE:

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

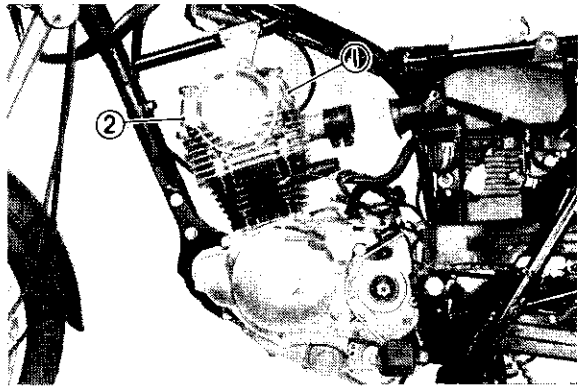
6. Tighten the tensioner lock nut.
7. Install the tensioner cap and the caps on the left crankcase cover.

Adjuster lock nut tightening torque: 30 Nm (3.0 m-kg, 22 ft-lb)

Adjuster cap tightening torque: 5 Nm (0.5 m-kg, 3.6 ft-lb)

Valve Clearance Adjustment

1. Remove the seat.
2. Turn the fuel petcock to "OFF" and disconnect the fuel pipe, remove the fuel tank.
3. Remove intake and exhaust tappet covers and caps on the left crankcase cover.



1. Intake tappet cover 2. Exhaust tappet cover

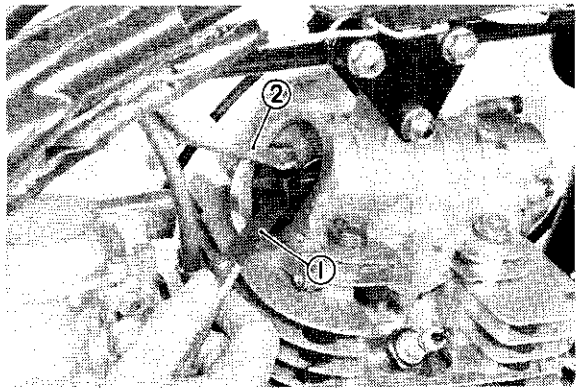
4. Align the "T" mark on the flywheel with the timing mark on the crankcase.
   This places the piston at the top dead center and the valve clearance should be checked and adjusted at T.D.C. on the compression stroke by observing when the valve adjusters have clearance.

Intake valve (Cold):
0.03 ~ 0.07 mm (0.001 ~ 0.003 in)
Exhaust valve (Cold):
0.11 ~ 0.15 mm (0.004 ~ 0.006 in)

Recheck the clearance after tightening the valve adjuster lock nut.

NOTE:

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

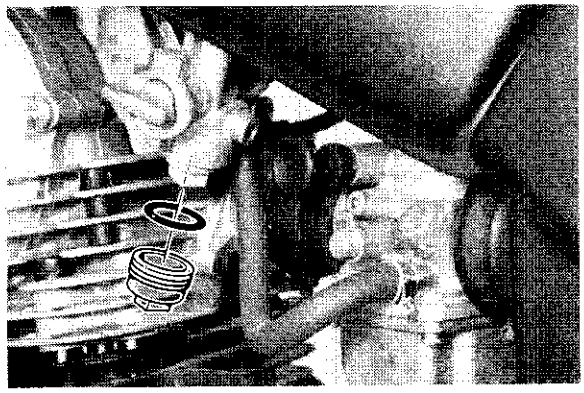


1. Feeler gauge
2. Valve adjusting tool

CHASSIS

Fuel cock

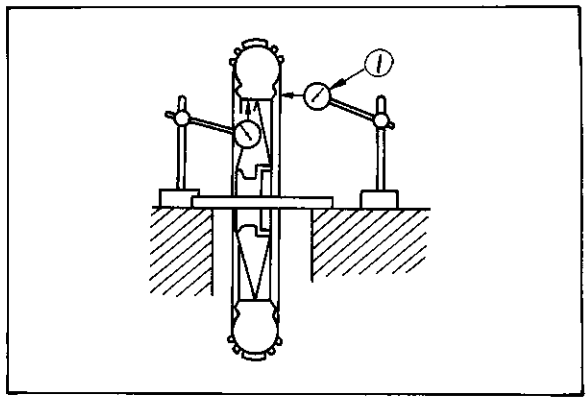
Clean the attached filter with solvent. Examine the filter and replace if damaged.
Inspect the gasket, replace if damaged and install the outlet fitting.



Spoke Adjustment

Raise the wheel off the ground.
Spin wheel.
Check rim run out as shown in illustration.

Rim runout limits:
Vertical: 2.0 mm (0.08 in)
Lateral: 2.0 mm (0.08 in)



1. Dial gauge

Rear Brake Adjustment

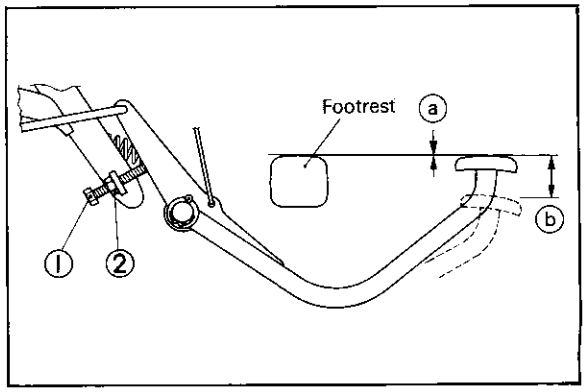
1. Pedal height
   By turning the adjuster bolt, adjust the brake pedal position so that its top end is approx. leveled with the footrest top end.

WARNING:

After adjusting the pedal height, the brake pedal free play should be adjusted.

2. Free play
   Turn the adjuster on the brake rod.

Pedal free play: 20 ~ 30 mm (0.8 ~ 1.2 in)

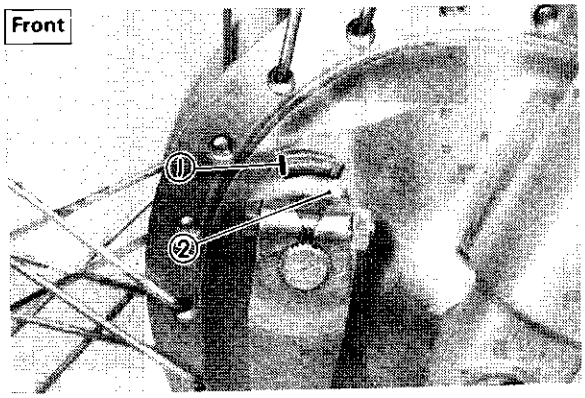


1. Adjuster bolt (For pedal height)
2. Lock nut

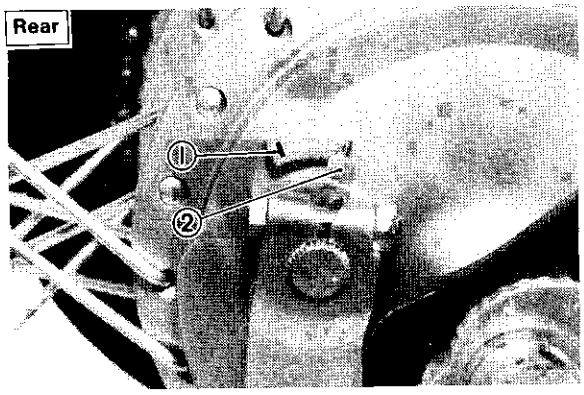
a. 0 mm (0 in)
b. 20 ~ 30 mm (0.8 ~ 1.2 in)

Brake Lining Inspection

To check, see the wear indicator position while depressing the brake pedal or pulling the brake lever. If the indicator reaches to the wear limit line to replace the shoes.



1. Wear limit 2. Wear indicator



1. Wear limit 2. Wear indicator

Drive Chain Tension Check

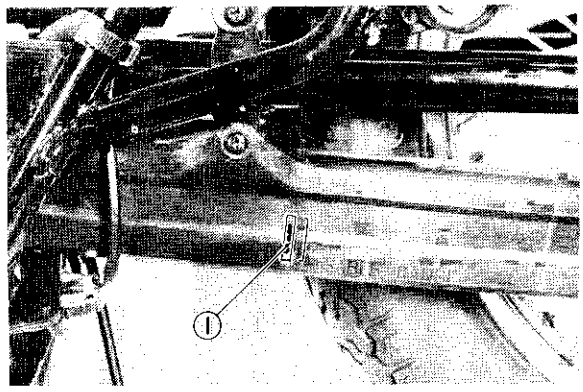
The chain tension should be checked at through the inspection window in the chain case by the following procedure.

1. Place the motorcycle on the center stand.
2. With the motorcycle in neutral gear, slightly rotate the rear wheel clockwise facing the inspection window to allow the lower chain to be slack in the window.
3. For the correct tension, the full chain link circle can be seen somewhere in the "USABLE RANGE" as embossed on the chain case.

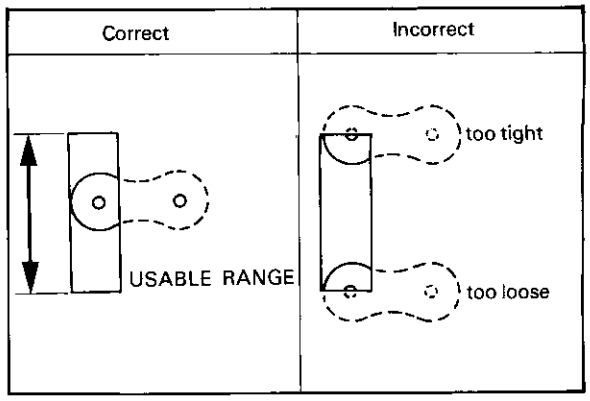
NOTE:

Check the chain link circle position horizontally through the inspection window while leaving the chain intact.

4. If any portion of the top or bottom of the chain link circle is hidden, adjust the chain.

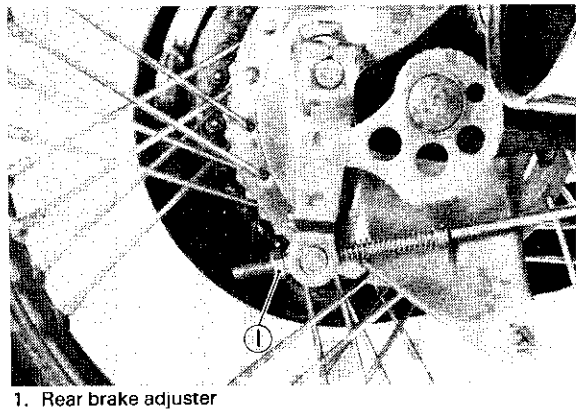


1. Inspection window



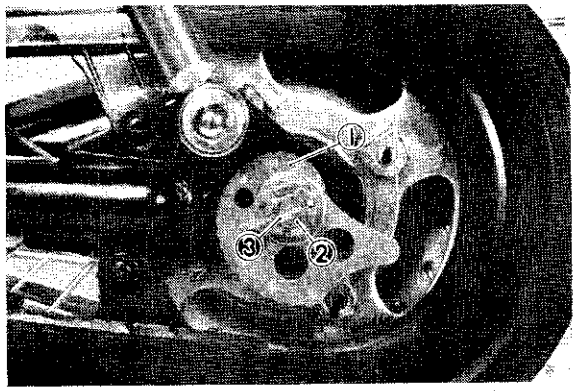
Drive chain tension adjustment

1. Loosen the rear brake adjuster.



1. Rear brake adjuster

2. Remove the cotter pin of the rear wheel axle nut with pliers.
3. Loosen the rear wheel axle nut.
4. Turn the chain puller both left and right until axle is situated in the same puller slot position on each side.

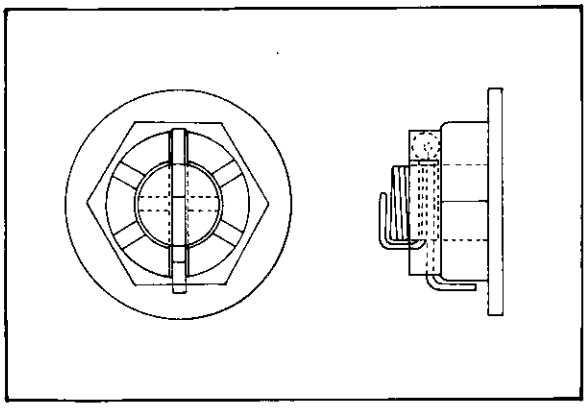


1. Chain puller 2. Axle nut 3. Cotter pin

5. Tighten the rear axle nut.

Axle nut torque:
65 Nm (6.5 m kg, 47.0 ft lb)

6. Insert the new cotter pin into the rear wheel axle nut and bend the end of the cotter pin as shown in the illustration (if the nut notch and the cotter pin hole do not match, tighten the nut slightly to match).
7. In the final step, adjust the play in the brake pedal.



CAUTION:

Excessive chain tension will overload the engine and other vital parts; keep the tension within the specified limits. Also, replace the rear axle cotter pin with a new one.

Drive Chain Lubrication

1. First, remove dirt and mud from the chain with a brush or cloth and then spray the lubricant between both rows of side plates and on all center rollers.
2. To clean the entire chain, first remove the chain from the motorcycle, dip it in solvent and clean out as possible. Then take the chain out of the solvent and dry it. Immediately, lubricate the chain to prevent the formation of rust.

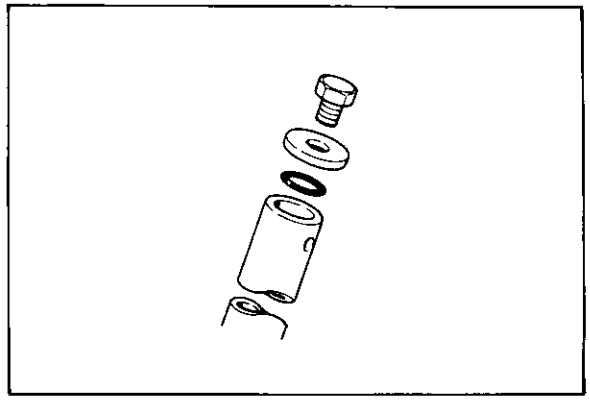
Recommended lubricant:
Yamaha chain and cable lube or
SAE 10W/30 motor oil

Front Fork Oil Change

WARNING:

Securely support the motorcycle so there is no danger of it falling over.

1. Remove the front wheel, front fender.
2. Pull out the fork leg.
3. Hold the top of spacer and plate to prevent falling down, keep the fork leg upside down and drain the oil.



4. Pour the specified amount of oil into the fork inner tube.

Recommended oil:
Yamaha fork oil 10Wt or equivalent

Quantity per leg:
184 cm^3 (6.49 Imp oz, 6.22 US oz)

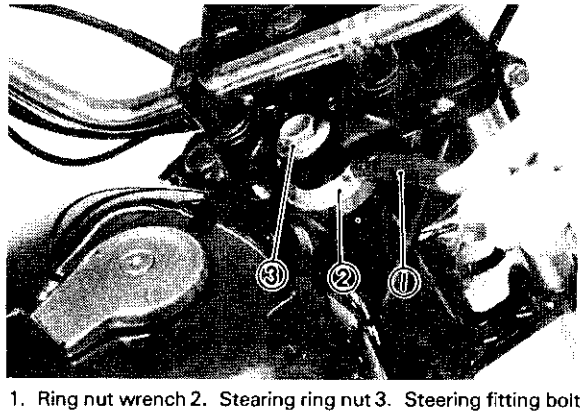
Front axle nut:
45 Nm (4.5 m-kg, 32.5 ft-lb)
Under bracket bolt:
32 Nm (3.2 m-kg, 23.0 ft-lb)
Front fender bolt:
20 Nm (2.0 m-kg, 14.5 ft-lb)
Inner tube cap bolt:
45 Nm (4.5 m-kg, 32.5 ft-lb)

Suspension, Steering and Swing Arm

1. Steering head adjustment
   a. Block the motorcycle up so that front wheel is off the ground.
   b. Grasp the bottom of the forks and gently rock fork assembly backward and forward, checking for any looseness in the steering assembly bearing.
   c. If the steering head needs adjustment, remove the handlebar cover and loosen the steering fitting bolt.
   d. Using the ring nut wrench, adjust the steering ring nut until steering head is tight without binding when the forks are turned.

NOTE:

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



1. Ring nut wrench 2. Stearing ring nut 3. Steering fitting bolt

NOTE:

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

2. Suspension
   a. Check the all suspension components for proper operation.
   b. Check the all suspension fittings for proper tightness.
3. Swing arm
   a. Check for freedom of up and down movement.
   b. Check side to side freeplay.

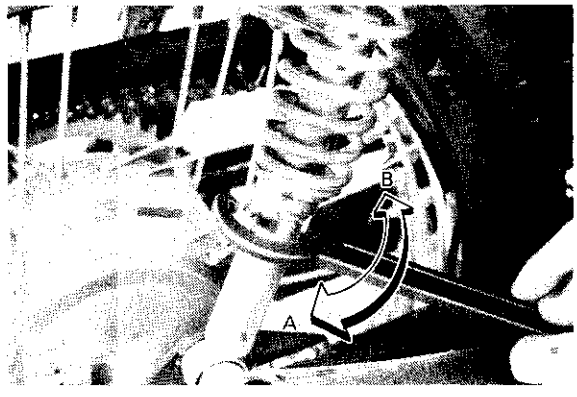
Swing arm free play:
1.0 mm (0.04 in) at end of swing arm

   c. Check the securing bolts for proper tightness.

Rear Shock Absorber

WARNING:

Always adjust the shock absorbers on each side to the same position.
Uneven adjustment can cause poor handling and loss of stability.



A. Stiffer B. Softer

Cable Inspection and Lubrication

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

Recommended lubricant:
Yamaha chain and cable lube or
SAE 10W/30 motor oil

Throttle Cables and Grip Lubrication

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

Lubrication of Levers, Pedals, etc.

1. Lubricate the pivoting parts of the brake and clutch levers with recommended lubricant.

Recommended lubricant:
Yamaha chain and cable lube or
SAE 10W/30 motor oil

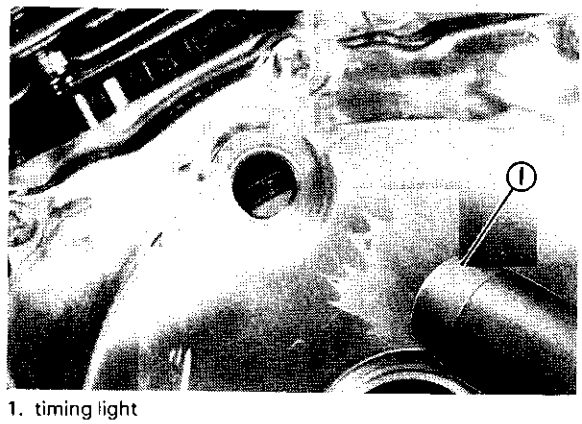
2. Lubricate the shaft of the brake pedal with lithium soap grease.

ELECTRICAL

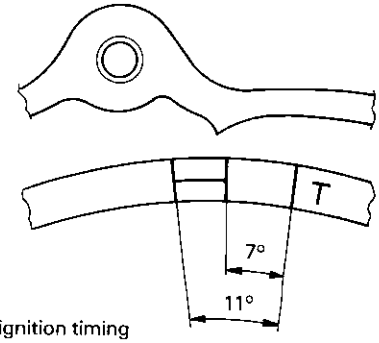
Ignition Timing

1. Checking the ignition timing
   Ignition timing is checked with a timing light by observing the position of the mark on the case and the marks on the rotor.
   a. Remove the caps on the crankcase cover (L).
   b. Connect the timing light to the spark plug lead wire.
   c. Start the engine and keep it running at the specified speed.
   d. The index projection on the crankcase must be between the two marks for firing on the rotor.
   If not, refer to Chapter 6 "Ignition System".

Specified idling speed: 1,200 r/min



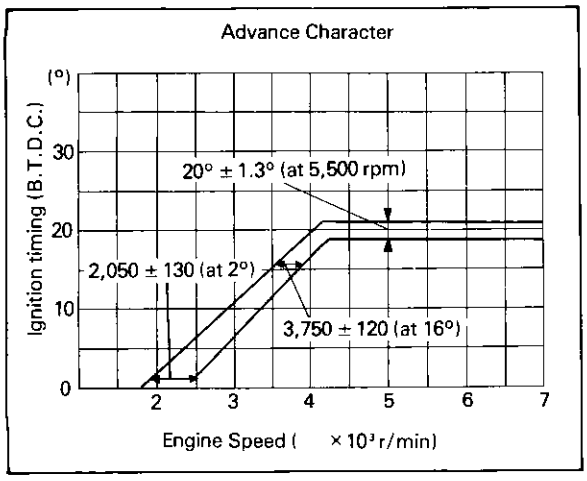
1. timing light



Basic ignition timing
9° degrees B.T.D.C.
at 1,200 r/min

NOTE:

Ignition timing is not adjustable.

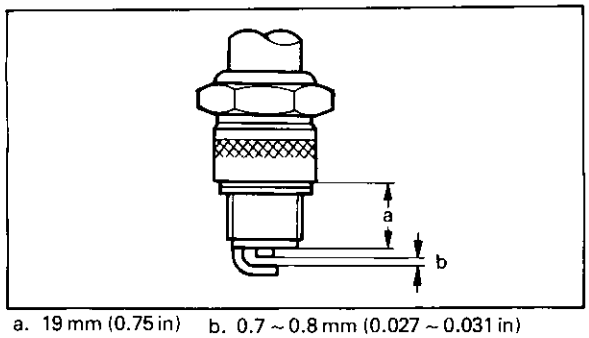


Spark plug

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 plug with new ones of the specified type. It is actually economical to install new plug often since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

1. The spark plug should be inspected and cleaned at the specified intervals.
2. Clean the electrodes of carbon and adjust the electrode gap to the specification.
3. Be sure to use the proper reach, type and electrode gap plug as a replacement to avoid overheating, fouling or piston damage.

Type: D7EA (NGK)
Electrode gap:
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
Tightening torque:
18 Nm (1.8 m-kg, 13.0 ft-lb)



a. 19 mm (0.75 in) b. 0.7 ~ 0.8 mm (0.027 ~ 0.031 in)

CHAPTER 3. ENGINE OVERHAUL

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CHAPTER 3.
ENGINE OVERHAUL

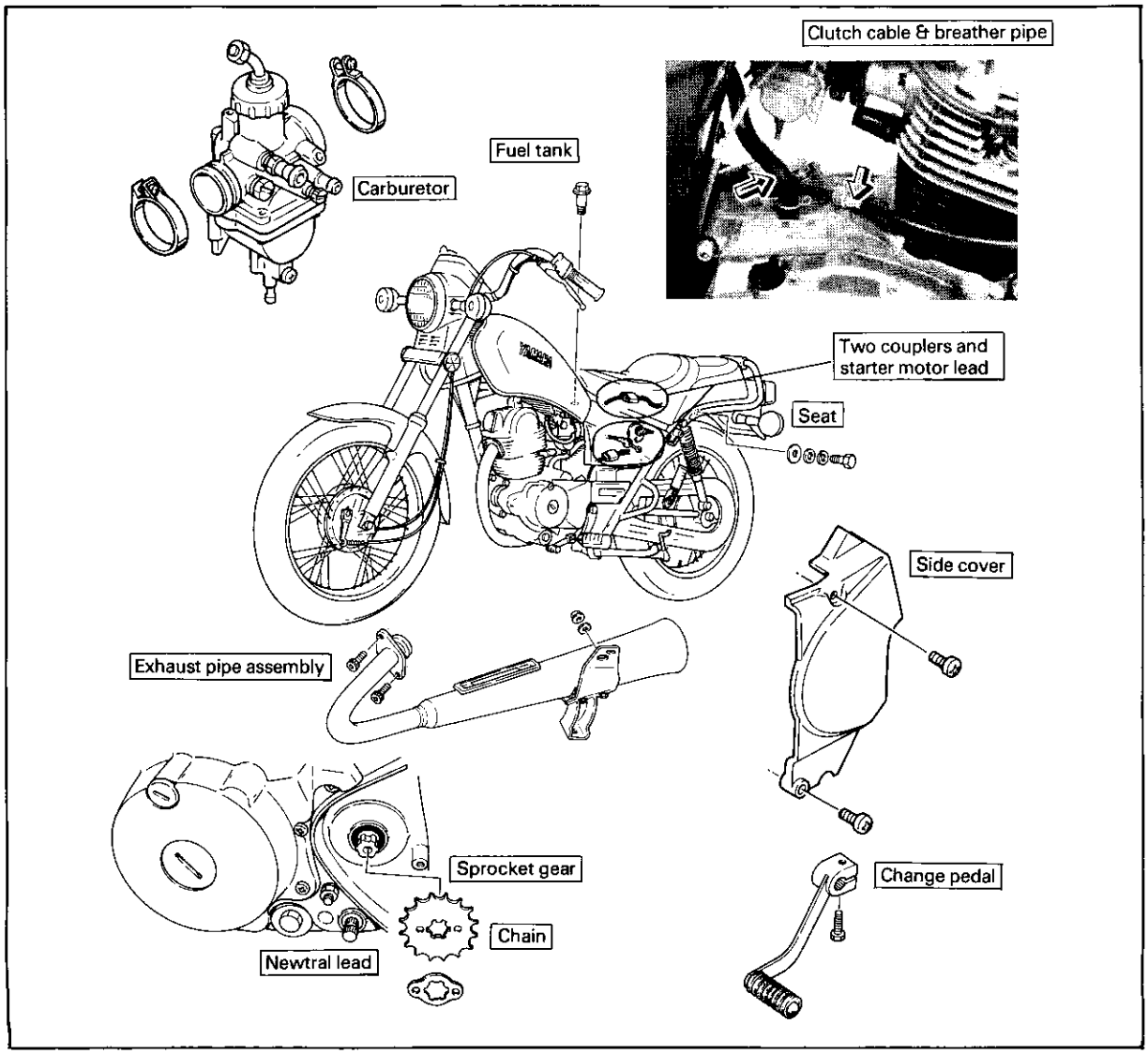
REMOVAL

Preparation for Removal

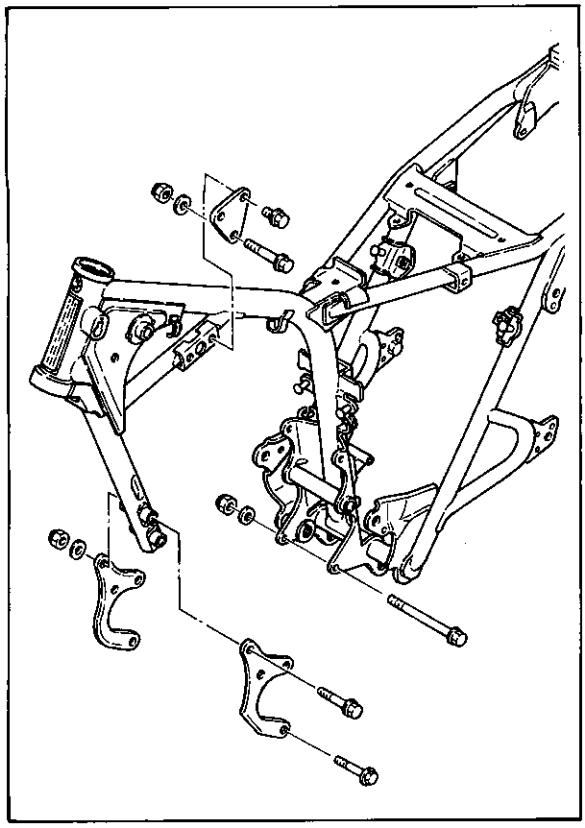
1. All dirt, mud, dust and foreign material should be thoroughly removed from the exterior of the before removal and disassembly. This will prevent any harmful foreign material from entering the interior of engine assembly.
2. Before engine removal and disassembly, be sure you have proper tools and cleaning equipment so you can perform a clean and efficient job.
3. During disassembly of the engine, clean and place all parts in trays in order of disassembly. This will ease and speed assembly time and insure correct reinstallation of all engine parts.
4. Start the engine and warm it for a few minutes; turn off the drain plug and drain engine oil.

Engine removal

1. Remove all of parts listed below illustration.



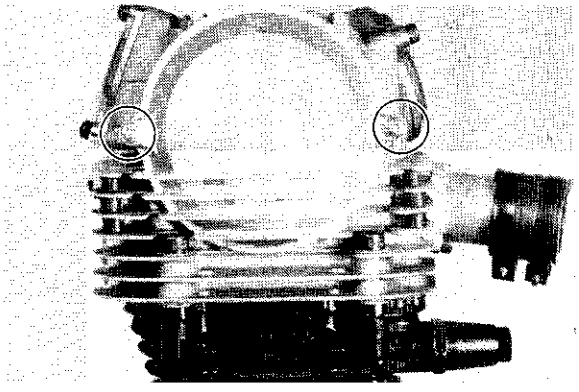
2. Remove the left hand footrest securing bolts.
3. Remove the engine mounting bolts.
4. Remove the engine from the right side of frame.



DISASSEMBLY

Cylinder Head and Cylinder

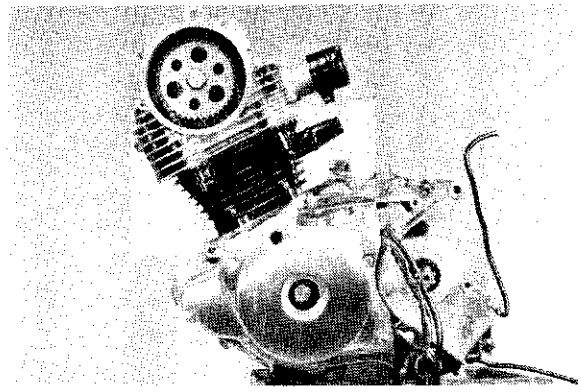
1. Remove the cam chain tensioner cap.
2. Loosen the tensioner lock nut.
3. Remove the chain tensioner assembly. Note the location of each part.

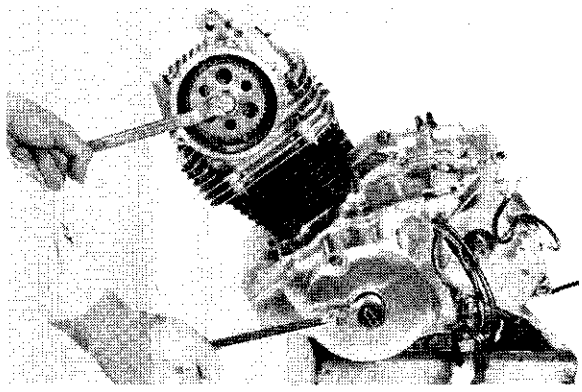


4. Loosen the side cover securing bolts and remove the side cover.
5. Remove the cam sprocket securing bolt (see the following photo).

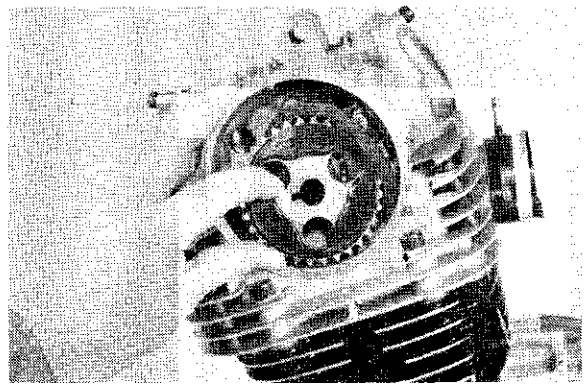
NOTE:

When removing the cam sprocket, it is not necessary to separate the cam chain.





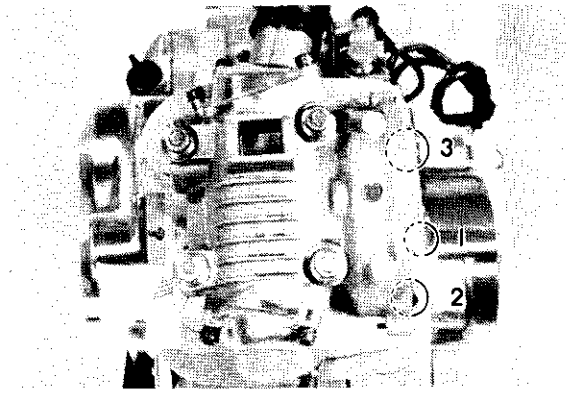
6. Remove the cam chain and cam chain sprocket.



7. Remove the six cylinder head retaining bolts (2 of which are internal hexagon bolts) and the cylinder retaining bolt.

NOTE:

Loosen the bolts in the order indicated in the following photo.



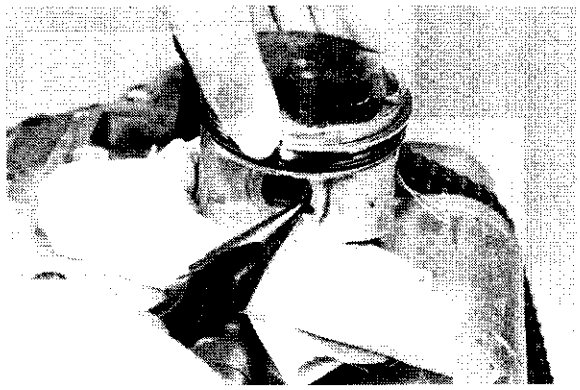
8. Remove the cylinder head and cylinder.
9. Remove the guide stoppers.

Piston Pin and Piston

1. Remove the piston pin clip from the 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.

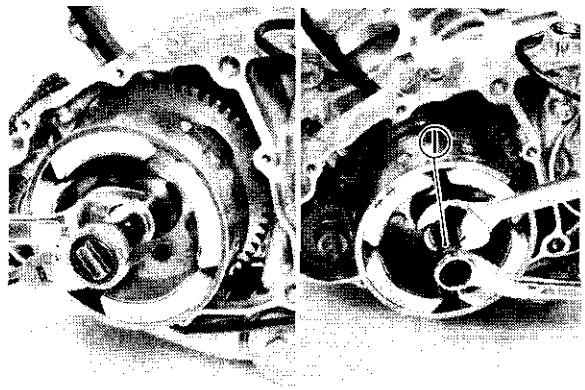


2. Push the piston pin from the opposite side, then pull out.

NOTE:

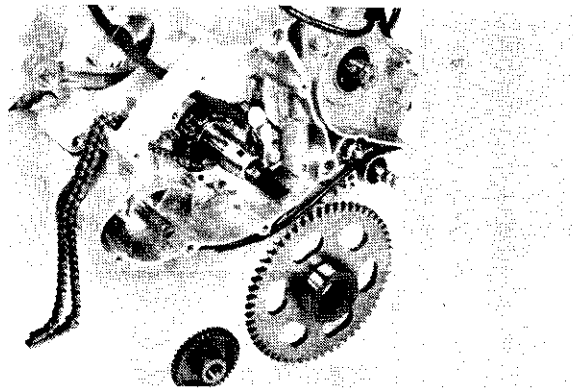
Before removing piston pin, deburr the clip groove and pin hole area.

3. Flywheel magneto removal
   a. Remove the flywheel securing nut.

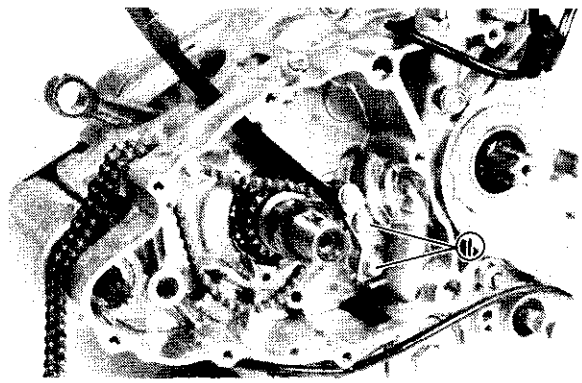


1. Flywheel puller

   b. Install the flywheel puller on the flywheel and tighten it.
   c. While holding the flywheel tighten the puller. This will pull the flywheel off the tapered end of the crankshaft.
   d. Remove the starter wheel and the idle gear.



4. Loosen the guide stopper locking bolt.



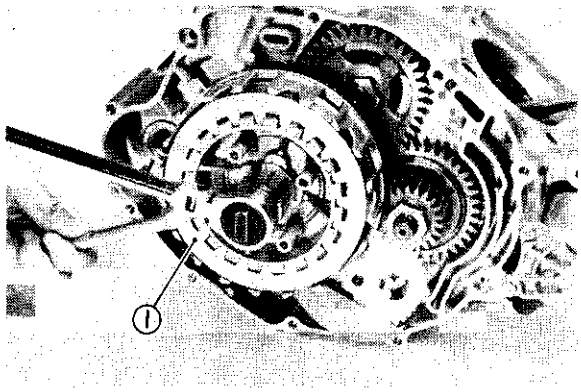
1. Guide stopper locking bolt

Crankcase Cover (Right)

1. Remove the oil filter cover holding bolts and the cover.
2. Remove the oil filter element.
3. Remove the crankcase cover holding bolts and the cover.

Clutch Assembly and Drive Gear

1. Remove the four clutch spring holding screws, pressure plates, clutch plates, friction plates, ball and push rod 2.
2. Install clutch holding tool on clutch boss. Remove lock nut, washer, clutch boss and housing in that order.

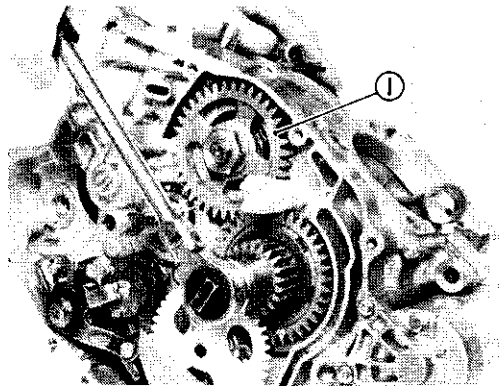


1. Clutch holding tool

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

Balancer Gear

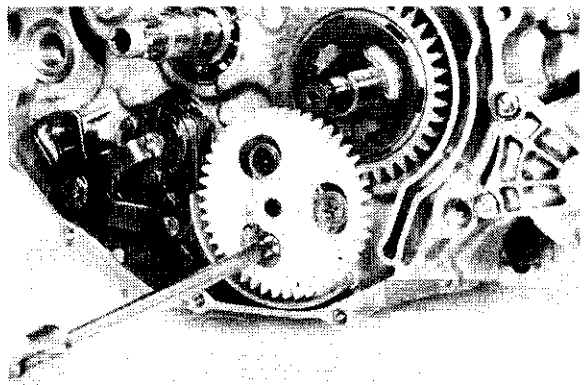
1. Flatten the lock washer.
2. First place a folded rag between the teeth of the drive gear and balancer gear to lock them. Then loosen the balancer gear securing nut.
3. Remove the balancer gear, the washers and the key.
4. Remove the drive gear and key.



1. Balancer gear

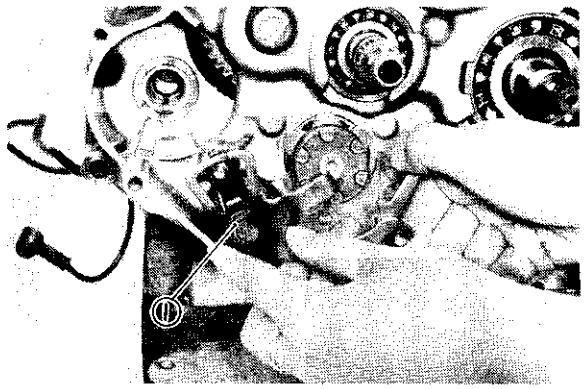
Oil Pump Assembly

Loosen the pump cover securing bolts and remove the oil pump assembly.

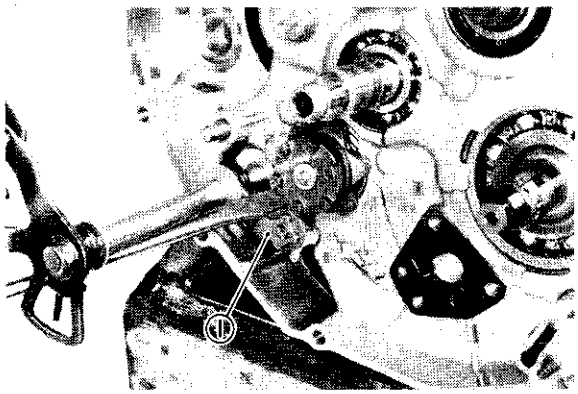


Change Shaft Assembly

1. Pull the shift shaft out from the right hand side.
2. Remove the shift lever assembly, and then remove the stopper lever assembly with the torsion spring.

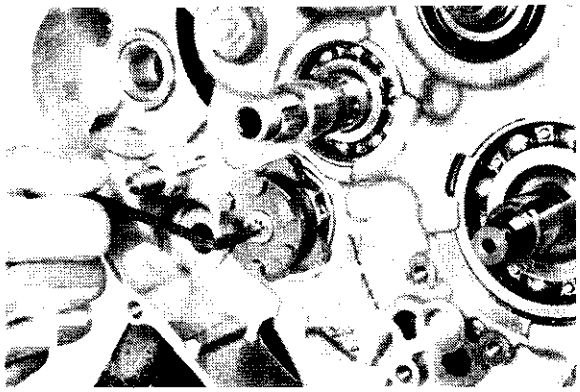


1. Shift shaft

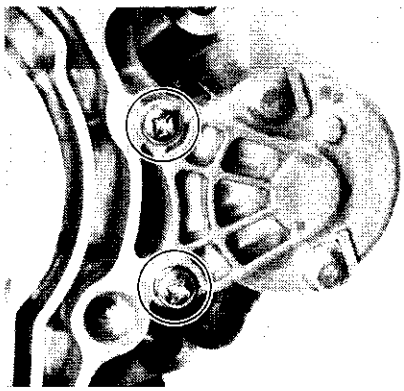


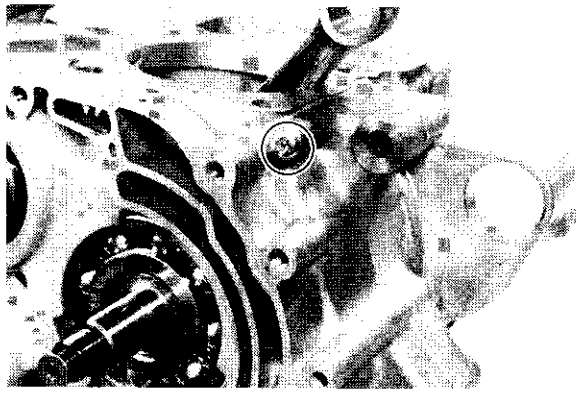
1. Stopper lever

3. Remove the segment.

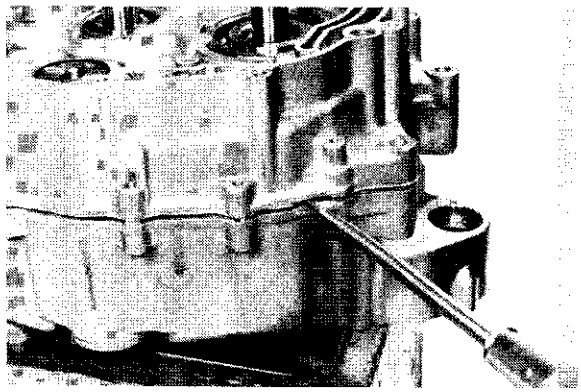


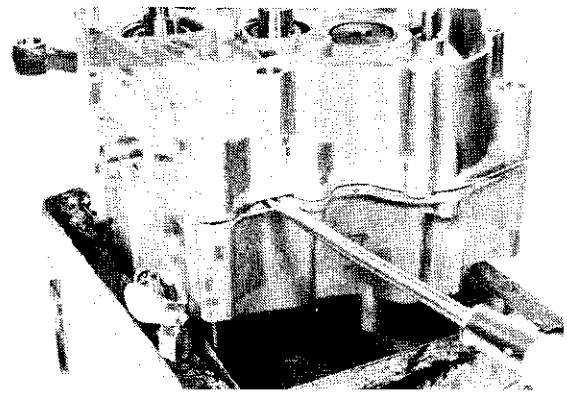
4. Remove starter motor assembly.





2. Remove the right crankcase by pulling it up.
   For this removal, slits in the crankcase can be used as shown in the photo.





Crankcase

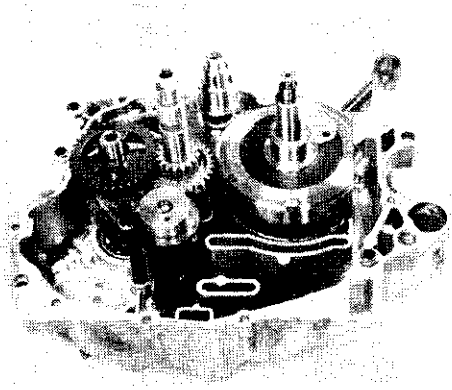
1. Working in a crisscross pattern, loosen all bolts 1/4 turn each. Remove them after all area loosened. Do not forget to remove right side holding bolt.

Transmission

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

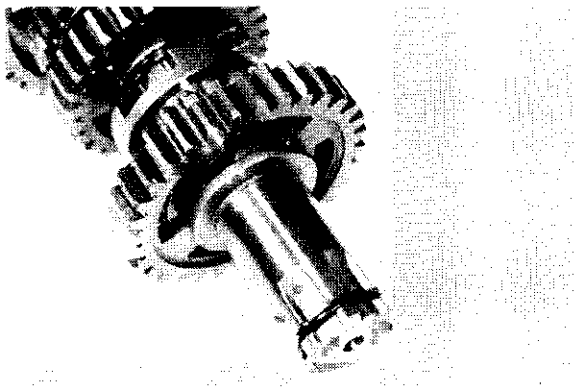
NOTE:

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



NOTE:

While removing the drive axle from the crankcase, pay careful attention to the oil seal lip. A recommended practice is to fit the "O" ring and to apply grease over the fitted area.



"O" ring

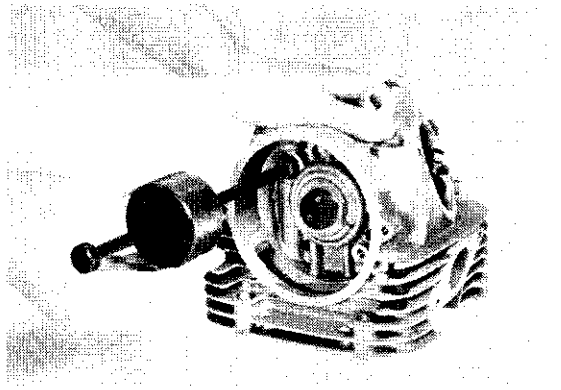
INSPECTION AND REPAIRING

Cylinder Head

1. Remove the intake and exhaust tappet covers.
2. Insert a 6 mm (0.24 in) screw into the rocker shaft, and withdraw the rocker shaft. It should be slide out easily.

NOTE:

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

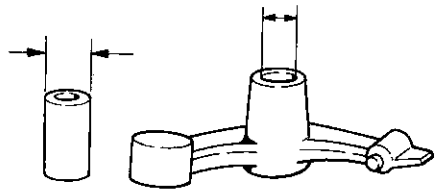


3. Rocker arm and rocker shaft
   a. The rocker arm usually wears at two locations: (1) at the rocker shaft hole, (2) at the cam lobe contacting surface.
   b. Measure the rocker arm inside diameter.

Standard size:
12.00 ~ 12.02 mm
(0.472 ~ 0.473 in)

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

Standard shaft diameter:
11.98 ~ 11.99 mm
(0.471 ~ 0.472 in)

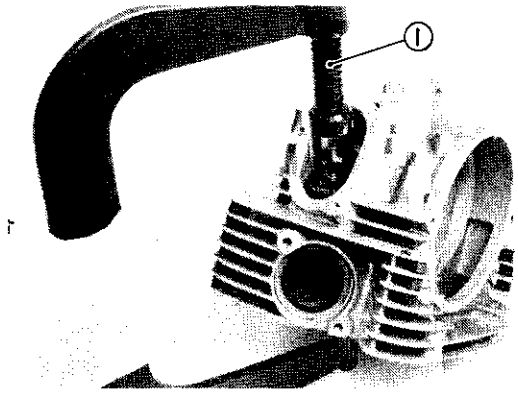


d. Standard clearance between the rocker shaft and hole should be 0.010 ~ 0.030 mm (0.0004 ~ 0.0012 in). If measurement shows more than 0.1 mm clearance, replace either or both parts as necessary.

4. Compress the valve spring and then remove both retainer locks.
   Remove the compressor and lift off the retainer and springs.

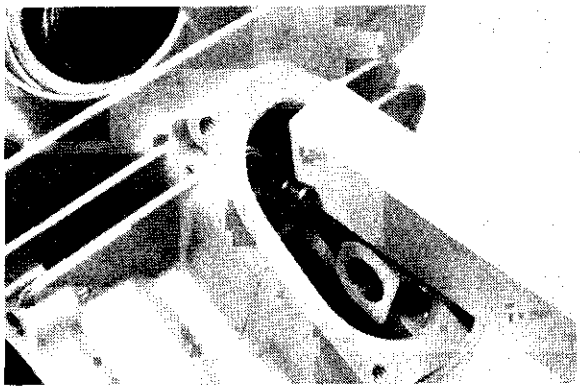
NOTE:

The retainer locks might be partially stuck in the retainer. Use a rubber hammer to tap the edge of the retainer a few times to loosen the retainer locks.



1. Valve spring compressor

5. Pull the valve out. If the step tip or retainer lock groove edges are slightly expanded, causing difficult removal, the surface might be damaged. First, use a fine file to remove any lip that exists on the stem and then remove the valve.



NOTE:

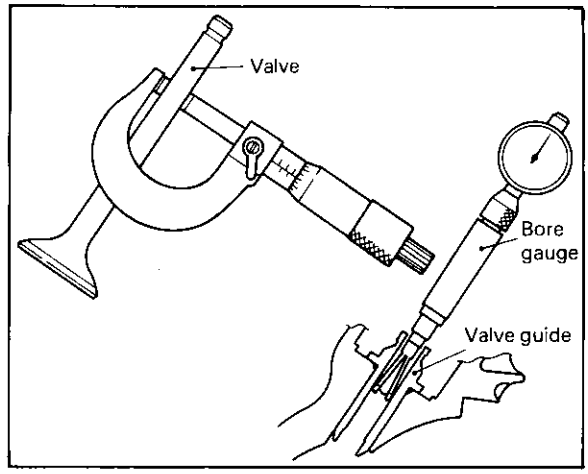
Be sure to remove the valve stem seal before removing the valve. Otherwise the seal could be damaged.

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

Valves, Valve Springs, Valve Guides and Valve Seats

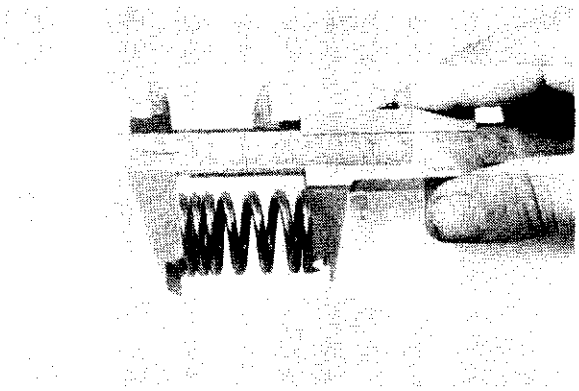
1. Check the intake and exhaust valve stems for bending and grooved wear. And check the stem ends for wear. Measurements should be done in three positions, upper, middle, and lower.

Intake valve stem diameter: 5.975 ~ 5.990 mm (0.2352 ~ 0.2358 in) Exhaust valve stem diameter: 5.995 ~ 5.970 mm (0.2344 ~ 0.2350 in)



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

b. Even though the spring is constructed of durable spring steel, it gradually loses some of its tension. This is evidenced one way by a gradual shortening of free length. Use a vernier caliper to measure spring free length. If the free length of any spring has decreased more than 2 mm (0.08 in) from its specification, replace it.

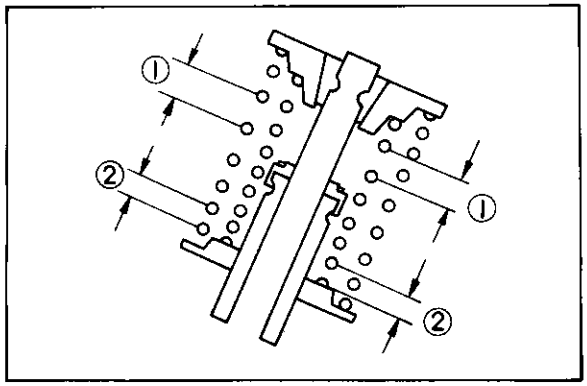


	Outer	Inner
Free length	37.2 mm (1.46 in)	35.5 mm (1.39 in)
Installed length (Valve closed)	32.0 mm (1.26 in)	30.5 mm (1.20 in)
Installed pressure (Valve closed)	18.5 ± 1.9 kg (40.8 ± 4.2 lb)	9.3 ± 1.0 kg (20.5 ± 2.2 lb)
Compressed length (Valve open)	24.0 mm (0.95 in)	22.5 mm (0.89 in)
Compressed pressure (Valve open)	56.3 ± 4.9 kg (124.1 ± 10.8 lb)	28.7 ± 2.6 kg (63.3 ± 5.7 lb)

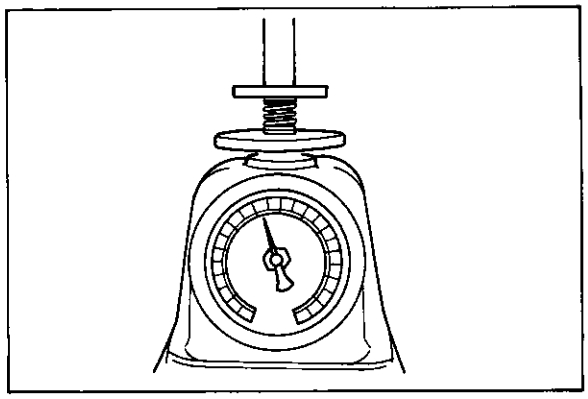
c. Another symptom of a fatigued spring is insufficient spring pressure when compressed. This can be checked using a valve spring compression rate gauge.
Test each spring individually. Place it in the gauge and compress the spring first to the specified compressed length with the valve closed (all spring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

NOTE:

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

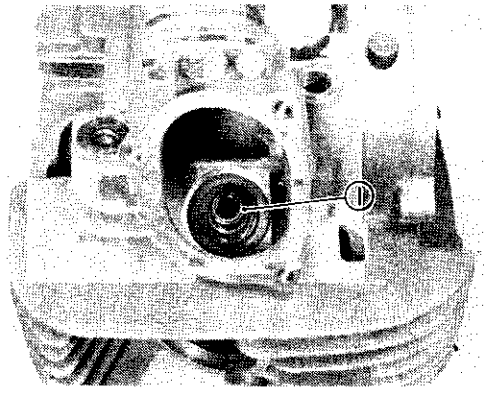


1. Larger pitch 2. Smaller pitch



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

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

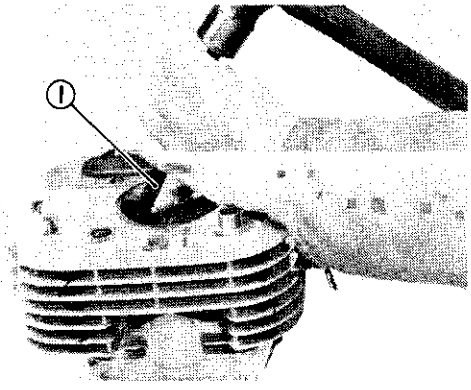


1. Valve stem seal

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

	Standard	Limit
Guide diameter (I.D.)	6.000 ~ 6.012 mm (0.2362 ~ 0.2367 in)	6.05 mm (0.2382 in)

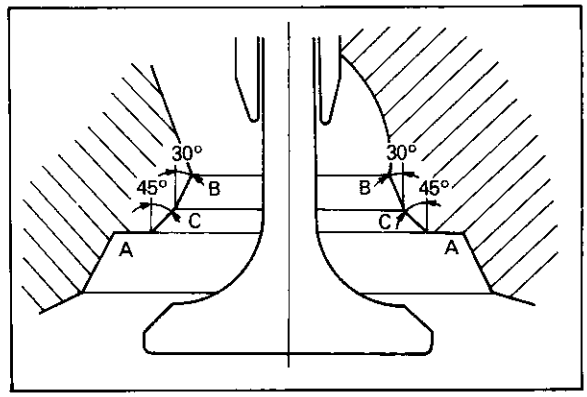
   b. To ease guide removal and reinstallation, and to maintain the correct interference fit, heat the head to 100°C (212°F).
      If possible, use an oven to avoid any possibility of head warpage due to uneven heating.
   c. Use the appropriate shouldered drive (special tool) to drive the old guide out and the new guide in.



1. Valve guide remover

   d. After installing the valve guide, use 6 mm (0.236 in) reamer (special tool) to obtain the proper valve clearance.
   e. After fitting the valve guide into the cylinder head, be sure to grind the valve seat, and perform valve lapping. The valve must be replaced by a new one.

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



CAUTION:

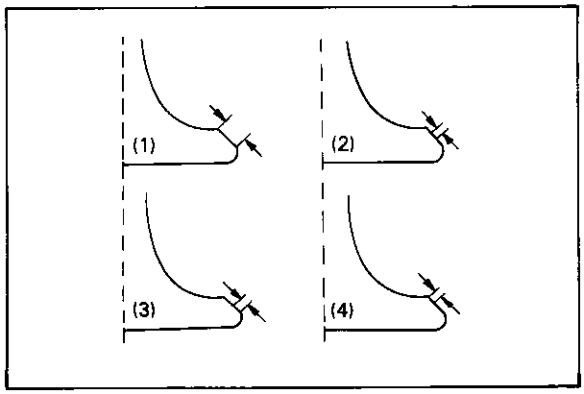
If the valve seat is obviously pitted or worn, it should be cleaned with a valve seat cutter. Use the 45° cutter, and when twisting the cutter, keep an even downward pressure to prevent chatter marks.

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

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

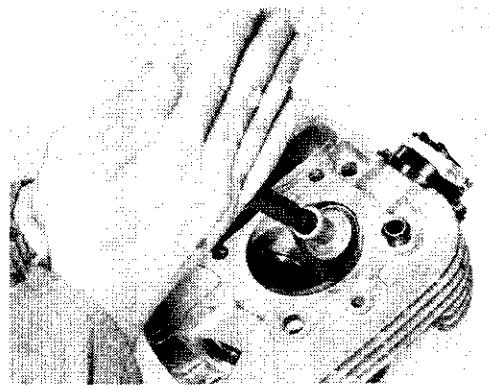
	Standard width	Wear limit
Seat width	1.0 mm (0.04 in)	1.6 mm (0.063 in)

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



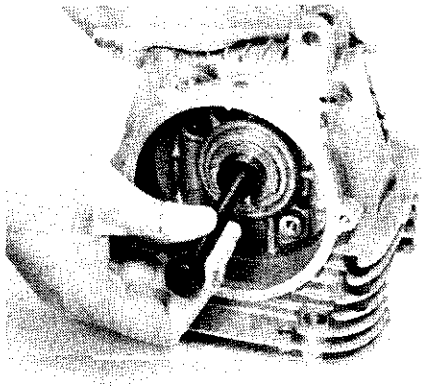
1) If the valve face shows that the valve seat is centered on the valve face, but too wide, then lightly use both the "FLAT" and the 30° cutters to reduce the seat width to 1.0 mm (0.04 in).
2) If the seat shows to be in the middle of the valve face, but too narrow, use the 45° cutter until the width equals 1.0 mm (0.04 in).
3) If the seat is too narrow, and right up near the valve margin, then first use the "FLAT" cutter and then the 45° cutter to get the correct seat width.
4) If the seat is too narrow and down near to bottom edge of the valve face, then first use the 30° cutter and then the 45° cutter.

7. Lapping the valve/valve seat assembly
a. The valve/valve seat assembly should be lapped if, (1) neither the seat or the valve face are severely worn, or: (2) if the valve face and valve seat have been resurfaced and now require a final light grinding operation for perfect sealing.
b. Apply a small amount of coarse lapping compound to the valve face. Insert the valve into the head. Rotate the valve until there is a burnished spot all the way around the valve face. Clean off the coarse compound, then follow the same procedure with fine compound. Continue lapping until the valve face shows a complete and smooth surface all the way around. Clean off all compound material.
Apply bluing dye to the valve face and rotate the valve face for full seat contact which is indicated by a shiny surface all around the valve face where the bluing has been rubbed away.



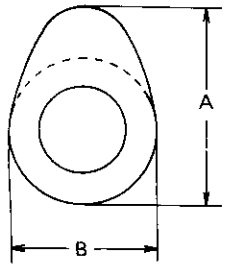
Camshaft

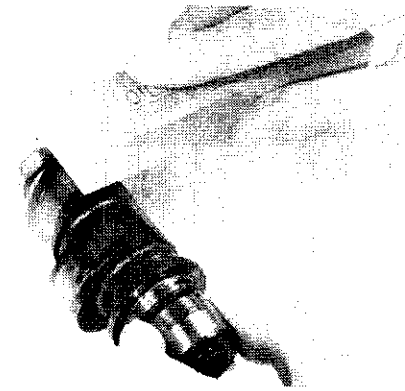
1. Flatten the lock washer.
2. Loosen and remove the bearing retaining bolts.
3. Insert a 10 mm (0.39 in) screw into the camshaft and withdraw the camshaft.

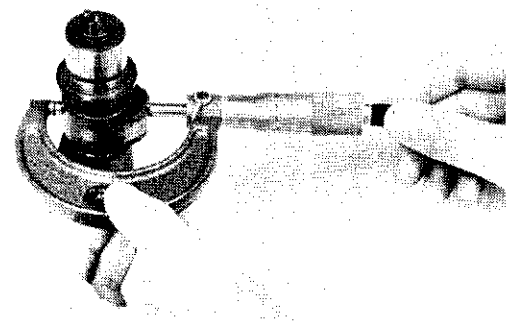


4. Camshaft
   a. The cam lobe metal surface may have a blue discoloration due to excessive friction. The metal surface could also start to flake off or become pitted. This is due to poor lubrication, incorrect clearances, or normal wear.
   b. If any of the above wear conditions are readily visible, the camshaft should be replaced.
   c. Even though the cam lobe surface appears to be in satisfactory condition, the lobes should be measured with a micrometer. Cam lobe wear can occur without scarring the surface. If this wear exceeds a predetermined amount, valve timing and lift are affected. Replace the camshaft if wear exceeds the limits.

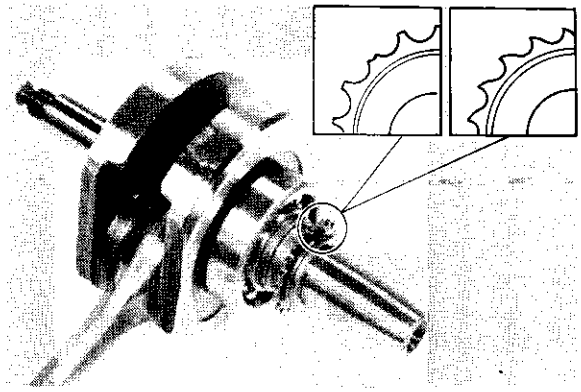
Wear limit	A	B
Intake	36.45 mm (1.435 in)	30.00 mm (1.181 in)
Exhaust	36.50 mm (1.437 in)	30.15 mm (1.187 in)







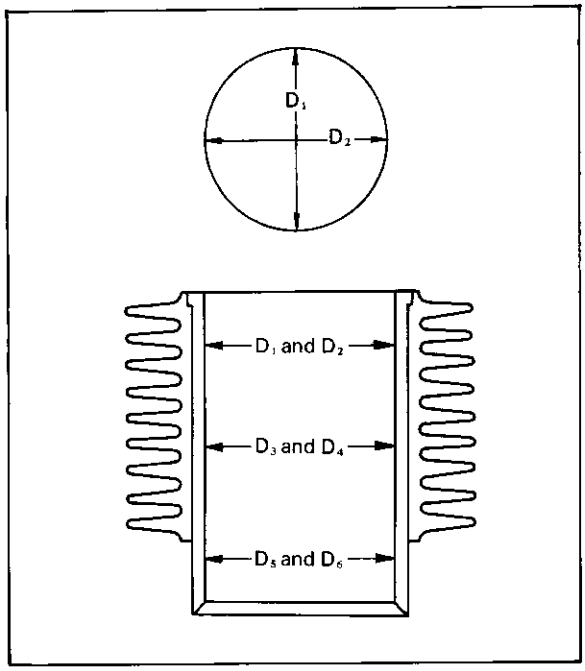
6. Cam sprocket and cam drive sprocket
   Check the cam sprocket and cam drive sprocket for wear or damage.



Cylinder

1. Visually check the cylinder walls for scratches. If vertical scratched are evident, the cylinder wall should be rebored or the cylinder should be replaced.
2. Measure cylinder wall wear in the manner as shown. If wear is excessive, compression pressure will decrease, and engine trouble will occur. Rebore the cylinder wall, and replace the piston and piston rings.

Cylinder wear should be measured at three depths by placing the measuring instrument in parallel to, and at right angles to, the crankshaft. (See the illustration.)
If the cylinder wall is worn more than wear limit, it should be rebored.

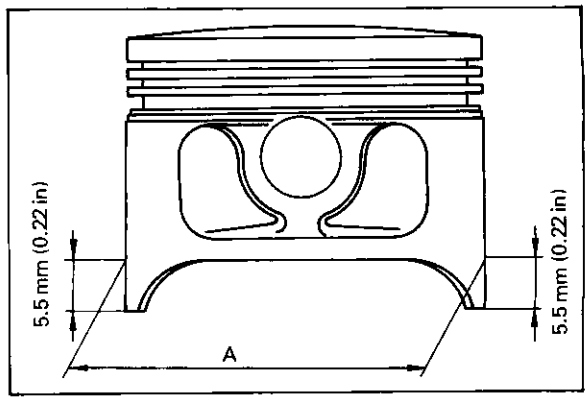


	Standard	Wear limit
Cylinder bore	65.0 ~ 65.02 mm (2.5590 ~ 2.5598 in)	65.1 mm (2.5630 in)
Cylinder taper	—	0.05 mm (0.002 in)

Piston and Piston Rings

1. Piston
   a. Using the micrometer, measure the outside diameter of the piston at the piston skirt.
   Measurement should be made at a point 5.5 mm (0.22 in) above the bottom edge of the piston by placing the micrometer in parallel to, and at right angles to, the piston pin.

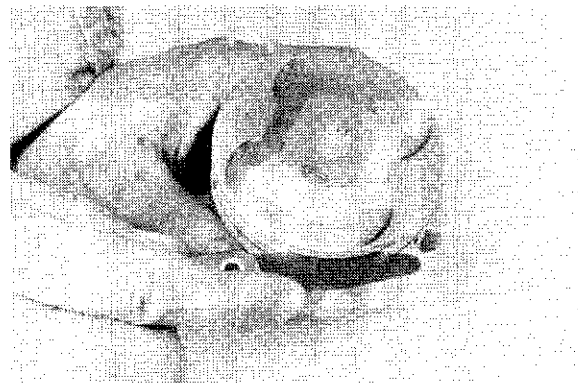
Piston clearance:
0.030 ~ 0.045 mm
(0.0012 ~ 0.0018 in)



	Size A
Standard	65.00 mm (2.559 in)
Oversize 1	65.25 mm (2.569 in)
Oversize 2	65.50 mm (2.579 in)
Oversize 3	65.75 mm (2.588 in)
Oversize 4	66.00 mm (2.598 in)

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

Side clearance	Top	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)
	2nd	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in)



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

Oversize 1	65.25 mm (2.567 in)
Oversize 2	65.50 mm (2.579 in)
Oversize 3	65.75 mm (2.588 in)
Oversize 4	66.00 mm (2.598 in)

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

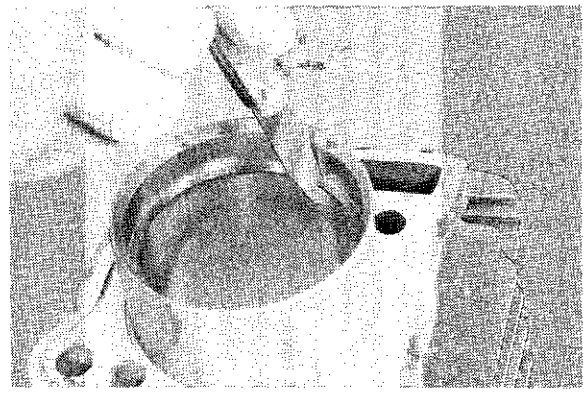
Size	Color
Oversize 1	Brown
Oversize 2	Blue
Oversize 3	Black
Oversize 4	Yellow

c. Insert each ring into the cylinder and push it down approximately 20 mm (0.8 in), using the piston crown so that the ring forms the right angles to the cylinder bore. Measure the end gap of the ring with a feeler gauge.
If the gap is beyond tolerance, replace the whole set of rings.

NOTE:

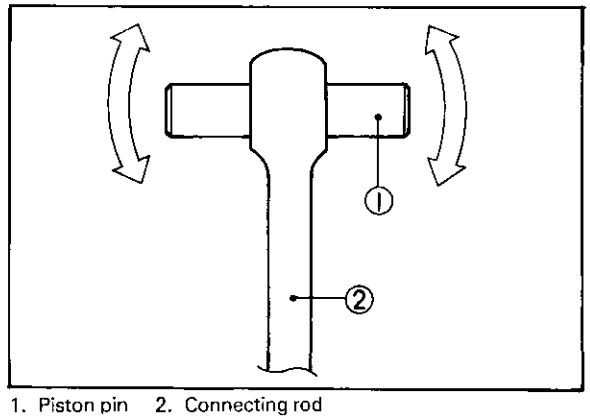
The end gap on the expander spacer of the oil control ring is unmeasureable. If the oil control ring rails show excessive gap all three components should be replaced.

	Standard	Limit
Top/2nd ring	0.15 ~ 0.35 mm (0.0059 ~ 0.0137 in)	0.6 mm (0.0236 in)
Oil control (Rails)	0.3 ~ 0.9 mm (0.0118 ~ 0.0354 in)	–

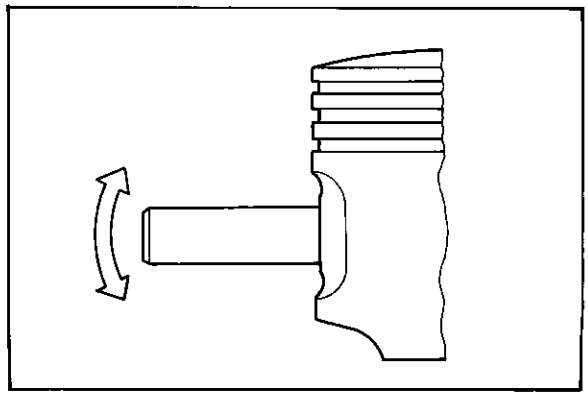


Piston Pin

1. Apply a light film of oil top pin.
Install in connecting rod small end. Check for play. There should be no noticeale vertical play. If play exists, check connecting rod small end for wear: Replace pin and connecting rod as required.
2. The piston pin should have no noticeable free play in position. If the piston pin is loose, replace the pin and/or the piston.



1. Piston pin 2. Connecting rod



Crankshaft

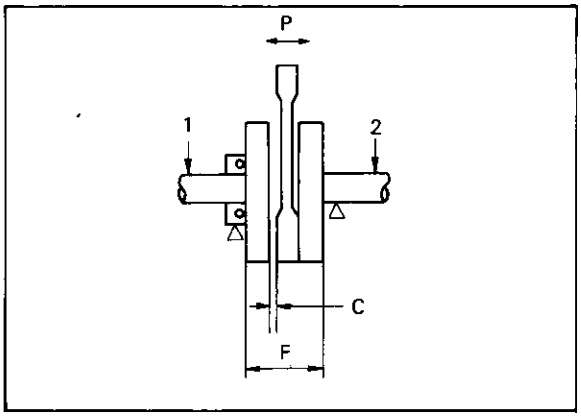
1. Check crankshaft components per chart.

Check connecting-rod axial play at small end (to determine the amount of wear or crank pin and bearing at big end).	Small end play should not exceed 2 mm (0.079 in).	If small end play exceeds 2 mm (0.079 in) disassemble crankshaft, check connecting rod, crank pin and big end bearing. Replace defective parts. Play after reassembly should be within 0.8 ~ 1.0 mm (0.031 ~ 0.039 in)
Check the connecting rod side clearance at big end.	Move the connecting rod to one side and insert a feeler gauge. Big end axial play should be within 0.35 ~ 0.65 mm (0.014 ~ 0.026 in).	If excessive axial play is present, 0.7 mm (0.028 in) or more, disassemble the crankshaft and replace any worn parts.
Check crankshaft assembly runout. (Misalignment of crankshaft parts.)	Dial gauge readings should be within 0.03 mm (0.00118 in).	Correct any misalignment by tapping the flywheel with a brass hammer and by using a wedge.

2. Crankshaft Specifications

Unit: mm (in)

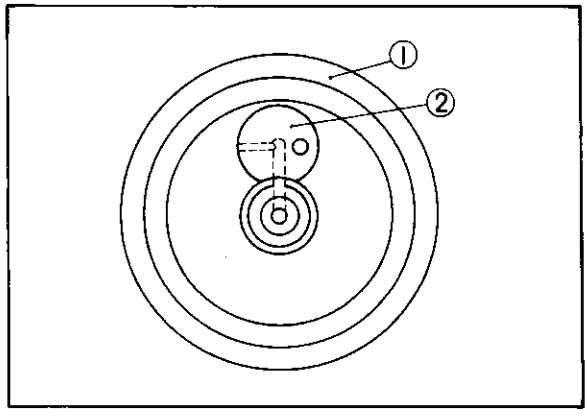
Deflection tolerance		Flywheel width	Rod clearance			
			Axial "P"		Side "C"	
Left side "1"	Right side "2"	"F"	New	Max.	Min.	Max.
0.03 (0.0012)	0.03 (0.0012)	58.95 ~ 59.00 (2.321 ~ 2.323)	0.8 ~ 1.0 (0.03 ~ 0.04)	2.0 (0.08)	0.3 (0.0118)	0.65 (0.0256)



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

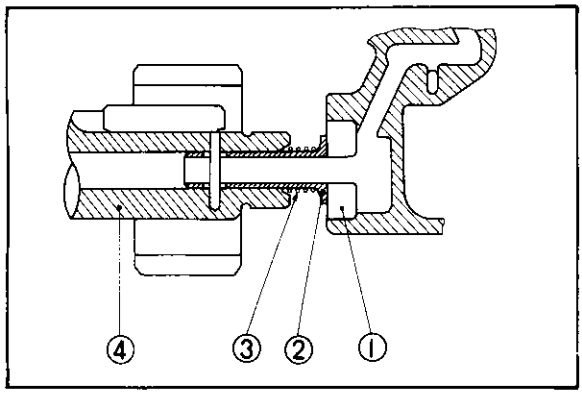
NOTE:

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



1. Crank assembly 2. Crank pin

Oil from the oil pump flows to the crankshaft pass by the pin.
Check the movement of the pin and the stretch force.



1. Crankcase cover
2. Pin
3. Spring
4. Crankshaft

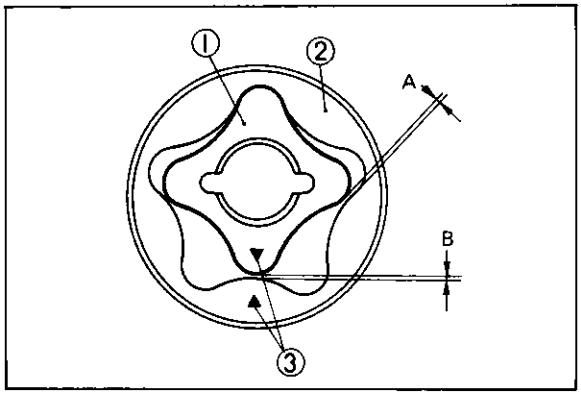
Oil Pump

1. Trochoid pump rotor width

Delivery pump: 8 mm (0.315 in)

2. Rotor dimensions-inner and outer

Clearance between A and B standard: 0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in) Limit: 0.15 mm (0.006 in)



1. Inner rotor 2. Outer rotor 3. Match marks

Primary Drive

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

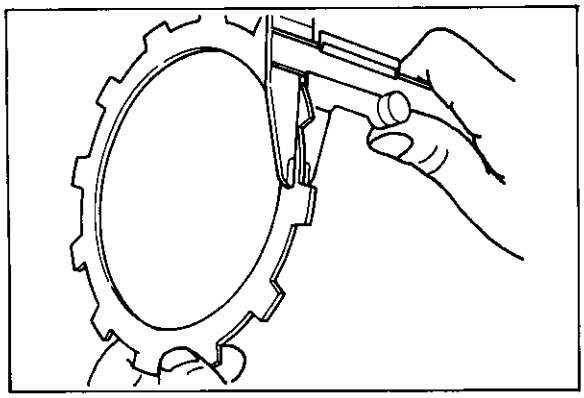
Primary reduction ratio		
No. of teeth		Ratio
Drive	Driven	
22	73	3.318

1. Check the drive gear and driven gear for obvious signs of wear or damage from foreign material within the primary case.
2. Replacement is necessary.
   Alphabets are scribed on the side of each gear. Check these alphabets, if a gear must be replaced due to damage, it is always advisable to pay strict attention to the lash simbols during replacement.

Clutch

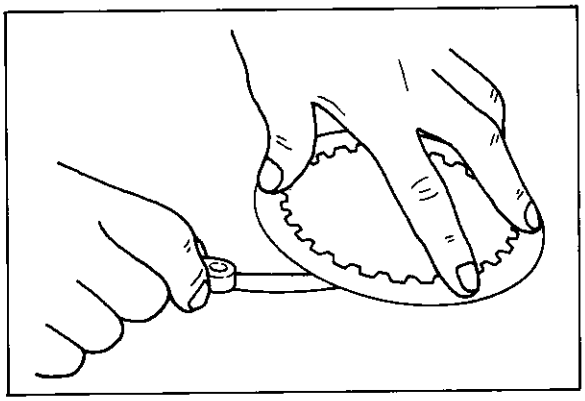
1. Checking friction plates
   The friction plates are liable to wear. The standard thickness of the friction plate is 2.8 mm (0.11 in). If it is worn more than 0.3 mm (0.012 in) or has uneven wear, it should be replaced.

Clutch friction plate wear limit:
2.7 mm (0.11 in)



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

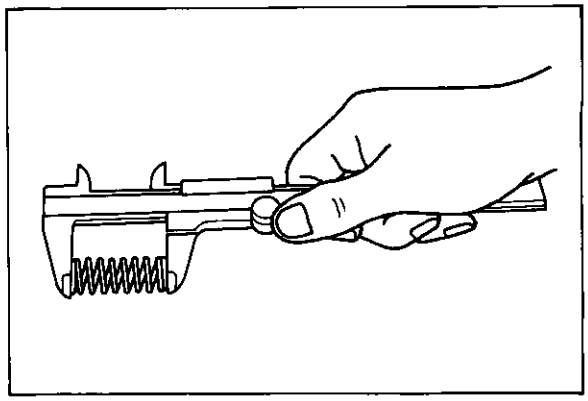
Clutch plate warpage limit:
0.05 mm (0.0020 in)



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

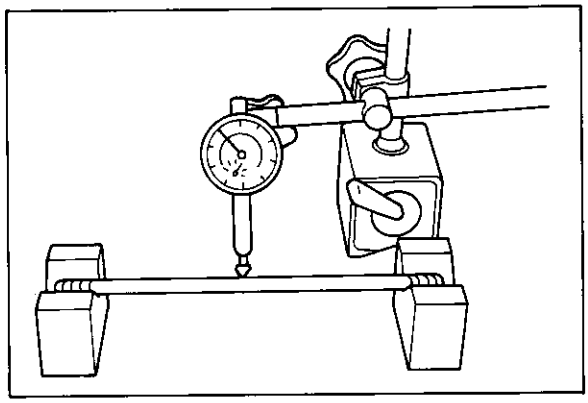
Clutch spring specifications:

Number of springs	4
Free length	34.9 mm (1.37 in)
Spring rate	1.738 kg/mm (97.3 lb/in)



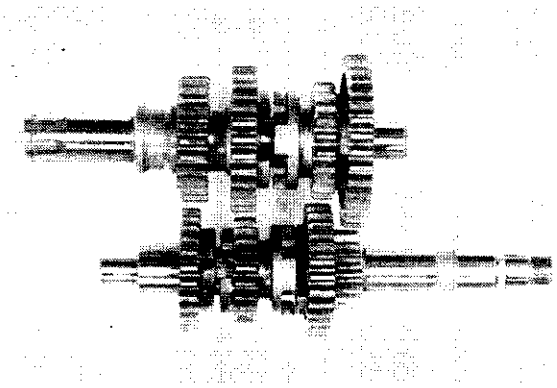
4. Checking the push rod
   By rolling the push rod on the "V" block, and check for bends. If any bend is found, replace the push rod.

Bend limit: 0.5 mm (0.02 in)



Transmission

1. Inspect each shift fork for signs of galling on gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.
2. Roll the guide bars across a surface plate. If any bar is bent, replace.
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or any damage, replace cam.
4. Check the camfollowers that ride in the grooves in the shift cam. If they are worn or damaged, replace.
5. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent, replace.
6. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the teeth for signs of pitting, galling, or other extreme wear. Replace as required.
7. Check to see that each gear moves freely on its shaft.
8. Check to see that all washers and clip are properly installed and undamaged. Replace bent or loose clips and bent washers.
9. 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.



Bearings and Oil Seals

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

NOTE:

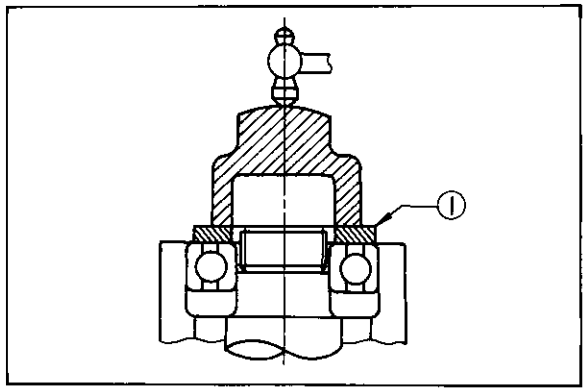
Place a piece of wood under the slot head screwdriver to prevent damage to case.

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

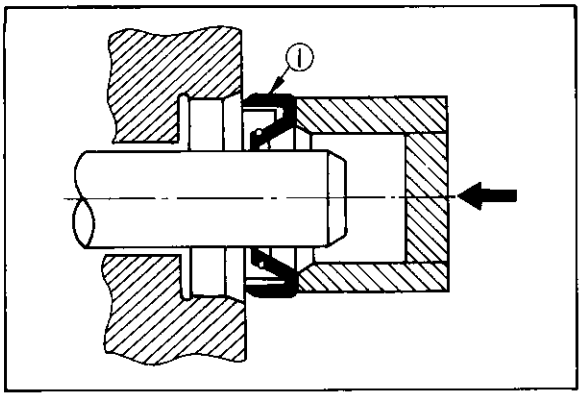
NOTE:

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

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



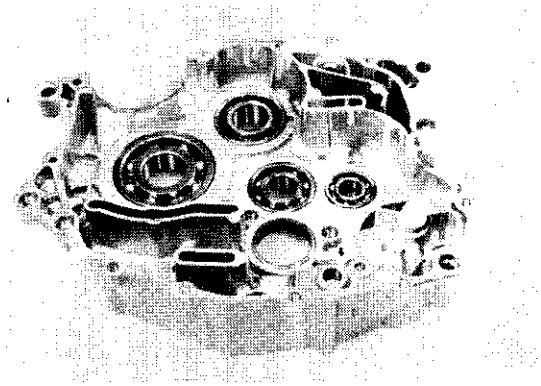
1. Spacer



1. Oil seal

Crankcase

1. Thoroughly wash the case halves in mild solvent.
2. Clean all gasket mating surfaces and crankcase mating surface thoroughly.
3. Visually inspect case halves for any cracks, road damage, etc.
4. Check all fittings not previously removed for signs of loosening or damage.
5. If bearings have been removed, check their seats for signs of damage (such as the bearing spinning in the seat, etc.).
6. Check oil delivery passages for signs of blockage.
7. If bearings have not been removed, oil them thoroughly immediately after washing and drying. Rotate the bearing checking for roughness indicating damaged races or balls.
8. Check needle bearing(s) in transmission for damage Replace as required.



ENGINE ASSEMBLING AND ADJUSTMENT

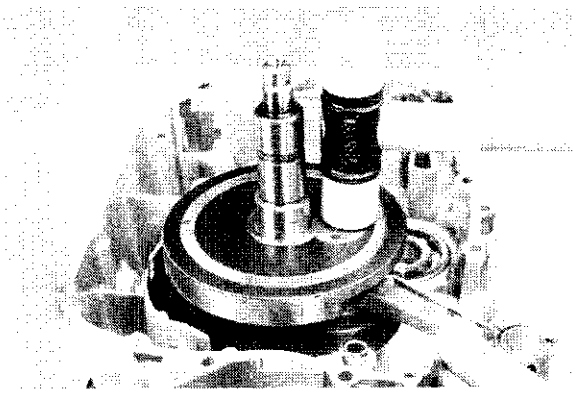
Crankshaft Installation

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

1. Place the left crankcase underside.
2. Fit the crankshaft onto the left case half by tapping the crankpin area with a soft head hammer while turning the crankshaft. Work slowly and carefully. Make sure the crankshaft is set evenly.

NOTE:

Pay attention to the parallelism between the crankweb and the crankcase surface.



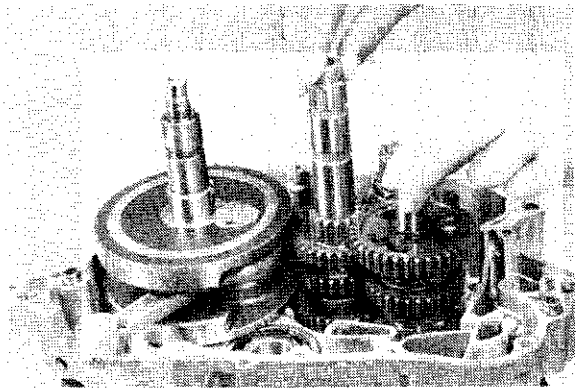
3. Install the drive axle and main axle.

NOTE:

While installing the drive axle into the crankcase, pay careful attention to the oil seal lip.

It is recommended to set a suitable "O-ring" into the drive axle groove.



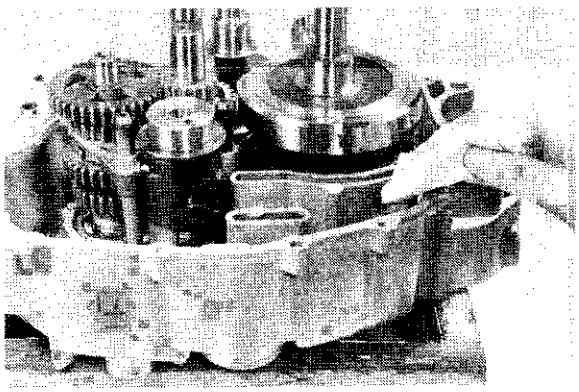


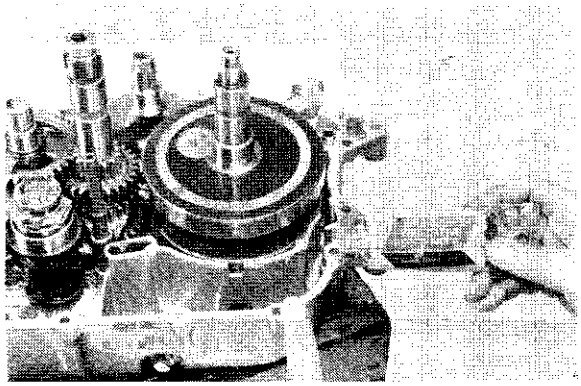
4. Install the shift cam.
5. Install the shift fork 1 and 2.
6. Check to see that all parts move freely prior to installing right case half.
   Check for correct transmission operation and make certain that all loose shims are in place.

NOTE:

Oil each gear and bearing thoroughly.

7. Install the balance weight.
8. Apply Yamaha Bond No. 4 to the mating surfaces of both case halves.
   Apply thoroughly, over all mating surfaces.





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

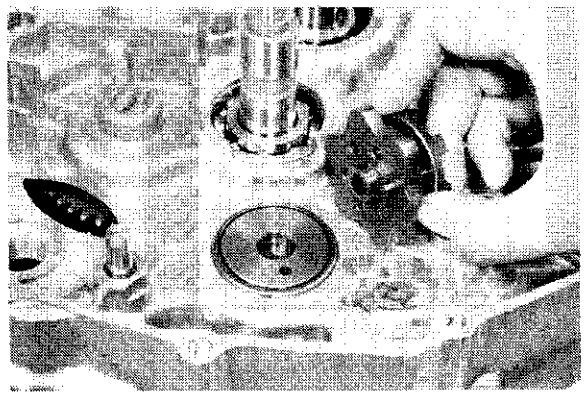
NOTE:

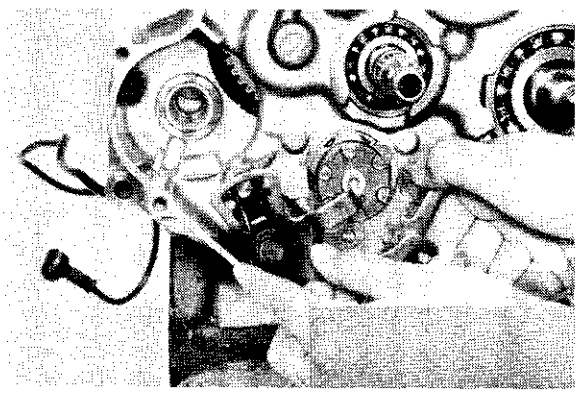
Do not tap on machined surface or end of crankshaft.

10. Install all crankcase bolts and tighten in stages, using a crisscross pattern.
11. After reassembly, apply a liberal coating of 4-stroke engine oil to the crank pin and bearing.
12. Check crankshaft and transmission shafts for proper operation and freedom of movement.

Shifter

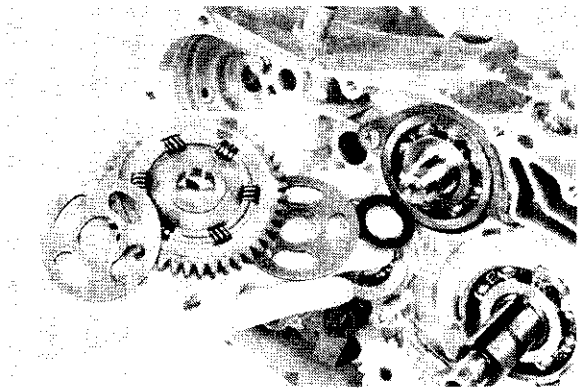
1. Install the segment. Bolt it.
2. Set the stopper lever and change arm.

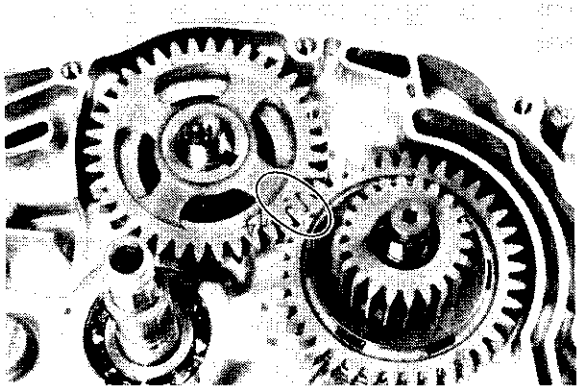




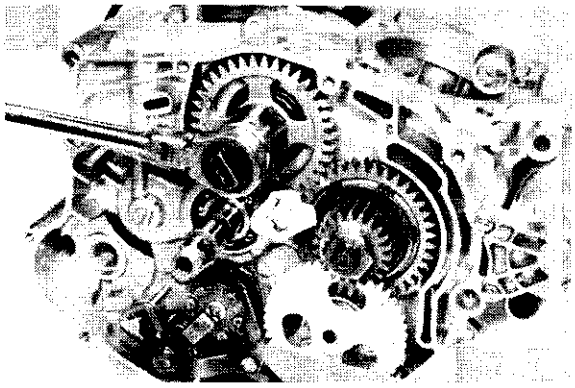
Balancer Drive Gear and Driven Gear

1. Fit into the balancer gear the buffer boss with dowel pins set every other interval.
2. Place balancer covers on both sides of the balancer gear and install.



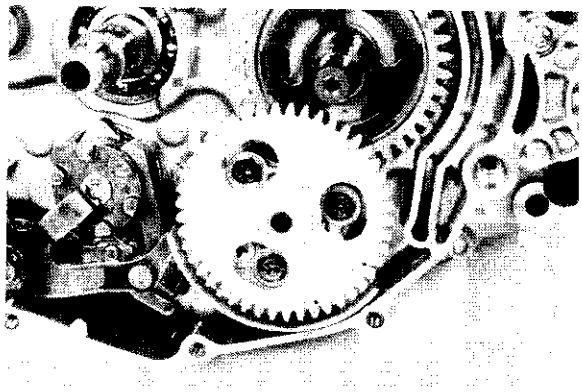


3. Install the keys for the balancer drive and driven gears with the marks in alignment. Install the primary drive gear.
4. Tighten the balancer gear lock nut by first placing a folded rag between the teeth of the balancer gears to lock them.



Tightening torque:
50 Nm (5.0 m-kg , 36.2 ft-lb)

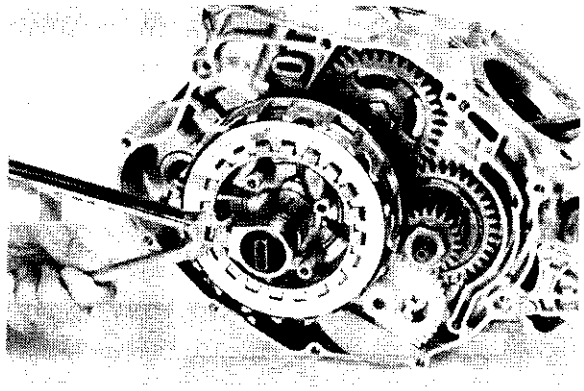
5. Bend the lock washer.
6. Install the oil pump assembly.



Clutch

1. First install the primary drive gear.
2. Install the clutch housing, thrust plate, push rod 2, ball and clutch boss in that order.
3. Install clutch holding tool on clutch boss and tighten lock nut.

Clutch lock nut torque:
50 Nm (5.0 m-kg, 36.2 ft-lb)



4. Install clutch plate and friction plate.
5. Install clutch pressure plate.
6. Continue installation of clutch and friction plates.
7. Tighten the primary drive lock nut by first placing a folded rag between the teeth of the primary gears to lock them as shown in the photo.

Crankcase Cover Right

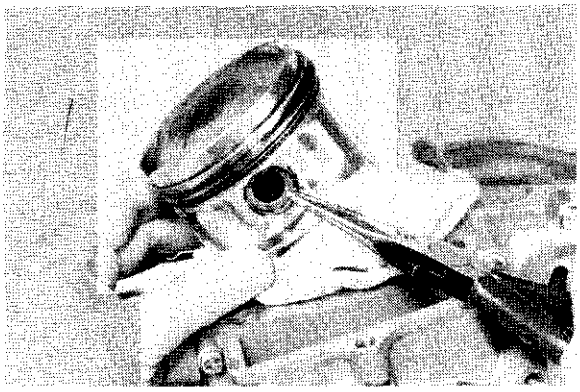
1. Install the crankcase cover.
2. Install the oil filter element and cover.

NOTE:

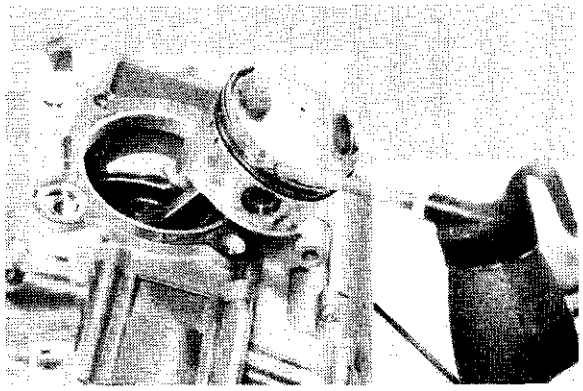
Tighten the screws using crisscross pattern.

Piston

1. Mount the piston (rings installed) onto the connecting rod.
   Be sure the arrow stamped on the piston crown points forward.
2. Install new piston pin clips in their grooves.



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

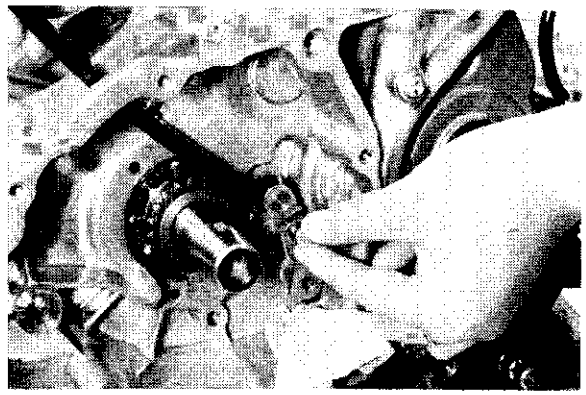


Cylinder

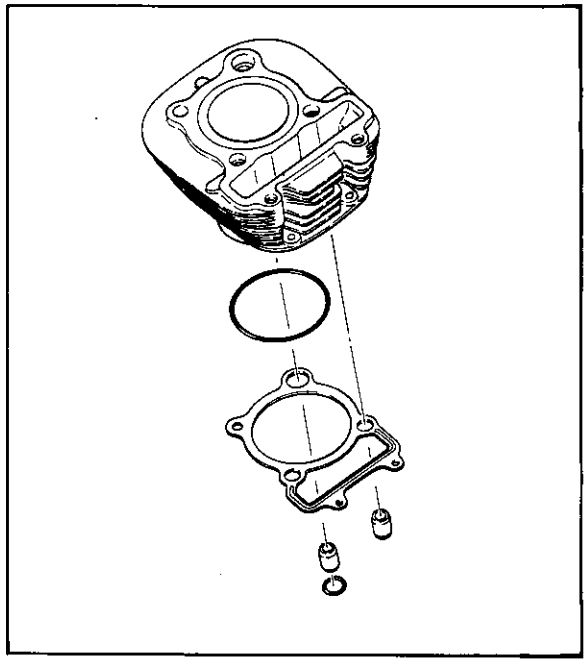
1. Install the chain tensioner.

NOTE:

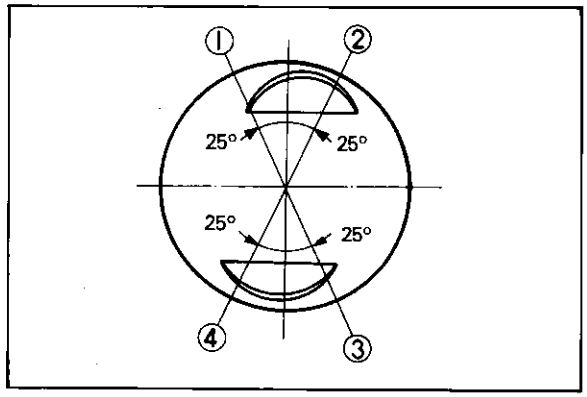
Place a shop rug on the crankcase hole to prevent falling down the tensioner holding bolt in it.



2. Install the cam chain guide to the crankcase.
3. Install the new "O-ring" and cylinder base gasket.

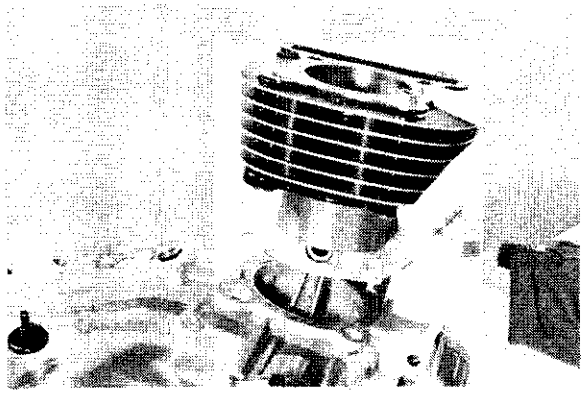


4. Off-set the three ring end gaps as shown.



1. Top
2. Oil ring (Lower rail)
3. 2nd
4. Oil ring (Upper rail)

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



6. Install the cylinder holding bolt.

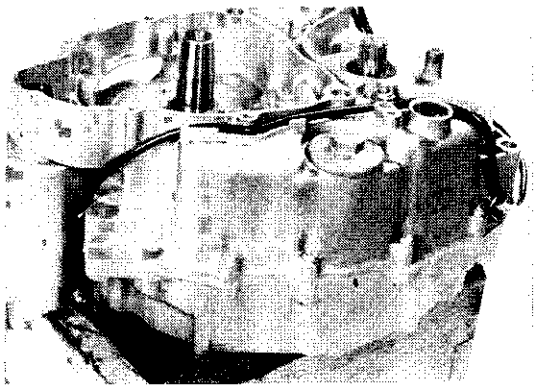
Cylinder Head

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

Tightening torque:
8 mm bolt . . . . . 4 pcs
22 Nm (2.2 m-kg, 15.9 ft-lb)
8 mm bolt . . . . . 2 pcs
20 Nm (2.0 m-kg, 14.5 ft-lb)
6 mm bolt . . . . . 1 pc
7 Nm (0.7 m-kg, 5.1 ft-lb)

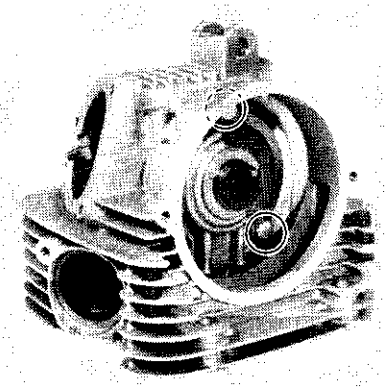
Starter Motor

Install the starter motor and layout the starter motor lead.

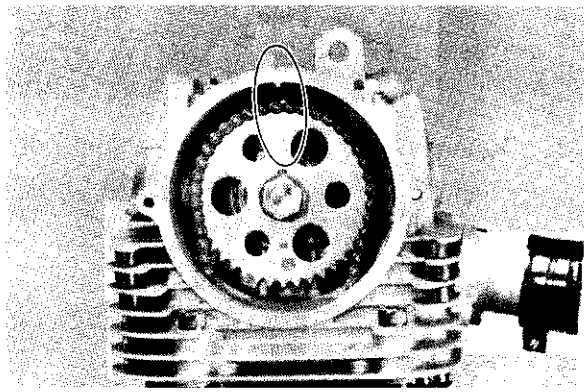


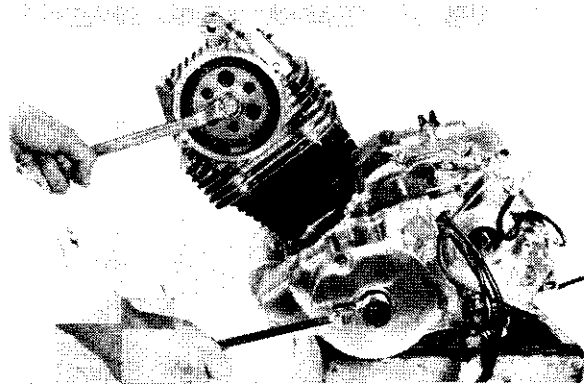
Cam Shaft, Cam Shaft Driven Sprocket, Cam Chain

1. Install the cam shaft, bearing plate and lock washer.
2. Tighten the bolt and bend the lock washer.



3. Install the chain while aligning the marks on the sprocket and cylinder head and also the marks on the crankshaft sprocket and crankcase, as shown.

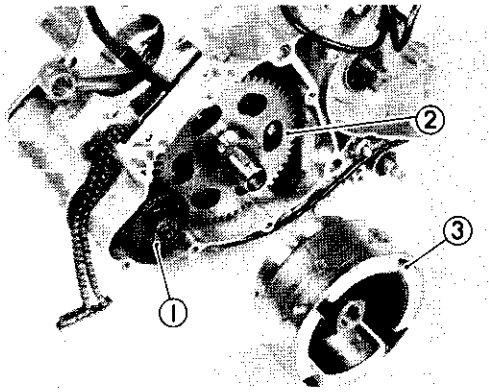




Sprocket bolt torque:
55 Nm (5.5 m-kg (39.8 ft-lb)

Starter Idle Gear and Flywheel Magneto

1. Install the idle gear, starter wheel and flywheel (starter clutch).



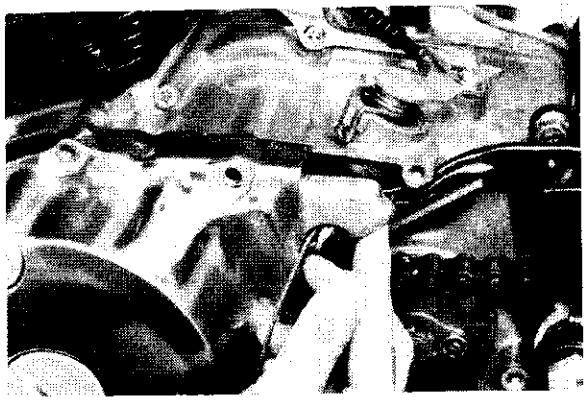
1. Idle gear 2. Starter wheel 3. Flywheel

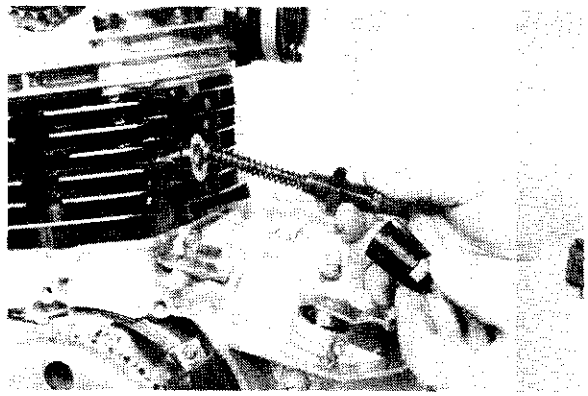
2. Tighten the flywheel nut.

Tightening torque:
50 Nm (5 m-kg, 36.0 ft-lb)

3. Install the crankcase cover (L). The lead wire grommet should be positioned properly.
4. Install the chain tensioner assembly. Adjust the tensioner. (Refer to the Chapter 2. "Cam chain adjustment")
5. Install the adjuster cap and tighten the cap.

Tightening torque:
5 Nm (0.5 m-kg, 3.6 ft-lb)





Drain Plug

Install and tighten the drain plug before filling engine oil.

Tightening torque:
43 Nm (4.3 m-kg, 31.0 ft-lb)

MOUNTING

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

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

Tightening torque				
Engine mounting bolts	Bolt size	Q'ty	m-kg	ft-lb
Front under	8 mm	4	3.2	23.1
Rear under	8 mm	1	3.2	23.1
Rear under	8 mm	2	3.2	23.1
Upper	8 mm	3	3.2	23.1

3. Install the lead wire, plug cap and breather pipe.
4. Install carburetor assembly.
5. Install the drive sprocket with the drive chain and the sprocket holder.
   Tighten the two bolts.

Tightening torque:
10 Nm (1.0 m-kg, 7.2 ft-lb)

6. Install the plate washer and spacer over the shift shaft.
7. Install the left crankcase cover and tighten bolts.
8. Install the shift pedal and tighten the bolt.
9. Install and adjust the clutch wire as shown in "Chapter 2".
10. Install the exhaust pipe assembly.
11. Install the fuel tank and seat.
12. Install the brake rod nut and the return spring.
13. Start the engine and check oil pressure, oil leakage and cam chain adjustment. See Engine oil checking procedure in Chapter 2.

CHAPTER 4. CARBURETION

AIR FILTER 4-1
CARBURETOR 4-1
Disassembly 4-1
Fuel Level 4-2
COASTING ENRICHER 4-3
Operation of enricher 4-3

4

CHAPTER 4.
CARBURETION

AIR FILTER

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

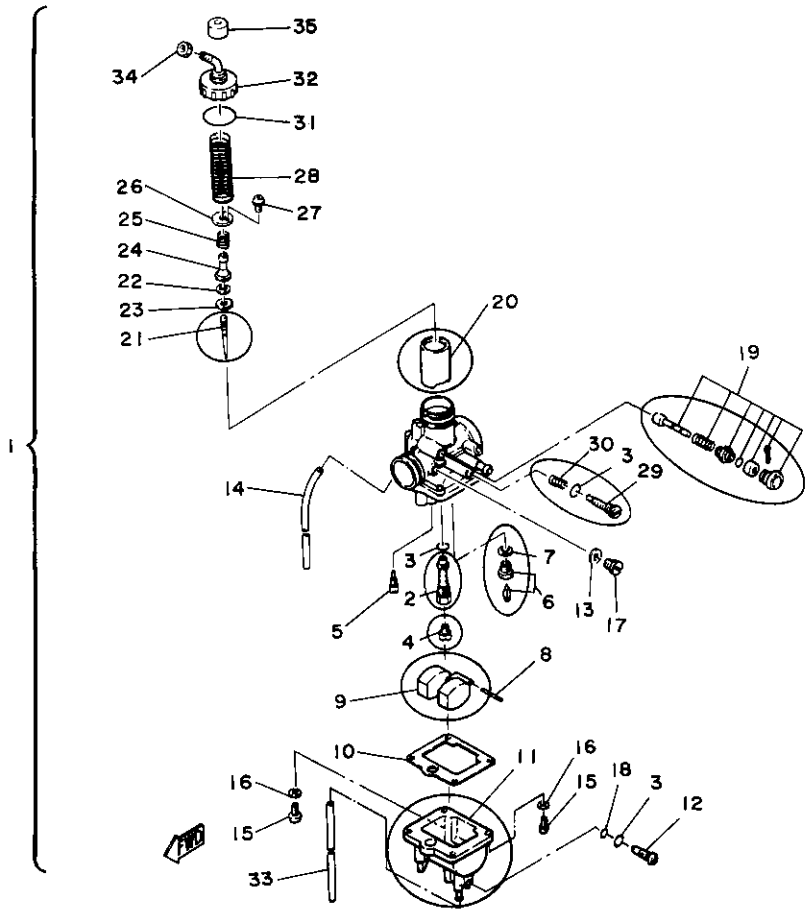
CARBURETOR

Disassembly

Remove the following circled parts as shown. Clean them and check their worn, damage or bending.

NOTE:

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



1. Carburetor ass'y 1
2. Main nozzle
3. Gasket
4. Main jet (#116)
5. Pilot jet (#038)
6. Needle valve ass'y
7. Needle valve washer
8. Float pin
9. Float
10. Float chamber gasket
11. Float chamber body
12. Screw plug
13. Gasket
14. Pipe 1
15. Pan head screw
16. Spring washer
17. Screw
18. O-ring
19. Starter plunger
20. Throttle valve 1
21. Needle
22. Clip
23. Ring
24. Washer
25. Spring
26. Spring seat
27. Pan head screw
28. Throttle valve spring
29. Pilot adjusting screw
30. Pilot adjusting spring
31. O-ring
32. Mixing chamber cap
33. Pipe
34. Cable adjusting nut
35. Cap

Fuel Level

NOTE:

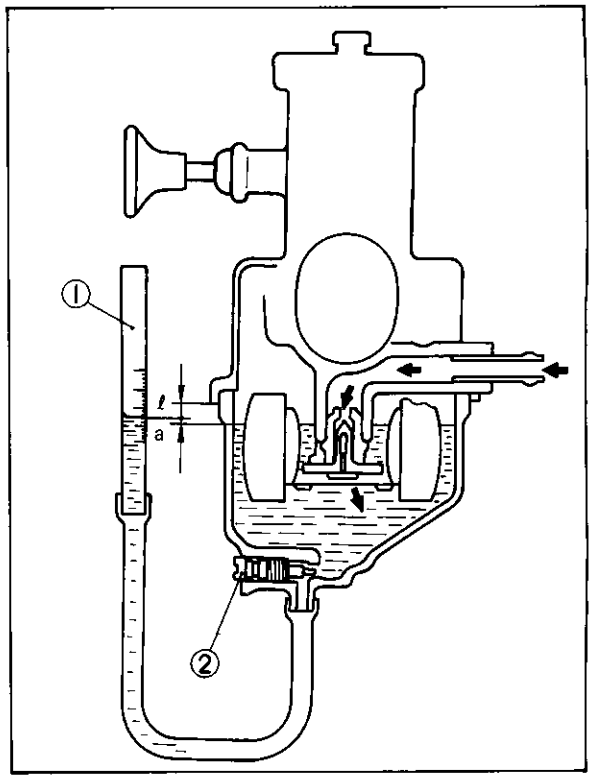
Before checking the fuel level, note the following:

1. Place the motorcycle on a level surface.
2. Adjust the motorcycle position by placing a suitable stand or a garage jack under the engine so that the carburetor is positioned vertically.

---

1. Connect the level gauge (special tool) or a vinyl pipe of 6 mm (0.24 in) in inside dia. to the float bowl nozzle.
2. Set the gauge as shown and loosen the drain screw.
3. Start the engine and stop it after a few minutes of run. This procedure is necessary to obtain the correct fuel level.
4. The fuel level should be in the specified range.

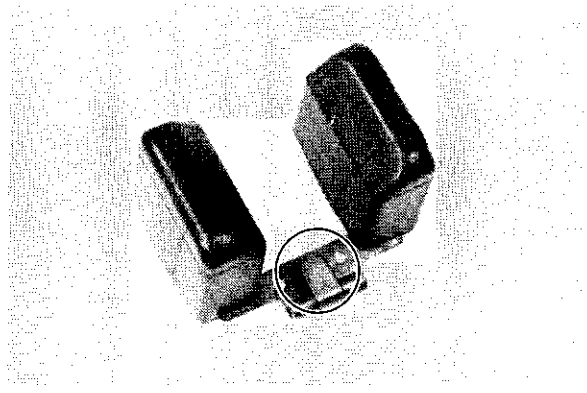
Specified range:
6.5 ~ 8.5 mm (0.256 ~ 0.334 in)
below the carb body edge



1. Fuel level gauge
2. Drain nozzle

ℓ. Fuel level (7.5 mm, 0.295 in)
a. Surface tension (2.0 mm, 0.08 in)

5. If the fuel level is incorrect, remove the carburetor from the motorcycle and check the fuel valve and float assembly for damage. Replace if damaged.
6. If no damage is found, correct the fuel level by slightly bending the float arm tang. Recheck the fuel level.



Float arm tang

COASTING ENRICHER

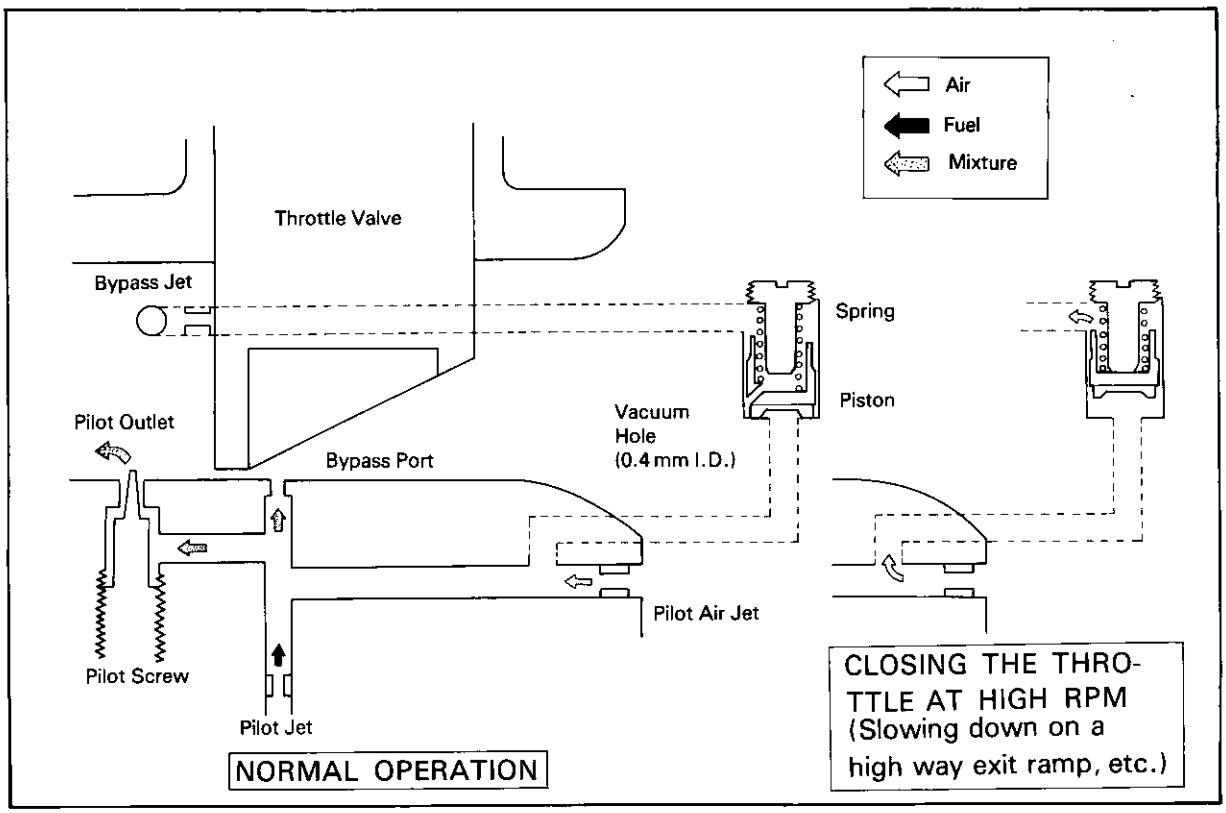
This model is equipped with an afterburning protection device (coasting enricher).

Afterburning is a phenomenon typical of the internal combustion engine. If throttle is precipitously closed on an engine revolving at high speed, a large amount of air mixed fuel spurts out of the pilot outlet (P.O), resulting in imcomplete burning in the combustion chamber. Such unburned elements are expelled together with exhaust gases and build up in the exhaust pipe or muffler. These elements, accumulated to the point of being inflammable, suddenly gets ignited and burned in contact with expelled gases of high temperature.

This phenomenon is refferred to "afterburning", which is basically accompanied with a loud explosive sound.

Operation of enricher

In the illustration, the valve (plunger) is pulled upward by the negative pressure developed as the result of the sudden closing of the throttle valve. Hence, the air-fuel mixture that was flowing to the pilot outlet and bypass port is now attracted to the bypass jet where relative negative pressure is higher, and the negative pressure acting on the pilot outlet increases the fuel flow that is taken in from the pilot jet with the resultant richer mixture.



Maintenance

Each individual plunger spring is rigorously tested for its preload and therefore must not be broken down or adjusted in any way. If an afterburning sound is heard during normal riding, clean the pilot air jet, pilot jet, and bypass port by blowing air into them.

CHAPTER 5. CHASSIS

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5

CHAPTER 5. CHASSIS

FRONT WHEEL

Checking Brake Shoe Wear

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

Front brake shoe diameter: 130 mm (5.12 in) Replacement limit: 132 mm (5.19 in) min.

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

Brake Drum

Oil or scratches on the inner surface or the brake drum will impair braking performance or result abnormal noises.

Remove oil by wiping with a rag soaked in lacquer thinner or solvent.

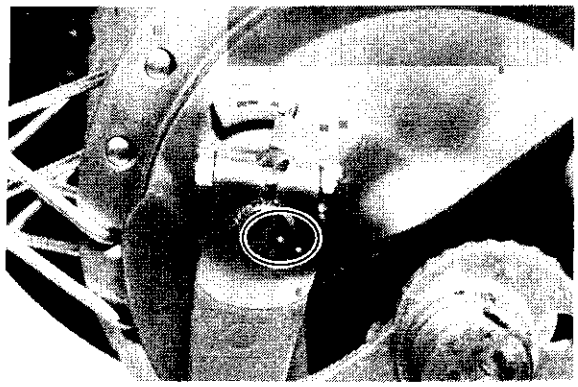
Remove scratches by lightly and evenly polishing with emery cloth.

Brake Shoe Plate

Remove the camshaft and grease. If the cam face is worn, replace.

WARNING:

When reassembling the cam lever, make sure a match mark on the cam lever and camshaft are alined. Or the cam lever touchs to the brake shoe plate, and cannot be operated properly.



Replacing Wheel Bearings

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

1. First clean the outside of the wheel hub.
2. Drive the bearing out by pushing the spacer aside (the spacer "floats" between the bearings) and tapping around the perimeter of the bearing inner race with a soft metal drift pin and hammer. Either or both bearings can be removed in this manner.
3. To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation. Use a socket that matches the outside race of the bearing as a tool to drive in the bearing.

Front Wheel Installation

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

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

Axle nut torque: 45 Nm (4.5 m-kg, 32.5 ft-lb)

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

REAR WHEEL

Removing the Rear Wheel

1. First remove the adjust nut and return spring from the brake rod; then, remove the brake rod and pin from the cam lever while pulling them apart.
2. Remove the cotter pin from the rear axle and loosen the axle nut.
3. The rear wheel can be removed by not necessarily cutting the chain.

Checking Brake Shoe Wear

See front wheel section, "Checking Brake Shoe Wear"

Rear brake shoe diameter: 110 mm (4.33 in) Replacement limit: 112 mm (4.41 in) min.

Brake Drum

See front wheel section, "Brake Drum".

Replacing Wheel Bearings

See front wheel section, "Replacing Wheel Bearings".

Installing Rear Wheel

The rear wheel can be reassembled by reversing the disassembly procedure. Note the following points.

1. When installing the chain, make certain the closed end of the joint link clip is facing direction of rotation.
2. Make sure the rear wheel axle is inserted on the right-hand side and that the chain pullers are installed with the punched side outward.
3. Make sure the rear wheel axle nut is properly torqued.

Tightening torque: 75 Nm (7.5 m-kg, 54.2 ft-lb)

RIMS AND SPOKES (FRONT AND REAR WHEELS)

Checking for Loose Spokes

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

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

Checking Rim "Run-Out"

See chapter 2, "Front brake and wheel".

TIRES AND TUBES

Removal

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

Installation

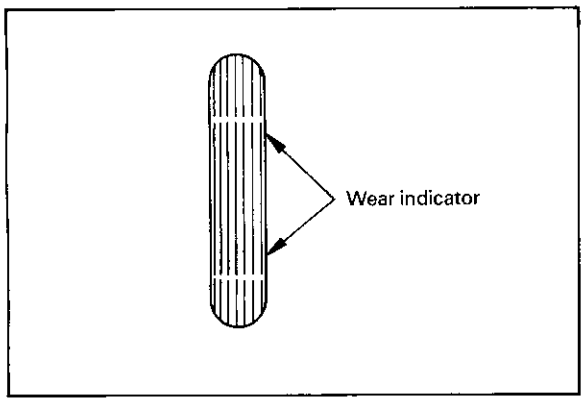
Reinstalling the tire and tube can be accomplished by reversing the disassembly procedure. The only difference in procedure would be right after the tubes has been installed, but before the tire has been completely slipped onto the rim, momentarily inflate the tube. This removes any creases that might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

Finally, inflate the tire.

	FRONT	REAR
Standard tire	Yokohama 3.00-17-4PR	Yokohama 3.50-16-4PR
Cold tire pressure Up to 90 kg (198 lb) load*	175 kPa (1.75 kg/cm², 24 psi)	200 kPa (2.0 kg/cm², 28 psi)
90 kg (198 lb) load ~ 156 kg (344 lb) load*	175 kPa (1.75 kg/cm², 24 psi)	220 kPa (2.2 kg/cm², 31 psi)
(Maximum load) High speed riding	175 kPa (1.75 kg/cm², 24 psi)	220 kPa (2.2 kg/cm², 31 psi)
Minimum tire tread depth	0.8 mm (0.03 in)	0.8 mm (0.03 in)

* Total weight of accessories, etc. excepting motorcycle.

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



DRIVE CHAIN AND SPROCKETS

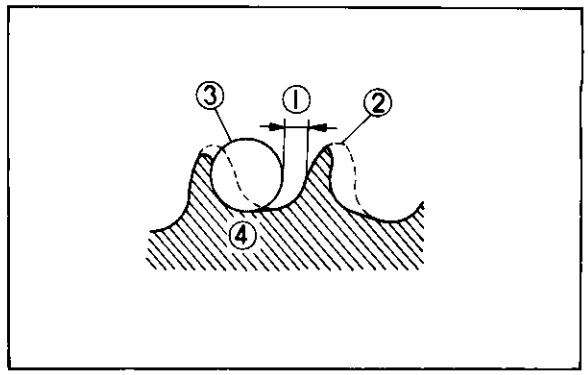
NOTE:

Please refer to General maintenance and Lubrication charts for additional information.

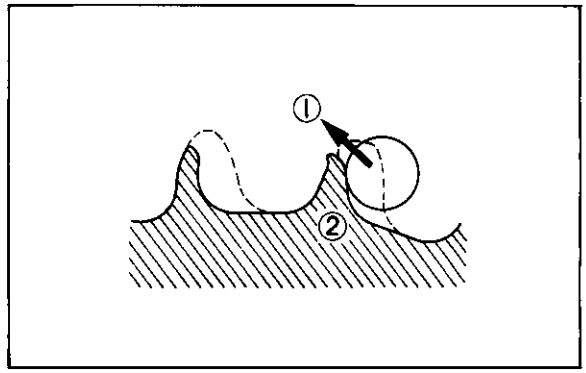
Drive Sprocket

1. Check sprocket wear. Replace if wear decreases tooth width as shown.
2. Replace if tooth wear shows a pattern such as that in the illustration, or as precaution and common sense dictate.
3. Tighten the securing bolts.

Drive Sprocket
Securing Bolt Torque:
10 Nm (1.0 m-kg, 7.2 ft-lb)



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

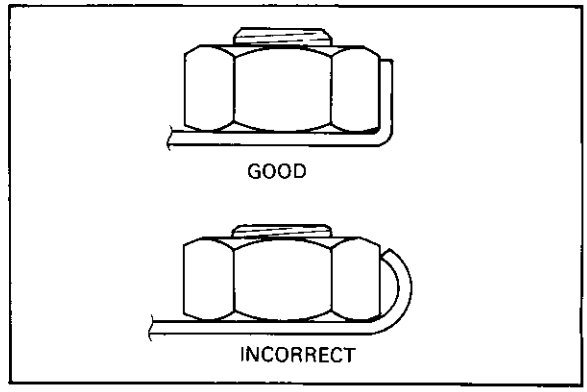


1. Slip off
2. Bent teeth

Driven Sprocket

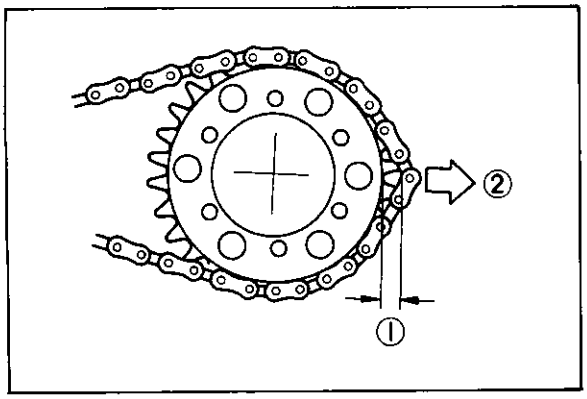
1. Check the sprocket wear using procedures for the drive sprocket.
2. Check the sprocket to see that it runs true. If bent, replace.
3. During reassembly, make sure that sprocket and sprocket seat are clean.
   Tighten the securing nuts in a crisscross pattern.
   Bend the tabs of the lock washers fully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

Driven Sprocket
Securing Nut Torque:
65 Nm (6.5 m-kg, 47 ft-lb)

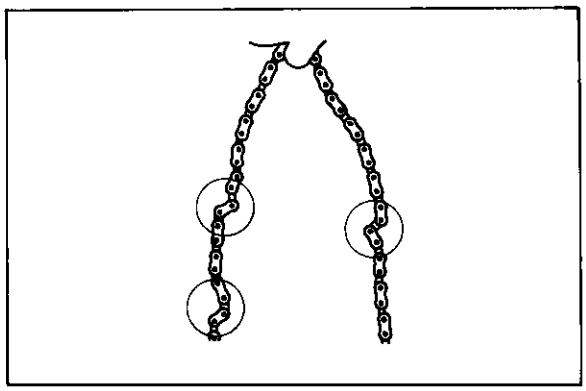


Chain Inspection

1. With the chain installed on the motorcycle, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect. (See page 3-2 for chain removal.)
   If any portion of the chain shows signs of damage, or if either sprocket shows signs of excessive wear, remove and inspect.
2. Check the chain for stiffness. Hold as illustrated. If stiff, soak in solvent solution, clean with wire brush, dry with high pressure air. Oil chain thoroughly and attempt to work out kinks. If still stiff, replace, chain.
3. Check the side plate for damage. Check to see if excessive play exists in pins and rollers. Check for damaged rollers. Replace as required.



a. Checking for excessively worn chain
1. 1/2 tooth
2. Pull



Chain Maintenance

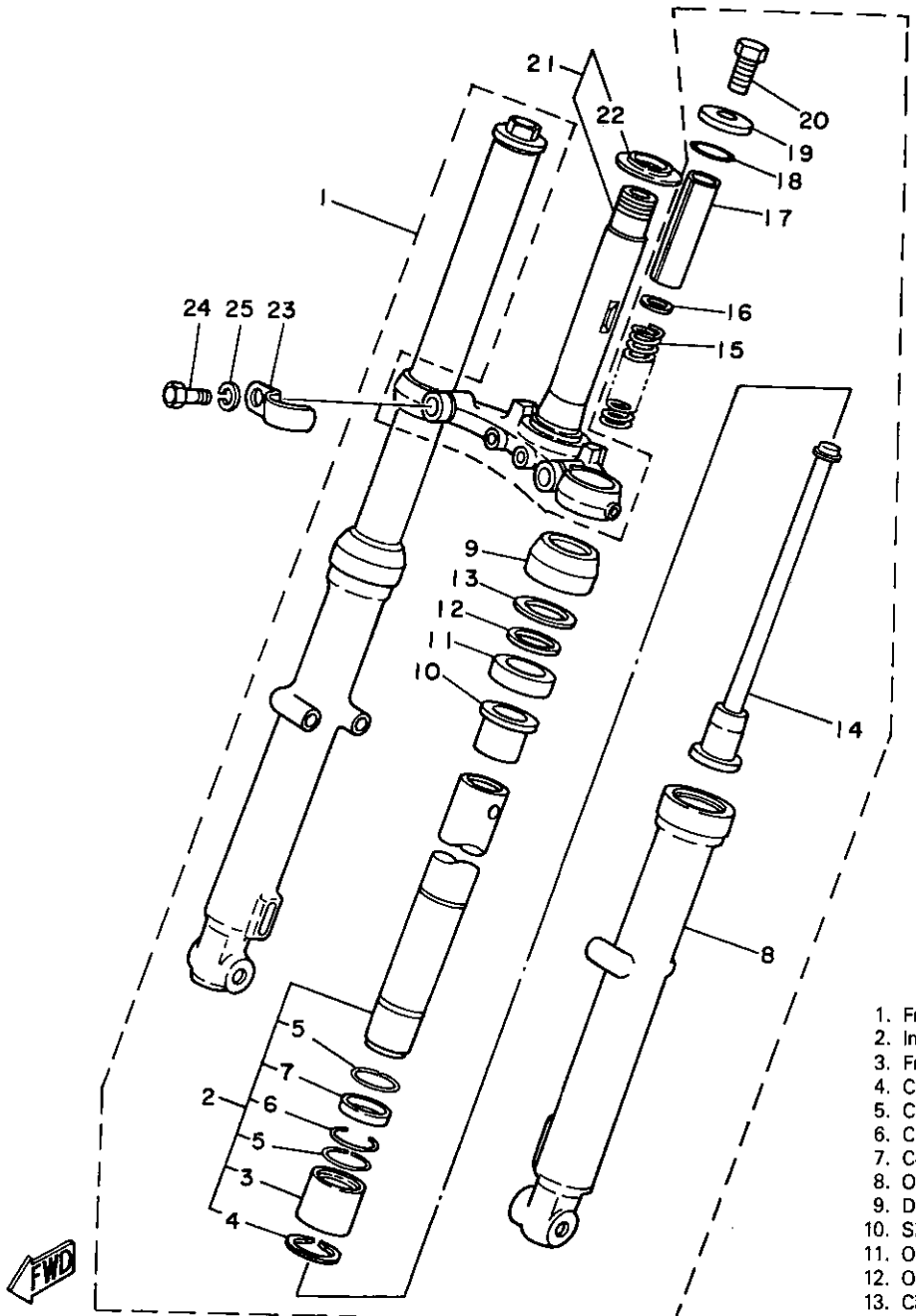
The chain should be lubricated according to the recommendations given in the General Maintenance/Lubrication charts, or more often if possible. (Preferably after every use.)

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

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

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

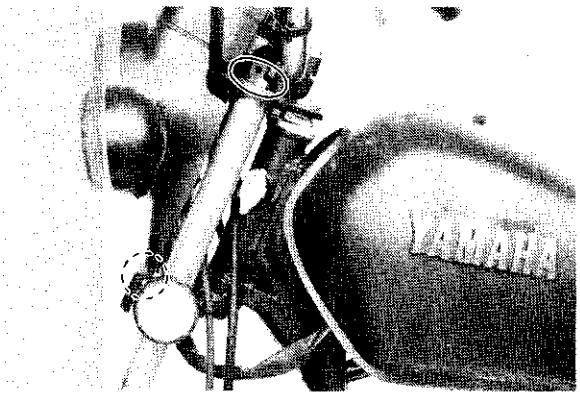
FRONT FORKS



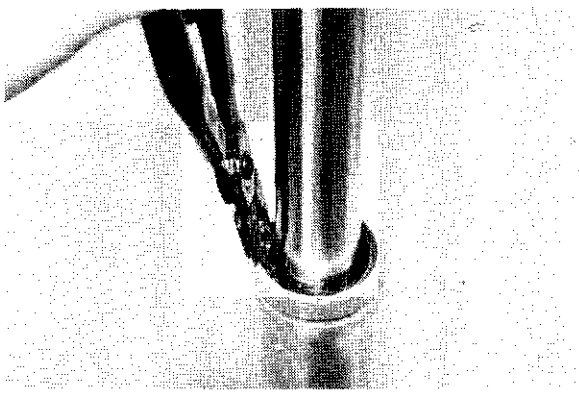
1. Front fork ass'y (L.H.)
2. Inner tube comp. 1
3. Front fork free-piston
4. Circlip
5. Circlip
6. Circlip
7. Collar
8. Outer tube 1
9. Dust seal
10. Slide metal 1
11. Oil seal
12. Oil seal washer
13. Circlip
14. Front fork cylinder comp.
15. Front fork spring
16. Plate washer
17. Spacer
18. O-ring
19. Plate washer
20. Bolt
21. Under bracket comp.
22. Ball race 1
23. Cable holder 1
24. Bolt
25. Spring washer

Disassembly

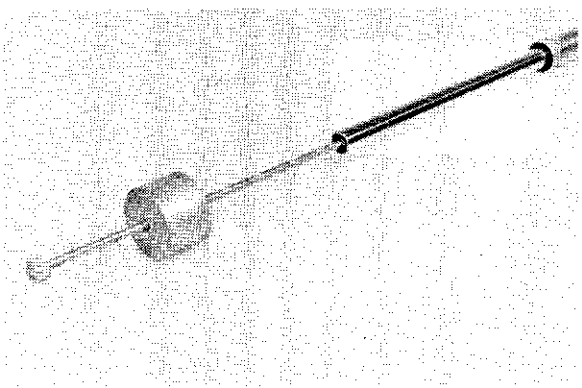
1. With the front wheel and front brake cable removed, the fork legs can be removed from the upper and lower brackets by loosening lower pinch bolts and removing.



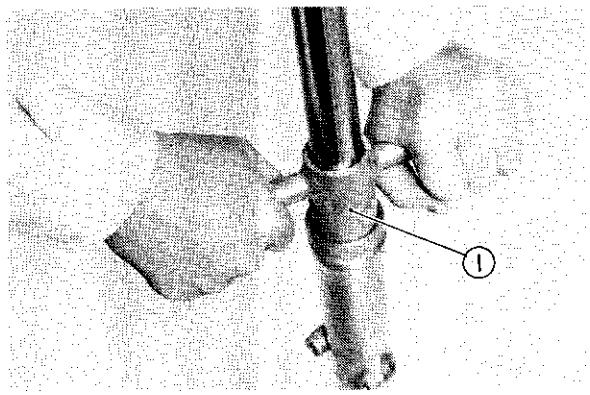
2. Drain the oil from both fork tubes.
3. Remove the circlip from the inner tube.



4. Screw the shock puller in the inner tube, pull out the inner tube.



5. Oil seal replacement
   Remove the old fork oil seal and install a new one.



1. Oil seal installer

Inspection

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

Assembly

1. When assembling the front fork, reverse the order of disassembly.
2. Installing the front forks
   a. Bring up the front fork to the correct position and partially tighten the under-bracket mounting bolt.
   b. Measure correct amount of oil and pour into each leg.

Recommended oil:
Yamaha fork oil 10Wt or equivalent

Quantity per leg:
184 cm^3 (6.49 Imp oz, 6.22 US oz)

NOTE:

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

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

5. Tighten all fitting bolts with specified torque.

Tightening torque:
Inner tube to handle crown (upper bracket): 48 Nm (4.8 m-kg, 35 ft-lb)
Inner tube to under bracket: 35 Nm (3.5 m-kg, 25 ft-lb)

STEERING HEAD

Adjustment

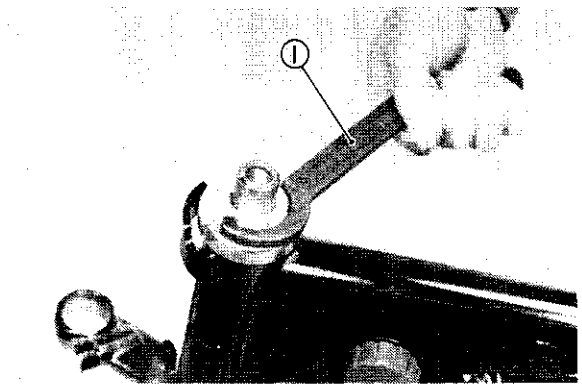
Refer to Chapter 2, Section 2-12, for steering head adjustment procedure.

Disassembly

1. Remove the following parts;
   a Head light unit
   b Flasher light (L.H and R.H.)
   c Head light body
   d Speedometer cable and electrical wiring connection
   e Brake and clutch cable
   f Steering fitting bolt and crown fitting bolts
   g Handle with handle crown
2. Remove the steering nut wrench with steering nut wrench.

NOTE:

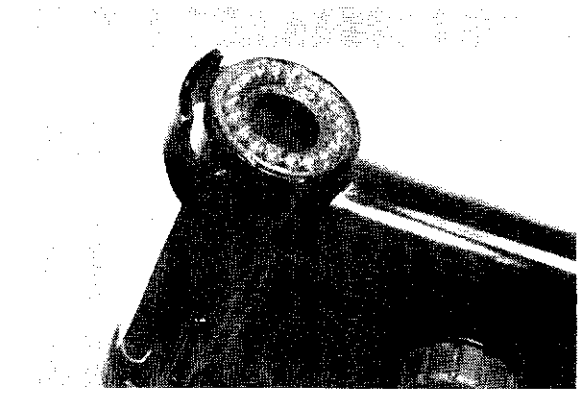
Support the under bracket with one hand to hold the bracket up into the head pipe so that the loose ball bearings will not fall out.



1. Steering nut wrench

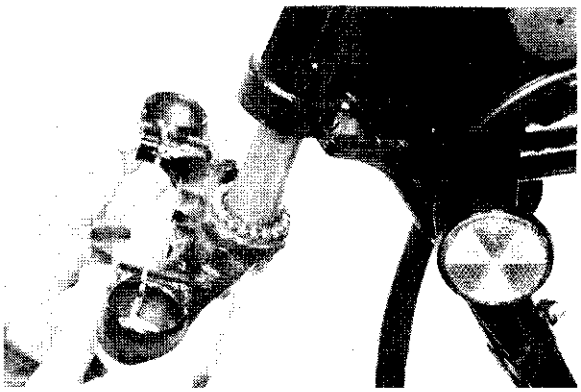
3. While still supporting the under bracket, carefully lift off the upper bearing cover.
4. Lift off the top bearing race and remove all of the ball bearings from the upper bearing assembly.

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

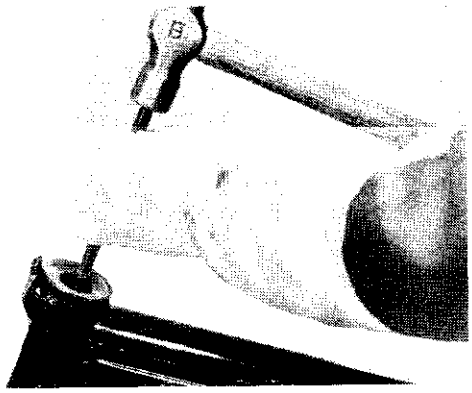


5. Remove the bracket while being very careful not to lose any ball bearings from the lower assembly.

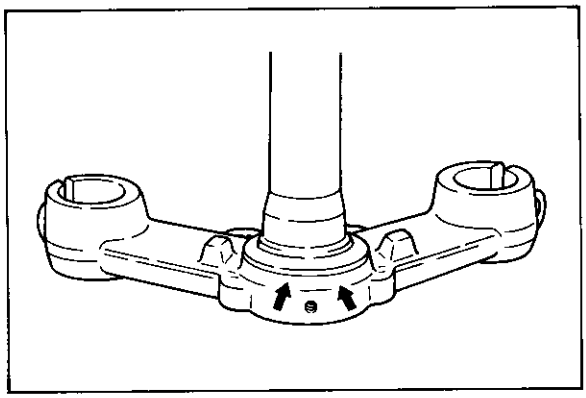
Ball quantity/size: 19 pcs., 1/4 in



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



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

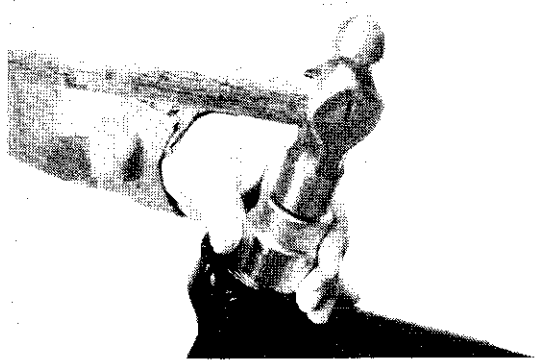


Inspection

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

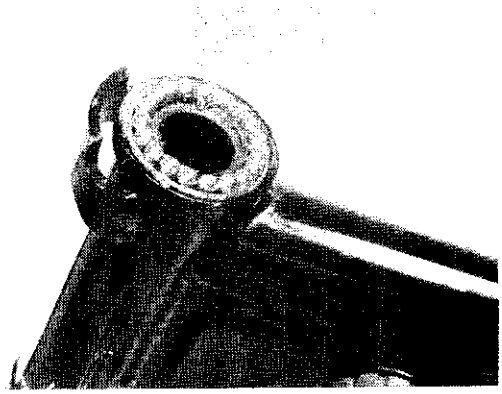
Installation

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

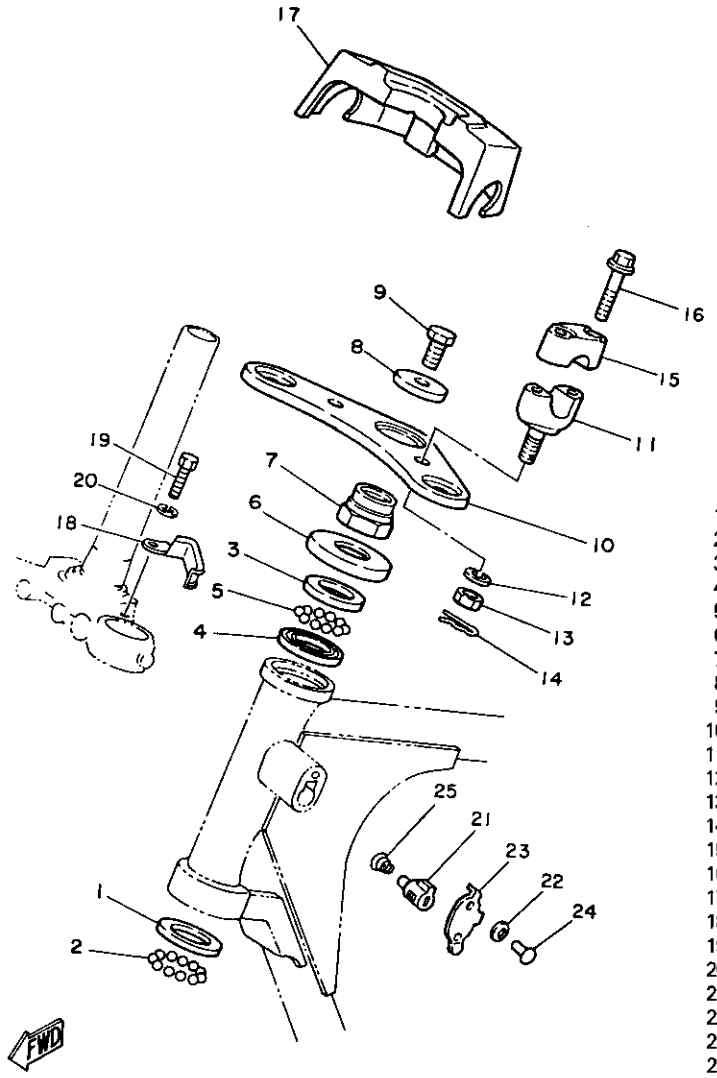


NOTE:

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



4. Carefully slip the underbracket stem up into the steering head. Hold the top bearing assembly in place so the stem does not knock and balls out of position.



1. Ball race 2
2. Ball
3. Ball race 1
4. Ball race 2
5. Ball
6. Ball race cover 2
7. Nut
8. Washer
9. Washer based bolt
10. Handle crown
11. Handle lower holder
12. Spring washer
13. Nut
14. Clip
15. Handle upper holder
16. Flange bolt
17. Upper cover
18. Cable holder
19. Bolt
20. Spring washer
21. Steering lock ass'y
22. Conical spring washer
23. Handle lock cap
24. Rivet
25. Conical spring

5. Set the upper bearing cover on and install the ring nut. Tighten the ring nut so that all freeplay is taken up, but so the bracket can still pivot freely from lock to lock. Recheck for freeplay after the entire fork unit has been installed. (Refer to Chapter 2. "Steering head adjustment".)
6. Install the fork tubes into the under-bracket.
7. Install the upper fork bracket. Tighten the steering fitting bolt. Torque to specification.

Tightening torque:
Steering fitting bolt:
45 Nm (4.5 m-kg, 32.5 ft-lb)

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

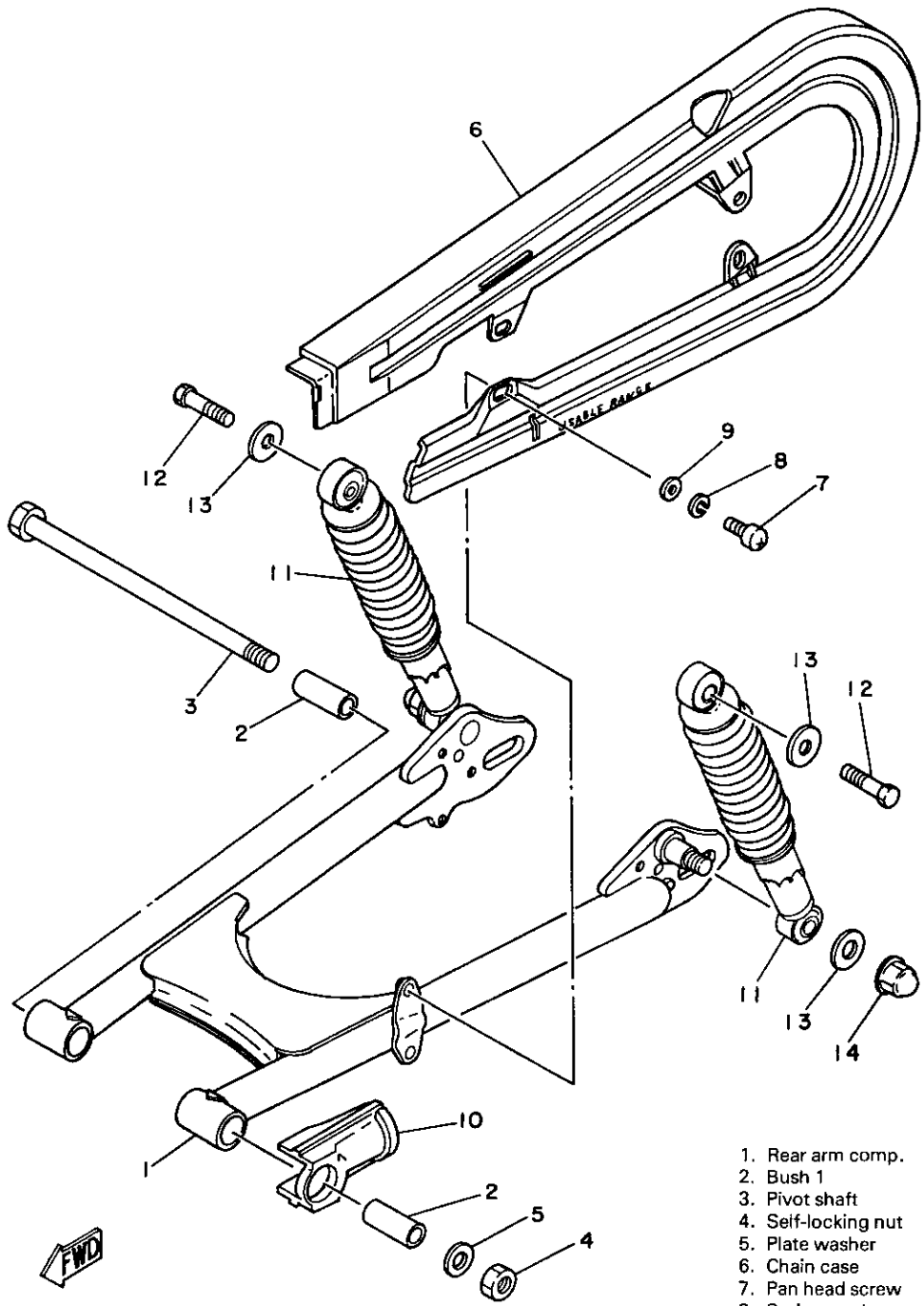
Upper fork tube bolt torque:
45 Nm (4.5 m-kg, 32.5 ft-lb)

9. Install the handlebars and torque to specification.

Handlebar mounting bolt torque:
20 Nm (2.0 m-kg, 14.4 ft-lb)

10. Install the front wheel.
11. Reconnect the clutch, front brake and check operation.

SWING ARM

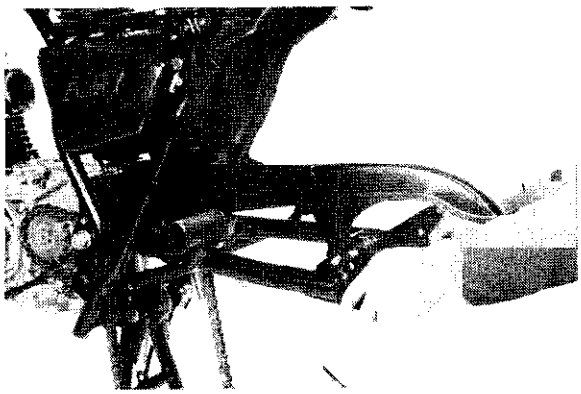


1. Rear arm comp.
2. Bush 1
3. Pivot shaft
4. Self-locking nut
5. Plate washer
6. Chain case
7. Pan head screw
8. Spring washer
9. Plate washer
10. Guard seal
11. Shock absorber ass'y
12. Bolt
13. Plate washer
14. Crown nut

Inspection

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

Swing arm freeplay: 1.0 mm (0.04 in)



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

Lubrication

1. This model is equipped with the oilles bushes, but it is recommended to apply grease on the bushes lightly.

Recommended lubricant: Lithium soap base grease

2. Wipe off excess grease.

Removal

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

NOTE:

Carefully remove the arm while noting the location of bushes, oil seal and plate washers.

Pivot shaft torque: 45 Nm (4.5 m-kg, 32.5 ft-lb)

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

NOTE:

Do not hammer in the bushes when installing; it may result in breakage to the bushes.

REAR SHOCK ABSORBER

Removal

1. Remove one rear shock absorber at a time, inspect and reinstall before removing the other.

Inspection

1. Check the rod. 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. Operate shock absorber rod to check damping. There should be no noticeable damping as shock extends.
4. Install the shock absorber on the motorcycle.

Rear shock absorber tightening torque: 35 Nm (3.5 m-kg, 25.5 ft-lb)

CABLES AND FITTINGS

Cable Maintenance

NOTE:

See General Maintenance/Lubrication Charts for additional information.

Cable maintenance is primarily concerned with preventing deterioration through rust and weathering and providing for proper lubrication to allow the cable to move freely within its housing.

Cable removal is straightforward and uncomplicated. Removal will not be discussed within this section. For details, see the individual maintenance section for which the cable is an integral part.

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

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

Recommended lubricant:
Yamaha chain and cable lube, or SAE 10W/30 motor oil

Throttle Maintenance

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

NOTE:

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

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

Lubrication of Levers, Pedals, etc.

1. Lubricate the pivoting parts of the brake and clutch levers with recommended lubricant.

Recommended lubricant:
Yamaha chain and cable lube, or SAE 10W/30 motor oil

2. Lubricate the shaft of the brake pedal with lithium soap grease.

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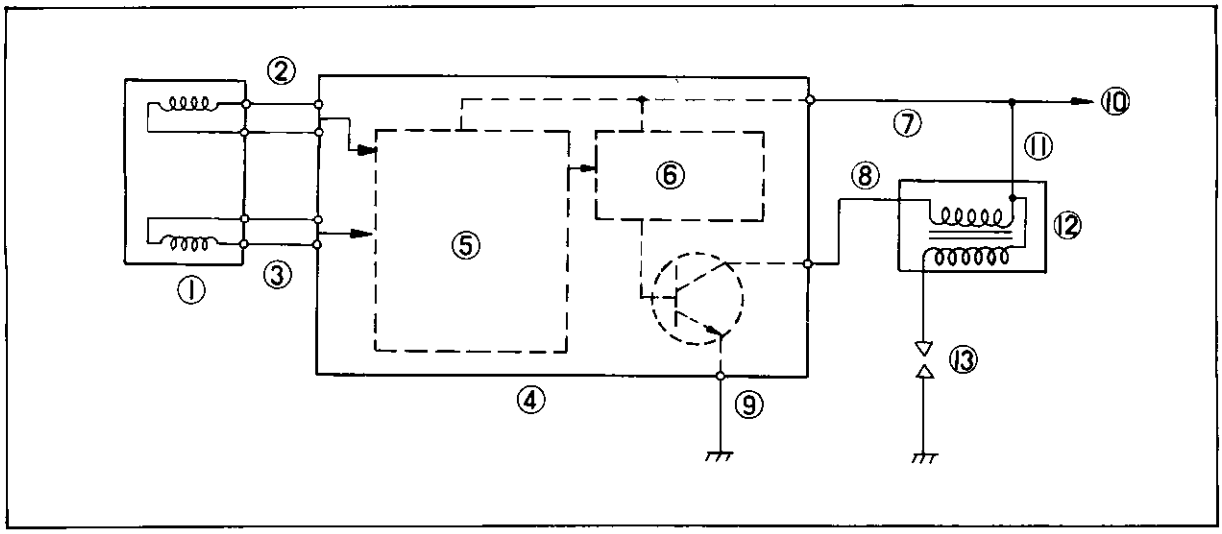
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CHAPTER 6. ELECTRICAL SYSTEM

IGNITION SYSTEM

Block Diagram



1. Pick-up coil
2. Green — Brown
3. Yellow — White
4. T.C.I. unit
5. Duty control, ignition advance control, and protective circuit
6. Amplifier
7. Red/White
8. Orange
9. Black
10. To engine stop switch
11. Red/White
12. Ignition coil
13. Spark plug

Description

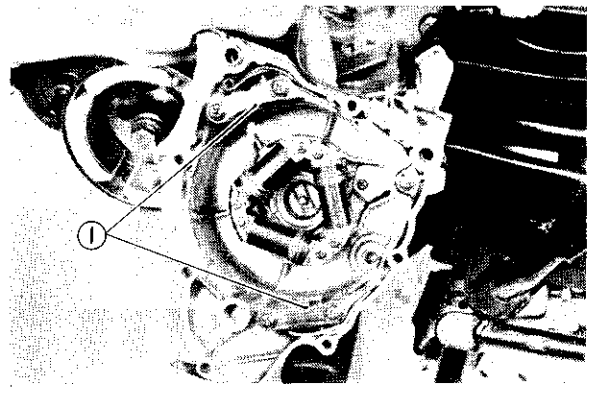
This model is equipped with a battery operated, fully transistorized breakerless ignition system. By using magnetic pick-up coil the need for contact breaker points is eliminated. This adds to the dependability of the system by eliminating frequent cleaning and adjustment of points and ignition timing. This TCI unit incorporates an automatic advance circuit controlled by signals generated by the pick-up coil. This adds to the dependability of the system by eliminating the mechanical advancer. This TCI (Transistor Control Ignition) system consists of two main units; a pick-up unit and an ignitor unit.

Operation

The TCI (Transistor Controled Ignition) functions on the same principle as a conventional DC ignition system with the exception of using magnetic pick-up coil and a T.C.I. unit in place of contact breaker points.

a. Pick-up unit

This unit consists of a pick-up coil and a magnet mounted on the generator base. When the rotor projection passes this pick-up coil, the two signals are generated at the pick-up coil and transmitted to the ignitor unit as a signal. The full ignition advance is determined by the length of the rotor projection.

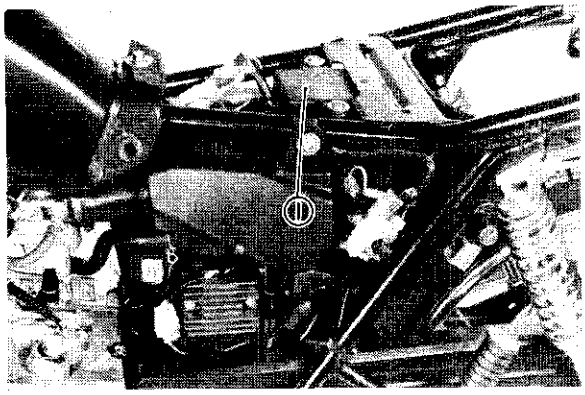


1. Pick-up coil

b. Ignitior Unit (T.C.I.)

This unit has such functions as the change of wave form, duty control, switching, and electrical ignition advance. The ignition timing is advanced electrically using two signals from the pick-up coil.

The duty control circuit is provided to control the on time period of the primary ignition current to reduce the electrical consumption. This unit also incorporates a protective circuit for the ignition coil. If the ignition switch is turned on and the crankshaft is not turned, the protective circuit stops current flow to the primary coil within a few seconds. When the crankshaft is turned over, the current is turned on again by the signals generated by the pick-up coil.



1. Ignitor unit

Ignition Timing

Refer to Chapter 2. "Ignitiion Timing".

If the ignition timing is not correct, replace the defective part.

Pick-up Coil Resistance Test

Use a pocket tester or equivalent ohmmeter to determine resistance and continuity of pickup coil windings.

Pickup Coil
Br — G, W — Y
230 Ω ± 10% at 20°C (68°F)

Spark Gap Test

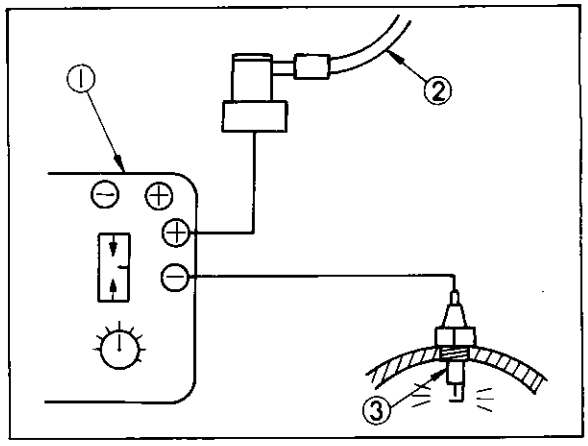
The entire ignition system can be checked for misfire and weak spark using the "Electro Tester"

If the ignition system will fire across a sufficient gap, the entire ignition system can be considered good.

If not, proceed with individual compoment tests until the problem is found.

1. Warm-up engine thoroughly so that all electrical components are at operating temperature.
2. Stop engine and connect tester as shown.
3. Start engine and increase spark gap until misfire occurs. (Test at various speed between idle and red line.)

Minimum Spark Gap: 6 mm (0.24 in)



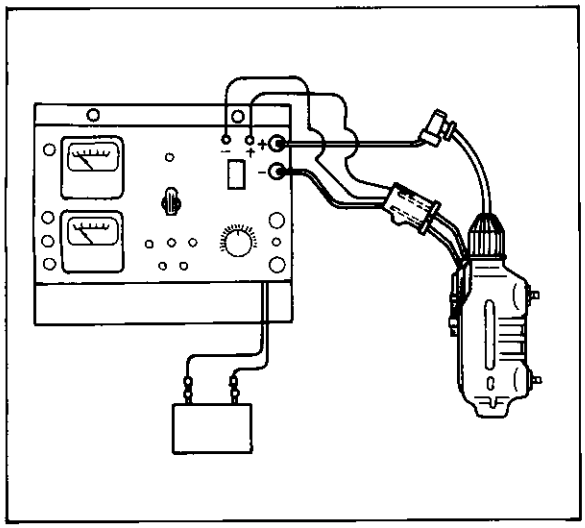
1. Electro tester
2. Plug wire from ignition coil
3. Spark plug

CAUTION:

Do not run engine in neutral above 6,000 r/min for more than 1 or 2 seconds.

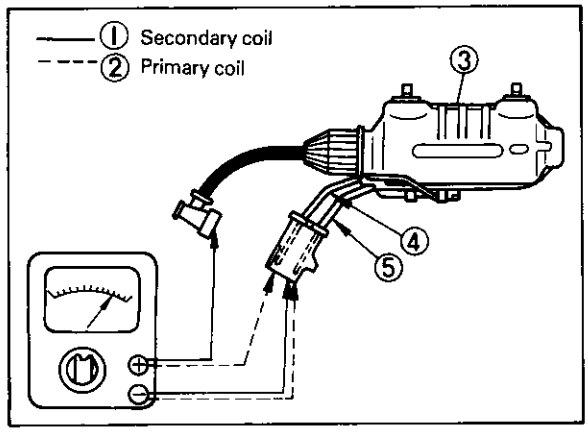
Ignition Coil Test

1. Coil spark gap test
   a. Remove the fuel tank and disconnect ignition coil from wire harness and the spark plug.
   b. Connect the Electro Tester as shown.
   c. Connect fully charged 12V battery to tester.
   d. Turn on spark gap switch and increase gap until misfire occurs.



Minimum Spark Gap: 6 mm (0.24 in)

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

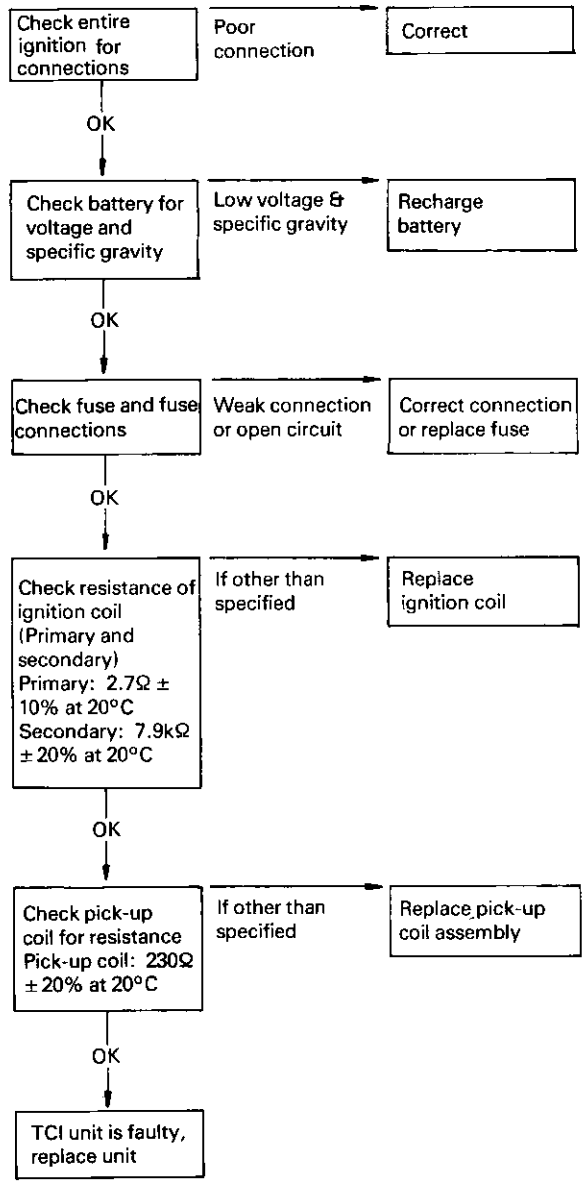


3. Ignition coil
4. Red/White
5. Orange

Primary Coil resistance Use (Ω × 1) scale	Secondary Coil resistance
2.75Ω ± 10% at 20°C	7.9kΩ ± 20% at 20°C

Troubleshooting

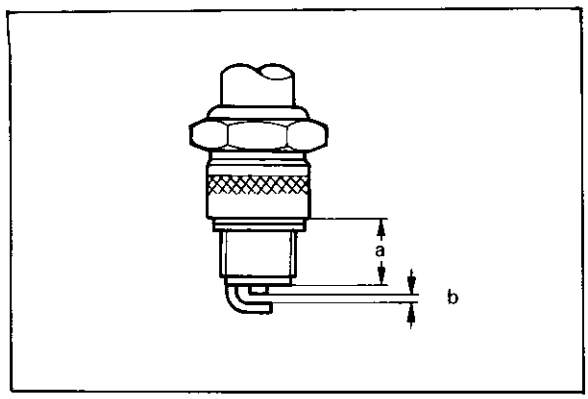
If the ignition system should become inoperative, the following troubleshooting aids will be useful.



SPARK PLUG

1. Check the electrode condition and wear, insulator color and electrode gap.
2. Use a wire gauge for measuring the plug gap.
3. If the electrodes become too worn, replace the spark plug.
4. When installing the plug, always clean the gasket surface. Wipe off any grime that might be present on the surface of the spark plug, and torque the spark plug properly.

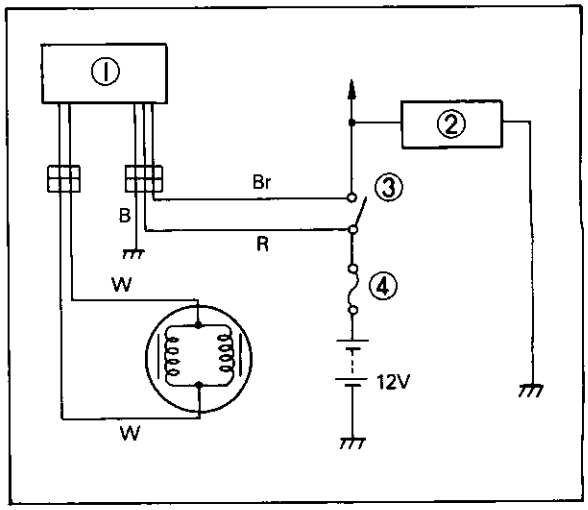
Type:
D7EA (NGK)
Electrode gap:
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
Tightening torque:
18 Nm (1.8 m-kg, 13.0 ft-lb)



a. 19 mm (0.75 in)
b. 0.7 ~ 0.8 mm (0.027 ~ 0.031 in)

CHARGING SYSTEM

Block Diagram

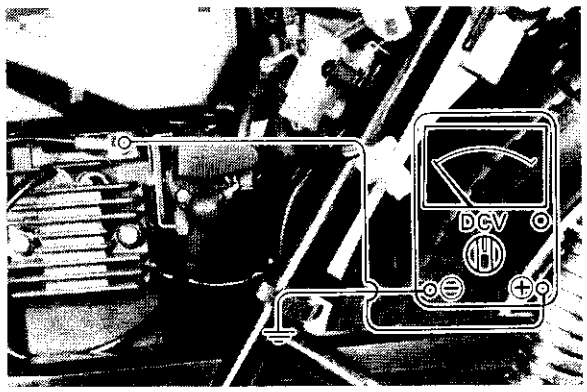


1. I.C. voltage regulator
2. Load
3. Main switch
4. Fuse

A.C. Magneto Generator Output Test

1. Checking method.
1) Connect D.C. voltmeter to the battery terminals.
2) Start the engine.
3) Accelerate engine to approximately 2,000 r/min or more and check generated voltage.

Generated voltage: 14.5 ± 0.5V



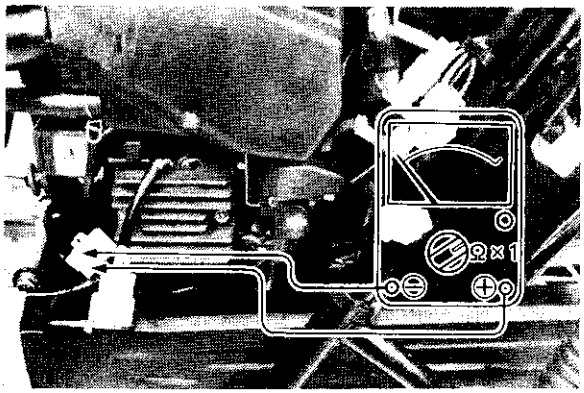
1. Battery

CAUTION:

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.

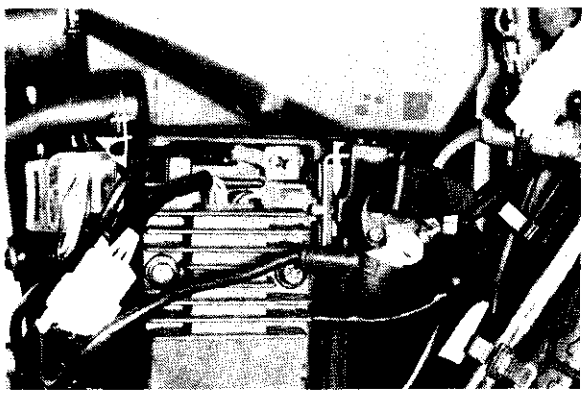
2. Resistance test of charging coil
   Check the resistance between terminals. If resistance is out of specification, check the coil connections. If the coil connections are good, then the coil is broken inside and it should be replaced.

Charging coil resistance: WHITE ~ WHITE 0.52Ω ± 10% at 20°C (68°F)

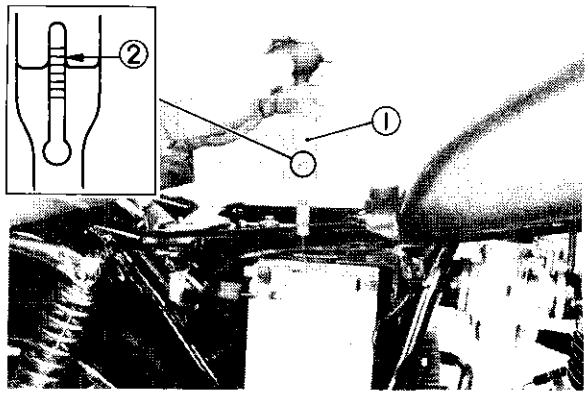


I.C. Voltage Regulator with Rectifier

1. Inspection
   Since I.C. 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.

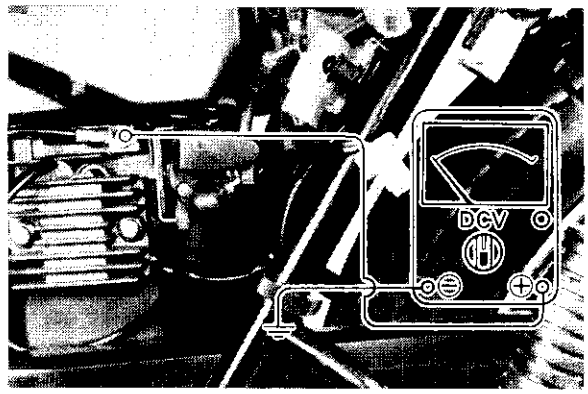


2. Checking method
   a. Measure the specific gravity of the battery, fluid. If it is less than 1.280, remove the battery and recharge until it is more than 1.280. (See page 6-7 for charging procedures)



1. Hydrometer
2. Reading

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



1. Battery

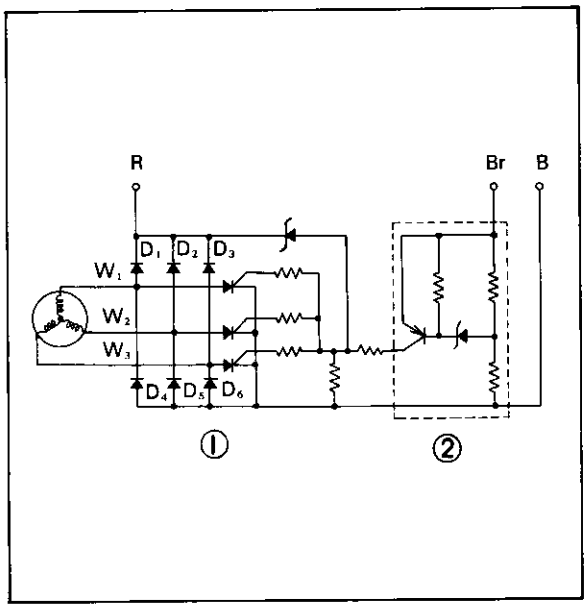
   c. Start engine.
   d. Accelerate engine to approximately 2,000 r/min. or more and check regulated voltage.

Regulated voltage: 14.5 ± 0.5V

   e. If voltage is off, check battery and generator. If generator and battery 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 motorcycle, the battery should not be removed, and it should be fully charged.
3. Never use a high voltage insulation ohmmeter such as a megaohmmeter for such a test. If high voltage is applied to the regulator terminals, the regulator will be damaged.



1. Rectifier
2. Regulator

3. Checking the silicon rectifier
   a. Check the silicon rectifier as specified using the Yamaha pocket tester.
   b. Even if only one of the elements is broken, replace the entire assembly.

NOTE:

In the following table, symbols W_1, W_2, W_3, W_4 are provided just for checking purposes; these are not shown on the actual motorcycle.

Checking element	Pocket test connecting point (+) (red)	Pocket test connecting point (−) (black)	Good	Replace (element shorted)	Replace (element opened)
D_1	R	W_1	○	○	×
	W_1	R	×	○	×
D_2	R	W_2	○	○	×
	W_2	R	×	○	×
D_3	W_3	R	○	○	×
	R	W_3	×	○	×
D_4	W_1	B	○	○	×
	B	W_1	×	○	×
D_5	W_2	B	○	○	×
	B	W_2	×	○	×
D_6	W_3	B	○	○	×
	B	W_3	×	○	×

CAUTION:

The silicon rectifier can be damaged if subjected 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.

LIGHTING SYSTEM

Lighting Circuit

See Chapter 7. "Wiring Diagram"

Battery

The battery fluid should be checked at specified intervals.

1. Checking
   a. If sulfation (white accumulations) occurs on plates due to lack of battery electrolyte, the battery should be replaced.
   b. If the bottom of the cells are filled with corrosive material falling off plates, the battery should be replaced.
   c. If the battery shows the following defects, it should be replaced.

1) The voltage will not rise to a specific value even after long hours charging.
2) No gassing occurs in any cell.

2. 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.

a. Negligence in keeping battery topped off with distilled water.
b. Battery being left discharged.
c. Over-charging by rushing charge.
d. Freezing.
e. Filling with water or sulfuric acid containing impurities.
f. Improper charging voltage/current on new battery.

Battery type	12V, 12AH
Electrolyte	Specific gravity: 1.280 Quantity: 600 cm^3
Re-charging current	1.2 Amperes/10 hours (or unit specific gravity reaches 1.280)
Re-fill fluid	Distilled water to maximum level line
Re-fill period	Check once per month or more often as required

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

a. Recharge the battery.
b. Store the battery in a cool, by place, and avoid temperatures below 0°C (32°F).
c. Recharge the battery before reinstallation.

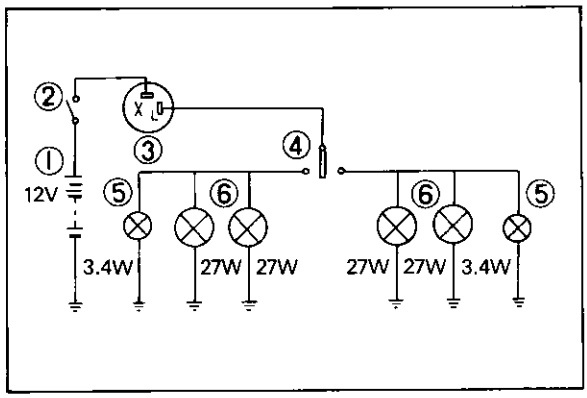
Lighting Tests and Checks

The 12V battery provides power for operation of the horn, taillight, brakelight, neutral light and flasher lights, etc. If none of the above operate, always check battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery water, or a defective charging system. See 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. Brakelight does not work.
a. Replace bulb.
b. Check for 12V on yellow wire to brakelight.
c. Check for 12V on brown wire to each brake switch (front brake and rear brake switches)
d. Check for ground on black wire to tail/brakelight assembly.
3. Taillight does not work.
a. Replace bulb.
b. Check for 12V on blue wire.
c. Check for ground on black wire to tail/brakelight assembly.
4. Flasherlight(s) do not work.
a. Replace 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 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.

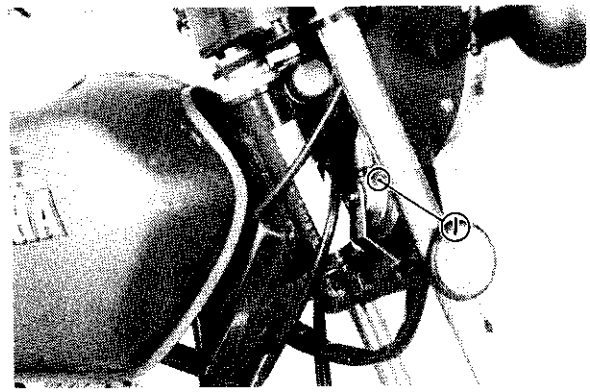
Flasher Relay and Horn

1. Flasher relay:
   The flasher relay is employed 12V, heat ribbon type.



1. Battery
2. Main switch
3. Flasher relay
4. Flasher switch
5. Flasher indicator light
6. Flasher light

2. Horn:
   The horn is a 12V, plane type, and has a tone volume adjusting screw on its back.



1. Adjusting screw

Switches

The main switch and right and left handlebar switches may be checked for continuity or shorts with a Pocket Tester on the (Ω — 1) scale.

1. Main switch

	R	Br
ON	○—○	
OFF		

2. Engine stop switch

	Br	R/W
OFF		
RUN	○—○	
OFF		

3. Dimmer switch

	Y	L/B	G
HI	○—○		
LO		○—○	

4. Flasher switch

	Dg	Br/W	Ch
R	○—○		
N			
L		○—○	

5. Horn button

	P	Ground
OFF		
PUSH	○—○	

6. "Start" botton

	Br	L/B	L/W	Ground
	○—○			
PUSH			○—○	

STARTING CIRCUIT

A. Operation

The starting circuit on this model consists of the starter motor, starter relay, starter cut-out relay, and the starting-circuit cut-off relay. If the engine stop switch and the main switch are both on, the starter motor can operate only if:

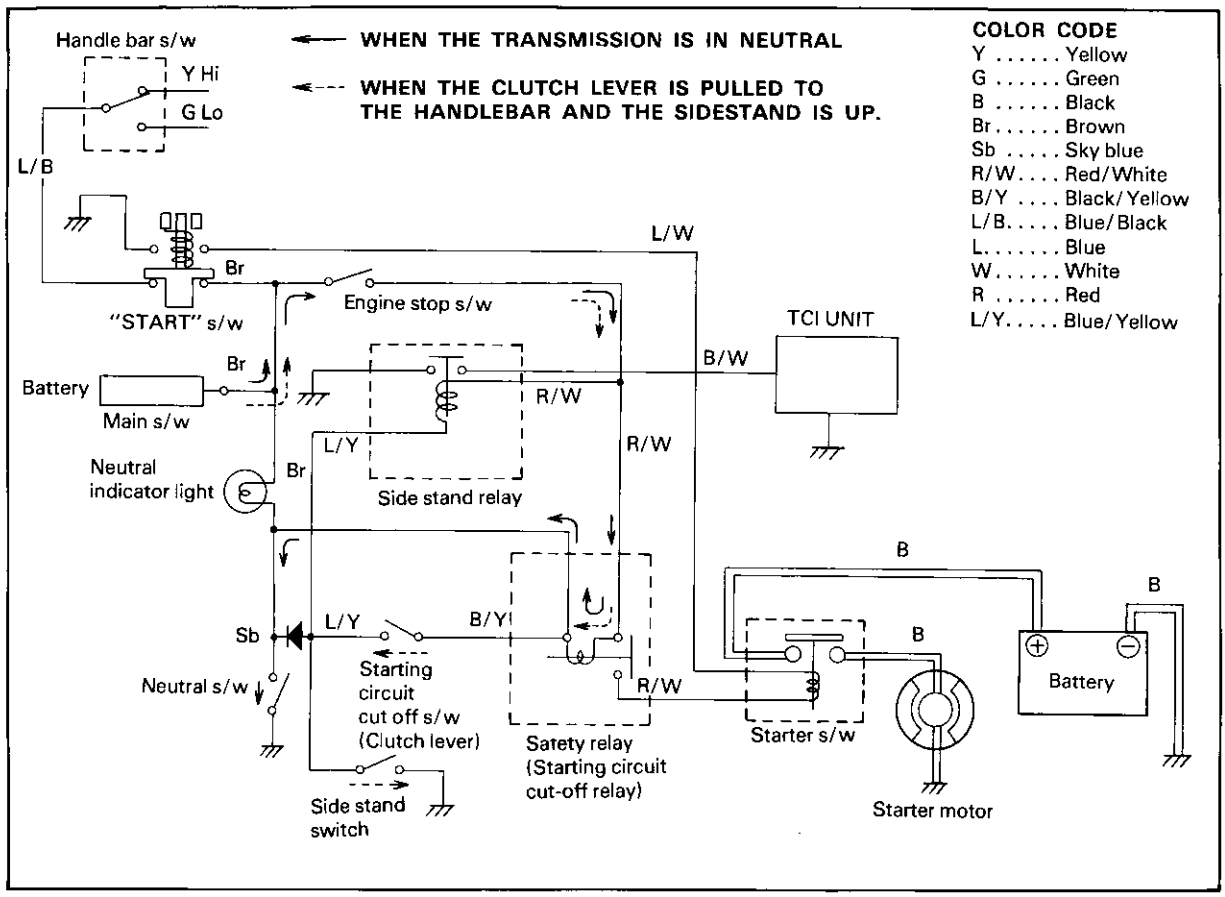
a. The transmission is in neutral (the neutral switch is on).

or if

b. The clutch lever is pulled to the handlebar (the clutch switch is on) and the sidestand is up (the sidestand switch is on).

▲ The starting-circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting-circuit cut-off relay is off so current cannot reach the starter motor.

When one or both of the above conditions have been met, however, the starting-circuit cut-off relay is on, and the engine can be started by pressing the starter switch. In addition, the starter switch is so constructed that when the "START" switch is turned on, the headlight goes off.



Function of the Diode

When the transmission is in a position other than Neutral:

Turning on the side stand switch (side stand switch on) makes electrical closed circuit.

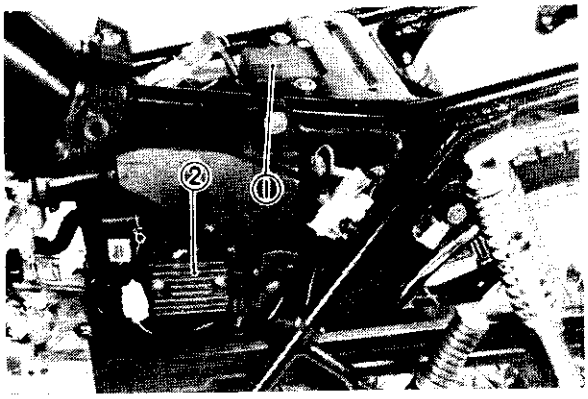
In this case, the diode interrupts the flow of current from the main switch to the neutral indicator light and to the side stand switch, and thus the light will not come on.

Sidestand relay

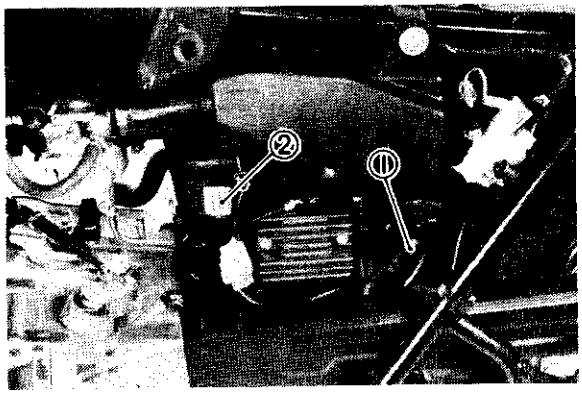
The sidestand relay operates by shorting the TCI control current. When the sidestand is down, the sidestand relay is closed, and the TCI control current is grounded through the sidestand relay. Thus, the engine will not run with the sidestand down unless the transmission is in neutral.

B. Inspection

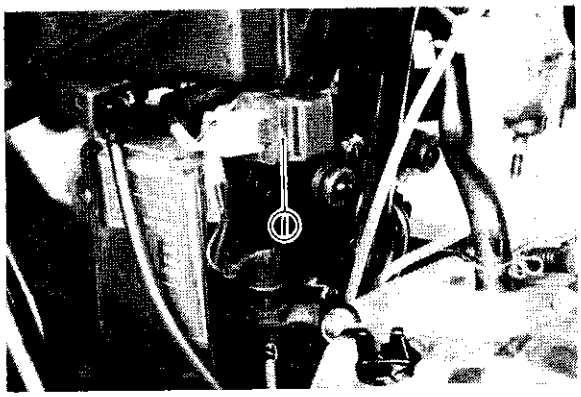
Situation of electrical compoment



1. Igniter unit (TCI unit)
2. IC regulator rectifier



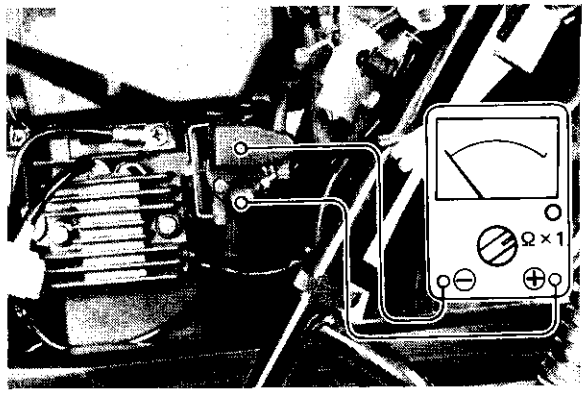
1. Starter relay
2. Starter circuit cutoff relay



Side stand safty relay

Starter Relay Switch Inspection

1. Disconnect starter relay leads at the relay.
2. Connect pocket tester leads to the relay terminals (ohms × 1 scale).
3. Turn ignition to "ON" position and engine stop switch to "RUN".
4. Push the starter button. The relay should click once and the scale should read zero does not read zero, the relay must be replaced.

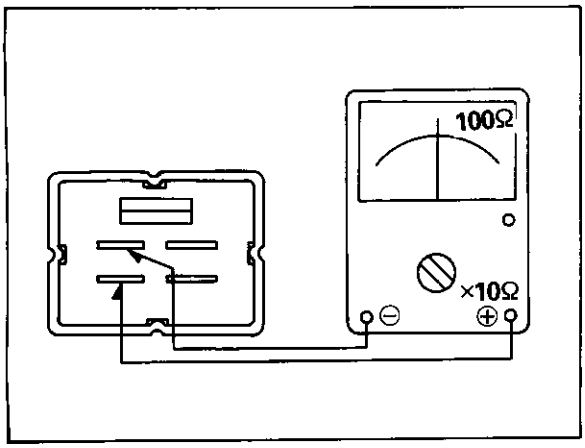


1. Battery lead wire (+)
2. Starter motor lead wire

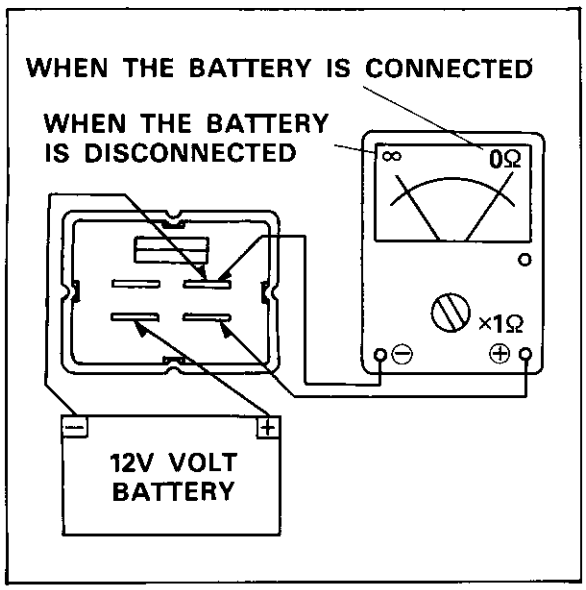
5. If the relay does not click, check the wires from the starter button and from the battery. Turn the ignition off. Use (ohms × 1) scale on tester. The resistance between (red/white, blue/white) wires should be no more than 3.5 ohms. If there is more resistance, the relay should be replaced.

STARTING-CIRCUIT CUT-OFF RELAY

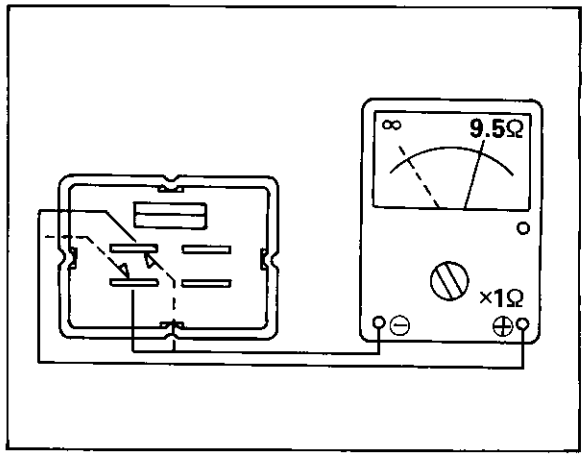
Check the resistance of the relay coil windings with the pocket tester. If the resistance is not within specification, replace the relay.



Check the relay function with a 12 volt battery and the pocket tester. Connect the leads as shown in the illustration. If the resistance readings do not equal those shown in the illustration, replace the realay.



Check the diode in the starting circuit cut-off relay with the pocket tester as shown in the illustration. Replace the relay if the diode is damaged.

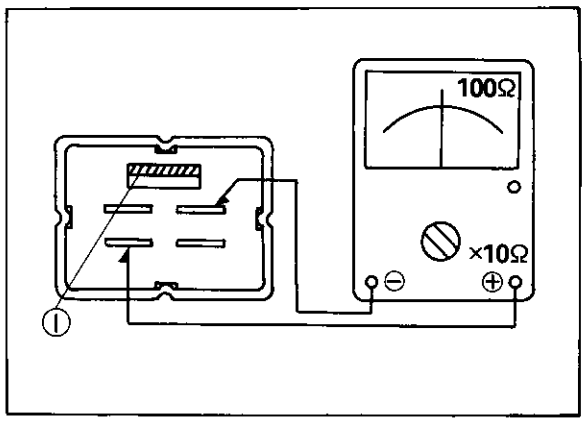


NOTE:

Only the Yamaha Pocket Tester will give a 9.5Ω reading when testing continuity. The particular characteristics of other testers will vary the continuity test readings.

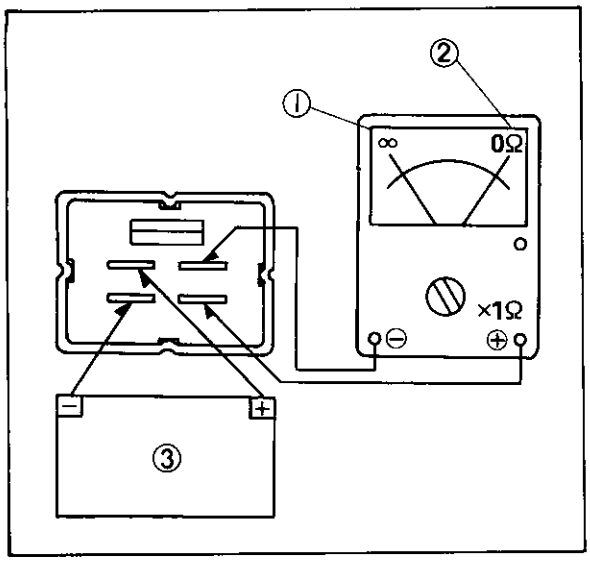
SIDESTAND RELAY

Check the resistance of the relay coil windings with the pocket tester. If the resistance is not within specification, replace the relay.



1. Blue

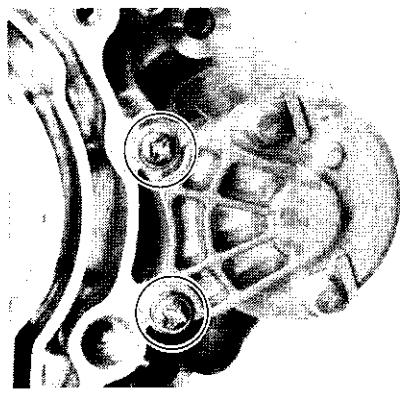
Check the relay contact breaker points with the pocket tester and a 12 volt batttery. Connect the leads as shown in the illustration. If the resistance readings do not equal those shown in the illustration, replace the relay.

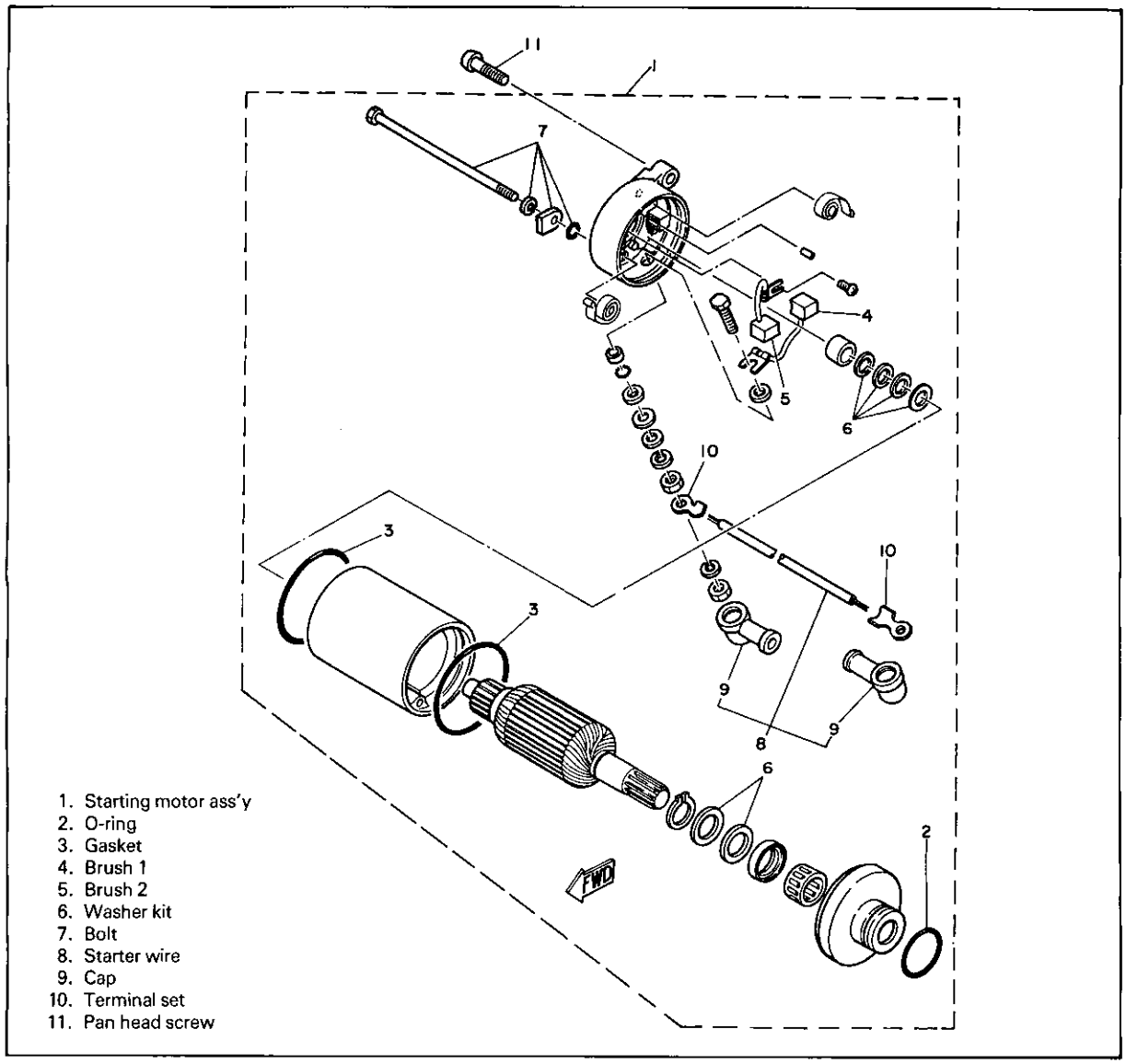


1. When the battery is connected
2. When the battery is disconnected
3. 12 volt battery

Starter Motor Removal

1. Disconnect the wires from the battery. Remove the negative wire first.
2. Disconnect the wires from the starter motor.
3. Remove the starter motor by loosening two securing bolts.
4. Place an oil pan under the engine, and drain the engine oil.





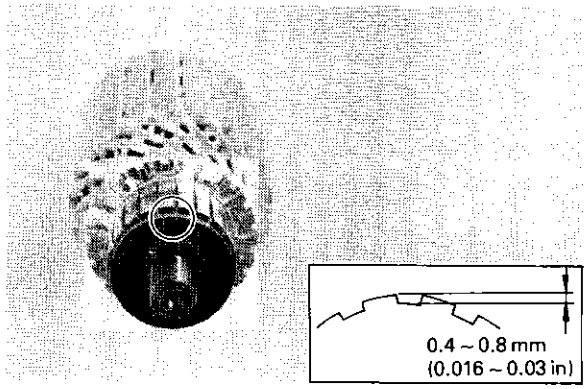
1. Starting motor ass'y
2. O-ring
3. Gasket
4. Brush 1
5. Brush 2
6. Washer kit
7. Bolt
8. Starter wire
9. Cap
10. Terminal set
11. Pan head screw

Starter Motor Inspection

1. Check the outer surface of the commutator. If its surface is dirty, clean with No. 600 grit sand paper.
2. The mica insulation between commutator segments should be 0.4 ~ 0.8 mm (0.016 ~ 0.03 in) below the segment level. If not, scrape to proper limits with appropriately shaped tool. (A hack saw blade can be ground to fit.)

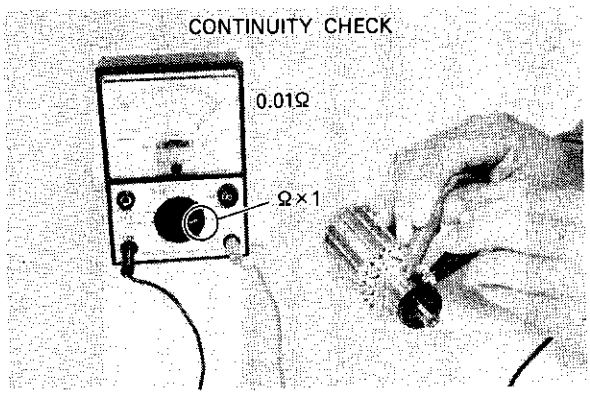
NOTE:

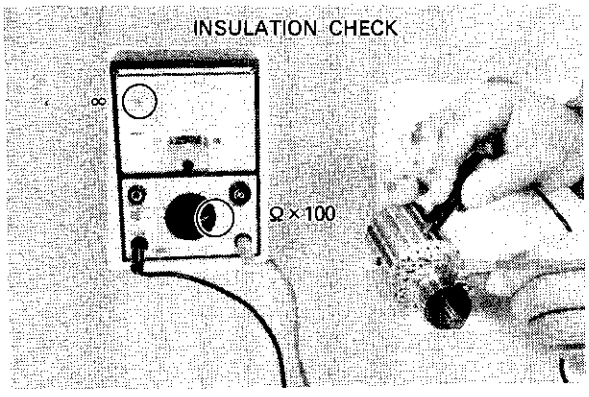
Mica insulation of commutator must be undercut to ensure proper operation of commutator.



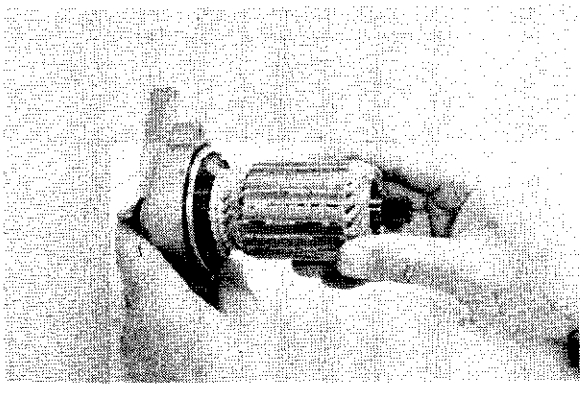
3. The starter's armature should be checked with an ohm meter for insulation breakdown (shorting to each other or to ground) and for continuity. Reference figure is given below.

Coil resistance:
Armature coil: 23 mΩ at 20°C (68°F)



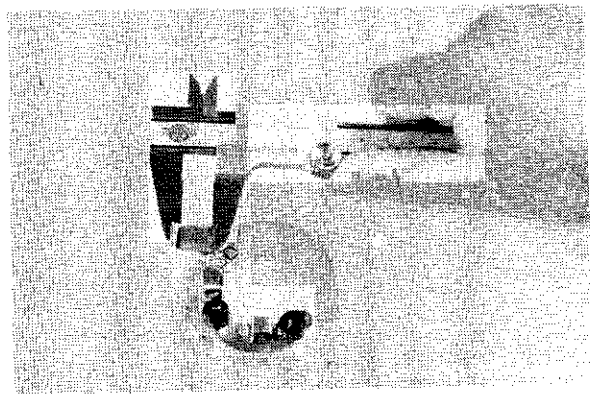


4. Check the front and rear cover bushes for damage. If damaged, the starter assembly must be replaced.



5. Check brush length. Replace brush if at, or near, limits.

Minimum brush length: 5.5 mm (0.22 in)



6. Check brush spring pressure. Compare it with a new spring. Replace the old spring if it is weak.

STD spring pressure: 600 gr (132 lb)

CHAPTER 7. APPENDICES

SPECIFICATIONS 7-1
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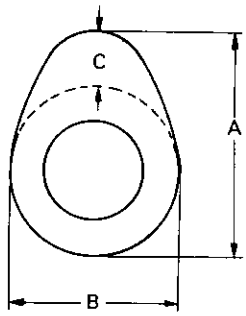
SPECIFICATIONS

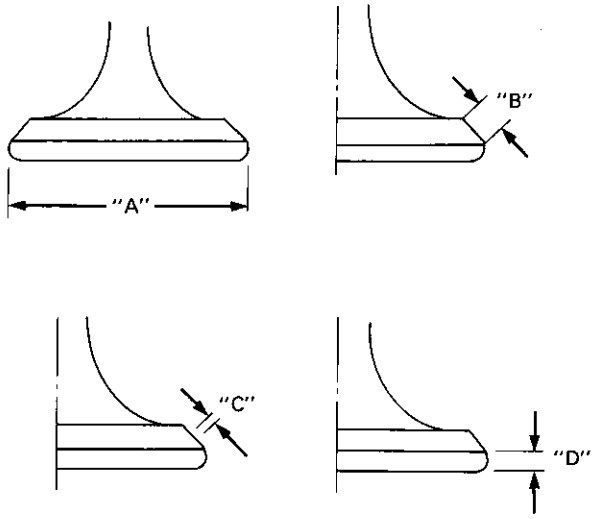
General Specifications

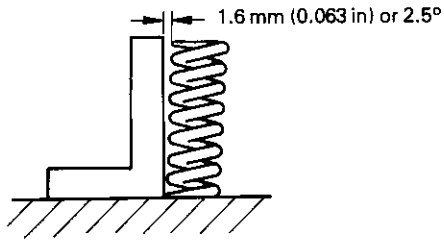
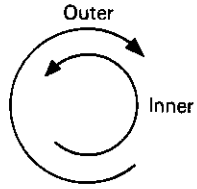
Item	Required ≪Allowance≫
Model:	
I.B.M. No.	5H0
Frame I.D. and starting number	5H0-000101
Engine I.D. and starting number	5H0-000101
Dimension:	
Overall length	1,940 mm (76.4 in)
Overall width	805 mm (31.7 in)
Overall height	1,085 mm (42.7 in)
Wheelbase	1,280 mm (50.4 in)
Minimum ground clearance	155 mm (6.1 in)
Weight:	
Net weight	103 kg (227 lb)
Performance:	
Climbing ability	23°
Minimum turning radius	2,000 mm (78.7 in)

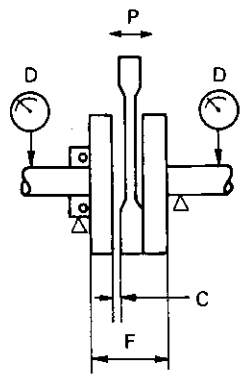
Engine Sepcifications

Item	Required ≪Allowance≫
Description:	
Engine type	Air cooled 4-stroke, forward incline, single, S.O.H.C.
Engine model	5H0
Displacement	184 cm^3
Bore × stroke	65 × 55.7 mm (2.559 × 2.193 in)
Compression ratio	9.5 : 1
Starting system	Electric starter
Ignition system	Battery ignition (Full trasistor ignition)
Lubrication system	Pressure lubricated, wet sump
Cylinder head:	
Combustion chamber type	Sphere + Sqnish
Combustion chamber volume (with D7EA)	22.7 cm^3
Head gasket thickness	1.0 mm (0.039 in)
Camshaft:	
Cam drive type	Drive chain (left side drive)
Camshaft bearing type (left)	Aluminum bush type
(right)	Cylinder head direct support
Cam chain type and No. of links	DID 25HT/104 Links

Item		Required ≪Allowance≫
Cam dimensions:		
	A (Cam height) IN.	36.59 ± 0.05 mm ≪36.45 mm≫ (1.441 ± 0.002 in ≪1.435 in≫)
	EX.	36.63 ± 0.05 mm ≪36.50 mm≫ (1.442 ± 0.002 in ≪1.437 in≫)
	B (Base circle) IN.	30.18 ± 0.05 mm ≪30.00 mm≫ (1.188 ± 0.002 in ≪1.181 in≫)
	EX.	30.30 ± 0.05 mm ≪30.15 mm≫ (1.193 ± 0.002 in ≪1.187 in≫)
	C (Cam lift) IN.	6.59 mm (0.259 in)
	EX.	6.63 mm (0.261 in)
	Camshaft runout limit	≪0.1 mm (0.0039 in)≫
	Valve timing:	
	Intake open	BTDC 28°
	Intake close	ABDC 60°
	Intake duration	268°
	Exhaust open	BBDC 72°
	Exhaust close	ATDC 32°
	Exhaust duration	284°
	Valve over lap	60°
Rocker arm and rocker shaft:		
Rocker arm bearing dia. (I.D.)		12.00 ~ 12.02 mm ≪12.05 mm≫ (0.4724 ~ 0.4732 in ≪0.4744 in≫)
Rocker arm shaft dia. (O.D.)		11.98 ~ 11.99 mm ≪11.96 mm≫ (0.4714 ~ 0.4720 in ≪0.4709 in≫)
Clearance		0.01 ~ 0.03 mm ≪0.11 mm≫ (0.0004 ~ 0.0012 in ≪0.0043 in≫)
Valve, valve seat and valve guide:		
Valve clearance (cold): IN.		0.03 ~ 0.07 mm (0.0012 ~ 0.0027 in)
	EX.	0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in)
No. of valves per cylinder		2 pcs.
Dimensions:		



Item	Required ≪Allowance≫
Valve head dia. (A): IN.	34 mm (1.338 in)
EN.	28.5 mm (1.122 in)
Valve face width (B): IN.	2.26 mm (0.089 in)
EX.	2.26 mm (0.089 in)
Valve seat width (C): IN.	1.0 mm (0.039 in)
EX.	1.0 mm (0.039 in)
Valve margin thickness (D): IN.	1.0 mm (0.039 in)
EX.	1.0 mm (0.039 in)
Valve stem outside dia.: IN.	$6^{-0.010}_{-0.025}$ mm ($0.236^{-0.0004}_{-0.0010}$ in)
EX.	$6^{-0.030}_{-0.045}$ mm ($0.236^{-0.0012}_{-0.0018}$ in)
Valve guide inside dia.: IN.	$6^{+0.012}_{0}$ mm ($0.236^{-0.0005}_{0}$ in)
EX.	$6^{+0.012}_{0}$ mm ($0.236^{+0.0005}_{0}$ in)
Valve stem to guide clearance: IN.	0.010 ~ 0.037 mm ≪0.07 mm≫ (0.0004 ~ 0.0015 in ≪0.0028 in≫)
EX.	0.025 ~ 0.052 mm ≪0.1 mm≫ (0.0009 ~ 0.0020 in ≪0.0039 in≫)
Valve springs:	
Free length: Inner	35.5 mm ≪34.3 mm≫ (1.39 in ≪1.350≫)
Outer	37.2 mm ≪35.9 mm≫ (1.46 in ≪1.41 in≫)
Spring rate: Inner	K_1 = 18.6 N/mm (1.86 kg/mm, 104.2 lb/in)
	K_2 = 24.3 N/mm (2.43 kg/mm, 136.1 lb/in)
Outer	K_1 = 35.5 N/mm (3.55 kg/mm, 198.9 lb/in)
	K_2 = 47.3 N/mm (4.73 kg/mm, 264.9 lb/in)
Installed length (valve closed): Inner	30.5 mm (1.20 in)
Outer	32.0 mm (1.26 in)
Installed pressure (valve closed): Inner	9.3 kg (20.5 lb)
Outer	18.5 kg (40.8 lb)
Compressed length (valve open): Inner	22.5 mm (0.89 in)
Outer	24.0 mm (0.95 in)
Compressed pressure (valve open): Inner	28.7 kg (63.3 lb)
Outer	56.3 kg (124.1 lb)
Wire diameter :Inner	2.7 mm (0.106 in)
Outer	3.8 mm (0.149 in)
Winding outside diameter: Inner	17.2 mm (0.677 in)
Outer	24.5 mm (0.964 in)
Tilt limit from vertical: Inner	1.5 mm (0.059 in) or 2.5°
Outer	1.6 mm (0.063 in) or 2.5°
Allowable tilt from vertical  	Direction of windings (Top to bottom) 
Cylinder:	
Material	Aluminum alloy with special cast iron sleeve
Bore size	65.00 ~ 65.02 mm ≪65.1 mm≫ (2.5590 ~ 2.5598 in ≪2.5629 in≫)
Taper limit	≪0.05 mm≫ (≪0.0020 in≫)
Out of round limit	≪0.01 mm≫ (≪0.0004 in≫)

Item	Required ≪Allowance≫
Piston	
Piston clearance	0.030 ~ 0.045 mm (0.0012 ~ 0.0017 in)
Piston clearance measuring position (from piston skirt bottom)	7.5 mm (0.3 in)
Piston pin bore size	16.002 ~ 16.013 mm (0.6300 ~ 0.6304 in)
Piston pin outside diameter	15.995 ~ 16.000 mm (0.6297 ~ 0.6299 in)
Over size piston diameter: 1st	65.25 mm (2.567 in)
2nd	65.50 mm (2.579 in)
3rd	65.75 mm (2.588 in)
4th	66.00 mm (2.598 in)
Piston ring:	
Piston ring dimension: Top ring B × T	1.2 × 2.7 mm (0.047 × 0.106 in)
2nd ring B × T	1.2 × 2.7 mm (0.047 × 0.106 in)
Oil ring B × T	2.5 × 2.8 mm (0.098 × 0.110 in)
Ring end gap (installed): Top ring	0.15 ~ 0.35 mm ≪0.6 mm≫ (0.0059 ~ 0.0137 in ≪0.024 in≫)
2nd ring	0.15 ~ 0.35 mm ≪0.6 mm≫ (0.0059 ~ 0.0137 in ≪0.024 in≫)
Oil ring	0.3 ~ 0.9 mm ≪1.0 mm≫ (0.012 ~ 0.035 in ≪0.038 in≫)
Ring groove side clearance: Top ring	0.03 ~ 0.07 mm ≪0.15 mm≫ (0.0012 ~ 0.0028 in ≪0.0059 in≫)
2nd ring	0.02 ~ 0.06 mm ≪0.15 mm≫ (0.0008 ~ 0.0024 in ≪0.0059 in≫)
Oil ring	N.A.
Over size piston ring: 1 st	65.25 mm (2.567 in)
2nd	65.50 mm (2.579 in)
3rd	65.75 mm (2.588 in)
4th	70 mm (2.598 in)
Big end bearing:	
Type	Needle bearing
Inside dia. × outside dia. × width	30 × 37 × 20 mm (1.18 × 1.46 × 0.79 in)
Crankshaft:	
Crankshaft assembly width (F)	58.95 ~ 59.00 mm (2.3208 ~ 2.3228 in)
Crankshaft deflection (D)	≪0.03 mm (0.0012 in) or less≫
Connecting rod large end side clearance (C)	0.35 ~ 0.65 mm (0.0138 ~ 0.0256 in)
Connecting rod small end deflection (P)	0.8 ~ 1.0 mm ≪2.0 mm≫ (0.0315 ~ 0.0394 in ≪0.079 in≫)
	
Crank pin outside dia. × length	30 × 55 mm (1.18 × 2.16 in)
Crank bearing type: Left	6305
Right	6306

Item	Required ≪Allowance≫
Clutch:	
Clutch type	Wet, multiple disc type
Clutch push mechanism	Inner push, cam axle type
Primary reduction ratio and method	73/22 (3.318)
Friction plate: Thickness/quantity	3.0 mm ≪2.7 mm≫/5 pcs. (0.118 in ≪0.106 in≫)
Clutch plate: Thickness/quantity	1.6 mm/4 pcs. (0.063 in)
Warp limit	≪0.05 mm (0.0020 in)≫
Clutch spring: Free length/quantity	34.9 mm ≪33.9 mm≫/4 pcs. (1.374 in ≪1.335 in≫)
Spring set weight	19.64 kg/23.6 mm (43.3 lb/0.929 in)
Spring rate	1.738 kg/mm (77.2 lb/in)
Clutch housing thrust clearance	0.10 ~ 0.35 mm (0.004 ~ 0.014 in)
Push rod bending limit	≪0.2 mm (0.0079 in) or less≫
Push lever axle: Bearing type and size	N.A.
Oil seal type and size	SD-14-26-6HS
Transmission:	
Type	Constant mesh, 4 speed
Gear ratio: 1st	36/16 (2.250)
2nd	30/22 (1.364)
3rd	26/26 (1.000)
4th	23/29 (0.793)
Bearing type: Main axle (Left)	6202
Main axle (Right)	6204
Drive axle (Left)	6304
Drive axle (Right)	6202
Oil seal type: Drive axle (Left)	20-35-6
Main axle (Left)	S-15-28-3.5HS
Secondary reduction ratio and method	44/15 (2.933), chain
Shifting mechanism:	
Operation system	Return type, left foot operation
Shifting type	Guide bar type, cam drum system
Oil seat type: Change lever	SD-12-22-5-HS
Air cleaner:	
Type/quantity	Oiled, form rubber/1 pc.
Carburetor:	
Type/manufacture/quantity	Y24P/TEIKEI/1 pc.
I.D. mark	5H000
Main jet (M.J.)	#116
Main air jet (M.A.J.)	#14
Pilot air jet (P.A.J.)	#10
Jet needle: Clip position (J.N.)	0202/5
Needle jet (N.J.)	
Pilot jet (P.J.)	#38
Mixture screw turns out	Preset
Starter jet (G.S.)	GS_1: #40, GS_2: # 40.6
Fuel level	6.5 ~ 8.5 mm (0.256 ~ 0.334 in)
Idling engine speed	1,200 r/min

Item	Required ≪Allowance≫
Lubrication:	
Transmission gear and engine sump oil	
Quantity	Total amount: 1.3 L (1.14 Imp qt, 1.37 US qt) Exchange with oil filter: 1.0 L (0.88 Imp qt, 1.06 US qt)
Type	Yamalube 2-cycle oil or 20W/40 "SE" motor oil
Oil pump:	
Type	Trochoid pump
Housing inside diameter	29.10 ~ 29.13 mm ≪29.28 mm≫ (1.1457 ~ 1.1467 in ≪1.152 in≫)
Housing depth (delivery)	8.03 ~ 8.07 mm ≪8.1 mm≫ (0.316 ~ 0.317 in ≪0.319 in≫)
Rotor diameter	28.98 ~ 29.00 mm ≪28.93 mm≫ (1.141 ~ 1.142 in ≪1.139 in≫)
Rotor thickness (delivery)	7.98 ~ 8.00 ≪8.95 mm≫ (0.3141 ~ 0.3149 in ≪0.3524 in≫)
Outer rotor and housing clearance	
Top clearance	0.1 ~ 0.15 mm ≪0.35 mm≫ (0.0039 ~ 0.0059 in ≪0.014 in≫)
Side clearance	0.03 ~ 0.09 mm ≪0.14 mm≫ (0.0012 ~ 0.0035 in ≪0.0055 in≫)
Tip clearance	0.15 mm or less ≪0.35 mm≫ (0.006 in ≪0.00138 in≫)
Relief valve opening pressure	N.A.
Oil cleaner type	Paper and iron net

Chassis Specifications

Item	Required ≪Allowance≫
Frame:	
Frame design	Tubular steel diamond frame
Steering system:	
Caster	26°30'
Trail	89 mm (3.5 in)
Number and size of balls in steering head:	
Upper race	22 pcs., 3/16 in
Lower race	19 pcs., 1/4 in
Lock to lock angle	L.R. 43°
Front suspension:	
Type	Telescopic fork
Front fork cushion travel	120 mm (4.72 in)
Front fork spring:	
Free length	326 mm (12.83 in)
Set length	311 mm (12.24 in)
Wire dia. × winding dia.	2.8 × 20.5 mm (0.11 × 0.81 in)
Spring constant	K_1 = 3 N/mm [0.3 kg/mm (0 ~ 110 mm)] (16.8 lb/in (0 ~ 4.33 in)) K_2 = 4 N/mm [0.4 kg/mm (110 ~ 135 mm)] (22.4 lb/in (4.33 ~ 5.31 in))
Inner tube outside diameter	mm (. in)
Front fork oil: Quantity	184 cm^3 (6.49 Imp oz, 6.22 US oz)
Type	Yamaha fork oil 10 wt.

Item	Required ≪Allowance≫
Rear suspension:	
Type	Swing arm
Damper type	Oil damper
Rear shock absorber travel	65 mm (2.56 in)
Rear wheel travel	78 mm (3.07 in)
Rear shock absorber spring:	
Free length	178.5 mm (7.03 in)
Set length (soft position)	161 mm (6.34 in)
Wire dia. × winding dia.	6.1 × 49.7 mm (0.24 × 1.96 in)
Spring constant	K_1 = 14 N/mm [1.4 kg/mm (0 ~ 60 mm)] (78.4 lb/in (0 ~ 2.36 in))
	K_2 = 20.9 N/mm [2.09 kg/mm (60 ~ 92.5 mm)] (117.0 lb/in (2.36 ~ 3.64 in))
Swing arm free play (limit)	≪1 mm (0.039 in)≫
Pivot shaft:	
Outside dia.	12 mm (0.47 in)
Bearing type and size	(ø12 × ø24 × 44 mm) (0.47 × 0.94 × 1.73 in)
Fuel tank:	10 L (2.2 Imp gal, 2.6 US gal)/Reserve 1.6 L (0.35 Imp gal, 0.42 US gal)
Capacity	
Fuel grade	Regular gasoline
Wheel:	
Type	Spoke
Tire size: Front	3.00-17-4PR Yokohama
Rear	3.50-16-4PR
Rim type: Front	1.60-17/steel
Rear	1.85-16/steel
Rim runout (limit): Front/Rear	≪2.0 mm≫ (≪0.08 in≫)
Rim hopping (limit): Front/Rear	≪2.0 mm≫ (≪0.08 in≫)
Bearing type:	
Front wheel (Left)	6301-RS
Front wheel (Right)	6302/3A
Rear wheel (Left)	6302Z
Rear wheel (Right)	6302Z
Oil seal type:	
Front wheel (Left)	SD-18-37-8
Front wheel (Right)	N.A.
Meter gear	SDD-47-58-7
Rear wheel (Left)	SD-22-42-7
Rear wheel (Right)	N.A.
Secondary drive chain:	
Type	DID428DS
Number of links	117 Links + Joint
Chain pitch	12.7 mm (0.5 in)
Chain free play	25 ~ 35 mm (0.98 ~ 1.38 in)
Front brake:	
Type	Drum brake (Leading trailing)
Drum inside dia. ≪wear limit≫	130 mm ≪132 mm≫ (5.12 in ≪5.19 in≫)
Shoe dia. × width	130 × 28 mm (5.12 × 1.10 in)
Shoe spring free length	36.5 mm (1.44 in)
Lining thickness ≪wear limit≫	4 mm ≪2 mm≫ (0.16 in ≪0.08 in≫)

Item	Required ≪Allowance≫
Rear brake:	
Type	Drum brake (leading trailing)
Drum inside dia. ≪wear limit≫	110 mm ≪112 mm≫ (4.33 in ≪4.41 in≫
Shoe dia. × width	106 × 25 mm (4.17 × 0.98 in)
Shoe spring free length	50.5 mm (1.99 in)
Lining thickness ≪wear limit≫	4 mm ≪2 mm≫ (0.16 in ≪0.08 in≫)

Electrical Specifications

Item	Required ≪Allowance≫
Voltage:	12V
Ignition system:	
Type	Battery ignition (Full transistor ignition)
Pulser coil resistance	
(Br — G, W — Y)	230Ω ± 10% at 20°C (68°F)
Ignition advancer:	BTDC9°/1,200 r/min
Advance type	Electrical
Advance angle	20°
Advance starting engine speed	2,050 ± 130 r/min
Full advance engine speed	3,750 ± 120 r/min
Ignition coil:	
Model/ Manufacturer	CM11-55 HITACHI
Spark gap	≪6 mm (0.24 in)/500 r/min≫
Primary winding resistance	2.75Ω ± 20% at 20°C (68°F)
Secondary winding resistance	7.9Ω ± 20% at 20°C (68°F)
Spark plug:	
Type	D7ES (N.G.K.)
Spark plug gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)
T.C.I. unit	HITACHI
Charging system:	
A.C. magneto generator:	
Model/ Manufacturer	5H0/YAMAHA
Rotor puller thread size	M16 × P1.5
Output	7A or more/3,000 r/min
Lighting coil resistance	9A or more/8,000 r/min
White-White	0.52Ω ± 10% at 20°C (68°F)
Rectifier with regulator:	
Model/ Manufacturer	SH222-12C/SHINDENGEN
(Rectifier)	
Type	I.C. type, full wave
Capacity	9A
Withstand voltage	200V
(Regulator)	
Type	I.C. type
Regulating voltage	14.5 ± 0.5V
Allowable amperage	9A
Battery:	
Model/ Manufacturer	GM7-38/G.S.
Capacity	12V, 8AH
Charging rate	0.8A × 10 hours
Specific gravity	1.280

Item	Required ≪Allowance≫
Starting system:	
Starter motor	
Type	Constant mesh type
Manufacturer	MITSUBA
Model	SM-7252
Output	0.4 kW
Armature coil resistance	0.023Ω ± 6% at 20°C (68°F)
Field coil resistance	.....
Brush size/Quantity	10.5 × 11 × 5.8 mm (0.41 × 0.43 × 0.23 in)/2 pcs.
Wear limit	5 mm (0.2 in)
Spring pressure	600 g (1.32 lb)
Commutator O.D./Wear limit	23 mm (0.91 in)/22 mm (0.87 in)
Mica undercut	0.6 mm (0.02 in)
Starter switch	
Manufacturer	HONDA LOCK
Model	N.A.
Amperage rating	Max. 100A
Cut-in voltage	Max. 5.5V
Winding resistance	.....
Lighting system:	
Headlight type	Sealed beam
Bulb wattage/quantity:	
Headlight	12V, 35W/35W × 1
Taillight	12V, 3CP (8W) × 1
Brake light	12V, 32CP (27W) × 1
Flasher light	12V, 32CP (27W) × 4
Flasher indicator light	12V, 3.4W × 2
Meter light	12V, 3.4W × 1
High beam indicator light	12V, 3.4W × 1
Neutral indicator light	12V, 3.4W × 1
Horn:	
Model/Manufacturer	MF-12/NIKKO HORN
Winding resistance	48Ω ± 10% at 20°C (68°F)
Amperage	1.5A
Flasher relay:	
Type	Heat ribbon type
Model/Manufacturer	FR9T21/MITSUBA
Flasher frequency	90 ± 9 cycle/min
Capacity	12V, 27W × 2 + 3.4W
Fuse:	
Rating	20A

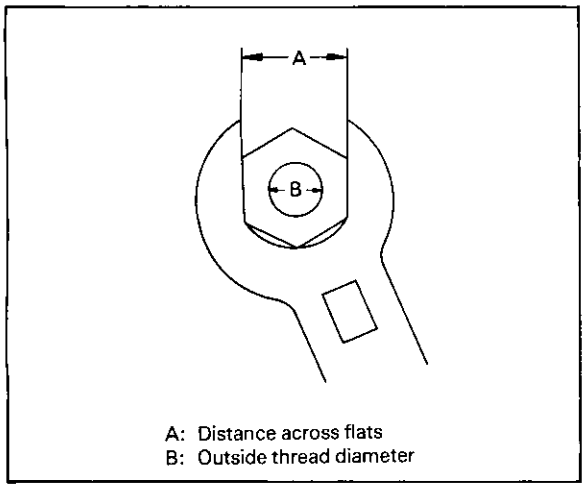
Torque Specifications

Part to be tightened	Thread and part name		Tightening torque		
			Nm	m-kg	ft-lb
Engine:					
Cylinder head, cylinder	M8	Hex bolt	22	2.2	15.9
	M8	Internal hex bolt	20	2.0	14.5
	M6	Internal hex bolt	10	1.0	7.2
Cylinder head cover	M6	Internal hex bolt	10	1.0	7.2
	M6	Pan head screw	0.7	0.7	5.1

Part to be tightened	Thread and part name		Tightening torque		
			Nm	m-kg	ft-lb
Camshaft bearing plate	M6	Hex bolt	8	0.8	5.8
Oil checking screw	M6	Hex bolt	7	0.7	5.1
Spark plug	M14	Hex nut	18	1.8	13.0
Balancer boss	M14	Hex nut	50	5.0	36.2
Flywheel magneto	M10	Hex nut	50	5.0	36.2
Valve clearance	M6	Hex nut	13.5	1.35	9.8
Cam sprocket	M10	Bolt	60	6.0	43.4
Chain tensioner	M6	Bolt	8	0.8	5.8
Oil pump	M6	Pan head screw	7	0.7	5.1
Drain plug	M35		43	4.3	31.1
Filter cover	M6	Internal hex bolt	10	1.0	7.2
	M6	Pan head screw	7	0.7	5.1
Bleed bolt	M5	Hex bolt	5	0.5	3.6
Carburetor manifold	M6	Internal hex bolt	12	1.2	8.7
Carburetor clamp hose	M5	Pan head screw	2	0.2	1.5
Air cleaner case cover	M6	Pan head screw	5	0.5	3.6
Air cleaner case	M6	Hex bolt	7	0.7	5.1
Exhaust pipe assembly	M6	Internal hex bolt	12	1.2	8.7
	M8	Hex bolt	20	2.0	14.5
Crankcase, Casecover	M6	Pan head screw	7	0.7	5.1
Balancer bearing plate	M6	Flat head screw	7	0.7	5.1
Clutch spring	M15	Hex bolt	6	0.6	4.3
Clutch boss	M14	Hex nut	50	5.0	36.2
Primary drive gear	M14	Hex nut	50	5.0	43.4
Push lever stopper	M8	Hex bolt	12	1.2	8.7
Push rod adjustment	M6	Hex nut	8	0.8	5.8
Drive sprocket	M6	Hex bolt	10	1.0	7.2
Shift cam	M6	Flat khead screw	12	1.2	8.7
Shift pedal	M6	Hex bolt	8	0.8	5.8
Magneto base	M6	Pan head screw	7	0.7	5.1
Neutral switch	M10		20	2.0	14.5
Chassis:					
Engine mounting	M8	Hex bolt, nut	32	3.2	23.1
Handle crown and inner tube	M10	Hex bolt, mut	45	4.5	32.5
Handle crown and handle holder	M8	Hex bolt	20	2.0	14.5
Front fork cap bolt	M10	Hex bolt	45	4.5	32.5
Under bracket and inner tube	M8	Hex bolt	32	3.2	23.0
Front wheel shaft	M10	Shaft, nut	45	4.5	32.5
Pivot shaft	M12	Shaft, nut	45	4.5	32.5
Rear wheel shaft	M14	Shaft, nut	65	6.5	47.0
Sprocket wheel	M10	Hex bolt	25	2.5	18.0
Rear shock absorber	M10	Hex bolt	35	3.5	25.5
Foot rest	M8	Hex bolt	20	2.0	14.5
Camshaft lever	M6	Hex bolt, nut	8	0.8	5.8
Front fork cylinder and outer tube	M10	Socket head bolt	23	2.3	16.6
Steering ring nut	M25		37	3.7	26.8
Steering fitting bolt	M14	Hex bolt	53	5.3	38.3
Spoke	.....		2	0.2	1.4
Grab bar	M8	Hex bolt	15	1.5	10.8
Rear foot rest	M10	Flange nut	45	4.5	32.5

General Torque Specifications

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a crisscross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.



A: Distance across flats
B: Outside thread diameter

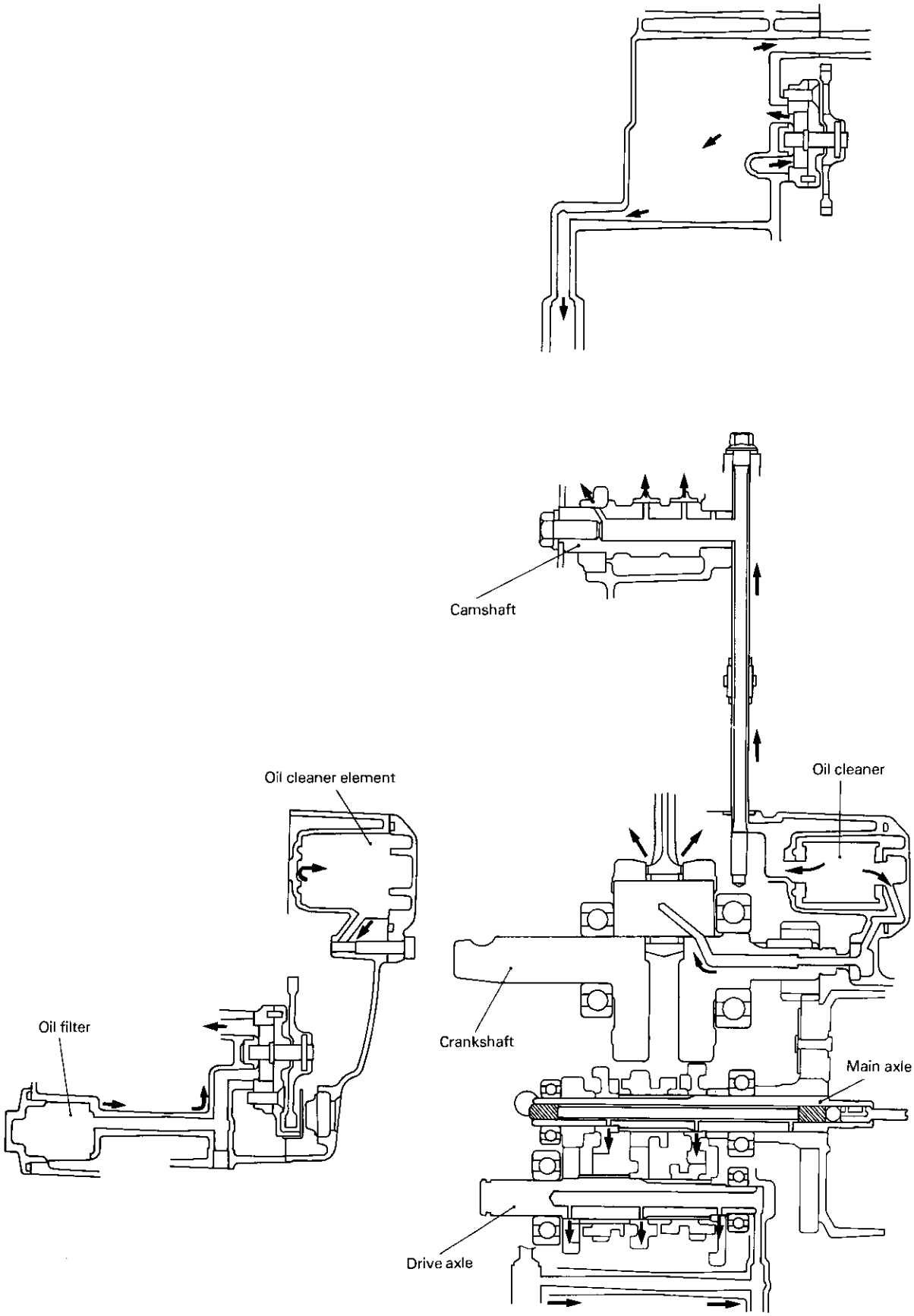
A	B	Torque specification			
		Nm	m-kg	ft-lb	in-lb
10 mm	6 mm	10	1.0	7.2	85
12 mm	8 mm	20	2.0	15	175
14 mm	10 mm	35 ~ 40	3.5 ~ 4.0	25 ~ 29	300 ~ 350
17 mm	12 mm	40 ~ 45	4.0 ~ 4.5	29 ~ 33	350 ~ 400
19 mm	14 mm	45 ~ 50	4.5 ~ 5.0	33 ~ 36	400 ~ 440
22 mm	16 mm	55 ~ 65	5.5 ~ 6.5	41 ~ 49	480 ~ 570
24 mm	18 mm	58 ~ 70	5.8 ~ 7.0	42 ~ 50	500 ~ 600
27 mm	20 mm	70 ~ 83	7.0 ~ 8.3	50 ~ 60	600 ~ 700

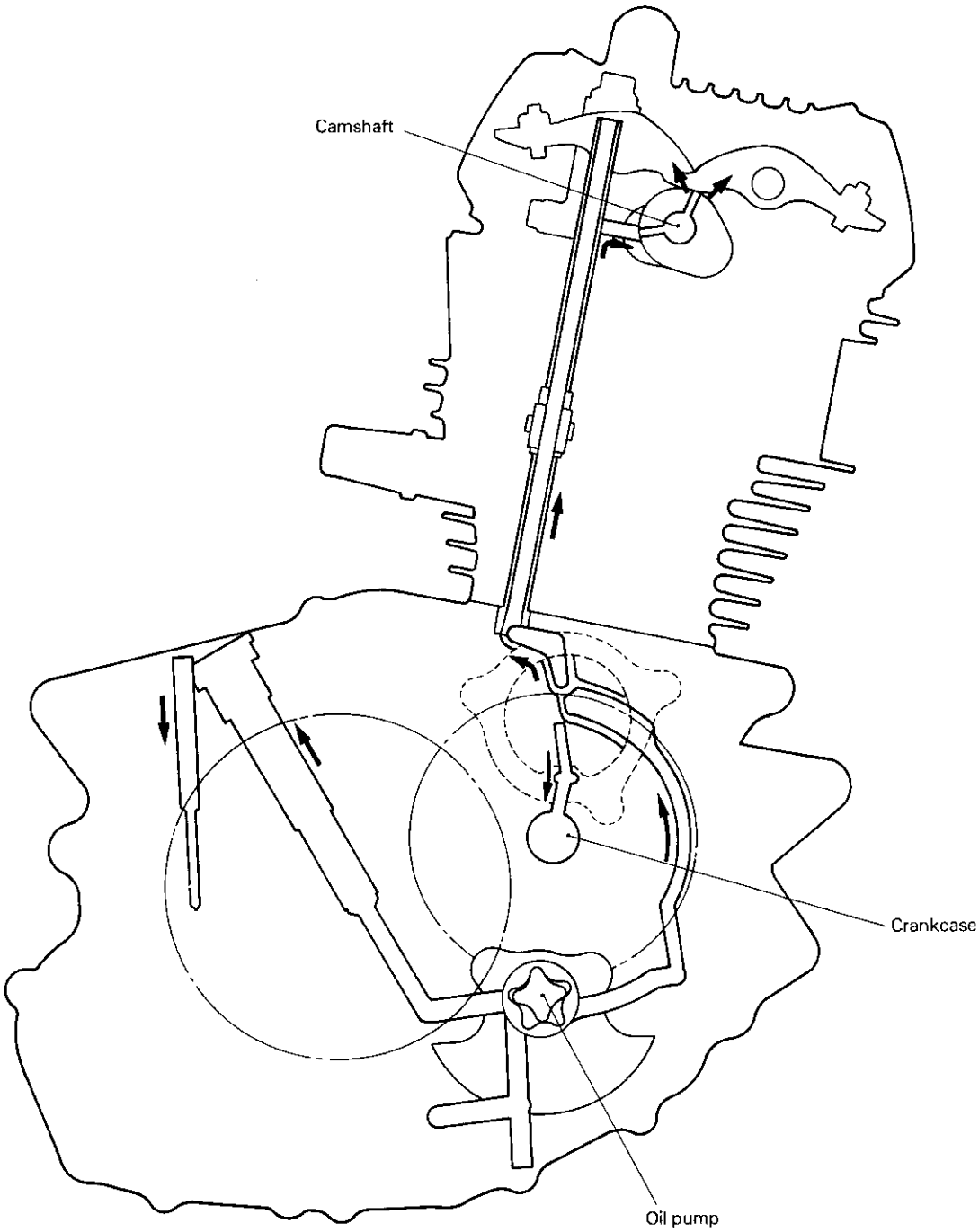
Conversion Tables

METRIC TO INCH SYSTEM			
	KNOWN	MULTIPLIER	RESULT
TORQUE	m-kg	7.233	ft-lb
	m-kg	86.80	in-lb
	cm-kg	0.0723	ft-lb
	cm-kg	0.8680	in-lb
WT	kg	2.205	lb
	g	0.03527	oz
FLOW/DISTANCE	km/ℓ	2.352	mpg
	km/hr	0.6214	mp
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
VOL./CAPACITY	cc (cm^3)	0.03382	oz (US liq)
	cc (cm^3)	0.06102	cu.in
	ℓ (liter)	2.1134	pt (US liq)
	ℓ (liter)	1.057	qt (US liq)
	ℓ (liter)	0.2642	gal (US liq)
MISC.	kg/mm	56.007	lb/in
	kg/cm^3	14.2234	psi (lb/in^3)
	Centigrade(°C)	9/5(°C) + 32	Fahrenheit(°F)

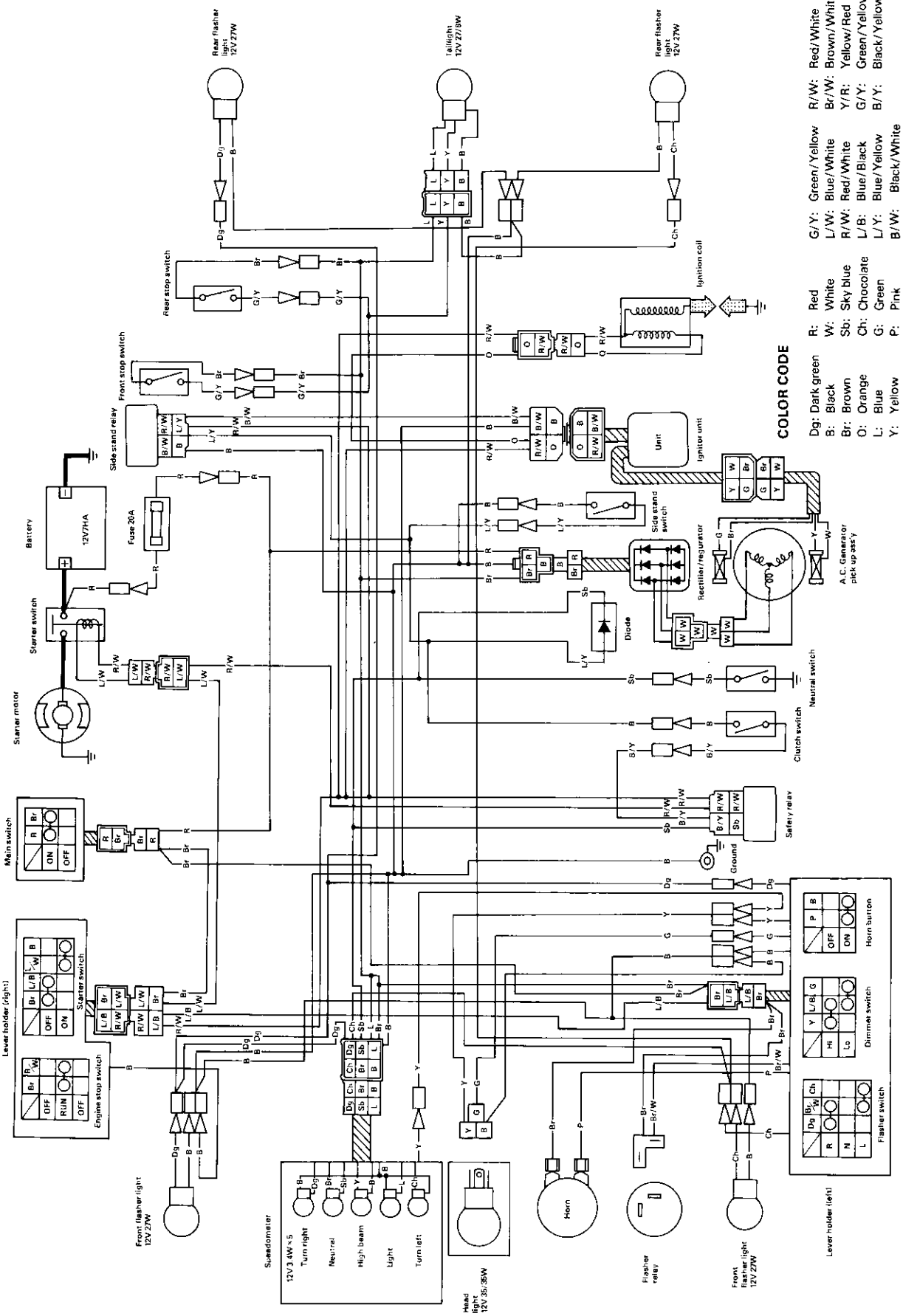
INCH TO METRIC SYSTEM			
	KNOWN	MULTIPLIER	RESULT
TORQUE	ft-lb	0.13826	m-kg
	in-lb	0.01152	m-kg
	ft-lb	13.831	cm-kg
	in-lb	1.1521	cm-kg
WT	lb	0.4535	kg
	oz	28.352	g
FLOW/DISTANCE	mpg	0.4252	km/ℓ
	mph	1.609	km/hr
	mi	1.609	km
	ft1	0.3048	m
	yd	0.9141	m
	in	2.54	cm
	in	25.4	mm
VOL./CAPACITY	oz (US liq)	29.57	cc (cm^3)
	cu.in	16.387	cc (cm^3)
	pt (US liq)	0.4732	ℓ (liter)
	qt (US liq)	0.9461	ℓ (liter)
	gal (US liq)	3.785	ℓ (liter)
MISC.	lb/in	0.017855	kg/mm
	psi (lb/in^3)	0.07031	kg/cm^3
	Fahrenheit(°C)	5/9(°F—32)	Centigrade(°F)

LUBRICATION CHART

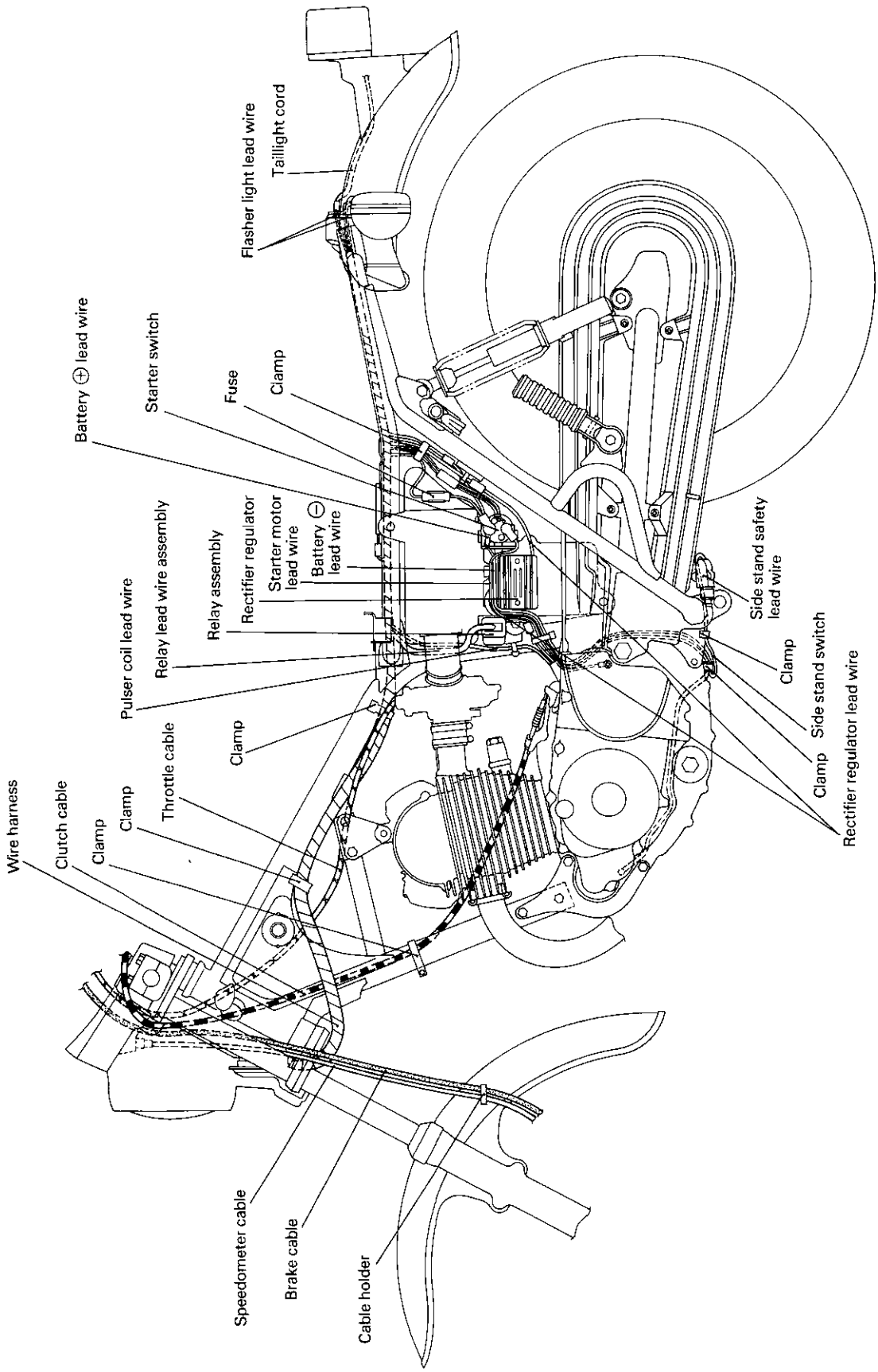


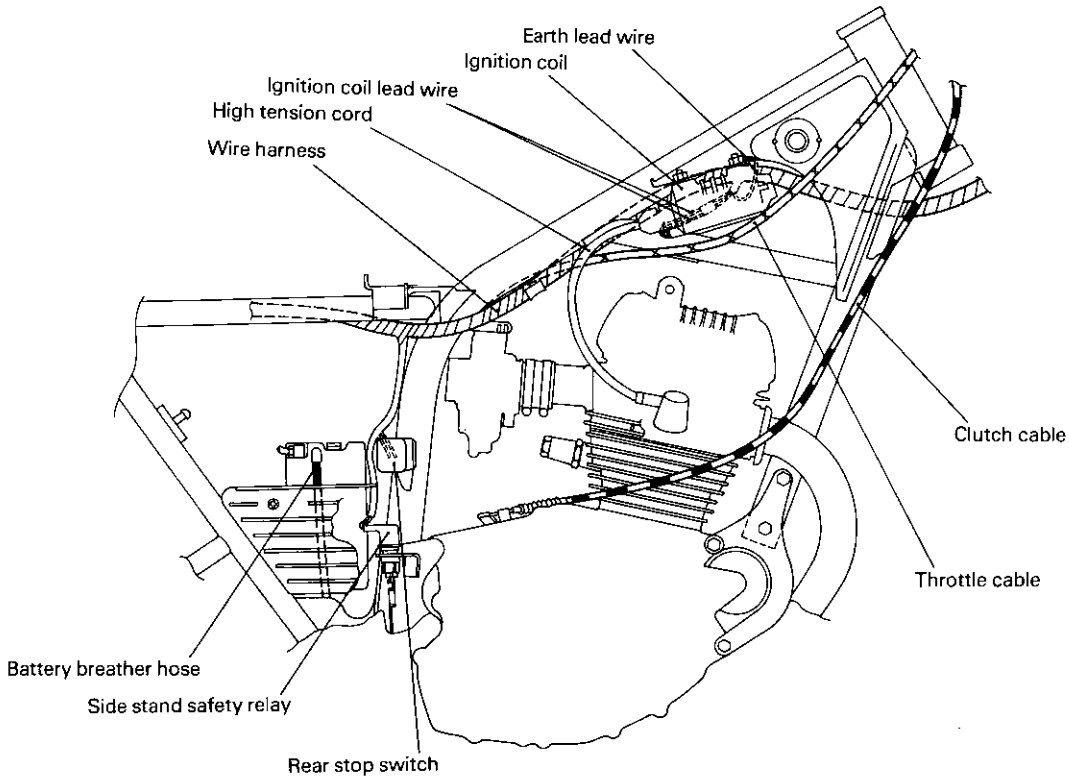

Camshaft
Crankcase
Oil pump

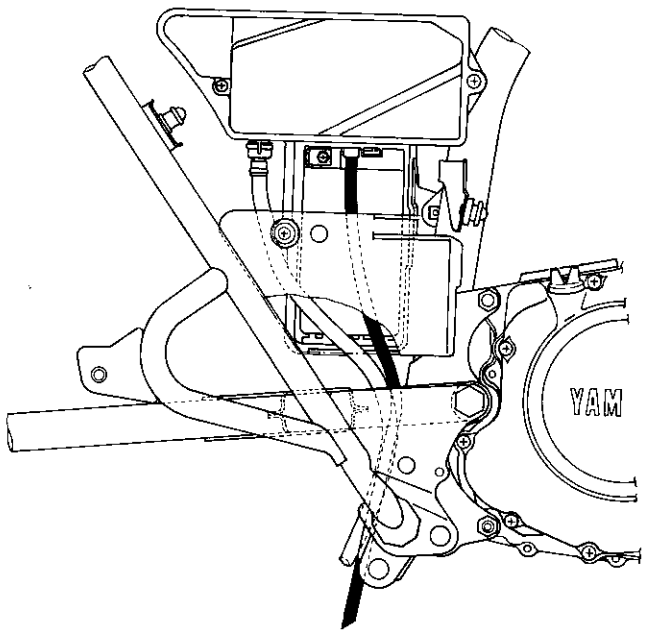
WIRING DIAGRAM

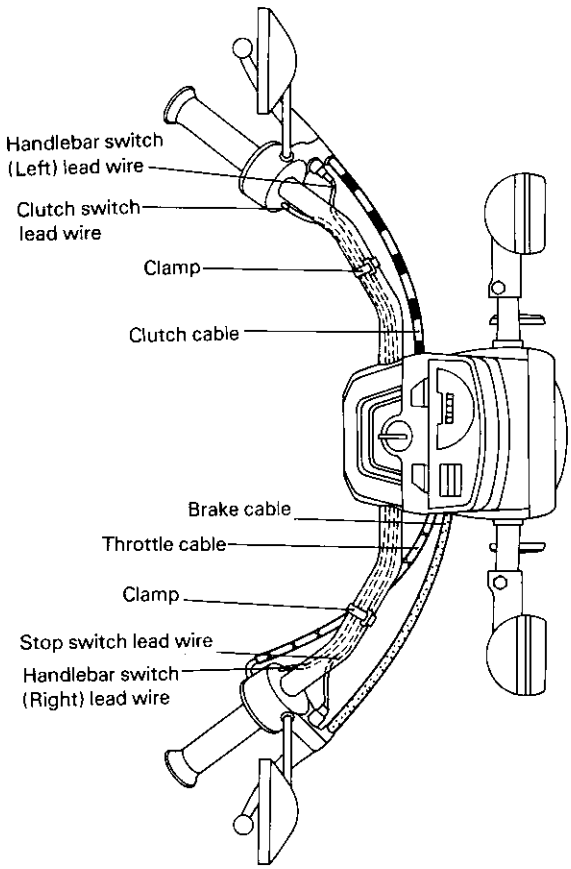


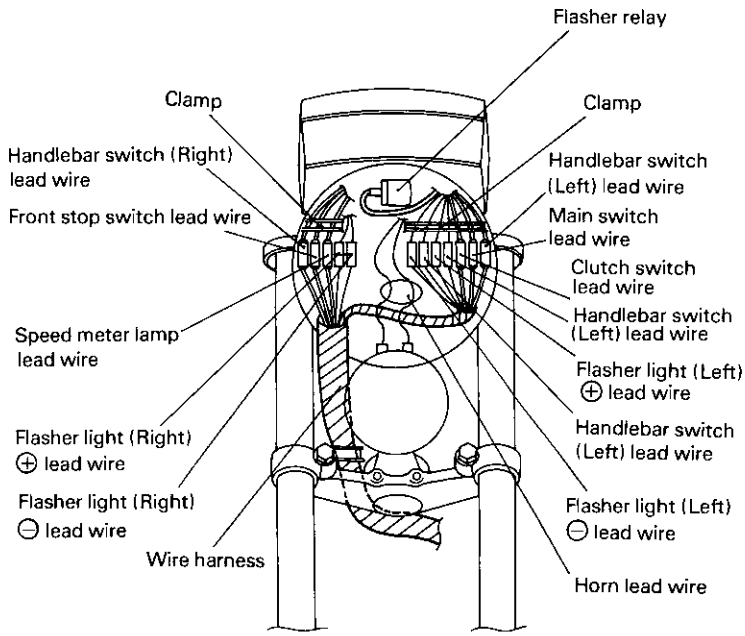
CABLE ROUTING

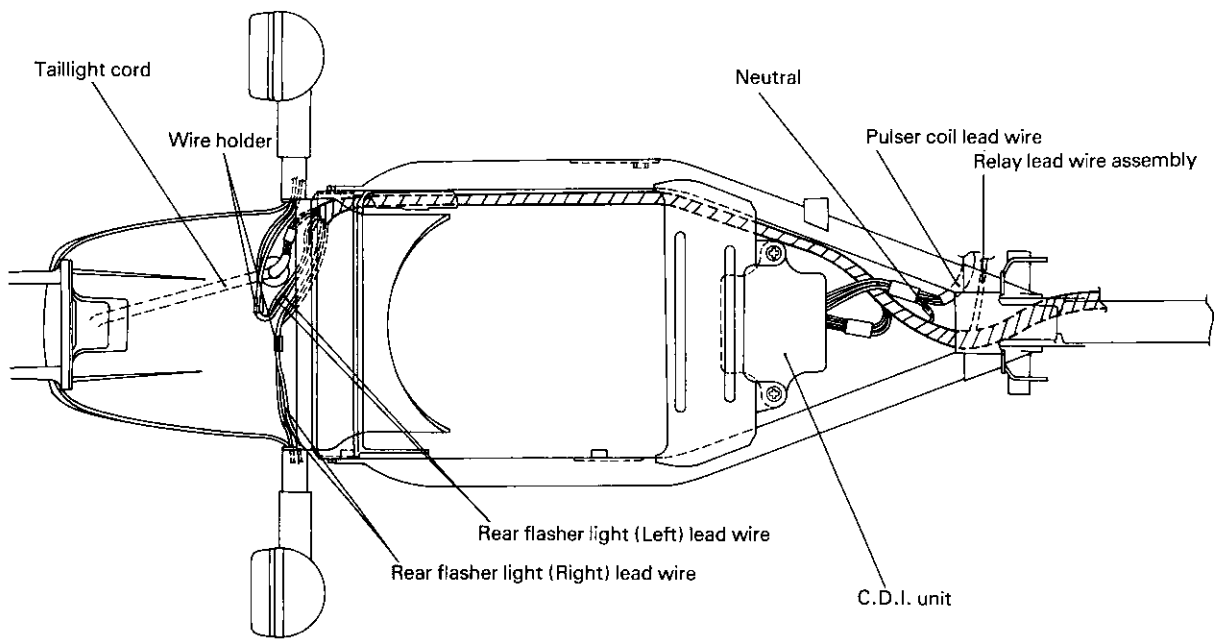



Earth lead wire
Ignition coil
Ignition coil lead wire
High tension cord
Wire harness
Clutch cable
Throttle cable
Battery breather hose
Side stand safety relay
Rear stop switch


YAM


Handlebar switch (Left) lead wire
Clutch switch lead wire
Clamp
Clutch cable
Brake cable
Throttle cable
Clamp
Stop switch lead wire
Handlebar switch (Right) lead wire


Flasher relay
Clamp
Clamp
Handlebar switch (Right) lead wire
Front stop switch lead wire
Handlebar switch (Left) lead wire
Main switch lead wire
Clutch switch lead wire
Handlebar switch (Left) lead wire
Speed meter lamp lead wire
Flasher light (Left) ⊕ lead wire
Handlebar switch (Left) lead wire
Flasher light (Right) ⊕ lead wire
Flasher light (Right) ⊖ lead wire
Flasher light (Left) ⊖ lead wire
Wire harness
Horn lead wire


Taillight cord
Wire holder
Neutral
Pulser coil lead wire
Relay lead wire assembly
Rear flasher light (Left) lead wire
Rear flasher light (Right) lead wire
C.D.I. unit