YAMAHA

DT250F

Service Manual

LIT-11616-01-25

2N6-28197-10

DT250F SERVICE MANUAL CORRECTION

You are requested to make the following explanations supersede the corresponding ones in this text.

(PP.19, 20)

CHAPTER 2-4. ELECTRICAL

B. Spark plug

The life of a spark plug and its coloring vary according to the habits of the rider.

It is actually economical to install new plugs often since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

1. How to "Read" spark plug (condition)
   a. Best.....When the porcelain around the center electrode is a light tan color.
   b. Bad.....If the electrode and porcelain are black and somewhat oily, replace the plug with a standard type.
   c. Bad.....If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a standard type.

NOTE:

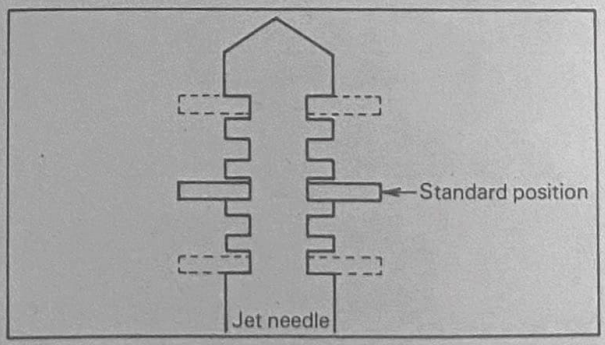
This information is a general guide only. These bad conditions are affected by improper timing, dirty air filter, or long periods of engine idling. Check for these conditions before changing the spark plug.

(P.41)

CHAPTER 4-1. CARBURETOR

B. Adjustment

2. Jet needle clip position
   The mid-range air/fuel supply is affected by the position of the needle in the needle jet. Check to see that the needle clip position is correct. If not, change the clip to the specified position.



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 mechanics education into one manual, so it is assumed that persons using this manual to perform maintenance and repairs on Yamaha motorcycles have a basic understanding of the mechanical precepts and procedures inherent to motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit for 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 machine will operate as designed. If there is any question about a service procedure, it is imperative that you contact a Yamaha dealer before continuing. Before attempting any service, check with your Yamaha dealer for any service information changes that apply to this model. This policy is intended to provided the customer with the most satisfaction from his machine and to conform with federal enviromental quality objectives.

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

NOTE:

This Service Manual contains special information regarding periodic maintenance to the emission control system for the DT250F. Please read this material carefully.

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

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

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

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

YAMAHA DT250F
SERVICE MANUAL
1ST EDITION, NOVEMBER 1978

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LIT-11616-01-25

INDEX

CHAPTER 1.
GENERAL INFORMATION

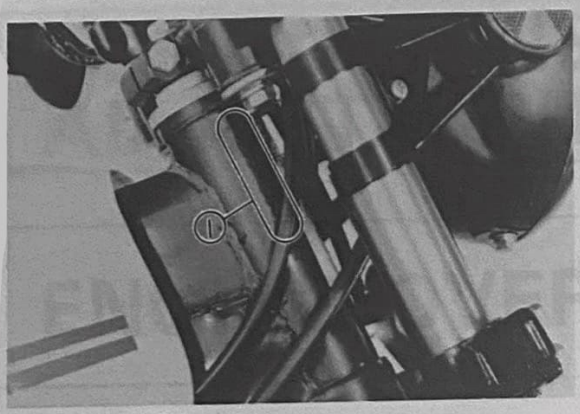
1

1-1. MACHINE IDENTIFICATION

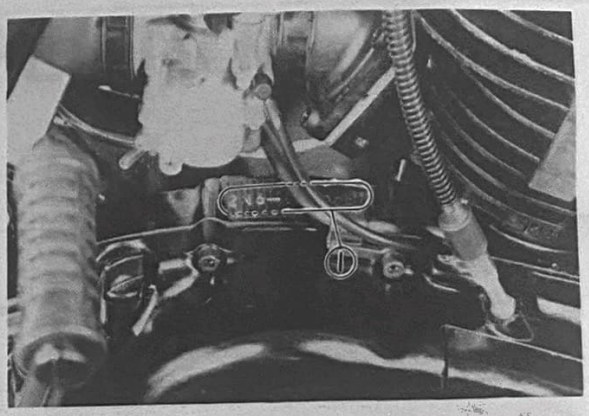
The frame serial number is located on the right-hand side of the head pipe assembly. The first three digits identify the model. This is followed by a dash. The remaining digits identify the production number of the unit.

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

Starting serial number
2N6-000101



Frame serial number

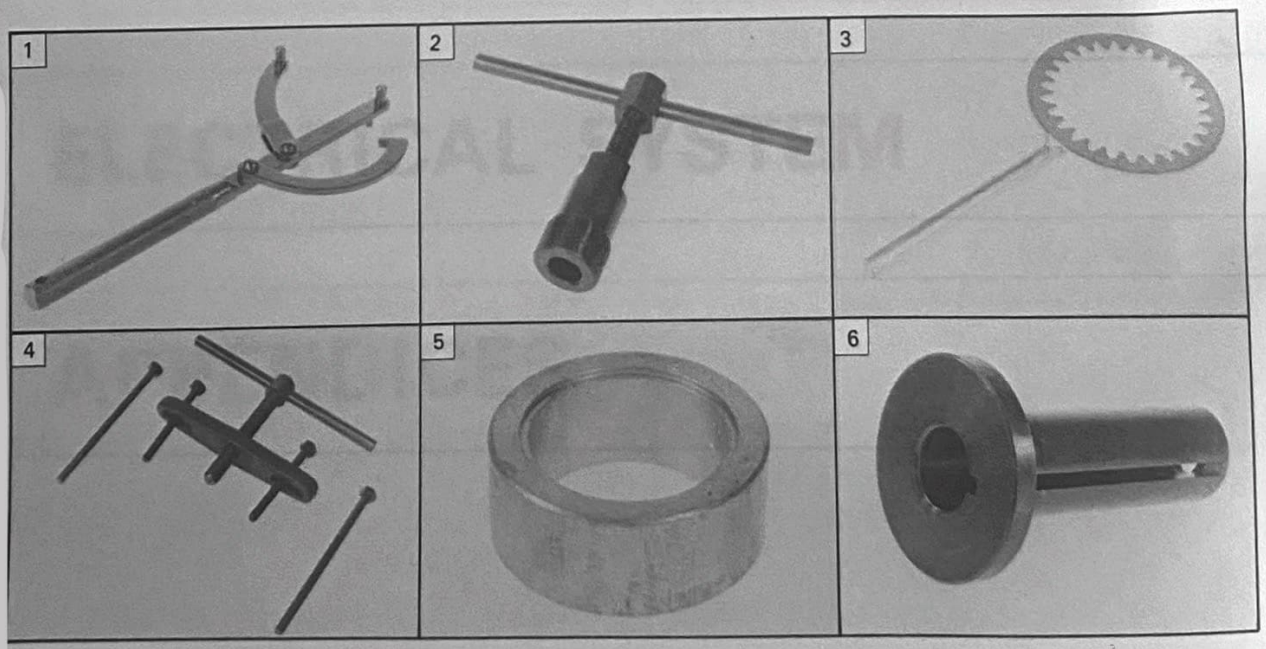


Engine serial number

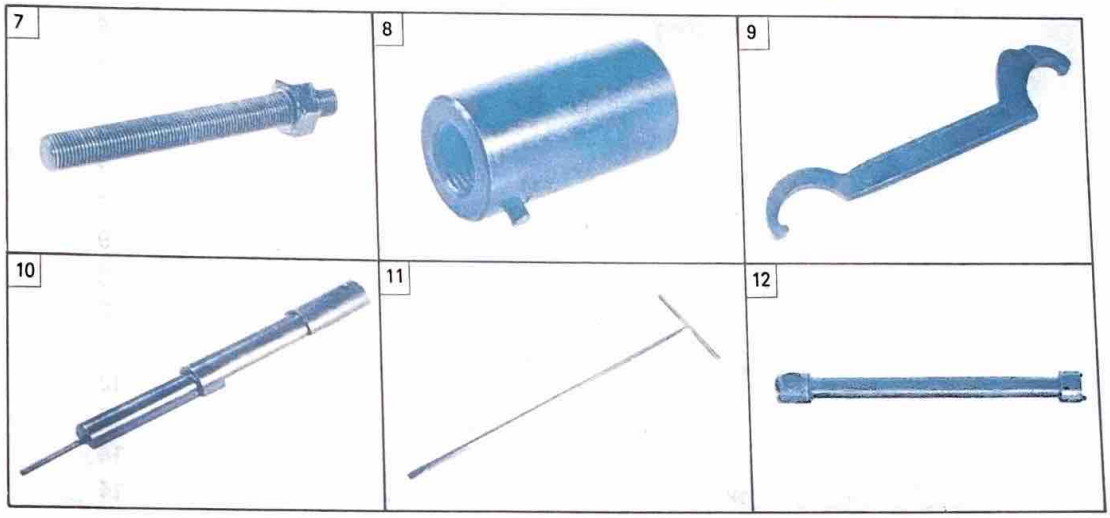
1-2. SPECIAL TOOLS AND GAUGES

A. Special Tools

	Parts name	Parts No.		Parts name	Parts No.
1	Flywheel holding tool	90890-01235	4	Crankcase separating tool	90890-01135
2	Flywheel puller	90890-01189	5	Spacer	90890-01288
3	Clutch holding tool	90890-01024	6	Crank installer pot	90890-01274

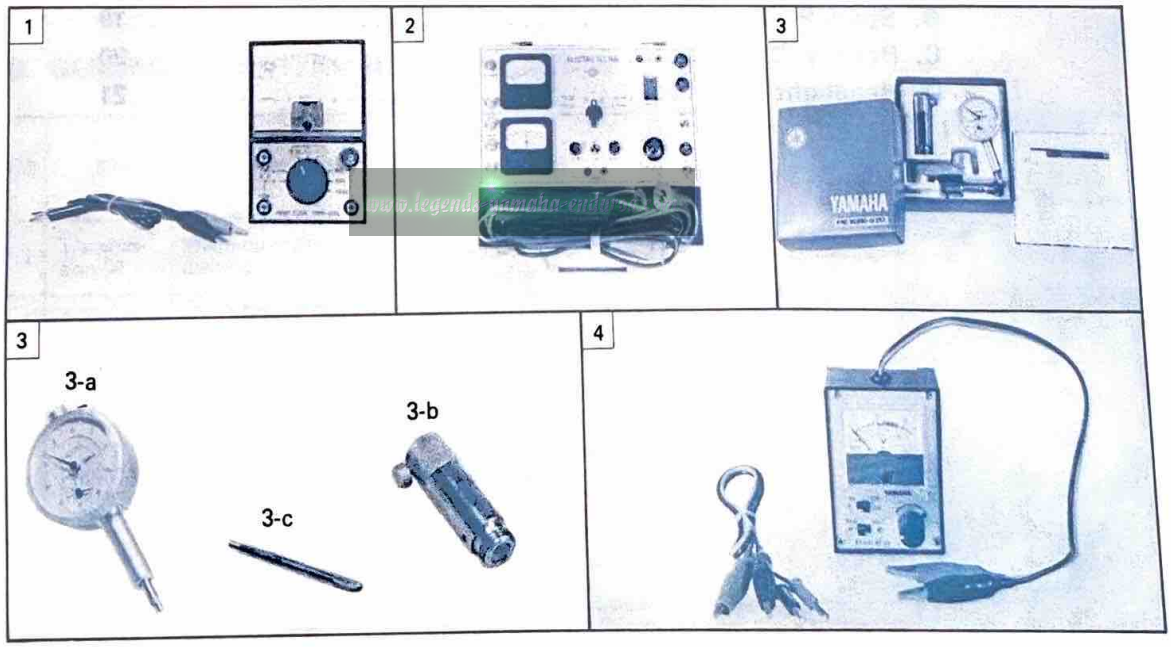


	Parts name	Parts No.		Parts name	Parts No.
7	Crank installer bolt	90890-01275	10	Piston pin puller	90890-01183
8	Crank installer bolt, adapter	90890-01278	11	Fork spring guide wrench	90890-01212
9	Steering nut wrench	90890-01268	12	Meter gear housing remover	90890-01052



B. Gauges

	Parts name	Parts No.		Parts name	Parts No.
1	Pocket tester	90890-03104	3-b	Dial gauge stand	90890-01195
2	Electro tester	90890-03021	3-c	Dial gauge needle	90890-03098
3	Dial gauge set	90890-01252	4	A.C. regulator checker	90890-03090
3-a	Dial gauge	90890-03097			



C. Additional Tools

1. Thickness gauge
2. Torque wrench
3. Tire pressure gauge
4. Measuring cup
5. Micrometer
6. Vernier caliper
7. Cylinder gauge
8. Grease gun

CHAPTER 2.
PERIODIC INSPECTION AND ADJUSTMENT

2-1. MAINTENANCE AND LUBRICATION INTERVAL CHARTS

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

A. 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
1.	Ignition Timing	Check and adjust ignition timing.	O	O	O
2.	Spark Plug	Check spark plug condition and plug gap. Replace plug every 3,000 km (2,000 mi).	O	O Replace	O Replace
3.	Fuel Hose	Check fuel hose for cracks and damage. Replace if necessary.	O	O	O
4.	Fuel Petcock	Check fuel petcock for proper function.	O	O	O
5.	Idle Speed	Check and adjust engine idle speed. Adjust cable free play.	O	O	O
6.	Exhaust System	Check and retighten exhaust system.	O	O	O
7.	Pulsating Air System	Check pulsating air system for proper function. Check hoses for cracks or damage. Replace if necessary.		O	O

B. GENERAL MAINTENANCE/LUBRICATION

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	15,000 km (9,500 mi) or 24 months
1.	Transmission Oil	Warm-up engine before draining.	Yamalube 4-cycle oil or SAE 10W/30 "SE" motor oil or "GL" gear oil	O	O	O	
2.	Autolube Pump	Check and adjust pump cable and minimum pump stroke.	–	O	O	O	
3.	Air Filter	Check for clogging. If necessary clean and dampen with oil.	–	O	O	O	
4.	Control and Meter Cables	Inspect and lubricate thoroughly.	Yamaha chain and cable lube or SAE 10W/30 motor oil	O	O	O	
5.	Throttle Cable	Adjust as necessary. Lightly lubricate.	Lithium base grease		O	O	
6.	Brake Pedal/Lever Pivot Shaft	Lubricate. Apply lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		O	O	
7.	Side Stand Pivot Shaft Kick Crank Boss	Lubricate. Apply lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		O	O	

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	15,000 km (9,500 mi) or 24 months
8.	Drive Chain	Adjust and lubricate thoroughly.	Yamaha chain and cable lube or SAE 10W/30 motor oil	CHECK CHAIN AND LUBE EVERY 500 km (300 mi)			
9.	Brake System	Inspect and adjust. Replace shoes if necessary.	—	○	○	○	
10.	Clutch	Adjust free play.	—	○	○	○	
11.	Font Fork Oil	Drain completely. Fill to specification.	Yamaha fork oil 10wt or equivalent				○
12.	Steering Bearings	Check steering assembly for looseness. Moderately repack every 15,000 km (9,500 mi).	Medium weight wheel bearing grease		○		○
13.	Wheel Bearings	Check bearings for smooth rotation. Moderately repack every 15,000 km (9,500 mi).	Medium weight wheel bearing grease		○		○
14.	Battery	Check specific gravity and breather pipe.	—		○	○	

C. ANTICIPATED MAINTENANCE

The maintenance items in this table are set apart from the regular periodic maintenance items because of their anticipated need of irregular service intervals. The service interval is dependent upon variable factors such as the severity of use, operating conditions, etc. Therefore, perform this maintenance when the described symptoms warrant it.

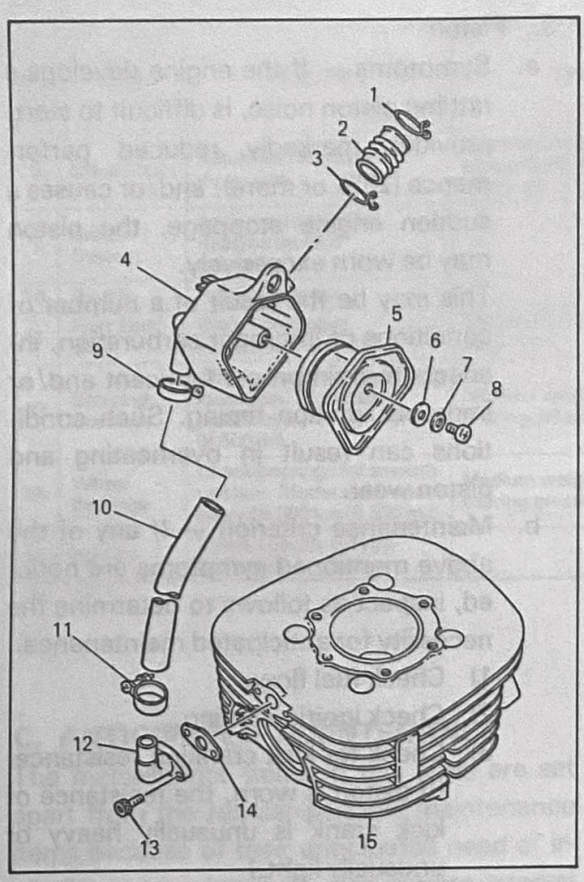
NO.	ITEM	REMARKS
1.	Spark Plug	If any spark plug failure is noticed replace the spark plug. Symptoms indicating spark plug failure are anticipated to occur around 3,000 km (2,000 mi).
2.	Decarbonization	If heavy power loss is evident, decarbonize the cylinder head, piston head, pulsating air port and exhaust system. Carbon build-up is anticipated to occur around 5,000 ~ 10,000 km (3,000 ~ 6,000 mi).
3.	Piston	If the piston rattles, the vehicle becomes hard to start, appears to be lacking power, or becomes in-operative, repair as follows: replace the piston and piston rings, clean, hone, or replace the cylinder. These symptoms are anticipated to occur mainly below 3,000 km (2,000 mi).

1. Spark plug
   a. Symptoms — If the spark plug becomes wet with fuel or oil, or receives an accumulation of carbon, the spark plug will become electrically shorted and ineffective. As a result, engine misfiring may occur, the engine may suddenly stop, and restarting will be impossible.
   b. Maintenance criterion — If above mentioned symptoms are noticed, remove the spark plug and inspect electrode for carbon bridging and/or oily electrode condition.
   c. Maintenance — After inspection, replace plug if necessary.
2. Decarbonization
   a. Symptoms — If a vehicle is driven habitually at low speed, the engine runs cold and thus carbon tends to build up on the cylinder exhaust port, cylinder head, piston head, pulsating air port, exhaust passage in the exhaust pipe, and in the silencer. With sufficient carbon deposits the exhaust passages become clogged and restricts the passage of exhaust gas. Eventually the engine will demonstrate poor performance, such as poor acceration (20 to 30% down from original) or afterburning or after running.
   b. Maintenance criterion — If any of the symptoms above are noticed, inspect as follows to determine the necessity for anticipated maintenance.
      1) Check fuel flow.
      2) Check ignition timing.
      3) Check spark plug for color and carbon build-up. (In the case of heavy carbon build-up, spark plug shows black color and/or the carbon build-up is evident.)
   c. Maintenance — After this inspection, if decarbonization is determined necessary, decarbonize the piston head, cylinder head, pulsating air port, exhaust passage of exhaust system by disassembling these components and carefully scraping the accumulated carbon with a round scraper.
3. Piston
   a. Symptoms — If the engine develops a rattling piston noise, is difficult to start, provides markedly reduced performance (20% or more), and/or causes a sudden engine stoppage, the piston may be worn excessively.
      This may be the result of a number of conditions of improper carburetion, inadequate or improper lubricant and/or improper ignition timing. Such conditions can result in overheating and piston wear.
   b. Maintenance criterion — If any of the above mentioned symptoms are noticed, inspect as follows to determine the necessity for anticipated maintenance.
      1) Check fuel flow.
      2) Check ignition timing.
      3) Check for kick cranking resistance. (If piston is worn, the resistance of kick crank is unusually heavy or unusually light.)
      4) Check spark plug for usual color or deposit. (If piston is worn, the spark plug may show a bright metalic color or deposit on the spark plug insulator.)
   c. Maintenance — If an inspection reveals damage to the cylinder, bore or replace cylinder, and replace piston and piston rings. Make sure proper piston clearance is maintained.

2-2. ENGINE

A. Pulsating Air System (Air injection)

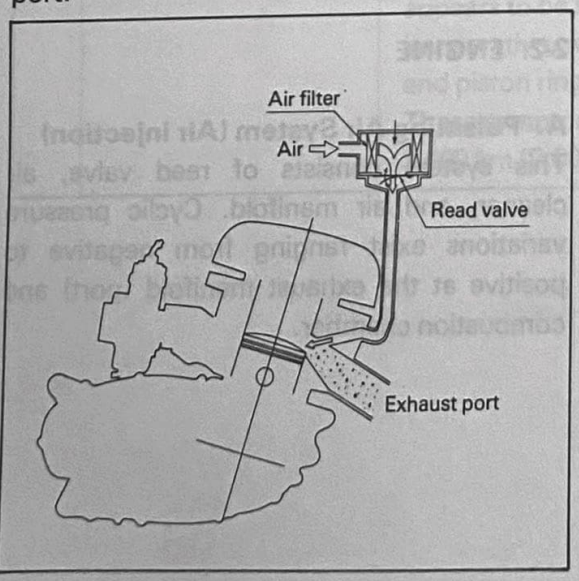
This system consists of reed valve, air cleaner, and air manifold. Cyclic pressure variations exist ranging from negative to positive at the exhaust manifold (port) and combustion chamber.



1. Clip
2. Duct
3. Clip
4. Air cleaner case assembly
5. Element assembly
6. Plate washer
7. Plain washer
8. Panhead screw
9. Hose clamp
10. Hose
11. Hose clamp
12. Joint
13. Allen screw
14. Gasket
15. Cylinder

The fresh air is drawn by the negative pressure in the exhaust manifold (port). The flow of fresh air is through the air cleaner and reed valve to said area.

Reed valve is closed and opened with the negative and positive pressure in the exhaust port.

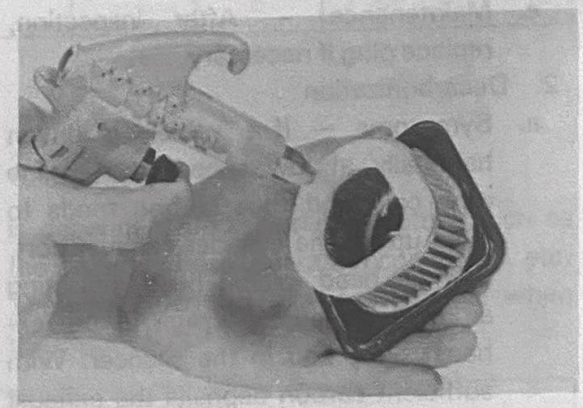


The application of air to the exhaust port oxidizes carbon monoxide (CO) and unburned hydrocarbon (HC). This reduces the amount of these pollutants emitted as exhaust gas.

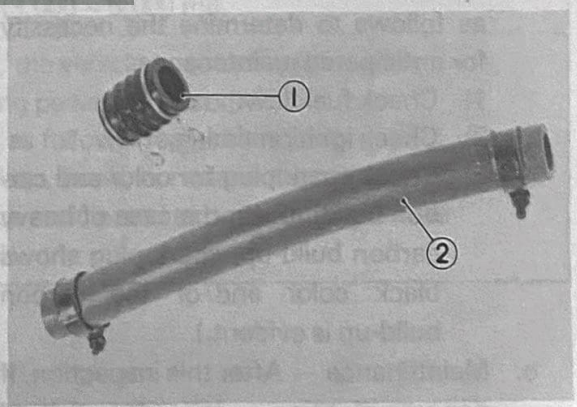
INSPECTION

It is necessary to remove the side covers, seat and fuel tank for checking this system.

1. Air cleaner element cleaning
   a. Remove the air cleaner element from the filter case.
   b. If the element is covered with dust, blow it off by compressed air from the inside.

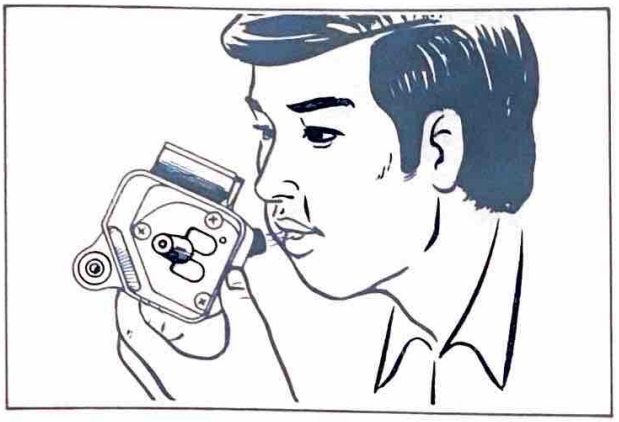


   c. If the element assembly is damaged, replace it.
2. Suction hose checking
   a. Visually check for damage and/or cracks.
   b. Replace the hose if any defect is found.



1. Duct 2. Hose

3. Reed valve checking
   a. Remove the air filter case assembly.
   b. Check the reed valve for leakage, blowing in air from the cylinder side of case with the mouth.



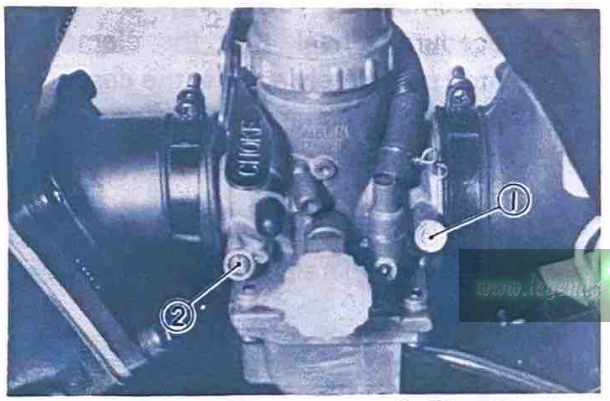
c. If there is any leakage, replace the air cleaner assembly.

After checking and servicing, reverse the removal procedure for reinstallation. Take care to tighten every joint securely.

B. Carburetor

1. Idle mixture

The idle mixture is set at the factory by the use of special equipment. No attempt should be made by the dealer to change this adjustment.



"Do not adjust" 1. Pilot air screw 2. Pilot outlet screw

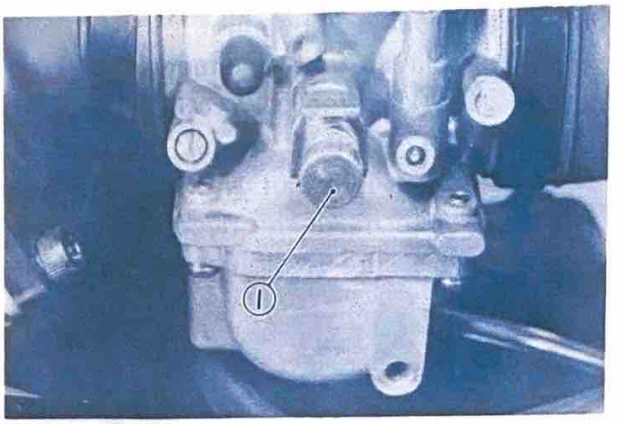
2. Idle speed

a. Start the engine and warm it up for about 5 minutes at 3,000 r/min with no load.

b. Remove the cap on the throttle stop screw.

c. Set the engine idle speed to the specified speed by turning the throttle stop screw in or out with the vehicle in the upright position.

Engine idle speed:
1,000 ~ 1,200 r/min



1. Throttle stop screw

d. After adjustment, install the cap.

NOTE:

Fit the cap with its stopper downward.

3. Carburetor (throttle opening) adjustment

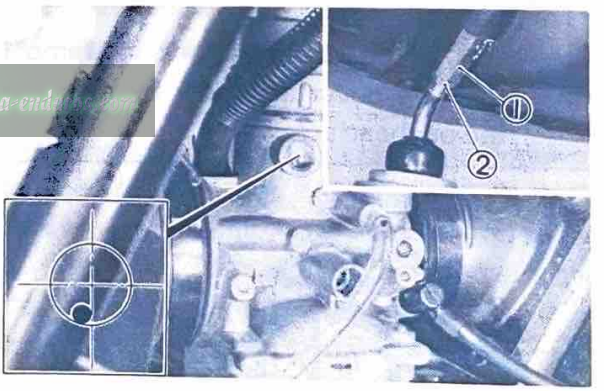
a. Remove the bolt from the throttle opening adjusting port of carburetor, and fully turn the throttle grip out.

b. Adjust the mark on the throttle slide in carburetor as illustrated.

1) Loosen the lock nut.

2) By turning the adjuster in or out, adjust throttle slide to the marked position.

3) Tighten the lock nut.



1. Adjuster 2. Lock nut

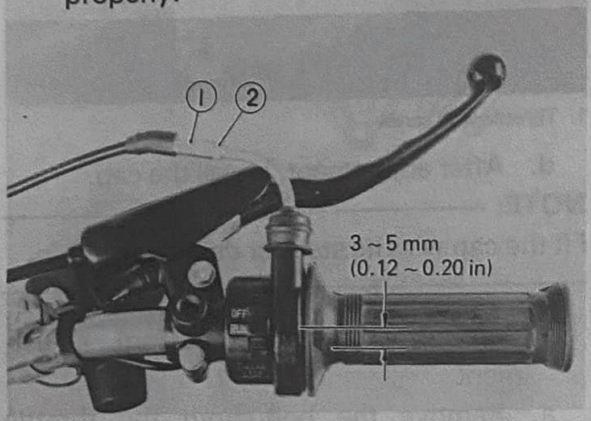
c. Turn the throttle grip in once, and fully open it again. With the throttle grip in this position, check the position of throttle slide.

d. Install the bolt and tighten.

NOTE:

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

4. Throttle cable adjustment
   Check play in turning direction of throttle grip. The free play should be 3 ~ 5 mm (0.12 ~ 0.20 in) at grip flange. Loosen the lock nut and turn the wire adjuster to make the necessary adjustment. Be sure to tighten the lock nut properly.



1. Adjuster 2. Lock nut

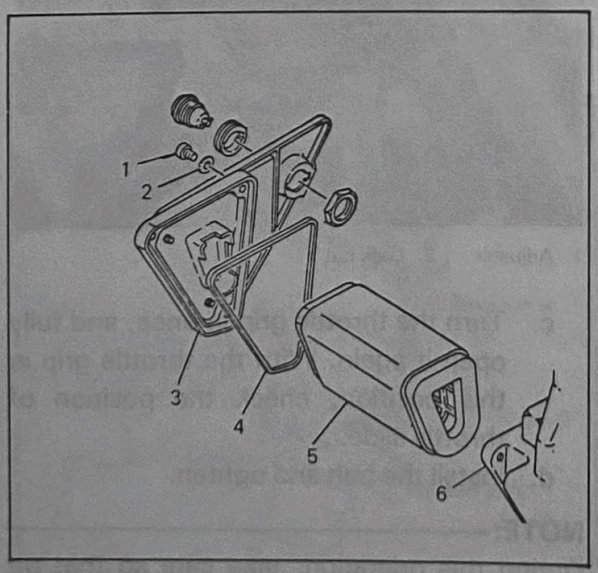
C. Exhaust System

Check the tightness of exhaust pipe joint nuts and if loose, retighten. If any gas leakage is found, replace the gasket.

D. Air Cleaner

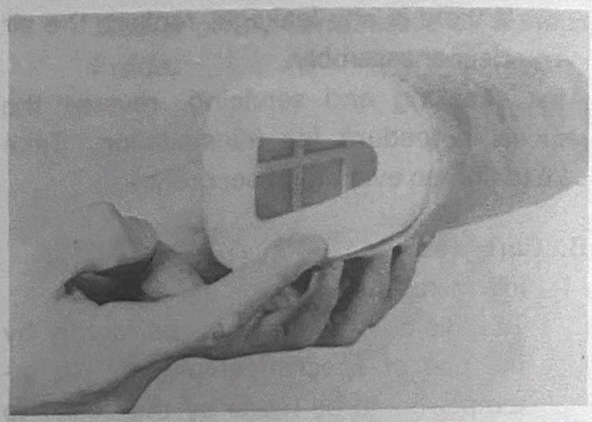
The air filter protects the engine from dirt which can enter with the intake air and cause rapid engine wear. This dirt is filtered from the air by the air filter element.

1. Removal
   a. Unlock the side cover lock and remove the side cover assembly by removing the panhead screws.



1. Panhead screw
2. Washer
3. Case cap
4. Seal
5. Element assembly
6. Air cleaner case

   b. Pull out the element from its case, remove element from guide.
2. Cleaning method
   Clean the element with solvent. After cleaning, remove the remaining solvent by squeezing the foam rubber. Then apply 30W motor oil to the entire surface and squeeze out the excess oil. Foam should be wet but not dripping. Coat the sealing edges of the filter element with light grease.



3. Reassemble by reversing the removal procedure. Check that the element is seated completely against the case.
4. The air filter element should be cleaned at 6 months or every 3,000 km (2,000 mi).
   It should be cleaned more often if the machine is operated in extremely dusty areas.

NOTE:

Each time cleaner element maintenance is performed, check the air inlet to the cleaner case for obstructions. Check the air cleaner joint rubber to the carburetor and manifold fittings for an airtight seal. Tighten all fittings thoroughly to avoid the possibility of unfiltered air entering the engine.

CAUTION:

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

E. Autolube Pump

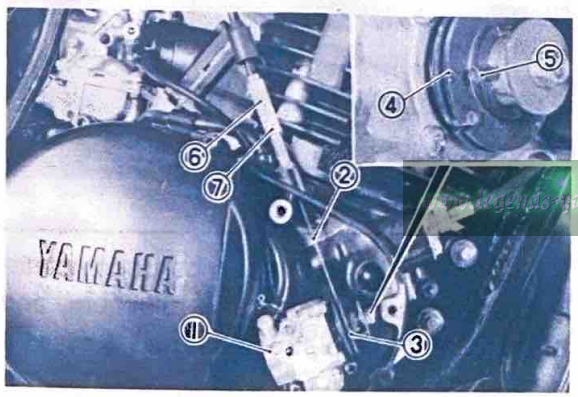
1. Cable adjustment

NOTE:

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

a. Fully open the throttle grip and adjust the pump cable so that the mark on the pump adjusting pulley aligns with the adjusting pulley guide pin.

Pulley mark: ⊠

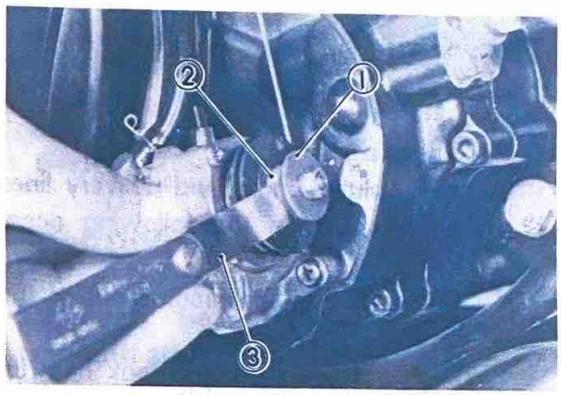


1. Oil pump
2. Pump cable
3. Adjust pulley
4. Match mark
5. Guide pin
6. Adjuster
7. Lock nut

b. If the mark and pin are not in alignment, loosen the cable length adjuster lock nut on top of the crankcase cover and adjust the cable length until alignment is achieved.
c. Tighten adjuster lock nut.
d. Back off the throttle grip once and fully open it again. Make sure that the pump cable is correctly adjusted.

2. Minimum pump stroke check and adjustment procedure

a. With the cable properly adjusted and the magneto cover removed, turn the crankshaft until the adjust plate moves out to its limit.
While running the engine at idle, observe the pump adjust plate carefully. Stop the engine the moment that the adjust plate moves out to its limit.
b. Measure the gap with the thickness gauge between the raised boss on the pump adjust pulley and the adjust plate.



1. Adjust plate
2. Adjust pulley
3. Thickness gauge

c. Repeat steps "a" and "b" above a few times. When the gap measured is the largest, the pump stroke is considered to be at a minimum.

NOTE:

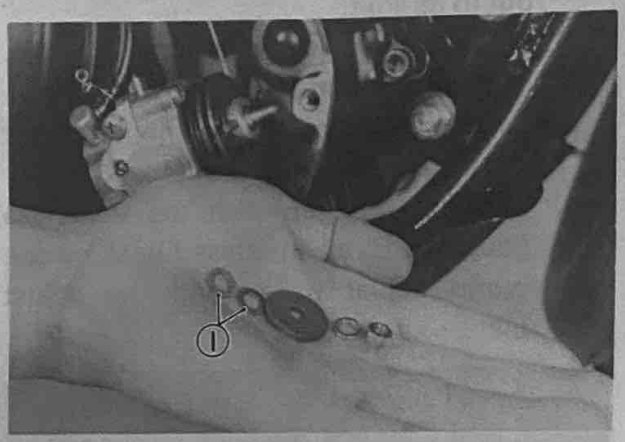
When inserting the thickness gauge between the adjust plate and the adjust pulley, be careful so that neither the plate nor the pulley is moved. In other words, do not force the thickness gauge into the gap.

Minimum pump stroke:
0.25 ~ 0.30 mm (0.010 ~ 0.012 in)

d. If clearance is not correct, remove the adjust plate lock nut and the adjust plate.
e. Remove or add an adjust shim as required. Tighten lock nut and remeasure gap.

NOTE:

Thicken shims increase pump stroke and output, thinner shims decrease pump stroke and output.



1. Adjust shim

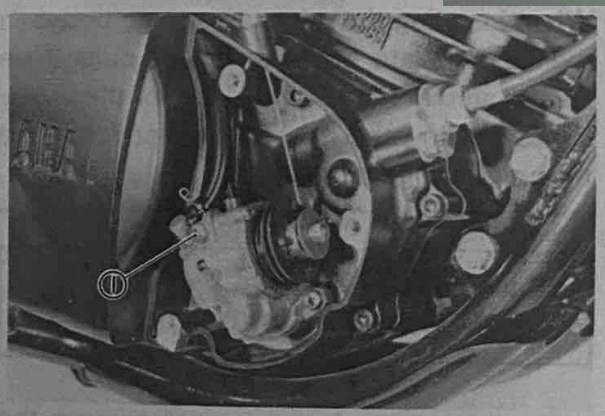
3. Air bleeding

The Autolube Pump and delivery lines must be bled on the following occasions:

- Setting up a new machine out of the crate.
- Whenever the Autolube tank has run dry.
- Whenever any portion of the Autolube system is disconnected.
- If the machine lies on its side after falling over.

a. Bleeding the pump case and/or oil pipe

1) Remove the bleed screw.

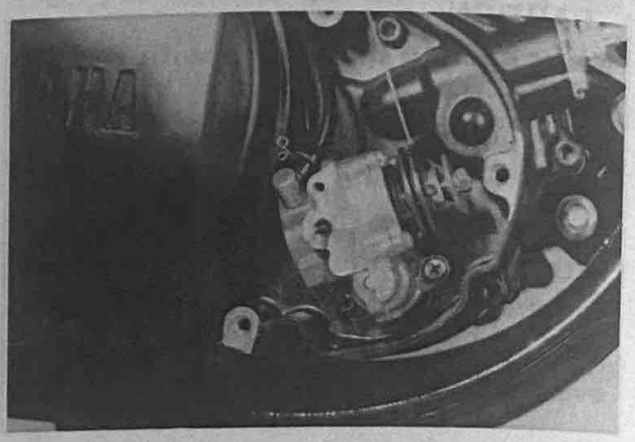


1. Bleed screw

2) Keep the oil running out until air bubbles disappear.

NOTE:

Check the bleed screw gasket, and if damaged, replace with a new one.

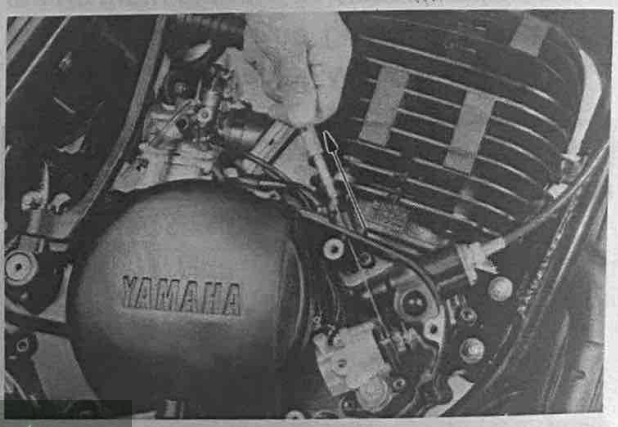


3) When air bubbles are expelled completely, tighten the bleed screw and install the pump cover.

b. Bleeding the pump distributor and/or delivery pipe

1) Start the engine.

2) Pull the pump wire all the way out to set the pump stroke to a maximum.



NOTE:

It is difficult to bleed the distributor completely with the pump stroke at a minimum, and therefore the pump stroke should be set to a maximum.

3) Keep the engine running at about 2,000 r/min for two minutes or so, and both distributor and delivery pipe can be completely bled.

F. Engine and Transmission Oil

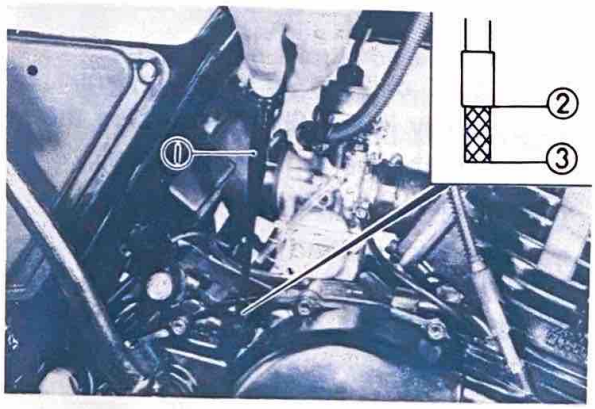
1. Engine oil (Autolube oil)

We recommend that first choice be Yamalube 2-cycle oil. If for any reason you should use another type, the oil should meet or exceed BIA certification "TC-W". Check container top or label for service specification.

CAUTION:

Under extremely cold conditions (0°C or below) SAE 30W and 40W oils become very thick and will not flow as readily to the Autolube pump. This may cause oil pump starvation and engine damage.

2. Transmission oil
   a. To check level, start the engine and let it run for several minutes to warm and distribute oil. Stop engine.
   Unscrew the dip stick and wipe it clean. Set it on the case threads in a level position. Do not screw dip stick into case. Remove and check level.



1. Dip stick 2. Maximum level 3. Minimum level

NOTE:

Be sure the machine is level and on both wheels.

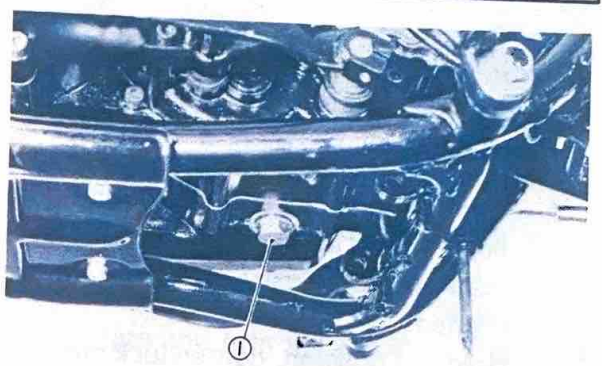
   b. The oil level should be between the minimum and maximum marks. Top off as required.

Recommended oil:
Yamalube 4-cycle oil or SAE 10W/30 "SE" motor oil or "GL" gear oil

   c. During the break-in period, replace the transmission oil 30 days or 1,000 km (600 mi) after the date of first use. The transmission should be drained and refilled approximately every 3,000 km (2,000 mi) or 6 months.

Transmission oil quantity:
Total (dry): 1,200 cc (1.3 qt)
Excharge: 1,100 cc (1.2 qt)

Transmission drain plug torque:
2.5 m-kg (18 ft-lb)



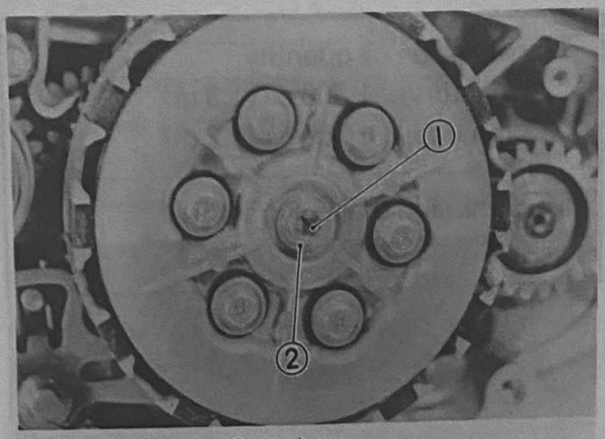
1. Drain plug

CAUTION:

Under no circumstances should any additives be included with the transmission oil. This oil also lubricates and cools the clutch. Many additives will cause sever clutch slippage. (This does not refer to additives already present in 4-cycle oils but to speciality items such as thickness or viscosity improvers.)

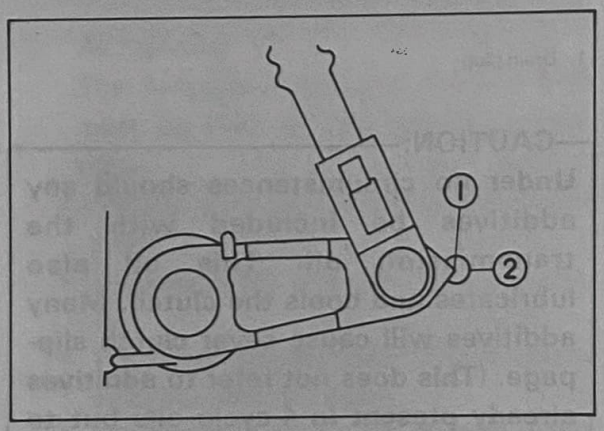
G. Clutch

1. Mechanism adjustment
   a. Fully loosen the cable in-line length adjuster lock nut and screw in the adjuster until tight.
   b. Turn the handle lever adjuster in.
   c. Loosen the rear brake and remove the kick crank.
   d. Drain the transmission oil and remove the crankcase cover (R).
   e. Loosen the clutch mechanism adjuster lock nut.



1. Adjusting screw 2. Lock nut

f. Push the push lever forward with your finger until it stops. With the push lever mark and crankcase match mark are aligned.
Hold this position, tighten lock nut.



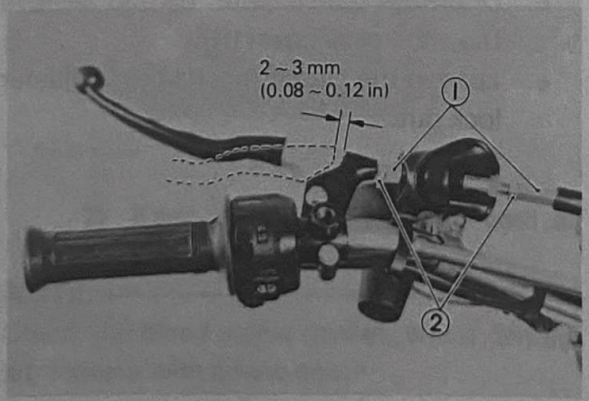
1. Push lever mark 2. Case match mark

g. Install the crankcase cover and the kick crank. Re-adjust brake pedal and clutch lever freeplay as required.

2. Freeplay adjustment

a. Loosen either the handle lever adjuster lock nut or the cable inline length adjuster lock nut.

b. Turn the length adjuster either in or out until proper lever freeplay is achieved.

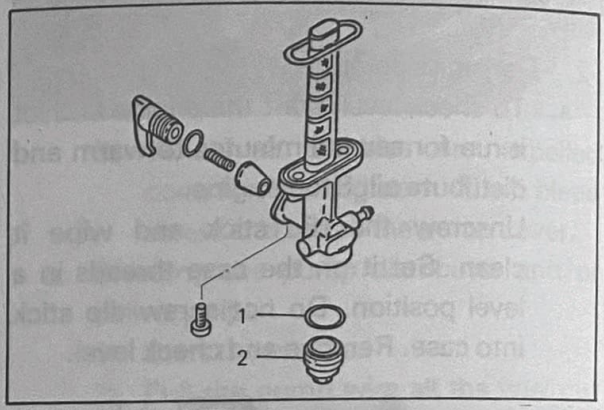


1. Adjuster 2. Lock nut

2-3. CHASSIS

A. Fuel Petcock

1. Place the petcock lever in "OFF" position, and remove the filter cup.
2. Clean the filter cup with a solvent or compressed air.



1. Filter gasket 2. Filter cup

3. If dust collects or rust develops excessively in the filter cup, clean the inside of the fuel tank with solvent.
4. Re-install the filter cup.

B. Fuel Hose

1. Visually check for cracks or damage. If any defect is found, replace the hose.

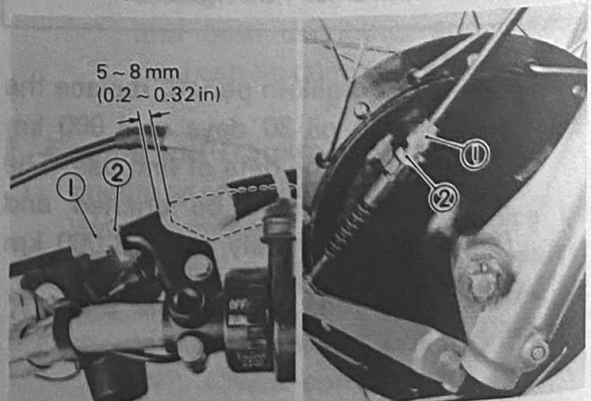
C. Brakes and Wheels

1. Front brake adjustment
Front brake cable freeplay can be adjusted to suit rider preference, but a minimum freeplay of 5 ~ 8 mm (0.2 ~ 0.3 in) should be maintained.
Freeplay can be adjusted at handlebar lever or brake shoe plate.

a. Loosen the adjuster lock nut (2).

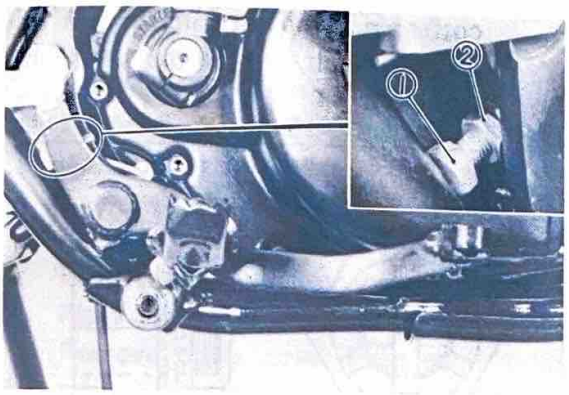
b. Turn the adjuster (1) in or out until adjustment is suitable.

c. Tighten the adjuster lock nut (2).



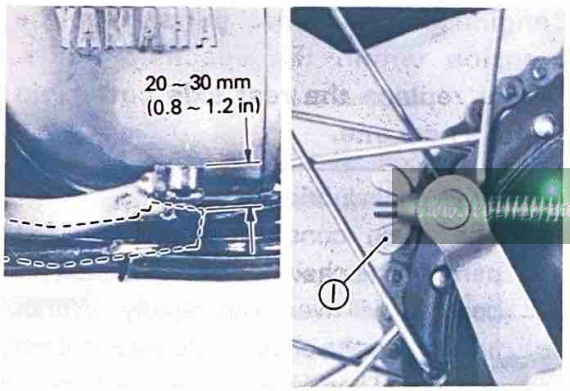
1. Adjuster 2. Lock nut

2. Brake pedal position adjustment
The position of the rear brake pedal should be adjusted to suit the rider. Loosen the lock nut and adjust the pedal height by turning the adjuster.



1. Adjuster 2. Lock nut

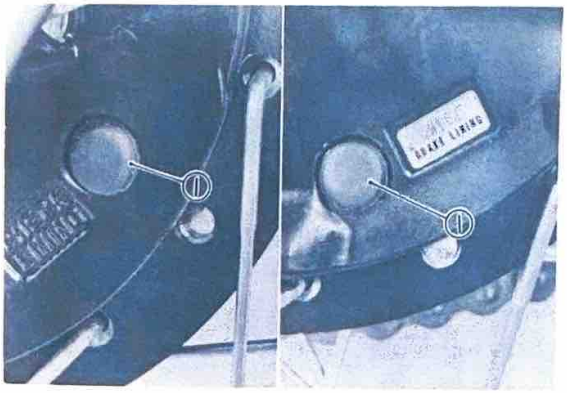
3. Rear brake adjustment
The rear brake should be adjusted so the end of the brake pedal moves 20 ~ 30 mm (0.8 ~ 1.2 in). To adjust, proceed as follows.
Turn the adjuster on the rear brake rod in or out until brake pedal freeplay is suitable.



1. Adjuster

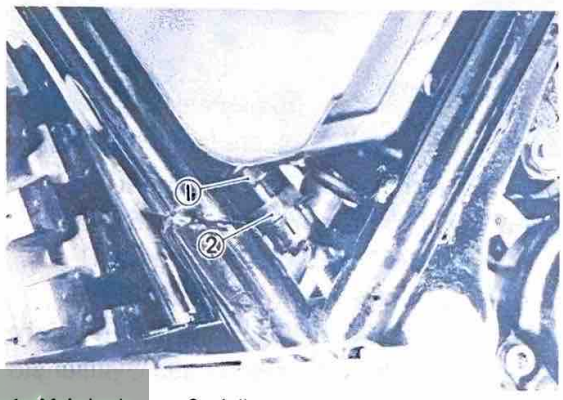
NOTE:
Rear brake pedal adjustment must be checked whenever chain is adjusted or rear wheel is removed and re-installed.

4. Brake lining check
Brake lining can be checked through the inspection hole in the brake shoe plate. If thickness is less than 2 mm (0.08 in), replace the brake shoes.
Always replace shoes as a set.



1. Inspection hole (Front) 1. Inspection hole (Rear)

5. Brakelight switch adjustment
The brakelight switch is operated by movement of the brake pedal. To adjust, hold the switch body so it does not rotate and turn the adjuster. Proper adjustment is achieved when the brakelight illuminates slightly before the brake starts to take effect.



1. Main body 2. Adjuster

6. Axles
Check axle nuts torque.

Front axle nut: 8 m-kg (57 ft-lb)
Rear axle nut: 9 m-kg (65 ft-lb)

7. Check tire pressure.
Recommended pressures:

	Normal riding	High speed or with passenger
Front	1.3 kg/cm² (18 p.s.i.)	1.5 kg/cm² (22 p.s.i.)
Rear	1.5 kg/cm² (22 p.s.i.)	1.8 kg/cm² (26 p.s.i.)

D. Drive Chain

1. Tension check

With both wheels on the ground (no rider on the machine), measure the slack in the chain. As illustrated, hold the chain, and make sure the chain deflection is 50 ~ 60 mm (2.0 ~ 2.4 in) at the center of the upper row.

NOTE:

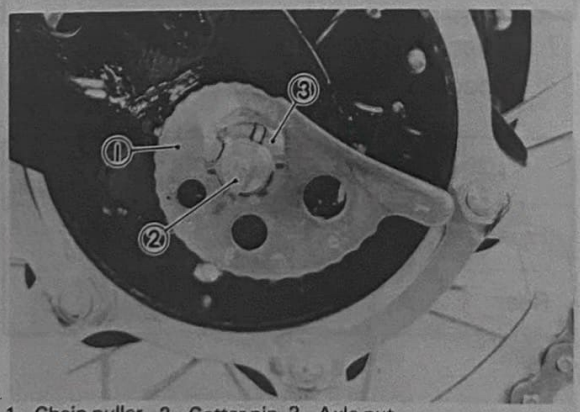
When checking the chain tension, push the chain tensioner down so it does not contact the chain.

If the chain deflects more than specified, adjust the chain tension.

2. Drive chain tension adjustment
   a. Loosen the rear brake adjuster.
   b. Remove the rear axle cotter pin.
   c. Loosen the rear wheel axle nut.
   d. Turn chain puller both left and right, until axle is situated in same puller slot position on each side.

NOTE:

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

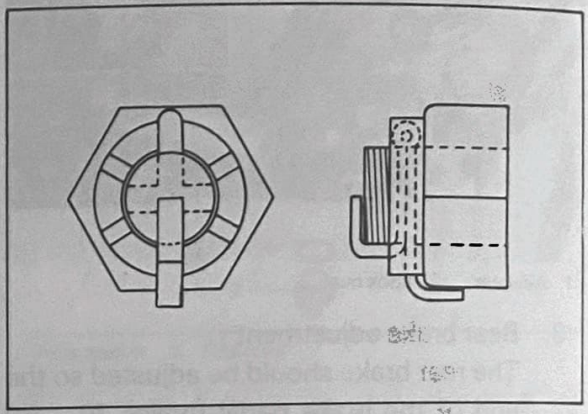


1. Chain puller 2. Cotter pin 3. Axle nut

   e. Tighten the rear axle nut.

Axle nut torque: 9.0 m-kg (65 ft-lb)

   f. Insert the new cotter pin into the rear wheel axle nut and bend the end of cotter pin. If the nut notch and pin hole do not match, tighten the nut slightly to match.



   g. In the final step, adjust the play in the brake pedal.

CAUTION:

Do not over tighten the chain. 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.

3. Drive chain lubrication

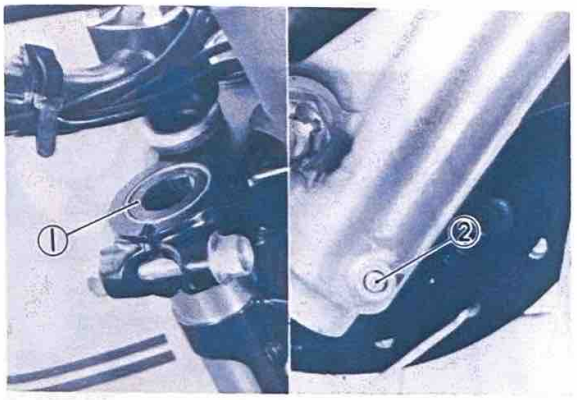
The chain consists of many moving parts. If the chain is not maintained properly, it will wear out rapidly. Without lubrication the chain could wear out very quickly. Therefore, form the habit of periodically servicing the chain. This service is especially necessary when riding in dusty conditions.

   a. Use Yamaha Chain and Cable Lube or SAE 10W/30 motor oil. 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. This should be performed every 500 km (300 mi) or whenever the chain becomes dry.
   b. To clean the entire chain, first remove the chain from the motorcycle, dip it in

solvent and clean out as much dirt as possible. Then take the chain out of the solvent and dry it. After drying, lubricate the chain to prevent the formation of rust.

E. Front Fork Oil Change

1. Elevate front wheel by placing a suitable stand under the engine.
2. Remove the handlebar and then loosen the fork pinch bolts.
3. Remove cap bolts from inner fork tubes.
4. Place container under each fork tube. Remove drain screw from each outer tube.



1. Cap bolt 2. Drain screw

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

NOTE:

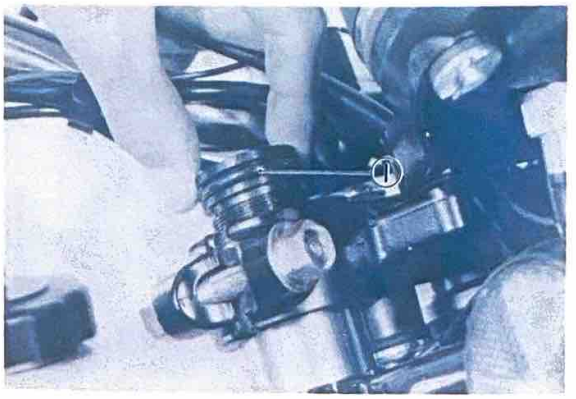
Check gasket, replace if damaged.

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

Recommended oil: Yamaha Fork Oil 10 wt or equivalent

Quantity per leg: 257 cc (8.6 oz)

8. After filling, slowly pump the fork tubes up and down to distribute the oil.



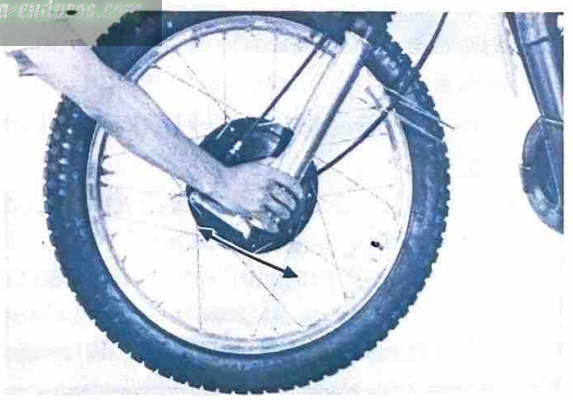
1. O-ring

9. Inspect O-ring on fork cap bolts and replace if damaged.
10. Install the fork cap bolts and torque to specification.

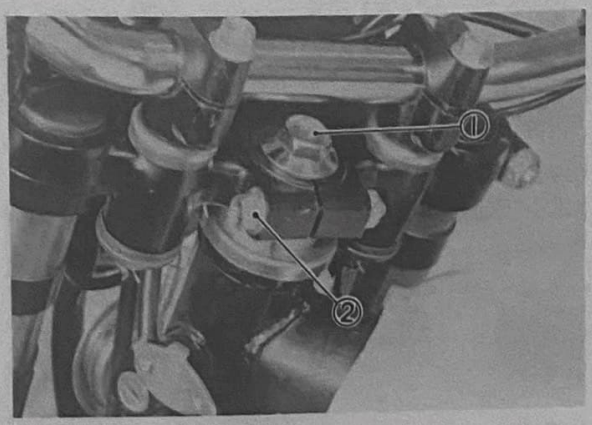
Fork cap bolt torque:	2.3 m-kg (17.0 ft-lb)
Fork pinch bolt:	3.3 m-kg (24 ft-lb)

F. Steering

1. Steering inspection
   a. Block machine up so that front wheel is off the ground.
   b. Grasp the bottom of the forks and gently rock the fork assembly backward and forward, checking fo looseness in the steering assembly bearings.



2. Steering adjustment
   a. If steering head needs adjustment, loosen steering fitting bolt and pinch bolts.

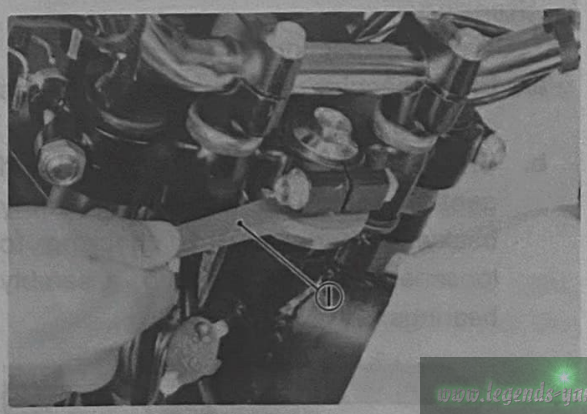


1. Fitting bolt 2. Pinch bolt

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

NOTE:

Excessive tightening of this nut will cause rapid wear of ball bearings and races. Recheck for looseness and freedom of movement.



1. Steering nut wrench

c. Tighten steering fitting bolt and pinch bolts.

Fitting bolt torque: 5.5 m-kg (40 ft-lb)
Pinch bolt torque: 2.3 m-kg (17 ft-lb)

NOTE:

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

G. Rear Shock Absorber Adjustment

The spring pre-load of the rear shock absorber can be adjusted to suit rider preference, weight and the course conditions.

When springing feels excessive and too hard:

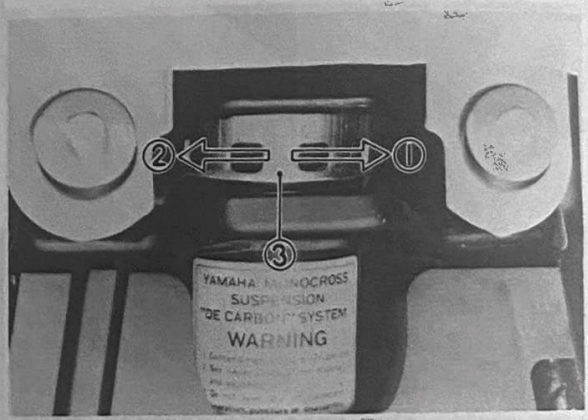
- Decrease the spring pre-load for softer ride.

When bottoming feels excessive and too soft:

- Increase the spring pre-load.

To adjust, use the special wrench (in the owner's tool kit) as shown. If the adjuster is raised, the spring becomes stiffer and if lowered the spring becomes softer.

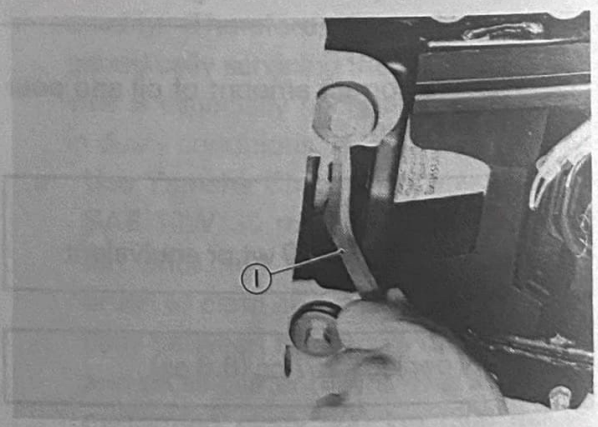
1. Remove the seat.



1. Stiffer 2. Softer 3. Adjuster

2. Turn the adjuster in or out until adjustment is suitable.

	Hard		STD	Soft	
Adjusting Position	2	1	*	1	2



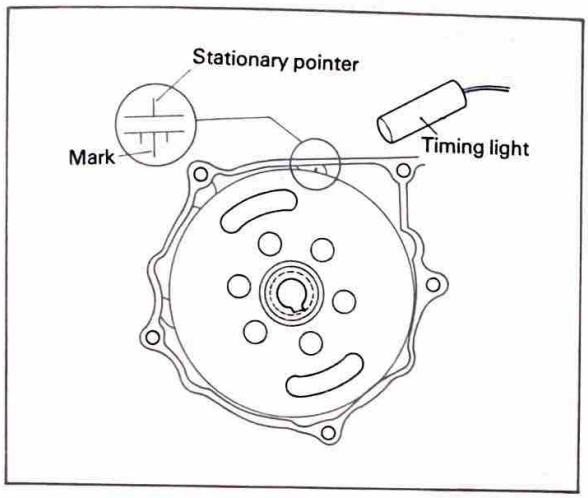
1. Special wrench

3. Install the seat and tighten the securing bolt.

2-4. ELECTRICAL

A. Ignition Timing

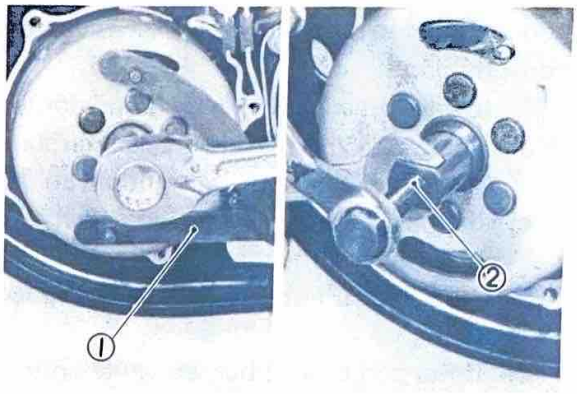
1. Ignition timing is checked with timing light by observing the position of the stationary pointer marked on the crankcace and the marks on the magneto flywheel.



2. Checking the ignition timing
   Using a timing light, the stationary pointer and mark (center mark) on the magneto flywheel, adjust the ignition timing correctly.
   a. Remove 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. Use a tachometer for checking.

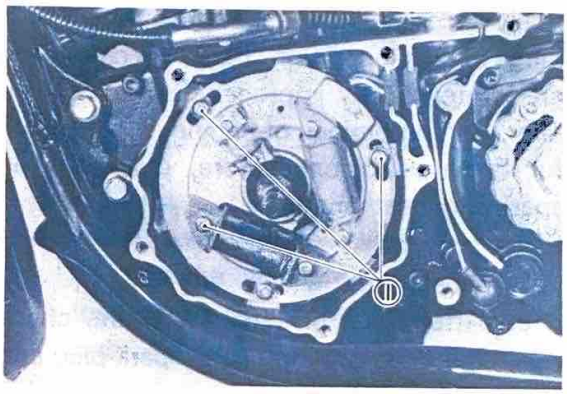
Specified speed: 4,000 r/min

   d. While running the engine at the specified speed, check to see that the stationary pointer is aligned with the magneto center mark. If the marks are out of alignment, follow the steps below.
3. Adjusting the ignition timing
   a. Remove the flywheel using magneto holder and magneto puller.



1. Flywheel holding tool 2. Flywheel puller

   b. Loosen base set screw and turn base until the stationary pointer and the mark on the base align.



1. Base set screws

   c. Tighten base set screw and install flywheel.
   d. Run engine and check marks for alignment by means of timing light.
   e. Repeat procedure (above steps a-d) until marks align.
   f. Re-install crankcase cover (L).

B. Spark Plug

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

good condition and prevent excessive fuel consumption.

1. How to "Read" spark plug (condition)
   a. Best..... When the porcelain around the center electrode is a light tan color.
   b. If the electrodes and porcelain are black and somewhat oily, replace the plug with a hotter-type for low speed riding.
   c. If the porcelain is burned white and/or the electrodes are partially burned away, replace the plug with a colder-type for high speed riding.

NOTE:

This information is a general guide only. It is rarely necessary to change to a different heat range spark plug. Often spark plug conditions are influenced by improper timing, dirty air filter, or long periods of engine idling. Check for these conditions before, changing the spark plug heat range.

2. Inspection
   a. After a run of initial 1,000 km, check the discoloration of the spark plug and clean it. After that, measure the plug gap and adjust it if it does not conform to the specification.
   b. Whenever the spark plug is replaced or cleaned, measure the plug gap and if incorrect, readjust the plug gap.

Plug gap:
0.7 ~ 0.9 mm (0.028 ~ 0.035 in)

   c. Replace the spark plug when the machine has travelled the specified distance.

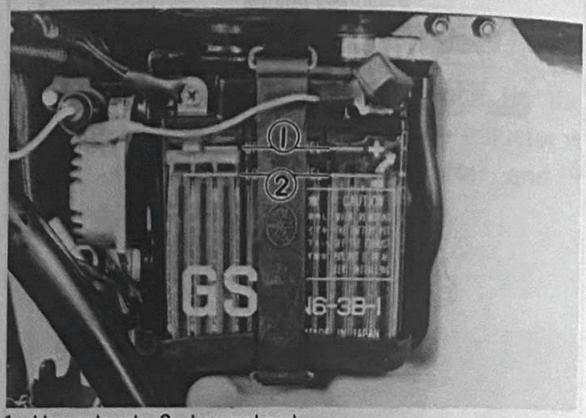
Replacement limit:
Initial 4,000 km (2,500 mi) and thereafter every 3,000 km (2,000 mi)
Standard spark plug:
B8ES (NGK)

Tightening torque:
2.5 m-kg (18 ft-lb)

C. Battery

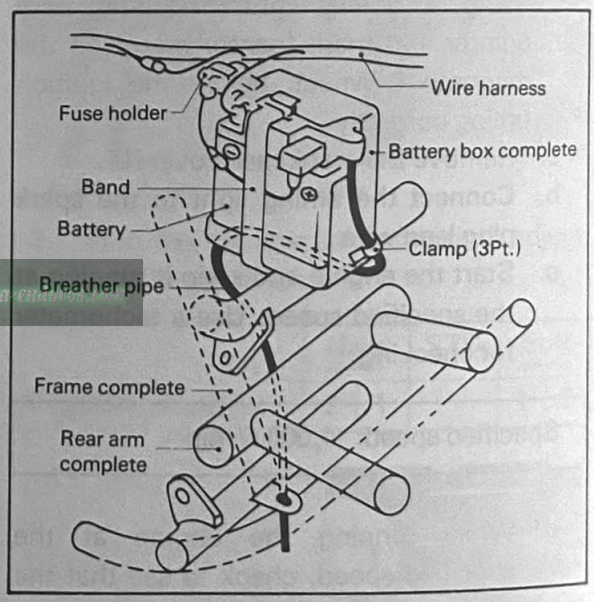
A poorly maintained battery will deteriorate quickly. The battery fluid should be checked at least once a month.

1. The level should be between the upper and lower level marks. Use only distilled water for refilling. Normal tap water contains minerals which are harmful to a battery.



1. Upper level 2. Lower level

2. Make sure the breather pipe is properly connected and is not damaged or obstructed.



3. 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.
3) The 6V battery requires a charging voltage of more than 8.4V in order to supply a current of 0.6A for 10 hours.

4. 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 (amperage too high)
d. Freezing.
e. Filling with water or sulfuric acid containing impurities.
f. Improper charging voltage/current on new battery.

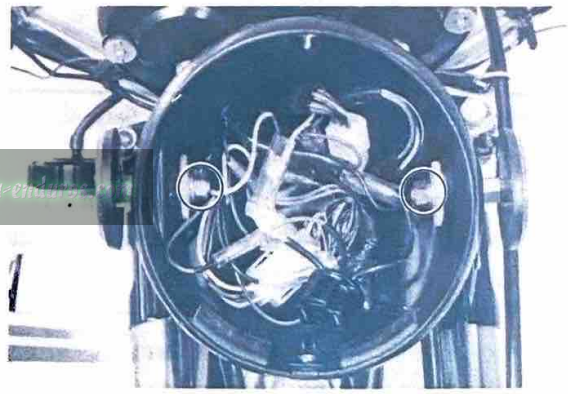
Battery type	6V, 6AH
Electrolyte	Specific gravity: 1.26 (at 20°C) Quantity: 250cc (8.45 oz)
Initial charging current	0.4 Amperes/15 hours (New battery)
Re-charging current	0.6 Amperes/10 hours (or until specific gravity reaches 1.26)
Re-fill fluid	Distilled water to upper level line
Re-fill period	Check once per month or more often as required

5. 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, dry place, and avoid temperatures below 0°C.
c. Recharge the battery before reinstallation.

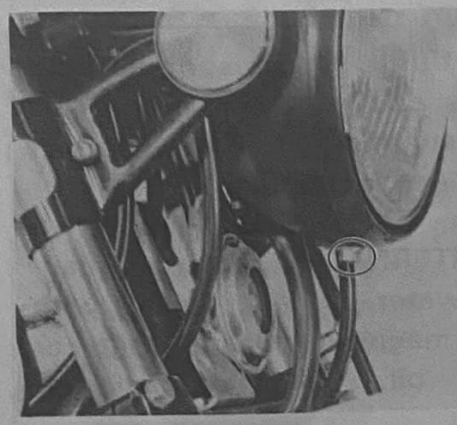
WARNING:
Battery fluid is poisonous and dangerous, causing severe burns, etc. Contains sulfuric acid. Avoid contact with skin, eyes or clothing.
Antidote: EXTERNAL-Flush with water. INTERNAL-Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately.
Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc., away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.
KEEP OUT OF REACH OF CHILDREN.

D. Headlight

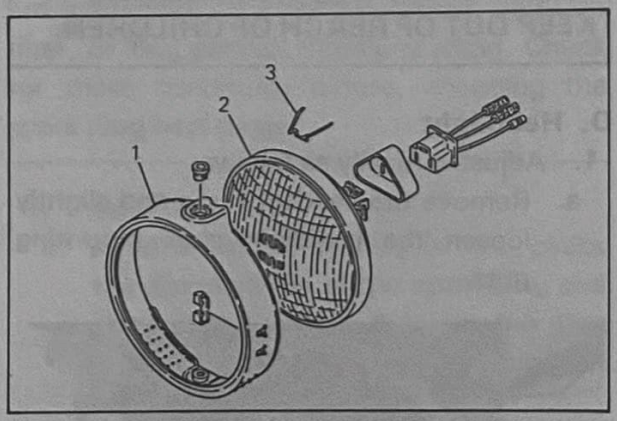
1. Adjust vertically as follows:
a. Remove the headlight unit and slightly loosen the headlight shell mounting nuts.



b. Next, adjust vertically by moving the headlight body. When adjustment is complete hold the body in place, and tighten the two mounting nuts. Then refit the headlight lens unit.
2. Adjust horizontally as follows:
a. Loosen the bolt holding the rim.
b. To adjust to the right; move the lens assembly to right side.
To adjust to the left; move the lens assembly to left side.
c. Tighten the bolt.



3. Replacing the headlight
   a. Unhook spring and pull the defective unit out of the lens unit assembly.
   b. Slip a new unit into position and install springs.
   c. Adjust headlight beam.

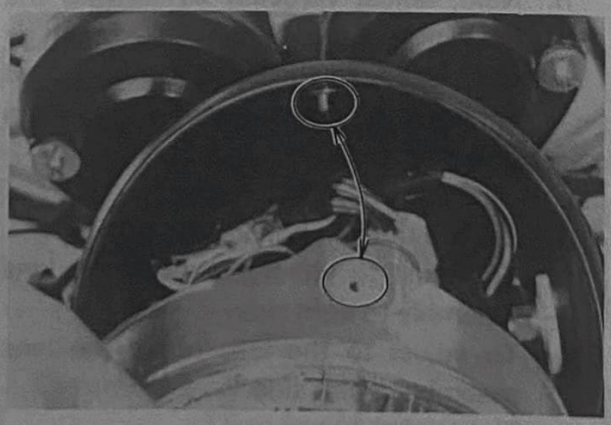


1. Retaining ring 2. Lens unit assembly 3. Set springs

4. When installing the headlight unit assembly, care should be used so that wires are not pinched.

NOTE:

Fit the hole in the headlight unit assembly over the projection of the headlight body.



CHAPTER 3.
ENGINE OVERHAUL

3

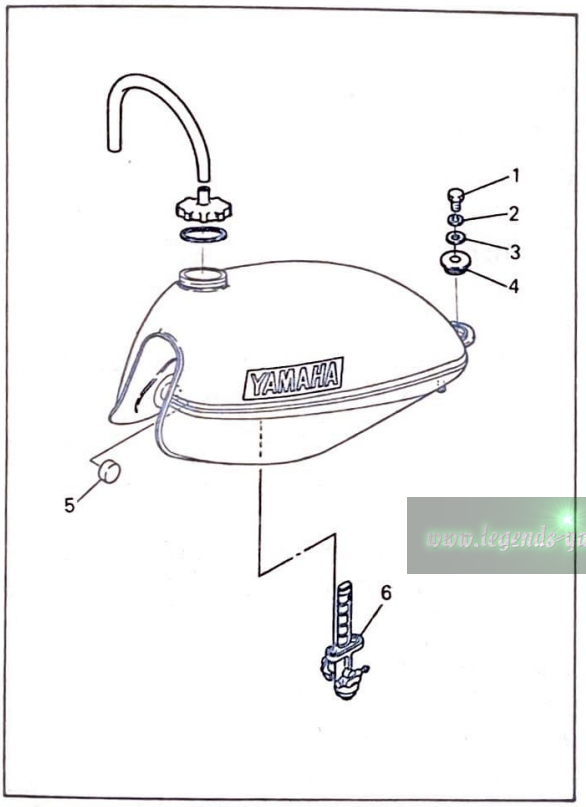
3-1. REMOVAL

A. Preparation for Removal

1. Always clean engine before removal. Do not begin work until all proper tools are available. As parts are removed, clean them and place them in trays in order of disassembly.
2. Start the engine and warm it for a few minutes. Turn off and drain transmission oil.

B. Fuel Tank Assembly

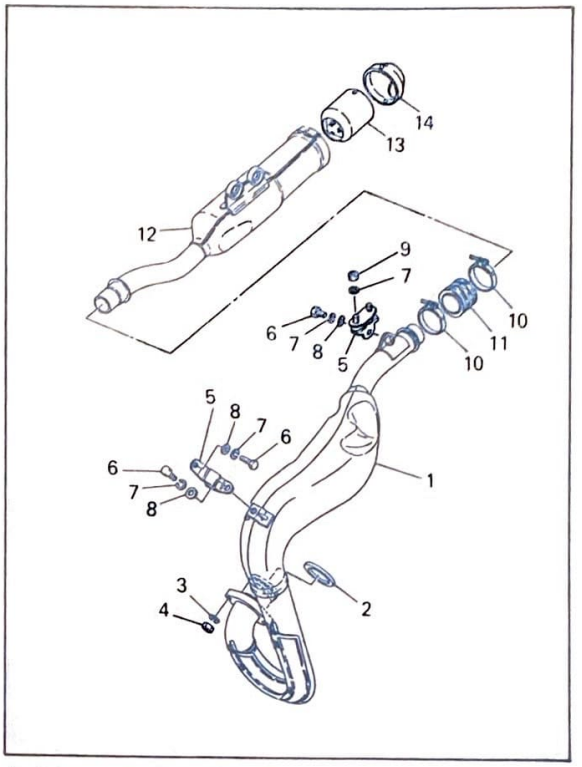
1. Turn fuel petcock to the "OFF" position and disconnect fuel pipe. Remove the bolt holding the rear of the fuel tank and remove the fuel tank.



1. Hexagon bolt
2. Spring washer
3. Plate washer
4. Damper
5. Damper
6. Fuel petcock

C. Muffler

1. Remove left side cover.
2. Remove exhaust pipe assembly.



1. Exhaust pipe assembly
2. Exhaust pipe gasket
3. Spring washer
4. Hexagon nut
5. Muffler stay
6. Hexagon bolt
7. Spring washer
8. Plate washer
9. Nut
10. Hose clamp
11. Muffler joint gasket
12. Silencer
13. Outlet pipe
14. Cap

D. Wiring and Cables

1. Remove the spark plug cap, oil pump cover, oil pipe at oil pump, and oil delivery pipe at carburetor.

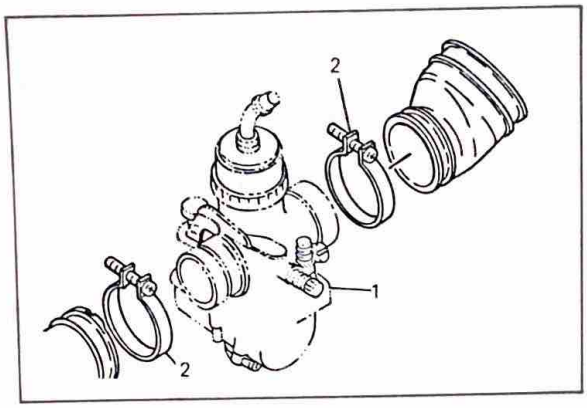
NOTE:

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

2. Remove the pump wire from pulley seat.
3. Remove the clutch cable and tachometer cable from the engine.
4. Disconnect the magneto lead wire.
5. Loosen the clamp and remove the suction pipe from the cylinder.

E. Carburetor

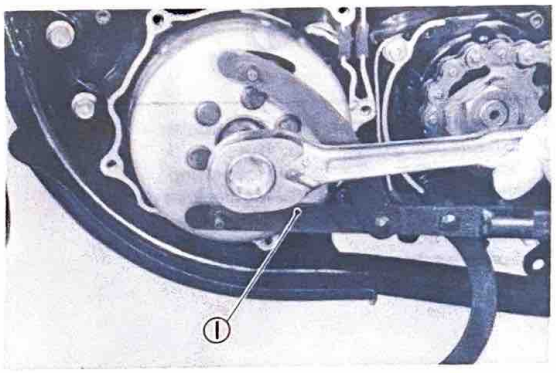
1. Loosen clamps on each end of the carburetor.
2. Note the location and routing of carburetor tubes and carefully remove the carburetor.



1. Carburetor 2. Clamp

F. Flywheel Magneto

1. Remove left crankcase cover screws and cover.
2. Remove the flywheel securing nut. (use Flywheel holding tool) .



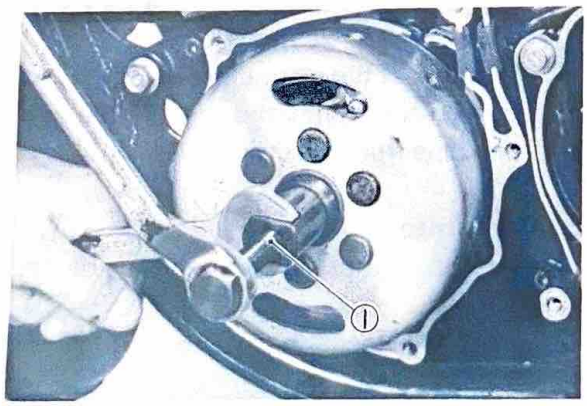
1. Flywheel holding tool

3. Install flywheel puller on flywheel and tighten it.

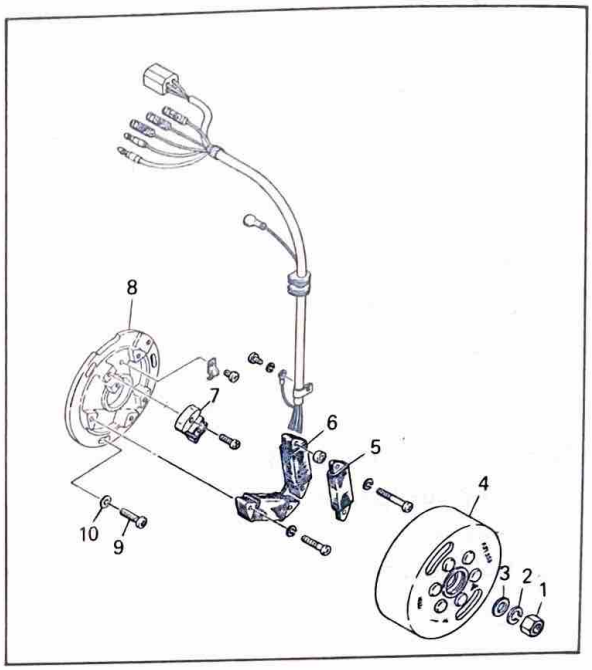
NOTE:

The puller body has lefthand thread.

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



1. Flywheel puller



1. Securing nut
2. Spring washer
3. Plate washer
4. Rotor assembly
5. Source coil 2
6. Source coil 1
7. Pulser assembly
8. Base
9. Panhead screw
10. Plate washer

G. Change Pedal

1. Remove bolt securing change pedal. Remove change pedal. (shift lever)

H. Drive Chain

1. Bend down lock tab, apply rear brake and loosen sprocket securing nut.
2. Remove the chain.

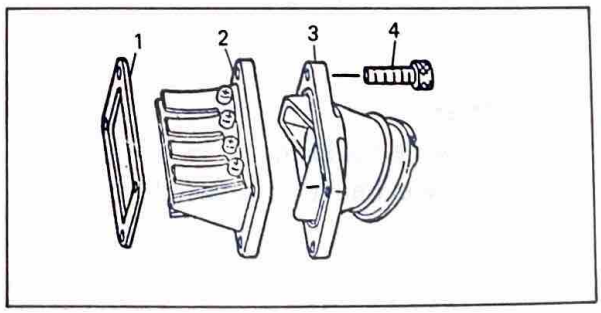
I. Removal

1. Remove the engine mounting bolts and remove engine from right side of frame.

3-2. DISASSEMBLY

A. Reed Valve Assembly

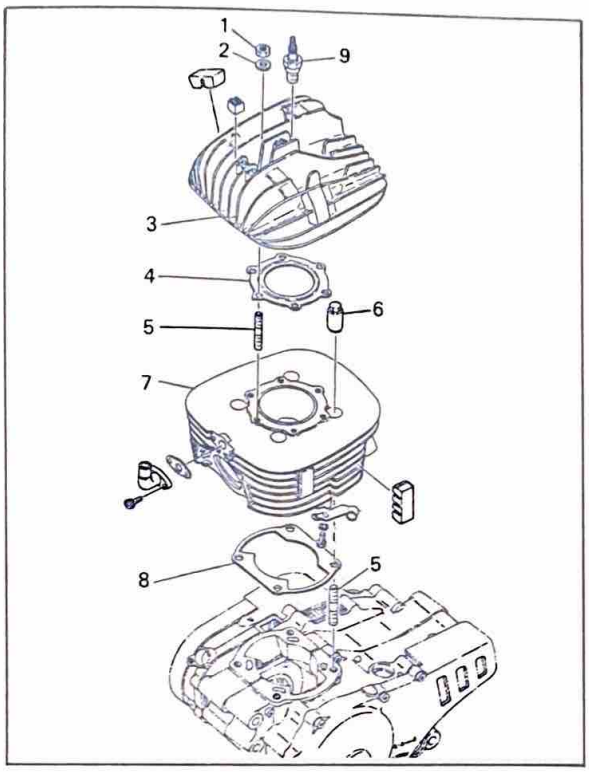
1. Remove reed valve assembly holding bolts (4), carburetor joint and reed valve assembly.



1. Valve seat packing
2. Reed valve assembly
3. Carburetor joint
4. Hexagon bolt

B. Cylinder Head and Cylinder

1. Remove the cylinder head holding nuts, cylinder head and head gasket.
2. Remove the cylinder holding bolt, cylinder and base gasket.



1. Hexagon nut
2. Plate washer
3. Cylinder head
4. Cylinder head gasket
5. Stud bolt
6. Cylinder holding bolt
7. Cylinder
8. Cylinder gasket
9. Spark plug

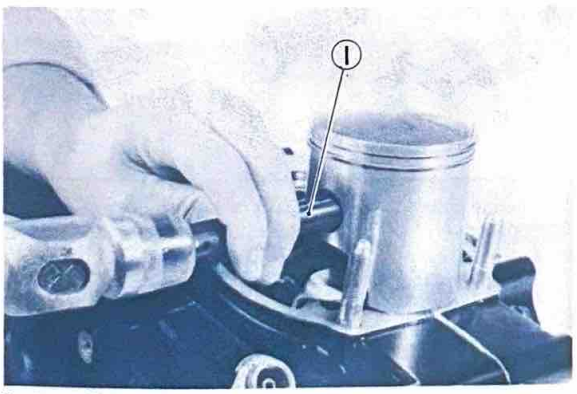
C. Piston Pin and Piston

1. Remove one piston pin clip from piston.

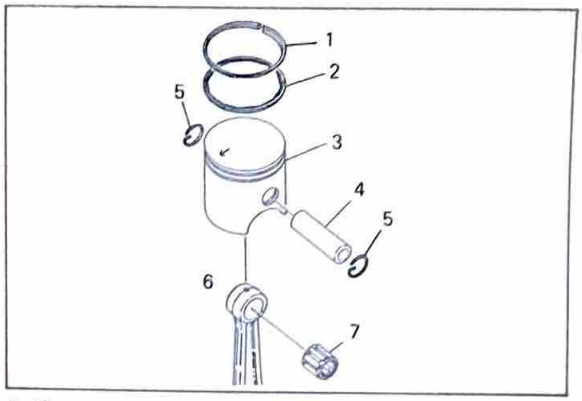
NOTE:

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

2. Remove the piston pin using the piston pin puller.



1. Piston pin puller



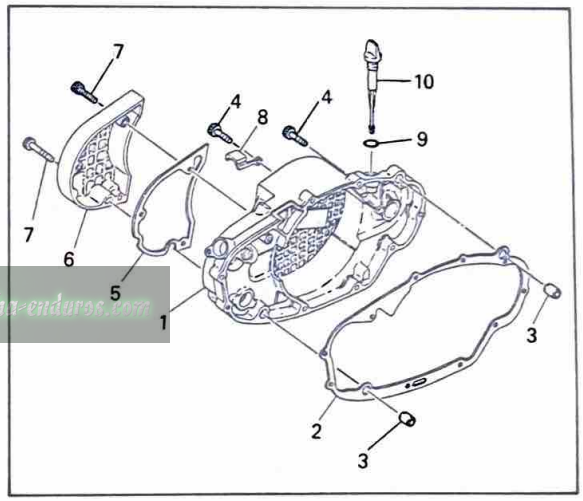
1. Piston ring (keystone)
2. Piston ring (keystone with expander)
3. Piston
4. Piston pin
5. Piston pin clip
6. Connecting rod
7. Bearing

D. Kick Crank (Kick Starter)

1. The bolt must be completely removed to remove the kick crank, (Kick starter).
2. Remove kick crank.

E. Crankcase Cover, Right

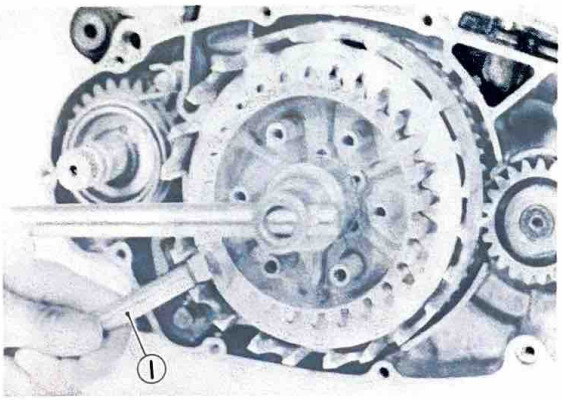
1. Remove right crankcase cover screws and cover. The cover can be removed without removing the Autolube pump.



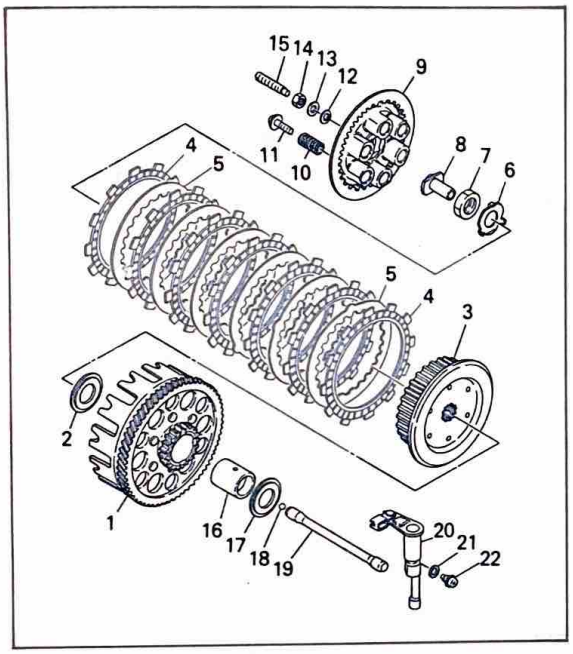
1. Crankcase cover, right
2. Gasket
3. Dowel pin
4. Panhead screw
5. Oil pump cover gasket
6. Oil pump cover
7. Panhead screw
8. Clamp
9. O-ring
10. Dipstick

F. Clutch Assembly and Primary Drive Gear

1. Remove clutch springs, pressure plate assembly, all clutch plates, all friction plates, and push rod 1 and ball.
2. Bend down lock tab and install clutch holding tool on clutch boss. Remove lock nut and washers.



1. Clutch holding tool

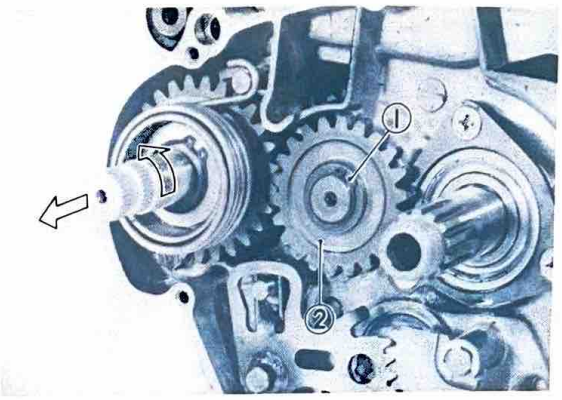


1. Primary driven gear comp.
2. Plate washer
3. Clutch boss
4. Friction plate
5. Clutch plate
6. Lock washer
7. Hexagon nut
8. Push rod 1
9. Pressure plate
10. Compression spring
11. Screw with washer
12. Spring washer
13. Plain washer
14. Nut
15. Screw
16. Spacer
17. Thrust platel
18. Ball
19. Push rod 2
20. Push lever assembly
21. Gasket
22. Screw

3. Loosen primary drive gear by first placing a folded rag (at least 16 layers) between the teeth of the primary gears to lock them. If an impact-wrench is used, be careful to not allow the connecting rod to bounce around.
4. Remove primary drive gear (use puller if necessary) and primary driven gear assembly.

G. Kick Axle Assembly and Kick Idle Gear

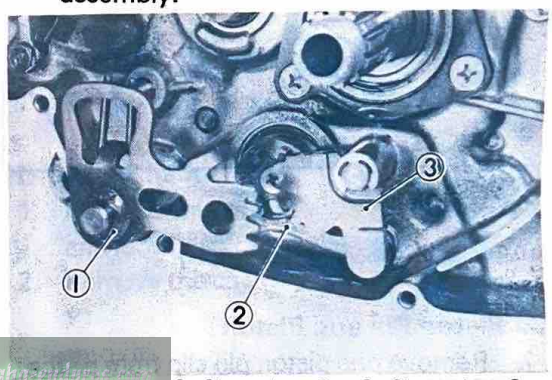
1. Remove the kick axle as an assembly. Remove the circlip, washer and idle gear.



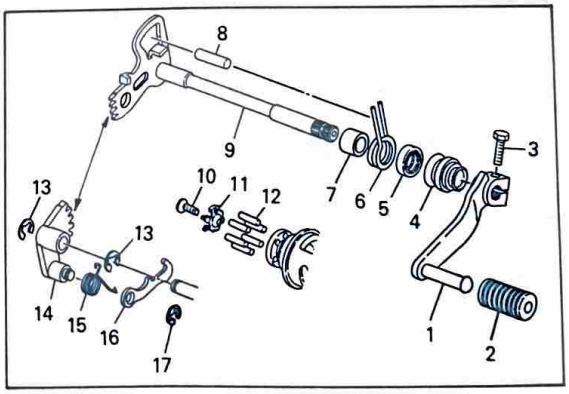
1. Circlip 2. Kick idle gear

H. Change Shaft Assembly

1. Remove the change shaft assembly.
2. Remove the circlip and change lever assembly.



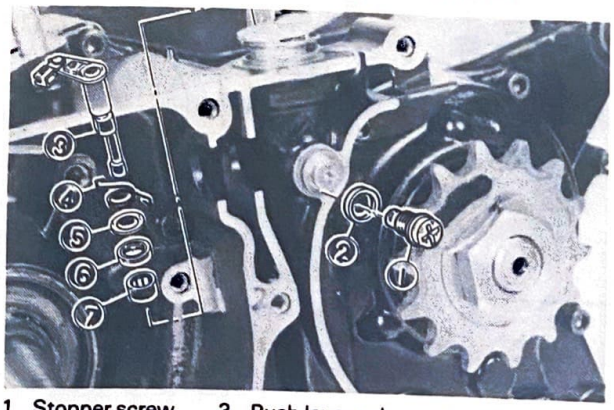
1. Change shaft assembly 2. Change lever 3 3. Change lever 2



1. Change pedal
2. Pedal cover
3. Bolt
4. Sealing boot
5. Oil seal
6. Torsion spring
7. Collar
8. Dowel pin
9. Change shaft assembly
10. Flat head screw
11. Side plate
12. Dowel pin
13. Circlip
14. Change lever 2
15. Torsion spring
16. Change lever 3
17. Circlip

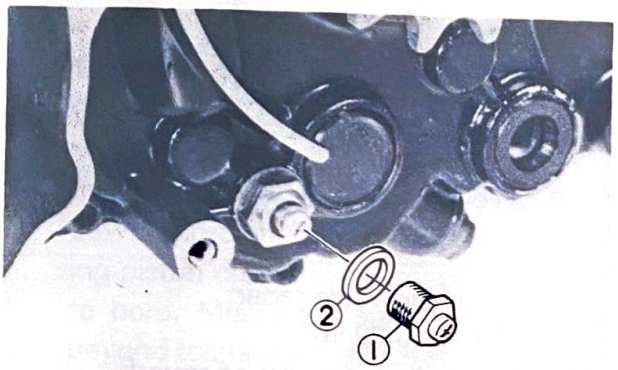
I. Clutch Push Lever Axle

1. Remove stopper screw and gasket. Pull push lever axle up to remove.



1. Stopper screw
2. Gasket
3. Push lever axle
4. Return spring
5. Plate washer
6. Oil seal
7. Bearing

J. Neutral Switch



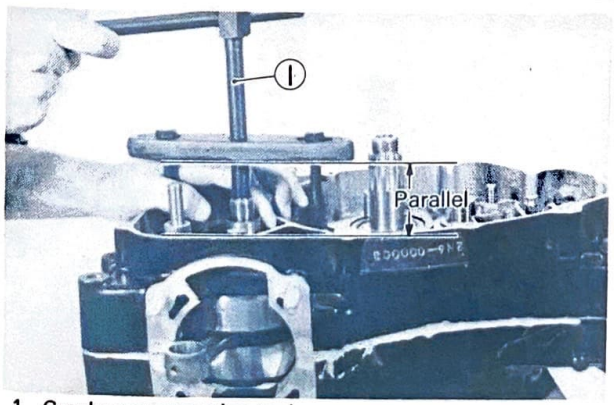
1. Neutral switch assembly
2. Gasket

K. Crankcase

1. Working in a crisscross pattern, loosen 14 panhead screws 1/4 turn each. Remove them after all are loosened.
2. Remove the oil seal retainer and install crankcase separating tool as shown.

NOTE:

Tighten the securing bolts on the crankcase separating tool, but make sure the tool body is parallel with the case. If necessary, one screw may be backed out slightly to level tool body.



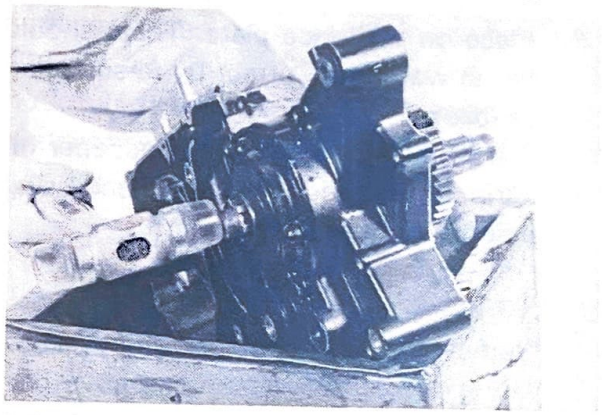
1. Crankcase separating tool

CAUTION:

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

L. Transmission

1. Remove drive sprocket nut, lock washer, sprocket and collar.
2. Tap lightly on the transmission drive shaft with a soft hammer to remove.

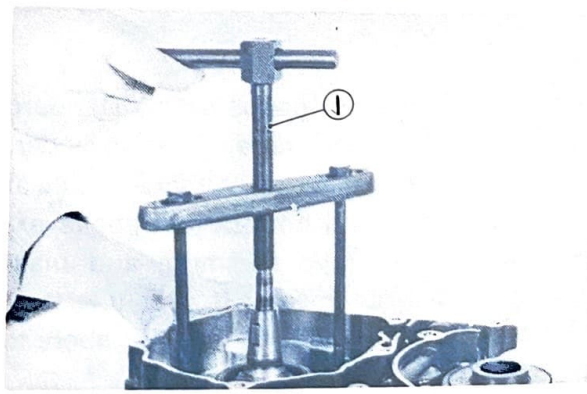


NOTE:

Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks. Further disassembly of the transmission can be accomplished after studying the parts list illustration, or section 3-4-B.

M. Crankshaft

1. Remove crankshaft assembly with crankcase separating tool.

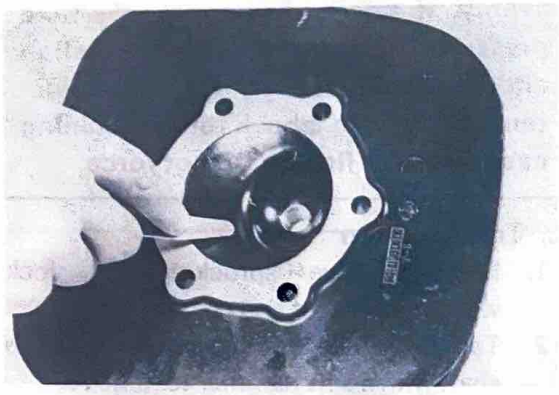


1. Crankcase separating tool

3-3. INSPECTION AND REPAIR

A. Cylinder Head

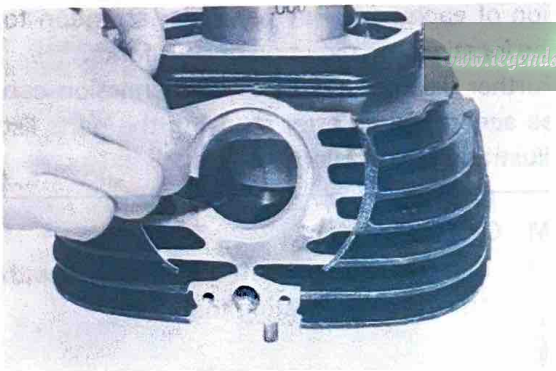
1. Using a rounded scraper, remove carbon deposits from combustion chamber.



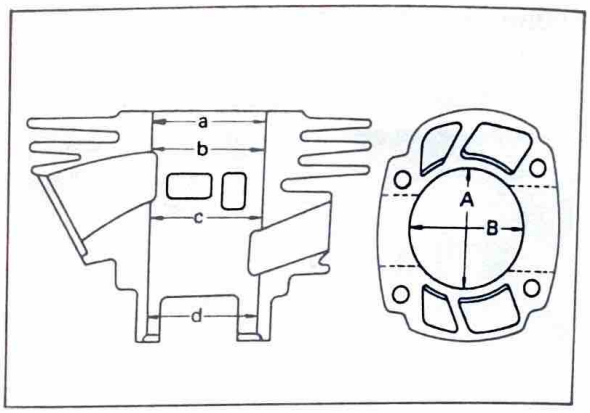
2. Place on a surface plate. There should be no warpage. Correct by re-surfacing as follows;
   Place 400 ~ 600 grit wet sandpaper on surface plate and re-surface head using a figure-eight sanding pattern.

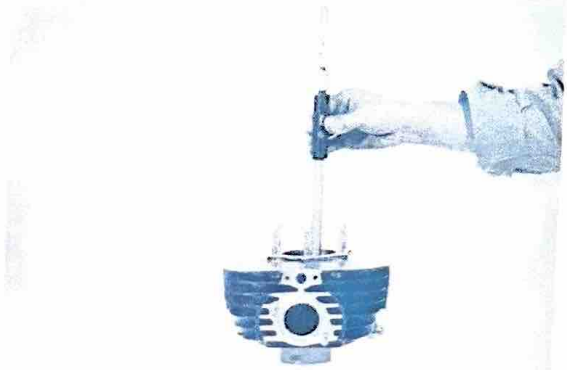
B. Cylinder

1. Remove the allen bolt, joint and gasket.
2. Using a rounded scraper, remove carbon deposits from exhaust port and pulsating air port.



3. Using a cylinder gauge set to standard bore size, measure the cylinder. Measure front-to-rear and side-to-side at top, center and bottom just above exhaust port. Take minimum and maximum measurements. If over tolerance and not correctable by honing, rebore to next oversize.

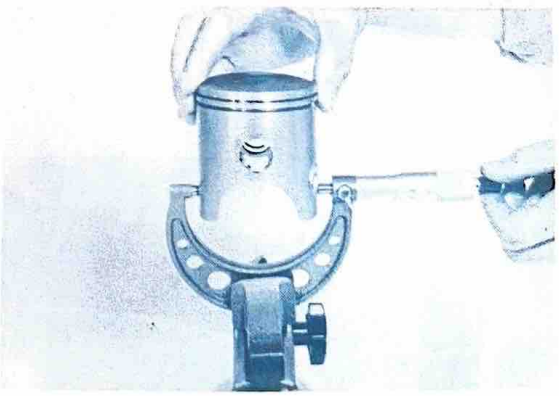




Maximum allowable taper:
0.05 mm (0.02 in)
Maximum allowable out-of-round:
0.01 mm (0.0004 in)

C. Piston

1. Remove carbon deposits from piston crown and ring grooves.
2. Using an outside micrometer, measure piston diameter. The piston is camground and tapered. The only measuring point is at right angles to the piston pin holes, about 10 mm (0.4 in) from the bottom of the piston. Compare piston diameter to cylinder bore measurements.



Piston clearance =
Minimum cylinder dia. − Maximum piston dia.

If beyond tolerance, hone cylinder to tolerance or bore to next oversize and fit oversize piston.

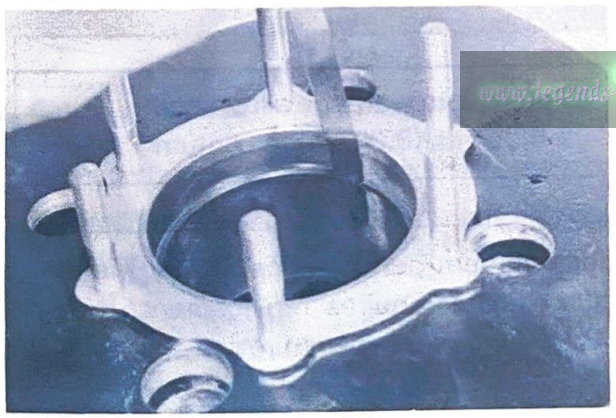
Piston clearance:
0.040 ~ 0.045 mm
(0.0016 ~ 0.0018 in)

Piston oversize:
70.25, 70.50, 70.75, 71.00 mm
(2.766, 2.776, 2.785, 2.795 in)

D. Piston Rings

1. Check rings for scoring. If any severe scratches are noticed, replace set.
2. Insert each ring into cylinder. Push down approximately 20 mm (0.8 in) using piston crown to maintain right angle to bore. Measure installed end gap. If beyond tolerance, replace set.

	Minimum	Maximum
Top and 2nd ring end gap, installed	0.2 mm (0.008 in)	0.4 mm (0.016 in)



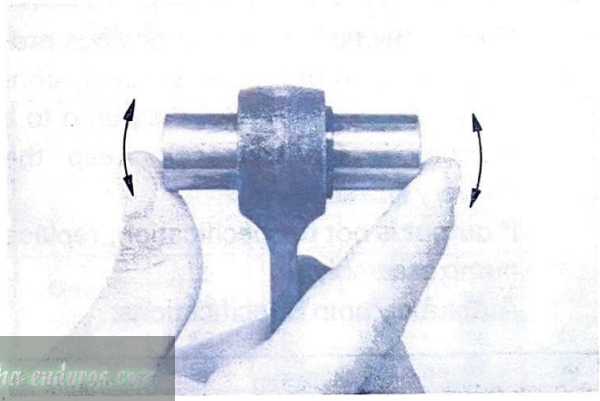
Piston ring oversize				
	70.25	70.50	70.75	71.00 mm
I.D. Mark	25	50	75	100

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

1st/2nd ring groove clearance:
Minimum: 0.02 mm (0.0008 in)
Maximum: 0.06 mm (0.0024 in)

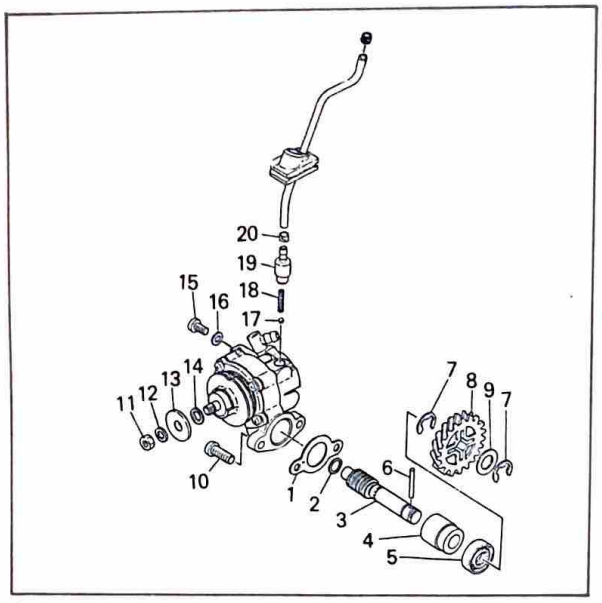
E. Piston Pin and Bearing

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



F. Autolube Pump

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



1. Pump case gasket
2. Plate washer
3. Worm shaft
4. Worm shaft outer metal
5. Oil seal
6. Dowel pin
7. Circlip
8. Drive gear
9. Plate washer
10. Panhead screw
11. Hexagon nut
12. Spring washer
13. Adjusting plate
14. Adjusting shim
15. Bind screw
16. Gasket
17. Ball
18. Compression spring
19. Nozzle
20. Clip

b. If all inspections show no obvious problems and output is still suspect, connect a delivery line from the pump to a graduated container (cc). Keep the delivery line short.
If output is not to specification, replace pump assembly.
Autolube Pump Specifications:

Pump stroke length	Minimum throttle		Maximum throttle	
	Min.	Max.	Min.	Max.
	0.25 mm	0.30 mm	1.85 mm	2.05 mm

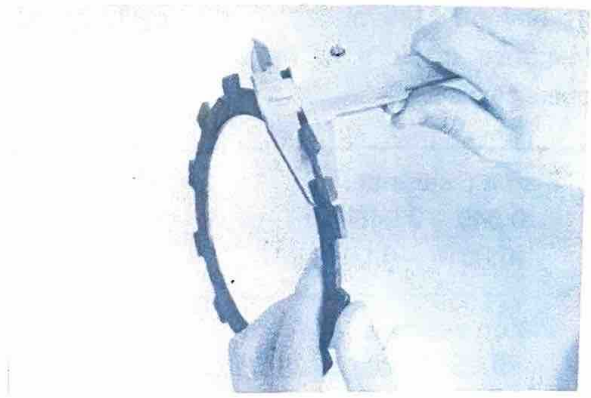
Pump output at 200 strokes	Minimum throttle		Maximum throttle	
	Min.	Max.	Min.	Max.
	0.31 cc	0.38 cc	2.3 cc	2.58 cc

See Chapter 2-2-E for pump stroke inspection.

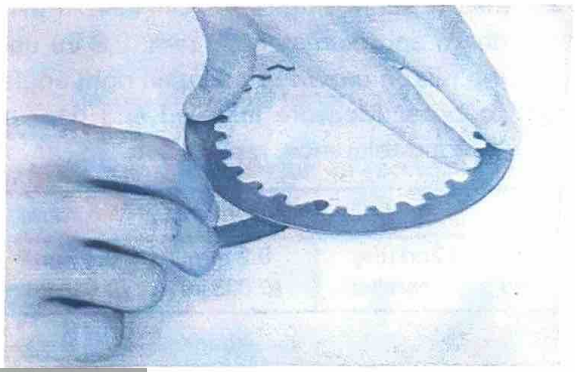
G. Clutch

1. Measure the friction plates at three or four points. If their minimum thickness exceeds tolerance, replace.

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



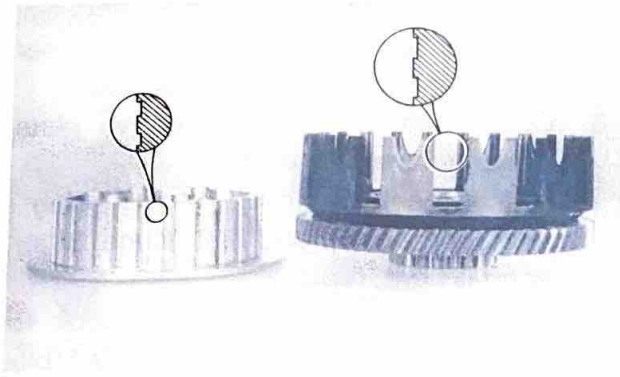
2. Check each clutch plate for signs of heat damage and warpage. Place on surface plate (plate glass is acceptable) and use feeler gauge as illustrated. If warpage exceeds tolerance, replace.



Clutch plate warpage allowance:
0.05 mm (0.002 in) maximum

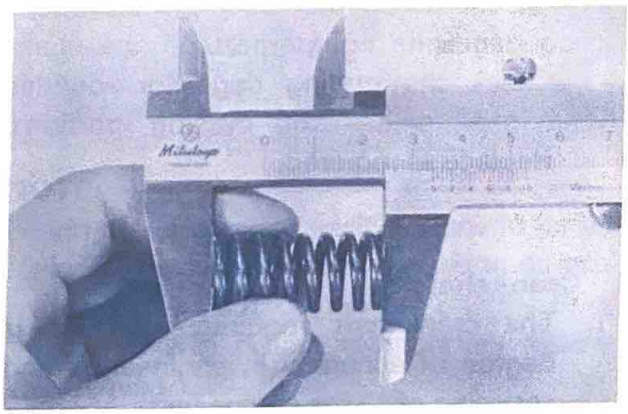
NOTE:
For optimum performance, if any friction or clutch plate requires replacement, it is advisable to replace the entire set.

3. Thoroughly clean the primary driven gear assembly and spacer. Apply a light film of oil on the bushing surface and spacer. Fit the spacer into the bushing. It should be a smooth, thumb-press fit. The spacer should rotate smoothly within the bushing.
4. Check splines on clutch boss for signs of galling. If moderate, deburr. If severe, replace.



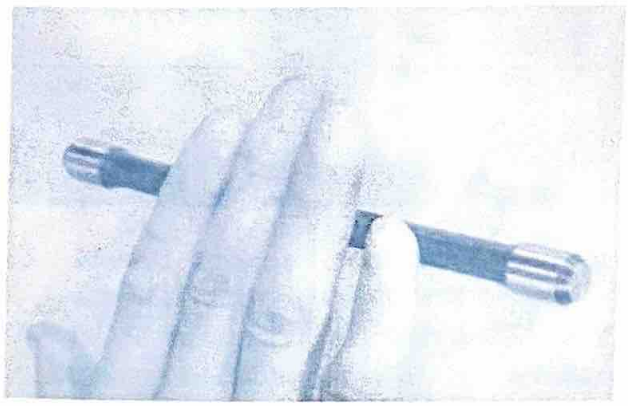
NOTE:
Galling on either the friction plate dogs of the clutch housing or clutch plate splines of the clutch boss will cause erratic clutch operation.

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



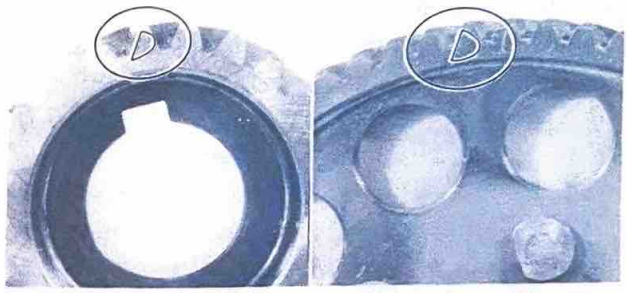
	New	Minimum
Clutch spring free length	34.9 mm (1.37 in)	33.9 mm (1.33 in)

6. Roll the push rod across a surface plate. If rod is bend, replace.



H. Primary Drive

1. If primary drive gears exhibit excessive noise during operation, gear lash may be incorrect. Numbers are scribed on the side of each gear. Add these numbers. If their total exceeds tolerance, replace with a numbered gear that will bring the total within specification.

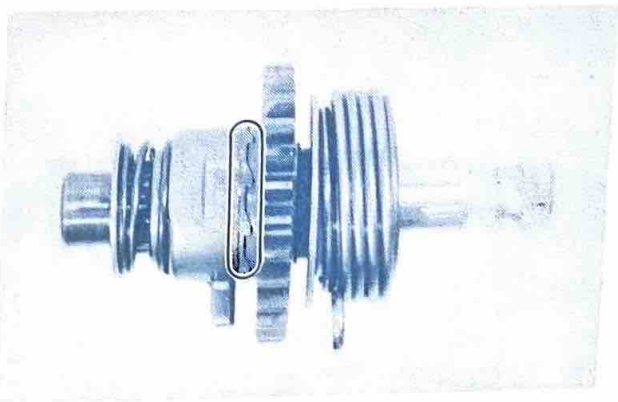


NOTE:
This procedure is rarely required. However, if a gear must be replaced due to damage, it is always advisable to pay strict attention to the back lash numbers during replacement.

Primary reduction gear back lash					
147 ± 1 (A-A, B-B, C-C, D-D, E-E)					
Back lash number					
	A	B	C	D	E
Drive	95 94	97 96	99 98	101 100	103 102
Driven	52 53	50 51	48 49	46 47	44 45

I. Kick Starter Mechanism

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

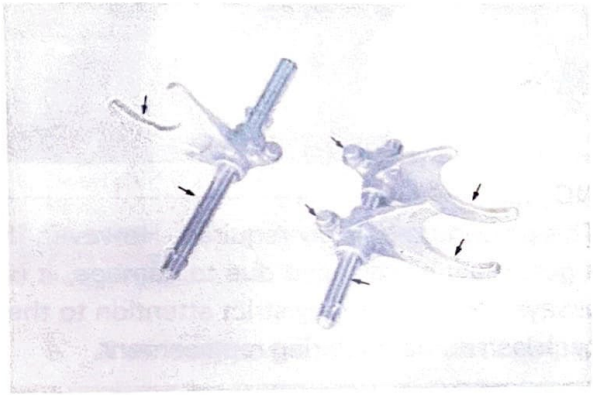


J. Change Shaft and Change Levers

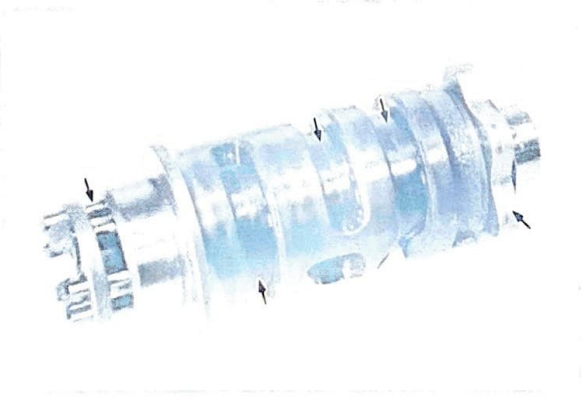
1. Inspect shift return spring. A broken or worn spring will impair the return action of the shifting mechanism.
2. Inspect change shaft assembly for bending of shaft, worm or bent splines, and broken or worn shift arm spring. A bent shaft will cause hard shifting.

K. Transmission

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



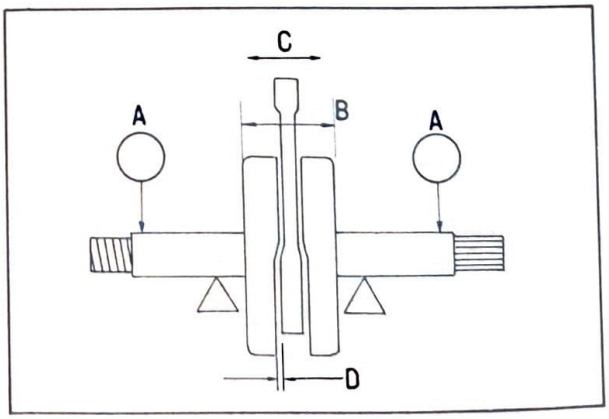
2. Roll the guide bars across a surface plate. If any bar is bent, replace.
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or any damage, replace cam.
4. Check the cam followers on each shift fork for wear. The follower should fit snugly into its seat in the shift fork, but should not be overly tight. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace.



5. Check shift cam dowel pins and side plate for looseness, damage, or wear. Repair as required, or replace.
6. Check the shift cam stopper plate, circlip, stopper for wear.
7. Check the transmission shafts using a centering device and dial gauge. If any shaft is bent, replace.
8. Carefully inspect each gear. Look for signs of obvious heat damage (blue discoloration). Check the gear teeth for signs of pitting, galling, or other extreme wear. Replace as required.
9. Check to see that each gear moves freely on its shaft.
10. Check to see that all washers and clips are properly installed and undamaged. Replace bent or loose clips and bent washers.
11. Check to see that each gear properly engages its counterpart on the shaft. Check the mating dogs for rounded edges, cracks, or missing portions. Replace as required.

L. Crankshaft

1. The crankshaft requires the highest degree of accuracy in engineering and servicing of all the engine parts.
2. The crankshaft is susceptible to wear and terefore the crank bearing must be inspected with special care.
3. Check crankshaft components by the chart.
   Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at large end).



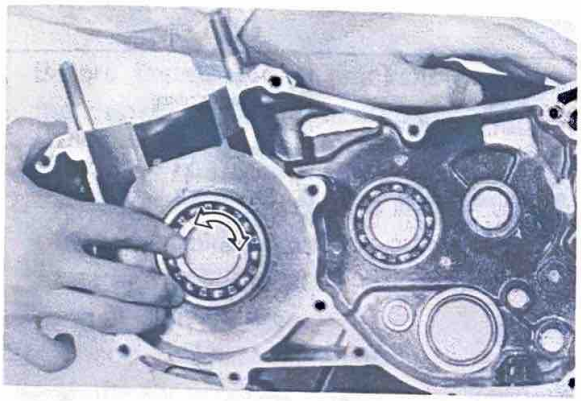
Crankshaft specifications

Unit: mm (in)

Deflection tolerance (A)		Flywheel width (B)	Rod clearance			
			Axial (C)		Side (D)	
Left side	Right side		Min.	Max.	Min.	Max.
0.03 (0.0012)	0.03 (0.0012)	$62\ ^{+0}_{-0.05}$ ($2.441\ ^{+0}_{-0.002}$)	0.4 ~ 1.0 (0.016 ~ 0.04)	2.0 (0.08)	0.25 (0.01)	0.75 (0.03)

M. Bearings and Oil Seals

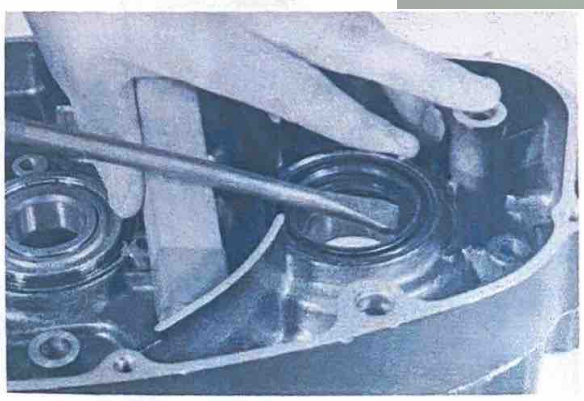
1. After cleaning and lubricating the bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing.



NOTE:

Bearing(s) are most easily removed or installed if the cases are first heated to approximately 90° ~ 120°C (194° ~ 248°F). Bring the case up to proper temperature slowly. Use an oven.

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



3. Always replace crankshaft oil seals whenever the crankshaft is removed.
4. Install bearing(s) and oil seal(s) with their manufacture marks or numbers facing outward. Before installation, apply grease to oil seal lip(s) and bearing(s).

N. Crankcase

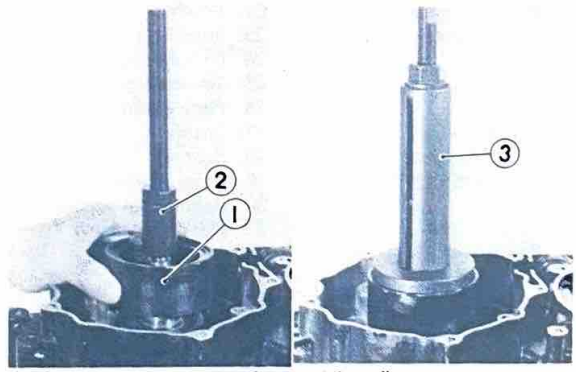
1. Visually inspect case halves for any cracks, damage, etc.
2. If bearing(s) have been removed, check their seats for signs of damage (such as the bearing spinning in the seat, etc.).
3. Check oil delivery passages in transfer ports for signs of blockage.
4. If bearings have not been removed, oil them thoroughly immediately after washing and drying. Rotate the bearings, checking for roughness indicating damaged races or balls.
5. Check needle bearing(s) in transmission section for damage. Replace as required.

3-4. ENGINE ASSEMBLY AND ADJUSTMENT

When reassembling the engine, reverse disassembly procedures taking care of following points.

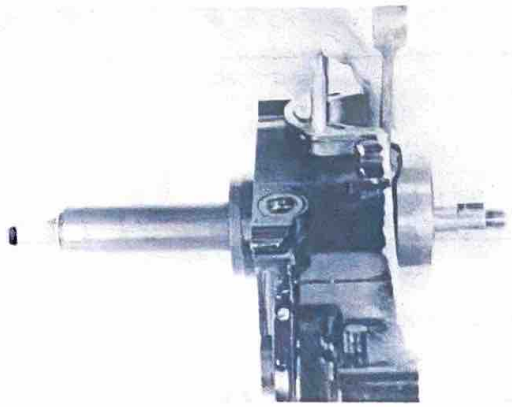
A. Crankshaft Installation

1. After all bearings and seals have been installed in both crankcase halves, install crankshaft. Use crankshaft setting tool.



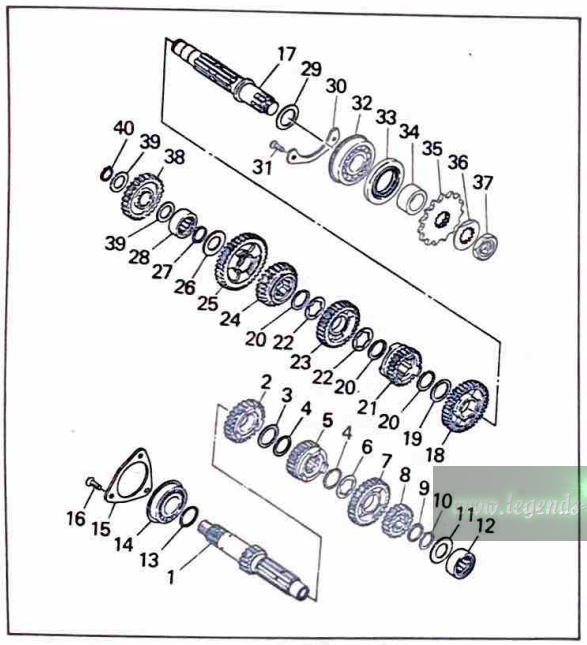
1. Spacer 2. Adapter 3. Crank install pot

2. Hold the connecting rod at top dead center with one hand while turning the handle of the installing tool with the other.

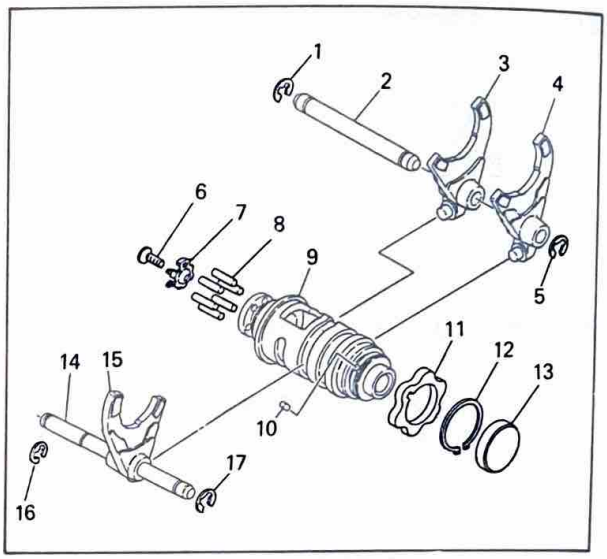


B. Transmission and Shifter Installation

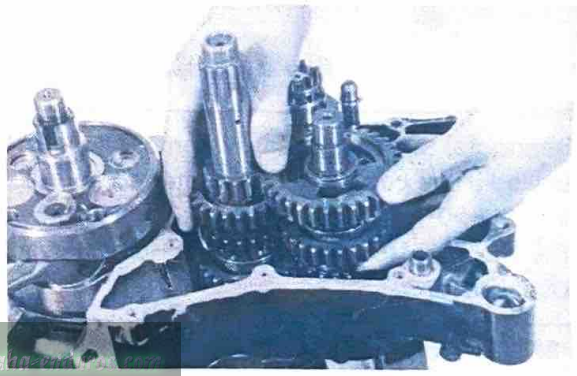
1. Check to see that all parts move freely and that all loose shims are in place. Make sure all shafts are fully seated.

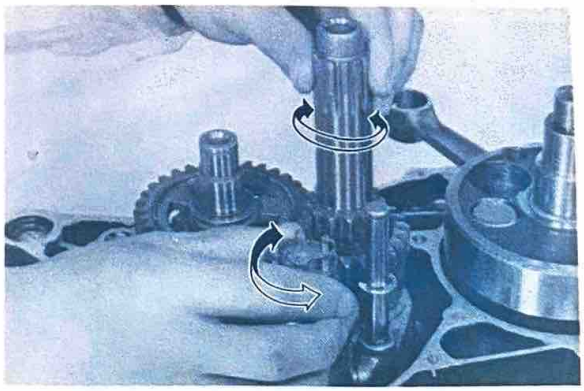


1. Main axle
2. 4th pinion gear
3. Plate washer
4. Circlip
5. 3rd pinion gear
6. Washer
7. 5th pinion gear
8. 2nd pinion gear
9. Plate washer
10. Circlip
11. Plate washer
12. Bearing
13. Drive axle shim
14. Bearing
15. Bearing cover plate
16. Flate head screw
17. Drive axle
18. 2nd wheel gear
19. Plate washer
20. Circlip
21. 5th wheel gear
22. Washer
23. 3rd wheel gear
24. 4th wheel gear
25. 1st wheel gear
26. Plate washer
27. Circlip
28. Bearing
29. Drive axle shim
30. Bearing cover plate
31. Flate head screw
32. Bearing
33. Oil seal
34. Collar
35. Drive sprocket
36. Lock washer
37. Nut
38. Kick idle gear
39. Plate washer
40. Circlip



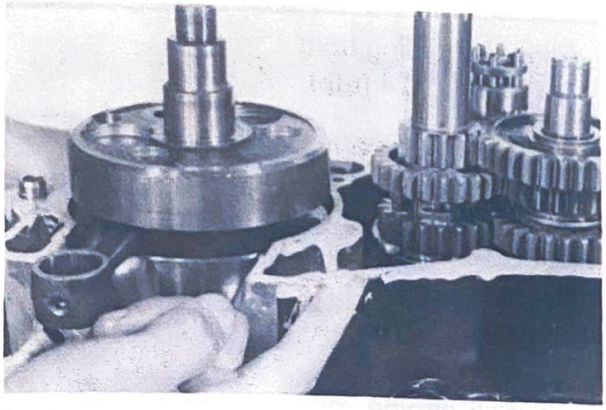
1. Circlip
2. Guide bar 2
3. Shift fork 1
4. Shift fork 2
5. Circlip
6. Flathead screw
7. Side plate
8. Dowel pin
9. Shift cam
10. Dowel pin
11. Stopper plate
12. Circlip
13. Plug
14. Guide bar 1
15. Shift fork 2
16. Circlip
17. Circlip





C. Crankcase

1. Apply YAMAHA BOND #4 to the mating surfaces of both case halves.

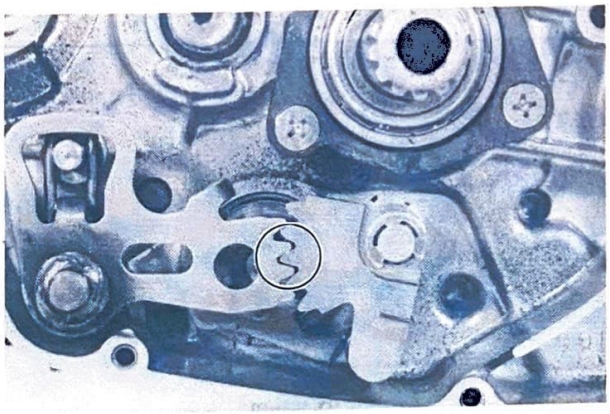


NOTE:
a. Do not tap on machined surface or end of crankshaft.
b. Before installing the crankshaft, check the crankshaft O-ring for damage.

2. After reassembly, apply a liberal coating of two-stroke oil to the crank pin and bearing and into each crankshaft bearing oil delivery hole.
3. Check crankshaft and transmission shafts for proper operation and freedom of movement.

D. Change Shaft Assembly

1. Take special care so that all parts are installed correctly. Refer to the illustration.
2. During installation, note the index mark on change lever 2 and center of change lever 1. Align.



E. Kick Starter Assembly

1. Install the kick starter assembly.
   Push the kick starter assembly straight in, and hook the spring to the spring hook.
2. After installing the kick assembly be sure to check whether it operates smoothly or not.

F. Kick Idle, Tachometer Drive and Primary Drive Gears

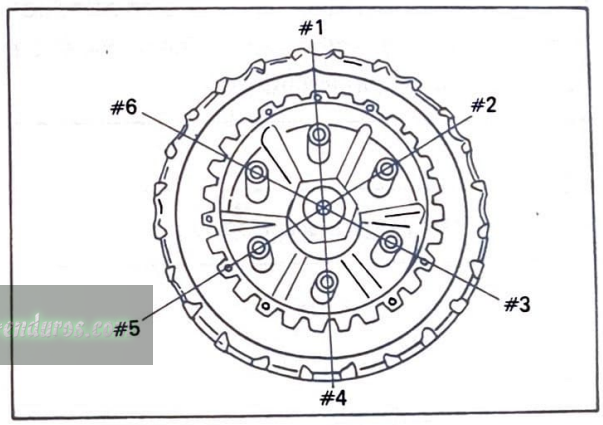
1. Install kick idle gear, tachometer drive and primary drive gear.

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

Primary drive gear nut torque:
7.5 m-kg (54 ft-lb)

G. Clutch and Clutch Push Lever Axle

1. Apply grease to push rod 1, 2, ball and push lever axle.
2. Install a clutch plate with cutaway offset approximately 60° from previous plate cutaway.

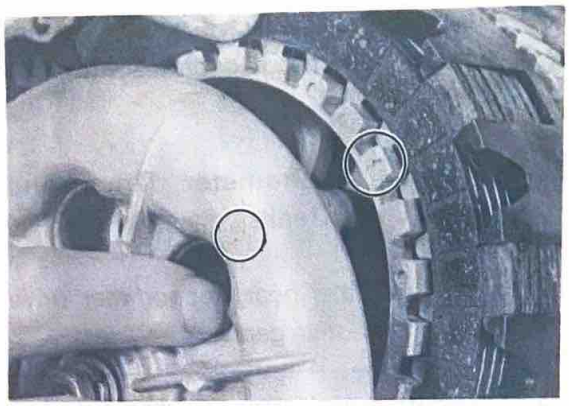


Clutch lock nut torque:
7.5 m-kg (54 ft-lb)

NOTE:
Install all parts with a coat of heavy motor oil on their mating surfaces.

3. Continue installation of clutch and friction plates.

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



4. After assembling, adjust the mechanism adjustment.

H. Crankcase Cover, Right

1. While properly engaging crankshaft and oil pump worm shaft, install crankcase cover (right).

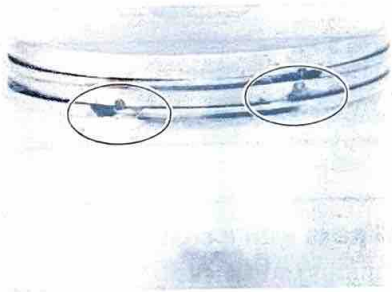
I. Piston

NOTE:

Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed. Note the two induction holes in the piston skirt. These must be to the rear during installation.

NOTE:

Make sure the rings are properly positioned.



J. Cylinder and Cylinder Head

1. Install cylinder and head with new base gasket (cylinder gasket) and head gasket.

Cylinder holding bolt: 3.3 m-kg (24 ft-lb)
Cylinder head holding nut: 2.5 m-kg (18 ft-lb)

3-5. MOUNTING

1. Install engine mounting bolts and nuts with proper tightening torque.

Bolt size	Tightening Torque
10 mm	4.0 m-kg (28 ft-lb)
8 mm	2.5 m-kg (18 ft-lb)

2. Install drive sprocket.

Drive sprocket nut torque: 7.5 m-kg (54 ft-lb)

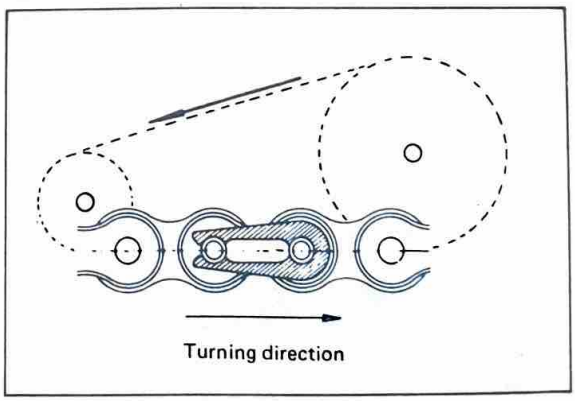
3. Install flywheel magneto.

Flywheel nut torque: 8.3 m-kg (60 ft-lb)

4. Install drive chain.

NOTE:

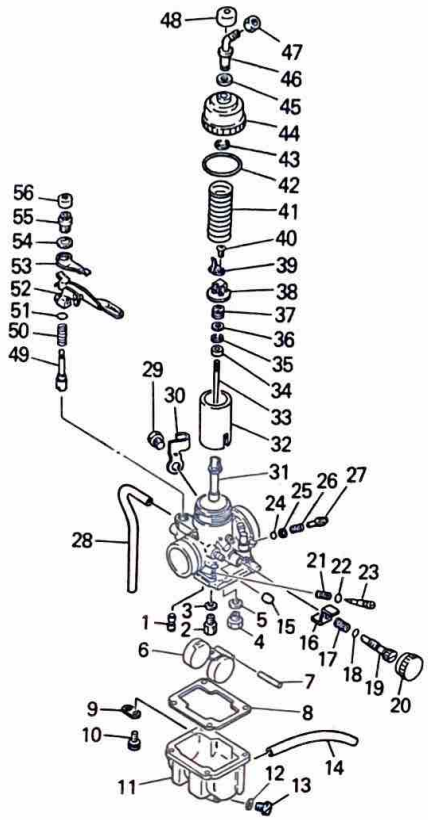
Install chain joint in proper direction.



CHAPTER 4.
CARBURETION

4

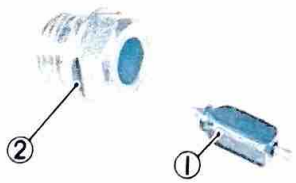
4-1. CARBURETOR



1. Pilot jet
2. Main jet
3. Main jet washer
4. Valve seat assembly
5. Valve seat washer
6. Float assembly
7. Float pin
8. Float chamber gasket
9. Plate
10. Panhead screw
11. Float chamber body
12. Packing
13. Screw plug
14. Hose
15. Cap
16. Throttle stop plate
17. Throttle stop spring
18. O-ring
19. Throttle stop screw
20. Cap
21. Air adjusting spring
22. O-ring
23. Pilot screw
24. O-ring
25. Washer
26. Air adjusting spring
27. Air adjusting screw
28. Hose
29. Screw plug
30. Clamp
31. Main nozzle
32. Throttle valve
33. Needle
34. Ring
35. Clip
36. Washer
37. Spring
38. Plate
39. Spring plate
40. Panhead screw
41. Throttle valve spring
42. O-ring
43. Clip
44. Mixing chamber top
45. Gasket
46. Wire guide tube
47. Wire adjusting nut
48. Cap
49. Starter plunger
50. Plunger spring
51. O-ring
52. Starter lever
53. Starter lever plate
54. Washer
55. Plunger cap
56. Plunger cover

A. Inspection

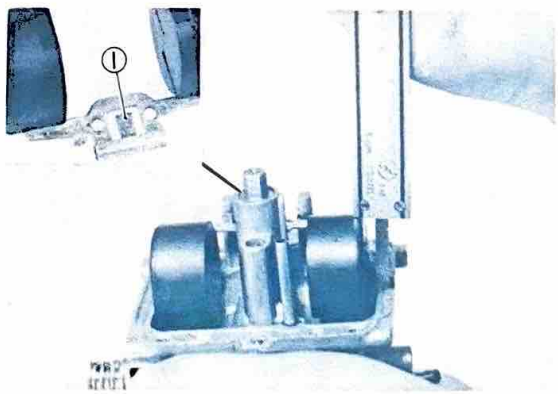
1. Examine carburetor body and fuel passages. If contaminated, wash carburetor in petroleum-based solvent.
   Do not use caustic carburetor cleaning solutions. Blow out all passages and jets with compressed air. (Never use compressed air with floats installed.)
2. Examine condition of floats. If floats are leaking or damaged, they should be replaced.
3. Inspect inlet needle valve and seat for wear or contamination. Replace these components as a set.



1. Float needle 2. Seat

B. Adjustment

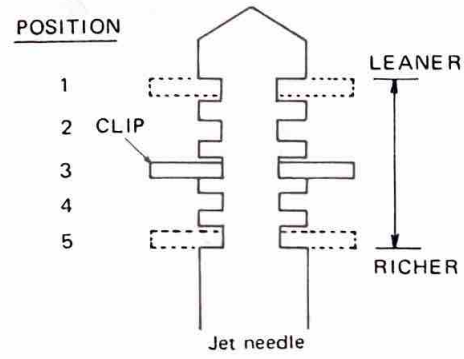
1. Float height
   Hold the carburetor in an upside down position. While holding the floats so the tang is just touching the float needle, measure the distance from the top of the float to the float bowl gasket surface. Bend the tang on the float arm if adjustment is necessary. Both floats must be at the same height. If the floats are too high, a lean air/fuel mixture will occur. If too low, a rich mixture will result.



1. Tang

Float height:
21.0 ± 2.5 mm (0.83 ± 0.1 in)

2. Jet needle
The mid-range air/fuel supply is affected by the position of the needle in the needle jet. If it is necessary to alter the mid-range air/fuel mixture characteristics of the machine, the jet needle position may be changed. Move the jet needle clip up for a leaner condition or toward the bottom position for a richer condition.



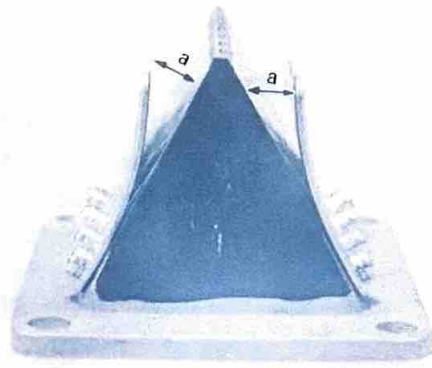
4-2. REED VALVE ASSEMBLY

A. Inspection

1. Inspect rubber intake manifold for signs of weathering or other deterioration.
2. Inspect reed petals for signs of fatigue cracks. Reed petals should fit flush or nearly flush against neoprene seats. If in doubt as to sealing ability, apply suction to carburetor side of assembly. Leakage should be only slight.
3. The valve stopper controls the movement of the valve. Check clearance "a".

Standard value "a":
7.5 mm (0.295 in)

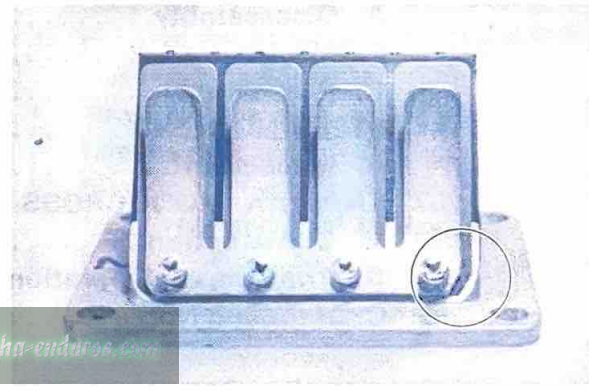
If it is 0.2 mm more or less than specified, replace the valve stopper.
The curvature of the reed valve stopper greatly affects engine output and durability of the reed valve. Never attempt to bend the stopper.

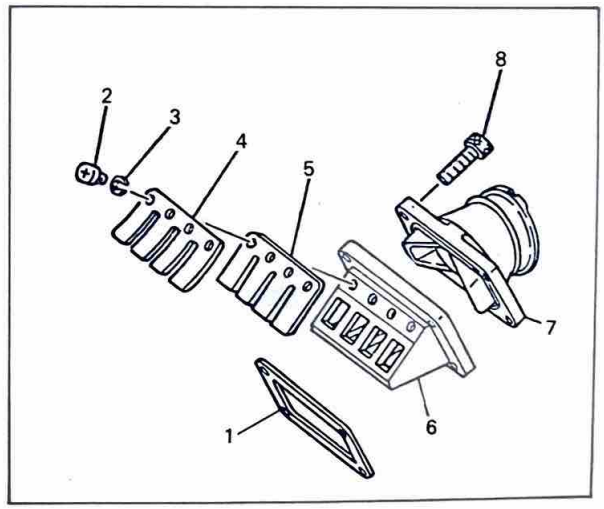


4. Check reed valve for bending. If beyond tolerance, replace reed valve.

Reed valve bending limit:
0.6 mm (0.024 in)

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





1. Valve seat packing
2. Panhead screw
3. Spring washer
4. Reed valve stopper
5. Reed valve
6. Reed valve seat
7. Carburetor joint
8. Allen screw

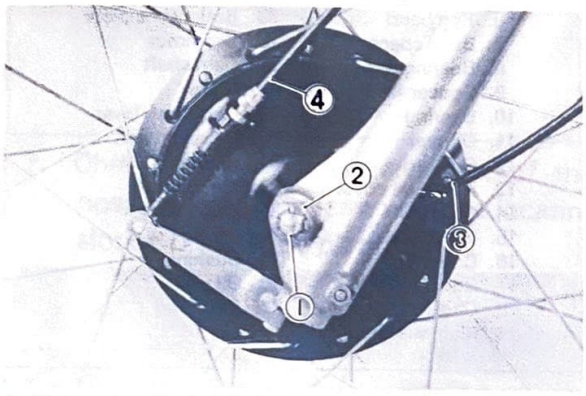
CHAPTER 5.
CHASSIS

5

5-1. WHEELS

A. Front Wheel Removal

1. Elevate the front wheel by placing a suitable stand under the engine.
2. Remove speedometer cable from front brake shoe plate: first remove clip and then pull cable out.
3. Remove brake cable: loosen all cable adjusters and remove cable from handle lever holder. Then remove cable from cam lever at front brake shoe plate.
4. Remove cotter pin from front wheel axle and remove axle nut.



1. Cotter pin 2. Axle nut 3. Speedometer cable
4. Front brake cable

5. Turn and pull out the front wheel axle; the wheel assembly can now be removed.

B. 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.

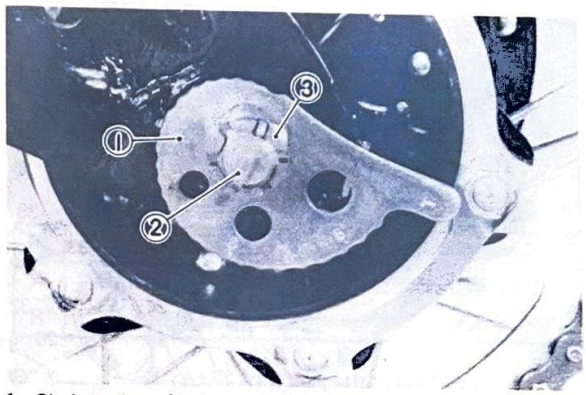
2. Torque the front axle nut.

Axle nut torque: 8 m-kg (57 ft-lb)

3. Install a new cotter pin; discard old pin.
4. Adjust the play in the brake lever.

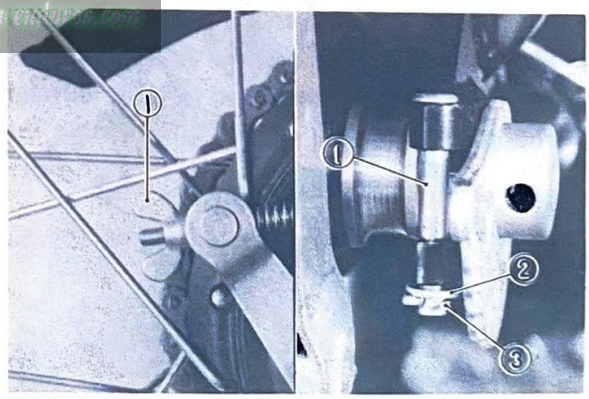
C. Rear Wheel Removal

1. Elevate the rear wheel by placing a suitable stand under the engine.
2. Remove the brake adjuster and brake rod from the brake shoe plate.



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

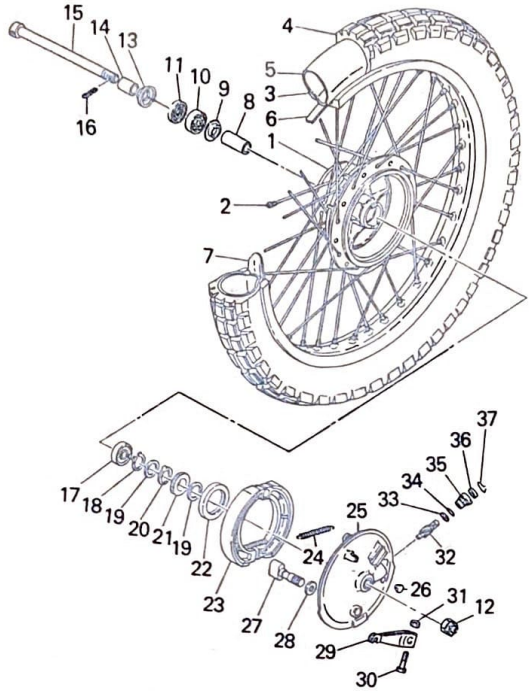
3. Remove the cotter pin from the axle nut and loosen the axle nut.
4. Remove the link clip, master link, remove the chain.
5. Remove the cotter pins (left and right). Then remove the clevis pins.
6. Pull the wheel backward, remove the rear wheel assembly.



1. Adjuster

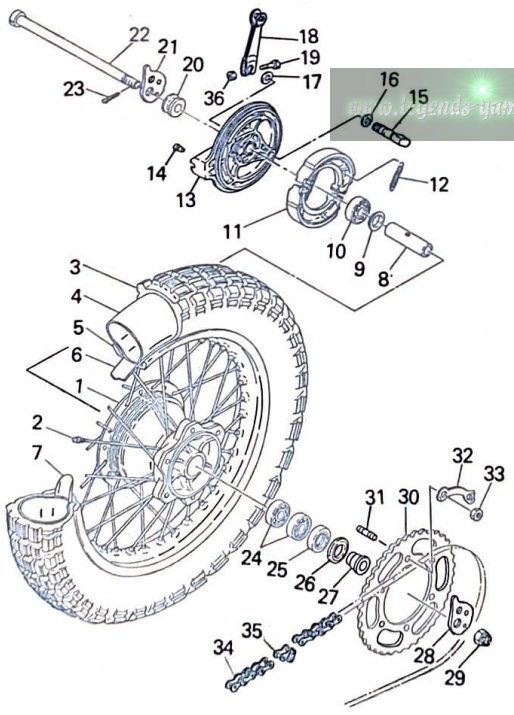
1. Clevis pin
2. Plain washer
3. Cotter pin

FRONT WHEEL



1. Front hub
2. Spoke
3. Front rim
4. Front tire
5. Front tube
6. Rim band
7. Bead spacer
8. Bearing spacer
9. Spacer flange
10. Bearing
11. Oil seal
12. Castle nut
13. Hub dust cover
14. Collar
15. Wheel axle
16. Cotter pin
17. Bearing
18. Circlip
19. Plate washer
20. Meter clutch
21. Drive gear
22. Oil seal
23. Brake shoe comp.
24. Tension spring
25. Brake shoe plate
26. Grommet
27. Cam shaft
28. Shim
29. Cam shaft lever
30. Hexagon bolt
31. Hexagon nut
32. Meter gear
33. Plate washer
34. O-ring
35. Bushing
36. Oil seal
37. Stop ring

REAR WHEEL

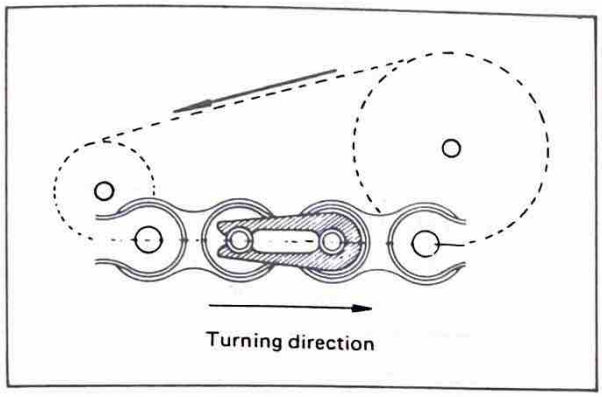


1. Rear hub
2. Spoke
3. Rear tire
4. Rear tube
5. Rear rim
6. Rim band
7. Bead spacer
8. Bearing spacer
9. Spacer flange
10. Bearing
11. Brake shoe comp.
12. Tension spring
13. Brake shoe plate
14. Grommet
15. Camshaft
16. Shim
17. Cam shaft seal
18. Cam shaft lever
19. Bolt
20. Collar
21. Chain puller, right
22. Wheel axle
23. Cotter pin
24. Bearing
25. Oil seal
26. Hub dust cover
27. Collar
28. Chain puller, left
29. Castle nut
30. Sprocket wheel gear
31. Stud bolt
32. Lock washer
33. Hexagon nut
34. Chain
35. Chain joint
36. Hexagon nut

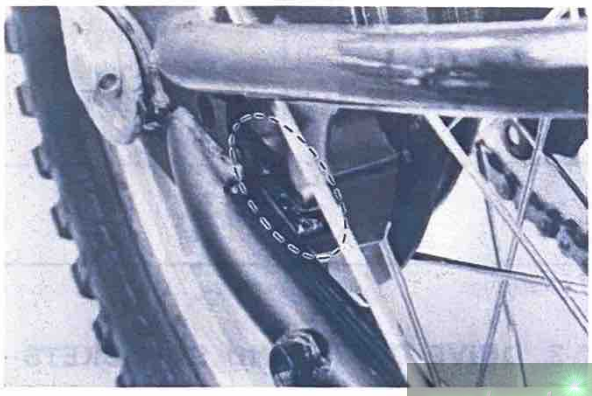
D. Rear Wheel Installation

The rear wheel can be reassembled by reversing the disassembly procedure. Take care of the following points.

1. When connecting the chain, make certain the closed end of the master link clip is facing direction of rotation.



2. Check for proper engagement of the boss on the swing arm with the locating slot on brake shoe plate.



3. Make sure the nut is properly torqued.

Tightening torque: 9.0 m-kg (65 ft-lb)

4. Make sure to adjust the chain tension. See chapter 2-3-D "Drive chain adjustment".
5. Adjust both brake pedal and brakelight switch.
6. Always use new cotter pins.

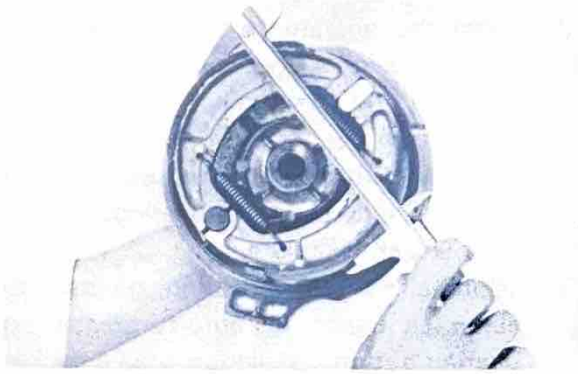
E. Axles

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

Tightening torque: Front: 8.0 m-kg (57 ft-lb) Rear: 9.0 m-kg (65 ft-lb)

F. Checking Brake Shoe Wear

1. Measure the outside diameter at the brake shoes with slide calipers. Also check thickness of individual shoes.



BRAKE SHOE INSTALLED DIAMETER

	Standard	Minimum
F	160 mm (6.3 in)	156 mm (6.14 in)
R	150 mm (5.9 in)	146 mm (5.75 in)

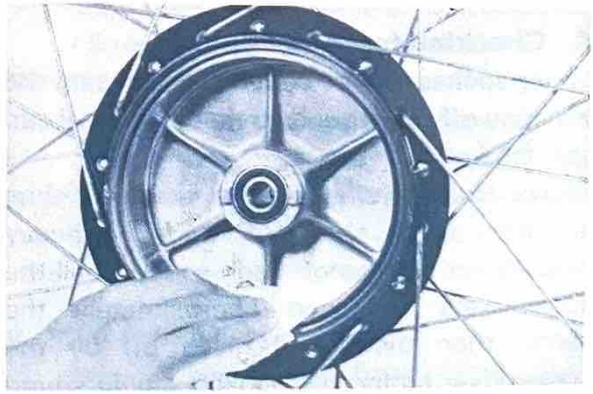
BRAKE SHOE THICKNESS

Standard	Minimum
4 mm (0.016 in)	2 mm (0.08 in)

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

G. Brake Drum

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



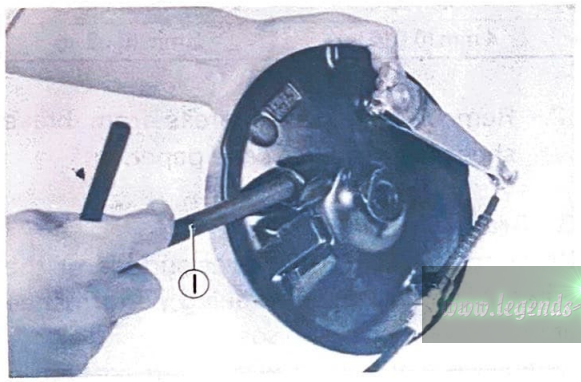
H. Replacing Wheel Bearings

If the bearings allow play in the wheel hub or if the 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.

I. Meter Drive and Driven Gear

Check meter drive and driven gear for any signs of galling, using meter gear bushing remover. Replace as required.



1. Meter gear bushing remover

5-2. RIMS AND SPOKES

A. Checking for Loose Spokes

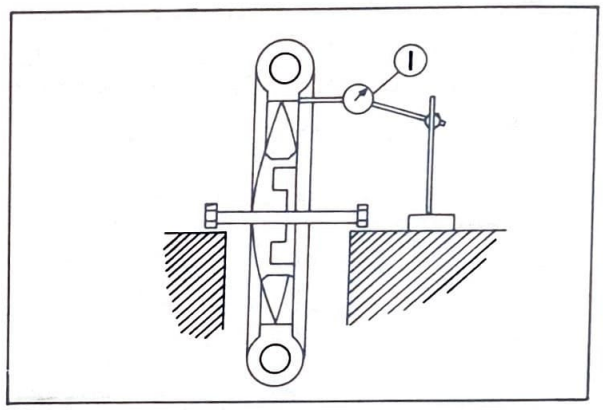
Loose spokes can be checked by bracing the machine off the ground so that the wheel can spin freely.

Slowly turn 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. It is also a good idea to check all spokes with a spoke wrench, so that they can be tightened immediately.

B. Checking Rims

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

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

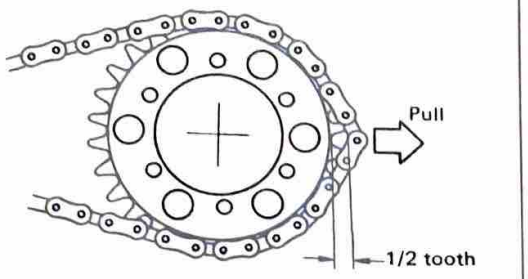


1. Dial gauge

5-3. DRIVE CHAIN AND SPROCKETS

A. Chain Inspection

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

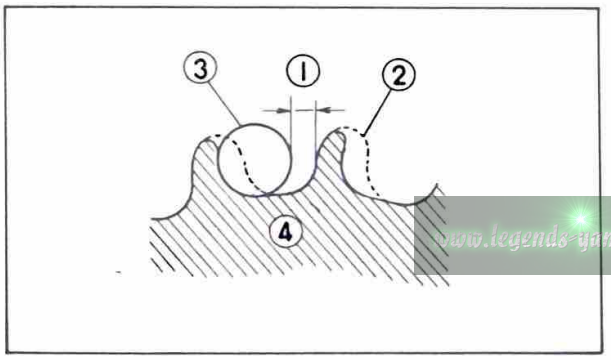


Checking for excessively worn chain

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

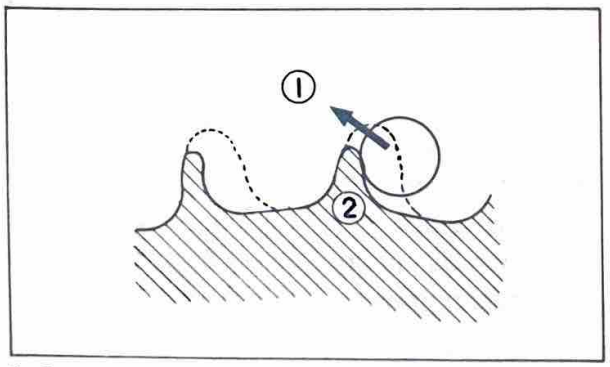
B. Drive Sprocket and Driven Sprocket

1. Check sprocket wear. Replace if tooth width has decreased as shown.



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

2. Replace if tooth wear shows a pattern such as that in the illustration or similar wear.



1. Slip off 2. Bend teeth

Drive sprocket securing bolt torque:
7.5 m-kg (54 ft-lb)
Driven sprocket securing nut torque:
4.0 m-kg (28 ft-lb)

3. Always use new locking tabs (lock washer) and bend over end when reinstalling a sprocket.

5-4. CABLES AND FITTINGS

A. Cable Maintenance

NOTE:

See maintenance and Lubrication Interval Charts for additional information.

Cable maintenance is primarily concerned with preventing deterioration through rust and weathering; and assuring that the cable moves 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 very important 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 a vertical position. Apply lubricant to uppermost end of cable. Leave in a vertical position until lubricant appears at bottom end. Allow excess to drain and re-install.

NOTE:

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

B. Throttle Maintenance

1. Remove two Phillips head screws from throttle housing assembly and separate two halves of housing.

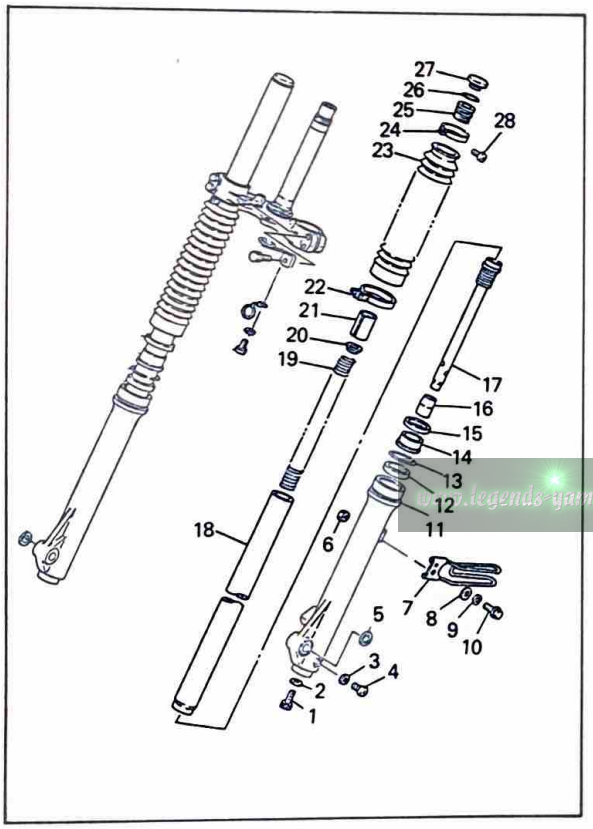
2. Disconnect cable end from throttle grip assembly and remove grip assembly.
3. Wash all parts in mild solvent and check contact surfaces for burrs or other damage. (Also clean and inspect right hand end of handlebar.)
4. Lubricate contact surfaces with light coat of lithium soap base grease and reassemble.

NOTE:

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

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

5-5. FRONT FORKS



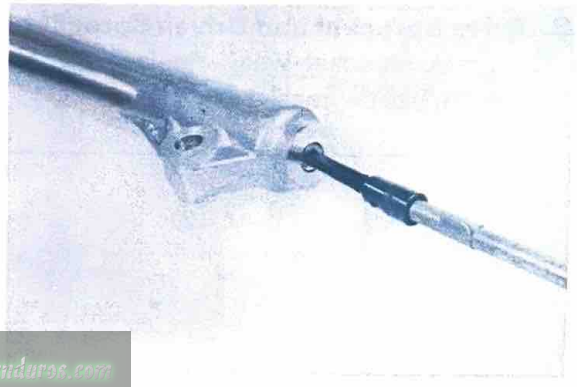
1. Cylinder holding bolt
2. Packing
3. Drain plug gasket
4. Drain plug
5. Plate washer
6. Hexagon nut
7. Wire holder
8. Plain washer
9. Spring washer
10. Flange bolt
11. Outer tube
12. Oil seal
13. Snap ring
14. Dust seal
15. Dust seal case
16. Spindle taper
17. Cylinder comp.
18. Inner tube comp.
19. Fork spring
20. Spring upper seat
21. Spacer
22. Boot band
23. Boot
24. Boot band
25. Cap bolt
26. Packing
27. Rubber cap
28. Screw

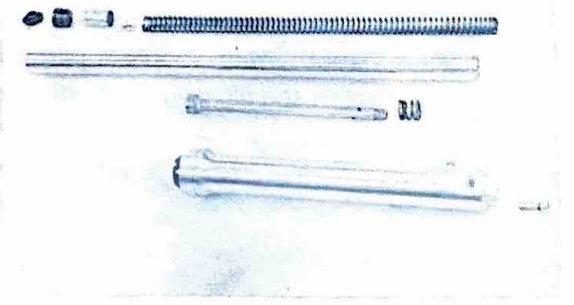
A. Disassembly

1. Remove the front wheel assembly and handlebar assembly.
2. Remove the rubber cap, cap bolt and fork spring.
3. Drain the oil and loosen the cylinder holding bolt in the bottom of the outer tube.
4. Loosen the handle crown pinch bolts and under bracket pinch bolts.
5. Slide the front fork (inner and outer tube as an assembly) down and out of the under bracket.
6. Remove the boot band and boot.
7. Remove the bolt from the bottom of the outer tube and pull the inner and outer tubes apart.

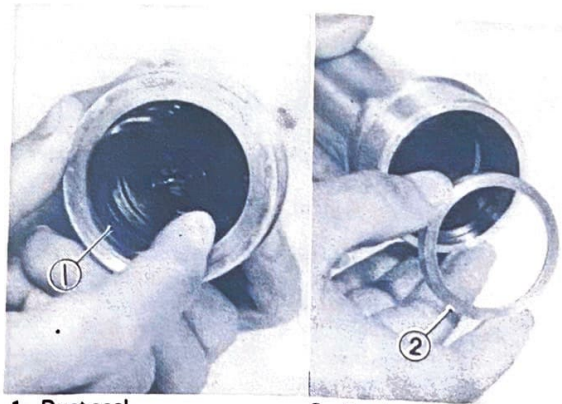
NOTE:

Use the fork spring guide wrench for removing the cylinder holding bolt.

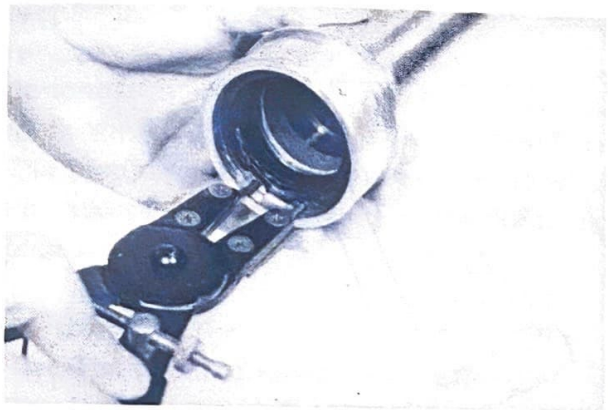




8. To replace the fork seal, remove the dust seal and pull out the dust seal case, such as bearing puller. And remove the snap ring with clip plier.



1. Dust seal
2. Dust seal case



9. Carefully pry out the old seal without damaging fork tube.

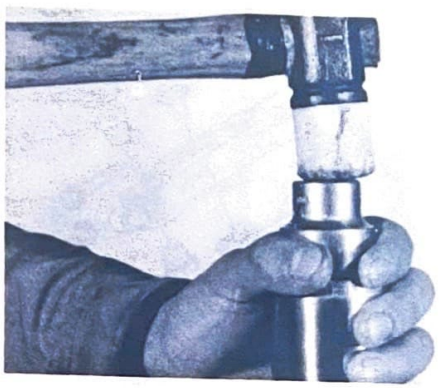
10. Insert the new seal "Open" side down (Manufacture's marks up) using large socket and soft hammer.

B. Inspection

1. Examine fork inner tube for scratches and straightness. If the tube is scratched severely or bent, it should be replaced.
2. If the lips of the oil seal are worn, or the oil seal is leaking, replace it.
3. Check the outer tube for dents. If any dent causes the inner tube to "hang up" during operation, the outer tube should be replaced.

C. Reassembly

1. When reassembling, reverse the removal procedure taking care of following points.
2. Make sure all components are clean before reassembly.
3. Insert the dust seal case using a large socket and steel hammer.



4. Install the inner tube to the handle crown.

NOTE:
The top of inner tube is flush with the upper surface of the handle crown.

5. Tighten the cylinder holding bolt.

Tightening torque:
2.3 m-kg (16 ft-lb)

NOTE:
Apply a holding agent, such as "LOC TITE" to threads of bolt.

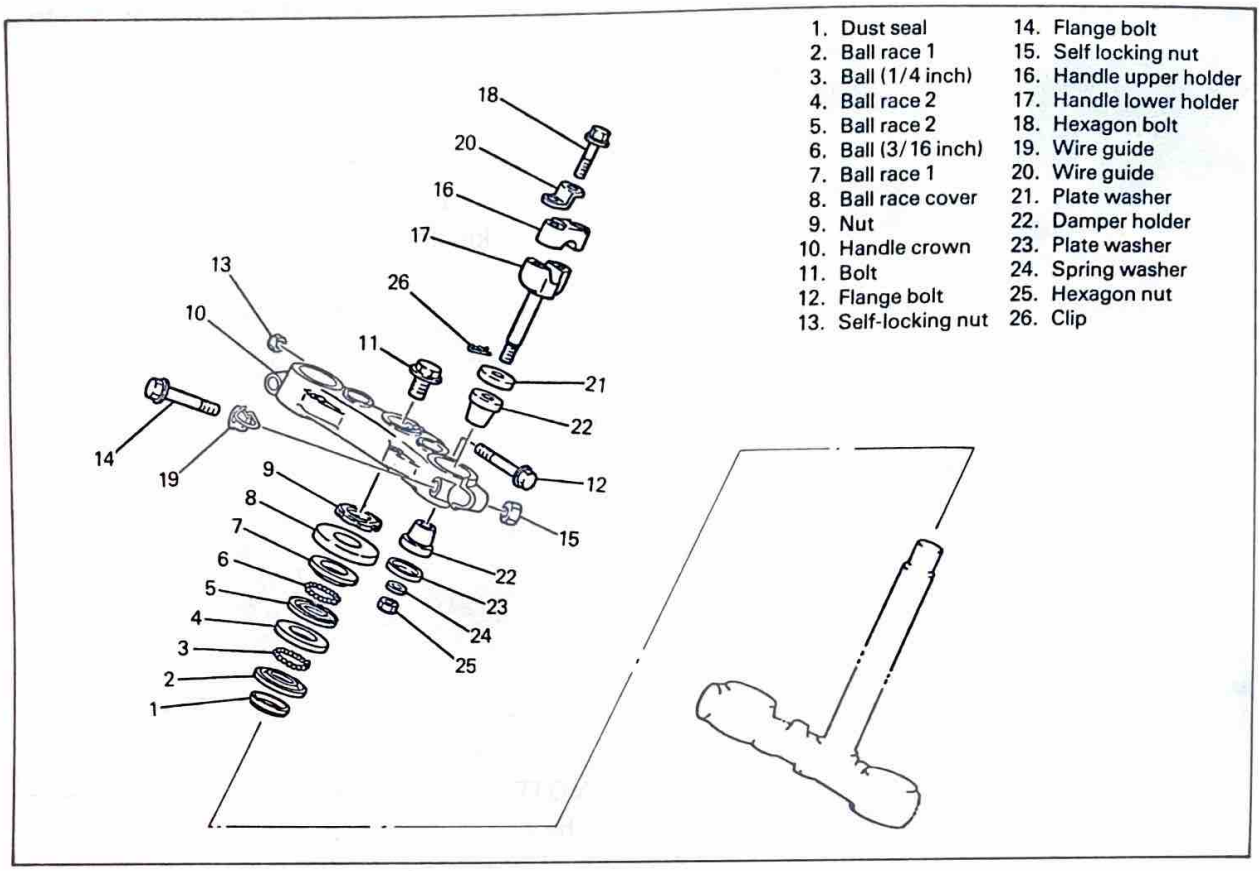
6. Pour specified amount of oil into the inner tube through the upper end opening.

Oil quantity:
257 cc (15.7 cu. in)

7. Tighten the cap and pinch bolts.

Tightening torque:	
Cap bolt:	2.3 m-kg (16 ft-lb)
Pinch bolt:	3.3 m-kg (24 ft-lb)

5-6. STEERING HEAD



A. Inspection

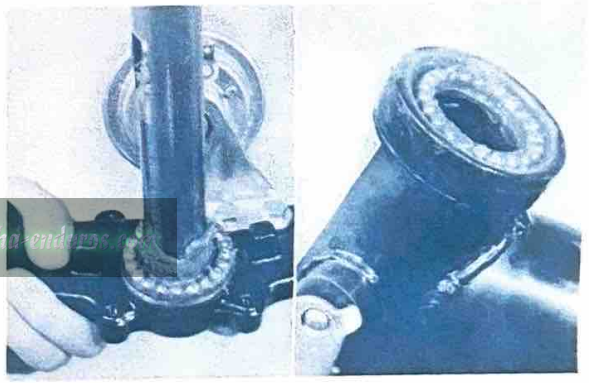
1. Examine all the balls for pits or partial flatness. If any one is found defective, the entire set (including both races) should be replaced. If either race is pitted, shows rust spots, or is damaged in any way, replace both races and all balls.

Ball quantity and size:	
Upper	22 pcs, 3/16 in
Lower	19 pcs, 1/4 in

2. Examine dust seal under lowest race and replace if damaged.
3. Grease the lower ball race of the upper and lower 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 a quality manufacturer—preferably waterproof.



4. Tightening torque.

Steering fitting bolt: 5.3 m-kg (38 ft-lb)
Pinch bolt: 2.3 m-kg (16 ft-lb)

NOTE:

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

Handlebars mounting bolt torque: 1.9 m-kg (14 ft-lb)

Recommended lubricant:
Medium weight wheel bearing grease

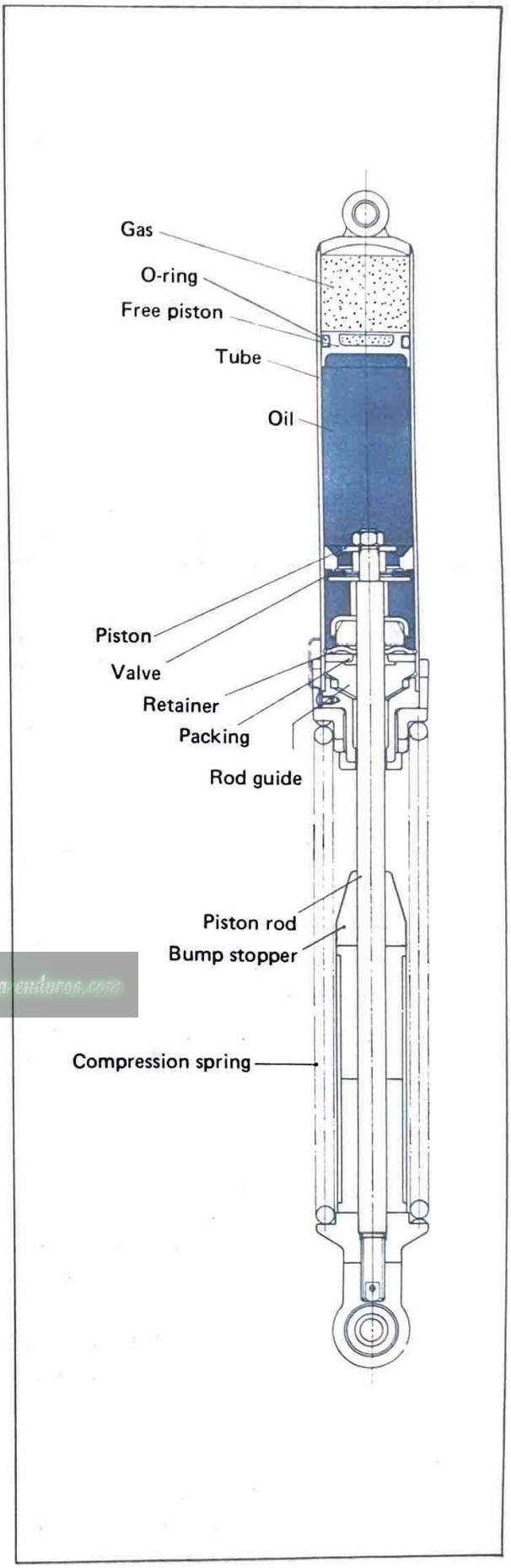
5. Wipe off excessive grease.

5-7. YAMAHA MONOCROSS SUSPENSION (DE CARBON SYSTEM)

As you may know, the Yamaha Monocross suspension developed by Dr. De Carbon has received high reputation for its outstanding performance. And now it has been modified to fit the DT250F through his cooperation. The features, construction and principles of operation will be explained in the following pages.

A. Construction

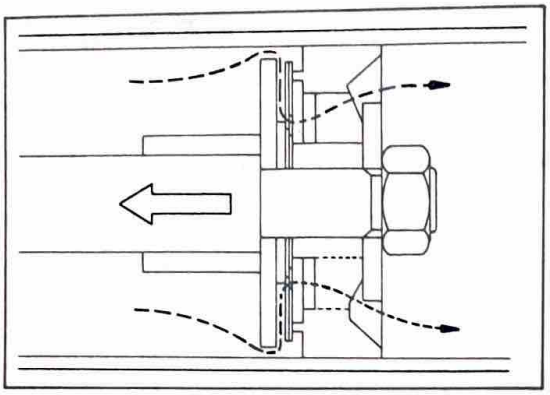
1. The new monocross suspension (MXS) has single cylinder construction, and the oil chamber is completely separated from the gas chamber by the free piston and O-ring for prevention of "aeration" (mixing of oil with gas).
2. A 15 kg/cm² (213 psi) high pressure nitrogen gas is sealed in the gas chamber. As the piston rod (this is not for the free piston) reciprocates, the volume of the gas chamber changes. The free piston is designed to freely move with the change in the gas chamber volume, thus compressing the oil at all times. Therefore, no frothing cavitation will occur in the oil.
3. The MXS valve is called the "floating valve". It is positioned between the center support, having a permanent flow passage, and the piston land. Because of this construction, the valve is allowed to respond quickly and correctly to the change in the gas chamber pressure without being affected by its inertia moment and friction with the tube wall.



B. Principles of Operation

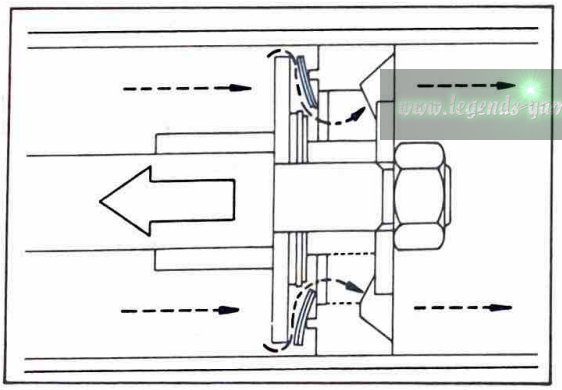
1. Stretch stroke

When the MXS stretches, the oil in the oil chamber flows downward in the direction of the arrows through the permanent passage provided in the center support.



As the piston speed increases, the floating valve is deformed conically, thus allowing the oil to flow faster in the direction of the arrows.

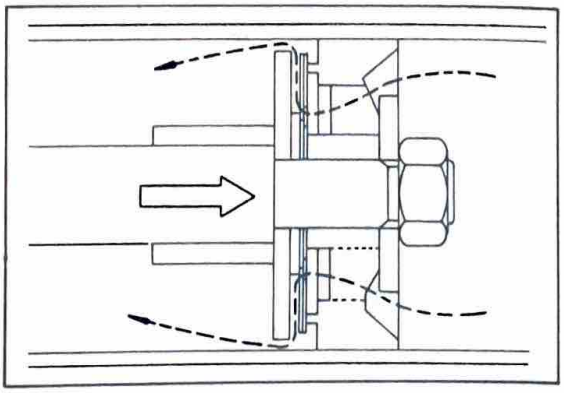
The movement of oil causes friction resistance and dampens the stretch of the suspension. The amount of this damping force is automatically controlled according to the speed of piston movement.



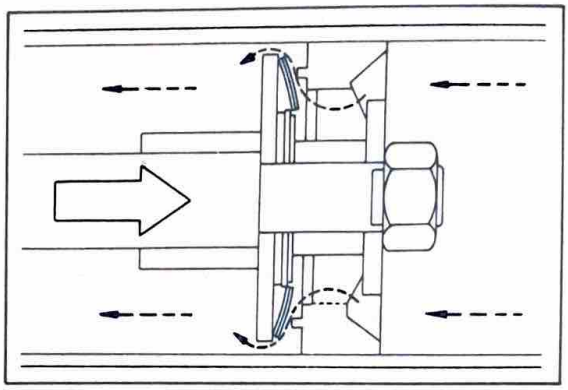
2. Compression stroke

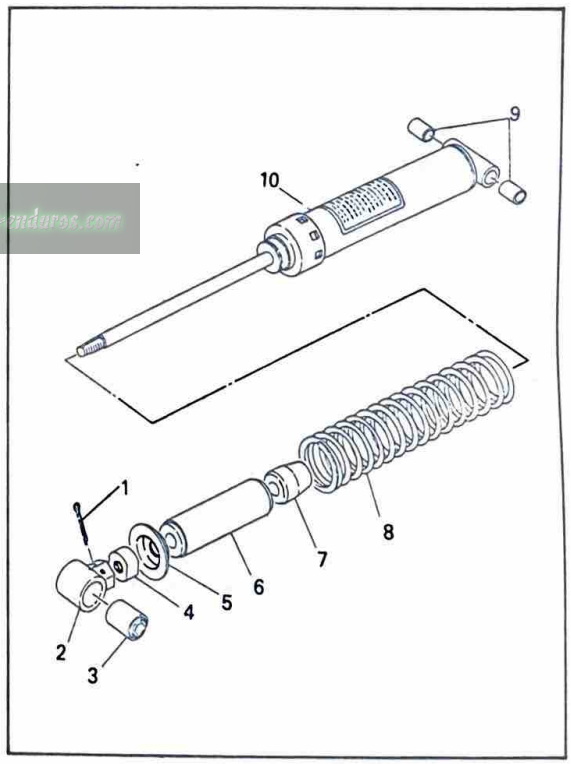
When the MXS is compressed, the oil stored under the piston moves upward in the direction of the arrows through the permanent passage.

As the piston moves faster, the floating valve is deformed conically, thus allowing the oil to pass the piston land in the direction of the arrows.



A damping force is caused by the movement of the oil and automatically controlled according to the piston speed.





1. Cotter pin
2. Upper bracket
3. Bushing
4. Spring upper seat
5. Spring guide
6. Rod sleeve
7. Bump stopper
8. Compression spring
9. Bushing
10. Sub assembly

C. Handling Notes

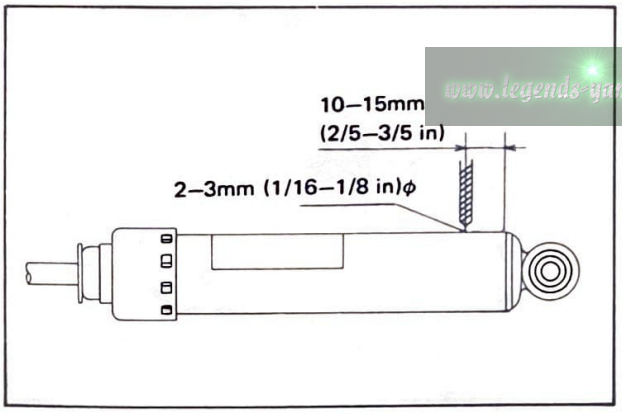
WARNING:

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

1. **Do not tamper with or attempt to open the cylinder assembly. Injury may result.**
2. **Do not subject shock absorber to an open flame or other high heat. This may cause the unit to explode due to excessive gas pressure.**
3. **Do not deform or damaged the cylinder in any way. Cylinder damage will result in poor damping performance.**

Notes on disposal

Gas pressure must be released before disposing of shock absorber. To do so, drill a 2 ~ 3 mm (1/16 ~ 1/8 in) hole through the cylinder wall at a point 10 ~ 15 mm (0.4 ~ 0.6 in) above the bottom of the cylinder.

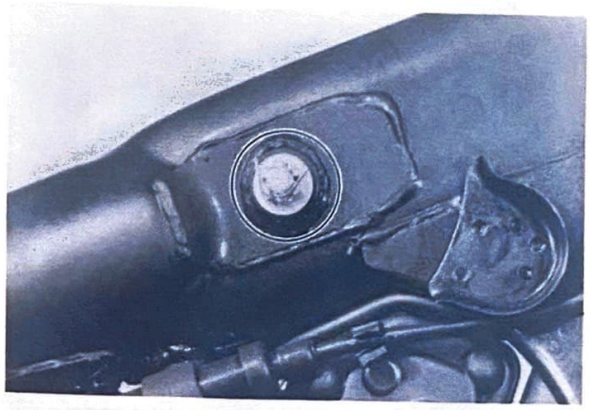


CAUTION:

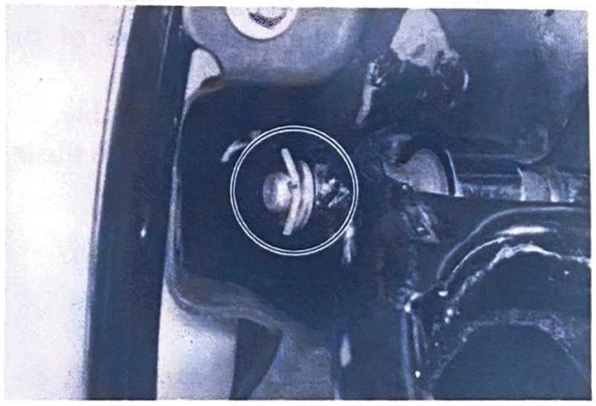
Always wear proper eye protection to prevent eye damage from escaping gas and/or metal chips.

D. Removal

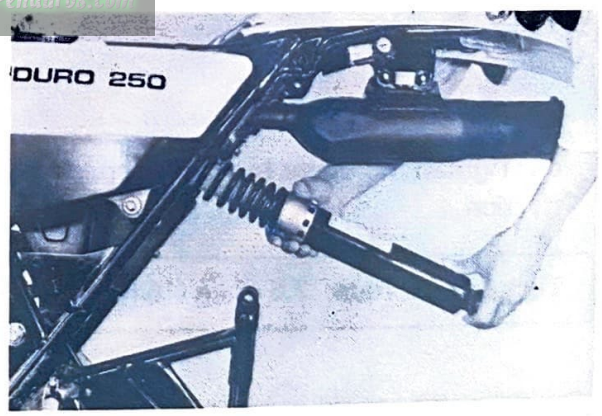
1. Raise the rear wheel by placing a suitable stand under the engine, and remove the rear wheel.
2. Remove the seat, fuel tank.
3. Remove the cotter pin and nut, and remove the bolt securing upper bracket to the frame.



4. Remove the cotter pin and washer, and remove the pivot shaft from the lower frame.



5. Pull the shock absorber backward from the frame.

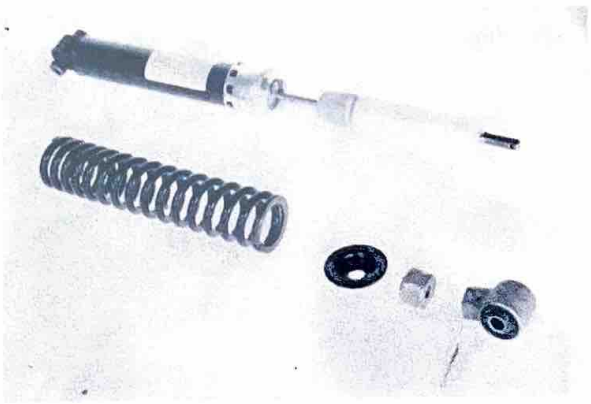


NOTE:

When removing the shock absorber, be careful not to bend the rod and cylinder case. Take care so the two washers are not lost.

6. Remove the cotter pin from upper bracket.

7. Remove the upper bracket and spring upper seat from piston rod.
8. Remove spring.



Upper bracket tightening torque:
5.5 m-kg (40 ft-lb)

9. When reassembling, reverse the removal procedure taking care of the following points.
   a. Use a new cotter pin in reassembly.
   b. Apply a thin coating of grease to the inner surface of the washer.

   c. Tighten the upper bracket to specification.

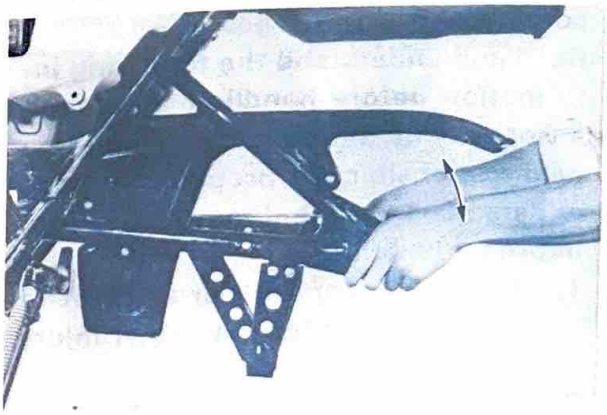
Tightening torque: 2.5 m-kg (18 ft-lb)

5-8. SWING ARM

A. Inspection

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

Swing arm freeplay: 1.0 mm (0.04 in)

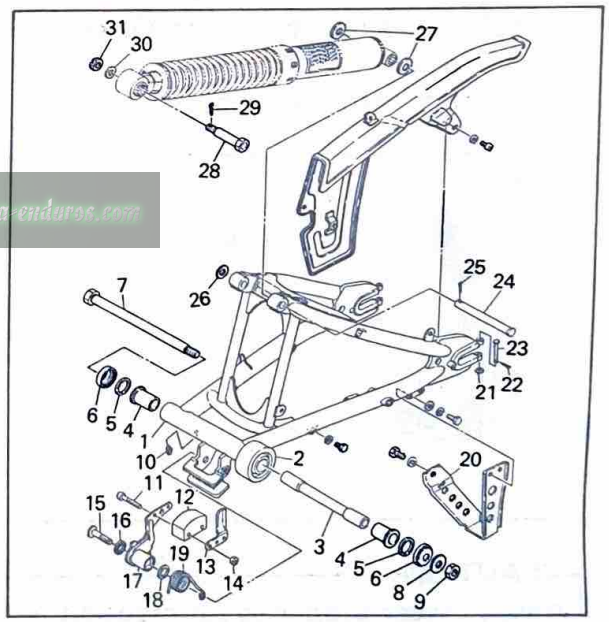


2. If freeplay is excessive, remove swing arm and replace swing arm bushing.

Tightening torque: 6.5 m-kg (48 ft-lb)

B. Lubrication

1. To lubricate, remove pivot shaft.
2. Apply liberal coating of lube grease on pivot shaft and inside of bushing. Reinstall pivot shaft.



1. Rear arm comp.
2. Guard seal
3. Collar
4. Bushing
5. Shim
6. Thrust cover
7. Pivot shaft
8. Plate washer
9. U-nut
10. Grease nipple
11. Panhead screw
12. Tensioner
13. Chain guard
14. Nut
15. Bolt
16. Oil seal
17. Tensioner arm
18. Oil seal
19. Torsion spring
20. Chain guard
21. Plate washer
22. Cotter pin
23. Clevis pin
24. Pin with hole
25. Cotter pin
26. Plate washer
27. Thrust cover
28. Bolt
29. Cotter pin
30. Plain washer
31. Slotted nut

CHAPTER 6.
ELECTRICAL SYSTEM

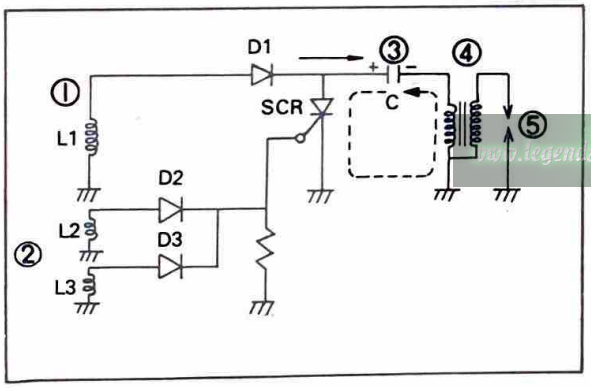
6

6-1. IGNITION SYSTEM

A. Capacitor Discharge Ignition (C.D.I.)

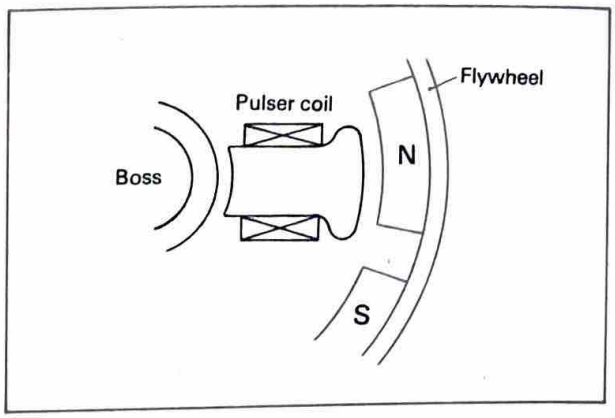
A capacitor discharge ignition (C.D.I.) system eliminates the need for a mechanical contact breaker, and its inherent disadvantages. A simple electronic circuit using a large storage capacitor and a Thyristor (Silicon Control Rectifier) provides a correctly-timed, high-intensity voltage to the spark plug.

1. Method of ignition operation
   The voltage generated by the charge coil is rectified by D1 (diode) and flows in the direction → thus charging C (condenser). On the other hand, the voltage generated by the pulser coils is rectified by D2 and D3 and combined, then applied to SCR as a gate signal.
   When the gate signal reaches the trigger level, SCR becomes conductive, thus allowing C to discharge its stored current. The current flows in the direction→. This change in the current generates a high surge of voltage in the secondary winding of the ignition coil, thus causing a spark to jump.

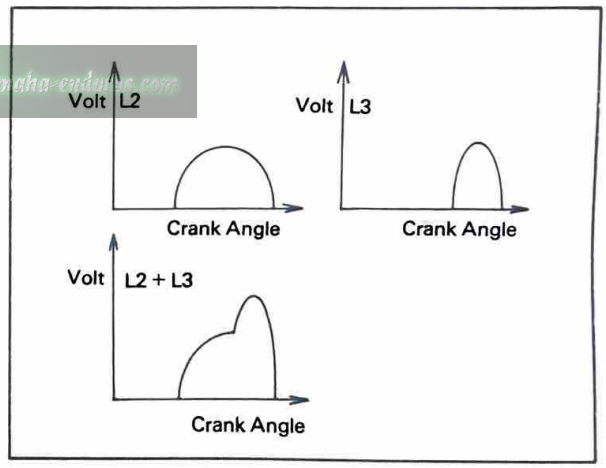


1. Charge coil
2. Pulser coil
3. Condenser
4. Ignition coil
5. Spark plug

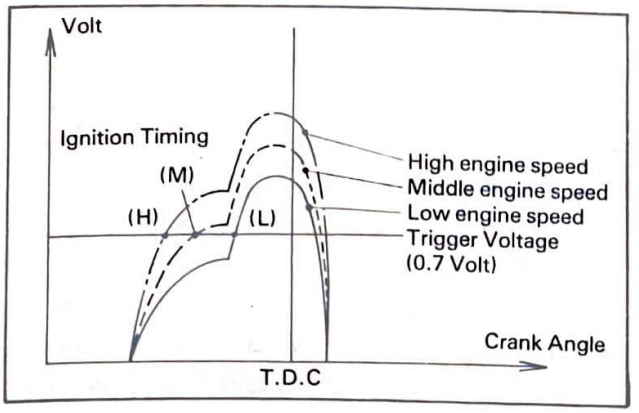
2. Generation of pulses
   A magnetic circuit is produced by using the magnet on the rotor, and pulses are generated according to the magnitude of voltage produced in the pulser coil by the variations in the magnetic flux.
   a. The magnetic circuit is formed by the pulser core, boss, flywheel and magnetic flux varies, and according to the variations, a voltage is produced in the pulser coil.



   b. The voltage is generated in the pulser coil, and when it reaches the trigger level, the SCR becomes conductive, thus causing the capacitor to discharge and to induce a spark jump at the spark plug.
3. Method of ignition advance
   This system is equiped with two pulser coils (L2, L3) and, as illustrated below, each pulse voltage generated by its pulser coil has a different wave form and phase. Their composite signal has two rise slopes and the voltage of the composite signal becomes greater with the increase of engine speed.



The SCR becomes conductive when the signal voltage exceeds a certain level (trigger voltage) and the composite signal voltage differs with engine speed, the ignition timing changes when the engine speed changes (show below).



B. Wiring Connections

The wiring between the magneto, C.D.I. unit, and ignition coil uses couplers to prevent any wrong connection.

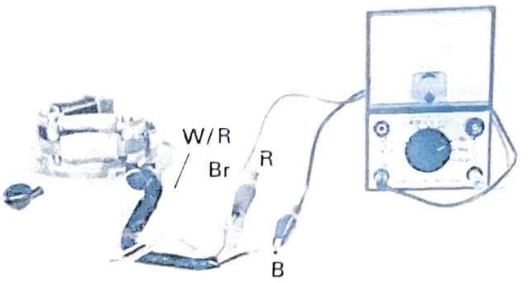
When connecting the ground circuit and the ignition coil, particular care should be taken. If these are connected wrong, the C.D.I. unit will become inoperative.

1. Wiring Notes
   a. Connection must be done accurately. Special care is required for connection of the ground circuit and ignition coil.
   b. The C.D.I. unit and ignition coil should be installed in the specified positions. If position is to be changed, a dry and airy place should be selected. Keep free from mud and water.
   c. To remove the rotor, be sure to use the flywheel magneto puller. Avoid using a hammer, or the rotor may be damaged.
   d. Handle the C.D.I. unit with special care. If you should drop it, the incorporated electronic components will be damaged.

C. Checking the Magneto Charge Coil and Pulser Coil

The resistance of the magneto charge coil and pulser coil are as specified below. To locate the cause of trouble (broken coil, short-circuit, etc.), measure the resistance across each lead as shown in chart.

Pulser coil	W/R—B	7.5Ω ± 10%
	W/G—B	5.1Ω ± 10%
Charge coil	Br—B	305Ω ± 10%
	Br—R	82Ω ± 10%

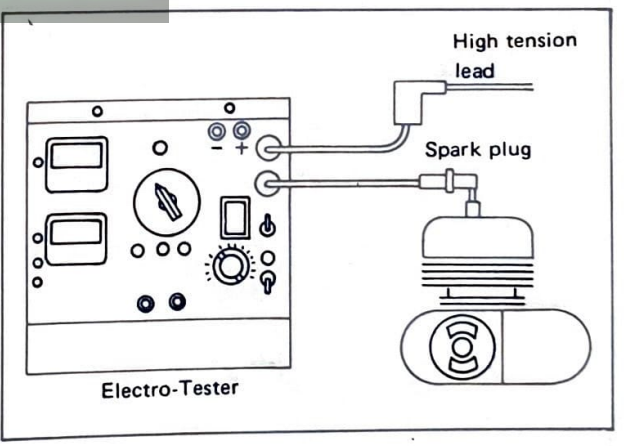


D. Spark Gap Test

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

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

Minimum spark gap: 5 mm (0.19 in)

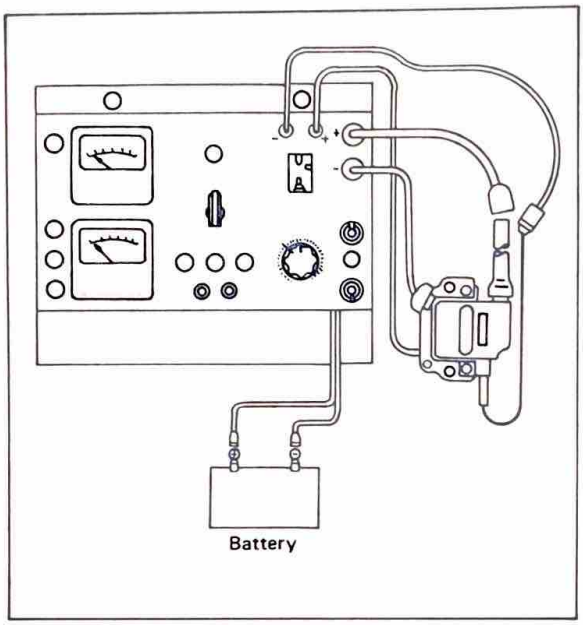


E. Ignition Coil Test

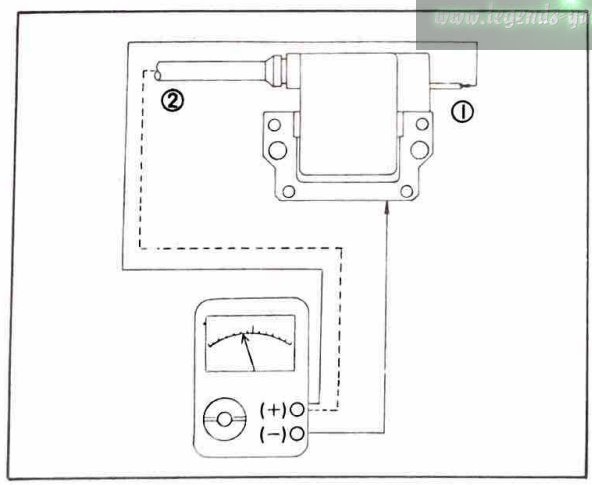
1. Coil spark gap test
   a. Remove fuel tank and disconnect ignition coil from wire harness and spark plug.

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

Minimum spark gap: 6 mm (0.24 in)



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



1. Primary coil resistance check
2. Secondary coil resistance check

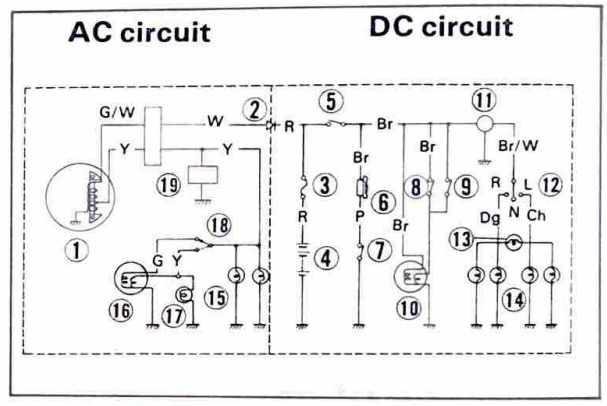
Primary coil resistance Use (Ω × 1) scale	Secondary coil resistance Use (Ω × 100) scale
1.0Ω ± 15%	5.9KΩ ± 15%

6-2. CHARGING SYSTEM

A. Description

The charging system consists of the flywheel, the charging/lighting coil, rectifier and battery. Alternating current from the charging/lighting coil flows to the headlight, meter lights, high beam indicator and, also, to the rectifier where it is converted to direct current for charging the battery. So long as all electrical load items are installed and working properly, the system does not require a regulator. This is due to the fact that as engine r.p.m. increases, frequency increases, lighting/charging coil impedance increases. This impedance increase acts to control the output of the magneto.

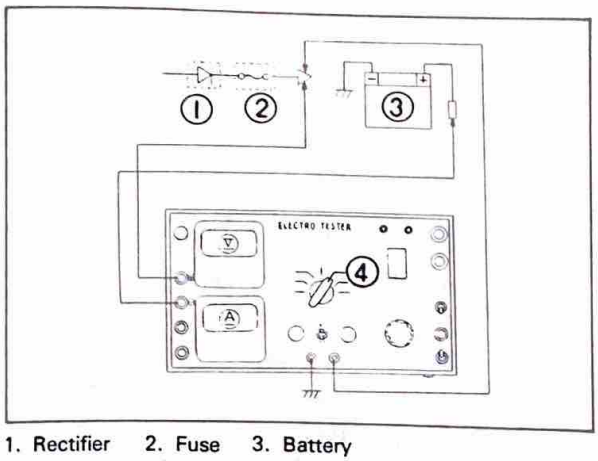
Charging circuit



1. Flywheel magneto
2. Silicon rectifier
3. Fuse
4. Battery
5. Main switch
6. Horn
7. Horn switch
8. Brakelight switch (front)
9. Brakelight switch (rear)
10. Tail/brakelight
11. Flasher relay
12. Flasher switch
13. Flasher indicator
14. Flasher lights
15. Meter lights
16. Headlight
17. High beam indication
18. Dimmer switch
19. Regulator

B. Charging Output Test

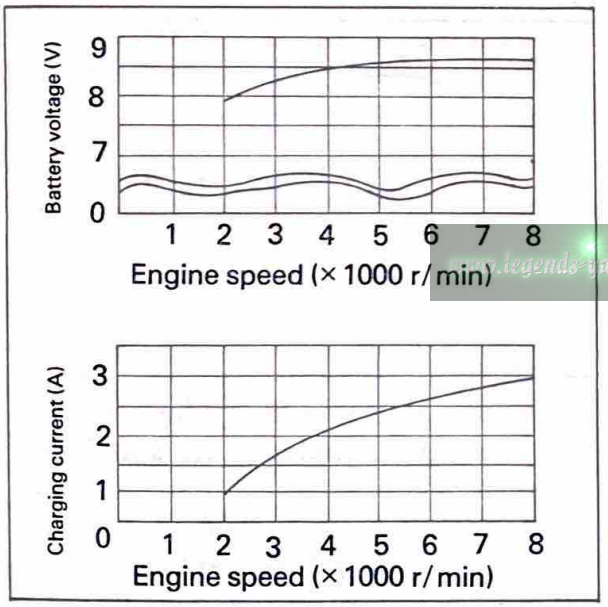
1. Voltage test
   a. Connect Electrotester.
   b. Turn ignition switch to ON position, start engine and note voltage readings at approximate specified rpm's.



1. Rectifier 2. Fuse 3. Battery
4. Set the tester in "DC VOLTAGE" position

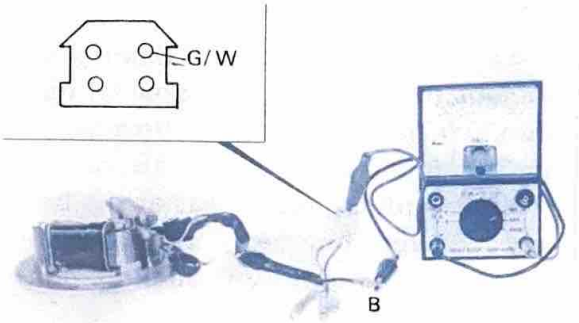
	Charging	
	Amperage (D.C.)	Voltage (D.C.)
2,500 r/min	1.0 ± 0.4A	5.5V or more
8,000 r/min	2.5 ± 0.5A	7.6V or less

CAUTION:
The battery must be fully charged when measuring the charging output test.



C. If the indicated voltage and amperage cannot be reached, perform the tests in step 2.

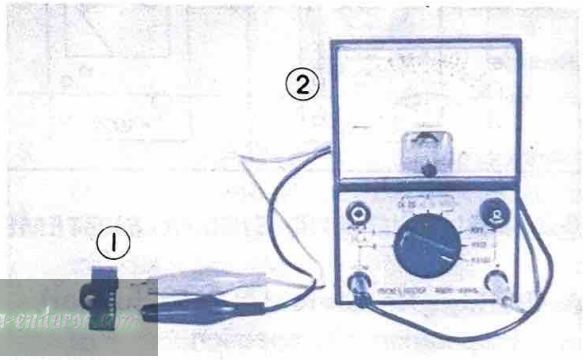
2. Charging coil resistance test
Check the resistance between terminal and ground. If resistance is out of specification, coil is broken. Check the coil connections. If the coil connections are good, then the coil is broken inside and it should be replaced.



Charging coil resistance
Ground to green/white leads 0.36Ω ± 10%/20°C (68°F)

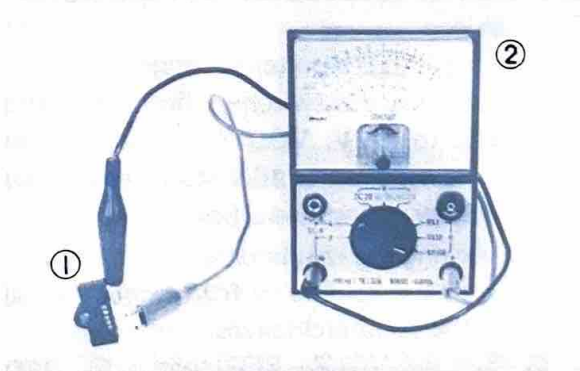
C. Checking Silicon Rectifier

1. Check with normal connection using Yamaha Pocket Tester:
Connect the tester's red lead (+) to the silicon rectifier's red lead, and connect the tester's black lead (−) to the rectifier's white lead.



1. Silicon rectifier 2. Pocket tester

2. Checking with reversed connection using Yamaha Pocket Tester:
Reverse the tester leads.



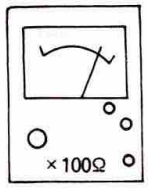
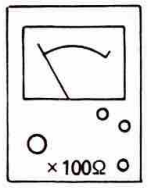
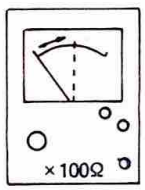
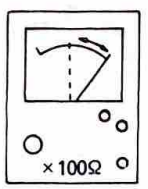
1. Silicon rectifier 2. Pocket tester

CAUTION:

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

NOTE:

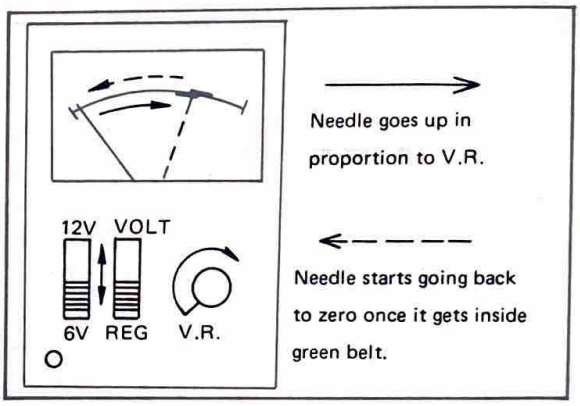
This rectifier test must be checked in both normal and reversed connections.

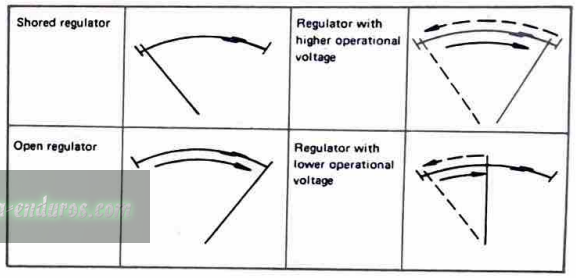
	Reversed connection	Normal connection
Good		
Replace		

6-3. LIGHTING AND SIGNAL SYSTEMS

A. Voltage Regulator (A.C. Regulator)

1. Preparation for inspection
   a. Instruments required for inspection
      A.C. regulator checker and 12V battery
   b. Connect the red lead wire (for power of the regulator checker to the positive side of the battery terminals and connect the black lead wire to the negative side.
   c. Checking the battery voltage
      First, set the switches, both right and left, to "12V, VOLT". If the checker needle points to 10 volts or more, the battery voltage is sufficient.
2. Checking the regulator
   a. Turn the volume (V.R.) of checker full to the counterclockwise.
   b. Set the VOLT—REG switch for RED and the 6V—12V switch for 6V.
   c. Connect the pintipped lead wires to the A.C. regulator; black to the regulator body and red to the regulator lead wire (Yellow/White).
   d. As the volume (V.R.) is gradually turned clockwise, the meter needle goes up. This needle comes back to zero as the regulator beings to operate.
      The regulator functions all right if the needle starts back toward zero within the green belt range on the scale.
      Good regulator:
      The meter needle begins to turn back within the green belt on the meter.





WARNING:

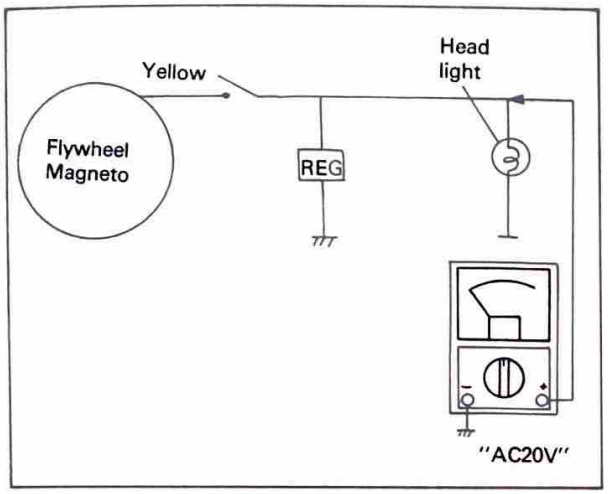
Use bulbs of the correct capacity for the headlight, meter light and high-beam indicator which are directly connected to the flywheel magneto.
If large capacity bulbs are used, the voltage will drop, giving a poor light. On the contrary, if smaller capacity bulbs are used, the voltage will rise, shortening the life of bulbs.

B. Lighting Tests and Checks—A.C. Circuit

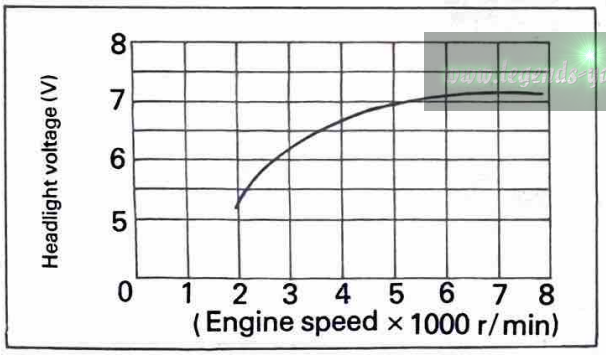
1. A.C. circuit output test
   With all A.C. lights in operation, the cir-

cuit will be balanced and the voltage will be the same at all points at a given rpm.

a. Switch Pocket Tester to "AC20V" position.
b. Connect positive (+) test lead to yellow connection and negative (−) test lead to a good ground.



c. Start engine, and check voltage at each engine speed in table below. (approximate engine speed)
If measured voltage is too high or too low, check for bad connections, damaged wires, burned out bulbs or bulb capacities which are too large throughout the A.C. lighting circuit.

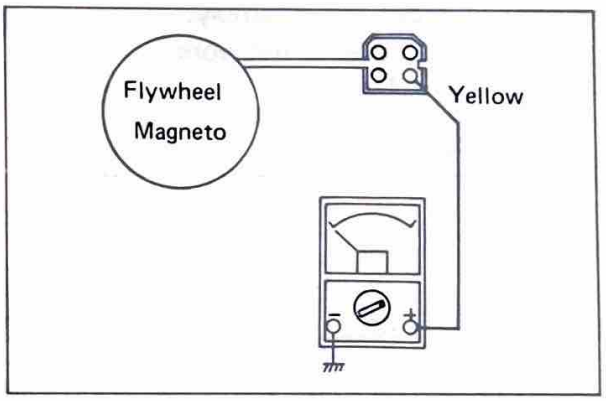


Engine r/min	Voltage
2,500 r/min	5.5V or more
8,000 r/min	7.6V or less

NOTE:
This voltage test can be made at any point throughout the A.C. lighting circuit and the readings should be the same as specified above.

2. Lighting coil resistance check
If voltage is incorrect in A.C. lighting circuit, check the resistance of the yellow wire windings of the lighting coil.
a. Switch Pocket Tester to "Ω × 1" position and zero meter.
b. Connect positive (+) test lead to yellow from magneto and negative (−) test lead to a good ground on engine. Read the resistance on ohms scale.

	Lighting coil Resistance (at 20°C 68°F)
Ground to Yellow Leads	0.23Ω ± 10%



3. If A.C. lighting circuit components check out properly but circuit voltage is still excessive, go to charging circuit checks. (Sec. 6-2)
If voltage is low in charging circuit due to a defective battery, rectifier, or connection voltage will be too high in lighting circuit.

C. Lighting Tests and Checks—D.C. Circuit

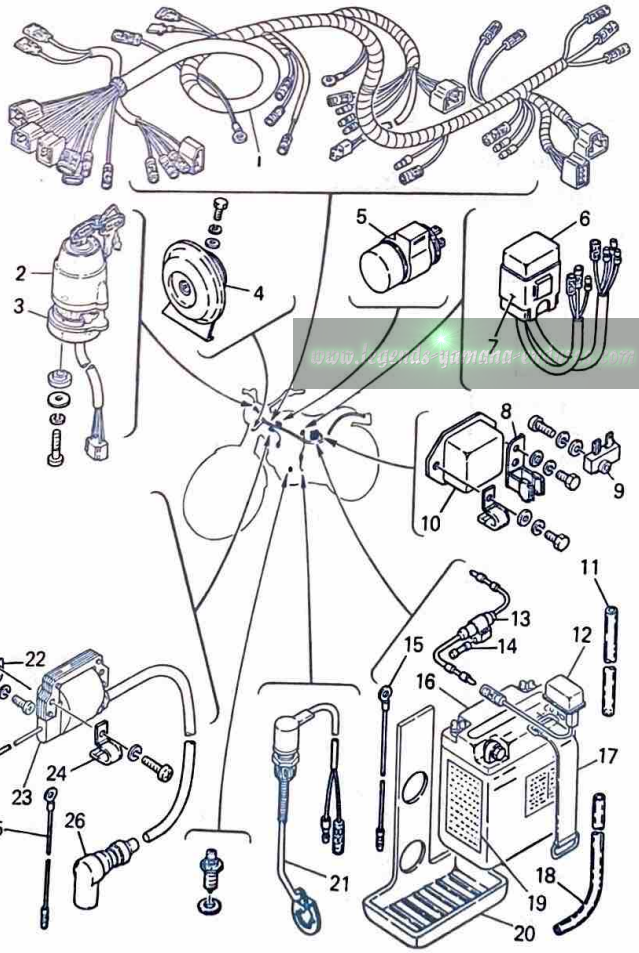
The 6V battery provides power for operation of the horn, taillight, brake, neutral light and flash lights. If none of the above operate, always check battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery water, or a defective charging system. See Section 2-4-C and 6-2 for checks of battery and charging system.

1. Horn does not work.
a. Check for 6V 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 6V on yellow wire to brakelight.
   c. Check for 6V on brown wire to each stop switch (front brake and rear brake switches).
   d. Check ground on black wire to tail/brakelight assembly.
3. Taillight does not work.
   a. Replace bulb.
   b. Check for 6V 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 6V on dark green wire to light.
      2) Check ground on black wire to light assembly.
   c. Left circuit
      1) Check for 6V 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 6V on brown wire to flasher switch on left handlebar.
      2) Check for 6V on brown wire to flasher relay.
      3) Replace flasher relay.
      4) Replace flasher switch.

ELECTRICAL



1. Wire harness
2. Main switch assembly
3. Switch damper
4. Horn
5. Flasher relay
6. C.D.I. Unit assembly
7. Band
8. Coupler clamp
9. Rectifier assembly
10. Voltage regulator
11. Hose
12. Lead wire
13. Fuse holder assembly
14. Fuse
15. Earth lead wire
16. Battery
17. Battery band
18. Hose
19. Battery label
20. Battery seat
21. Brake light switch
22. Ignition coil bracket
23. Ignition coil
24. Clamp
25. Earth lead wire

CHAPTER 7.
APPENDICES

7

7-1. TROUBLESHOOTING GUIDE

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

A. No Start or Difficult to Start

Ignition System	
Possible Cause	Remedy
No Spark.	1. Check Ignition Main Switch. 2. Check Engine Stop Switch 3. Check Wiring, Magneto Coil. 4. Check Coil. 5. Check High Tension Lead. 6. Check Spark Plug. 7. Check Ignition Timing.
Weak or Intermittent Spark.	1. Use Electro Tester, Spark Gap Test. 2. Check Spark Plug. 3. Check High Tension Lead. 4. Check Ignition Assembly.
Air/Fuel Systems	
Possible Cause	Remedy
No Fuel.	1. Check Fuel Tank. 2. Check Petcock.
Intermittent or Poor Fuel Flow.	1. Clean Fuel Tank, Check Cap Vent. 2. Clean Petcock. 3. Remove Carburetor, Service.
Bad Fuel.	1. Flush Fuel System, Complete. 2. Add Fresh Fuel, Proper Grade.
Blocked Air Intake or Malfunction.	1. Clean and Lube Filter. 2. Check Reed Valve Assembly.
Engine/Exhaust Systems	
Possible Cause	Remedy
Incorrect Compression Pressure.	1. If Reading too High, Check for Excessive Carbon. 2. If Reading too Low, Check: a. Cylinder Head Gasket. b. Cylinder Base Gasket. c. Piston, Rings, Cylinder.
Poor Bottom End Compression.	1. Check Crankcase Seals L. & R.
Blocked Exhaust System.	1. Check Muffler/Spark Arrester. 2. Check Exhaust Port Carbon Formation. 3. Check Exhaust Pipe for Internal Damage.

B. Poor Idle and/or Low Speed Performance

Ignition System	
Possible Cause	Remedy
Spark Plug Fouled or Incorrect Gap.	1. Clean and Gap, or Replace if Necessary.
Incorrect Ignition Timing.	1. Reset Timing.
Weak Spark.	1. Check Ignition Coil
Air/Fuel Systems	
Possible Cause	Remedy
Tank Cap Vent Plugged.	1. Clean or Repair as Necessary.
Fuel Petcock Plugged.	1. Clean or Repair as Necessary.
Carburetor Slow Speed System Inoperative	1. Clean or Repair as Necessary.
Air/Fuel Systems	
Possible Cause	Remedy
Pilot Screw Out of Adjustment or Plugged.	1. Clean or Repair as Necessary.
Carburetor Float Level Incorrect.	1. Clean or Repair as Necessary.
Starter Lever on.	1. Clean or Repair as Necessary.
Air Leak.	1. Clean or Repair as Necessary.
Carburetor Not Level.	1. Clean or Repair as Necessary.
Engine/Exhaust Systems (See "No Start").	

C. Poor Mid-Range and High Speed Performance

Ignition Systems	
Possible Cause	Remedy
Spark Plug Incorrect.	1. Clean and Gap or Change Plug if Necessary.
Advance Defective.	1. Check for Correct "Retard" to "Full Advance" Position.
Ignition Timing Incorrect.	1. Reset.
Air/Fuel Systems	
Possible Cause	Remedy
Dirty Air Filter Element.	1. Clean.
Carburetor Float Level Incorrect.	1. Measure and Change if Required.
Incorrect Main Jet Size.	1. Remove Jet and Check Size.
Incorrect Jet Needle Notch.	1. Check Position of Clip in Needle.
Cracked or Leaking Reeds.	1. Remove.
Carburetor Not Level.	1. Level.

7-2. GENERAL SPECIFICATIONS

A. General

Model	DT250F
Model (I.B.M. No.) Frame I.D. & Starting Number Engine I.D. & Starting Number	2N6 2N6-000101 2N6-000101
Dimension: Overall Length Overall Width (Standard) Overall Height (standard) Seat Height Wheelbase Minimum Ground Clearance	 2,185 mm (86.0 in) 870 mm (34.4 in) 1,165 mm (45.9 in) 855 mm (33.7 in) 1,420 mm (55.9 in) 260 mm (10.2 in)
Weight: Net Weight	 122.7 kg (270.5 lb)
Performance: Minimum Turning Radius	 2,200 mm (86.6 in)

B. Engine

Model	DT250F
Description: Engine Type Engine Model Displacement Bore × Stroke Compression Ratio Starting System Ignition System Lubrication System	 Air Cooled, 2-stroke Gasoline Torque Induction 2N6 246 cc (15.01 cu. in) 70 × 64 mm (2.76 × 2.52 in) 6.7 : 1 Primary kick starter C.D.I. ignition Separate lubrication (Yamaha Autolube)
Cylinder head: Combustion Chamber Volume Combustion Chamber Type Head Gasket Thickness	 30.7 cc (1.874 cu. in) Dome + Squish 1.0 mm (0.04 in)
Cylinder: Material Bore Size Wear Limit Taper Limit Out of Round Limit	 Aluminum cylinder with cast iron sleeve 70 mm (2.756 in) 70.1 mm (2.76 in) 0.05 mm (0.002 in) 0.01 mm (0.0004 in)
Piston: Piston Skirt Clearance Piston Over Size Piston Pin Outside Diameter × Length	 0.040 ~ 0.045 mm 70.25, 70.50, 70.75, 71.00 mm 18 × 59 mm (0.709 × 2.322 in)

Model	DT250F
Piston Rings:	
Piston Ring Design (Top/Second)	Keystone/Keystone with expander
Ring End Gap (installed) (Top/Second)	0.2 ~ 0.4 mm (0.008 ~ 0.016 in)
Ring Groove Side Clearance (Top/Second)	0.1 ~ 0.38 mm (0.004 ~ 0.015 in)
Small end Bearing: Type	Needle bearing (18 × 22 × 22)
Big end Bearing: Type	Needle bearing (25 × 31 × 20)
Crankshaft:	
Crankshaft Assembly width (F)	$62^{-0}_{-0.05}$ mm ($2.441^{-0}_{-0.002}$ in)
Crankshaft Deflection (A)	0.03 mm (0.001 in)
Connecting Rod Big End Side Clearance (C)	0.25 ~ 0.75 mm (0.01 ~ 0.029 in)
Connecting Rod Small End Deflection (S)	0.8 ~ 2.0 mm (0.031 ~ 0.079 in)
Crank Pin Outside Diameter × Length	25 × 60 mm (0.98 × 2.36 in)
Crank Pin Type	Hollow type
Crank Bearing Type (Left)	6206-C3
" (Right)	6206-C3
Crank Oil Seal Type (Left)	SD 30 × 55 × 12
" (Right)	SW 40 × 55 × 12
Clutch:	
Clutch Type	Wet, multiple disc type
Clutch Operating Mechanism	Inner push type, Cam axle
Primary Reduction Ratio & Method	65/23 (2.826), Helical gear
Friction Plate — Thickness/Quantity	3.0 mm (0.12 in) × 7 pcs
— Wear Limit	2.7 mm (0.106 in)
Clutch Plate — Thickness/Quantity	1.2 mm (0.047 in) × 6 pcs
— Warp Limit	0.05 mm (0.002 in)
Clutch Spring — Free Length/Quantity	34.9 mm (1.37 in) × 6 pcs
— Wear Limit	33.9 mm (1.33 in)
Clutch Housing Axial Play (Wear Limit)	0.05 ~ 0.25 mm (0.002 ~ 0.01 in)
Transmission:	
Type	Constant mesh, 5 speed forward
Gear Ratio 1st (Teeth) (Ratio)	33/13 (2.538)
2nd	34/19 (1.789)
3rd	26/20 (1.300)
4th	23/23 (1.000)
5th	20/26 (0.769)
Transmission Gear Oil Quantity	Total: 1,200 cc (73.2 cu. in) Exchange: 1,100 cc (67.1 cu. in)
Transmission oil type	Yamalube 4-cycle oil or SAE 10W/30 "SE" motor oil or "GL" gear oil
Secondary Reduction Ratio & Method	47/14 Chain
Intake:	
Air Cleaner — Type/Quantity	Wet-foam rubber/1 PC
— Oil Grade	SAE 10W/30 "SE" motor oil
Induction System	Reed valve
Reed Valve:	
Type	V type
Bending Limit	0.6 mm (0.024 in)
Valve Lift	7.5 mm (0.30 in)

Model	DT250F
Carburetor:	
Type & Manufacturer/Quantity	VM28SS
I.D. Mark	2N600
Main Jet (M.J.)	# 150
Air Jet (A.J.)	2.5
Jet Needle-clip Position (J.N.)	5F36-3
Needle Jet (N.J.)	O-4
Cutaway (C.A.)	3.0
Pilot Jet (P.J.)	50
Air Screw (turns out) (A.S.)	Preset
Starter Jet (G.S.)	40
Fuel Level (F.L.)	21.0 ± 2.5 mm
Engine Idling Speed	1,000 ~ 1,200 r/min
Lubrication:	
Autolube Pump	
— Color Code	Red
— Minimum Stroke	0.25 ~ 0.30 mm
— Maximum Stroke	1.85 ~ 2.05 mm
Autolube Pump	
— Reduction Ratio	18/23 × 55/1
— Minimum Output/200 strokes	0.31 ~ 0.38 cc
— Maximum Output/200 strokes	2.3 ~ 2.58 cc
Throttle Position (Adjusting Mark)	⊠ (at full throttle)
Oil Tank Capacity	1.1 lit (1.04 qt)
Oil Grade	Yamalube 2-cycle oil or 2-stroke engine oil "BIA certified for service TC-W"

C. Chassis

Frame:	
Frame Design	Tubular, double cradle
Steering system:	
Caster	28°30′
Trail	120 mm (4.72 in)
Number & Size of Balls in Steering Head	
Upper Race	3/16 in × 22 pcs
Lower Race	1/4 in × 19 pcs
Lock to Lock Angle	47°30′
Front suspension:	
Type	Telescopic fork
Damper Type	Coil spring, oil damper
Front Fork Travel	195 mm (7.68 in)
Front Fork Spring:	
Free Length	524 mm (20.6 in)
Wire Diameter × Winding Diameter	ø4 mm (0.16 in) × ø26.5 mm (1.04 in)
Spring Constant	K_1: 0.35 kg/mm, K_2: 0.382 kg/mm (0 ~ 60 mm) (60 mm ~)
Inner Tube Outside Diameter	36 mm (1.42 in)

Model	DT250F
Oil Seal Type	SD36—48—10.5
Front Fork Oil Quantity & Type	257 cc (15.7 cu. in) Yamaha fork oil 10wt or equivalent
Rear suspension:	
Type	Monocross
Gas Pressure	15 kg/cm² (213 psi)
Gas Properties	Nitrogen gas
Absorber Stroke	89 mm (3.5 in)
Wheel Travel	152 mm (6.0 in)
Compression Spring:	
Free Length	265 mm (10.4 in)
Set Length	260 mm (10.2 in)
Spring Constant	K_1 = 4.02 kg/mm, K_2 = 5.52 kg/mm
Number of Windings	16.75 turns
Spring Diameter	ø 9.0 mm (0.35 in)
Spring O.D.	ø57.0 mm (2.24 in)
Swing Arm Free Play	None
Pivot Shaft — Outside Diameter	ø16 mm (0.63 in)
Fuel tank:	
Capacity	8.5 ℓ (2.2 us gal)
Fuel Grade	Regular
Wheel:	
Tire Size (Front)	3.00-21-4PR/Dunlop
(Rear)	4.00-18-4PR/Dunlop
Tire Pressure (Normal) (Front)	1.3 kg/cm² (18 psi)
(Rear)	1.5 kg/cm² (22 psi)
Rim Size (Front)	1.60×21
(Rear)	1.85×18
Rim Run Out Limit (Front/Rear)	
Vertical	2 mm (0.08 in)
Lateral	2 mm (0.08 in)
Secondary Drive Chain Type	
Type	DID 520 DS
Number of Links	103
Chain Free Play	50 ~ 60 mm (1.97 ~ 2.4 in)
Brake:	
Front Brake	
Type	Leading, Trailing
Drum Diameter (Limit)	ø160 mm (6.3 in)
Shoe Diameter × Width	160×25 mm (6.3×1.0 in)
Shoe Spring Free Length	68 mm (2.68 in)
Lining Thickness (Wear Limit)	4 mm/2 mm (0.16/0.08 in)
Rear Brake	
Type	Leading, Trailing
Drum Diameter	ø150 mm (5.9 in)
Shoe Diameter	1.50×25 mm (5.9×1.0 in)
Shoe Spring Free Length	68 mm (2.68 in)
Lining Thickness (Wear Limit)	4 mm/2 mm (0.16/0.08 in)

D. Electrical

Model	DT250F
Ignition system:	
Type	C.D.I. Magneto
— Model/Manufacturer	F03T35371/Mitsubishi
— Voltage	6V
— Charge Coil Resistance	82Ω ± 10% (Red-Black)
— Charge Coil Resistance	305Ω ± 10% (Brown — Black)
— Pulser Coil Resistance	7.8Ω ± 10% (White/Red — Black)
	5.1Ω ± 10% (White/Green — Black)
— Flywheel Puller Thread Size	27 mm (1.08 in)
Ignition Timing:	1.75 mm ± 0.15 mm (0.0689 ± 0.006 in)
Ignition Coil:	
Model/Manufacturer	F6T411/Mitsubishi
Spark Gap	6 mm (0.24 in)
Primary Winding Resistance	1.0Ω ± 15% at 20°C
Secondary Winding Resistance	5.9KΩ ± 20% at 20°C
Diode	Yes
Spark Plug	
Type/Manufacture	B8ES/NGK
Spark Plug Gap	0.7 ~ 0.9 mm (0.028 ~ 0.035 in)
CDI unit	
Type/Manufacture	F08T01271/Mitsubishi
Charging system:	
C.D.I. Magneto	F03T35371/Mitsubishi
Charging Output	1.0 ± 0.4A/2,500 r/min
	2.5 ± 0.5A/8,000 r/min
Charge Coil Resistance	0.36Ω ± 10% (Green/White — Black)
Lighting Output	5.5V or more/2,500 r/min
	7.6V or less/8,000 r/min
Lighting Coil Resistance	0.23Ω ± 10% (Yellow — Black)
Rectifier	
Type	DE41/Stanley
Capacity	3A
Withstand Voltage	400V
Rating	Silicon
Battery	
Model/Manufacture	6N6-3B-1
Capacity	6V-6AH
Charging Rate	0.6 × 10 hour
Specific Gravity	1.26
Lighting System:	
Heat Light Type	Sealed beam
Bulb Wattage	
Headlight Wattage	6V, 35W/35W
Tail/Stop Light Wattage	6V, 5.3W/25W
Flasher Light Wattage	6V, 17W
Flasher Pilot Light Wattage	6V, 3W
Meter Light Wattage	6V, 3W
High Beam Indicator Light Wattage	6V, 3W
Neutral Light Wattage	6V, 3W
Oil Level Indicator Light Wattage	6V, 3W

Model	DT250F
Horn: Model Maximum Amperage	 MF-6 1.5A or less
Flasher relay: Type Flasher Frequency	 FU637SD/Nippon denso 85 cycle/min
Fuse Rating/Q'ty	 10A/1
Voltage regulator Model/Manufacture Voltage	 F08B8007/Mitsubishi 7.0 ± 0.2 V

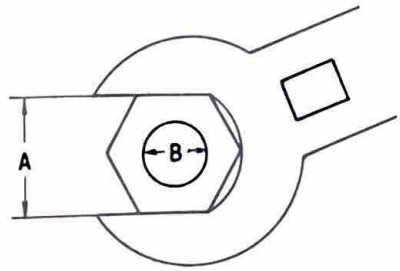
7-3. TORQUE SPECIFICATIONS

The list at right covers those stud/bolt sizes with standard I.S.O. pitch threads. Torque specifications for components with thread pitches other than standard are given within the applicable chapter.

Torque specifications call for dry, clean threads. Components such as the cylinder or cylinder head should be at room temperature prior to torquing. A cylinder head or any other item with several fastners should be torqued down in a cross-hatch pattern in successive stages until torque specification is reached. The method is similar to installing an automobile wheel and will avoid warping the component.

A	B	TORQUE SPECIFICATION		
		m-kg	ft-lb	in-lb
10 mm	6 mm	1.0	7.2	85
12 mm	8 mm	2.0	15	175
14 mm	10 mm	3.5	29	300
17 mm	12 mm	4.0	29	350
19 mm	14 mm	4.5	33	400
22 mm	16 mm	6.0	44	510
24 mm	18 mm	6.5	47	550
27 mm	20 mm	7.5	54	640
Spark plug		2.5	20	230

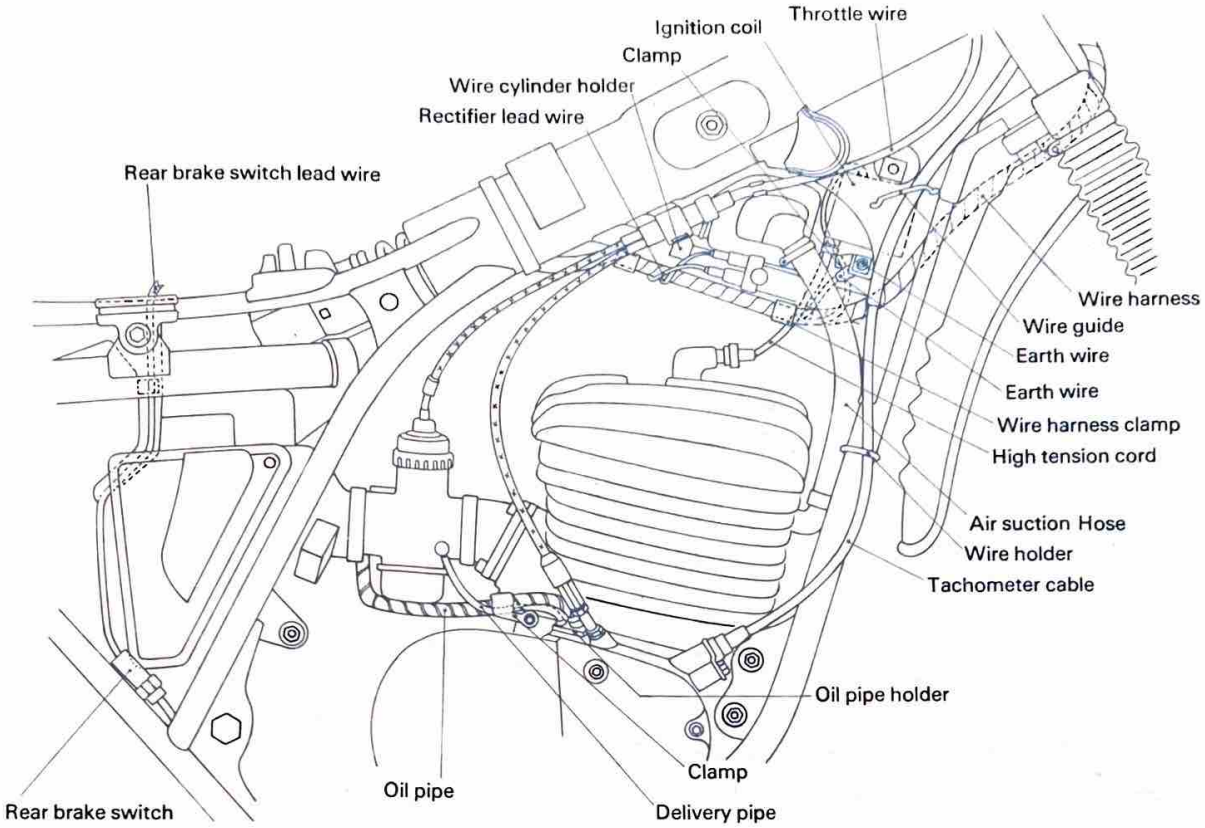
Standard Torque Setting

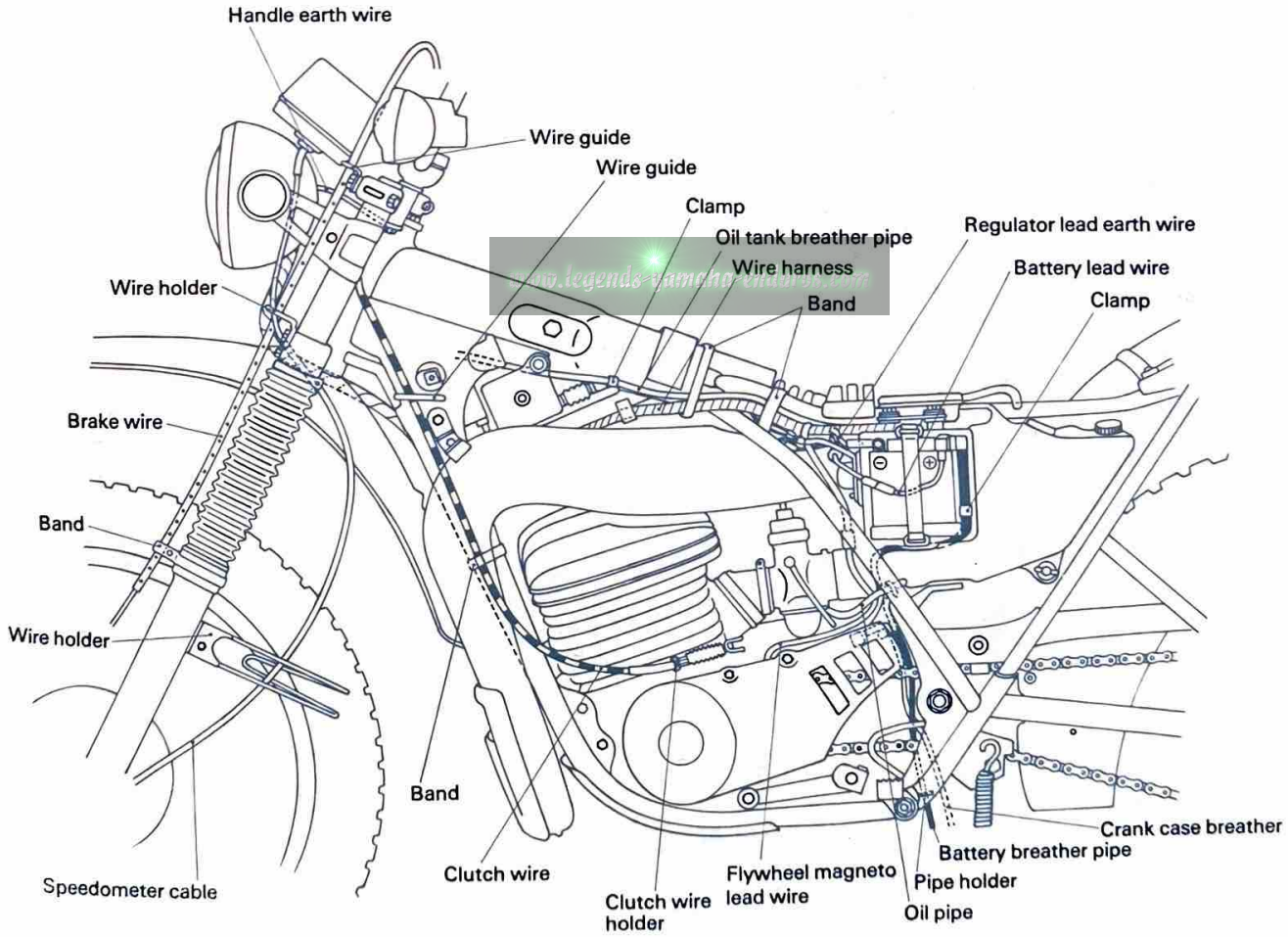


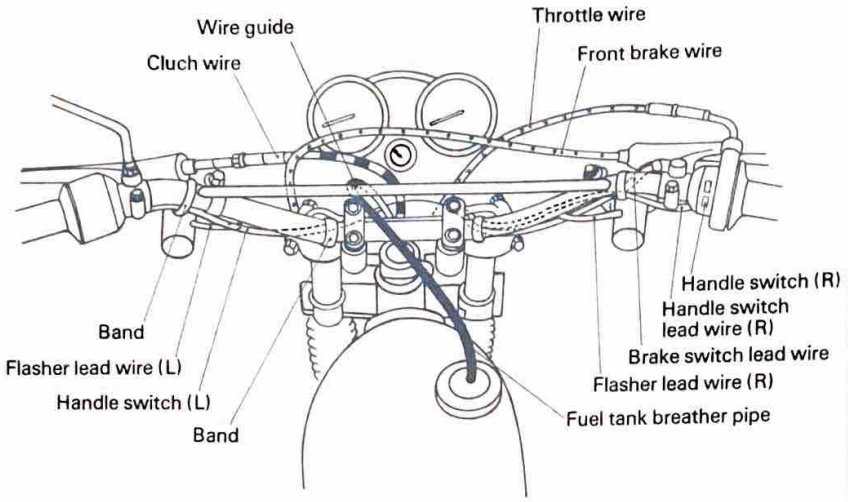
A. Distance across flats
B. Outside thread diameter

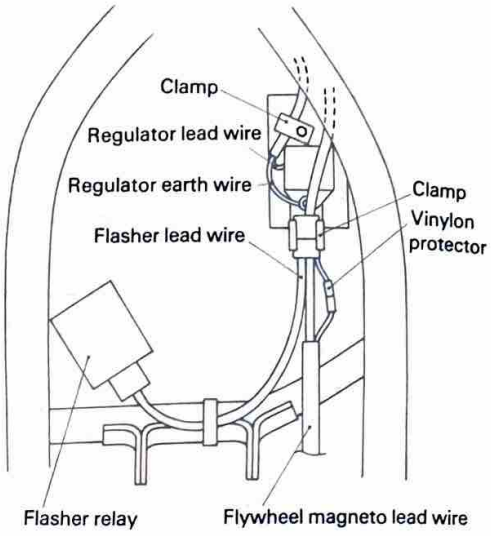
Engine		Tightening torque		
Cylinder head	— Nut	M8	2.5 m-kg	(18 ft-lb)
	— Stud bolt	M8	2.5 m-kg	(18 ft-lb)
Cylinder	— Nut	M10	3.3 m-kg	(24 ft-lb)
	— Stud bolt	M10	3.3 m-kg	(24 ft-lb)
Spark plug		M14	2.5 m-kg	(18 ft-lb)
Clutch boss		M20	7.5 m-kg	(54 ft-lb)
Push rod 1		M8	1.5 m-kg	(10 ft-lb)
Primary drive		M18	7.5 m-kg	(54 ft-lb)
Drive sprocket		M18	7.5 m-kg	(54 ft-lb)
Flywheel magneto		M12	8.3 m-kg	(60 ft-lb)
Chassis		**Tightening torque**		
Engine mount	— front	M8	2.5 m-kg	(18 ft-lb)
	— rear, upper	M8	2.5 m-kg	(18 ft-lb)
	— rear, lower	M10	4.0 m-kg	(29 ft-lb)
Front fender		M6	0.4 m-kg	(3 ft-lb)
Mud guard		M6	0.4 m-kg	(3 ft-lb)
Pivot shaft		M14	6.5 m-kg	(47 ft-lb)
Tensioner arm		M10	1.5 m-kg	(10 ft-lb)
Rear shock absorber		M10	2.5 m-kg	(18 ft-lb)
Front fork cap		M30	2.3 m-kg	(17 ft-lb)
Handle crown	— Inner tube	M10	3.3 m-kg	(24 ft-lb)
	— Steering pinch bolt	M8	2.3 m-kg	(16 ft-lb)
	— Steering	M14	5.5 m-kg	(40 ft-lb)
	— Handle holder	M10	3.2 m-kg	(23 ft-lb)
Handle holder, upper		M8	1.9 m-kg	(14 ft-lb)
Front wheel axle		M14	8.0 m-kg	(57 ft-lb)
Rear wheel axle		M16	9.0 m-kg	(65 ft-lb)
Sprocket wheel gear		M10	4.0 m-kg	(28 ft-lb)
Footrest assembly		M12	6.0 m-kg	(42 ft-lb)

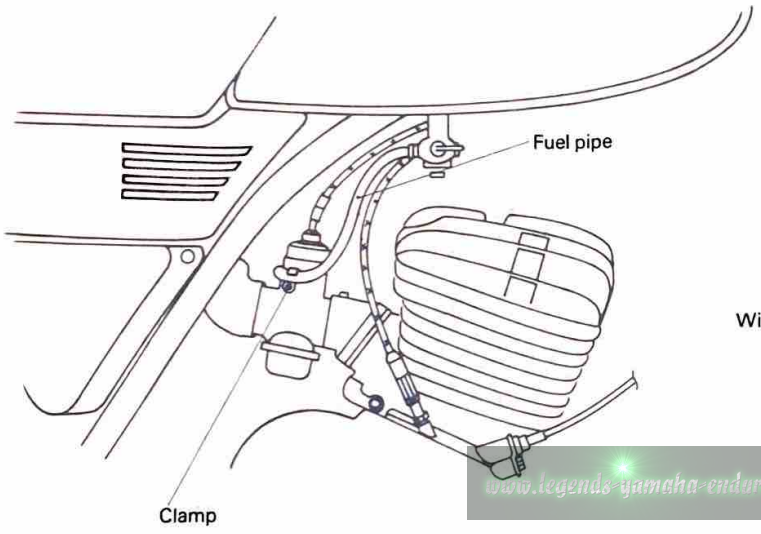
7-4. CABLE ROUTING DIAGRAMS

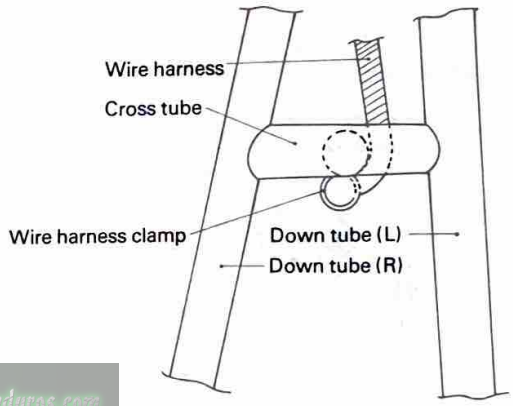


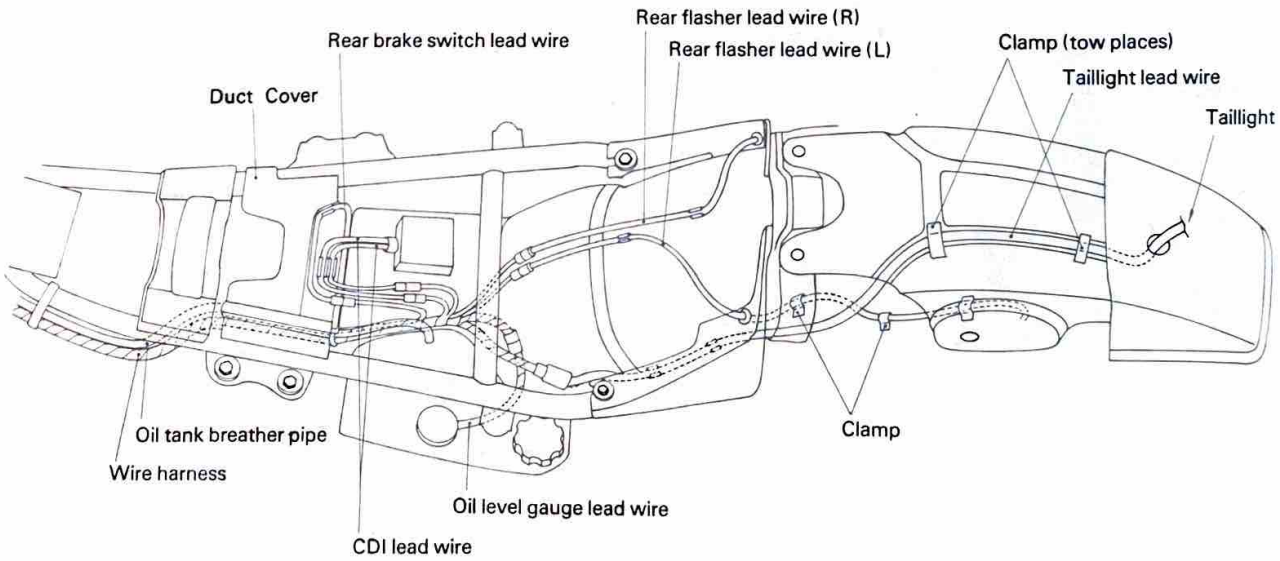




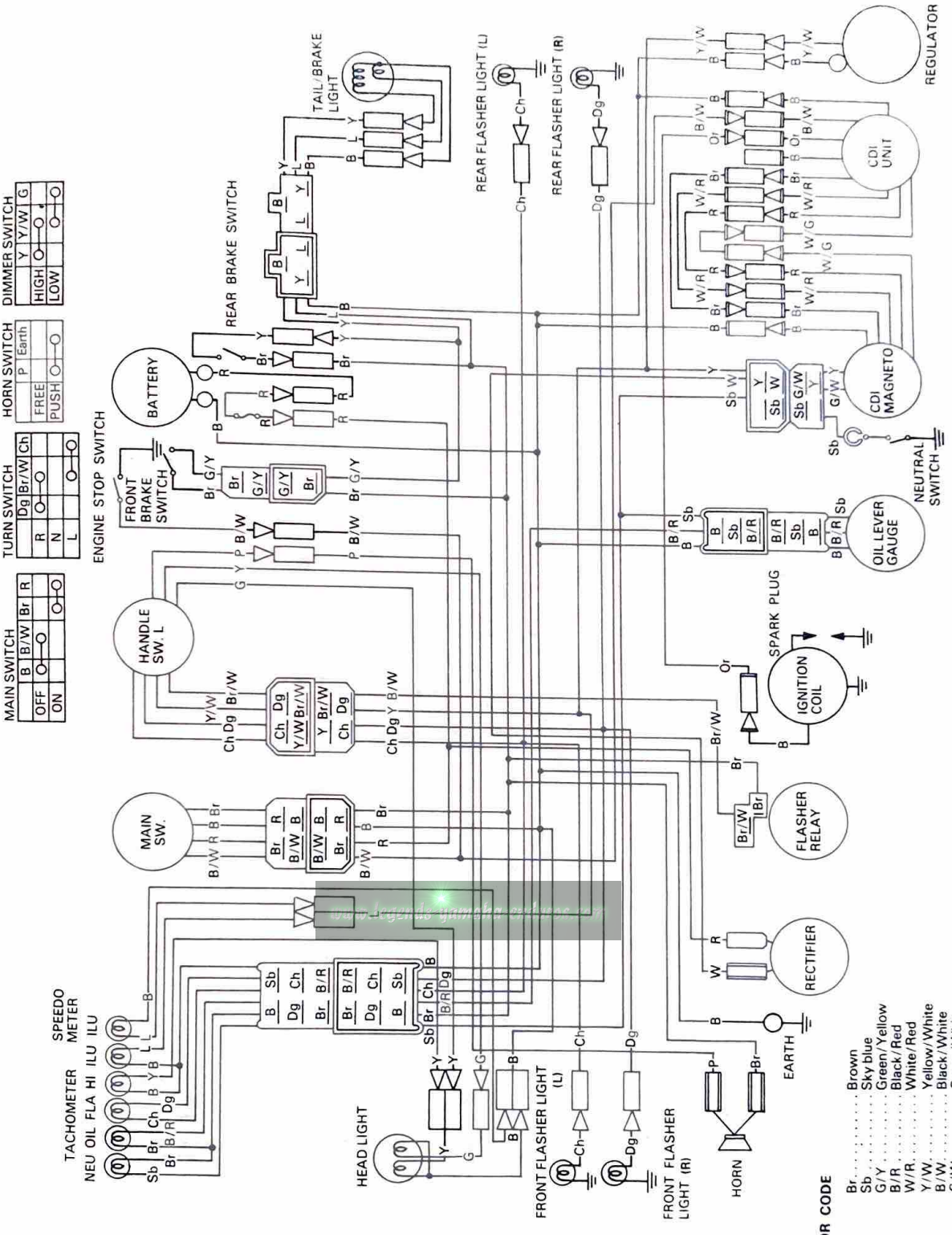








7-5. CIRCUIT DIAGRAM



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