YAMAHA

YZ 80A

Service Manual

462-28197-10

NOTICE

This manual has been written by Yamaha Motor Company for use by Authorized Yamaha Dealers and their qualified mechanics. In light of this purpose it has been assumed that certain basic mechanical precepts and procedures inherent to our product are already known and understood by the reader.
Without such basic knowledge, repairs or service to this model may render the machine unsafe, and for this reason we must advise that all repairs and/or service be performed by an Authorized Yamaha dealer who is in possession of the requisite basic product knowledge.

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The Research, Engineering, and Service Departments of Yamaha are continually striving to further improve all models manufactured by the company. Modifications are therefore inevitable and changes in specifications or procedures will be forwarded to all Authorized Yamaha Dealers and will, where applicable, appear in future editions of this manual.

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YAMAHA
1974 YZ80A
SERVICE MANUAL

1st Edition FEBRUARY 1974

PRINTED IN JAPAN

FOREWORD

This service manual has been written to acquaint the mechanic with the maintenance and troubleshooting procedured required to provide optimum performance and longevity of the unit.

The information enclosed should be closely studied to avoid unnecessary repairs and to provide the owner with a sound, safe, dependable machine.

Service Department
YAMAHA MOTOR COMPANY LTD.

TABLE OF CONTENTS

I. GENERAL

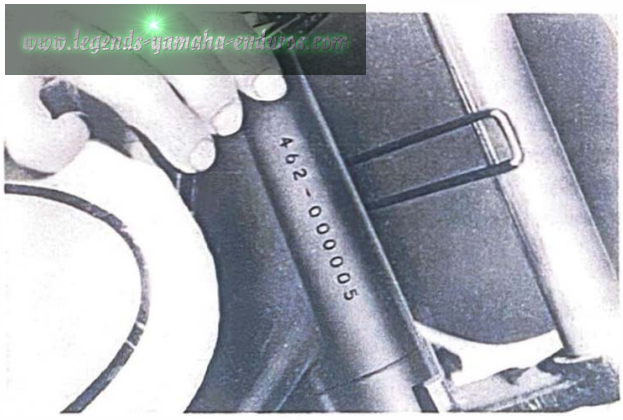
1–1 MACHINE IDENTIFICATION

The frame serial number is located on the right-hand side of the headstock assembly. The first three digits identify the model. This is followed by a dash. The remaining digits identify the production number of the unit. Yamaha production usually begins at . . . 101

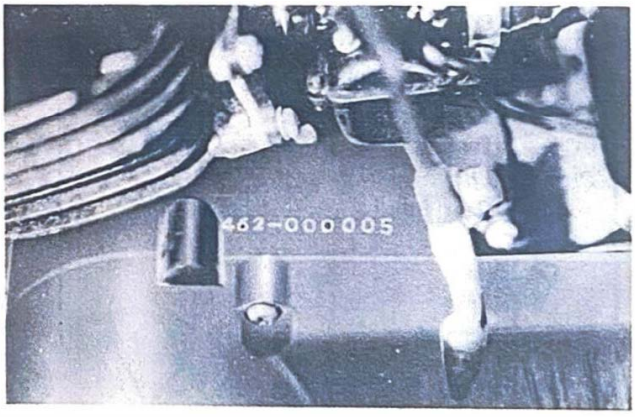
The engine serial number is located on a raised boss on the upper rear, left-hand side of the engine. Engine identification follows the same code as frame identification.

Normally, both serial numbers are identical; however, on occasion they may be two or three numbers off.

STARTING SERIAL NUMBER
462 – 000101



FRAME
SERIAL NUMBER



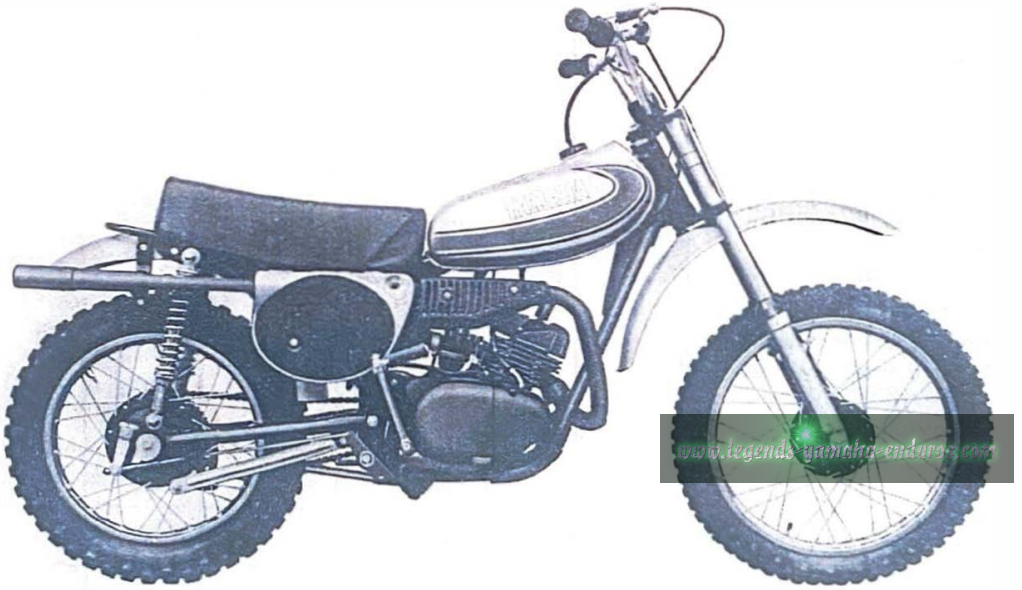
ENGINE
SERIAL NUMBER

1–2 SPECIFICATIONS

A. GENERAL SPECIFICATIONS

Model	YZ80A
Dimensions:	
Overall length	66.9 in. (1,700 mm)
Overall width	30.9 in. (785 mm)
Overall height	36.8 in. (935 mm)
Wheelbase	45.9 in. (1,165 mm)
Ground clearance	6.3 in. (160 mm)
Weight (dry):	135 lbs. (61 kg)
Engine:	
Model	462
Type	Air cooled, 2-stroke, Torque Induction
Cylinders	Single cylinder
Displacement	4.39 cu.in. (72 cc)
Bore and stroke	1.850 x 1.654 in. (47 x 42 mm)
Starting	Kick starter (primary kick)
Ignition	Magneto ignition
Spark plug	NGK B-7HS
Transmission:	
Primary reduction	Gear, reduction ratio 68/19 = (3.579)
Secondary reduction	Chain, reduction ratio 43/14 = (3.071)
Clutch	Wet, multi-disc
Gear box	Constant mesh, 5-speed forward
Gear ratio:	
First	39/12 (3.250)
Second	34/17 (2.000)
Third	30/21 (1.429)
Fourth	27/24 (1.125)
Fifth	25/26 (0.961)
Chassis:	
Frame model	462
Frame	Double-cradle
Suspension (Front)	Telescopic (coil spring oil damper)
Suspension (Rear)	Swing arm (coil spring oil damper)
Steering:	
Caster	61°
Trail	3.4 in. (87 mm)
Tire size	2.75 - 16 - 4PR
Tire size	3.00 - 14 - 4PR
Gasoline tank capacity	1.1 gals. (4.3 liters)
Oil tank capacity	0.3 qts. (0.25 liters)

B. EXTERNAL VIEWS



1–3 MAINTENANCE SPECIFICATIONS

A. MAINTENANCE AND LUBRICATION INTERVALS

This chart should be considered strictly as a guide to general maintenance and lubrication intervals. You must take into consideration that weather, terrain, geographical locations, 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.
Additionally, if the machine is not subjected to constant competition and is used primarily for trail riding, the maintenance intervals can be extended.

B. COMPETITION

MAINTENANCE/LUBRICATION SCHEDULE

ITEM	RACE MEET INTERVAL					
	EVERY MEET	EVERY SECOND	EVERY THIRD	EVERY FOURTH	EVERY SEASON	AS REQUIRED
PISTON						
Inspect	X					
Clean	X					
Replace						X
PISTON RINGS						
Replace	X					
CYLINDER						
Inspect (Compression Check)	X					
Clean	X					
Replace						X
Check head bolt torque	(2)					
CLUTH						
Adjust	X					
Replace (Plates)						X
TRANSMISSION						
Change oil		X				
Inspect gears					X	
Replace bearings					X	
Inspect shift forks					X	
ENGINE MAIN BEARINGS						
Replace					X	
CONNECTING ROD						
Check bearings	X					
Replace big end bearing					X	
Replace small end bearing						X
CARBURETOR						
Check/Adjust/Tighten	X					
Clean & Inspect	X					
PISTON PIN						
Inspect	X					
Replace						X
EXHAUST SYSTEM						
Inspect	X					
FLYWHEEL NUT						
Torque to	X					

ITEM	RACE MEET INTERVAL					
	EVERY MEET	EVERY SECOND	EVERY THIRD	EVERY FOURTH	EVERY SEASON	AS REQUIRED
KICK STARTER						
Inspect idler gear					X	
Replace						X
FRAME						
Clean & Inspect	X					
SWING ARM						
Check	X					
Lubricate						
CONTROLS & CABLES						
Check & Adjust	X					
Lubricate	X		X			
BRAKES						
Clean/Check/Adjust	X					
Replace						X
WHEELS AND TIRES						
Check pressure	X					
Check runout	X					
Check spoke tension	(1)					
Check bearings	X					
Replace bearing						X
STEERING HEAD						
Check	X					
Clean and repack			X			
CDI WIRING						
Check connections	X					
AIR FILTER						
Clean and oil	X					
Replace						X
SPARK PLUG						
Replace	(2)					
DRIVE CHAIN						
Clean & lubricates	(2)					
Check tension and alignment	(2)					
Replace						X
FITTINGS AND FASTENERS						
Tighten	X					
FUEL TANK						
Clean/Flush	X					
Clean petcock filter	X					
SHOCK ABSORBERS						
Drain & refill				X		
FRONT FORKS						
Drain & Refill			X			
Replace seals						X

(1) Check spoke tension after each heat (moto)
(2) Every heat (moto)

C. MAINTENANCE SPECIFICATIONS

ITEM \ MODEL		YZ80A	
ENGINE - Top End			
Cylinder head Volume		9.1 ± 0.2 cc	
Cylinder Taper limit		0.002 in.	(0.05 mm.)
Cylinder Out-of Round Limit		0.0004 in.	(0.01 mm.)
Ring End Gap, FREE APPROX.	Top	0.30 in.	(7.5 mm.)
	2nd	0.16 in.	(4 mm.)
Ring End Gap, INSTALLED	Top	0.006~0.014 in.	(0.15 ~ 0.35 mm.)
	2nd	0.006~0.014 in.	(0.15 ~ 0.35 mm.)
Ring Groove Clearance	Top	0.012~0.0032 in.	(0.03 ~ 0.08 mm.)
	2nd	0.0012~0.0032 in.	(0.03 ~ 0.08 mm.)
Piston Clearance, Nominal		0.0014~0.0016 in.	(0.035 ~ 0.040 mm.)
Piston Maximum Wear Limit		0.004 in.	(0.1 mm.)
ENGINE - Crankshaft			
Small End Play, Nominal		0.032~0.039 in.	(0.8 ~ 1.0 mm.)
Small End Play, Wear Limit		0.079 in.	(2.0 mm.)
Large End Clearance, Nominal		0.016~0.020 in.	(0.4 ~ 0.5 mm.)
Large End Clearance, Wear Limit		0.024 in.	(0.6 mm.)
Runout, Clutch Side		0.0012 in.	(0.03 mm.)
Runout, Ignition Side		0.0012 in.	(0.03 mm.)
Flywheel Width		1.50 $^{-0.0020}_{-0.0039}$ in.	(38 $^{-0.05}_{-0.10}$ mm.)
ENGINE - Clutch			
Friction Plate Thick., Nom.		0.138 in.	(3.5 mm.)
Friction Plate Wear Limit		0.126 in.	(3.2 mm.)
Clutch Plate Warp Allowance		0.002 in.	(0.05 mm.)
Spring Free Length, Nominal		1.24 in.	(31.5 mm.)
Spring Free Length, Wear Limit		1.20 in.	(30.5 mm.)
AUTOLUBE			
Pump Plunger Diameter		0.16 in.	(4.0 mm.)
Pump Overall Drive Ratio		19/28	
Pump Stroke at Idle, Max.		0.014 in.	(0.35 mm.)
Pump Stroke at Idle, Min.		0.012 in.	(0.30 mm.)
Stroke at Full Throttle, Max.		0.070 in.	(1.80 mm.)
Stroke at Full Throttle, Min.		0.065 in.	(1.65 mm.)

ITEM \ MODEL	YZ80A	
IGNITION		
Minimum Spark Gap/rpm	0.24 in/500 r.p.m.	(6 mm./500 r.p.m.)
Ignition Coil Primary Res.	1.02Ω ± 10%/20°C	
Ignition Coil Secondary Res.	6.0KΩ ± 20%/20°C	
Source Coil Resistance	1.34Ω ± 10%/20°C	
Condenser Capacity	0.30 μF	
Ignition Point Gap	0.012~0.016 in.	(0.30 ~ 0.40 mm.)
Spark Plug Manufacturer	NGK	
Spark Plug Type	B-7HS	
Ignition Timing	0.07 ± 0.006 in.	(1.8 ± 0.15 mm.)
CARBURETION		
Manufacturer	TEIKEI	
Model Number	Y16P-3	
I.D. Number	46260	
Venturi Size	16φmm	
Main jet	#86	
Jet Needle/Clip Position	035-2	
Cut Away	1.0	
Pilot Jet	#34	
Air Jet	2.5 mm	
Starter jet	#50	
Air Screw (turns out)	1 1/2	
Float Level	0.905 ± 0.10 in.	(23 ± 25 mm.)
CHASSIS		
Front Wheel		
Tire Manufacturer	INOUE	
Tire Tread Type	KNOBBY	
Tire Size	2.50-16-4PR	
Tire Nominal Pressure	20 lb/in²	(1.4 kgs/cm²)
Brake Shoe Diameter, Nom.	3.7 in.	(95 mm.)
Brake Shoe Wear Limit	3.5 in.	(90 mm.)
Rim Runout Limits, Vertical	0.07 in.	(2 mm.)
Rim Runout Limits, Lateral	0.07 in.	(2 mm.)

ITEM \ MODEL	YZ80A	
Rear wheel		
Tire Manufacturer	INOUE	
Tire Tread Type	KNOBBY	
Tire Size	3.00-14-4PR	
Tire Nominal Pressure	29 lb/in.^{2}	(2.0 kgs/cm^2)
Brake Shoe Diameter, Nom.	4.3 in.	(110 mm.)
Brake Shoe Wear Limit	4.1 in.	(105 mm.)
Rim Runout Limits, Vertical	0.07 in.	(2 mm.)
Rim Runout Limits, Lateral	0.07 in.	(2 mm.)
Front Fork Travel	4.3 in.	(110 mm.)
Front Spring Free Length	16.5 in.	(418.8 mm.)
Rear Cushion Travel	3.0 in.	(75 mm.)
Drive Chain Type/Size	DK420	
Drive Chain Number of Links	100L	
VOLUMES/CAPACITIES/GRADES		
Fork Capacity (each Leg)	105～110 c.c.	
Oil Grade	SAE10W/30	
Gasoline Tank Capacity	4.3 ℓ.	
Fuel Grade (min. octane)	90 +.	
Oil Tank Capacity	0.25 ℓ.	
Lubricant Grade	SAE10W/30	
Transmission Capacity	500～550 c.c.	
Lubricant Grade	Motor oil SAE10W/30 Type SE	

2. ENGINE MAINTENANCE

2–1 CYLINDER HEAD

A. Removal

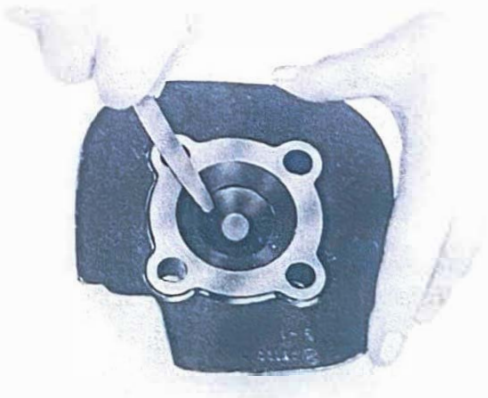
Remove bolts securing cylinder head to cylinder. Remove cylinder head and gasket.

NOTE:
Break each bolt loose (1/4 turn) prior to removing any one bolt.

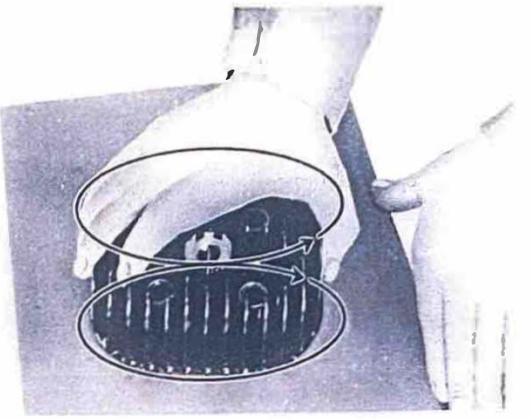
Head combustion chamber volume	9.1 ± 0.2 cc

B. Maintenance - Cylinder Head

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



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



4. Clean Spark plug gasket mating surface thoroughly.

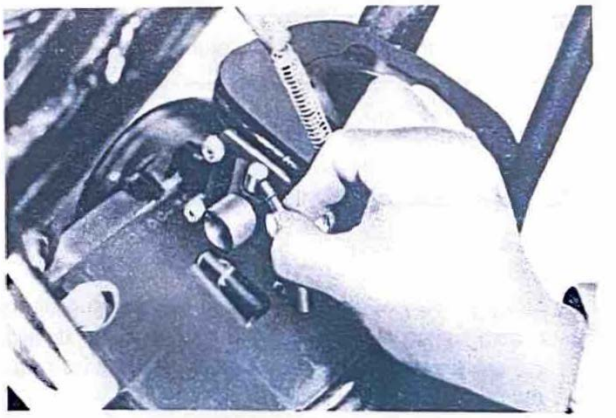
5. Wash head in solvent and wipe dry.

6. Install new cylinder head gasket during reassembly.

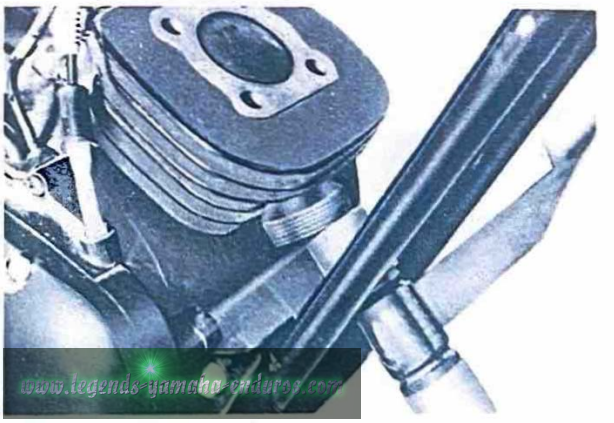
Cylinder head bolt torque (Engine cold)	85 in-lbs (1.0 m-kgs)

A. Removing Cylinder

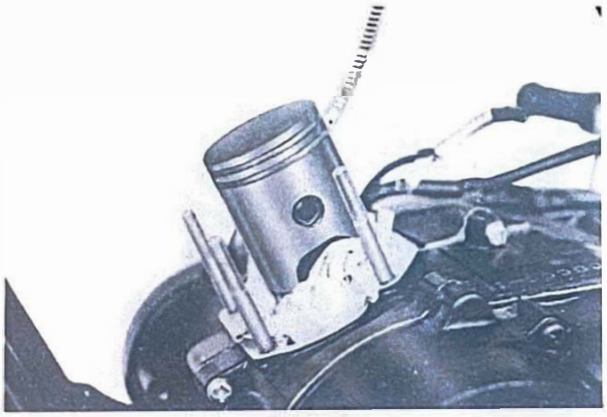
1. Remove banjo bolt securing oil pump delivery line to carburetor joint.



2. If necessary, loosen the cylinder by striking it lightly with a rubber or rawhide hammer.

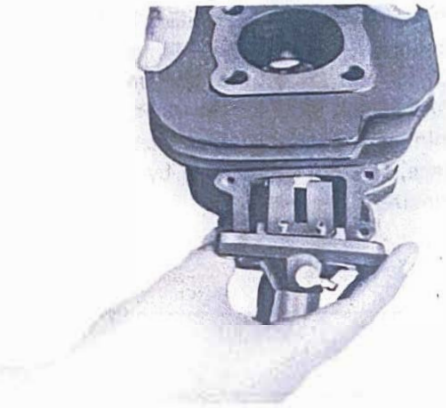


3. With piston at Top Dead Center, raise cylinder until cylinder skirts clear crankcase. Stuff a clean shop rag into crankcase cavity, around rod, to prevent dirt and other foreign particles from entering. Remove cylinder.

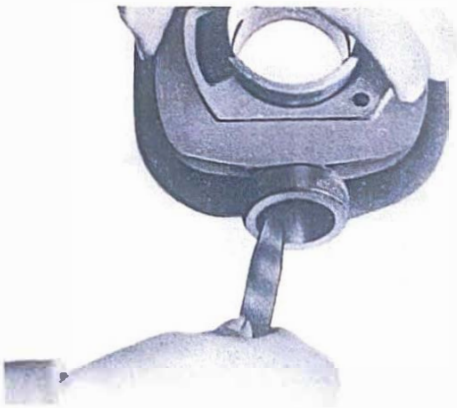


B. Maintenance - Cylinder

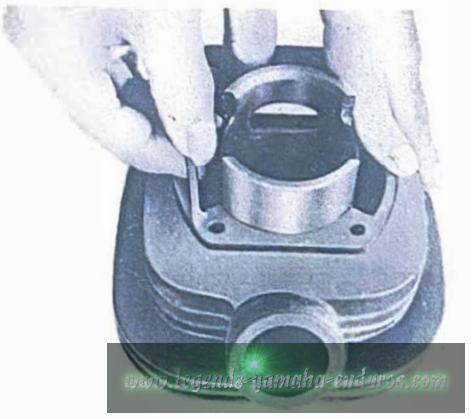
1. Remove reed valve assembly.



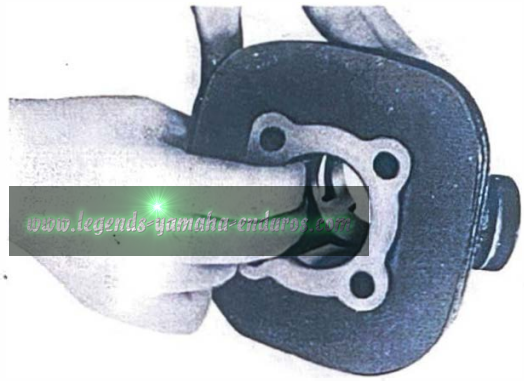
2. Using a rounded scraper, remove carbon deposits from exhaust port.



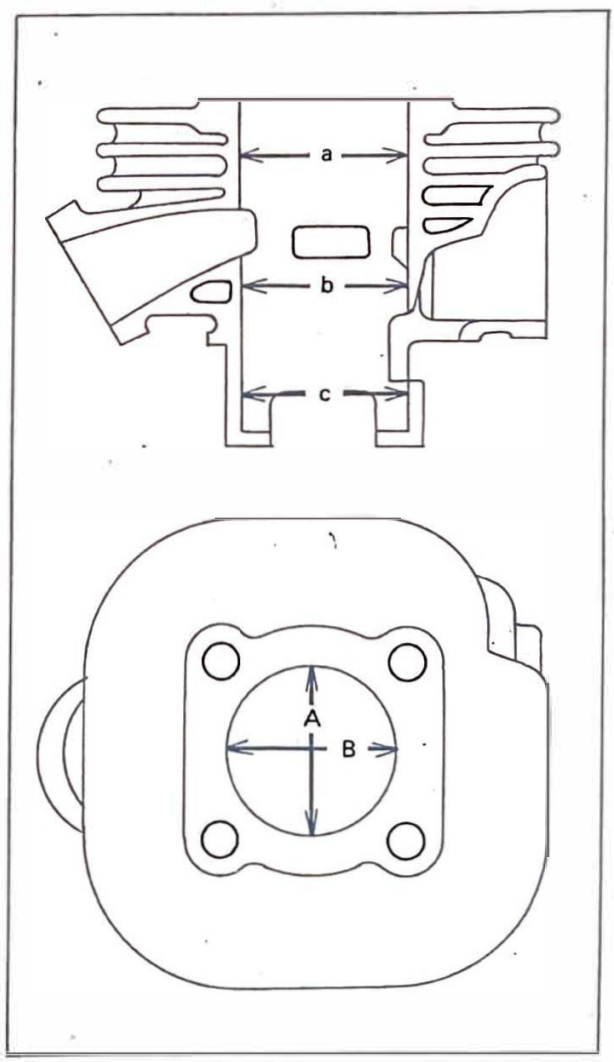
3. Remove cylinder base gasket and clean gasket seat on cylinder and crankcase thoroughly.



4. Check cylinder bore. Using a cylinder hone or a wet sandpaper, remove any scoring. Hone lightly, using smooth stones or 400—600 grit wet sandpapers. Hone no more than required to avoid excess piston clearance.



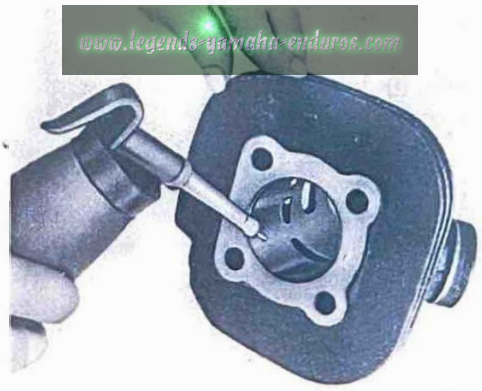
5. Using a cylinder gauge set to standard bore size, measure the cylinder. Measure at six points; at top, center, and 10 mm (½ ") from bottom of skirts, in line with the piston pin and at right angle to pin. Compare minimum and maximum measurements. If over tolerance, and not correctable by honing, rebore to next over-size.



Maximum allowable taper	0.002 in. (0.05 mm.)

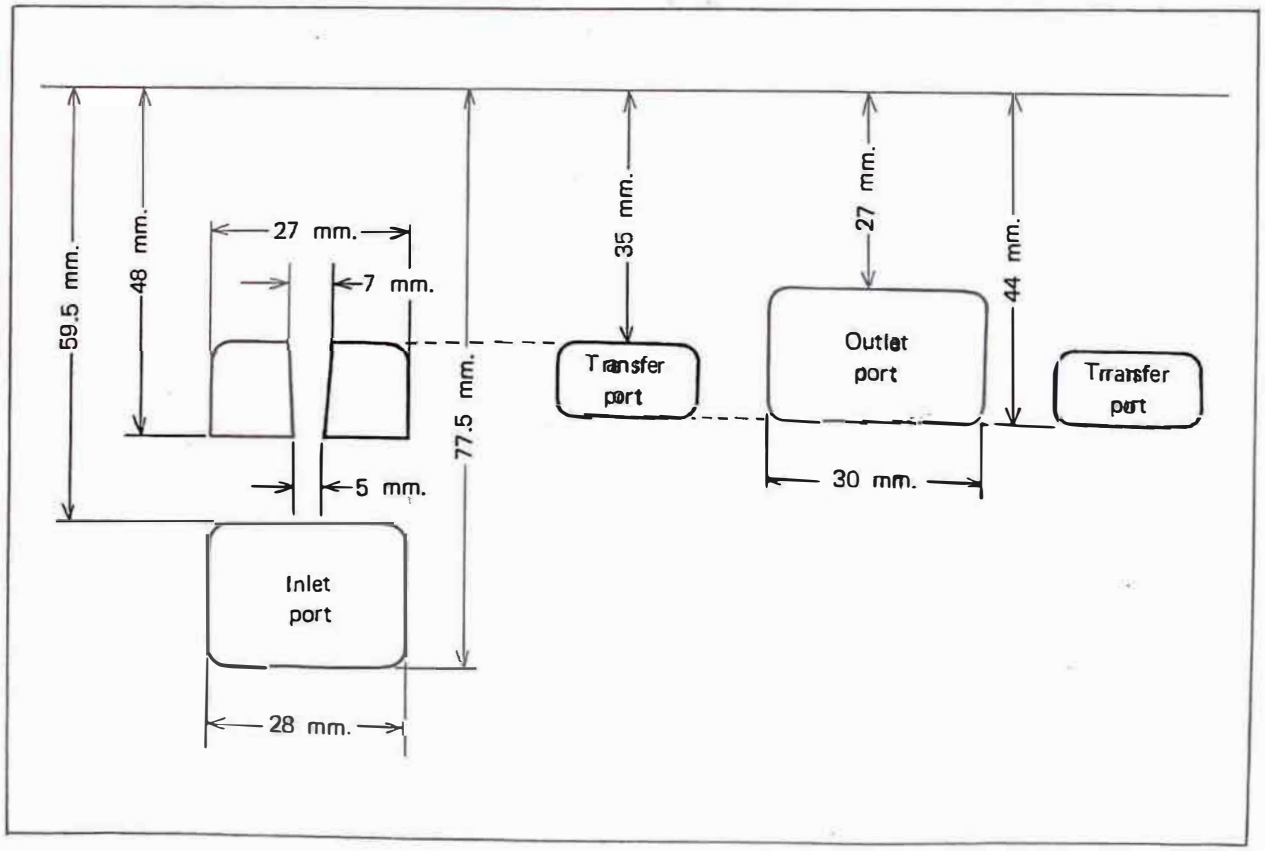
Maximum allowable out-of-round	0.0004 in. (0.01 mm.)

6. Wash cylinder thoroughly with soap and water. Dry. Coat walls with light oil film immediately.



7. During re-assembly, always use a new cylinder base gasket.

C. Port Timing Diagrams

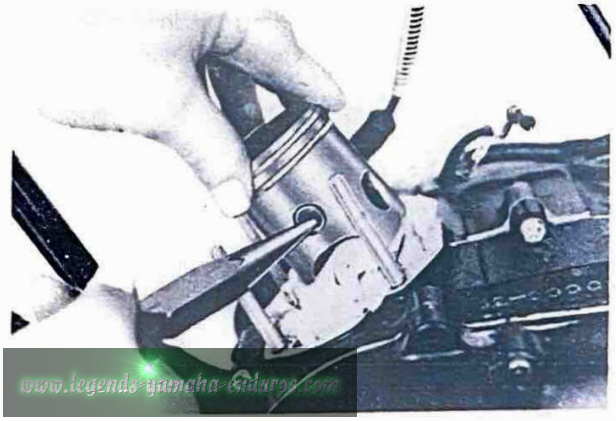


2–2 PISTON PIN

A. Piston Pin Removal

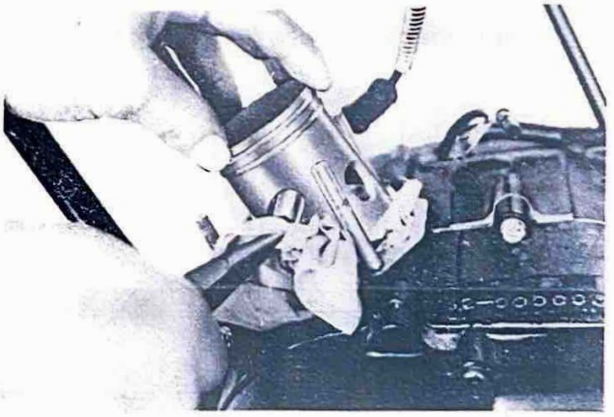
1. Remove piston pin clip (1) from piston.

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



2. Push piston pin from opposite side, then pull out. Protect pin with reg as shown in illustration.

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

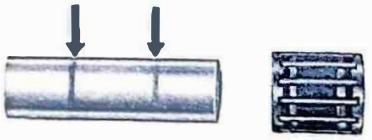


B. Maintenance - Piston Pin and Bearing

1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.

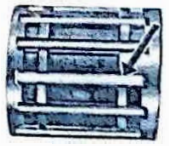
2. Check the pin and bearing for signs fo heat discoloration. If excessive (heavily blued), replace both.

NOTE:
Shiny spots on pin from race wear are normal, replace pin and bearing only if wear is excessive (in dentation on pin, etc.).

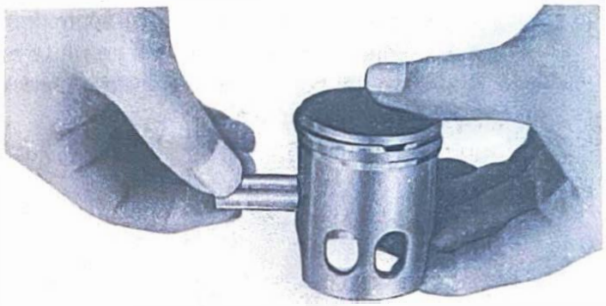


3. Check the bearing cage for excessive wear. Check the rollers for signs of flat spots. If found, replace pin and bearing.

4. Apply a 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 diameter and wear. Replace pin and bearing or all as required.



5. The piston pin should fit snugly in its bore so that it drags a little as you turn it. If the piston is loose replace the pin and/or piston.



2–3 · PISTON RINGS

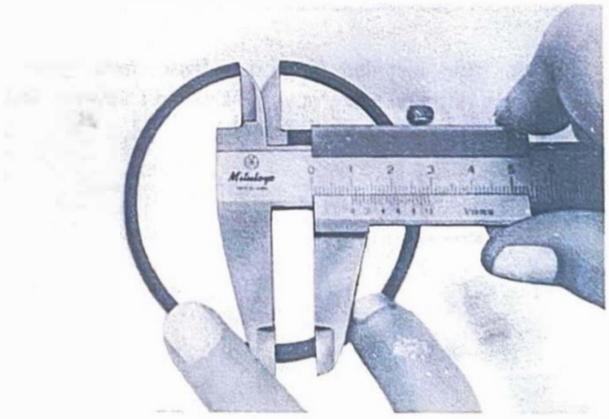
A. Removal

Put your thumb at each end of the piston ring and pull the piston ring ends apart. Remove the ring by moving the ring off the piston at the side opposite the ring ends.

B. Maintenance - Piston Rings

1. Check rings for scoring. If any severe scratches are noticed, replace set.

2. Measure ring end gap in free position. If beyond tolerance, replace set.



Top ring end gap, free	Approx.	0.30 in. (7.5 mm.)
2nd ring end gap, free	Approx.	0.16 in. (4 mm.)

3. Insert ring into cylinder. Push down approximately ¾" (20 mm.) into cylinder using piston crown to maintain right-angle to bore. Measure installed end gap. If beyond tolerance, replace set.

Top ring end gap, installed	0.006 ~ 0.014 in. (0.15 ~ 0.35 mm.)
2nd ring end gap, installed	0.006 ~ 0.014 in. (0.15 ~ 0.35 mm.)

4. Holding cylinder towards light, check for full seating of ring around bore. If not fully seated, check cylinder. If cylinder not out-of-round, replace ring.

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

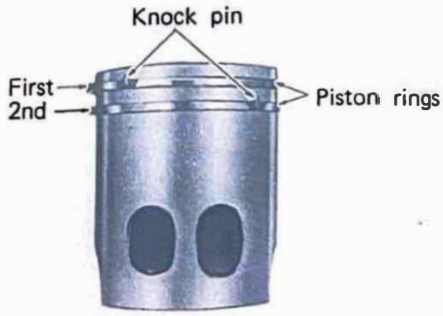
6. With ring installed in groove, insert feeler gauge between ring side and groove. If beyond tolerance, replace ring and/or piston as required.

Top ring groove, clearance	0.0012 ~ 0.0032 in. (0.03 ~ 0.08 mm.)
2nd ring groove, clearance	0.0012 ~ 0.0032 in. (0.03 ~ 0.08 mm.)

C. Installing the Piston Ring

1. During installation, make sure ring ends are properly positioned on either side of locating pin in ring groove. Make sure ring expander is positioned in like manner. Apply liberal coating of two-stroke oil to ring.

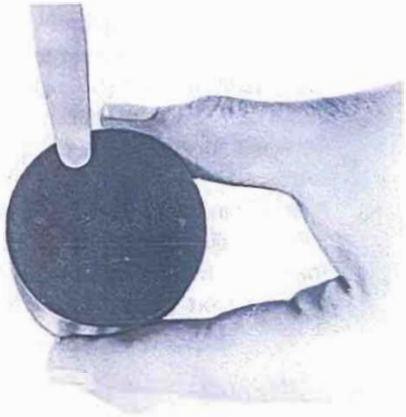
2. New rings require break-in. Follow new machine break-in procedure.



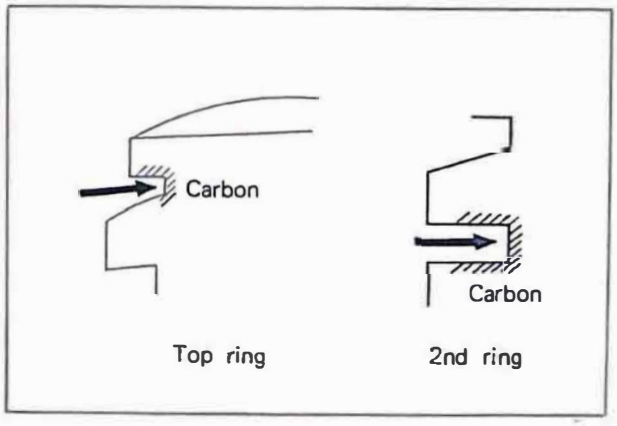
2–4 PISTON

A. Maintenance - Piston

1. Using a rounded scraper, remove carbon deposits from piston crown.

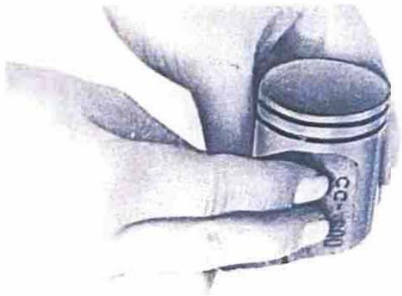


2. Break a used piston ring in two. File end square. De-burr edges to avoid scratching ring groove and clean carbon deposits from ring grooves.

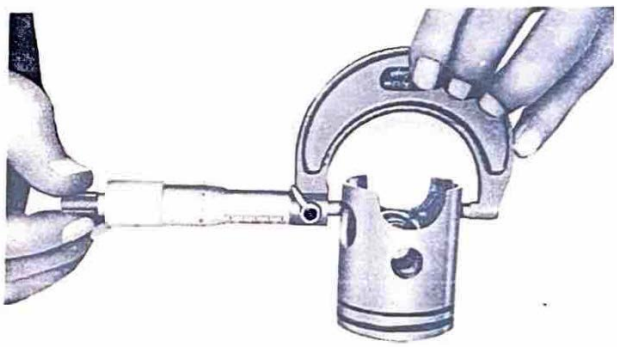


3. Using 400-600 grit wet sandpaper, lightly sand score marks and lacquer deposits from sides of piston. Sand in cross-hatch pattern. Do not sand excessively.

4. Wash piston in solvent and wipe dry.



5. Using an outside micrometer, measure piston diameter. The piston is cam-ground and tapered. The only measuring point is at right-angles to the piston pin holes about ½" (10 mm.) from bottom of piston.
Compare piston diameter to cylinder bore measurements.
Piston maximum diameter subtracted from minimum cylinder diameter gives piston clearance. If beyond tolerance, hone cylinder and refit new piston, or rebore to next over-size and fit new piston.

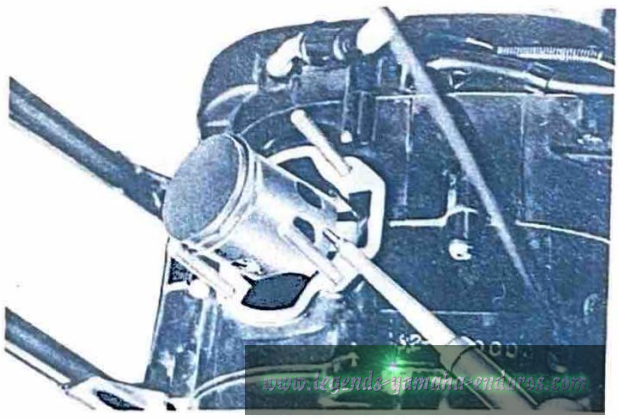


Piston clearance	0.0014 ~ 0.0016 in. (0.035 ~ 0.040 mm.)
Maximum wear limit	0.004 in. (0.1 mm.)

B. Installation - Piston

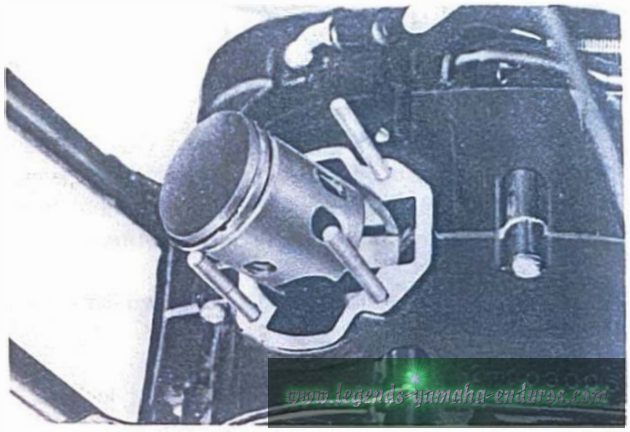
1. During re-assembly, coat the piston skirt areas liberally with two-stroke oil.

2. Install new piston pin circlips and make sure they are fully seated within their grooves.



3. 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.

4. Make sure the ring is properly positioned as the cylinder is installed.



2–5 CLUTCH

A. Adjustment

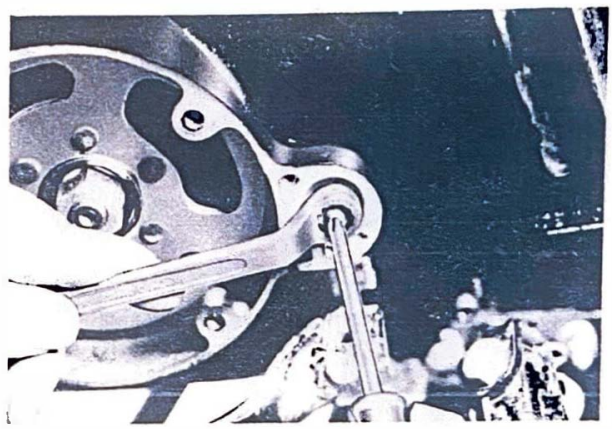
The clutch push lever is so designed that it is positioned behind the push lever axle before it is operated and ahead after it is operated. Therefore, if the clutch push lever does not move as specified, adjustment is necessary.

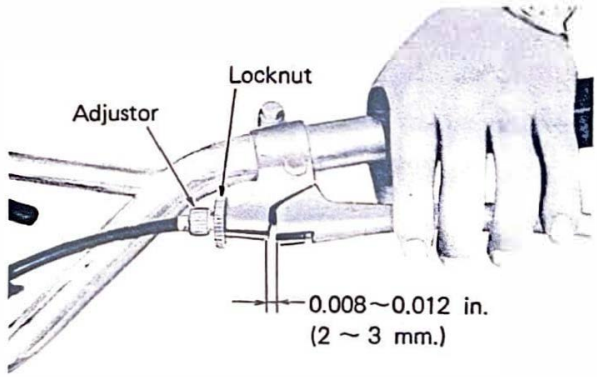
Proper clutch adjustment requires two separate procedures.

1. Loosen cable length adjusting screw locknut.
2. Turn clutch cabel adjustor (at lever) all the way into the lever.

NOTE:
The above procedure provides for maximum cable freeplay to allow for proper clutch actuating mechanism adjustment.

3. Remove generator
4. Loosen adjustor locknut. Using a Phillips screwdriver, in until it lightly seats against the push rod.
   Next, back the screw off ¼ turn to get the proper spacing.
5. Tighten locknut.
6. At clutch lever assembly, left handlebar, turn cable length adjustor in or out until freeplay at lever pivot equals 0.008 ~ 0.012 in (2 ~ 3 mm).
7. Tighten adjusting bolt locknut.
8. Re-install generator cover.

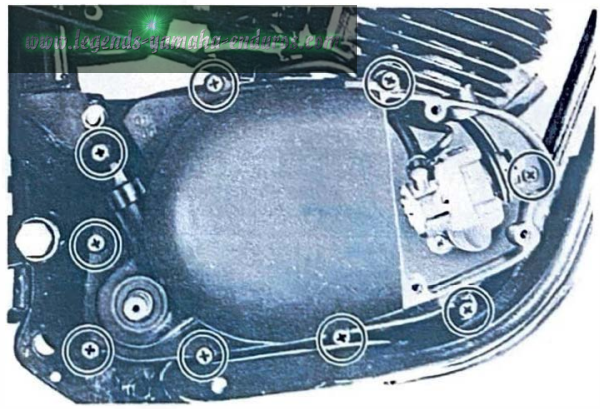




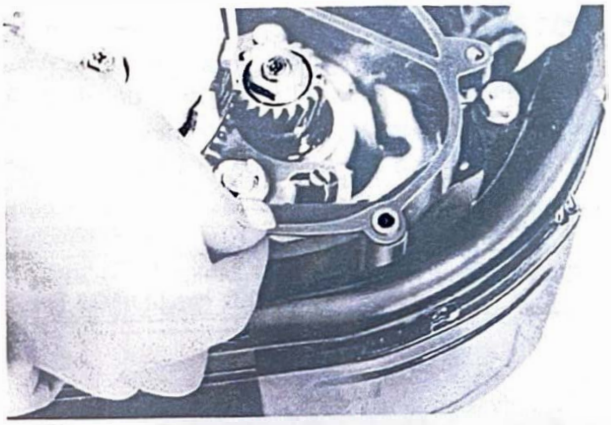
Removal

1. Remove screws securing right crankcase cover.
2. Remove crankcase cover.
   The cover can be removed with oil pump attached.

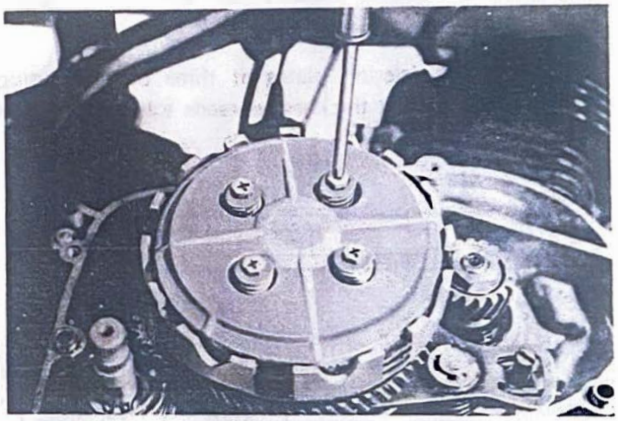
NOTE:
If cylinder in place, remove banjo bolt securing oil delivery line.



3. Remove crankcase cover gasket.
   Replace during re-assembly.



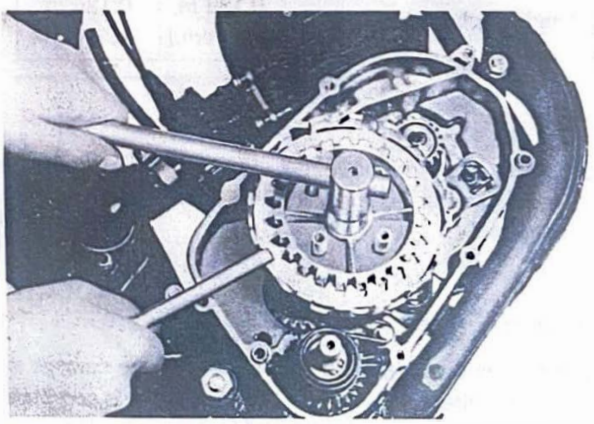
4. Remove clutch spring holding screws pressure plate, and push rod.



5. Install clutch holding tool on clutch boss.

6. Remove lock nut, washer, and clutch boss in that order.

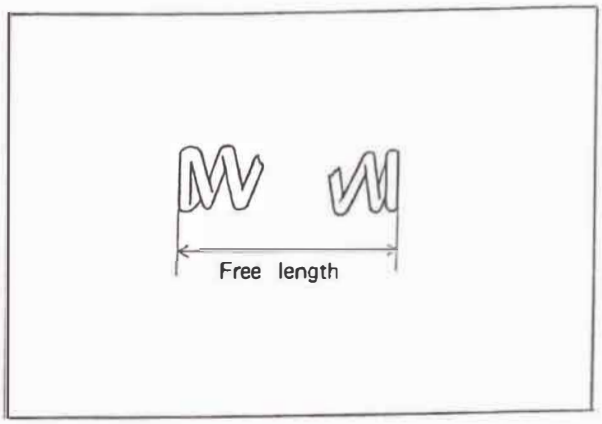
7. If the clutch housing spacer remains on the transmission main shaft remove it.
   Remove the thrust plate and thrust plate spacers.



C. Clutch Springs

Measure each clutch spring. If beyond tolerance, replace.

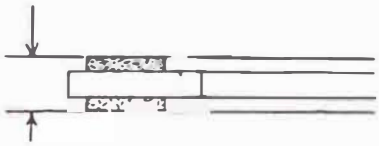
NOTE:
For optimum clutch operation it is advisable to replace the clutch springs as a set if one or more are faulty.

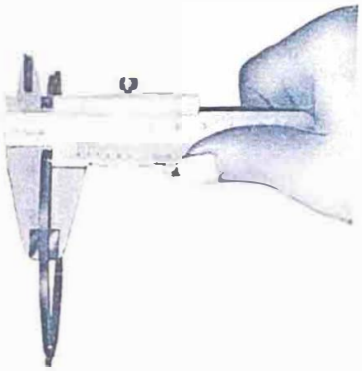


	New	Minimum
Clutch spring free length	1.24 in. (31.5 mm.)	1.20 in. (30.5 mm.)

D. Clutch Friction Plates

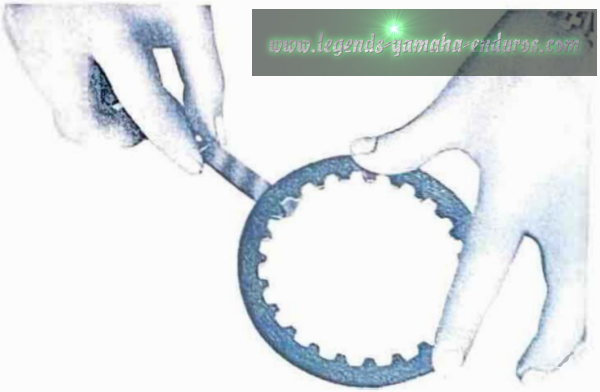
1. Measure the friction plates at three or four points. If their minimum thickness exceeds tolerance, replace.





	New	Wear limit
Friction plate thickness	0.138 in. (3.5 mm.)	0.126 in. (3.2 mm.)

2. Check the friction plates for signs of warpage and heat damage (glazing, discoloration, etc.) replace as required.



E. Clutch Plates

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

Clutch plate warp allowance	0.02 In. (0.05 mm.)

NOTE:

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

F. Installation

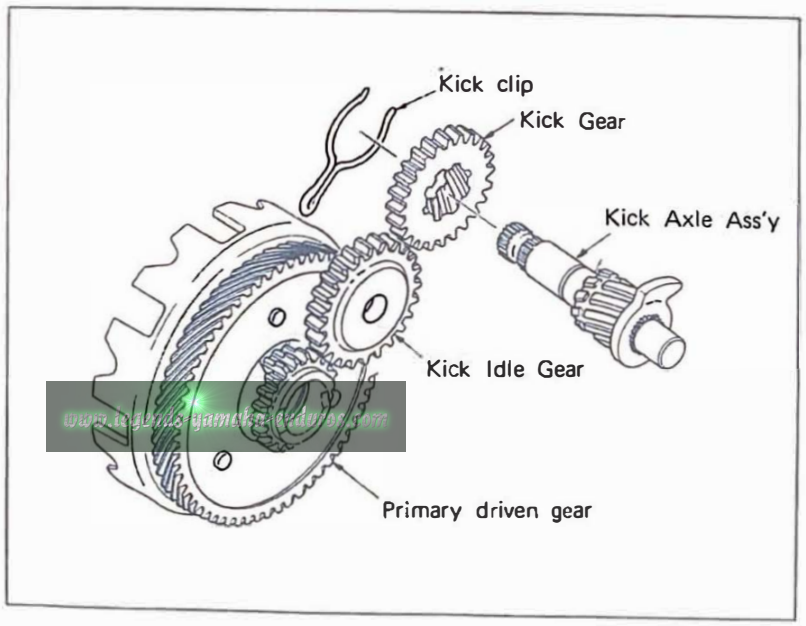
During installation of the clutch assembly, take care that the thickest clutch plate is installed on the clutch boss first.

Take care that the thrust plates and thrust bearings do not slip out of position as the housing and clutch boss are installed. Install all parts with a heavy coat of 10W-30 motor oil on their mating surfaces.

Clutch securing nut torque	350 ~ 390 in-lbs. (4.0 ~ 4.5 m-kgs.)

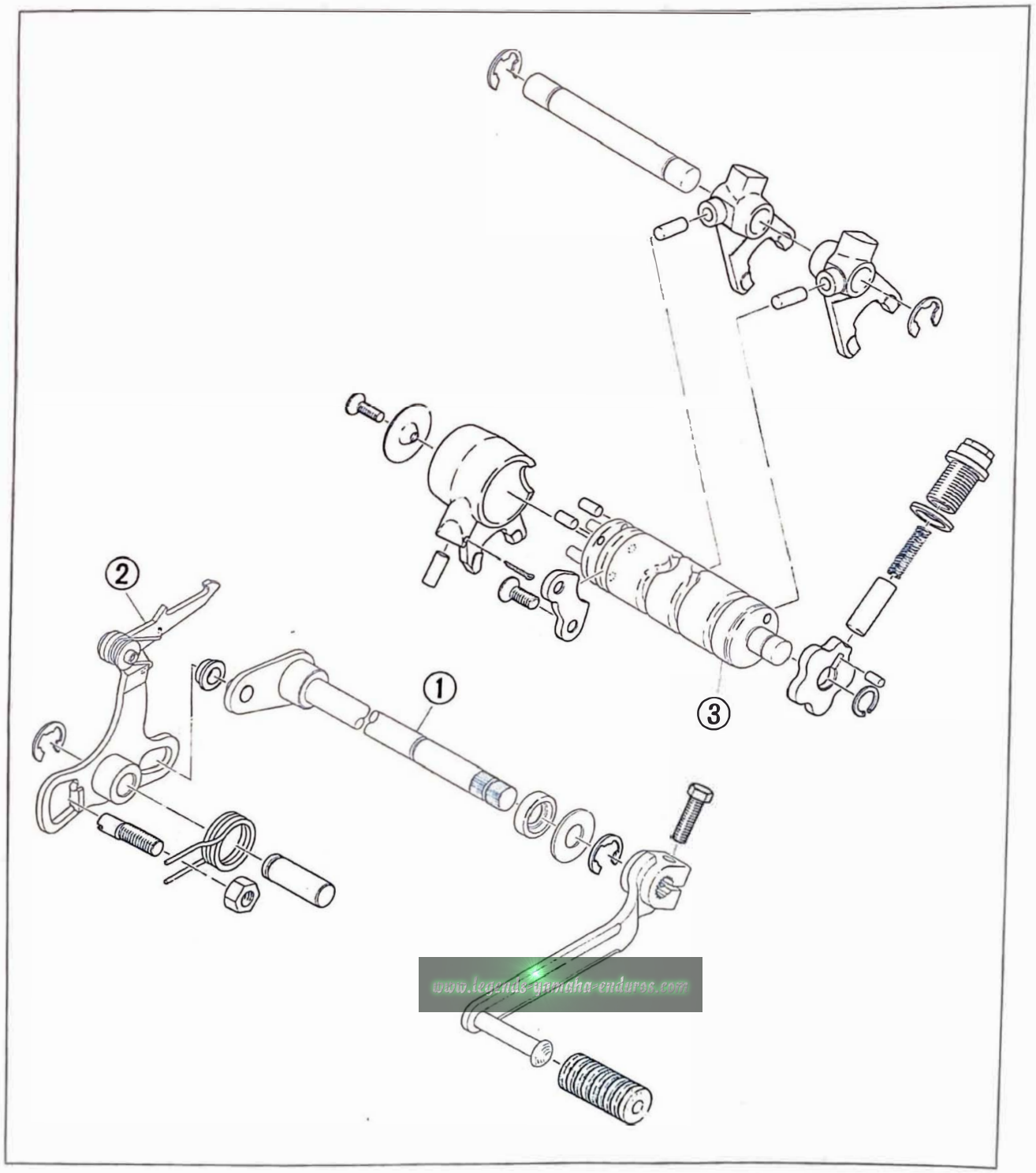
2–6 KICK STARTER MECHANISMS

The primary coupled kick-starter system is employed with a "non-constant-mesh" mechanism instead of the constant mesh kick gear type, such as the ratchet and roller-lock systems.
That is, the kick gear meshes with the idler gear only when the kick starter pedal is kicked. After the engine started, the kick gear and the idler gear disengage.



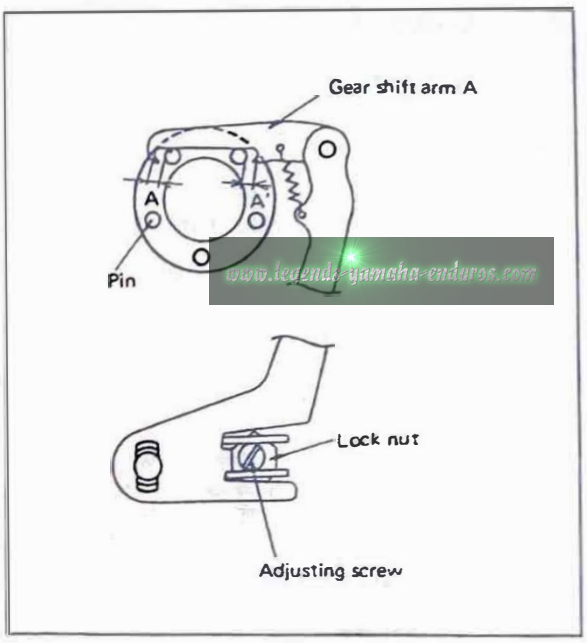
A. Description

As the change pedal is raised or depressed, change shaft (1). The arm (2) on change shaft (1) pushes or pulls on one of the gear shift pins attached to the gear shift drum (3). A total to five gear shift pins are attached to the drum, and therefore, each time the change pedal is depressed the drum rotates 1/5 of a revolution. As the drum turns, the shift forks slide back and forth in the slotted guides. Movement of the shift forks result in shifting transmission gears to the desired position.



B. Adjustment

Adjusting or correcting the travel of the gear shift arm to prevent improper shifting progression (excess feed or insufficient feed of the gear shift arm) is accomplished by turning the gear shift return spring stop screw (eccentric bolt) in or out. Adjust the adjusting screw until distance A and A' are equal. Adjust in 2nd, 3rd, or 4th gear.



2–7 CRANKSHAFT

A. Removal and Installation

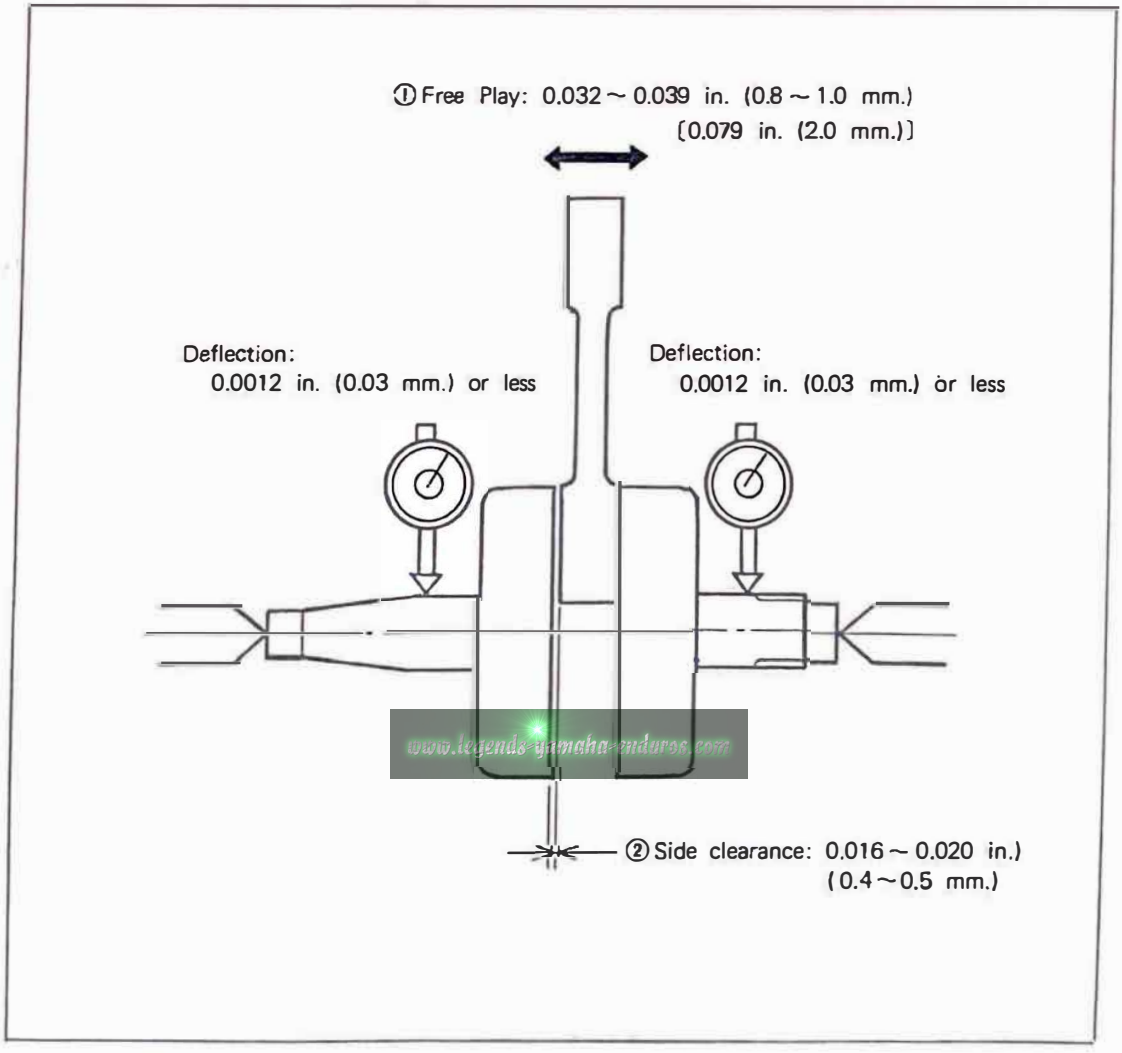
Refer to engine overhaul chapter of GT1/GTMX Service Manual for detailed procedures for removal and installation of crankshaft assembly.

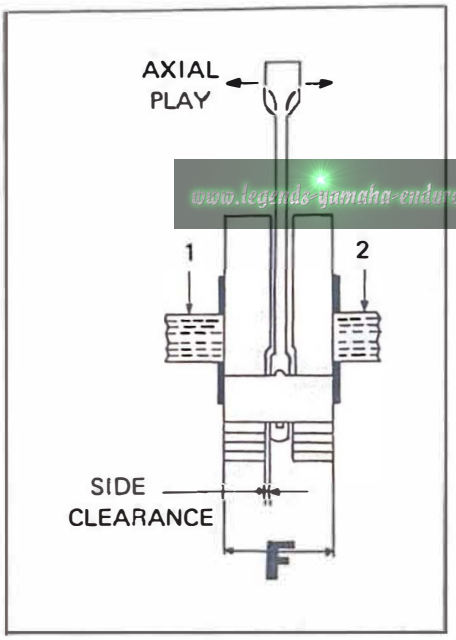
B. Checking the Crankshaft Components

1. Check connecting rod axial play at small end (to determine the amount of wear of crank pin and bearing at large end).
   Small end deflection ① should not exceed 0.079 in. (2 mm). If measured more than 2 mm., disassemble the crankshaft, and check connecting rod, crank pin and bearing. Replace as required. After reassembly, small end deflection ① should be within 0.032 ~ 0.039 In. (0.8 ~ 1.0 mm).

2. Check connecting rod for axial play at large end. Move connecting rod to one side and insert a feeler gauge. Large end axial play ② should be within 0.016 ~ 0.020 in. (0.4 ~ 0.5 mm).
   If excessive axial play ② is present, disassemble the crankshaft and replace worn parts.

3. Check crankshaft for accuracy of assembling. (Check crankshaft for alignment.)
   Dial gauge readings at indicated positions should be 0.0012 in. (0.03 mm.) or less. Correct by tapping the flywheel with a brass hammer or by using a wedge.





CRANKSHAFT SPECIFICATIONS						
DEFLECTION TOLERANCE		FLYWHEEL WIDTH	ROD CLEARANCE			
			AXIAL PLAY		SIDE	
1	2	F	New	Max	Min	Max
0.0012 in. (0.03 mm.)	0.0012 in. (0.03 mm.)	1.50 in. (38 mm.)	0.032~0.029 in. (0.8 ~ 1.0 mm.)	0.079 in. (2.0 mm.)	0.016 in. (0.4 mm.)	0.020 in. (0.5 mm.)

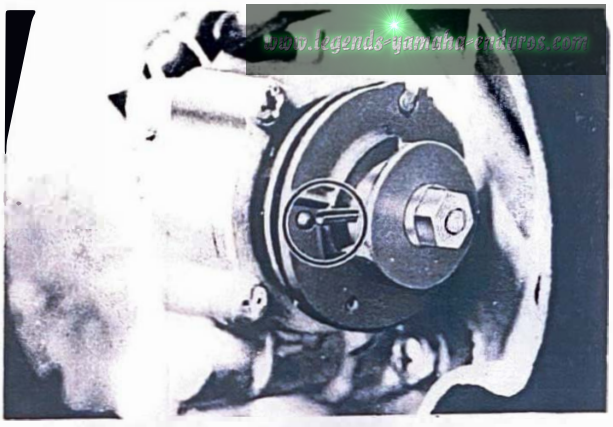
2–8 ENGINE – AUTOLUBE

A. Cable Adjustment

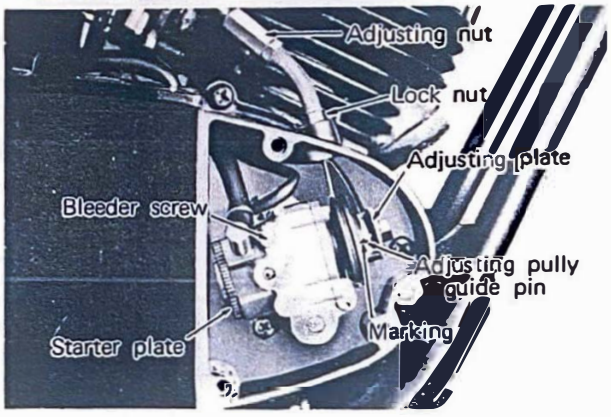
1. Remove Autolube pump cover, which is located on forward portion of the right-hand crankcase cover.

2. Rotate throttle until all slack is removed from all cables. Hold this position.

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



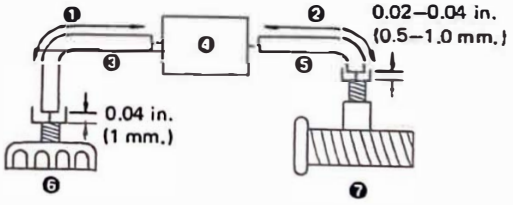
4. If the mark and pin are not in alignment, loosen cable length adjustor lock nut on upper edge of crankcase cover and adjust cable length until alignment is achieved. Tighten adjustor locknut.
   Next, rotate throttle grip to full open position. Check pin. Pin should not strike boss on pump pulley at full throttle or idle. Adjust cable elngth as required to correct.



NOTE:
Before adjusting Autolube cable, always set throttle cable freeplay first.

Throttle Cable Adjustment

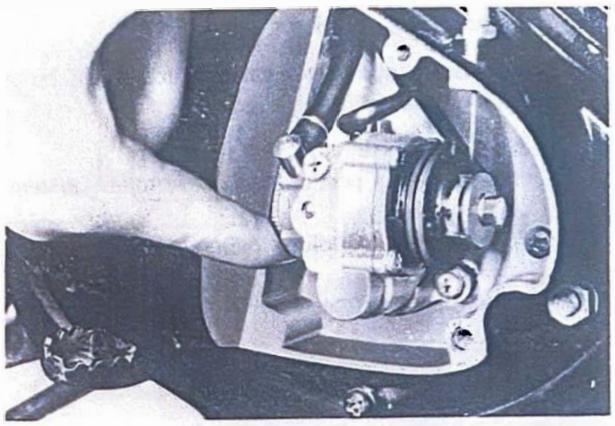
a. Make cable slack adjustment at cable adjustor near throttle grip. Loosen locknut and turn adjustor until there is 0.02 - 0.04 in. (0.5 - 1.0 mm.) slack between throttle cable housing and cable adjustor. Retighten locknut.
b. Loosen cable adjustor locknut (at top of carburetor) and turn cable adjustor until there is 0.04 in. (1.0 mm.) slack in cable "B". Retighten locknut.



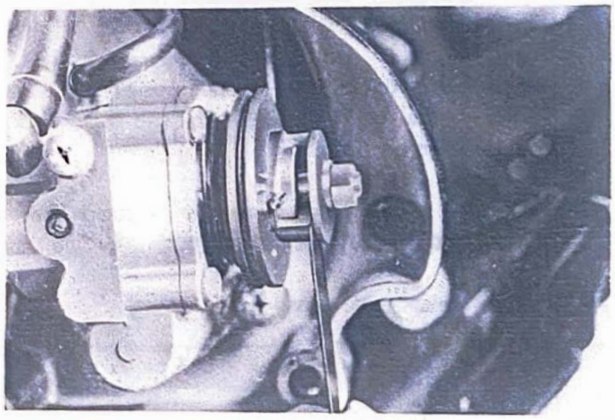
1. Slide
2. Slide
3. Cable "B"
4. Junction Block
5. Cable "A"
6. Carburetor Cap
7. Throttle Grip

B. Pump Stroke Adjustment

1. With throttle closed, rotate plastic bleed wheel until the pump plunger moves fully out and away from the pump body to its outermost limit.



2. Measure gap between raised boss on pump calbe pulley and pump stopper plate. If clearance is incorrect, remove adjust plate locknut and adjust plate.

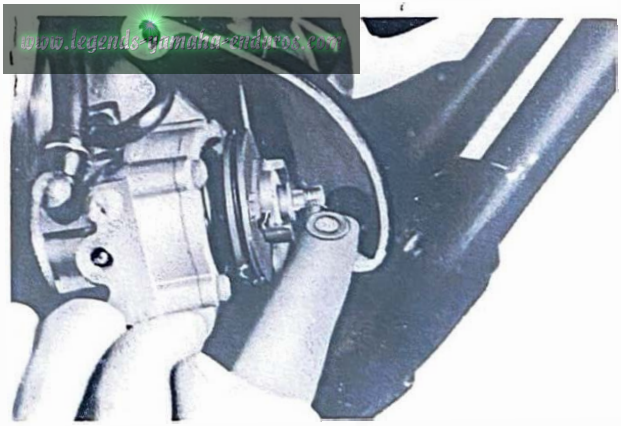


Minimum Pump Stroke:	0.012 ~ 0.014 in. (0.30 ~ 0.35 mm.)
Maximum Pump Storke: *	0.065 ~ 0.070 in. (1.65 ~ 1.80 mm.)

* Pump stroke at full throttle

3. Remove or add an adjustment shim as required.

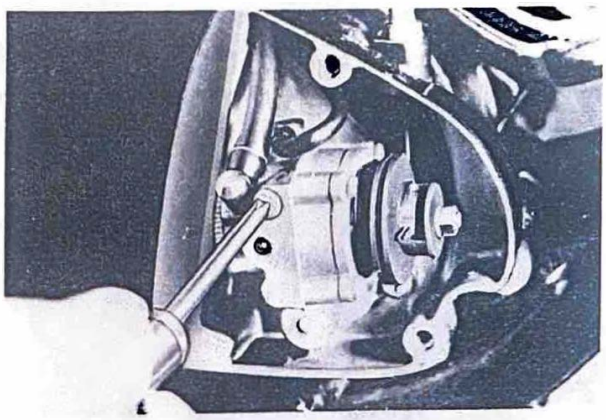
4. Reinstall adjust plate and locknut. Tighten the lock nut. Re-measure gap. Repeat procedure as required.



C. Bleeding the Pump

1. The Autolube pump and delivery lines must be bled on any of the following occasions:
   a. A new machine out of the crate.
   b. Whenever any portion of the Autolube system is disconnected.
   c. Whenever the Autolube reservoir tank has run dry.

2. Remove the pump cover.

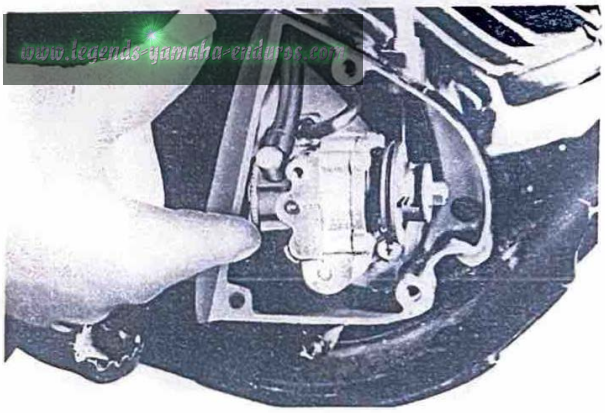


3. Remove the pump bleed screw.

4. Turn the throttle to the full open position, and allow 3 to 5 minuts to fill pump with oil and begin to drain from bleed screw hold.

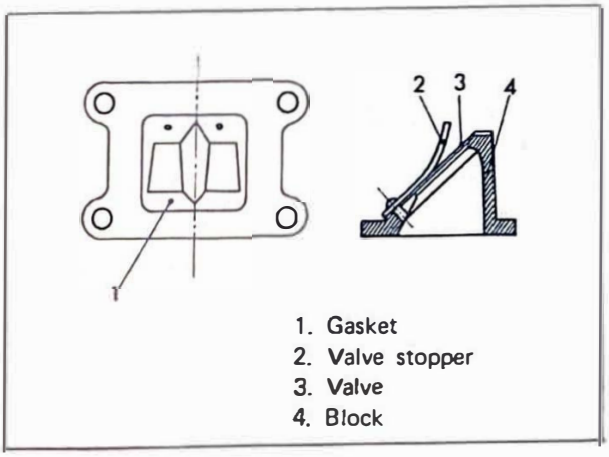
5. Rotate the plastic bleed wheel until a steady flow of oil, with no air bubbles, comes out.

6. Re-install bleed screw and pump cover.



2–9 REED VALVE

The reed valve quickly responses to variation in the crankcase pressure and the inertia force of the mixture streaming into the crankcase. Special care should be taken in handling it.



1. Gasket
2. Valve stopper
3. Valve
4. Block

A. Valve

Check the valve, and if cracked or broken, replace. Check the reed valve bending.

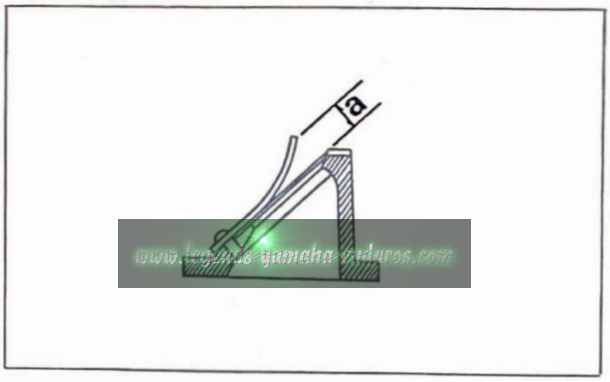
Bending limit:	0.012 in. (0.3 mm.)	or less

B. Valve Stopper

The valve stopper controls the movement of the valve. Check clearance "a".

Standard value: "a"	0.28 ± 0.008 in. (7 ± 0.2 mm.)

If clearance "a" is larger than specified, the valve can break. If smaller, valve performance can be impaired.



C. Set-Screw

Check the valve and valve stopper set-screw. If any one of the set screws is tightened too much, the valve or the valve stopper may be deformed.

Tightening torque:	6.95 in-lbs (8.0 cm-kg.)

D. Gasket

Check to see whether or not the gasket flakes off the block. If it flakes off, valve performance will be impaired.

E. Maintenance

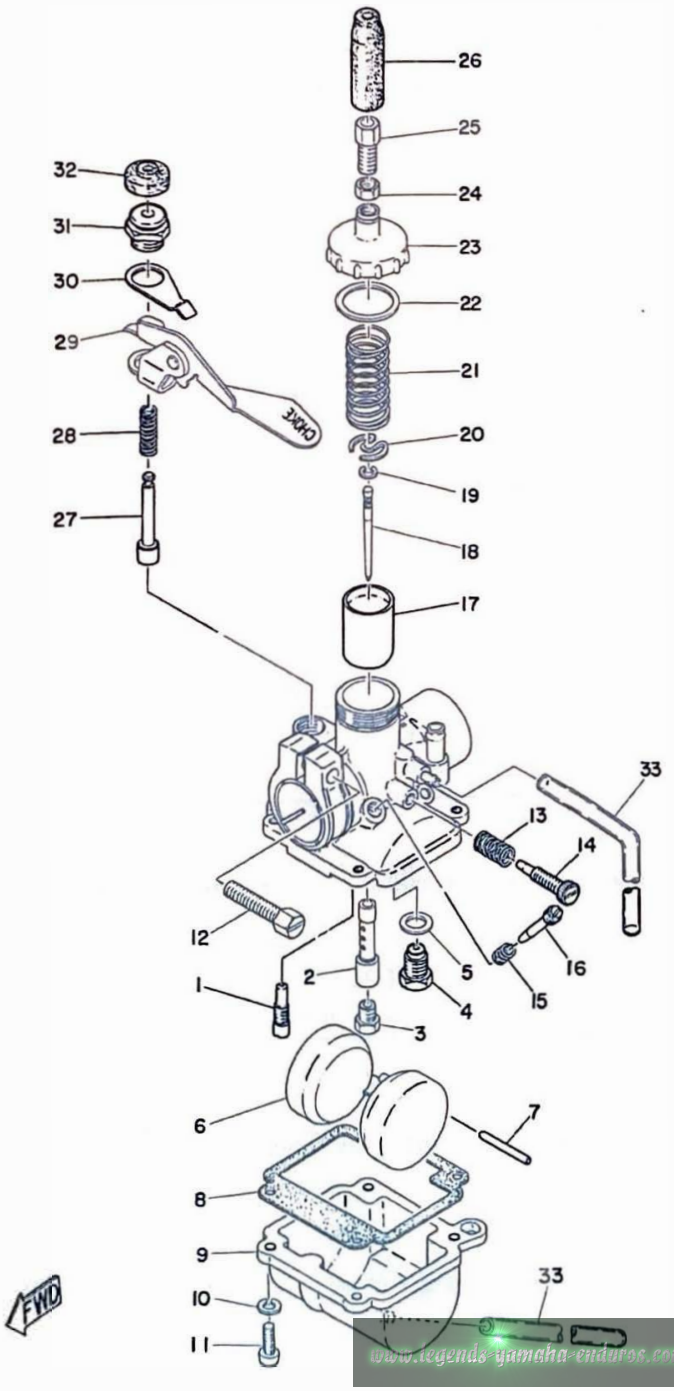
If a valve, valve stopper, a gasket, or a case and set-screw is faulty, it should be replaced in the reed valve assembly.

3. CARBURETOR

3–1 CARBURETOR SETTINGS

A. Description

The carburetor is of primary concern to proper engine operation. Considerable care should be taken during disassembly, inspection, and maintenance to see that all circuits are working correctly and that all adjustments are properly made.



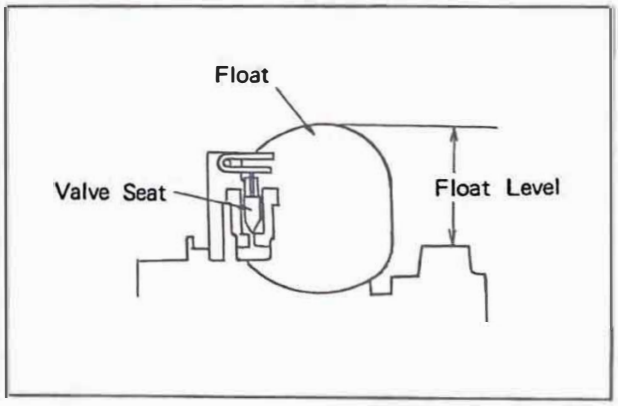
1. Pilot jet
2. Main nozzle
3. Main jet
4. Valve seat ass'y
5. Valve seat washer
6. Float
7. Float pin
8. Gasket
9. Float chamber body
10. Spring washer
11. Panhead screw
12. Body fitting screw
13. Pilot adjusting spring
14. Pilot adjusting screw
15. Air adjusting spring
16. Air adjusting screw
17. Throttle valve
18. Needle
19. Clip
20. Spring seat
21. Throttle valve spring
22. Packing
23. Mixing chamber cap
24. Wire adjusting nut
25. Wire adjusting screw
26. Cap
27. Starter plunger
28. Plunger spring
29. Starter lever
30. Stopper
31. Plunger cap
32. Plunger cap cover
33. Pipe

Carburetor Specifications

ITEM	ABBREV.	
MANUFACTURER	–	Teikei
MODEL	–	Y16P-3
I. D. NUMBER	–	46260
MAIN JET	M.J.	#86
NEEDLE JET	N.J.	2.080
JET NEEDLE/CLIP POSITION	J.N.	035-2
CUT AWAY	C.A.	1.0
PILOT JET	P.J.	#34
AIR JET	A.J.	2.5 mm-dia.
STARTER JET	S.J.	#50
AIR SCREW (TURNS OUT)	A.S.	1½
IDLE SPEED (r.p.m.)	–	1300 ± 50
FLOAT LEVEL	F.L.	0.905 ± 0.10 in. (23 ± 2.5 mm.)

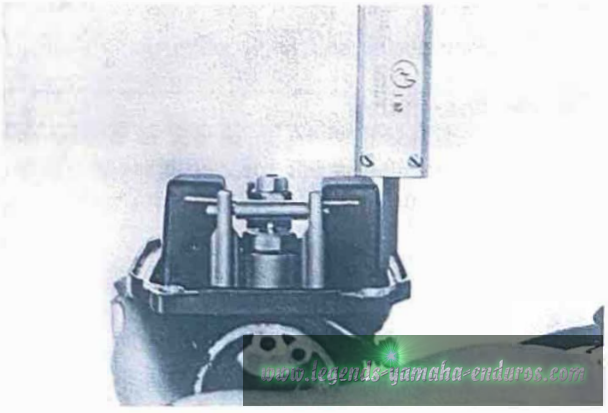
B. Adjusting Float Level

1. Float level is set according to the design of the carburetor and float bowl chamber. Under no circumstances should float level be altered in an attempt to correct a performance problem. Look for the problem in other, related components or carburetor circuits.

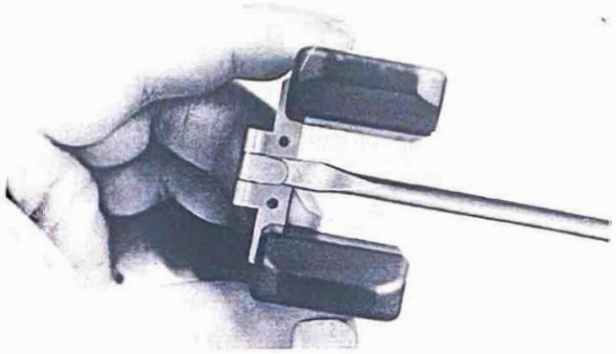


2. Using a vernier caliper, measure distance of the float from the top of the float chamber gasket sheet (gasket removed) to the float.

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



3. To correct float height, remove the float and bend the tang a slight amount as required.
   Both the right and left sides of the float should measure identically. Correct as required.



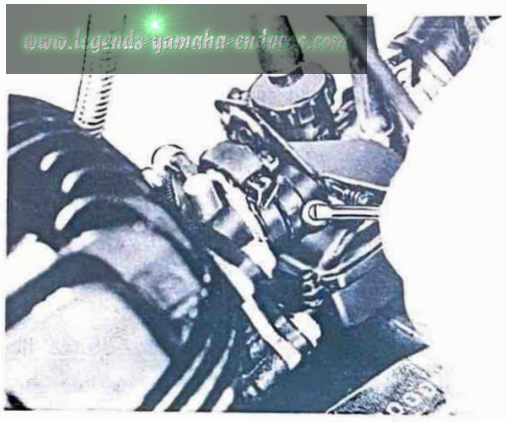
3–2 TUNING FOR COMPETITION

Cylinder porting, combustion chamber compression, ignition timing, muffler design, and carburetor size and component selection are all balanced to achieve optimum performance. However, variations in temperature, humidity and altitude, to name a few, will affect carburetion and consequently, engine performance.

The following list gives each of the major components of the carburetor that can be readily changed in order to modity carburetor performance if required.

A. Idle Air Mixture and Idle Speed

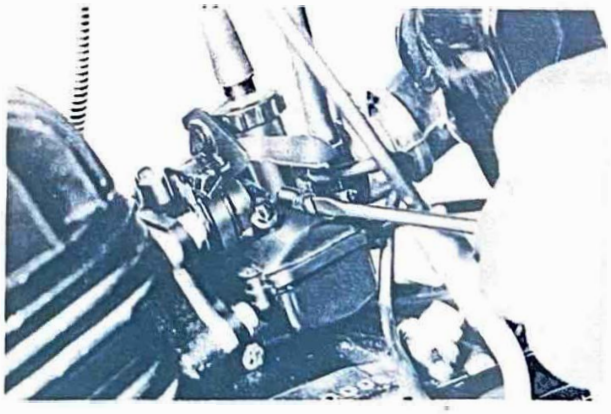
The idle mixture and idle speed screw are separate adjustments but they must be adjusted at the same time to achieve an optimum operating condition at engine idle speeds.



1. Idle Mixture Screw
   Turn idle mixture screw until it lightly seats, then back it out to turns specified in "Carburetor Specifications." This adjustment can be made with engine stopped.

2. Start the engine and let it warm up.

3. Idle Speed Screw
   Turn idle speed screw in or out to achieve smooth engine operation at idle speed specified in "Carburetor Specifications."

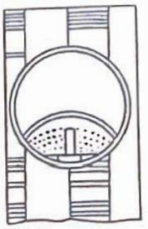


B. Pilot Jet

Controls the ratio of fuel to air in the idle circuit. Changing the jet to one with a higher number supplies more fuel to the circuit giving a richer mixture.

OPERATING RANGE MOST AFFECTED BY THE PILOT JET:
ZERO TO 1/8 THROTTLE

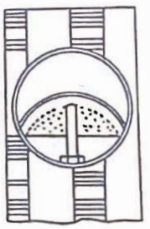
Up To 1/8 Open
Pilot Jet



C. Throttle Valve (Slide):

The throttle valve (slide) has a portion of the base cut away to control air flowing over the main nozzle. A wider angle (more "cutaway") will create a leaner mixture. Throttle valves are numbered according to the angle of the cutaway. The higher the number, the more cutaway, the leaner the mixture.
OPERATING RANGE MOST AFFECTED BY THE THROTTLE VALVE:
1/8 TO 1/4 THROTTLE.

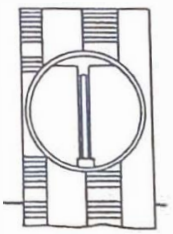
From 1/8 to 1/4 Open
Cut Away



D. Jet Needle

The jet needle is fitted within the throttle valve. The tapered end of the needle fits into the main nozzle outlet. Raising the needle allows more fuel to flow out of the nozzle outlet giving a richer mixutre. There are five circlip grooves at the top of the needle. Moving the needle clip from the first, or top groove, through the fifth, or bottom groove, will give a correspondingly richer mixture.
OPERATING RANGE MOST AFFECTED BY THE JET NEEDLE:
1/4 TO 3/4 THROTTLE.

1/4 to 3/4 Open
Jet Needle



E. Main Jet

The main jet controls overall fuel flow through the main nozzle. Changing the jet to one with a higher number supplies more fuel to the main nozzle giving a richer mixture.
OPERATING RANGE MOST AFFECTED BY THE MAIN JET:
3/4 TO FULL THROTTLE.

NOTE:
Excessive changes in main jet size can affect overall performance.

3/4 To Full Open
Main Jet

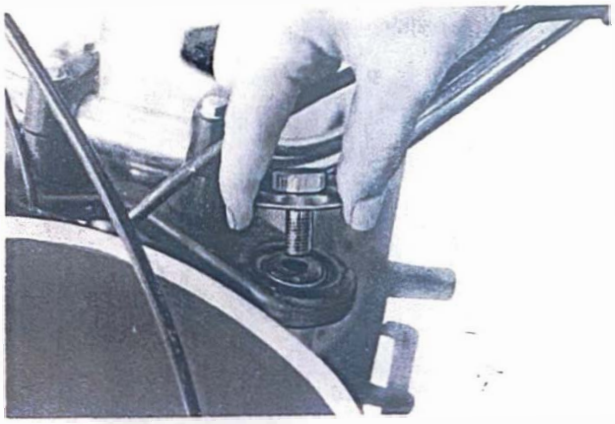
F.

YZ80A engine is turned for high performance. Changes to components should be done gradually, one change at a time. After each change make a thorough spark plug test reading at tall operating ranges and loads. This will assure that a change will not affect performance at some other operating range nor cause a lean condition with resultant over-heating.

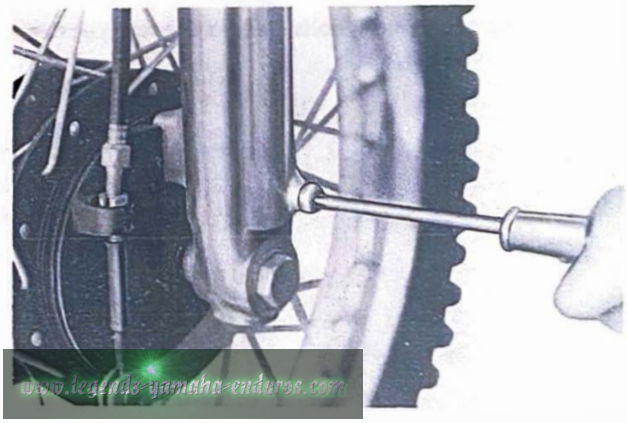
4. CHASSIS

4–1 FRONT FORKS

A. Replacing Fork Oil

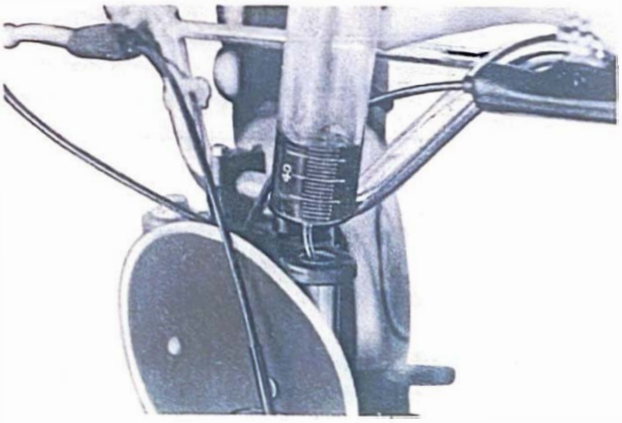


1. With the front wheel removed or raised off the floor with a suitable frame stand.
2. Remove cap bolts on inner fork tubes.



3. Remove drain screw from each outer tube with open container under each drain hole.
4. After most of oil has drained, slowly raise and lower outer tubes to pump out remaining oil.
5. Replace drain screws.

NOTE:
Check gasket, replace if damaged.



6. Pour specified amount of oil into the inner tube through the upper end opening. Use 10W/30 "SE" motor oil.

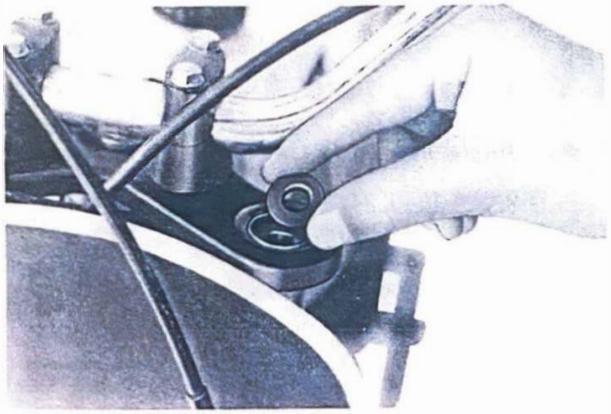
NOTE:
Specialty type fork oils of quality manufacture may be used.

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

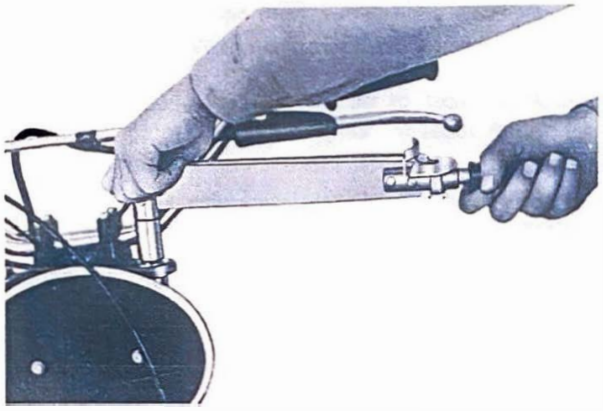
Front fork Oil Capacity	105 ~ 110 c.c. (3.6 ~ 3.7 oz.) per side

7. After filling, slowly pump the outer tubes up and down to distribute the oil.

8. Inspect packing on fork cap bolts and replace if damaged.



9. Replace fork cap bolts and torque to specification.

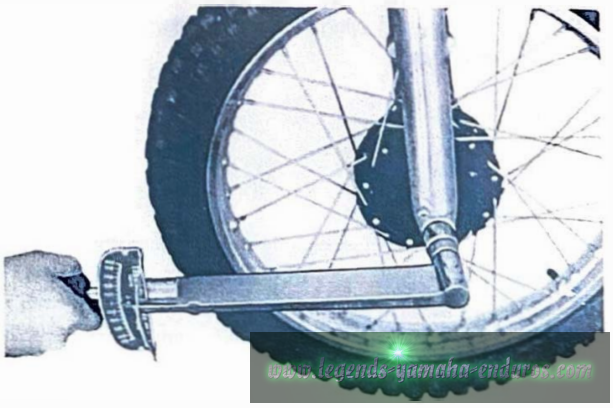


Fork cap bolt torque:	300 ~ 350 in-lbs. (3.5 ~ 4.0 m-kgs.)

B. Installing Front Wheel

— CAUTION —

After replacing wheel and axle, righten axle nut IFRST and install a new cotter pin.

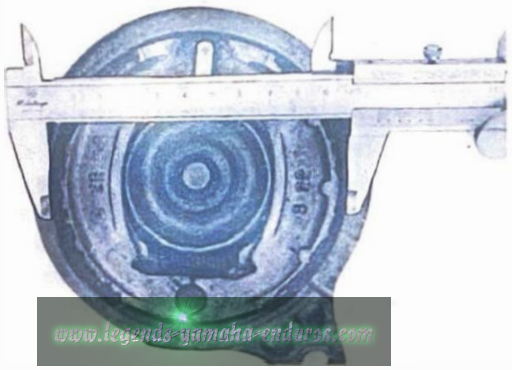


Front wheel axle nut torque:	350 ~ 400 in-lbs (4.0 ~ 4.5 m-kgs)

4–2 CHECKING BRAKE SHOE WEAR

A. Front Brake Shoes

Measure the outside diameter at the brake shoe with slide calipers. If it measures less than specified, replace.



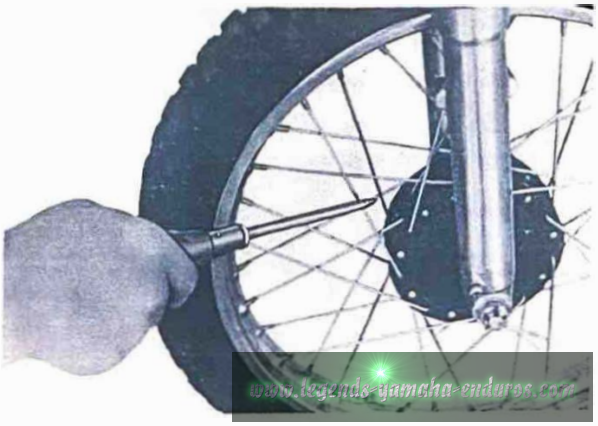
Front brake shoes	
Nominal diameter	3.7 in. (95 mm.)
Replacemtn limit	3.5 in. (90 mm.)

B. Rear Brake Shoes

Measure the outside diameter at the brake shoe with slide calipers. If it measures less than specified, replace.

Rear brake shoes	
Nominal diameter	4.3 in. (110 mm.)
Replacement limit	4.1 in. (105 mm.)

4–3 RIMS AND SPOKES (Front & Rear Wheels)

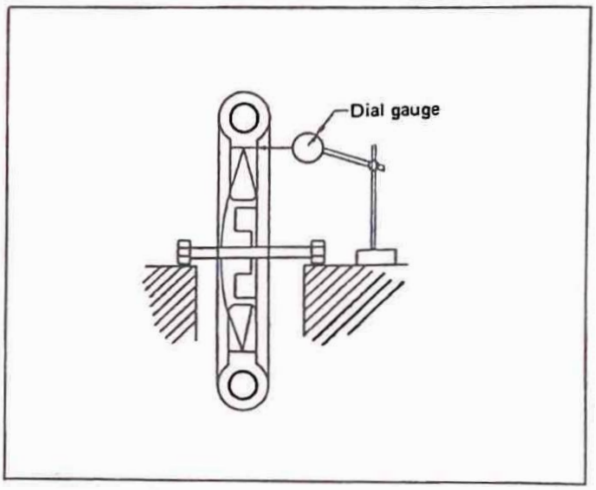


A. Checking for loose spokes

Loose spokes can be checked by bracing the machine off the ground so that the wheel can spin free.
Slowly revolve the wheel and at the same time let the metal shaft of a fairly heavy screwdriver counce off each spoke. If all the spokes are tightened approximately the same then the sound given off by the screwdriver hitting the spokes shoudl sound the same. If one spoke makes a dull flat sound, then check it for looseness.

B. Checking rim "run-out"

While you have the wheel elevated, you should check that it does not have too much run-out.
"Run-out" is the amount the wheel deviates from a straight line as it spins. Spin the wheel, and solidly anchor some sort of a pointer about 1/8" (3 mm) away from the side of the rim. As the wheel spins, the distance between the pointer and the rim should not change more than 1/16" (2 mm) total. Any greater fluctuation should be eliminated by properly adjusting the spokes.



Run-out limits:	0.07" (1/16") Lateral 2 mm.
Run-out limits:	0.07" (1/16") Vertical 2 mm.

4–4 TIRES AND TUBES

A. Removal

1. Remove valve cap, valve core, and valve stem lock nut.
2. When all air is out of tube, separate tire bead from rim (both) sides by stepping on tire with your foot.
3. Use Two tire removal irons (with rounded edges) and begin to work the tire bead over the edge of the trim, starting 180° opposite the tube stem.

   Take care to avoid pinching the tube as you do this.
4. After you have worked one side of the tire completely off the rim, then you can slip the tube out. Be very careful not to damage the stem while pushing it back out of the rim hole.

NOTE:

If you are changing the tire itself, then finish the removal by working the tire off the same rim edge just previously mentioned.

B. Installing Tire & Tube

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

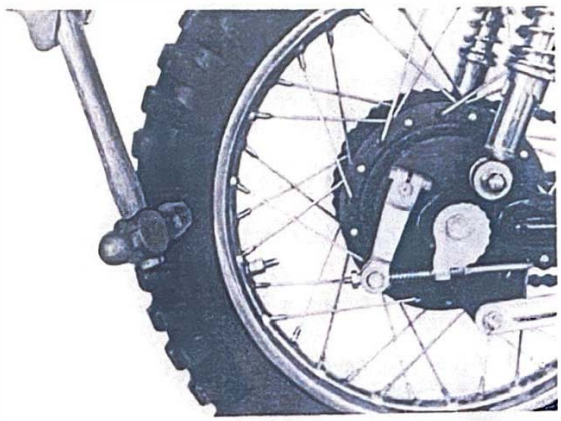
Tire pressure	Front	20 lb/in.² (1.4 kgs/cm.²)
	Rear	29 lb/in.² (2.0 kgs/cm.²)

C. Bead Spacers

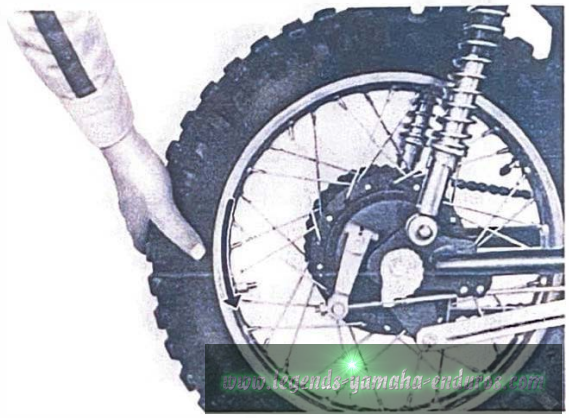
A motocrosser has lower tire pressures and is usually driven at high power over a rough, tortuous terrain. Therefore, the tire and tube tends to slip around the wheel rim. To prevent this, a bead spacer is used. If the tire valve is tilted, it should be corrected in the following manner:

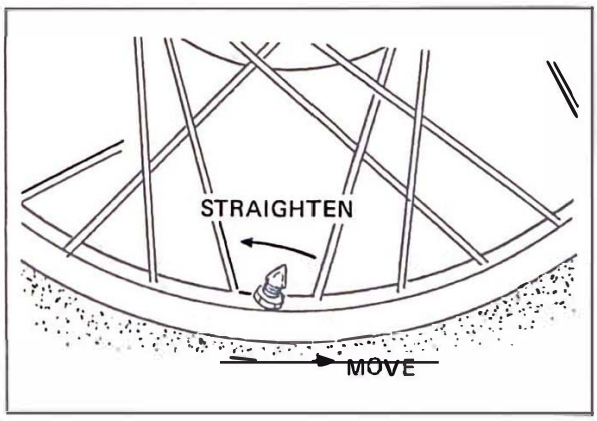
1. Deflate the tire, and loosen the tire valve lock nut and bead spacer lock nut(s).

2. Lightly strike the tire wall with a hammer until both beads have broken free of the rim.



3. Turn the tire in the reverse direction as shown in the figure, and apply quick brake. By using the inertia of the turning tire, the fault can be corrected.



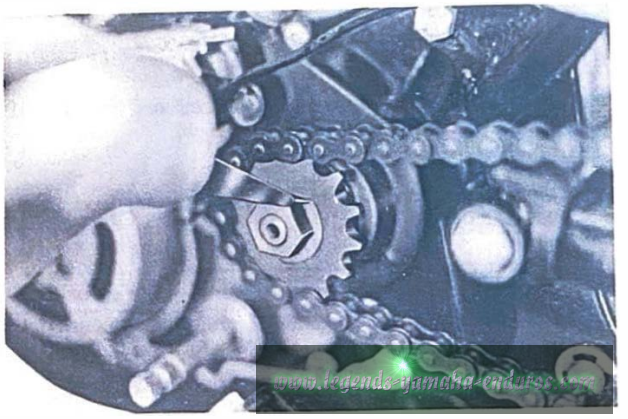


4–5 CHAIN AND SPROCKETS

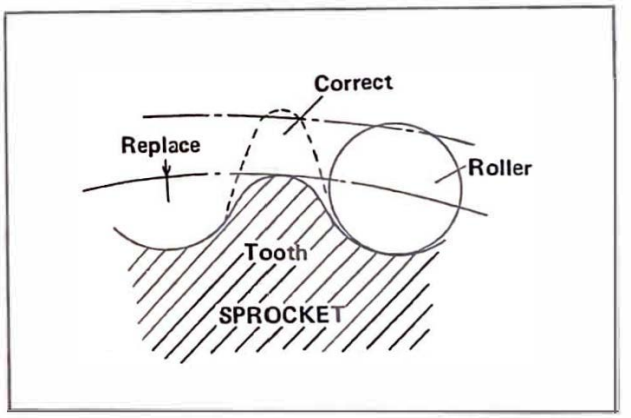
NOTE:
Please refer to Maintenance interfals and Lubrication charts for additional information.

A. Drive Sprocket

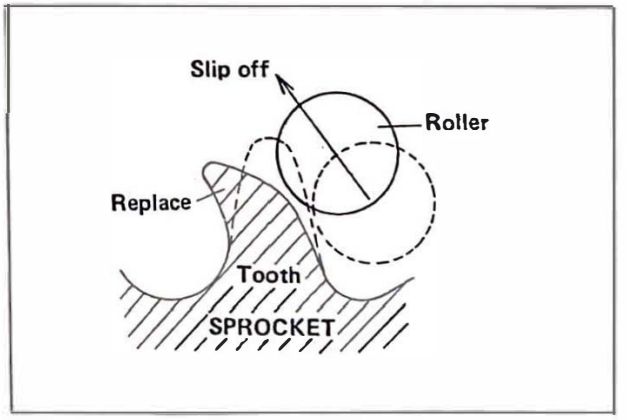
With the left crankcase cover removed, proceed as follows:



1. Using a blunt chisel, flatten the drive sprocket lock washer tab.
2. With the drive chain in place, transmission in gear, firmly apply the rear brake. Remove the sprocket securing nut. Remove the sprocket.
3. Check sprocket wear. Replace if wear decreases tooth height to a point approaching the roller center line.



4. Replace if tooth wear shows a pattern such as that in the illustration, or as precaution and common sense dictate.
5. During reassembly, make sure the lock washer splines are properly seated on the drive shaft splines. Tighten securing nut thoroughly to specified torque value. Bend lock washer tab fully against securing nut flats.



Drive sprocket nut torque	350 ~ 400 in-lbs. (4.0 ~ 4.5 m-kgs.)

B. Driven Sprocket

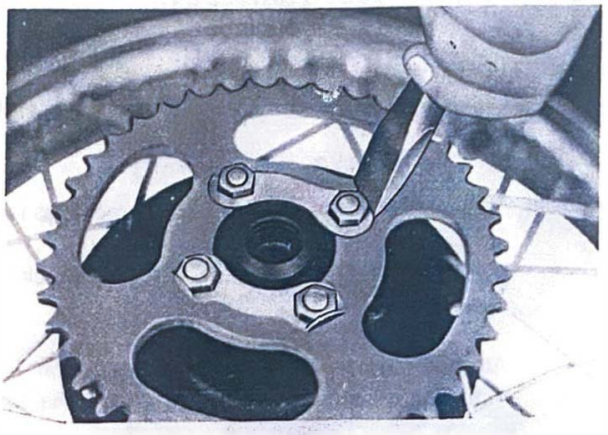
With the rear wheel removed, proceed as follows:

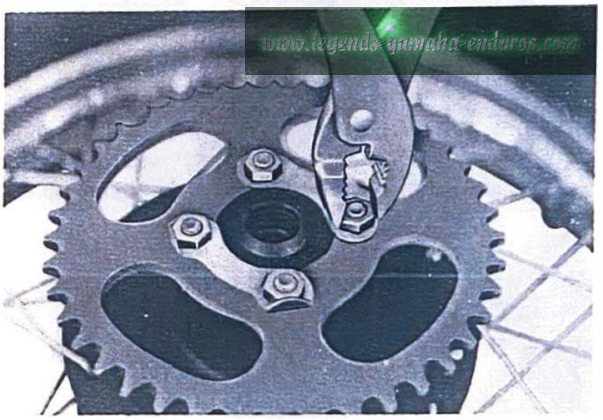
1. Using a blunt chisel, flatten the securing bolt lock washer tabs. Remove the securing bolts (4). Remove the lock washers and sprocket.

2. Check sprocket wear per procedures for the drive sprocket.

3. Check the sprocket to see that it runs true. Do not sprocket.

4. During reassembly, make sure that sprocket and sprocket seat are clean. Tighten the securing bolts in a crosshatch pattern. Bend the tabs of the lock washers fully against the securing bolt flats.



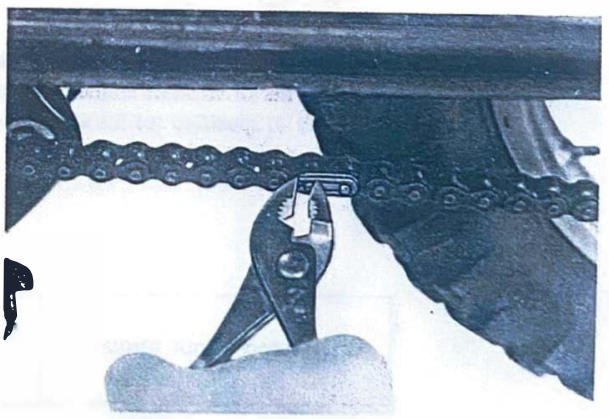


Driven sprocket securing bolt torque	175 in-lbs. (2.0 m-kgs.)

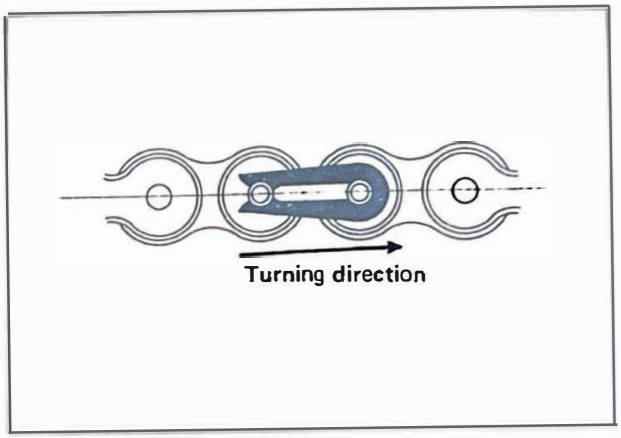
C. Chain Removal and Installation

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

1. Using a blund-nosed pliers, remove the master link clip and side plate. Remove the chain.



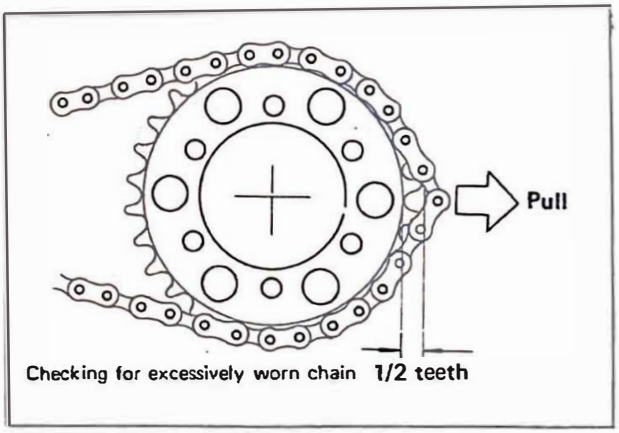
2. During reassembly, the master link clip must be installed with rounded end facing the direction of travel.



D. Chain Inspection

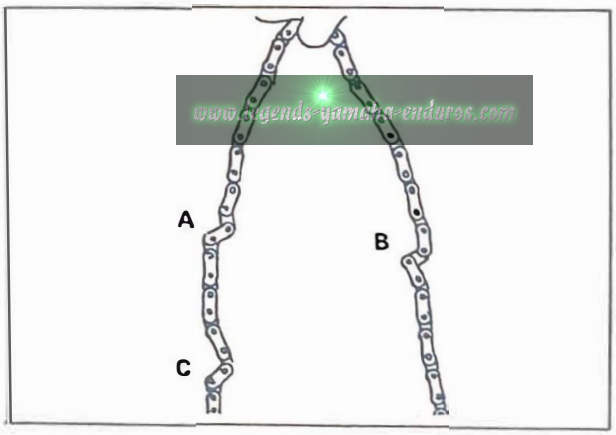
1. With the chain installed on the machine, excessive wear may be roughly determined by attempting to pull the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect.

   If any portion of the chain shows signs of damage, or if either sprocket shows signs of excessive wear, remove and inspect.



2. Check the chain for stiffness. Hold as illustrated. If stiff, soak in solvent solution, clean with medium bristle brush, dry with high pressure air. Oil chain thoroughly and attempt to work out kinks. If still stiff, replace.

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



E. Chain Maintenance

The chain should be lubricated per the recommendations given in the Maintenance and Lubrication chart. More often if possible. Preferably after every use.

1. Wipe off dirt with shop rag. If accumulation is severe, use soft bristle brush, then rag.

2. Apply lubricant between roller and side plates on both inside and outside of chain. Don't skip a portion as this will cause uneven wear. Apply thoroughly. Wipe off excess.

   NOTE:

   Chain and lubricant should be at room temperature to assure penetration of lubricant into rollers.
   Choice of lubricant is determined by use and terrain. SAE 20wt. 30wt may be used, but several specialty types by accessory manufacturers offer more penetration corrosion resistance and shear strength for roller protection.
   In certain areas, semi-drying lubricants are preferrable. These will resist picking up and particles, dust, etc.

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

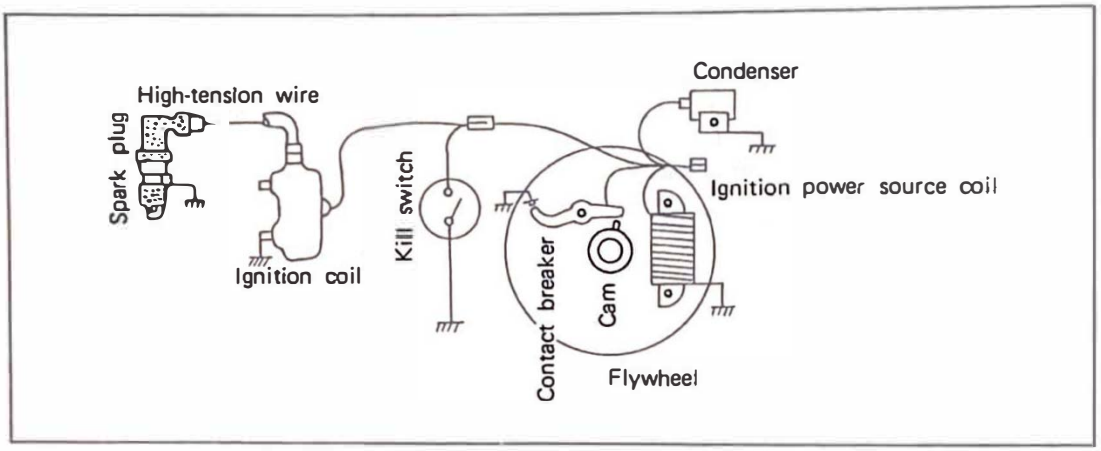
4. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly while off machine. Work each roller thoroughly to make sure lubricant penetrates. Wipe off excess. Re-install.

5. ELECTRICAL SYSTEM

5–1 IGNITION SYSTEM

A. Description of Operation

The ignition system consists of the components as shown below. As the flywheel rotates, the contact breaker points open and close. This make-and-break operation develops an electromotive force in the ignition power source coil, and produces a voltage in the ignition coil primary windings. The ignition coil is a king of transformer, with a 1:50 turns ratio of the primary to the secondary winding. The voltage (150-300V) which is produced in the primary coil, is stepped up to 12,000-14,000V by mutualinduction and the electric spar jumps across the spark plug electrodes.



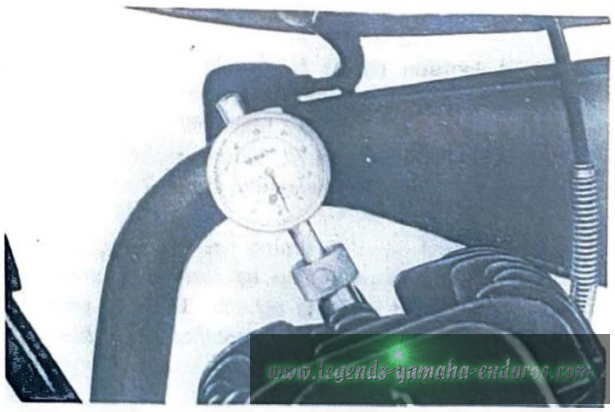
B. Component Parts

PART NAME	MANUFACTURER	MODEL/TYPE
Flywheel Magneto	Mitsubishi	F000T-00173
Ignition Coil	"	F6T-40184
Contact Breaker Ass'y	"	—
Condenser	"	—

C. Ignition Timing

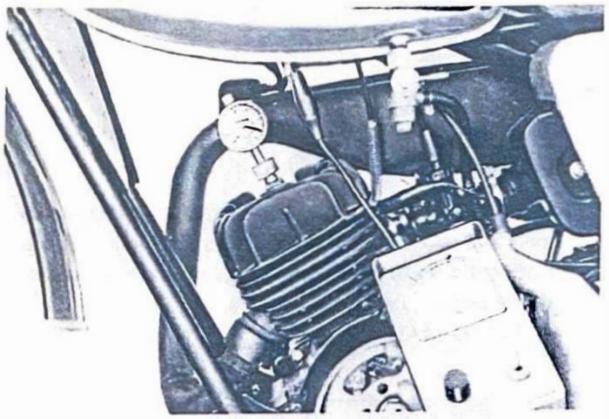
Ignition timing must be set with a dial indicator (to determine piston position) and a low-range ohmmeter (to determine exactly when contact breaker points begin to open). Proceed as follows:

1. Remove spark plug and screw Dial Gauge Stand into spark plug hole.
2. Insert Dial Gauge Assembly into stand.
3. Remove generator cover.

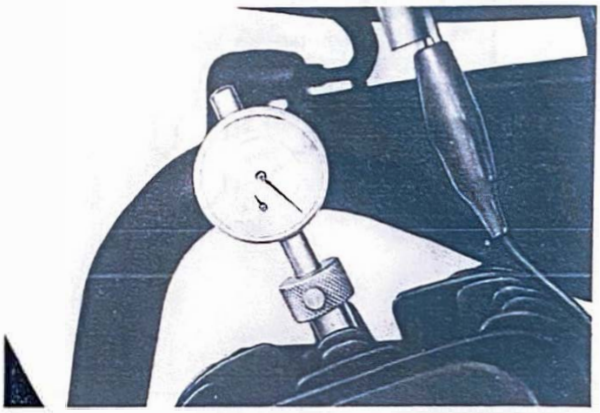


4. Check point checker for full scale defelction. Connect red lead of Point Checker to balck wire in wire harness coming from magneto.

5. Connect black lead of Point Checker to unpainted surface of cylinder fin or unpainted crankcase bolt or screw.



6. Rotate magneto flywheel until piston is at top-dead-center. Set the zero on dial indicator face to line up exactly with dial indicaort needle. Tighten set screw on spark plug stand to secure dial gauge assembly. Rotate flywheel back and forth to be sure that indicator needle does not go past zero.



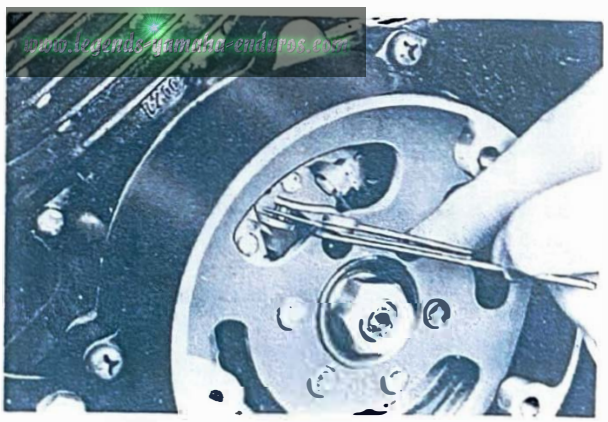
7. Starting at T.D.C. rotate flywheel clockwise until dial indicator reads approximately 4 needle revolutions before top-deal-center (B.T.D.C.).

8. Slowly turn flywheel counterclockwise until dial indicator reads ignition advance setting listed in Specifications. Table. At this time, the point checker needle should swing from "CLOSED" to "OPEN" position, indicating the contact breaker (ignition points) have just begun to open.

9. Repeat steps 7 and 8 to verify point opening position. If points do not open within specified tolerance, they must be adjusted.

10. Adjust ignition points by barely loosening Pan-head screw and carefully rotating contact breaker assembly with a slotted screwdriver. Make minor adjustment and retighten Pan-head screw before rechecking timing. Recheck timing by repeating steps 7 - 8.

11. When correct ignition timing has been accomplished, check maximum point gap by turning flywheel until maximum point opening occurs. Measure point gap with thickness gauge. See Specification Table.



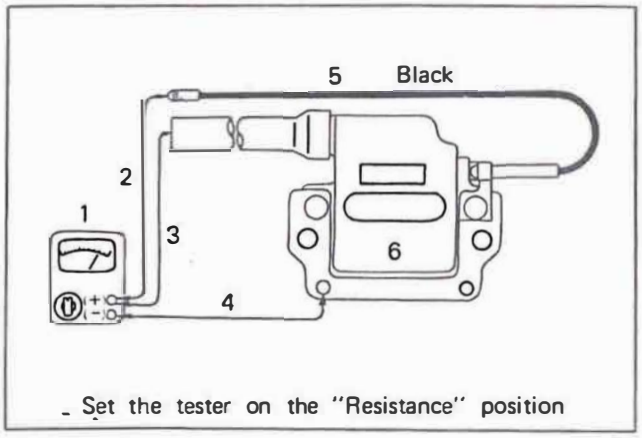
NOTE:
If the maximum point gap is over tolerance the point rubbing block is probably worn and the contact breaker assembly should be replaced. Do not attempt to bend fixed point bracket to decrease maximum point gap. This will only result In point misalignment, difficulty in setting timing and premature point failure.

IGNITION TIMING SPECIFICATIONS			
POINT GAP			TIMING (B.T.D.C.)
NOMINAL	MINIMUM	MAXIMUM	
0.014 in. (0.35 mm.)	0.012 in. (0.30 mm.)	0.016 in. (0.40 mm.)	0.07 ± 0.006 in. (1.8 ± 0.15 mm.)

5–2 IGNITION COIL

A. Direct Current Resistance Testing

Use a Pocket Tester or equivalent ohmmeter to determine resistance and continuity of primary and secondary coil windings.



- Set the tester on the "Resistance" position

1. Pocket-tester
2. Primary coil resistance value
3. Secondary coil resistance value
4. Ground
5. Primary lead wire
6. Ignition coil

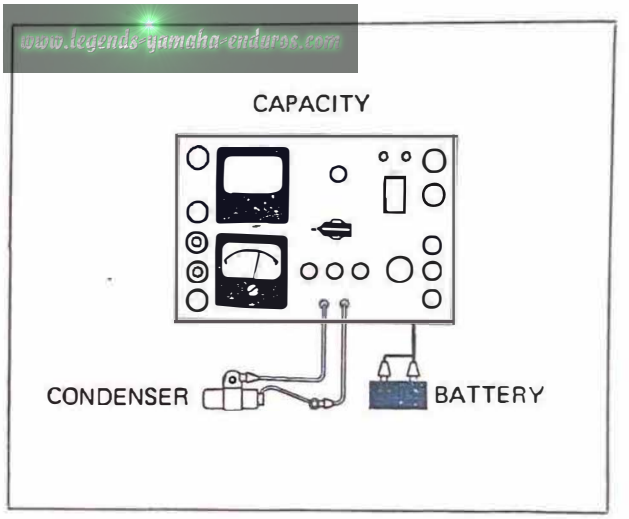
	Model YZ80A	Temperature
Primary Coil Resistance (Use (Ω x 1) Scale)	1.02Ω ± 10%	20°C or 68°F
Secondary Coil Resistance (Use (Ω x 100) Scale)	6.0KΩ ± 20%	20°C or 68°F

5–3 CONDENSER

The condenser instantly stores a static electric charge as the contact breaker points separate, and the energy stored in the condenser discharges instantly when teh points are closed. If it were not for the condenser, an electric are would jump across the separating contact points, causing them to burn.
Burned contact points greatly affect the flow of current in the primary winding of the ignition coil. If the contact points show excessive wear, or the spark is weak (the ignition coil is in good condition), check the condenser.

1. Condenser insulation test (use electro-tester)
   a. Set ohmmeter to highest resistance scale (Ω x 1000 or higher).
   b. Remove condenser from engine and connect ohmmeter as shown below.
   c. Resistance reading should be "Infinity" or very close to it.

Minimum resistance: 3MΩ



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

Condenser capacity 0.30 μF

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

5–4 SPARK PLUG

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

If the insulator tip shows a very light tan or white color is actually pure white or if electrodes show signs of melting, than a spark plug with a colder heat range is required.

Remember, the insulator area surrounding the positive electrode of the spark plug must be a medium-to-light tan color. If it is not, check carburetion, timing and ignition adjustments.

The spark plug must be removed and checked prior to using the machine. Check electrode wear, insulator color, and negative to positive electrode gap.

Spark plug type	B-7HS
Spark plug gap	0.020 ~ 0.024 in. (0.5 ~ 0.6 mm.)

Engine conditions will cause any spark plug to slowly break down and erode. If erosion begins to increase, or if the electrodes finally become too worn, or if for any reason you believe the spark plug is not functioning correctly, replace it.

When installing the plug, always clean the gasket surface, use a new gasket, wipe off any grime that might be present on the surface of the spark plug, torque the spark plug properly.

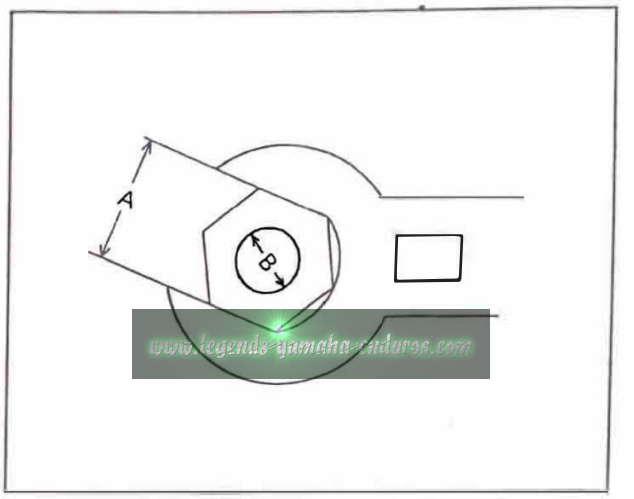
Spark Plug Tightening Torque:	230 ~ 250 in-lbs. (2.5 ~ 3.0 m-kgs.)

APPENDICES

A. 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 fasteners should be successive stages until torque specification is reached. The method is similar to installing an automovile wheel and will avoid warping the component.



A (NUT)	B (BOLT)	TORQUE SPECIFICATION		
		m-kgs	ft-lbs	in-lbs
10mm.	6mm.	1.0	7.2	85
13mm.	8mm.	2.0	15	175
14mm.	8mm.	2.0	15	175
17mm.	10mm.	3.5 - 4.0	25 - 29	300 - 350
19mm.	12mm.	4.0 - 4.5	29 - 33	350 - 400
22mm.	14mm.	4.5 - 5.0	33 - 36	400 - 440
26mm.	17mm.	5.8 - 7.0	42 - 50	500 - 600
27mm.	18mm.	5.8 - 7.0	42 - 50	600 - 600
30mm.	20mm.	7.0 - 8.3	50 - 60	600 - 700
SPARK PLUG		2.5 - 3.0	18 - 22	230 - 250

TORQUE VALUES

Cylinder Head Holding Nut	(6 mm.)	85 in-lbs.	1.0 m-kg
Flywheel Securing Nut	(12 mm.)	300 - 350 in-lbs.	3.5 - 4.0 m-kgs.
Spark Plug	(14 mm.)	230 - 250 in-lbs.	2.5 - 3.0 m-kgs.
Drive Sprocket Securing Nut	(12 mm.)	350 - 400 in-lbs.	4.0 - 4.5 m-kgs.
Clutch Boss Securing Nut	(12 mm.)	350 - 400 in-lbs.	4.0 - 4.5 m-kgs.
Front Axle Securing Nut	(12 mm.)	350 - 400 in-lbs.	4.0 - 4.5 m-kgs.
Pivot Shaft Securing Nut	(10 mm.)	350 - 400 in-lbs.	4.0 - 4.5 m-kgs.
Rear Axle Securing Nut	(12 mm.)	350 - 400 in-lbs.	4.0 - 4.5 m-kgs.
Front Fork Cap Bolt	(10 mm.)	350 - 400 in-lbs.	4.0 - 4.5 m-kgs.
Front Fork Stem Bolt	(10 mm.)	300 - 350 in-lbs.	3.5 - 4.0 m-kgs.
Driven Sprocket Securing Nut	(8 mm.)	300 - 350 in-lbs.	3.5 - 4.0rrm-kgs.

B. Conversion Tables

MILLIMETERS to Inches

	0	0.1	0.02	0.3	0.4	0.5	0.6	0.7	0.8	0.9
0		0.0039	0.0079	0.0118	0.0157	0.0197	0.0236	0.2760	0.0315	0.0354
1	0.0394	0.0433	0.0472	0.0512	0.0551	0.0591	0.0630	0.0669	0.0709	0.0748
2	0.7890	0.0827	0.0866	0.0906	0.0945	0.0984	0.1024	0.1063	0.1102	0.1142
3	0.1181	0.1200	0.1260	0.1299	0.1339	0.1378	0.1417	0.1457	0.1496	0.1535
4	0.1575	0.1614	0.1654	0.1693	0.1732	0.1772	0.1811	0.1850	0.1890	0.1929
5	0.1969	0.2000	0.2047	0.2087	0.2126	0.2165	0.2205	0.2244	0.2283	0.2323
6	0.2362	0.2402	0.2441	0.2480	0.2520	0.2559	0.2598	0.2638	0.2677	0.2717
7	0.2756	0.2795	0.2835	0.2874	0.2913	0.2953	0.2992	0.3031	0.3071	0.3110
8	0.3150	0.3189	0.3228	0.3268	0.3307	0.3346	0.3386	0.3425	0.3465	0.3504
9	0.3543	0.3583	0.3622	0.3661	0.3701	0.3740	0.3780	0.3819	0.3858	0.3898
10	0.3937	0.3976	0.4016	0.4055	0.4094	0.4134	0.4173	0.4213	0.4252	0.4291

0.01mm.=0.0004" 0.03mm.=0.0012" 0.05mm.=0.0020" 0.07mm.=0.0028" 0.09mm.=0.0035"
0.02mm.=0.0008" 0.04mm.=0.0016" 0.06mm.=0.0024" 0.08mm.=0.0031" 0.10mm.=0.0039"

Inches to Milimeters

	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0		0.254	0.508	0.762	1.016	1.270	1.524	1.778	2.032	2.286
0.1	2.540	2.794	3.048	3.302	3.556	3.810	4.064	4.318	4.572	4.826
0.2	55.080	5.334	5.588	5.842	6.096	6.350	6.604	6.858	7.112	7.366
0.3	7.620	7.874	8.128	8.382	8.636	8.890	9.144	9.398	9.652	9.906
0.4	10.160	10.414	10.668	10.922	11.176	11.430	11.684	11.938	12.192	12.446
0.5	12.700	12.954	13.208	13.462	13.716	13.970	14.224	14.478	14.732	14.986
0.6	15.240	15.494	15.748	16.002	16.256	16.510	16,763	17.018	17.272	17.526
0.7	17.780	18.034	18.288	18.542	18.796	19.050	19.304	19.558	19.812	20.066
0.8	20.320	20.574	20.828	21.082	21.336	21.590	21.844	22.098	22.352	22.606
0.9	22.860	23.114	23.368	23.622	23.876	24.130	24.384	24.638	24.892	25.146
1.0	25.400	25.654	25.098	26.162	26.416	26.670	26.924	27.178	27.432	27.686

0.001"=0.0254mm. 0.003"=0.0762mm. 0.005"=0.1270mm. 0.007"=0.1778mm. 0.009"=0.2286mm.
0.002"=0.0508mm. 0.004"=0.1016mm. 0.006"=0.1524mm. 0.008"=0.2032mm. 0.010"=0.254mm.

Metric to Inch System

	KNOWN	MULTIPLIER (Rounded off)	RESULT
TORQUE	Kg-m.	7.235	ft-lbs.
	Kg-m.	86.82	in-lbs.
	kg-cm.	0.0724	ft-lbs.
	kg-cm.	0.8682	in-lbs.
WEIGHT	kg.	2.205	lb.
	g.	0.03527	oz.
FLOW/DISTANCE	kg/l.	2.352	mpg.
	kg/hr.	0.6214	mph.
	km.	0.6214	mi.
	m.	3.281	ft.
	m.	1.094	yd.
	cm.	0.3937	in.
	mm.	0.03937	in.
VOLUME/CAPACITY	c.c.(cm.)	0.03381	oz. (U.S. liq.)
	c.c.(cm.)	0.06102	cu.in.
	l.(liter)	2.1134	pt. (U.S. liq.)
	l.(liter)	1.057	qt. (U.S. liq.)
	l.(liter)	0.2642	gal. (U.S. liq.)
MISC.	kg/mm.	56.007	lb/in.
	kg/cm.	14.2234	psi (lb/in.^{2})
	Centigrade (C)	5/9 (°F-32)	Fahrenheit (°F)

Inch to Metric System

	KNOWN	MULTIPLIER (Rounded off)	RESULT
TORQUE	ft-lbs.	0.13826	kg-m.
	ft-lbs.	0.01152	kg-m.
	in-lbs.	13.825	kg-cm.
	in-lbs.	1.1518	kg-cm.
WEIGHT	lb.	0.4536	kg.
	oz.	28.35	g.
FLOW/DISTANCE	mpg.	0.4252	km/l.
	mph.	1.609	km/hr.
	mi.	1.609	km.
	ft.	0.3048	m.
	yd.	0.9144	m.
	in.	2.54	cm.
	in.	25.4	mm.
VOLUME/CAPACITY	oz. (U.S. liq.)	29.57	c.c. (cm.)
	cu.in.	16.387	c.c. (cm.)
	pt.(U.S.liq.)	0.4732	l.(liter)
	qt.(U.S.liq.)	0.9463	l.(liter)
	gal.(U.S.liq.)	3.7853	l.(liter)
MISC.	lb/in.	0.017855	kg/mm.
	psi (lb/in.^{2})	0.07031	kg/cm.
	Fahrenheit (°F)	9/5 (°C+32)	Centigrade (°C)

DEFINITION OF TERMS:

Kg-m = Kilogram meters: Usually torque.
g = Gram (s).
kg = Kilogram (s): 1,000 grams.
km = Kilometer(s).
l = Liter(s).
km/l = Kilometer(s) perliter: Mileage.
cc = Cubic centimer(s) (cm): Volume or capacity.
kg/mm = Kilogram(s) permillimeter: Usually spring compression rate.
kg/cm = Kilogram(s) perssquare centimer: Pressure.

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