



**YAMAHA**

**TY250A**

**OWNER'S SERVICE MANUAL**

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LIT-11624-34-00

# NOTICE

Yamaha Motor Company is confident you will enjoy your new Yamaha to the utmost. We have made every effort to provide you with a safe, well-engineered and constructed product.

This Owner's Service Manual will acquaint you with several features and maintenance procedures concerning your Yamaha. However, if you are unfamiliar with the product, or the features or procedures outlined within this manual, we strongly urge you to consult your Authorized Yamaha Dealer for additional information.

TY250A OWNER'S SERVICE MANUAL

1974

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# — FOREWORD —

Yamaha's TY250A Trials is a completely new model designed solely for the rigors of Trials competition. Production is limited. Each unit is assembled and checked according to the same rigorous principles as our championship road racing and motocross models.

This Owner's Service Manual is included with your TY250A to provide basic information for operation and maintenance. Additional information regarding major repairs, such as crankcase disassembly, can be found within the DT250A/360A Service Manual and various other information and training manuals available from your Authorized Yamaha Dealer.

YAMAHA MOTOR COMPANY, LTD.  
SERVICE DEPARTMENT  
INTERNATIONAL DIVISION  
IWATA, JAPAN

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# CHAPTER I

## I. 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 number is followed by a dash. The remaining digits identify the production number of the unit. Yamaha production begins -000101.

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



Frame Serial Number

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



Engine Serial Number

### NOTE:

Always check your registration papers against the actual machine serial numbers. If any discrepancy is found, have it corrected immediately.



# CHAPTER II

## II. GENERAL SPECIFICATIONS

These specifications are for general use. For a more complete list refer to Maintenance Specifications and/or the DT250A/360A Service Manual.

<b>DIMENSIONS/WEIGHTS</b>		
Overall Length	1,985 mm	{78.1 in.}
Overall Width	835 mm	{32.9 in.}
Overall Height	1,110 mm	{43.7 in.}
Wheelbase	1,295 mm	{51.0 in.}
Minimum Ground Clearance	285 mm	{11.2 in.}
Seat Height (Unloaded)	760 mm	{29.9 in.}
Machine Net Weight	93 kg	{205 lbs.}
<b>PERFORMANCE</b>		
Minimum Turning Radius	1,600 mm	{53.0 in.}
Braking Distance	15m @50km/h {49.2ft @31mph}	
<b>ENGINE</b>		
Type	2-stroke, Gasoline "Torque Induction"	
Bore x Stroke	70 x 64 mm	{2.756 x 2.520 in.}
Displacement	246 cc	{15.01 cu. in.}
Starting System	Primary Kick	
Lubricating System	Separate Lubrication {Yamaha Autolube}	

## CARBURETION

Manufacturer/Type	T.K./ Y26P
Idle r.p.m.	1,050 – 1,150 r.p.m.
Main Jet	#114
Needle Jet	S85
Jet Needle # / Clip Position	5C9 2-4
Air Jet (Turns Out)	1½
Cut Away	3.0
Air Cleaner Type	Wet, Molt Plain

## CLUTCH

Type	Wet, Multiple-disk
Primary Drive System	Gear
Primary Drive Ratio	68/20 (3.400)

## TRANSMISSION

Type	Constant Mesh, 5-speed Forward
Reduction Ratio	1st. 38/14 (2.714)
	2nd. 35/17 (2.058)
	3rd. 32/21 (1.523)
	4th. 26/26 (1.000)
	5th. 21/32 (0.656)

## SECONDARY DRIVE

Type / Size	D1D/ 428H
Reduction Ratio	53/14 (3.785)

## ELECTRICAL

Ignition Type / Timing	Magneto	0.3 – 0.4 mm	
Spark Plug/Mfr. / Type /Gap	NGK	B-7ES	0.4 – 0.5 mm
Headlight Rating	6V 35W/35W		
Taillight/Stop Light Rating	6V 5.3W/17W		

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## CHASSIS

Frame Type	High Tension Diamond		
Front Suspension / Type	Telescope Forks		
Rear Suspension / Type	Swinging Arm		
Chaster /Type	63°30' / 88 mm (3.46 in.)		
Front Tire /Size /Tread Type	2.75-21-4PR	Trials Universal	
Nominal Pressure	0.9 kg/cm <sup>2</sup>	(13 lbs./in. <sup>2</sup> )	
Rear Tire /Size /Tread Type	4.00-18-4PR	Trials Universal	
Nominal Pressure	1.1 kg/cm <sup>2</sup>	(16 lbs./in. <sup>2</sup> )	
Front Brake Type/Actuating Method	Internal Expansion	Right Hand Operation	
Rear Brake Type/Actuating Method	Internal Expansion	Right Foot Operation	

## VOLUMES/TYPE FLUID

Gasoline Tank /Type	6.0 lit.	(1.59 US gal.)	Low-Lead Gasoline
Oil Tank /Type	0.35 lit.	(0.37 US qt.)	Sae "SE" 10W/30wt.
Transmission /Type	1,000 cc		Sae "SE" 10W/30wt.
Front Fork (Each) /Type	Non-foaming Hydraulic Fluid 10, 20, 30wt.		

NOTE: The Research and Engineering Departments of Yamaha are continually striving to further perfect all models. Improvements and modifications are therefore inevitable.

In light of this fact, all specifications within this manual are subject to change without notice to the owner. Information regarding changes is forwarded to all Authorized Yamaha Dealers as soon as available. If a discrepancy is noted, please consult your dealer.

# CHAPTER III

## III. MAINTENANCE SPECIFICATIONS

PAGE	ITEM	NOMINAL (NEW)	MINIMUM (ALLOWABLE)	MAXIMUM (ALLOWABLE)
26 – 28	<b>AUTOLUBE</b> Minimum Pump Stroke (At Idle) Maximum Pump Stroke (At Full Throttle)	0.20 ~ 0.25mm 1.85 ~ 2.05mm	— —	— —
107 – 109	<b>MAGNETO/IGNITION</b> Ignition Source Coil Resistance Secondary Ignition Coil Resistance (Primary) Secondary Ignition Coil Res. (Secondary) Lighting Source Coil Res. (Day Winding) Lighting Source Coil Res. (Night Winding) Ignition Timing Ignition Point Gap Condenser Capacity	0.1Ω 1.7Ω 6.0KΩ 0.4Ω 4.2Ω -3.1m±0.15 0.3 ~ 0.4mm 0.3μF	— — — — — — — —	— — — — — — — —
55 – 63	<b>ENGINE – TOP END</b> Cylinder Taper Cylinder Out of Round Piston Clearance Top Ring End Gap (Free) Top Ring End Gap (Installed) 2nd Ring End Gap (Free) 2nd Ring End Gap (Installed) Ring/Ring Groove Clearance (2nd Ring Only) Connecting Rod Axial Play Connecting Rod/Crank Side Clearance Compression Pressure	0.008mm — 0.040 ~ 0.045mm approximately 5.5mm — approximately 7.0mm — — 2.0mm 0.3mm 7.0kg/cm <sup>2</sup>	— — — — 0.2mm — 0.2mm 0.03mm — — —	0.05mm 0.05mm — — 0.4mm — 0.4mm 0.08mm 3.0mm 0.4 ~ 0.5mm —
67 – 76	<b>ENGINE – CLUTCH</b> Friction Plate Thickness Clutch Plate Warp Allowance Spring Free Length	3.0mm — 31.5mm	2.7mm — 30.5mm	— 0.05mm —



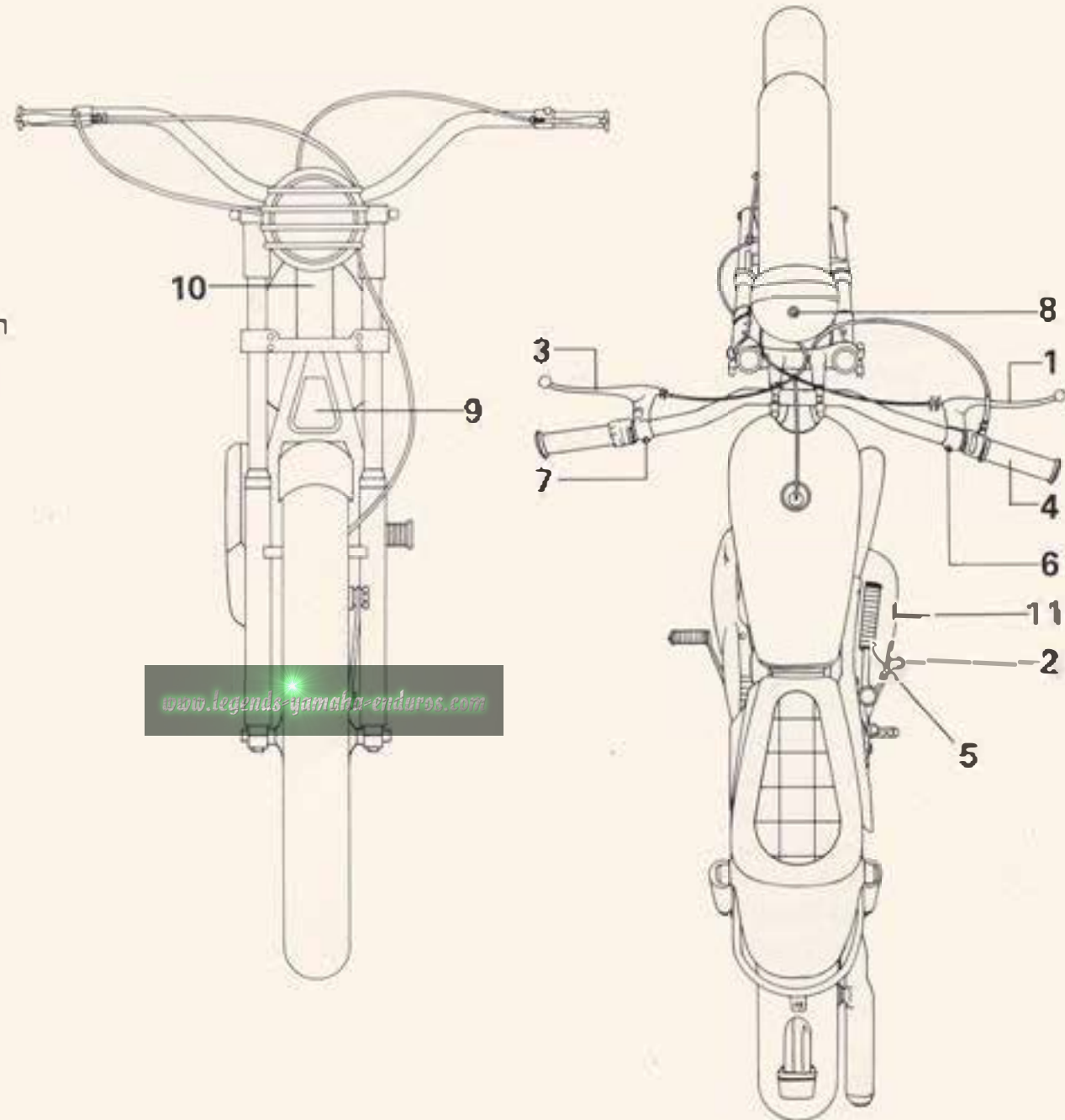
PAGE	ITEM	NOMINAL (NEW)	MINIMUM (ALLOWABLE)	MAXIMUM (ALLOWABLE)
67 – 76	<b>ENGINE – CLUTCH (Continued)</b>			
	Spring Set Length Difference	—	—	1mm
	Primary Driven Gear (Clutch Hsg.) End Play	0.2mm	0.05mm	0.36mm
	Housing Bushing Inner Diameter	33mm $-0.025$ $-0.041$	—	—
	Bushing Spacer O. D.	33mm $+0.007$ $-0.014$	—	—
	Bushing/Spacer Clearance	0.020 ~ 0.040mm	—	—
	Main Shaft Outer Diameter	25mm $-0.045$ $-0.060$	—	—
	Bushing Spacer Inner Diameter	25mm $+0.010$ $-0.010$	—	—
	Main Shaft/Spacer Clearance	0.045 ~ 0.070mm	—	—
87 – 103	<b>CHASSIS</b>			
	Front Brake Shoe Diameter	110mm	105mm	—
	Rear Brake Shoe Diameter	130mm	125mm	—
	Wheel Run-out Limits Vertical	—	—	2mm
	Wheel Run-out Limits Lateral	—	—	2mm
	Front Fork Spring Free Length	400.5	—	—
	Rear Shock Spring Free Length	215mm	—	—
—	<b>TORQUE VALUES</b>			
	See, also, Torque Chart. Page 42	—	—	—
	Transmission Drain Plug	4.5–5.0kg·m	—	—
	Front Fork Cap Bolt	10kg·m	—	—
	Front Axle Securing Nut	4.0–4.5kg·m	—	—
	Rear Axle Securing Nut	4.5–5.0kg·m	—	—
	Cylinder Head Bolt	2.0kg·m	—	—
	Cylinder Cap Bolt	2.0kg·m	—	—
	Flywheel Securing Nut	4.0–4.5kg·m	—	—
	Clutch Securing Nut	5.8–7.0kg·m	—	—
	Drive Sprocket Securing Nut	5.8–7.0kg·m	—	—
Drive Sprocket Securing Bolt(s)	2.0kg·m	—	—	



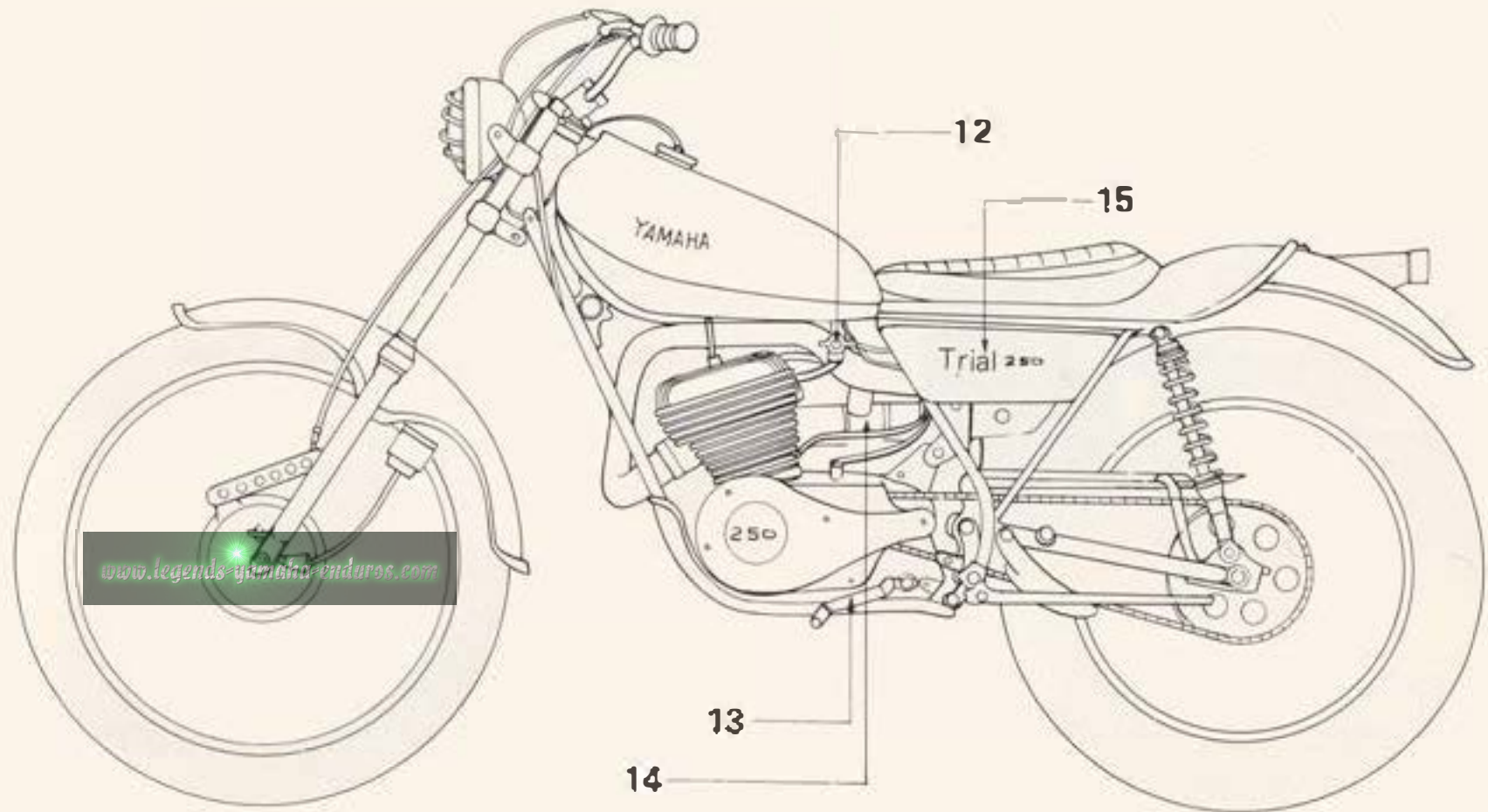
# CHAPTER IV

## IV. NOMENCLATURE

1. Front Brake Lever
2. Rear Brake Pedal
3. Clutch Lever
4. Throttle
5. Kick Crank
6. Kill Switch
7. Headlight On/Off Switch
- Headlight Hi/Lo Switch
8. High Beam Indicator
9. Tool Box
10. Frame Serial Number
11. Engine Serial Number



- 12. Fuel Petcock
- 13. Shift Lever
- 14. Starter Jet Lever
- 15. Autolube Tank



# CHAPTER V

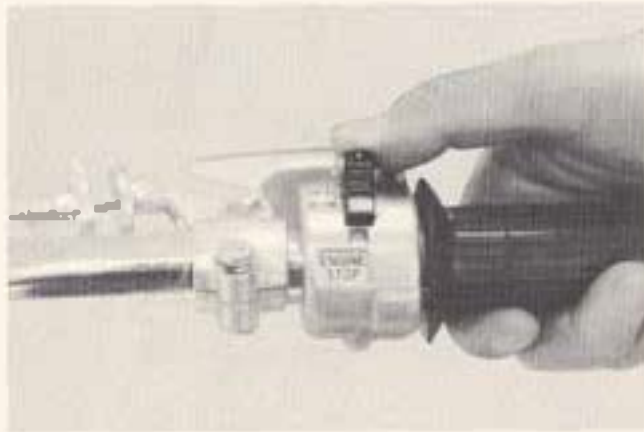
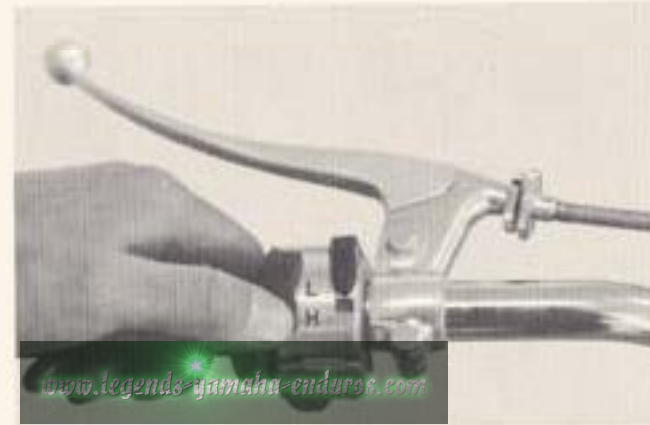
## V. BASIC INSTRUCTIONS

### 1. Control Functions

#### 1. Kill Switch

Make sure that the "kill" switch is on "RUN". The "kill" switch has been equipped to ensure safety in an emergency such as when the motorcycle is upset or trouble takes place in place in the throttle system.

The engine will not start when the "kill" switch is turned to "OFF".

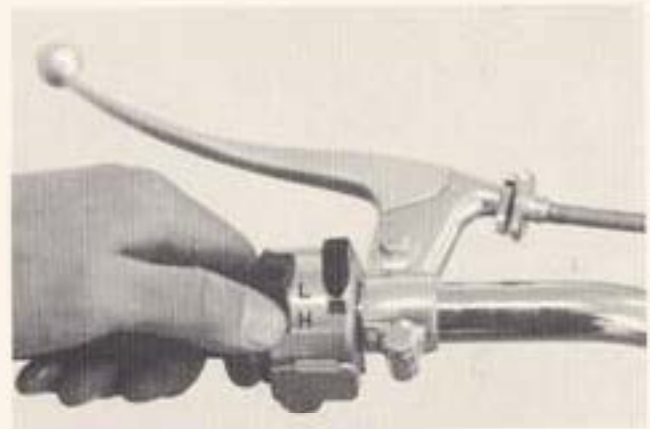


#### 2. Headlight On/Off Switch

The headlight on/off switch is located on the left handle lever assembly R-side. Push the switch forward for on. Pull back for off.

#### 3. Headlight Hi/Lo Switch

The headlight hi/lo switch is located on the left handle lever assembly L-side. Push the switch forward for low beam. Pull back for high.



#### 4. Brake Light Switch

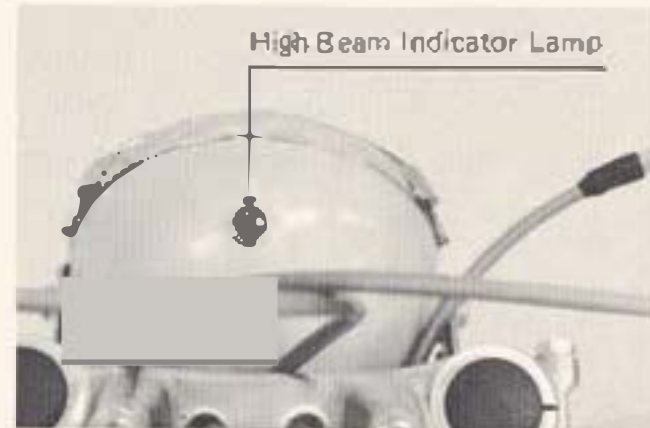
The brake light switch is located on the right-hand side of the machine next to the rear fender, to the rear of the engine.

The switch is connected to the brake pedal and is actuated when the pedal is depressed.



#### 5. High Beam Indicator

Located on top of the headlight shell. The high beam indicator is lit when the headlight high beam circuit is in operation.



#### 6. Autolube Tank

The autolube tank is located below the left side of the seat. A window situated at the lower portion of the tank provides an indication when oil level decreases within the tank. (See Autolube Section for filling instructions.)



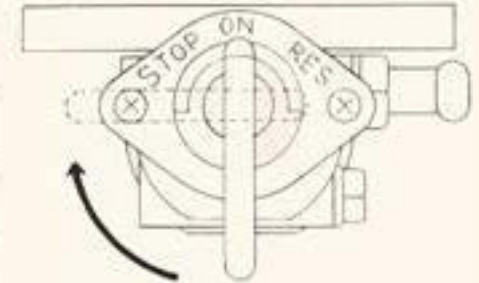


## 7. Fuel Tank and Petcock

The fuel tank incorporates a threaded plastic filler cap. The cap has a vent tube which is routed to the front of the tank and down along a frame down-tube.



The fuel tank petcock is situated to the rear left side of the fuel tank. Turn the petcock lever to the vertical position and fuel will flow to the carburetor. Turn lever to the stop position to shut off fuel supply to the carburetor.



## 8. Front Brake Lever

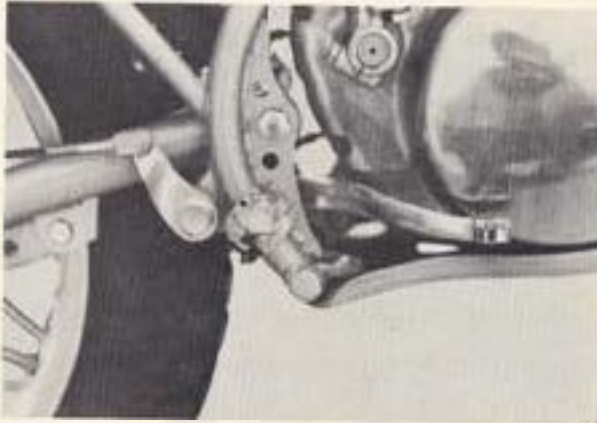
Located on the right handlebar. The front brake lever actuates the single leading-shoe front brake when it is squeezed.





### 9. Rear Brake Pedal

Located directly in front of the rider's right footrest. The rear brake pedal actuates the single leading-shoe rear brake when it is depressed.



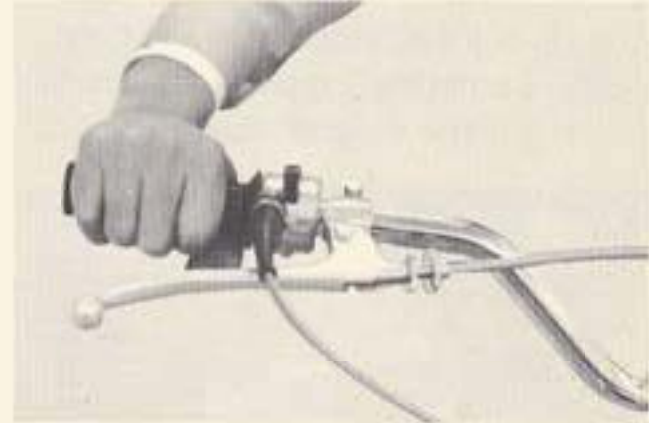
### 10. Clutch Lever

Located on the left handlebar. The clutch lever will disengage the clutch when squeezed.



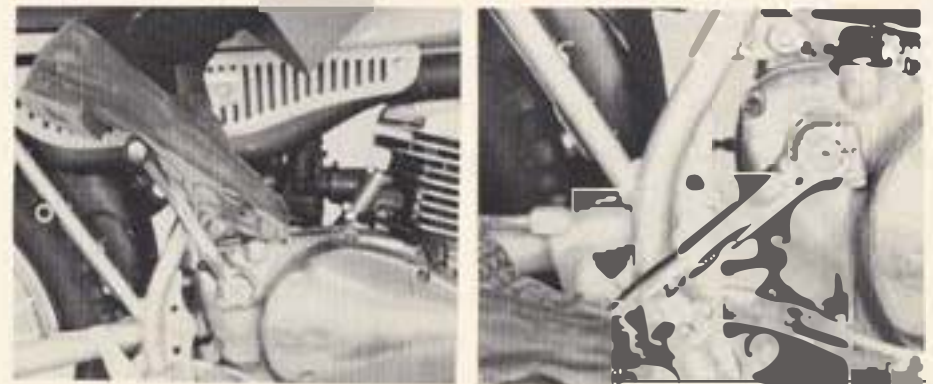
### 11. Throttle

The throttle is the positivereturn type, and is located on the right handlebar.



### 12. Kick Crank

The kick starter crank is located on the right rear side of the engine. Rotate the crank lever out, press your foot upon it firmly, push down until the gears engage the primary drive train and kick briskly to start the engine.



### 13. Shift Lever

The transmission shift lever is located on the left-hand side of the machine directly in front of the rider's footrest. The shift mechanism is of the ratcheting type and controls gear selection for the 5-speed transmission.



### 14. Carburetor Starter Jet

The carburetor starter jet is located on the left side of the carburetor assembly. The jet is designed to supply an extra rich fuel/air mixture for cold engine starts. It is actuated by a lever. Push the lever down to turn the jet on. Always disengage the lever after the engine is running smoothly. Never ride the machine with the lever down.



### 15. Drive Chain Tensioner

The drive chain tensioner is located on the underside of the drive chain midway between the drive and driven sprockets.

The tensioner is designed to remove small amounts of excessive chain slack, thereby reducing the "lurch" caused by rapid throttle changes.



## 16. Chain Oiler

Located on the left arm of the swingarm. The chain oiler allows oil to flow onto the chain when depressed. The filler cap is directly in front of the oiler.

## 2. Gasoline and Oil

### 1. Gasoline

Use gasoline with an octane rating of 86+. Some regular gasolines and most mid-range gasolines have such ratings. High-test or Ethyl grade gasolines usually have octane ratings in excess of 94. In addition, they often have considerable tetra-ethyl lead added, which can cause spark plug problems.

Always use fresh, name-brand gasoline. Low-lead or unleaded gasolines are suitable provided they meet the minimum (86+) octane requirements.

### CAUTION:

*With the autolube feature it is unnecessary and even harmful to the engine to mix oil with the gasoline. Never mix oil with the gasoline. Always use straight gasoline.*

## 2. Oil

### 1) Autolube Oil

We recommend that your first choice be Yamalube which can be purchased from any Authorized Yamaha Dealer. If for any reason you should use another type, the oil should meet or exceed SIA certification "TC-W". Check container top or label for service specification.

### CAUTION:

*Under extremely cold conditions (+32 degrees Fahrenheit or below) some oils become very thick and will not flow as readily to the autolube pump. This may cause oil pump starvation. Yamalube will flow normally to the pump at ambient temperatures down to zero degree Fahrenheit.*



### 3. Autolube Tank

Always check Autolube tank oil level before operating machine. If oil level shows at sight glass window:

- 1) Remove side cover.



- 2) Unscrew wing nut holding tank to frame.



- 3) Rotate hinged tank away from frame and remove cap.



- 4) Top off tank. Re-install side cover.

### 4. Chain Oiler

The filler cap is located on the left-hand side of the swing arm. Remove the cap and top off with recommended oil. See lubrication Intervals for type.

## 5. Transmission

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



### NOTE:

Be sure the machine is level and on both wheels.

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

Recommended Oil: Motor Oil,  
SAE 10W-30wt.  
Type "SE".

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

Transmission Drain Plug Torque:  
4.5 ~ 5.0 kgm (400 ~ 440 in-lbs.)

Transmission Oil Quantity: 1000 cc (1.0 qts.)

Transmission oil should be replaced several times during the breakin period. If the unit is used for competition, oil replacement should also be often. See Maintenance Chapter.

### 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 severe clutch slippage.*



# CHAPTER VI

## OPERATION

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### CAUTION

1. Before riding this motorcycle, become thoroughly familiar with all operating controls and their function.  
Consult your Yamaha dealer regarding any control or function you do not thoroughly understand.
2. This model is designed for competition use only. It is not equipped with U.S. Government approved lighting, mirrors, horn or directional signals. In most instances, it is illegal to ride this model (either day or night) on any public street or highway.

## 1. Pre-Operation Check Chart

ITEM	ROUTINE	PAGE
BRAKES	Check operation/adjustment	22
CLUTCH	Check operation/lever adjustment	2 2-23
AUTOLUBE TANK	Check oil level/top-off as required	15
TRANSMISSION	Check oil level/top-off as required	16
DRIVE CHAIN	Check alignment/adjustment/lubrication	14.82.83.84
SPARK PLUG(S)	After break-in check color/cond'n weekly/500 miles	28.29
THROTTLE	Check for proper throttle and autolube cable operation	85
AIR FILTER	Foam type - must be clean and damp w/oil always	39-40
WHEELS & TIRES	Check pressure/runout/spoke tightness/axle nuts	87-95
FITTINGS/FASTENERS	Check all - tighten as necessary	—
LIGHTS/SIGNALS	Check headlight/tail - stop lights	104-109

Pre-operation checks should be made each time the machine is used. Such an inspection can be thoroughly accomplished in a very short time; and the added safety it assures is more than worth the time involved.

## 2. Starting and Operation

### **CAUTION:**

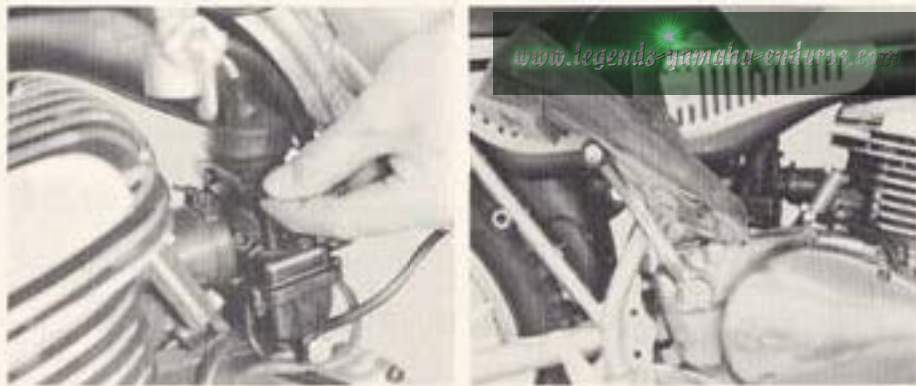
*Prior to operating the machine, perform steps listed in preoperation check list.*

Turn fuel petcock lever to open (vertical) position.

Check ignition kill button. Kill button must be in fully extended position to complete ignition circuit.

### 1. Starting Cold

Depress the starter lever. Keep the throttle completely closed. Engage the kick starter and start the engine.



### 2. Starting with Engine Warm

Do not engage starter lever. Open throttle slightly (1/4 turn). Engage the kick starter and start the engine.

### 3. Warm-up

Run the engine at idle or between idle and 1/8th throttle using the starter lever as required until the engine is warm.

This procedure normally takes 2 to 3 minutes. To check, see if the engine responds normally to throttle with starter lever off.

### **CAUTION:**

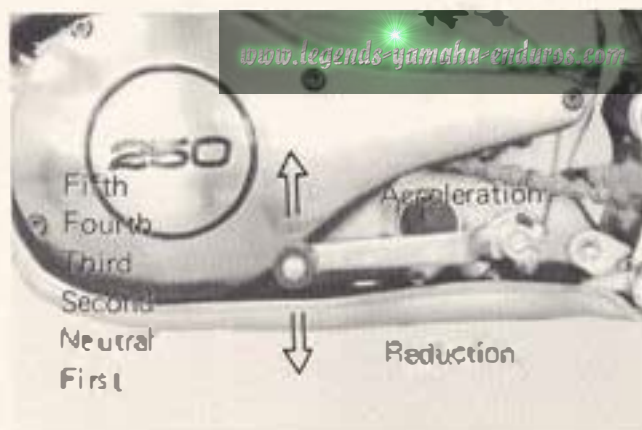
*See "Break-in Section" prior to operating engine for first time.*

### **NOTE:**

The kick mechanism is of the primary type. Therefore, the engine may be started in any gear provided clutch is disengaged. The engine may be started in neutral with clutch engaged or disengaged.

#### 4. Shifting

A 5-speed transmission is employed. Low gear is at the bottom of the shift pattern; high gear at the top of the shift pattern; neutral is located half-way between first and second positions.



The shift mechanism is of the ratcheting type common to most motorcycles. Allow the lever to return to its "at rest" position prior to selecting another gear. Neutral is selected by pulling up or depressing on the shift lever halfway between first and second gears.

With the engine running in the neutral position, disengage the clutch (pull in clutch lever), press down on the shift lever until low gear is engaged, remove foot from shift lever, increase engine speed slightly, slowly release clutch lever while advancing throttle. Repeat procedure for remaining gears.

Except during competition, shift the transmission when engine speed is approximately 3,000 to 4,000 rpm. This can be interpreted as approximately one-half throttle. (See "Break-In").

#### **WARNING**

*Model TY250A is not equipped with highway approved lighting. This model is designed solely for competition use and should not be used on streets or highways at any time. In most instances, it is illegal to drive this model on any public streets or highways.*



### 3. Break-In Procedure

You must not put an excessive load on the engine during the first ten to twenty hours of operation. If speedometer mileage is maintained, use the following break-in procedure:

0 to 50 miles

Avoid operation above one half throttle.

50 to 100 miles

Avoid full throttle operation. Allow the motorcycle to rev freely through the gears but do not use full throttle at any time.

100 to 250 miles

Avoid prolonged full throttle operation. Avoid cruising speeds in excess of one half throttle. Vary speeds occasionally.

250 miles and beyond

Avoid full throttle operation. Avoid cruising speeds in excess of 60 mph.

# CHAPTER VII

## VII. MECHANICAL ADJUSTMENTS

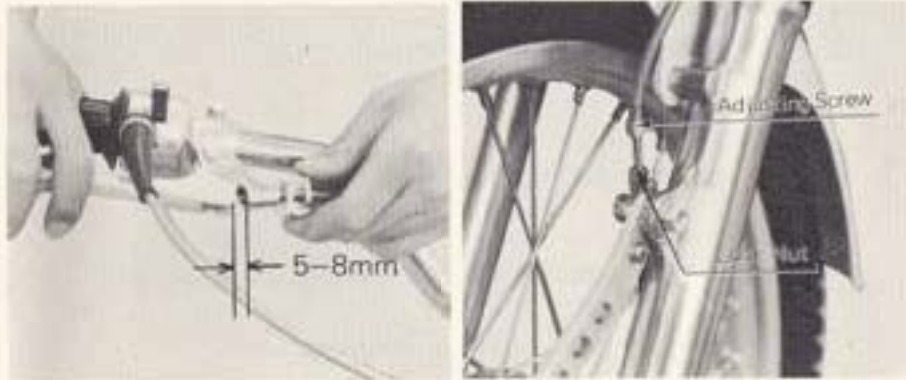
### 1. Brakes

#### 1. Front Brake

Front brake should be adjusted to suit rider preference with a minimum cable slack of 5 ~ 8 mm play at the brake lever pivot point.

Adjustment is accomplished at one of two places; either the handle lever holder or the front brake hub.

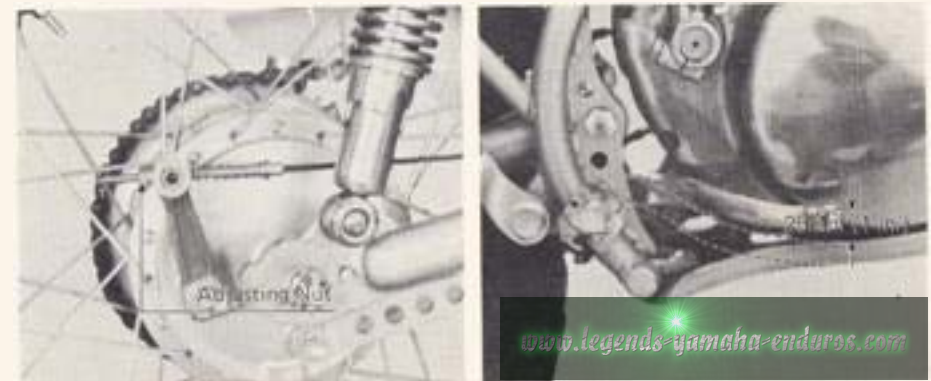
- 1) Loosen the adjuster locknut.
- 2) Turn the cable length adjuster in or out until adjustment is suitable.
- 3) Tighten the adjusting bolt locknut.



#### 2. Rear Brake

Adjust rear brake pedal play to suit, providing a minimum of 25mm freeplay. Adjustment is accomplished as follows:

- 1) Using a 10mm wrench, turn the adjustment nut on the rear brake ferrule in or out until brake pedal freeplay is suitable (25mm minimum freeplay).



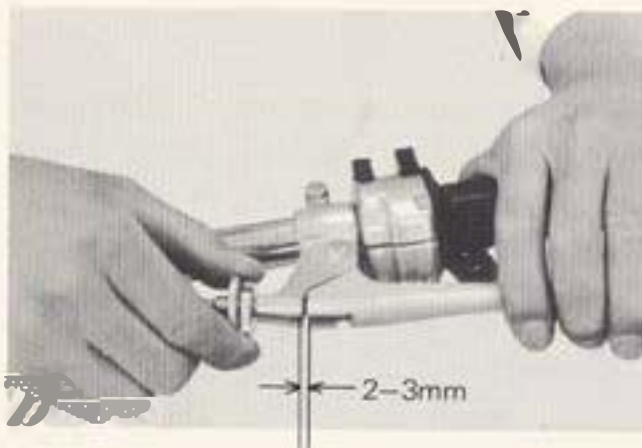
#### NOTE:

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

#### 2. Clutch Adjustment

Proper clutch adjustment requires two separate procedures.

1. Loosen cable, adjust screw locknut.
2. Turn clutch cable adjuster (at lever) all the way into the lever.

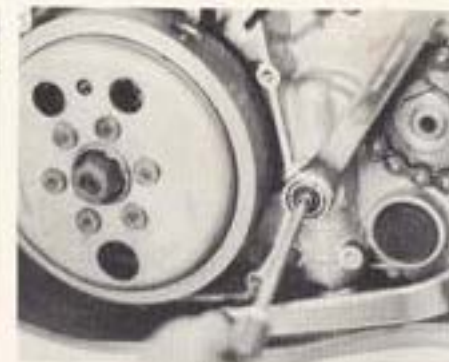


**NOTE:**

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

3. Remove left crankcase side cover. If necessary, remove shifter lever.
4. Loosen adjuster locknut.

Using a Philips screwdriver, turn adjust screw in or out until clutch arm (located under the engine directly below the adjust screw), is directly in line with the main axle center line.



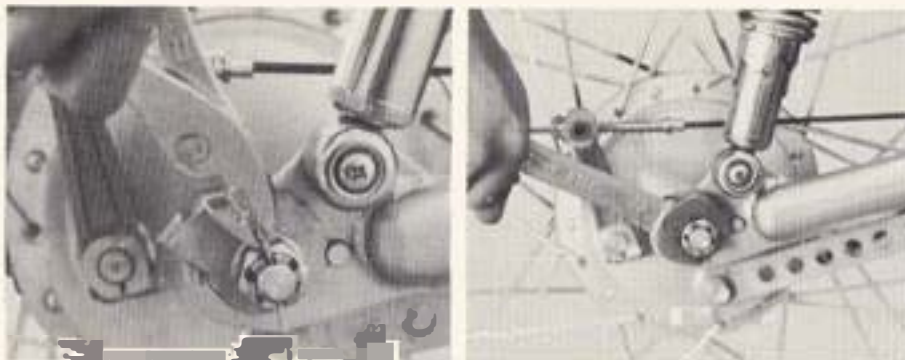
5. Tighten locknut
6. At clutch lever assembly, left handlebar, turn cable length adjuster in or out until freeplay at lever pivot equals 2 ~ 3 mm
7. Tighten adjusting bolt locknut.
8. Re-install side cover.
9. Re-install shifter lever.

### 3. Drive Chain Adjustment

To adjust drive chain, proceed as follows:

1. Remove rear axle cotter pin.
2. Loosen rear axle securing nut.





3. With rider in position on machine, both wheels on ground, set axle adjusters until there is 3/4 to 1 inch slack in the drive chain at the bottom of the chain at a point midway between the drive and driven axles.
4. Turn cam adjusters both left and right until axle is situated in same cam slot position.
5. Tighten the rear axle securing nut.

Axle Nut Torque: 4.5 – 5.0 kg-m (400 – 440 in.-lbs.)



6. Install a new cotter pin, bend the ends.



7. Check brake light operation and brake pedal free play.

**CAUTION:**

*Whenever the chain is adjusted and/or the rear wheel is removed, always check during reassembly:*

1. *Rear axle alignment*
2. *Brake pedal free play*
3. *Stop light operation*

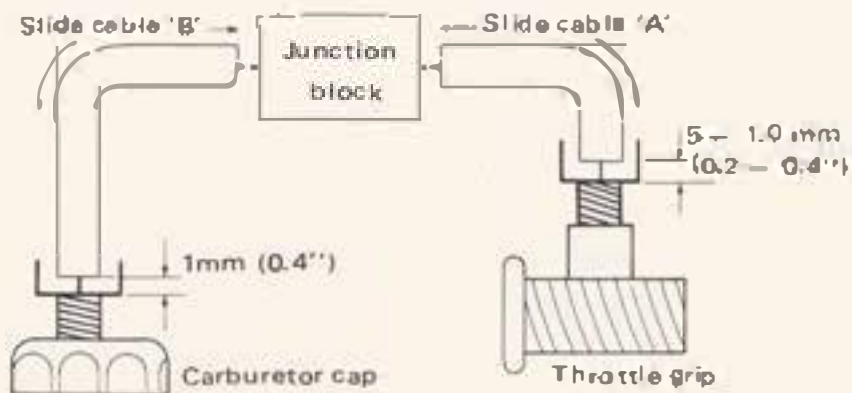
#### 4. Carburetor

Under normal operating conditions, there are only three adjustments to be made to the carburetor.



## 1. Throttle cable adjustment:

- 1) Lift the rubber mixing chamber
- 2) Grasp outer cable housing. Lift up. Slack should equal 1mm. If slack is incorrect, loosen adjusting bolt locknut and turn adjusting bolt in or out as required to achieve correct slack. Tighten adjusting bolt locknut. Re-install cap cover.
- 3) Grasp throttle cable housing at throttle lever on right handlebar. Pull out. Slack should equal 1mm. If not, loosen cable length adjuster locknut and adjust cable length accordingly.



- 4) Tighten adjuster locknut.

## 2. Idle speed and idle air adjustments:

- 1) Turn idle air screw in until lightly seated.

- 2) Back out 1½ turns.



- 3) Turn idle speed adjust screw until idle is approximately 1050 to 1150 rpm.



Idle Air Screw: 1½ turns out  
Idle Speed: 1050 - 1150 r.p.m.

**NOTE:**

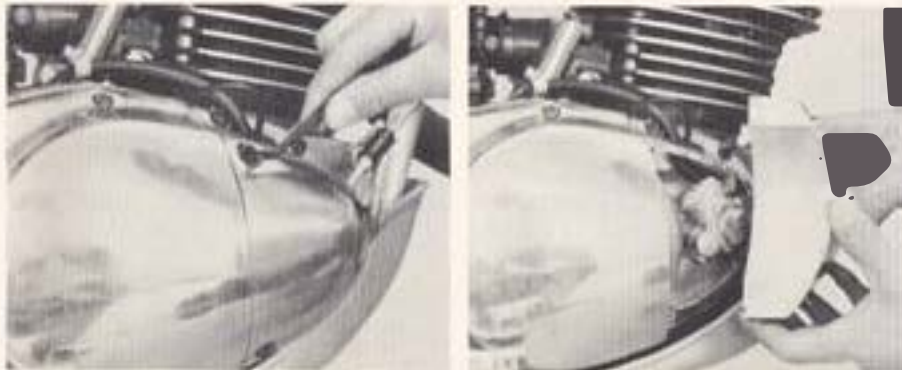
Idle air mixture and idle speed adjustment screws should be so adjusted that engine response to throttle changes from idle position is rapid and without hesitation.

- 4) If the engine, when warm, hesitates or "bogs", after adjusting as described, turn idle air mixture screw in or out, in 1/4 turn increments, until bogging problem decreases. Readjust idle speed, recheck throttle cable slack.

**5. Adjusting Autolube**

**1. Cable Adjustment**

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

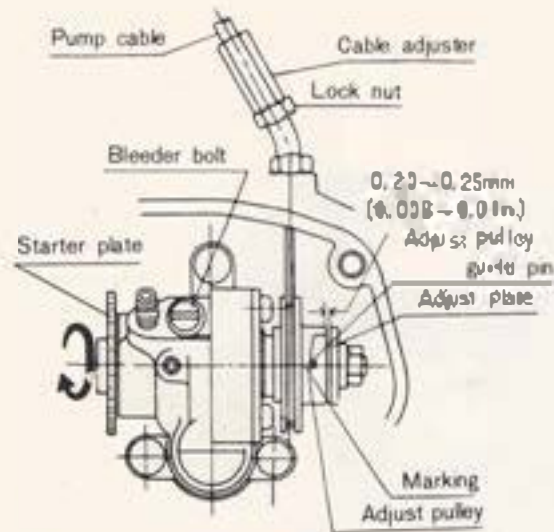


- 2) Rotate throttle until all slack is removed from all cables. Hold this position.

- 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 adjuster lock nut on upper edge of crankcase cover and adjust cable length until alignment is achieved. Tighten adjuster locknut.



## 2. Pump Stroke Adjustment

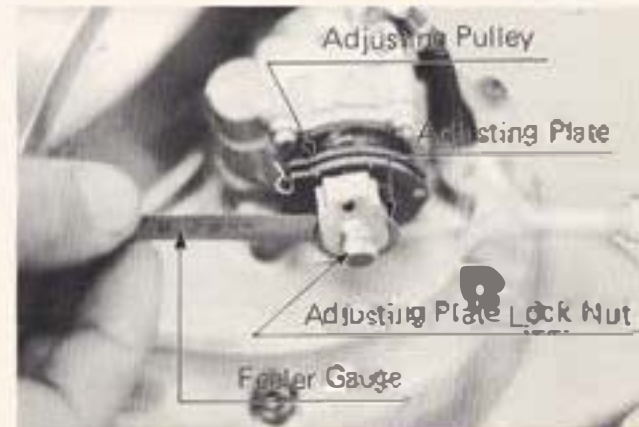
### NOTE:

Autolube pump stroke adjustment requires special tool. This tool, Autolube Pump Feeler Gauge, may be purchased from your Authorized Yamaha Dealer.

- 1) 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 cable pulley and pump stopper plate. Clearance should equal 0.20 to 0.25 mm. If clearance is incorrect, remove adjust plate locknut and adjust plate.



Minimum Pump Stroke: 0.20 – 0.25 mm  
(0.008 – 0.010 in.)



- 3) Remove or add an adjustment shim as required.



- 4) Re-install adjust plate and locknut. Tighten the locknut. Re-measure gap. Repeat procedure as required.



## 6. Spark Plug

The spark plug in your machine 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, then a plug white, a hotter heat range might be required. This situation is quite common during the engine break-in period.

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

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

Your machine is equipped with a relatively hot spark plug to insure clean, smooth, low speed operation. If the machine is to be



operated at higher R.P.M. ranges for extended periods, install the next colder spark plug.

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 Gap: 0.20 ~ 0.24 in.  
(0.5 ~ 0.6 mm)

It is alright for you, as the owner, to exchange the standard plug. 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.

Standard Spark Plug: B-7ES

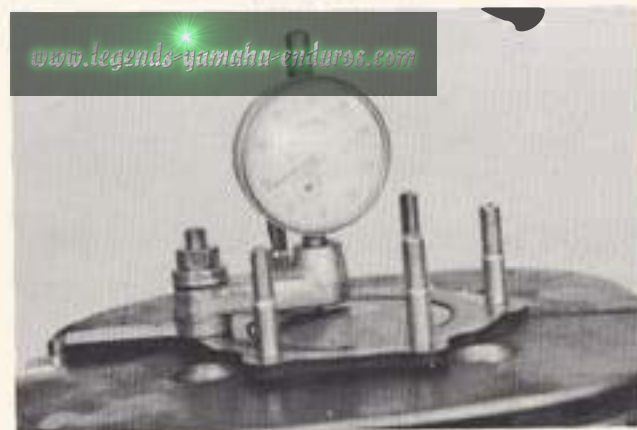
When installing the plug, always clean the gasket surface, use a new gasket. Wipe off any grime that might be present on the surface of the spark plug, torque the spark plug properly.

Spark Plug Tightening  
Torque: 230 ~ 250 in-lbs.

## 7. 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 cylinder head.
- 2) Insert dial gauge stand and dial gauge



- 3) Remove engine crankcase left cover to gain access to contact breaker assembly (ignition points).
- 4) Connect red lead of Point Checker to black wire in wire harness coming from magneto. Deactivate "kill" switch.
- 5) Connect red lead of point checker to unpainted surface of cylinder fin or crank case bolt or screw.

- 6) Rotate magneto flywheel until piston is at top-dead-center (TDC). Tighten set screw on dial gauge stand to secure dial gauge assembly. Set the zero on dial indicator needle. Rotate flywheel back and forth to be sure that indicator needle does not go past zero.
- 7) Starting at TDC, rotate flywheel clockwise until dial indicator reads approximately 3.1 mm (0.12") before top-dead-center (BTDC).
- 8) Slowly turn flywheel counterclockwise until gauge indicates correct timing figure. At this time, the ohmmeter needle should swing from "CLOSED" to "OPEN" position, indicating the contact breaker (ignition points) have just begun to open.



Ignition Timing:  $3.1 \pm 0.15$  mm B.T.D.C.

- 9) Repeat step 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 Phillips-head screw and carefully rotating contact breaker assembly with a slotted screwdriver until point checker indicates points "OPEN". Re-tighten Phillips-head screw. Repeat steps 6 thru 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.

Maximum Allowable Point Gap: 0.4 mm



**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 the fixed point bracket to decrease maximum point gap. This will only result in point misalignment, difficulty in setting timing and premature point failure. See "Magneto Flywheel Removal" for point replacement procedure.

- 12) Remove dial gauge assembly and dial gauge stand. Replace cylinder head.

Cylinder head nut Torque: 2.0 Kg-m  
(175 in-lbs.)



Disconnect point checker.  
Replace engine crankcase cover.



# CHAPTER VIII

## VIII. MAINTENANCE AND MINOR REPAIRS

The following sections provide information for the disassembly, troubleshooting and maintenance of various components of the motorcycle. If you do not have the necessary tools and an understanding of the mechanical principles involved, please refrain from attempting repairs. The use of improper tools and/or procedures can cause major damage to the unit with resultant additional repair costs.

To properly understand the procedures outlined we suggest you consult the DT250A/360A Service Manual (1974) and the various other technical publications produced by Yamaha Motor Company or Yamaha International Corporation.

Finally, we suggest you consult your Yamaha Dealer prior to attempting any repair procedures. This is particularly important during the first ninety days the machine is in use.



## PERIODIC MAINTENANCE INTERVALS

Page	Item	www.legends-yamaha-enduros.com	Remarks	Initial (miles)		Thereafter every (miles)	
				250	500	500	1,000
22	Brake System (Complete)	A L S ● P R E O P  C H K	Chk/Adj. as required-Repair as required	0		0	
22. 23	Clutch		Check/Adjust as required	0		0	
28. 29	Spark Plug		Inspect/Clean or replace as required	0	0	0	
87-95	Wheels and Tires		Pressure/Spoke Tension/Runout	0	0	0	
—	Fittings and Fasteners		Tighten before each trip	0	0	0	
85	Grip wire		Cable Oper/Adj. (incl. Autolube)	0	0		0
82-85	Drive Chain		Tension/Alignment	0	0	0	
16	Transmission Oil Level Check		Includes Trans./Autolube Tank (See Note #1)	0	0	0	
39. 40	Air Filter		Foam Type (See Service Notes #2 & #4)	0	0	0	
11	Fuel Petcock		Clean/Flush Tank as required	0	0		0
29.30.31	Ignition Timing	Adjust/Clean/Replace points as required		0		0	
24.25.26	Carburetor Adjustment	Check Operation/Synch./Fittings		0		0	
41-48	Carburetor Overhaul	Clean/Repair as required/Refit/Adjust		0		0	
56-57	Cylinder Compression	Preventive Maintenance Check		0		0	
—	Decarbonize Engine	Includes Exhaust System		0		0	

### SERVICE NOTES:

- #1. Check Autolube tank level before each ride. Top off when oil level shows at the sight glass or before any prolonged use. See "Lubrication Intervals" for type of oil to use.
- #2. Foam elements air filters must be damp with oil at all times to function properly. Remove, clean, and oil filter at least once per month or every 250 ~ 500 miles; whichever occurs first. (If extremely hard usage, such as dirt riding, clean and lube daily.) See "Lubrication Intervals" for additional details.
- #3. Pre-operational checks should be made each time the machine is used. Such an inspection can be thoroughly accomplished in a very short time, and the added safety it assures the rider is more than worth the minimal time involved.
- #4. For additional information regarding drive chain, transmission oil level, wet-type air filter, see "Lubrication Intervals".

# LUBRICATION INTERVALS

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Page	Item	Remarks	Type	Period					
				Initial (miles)			Thereafter every (miles)		
				250	500	1,000	500	1,000	
26-28	Autolube	P R E O P C H K	See Service Notes	#1	See Service Notes				
16	Trans. Oil		Warm Engine Before Draining	#2	0	CHK	0	CHK	0
82-85	Drive Chain		Lube/Adjust as required	#3	See Service Notes				
82-85	Drive Chain		Remove/Clean/Lube/Adjust	#3	0		0		
39, 40	Air Filter		Foam Type	#9	See Service Notes				
-	Throttle Grip & Housing		Light Application	#6	0				0
103	Rear Arm Pivot Shaft		Zirc-Apply Until Shows	#6			0		0
-	Brake Pedal Shaft		Light Application	#5			0		0
-	Change Pedal Shaft		Light Application	#5			0		0
95, 96, 97	Front Forks	Drain Completely-Ck Specs	#3		CHK	0		0	
-	Steering Ball Races	Inspect Thoroughly/Med. Pack	#7			0		0	
-	Point Cam Lubr. Wick	Very Light Application	#8			0		0	
-	Wheel Bearings	Do not Over-Pack	#7			0		0	

#1. Check tank level before each ride. Top off when oil level is at sight glass or before any prolonged use. Use the following lubricant in order of preference:

Yamalube, or two-stroke oil labeled "BIA certified for service TC-W"

#2. At ambient temperatures of 45-90°F, use 10W/30 "SE". Do not use "additives" in oil.

#3. Use 10W/30 "SE" motor oil. (If desired, specialty type lubricants of quality manufacture may be used.)

"Drive Chain"—Lube every 150-200 miles. If severe usage, every 50-100 miles or after every event.

#4. Use graphic base type (specialty types available—use namebrand, quality manufacturer).

#5. Light duty: smooth, lightweight, "White" grease. Heavy duty: standard 90wt. lube grease (do not use lube grease on throttle/housing).

#6. Use standard 90wt. lube grease—smooth, not coarse.

#7. Medium-weight wheel bearing grease of quality manufacturer—preferably waterproof.

#8. Lightweight machine oil.

#9. Air filters—foam element air filters must be damp with oil at all times to function properly. Clean and lube monthly or per mileage. If hard usage, clean and lube daily. Do not over-oil. Use SAE 10W/30 "SE".

## Maintenance and Lubrication Intervals

These charts 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. If you are in doubt as to how closely you can follow these time recommendations, check with the YAMAHA dealer in your area.

## Competition

The serious competitor will no doubt already have a maintenance and lubrication schedule of his own. However, until one can be established according to individual usage, we suggest the following:

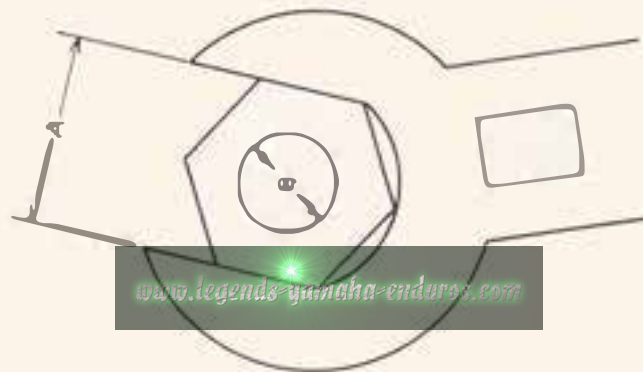
1. Cut the mileage recommendations by one-half. If no speedometer; estimate 10.15 mph average speed.
2. Immediately preceding each competition, pay particular attention to the following:
  - 1) A thorough pre-operation check.
  - 2) Clean and lubricate air filter.
  - 3) Lubricate all controls, cables and rear arm pivot.
3. Every other competition, perform the steps outlined in No. 2, and:
  - 1) Disassemble top end and inspect.
  - 2) Replace piston rings.
  - 3) Decarbonize as required.
  - 4) Service carburetor.
  - 5) Replace transmission oil.
  - 6) Check front fork operation and steering adjustment.
  - 7) Remove chain: clean, oil and re-install.
  - 8) Remove wheel assemblies and service brakes.
  - 9) Check rear shock and swing arm operation.
- 10) Adjust Autolube pump stroke and cable.



## Torque Specifications

The list below 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 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 (NUT)	B (BOLT)	TORQUE SPECIFICATION		
		Kg.m	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	500~600
30mm	20mm	7.0~8.3	50~60	600~700
SPARK PLUG		2.7~2.9	19~21	230~250

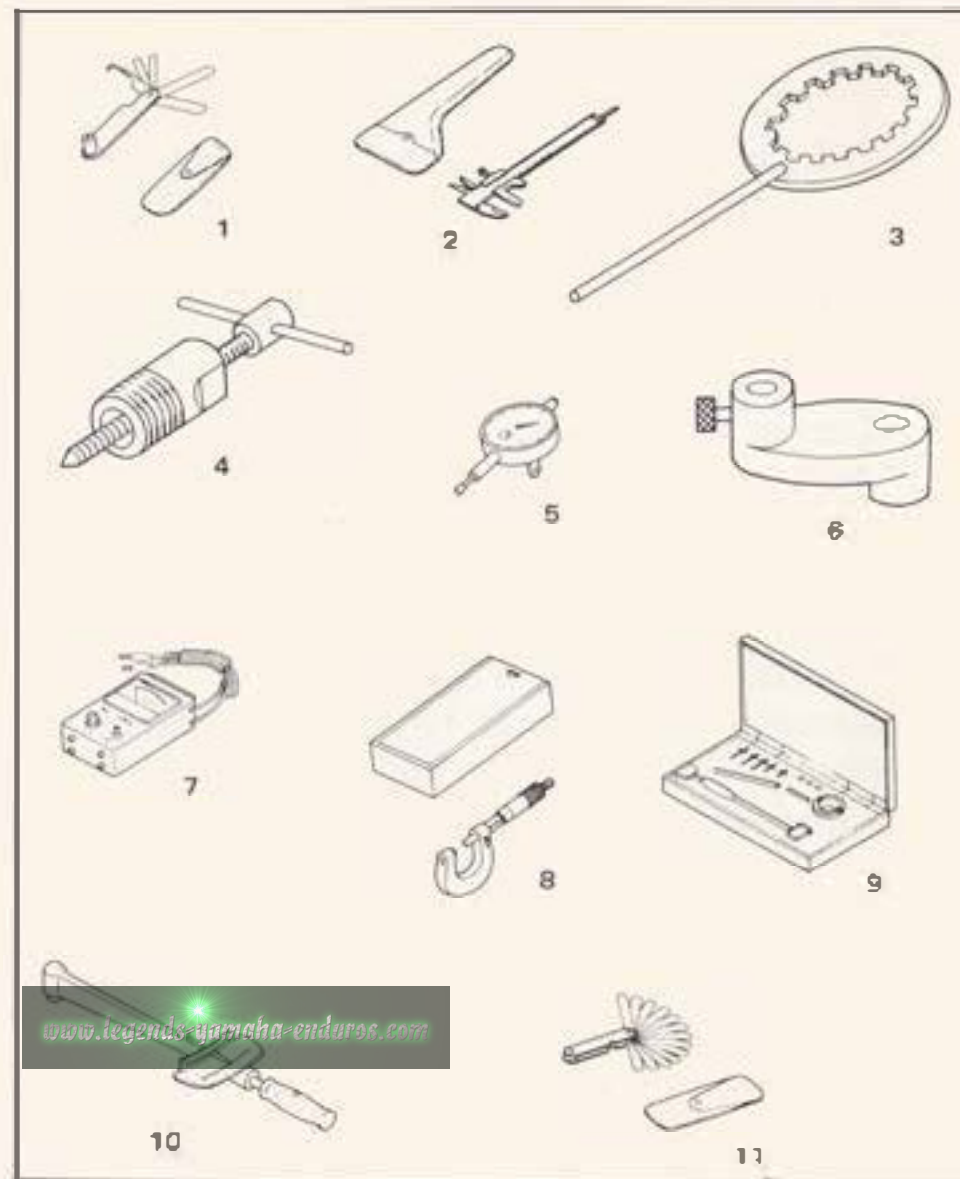


## Tools

The Owner's Tool Kit supplied with the machine provides the minimum tools required for emergency repairs and minor maintenance. The maintenance procedures outlined within this manual require additional special tools and instruments. A comprehensive list of the special tools is given below. For your convenience, we have also included a list of additional recommended hand tools and supplies.

## Special Tools and Instruments

- \*1. Autolube Feeler Gauge
- \*2. Vernier Calipers (0-150mm)
- \*3. Clutch Holding Tool (DT1)
- \*4. Magneto Flywheel Puller (YG1)
- \*5. Dial Gauge (mm)
- \*6. Dial Gauge Stand
- \*7. Point Checker (or continuity checker)
- \*8. Outside Micrometer (50-75mm)
- \*9. Cylinder Gauge (50-100mm)
- 10. Torque Wrench (0-10 Kg-m or 0-600 in lb)
- 11. Feeler Gauge Set



### \*NOTE:

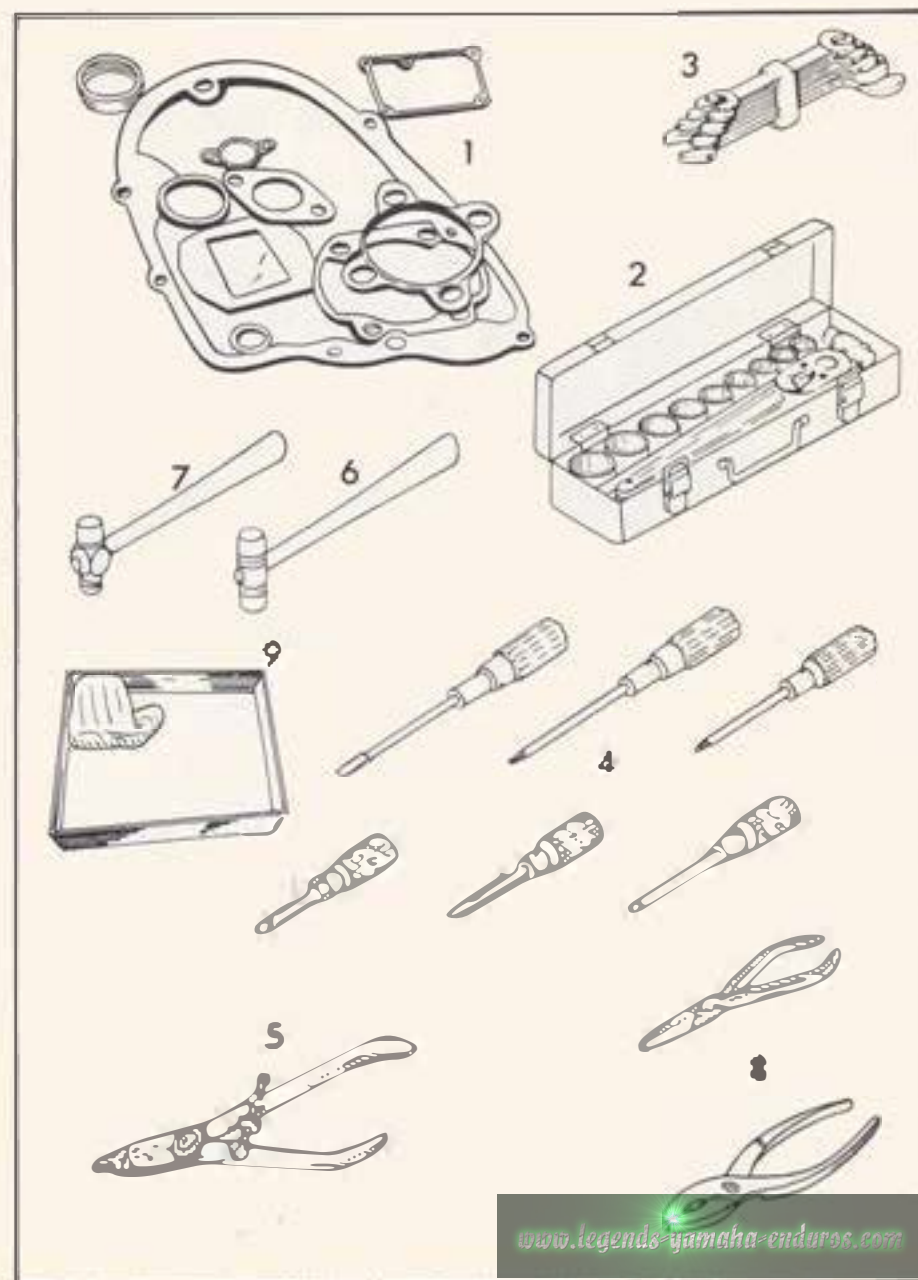
Those items marked with asterisk (\*) are available from your Yamaha dealer.

## General Tools and Materials

1. TY250A Gasket Kit
- \*2. Socket Wrench Set (mm)
- \*3. Combination Wrench Set (mm)
4. Selection of Phillips and Standard Screwdrivers
5. Circlip Pliers (outside)
6. Soft-faced Hammer
7. Steel Hammer
8. Selection of pliers and wire cutters
9. Several Parts Trays and Shop Rags

### \*NOTE:

See torque chart for sizes required.

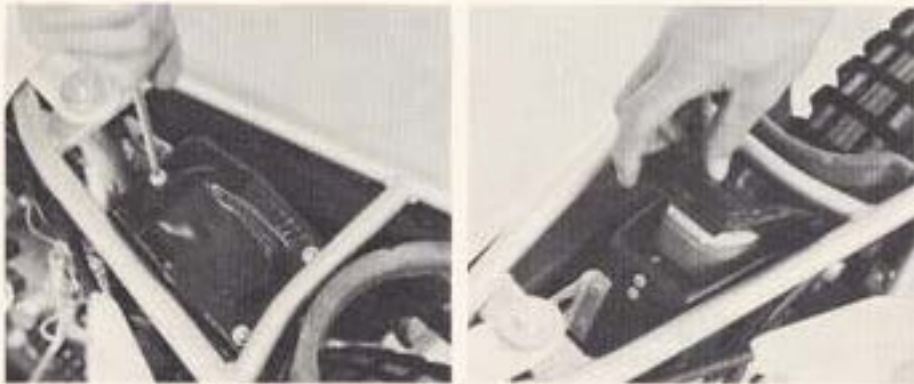


## Air Filter

1. Remove the seat securing bolt. Remove the seat.



2. Remove the Pan-head screws (3) holding the air filter case cover in place. Remove the cover.



3. Remove the air filter element assembly.



4. Slip the element off the wire mesh guide.





5. Wash the element gently, but thoroughly, in solvent.
6. Squeeze excess solvent out of element and dry.



7. Pour a small quantity of motor oil onto filter element and work thoroughly into the porous foam material.

**NOTE:**

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

8. Re-insert the wire mesh filter element guide into the element.

9. Coat the upper and lower edges of the filter element with 90wt. lube grease. This will provide an air-tight seal between the filter case cover and filter seat.
10. Re-install the element assembly, case cover and seat.

**NOTE:**

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

**CAUTION:**

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



## Carburetor

1. Turn fuel petcock lever to the "OFF" position.
2. Remove the gasoline tank fuel line from fitting at carburetor.



3. Loosen the manifold and inlet joint bands (hose clamps) on front and rear of carburetor.

### NOTE:

Main jet can be easily removed without dismounting carburetor.



Main Jet: # 114

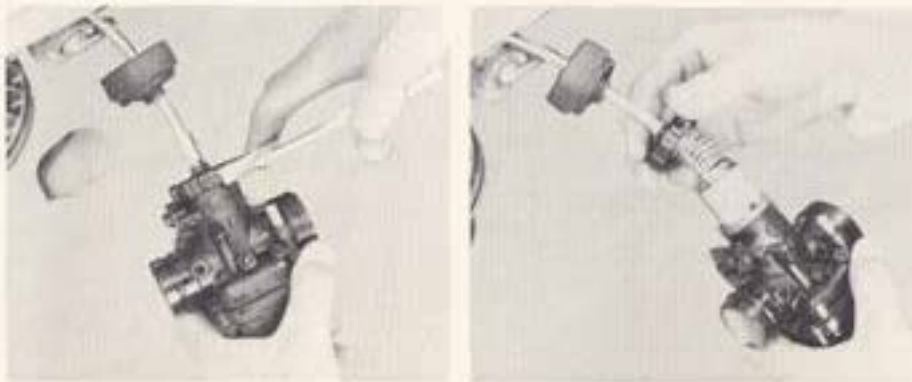
4. Push the air cleaner joint (hose) off the carburetor inlet.
5. Rotating the carburetor body, work it off the cylinder manifold joint.



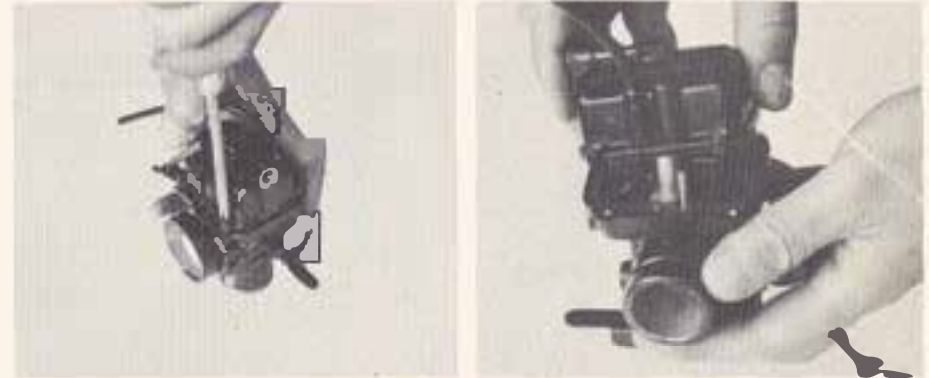
6. Noting the presence, location and routing of all vent and overflow tubes, pull the carburetor toward you.
7. With the carburetor clear of the engine, push the mixing chamber cover off.



8. Unscrew the mixing chamber top. Remove the side and needle assembly.



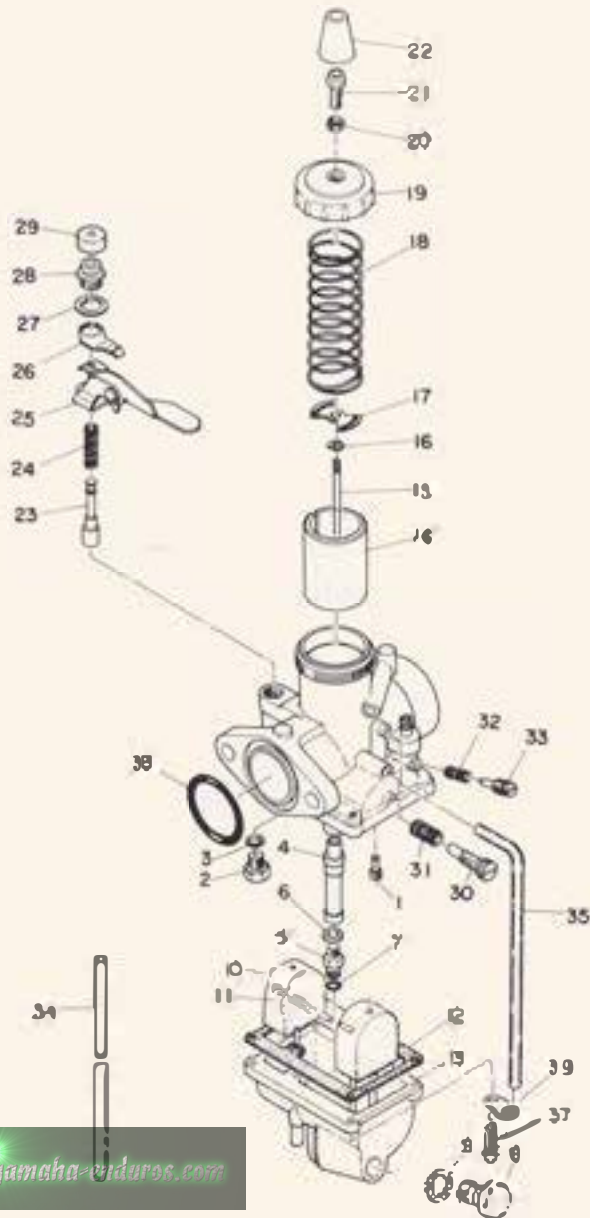
9. Remove the pan-head screws (4) holding float chamber body.



10. Remove dual float. If fuel has entered a float, replace it. If a pin is loose or missing, or if the float is damaged in any fashion, replace.
11. On the carburetor body, remove the pin securing the float arm. Remove dual float ass'y.

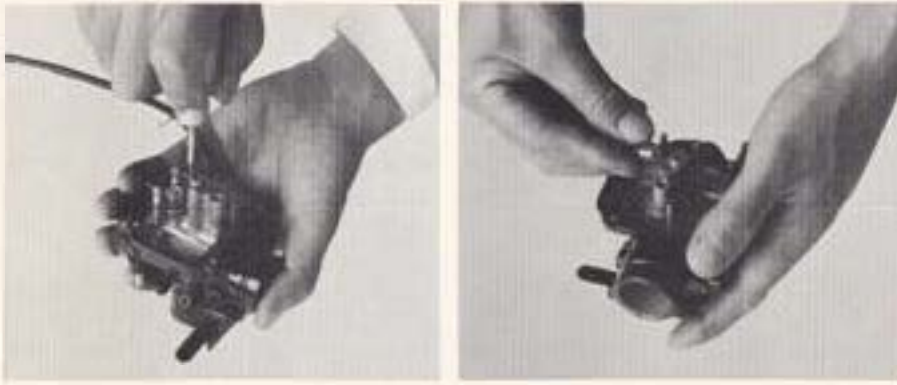


## CARBURETOR



- |                           |                          |
|---------------------------|--------------------------|
| 1. Pilot Jet              | 20. Adjusting Wire Nut   |
| 2. Valve Seat Ass'y       | 21. Adjusting Wire Screw |
| 3. Valve Seat Washer      | 22. Cap                  |
| 4. Main Nozzle            | 23. Starter Plunger      |
| 5. Needle Jet Setter      | 24. Plunger Spring       |
| 6. Main Jet Washer        | 25. Starter Lever        |
| 7. O-ring                 | 26. Starter Lever Plate  |
| 8. Main Jet               | 27. Starter Lever Washer |
| 9. Gasket                 | 28. Plunger Cap          |
| 10. Float                 | 29. Plunger Cap Cover    |
| 11. Float Pin             | 30. Throttle Screw       |
| 12. Float Chamber Gasket  | 31. Throttle Stop Spring |
| 13. Float Chamber Body    | 32. Air Adjusting Spring |
| 14. Throttle Valve        | 33. Air Adjusting Screw  |
| 15. Needle                | 34. Over Flow Pipe       |
| 16. Clip                  | 35. Breather Pipe        |
| 17. Spring Seat           | 36. Plate                |
| 18. Throttle Valve Spring | 37. Pan Head Screw       |
| 19. Top Mixing Chamber    | 38. O-ring               |

12. Remove the inlet needle directly beneath the float arm tang. Inspect the needle and seat for signs of excessive wear or attached foreign particles. Replace as required. Always replace inlet needle and inlet valve seat as an assembly.



13. Remove, in order, the following components:

- 1) Pilot Jet



- 2) Main Nozzle (push from bottom through venturi).



- 3) Throttle Screw (Idle Speed Screw)  
4) Air Adjusting Screw (Idle Mixture Screw)



14. Push down on the starter jet lever to open the circuit.
15. Wash the carburetor in petroleum-base solvent. Wash all associated parts.

**NOTE:**

It is rarely necessary to "boil" the carburetor in a warm or hot carburetor bath.

16. Using high pressure air, blow out all passages and jets.



**NOTE:**

Never direct high pressure air into carburetor with float bowl installed.  
Damage to float assembly may occur.

17. Re-install all components.  
Using a vernier caliper, measure the float height from the top of the float to the float chamber gasket seat. (gasket removed).



Float Height:	21 mm
---------------	-------

**NOTE:**

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

To correct float height, remove the arm and bend the tang a slight amount as required.  
Correct as required.

18. Install the float chamber body.
19. Moving to machine, push needle out of seat in throttle valve (slide). Inspect for signs of bending, scratches or wear. Replace as required.



20. Check needle clip position. Clip position is counted starting with the first clip groove at the top of the needle.

Jet Needle Type:	5C92 - 4
Clip Position:	4

21. Check throttle valve (slide) for signs of wear. Insert into carburetor body and check for free movement. If slide, or body, is out-of-round, causing slide to stick, replace.

22. Install throttle valve and needle assembly in carburetor mixing chamber. Tighten mixing chamber top as tight as possible by hand. Do not use pliers or vice-grips as they may deform the mixing chamber chape, causing the throttle valve to stick during operation.
23. Install the mixing chamber top cover and all overflow and vent tubes. Reinstall carburetor. Check position and routing of all tubes. Check tightness of all fittings. Make sure carburetor is mounted in a level position.
24. After installation, re-adjust throttle cable and Autolube pump cable per directions in "Mechanical Adjustments."

## Troubleshooting

A Trials machine requires immediate, predictable throttle response over a wide operating range. Cylinder porting, combustion chamber compression, ignition timing, muffler design, carburetor size and component selection are all balanced to achieve this goal. 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 TY250A carburetor that can be readily changed in order to modify carburetor performance, if required. If you are unfamiliar with carburetor theory, we suggest you refrain from making changes. Quite often, a performance problem is caused by another related component, such as the exhaust system, ignition timing or combustion chamber compression.

### NOTE:

See "Mechanical Adjustments" for additional carburetor adjustments.

## Idle Air Mixture Screw:

Controls the ratio of air to fuel in the idle circuit. Turning the screw in decreases the air supply giving a richer mixture. Normally, for Trials competition, the idle mixture screw is backed out to a lean position. OPERATING RANGE MOST AFFECTED BY THIS ADJUSTMENT: ZERO TO 1/8 THROTTLE.

## 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 THIS JET: ZERO TO 1/8 THROTTLE.

### 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 1/2 (+) THROTTLE.

### 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 mixture. 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.

### 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.

#### CAUTION:

*The fuel/air mixture ratio is a governing factor upon engine operating temperature. Any carburetor changes, whatsoever, must be followed by a thorough spark plug test.*

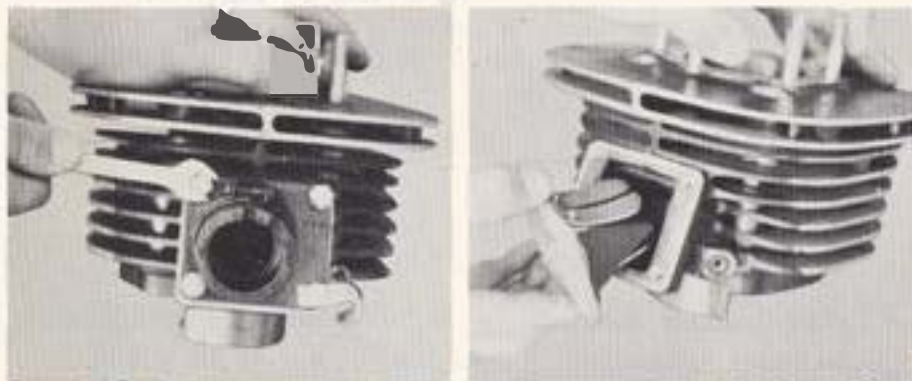


## Reed Valve

With carburetor removed, proceed as follows:

1. Remove the bolts (4) holding the intake manifold and reed valve assembly to cylinder.

Remove assembly.



2. Inspect rubber intake manifold for signs of weathering, checking or other deterioration.



3. Inspect reed petals for signs of fatigue cracks. Reed petals should fit flush or nearly flush against neoprene seats. If in doubt as to sealing ability, apply suction to carburetor side of assembly. Leakage should be slight to moderate.



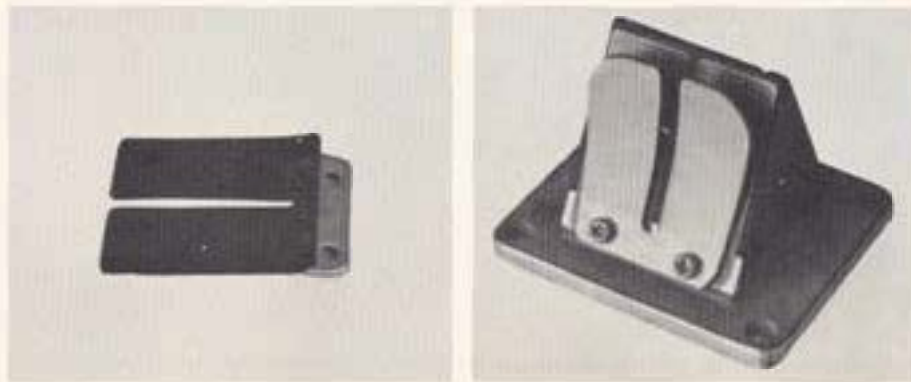
4. If disassembly of the reed valve assembly is required, proceed as follows:
  - 1) Remove pan-head screw (2) securing stopper plate and reed to reed block. Handle reed carefully. Avoid scratches and do not bend. Note from which side of the reed block the reed and stopper plate were removed. Re-install on same side.



- 2) During reassembly, clean reed block, reed, and stopper plate thoroughly. Apply a holding agent, such as "Lock-Tite," to threads of Phillips screws. Tighten each screw gradually to avoid warping. Tighten the screws thoroughly.

**NOTE:**

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



5. During reassembly of the reed valve assembly and manifold, install new gaskets and torque securing bolts gradually and in pattern. Tighten thoroughly.

### Top End and Muffler

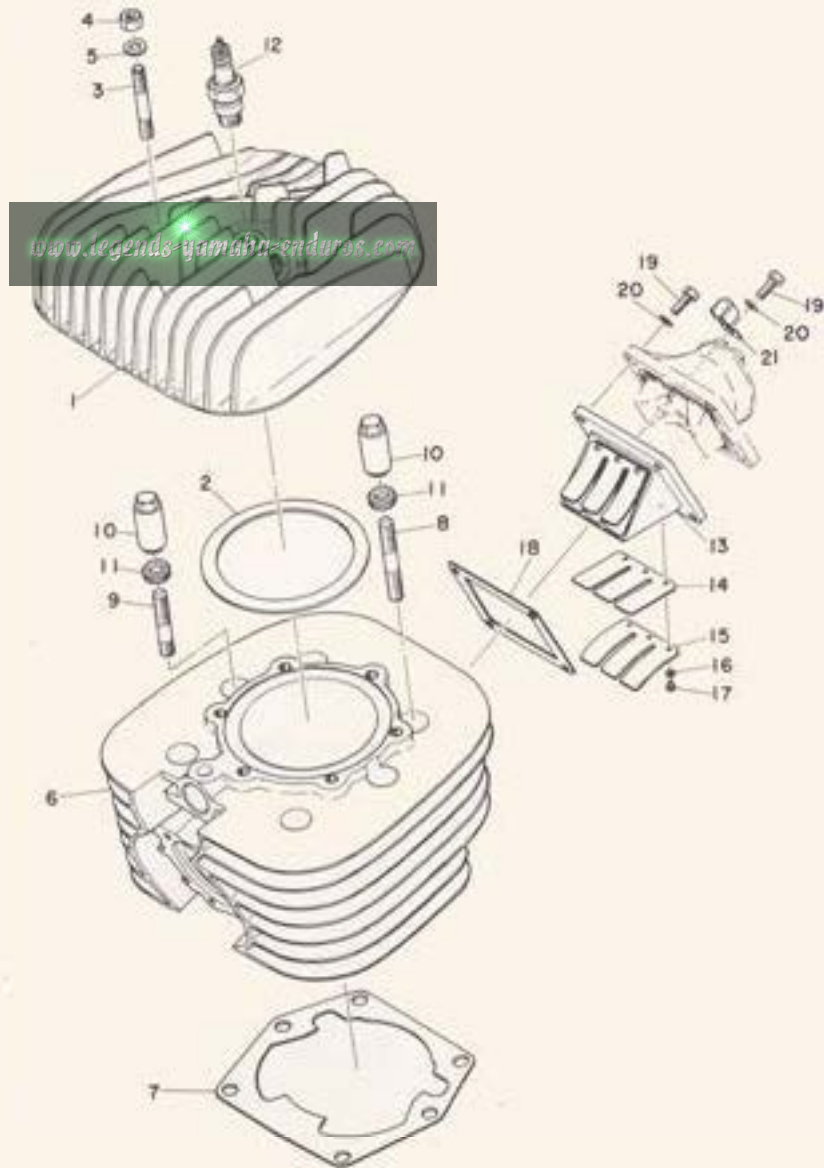
With the carburetor removed, proceed as follows:

### Muffler and Cylinder Head Removal

1. Remove seat assembly.
2. Remove securing bolt at rear of fuel tank.



## CYLINDER HEAD



1. Cylinder Head
2. Cylinder Head Gasket
3. Stud Bolt
4. Nut
5. Washer
6. Cylinder
7. Cylinder Gasket
8. Cylinder Holding Bolt 1
9. Cylinder Holding Bolt 2
10. Holding Nut
11. Holding Washer
12. Spark Plug
13. Reed Valve Ass'y
14. Reed Valve
15. Reed Valve Stopper
16. Spring Washer
17. Pan Head Screw
18. Valve Seat Packing
19. Bolt
20. Spring Washer
21. Clamp



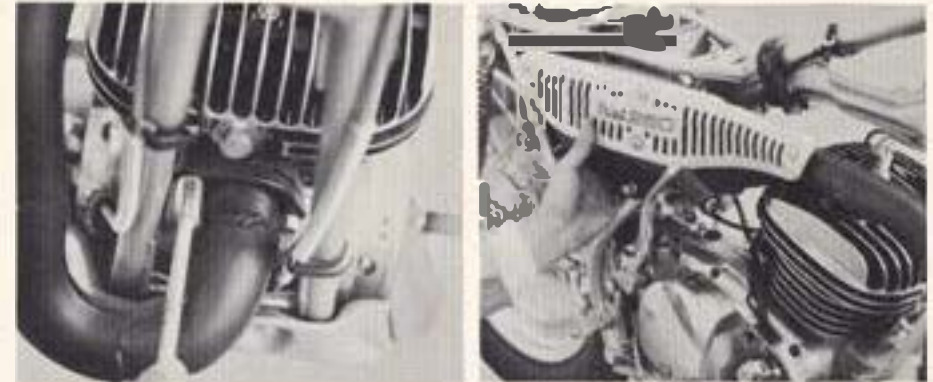
3. Lift rear of fuel tank up and pull back to clear frame mounts.



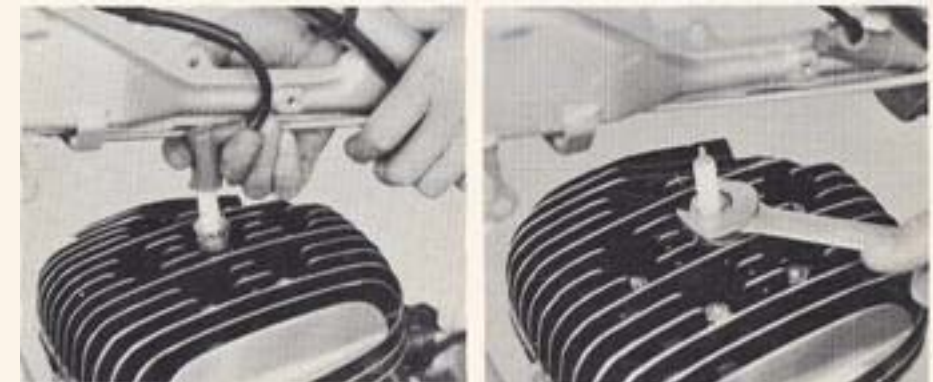
4. Remove coil springs at muffler/spark arrester joint.



5. Remove bolts (2) holding muffler to cylinder. Remove muffler.



6. Remove spark plug lead wire. Loosen, but do not remove spark plug.

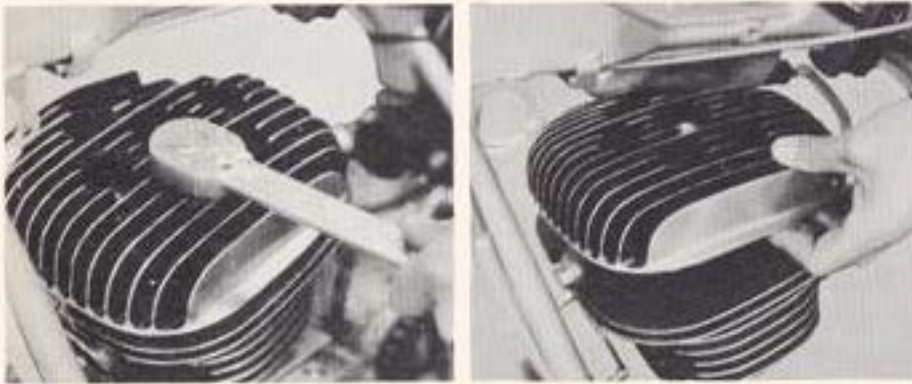




7. Remove nuts (6) securing cylinder head to cylinder. Remove cylinder head and gasket.

**NOTE:**

Break each nut loose (1/4 turn) prior to removing any one nut.



2. Remove cap bolts (4) securing cylinder to crankcase.

**NOTE:**

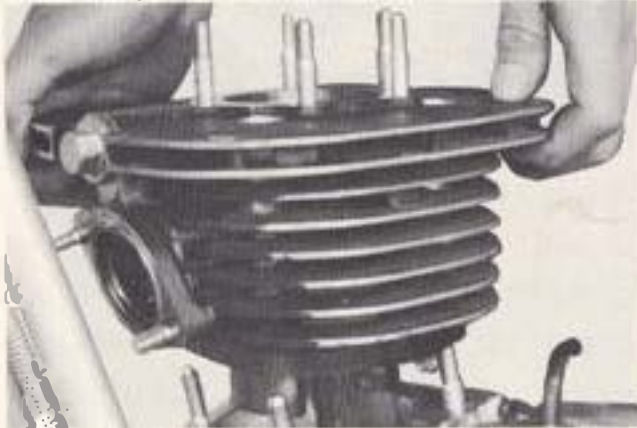
Break each bolt loose (1/4 turn) prior to removing any one bolt.

### Cylinder Removal

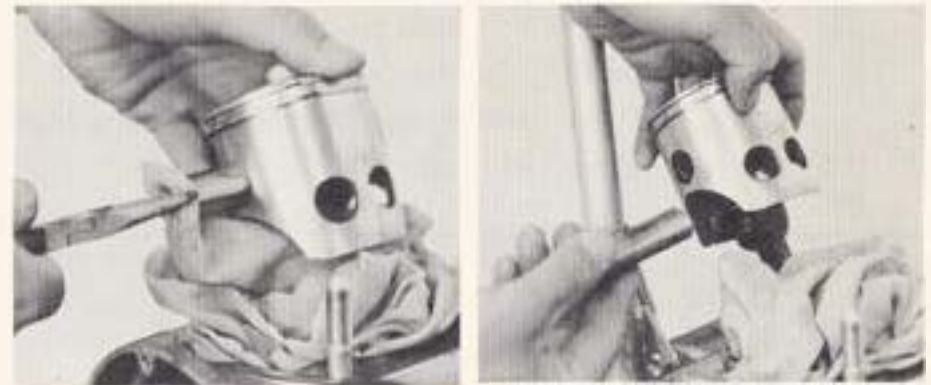
1. Remove banjo bolt securing oil pump delivery line to cylinder.



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



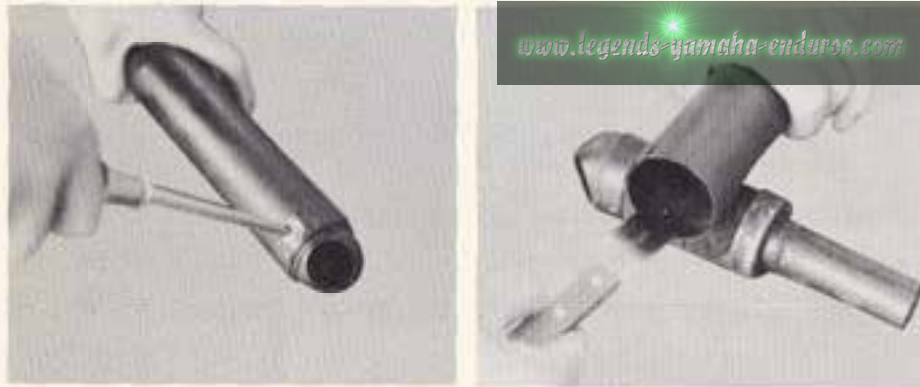
4. Remove wrist pin clip (1) from piston. Push wrist pin out from opposite side. Remove piston.



#### Maintenance—Muffler/Spark Arrester

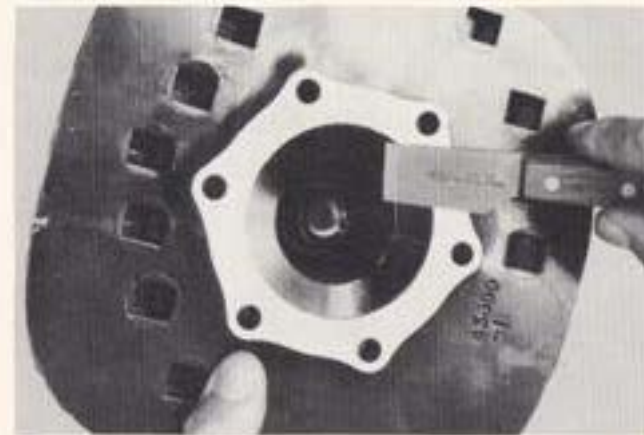
1. Using a rounded scraper, remove excess carbon deposits from manifold area of muffler. Check muffler gasket condition. The gasket seat is located around the cylinder exhaust port.
2. Carbon deposits within the muffler may be removed by lightly tapping the outer shell with a hammer and then blowing out with compressed air. Heavy wire, such as a coat hanger, may be inserted to break loose deposits. Use care.

3. Remove spark arrester. Remove Phillips screw holding baffle in place. Clean carbon out of baffle and arrester assembly with scraper. Re-install.



### Maintenance—Cylinder Head

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



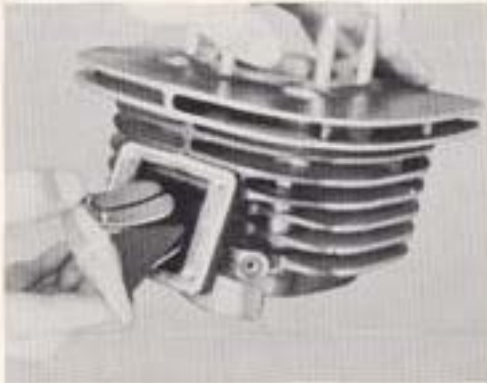
3. Place head on a surface plate. There should be no warpage. Correct by resurfacing. (Place 400,600 grit wet sand paper on surface plate and resurface head using a figure-eight sanding pattern. Rotate head several times to avoid removing too much material from one side.)
4. Clean spark plug gasket mating surface thoroughly.
5. Wash head in solvent and wipe dry.
6. Install new cylinder head gasket during reassembly.

Cylinder Head Nut Torque	2.0 Kg-m (175 in-lbs.)
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## 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, remove any scoring. Hone lightly, using smooth stones. 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 from bottom of skirts, in line with the wrist pin and at right angle to pin. Compare minimum and maximum measurements. If over tolerance, and not correctable by honing, re-bore to next over-size.



Max. Allowable Taper: 0.05 mm.

Max. Allowable Out-of-Round: 0.005 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.

**Cylinder Bolt Torque: 2.0 Kg-m (175 in-lbs.)**

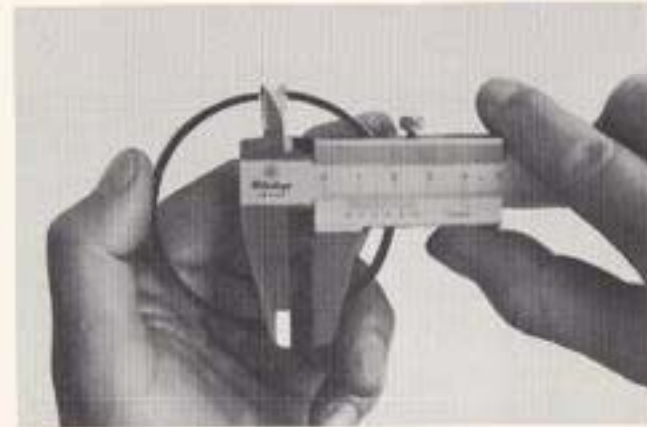
### Maintenance—Piston Rings

1. Remove rings from piston. Remove ring expander from lower ring groove.



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

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



Top Ring End Gap, Free	approx. 5.5 mm
2nd Ring End Gap, Free	approx. 7.0 mm

4. Insert each ring into cylinder. Push down approximately  $\frac{3}{4}$ " using piston crown to maintain right-angle to bore. Measure installed end gap. If beyond tolerance, replace set.



7. With Rings installed in grooves, insert feeler gauge between ring edge and groove. If beyond tolerance, replace ring and/or piston as required.

	Min.	Max.
Top Ring Groove Clearance	—	—
2nd Ring Groove Clearance	0.03 mm	0.08 mm

	Min.	Max.
Top Ring End Gap, Installed	0.2 mm	0.4 mm
2nd Ring End Gap, Installed	0.2 mm	0.4 mm

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

8. 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 rings.
9. New rings require break-in. Follow first portion of new machine break-in procedure.

## 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 wrist pin holes about  $\frac{1}{2}$ " from bottom of piston. Compare piston diameter to cylinder bore measurements.

Standard Piston Dia.: 70mm



Piston minimum diameter subtracted from maximum cylinder diameter gives piston clearance. If beyond tolerance, hone cylinder to tolerance or re-bore to next over-size and fit new piston.

	Min.	Max.
Piston Clearance	0.040 mm	0.045 mm
Maximum Wear Limit	0.1 mm	

6. During re-assembly, coat the piston skirt areas liberally with two-stroke oil.
7. Install new piston pin circlips and make sure they are fully seated within their grooves.





8. 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.



9. Make sure the rings are properly positioned as the cylinder is installed.



## Maintenance—Piston Pin, Bearing and Connecting Rod

1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.
2. Check the pin and bearing for signs of heat discoloration. If excessive (heavily blued), replace both.



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.

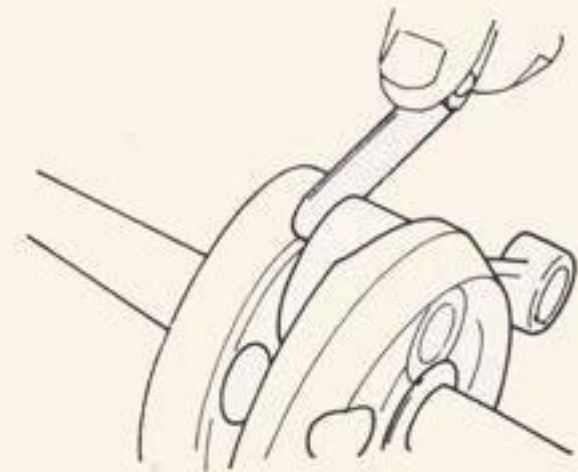


Wear Limit:	0.5 mm
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5. Mount a dial gauge at right angles to the connecting rod small end and measure axial play. (Push the bottom of the rod to one side then rock the top from side to side.)



6. Remove the dial gauge and slide the connecting rod to one side. Insert a feeler gauge between the side of the connecting rod big end and the crank wheel. Measure clearance.



7. If any of the these measurements exceed tolerance, crankshaft repair is required. Take the machine to your Authorized Dealer.
8. During reassembly, apply a liberal coating of two-stroke oil to the piston pin and bearing. Apply several drops of oil to the connecting rod big end. Apply several drops of oil into each crankshaft bearing oil delivery hole.



	Nominal	Limit
Connecting rod axial play	0.8–1.0mm	2.0mm
Connecting rod/crank side clearance	0.4mm	0.6mm

## Troubleshooting—Top End and Muffler

If performance is not up to par, the following procedure will indicate if top end repair is required.

1. Adjust ignition timing.
2. Make a spark plug reading. Adjust spark plug and/or carburetion as required.
3. Warm up engine. Insert compression gauge into spark plug hole. With ignition off and throttle on, kick engine over briskly several times. If compression measurement exceeds tolerance disassemble cylinder head and decarbonize.
4. Decarbonize muffler/spark arrester assembly. Decarbonize cylinder head and piston crown. Take care that carbon does not drop into crankcase cavity or foul ring grooves. Reassemble.
5. Reassemble and re-check compression pressure. If no improvement, disassemble top end completely.

	Nominal
Compression Pressure	7.0 kg/cm <sup>2</sup> at 650 – 700 r.p.m.



## Ignition

### NOTES:

For timing procedure, see "Mechanical Adjustments, Ignition Timing." For theory of operation and troubleshooting, see "Electrical System."

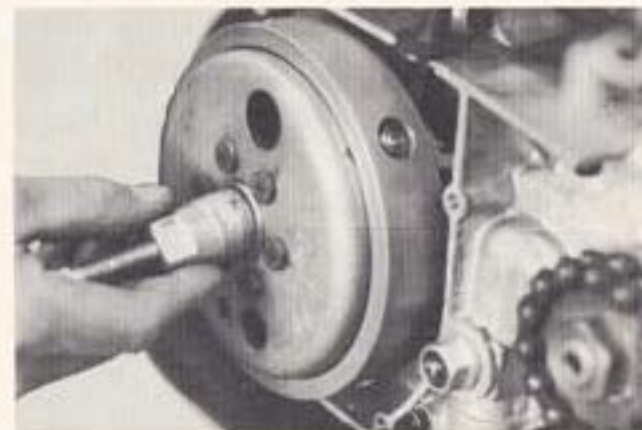
1. Remove left crankcase cover.
2. Remove the Flywheel Magneto securing nut, lock washer and bevelled washer. Note installation order and direction.



3. Install the Flywheel Magneto Puller.

### NOTE:

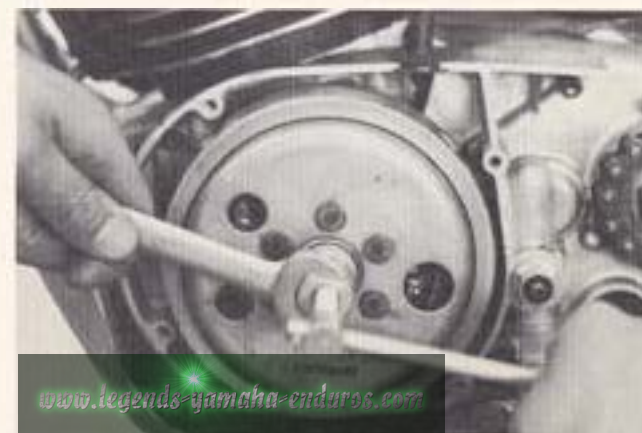
The puller body has a left hand thread.



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

### NOTE:

If the flywheel is frozen on the taper, keep pressure on the push bolt while tapping on the end of the bolt with a light steel hammer.





5. With the flywheel removed, the magneto backing plate is exposed, allowing for replacement of any assembly therein.
6. The ignition source coil is located on the right-hand side of the backing plate. The lighting source coil is on the left.

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

## Maintenance

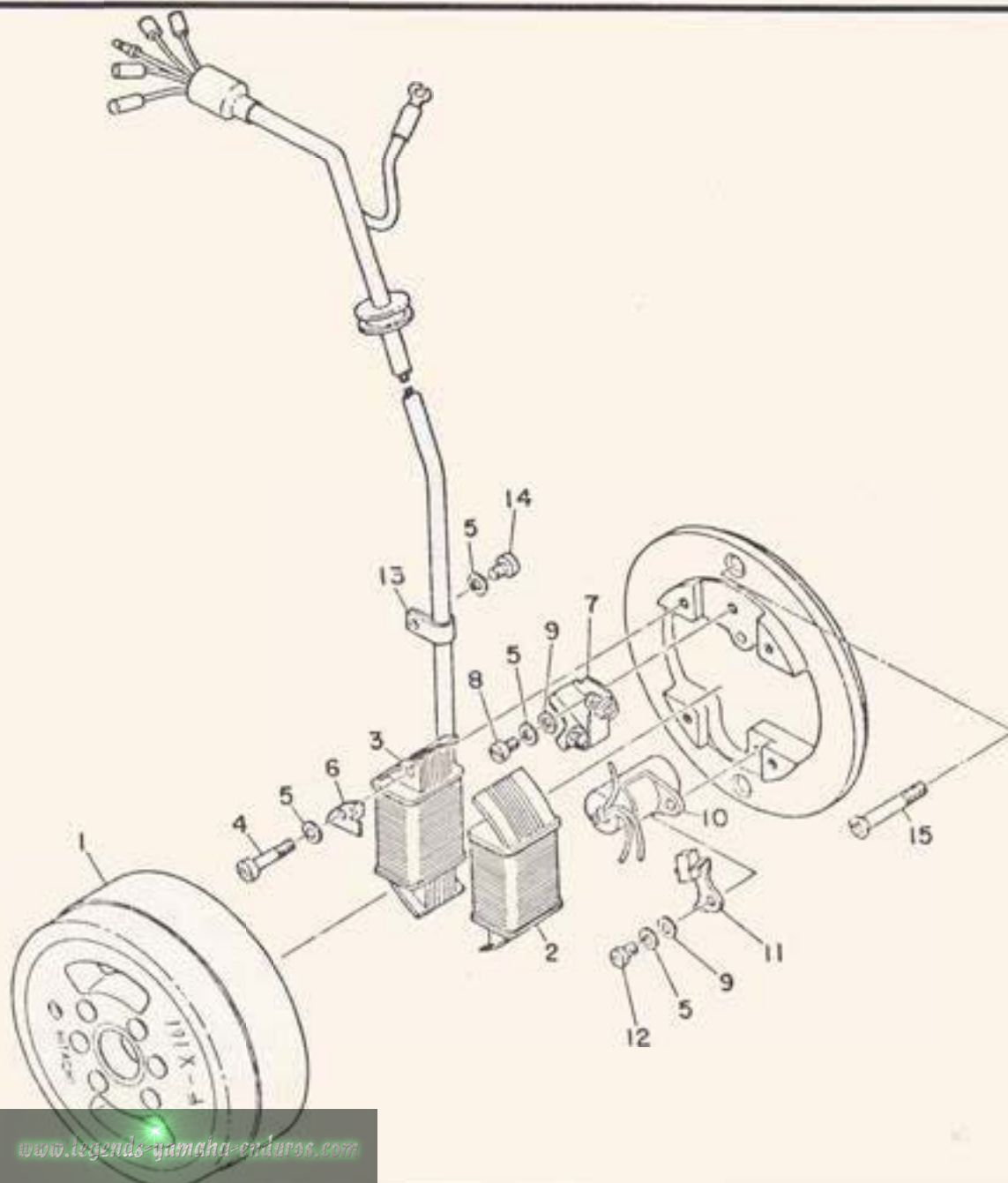
1. Apply a few drops of lightweight machine oil or distributor lubricant to the point cam lubricating wick.

	Nominal	Max. Allowable
Point Gap	0.35 mm	0.40 mm

### NOTE:

There is no separate point gap adjustment. Point gap is directly related to ignition timing and cam follower wear.

New points, when installed, should be lightly burnished and thoroughly cleaned per paragraph number two.



1. Rotor Ass'y
2. Lighting Coil
3. Source Coil
4. Screw
5. Spring Washer
6. Timing Plate
7. Contact Breaker Ass'y
8. Panhead Screw
9. Plain Washer
10. Condenser
11. Lubricator
12. Panhead Screw
13. Lead Clamp
14. Panhead Screw
15. Flathead Screw

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4. When replacing ignition condenser, source coil, or lighting source coil, soldering is required. Use a low wattage gun. Do not allow wiring to overheat as lacquer insulation on coil windings may be destroyed. The use of a heat sink is recommended.
5. When installing flywheel magneto, make sure woodruff key is properly seated in keyway in crankshaft. Apply a light coating of lithium soap base grease to tapered portion of crankshaft end. Carefully install flywheel taking care to align for woodruff key. Install bevelled washer, lockwasher and lock nut. Tighten carefully to recommended torque value.

Flywheel Securing Bolt Torque:  
4.0 ~ 4.5 Kg-m (350 ~ 400 in-lbs.)

**NOTE:**

Whenever the flywheel magneto is removed, ignition timing must be re-set.

## Clutch, Shifter and Kick Starter

**NOTE:**

Clutch adjustment is covered in Chapter VII. "Mechanical Adjustments."

1. Remove the engine protector.



2. Remove the kick crank.
3. To allow clearance for side cover removal, remove the rear brake cable adjust nut and clevis pin.
4. If cylinder is in place, remove the banjo bolt holding the oil pump delivery line in place.

5. Remove the Autolube pump cover.



6. Rotate the pump pulley to increase cable slack and remove the cable end from its seat in the pulley.



7. Using a 10mm wrench, loosen the cable length adjuster locknut. Remove the adjuster and cable.



8. Remove the Allen bolts holding the side cover in place. Push down on the brake pedal to provide clearance and remove the cover. Note the location of the kick axle shim.

**NOTE:**

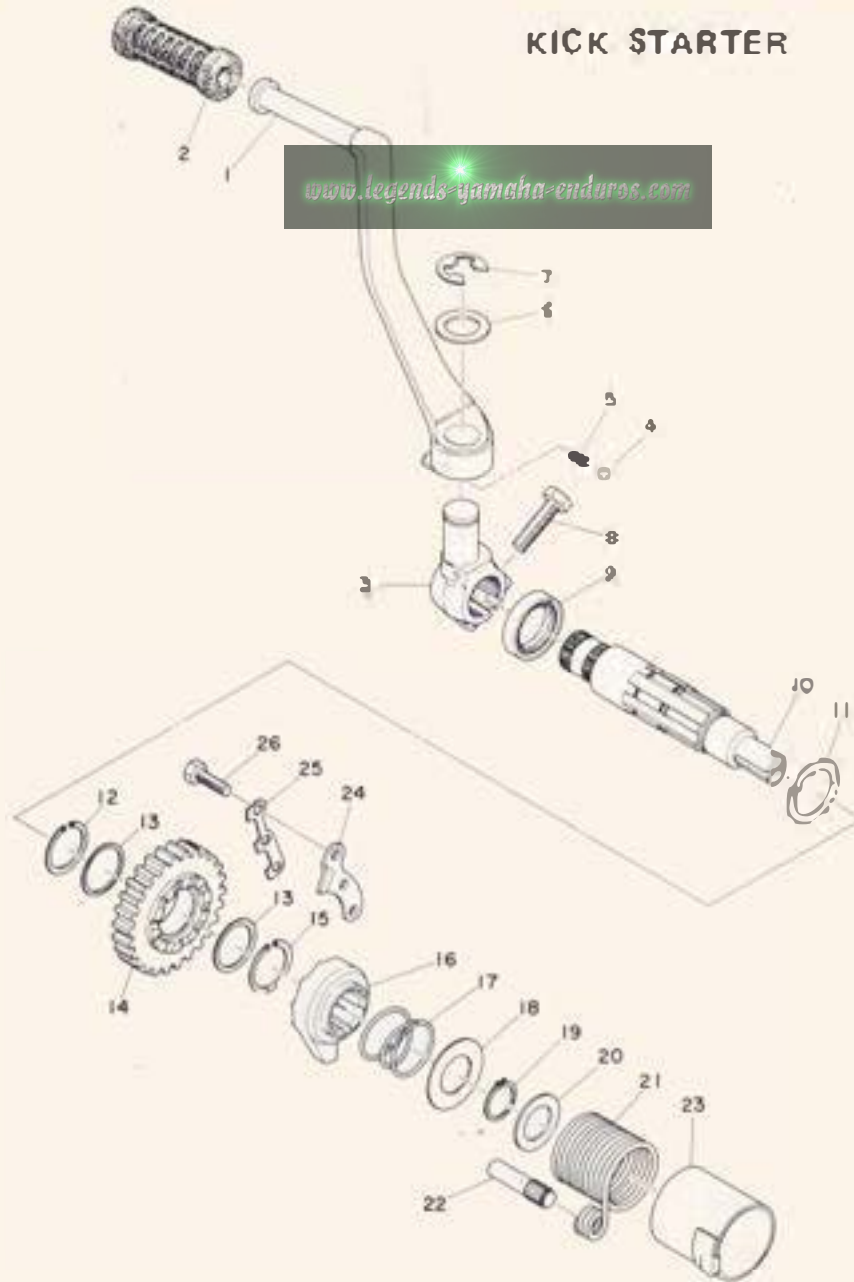
The Autolube pump assembly need not be removed for this procedure.



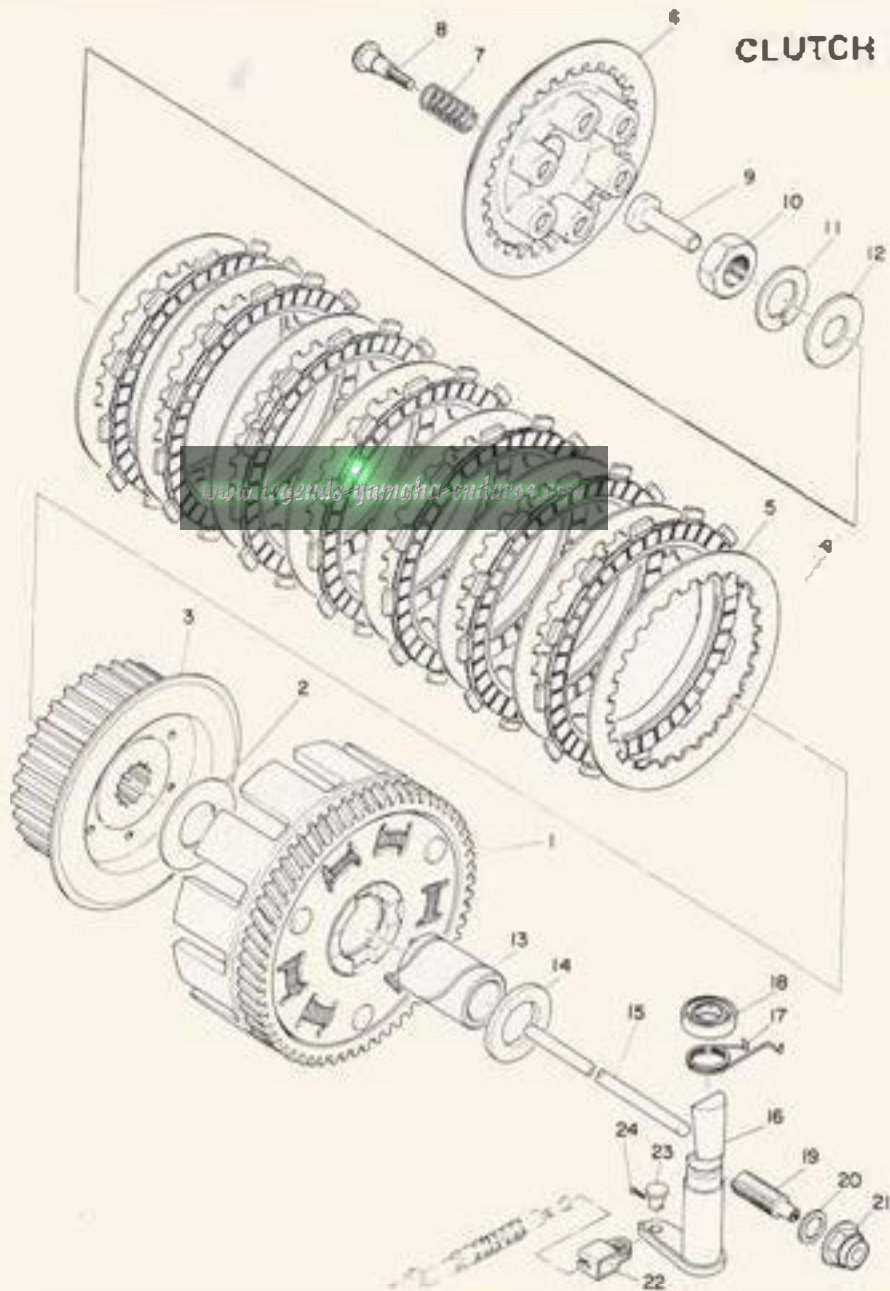
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## KICK STARTER



1. Kick Crank
2. Kick Lever Cover
3. Kick Crank Boss
4. Ball
5. Boss Stopper Spring
6. Washer
7. Circlip
8. Bolt
9. Oil Seal
10. Kick Axle
11. Plain Washer
12. Circlip
13. Gear Hold Washer
14. Kick Gear
15. Circlip
16. Ratchet Wheel
17. Ratchet Wheel Spring
18. Spring Cover
19. Circlip
20. Gear Hold Washer
21. Kick Spring
22. Kick Spring Stopper
23. Spring Guide
24. Ratchet Wheel Guide
25. Lock Washer
26. Bolt



## CLUTCH

1. Primary Driven Gear Comp.
2. Thrust Plate
3. Clutch Boss
4. Friction Plate
5. Clutch Plate
6. Pressure Plate
7. Clutch Spring
8. Spring Screw
9. Push Rod
10. Lock Nut
11. Spring Washer
12. Plain Washer
13. Spacer
14. Thrust Plate
15. Push Rod
16. Push Lever Axle
17. Return Spring
18. Oil Seal
19. Adjusting Screw
20. Gasket
21. Adjusting Nut
22. Joint
23. Pin
24. Cotter Pin

9. Remove the Phillips screws (7) holding the pressure plate. Remove the clutch springs, pressure plate and push rod. Remove the clutch plates, friction plates.

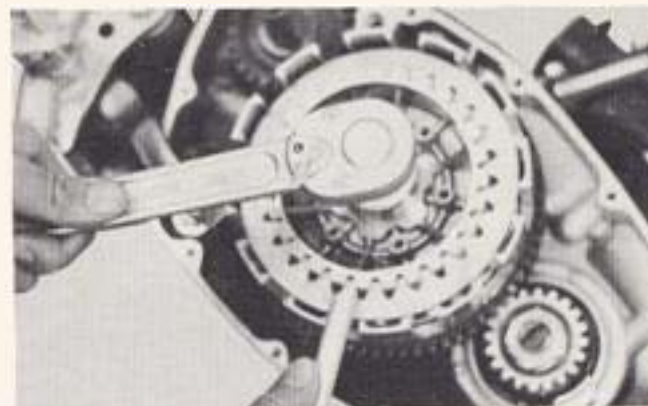
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**NOTE:**

When removing Phillips spring screws, loosen each screw in several stages working in a cross-hatch pattern to avoid any unnecessary warpage. Note the condition of each piece as it is removed and its location with the assembly.

10. Using the clutch holding tool, remove the clutch securing nut and bevelled lock washer. Remove the clutch boss and driven gear (clutch housing).



11. If the clutch housing spacer remains on the transmission main shaft, remove it. Remove the thrust plate and thrust plate spacers.
12. The kick crank assembly, complete, may be removed by rotating the kick axle counter-clockwise approximately 45° and pulling out. This procedure allows the ratchet wheel arm to clear the ratchet wheel stopper.





**NOTE:**

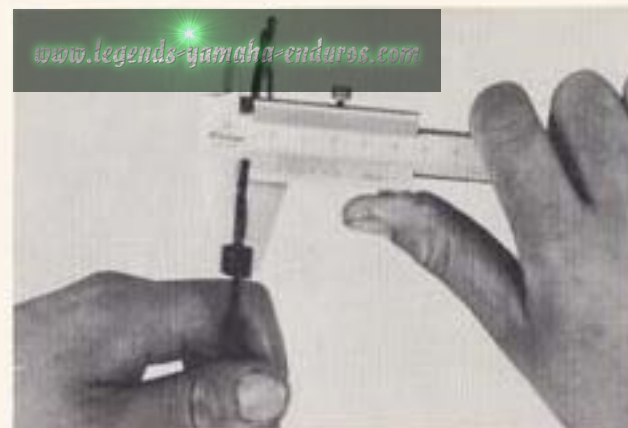
The kick crank return spring is located within the crankcase assembly. Note how the leading edge of the torsion spring fits into a groove machined into the end of the kick axle. Note the amount of pre-load on the spring during disassembly. The same pre-load must be exerted during reassembly in order for proper detenting of the ratchet wheel.



**Troubleshooting—Clutch Assembly**

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	2.7 mm



2. Check the plates for signs of warpage and heat damage, replace as required.

**NOTE:**

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

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

Clutch Plate Warp Allowance:	0.05 mm Maximum
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4. Thoroughly clean the clutch housing 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. If appropriate measuring devices are available, measure the minimum I.D. of the clutch housing bushing and the maximum O.D. of the bushing spacer. If beyond tolerance, have dealer replace bushing and refit.



	Nominal
Clutch Housing Bushing I.D.	33mm $-0.025$ $-0.041$
Bushing Spacer O.D.	33mm $+0.007$ $-0.014$
Bushing/Spacer Clearance	0.020 ~ 0.040 mm

5. Check the bushing and spacer for signs of galling, heat damage, etc. If severe, replace as required.
6. Apply thin coat of oil on transmission main shaft and bushing spacer I.D. Slip spacer over main shaft. Spacer should fit with approximately same "feel" as in clutch housing. Replace as required. See measurement tolerances.

	Nominal
Main Shaft O.D.	25mm $-0.045$ $-0.060$
Bushing Spacer I.D.	25mm $+0$ $-0.010$
Shaft/Spacer Clearance	0.045~0.070 mm

7. Check dogs on driven gear (clutch housing). Look for cracks and signs of galling on edges. If moderate, deburr. If severe, replace.



8. 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.

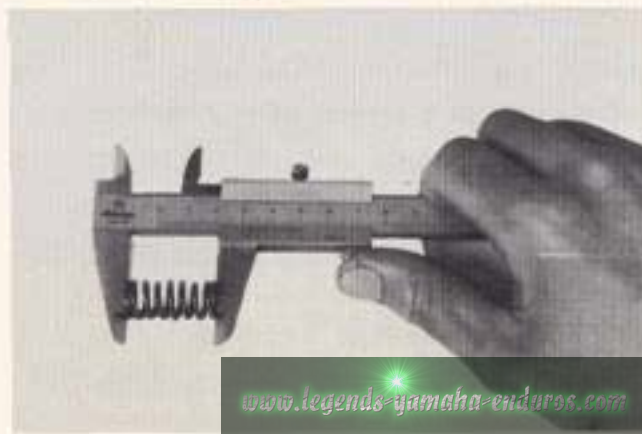
9. Fit the clutch thrust bearing (two pieces) against the thrust plate with a light film of oil on all parts. Check for smooth rotation. Check for signs of excessive wear, all parts. Replace as necessary.
10. If clutch operation has been abnormal, and the above procedures show no major failures, install the clutch housing on the transmission main shaft with thrust plates, bearing spacer, and clutch boss in their proper positions for reassembly. Do not install clutch or friction plates. Install lock washers and clutch securing nut. Torque to standard assembly value.

Clutch Securing Nut Torque:  
5.8 ~ 7.0 Kg·m (500 ~ 600 in-lbs.)

11. With transmission in neutral and primary drive gear stationary, clutch boss should turn without excessive drag within the clutch housing. If housing does not turn easily, indicating insufficient housing end play, check thrust plates and thrust bearing for incorrect thickness. Correct by installing thinner thrust plates. Clutch housing end play is given in table and can be measured with a dial gauge.

	Nominal	Min.	Max.
Clutch Housing End Play	0.2mm	0.05mm	0.036mm

12. Measure each clutch spring. If beyond tolerance replace.

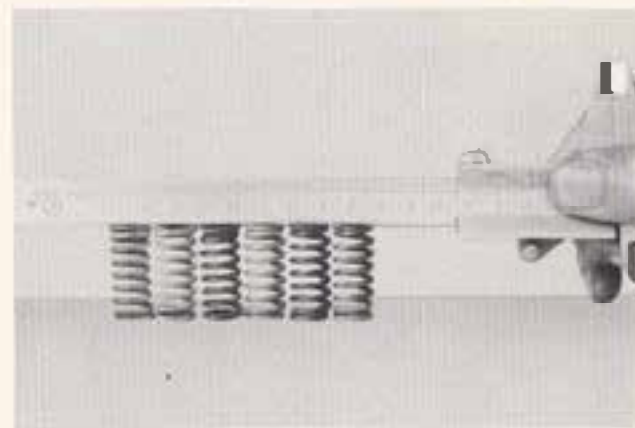


	New	Min.
Clutch Spring Free Length	31.5mm	30.5mm

**NOTE:**

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

13. Stack the clutch spring set on a level surface. Rotate each spring until all are at approximately the same vertical angle and maximum apparent height. Place straight edge across set. If any spring exceeds tolerance, replace that spring.



Clutch Spring set maximum length difference: 1 mm

14. During installation of the clutch assembly, take care that the thickest clutch plate is installed on the clutch boss first. Do not allow the cushion rings to become twisted during assembly. Take care that the thrust plates and thrust bearing 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:  
5.8 ~ 7.0 Kg-m (500 ~ 600 in.-lbs.)

## Shift Mechanism

### NOTE:

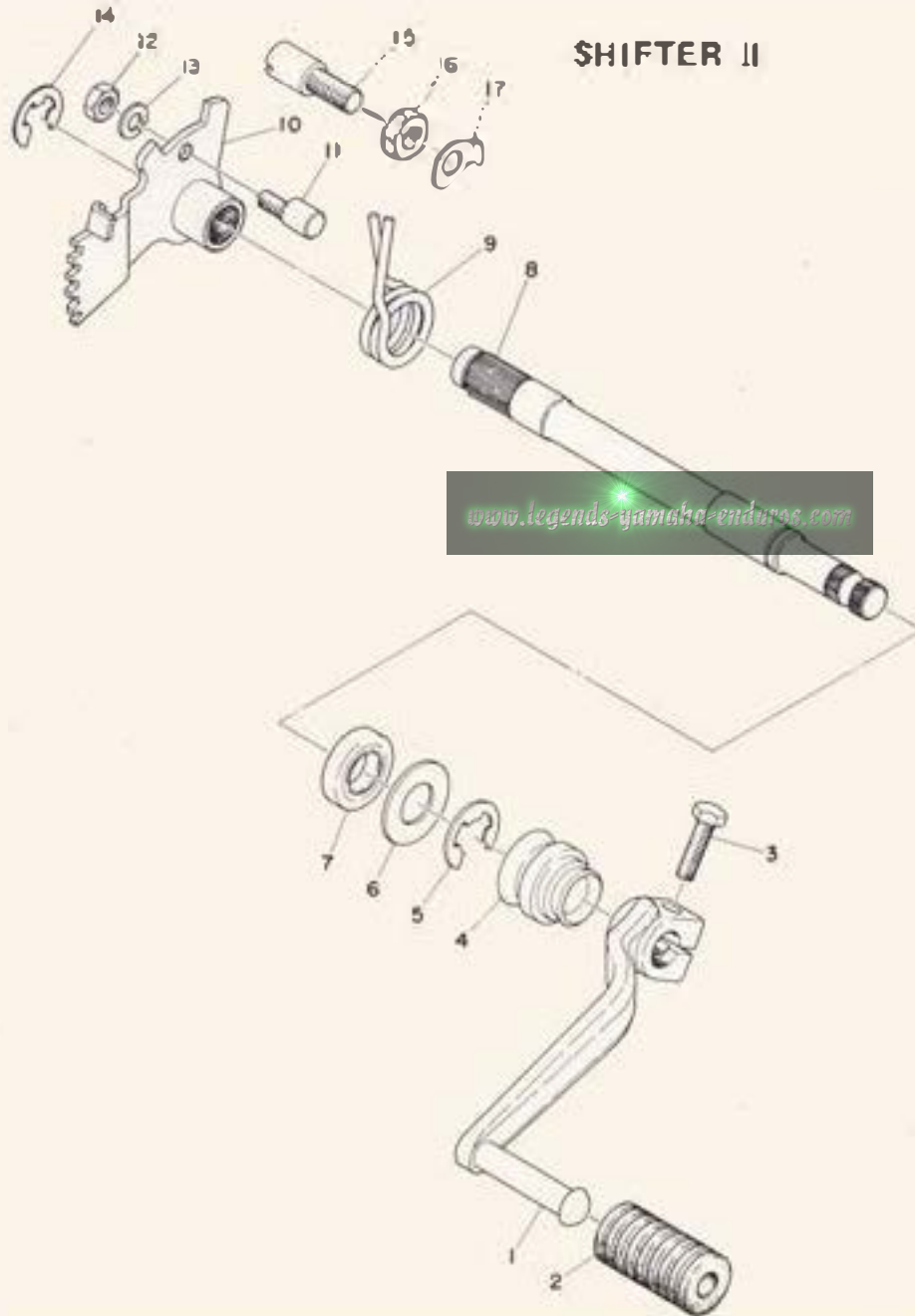
Shifter maintenance and adjustment should be performed with clutch assembly removed.

1. Remove the "E" clip securing change lever number two. Push down on change lever number three and remove the assembly.

2. With the change pedal in place on the shaft, push down—then up. There should be no freeplay. If evident, the shaft return spring is fatigued, replace.
3. Check the return spring for change levers two and three. If it will not hold change lever three firmly against the shift cam dowel pins, replace.
4. During reassembly, note the index marks on change levers two and one. Align.

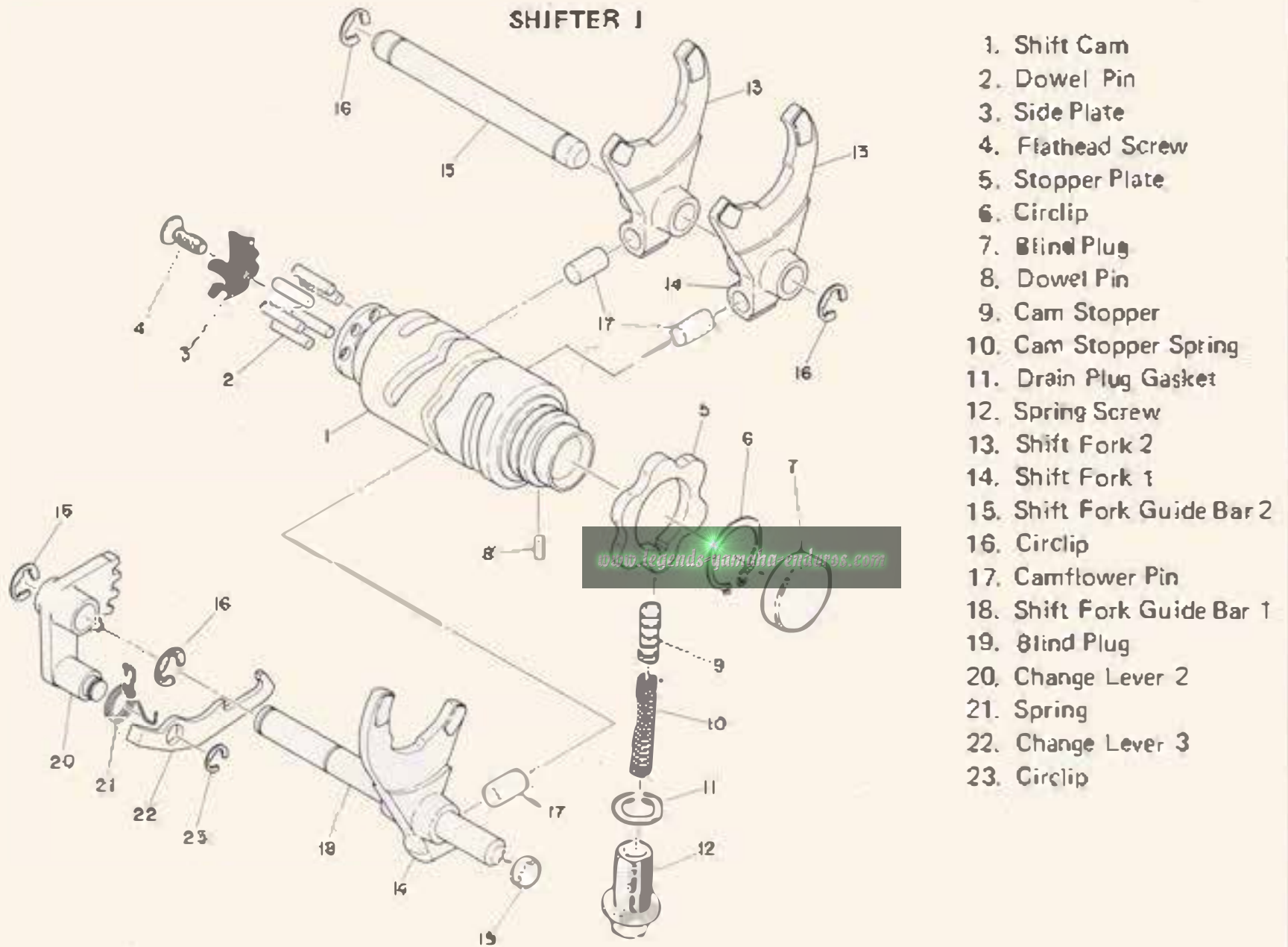


## SHIFTER II



1. Change Pedal
2. Change Pedal Cover
3. Bolt
4. Sealing Boot
5. Circlip
6. Change Axle Washer
7. Oil Seal
8. Change Shaft
9. Shaft Return Spring
10. Change Lever
11. Adjusting Screw
12. Nut
13. Spring Washer
14. Circlip
15. Adjusting Screw
16. Nut
17. Lock Washer

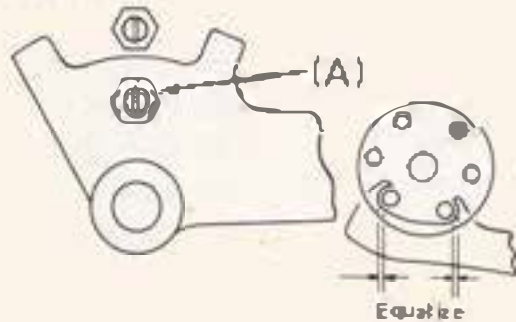
## SHIFTER 1



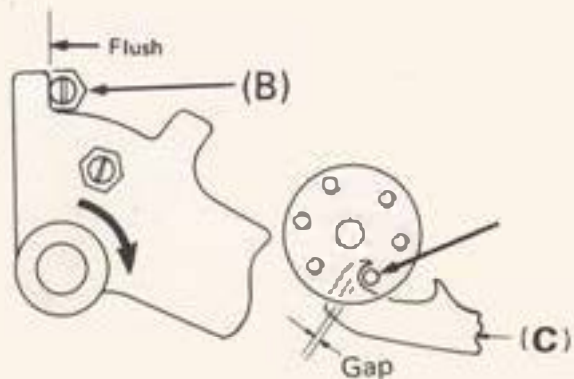
1. Shift Cam
2. Dowel Pin
3. Side Plate
4. Flathead Screw
5. Stopper Plate
6. Circlip
7. Blind Plug
8. Dowel Pin
9. Cam Stopper
10. Cam Stopper Spring
11. Drain Plug Gasket
12. Spring Screw
13. Shift Fork 2
14. Shift Fork 1
15. Shift Fork Guide Bar 2
16. Circlip
17. Camflower Pin
18. Shift Fork Guide Bar 1
19. Blind Plug
20. Change Lever 2
21. Spring
22. Change Lever 3
23. Circlip

## Adjustment

1. In 2nd~4th gear, check for proper centering. Change adjustment on screw (A) as required.



2. Shift up from 2nd~4th. Shift completely until arm on change lever No. 1 butts against adjusting screw (B).
3. While arm is butted against adjusting screw, measure clearance between Change Lever No. 3 (C) and shift drum dowel pin.



4. Repeat steps (2) and (3) shifting from 4th~2nd. Clearance must equal (3) above. Change adjustment using screw (A) as required.

5. Repeat Step (1).

## Drive Sprockets and Chain

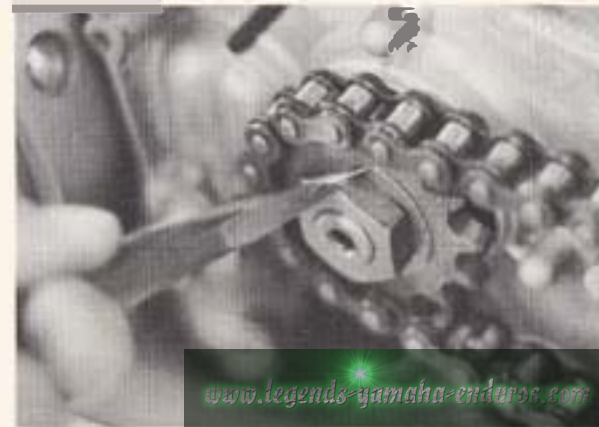
### NOTE:

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

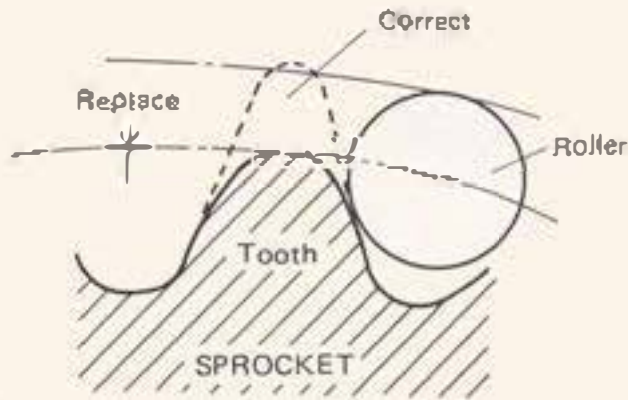
## Drive Sprocket

With the left crankcase cover removed, proceed as follows:

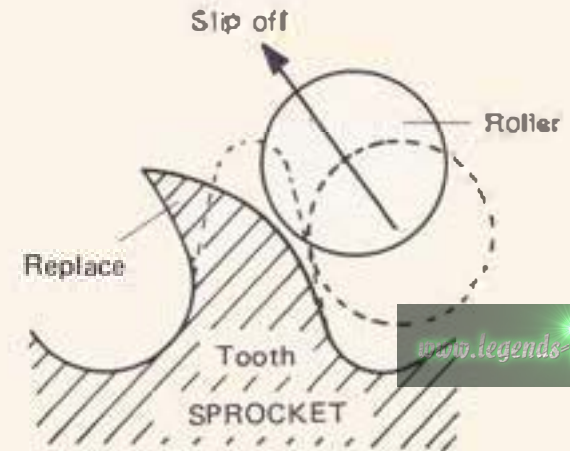
1. Using a blunt chisel, flatten the drive sprocket lock washer tab.



2. With the drive chain in place, transmission in gear, firmly apply the rear brake. Remove the sprocket securing nut. Remove the sprocket.
3. Check sprocket wear. Replace if wear decreases tooth 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 caution and common sense dictate.



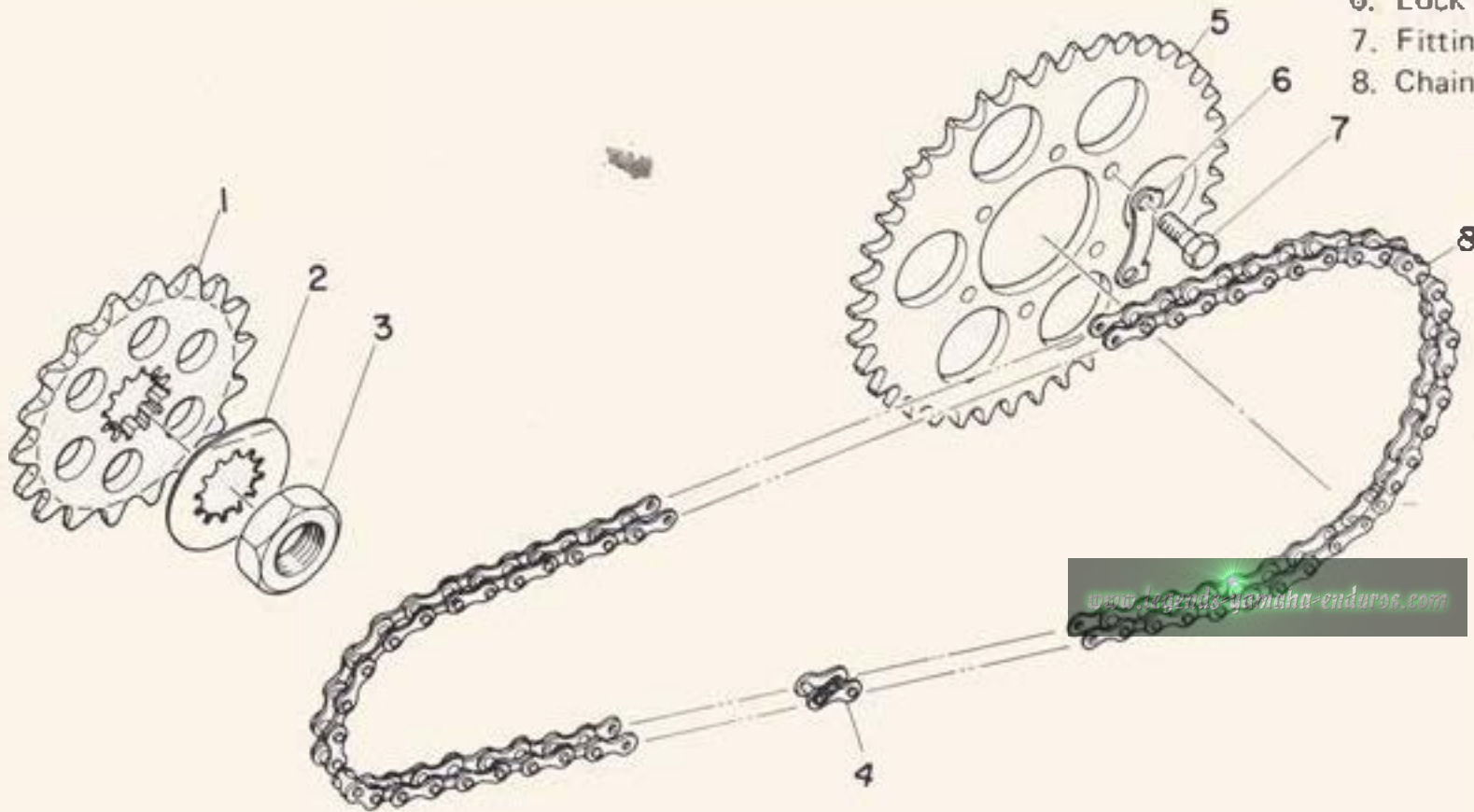
5. During reassembly, make sure the lock washer splines are properly seated on the drive shaft splines. Tighten securing nut thoroughly to specified torque value. Bend lock washer tab fully against securing nut flats.

Drive Sprocket Securing Nut Torque:  
5.8 ~ 7.0 Kg·m (500 ~ 600 in-lbs.)



## DRIVE SPROCKETS AND CHAIN

1. Drive Sprocket
2. Lock Washer
3. Lock Nut
4. Chain Joint
5. Sprocket Wheel Gear
6. Lock Washer
7. Fitting Bolt
8. Chain

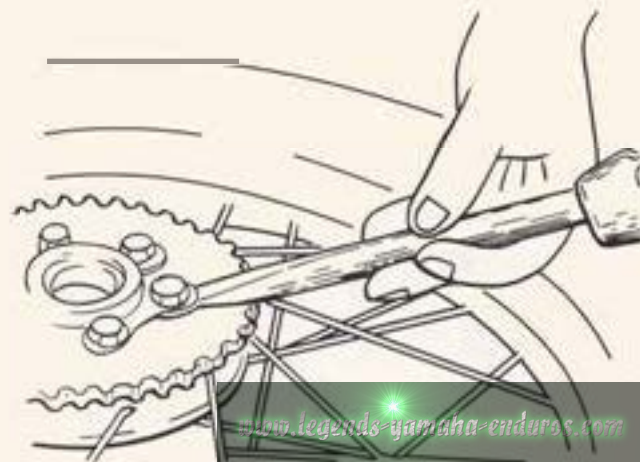


## Driven Sprocket

With the rear wheel removed, proceed as follows:

1. Using a blunt chisel, flatten the securing bolt lock washer tabs. Remove the securing bolts (6). 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 heat and hammer to straighten. Use a press if severely bent, replace.
4. During reassembly, make sure the sprocket and sprocket seat are clean. Tighten the securing bolts in a cross-hatch pattern. Bend the tabs of the lock washers fully against the securing bolt flats.

Driven Sprocket Securing Bolt Torque:  
2.0 Kg·m (175 in-lb.)

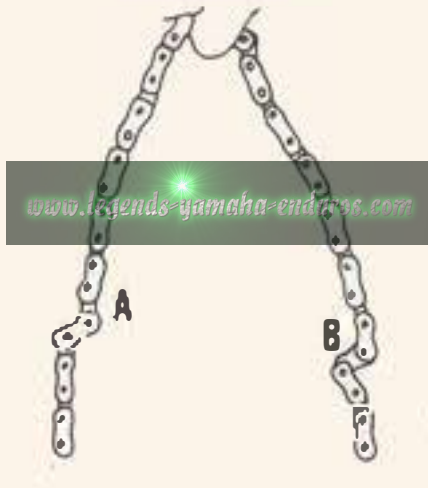


## Chain

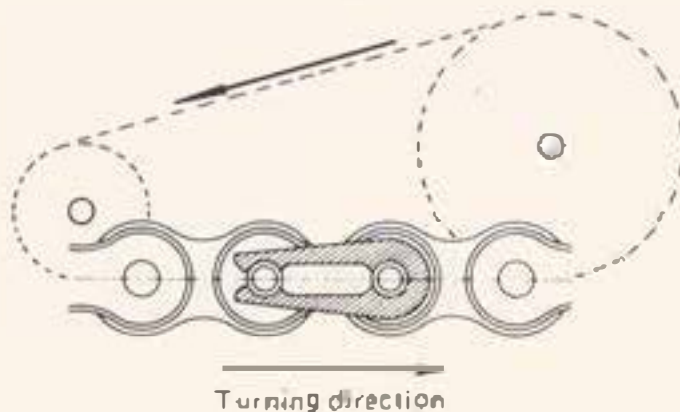
### NOTE:

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

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

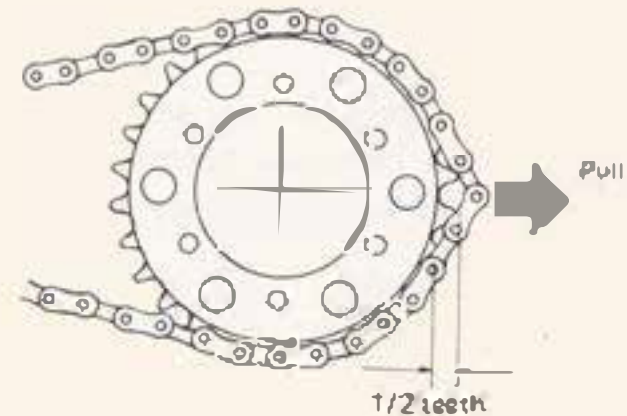


3. Check the side plates for visible wear. Check to see if excessive play exists in pins and rollers. Check for damaged rollers. Replace as required.
4. During reassembly, the master link clip must be installed with the rounded end facing the direction of travel.



## Troubleshooting

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.

## Maintenance

The chain should be lubricated per the recommendations given in the Maintenance and Lubrication Intervals charts. More often, if possible. Preferably after every use. See "Chassis and Suspension, Swing Arm", for additional information regarding chain guide and oiler.

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. or 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 preferable. These will resist picking up sand particles, dust, etc. Consult your Authorized Yamaha Dealer.

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. Reinstall.

### NOTE:

The swing arm chain oiler is designed to provide periodic chain lubrication during operation only. It will not provide complete lubrication to the areas between the inner and outer side plates.



## Cables

### NOTE:

See Maintenance and Lubrication Intervals Charts for additional information.

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

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

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

## Maintenance

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

### NOTE:

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

Under certain conditions, a water displacing lubricant is more suitable. Check with the Authorized Yamaha Dealer in your area.

## Throttle Cable Cylinder

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

1. Remove throttle cable number one from handlebar housing.
2. Remove throttle cable number two from carburetor mixing chamber top.
3. Remove Autolube pump cable from pump pulley. Remove cable adjuster.
4. Remove seat and fuel tank.
5. Remove cable/cylinder assembly completely.
6. Remove cylinder cap, throttle cable two and Autolube pump cable.
7. Wash assembly thoroughly in solvent.
8. Lubricate all associated cables,

9. Apply a thin coating of lubricant to cylinder walls.

### NOTE:

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

10. Reassemble all cables. Make sure cylinder is sealed from ravages of weather and riding conditions. Re-install. See cable routing diagrams for correct installation position. See Mechanical Adjustments Chapter for correct cable adjustment.

# CHAPTER IX

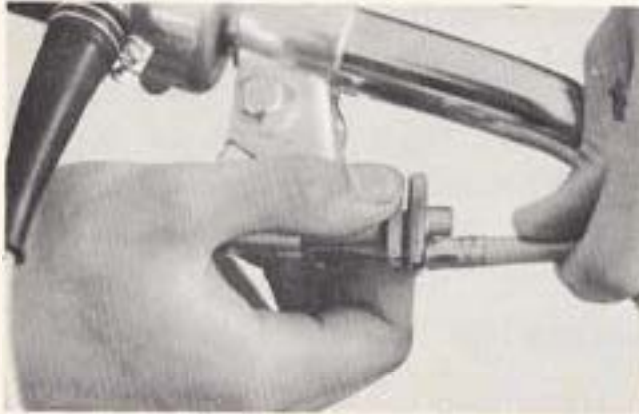
## IX CHASSIS AND SUSPENSION

### 1. Wheels and Tires

#### 1. Front Wheel

##### 1) Removal

1. Disconnect the brake cable at the front brake lever.



2. Remove cotter pin from front wheel nut.
3. Remove the front wheel nut.



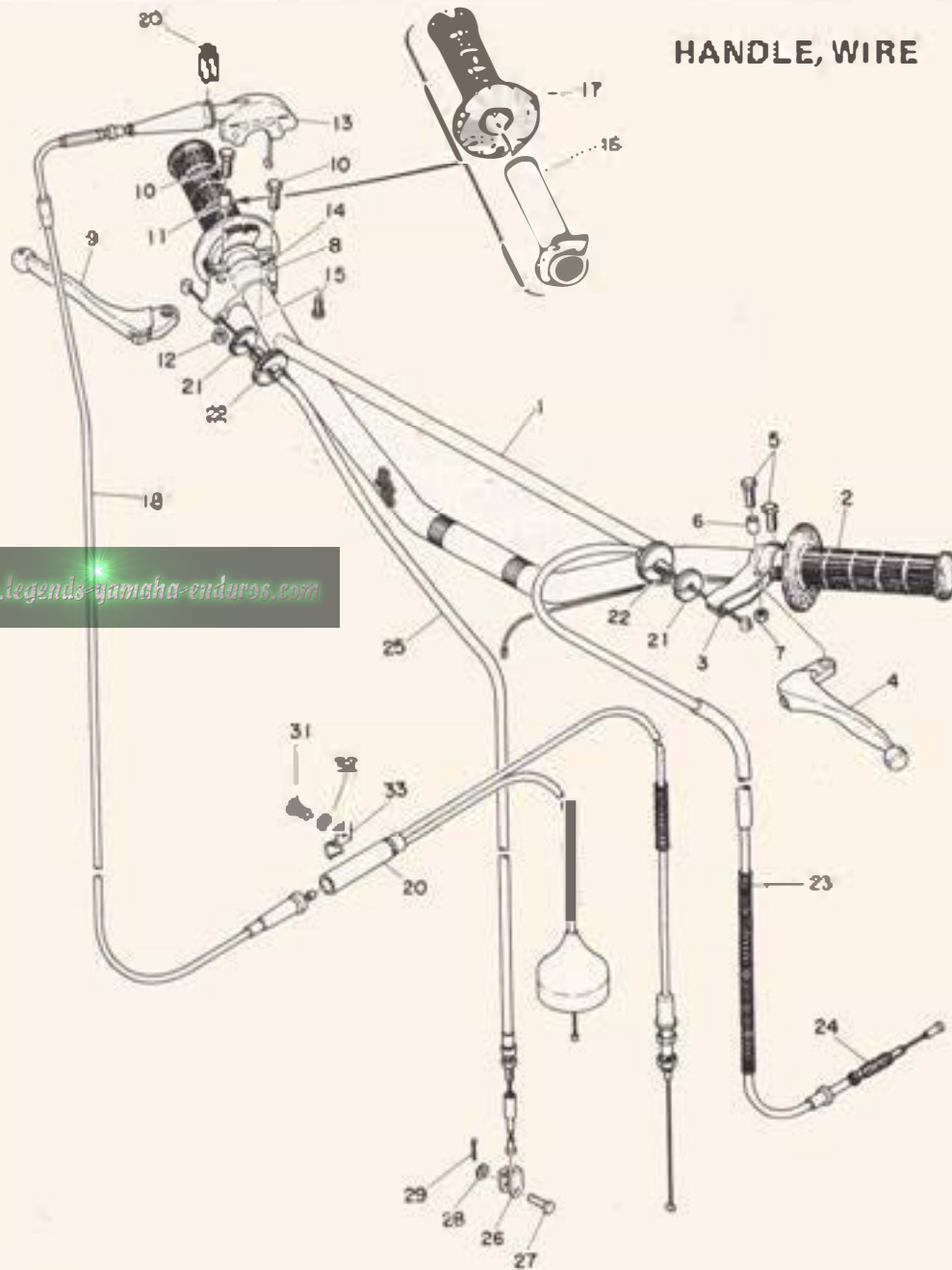
4. Loosen the front wheel axle nuts.



5. Remove the front wheel axle by simultaneously twisting and pulling out on the axle.



## HANDLE, WIRE



- |                       |                       |
|-----------------------|-----------------------|
| 1. Handle             | 23. Clutch Wire       |
| 2. Left Grip          | 24. Boot              |
| 3. Lever Holder (L)   | 25. Front Brake Wire  |
| 4. Left Lever         | 26. Wire Joint        |
| 5. Bolt               | 27. Link Joint Pin    |
| 6. Lever Collar       | 28. Pedal Link Washer |
| 7. Nut                | 29. Cotter Pin        |
| 8. Lever Holder (R)   | 30. Holder            |
| 9. Right Lever        | 31. Panhead Screw     |
| 10. Bolt              | 32. Spring Washer     |
| 11. Lever Collar      |                       |
| 12. Nut               |                       |
| 13. Upper Grip Cap    |                       |
| 14. Under Grip Cap    |                       |
| 15. Panhead Screw     |                       |
| 16. Guide Tube        |                       |
| 17. Right Grip        |                       |
| 18. Throttle Wire 1   |                       |
| 19. Throttle Wire 2   |                       |
| 20. Wire Guide Holder |                       |
| 21. Lock Nut          |                       |
| 22. Adjusting Bolt    |                       |



6. Raise the front of the machine and set it on a box. Then remove the wheel assembly.

## 2) Checking Brake Shoe Wear

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



Front Brake Shoe Diameter:	110 mm
Replacement Limit:	105 mm

## 3) Brake Drum

Oil or scratches on the inner surface of 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 rubbing with emery cloth.

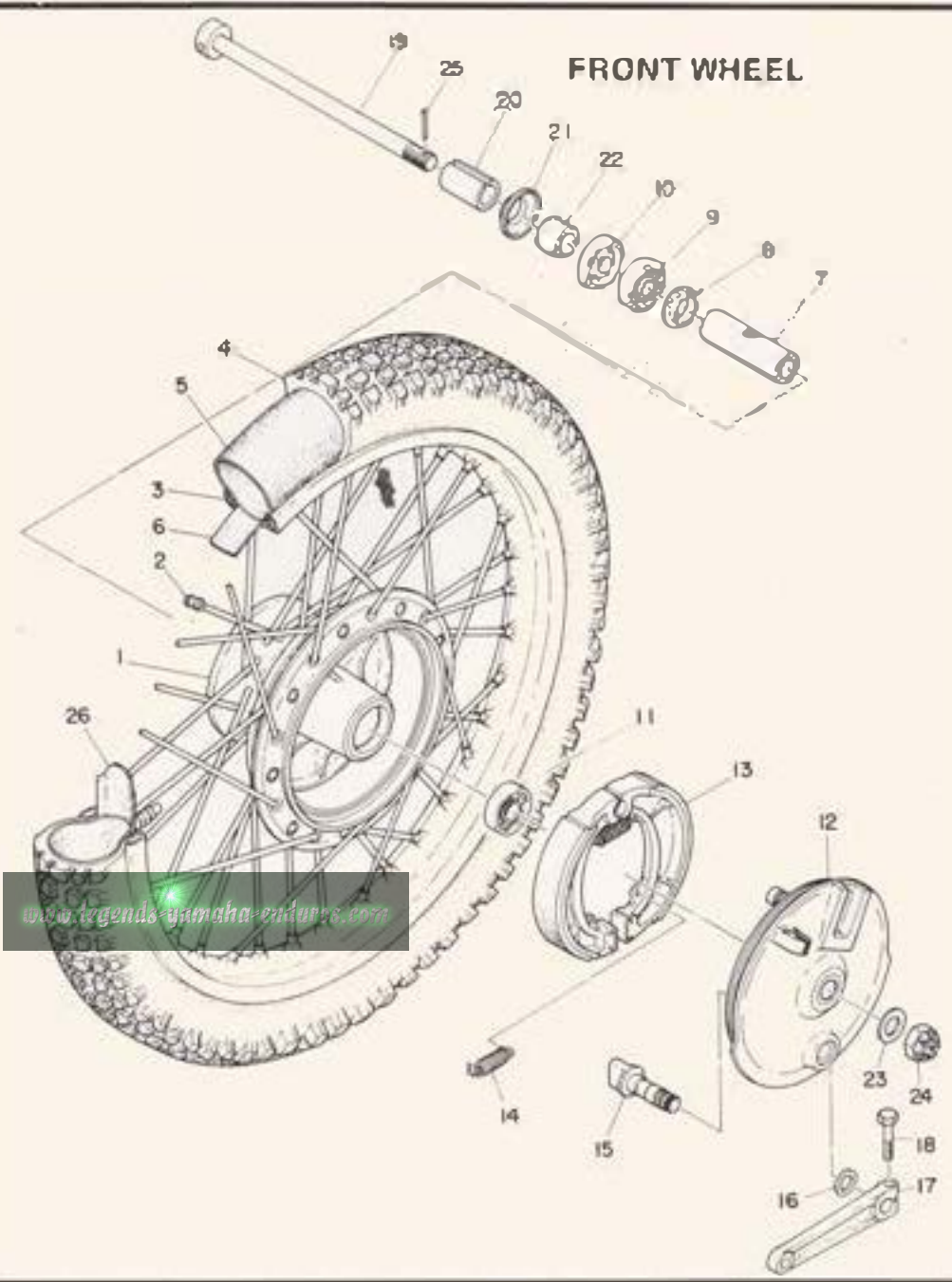
## 4) Replacing Wheel Bearings

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

1. First clean the outside of the wheel hub.
2. Insert the bent end of the special tool into the hole located in the center of the bearing spacer, and drive the spacer out from the hub by tapping the other end of the special tool with a hammer. (Both bearing spacer and spacer flange can easily be



3. Push out the bearing on the other side.
4. To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation and use the bearing fitting tool.



**FRONT WHEEL**

1. Front Hub
2. Spoke
3. Front Rim
4. Front Tire
5. Front Tube
6. Rim Band
7. Bearing Spacer
8. Spacer Flange 2
9. Bearing
10. Oil Seal
11. Bearing
12. Brake Shoe Plate
13. Brake Shoe Comp.
14. Brake Shoe Return Spring
15. Camshaft
16. Camshaft Seal
17. Camshaft Lever
18. Bolt
19. Wheel Shaft
20. Collar
21. Hub Dust Cover
22. Wheel Shaft Collar
23. Plain Washer
24. Shaft Nut
25. Cotter Pin
26. Bead Spacer

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5. Check the lips of the seals for damage or warpage. Replace if necessary.

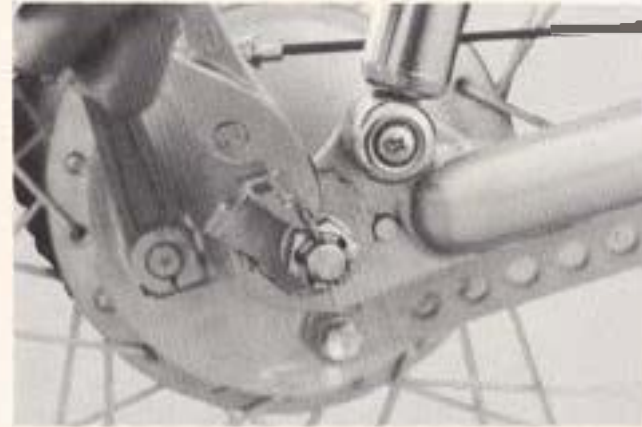
## 2. Rear Wheel

The rear wheel is 18-in. size, and the rear tire is Trials Universal. A single leading-shoe type brake is used. A labyrinth seal between the wheel hub and the brake plate is provided to prevent water and dust leakage.

### 1) Removal

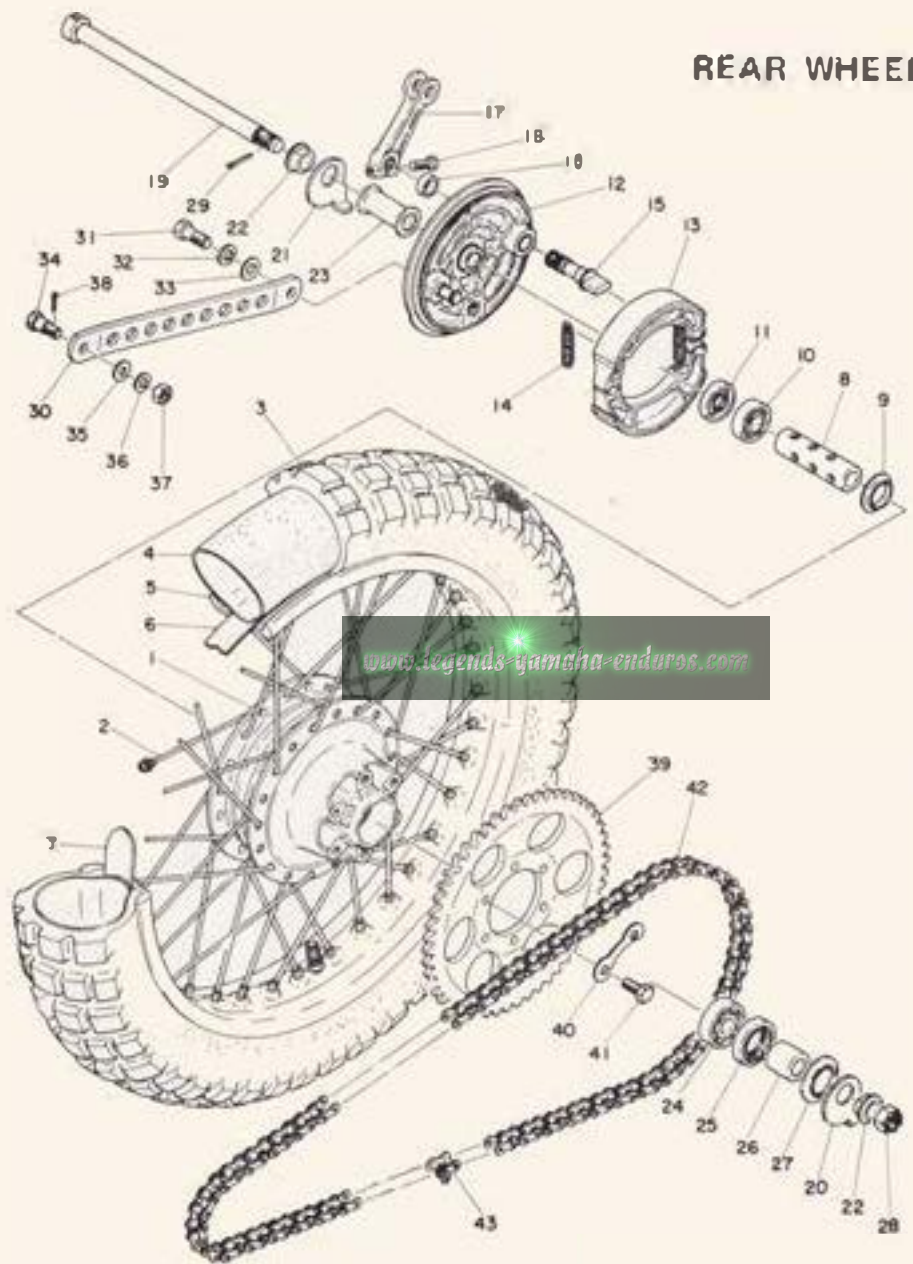
1. Remove the tension bar and brake rod from rear shoe plate.

2. Remove cotter pin from rear wheel shaft nut.



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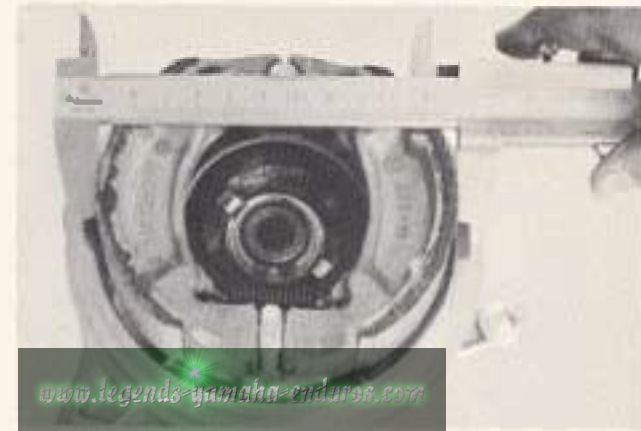


## REAR WHEEL

- |                        |                         |
|------------------------|-------------------------|
| 1. Rear Hub            | 24. Bearing             |
| 2. Spoke Set           | 25. Oil Seal            |
| 3. Rear Tire           | 26. Shaft collar        |
| 4. Rear Tube           | 27. Dust Cover          |
| 5. Rear Rim            | 28. Shaft Nut           |
| 6. Rim Band            | 29. Cotter Pin          |
| 7. Bead Spacer         | 30. Tension Bar         |
| 8. Bearing Spacer      | 31. Tension Bar Bolt    |
| 9. Spacer Flange       | 32. Spring Washer       |
| 10. Bearing            | 33. Plain Washer        |
| 11. Oil Seal           | 34. Tension Bar Bolt    |
| 12. Brake Shoe Plate   | 35. Plain Washer        |
| 13. Brake Shoe Comp    | 36. Spring Washer       |
| 14. Return Spring      | 37. Nut                 |
| 15. Camshaft           | 38. Cotter Pin          |
| 16. Camshaft Seal      | 39. Sprocket Wheel Gear |
| 17. Camshaft Lever     | 40. Lock Washer         |
| 18. Bolt               | 41. Bolt                |
| 19. Wheel Shaft        | 42. Chain               |
| 20. Chain Left Puller  | 43. Chain Joint         |
| 21. Chain Right Puller |                         |
| 22. Wheel Shaft Collar |                         |
| 23. Shaft Collar       |                         |



3. Remove the rear wheel shaft nut.
4. Pull out the rear wheel shaft by simultaneously twisting and pulling out



Rear Brake Shoe Diameter:	130 mm
Replacement Limit:	125 mm

5. Remove the rear brake shoe plate.
  6. Lean the machine to the right and remove the rear wheel assembly.
- 2) Checking Brake Shoe Wear
1. Measure the outside diameter at the brake shoe with slide calipers. If it measures less than specified, replace.

2. Smooth out a rough shoe surface with sandpaper or a file.
- 3) 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 rubbing with emery cloth.
- 4) Replacing Wheel Bearings
- See front wheel section.

### 3. Checking Rings and Spokes (Front & Rear Wheels)

#### 1) 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 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 any spoke makes a dull flat sound, check it for looseness.

#### 2) Checking rim "run-out"

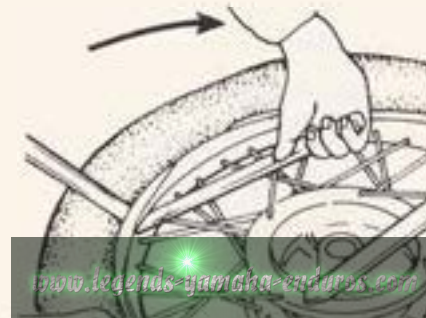
While you have the wheel elevated, you should check that it does not have too much run-out. "Run-out" is the amount the wheel deviates from a straight line as it spins. Spin the wheel, and solidly anchor some sort of a pointer about 1/8" away from the side of the rim. As the wheel spins, the distance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

dealer remove this rim warpage by properly adjusting the spokes.

Run-Out Limits:	2mm 0.07in. (1/16") Lateral
Run-Out Limits:	2mm 0.07in. (1/16") Vertical

### 4. Tire Repairs

- 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 rim, starting 180° opposite the tube stem. Take care to avoid pinching the tube as you do this.



- 4) After you have worked one side of the tire completely off the rim, then you can slip the tube out. Be very careful not to damage the stem while pushing it back out to 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.

5. Installing Tire

Re-installing the tire assembly can be accomplished by reversing the disassembly procedure. The only difference in procedure would be right after the tube has been installed. Before the tire has been completely slipped onto the rim, inflate the tube. This removes any creases that might exist. Release the air and continue with reassembly. Also, right after the tire has been completely slipped onto the rim, check to make sure that the stem is squarely in the center of the hole in the rim.

Tire Pressure	Front	13 lbs/in <sup>2</sup> (0.9 kg/cm <sup>2</sup> )	Normal riding
	Rear	16 lbs/in <sup>2</sup> (1.1 kg/cm <sup>2</sup> )	

2. Front Forks and Steering Head

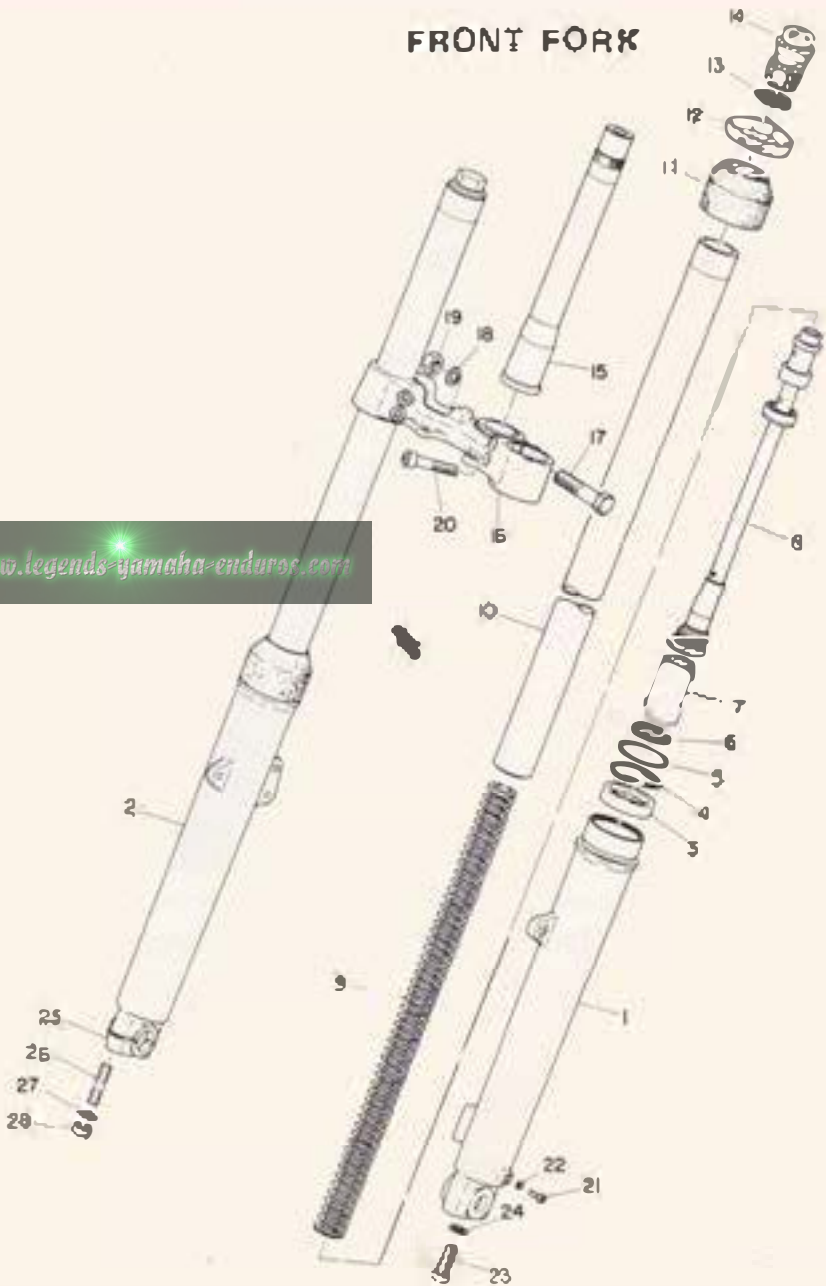
1. General - The front forks on your machine utilizes chrome plated tubular steel fork legs (inner tubes) and tubular aluminum sliders (outer tubes). The bearing surface is the entire inside surface of the aluminum outer tube.

The steering head pivot is supported by two sets of uncaged ball and race bearing assemblies.



# FRONT FORK

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1. Outer Tube Left
2. Outer Tube Right
3. Oil Seal
4. Oil Seal Washer
5. Oil Seal Clip
6. Circlip
7. Piston
8. Cylinder Comp.
9. Fork Spring
10. Inner Tube
11. Dust Seal
12. Wire Holder
13. O-Ring
14. Cap Bolt
15. Steering Shaft
16. Under Bracket
17. Bolt
18. Spring Washer
19. Nut
20. Under Bracket Bolt
21. Drain Plug
22. Drain Plug Gasket
23. Bolt
24. Packing
25. Axle Holder
26. Axle-Holder Bolt
27. Spring Washer
28. Nut



## 2. Front Fork Oil Change

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



- 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 gaskets, replace if damaged.

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



Recommended Oil:	Non-foaming hydraulic fluid, 10, 20, 30 wt. (fork oil)
Quantity:	162 cc 5.5 oz. (per leg)

### NOTE:

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

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



- 8) Inspect O-ring on fork cap bolts and replace if damaged.



- 9) Replace fork cap bolts and torque to specification.



Fork Cap Torque: 10 Kg-m (600 in-lbs.)

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



Fork Tube Pinch Bolt Torque:  
0.8 ~ 1.2 Kg-m (70 ~ 100 in-lbs.)

### 3. Front Fork Disassembly

- 1) With the front wheel removed and the various pinch bolts loosened, the fork legs can be removed from the upper and lower brackets.



- 2) Disassembly procedure for individual fork tube assembly is found in DT250A/360A Service Manual.

#### NOTE:

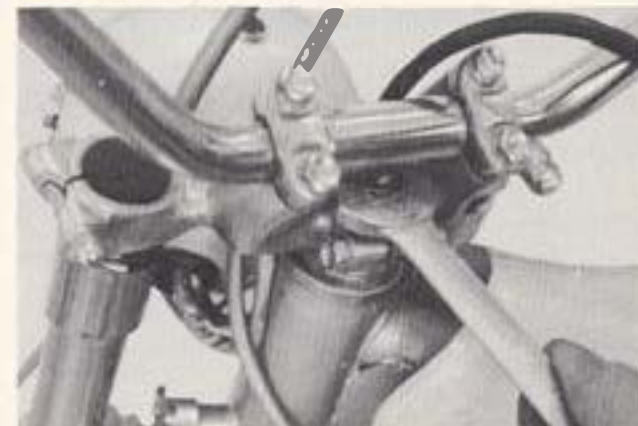
Proper fork seal installation is important. Also, carefully tap seal in with large socket to avoid damage to aluminum fork tube.

### 4. Steering Head Adjustment

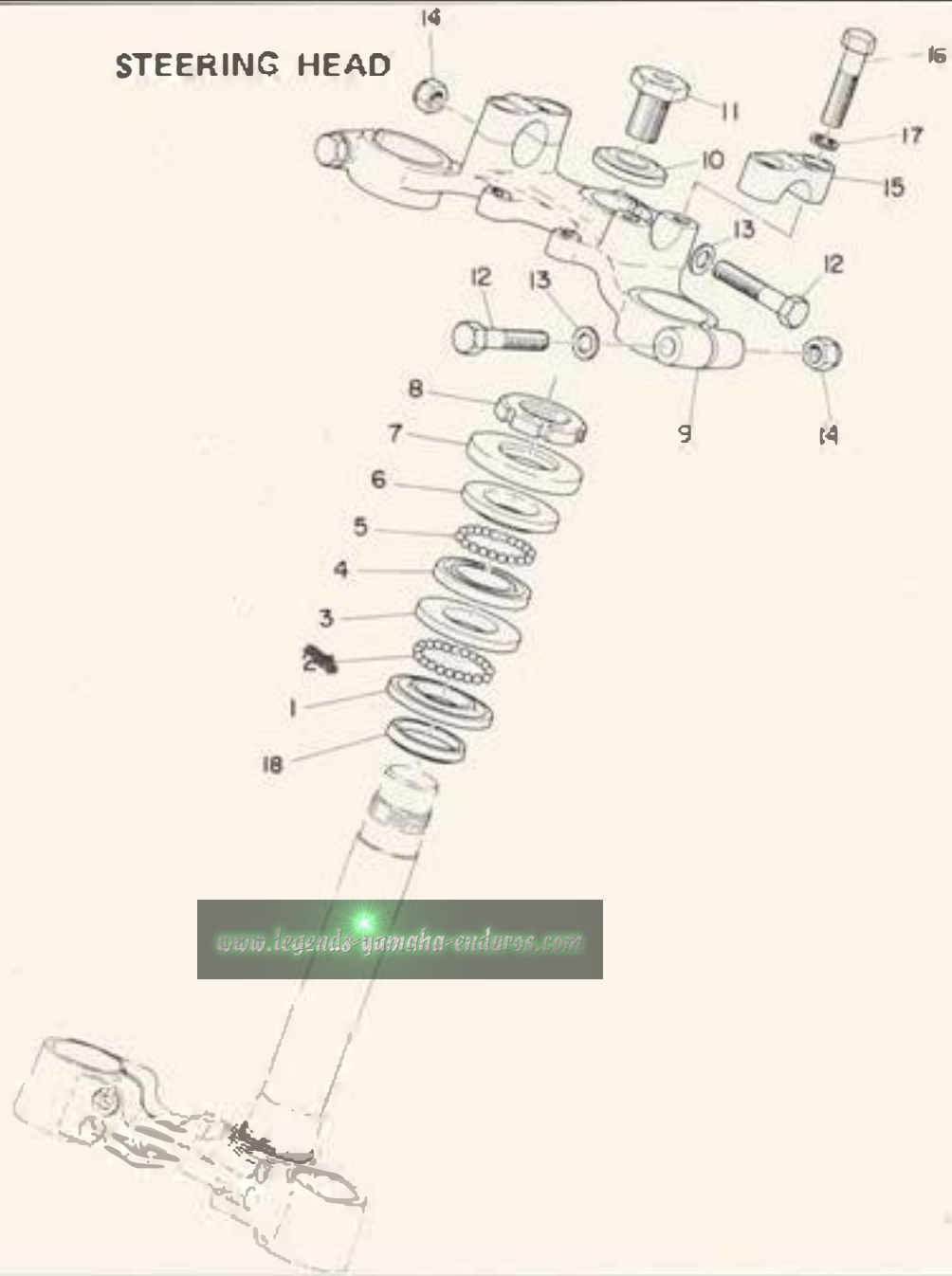
- 1) With front wheel elevated, grab bottoms of fork legs and gently push and pull to check steering head free play. There should be no noticeable free play.



- 2) Loosen stem bolt.



## STEERING HEAD



1. Ball Race 1
2. Ball
3. Ball Race 2
4. Ball Race 2
5. Ball
6. Ball Race 1
7. Ball Race Cover
8. Ring Nut
9. Handle Crown
10. Crown Washer
11. Steering Fitting Bolt
12. Bolt
13. Pedal Link Washer
14. Fitting Nut
15. Handle Upper Holder
16. Bolt
17. Spring Washer
18. Dust Seal



- 3) To adjust, first loosen upper stem pinch bolt.



- 4) Use steering nut wrench to tighten ring nut. Tighten until free play is eliminated.

**CAUTION:**

*Forks must swing from lock to lock without binding or catching.*



- 5) Tighten stem bolt and torque to specification.

Stem Bolt Torque: 4.5 ~ 5.0 Kg·m  
(400 ~ 440 in-lbs.)

- 6) Tighten pinch bolts at fork corn and torque to specification.



Stem Pinch Bolt Torque:  
1.6 ~ 2.4 Kg·m (90 ~ 150 in-lbs.)

For Tube Pinch Bolt Torque:  
0.8 ~ 1.2 Kg·m (70 ~ 100 in-lbs.)

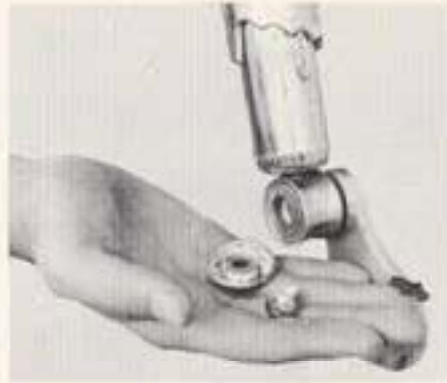
**NOTE:**

For steering head disassembly - refer to DT250A/360A Service Manual for correct procedure.

### 3. Rear Shock Absorbers and Swing Arm

#### 1. Rear Shock Removal and Inspection

- 1) After rear wheel has been removed, remove two Phillips head screws, lock washers and cup washers from each shock.



- 2) Remove shock.

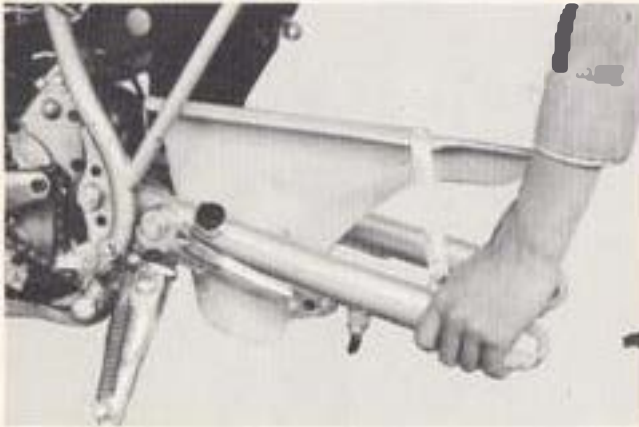
- 3) Place shock bottom eyelet in vise. Grasp and compress spring from it too. Remove upper spring seat and spring.

- 4) Operate shock absorber shaft to check damping. As you push down, only slight damping should be felt. Return stroke will have considerable damping. If there is no damping, replace shock.



## 2. Swing Arm Inspection

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



Swing Arm Free Play: 1.0 mm (0.04 in.)

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

3. Swing arm pivot lubrication—as required, apply grease to zerk fitting on top of pivot with low pressure hand operated gun. Apply until fresh grease appears at both ends of pivot shaft.

Wipe off excess.



Recommended Lubricant:

90wt., smooth lube grease

# CHAPTER X

## ELECTRICAL SYSTEM

### 1. General Information and Schematics

#### 1. General

- 1) The TY250A uses a flywheel magneto to generate electrical current/voltage for the ignition system and the lighting system. There are two coils attached to the magneto backing plate. The right-hand coil supplies primary voltage to the ignition coil. The left-hand coil provides alternating current (A.C.) for operation of the lights and horn.

#### NOTE:

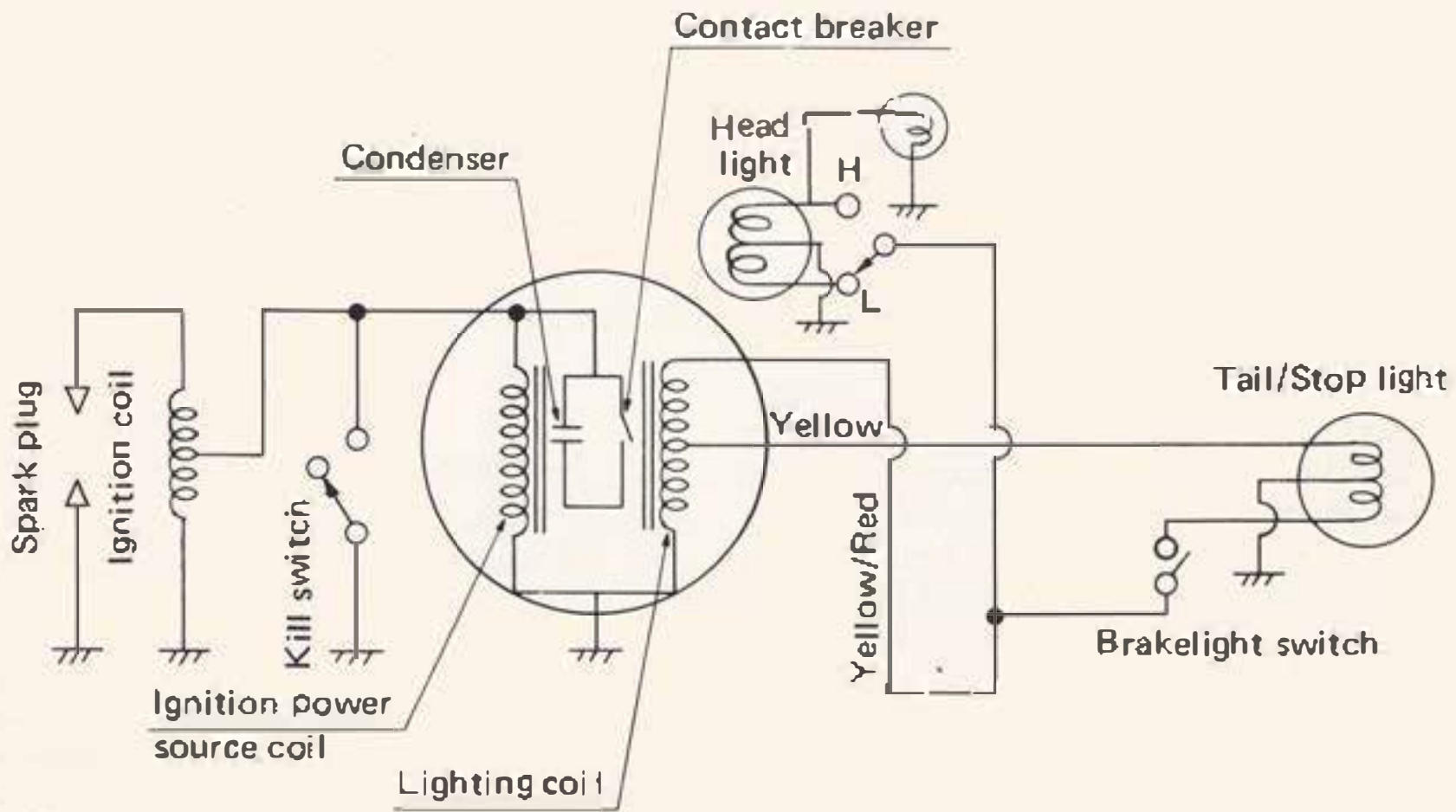
If headlight filament burns out while engine is running, the taillight filament may also burn out because of excess voltage. Always check taillight operation when replacing headlight.



Table of Component Parts

PART NAME	MANUFACTURER	MODEL/TYPE
Flywheel Magneto	HITACHI	F-X161
Ignition Coil	HITACHI	CM61-20M
Contact Breaker Assy	HITACHI	
Condenser	HITACHI	
Spark Plug	N.G.K.	B-8ES
Headlight	KOITO	6V 35/35W
High Beam Indicator	KOITO	6V 1.5W
Taillight	STANLEY	6V 17/5.3W
Brakelight Switch	ASAHI DENSO	YST35S-001

# Wiring Diagram



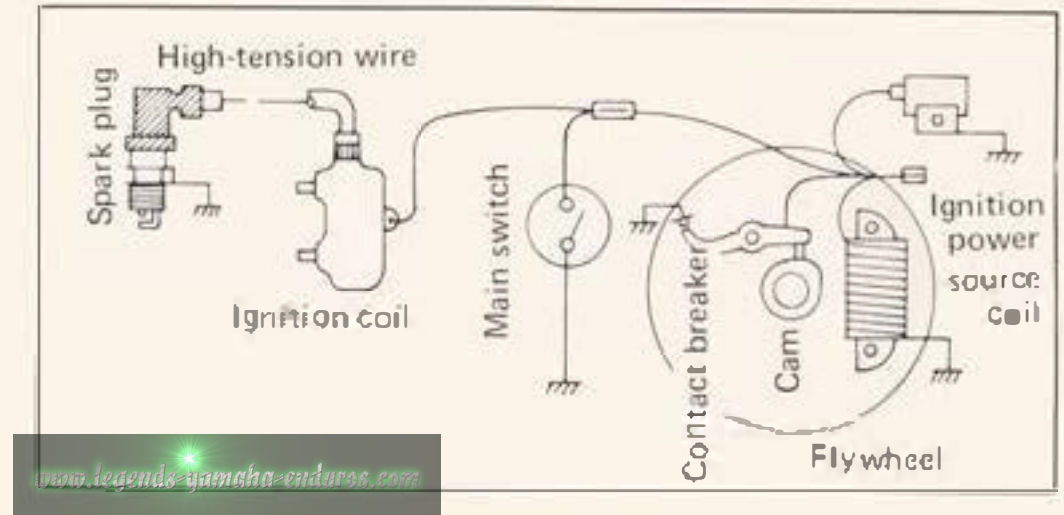
## 2. Magneto Ignition System

### 1. Description

The ignition system consists of the following parts:

- 1) Flywheel magneto
- 2) Ignition source coil
- 3) Contact breaker assembly (points)
- 4) Ignition condenser
- 5) Ignition coil (voltage step-up coil)
- 6) Kill button
- 7) Spark plug

As the flywheel rotates, the contact breaker points begin to open and close, alternately. 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 kind of transformer, with a 1:50 turn 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 mutual-induction and the electric spark jumps across the spark plug electrodes.



### 2. Ignition Timing

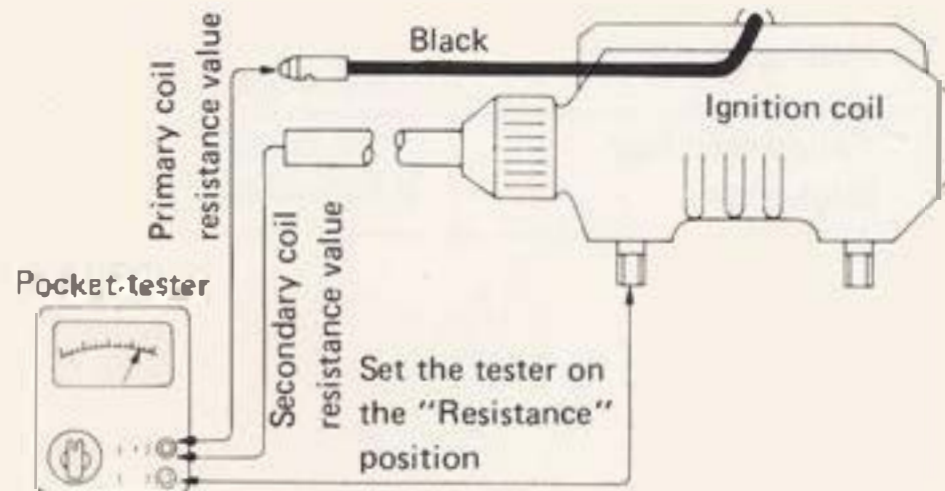
Refer to "Mechanical Adjustments, Ignition Timing" for step-by-step procedure.

#### Spark Test:

Remove the spark plug from the cylinder head and reconnect the high voltage lead. Then hold the spark plug approximately 7mm away from the head and see if it sparks as you crank the kick starter. If it sparks at 7mm, or so, and has a blue white color, the ignition coil should be considered to be in good condition.

### 3. Ignition Coil

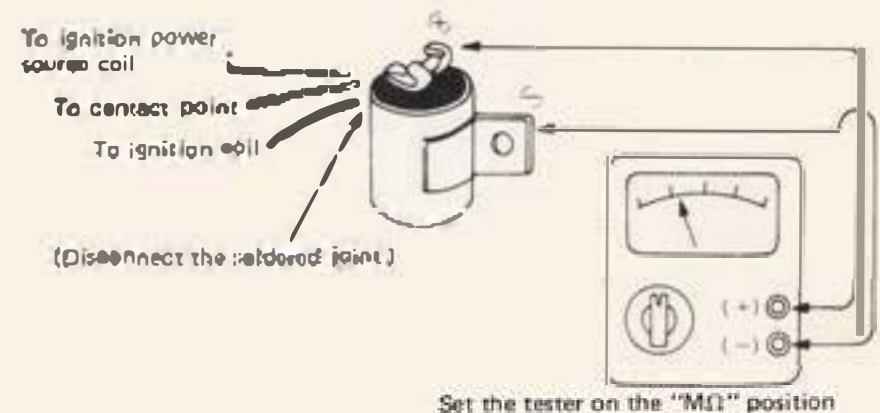
Primary coil res:	$1.75\Omega \pm 10\%$ ( $20^{\circ}\text{C}$ or $68^{\circ}\text{F}$ )
Secondary coil res:	$6.0\text{K}\Omega \pm 10\%$ ( $20^{\circ}\text{C}$ or $68^{\circ}\text{F}$ )



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.

### 4. 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 the points are closed. If it were not for the condenser, an electric arc would jump across the separating contact points, causing them to burn.



Insulation resistance tests should be conducted by connecting the tester as shown. If the pointer swings fully and the reading is more than  $3\text{M}\Omega$ , the insulation is in good condition. If the insulation is faulty, the pointer will stay pointing at the uppermost reading, indicating very little resistance.



**NOTE:**

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

Capacity tests can be performed by simply setting the tester to the condenser capacity. The tester should be connected with the condenser in the same way as in the case of the insulation resistance test. Before this measurement, be sure to set the tester correctly. If the reading is within  $0.3\mu\text{F}\pm 10\%$ , the condenser capacity is correct.

As the flywheel magneto rotates, an alternating voltage is generated in the lighting coil. Separate electrical taps on the lighting coil are provided for day and night operation.

LIGHTING COIL OUTPUT	
Yellow lead (daytime):	3V @2,000 rpm 9V @8,000 rpm
Yellow/red lead (nighttime)	6V @2,000 rpm 8.5V @8,000 rpm

### 3. Lighting System

#### 1. Description

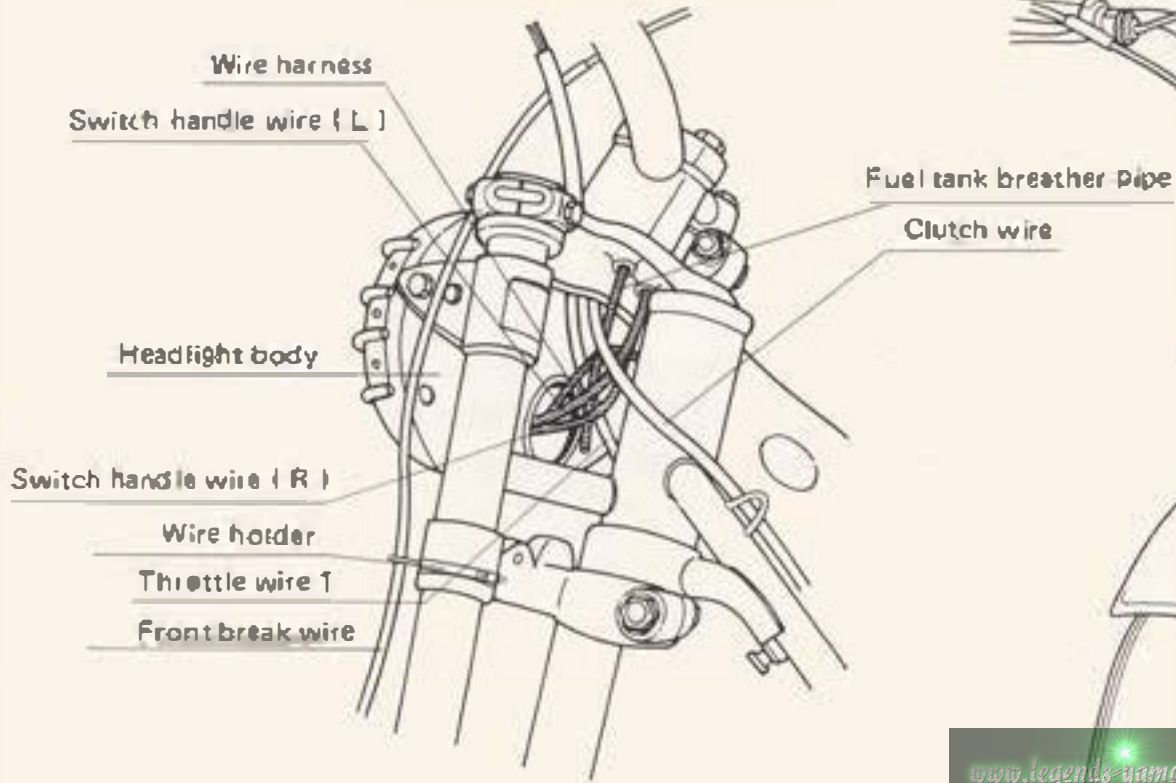
The lighting system consists of a lighting coil (located in the flywheel magneto assembly), headlight, taillight, headlight hi/lo switch, brake-light switch, and a high beam indicator.

# APPENDICES

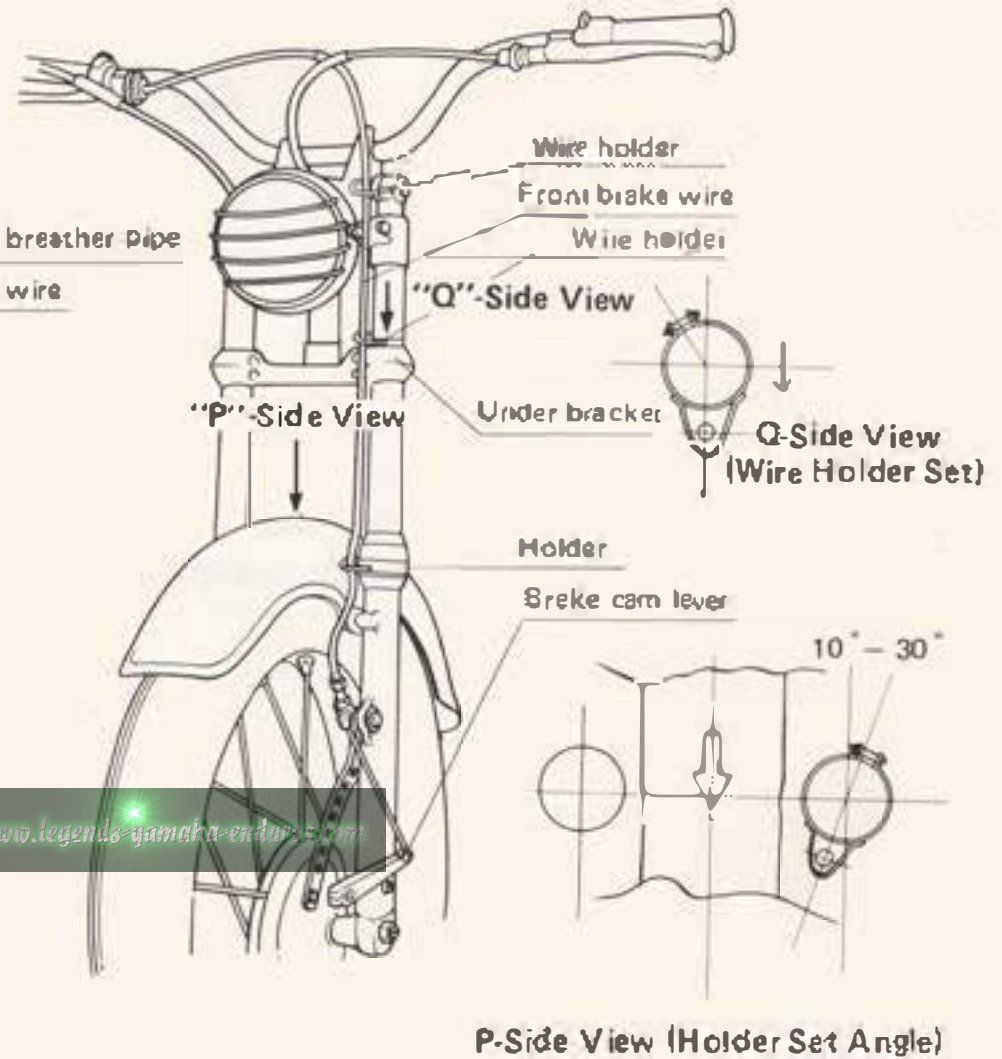
The following is included to provide additional information for metric to inch system conversions, machine storage, etc. We feel you should be familiar with each assembly's structure even though you, the owner, are advised to refrain from attempting disassembly yourself.

# CABLE ROUTING DIAGRAMS

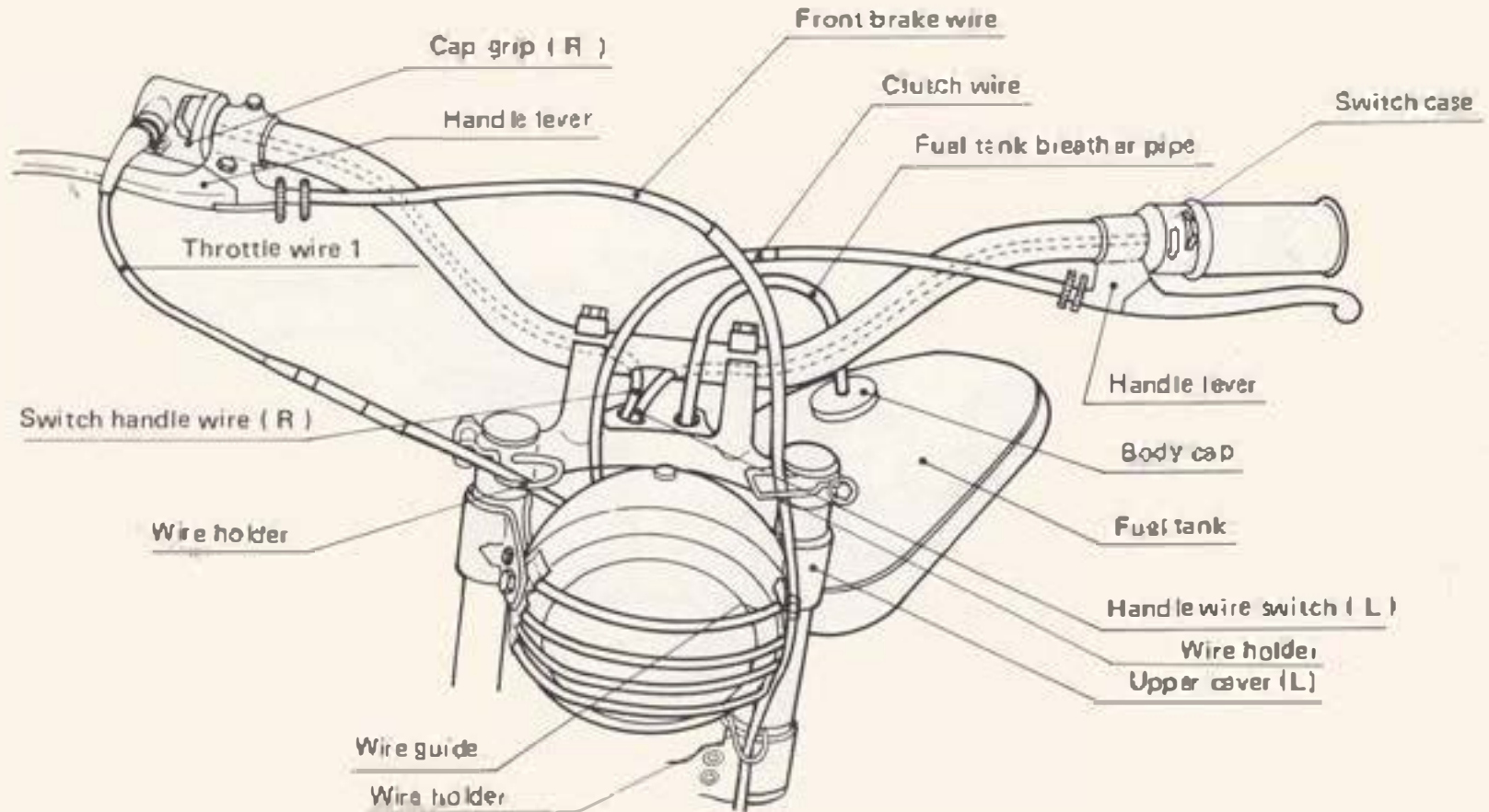
HEADLIGHT-SIDE VIEW



FRONT-VIEW

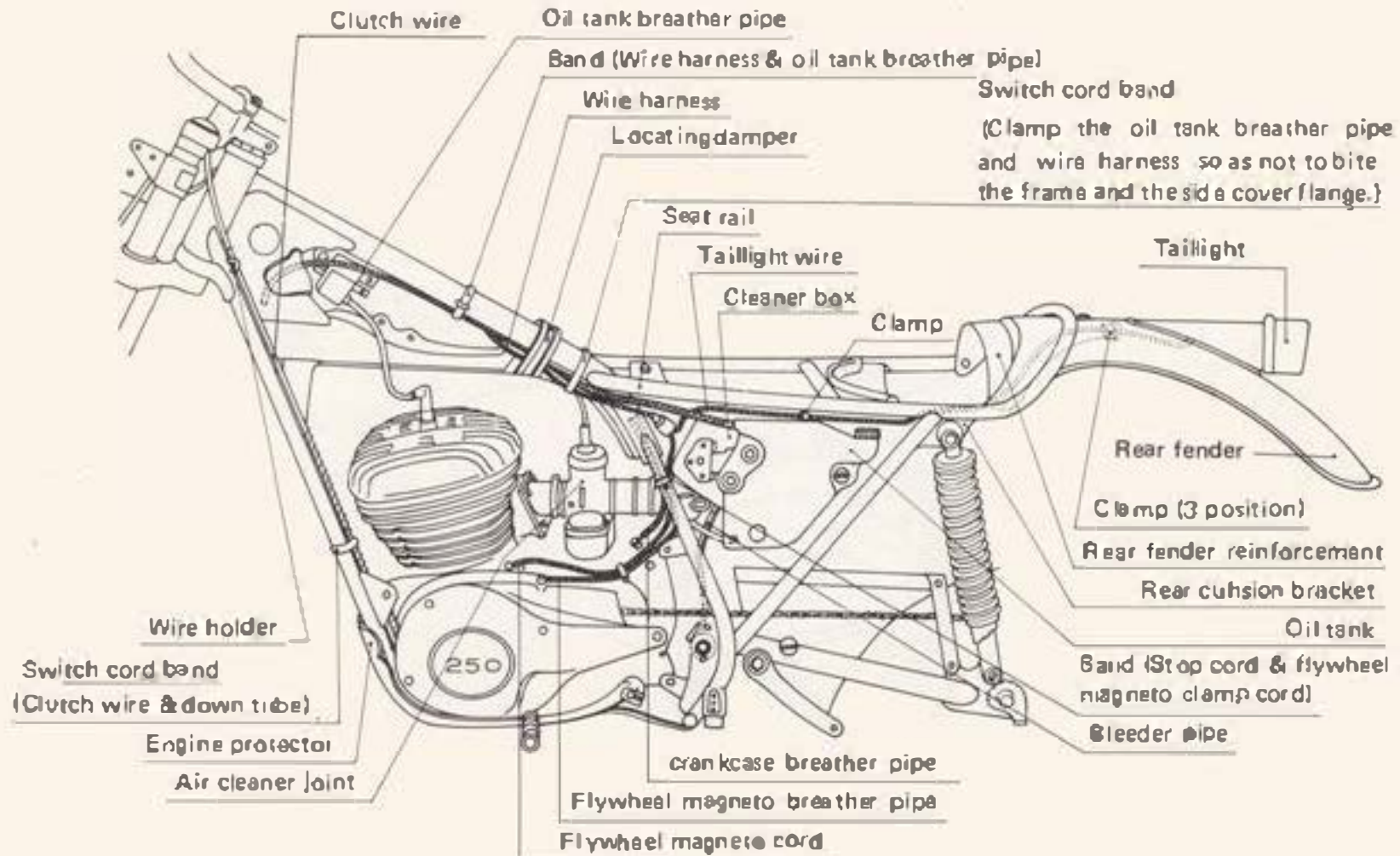


## HANDLE CROWN SIDE VIEW

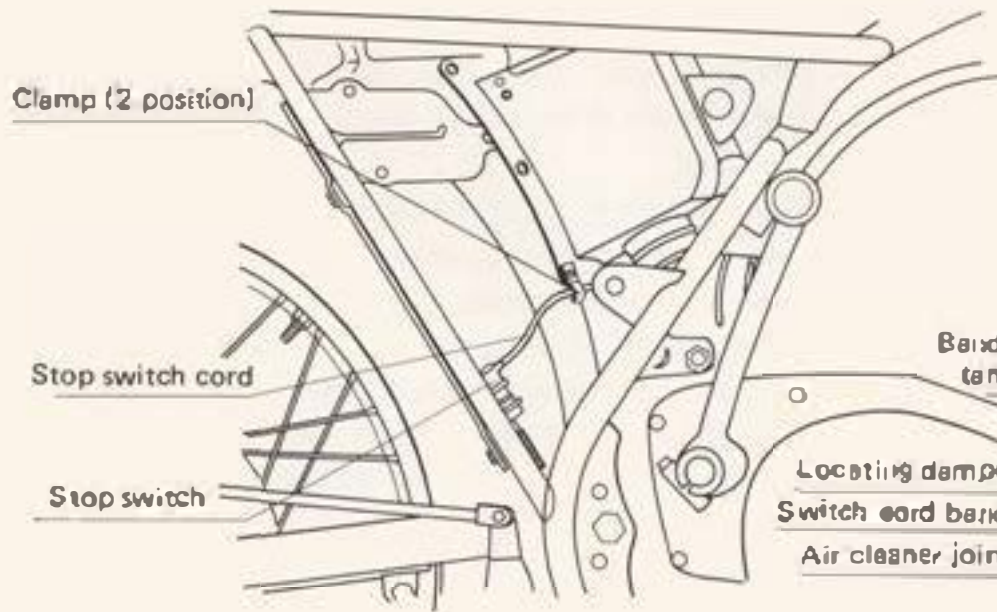




## LEFT-SIDE VIEW



### STOP SWITCH-SIDE VIEW

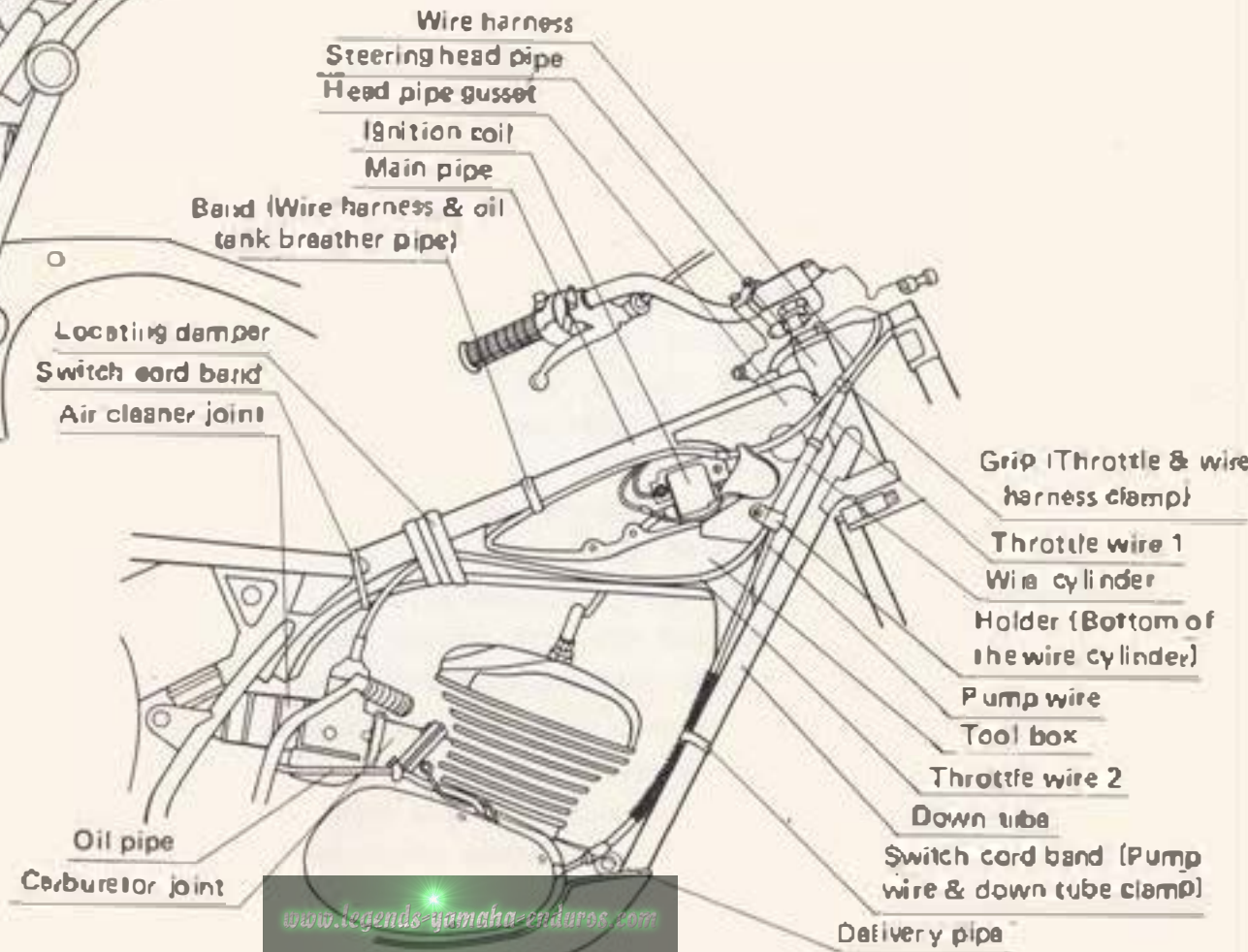


Clamp (2 position)

Stop switch cord

Stop switch

### RIGHT-SIDE VIEW



Wire harness

Steering head pipe

Head pipe gusset

Ignition coil

Main pipe

Band (Wire harness & oil tank breather pipe)

Locating damper

Switch cord band

Air cleaner joint

Oil pipe

Carburetor joint

[www.legends-yamaha-enduros.com](http://www.legends-yamaha-enduros.com)

Grip (Throttle & wire harness clamp)

Throttle wire 1

Wire cylinder

Holder (Bottom of the wire cylinder)

Pump wire

Tool box

Throttle wire 2

Down tube

Switch cord band (Pump wire & down tube clamp)

Delivery pipe

## CLEANING AND STORAGE

### A. Cleaning

Frequent thorough cleaning of your motorcycle will not only enhance its appearance but will improve general performance and extend the useful life of many components.

#### 1. Before cleaning the machine:

- a. Block off end of exhaust pipe to prevent water entry; a plastic bag and strong rubber band may be used.
- b. Remove air cleaner or protect it from water with plastic covering.
- c. Make sure spark plug(s), gas cap, oil tank cap, transmission oil filler cap and battery caps are properly installed.

2. If engine case is excessively greasy, apply degreaser with a paint brush. Do not apply degreaser to chain, sprockets, or wheel axles.

3. Rinse dirt and degreaser off with garden hose, using only enough hose pressure to do the job. Excessive hose pressure may cause water seepage and contamination of wheel bearings, front forks, brake drums, and transmission seals. Many expensive repair bills have resulted from improper high-pressure detergent applications such as those available in coin-operated car washes.

4. Once the majority of the dirt has been hosed off, wash all surfaces with warm water and mild, detergent-type soap. An old tooth brush or bottle brush is handy to reach those hard-to-get-to places.
5. Rinse machine off immediately with clean water and dry all surfaces with a chamois, clean towel, or soft absorbent cloth.
6. Immediately after washing, remove excess moisture from chain and lubricate to prevent rust.
7. Chrome-plated parts such as handlebars, rims, spokes, forks, etc., may be further cleaned with automotive chrome cleaner.
8. Clean the seat with a vinyl upholstery cleaner to keep the cover pliable and glossy.
9. Automotive-type wax may be applied to all painted and chrome-plated surfaces. Avoid combination cleaner-waxes. Many contain abrasives which may mar paint or protective finish on fuel and oil tanks.
10. After finishing, start the engine immediately and allow to idle for several minutes.



## B. Storage

Long term storage (30 days or more) of your motorcycle will require some preventive procedures to insure against deterioration. After cleaning machine thoroughly, prepare for storage as follows:

1. Drain fuel tank, fuel lines, and carburetor float bowl(s).
2. Remove empty fuel tank, pour a cup of 10W to 30W oil in tank, shake tank to coat inner surfaces thoroughly and drain off excess oil. Re-install tank.
3. Remove spark plug(s), pour about one tablespoon of 10W to 30W oil in spark plug hole(s) and re-install spark plugs. Kick engine over several times (with ignition off) to coat cylinder walls with oil.
4. Remove drive chain. Clean thoroughly with solvent and lubricate with graphite-base chain lubricant. Re-install chain or store in a plastic bag (tie to frame for safe-keeping).
5. Lubricate all control cables.
6. Remove battery and charge. Store in a dry place and re-charge once a month. Do not store battery in an excessively warm or cold place (less than 32°F or more than 90°F).

7. Block up frame to raise both wheels off ground (Main stands can be used on machines so equipped.)
8. Deflate tires to 15psi.
9. Tie a plastic bag over exhaust pipe outlet(s) to prevent moisture entering.
10. If storing in humid or salt-air atmosphere, coat all exposed metal surfaces with a light film of oil. Do not apply oil to rubber parts or seat cover.



## CONVERSION TABLES

### LENGTHS

Multiply	By	To Obtain
Millimeters (mm)	0.03937	Inches
Inches (in)	25.4	Millimeters
Centimeters (cm)	0.3937	Inches
Inches (in)	2.54	Centimeters

Multiply	By	To Obtain
Kilometers (km)	0.6214	Miles
Miles (mi)	1.609	Kilometers
Meters (m)	3.281	Feet
Feet (ft)	0.3048	Meters

### WEIGHTS

Kilograms (kg)	2.205	Pounds
Pounds	0.4536	Kilograms

Grams (g)	0.03527	Ounces
Ounces (oz)	28.25	Grams

### VOLUMES

Cubic centimeters (cc)	0.06102	Cubic inches
Cubic inches (cu.in.)	16.387	cc.
Liters (l)	0.264	Gallons
Gallons (gal)	3.785	Liters
U.S. gallons	1.2	Imperial gals.
Imperial gallons	4.537	Liters

Imperial gallons	277.274	cu.in.
Liters (l)	1.057	Quarts
Quarts (qt)	0.946	Liters
Cubic centimeters (cc)	0.0339	Fluid ounces
Fluid ounces (fl.oz)	29.57	cc.

### MISCELLANEOUS

Metric horsepower (qs)	1.014	bhp
Brake horsepower (bhp)	0.9859	ps.
Kilogram-meter (kg-m)	7.234	Foot-pounds
Kilograms/sq.cm (kg/cm <sup>2</sup> )	14.22	Pounds/sq.in. (Lbs/in <sup>2</sup> or psi)
Centigrade (C°)	(C° x 9/5) + 32	Fahrenheit (F°)

Footpounds (ft-lbs)	0.1383	kg-m
Kilometers per liter (km/l)	2.352	mpg
Miles per gallon (mpg)	0.4252	km/l

## MILLIMETERS TO INCHES

	0	0.1	0.2	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	0.0276	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	0.0787	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	0.3542	0.3583	0.4016	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=0.004    0.03mm=0.0012    0.05mm=0.0020    0.07mm=0.0028    0.09mm=0.0035  
 0.02mm=0.008    0.04mm=0.0016    0.06mm=0.0024    0.08mm=0.0031    0.10mm=0.0039

## INCHES TO MILLIMETERS

	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	5.080	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	16.764	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	25.908	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







# WARRANTY

(for U.S. A. and CANADA)

Yamaha's warranty on the TY250A extends for a period of 90 days from date of sale. Other conditions regarding your warranty coverage are explained in the Warranty Policy.

If any questions arise regarding warranty, consult your Authorized Yamaha Dealer, or:

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