



**YAMAHA**

# **GT80E GTMXE**

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## **Service Manual**

## NOTICE

This manual has been written by Yamaha Motor Company for use by Authorized Yamaha Dealers and their qualified mechanics. In light of this purpose it has been assumed that certain basic mechanical precepts and procedures inherent to our product are already known and understood by the reader. This service manual has been written to acquaint the mechanic with common disassembly, inspection, reassembly, maintenance, and troubleshooting procedures associated with this machine.

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

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

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

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

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

**YAMAHA GT80E, GTMXE  
SERVICE MANUAL  
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## CHAPTER 1. GENERAL INFORMATION

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1

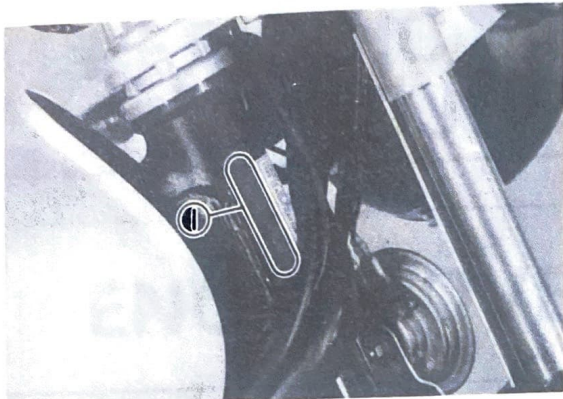
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# CHAPTER 1. GENERAL INFORMATION

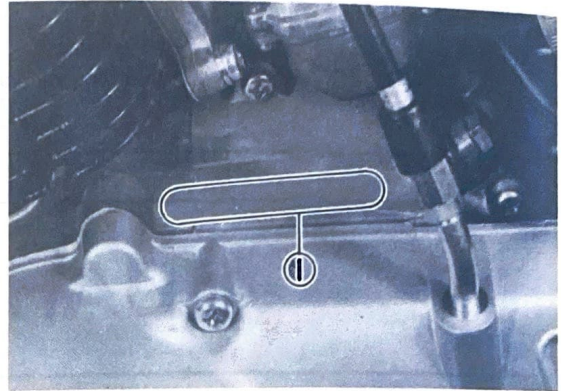
## 1-1. MACHINE IDENTIFICATION

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

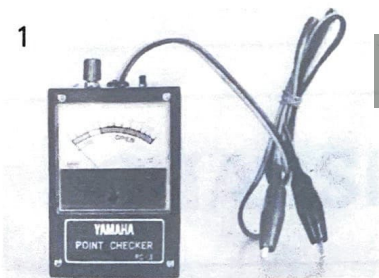


1. Frame serial number

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



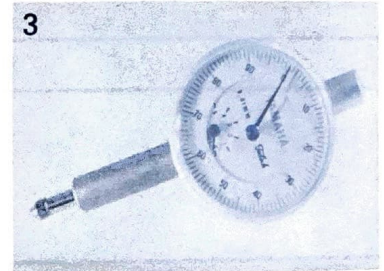
1. Engine serial number



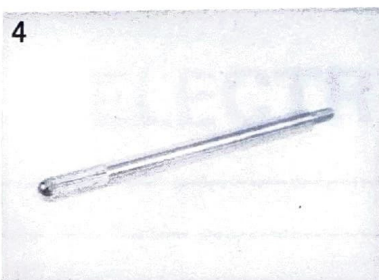
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2



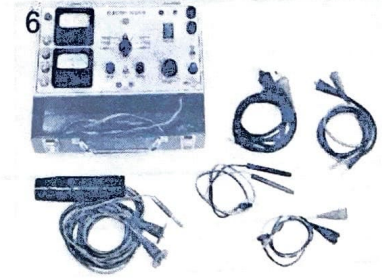
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4



5



6



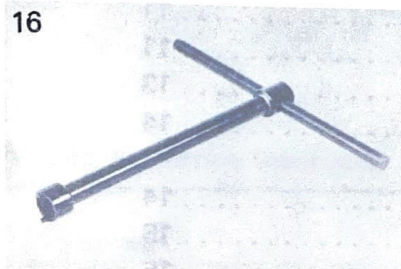
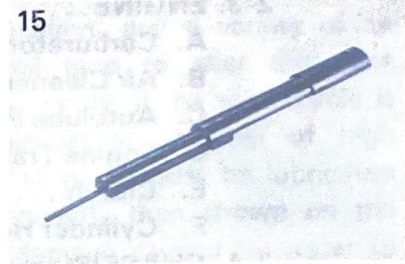
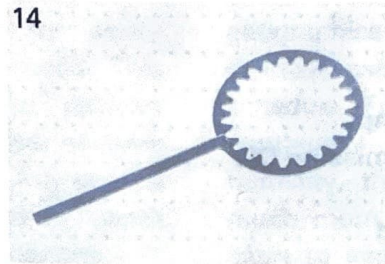
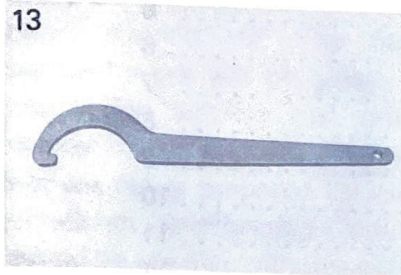
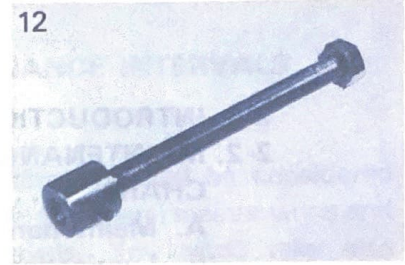
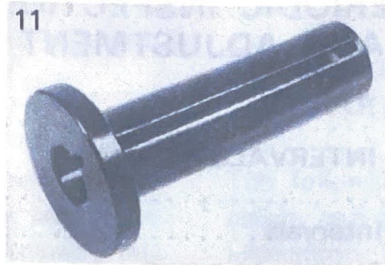
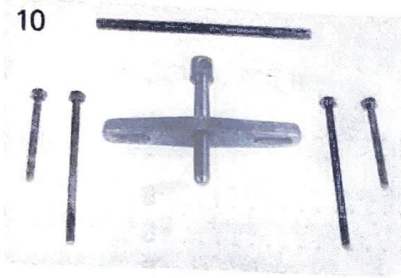
7



8



9



| No. | Description                  | Tool No.    |
|-----|------------------------------|-------------|
| 1   | Point checker                | 90890-03064 |
| 2   | Dial gauge stand No. 2       | 90890-01195 |
| 3   | Dial gauge                   | 90890-03002 |
| 4   | Dial gauge needle (56 mm)    | 90890-03042 |
| 5   | Pocket Tester                | 90890-03096 |
| 6   | Electro Tester               | 90890-03021 |
| 7   | Flywheel holder              | 90890-01235 |
| 8   | Flywheel puller              | 90890-01189 |
| 9   | Exhaust pipe ring nut wrench | 90890-01040 |
| 10  | Crankcase separation tool    | 90890-01135 |
| 11  | Crankshaft setting pot       | 90890-01012 |
| 12  | Crankshaft setting bolt      | 90890-01017 |
| 13  | Steering nut wrench          | 90890-01051 |
| 14  | Clutch holding tool          | 90890-01022 |
| 15  | Piston pin puller            | 90890-01183 |
| 16  | Meter gear bushing tool      | 90890-01052 |



## CHAPTER 2. PERIODIC INSPECTION AND ADJUSTMENT

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## CHAPTER 2. PERIODIC INSPECTION AND ADJUSTMENT

### 2-1. INTRODUCTION

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

### 2-2. MAINTENANCE INTERVALS CHARTS

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

#### A. Maintenance Intervals

Unit: km (mile)

| Item                       | Remarks                                         | Initial      |              |                  |                  | Thereafter every |                  |                  |
|----------------------------|-------------------------------------------------|--------------|--------------|------------------|------------------|------------------|------------------|------------------|
|                            |                                                 | 400<br>(250) | 800<br>(500) | 1,600<br>(1,000) | 3,200<br>(2,000) | 1,600<br>(1,000) | 3,200<br>(2,000) | 6,400<br>(4,000) |
| Cylinder head/Exhaust pipe | Decarbonize                                     |              |              | ○                | ○                |                  |                  | ○                |
| Spark plug                 | Inspect/Clean or replace as required            |              |              | ○                | ○                | ○                |                  |                  |
| Air filter                 | Clean/Replace as required                       |              |              | ○                | ○                | ○                |                  |                  |
| Carburetor                 | Check operation/Adjust as required              |              | ○            |                  | ○                |                  | ○                |                  |
| Brake system (complete)    | Check/Adjust as require—Repair as required      | ○            | ○            | ○                |                  | ○                |                  |                  |
| Wheels and tires           | Checks pressure/Wear/Balance/Runout             | ○            | ○            | ○                |                  | ○                |                  |                  |
| Fuel petcock               | Clean/Flush tank as required                    | ○            |              | ○                |                  |                  | ○                |                  |
| Autolube pump              | Check/Adjust/Air bleeding                       | ○            |              | ○                |                  | ○                |                  |                  |
| Battery (GT80E)            | Top-up/Check specific gravity and breather pipe | ○            | ○            | ○                | ○                | ○                |                  |                  |
| Ignition timing            | Adjust/Clean or replace as required             |              | ○            | ○                | ○                |                  | ○                |                  |
| Lights/Signals (GT80E)     | Check operation/Replace as required             | ○            | ○            | ○                | ○                | ○                |                  |                  |
| Fittings/Fasterns          | Tighten before each trip and/or .....           | ○            | ○            | ○                | ○                | ○                |                  |                  |
| Drive chain                | Check tension/Alignment                         | ○            | ○            | ○                | ○                | ○                |                  |                  |

## B. Lubrication Intervals

Unit: km (mile)

| Item                             | Remarks                                   | Type<br>(Recommended lubricants)                             | Initial               |              |                  |                  | Thereafter every |                  |                  |
|----------------------------------|-------------------------------------------|--------------------------------------------------------------|-----------------------|--------------|------------------|------------------|------------------|------------------|------------------|
|                                  |                                           |                                                              | 400<br>(250)          | 800<br>(500) | 1,600<br>(1,000) | 3,200<br>(2,000) | 1,600<br>(1,000) | 3,200<br>(2,000) | 6,400<br>(4,000) |
| Transmission oil                 | Replace/Warm engine before draining       | 1. Yamalube 4-cycle oil<br>2. SAE 10W/30 type "SE" motor oil | ○                     |              | ○                |                  | check            | ○                |                  |
| Control/Meter cables (GT80E)     | Apply thoroughly                          | Yamaha chain and cable lube or SAE 10W/30 motor oil          |                       |              | ○                | ○                |                  | ○                |                  |
| Throttle grip/Housing            | Apply lightly                             | Lithium base grease                                          |                       |              |                  | ○                |                  | ○                |                  |
| Brake camshaft                   | Apply lightly                             | Lithium base grease                                          |                       |              | ○                |                  | ○                |                  |                  |
| Front forks                      | Drain completely—<br>Check specifications | Yamaha fork oil 10W,                                         |                       |              |                  | ○                |                  |                  | ○                |
| Steering bearings                | Inspect thoroughly/<br>Pack moderately    | Medium-weight wheel bearing grease                           |                       |              |                  | check            |                  | check            | ○                |
| Speedometer gear housing (GT80E) | Inspect thoroughly/<br>Pack moderately    | Lithium base grease                                          |                       |              |                  | ○                |                  |                  | ○                |
| Wheel bearings                   | Do not over-pack                          | Medium-weight wheel bearing grease                           |                       |              |                  | ○                | check            | ○                |                  |
| Drive chain                      | Lube/Adjust as required                   | Yamaha chain and cable Lube or SAE 10W/30 motor oil          | Every 400 km (250 mi) |              |                  |                  |                  |                  |                  |
|                                  | Remove/Clear/Lube/Adjust                  |                                                              |                       |              | ○                |                  | ○                |                  |                  |
| Brake pedal shaft                | Apply lightly                             | Lithium base grease                                          |                       |              | ○                |                  | ○                |                  |                  |
| Stand shaft pivot                | Apply lightly                             | Lithium base grease                                          |                       |              | ○                |                  |                  | ○                |                  |
| Point cam lubrication wick(s)    | Apply very lightly                        | Light-weight machine oil                                     |                       |              | ○                |                  |                  |                  | ○                |

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### 2-3. ENGINE

#### A. Carburetor

##### 1. Pilot air screw

Turn air adjusting screw until it lightly seats, then back it out to specification. This adjustment can be made with engine stopped.

Air screw (Turns out): 1 - 1/2

##### 2. Start the engine and let it warm up.

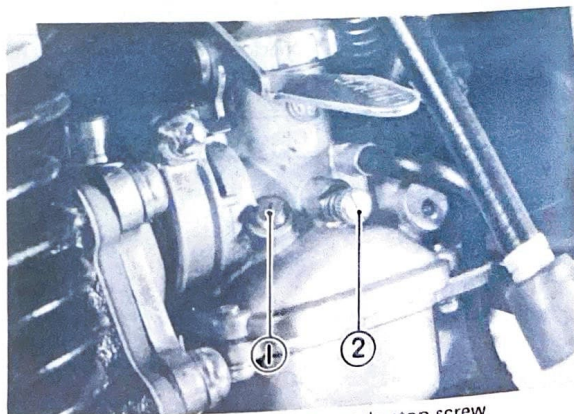
##### 3. Throttle stop screw

Turn throttle stop screw in or out to achieve smooth engine operation at specified idle speed.

Idling speed: 1,250 – 1,400 rpm

#### NOTE:

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



1. Pilot air screw

2. Throttle stop screw

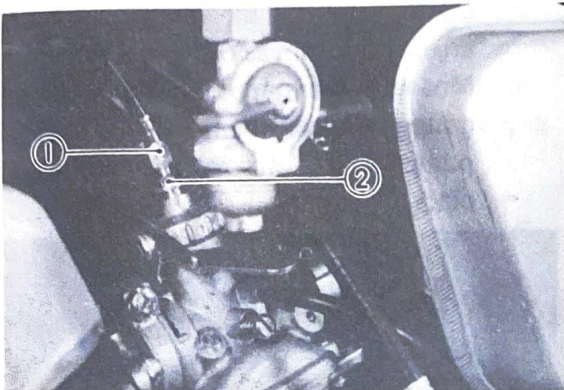


#### 4. Throttle cable

##### a. Throttle cable 2.

Loosen cable adjuster lock nut (at top of carburetor) and turn cable adjuster until specified free play is obtained. Retighten lock nut.

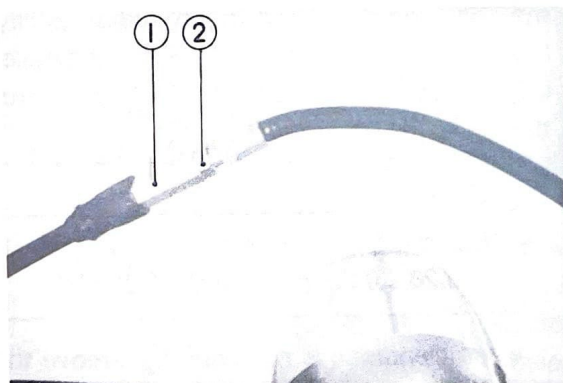
1.0mm—2.0mm (0.04in — 0.08in)



- 1. Adjuster
- 2. Lock nut

##### b. Throttle cable 1

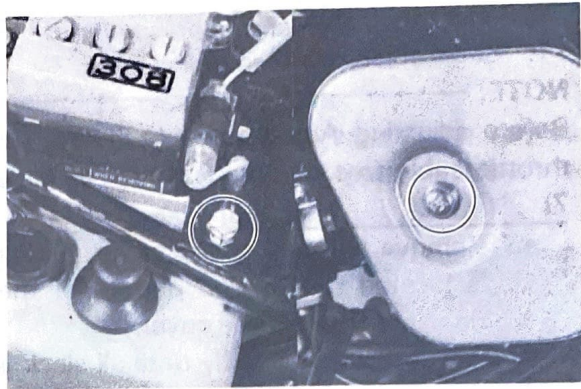
After engine idle speed and throttle cable 2. are set, check play in turning direction of throttle grip. The play should be 3—6 mm (0.12—0.24 in) at grip flange. Loosen the lock nut and turn the wire adjuster to make the necessary adjustment. After adjusting, be sure to tighten the lock nut properly.



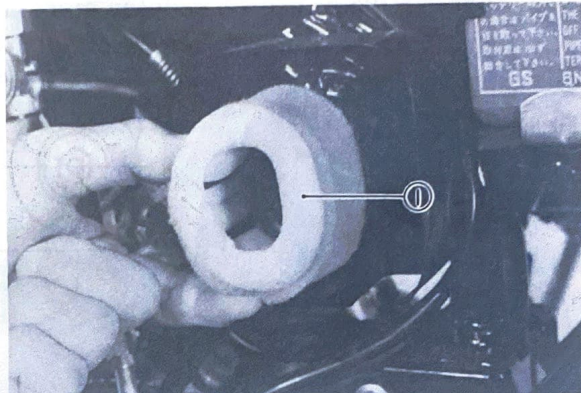
- 1. Adjuster
- 2. Lock nut

#### B. Air Cleaner

1. Remove the oil tank mounting bolt and then the tank. Remove the air filter case cap fitting screw and then the cap.



2. Remove the air cleaner element assembly.



1. Air filter element

3. Wash the element gently, but thoroughly, in solvent.
4. Squeeze excess solvent out of element and dry.
5. Pour a small quantity of 2-stroke motor oil onto cleaner element and work thoroughly into the porous foam material. Element must be damp with oil, but not dripping.
6. Re-insert the cleaner element guide into the element.
7. Re-install the element assembly and case cover.

#### NOTE:

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



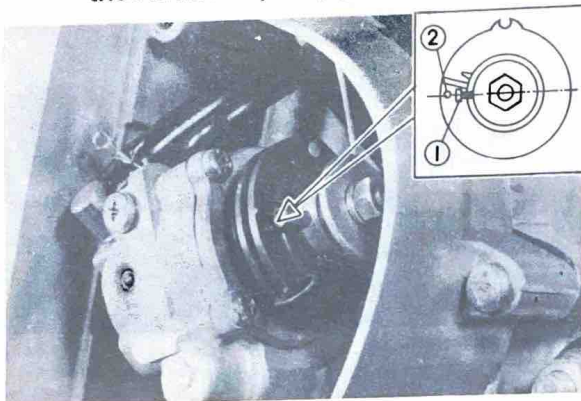
### C. Autolube pump

#### 1. Cable adjustment

##### NOTE:

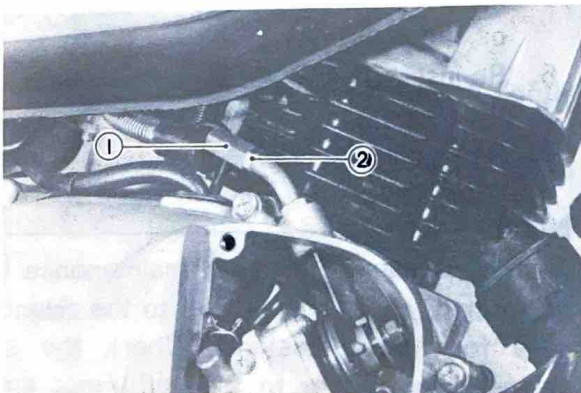
Before adjusting Autolube cable always set throttle cable free play first. (Refer to page 7)

- Remove autolube pump cover, which is located on forward portion of the right-hand crankcase cover.
- Rotate throttle slightly until all slack is removed from all cables. Hold this position.
- Check to see that the Autolube pump plunger pin is aligned with the mark on the Autolube pump pulley.



- Plunger
- Mark

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



- Adjuster
- Lock nut

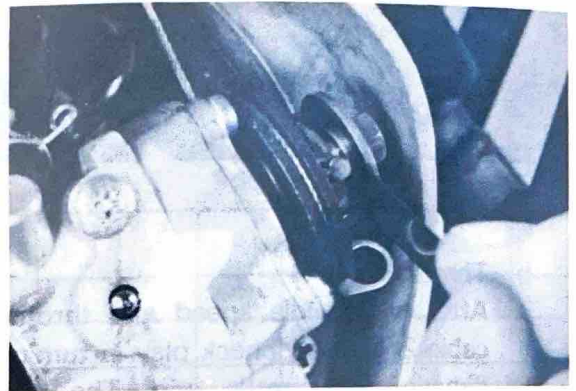
- Tighten adjuster lock nut.

#### 2. Pump stroke adjustment

Normally the checking and adjustment of the pump stroke are not required, but

if any sign of trouble resulting from an incorrect minimum pump stroke is noticed (e.g., excessive engine oil consumption or engine seizure), proceed as follows:

- Remove the pump cover and start the engine.
- While running the engine idle, observe the pump adjust plate carefully, and stop the engine the moment that the adjust plate moves out to the limit.
- Measure the gap with the thickness gauge between the raised boss on the pump adjust pulley and the adjust plate.



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

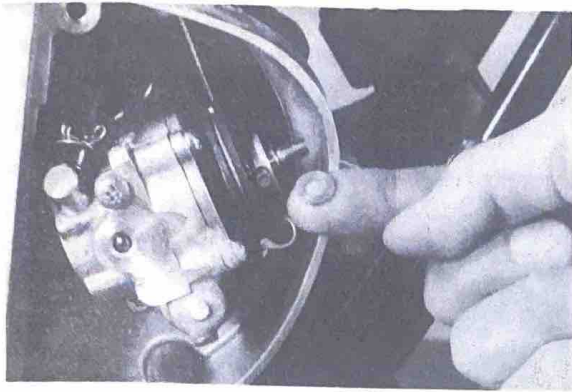
##### NOTE:

When inserting the thickness gauge between the adjusting plate and the adjusting pulley, be careful so that either the plate or the pulley is not moved. In other words, do not force the thickness gauge into the gap.

Minimum pump stroke:

0.20—0.25 mm (0.008—0.010 in)

- If clearance is not correct, remove the adjust plate lock nut and the adjust plate.
- Remove or add an adjust shim as required.



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

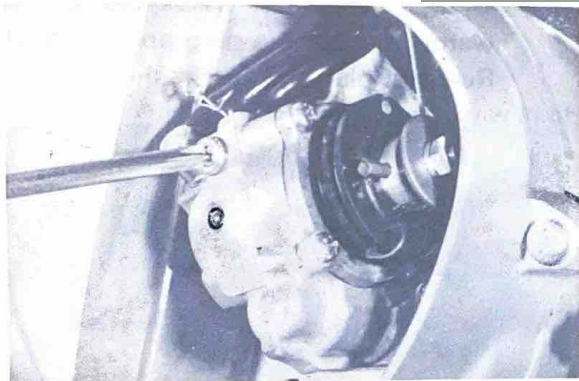
### 3. Air bleeding

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

- Setting up a new machine out of the crate.
- Whenever the Autolube tank has run dry.
- Whenever any portion of the Autolube system is disconnected.

#### a. Bleeding the pump case and/or oil pipe

- 1) Remove the pump cover and remove the bleed screw.



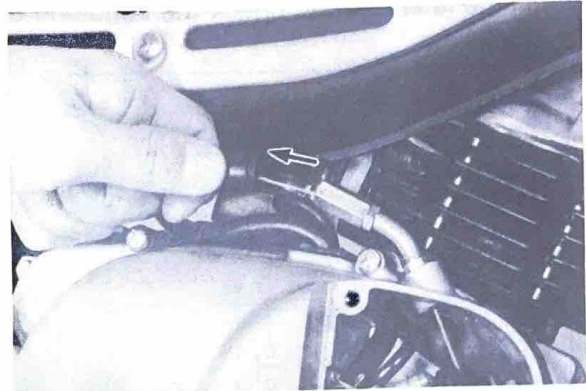
- 2) Keep the oil running out until air bubbles disappear.
- 3) When air bubbles are expelled completely, tighten the bleed screw and install the pump cover.

#### **NOTE:**

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

#### b. Bleeding the pump distributor and/or delivery pipe

- 1) Start the engine.
- 2) Pull the pump wire all the way out to set the pump stroke to maximum.



#### **NOTE:**

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

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

## D. Engine and Transmission Oil

### 1. Engine

#### a. Autolube oil

We recommend that your first choice be Yamalube 2-cycle oil. If for any reason you should use another type, the oil should have the BIA certification "for service TC-W". Check container top or label for service specification. If the above oils not available, use a 30W or 40W 2-stroke oil for air-cooled engines.

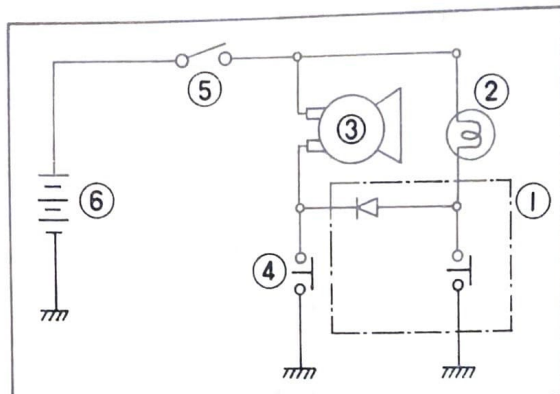
#### b. Autolube tank

Always check Autolube tank oil level before operating machine. If oil caution light comes on, remove filler cap and top up tank.



**NOTE:**

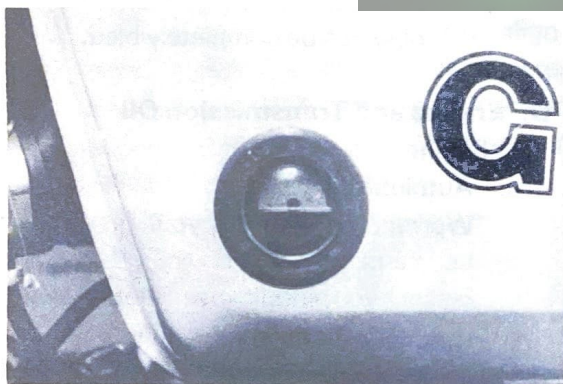
The oil caution light has been designed to come on when the transmission is in the neutral position. This will allow you to frequently check the condition of the bulb. If the caution light does not come on while the machine is in neutral, check the condition of the bulb.



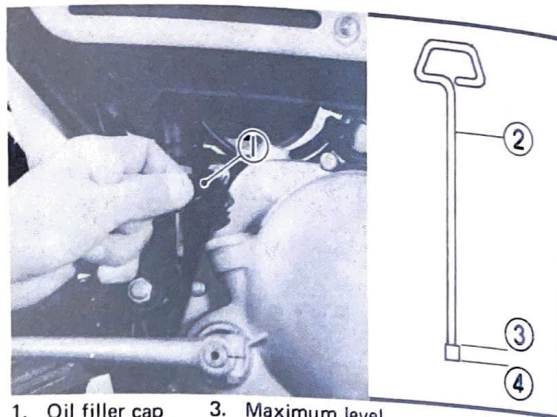
- |                              |                |
|------------------------------|----------------|
| 1. Oil level switch assembly | 4. Horn switch |
| 2. Oil caution light         | 5. Main switch |
| 3. Horn                      | 6. Battery     |

**Autolube tank (GTMXE)**

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

**2. Transmission**

- a. To check level, start the engine and let it run for several minutes to warm and distribute oil. With the engine stopped, unscrew the dipstick and clean. Set it on the case threads in a level position. Remove and check level.



- |                   |                  |
|-------------------|------------------|
| 1. Oil filler cap | 3. Maximum level |
| 2. Dip stick      | 4. Minimum level |

**NOTE:**

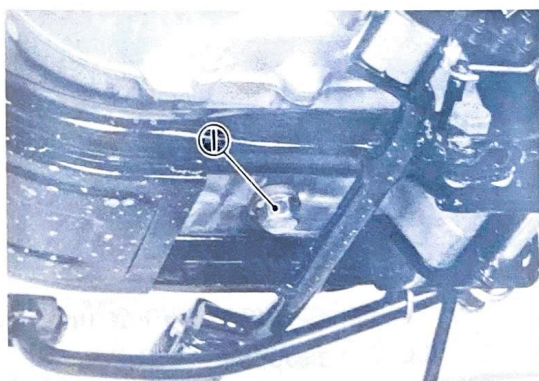
Be sure the machine is level and on both wheel.

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

**Recommended oil:**

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

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



1. Drain plug

Transmission drain plug torque:  
2 m·kg (14 ft·lb)

**Transmission oil quantity:**

Total (dry):  
550—600 cc (0.58—0.63 U.S. qt)

Exchange:  
500—550 cc (0.53—0.58 U.S. qt)

**NOTE:** \_\_\_\_\_  
Transmission oil should be replaced several times during the break-in period.

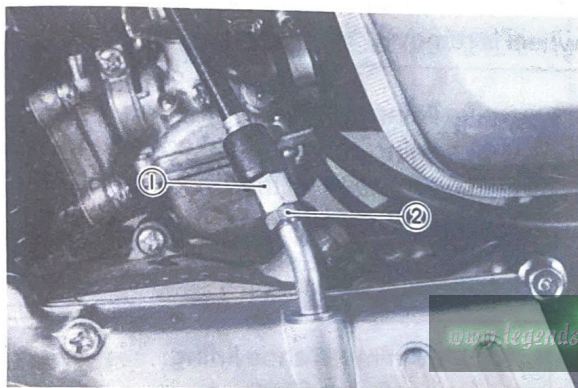
**CAUTION:** \_\_\_\_\_  
Under no circumstances should any additives be included with the transmission oil. This oil also lubricates and cools the clutch. Additives may cause clutch slippage.

## E. Clutch

Proper clutch adjustment requires two separate procedures.

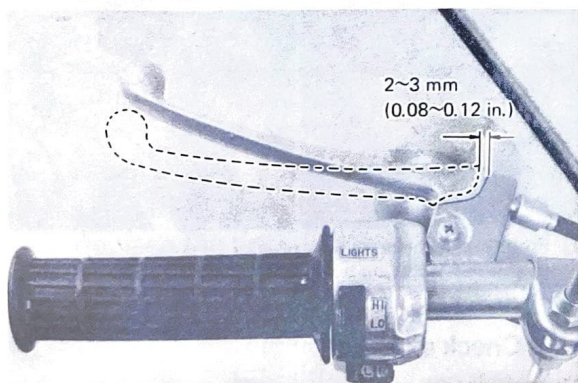
### 1. Free play adjustment

- a. Loosen the cable adjuster lock nut.



1. Adjuster
2. Lock nut

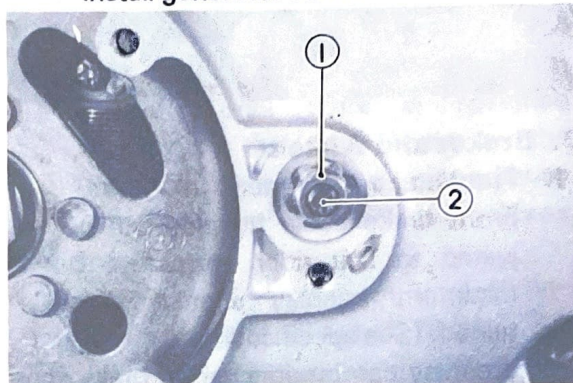
- b. Turn clutch cable adjusting screw in or out until proper lever free play is achieved.



**NOTE:** \_\_\_\_\_  
The above procedure provides for maximum cable free play to allow for proper clutch actuating mechanism adjustment.

### 2. Mechanism adjustment

- a. Remove the generator cover.
- b. Loosen the adjusting screw lock nut, and slowly tighten the adjusting screw until resistance is felt.
- c. Back adjusting screw in approximately 1/4 turn and tighten lock nut. Re-install generator cover.



1. Lock nut
2. Adjusting screw

- d. Readjust handle lever free play as required.
- e. Install the generator cover.

## F. Cylinder Head

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

Cylinder head nut torque:  
1.0 m-kp (7.0 ft-lb)

## 2-4. CHASSIS

### A. Fuel Petcock

1. Clean fuel filter
  - a. Turn fuel petcock to "OFF" position.
  - b. Remove filter cap, filter net and filter gasket.
  - c. Clean filter and cap.

**NOTE:** \_\_\_\_\_  
If filter is damaged, replace.





## B. Brakes and Wheels

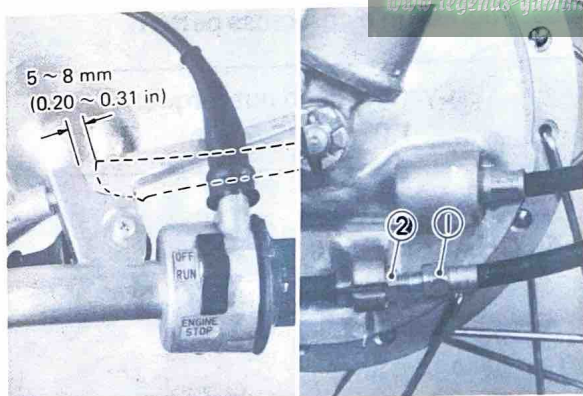
### 1. Front brake adjustment

Front brake cable freeplay can be adjusted to suit rider preference but a minimum freeplay should be maintained. (See specification)

Freeplay can be adjusted at brake shoe plate.

- Loosen the adjuster lock nut.
- Turn the adjuster in or out until adjustment is suitable.
- Tighten the adjuster lock nut.

Minimum freeplay:  
5—8 mm (0.2—0.3 in)



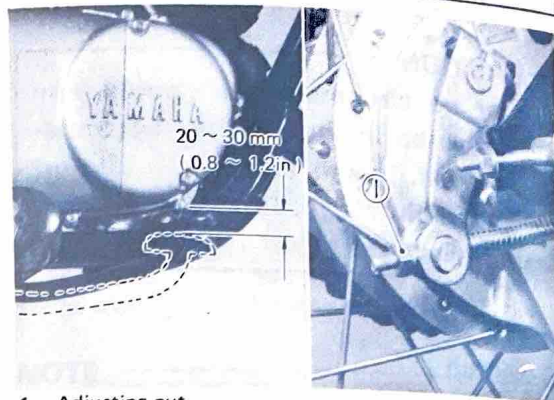
- Adjuster
- Lock nut

### 2. Rear brake adjustment

Adjust rear brake pedal play to suit, providing the minimum specified freeplay. Adjustment is accomplished as follows:

- Turn the adjusting nut on the rear brake rod in or out until brake pedal freeplay is suitable.

Minimum freeplay:  
20—30 mm (0.8—1.2 in)



- Adjusting nut

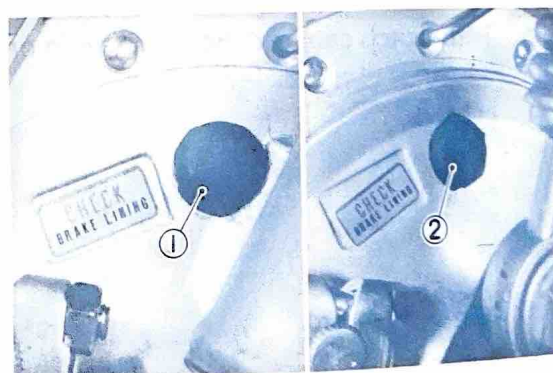
### NOTE:

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

### 3. Brake lining check

Brake lining can be checked through the inspection hole in the brake shoe plate. If thickness is less than specified, replace the brake shoes.

Minimum shoe lining:  
2 mm (0.08 in)



- Front brake checking hole plug
- Rear brake checking hole plug

### 4. Front and rear axles Check axle nut

Front axle nut torque:  
4 m·kg (29 ft·lb)

Rear axle nut torque:  
6 m·kg (43 ft·lb)

## 5. Tires

### a. Important notice

Proper loading of GT80E is important for the handling, braking, and other performance and safety characteristics. **NEVER OVERLOAD THE MOTORCYCLE.**

#### **WARNING:**

**Never overload the motorcycle beyond specified tire limits. Operation of an overloaded tire could cause tire damage, an accident and injury.**

|                                                | FRONT                           | REAR                            |
|------------------------------------------------|---------------------------------|---------------------------------|
| GT80E BASIC WEIGHT with oil and full fuel tank | 32 kg (71 lb)                   | 37 kg (82 lb)                   |
| Standard tire                                  | NITTO 2.50-15-4PR               | NITTO 2.75-14-4PR               |
| Tire load limit                                | 118 kg (260 lb)                 | 128 kg (280 lb)                 |
| Cold tire pressure Normal riding               | 1.5 kg/cm <sup>2</sup> (22 psi) | 2.0 kg/cm <sup>2</sup> (28 psi) |
| High speed riding                              | 1.5 kg/cm <sup>2</sup> (22 psi) | 2.3 kg/cm <sup>2</sup> (32 psi) |
| Extra load riding                              | 2.3 kg/cm <sup>2</sup> (32 psi) | 2.3 kg/cm <sup>2</sup> (32 psi) |
| Minimum tire tread depth                       | 0.8 mm (0.03 in)                | 0.8 mm (0.03 in)                |

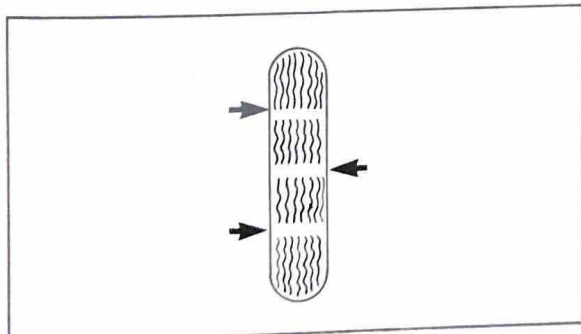
Make sure the total weight of the motorcycle with accessories rider(s) etc., does not exceed the tire limits.

#### Tires pressure (GTMXE)

|       |                    |
|-------|--------------------|
| FRONT | 1.5 kg/cm (22 psi) |
| REAR  | 2.0 kg/cm (28 psi) |

### b. Check the tire wear

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



## C. Drive Chain

### 1. Drive chain adjustment

To adjust drive chain, proceed as follows:

- Remove rear axle cotter pin.
- Loosen rear axle securing nut.
- Remove tension bar bolt clip and loosen tension bar lock nut.
- With rider in position on machine and both wheels on ground, set chain adjusters until there is specified freeplay in the drive chain at the bottom of the chain at a point midway between the drive and driven sprockets.

Chain freeplay: 20 mm (0.79 in)



- Turn left and right adjusters (chain puller bolts) until axle is situated in the same position by position marks on swing arm axle locating tabs.
- Tighten the rear axle securing nut and tension bar lock nut.

#### Axle nut torque:

6 m-kg (43 ft-lb)

#### Tension bar lock nut torque:

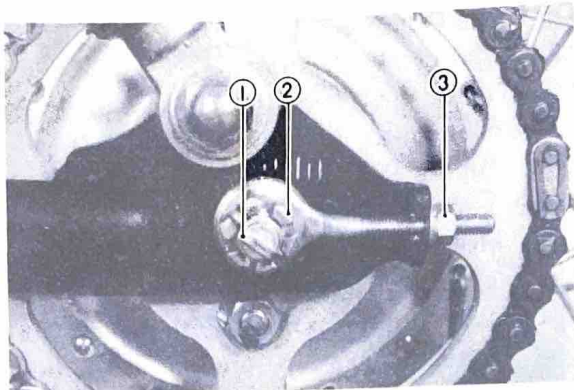
2 m-kg (14 ft-lb)

- Install a new cotter pin and bend the end over.

#### **NOTE:**

Tighten bolt lock nuts thoroughly.





1. Cotter pin  
2. Axle nut  
3. Adjuster lock nut

- h. After adjusting, check the rear brake free play.

## 2. Drive chain maintenance

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

- a. Wipe off dirt with shop rag. If accumulation is severe, use wire brush, then rag.
- b. Apply lubricant between roller and side plates on both inside and outside of chain.

Don't skip a portion as this will cause uneven wear.

Apply thoroughly. Wipe off excess.

## NOTE:

Use Yamaha Chain and Cable Lube.

- c. Periodically, remove the chain. Wipe and/or brush excess dirt off. Blow off with high pressure air.
- d. Soak chain in solvent, brushing off remaining dirt. Dry with high pressure air. Lubricate thoroughly while off the machine. Work each roller thoroughly to make sure lubricant penetrates. Wipe off excess. Re-install.

## D. Front Fork Oil Change

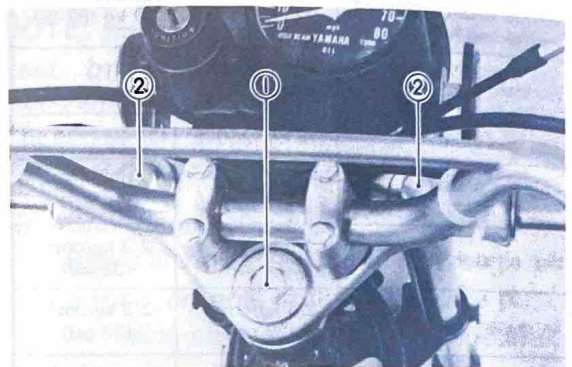
See chapter 5-5 for Front Forks.

## E. Steering Head, Suspension and Swing Arm

### 1. Steering head adjustment

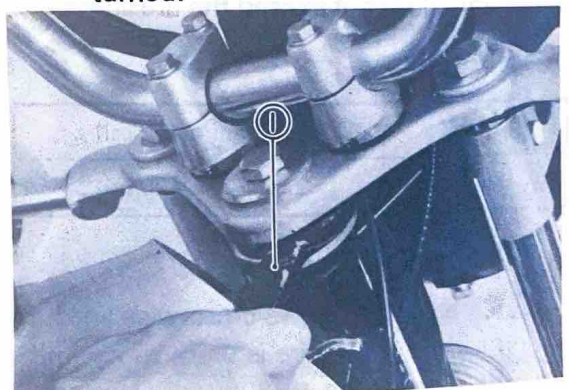
The steering assembly should be checked periodically for looseness. Do this as follows:

- a. Block machine up so that front wheel is off the ground.
- b. Grasp bottom of the forks and gently rock the fork assembly backward and forward, checking for looseness in the steering assembly bearings.
- c. If steering head needs adjustment, loosen steering bolt and front fork cap bolts.



1. Steering bolt 2. Front fork cap bolt

- d. Adjust steering nut until steering head is tight without binding when forks are turned.



1. Steering nut wrench

## NOTE:

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

- e. Tighten steering bolt and front fork cap bolts in that order.



Steering bolt torque:  
3 m-kg (22 ft-lb)

Front fork cap bolt torque:  
2 m-kg (14 ft-lb)

**NOTE:**

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

**2. Suspension**

- a. Check all suspension components for proper operation.
- b. Check all suspension components for proper tightness.
- c. Check rear shocks (right and left) for identical adjustment.

**3. Swing arm**

- a. Check for freedom of up and down movement.
- b. Check side to side freeplay.

Swing arm freeplay:

1 mm (0.04 in) at end of swing arm

- c. Check all securing bolts for proper tightness.

**2-5. ELECTRICAL**

**A. Contact Breaker Points**

1. Apply a few drops of light-weight machine oil or distributor lubricant to the point cam lubricator.
2. The ignition points can be lightly sanded with 400—600 grit sandpaper to remove corrosion. Place a piece of clean paper between the points, let them close, and remove the paper. Repeat until no residue shows. The paper may be dipped in lacquer thinner or point cleaning fluid to remove oil and sanding residue from point surfaces.
3. Point replacement should only be necessary when point gap exceeds maximum tolerance; when the points are severely pitted; or if the points

become shorted or show faulty operation.

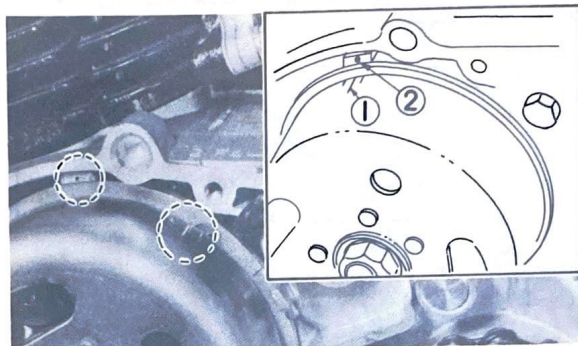
**NOTE:**

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

**B. Ignition Timing**

**1. Ignition timing checking**

- a. Ignition timing is checked with a timing light by observing the position of the stationary mark stamped on the crank-case and the pointers on the magneto flywheel.



1. Pointers 2. Stationary mark

- b. Connect timing light to spark plug lead wire.

- c. Start the engine and keep the engine speed as specified on the label.

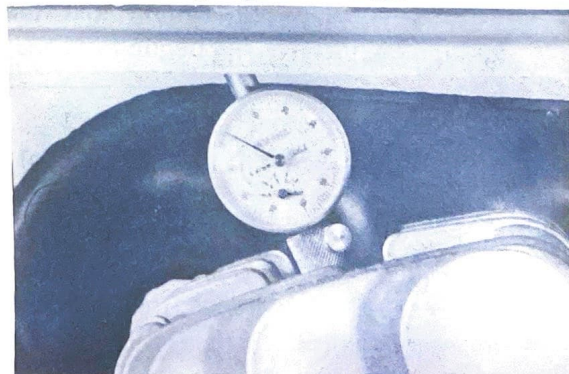
- d. The center pointer of the magneto flywheel should line up the stationary mark on the crankcase at a specified engine speed.

**2. Ignition timing adjustment**

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

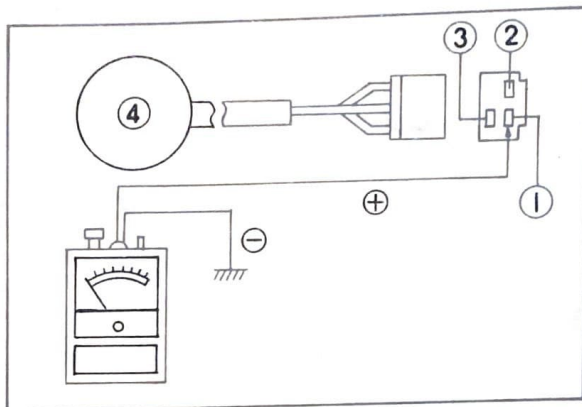
Proceed as follows:

- a. Remove spark plug and screw dial gauge stand into spark plug hole.
- b. Insert dial gauge into stand.





- c. Remove generator cover.
- d. Switch on point checker and adjust.  
Disconnect magneto harness from main harness. Connect red lead of Point Checker to black wire pin in wire harness connector coming from magneto.
- e. Connect black lead of Point Checker to unpainted surface of cylinder fin or unpainted crankcase bolt or screw.



1. Black
2. Yellow
3. Green/Red
4. Flywheel magneto

- f. Rotate magneto flywheel until piston is at top-dead-center (T.D.C.). Set the zero on dial gauge face to line up exactly with dial gauge needle. Tighten set screw on spark plug stand to secure dial gauge assembly. Rotate flywheel back and forth to be sure that indicator needle does not go past zero.
- g. Starting at T.D.C. rotate flywheel clockwise until dial gauge reads approximately 3-1/2 needle revolutions before-top-dead-center (B.T.D.C.).
- h. Slowly turn flywheel counterclockwise until dial gauge reads ignition advance setting listed in Specifications Table. At this time the point checker needle should swing from "CLOSED" to "OPEN" position, indicating that the ignition points have just begun to open.

Ignition timing (B.T.D.C.):  
 $1.8 \pm 0.15 \text{ mm (0.07} \pm 0.006 \text{ in)}$

- i. Repeat steps g. and h. to verify point opening position. If points do not open within specified tolerance, they must be adjusted.

- j. Adjust ignition points by slightly loosening Phillips head screw and carefully rotating contact breaker assembly with a slotted screwdriver. Make small adjustment and retighten Phillips head screw before rechecking timing. Recheck timing by repeating steps g. and h.
- k. After ignition timing has been set, check maximum point gap with thickness gauge.

#### Point gap:

Normal: . . . . 0.035 mm (0.014 in)  
 Minimum: . . . 0.30 mm (0.012 in)  
 Maximum: . . . 0.40 mm (0.016 in)

#### NOTE:

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

1. Remove dial gauge assembly and dial gauge holder. Disconnect point checker. Reconnect magneto harness. Replace spark plug and generator cover.

#### Spark plug torque:

2.0 m·kg (14 ft·lb)

### C. Spark Plug

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

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

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

Spark plug gap: (Use wire gap gauge)  
0.5—0.6 mm (0.020—0.024 in)

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

Spark plug: B-7HS (NGK)

Spark plug torque:  
2.0 m·kg (14 ft·lb)

#### D. Battery

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

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

#### NOTE:

A new battery must be properly serviced and charged before installation. See the Assembly Manual and Section 6 (Page 54) of this manual for details.

Charging current: 0.4 A.  
Charging hours: 10 hrs.

#### E. Headlight

1. Adjust vertically as follows:

- a. Remove the headlight and slightly loosen the headlight shell mounting nuts.



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

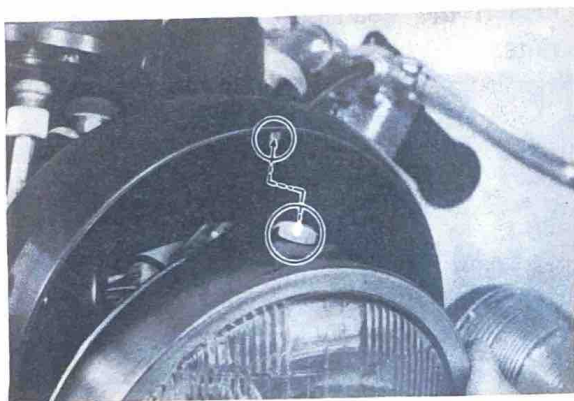




3. Replacing the headlight bulb.
  - a. Unhook spring and pull the defective unit out of the lens unit assembly.
  - b. Slip a new unit into position and install spring.
  - c. Adjust headlight beam.
4. When installing the headlight unit assembly, care should be used so that wires are not printed.

**NOTE:** \_\_\_\_\_  
Fit the hole in the headlight unit assembly over the projection of the headlight body.

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## CHAPTER 3. ENGINE OVERHAUL

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## CHAPTER 3. ENGINE OVERHAUL

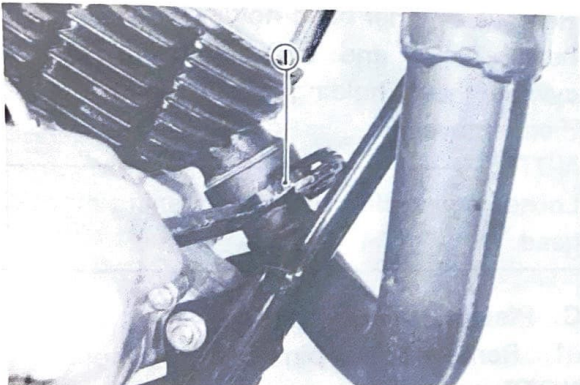
### 3-1. REMOVAL

#### A. Preparation for Removal

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

#### B. Exhaust

1. Remove the exhaust pipe ring nut holding exhaust pipe to cylinder.



1. Exhaust pipe ring nut wrench

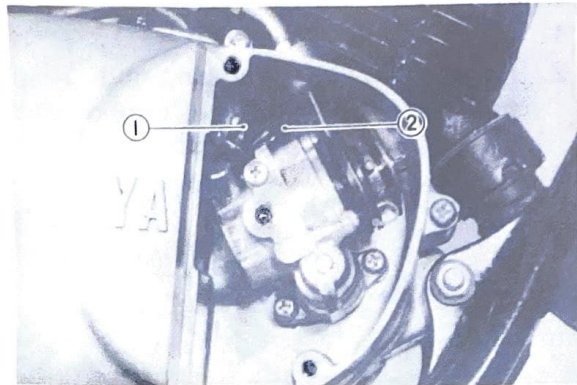
2. Loosen muffler ring nut and remove exhaust pipe.

#### C. Gear Change Pedal

Completely remove bolt securing gear change pedal. Remove pedal.

#### D. Wiring and Cables

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

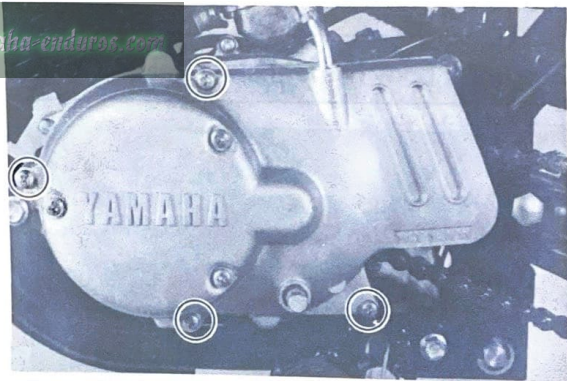


1. Oil pipe
2. Oil delivery pipe

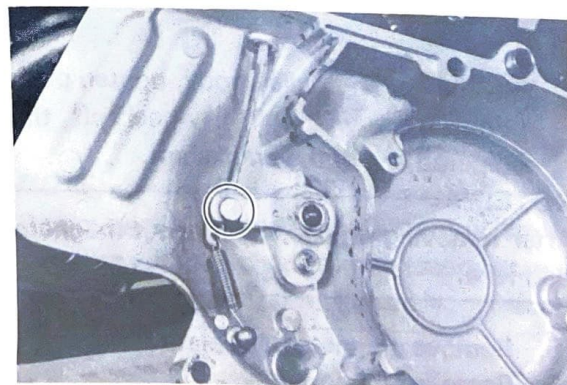
#### NOTE:

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

4. Remove the clip and oil pump wire.
5. Remove left crankcase cover.



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



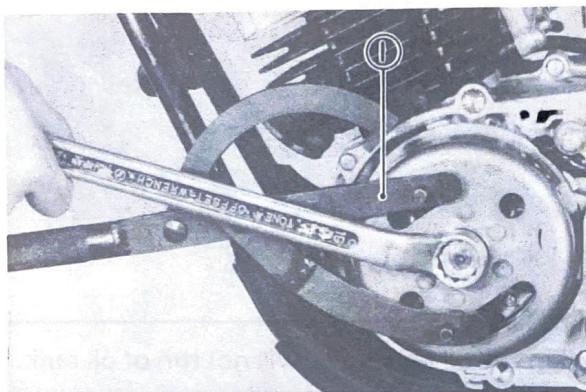


### E. Carburetor

1. Loosen carburetor hose clamp.
2. Remove mixing chamber top and throttle valve assembly.
3. Remove the body fitting screw.
4. Remove the carburetor.

### F. Flywheel Magneto

1. Remove left crankcase cover.
2. Remove flywheel securing nut using flywheel holder. Note the position and direction of the washers.

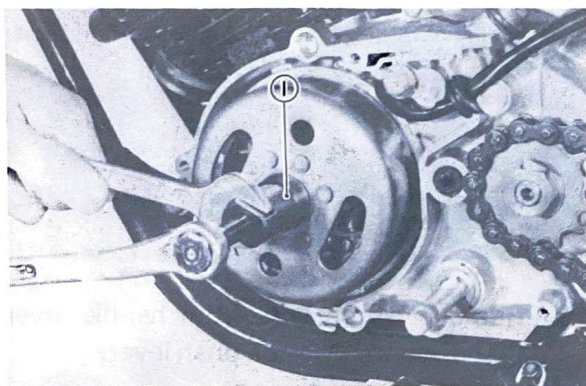


1. Flywheel holder

3. Install and tighten flywheel puller snugly on flywheel.

#### NOTE:

The puller body has lefthand threads.



1. Flywheel puller

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

#### NOTE:

After removing engine, disconnect magneto lead wire.

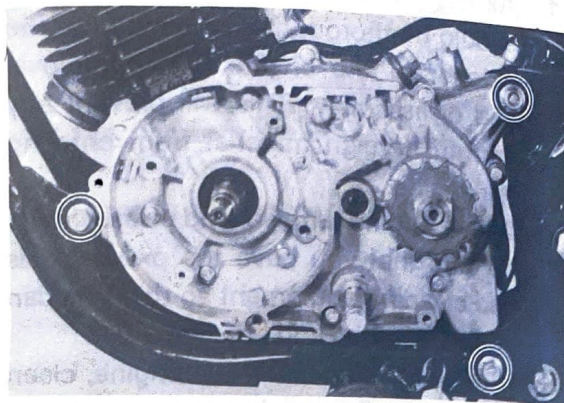
5. Remove magneto back plate assembly.
6. Remove woodruff key.

### G. Drive Chain

Remove master link and chain.

### H. Removal

1. Remove engine mounting bolts, ground lead wire.



2. Disconnect magneto wire.
3. Remove engine.

## 3-2. DISASSEMBLY

### A. Reed Valve Assembly

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

### B. Cylinder Head and Cylinder

Remove cylinder head holding nuts, cylinder head gasket and cylinder head. Loosen cylinder head holding nuts 1/4 turn each, then remove nut.

#### NOTE:

Loosen spark plug before loosening cylinder head.

### C. Piston Pin and Piston

1. Remove piston pin clip from piston.

#### NOTE:

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

2. Push piston pin from opposite side, then pull out.  
Protect pin with rag.

#### NOTE:

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



#### D. Kick Crank (Kick Starter)

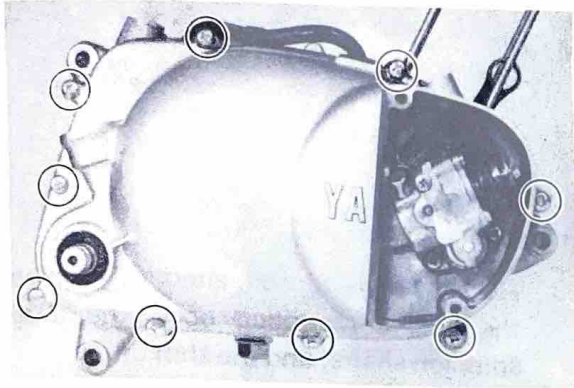
Remove kick crank securing bolt and kick crank.

#### NOTE:

The bolt must be completely removed from the kick crank.

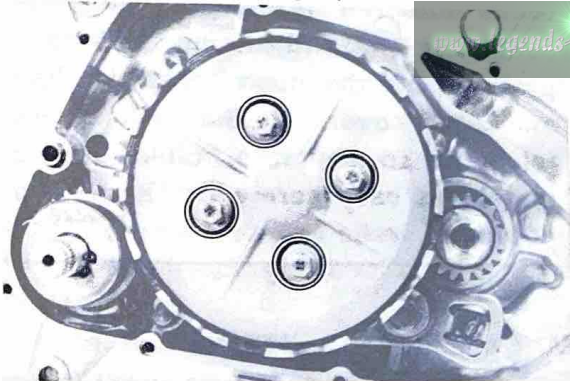
#### E. Crankcase Cover

Remove righthand crankcase cover holding screws and the cover.

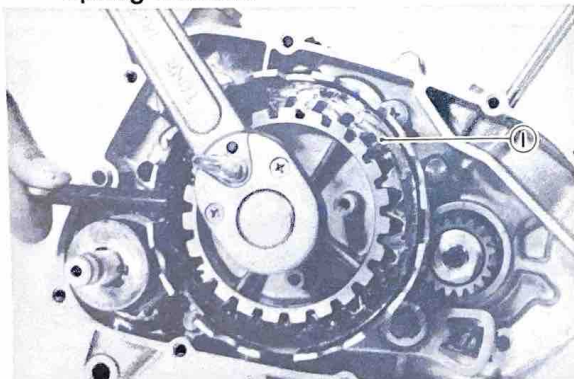


#### F. Clutch Assembly and Primary Drive Gear

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

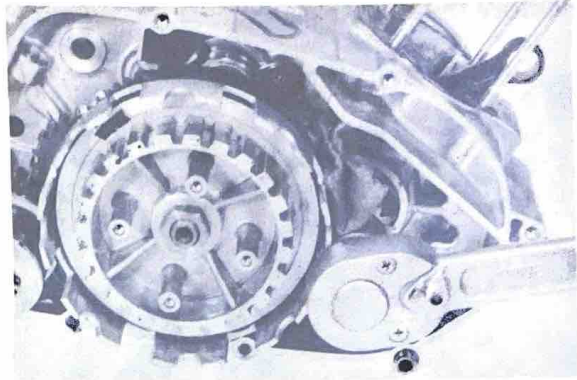


2. Install clutch holding tool on clutch boss. Remove lock nut and Belleville spring washer.



1. Clutch holding tool

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



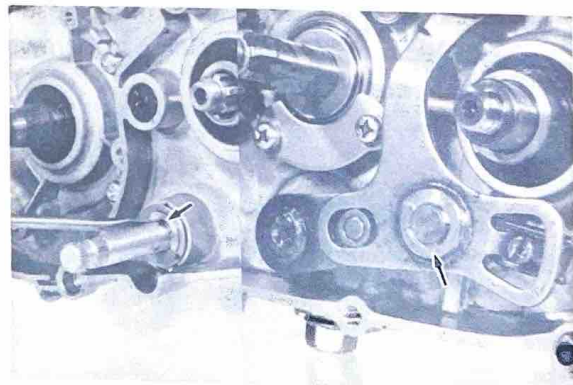
4. Remove driven gear assembly and clutch boss, drive gear, pump drive gear, straight key, O-ring and collar.

#### G. Kick Axle Assembly

Remove kick axle assembly.

#### H. Change Shaft Assembly

1. Remove the circlip and change axle washer on the left side of the change shaft assembly.
2. Remove the circlip holding the change lever assembly to the right side of the change shaft, and remove the change lever assembly, change shaft assembly and change return spring.



#### NOTE:

Remove the change shaft return spring together with the change lever assembly, and remove the change shaft assembly.

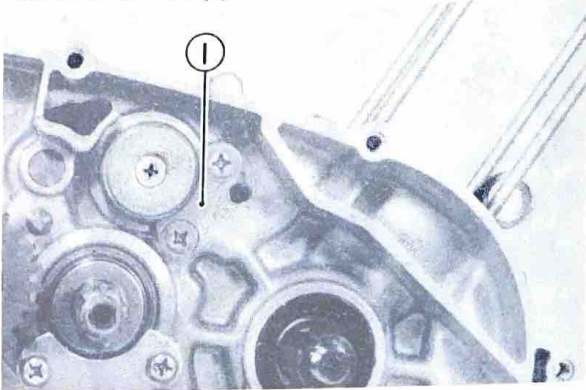


### I. Clutch Push Rod

Remove clutch push rod from left side crankcase.

### J. Stopper Plate

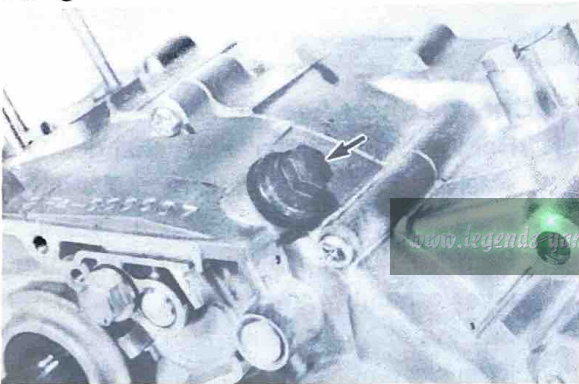
Remove the stopper plate.



1. Stopper plate

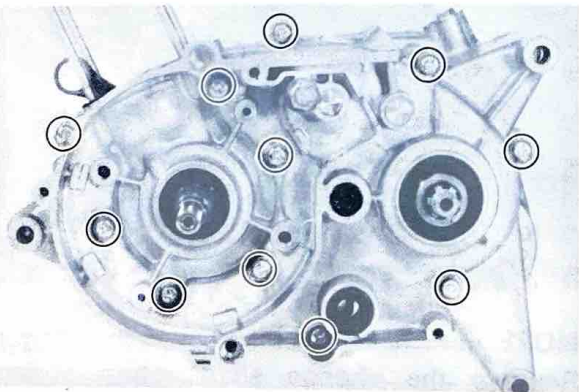
### K. Shift Cam Stopper

Remove the shift cam stopper, stopper spring and gasket.



### L. Crankcase

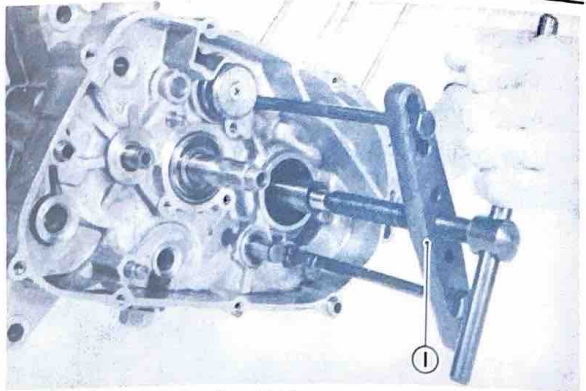
1. Working in a crisscross pattern, loosen each screw 1/4 turn. Remove screws after all are loosened.



2. Install crankcase separating tool as shown.  
Use a thick plain washer to protect the end of crankshaft.

### NOTE:

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



1. Crankcase separating tool

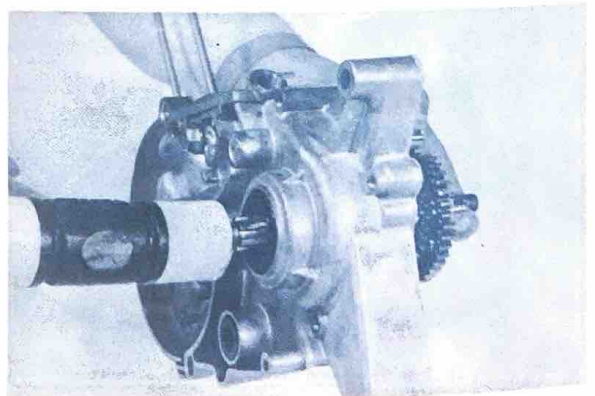
3. As pressure is applied, alternately tap on the engine mounting boss, the transmission shafts, and the shift drum.

### CAUTION:

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

### M. Transmission and Shifter

Transmission shaft, shift forks and shift cam should be removed as an assembly. To remove, tap lightly on the transmission drive shaft with a soft hammer.

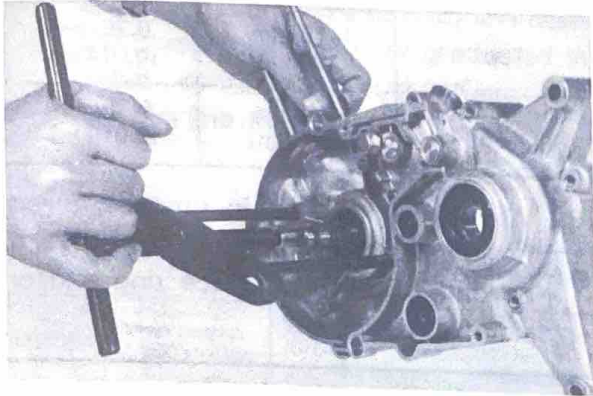


**NOTE:**

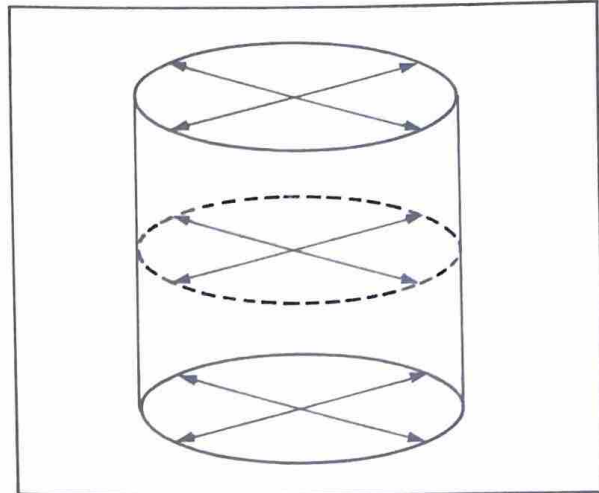
Remove assembly carefully. Note the position of each part. Pay particular attention to the location and direction of shift forks.

**N. Crankshaft**

Remove crankshaft assembly with the crankcase separating tool.



Cylinder wear should be measured at three depths with a cylinder bore gauge. (See illustration.)

**3-3. INSPECTION AND REPAIR****A. Cylinder Head**

1. Remove spark plug.
2. Using a rounded scraper, remove carbon deposits from combustion chamber. Take care to avoid damaging spark plug threads. Do not use a sharp instrument. Avoid scratching the aluminum.
3. Place on a surface plate. There should be no warpage. Correct by re-surfacing as follows:  
Place 400–600 grit wet sandpaper on surface plate and re-surface head using a figure-eight sanding pattern. Rotate head several times to avoid removing too much material from one side.

**B. Cylinder**

1. Inspect the cylinder walls for scratches. If vertical scratches are evident, the cylinder wall should be rebored or the cylinder should be replaced.
2. Measure cylinder wall wear as shown. If wear is excessive, compression pressure will decrease. Rebore the cylinder wall and replace the piston and piston rings.

|                       | Standard                           | Wear Limit             |
|-----------------------|------------------------------------|------------------------|
| Cylinder bore         | 47.00–47.02 mm<br>(1.850–1.852 in) | 47.10 mm<br>(1.854 in) |
| Cylinder taper        | —                                  | 0.05 mm<br>(0.002 in)  |
| Cylinder out-of-round | —                                  | 0.01 mm<br>(0.0004 in) |

If the cylinder wall is worn more than wear limit, it should be rebored.

**C. Piston Pin and Bearing**

1. Check the pin for signs of wear. If any wear is evident, replace pin and bearing.
2. Check the pin and bearing for signs of heat discoloration. If excessive (indentation on pin, etc.), replace pin and bearing.
3. Check the bearing cage for excessive wear or damage. Check the rollers for signs of flat spots. If such wear is found, replace pin and bearing.
4. Apply light film of oil to pin and bearing surfaces. Install in connecting rod small end to inspect for wear. Check for play. There should be no noticeable vertical play. If play exists, check connecting rod small end for wear. Replace pin, connecting rod and/or bearing, as required.



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

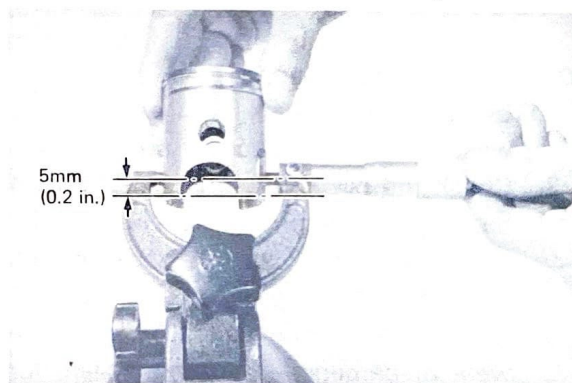
#### D. Piston

- Remove piston rings.
- Remove carbon deposits from piston crown.
- Carefully remove carbon deposits from ring grooves with filed end of ring.
- Remove score marks and lacquer deposits from sides of piston using 600–800 grit wet sandpaper. Sand in a crisscross pattern. Do not sand excessively.

- Wash piston in solvent and wipe dry.
- Measure the outside diameter of the piston at the piston skirt.

Measurement should be made at a point 5 mm (0.2 in) above the bottom edge of the piston. Place the micrometer at right angles to the piston pin.

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



| Piston clearance        |                         |
|-------------------------|-------------------------|
| Minimum                 | Maximum                 |
| 0.035 mm<br>(0.0014 in) | 0.040 mm<br>(0.0016 in) |
| Piston over size        |                         |
| 47.25 mm (1.860 in)     |                         |
| 47.50 mm (1.870 in)     |                         |
| 47.75 mm (1.880 in)     |                         |
| 48.00 mm (1.890 in)     |                         |

#### E. Piston Rings

- Check rings for scroing. If any severe scratches are noticed, replace ring set.
- Push the ring into the bore and check end gap clearance with a feeler gauge. If beyond tolerance, replace ring set.

| Ring end gap, installed |                       |                       |
|-------------------------|-----------------------|-----------------------|
|                         | Minimum               | Maximum               |
| Top                     | 0.15 mm<br>(0.006 in) | 0.35 mm<br>(0.014 in) |
| Second                  | 0.15 mm<br>(0.006 in) | 0.35 mm<br>(0.014 in) |

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

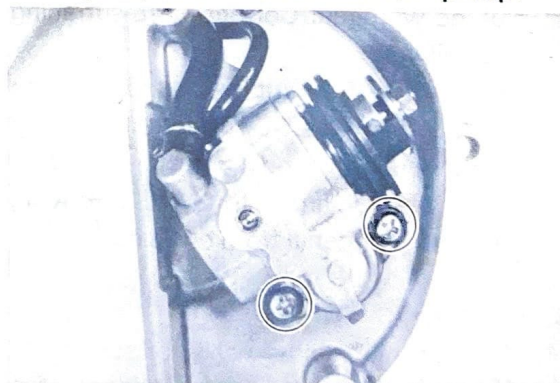
| Ring groove clearance |                        |                        |
|-----------------------|------------------------|------------------------|
|                       | Minimum                | Maximum                |
|                       | 0.03 mm<br>(0.0012 in) | 0.05 mm<br>(0.0020 in) |

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

#### F. Autolube Pump

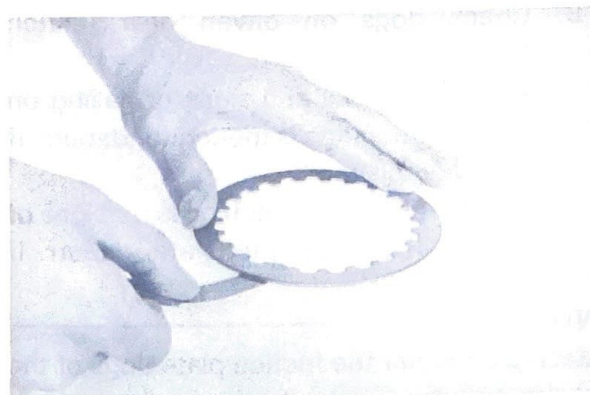
(Disassembly is not normally necessary)

- Removal and disassembly
  - Remove (two) Phillips screws securing pump to crankcase. Remove pump.



- Troubleshooting and repair
  - Wear or an internal malfunction may cause pump output to vary from the factory setting. This situation is, however, extremely rare. If improper output is suspected, check the following:

- 1) Obstructions in delivery line to pump or from pump to cylinder.
  - 2) Worn or damaged pump body seal.
  - 3) Improperly installed or routed oil delivery line.
  - 4) Loose fitting(s) allowing air to enter pump and/or engine.
- b. If all inspections show no obvious problems and improper output is still suspected, connect a delivery line from the pump to a container graduated in cubic centimeters (cc). Keep the delivery line short.



Clutch plate warpage allowance:  
0.05 mm (0.002 in)

|       |                            | Maximum throttle                     | Minimum throttle                     |
|-------|----------------------------|--------------------------------------|--------------------------------------|
| GT80E | Pump output at 200 strokes | 3.89 – 4.27 cc<br>(0.132 – 0.144 oz) | 0.50 – 0.63 cc<br>(0.017 – 0.021 oz) |
| GTMXE | Pump output at 200 strokes | 3.64 – 4.27 cc<br>(0.123 – 0.144 oz) | 0.50 – 0.62 cc<br>(0.017 – 0.021 oz) |

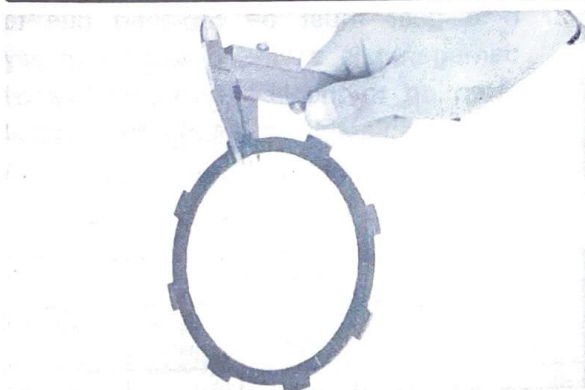
### 3. Reassembly

Always install a new pump case gasket.

## G. Clutch

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

|                          | New                 | Wear limit          |
|--------------------------|---------------------|---------------------|
| Friction plate thickness | 3.5 mm<br>(0.14 in) | 3.2 mm<br>(0.13 in) |

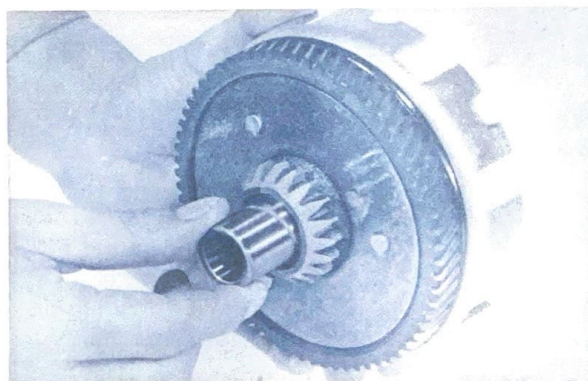


2. Check each clutch plate for signs of heat damage and warpage. Place on surface plate (plate glass is acceptable) and use feeler gauge as illustrated. If warpage exceeds tolerance, replace.

## NOTE:

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

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



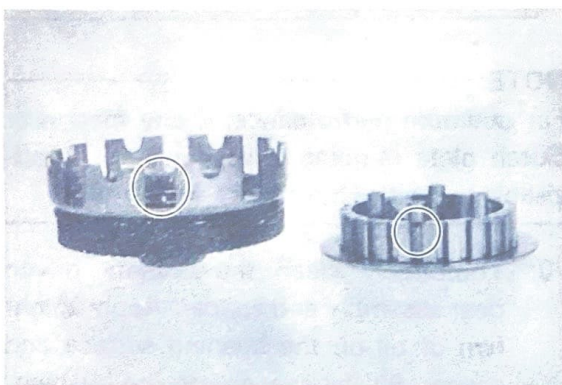
4. Check the bushing, spacer and main shaft for signs of galling heat damage, etc. If damage is severe, replace as required.
5. Apply a thin film of oil to transmission main shaft and inside surface of bushing spacer. Slip spacer cover main shaft. Spacer should fit with approximately same "feel" as in clutch housing. Replace as required.



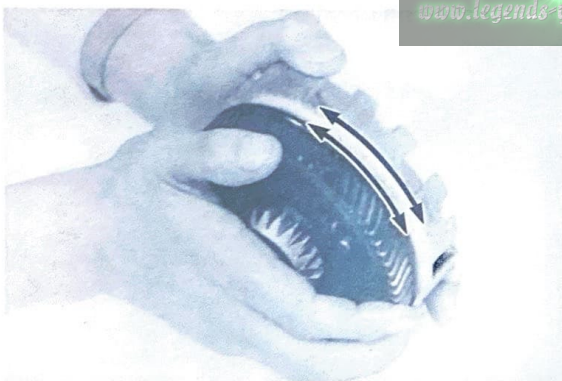
6. Check dogs on driven gear (clutch housing).  
Look for cracks and signs of galling on edges. If damage is moderate, deburr. If severe, replace.
7. Check splines on clutch boss for signs of galling. If damage moderate, deburr. If severe, replace.

**NOTE:**

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

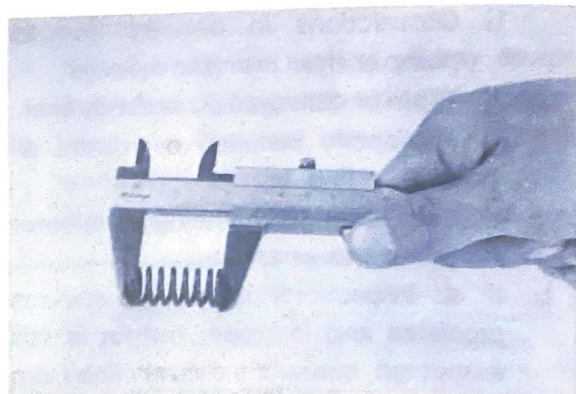


8. Check for circumferential play by hand.  
If excess play exists, replace it.



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

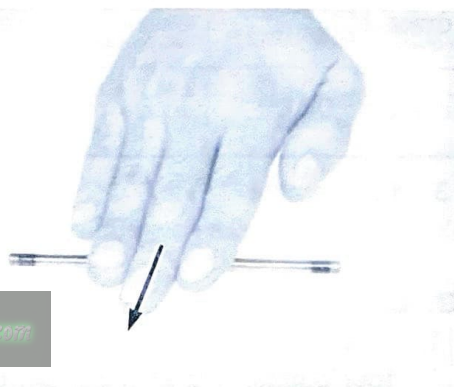
|                           | New                  | Minimum              |
|---------------------------|----------------------|----------------------|
| Clutch spring free length | 31.5 mm<br>(1.24 in) | 30.5 mm<br>(1.20 in) |



**NOTE:**

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

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



## H. Primary Drive

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

| Primary drive gear |                | Primary driven gear |                | Lash tolerance |
|--------------------|----------------|---------------------|----------------|----------------|
| Lash number        | Indicated mark | Lash number         | Indicated mark |                |
| 77                 | B              | 57<br>56            | B              | 133 ± 1        |
| 78<br>79           | C              | 55<br>54            | C              |                |
| 80                 | D              | 53<br>52            | D              |                |

3. Check crankshaft collar where the crankshaft seal rides. It should not be severely worn or galled. If so, replace collar and seal.
4. Check the O-ring. If damaged or misshapen, replace.

#### I. Kick Starter

1. Check the ratchet teeth on the kick gear and the ratchet wheel. The mating edges should fit flush against each other. If there is severe rounding off, replace as a set.
2. Check to see that the kick gear spins freely on the kick axle. If not, replace either or both as required. Replace if any signs of galling are found.
3. The kick gear clip is built into the ratchet wheel. The force of the clip is measured by a spring scale.

Standard tension:

0.8—1.2 kg (1.8—2.6 lb)



#### J. Transmission

1. Inspect each shift fork for signs of galling on gear contact surfaces. Check for bending. Make sure each fork slides freely on its guide bar.
2. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or any damage, replace cam.
3. Check the cam followers on each shift fork for wear. The follower should fit snugly into its seat in the shift fork, but not over-tight. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace.

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

#### K. Crankshaft

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

| Rod axial play (A) |                   |
|--------------------|-------------------|
| Minimum            | Maximum           |
| 0.8 mm (0.031 in)  | 1.0 mm (0.039 in) |

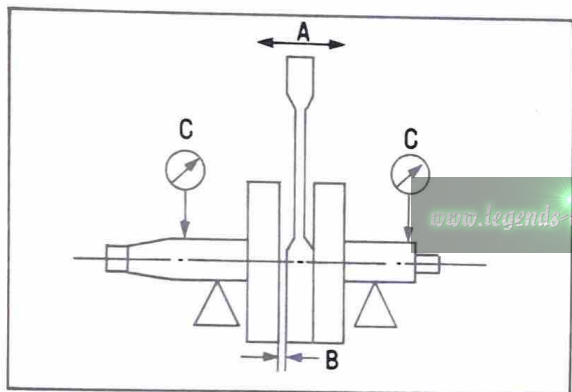
2. Check the connecting rod side clearance at big end. If axial play exceeds tolerance, disassemble the crankshaft and replace any worn parts. Big end axial play should be within specification.



| Rod side clearance (B) |                       |
|------------------------|-----------------------|
| Minimum                | Maximum               |
| 0.2 mm<br>(0.0079 in)  | 0.8 mm<br>(0.0315 in) |

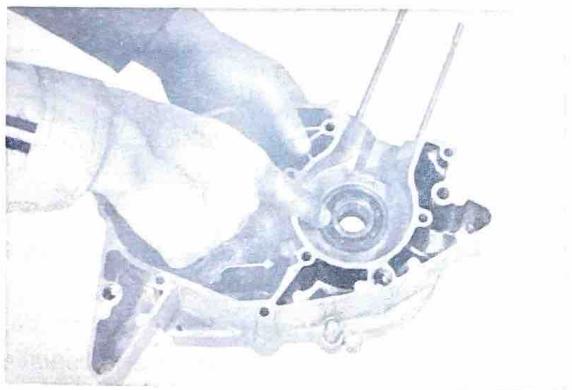
- Check crankshaft assembly runout (misalignment of crankshaft parts). Dial gauge readings should be within specification. Correct any misalignment by tapping the flywheel with a brass hammer and/or by using a wedge.

| Deflection tolerance (C) |                     |
|--------------------------|---------------------|
| Left side                | Right side          |
| 0.03 mm (0.0012 in)      | 0.03 mm (0.0012 in) |



#### L. Bearing and Oil Seal

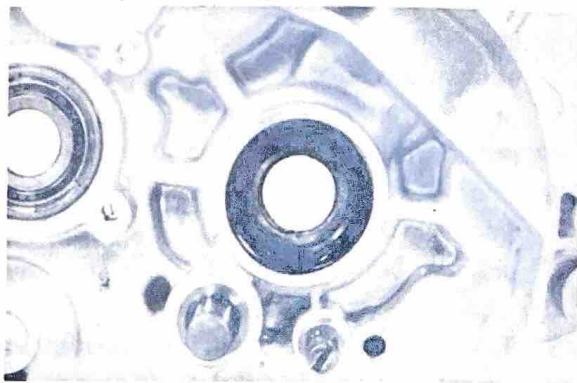
- After cleaning and lubricating bearings, rotate inner race with a finger. If rough spots are noticed, replace the bearing.



#### NOTE:

Bearing(s) are most easily removed or installed if the cases are first heated in an oven to approximately 90–120°C (200–250°F). Bring the case up to proper temperature slowly. Do not use a hot plate or torch.

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



#### 3. Installation

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

#### M. Crankcase

- Thoroughly wash the case halves in mild solvent.
- Clean all gasket mating surfaces and crankcase mating surfaces thoroughly.
- Visually inspect case halves for any cracks, road damage, etc.
- Check all fittings not previously removed for signs of loosening or damage.
- If bearings have been removed, check their seats for signs of damage (such as the bearing spinning in the seat, etc.)
- Check oil delivery passages in transfer ports for signs of blockage.
- If bearings have not been removed, oil them thoroughly immediately after washing and drying. Rotate the bearings, checking for roughness indicating damaged races or balls.
- Check engine mount damper for damage. Replace as required.

### 3-4. ENGINE ASSEMBLY AND ADJUSTMENT

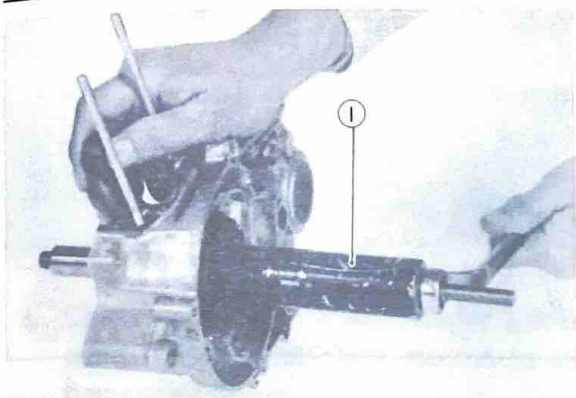
#### A. Crankshaft Installation

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

1. Set the crankshaft into left case half and install crankshaft installing tool.

#### NOTE:

Make certain that each part is positioned properly.



1. Crankshaft setting pot

2. Hold the connecting rod at top dead center while turning the nut of the installing tool.

Operate tool until crankshaft bottoms against bearing.

#### B. Transmission and Shifter Installation

1. Assemble the transmission shafts, shift cam and shift fork as an assembly.
2. Install the assembly into the left case half.

Tap into place with soft hammer until all shafts are fully seated.

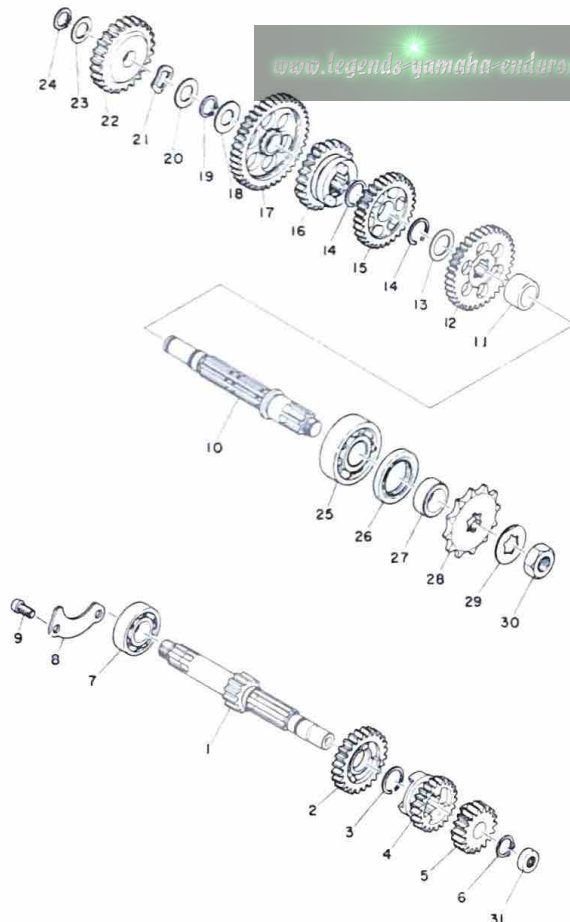
3. Check to see that all parts move freely prior to installing right case half.

Check for correct transmission operation and make certain that all loose shims are in place.

#### NOTE:

Oil each gear and bearing thoroughly.

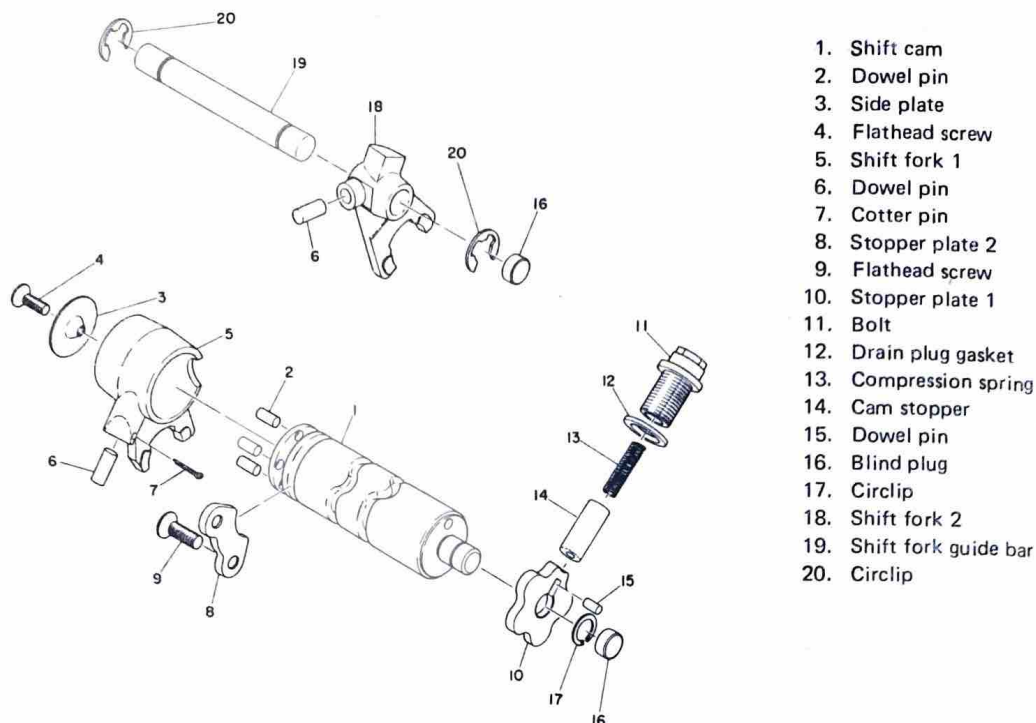
### TRANSMISSION



1. Main axle
2. 4th pinion gear
3. Clip
4. 3rd pinion gear
5. 2nd pinion gear
6. Circlip
7. Bearing
8. Bearing cover plate
9. Panhead screw
10. Drive axle
11. Collar
12. 2nd wheel gear
13. Driveaxle shim
14. Clip
15. 3rd wheel gear
16. 4th wheel gear
17. 1st wheel gear
18. Shim
19. Circlip
20. Thrust washer
21. Wave washer
22. Kick idle gear
23. Change shaft washer
24. Circlip
25. Bearing
26. Oil seal
27. Distance collar
28. Drive sprocket
29. Lock washer
30. Lock nut
31. Push rod seal



## SHIFTER



### C. Crankcase

1. Apply YAMAHA BOND #4 to the mating surfaces of both case halves. Apply thoroughly over all mating surfaces.
2. Set crankcase right onto shafts and tap lightly on the case with a soft hammer to assemble.

#### NOTE:

Do not tap on machined surfaced or end of crankshaft.

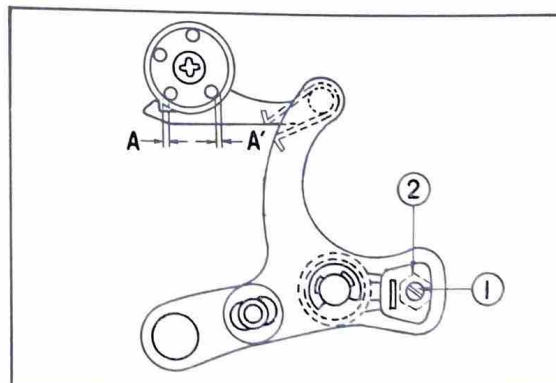
3. Install all crankcase screws and tighten in stages, using a crisscross pattern.

Crankcase screw torque:  
1 m-kg (7 ft-lb)

4. After reassembly, apply a liberal coating of two-stroke oil to the crank pin and bearing and into each crankshaft bearing oil delivery hole.
5. Install the shift cam stopper plate.
6. Check crankshaft and transmission shafts for proper operation and freedom of movement.

### D. Change Shaft Assembly

1. Install the change lever assembly, change shaft assembly together with return spring.
2. Install the circlip holding the change lever assembly. And install circlip and change axle washer on change shaft assembly.
3. To adjust and correct the travel of the gear shift arm to prevent improper shifting progression (excess feed or insufficient feed of the gear shift arm), turn the adjusting screw until distance A and A' are equal. Adjust with transmission in the 2nd gear position.



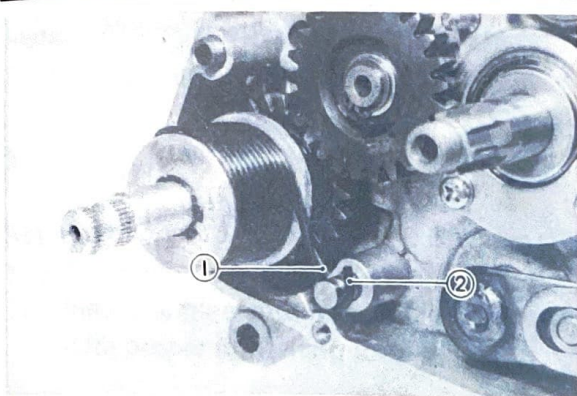
1. Adjusting screw
2. Lock nut

### E. Kick Starter Assembly

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

#### NOTE:

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



1. Kick gear clip 2. Kick spring

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

### F. Kick Idle Gear, Primary Drive Gear and Clutch Assembly

1. Install kick idle gear and primary drive gear.

#### NOTE:

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

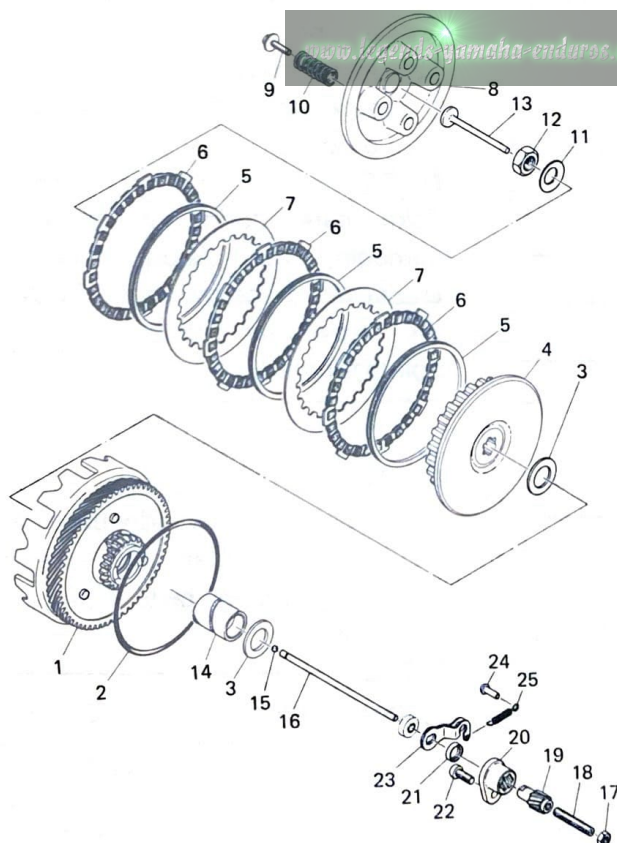
2. Install thrust plate primary driven gear, thrust plate and clutch boss in that order.
3. Install clutch holding tool on clutch boss and tighten locknut.

Clutch lock nut torque:  
4.5 m·kg (33 ft·lb)

#### NOTE:

Install clutch plate on the clutch boss first. Install all parts with a heavy coat of SAE 10W/30 motor oil on their mating surfaces.

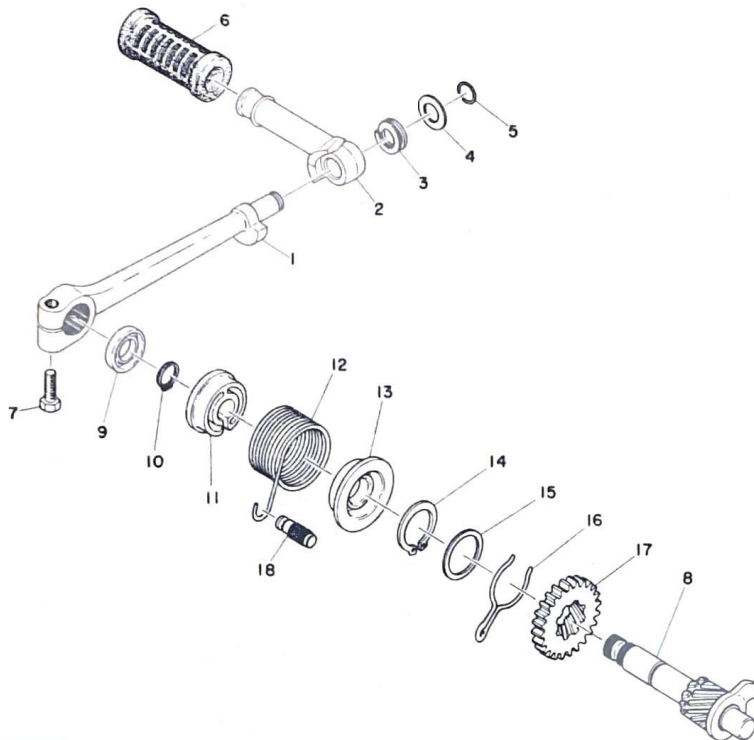
## CLUTCH



1. Primary driven gear comp.
2. O-Ring
3. Thrust plate
4. Clutch boss
5. Cushion ring
6. Friction plate
7. Clutch plate
8. Pressure plate
9. Hexagon with washer bolt
10. Clutch spring
11. Belleville spring
12. Hexagon nut
13. Push rod 1
14. Spacer
15. Ball
16. Push rod 2
17. Nut
18. Adjusting screw
19. Push screw
20. Push screw housing
21. Oil seal
22. Panhead screw
23. Push lever
24. Spring hook
25. Lever return spring



## KICK STARTER



1. Kick crank ass'y
2. Kick lever
3. Kick crank spring
4. Kick lever washer
5. Kick lever clip
6. Kick lever cover
7. Bolt
8. Kick axle ass'y
9. Oil seal
10. Circlip
11. Kick spring cover
12. Kick spring
13. Kick spring guide
14. Circlip
15. Shin
16. Kick clip
17. Kick gear
18. Kick spring stopper

4. Install steel ball and push rod 1 into main axle.
5. Install clutch pressure plate, clutch springs and clutch spring holding screws.

Clutch spring holding screw torque:  
0.6 m-kg (4.3 ft-lb)

**CAUTION:**  
Tighten primary drive gear nut at this time.

Primary drive gear nut torque:  
6 m-kg (43 ft-lb)

### G. Crankcase Cover

Install new case cover gasket and crankcase cover. Working in a crisscross pattern, tighten holding screws gradually until proper torque is reached.

Crankcase cover holding screw torque:  
1 m-kg (7 ft-lb)

### H. Piston

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

#### NOTE:

Take care during installation to avoid damaging the piston skirts against the crankcase as the cylinder is installed. Be sure the arrow stamped on the piston crown points forward.

### I. Cylinder

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

#### NOTE:

Make sure the rings are properly positioned.

## J. Cylinder Head

Install cylinder head gasket and cylinder head. Working in a crisscross pattern, tighten head nuts in two steps.

Head nut torque: 1 m-kg (7 ft-lb)

## K. Reed Valve

Install reed valve assembly and carburetor joint.

## 3-5. REMOUNTING ENGINE

Refer to chapter 3-1 for removal. Reverse the applicable removal steps.

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

|                       |                     |
|-----------------------|---------------------|
| Front, 8 mm bolt      | 2.5 m-kg (18 ft-lb) |
| Rear Upper, 8 mm bolt | 2.5 m-kg (18 ft-lb) |
| Rear Lower, 8 mm bolt | 2.5 m-kg (18 ft-lb) |

2. Install drive sprocket.

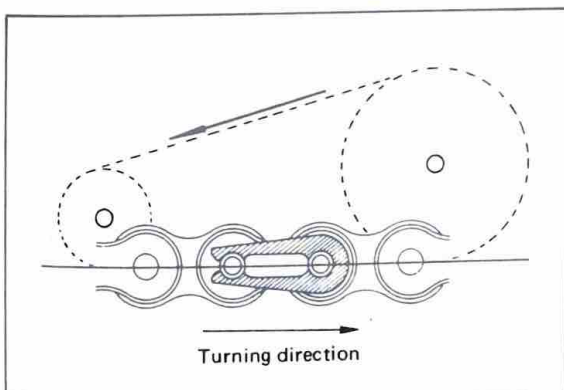
Drive sprocket nut torque: [www.legend-yamaha-enduros.com](http://www.legend-yamaha-enduros.com)  
4.0 m-kg (29 ft-lb)

3. Install flywheel magneto.

Flywheel nut torque:  
5.0 m-kg (36 ft-lb)

4. Install drive chain.

**NOTE:** \_\_\_\_\_  
Install chain joint in proper direction.





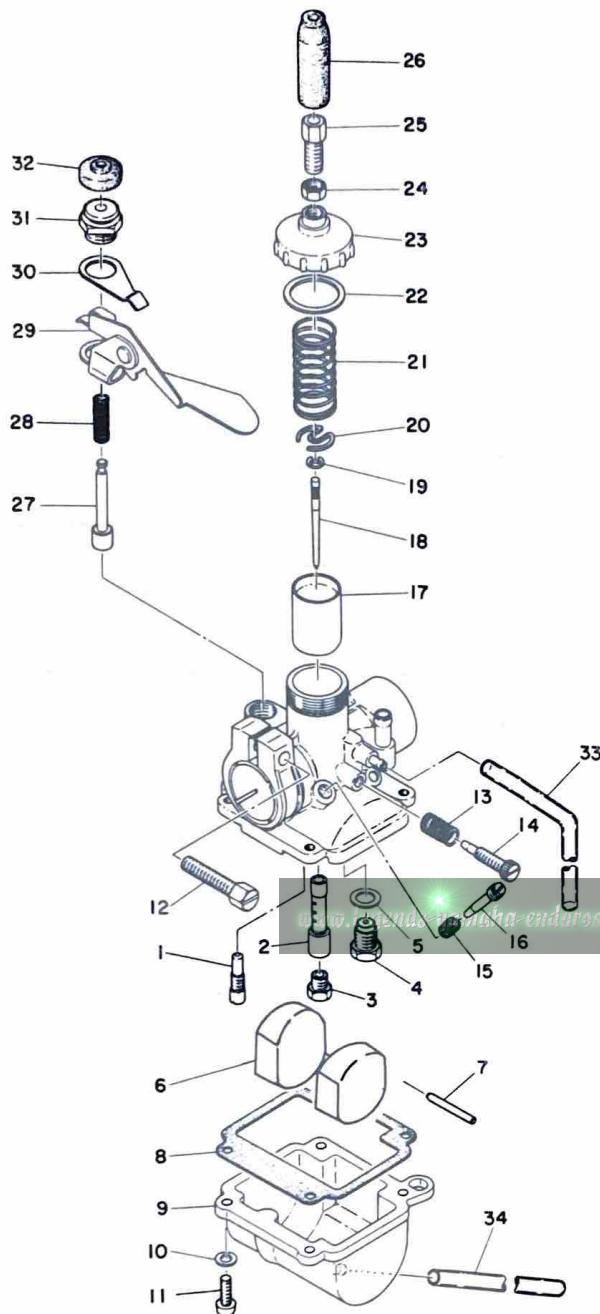
## CHAPTER 4. CARBURETION

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4

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# CARBURETOR



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



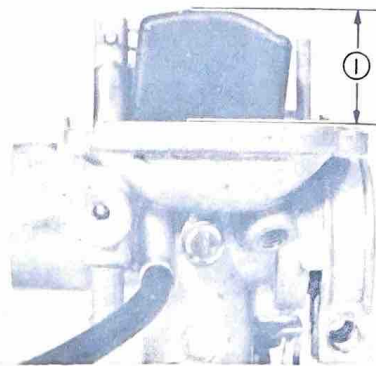
## CHAPTER 4. CARBURETION

### 4-1. CARBURETOR

#### A. Inspection and Repair

1. Remove following parts
  - a) Pilot air screw
  - b) Idle speed screw
  - c) Float chamber
  - d) Float
  - e) Needle valve
  - f) Valve seat
  - g) Needle jet
  - h) Needle jet
  - i) Pilot jet
2. Wash carburetor in petroleum base solvent.  
Wash all associated parts.
3. Using high pressure air, blow out all passages and jets.
4. Inspect needle and seat for signs of excessive wear or foreign particles. Replace as required. Always replace inlet needle and valve seat as an assembly.

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



1. Float level

Float level:  
 $23.0 \pm 2.5 \text{ mm } (0.91 \pm 0.10 \text{ in})$

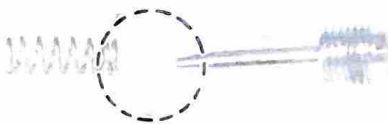
#### NOTE:

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

- c. To correct float level, remove float assembly and bend tang a slight amount as required.



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



6. Float level

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

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

10. Install throttle valve and needle assembly in carburetor mixing chamber.
11. Install mixing chamber top.
12. Re-install carburetor. Check position and routing of all tubes. Check tightness of all fittings. Make sure carburetor is mounted in a level position.
13. After installation, readjust throttle cable and Autolube pump cable. See directions in Chapter 2, Section 2-3-A and 2-3-C.

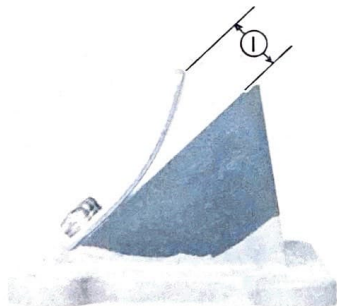
## 4-2. REED VALVE ASSEMBLY

### A. Removal and Inspection

With carburetor removed, proceed as follows:

1. Remove the bolts holding the carburetor joint and reed valve assembly to cylinder. Remove assembly.
2. Inspect rubber carburetor joint for signs of weathering, cracking 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.
4. Check valve stopper clearance. If beyond tolerance, replace valve stopper.

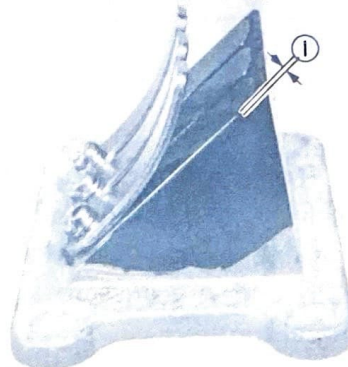
|       | Valve stopper clearance:              |
|-------|---------------------------------------|
| GT80E | $8 \pm 0.3$ mm ( $0.31 \pm 0.012$ in) |
| GTMXE | $7 \pm 0.3$ mm ( $0.28 \pm 0.012$ in) |



1. Valve stopper clearance

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

Reed valve bending limit:  
0.3 mm (0.012 in)



1. Bending distance

6. If disassembly of the reed valve assembly is required, proceed as follows;
  - a. Remove Phillips screws securing stopper plate and reed to reed block. Handle reed carefully. Avoid scratches and do not bend. Note from which side of the reed block the reed and stopper plate were removed. Re-install on same side.

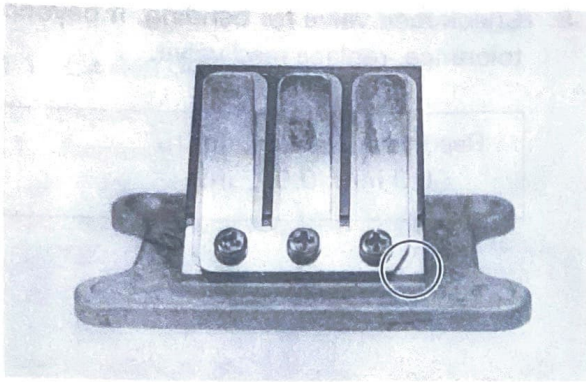
### NOTE:

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

- b. During reassembly, clean 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.

Torque: 0.08 m·kg (0.6 ft·lb)





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

Reed valve securing bolt torque:  
1 m-kp (7 ft-lb)

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## CHAPTER 5. CHASSIS

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## CHAPTER 5. CHASSIS

### 5-1. FRONT WHEEL

#### A. Removal

1. Remove front brake wire, speedometer cable (GT80E), from front brake shoe plate.
2. Remove cotter pin from front axle nut.
3. Loosen the axle pinch bolt at the bottom of the right hand fork leg (GTMXE).
4. Remove front axle nut.
5. Remove the front wheel axle by simultaneously twisting and pulling out on the axle. Then remove the wheel assembly.

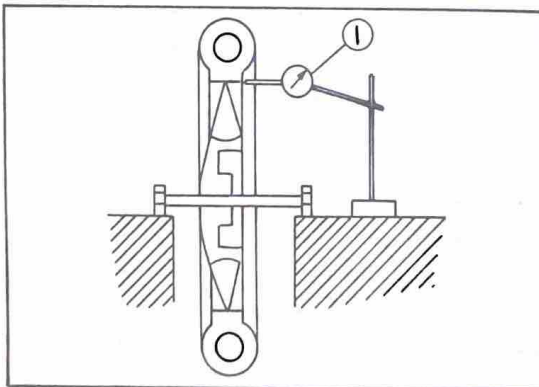
#### B. Front Axle Inspection

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

#### C. Front Wheel Inspection

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

|       | Rim run-out limits:                                       |
|-------|-----------------------------------------------------------|
| GT80E | Vertical — 1.0 mm (0.04 in)<br>Lateral — 0.7 mm (0.03 in) |
| GTMXE | Vertical — 2.0 mm (0.08 in)<br>Lateral — 2.0 mm (0.08 in) |

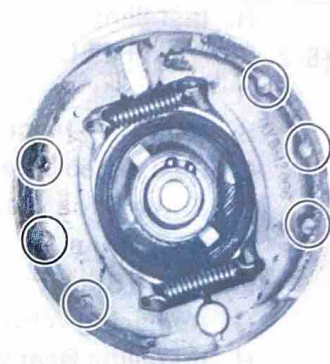


1. Dial gauge

#### D. Brake Shoe Wear Inspection

1. Measure the brake shoe thickness at 3 or 4 points. If beyond wear limits, replace brake shoe.

Brake shoe wear limit:  
2 mm (0.08 in) minimum thickness



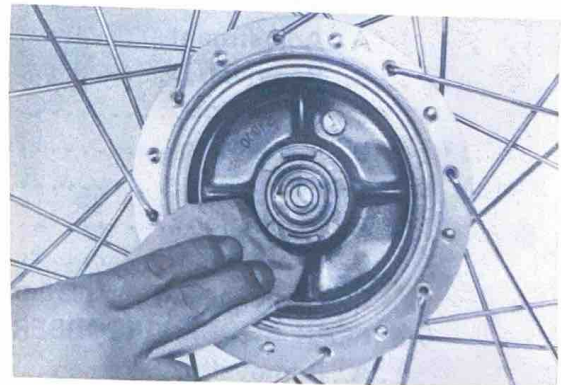
2. Remove any glazed areas from brake shoes using coarse sand paper.

#### E. Brake Drum Inspection

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

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

Remove scratches by lightly and evenly polishing with emery cloth.



#### F. Brake Shoe Plate Inspection

1. Remove the camshaft and grease. Sparingly if the cam face is worn, replace.

**NOTE:**

Before removing the cam lever put a match mark on the cam lever and camshaft to indicate their positions for easy assembly.

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

**G. Replacing Wheel Bearings**

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

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

**CAUTION:**

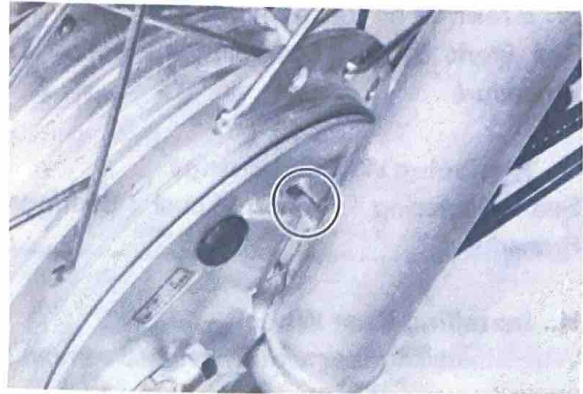
**Do not strike the center race or balls of the bearing. Contact should be made only with the outer race.**

**H. Installing Front Wheel**

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

1. Lightly grease lips of front wheel oil seals and gear teeth of speedometer drive and driven gears. Use light-weight lithium soap base grease.

2. Check for proper engagement of the boss on the outer fork tube with the locating slot on brake shoe plate.



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

**Axle nut torque: 4 m-kg (29 ft-lb)**

- c. Install a new cotter pin.

**5-2. REAR WHEEL****A. Removal**

1. Disconnect the chain joint and remove the chain.
2. Remove the cotter pin and then remove the tension bar and brake rod from the rear shoe plate.
3. Loosen the chain adjuster. Nut right and left sides.
4. Remove the cotter pin and then remove the rear axle nut.
5. Remove the righthand chain adjuster and distance collar.
6. Remove the rear brake plate.
7. Remove the rear wheel assembly.

**B. Rear Axle Inspection**

See Front Axle Inspection Procedure.

**C. Rear Wheel Inspection**

See Front Wheel Inspection Procedures.

**D. Brake Shoe Wear Inspection**

See Front Brake Shoe Wear Inspection Procedures.



### E. Rear Drum Inspection

See Front Drum Inspection Procedure.

### F. Brake Shoe Plate Inspection

See Front Brake Shoe Plate Inspection 1) Procedure.

### G. Replacing Wheel Bearings

See Replacing Front Wheel Bearings Procedures.

### H. Installing Rear Wheel

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

1. Lightly grease lip of rear wheel oil seals.
2. Adjust drive chain. (Refer to 2-4-c)
3. Always secure the rear wheel axle as follows:
  - a. Tighten the rear axle nut and tension bar nut.

|                                              |
|----------------------------------------------|
| Rear axle nut torque:<br>6 m-kg (43 ft-lb)   |
| Tension bar nut torque:<br>2 m-kg (14 ft-lb) |

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- b. Install new cotter pin.

## 5-3. TIRES AND TUBES

### A. Removal

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

### NOTE:

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

### B. Installation

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

## 5-4. DRIVE CHAIN AND SPROCKETS

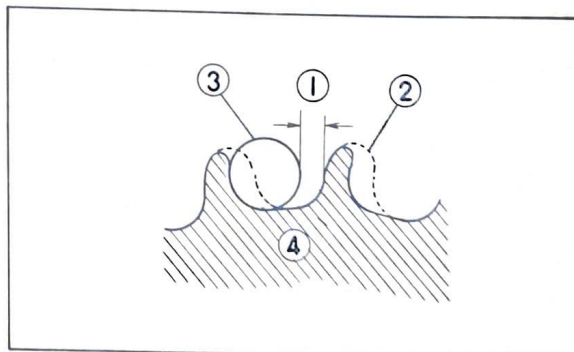
### NOTE:

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

### A. Drive Sprocket

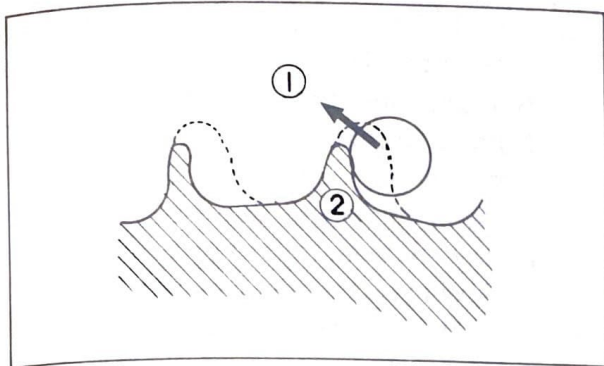
With the left crankcase cover removed, proceed as follows;

1. Remove sprocket securing circlip. Remove sprocket.
2. Check sprocket wear. Replace if tooth width has decreased as shown.



1. 1/4 tooth
2. Original width
3. Roller
4. Sprocket

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



1. Tendency to slip off
2. Bend teeth

### B. Driven Sprocket

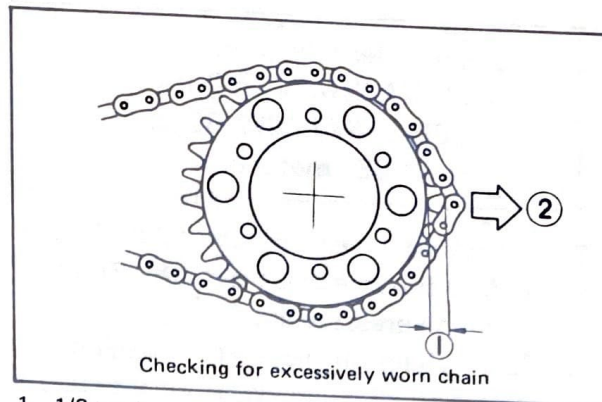
With the rear wheel removed, proceed as follows:

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

Driven sprocket securing nut torque:  
4 m-kp (29 ft-lb)

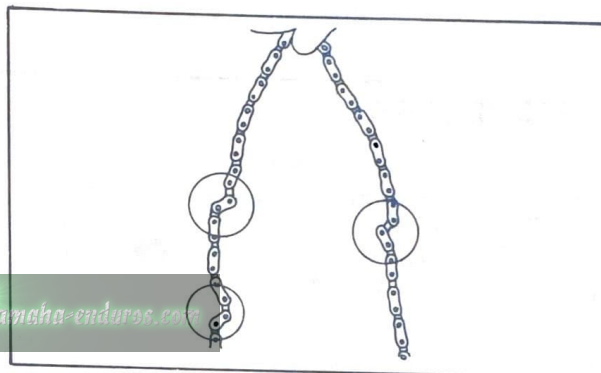
### C. Chain Inspection

1. With the chain installed on the machine, excessive wear may be checked for by taking up chain freeplay and pulling the chain away from the rear sprocket. If the chain will lift away more than one-half the length of the sprocket teeth, remove and inspect the chain. If any portion of the chain shows signs of damage, or if either sprocket shows signs of excessive wear, remove and replace chain and damaged sprocket(s).



1. 1/2 tooth
2. Pull

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



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

### D. Chain Maintenance

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

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



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

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

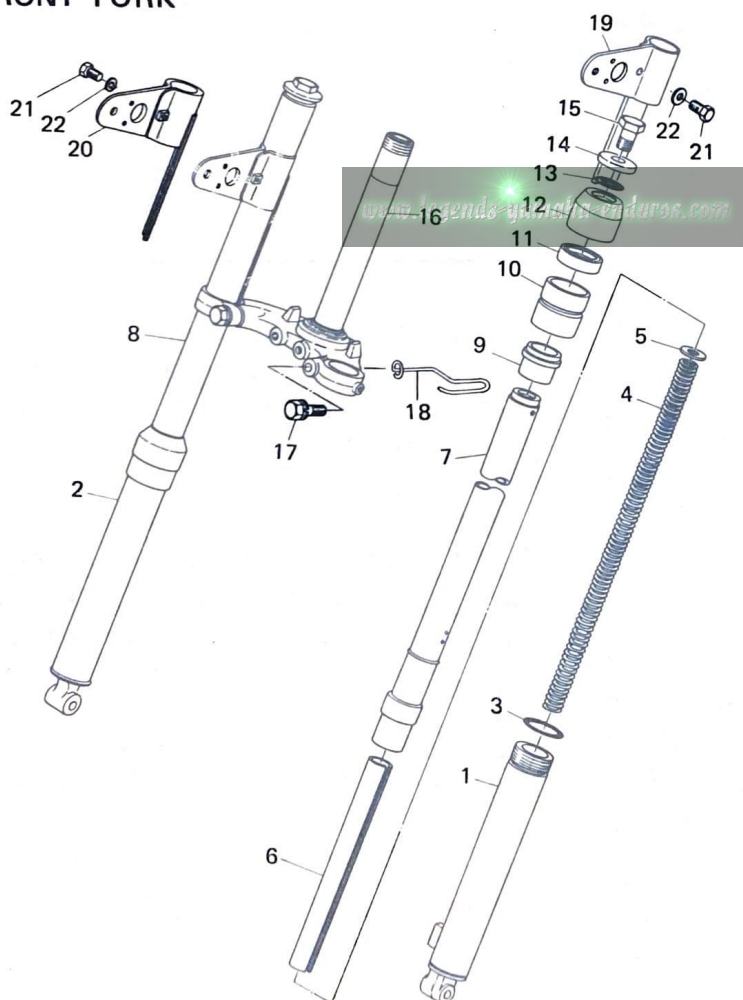
2. Remove the front fork.
3. Drain the oil from the fork.
4. Remove the dust seal.
5. Install a strap wrench around the outer tube nut and remove the nut.
6. Remove inner tube and spring assembly from outer tube.
7. Carefully pry out oil seal and O-ring without damaging outer tube nut. To remove oil seal, tap the under side of the seal using punch and hammer.
8. Inspect the O-ring in the outer tube nut, if damaged, replace it.
9. Insert new seal with "open" side down using large socket and hammer.

## 5-5. FRONT FORKS

### A. Removal and Disassembly

1. Remove the fork cap bolt and loosen the under bracket bolt.

### FRONT FORK



1. Outer left tube
2. Outer right tube
3. O-Ring
4. Fork spring
5. Spring upper washer
6. Spacer
7. Inner left tube
8. Inner right tube
9. Slide metal
10. Outer nut comp.
11. Oil seal
12. Dust seal
13. Packing
14. Cap washer
15. Cap bolt
16. Under bracket comp.
17. Under bracket bolt
18. Wire holder
19. Head lamp left stay (GT80E)
20. Head lamp right stay (GT80E)
21. Bolt
22. Plain washer

## B. Inspection

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

## C. Assembly and Installation

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

### NOTE:

- a. When installing the outer tube nut, grease the oil seal lip, and install it with special care.
- b. After assembling, check see if the inner to tube slides smoothly.

### 2. Installing the front forks on the frame

- a. Bring up the front forks to the correct position and partially tighten the under-bracket bolt.

Under bracket bolt:  
2 m-kg (14 ft-lb)

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

Recommended front fork oil:  
Yamaha fork oil SAE10W

Front fork oil capacity:  
 $112 \pm 4$  cc ( $3.79 \pm 0.135$  oz)

- c. After filling, slowly pump the outer tubes up and down to distribute the oil.
- d. Inspect O-ring on fork cap bolts and replace if damaged.
- e. Install the fork cap bolts and torque to specification.

Cap bolt torque: 2 m-kg (14 ft-lb)

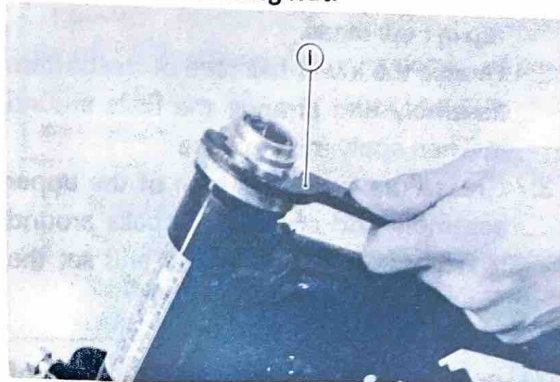
## 5-6. STEERING HEAD

### A. Adjustment

See chapter 2-4 for Steering Head Adjustment.

## B. Removal

1. Remove front wheel, front forks, handlebars, [headlight, flasher light, speedometer cable (GT80E)], number plate (GTMXE).
2. Remove steering stem bolt and washer.
3. Remove handle crown (upper bracket) and [speedometer as an assembly (GT80E)].
4. Remove steering nut.



1. Steering nut wrench

### CAUTION:

**Support under bracket (steering stem) so that the loose bearings will not fall out.**

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

Ball quantity/size: (upper)  
22 pcs./ 3/16 in

7. Remove under bracket. Be very careful not to lose any bearings from the lower assembly.

Ball quantity/size: (lower)  
19 pcs./ 1/4 in

8. Remove races from head pipe using drift pinch and hammer. Work the race out gradually by tapping lightly around its complete backside diameter.
9. Remove the bearing race from the lower bracket by tapping around its backside diameter with a drift punch and hammer.



### C. Inspection

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

### D. Installation

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

#### NOTE:

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

4. Carefully slip the under bracket stem up into the steering head. Hold the top bearing assembly in place so the stem does not knock any balls out of position.
5. Set the upper bearing cover on and install the ring nut. Tighten the ring nut so all free play is taken up, but so the bracket can still pivot freely from lock to lock. Recheck for free play after the entire fork unit has been installed. (Refer to Chapter 2-4-E-1 for Steering head adjustment.)
6. Install the fork tubes into the under bracket to ease headlight body installation.
7. Install the headlight body and stays onto the fork tubes with rubber and steel spacing washers properly in place.
8. Install handle crown (upper bracket). Tighten steering stem bolt.

Steering stem bolt torque:  
3 m-kg (22 ft-lb)

9. Install front fork cap bolt.

Cap bolt torque:  
2 m-kg (14 ft-lb)

10. Tighten under bracket pinch bolt.

Pinch bolt torque:  
2 m-kg (14 ft-lb)

11. Install handlebars and torque to specification.

#### CAUTION:

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

Handlebar mounting bolt torque:  
1.2 m-kg (8 ft-lb)

12. Continue reassembly in reverse assembly order.

## 5-7. SWING ARM

### A. Inspection

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

Swing arm free play:  
1 mm (0.04 in) maximum

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

### B. Lubrication

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

Recommended lubricant  
Smooth chassis lube grease

3. Wipe off excessive grease.

### C. Removal and Installation

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

Pivot bolt torque:  
2.5 m-kp (18 ft-lb)

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

#### NOTE:

Do not tap on bushing. Press in new bushings.

## 5-8. REAR SHOCK ABSORBER

### A. Removal

1. Remove rear shock absorber from machine.

### B. Inspection

1. Check the rod. If it is bent or damaged, replace the shock absorber.
2. Check for oil leakage. If oil leakage is evident, replace the shock absorber.
3. Operate shock absorber rod to check damping. There should be no noticeable damping as shock extends.
4. Install the shock absorber on the machine.

Rear shock absorber tightening torque:  
3 m-kp (22 ft-lb)

## 5-9. CABLES AND FITTINGS

### A. Cable Maintenance

#### NOTE:

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

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

#### WARNING:

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

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

#### NOTE:

Use Yamaha Chain and Cable Spray.

### B. Throttle Maintenance

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

#### NOTE:

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

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



### C. Cable Junction Maintenance

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

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

**NOTE:** \_\_\_\_\_

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

---

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

## CHAPTER 6. ELECTRICAL

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## CHAPTER 6. ELECTRICAL

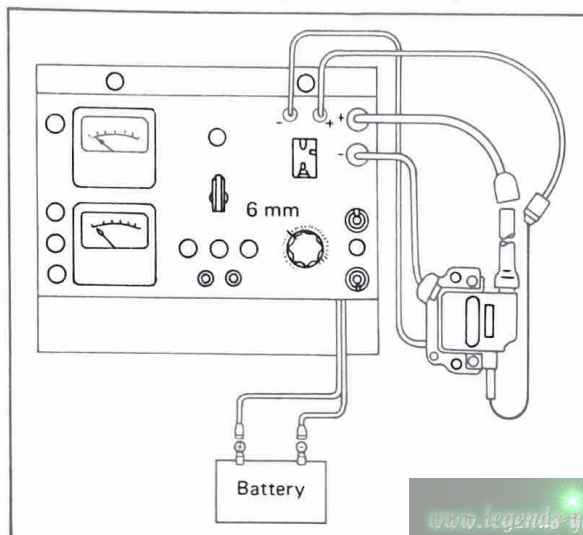
### 6-1. IGNITION SYSTEM

#### A. Ignition Timing

See Chapter 2-5 for Ignition Timing

#### B. Ignition Coil

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

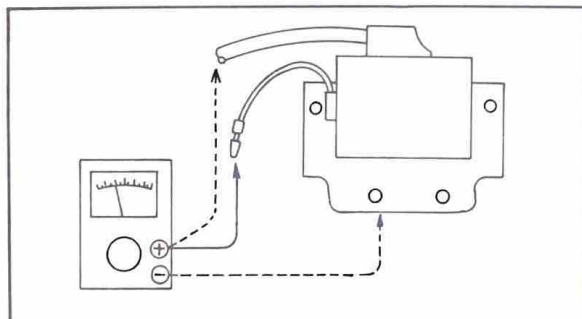


- c. Connect fully charged battery to tester.
  - d. Turn on spark gap switch and increase gap until misfire occurs.

Minimum spark gap: 6 mm (0.24 in)

#### 2. Coil winding resistance tests

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



|       | Primary coil resistance                                                   | Secondary coil resistance                                                        |
|-------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| GT80E | $1.7\Omega \pm 10\%$<br>at $20^{\circ}\text{C}$ ( $68^{\circ}\text{F}$ )  | $6.0\text{K}\Omega \pm 20\%$<br>at $20^{\circ}\text{C}$ ( $68^{\circ}\text{F}$ ) |
| GTMXE | $1.02\Omega \pm 10\%$<br>at $20^{\circ}\text{C}$ ( $68^{\circ}\text{F}$ ) |                                                                                  |
|       | $1.7\Omega \pm 10\%$<br>at $20^{\circ}\text{C}$ ( $68^{\circ}\text{F}$ )  |                                                                                  |

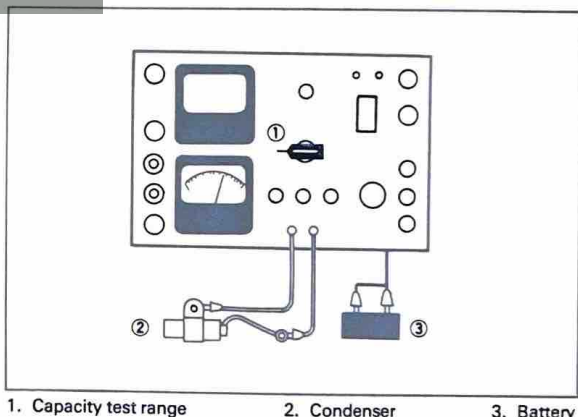
#### C. Condenser Test

If the contact points show excessive wear, or the spark is weak (but the ignition coil is in good condition), check the condenser.

Capacity test (use electro tester).

- a. Calibrate capacity scale.
  - b. Connect tester.
  - c. Meter needle will deflect and return to center as condenser is charged.
- After needle stop, note reading on " $\mu\text{F}$ " scale.

|       | Condenser capacity |
|-------|--------------------|
| GT80E | $0.25\mu\text{F}$  |
| GTMXE | $0.30\mu\text{F}$  |



#### CAUTION:

To prevent shock after this measurement, the condenser should be discharged by connecting the positive and negative side with a thick wire.

#### 1. Inspection

Instruct the rider to:

- a. Inspect and clean the spark plug at least once per month or every 600 km (400 mi.)

- b. Clean the electrodes of carbon and adjust the electrode gap.
- c. Be sure to use the proper reach plug as a replacement to avoid overheating, fouling or piston damage.

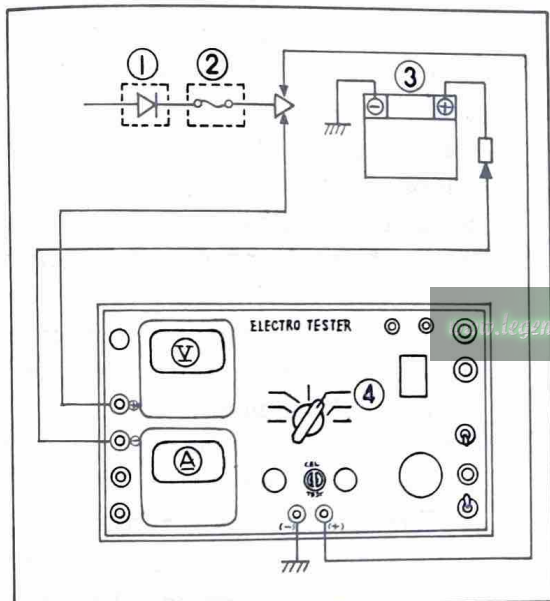
Spark plug type: B-7HS (NGK)

Spark plug gap: (use wire gap gauge)  
0.5—0.6 mm (0.020—0.024 in)

## 6-2. CHARGING SYSTEM (GT80E)

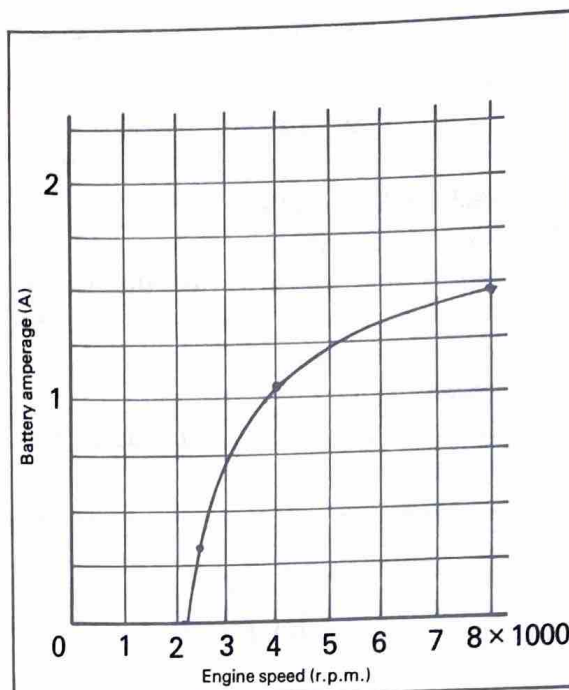
### A. Charging Circuit Test

1. Charging output test
  - a. Connect tester as shown.

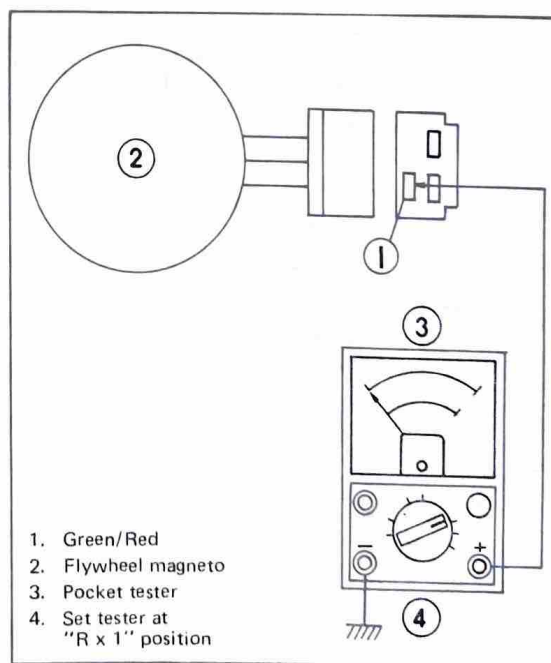


1. Rectifier
2. Fuse
3. Battery
4. Set the tester in "DC VOLTAGE" position

- b. Turn ignition switch to ON position, start engine and note voltage and amperage readings.
- c. Switch to night time (lights on) and note voltage and amperage readings.



- d. If the indicated voltage and amperage cannot be reached, perform the tests in step 2.
2. Charging coil resistance test  
Check the resistance between terminal and ground. If resistance is out of specification, coil is broken. Check the coil connections. If the coil connections are good, then the coil is broken inside and it should be replaced.



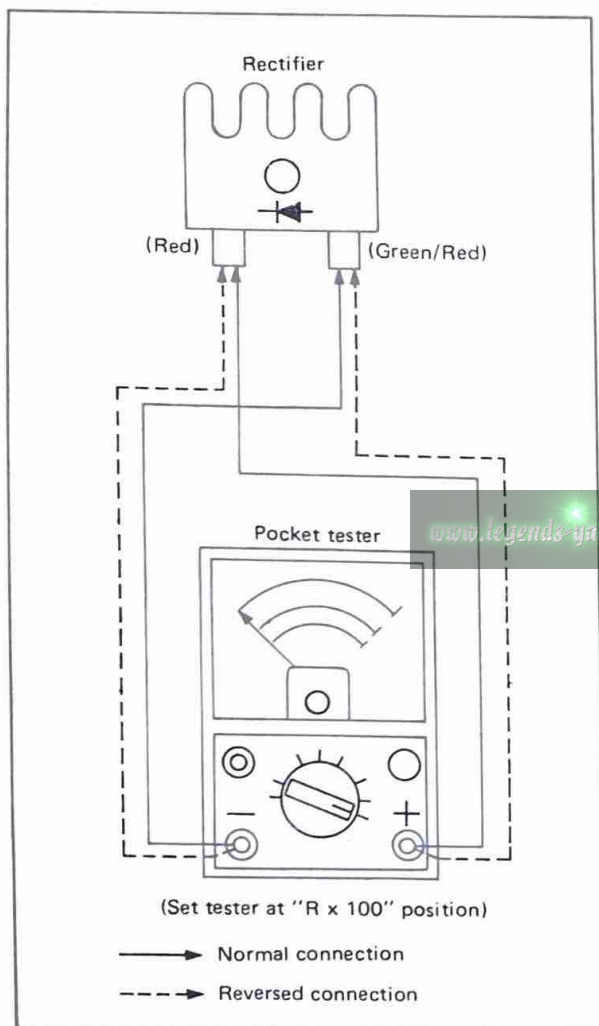
1. Green/Red
2. Flywheel magneto
3. Pocket tester
4. Set tester at "R x 1" position



Charging coil resistance  
Ground to Green/Red leads:  
0.29  $\pm$  at 20°C (68°F)

## B. Checking Silicon Rectifier

1. Normal connection: Connect the tester's red lead (+) to the silicon rectifier's red point, and connect the tester's black lead (-) to the rectifier's Green/Red point.
2. Check with reversed connections: Reverse the tester leads.



## CAUTION:

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

## NOTE:

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

## C. Battery

### 1. Checking

- a. If battery sulfation (white accumulations) occurs on plates due to lack of battery electrolyte, the battery should be replaced.
- b. If the bottoms of the cells are filled with corrosive material falling off the plates, the battery should be replaced.
- c. If the battery shows the following defects, it should be replaced:
  - 1) The voltage will not rise to a specific value even after many hours of charging.
  - 2) No gassing occurs in any cell during charging.
  - 3) The battery requires a charging voltage of more than 8.4 V in order to supply a current of 0.4 A for 10 hours.

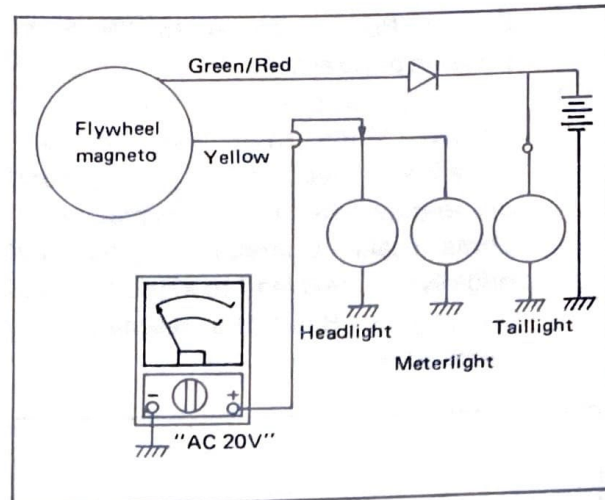
### 2. Service life

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

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

|                     | Good | Replace |  |
|---------------------|------|---------|--|
| Normal connection   |      |         |  |
| Reversed connection |      |         |  |

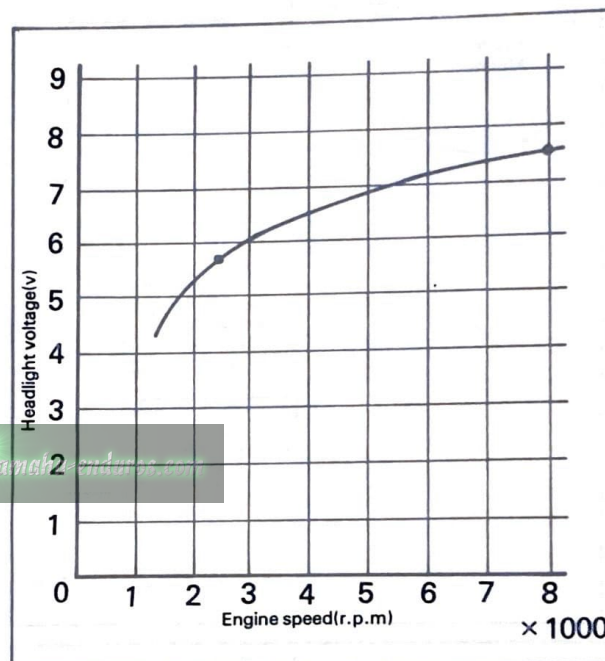
|                          |                                                        |
|--------------------------|--------------------------------------------------------|
| Battery                  | 6V, 4AH                                                |
| Electrolyte              | Specific gravity: 1.26                                 |
| Initial charging current | 0.25A/16 hours (new battery)                           |
| Recharging current       | 0.4A/10 hours (or until specific gravity reaches 1.26) |
| Refill fluid             | Distilled water (to maximum level line)                |
| Refill period            | Check once per month (or more often, as required)      |



### 3. Storage

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

- Recharge the battery once a month.
- Store the battery in a cool, and dry place.
- Recharge the battery before reinstallation.



## 6-3. LIGHTING AND SIGNAL SYSTEMS (GT80E)

### A. Lighting tests and checks A.C. circuit

#### 1. A.C. Circuit Output Test

With all A.C. lights in operation the circuit will be balanced and the voltage will be the same at all points at a given rpm.

- Switch Pocket Tester to "AC20V" position.
- Connect positive (+) test lead to yellow Connection and negative (-) test lead to a good ground.
- Start engine, turn on lights and check voltage at each engine speed.

If measured voltage is too high or too low, check for bad connections, damaged wires, burned out bulbs or bulb capacities that are too large throughout the A.C. lighting circuit.

#### NOTE:

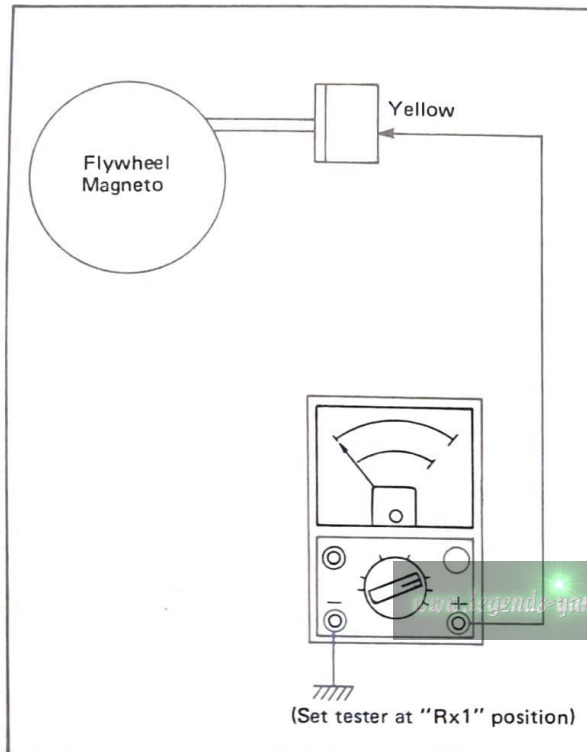
This voltage test can be made at any point throughout the A.C. lighting circuit and the readings should be the same as specified above.

#### 2. Lighting Coil Resistance Check

If voltage is incorrect in A.C. lighting circuit, check the resistance of the yellow wire windings of the lighting coil.



- a. Switch Pocket Tester to "R × 1" position and zero meter.
- b. Connect positive (+) test lead to yellow. Wire from magneto and negative (-) test lead to good ground on engine. Read the resistance on ohms scale. Connect magneto and negative (-) test lead to a good ground on engine. Read the resistance on ohms scale.



| Lighting coil resistance |                                                                        |
|--------------------------|------------------------------------------------------------------------|
| Ground to Yellow leads   | $0.2 \Omega \pm 10\%$ at $20^{\circ}\text{C}$ ( $68^{\circ}\text{F}$ ) |

3. If A.C. lighting circuit components check out properly but circuit voltage is still excessive, go to charging circuit checks. The two circuits share a common source coil. If voltage is low in charging circuit due to a defective battery, rectifier or connection, voltage will be too high in lighting circuit.

### B. Lighting Test and Check D.C. Circuit

The battery provides power for operation of the horn, tail light, stop light, and flasher light. If none of the above operates, always

check battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery water, or a defective charging system. See section 6-2 Charging System, for checks of battery and charging system. Also check fuse condition. Replace "open" (blown) fuses.

#### 1. Horn does not work:

- a. Check for 6V on brown wire to horn.
- b. Check for good grounding of horn (pink wire) when horn button is pressed.

#### 2. Brake light does not work:

- a. Check bulb.
- b. Check for 6V on yellow wire to brake light.
- c. Check for 6V on brown wire to each brake light switch (front brake and rear brake switches).

#### 3. Taillight does not work:

- a. Check bulb.
- b. Check for 6V on blue wire.
- c. Check for ground on black wire to tail/stop light assembly.

#### 4. Flasher light(s) do not work:

- a. Check bulb.

#### b. Right circuit:

- 1) Check for 6V on dark green wire to light.
- 2) Check for ground on black wire to light assembly.

#### c. Left circuit:

- 1) Check for 6V on dark brown wire to light.
- 2) Check for ground on black wire to light assembly.

#### c. Right and left circuits do not work:

- 1) Check for 6V on brown/white wire to flasher switch on left handlebar.
- 2) Check for 6V on brown wire to flasher relay.
- 3) Replace flasher relay.
- 4) Replace flasher switch.

#### 5. Oil caution light does not work.

- a. Place shift lever in neutral gear to check bulb.
- b. Replace bulb.
- c. Check for 6V on black/red wire to oil level switch.
- d. Replace oil level switch.

## CHAPTER 7. APPENDICES

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## CHAPTER 7. APPENDICES

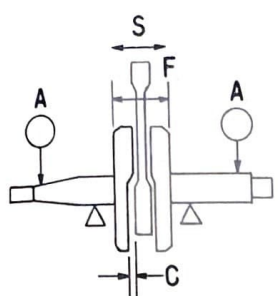
### 7-1. GENERAL SPECIFICATION

#### A. General

| Item                                                                                                                                          | GT80E                                                                                                                    | GTMXE                                                                                                                    |
|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| Model:<br>Model (I.B.M. No.)<br>Frame I.D. & Starting Number<br>Engine I.D. & Starting Number                                                 | GT80E (2F4)<br>2F4-000101<br>2F4-000101                                                                                  | GTMXE (367)<br>367-400101<br>367-400101                                                                                  |
| Dimension:<br>Overall Length<br>Overall Width (standard)<br>Overall Height (standard)<br>Seat Height<br>Wheelbase<br>Minimum Ground Clearance | 1,565 mm (61.6 in)<br>710 mm (28.0 in)<br>930 mm (36.6 in)<br>655 mm (25.8 in)<br>1,045 mm (41.1 in)<br>170 mm ( 6.7 in) | 1,560 mm (61.4 in)<br>710 mm (28.0 in)<br>930 mm (36.6 in)<br>655 mm (25.8 in)<br>1,045 mm (41.1 in)<br>195 mm ( 7.7 in) |
| Weight:<br>Net Weight                                                                                                                         | 64 kg (141.1 lb)                                                                                                         | 59 kg (130 lb)                                                                                                           |
| Performance:<br>Minimum Turning Radius                                                                                                        | 1,500 mm (59.1 in)                                                                                                       | 1,500 mm (59.1 in)                                                                                                       |

#### B. Engine

|                                                                                                                                                                   |                                                                                                                                                                                                                 |                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Description:<br>Engine Type<br><br>Engine Model<br>Displacement<br>Bore x Stroke<br>Compression Ratio<br>Starting System<br>Ignition System<br>Lubrication System | Air cooled 2 stroke, gasoline,<br>Torque induction<br>2F4<br>72 cc (4.39 cu.in)<br>47 mm x 42 mm (1.850 in x 1.654 in)<br>7.1 : 1<br>Primary kick<br>Flywheel magneto<br>Separate lubrication (Yamaha Autolube) | Air cooled 2 stroke, gasoline,<br>Torque induction<br>367<br>72 cc (4.39 cu.in)<br>47 mm x 42 mm (1.850 in x 1.654 in)<br>6.8 : 1<br>Primary kick<br>Flywheel magneto<br>Separate lubrication (Yamaha Autolube) |
| Cylinder head:<br>Combustion Chamber Volume<br><br>Cylinder:<br>Material<br>Bore Size<br>Taper Limit<br>Out of Round Limit                                        | 9.1 ± 0.2 cc (0.56 ± 0.012 cu. in)<br><br>Special cast iron<br>47 <sup>+0.020</sup> <sub>-0</sub> mm (1.850 <sup>+0.0008</sup> <sub>-0</sub> in)<br>0.05 mm (0.002 in)<br>0.01 mm (0.0004 in)                   | 9.4 ± 0.2 cc (0.57 ± 0.012 cu. in)<br><br>Special cast iron<br>47 <sup>+0.020</sup> <sub>-0</sub> mm (1.850 <sup>+0.0008</sup> <sub>-0</sub> in)<br>0.05 mm (0.002 in)<br>0.01 mm (0.0004 in)                   |
| Piston:<br>Piston Clearance<br>Piston Over Size                                                                                                                   | 0.035 – 0.040 mm (0.0014 – 0.0016 in)<br>47.25 mm, 47.50 mm (1.860 in, 1.870 in)<br>47.75 mm, 48.00 mm (1.880 in, 1.890 in)                                                                                     | 0.035 – 0.040 mm (0.0014 – 0.0016 in)<br>47.25 mm, 47.50 mm (1.860 in, 1.870 in)<br>47.75 mm, 48.00 mm (1.880 in, 1.890 in)                                                                                     |
| Pistons Ring:<br>Piston Ring Design (Top)<br>" (2nd)<br>Ring End Gap (Installed) (Top)<br>" (2nd)<br>Ring Groove Side Clearance (Top)<br>" (2nd)                  | Keystone ring<br>Plain ring<br>0.15 – 0.35 mm (0.006 – 0.014 in)<br>0.15 – 0.35 mm (0.006 – 0.014 in)<br>0.03 – 0.05 mm (0.001 – 0.002 in)<br>0.03 – 0.05 mm (0.001 – 0.002 in)                                 | Keystone ring<br>Plain ring<br>0.15 – 0.35 mm (0.006 – 0.014 in)<br>0.15 – 0.35 mm (0.006 – 0.014 in)<br>0.03 – 0.05 mm (0.001 – 0.002 in)<br>0.03 – 0.05 mm (0.001 – 0.002 in)                                 |
| Small End Bearing:<br>Type<br><br>Big End Bearing:<br>Type                                                                                                        | Needle bearing<br><br>Needle bearing                                                                                                                                                                            | Needle bearing<br><br>Needle bearing                                                                                                                                                                            |

|                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Crankshaft:</b><br>Crankshaft Assembly Width (F)<br>Crankshaft Deflection (A)<br>Connecting Rod Big End Side Clearance (C)<br>Connecting Rod Small End Deflection (S)                                                                                                                                                           |  | $38_{-0.10}^{+0.05}$ mm ( $1.50_{-0.004}^{+0.002}$ in)<br>0.03 mm (0.0012 in)<br>0.2 – 0.8 mm (0.0079 – 0.0315 in)<br>0.8 – 1.0 mm (0.031 – 0.040 in)                                                                                                                                                             | $38_{-0.10}^{+0.05}$ mm ( $1.50_{-0.004}^{+0.002}$ in)<br>0.03 mm (0.0012 in)<br>0.2 – 0.8 mm (0.0079 – 0.0315 in)<br>0.8 – 1.0 mm (0.031 – 0.040 in)                                                                                                                                                             |
|                                                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                   |
| Crank Bearing Type (Left) x Q'ty<br>" (Right) "<br>Crank Oil Seal Type (Left) "<br>" (Right) "                                                                                                                                                                                                                                     |  | 6204 C <sub>3</sub><br>6204 C <sub>3</sub><br>SD20-35-7<br>SW28-40-8                                                                                                                                                                                                                                              | 6204 C <sub>3</sub><br>6204 C <sub>3</sub><br>SD-20-35-7<br>SW-28-40-8                                                                                                                                                                                                                                            |
| <b>Clutch:</b><br>Clutch Type<br>Clutch Push Mechanism<br>Primary Reduction Ratio & Method<br>Friction Plate - Thickness/Quantity<br>- Wear Limit<br>Clutch Plate - Thickness/Quantity<br>- Warp Limit<br>Clutch Spring - Free Length/Quantity<br>- Warp Limit<br>Clutch Housing Axial Play (Wear Limit)<br>Push Rod Bending Limit |  | Wet, multiple disc type<br>Inner push type, screw push system<br>68/19 (3.578), Helical gear<br>3.5 mm (0.14 in) x 3 pcs<br>3.2 mm (0.13 in)<br>1.6 mm (0.06 in) x 2 pcs<br>0.05 mm (0.002 in)<br>31.5 mm (1.24 in) x 4 pcs<br>30.5 mm (1.20 in)<br>0.05 mm – 0.25 mm (0.002 in – 0.010 in)<br>0.15 mm (0.006 in) | Wet, multiple disc type<br>Inner push type, screw push system<br>68/19 (3.578), Helical gear<br>3.5 mm (0.14 in) x 3 pcs<br>3.2 mm (0.13 in)<br>1.6 mm (0.06 in) x 2 pcs<br>0.05 mm (0.002 in)<br>31.5 mm (1.24 in) x 4 pcs<br>30.5 mm (1.20 in)<br>0.05 mm – 0.25 mm (0.002 in – 0.010 in)<br>0.15 mm (0.006 in) |
| <b>Transmission:</b><br>Type<br>Gear Ratio 1st (Teeth) (Ratio)<br>2nd<br>3rd<br>4th<br>Transmission Gear Oil Quantity & Type<br>Secondary Reduction Ratio & Method                                                                                                                                                                 |  | Constant mesh 4 speed<br>39/12 (3.250)<br>34/17 (2.000)<br>30/21 (1.428)<br>27/24 (1.125)<br>Total: 550 – 600 cc (0.58 – 0.63 us.qt)<br>Exchange: 500 – 550 cc (0.53 – 0.58 us.qt)<br>Yamalube 4-cycle oil on SAE 10W/30<br>41/14 (2.928), Chain                                                                  | Constant mesh 4 speed<br>39/12 (3.250)<br>34/17 (2.000)<br>30/21 (1.428)<br>27/24 (1.125)<br>Total: 550 – 600 cc (0.58 – 0.63 us.qt)<br>Exchange: 500 – 550 cc (0.53 – 0.58 us.qt)<br>Yamalube 4-cycle oil on SAE 10W/30<br>41/14 (2.928), Chain                                                                  |
| <b>Kick Starter:</b><br>Type                                                                                                                                                                                                                                                                                                       |  | Kick, Mesh type                                                                                                                                                                                                                                                                                                   | Kick, Mesh type                                                                                                                                                                                                                                                                                                   |
| <b>Intake:</b><br>Air Cleaner-Type/Quantity<br>Reed Valve<br>Type<br>Bending Limit<br>Valve Lift<br>Tightening Torque                                                                                                                                                                                                              |  | Oiled foam rubber<br>"V" type<br>0.3 mm (0.012 in) or less<br>$8 \pm 0.3$ mm ( $0.31 \pm 0.012$ in)<br>0.08 m·kg (0.6 ft·lb)                                                                                                                                                                                      | Oiled foam rubber<br>"V" type<br>0.3 mm (0.012 in) or less<br>$7 \pm 0.3$ mm ( $0.28 \pm 0.012$ in)<br>0.08 m·kg (0.6 ft·lb)                                                                                                                                                                                      |
| <b>Carburetor:</b><br>Type & Manufacturer/Quantity<br>I.D. Mark<br>Main Jet (M.J.)<br>Air Jet (A.J.)<br>Jet Needle-clip Position (J.N.)<br>Needle Jet (N.J.)<br>Cutaway (C.A.)<br>Pilot Jet (P.J.)<br>Air Screw (turns out) (A.S.)<br>Starter Jet (G.S.)<br>Fuel Level (F.L.)<br>Engine Idling Speed                               |  | Y16P-3A, TEIKEI/1 pc<br>2F460<br>#88<br>0.5<br>032-2/5<br>2.090<br>2.0<br>#38<br>1-1/2<br>#50<br>$23.0 \pm 2.5$ mm ( $0.91 \pm 0.10$ in)<br>1,250 – 1,400 rpm                                                                                                                                                     | Y16P-3, TEIKEI/1 pc<br>36761<br>#94<br>2.5 – 3.0<br>049-2<br>2.080<br>1.0<br>#34<br>1-1/2<br>#50<br>$23.0 \pm 2.5$ mm ( $0.91 \pm 0.10$ in)<br>1,250 – 1,350 rpm                                                                                                                                                  |



|                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                   |                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Lubrication:</b><br>Autolube Pump-Color Code<br>Autolube Pump-Minimum Stroke<br>Autolube Pump-Reduction Ratio<br>Autolube Pump-Minimum Output/200 strokes<br>Autolube Pump-Maximum Output/200 strokes<br>Throttle Position (Adjusting Mark)<br>Oil Tank Capacity<br>Oil Grade | Yellow<br>0.20 – 0.25 mm (0.008 – 0.010 in)<br><br>0.50 – 0.63 cc (0.017 – 0.021 oz)<br><br>3.89 – 4.27 cc (0.132 – 0.144 oz)<br><br>At idle (when throttle valve begin to open)(○)<br>0.7 lit (0.74 U.S.qt)<br>YAMALUBE 2 stroke | 0.20 – 0.25 mm (0.008 – 0.010 in)<br><br>0.50 – 0.62 cc (0.017 – 0.021 oz)<br><br>3.64 – 4.27 cc (0.123 – 0.144 oz)<br><br>At idle (when throttle valve begin to open)(○)<br>0.7 lit (0.74 U.S.qt)<br>YAMALUBE 2 stroke |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

### C. Chassis

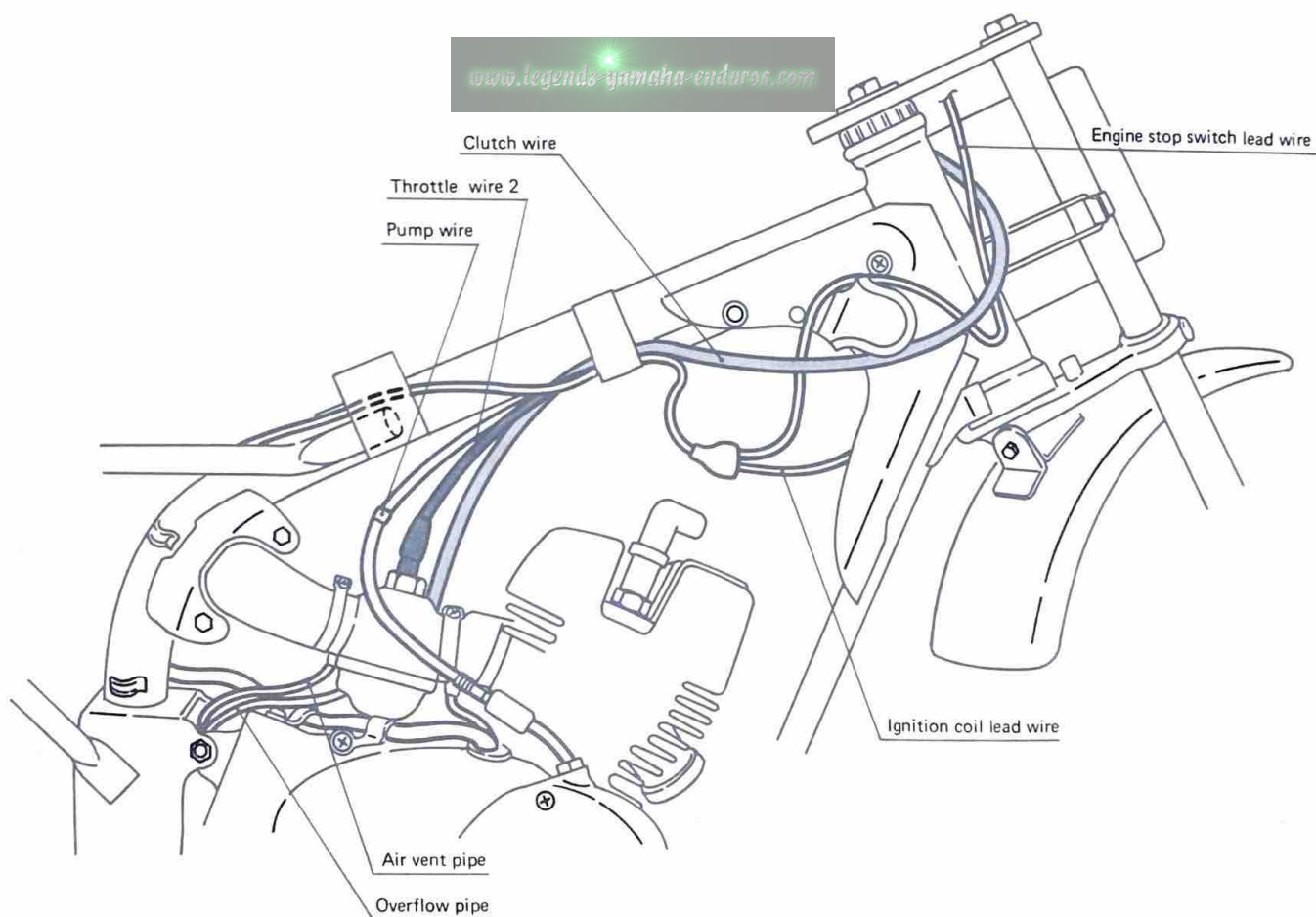
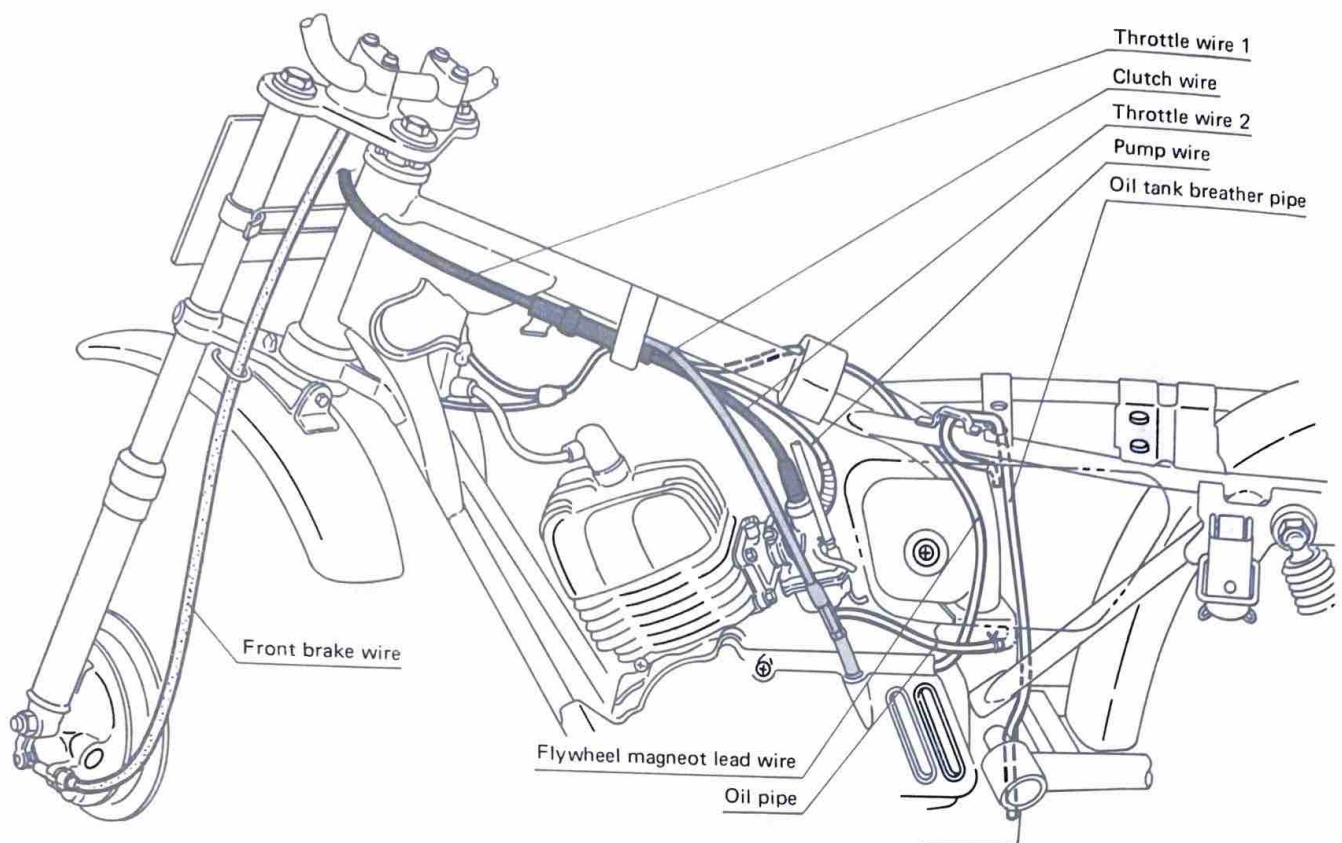
|                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frame:</b><br>Frame Design                                                                                                                                                                                                                      | Tubular steel double cradle frame                                                                                                                                                                                                                     | Tubular steel double cradle frame                                                                                                                                                                                                                     |
| <b>Steering system:</b><br>Caster<br>Trail<br>Number & Size of Balls in Steering Head<br>Upper Race<br>Lower Race<br>Lock to Lock Angle (each)                                                                                                     | 63°30'<br>68 mm (2.7 in)<br><br>22 pcs 3/16 in<br>19 pcs 1/4 in<br>47°                                                                                                                                                                                | 63°30'<br>68 mm (2.7 in)<br><br>22 pcs 3/16 in<br>19 pcs 1/4 in<br>47°                                                                                                                                                                                |
| <b>Front Suspension:</b><br>Type<br>Damper Type<br>Front Fork Cushion Travel<br>Front Fork Spring<br>Free Length<br>Spring Constant<br><br>Front Fork Oil Quantity & Type                                                                          | Telescopic fork<br>Coil spring, Oil damper<br>75 mm (2.95 in)<br><br>386 mm (15.20 in)<br>$k_1 = 0.4 \text{ kg/mm (22.4 lb/in)}$<br>$k_2 = 0.9 \text{ kg/mm (50.1 lb/in)}$<br>$112 \pm 4 \text{ cc (3.79} \pm 0.135 \text{ oz)}$ ,<br>YAMAHA FORK OIL | Telescopic fork<br>Coil spring, Oil damper<br>75 mm (2.95 in)<br><br>386 mm (15.20 in)<br>$K_1 = 0.4 \text{ kg/mm (22.4 lb/in)}$<br>$K_2 = 0.9 \text{ kg/mm (50.1 lb/in)}$<br>$112 \pm 4 \text{ cc (3.79} \pm 0.135 \text{ oz)}$ ,<br>YAMAHA FORK OIL |
| <b>Rear Suspension:</b><br>Type<br>Damper Type<br>Rear Shock Absorber Travel<br>Rear Wheel Travel<br>Swing Arm Free Play                                                                                                                           | Swing arm<br>Coil spring, Oil damper<br>65 mm (2.56 in)<br>72 mm (2.83 in)<br>1.0 mm (0.04 in)                                                                                                                                                        | Swing arm<br>Coil spring, Oil damper<br>65 mm (2.56 in)<br>79 mm (3.11 in)<br>1.0 mm (0.04 in)                                                                                                                                                        |
| <b>Fuel Tank:</b><br>Capacity<br>Fuel Grade                                                                                                                                                                                                        | 4.8 lit (1.3 U.S.gal)<br>Regular or lead gasoline                                                                                                                                                                                                     | 4.8 lit (1.3 U.S. gal)<br>Regular or lead gasoline                                                                                                                                                                                                    |
| <b>Wheel:</b><br>Tire Size (Front)<br>(Rear)<br>Tire Pressure (Front)<br>(Rear)<br>Rim Size (Front)<br>(Rear)<br>Rim Run Out Limit (Front/Rear)<br>Vertical<br>Lateral<br>Secondary Drive Chain Type<br>Type<br>Number of Links<br>Chain Free Play | 2.50–15–4PR<br>2.75–14–4PR<br>See Page –13<br><br>1.40 x 15<br>1.40 x 14<br><br>1 mm (0.04 in)<br>0.7 mm (0.03 in)<br><br>DK420<br>91L + Joint<br>20 mm (0.79 in)                                                                                     | 2.50–15–4PR<br>2.75–14–4PR<br>1.5 kg/cm (22 psi)<br>2.0 kg/cm (28 psi)<br>1.40 x 15<br>1.40 x 14<br><br>2 mm (0.08 in)<br>2 mm (0.08 in)<br><br>DK420<br>91L + Joint<br>20 mm (0.79 in)                                                               |
| <b>Brake:</b><br>Front Brake<br>Type<br>Drum Diameter (Limit)<br>Shoe Diameter x Width<br>Lining Thickness (Wear Limit)<br>Rear Brake<br>Type<br>Drum Diameter<br>Shoe Diameter x Width<br>Lining Thickness (Wear Limit)                           | Drum brake<br>110 mm (4.33 in)<br>110 x 25 mm (4.33 x 0.98 in)<br>2 mm (0.08 in)<br><br>Drum brake<br>110 mm (4.33 in)<br>110 x 25 mm (4.33 x 0.98 in)<br>2 mm (0.08 in)                                                                              | Drum brake<br>110 mm (4.33 in)<br>110 x 25 mm (4.33 x 0.98 in)<br>2 mm (0.08 in)<br><br>Drum brake<br>110 mm (4.33 in)<br>110 x 25 mm (4.33 x 0.98 in)<br>2 mm (0.08 in)                                                                              |

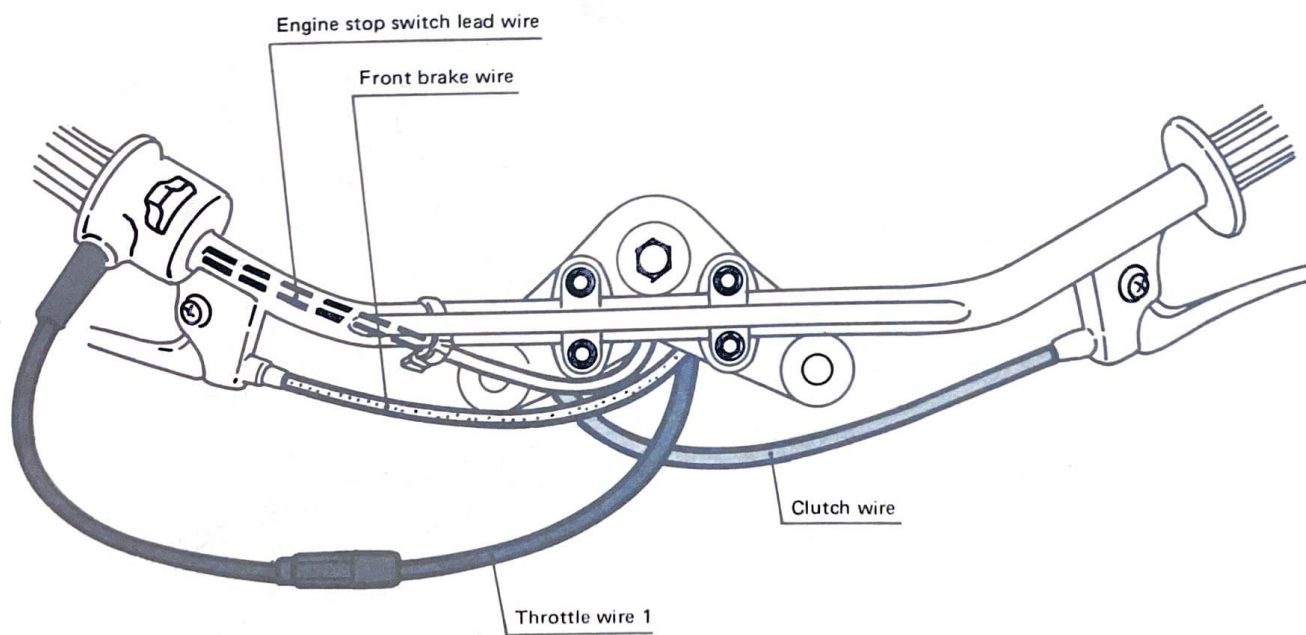
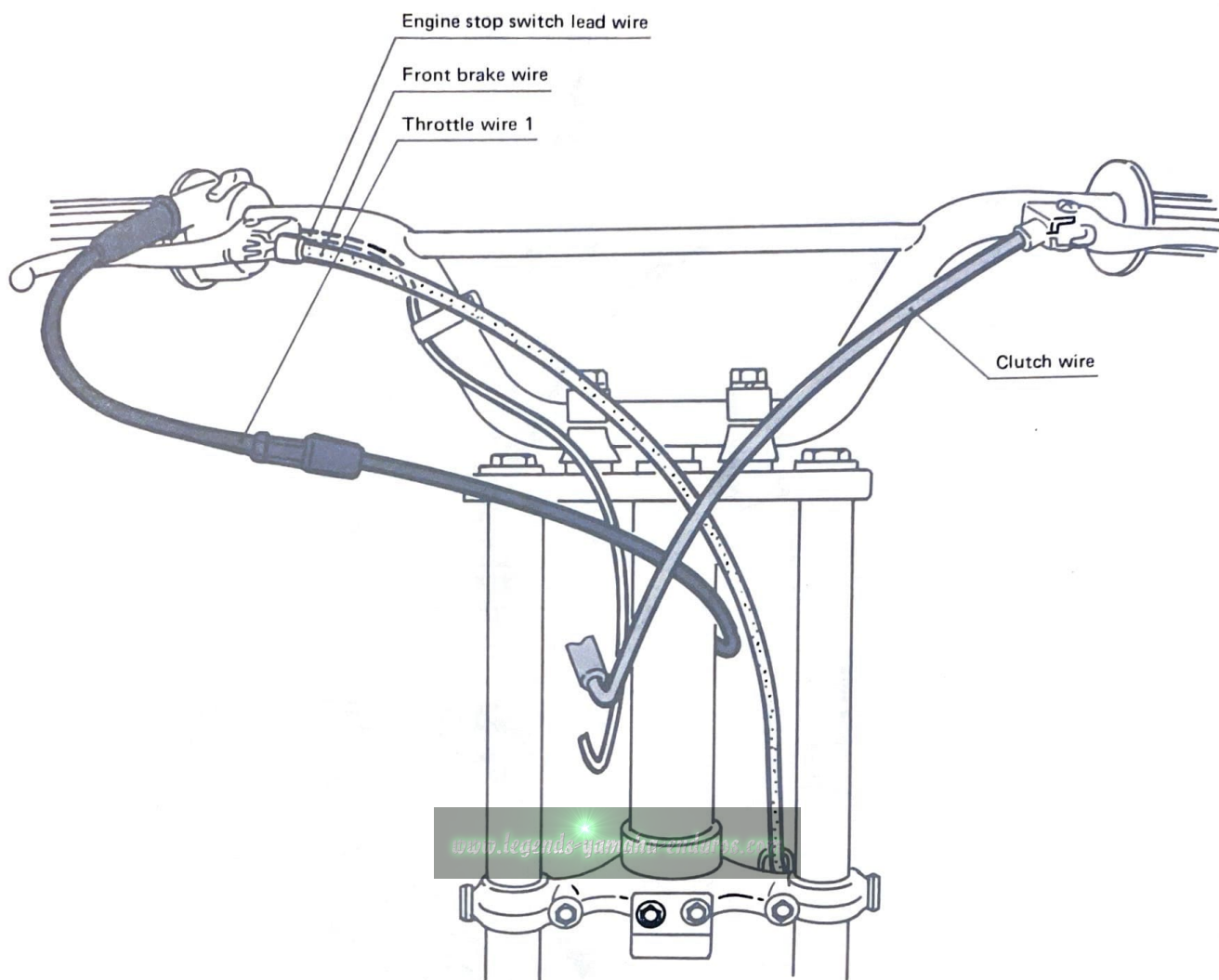
## D. Electrical

|                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Ignition System:<br>Type-Flywheel magneto<br>(Contact breaker point)<br>Model/Manufacturer<br>Voltage<br>Source Coil Resistance                                                                                                                                                                         | F11-L57/HITACHI<br>6V<br>1.54Ω ± 10% at 20°C (68°F)                                                                                                                                                                                                                                                         | F0T00173/MITSUBISHI<br>6V<br>1.34Ω ± 10% at 20°C (68°F)                                                                                                                                                                                                                                                                                                                                                                          |
| Ignition Timing:                                                                                                                                                                                                                                                                                        | 1.8 ± 0.15 mm (0.07 ± 0.006 in)                                                                                                                                                                                                                                                                             | 1.8 ± 0.15 mm (0.07 ± 0.006 in)                                                                                                                                                                                                                                                                                                                                                                                                  |
| Ignition Coil:<br>Model/Manufacturer<br><br>Spark Gap<br><br>Primary Winding Resistance<br><br>Secondary Winding Resistance<br><br>Doide<br>Spark Plug<br>Type/Manufacture<br>Spark Plug Gap<br>Contact Breaker<br>Point Gap<br>Point Spring Pressure<br>Condenser<br>Capacity<br>Insulation Resistance | CM61-20/HITACHI<br><br>6 mm (0.24 in)/300 rpm<br><br>1.7Ω ± 10% at 20°C (68°F)<br><br>6.0KΩ ± 20% at 20°C (68°F)<br><br>Yes (not included)<br><br>B-7HS (NGK)<br>0.5 – 0.6 mm (0.020 – 0.024 in)<br><br>0.3 – 0.4 mm (0.012 – 0.016 in)<br>750 ± 100 g (26.5 ± 3.53 oz)<br><br>0.25 μF ± 10%<br>5MΩ or more | F6T40184/MITSUBISHI<br>(CM61-20N/HITACHI)<br>6 mm (0.24 in) or more/500 rpm<br>(6 mm (0.24 in) or more/500 rpm)<br>1.02Ω ± 10% at 20°C (68°F)<br>(1.7Ω ± 10% at 20°C (68°F))<br>6.0KΩ ± 20% at 20°C (68°F)<br>(6.0KΩ ± 20% at 20°C (68°F))<br>Yes (not included)<br><br>B-7HS (NGK)<br>0.5 – 0.6 mm (0.020 – 0.024 in)<br><br>0.3 – 0.4 mm (0.012 – 0.016 in)<br>750 ± 100g (26.5 ± 3.53 oz)<br><br>0.30 μF ± 10%<br>5MΩ or more |
| Charging System:<br>Flywheel Magneto<br>Charge Coil Resistance (Green/Red)<br>Lighting Output<br>Lighting Coil Resistance (Yellow)<br>Rectifier<br>Type<br>Capacity<br>Withstand Voltage<br>Rating<br>Battery<br>Model/Manufacture<br>Capacity<br>Charging Rate<br>Specific Gravity                     | F11-L57<br>0.29Ω ± 10% at 20°C (68°F)<br><br>0.2Ω ± 10% at 20°C (68°F)<br><br>DE4504, S5108<br>4A<br>400V<br>Silicon<br><br>6N4-2A-2/GS<br>6V-4AH<br>0.4A x 10 hours<br>1.26                                                                                                                                | F0T00173<br>.....<br><br>.....<br><br>.....<br>.....<br>.....<br>.....<br>.....<br>.....<br>.....<br>.....<br>.....<br>.....                                                                                                                                                                                                                                                                                                     |
| Lighting System:<br>Head Light Type<br>Bulb Wattage/Q'ty<br>Head Light Wattage<br>Tail/Stop Light Wattage<br>Flasher Light Wattage<br>Flasher Pilot Light Wattage<br>Meter Light Wattage<br>High Beam Indicator Light Wattage<br>Oil Level Indicator Light Wattage                                      | Sealed beam<br><br>6V, 30W/30W<br>6V, 5.3W/25W<br>6V, 17W<br>6V, 3W<br>6V, 3W<br>6V, 3W<br>6V, 3W                                                                                                                                                                                                           | .....<br>.....<br>.....<br>.....<br>.....<br>.....<br>.....<br>.....                                                                                                                                                                                                                                                                                                                                                             |
| Horn:<br>Model<br>Maximum Amperage                                                                                                                                                                                                                                                                      | FM2-6<br>1.5A                                                                                                                                                                                                                                                                                               | .....<br>.....                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Flasher Relay:<br>Type<br>Flasher Frequency                                                                                                                                                                                                                                                             | Condenser<br>85 cycle/min                                                                                                                                                                                                                                                                                   | .....<br>.....                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Fuse:<br>Rating/Q.ty                                                                                                                                                                                                                                                                                    | 10A/ 1 pc                                                                                                                                                                                                                                                                                                   | .....                                                                                                                                                                                                                                                                                                                                                                                                                            |



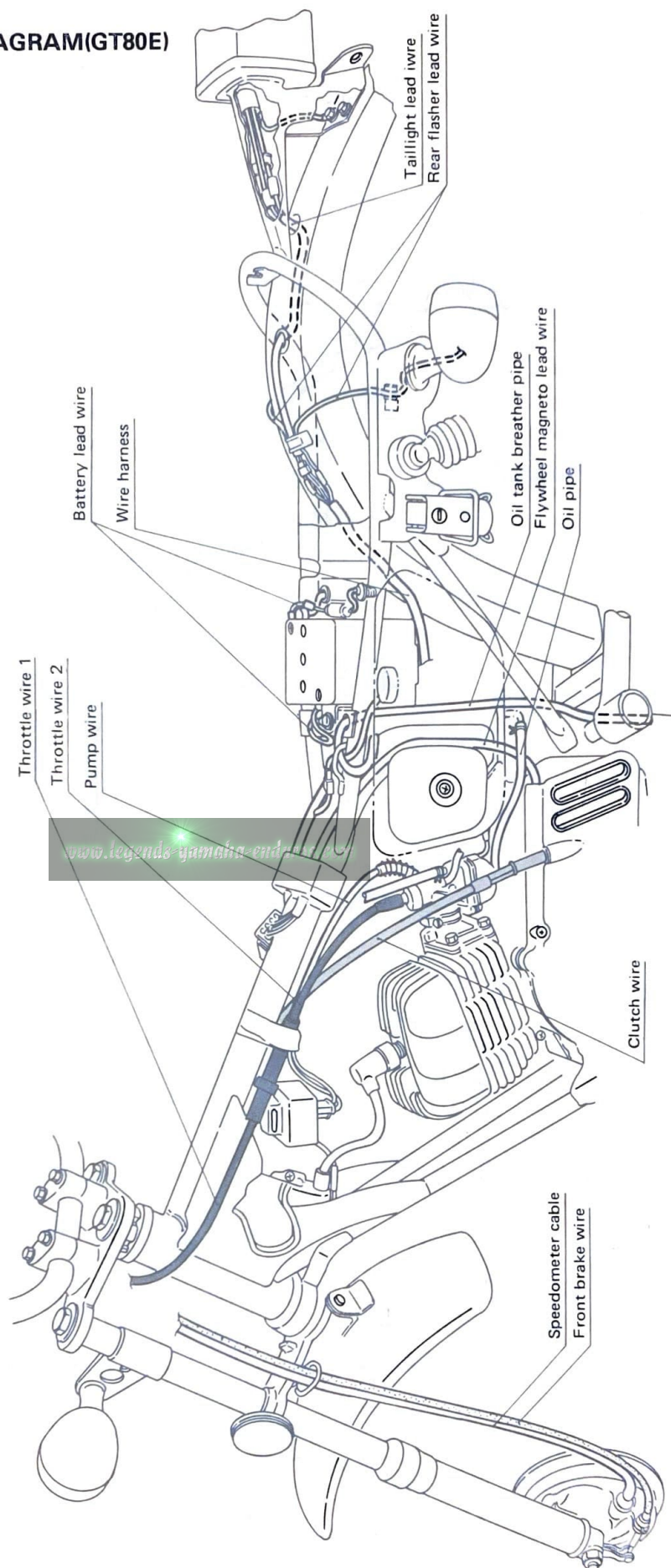
## 7-2. CABLE ROUTING DIAGRAM(GTMXE)

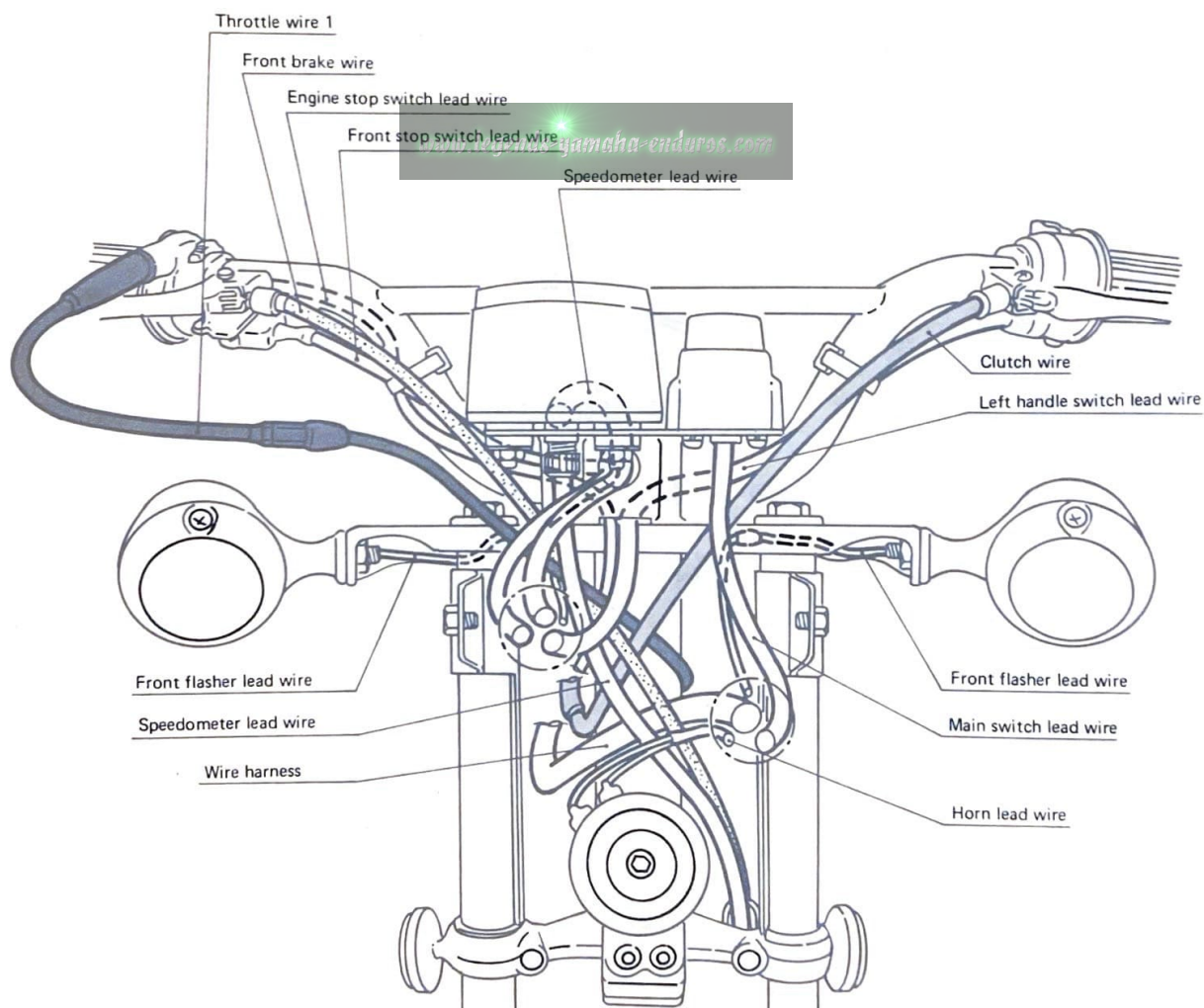
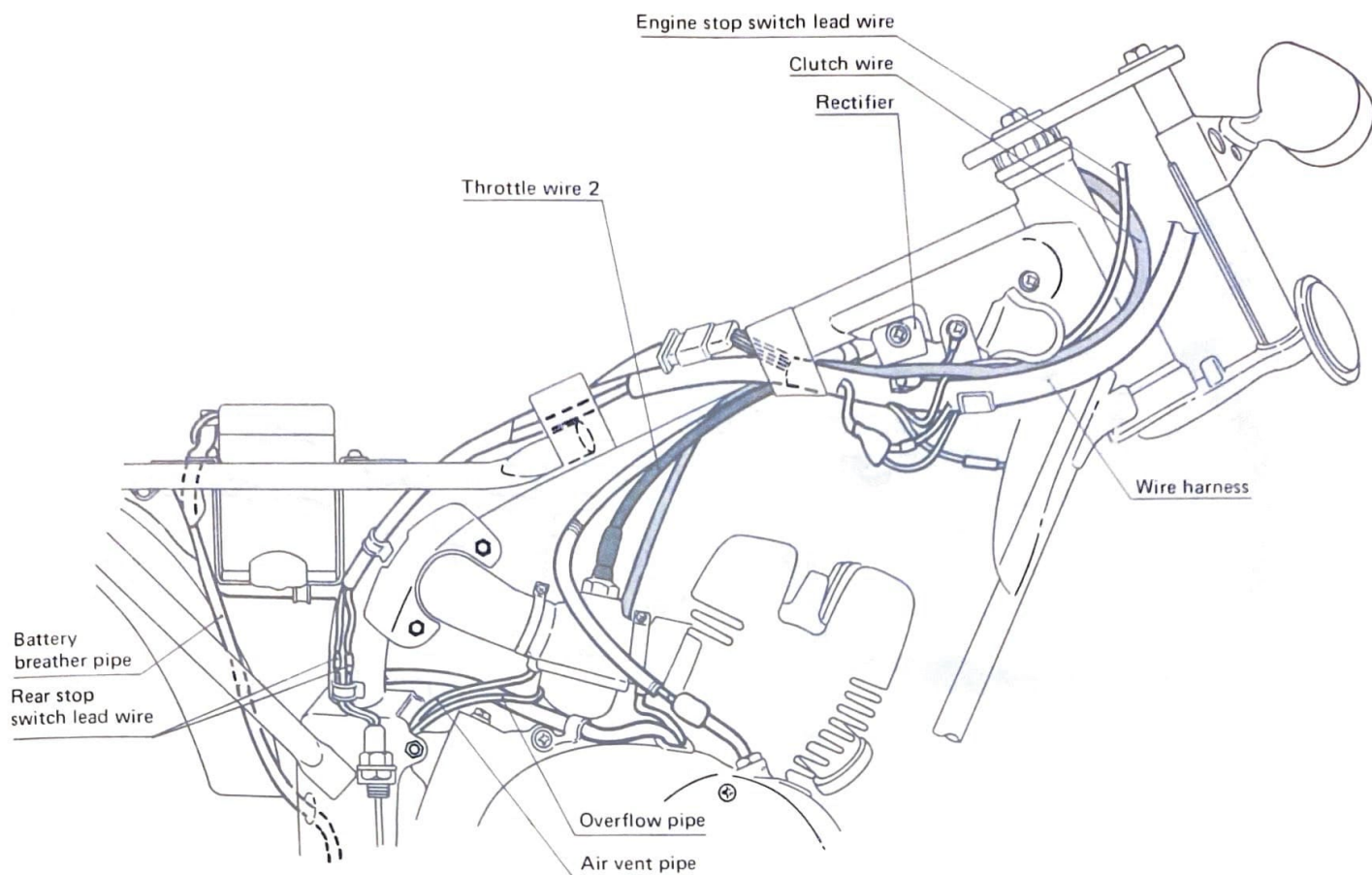




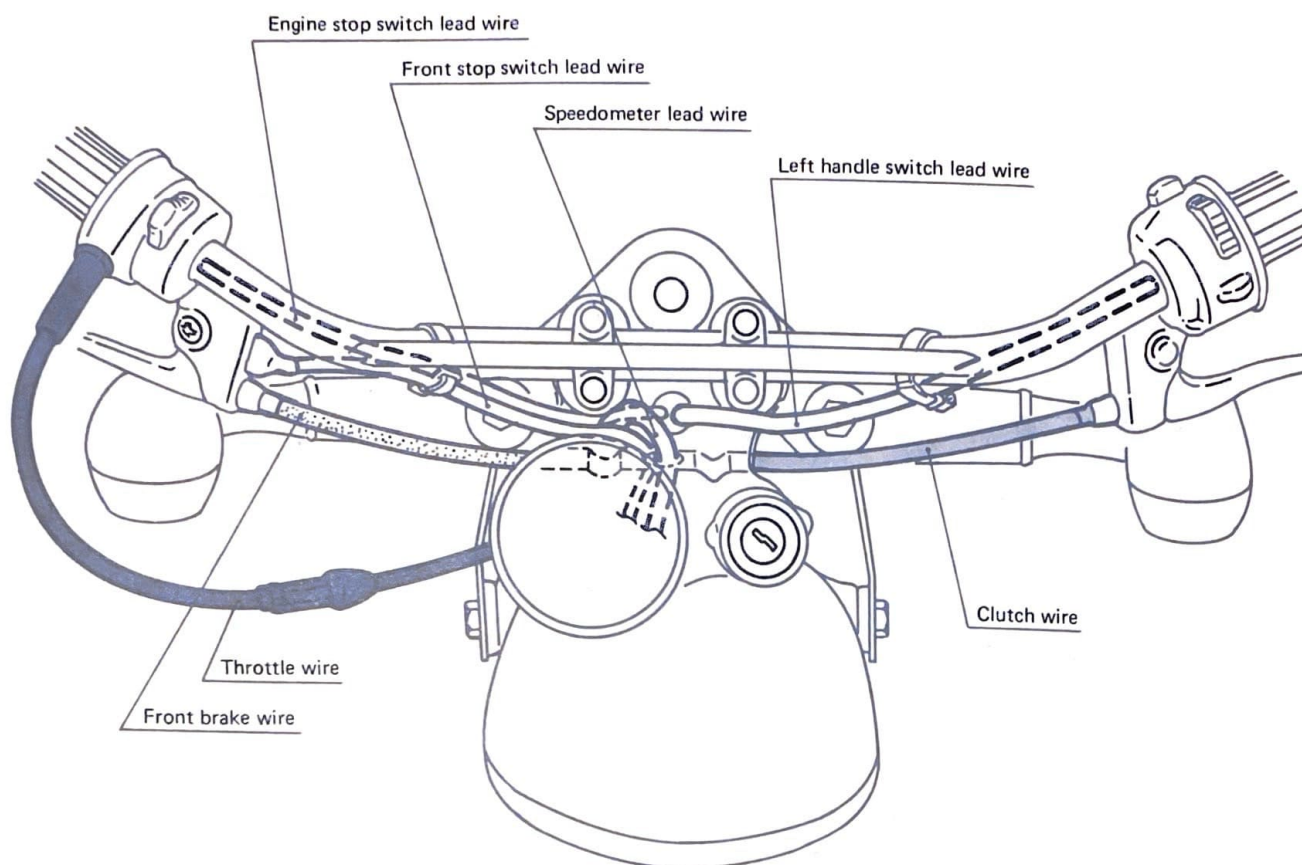


# CABLE ROUTING DIAGRAM(GT80E)



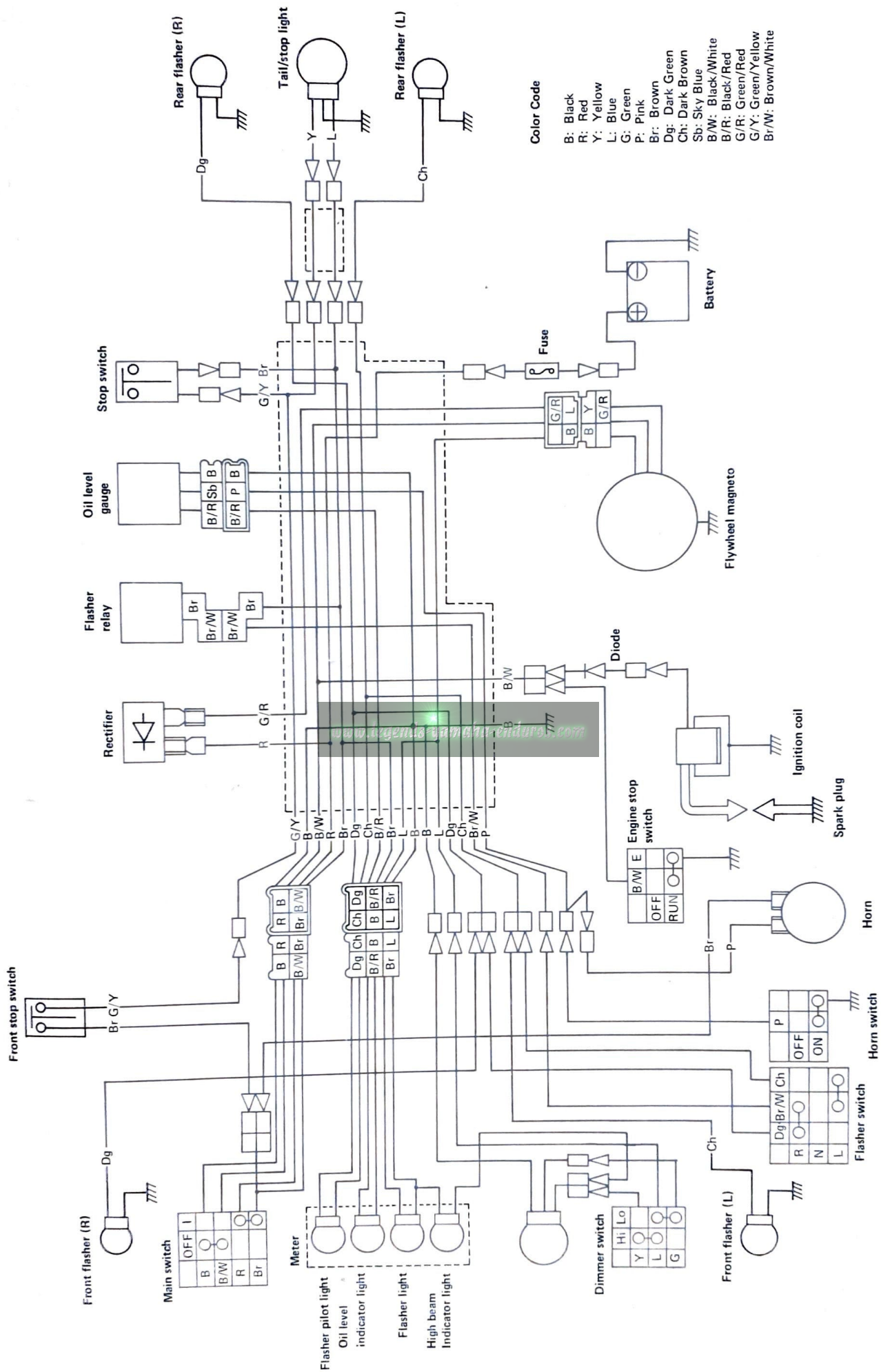






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## 7.3. CIRCUIT DIAGRAM





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