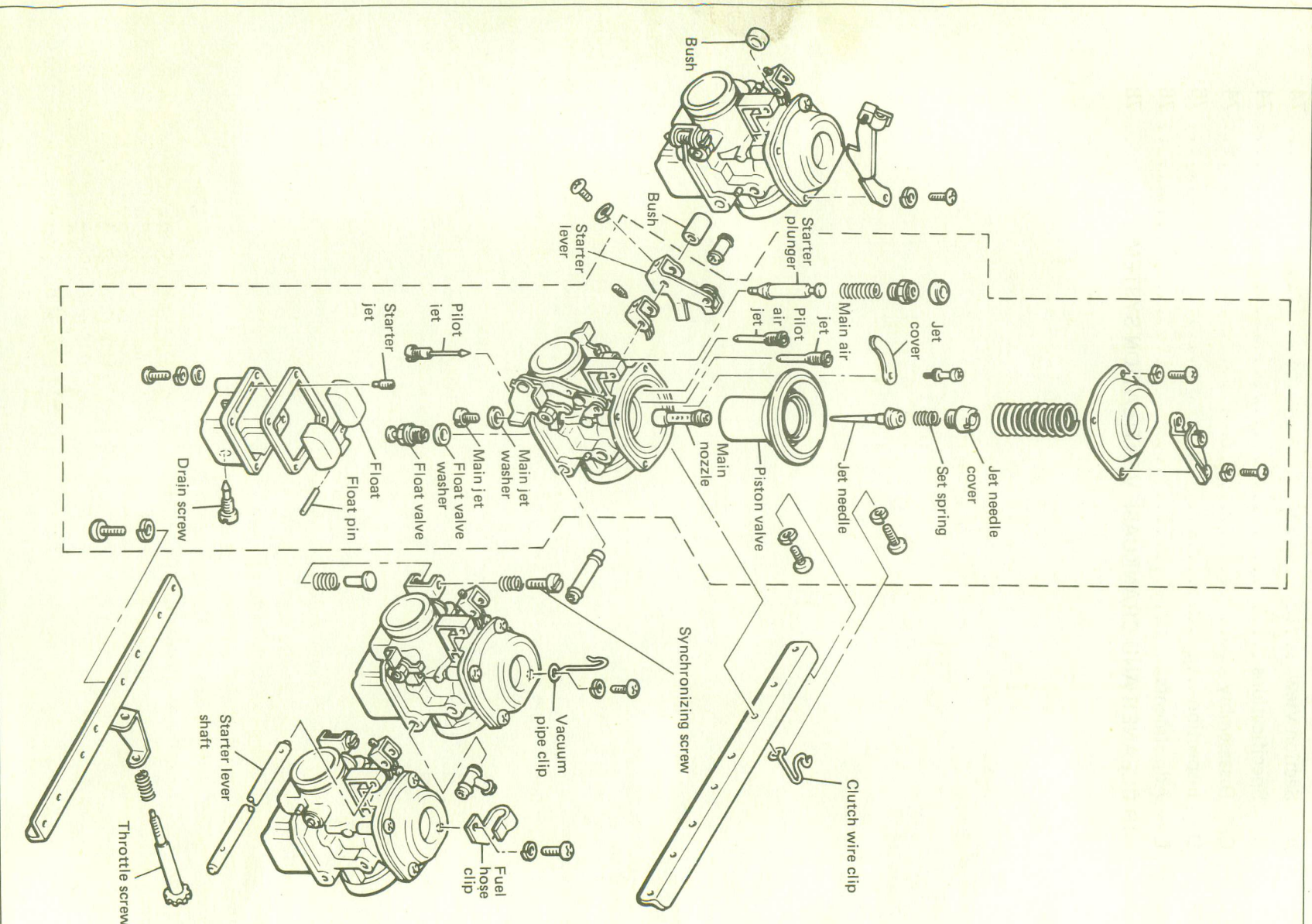


CHAPTER 4. CARBURETION

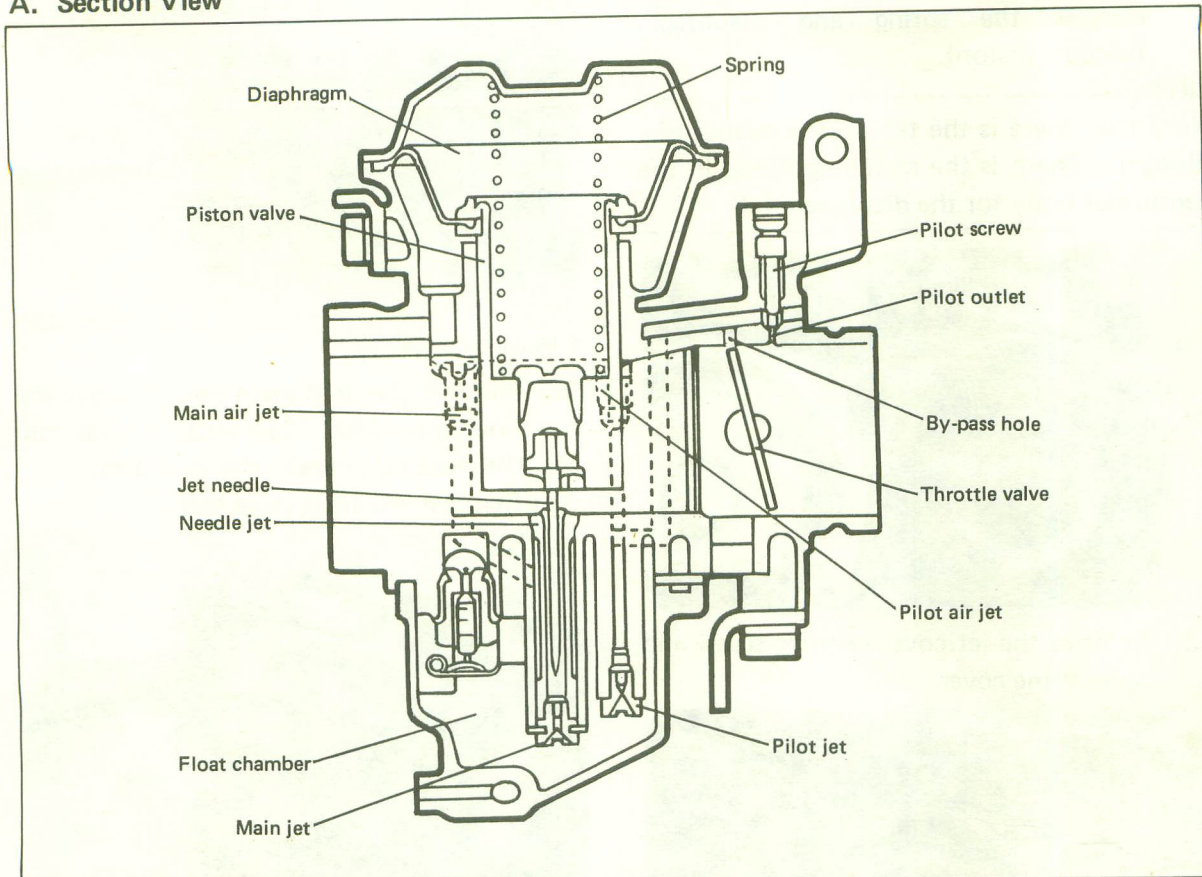
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CHAPTER 4. CARBURETION

CARBURETOR



A. Section View



B. Specifications

Main jet	# 110
Jet needle	Y-10
Needle jet	ϕ 3.2
Starter jet	# 40
Fuel level	$3 \pm 1 \text{ mm } (0.118 \pm 0.039 \text{ in})$
Pilot screw	Preset
Float valve seat	ϕ 2.0
Engine idle speed	1,050 r/min

CAUTION:

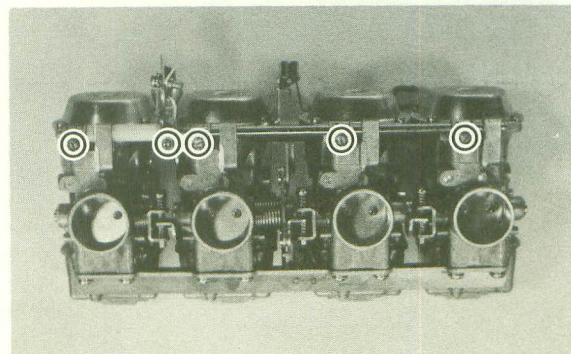
The pilot screw settings are adjusted for maximum performance at the factory with the use of specialized equipment. Do not attempt to change these settings. If all other engine systems are functioning correctly, any changes will decrease performance and cause increased exhaust emissions.

C. Disassembly

CAUTION:

Separation of the carburetor is not recommended. Usual disassembly for cleaning and inspection is not necessary to separate the carburetors. The carburetor body support screws are locked with a locking compound such as "LOCTITE". If the carburetors are separated, misalignment will result.

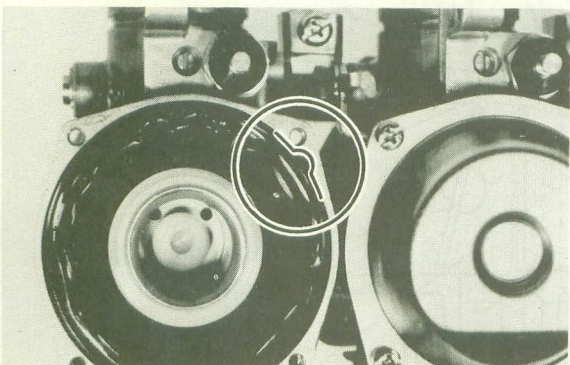
1. Loosen the starter lever securing screws and remove the starter lever shaft, bushes, and levers. Note the positions of the bushes.



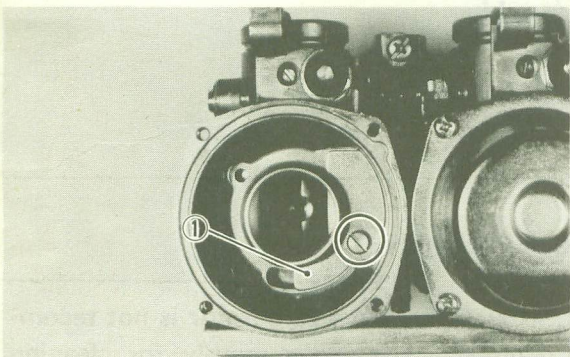
2. Remove the vacuum chamber cover and remove the spring and diaphragm (vacuum piston).

NOTE:

Note that there is the tab on the rubber diaphragm. There is the matching recess in the carburetor body for the diaphragm tab.

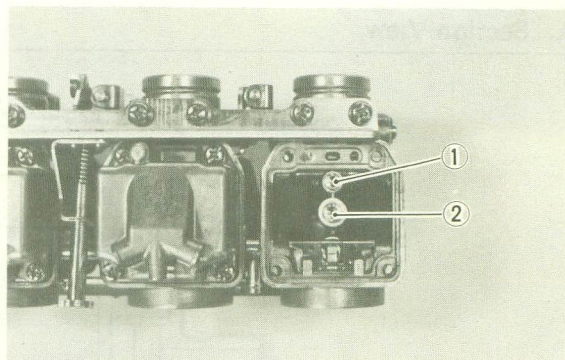
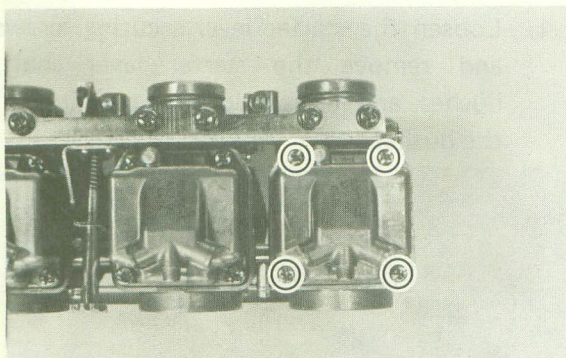


3. Remove the jet cover securing screw and remove the cover.



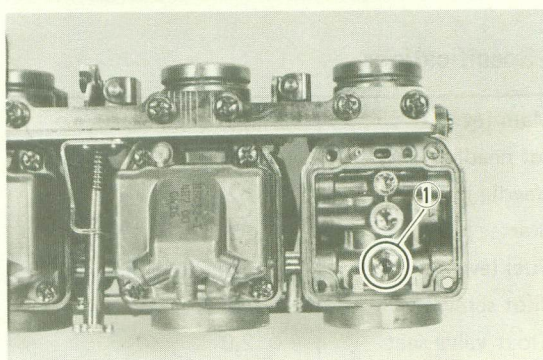
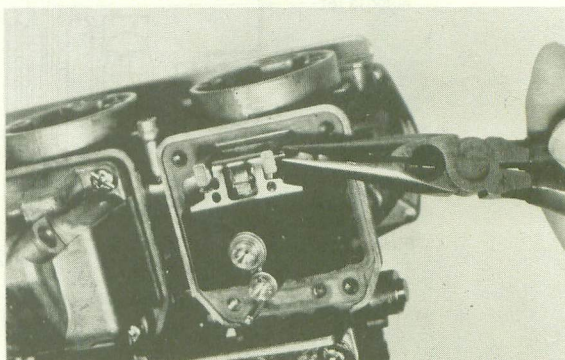
1. Jet cover

4. Remove the screws holding the float chamber cover and remove the cover. The main and pilot jets are located in the float bowl. Remove the jets if necessary.



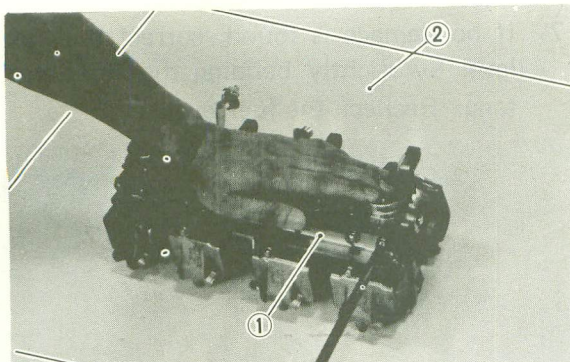
1. Pilot jet 2. Main jet

5. Pull out the float pivot pin. Remove the float assembly. Be careful to not lose the float valve under the float arm. Remove the float valve seat.



1. Float valve seat

6. Reassemble in reverse order. Pay close attention to the installation of the vacuum piston diaphragm and the location of each jet.
7. If the carburetors should be separated, care must be taken so that they are put together in place according to the following procedures:
 - a. Place the carburetors on a surface plate and install the lower support plate. Apply a thread locking compound such as "LOCTITE" and tighten the screws securely while holding the carburetor body.



1. Lower support plate 2. Surface plate

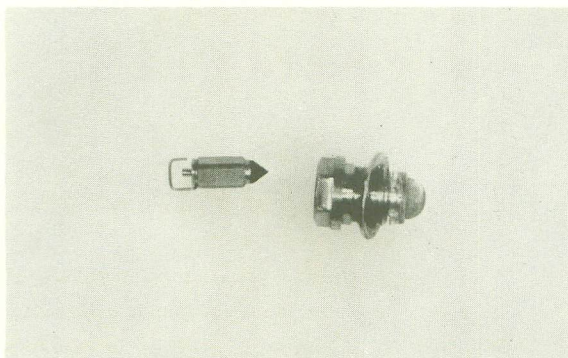
NOTE:

When reassembling, the surface plate should be used for the proper carburetor alignment.

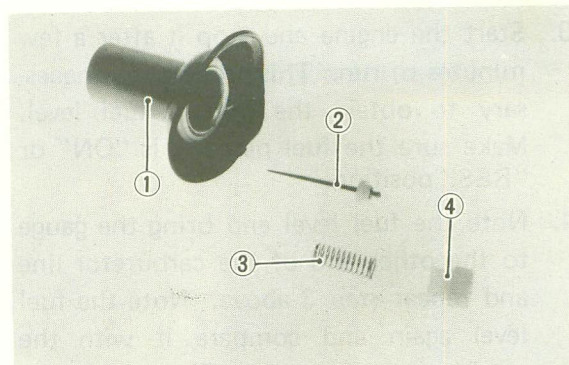
- b. Install the upper support plate. Apply a thread locking compound such as "LOCTITE" to the support screw threads and tighten the screws securely.

D. Inspection

1. Examine the carburetor body and fuel passages. If contaminated, wash the carburetor in a petroleum-based solvent. Do not use caustic carburetor cleaning solutions. Blow out all passages and jets with compressed air.
2. Examine the condition of the floats. If the floats are damaged, they should be replaced.
3. Inspect the float needle valve and seat for wear or contamination. Replace these components as a set.

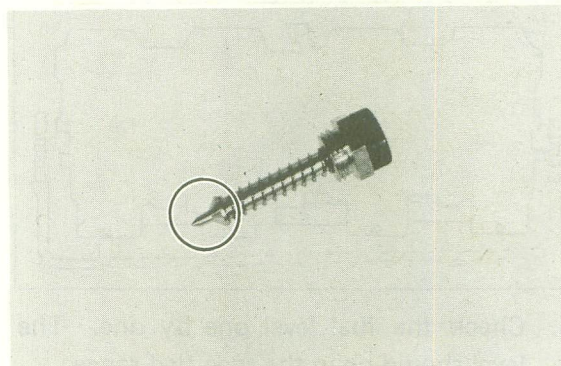


4. Inspect the vacuum piston and rubber diaphragm. If the piston is scratched or the diaphragm is torn, the assembly must be replaced.



1. Vacuum piston 2. Needle jet
3. Set spring 4. Needle jet cover

5. Inspect the starter plunger for damage. If damaged, replace.



E. Adjustment

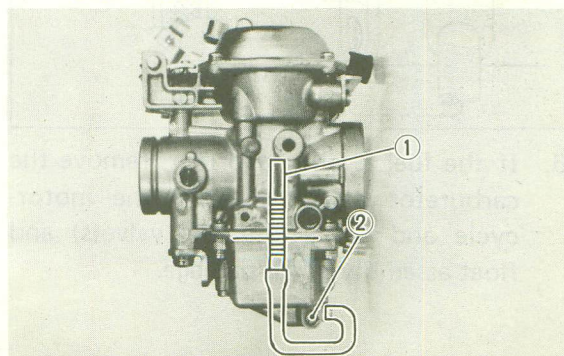
Fuel level

NOTE:

Before checking the fuel level, note the following:

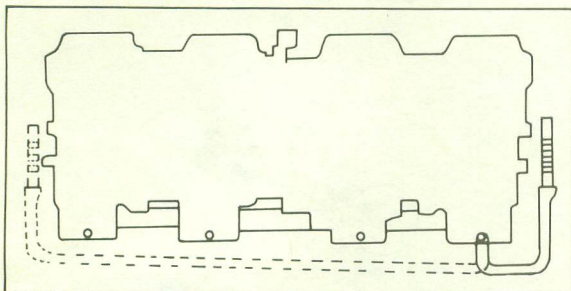
1. Place the motorcycle on a level surface.
2. Adjust the motorcycle position by placing a suitable stand or a garage jack under the engine so that the carburetor is positioned vertically.

1. Connect the level gauge (special tool) or a vinyl pipe of 6 mm (0.24 in) in inside dia. to the float bowl nozzle left or right side carburetor.
2. Set the gauge as shown and loosen the drain screw.



1. Level gauge 2. Drain screw

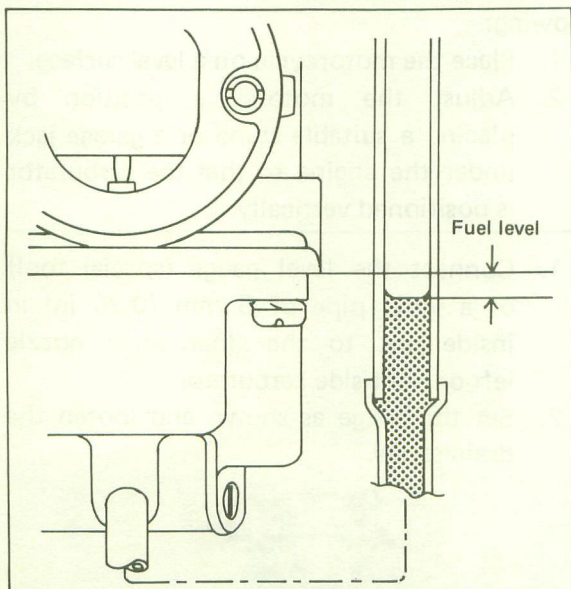
3. Start the engine and stop it after a few minutes of run. This procedure is necessary to obtain the correct fuel level. Make sure the fuel petcock is "ON" or "RES" position.
4. Note the fuel level and bring the gauge to the other end of the carburetor line and repeat step 3 above. Note the fuel level again and compare it with the previous gauge reading. They should be equal. If not, place a suitable size of wooden piece or the like under the center stand and adjust.



5. Check the fuel level one by one. The level should be in the specified range.

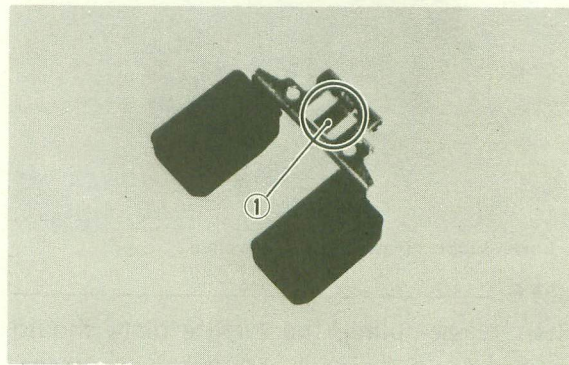
Fuel level:

$3 \pm 1 \text{ mm}$ ($0.118 \pm 0.039 \text{ in}$)
below from the carburetor mixing
chamber body edge.



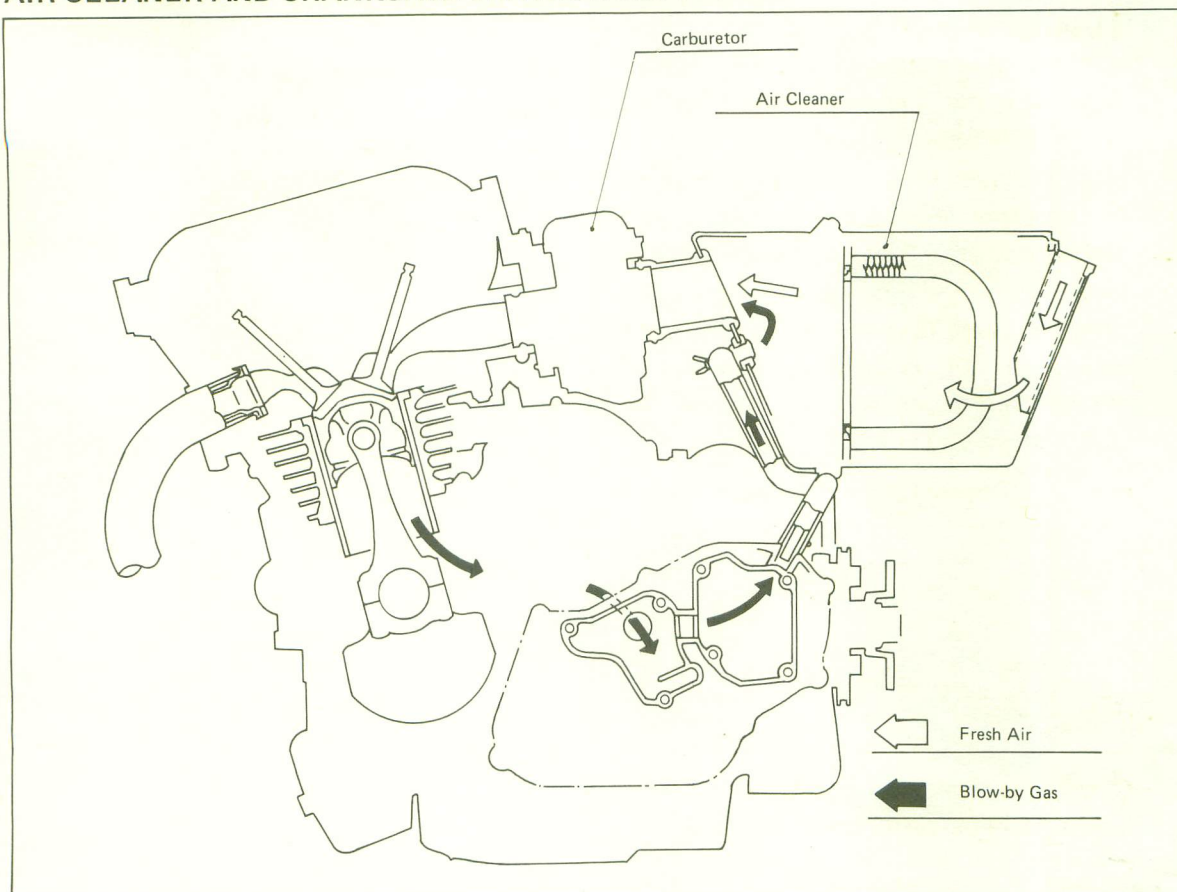
6. If the fuel level is incorrect, remove the carburetor assembly from the motor-cycle and check the fuel valve(s) and float assembly(s) for damage.

7. If no damage is found, correct the fuel level by slightly bending the float arm tang. Recheck the fuel level.



1. Float arm tang

AIR CLEANER AND CRANKCASE VENTILATION SYSTEM



Refer to "CHAPTER 2" for the air cleaner maintenance.

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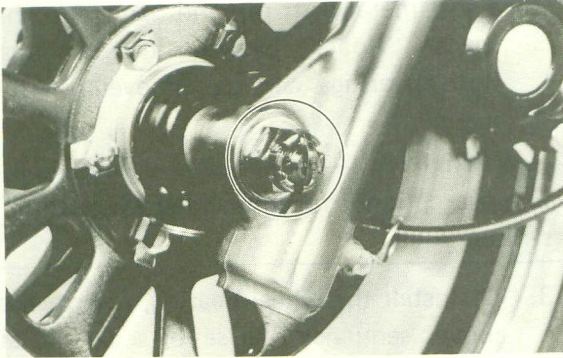
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CHAPTER 5. CHASSIS

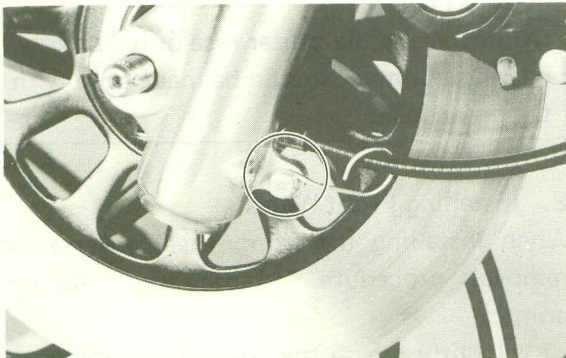
FRONT WHEEL

A. Removal

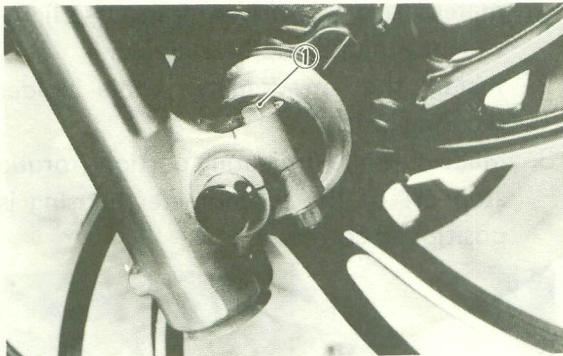
1. Place the motorcycle on the center stand.
2. Remove the cotter pin and wheel axle



3. Remove the speedometer cable holder securing bolt.



4. Loosen the pinch bolt securing the axle.

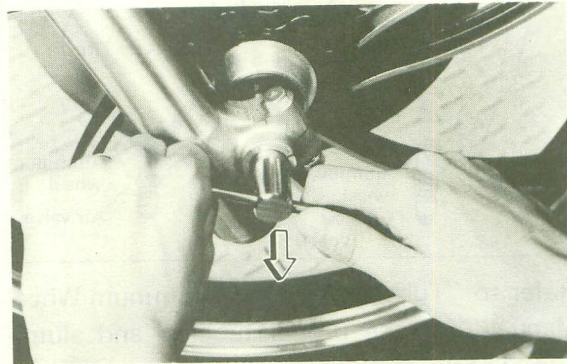


1. Pinch bolt

5. Remove the axle shaft and the front wheel. In this case, make sure the motorcycle is properly supported.

NOTE:

Do not depress the brake lever when the wheel is off the motorcycle as the brake pads will be forced to shut.



B. Front Axle Inspection

Remove any corrosion from the axle with fine emery cloth. Place the axle on a surface plate and check for bends. If bent, replace axle. Do not attempt to straighten a bent axle.

C. Front Wheel Inspection

This motorcycle is equipped with aluminum wheels designed to be compatible with either tube or tubeless tires.

Tubeless tires are installed as standard equipment.

—WARNING:—

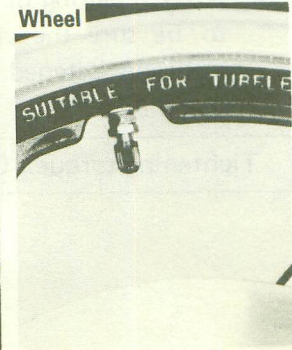
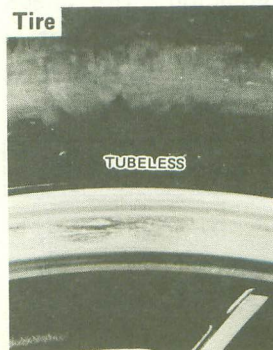
Do not attempt to use tubeless tires on a wheel designed for use only with tube-type tires. Tire failure and personal injury may result from sudden deflation.

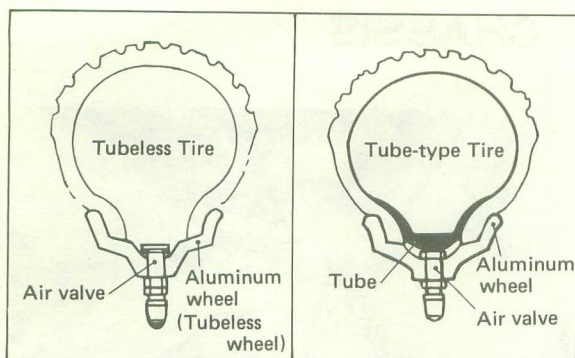
Tube-type Wheel → Tube-type
Tires Only

Tubeless-type Wheel → Tube-type
or Tubeless tires

—WARNING:—

When using tube-type tires, be sure to install the proper tube also.





Refer to "Tubeless Tire and Aluminum Wheel Manual" for the proper tubeless and aluminum wheel servicing.

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 the deflection exceeds the tolerance below, check the wheel bearings or replace the wheel as required.

Rim-run-out limits:

Vertical — 2 mm (0.079 in)
Lateral — 2 mm (0.079 in)

3. Check wheel balance. Rotate the wheel lightly several times and observe resting position. If the wheel is not statically balanced, it will come to rest at the same position each time. Install an appropriate balance weight at lightest position (at top).

NOTE:

The wheel should be balanced with the brake disc installed.

4. After installing a tire, ride conservatively to allow the tire to seat itself on the rim properly. Failure to allow proper seating may cause tire failure resulting in damage to the motorcycle and injury to the rider.
5. After repairing or replacing a tire, check to be sure the valve stem lock nut is securely fastened. If not, torque it as specified.

Tightening torque: 0.15 m·kg (1.1 ft·lb)

D. 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. Clean the outside of the wheel hub.
2. Drive the bearing out by pushing the spacer aside and tapping around the perimeter of the bearing inner race with a soft metal drift pin and hammer. The spacer "floats" between the bearings. Both bearings can be removed in this manner.

WARNING:

Eye protection is recommended when using striking tools.

3. To install the wheel bearing, reverse the above sequence. Use a socket that matches the outside race of the bearing as a tool to drive in the bearing.

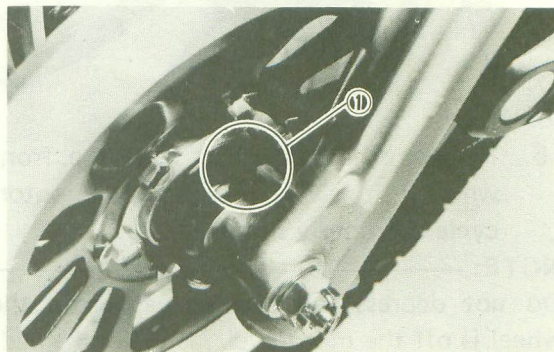
CAUTION:

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

E. Installing Front Wheel

When installing the front wheel, reverse the removal procedure. Note the following points:

1. Lightly grease the lips of the front wheel oil seals and the gear teeth of speedometer drive and driven gears. Use light-weight lithium soap base grease.
2. Install the speedometer cable holder securing bolt.
3. Make sure the projecting portion (torque stopper) of the speedometer housing is positioned correctly.



1. Torque stopper

4. Tighten the axle nut and install a new cotter pin.

Axle nut torque: 10.7 m-kp (77.4 ft-lb)

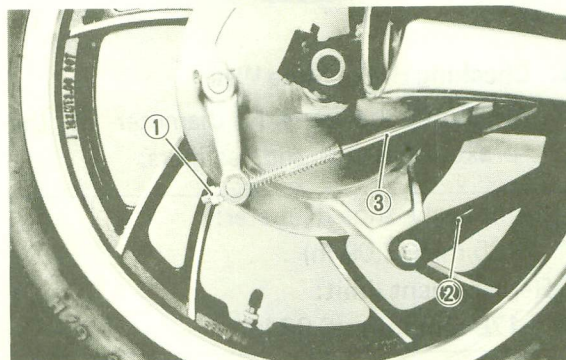
5. Install the front fender
6. Before tightening the pinch bolt, compress the front forks several times to make sure of proper fork operation.
7. Tighten the axle pinch bolt.

Axle pinch bolt torque:
2.0 m-kp (14.5 ft-lb)

REAR WHEEL

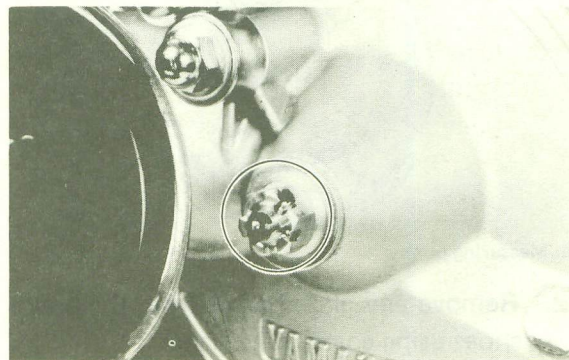
A. Removal

1. Place the motorcycle on the center stand.
2. Remove the tension bar and the brake rod from the brake shoe plate. The tension bar can be removed by removing the cotter pin and nut from the tension bar bolt. The brake rod can be removed by removing the adjuster.

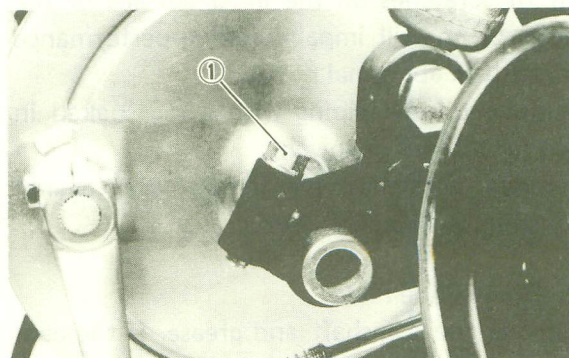


1. Adjuster 3. Tension bar
2. Brake rod

3. Remove the axle nut cotter pin and axle nut.

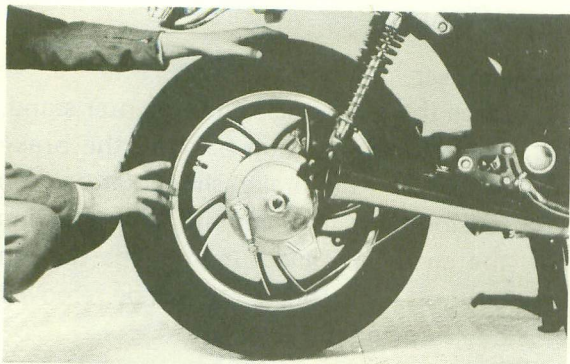


4. Loosen the rear axle pinch bolt and pull out the rear axle.



1. Pinch bolt

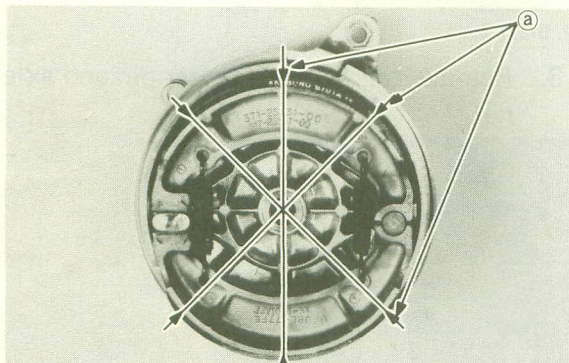
5. Move the wheel to the right side to separate it from the final gear cases and remove the rear wheel.



B. Checking Brake Shoe Wear

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

Front brake shoe diameter:
180 mm (7.09 in)
Replacement limit:
176 mm min. (6.93 in)



a. Measuring points

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

C. Brake Drum

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

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

Remove scratches by lightly and evenly polishing with emery cloth.

D. Brake Shoe Plate

Remove the camshaft and grease. 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.

E. Rear Axle Inspection

(See Front Wheel, Axle Inspection Procedure.)

F. Replacing Wheel Bearings

Rear wheel bearing replacement is similar to the procedure for the front wheel.

G. Rear Wheel Inspection

(See Front Wheel, Inspection Procedures)

H. Installing Rear Wheel

1. Lightly grease lips of rear wheel oil seals.
2. Install the wheel assembly and axle.

NOTE:

When installing the rear wheel, be sure the splines on the wheel hub fit into the final gear case. Lightly apply grease to the gear teeth.

Always use a new cotter pin on the axle nut.

Tightening torque:

Axle nut: 10.7 m-kp (77.4 ft-lb)
Axle pinch bolt: 0.6 m-kp (4.5 ft-lb)

FRONT BRAKE

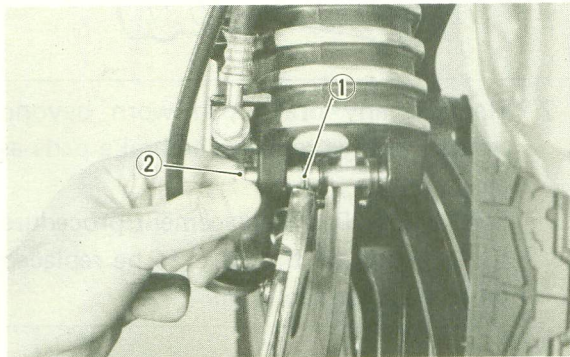
CAUTION:

Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If any hydraulic connection in the system is opened, the entire system should be disassembled, drained, cleaned and then properly filled and bled upon reassembly. Do not use solvents on brake internal components. Solvents will cause seals to swell and distort. Use only clean brake fluid for cleaning. Use care with brake fluid. Brake fluid is injurious to eyes and will damage painted surfaces and plastic parts.

A. Caliper Pad Replacement

It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

1. Pull out the pad retaining pin while pinching the coil spring clip ends with pliers.

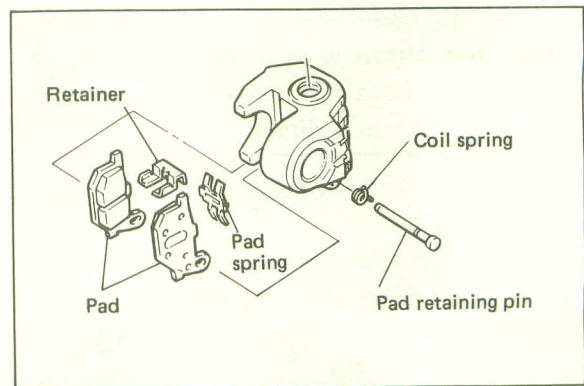


1. Coil spring clip 2. Pad retaining pin

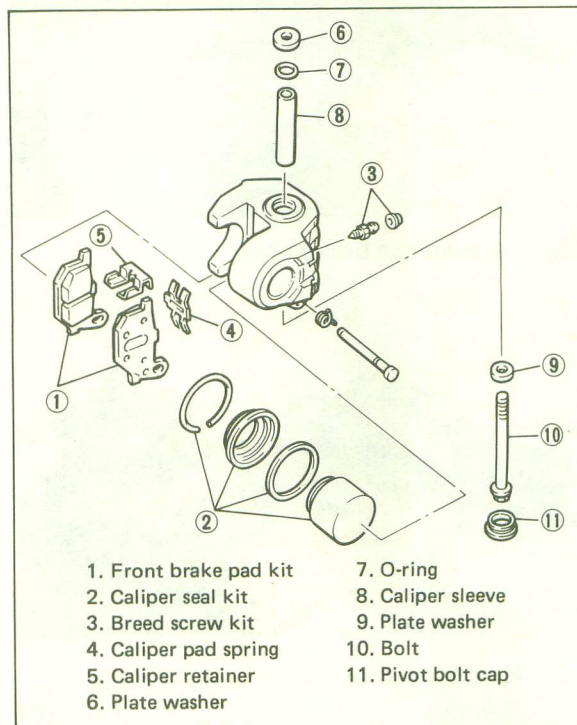
2. Install the new brake pads. Replace the following parts if pad replacement is required.
 - a. Pads
 - b. Coil spring
 - c. Pin

NOTE:

Replace the pads as a set if either is found to be worn to the wear limit.



B. Caliper Disassembly



1. Remove the brake hose from the caliper. Allow the caliper assembly to drain into a container.
2. Place the open hose end into the container and pump the old fluid out of the master cylinder.
3. Remove the coil spring, pin and pads.
4. Remove the brake caliper holding bolt from the front fork.
5. Remove the retaining ring and the dust seal.
6. Carefully force the piston out of the caliper cylinder with compressed air. Never try to pry out the piston.

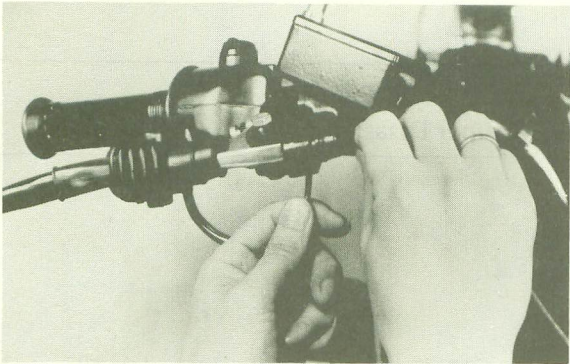
—WARNING:—

Cover the piston with a rag. Use care so that piston does not cause injury as it is expelled from the cylinder.

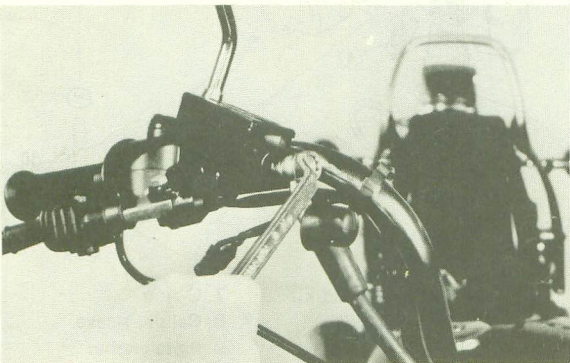
7. Remove the piston seal.

C. Master Cylinder Disassembly

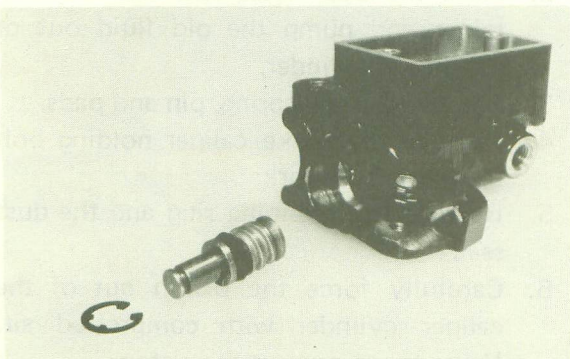
1. Remove the brake light switch.



2. Remove the brake hose.



3. Remove the brake lever and spring.
4. Remove the master cylinder from the handlebar. Remove the cap and drain the remaining fluid.
5. Remove the master cylinder dust boot.
6. Remove the snap ring.



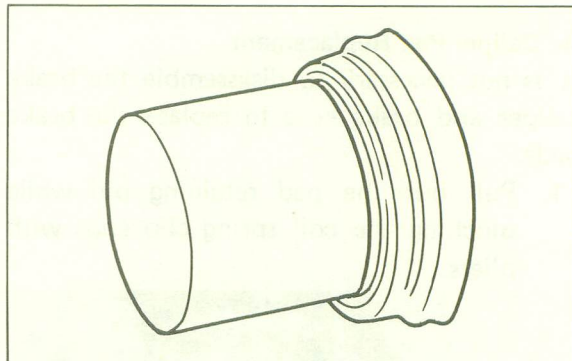
7. Remove the master cylinder cup assembly. Note that the cylinder cups are installed with the larger diameter (lips) inserted first.

D. Brake Inspection and Repair

Recommended Brake Component Replacement Schedule:

Brake pads; As required
Piston seal, dust seal; Every two years
Brake hoses; Every four years
Brake fluid; Replace only when brakes are disassembled

1. Replace the caliper piston if it is scratched.

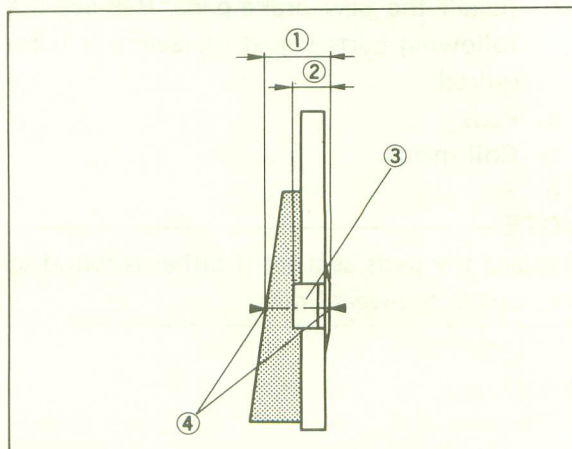


2. Replace any brake pad worn beyond limits. Always replace the brake pads as a set.

See Caliper Pad Replacement procedure for a listing of the parts to be replaced when pads are replaced.

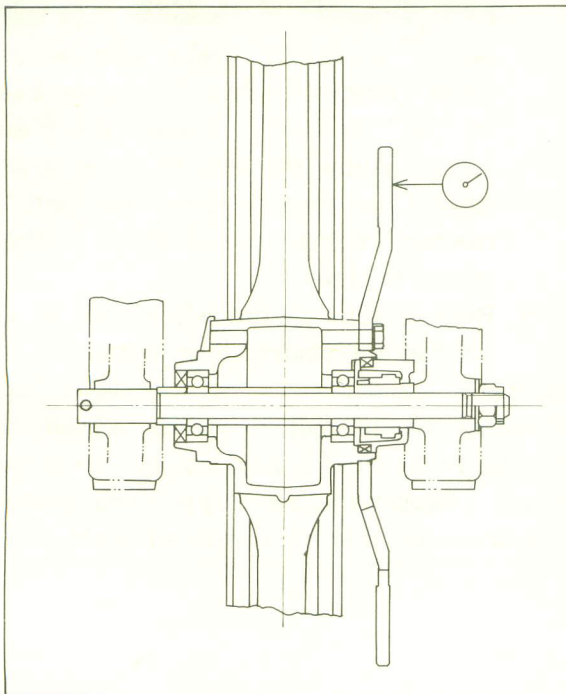
Wear limit:

6.5 mm (0.26 in)



1. Pad thickness
2. Wear limit
3. Wear indicator
4. Measuring points

3. Replace piston and dust seals if damaged. Replace seals every two years.
4. Inspect master cylinder body. Replace if scratched. Clean all passages with new brake fluid.
5. Inspect the brake hoses. Replace every four years or immediately if cracked, frayed, or damaged.
6. Check for wear and deflection of disc.



Maximum deflection:
0.15 mm (0.006 in)
Minimum disc thickness:
6.5 mm (0.26 in)

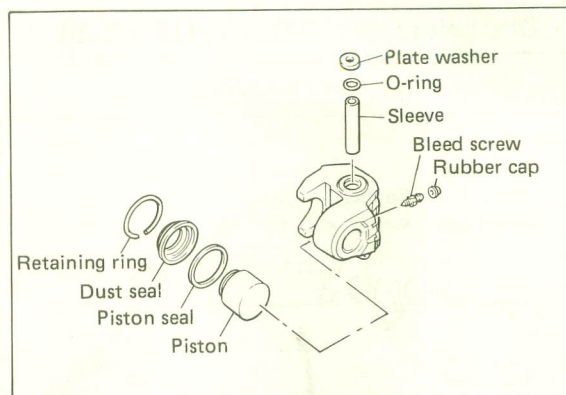
If disc is worn beyond minimum thickness or deflection exceeds specified amount, replace disc.

E. Brake Reassembly

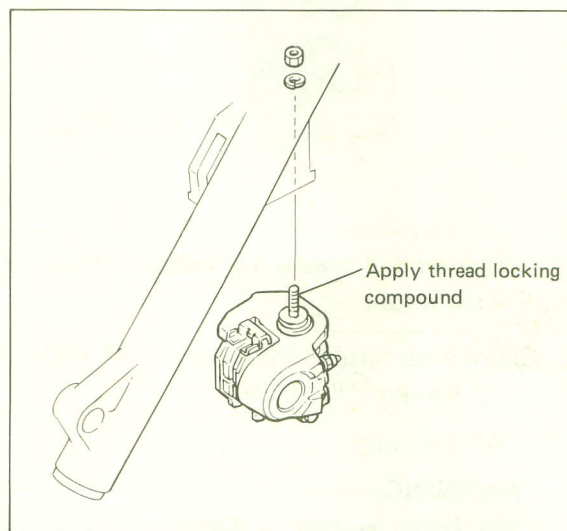
1. Caliper reassembly

All internal parts should be cleaned in new brake fluid only. Internal parts should be lubricated with brake fluid when installed. Replace the following parts whenever a caliper is disassembled.

- *Bleed screw and rubber cap
- *O-ring
- *Piston seal
- *Dust seal
- *Retaining ring



- a. Install the piston seal and piston.
- b. Install the pads.
2. Apply a thread locking compound such as "LOCTITE" to the pivot bolt.
3. Install the caliper assembly on the front fork.



—WARNING:—

When installing the pivot bolt, apply it with a thread locking compound such as "LOCTITE" and tighten to the specification.

Pivot bolt torque:
2.6 m-kp (18.8 ft-lb)

4. Attach the brake hoses.

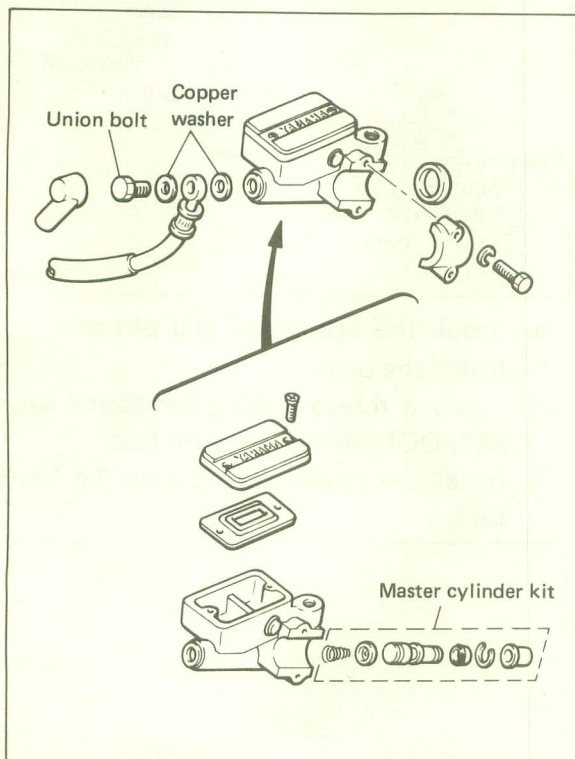
Brake hose torque: 2.6 m-kp (18.8 ft-lb)

5. Brake disc assembly

If brake disc has been removed from hub or is loose, tighten bolts. Use new locking washers and bend over locking tabs after bolts are tightened.

Disc bolt torque: 2.0 m-kp (14.5 ft-lb)

6. Master cylinder reassembly



Reassemble master cylinder as shown in illustration.

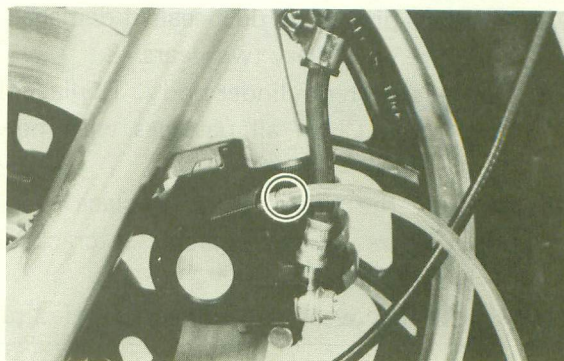
Brake hose torque: (all brake union bolts)
2.6 m-kp (18.8 ft-lb)

7. Air bleeding

—WARNING:—

If the brake system is disassembled or if any brake hose has been loosened or removed, the brake system must be bled to remove air from the brake fluid. If the brake fluid level is very low or brake operation is incorrect, bleed the brake system. Failure to bleed the brake system properly can result in a dangerous loss of braking performance.

- Add proper brake fluid to the reservoir. Install the diaphragm, being careful not to spill or overflow the reservoir.
- Connect the clear plastic tube of 4.5 mm (3/16 in) inside diameter tightly to the caliper bleed screw. Put the other end of the tube into a container.

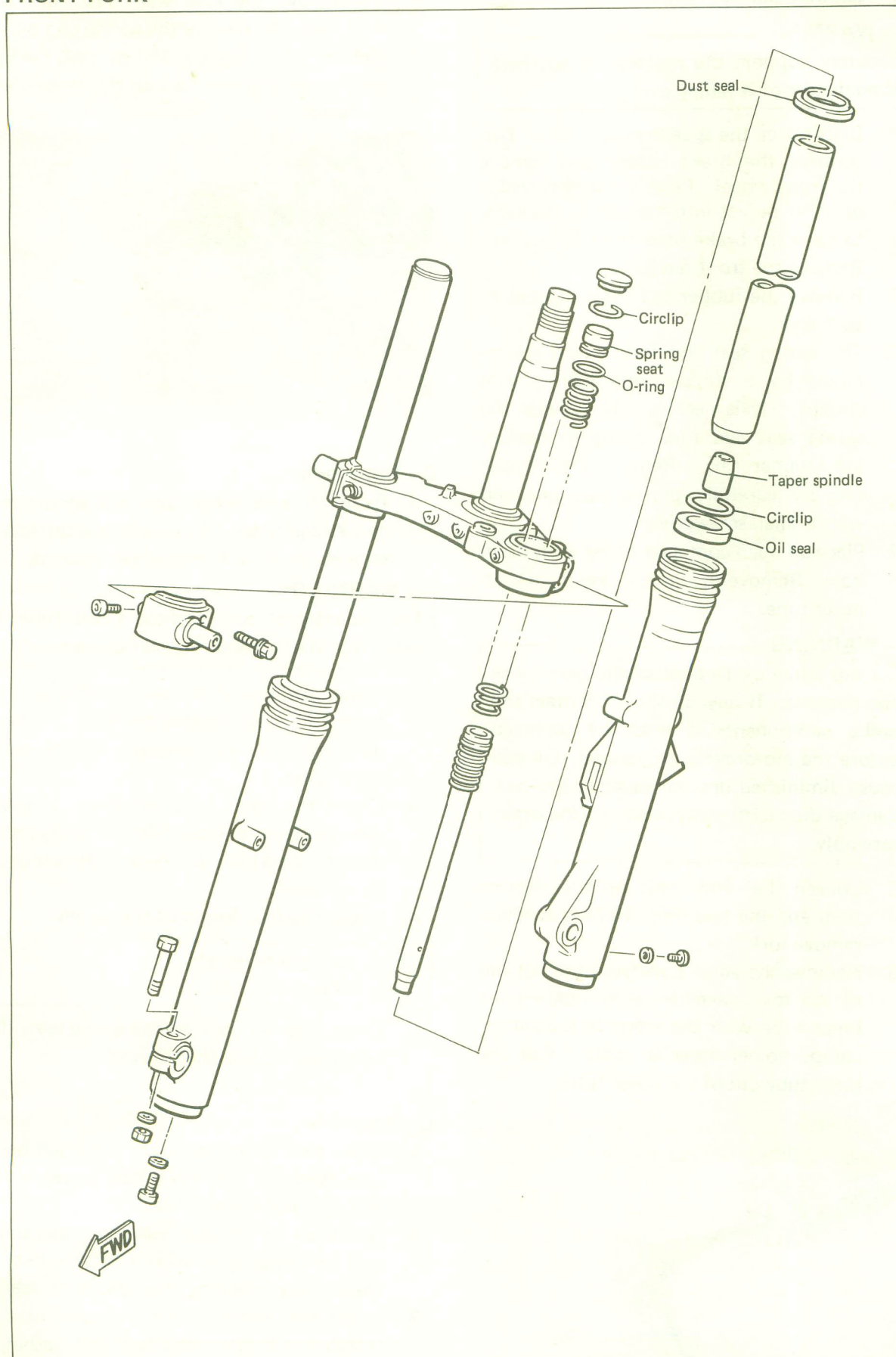


- Slowly apply the brake lever several times. Pull in the lever. Hold the lever in "on" position. Loosen the bleed screw. Allow the lever to travel slowly toward its limit. When the limit is reached, tighten bleed screw. Then release the lever.
- Repeat step "c" procedure until all air bubbles are removed from system.

NOTE:—

If bleeding is difficult, it may be necessary to let the brake fluid system stabilize for a few hours. Repeat the bleeding procedure when the tiny bubbles in the system settle out.

FRONT FORK



A. Removal and Disassembly

—WARNING:—

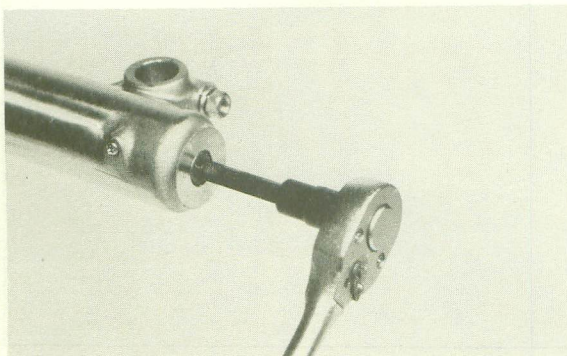
Securely support the motorcycle so there is no danger of it falling over.

1. Disconnect the speedometer cable. Disconnect the brake caliper and remove the front wheel. Place a wooden wedge or other object into the caliper assembly to keep the brake pads from falling out. Remove the front fender.
2. Remove the rubber cap from the top of each fork.
3. The spring seat and fork spring are retained by a stopper ring (spring wire circlip). It is necessary to depress the spring seat and fork spring to remove the stopper ring. Remove the stopper ring by carefully prying out one end with a small screwdriver.
4. Place an open container under each drain hole. Remove the drain screw from each outer tube.

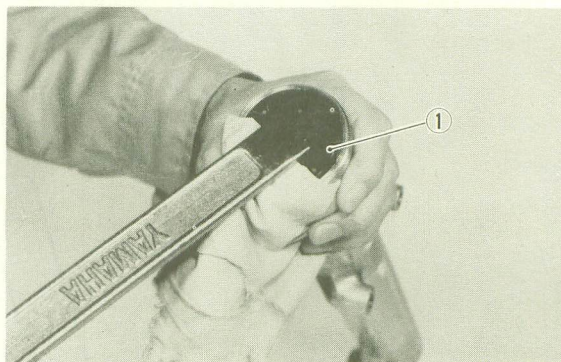
—WARNING:—

Do not allow oil to contact the disc brake components. If any oil should contact the brake components it must be removed before the motorcycle is operated. Oil will cause diminished braking capacity and will damage the rubber components of the brake assembly.

5. Loosen the pinch bolt on the steering stem and the two pinch bolts crown and remove fork.
6. Remove the Allen bolt from the bottom of the fork assembly while holding the inner tube with the front fork cylinder comp. holder (special tool). Pull the inner tube out of the outer tube.



7. To remove the fork seal. Pry out the dust seal and remove the spring clip over the oil seal. Pry out the oil seal, being very careful to not damage the fork tube surfaces.



1. Dust seal

B. Inspection

1. Examine fork inner tube for scratches and straightness. If the tube is scratched severely or bent, it should be replaced.

—WARNING:—

Do not attempt to straighten a fork tube, since this may weaken the part dangerously.

2. Check the seal outer seat. If leakage is from this area, replace the seal. If this does not cure the leakage, replace the outer tube.
3. Check the outer tube for dents. If any dent causes the inner tube to "hang up" during operation, the outer tube should be replaced.
4. Check the free length of the springs.

Fork spring free length:
606 mm (23.86 in)

5. Check the "O-ring" on the spring seat. If damaged, replace the "O-ring".

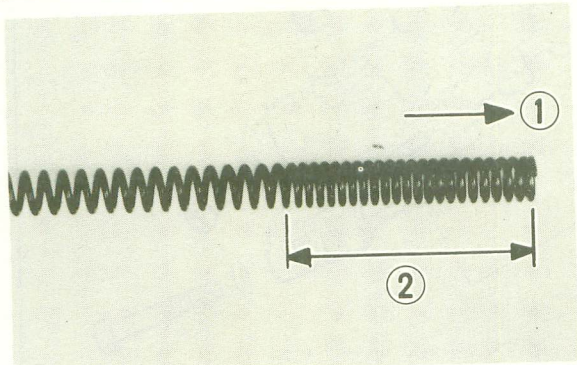
C. Assembly

1. Make sure all components are clean before assembly. Always install a new fork seal. Do not re-use a seal.
2. Apply oil to the fork seal and install the seal by pressing in with a large socket. Install the retaining clip and dust seal.
3. Install the inner tube into the outer tube. Install and tighten allen bolt and washer.

The assembly procedure is the reverse of the disassembly procedure.

NOTE:

When installing the fork springs, the greater pitch should be at the bottom. The main fork spring has a small coil diameter at the bottom.



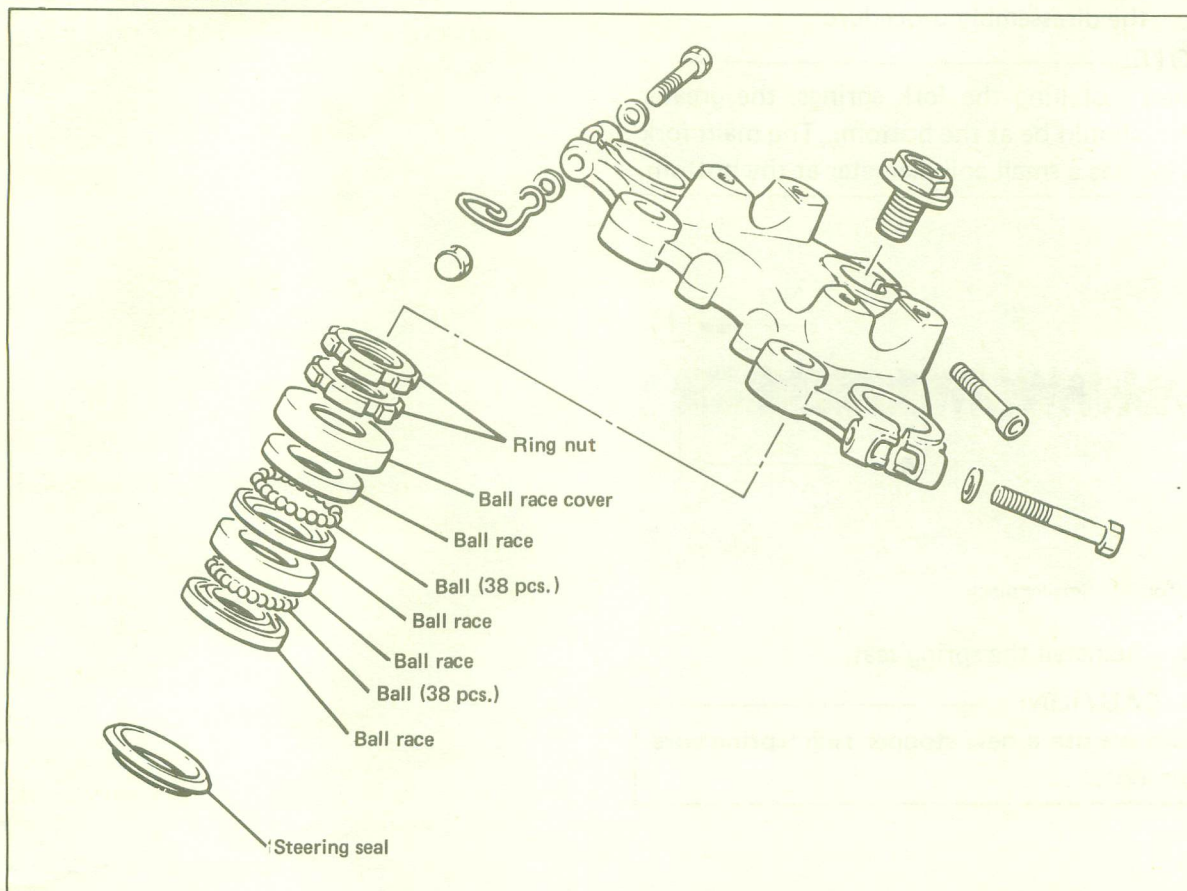
1. Top 2. Smaller pinch

4. Reinstall the spring seat.

CAUTION:

Always use a new stopper ring (spring wire circlip).

STEERING HEAD

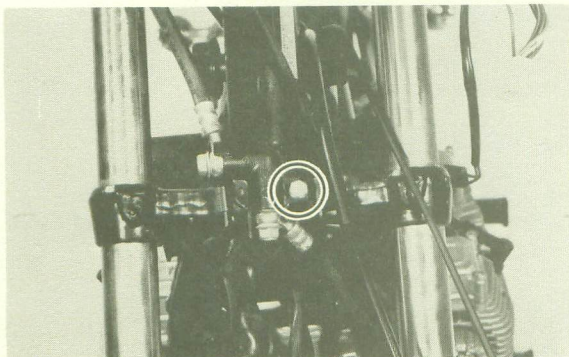


A. Adjustment

Refer to "D. Reassembly" for steering head adjustment procedure.

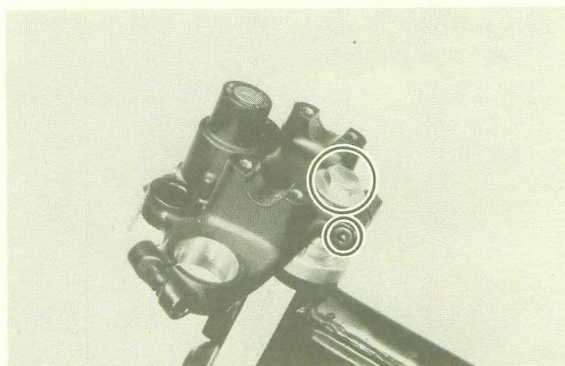
B. Removal

1. Remove the front wheel, front forks and handlebars.
2. Remove the front brake pipe junction.

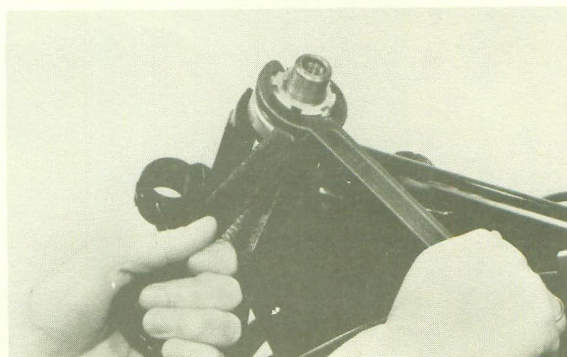


3. Loosen the steering stem (upper bracket) pinch bolt.

4. Remove the stem bolt and steering crown.

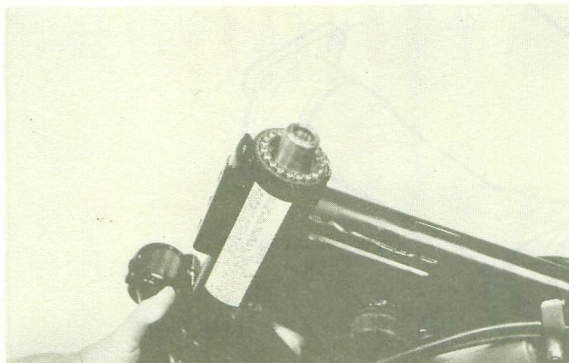


5. Remove the top fitting nut (ring nut).



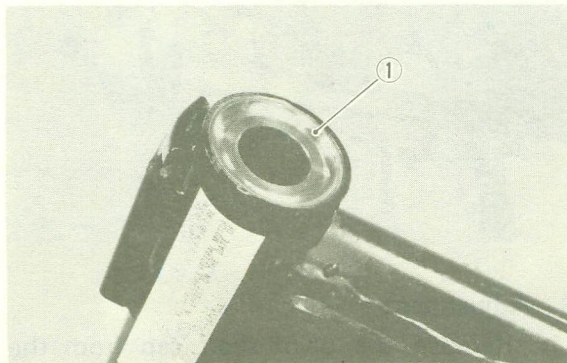
6. Support the steering stem (under bracket) and remove the bottom fitting nut (ring nut).
7. Remove the top bearing race and all of the bearing balls from the upper bearing

Ball quantity (upper and lower): 38 pcs.



C. Inspection

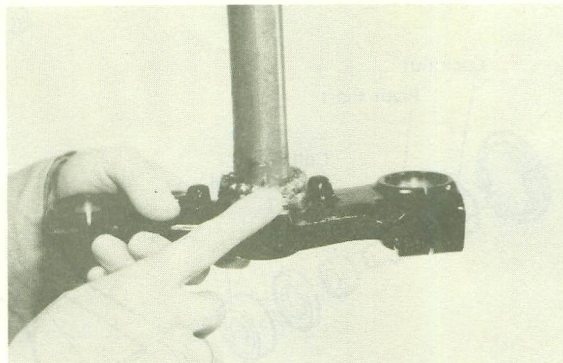
1. Wash the bearings in solvent.
2. Inspect the bearings for pitting or other damage. Replace the bearings if pitted or damaged. Replace the races when bearing balls are replaced.
3. Clean and inspect the bearing races. Spin the bearings by hand. If the bearings are not smooth in their operation in the races, replace bearing balls and races.



1. Bearing race

D. Reassembly

1. Grease the bearings and races with wheel bearing rease.



2. Install the steering stem (under brakcet), bearing balls, and races.
3. Install the bottom fitting nut. Tighten it to approximately 2.5 m-kg (18 ft-lb) and loosen it approximately 1/4 turn.
4. While holding the bottom fitting nut with the ring nut wrench, tighten the top fitting nut securely.
5. Continue reassembly in the reverse of disassembly order.
6. When assembly is complete, check the steering stem by turning it from lock to lock. If there is any binding or looseness, readjust the steering stem tightness.

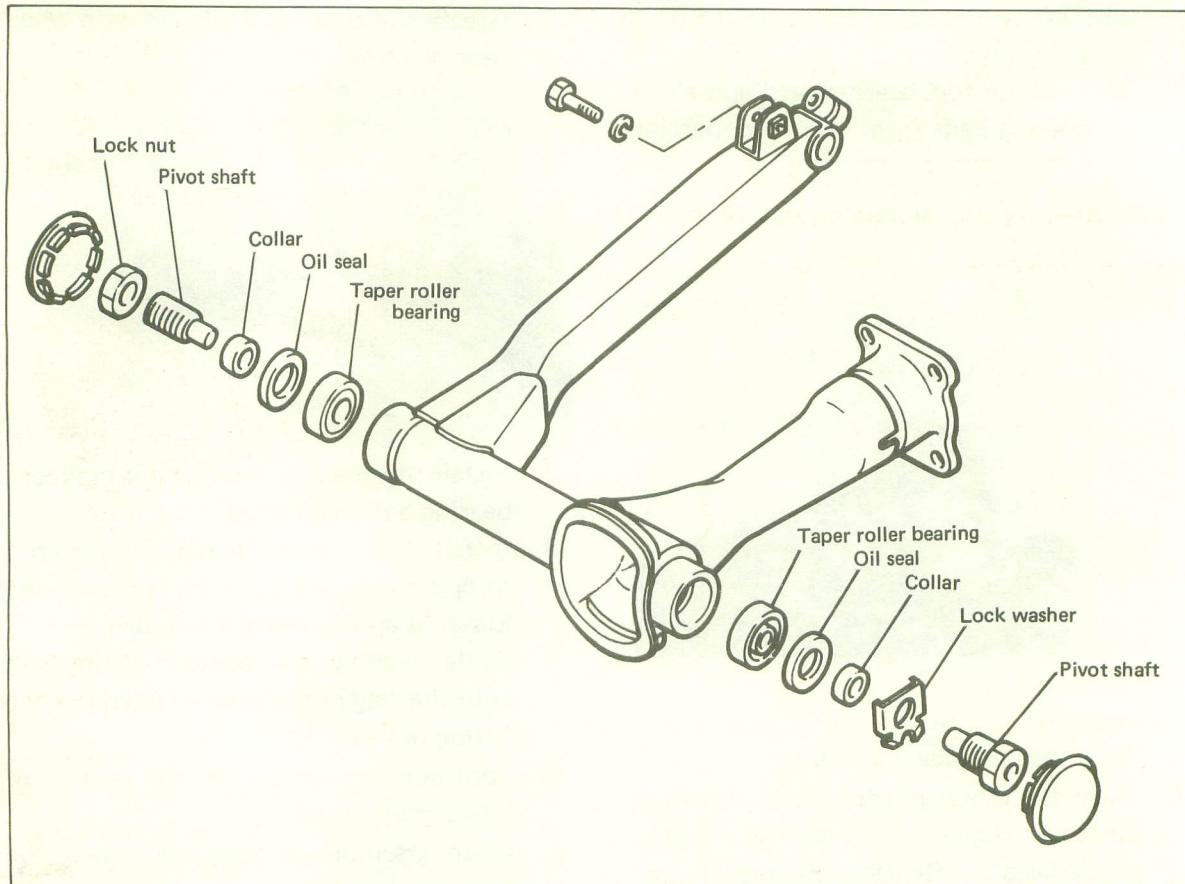
Pinch bolt torque:

2.0 m-kg (14.5 ft-lb)

Steering stem bolt torque:

5.4 m-kg (39.1 ft-lb)

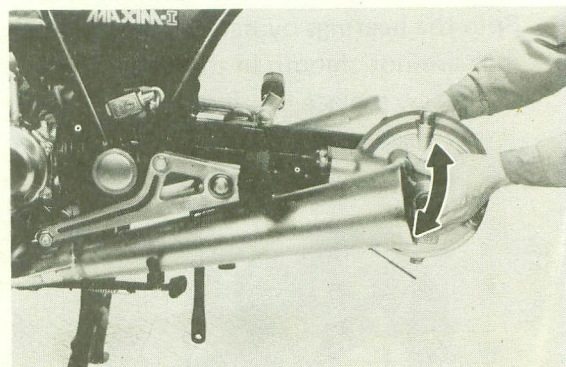
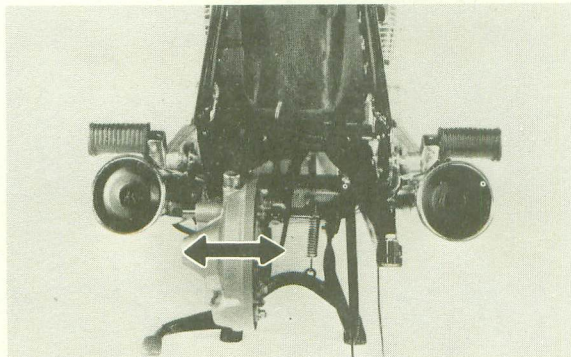
SWING ARM



A. Inspection

1. Free play inspection

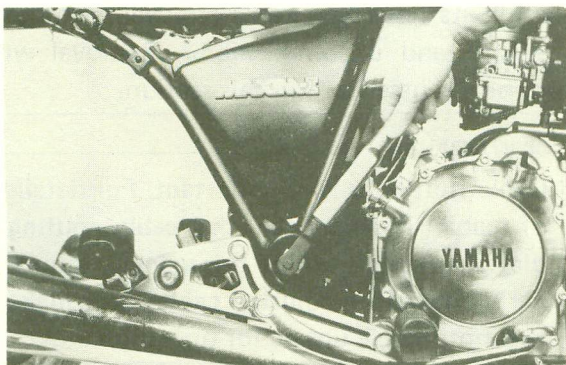
Remove the rear wheel and both shock absorbers. Grasp the swing arm and try to move it from side to side as shown. There should be no noticeable side play.



2. The swing arm is mounted on tapered bearings. Move the swing arm up and down as shown. The swing arm should move smoothly, without tightness, binding or rough spots that could indicate damaged bearings.

B. Adjustment

1. Remove the pivot shaft cap from the right side of the swing arm.
2. Loosen the right pivot shaft lock nut and tighten the pivot shaft (clockwise) to 0.5 ~ 0.6 m-kg (43 ~ 52 in-lb).



3. Tighten the pivot shaft lock nut.

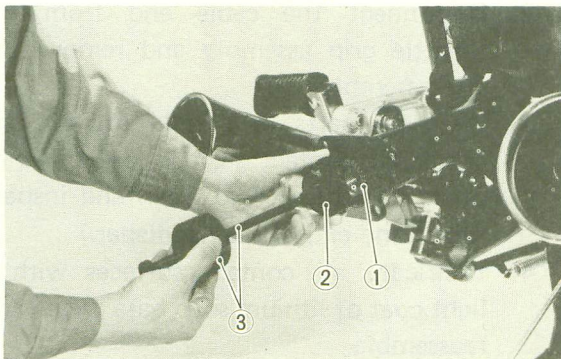
NOTE:—

Do not allow the pivot shaft to turn while tightening the lock nut.

Pivot shaft lock nut torque:
10 m-kG (72.3 ft-lb)

C. Removal

1. Remove the middle gear flange holding bolts.
2. Remove the rear wheel and shock absorbers.
3. Remove the final gear assembly.
4. Install the drive shaft puller attachment (special tool) on the side hammer bolt (special tool). Insert the 2 arms of the puller into the mouth of drive shaft housing. Tighten the 2 arms around the toothed flange of the drive shaft out of the universal joint. Pull out the drive shaft from the housing.



1. Drive shaft
2. Drive shaft puller
3. Slide hammer

5. Remove the swing arm pivot caps, the pivot shafts and the swing arm.

D. Inspection and Lubrication

1. Remove the oil seals and the bearings. Inspect the bearings for pitting or other damage. Make sure that the bearings roll freely. If a bearing is damaged, both bearings and both sets of inner and outer bearing races should be replaced.



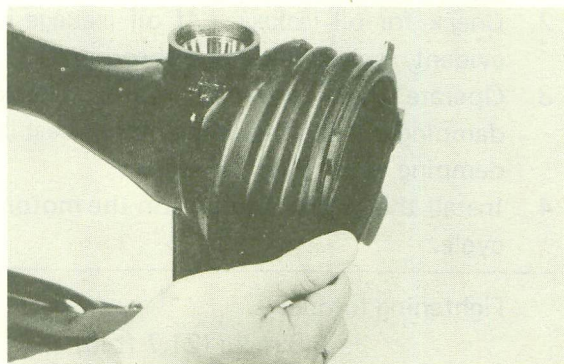
CAUTION:—

Do not use compressed air to spin the bearings dry. This causes damage to the bearing surfaces.

NOTE:—

When installing new bearings, grease liberally with lithium base, waterproof wheel bearing grease.

2. Always replace the grease seals when bearings are removed.
3. Examine the rubber boot for damage. Replace if damaged.



E. Installation

Installation of the swing arm can be accomplished by reversing the removal procedure. Observe adjustment procedures for obtaining equal frame/swing arm spacing.

Tightening torque:

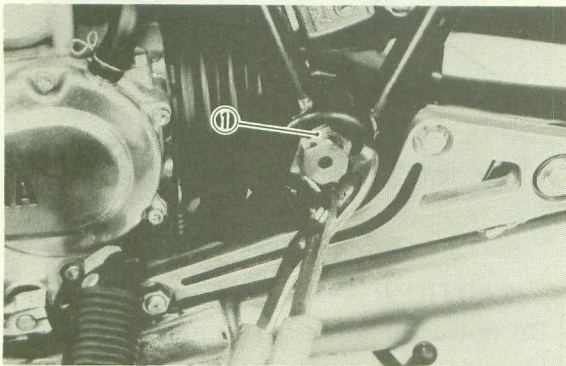
Left side pivot shaft: 10 m-kg (72.3 ft-lb)

Right side pivot lock nut:

10 m-kg (72.3 ft-lb)

CAUTION:

A lock washer for left side pivot bolt must be replaced with a new one and the tab should be bent over along the bolt flat after tightening.



1. Lock washer

REAR SHOCK ABSORBER

A. Removal

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

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 the shock extends.
4. Install the shock absorber on the motorcycle.

Tightening torque:

3.0 m-kg (21.7 ft-lb)

CABLE AND FITTINGS

A. Cable Maintenance

NOTE:

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

within its housing. Cable removal is straight forward and uncomplicated. Removal will not be discussed within this section.

WARNING:

Cable routing is very important. For details of cable routing, see the cable routing diagrams at the end of this manual. Improperly routed or adjusted cables may make the motorcycle 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 the cable strands. If damage is evident, replace the cable assembly.
3. To lubricate the cable, hold it in a vertical position. Apply lubricant to the uppermost end of cable. Leave it in the vertical position until lubricant appears at the bottom. Allow any excess to drain and reinstall the cable.

NOTE:

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

B. Throttle Maintenance

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

NOTE:

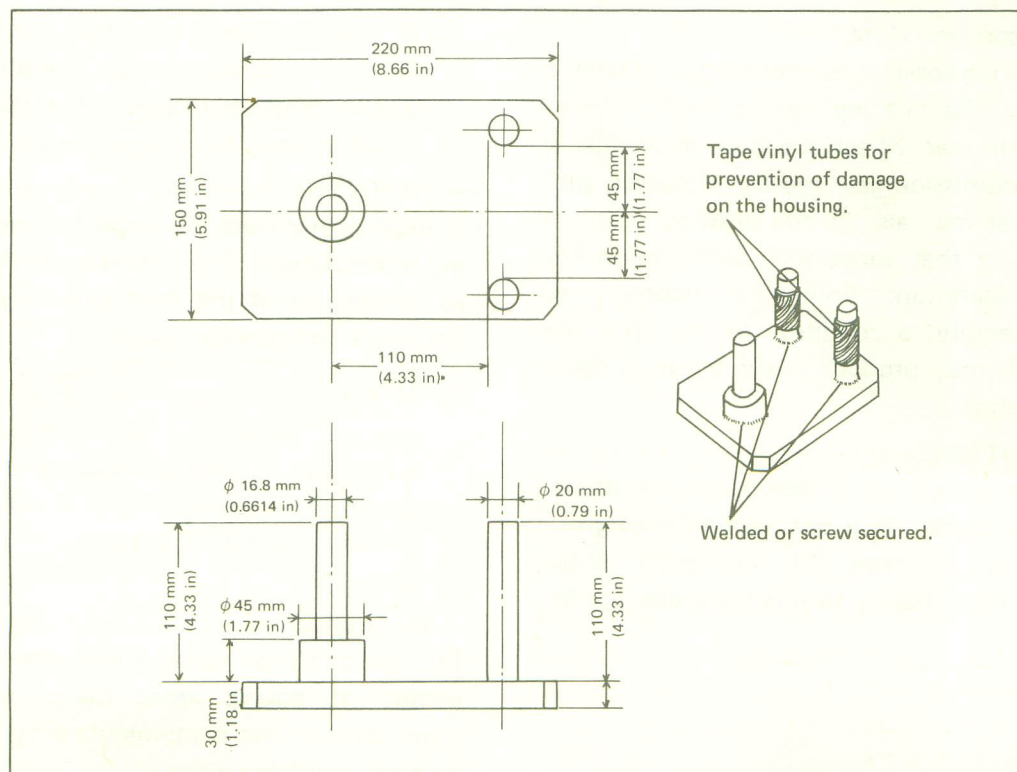
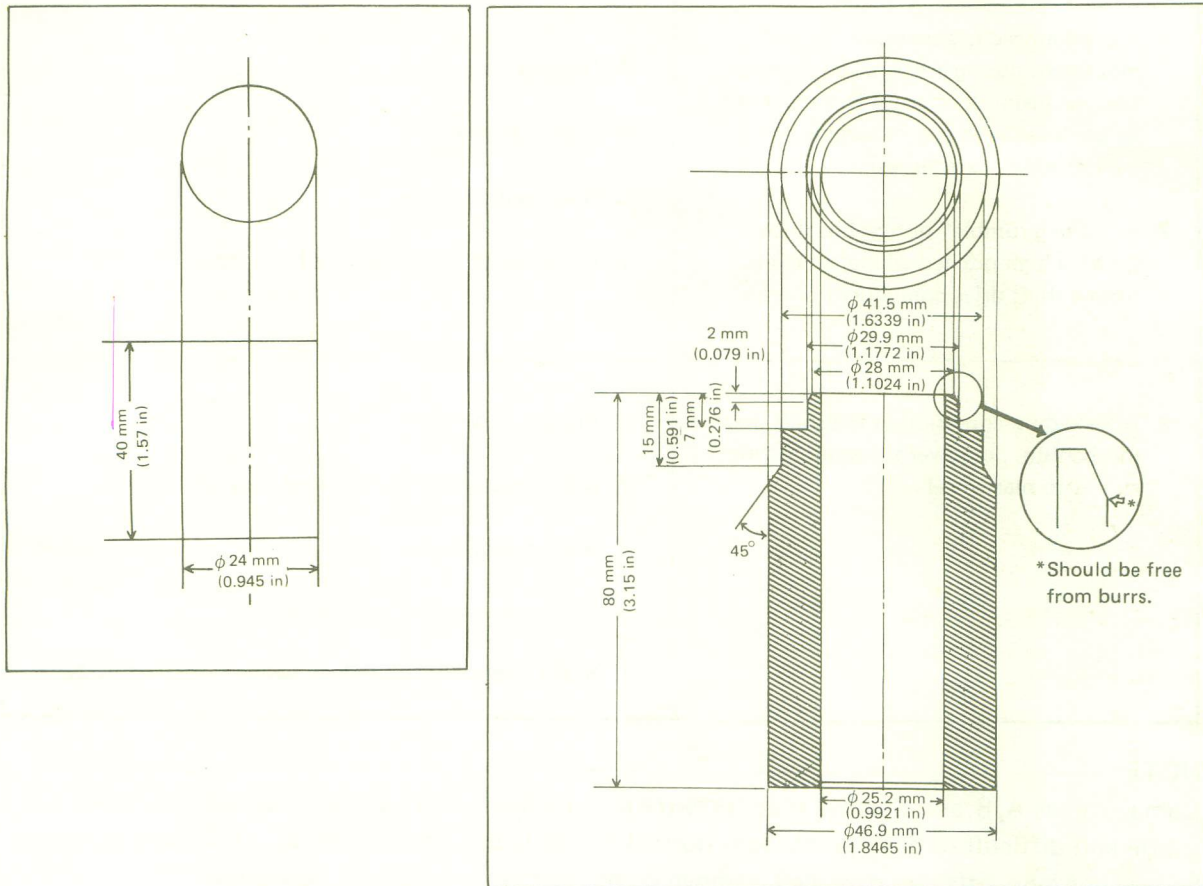
Tighten the housing screws evenly to maintain an even gap between the two halves.

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

SHAFT DRIVE

Refer to "CHAPTER 3". for the middle gear.

The following special tools are not available but can be constructed for the final gear disassembly and assembly:



A. Troubleshooting

1. The following conditions may indicate damaged shaft drive components:

Symptoms	Possible damaged areas
1. A pronounced hesitation or "jerky" movement during acceleration, deceleration, or sustained speed. (This must not be confused with engine surging or transmission characteristics). 2. A "rolling rumble" noticeable at low speed; a high-pitched whine; a "clunk" from a shaft drive component or area.	A. Damage to bearings. B. Improper gear lash. C. Gear tooth damage. D. Drive flange/universal joint bolts loose.
3. A locked-up condition of the shaft drive mechanism; no power transmitted from engine to rear wheel.	E. Broken drive-shaft. F. Disconnected flange/universal joint connection. G. Broken gear teeth. H. Seizure due to lack of lubrication. I. Small foreign object lodged between moving parts.

NOTE:

Damage areas A, B, and C above may be extremely difficult to diagnose. The symptoms are quite subtle and difficult to distinguish from normal motorcycle operating noise. If there is reason to believe component(s) are damaged, remove component(s) for specific inspection.

2. Inspection Notes:

- a. During coasting, accelerating or decelerating, the "rolling rumble" will increase with rear wheel speed, not engine or transmission gear speeds. However, such noise may also be due to wheel bearings.
- b. Noise that varies with acceleration and deceleration: Following incorrect re-assembly, a condition of too-little gear lash may produce a whine during deceleration.

CAUTION:

Too-little gear lash is extremely destructive to gear teeth. If a test ride following re-assembly indicates this condition, stop riding immediately to minimize damage to gears.

- c. A slight "thunk" must be distinguished from normal motorcycle operation. It will be most noticeable at low speed and could indicate broken gear teeth.

WARNING:

If broken gear teeth are suspected, stop riding immediately. This condition could lead to locking-up of the shaft drive assembly and result in harm to a rider.

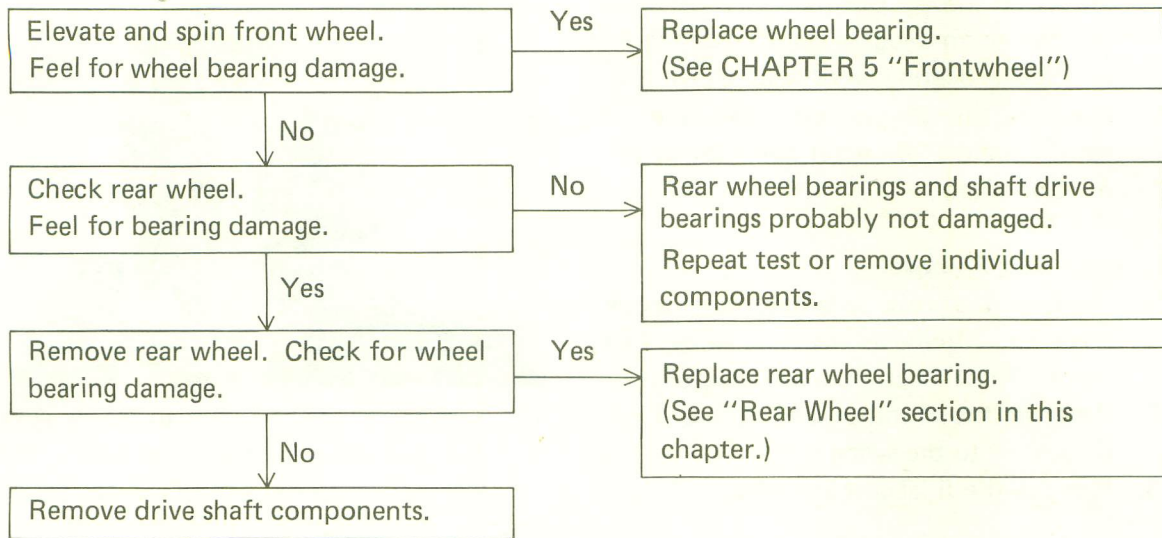
- d. If the drive flange/universal joint bolts are slightly loose, a "clunk" may be felt when slowly taking off, or when changing from slow acceleration to slow deceleration. At high speed this will result in vibration.

WARNING:

Do not continue riding a motorcycle suspected of having loose flange/universal joint bolts. The components may break, causing injury to a rider.

3. Troubleshooting Chart

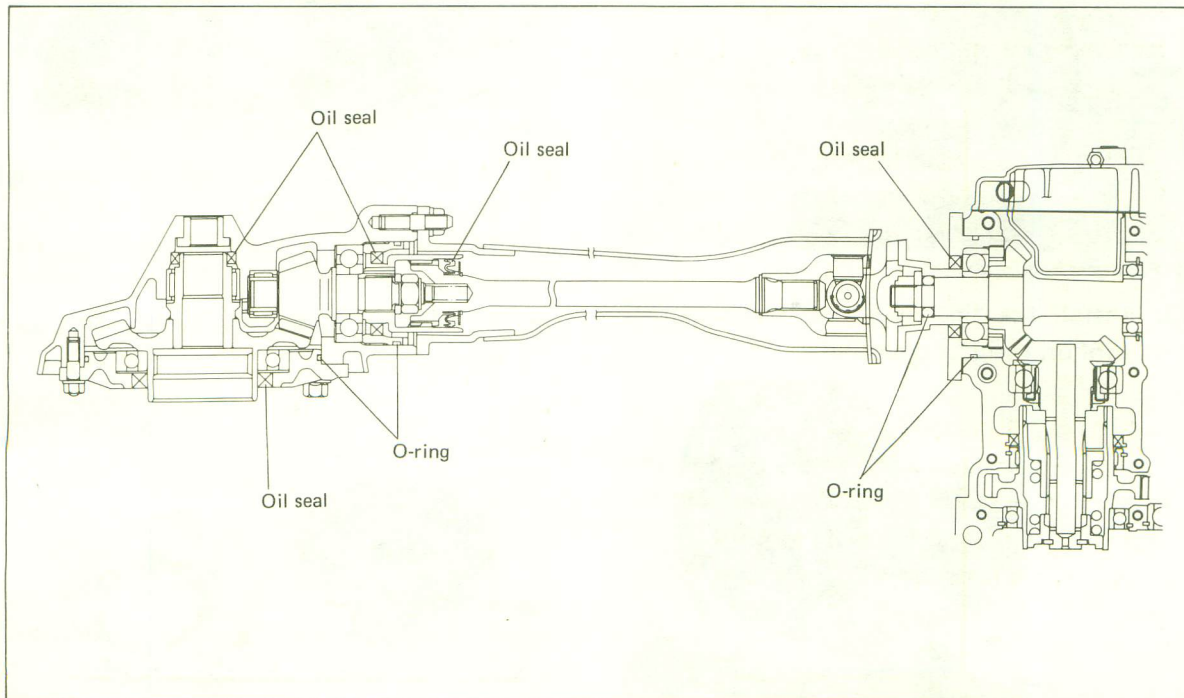
Where Basic Conditions "a" and "b" above exist, consider the following Chart:



4. Oil Leak Inspection

If a shaft drive component is suspected of leaking oil, first thoroughly clean the entire motorcycle. The apparent location of an oil leak on a dusty motorcycle may be misleading. Dry the motorcycle and apply a leak-localizing compound or a dry-powder spray that will limit the flow of any leaking oil. Operate the motorcycle prepared in this way for the distance necessary to precisely locate the

leak. There are the possibilities that a component housing may have been damaged by road debris or an accident, or a gasket or seal may be cracked or broken. However, on new or nearly new motorcycle an apparent oil leak may be the result of a rust-preventive coating or excess assembly lubrication of seals. Always clean the motorcycle and recheck the suspected location of any apparent leakage.



5. Checking Drained Oil

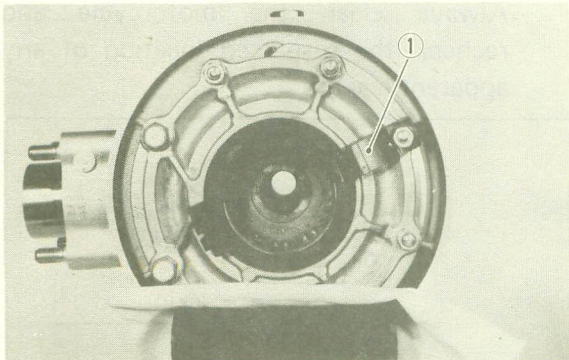
Whenever a problem is suspected in either the middle or final gear assemblies, drain and inspect the oil. Metal particles on the drain plug or in the oil could indicate a bearing seizure or other problem in the component. However, a small amount of metal particles in the oil is normal.

B. Final Gear Removal

1. Remove the rear axle and left shock absorber. Remove the rear wheel (see "Rear Wheel" section in this chapter).
2. Remove the 4 nuts holding the Final Drive unit to the swing arm.
3. Remove the final gear assembly.

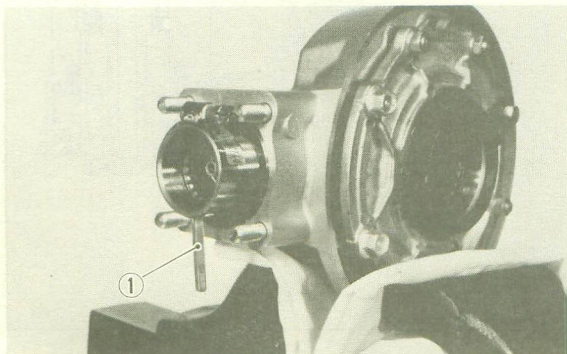
C. Gear Lash Check and Adjustment

1. Secure the gear case in a vice or other support.
2. Remove one nut from the final gear case stud bolt. Install the gear holder (special tool) over the ring gear surface and stud bolt. Tighten the holder to stud bolt with a nut.



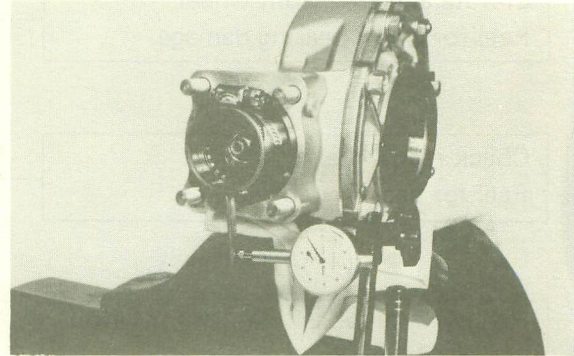
1. Final gear holding tool

3. Install the final gear lash measurement tool on the gear coupling.



1. Gear lash measurement tool (Final gear)

4. Mount a dial gauge against the lash measurement tool at the scribed mark (60 mm, 2.36 in from the center of the shaft).



5. Use the special wrench to gently rotate the gear coupling back and forth. Note the lash measurement on the dial gauge.

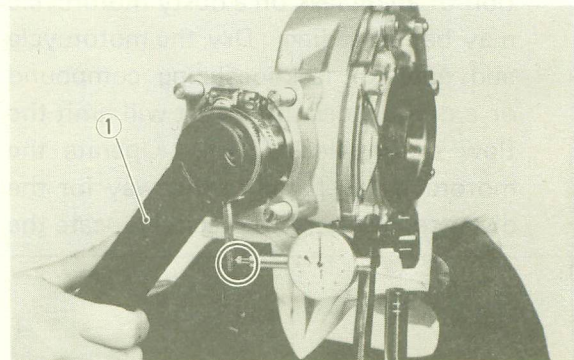
Final gear lash:

0.25 ~ 0.50 mm (0.010 ~ 0.020 in):

When using the measurement tool.

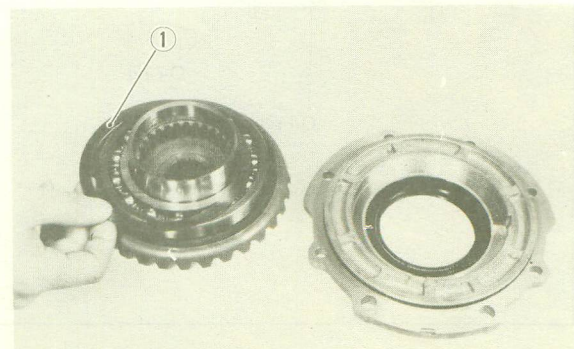
0.1 ~ 0.2 mm (0.004 ~ 0.008 in):

Actual gear lash on the final gear teeth.



1. Middle and final gear holding tool

6. If the gear lash exceeds the specified limits, adjust as follows:
 - a. To reduce gear lash, increase the ring gear shim.
 - b. To increase gear lash, reduce ring gear shim.

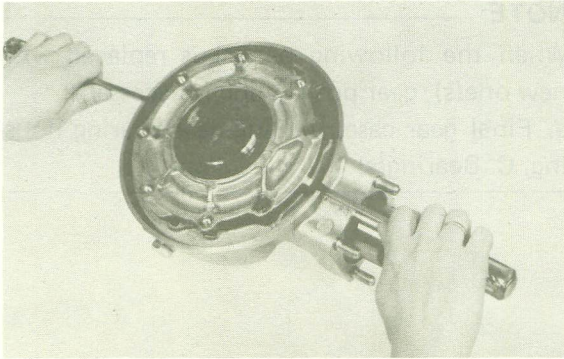


1. Ring gear shim

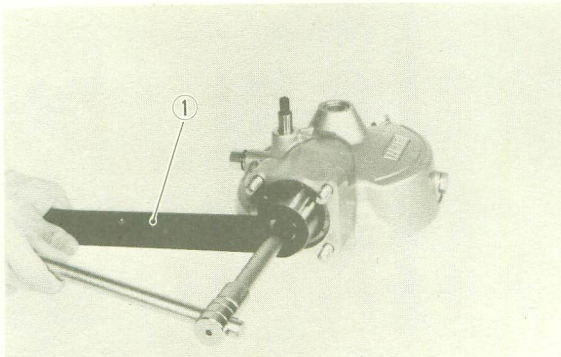
- c. If it is necessary to increase the ring gear shim by more than 0.1 mm reduce the thrust washer thickness by 0.1 mm for each 0.1 mm of ring gear shim increase and if it is necessary to reduce shim by more than 0.1 mm, reverse above procedure.

D. Final Gear Disassembly

1. Remove the nuts and bolts holding the bearing housing.
2. Remove the ring gear assembly and thrust washer from the final gear case.



3. Remove the self-locking nut from drive pinion by using the holding tool (special tool) and remove the coupling.

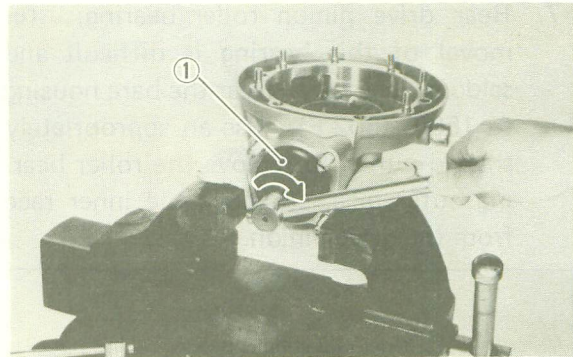


1. Middle and final gear holding tool

4. Remove the drive pinion bearing retainer with the retainer remover (special tool).

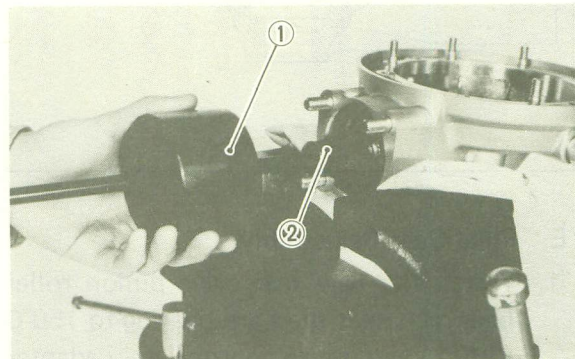
CAUTION:

The drive pinion bearing retainer nut is left hand threads. Turn the retainer nut clockwise to loosen.



1. Drive pinion bearing retainer remover

5. Remove the drive pinion and bearing with the slide hammer and adapter (special tool).

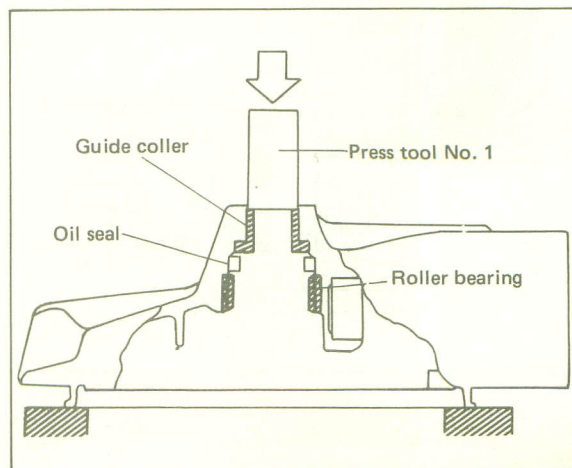


1. Slide hammer 2. Adapter

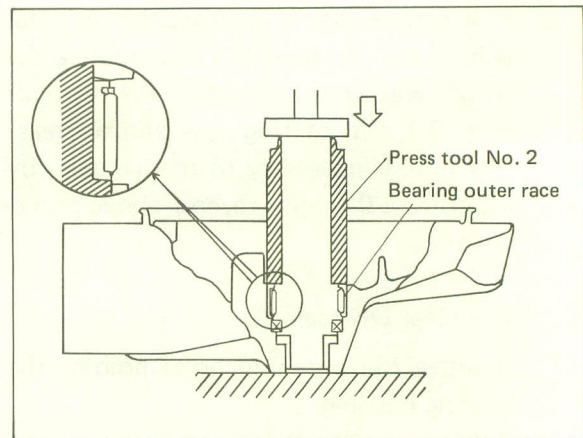
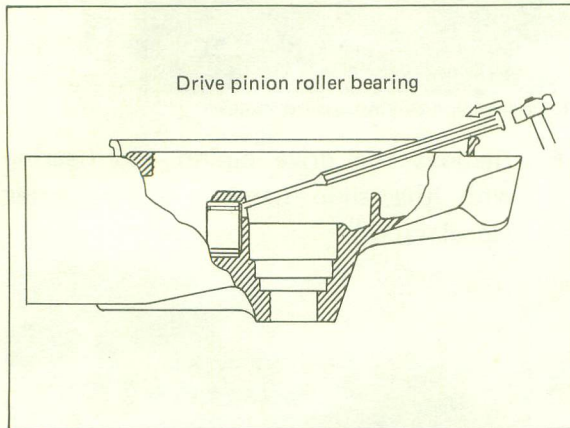
CAUTION:

This drive pinion removal should be performed only if gearing replacement is necessary. Do not re-use bearings or races after removal.

6. Remove the guide collar, oil seal, and roller bearing from the main housing by using the press tool No. 1 (special tool) and a press. Use an appropriate supports for the main housing during this operation. The roller bearing may be re-used if undamaged. Do not re-use oil seal.



7. Rear drive pinion roller bearing; removal of this bearing is difficult and seldom necessary. Heat the bare housing to 150°C (302°F). Use an appropriately shaped punch to remove the roller bearing outer race. Remove the inner race from the drive pinion.



3. Final drive/ring gear positioning

NOTE:

When the following part(s) is replaced with new one(s), gear positioning is necessary:

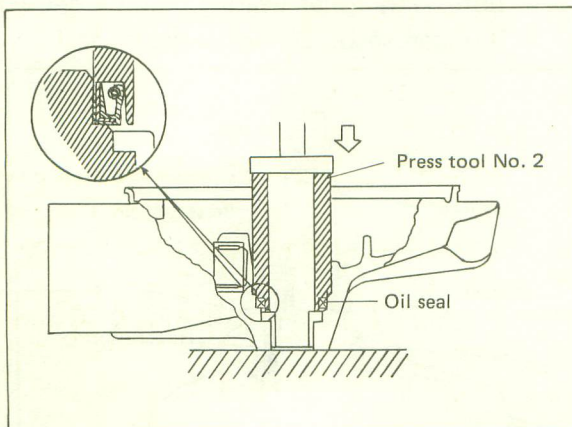
- a. Final gear case, b. Ring gear bearing housing, C. Bearing(s)

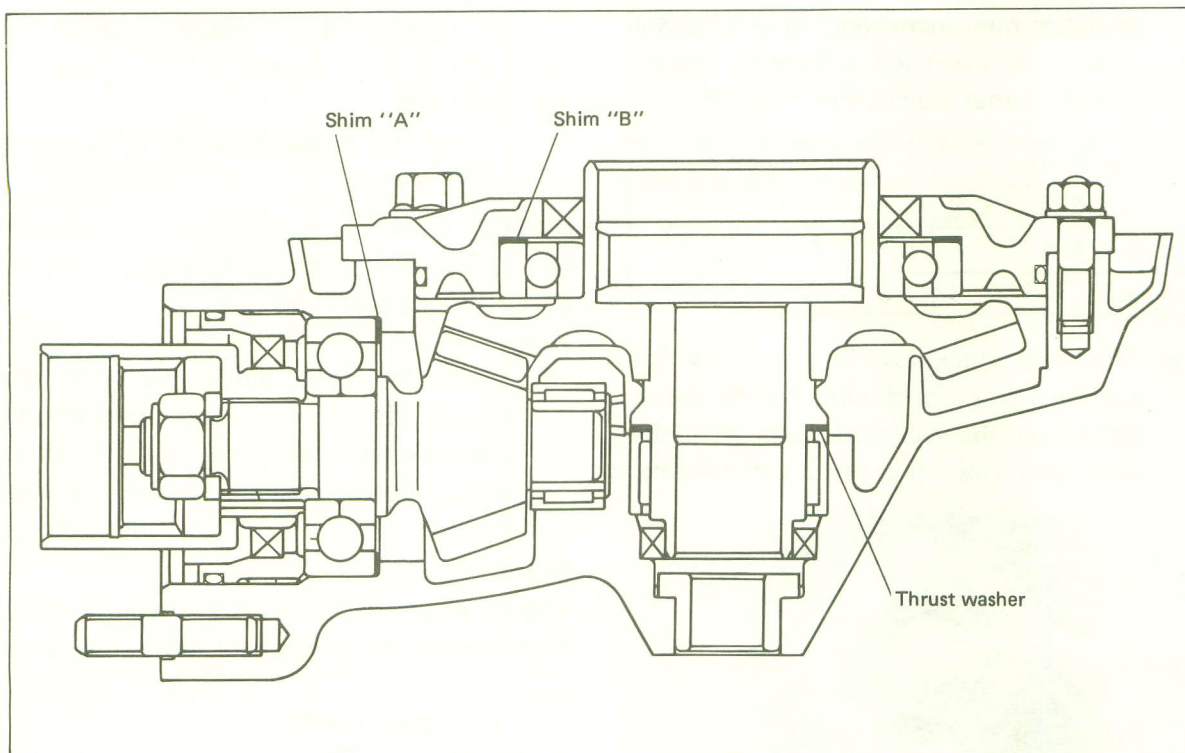
E. Final Gear Reassembly

1. Install the new rear drive pinion roller bearing. Heat the bare bearing to 150°C (302°F) and use an appropriately adapter to install the roller bearing outer race. Install the inner race onto the drive pinion.
2. Using the press tool No. 2 (special tool) and a press, install the guide collar, new oil seal, and roller bearing into the main housing in that order.

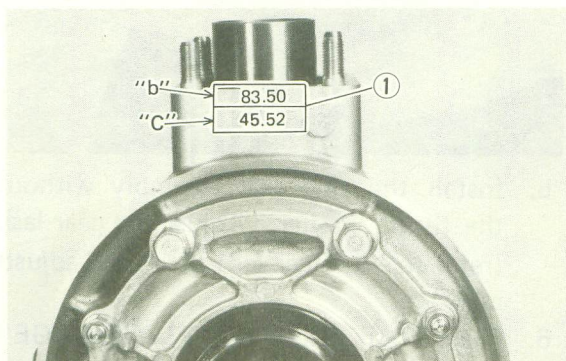
NOTE:

The removed roller bearing can be used if undamaged; however, we recommend replacement with a new one.

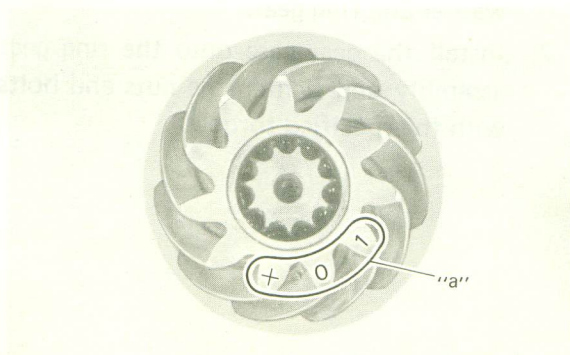




- a. The shim thickness "A" necessary for the drive pinion gear positioning can be calculated from the informations found on the final gear case and on the drive gear end.



1. Size number



To find shim thickness "A" use the formula:

$$A = a - b$$

Where:

a = a numeral (usually a decimal number) on the gear near the tooth and ; either added to or detracted from the nominal size "84".

b = a numeral on the gear case appearing as a whole figure (ie. 83.50).

Example:

1) If the pinion gear is marked

" +01 " "a" is 84.01.

2) If the gear case is marked "83.50".

$$A = 84.01 - 83.50$$

$$A = 0.51$$

Then the necessary shim thickness is 0.51 mm.

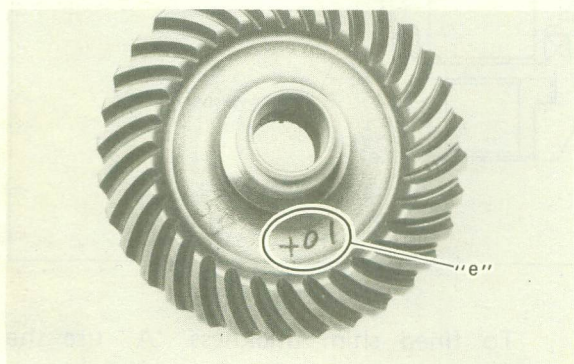
Shim sizes are supplied in the following thicknesses:

0.15 mm, 0.30 mm, 0.40 mm, 0.50 mm, 0.60 mm.

Because the shims can only be selected in 0.05 mm increments the following chart should be used when encountering last digits that are not 5 or zero (0):

Last digits	Rounding
0, 1, 2	0
3, 4, 5, 6, 7	5
8, 9	10

- b. The shim thickness "B" necessary for the ring gear positioning can be calculated from the informations found on the final gear case, ring gear, and bearing.



To find shim thickness "B" use the formula:

$$B = c + d - (e + f)$$

Where:

c = a numeral on the gear case appearing as a whole figure (ie. 45.52)

d = a numeral (usually a decimal number) on the outside of the ring gear bearing housing and added to the nominal size "3".

e = a numeral (usually a decimal number) on the inside of the ring gear and; either added to or detracted from the nominal size "35.40".

f = a bearing thickness (considered constant)

Distance "f" = 13.00 mm

Example:

- 1) If the gear case is marked "45.52".
- 2) If the ring gear bearing housing is marked "35" "d" is 3.35.
- 3) If the ring gear is marked "+01" "e" is $35.40 + 0.01 = 35.41$.
- 4) "f" is 13.00.

$$B = c + d - (e + f)$$

$$B = 45.52 + 3.35 - (35.41 + 13.00)$$

$$B = 48.87 - (48.41)$$

$$B = 0.46$$

Then the necessary shim thickness is 0.41 mm.

NOTE:

Use the chart for the drive pinion shim to select the ring gear shim size.

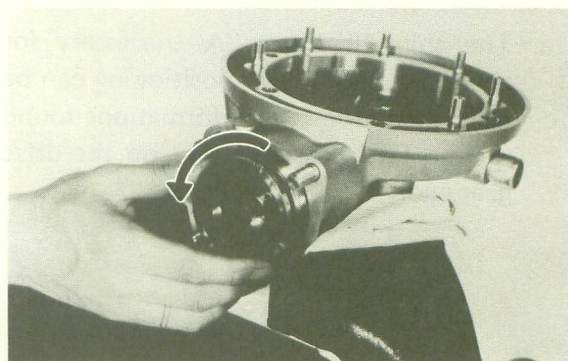
4. Install the drive pinion gear with the proper size of shim(s) and secure it with the bearing retainer nut with the drive pinion bearing retainer remover (special tool).

NOTE:

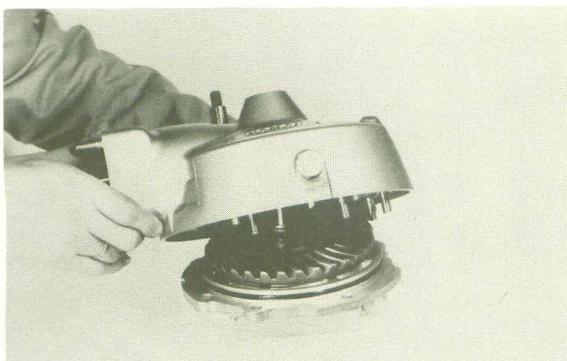
The bearing retainer nut is left hand threads; turn the nut to counterclockwise to tighten.

Tightening torque:

11 m-kp (80 ft-lb)



5. Install the ring gear assembly without the thrust washer. Adjust the gear lash (refer to "C. Gear lash check and adjustment).
6. Place four pieces of "PLASTIGAGE" between the originally fitted thrust washer and ring gear.
7. Install the gear case onto the ring gear assembly and tighten the nuts and bolts with the specified torque.

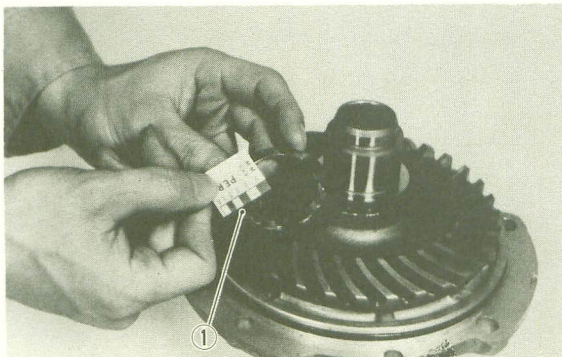


Tightening torque:
Bolt/Nut 2.3 m·kg
(16.6 ft·lb)

NOTE:

Do not turn the drive pinion/ring gear when measuring clearance with "PLASTIGAGE".

8. Remove the ring gear assembly and determine the clearance by measuring the width of the flattened "PLASTIGAGE".

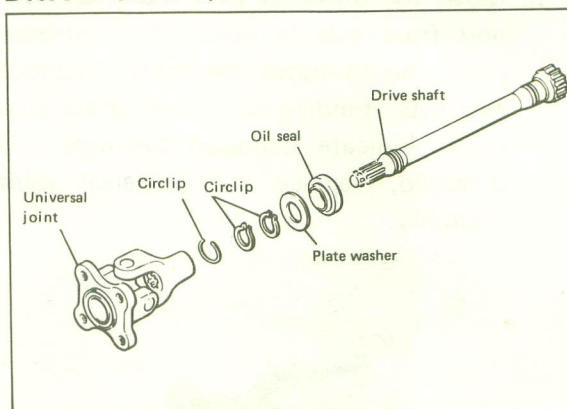


1. PLASTIGAGE

Ring gear thrust clearance:
0.1 ~ 0.2 mm

9. If the clearance exceeds the specification above, replace the thrust washer to obtain the proper clearance.

DRIVE SHAFT/JOINT



A. Removal

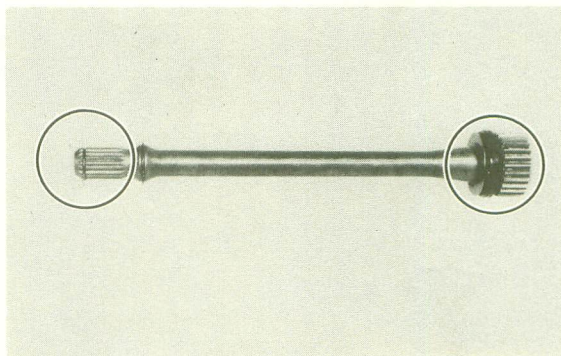
1. Remove the rear wheel. See "REAR WHEEL A. Removal" in this chapter.
2. Remove the final gear case assembly.
3. Remove the drive shaft. See "SWING ARM removal" in this chapter.
4. To remove the universal joint, it is necessary to remove the swing arm. Remove the universal joint assembly.

B. Inspection

1. Drive shaft
Inspect the shaft splines for wear and/or damage. If excessive, replace the drive shaft.

NOTE:

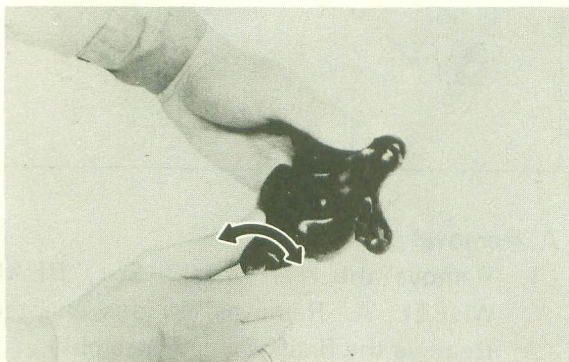
When installing the drive shaft, lubricate splines with molybdenum disulfide grease.



2. Universal joint

- a. There should be no noticeable play in the universal joint bearings. If there is any play in the bearing, replace the universal joint assembly.

- b. Move the universal joint up and down and from side to side. The universal joint should move smoothly. Without tightness, binding or rough spots that could indicate damaged bearings. If damaged, replace the universal joint assembly.



C. Reinstallation

When installing the drive shaft and the universal joint, reverse the removal procedure. Note the following points:

1. Lubricate the shaft splines with molybdenum disulfide grease.
2. Tighten the universal joint securing bolts and final gear case securing nuts with the specified torque:

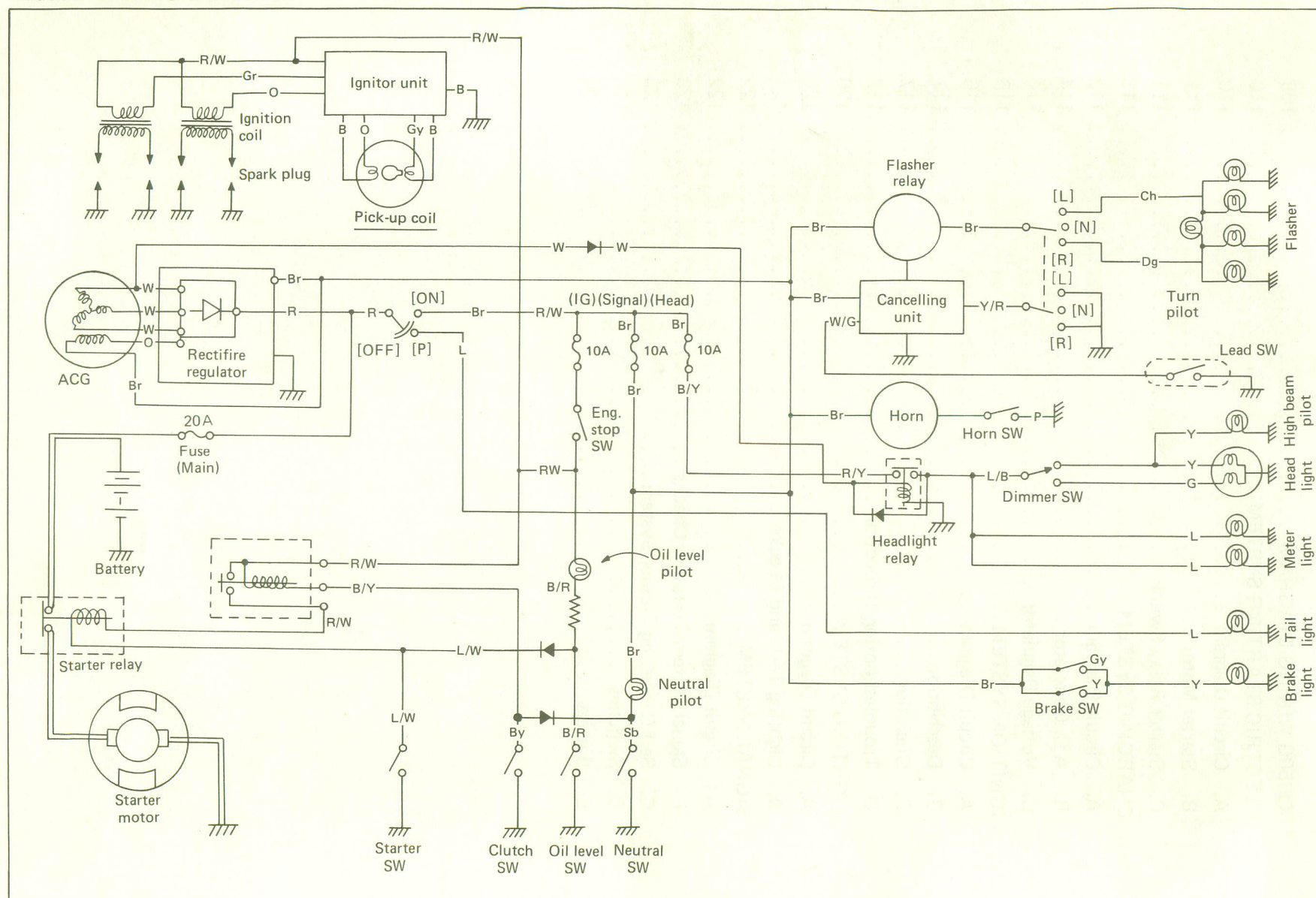
Final gear case: 4.2 m-kp (30.4 ft-lb)

Universal joint: 4.4 m-kp (31.8 ft-lb)

CHAPTER 6. ELECTRICAL

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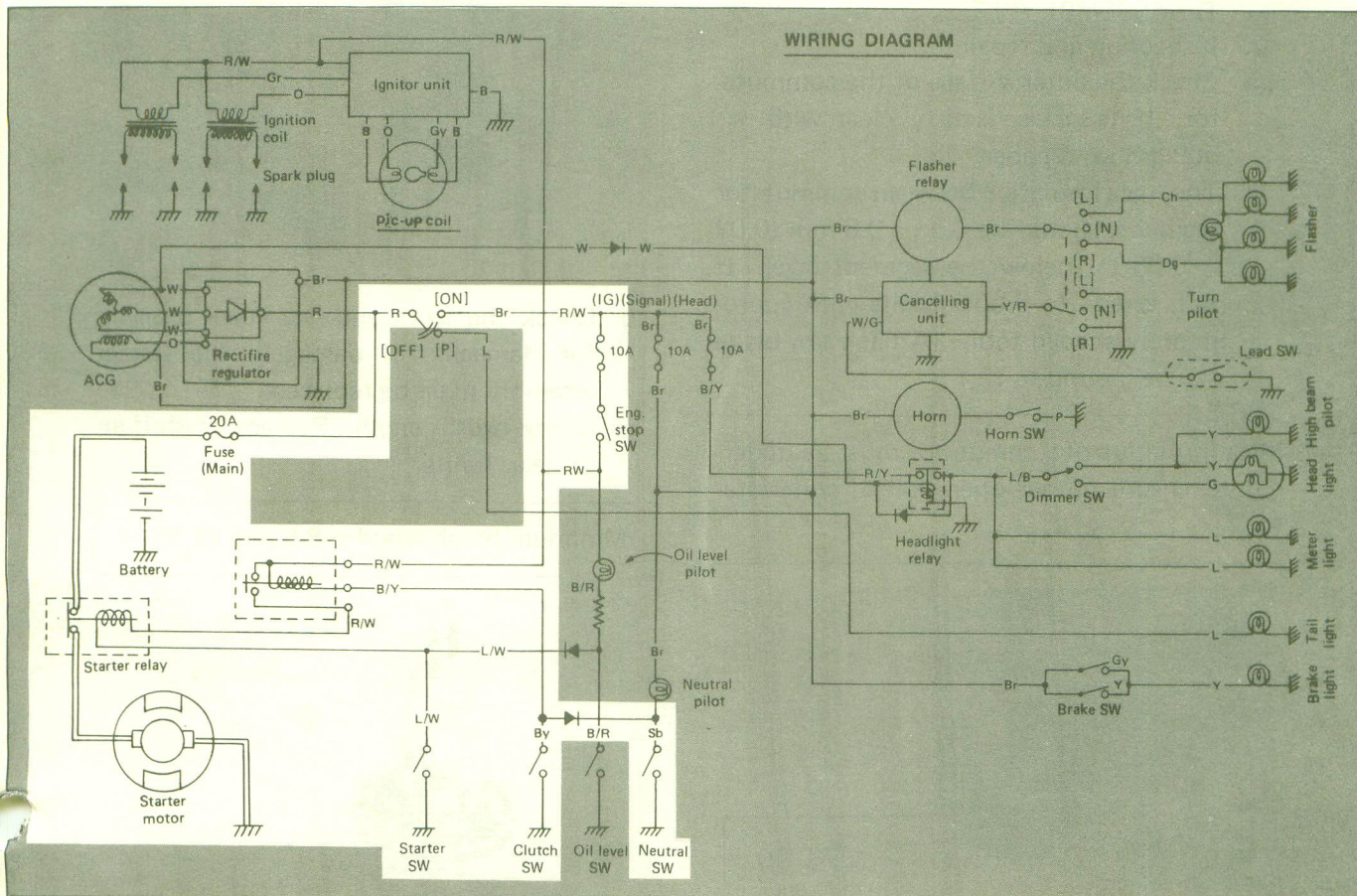
XJ650G WIRING DIAGRAM



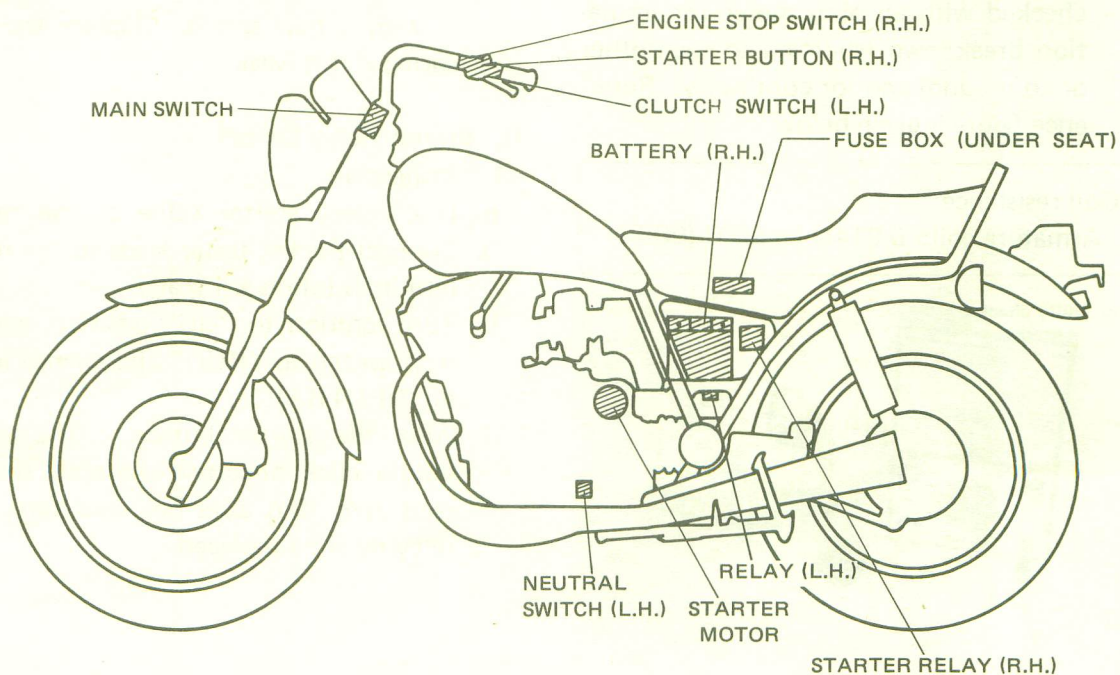
CHAPTER 6. ELECTRICAL

ELECTRIC STARTING SYSTEM

A. Circuit Diagram



Above circuit diagram shows starter circuit in wiring diagram.

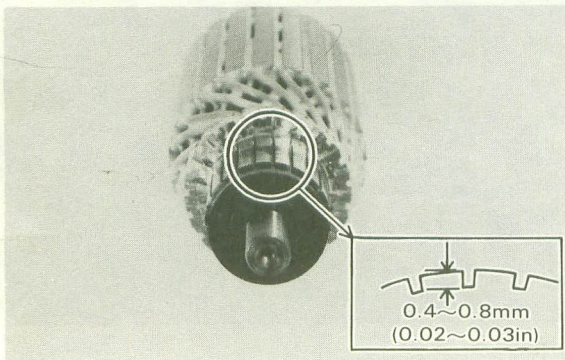


B. Starter Motor

1. Removal (see CHAPTER 3. "ENGINE DISASSEMBLY")
2. Inspection and repair
 - a. Check the outer surface of the commutator. If its surface is dirty, clean with # 600 grit sand paper.
 - b. The mica insulation between commutator segments should be 0.4 ~ 0.8 mm (0.02 ~ 0.03 in) below the segment level. If not, scrape to proper limits with appropriately shaped tool. (A hack saw blade can be ground to fit.)

NOTE:

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

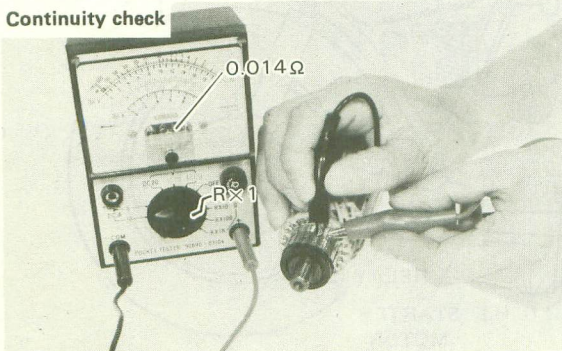


- c. The starter's armature coil should be checked with an ohm meter for insulation breakdown (shorting to each other or to ground) and for continuity. Reference figure is given below.

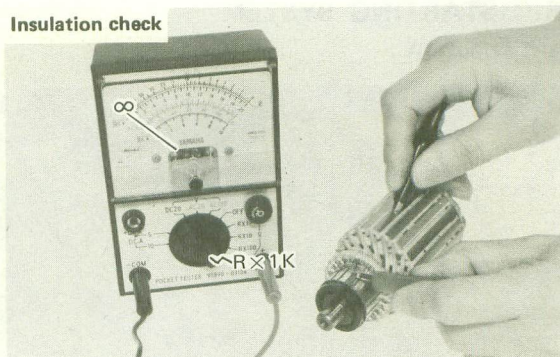
Coil resistance:

Armature coil: 0.014Ω at 20°C (68°F)

Continuity check

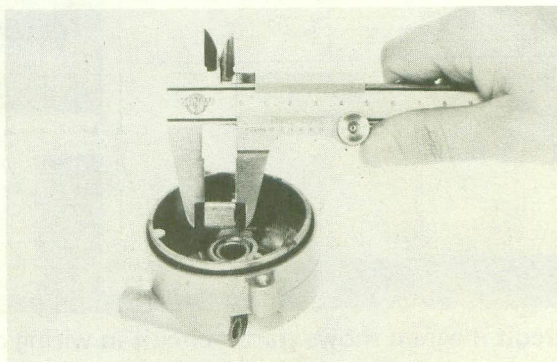


Insulation check



- d. Check the front and rear cover bearings for damage. If damaged, the starter assembly must be replaced.
- e. Check brush length. Replace brush if at, or near, limits.

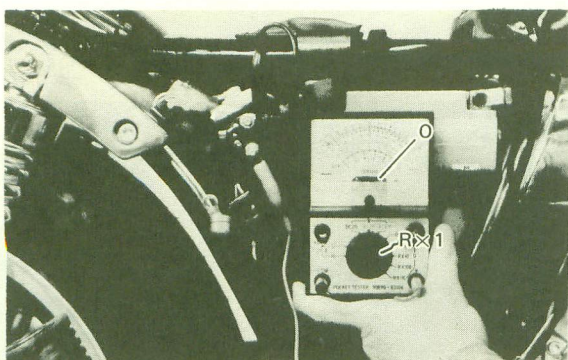
Minimum brush length: 8.5 mm (0.33 in)



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

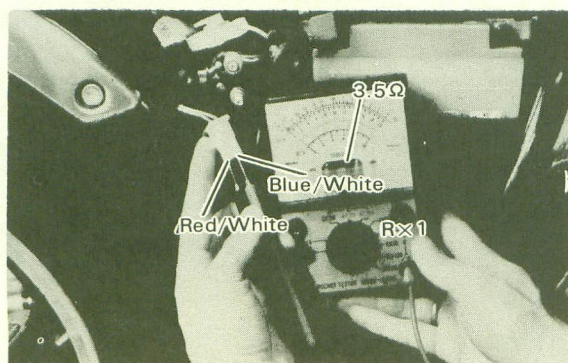
C. Starter Relay Switch

1. Inspection
 - a. Disconnect starter cable at the relay.
 - b. Connect pocket tester leads to the relay terminals (ohms x 1 scale).
 - c. Turn ignition to "ON" position, engine stop switch to "RUN" and change lever to "NEUTRAL".
 - d. Push the starter button. The relay should click once and the scale should read zero if it does not read zero, the relay must be replaced.



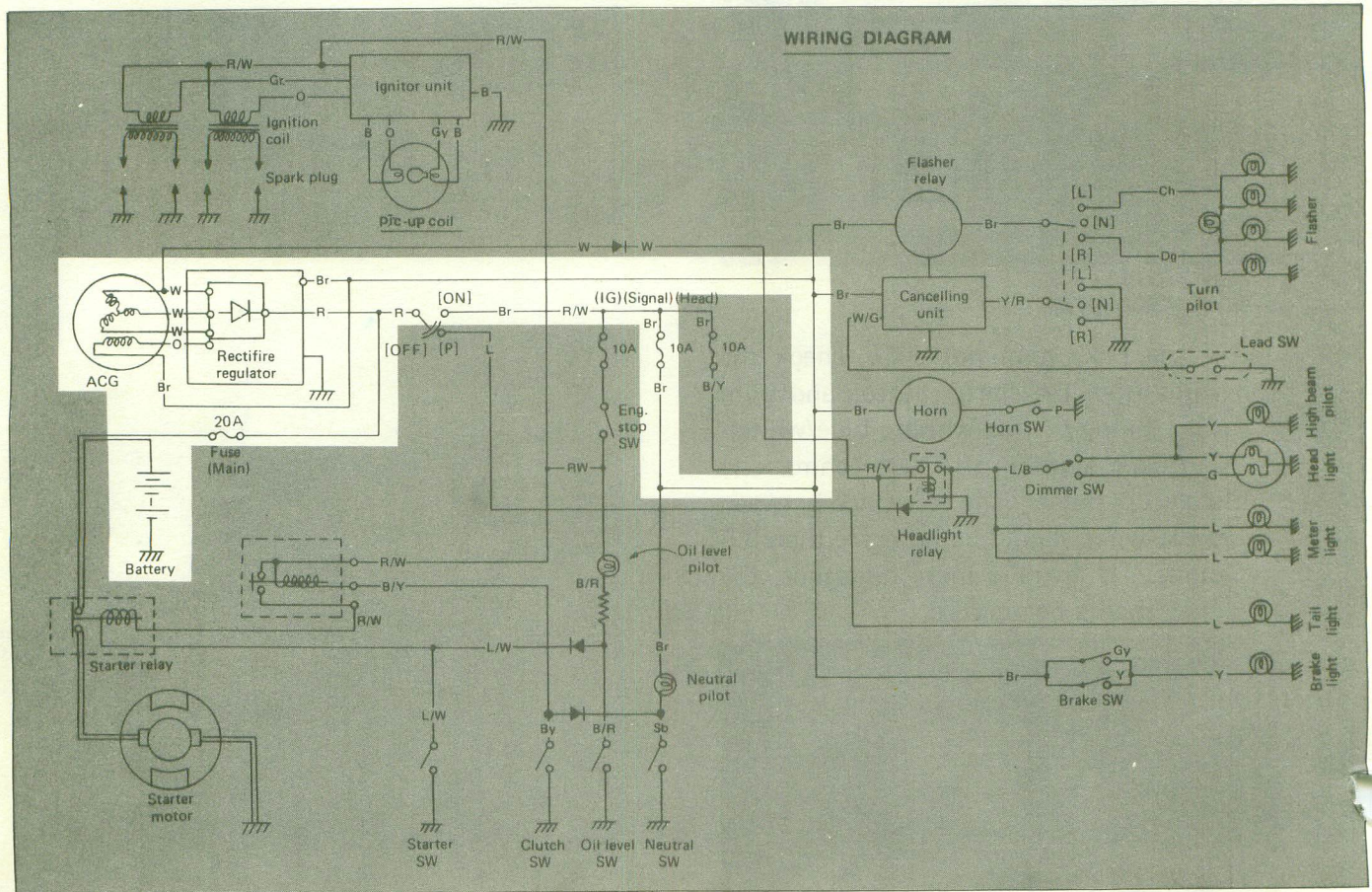
1. Battery lead wire (+)
2. Starter motor lead wire

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

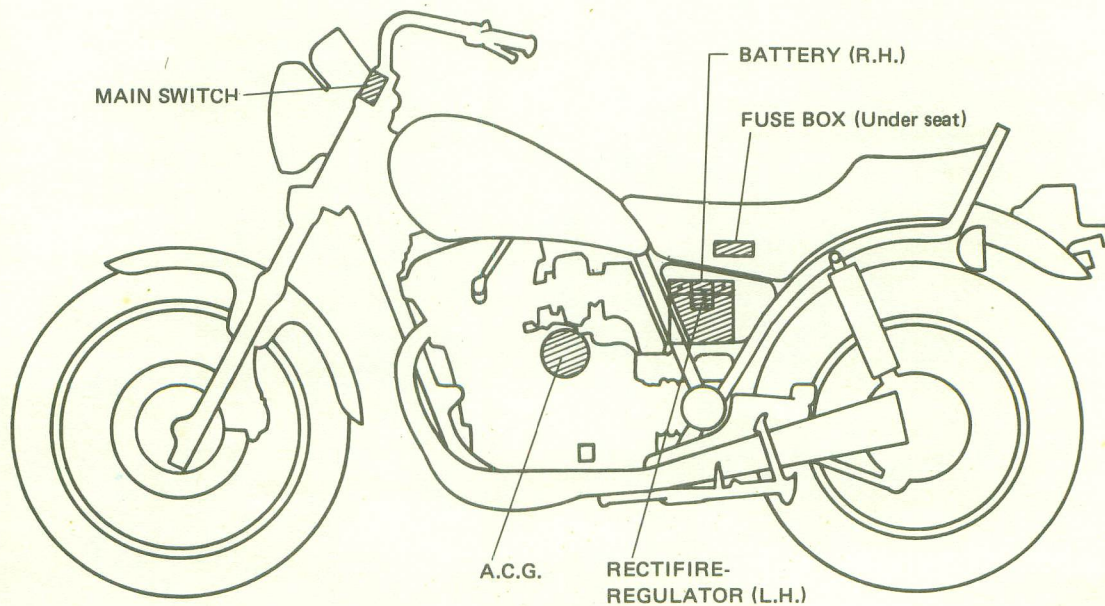


CHARGING SYSTEM

A. Circuit Diagram



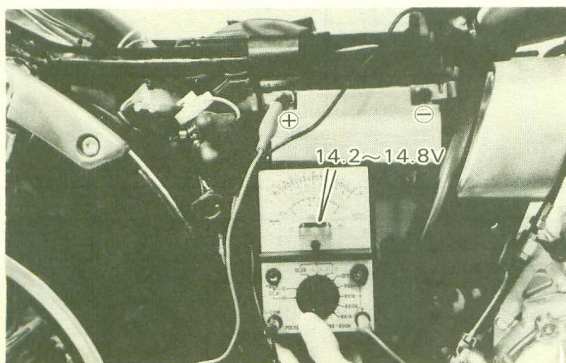
Above circuit diagram shows charging circuit in wiring diagram.



B. A.C. Generator

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

Generated voltage: $14.5 \pm 0.3V$



- d. If the indicated voltage cannot be reached, then perform the tests in step 2.

CAUTION:

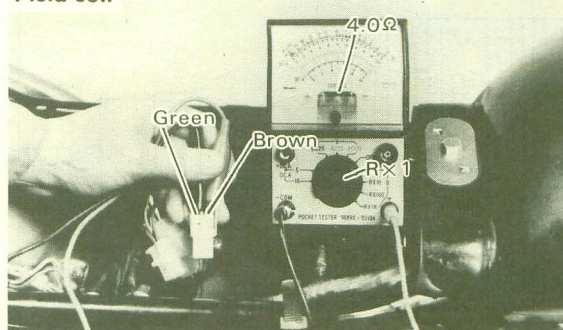
Never disconnect wires from the battery while the generator is in operation. If the battery is disconnected, the voltage across the generator terminals will increase, damaging the semiconductors.

2. Resistance test of field coil and stator coil.

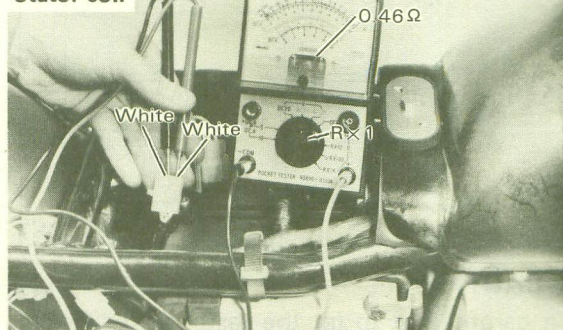
Check the resistance between terminals. If resistance is out of specification, coil is broken. Check the coil connections. If the coil connections are good, then the coil is broken inside and it should be replaced.

Field coil resistance: (Green-Brown)
 $4.0\Omega \pm 10\%$ at $20^{\circ}C$ ($68^{\circ}F$)
Stator coil resistance: (White-White)
 $0.46\Omega \pm 10\%$ at $20^{\circ}C$ ($68^{\circ}F$)

Field coil



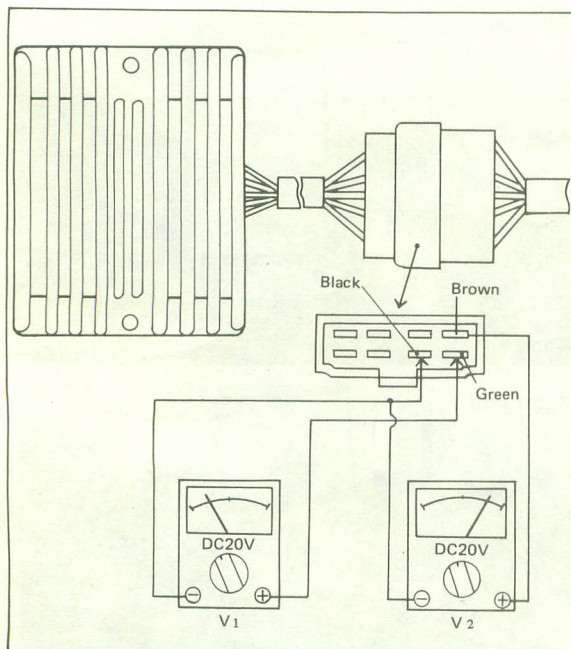
Stator coil



C. Voltage Regulator

The IC Voltage Regulator is a small and, normally, very reliable component. Due to its construction, it is lightweight and free from the wear and misadjustment associated with mechanical voltage regulators. If the following inspection reveals that the regulator is faulty, it cannot be adjusted and must be replaced.

1. Checking IC Voltage Regulator
 - a. Remove the seat.
 - b. Remove the left side cover.
 - c. Measure the specific gravity of the battery fluid. If it is less than 1.260, remove the battery and recharge until it is more than 1.260. (See page 124 for charging procedures)
 - d. Check the battery terminals and couplers for looseness.
 - e. Connect two Yamaha pocket testers to the regulator coupler as illustrated.



CAUTION:

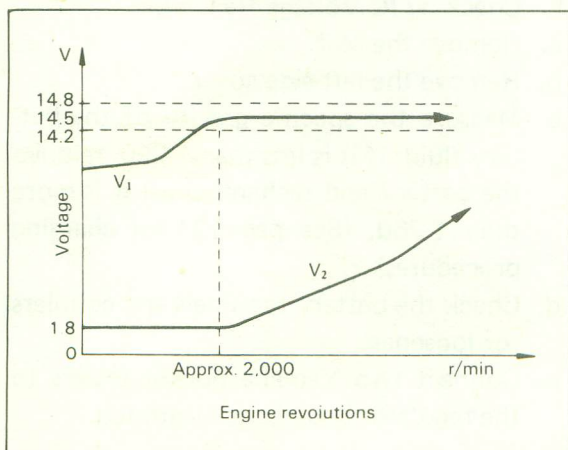
Be careful not to let the tester leads short circuit when connecting them to the regulator snap connector leads.

- f. Turn the main switch on. Make sure that V_2 is less than 1.8V.

NOTE:

Do not turn on lights or signals.

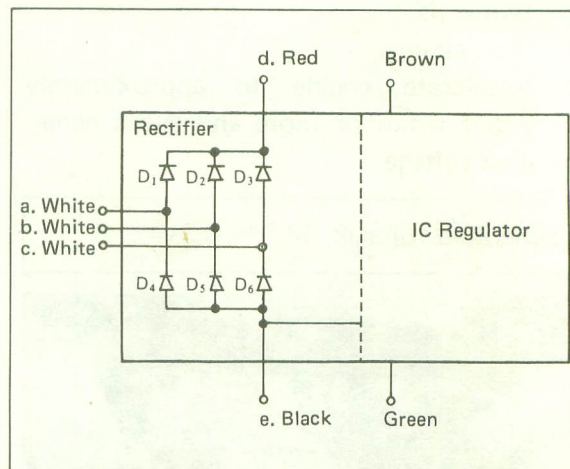
- g. Make sure that V_2 gradually increases up to 9 ~ 11V when the engine is started and its revolutions go up.



- h. Make sure that V_1 maintains the level of 14.2 ~ 14.8V even when engine revolutions increase.
- i. If these levels are not maintained, the regulator is defective and must be replaced.

2. Checking the silicon rectifier

- a. Check the silicon rectifier as specified using the Yamaha pocket tester.



Checking element	Pocket tester connecting point		Good	Replace (element shorted)	Replace (element opened)
	(+) (red)	(-) (black)			
D1	d	a	○	○	x
	a	d	x	○	x
D2	d	b	○	○	x
	b	d	x	○	x
D3	d	c	○	○	x
	c	d	x	○	x
D4	a	e	○	○	x
	e	a	x	○	x
D5	b	e	○	○	x
	e	b	x	○	x
D6	c	e	○	○	x
	e	c	x	○	x

○ : Continuity

x : Discontinuity (∞)

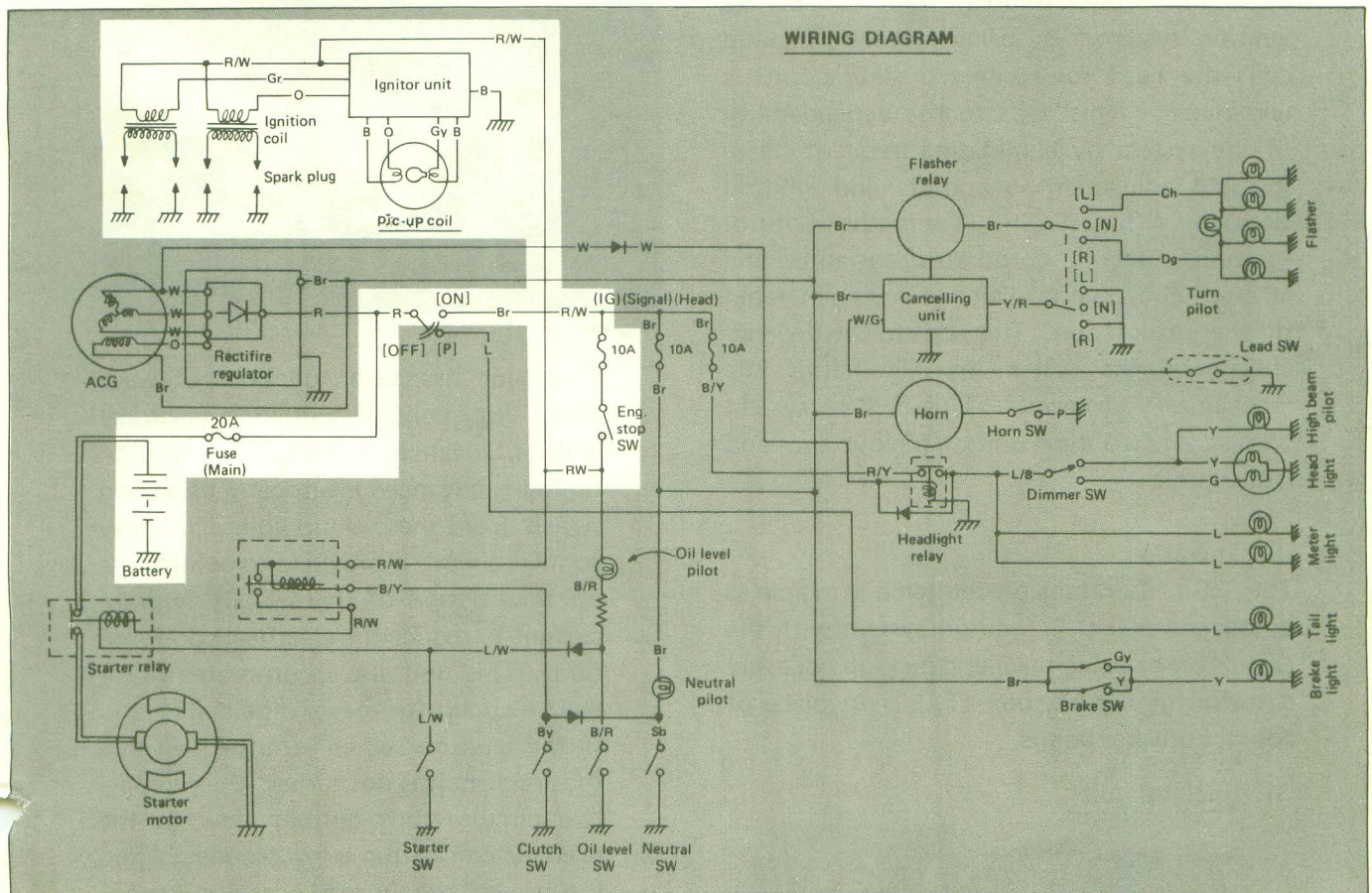
- b. Even if only one of the elements is broken, replace the entire assembly.

CAUTION:

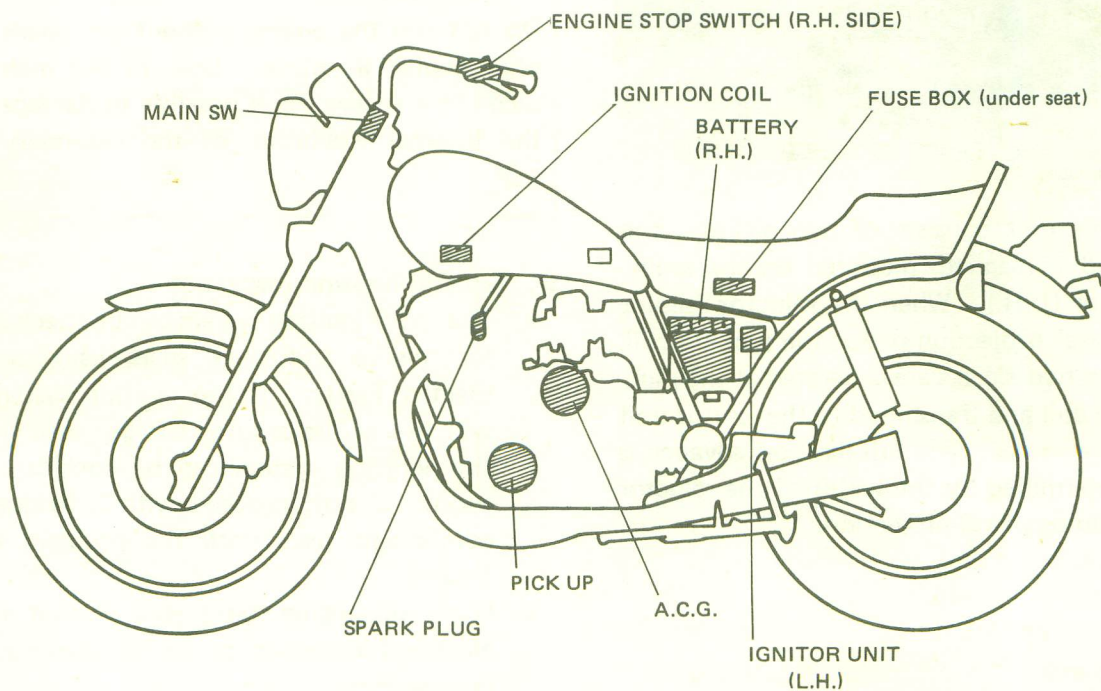
The silicon rectifier can be damaged if subjected to overcharging. Special care should be taken to avoid a short circuit and/or incorrect connection of the positive and negative leads at the battery. Never connect the rectifier directly to the battery to make a continuity check.

IGNITION SYSTEM

A. Circuit Diagram



Above circuit diagram shows only ignition circuit in wiring diagram.



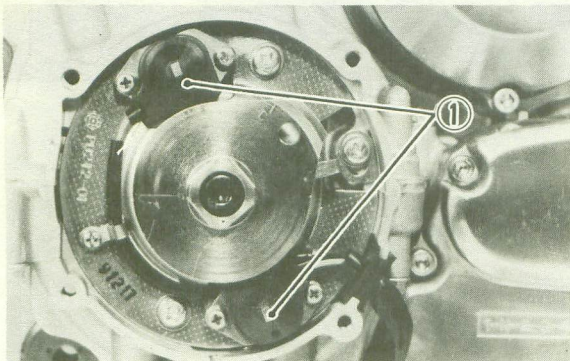
B. Description

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

C. Operation

The T.C.I. functions on the same principle as a conventional D.C. ignition system with the exception of using magnetic pick-up coils and a transistor control box (T.C.I.) in place of contact breaker points.

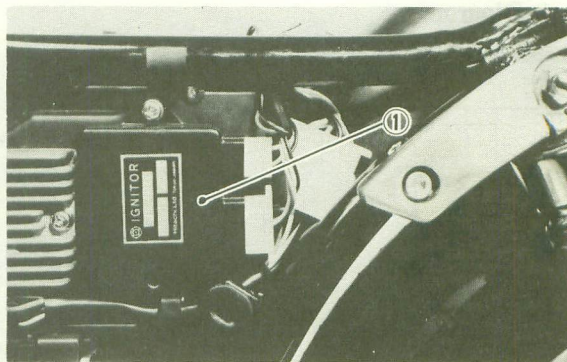
1. Pick-up unit



1. Pick-up coils

This unit consists of two pick-up coils and a magneto mounted on the crankcase (L.H.). When the reluctor (timing plate) projection passes the pick-up coil, the two signals are generated at the pick-up coil and transmitted to the ignitor unit as a signal. The full ignition advance is determined by the width of the reluctor (timing plate) projection.

2. Ignitor unit



1. Ignitor unit (T.D.I. unit)

This unit has such functions of wave form, duty control, switching, electrical ignition advance, and etc. The ignition timing is advanced electrically using two signals from the pick-up coil. The duty control circuit is provided to control the on time period of the primary ignition current to reduce the electrical consumption. This unit also incorporates a protective circuit for the ignition coil.

If the ignition switch is turned on and the crankshaft is not turned, the protective circuit stops current flow to the primary coil within a few seconds. When the crankshaft is turned over, the current is turned on again by the signals generated by the pick-up coils.

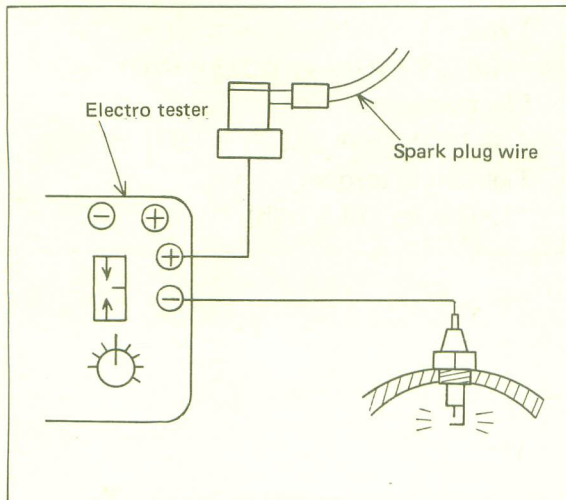
CAUTION:

Do not run the engine without any spark plug cap(s) in place. Due to the high secondary voltage, it is possible to damage the internal insulation of the secondary coil.

D. Troubleshooting/Inspection

1. The entire ignition system can be checked for misfire and weak spark using the Electro Tester. If the ignition system will fire across a sufficient gap, the entire ignition system can be considered good. If not, proceed with individual component tests until the problem is found.
 - a. Warm up engine thoroughly so that all electrical components are at operating temperature.

- b. Stop the engine and connect the tester as shown.



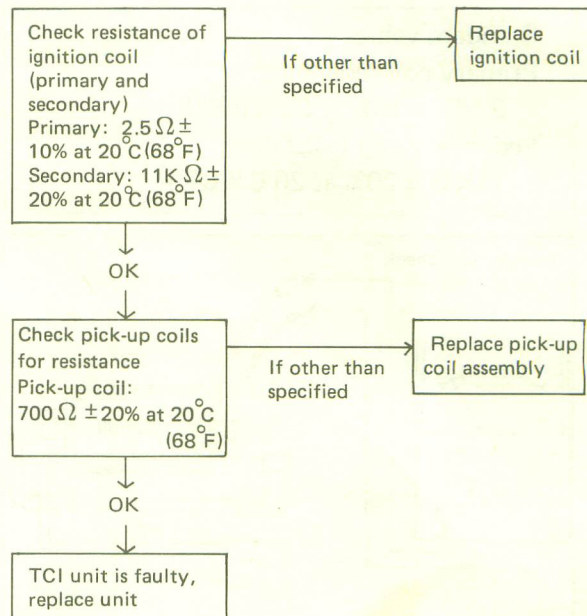
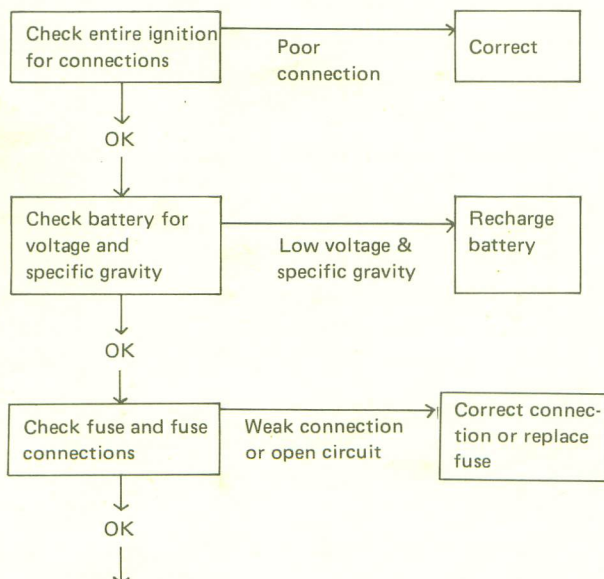
- c. Start the engine and increase the spark gap until misfire occurs. (Test at various r/min between idle and red line.)

Minimum spark gap: 6 mm (0.24 in)

CAUTION:

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

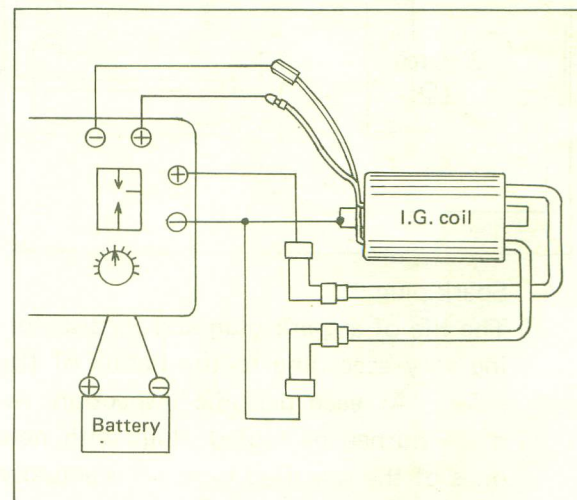
2. If the ignition system should become inoperative, the following troubleshooting aids will be useful.



3. Ignition coil

- a. Coil spark gap test.

- 1) Remove the fuel tank and disconnect the ignition coil from wire harness and spark plugs.
- 2) Connect the Electro Tester as shown.



- 3) Connect fully charged battery to tester.
- 4) Turn on spark gap switch and the increase gap to maximum unless misfire occurs first.

Minimum spark gap: 6 mm (0.24 in)

- b. Direct current resistance test. Use a pocket tester or equivalent ohmmeter to determine resistance and continuity of primary and secondary coil windings.

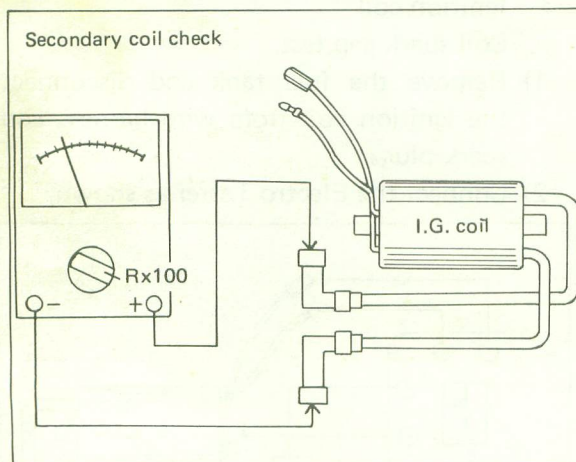
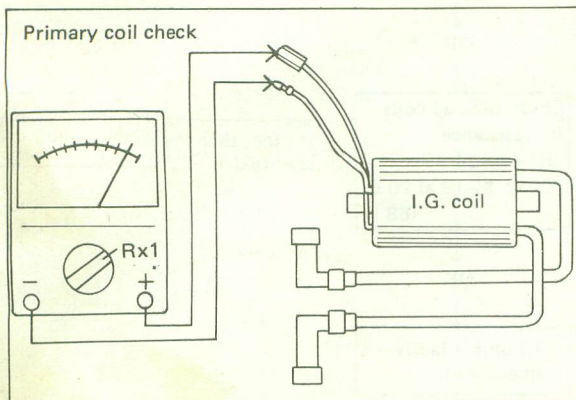
Standard value:

Primary coil resistance:

$2.5\Omega \pm 10\%$ at 20°C (68°F)

Secondary coil resistance:

$11\text{K}\Omega \pm 20\%$ at 20°C (68°F)



avoid overheating, fouling or piston damage.

Type:

BP7ES (NGK) or W22EP (ND)

Electrode gap:

0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

Tightening torque:

2.0 m·kg (14.5 ft·lb)

4. Spark plug

The life of a spark plug and its discoloring vary according to the habits of the rider. At each periodic inspection, replace burned or fouled plugs with new ones of the specified type. It is actually economical to install new plugs often since it will tend to keep the engine in good condition and prevent excessive fuel consumption.

a. Inspection

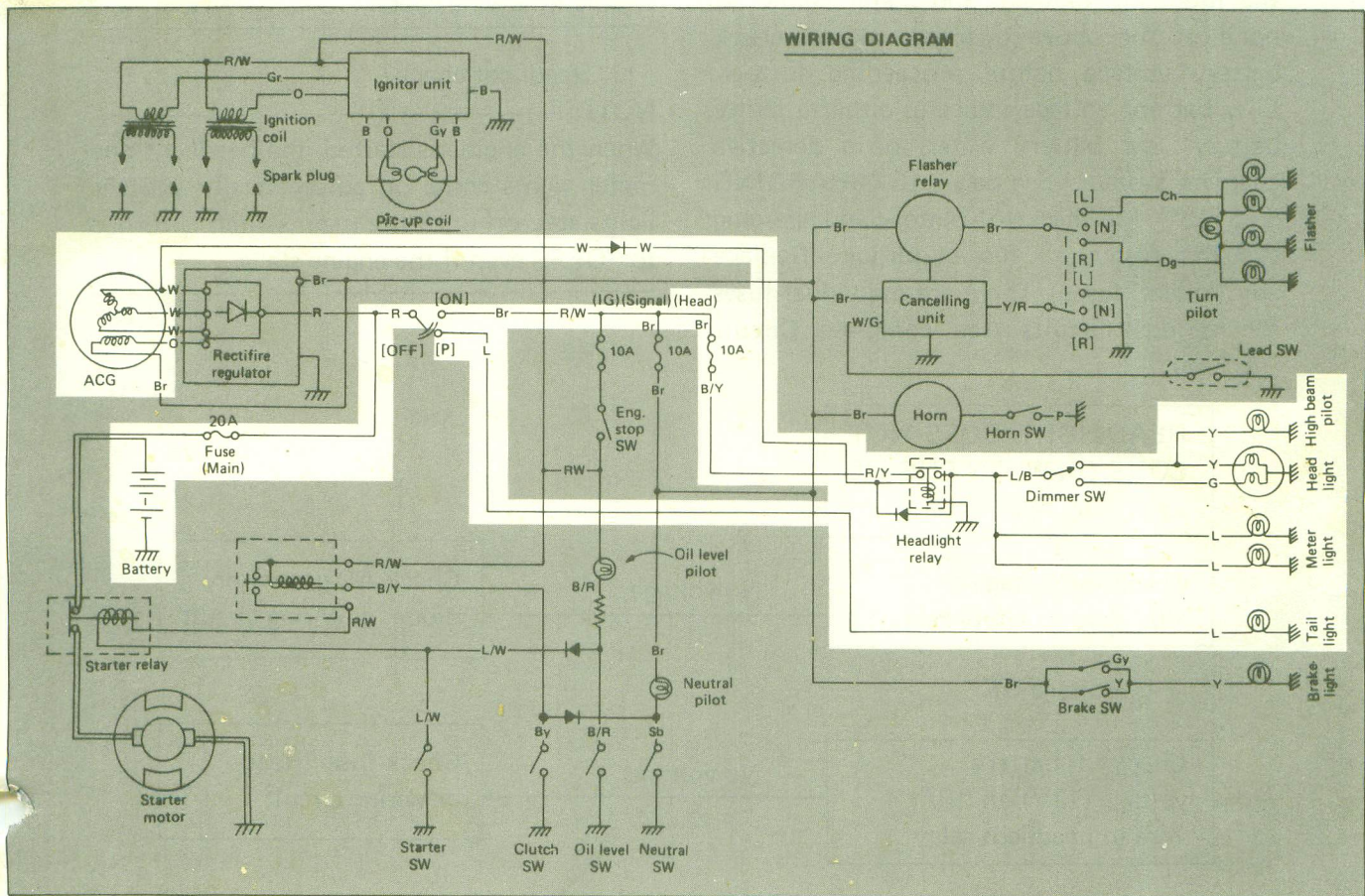
- 1) Inspect and clean the spark plug every 4,000 km (2,500 mi) and replace after initial 13,000 km (8,000 mi).
- 2) Clean the electrodes of carbon and adjust the electrode gap to the specification.

b. Installation

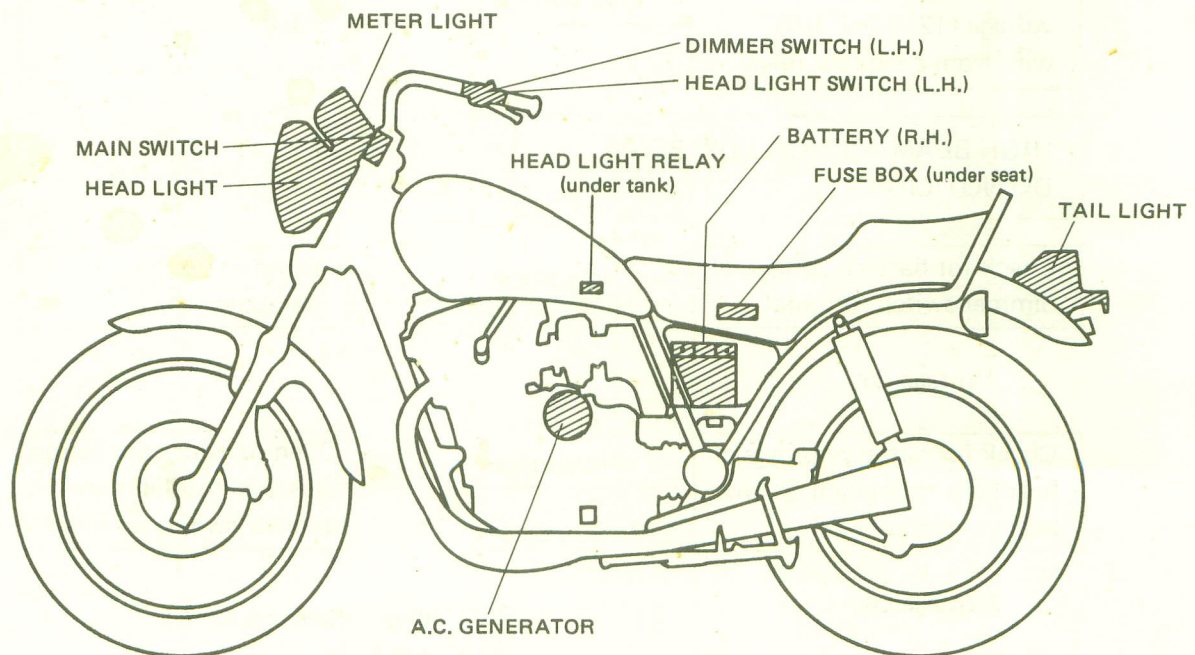
Be sure to use the proper reach, type and electrode gap plug(s) as a replacement to

LIGHTING SYSTEM

A. Circuit Diagram



Above circuit diagram shows only lighting circuit in wiring diagram.



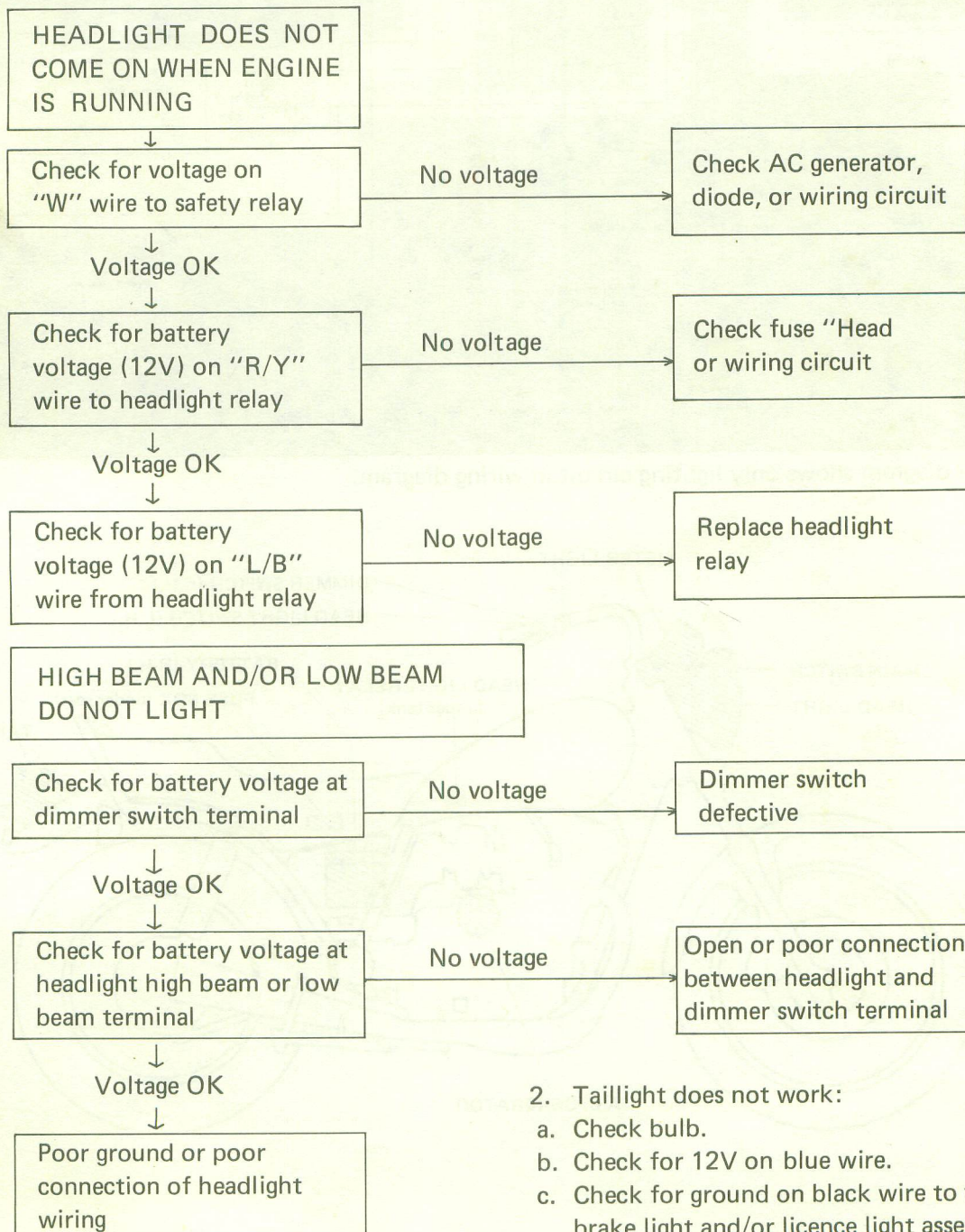
B. Lighting Tests and Checks

The battery provides power for operation of the headlight, taillight, and meter lights. 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 page 113 "CHARGING SYSTEM" for checks of battery and charging system. Also check fuse condition. Replace any "open" fuses. There are individual fuses for various circuits (see complete Circuit Diagram).

NOTE: _____
Check the headlight bulb first before performing the following check.

1. Headlight check

NOTE: _____
When the engine is started, the headlight and meter lights come on automatically and the lights stay on until the main switch is turned to "OFF" even if the engine stalls.

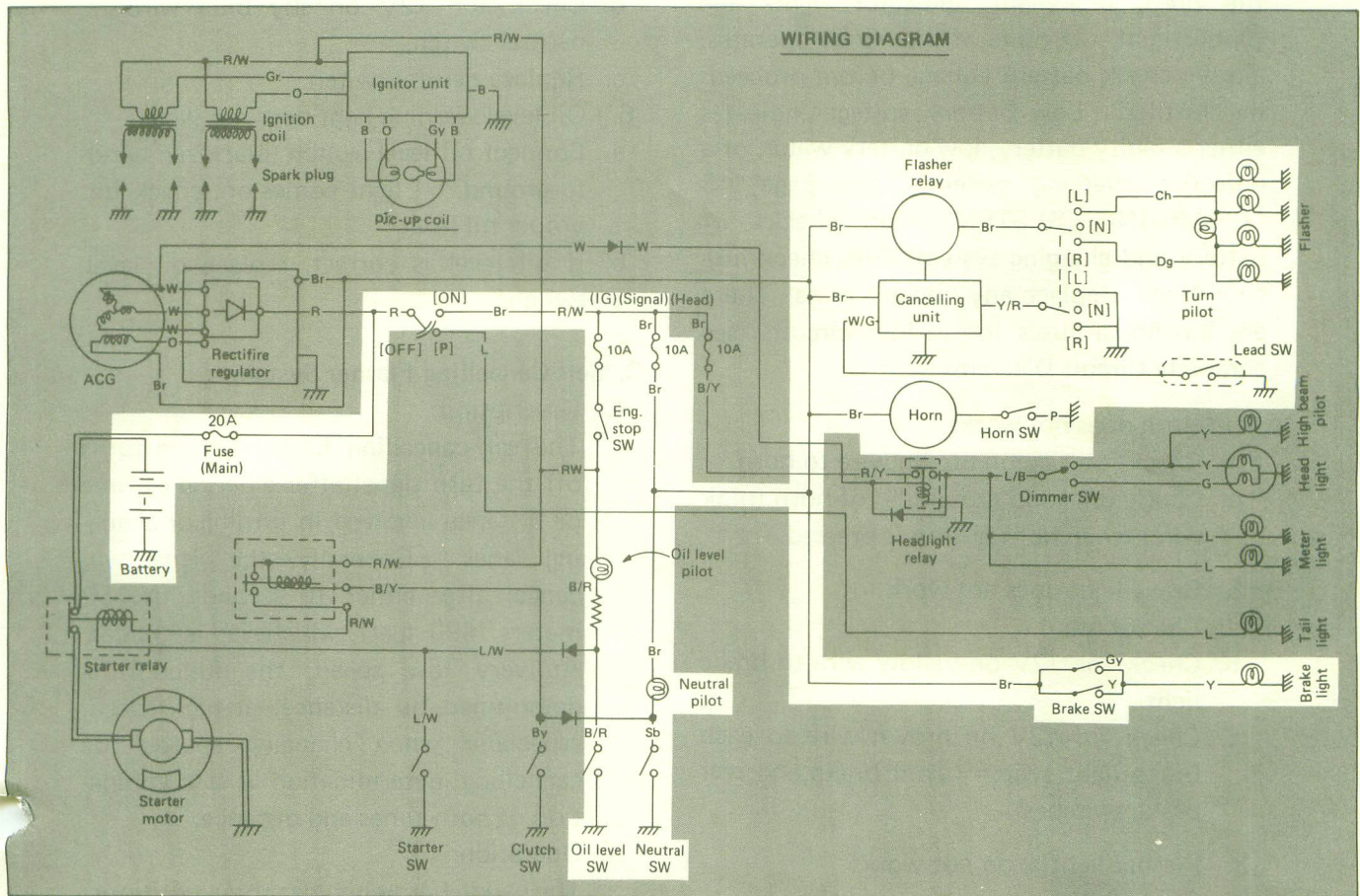


2. Taillight does not work:

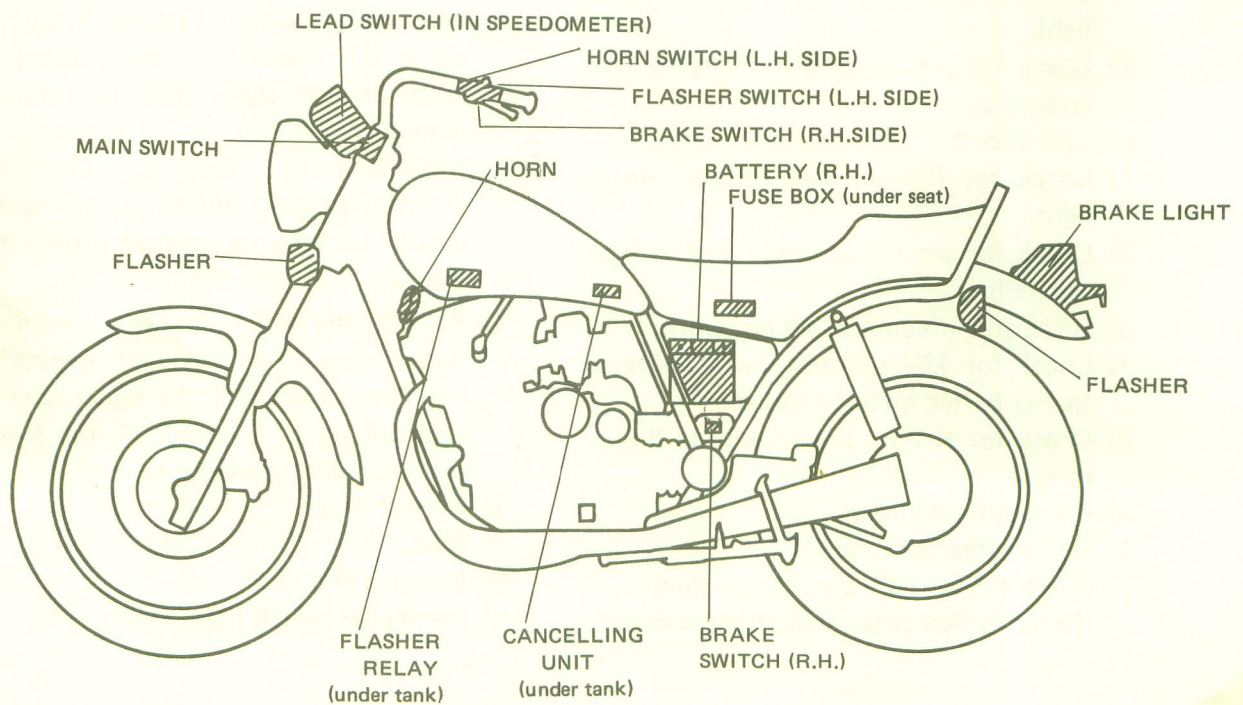
- Check bulb.
- Check for 12V on blue wire.
- Check for ground on black wire to tail/brake light and/or licence light assembly.

SIGNAL SYSTEM

A. Circuit Diagram



Above circuit diagram shows only signal circuit in wiring diagram.



B. Signal System Tests and Checks

The battery provides power for operation of the horn, brakelight, indicator lights 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 page 113 "CHARGING SYSTEM" for checks of battery and charging system. Also check fuse condition. Replace any "open" fuses. There are individual fuses for various circuits (see complete Circuit Diagram).

1. Horn does not work:
 - a. Check for 12V on brown wire to horn.
 - b. Check for good grounding of horn (pink wire) when horn button is pressed.
2. Brake light does not work:
 - a. Check bulb.
 - b. Check for 12V on yellow wire to brake light.
 - c. Check for 12V on brown wire to each brake light switch (front brake and rear brake switches).
3. Flasher light(s) do not work:
 - a. Check bulb.
 - b. Right circuit:
 - 1) Check for 12V on dark green wire to light.
 - 2) Check for ground on black wire to light assembly.
 - c. Left circuit:
 - 1) Check for 12V on dark brown wire to light.
 - 2) Check for ground on black wire to light assembly.
 - d. Right and left circuits do not work:
 - 1) Check for 12V on brown/white wire to flasher switch on left handlebar.
 - 2) Check for 12V on brown wire to flasher relay.
 - 3) Replace flasher relay.
 - 4) Replace flasher switch.
 - e. Check flasher self-cancelling system.
(Refer to flasher self-cancelling system.)

4. Neutral light does not work:
 - a. Check bulb.
 - b. Check for 12V on sky blue wire to neutral switch.
 - c. Replace neutral switch.
6. Oil level warning light does not work:
 - a. Connect oil level switch (black/red wire) to ground. If light comes on, check for proper oil level.
 - b. If oil level is correct, replace oil level switch.

C. Self-Cancelling Flasher System

1. Description:

The self-cancelling flasher system turns off the turn signal after a period of time or distance involved in turning or changing lanes. Generally, the signal will cancel after either 10 seconds, or 150 meters (490 feet), whichever is greater. At very low speed, the function is determined by distance; at high speed, especially when changing speeds the cancelling determination is a combination of both times and distance.
2. Operation:

The handlebar switch has three positions: L (left), OFF, and R (right). The switch lever will return to the "OFF" position after being pushed to L or R, but the signal will function. By pushing the lever in, the signal may be cancelled manually.
3. Inspection

If the flasher self-cancelling system should become inoperative, proceed as follows:

 - a. Pull of the 6-pin connector from the flasher cancelling unit, and operate the handlebar switch, if the signal operates normally in L, R, and OFF, the following are in good condition.
 - 1) Flasher unit
 - 2) Bulb
 - 3) Lighting circuit
 - 4) Handlebar switch light circuit

If (1) through (4) are in good condition, the following may be faulty:

- 1) Flasher cancelling unit.
- 2) Handlebar switch reset circuit.
- 3) Speedometer sensor circuit.
- b. Pull off the 6-pin connector from the flasher cancelling unit, and connect a tester (ohms x 100 range) across the white/green and the black lead wires on the wire harness side. Turn the speedometer shaft. If the tester needle swing back and forth between 0 and ∞ , the speedometer sensor circuit is in good condition. If not, the sensor to wire harness may be inoperative.
- c. Pull the 6-pin connector from the flasher cancelling unit. Check if there is continuity between the yellow/red lead wire on the wire harness side and the chassis.

Flasher switch OFF: ∞
Flasher switch L or R: 0 ohms

If the tester needle does not swing as indicated above, check the handlebar switch circuit and wire harness.

- d. If no defect is found with the above three check-ups and the flasher cancelling system is still inoperative, replace the flasher cancelling unit.
- e. If the signal flashes only when the handlebar switch lever is turned to L or R and it turns off immediately when the handlebar switch lever returns to center, replace the flasher cancelling unit.

D. Switches

Switches may be checked for continuity with a pocket tester on the "ohm x 1" position.

1. Main switch

Switch Position	Wire Color		
	R	Br	L/Y
ON	○—○—○		
OFF			
LOCK			
P (parking)	○—○—○		

2. "ENGINE STOP" Switch

Switch Position	Wire Color	
	R/W	R/W
RUN	○—○	
OFF		

3. "START" switch

Button Position	Wire Color	
	L/W	Ground
PUSH	○—○	
OFF		

4. "LIGHTS" (Dimmer) switch

Switch Position	Wire Color					
	Y	L/Y	G	G	L/G	Y/B
HI	○—○			○—○		
LO		○—○			○—○	

5. "TURN" switch

Switch Position	Wire Color				
	Ch	Br/W	Dg	Y/R	Ground
L	○—○			○—○	
L → N	○—○				
N → Push					
R → N		○—○			
R		○—○	○—○	○—○	

6. "HORN" Switch

Button Position	Wire Color	
	P	Ground
PUSH	○—○	
OFF		

E. Battery

1. Checking

If the battery shows the following defects, it should be replaced.

- a. The battery voltage will not rise to a specific value or no gassing occurs in any cell even after many hours of charging.
- b. Sulfation of one or more cells is indicated by the plates turning white or an accumulation of material in the bot-

tom of the cell.

- c. Specific gravity readings after a long slow charge indicate a cell to be lower than any others.
- d. Warpage or buckling of plates or insulators is evident.

—WARNING:—

Battery fluid is poisonous and dangerous, causing severe burns, etc. Contains sulfuric acid. Avoid contact with skin, eyes or clothing.

Antidote: EXTERNAL-FLUSH with water. INTERNAL-Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil. Call physician immediately.

Eyes: Flush with water for 15 minutes and get prompt medical attention. Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc., away. Ventilate when charging or using in enclosed space. Always shield eyes when working near batteries.

KEEP OUT OF REACH OF CHILDREN.

Battery	12N12A-4A-1
Electrolyte	Specific gravity: 1.280
Initial charging current	1.2 amp for 10 hours (new battery)
Recharging current	10 hours (or until specific gravity reaches 1.280)
Refill fluid	Distilled water (to maximum level line)
Refill period	Check once per month (or more often, required)

2. 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 or sulfuric acid containing impurities.
 - f. Improper charging voltage or current on new battery.
3. If the motorcucle is not to be used for a long time, remove the battery and have it stored. The following instructions should be observed:
 - a. Recharge the battery periodically.
 - b. Store the battery in a cool, dry place.
 - c. Recharge the battery before reinstallation.

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CHAPTER 7. APPENDICES

SPECIFICATIONS

General Specifications

	XJ650G
Basic color	Black Blue or New Ruby Red
Dimensions:	
Overall length	2,165 mm (85.2 in)
Overall width	860 mm (33.9 in)
Overall height	1,180 mm (46.5 in)
Seat height	750 mm (29.5 in)
Wheelbase	1,445 mm (56.9 in)
Minimum ground clearance	150 mm (5.9 in)
Caster (steering head angle)	29°
Trail	124 mm (4.88 in)
Weight:	
Net	203 kg (447 lb)
Engine:	
Type	D.O.H.C. air-cooled, gasoline
Bore x stroke x cylinders	63.0 x 52.4 mm x 4 (2.480 x 2.063 in x 4)
Displacement	653 cc (39.85 cu. in)
Compression ratio	9.2 : 1
Lubrication:	
Lubrication system	Pressure lubricated, wet sump
Delivery pump type	Trochoid
Carburetion:	
Manufacture	HITACHI
Type	HSC32, constant velocity
Rated venturi size	32 mm (1.26 in)
Air filter:	Dry type element
Ignition:	
Type	Battery ignition (Full transistor ignition)
Spark plug	BP7ES (NGK) or W22EP (ND)
Charging:	
Type	Three-phase, regulated alternator
Manufacture, I.D. No.	HITACHI, LD119-08
Maximum output	14V 19A
Battery type	12N12A-4A
Battery dimensions	80 x 160 x 134 mm (3.15 x 6.30 x 5.28 in)
Regulator/Rectifier	S8534, I.C. type, full wave
Regulating voltage (No. load)	14.2 ~ 14.8V
Starting:	Electric starter
Primary drive:	
Type	Spur gear
Teeth, ratio	97/58 1.672
Clutch:	Wet, multiple disc
Transmission:	
Type	Constant mesh, 5-speed drum shifter

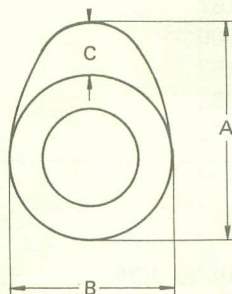
	XJ650G
Teeth, ratio 1st 2nd 3rd 4th 5th	35/16 2.187 30/20 1.500 30/26 1.152 28/30 0.933 26/32 0.812
Secondary drive: Type Transmission output: Type, teeth, ratio Middle gear case: Type, teeth, ratio Final gear case: Type, teeth, ratio	Shaft drive Spur gear, 49/36, 1.361 Bevel gear, 19/18, 1.055 Bevel gear, 32/11, 2.909
Chassis: Frame Suspension: Front (type, travel) Rear (type, travel) Tires: Front Rear Brakes: Front Rear Fuel tank: Total Reserve Wheels: Front Rear	Tubular steel double cradle Telescopic fork 150 mm (5.91 in) Swing arm, 80 mm (3.15 in) 3.25H19-4PR, Tubeless 130/90-16 67H, Tubeless Single hydraulic disc Drum brake 13 Lit (3.4 US. gal) 3.4 Lit (0.8 US. gal) MT1.85 x 19, Cast Aluminum MT3.00 x 16, Cast Aluminum

Maintenance Specifications

1. Engine

Engine oil capacity: Total amount Oil and filter change Oil change Recommended lubricant: If temperature does not go below 5°C (40°F) If temperature does not go above 15°C (60°F)	3,200 cc (3.4 US. qt) 2,650 cc (2.8 US. qt) 2,350 cc (2.5 US. qt) SAE 20W/40 SE motor oil SAE 10W/30 SE motor oil
Cranking pressure (at seal level): Maximum difference between cylinders:	11 kg/cm ² (156 psi) 1 kg/cm ² (14 psi)

Camshafts:



Dimensions		Standard size	Wear limit
Intake	A	36.80 mm (1.449 in)	36.65 mm (1.443 in)
	B	28.0 mm (1.102 in)	27.85 mm (1.096 in)
	C	8.50 mm (0.335 in)	—
Exhaust	A	35.80 mm (1.449 in)	35.65 mm (1.404 in)
	B	28.0 mm (1.102 in)	27.85 mm (1.096 in)
	C	7.8 mm (0.307 in)	—

Camshaft bearing surface diameter:

24.967 ~ 24.980 mm (0.9830 ~ 0.9835 in)

Camshaft-to-cap clearance:

0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)

Standard

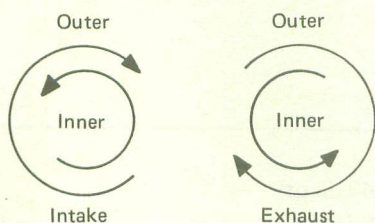
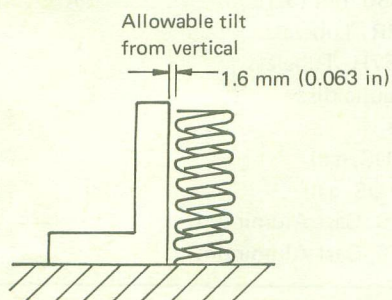
0.160 mm (0.006 in)

Maximum

0.1 mm (0.004 in)

Camshaft runout limit

Valves:



	Inner Intake/Exhaust	Outer Intake/Exhaust
Free length	35.9 mm (1.413 in)	39.5 mm (1.555 in)
Spring rate	2.36 kg/mm (132.2 lb/in)	4.58 kg/mm (256.5 lb/in)
Installed length (valve closed)	31.0 mm (1.220 in)	34.0 mm (1.339 in)
Installed pressure (valve closed)	9.0 kg (19.8 lb)	19.1 kg (42.1 lb)
Compressed length (valve open)	IN: 22.8 mm (0.898 in) EX: 23.5 mm (0.925 in)	IN: 25.8 mm (1.016 in) EX: 26.5 mm (1.043 in)
Wire diameter	2.8 mm (0.110 in)	3.9 mm (0.154 in)
Number of windings	7.75	6.1
Winding O.D.	20.6 ^{+0.3} ₀ mm (0.811 ^{+0.012} ₀ in)	29.4 ⁰ _{-0.3} mm (1.157 ⁰ _{-0.012} in)

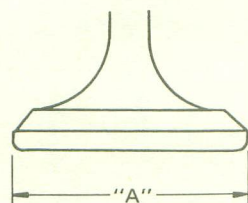
Valve stem run-out maximum

0.03 mm (0.0012 in)

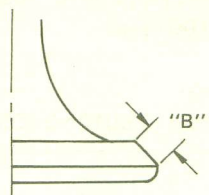
Valve seat width standard/maximum

1.0 mm (0.039 in)/2.0 mm (0.080 in)

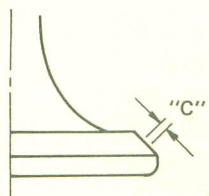
INTAKE



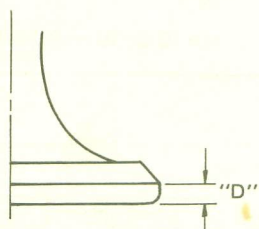
Clearance (Cold engine)	0.11 ~ 0.15 mm (0.004 ~ 0.006 in)
"A" head diameter	33 ± 0.1 mm (1.2992 ± 0.0039 in)
"B" face width	2.3 mm (0.0906 in)
"C" seat width	1.0 ± 0.1 mm (0.0394 ± 0.0039 in)
"D" margin thickness (minimum)	1.2 ± 0.2 mm (0.0472 ± 0.0079 in)



Stem diameter (O.D.)	$7 \begin{smallmatrix} -0.010 \\ -0.025 \end{smallmatrix} \text{ mm}$ $(0.2756 \begin{smallmatrix} -0.0004 \\ -0.0010 \end{smallmatrix} \text{ in})$
Guide diameter (I.D.)	$7 \begin{smallmatrix} +0.012 \\ 0 \end{smallmatrix} \text{ mm}$ $(0.2756 \begin{smallmatrix} +0.0005 \\ 0 \end{smallmatrix} \text{ in})$
Stem-to-guide clearance	$0.010 \sim 0.037 \text{ mm}$ $(0.0004 \sim 0.0015 \text{ in})$

EXHAUST

Clearance (Cold engine)	0.16 ~ 0.20 mm (0.006 ~ 0.008 in)
"A" head diameter	28 ± 0.1 mm (1.2205 ± 0.0039 in)
"B" face width	2.3 mm (0.0906 in)
"C" seat width	1.0 ± 0.1 mm (0.0394 ± 0.0039 in)
"D" margin thickness (minimum)	1.0 ± 0.2 mm (0.0392 ± 0.0079 in)
Stem diameter (O.D.)	7 $\begin{smallmatrix} -0.025 \\ -0.040 \end{smallmatrix}$ mm (0.2756 $\begin{smallmatrix} -0.0010 \\ -0.0016 \end{smallmatrix}$ in)
Guide diameter (I.D.)	7 $\begin{smallmatrix} +0.012 \\ 0 \end{smallmatrix}$ mm (0.2756 $\begin{smallmatrix} +0.0005 \\ 0 \end{smallmatrix}$ in)
Stem-to-guide clearance	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)



Cylinder and piston:		Aluminum alloy		
Cylinder material		Pressed in; special cast iron		
Cylinder liner		63.00 mm (2.4803 in)		
Bore size: standard		63.10 mm (2.4843 in)		
Wear limit		0.05 mm (0.0020 in)		
Cylinder taper limit		0.01 mm (0.0004 in)		
Cylinder out-of-round limit		0.030 ~ 0.050 mm (0.0012 ~ 0.0020 in)		
Piston clearance: standard		0.1 mm (0.0039 in)		
maximum		213 g (7.520 oz)		
Piston weight (include rings, pin and clips)				
Piston rings:		Top	2nd	Oil
Design		Barrel	Taper	Expander
End gap (installed): standard		0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in)	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in)	0.3 ~ 0.9 mm (0.0118 ~ 0.035 in)
limit		1.0 mm (0.0394 in)	1.0 mm (0.0394 in)	1.5 mm (0.0591 in)
Side clearance: standard		0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)	0.02 ~ 0.06 mm (0.008 ~ 0.0024 in)	—
limit		0.15 mm (0.0059 in)	0.15 mm (0.0059 in)	—

2. Carburetion

Manufacturer	HITACHI	Fuel level	3 ± 1 mm (0.118 ± 0.039 in)
Model I.D. No.	4H700	Pilot screw	Preset
Main jet	# 110	Air jet, Main	# 50
Needle jet	φ 3.2	Air jet, Pilot	# 195
Pilot jet	# 40	Throttle valve	32 mm (1.26 in)
Starter jet	# 40 (φ 0.9)	Float valve seat	φ 2.0
Jet needle	Y-10	Engine idle speed	1,050 r/min

3. Chassis

*Total weight of accessories, etc. excepting motorcycle.

Wheels and tires:		
Rim run-out: vertical	2.0 mm (0.079 in)	
horizontal	2.0 mm (0.079 in)	
Tire pressure (cold):	Front	Rear
Up to 90 kg (198 lb) load*	1.8 kg/cm ² (26 psi)	2.0 kg/cm ² (28 psi)
90 kg (198 lb) ~ 160 kg (353 lb) load*	2.0 kg/cm ² (26 psi)	2.3 kg/cm ² (32 psi)
160 kg (353 lb) ~ 230 kg (507 lb) load* (Maximum load)	2.0 kg/cm ² (28 psi)	2.8 kg/cm ² (40 psi)
High speed riding	2.3 kg/cm ² (36 psi)	2.5 kg/cm ² (40 psi)
Minimum tire tread depth	0.8 mm (0.03 in)	0.8 mm (0.03 in)
Brakes:		
Recommended fluid	DOT # 3	
Pad wear limit	6.5 mm (0.26 in)	
Rear brake lining wear limit	2 mm (0.08 in)	
Brake disc maximum deflection	0.15 mm (0.006 in)	
Brake disc minimum thickness	6.5 mm (0.26 in)	
Front brake free play (end of lever)	5.0 ~ 8.0 mm (0.2 ~ 0.3 in)	
Rear brake free play (end of pedal)	20 ~ 30 mm (0.8 ~ 1.2 in)	
Front forks:		
Travel	150 mm (5.91 in)	
Spring free length	606 mm (23.86 in)	
Spring preload length	571 mm (22.48 in)	
Spring rate: 0 ~ 100 mm (0 ~ 3.94 in)	0.475 kg/mm (26.6 lb/in)	
100 ~ 150 mm (3.94 ~ 5.91 in)	0.626 kg/mm (35.1 lb/in)	
Fork oil capacity (each side)	262 cc (9.24 oz)	
Oil type	Yamaha Fork Oil 10Wt or equivalent	
Rear shock absorbers:		
Spring free length	232.5 mm (9.15 in)	
Spring preload length	216.5 mm (8.52 in)	
Spring rate: 0 ~ 55 mm (0 ~ 2.17 in)	1.6 kg/mm (89.6 lb/in)	
55 ~ 80 mm (2.17 ~ 3.15 in)	2.2 kg/mm (123.2 lb/in)	
Travel	80 mm (3.15 in)	

4. Electrical

Ignition timing retarded: Ignition timing advance:	10° at 1,050 r/min 4,100 $\begin{smallmatrix} +400 \\ -350 \end{smallmatrix}$ r/min at 35.5° 1,800 $\pm$ 200 r/min at 12° 37.5° $\pm$ 2° at 5,000 r/min Advance (Rotor Shaft Degree) (x 1,000 r/min)
Spark plug: Electrode gap	NGK BP7ES or ND W22EP 0.7 ~ 0.8 mm (0.023 ~ 0.032 in)
Spark plug cap resistance:	5.0k Ω (No. 1, No. 4), 10k Ω (No. 2, No. 3)
Pick up coil: Resistance	700 Ω $\pm$ 20% at 20°C (68°F)
Ignition coil type: Spark gap Primary resistance Secondary resistance	HITACHI CM12-09 2.5 Ω $\pm$ 10% at 20°C (68°F) 11k Ω $\pm$ 20% at 20°C (68°F)
Starter motor type: Armature coil resistance Brush length: standard minimum Brush spring pressure Armature mica undercut	ND. ADB4D2 0.014 Ω $\pm$ 6% at 20°C (68°F) 12.0 mm (0.472 in) 8.5 mm (0.33 in) 800 $\pm$ 150g (28.24 $\pm$ 5.30 oz) 0.6 mm (0.024 in)
Battery type: Charging rate	G.S. 12N12A-4A 1.2 Amps for 10 Hours
Generator type: Output Field (inner) coil resistance Stator (outer) coil resistance	HITACHI LD119-08 14V-19A at 5,000 r/min 4.0 Ω $\pm$ 10% at 20°C (68°F) 0.46 Ω $\pm$ 10% at 20°C (68°F)
Regulator type: Regulated voltage Allowable amperage	I.C. (S8534) 14.5 $\pm$ 0.3V 3A
Starter relay switch: Cut-in voltage	HONDA LOCK 8V
Headlight: Tail/brake light: Flasher light: License light: Pilot lights: Turn High beam Neutral Oil level Meter light	12V, 50W/40W 12V, 8W (3CP)/27W (32CP) 12V, 27W (32CP) x 4 12V, 8W (3CP) x 2 12V, 3.4W x 2 12V, 3.4W x 1 12V, 3.4W x 1 12V, 3.4W x 1 12V, 3.4W x 2

Tightening torque

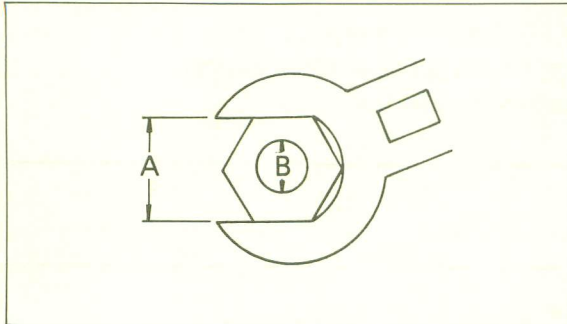
(Unit: m·kg)

Part to be tightened		Part name	Thread size	Q'ty	Tightening torque		Remarks
					m-kg	ft-lb	
ENGINE:							
Cylinder head	Nut	M10 P1.25	12	3.2	23.1	Apply oil.	
Cylinder head cover	Bolt	M6 P1.0	20	1.0	7.2		
Spark plug	—		4	2.0	14.5		
Cylinder	Nut	M8 P1.25	2	2.0	14.5	Cam chain case Front & Rear	
Cam shaft cap	Bolt	M6 P1.0	20	1.0	7.2	Tighteni in 3-stages.	
Cam sprocket	Bolt	M7 P1.0	4	2.0	14.5		
Cam chain tensioner adjustment lock nut	Nut	M8 P1.25	1	0.9	6.5		
Cam chain tensioner adjustment lock bolt	Bolt	M6 P1.0	1	0.6	4.3		
Connecting rod	Nut	M7 P0.75	8	2.5	18.1		
Generator (rotor)	Bolt	M10 P1.25	1	5.5	39.8		
Drain plug	Bolt	M14 P1.5 M8 P1.25	1 1	4.3 1.6	31.0 11.6	Crankcase drain Middle gear case drain	
Oil filter	Bolt	M20 P1.5	1	1.5	11.0		
Pump cover	Screw	M6 P1.0		0.7	5.1		
Strainer cover	Bolt	M6 P1.0	13	1.0	7.2		
Crankcase	Flange Bolt	M8 P1.25 M6 P1.0	12 27	2.4 1.2	17.5 8.7		
Clutch boss	Nut	M20 P1.0	1	7.2	52.0		
Clutch spring screw	Bolt	M6 P1.0	5	1.0	7.2		
Change pedal	Bolt	M6 P1.0	1	1.0	7.2		
Neutral switch	—	M10 P1.25	1	2.0	14.5		
Exhaust pipe	Nut	M6 P1.0	8	1.0	7.2		
SHAFT DRIVE:							
—Middle Gear —							
Drive Shaft	Nut	M34 P1.5	1	11	80.0	Stake.	
Mount cover	Screw	M8 P1.25	4	2.5	18.1	Stake.	
Driven shaft	Nut	M14 P1.5	1	12	87.0	Use LOCKTITE! Stake.	
Bearing cap	Flange Bolt	M8 P1.25	4	2.5	18.1		
— Final Gear —							
Drive shaft	Nut	M14 P1.5	1	11	80.0		
Bearing housing	Flange Bolt	M10 P1.25	2	2.3	16.6		
Bearing housing	Nut	M8 P1.25	6	2.3	16.6		
Oil mount screw	Plug	M14 P1.5	1	2.3	16.6		
Oil drain screw	Plug	M14 P1.5	1	2.3	16.6		
Bearing retainer	—	M65 P1.5	1	11	80.0	Left hand screw	
CHASSIS:							
Engine Mounting Bolt	Front, upper	Nut	M10 P1.25	1	4.2	30.4	
	Front, under	Bolt	M10 P1.25	2	4.2	30.4	
	Rear	Nut	M12 P1.25	1	7.0	50.6	

Part to be tightened		Part name	Thread size	Q'ty	Tightening torque		Remarks
					m-kg	ft-lb	
Engine Mounting Stay	Front	Bolt	M8 P1.25	4	2.0	14.5	
Handle crown & Steering shaft		Bolt	M14 P1.25	1	5.4	39.1	
		Bolt	M8 P1.25	1	2.0	14.5	
Handle crown & Inner tube		Nut cap	M8 P1.25	1	2.0	14.5	
Handle crown & Handle holder		Bolt	M8 P1.25	2	2.0	14.5	
Front fork							
Under bracket & Inner tube		Bolt	M8 P1.25	4	2.0	14.5	
Front wheel shaft		Nut Castle	M14 P1.5	1	10.7	77.4	
Front wheel Axle pinch bolt		Nut self locking	M8 P1.25	2	2.0	14.5	
Pivot shaft		Bolt	M22 P1.5	1	0.55	4.0	Taper roller bearing
Rear wheel shaft		Nut castl	M14 P1.5	1	10.7	77.4	
Rear shock absorber (Upper)		Nut cap	M10 P1.25	2	3.0	21.7	
Rear shock absorber (Lower)		L Nut cap	M10 P1.25	2	3.0	21.7	
		R Bolt					
Footrest		Nut	M10 P1.25	2	4.2	30.4	
Tension bar & Brake plate		Bolt	M8 P1.25	1	2.0	14.5	
Tension bar & Rear arm		Bolt	M8 P1.25	1	2.0	14.5	
Camshaft lever & Camshaft		Bolt	M6 P1.0	1	0.9	6.5	
Disc brake section							
Brake disc & Hub (Front)		Bolt	M8 P1.25	12	2.0	14.5	Lock washer
Master cylinder & Brake hose (Front)		Bolt union	M10 P1.25	1	2.6	18.8	
Brake hose & Joint		Bolt union	M10 P1.25	1	2.6	18.8	
Caliper & Brake hose		Bolt union	M10 P1.25	1	2.6	18.8	
Caliper & Front fork (Front)			M8 P1.25	1	2.6	18.8	
Caliper bleed screw (Front)			M8 P1.25	1	0.6	4.3	
Front fender		Bolt	M8 P1.25	4	1.0	7.2	
Master cylinder cap		Screw	M5 P0.8	2	0.18	1.3	
Pivot shaft		Bolt	M22 P1.5	1	10.0	72.3	Lock washer
Final gear & Rear arm		Nut	M10 P1.25	4	4.2	30.4	
Cross Joint		Hexagon bolt with washer	M8 P1.25	4	4.4	31.8	
Muffler bracket & Frame		Bolt	M10 P1.25	3	4.3	31.1	
Rear fender		Bolt	M10 P1.25	2	3.2	23.1	
Muffler bracket & Muffler		Bolt	M10 P1.25	2	2.5	18.1	
Master cylinder & Master cylinder bracket		Bolt	M6 P1.0	2	0.9	6.5	

General Torque Specifications

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a criss-



cross fashion, in progressive stages, until full torque is reached. Unless otherwise specified, torque specifications call for clean, dry threads. Components should be at room temperature.

A (Nut)	B (Bolt)	General torque specifications	
		m-kg	ft-lb
10 mm	6 mm	0.6	4.5
12 mm	8 mm	1.5	11
14 mm	10 mm	3.0	22
17 mm	12 mm	5.5	40
19 mm	14 mm	8.5	51
22 mm	16 mm	13.0	94

CONVERSION TABLES

METRIC TO INCH SYSTEM			
	KNOWN	MULTIPLIER	RESULT
TORQUE	m-kg	7.233	ft-lb
	m-kg	86.80	in-lb
	cm-kg	0.0723	ft-lb
	cm-kg	0.8680	in-lb
WT.	kg	2.205	lb
	g	0.03527	oz
FLOW/DISTANCE	km/lit	2.352	mpg
	km/hr	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
VOL./CAPACITY	cc (cm ³)	0.03382	oz (US liq)
	cc (cm ³)	0.06102	cu.in
	lit (liter)	2.1134	pt (US liq)
	lit (liter)	1.057	qt (US liq)
	lit (liter)	0.2642	gal (US liq)
MISC.	kg/mm	56.007	lb/in
	kg/cm ²	14.2234	psi (lb/in ²)
	Centigrade (°C)	9/5(°C) + 32	Fahrenheit (°F)

INCH TO METRIC SYSTEM			
	KNOWN	MULTIPLIER	RESULT
TORQUE	ft-lb	0.13826	m-kg
	in-lb	0.01152	m-kg
	ft-lb	13.831	cm-kg
	in-lb	1.1521	cm-kg
WT.	lb	0.4535	kg
	oz	28.352	g
FLOW/DISTANCE	mpg	0.4252	km/lit
	mph	1.609	km/hr
	mi	1.609	km
	ft	0.3048	m
	yd	0.9141	m
	in	2.54	cm
	in	25.4	mm
VOL./CAPACITY	oz (US liq)	29.57	cc (cm ³)
	cu.in	16.387	cc (cm ³)
	pt (US liq)	0.4732	lit (liter)
	qt (US liq)	0.9461	lit (liter)
	gal (US liq)	3.785	lit (liter)
MISC.	lb/in	0.017855	kg/mm
	psi (lb/in)	0.07031	kg/ch ²
	Fahrenheit (°C)	5/9(°F-32)	Centigrade (°F)

DEFINITION OF TERMS:

m-kg	=	Meter-kilogram(s) (usually torque)
g	=	Gram(s)
kg	=	Kilogram(s) (1,000 grams)
lit	=	Liter(s)
km/lit	=	Kilometer(s) per liter (fuel consumption)
cc	=	Cubic centimeter(s) (cm ³) (volume or capacity)
kg/mm	=	Kilogram(s) per millimeter (usually spring compression rate)
kg/cm ²	=	Kilogram(s) per square centimeter (pressure)

CONSUMER INFORMATION**Notice**

The information presented represents results obtainable by skilled drivers under controlled road and vehicle conditions, and the information may not be correct under other conditions.

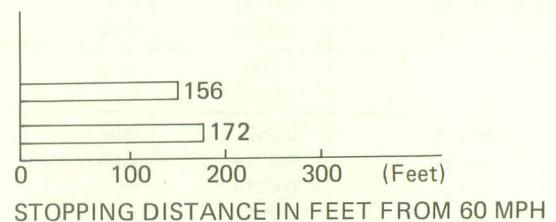
STOPPING DISTANCE

This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system.

**FULL OPERATIONAL
SERVICE BRAKE**

("Partial failure" information is not applicable and is not included)

LOAD
LIGHT
MAXIMUM

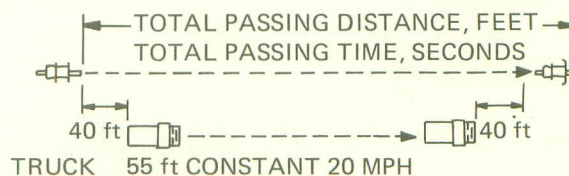
**ACCELERATION AND PASSING ABILITY**

This figure indicates passing times and distances that can be met or exceeded by the vehicles to which it applies, in the situations diagrammed below. The low-speed pass assumes an initial speed of 20 mph. and a limiting speed of 35 mph. This high-speed pass assumes an initial speed of 50 mph. and a limiting speed of 80 mph.

LOW-SPEED PASS

INITIAL SPEED: 20 MPH

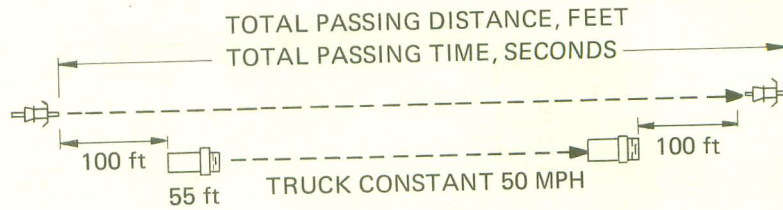
LIMITING SPEED: 35 MPH



HIGH-SPEED PASS

INITIAL SPEED: 50 MPH

LIMITING SPEED: 80 MPH

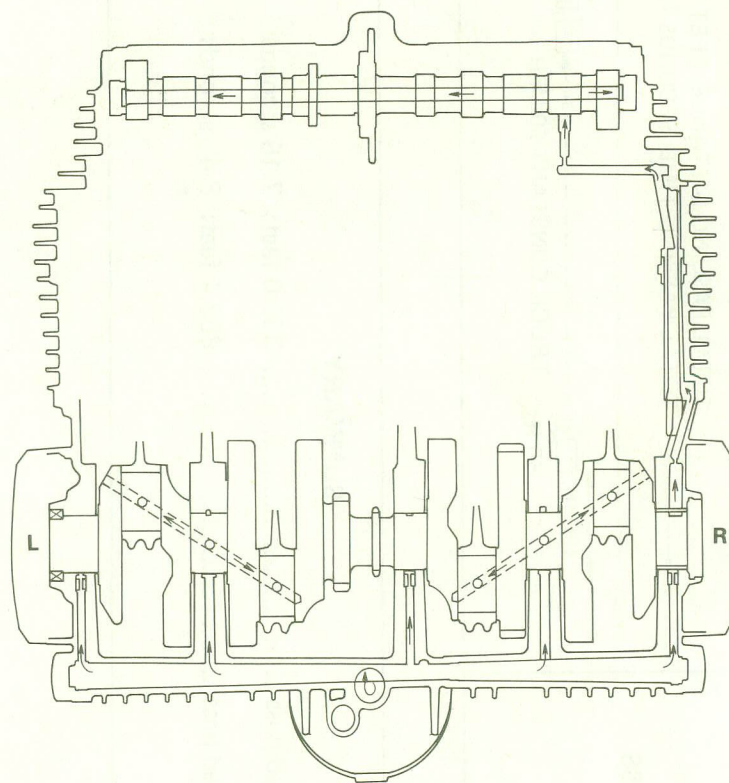
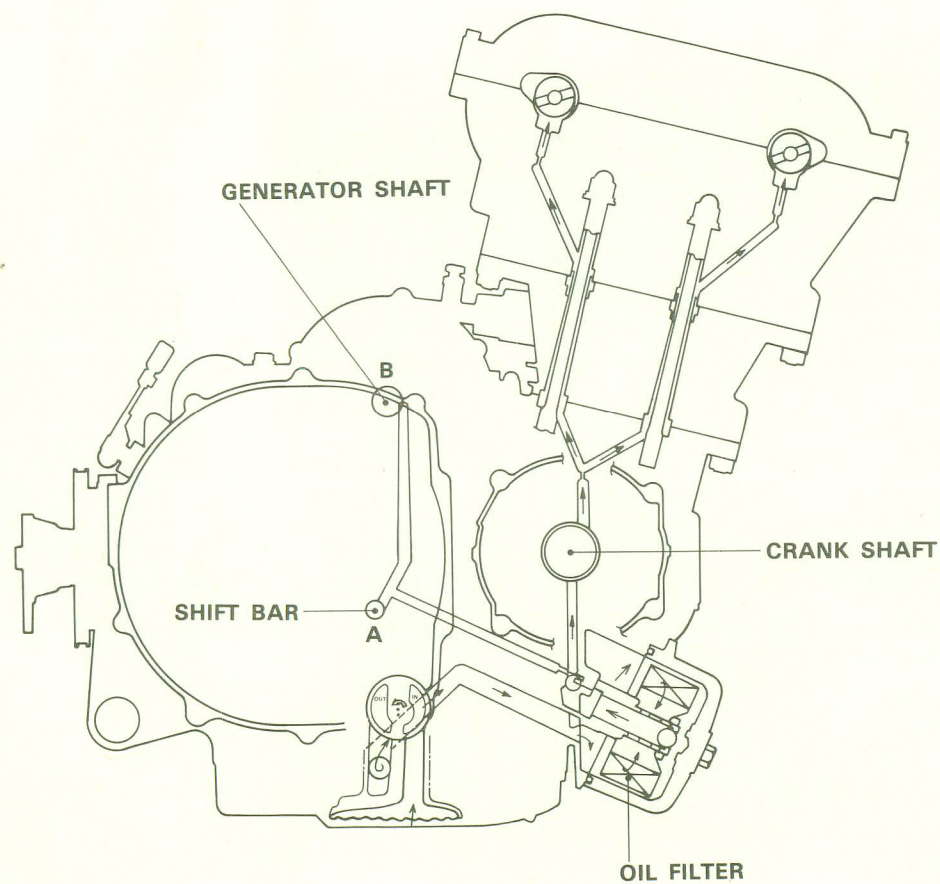


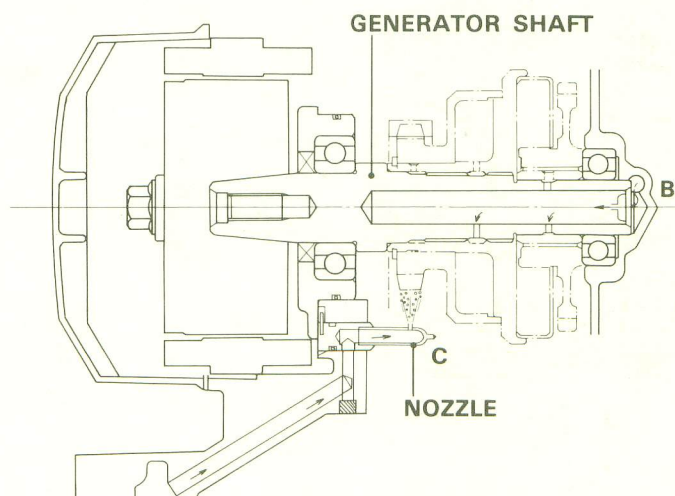
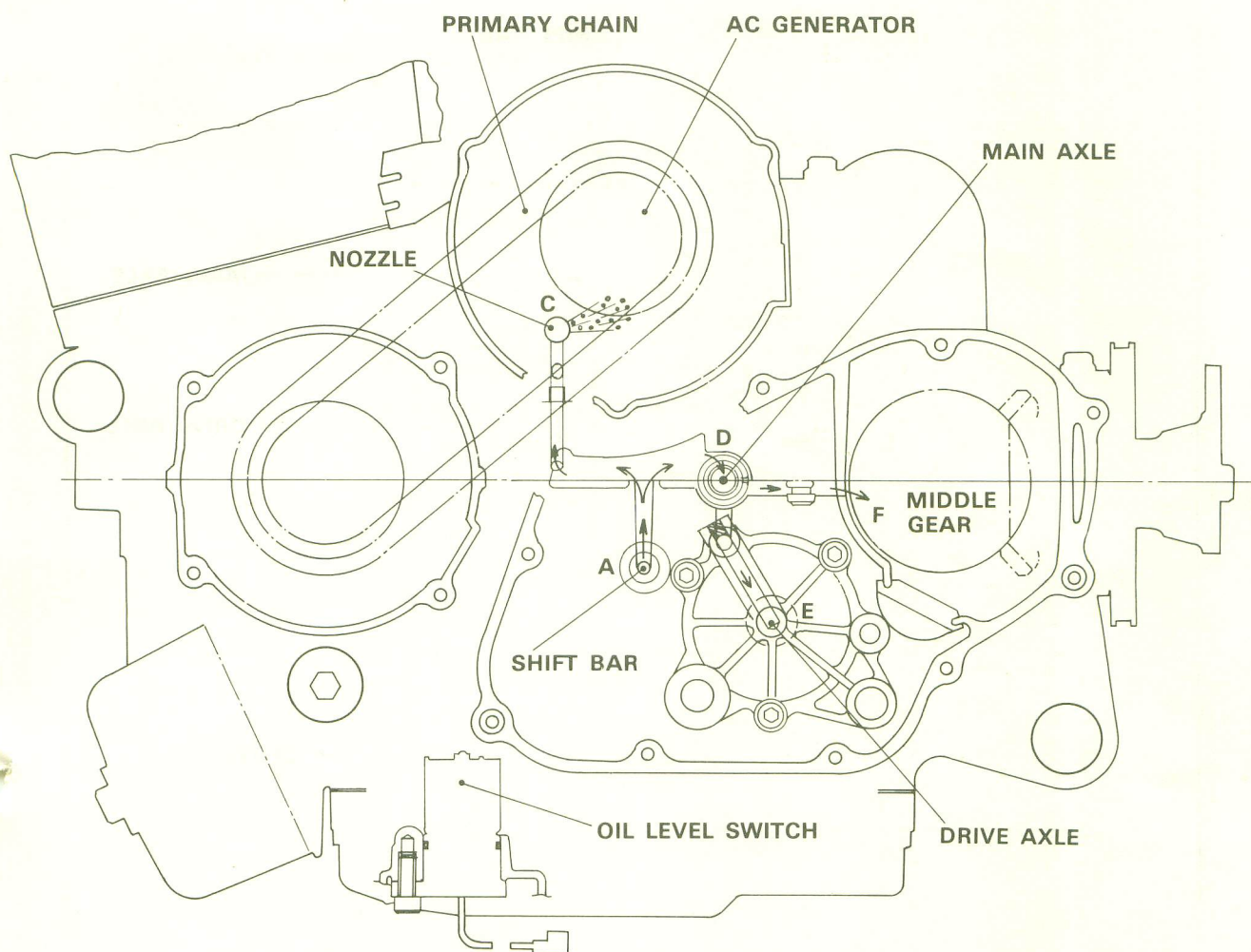
SUMMARY

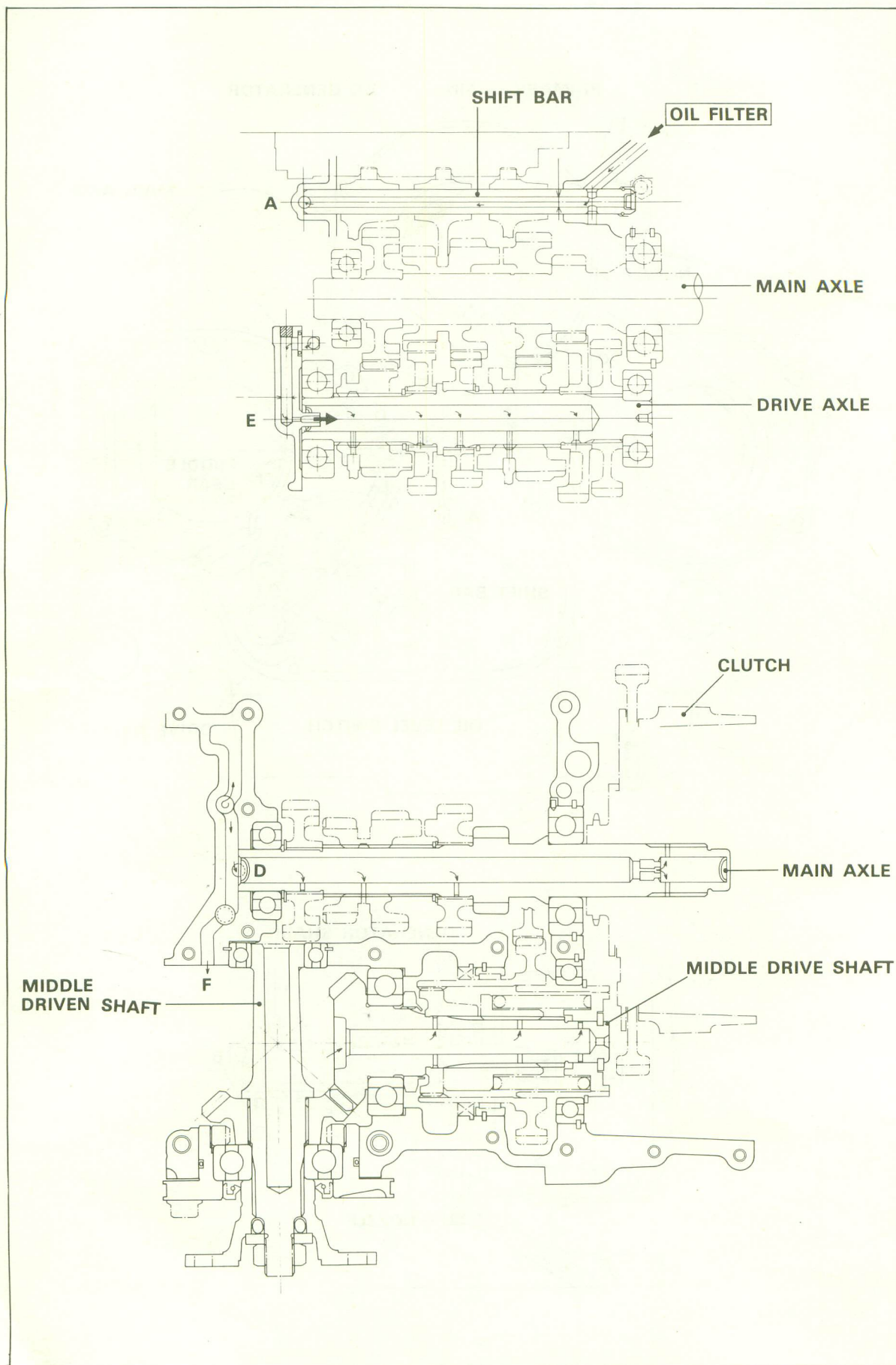
Low-speed pass 353.0 feet: 7.15 seconds

High-speed pass 883.4 feet: 8.4 seconds

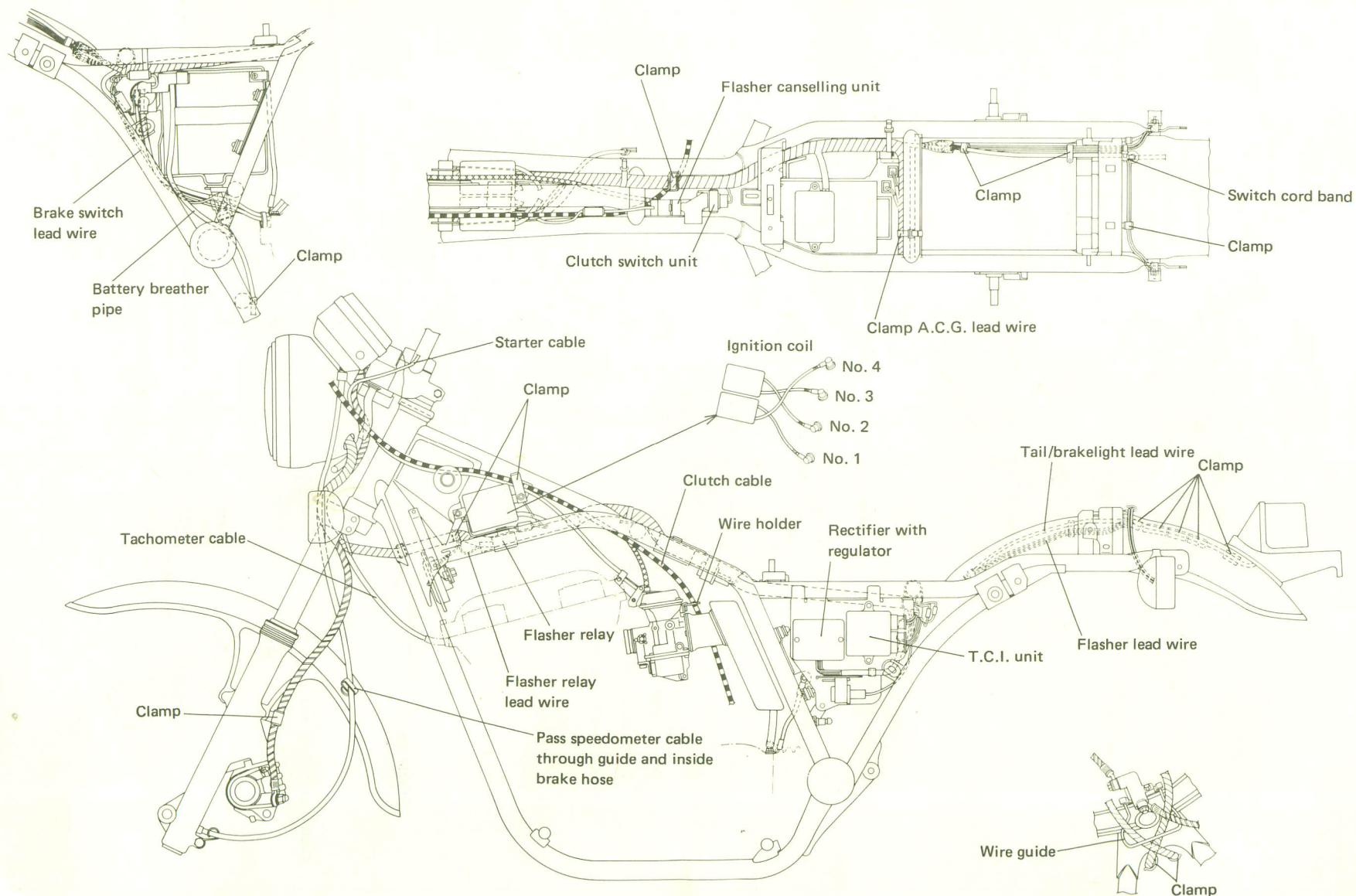
LUBRICATION DIAGRAM

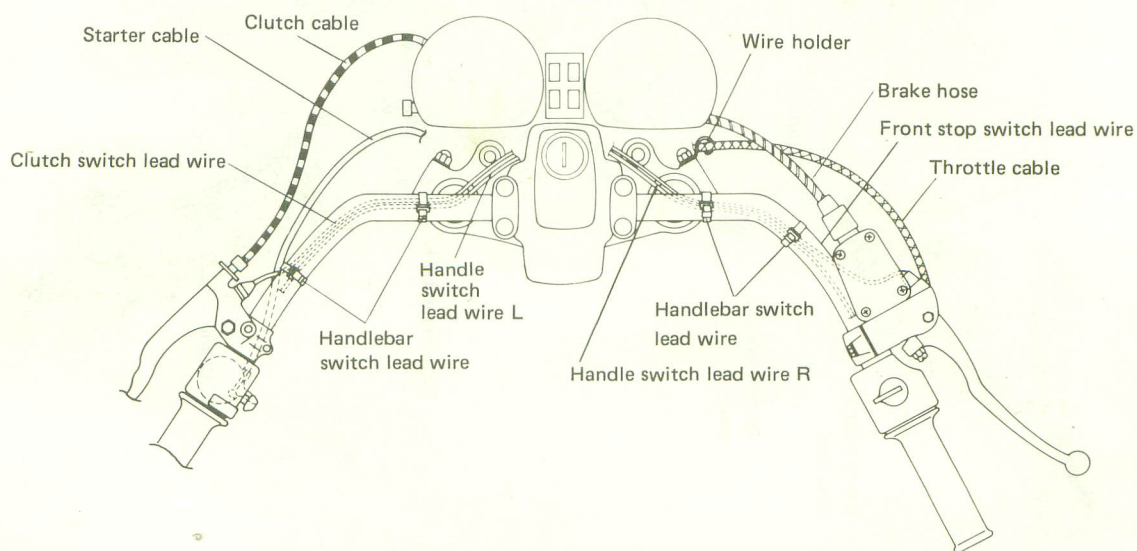
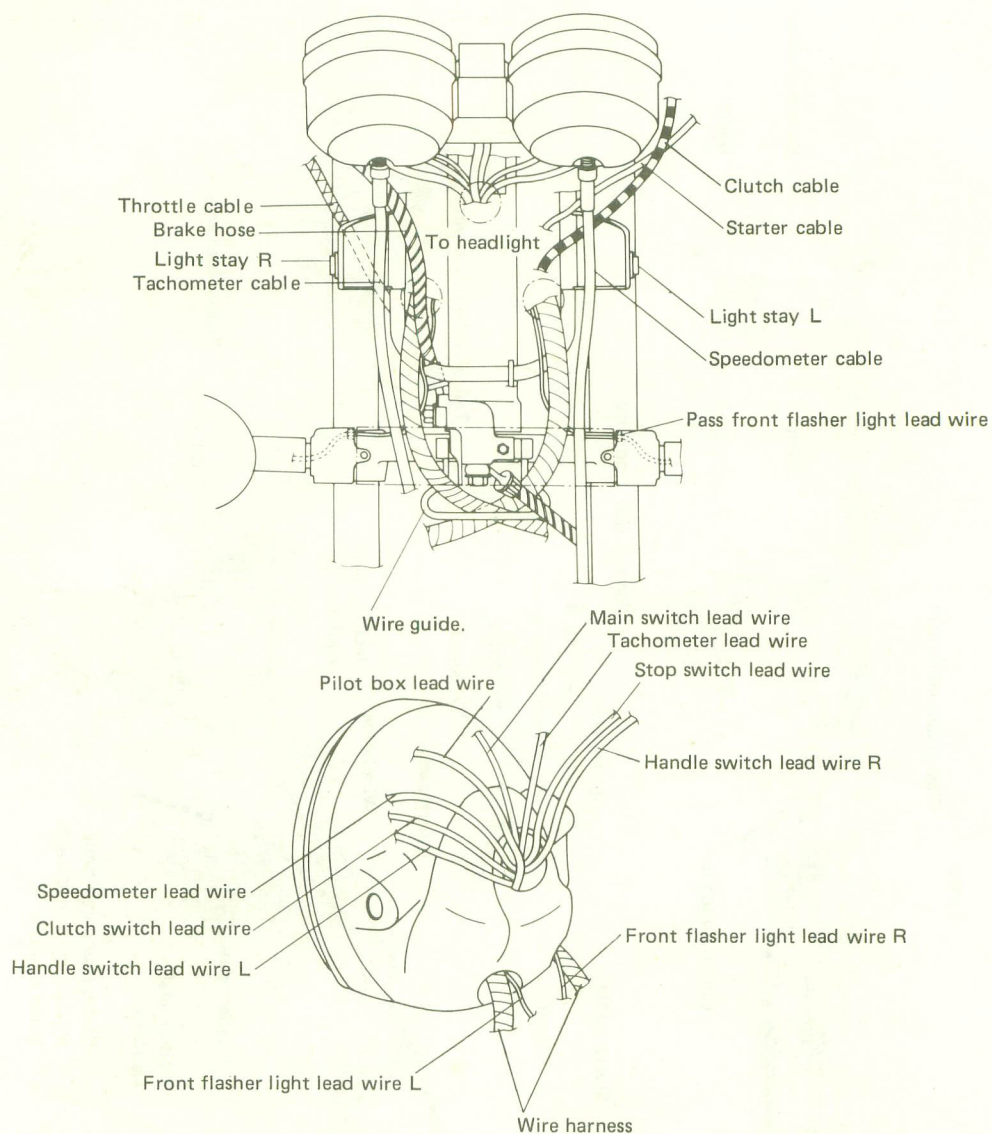




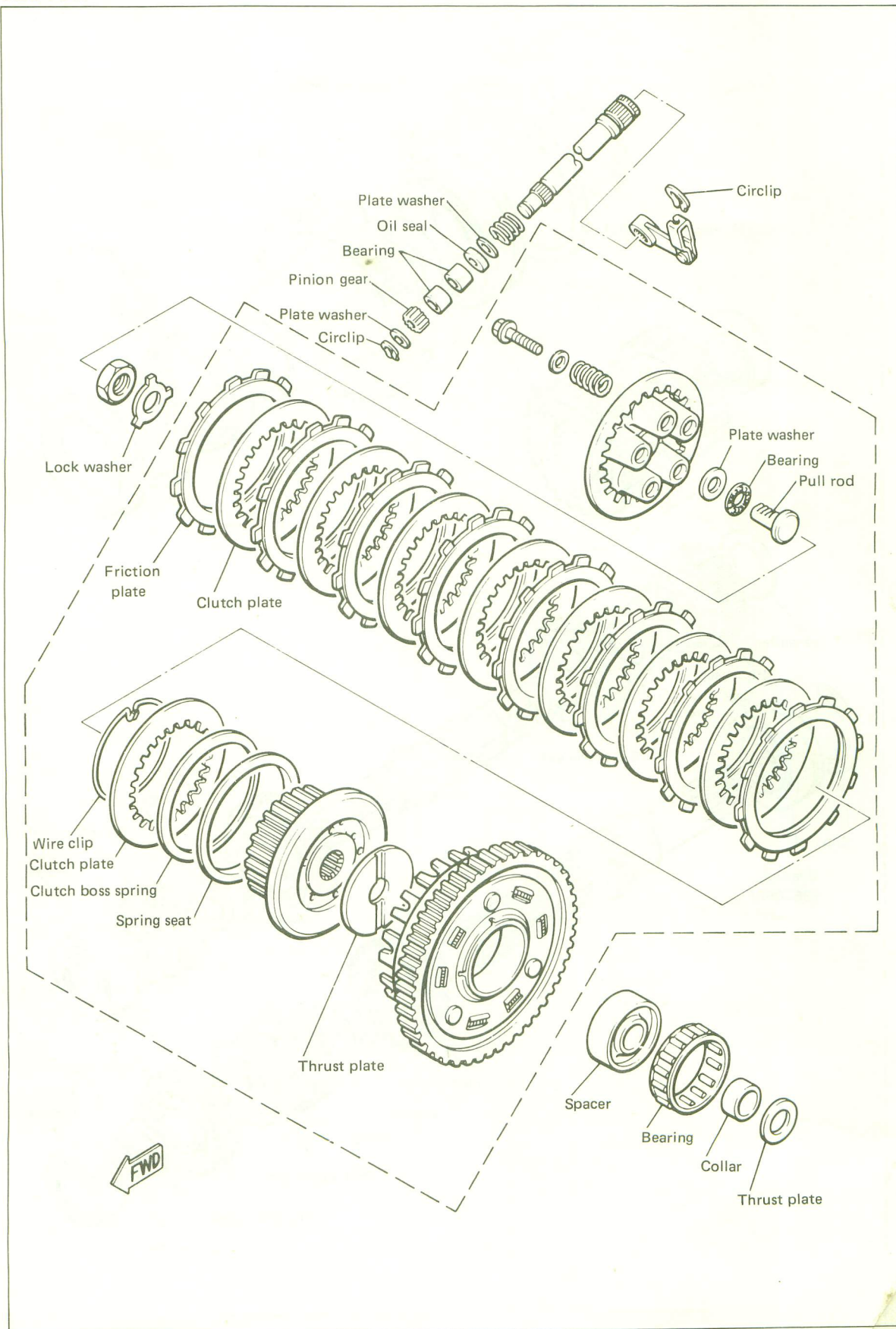


CABLE ROUTING

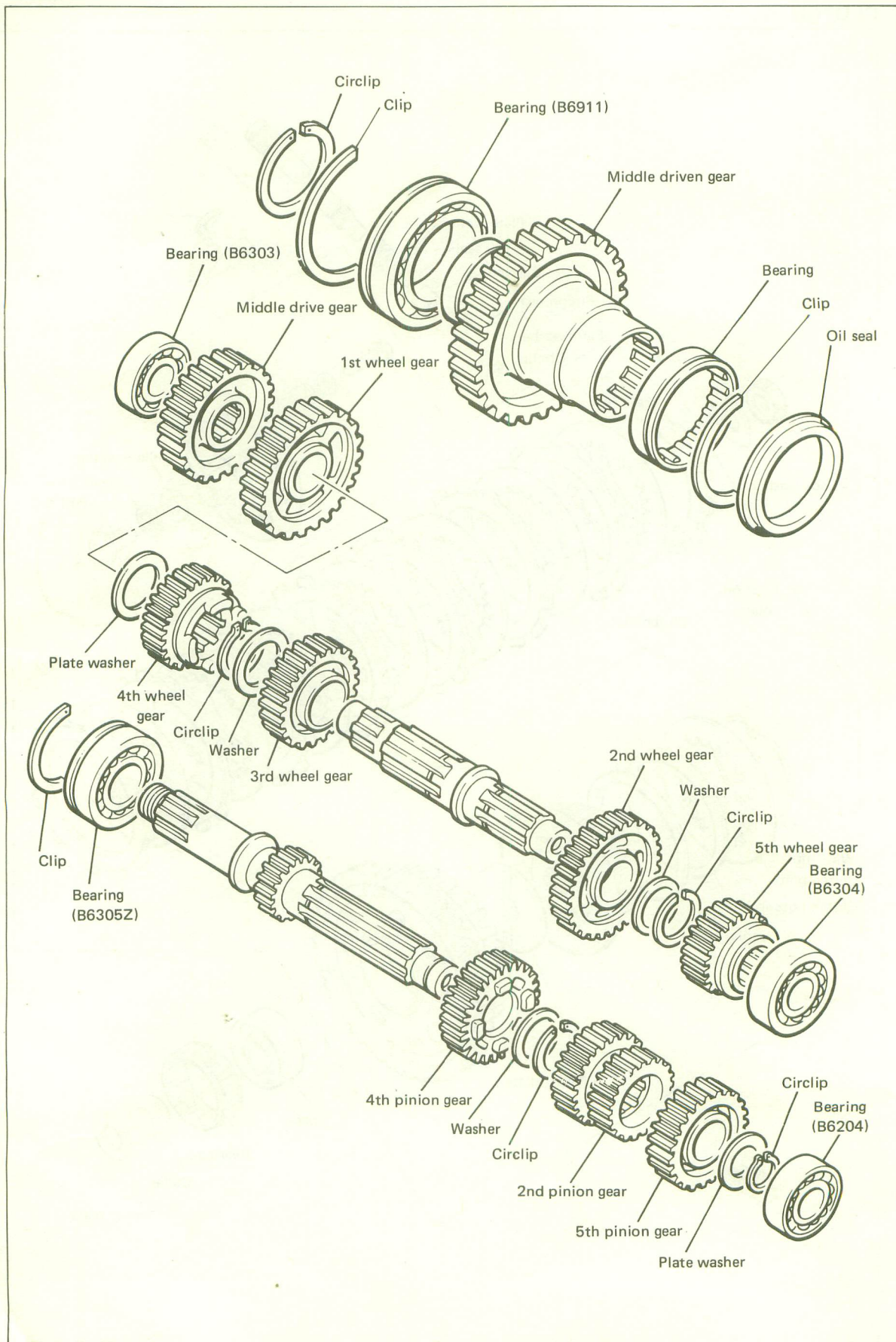




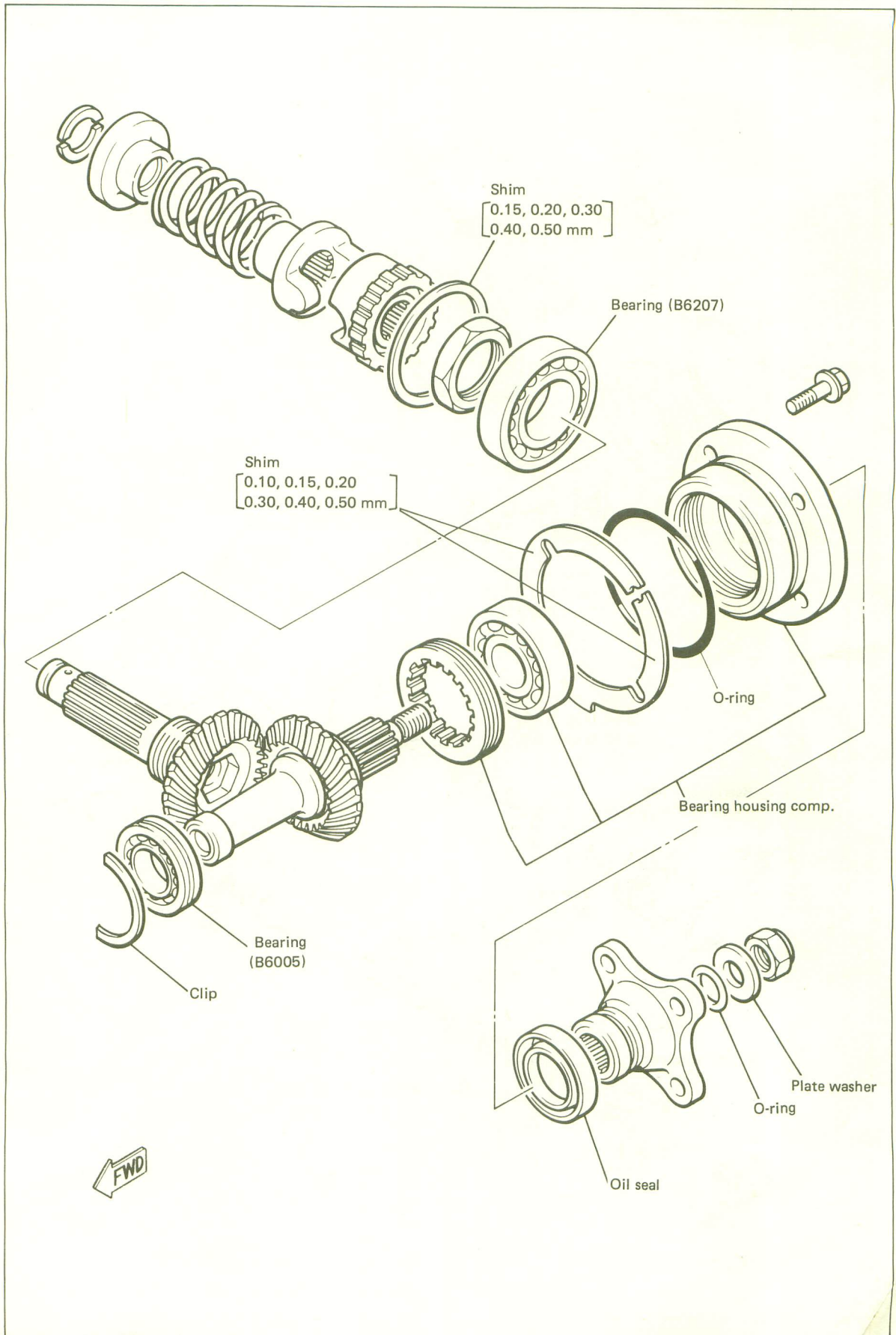
PARTS ILLUSTRATIONS CLUTCH



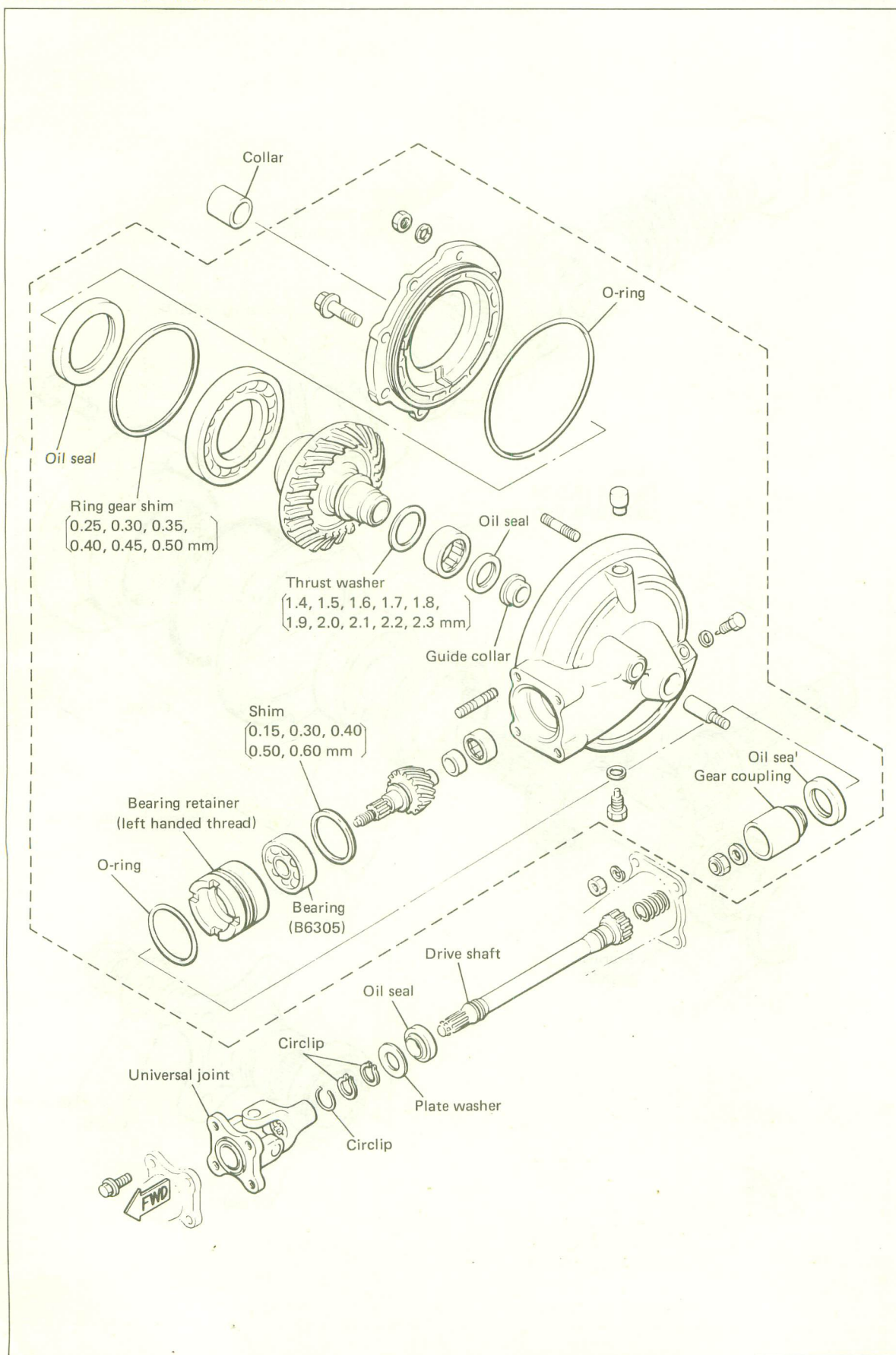
TRANSMISSION



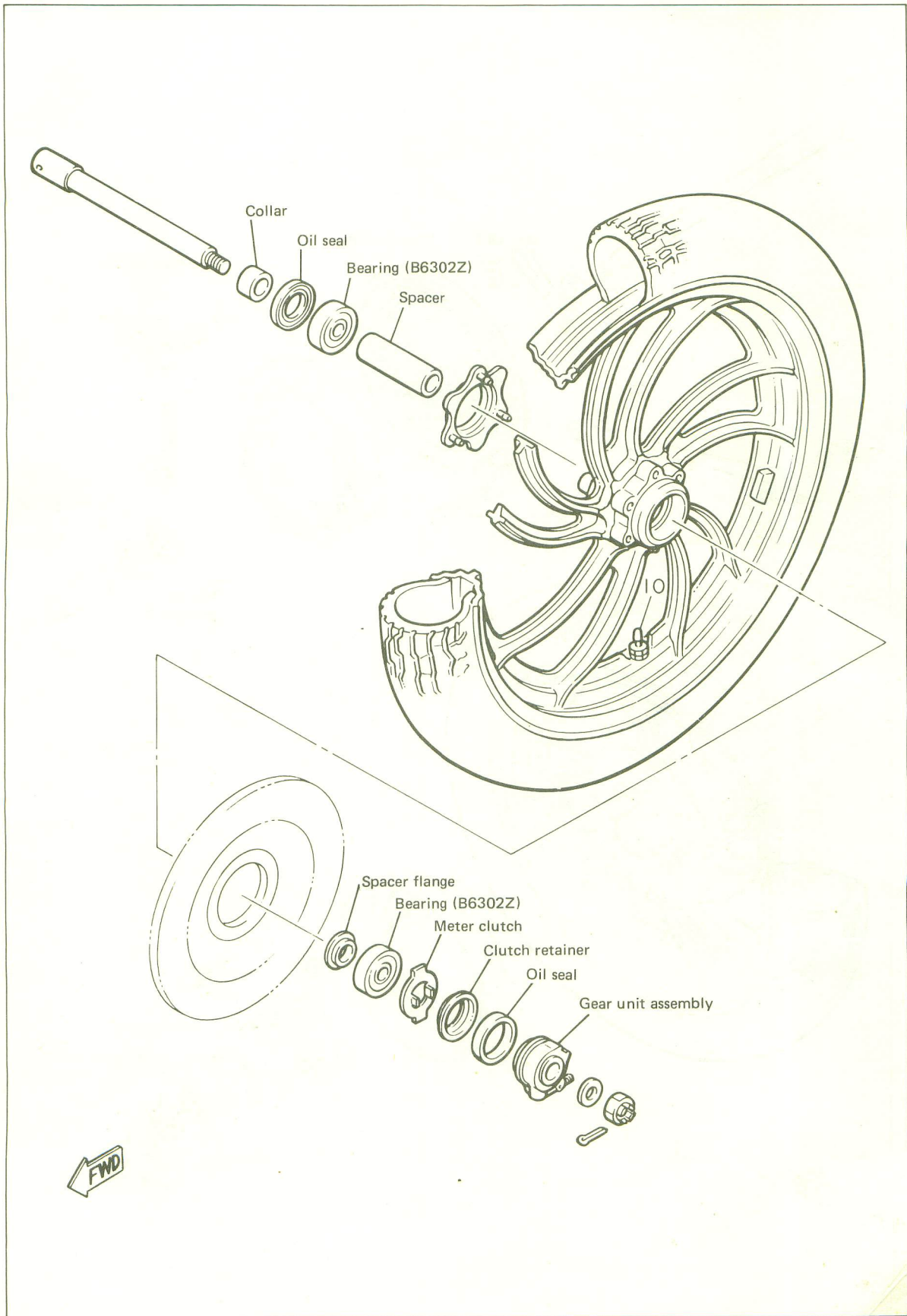
MIDDLE GEAR/DAMPER



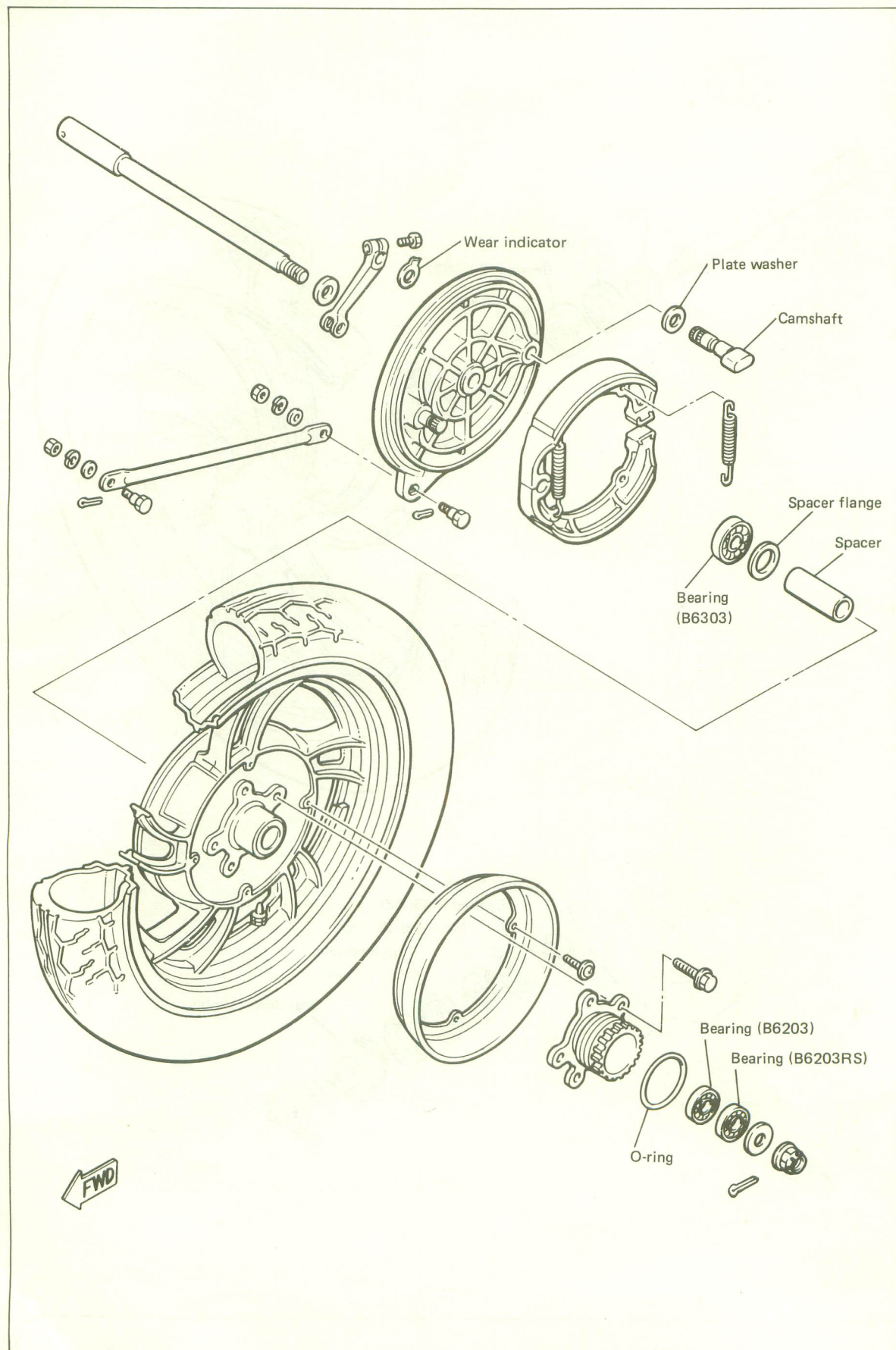
FINAL GEAR / DRIVE SHAFT



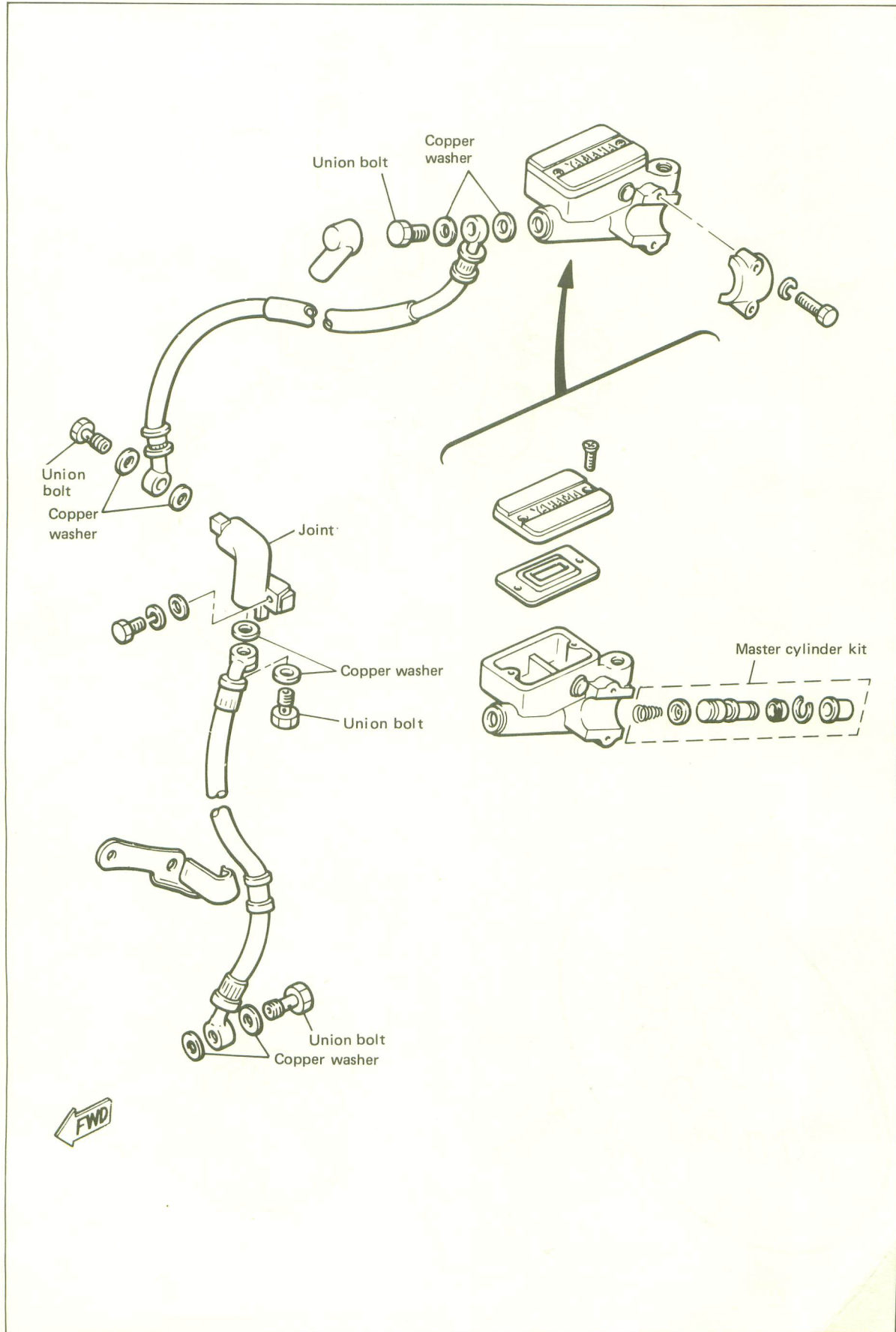
FRONT WHEEL



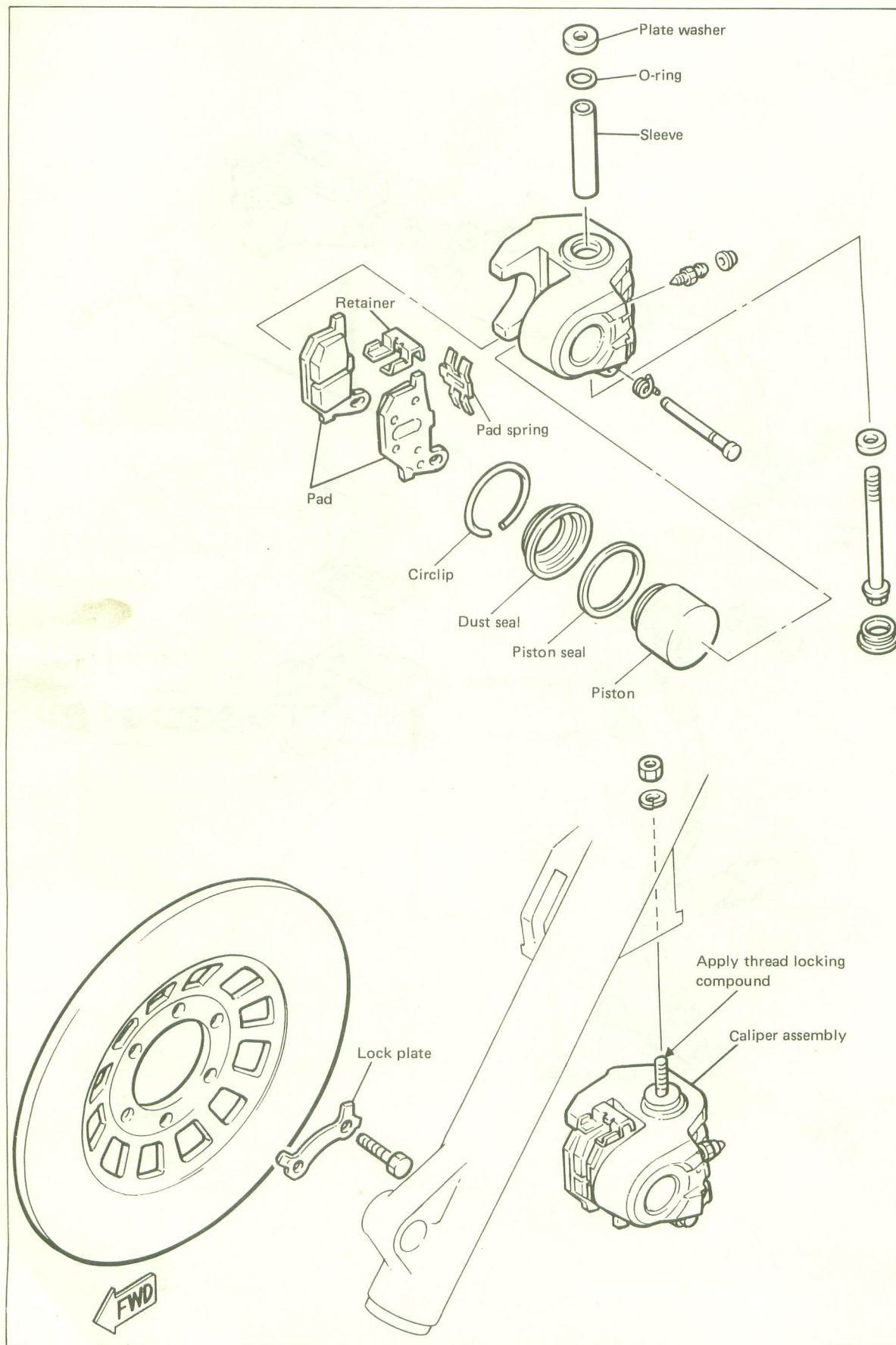
REAR WHEEL



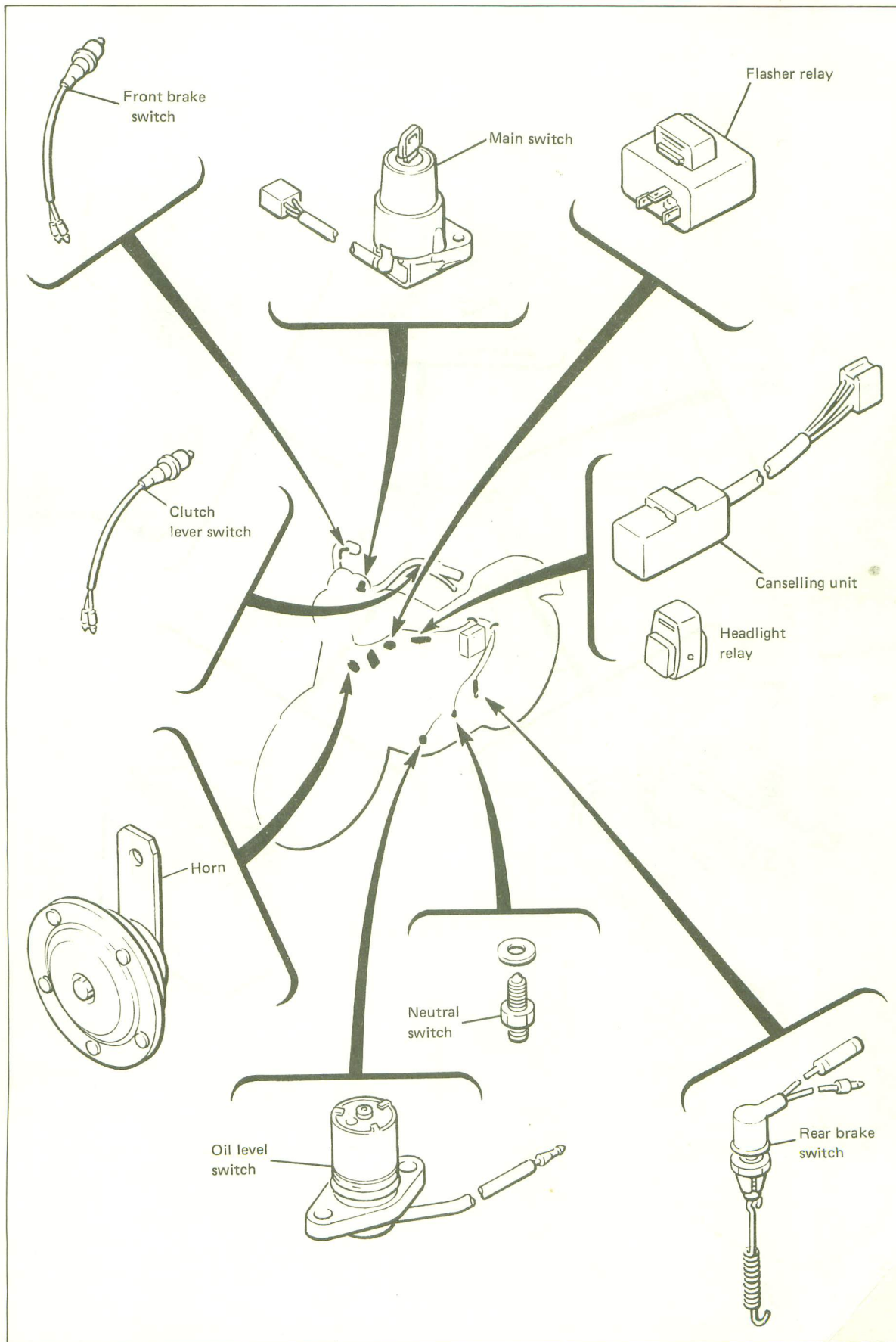
FRONT BRAKE (MASTER CYLINDER)

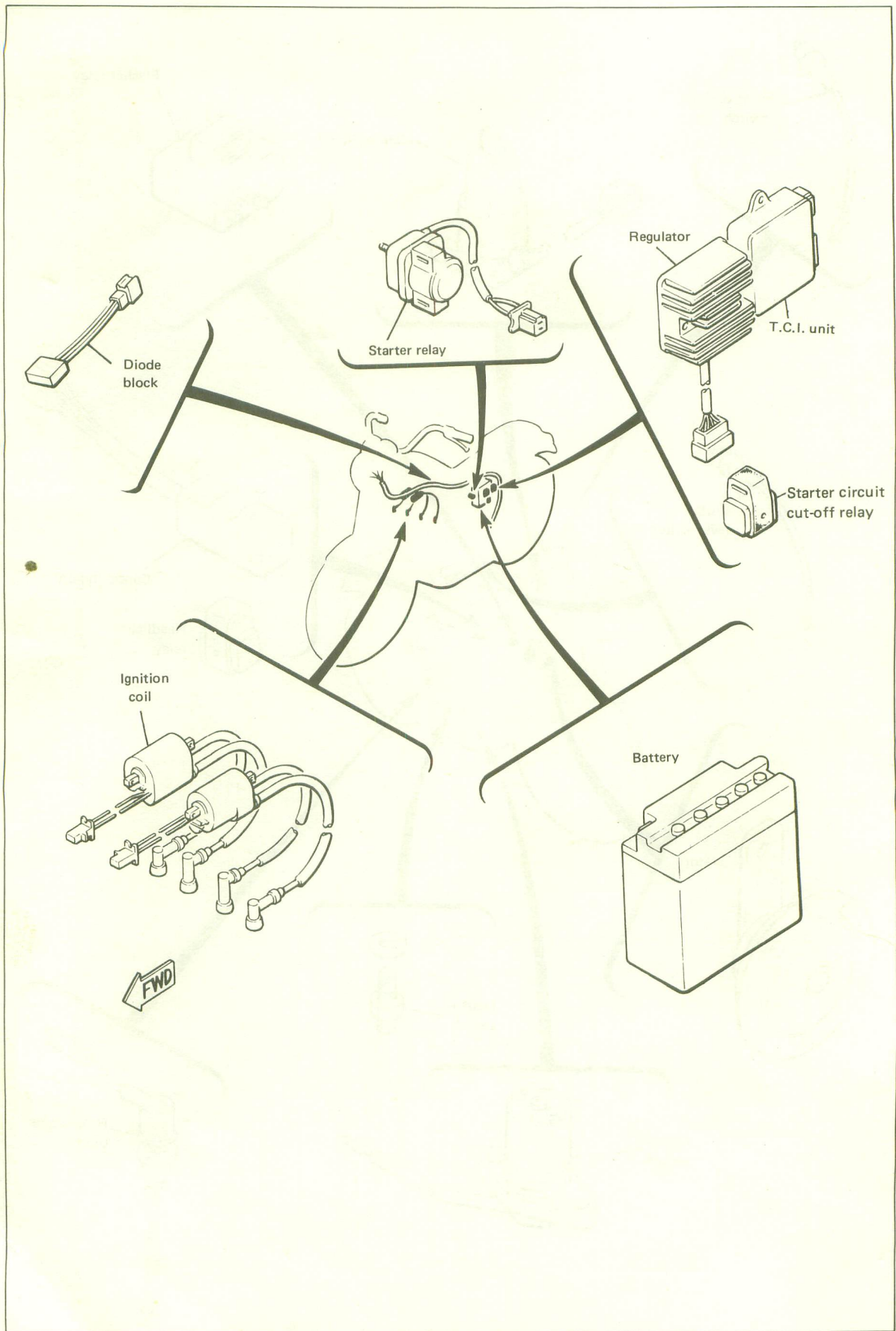


FRONT BRAKE (CALIPER)



ELECTRICAL COMPONENTS

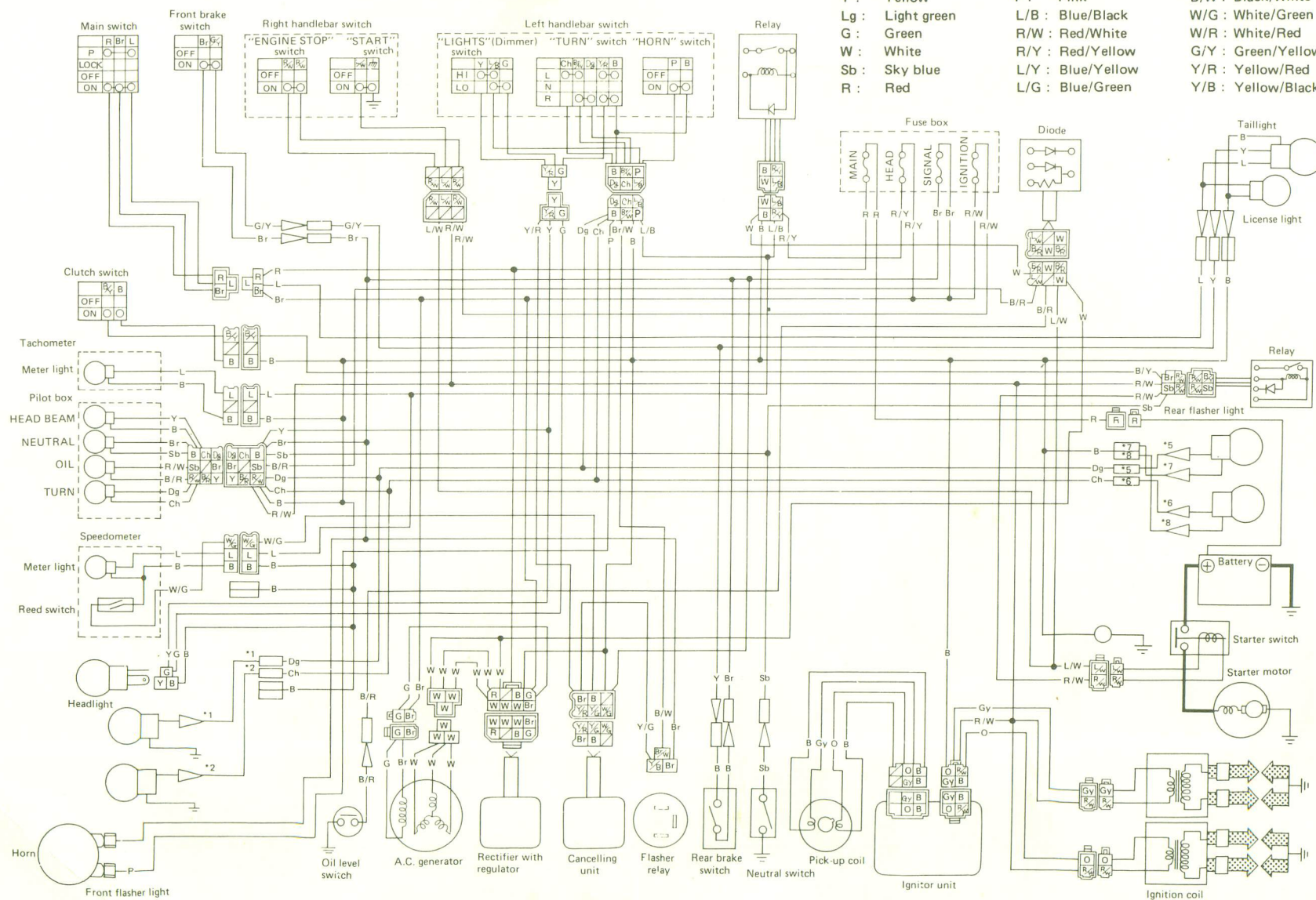




WIRING DIAGRAM

COLOR CODE

Dg : Dark green	Br : Brown	L/W : Blue/White
Ch : Chocolate	O : Orange	Br/W : Brown/White
B : Black	L : Blue	Y/G : Yellow/Green
Y : Yellow	P : Pink	B/W : Black/White
Lg : Light green	L/B : Blue/Black	W/G : White/Green
G : Green	R/W : Red/White	W/R : White/Red
W : White	R/Y : Red/Yellow	G/Y : Green/Yellow
Sb : Sky blue	L/Y : Blue/Yellow	Y/R : Yellow/Red
R : Red	L/G : Blue/Green	Y/B : Yellow/Black



—MEMO—