YAMAHA

XJ650G

Service Manual G

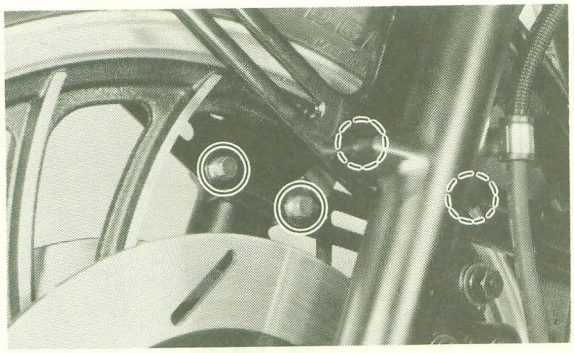
LIT-11616-01-94

4H7-28197-10

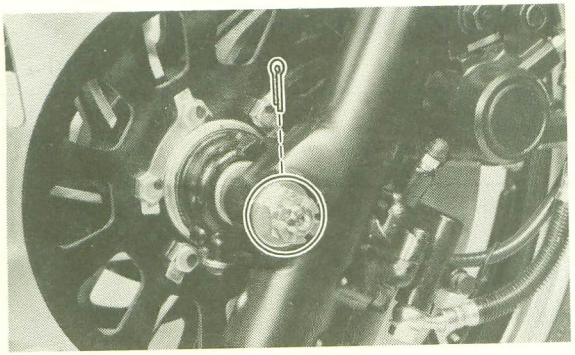
*CHASSIS

A. FRONT WHEEL

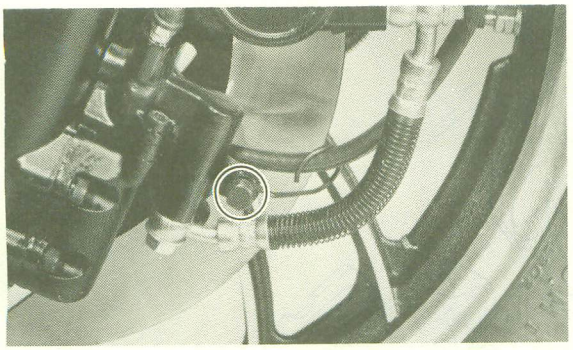
1. Place the motorcycle on the center stand.
2. Remove the front fender securing bolts and remove the fender.



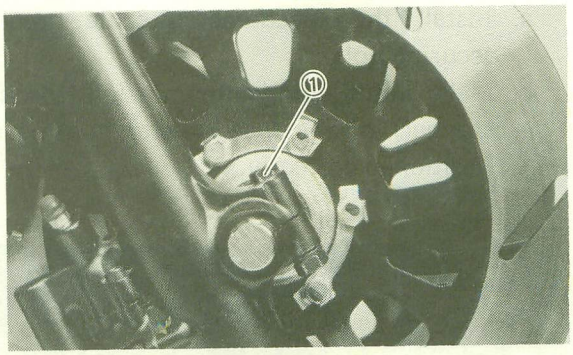
3. Remove the cotter pin and wheel axle nut.



4. Remove the speedometer cable holder securing bolt.

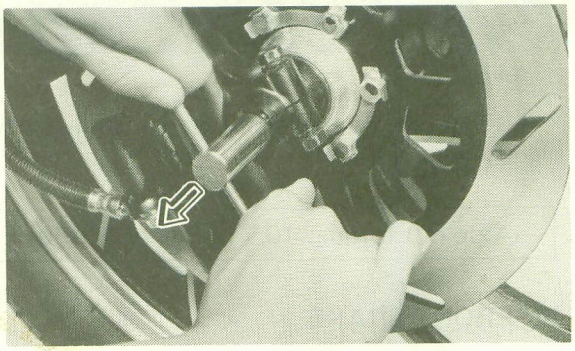


5. Loosen the pinch bolt securing the axle.



1. Pinch bolt

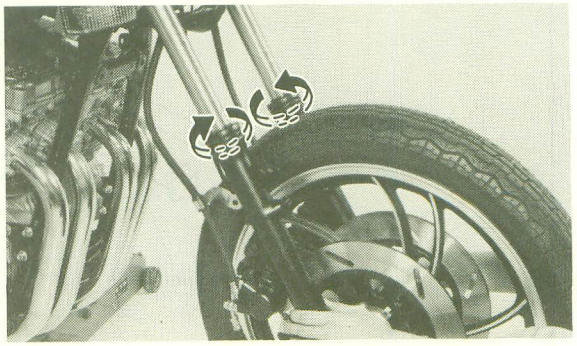
6. Remove the axle shaft and the front wheel. In this case, make sure the motorcycle is properly supported.



NOTE:

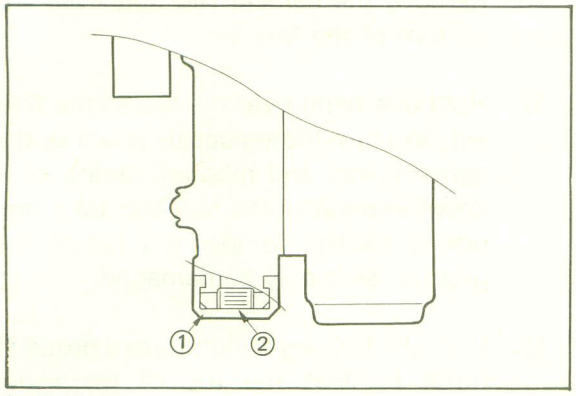
Do not depress the brake lever when the wheel is off the motorcycle as the brake pads will be forced to shut.

7. Lower the wheel until the brake discs come off the calipers. Turn the calipers outward so they do not obstruct the wheel and remove the wheel.



Anti-dive adjustment

1. Remove the rubber cap from the bottom of the anti-dive unit.
2. Observe the head of the adjusting bolt through the machines slot(s) in the bottom of the anti-dive unit. In the standard position, four lines will be visible on the adjusting bolt head. Consult the fork adjustment chart below to determine the proper setting.

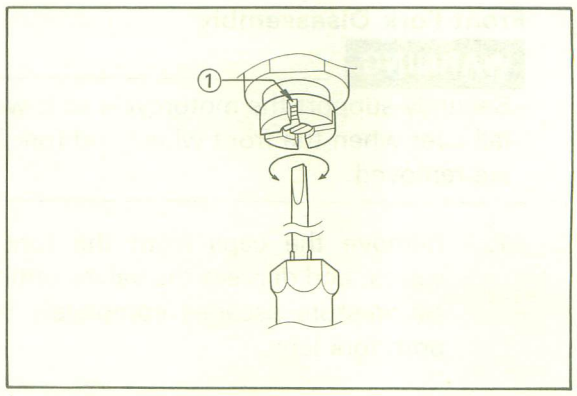


1. Rubber cap 2. Adjusting bolt

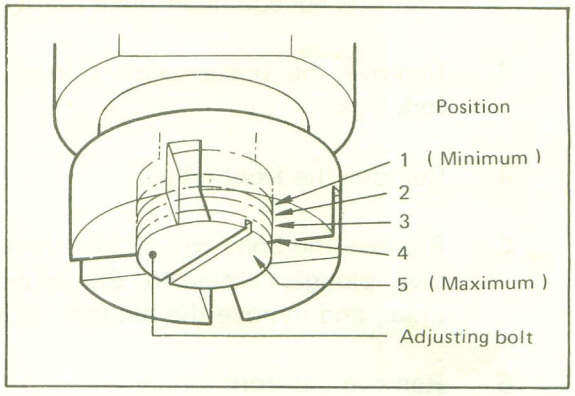
3. To decrease the anti-dive effect, turn the adjusting bolt counterclockwise until the first line appears level to the top of the machined slot(s).

WARNING:

When the first line appears in the machined slot(s), the adjusting bolt will bottom in the anti-dive unit and a resistance will be felt. Do not attempt to turn the adjusting bolt beyond this point, or the anti-dive unit will be damaged.



1. Machined slot



4. To increase the anti-dive effect, turn the adjusting bolt clockwise.
5. Replace the rubber cap.

WARNING:

The anti-dive settings must be the same on both anti-dive units. Hence, be sure to perform the above procedure on both anti-dive units.

Adjusting bolt position	Loading condition		
	Solo rider	With accessory equipments or passenger	With accessory equipments and passenger
1	○		
2	○	○	
3	○	○	○
4		○	○
5			○

CAUTION:

Disconnect the wire connector carefully. Do not pull on the wire connector. It is indexed and could be damaged if you pull on it. Do not touch the connector contacts. They are gold plated.

11. Remove the display plate and the LCD unit.
12. Clean the display plate and the LCD unit.

CAUTION:

a. **Use compressed-air lens cleaner (as used on cameras) to clean the display and the LCD unit. Do not use shop air for this purpose.**
b. **Use a soft cloth. Do not use cotton. It will leave lint deposits which will interfere with the delicate contacts.**
c. **Very carefully clean the LCD unit because it is possible to generate enough static electricity to damage it.**

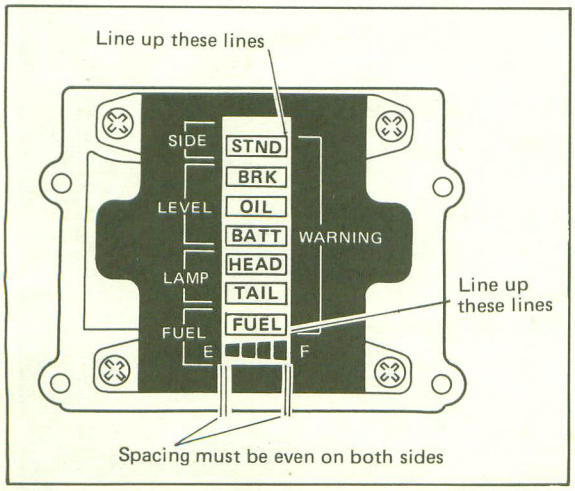
13. Reinstall the LCD unit into the display holder.

CAUTION:

Do not touch the LCD connector with bare hands.

IMPORTANT NOTE:

The LCD unit must line up as shown in the illustration to seal the LCD unit properly.



14. Reinstall the LCD reflector so that the shiny surface faces toward the LCD unit.
15. Carefully place the wire connector on the LCD connector and seat it on its two indexing points. Install the display plate and carefully screw in the wire connector indexing screw first. Then screw in the remaining four holding screws. Do not overtighten the screws.

Tightening torque:
3 mm: 10 cm-kg (0.7 ft-lb)
(Use LOCTITE)
4 mm: 24 cm-kg (1.7 ft-lb)

16. Reinstall the display holder on the microcomputer.

IMPORTANT NOTE:

Before reinstalling the components, connect the LCD assembly to the motorcycle and check that it is function properly.

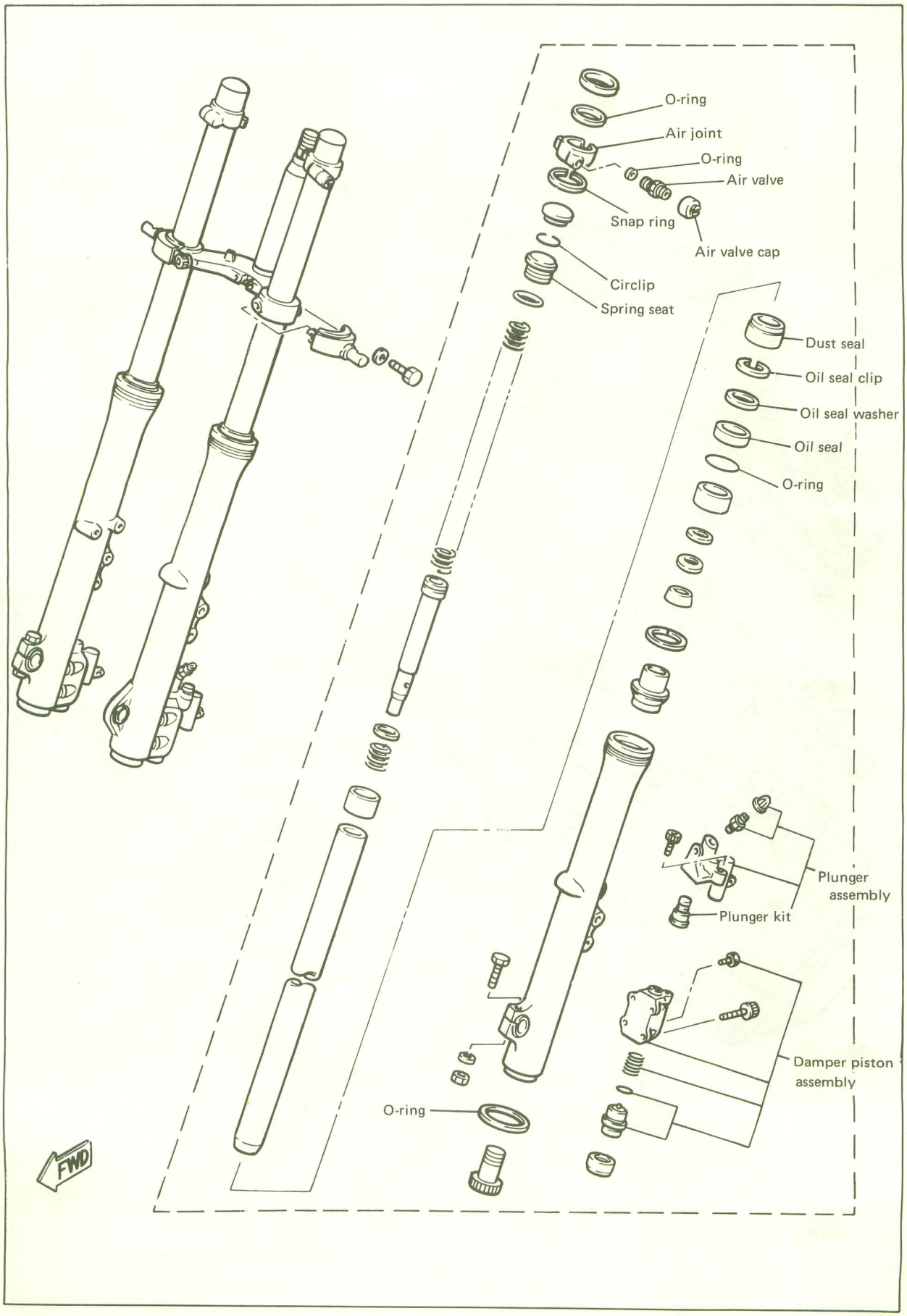
17. Reinstall the entire unit in the instrument panel.
18. Reinstall the instrument panel back to the motorcycle.
19. Check that the COM system is functioning properly.

SPECIFICATIONS

General Specifications

	XJ750RH
Basic color	New Yamaha Black or Brilliant Red
Dimensions:	
Overall length	2,110 mm (83.1 in)
Overall width	860 mm (33.9 in)
Overall height	1,120 mm (44.1 in)
Seat height	775 mm (30.5 in)
Wheelbase	1,445 mm (56.9 in)
Minimum ground clearance	140 mm (5.5 in)
Caster (steering head angle)	28°
Trail	114 mm (4.49 in)
Weight:	
Net	218 kg (480 lb)
Engine:	
Type	D.O.H.C. air-cooled, gasoline
Bore x stroke x cylinders	65.0 x 56.4 mm x 4 (2.559 x 2.220 in x 4)
Displacement	748 cc (45.64 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	25.3 mm (0.996 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	YB14L-A2
Battery dimensions	89 x 116 x 134 mm (3.50 x 6.54 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
Teeth, ratio 1st	35/16 2.187
2nd	30/20 1.500
3rd	30/26 1.153
4th	28/30 0.933
5th	26/32 0.812

FRONT FORK


O-ring
Air joint
O-ring
Air valve
Snap ring
Air valve cap
Circlip
Spring seat
Dust seal
Oil seal clip
Oil seal washer
Oil seal
O-ring
Plunger assembly
Plunger kit
Damper piston assembly
O-ring
FWD

CHAPTER 1. GENERAL INFORMATION

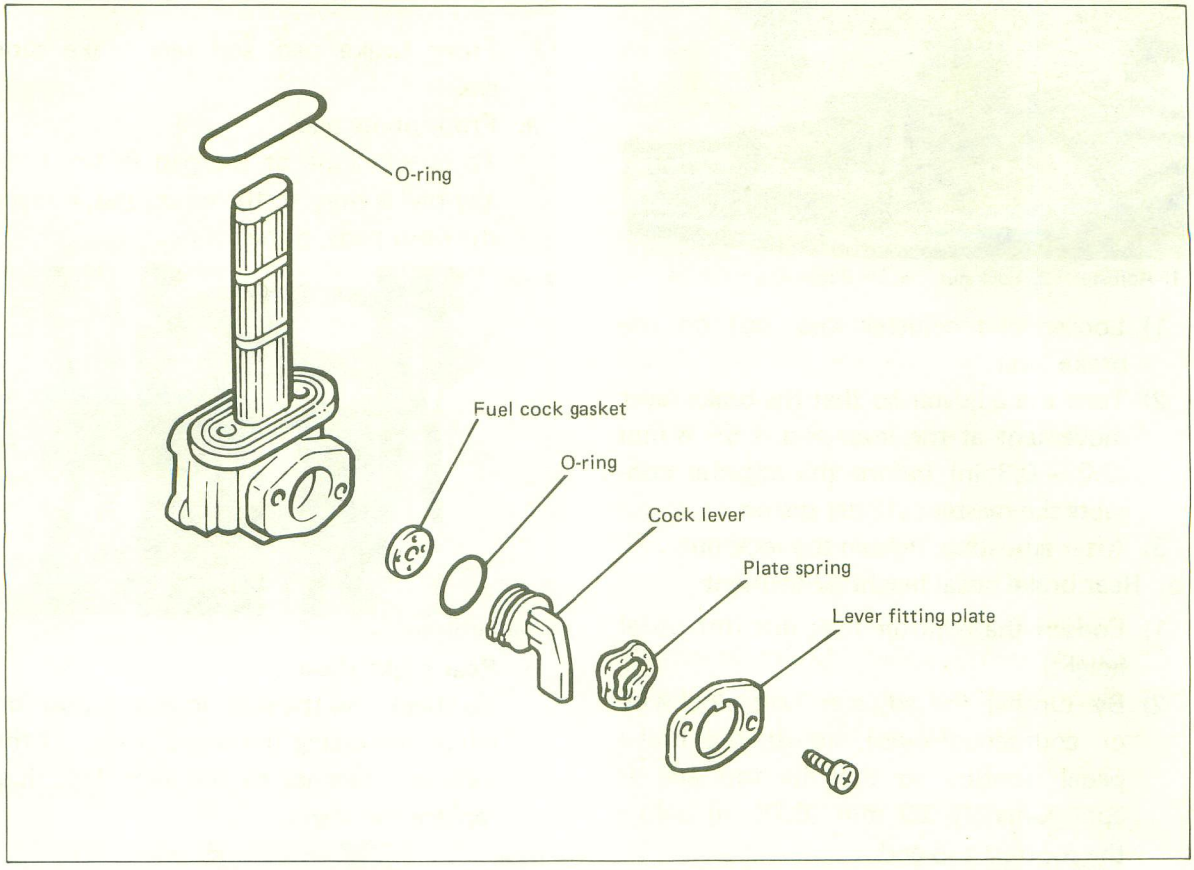
GENERAL MAINTENANCE/LUBRICATION

No.	Item	Remarks	Type	Initial break-in		Thereafter every		
				1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months	16,000 km (10,000 mi) or 24 months
1	Engine oil	Warm-up engine before draining.	Refer to page 17.	○	○	○		
2	Oil filter	Replace.	—	○	○		○	
3	Final gear oil	Replace.	Refer to page 18.	○			○	
4	Air filter	Clean with compressed air.	—		○		○	
5*	Brake system	Adjust free play. Front: Replace pads if necessary. Rear: Replace shoes if necessary.	—	○	○	○		
6*	Clutch	Adjust free play	—	○	○	○		
7*	Control and meter cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W/30 motor oil	○	○	○		
8*	Rear arm pivot bearings	Check bearing assembly for looseness. Moderately repack every 16,000 km (10,000 mi).	Medium weight wheel bearing grease					Repack
9*	A.C. generator	Replace generator brushes. Replace at initial 13,000 km (8,000 mi) and thereafter every 16,000 km (10,000 mi)	—					Replace
10	Brake/clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or 10W/30 motor oil		○	○		
11	Change/Brake pedal shaft pivot	Apply chain lube lightly.	Yamaha chain and cable lube or 10W/30 motor oil		○	○		
12	Center and side stand pivots	Apply chain lube lightly.	Yamaha chain and cable lube or 10W/30 motor oil		○	○		
13*	Front fork oil	Drain completely. Refill to specification.	Yamaha fork oil 10wt or equivalent					○
14*	Steering Ball Bearing and races	Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi).	Medium weight wheel bearing grease		○	○		Repack
15*	Wheel bearings	Check bearings for smooth rotation, Replace if necessary.	—		○	○		
16	Battery	Check specific gravity. Check breather pipe for proper operation.	—		○	○		

*It is recommended that these items be serviced by a Yamaha dealer or other qualified mechanic.

CHASSIS

A. Fuel Petcock



If the fuel petcock is leaking or excessively contaminated, it should be removed from the fuel tank and inspected.

1. Remove the fuel tank and position it so that fuel will not spill when the petcock is removed.
2. Remove the petcock and inspect the filter screen. Replace the filter if seriously contaminated.
3. Remove the screws on the front and rear of the petcock and remove the plate, gaskets, lever, and diaphragm.
4. Inspect all components and replace any that are damaged. If the diaphragm is in any way damaged, or the petcock body gasket surfaces scratched or corroded, the petcock assembly must be replaced. If there is abrasive damage to any component, the fuel tank must be drained and flushed.
5. Reassemble the petcock and install it on the fuel tank.

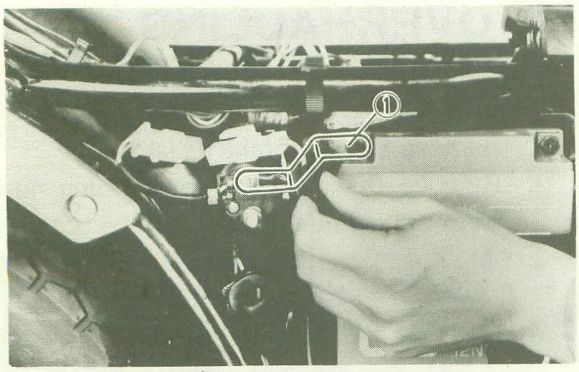
B. Front and Rear Brake

1. Brake adjustment

a. Front brake lever free play adjustment.
The brake can be adjusted by simply adjusting the free play of the brake lever. The piston in the caliper moves forward as the brake pad wears out, automatically adjusting the clearance between the brake pads and brake disc.

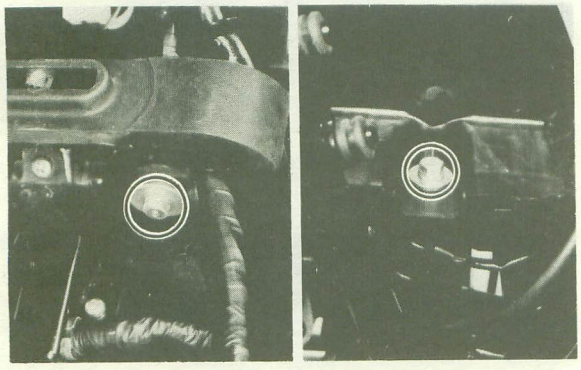
CAUTION:

Proper lever free play is essential to avoid excessive brake drag.



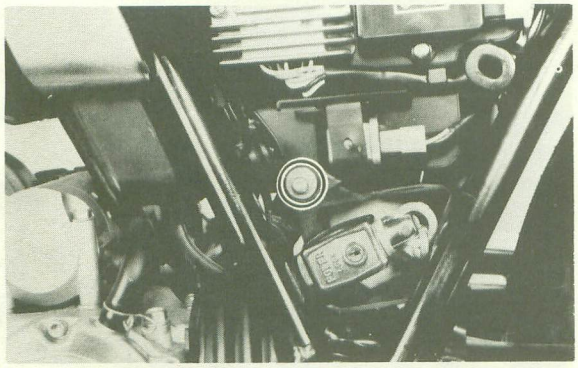
1. Positive battery plate

2. Remove the battery case holding bolts and remove the battery case.

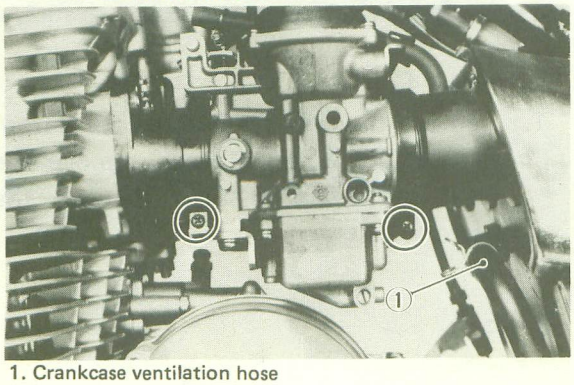


E. Air Cleaner Case

1. Remove the ignitor unit mounting board securing screw and disconnect all connectors. Remove the board assembly.

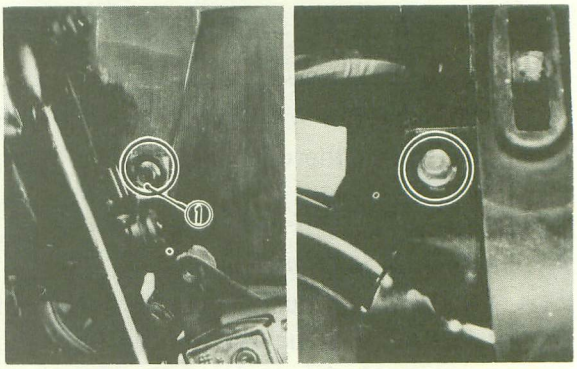


2. Remove the clamps holding the carburetors to the air cleaner case and intake manifolds. Remove the crankcase ventilation hose at the air cleaner case.



1. Crankcase ventilation hose

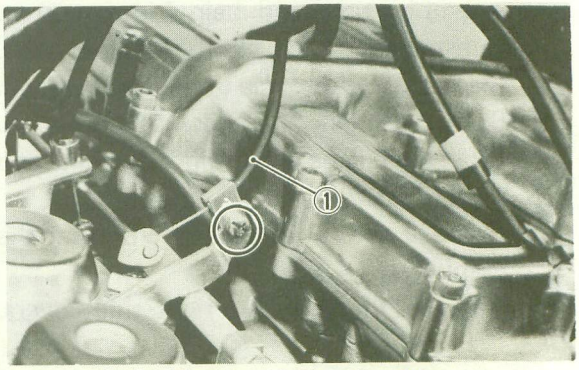
3. Remove the bolts holding the air cleaner case to the frame (left and upper)



1. Engine ground wire

NOTE:
The engine ground wire is secured together with left side holding bolt.

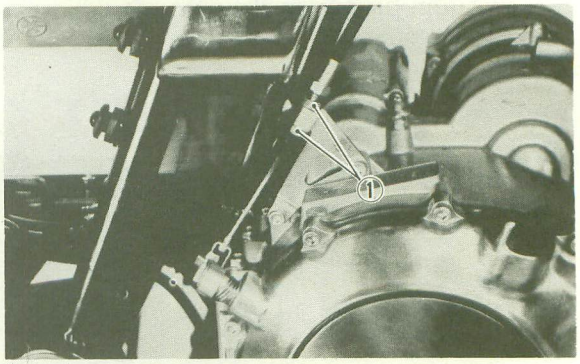
4. Remove the starter (CHOKE) cable from the carburetor.
5. Remove the air cleaner joint rubbers and pull the carburetor assembly to the rear.
6. Disconnect the throttle cable from the carburetor throttle lever and remove the carburetor assembly to the right.



1. Starter (CHOKE) cable 2. Throttle cable

F. Wiring and Cables

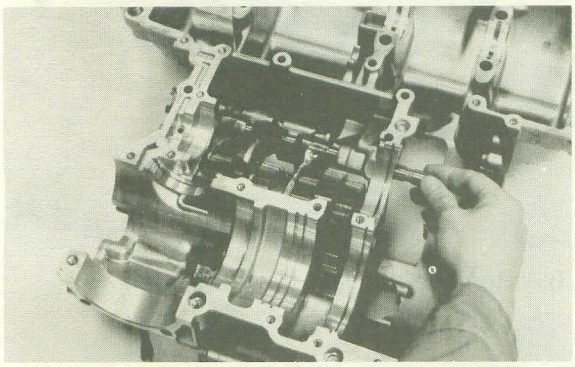
1. Disconnect the clutch cable at the crankcase side.



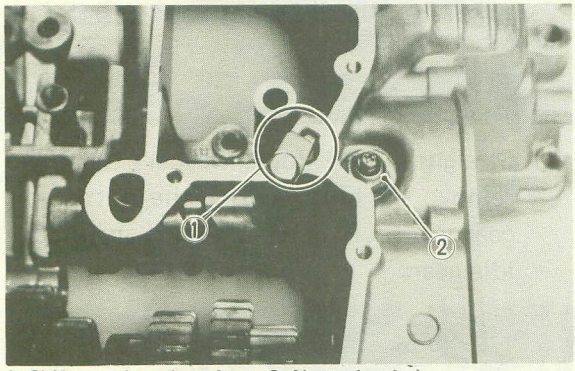
1. Lock nut

L. Lower Crankcase

1. Remove the dowel pin and "O-ring".
2. Remove the shift fork guide bar and shift forks. The shift forks are identified by numbers cast on their sides.

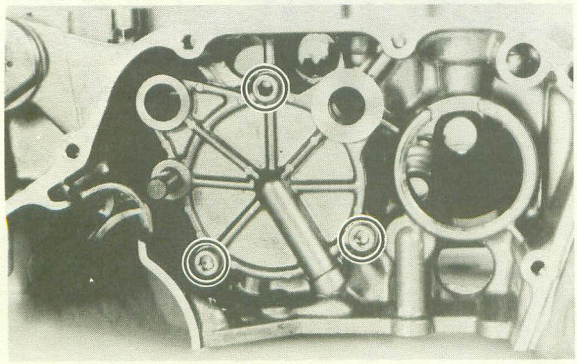


3. Remove the bolt securing the shift cam locating pin and remove the stopper plate and locating pin.
4. Remove the neutral switch.

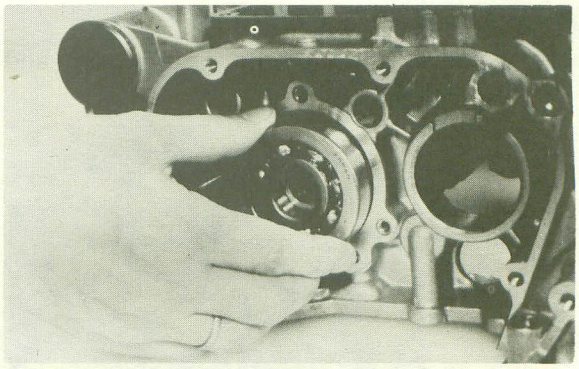


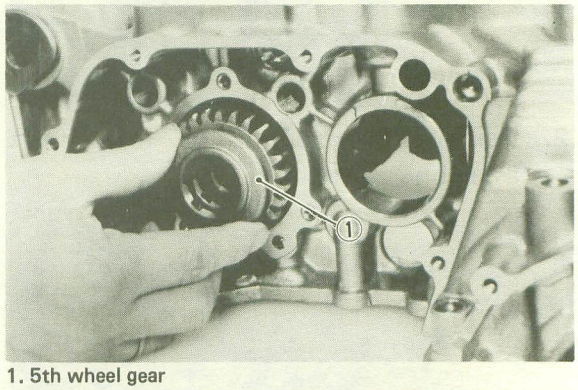
1. Shift cam locating pin 2. Neutral switch

5. Pull out the shift cam.
6. Remove the driven shaft bearing cover holding screws and remove the bearing cover.

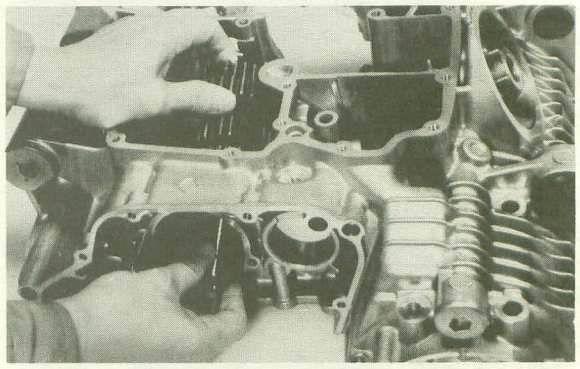


7. Remove the bearing and 5th wheel gear from the driven shaft and pull out the driven shaft assembly.



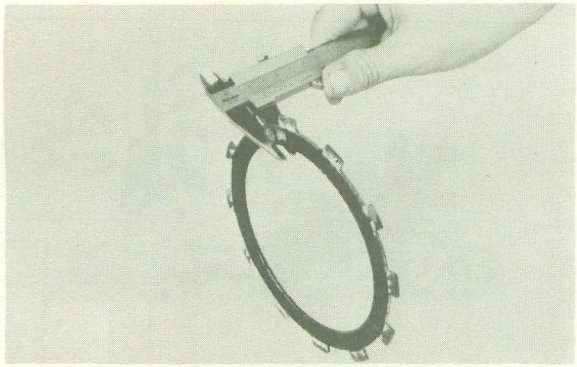


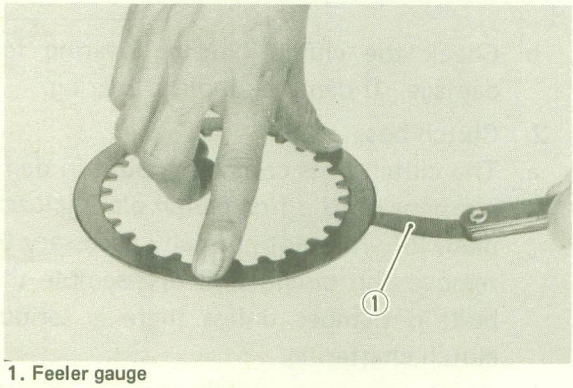
1. 5th wheel gear



clutch plates for warpage with a dial gauge and stand. Replace clutch plate or friction plates as a set if any is faulty or beyond wear limits.

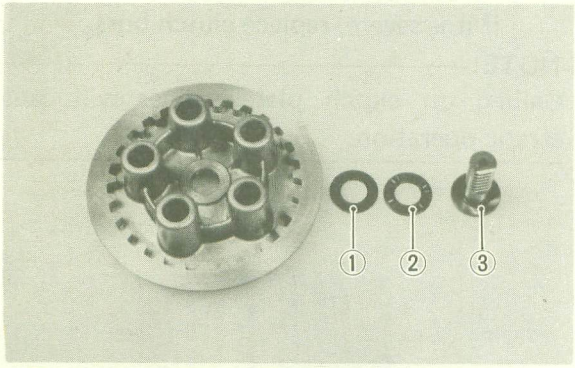
	Standard	Wear limit
Friction plate thickness	3.0 mm (0.12 in)	2.8 mm (0.11 in)
Clutch plate warp limit	—	0.05 mm (0.0020 in)





1. Feeler gauge

4. Clutch actuating mechanism



1. Plate washer 2. Thrust bearing 3. Pull rod

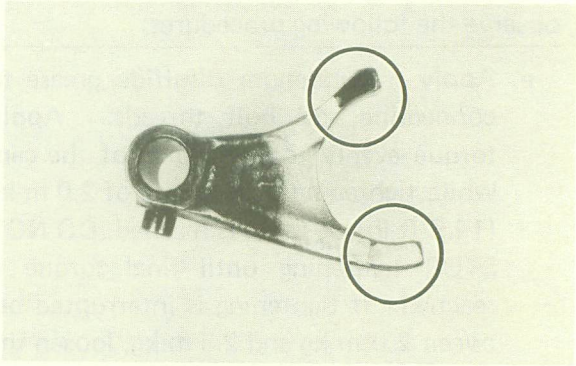
a. Check the pull rod rack gear teeth for wear and damage, replace if damaged.
b. Check the pull rod thrust bearing for damage, replace if damaged.
c. Check the clutch lever shaft pinion gear teeth for damage, replace if damaged.

5. Clutch springs
Measure the clutch spring free length. Replace the springs as a set if any is less than minimum free length.

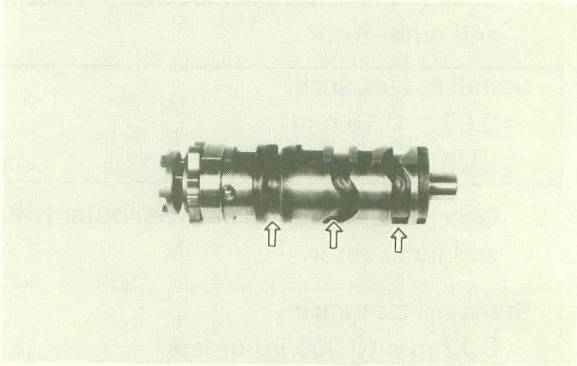
Clutch spring minimum length: 39.1 mm (1.539 in)

L. Transmission

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

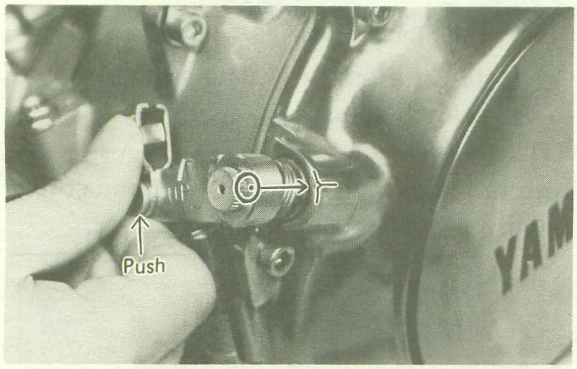


2. Roll the guide bar across a surface place. If the bar is bent, replace.
3. Check the shift cam grooves for signs of wear or damage. If any profile has excessive wear and/or damage, replace cam.



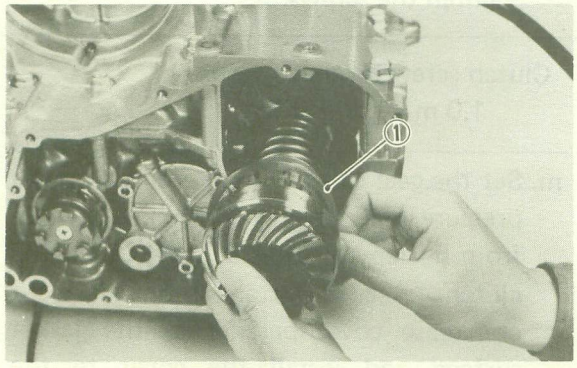
4. Check the cam followers on each shift fork for wear. Check the ends that ride in the grooves in the shift cam. If they are worn or damaged, replace the shift forks.

n. If the clutch lever has been removed, install the lever return spring and lever on the shaft after installing the right crankcase cover. In this case make sure that the punch mark on the lever should align with the mark on the crankcase cover when pushing the lever towards the front by hand and then install the circlip.



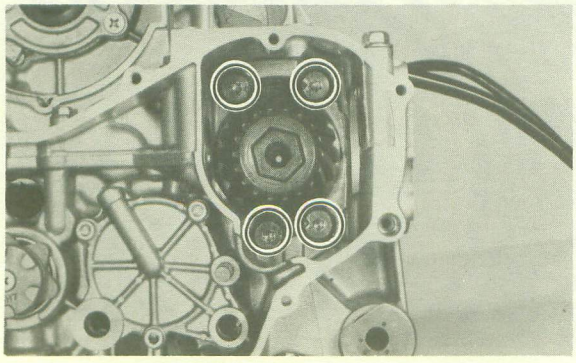
6. Middle gear (installation only, refer to page 67 for the middle gear adjustment)
a. Install the middle drive gear assembly with the proper size of shim(s) and secure it with the bearing retainers and new "TORX" screws.

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



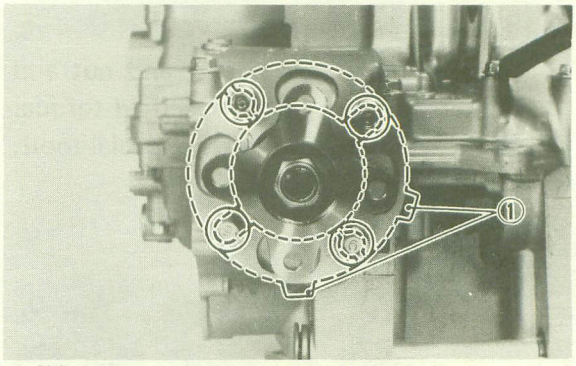
1. Shims

b. Stake the screw heads to the dents on the bearing retainers with a center punch.



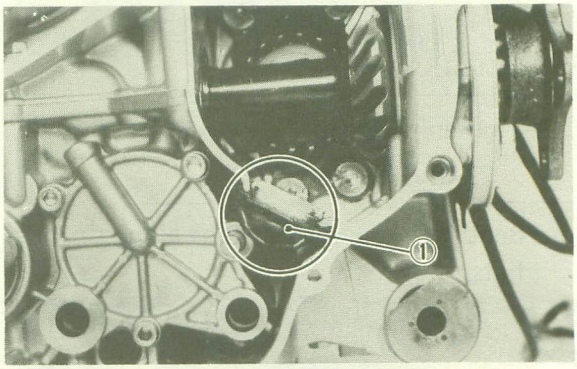
c. Install the driven gear assembly with the proper size of shims and secure it with the bolts. Apply a thread locking compound such as "LOCTITE" to the bolt threads.

Tightening torque: 2.5 m-kg (18.1 ft-lb)



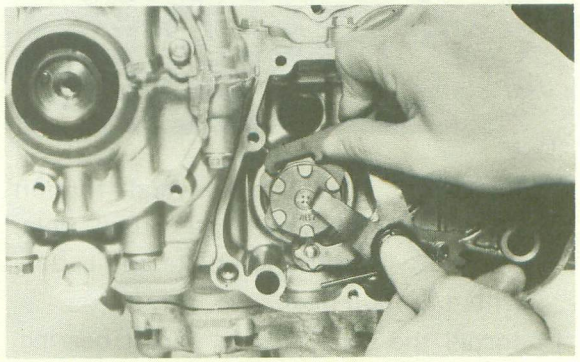
1. Shims

d. Install the middle gear case half moon seal onto the crankcase.



1. Seal

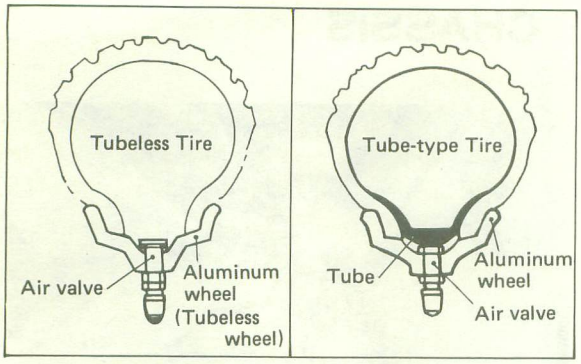
7. Shifter assembly
a. Install the shift shaft assembly with the stopper lever.



b. Install the shift lever assembly with the positioning spring is properly located on the stopper pin and the teeth should be set properly as shown.

CHAPTER 4. CARBURETION

4



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 reset 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.

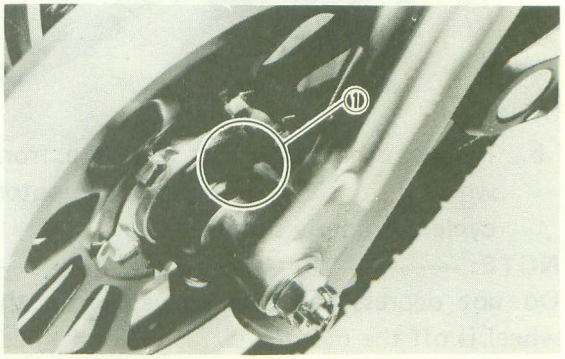
3. To install the wheel bearing, reverse the above sequence. Use a socket that matches the outside race of the bearing as a tool to drive in the bearing.

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

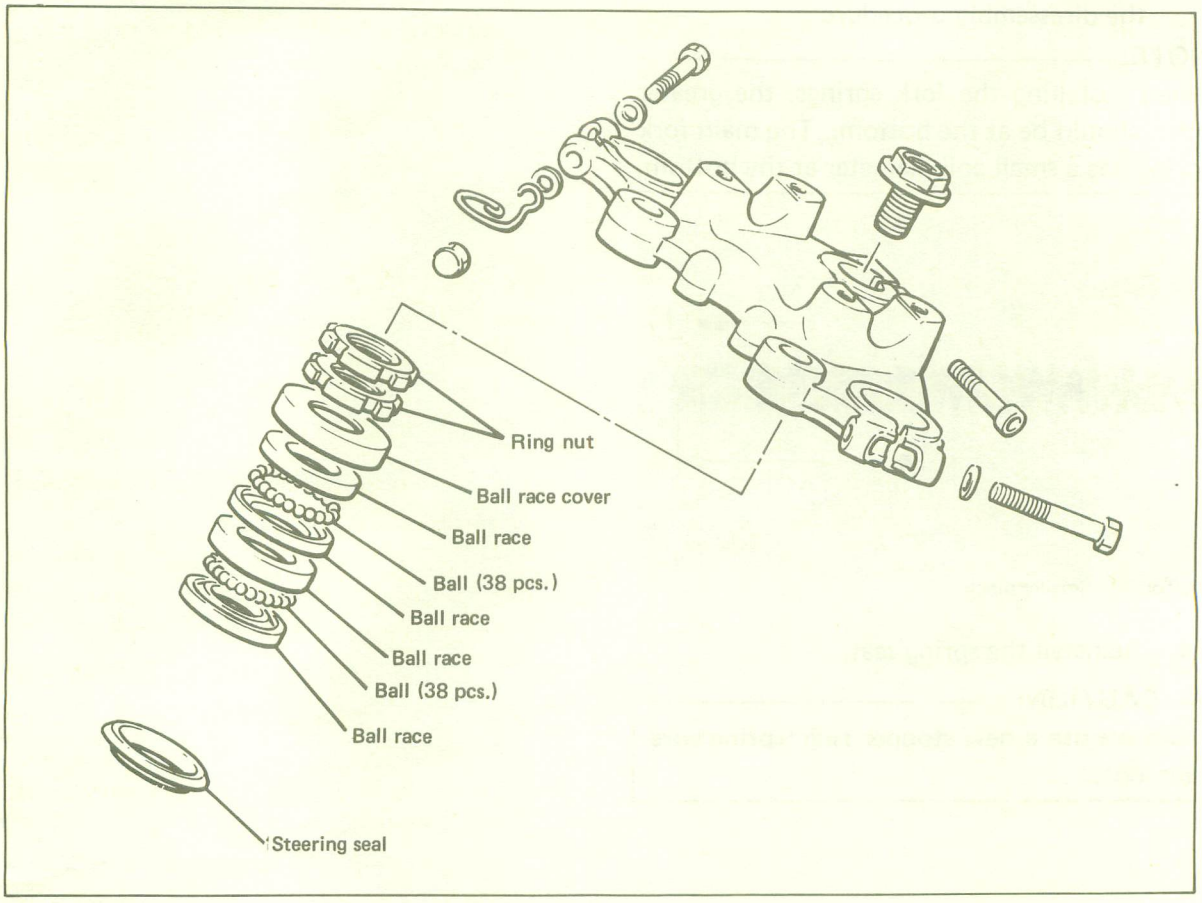
When installing the front wheel, reverse the removal procedure. Note the following points:

1. Lightly grease the lips of the front wheel oil seals and the gear teeth of speedometer drive and driven gears. Use lightweight 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

STEERING HEAD

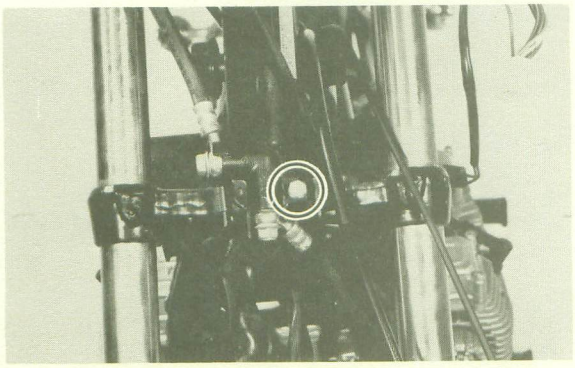


A. Adjustment

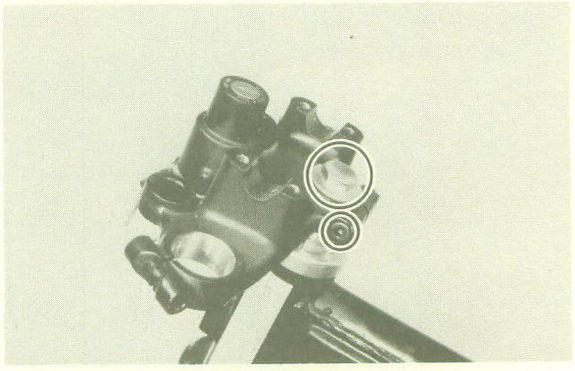
Refer to "D. Reassembly" for steering head adjustment procedure.

B. Removal

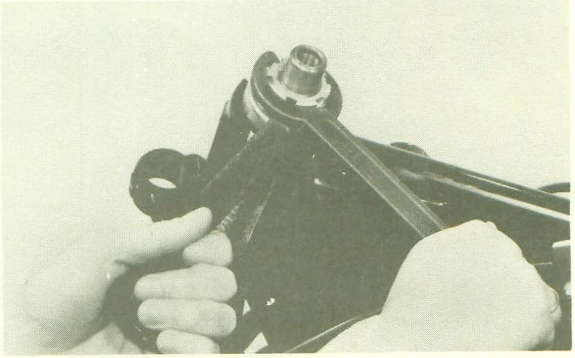
1. Remove the front wheel, front forks and handlebars.
2. Remove the front brake pipe junction.



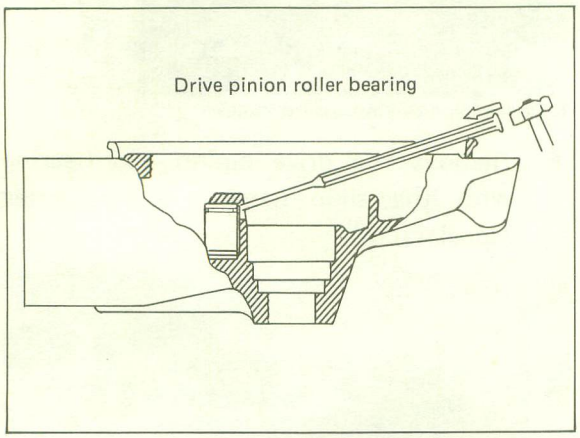
3. Loosen the steering stem (upper bracket) pinch bolt.
4. Remove the stem bolt and steering crown.



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



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.

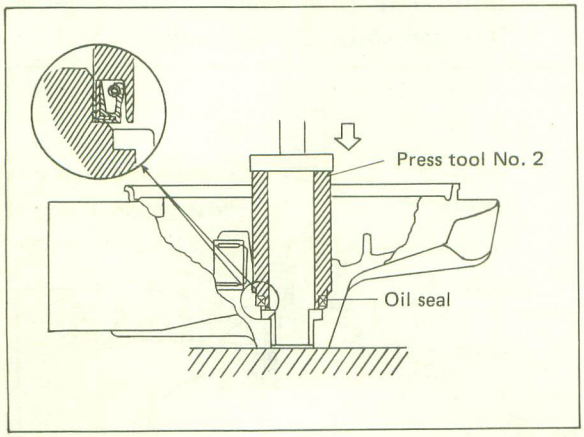


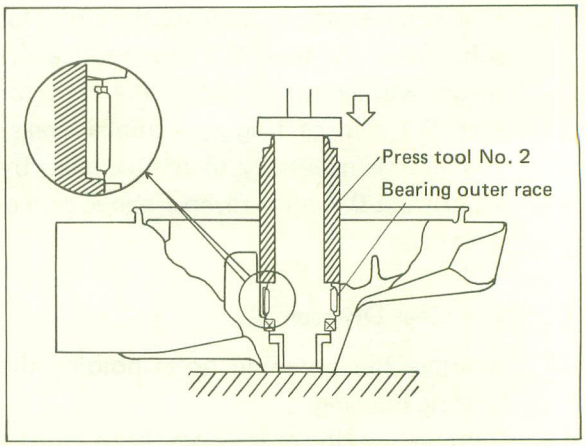
E. Final Gear Reassembly

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 coller, 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.





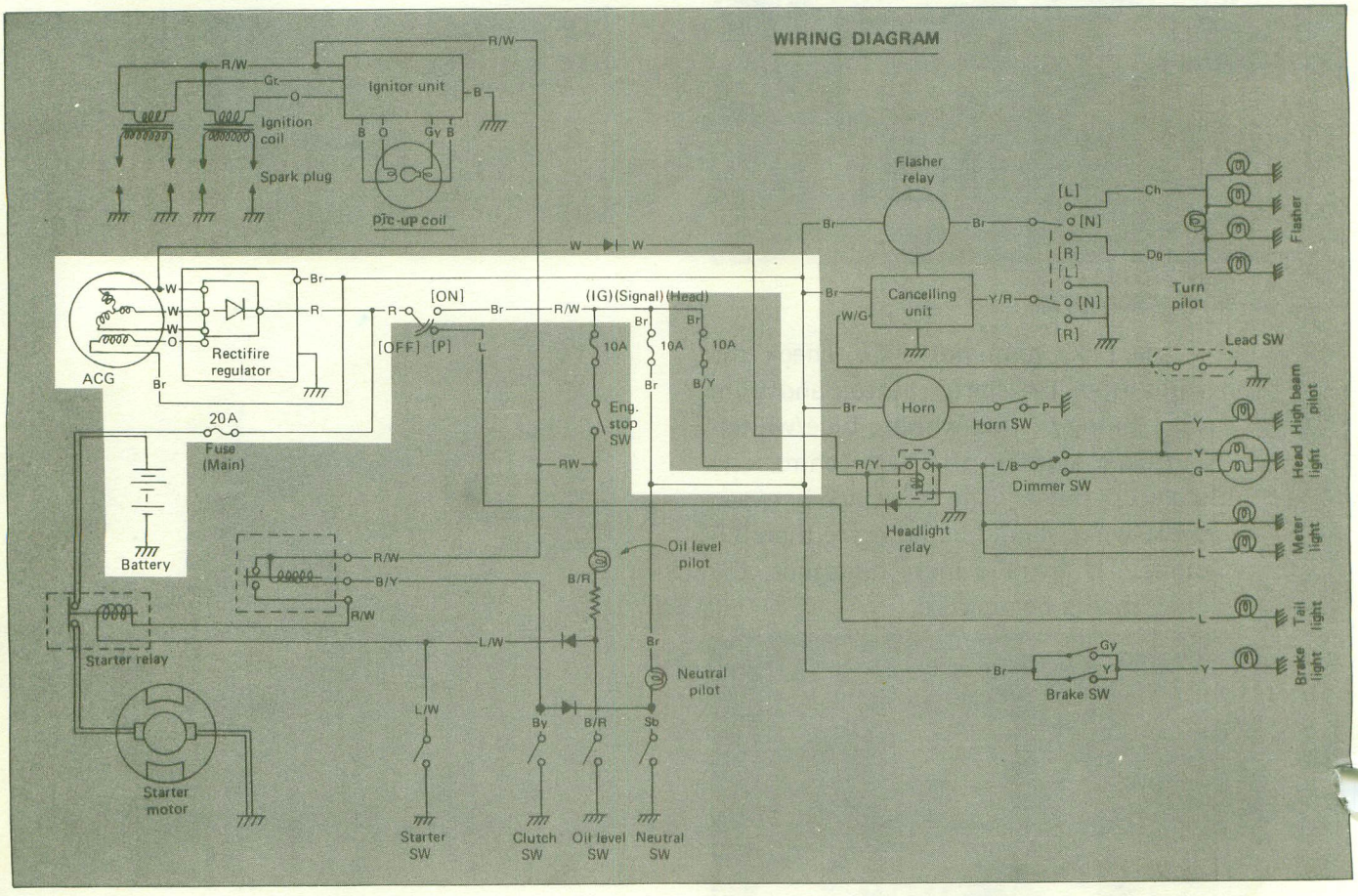
3. Final drive/ring gear positioning

NOTE:

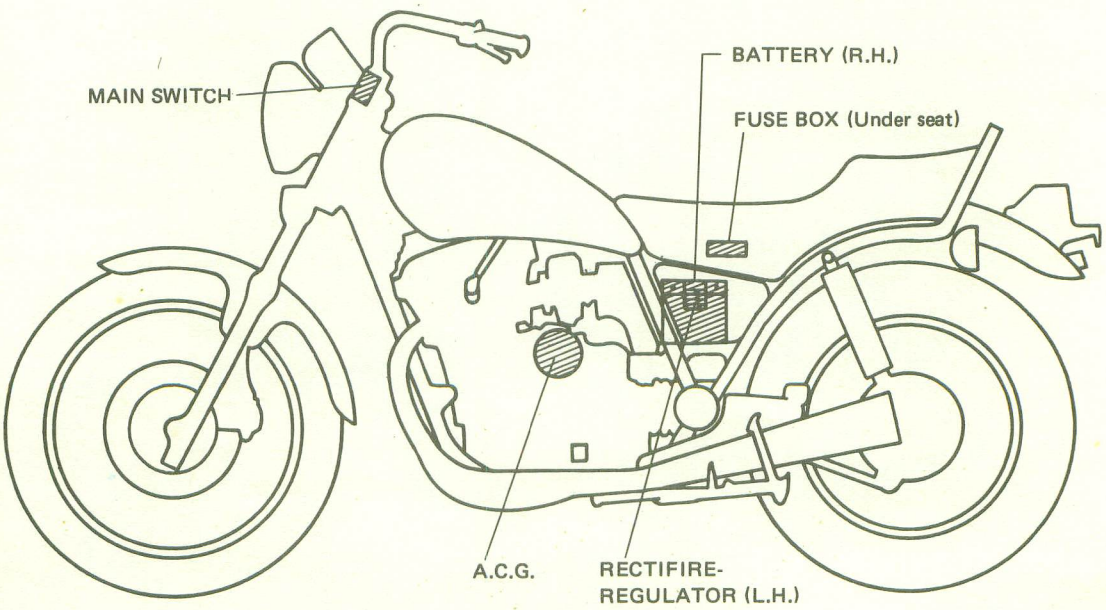
When the following part(s) is replaced with new one(s), gear positioning is necessary:
a. Final gear case, b. Ring gear bearing housing, C. Bearing(s)

CHARGING SYSTEM

A. Circuit Diagram



Above circuit diagram shows charging circuit in wiring diagram.



B. Signal System Tests and Checks

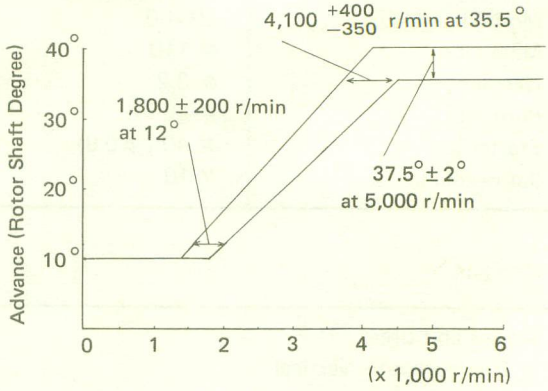
The battery provides power for operation of the horn, brakelight, indicator lights and flasher light. If none of the above operates, always check battery voltage before proceeding further. Low battery voltage indicates either a faulty battery, low battery water, or a defective charging system. See page 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).

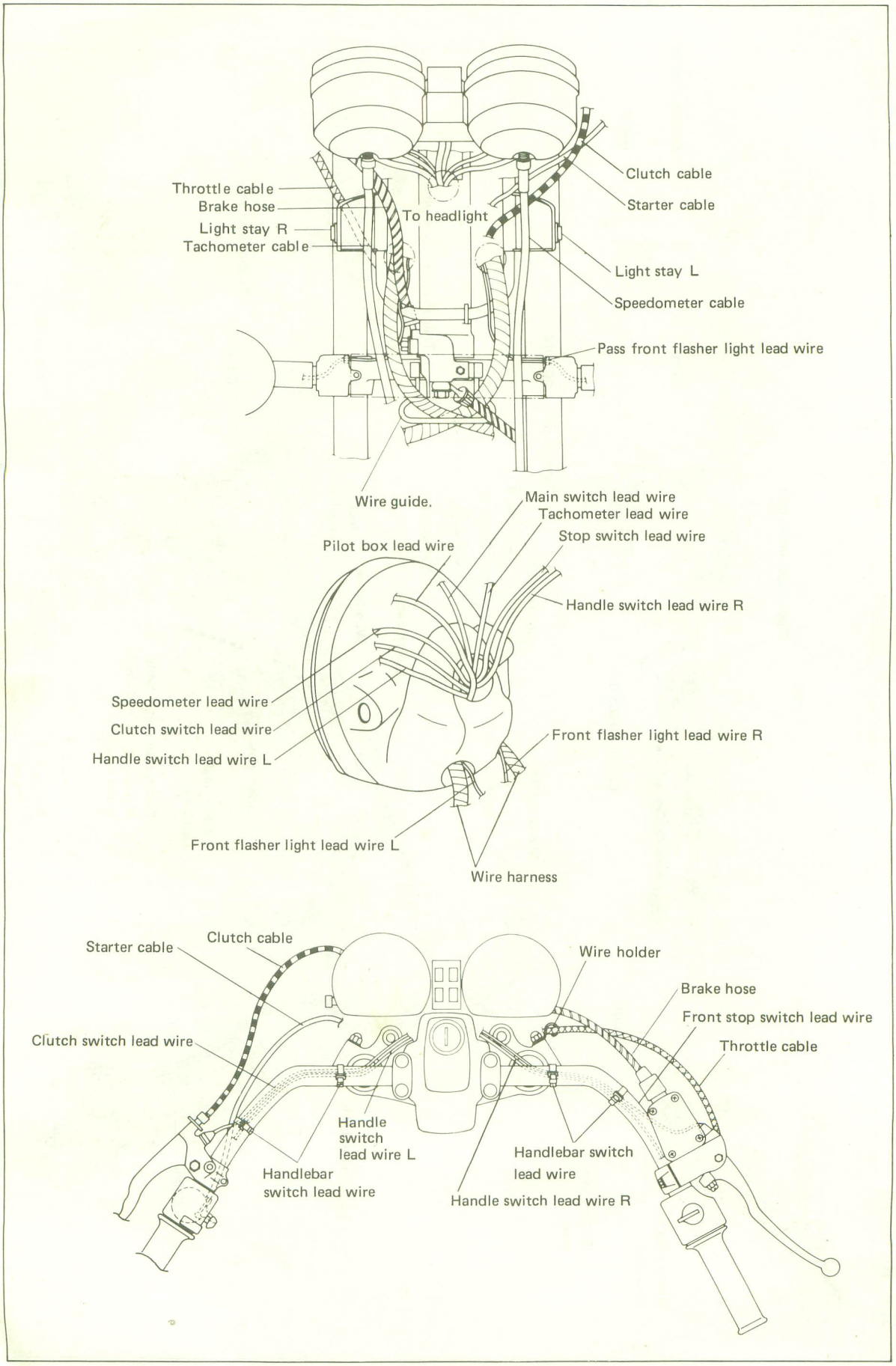
1. Horn does not work:
   a. Check for 12V on brown wire to horn.
   b. Check for good grounding of horn (pink wire) when horn button is pressed.
2. Brake light does not work:
   a. Check bulb.
   b. Check for 12V on yellow wire to brake light.
   c. Check for 12V on brown wire to each brake light switch (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 flahser 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

4. Electrical

Ignition timing retarded: Ignition timing advance:	10° at 1,050 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:	5.0kΩ (No. 1, No. 4), 10kΩ (No. 2, No. 3)
Pick up coil: Resistance	 700Ω ± 20% at 20°C (68°F)
Ignition coil type: Spark gap Primary resistance Secondary resistance	 HITACHI CM12-09 2.5Ω ± 10% at 20°C (68°F) 11kΩ ± 20% at 20°C (68°F)
Starter motor type: Armature coil resistance Brush length: standard minimum Brush spring pressure Armature mica undercut	ND. ADB4D2 0.014Ω ± 6% at 20°C (68°F) 12.0 mm (0.472 in) 8.5 mm (0.33 in) 800 ± 150g (28.24 ± 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 4.0Ω ± 10% at 20°C (68°F) 0.46Ω ± 10% at 20°C (68°F)
Regulator type: Regulated voltage Allowable amperage	I.C. (S8534) 14.5 ± 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


Throttle cable
Brake hose
Light stay R
Tachometer cable
To headlight
Clutch cable
Starter cable
Light stay L
Speedometer cable
Pass front flasher light lead wire
Wire guide.
Main switch lead wire
Tachometer lead wire
Stop switch lead wire
Pilot box lead wire
Handle switch lead wire R
Speedometer lead wire
Clutch switch lead wire
Handle switch lead wire L
Front flasher light lead wire R
Front flasher light lead wire L
Wire harness
Starter cable
Clutch cable
Wire holder
Brake hose
Front stop switch lead wire
Clutch switch lead wire
Throttle cable
Handle switch lead wire L
Handlebar switch lead wire
Handlebar switch lead wire
Handle switch lead wire R