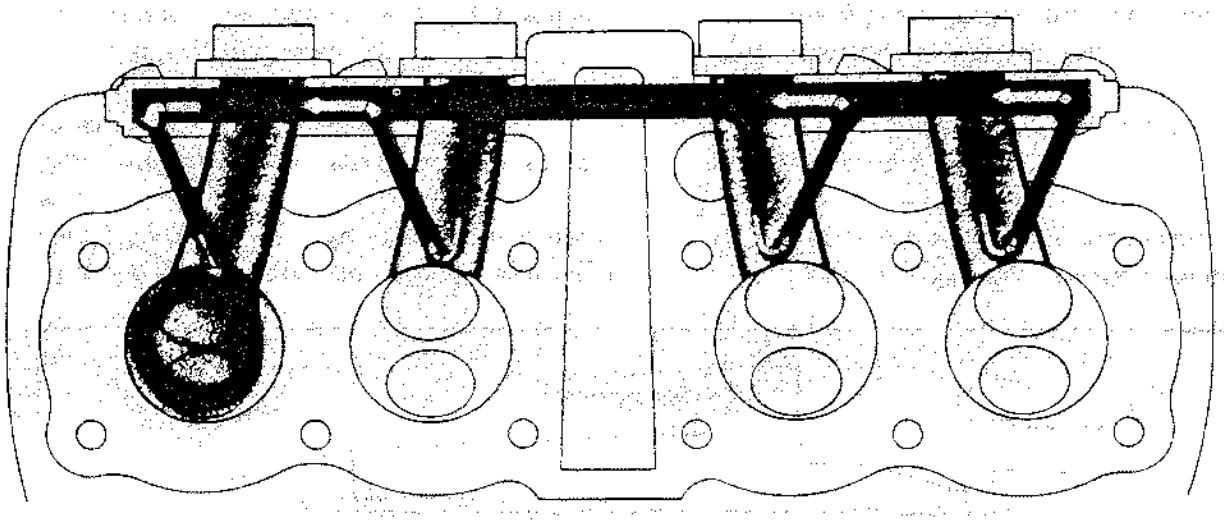
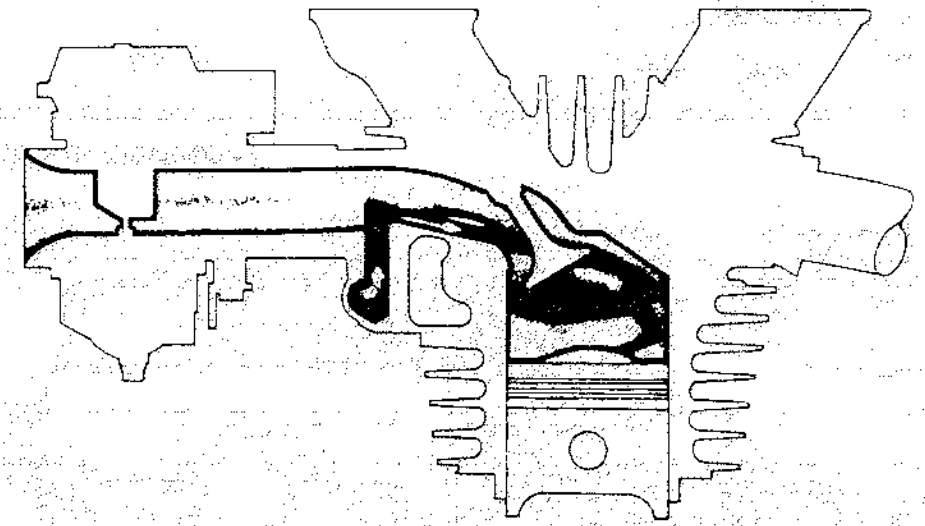
MAJOR FEATURES

YAMAHA INDUCTION CONTROL SYSTEM



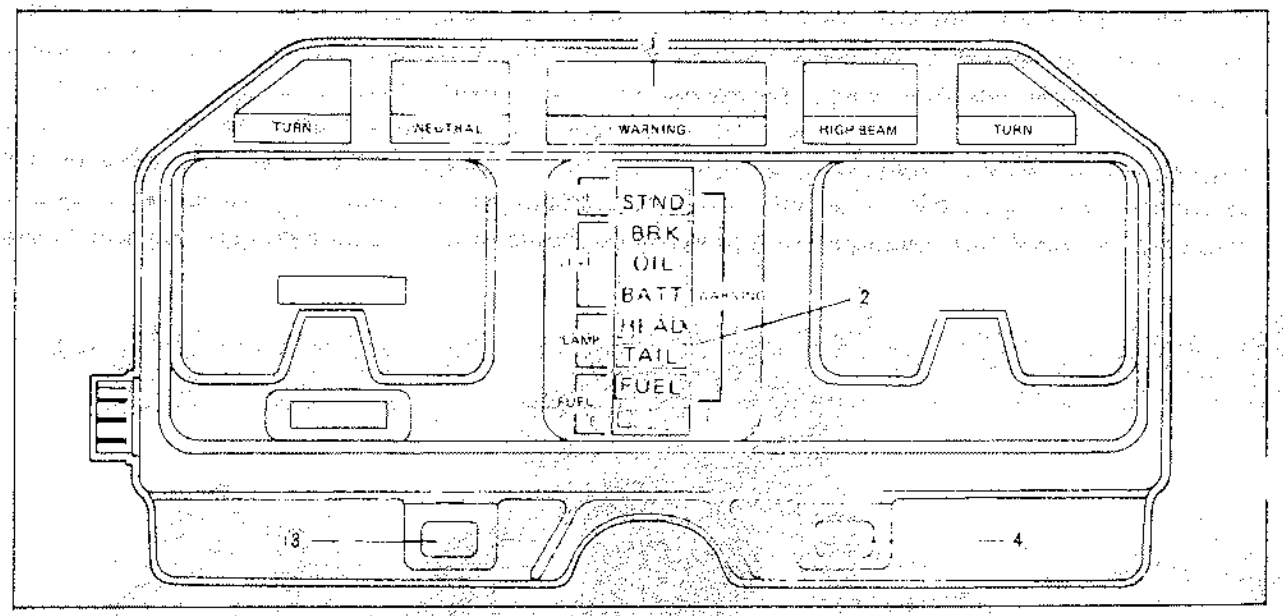


This system has subintake ports. The cross-sectional area of these subntake port is smaller than that of main intake ports. The smaller ports enter the main ports just above the intake valve seat and at such an angle that their charge is directed around the walls of the cylinder; this results in a swirling effect as the mixture is compressed into the combustion chamber.

The subintake ports for all four cylinders are interconnected. Since only one cylinder is on the intake stroke at a time, the subintake port for that cylinder draws mixture from the other three carburetors and subintake ports. When the piston is moving down and the intake valve opens, a vacuum is created in the main and subintake ports. But since the area of the subintake port is so much smaller, the mixture moves faster through it than through the main intake port. The charge from the subintake port, therefore, blasts around the wall of the cylinder, swirling the entire intake charge. This results in more complete burning of the air-fuel mixture.

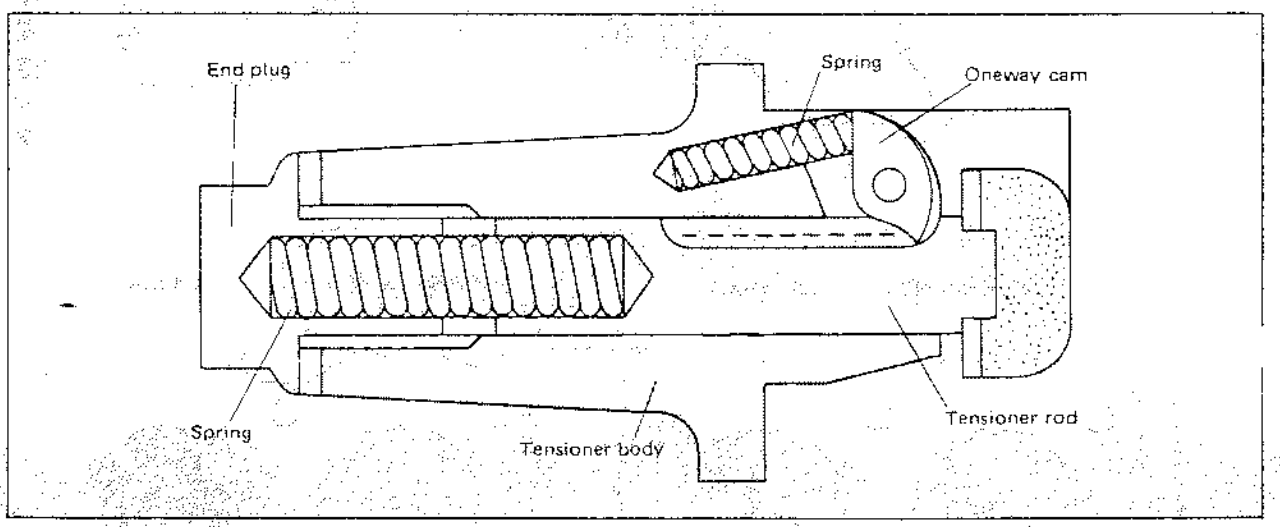
COMPUTERIZED MONITOR SYSTEM

This system monitors seven separate functions and will warn you of any malfunction if encountered until it is fixed. In addition, the fuel gauge in this system indicates the amount of fuel in the tank.



1. Warning light (Red) 2. Display panel 3. Check switch 4. Warning control switch

CAM CHAIN TENSIONER



This model has been equipped the automatic cam chain tensioner. No adjustment is necessary.

When installing this tensioner onto the cylinder proceed as follows:

1. Remove the end plug and spring from the tensioner assembly.
2. Unlock the oneway cam by pushing it with your finger and push the tensioner rod into the tensioner body until it stops.
3. Install the tensioner to the cylinder and torque the bolts to the specification.

Tightening torque:
10 Nm (1.0 m·kg, 7.2 ft·lb)

4. Reinstall the spring and end plug with the gasket. Torque the end plug to the specification.

Tightening torque:
15 Nm (1.5 m·kg, 11 ft·lb)

PERIODIC INSPECTIONS/ADJUSTMENTS AND NEW SERVICE

INTRODUCTION

This chapter includes all information necessary to perform recommended inspections and adjustments. These preventive maintenance procedures, if followed, will ensure more reliable vehicle operation and a longer service life. The need for costly overhaul work will be greatly reduced. This information applies to vehicles already in service and to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

MAINTENANCE INTERVALS CHARTS

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

PERIODIC MAINTENANCE

Unit: km (mi)

Item	Remarks	Initial			Thereafter every	
		500 (300)	1,500 (1,000)	3,000 (2,000)	3,000 (2,000)	6,000 (4,000)
Cylinder(s)	Check compression	○		○	○	
Valve(s)	Check/Adjust valve clearance			check		10,000 (6,000)
Spark plug(s)	Inspect/Clean or replace as required	○		○	○	
Air filter	Dry type – Clean/Replace as required		○	○	1,500 (1,000)	
Carburetor(s)	Check operation/Adjust as required			○	○	
Brake system (complete)	Check/Adjust as required – Repair as required	○	○	○	1,500 (1,000)	
Wheels and tires	Check pressure/Wear/Balance/Damage	○	○	○	○	
Wheel bearings	Check bearings for smooth rotation Replace if necessary			○	○	
Fuel cocks	Clean/Flush tank as required	○	○		○	
Fitting/Fasteners	Tighten before each trip and/or...	○	○	○	○	
Battery	Top-up/Check specific gravity and breather pipe	○	○	○	○	
Ignition timing	Check/Repair as required			check		check
A.C. Generator	Replace generator brushes	every 15,000 (10,000)				
Lights/Signals	Check operation/Replace as required	○	○	○	○	

LUBRICATION INTERVALS

Unit: km (mi)

Item	Remarks	Type (Recommended lubricants)	Initial			Thereafter every	
			500 (300)	1,500 (1,000)	3,000 (2,000)	3,000 (2,000)	6,000 (4,000)
Engine oil	Replace/Warm engine before draining	SAE 20W40 type SE motor oil	○		○		5,000 (3,000)
Oil filter	Replace/After installing start engine check oil leaks	—	○		5,000 (3,000)		10,000 (6,000)
Final gear oil	Replace	SAE 80 API GL-4 Hypoid gear oil	○			-	10,000 (6,000)
Hydraulic brake fluid reserve	Use new fluid only Check brake fluid leakage.	DOT #3	check	check	check	check	
Control/Meter cables	Apply thoroughly	SAE 10W30 motor oil		○	○	○	
Throttle grip/ Housing	Apply lightly	Lithium base grease	○		○		○
Brake pedal shaft	Apply lightly	SAE 10W30 motor oil			○	○	
Change pedal shaft/ Brake and clutch lever pivot	Apply lightly	SAE 10W30 motor oil			○	○	
Center and side stand pivots	Apply lightly	SAE 10W30 motor oil			○	○	
Rear arm pivot bearing	Apply grease fully yearly or...	Medium-weight wheel bearing grease					12,000 (8,000)
Front forks	Drain completely/Replace — Check specifications	SAE 10W30 type SE motor oil			○		○
Steering bearings	Inspect thoroughly/ Pack moderately	Medium-weight wheel bearing grease			check		12,000 (8,000)
Speedometer gear housing	Inspect thoroughly/ Pack moderately	Lithium base grease					12,000 (8,000)

NOTE:

Brake fluid replacement:

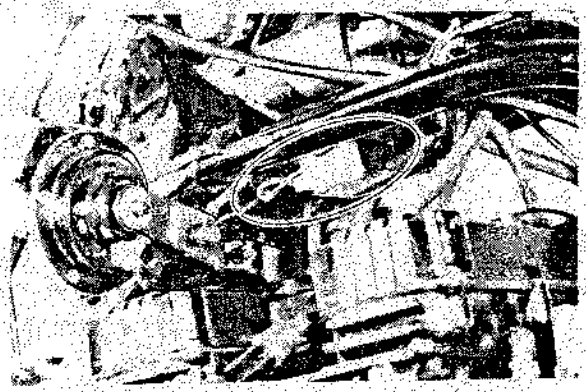
1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder replace the oil seals every two years.
3. Replace the brake hoses every four years, or if cracked or damaged.

ENGINE

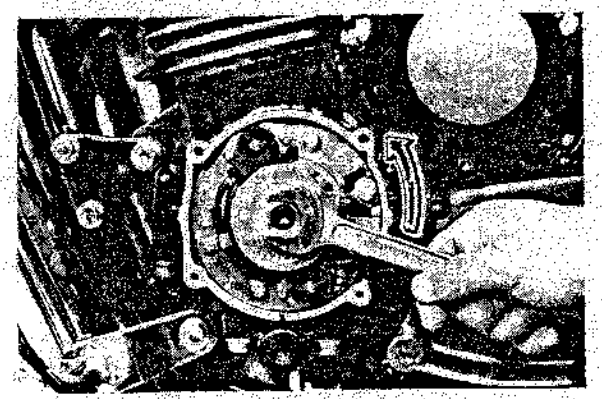
A. Valve clearance adjustment

NOTE:
Valve clearance must be measured with the engine and at room temperature.

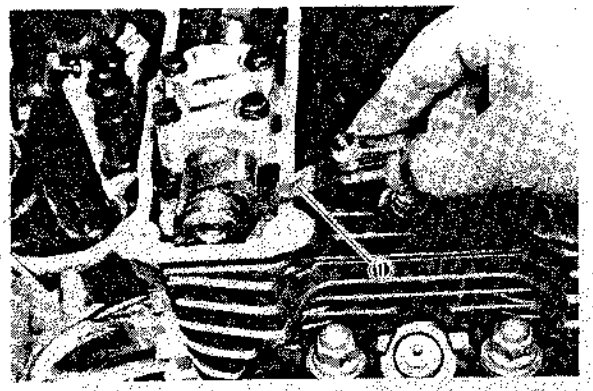
1. Remove the seat and fuel tank.
2. Remove the flasher relay, and spark plug lead wires.



3. Remove the cylinder head cover and left crankcase cover (pick-up base cover). Care should be taken to not scratch or damage the gasket sealing surfaces.
4. Turn the crankshaft with the nut on the left end of the crankshaft to turn the cams. The proper position of the cam when measuring the valve clearance is with the cam lobe directly opposite the valve lifter.



5. Insert a feeler gauge between the valve lifter and the camshaft base circle.



1. Feeler gauge

Intake valve clearance (cold): 0.11 ~ 0.15 mm (0.004 ~ 0.006 in) Exhaust valve clearance (cold): 0.16 ~ 0.20 mm (0.006 ~ 0.008 in)

Adjustment

Valve clearance is adjusted by replacing the adjusting pad on the top of the valve lifter. Adjusting pads are available in 25 thicknesses ranging from No. 200 (2.000 mm (0.078 in)) to No. 320 (3.20 mm (0.126 in)) in steps of 0.05 mm (0.002 in). The thickness of each pad is marked on the pad face that contacts of the valve lifter (not the cam). Adjustment of the valve clearance is accomplished as follows:

1. Determine valve clearance (feeler gauge measurement.)
2. Remove adjusting pad and note number.
3. Select proper pad from appropriate chart (intake or exhaust chart).
4. Install new pad and check installed clearance.

Procedure

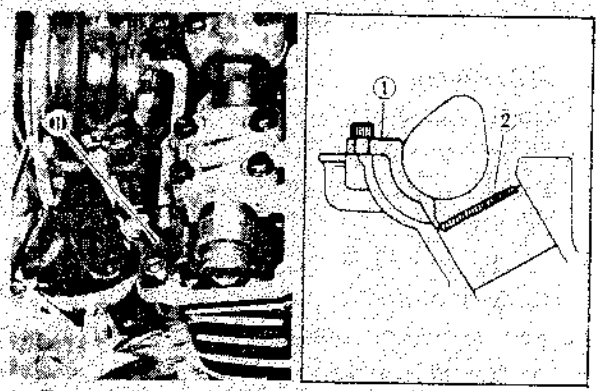
1. Measure valve clearance. If clearance is incorrect, record the measured amount of clearance. This must be measured carefully.
2. There is a slot in the valve lifter. This slot must be positioned opposite the blades of the tappet adjusting tool before the tools is installed.
3. Turn the cam until the lobe fully depresses the valve lifter and opens the valve. Install the tappet adjusting tool as shown to hold the lifter in this depressed position.

NOTE:

The tappet adjusting tool is fastened to the cylinder head securely using one allen screw such as one used to install the cylinder head cover. Make sure that the tool contacts the lifter only, and not the pad.

CAUTION:

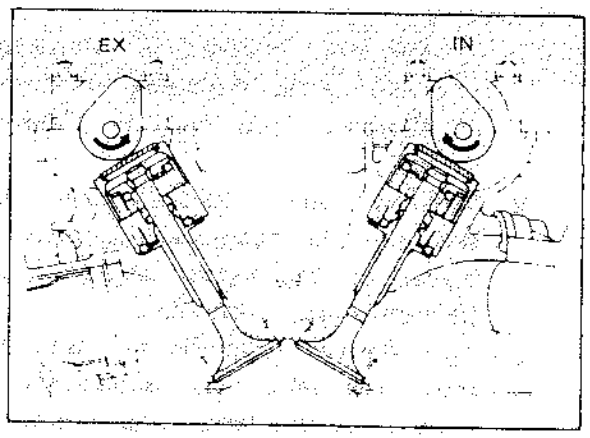
If the cam lobe touches the tappet adjusting tool, the stress may fracture the cylinder head. DO NOT ALLOW THE CAM TO CONTACT THE TAPPET ADJUSTING TOOL.



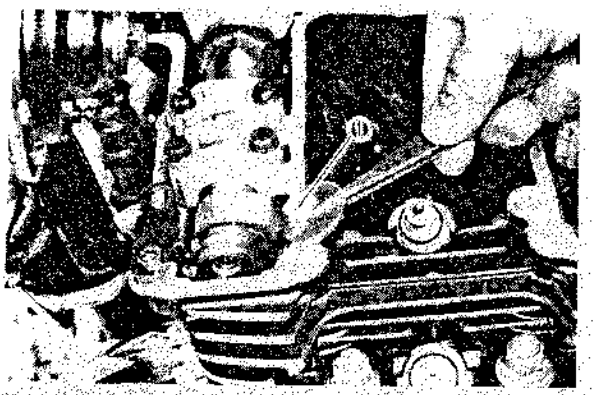
1. Tappet adjusting tool 2. Adjusting pad

4. Carefully rotate the cam so that the pad can be removed. To avoid cam touching the adjusting tool, turn cams as follows: (view from left side of the motorcycle)

   Intake: Carefully rotate CLOCKWISE.
   Exhaust: Carefully rotate COUNTER-CLOCKWISE.



5. Remove the pad from the lifter. There is a slot in the lifter. Use a smaller screwdriver or other blade and a magnetic rod to remove the pad. Note the number on the pad.



1. Adjusting pad

6. Proper pad selection is made as follows: (Use appropriate chart for exhaust or intake valves.) Refer to the table in the next page.
   a. Find number of original (installed) pad number on chart. Read down on chart.
   b. Find measured valve clearance (from step 1) on chart. Read across.
   c. At the intersection of installed pad number (down) and measured clearance (across) is a new pad number.

EXAMPLE:
Intake valve, installed pad:
No. 250 (read down)
Measured clearance:
0.32 mm (0.012 in) (read across)
New pad number: No. 270
(intersection of down & across)

NOTE:

The new pad number is to be used as a guide only. Verify the correctness of this choice in the following step(s).

7. Install the new pad in the lifter. Install the pad with the number down.
8. Remove tappet adjusting tool.
9. Turn crankshaft to rotate cam several rotations. This will set the pad in the lifter.
10. Check valve clearance (step 3). If clearance is incorrect, repeat preceding steps until proper clearance is obtained.
11. Inspect head cover gasket. If bent or torn, replace gasket.
12. Reinstall removed parts in reverse order.

PAD SELECTION CHART

INTAKE

Measured clearance	INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00 ~ 0.05			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.06 ~ 0.10		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.11 ~ 0.15																									
0.16 ~ 0.20	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.21 ~ 0.25	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.26 ~ 0.30	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.31 ~ 0.35	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.36 ~ 0.40	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.41 ~ 0.45	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.46 ~ 0.50	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.51 ~ 0.55	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.56 ~ 0.60	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.61 ~ 0.65	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.66 ~ 0.70	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.71 ~ 0.75	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.76 ~ 0.80	265	270	275	280	285	290	295	300	305	310	315	320													
0.81 ~ 0.85	270	275	280	285	290	295	300	305	310	315	320														
0.86 ~ 0.90	275	280	285	290	295	300	305	310	315	320															
0.91 ~ 0.95	280	285	290	295	300	305	310	315	320																
0.96 ~ 1.00	285	290	295	300	305	310	315	320																	
1.01 ~ 1.05	290	295	300	305	310	315	320																		
1.06 ~ 1.10	295	300	305	310	315	320																			
1.11 ~ 1.15	300	305	310	315	320																				
1.16 ~ 1.20	305	310	315	320																					
1.21 ~ 1.25	310	315	320																						
1.26 ~ 1.30	315	320																							
1.31 ~ 1.35	320																								

VALVE CLEARANCE (engine cold) 0.11 ~ 0.15 mm
Example: Installed is 250
Measured clearance is 0.32 mm
Replace 250 pad with 270
Pad Number: (example) Pad No. 250 = 2.50 mm
Pad No. 255 = 2.55 mm
Always install pad with number down.

EXHAUST

Measured clearance	INSTALLED PAD NUMBER																								
	200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320
0.00 ~ 0.05				200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305
0.06 ~ 0.10			200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310
0.11 ~ 0.15		200	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315
0.16 ~ 0.20																									
0.21 ~ 0.25	205	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320	
0.26 ~ 0.30	210	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320		
0.31 ~ 0.35	215	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320			
0.36 ~ 0.40	220	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320				
0.41 ~ 0.45	225	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320					
0.46 ~ 0.50	230	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320						
0.51 ~ 0.55	235	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320							
0.56 ~ 0.60	240	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320								
0.61 ~ 0.65	245	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320									
0.66 ~ 0.70	250	255	260	265	270	275	280	285	290	295	300	305	310	315	320										
0.71 ~ 0.75	255	260	265	270	275	280	285	290	295	300	305	310	315	320											
0.76 ~ 0.80	260	265	270	275	280	285	290	295	300	305	310	315	320												
0.81 ~ 0.85	265	270	275	280	285	290	295	300	305	310	315	320													
0.86 ~ 0.90	270	275	280	285	290	295	300	305	310	315	320														
0.91 ~ 0.95	275	280	285	290	295	300	305	310	315	320															
0.96 ~ 1.00	280	285	290	295	300	305	310	315	320																
1.01 ~ 1.05	285	290	295	300	305	310	315	320																	
1.06 ~ 1.10	290	295	300	305	310	315	320																		
1.11 ~ 1.15	295	300	305	310	315	320																			
1.16 ~ 1.20	300	305	310	315	320																				
1.21 ~ 1.25	305	310	315	320																					
1.26 ~ 1.30	310	315	320																						
1.31 ~ 1.35	315	320																							
1.36 ~ 1.40	320																								

VALVE CLEARANCE (engine cold) 0.16 ~ 0.20 mm
Example: Installed is 250
Measured clearance is 0.32 mm
Replace 250 pad with 265
Pad Number: (example) Pad No. 250 = 2.50 mm
Pad No. 255 = 2.55 mm
Always install pad with number down

B. Spark plug

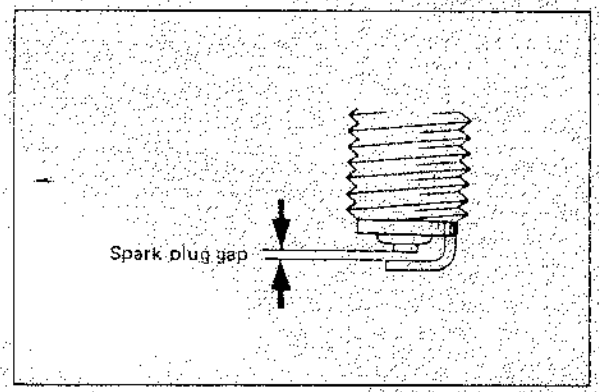
The spark plug is an important engine component and is easy to inspect. The condition of the spark plug can indicate something of the condition of the engine.

For example, a very white center electrode porcelain color could indicate an intake tract air leak or carburetion problem for that cylinder. Do not attempt to diagnose such problems yourself. Instead, take the motorcycle to your Yamaha dealer.

You should periodically remove the inspect the spark plug because heat and deposits will cause any spark plug to slowly break down and erode. If electrode erosion becomes excessive, or if carbon and other deposits are excessive, you should replace the spark plug with one of the proper types.

Standard spark plug:
BP7ES (N.G.K.) or W22EP-U (ND)

Before installing any spark plug, measure the electrode gap with a wire thickness gauge and adjust to specifications.



Spark plug gap:
0.7 ~ 0.8 mm (0.028 ~ 0.031 in)

When installing the plug, always clean the gasket seat surface and use a new gasket. Wipe off any grime from the threads and torque the spark plug properly.

Spark plug torque:
20 Nm (2.0 m·kg, 14.5 ft·lb)

C. Ignition timing

1. Ignition timing is checked with a timing light by observing the position of the stationary pointer and the marks stamped on the timing plate.

The timing plate is marked as follows:
" ⌴ "..... Firing range for No. 1 (L.H.) cylinder
" T "..... Top Dead Center for No. 1 (L.H.) and No. 4 (R.H.) cylinders.

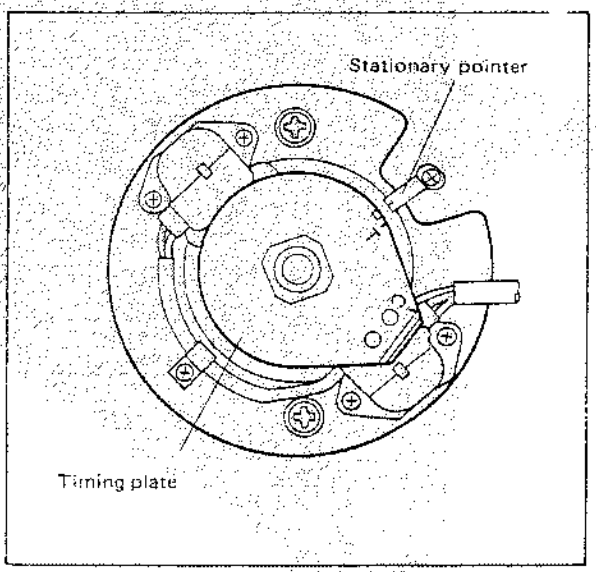
2. Connect the timing light to No. 1 (L.H.) spark plug lead wire.
3. Start the engine and keep the en e speed as specified. Use a tachometer to check the engine speed.

Specified engine speed: 1,200 r/min

4. The stationary pointer should be within the limits of " ⌴ " on the timing plate. If it exceeds the limits or does not steady, check the timing plate for tightness and/or ignition system for damage. (See "ELECTRICAL")

CAUTION:

Never bend the stationary pointer.

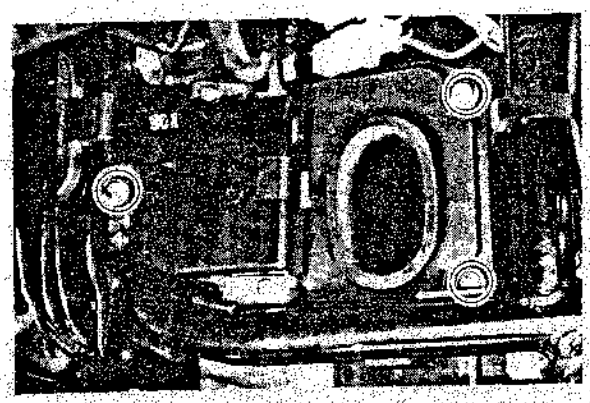


D. Air filter

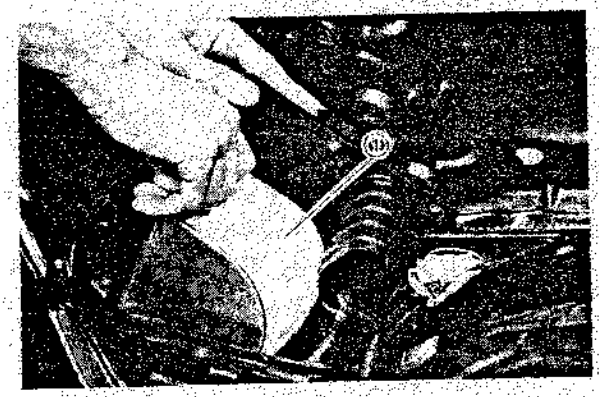
1. Removal

a. Open the seat.

b. Remove the air filter case cover by removing the three screws.

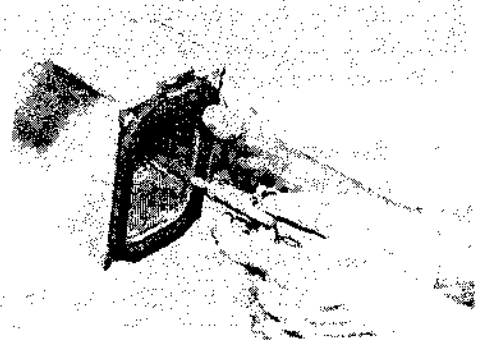


c. Pull out the element.



1. Air filter element

2. Cleaning method
Tap the element lightly to remove most of the dust and dirt; then blow out the remaining dirt with compressed air from the inner surface of the element. If element is damaged, replace it.



3. Reassemble by reversing the removal procedure. Check whether the element is seated completely against the case.

4. The air filter element should be cleaned at the specified intervals.

CAUTION:

The engine should never be run without the air cleaner element installed; excessive piston and/or cylinder wear may result.

E. Carburetor

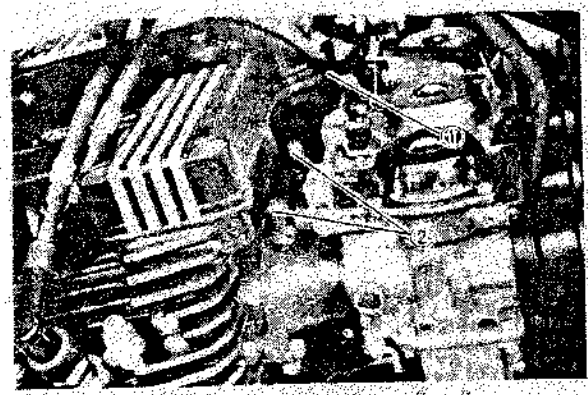
Synchronization

The seat must be opened and the rear of the tank elevated to gain access to the vacuum connections and synchronizing screw of the carburetors.

NOTE:

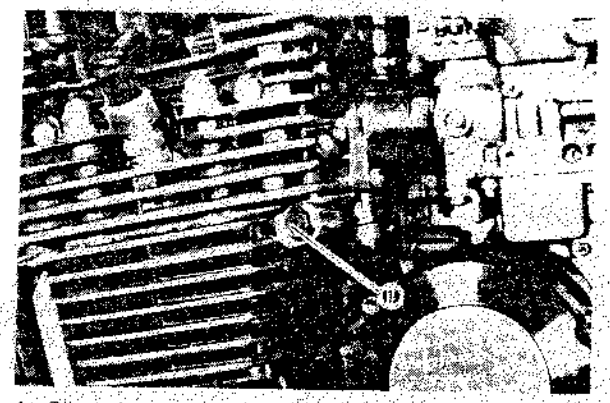
The valve clearances must be set properly before synchronizing the carburetors.

1. Remove the vacuum pipe from the carburetor manifold (No. 3 cylinder) and turn the fuel cock to "PRI".
2. Remove the rubber caps from the No. 1, 2, and 4 carburetor manifolds.



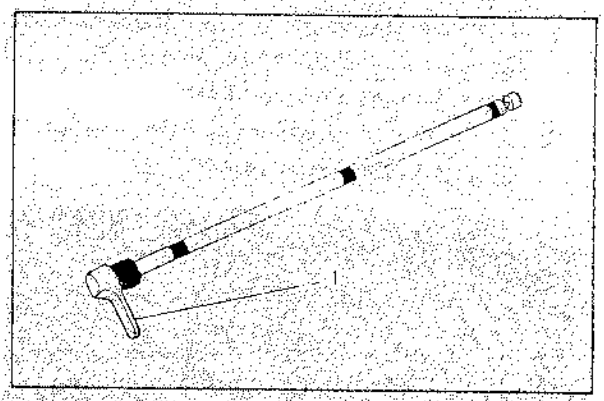
1. Vacuum pipe (#3) 2. Rubber cap (#1, #2)

3. Remove either the left or right (but not both) blind plug at the end of the Y.I.C.S. (Yamaha Induction Control System) passage in the cylinder.



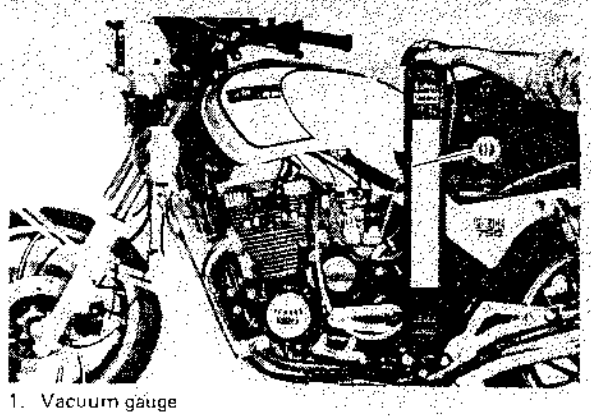
1. Blind plug

4. Insert the Y.I.C.S. shutoff tool (special tool) fully and flip the locking lever.



1. Locking lever

5. Connect each vacuum gauge hose to its proper carburetor.



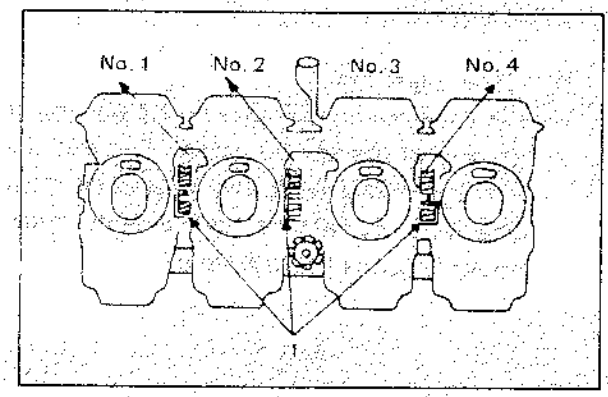
1. Vacuum gauge

6. Start the engine allow it to warm-up for a few minutes. The warm-up is complete when engine responds normally to the throttle opening.

7. Make sure the engine idle speed is 950 ~ 1,000 r/min. If it does not, adjust the idle speed with the throttle stop screw.

NOTE:
With the Y.I.C.S. shutoff tool fitted, the engine speed generally drops a little. Thus, continue with the following steps at idle speed of 950 ~ 1,000 r/min.

8. Each gauge reading will indicate the same if the carburetors are synchronized. The No. 3 carburetor has no synchronizing screw and the other carburetors are to be synchronized to it in order, one at a time.
   First, synchronize carburetor No. 1 to carburetor No. 2 by turning the No. 1 synchronizing screw until both gauges read the same.
   Second, in the same way synchronize carburetor No. 4 to carburetor No. 3.
   Third, by adjusting No. 2 screw to watch No. 3 carburetor reading, No. 1 and No. 2 carburetors will both change to match No. 3 carburetor.



1. Synchronizing screws

9. Remove the Y.I.C.S. shutoff tool and reinstall the blind plug.

Tightening torque:
22 Nm (2.2 m·kg, 16 ft·lb)

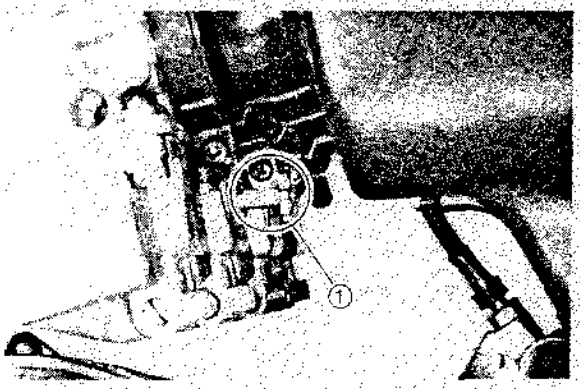
10. Check the idle speed.
    Adjust if necessary.
    (Refer to "Idle Speed Adjustment".)

Idle Speed Adjustment

NOTE:
Carburetors must be synchronized before setting final idle speed. The idle speed adjustment is made by turning only one throttle stop screw.

1. The engine must be warmed up before setting idle speed.
2. Set the engine idle speed by turning the throttle stop screw in (to increase engine speed) or out (to decrease engine speed).

Standard idle speed: 1,050 r/min



1. Throttle stop screw

F. Engine oil

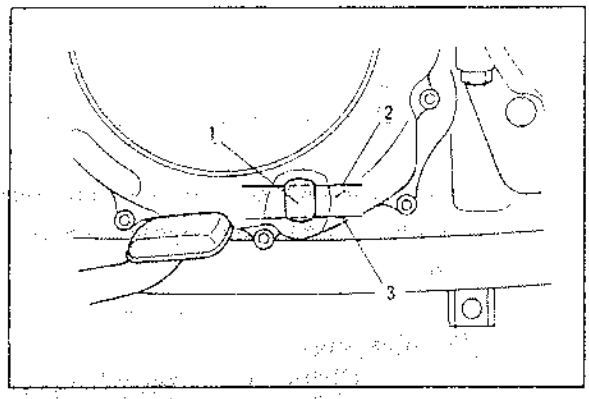
1. Oil level measurement.

a. Place the motorcycle on the center stand. Warm up the engine for several minutes.

NOTE:
Be sure the motorcycle is positioned straight up when checking the oil level; a slight tilt toward the side can produce false readings.

b. With the engine stopped, check the oil level through the level window located at the lower part of the right side crankcase cover.

NOTE:
Wait a few minutes until the oil level settles before checking.



1. Level window 2. Maximum mark 3. Minimum mark

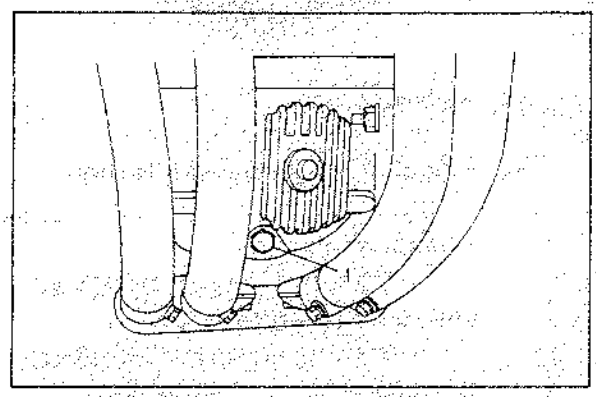
c. The oil level should be between maximum and minimum marks. If the level is lower, add sufficient oil to raise it to the proper level.

2. Engine oil and oil filter replacement.

a. Start the engine and stop it after a few minutes of warm-up.

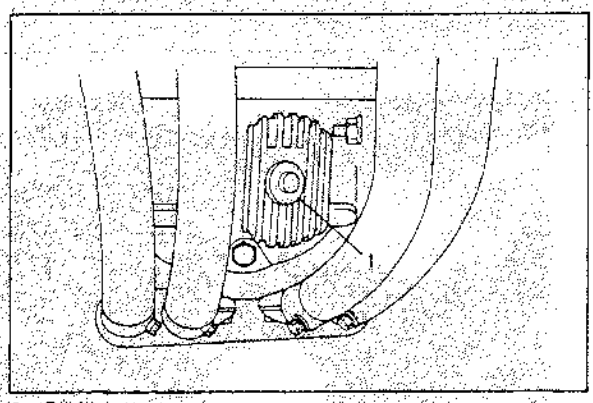
b. Place an oil pan under the engine and remove the oil filler cap.

c. Remove the drain plug and drain the oil.



1. Engine drain plug

d. Remove the oil filter bolt and filter element.



1. Oil filter cover

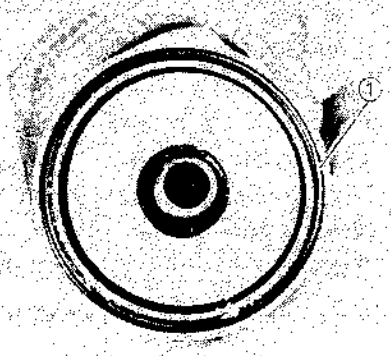
e. Re-install the drain plug (make sure it is tight).

Drain plug torque:
43 Nm (4.3 m·kg, 31 ft·lb)

f. Install the new oil filter element, new O-ring and filter cover, tighten the oil filter bolt.

Oil filter bolt:
15 Nm (1.5 m·kg, 11 ft·lb)

NOTE:
Make sure the O-ring is positioned properly.

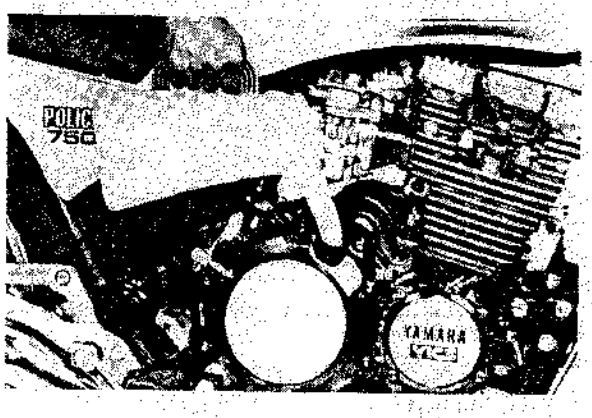


1. Proper O-ring position

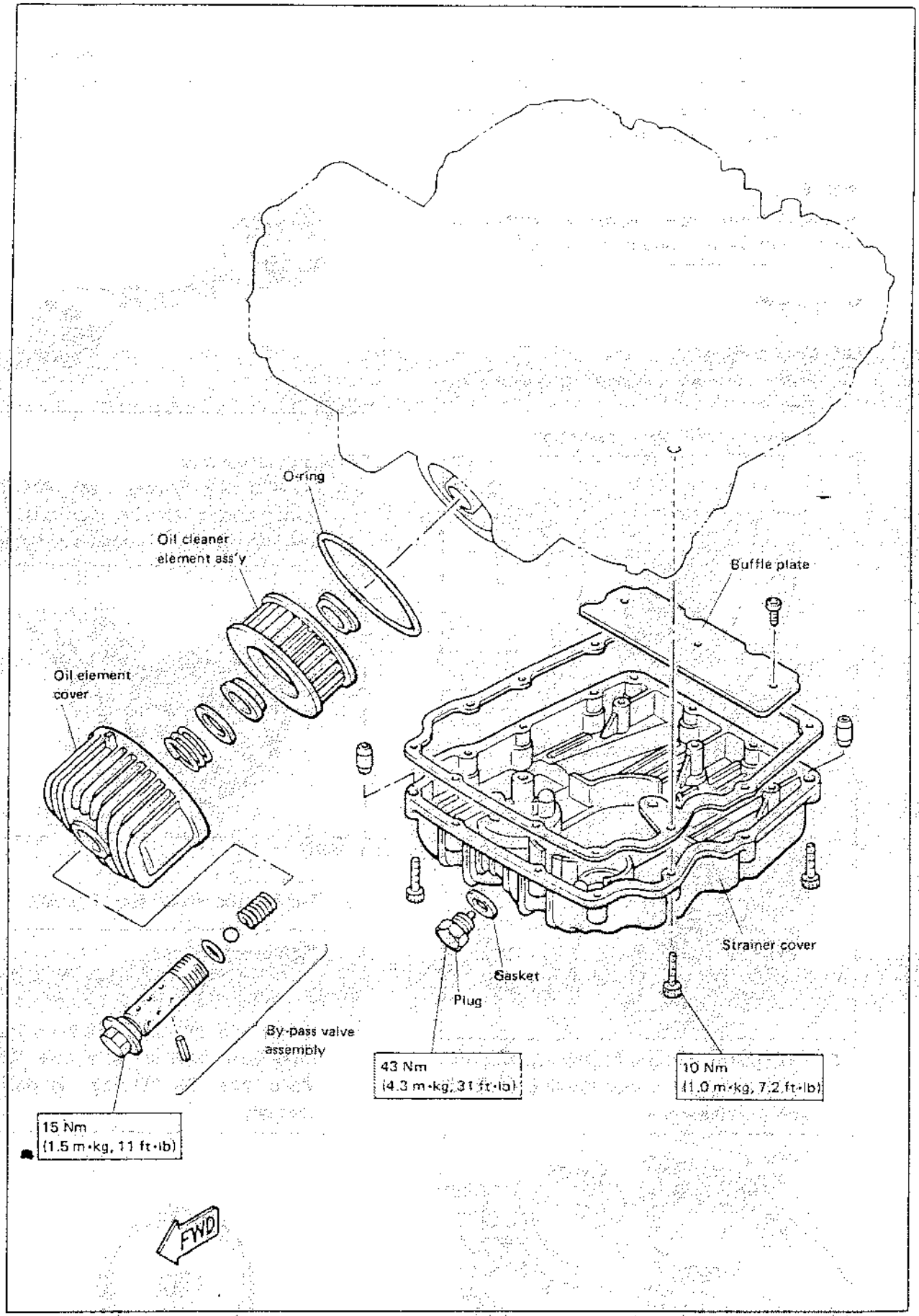
g. Add oil through the oil filler hole.

Periodic oil change:
2.5 L (2.2 Imp qt, 2.6 US qt)
With oil filter replacement:
2.8 L (2.5 Imp qt, 3.0 US qt)
Recommended oil: See page 24

CAUTION:
Take care not to allow foreign material to enter the crankcase.



OIL CLEANER


O-ring
Oil cleaner element ass'y
Oil element cover
Buffle plate
Strainer cover
Gasket
Plug
By-pass valve assembly
43 Nm (4.3 m·kg, 31 ft·lb)
10 Nm (1.0 m·kg, 7.2 ft·lb)
15 Nm (1.5 m·kg, 11 ft·lb)
FWD

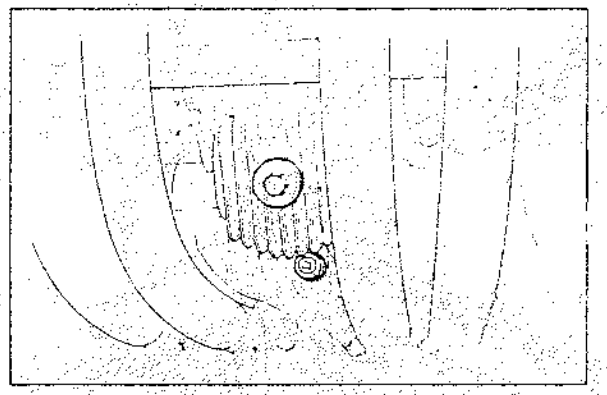
h. After replacement of engine oil, and/or oil filter, be sure to check for any oil leakage. The oil level indicator should go off after the oil is filled.

NOTE:
If the indicator light flickers or remains on, the oil level switch should be checked.

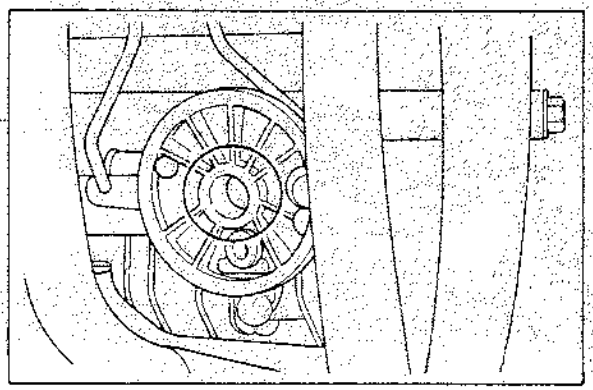
G. Oil cooler

Oil cooler removal

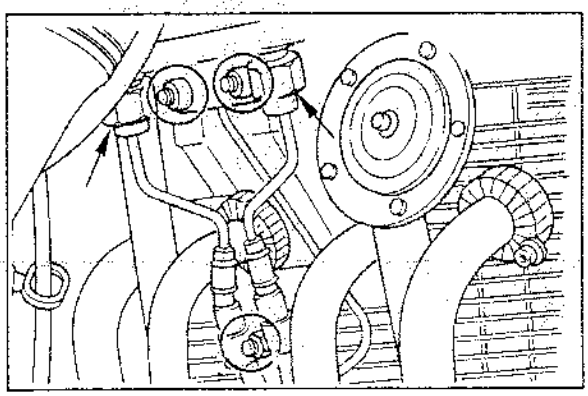
1. Place an open container under the engine.
2. Remove the oil cleaner cap bolt.



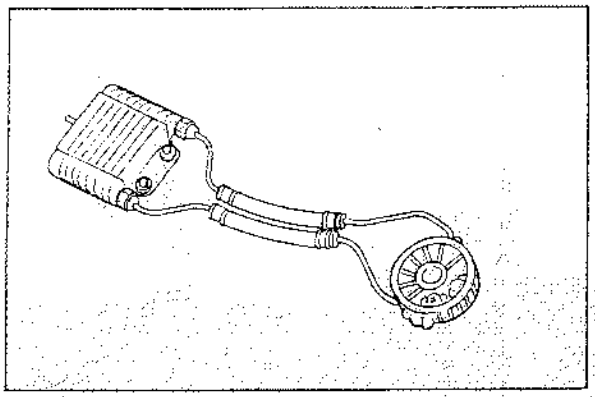
3. Remove the spacer securing bolt.



4. Loosen the oil hose fitting nuts (2), then remove the oil cooler holding bolts (2) and the clamp bolt.

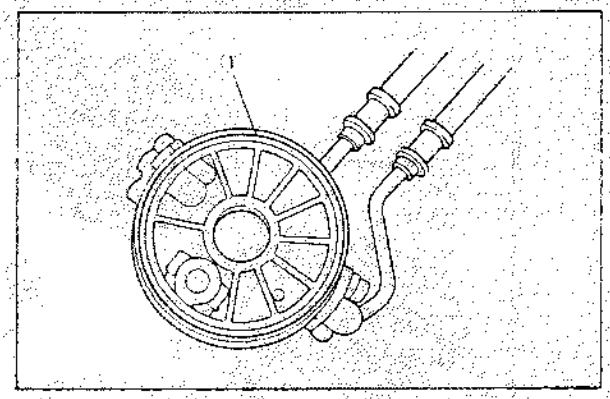


5. Remove the oil cooler assembly, pulling down and then away from the motorcycle.



Oil cooler installation

1. Install a new "O-ring" and install the oil cooler spacer to the crankcase. Make sure the "O-ring" is positioned properly.

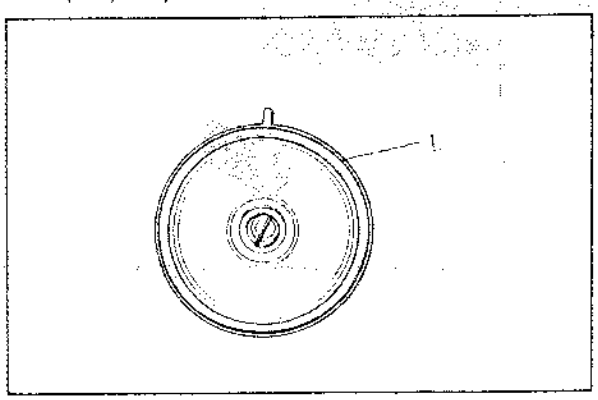


1. O-ring

2. Tighten the spacer securing bolt.

Tightening torque:
50 Nm (5.0 m·kg, 36 ft·lb)

3. Install the oil filter element into the filter cover and install a new "O-ring". Make sure the "O-ring" is positioned properly.



1. O-ring

4. Tighten the oil cleaner cap bolt.

Tightening torque: 15 Nm (1.5 m·kg, 11 ft·lb)

5. Tighten the oil cooler holding bolts (2).

Tightening torque: 10 Nm (1.0 m·kg, 7.2 ft·lb)

6. Tighten the clamp bolt.

Tightening torque: 10 Nm (1.0 m·kg, 7.2 ft·lb)

7. Tighten the oil hose fitting nuts (2).

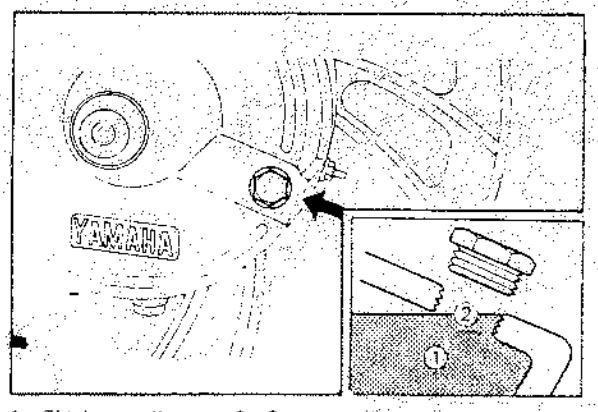
Tightening torque: 45 Nm (4.5 m·kg, 32 ft·lb)

H. Final gear oil

1. Oil level measurement.
   a. Place the motorcycle on a level place and place it on the center stand. The engine should be cool (at atmospheric temperature).
   b. Remove the oil filler cap and check the oil level whether it is to the hole brim. If it is not up to this level, replenish oil.

CAUTION:

Take care not to allow foreign material to enter the final gear case.

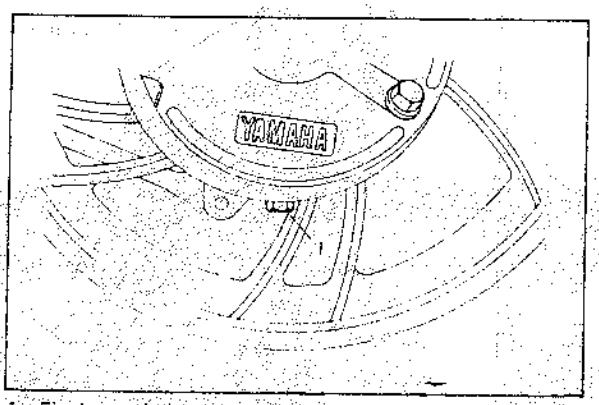


1. Final gear oil 2. Correct oil level

2. Gear oil replacement.
   a. Place an oil pan under the final gear case.
   b. Remove the final gear oil filler cap and the drain plug, and drain the oil.
   c. Reinstall and tighten the final gear case drain plug.

Tightening torque: 23 Nm (2.3 m·kg, 17 ft·lb)

   d. Fill the gear case to the specified level.



1. Final gear drain plug

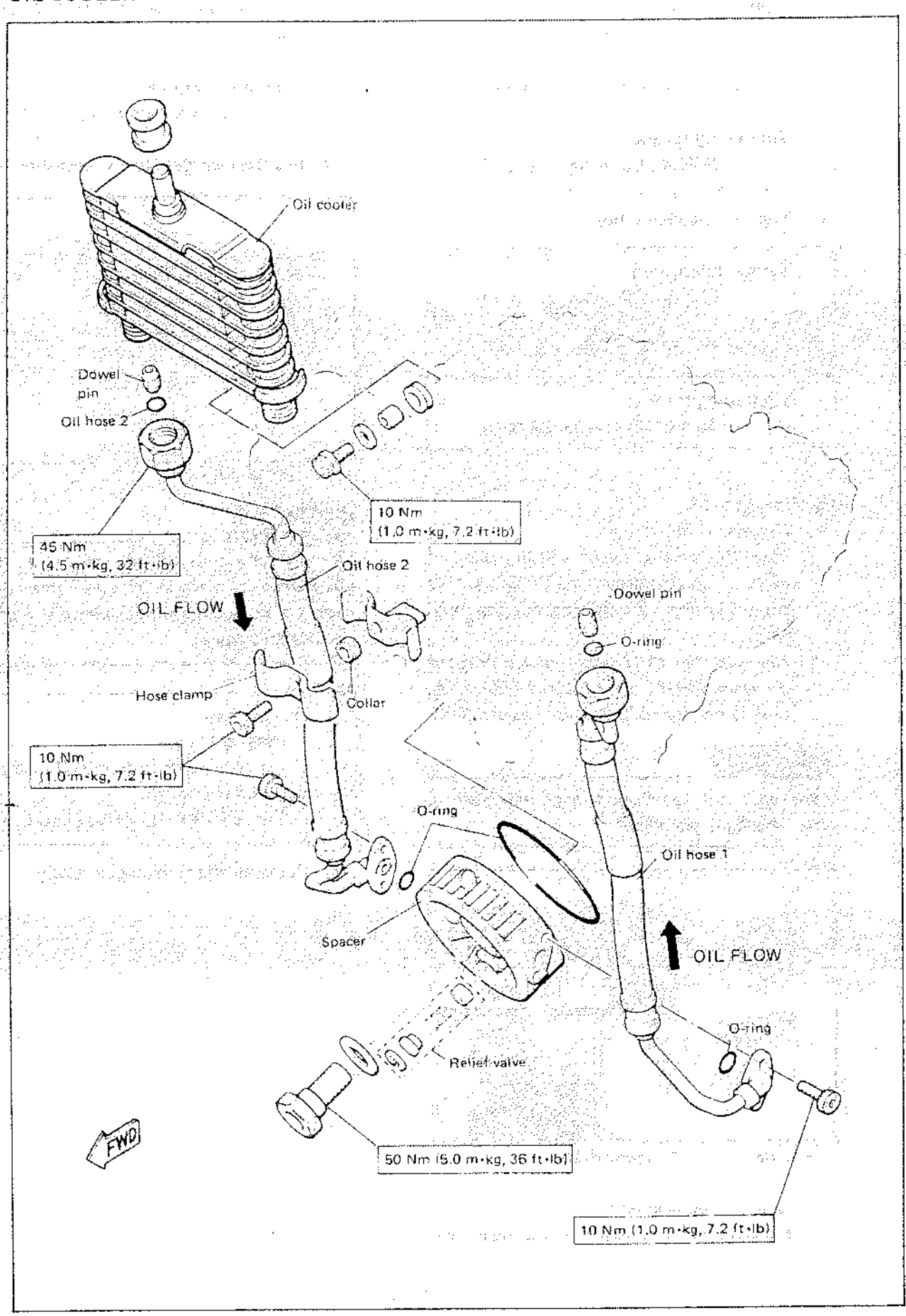
WARNING:

When draining or filling, take care not to allow foreign material to enter the final gear case. Do not to allow the gear oil to contract the tire and wheel.

Oil capacity: Final gear case: 0.2 L (0.18 Imp qt, 0.21 US qt) Recommended oil: SAE 80 API GL-4 Hypoid gear oil

   e. Reinstall the filler cap securely.

OIL COOLER


Oil cooler
Dowel pin
Oil hose 2
45 Nm (4.5 m·kg, 32 ft·lb)
10 Nm (1.0 m·kg, 7.2 ft·lb)
Oil hose 2
OIL FLOW
Hose clamp
Collar
10 Nm (1.0 m·kg, 7.2 ft·lb)
Dowel pin
O-ring
O-ring
Oil hose 1
Spacer
OIL FLOW
O-ring
Relief valve
FWD
50 Nm (5.0 m·kg, 36 ft·lb)
10 Nm (1.0 m·kg, 7.2 ft·lb)

I. Compression pressure measurement

Insufficient compression pressure will result in performance loss and may indicate leaking valves or worn or damaged piston rings.

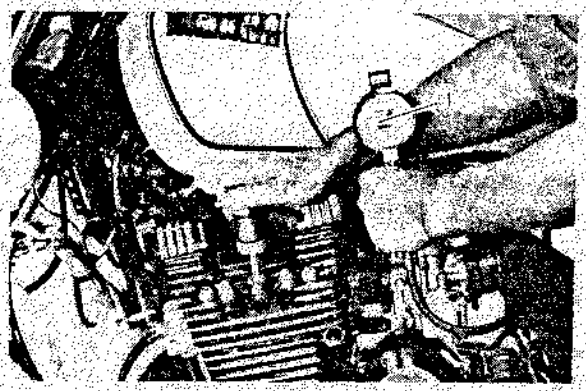
Procedure:

1. Make sure the valve clearance is correct.
2. Warm up the engine 2 ~ 3 minutes.
3. Remove all the spark plugs.
4. Install a compression check gauge.
5. Turn over the engine with the electric starter (make sure the battery is fully charged) with the throttle wide open until the pressure indicated on the gauge does not increase further.

Compression pressure (at sea level):
Standard:
834 kPa (8.5 kg/cm², 121 psi)
Minimum:
686 kPa (7.0 kg/cm², 100 psi)
Maximum:
932 kPa (9.5 kg/cm², 135 psi)

WARNING:

When cranking the engine, ground the removed spark plug wires to prevent sparking.



1. Compression gauge

6. If the pressure is too low, squirt a few drops of oil into the cylinder being measured. Measure compression again. If there is a higher reading than before (without oil), the piston rings may be worn or damaged. If the pressure remains the same after measuring with the oil, either or both the rings and valves may be the cause.
7. Check each cylinder. Compression pressure should not vary more than specified value from one cylinder to any other cylinder.

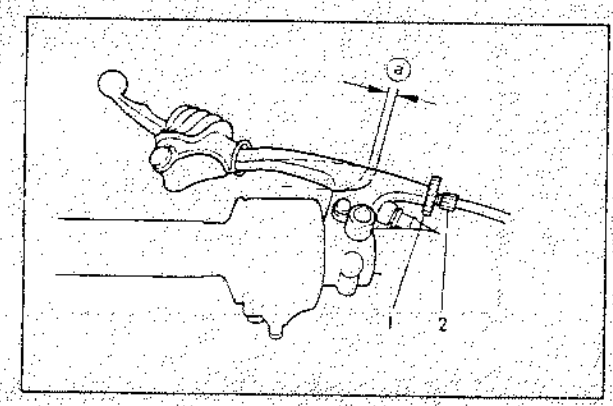
Difference in gauge reading:
Less than 98 kPa (1 kg/cm², 14 psi)

J. Clutch adjustment

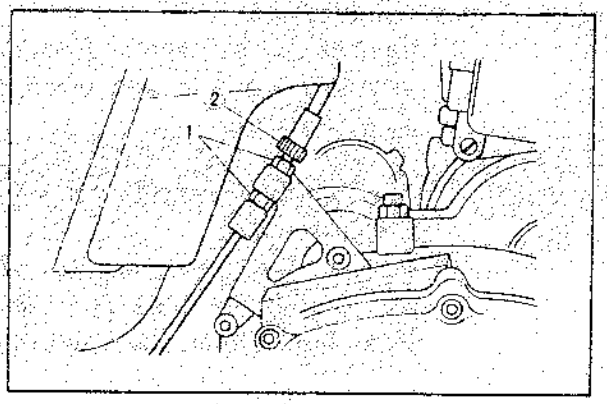
Free play adjustment

1. Loosen either the handlebar lever adjuster locknut or the cable length adjuster locknut.
2. Turn the cable length adjuster either in or out until proper lever free play is achieved.

Clutch lever free play:
2 ~ 3 mm (0.08 ~ 0.12 in)

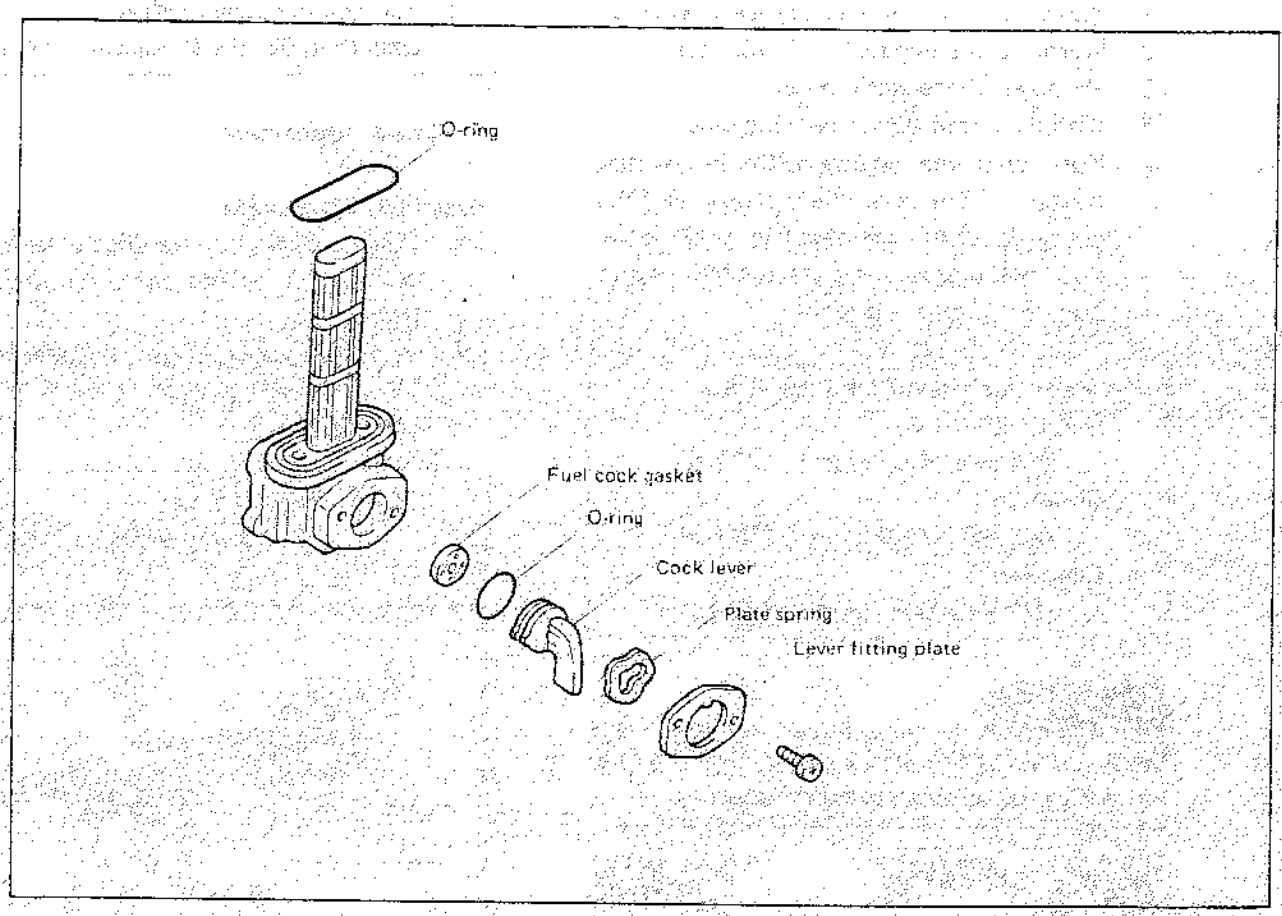


1. Locknut 2. Adjuster a. 2 ~ 3 mm (0.08 ~ 0.12 in)



1. Locknut 2. Adjuster

A. Fuel cock



If the fuel cock 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 fuel cock is removed.
2. Remove the fuel cock and inspect the filter screen. Replace the filter if seriously contaminated.
3. Remove the screws on the front and rear of the fuel cock and remove the plate, gasket, lever, and diaphragm.
4. Inspect all components and replace any that are damaged. If the diaphragm is in any way damaged, or the fuel cock body gasket surfaces scratched or corroded, the fuel cock assembly must be replaced. If there is abrasive damage to any component, the fuel tank must be drained and flushed.
5. Reassemble the fuel cock and install it on the fuel tank.

B. Front and rear brake

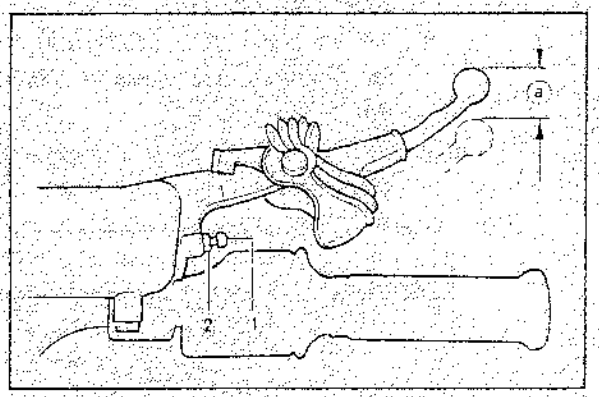
Front brake adjustment

The front brake lever should be so adjusted that it has a free play of 5 ~ 8 mm (0.2 ~ 0.3 in) at the lever end.

1. Loosen the locknut on the brake lever.
2. Turn the adjuster so that the brake lever movement at the lever end is 5 ~ 8 mm (0.2 ~ 0.3 in) before the adjuster contacts the master cylinder piston.
3. After adjusting, tighten the lock nut.

NOTE:

Check for correct play and make sure it is working properly.



1. Locknut 2. Adjuster a. 5 ~ 8 mm (0.2 ~ 0.3 in)

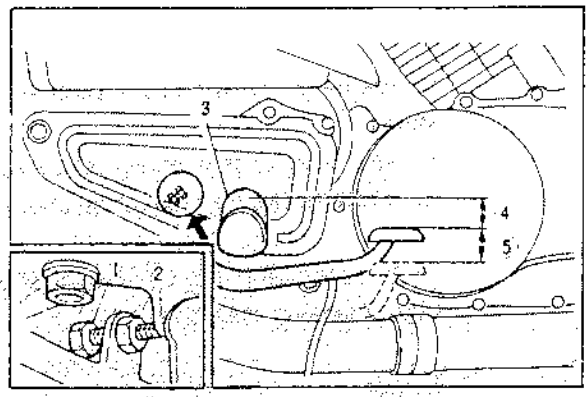
Rear brake adjustment

1. Pedal height

a. Loosen the adjuster locknut (for pedal height).

b. By turning the adjuster clockwise or counterclockwise, adjust the brake pedal position so that its top end is approximately 20 mm (0.8 in) below the top of the footrest.

c. Secure the adjuster locknut.



1. Adjuster (for pedal height)
2. Locknut
3. Footrest
4. Pedal height 20 mm (0.8 in)
5. Free play 20 ~ 30 mm (0.8 ~ 1.2 in)

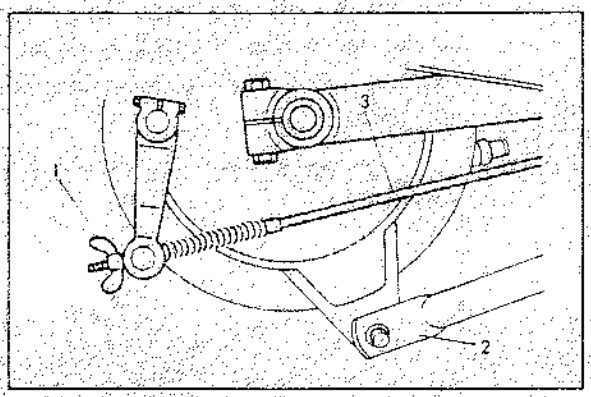
WARNING:

After adjusting the pedal height, the brake pedal free play should be adjusted.

2. Free play

The rear brake should be adjusted to suit rider preference within a 20 ~ 30 mm (0.8 ~ 1.2 in) free play at the brake pedal end.

To adjust, turn the adjuster on the brake rod clockwise to reduce play; turn the adjuster counterclockwise to increase play.



1. Adjuster

WARNING:

Check to see whether or not the brake light operates correctly after adjusting.

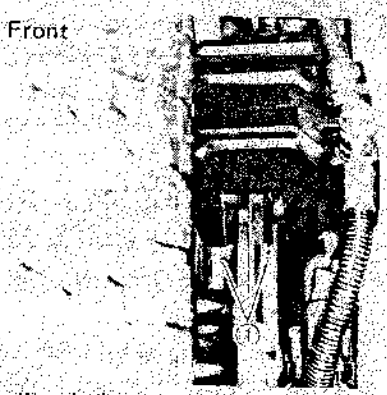
Checking the front brake pads and rear brake shoes

A wear indicator is attached to each brake to facilitate brake pad and shoe check.

This indicator permits a visual check without disassembling the pads.

Front:

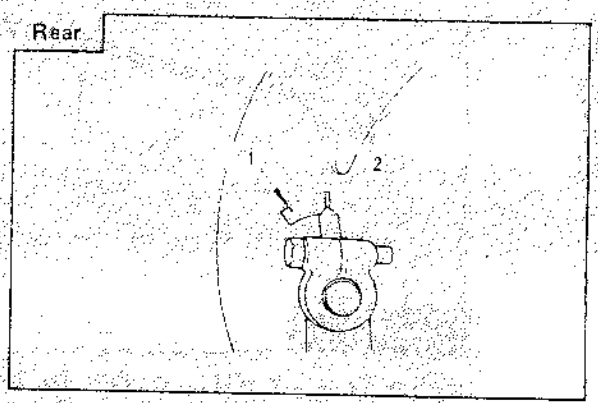
To check, look at the pad wear indicator in back of the caliper. If any pad is worn to the wear limit, ask a Yamaha dealer to replace the pads.



1. Wear indicator

Rear:

To check, see the wear indicator position while depressing the brake pedal. If the indicator reaches to the wear limit line, replace the shoes.



1. Wear limit 2. Wear indicator

Inspecting the brake fluid level

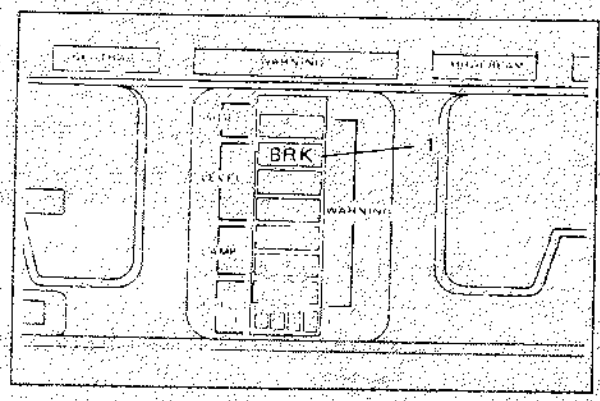
Insufficient brake fluid may allow air to enter the brake system, possible causing the brakes to become ineffective.

Before riding, check the brake fluid level with computerized monitor system and replenish when necessary, and observe these precautions:

1. Use only the designated quality brake fluid; otherwise, the rubber seals may deteriorate, causing leakage and poor brake performance.

Recommended brake fluid: DOT #3

2. Refill with the same type of brake fluid; mixing fluids may result in a harmful chemical reaction and lead to poor performance.
3. Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point and may result in vapor lock.
4. Brake fluid may erode painted surfaces or plastic parts. Always clean up spilled fluid immediately.
5. Check the cause if the brake fluid level goes down.



1. "BRK" indicator

Brake fluid replacement

1. Complete fluid replacement should be done only by trained Yamaha service personnel.
2. Complete fluid replacement should be done whenever the caliper cylinder or master cylinder is disassembled, or the fluid becomes seriously contaminated.
3. Replace the following components whenever damaged or leaking. Also:

a. Replace all brake seals every two years.
b. Replace all brake hoses every four years.
c. Replace the plunger kits every two years.

C. Tires and wheels

Tires

To ensure maximum performance, long service, and safe operation, note the following:

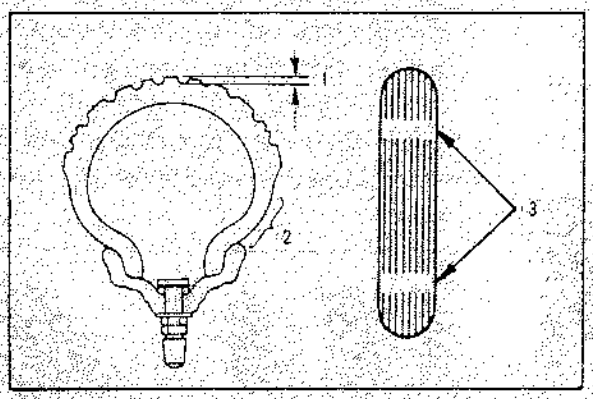
1. Tire air pressure
   Check and adjust the tire pressure.

WARNING:

Tire inflation pressure should be checked and adjusted when the temperature of the tire equals the ambient air temperature. Tire inflation pressure must be adjusted according to total weight of cargo, rider, and accessories (fairing, saddlebags, etc. if approved for this model), and vehicle speed.

Cold tire pressure:
Front: 196 kPa (2.0 kg/cm², 28 psi)
Rear: 226 kPa (2.3 kg/cm², 32 psi)

2. Tire inspection
   If a tire tread shows crosswise lines (minimum tread depth), if the tire has a nail or glass fragments in it, or if the side wall is cracked, replace the tire.



1. Tread depth 2. Side wall 3. Wear indicator

WARNING:

1. **It is dangerous to ride with a worn-out tire. When a tire tread begins to show lines, replace the tire immediately. Brakes, tires, and related wheel parts replacement should be left to a Yamaha Service Technician.**
2. **Patching a punctured tube is not recommended. If it is absolutely necessary to do so, use great care and replace the tube as soon as possible with a good quality replacement.**
3. **The tires equipped on this motorcycle are suited to normal riding and touring. They are not suited for sustained high speed running or racing and must not be used for such purposes. Consider your riding skill, road and weather conditions, and correct weight distribution when loading your motorcycle.**

Cast wheels

WARNING:

The wheels on this model are not designed for use with tubeless tires. Do not attempt to use tubeless tires on this model.

To ensure maximum performance, long service, and safe operation, note the following:

1. Check for cracks, bends, or warpage of the wheels. If any abnormal condition exists in a wheel, consult a Yamaha dealer. Do not attempt even small repairs to the wheel. If a wheel is deformed or cracked, it must be replaced.
2. Tires and wheels should be balanced whenever either one is changed or replaced. Failure to have a wheel balanced can result in poor performance, adverse handling characteristics, and shortened tire life.
3. 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.
4. After repairing or replacing a tire, check to be sure the valve stem lock nut is securely fastened. If not, torque it as specified.

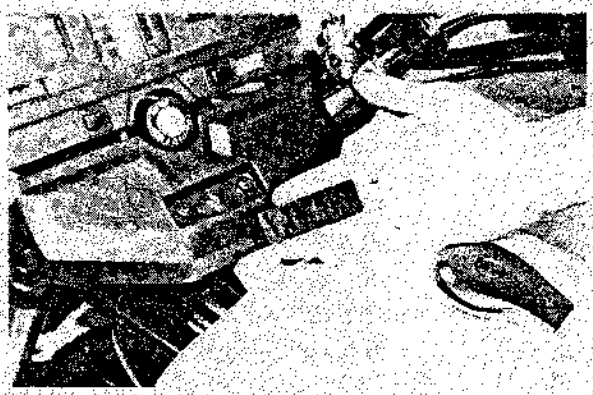
Tightening torque:
1.5 Nm (0.15 m·kg, 1.1 ft·lb)

D. Front fork oil change

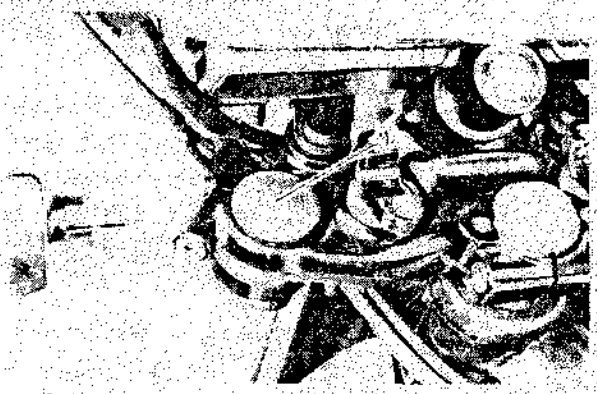
WARNING:

1. Fork oil leakage can cause loss of stability and safe handling. Have any problem corrected before operating the motorcycle.
2. Securely support the motorcycle so there is no danger of it falling over.

1. Raise the motorcycle or remove the front wheel so that there is no weight on the front end of the motorcycle.
2. Remove the center handlebar cover and handlebar.

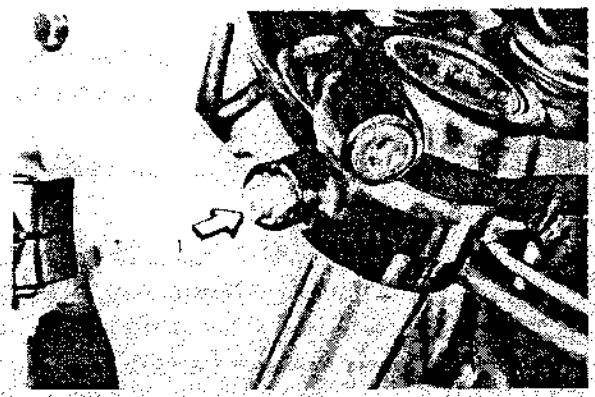


3. Remove the rubber cap from the top of each fork.



1. Rubber cap

4. Remove the air valve caps from the each fork.
5. Keep the valve open by pressing it for several seconds so that the air can be let out of the inner tube.

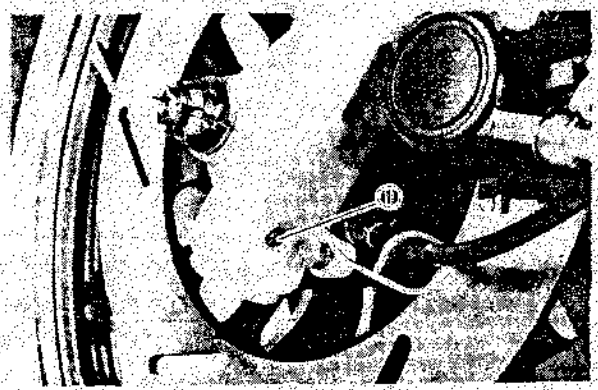


1. Push

6. 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.
7. 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.



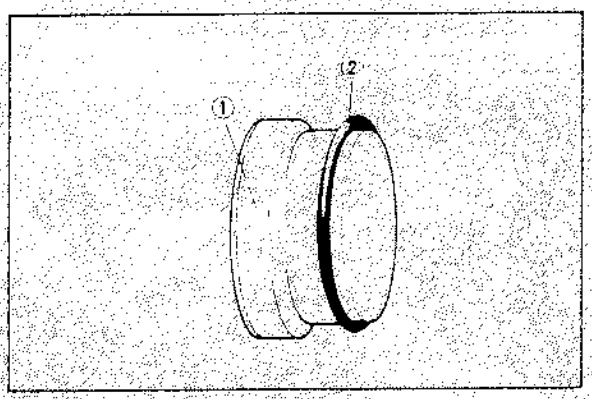
1. Drain screw

8. When most of the oil has drained, slowly raise and lower the outer tubes to pump out the remaining oil.
9. Inspect the drain screw gasket. Replace if damaged. Reinstall the drain screw.

10. Pour the specified amount of oil into the fork inner tube.

Front fork oil (each fork):
309 cm³ (10.9 Imp oz, 10.4 US oz)
SAE 10W30 type SE motor oil

11. After filling, slowly pump the forks up and down to distribute the oil.
12. Inspect the O-ring on the spring seat. Replace O-ring if damaged.



1. Spring seat 2. O-ring

13. Reinstall the spring seat and fill the fork with air using a manual air pump or other pressurized air supply. Refer to "Front fork and rear shock absorber adjustment" for proper air pressure adjusting.

CAUTION:

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

Maximum air pressure:
245 kPa (2.5 kg/cm², 36 psi)
Do not exceed this amount.

E. Front fork and rear shock absorber

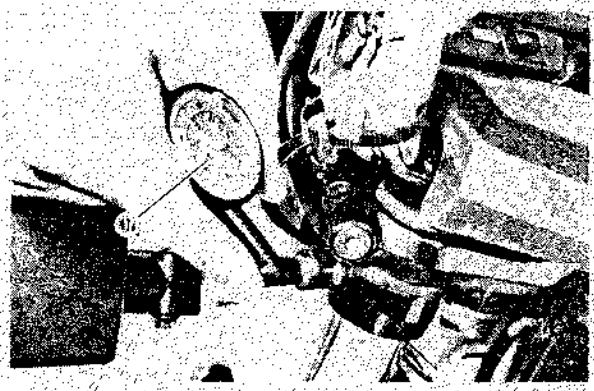
Front fork:

1. Elevate the front wheel by placing the motorcycle on the center stand.

NOTE:

When checking and adjusting the air pressure, there should be no weight on the front end of the motorcycle.

2. Remove the air valve caps from each fork.
3. Using the air gauge, check and adjust the air pressure.
   If the air pressure is increased, the suspension becomes stiffer and if decreased, it becomes softer.
   To increase:
   Use a manual air pump or other pressurized air supply.
   To decrease:
   Replace the air by pushing the valve pin.



1. Air gauge

NOTE:

An optional air check gauge is available. Please ask a neaby Yamaha dealer.
P/No. 2X4-2811A-00

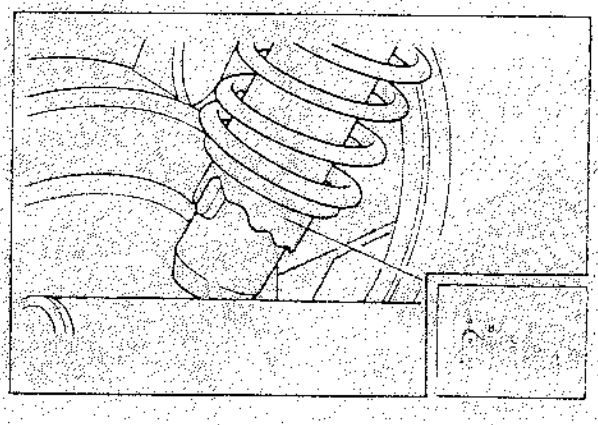
Standard air pressure:
39.2 kPa (0.4 kg/cm², 5.7 psi)
Maximum air pressure:
245 kPa (2.5 kg/cm², 36 psi)
Minimum air pressure: Zero
* Never exceed the maximum pressure, or oil seal damage may occur.
* The difference between both the left and right tubes should be 9.81 kPa (0.1 kg/cm², 1.4 psi) or less.

4. Install the air valve caps securely.

Rear shock absorber:

1. Spring preload
   If the spring seat is raised, the spring becomes stiffer and if lowered, it becomes softer.

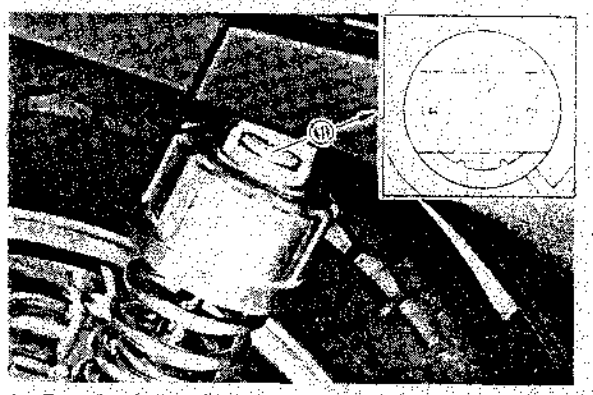
Standard position – A
A. position – Softest
E. position – Stiffest



2. Damping force
   Turn the damping force adjuster by your fingers to increase or decrease the damping force. If it is difficult to turn it with your fingers, use a screw driver.

Standard position – No. 1
No. 1 – Minimum damping force
No. 4 – Maximum damping force

NOTE:
When adjusting the damping force, the adjuster should be placed in the clicked position. If not, the damping force will be set to the maximum (No. 4).
Always adjust both the right and left absorbers to the same position.

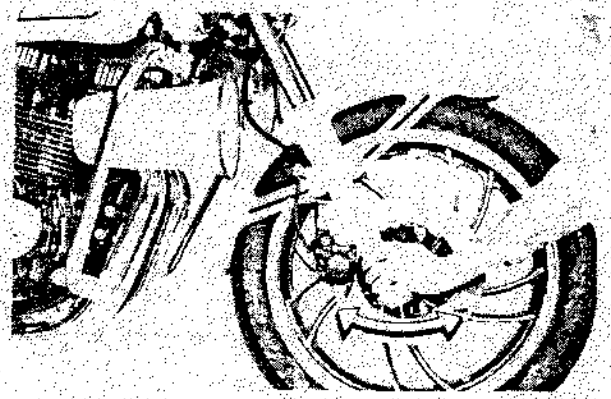


1. Damping force adjuster

F. Steering head adjustment

The steering assembly should be checked periodically for looseness.

1. Raise the front end of the motorcycle so that there is no weight on the front wheel.
2. Grasp the bottom of the forks and gently rock the fork assembly backward and forward, checking for looseness in the steering assembly bearings.



3. If there is looseness in the steering head, loosen the steering stem and front fork pinch bolts and steering fitting bolt.
4. Use a steering nut wrench to loosen steering fitting nut.
5. Tighten the steering fitting nut until the steering head is tight, but does not bind when forks are turned.
6. Retighten the steering fitting nut, steering fitting bolt and steering stem and front fork pinch bolts, in that order.
7. Recheck steering adjustment to make sure there is no binding when the forks are moved from lock to lock. If necessary, repeat adjustment procedure.

G. Cable inspection and lubrication

WARNING:

Damage to the outer housing of the various cables, may cause corrosion and often free movement will be obstructed. An unsafe condition may result so replace such cables as soon as possible.

If the inner cables do not operate smoothly, lubricate or replace them.

Recommended lubricant:
Yamaha Chain and Cable Lube or
SAE 10W30 motor oil

H. Throttle cable and grip lubrication

The throttle twist grip assembly should be greased when the cable is lubricated, since the grip must be removed to get at the end of the throttle cable. Two screws clamp the throttle housing to the handlebar. Once these two are removed, the end of the cable can be held high to pour in several drops of lubricant. With the throttle grip disassembled, coat the metal surface of the grip assembly with a suitable all-purpose grease to cut down friction.

I. Brake and change pedal/brake and clutch levers

Lubricate the pivoting parts of each lever and pedal.

Recommended lubricant: Yamaha Chain and Cable Lube or SAE 10W30 motor oil

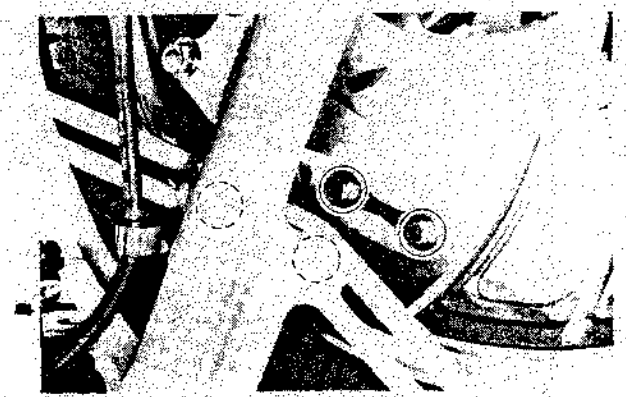
J. Center and side stand pivots

Lubricate the center and side stands at their pivot points.

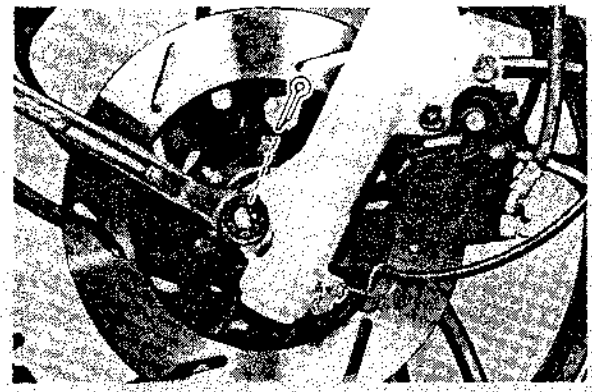
Recommended lubricants: Yamaha Chain and Cable Lube or SAE 10W30 motor oil

K. Front wheel removal

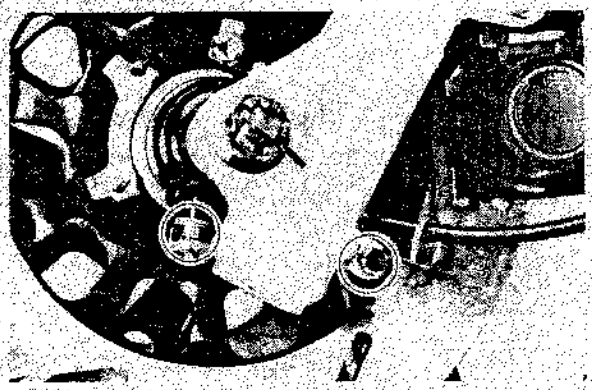
1. Place the motorcycle on the center stand.
2. Remove the front fender securing bolts and remove the fender.



3. Remove the cotter pin and wheel axle nut.



4. Remove the speedometer cable holder securing bolt.

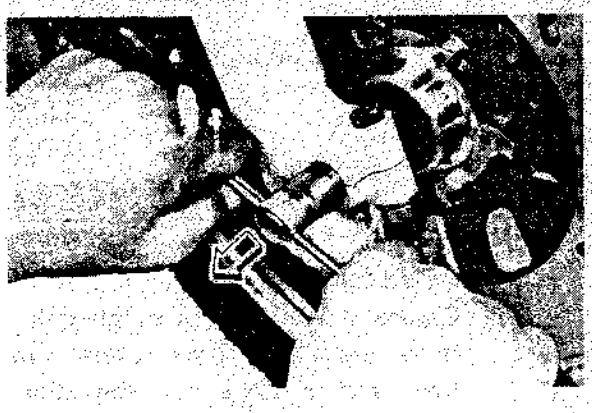


5. Loosen the pinch bolt securing the axle.



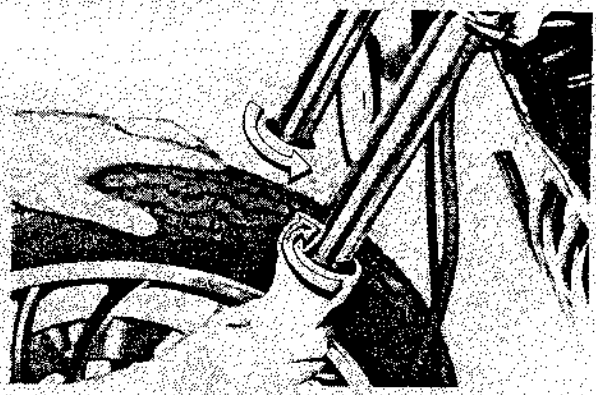
1 Pinch bolt

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.



8. For reassembly, follow the procedure below with case;
   a. Install the speedometer cable holder securing bolt.
   b. Make sure the projecting portion (torque stopper) of the speedometer housing is positioned correctly.



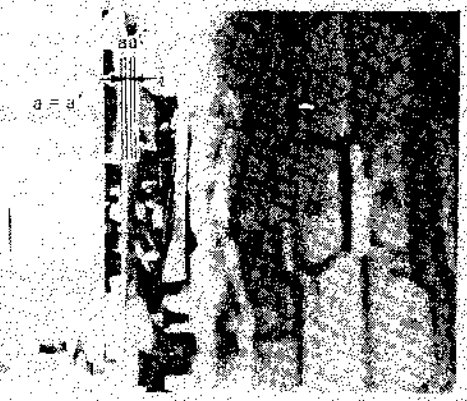
1. Torque stopper

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

Axle nut torque:
105 Nm (10.5 m·kg, 75 ft·lb)

   d. Install the front fender.
   e. Before tightening the pinch bolt, compress the front forks several times to make sure of proper fork operation.

With the axle pinch bolt loose, work the right fork leg back and forth until the proper clearance between the disc and caliper bracket on the front is obtained.

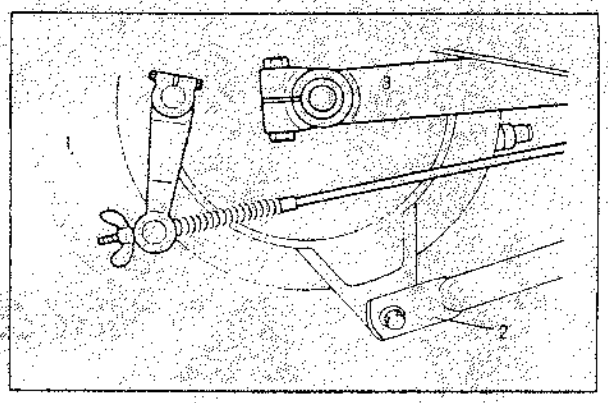


   f. Tighten the axle pinch bolt.

Axle pinch bolt torque:
20 Nm (2.0 m·kg, 14 ft·lb)

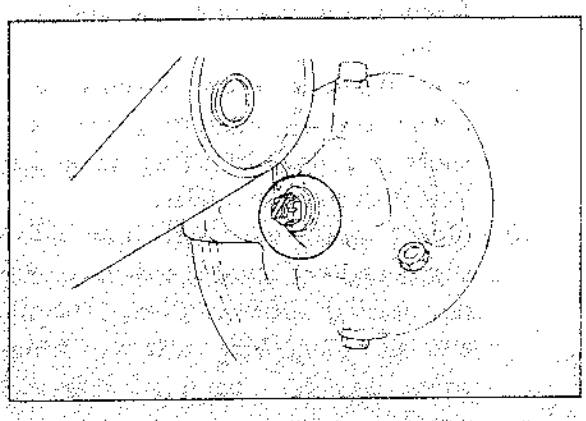
WARNING:
Always use a new cotter pin on the axle nut.

L. Rear wheel 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.

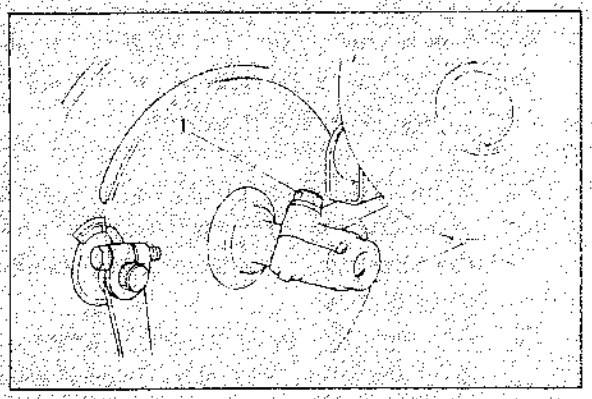


1. Adjuster 2. Tension bar 3. Brake rod

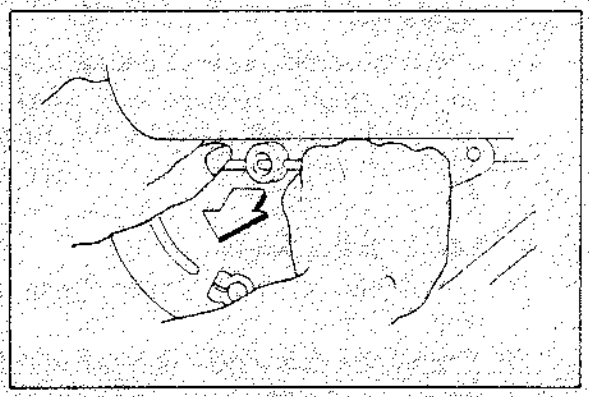
3. Remove the axle nut cotter pin and axle nut. Discard the old pin.



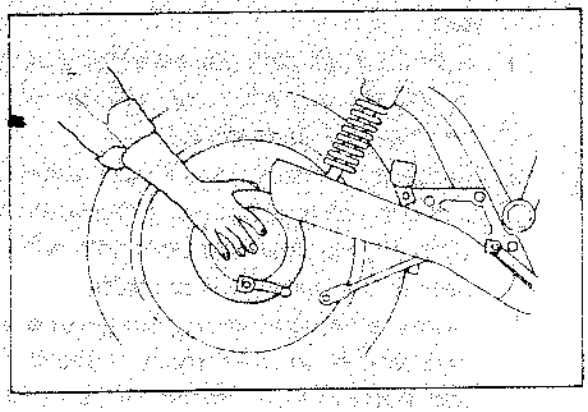
4. Loosen the rear axle pinch bolt and pull out the rear axle.



1. Pinch bolt



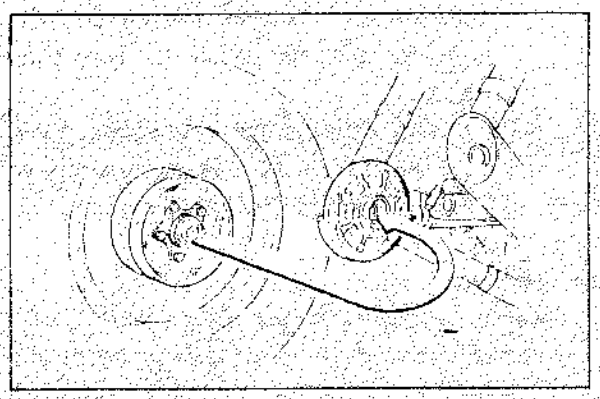
5. Move the wheel to the right side to separate it from the final gear case and remove the rear wheel.



6. To install the rear wheel, reverse the removal procedure.

NOTE:

Before installing the rear wheel, apply light coating of lithium base grease to final gear case splines and rear wheel hub splines.
When installing the rear wheel, be sure the splines on the wheel hub fit into the final gear case.



Tightening torque:
Axle nut:
105 Nm (10.5 m·kg, 75 ft·lb)
Axle pinch bolt:
6 Nm (0.6 m·kg, 4.3 ft·lb)

WARNING:

Always use a new cotter pin on the axle nut.

7. Adjust the rear brake. See page 19.

WARNING:

Check the operation of the brake light after adjusting the rear brake.

M. Front fork disassembly

WARNING:

Securely support the motorcycle so it won't fall over when the front wheel and fork legs are removed.

1. Remove the caps from the fork air valves, and depress the valves until the air pressure escapes completely from both fork legs.

2. Disconnect the speedometer cable from the speedometer drive unit.
3. Remove the brake calipers from the fork legs.
4. Remove the front wheel.
5. Remove the front fender.
6. Loosen the fork pinch bolts in the handle crown and underbracket.
7. Slide the fork legs out of the handle crown, and remove the rubber O-rings and the air valve brackets from the fork legs.
8. Remove the spring wire circlips from the outside of the fork legs, and remove the fork legs from the motorcycle.

NOTE:
Perform the fork leg disassembly and reassembly procedures on one fork leg at a time.

9. Remove the rubber cap from the top of the fork tube.
10. Push down on the spring seat, and remove the spring seat circlip from the fork tube.
11. Remove the spring seat and fork spring.
12. Inspect the O-ring on the spring seat, and replace the O-ring if it is damaged.
13. Over a drain pan, turn the fork leg upside down and slowly pump the fork oil out of the fork leg.
14. Remove the damper rod bolt from the bottom of the fork leg.
15. Hold one hand over the top of the fork leg, and turn the leg upside down so the damping rod and rebound spring slide down and out of the fork leg; take care not to let the damper rod fall to the ground, as it may be damged.
16. With the fork leg upright, use a propane torch to heat the top of the slider lightly, and remove the dust seal with a thin screwdriver. Take care not to scratch the inner tube. Discard the dust seal.

CAUTION:
Do not apply too much heat to the slider, as the paint will be damaged.

17. Remove the retaining clip and oil seal washer.
18. Hold the fork leg horizontally, securely clamp the axle-mounting boss of the slider in a vise with soft jaws, and again heat the top of the slider.
19. Slowly push the inner tube into the slider, and then pull the inner tube back out quickly until it tops out; the oil seal and guide bushing will be dislodged from the slider after this is done several times.

CAUTION:
Avoid bottoming the inner tube in the slider during the above procedure, as the oil lo valve assembly will be damaged.

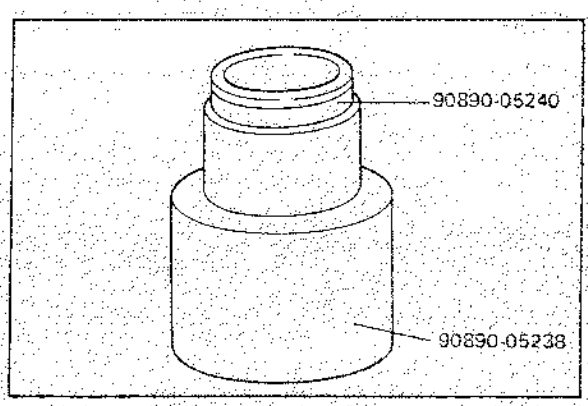
22. Remove all components of the oil lock valve assembly and inspect them; replace the assembly if there are any damaged components.
23. Remove the oil seal, seal spacer, and both bushings from the inner tube; discard these parts and use new ones during reassembly.
24. Clean all components of the fork leg and inspect them; replace any worn or damaged components prior to reassembly.

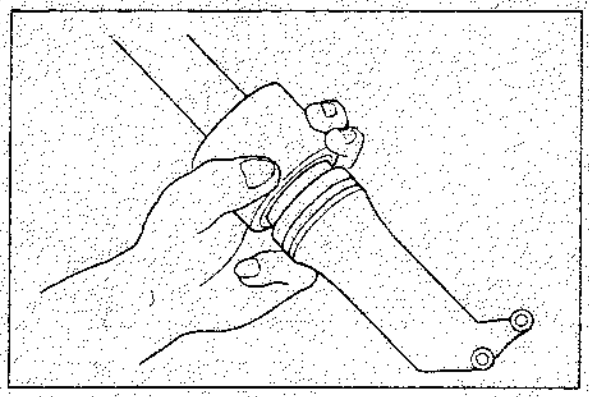
N. Front fork reassembly

1. Install the rebound spring on the damper rod.
2. Install the slide bushing (slide metal 2) on the inner tube.
3. Install the damper rod in the inner fork tube, and allow it to slide slowly down the tube until it protrudes from the bottom.
4. Install the oil lock plate washer and valve spring, the oil lock valve, and the oil lock piece on the damper rod.
5. Carefully insert the inner tube and damper rod assembly into the slider, and align the damper rod bolt hole with the hole in the bottom of the slider.
6. Apply a thread-locking compound such as Loctite® to the threads of the damper rod holding bolt, install the bolt in the damper rod, and torque it to specification.

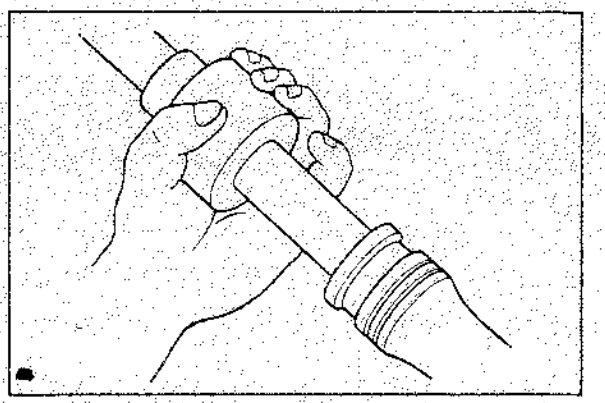
Tightening torque:
20 Nm (2.0 m·kg, 14 ft·lb)

7. Install the guide bushing (slide metal 1) in the special 36 mm (1.42 in) fork tool. Use the tool to align the bushing in the top of the slider.

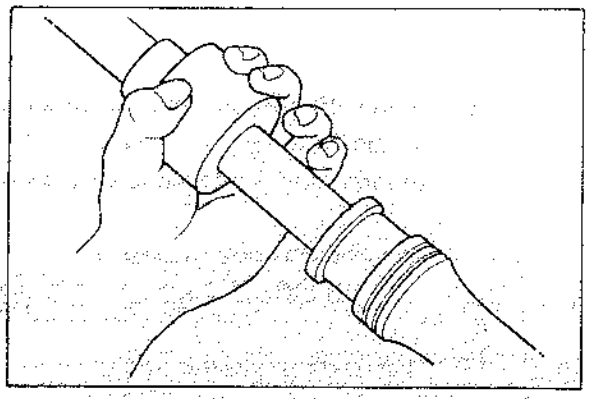




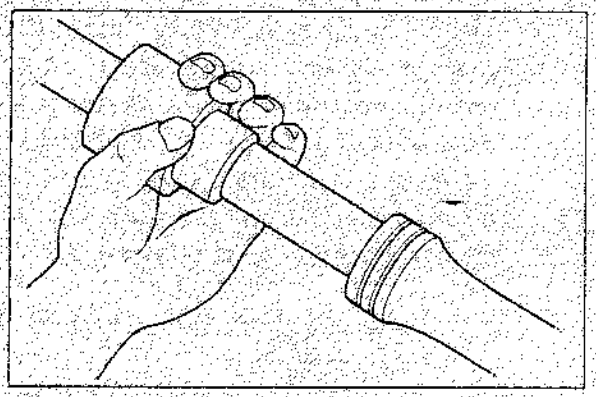
9. Remove the large part of the fork tool, place the small part on the guide bushing, and use the large part of the tool to drive in the bushing.



10. Install a new seal spacer, making sure the beveled edge faces upward.
11. Oil and install a new oil seal in the top of the slider with the special tool.



12. Install the oil seal washer and circlip, and gently tap the dust seal into place with the special tool.



13. Pour the specified amount of the recommended fork oil into the fork leg.

Fork oil capacity:
267 cm³ (9.40 Imp oz, 9.03 US oz)
Recommended oil:
Yamaha Fork Oil 10 wt

11. Slowly pump the fork leg up and down to distribute the oil.
12. Install the fork spring, spring seat, and a new spring seat circlip.
13. Install the rubber cap in the top of the fork leg.
14. Slide the fork leg into the underbracket, and install the spring wire circlip, air valve bracket, and rubber O-ring on the fork leg.
15. Slide the fork leg the rest of the way into the handle crown, and align the air valve bracket properly. Torque the pinch bolts in the handle crown and underbracket.

Tightening torque:
20 Nm (2.0 m·kg, 14 ft·lb)

16. Install the proper amount of air pressure in the fork legs. Take care not to exceed the maximum allowable air pressure.

Maximum fork air pressure:
118 kPa (1.2 kg/cm^2, 17.1 psi)

17. Install the air valve caps.

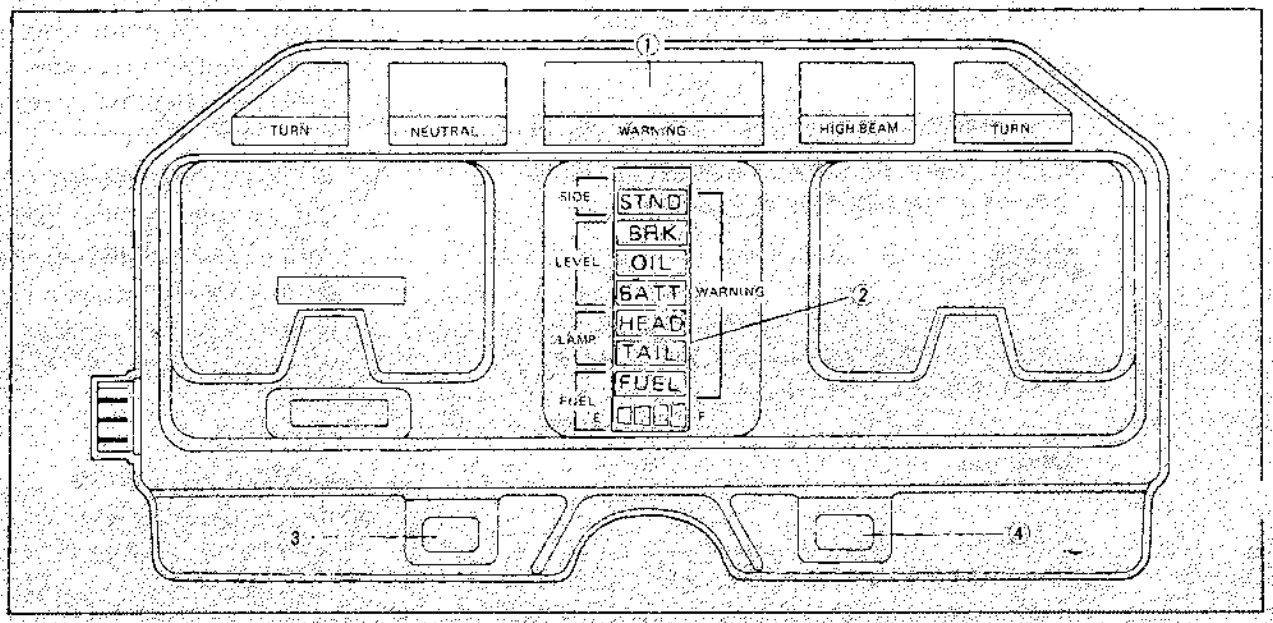
WARNING:

Make sure not oil has contacted any disc brake components or the anti-dive actuating piston housing; oil will cause diminished braking capacity and damage the rubber components of the brake assembly and anti-dive actuating piston assembly. Make sure all oil is removed from the brake and actuating piston assemblies before they are reassembled and the motorcycle is operated.

18. Install the front fender, front wheel, and brake calipers.
19. Connect the speedometer cable to the drive unit, and check the operation of the motorcycle.

A. Computerized monitor system

This system monitors seven separate functions and will warn you of any malfunction if encountered until it is fixed. In addition, the fuel gauge in this system indicates the amount of fuel in the tank.



1. Warning light (Red) 2. Display panel 3. Check switch 4. Warning control switch

Display panel

STND

This indicator is displayed when the sidestand is extended.

BRK

This indicator is displayed when the brake fluid level is below specification in the front brake master cylinder.

OIL

This indicator is displayed when the engine oil level is low. If it remains displayed or keeps flickering while riding, add engine oil.

BATT

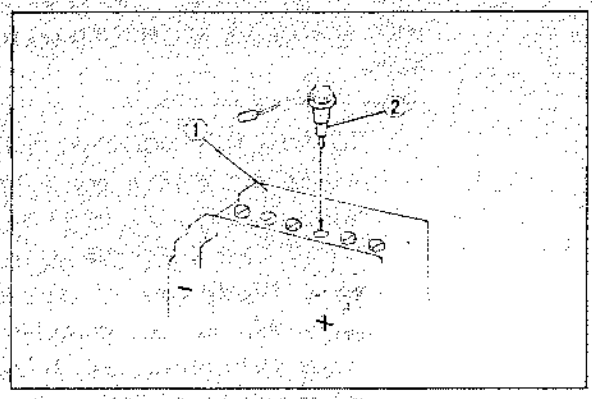
This indicator is displayed when the battery fluid level is low. If it remains displayed, add distilled water.

NOTE:

The battery sensor terminal must be cleaned approximately every 5,000 km (3,000 mi). The terminal is constructed of lead, and its surface may become corroded, allowing a system malfunction. Also, the terminal must be installed in the fourth cell from the negative terminal on the battery, as the sensor must pick up a specified voltage.

CAUTION:

Make sure that the connection to the battery is correct; otherwise, damage to the microcomputer may occur.



1. Battery 2. Battery sensor

HEAD

This indicator is displayed when the headlight bulb is burned out. If it remains displayed, have it replaced and correctly adjusted.

TAIL

This indicator is displayed when the taillight and/or brake light bulb is burned out. If it remains displayed, have it replaced.

FUEL

This indicator is displayed when the fuel level is low. If it remains displayed or keeps flickering while riding, add fuel.

Operation

NOTE:

Before starting out on the road, check the motorcycle conditions using computerized monitor system.

1. When the main switch is turned on, all seven liquid crystal displays (LCDs) come on, with the bottom fuel display (■■■■) indicating the amount of fuel in the tank.
2. When the engine is started, the system begins its scan of the motorcycle conditions. From top to bottom all the LCDs flash on and then off in sequence. If any one condition is found improper or inadequate, the red warning light will begin flashing and the LCD for the area in question will remain displayed.

WARNING:

If any LCD remains displayed or the warning light flashes on, correct the problem immediately.

3. Warning light operation can be controlled by the warning control switch. If the control switch is pushed once, the warning light glow will change from a flashing to a steady one. If pushed again, the glow will go out completely. Still another push on the switch brings back the warning light operation all over again.

NOTE:

1. This switch operates only when a malfunction is displayed on an LCD.
2. Even if the warning light is made to glow steady or to go out, it will begin flashing on with another malfunction.

4. The entire monitoring system condition can be checked by pushing the check switch. The system will scan through the seven areas in sequence, just as when the engine was first started, to assure the rider that the system is functioning properly.

GENERAL CAUTION:

Failure to observe any of the following "mustn't" may result in malfunction of the microcomputer or damage to the electrical circuit.

1. **Taillight, brake light and other bulbs of wattage other than specified mustn't be used.**
2. **Extra electric accessories mustn't be connected to the computerized monitor system circuit (ex: taillight, headlight etc.).**
3. **The instrument panel mustn't be subjected to any water splashes or steam from underneath.**
4. **The display panel mustn't be pressed hard or given any shock.**
5. **A magnet or other magnetized objects mustn't be put near the display panel.**

Troubleshooting

1. After the main switch is turned on:

PROBLEM	CAUSE	SOLUTION
a. Warning light doesn't come on.	Bulb is burned out.	Replace bulb.
	Low battery charge.	Recharge battery.
	Faulty coupler connection.	Clean coupler contacts.
	Broken wire.	Replace wiring.
	CMS control unit failed.	Replace CMS control unit.
b. Liquid crystal display (LCD) flashes on and off.	CMS control unit failed.	Replace CMS control unit.
c. LCD does not function.	LCD connectors incorrectly installed.	Reinstall connectors.
	Broken wire.	Replace wiring.
	Faulty contact between LCD panel and control unit.	Clean contacts.
	LCD panel failed.	Replace LCD panel.
	CMS control unit failed.	Replace CMS control unit.
d. LCD only partially displays.	LCD panel failed.	Replace LCD panel.

2. After the engine is started:

PROBLEM	CAUSE	SOLUTION
a. LCD does not cycle.	Faulty coupler connection.	Clean coupler contacts.
	Broken wire.	Replace wiring.
	CMS control unit failed.	Replace CMS control unit.

3. After the check switch is pushed:

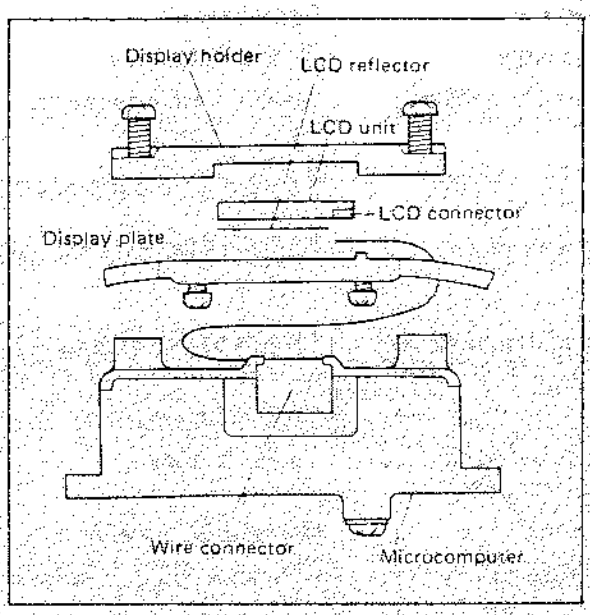
PROBLEM	CAUSE	SOLUTION
a. LCD does not cycle.	Check switch failed.	Replace check switch.
	Faulty coupler connection.	Clean coupler contacts.
	Broken wire.	Replace wiring.
	CMS control unit failed.	Replace CMS control unit.

4. After the warning control switch is pushed:

PROBLEM	CAUSE	SOLUTION
a. Warning light continues to flash.	Warning control switch failed.	Replace warning control switch.
	Faulty coupler connection.	Clean coupler contacts.
	Broken wire.	Replace wiring.
	CMS control unit failed.	Replace CMS control unit.

Cleaning and replacement

Use the following procedure to replace the LCD unit or the microcomputer unit.



1. Remove the headlight lens and the two headlight body holding bolts. This will give you easy access to the instrument-panel holding nuts.
2. Disconnect the wire connectors in the headlight assembly that lead to the instrument panel.
3. Disconnect the speedometer cable.
4. Disconnect the instrument-panel holding nuts, and remove the panel.
5. Remove the three nuts which secure the instrument-panel mounting bracket, and remove the bracket.
6. Place the instrument panel assembly on a clean work surface, and remove the back panel.
7. Remove the four phillips head screws which secure the LCD/microcomputer, and remove the unit.
8. Remove the four screws which hold the LCD display holder.
9. Very carefully turn the display holder over, and completely remove the five display plate holding screws. Remove the LCD reflector and the display plate.
10. Detach the wire connector from its indexing points.

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:

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

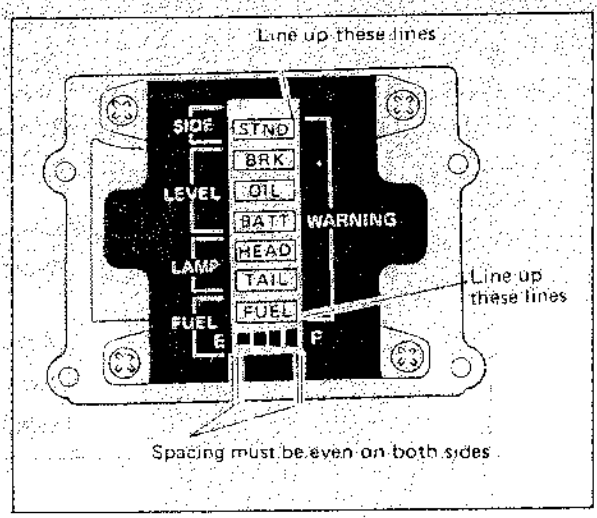
13. Reinstall the LCD unit into the display holder.

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: 1 Nm (10 cm·kg, 0.7 ft·lb)
(Use Loctite®)
4 mm: 2.4 Nm (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.

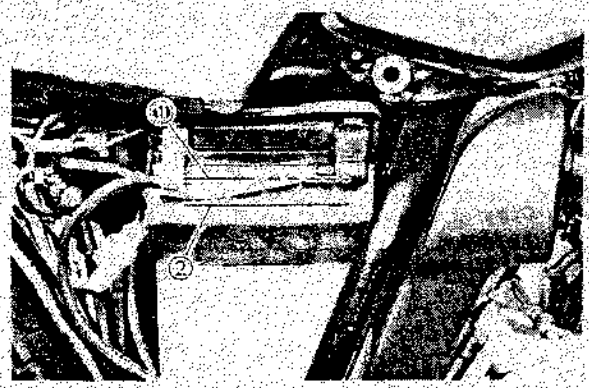
17. Reinstall the entire unit in the instrument panel.
18. Reinstall the instrument panel back to the motorcycle.
19. Check that the COM system is functioning properly.

B. Battery
Check the level of the battery fluid and see if the terminals are tight. Add distilled water if the fluid level is low.

CAUTION:
When inspecting the battery, be sure the breather pipe is routed correctly. If the vent tube touches the frame or exits in such a way as to cause battery electrolyte or gas to exit onto the frame, structural and cosmetic damage to the motorcycle can occur.

WARNING:
Battery electrolyte is poisonous and dangerous, causing severe burns, etc. It 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 closed space. Always shield eyes when working near batteries. KEEP OUT OF REACH OF CHILDREN.

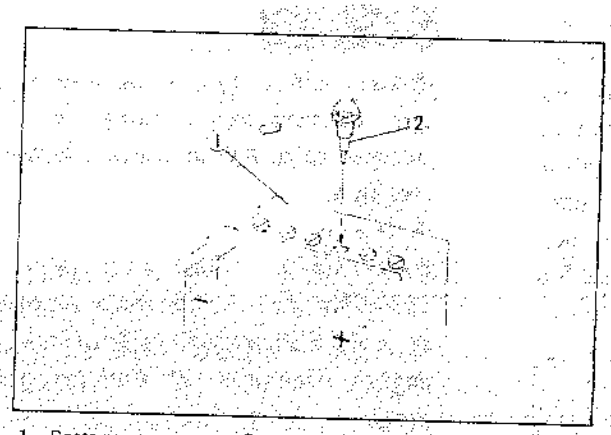
Replenishing the battery fluid
A poorly maintained battery will deteriorate quickly. The battery fluid should be checked at least once a month.
1. The level should be between the upper and lower level marks. Use only distilled water if refilling is necessary.



1. Upper level 2. Lower level

CAUTION:
Normal tap water contains minerals which are harmful to a battery; therefore, refill only with distilled water.

CAUTION:
Install the battery sensor into 3RD hole from positive terminal.



1. Battery 2. Battery sensor

2. When the motorcycle is not to be used for a month or longer, remove the battery and store it in a cool, dark place. Completely recharge the battery before reusing.
3. If the battery is to be stored for a longer period than the above, check the specific gravity of the fluid at least once a month and recharge the battery when it is too low.
4. Always make sure the connections are correct when putting the battery back in the motorcycle.
   Make sure the breather pipe is properly connected and is not damaged or obstructed.

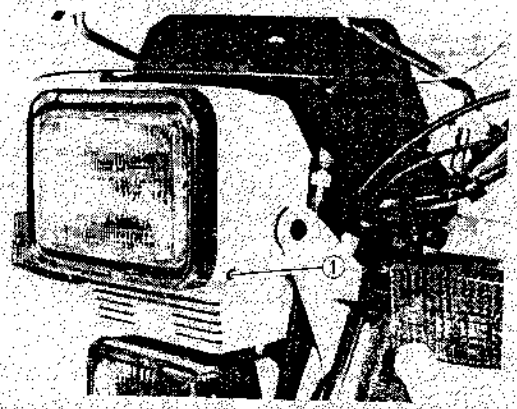
CAUTION:

Make sure that the connection to the battery is correct; otherwise, damage to the microcomputer may occur.

C. Headlight

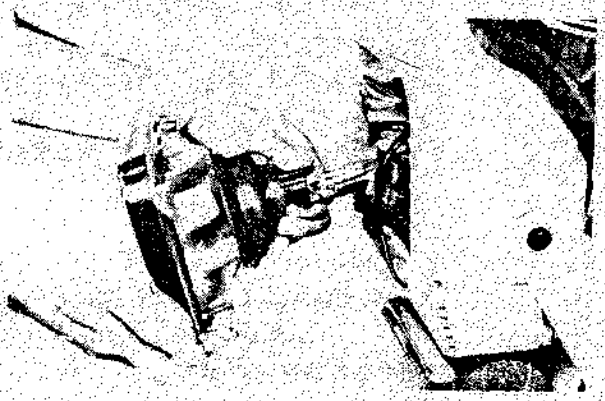
This motorcycle is equipped with a quartz bulb headlight. If the headlight bulb burns out, replace the bulb as follows:

1. Headlight bulb replacement
   a. Remove the 2 screws holding the light unit assembly to the headlight body.

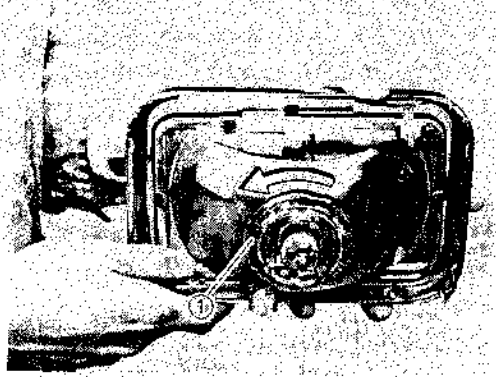


1. Holding screw

   b. Disconnect the lead wires and remove the light unit assembly.



   c. Turn the bulb holder counterclockwise and remove the defective bulb.



1. Bulb holder

   d. Slip a new bulb into position and secure it with the bulb holder.

CAUTION:

Avoid touching the glass part of the bulb. Also keep it free from oil stains; otherwise, the transparency of the glass, life of the bulb and illuminous flux will be adversely affected. If the glass is oil stained, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

WARNING:

Keep flammable products or your hands away from the bulb while it is on, because it heats up. Do not touch the bulb until it cools down.

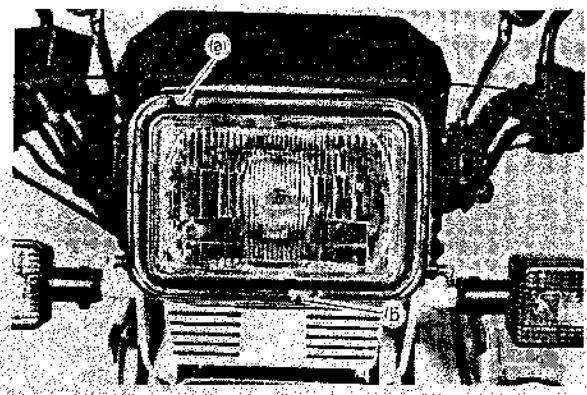


e. Reinstall the light unit assembly to the headlight body. Adjust the headlight beam if necessary.

2. Headlight beam adjustment

a. Horizontal adjustment:
To adjust the beam to the right, turn the adjusting screw counterclockwise.
To adjust the beam to the left, turn the screw clockwise.

b. Vertical adjustment:
To adjust the beam to the upper, turn the adjusting screw clockwise.
To adjust the beam to the lower, turn the screw counterclockwise.



a. Horizontal adjusting screw
b. Vertical adjusting screw

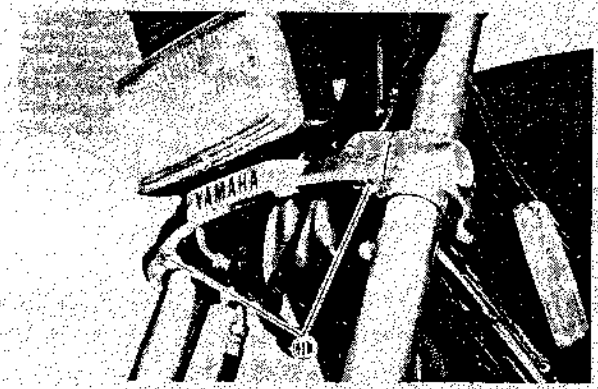
D. Fog light

This motorcycle is equipped with a quartz bulb fog light.

If the fog light bulb burns out, replace the bulb as follows:

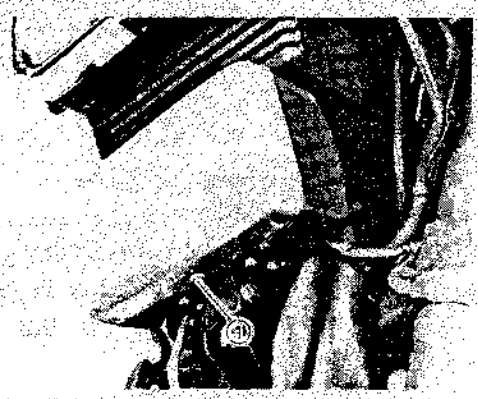
1. Auxiliary low beam light bulb replacement.

a. Remove the two screws holding the emblem to the flasher light bracket.



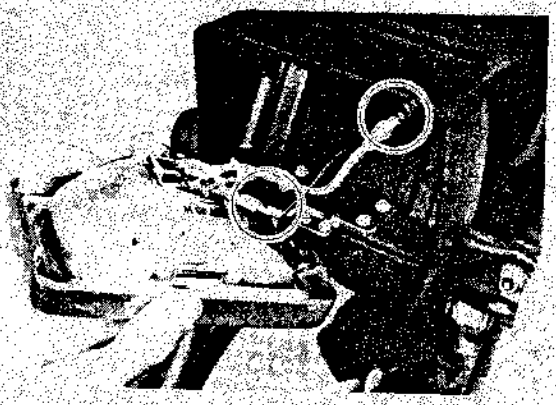
1. Holding screw

b. Remove the screw holding the light unit assembly to the auxiliary low beam light body.

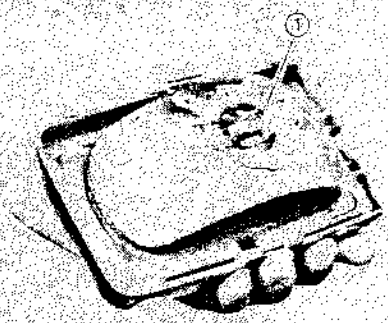


1. Holding screw

c. Disconnect the lead wires and remove the light unit assembly.



d. Unhook the bulb retaining clip and remove the clip.



1. Bulb retaining clip

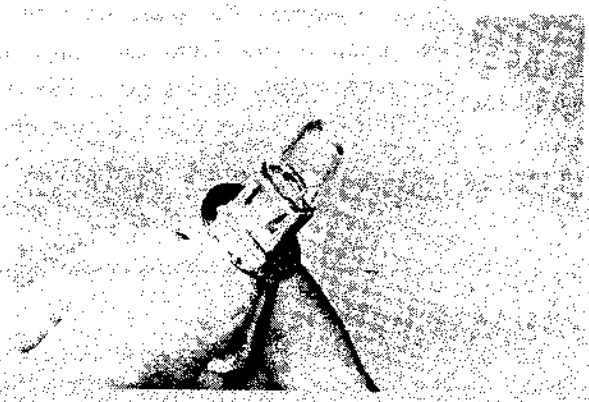
e. Remove the defective bulb and slip a new bulb into position.

CAUTION:

Avoid touching the glass part of the bulb. Also keep it free from oil stains; otherwise, the transparency of the glass, life of the bulb and illuminous flux will be adversely affected. If the glass is oil stained, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.

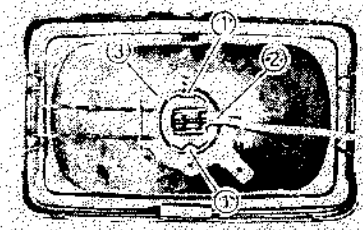
WARNING:

Keep flammable products or your hands away from the bulb while it is on, because it heats up. Do not touch the bulb until it cools down.



f. For reassembly, follow the procedure below with care;

1) Make sure the projecting portions of the bulb holder are positioned correctly.



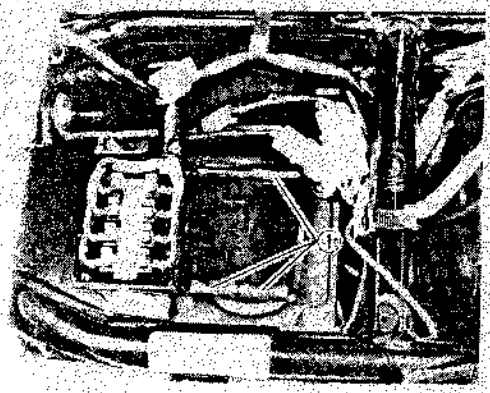
1. Projecting portion 2. Bulb 3. Bulb holder

2) Adjust the auxiliary low beam light beam.

2. Auxiliary low beam light beam adjustment.

E. Fuse

1. The fuse block is located under the seat.



1. Spare fuse

2. If any fuse is blown, turn off the ignition switch and the switch in the circuit in question and install a new fuse of proper amperage.

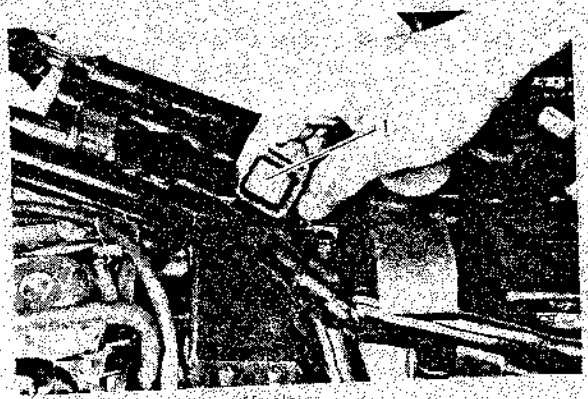
Then turn on the switches, and see if the electrical device operates. If the fuse immediately blows again, solve the cause.

WARNING:

Do not use fuses of a higher amperage rating than those recommended.

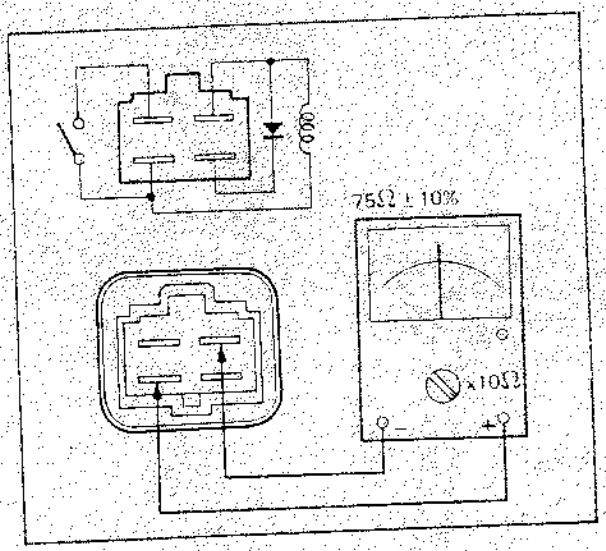
F. Starting circuit cut off relay

1. Remove the seat, and fuel tank.
2. Remove the starting circuit cut off relay from the frame, and disconnect the connector.



1. Starting circuit cut off relay

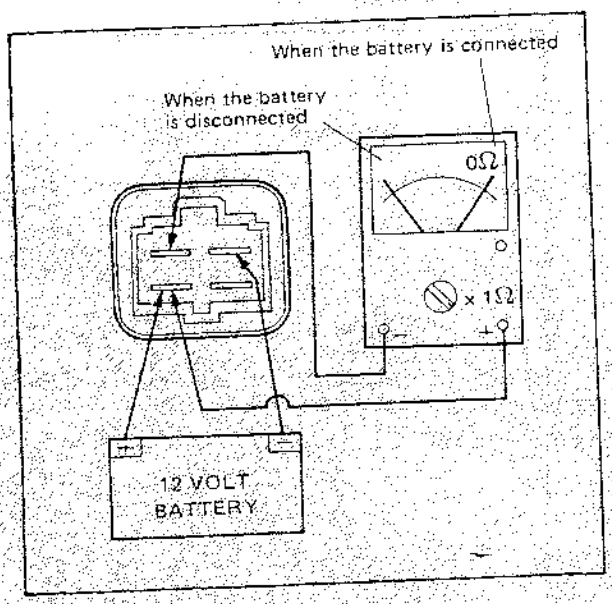
3. Check the resistance of the relay coil windings with the pocket tester. If the resistance is not within specification, replace the relay.



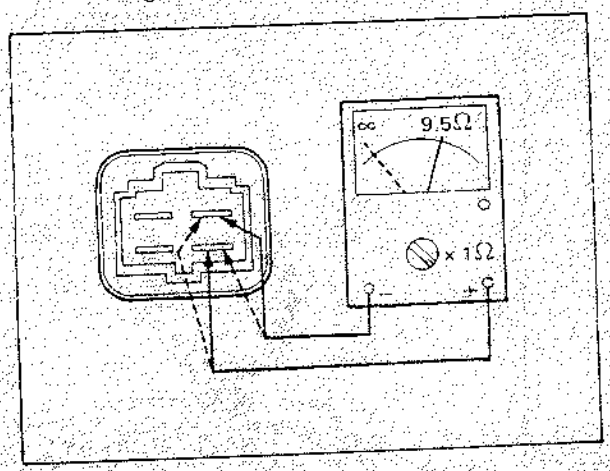
4. Check the relay function with a 12 volt battery and the pocket tester. Connect the leads as shown in the illustration. If the resistance readings do not equal those shown in the illustration, replace the relay.

CAUTION:

Wrong connection of the battery leads may cause damage to the relay diode.



5. Check the diode in the relay with the pocket tester as shown in the illustration. Replace the relay if the diode is damaged.

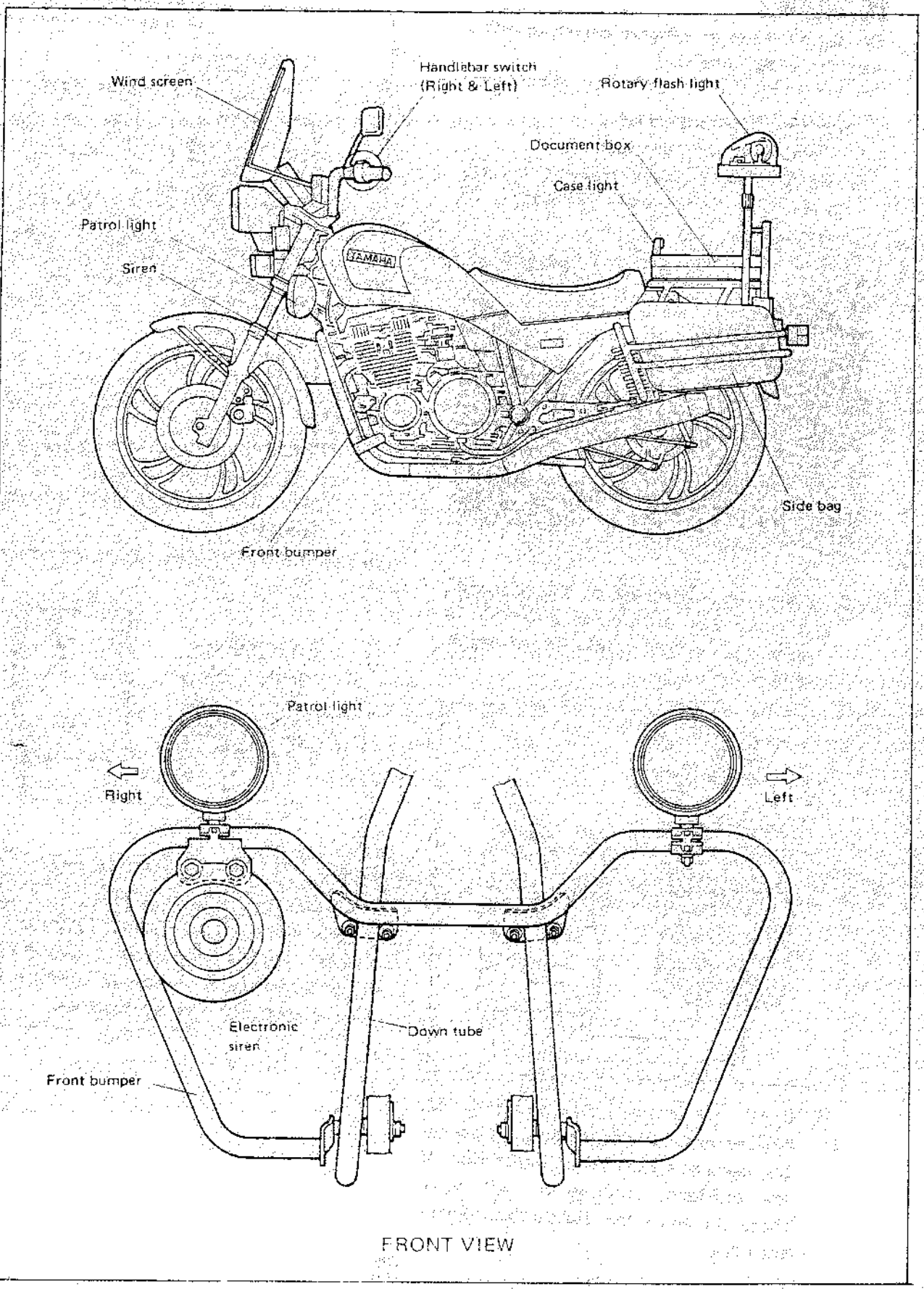


NOTE:

Only the Yamaha Pocket Tester will give a 9.5Ω reading when testing continuity. The particular characteristics of other testers will vary the continuity test readings.

POLICE EQUIPMENT AND ELECTRICAL

POLICE EQUIPMENT



VARIOUS TYPES OF COMBINATIONS FOR POLICE EQUIPMENT

Police equipment comes in the combinations as shown in the table, due to regulation or choice.

○: Equipped
X: Not equipped

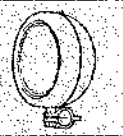
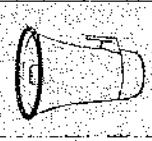
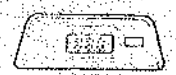
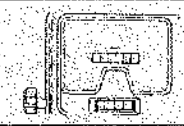
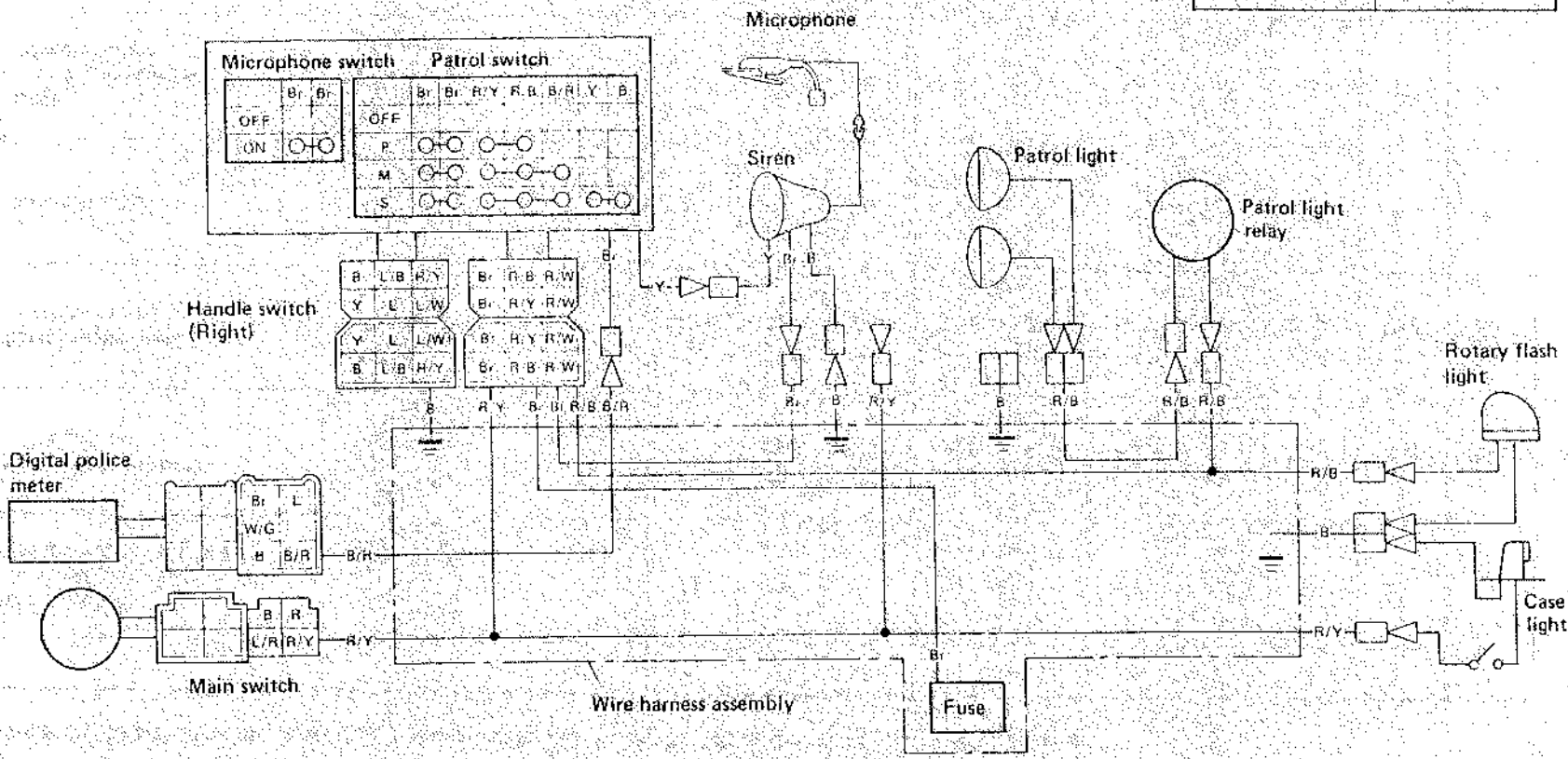
	A	B	C	D	E	F	G	H	I	J	K	L
Wind Screen Mounted on the handlebars *: Mounted on the frame 	○	○	X	○	○	○	○	○	○	○*	○	X
Patrol Light (Front) Ⓓ Rotary type 	○ Red	○ Red	○ Blue	○ Blue	○ Blue	○ Red	○ Red	○ Blue	○ Red	○ Blue	Ⓓ Blue	○ Red
Patrol Light (Rear) Ⓓ Rotary type 	Ⓓ Red	Ⓓ Red	Ⓓ Blue	Ⓓ Blue	Ⓓ Blue	Ⓓ Red	Ⓓ Red	Ⓓ Blue	Ⓓ Red	Ⓓ Blue	X	Ⓓ Red
Document Box 	○	X	X	○	○	○	○	○	○	X	X	X
Siren *: With Loud-speaker Ⓜ Motor driven 	○	○*	X	○	○	○	○	○*	○*	○	Ⓜ	Ⓜ
Digital Police Meter *: Analogue type 	X	X	○	○	○	○	○	○	○	*	X	○
Radiotelegraphic Apparatus Made by Motoroller	X	○	X	X	X	X	X	X	X	X	X	X
Speedometer 	km/h	km/h	km/h & mi/h	km/h	mi/h	km/h	mi/h	km/h	km/h	km/h	km/h	km/h

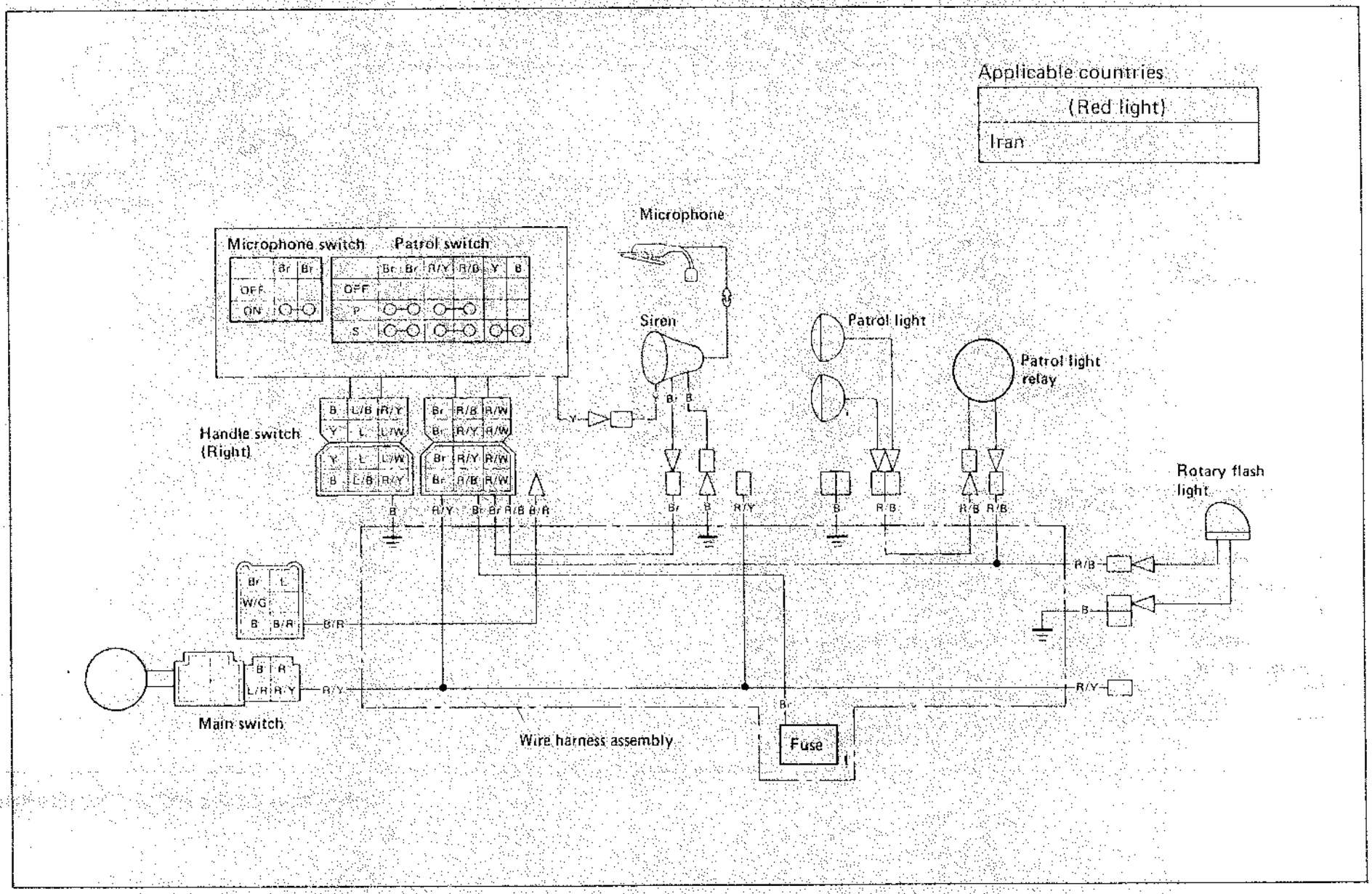
Diagram for Each Country (1)

Applicable countries

(Red light)	(Blue light)
Peru	Venezuela
Pakistan	Dominica
India	
Columbia	



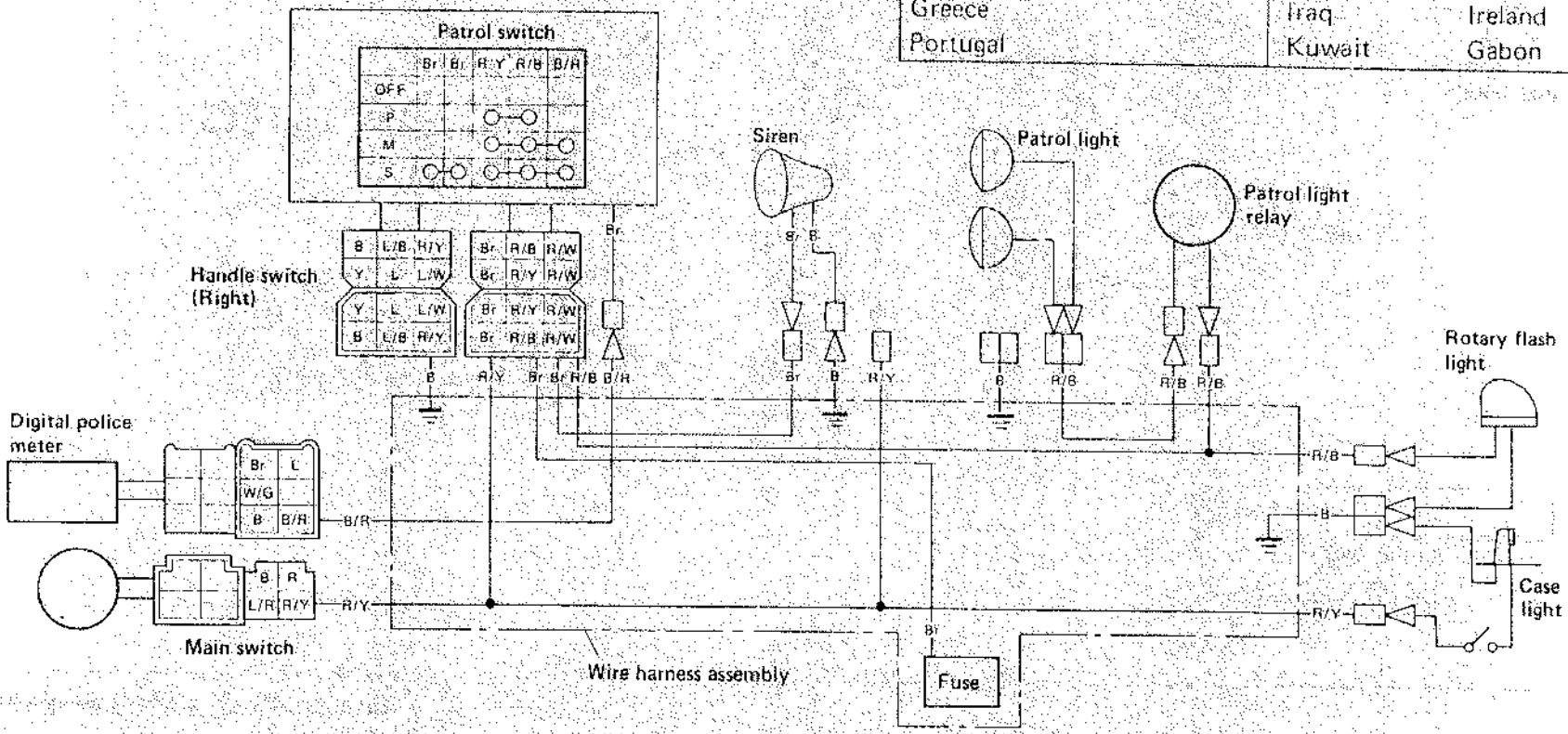
Police Wiring Diagram for Each Country (2)



Police Wiring Diagram for Each Country (3)

Applicable countries

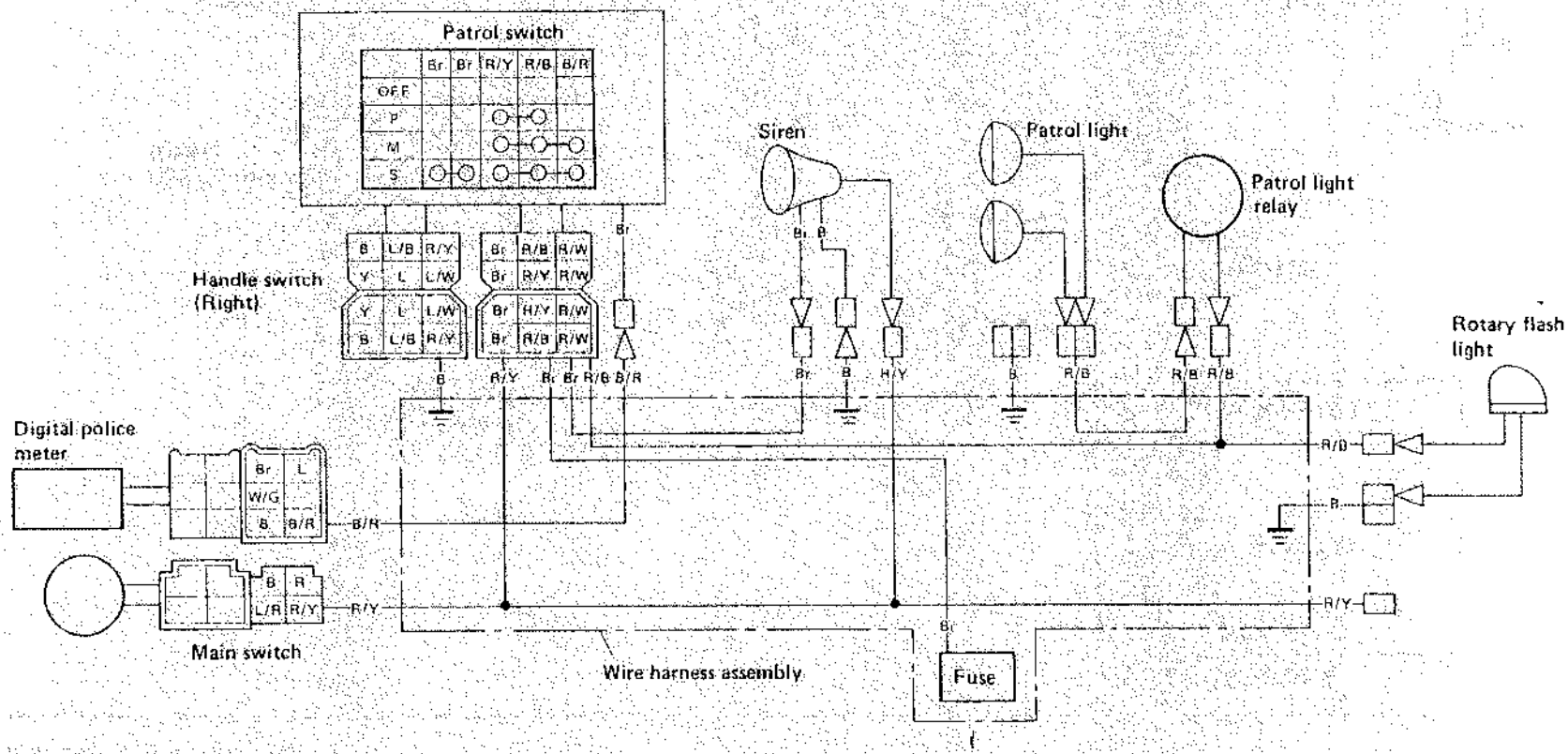
(Blue light)		(Red light)	
Argeria	Cyprus	Uganda	Saudi Arabia
South Yemen	Bahama	Kenya	Jordan
South Africa	Dubai	Syria	Suda
Guinea	Abu Dhabi	Tanzania	Doha-Qatar
Egipt	Muscat oman	North yemen	Malawi
Greece		Iraq	Ireland
Portugal		Kuwait	Gabon



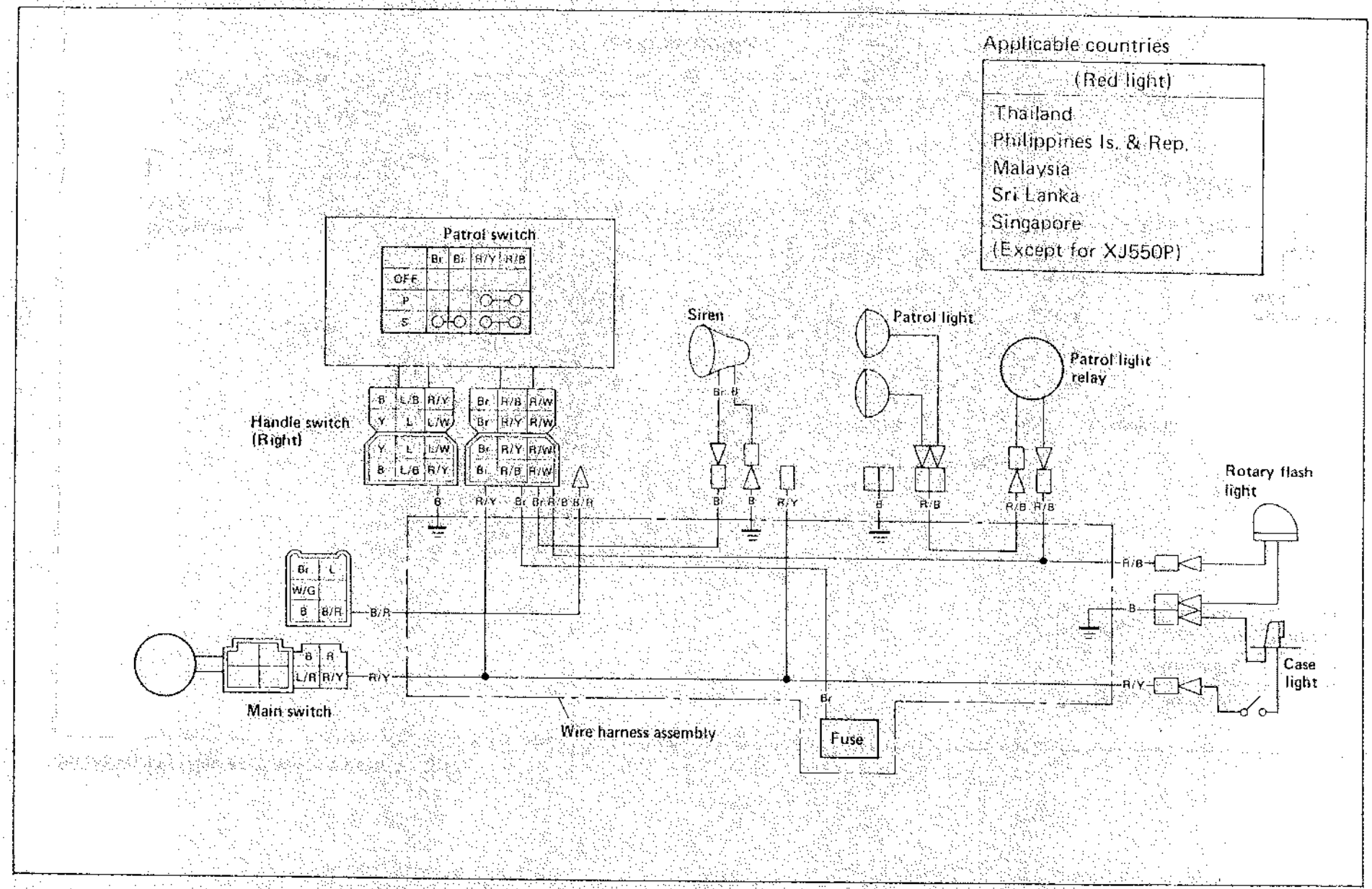
Police Wiring Diagram for Each Country (4)

Applicable countries

(Red light)
Singapore (Only for XJ550P)



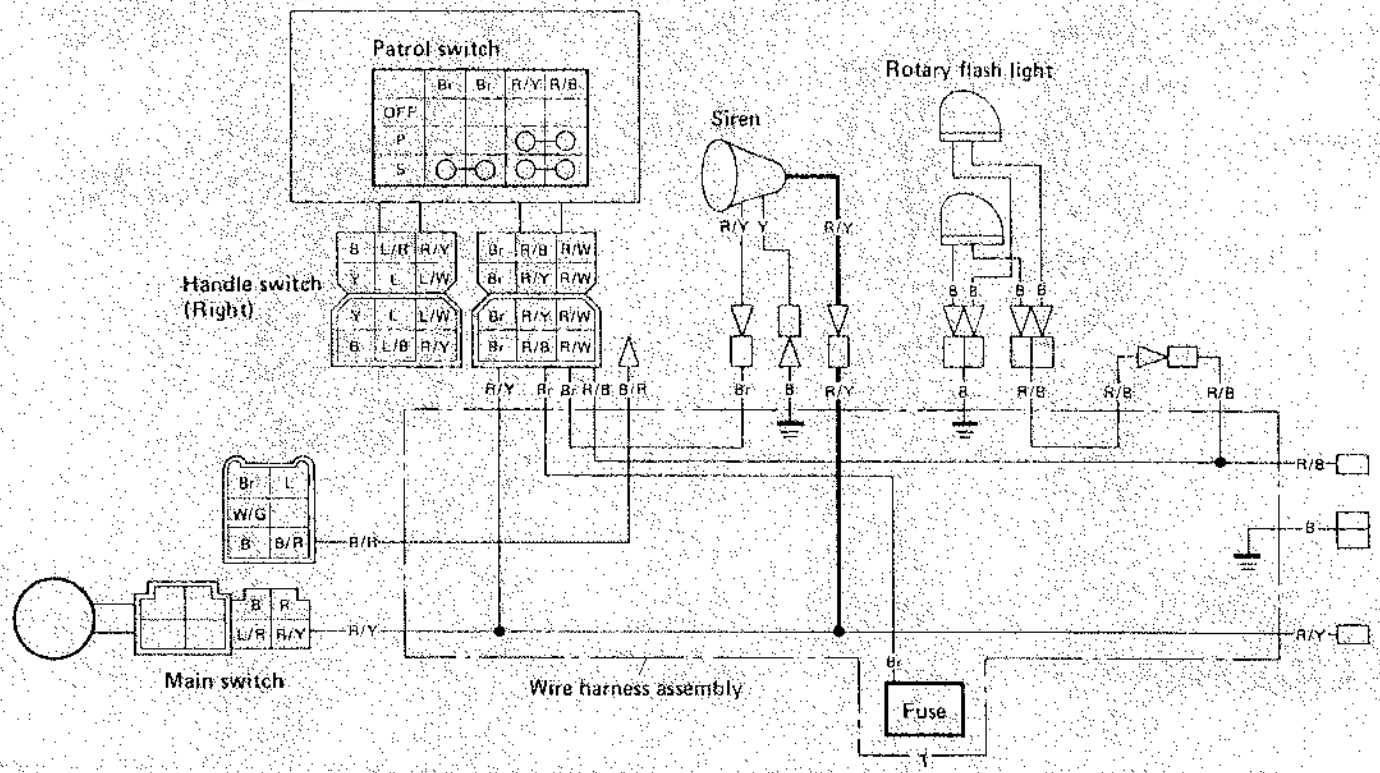
Police Wiring Diagram for Each Country (5)



Police Wiring Diagram for Each Country (6)

Applicable Countries

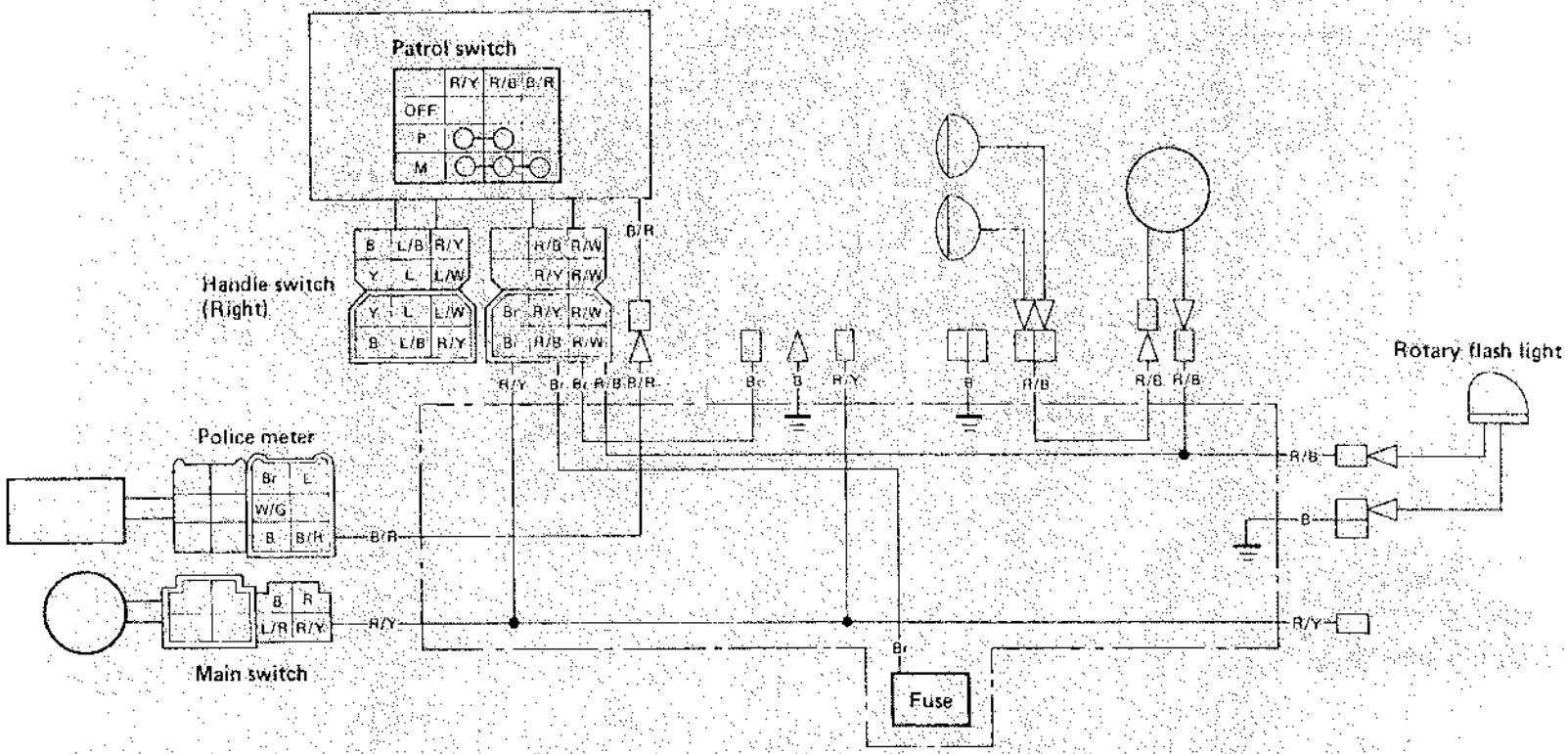
(Blue light)
Zimbabwe



Police Wiring Diagram for Each Country (7)

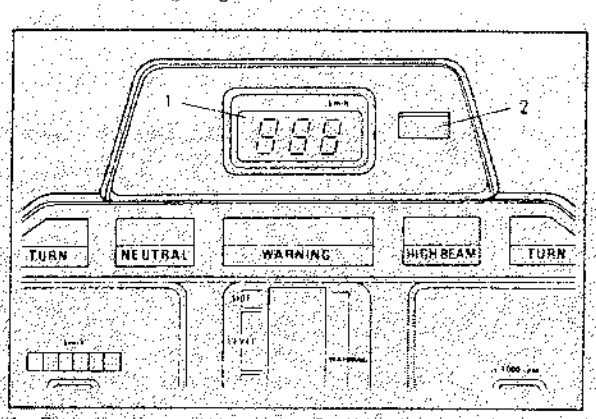
Applicable Countries

(Blue light)
Hong Kong



DIGITAL POLICE METER (If so equipped)

When the patrol switch is slided to the "M" position, the digital police meter indicates the speed at which the police bike was running at that instant, instantaneously making the meter stop light glow in red.



1. Digital police meter 2. Meter stop light

Digital Police Meter Adjustment

Digital police meter can be adjusted by pushing down the four rocker switches located at the bottom of the police meter. (Fig. 1)

Four Rocker Switches (Fig. 2)

ON: The numbered side of the switch is pushed down.

OFF: The other side is pushed down.

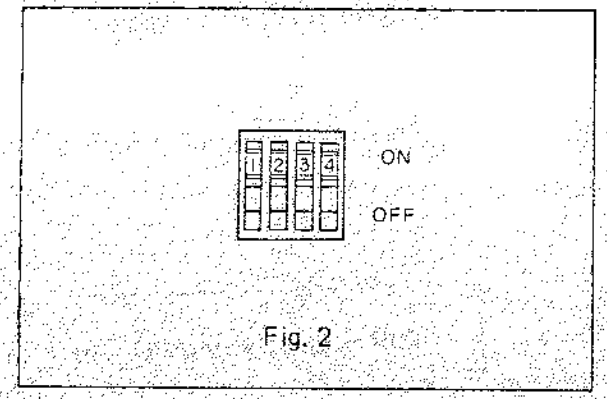


Fig. 2

NOTE:

Push each switch over the cover with a round-head stick. (Fig. 3)

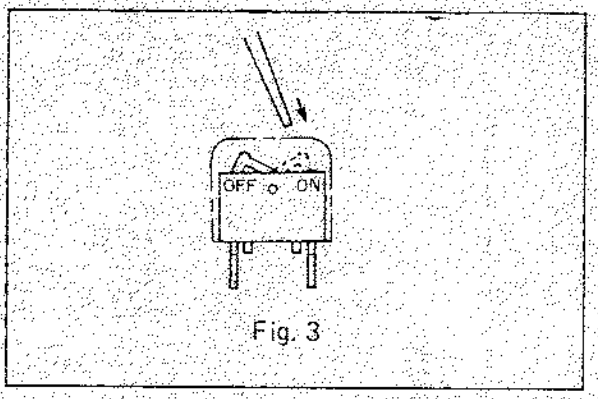


Fig. 3

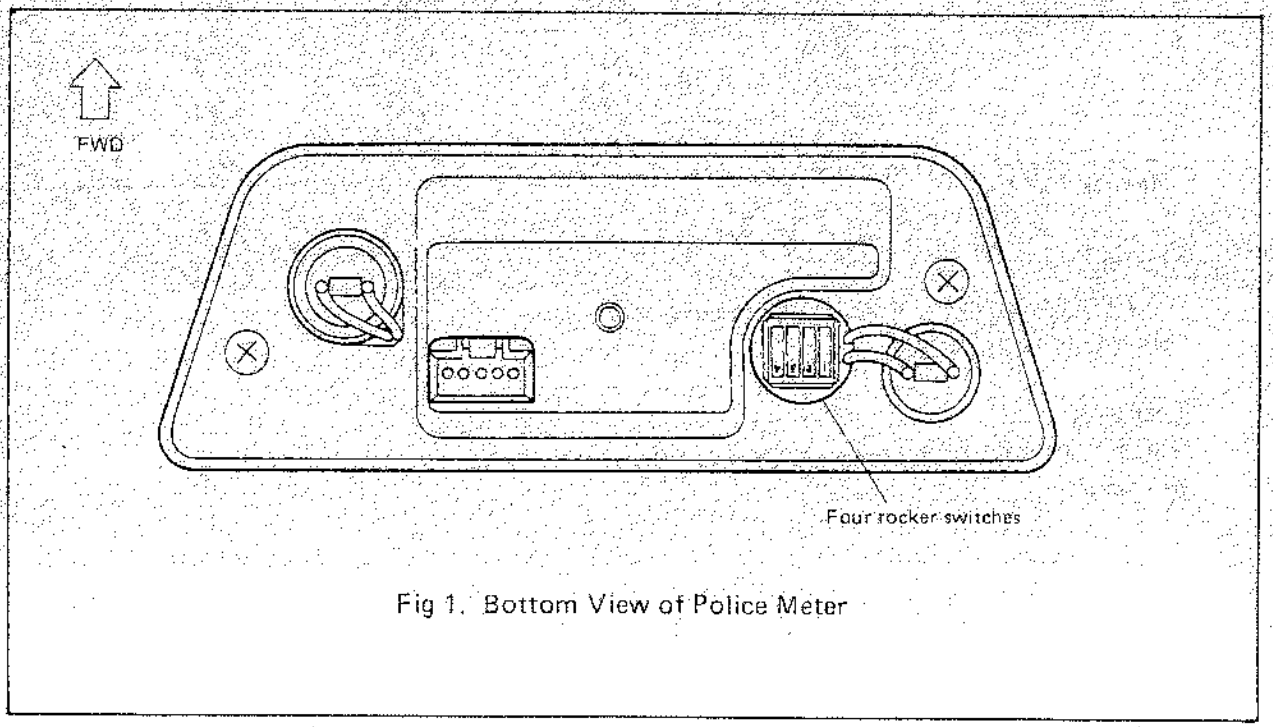


Fig 1. Bottom View of Police Meter

Adjustment of the Switch Position

Adjust the digital police meter by the switch position as shown in Table 1.

How to make adjustment

If you want to make a meter reading

ⓐ Push the No. 2 switch to "OFF".
ⓑ Push the No. 2, No. 3 and No. 4 switches to "OFF".

Police Meter Adjusting Rate		Switch Number			
		1	2	3	4
Increase ↑	+ 10.5 (%)	OFF	OFF	OFF	ON
	+ 9.0	ON	OFF	OFF	ON
	+ 7.5	OFF	ON	OFF	ON
	+ 6.0	ON	ON	OFF	ON
	+ 4.5	OFF	OFF	ON	ON
	+ 3.0	ON	OFF	ON	ON
	+ 1.5	OFF	ON	ON	ON
	*0	ON	ON	ON	ON
Decrease ↓	− 1.5	OFF	OFF	OFF	OFF
	− 3.0	ON	OFF	OFF	OFF
	− 4.5	OFF	ON	OFF	OFF
	− 6.0	ON	ON	OFF	OFF
	− 7.5	OFF	OFF	ON	OFF
	− 9.0	ON	OFF	ON	OFF
	− 10.5	OFF	ON	ON	OF
	− 12.0	ON	ON	ON	OFF

*Normal Position

Increase:

Adjustment makes the digital police meter reading indicated bigger.

Decrease:

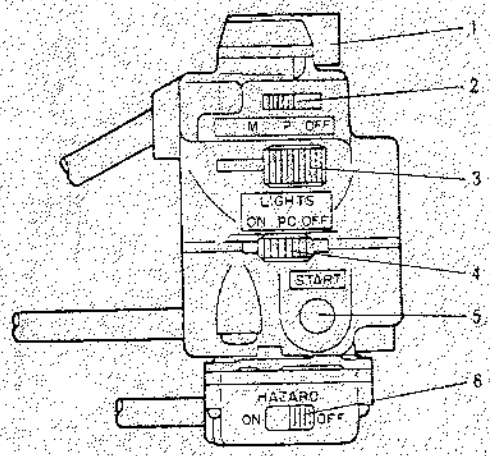
Adjustment makes the meter reading indicated smaller.

HANDLEBAR SWITCHES (Right)

In accordance with regulations for various countries, the five types of handlebar switches (Right) are provided.

		Electronic Siren		
		Equipped		Not Equipped
		With Mic.	Without Mic.	
Digital Police Meter	Equipped	24L-10 (Fig. 1)	24L-30 (Fig. 3)	24L-50 (Fig. 5)
	Not Equipped	24L-20 (Fig. 2)	24L-40 (Fig. 4)	

Fig. 1 24L-10



1. "ENGINE STOP" switch
2. Mic. switch
3. Patrol switch
4. "LIGHTS" switch
5. "START" switch
6. "HAZARD" switch

Fig. 2 24L-20

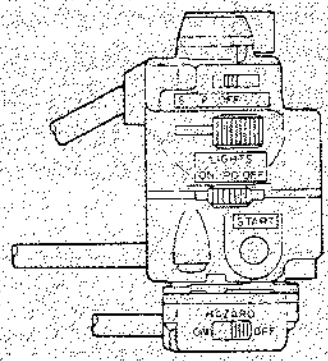


Fig. 3 24L-30

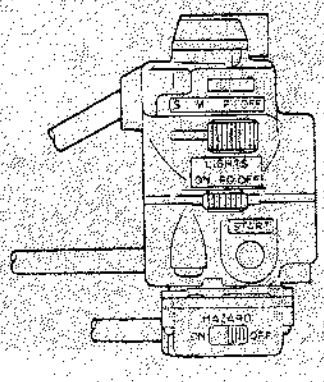


Fig. 4 24L-40

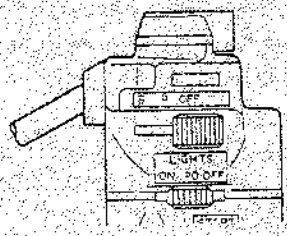
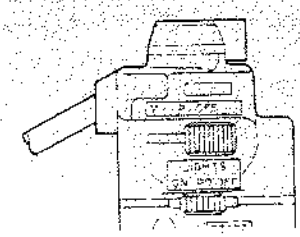
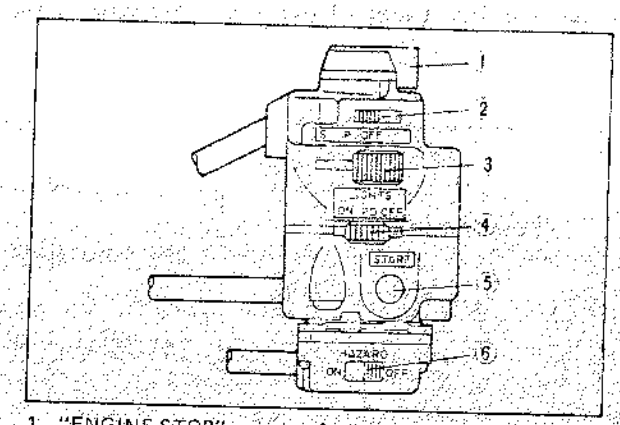


Fig. 5 24L-50





1. "ENGINE STOP" switch
2. Mic. switch
3. Patrol switch
4. "LIGHTS" switch
5. "START" switch
6. "HAZARD" switch

"ENGINE STOP" Switch

The engine stop switch is a safety device for use in an emergency such as when the motorcycle overturn or when trouble occurs in the throttle system. The engine will not start when the engine stop switch is turned to "OFF". In case of an emergency, turn the switch to "OFF".

	R/W	R/W
OFF		
RUN	○	○
OFF		

○ : Continuity

"MIC." Switch (If so equipped)

The loudspeaker can be used not only at the "MIC." position but at positions other than when the patrol switch is "OFF".

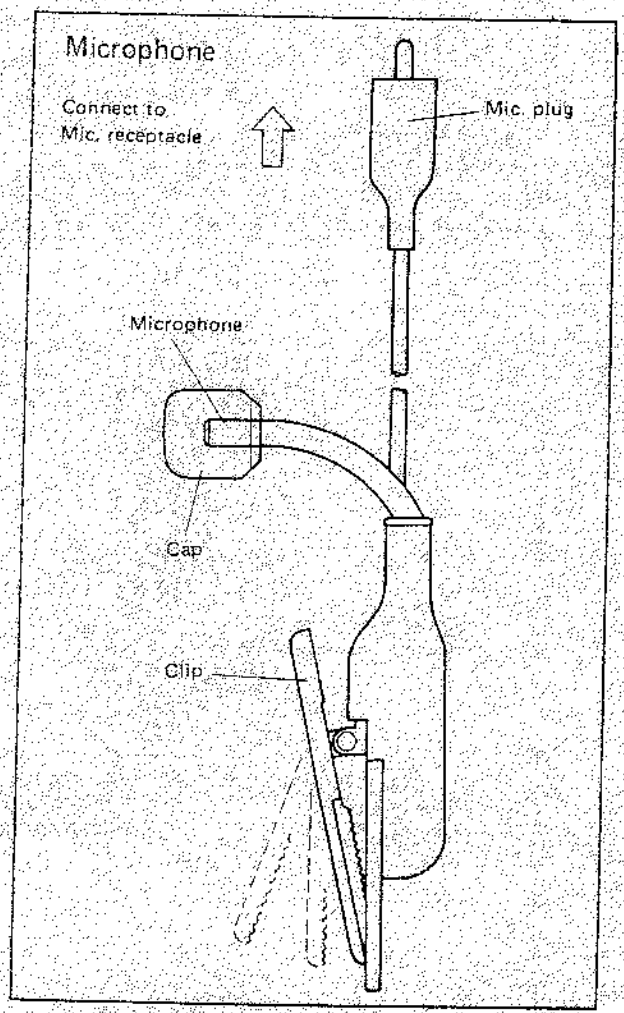
Patrol switch position	OFF	P	M*	S*
Patrol light		○	○	○
Rotary flash light		○	○	○
Digital police meter*			○	○
Siren*				○
Microphone*		○	○	○

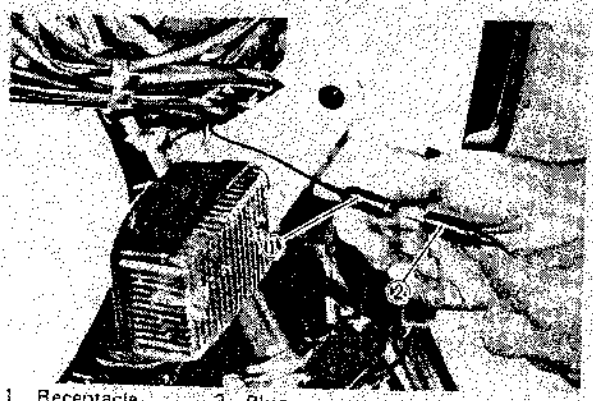
*If so equipped. ○ : ON position

How to use the loudspeaker:

1. Connect the leads from the microphone to Mic. jack.

Specified microphone type:
Condenser type CY-26PD
(P/No. 1T7-98622-90)



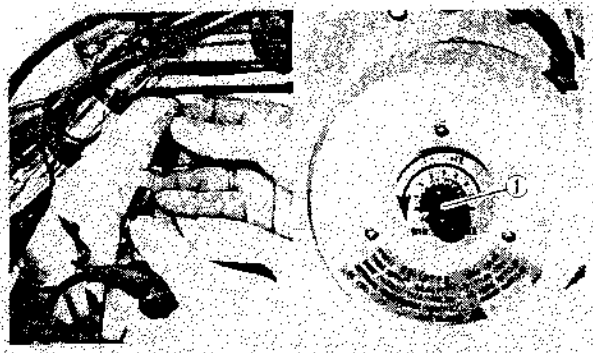


1. Receptacle 2. Plug

CAUTION:

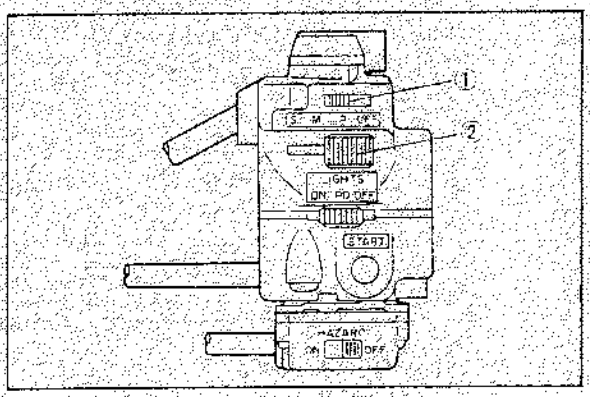
Do not use only microphones other than specified, or damage may occur to the microphone.

2. Turn the volume control knob on back of the loudspeaker counterclockwise until it stops.



1. Volume control knob

3. Turn on the "MIC." switch and adjust the loudness with the volume control knob.

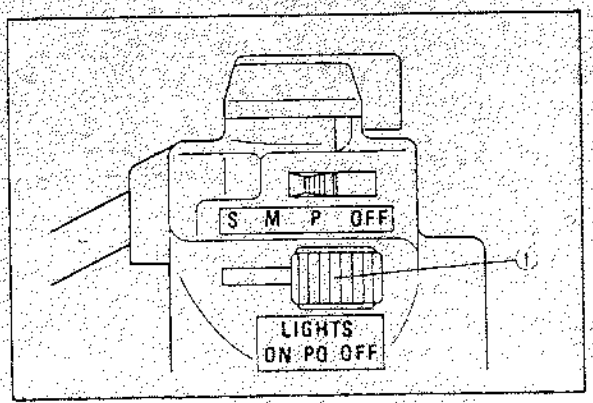


1. "MIC" switch 2. Patrol switch

	Br_1	Br_2
OFF		
MIC.	○——	——○

○ : Continuity

Patrol Switch (Meter-stop/Siren Switch)



1. Patrol switch
S. Siren M. Meter stop P. Patrol light

Push the switch to the "P" for the patrol light, to the "M" to stop the digital police meter, and to the "S" to sound the siren.
The five types of the patrol switch are provided to various combinations for police equipment.

24L-10							
	Br_1	Br_2	R/Y_1	R/B	B/R	Y_1	(B)
OFF							
P	○—○		○—○				
M	○—○		○—○	○			
S	○—○		○—○	○		○—○	

24L-20						
	R/Y_1	R/B	Br_1	Br_2	Y_1	(B)
OFF						
P	○—○		○—○			
S	○—○		○—○		○—○	

24L-30					
	R/Y_1	R/B	B/R	Br_1	Br_2
OFF					
P	○—○				
M	○—○		○		
S	○—○		○	○—○	

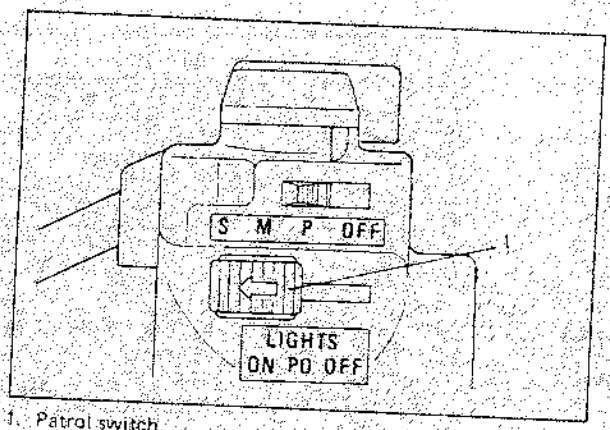
24L-40				
	R/Y_1	R/B	Br_1	Br_2
OFF				
P	○—○			
S	○—○		○—○	

24L-50			
	R/Y_1	R/B	B/R
OFF			
P	○—○		
M	○—○	○	

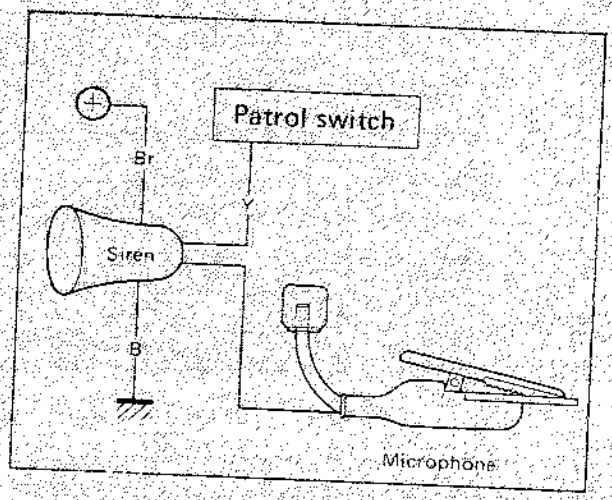
For further details "Police Wiring Diagram For Each Country". (See pages 42 ~ 48.)

Siren (If so equipped)

The siren keeps on sounding all through the time the patrol switch is held at the "S" position.



1. Patrol switch



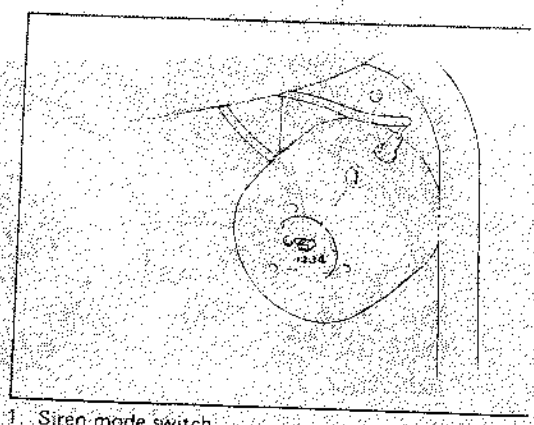
If the siren does not sound, check the circuit as followings:

1. Check the voltage between the brown lead and chassis ground.
2. Check the continuity between the black lead and chassis ground.
3. Connect the yellow lead to chassis ground. If the siren sounds, the patrol switch should be checked.
4. See "Patrol Switch" and check continuity between leads.

Non-Mic Type Siren (If so equipped)

This type of siren is available in four different tones. For selecting a particular tone:

1. Remove the siren cover.
2. Move the siren mode switch to a selected tone.



1. Siren mode switch

"LIGHTS" Switch

Turn the light switch to the "ON" to tu the headlight, the taillight an he m lights. Turn the light switch to "PO" to on the auxiliary light, taillight, and n light.

	R/Y_2	L	L/B	
OFF				
PO	○	○		
ON	○	○	○	

"START" Switch

To start the engine, push the starter switch

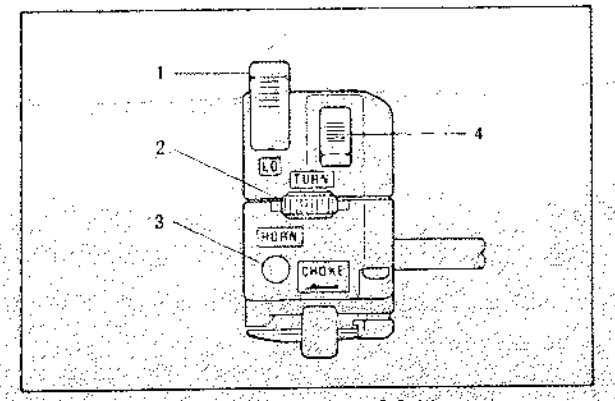
	L/W	B
OFF		
PUSH (ON)	○	○

"HAZARD" Switch

This switch is used under emergency or h ardous conditions.

	Br/W	Br/W	Br/Y	Ch	Dg
OFF	○	○			
ON			○	○	○

HANDLEBAR SWITCHES (Left)



1. "LIGHTS" (Dimmer) switch
2. "TURN" switch
3. "HORN" switch
4. Passing light switch "PASS"

"LIGHTS" (Dimmer) Switch

Turn to the "HI" for the high beam and to the "LO" for the low beam.

"TURN" Switch

This is a three-way switch: the center position is off; turn to the "L" for the left flasher and to the "R" for the right flasher.

"HORN" Switch

Press the switch to sound the horn.

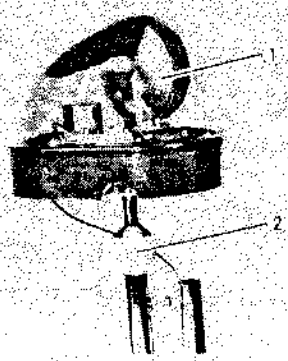
Passing Light Switch "PASS"

When you are passing a vehicle ahead, the passing light switch button should be depressed to that the headlight gives a signal to the rider.

Rotary Flash Lifht

This flash light can be adjusted in its height. For this adjustment:

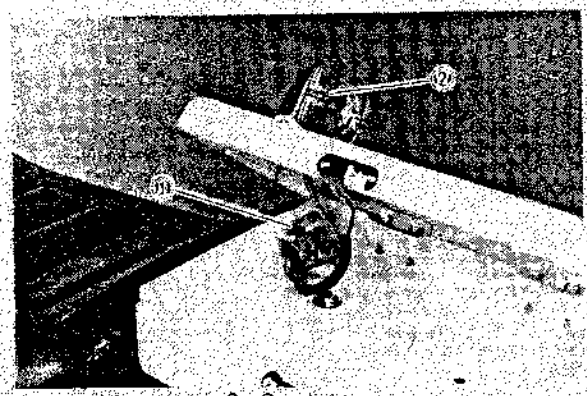
1. Loosen the stopper.
2. Select a proper height by moving the flasher light up and down.
3. Then, secure the stopper.



1. Rotary flash light
2. Stopper

Case Light

Open the trunk case, and the switch can be seen. Lights when the switch is turned on.

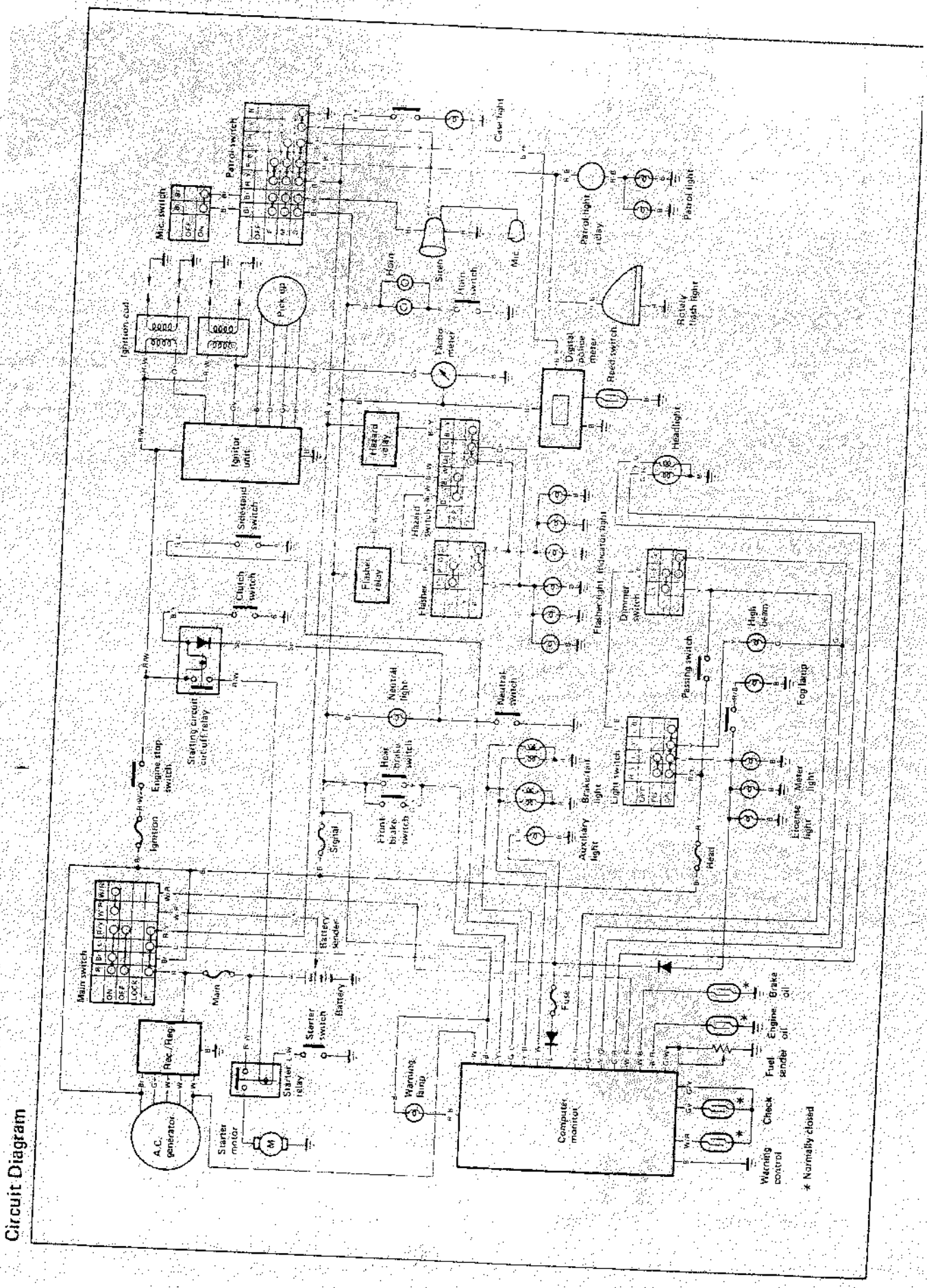


1. Case light switch
2. Case light

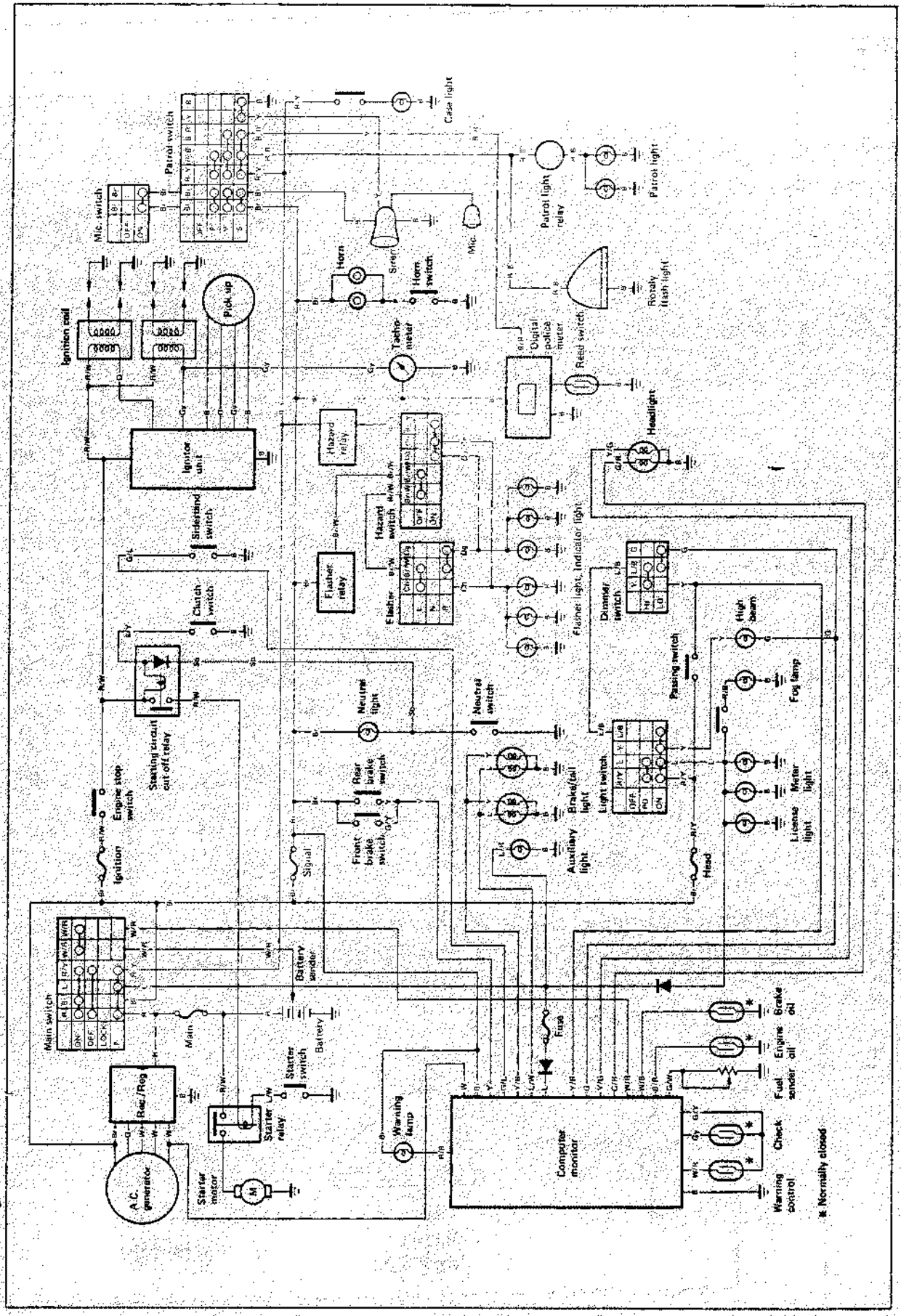
NOTE:

If the switch is turned on, the battery will be discharged, because it is directly connected to the battery. Be sure to turn off the switch after using it.

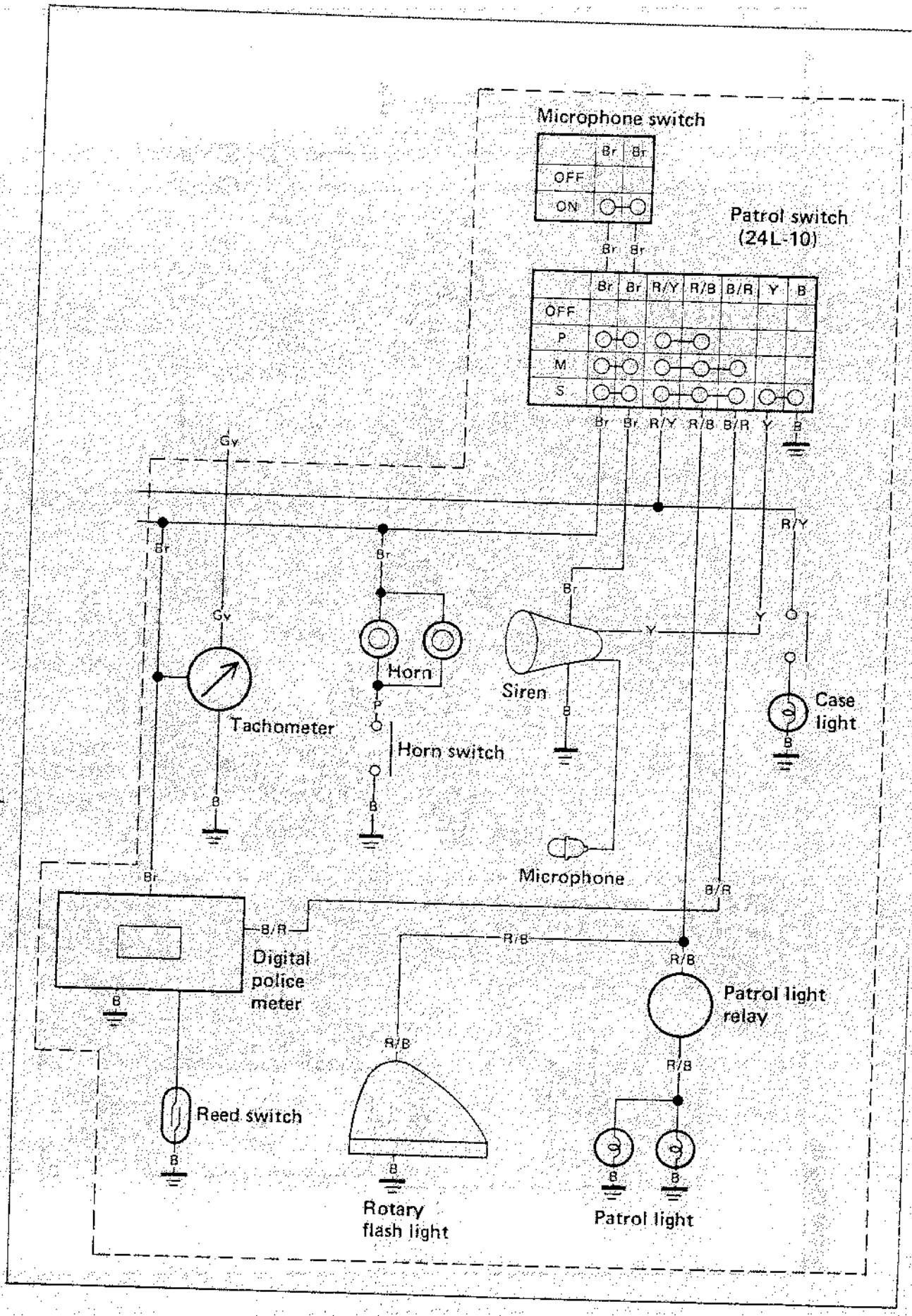
XJ650P/XJ750P CIRCUIT DIAGRAM



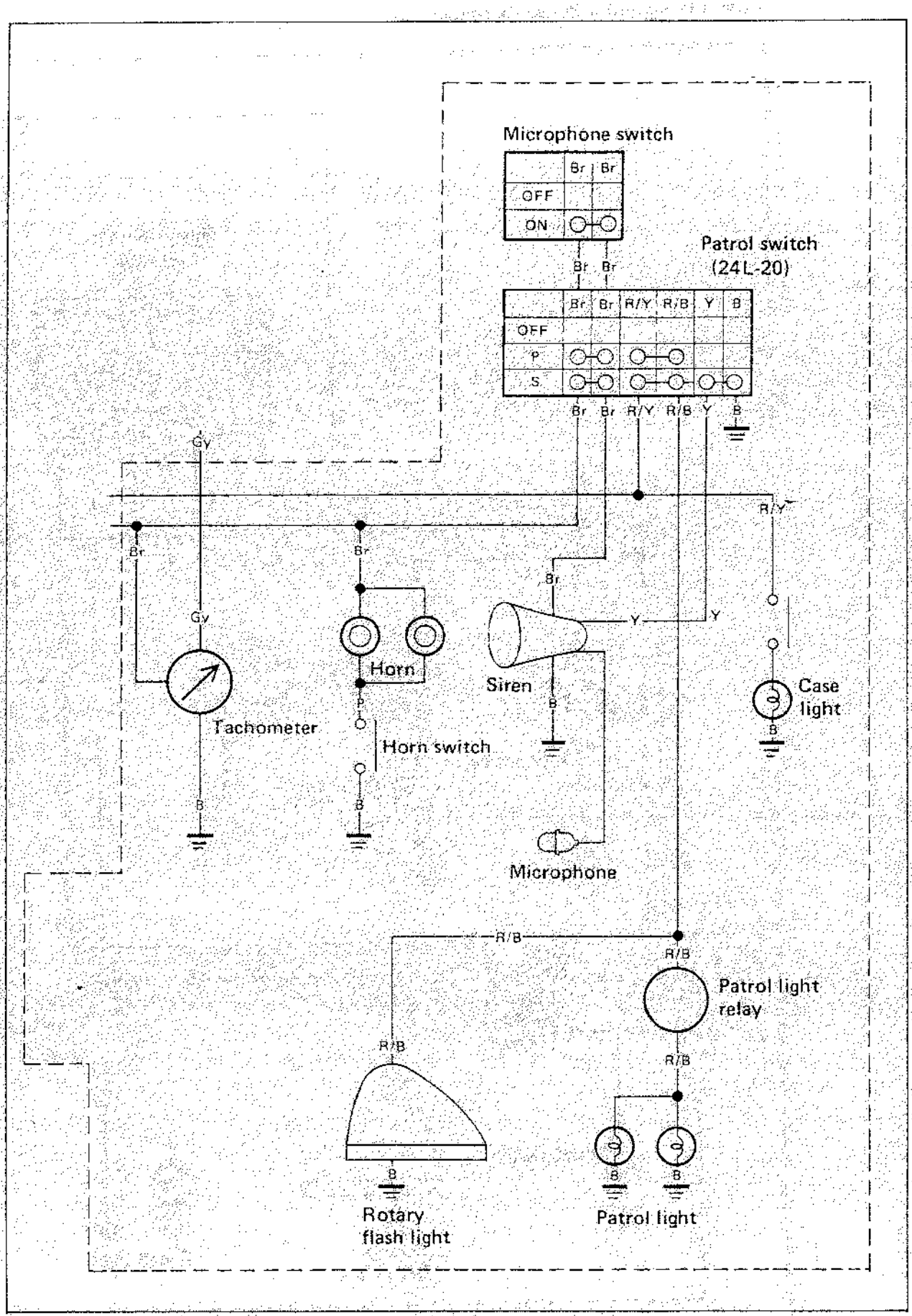
Circuit Diagram



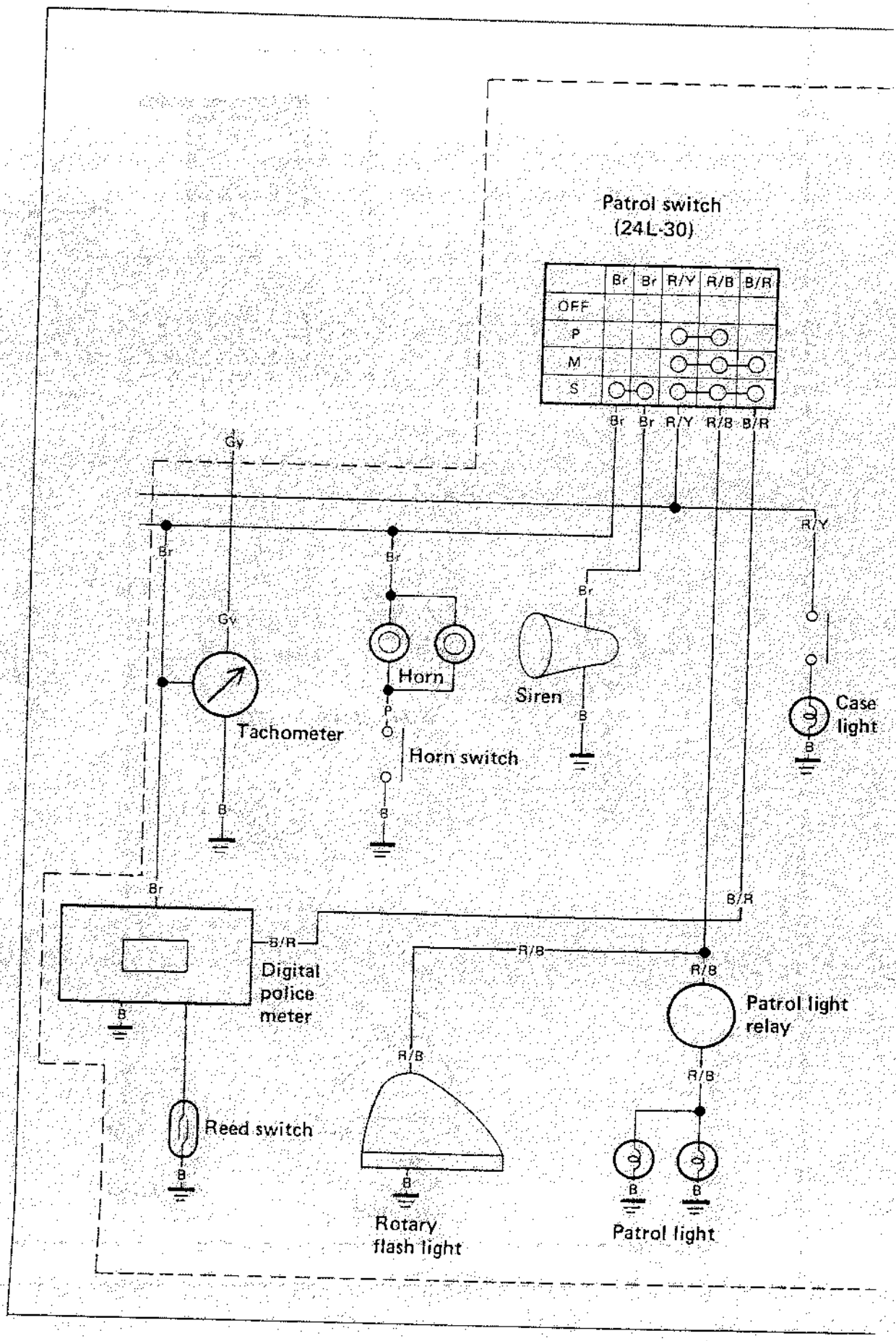
Circuit Diagram for Police Equipment (1)



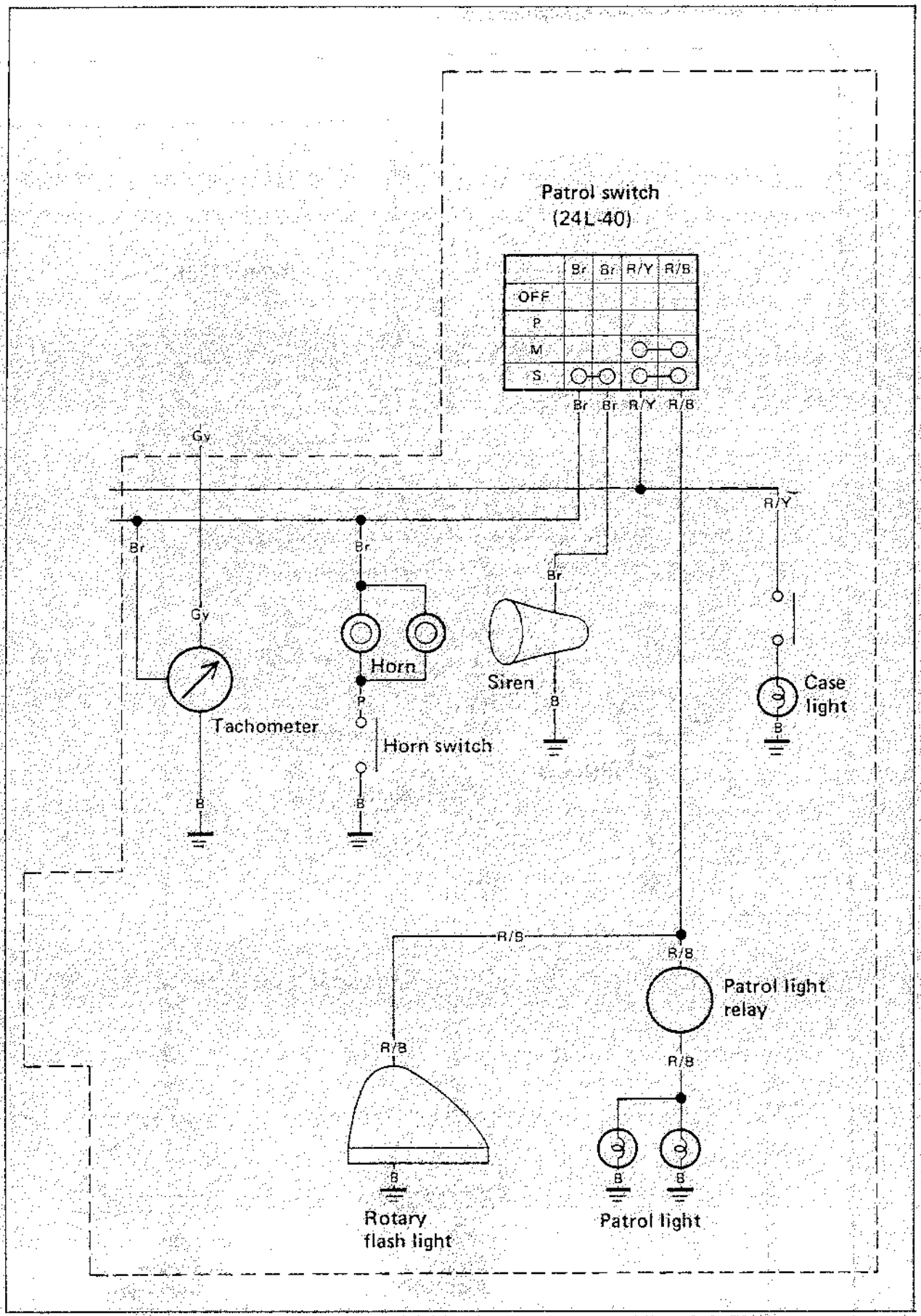
Circuit Diagram for Police Equipment (2)



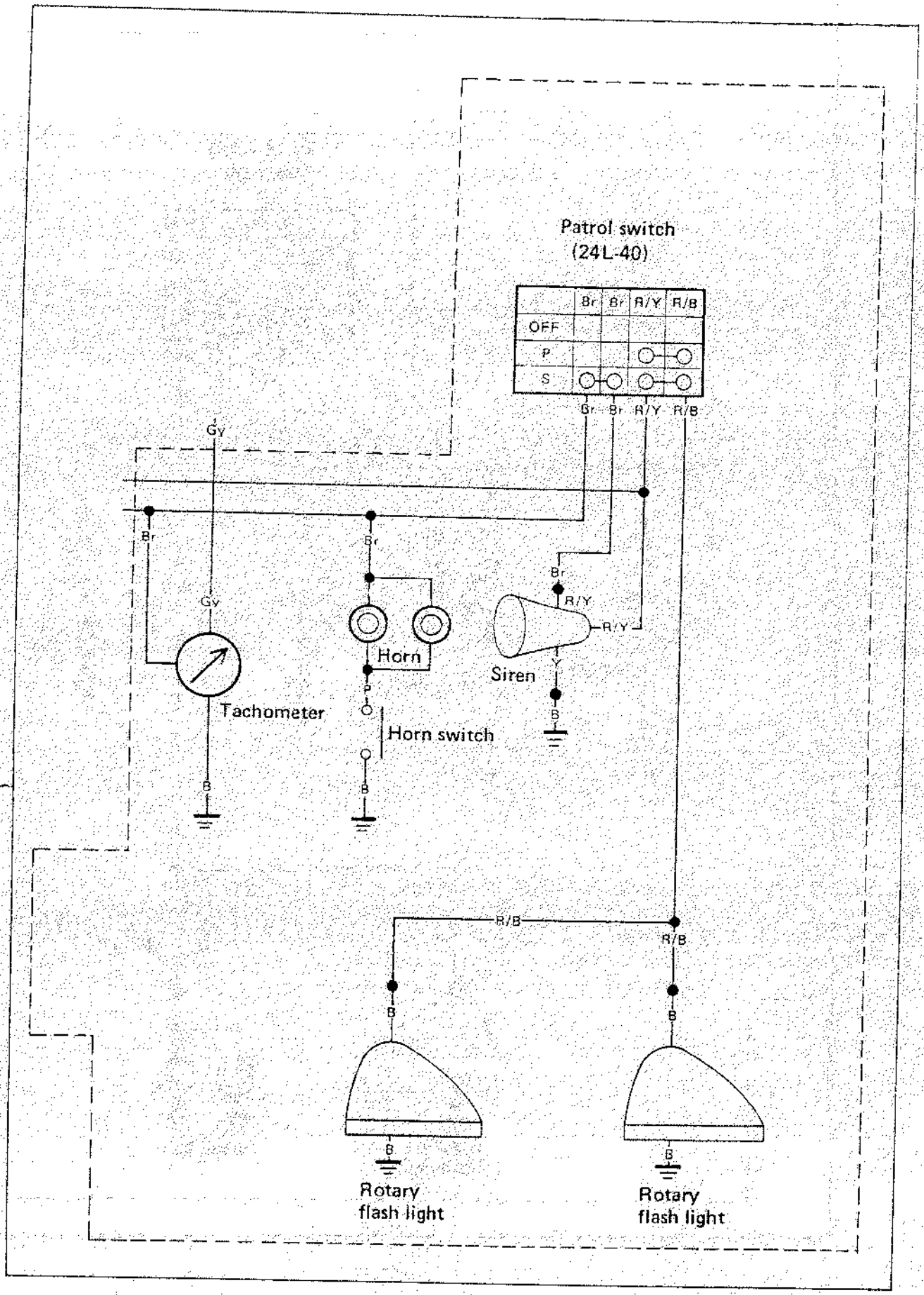
Circuit Diagram for Police Equipment (3)



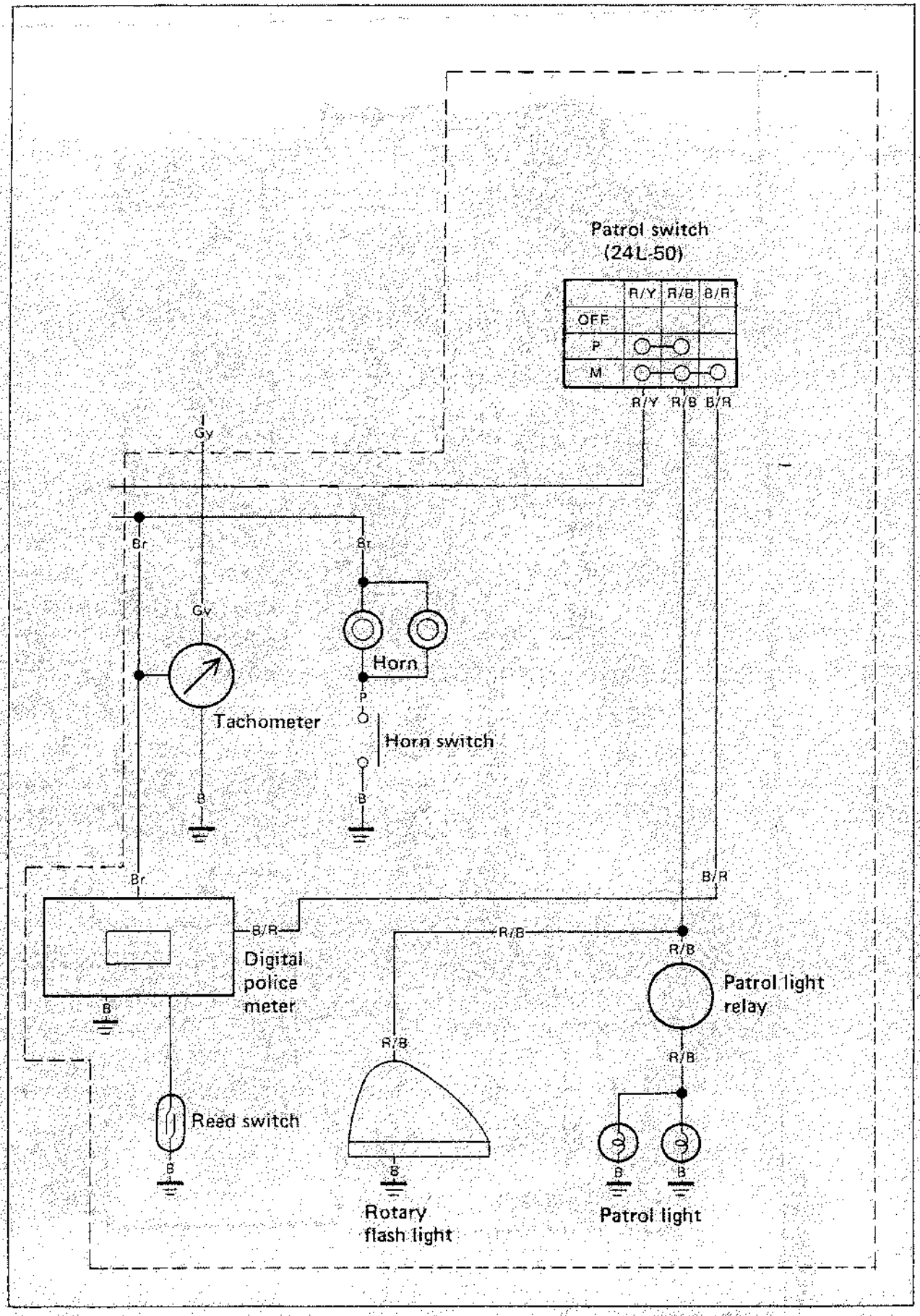
Circuit Diagram for Police Equipment (4)

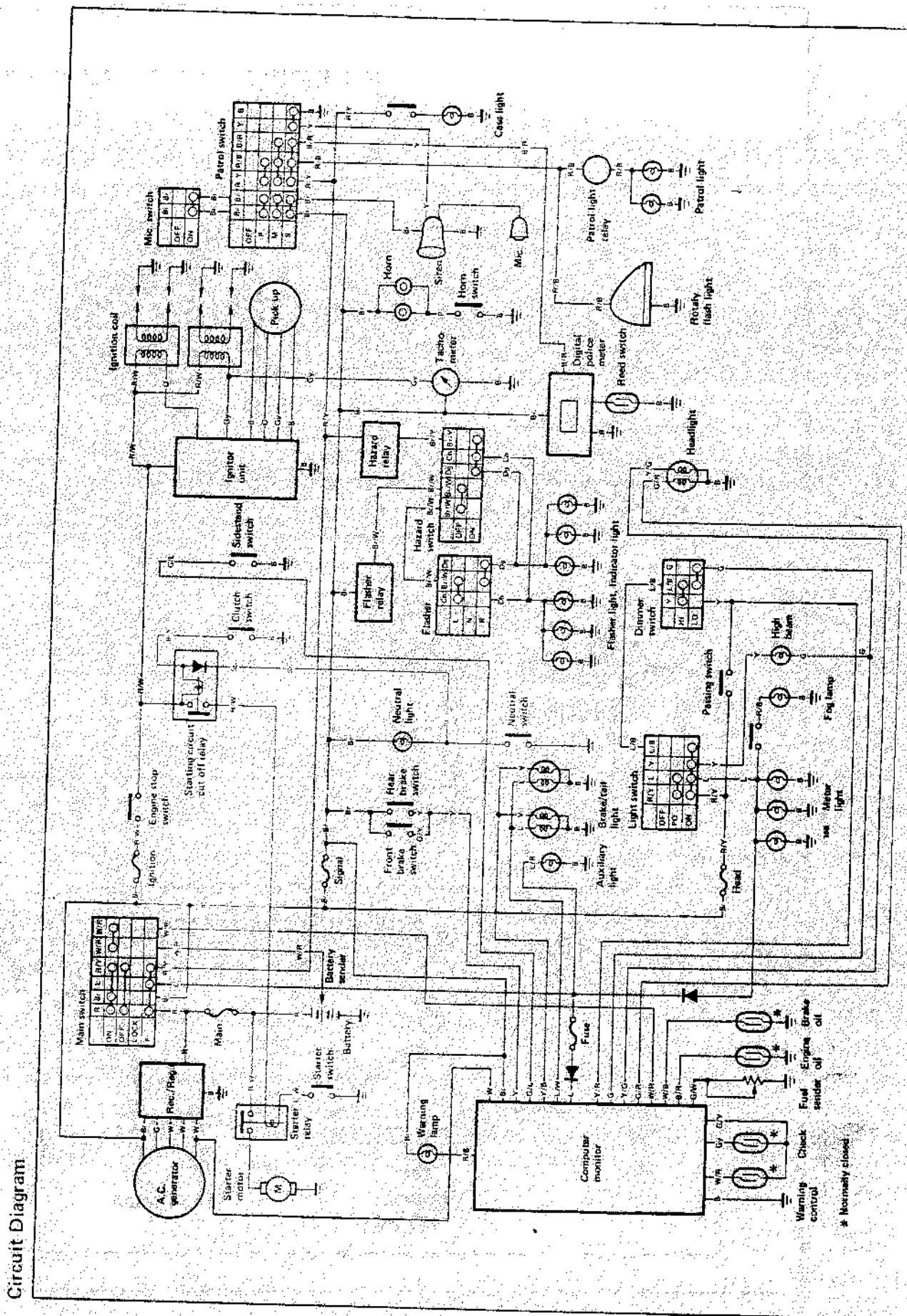


Circuit Diagram for Police Equipment (5)

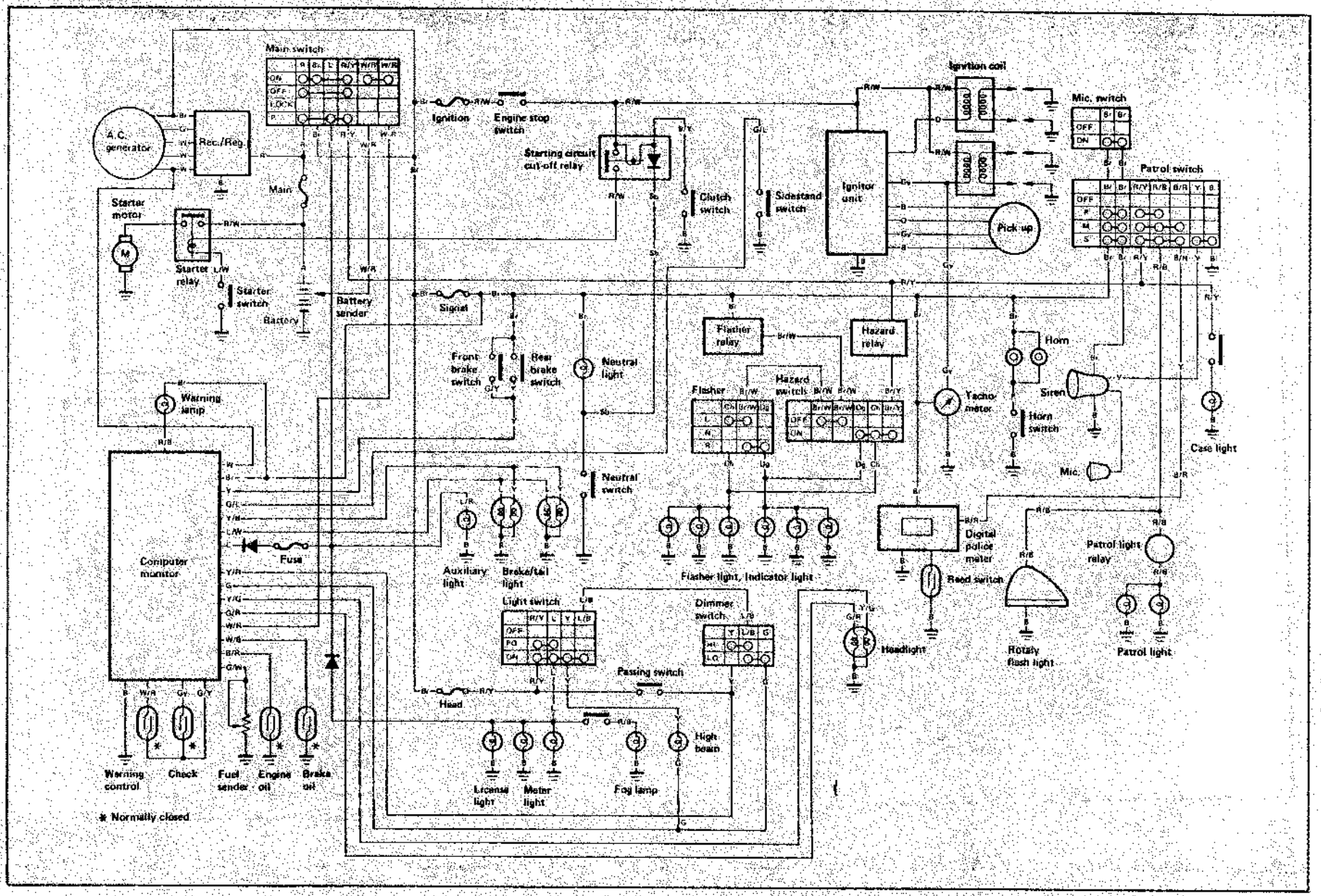


Circuit Diagram for Police Equipment (6)

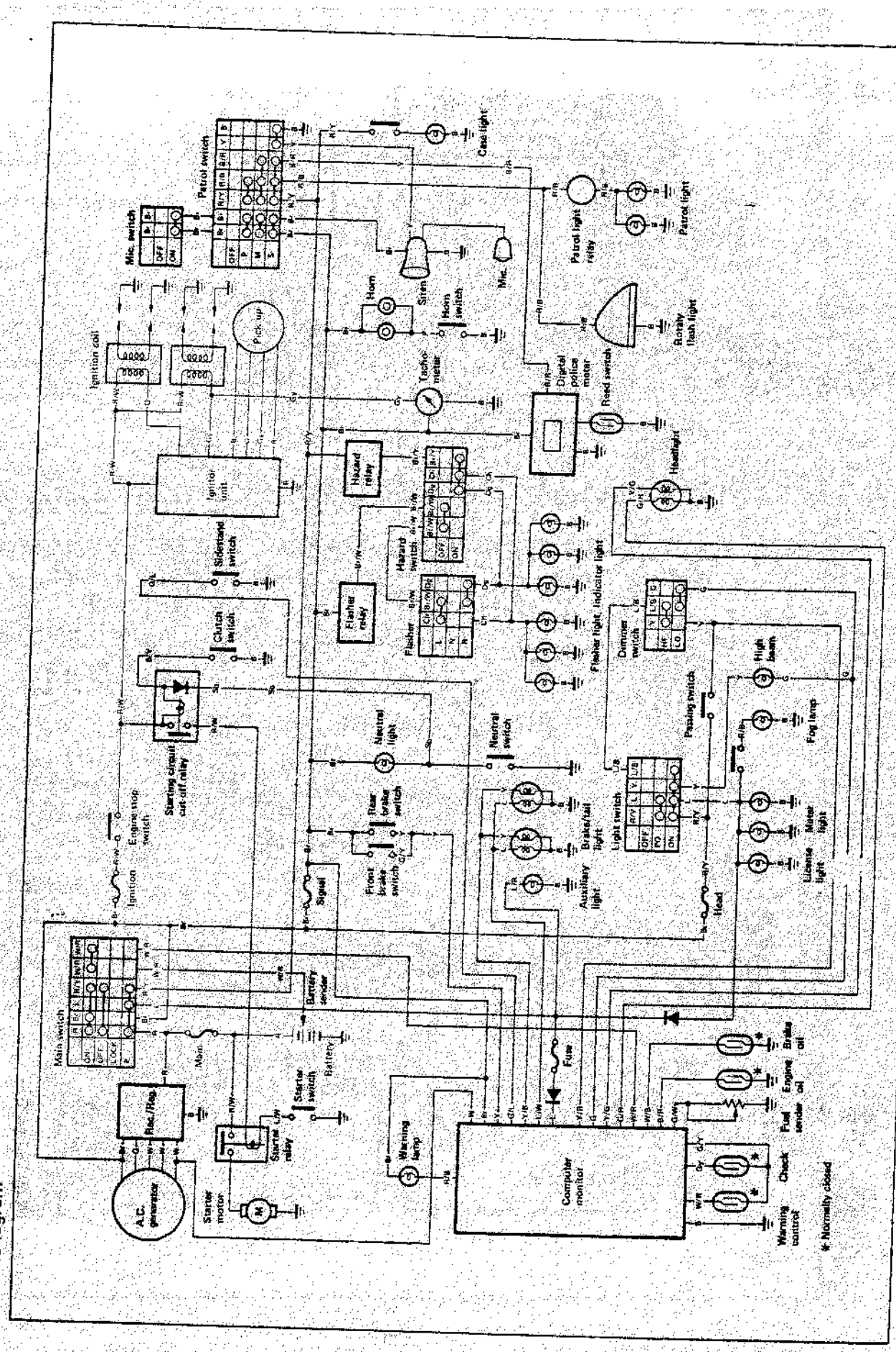



Circuit Diagram
Case light
Patrol switch
Mic switch
Patrol light
Patrol light relay
Horn
Siren
Mic
Horn switch
Rotary flash light
Pick up
Ignition coil
Tacho meter
Digital police meter
Reed switch
Ignitor unit
Hazard relay
Headlight
Sidestand switch
Hazard switch
Flasher relay
Flasher
Flasher light, indicator light
Dimmer switch
High beam
Clutch switch
Passing switch
Fog lamp
Starting circuit cut off relay
Neutral light
Neutral switch
Engine stop switch
Rear brake switch
Front brake switch
Brake/tail light
Light switch
Auxiliary light
Meter light
Ignition
Signal
Head
Battery sender
Main switch
Main
Battery
Fuse
Brake oil
Engine oil
Fuel sender
Rec./Reg.
Starter switch
Starter relay
Warning lamp
Computer monitor
Check
Warning control
A.C. generator
Starter motor
* Normally closed

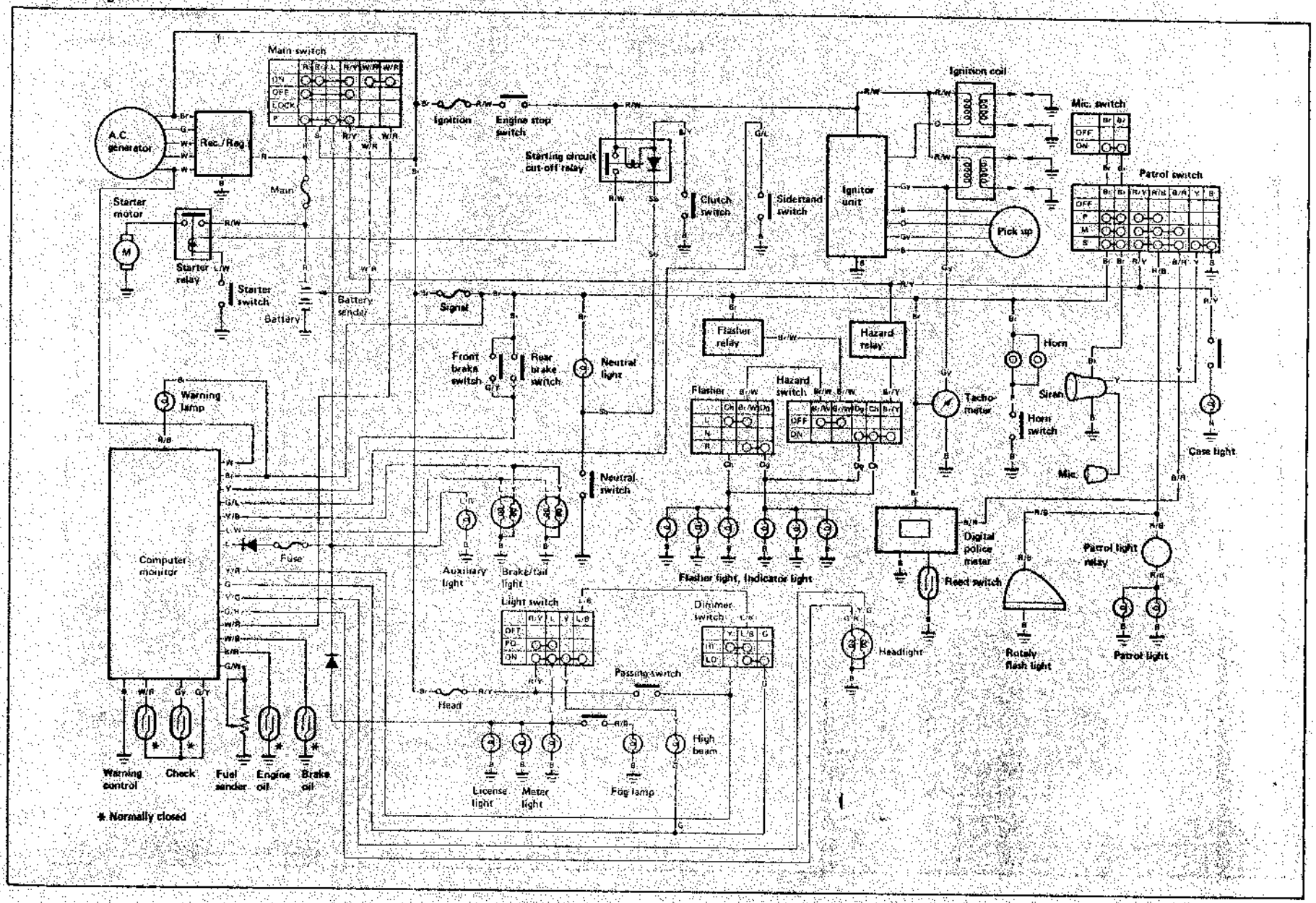
Circuit Diagram

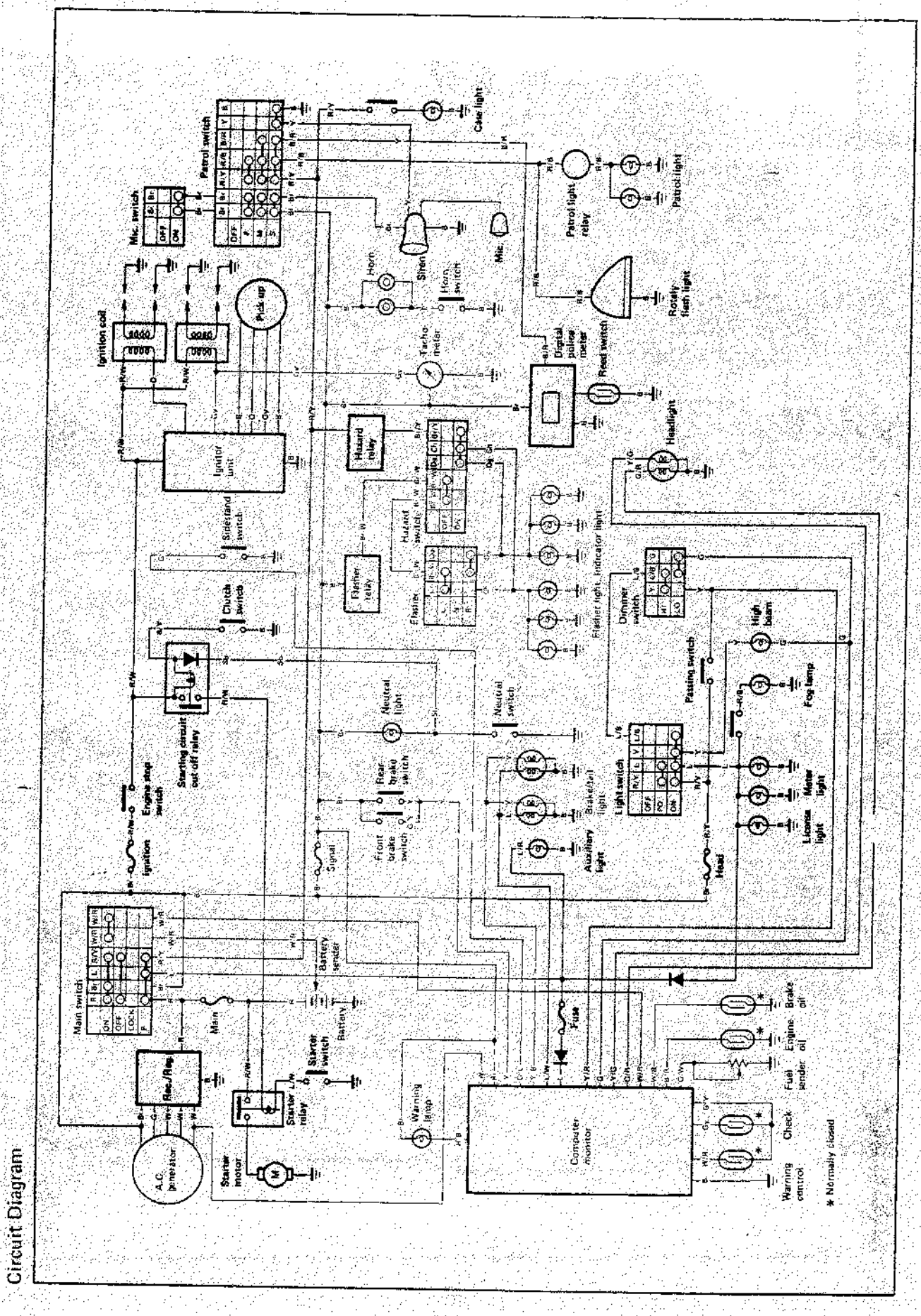


Circuit Diagram



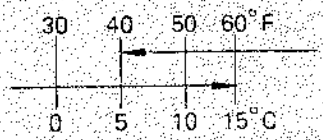
Circuit Diagram




Circuit Diagram
Case light
Patrol switch
Mic. switch
Patrol light
Patrol light relay
Patrol light
Horn
Siren
Horn switch
Mic.
Rotary flash light
Ignition coil
Pick up
Tacho meter
Digital pulse meter
Reed switch
Ignitor unit
Hazard relay
Headlight
Sidestand switch
Hazard switch
Flasher relay
Flasher light, indicator light
Dimmer switch
High beam
Clutch switch
Passing switch
Fog lamp
Starting circuit cut-off relay
Neutral light
Neutral switch
Engine stop switch
Rear brake switch
Brake/tail light
Light switch
Meter light
Ignition
Front brake switch
Signal
Auxiliary light
License light
Heat
Main switch
Battery sender
Main
Battery
Fuse
Brake oil
Engine oil
Rec./Reg.
Starter switch
Fuel sender
Starter relay
Warning lamp
Computer monitor
Check
A.C. generator
Starter motor
Warning control
* Normally closed

SPECIFICATIONS

I. GENERAL SPECIFICATIONS

Item \ Model	XJ650P	[XJ750P]
Model:		
Model Code Number	37G	[24L]
Frame Starting Number	37G-000101	[24L-000101]
Engine Starting Number	37G-000101	[24L-000101]
Dimensions:		
Overall Length	2,160 mm (85.0 in)	
Overall Width	725 mm (28.5 in)	
Overall Height	1,195 mm (47.0 in)	
	*1,495 mm (58.9 in)	*For Wind Screen
Seat Height	770 mm (30.3 in)	
Wheelbase	1,445 mm (56.9 in)	
Minimum Ground Clearance	140 mm (5.51 in)	
Weight:		
With Oil and Full Fuel Tank	265 kg (584 lb)	
Minimum Turning:	2,600 mm (102.4 in)	
Engine:		
Engine Type	Air cooled 4-stroke, DOHC	
Cylinder Arrangement	Forward inclined, parallel 4-cylinder	
Displacement	653 cm^3 (39.85 in^3)	[748 cm^3 (45.64 in^3)]
Bore x Stroke	63.0 x 52.4 mm (2.480 x 2.063 in)	[65.0 x 56.4 mm (2.56 x 2.22 in)]
Compression Ratio	9.2 : 1	
Compression Pressure	932 ~ 1,079 kPa (9.5 ~ 11 kg/cm^2, 135 ~ 156 psi)	
Starting System	Electric starter	
Lubrication System:	Pressure lubricated, Wet sump	
Engine Oil Type Grade		SAE 20W40 type SE motor oil SAE 10W30 type SE motor oil
Engine Oil Capacity:		
Periodic Oil Change	2.6 L (2.29 Imp qt, 2.75 US qt)	
Oil Filter Replacement	2.9 L (2.55 Imp qt, 3.06 US qt)	
Total Amount	3.6 L (3.17 Imp qt, 3.81 US qt)	
Middle/Final Gear Oil:		
Grade or Type	SAE 80 API "GL-4" Hypoid gear oil	
Final Gear Case Oil Amount	0.2 L (0.176 Imp qt, 0.211 US qt)	
Air Filter:	Dry type element	
Fuel:		
Type	Regular gasoline	
Tank Capacity	19.0 L (4.18 Imp gal, 5.02 US gal)	
Reserve Amount	3.6 L (0.79 Imp gal, 0.95 US gal)	

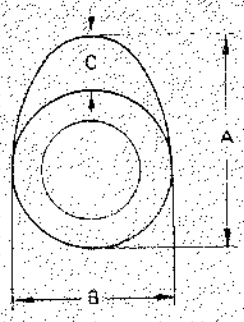
Item \ Model	XJ650P	[XJ750P]
Carburetor:		
Type	HSC32	
Manufacturer	HITACHI	
Spark Plug:		
Type	BP7ES, W22EP-U	
Manufacturer	(NGK) (ND)	
Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in)	
Clutch Type:	Wet, multiple disc	
Transmission:		
Primary Reduction System	Gear	
Primary Reduction Ratio	97/58 (1.672)	
Secondary Reduction System	Shaft drive	
Secondary Reduction:		
Transmission Output — Type/teeth (ratio)	Spur gear, 49/36 (1.361)	
Middle Gear Case — Type/teeth (ratio)	Bevel gear, 19/18 (1.055)	
Final Gear Case — Type/teeth (ratio)	Bevel gear, 32/11 (2.909)	
Transmission Type	Constant mesh, 5-speed	
Operation	Left foot operation	
Gear Ratio: 1st	35/16 (2.188)	
2nd	30/20 (1.500)	
3rd	30/26 (1.154)	
4th	28/30 (0.933)	
5th	26/32 (0.813)	
Chassis:		
Frame Type	Tubular steel, double cradle	
Caster Angle	28° 00'	
Trail	114 mm (4.49 in)	
Tire:		
Tire Type	With tube	
Tire Size (F)	3.25H19 4PR	
Tire Size (R)	120/90-18 65H	
Tire Pressure:	(Cold tire pressure)	
Front	196 kPa (2.0 kg/cm^2, 28 psi)	
Rear	225 kPa (2.3 kg/cm^2, 32 psi)	
Brake:		
Front Brake Type	Dual hydraulic disc	
Operation	Right hand operation	
Rear Brake Type	Drum brake	
Operation	Right foot operation	
Suspension:		
Front Suspension	Telescopic fork	
Rear Suspension	Swingarm	
Shock Absorber:		
Front Shock Absorber	Oil damper, Air & coil spring	
Rear Shock Absorber	Oil damper, Air & coil spring	
Wheel Travel:		
Front Wheel Travel	150 mm (5.91 in)	
Rear Wheel Travel	96 mm (3.78 in)	
Electrical:		
Ignition System	T.C.I. ignition (Full transistor ignition)	
Generator System	A.C. generator	
Battery Type or Model	YB14L-A2	
Battery Capacity	12V 14AH	

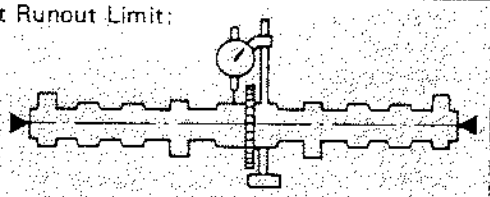
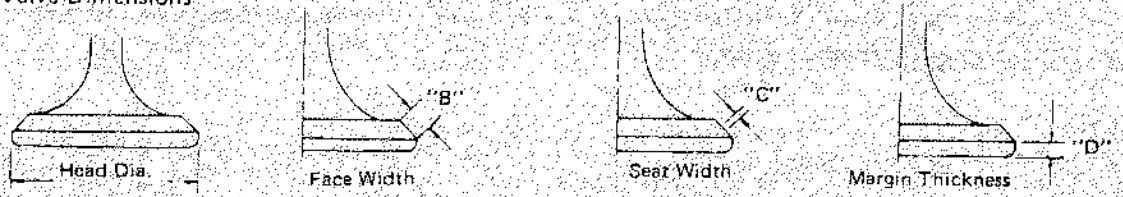
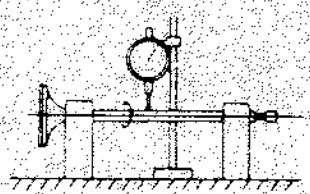
Item \ Model	XJ650P	[XJ750P]
Headlight Type:	Halogen quartz bulb	
Bulb Wattage x Pcs:		
Headlight	60W/55W x 1	
Turn Light	27W x 4	
Tail/Brake Light	8W/27W x 2	
Meter Light	3.4W x 2 (*3)	*For stop meter
Auxiliary Light	3.4W x 1	
License Light	8W x 1	
Fog Light	35W x 1	
Indicator Light Wattage x Pcs.:		
Neutral	3.4W x 1	
High Beam	3.4W x 1	
Speed Warning	3.4W x 1	
Turn	3.4W x 2	

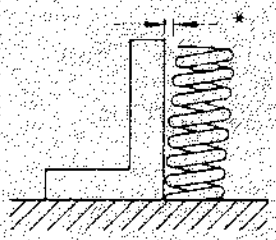
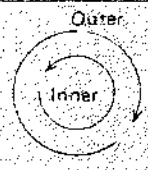
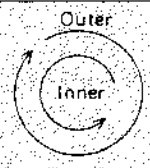
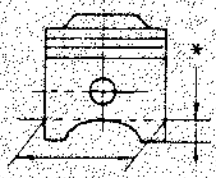
II. MAINTENANCE SPECIFICATIONS

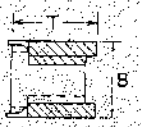
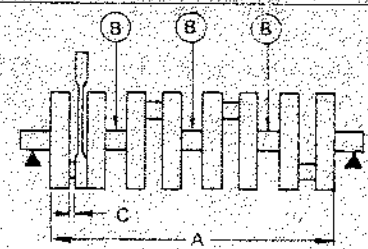
A. Engine

Item \ Model	XJ650P	[XJ750P]
Cylinder Head:		
Warp Limit	< 0.03 mm (0.0012 in) >	
	* Lines indicate straightedge measurement	
Cylinder:		
Material	Aluminum alloy with cast iron sleeve	
Bore Size	63.0 mm (2.480 in)	[65.0 mm (2.559 in)]
Taper Limit	< 0.05 mm (0.0020 in) >	
Out-of-round Limit	< 0.01 mm (0.0004 in) >	
Camshaft:		
Drive Method	Chain drive (Center)	
Cam Cap Inside Diameter	$25^{+0.021}_{-0}$ mm ($0.98^{+0.008}_{-0}$ in)	
Camshaft Outside Diameter	$25^{-0.020}_{-0.033}$ mm ($0.98^{-0.0008}_{-0.0013}$ in)	
Shaft-to-cap Clearance	0.20 ~ 0.054 mm (0.0008 ~ 0.0021 in)	
Cam Dimensions:		
Intake "A"	36.50 mm (1.437 in)	[36.80 mm (1.449 in)]
< Limit >	36.35 mm (1.431 in)	[36.65 mm (1.443 in)]
"B"	28.00 mm (1.102 in)	
< Limit >	27.85 mm (1.096 in)	
"C"	8.50 mm (0.335 in)	[8.80 mm (0.346 in)]
Exhaust "A"	35.80 mm (1.409 in)	
< Limit >	35.65 mm (1.404 in)	
"B"	28.00 mm (1.102 in)	
< Limit >	27.85 mm (1.096 in)	
"C"	7.80 mm (0.307 in)	



Item \ Model	XJ650P	[XJ750P]
Camshaft Runout Limit: 	< 0.06 mm (0.0024 in) >	
Cam Chain Type/Number of Links	BUSH-CHAIN/120	
Cam Chain Adjustment Method	Automatic	
Valve, Valve Seat, Valve Guide:		
Valve Clearance (Cold) IN.	0.11 ~ 0.15 mm (0.0043 ~ 0.0059 in)	
EX.	0.16 ~ 0.20 mm (0.0063 ~ 0.0079 in)	
Valve Dimensions 		
"A" Head Dia. IN.	33 ± 0.1 mm (1.30 ± 0.0039 in)	
EX.	28 ± 0.1 mm (1.10 ± 0.0039 in)	
"B" Face Width IN.	2.3 mm (0.091 in)	
EX.	2.3 mm (0.091 in)	
"C" Seat Limit Width IN.	1 ± 0.1 mm (0.0394 ± 0.039 in)	
EX.	1 ± 0.1 mm (0.0394 ± 0.039 in)	
"D" Margin Thickness Limit IN.	1.0 ~ 1.4 mm (0.039 ~ 0.055 in)	
EX.	0.8 ~ 1.2 mm (0.031 ~ 0.047 in)	
Stem Outside Diamerer IN.	$7\ ^{-0.010}_{-0.025}$ mm ($0.2756\ ^{-0.0004}_{-0.0010}$ in)	
EX.	$7\ ^{-0.010}_{-0.040}$ mm ($0.2756\ ^{-0.0010}_{-0.0016}$ in)	
Guide Inside Diameter IN.	$7\ ^{+0.012}_{-0}$ mm ($0.2756\ ^{+0.0005}_{-0}$ in)	
EX.	$7\ ^{+0.012}_{-0}$ mm ($0.2756\ ^{+0.0005}_{-0}$ in)	
Stem-to-guide Clearance IN.	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)	
EX.	0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in)	
Stem Runout Limit 	< 0.03 mm (0.0012 in) >	
Valve Seat Width Standard < Limit >	1.0 mm (0.039 in) < 2.0 mm (0.080 in) >	
Valve Spring:		
Free Length		
Inner Spring IN.	35.9 mm (1.413 in)	
EX.	35.9 mm (1.413 in)	
Outer Spring IN.	39.5 mm (1.555 in)	
EX.	39.5 mm (1.555 in)	

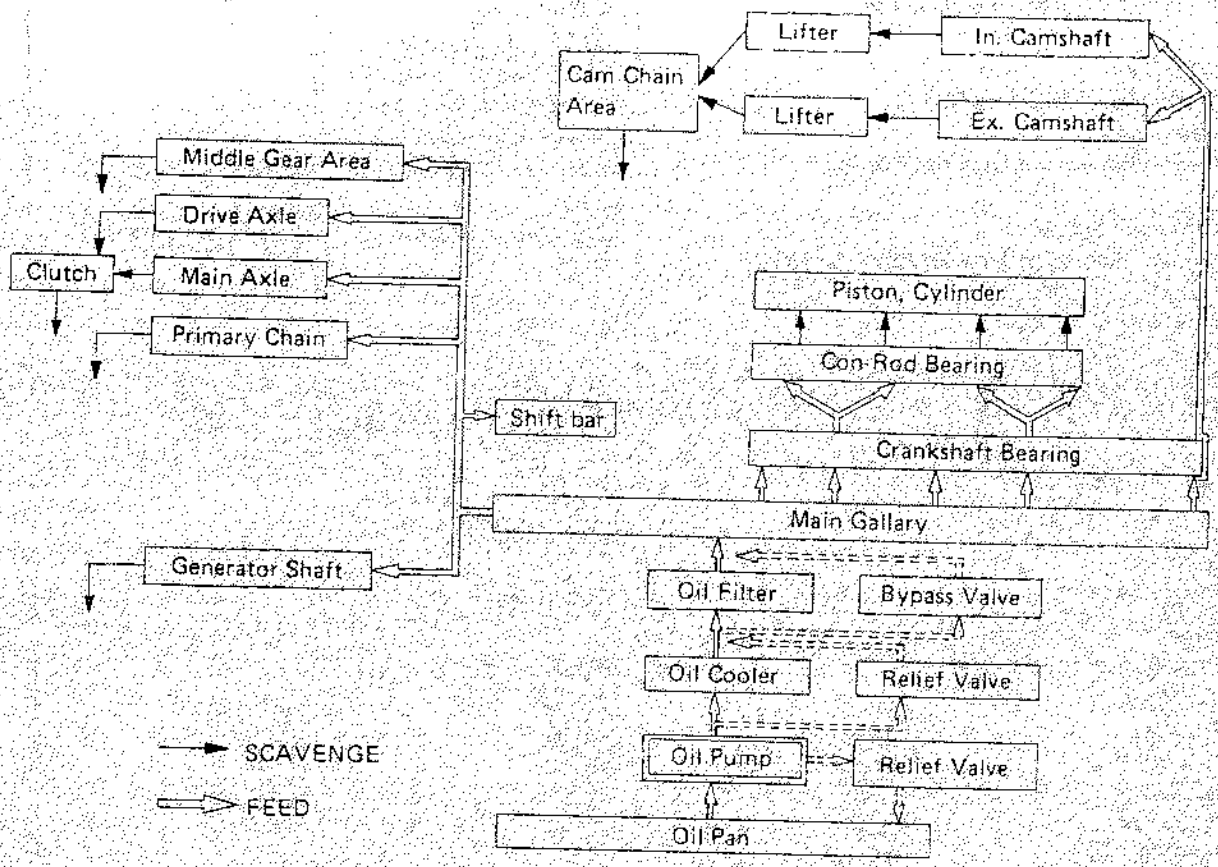
Item		Model XJ650P	[XJ750P]
Spring Rate			
Inner Spring	IN.	2.36 kg/mm (132 lb/in)	
	EX.	2.36 kg/mm (132 lb/in)	
Outer Spring	IN.	4.58 kg/mm (256 lb/in)	
	EX.	4.58 kg/mm (256 lb/in)	
Compressing Length (Valve Closed)			
Inner Spring	IN.	31.0 mm (1.220 in)	
	EX.	31.0 mm (1.220 in)	
Outer Spring	IN.	34.0 mm (1.339 in)	
	EX.	34.0 mm (1.339 in)	
Compressed Force (Valve Closed)			
Inner Spring	IN.	9.0 kg (20 lb)	
	EX.	9.0 kg (20 lb)	
Outer Spring	IN.	19.1 kg (42.1 lb)	
	EX.	19.1 kg (42.1 lb)	
Tilt Limit			
Inner Spring	IN. & EX.	2.5°, 1.8 mm (0.071 in)	
Outer Spring	IN. & EX.	2.5°, 1.8 mm (0.071 in)	
			
Direction of Winding (Top View)		Intake	Exhaust
			
Piston:			
Piston Size/ Measuring Point*		63.00 mm (2.480 in)/*7.5 mm (0.295 in)	
		[65.00 mm (2.559 in)/*7.5 mm (0.295 in)]	
		(From bottom line of piston skirt)	
Clearance between Piston & Cylinder		0.030 ~ 0.060 mm (0.0012 ~ 0.0020 in)	
< Limit >		< 0.1 mm (0.0039 in) >	
Oversize	1st	—	
	2nd	63.50 mm (2.500 in)	[65.50 mm (2.579 in)]
	3rd	—	
	4th	64.00 mm (2.520 in)	[66.00 mm (2.598 in)]
Piston Pin Hole Off-Set		0 mm (0 in)	[0.5mm(0.02in)/In-side]

Item \ Model	XJ650P	[XJ750P]
Piston Ring:		
Sectional Sketch		
 Top Ring	B = 1.2 $^{-0.01}_{-0.03}$ mm (0.047 $^{-0.0004}_{-0.0012}$ in) T = 2.6 ± 0.1 mm (0.102 ± 0.0004 in)	[T = 2.7 ± 0.1 mm (0.106 ± 0.0004 in)]
 2nd Ring	B = 1.5 $^{-0.01}_{-0.03}$ mm (0.059 $^{-0.0004}_{-0.0012}$ in)	[B = 1.2 $^{-0.01}_{-0.03}$ mm (0.047 $^{-0.0004}_{-0.0012}$)]
 Oil Ring	T = 2.8 ± 0.1 mm (0.110 ± 0.004 in) B = 2.5 mm (0.98 in) T = 2.8 ± 0.15 mm (0.110 ± 0.0059 in)	[T = 2.7 ± 0.1 mm (0.106 ± 0.0004 in)]
End Gap (Installed)		
Limit — Top Ring	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in) < 1.0 mm (0.039 in) >	
2nd Ring	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in) < 1.0 mm (0.039 in) >	
Oil Ring	0.3 ~ 0.9 mm (0.012 ~ 0.035 in) < 1.5 mm (0.0591 in) >	
Side Clearance		
Limit — Top Ring	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in) < 0.15 mm (0.0059 in) >	
2nd Ring	0.02 ~ 0.06 mm (0.0008 ~ 0.0024 in) < 0.15 mm (0.0059 in) >	
Oil Ring	—	
Plating or Coating		
Top Ring	Chrome, Ferox	
2nd Ring	—	
Oil Ring	Chrome, Ferox	
Connecting Rod:		
Connecting Rod Length	115.5 ± 0.05 mm (4.55 ± 0.002 in)	
Oil Clearance	0.016 ~ 0.040 mm (0.0006 ~ 0.0016 in)	
Color Code — Corresponding size	1. Blue 1.5 $^{+0.006}_{+0.002}$ mm (0.0591 $^{+0.00024}_{+0.00007}$ in) 2. Black 1.5 $^{+0.002}_{-0.002}$ mm (0.0591 $^{+0.00007}_{-0.00007}$ in) 3. Brown 1.5 $^{-0.002}_{-0.006}$ mm (0.0591 $^{-0.00007}_{-0.00024}$ in) 4. Green 1.5 $^{-0.006}_{-0.010}$ mm (0.0591 $^{-0.00024}_{-0.00039}$ in)	
Crankshaft:		
		
Crank Assembly Width "A"	340.8 ~ 342.0 mm (13.42 ~ 13.46 in)	
Runout Limit "B"	< 0.04 mm (0.0016 in) >	
Big End Side Clearance "C"	0.16 ~ 0.26 mm (0.0063 ~ 0.0102 in)	
Journal Oil Clearance	0.020 ~ 0.044 mm (0.00079 ~ 0.00173 in)	

Item \ Model	XJ650P	[XJ750P]
Clutch:		
Friction Plate Thickness/Quantity	3.0 ± 0.1 mm (0.12 ± 0.004 in)/8 pcs.	
Wear Limit	< 2.8 mm (0.11 in) >	
Clutch Plate Thickness/Quantity	1.6 mm (0.06 in)/ 7pcs.	
Warp Limit	< 0.05 mm (0.002 in) >	
Clutch Spring Free Length/Quantity	40.1 mm (1.58 in)/ 5 pcs.	[41.2 mm (1.62 in)/ 5 pcs.]
Minimum Length	39.1 mm (1.539 in)	[40.2 mm (1.58 in)]
Primary Reduction Gear Backlash Tolerance	116	
Primary Drive Gear Backlash Number	87 ~ 93	
Primary Driven Gear Backlash Number	25 ~ 31	
Clutch Release Method	Rack & Pinion, Outer pull	
Transmission:		
Main Axle Run-out Limit	< 0.08 mm (0.0031 in) >	
Drive Axle Run-out Limit	< 0.08 mm (0.0031 in) >	
Shifter:		
Shifter Type	Cam drum	—
Carburetor:		
Type/Manufacturer/Quantity	HSC32/HITACHI/4 pcs.	
I.D. Mark	37G 00	[5N1 00]
Main Jet (M.J.)	#110	[#118]
Main Air Jet (M.A.J.)	#55	[#80]
Jet Needle (J.N.)	Y-11	[Y-14]
Needle Jet (N.J.)	φ 3.2	
Throttle Valve (Th. V.)	13°	
Pilot Jet (P.J.)	#45	[#43]
Pilot Air Jet (P.A.J.)	#195	
Pilot Screw (turns out) (P.S.)	2 and 1/2	
Pilot Outlet Size (P.O.)	φ 0.9	
Starter Jet (G.S.)	#40	[#43]
Valve Seat Size (V.S.)	φ 2.0	
Fuel Level (F.L.)	3.0 ± 1 mm (0.12 ± 0.04 in)	
Float Height (F.H.)	17.5 ± 0.5 mm (0.7 ± 0.02 in)	
Engine Idling Speed	1,050 ± 50 r/min	
Vacuum Pressure at Idling Speed	24 ± 1.3 kPa (180 ± 10 mmHg, 7.1 ± 0.4 inHg)	
Vacuum Synchronous Difference	Below 1.3 kPa (10 mmHg, 0.4 inHg)	
Lubrication System:		
Oil Filter Type	Paper filter	
Oil Pump Type	Trochoid pump	
Tip Clearance	0.03 ~ 0.09 mm (0.001 ~ 0.004 in)	
Side Clearance	0.03 ~ 0.08 mm (0.001 ~ 0.003 in)	
Bypath Valve Setting Pressure	98 ± 20 kPa (1.0 ± 0.2 kg/cm, 14.2 ± 2.8 lb/in)	
Relief Valve Operating Pressure	490 ± 60 kPa (5.0 ± 0.6 kg/cm, 71.1 ± 8.5 lb/in)	

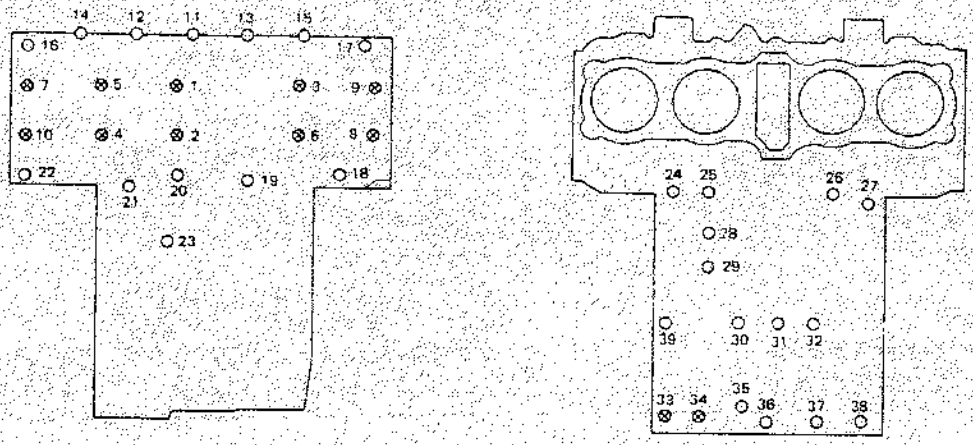
Item	Model	XJ650P	[XJ750P]

Lubrication Diagram



Middle Gear Backlash:	0.1 ~ 0.2 mm (0.0039 ~ 0.0079 in)
Final Gear Backlash:	0.1 ~ 0.2 mm (0.0039 ~ 0.0079 in)

Crankcase Tightening Sequence:



Tightening torque:
○ ..... 8 mm bolt: 24 Nm (2.4 m·kg, 17.5 ft·lb)
○ ..... 6 mm bolt: 12 Nm (1.2 m·kg, 8.7 ft·lb)

Tightening Torque

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
ENGINE:							
Cylinder head	Nut	M10 P1.25	12	32	3.2	23.1	Apply oil.
Cylinder head cover	Bolt	M6 P1.0	20	10	1.0	7.2	
Spark plug	–		4	20	2.0	14.5	
Cylinder	Nut	M8 P1.25	2	20	2.0	14.5	Cam chain case Front & Rear
Cam shaft cap	Bolt	M6 P1.0	20	10	1.0	7.2	Tighten in 3-stages.
Cam sprocket	Bolt	M7 P1.0	4	20	2.0	14.5	
Cam chain tensioner adjustment lock nut	Nut	M8 P1.25	1	9	0.9	6.5	
Cam chain tensioner adjustment lock bolt	Bolt	M6 P1.0	1	6	0.6	4.3	
Connecting rod	Nut	M7 P0.75	8	25	2.5	18.1	
Generator (rotor)	Bolt	M10 P1.25	1	55	5.5	39.8	
Drain plug	Bolt	M14 P1.5	1	43	4.3	31.0	Crankcase drain
		M8 P1.25	1	24	2.4	17.5	
Oil filter	Bolt	M20 P1.5	1	15	1.5	11.0	
Pump cover	Screw	M6 P1.0		7	0.7	5.1	
Strainer cover	Bolt	M6 P1.0	13	10	1.0	7.2	
Crankcase	Flange Bolt	M8 P1.25	12	24	2.4	17.5	
		M6 P1.0	27	12	1.2	8.7	
Clutch boss	Nut	M20 P1.0	2	72	7.2	52.0	
Clutch spring screw	Bolt	M6 P1.0	5	10	1.0	7.2	
Change Pedal	Bolt	M6 P1.0	1	10	1.0	7.2	
Neutral switch	–	M10 P1.25	1	20	2.0	14.5	
Exhaust pipe	Nut	M6 P1.0	8	10	1.0	7.2	
SHAFT DRIVE:							
Middle Gear							
Drive Shaft	Nut	M34 P1.5	1	110	11	80.2	Stake.
Mount cover	Screw M	M8 P1.25	4	25	2.5	18.1	Stake.
Driven shaft	Nut	M14 P1.5	1	120	12	87.0	Use Loctite® Stake
Bearing cap	Flange Bolt	M8 P1.25	4	25	2.5	18.1	
Final Gear							
Drive shaft	Nut	M14 P1.5	1	110	11	80.0	
Bearing housing	Flange Bolt	M10 P1.25	2	23	2.3	16.6	
Bearing housing	Nut	M8 P1.25	6	23	2.3	16.6	
Oil mount screw	Plug	M14 P1.5	1	23	2.3	16.6	
Oil drain screw	Plug	M14 P1.5	1	23	2.3	16.6	
Bearing retainer	–	M65 P1.5	1	110	11	80.0	Left hand screw

B. Chassis

Item \ Model	XJ650P [XJ750P]
Steering System:	
Steering Bearing Type	Ball Bearing
No./Size of Steel Balls — Upper	19 pcs/1/4 in
— Lower	19 pcs/1/4 in
Lock-to-lock Angle	38.5°
Front Suspension:	
Front Fork Travel	150 mm (5.9 in)
Fork Spring Free Length	540.5 mm (21.28 in)
Spring Rate/Stroke	K_1 = 8.26 N/mm (0.842 kg/mm, 47.1 lb/in)/ 0 ~ 100 mm (0 ~ 5.91 in)
	K_2 = 11.4 N/mm (1.164 kg/mm, 65.2 lb/in)/ 100 ~ 150 mm (3.94 ~ 5.91 in)
Optional Spring	No.
Oil Capacity	267 cm^3 (9.40 Imp oz, 9.03 US oz)
or Oil Level	171 mm (6.73 in) (From top of inner tube fully compressed without spring.)
Oil Grade	Yamaha fork oil (10) wt or equivalent
Enclosed Air Pressure	39.2 kPa (0.4 kg/cm^2, 5.69 psi)
< Limit >	118 kPa (1.2 kg/cm^2, 17.1 psi)
Rear Suspension:	
Shock Absorber Travel	80 mm (3.15 in)
Spring Free Length	227.8 mm (8.97 in)
Spring Rate/stroke	K_1 = 17.7 N/mm (1.8 kg/mm, 100.8 lb/in)/ 0 ~ 55 mm (0 ~ 2.17 in)
	K_2 = 21.6 N/mm (2.2 kg/mm, 123.2 lb/in)/ 55 ~ 80 mm (2.17 ~ 3.15 in)
Optional Spring	No.
Rear Arm:	
Swing Arm Free Play Limit — End	0 mm (0 in)
— Side	0 mm (0 in)
Wheel:	
Front Wheel Type	Cast Wheel
Rear Wheel Type	Cast Wheel
Front Rim Size/Material	MT1.85 x 19/Aluminum
Rear Rim Size/Material	MT2.15 x 18/Aluminum
Rim Runout Limit — Vertical	< 1.0 mm (0.04 in) >
— Lateral	< 0.5 mm (0.02 in) >
Front Disc Brake:	
Type	Dual disc
Outside Dia. x Thickness	267 x 5 mm (10.5 x 0.2 in)

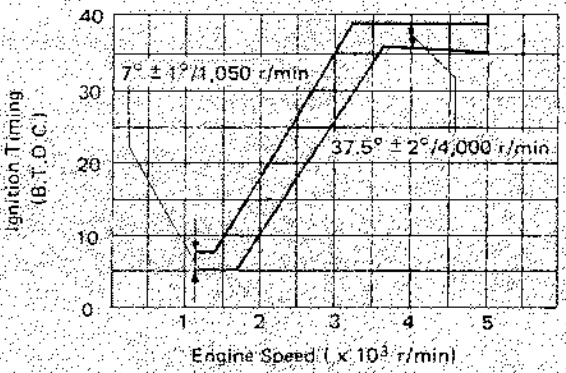
Item \ Model	XJ650P	[XJ750P]
Pad Thickness < Limit >*	6.0 mm (0.24 in) < 1.5 mm (0.06 in) >	
Master Cylinder Inside Dia.	15.87 mm (0.62 in)	
Caliper Cylinder Inside Dia.	38.18 mm (1.50 in)	
Brake Fluid Type	DOT #3	
Rear Drum Brake:		
Type	Leading trailing	
Drum Inside Dia.	200 mm (7.87 in)	
< Limit >	< 201 mm (7.91 in) >	
Lining Tickness	4 mm (0.16 in)	
< Limit >	< 2 mm(0.08 in) >	
Shoe Spring Free Length	68 mm (2.68 in)	
Brake Lever & Brake Pedal:		
Brake Lever Free Play	10 ~ 20 mm (0.39 ~ 0.79 in)	
Brake Pedal Free Play	20 ~ 30 mm (0.8 ~ 1.2 in)	
Brake Pedal Position	20 mm (0.8 in) (Vertical height below footrest top.)	
Clutch Lever Free Play:	2 ~ 3 mm (0.08 ~ 0.12 in)	

Tightening Torque

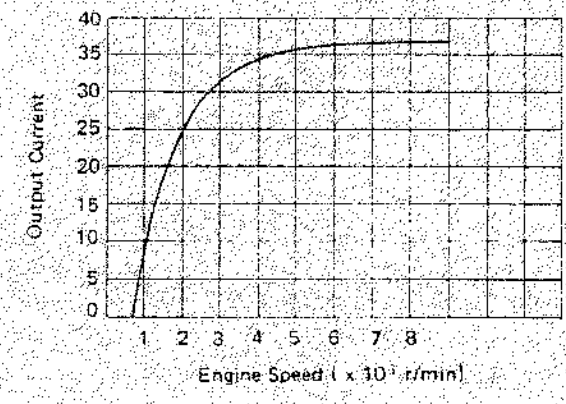
Part to be tightened	Part name	Thread size	Q'ty	Tightening torque			Remarks
				Nm	m·kg	ft·lb	
CHASSIS:							
Engine – Front, upper	Nut	M10 P1.25	1	42	4.2	30	
Mounting – Front, under	Bolt	M10 P1.25	2	42	4.2	30	
Bolt – Rear	Nut	M12 P1.25	1	70	7.0	50	
Engine Mounting Stay – Front	Bolt	M8 P1.25	4	20	2.0	14	
Handle crown & Steering shaft	Bolt Bolt	M14 P1.25 M8 P1.25	1 1	54 20	6.4 2.0	39 14	
Handle crown & Inner tube	Nut cap	M8 P1.25	1	20	2.0	14	
Handle crown & Handle holder	Bolt	M8 P1.25	2	20	2.0	14	
Front fork							
Under bracket & Inner tube	Bolt	M8 P1.25	4	20	2.0	14	
Front wheel shaft	Nut castle	M14 P1.5	1	107	10.7	77	
Front wheel & Axle pinch bolt	Nut self	M14 P125	2	20	2.0	14	
Pivot shaft	Bolt	M22 P1.5	1	5.5	0.55	4	Taper roller bearing
Rear wheel shaft	Nut castle	M14 P1.5	1	107	10.7	77	
Rear shock absorber (Upper)	Nut cap	M10 P1.25	2	30	3.0	22	
Rear shock absorber (Lower)	L Nut cap R Bolt	M10 P1.25	2	30	3.0	22	
Footrest	Nut	M10 P1.25	2	42	4.2	30	
Tension bar & Brake plate	Bolt	M8 P1.25	1	20	2.0	14	
Tension bar & Rear arm	Bolt	M8 P1.25	1	20	2.0	14	
Camshaft lever & Camshaft	Bolt	M6 P1.0	1	9	0.9	6.5	
Disc brake section							
Brake disc & Hub (Front)	Bolt	M8 P1.25	12	20	2.0	14	Lock washer
Master cylinder & Brake hose (Front)	Bolt union	M10 P1.25	1	26	2.6	19	
Brake hose & Joint	Bolt union	M10 P1.25	1	26	2.6	19	
Caliper & Brake hose	Bolt union	M10 P1.25	1	26	2.6	19	
Caliper & Front fork (Front)		M8 P1.25	1	26	2.6	19	
Caliper bleed screw (Front)		M8 P1.26	1	6	0.6	4.3	
Front fender	Bolt	M8 P1.25	4	10	1.0	7.2	
Master cylinder cap	Screw	M5 P0.8	2	1.8	0.18	1.3	
Pivot shaft	Bolt	M22 P1.5	1	100	10.0	72	Lock washer
Final gear & Rear arm	Nut	M10 P1.25	4	42	4.2	30	
Cross Joint	Hexagon bolt with washer	M8 P1.25	4	44	4.4	32	
Muffler bracket & Frame	Bolt	M10 P1.25	3	43	4.3	31	
Rear fender	Bolt	M10 P1.25	2	32	3.2	23	
Muffler bracket & Muffler	Bolt	M10 P1.25	2	25	2.5	18	
Master cylinder & Master cylinder bracket	Bolt	M6 P1.0	2	9	0.9	6.5	

C. Electrical

Item \ Model	XJ650P [XJ750P]
Voltage:	12V
Ignition System:	
Ignition Timing (B.T.D.C.)	7 ± 1° at 1,050 r/min
Advanced Timing (B.T.D.C.)	37.5 ± 2° at 4,000 r/min



Advancer Type	Electrical
Pick up Coil Resistance (Color)	650Ω ± 20% at 20°C (68°F) (O – B)/(Gy – Br)
T.C.I. Unit Model/Manufacturer	5G2-10/HITACHI
Ignition Coil Model/Manufacturer	4H7-61/HITACHI
Minimum Spark Gap	6 mm (0.24 in) or more at 500 r/min (19 KV/100 r/min at 6V, 16KV/9,500 r/min at 14V)
Primary Winding Resistance	2.5Ω ± 10% at 20°C (68°F)
Secondary Winding Resistance	11 kΩ ± 20% at 20°C (68°F)
Charging System:	
Type	A.C. Generator
Model/Manufacturer	22N-10/HITACHI
Nominal Output	14V 26A at 5,000 r/min



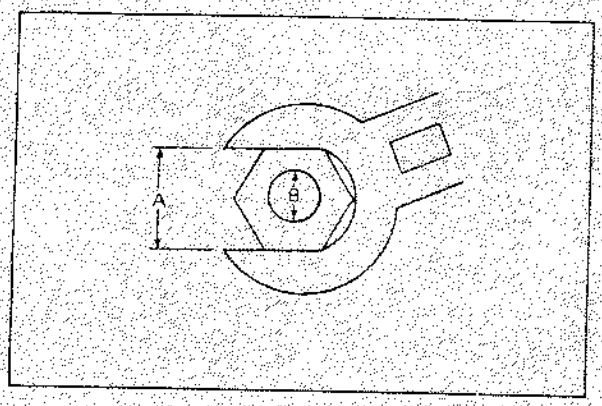
Field (Inner) Coil Resistance (Color)	4.9Ω ± 10% at 20°C (68°F) (G – Br)
Armature (Outer) coil Resistance (Color)	1.8Ω ± 10% at 20°C (68°F) (W – W)
Brush Ouverall Length	17 mm (0.67 in)
– Wear Limit	10 mm (0.39 in)
– Spring Pressure	360 g (12.7 oz)
Voltage Regulator: – Type	Semi Conductor, Field Control Type
– Model/Manufacturer	4H7-50/TOSHIBA
– No load Regulated Voltage	14 ~ 15V

Item \ Model	XJ650P [XJ750P]
Rectifier:	
– Model/Manufacturer	4H7-50/TOSHIBA
– Capacity	15A
– Withstand Voltage	300V
Battery:	
Capacity	12V, 14AH
Specific Gravity	1.280
Electric Starter System	Constant mesh type
Starter Motor – Model/Manufacturer	4K0-50/ND
– Output	0.6 kw
Armature Coil Resistance	0.014Ω ± 6% at 20°C (68°F)
Brush Overall Length	12 mm (0.47 in)
< Limit >	< 8.5 mm (0.33 in) >
– Spring Pressure	800 ± 150 g (28.22 ± 5.29 oz)
Commutator Dia.	28 mm (1.1 in)
< Wear Limit >	< 27 mm (1.06 in) >
Mica Undercut	0.6 mm (0.024 in)
Starter Switch Model/Manufacturer	3H5-00/HONDA LOCK
Amperage Rating	150A
Horn:	
Type	Plane type
Quantity	2 pcs.
Model/Manufacturer	2H9-20, 2H9-30/NIKKO
Maximum Amperage	2.5A
Flasher Relay:	
Type	Condenser type
Model/Manufacturer	4G0-20/NIPPON DENSO
Self Cancelling Device	No
Flasher Frequency	85 ± 10 cycle/min.
Wattage	27W x 2 + 3.4W
Hazard Flasher Relay:	
Type	Heat ribbon type
Model/Manufacturer	3H5-00/MITSUBA
Flasher Frequency	85 ± 10 cycle/min.
Wattage	27W x 4 + 3.4W x 2
Oil Level Switch:	
Model/Manufacturer	5G2-00/NIPPON DENSO
Fuel Gauge:	
Model/Manufacturer	5G2-01/NIPPON SEIKI
Sender Unit Resistance – Full	24 ± 10Ω
– Empty	315 ± 15Ω
Starting Circuit Cut Off Relay:	Yes
Model/Manufacturer	12R-00/OMRON
Coil Winding Resistance	100Ω ± 10% at 20°C (68°F)
Circuit Breaker:	
Type	Fuse
Amperage for Individual Circuit	
Main	30A/1 pc.
Headlight	15A/1 pc.
Signal	10A/1 pc.
Ignition	10A/1 pc.
Tail	5A/1 pc.

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.

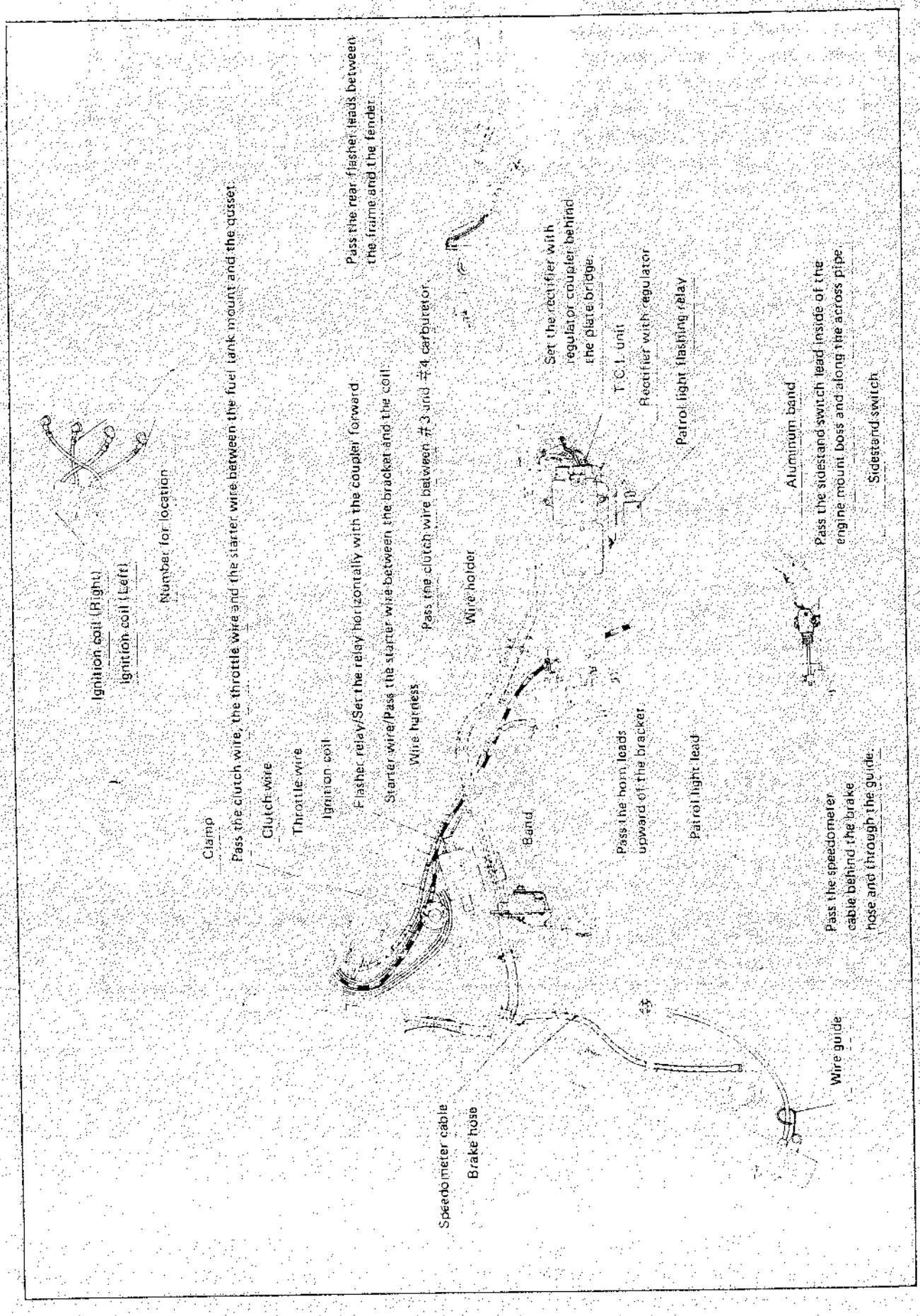
A (Nut)	B (Bolt)	General torque specifications		
		Nm	m·kg	ft·lb
10 mm	6 mm	6	0.6	4.3
12 mm	8 mm	15	1.5	11
14 mm	10 mm	30	3.0	22
17 mm	12 mm	55	5.5	40
19 mm	14 mm	85	8.5	51
22 mm	16 mm	130	13.0	94



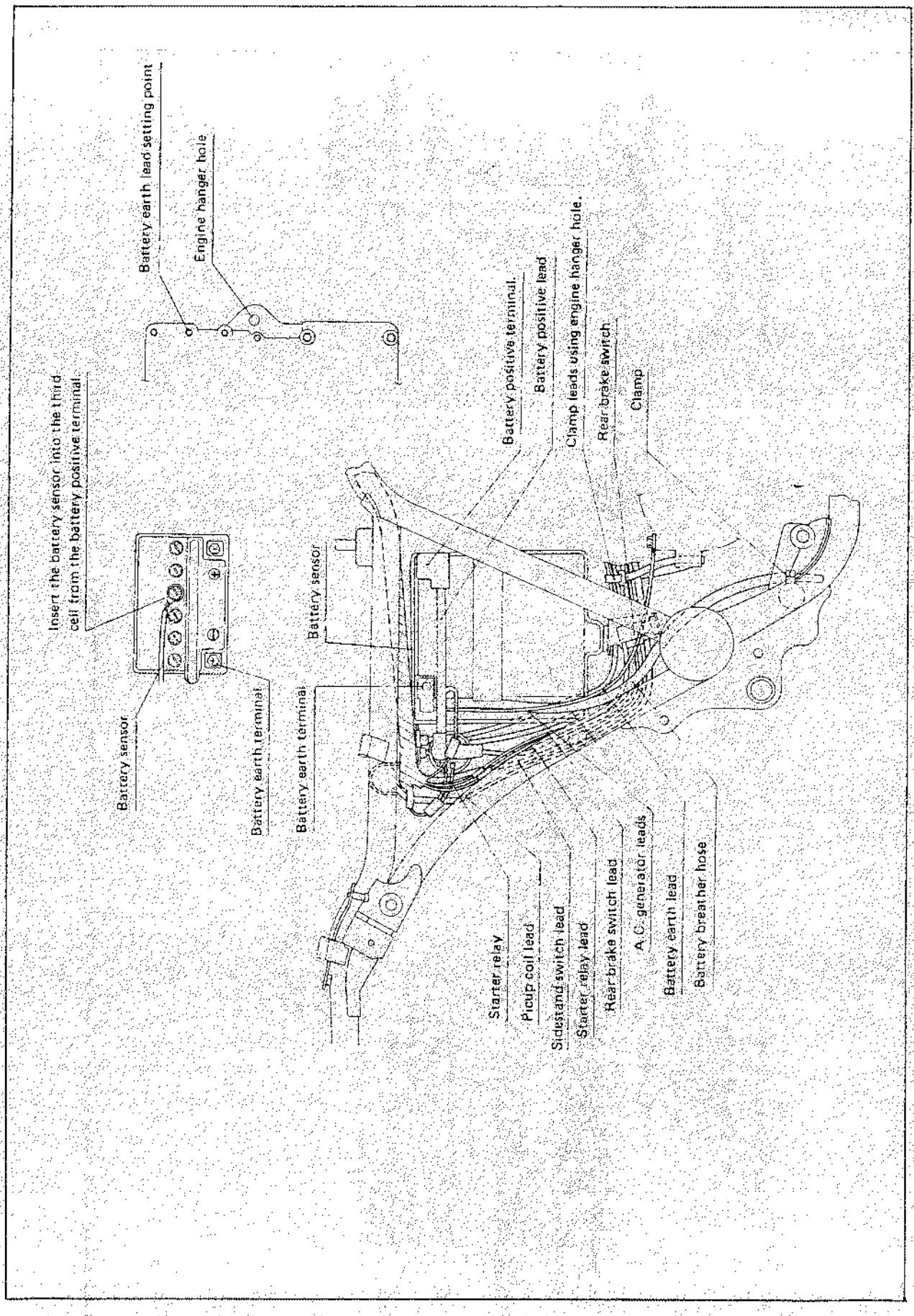
DEFINITION OF UNITS

Unit	Read	Definition	Measure
mm	millimeter	10^{-3} meter	Length
cm	centimeter	10^{-2} meter	Length
kg	kilogram	10^{3} gram	Weight
N	Newton	1 kg x m/sec^2	Force
Nm	Newton meter	N x m	Torque
m·kg	Meter kilogram	m x kg	Torque
Pa	Paskal	N/m^2	Pressure
N/mm	Newton per millimeter	N/mm	Spring rate
L	Liter	—	Volume or Capacity
cm^3	Cubic centimeter		
r/min	Rotation per minute	—	Engine speed

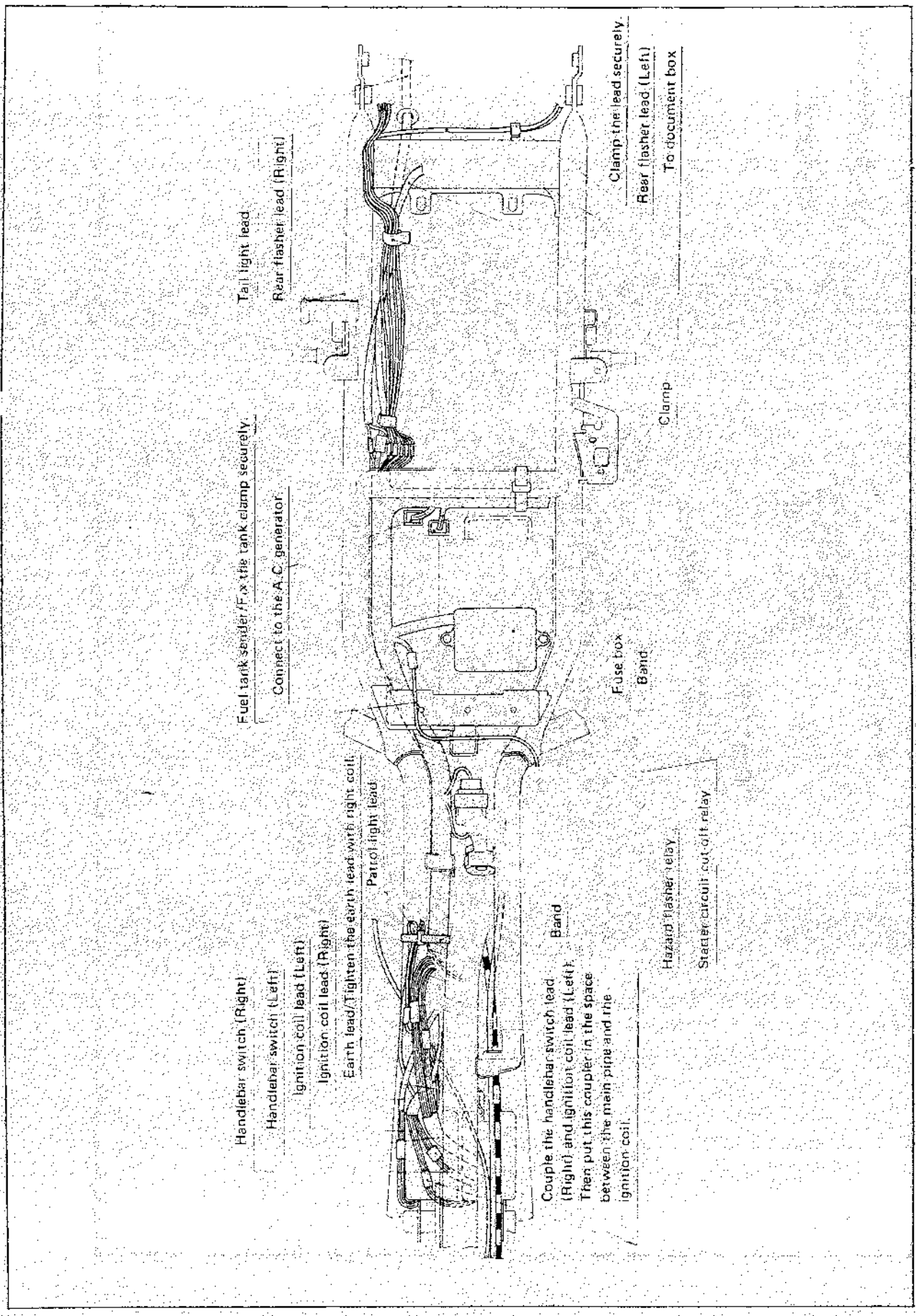
CABLE ROUTING (1)



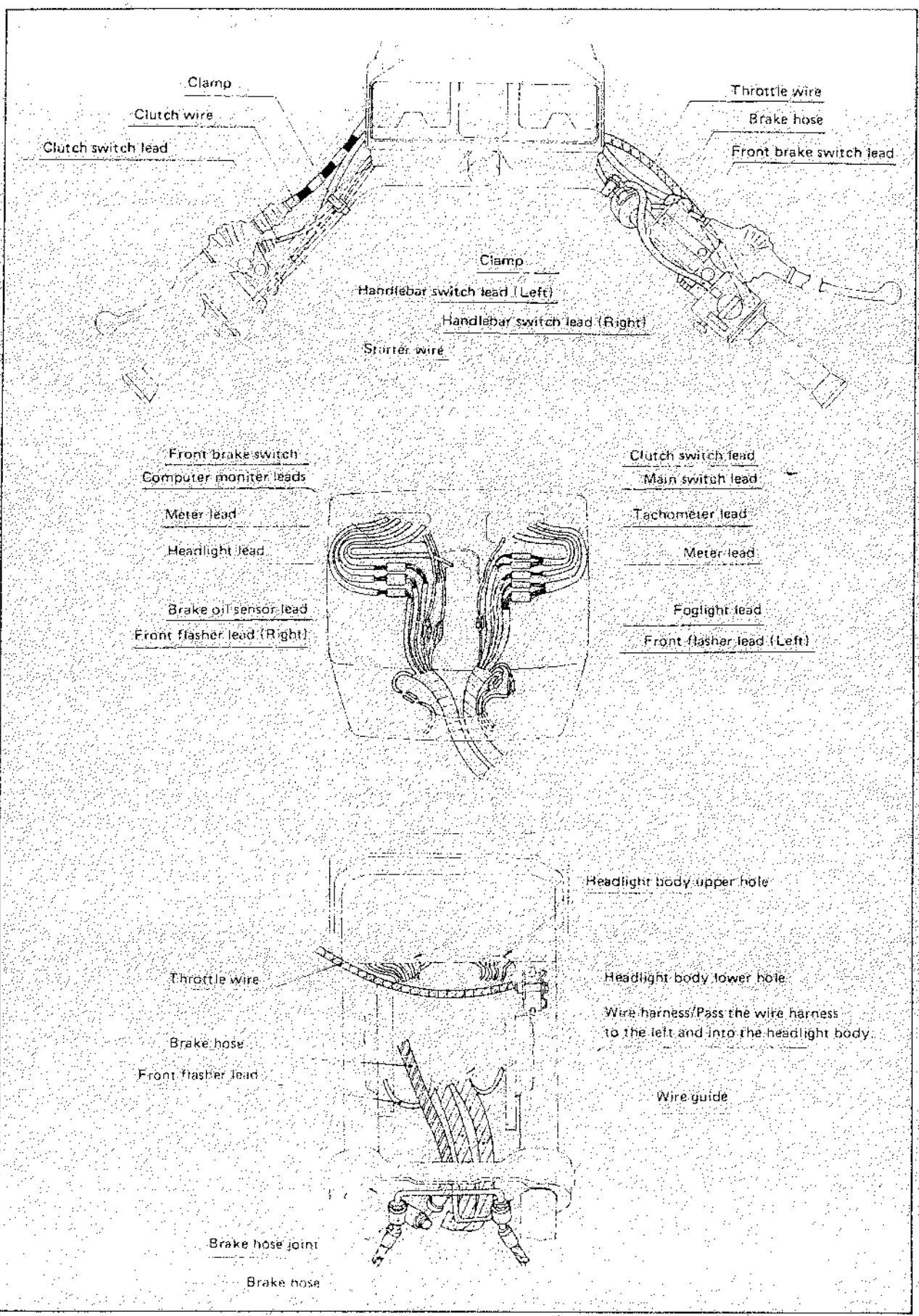
CABLE ROUTING (2)



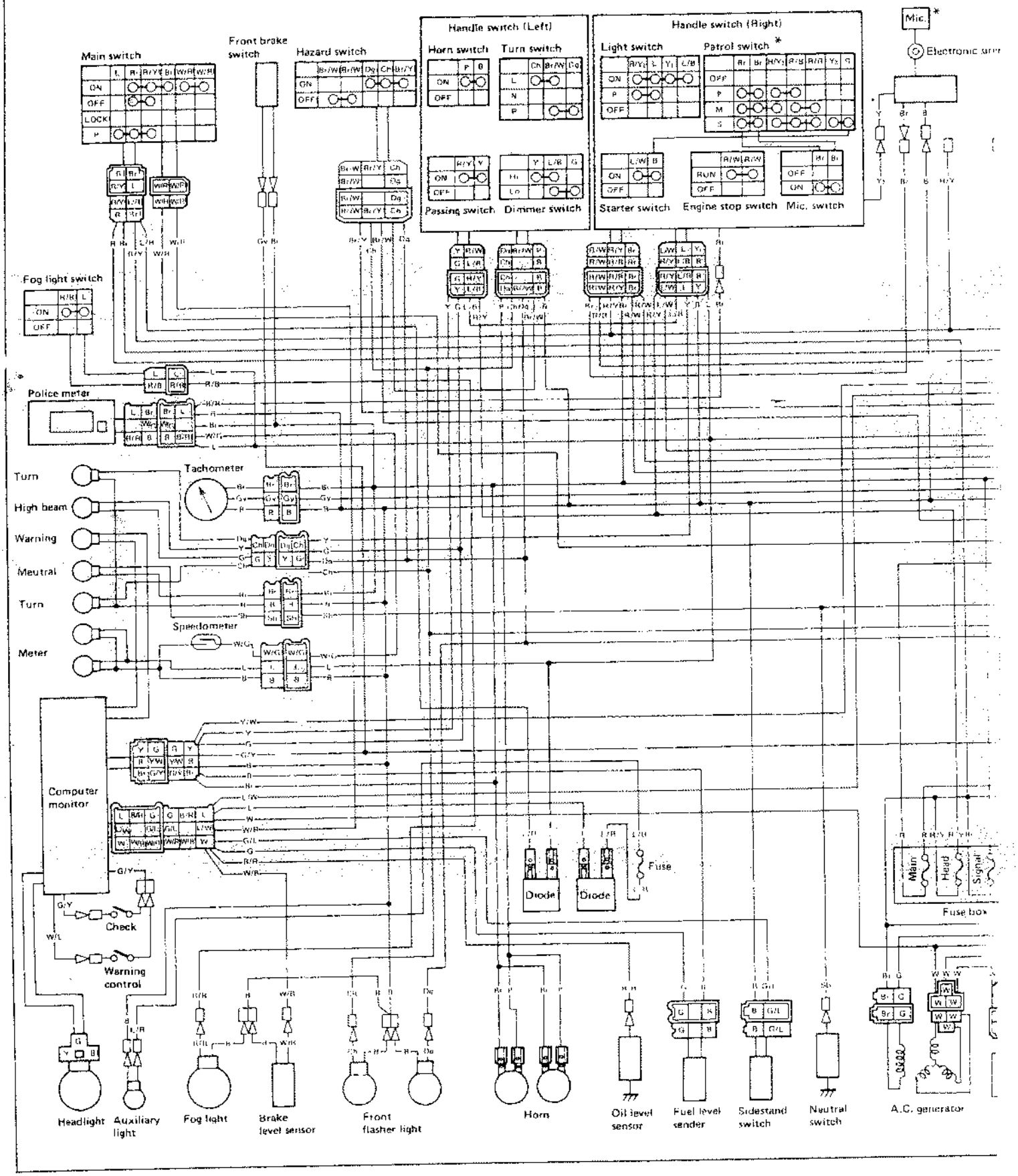
CABLE ROUTING (3)



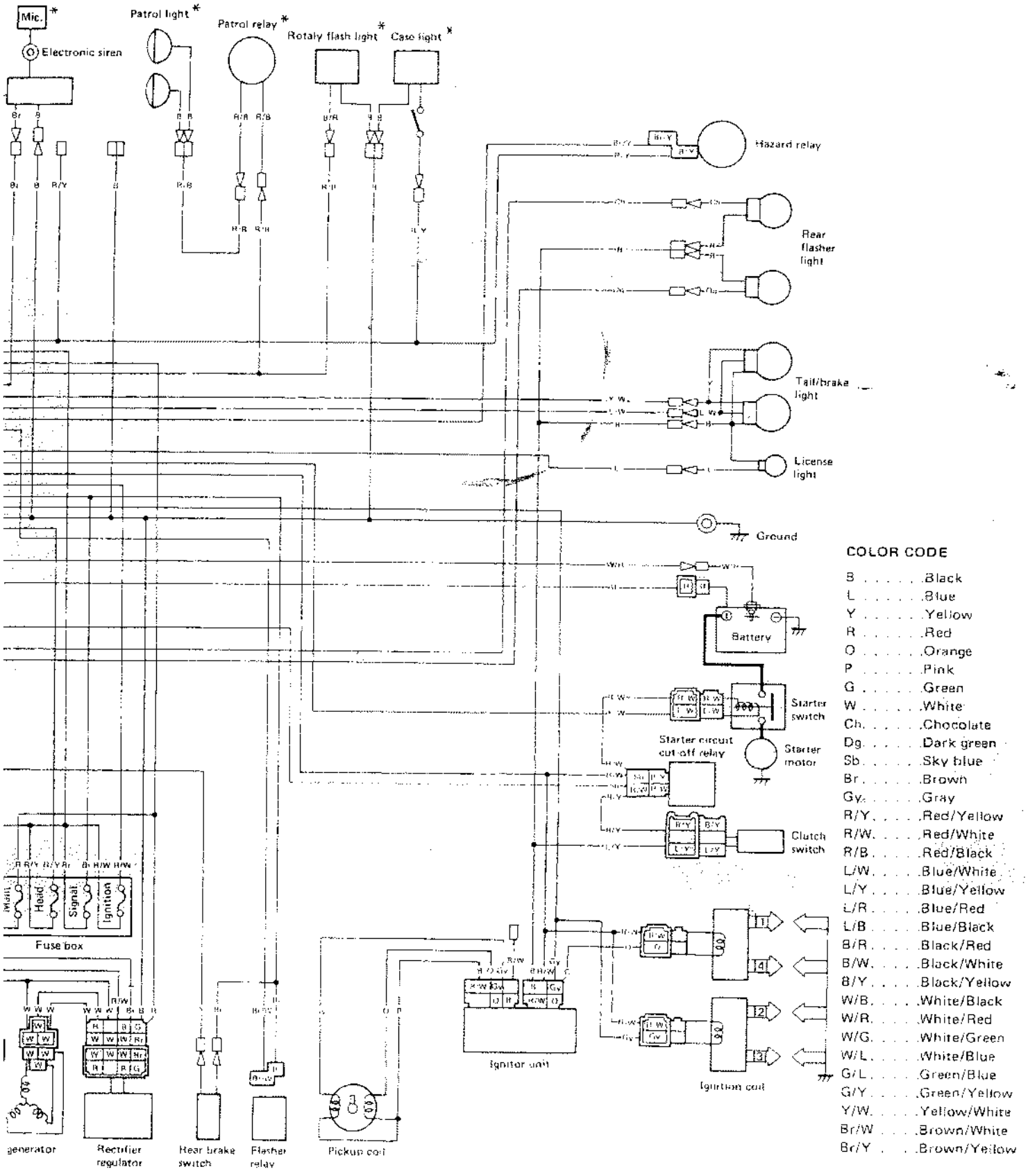
CABLE ROUTING (4)



XJ650P/XJ750P WIRING DIAGRAM



*Police equipment is different according to the country. (See pages 42~48 for more detail.)



COLOR CODE

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