YAMAHA

XJ650J

Supplementary Service Manual

J

LIT-11626-02-87

Particularly important information is distinguished in manual by the following notations.

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

CAUTION: A CAUTION indicates special procedure that must be followed to avoid damage to the motorcycle.

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

Starting Serial Number

XJ650J	5N8-000101



FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the XJ650J. For complete information on service procedures, it is necessary to use this Supplementary Service Manual together with following manual:

XJ650G Service Manual (LIT-11616-01-94)

SERVICE DEPT.
INTERNATIONAL DIVISION
YAMAHA MOTOR CO., LTD.

NOTE:
This Supplementary Service Manual contains information regarding periodic maintenance to the emission control system for the XJ650J. Please read this material carefully.

NOTICE

This manual was written by the Yamaha Motor Company primarily for use by Yamaha dealers and their qualified mechanics. It is not possible to put an entire mechanic's education into one manual, so it is assumed that persons using this book to perform maintenance and repairs on Yamaha motorcycles have a basic understanding of the mechanical concepts and procedures inherent to motorcycle repair technology. Without such knowledge, attempted repairs or service to this model may render it unfit for use and/or unsafe.

This model has been designed and manufactured to perform within certain specifications in regard to performance and emissions. Proper service with the correct tools is necessary to ensure that the motorcycle will operate as designed. If threre is any question about a service procedure, it is imperative that you contact a Yamaha dealer for any service information changes that apply to this model. This policy is intended to provide the customer with the most satisfaction from his motorcycle and to conform with federal environmental quality objectives.

Yamaha Motor Company, Ltd. is continually striving to improve all models manufactured by Yamaha. Modifications and significant changes in specifications or procedures will be forwarded to all Authorized Yamaha dealers and will, where applicable, appear in future editions of this manual.

MAINTENANCE AND LUBRICATION CHART

Periodic maintenance emission control system

No.	Item	Remarks	Initial break-in		Thereafter every	
			1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months
1*	Valve clearance	Check and adjust valve clearance when engine is cold.		○		○
2	Spark plugs	Check condition. Adjust cap. Clean. Replace at 13,000 km (or 18 months) and thereafter every 12,000 km (or 18 months)		○	○	Replace every 12,000 km (7,500 mi) or 18 months
3*	Crankcase ventilation system	Check ventilation hose for cracks or damage. Replace if necessary.		○		○
4*	Fuel line	Check fuel hose and vacuum pipe for damage. Replace if necessary.		○		○
5*	Exhaust system	Check for leakage. Retighten if necessary. Replace gasket(s) if necessary.		○	○	
6*	Idle speed	Check and adjust engine idle speed. Adjust cable free play if necessary.		○	○	
7*	Carburetor synchronization	Adjust synchronization of carburetors.		○	○	

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

General maintenance/lubrication

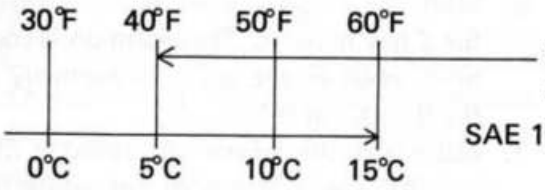
No.	Item	Remarks	Type	Initial break-in		Thereafter every		
				1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months	16,000 km (10,000 mi) or 24 months
1	Engine oil	Warm-up engine before draining.	Refer to NOTE 1	○	○	○		
2	Oil filter	Replace.	–	○	○		○	
3	Final gear oil	Replace.	Refer to NOTE 2	○			○	
4*	Air filter	Clean with compressed air.	Refer to NOTE 3		○		○	
5*	Brake system	Adjust free play. Replace pads if necessary. (Front) Replace shoes if necessary (rear).	–	○	○	○		
6*	Clutch	Adjust free play.	–	○	○	○		
7*	Control and meter cable	Apply chain lube thoroughly.	Yamaha chain and cable lube or SAE 10W/30 motor oil	○	○	○		
8*	Rear arm Pivot bearing	Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi).	Medium weight wheel bearing grease					Repack
9*	A.C. Generator	Replace generator brushes. Replace at initial 13,000 km (8,000 mi) and thereafter every 16,000 km (10,000 mi).	–					Replace

No.	Item	Remarks	Type	Initial break-in		Thereafter every		
				1,000 km (600 mi) or 1 month	5,000 km (3,000 mi) or 7 months	4,000 km (2,500 mi) or 6 months	8,000 km (5,000 mi) or 12 months	16,000 km (10,000 mi) or 24 months
10	Brake/Clutch lever pivot shaft	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		
11	Brake pedal and change pedal shaft pivots	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		
12	Center and side stand pivots	Apply chain lube lightly.	Yamaha chain and cable lube or SAE 10W/30 motor oil		○	○		
13	Front fork oil	Drain completely. Refill to specification.	Yamaha fork oil 10Wt or equivalent					○
14	Steering bearing and races	Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi).	Medium weight wheel bearing grease		○	○		Repack
15	Wheel bearings	Check bearings for smooth rotation. Replace if necessary.	–		○	○		
16	Battery	Check specific gravity Check breather pipe for proper operation.	–		○	○		

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

NOTE:

1. Engine oil type:



YAMALUBE 4-cycle oil or SAE 20W/40 type "SE" motor oil
SAE 10W/30 type "SE" motor oil

2. Final gear oil type:
   SAE 80 API "GL-4" Hypoid gear oil
3. The air filter should be cleaned more often than specified intervals if the machine is operated in extremely dust areas.

NEW SERVICE

*ENGINE

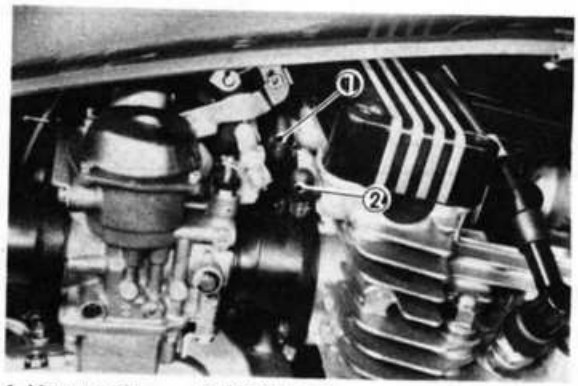
SYNCHRONIZATION

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:

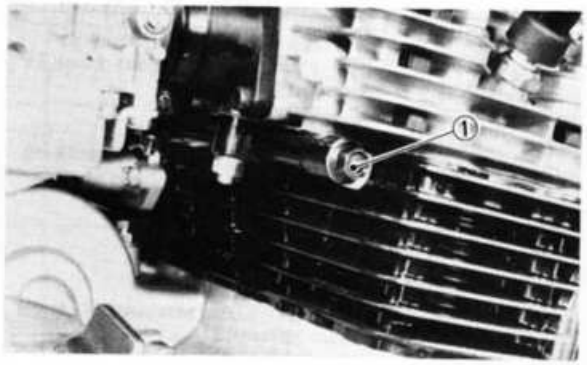
The valve clearances must be set properly before synchronizing the carburetors.

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



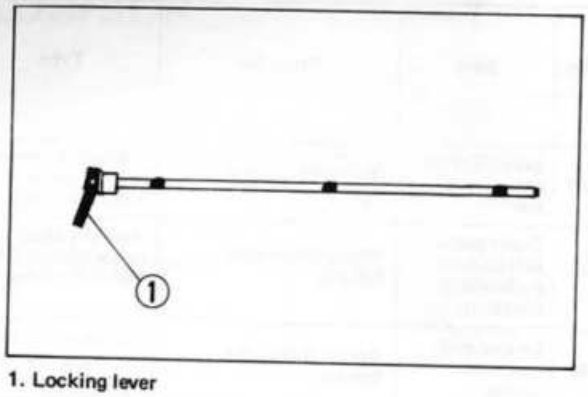
1. Vacuum pipe 2. Rubber cap

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



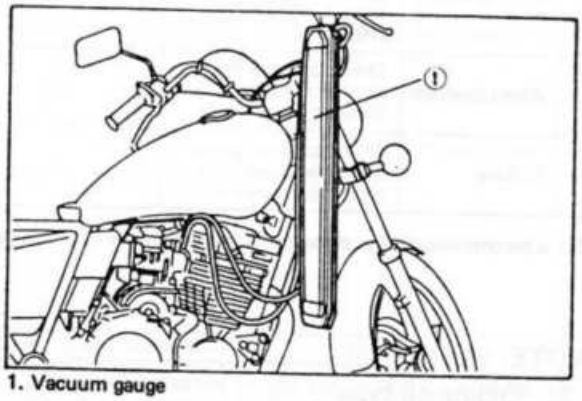
1. Blind plug

4. Insert the YICS 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

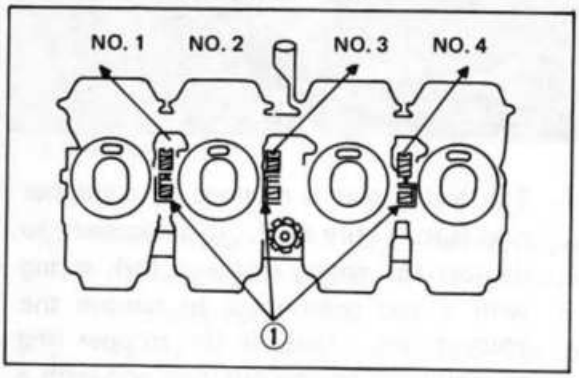
6. Start the engine allow it to warm-up for a few minutes. The warm-up is complete when engine responds normally to the throttle opening.
7. Make sure the engine idle speed is 950 ~ 1,000 r/min. If it does not, adjust the idle speed with the throttle stop screw.

NOTE:

With the YICS 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 YICS shutoff tool and reinstall the blind plug.

Tightening torque: 2.2 m-kg (16.0 ft-lb)

10. Check the idle speed.
    Adjust if necessary.

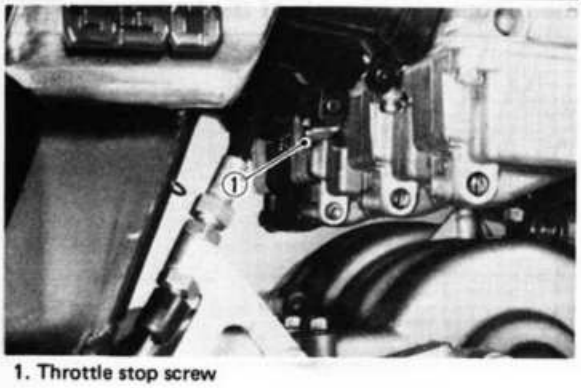
IDLE SPEED ADJUSTMENT

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

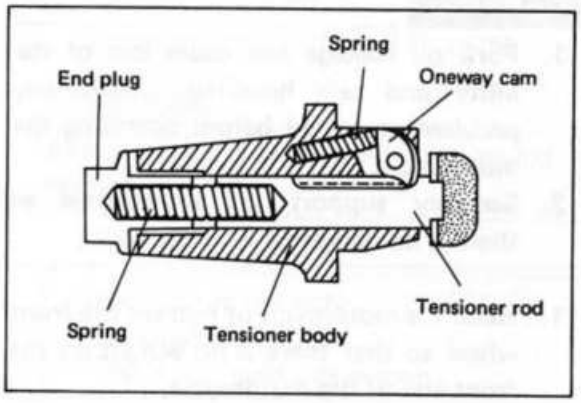
CARBURETION

1. Specification

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

CAM CHAIN TENSIONER

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



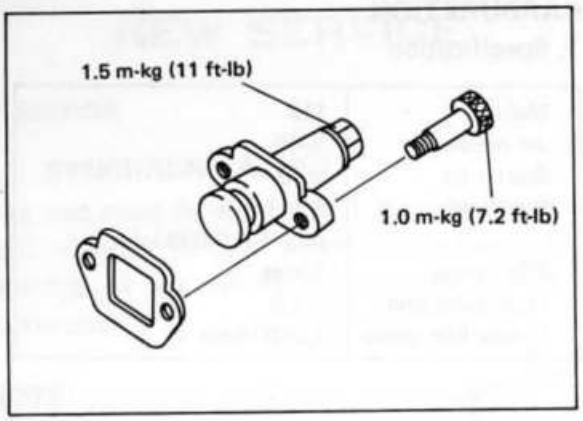
When installing this tensioner onto the cylinder proceed as follows:

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: 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: 1.5 m-kg (11 ft-lb)



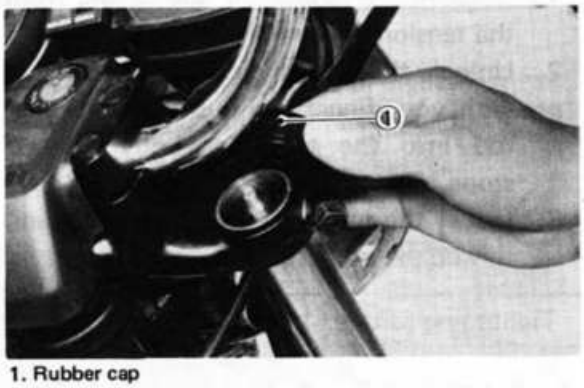
FRONT FORK

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. Unscrew the rubber cap from the top of each fork and remove it.

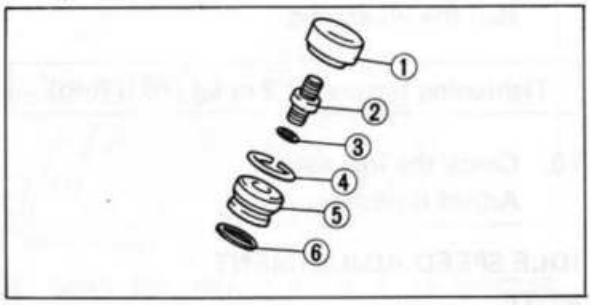


1. Rubber cap

3. Keep the valve open by pressing it for several seconds so that the air can be let out of the inner tube.



4. The spring seat is retained by a stopper ring (spring wire clip). It is necessary to depress the spring seat and fork spring with a seat compresser to remove the stopper ring. Remove the stopper ring by carefully prying out one end with a screw-driver.

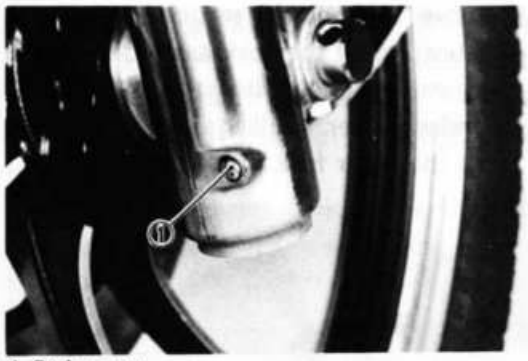


1. Cap
2. Valve
3. O-ring
4. Stopper ring
5. Spring seat
6. O-ring

5. Place an open container under each drain hole. Remove the drain screw.

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.

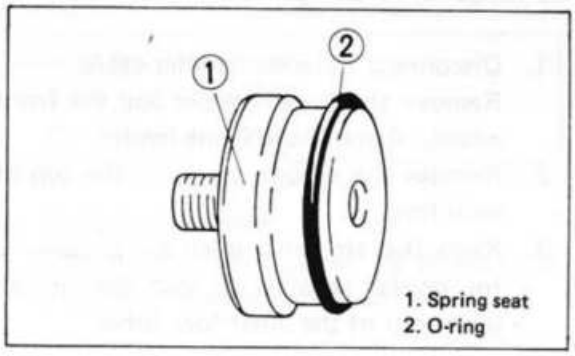


1. Drain screw

6. When most of oil has drained, slowly raise and lower the outer tubes to pump out the remaining oil.
7. Inspect the drain screw gasket. Replace if damaged. Re install the drain screw.
8. Pour the specified amount of oil into the inner tube.

Fork oil capacity: 278 cm³ (9.4 US oz)
Recommended oil: Yamaha fork oil 10 wt or equivalent

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



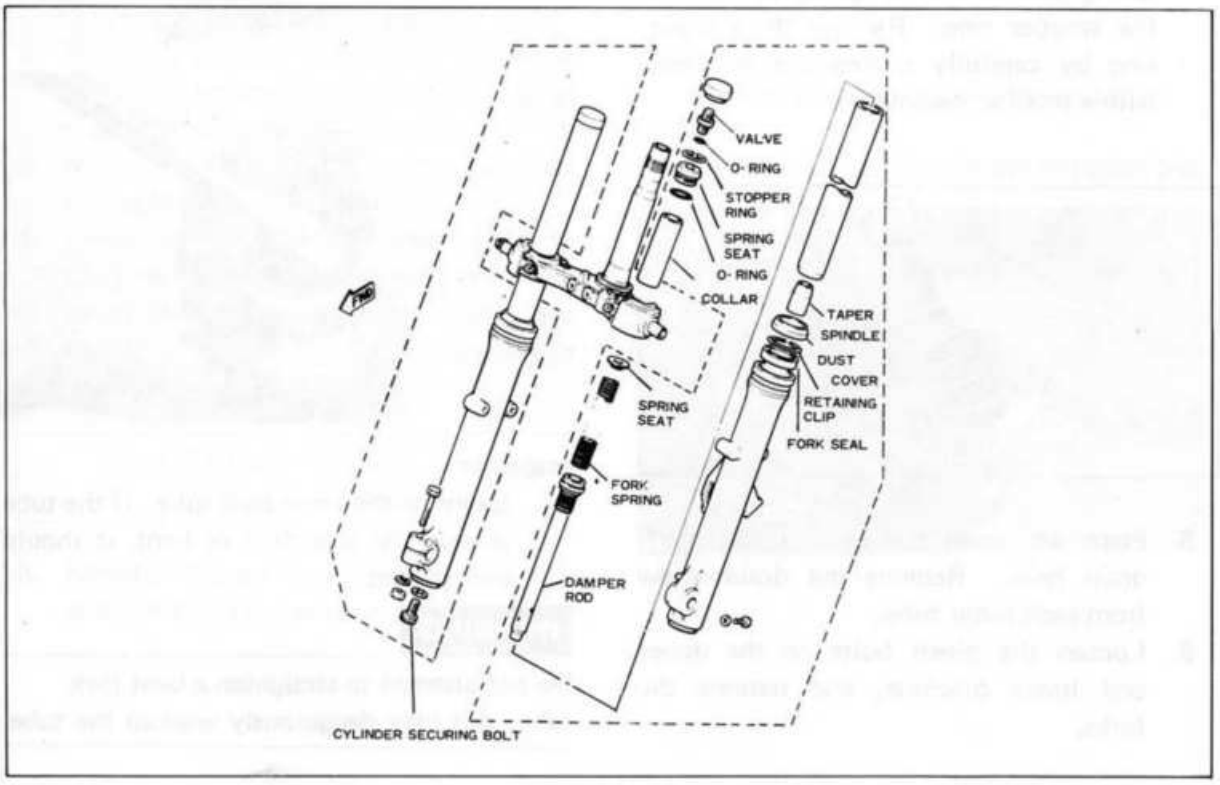
1. Spring seat
2. O-ring

11. Reinstall the spring seat and fill the fork with air using a manual air pump.

CAUTION:

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

Maximum air pressure: 1.2 kg/cm² (17 psi) **Do not exceed this amount.**



Removal And Disassembly

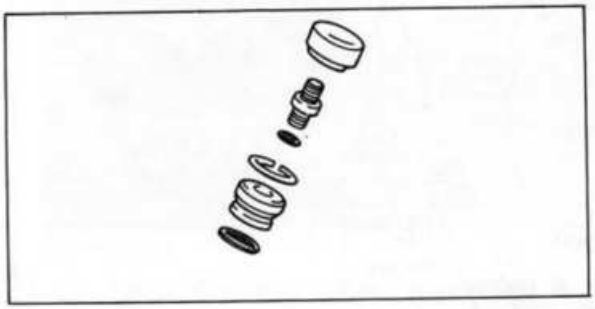
WARNING:

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

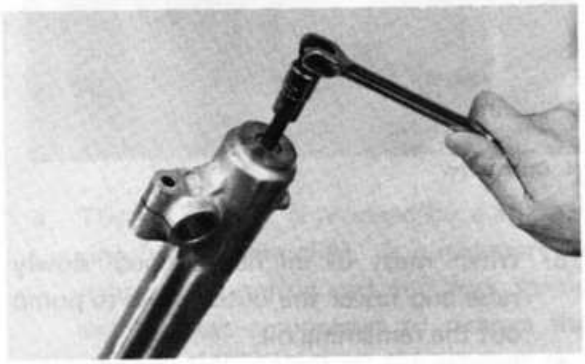
1. Disconnect the speedometer cable. Remove the brake caliper and the front wheel. Remove the front fender.
2. Remove the rubber cap from the top of each fork.
3. Keep the air valve open by pressing it for several seconds so that the air can be let out of the inner fork tube.



4. 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.



5. Place an open container under each drain hole. Remove the drain screw from each outer tube.
6. Loosen the pinch bolts on the upper and lower brackets, and remove the forks.
7. Remove the cylinder securing bolt from the bottom of the fork assembly. Hold the inner tube with the front-fork-cylinder holder. Pull the inner fork tube from the outer fork tube.



8. Remove the retaining clip from the outer fork tube, and pry out the fork seal. Be careful not to damage the fork tube surface.





Inspection

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

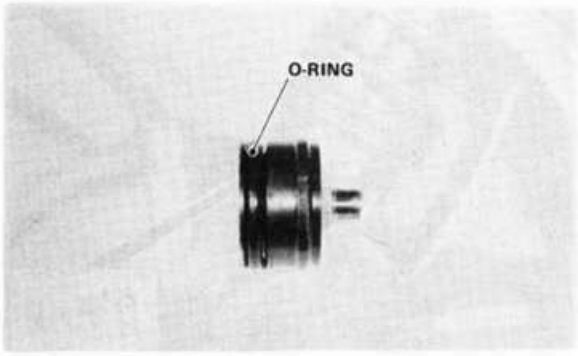
WARNING:

Do not attempt to straighten a bent fork tube; this may dangerously weaken the tube.

2. Inspect the outer surface of the fork seal seat in the outer fork tube. If this surface is damaged, replace the outer fork tube. If it is not damaged, replace the fork seal.
3. Check the outer fork tubes for dents. Replace the tube if it is dented.
4. Check the free length of the springs.

Fork spring free length:
467 mm (18.39 in)

5. Check the o-ring on the spring seat. If it's damaged, replace it.



Assembly

1. Make sure all components are clean before assembly. Always install a new fork seal. Do not reuse a seal.
2. Apply oil to the fork seal, and install the fork seal by pressing it in with a large socket. Install the retaining clip.
3. Install the inner fork tube into the outer fork tube.
4. Apply Loctite®Stud N' Bearing Mount (red) to the cylinder securing bolt, and install the bolt and a copper washer into the outer fork tube. Torque the bolt to specification.

TIGHTENING TORQUE:
2.0 m-kg (14.5 ft-lb)

5. Reinstall the spring seat and fill the fork with air using a manual air pump.

CAUTION:

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

Maximum air pressure:
1.2 kg/cm² (17 psi)
Do not exceed this amount

Air pressure adjustment

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

NOTE:

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

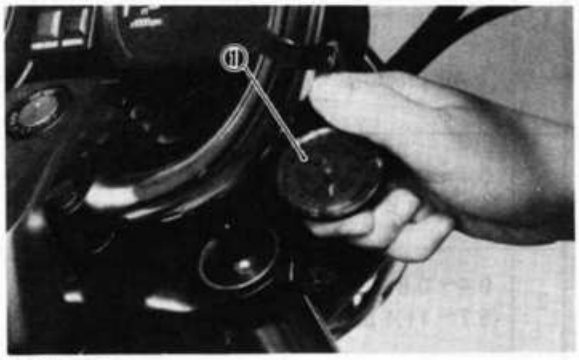
2. Remove the rubber caps from each fork.
3. Using an air gauge, check and adjust the air pressure.
   *Increase air pressure — cause initial load to increase, and absorber becomes hard.
   *Decrease air pressure — cause initial load to decrease, and absorber becomes soft.

To increase:

Fill the air using a manual air pump.

To decrease:

Release the air by pushing the valve pin.



1. Air gauge

Standard air pressure:
0.4 kg/cm² (5.7 psi)
Maximum air pressure:
1.2 kg/cm² (17 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 0.1 kg/cm² (1.4 psi) or less.

4. Install the rubber caps securely.

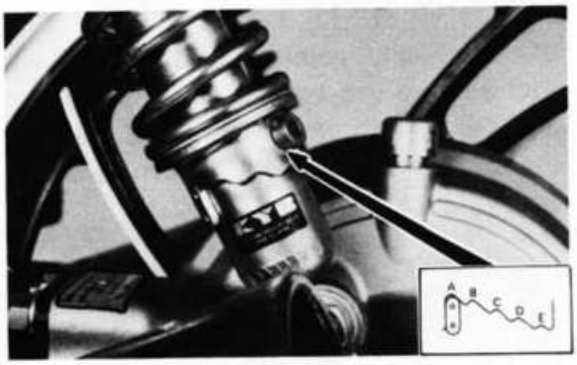
Rear shock absorber adjustment

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

WARNING:

Adjust both the right and left sides to the same position.



Compatibility chart

Recommended combinations of the front fork and the rear shock absorber.

Use this table as guidance to meet specific riding conditions and motorcycle load.

	Front fork	Rear shock absorber	Loading condition			
	Air pressure	Spring seat	Solo rider	With passenger	With accessory equipment	With accessory equipments and passenger
1	0.4 ~ 0.8 kg/cm² (5.7 ~ 11.4 psi)	A ~ C	○			
2	0.4 ~ 0.8 kg/cm² (5.7 ~ 11.4 psi)	A ~ C	○	○		
3	0.4 ~ 0.8 kg/cm² (5.7 ~ 11.4 psi)	C ~ E		○	○	
4	0.8 ~ 1.2 kg/cm² (11.4 ~ 17.1 psi)	E			○	○

*ELECTRICAL

STARTING CIRCUIT CUT–OFF SYSTEM

The starting circuit cut-off system is employed. Hence, the following description.

Starting circuit operation

The starting circuit on this model consists of the starter motor, starter relay, and the starting-circuit cut-off relay. If the engine stop switch and the main switch are both on, the starter motor can operate only if:

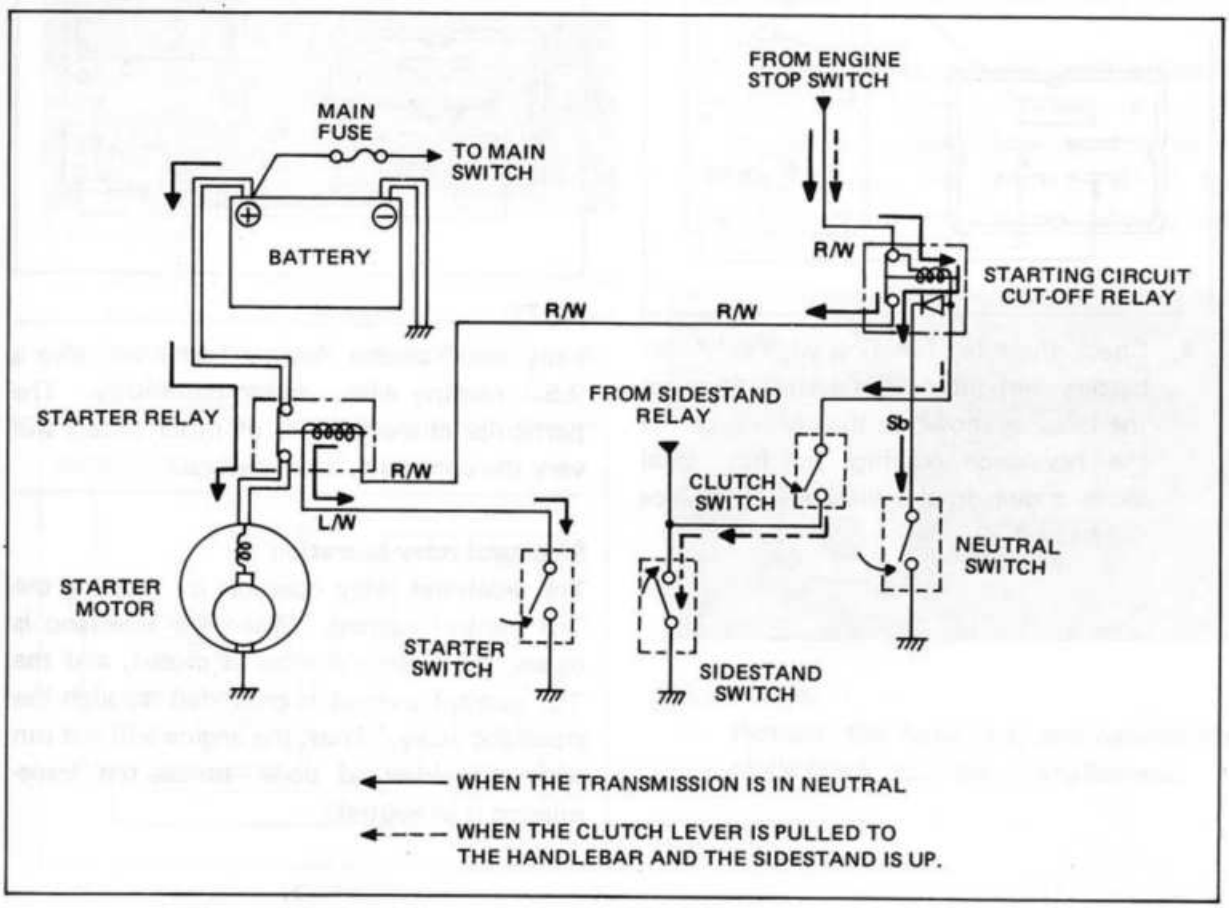
a. The transmission is in neutral (the neutral switch is on).

or if

b. The clutch lever is pulled to the handlebar (the clutch switch is on) and the sidestand is up (the sidestand switch is on.)

The starting-circuit cut-off relay prevents the starter from operating when neither of these conditions has been met. In this instance, the starting-circuit cut-off relay is off so current cannot reach the starter motor.

When one or both of the above conditions have been met, however, the starting-circuit cut-off relay is on, and the engine can be started by pressing the starter switch.



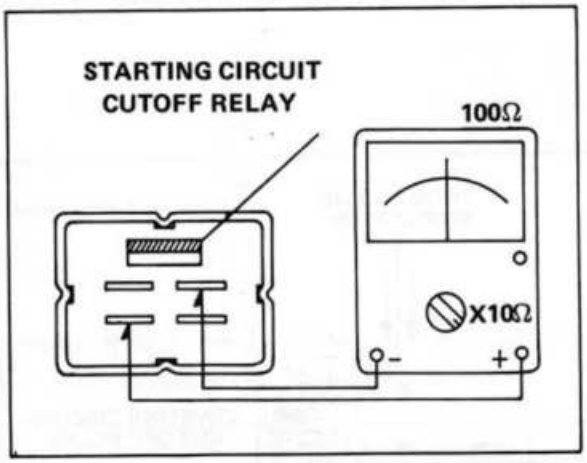
Starting-circuit cut-off relay inspection

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

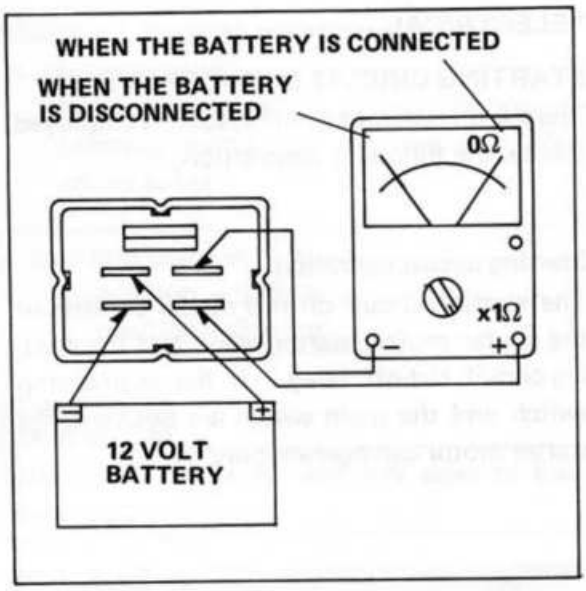


1. Starting-circuit cut-off relay

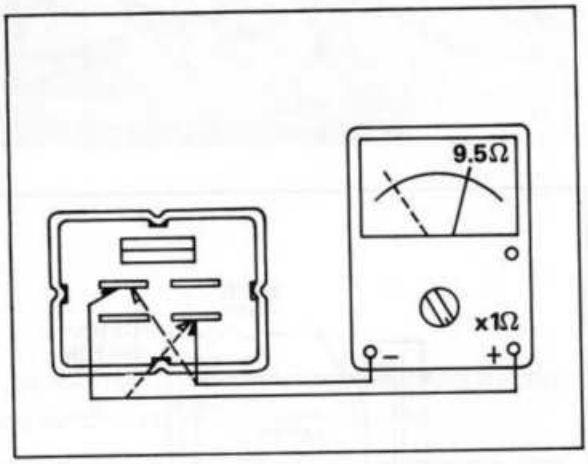
3. Check the resistance of the relay coil windings with the pocket tester. If the resistance is not within specification, replace the relay.



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.



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

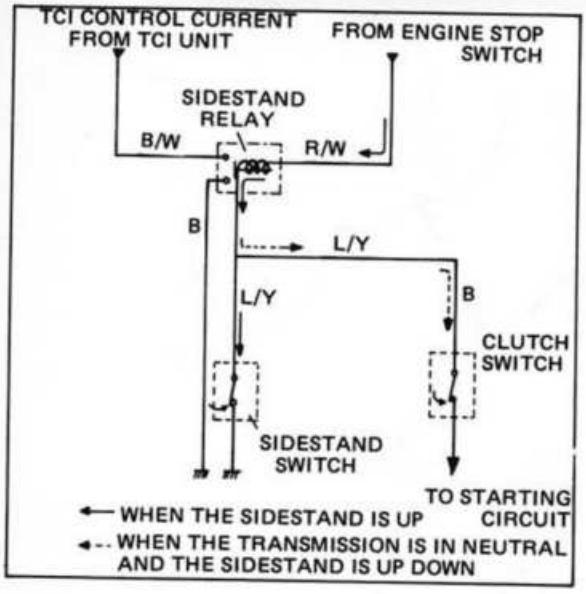


NOTE:

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.

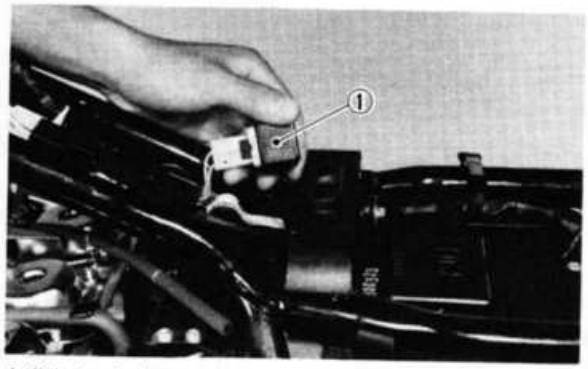
Sidestand relay operation

The sidestand relay operates by shorting the TCI control current. When the sidestand is down, the sidestand relay is closed, and the TCI control current is grounded through the sidestand relay. Thus, the engine will not run with the sidestand down unless the transmission is in neutral.



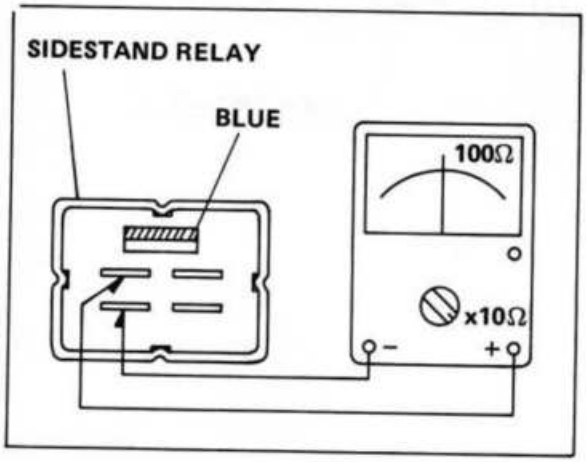
Sidestand relay inspection

1. Open the seat, and remove the fuel tank.
2. Remove the sidestand relay from the frame, and disconnect the connector.

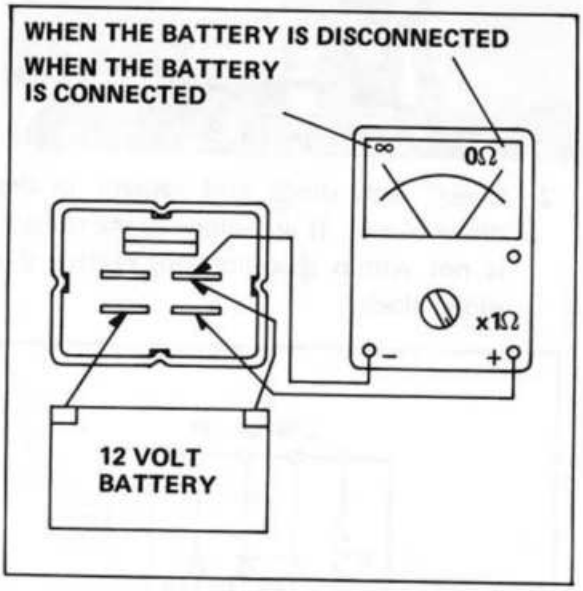


1. Sidestand relay

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



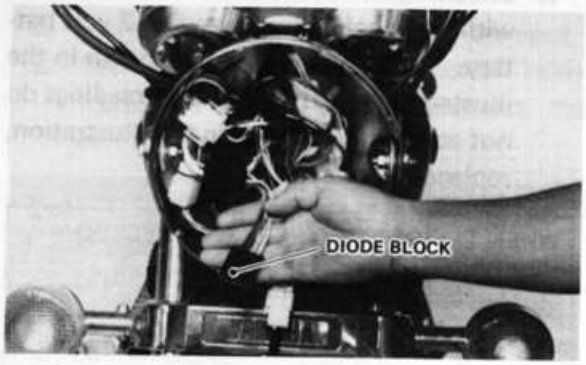
Sidestand switch inspection

1. Remove the seat and side cover (R). Disconnect the connector from the wiring harness.
2. Connect the pocket tester leads as shown, and set the tester selector to ohm x 1. When the sidestand is up, the tester should read zero ohms. When the sidestand is down, the tester should read infinity.

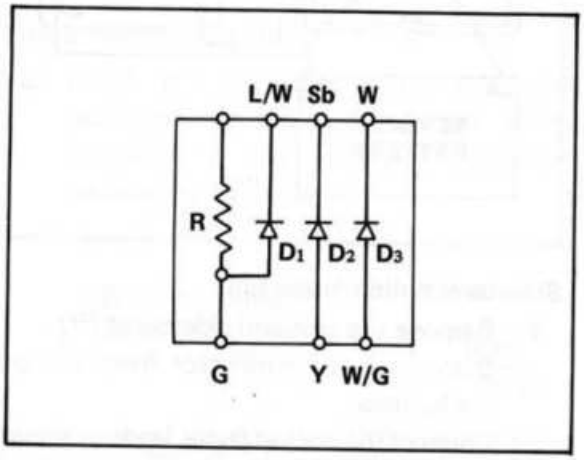


Diode block

1. Remove the headlight, and remove the diode block from the wiring harness.

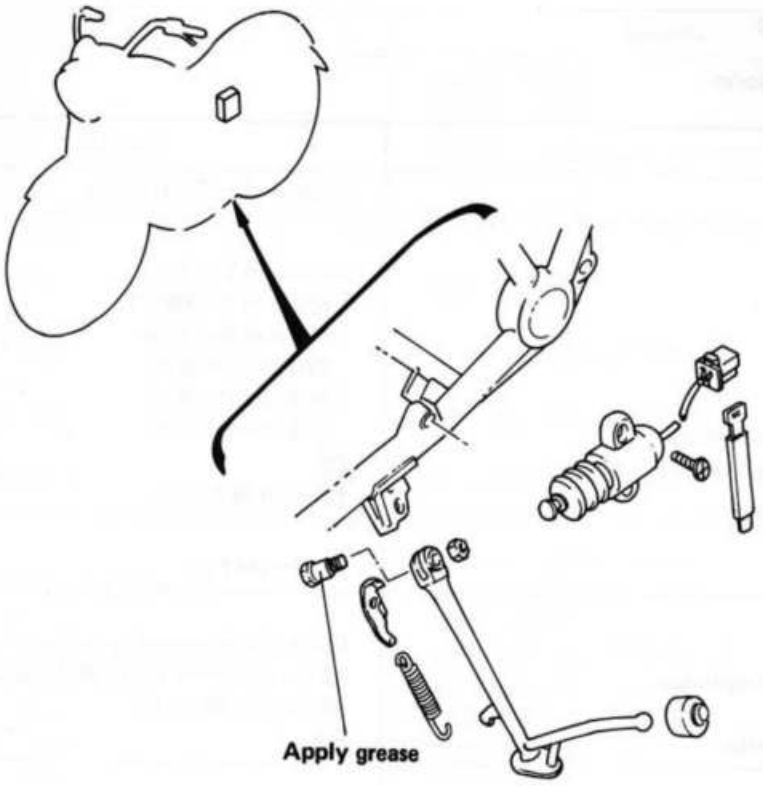


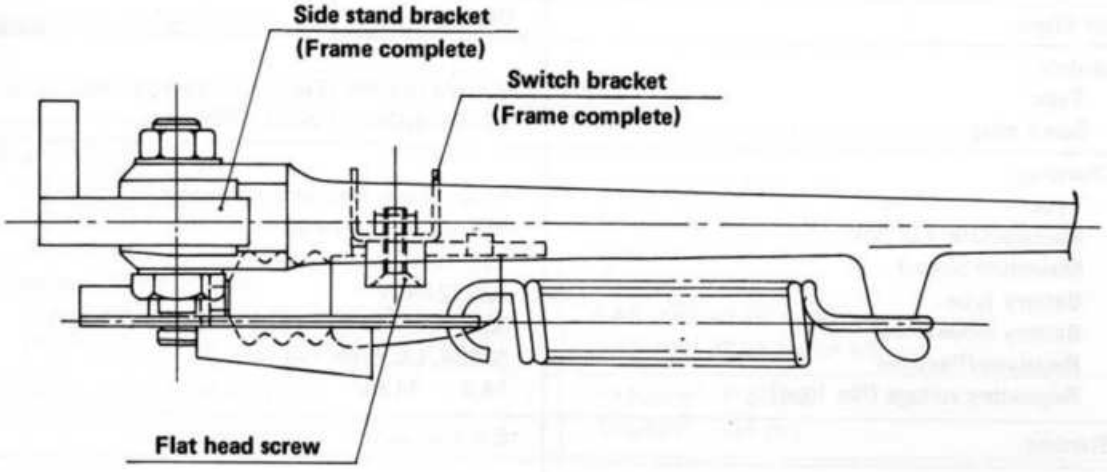
2. Check each diode and resistor in the diode block. If any diode in the resistor is not within specification, replace the diode block.



Checking element	Pocket tester connecting point		Good	Replace (element shorted)	Replace (element opened)
	(+) (red)	(-) (black)			
R	B/R	G	8.2Ω	0Ω	∞
D1	L/W	G	○	○	x
	G	L/W	x	○	x
D2	Sb	Y	○	○	x
	Y	Sb	x	○	x
D3	W	W/G	○	○	x
	W/G	W	x	○	x

○ : Continuity
x : Disconitnuity (∞)


Apply grease


Side stand bracket
(Frame complete)
Switch bracket
(Frame complete)
Flat head screw

SPECIFICATIONS

General Specifications

	XJ650J
Basic color	Black Red or Frost Silver
Dimensions: Overall length Overall width Overall height Seat height Wheelbase Minimum ground clearance Caster (steering head angle) Trail	 2,165 mm (85.2 in) 855 mm (33.66 in) 1,170 mm (46.1 in) 770 mm (30.3 in) 1,445 mm (56.9 in) 145 mm (5.7 in) 29° 124 mm (4.88 in)
Weight: Net	 203 kg (447 lb)
Engine: Type Bore x stroke x cylinders Displacement Compression ratio	 D.O.H.C. air-cooled, gasoline 63.0 x 52.4 mm x 4 (2.480 x 2.063 in x 4) 653 cc (39.85 cu.in) 9.2 : 1
Lubrication: Lubrication system Delivery pump type	 Pressure lubricated, wet sump Trochoid
Carburetion: Manufacture Type Rated venturi size	 HITACHI HSC32, constant velocity 32 mm (1.26 in)
Air filter:	Dry type element
Ignition: Type Spark plug	 Battery ignition (Full transistor ignition) BP7ES (NGK) or W22EP (ND)
Charging: Type Manufacture, I.D. No. Maximum output Battery type Battery dimensions Regulator/Rectifier Regulating voltage (No. load)	 Three-phase, regulated alternator HITACHI, LD119-08 14V 19A 12N12A-4A 80 x 160 x 134 mm (3.15 x 6.30 x 5.28 in) S8534, I.C. type, full wave 14.2 ~ 14.8V
Starting:	Electric starter
Primary drive: Type Teeth, ratio	 Spur gear 97/58 1.672
Clutch:	Wet, multiple disc
Transmission: Type	 Constant mesh, 5-speed drum shifter

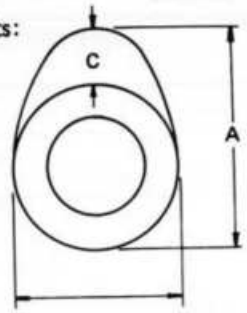
	XJ650J
Teeth, ratio 1st	35/16 2.187
2nd	30/20 1.500
3rd	30/26 1.152
4th	28/30 0.933
5th	26/32 0.812
Secondary drive:	
Type	Shaft drive
Transmission output:	
Type, teeth, ratio	Spur gear, 49/36, 1.361
Middle gear case:	
Type, teeth, ratio	Bevel gear, 19/18, 1.055
Final gear case:	
Type, teeth, ratio	Bevel gear, 32/11, 2.909
Chassis:	
Frame	Tubular steel double cradle
Suspension: Front (type, travel)	Telescopic fork 150 mm (5.91 in)
Rear (type, travel)	Swing arm, 80 mm (3.15 in)
Tires: Front	3.25H19-4PR, Tubeless
Rear	130/90-16 67H, Tubeless
Brakes: Front	Single hydraulic disc
Rear	Drum brake
Fuel tank: Total	13 Lit (3.4 US. gal)
Reserve	3.4 Lit (0.8 US. gal)
Rim size: Front	MT1.85 x 19, Cast Aluminum
Rear	MT3.00 x 16, Cast Aluminum

Maintenance Specifications

1. Engine

Engine oil capacity:	
Total amount	3,500 cm^3 (3.7 US. qt)
Oil and filter change	2,650 cm^3 (2.8 US. qt)
Oil change	2,350 cm^3 (2.5 US. qt)
Recommended lubricant:	
If temperature does not go below 5°C (40°F)	SAE 20W/40 SE motor oil
If temperature does not go above 15°C (60°F)	SAE 10W/30 SE motor oil
Cranking pressure (at seal level):	11 kg/cm^2 (156 psi)
Maximum difference between cylinders:	1 kg/cm^2 (14 psi)

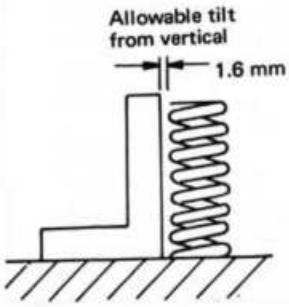
Camshafts:

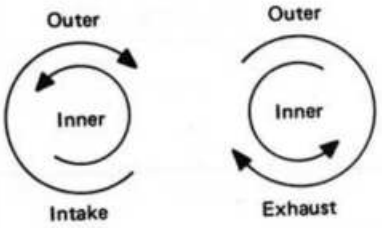


Dimensions		Standard size	Wear limit
Intake	A	36.80 mm (1.449 in)	36.65 mm (1.443 in)
	B	28.0 mm (1.102 in)	27.85 mm (1.096 in)
	C	8.50 mm (0.335 in)	–
Exhaust	A	35.80 mm (1.449 in)	35.65 mm (1.404 in)
	B	28.0 mm (1.102 in)	27.85 mm (1.096 in)
	C	7.8 mm (0.307 in)	–

Camshaft bearing surface diameter:	24.967 ~ 24.980 mm (0.9830 ~ 0.9835 in)
Camshaft-to-cap clearance:	
Standard	0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in)
Maximum	0.160 mm (0.006 in)
Camshaft runout limit	0.1 mm (0.004 in)

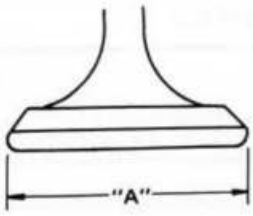
Valves:





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

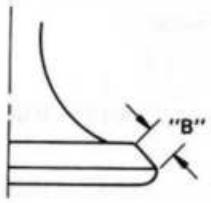
Valve stem run-out maximum	0.03 mm (0.0012 in)
Valve seat width standard/maximum	1.0 mm (0.039 in)/2.0 mm (0.080 in)



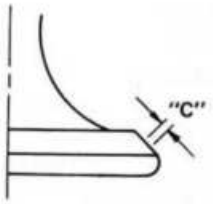
In

INTAKE

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

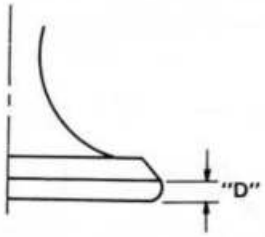


Stem diameter (O.D.)	$7\ ^{-0.010}_{-0.025}$ mm (0.2756 $^{-0.0004}_{-0.0010}$ in)
Guide diameter (I.D.)	$7\ ^{+0.012}_{0}$ mm (0.2756 $^{+0.0005}_{0}$ in)
Stem-to-guide clearance	0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in)



EXHAUST

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

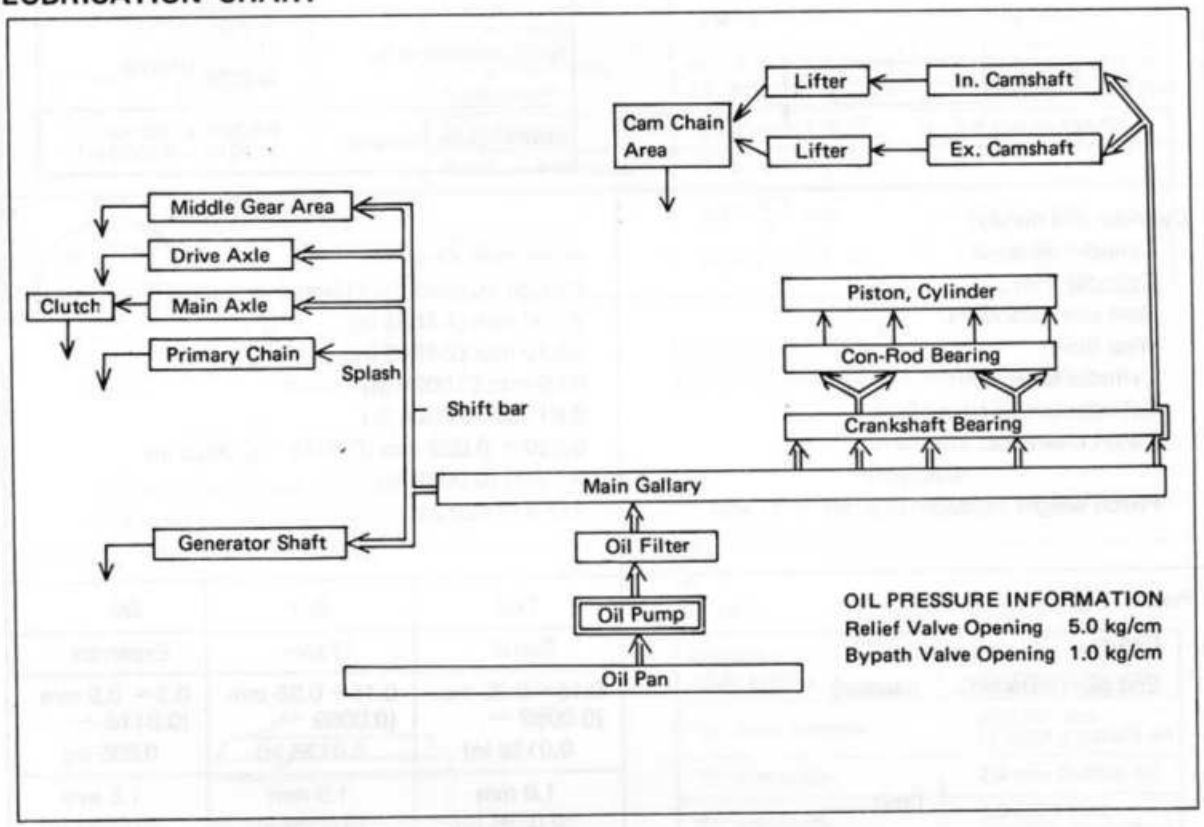


Cylinder and piston:	
Cylinder material	Aluminum alloy
Cylinder liner	Pressed in; special cast iron
Bore size: standard	63.00 mm (2.4803 in)
Wear limit	63.10 mm (2.4843 in)
Cylinder taper limit	0.05 mm (0.0020 in)
Cylinder out-of-round limit	0.01 mm (0.0004 in)
Piston clearance: standard	0.030 ~ 0.050 mm (0.0012 ~ 0.0020 in)
maximum	0.1 mm (0.0039 in)
Piston weight (include rings, pin and clips)	213 g (7.520 oz)

Piston rings:	Top	2nd	Oil
Design	Barrel	Taper	Expander
End gap (installed): standard	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in)	0.15 ~ 0.35 mm (0.0059 ~ 0.0138 in)	0.3 ~ 0.9 mm (0.0118 ~ 0.035 in)
limit	1.0 mm (0.0394 in)	1.0 mm (0.0394 in)	1.5 mm (0.0591 in)
Side clearance: standard	0.03 ~ 0.07 mm (0.0012 ~ 0.0028 in)	0.02 ~ 0.06 mm (0.008 ~ 0.0024 in)	–
limit	0.15 mm (0.0059 in)	0.15 mm (0.0059 in)	–

Crankshaft:	
Crank journal/bearing oil clearance	0.040 ~ 0.064 mm (0.0016 ~ 0.0025 in)
Main journal run-out (maximum)	0.040 mm (0.0016 in)
Connecting rods	
Weight	345 g (12.2 oz)
Rod bearing oil clearance	0.03 ~ 0.09 mm (0.0012 ~ 0.0035 in)
Oil pump:	
Housing-to-outer rotor clearance	0.09 ~ 0.15 mm (0.0035 ~ 0.0059 in)
Outer rotor-to-inner rotor clearance	0.12 mm (0.005 in) or less
Clutch:	
Friction plate: thickness/q'ty	3.0 mm (0.12 in)/8
minimum thickness	2.8 mm (0.11 in)
Clutch plate: thickness	1.6 mm (0.063 in)/7
warp limit	0.05 mm (0.0020 in)
Clutch spring: length/q'ty	40.1 mm (1.579 in)/5
minimum length	39.1 mm (1.539 in)
spring rate	1.184 kg/mm (66.3 lb/in)
Clutch lever freeplay (at lever pivot point)	2 ~ 3 mm (0.08 ~ 0.12 in)
Transmission shaft run-out maximum:	0.08 mm (0.0031 in)
Middle gear case lash:	0.1 ~ 0.2 mm (0.0039 ~ 0.0079 in)

LUBRICATION CHART



2. Carburetion

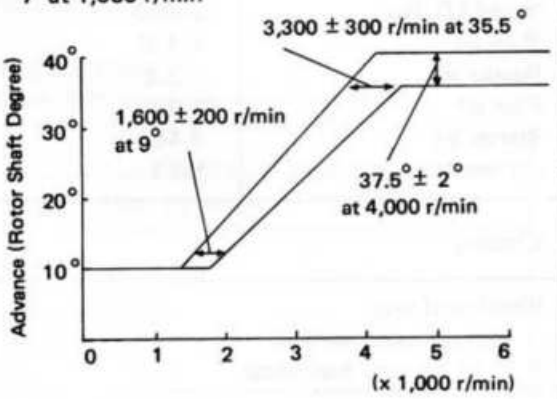
Manufacturer	HITACHI	Fuel level	3± 1 mm (0.118± 0.039 in)
Model I.D. No.	5N800	Pilot screw	Preset
Main jet	# 110	Air jet, Main	# 50
Needle jet	ϕ 3.2	Air jet, Pilot	# 205
Pilot jet	# 40	Throttle valve	32 mm (1.26 in)
Starter jet	# 40	Float valve seat	ϕ 2.0
Jet needle	Y-10	Engine idle speed	1,050 r/min

3. Chassis

*Total weight of accessories, etc. excepting motorcycle.

Wheels and tires:		
Rim run-out: vertical	2.0 mm (0.079 in)	
horizontal	2.0 mm (0.079 in)	
Tire pressure (cold):	Front	Rear
Up to 90 kg (198 lb) load*	1.8 kg/cm² (26 psi)	2.0 kg/cm² (28 psi)
90 kg (198 lb) ~ 160 kg (353 lb) load*	2.0 kg/cm² (26 psi)	2.3 kg/cm² (32 psi)
160 kg (353 lb) ~ 230 kg (507 lb) load* (Maximum load)	2.0 kg/cm² (28 psi)	2.8 kg/cm² (40 psi)
High speed riding	2.3 kg/cm² (36 psi)	2.5 kg/cm² (40 psi)
Minimum tire tread depth	0.8 mm (0.03 in)	0.8 mm (0.03 in)
Brakes:		
Recommended fluid	DOT # 3	
Pad wear limit	6.5 mm (0.26 in)	
Rear brake lining wear limit	2 mm (0.08 in)	
Brake disc maximum deflection	0.15 mm (0.006 in)	
Brake disc minimum thickness	6.5 mm (0.26 in)	
Front brake free play (end of lever)	5.0 ~ 8.0 mm (0.2 ~ 0.3 in)	
Rear brake free play (end of pedal)	20 ~ 30 mm (0.8 ~ 1.2 in)	
Front forks:		
Travel	150 mm (5.91 in)	
Spring free length	606 mm (23.86 in)	
Spring preload length	571 mm (22.48 in)	
Spring rate: 0 ~ 100 mm (0 ~ 3.94 in)	0.475 kg/mm (26.6 lb/in)	
100 ~ 150 mm (3.94 ~ 5.91 in)	0.626 kg/mm (35.1 lb/in)	
Fork oil capacity (each side)	262 cc (9.24 oz)	
Oil type	Yamaha Fork Oil 10 wt or equivalent	
Rear shock absorbers:		
Spring free length	232.5 mm (9.15 in)	
Spring preload length	216.5 mm (8.52 in)	
Spring rate: 0 ~ 55 mm (0 ~ 2.17 in)	1.6 kg/mm (89.6 lb/in)	
55 ~ 80 mm (2.17 ~ 3.15 in)	2.2 kg/mm (123.2 lb/in)	
Travel	80 mm (3.15 in)	

4. Electrical

Ignition timing retarded: Ignition timing advance:	7° at 1,050 r/min 
Spark plug: Electrode gap	NGK BP7ES or ND W22EP 0.7 ~ 0.8 mm (0.023 ~ 0.032 in)
Spark plug cap resistance:	5.0kΩ (No. 1, No. 4), 10kΩ (No. 2, No. 3)
Pick up coil: Resistance	650Ω ± 20% at 20°C (68°F)
Ignition coil type: Spark gap Primary resistance Secondary resistance	HITACHI CM12-09 2.5Ω ± 10% at 20°C (68°F) 11kΩ ± 20% at 20°C (68°F)
Starter motor type: Armature coil resistance Brush length: standard minimum Brush spring pressure Armature mica undercut	ND. ADB4D2 0.014Ω ± 6% at 20°C (68°F) 12.0 mm (0.472 in) 8.5 mm (0.33 in) 800 ± 150 g (28.24 ± 5.30 oz) 0.6 mm (0.024 in)
Battery type: Charging rate	G.S. 12N12A-4A 1.2 Amps for 10 Hours
Generator type: Output Field (inner) coil resistance Stator (outer) coil resistance	HITACHI LD119-08 14V-19A at 5,000 r/min 4.0Ω ± 10% at 20°C (68°F) 0.46Ω ± 10% at 20°C (68°F)
Regulator type: Regulated voltage Allowable amperage	I.C. (S8534) 14.5 ± 0.3V 3A
Starter relay switch: Cut-in voltage	8V
Headlight: Tail/brake light: Flasher light: License light: Pilot lights: Turn High beam Neutral Oil level Meter light	12V, 50W/40W 12V, 8W (3CP)/27W (32 CP) 12V, 27W (32 CP) x 4 12V, 8W (3 CP) x 2 12V, 3.4W x 2 12V, 3.4W x 1 12V, 3.4W x 1 12V, 3.4W x 1 12V, 3.4W x 2

Tightening torque

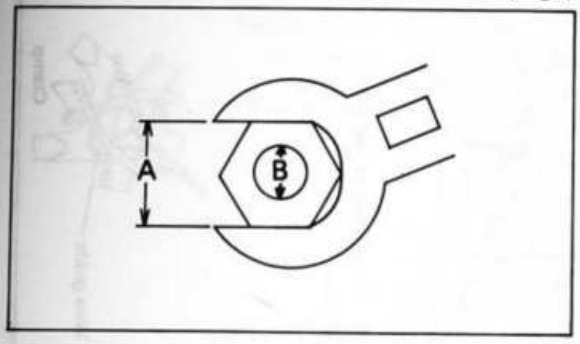
(Unit: m-kg)

Part to be tightened	Part name	Thread size	Q'ty	Tightening torque		Remarks
				m-kg	ft-lb	
ENGINE:						
Cylinder head	Nut	M10 P1.25	12	3.2	23.1	Apply oil.
Cylinder head cover	Bolt	M6 P1.0	12	1.0	7.2	
Spark plug	–	M14 P1.25	4	2.0	14.5	
Cylinder	Nut	M12 P1.25	2	2.2	16	Cam chain case Front & Rear
Cam shaft cap	Bolt	M6 P1.0	20	1.0	7.2	Tighten in 3-stages.
Cam sprocket	Bolt	M7 P1.0	4	2.0	14.5	
Cam chain tensioner	Bolt	M6 P1.0	2	1.0	7.2	
Connecting rod	Nut	M7 P0.75	8	2.5	18.1	
Generator (rotor)	Bolt	M10 P1.25	1	5.5	39.8	
Drain plug	Bolt	M14 P1.5 M8 P1.25	1 1	4.3 2.4	31.0 17.5	Crankcase drain Middle gear case drain.
Oil filter	Bolt	M20 P1.5	1	1.5	11.0	
Pump cover	Screw	M6 P1.0		0.7	5.1	
Strainer cover	Bolt	M6 P1.0	13	1.0	7.2	
Crankcase	Flange Bolt	M8 P1.25 M6 P1.0	12 27	2.4 1.2	17.5 8.7	
Clutch boss	Nut	M20 P1.0	1	7.2	52.0	
Clutch spring screw	Bolt	M6 P1.0	5	1.0	7.2	
Change pedal	Bolt	M6 P1.0	1	1.0	7.2	
Neutral switch	–	M10 P1.25	1	2.0	14.5	
Exhaust pipe	Nut	M6 P1.0	8	1.0	7.2	
SHAFT DRIVE:						
– Middle Gear –						
Drive Shaft	Nut	M34 P1.5	1	11	80.0	Stake.
Mount cover	Screw	M8 P1.25	4	2.5	18.1	Stake.
Driven shaft	Nut	M14 P1.5	1	12	87.0	Use LOCTITE: Stake.
Bearing cap	Flange Bolt	M8 P1.25	4	2.5	18.1	
– Final Gear –						
Drive shaft	Nut	M14 P1.5	1	11	80.0	
Bearing housing	Flange Bolt	M10 P1.25	2	2.3	16.6	
Bearing housing	Nut	M8 P1.25	6	2.3	16.6	
Oil mount screw	Plug	M14 P1.5	1	2.3	16.6	
Oil drain screw	Plug	M14 P1.5	1	2.3	16.6	
Bearing retainer	–	M65 P1.5	1	11	80.0	Left hand screw
CHASSIS:						
Engine Mounting Bolt — Front, upper	Nut	M10 P1.25	1	4.2	30.4	
Engine Mounting Bolt — Front, under	Bolt	M10 P1.25	2	4.2	30.4	
Engine Mounting Bolt — Rear	Nut	M12 P1.25	1	7.0	50.6	

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

General Torque Specifications

This chart specifies torque for standard fasteners with standard I.S.O. pitch threads. Torque specifications for special components or assemblies are included in the applicable sections of this book. To avoid warpage, tighten multi-fastener assemblies in a criss-cross fashion, in progressive stages, until full torque is reached. Unless otherwise speicfied, torque specifications call for clean, dry threads. Components should be at room temperature.



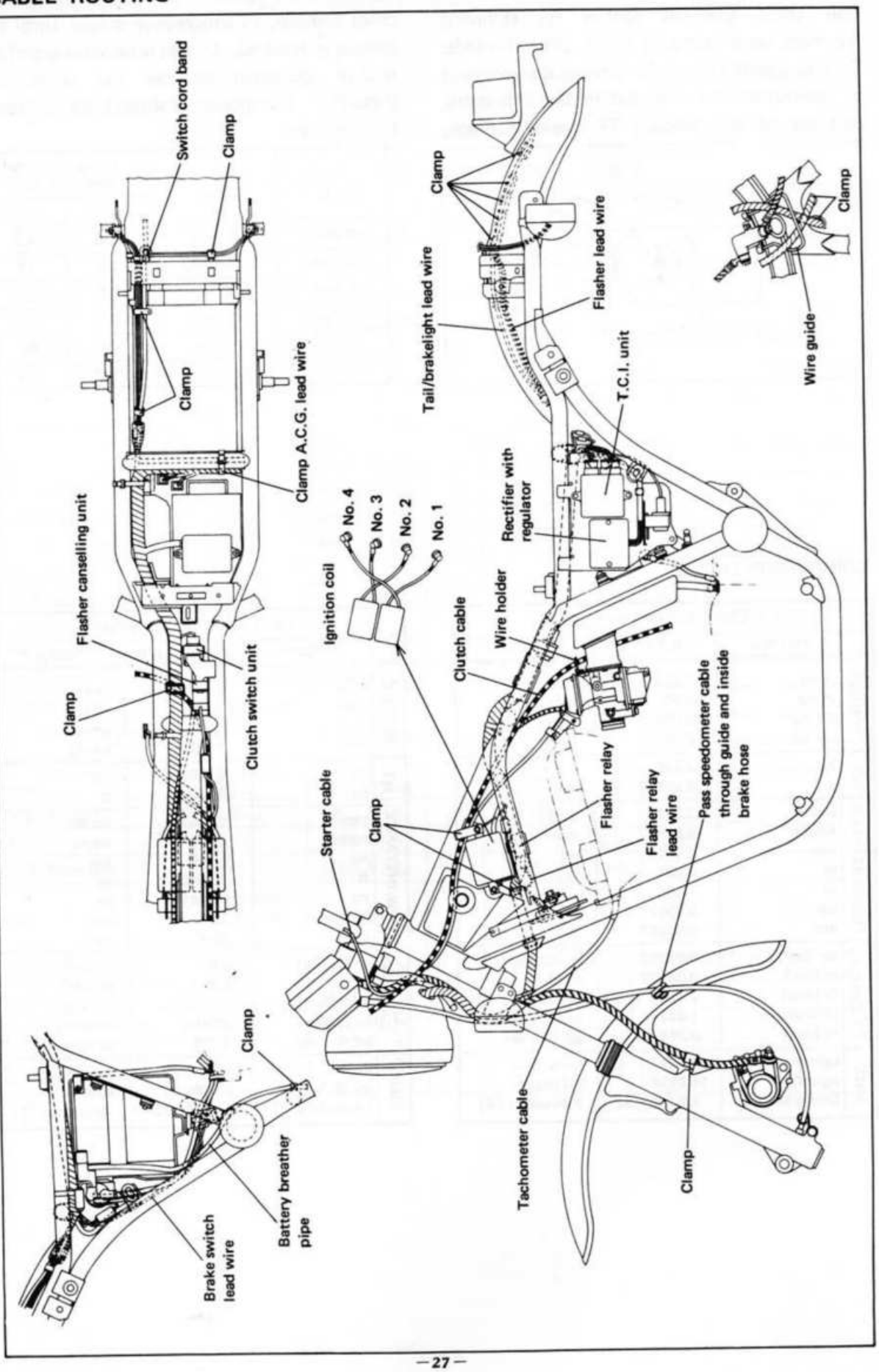
A (Nut)	B (Bolt)	General torque specifications	
		m-kg	ft-lb
10 mm	6 mm	0.6	4.5
12 mm	8 mm	1.5	11
14 mm	10 mm	3.0	22
17 mm	12 mm	5.5	40
19 mm	14 mm	8.5	51
22 mm	16 mm	13.0	94

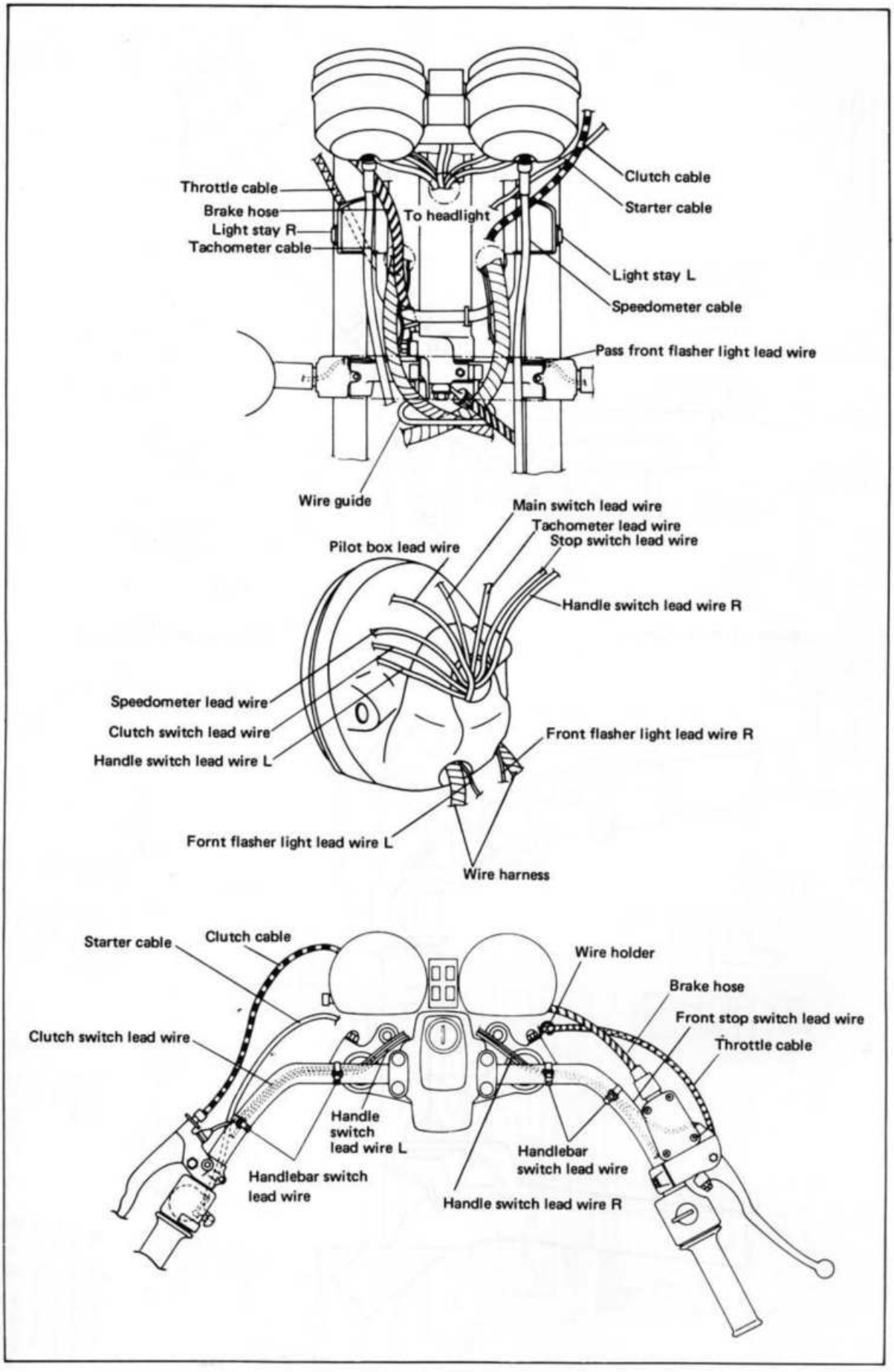
CONVERSION TABLES

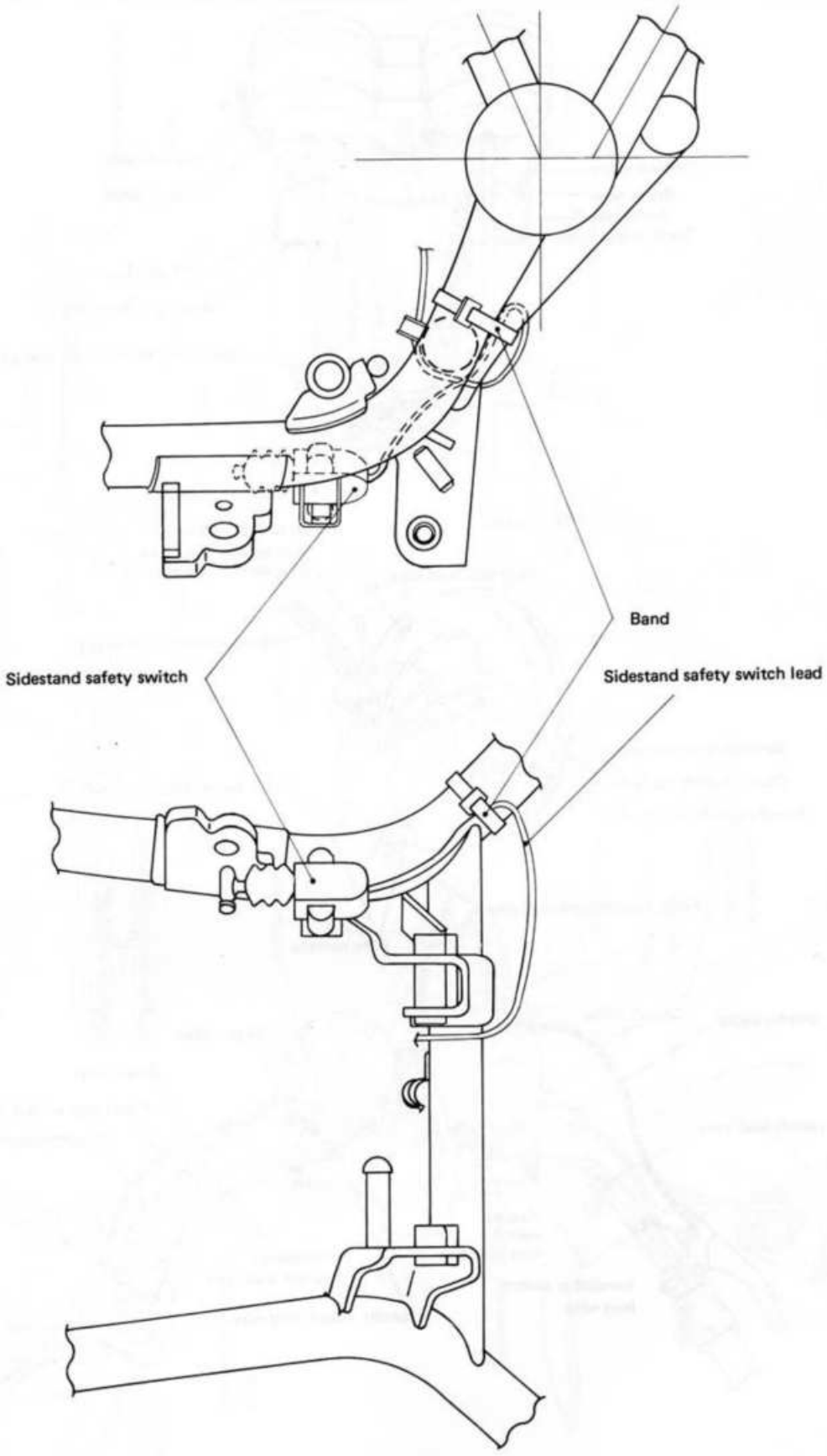
	METRIC TO INCH SYSTEM		
	KNOWN	MULTIPLIER	RESULT
TORQUE	m-kg	7.233	ft-lb
	m-kg	86.80	in-lb
	cm-kg	0.0723	ft-lb
	cm-kg	0.8680	in-lb
WT	kg	2.205	lb
	g	0.03527	oz
FLOW/DISTANCE	km/lit	2.352	mpg
	km/hr	0.6214	mph
	km	0.6214	mi
	m	3.281	ft
	m	1.094	yd
	cm	0.3937	in
	mm	0.03937	in
VOL/CAPACITY	cc (cm^3)	0.03382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

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

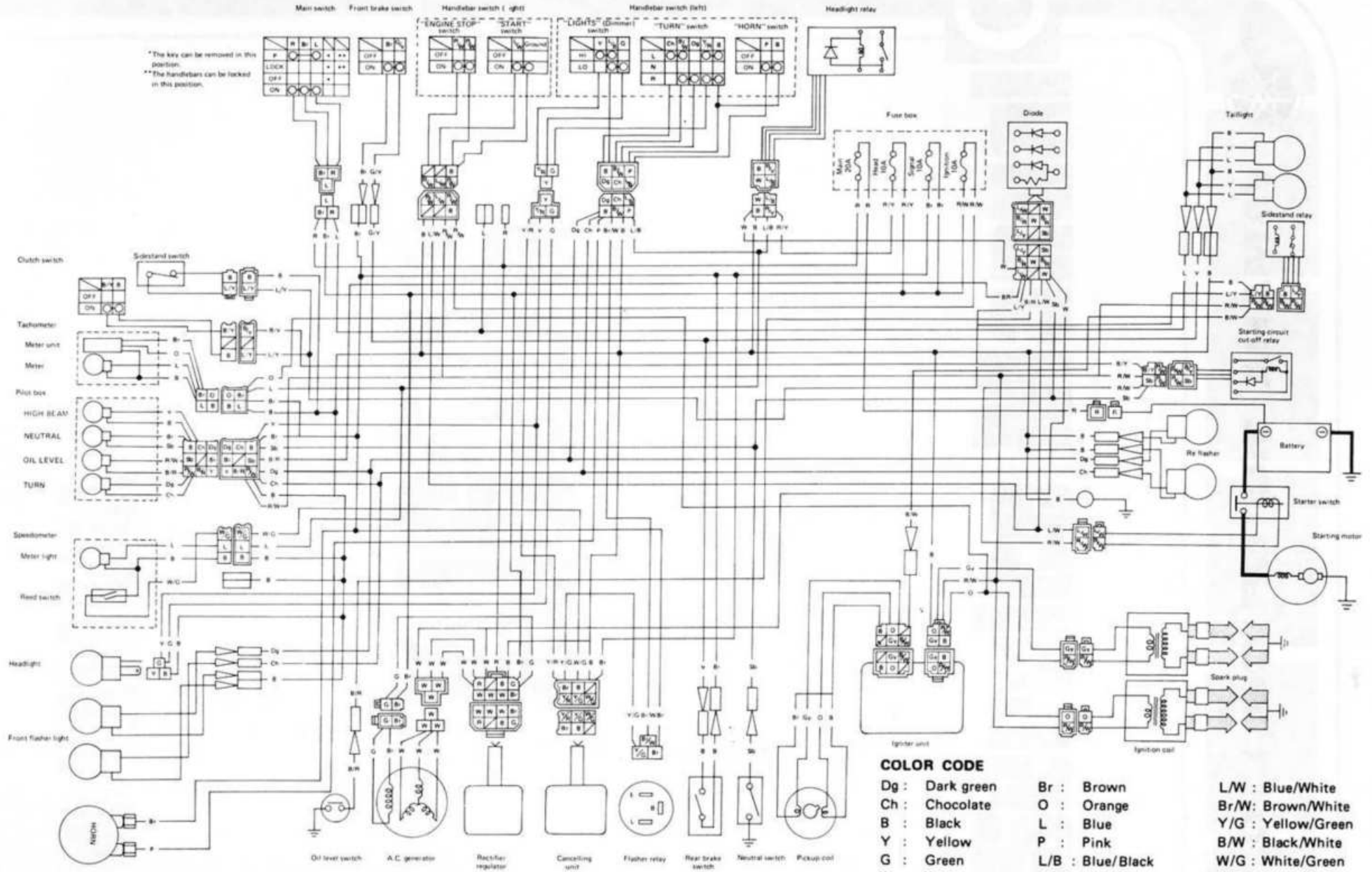
CABLE ROUTING




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


Band
Sidestand safety switch
Sidestand safety switch lead

XJ650J WIRING DIAGRAM



COLOR CODE

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