



YAMAHA

XJ650RJ

**Supplementary
Service Manual**

J

FOREWORD

This Supplementary Service Manual has been prepared to introduce new service and new data for the XJ650RJ. For complete information on service procedure, it is necessary to use this Supplementary Service Manual together with following manuals:

| |
|---|
| 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 XJ650RJ. 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 there is any question about a service procedure it is imperative that you contact a Yamaha dealer before continuing. Before attempting any service, check with your 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 further 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.

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

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

CAUTION: A CAUTION indicates special 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

XJ650RJ 5V2-0000101



MAINTENANCE AND LUBRICATION CHART

Periodic Maintenance Emission Control System

| No. | Item | Remarks | INITIAL BREAK-IN | | THEREAFTER EVERY | |
|-----|------------------------------|--|------------------------------------|---------------------------------------|---------------------------------------|---|
| | | | 1,000 km or 1 month (600 mi) | 5,000 km or 7 months (3,000 mi) | 4,000 km or 6 months (2,500 mi) | 8,000 km or 12 months (5,000 mi) |
| 1.* | Cam Chain | Adjust chain tension. | ○ | ○ | | ○ |
| 2.* | Valve clearance | Check and adjust valve clearance when engine is cold. | | ○ | | ○ |
| 3. | Spark Plug | Check condition. Adjust gap. Clean. Replace after initial 13,000 km (8,000 mi) or 18 months and thereafter every 12,000 km (7,500 mi) or 18 months | | ○ | ○ | Replace every 12,000 km (7,500 mi) or 18 months |
| 4.* | Crankcase Ventilation System | Check ventilation hose for cracks or damage. Replace if necessary. | | ○ | | ○ |
| 5.* | Fuel Line | Check fuel hose (and vacuum pipe) for cracks or damage. Replace if necessary. | | ○ | | ○ |
| 6.* | Exhaust System | Check for leakage. Retighten as necessary. Replace gasket(s) if necessary. | | ○ | ○ | |
| 7.* | Idle Speed | Check and adjust engine idle speed. Adjust cable free play if necessary. | | ○ | ○ | |
| 8.* | Carburetor Synchronization | Adjust synchronization of carburetors. | | ○ | ○ | |

*It is recommended that these items be inspected and service by a Yamaha Dealer or other qualified mechanic.

General Maintenance/Lubrication

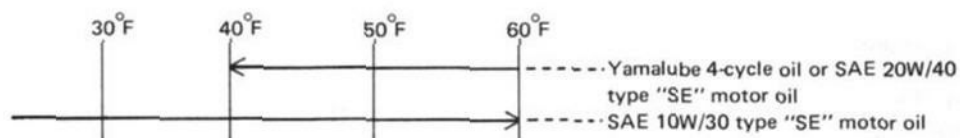
| No. | Item | Remarks | Type | INITIAL BREAK-IN | | THEREAFTER EVERY | | |
|-----|-------------------------|--|---|------------------------------------|---------------------------------------|---------------------------------------|--|--|
| | | | | 1,000 km or 1 month (600 mi) | 5,000 km or 7 months (3,000 mi) | 4,000 km or 6 months (2,500 mi) | 8,000 km or 12 months (5,000 mi) | 16,000 km or 24 months (10,000 km) |
| 1. | Engine Oil | Warm-up engine before draining | Refer to NOTE | ○ | ○ | ○ | | |
| 2. | Oil Filter | Replace | — | ○ | ○ | | ○ | |
| 3.* | Air Filter | Clean with compressed air. Refer to NOTE: | — | | ○ | | ○ | |
| 4.* | Brake System | Adjust free play. Replace pads if necessary. (Front) Replace shoes if necessary. (Rear) | — | ○ | ○ | ○ | | |
| 5.* | Clutch | Adjust free play. | — | ○ | ○ | ○ | | |
| 6. | Final Gear Oil | Replace | SAE 80 API "GL-4" Hypoid gear oil | ○ | | | ○ | |
| 7. | Control and Meter Cable | Apply chain lube thoroughly | Yamaha chain and cable lube or SAE 10W/30 motor oil | ○ | ○ | ○ | | |

| No. | Item | Remarks | type | INITIAL BREAK-IN | | THEREAFTER EVERY | | | |
|------|---------------------------------------|--|--|------------------------------------|---------------------------------------|---------------------------------------|--|--|---------|
| | | | | 1,000 km or 1 month (600 mi) | 5,000 km or 7 months (3,000 mi) | 4,000 km or 6 months (2,500 mi) | 8,000 km or 12 months (5,000 mi) | 16,000 km or 24 months (10,000 mi) | |
| 8.* | Rear Arm Pivot | Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi) | Medium weight wheel bearing grease | | | | | | Repack |
| 9. | Center and Side stand Pivots | Apply lightly. | Yamaha chain and cable lube or SAE 10W/30 motor oil | | ○ | ○ | | | |
| 10.* | Front Fork Oil | Drain completely. Refill to specification. | Yamaha fork oil 10 Wt or equivalent | | | | | ○ | |
| 11.* | Steering Ball Bearing and Races | Check bearings assembly for looseness. Moderately repack every 16,000 km (10,000 mi) | Medium weight wheel bearing grease | | ○ | ○ | | | Repack |
| 12.* | Wheel Bearings | Check bearings for smooth rotation. Replace if necessary. | — | | ○ | ○ | | | |
| 13.* | Battery | Check specific gravity. Check breather pipe for proper operation. | — | | ○ | ○ | | | |
| 14. | Change/Brake Pedal Shaft Pivot | Apply lightly. | Yamaha chain and cable lube or SAE 10W/30 motor oil. | | ○ | ○ | | | |
| 15.* | 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 |
| 16. | Brake/Clutch Lever Pivot Shaft | Apply lightly | Yamaha chain and cable lube or SAE 10W/30 motor oil. | | ○ | ○ | | | |

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

NOTE:

1) Engine oil type



2) Air Filter

The air filter should be cleaned more often than specified intervals if the machine is operated in extremely dust areas.

NEW SERVICE

* ENGINE

ENGINE REMOVAL

NOTE:

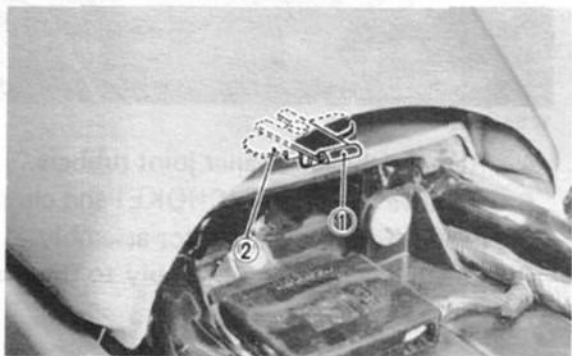
It is not necessary to remove the engine in order to remove the cylinder head, cylinder, or pistons.

A. Preparation for Removal

1. All dirt, mud, dust and foreign material should be thoroughly removed from the exterior of the engine before removal and disassembly. This will help keep harmful foreign material from the engine oil.
2. Before the engine removal and disassembly, be sure that you have the proper tools and cleaning equipment so that you can perform a clean and efficient job.
3. During disassembly of the engine, clean and place all of the parts in trays in order of disassembly. This will speed up assembly time and help insure correct reinstallation of all the engine parts.
4. Place the motorcycle on its center stand. Start the engine and allow it to warm up. Stop the engine and drain the engine and middle gear oil.
5. Remove the oil filter element from the crankcase.
6. Remove the left and right side covers.

B. Fuel Tank

1. Turn the fuel cock to "ON".
2. Open the seat and remove the fuel tank securing clamp and retainer. Lift the rear end of the fuel tank and disconnect the fuel pipe and vacuum pipe from the cock.

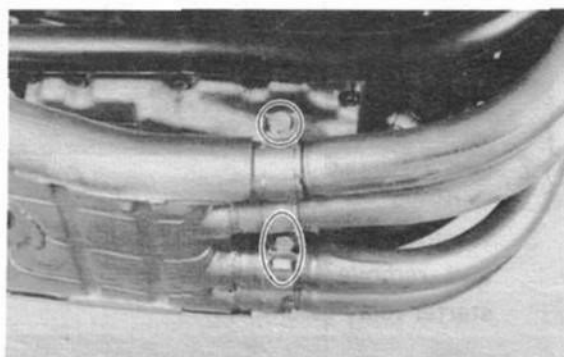


1. Clip 2. Retainer

3. Remove the tool tray.

C. Brake Pedal and Exhaust Pipe

1. Remove the rear brake pedal.
2. Remove the exhaust pipe holding nuts from the cylinder head.
3. Loosen the clamp bolts securing the exhaust pipes to the right and left mufflers. Remove the exhaust pipes.



4. Remove the bolts holding the muffler bracket to the crankcase.



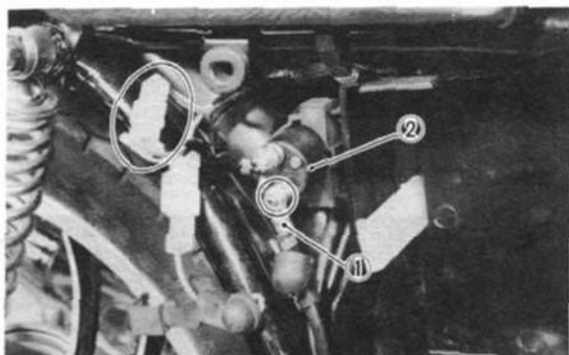
D. Battery Case

1. Remove the negative battery cable from the battery terminal then remove the positive battery plate. Remove the battery.



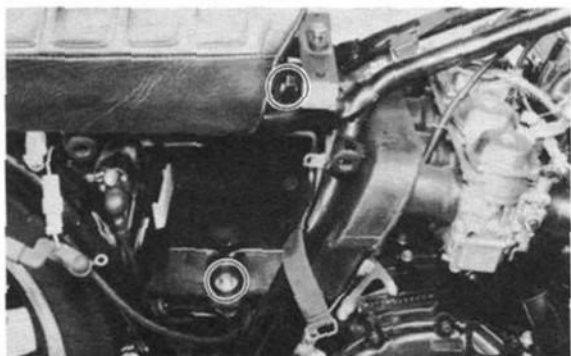
1. Positive battery plate

2. Remove the starter motor lead wire from the starter relay and disconnect the relay leads from the wire harness.



1. Starter motor lead wire
2. Starter relay

3. Remove the battery case holding bolts and remove the battery case with the starter relay assembly.



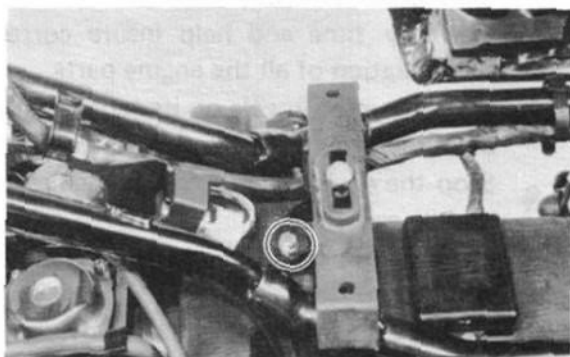
E. Air Cleaner Case

1. Remove the ignitor unit mounting board securing screw and disconnect all connectors. Remove the board assembly.
2. Remove the clamps holding the carburetors to the air cleaner case and intake manifolds. Remove the crankcase ventilation hose at the air cleaner case.



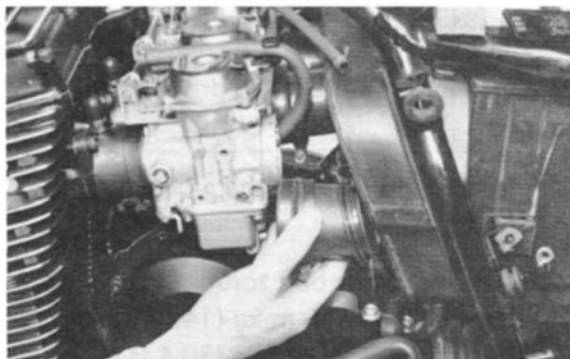
1. Crankcase ventilation hose

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



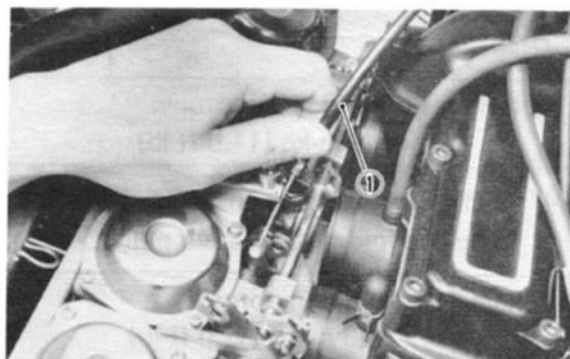
1. Engine ground wire

4. Remove the air cleaner joint rubbers.
5. Remove the starter (CHOKE) and clutch cables from the carburetor assembly.
6. Pull the carburetor assembly to the rear.



1. Starter (CHOKE) cable
2. Clutch cable

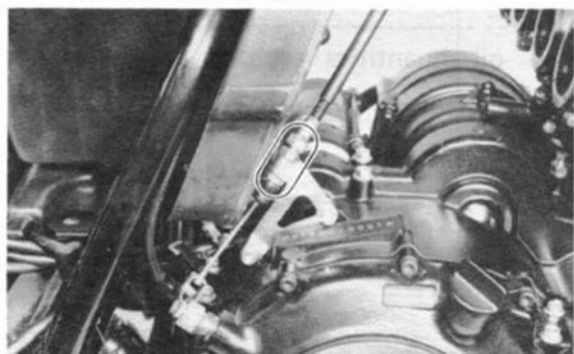
7. Disconnect the throttle cable from the carburetor throttle lever and remove the carburetor assembly to the right.



1. Throttle cable

F. Wiring and Cables

1. Disconnect the clutch cable at the crank-case side.
2. Remove the spark plug lead wires and the tachometer cable.

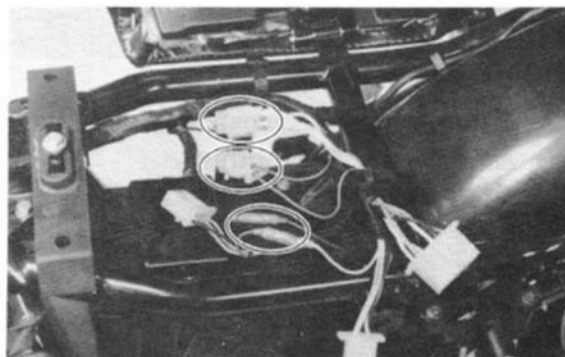


3. Disconnect the pick-up coil and A.C.G. lead wire couplers.

Position the disconnected wires so they will not be damaged during engine removal.

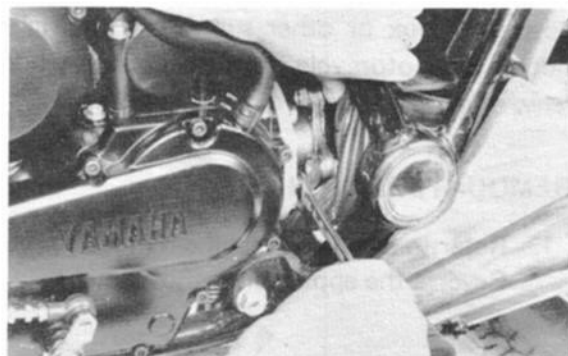
CAUTION:

The A.C.G. lead, starter cable, and pick-up lead are clamped at the upper cross tube of the frame. Do not forget to remove this clamp before removing the engine.



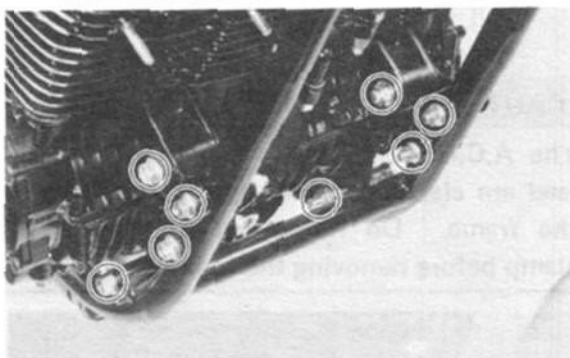
G. Drive Shaft Joint

1. Remove the coil spring holding the rubber boot.
2. Pull the rubber boot from the drive shaft coupling to expose the joint bolts.
3. Remove the joint bolts on the drive shaft coupling.



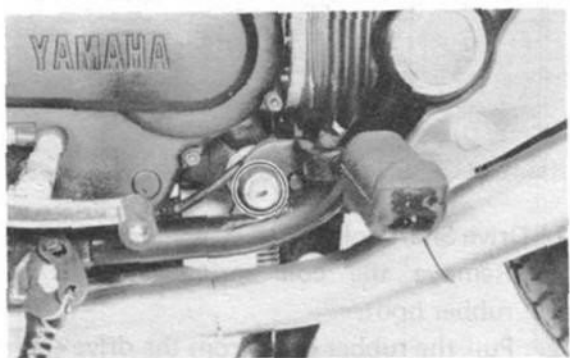
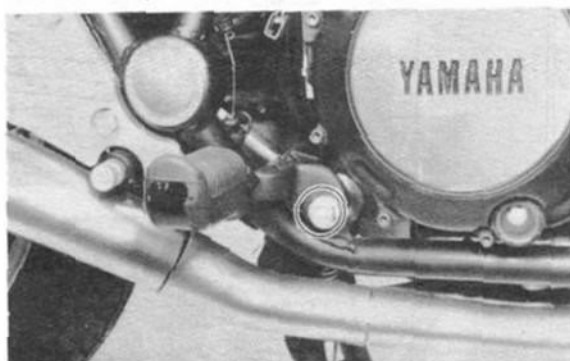
I. Engine Removal

1. Remove the front engine mounting bolts and nuts. Remove the brackets.



1. Front engine mounting bolts

2. Remove the rear engine mounting bolts and right and left footrests.



3. Slide the engine forward slightly and remove the engine to the right.

NOTE:

Position a box or other support to the right side of the motorcycle for the assistance when removing the engine.

REMOUNTING ENGINE

1. Refer to page 3 for engine removal. Reverse the applicable removal steps.

CAUTION:

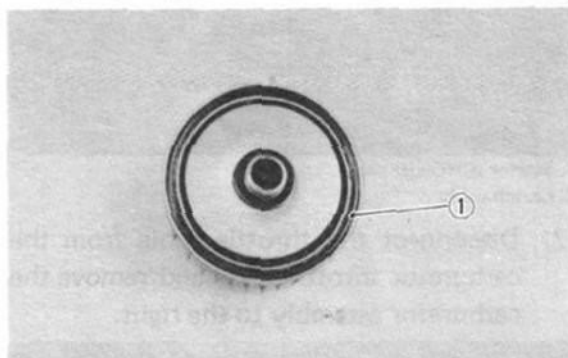
Always use new bolts in the drive shaft coupling.

2. Install and tighten the engine mounting bolts.

Engine mounting bolt torque:

| | |
|-------------|-----------------------|
| 8 mm bolt: | 2.0 m-kg (14.5 ft-lb) |
| 10 mm bolt: | 4.2 m-kg (30.4 ft-lb) |
| 12 mm bolt: | 7.0 m-kg (50.6 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

Oil filter mounting bolt torque:

1.5 m-kg (11.0 ft-lb)

4. Install and tighten the engine oil drain plug and middle gear drain plug.

Engine oil drain plug torque:

4.3 m-kg (31.0 ft-lb)

Middle gear drain plug torque:

2.4 m-kg (17.5 ft-lb)

5. Add oil to the engine and middle gear case.

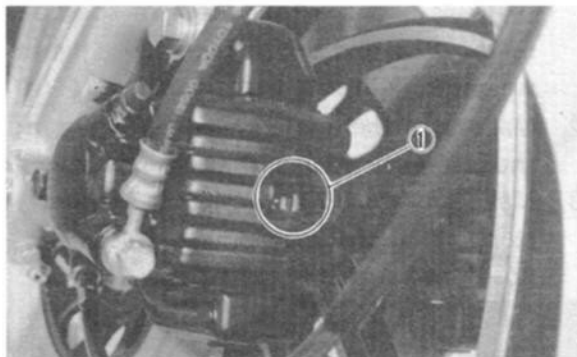
Oil quantities: 3.6 l (3.8 US. qt.)

NOTE:

The oil quantities are for an overhauled engine.

A. Front Brake Pad Check

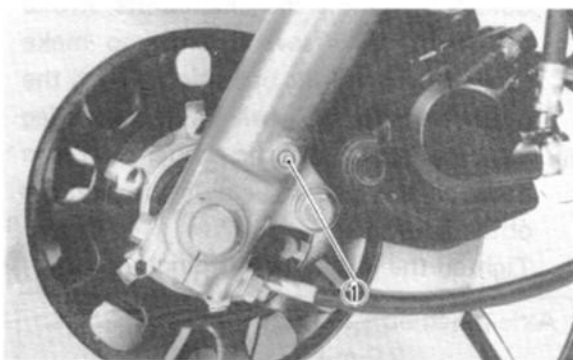
To check pad wear, open the wear indicator cap. If any pad is worn to the red line, replace both pads in the caliper.



1. Wear indicator

B. Front Fork Oil Change

1. Raise the motorcycle or remove the front wheel so that there is no weight on the front end of the motorcycle. Remove the handlebar if necessary.
2. Remove the rubber cap from the top of each fork.
3. The spring seat and fork spring are retained by a stopper ring (spring wire circlip). It is necessary to depress the spring seat and fork spring to remove the stopper ring. Remove the stopper ring by carefully prying out one end with a small screwdriver.
4. Place an open container under each drain hole. Remove the drain screw from each outer tube.



1. 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.

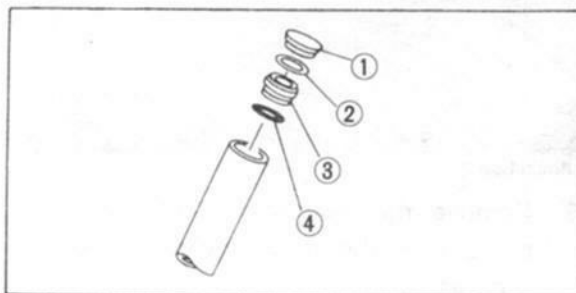
5. When most of the oil has drained, slowly raise and lower the outer tubes to pump out the remaining oil. It may be necessary to remove the spring seat and top spring to keep them from falling out when raising fork tubes.
6. Inspect the drain screw gasket. Replace if damaged. Reinstall the drain screw.
7. Pour the specified amount of oil into the fork inner tube.

Front fork oil (each fork):

236 cc (7.98 US oz)

Recommended oil:

YAMAHA FORK OIL 10Wt or equivalent.



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

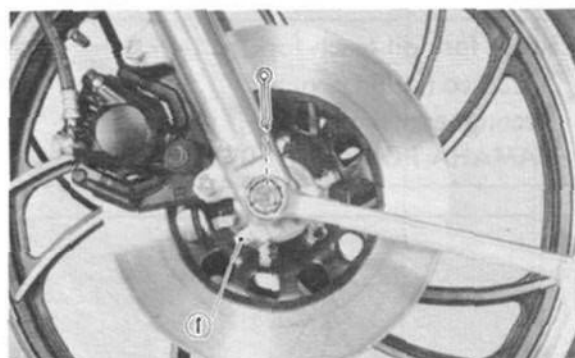
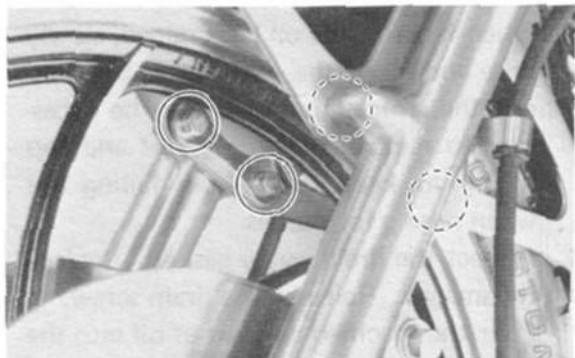
8. After filling, slowly pump the forks up and down to distribute the oil.
9. Inspect the "O-ring" on the spring seat. Replace "O-ring" if damaged.
10. Reinstall the spring seat, stopper ring and rubber cap.

CAUTION:

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

C. 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. Loosen the left and right pinch bolts securing the axle.



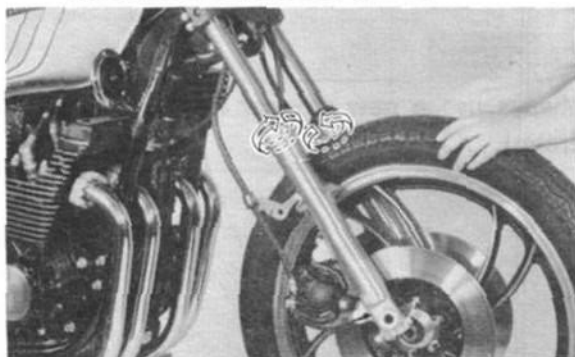
1. Pinch bolt

5. Remove the axle shaft. 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.

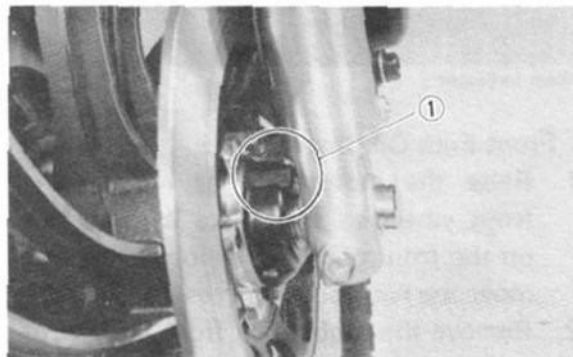
6. Lower the wheel until the brake discs come off the calipers. Turn the calipers outward so they do not obstruct the wheel and remove the wheel.



D. Installing Front Wheel

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

1. Lightly grease the lips of the front wheel oil seals and the gear teeth of speedometer drive and driven gears. Use light-weight lithium soap base grease.
2. Make sure there is enough gap between the disc pads to slide the disc into place.
3. Make sure the projecting portion (torque stopper) of the speedometer housing is positioned correctly.



1. Torque stopper

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

Axle nut torque:

10.7 m-kp (77.4 ft-lb)

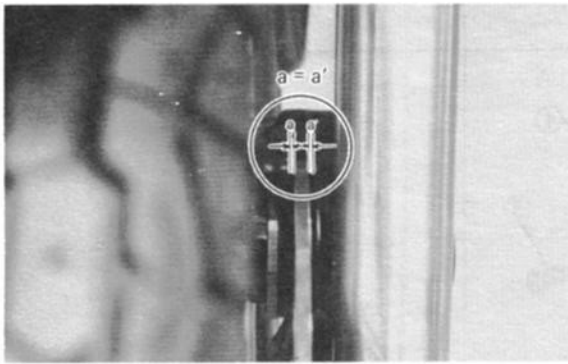
NOTE:

Tighten the pinch bolts temporarily before tightening the axle nut.

5. Install the front fender.
6. Before tightening the pinch bolts, stroke the front forks several times to make sure of proper fork operation. With the pinch bolts loose, work the left fork leg back and forth until the proper clearance between the disc and caliper bracket are obtained.
7. Tighten the left and right pinch bolts.

Axle pinch bolt torque:

2.0 m-kp (14.5 ft-lb)



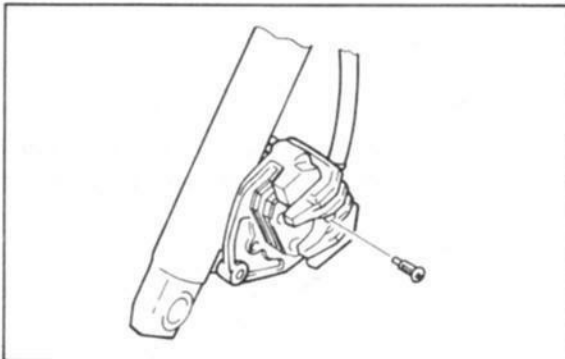
E. Caliper Pad Replacement

CAUTION:

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

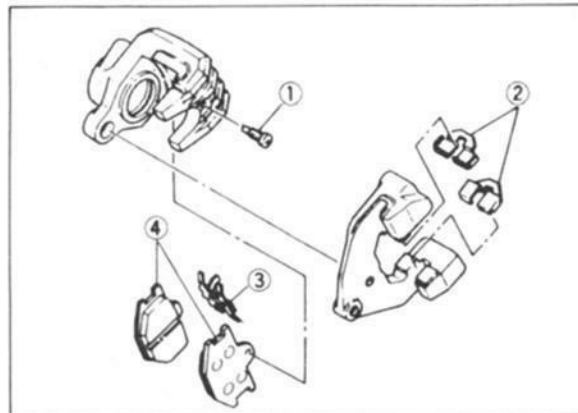
It is not necessary to disassemble the brake caliper and brake hose to replace the brake pads.

1. Remove the front fender and front wheel.
2. Remove the Phillips screw that holds the brake pads.



3. Pull the caliper cylinder out of the caliper frame.
4. Install new brake pads. Always replace pad as a set. Replace the following when pads are replaced.

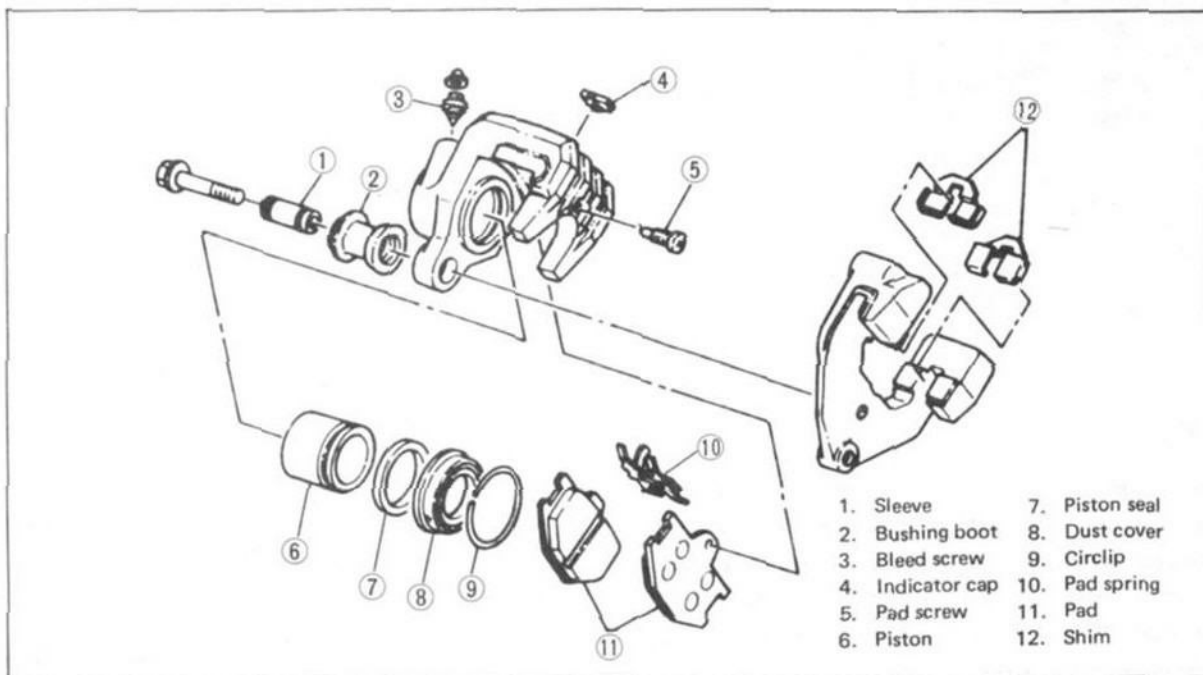
- a. Pad screw
- b. Shims
- c. Pad spring
- d. Pads



1. Pad screw
2. Shim
3. Pad spring
4. Pad

5. Lightly grease the surfaces of the shim and of the pad spring where they contact the pad.

F. Caliper Disassembly



1. Remove the caliper brake hose. Allow fluid in the caliper assembly to drain into a container.
2. Place the open hose end into the container and pump the old fluid out carefully.
3. Remove the caliper support bolt and the pad securing screw as described in the Caliper Pad Replacement procedure (Page 9).
4. Remove the caliper assembly from the caliper frame.
5. Remove the retaining ring and the dust seal.
6. Remove the piston.

CAUTION:

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

7. Remove the piston seal.

G. Brake Inspection and Repair

Recommended Brake Component Replacement Schedule:

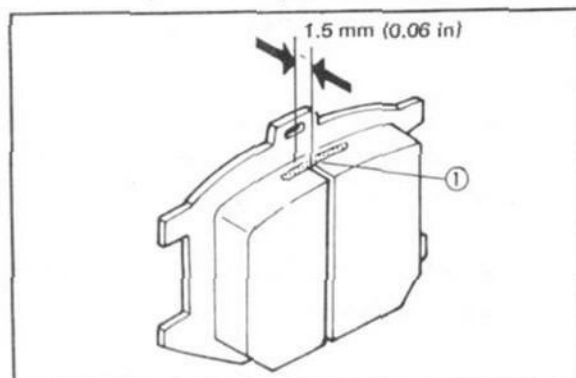
Brake pads; As required
 Piston seal, dust seal; Every two years
 Brake hoses; Every four years
 Brake fluid; Replace only when brakes are disassembled

1. Replace the caliper piston if it is scratched.
2. Replace any brake pad worn beyond limits. Always replace the brake pads as a set.

Wear limit:

1.5 mm (0.06 in)

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



1. Wear limit

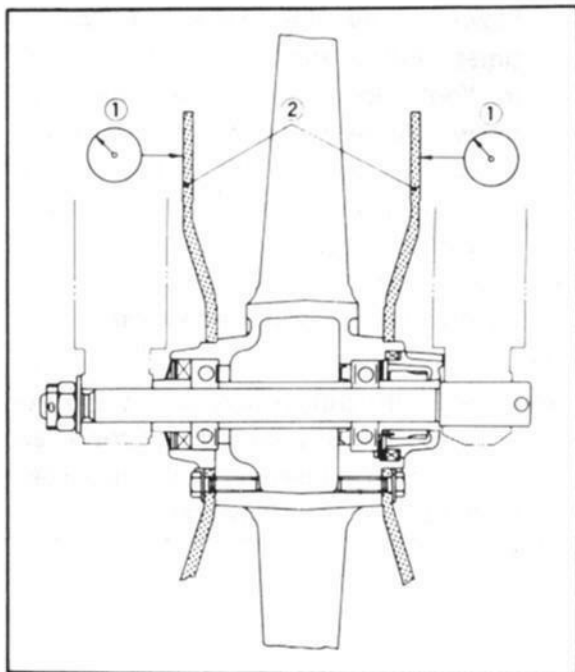
3. Replace piston and dust seals if damaged. Replace seals every two years.
4. Inspect master cylinder body. Replace if scratched. Clean all passages with new brake fluid.
5. Inspect the brake hoses. Replace every four years or immediately if cracked, frayed, or damaged.
6. Check for wear and deflection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

Maximum deflection:

0.15 mm (0.006 in)

Minimum disc thickness:

4.5 mm (0.18 in)



1. Dial gauge 2. Disc

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

H. Brake Reassembly

1. All internal parts should be cleaned in new brake fluid only. Internal parts should be lubricated with brake fluid when installed.
2. Caliper Reassembly

Replace the following parts whenever a caliper is disassembled: bleed screw and cap, boot bushing, piston seal, dust seal, and retaining ring.

 - a. Install the piston seal and piston. Place the caliper cylinder into the caliper

frame.

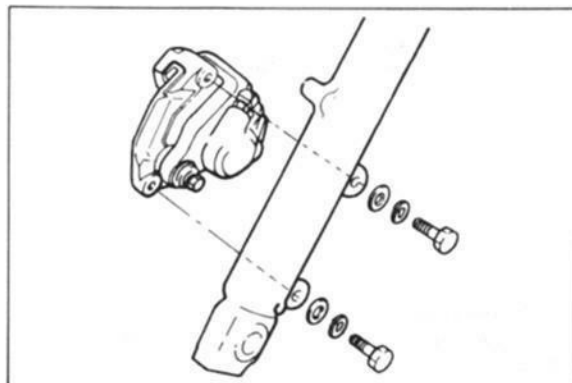
- b. Install the pad spring, shims and pads.
- c. Apply a thread locking compound such as "LOCTITE" to the support bolt.
- d. Install the caliper assembly on the front fork.

Support bolt (caliper cylinder) torque:

1.8 m-kg (13.0 ft-lb)

Support bolt (caliper bracket) torque:

2.6 m-kg (18.8 ft-lb)



3. Attach the brake hoses.

Brake hose torque:

2.6 m-kg (18.8 ft-lb)

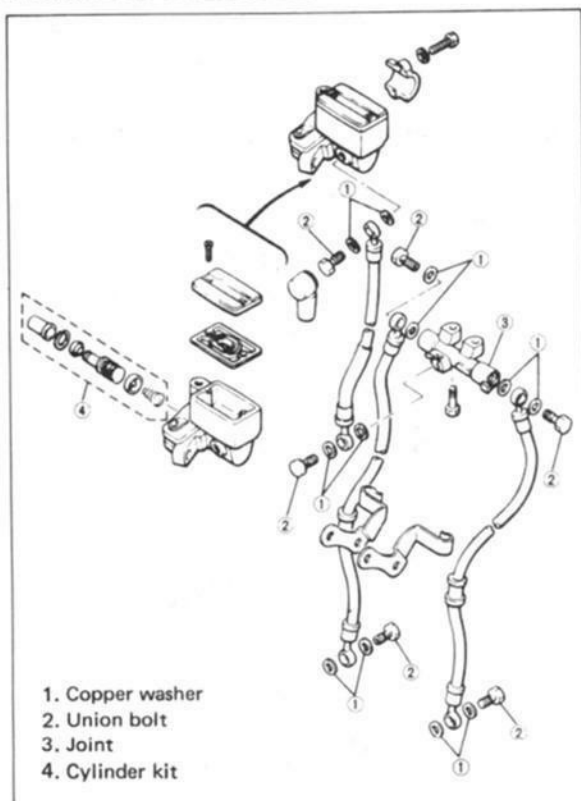
4. Master-cylinder reassembly

Reassemble master cylinder as shown in illustration.

Brake hose torque: (all brake union bolts)

2.6 m-kg (18.8 ft-lb)

I. MASTER CYLINDER



5. Brake disc assembly

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

Disc bolt torque:
20 m-kg (14.5 ft-lb)

J. Air Bleeding

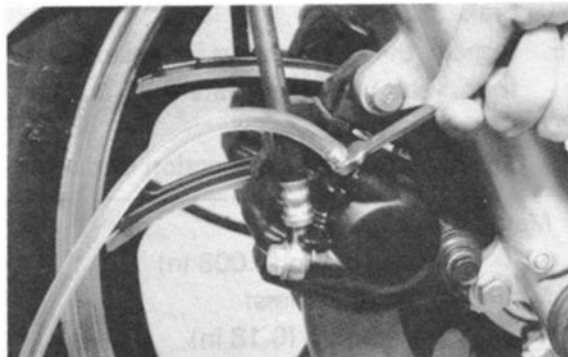
WARNING:

If the brake system is disassembled or if any brake hose has been loosened or removed, the brake system must be bled to remove air from the brake fluid. If the brake fluid level is very low or brake operation is incorrect, bleed the brake system.

Failure to bleed the brake system properly can result in a dangerous loss of braking performance.

- a. Add proper brake fluid to the reservoir. Install the diaphragm, being careful not to spill or overflow the reservoir.

- b. Connect the clear plastic tube of 4.5 mm (3/16 in) inside diameter tightly to the caliper bleed screw. Put the other end of the tube into a container.



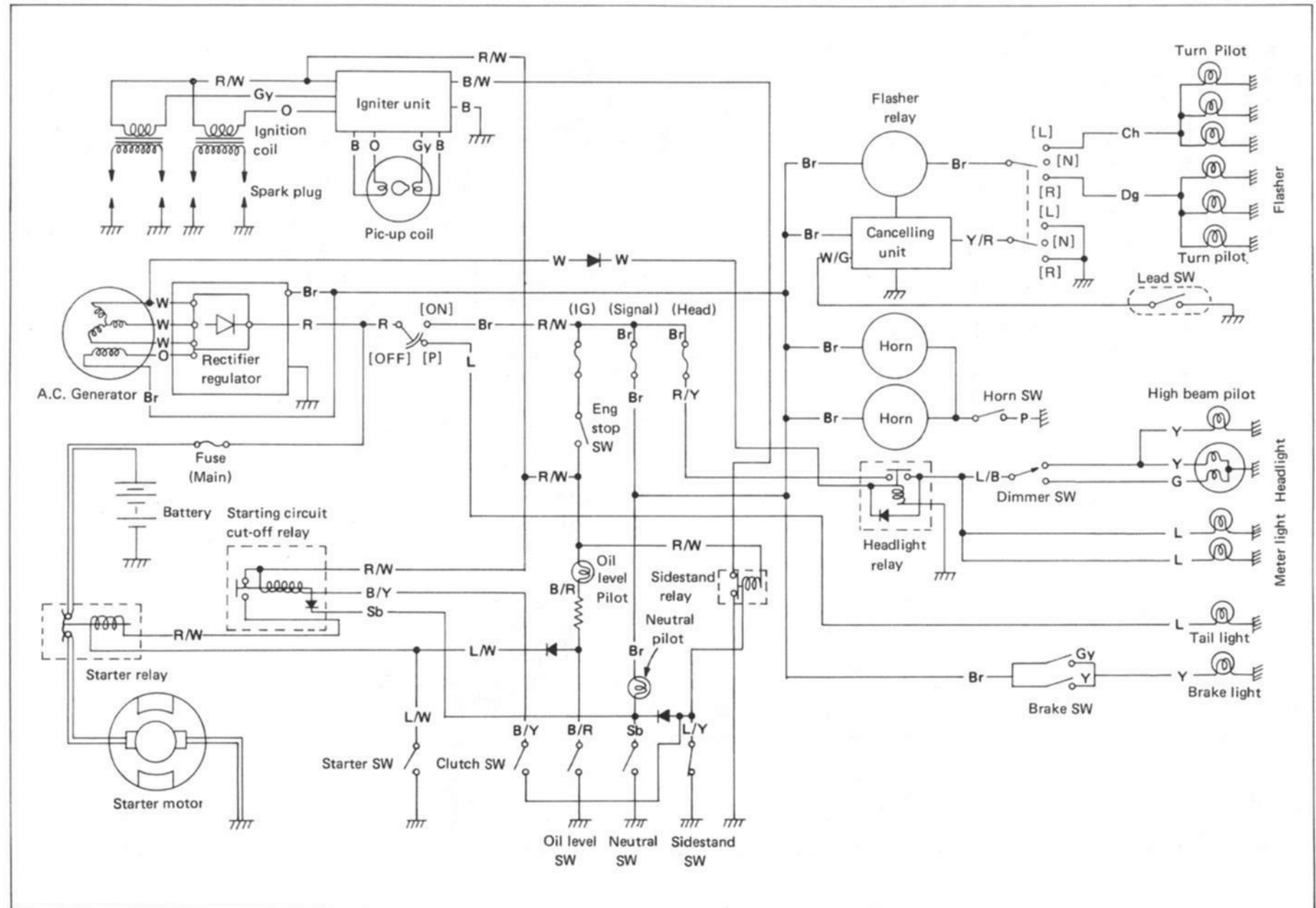
- c. Slowly apply the brake lever several times. Pull in the lever. Hold the lever in "on" position. Loosen the bleed screw. Allow the lever to travel slowly toward its limit. When the limit is reached, tighten bleed screw. Then release the lever.
- d. Repeat step "c" procedure until all air bubbles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

NOTE:

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

* ELECTRICAL

XJ650RJ CIRCUIT DIAGRAM



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).

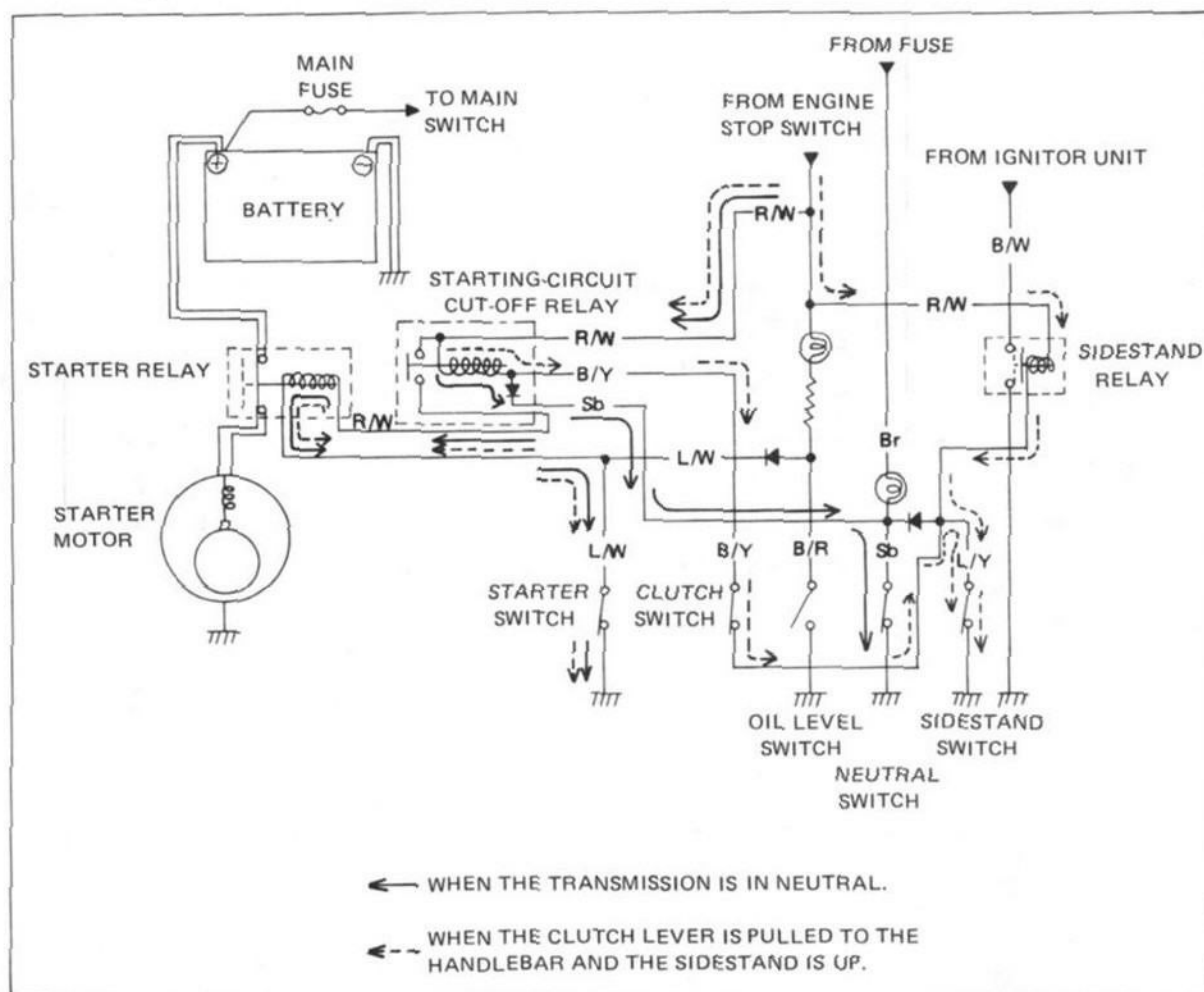
The starting-circuit cut-off relay prevents the

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.

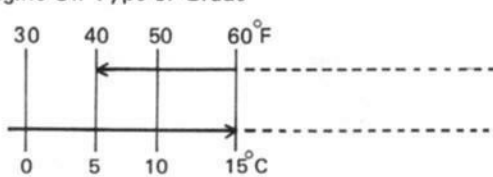
A. Sidestand Relay

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.



SPECIFICATIONS

I. GENERAL SPECIFICATIONS

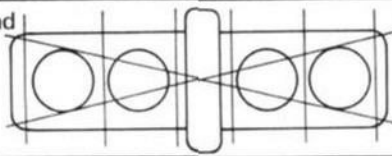
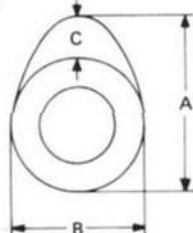

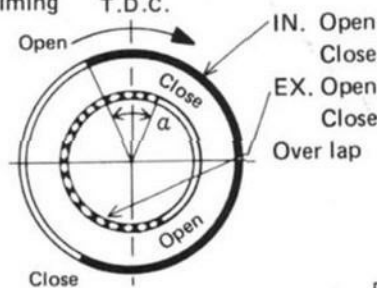
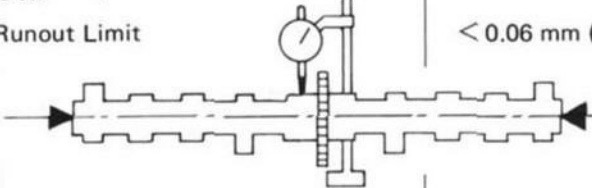
| | | |
|-----|---|--|
| 1. | Model Code Number | 5V2 |
| 2. | Federal V.I.N. Number | JYA5N800*CA000101 |
| 3. | Frame Starting Number | 5V2-0000101 |
| 4. | Engine Starting Number | 5V2-0000101 |
| 5. | Dimensions: | |
| a. | Overall length | 2,170 mm (85.4 in) |
| b. | Overall Width | 730 mm (28.7 in) |
| c. | Overall Height | 1,130 mm (44.5 in) |
| d. | Seat Height | 780 mm (30.7 in) |
| e. | Wheelbase | 1,435 mm (56.5 in) |
| f. | Minimum Ground Clearance | 140 mm (5.5 in) |
| 6. | Weight: | |
| a. | With Oil and Full Fuel Tank | 227 kg (500 lb) |
| b. | Engine Dry Weight | 95 kg (209 lb) |
| 7. | Minimum Turning Radius | 2,400 mm (94.5 in) |
| 8. | Engine: | |
| a. | Engine Type | D.O.H.C., air-cooled, gasoline |
| b. | Cylinder Arrangement | Forward-incline, parallel 4-cylinder |
| c. | Displacement | 653 cc (39.85 cu.in) |
| d. | Bore x Stroke | 63.0 x 52.4 mm (2.480 x 2.063 in) |
| e. | Compression Ratio | 9.2 : 1 |
| f. | Compression Pressure | 9.5 ~ 11 kg/cm ² (135 ~ 156 psi) |
| g. | Starting System | Electric |
| 9. | Lubrication System | Pressure lubricated, Wet sump |
| 10. | Engine Oil Type or Grade | |
| |  | Yamalube 4-cycle oil SAE 20W/40 type "SE" motor oil SAE 10W/30 type "SE" motor oil |
| 11. | Engine Oil Capacity | |
| a. | Periodic Oil Change | 2.65 lit (2.80 US. qt) |
| b. | Oil Filter Replacement | 2.95 lit (3.12 US. qt) |
| c. | Total Amount | 3.5 lit (3.70 US. qt) |
| 12. | Middle/Final Gear Oil | |
| a. | Grade or Type | SAE 80 API "GL-4" Hypoid gear oil |
| b. | Final Gear Case Oil Amount | 0.2 lit (0.21 US. qt) |
| 13. | Air Filter | Dry type element |

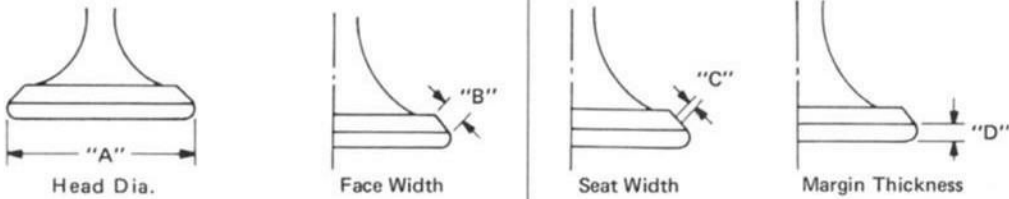
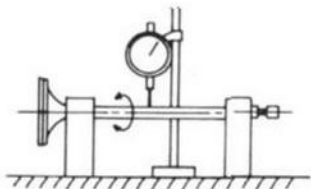
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|-----|--|-----|--------------------------------------|
| 14. | Fuel | | |
| a. | Type | | Regular gasoline |
| b. | Tank Capacity | | 19.5 lit (5.2 US. gal) |
| c. | Reserve Amount | | 3.8 lit (1.0 US. gal) |
| 15. | Carburetor | | |
| a. | Type | | HSC32 |
| b. | Manufacturer | | HITACHI |
| 16. | Spark Plug | | |
| a. | Type | | BP7ES, W22EP |
| b. | Manufacturer | | (NGK) (ND) |
| c. | Gap | | 0.7 ~ 0.8 mm (0.023 ~ 0.032 in) |
| 17. | Clutch Type | | Wet, multiple disc |
| 18. | Transmission: | | |
| a. | Primary Reduction System | | Gear |
| b. | Primary Reduction Ratio | | 97/58 (1.672) |
| c. | Secondary Reduction System | | Shaft drive |
| d. | 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) |
| e. | Transmission Type | | Constant mesh, 5-speed, drum shifter |
| f. | Operation | | Left foot operation |
| g. | Gear Ratio | | |
| | 1st | | 35/16 (2.187) |
| | 2nd | | 30/20 (1.500) |
| | 3rd | | 30/26 (1.153) |
| | 4th | | 28/30 (0.933) |
| | 5th | | 26/32 (0.812) |
| 19. | Chassis: | | |
| a. | Frame Type | | Tubular steel double cradle |
| b. | Caster Angle | | 27°45' |
| c. | Trail | | 115 mm (4.53 in) |
| 20. | Tire | | |
| a. | Tire Type | | Tubeless |
| b. | Tire Size (F) | | 3.25H19-4PR |
| c. | Tire Size (R) | | 120/90-18 65H |
| 21. | Tire Pressure | | (Cold tire pressure) |
| a. | Up to 90 kg (198 lb) load* | (F) | 1.8 kg/cm ² (26 psi) |
| | | (R) | 2.0 kg/cm ² (28 psi) |
| b. | 90 kg (198 lb) ~ 160 kg (353 lb) load* | (F) | 2.0 kg/cm ² (28 psi) |
| | | (R) | 2.3 kg/cm ² (32 psi) |

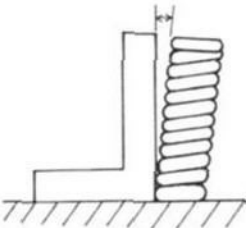
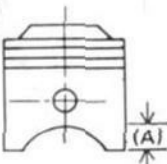
| | | |
|---|--|---|
| c. | 160 kg (353 lb)~ 230 kg (507 lb) load* (F) | 2.0 kg/cm ² (28 psi) |
| | (Maximum load) (R) | 2.8 kg/cm ² (40 psi) |
| d. | High-speed Riging (F) | 2.3 kg/cm ² (32 psi) |
| | (R) | 2.5 kg/cm ² (36 psi) |
| * Total weight of accessories, etc. excepting motorcycle. | | |
| 22. | Brake | |
| a. | Front Brake Type | Dual hydraulic disc |
| b. | Operation | Right hand |
| c. | Rear Brake Type | Drum brake |
| d. | Operation | Right foot |
| 23. | Suspension | |
| a. | Front Suspension | Telescopic fork |
| b. | Rear Suspension | Swingarm |
| 24. | Shock Absorber | |
| a. | Front Shock Absorber | Oil damper, coil spring |
| b. | Rear Shock Absorber | Oil damper, coil spring |
| 25. | Wheel Travel | |
| a. | Front Wheel Travel | 150 mm (5.91 in) |
| b. | Rear Wheel Travel | 96 mm (3.78 in) |
| 26. | Electrical: | |
| a. | Ignition System | Battery ignition (Full transistor ignition) |
| b. | Generator System | A.C. generator |
| c. | Battery Type or Model | 12N12A |
| d. | Battery Capacity | 12V 12AH |
| 27. | Headlight Type | HALOGEN (Antivibratory bulb) |
| 28. | Bulb Wattage x Pcs | |
| a. | Headlight | 60W/55W 1 pcs. |
| b. | Turn light | 27W x 4 pcs. |
| c. | Tail/Stop light | 8W/27W x 2 pcs. |
| d. | Meter light | 3.4W x 2 pcs. |
| 29. | Indicator light Wattage x Pcs. | |
| a. | " Neutral " | 3.4W x 1 pcs. |
| b. | " High Beam " | 3.4W x 1 pcs. |
| c. | " Oil " | 3.4W x 1 pcs. |
| d. | " Turn " | 3.4W x 1 pcs. |

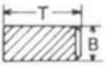

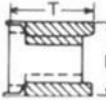
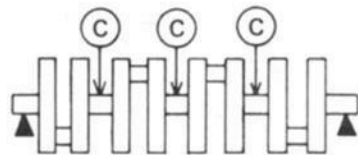
II. MAINTENANCE SPECIFICATIONS

A. Engine

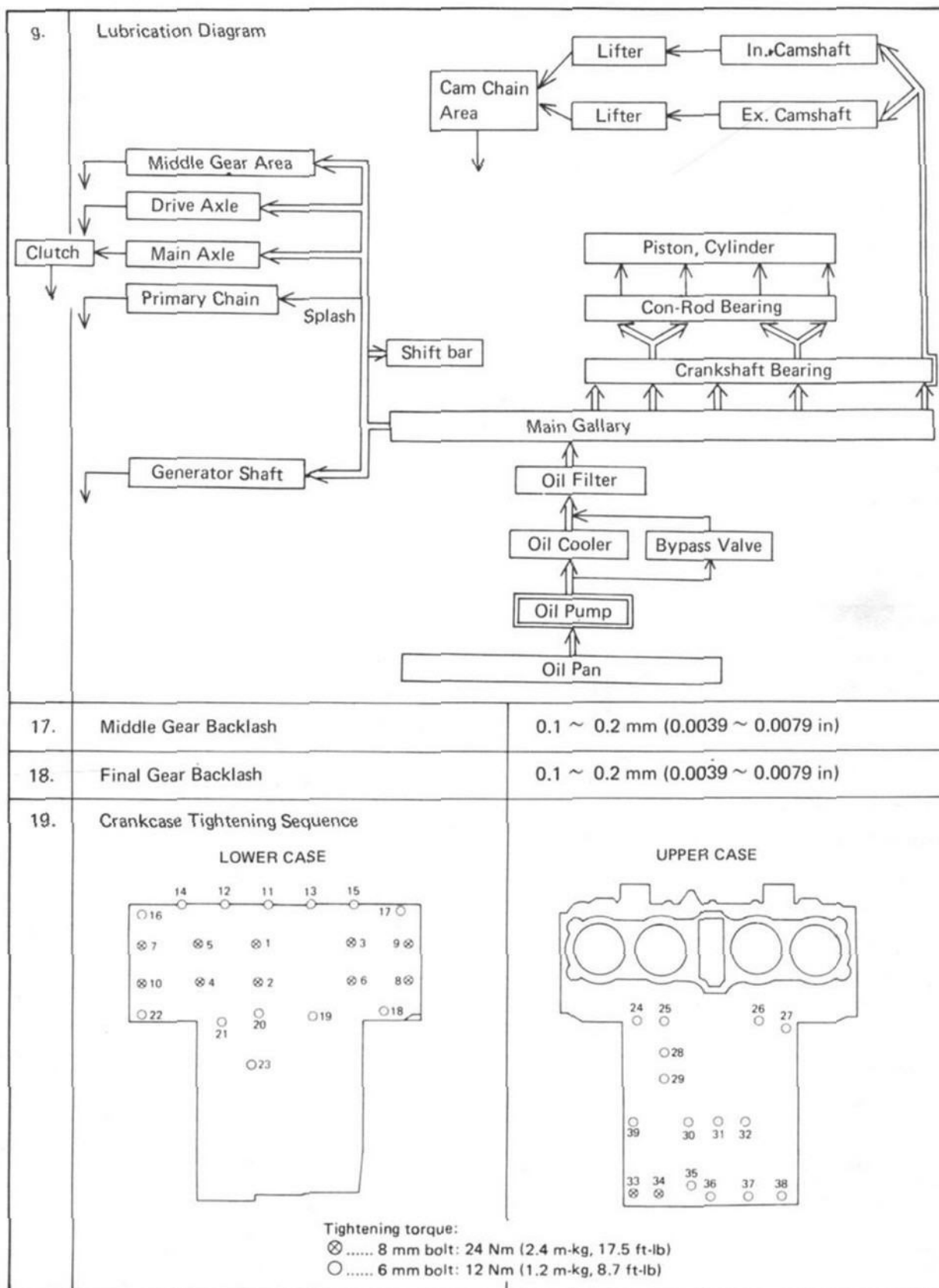
| | | | |
|----------------------------------|--|--|---|
| 1. a. b. | Cylinder Head Volume Warp Limit |  | 24.2 cc < 0.03 mm (0.0012 in) > *Lines indicate straightedge measurement |
| 2. a. b. c. d. | Cylinder Material Bore Size Taper Limit Out-of-round Limit | | Aluminum alloy with cast iron sleeve 63.0 mm (2.480 in) < 0.05 mm (0.0020 in) > < 0.01 mm (0.0004 in) > |
| 3. a. b. c. d. e. | Camshaft Drive Method Cam Cap Inside Diameter Camshaft Outside Diameter Shaft-to-cap Clearance Cam Dimensions Intake |  | Chain drive Center 25 ^{+0.021} ₀ mm (0.98 ^{+0.008} ₀ in) 25 ^{-0.020} _{-0.033} mm (0.98 ^{-0.0008} _{-0.0013} in) 0.020 ~ 0.054 mm (0.0008 ~ 0.0021 in) |
| | Exhaust |  | 36.50 mm (1.437 in) 28.00 mm (1.102 in) 8.50 mm (0.335 in) 35.80 mm (1.409 in) 28.00 mm (1.102 in) 7.80 mm (0.307 in) |
| f. | Valve Timing |  | B.T.D.C. 34° A.B.D.C. 58° B.B.D.C. 66° A.T.D.C. 26° α = 60° |
| g. | Camshaft Runout Limit |  | < 0.06 mm (0.0024 in) > |
| h. i. | Cam Chain Type/Number of Links Cam Chain Adjustment Method | | BUSH-CHAIN/120 Manual |

| | | | |
|----|---|------------|--|
| 4. | Valve, Valve Seat, Valve Guide | | |
| a. | Valve Clearance (Cold) | IN. EX. | 0.16 ~ 0.20 mm (0.0063 ~ 0.0079 in) 0.16 ~ 0.20 mm (0.0063 ~ 0.0079 in) |
| b. | Valve Dimensions | | |
| |  | | |
| | "A" Head Dia. | IN. EX. | 33 ± 0.1 mm (1.30 ± 0.0039 in) 28 ± 0.1 mm (1.10 ± 0.0039 in) |
| | "B" Face Width | IN. EX. | 2.3 mm (0.091 in) 2.3 mm (0.091 in) |
| | "C" Seat Limit Width | IN. EX. | 1 ± 0.1 mm (0.0394 ± 0.039 in) 1 ± 0.1 mm (0.0394 ± 0.039 in) |
| | "D" Margin Thickness Limit | IN. EX. | 0.7 mm (0.028 in) 0.7 mm (0.028 in) |
| c. | Stem Outside Diameter | IN. EX. | 7 ^{-0.010} _{-0.025} mm (0.2756 ^{-0.0004} _{-0.0010} in) 7 ^{-0.010} _{-0.040} mm (0.2756 ^{-0.0010} _{-0.0016} in) |
| d. | Guide Inside Diameter | IN. EX. | 7 ^{+0.012} ₀ mm (0.2756 ^{+0.0005} ₀ in) 7 ^{+0.012} ₀ mm (0.2756 ^{+0.0005} ₀ in) |
| e. | Stem-to-guide Clearance | IN. EX. | 0.010 ~ 0.037 mm (0.0004 ~ 0.0015 in) 0.025 ~ 0.052 mm (0.0010 ~ 0.0020 in) |
| f. | Stem Runout Limit | | < 0.03 mm (0.0012 in) > |
| |  | | |
| g. | Valve Seat Width Standard < Limit > | | 1.0 mm (0.039 in) < 2.0 mm (0.080 in) > |
| 6. | Valve Spring | | |
| a. | Free Length | | |
| | Inner Spring | IN. EX. | 35.9 mm (1.413 in) 35.9 mm (1.413 in) |
| | Outer Spring | IN. EX. | 39.5 mm (1.555 in) 39.5 mm (1.555 in) |

| | | | |
|----|---|------------|--|
| b. | Spring Rate | | 2.36 kg/mm (132 lb/in) 2.36 kg/mm (132 lb/in) 4.58 kg/mm (256 lb/in) 4.58 kg/mm (256 lb/in) |
| | Inner Spring | IN. EX. | |
| | Outer Spring | | 4.58 kg/mm (256 lb/in) 4.58 kg/mm (256 lb/in) |
| | IN. EX. | | |
| c. | Compressing Length (Valve Closed) | | 31.0 mm (1.220 in) 31.0 mm (1.220 in) 34.0 mm (1.339 in) 34.0 mm (1.339 in) |
| | Inner Spring | IN. EX. | |
| | Outer Spring | | 34.0 mm (1.339 in) 34.0 mm (1.339 in) |
| | IN. EX. | | |
| d. | Compressed Force (Valve Closed) | | 9.0 kg (20 lb) 9.0 kg (20 lb) 19.1 kg (42.1 lb) 19.1 kg (42.1 lb) |
| | Inner Spring | IN. EX. | |
| | Outer Spring | | 19.1 kg (42.1 lb) 19.1 kg (42.1 lb) |
| | IN. EX. | | |
| e. | Tilt Limit | | 2.5° 2.5° |
| | Inner Spring | IN. & EX. | |
| | Outer Spring | IN. & Ex. | |
| f. |  | | |
| | Direction of Winding (Top View) | | |
| | | | Intake |
| | | | Exhaust |
| | | | Outer |
| | | | Inner |
| | | | Outer |
| | | | Inner |
| 7. | Piston | | 63.0 mm (2.48 in)/ 7.5 mm (0.295 in) (From bottom line of piston skirt) |
| | Piston Size/ Measuring Point (A) | | |
| a. |  | | 0.03 ~ 0.05 mm (0.0012 ~ 0.0020 in) |
| | Clearance between Piston & Cylinder < Limit > | | |
| b. | Oversize | | < 0.1 mm (0.0039 in) > 63.25 mm (2.49 in) 63.50 mm (2.50 in) 63.75 mm (2.51 in) 64.00 mm (2.52 in) |
| | 1st 2nd 3rd 4th | | |
| c. | Piston Pin Hole Off-Set | | 0.5 mm (0.02 in)/In-side |
| | | | |

| | | | |
|-----|---|---|---|
| 8. | Piston Ring Sectional Sketch | | |
| a. |  <div>Top Ring</div>  <div>2nd Ring</div>  <div>Oil Ring</div> | | $B = 1.2_{-0.03}^{+0.01}$ mm ($0.047_{-0.0012}^{+0.0004}$ in) $T = 2.6 \pm 0.1$ mm (0.102 ± 0.0004 in) $B = 1.5_{-0.03}^{+0.01}$ mm ($0.059_{-0.0012}^{+0.0004}$ in) $T = 2.8 \pm 0.1$ mm (0.110 ± 0.0004 in) $B = 2.5$ mm (0.098 in) $T = 2.8 \pm 0.15$ mm (0.110 ± 0.0059 in) |
| b. | End Gap (Installed) Limit | <div>Top Ring</div> <div>2nd Ring</div> <div>Oil Ring</div> | $0.15 \sim 0.35$ mm ($0.0059 \sim 0.0138$ in) < 1.0 mm (0.039 in) $>$ $0.15 \sim 0.35$ mm ($0.0059 \sim 0.0138$ in) < 1.0 mm (0.039 in) $>$ $0.3 \sim 0.9$ mm ($0.012 \sim 0.035$ in) < 1.5 mm (0.0591 in) $>$ |
| c. | Side Clearance Limit | <div>Top Ring</div> <div>2nd Ring</div> <div>Oil Ring</div> | $0.03 \sim 0.07$ mm ($0.0012 \sim 0.0028$ in) < 0.15 mm (0.0059 in) $>$ $0.02 \sim 0.06$ mm ($0.0008 \sim 0.0024$ in) < 0.15 mm (0.0059 in) $>$ — |
| d. | Plating or Coating | <div>Top Ring</div> <div>2nd Ring</div> <div>Oil Ring</div> | Chrome, Ferox — Chrome, Ferox |
| 9. | Connecting Rod | | |
| a. | Oil Clearance | | $0.03 \sim 0.09$ mm ($0.0012 \sim 0.0035$ in) |
| b. | Color Code | | 1. Blue, 2. Black, 3. Brown, 4. Green |
| 10. | Crankshaft | | |
| |  | | |
| a. | Runout Limit "C" | | < 0.04 mm (0.0016 in) $>$ |
| b. | Oil Clearance | | $0.020 \sim 0.044$ mm ($0.0008 \sim 0.0017$ in) |
| c. | Color Code | | 1. Blue, 2. Black, 3. Brown, 4. Green, 5. Yellow |
| d. | Connecting Rod Length | | 115.5 ± 0.05 mm (4.55 ± 0.002 in) |
| 11. | Balancer Drive Method | | Chain, Gear |


| | | |
|-----|---|---------------------------------------|
| 12. | Clutch | |
| a. | Friction Plate Thickness/Quantity | 3.0 ± 0.1 mm (0.12 ± 0.004 in)/8 pcs. |
| b. | Wear Limit | < 2.8 mm (0.11 in) > |
| c. | Clutch Plate Thickness/Quantity | 1.6 mm (0.06 in)/7 pcs. |
| d. | Warp Limit | < 0.05 mm (0.002 in) > |
| e. | Clutch Spring Free Length/Quantity | 40.1 mm (1.58 in)/ |
| | < Limit > | < 0.1 mm (0.0004 in) > |
| f. | Minimum Length | 39.1 mm (1.539 in) |
| g. | Primary Reduction Gear Backlash Tolerance | 118 |
| h. | Primary Drive Gear Backlash Number | 87~ 91 |
| i. | Primary Driven Gear Backlash Number | 27 ~ 32 |
| j. | Clutch Release Method | Rack & Pinion pull, Outer pull |
| 13. | Transmission | |
| a. | Main Axle Run-out Limit | < 0.08 mm (0.0031 in) > |
| 14. | Shifter | |
| a. | Shifter Type | Cam drum |
| 15. | Carburetor | |
| a. | Type/Manufacturer/Quantity | HSC32/HITACHI/4 pcs. |
| b. | I.D. Mark | 4H700 |
| c. | Throttle Valve Size | φ 32 mm (φ 1.26 in) |
| d. | Venturi Size | φ 27.4 mm (φ 1.08 in) |
| e. | Main Jet (M.J.) | # 110 |
| f. | Main Air Jet (M.A.J.) | # 50 |
| g. | Jet-Needle (J.N.) | Y-10 |
| h. | Needle Jet (N.J.) | φ 3.2 |
| i. | Throttle Valve (Th.V.) | 13 |
| j. | Pilot Jet (P.J.) | # 40 |
| k. | Pilot Air Jet (P.A.J.) | # 195 |
| l. | Pilot Screw (turns out) (P.S.) | 2 and 1/2 |
| m. | Pilot Outlet Size (P.O.) | φ 0.9 |
| n. | Starter Jet (G.S.) | # 40 |
| o. | Valve Seat Size (V.S.) | φ 2.0 |
| p. | Fuel Level (F.L.) | 3 ± 1 mm (0.12 ± 0.04 in) |
| q. | Float Height (F.H.) | 17.5 ± 0.5 mm (0.7 ± 0.02 in) |
| r. | Engine Idling Speed | 1,050 ± 50 r/min |
| s. | Vacuum Pressure at Idling Speed | Above 180 mmHg |
| 16. | Lubrication System: | |
| a. | Oil Filter Type | Paper filter |
| b. | Oil Pump Type | Trochoid pump |
| c. | Tip Clearance | 0.03 ~ 0.09 mm (0.001 ~ 0.004 in) |
| d. | Side Clearance | 0.03 ~ 0.08 mm (0.01 ~ 0.003 in) |
| e. | Bypass Valve Setting Pressure | 1.0 ± 0.2 kg/cm (14.2 ± 2.8 lb/in) |
| f. | Relief Valve Operating Pressure | 5.0 ± 0.6 kg/cm (7.1 ± 8.5 lb/in) |



| 20. | 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 M8 P1.25 | 1 1 | 43 24 | 4.3 2.4 | 31.0 17.5 | Crankcase drain |
| 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 M6 P1.0 | 12 27 | 24 12 | 2.4 1.2 | 17.5 8.7 | |
| Clutch boss | Nut | M20 P1.0 | 1 | 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 | 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 |

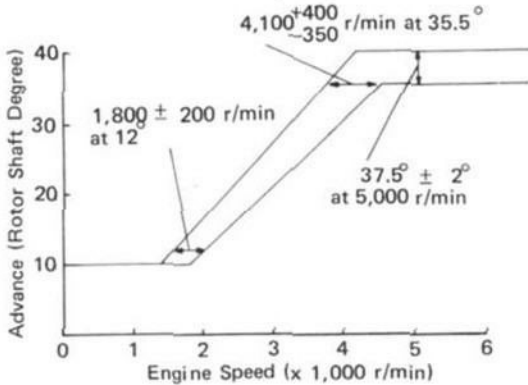
B. Chassis

| | | |
|------|---------------------------------|---|
| 1. | Steering System | |
| a. | Steering Bearing Type | Ball Bearing |
| b. | No./Size of Steel Balls | |
| | Upper | 19 pcs/1/4 in |
| | Lower | 19 pcs/1/4 in |
| c. | Lock-to-lock Angle | 42° |
| 2. | Front Suspension | |
| a. | Front Fork Travel | 150 mm (5.9 in) |
| b. | Fork Spring Free Length | 540.5 mm (21.28 in) |
| c. | Spring Rate/Stroke | K ₁ = 0.421 kg/mm 0 ~ 100 mm K ₂ = 0.581 kg/mm 100 ~ 150 mm |
| d. | Optional Spring | No. |
| e. | Oil Capacity or Oil Level | 236 ± 4 cc (7.98 ± 0.14 US oz) 400 mm (15.7 in) (From top of inner tube fully compressed without spring.) |
| f. | Oil Grade | Yamaha fork oil (10) wt or equivalent |
| 3. | Rear Suspension | |
| a. | Shock Absorber Travel | 80 mm (3.15 in) |
| b. | Spring Free Length | 236.5 mm (9.31 in) |
| c. | Spring Rate/stroke | K ₁ = 1.7 kg/mm (95.2 lb/in)/ 0 ~ 55 mm (0 ~ 2.17 in) K ₂ = 2.1 kg/mm (117.6 lb/in)/ 55 ~ 80 mm (2.17 ~ 3.15 in) |
| d. | Optional Spring | No. |
| 4. | Rear Arm | |
| a. | Swing Arm Free Play Limit | |
| | — End | 0 mm (0 in) |
| | — Side | 0 mm (0 in) |
| 5. | Wheel | |
| a. | Front Wheel Type | Cast Wheel |
| | Rear Wheel Type | Cast Wheel |
| b. | Front Rim Size/Material | MT1.85 x 19/Steel, Aluminum |
| | Rear Rim Size/Material | MT2.15 x 18/Steel, Aluminum |
| c. | Rim Runout Limit | |
| | — Vertical | < 0.5 mm (0.02 in) > |
| | — Lateral | < 1.0 mm (0.04 in) > |
| 6-1. | Disc Brake | |
| a. | Type | Dual disc |
| b. | Outside Dia. x Thickness | |
| | Front | 267 x 5 mm (10.5 x 0.2 in) |

| | | |
|------|---|---|
| c. | Pad Thickness < Limit > *  | 6.5 mm (0.26 in) < 1.5 mm (0.06 in) > |
| d. | Master Cylinder Inside Dia. Front | 15.87 mm (0.62 in) |
| e. | Caliper Cylinder Inside Dia. Front | 38.18 mm (1.50 in) |
| f. | Brake Fluid Type | DOT # 3 |
| 6-2. | Drum Brake | |
| a. | Type Rear | Leading trailing |
| b. | Drum Inside Dia. Rear | 200 mm (7.87 in) |
| c. | Lining Thickness < Limit > | 4 mm (0.16 in) < 2 mm (0.08 in) > |
| d. | Shoe Spring Free Length Rear. | 68 mm (2.68 in) |
| 7. | Brake Lever & Brake Pedal | |
| a. | Brake Lever Free Play | 5.0 ~ 8.0 mm (0.2 ~ 0.3 in) |
| b. | Brake Pedal Free Play | 20 ~ 30 mm (0.8 ~ 1.2 in) |
| c. | Brake Pedal Position | 40 mm (1.6 in) (Vertical height below footrest too.) |
| 8. | Clutch Lever Free Play | 2 ~ 3 mm (0.08 ~ 0.12 in) |

| 9. | Tightening Torque | | | | | | | | |
|---|-------------------|--------------------------|-------------|----------|-------------------|------|-------|----------------------|--|
| Part to be tightened | | Part name | Thread size | Q'ty | Tightening torque | | | Remarks | |
| | | | | | Nm | m-kg | ft-lb | | |
| CHASSIS: | | | | | | | | | |
| Engine Mounting Bolt | Front, upper | Nut | M10 P1.25 | 1 | 42 | 4.2 | 30.4 | | |
| | Front, under | Bolt | M10 P1.25 | 2 | 42 | 4.2 | 30.4 | | |
| | Rear | Nut | M12 P1.25 | 1 | 70 | 7.0 | 50.6 | | |
| Engine Mounting Stay | | Front | Bolt | M8 P1.25 | 4 | 20 | 2.0 | 14.5 | |
| Handle crown & Steering shaft | | Bolt | M14 P1.25 | 1 | 54 | 5.4 | 39.1 | | |
| | | Bolt | M8 P1.25 | 1 | 20 | 2.0 | 14.5 | | |
| Handle crown & Inner tube | | Nut cap | M8 P1.25 | 1 | 20 | 2.0 | 14.5 | | |
| Handle crown & Handle holder | | Bolt | M8 P1.25 | 2 | 20 | 2.0 | 14.5 | | |
| Front fork | | | | | | | | | |
| Under bracket & Inner tube | | Bolt | M8 P1.25 | 4 | 20 | 2.0 | 14.5 | | |
| Front wheel shaft | | Nut castle | M14 P1.5 | 1 | 107 | 10.7 | 77.4 | | |
| Front wheel Axle pinch bolt | | Nut self | M8 P1.25 | 2 | 20 | 2.0 | 14.5 | | |
| Pivot shaft | | Bolt | M22 P1.5 | 1 | 5.5 | 0.55 | 4.0 | Taper roller bearing | |
| Rear wheel shaft | | Nut castl | M14 P1.5 | 1 | 107 | 10.7 | 77.4 | | |
| Rear shock absorber (Upper) | | Nut cap | M10 P1.25 | 2 | 30 | 3.0 | 21.7 | | |
| Rear shock absorber (Lower) | | L Nut cap R Bolt | M10 P1.25 | 2 | 30 | 3.0 | 21.7 | | |
| Footrest | | Nut | M10 P1.25 | 2 | 42 | 4.2 | 30.4 | | |
| Tension bar & Brake plate | | Bolt | M8 P1.25 | 1 | 20 | 2.0 | 14.5 | | |
| Tension bar & Rear arm | | Bolt | M8 P1.25 | 1 | 20 | 2.0 | 14.5 | | |
| 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 | 14.5 | Lock washer | |
| Master cylinder & Brake hose (Front) | | Bolt union | M10 P1.25 | 1 | 26 | 2.6 | 18.8 | | |
| Brake hose & Joint | | Bolt union | M10 P1.25 | 1 | 26 | 2.6 | 18.8 | | |
| Caliper & Brake hose | | Bolt union | M10 P1.25 | 1 | 26 | 2.6 | 18.8 | | |
| Caliper & Front fork (Front) | | | M8 P1.25 | 1 | 26 | 2.6 | 18.8 | | |
| 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 | 72.3 | Lock washer | |
| Final gear & Rear arm | | Nut | M10 P1.25 | 4 | 42 | 4.2 | 30.4 | | |
| Cross Joint | | Hexagon bolt with washer | M8 P1.25 | 4 | 44 | 4.4 | 31.8 | | |
| Muffler bracket & Frame | | Bolt | M10 P1.25 | 3 | 43 | 4.3 | 31.1 | | |
| Rear fender | | Bolt | M10 P1.25 | 2 | 32 | 3.2 | 23.1 | | |
| Muffler bracket & Muffler | | Bolt | M10 P1.25 | 2 | 25 | 2.5 | 18.1 | | |
| Master cylinder & Master cylinder bracket | | Bolt | M6 P1.0 | 2 | 9 | 0.9 | 6.5 | | |

C. Electrical

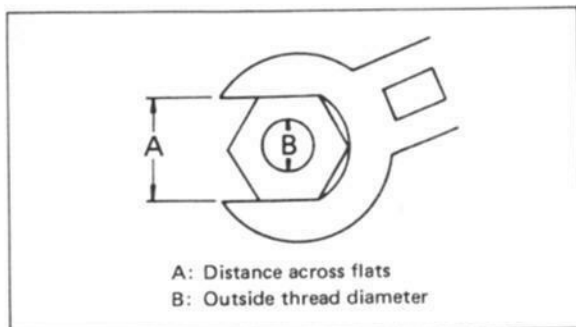
| | | |
|----|--|--|
| 1. | Voltage | 12V |
| 2. | Ignition System | |
| a. | Ignition Timing (B.T.D.C.) Advanced iTiming (B.T.D.C.) | $10^{\circ} / 1,050 \text{ r/min}$ $37.5^{\circ} \pm 2^{\circ} / 5,000 \text{ r/min}$ |
| |  <p>Advance (Rotor Shaft Degree)</p> <p>Engine Speed (x 1,000 r/min)</p> <p>1,800 \pm 200 r/min at 12</p> <p>4,100 $^{+400}_{-350}$ r/min at 35.5°</p> <p>37.5° \pm 2° at 5,000 r/min</p> | |
| b. | Advancer Type | Electrical |
| 3. | T.C.I. | |
| a. | Pick up Coil Resistance (Color) | 700 Ω \pm 20% at 20°C (68°F) (O – B, Gy – Br) |
| b. | T.C.I. Unit-Model/Manufacturer | TID14-08/HITACHI |
| 4. | Ignition Coil-Model/Manufacturer | CM-12-09/HITACHI |
| b. | 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) |
| c. | Primary Winding Resistance | 2.5 Ω \pm 10% at 20°C (68°F) |
| d. | Secondary Winding Resistance | 11K Ω \pm 20% at 20°C (68°F) |
| 5. | Charging System | |
| a. | Type | A.C. Generator |
| b. | Model/Manufacturer | LD119-08/HITACHI |
| c. | OutPut | 14V 19A at 5,000 r/min |
| d. | Field (Inner) Coil Resistance (Color) | 4.0 Ω \pm 10% at 20°C (68°F) (G – B) |
| e. | Armature (Outer) Coil Resistance (Color) | 0.46 Ω \pm 10% at 20°C (68°F) (W – W) |
| f. | Brush-Overall Length | 17 mm (0.67 in) |
| g. | – Wear Limit | 10 mm (0.39 in) |
| h. | – Spring Pressure | 360 g (12.7 oz) |
| 6. | Voltage Regulator – Type | I.C. type |
| b. | – Model/Manufacture | S8534/SHIBAURA |
| c. | – No Load Regulated Voltage | 14.5V |
| 7. | Rectifier – Model/Manufacturer | S8534/SHIBAURA |
| b. | – Capacity | 15A |
| c. | – Withstand Voltage | 300V |

| | | |
|-----|------------------------------------|---------------------------------------|
| 8. | Battery | |
| a. | Capacity | 12V 12AH |
| b. | Specific Gravity | 1.280 |
| 9. | Electric Starter System | Constant mesh type |
| a. | Starter Motor — Model/Manufacturer | ADB4D4/ND |
| b. | — Output | 0.6 kw |
| c. | Armature Coil Resistance | $0.014 \Omega \pm 6\%$ at 20°C (68°F) |
| d. | Brush-Overall Length | 12 mm (0.47 in) |
| e. | < Limit > | < 8.5 mm (0.33 in) > |
| f. | — Spring Pressure | 800 \pm 150 g (28.22 \pm 5.29 oz) |
| g. | Commutator Dia. | 28 mm (1.1 in) |
| h. | < Wear Limit > | < 27 mm (1.06 in) > |
| i. | Mica Undercut | 0.6 mm (0.024 in) |
| | Starter Switch Manufacturer | HONDA LOCK |
| | Amperage Rating | 150 A |
| 10. | Horn | |
| a. | Type | Plane type |
| | Quantity | 2 pcs. |
| b. | Model/Manufacturer | SFH-12, SFL-12/Nikko |
| c. | Maximum Amperage | 2.5A |
| 11. | Flasher Relay | |
| a. | Type | Condenser type |
| b. | Model/Manufacturer | 4H7/ND |
| c. | Self Cancelling Device | Yes |
| d. | Flasher Frequency | 85 \pm 10 cycle/min |
| e. | Wattage | 27W x 2 + 3.4W |
| 12. | Self Cancelling Unit | |
| a. | Model/Manufacturer | 1A0/MATSUSHITA |
| 13. | Oil Level Switch | |
| a. | Manufacturer | N.D |
| 14. | Starting Circuit Cut Off Relay | Yes |
| a. | Model/Manufacturer | 4H7-01/TATEISHI |
| b. | Coil Winding Resistance | $100 \Omega \pm 10\%$ at 20°C (68°F) |
| 15. | Headlight Relay | Yes |
| a. | Model/Manufacturer | 3H5-00/TATEISHI |
| b. | Coil Winding Resistance | 100Ω at 20°C (68°F) |
| 16. | Side Stand Relay | Yes |
| a. | Model/Manufacturer | 4U8/TATEISHI |
| b. | Coil Winding Resistance | 100Ω at 20°C (68°F) |
| 17. | Circuit Breaker | |
| a. | Type | Fuse |
| b. | Amperage for Individual Circuit | |
| | Main | 10A/1 pc. |
| | Headlight | 10A/1 pc. |
| | Signal | 10A/1 pc. |
| | Ignition | 10A/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 | |
|------------|-------------|-------------------------------|-------|
| | | 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 ² | 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/cm ² |
| | Fahrenheit (°F) | 5/9 (°F-32) | Centigrade (°F) |

DEFINITIONS OF UNITS

| | | |
|--------------------|---|--|
| m-kg | = | Meter-Kilogram(s)(usually torque) |
| g | = | Gram(s) |
| kg | = | Kilogram(s) (1000 grams) |
| lit | = | Liter(s) |
| km/lit | = | Kilometer(s) per liter (fuel consumption) |
| cc | = | Cubic centimeter(s) (cm ³) (volume or capacity) |
| kg/mm | = | Kilogram(s) per millimeter (usually spring compression rate) |
| kg/cm ² | = | Kilogram(s) per square centimeter (pressure) |

COLOR CODES

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

CONSUMER INFORMATION

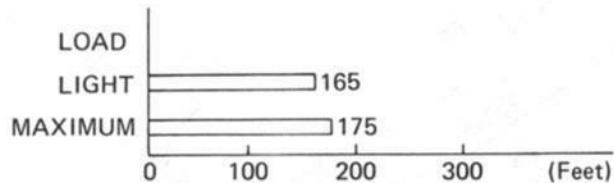
NOTICE

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

STOPPING DISTANCE

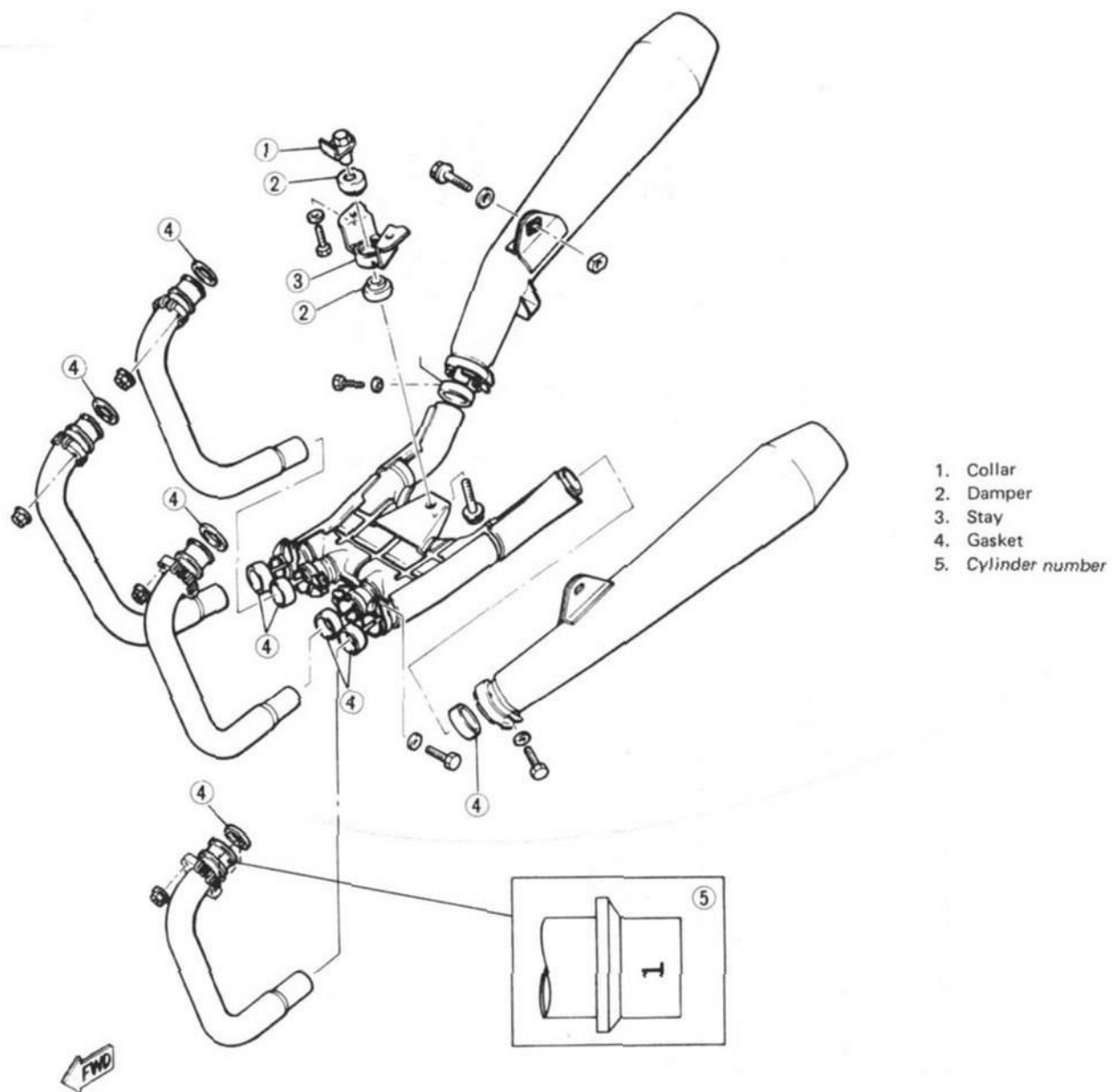
This figure indicates braking performance that can be met or exceeded by the vehicles to which it applies, without locking the wheels, under different conditions of loading and with partial failures of the braking system.

FULL OPERATIONAL SERVICE BRAKE

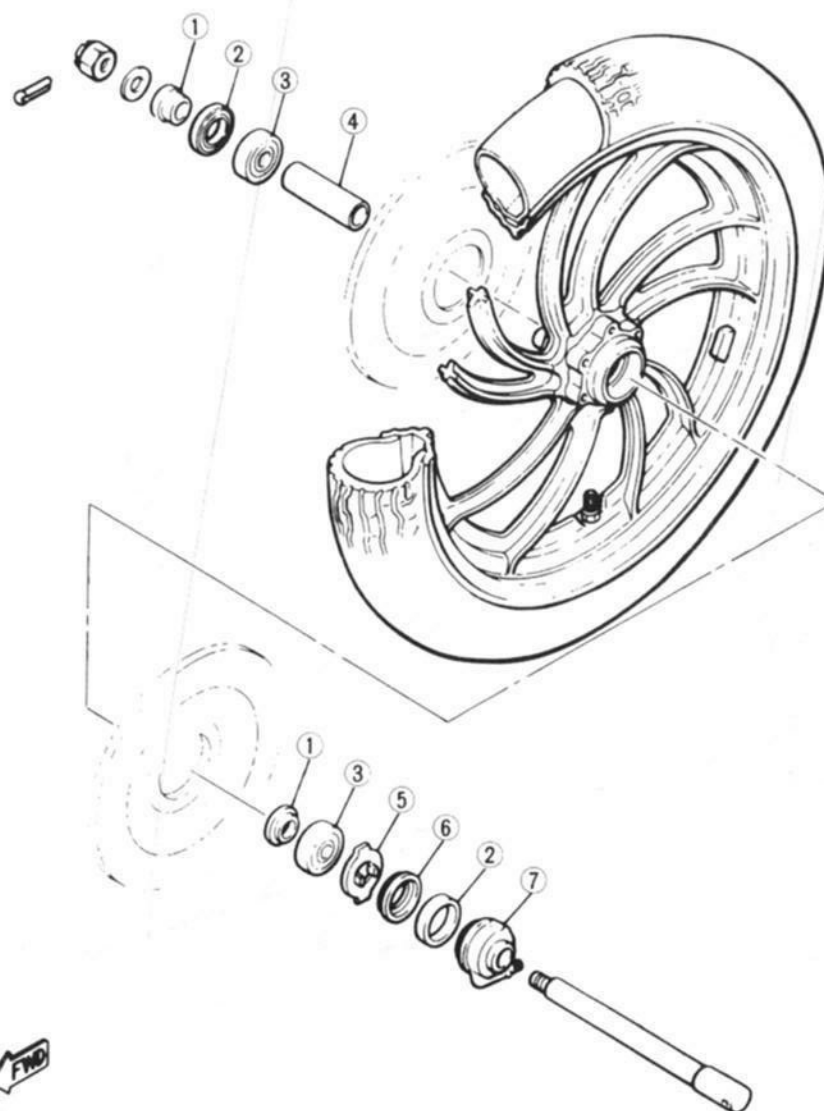


Stopping Distance in Feet from 60 mph, using the fully operational Service brake System, at lightly loaded and maximum loaded vehicle weight.

A. Exhaust

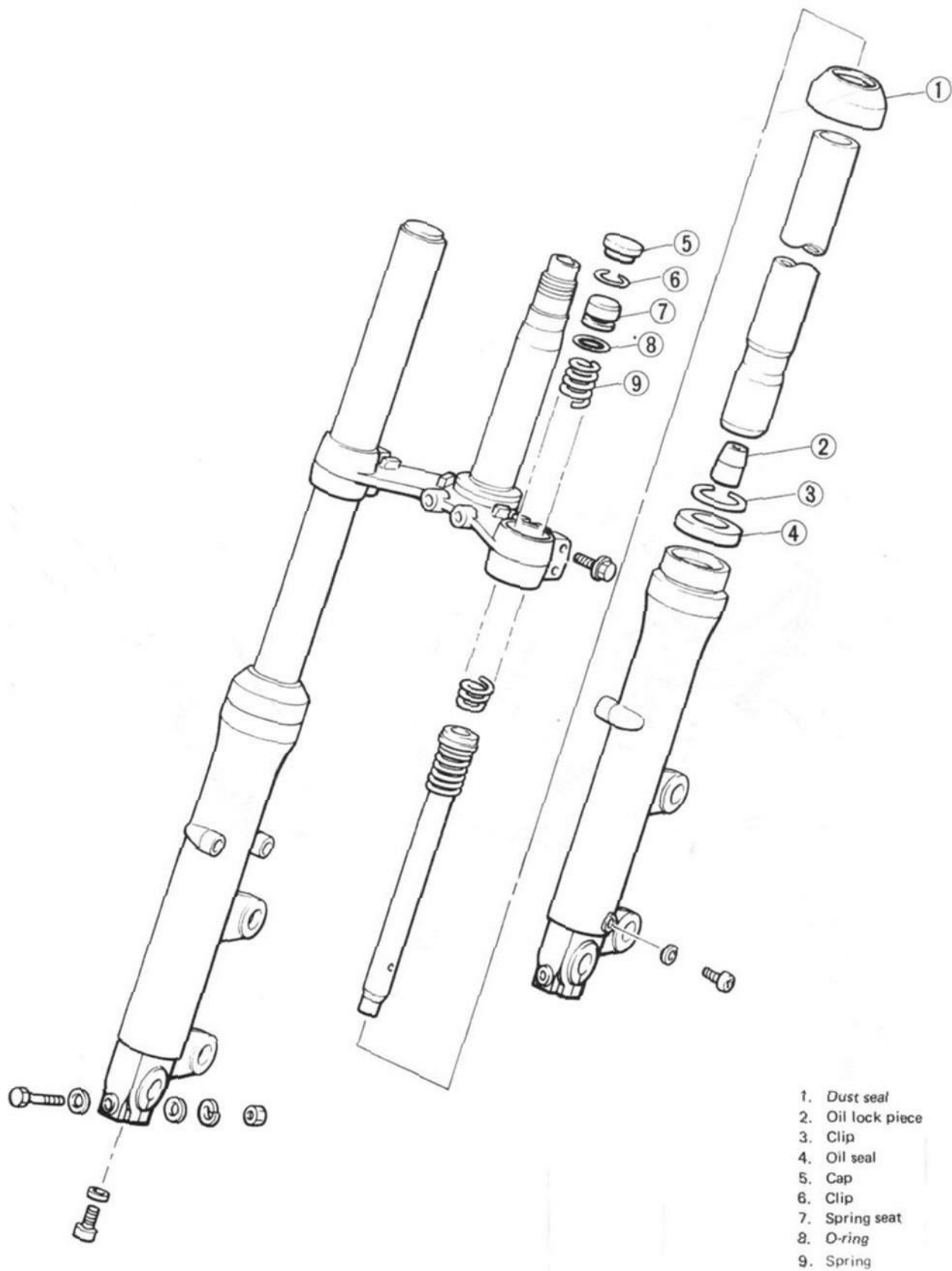


B. Front Wheel

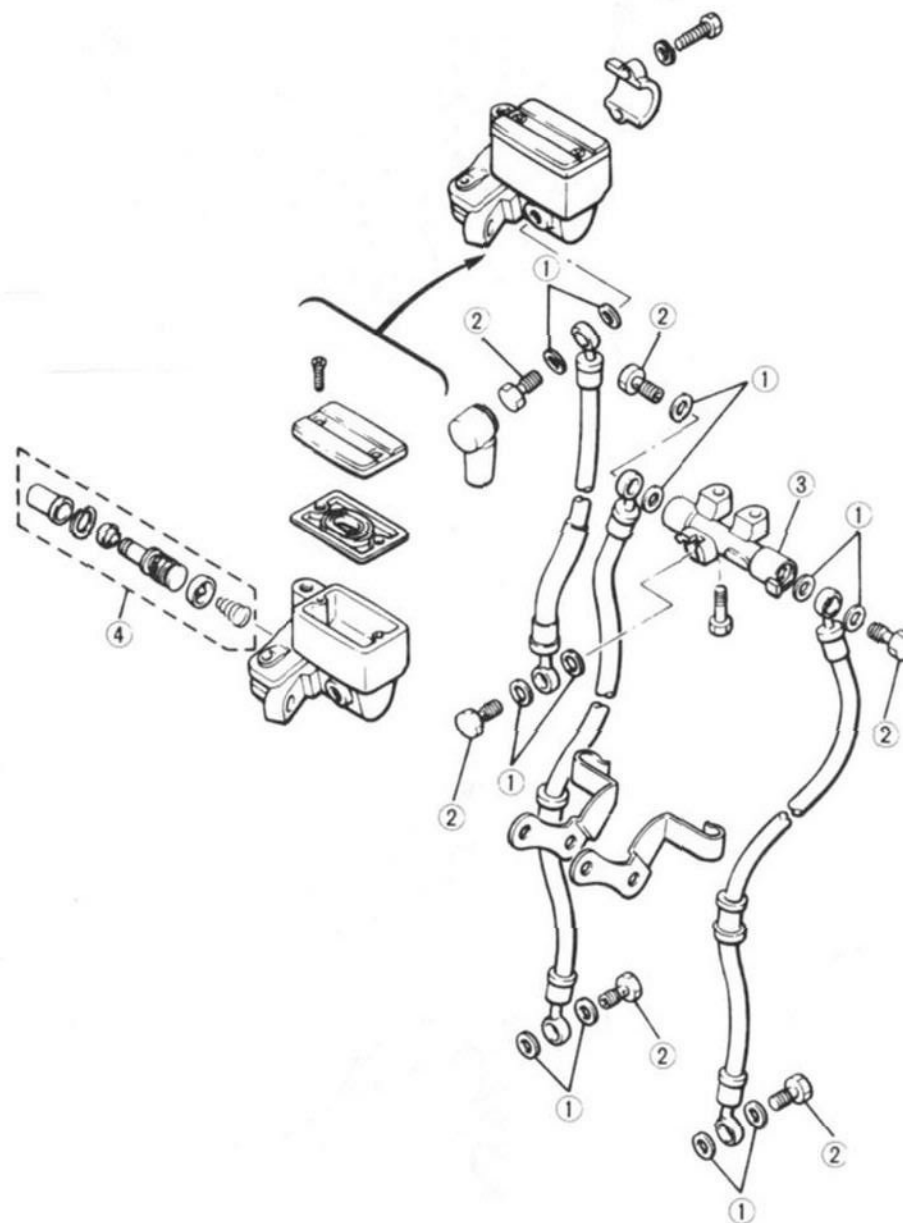


1. Collar
2. Oil seal
3. Bearing (B6302Z)
4. Spacer
5. Meter clutch
6. Clutch retainer
7. Gear unit assembly

C. Front Fork

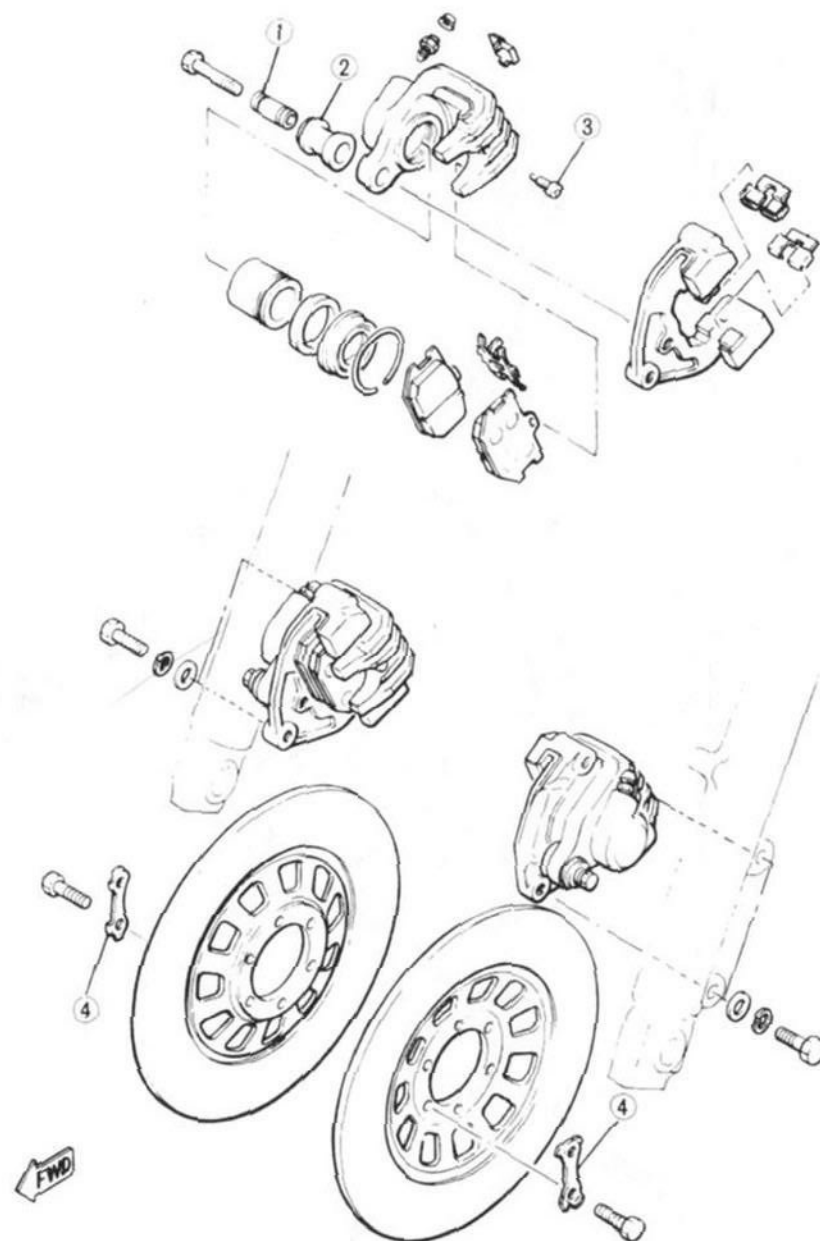


D. Front Brake (Master Cylinder)



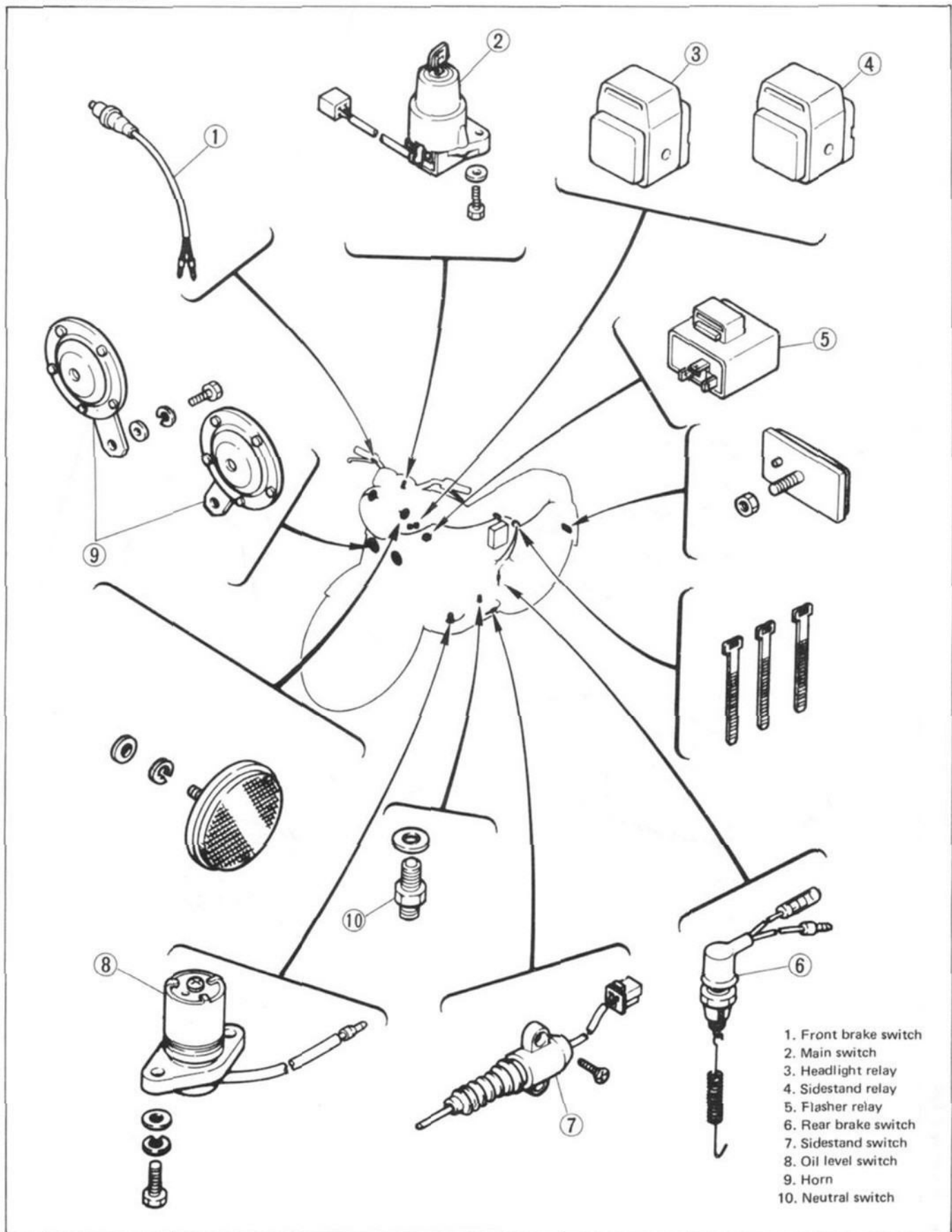
- 1. Copper washer
- 2. Union bolt
- 3. Joint
- 4. Master cylinder kit

E. Front Brake (Caliper)

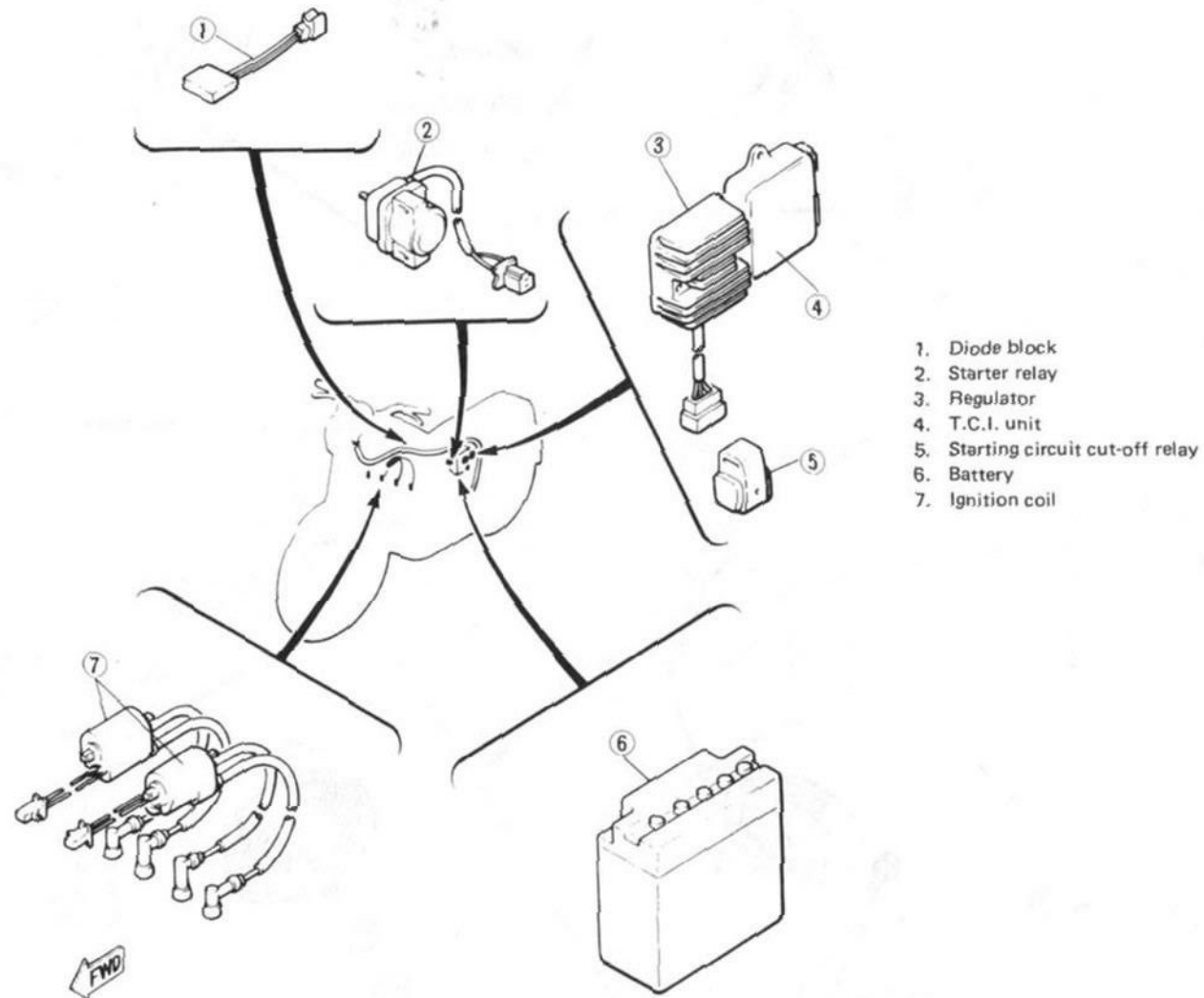


1. Sleeve
2. Boot
3. Pad retaining screw
4. Lock plate

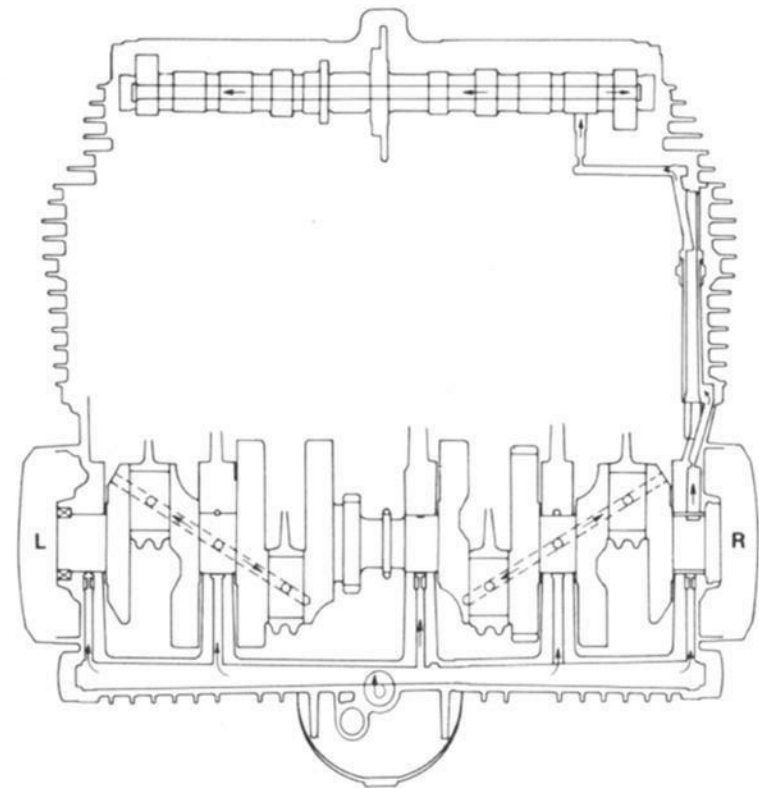
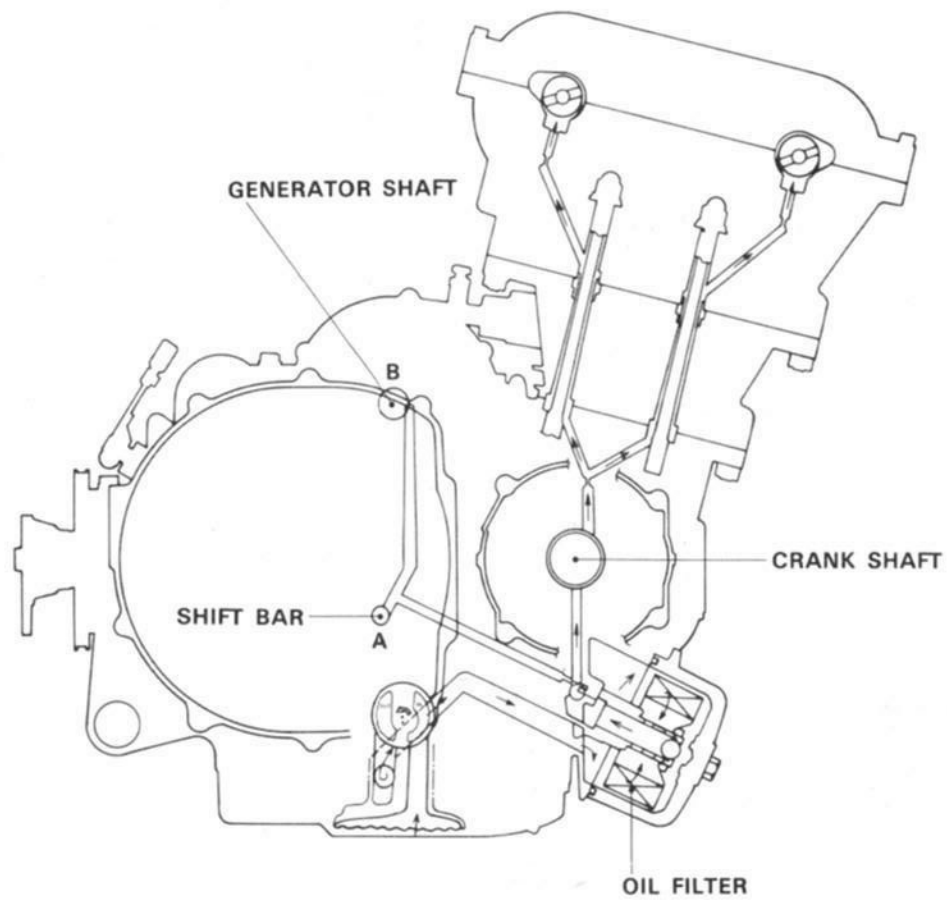
F. Electrical (1)

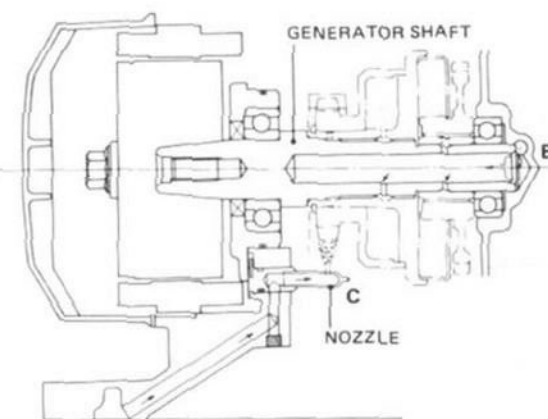
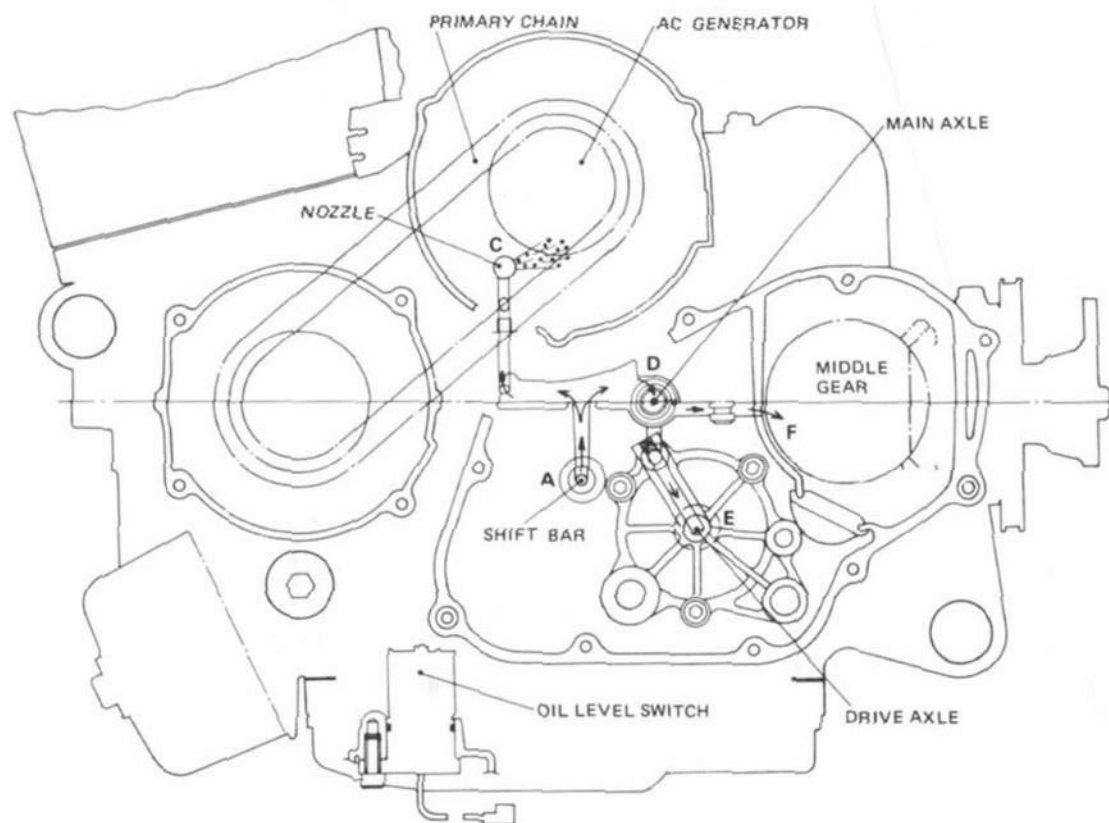


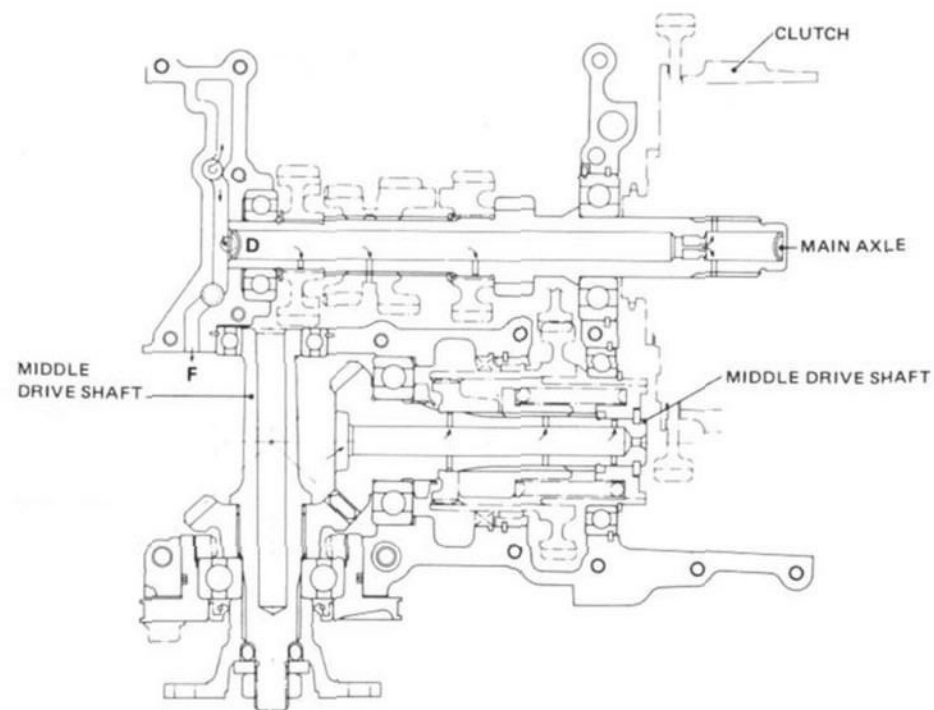
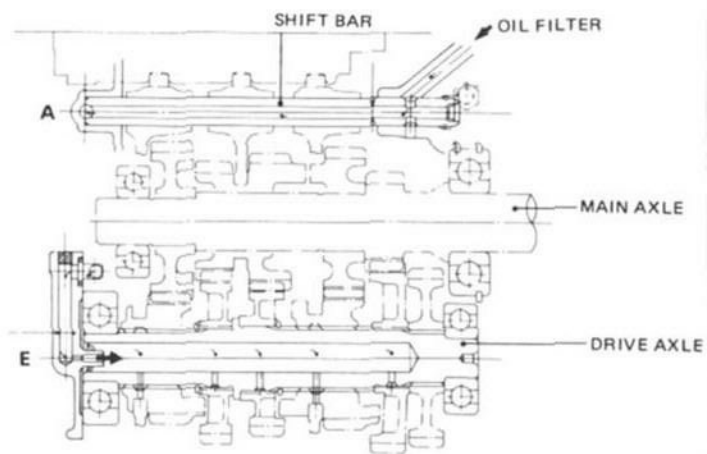
G. Electrical (2)



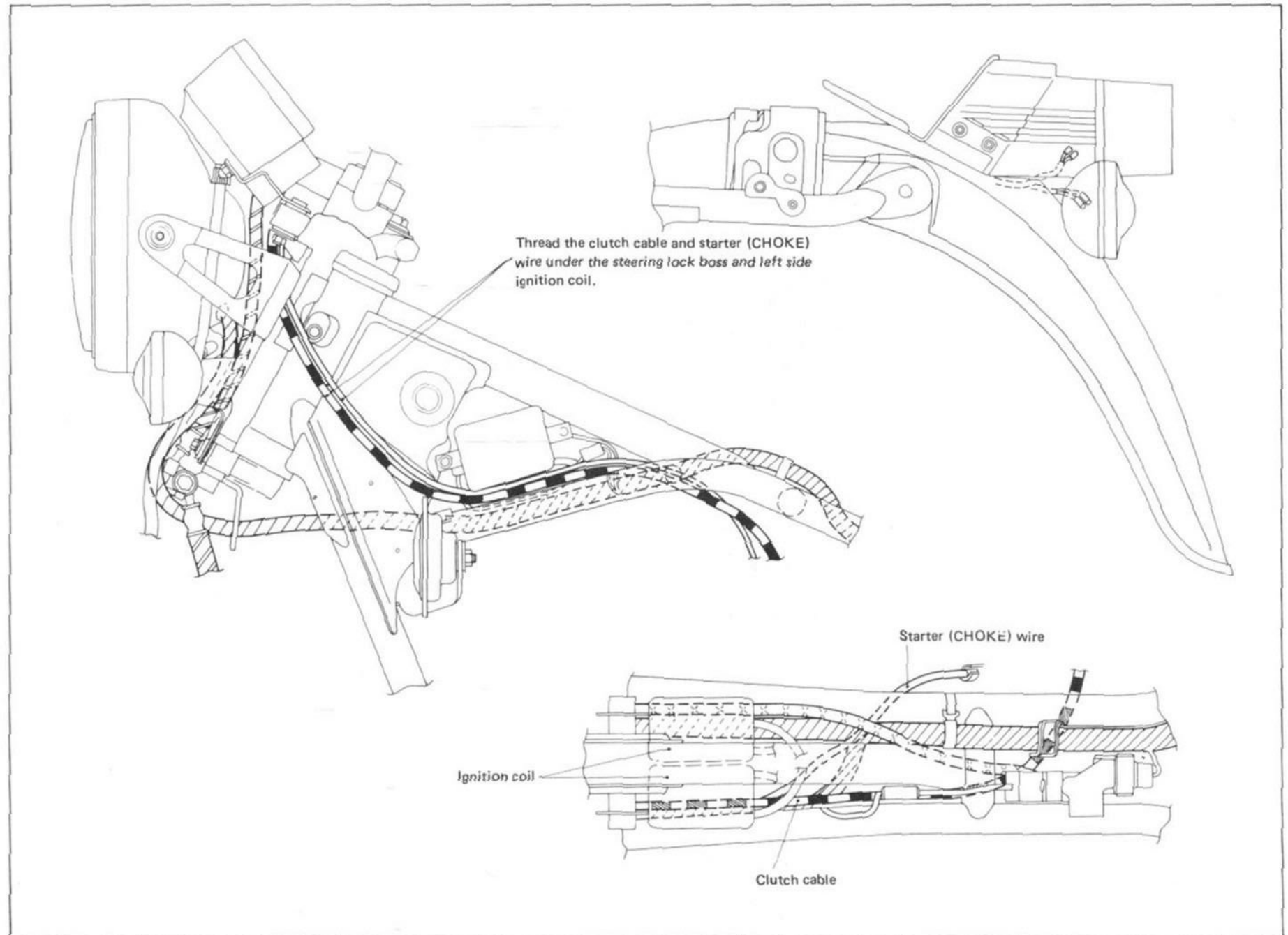
LUBRICATION DIAGRAM

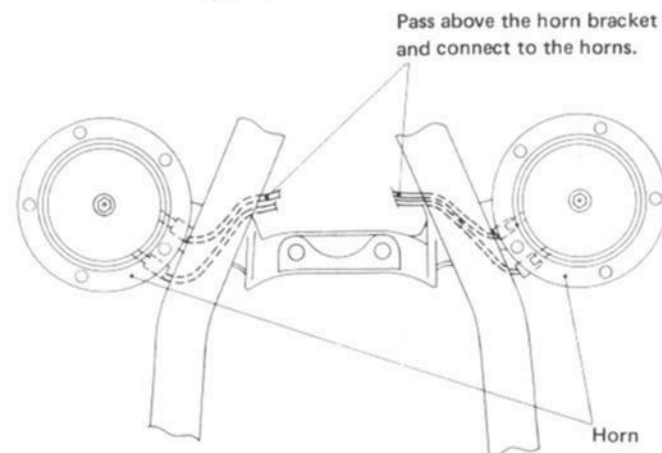
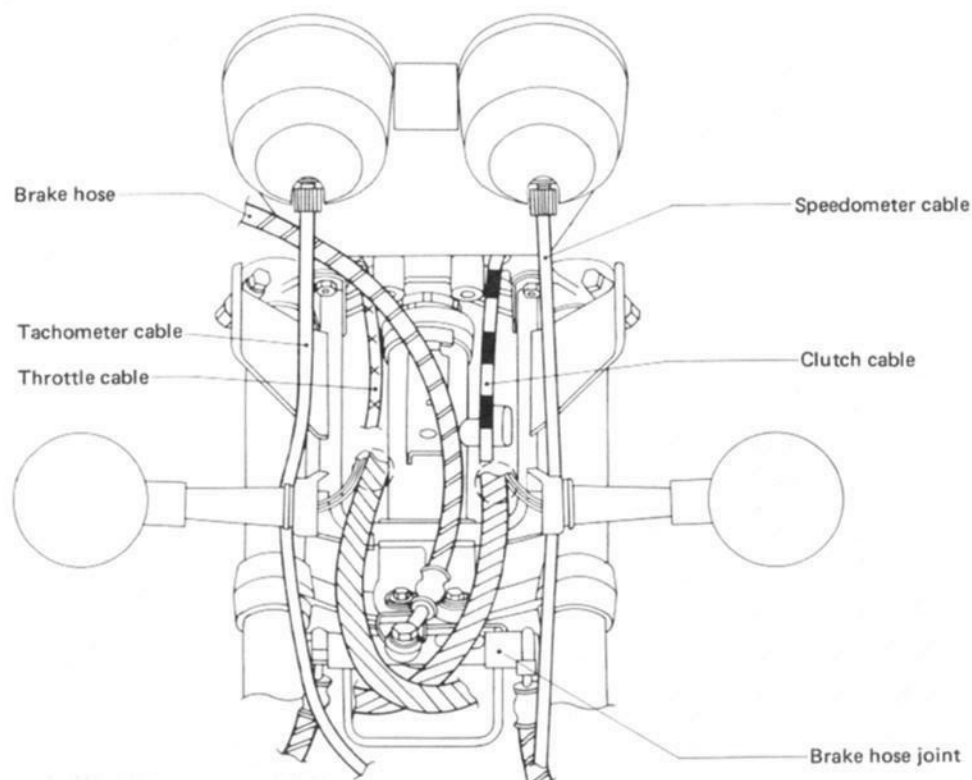
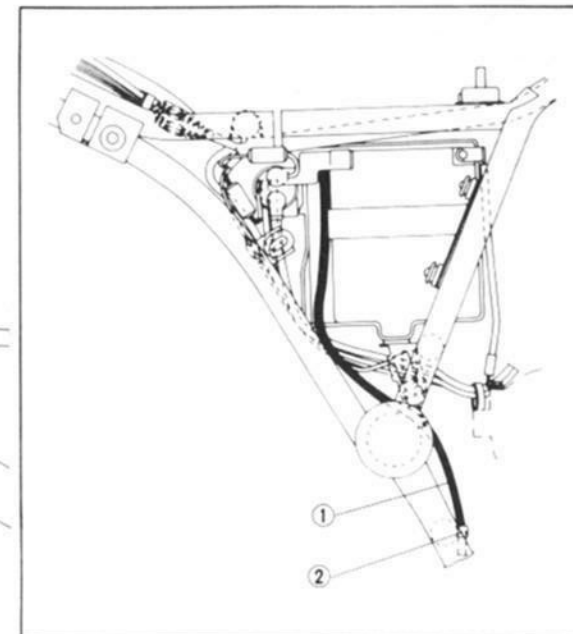
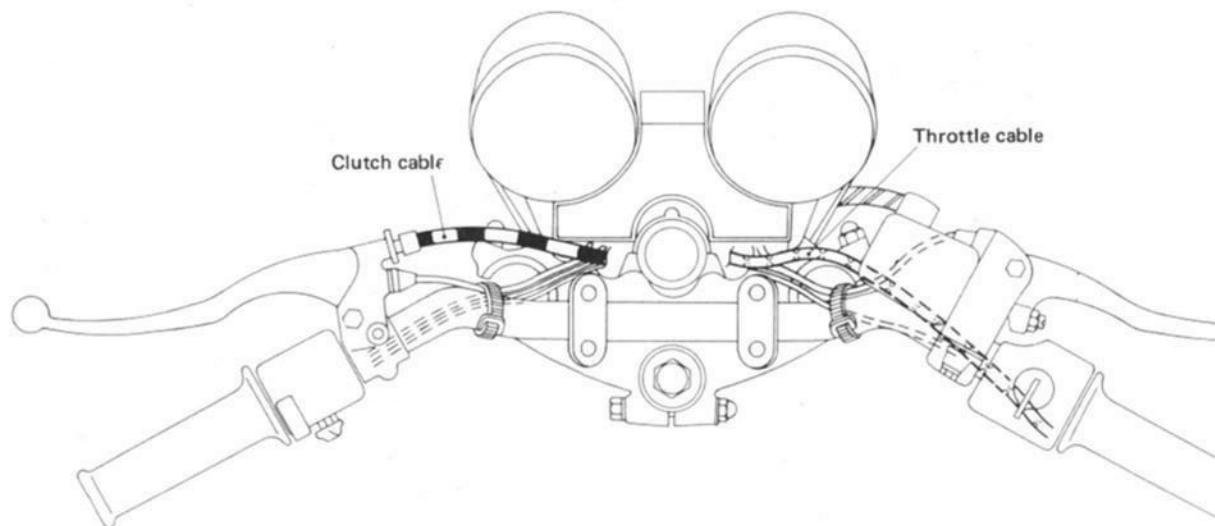






CABLE ROUTING





XJ650RJ WIRING DIAGRAM

