

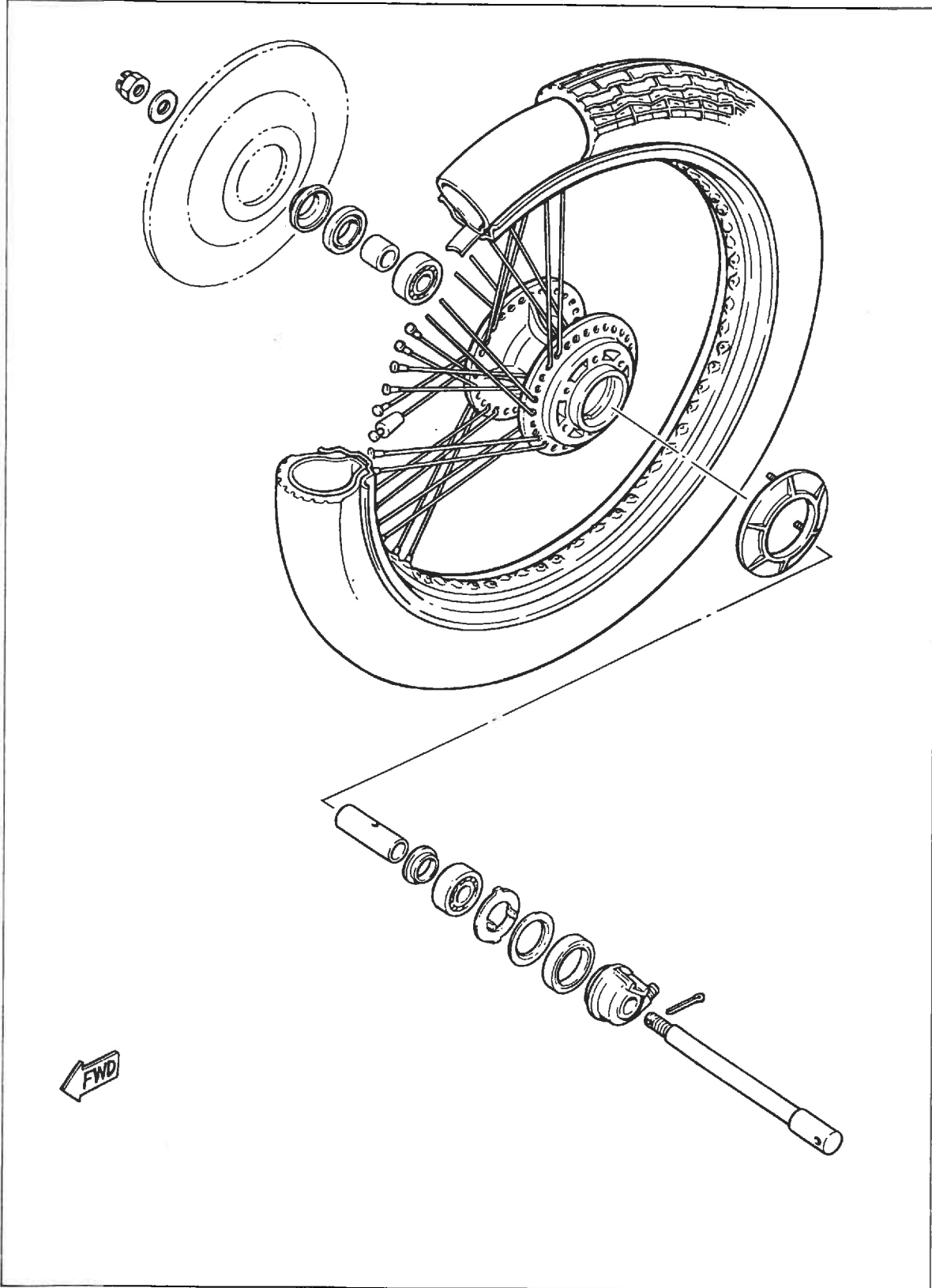
CHAPTER 5. CHASSIS

FRONT WHEEL	5-1
A. Removal	5-2
B. Front Axle Inspection	5-2
C. Front Wheel Inspection	5-2
D. Replacing The Wheel Bearings	5-2
E. Installing the Front Wheel	5-3
REAR WHEEL	5-4
A. Removal	5-5
B. Checking Brake Shoe Wear	5-5
C. Brake Drum	5-5
D. Brake Shoe Plate	5-5
E. Rear Axle Inspection	5-5
F. Replacing The Wheel Bearings	5-5
G. Rear Wheel Inspection	5-6
H. Installing The Rear Wheel	5-6
FRONT BRAKE	5-6
A. Brake Pad Replacement	5-6
B. Caliper Disassembly	5-7
C. Master Cylinder Disassembly	5-7
D. Brake Inspection and Repair	5-8
E. Brake Assembly	5-8
FRONT FORK	5-12
A. Removal and Disassembly	5-12
B. Inspection	5-13
C. Assembly	5-14
STEERING HEAD	5-15
A. Adjustment	5-15
B. Removal	5-15
C. Inspection	5-16
D. Assembly	5-16
SWING ARM	5-17
A. Free Play Inspection	5-17

CABLE AND FITTING5-17
A. Cable Maintenance5-17
B. Throttle Maintenance5-18

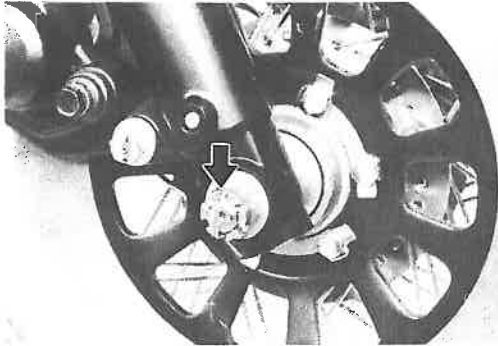
CHASSIS

FRONT WHEEL

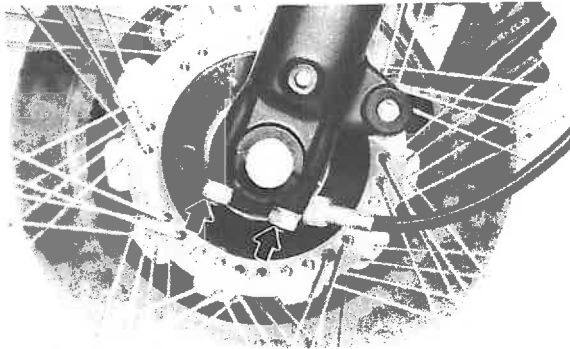


A. Removal

1. Place the motorcycle on the centerstand.
2. Remove the cotter pin and axle nut.



3. Loosen the axle holder securing nuts.



4. Remove the speedometer cable.
5. Remove the axle and the front wheel. Make sure the motorcycle is properly supported.

NOTE: _____

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

B. Front Axle Inspection

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

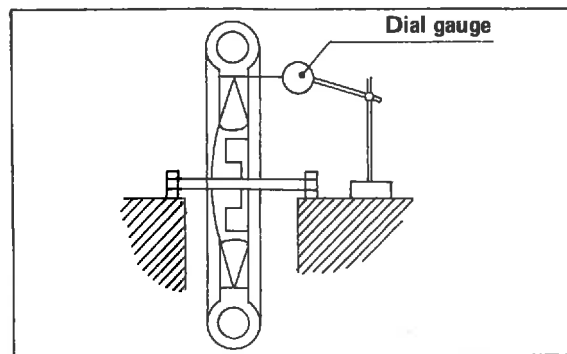
C. Front Wheel Inspection

1. Check for cracks, bends, or warpage of the wheels. If a wheel is deformed or cracked, it must be replaced.
2. Check wheel run-out. If the deflection exceeds the tolerance below, check the wheel bearings or replace the wheel as required.

Rim run-out limits:

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

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



NOTE: _____

The wheel should be balanced with the brake disc installed.

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

TIGHTENING TORQUE:

1.47 Nm (0.15 m·kg, 1.1 ft·lb)

D. Replacing The Wheel Bearings

If the bearings allow play in the wheel hub or if the wheel does not turn smoothly, replace the bearings as follows:

1. Clean the outside of the wheel hub.

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

WARNING:

Eye protection is recommended when using striking tools.

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

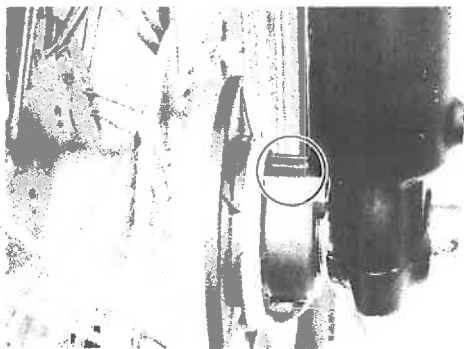
CAUTION:

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

E. Installing The 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 the speedometer drive and driven gears. Use lightweight lithium-soap base grease.
2. Make sure the projecting portion (torque stopper) of the speedometer housing is positioned correctly.

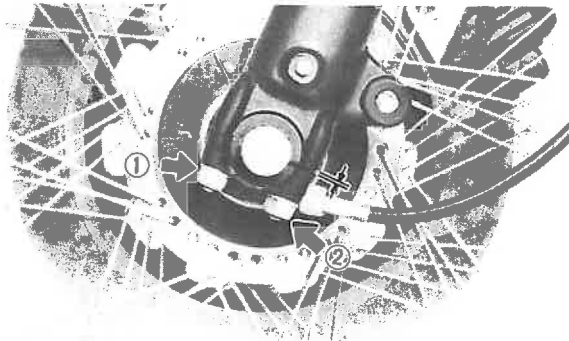


3. Install the speedometer cable. Tighten the axle nut and install a new cotter pin.

TIGHTENING TORQUE:

105 Nm (10.7 m·kg, 77.4 ft·lb)

4. Before tightening the pinch bolt, compress the front forks several times to check for proper fork operation.
5. Tighten the axle holder securing nuts. Tighten the axle holder securing nuts. Tighten first the front side and then the rear side, so the rear side can have clearance.



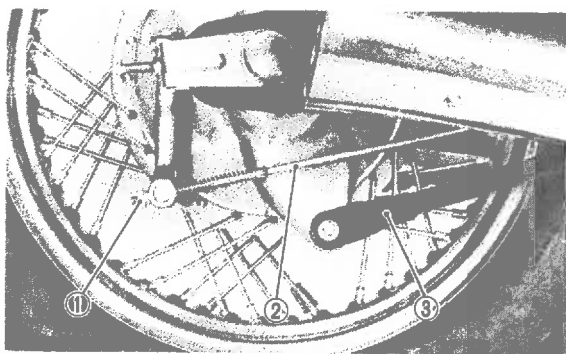
1. Axle holder nut 2. Axle holder nut

TIGHTENING TORQUE:

19.6 Nm (2.0 m·kg, 14.5 ft·lb)

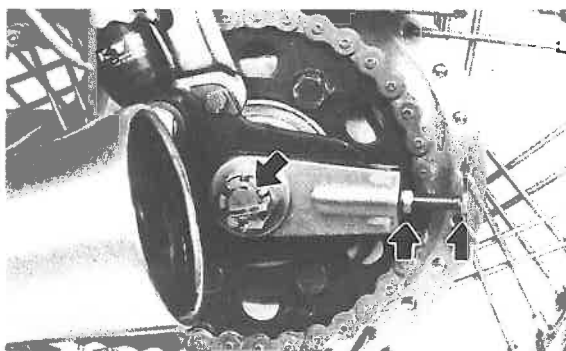
A. Removal

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



1. Adjuster 2. Brake rod 3. Tension bar

3. Remove the axle-nut cotter pin and the axle nut. Loosen the lock nuts and the adjust bolts.

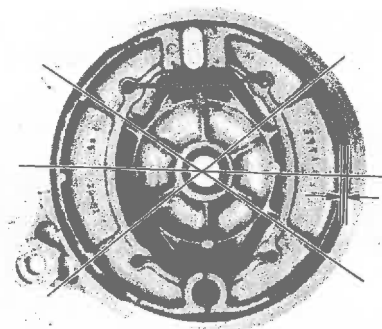


4. Pull out the rear axle.

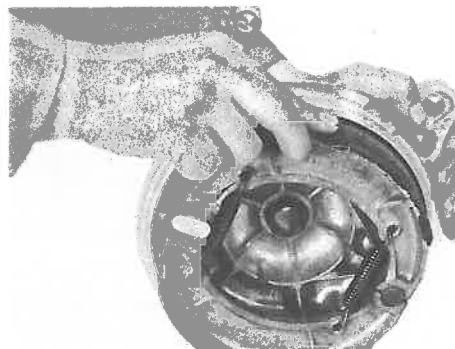
B. Checking Brake Shoe Wear

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

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



2. Remove any glazing from the brake shoes with coarse sandpaper.



C. Brake Drum

Oil or scratches on the inner surface of the brake drum will impair braking performance or result in abnormal noises. Remove oil by wiping the brake drum with a rag soaked in lacquer thinner or solvent. Remove scratches by lightly and evenly polishing the brake drum with emery cloth.

D. Brake Shoe Plate

Remove the camshaft, and grease it. If the cam face is worn, replace the camshaft.

NOTE:

Before removing the cam lever, put alignment marks on the cam lever and camshaft to indicate their relative positions for easy assembly.

E. Rear Axle Inspection

Refer to "Front Axle Inspection" on page 5-1.

F. Replacing The Wheel Bearings

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

G. Rear Wheel Inspection

See "Front Wheel Inspection" on page 5-1.

H. Installing The Rear Wheel

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

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

TIGHTENING TORQUE: Axle nut: 147 Nm (15 m·kg, 108.5 ft·lb)
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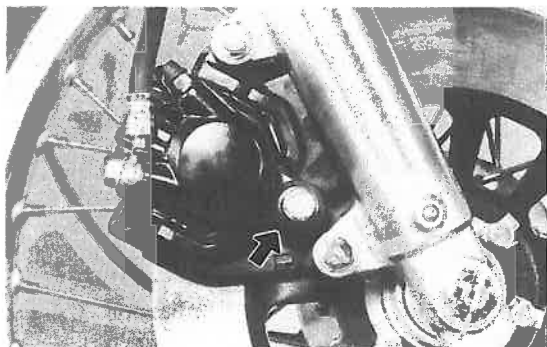
FRONT BRAKE

CAUTION: _____

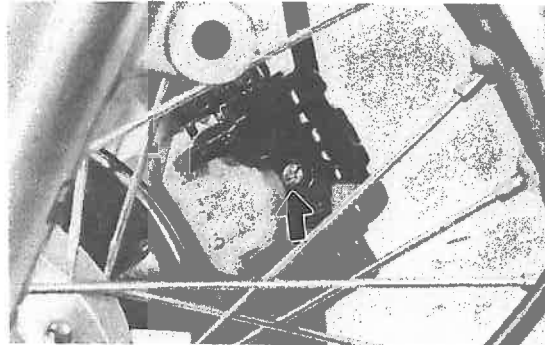
Disc brake components rarely require disassembly. Do not disassemble components unless absolutely necessary. If any hydraulic connection in the system is opened, the entire system should be disassembled, drained, cleaned, and then properly filled and bled upon reassembly. Do not use solvents on brake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

A. Brake Pad Replacement

1. Remove the support bolt.



2. Remove the brake pad screw.



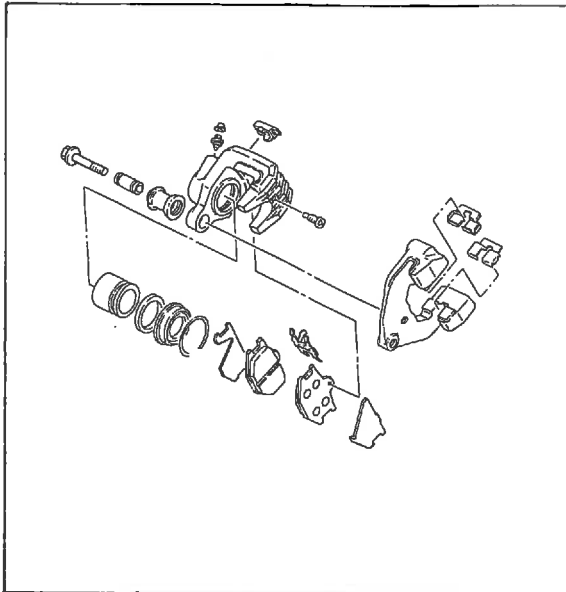
3. Remove the caliper from the support bracket.
4. Remove the pads from the support bracket.



5. Install the new brake pads. Replace the following parts if pad replacement is required.
 - Pads
 - Retainer pad spring

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

B. Caliper Disassembly



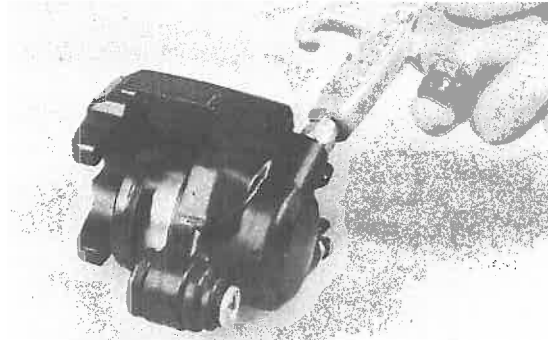
1. Remove the brake hose from the caliper. Allow the caliper assembly to drain into a container.
2. Place the open hose end into the container and pump the old fluid out of the master cylinder.
3. Remove the retaining nut and the dust seal.



4. Carefully force the piston out of the caliper cylinder with compressed air. Never try to pry out the piston.

WARNING:

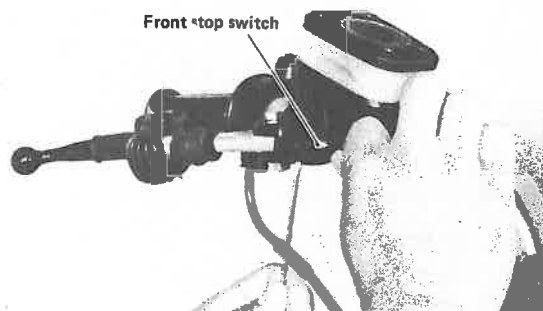
Cover the piston with a rag. Use care so that the piston does not cause injury as it is expelled from the cylinder.



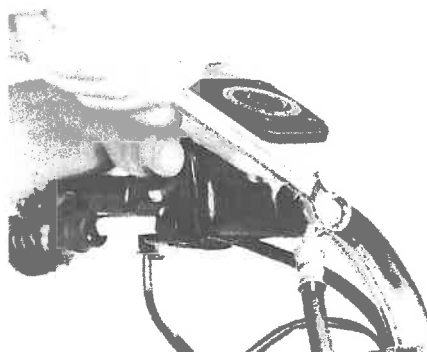
7. Remove the piston seal.

C. Master Cylinder Disassembly

1. Remove the brake light switch.



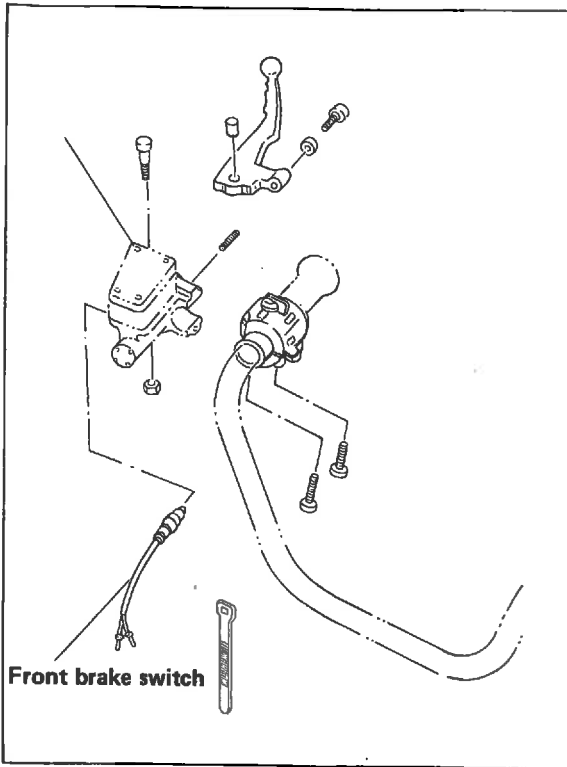
2. Remove the brake hose.



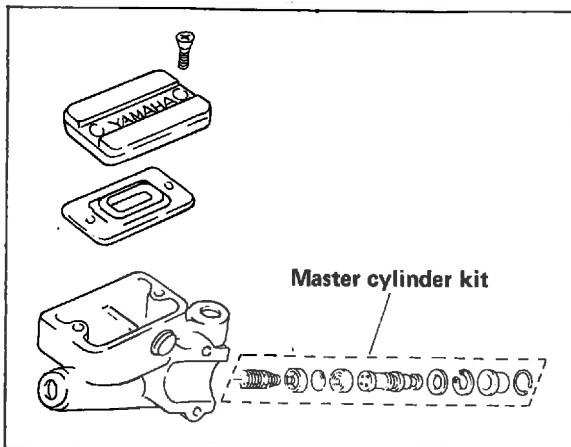
3. Remove the brake lever and spring.

NOTE:

Never lose the spring.



4. Remove the master cylinder from the handlebar. Remove the cap, and drain the remaining fluid.
5. Remove the master cylinder dust boot.
6. Remove the snap ring.



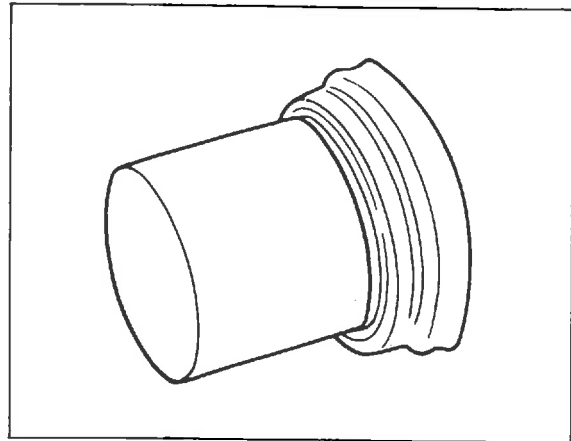
7. Remove the master-cylinder-cup assembly. Note that the cylinder cups are installed with the larger diameter (lips) inserted first.

D. Brake Inspection And Repair

Recommended Brake Component Replacement Schedule:

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

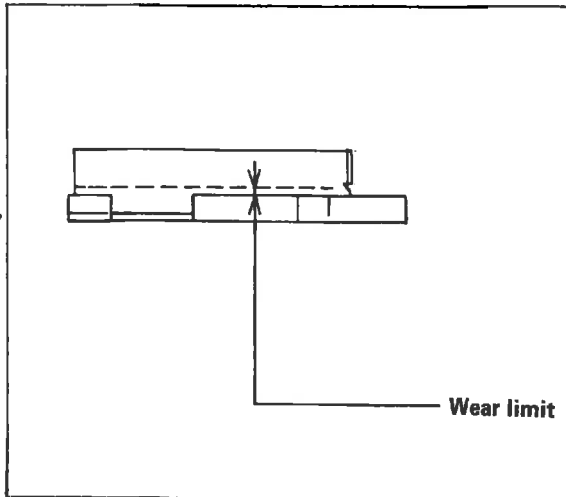
1. Replace the caliper piston if it is scratched.



2. Replace any brake pad that is worn beyond limits. Always replace the brake pads as a set. See "Brake Pad Replacement" for a listing of the parts to be replaced when pads are replaced.

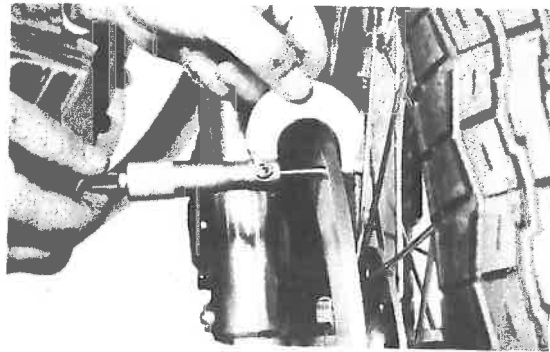
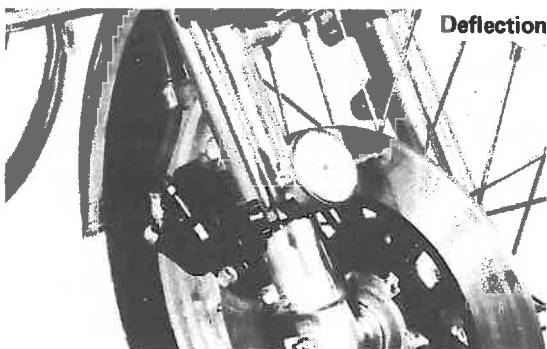
Wear limit: 1.0mm (0.04 in)





3. Replace the piston and dust seals if damaged. Replace the seals every two years.
4. Inspect the master cylinder body; replace if scratched. Clean all the passages with new brake fluid.
5. Inspect the brake hoses. Replace the hoses every four years or immediately if cracked, frayed, or damaged.
6. Check for wear and deflection of the disc. If the disc is worn beyond minimum thickness or if deflection exceeds the specified amount, replace the disc.

Maximum deflection:
0.5 mm (0.020 in)
Minimum disc thickness:
6.5 mm (0.26 in)



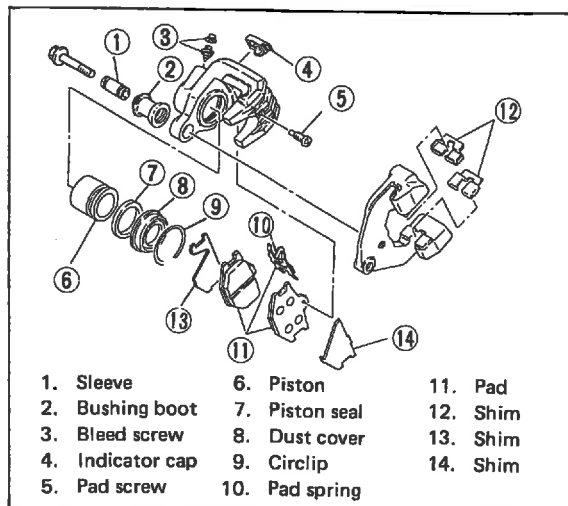
Thickness

E. Brake Assembly

Caliper

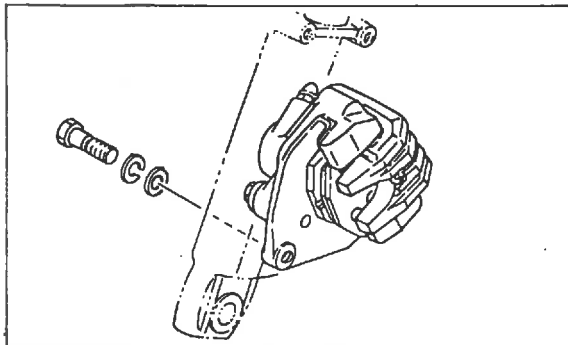
All internal parts should be cleaned in new brake fluid only. Internal parts should be lubricated with brake fluid when installed. Replace the following parts whenever a caliper is disassembled:

- Bleed screw and rubber cap
- Caliper boot
- Piston seal
- Dust seal
- Retaining ring



1. Install the piston seal and the piston.
2. Install the pads.
3. Install the caliper assembly on the front fork. Apply Loctite® Stud N' Bearing Mount to the threads of the pivot bolt, and torque the bolt to specification.

TIGHTENING TORQUE:
25.6 Nm (2.6 m·kg, 18.8 ft·lb)



4. Attach the brake hoses.

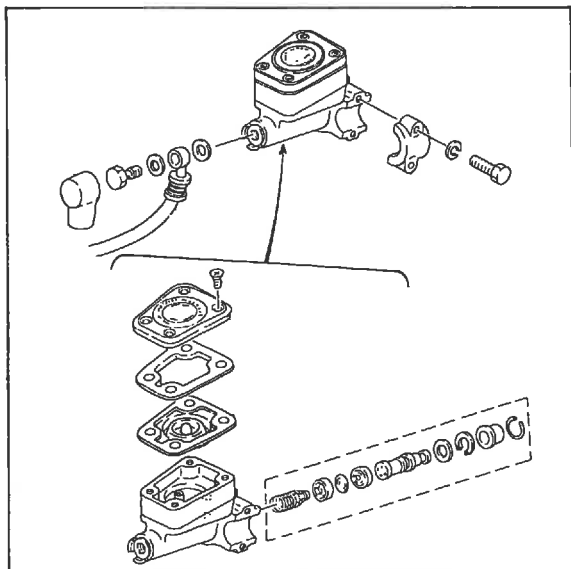
TIGHTENING TORQUE:
25.5 Nm (2.6 m·kg, 18.8 ft·lb)

5. If the brake disc has been removed from the hub or is loose, tighten the bolts. Use new lock plates, and bend the lock tabs against a bolt flat after the bolts are torqued to specification.

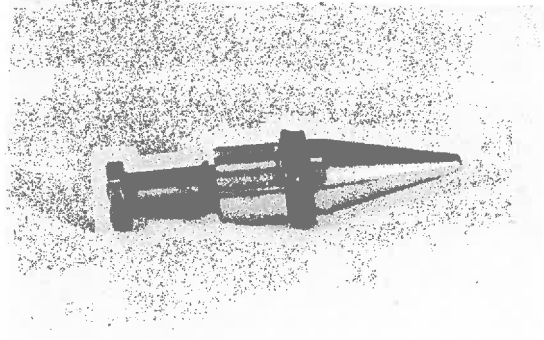
TIGHTENING TORQUE:
19.6 Nm (2.0 m·kg, 14.5 ft·lb)

6. Reassemble the master cylinder as shown in the illustration.

TIGHTENING TORQUE:
(all brake union bolts)
25.5 Nm (2.6 m·kg, 18.8 ft·lb)



Use the special tool, when installing the new cylinder seal into the piston.

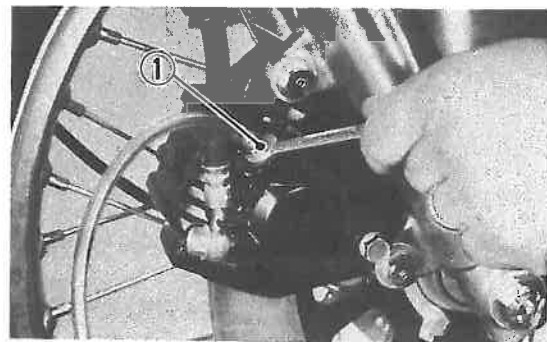


Bleeding the brakes

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.

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



1. Bleed screw

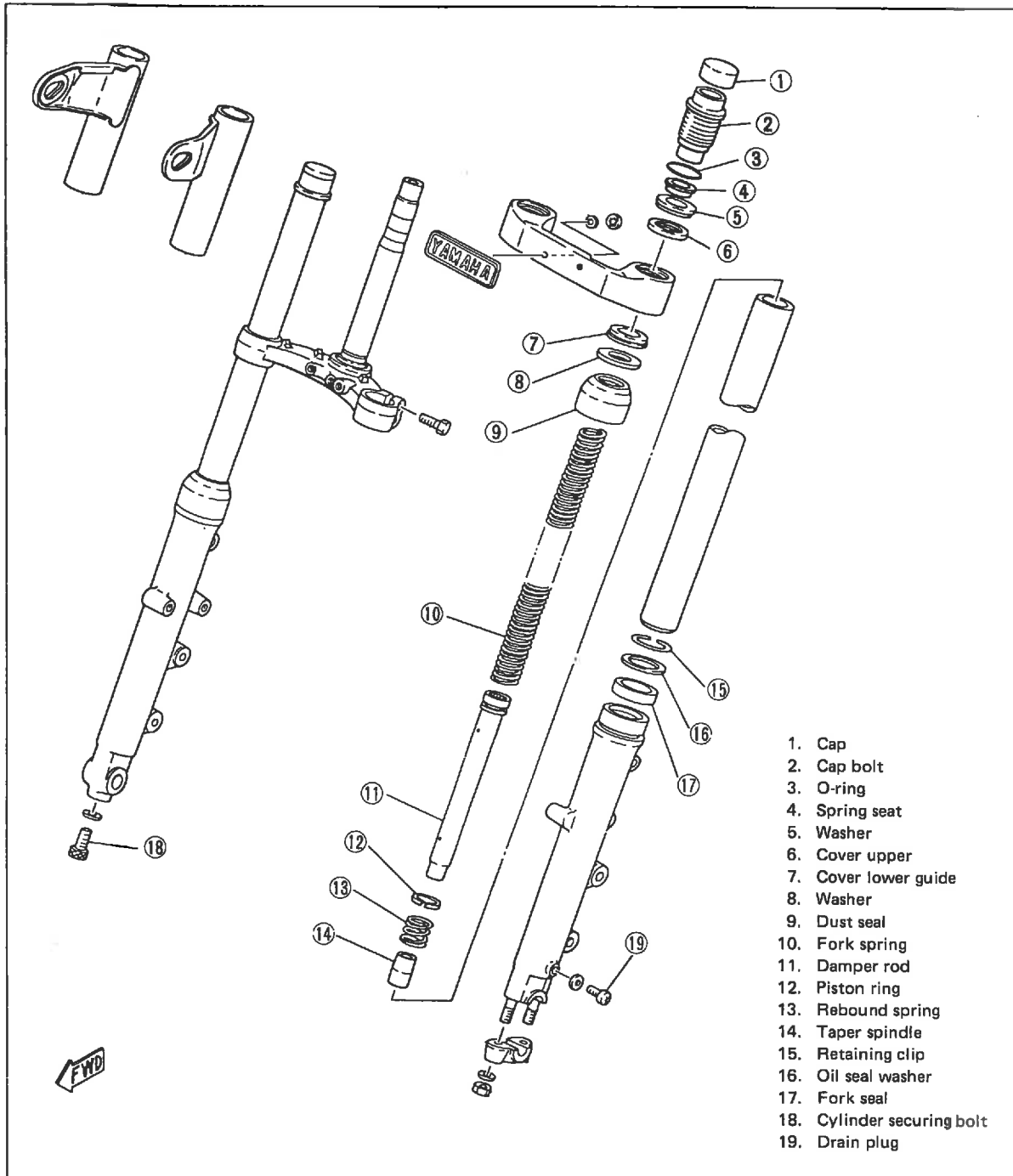
3. Slowly apply the brake lever several times. Pull in the lever. Hold the lever in this "on" position. Loosen the bleed screw. Allow the lever to travel slowly toward its limit. When the limit is reached, tighten the bleed screw. Then release the lever.
4. Repeat the above procedure while adding brake fluid to the reservoir until

all air bubbles are removed from the 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 have settled out.

FRONT FORK

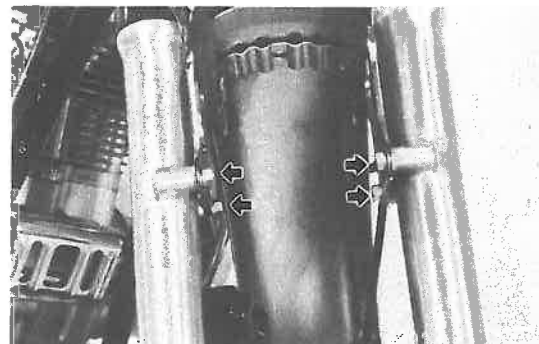


A. Removal And Disassembly

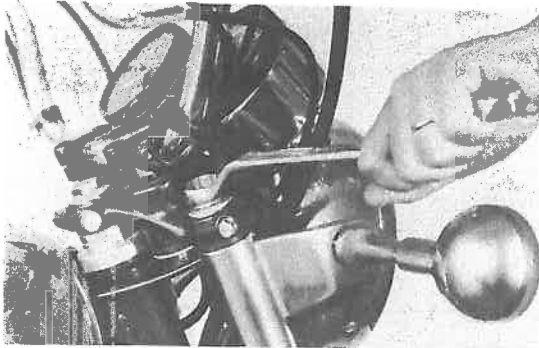
WARNING:

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

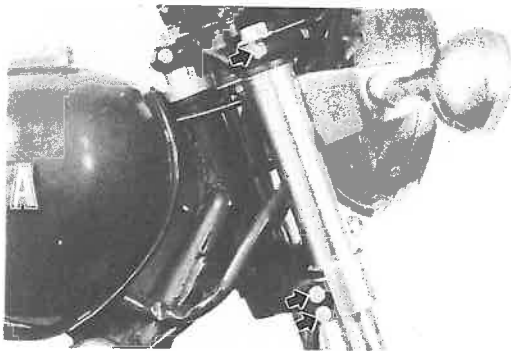
1. Disconnect the speedometer cable. Remove the front wheel. Remove the front fender.



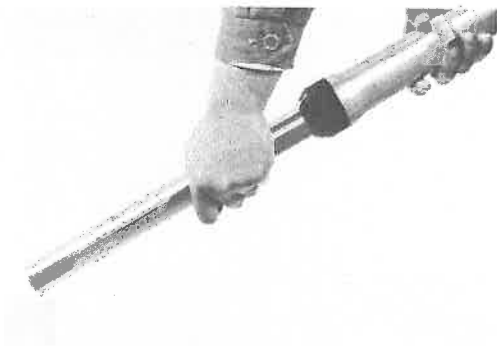
2. Remove the wire holder from the front fender.
3. Loosen the caliper securing bolts (2) and remove the caliper assembly.



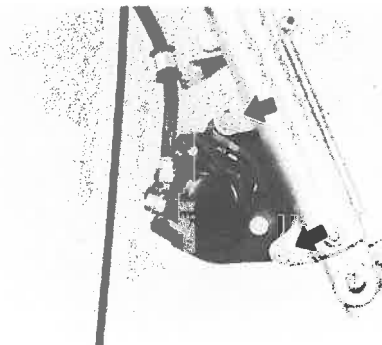
4. Remove the rubber caps and loosen the cap bolts.



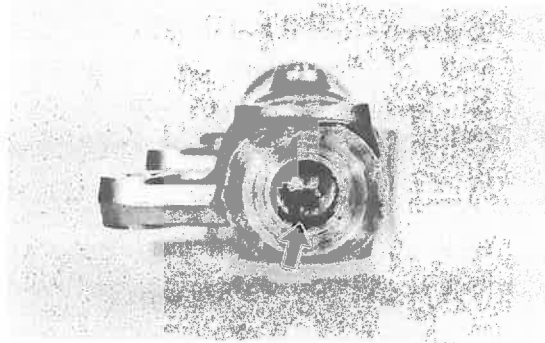
5. Loosen the pinch bolts on the upper and lower brackets and pull down the forks.



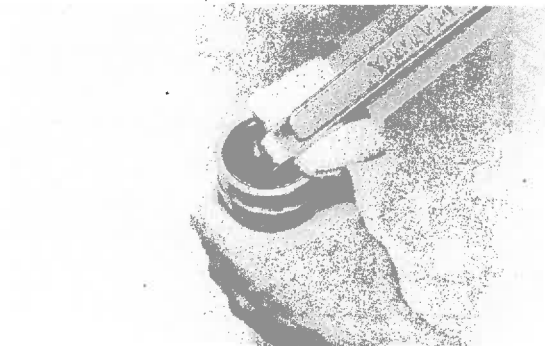
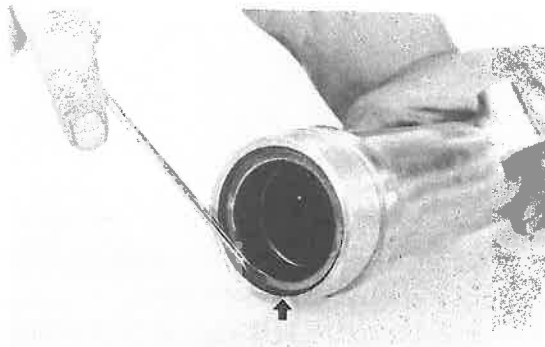
6. Remove the cap bolts and drain fork oil.



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



B. 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:
610 mm (24.0 in)

5. Check the o-ring on the cap bolt. If it's damaged, replace it.



C. 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:
19.6 Nm (2.0 m·kg, 44.5 ft·lb)

5. Fill fork oil and put the fork springs into the fork tubes. Install the cap bolts.

Recommended oil:

Yamaha Fork Oil 10 wt or Equivalent
Oil capacity: 164 ~ 172 cm³
(5.78 ~ 6.07 Imp oz,
5.54 ~ 5.82 US oz)

6. Install the fork assembly and tighten the upper and lower pinch bolts.

TIGHTENING TORQUE:

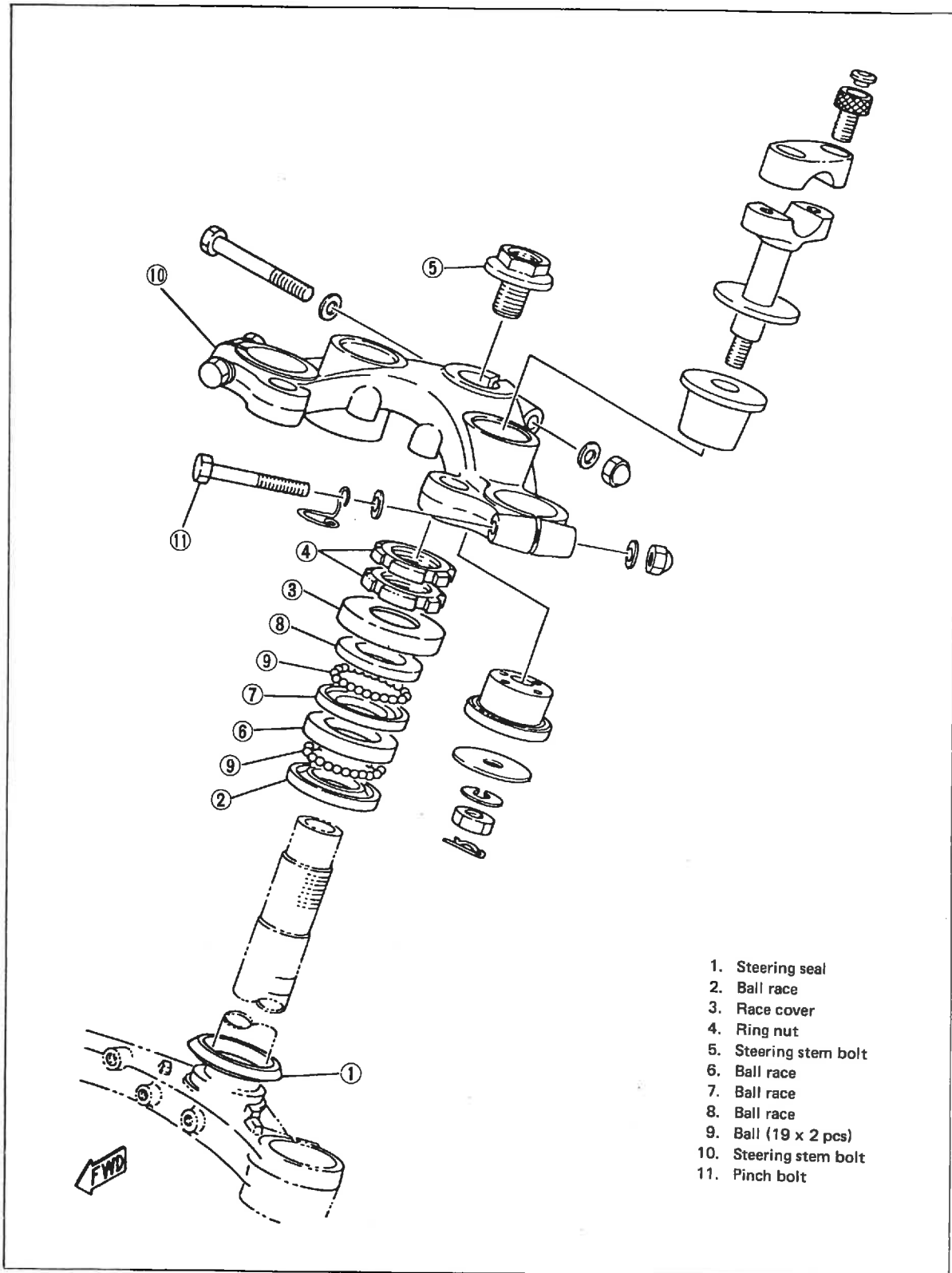
Upper 9.81 Nm (1.0 m·kg, 7.23 ft·lb)
Lower 19.6 Nm (2.0 m·kg, 14.5 ft·lb)

7. Tighten the fork cap bolts.

TIGHTENING TORQUE:

19.6 Nm (2.0 m·kg, 44.5 ft·lb)

STEERING HEAD



A. Adjustment

Refer to "D. Assembly" for steering head adjustment procedures.

B. Removal

1. Remove the seat, fuel tank, and the upper bracket cover.

2. Remove the headlight lens unit, and disconnect all wiring connectors in the headlight shell.
3. Remove the two meter-bracket holding bolts and the headlight vertical-adjustment screw. Remove the meter bracket with the headlight shell.
4. Remove the handlebars.
5. Disconnect the horn lead wire.
6. Remove the front fork assembly.
7. Remove the stem bolt, loosen the pinch bolt, and remove the steering crown.
8. Remove the top ring nut.
9. Support the steering stem, and remove the lower ring nut.
10. Remove the top bearing race and all of the balls from the upper bearing.

TIGHTENING TORQUE:

Pinch bolt:

9.81 Nm (1.0 m·kg, 7.23 ft·lb)

Steering stem bolt:

53 Nm (5.4 m·kg, 39.1 ft·lb)

Ball quantity (upper and lower): 38 pcs.

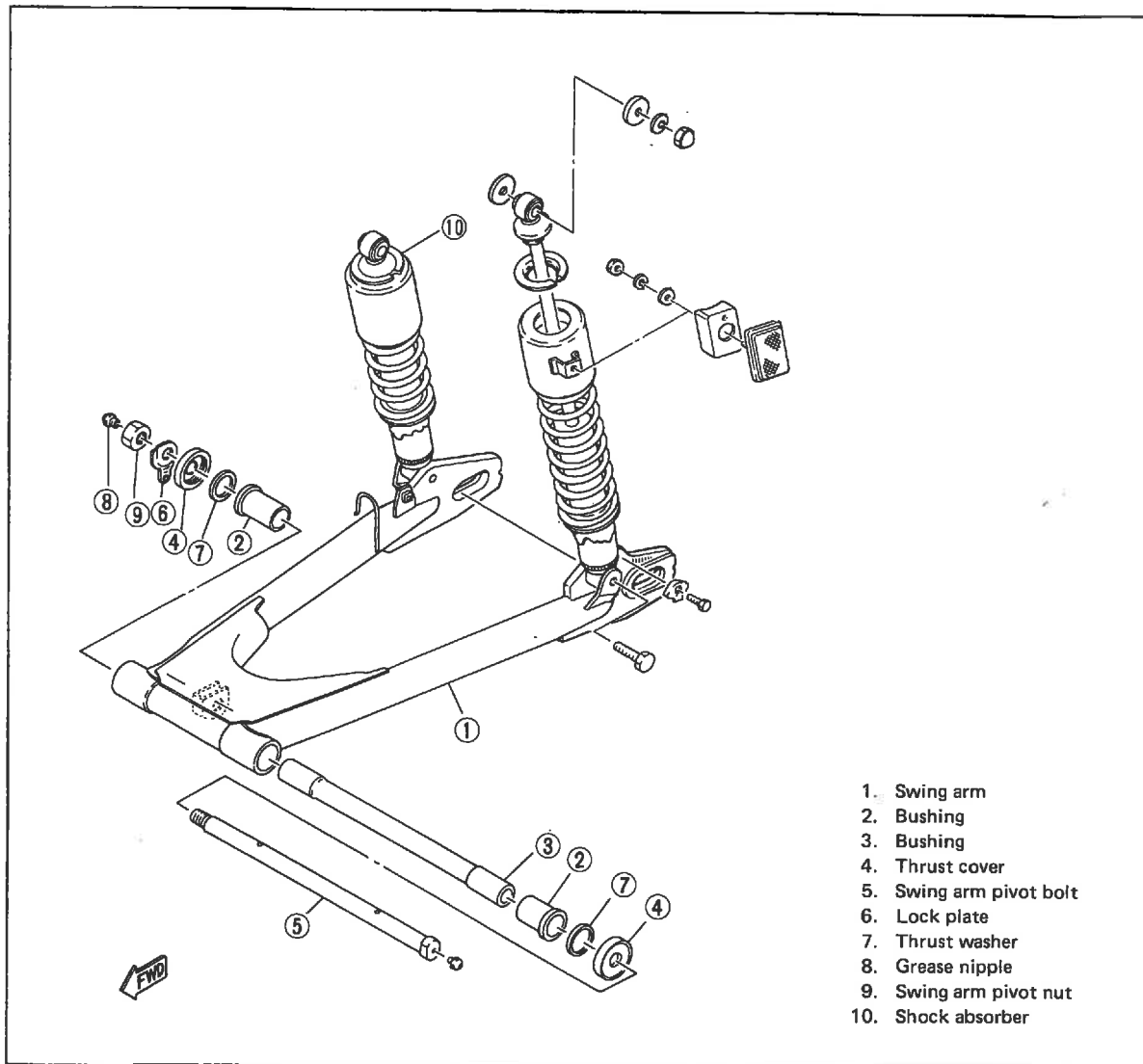
C. Inspection

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

D. Assembly

1. Grease the bearings and races with wheel bearing grease.
2. Install the steering stem, balls, and races.
3. Install the lower ring nut. Tighten it to approximately 24.5 Nm (2.5 m·kg, 18 ft·lb) and loosen it approximately 1/4 turn.
4. While holding the lower ring nut with the ring nut wrench, tighten the top ring nut securely.
5. Continue assembly; reverse the disassembly procedure.
6. When assembly is complete, check the steering stem by turning it from lock to lock. If there is any binding or looseness, readjust the tightness of the steering stem.

SWING ARM



A. Free Play Inspection

1. Remove the rear wheel and the shock absorber. Grasp the swingarm and try to move it from side to side as shown. There should be no noticeable side play.
2. The swingarm is mounted on bushes. Move the swingarm up and down as shown. The swingarm should move smoothly, without tightness, binding, or rough spots that could indicate damaged bushes.
3. If there is a noticeable side play, change the bushes.
4. If the swingarm does not move smoothly, check the bushing for its movement. When the bushing moves freely, change to thinner thrust washers.

CABLES AND FITTINGS

A. Cable Maintenance

NOTE:

See "Maintenance and Lubrication" intervals charts. Cable maintenance is primarily concerned with preventing deterioration and providing proper lubrication to allow the cable to move freely within its housing. Cable removal is straightforward and uncomplicated. Removal is not discussed within this section.

WARNING:

Cable routing is very important. For details of cable routing, see the cable routing diagrams at the end of this manual. Improperly routed or adjusted cables may make the motorcycle unsafe for operation.

1. Remove the cable.
2. Check for free movement of the cable within its housing. If movement is obstructed, check for frayed strands or kinking of the cable. If damage is evident, replace the cable.
3. To lubricate the cable, hold it in a vertical position. Apply lubricant to the uppermost end of the cable. Leave it in the vertical position until the lubricant appears at the bottom. Allow any excess to drain, and reinstall the cable.

NOTE:

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

B. Throttle Maintenance

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

NOTE:

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

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