

CHAPTER 5. CHASSIS

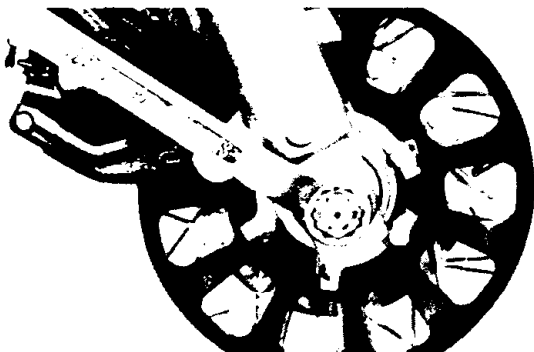
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CHAPTER 5. CHASSIS

5-I. FRONT WHEEL

A. Removal

1. Remove cotter pin from front axle nut.
2. Remove the front axle nut.
3. Loosen the two **axle** holder nuts at the bottom of the fork leg.
4. Raise the front wheel of the machine by placing suitable stand under the engine.
5. Remove the front wheel axle by simultaneously twisting and pulling out on the axle. Then remove the wheel assembly. The speedometer gear unit housing must be removed.



B. Front axle inspection

Remove any corrosion from axle with emery cloth. Place the axle on a surface plate and check for bends. If bent, replace axle.

C. Front wheel inspection

1. A rim can develop warpage. It is due to (1) running the wheel into an object and bending the outer rim, or (2) one or more spokes loosening.
2. Check for warpage by mounting the wheel on a stand (or, if the wheel is attached to a motorcycle, it can be blocked up and held in place). Use some device to measure or detect movement then slowly spin the wheel and note the amount of rim "run-out". It should not exceed 2 mm(0.08 in).
3. If all the spokes are tight, and the rim shows no obvious signs of damage, and yet run out is still excessive, do the following:

- a) If the run out is up and down, loosen spokes opposite the high spot and tighten the spokes at the high spot.
- b) If the run out is sideways, loosen the spokes at the high spot, and tighten the spokes opposite the high spot.

D. Replacing wheel bearings

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

1. Clean the outside of the wheel hub.
2. Drive the bearing out by pushing the spacer aside and tapping around the perimeter of the bearing inner race with a soft metal drift pin and hammer. The spacer "floats" between the bearings. Both bearings can be removed in this manner.
3. To install the wheel bearing, reverse the above sequence. Be sure to grease the bearing before installation. Use a socket that matches the outside race of the bearing as a tool to drive in the bearing.

CAUTION:

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

E. Installing front wheel

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

1. Lightly grease lips of front wheel oil seals and gear teeth of speedometer drive and driven gears. Use lightweight lithium soap base grease.
2. Make sure there is enough gap between disc pads.
3. Check for proper engagement of the boss on the outer fork tube with the locating slot on speedometer gear unit housing.
4. Always secure the front wheel axle as follows:
 - a Tighten the front axle nut.

Axle nut torque:
8.5 m-kg (61 ft-lb)

- b. Tighten axle holder nuts. First tighten nut on front end of axle holder, then tighten nut on rear end.

Holder nut torque:
1 .0 m-kg (7 ft-lb)

- c. install a new cotter pin.

5-2. REAR WHEEL

A. Removal

1. Place machine on center stand.
2. Disconnect the tension bar, and the brake rod from the rear shoe plate. Pay strict attention to the presence and location of the tension bar lock washer and cotter key. These are safety parts and must be included during assembly.



2. Loosen the chain tension adjusting nuts and bolts on both right and left sides.
3. Remove the rear axle cotter pin and nut.
4. Remove the right-hand chain adjuster and distance collar.
5. Remove the rear brake plate.
6. Lean the machine to the left and remove the rear wheel assembly.

B. Rear axle inspection

(See front Wheel, Axle Inspection Procedure.)

C. Replacing wheel bearings

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

D. Rear wheel inspection

(See Front Wheel, Inspection Procedures.)

E. Installing rear wheel

1. Lightly grease lips of rear wheel oil seals.
2. To install the rear wheel, reverse the removal procedure.

NOTE:

Always use a new cotter pin on the axle nut.

Torque:
Axle nut: 15 m-kg(108 ft-lb)

F. Rear Wheel lubrication (on page 41)

5-3. BRAKES

CAUTION:

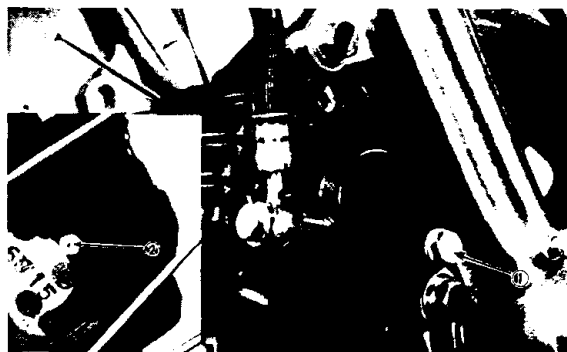
Disc brake components rarely require disassembly. Do not disassembly components unless absolutely necessary. If any hydraulic connection in the system is opened, the entire system should be disassembled, drained, cleaned and then properly filled and bled upon reassembly.

CAUTION:

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.

A. Caliper pad replacement

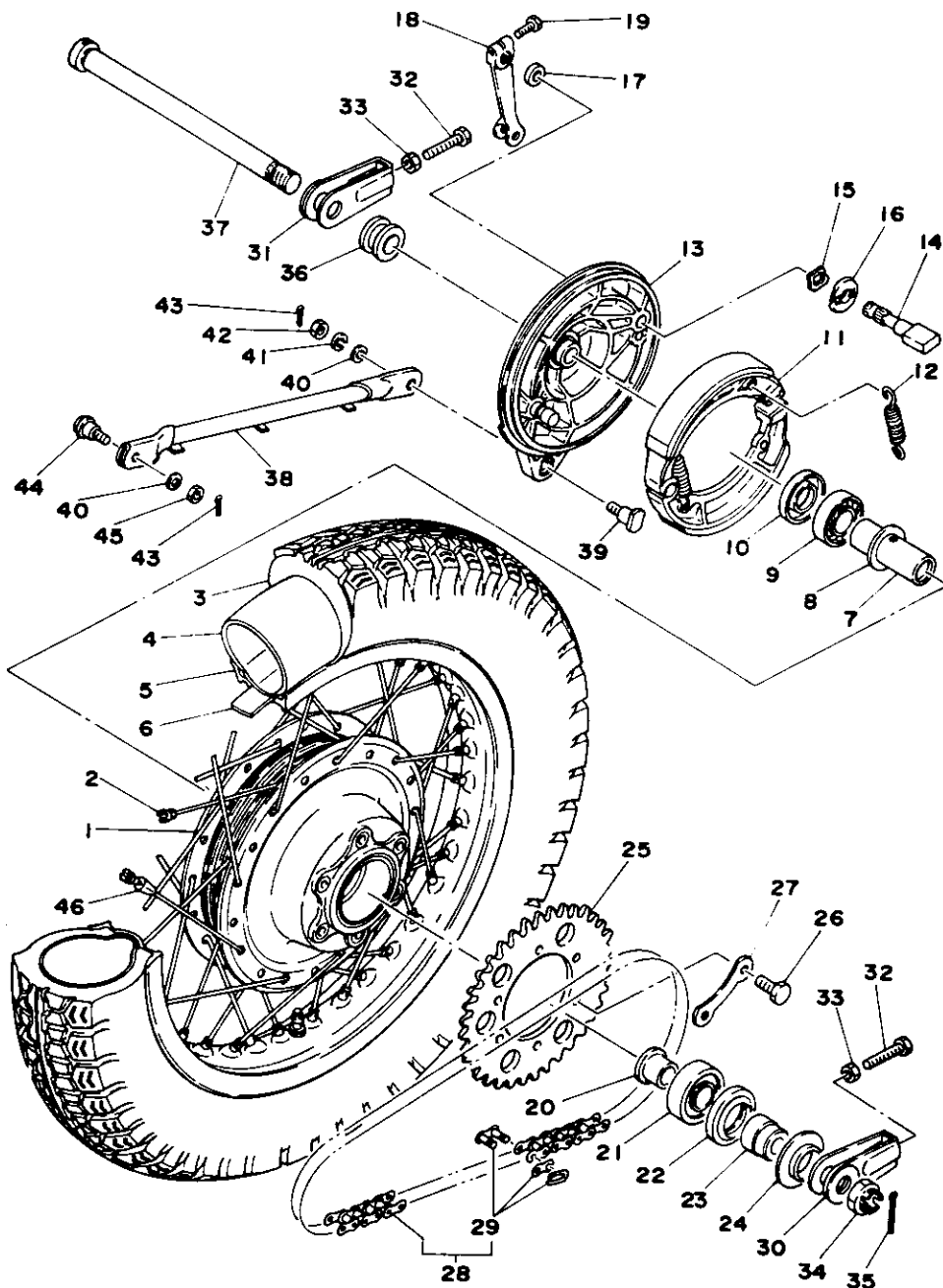
1. It is not necessary to disassemble the brake fluid hoses to replace the brake pads.
2. Remove the caliper support bolt.*
3. Remove the phillips screw that holds the brake pads.



1. Caliper support bolt
2. Pad screw

4. Pull caliper cylinder off caliper frame.
5. Install new brake pads. Replace pads as a set.

REAR WHEEL



- | | | |
|----------------------|--------------------------|---------------------|
| 1. Rear, hub | 17. Cam shaft, seal | 33. Hexagon, nut |
| 2. Spoke set | 18. Cam shaft lever | 34. Castle, nut |
| 3. Rear, tire | 19. Hexagon, bolt | 35. Cotter, pin |
| 4. Tube | 20. Collar | 36. Collar |
| 5. Rim | 21. Bearing | 37. Wheel, shaft |
| 6. Rim, bend | 22. Oil seal | 38. Tension, bar |
| 7. Spacer | 23. Collar | 39. Bolt |
| 8. Flange | 24. Dust, cover | 40. Plate, washer |
| 9. Bearing | 25. Sprocket wheel, gear | 41. Spring, washer |
| 10. Oil seal | 26. Bolt | 42. Nut, hexagon |
| 11. Brake shoe comp. | 27. Lock, washer | 43. Cotter, pin |
| 12. Spring, tension | 28. Chain | 44. Bolt |
| 13. Brake shoe plate | 29. Chain, joint | 45. Hexagon, nut |
| 14. Cam shaft | 30. Chain left, puller | 46. Wheel, balancer |
| 15. Wave, washer | 31. Chain right puller | |
| 16. Cam shaft shim | 32. Hexagon bolt | |

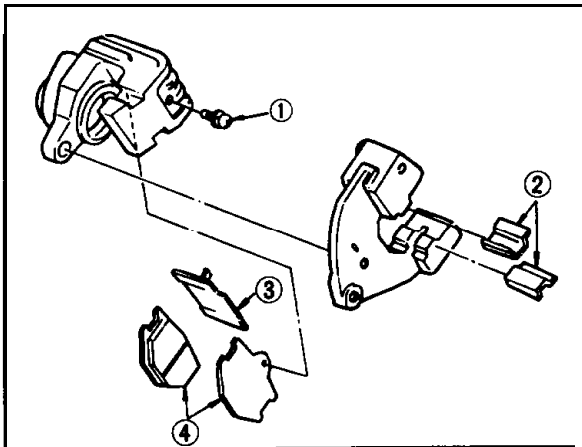
B. Caliper disassembly

1. Remove caliper brake hose. Allow 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 caliper support bolt and pad securing screw as in Caliper pad replacement procedure.
4. Remove caliper assembly from caliper frame.
5. Remove retaining ring and dust seal.
6. Carefully force the piston out of the caliper cylinder with compressed air. Never try to pry out the piston.

CAUTION:

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

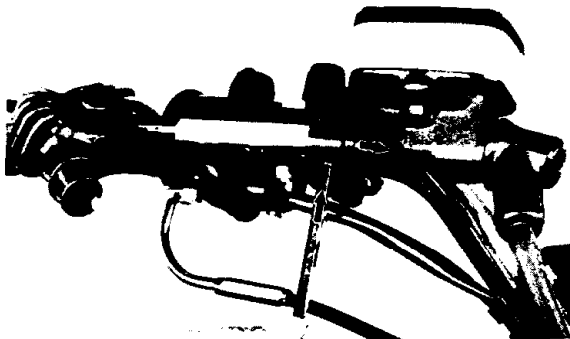
7. Remove piston seal.



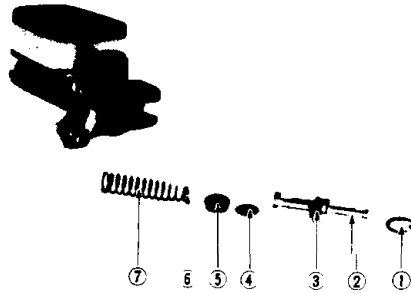
1. Pad screw 3. Shim
2. Shim 4. Pads.

C. Master cylinder disassembly

1. Remove brake hose.
2. Remove front brake switch.



3. Remove brake lever and spring.
4. Remove master cylinder from handlebars. Remove cap and drain remaining fluid.



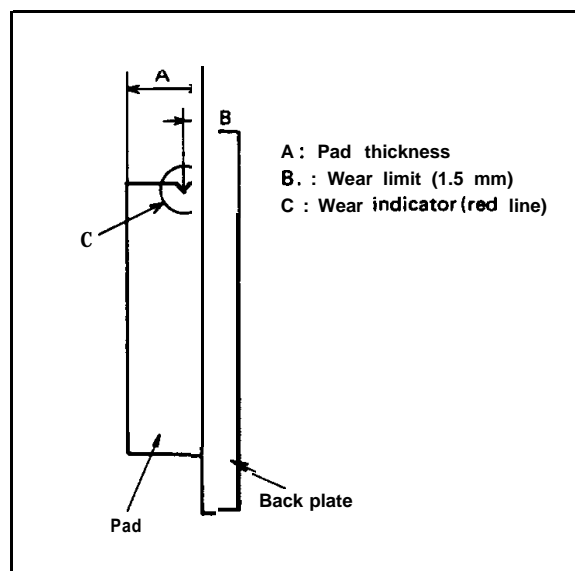
1. Snap ring
2. Cylinder cup (R)
3. Piston
4. Shim
5. Piston cup
6. Spacer
7. Return spring

D. Brake inspection and repair

Recommended Brake Component Replacement Schedule:

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

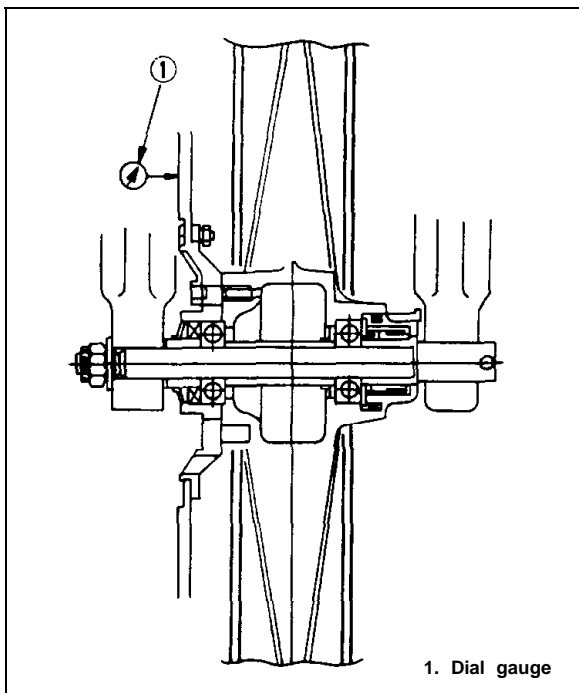
1. Replace caliper piston if it is scratched.
2. Replace any brake pad worn beyond limits.
Replace brake pads as a set.



See "Caliper Replacement Pad" procedure for parts to be replaced when pads are replaced.

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

Wear limit:
1.5 mm (0.06 in)



1. Dial gauge

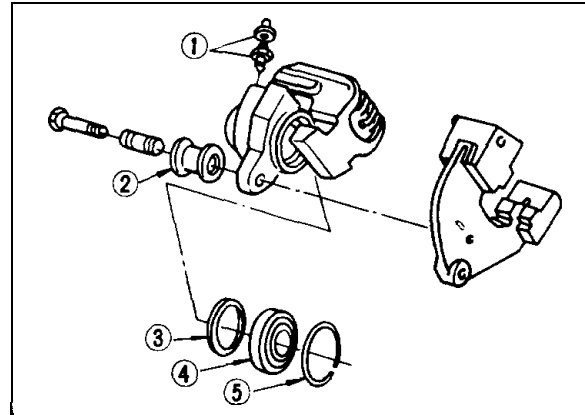
Maximum deflection: 0.15 mm(0.006 in)
Minimum disc thickness: 6.5 mm(0.26 in)

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

E. Brake reassembly

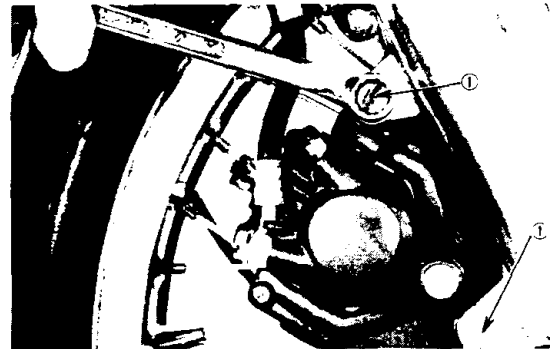
1. All internal parts should be cleaned in new brake fluid. Internal parts should be lubricated with brake fluid when installed.
2. Caliper reassembly
Replace the following parts whenever a caliper is disassembled: bleed screw and

cap, boot bushing, piston seal, dust seal, retaining ring.



- | | |
|---------------------------|-------------------|
| 1. Bleed screw (with cap) | 4. Dust seal |
| 2. Bush boot | 5. Retaining ring |
| 3. Piston seal | |

- a. Install piston seal and piston. Place caliper cylinder into caliper frame.
- b. Install pad spring and retainer. Install dust seal and clip.
- c. Install pad spring and pads.
- d. Install support bolt and remount caliper on brackets.



1. Mounting bolt

Mounting bolt torque:
3.5 m-kG (25 ft-lb)

3. Attach brake hoses.
4. Master cylinder reassembly
Reassemble master cylinder.

Brake hose torque:
(all brake union bolts)
2.5 m-kG (18 ft-lb)

5. Brake disc assembly

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

Disc bolt torque:
2.0 m·kg (14 ft·lb)

6. Air bleeding

CAUTION:
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.**

- 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 tightly to the caliper bleed screw. Put the end of the tube into a container.
- c. Slowly apply the brake lever several times. Pull in lever. Hold lever in "on" position. Loosen bleed screw. Allow the lever to travel slowly toward its limit. When the limit is reached, tighten bleed screw.
- d. Continue step C until all air bubbles are removed from system.

NOTE:
If bleeding is difficult, it may be necessary to let the brake system stabilize for a few hours. Repeat bleeding procedure.

5-4. WHEELS, TIRES, TUBES

A. Wheel inspection

Wheels should be inspected frequently. Wheel run-out is discussed in Chapter 5-1.

B. Tire, tube removal

- 1. Remove valve cap, valve core and valve stem lock nut.
- 2. When all air is out of tube, separate tire bead from rim (both sides) by stepping on tire with your foot.

- 3. Use two wide, flat tire irons with rounded edges to work the tire bead over the edge of the rim, starting 180° opposite the tube stem. Be careful not to pinch the tube as you do this.
- 4. After you have worked on side of the tire completely off the rim, slip the tube out. Be very careful not to damage the stem while pushing it back out of the rim hole.

NOTE:
If you are changing the tire itself, then finish the removal by working the second bead off the rim.

C. Installation

Reinstall the tire and tube by reversing the disassembly procedure. After the tube has been installed, but before the tire has been completely slipped onto the rim, put a small amount of air into the tube. This removes any creases that might exist. Release the air and continue with reassembly. After the tire has been completely slipped onto the rim, make sure the stem comes out of the hole in the rim at a right angle to the rim. Finally inflate the tire. Refer to PAGE (10).

	Front Tire	Rear Tire
Normal riding	1.6 kg/cm ² (22 psi)	2.0 kg/cm ² (29psi)

NOTE:
Make sure the wheel is balanced every time the tire is _____ to "Front wheel inspection".)

5-5. REAR WHEEL SPROCKET

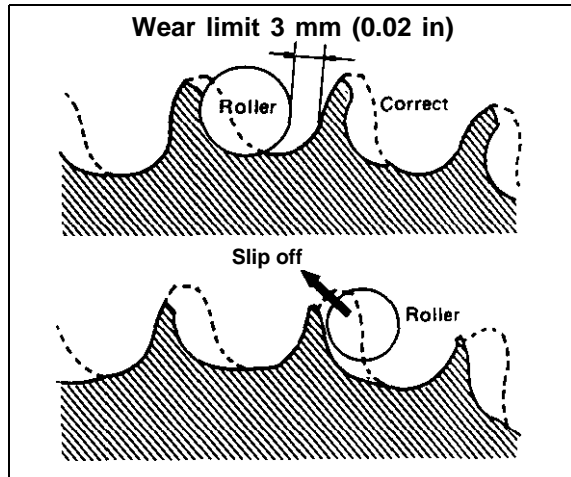
- 1. Bend the lock washer ears flat.
- 2. Remove the sprocket mounting bolts. Check the lock washer and bolt for damage. If the lock washer is not bent over the hexagon bolt head, or is broken, or the bolt is loose, the sprocket can come loose.

Tightening torque:
3.0 m·kg (22 ft·lb)

NOTE:

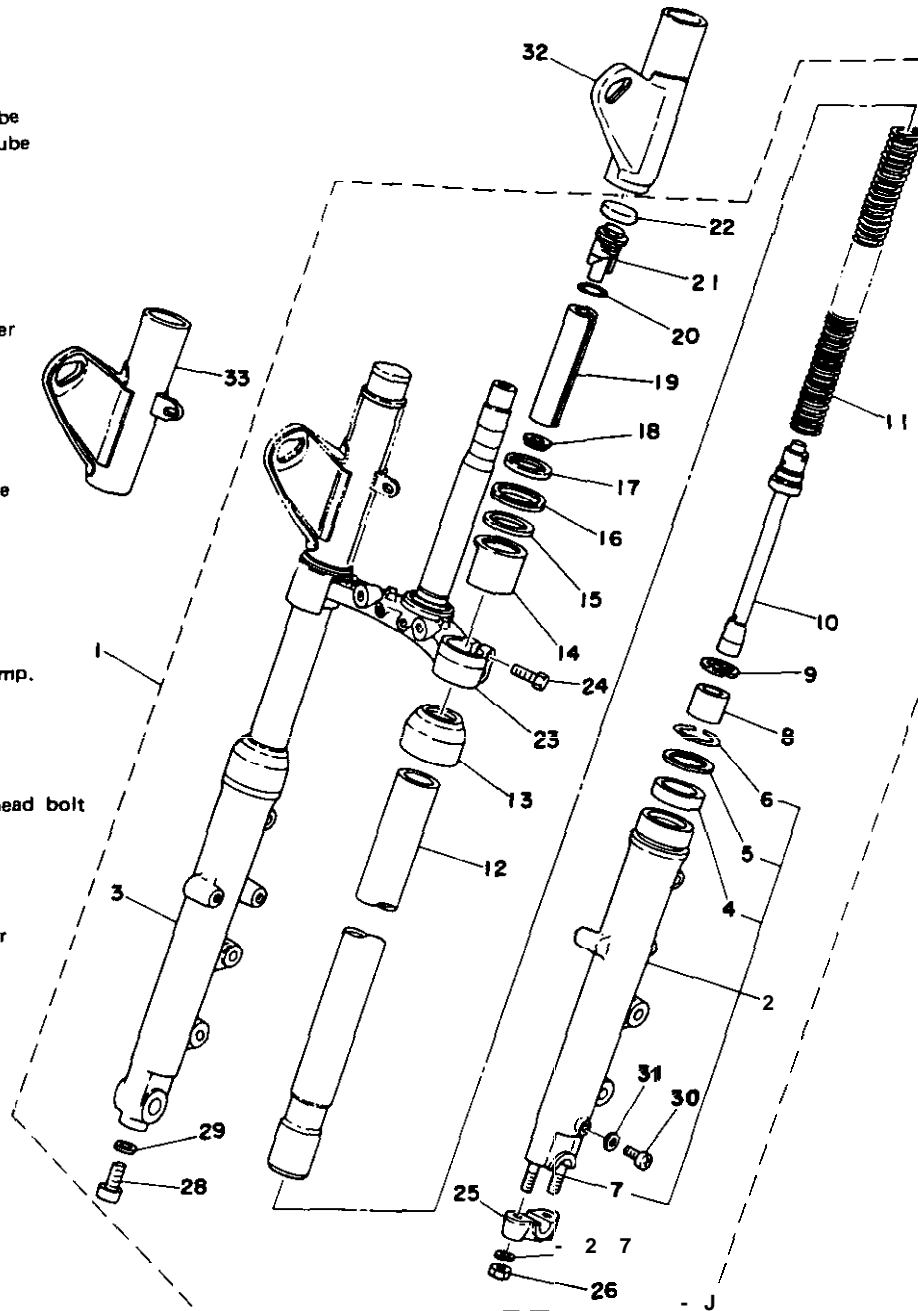
Be sure that all lock tabs are not cracked or broken and that they are all bent up against the bolts.

- 3 Constant friction and force from the chain creates wear on the sprocket teeth. If wear has progressed to the extent shown in this illustration, replace the sprocket.



5-6. FRONT FORKS

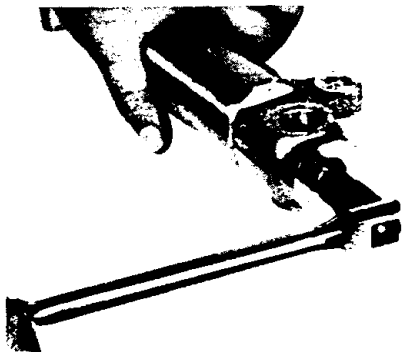
- 1. Front fork Ass'y
- 2. Outer lift fork tube
- 3. Outer right fork tube
- 4. Oil seal
- 5. Oil seal washer
- 6. Oil seal clip
- 7. Bolt
- 8. front fork piston
- 9. Circlip
- 10. Front fork cylinder
- 11. Spring
- 12. Inner fork tube
- 13. Dust seal
- 14. Outer cover
- 15. Gasket
- 16. Cover under guide
- 17. Washer
- 18. Spring upper seal
- 19. Spacer
- 20. O-ring
- 21. Cap bolt
- 22. Cap
- 23. Under bracket comp.
- 24. Bolt
- 25. Axle holder
- 26. Nut
- 27. Plate washer
- 28. Hexagon socket head bolt
- 29. Gasket
- 30. Drain plug
- 31. Drain plug gasket
- 32. Upper left cover
- 33. Upper right cover



A. Removal and disassembly

NOTE: _____
For fork oil replacement only, refer to PAGE (12)

1. Disconnect speedometer cable. Disconnect brake calipers and remove front wheel. Place wooden wedge or other object into caliper assemblies to keep brake pads apart. Remove front fender.
2. Loosen pinch bolts on steering stem and crown and remove fork.
3. Remove fork tube caps, spring stopper seats, and oil drain screws. Drain fork oil.
4. Remove Allen bolt from bottom of fork assembly. Pull inner tube out of outer tube.



5. To remove fork seal, pull off dust cover. Remove spring clip over oil seal. Pry out oil seal, being careful to not damage the fork tube.



B. inspection

1. Examine fork inner tube for scratches and straightness. If the tube is scratched severely or bent, it should be replaced.
2. If the lips of the oil seal are worn, or the oil seal is leaking, replace it.
3. Check the outer tube for dents. If any dent causes the inner tube to "hang up" during operation, the outer tube should be replaced.
4. Check the free length of the springs.

Spring free length:
482 mm (18.98 in)

5. Check the O-ring on the top spring seat. If damaged, replace O-ring.



1. O-ring

C. Assembly

1. Make sure all components are clean before assembly.
2. Apply oil to the fork seal and install the seal spacer and seal by pressing in with a large socket. Install retaining clip.
3. Install inner tube into outer tube. Install dust cover. Install and tighten Allen bolt and washer. Assembly procedure is the reverse of the disassembly procedure.

NOTE: _____
When installing fork springs, the greater pitch should be at the bottom.



1. Bottom
2. To P

5-7. STEERING HEAD

A. Adjustment

(See Chapter 2-4 for Steering Head Adjustment.)

B. Removal

1. Remove front wheel, front forks and handle bars.
2. Remove front brake pipe junction.
3. Loosen steering stem (underbracket) pinch bolt. Remove stem bolt and washer.



1. Crown pinch bolt
2. Fork pinch bolt
3. Steering fitting bolt

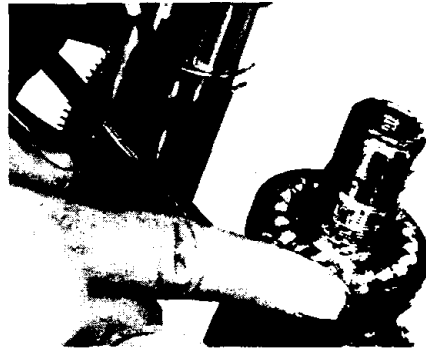
4. Remove steering crown.
5. Remove top fitting nut. Use proper spanner.
6. Support steering stem (underbracket) and remove bottom fitting nut.
7. Remove bearings.

C. Inspection

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

D. Reassembly

1. Grease bearings and races with wheel bearing grease.



2. Install steering stem (underbracket) and bearings.
3. Install bottom fitting nut. Tighten to approximately 2.0 ~ 2.6 m-kg (14 ~ 19 ft-lb). Do not over-tighten. Tighten top fitting nut.
4. Continue reassembly in reverse assembly order.
5. When assembly is complete, check steering stem by turning it from lock to lock. If there is any binding or looseness, re-adjust steering stem tightness.

Pinch bolt torque:

Handle crown 1.0 m-kg (7 ft-lb)

Under bracket. 1.5 m-kg (11 ft-lb)

Steering stem bolt torque:

5.5 m-kg (40 ft-lb)

5-8. SWING ARM

A. Inspection

1. Free play inspection

Remove rear wheel and shock absorbers. Grasp the swing arm and move it from side to side as shown. There should be no noticeable side play.



Swing arm freeplay: 1 mm (0.4 in)

2. If freeplay is excessive, remove swing arm and replace swing arm bushing.

B. Swing arm removal

1. Remove nut on swing arm pivot bolt and tap out bolt with a long aluminum or brass rod.

NOTE: _____
Carefully remove the arm while noting the location of spacing washers and shims.

Pivot bolt torque: 6.5 m-kg (47 ft-lb)

2. Tap out old bushing from each side of pivot using the long rod.
3. Install new bushings using a press.

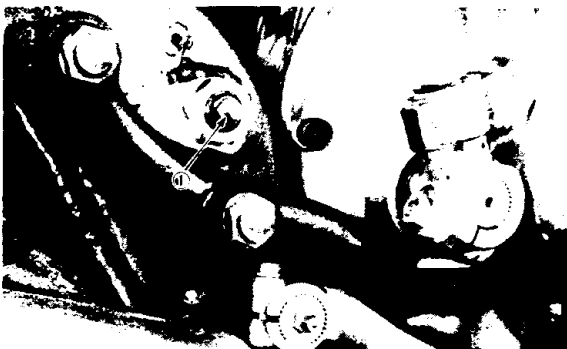
NOTE: _____
If tapping on bushing, bushing may be broken.

C. Swing arm lubrication

1. Apply grease to grease fitting on top of pivot with low pressure hand operated gun. Apply until fresh grease appears at both ends of pivot shaft.

Recommended lubricant:
Medium-weight grease

2. Wipe off excess grease.



1. Grease fitting

5-9. REAR SHOCK ABSORBER

A. Removal

Remove one (1) rear shock absorber at a time, inspect and reinstall before removing the other.

B. Inspection

1. Check the rod. If it is bent or damaged, replace the shock absorber.
2. Check for oil leakage. If oil leakage is evident, replace the shock absorber.

3. Operate shock absorber rod to check damping. There should be no noticeable damping as shock extends.
4. Install the shock absorber on the machine.

Rear shock absorber tightening
torque:
3 m-kg (22 ft-lb)

5-10. CABLES AND FITTINGS

A. Cable maintenance

NOTE: _____
See maintenance and lubrication intervals charts. Cable maintenance is primarily concerned with preventing deterioration through rust and weathering and providing proper lubrication to allow the cable to move freely within its housing. Cable removal is straightforward and uncomplicated. Removal will not be discussed within this section.

WARNING: _____
Cable routing is very important. For details of cable routing, see the table routing diagrams! at the end of the manual. Improperly routed, assembled or adjusted cables may make the vehicle unsafe for operation.

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

NOTE: _____
Choice of lubricant depends upon conditions and preferences. However, a semi-drying chain and cable lubricant will probably perform adequately under most conditions.

B. Throttle maintenance

1. Remove Phillips head screws from throttle housing assembly and separate two halves of housing.
2. Disconnect cable end from throttle grip assembly and remove grip assembly.