

FRONT FORKS

Front Fork Service

Before suspecting major trouble, drain the front fork oil and refill with the proper type and quantity fork oil; refer to *Front Fork Oil Change* in Chapter Three. If you still have trouble, such as poor damping, a tendency to bottom or top out or leakage around the rubber seals, follow the service procedures in this section.

To simplify fork service and to prevent the mixing of parts, the legs should be removed, serviced and installed individually.

Removal/Installation

1. Place the bike on the centerstand on a level surface.
2. Remove the cap (**Figure 61**) from the top of both fork tubes.

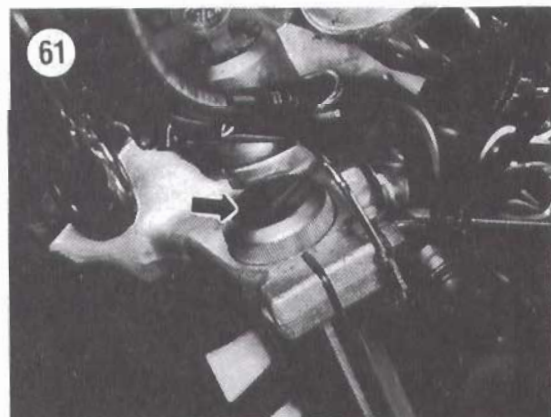
WARNING

Always bleed off all air pressure; failure to do so may cause personal injury when partially disassembling the fork for changing the oil.

NOTE

Release air pressure gradually. If released too fast, fork oil will spurt out with the air. Protect your eyes and clothing accordingly.

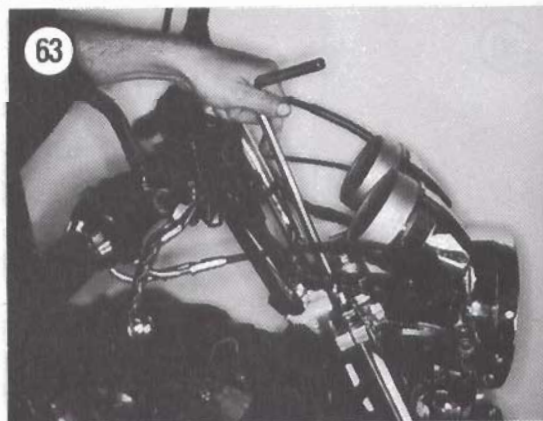
3. On models so equipped, depress the valve stem and bleed off *all* air pressure. Repeat for the other fork assembly.



NOTE

Insert a piece of vinyl tubing or wood in the caliper in place of the brake disc. That way if the brake lever is inadvertently squeezed, the pistons will not be forced out of the cylinders. If this does happen, the caliper may have to be disassembled to reseat the piston and the system will have to be bled. By using the wood, bleeding the brake is not necessary when installing the wheel.

4. Remove the brake caliper as follows:
 - a. Loosen, then remove the bolts (A, **Figure 62**) securing the brake caliper assembly to the front fork.
 - b. Remove the caliper assembly (B, **Figure 62**) from the brake disc.
5. Remove the front wheel (C, **Figure 62**) as described in this chapter.
6. Remove the screws securing the front fender to the front forks.

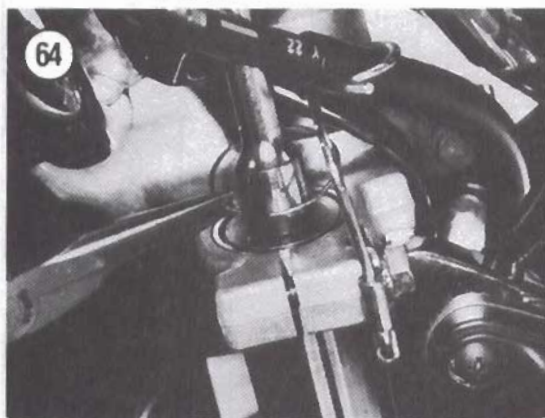


NOTE

The Allen bolt at the base of the slider has been secured with a thread locking agent and is often very difficult to remove because the damper rod will turn inside the slider. It sometimes can be removed with an air impact driver. If you are unable to remove it, take the fork tubes to a dealer and have the bolts removed.

7. If the fork assembly is going to be disassembled, perform the following:

- a. Use an Allen wrench to loosen (just break it loose) the Allen bolt at the base of the slider. If the bolt is loosened too much, fork oil may start to drain out of the slider.
- b. Use a suitable size socket and T-handle extension (Figure 63) to depress the top cap while removing the retaining ring (Figure 64). Discard the old retaining ring as a new one must be installed every time the ring is removed.



- c. Remove the top cap and spring spacer.
8. Loosen the upper and lower fork bridge bolts (Figure 65).
9. Twist the fork tube slightly and withdraw it from the upper and lower fork bridges.
10. Install by reversing these removal steps while noting the following:
 - a. Install the fork tube and push it up until it is flush with the top surface of the upper fork bridge (Figure 66).
 - b. Install the front axle into both fork sliders to assure correct alignment between both fork assemblies.
 - c. Tighten the upper and lower fork bridge bolts to the torque specifications listed in Table 1.
 - d. Remove the front axle from both fork sliders.
 - e. On models so equipped, add air pressure to the fork assemblies if so desired. Refer to Table 4 for recommended air pressure.

Disassembly

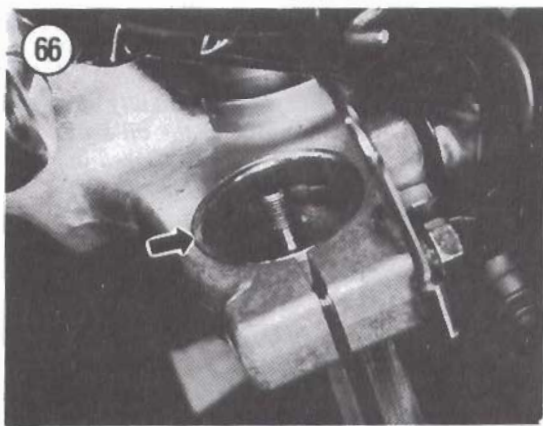
Refer to Figure 67 during the disassembly and assembly procedures.

1. On models so equipped, make sure all air pressure is released from the fork assembly prior to disassembly. Depress the valve stem and bleed off all air pressure.

NOTE

The top cap and spring spacer were removed during fork assembly removal.

2. Carefully withdraw the fork spring and spring seat from the fork tube.



3. Turn the fork assembly upside down and drain the fork oil into a suitable container. Pump the fork several times by hand to expel most of the remaining oil. Dispose of the fork oil properly.

NOTE

If you recycle your engine oil, do not add the fork oil to the engine oil because the recycler probably will not accept the oil.

4. Remove the Allen bolt and gasket from the slider. If the Allen bolt was not loosened during the removal procedure, use special Kawasaki tools and perform the following:

- a. Install the adapter (part No. 57001-1057) onto the extension bar and handle (part No. 57001-183).
 - b. Insert this special tool setup into the fork tube and index it into the hex receptacle in the top of the damper rod to hold the damper rod in place.
 - c. Using an Allen wrench, loosen then remove the Allen bolt and washer from the base of the slider.
4. Remove the dust seal from the slider.
5. Remove the stopper ring from the top of the slider.

NOTE

On this type of fork, force is needed to remove the fork tube from the slider.

6. Install the fork tube in a vise with soft jaws.
7. There is an interference fit between the bushing in the fork slider and the bushing on the fork tube. In order to remove the fork tube from the slider, pull hard on the fork tube using quick in-and-out strokes (**Figure 68**). Doing so will withdraw the bushing, washer and the oil seal from the slider.

NOTE

It may be necessary to heat slightly the area on the slider around the oil seal prior to removal. Use a rag soaked in hot water; do not apply a flame directly to the fork slider.

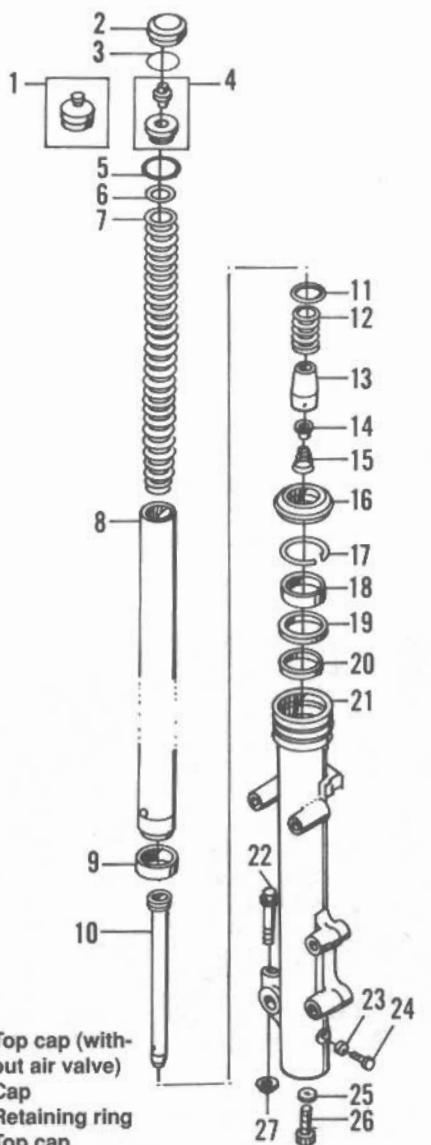
8. Withdraw the fork tube from the slider.

NOTE

Do not remove the fork tube bushing unless it is going to be replaced. Inspect it as described in this chapter.

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FRONT FORK



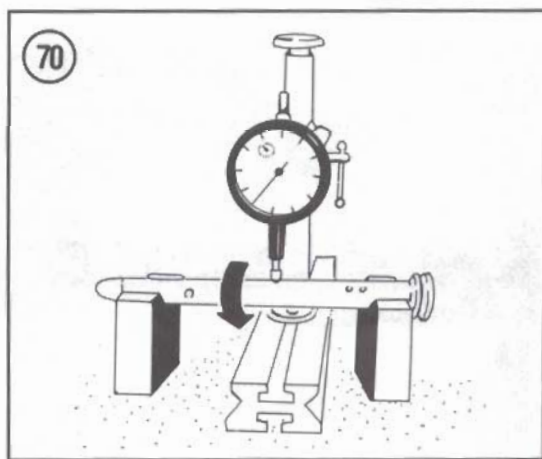
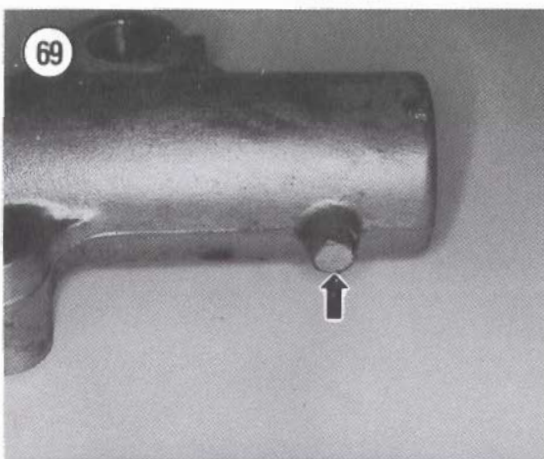
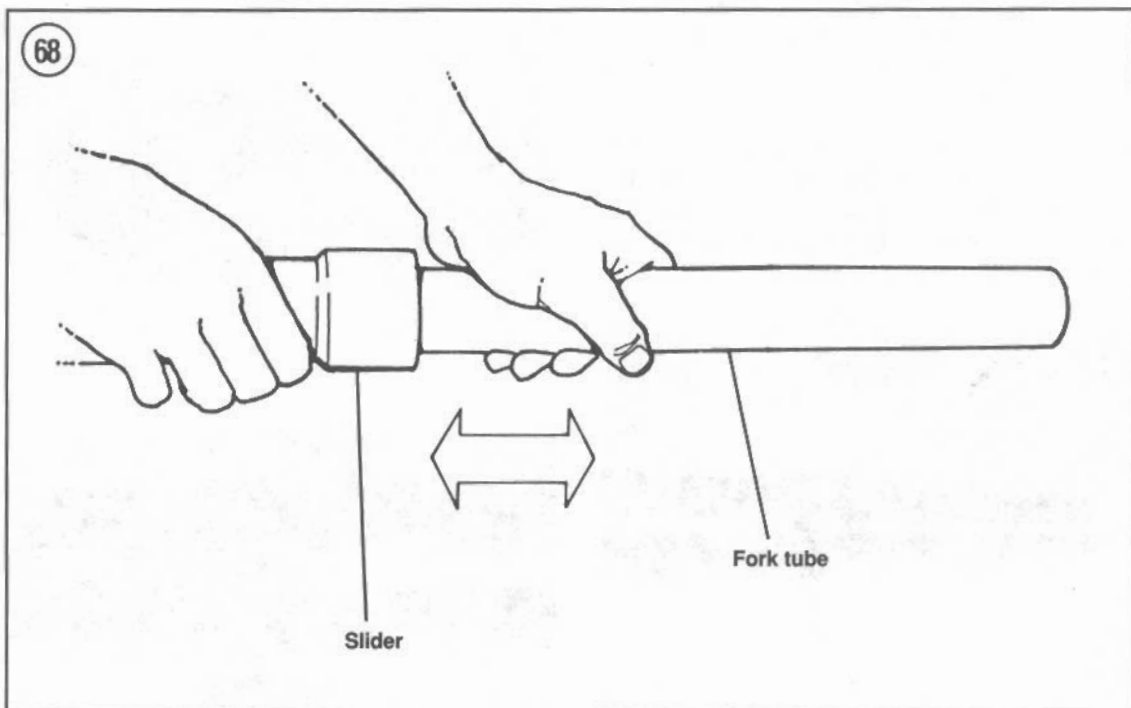
1. Top cap (with-out air valve)
2. Cap
3. Retaining ring
4. Top cap (with air valve)
5. O-ring
6. Spring seat
7. Fork spring
8. Fork tube
9. Fork tube bushing
10. Damper rod
11. Damper rod piston
12. Rebound spring
13. Oil lock piece
14. Valve
15. Spring
16. Dust seal
17. Stopper ring
18. Oil seal
19. Washer
20. Slider bushing
21. Slider
22. Bolt
23. Gasket
24. Drain bolt
25. Gasket
26. Allen bolt
27. Nut

9. Remove the oil lock piece, spring and valve from the damper rod.
10. Remove the damper rod and rebound spring from the slider.
11. Inspect the components as described in this chapter.

Inspection

1. If still installed, remove the drain screw and sealing washer (Figure 69).

2. Thoroughly clean all parts in solvent and dry them. Check the fork tube for signs of wear or scratches.
3. Check the damper rod for straightness. Figure 70 shows one method. The damper rod should be replaced if the runout is 0.2 mm (0.008 in.) or greater.
4. Make sure the oil holes (Figure 71) in the damper rod are clear. Clean out if necessary.
5. Inspect the damper rod (Figure 72) and its piston ring (Figure 73) for wear or damage. Replace as necessary.



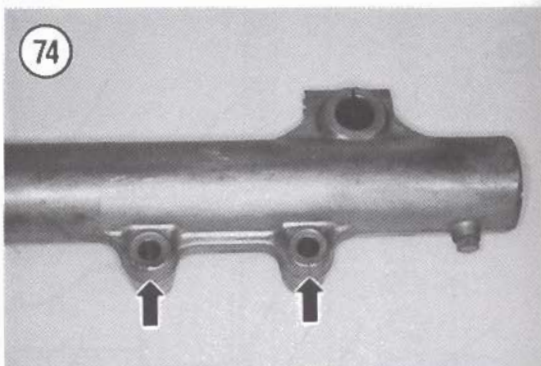
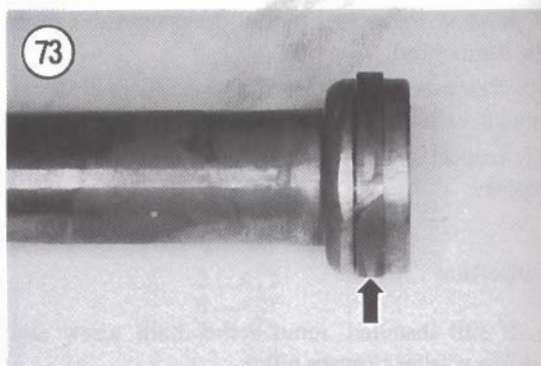
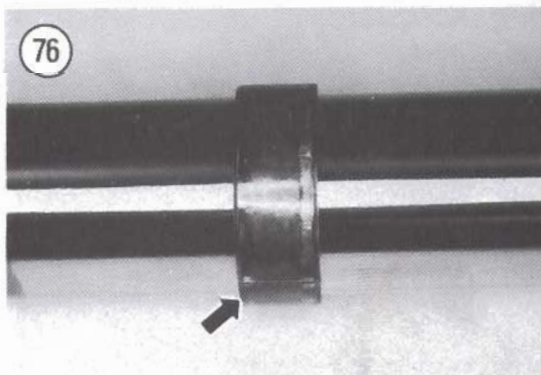
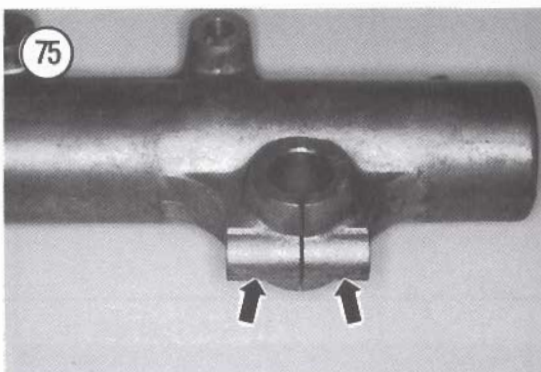
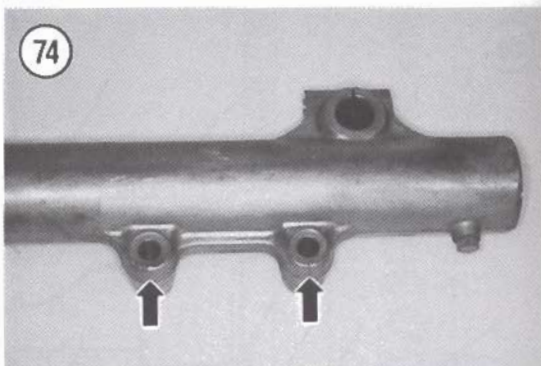
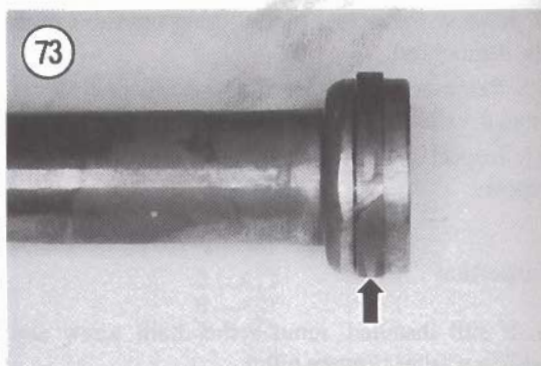
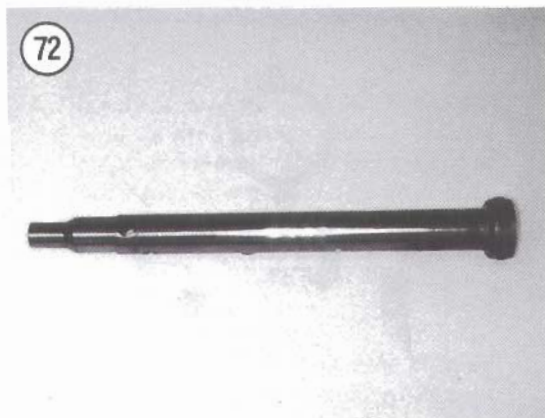
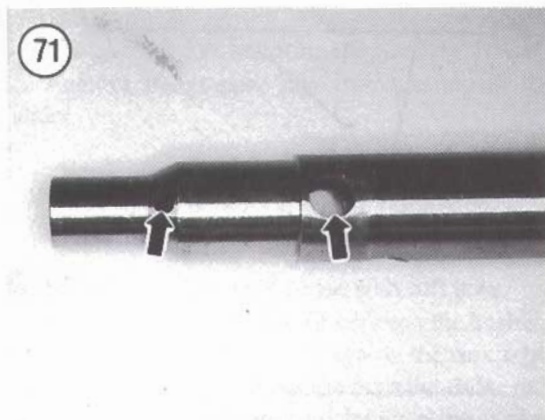
6. Check the fork tube for straightness. If bent or severely scratched, it should be replaced.

7. Check the slider for dents or exterior damage that may cause the upper fork tube to hang up during riding. Replace if necessary.

8. Inspect the brake caliper mounting bosses (Figure 74) and the front axle pinch bolt area (Figure 75) on the slider for crack or damage. If damaged, replace the slider.

9. Inspect the bushings on the slider (Figure 76) and fork tube (Figure 77) bushings. If either is scratched or scored they must be replaced. If the Teflon coating is worn off so that the copper base material is showing on approximately 3/4 of the total surface, the bushing must be replaced.

10. Inspect the fork cap retaining ring groove (Figure 78) in the fork tube for wear or damage. The groove cannot be "rounded off" at the upper portion since that would allow the retaining ring to slip out when riding. If necessary, replace the fork tube.



11. Inspect the fork top cap for wear or damage. Check the O-ring seal for hardness or deterioration, replace if necessary.
12. Inspect the oil seal seating area (Figure 79) in the slider for damage or burrs. Clean up if necessary.
13. Inspect the gasket on the Allen bolt (Figure 80), replace if damaged.

NOTE

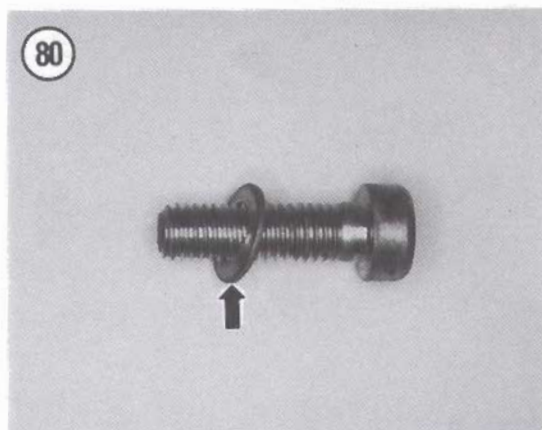
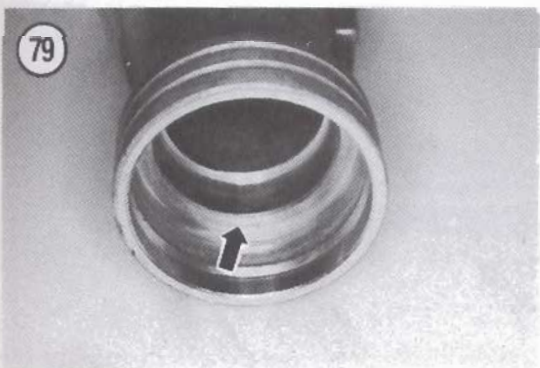
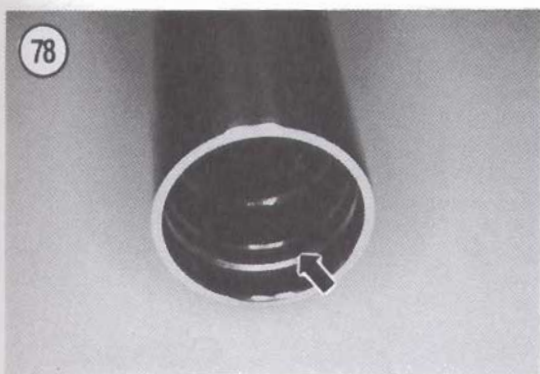
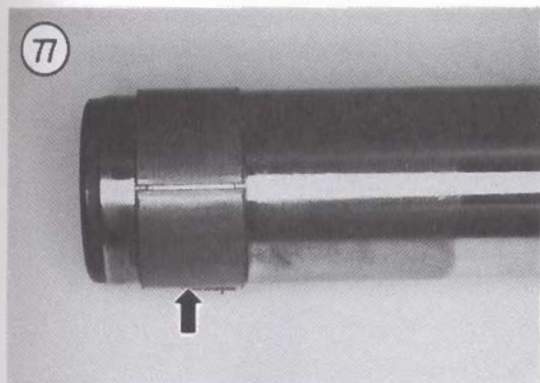
Kawasaki does not provide any dimensions for either a new spring or for a

service limit dimension for the un-compressed length of the fork spring. If you suspect the spring has sagged, take the spring to a Kawasaki dealer and compare the length to a new spring. Replace if necessary.

14. Inspect the fork spring for wear or damage, replace if necessary.
15. Any parts that are worn or damaged should be replaced. Simply cleaning and reinstalling unserviceable components will not improve performance of the front suspension.

Assembly

1. Coat the sliding portions of all parts with fresh SAE 10W-20 fork oil prior to installation.
2. Install the rebound spring onto the damper rod (Figure 81) and insert this assembly into the fork



tube (**Figure 82**). Push the damper rod in until it exits the bottom of the fork tube (**Figure 83**).

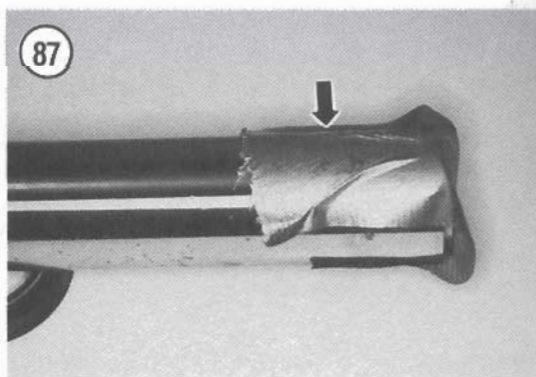
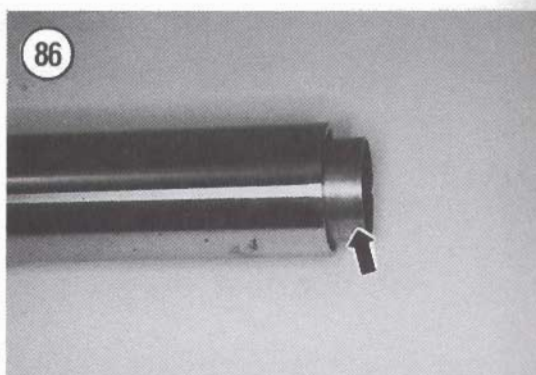
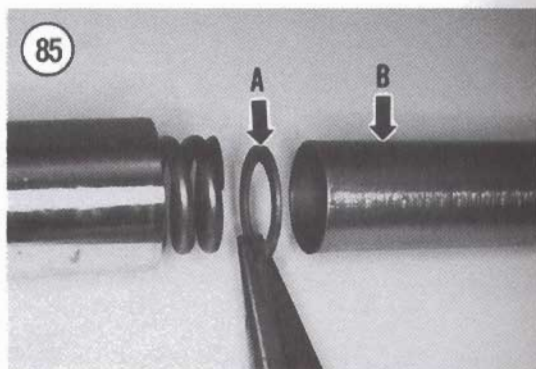
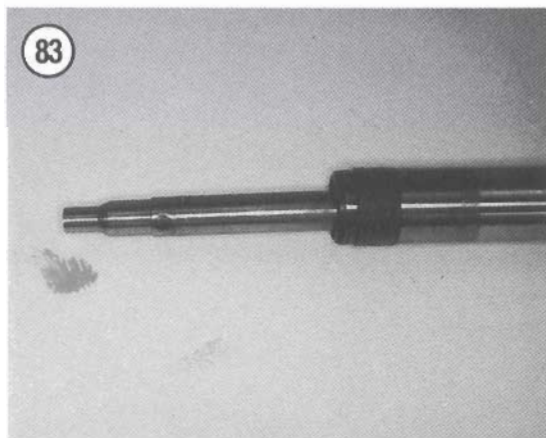
3. Temporarily install the fork spring (**Figure 84**), spring seat (A, **Figure 85**) and spacer (B, **Figure 85**) to hold the damper rod in place. Push the spacer in until it bottoms out (**Figure 86**).

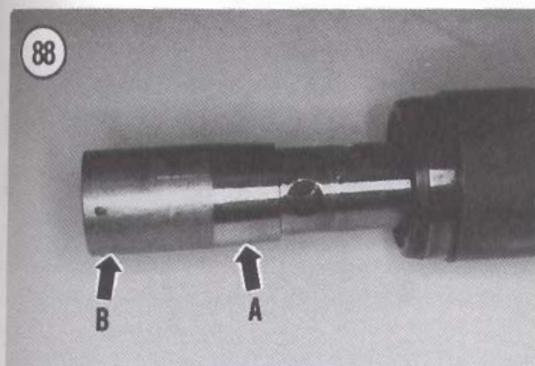
4. Apply a strip of duct tape (**Figure 87**) over the end of the fork tube to temporarily hold the fork spring, seat and spacer in place.

5. Position the oil lock piece with the tapered end (A, **Figure 88**) going on first and install it onto the damper rod. Push it on until it stops (B, **Figure 88**).

6. Position the valve with the flange side going in first (**Figure 89**) and install the valve into the end of the oil lock piece.

7. Position the spring with the smaller diameter coils going in first (**Figure 90**) and apply a small amount of cold grease (**Figure 91**) to the smaller diameter coils.



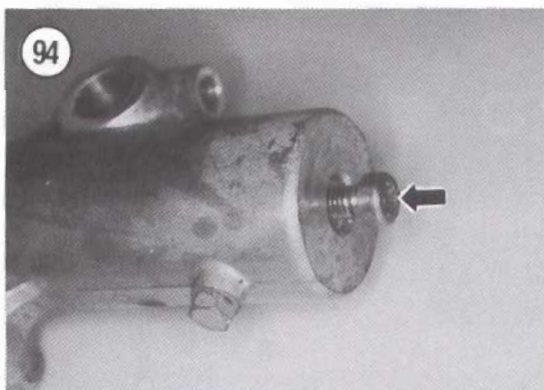
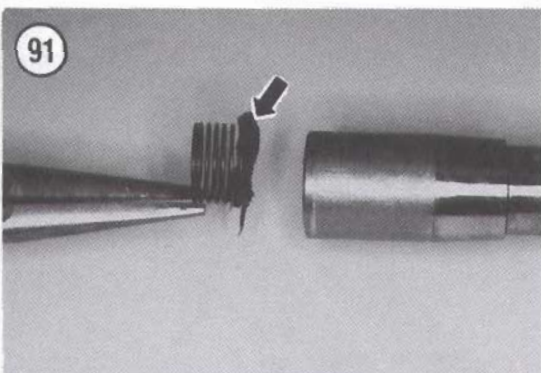
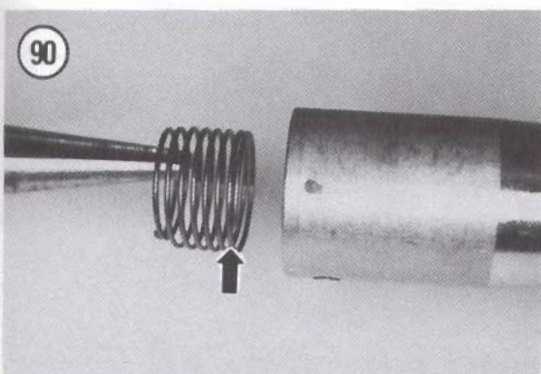
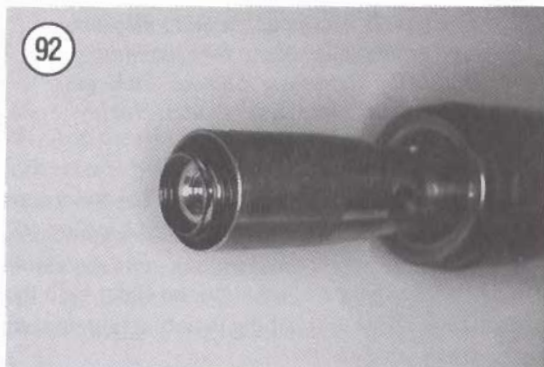
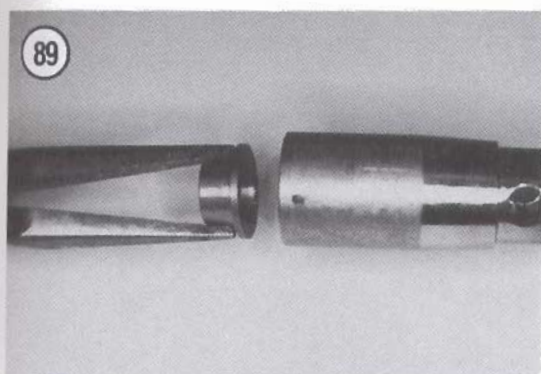


8. Install the spring into the end of the valve. Push the spring in until it stops and is held in place on the valve (**Figure 92**).

9. Install the upper fork assembly into the slider (**Figure 93**).

10. Make sure the gasket (**Figure 80**) is on the Allen bolt.

11. Apply blue Loctite (No. 242) to the threads of the Allen bolt prior to installation. Install it in the fork slider (**Figure 94**) and screw it into the base of



the damper rod. Tighten to the torque specification listed in **Table 1**.

12. Remove the strip of duct tape from the top of the fork tube.

13. Slide the fork slider bushing (A, **Figure 95**) and the washer (B, **Figure 95**) down the fork tube and rest it on top of the fork slider.

NOTE

*The following special tool is **very expensive**. If you work on a lot of different bikes, this special tool is a must for your tool box. It is adjustable and will work on almost all Japanese fork assemblies (including Japanese "Showa" forks installed on some late model Harley-Davidson motorcycles).*

14. Install the special tool (A, **Figure 96**) down onto the washer (B, **Figure 96**) and slider bushing (C, **Figure 96**).

15. Drive the slider bushing into the slider with the special tool. Drive the bushing in until it bottoms out in the slider.

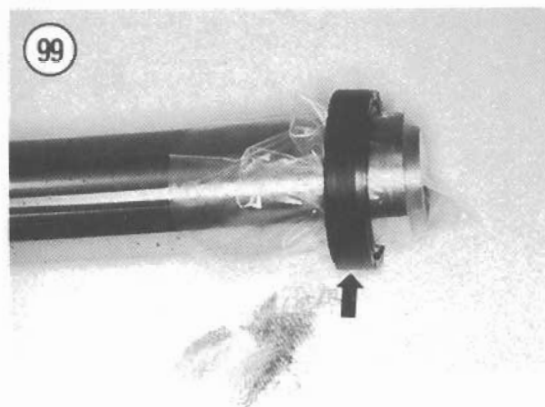
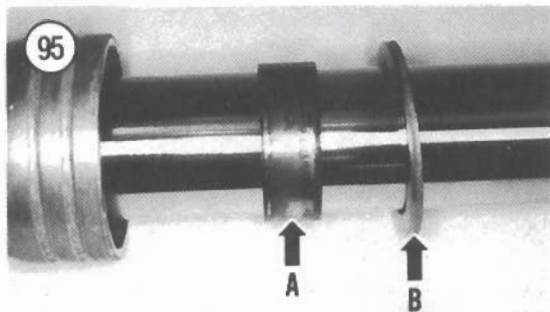
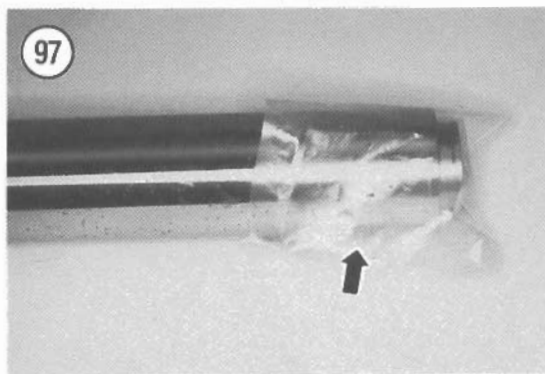
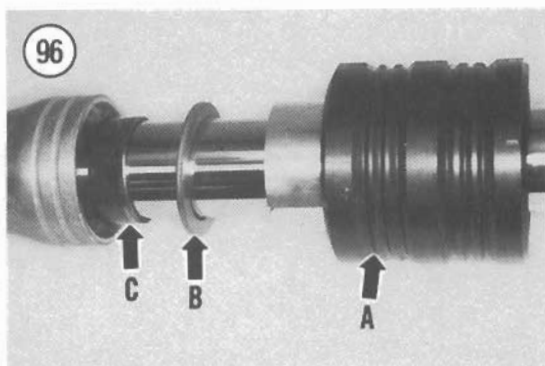
16. Remove the special tool.

CAUTION

Do not use a "reclosable" type of plastic bag as the closure portion of the bag is thick and can damage the oil seal when it passes over it. If using this type of bag, cut off the closure portion, then use the modified bag.

17. Place a small plastic bag (**Figure 97**) over the top of the fork tube to protect the oil seal during installation over the sharp top surface opening of the fork tube.

18. Coat the new seal with fresh SAE 10W-20 fork oil.



19. Position the seal with the open groove facing upward (**Figure 98**) and slide the oil seal (**Figure 99**) over the plastic bag and down the fork tube.

20. Remove the plastic bag.

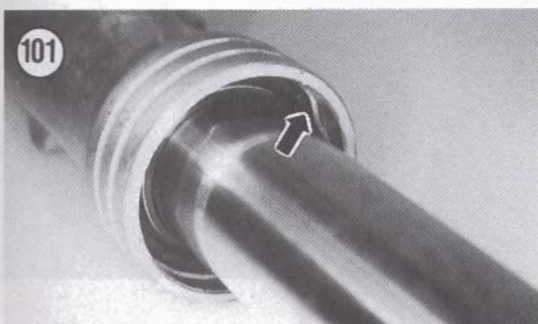
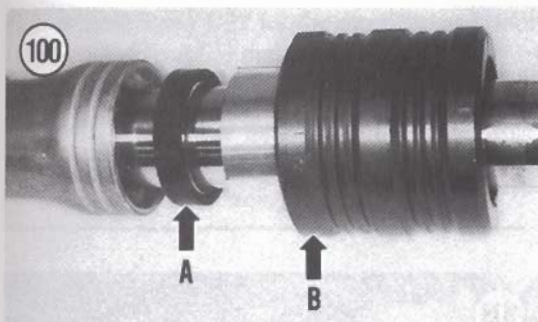
21. Use the same special tool set-up used in Step 14 to drive in the oil seal (A, **Figure 100**).

22. Drive the oil seal into the slider with the special tool (B, **Figure 100**) until the groove in the slider can be seen above the top surface of the oil seal.

23. Remove the special tool.

24. Install the stopper ring and slide it down the fork tube.

25. Install the stopper ring and make sure it is completely seated in the groove in the fork slider (**Figure 101**).



26. Install the dust seal (**Figure 102**) into the slider. Press it in until it is completely seated.

27. Install the fork assembly into the frame, as described in this chapter, then fill it with fork oil.

NOTE

Kawasaki recommends that the fork oil level be measured, if possible, to ensure a more accurate filling.

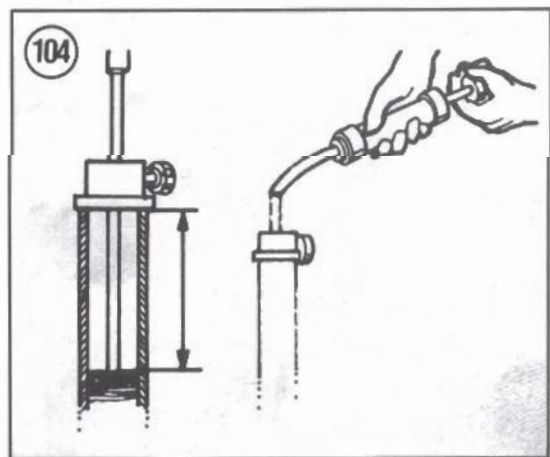
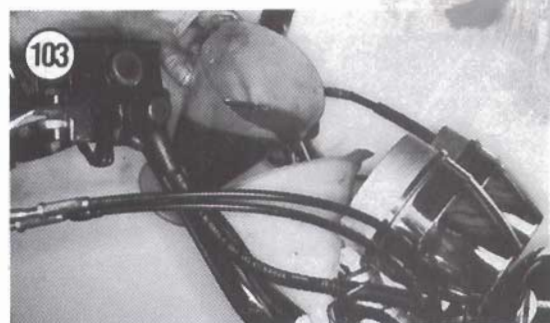
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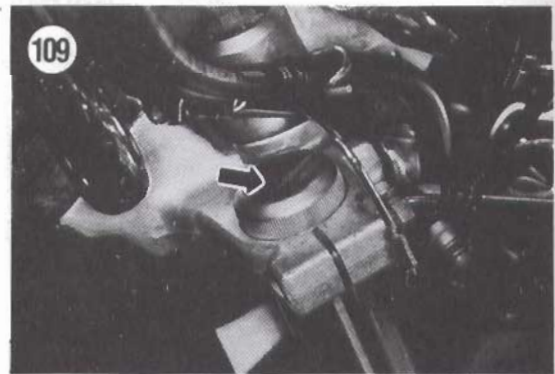
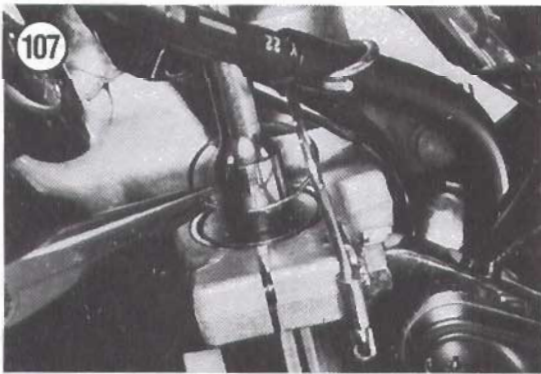
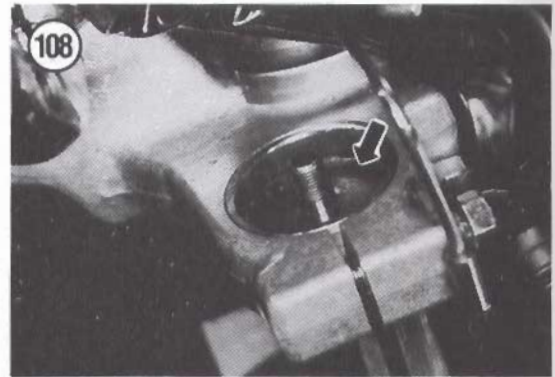
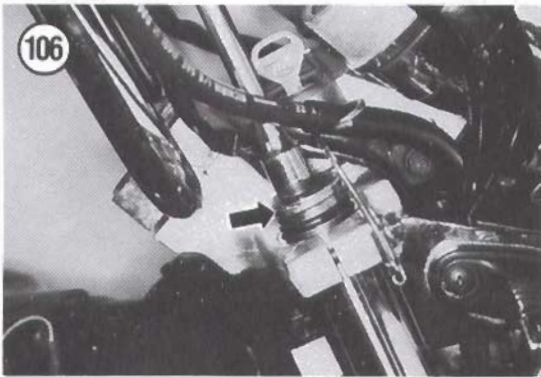
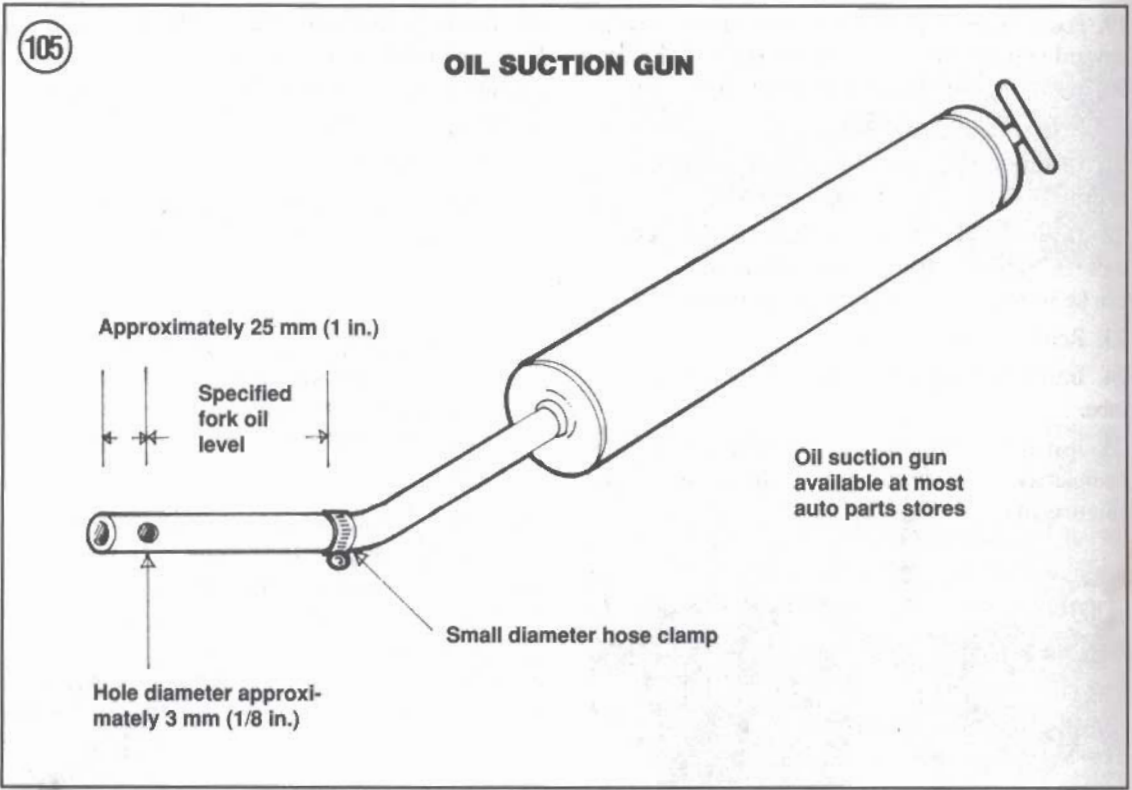
To measure the correct amount of fluid, use a plastic baby bottle or a mixing container. These bottles or containers have measurements in milliliters (ml) on the side.

28. Add the recommended amount of fork oil to the fork assembly (**Figure 103**). Refer to **Table 3** for the recommended viscosity and quantity.

29. Compress the fork assembly completely, hold it in this position, and measure the fork oil level.

30. Use an accurate ruler or oil level gauge (**Figure 104**), to achieve the correct oil level listed in **Table 3**.





NOTE

An oil level measuring device can be made as shown in **Figure 105**. Position the lower edge of the hose clamp the specified oil level distance up from the small diameter hole. Fill the fork with a few ml's more than the required amount of oil. Position the hose clamp on the top edge of the fork tube and draw out the excess oil. Oil is sucked out until the level reaches the small diameter hole. A precise oil level can be achieved with this simple device.

31. Allow the oil to settle completely and recheck the oil level measurement. Adjust the oil level if necessary.
32. Extend the fork slider.
33. Repeat Steps 1-32 for the other fork assembly. Both fork assemblies must be installed to complete this procedure.
34. Install the front fender and the front wheel. Maintain jack pressure under the engine.

35. Install the fork spring with the smaller diameter coils going in first.
36. Install the spring seat, spacer and top cap (**Figure 106**).

WARNING

Make sure the retaining ring is seated correctly in the fork tube groove. If the ring works loose while riding, the fork assembly will compress and could result in an accident.

37. Use a suitable size socket and extension; depress the top cap and spring. Install a *new* retaining ring (**Figure 107**) and make sure the retaining ring is seated correctly in the fork tube groove (**Figure 108**).
38. Remove the jack from under the engine.
39. On models so equipped, add air pressure to the fork assemblies if so desired. Refer to **Table 4** for recommended air pressure.
40. Install the cap (**Figure 109**) onto the top of both fork tubes.

Table 1 FRONT SUSPENSION TIGHTENING TORQUES

Item	N•m	ft.-lb.
Front axle nut	59	43
Front axle pinch bolt and nut	13	9.5
Brake disc bolts	23	16.5
Handlebar upper holder Allen bolts	24	17.5
Steering stem bolt	39	29
Fork cap bolt air valve	7.8	5.7
Fork drain bolt	7.8	5.7
Fork bridge bolts		
Upper	20	14.5
Lower	25	18
Fork slider Allen bolt	20	14.5

Table 2 TIRE SIZE AND INFLATION PRESSURE (COLD)*

Tire size				
Front	100/90-19H tubeless			
Rear	150/90-15 74H, 150/90 B15 M/C 74H or 150/90-15 M/C 74H tubeless			
Tire Pressure				
Load	Front		Rear	
	psi	kPa	psi	kPa
Up to 215 lbs. (97.5 kg) U.S., Canada, Australia, South Africa models	28	200	28	200
215 to 406 lbs. (97 to 184 kg) All other models	28	200	32	225
215 to 397 lbs. (97 to 180 kg)	28	200	32	225

* Tire inflation pressure for factory equipped tires. Aftermarket tires may require different inflation pressure; refer to manufacturer's specifications.

Table 3 FORK OIL CAPACITY AND DIMENSIONS

Fork oil	SAE 10W-20 fork oil
Viscosity	
Capacity per leg	
Oil change only	310-320 ml (10.48-10.82 U.S. oz. 8.73-9.0 Imp. oz.)
After disassembly	
U.S. and Canadian models	359-364 ml (12.04-12.31 U.S. oz. 10.11-10.25 Imp. oz.)
All other models	370-375 ml (12.51-12.68 U.S. oz. 10.42-10.56 Imp. oz.)
Oil level each leg	
U.S. and Canadian models	220-240 mm (8.66-9.45 in.)
All other models	205-225 mm (8.07-8.86 in.)

Table 4 FRONT SUSPENSION SPECIFICATIONS

Item	Wear limit
Front axle runout	0.2 mm (0.01 in.)
Front wheel rim runout	
Radial	0.8 mm (0.031 in.)
Axial	0.5 mm (0.019 in.)
Front fork spring free length limit	NA*
Front fork air pressure	
Standard	atmospheric pressure
Usable range	0-49 kPa (0-7.1 psi)

* Kawasaki does not provide any standard length or service limit dimensions for the fork spring.