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REAR AXLE SUSPENSION

1 INTRODUCTION ..... 3  
2 AXLE/SPRING REMOVAL ..... 3  
3 SPRING DISASSEMBLY ..... 5  
4 CLEANING, INSPECTION, AND REPAIR ..... 5  
    4.1 Cleaning ..... 5  
    4.2 Inspection ..... 5  
    4.3 Repair ..... 5  
5 SPRING ASSEMBLY ..... 5  
6 AXLE/SPRING INSTALLATION ..... 6

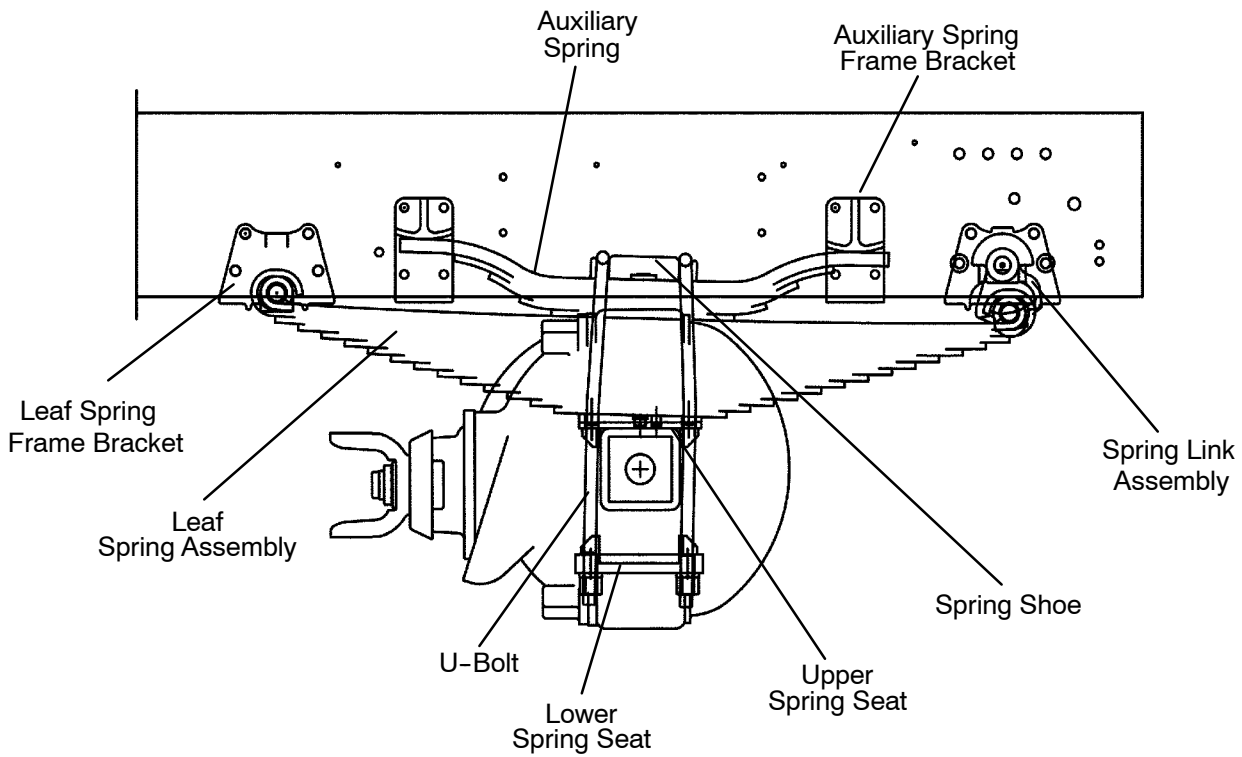
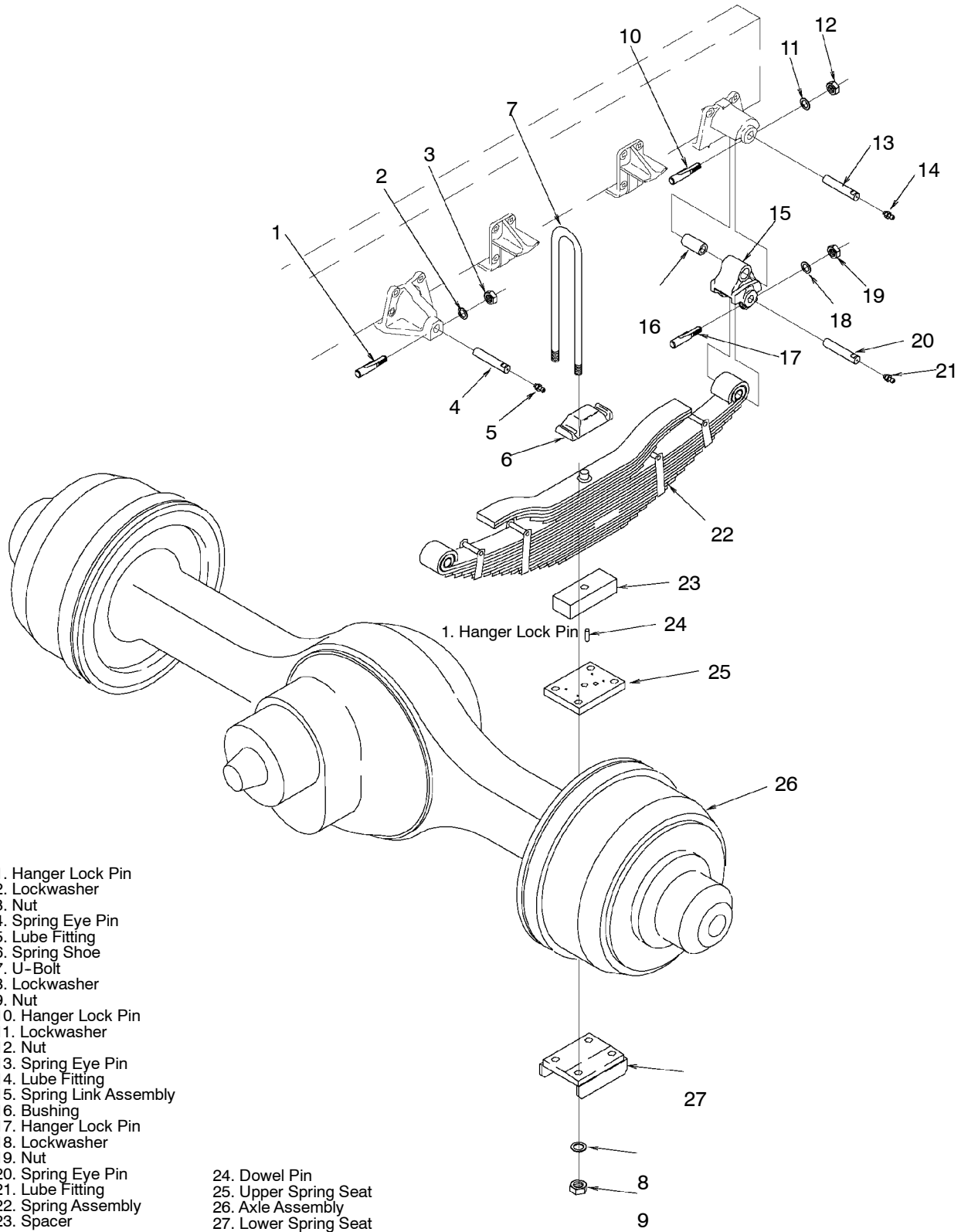


Figure 1. Rear Axle Suspension Assembly



- 1. Hanger Lock Pin
- 2. Lockwasher
- 3. Nut
- 4. Spring Eye Pin
- 5. Lube Fitting
- 6. Spring Shoe
- 7. U-Bolt
- 8. Lockwasher
- 9. Nut
- 10. Hanger Lock Pin
- 11. Lockwasher
- 12. Nut
- 13. Spring Eye Pin
- 14. Lube Fitting
- 15. Spring Link Assembly
- 16. Bushing
- 17. Hanger Lock Pin
- 18. Lockwasher
- 19. Nut
- 20. Spring Eye Pin
- 21. Lube Fitting
- 22. Spring Assembly
- 23. Spacer

- 24. Dowel Pin
- 25. Upper Spring Seat
- 26. Axle Assembly
- 27. Lower Spring Seat

Figure 2. Suspension Assembly Component Breakdown

**1 INTRODUCTION.**

The suspension consists of multi-leaf semi-elliptic springs and auxiliary leaves. The springs are used to attach the axle to the vehicle frame. The axle is attached to the springs by means of a shoe plate on top of the springs and U-bolts on either side of the springs. These bolts clamp the axle housing firmly to the spring. The front eye of the spring is mounted to a stationary frame bracket, while the rear eye of the spring is mounted to a spring link. The spring link allows for variations in spring length during compression and rebound of the spring.

**2 AXLE/SPRING REMOVAL.**

**⚠ WARNING**

**Use hoisting equipment and supports of sufficient capacity to accommodate the vehicle weight, as personnel will be required to work under the vehicle.**

**NOTE**

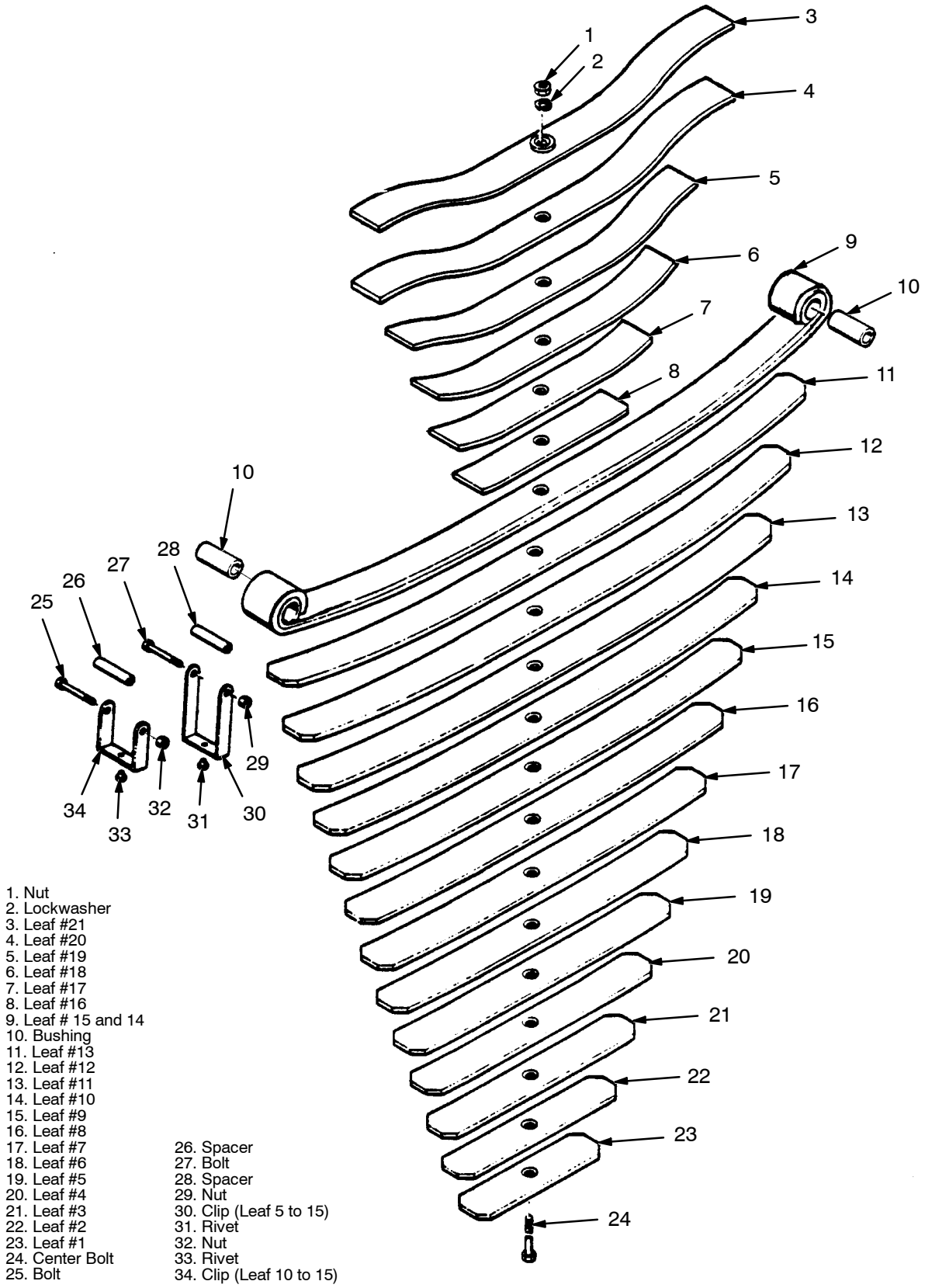
**Both rear spring assemblies are removed the same way. The left side spring assembly is shown.**

Refer to Figure 2 for the following procedures:

- (1) Raise the rear end of the vehicle and position solid supports under the frame and axle. The springs should be in a relaxed position.
- (2) Remove four nuts (9), lockwashers (8), two U-bolts (7), spring shoe (6), and lower spring seat (27) from rear spring assembly.
- (3) Support spring assembly (22). Remove nuts (3 and 12) and lockwashers (2 and 11) from hanger lock pins (1 and 10).
- (4) Using a brass drift and heavy hammer, drive hanger lock pins (1 and 10) from the spring eye pins (4 and 13).
- (5) Using a suitable lifting device, remove two spring eye pins (4 and 13) and spring assembly (22) from front and rear frame brackets.
- (6) Remove nut (19), lockwasher (18) from hanger lock pin (17).
- (7) Using a brass drift and heavy hammer, remove hanger lock pin (17) from spring eye pin (20).
- (8) Remove spring eye pin (20) and spring link assembly (5) from spring assembly (22).
- (9) Remove three lube fittings (5, 14, and 21) from spring eye pins (4, 13, and 20).
- (10) If damaged, remove bushing (16) from spring link assembly (15).
- (11) Remove upper spring seat (25), dowel pin (24) and spacer (23) from spring assembly (22).

**⚠ CAUTION**

**Use caution when lifting or handling rear spring assembly. It is heavy and can cause injury if dropped or improperly lifted. Use a floor jack or a helper to remove the rear spring assembly.**



- 1. Nut
- 2. Lockwasher
- 3. Leaf #21
- 4. Leaf #20
- 5. Leaf #19
- 6. Leaf #18
- 7. Leaf #17
- 8. Leaf #16
- 9. Leaf # 15 and 14
- 10. Bushing
- 11. Leaf #13
- 12. Leaf #12
- 13. Leaf #11
- 14. Leaf #10
- 15. Leaf #9
- 16. Leaf #8
- 17. Leaf #7
- 18. Leaf #6
- 19. Leaf #5
- 20. Leaf #4
- 21. Leaf #3
- 22. Leaf #2
- 23. Leaf #1
- 24. Center Bolt
- 25. Bolt
- 26. Spacer
- 27. Bolt
- 28. Spacer
- 29. Nut
- 30. Clip (Leaf 5 to 15)
- 31. Rivet
- 32. Nut
- 33. Rivet
- 34. Clip (Leaf 10 to 15)

Figure 3. Leaf Spring Assembly

**3 SPRING DISASSEMBLY.**

Refer to Figure 3 for the following procedure:

- (1) Mark the spring leaves in sequence for ease of assembly.
- (2) Remove nut (1), lockwasher (2), center bolt (24), and loose leaves.

**NOTE**

**Clips are on both ends of spring assembly. Front end is shown.**

- (3) Remove two nuts (29 and 32) and spacers (26 and 28) from clips (30 and 34).
- (4) Repeat step 3 for rear end of spring.
- (5) Remove remaining leaves.

**NOTE**

**Only remove clips if the clips or the leaf it is mounted to is damaged.**

- (6) If damaged, center punch and drill out rivets (31 and 33) to remove clips.

**⚠ WARNING**

**When using a hydraulic press for removal or installation of bushings, wear a face shield to prevent possible injury to personnel.**

**NOTE**

**Only remove bushings if they are damaged and need to be replaced.**

- (7) With the use of a press, remove two bushings (10) from main spring (9).

**NOTE**

**The top two main springs (11 and 12) are an assembly and cannot be replaced individually.**

**4 CLEANING, INSPECTION, AND REPAIR**

**4.1 Cleaning.**

- (1) Clean all parts in dry cleaning solvent. Do not use an oil based solvent.

- (2) Blow dry using clean dry compressed air or wipe dry using lint free cloth.

**4.2 Inspection.**

- (1) Check leaf sections for signs of damage such as cracks, chips, or corrosion.
- (2) Check clips for signs of damage such as bends, breaks, or cracks.
- (3) Check bushings in spring hanger and spring eyes for signs of out of round wear, chafing, corrosion or other damage.

**4.3 Repair.** Repair of parts in the suspension assembly is limited to the replacement of parts that are damaged.

**NOTE**

**No welding of this assembly is permitted.**

**⚠ CAUTION**

**Do not attempt to straighten bent parts.**

**5 SPRING ASSEMBLY.**

Refer to Figure 2 for the following procedure:

- (1) If previously removed, install two bushings (10) in both ends of the main spring (9).
- (2) Install clip (30) on leaf 5 (19) with new rivet (31). Install clip (34) on leaf 10 (14) with new rivet (33).
- (3) Repeat step 2 for rear end of spring.

**NOTE**

**Spring assembly may have 21 or 22 leaves and should be assembled in the same order as they were disassembled.**

- (4) Assemble spring leaves and install center bolt (24) with lockwasher (2) and nut(1). Do not tighten.
- (5) Install spacers (26 and 28) over spring 15 or 16 on clips (30 and 34) with bolts (25 and 27) and nuts (29 and 32).
- (6) Repeat step 5 for rear end of spring assembly.
- (7) Tighten nut (1).

**6 AXLE/SPRING INSTALLATION.**

Refer to Figure 1 for the following procedure:

- (1) Coat spring eye pin (20) and spring link hole (15) with anti-seize compound.

**NOTE**

**When installing spring link assembly, install with hanger lock pin to inside on left side and outside on right side.**

- (2) Position spring link assembly (15) on front spring assembly (22) and install spring eye pin (20) with locking slot in down position.

**⚠ CAUTION**

**If the hanger lock pin is allowed to enter the slot on an angle, it will wedge and gall. When locked in this position it will become loose in a short time and allow the pin to turn and wear the spring link assembly, elongating the hole in the bracket, resulting in failure of pin, spring eye or bracket.**

**NOTE**

**Insert screwdriver in end slot of spring eye pin. As hanger lock pin is inserted, turn pin until hanger lock pin taper slides into flat surface of pin locking slot. This will allow spring lock pin to contact the spring eye pin on the high side and roll it into proper position.**

- (3) Install hanger lock pin (17) in spring link assembly (15). Be sure to read preceding caution and note.

**⚠ CAUTION**

**Do not hammer hanger lock pin excessively to force spring slot into alignment or after slot is aligned. This induces extreme separating stress to bracket and is unnecessary for adequate seating.**

- (4) Tap hanger lock pin (17) with hammer to lock pin with spring eye pin.
- (5) Install lockwasher (18) and nut (19) on hanger lock pin (17) Torque to 55 ft. lbs. (75 N·m).

**NOTE**

**Keep threads of hanger lock pins free from anti-seize compound.**

- (6) Coat front and rear spring eye pins (4 and 13) and front and rear locking pin holes with anti-seize compound.

**⚠ CAUTION**

**Use caution when lifting or handling rear spring assembly. It is heavy and can cause injury if dropped or improperly lifted. Use a floor jack or a helper to install the rear spring assembly.**

- (7) Using a suitable lifting device, position front spring assembly (22) in front and rear frame brackets.
- (8) Install spring eye pins (4 and 13) with locking slot in down position through front and rear frame hangers and spring assembly (22).

**⚠ CAUTION**

**If the hanger lock pin is allowed to enter the slot on an angle, it will wedge and gall. When locked in this position it will become loose in a short time and allow the pin to turn and wear the spring link assembly, elongating the hole in the bracket, resulting in failure of pin, spring eye or bracket.**

**NOTE**

**Insert screwdriver in end slot of spring eye pin. As hanger lock pin is inserted, turn pin until hanger lock pin taper slides into flat surface of pin locking slot. This will allow spring lock pin to contact the spring eye pin on the high side and roll it into proper position.**

- (9) Install hanger lock pins (1 and 10) in front and rear frame hangers.

**⚠ CAUTION**

**Do not hammer hanger lock pin excessively to force spring slot into alignment or after slot is aligned. This induces extreme separating stress to bracket and is unnecessary for adequate seating.**

- (10) Tap lock pins (Figure 1, Item 1 and 10) with hammer to lock pins with spring eye pin.

- (11) Install spring eye pins (4, 13, and 20) with lock slot down in front frame and rear frame brackets.
- (12) Install lockwashers (2 and 11), nuts (3 and 12) on hanger lock pins (1 and 10). Torque to 55 ft. lbs. (75 N.m).
- (13) Install three lube fittings (5, 14, and 21) in spring eye pins (4, 13, and 20).
- (14) Refer to group 85 for correct lubricant for spring assembly.
- (15) Position upper spring seat (25), dowel pin (24) and spacer (23) on axle.
- (16) Install axle assembly (26) on spring assembly (22) with spring shoe (6), two U-bolts (7), lower spring seat (27) four lockwashers (8) and four nuts (9). Torque to 460 ft. lbs. (624 N.m).
- (17) Raise rear end of vehicle and remove solid supports. Lower vehicle to ground.

** WARNING**

**Use hoisting equipment and supports of sufficient capacity to accommodate the vehicle weight, as personnel will be required to work under the vehicle.**



