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| 8.2013 | <b>722</b> | <b>002</b> | <b>1</b> | 1(32) |

## **SB-10054290-9105**

Top Plate and Spring Seat, Replacement  
CHU, CXU

## **PI0827, Top Plate and Spring Seat, Replacement**

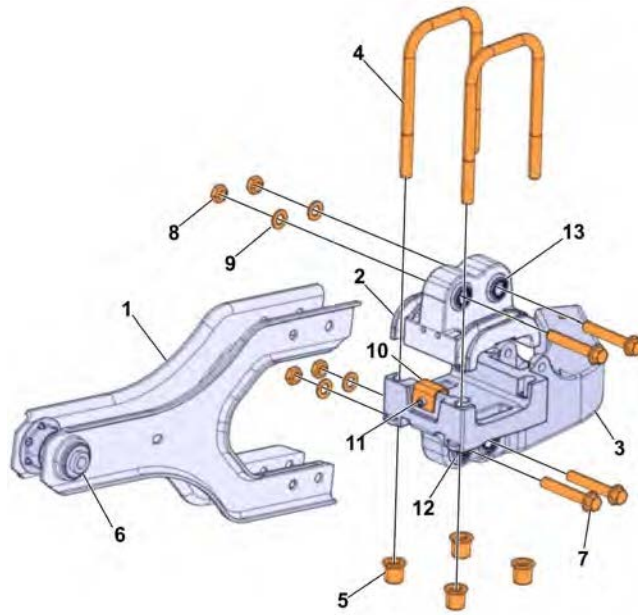
(August 2013)

**Note:** Information is subject to change without notice.  
Illustrations are used for reference only and may differ slightly from the actual vehicle being serviced. However, key components addressed in this information are represented as accurately as possible.

A number of Pre Production vehicles have been built equipped with the Twin Y Air Suspension. Upon review of these vehicles it has been determined that some have defective bushings within the top plate and spring seat. To address the defective bushings, this bulletin as been created which covers parts involved (Table 1 and Figure 1) , a procedure for inspection and a procedure for replacement of the top plate and spring seat, if replacement is found necessary.

Table 1 contains a complete list of service parts that may be required to fix the bushing problem. Figure 1 shows the location of these parts.

| <b>Service Parts (Table 1)</b> |   |                 |
|--------------------------------|---|-----------------|
| <b>Part Number</b>             | <b>Description</b>                        | <b>Quantity</b> |
| 21799969                       | Top Plate (LH)                            | 1 per Wheel     |
| 21799970                       | Top Plate (RH)                            | 1 per Wheel     |
| 21947030                       | Spring Seat (LH)                          | 1 per Wheel     |
| 21947031                       | Spring Seat (RH)                          | 1 per Wheel     |
| 21759985                       | Service U Bolts                           | 2 per Wheel     |
| 947971                         | U Bolt Fasteners                          | 4 per Wheel     |
| 995681                         | Y Blade to Seat Fasteners (M18)           | 4 per Wheel     |
| 22035866                       | Y Blade to Seat Fasteners (Nuts)          | 4 per Wheel     |
| 22039810                       | Y Blade to Seat Fasteners (Spring Washer) | 4 per Wheel     |
| 990861                         | S Cam Tube Support Bracket Fastener       | 1 per Wheel     |
| 996522                         | Set Screw for Pressure Plate              | 1 per Wheel     |



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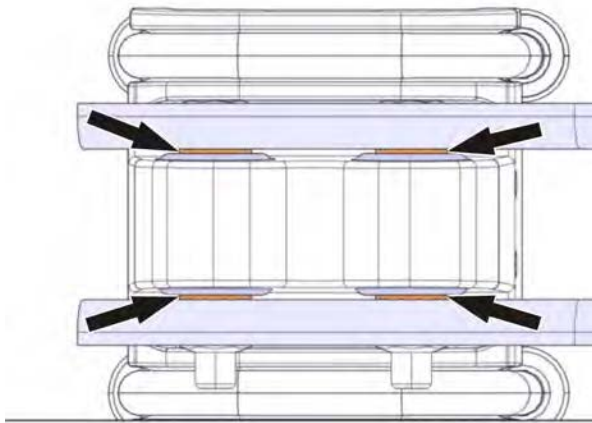
Figure 1 Location of Service Parts

- 1 — Y Blade (Shown for reference only not listed as a replacement part)
- 2 — Top Plate (Shown in table 1 as LH and RH)
- 3 — Spring Seat (Shown in table 1 as LH and RH)
- 4 — Service U bolts
- 5 — Fasteners for Service U bolts
- 6 — Bushing within Y blade at hanger bracket (Shown for reference only not listed as a replacement part)
- 7 — Fasteners for Top Plate and Spring Seat (M18)
- 8 — Fasteners for Top Plate and Spring Seat (Nuts)
- 9 — Fasteners for Top Plate and Spring Seat (Spring Washers)
- 10 — Pressure Plate (Shown for reference only not listed as a replacement part)
- 11 — Set Screw for Pressure Plate
- 12 — Spring Seat Bushings (If bushings are found defective the Spring Seat will be replaced which includes new bushings)
- 13 — Top Plate Bushings (If bushings are found defective the Top Plate will be replaced which includes new bushings)

## Inspection Procedure

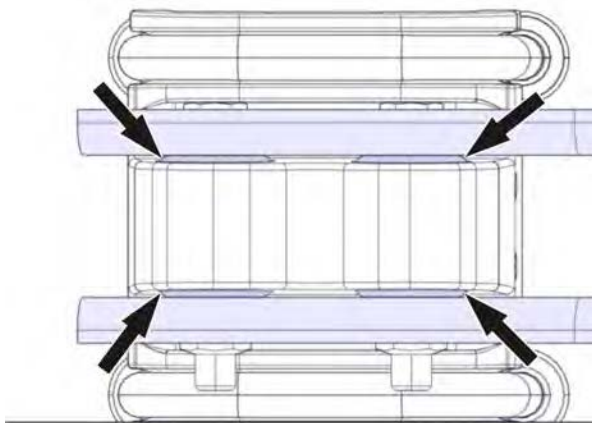
### TWIN Y AIR SUSPENSION BUSHING INSPECTION

1. Visual inspection, do the Y blades make contact with the outer shell of the bushing? See figures for pass or fail. If passes, continue with Step 2. If fails, proceed to the Top Plate and Spring Seat, Replacement procedure on page 7.



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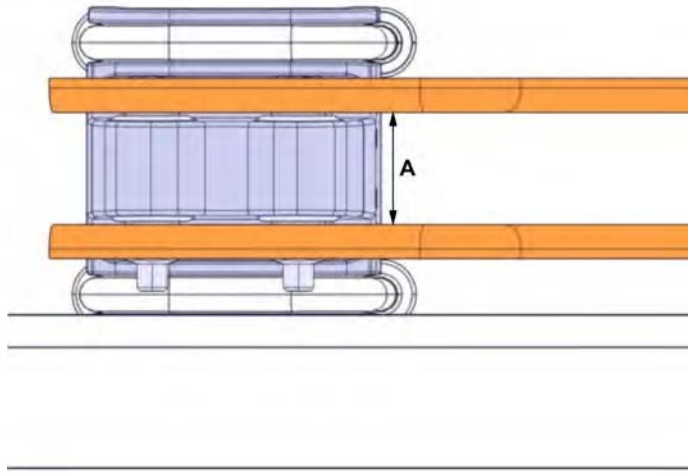
**PASS**



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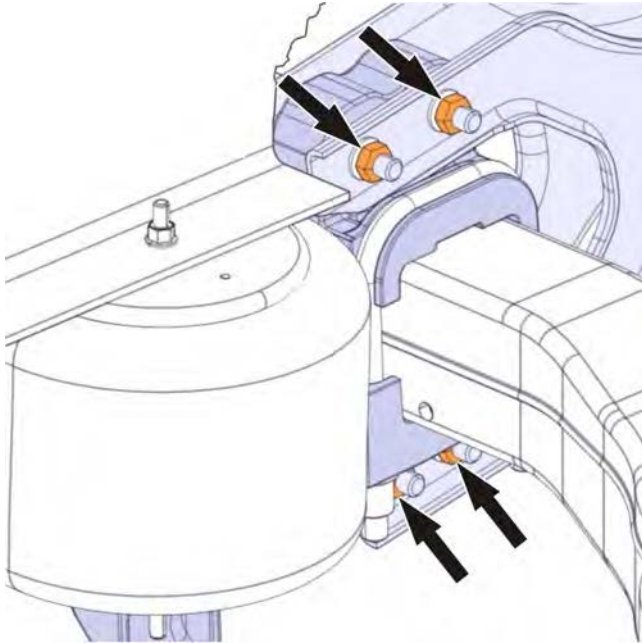
**FAIL**

2. Measure the distance between the Y blades as close as possible to top plate and spring seat (dimension A). If the distance is less than 64.7 mm (2.55 in) it fails. If fails, proceed to the Top Plate and Spring Seat, Replacement procedure on page 7. If test passes, continue with Step 3.



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3. Check torque on top plate and spring seat fasteners with torque wrench set to 135 Nm (100 ft-lb). If the torque wrench moves more than approximately 10 degrees the test fails. If test fails, proceed to the Top Plate and Spring Seat, Replacement procedure on page 7. If test passes, continue with Step 4.



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4. Check torque on top plate and spring seat fasteners with torque wrench set to 271 Nm (200 ft-lb). If the torque wrench moves more than approximately 10 degrees the test fails. If test fails, proceed to the Top Plate and Spring Seat, Replacement procedure on page 7. If test passes, continue with Step 5.

5. Check torque on top plate and spring seat fasteners with torque wrench set to 407 Nm (300 ft-lb). If the torque wrench moves more than approximately 10 degrees the test fails. If test fails, proceed to the Top Plate and Spring Seat, Replacement procedure on page 7.

**Note:** If the bushings pass this final torque test, the bushings are not defective and the procedure is complete and no further action will be required.

## Top Plate and Spring Seat, Replacement

### REMOVAL

1. Park the vehicle on a flat level surface. Place the shift lever in neutral. Apply the parking brake. Chock the front wheels.
2. Disconnect all cables from the negative (ground) battery terminals to prevent personal injury from electrical shock and prevent damage to electrical components.
- 3.

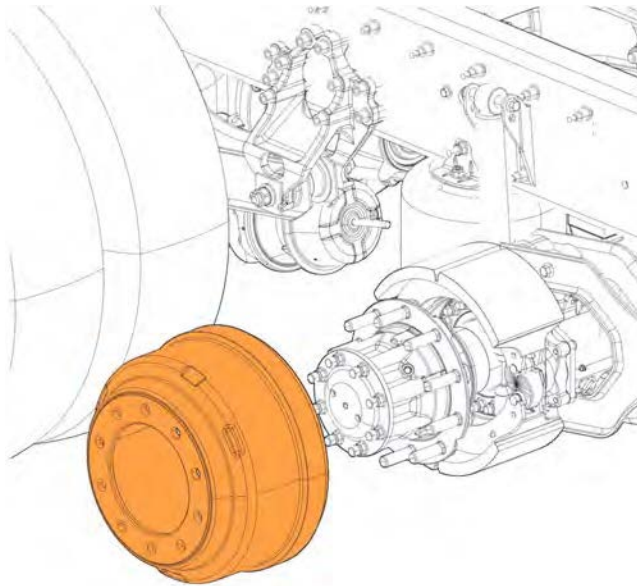


### **DANGER**

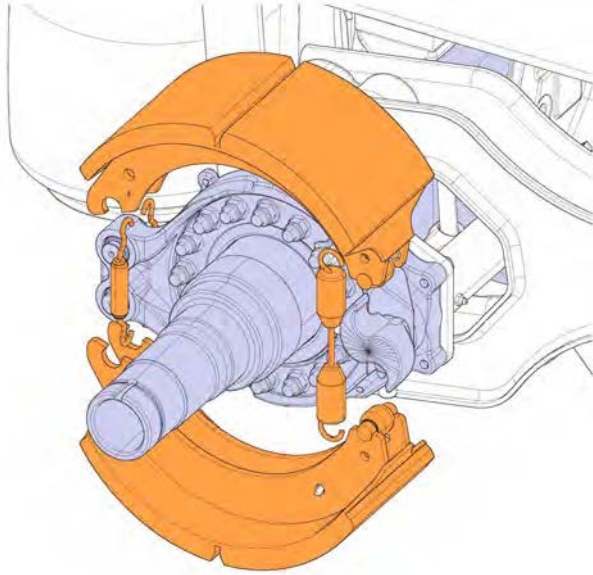
Failure to properly support the front of the axle housing may result in the axle rolling forward, causing serious injury or death.

Following safe lifting guidelines, lift and support both the frame and the axle housing.

4. Remove the wheels and tires.
5. Release the parking brake.
6. Cage the brake chamber.
7. Back-off the brake slack adjuster so that the brake drum can be removed.
8. Remove the brake drum.



9. Remove the brake shoes.



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Hub Removed For Illustration Purpose Only

10.



**CAUTION**

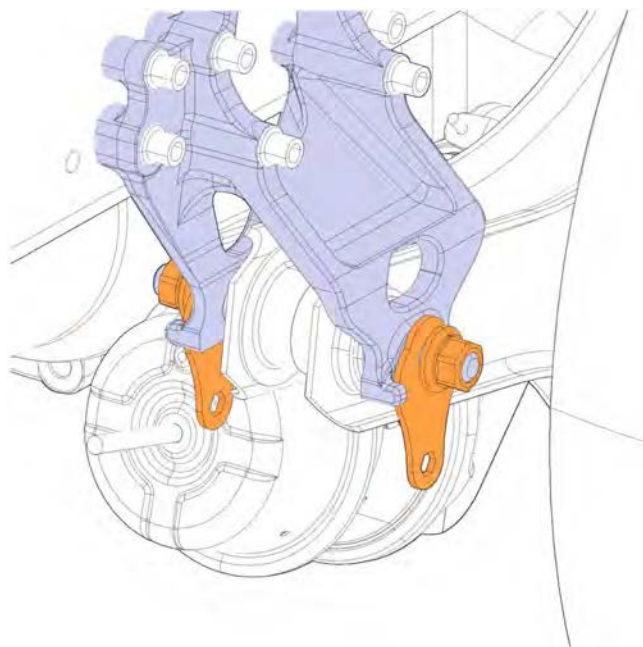
The weight of the axle housing is not distributed evenly. Make sure the jack can safely support the axle housing before removing the trailing blade bolts. If the axle housing is not supported properly, the housing can fall off the jack and result in component damage.

Before loosening the trailing blade fastener (left side), mark the adjusting washers for re-installation.

Loosen the fastener securing the trailing blade to the hanger bracket (right side).

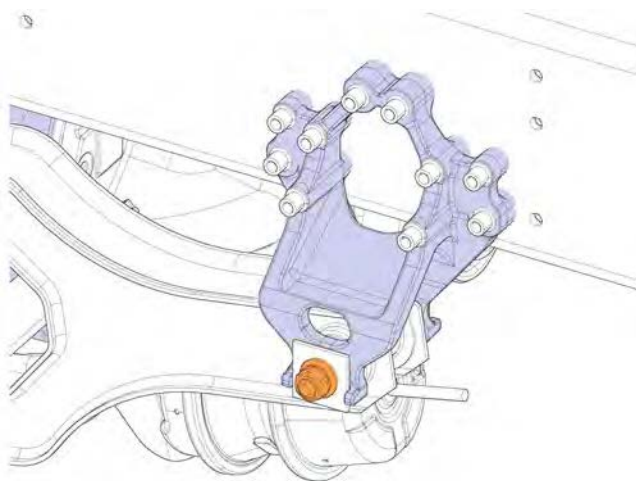
**Note:** Use care when loosening the trailing blade fastener, so that the fastener is not damaged.





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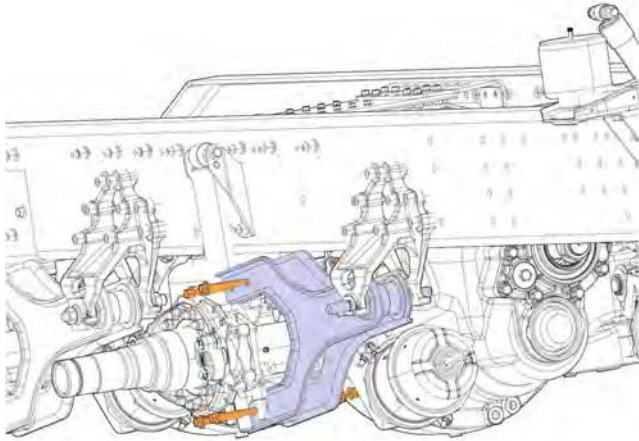
Left Side Shown



W7072863

Right Side Shown

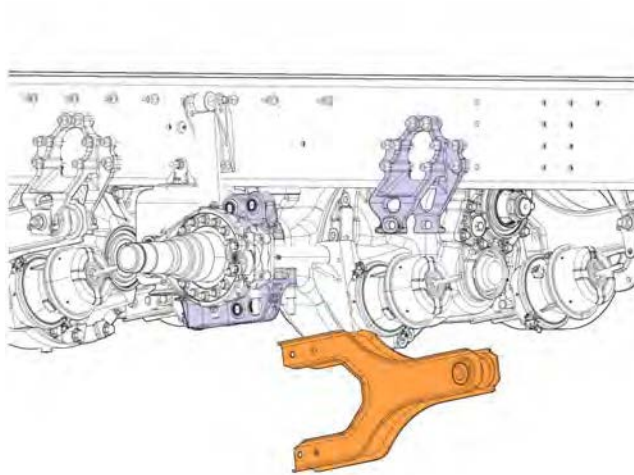
11. With assistance, remove the fasteners securing the trailing blade to the top plate and spring seat on the axle. Discard the fasteners.



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12. Remove the previously-loosened trailing blade fastener at the frame hanger bracket.

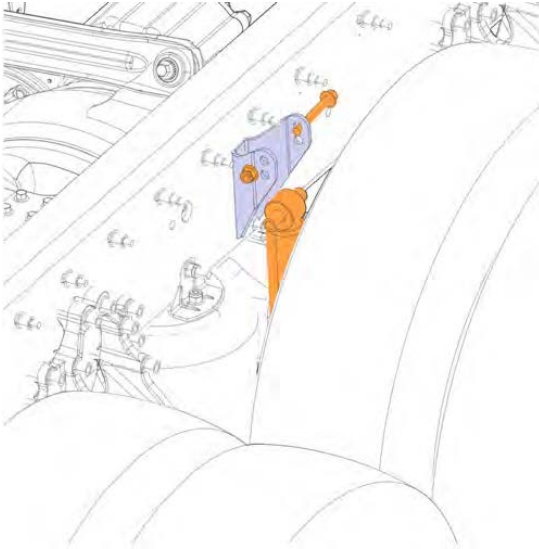


W7068414

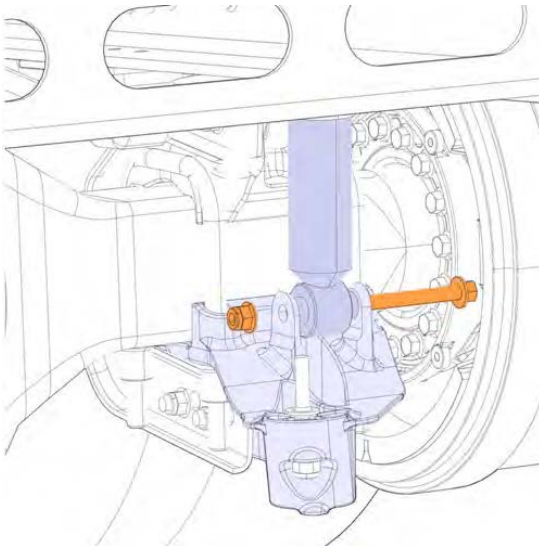
13. Remove the trailing blade from the axle and the frame hanger bracket.

14. Remove the fasteners securing shock absorbers to the mounting brackets. Remove the shock absorbers.

**Note:** While removing the shock absorbers, pay close attention to the mounting location on the upper mounting bracket for proper re-installation.



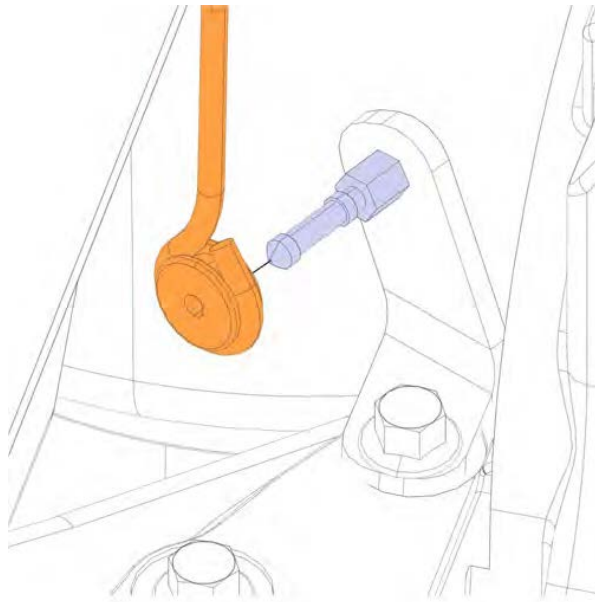
W7068435



W7068619

15. Remove the fasteners that attach the S-cam tube support bracket to the top plate. Loosen the U-bolt on the S-cam tube to allow clearance for removal of the top plate.

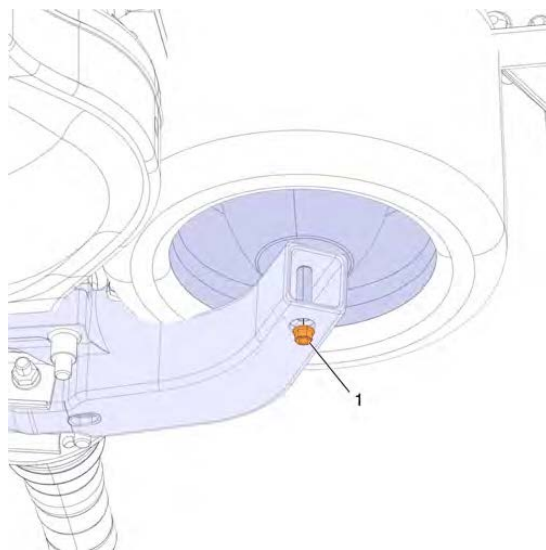
16. Using the dash mounted rear suspension air dump switch, release the air in the rear air spring or disconnect the leveling rod from the leveling valve so that the pressure is released from the air springs.



W6079166

MACK Fab Axle Shown

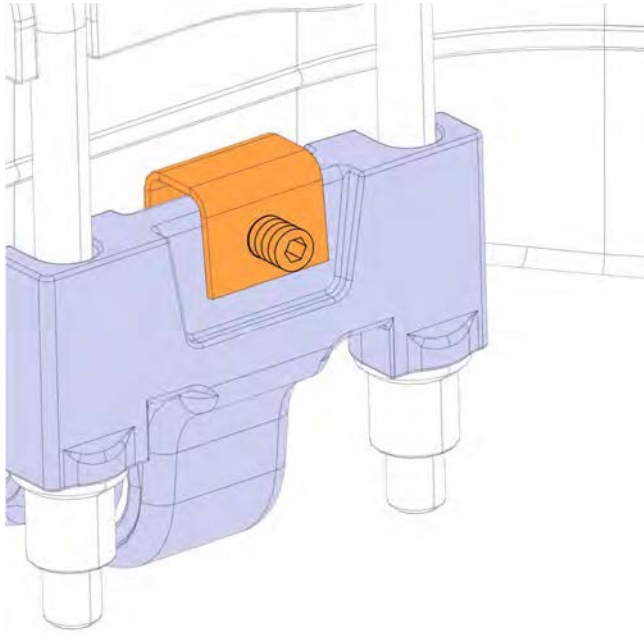
17. Remove the air spring fastener securing the air spring to the spring seat.



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1 — Fastener Attaching Air Spring to Spring Seat

18. Loosen the set screw in the spring seat that secures the pressure plate against the axle housing.



W6079167

19.

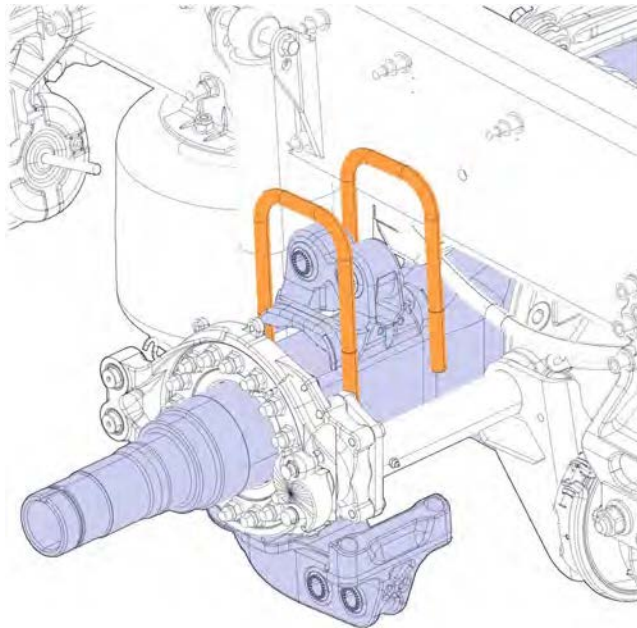


**CAUTION**

To avoid component damage support the spring seat when removing the U-bolts. The spring seat may separate from the axle housing and fall.

Remove the U-bolts securing the top plate and spring seat to the axle housing.

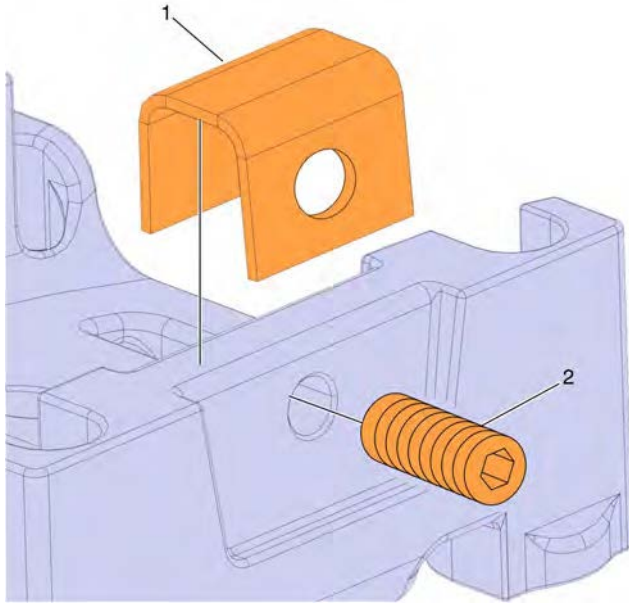
**Note:** Some applications maybe equipped with Huck<sup>R</sup> type fasteners and require using a removal tool.



W7072409

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20. Remove the top plate and spring seat. Remove the set screw and pressure plate from the spring seat.



W7079173

1 — Pressure Plate

2 — Set Screw

21. For top plate and spring seat removal on the left side of the axle, repeat Steps 4 through 20.

**Note:** Before loosening the left side trailing blade fasteners, mark the adjusting washers for re-installation.

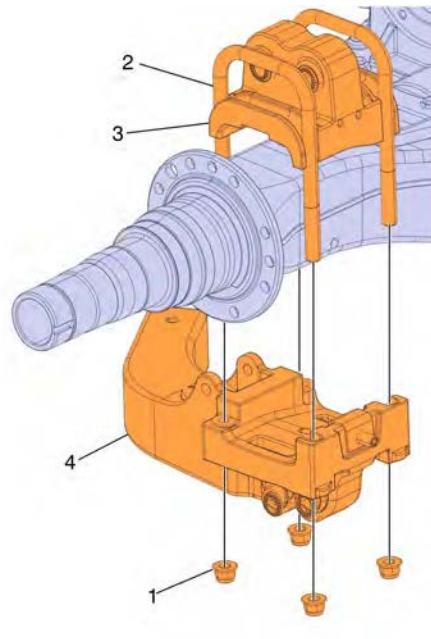


## INSTALLATION

1. With assistance, install the top plate and spring seat onto the axle housing using new U-bolts and fasteners.

Hand tighten U-bolt fasteners so that the spring seat is against the bottom of the axle (do not overtighten).

**Note:** Before tightening the U-bolts, make sure the axle guide pins are properly positioned in the hole in the top plate.

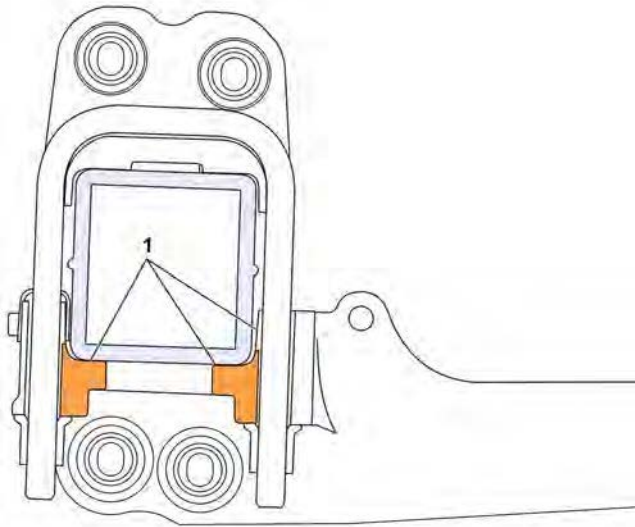


W7080093

- 1 — U-Bolt Fasteners
- 2 — U-Bolts
- 3 — Top Plate
- 4 — Spring Seat

2. Assemble pressure plate and set screw on the spring seat (both sides), do not tighten at this time.

**Note:** While installing the pressure plate to the spring seat make sure that the spring seat is touching the vertical wall and lower surface of the axle housing.

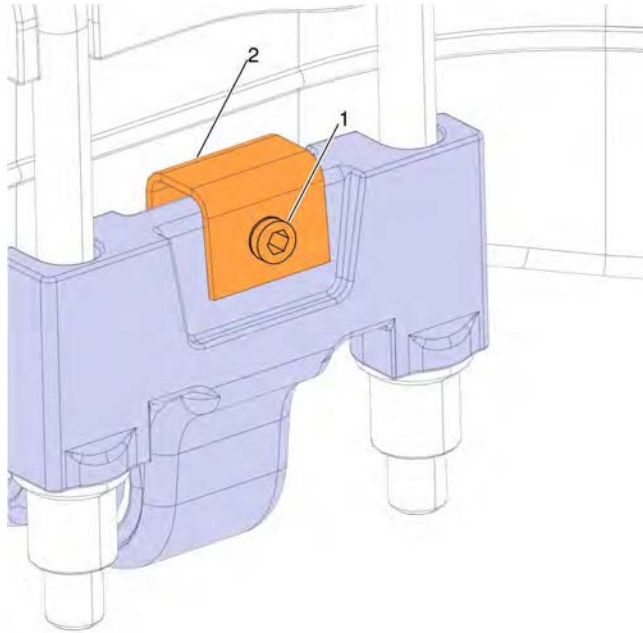


W7081619

1 — Alignment Area

3. Hand tighten the set screw attaching the pressure plate.

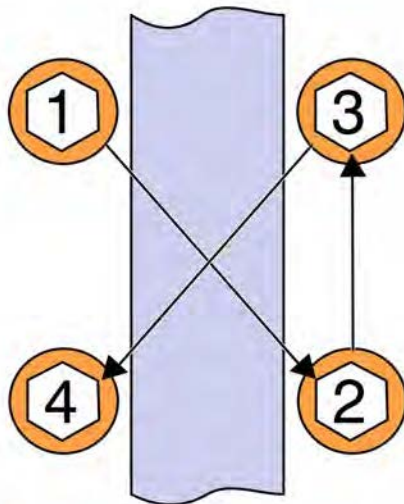
**Note:** This is needed to keep the spring seat in position while tightening the U-bolts.



W6079168

- 1 — Set Screw
- 2 — Pressure Plate

4. Gradually tighten the U-bolt fasteners in increments using the X-pattern shown until each is finally tightened to  $540 \pm 75$  Nm ( $400 \pm 55$  ft-lb).



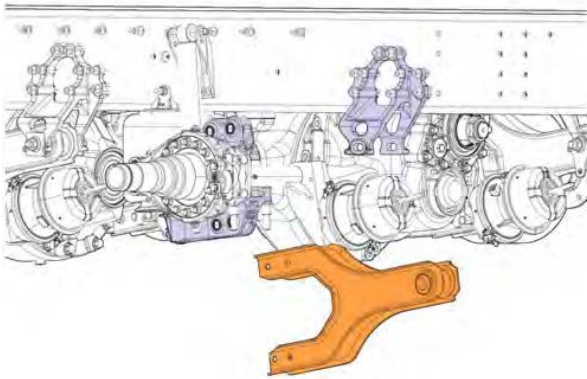
W7076443

5. Tighten the set screw attaching the pressure plate to the spring seat to  $70 \pm 12$  Nm ( $50 \pm 9$  ft-lb).

**Note:** If applicable, cut or shorten the U-Bolts approximately one inch past the end of the nut.

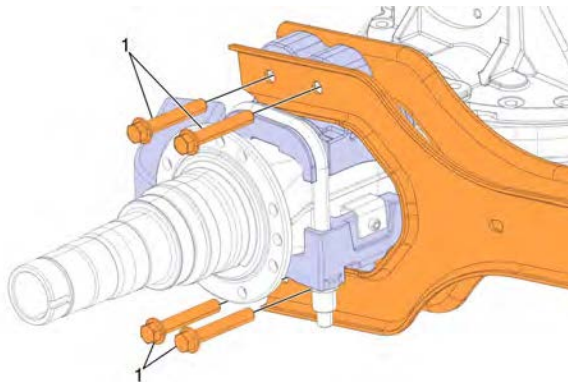
6. Install the fasteners securing the S-cam tube support bracket to the top plate. Tighten the fasteners to  $60 \pm 10$  Nm ( $44 \pm 7$  ft-lb). Tighten the U-bolt fasteners on the S-cam tube to  $40 \pm 6$  Nm ( $29 \pm 4$  ft-lb).

7. Position the trailing blade onto the vehicle.



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8. Install new fasteners securing the trailing blade to the top plate and spring seat on the axle. Do not tighten the fasteners.

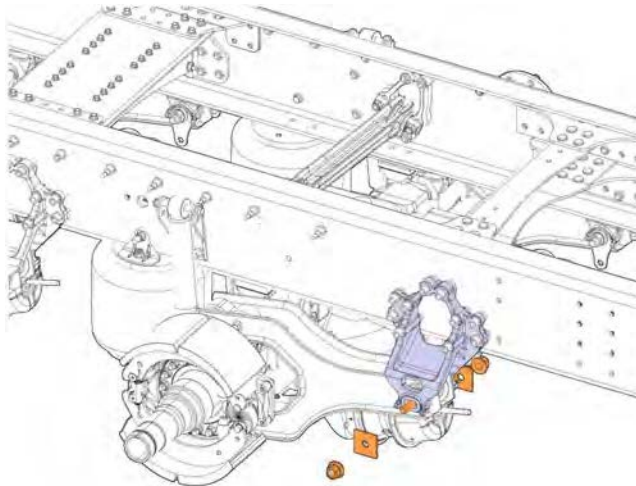


W7080092

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9. Position the opposite end of the trailing blade onto the frame hanger bracket. Loosely attach with the bolt, cam adjustment washers (left-hand side) and spacer adjustment washers (right-hand side).

**Note:** Do not tighten the fasteners at the frame hanger until the vehicle is at the correct ride height.



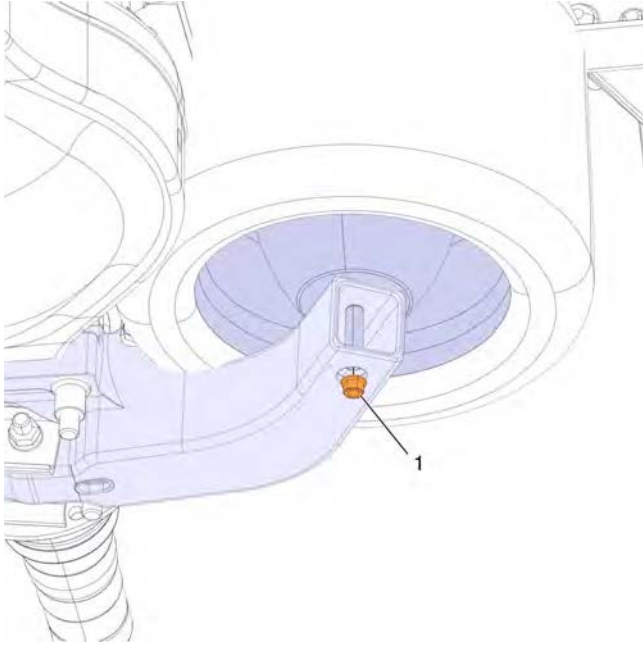
W7068412

10. Tighten the fasteners securing the trailing blade to the axle (top plate and spring seat) to  $475 \pm 50$  Nm ( $350 \pm 37$  ft-lb).

**Note:** Wait one minute after torquing the fasteners, then re-torque them to the same value.

**Note:** Do not tighten the fastener at the frame hanger bracket until the vehicle is at the correct ride height.

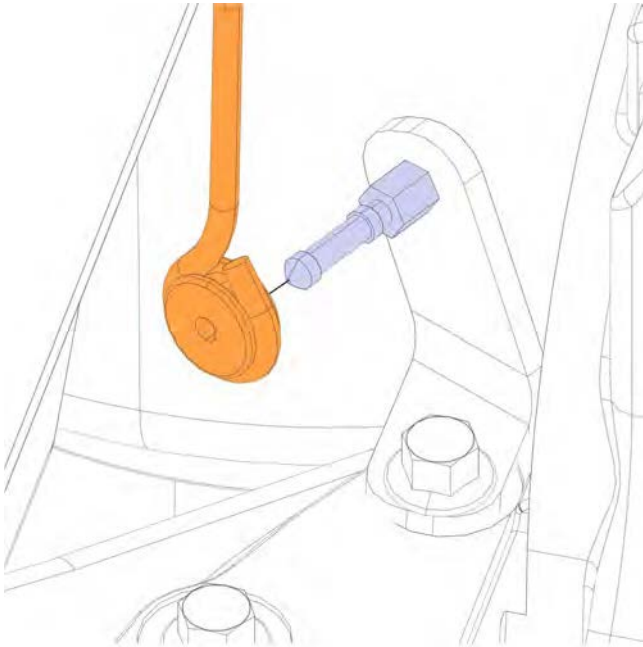
11. Align the air spring stud in the spring seat and attach it using the fastener. Tighten the fastener to  $70 \pm 10$  Nm ( $50 \pm 7$  ft-lb).



W6080097

1 — Fastener Attaching Air Spring to Spring Seat

12. Connect leveling rod to the axle housing.

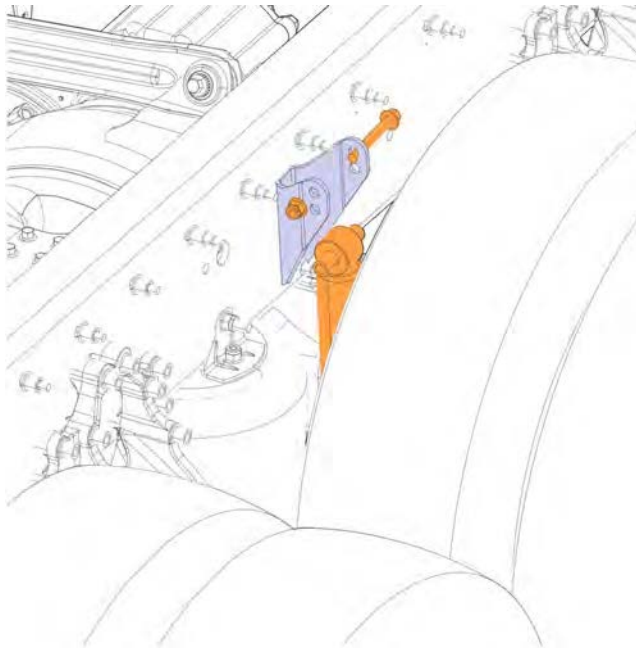


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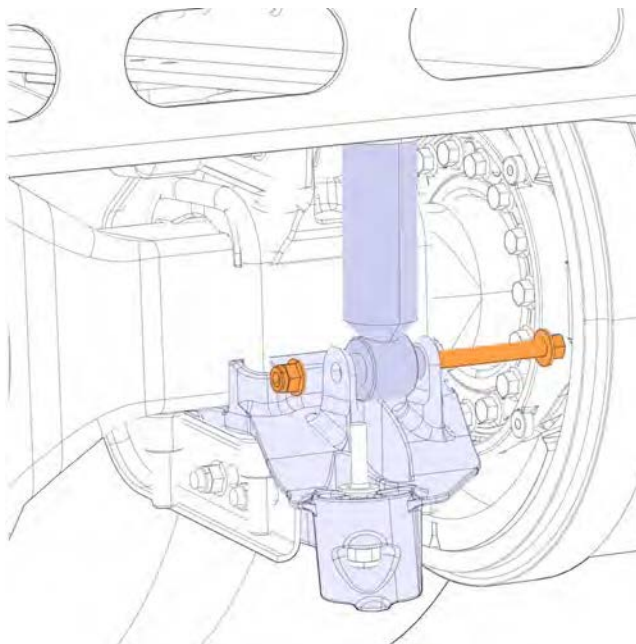
13. Loosely attach the shock absorber to the vehicle using the shock mounting fasteners.

**Note:** While re-installing the shock absorber onto the upper mounting bracket be sure to attach it in the location where previously removed.

**Note:** Do not tighten the shock mounting fasteners until the vehicle is at the correct ride height.



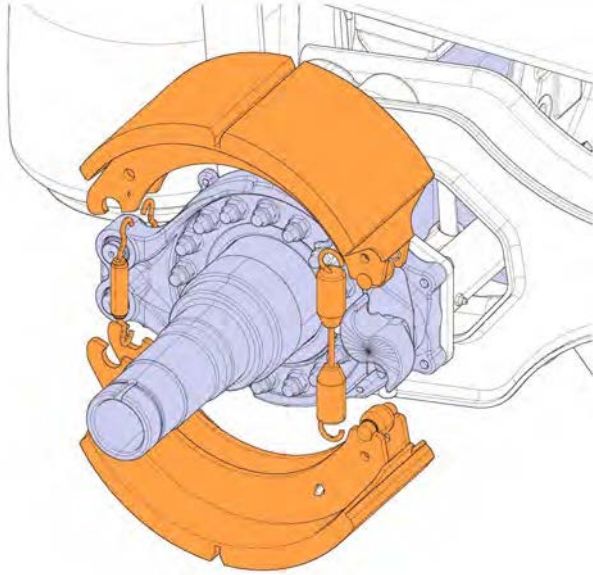
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W7068619



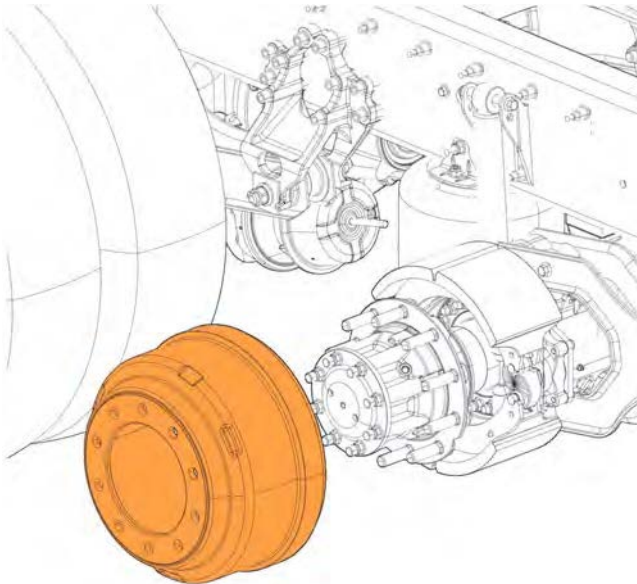
14. Install the brake shoes.



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Hub Removed For Illustration Purpose Only

15. Install the brake drum.



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16. Install the wheels and tires and tighten fasteners securely.

**Note:** Final torque should be done after vehicle is lowered and park brake is set.

17. For top plate and spring seat installation on the left side of the axle, repeat Steps 1 through 15.

**Note:** Before loosening the left side trailing blade fasteners, mark the adjusting washers for re-installation.

18. Reconnect all previously removed cables to the negative (ground) battery terminals.

19. Start the engine and fill the air system to proper operating pressure (120 psi [8 kPa]), so that the brakes can be adjusted properly. Once the proper operating pressure is reached turn off the engine.

**Note:** Make sure the park brake is released.

20. Uncage the brake chambers.

21. Adjust brakes to specifications, refer to the brake manufacturer's specifications for this procedure

22. Remove jack stands and jack from under the vehicle.

23.



**DANGER**

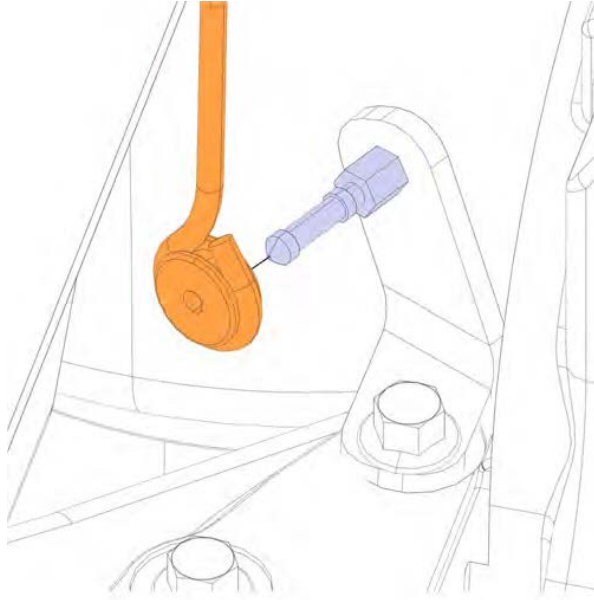
Stay clear when suspension air is released. Chassis may drop quickly, which can cause serious injury or death to anyone under the vehicle.



**DANGER**

Use caution when moving the load leveling valve arm down. This will release the suspension air and the chassis may drop quickly, possibly causing serious injury or death to anyone under the vehicle.

Release the air in the rear air springs by using the dash mounted rear suspension air switch or disconnect the leveling rod from the leveling valve at the differential. Move the valve lever so that the air springs are deflated.



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MACK Fab Axle Shown

24. Fill the rear air springs by using the dash mounted rear suspension air switch or re-connect leveling rod to the leveling valve.

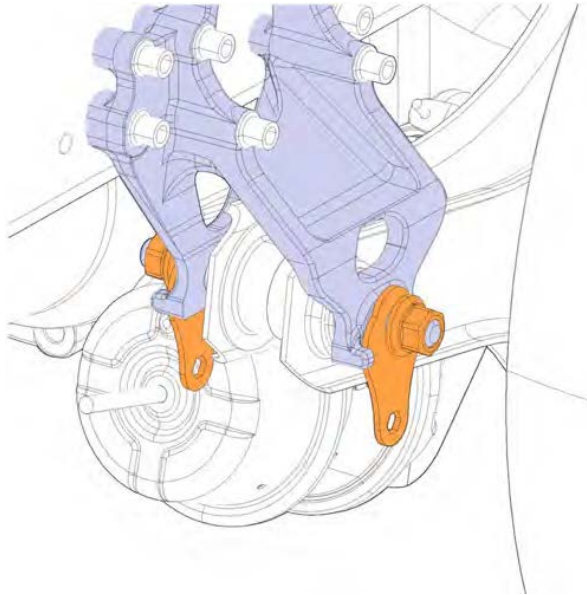
**Note:** Ensure that the air system is at normal operating pressure (120 psi [8 kPa]).

25. Check the ride height, refer to Air Suspension Ride Height Check/Adjustment procedure on page 29.

26. Align the previously made marks on the alignment washers (left side only).

**Note:** This should assist in getting close to the proper alignment.

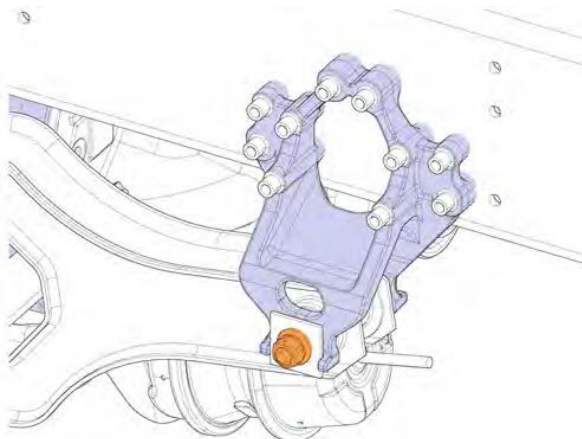
**Note:** After a suspension component replacement an alignment should be performed.



W6072195

Left Side Shown

27. With vehicle at correct ride height, tighten fastener at the frame hanger bracket to  $675 \pm 67$  Nm ( $500 \pm 50$  ft-lb).



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Right Side Shown

28. With vehicle at correct ride height, tighten the upper and lower shock absorber mounting fasteners to  $220 \pm 35$  Nm ( $160 \pm 25$  ft-lb).
29. Apply the parking brake.
30. Tighten the wheel fasteners to  $645 \pm 35$  Nm ( $475 \pm 25$  ft-lb).
31. Remove the wheel chocks.
32. After a suspension component replacement an alignment should be performed.
33. Road-test the vehicle for 10 miles to seat components, then follow the procedure in installation Step 4 to re-tighten the U-bolt fasteners.

## Air Suspension Ride Height Check/Adjustment

Prepare the vehicle for ride height calculation as follows:

1. Park the vehicle on a level surface (the front wheels must be pointed straight ahead).
2. Free and center all suspension joints by slowly moving the vehicle back and forth twice without using the brake. When coming to a complete stop, make sure the brakes (parking and service) are released.
3. Chock the front wheels.

**Note:** Measurements must be performed on an unloaded vehicle.

4. Check all tires for proper inflation. Adjust tire air pressure to tire manufacturer's specifications.
5. Using the dash mounted rear suspension air dump switch release the air in the rear air spring, or disconnect the leveling rod from the leveling valve so that the pressure is released from the air springs.



### WARNING

Avoid personal injury. BEFORE releasing air pressure from air springs, BE SURE neither your hand nor another persons hand, etc., is in a position where it could be pinched between components when the frame/suspension drops.

6. Start the engine and allow the air system to attain normal operating pressure of 827 kPa (120 psi). Turn off the engine.
7. Fill the rear air springs with air using the dash mounted switch or reconnect the actuator rod to the load leveling valve lever.

Ensure the air system is at normal operating pressure of 827 kPa (120 psi).

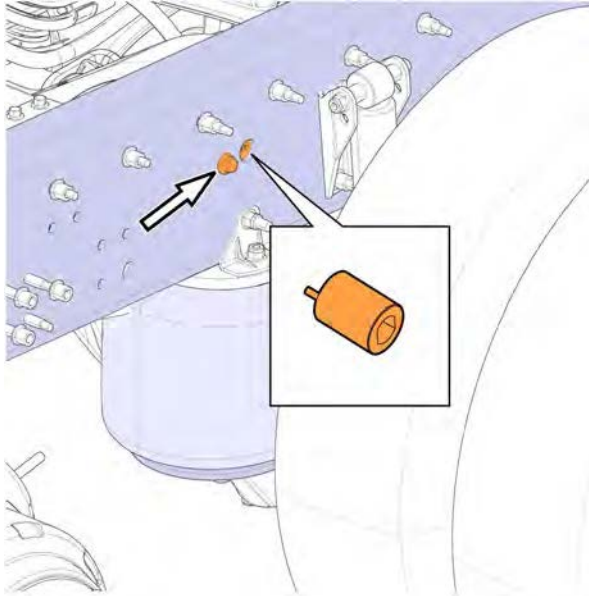
8. Measure the size of the frame.

**Note:** The ride height measurement is dependent on frame size.

**Note:** Figure 1 shows an image of frame types with measurements from top of frame to frame mounting bracket.

9. Measure the distance from the floor to the center of the axle.
10. Measure the distance from the bottom edge of the frame to the floor, using special tool **9992870**.
11. The difference in the two measurements is the ride height. Verify that the vehicle is at the correct ride height.

12. Adjust the ride height (if required).



W7081225

13. Loosen the fastener securing the load leveling valve to the frame. Use the ride height adjustment socket wrench **J-44544** to adjust the valve so the ride height is within specification. The suspension ride height is changed by turning the load leveling valve clockwise (to raise) or counter-clockwise (to lower). Tighten the fastener securing the load leveling valve to the frame to  $175 \pm 40$  Nm ( $129 \pm 30$  ft-lb).

14. Re-check the ride height to confirm the accuracy of the leveling valve adjustments

15. Using the dash mounted rear suspension air dump switch release the air in the rear air spring, or disconnect the leveling rod from the leveling valve so that the pressure is released from the air springs.



### **WARNING**

Avoid personal injury. BEFORE releasing air pressure from air springs, BE SURE neither your hand nor another persons hand, etc., is in a position where it could be pinched between components when the frame/suspension drops.

16. Start the engine and allow the air system to attain normal operating pressure of 827 kPa (120 psi). Turn off the engine.

17. Fill the rear air springs with air using the dash mounted switch or reconnect the actuator rod to the load leveling valve lever.

Ensure the air system is at normal operating pressure of 827 kPa (120 psi).

18. Re-check the ride height.

If the ride height measurement is not within the specifications. Check the leveling valve and other suspension components for wear or damage.

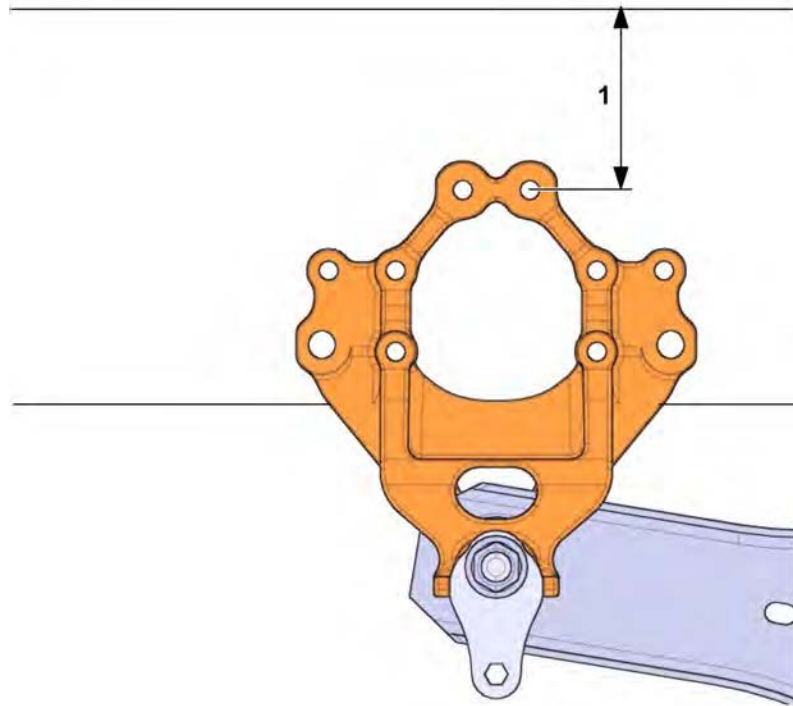
19. Apply the parking brake.

20. Remove the wheel chocks.

**Frame and Ride Height Specifications**

**Table A — Frame Height and Ride Height Measurements**

| Frame Height mm (in.) including frame type | Ride Height mm. (in.) (unloaded) |
|--|----------------------------------|
| 266 (10.47)                                | 210 ± 5 (mm), 8.27 ± .2 (in)     |
| 300 (11.81)                                | 193 ± 5 (mm), 7.6 ± .2 (in)      |



W7081729

1 = 103 mm (for 266 frame height)  
and 120 mm (for 300 frame height)

**Figure 1**  
Ride Height Adjustment

**Reimbursement**

|  |                             |
|--|-----------------------------|
| <b>This repair is covered by an authorized Service Program. Reimbursement is obtained via the normal claim handling process.</b> |                             |
| <b>Claim Type (used only when uploading from the Dealer Bus. Sys.)</b>   | B                           |
| <b>Recall Status</b>   |                             |
| Vehicle inspected, repair not required   | 1- Inspected OK             |
| Vehicle repaired per instruction   | 2- Modified per instruction |
| <b>Labor Code</b>  |                             |
| Primary Labor Code   |                             |
| Labor Code Inspection (only) complete vehicle  | 1361C-01-96<br>2.0 hrs.     |
| Labor Code Repair each wheel end   | 1361D-01-96<br>3.1 hrs.     |
| Time to take charge and determine campaign status  | 17003-0-01 —<br>0.3 hrs.    |
| <b>Causal Part</b>   | 85003025                    |
| <b>Parts Disposition</b>   |                             |
| <b>Authorization Number</b>  |                             |
| <b>Expiration Date</b>   | >                           |

**Note:** Take Charge Time is not included in the Labor Code for this operation. Take charge may be eligible but can only be used once per repair visit. If vehicle is having other warranty repairs performed, take charge should be charged to the warranty repair, otherwise take charge can be charged to this service program.