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MERITOR®

Technical Bulletin

Replacing the Axle Seats on Meritor RideStar™ RHP Series Single-Axle and Sliding Tandem Trailer Air Suspensions

Hazard Alert Messages

Read and observe all Warning and Caution hazard alert messages in this publication. They provide information that can help prevent serious personal injury, damage to components, or both.

How to Obtain Additional Maintenance and Service Information

Refer to Maintenance Manual 14, Trailer Axles; Maintenance Manual 14L, RideStar™ RHP Series Single-Axle Trailer Air Suspension System; and Maintenance Manual 14S, RideStar™ RHP Series Sliding Tandem Trailer Air Suspension System. To obtain these publications, call ArvinMeritor's Customer Service Center at 800-535-5560, or visit the Tech Library on our website at arvinmeritor.com.

Before You Remove the Axle Seats from the Trailer Axle

Meritor recommends that you apply reference marks to indicate the positions of the axle seats you will remove from the trailer axle assembly to help ensure correct reinstallation.

Remove the Trailer Axle Assembly

⚠ WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service procedures.

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a trailer supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

1. Wear safe eye protection.
2. Park the vehicle on a level surface. Set the parking brake. Block the wheels to prevent the vehicle from moving.
3. Lower the landing gear. Use an appropriate lifting device to raise the trailer frame, so that the tires are just off the ground. Support the trailer with safety stands.

⚠ WARNING

Verify that all people are clear of the trailer before you inflate or deflate the air springs. The air suspension system has various pinch-points that can cause serious personal injury.

4. Exhaust the air pressure from the suspension air springs.

⚠ ASBESTOS AND NON-ASBESTOS FIBERS WARNING

Some brake linings contain asbestos fibers, a cancer and lung disease hazard. Some brake linings contain non-asbestos fibers, whose long-term effects to health are unknown. You must use caution when you handle both asbestos and non-asbestos materials.

5. Remove the tires, drums, brake shoes and brake hardware from the axle being serviced. Do not remove the hubs.
6. Disconnect the brake chamber clevis from the slack adjusters. Remove the brake chamber attaching hardware and retain it for reassembly. Let the chamber hang on the brake hoses.
7. Remove the retaining nut and push the air spring up off the seat. Retain the nut for reassembly.
   - **If you are removing the rear axle:** Disconnect the leveling valve rod.

8. Use a jack to raise the axle approximately four-inches (107 mm). Disconnect the lower shock absorber bolt. Retain the bolt for reassembly. Rotate the shock absorber up and out of the way. Figure 1.

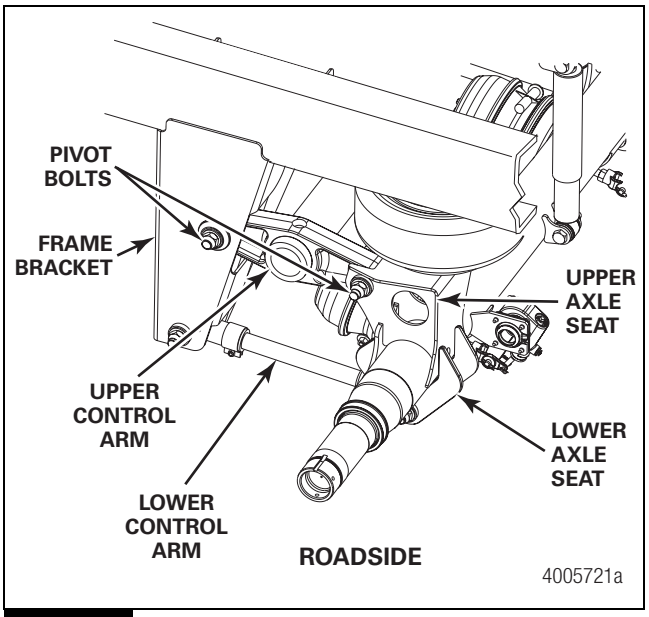

Figure 1

9. Verify that the pivot bolts on the upper control arm spin freely.
   - **If you find corrosion between the pivot bolts and the inner sleeves:** Use an impact wrench on the pivot bolt heads to spin and disengage the bolts.
10. Remove the nuts that secure the upper control arm to the frame brackets and axle seats. Note the orientation of the bolts used at each pivot bolt location. Use the same orientation at reassembly. Discard the nuts. All upper control arm hardware must be replaced with new during reassembly.
    - **If equipped with shear or tamper-proof nuts:** Use a disc grinder to grind off the tack weld between the shear nut and pivot bolt thread. Hold the nut with a pipe wrench. Use an impact wrench on the pivot bolt head. Discard the nut. Do not use it for reassembly.
    - **If equipped with standard Nylok® nuts:** Hold the pivot bolt with a wrench. Use an impact wrench to remove the nut. Discard the nut. Do not use it for reassembly.
11. Verify that the axle is supported correctly. Remove the lower control arm bolts. Retain the bolts for reassembly. Push the lower control arms down and out of the way.
12. Place a block of wood under the upper control arm where it attaches to the center hanger, which will keep the upper control arm from falling when the axle seat pivot bolts are removed.

⚠ WARNING

After you've removed the pivot bolts, keep clear of the upper control arm. Do not stand under the upper control arm when you pull the axle away from the suspension. Serious personal injury and damage to components can result.

13. Remove the pivot bolts from the axle seats at the upper control arms and pull the axle away from the suspension. Discard the bolts. Ensure that you're not standing under the upper control arm when pulling the axle away. Pull the axle straight off the suspension to prevent the axle seats from binding onto the bushings.
14. Use a marking device such as chalk to apply reference marks on the axle. It is important to add these marks before turning the axle over to eliminate any confusion and possibility for error. If possible, place the marks toward the center, inboard side, of the axle, and up and over the top, to ensure that the marks remain during the axle seat replacement procedure. Figure 2.

    Indicate the location and orientation of components as follows.

    A. Mark the axle top and label the "curbside" and "roadside" ends.

    B. Mark the position of the upper axle seats. Label their "curbside" and "roadside" position.

    C. Mark to indicate which side of the axle the upper control arm is located.

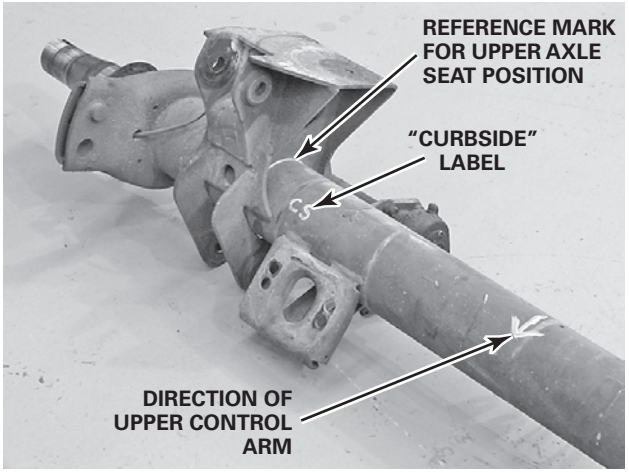

Figure 2

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15. Turn the axle over. Set it on a flat surface, so that it rests on the air spring seats. Figure 3.

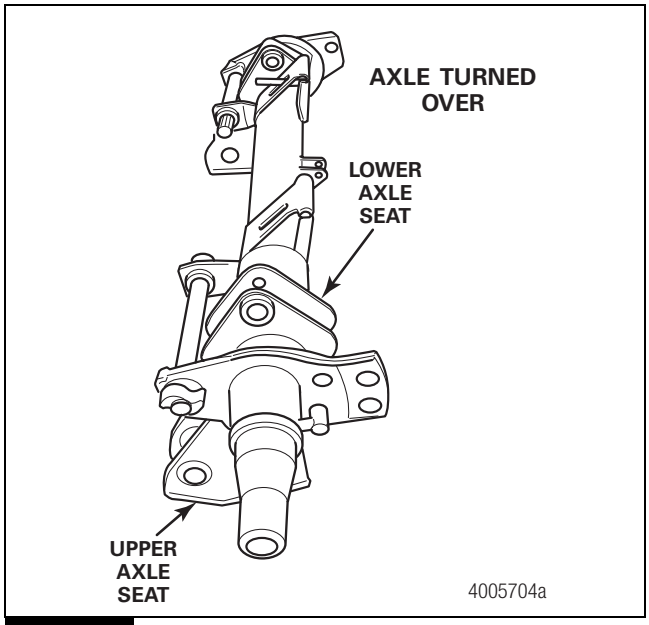

Figure 3

16. Replace the shock absorber mounting tabs, if necessary.
    A. Apply reference marks to indicate the center position of each mounting tab and which way the longer tab ends face. The axles with a ride height of 16-1/2-inches (419 mm) and 18-1/2-inches (470 mm) have tabs that face UP. The axles with a ride height of 17-1/2-inches (445 mm) have tabs that face DOWN. Figure 4.
    B. Mark the rotation of each mounting tab, with a horizontal line. This is important as it sets the shock stroke.

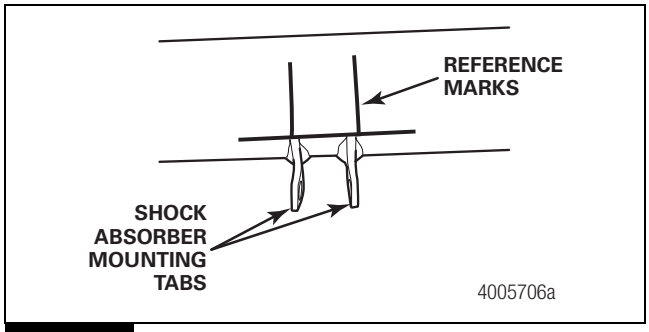

Figure 4

17. Use an air-arc or torch to remove the shock absorber mounting tabs.
    - **If you use an air-arc:** Use care to remove only the welds to prevent gouging the axle tube.
    - **If you use a torch:** Ensure that the cuts are high enough to prevent gouging the axle tube.

18. Grind off the remaining weld. Ensure that you do not grind flush to the axle tube. Figure 5.

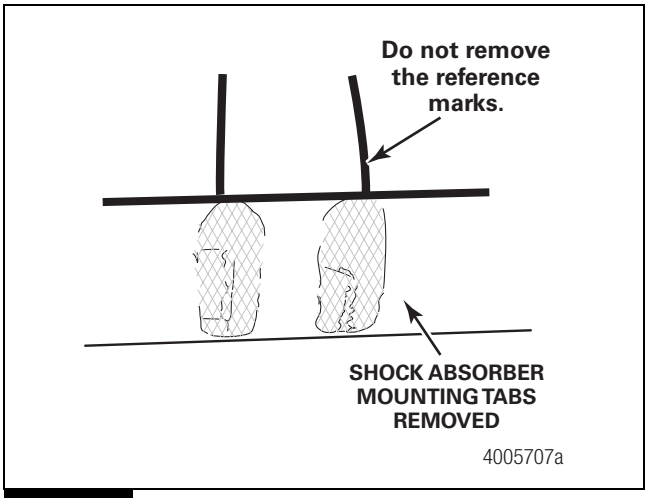

Figure 5

19. Install the mounting tabs onto a shock absorber or spacer to set the correct distance. Figure 6.

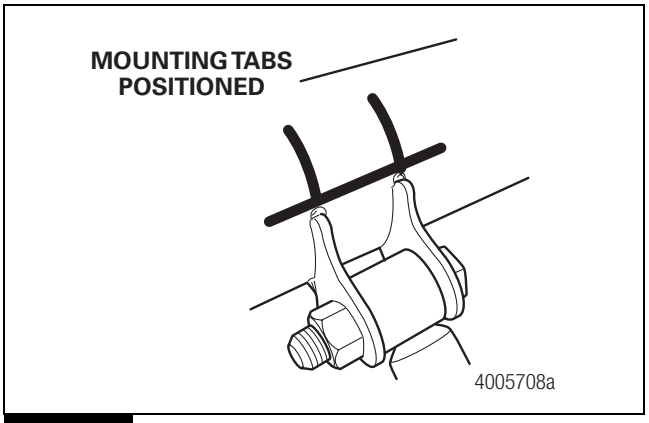

Figure 6

20. Place the mounting tabs in position according to the reference marks and old weld marks on the axle. Verify the tabs are facing the same way as those you removed.

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21. Tack weld the tabs in place. Run the outside welds. Remove the shock absorber. Run the inside welds. Figure 7.

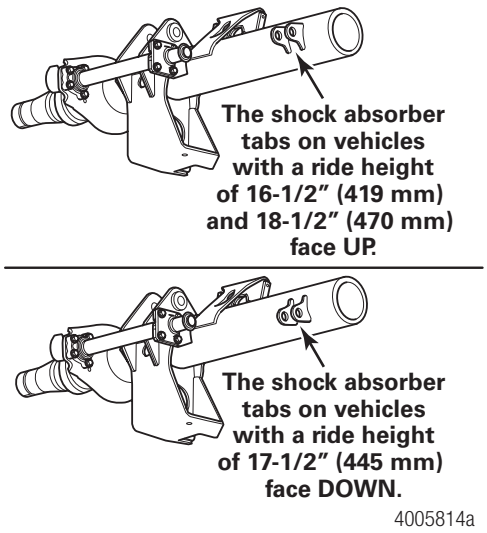

Figure 7

22. After welding the mounting tabs, use a torch to heat the opposite side of the axle for one minute. This will help to reduce the toe effect of the mounting tab welds. Avoid concentrating the heat in one area. Move the torch over an area equal to the area of the shock tabs.

Remove the Axle Seats

You can perform this procedure with or without the hubs. If necessary, place even blocks under the axle seats to raise the hubs off the floor.

1. Measure from the center of the splined end of the camshaft to the flat surface that the axle seats are on. Figure 8. Refer to the following measurement examples. These are approximate measurements.

Ride Height	Center of Camshaft to the Floor or Bottom of the Axle Seats (Nominal)
16-1/2″ (419 mm)	9″ (229 mm)
17-1/2″ (445 mm)	10″ nominal (254 mm)
18-1/2″ (470 mm)	11″ (279 mm)

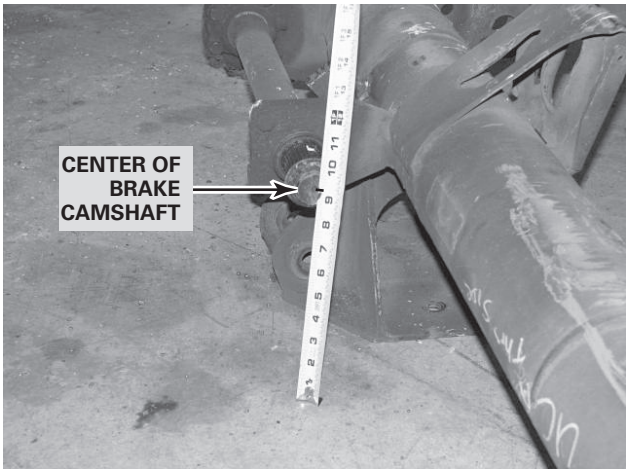

Figure 8

2. Use an air-arc or torch to remove the lower axle seats. Note that the lower axle seats will be facing up and are welded to the upper axle seats. Figure 9 and Figure 10.

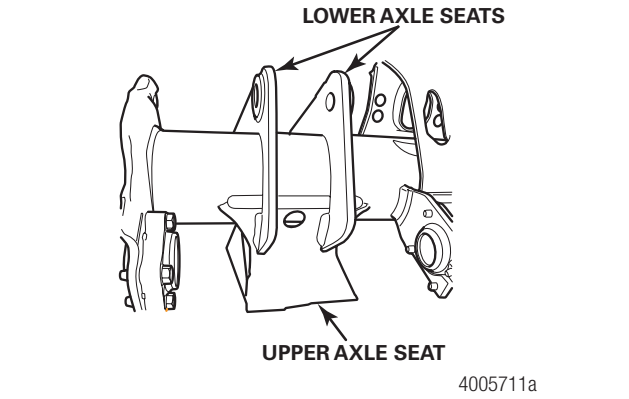

Figure 9

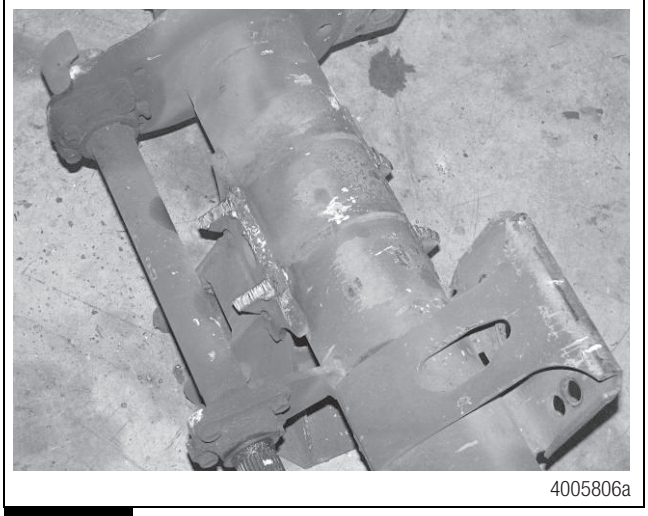

Figure 10

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3. Use floor jacks to raise the axle so the upper axle seats are off the floor.
4. Use an air-arc to remove the upper axle seats. An air-arc is the preferred tool for this procedure. However, a cut-off wheel in a grinder may also be used if necessary. The use of a torch or plasma cutter is not recommended as this will overheat the axle.
5. Remove only the welds. Do not gouge the axle tube. Figure 11.

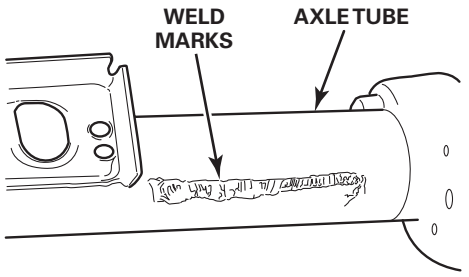

Figure 11

6. Grind the welds until they are flush with the axle. Do not grind into the axle tube.

Install the New Upper Axle Seats

1. Place the new upper axle seats on a flat surface in the same position and with the same orientation as the ones you removed.
2. Verify that the new axle seats are the same height as the ones you removed. Measure from the air spring mounting plate to the axle cutout. Compare the dimension to the size of those removed. Figure 12.

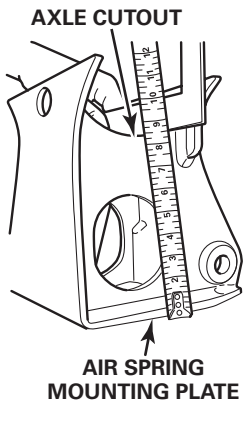

Figure 12

3. Place the upper axle seats facing the same direction on a flat surface approximately 42-inches (1067 mm) apart. Install a straightedge against both axle seats. Figure 13.

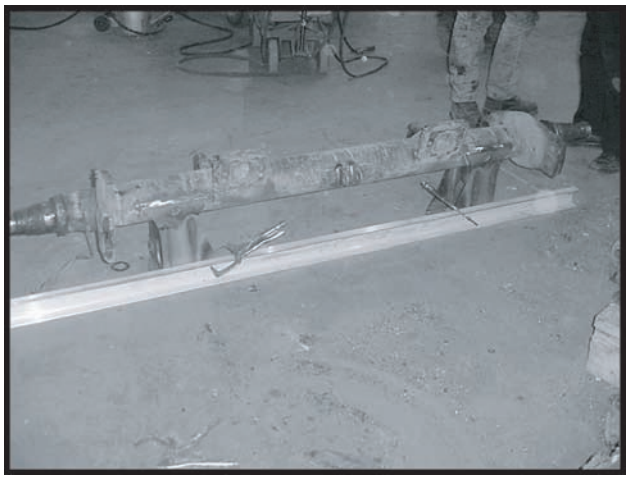

Figure 13

4. Use floor jacks to lower the axle into the axle seats and align it with the reference marks on the curbside of the axle. This will center the axle into the seats from side-to-side. Do not use the top center hole on the axle tube as a centering mark. Figure 14.

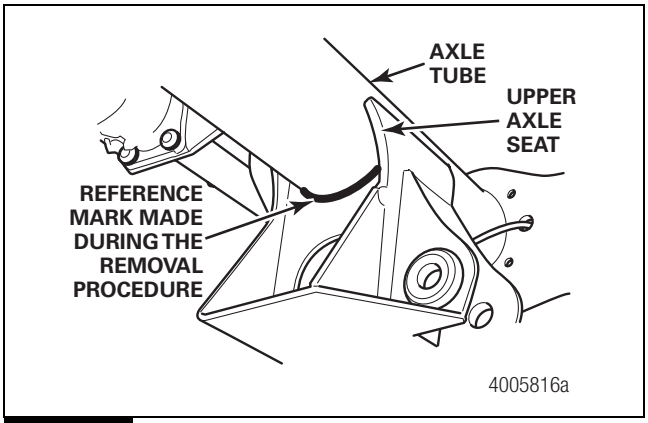

Figure 14

5. Clamp the curbside axle seat to the straightedge. Run a tape measure through the bolt holes. Measure from the inside mounting flange on one axle seat to the inside flange on the other axle seat. Adjust the axle seats to obtain a distance of 41-7/8-inches (1064 mm). Figure 13, Figure 15 and Figure 16.

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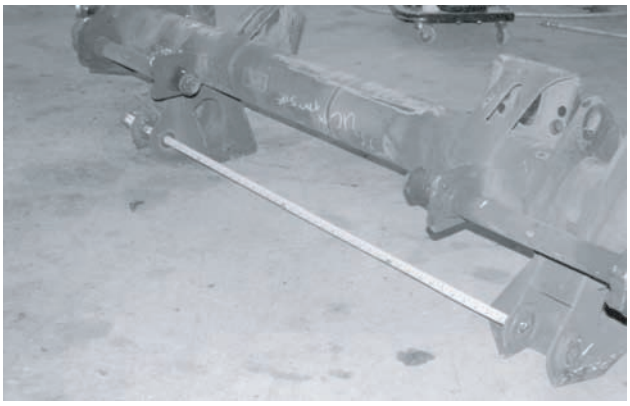

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Figure 15

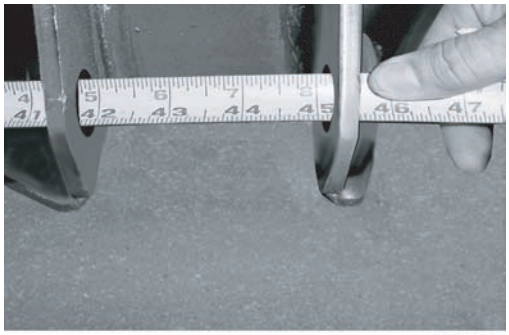

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Figure 16

6. Clamp the roadside axle seat to the straightedge. Recheck the measurement. The distance must be exactly 41-7/8-inches (1064 mm). Figure 13, Figure 15 and Figure 17.

   - **If you are unsure that the measurement is correct:** Install the upper control arm into the replacement axle seats. This will also establish the correct distance between the axle seats.

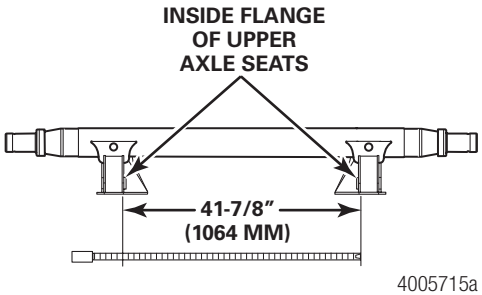

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Figure 17

7. Measure from the center of the splined end of the camshaft to the flat surface that the axle seats are on. Rotate the axle to match the dimension recorded before the old axle seats were removed. This will help maintain the correct camshaft location to ride height. Figure 18.

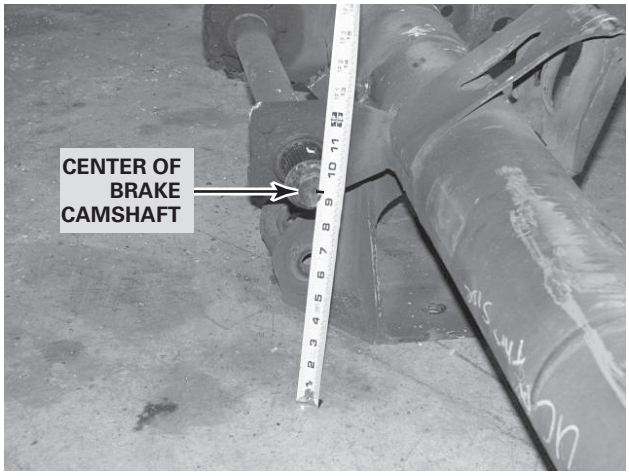

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Figure 18

8. Measure and verify that a distance of 41-7/8-inches (1064 mm) still exists between the axle seats. The preferred method of obtaining this measurement is to run a measuring tape through the bolt holes. Ensure that the squaring bar remains in place. Figure 17.

9. Tack weld the axle seats to the axle. The welds should be made one-inch (25.4 mm) in from each corner on each axle seat. Figure 19.

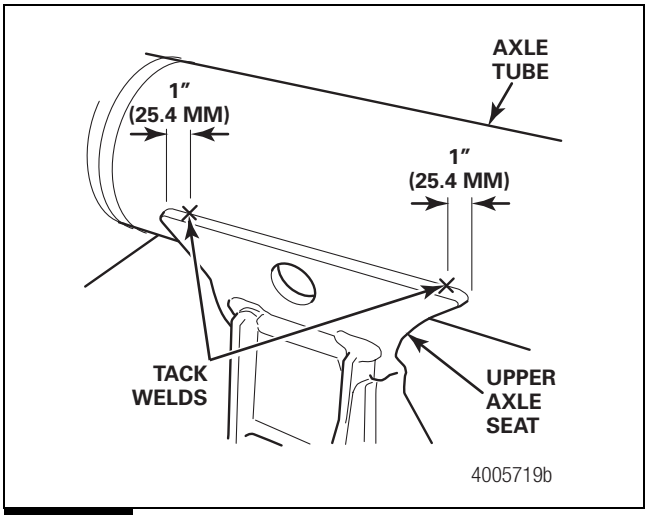

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Figure 19

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Weld the Upper Axle Seats onto the Trailer Axle

⚠ WARNING

You must follow correct welding procedures and weld at locations authorized by Meritor when you weld to suspension components. Welding at locations other than those authorized by Meritor will void the warranty and can reduce trailer axle fatigue life. Serious personal injury and damage to components can result.

Do not weld onto the upper control arm as this can reduce the fatigue life of the control arm. Serious personal injury and damage to components can result.

Wear safe clothing and eye protection when you use welding equipment. Follow instructions provided by welding equipment manufacturers to prevent serious personal injury and damage to components.

1. Wear appropriate clothing and eye protection when using welding equipment.
2. Use 0.035 E70 wire and 75/25 gas to weld the axle seats.
3. Apply the weld in one continuous pass. Start the first weld pass one-inch (25.4 mm) from the edge. Weld to the outside edge, cross back and continue to the opposite edge, then cross back again and end one-inch (25.4 mm) from the edge. Only one pass is needed for a 1/2-inch (12.7 mm) weld. Figure 20.

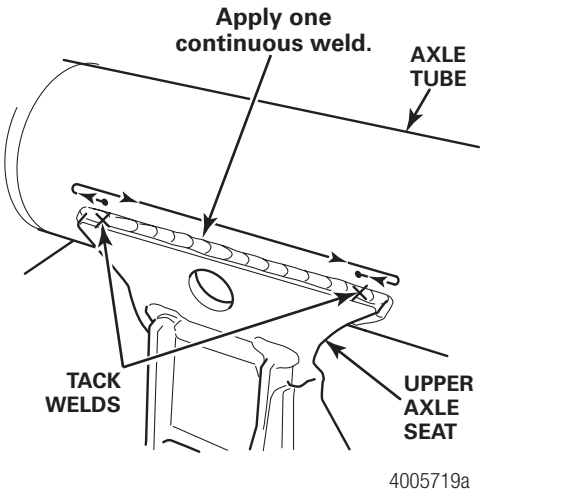

Figure 20

4. Complete the welding for one axle seat, front and back. Then, weld the other axle seat, front and back. Figure 21.

Figure 21

Install the New Lower Axle Seats

1. Assemble a pair of X and Y parts onto a bushing inner metal spacer. The bosses should be on the outside. Assembling the seats before welding will help ensure they are installed with the correct width. Figure 22.

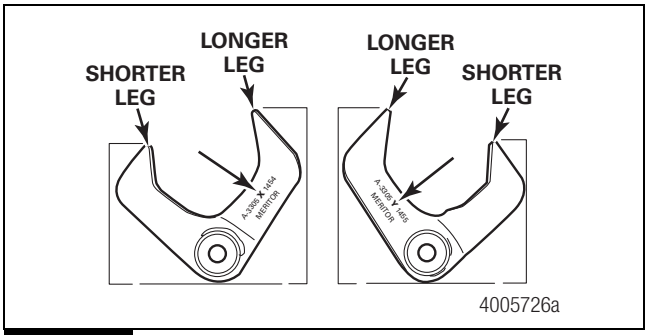

Figure 22

2. Place the lower axle seats into position. Verify the shorter legs face towards the upper control arm. Figure 22 and Figure 23.

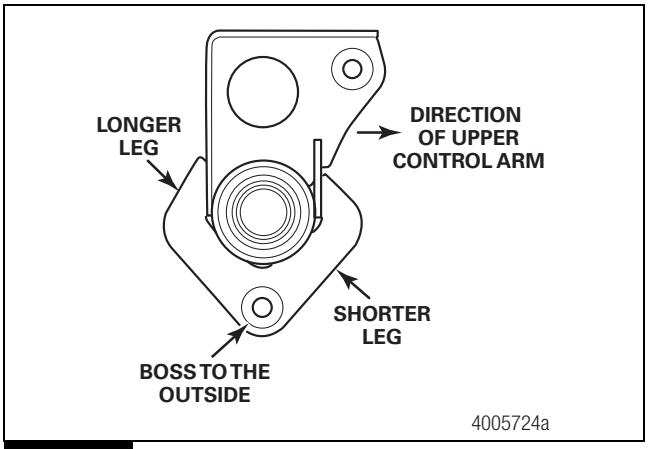

Figure 23

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3. Use a straightedge to align the lower axle seats with the upper axle seats. Verify that the bolt holes are as close to the center of the axle as possible. Figure 24 and Figure 25.

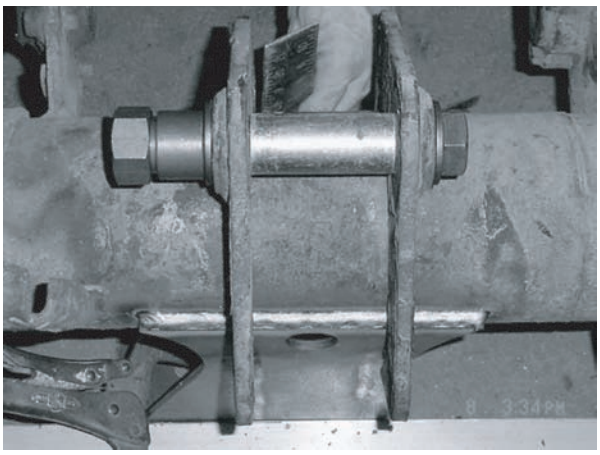

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Figure 24

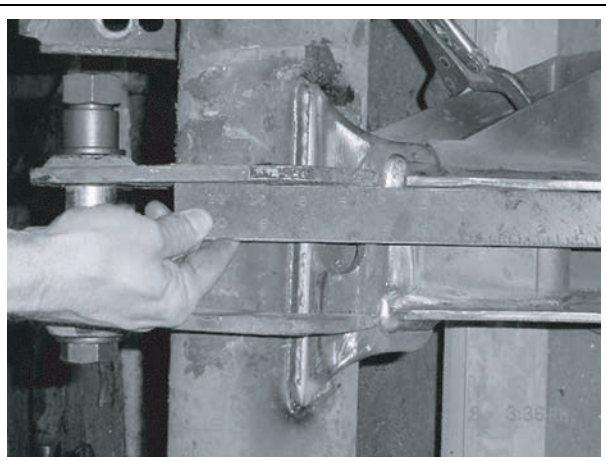

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Figure 25

4. Tack weld each side of the lower axle seats. Verify that the lower axle seats measure 41-7/8-inches (1064 mm) from inside flange-to-inside flange. Figure 26.
5. Weld the lower axle seats onto the upper axle seats. When the weld has cooled, remove the bolts and inner metal sleeves. Figure 26.

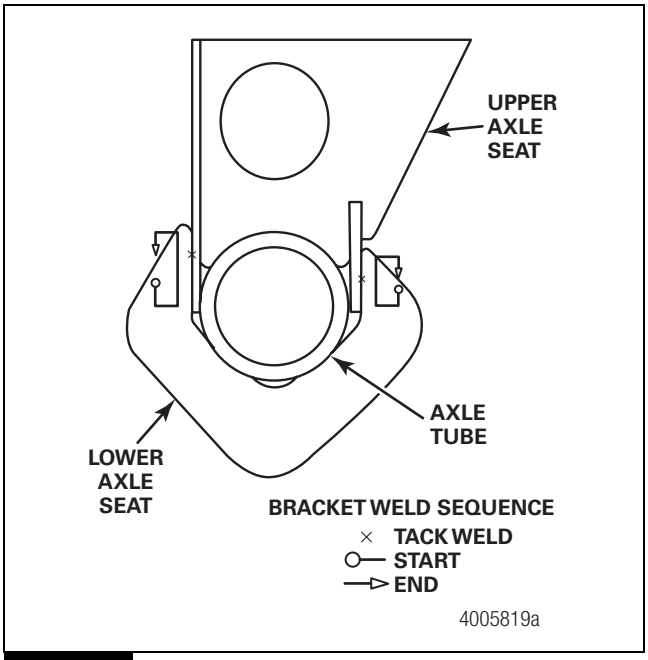

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Figure 26

Reinstall the Trailer Axle Assembly

1. Flip the axle over and move it into position under the trailer.
2. Install the upper axle seats into the upper control arm. Install the new bolts and nuts but do not tighten. Verify the bolts are installed in the same orientation as those removed. Bolts installed with an incorrect orientation can cause interference with brake components.
3. Install the lower control arms into the lower axle seats. Install the nuts and bolts but do not tighten. If using new hardware, verify the bolts are the same type as the original. Ensure the bolts are installed with the same orientation as those removed.
4. Reinstall the air springs, shock absorbers and brake chambers reusing existing hardware.
5. Set the axle to the correct ride height and tighten all of the nuts. Refer to the appropriate maintenance manual or the tag on the trailer for the correct torque specifications. If you install shear nuts on the non-alignment pivot bolts, apply a tack weld on the threads after shearing the nut off to ensure no back-off occurs.
6. Reassemble the brake shoes, drums and wheels.

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