About This Manual
This manual provides the correct lubrication, service and installation procedures for the Meritor RideStar™ RHP Series sliding tandem trailer air suspension system.

Before You Begin
1. Read and understand all instructions and procedures before you begin to service components.
2. 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.
3. Follow your company’s maintenance and service, installation, and diagnostics guidelines.
4. Use special tools when required to help avoid serious personal injury and damage to components.

Hazard Alert Messages and Torque Symbols

⚠️ WARNING
A Warning alerts you to an instruction or procedure that you must follow exactly to avoid serious personal injury and damage to components.

⚠️ CAUTION
A Caution alerts you to an instruction or procedure that you must follow exactly to avoid damage to components.

⚠️ This symbol alerts you to tighten fasteners to a specified torque value.

How to Obtain Additional Maintenance and Service Information

On the Web
Visit Literature on Demand at meritorhvs.com to access product, service, aftermarket, and warranty literature for ArvinMeritor’s truck, trailer and specialty vehicle components.

ArvinMeritor’s Customer Service Center
Call ArvinMeritor’s Customer Service Center at 800-535-5560.

Technical Electronic Library DVD
The DriveTrain Plus™ by ArvinMeritor Technical Electronic Library DVD contains product and service information for most Meritor and Meritor WABCO products. Specify TP-9853.

How to Obtain Tools and Supplies Specified in This Manual
Call ArvinMeritor’s Commercial Vehicle Aftermarket at 888-725-9355 to obtain Meritor tools and supplies.

How to Obtain Labels
Call ArvinMeritor’s Commercial Vehicle Aftermarket at 800-535-5560 to obtain Meritor’s labels.

How to Obtain Kits
Call ArvinMeritor’s Commercial Vehicle Aftermarket at 888-725-9355.
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## RideStar™ RHP Series Sliding Tandem Trailer Air Suspension System

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*Meritor Maintenance Manual 14S (Revised 05-14)*
Description

The Meritor RideStar™ RHP Series sliding tandem trailer air suspension system centers around a stabilized parallelogram design that incorporates a single unified frame bracket. The upper and lower control arms are parallel to each other. The air springs mount directly over the axle. Figure 2.1.
Ride height and mounting height are important measurements for overall vehicle height. Measure ride height from the centerline of the axle to the bottom of the slider frame. Measure mounting height from the centerline of the axle to the bottom of the trailer frame. Figure 2.2.

Refer to the trailer manufacturer’s specifications for the correct ride height. Note that the nominal ride height, also referred to as the design height, refers to the designed ride height and may not be the same as the actual ride height. To determine the nominal ride height, measure the distance from the top of the axle to the top of the axle seat. Add 10-inches (25 cm) to this measurement to determine the nominal ride height. Figure 2.3.
Components

- Frame brackets and slider assembly
- Upper and lower control arms
- Axle assemblies
- Air springs
- Shock absorbers

Features

- A compact 37,600 lb (17 055 kg) capacity tandem trailer air suspension and slider system designed for sliding tandems.
- A nominal ride height of 16.5-18.5-inches (41.9-47.0 cm) with eight-inches (20.3 cm) of total travel, three-inches (7.6 cm) jounce and five-inches (12.7 cm) of rebound.
- A mounting height of 24.5-26.5-inches (62.2-67.3 cm).
- An air system option is available when transporting the trailer by rail car.

Identification

The identification tag is located on the roadside of the suspension near the pin release handle. Figure 2.4.

The model number on the identification tag provides suspension and axle information. Figure 2.5.

![Figure 2.4](image)

![Figure 2.5](image)
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.

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

Check fastener torque values, tighten loose fasteners and replace damaged fasteners. Loose, damaged or missing fasteners can cause loss of vehicle control, serious personal injury and damage to components.

Inspection

Inspect the suspension, air suspension components, height control valve and axle at regular intervals during normal operation and each time the trailer is serviced.

- Before each trip, visually inspect the system. Listen for air leaks.

After 1,000 Miles (1600 km) and Annually Thereafter

1. Visually inspect all nuts and bolts for looseness or movement. Figure 3.1. Tighten loose fasteners to the correct torque specified in Section 8. Thereafter, inspect the suspension each time the trailer is serviced.

2. Check for looseness of the alignment pivot bolts. If the bolts are loose, realign the axles as described in Section 4 prior to retightening the bolts.

3. Replace damaged fasteners to maintain the correct torque specifications and to comply with warranty requirements. Refer to Section 8.
Figure 3.1

**BOLT KITS**

1. Upper Control Arm, Axle End
2. Upper Control Arm, Frame Bracket End — Roadside
3. Upper Control Arm, Frame Bracket End — Curbside
4. Lower Control Arm — Fixed, Axle End
5. Lower Control Arm — Fixed, Side Plate End
6. Lower Control Arm — Adjustable, Axle End
7. Lower Control Arm — Adjustable, Side Plate End
8. Lower Control Arm — Adjustable, Clamp Bolt
9. Upper Air Spring Nut, 3/4-16 NF
10. Upper Air Spring Nut, 1/2-13 NC
11. Lower Air Spring Nut
12. Shock Absorber — Upper and Lower
13. Height Control Linkage — Upper and Lower
14. Height Control Valve Mounting Bolt
15. Slider Hold Down Clip

*CURBSIDE SIMILAR*
Maintenance

Slider

1. Inspect for loose, broken or missing fasteners. Repair or replace as needed. Refer to Section 8 for the correct torque specifications.

2. Check the slider locking pins, slider pull-bar mechanism and slider wear pads for signs of excessive wear or binding. Figure 3.2. Repair or replace as needed.

3. Inspect the structure of the slider box and crossmembers for damage. Repair as needed.

4. Inspect the front and rear hold down clips to ensure that they are secured correctly around the body rails.
### Trailer Air Suspension

1. Inspect for loose, broken or missing fasteners. Repair or replace as needed. Refer to Section 8 for the correct torque specifications.

2. Inspect the welds for cracks at the axle, frame bracket and upper control arm crosstube.

3. Inspect the bushings for ragged or loose pieces that can protrude from the connection area. Use a two-foot (61 cm) pry bar to check for looseness or free play.
   - If looseness or free play exceeds 0.062-inch (1.6 mm) vertical play: Contact the ArvinMeritor Customer Service Center at 800-535-5560.

4. Inspect the flex member of the air springs for cuts and abrasions. Replace the air spring if it is cut or damaged.

5. Check for obstructions or interference to the air spring surface that can damage the air spring. Relocate and secure items, such as air hoses, that can contact the air spring.

6. Check for leaks in the air lines at the air spring bead plate, piston and mounting studs. Replace air lines, fittings or air springs that leak. Refer to Section 4.

7. Inspect the shock absorbers for worn bushings, oil leaks and dents. Check that the mounting holes have not enlarged.

8. After normal operation, check the shock absorbers for heat.
   - Warm shock absorbers most likely indicate that the shock absorbers are operating correctly.
   - Cold shock absorbers can indicate that the shock absorbers are not operating correctly and must be replaced. Replace the shock absorbers as necessary.

9. Inspect the structure of the suspension. Figure 3.3. Inspect the following items.
   - Upper axle seats
   - Upper control arms
   - Lower axle seats
   - Lower control arms
   - Axle welds
   - Brake interference, cam or chamber
   - Frame brackets
   - Shock absorber brackets

### Inspection

#### Height Control Valve

There are three basic configurations for plumbing the height control valve (HCV) into the air suspension system.

- No-dump
- Auto-dump
- Manual-dump/auto-reset

The no-dump configuration is standard equipment. In the no-dump configuration, the valve maintains air pressure and enables the trailer to maintain ride height during loading and unloading, if it is attached to an air supply. Meritor provides conversion kits to change from one HCV configuration to another. Each of the HCV configurations and conversion kits are described in detail in the axle alignment procedures. Refer to Section 4.
**WARNING**

The no-dump configuration uses a vent tube that extends below the height control valve to vent the valve to the atmosphere. Do not plug this pilot port with a pipe plug. The vent tube must extend below the HCV to prevent contaminants from entering the valve and affecting its operation. Serious personal injury and damage to components can result.

The auto-dump height control valve has a protective tie wrap that must be removed before you put the valve into service. Serious personal injury and damage to components can result.

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 vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

1. Park the unloaded vehicle on a level surface. Block the wheels to prevent the vehicle from moving.

2. Disconnect the height control linkage. Figure 3.4 and Figure 3.5.

Figure 3.4

![Figure 3.4](image)

**WARNING**
Verify that all personnel 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.

3. Check the air supply to the height control valve. A minimum of 65 psi (448 kPa) is required to correctly test the height control valve.

4. Rotate the lever UP 30 to 45 degrees. Air should begin to flow into the air springs within six seconds.

5. Rotate the lever to the neutral position. Airflow should stop.

6. Rotate the lever DOWN 30 to 45 degrees. Air should begin to flow out of the air springs within six seconds.

7. Rotate the lever to the neutral position. Airflow should stop.

   • If the air does not flow to and from the air springs: Drain the air from the system. Use compressed air to clean the screens in the supply and delivery ports.

8. Connect the air lines to the height control valve and repeat the above steps.

   • If air still does not flow to and from the air springs, or if the airflow cannot be stopped in the neutral position: Replace the height control valve.

9. Inspect the height control valve for air leaks and a cracked lever arm housing.

   • If air leaks or cracks are detected: Replace the height control valve.
Axle Inspection and Maintenance

For correct inspection and maintenance procedures and intervals, refer to Maintenance Manual 14, Trailer Axles. To obtain this publication, refer to the Service Notes page on the front inside cover of this manual.

Lubrication

The RideStar™ RHP Series slider box or suspension does not require lubrication. For lubrication and maintenance requirements for axles, hubs and brakes, refer to Maintenance Manual 14, Trailer Axles; and Maintenance Manual 1, Preventive Maintenance and Lubrication. To obtain these publications, refer to the Service Notes page on the front inside cover of this manual.
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.

⚠️ WARNING

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

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 vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

Verify that all personnel 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.

Removal and Installation

Height Control Valve (HCV)

1. Park the unloaded vehicle on a level surface. Block the wheels to prevent the vehicle from moving.
2. Drain all the air from the surge tank and air springs.
3. Remove the air supply and delivery lines from the height control valve.
4. Disconnect the linkage. Replace bent or damaged linkage.
5. Remove the height control valve from the bracket. Figure 4.1.
6. Install the new HCV onto the mounting bracket. Tighten the mounting bolts to 5 lb-ft (7 N·m).
7. On a Hadley 500 Series HCV, remove the locating pin at the lever arm of the height control valve.
8. Connect the linkage. Tighten the upper and lower linkage bolts to 5 lb-ft (7 N·m).

⚠️ CAUTION

The Hadley 1500 HCV is equipped with 3/8-inch (9.525 mm) push-to-connect fittings. Do not use sealant on push-to-connect fittings. Damage to components can result.

9. Attach the air supply and delivery lines. On the 500 Series HCV, apply a sealant tape or an equivalent product to the connections to ensure they will not leak during operation. Avoid sharp bends in the air lines. Do not use sealant on the 1500 Series HCV.
10. Charge the air system.
11. Use a soapy spray solution to check the entire system for air leaks.
12. Verify the ride height setting. Refer to the procedures in this section.
HCV Installation Options

In 2005 the Meritor RideStar™ RHP Series trailer air suspension system converted to a Hadley 1500 Series HCV. The suspension may be equipped with one of the following HCV configurations.

- With a 500 Series auto-dump configuration or a 500 Series no-dump configuration. Figure 4.2 and Figure 4.4.
- With a 1500 Series auto-dump configuration or a 1500 Series no-dump configuration. Figure 4.3 and Figure 4.5.

Adjustment

Verify Ride Height

1. Refer to the trailer manufacturer’s specifications for the correct ride height.
2. Unload the vehicle before you adjust the height control valve. Support the trailer king pin at the normal operating height.
3. Verify the correct ride height by measuring the ride height from the axle centerline to the bottom of the slider frame.
   - If the measured ride height does not meet the trailer manufacturer’s specifications: Continue to the next step.
   - If the measured ride height does meet the trailer manufacturer’s specifications: Go to Step 12.
4. Disconnect the height control valve linkage from the lever arm. Inflate or deflate the air springs by raising or lowering the height control lever arm 30 to 45 degrees. Hold the lever arm in the UP position for at least 15 seconds or until the air bags are correctly inflated. Figure 4.6 and Figure 4.7.

5. Check the ride height. Figure 4.8. Repeat the previous step until the measured ride height matches the trailer manufacturer’s specified ride height.

6. On a Hadley 500 Series HCV, insert the locating pin or a 1/8-inch (3.175 mm) drill bit at the lever arm of the height control valve.

7. Loosen the 0.25-inch adjusting screw located on the lever arm body. Allow the lever arm to swing free.

8. Align the end of the lever arm to the top opening of the linkage. Loosely insert the upper linkage bolt.

9. Tighten the 0.25-inch adjusting screw.

10. On Hadley 500 models, remove the locating pin or drill bit.

11. Connect the upper linkage bolt. Tighten the bolt to 5 lb-ft (7 N·m).

12. Verify that the overall trailer height does not exceed the local legal limit.
   - If the ride height is not within the specification: Repeat the ride height adjustment procedure until the ride height is correct.

Maintain the Correct Ride Height When You Change an HCV

You must maintain the correct ride height when you change an HCV. Refer to the trailer manufacturer’s specifications for the correct ride height.
Removal and Installation

Air Spring

NOTE: The suspension may be equipped with an air system option for transporting the trailer by rail car. This option is referred to as “trailer on flat car” (TOFC) and uses double-convoluted air springs with TOFC spacers as shown in Figure 4.9.

Figure 4.9

Figure 4.10 shows the standard air spring used on the suspension.

Figure 4.10

1. Identify the specific air spring that is damaged or leaking air.
2. Park the trailer on a level surface. Block the tires to prevent the trailer from moving.
3. Use an appropriate lifting device to raise the trailer to extend the air springs, but not enough to raise the tires off the ground. Support the trailer with safety stands.
4. Verify that all the air has been exhausted from the air system.
5. Remove the air inlet line and fitting from the damaged air spring. Figure 4.11.
6. Remove the nuts from the studs that secure the top of the air spring.
7. Remove the nut from the bottom of the air spring. You can reach the nut from inside the front or rear of the upper axle seat.
8. Compress the air spring. Remove the spring from the suspension.
9. Compress the new air spring. Slide the spring into the space between the axle seat and slider frame.
10. Align the air inlet and mounting stud. Insert them into the holes in the slider frame.
11. Install the lower nut. Tighten the lower nut to 30-35 lb-ft (41-47 N·m).
12. Install the nuts on the top mounting studs. Tighten the 1/2-13 UNC nut to 20-25 lb-ft (30-35 N·m). Tighten the 3/4-16 UNF nut to 45-50 lb-ft (60-70 N·m).
13. Install the fitting and inlet air line to the top of the air spring. Apply a sealant tape.
14. Seat the valve at the bottom of the air tank. Pressurize the air system.
15. Check that items such as tires, air lines or suspension components do not interfere with the air spring flex members.
16. Use a soap solution to check the entire system for air leaks.
17. Raise the trailer. Remove the safety stands.
18. Verify that the ride height of the trailer is correct.
   - If the ride height is incorrect: Adjust the height control lever arm to obtain the correct ride height. Refer to the trailer manufacturer’s specifications for the correct ride height.
Component Removal, Installation and Adjustment

Upper Control Arm

⚠️ CAUTION
Use a two-foot (61 cm) pry bar to check the pivot bushings for looseness and wear. Verify that pivot bushing free play does not exceed 0.062-inch (1.575 mm), which can cause the bushings to wear excessively. Damage to components can result. If pivot bushing free play exceeds 0.062-inch (1.575 mm), contact ArvinMeritor's Customer Service Center at 800-535-5560 for assistance.

1. Lower the landing gear. Use an appropriate lifting device to raise the trailer frame so that the tires are off the ground. Support the trailer with safety stands. Set the parking brake.

2. Exhaust the air pressure from the suspension air springs. Remove the wheels from the axle where you are removing the bushings to access the pivot bolts.

- If there is corrosion between the pivot bolts and the inner sleeves: Use an impact wrench to spin the pivot bolt heads at all four connections to disengage the bolts from the corrosion to the inner sleeves.

3. Remove only the lock nut at the frame bracket on the roadside and curbside at the upper pivot connections.
   - If the nut is tamper-proof: Remove the nut by grinding off the tack weld between the nut and the bolt thread. Use a pipe wrench to grip the nut while using an impact wrench on the bolt head.

4. Record the pivot bolt orientation. Remove the pivot bolts from the frame brackets. Slide the upper control arm out of the frame brackets to provide access to the bushings and inner sleeves, if equipped.

5. Remove the bushings and inner sleeves, if equipped. Remove any burrs and clean the inside diameter of the upper control arm ends. Figure 4.12 and Figure 4.13.
6. Visually inspect the upper control arm bushing tubes, frame brackets and axle seats.

   A. You must measure the bore diameter and bushing tube length of all four upper control arm bushing tubes before installing the new bushings. The bore diameter must be 2.240-2.250-inches (56.896-57.150 mm). Figure 4.14. The bushing tube length must be 2.590-inches (65.786 mm) or greater. Figure 4.15.

   • If any of the four upper control arm bushing tubes are not within the specifications: Replace the upper control arm.

   B. Inspect the frame brackets and axle seats for wear from contact with the upper control arm bushing tubes. Wear that is less than 25 percent of the material thickness is acceptable.

   • If the wear is more than 25 percent of the material thickness: Contact the ArvinMeritor Customer Service Center at 800-535-5560.

7. Using light mineral oil, Meritor specification O-92-B, lightly lubricate the inside diameter of the upper control arm bushing tubes. Figure 4.16.
8. The bushing tool part number A-3256-H-1152 consists of the following components: Figure 4.17.
   - Draw plate
   - Draw bolt
   - Two flat washers
   - Draw nut


10. Place the draw plate onto the inside surface of the upper control arm bushing tube. Figure 4.18.
    A. Insert the draw bolt with a flat washer, through the draw plate and bushing tube.
    B. Place the bushing over the draw bolt and into the upper control arm bushing tube.
    C. Thread the draw nut and flat washer onto the draw bolt until it sets against the bushing.

11. Snug the draw bolt while ensuring that the bonded bushing and draw plate rest securely on the upper control arm bushing tube.

12. While holding the draw nut with a wrench, turn the draw bolt CLOCKWISE using a maximum one-half-inch impact at a reduced and steady speed. Draw the bonded bushing into the upper control arm bushing tube.

13. If the bolt stops turning or extreme resistance is present, reverse the impact and loosen the tool assembly. Inspect all components of the tool for damage. Reset the draw plate ensuring that the bonded bushing is correctly seated against the upper control arm bushing tube. Verify lubrication on the bushing and control arm tube and repeat the above procedure.

14. Continue rotating the draw bolt until the bolt stops turning and the bushing is fully inserted. Thread damage to the draw bolt or draw nut can occur if over tightened.

15. Ensure that the bonded bushing is centered in the upper control arm bushing tube from side-to-side. Install the thrust washers onto the bonded bushings. Figure 4.19.
16. Position the upper control arm into the frame brackets. Ensure that the thrust washers attached to the bonded bushing remain in position. Using the recorded pivot bolt orientation, insert a new pivot bolt, flat washers, alignment washers and nut on the roadside. Insert a new pivot bolt, flat washers and nut on the curbside. Figure 4.20.

17. Loosely install the roadside and curbside nuts. Do not completely tighten at this time.

18. Remove only the lock nuts at the upper axle seat on the roadside and curbside upper pivot connections.

- **If the nut is tamper-proof**: Remove the nut by grinding off the tack weld between the nut and the bolt thread. Use a pipe wrench to grip the nut while using an impact wrench on the bolt head.

19. Remove the pivot bolts from the upper axle seats. Record the pivot bolt orientation. Slide the upper control arm out of the upper axle seats to provide access to the bushings and inner sleeves, if equipped.

20. Remove the bushings and inner sleeves, if equipped. Remove any burrs and clean the inside diameter of the upper control arm ends. Figure 4.12 and Figure 4.13.

21. Repeat Steps 7-15 to install the bonded bushing.

22. Position the upper control arm into the upper axle seats. Ensure that the thrust washers attached to the bonded bushing remain in position. Using the recorded pivot bolt orientation, insert a new pivot bolt, flat washers and nut on the roadside and curbside.

23. Loosely install the axle seat nuts. Do not completely tighten at this time.

24. Determine the correct suspension ride height. Refer to the trailer manufacturer’s specifications. The upper control arm must be at the correct ride height before applying the required torque to all upper pivot bolts. Figure 4.21.
25. Install the shear nut (Meritor part number M301551) and hand-tighten it to the pivot bolt. Figure 4.22.

26. Apply enough constant torque to shear off the outer hex portion of the shear nut from the pipe section of the nut.

**CAUTION**
Apply sufficient tack weld between the pipe section of the shear nut and the pivot bolt threads to prevent the nuts from loosening during operation, which can result in damage to components.

27. Apply sufficient tack weld between the pipe section of the shear nut and the pivot bolt threads. Figure 4.23.

28. Reinstall the wheels and tires. Remove the safety stands at the rear of the trailer. Slowly lower the trailer back down onto the suspension.

29. Check the suspension ride height to verify it is correct. If adjustment is necessary, refer to the ride height adjustment procedures in this section.

30. Axle realignment is required. Refer to the axle alignment procedures in this section.

31. Refer to Section 8 for torque specifications.

**Lower Control Arm**

1. Park the trailer on a level surface.

2. Lower the landing gear. Use an appropriate lifting device to raise the rear of the trailer frame so that the tires are off the ground. Support the trailer with safety stands.

3. Exhaust the air pressure from the suspension air springs. Remove the wheels from the axle to access the pivot bolts.
   - If there is corrosion between the pivot bolts and inner sleeves: Use an impact wrench to spin the pivot bolt heads at all four connections to disengage the bolts from corrosion to the inner sleeves.

4. Remove the torque nut from the frame bracket and lower axle seat.
   - If the nut is tamper-proof: Remove the nut by grinding off the tack weld between the nut and the bolt thread. Use a pipe wrench to remove the nut.

5. Remove the pivot bolts. Remove the lower control arm.

6. Remove the bushings and inner sleeves. Remove any burrs and clean the inside diameter of the lower control arm ends.

7. Insert new bushings into the lower control arm ends. Insert the inner sleeve through the bushings. Use light mineral oil, Meritor specification O-92-B, for lubrication. Center the inner sleeve in the lower control arm ends.

8. Position the lower control arm into the frame bracket and lower axle seat. Insert a new bolt, flat washers and nut at both pivot connections.

9. Tighten the nuts to 540-560 lb·ft (730-760 N·m).

**Axle Alignment**

**Before You Align the Axle**

1. Park the trailer on a level surface.

2. Adjust the trailer landing gear so that the height of the king pin is the same as when the trailer is connected to the tractor.

3. Release the parking brakes. Block the wheels of the axle that is not being aligned to keep the locking pins tight against the same side of the body rail holes, front or rear.
Front Axle

1. Verify that the suspension is at the correct ride height. Refer to the trailer manufacturer’s specifications. Figure 4.24.

   ![Figure 4.24](image)

2. Measure from the king pin to each end of the first axle, measurements A and B. To obtain the correct alignment, the difference between measurements A and B must not exceed 1/8-inch (3.175 mm). Figure 4.25.
   - If adjustment is required: Proceed to Step 3.
   - If adjustment is not required: Proceed to Section 4.

3. Loosen the bolt that connects the upper control arm to the frame bracket located on the same side of the suspension as the adjustable lower control arms. Loosen the lower control arm clamp bolts. You must loosen this connection before you align the axle to prevent premature bushing and component damage.

4. Align the axle so that the difference between measurements A and B does not exceed 1/8-inch (3.175 mm). Figure 4.25.

5. Adjust the length of the adjustable lower control arm as required.

6. Check the axle alignment from the king pin.
   - If adjustment is required: Repeat Steps 3 and 4 until the alignment is correct.
   - If adjustment is not required: Proceed to Section 4.

7. When the axle is aligned correctly, tighten the lower control arm clamp bolts to 160-170 lb-ft (217-231 N·m).

8. Tighten the upper control arm pivot bolt to 590-610 lb-ft (800-830 N·m).

Rear Axle

1. Check the dimension from the centerline of the front axle to the centerline of the rear axle, measurements C and D.

2. To obtain the correct alignment, the difference between measurements C and D must not exceed 1/16-inch (1.588 mm). Figure 4.25.
   - If adjustment is required: Proceed to Step 3.
   - If adjustment is not required: Proceed to Step 7.

3. Loosen the bolt that connects the upper control arm to the frame bracket located on the same side of the suspension as the adjustable lower control arms. Loosen the lower control arm clamp bolts. You must loosen this connection before you align the axle to prevent premature bushing and component damage.

4. Align the axle so that the difference between measurements C and D does not exceed 1/16-inch (1.588 mm). Figure 4.25.

5. Adjust the length of the adjustable lower control arm as required.

6. Check the axle alignment.
   - If adjustment is required: Repeat Steps 3 and 4 until the alignment is correct.
   - If adjustment is not required: Proceed to Step 7.

7. When the axle is aligned correctly, tighten the lower control arm clamp bolts to 160-170 lb-ft (217-231 N·m).

8. Tighten the upper control arm pivot bolt to 590-610 lb-ft (800-830 N·m).
Auto-Dump Configuration
The auto-dump configuration prevents the RideStar™ RHP Series sliding tandem trailer air suspension from moving the trailer floor up and down as much as three-inches (76 mm). This is a usual occurrence with any soft, low spring-rate suspension. However, without the auto-dump configuration, the RideStar™ RHP Series suspension design would still prevent dock walk.

Trailer applications may require automatic dump of the suspension when the glad hands are disconnected from the trailer. The suspension may be equipped with either the 500 Series HCV (Figure 4.2) or the 1500 Series HCV (Figure 4.3).

The HCV’s automatic exhaust and fill operation ensures that the suspension air pressure is correct. The valve automatically exhausts air from the air springs and lowers the suspension to the bump stops each time you engage the trailer’s parking brake. The HCV refills the suspension when you release the parking brake.

The HCV air plumbing allows the HCV to dump the air suspension when the pilot air is lost to the Auto-Dump valve pilot port. Refer to Figure 4.26 for the 500 Series and Figure 4.3 for the 1500 Series.

To Auto-Dump from No-Dump (Kit M306531)
500 Series HCV Only
This kit provides the auto-dump valve and associated fitting to convert the HCV as shown in Figure 4.27 to that shown in Figure 4.26.

1. Remove and discard the vent tube.
2. Connect the auto-dump valve delivery port into the HCV pilot port.
3. Connect a supply line to the auto-dump valve supply port.
4. Connect a pilot line from the spring brake valve to the auto-dump valve pilot port.

1500 Series HCV Only
Replace the no-dump HCV (Figure 4.5) with the auto-dump HCV (Figure 4.3).

No-Dump Configuration
The no-dump configuration enables the trailer to maintain ride height during loading and unloading if it is attached to an air supply. The suspension may be equipped with either the 500 Series HCV (Figure 4.4) or the 1500 Series HCV (Figure 4.5).

Some applications do not require the suspension to dump air from the air springs. Figure 4.27 shows the plumbing for the 500 Series no-dump configuration. Figure 4.3 shows the plumbing for the 1500 Series no-dump configuration.
**Component Removal, Installation and Adjustment**

**WARNING**

You must use a vent tube that extends below the height control valve (HCV) to vent the valve to the atmosphere. Do not plug a pilot port with a pipe plug. If you do not install a vent tube as instructed, contaminants can enter the valve and affect its operation. Incorrect trailer height adjustment can result. A trailer operated with a ride height that's too high can strike an overhead object. Serious personal injury and damage to components can result.

1. You must vent the HCV pilot port to the atmosphere. Use a vent tube approximately 10-inches (254 mm) long with a 0.25-inch (6 mm) maximum outside diameter. The vent tube must extend below the HCV. All tubing must be SAE J844 Type B.

2. Install the air lines only as shown in the plumbing arrangement in Figure 4.27.

3. You must vent the pilot port as shown in Figure 4.27. Do not plug a pilot port with a pipe plug.

**To No-Dump from Auto-Dump (Kit M306532)**

**500 Series HCV Only**

This kit provides the fittings and vent tube to convert the HCV as shown in Figure 4.26 to that shown in Figure 4.27.

1. Remove and discard the auto-dump valve.

2. Block the supply and pilot lines that were connected to the auto-dump valve.

3. Install the vent tube to the HCV pilot port.

**1500 Series HCV Only**

Replace the auto-dump HCV (Figure 4.3) with the no-dump HCV (Figure 4.5).

**Manual-Dump/Auto-Reset Configuration**

**500 Series HCV Only**

The RideStar™ RHP Series suspension is not equipped with a manual-dump/auto-reset valve. Use conversion Kit M306537 to install a manual-dump valve.

The manual-dump/auto-reset configuration uses the auto-dump valve 500 Series HCV along with a manual dump/auto-reset valve, part number 7806A1030. Figure 4.28. You can manually control system dumps or suspension air fills only when connected to an air supply with the trailer parking brakes applied.

The HCV dumps the air suspension when the pilot air is removed from the pilot port on the HCV. Pilot air is controlled by a manual-dump/auto-reset valve. When the trailer parking brakes are released, the valve automatically resets allowing the HCV to refill the air springs. Figure 4.28.

**WARNING**

You must install manual-dump/auto-reset air lines exactly as shown in the above graphic. Any other plumbing arrangement will affect the manual-dump/auto-reset valve's operation and result in an incorrect trailer height. A trailer operated with a ride height that's too high can strike an overhead object. Serious personal injury and damage to components can result.

1. Install the air lines only as shown in the plumbing arrangement in Figure 4.28. All tubing must be SAE J844 Type B.

2. Install a manual-dump/auto-reset valve at the original equipment manufacturer's specified location. An enclosure kit for the manual-dump valve is not available from Meritor.
To Manual-Dump/Auto-Reset from Auto-Dump (Kit M306537)

This kit provides the manual-dump/auto-reset valve and associated fittings to convert the HCV as shown in Figure 4.26 to that shown in Figure 4.28. Note that the kit does not include an enclosure for the manual-dump valve.

1. Remove and discard the auto-dump valve.
2. Block the supply and pilot lines that were connected to the auto-dump valve.
3. Install the manual-dump/auto-reset valve at the original equipment manufacturer’s specified location.
4. Install the valve only as shown in the plumbing arrangement in Figure 4.28.
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.

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

Check Welding Procedures Before You Weld to Suspension Components

⚠️ WARNING
You must follow correct welding procedures when you weld to any suspension components. Incorrect weld placement will void Meritor's warranty and can reduce the fatigue life of the trailer axle beam. Serious personal injury and damage to components can result.

Axle

Refer to Maintenance Manual 14, Trailer Axles; and Maintenance Manual 8, Drive Axle Housings, for correct welding procedures before you weld to any suspension components. To obtain these publications, refer to the Service Notes page on the front inside cover of this manual.

Suspension

⚠️ WARNING
Do not weld on the upper control arm. Welding on the upper control arm can reduce the fatigue life of the control arm. Serious personal injury and damage to components can result.

All materials except the upper control arm can be welded with a low hydrogen rod or wire, such as AWA 7018 or AWA E71T-1.

Slider

⚠️ WARNING
Do not weld within 0.5-inch (12.7 mm) of the slider edges. Incorrect welding can reduce slider fatigue life. Serious personal injury and damage to components can result.

Do not weld within 0.5-inch (12.7 mm) of the slider edges. If a crack is found at the edge of the material, add an extension tab. Weld across the crack onto the tab. Then remove the tab, grind and sand smooth.
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.

⚠️ WARNING

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

Check Body Rail Specifications

Check the following dimensions on the trailer to ensure that the Meritor RideStar™ RHP Series sliding tandem trailer air suspension system correctly fits the trailer.

1. The distance between the trailer body rails must be 0.125-inch (3.2 mm) wider than the slider bearing surface to allow the slider to be placed securely between the body rails.

2. The trailer body rail hole diameter must be 0.188-inch (4.8 mm) larger in diameter than the pin size to allow the slider pins to enter or retract from the body rail.

3. Verify that the measurement from the center line of the holes in the trailer body rail to the slider contact surface of the body rail is the same as the measurement from the center line of the pins on the slider to the top of the wear strip.

4. Verify the following to ensure that the slider locking pins will slide through the body rails on both sides of the trailer.
   • The stationary stop bar at the rear of the trailer must be perpendicular to the body rails.
   • The measurement from the rear of the slider to the center of the locking pins matches the hole spacing in the body rails when the slider is against the rear stationary stop bar.
   • The stop bar notches at the front of the slider align with the holes in the body rails.

Installation

Slider-to-Trailer Retrofit

⚠️ WARNING

Remove all air from the system before you service any air system component. Pressurized air can cause serious personal injury.

1. Release the air from the currently installed suspension and disconnect the air lines.

2. Remove the hold down clips.

3. Pull out the slider pin release lever on the currently installed suspension.

4. Use a lift truck to lift the trailer from the currently installed suspension.

5. Pull the currently installed suspension out from under the trailer.

6. Remove the hold down clips from the suspension.

7. Using the lift truck, position the new suspension, with the tires installed, under the trailer. Figure 6.1.

8. Pull the slider pin release lever out to lock the pins in the retracted position.

9. Lower the trailer onto the new suspension.

10. Check that the suspension fits securely inside of the trailer body rails.

11. Pull and release the slider pin release lever.

Figure 6.1

[Image: BODY RAIL SLIDER LOCKING PINS SLIDER PIN RELEASE HANDLE]
12. Install the hold down clips. Figure 6.2. Tighten the clips to 85 lb-ft (115 N·m).

13. Attach the air lines to the suspension. Apply a sealant, such as Teflon® tape, to all fittings. Pressurize the system.

14. If the slider pins do not extend through the rail holes, apply the brakes. Slide the trailer until the pins align with and extend through the rail holes.

15. Align the axles. Refer to Section 4.

16. Attach the slider suspension positioning warning label, part number TP-97125, and the torque specification warning label, part number TP-97126, to the trailer. Figure 6.3. To obtain the labels, contact ArvinMeritor’s Customer Service Center at 800-535-5560.

17. Check the trailer ride height. Adjust as necessary. Refer to Section 4. Verify that the overall trailer height does not exceed the local legal limit.
Slider Repositioning

Operation

⚠️ WARNING
Before you operate a vehicle equipped with a sliding trailer suspension, lock the sliding suspension securely and position it correctly. Loss of vehicle control, serious personal injury and damage to components can result when the sliding suspension is not locked securely and positioned correctly.

The RideStar™ RHP Series sliding tandem trailer air suspension system must be securely locked prior to operation. The suspension is locked when the main body of each lock pin extends through the holes in the rails. Before pulling the trailer, carefully inspect the suspension to ensure that it is correctly positioned and the main body of each lock pin extends through the holes in the rails. Apply the trailer brakes and gently rock the trailer backward and forward to ensure that the suspension is secure.

To Correctly Reposition the Sliding Suspension

1. Set both the tractor and trailer brakes. Remove the locator stop bar, if the option is available, from behind the slider. Move it to the desired location.
2. Release the lock pins by pulling the operating handle all the way OUT. Lock the operating handle into place.
3. Release the tractor brakes. Carefully drive forward or backward until the sliding suspension is at the desired location. Do not exceed 3 mph (5 km/h).
4. Release the operating handle. Check that the suspension is locked securely. The main body of each lock pin must extend through the holes in the rails.
5. Immediately lock the locator stop bar in both body rails located directly behind the slider.
6. With the trailer brakes applied, gently rock the trailer backward and forward to ensure that the sliding suspension is locked correctly. Check that the main body of each lock pin extends through the holes in the rails.
7. Follow Step 6 at each stop before you operate the vehicle and pull the trailer.
Troubleshooting

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

### Table A

<table>
<thead>
<tr>
<th>Condition</th>
<th>Possible Cause</th>
<th>Recommended Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>All of the air springs are flat.</td>
<td>There is insufficient air pressure supplied to the suspension tandem.</td>
<td>Build the air pressure to 65 psi (448 kPa) or more. Check the compressor for correct function. Check all the air lines and fittings leading to the suspension tandem for leaks. Repair or replace as necessary.</td>
</tr>
<tr>
<td></td>
<td>The pressure protection valve is not working correctly.</td>
<td>Check and replace the valve if necessary.</td>
</tr>
<tr>
<td></td>
<td>The height control valve supply or delivery fitting is clogged.</td>
<td>Inspect the height control valve supply and delivery fittings for restrictions and clean as necessary.</td>
</tr>
<tr>
<td></td>
<td>There is an air leak within the suspension tandem due to loose fittings or air lines.</td>
<td>Verify that adequate pressure is being supplied to the suspension tandem. Check all the air lines and fittings on the suspension tandem for leaks. Repair or replace as necessary.</td>
</tr>
<tr>
<td></td>
<td>The suspension is overloaded.</td>
<td>Reduce the load to the suspension rated capacity.</td>
</tr>
<tr>
<td></td>
<td>There is a hole or tear in the air spring.</td>
<td>Check for the correct clearance and determine the cause of the air spring damage. After the cause has been remedied, replace with the correct air spring. Check the shocks for damage.</td>
</tr>
<tr>
<td>The air springs are fully extended but do not exhaust.</td>
<td>The height control valve delivery port or exhaust port is plugged.</td>
<td>Inspect the ports for restrictions. Repair or replace as necessary.</td>
</tr>
<tr>
<td></td>
<td>The height control linkage is broken.</td>
<td>Replace the linkage.</td>
</tr>
<tr>
<td></td>
<td>The height control valve is not adjusted correctly.</td>
<td>Inspect and adjust as necessary.</td>
</tr>
<tr>
<td></td>
<td>The height control linkage is broken.</td>
<td>Replace the linkage.</td>
</tr>
<tr>
<td></td>
<td>The air filters are clogged.</td>
<td>Inspect and clean or replace as necessary.</td>
</tr>
<tr>
<td></td>
<td>There is moisture in the air tank.</td>
<td>Drain the air tank and evacuate the moisture from the air system.</td>
</tr>
<tr>
<td></td>
<td>There are clogged filter screens in the height control valve.</td>
<td>Inspect and clean or replace as necessary.</td>
</tr>
<tr>
<td></td>
<td>There is insufficient air pressure supplied to the suspension tandem.</td>
<td>Build the air pressure to 65 psi (448 kPa) or more. Check the compressor for correct function. Check all the air lines and fittings leading to the suspension tandem for leaks. Repair or replace as necessary.</td>
</tr>
<tr>
<td>The suspension ride height is not maintained during operation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Possible Cause</td>
<td>Recommended Action</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>The main air pressure drops to 65 psi (448 kPa), cannot release the brakes.</td>
<td>There is a hole or tear in the air spring.</td>
<td>Check for the correct clearance and determine the cause of the air spring damage. After the cause has been remedied, replace with the correct air spring. Check the shocks for damage.</td>
</tr>
<tr>
<td></td>
<td>There is insufficient air pressure supplied to the suspension tandem.</td>
<td>Build the air pressure to 65 psi (448 kPa) or more. Check the compressor for correct function. Check all the air lines and fittings leading to the suspension tandem for leaks. Repair or replace as necessary.</td>
</tr>
<tr>
<td></td>
<td>There is an air leak within the suspension tandem due to loose fittings or air lines.</td>
<td>Verify that adequate pressure is being supplied to the suspension tandem. Check all the air lines and fittings leading to the suspension tandem for leaks. Repair or replace as necessary.</td>
</tr>
<tr>
<td>The ride is harsh.</td>
<td>The ride height is incorrect.</td>
<td>Check and adjust the ride height.</td>
</tr>
<tr>
<td></td>
<td>The air springs are flat.</td>
<td>Refer to the recommendations for flat air springs.</td>
</tr>
<tr>
<td></td>
<td>The tire size is incorrect.</td>
<td>Replace the tires with the recommended tire size. Contact the original equipment manufacturer for tire size specifications.</td>
</tr>
<tr>
<td>The tire clearance is incorrect in full jounce.</td>
<td>The trailer axles are out of alignment.</td>
<td>Realign the axles. Refer to Section 4 in this manual.</td>
</tr>
<tr>
<td></td>
<td>The pin linkage, pull rod or pull handle is bent.</td>
<td>Straighten or replace as necessary.</td>
</tr>
<tr>
<td>The trailer is not pulling straight, dog-track.</td>
<td>The manual override pin has not been pulled out.</td>
<td>Pull out the manual override pin.</td>
</tr>
<tr>
<td>The slider lock pins do not fully engage.</td>
<td>The P-3 pin pull air cylinder is not working correctly.</td>
<td>Insert the manual override pin to retract the slider lock pins. Determine the cause of the P-3 pin pull system problem.</td>
</tr>
<tr>
<td>The pin pull handle on the P-3 system will not pull or is very difficult to pull.</td>
<td>The plunger valve is not working correctly.</td>
<td>Insert the manual override pin to retract the slider lock pins. Check the plunger valve for adjustment and correct function. Determine if the plunger valve is supplying the correct pressure when activated.</td>
</tr>
<tr>
<td>The slider lock pins will not retract on the P-3 pin pull system.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Torque Specifications

⚠️ WARNING
Check fastener torque values, tighten loose fasteners and replace damaged fasteners. Loose, damaged or missing fasteners can cause loss of vehicle control, serious personal injury and damage to components.

Check fastener torque values after 1,000 miles (1600 km) and annually thereafter. Retighten loose fasteners. Replace damaged fasteners to maintain correct torque values and comply with warranty requirements.

Table B: Torque Specifications

<table>
<thead>
<tr>
<th>Fasteners</th>
<th>lb-ft</th>
<th>N-m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Control Arm, Axle End</td>
<td>540-560</td>
<td>730-760</td>
</tr>
<tr>
<td>Upper Control Arm, Frame Bracket End — Roadside</td>
<td>590-610</td>
<td>800-830</td>
</tr>
<tr>
<td>Upper Control Arm, Frame Bracket End — Curbside</td>
<td>540-560</td>
<td>730-760</td>
</tr>
<tr>
<td>Lower Control Arm — All Pivot Connections</td>
<td>540-560</td>
<td>730-760</td>
</tr>
<tr>
<td>Lower Control Arm — Adjustable, Clamp Bolt</td>
<td>160-170 Dry</td>
<td>217-231 Dry</td>
</tr>
<tr>
<td>Upper Air Spring Nut, 3/4-16 NF</td>
<td>45-50</td>
<td>60-70</td>
</tr>
<tr>
<td>Upper Air Spring Nut, 1/2-13 NC</td>
<td>20-25</td>
<td>30-35</td>
</tr>
<tr>
<td>Lower Air Spring Nut</td>
<td>30-35</td>
<td>41-47</td>
</tr>
<tr>
<td>Shock Absorber — Upper and Lower</td>
<td>225-275</td>
<td>305-375</td>
</tr>
<tr>
<td>Height Control Linkage — Upper and Lower</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Height Control Valve Mounting Bolt</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Slider Hold Down Clip</td>
<td>85 Dry</td>
<td>115 Dry</td>
</tr>
</tbody>
</table>