

## 32-01

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### Suspension Inspecting

#### Freightliner Spring Front and Rear Suspension Spring Assemblies Inspection

Inspect the front and rear suspension spring assemblies for pitted, cracked, broken, or abnormally bent leaves, and extreme rust. If any of these conditions exist, replace the spring assembly. See **Group 32** of the *Business Class® M2 Workshop Manual* for instructions.

#### **WARNING**

Do not replace individual leaves of a damaged leaf spring assembly; replace the complete spring assembly. Visible damage (cracks or breaks) to one leaf causes hidden damage to other leaves. Replacement of only the visibly damaged part(s) is no assurance that the spring is safe. On front spring assemblies, if cracks or breaks exist in the two top leaves, a loss of vehicle control could occur. Failure to replace a damaged spring assembly could cause an accident resulting in property damage, serious personal injury, or death.

**IMPORTANT:** On multi-leaf suspensions, closely inspect each component of the leaf spring assemblies, including the brackets, U-bolts, and related parts.

#### Freightliner Spring Rear Suspension Spring Brackets and Equalizer Brackets (Tandems) Inspection

Inspect the forward and rear spring brackets, equalizer brackets (tandems), and the wear pads, for wear, cracks, and other damage. If any of these conditions exist, replace the damaged bracket(s) and wear pad(s). See **Group 32** of the *Business Class® M2 Workshop Manual* for instructions.

#### **WARNING**

Failure to replace the forward spring brackets, equalizer brackets, or rear spring brackets if they are worn, cracked, or otherwise damaged could result in progressive damage to and eventual breakage of the bracket. This could cause a loss of vehicle control resulting in property damage, serious personal injury or death.

#### Freightliner Spring Tandem Axle Suspension Crossmember and Gussets Inspection

Inspect the tandem-axle frame crossmember and gussets for wear, cracks, and other damage. If any of these conditions exist, replace the damaged parts. See *Section 31.00, Subject 130*, of the *Business Class® M2 Workshop Manual* for instructions. Check all fasteners for tightness. See Group 00 of this manual for torque values.

## **⚠ CAUTION**

Failure to replace the suspension crossmember or gussets if they are cracked, worn, or otherwise damaged could result in damage to the vehicle chassis.

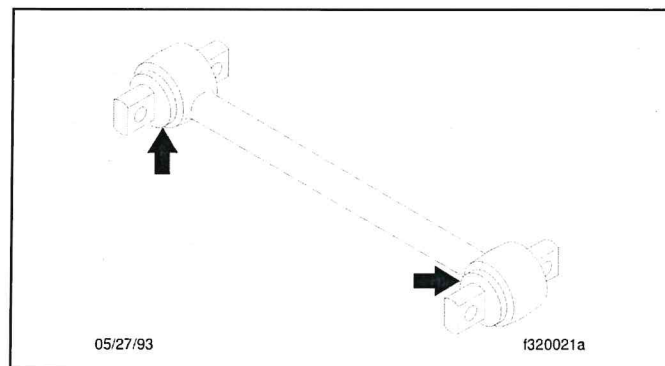
## Freightliner Spring Shock Absorber Check

**NOTE:** Shock absorbers are optional on spring suspensions.

Make sure that the shock absorber brackets are tight and that the shock absorber is not striking or rubbing on the frame or some other part of the chassis. Check the rubber mounting bushings and replace if worn. Inspect the shock absorber for oil leakage, which is defined as being drips of oil on the sides of the shock absorber. If the shock absorber is worn or damaged, replace it with a new one.

## Freightliner 23K, 26K, 30K Spring Single and Tandem Radius Rod Bushing Check

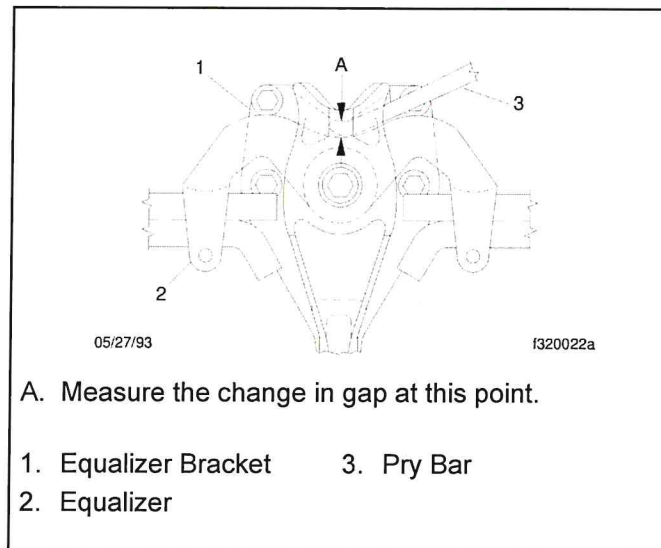
1. Without detaching the torque arms, use your hand to attempt to move each of the radius rod ends up, down, in, and out. If there is any movement, replace the torque arm.
2. Inspect the weld seams between the torque arm tube and the shorter bushing tubes. If there are cracks, replace the torque arm. Do not weld the torque arm for any reason.
3. Inspect the rubber bushing ends. See Fig. 1 . Replace the torque arm for any of the following reasons:
  - There are gaps between the rubber bushing and the pin or the outer steel sleeve.
  - Either bushing end contacts a torque arm pin mounting bolt.
  - There are cracks in the bushing.
  - Part of the rubber bushing extends beyond the outside diameter of the outer bushing sleeve.



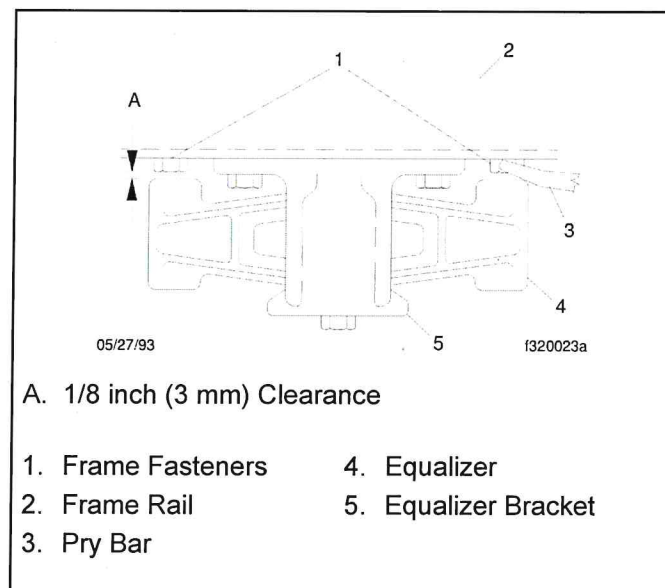
**Fig. 1, Torque Arm Bushings**

## Freightliner Spring Tandem Suspension Equalizer Bushing Check

1. Block the frame up enough to take the weight of the chassis off of the springs. Attempt to move the equalizer up and down, by using a pry bar between the top of the equalizer and the top of the equalizer bracket. Apply hand-pressure only. See Fig. 2 . If movement at the center of the equalizer exceeds 1/8 inch (3 mm), replace the equalizer bushings.



**Fig. 2, Side View of the Equalizer**



**Fig. 3, Top View of the Equalizer**

2. With the vehicle unloaded, attempt to move the equalizer side to side using a pry bar between the equalizer and frame rail. Apply hand-pressure only. See Fig. 3 . If clearance between the equalizer assembly and any frame component or fastener is less than 1/8 inch (3 mm), replace the equalizer bushings.



## 52-Inch Multi-leaf Spring Component Check

No lubrication is required on the 52-inch multi-leaf spring rear suspension.

Inspect the stabilizer bar, if present, for irregular bushing wear or cracks in the brackets. Check the rubber helper spring, if present, for cracks.

## 60-Inch Tapered Leaf Spring Component Check

No lubrication is required on the 60-inch tapered leaf spring rear suspension.

Inspect the rear shackle brackets for bushing wear or cracks.

Inspect the stabilizer bar, if present, for irregular bushing wear or cracks in the brackets. Check the rubber helper spring, if present, for cracks.

## Freightliner AirLiner Component Clearance Check

Check that the air line support brackets are positioned so the air lines do not rub against anything. Reposition any configurations that could contact and result in friction and wear. There must be at least 1 inch (25 mm) clearance around the rubber air spring when inflated. If the clearance is less than 1 inch (25 mm), relocate the obstructing parts.

### CAUTION

Failure to relocate obstructing parts could result in damage to the air spring.

## Freightliner AirLiner Component Inspection and Operation Check

### WARNING

**Inspect the components and check their operation as described below. Failure to perform these inspections and checks could result in separation of worn suspension components and loss of vehicle control, possibly causing personal injury or death, or property damage.**

1. Chock the front tires. Raise the rear of the vehicle so the tires just clear the ground and the suspension is fully extended. Place safety stands under the vehicle frame.
2. Squeeze all air springs to check for complete deflation.
3. Inspect the air spring piston for cracks, chips, and broken areas. Check the air bag for rips, tears, and holes. Verify that the air spring assembly does not leak.
4. Check the axle connection welds (beam seat to equalizing beam) and axle adapter to axle for cracks. If welds are cracked, grind them out and reweld the parts.
5. Move the axle up and down while checking for signs of looseness due to worn parts at the front pivot connections. Replace any worn parts.
6. Inspect the shock absorbers for oil leaks and worn rubber bushings. Replace the shock absorbers and/or rubber bushings if wear or damage is noted.

7. Inspect the stabilizer bar, if so equipped, for irregular bushing wear or cracks in the brackets. The stabilizer bar is optional on 10,000- and 15,000-pound AirLiner suspension systems.
8. Remove the safety stands and lower the rear of the vehicle to the ground. Run the engine until air pressure of at least 100 psi (689 kPa) is maintained throughout the system.
9. Check that all air springs are inflated.

## Freightliner AirLiner Control Rod Check

1. Without disconnecting the control rods, use your hand to attempt to move each of the control rod ends up, down, in, and out. If there is any movement, examine the control rods for wear or damage. Replace if necessary.
2. Inspect the rubber bushings for cracks or cuts.
3. Check for any shifting of the barpin.
4. Check for cracks in the metal components and welds.

**NOTE:** The Freightliner AirLiner Suspension is manufactured at numerous weight ratings up to 46,000 pounds. The control rod on the 46,000-pound-rated suspension is larger, and is fastened differently than on other applications.

## Freightliner TufTrac

1. Inspect the suspension spring assemblies for pitted, cracked, broken, or abnormally bent leaves, and extreme rust. If any of these conditions exist, replace the spring assembly.

### **WARNING**

**Do not replace individual leaves of a damaged leaf spring assembly; replace the complete spring assembly. Visible damage (cracks or breaks) to one leaf causes hidden damage to other leaves. Replacement of only the visibly damaged part(s) is no assurance that the spring is safe. On front spring assemblies, if cracks or breaks exist in the two top leaves, a loss of vehicle control could occur. Failure to replace a damaged spring assembly could cause an accident resulting in property damage, serious personal injury, or death.**

**IMPORTANT:** On multi-leaf suspensions, closely inspect each component of the leaf spring assemblies, including the brackets, U-bolts, and related parts.

2. Inspect the brackets for cracks in the castings. Inspect the V-rod tower welds for cracking or other signs of damage. Also check for contact between the frame rail and the upper axle clamp brackets. If contact exists, check the V-rod bushing for wear. Check the V-rod fastener torques.
3. Inspect the rubber center bearing and spring tip pads for excessive wear, including de-lamination of the rubber-to-metal shim interface, and distortion and degradation of rubber.
4. Inspect the V-rods and lower control rods for wear and looseness.

4.1

Without disconnecting the control rods, use your hand to attempt to move each of the control rod ends up, down, in, and out. If there is any movement, examine the control rods for wear or damage. Replace if necessary.

- 4.2 Inspect the rubber bushings for cracks or cuts.
- 4.3 Check for any shifting of the barpin.
- 4.4 Check for cracks in the metal components and welds.
5. Check all fasteners for looseness.
6. Inspect the shock absorbers for oil leaks and worn rubber bushings. Replace the shock absorbers and/or rubber bushings if wear or damage is noted.

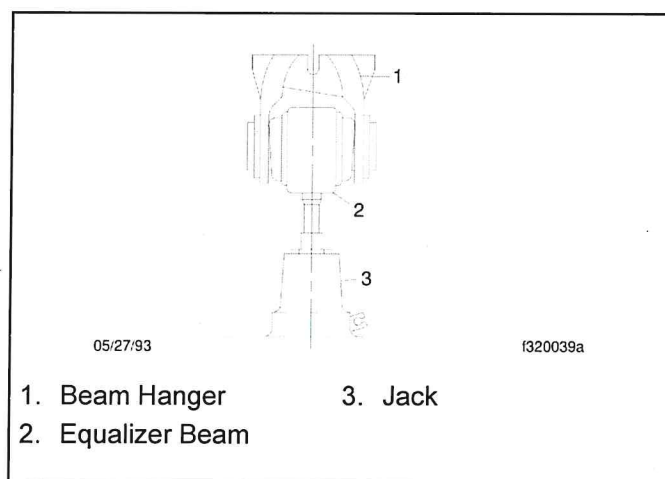
## Hendrickson Suspension Inspection

Inspect the suspension assembly for wear, cracks, and damage to its components. Replace the component(s) if any wear, cracks, or damage exists. Check all fasteners for tightness.

Check for distorted or frayed rubber at the beam end bushings. If the bushings are damaged, replace them.

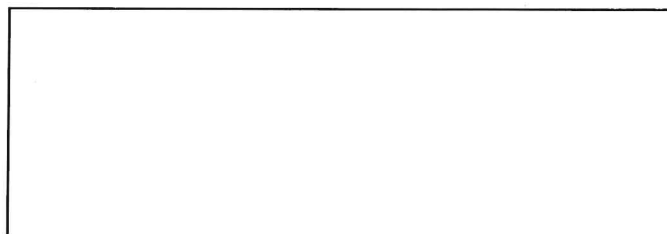
Check that the ends of the equalizer beam are not lower in the beam hanger.

If the equalizer beam ends appear lower, use a jack to raise each beam end, then check for movement of the inner metal of the rubber end bushing. See Fig. 4 . Movement cannot be corrected by tightening the fastener, because parts could be damaged. If there is movement, replace the rubber end bushings and all connecting parts.

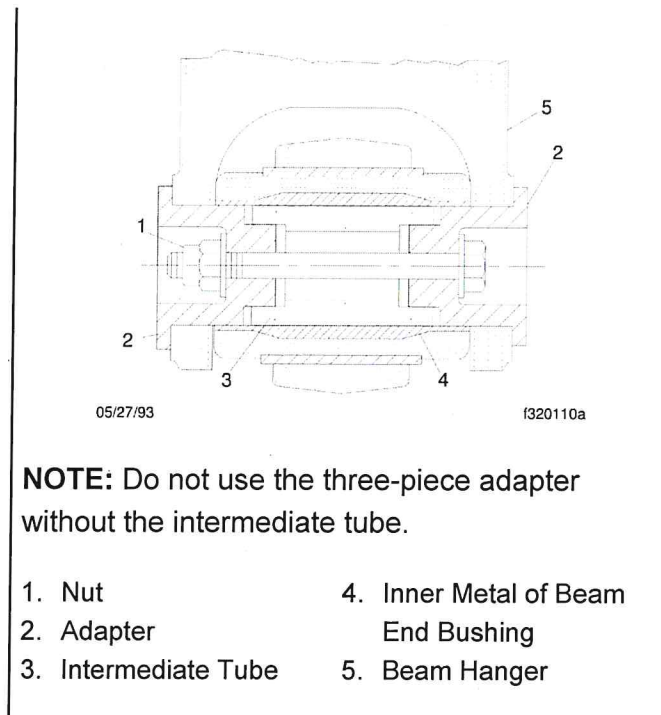


**Fig. 4, Raising the Beam End**

After repairs to the suspension, check the fastener torque after the vehicle has been in service for 2500 miles (4000 km). Tighten the adapter-type beam end connection nut 210 to 240 lbf·ft (285 to 325 N·m). See Fig. 5 . Do not overtorque.







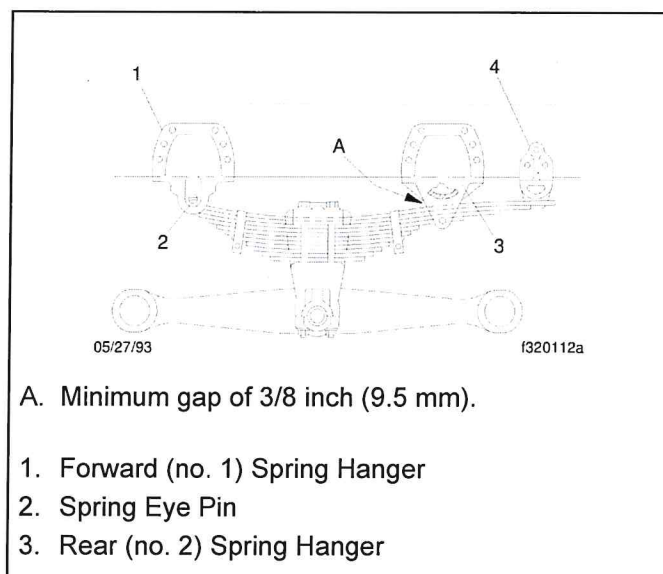
**Fig. 5, Three-Piece Adapter-Type Beam End Connection**

## **⚠ WARNING**

Insufficient beam end fastener torque could cause the beam to separate from the axle. This will cause loss of vehicle control resulting in property damage, serious personal injury or death.

## Hendrickson Leaf Spring Assembly Inspection

1. Inspect the spring hangers for wear of the spring pin holes, cams, and the spring hanger legs. See Fig. 6 .



4. Rear (no. 3) Extension
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**Fig. 6, Unloaded RTE Spring Suspension**

2. If equipped with the RTE series, the gap between the rear (no. 2) spring hanger and the top spring leaf should measure at least 3/8 inch (9.5 mm) in an unloaded condition.  
  
If the measurement is less than 3/8 inch (9.5 mm), install new rear (no. 3) extension hangers. Lubricate the bolt threads with SAE 20 oil. Tighten the 1/2–13 locknuts with hardened washers 85 lbf·ft (115 N·m).
3. Inspect the spring leaves for cracks, gouges, wear, or abnormal bends. The main (no. 1) and wrapper spring leaves (no. 2)—the top two spring leaves—may be individually replaced. If equipped with the RTE series suspension, the first, second, and third spring leaves (the top three spring leaves) may be individually replaced. If a spring leaf is damaged below these numbers in a pack, replace the spring assembly. In addition, replace both spring assemblies to ensure even spring deflection.

## Hendrickson Radius Rod Bushing Check

1. Without detaching the torque arms, use your hand to attempt to move each of the radius-rod ends up, down, in, and out. If there is any movement, replace the torque arm.
2. Inspect the rubber bushing ends. Replace the torque arm if there are gaps between the rubber bushing and the pin or the outer steel sleeve, if either bushing end contacts a torque arm pin mounting bolt, if there are cracks in the bushing, or if part of the rubber bushing extends beyond the outside diameter of the outer bushing sleeve.

## Chalmers Suspension Inspection

Chock the front wheels to prevent the vehicle from moving. Place the transmission in neutral and release the spring or driveline brakes before inspecting the rear suspension.

Power wash the Chalmers rear suspension or clean it with a hard-bristle brush before performing a visual inspection.

1. Visually inspect the rubber bushings for cracks or other damage.  
  
Try to move the torque rod ends, using your hands only, and check for any free-play. If free-play is felt, replace the torque rod end bushing. Do not use a pry bar to check for free-play. Use of a pry bar may lead to premature bushing replacement.
2. If equipped with optional shock absorbers, check for worn, broken, or damaged shock bushings, heavy corrosion on the shock absorber body, or fluid leaking from the shock absorber. Replace the shock absorbers if any of these conditions are found.
3. Lift the rear of the vehicle and support the frame on jack stands to unload the suspension components. The vehicle is lifted high enough when the beam ends are off of the saddles. All jack stands must be of sufficient strength and rigidity to safely support the vehicle. Do not perform any work on or around a vehicle that is supported solely by a lifting device.

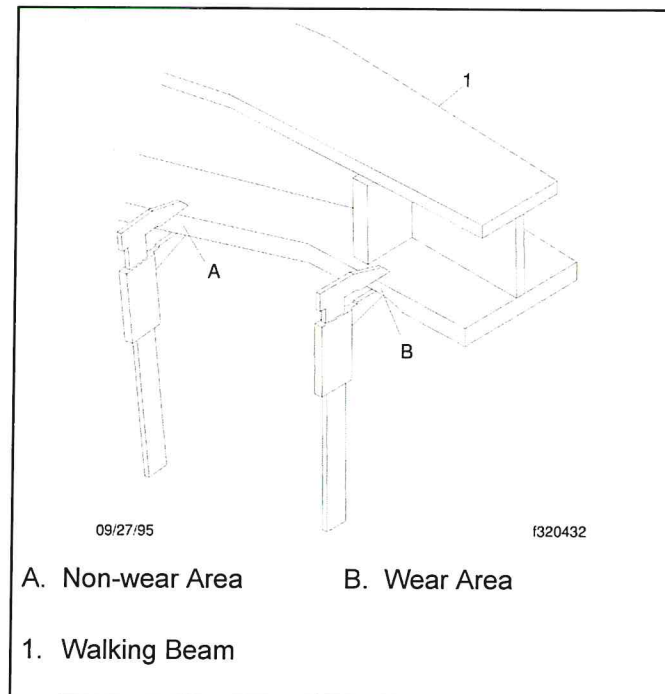
Visually inspect the walking beam for cracks, or other damage. If damage is found, replace the walking beam.

Keep the vehicle supported by the jack stands for the next operation.



4. Manipulate the walking beam so that a micrometer, vernier, or dial caliper can be used to determine the wear area thickness on the bottom face. See Fig. 7 . Measurements should be taken a minimum of 1/2 inch (13 mm) from the beam flange edges to eliminate any edge wear that may have occurred. Subtract the wear area thickness from the nonwear area to determine the amount of wear.

If the beams show any wear greater than the allowable 0.062-inch (1.5-mm) wear, a Chalmers wear plate must be installed, or the walking beam must be replaced.



**Fig. 7, Walking Beam End Wear Thickness**

5. Rotate the restrictor cans 360 degrees and visually inspect the cans for cracks, severe corrosion, and distortion. If any of these conditions are present or the restrictor can is missing, replace the restrictor can.

## **⚠ WARNING**

**Replace all cracked or missing restrictor cans. Failure to do so could lead to loss of vehicle control, which could result in property damage, serious personal injury, or death.**

6. Remove the jack stands, then lower the vehicle. Check that the spring or driveline brake is applied, then remove the wheel chocks.

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