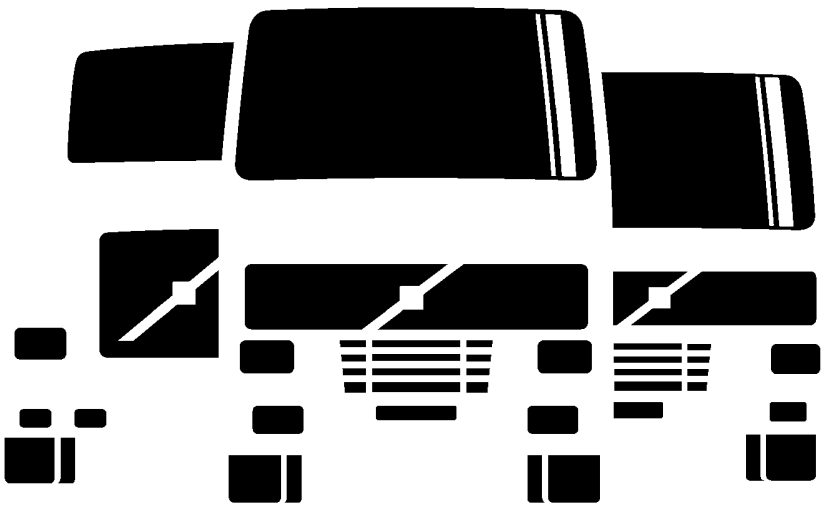
Service Manual
Trucks

Group **726-610**

Volvo Air Suspension

WX, WG, WIA, AC



PV776-726-610SM

VOLVO

Foreword

The descriptions and service procedures contained in this manual are based on designs and methods studies carried out up to December 97.

The products are under continuous development. Vehicles and components produced after the above date may therefore have different specifications and repair methods. When this is believed to have a significant bearing on this manual, supplementary service bulletins will be issued to cover the changes.

The new edition of this manual will update the changes.

In service procedures where the title incorporates an operation number, this is a reference to an V.S.T. (Volvo Standard Times).

Service procedures which do not include an operation number in the title are for general information and no reference is made to an V.S.T.

The following levels of observations, cautions and warnings are used in this Service Documentation:

Note: Indicates a procedure, practice, or condition that must be followed in order to have the vehicle or component function in the manner intended.

Caution: Indicates an unsafe practice where damage to the product could occur.

Warning: Indicates an unsafe practice where personal injury or severe damage to the product could occur.

Danger: Indicates an unsafe practice where serious personal injury or death could occur.

Volvo Trucks North America, Inc.
Greensboro, NC USA

Order number: PV776-726-610SM

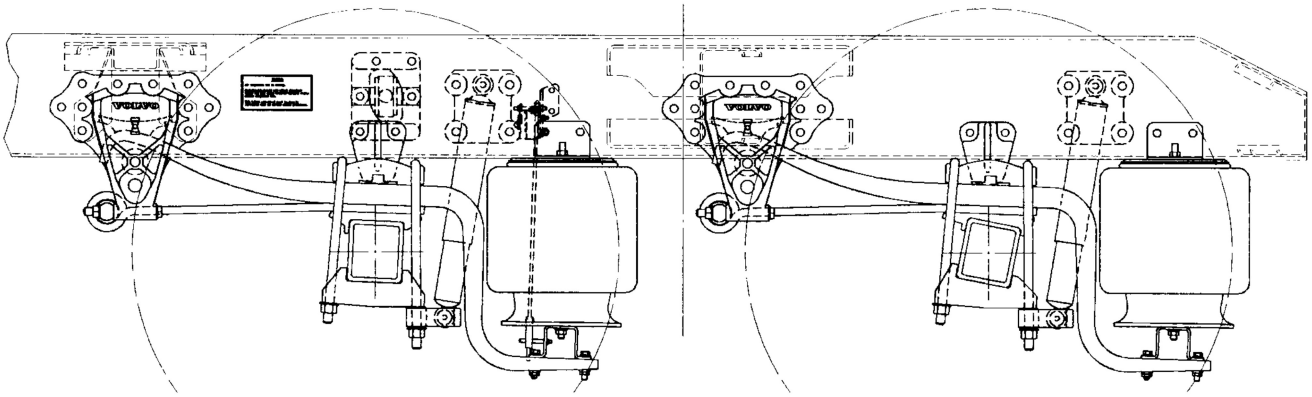
USA02048

Contents

Operation Numbers

General

Volvo Air Suspension



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This information covers specifications, service procedures, ride height adjustments and calculations, and pinion angles for the Volvo Air Suspension. Information in this manual is essential to maintain proper serviceability and proper ride height set by the manufacturer for the Volvo Air Suspension.

WARNING

The Volvo Air Suspension is set at the factory. Changing the ride height will affect the driveshaft angles and may cause driveline vibration and/or shorten component life.
Ride height adjustments must be performed in accordance with all service manual procedures.

Specifications

Air Suspension Tightening Torques

U-Bolts for Suspension	3/4 - 16	STANDARD 413 ± 41 Nm (305 ± 30 ft-lb)
	7/8 - 14	OPTIONAL 576 ± 57 Nm (425 ± 42 ft-lb)
Radius Spring to Spring Hanger Bracket	M16	275 ± 45 Nm (203 ± 33 ft-lb)
Air Spring Crossbeam (Pedestal) to Z-Spring	M12	105 ± 20 Nm (77 ± 15 ft-lb)
Air Spring to Crossbeam (Pedestal)	M12	50 ± 10 Nm (37 ± 7.5 ft-lb)
Torque Rod to Frame-Mounted Bracket	.62-11	271 ± 27 Nm (200 ± 20 ft-lb)
Torque Rod to Axle Housing	.62-11	271 ± 27 Nm (200 ± 20 ft-lb)
Shock Absorber Bracket to Frame	.62-11	271 ± 27 Nm (200 ± 20 ft-lb)
Shock Absorber to Bracket (Upper and Lower)	.38-16	47 ± 7 Nm (35 ± 5 ft-lb)
Bracket for Leveling Valve to Frame	.62-11	271 ± 27 Nm (200 ± 20 ft-lb)
Leveling Valve to Bracket	M6	10 ± 1.5 Nm (7 ± 1 ft-lb)
Leveling Valve Control Arm to Lever on Valve and Air Spring Crossbeam	M6	10 ± 1.5 Nm (7 ± 1 ft-lb)
Spring Hanger Bracket to Frame	.62-11	271 ± 27 Nm (200 ± 20 ft-lb)

Axle Pinion Angles

AXLE PINION ANGLES			
AXLE MODEL	FIRST AXLE	SECOND AXLE (52" spacing)	SECOND AXLE (60" spacing)
Eaton 23080/23105 **Meritor (Rockwell)** RS-23-160/RS-23-186	3.5°	- - -	- - -
Eaton D404	2.5°	10.5°	9.0°
Meritor (Rockwell) RT-40-145	2.5°	12.0°	10.5°

Note: Second tandem axle pinion angle may vary because of frame slope. *These are nominal angles.*

Suspension Applications

Suspension Configuration	Maximum GAWR Metric Ton (lb)	Maximum GCW Metric Ton (lb)	Axle Spacing mm (in.)	Required Number of Parking Chambers	Available Axles	
					Models	Metric Ton (lb)
4x2	9 (20,000)	50 (110,000) **(1)**	N/A	TWO	Eaton Meritor (Rockwell)	10 (23,000)
6x4	17 (38,000)		1320 (52")	TWO (1st Axle)	Eaton Meritor (Rockwell)	18 (40,000)
	18 (40,000)		1320 (52")	FOUR		
	18 (40,000)		1524 (60")	FOUR		

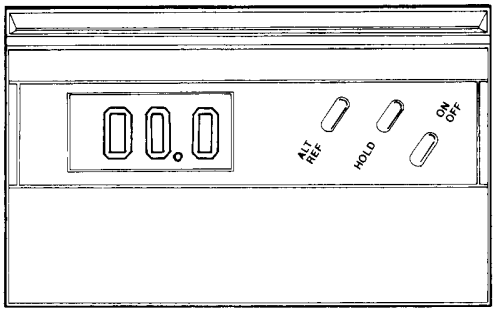
(1) GCW (Gross Combination Weight) rating can be reduced by vehicle operating applications, engine horsepower/torque, axle type/model, axle ratio, and/or vehicle tire size.

Tools

Volvo Air Suspension Tools

The following tools can be used to ensure proper inclinations and/or angles on the Volvo Air Suspension:

The Anglemaster is a digital inclinometer, available from Dana-Spicer (telephone: 419–535–4300).



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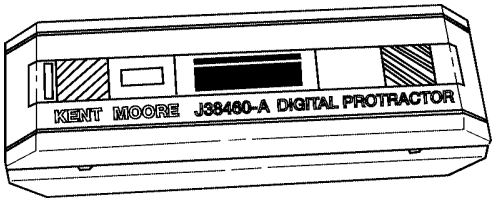
The J38460–A is a digital protractor, available from Kent-Moore (telephone: 800–328–6657).



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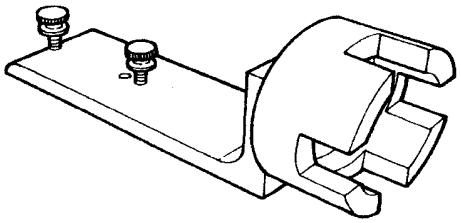
The J38460–25 may be used along with the Kent-Moore digital protractor or the Dana-Spicer digital inclinometer for checking pinion angles. It is available from Kent-Moore (telephone: 800–328–6657).



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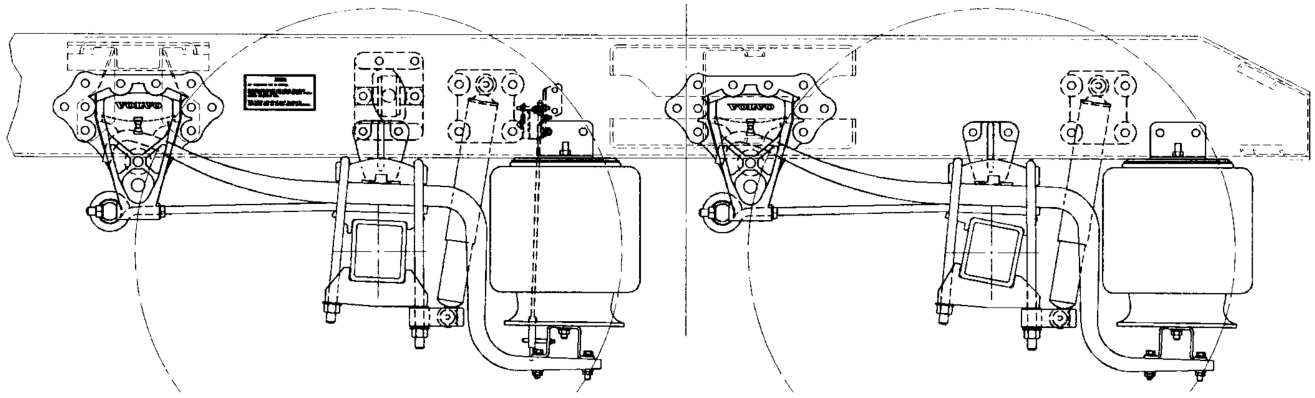
Design and Function

Rear Air Suspension



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The Air-Ride Suspension has been refined by Volvo Trucks North America. The result of this refinement process is the Volvo Air Suspension. The Volvo Air Suspension is a rear air suspension with improved ride and increased durability.

Ride height has a direct relationship with driveline pinion angles. It is very important that the ride height specifications recommended by Volvo Trucks North America are maintained.

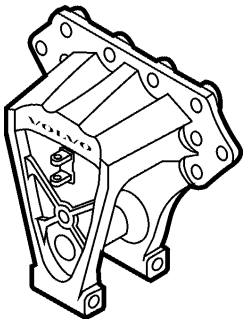
⚠ WARNING

The Volvo Air Suspension is set at the factory. Changing the ride height will affect the driveshaft angles and may cause driveline vibration and/or shorten component life.
Ride height adjustments must be performed in accordance with all service manual procedures.

Volvo Air Suspension Components

Spring Bracket

The Volvo Air Suspension bracket is a ductile iron casting and includes an internal alignment guide to help center the Z-spring within the bracket during initial assembly.



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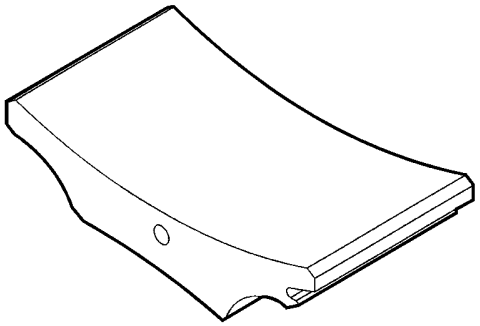
Wear Plate

The wear plate (pad) is constructed of the same material (Ultra-High Molecular Weight Polyethylene) as earlier wear plates. This material provides an extremely smooth surface for the spring to contact and virtually eliminates the noise associated with the metal-to-metal contact of other suspension designs. The Volvo Air Suspension wear plate mounts with a single fastener into a pocket between the vertical legs of the spring bracket.

Note: Wear plates (pads) must be replaced in pairs (left and right) to avoid excessive stress on the suspension.



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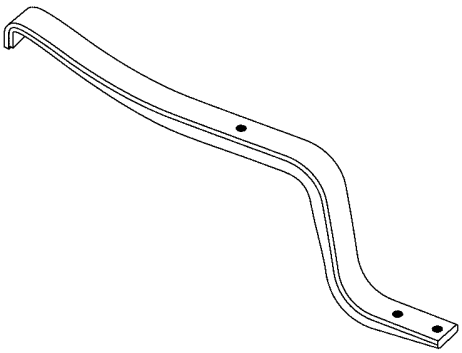
Z-Spring

The Z-spring has been improved to provide a larger clamping surface, an improved alignment with mating components, and increased clearance to the lower shock mounting bracket.



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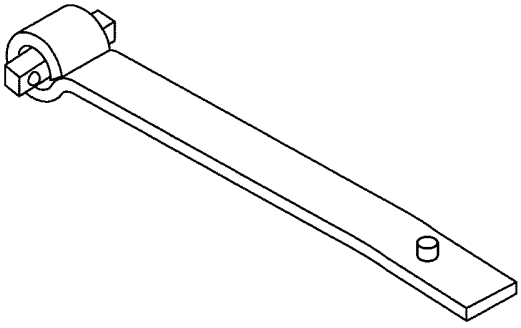
Radius Spring

The radius spring is crucial to the vehicle's alignment. The radius spring has an improved bushing for increased component durability. The Volvo Air Suspension spring uses a locating pin that precisely locates the radius spring for an improved fit with the mating Z-spring and axle seat. Precisely locating the radius spring helps to improve the vehicles overall axle alignment.



W7000761

Crossbeam

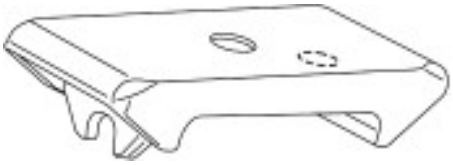
The crossbeam (pedestal plate) has been greatly refined to improve strength while reducing weight. The Volvo Air Suspension crossbeam uses only four mounting bolts (two on each end) for easy installation of the Z-spring.

W7000704

Crossbeam

Axle Seat

The axle seat defines the axle pinion inclination. It has been refined to eliminate the extra spacers necessary in earlier designs. By eliminating the spacers, the Volvo Air Suspension axle seat forms a strong, secure joint between the radius spring and the axle.

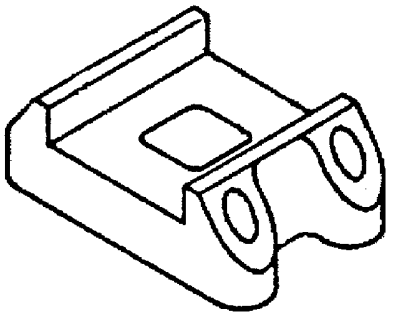


W7000727

Axle seat

Bottom Plate

The bottom axle plate is found underneath the axle housing, and is held in place by U-bolts. It helps maintain axle alignment with the springs in the suspension and prevents movement of the axle. It can also be helpful in keeping U-bolts properly aligned and secured.



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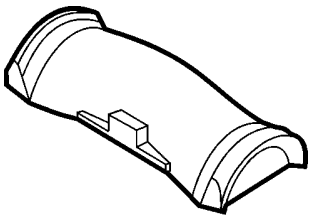
Bottom plate

Top Plate

The top plate (upper clip) is located at the top of the Z-spring and is clamped down by the U-bolts. It is helpful in maintaining alignment of the U-bolts to secure and align the Z-spring, radius spring, and axle seats. The top plate also helps maintain a secure surface for U-bolts when torqued.



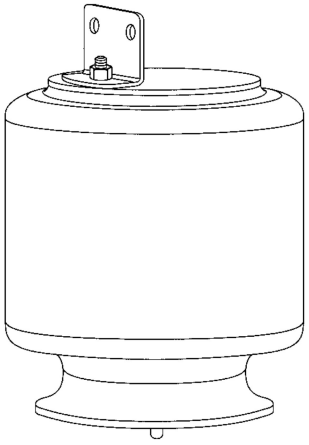
W7000712

Top plate

Air Spring

The air spring in the Volvo Air Suspension system is a rolling-lobe, sleeve type with a composite piston. The air spring uses a single stud to attach to the crossbeam.

> **CAUTION**
>
> Do not mix the air springs of the Volvo Air Suspension with air springs of earlier suspensions. System failure may result.



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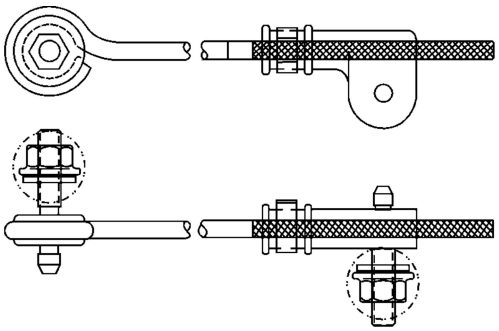
Link Rod

The Volvo Air Suspension uses a link rod that is factory adjusted and set to accurately control the dimensions of the air springs, prevent inappropriate adjustments, and avoid unnecessary servicing.



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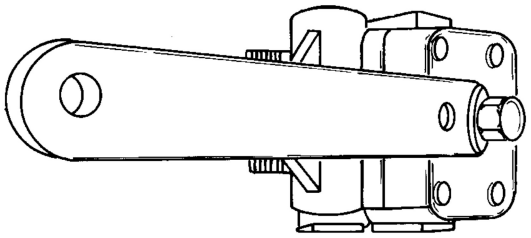
Leveling/Height Valve

The leveling valve was designed to simplify the chassis air suspension system. The quick-dump valve is now combined into the height control valve. This eliminates one valve and the related plumbing.

The valve is located on the left side of the frame rail, adjacent to the fifth wheel.

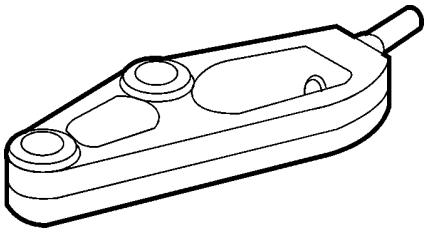
The Volvo Air Suspension height valve incorporates an integrated dump feature that eliminates the need for a separate valve and allows the rear to be lowered to back under a trailer.



W7000759

Shock Absorber Bracket, Lower

The lower shock absorber bracket on the Volvo Air Suspension has been redesigned to eliminate the need for left-hand and right-hand versions.



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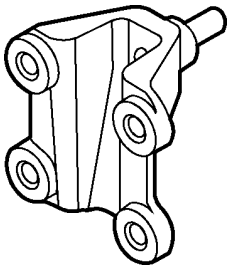
Shock Absorber Bracket, Upper

The upper shock absorber bracket has been redesigned to eliminate the need for left-hand and right-hand versions.



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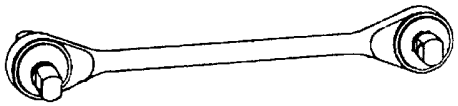
Torque Rod

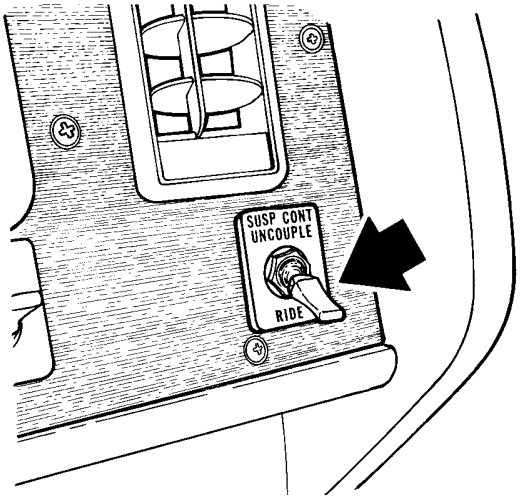
The torque rod is located on top of the axle housing. It is positioned between the frame rail mounted bracket and the axle housing mounted bracket. It helps maintain lateral alignment of the rear axle or axles for the suspension.



W7000722

Pneumatic Switch

The air suspension level switch is used to lower the truck (“uncouple”) when connecting and disconnecting to trailers. It then enables you to return to the raised position (“ride”) for a better ride.



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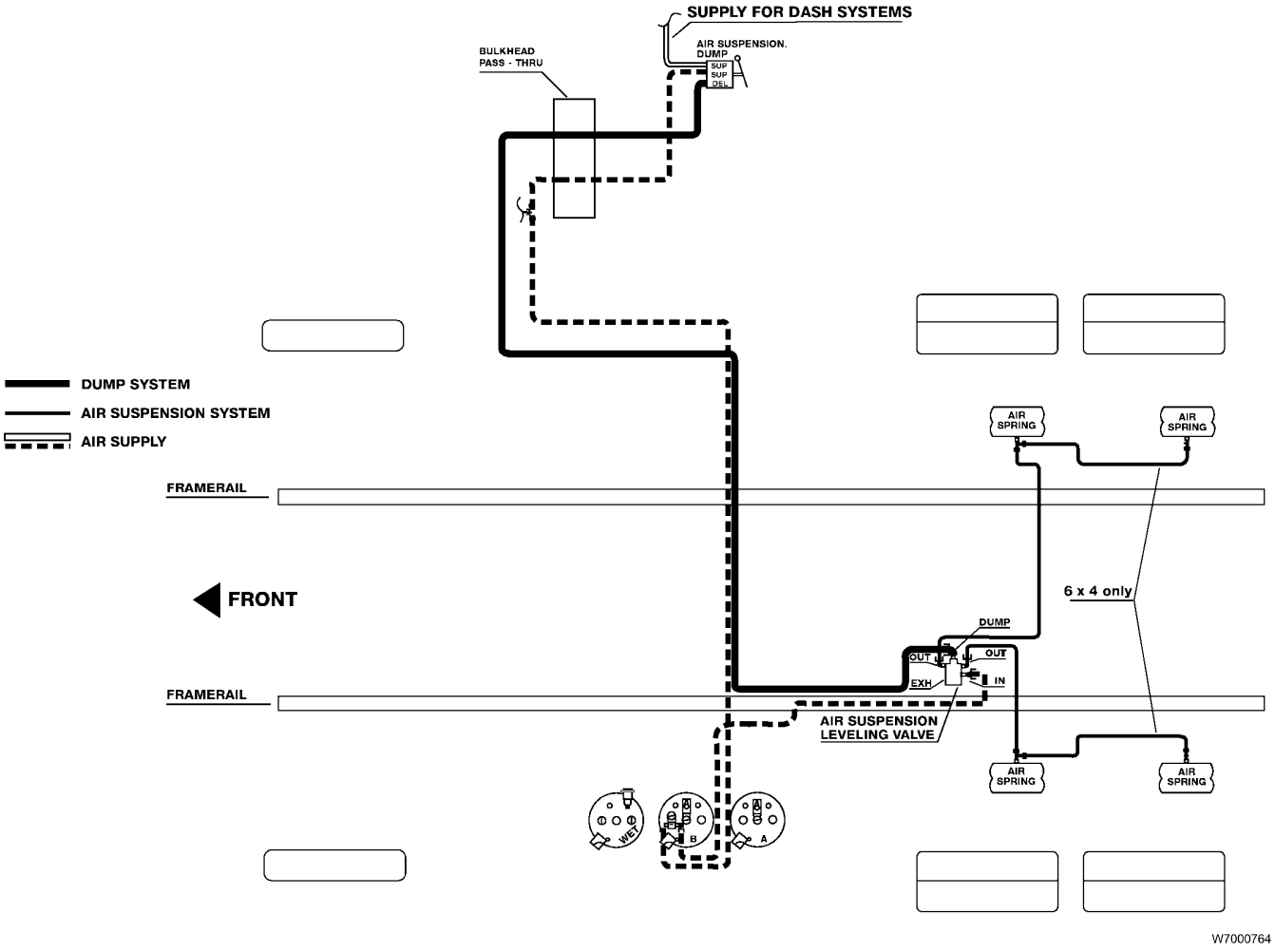
Dump Switch Operation

To “dump” air from the system (to lower the suspension), push the switch to the position labeled “uncouple.”

To fill the system (to return to the normal ride height), push the switch to the position labeled “ride.”

Note: Lower the suspension when disconnecting and connecting the trailer.



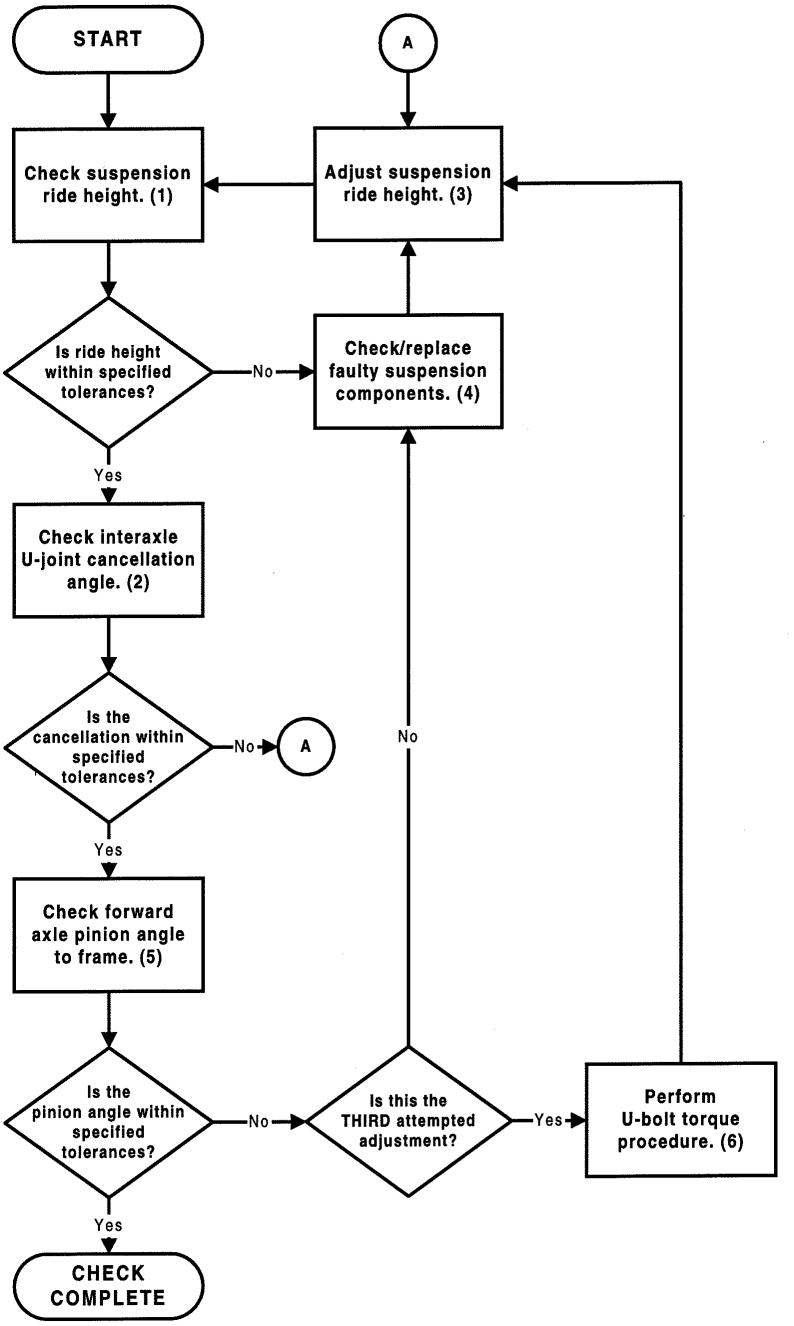
Volvo Air Suspension

Troubleshooting

Suspension Troubleshooting

Problem	Cause
Vibration	U-joint angle incorrect
	Improper phasing of drivelines
	Axle inclination incorrect
	Worn wear plate
	Worn radius arm bushing
	Improper ride height
	Broken or defective Z-spring
	Thrust alignment incorrect
	Improper wheel run-out or balance
	Broken or loose U-bolts
	Excessive wheel bearing end play
	Mismatched wheels and tires
Bottoming Out	Broken or defective shock absorber
	Defective leveling valve
	Overloaded vehicle
	Pressure regulator set too low
	Wrong air spring
	Improper ride height
	Broken or defective spring
	Low air pressure
Tracking	Thrust alignment incorrect
	Worn or defective torque rod bushing
	Worn radius arm bushing
	Broken or loose U-bolts
	Broken or defective spring
	Total wheel alignment incorrect
	Lateral alignment of axles incorrect
Ride Height Incorrect	Defective leveling valve
	Ride height not set properly
	Axle inclination incorrect
	Overloaded vehicle
	Defective air spring
Low Air Pressure	Defective manifold
	Defective leveling valve
	Air leak or loose line
	Defective pressure regulator
	Defective dump switch

Volvo Air Suspension Ride Height and Driveline Angle Check Flow Diagram



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1 See “Air Suspension, Adjustment (Ride Height and Driveline Calculation)” page 21
2 See “Interaxle U-joint Angle Cancellation Check (Calculation)” page 23
3 See “Air Suspension Height, Adjustment” page 29
4 See “Volvo Air Suspension Component Replacement” page 31
5 See “Forward Axle Pinion Angle to Frame Check” page 25
6 See “Rear Spring U-bolt Torque, Adjustment” page 27

Service Procedures

Guidelines for Working on the Volvo Air Suspension

Note: Ride height has a direct relationship with driveline pinion angles. It is critical that you maintain all ride height specifications as recommended by Volvo Trucks North America.
Interaxle cancellation (equal forward and rear interaxle U-joint angles) is the key to reduced driveline vibrations and increased component life. “Air Suspension, Adjustment (Ride Height and Driveline Calculation)” page 21, describes how to achieve interaxle cancellation by maintaining the proper ride height and pinion angles.

To ensure personal safety and to help avoid accidental damage to suspension components, follow these guidelines any time work is performed on the Volvo Air Suspension.

1
Chock the front wheels on vehicle and release the parking brakes.

DANGER

Personal injury hazard. Never work under the vehicle unless the front wheels are securely chocked. Failure to chock the wheels can result in the vehicle rolling, which can cause serious injury or death to anyone under or near the vehicle.

2
Dump (release) the suspension air.

DANGER

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

3
When lifting the chassis to perform any procedure, always support the chassis with adequate jack stands before beginning work on the air suspension.

Note: Never jack directly under the crossbeam. The crossbeam is not designed to support vehicle weight.

DANGER

Personal injury hazard. Never work under or around a raised vehicle unless it is securely supported on jack stands of adequate rating. Failure to use adequate jack stands can result in the vehicle falling, which can cause serious injury or death to anyone under the vehicle.

4
To ensure that the U-bolts holding the rear suspension to the drive axle retain their clamp load, observe the following practices:

a. Any time you work on the suspension, make sure you loosen both sides of the suspension on an axle at the same time. It is difficult to realign all parts with opposite side of the axle restricting motion.

b. Whenever the U-bolts are loosened, always support the nose of the axle with an adequate jack.

⚠ DANGER

Failure to properly support the nose of the axle may result in the axle falling, which can cause serious injury or death to anyone under the vehicle.

c. Whenever the U-bolts are loosened and/or the suspension components attached to the axle are being worked on, make sure that the locating features on each component is properly engaged so that the components are positioned together properly.

d. Make sure that the pin in the radius spring has not been pushed out of position. If the pin is correctly set, make sure that the pin in placed in its proper position relative to the axle seat and Z-spring before clamping it with the U-bolts.

e. Always replace both U-bolts at a particular axle position. The longer of the two U-bolts is positioned to the rear side of the axle housing.

f. Before torquing the U-bolt nuts, position the suspension at approximately the normal ride height and make sure the bolts holding the crossbeam (pedestal plate) to the Z-spring are loosened. This will help provide proper alignment for the Z-springs.

g. Always “snug-up” the U-bolt nuts all over first before torquing, using a handheld clicker-style torque wrench.

5
After work has been performed on the air suspension, vehicle realignment may be required. Refer to proper service information.

7281-05-02-01 Air Suspension, Adjustment (Ride Height and Driveline Calculation)

WARNING

The Volvo Air Suspension is set at the factory. Changing the ride height will affect the driveshaft angles and may cause driveline vibration and/or shorten component life. **Ride height adjustments must be performed in accordance with all service manual procedures.**

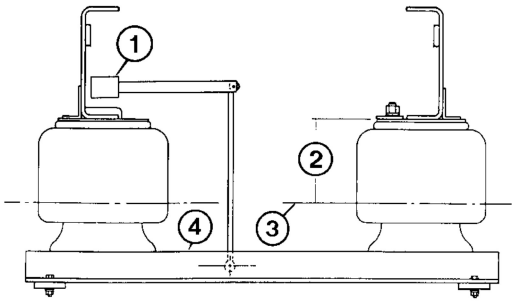
CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Other special equipment: J38460–A, J38460–25

Air Suspension Ride Height Check (Calculation)

1



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1 Leveling valve
2 Ride height
3 Axle center line
4 Crossbeam

Before you can accurately calculate the ride height, prepare the vehicle using these steps:

- Measurements must be performed on an unloaded vehicle.
- Park the vehicle on a level surface.
- The steer and rear drive axle tires must be at normal operating pressure.
- 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.
- Front wheels must be pointed straight ahead.

2

Chock the front wheels on the vehicle.

DANGER

Personal injury hazard. Never work under the vehicle unless the front wheels are securely chocked. Failure to chock the wheels can result in the vehicle rolling, which can cause serious injury or death to anyone under or near the vehicle.

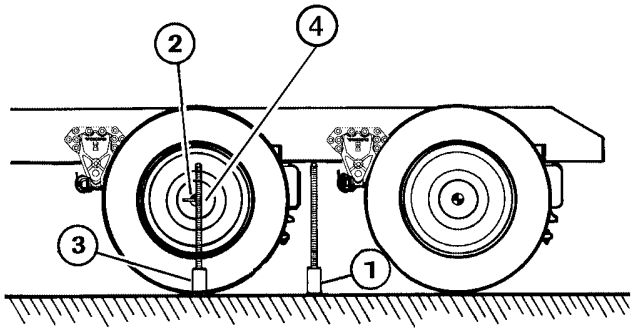
3
Dump (release) the suspension air (see "Dump Switch Operation" page 15).

DANGER

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

Start the engine and fill the suspension with air. Turn off the engine.

4



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The ride height is the distance from the axle centerline to the bottom of the frame rail. The ride height must be within the following specifications:

- 196–216 mm (7.75–8.5 in.)

To accurately measure ride height:

a. Measure from the ground to the bottom of the frame rail (1).
b. Locate the axle centerline (the center hole on the end of the hub works best) using a steel rule or an appropriate tool (2). Measure from the ground to the axle centerline (3).
c. Calculate the difference between (1) and (3). The difference is the ride height (4).
d. Ride height should fall within specifications (see above).

5
Record the measurement for calculation (refer to "Calculation Form" page 26). If the measurement is not within the specified range, it must be corrected before proceeding. If the ride height is not in specification, check for the following:

- Excessively worn wear plates (pads).

  Note: Wear plates (pads) must be replaced in pairs (left and right on same axle); see "Wear Plate (Pad), Replacement" page 40.

- Damaged spring hanger frame bracket.
- Damaged air spring, Z-spring, and/or radius spring.
- Damaged link rod
- Faulty leveling valve

Replace the components as necessary, then adjust the suspension ride height (see "Air Suspension Height, Adjustment" page 29).

6
Remeasure the ride height using steps 4a-d, above. Repeat as necessary until the measurement is within specifications.

7
Proceed to "Interaxle U-joint Angle Cancellation Check (Calculation)" page 23.

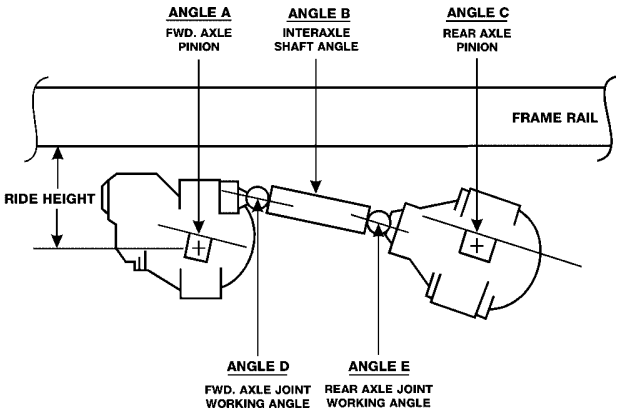
Interaxle U-joint Angle Cancellation Check (Calculation)

1

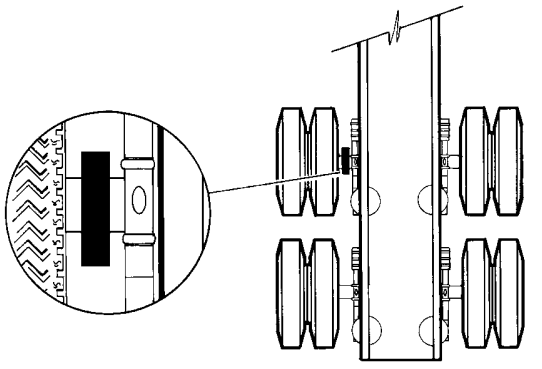
The steps from "Air Suspension Ride Height Check (Calculation)" page 21, must be performed before continuing with this procedure.

Note: All angle measurements are relative to level ground.

2



W7000742

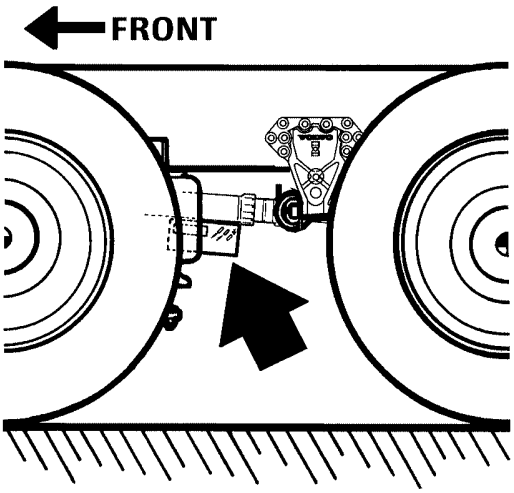


W7000252

Measure the **forward** axle angle **(A)** using an inclinometer or recommended tool. Record the measurement for calculation (refer to "Calculation Form" page 26).

Note: Wipe surface clean of dirt and debris before taking measurement.

3



W7000756

Measure the interaxle shaft angle **(B)** using the recommended tooling. Record the measurement for calculation (refer to "Calculation Form" page 26).

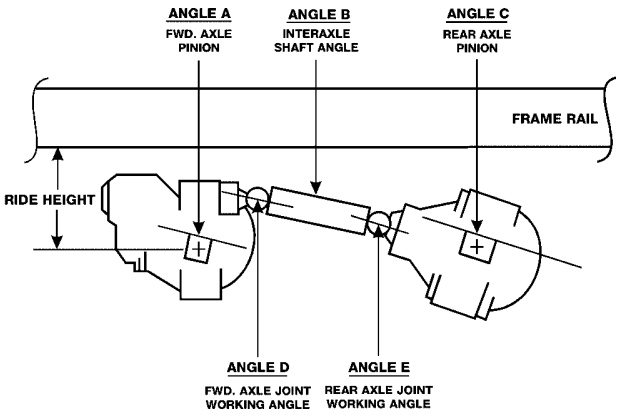
Note: Wipe surface clean of dirt and debris before taking measurement.

4

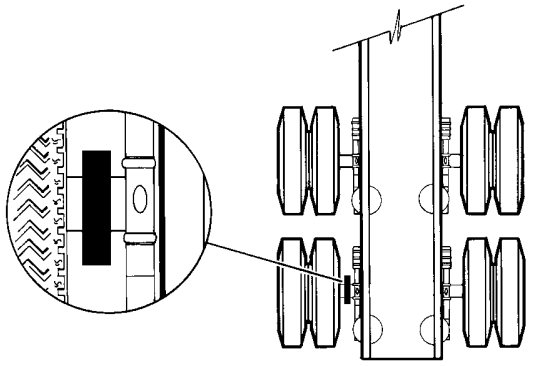
Calculate : **B – A = D**

The interaxle angle minus the forward axle angle will give the value **(D)** (refer to "Calculation Form" page 26).

5



W7000742



W7000253

Measure the **rear** axle angle **(C)** using the recommended tooling. Record the measurement for calculation (refer to "Calculation Form" page 26).

Note: Wipe surface clean of dirt and debris before taking measurement.

6

Calculate: **C – B = E**

The rear axle angle minus the interaxle angle will give the value **(E)**. Record the measurement for calculation (refer to "Calculation Form" page 26).

7

Calculate: **D – E = F**

Record the measurement for calculation (refer to "Calculation Form" page 26).

Compare the value of angle **(F)** with the following guidelines:

If **(F)** is less than -1.5, lower the ride height.

If **(F)** is between -1.5 and +1.5, no adjustment is necessary.

If **(F)** is greater than +1.5, raise the ride height.

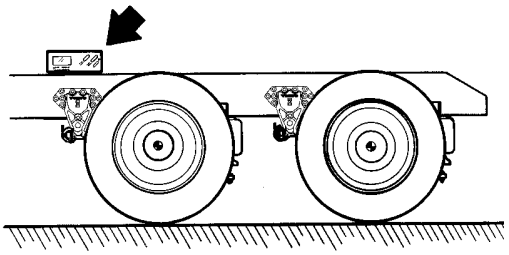
For procedures on lowering or raising ride height, refer to "Air Suspension Height, Adjustment" page 29.

8

Proceed to "Forward Axle Pinion Angle to Frame Check" page 25.

Forward Axle Pinion Angle to Frame Check

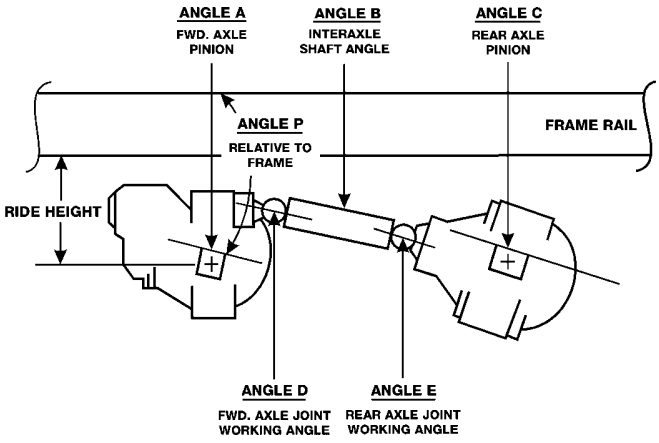
1



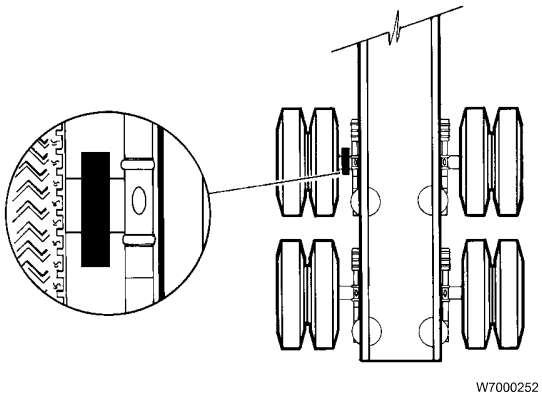
W7000757

Place an inclinometer or recommended tool on top of the frame. “Zero-out” inclinometer or recommended tool.

2



W7000743



W7000252

Measure the **forward** axle angle **(P)**, using the “zero’d out” inclinometer or recommended tool.

3

The angle (P) measurement must be within the specified range, as shown in the following table:

Forward Axle Angle Relative to Frame (P)	
Axle Model	**Specification (in degrees)**
Tandem, 6x4	2.5 +0/-1
Single, 4x2	3.5 ± 1

If angle (P) is outside the specifications, it must be corrected. Check for the following:

- Excessively worn wear plates (pads).

  Note: Wear plates (pads) must be replaced in pairs (left and right on same axle); see “Wear Plate (Pad), Replacement” page 40.

- Damaged spring hanger frame bracket.
- Damaged air spring, Z-spring, and/or radius spring.
- Damaged link rod.
- Broken/loose U-bolts.
- Faulty leveling valve.

Replace the components as necessary, then adjust the suspension ride height (see “Air Suspension Height, Adjustment” page 29).

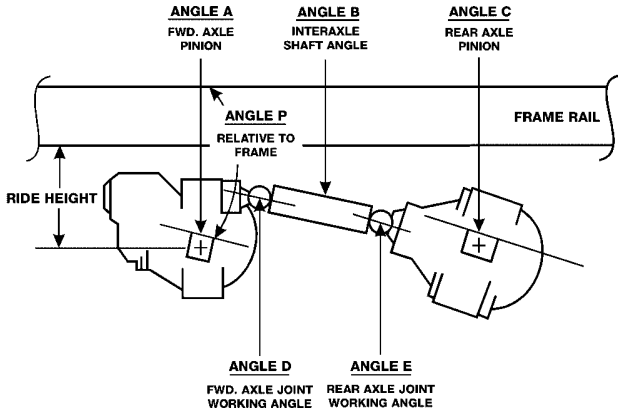
4

Repeat all steps in “Air Suspension Ride Height Check (Calculation)” page 21, “Interaxle U-joint Angle Cancellation Check (Calculation)” page 23, and “Forward Axle Pinion Angle to Frame Check” page 25.

Note: If, after the second attempt, the axle pinion angles are still not within specification, perform the “Rear Spring U-bolt Torque, Adjustment” page 27, as a last attempt to correct the axle pinion angles.

Calculation Form

Use this form to record the measurements for calculating ride height and checking pinion angles (all angle measures are in degrees).



	ANGLE	MEASUREMENTS	
		INITIAL	FINAL
1) MEASURE THE RIDE HEIGHT: Ride Height must be within specification: 196 - 216 mm (7.75 - 8.5 in) If ride height is not within specification, it must be corrected before continuing.			
2) MEASURE FORWARD AXLE ANGLE (Relative to the ground)	A		
3) MEASURE THE INTERAXLE SHAFT (Relative to the ground)	B		
4) CALCULATE: B - A = The difference between B and A is value "D"	D		
5) MEASURE THE REAR AXLE ANGLE Relative to the ground	C		
6) CALCULATE: **C - B =** The difference between C and B is value "E"	E		
7) CALCULATE: **D - E =**	± F		

ACTION:	LOWER RIDE HEIGHT	No Adjustment	RAISE RIDE HEIGHT
IF ANGLE "F" IS:	less than -1.5	between -1.5 and 1.5	greater than 1.5

Note: The Air Suspension ride height cannot fall outside the specified tolerance. If the adjustment for angle (F) requires that the air suspension ride height be adjusted outside the specified range, see “Suspension Troubleshooting” page 17.

MEASURE FORWARD AXLE ANGLE (RELATIVE TO FRAME)	SPECIFICATIONS		P		
	Tandem, 6x4	2.5 +0/- 1			
	Single, 4x2	3.5 ± 1			

Note: If angle (P) is not within tolerance, see “Suspension Troubleshooting” page 17.

7229-05-02-01
Rear Spring U-bolt Torque, Adjustment

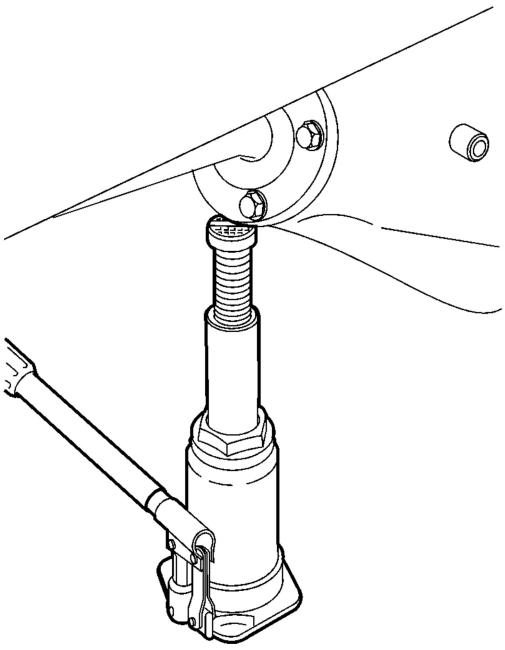
CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Loosening and re-torquing the suspension U-bolts in a particular sequence can influence the axle pinion angle. Both U-bolts on the left and right side on the same axle must be loosened and re-torqued.

Method 1 (Preferred)

1



W7000752

Support the nose of the axle with an adequate jack.

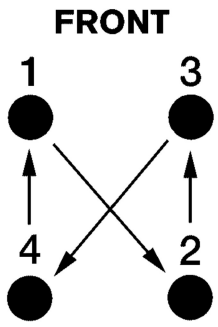
DANGER

Failure to properly support the nose of the axle may result in the axle rolling forward.
Personal injury hazard! Never work under or around a raised vehicle unless it is securely supported on jack stands of adequate rating. Failure to use adequate jack stands can result in the vehicle falling, which can cause serious injury or death to anyone under the vehicle.

2
Loosen the U-bolts enough to allow the bottom plate to be slightly free from the axle housing. Lower the jack slightly, approximately 10–12 mm (.38–0.50 in.).

3
“Snug-up” the U-bolt nuts so that there is no movement in the bottom plate.

4



W7000750

Hand-torque the U-bolt nuts to 413 ± 41 Nm (305 ± 30 ft-lb) for 3/4–16, or 576 ± 57 Nm (425 ± 42 ft-lb) for 7/8–14.

3/4–16:
413 ± 41 Nm
(305 ± 30 ft-lb)
7/8–14:
576 ± 57 Nm
(425 ± 42 ft-lb)

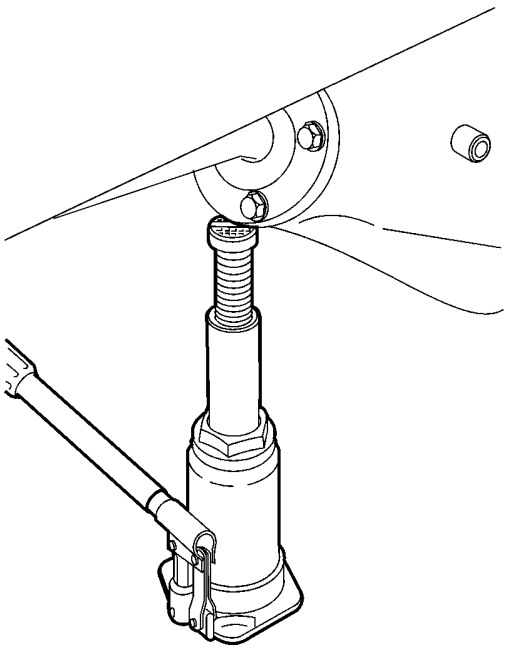
Note: Use the “crossover method” (see pattern above) to evenly tighten the U-bolt nuts. Torque nuts in approximately 100 Nm (75 ft-lb) increments until full torque is obtained.

5
Road-test the vehicle to seat components, then re-torque the U-bolt nuts.

6
Re-perform the procedure: “Air Suspension, Adjustment (Ride Height and Driveline Calculation)” page 21. If axle pinion angles are still outside the specifications, proceed with Method 2.

Method 2

1



W7000752

Support the nose of the axle with an adequate jack.

DANGER

Failure to properly support the nose of the axle may result in the axle rolling forward.**Personal injury hazard!** Never work under or around a raised vehicle unless it is securely supported on jack stands of adequate rating. Failure to use adequate jack stands can result in the vehicle falling, which can cause serious injury or death to anyone under the vehicle.

2

Loosen the U-bolts enough to allow the bottom plate to be slightly free from the axle housing. Lower the jack slightly, approximately 10–12 mm (.38–0.50 in.).

3

"Snug-up" the U-bolt nuts so that there is no movement in the bottom plate.

4

Hand-torque the U-bolt nuts to 413 ± 41 Nm (305 ± 30 ft-lb) for 3/4–16, or 576 ± 57 Nm (425 ± 42 ft-lb) for 7/8–14.

3/4–16:
413 ± 41 Nm
(305 ± 30 ft-lb)
7/8–14:
576 ± 57 Nm
(425 ± 42 ft-lb)

Note: Torquing one U-bolt before the other can influence the axle pinion angle.
Torquing the nuts on the U-bolt on the rear side of the axle housing (left and right) first can ***decrease*** the axle pinion angle.
Torquing the nuts on the U-bolt on the front side of the axle housing (left and right) first can ***increase*** the axle pinion angle.

5

Road-test the vehicle to seat components, then re-torque the U-bolt nuts.

6

Re-perform the procedure: "Air Suspension, Adjustment (Ride Height and Driveline Calculation)" page 21.

7281-05-03-01
Air Suspension Height, Adjustment

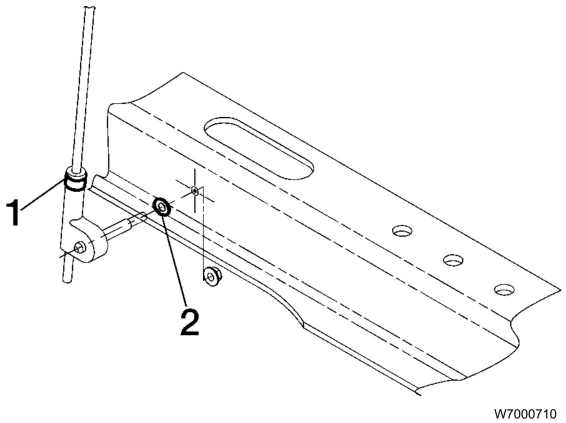
CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

1
The suspension ride height is raised or lowered by adjusting the link rod length.

Note: If the vehicle is equipped with a non-adjustable (fixed length) rod, it must be replaced with an adjustable link rod before performing this procedure. See “Link Rod, Replacement” page 32.

2



W7000710

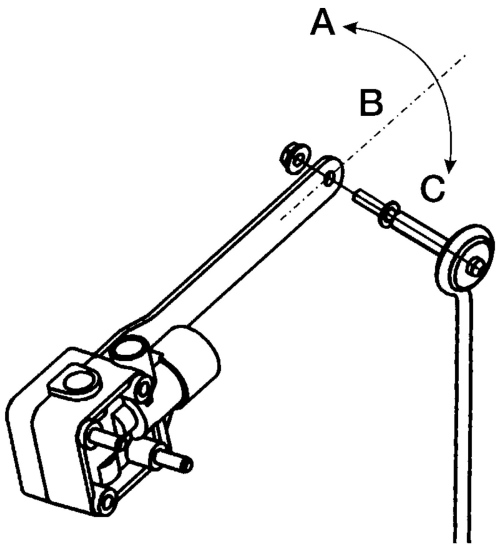
1 clamp
2 washer

Remove the clamp from the lower end of the link rod. Remove the nut and disconnect the lower end of the link rod from the crossbeam (pedestal plate). The upper end of the link rod should remain mounted to the leveling valve arm during the adjustment procedure.

3
Install a new clamp on the rubber mount on the lower end of the link rod.

Note: If using a permanent “crimp” style clamp, you must first remove the rubber mount from the link rod before installing the clamp.

4



W7000746

A - raise
B - neutral
C - lower

Raising ride height:
Raise the ride height by holding the leveling valve arm **upwards** until the ride height is within specifications, as follows:

- 196–216 mm (7.75–8.5 in.)

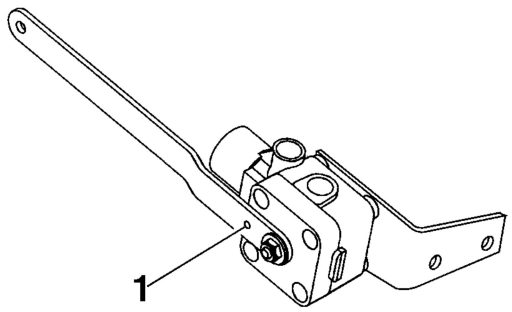
DANGER

Use caution when moving the 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.

OR
Lowering ride height:
Lower the ride height by holding the leveling valve arm **down** until the ride height is within specifications, as follows:

- 196–216 mm (7.75–8.5 in.)

5



W7000766

Return the leveling valve arm to the neutral position. Place the short side of a 5/32 in. Allen wrench through the hole (1) on the leveling valve arm and into the valve. This locks the arm in the neutral position.

Note: If the leveling valve arm is not kept in the neutral position, the ride height may move out of the specified range.

6
Adjust the position of the lower rubber mount on the link rod so that the lower mounting stud is aligned with the hole in the crossbeam (pedestal plate).

7
Reinstall the lower mounting stud of the link rod to the crossbeam. Note the position of the washer. Torque to 10 ± 1.5 Nm (7 ± 1 ft-lb).

10 ± 1.5 Nm (7 ± 1 ft-lb)

Note: Do not crimp or tighten the clamp at the lower end of the link rod at this time.

8
Remove the Allen wrench from the leveling valve.

CAUTION

Failure to remove the Allen wrench will damage the leveling valve and/or link rod.

9
Dump (release) the suspension air (see “Dump Switch Operation” page 15).

DANGER

Stay clear when suspension air is released. Chassis may drop quickly, possibly causing serious injury to anyone under the vehicle.

10
Crank the truck to build up air pressure to check the ride height (see “Air Suspension Ride Height Check (Calculation)” page 21). The ride height must be within specifications, as follows:

196–216 mm (7.75–8.5 in.)

11
Perform the “Interaxle U-joint Angle Cancellation Check (Calculation)” page 23), and the “Forward Axle Pinion Angle to Frame Check” page 25

12
Crimp or tighten clamp at the lower end of the link rod.

Volvo Air Suspension Component Replacement

7281-03-02-08 Rear Suspension Leveling Valve, Replacement

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

CAUTION

Do not try to adjust the leveling valve. Do not take the leveling valve apart. Do not lengthen or shorten the handle on the valve.

Removal

1
Chock the front wheels on vehicle and release the parking brakes.

DANGER

Personal injury hazard. Never work under the vehicle unless the front wheels are securely chocked. Failure to chock the wheels can result in the vehicle rolling, which can cause serious injury or death to anyone under or near the vehicle.

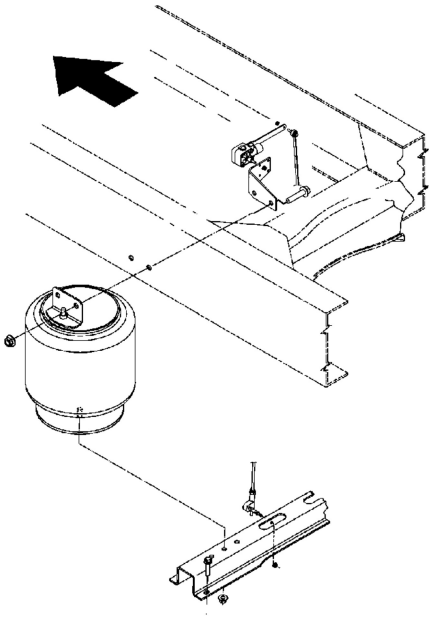
2
Dump (release) the suspension air (see “Dump Switch Operation” page 15).

DANGER

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

3
Remove the rod from the leveling valve arm

4



W7000767

Remove the bolts from the frame that hold the valve mounting bracket in place.

Note: These may be Huck-style fasteners, which require additional effort for removal.

WARNING

Heating the suspension components and frame rail may weaken them. Hot surfaces can also cause serious burns.

5
Note the air line positions and orientation to the fittings in the valve. Disconnect the air lines, and remove the valve.

6
Swap fittings (or position new fittings) to the replacement valve.

7
Swap bracket from former valve to replacement valve. Torque to 10 ± 1.5 Nm (7 ± 1 ft-lb).

10 ± 1.5 Nm (7 ± 1 ft-lb)

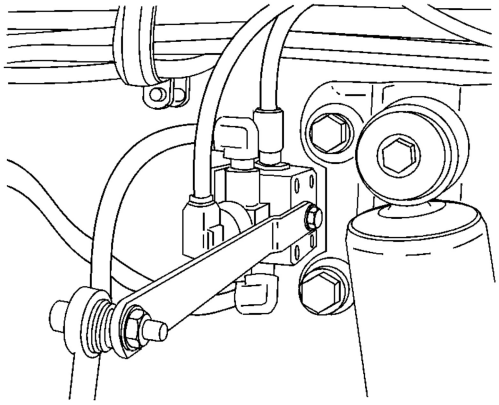
Installation

8
Lay the valve in the frame and install the air lines.

9
Install the bolts through the valve bracket, the frame and the air spring bracket. Torque bolts to 60 ± 10 Nm (44 ± 7 ft-lb).

60 ± 10 Nm (44 ± 7 ft-lb)

10



W7000713

Connect the link rod onto the arm. Torque the rod to 10 ± 1.5 Nm (7 ± 1 ft-lb).

10 ± 1.5 Nm (7 ± 1 ft-lb)

11
When completed, crank the truck to build up air pressure to check the ride height (see “Air Suspension Ride Height Check (Calculation)” page 21).

The ride height must be within the following specifications:

- 196-216 mm (7.75-8.5 in.)

See “Air Suspension Height, Adjustment” page 29.

7647-03-02-02 Link Rod, Replacement

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

1
Dump (release) the suspension air (see “Dump Switch Operation” page 15).

DANGER

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

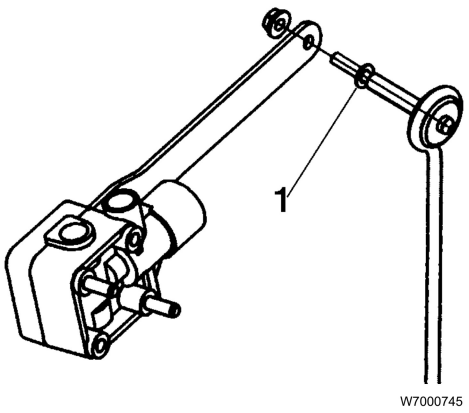
2
Unbolt link rod from leveling valve arm and crossbeam (pedestal). Remove from vehicle.

Installation

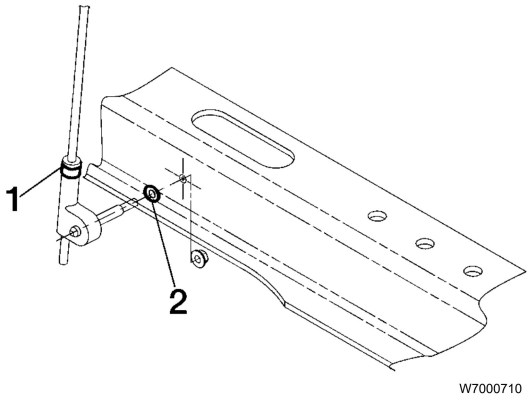
3
Pre-set the length of the replacement link rod to approximately 505 mm (19.88 in.).

Note: Do not crimp or tighten the clamp at the lower end of the link rod at this time.

4



1 washer



1 clamp
2 washer

Install link rod. Note position of washer. Torque both nuts to 10 ± 1.5 Nm (7 ± 1 ft-lb).

10 ± 1.5 Nm (7 ± 1 ft-lb)

Note: Mount in same hole in the crossbeam (pedestal) as the original link rod. Do not crimp or tighten clamp at lower end of the link rod at this time.

5
When completed, crank the truck to build up air pressure to check the ride height (see “Air Suspension Ride Height Check (Calculation)” page 21).

The ride height must be within the following specifications:

- 196-216 mm (7.75-8.5 in.)

See “Air Suspension Height, Adjustment” page 29.

6
Crimp or tighten clamp at the lower end of the link rod.

7262-03-02-03 Crossbeam (Pedestal), Replacement

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

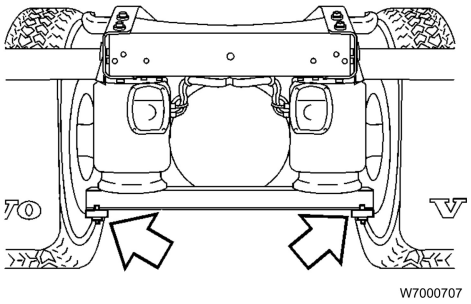
1
Raise the rear suspension and support the frame with jack stands, maintaining the approximate ride height. Dump (release) the suspension air to relieve pressure off the air springs.

DANGER

Stay clear when suspension air is released. Chassis may drop quickly, possibly causing serious injury to anyone under the vehicle.

2
Remove the nuts that hold the air bags to the crossbeam (pedestal plate). Push the air springs out of the crossbeam and forward.

3



Remove the nuts and bolts that hold the crossbeam to the Z-springs and remove the crossbeam.

Installation

4
Install the crossbeam to the Z-spring with the nuts and bolts. Torque the bolts to 105 ± 20 Nm (77 ± 15 ft-lb).

105 ± 20 Nm (77 ± 15 ft-lb)

5
Install the air springs back onto the crossbeam and torque the nuts to 50 ± 10 Nm (37 ± 7.5 ft-lb).

50 ± 10 Nm (37 ± 7.5 ft-lb)

CAUTION

Over-torque will damage the air spring.

6
When completed, jack the rear of the truck up, remove the jack stands and lower the vehicle. Crank the truck to build air pressure to raise the air suspension.

7224-03-02-03 Z-Spring, Replacement

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

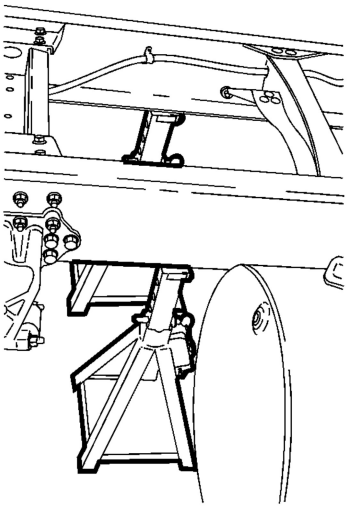
Not Included:

- Spring Center Bolt Replacement
- Spring Leaf Replacement (Each Spring)

Removal

1
Remove isolator (spring roller) from spring hanger (frame) bracket. This is located under hook end of Z-spring.

2



W7000718

Chock wheels on vehicle. Jack up vehicle and place jack stands under frame rails. Secure jack stands and lower vehicle.

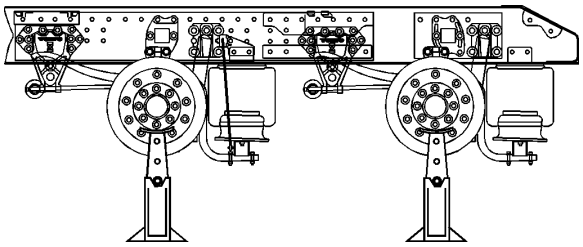
Note: Follow the “Guidelines for Working on the Volvo Air Suspension” page 19.

DANGER

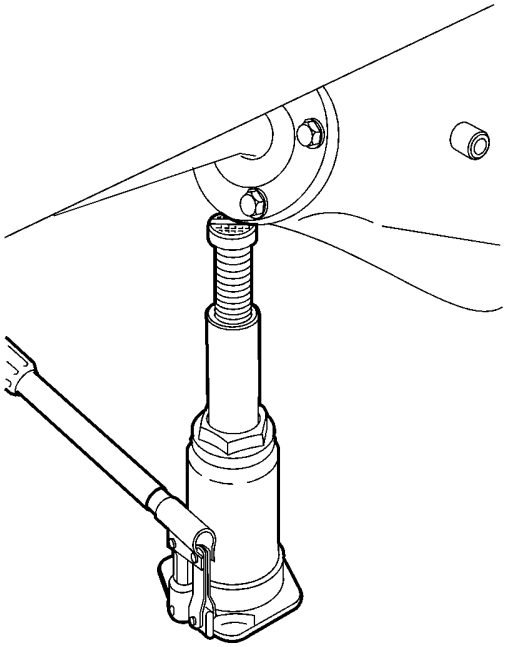
Personal injury hazard. Never work under the vehicle unless the front wheels are securely chocked. Failure to chock the wheels can result in the vehicle rolling, which can cause serious injury or death to anyone under the vehicle.

3
Remove wheels and tires on axle (or axles) to be worked on.

4



W7000763



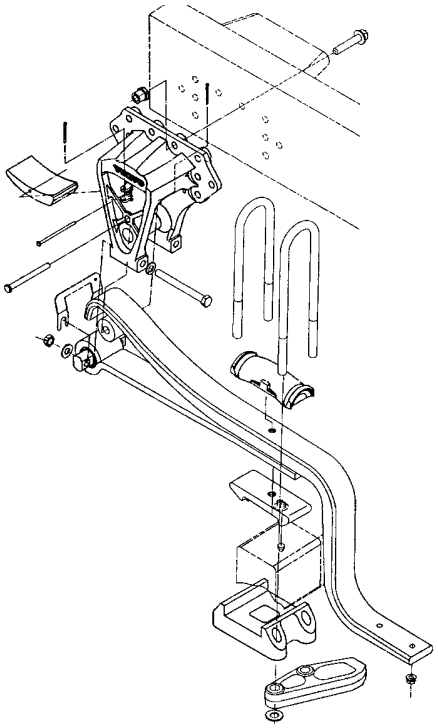
W7000752

Jack up vehicle and place jack stands under axle(s) being worked on. While lowering axle onto jack stands, support the nose of the axle with a bottle jack to prevent axle from rolling forward.

⚠ DANGER

Failure to properly support the nose of the axle may result in the axle rolling forward.
Personal injury hazard! Never work under or around a raised vehicle unless it is securely supported on jack stands of adequate rating. Failure to use adequate jack stands can result in the vehicle falling, which can cause serious injury or death to anyone under the vehicle.

5



W7000715

Remove nuts from U-bolts, then remove bottom plate, U-bolts, and top (clip) plate. Leave lower shock bracket attached to shock absorber, but move bracket clear of work area.

6
Remove bolts from crossbeam (pedestal plate).

7
Remove Z-spring.

Installation

8
Install Z-spring into place.

9
Install bolts to crossbeam. Leave loose; do not torque at this time.

10
Install top (clip) plate, U-bolts, and bottom plate. Reposition lower shock bracket. Snug up U-bolt nuts, but do not torque at this time.

Note: Refer to "Top and Bottom Plate, Replacement" page 44, for information on positioning the top and bottom plates.

11
Raise vehicle and remove jack stands supporting the axle(s).

12
Install wheels and tires. Torque nuts to 645 ± 35 Nm (475 ± 25 ft-lb.) — 645 ± 35 Nm (475 ± 25 ft-lb)

13
Raise vehicle and temporarily remove remaining jack stands supporting the frame rails. Lower the vehicle to the ground.

14
Crank the vehicle to build air pressure to raise the air suspension.

15
Reinstall the isolator (spring roller) with retaining pin and split pin.

16
Support the frame with jack stands (maintaining the approximate normal ride height). Deflate the air springs to relieve pressure off the Z-spring.

17
Center the Z-spring within the spring hanger (frame) bracket.

Note: It may be necessary to temporarily position a shim between the left side of the spring and the leg of the spring hanger (frame) bracket to keep the Z-spring centered during the U-bolt nut torque procedure.

18
Hand-torque the U-bolt nuts to 413 ± 41 Nm (305 ± 30 ft-lb) for 3/4-16, or 576 ± 57 Nm (425 ± 42 ft-lb) for 7/8-14.

Note: To ensure proper torque, refer to "Rear Spring U-bolt Torque, Adjustment" page 27.

3/4-16: 413 ± 41 Nm (305 ± 30 ft-lb)
7/8-14: 576 ± 57 Nm (425 ± 42 ft-lb)

19
Torque nuts for crossbeam mounting bolts to 105 ± 20 Nm (77 ± 15 ft-lb).

105 ± 20 Nm (77 ± 15 ft-lb)

20
Raise the vehicle and remove jack stands supporting frame rails.

21
Crank the truck to build air pressure to raise the air suspension. Perform the procedures for "Air Suspension, Adjustment (Ride Height and Driveline Calculation)" page 21.

Note: Vehicle realignment may be required. See "Guidelines for Working on the Volvo Air Suspension" page 19.

6521-03-02-15 V Torque Rod Frame Bracket, Replacement (Upper)

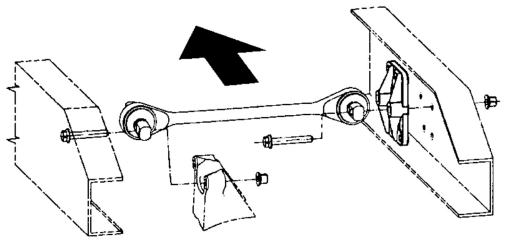
CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

1
Remove any wires or air line clippings from torque rod.

2



W7000716

Remove the two (2) bolts through torque rod at frame rail side bracket.

3
Remove the two (2) bolts through torque rod at axle housing bracket and remove the torque rod.

4
Remove the four (4) fasteners to the torque rod bracket at the frame rail and remove the bracket.

Note: These may be Huck-style fasteners, which require additional effort for removal.

WARNING

Heating the suspension components and frame rail may weaken them. Hot surfaces can also cause serious burns.

Installation

5
Install four (4) bolts to torque rod bracket at frame rail.

Note: Use only approved fasteners.

6
Install two (2) bolts through torque rod at axle housing bracket.

7
Install two (2) bolts through torque rod at frame rail side bracket.

8
Torque the bolts to torque rod and torque rod bracket to 271 ± 27 Nm (200 ± 20 ft-lb).

271 ± 27 Nm (200 ± 20 ft-lb)

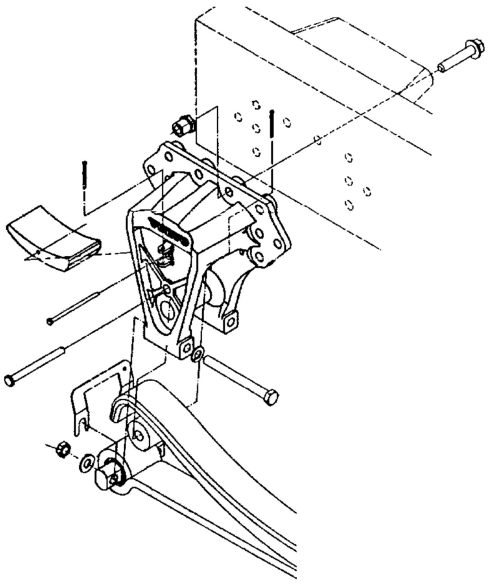
9
Re-attach any wires or air line clippings to the torque rod.

7222-03-02-01 Spring Hanger Bracket, Replacement

> **CAUTION**
>
> Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

1

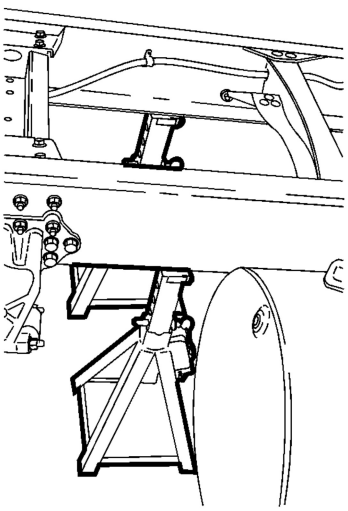


W7000720

Remove the retaining pin and isolator (spring roller) from spring hanger (frame) bracket (located under hook end of Z-spring).

Note: Follow the “Guidelines for Working on the Volvo Air Suspension” page 19.

2



W7000718

Place jack stands on each side of truck and deflate air bags to relieve pressure off of the Z-spring.

3

Remove the nuts and bolts from the radius spring.

4

Remove nuts from the bolts on the spring hanger.

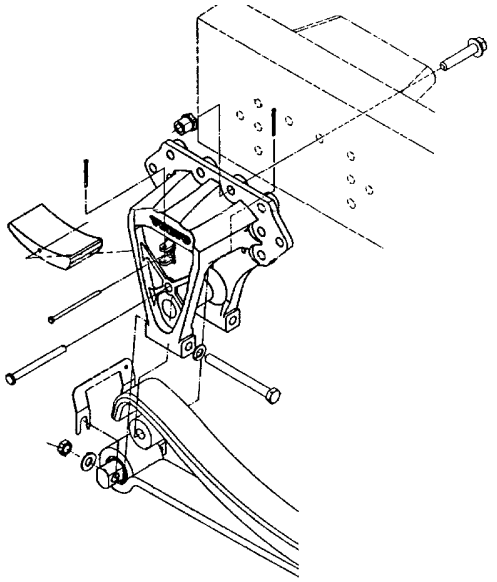
Note: These may be Huck-style fasteners, requiring additional effort for removal.

> **WARNING**
>
> Heating the suspension components and frame rail may weaken them. Hot surfaces can also cause serious burns.

5

Raise the rear of the truck to relieve pressure off the spring hanger bolts.

6



W7000720

Remove spring hanger bolts in front and behind the bracket.

7
Remove hanger.

8
Remove the split pin and retaining pin holding the wear plate (pad) into the spring hanger (frame) bracket. Remove the wear plate.

Note: We recommend replacing wear plates (pads). They should be replaced in pairs (left and right) on the same axle. See "Wear Plate (Pad), Replacement" page 40.

Installation

9
Install the wear plate (pad), add retaining pin and replacement split pin in the spring hanger (frame) bracket.

Note: New plates (pads) should be installed. They should be replaced in pairs (left and right) on the same axle. See "Wear Plate (Pad), Replacement" page 40.

10
Work the spring hanger bracket back onto the Z-spring.

11
Install all bolts to reattach the spring hanger and any other bolts that were removed to get to spring hanger. Torque spring hanger bolts to 271 ± 27 Nm (200 ± 20 ft-lb).

271 ± 27 Nm (200 ± 20 ft-lb)

Note: Use only approved fasteners.

12
Install bolts for radius spring. Torque radius spring bolts to 275 ± 45 Nm (203 ± 33 ft-lb).

275 ± 45 Nm (203 ± 33 ft-lb)

13
Install retaining pin and isolator (spring roller) in spring hanger (frame) bracket, under Z-spring.

14
Raise the vehicle and remove jack stands supporting the frame rails. Lower the vehicle to the ground.

15
Crank the truck to build air pressure to raise the air suspension.

16
Ride height and pinion angle may require adjustment. See "Air Suspension, Adjustment (Ride Height and Driveline Calculation)" page 21.

Note: Vehicle wheel realignment may be required. See "Guidelines for Working on the Volvo Air Suspension" page 19.

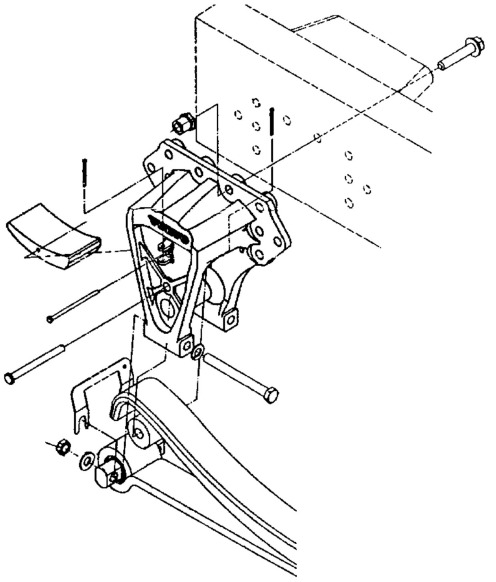
7269-03-02-06
Wear Plate (Pad), Replacement

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

1



W7000720

Remove the retaining pin and isolator (spring roller) from spring hanger (frame) bracket (located under hook end of Z-spring).

Note: Follow the “Guidelines for Working on the Volvo Air Suspension” page 19.

Note: It is strongly recommended that the wear plates (pads) be replaced in pairs (left and right side) on the same axle.

2

Chock front wheels on vehicle.

Note: Follow the “Guidelines for Working on the Volvo Air Suspension” page 19.

DANGER

Personal injury hazard. Never work under the vehicle unless the front wheels are securely chocked. Failure to chock the wheels can result in the vehicle rolling, which can cause serious injury or death to anyone under the vehicle.

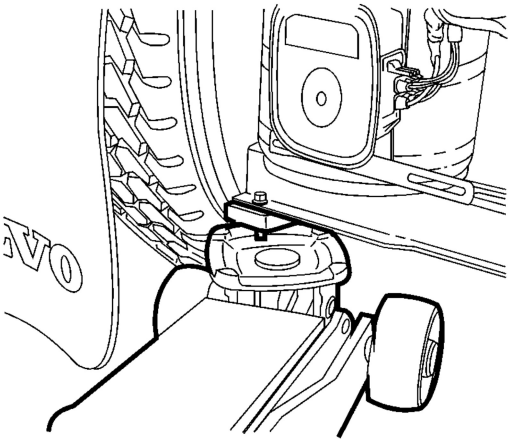
3

Dump (release) the suspension air (see “Dump Switch Operation” page 15).

DANGER

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

4



W7000725

Jack the vehicle from under the rear of the Z-spring at the crossbeam (pedestal plate) mounting until there is sufficient gap between the wear plate and Z-spring to remove the wear plate.

Note: Jacking both the left and right sides simultaneously will help obtain a sufficient gap. Also, lifting (and properly supporting) the rear of the chassis may increase the size of the gap.

5
Remove the split pin and the retaining pin holding the wear plate into the spring hanger (frame) bracket.

6
Pry out the old wear plate.

Installation

7
Install the replacement wear plate into the spring hanger (frame) bracket.

Note: The thick end of the wear plate is always positioned to the rear of the vehicle.

8
Install the retaining pin and a replacement split pin into the spring hanger (frame) bracket to hold the installed wear plate.

9
Remove the supports and lower the vehicle to the ground.

10
Crank truck to build air pressure to raise the air suspension.

11
Install the isolator (spring roller), retaining pin, and a replacement split pin in the spring hanger (frame) bracket, under the Z-spring.

12
Ride height and axle pinion angle may require adjustment. See “Air Suspension, Adjustment (Ride Height and Driveline Calculation)” page 21.

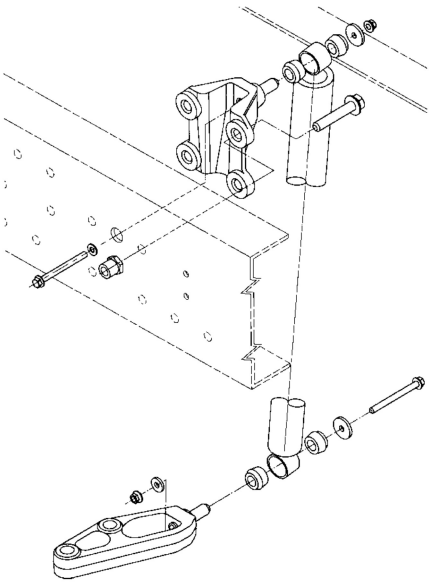
7614-03-02-06 Rear Shock Absorber Bracket, Replacement (Upper)

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

1



W7000744

Remove upper shock mounting bolt. Remove shock and position out of the work area.

2
Remove frame fasteners from upper shock bracket.

Note: These may be Huck-style fasteners, requiring additional effort for removal.

WARNING

Heating the suspension components and frame rail may weaken them. Hot surfaces can also cause serious burns.

3
Remove upper shock bracket.

Installation

4
Install the shock bracket. Torque fasteners to 271 ± 27 Nm (200 ± 20 ft-lb). 271 ± 27 Nm (200 ± 20 ft-lb)

Note: Use only approved fasteners.

5
Install shock, bushings, and upper shock mounting bolt. Torque bolt to 47 ± 7 Nm (35 ± 5 ft-lb). 47 ± 7 Nm (35 ± 5 ft-lb)

Note: When replacing shocks, use only Volvo-approved components (shocks and bushings).

7614-03-02-03 Rear Shock Absorber Bracket, Replacement (Lower)

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

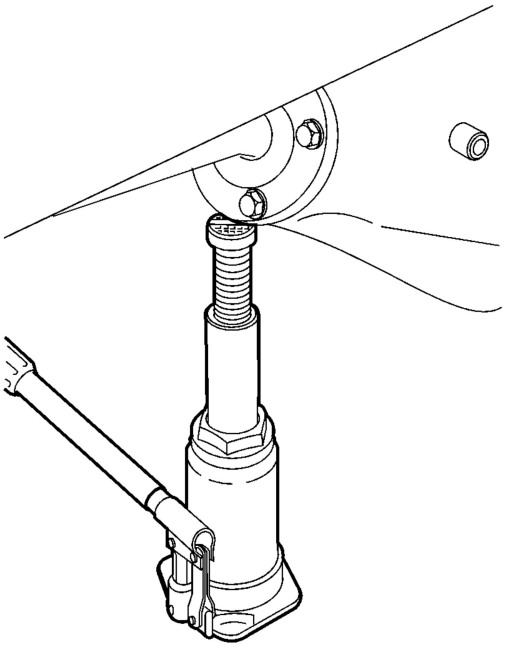
1
Chock front wheels on vehicle and remove nuts from U-bolts on axle to be worked on.

Note: Follow the “Guidelines for Working on the Volvo Air Suspension” page 19.

DANGER

Personal injury hazard. Never work under the vehicle unless the front wheels are securely chocked. Failure to chock the wheels can result in the vehicle rolling, which can cause serious injury or death to anyone under the vehicle.

2



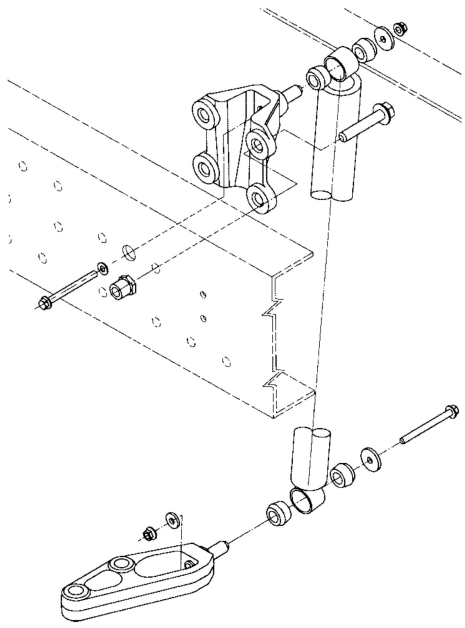
W7000752

Support the nose of the axle with an adequate jack.

DANGER

Personal injury hazard. Never work under or around a raised vehicle unless it is securely supported on jack stands of adequate rating. Failure to use adequate jack stands can result in the vehicle falling, which can cause serious injury or death to anyone under the vehicle.

3



W7000744

Remove nuts from rear U-bolt. Loosen bolts from front U-bolt, but do not remove.

4
Remove lower shock bracket from U-bolt.

5
Remove lower shock mounting bolt and remove lower shock bracket.

Installation

6

Install shock, bushings, and lower shock mounting bolt. Torque bolt to 47 ± 7 Nm (35 ± 5 ft-lb).	47 ± 7 Nm (35 ± 5 ft-lb)

Note: When replacing shocks, use only Volvo-approved components (shocks and bushings).

7
Install lower shock bracket. Install U-bolts and snug up the U-bolt nuts.

8

Hand-torque the U-bolt nuts to 413 ± 41 Nm (305 ± 30 ft-lb) for 3/4-16, or 576 ± 57 Nm (425 ± 42 ft-lb) for 7/8-14.	3/4-16: 413 ± 41 Nm (305 ± 30 ft-lb) 7/8-14: 576 ± 57 Nm (425 ± 42 ft-lb)

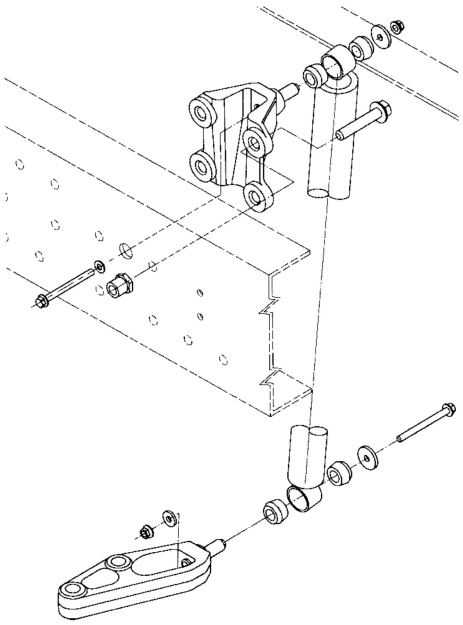
Note: To ensure proper torque, refer to “Rear Spring U-bolt Torque, Adjustment” page 27.

7612-03-02-01 Rear Shock Absorber, Replacement

> **CAUTION**
>
> Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

1



W7000744

Remove lower shock mounting bolt.

Note: Follow the “Guidelines for Working on the Volvo Air Suspension” page 19.

2
Remove upper shock mounting bolt and remove shock.

Installation

3

Install shock and bushings. Torque bolts to 47 ± 7 Nm (35 ± 5 ft-lb).	47 ± 7 Nm (35 ± 5 ft-lb)

Note: When replacing shocks, use only Volvo-approved components (shocks and bushings).

7222-03-02-07 Top and Bottom Plate, Replacement

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

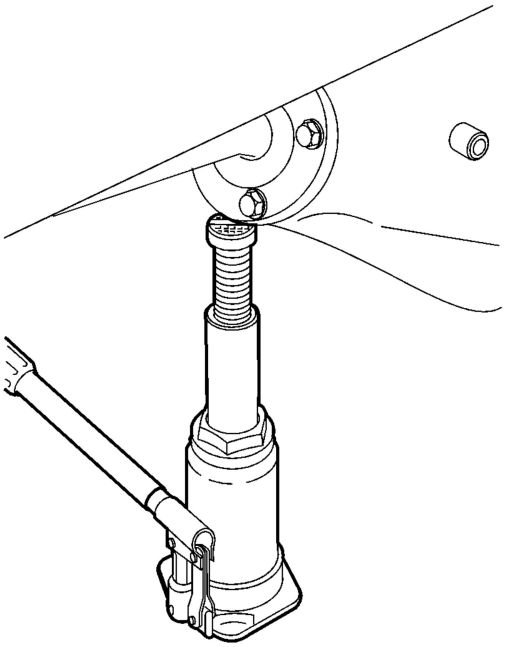
1
Chock front wheels on vehicle.

Note: Follow the “Guidelines for Working on the Volvo Air Suspension” page 19.

DANGER

Personal injury hazard. Never work under the vehicle unless the front wheels are securely chocked. Failure to chock the wheels can result in the vehicle rolling, which can cause serious injury or death to anyone under or near the vehicle.

2



W7000752

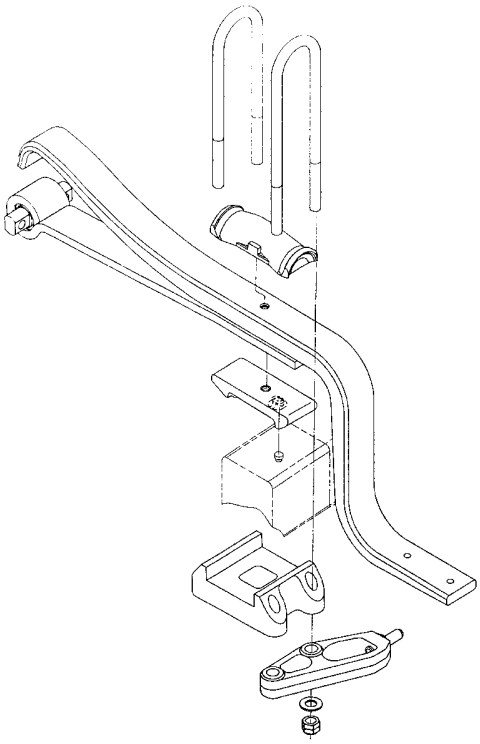
Support the nose of the axle with an adequate jack.

DANGER

Personal injury hazard. Never work under or around a raised vehicle unless it is securely supported on jack stands of adequate rating. Failure to use adequate jack stands can result in the vehicle falling, which can cause serious injury or death to anyone under the vehicle.

3
Remove nuts from the U-bolts, then remove the bottom plate and U-bolts. Leave lower shock bracket attached to shock absorber, but position bracket clear of the work area.

4



W7000747

Remove the top plate.

Installation

5
Install the top plate.

Note: Make sure the alignment pin on the bottom of the top plate is engaged into the pocket on the top surface of the Z-spring.

For models using an earlier-style top plate (without an alignment pin), follow steps a-e to locate where the top plate should be placed after the radius spring and Z-spring are resting together on the axle:

a. Hold/block the correct lower plate to the axle housing underside and insert a U-bolt over the top plate hanging down through the holes in the lower plate.

b. Using a small square, make sure that the U-bolt threads sticking through the hole are perpendicular to the surface bottom.

c. The top plate should be positioned so that it is square with the U-bolt, and so that the bolt and curve line up.

d. Use chalk or marker pen to mark the Z-spring to identify the location for the plate that lines up the clip groove with the U-bolt.

e. Snug up the U-bolts before tightening with a torque wrench (see “Rear Spring U-bolt Torque, Adjustment” page 27).

6
Install the U-bolts.

Note: The longer U-bolt is positioned to the rear side of the axle housing.

7
Install the bottom plate.

Note: Install with the arrow (located on the bottom of the plate) pointing towards the front of the truck.

8
Reposition the lower shock bracket on the U-bolt.

9
Snug up the U-bolt nuts, but do not torque.

10
Loosen the mounting bolts for the crossbeam (pedestal plate) to the Z-spring.

11
Remove the jack stands and lower the vehicle to the ground.

12
Crank the truck to build air pressure to raise the air suspension.

13
Support the frame (maintaining the approximate normal ride height). Deflate the air springs to relieve pressure off of the Z-springs.

14
Center the Z-spring within the spring hanger (frame) bracket.

Note: It may be necessary to temporarily position a shim between the left side of the spring and the leg of the spring hanger (frame) bracket to keep the Z-spring centered during the U-bolt nut torque procedure.

15
Hand-torque the U-bolt nuts to 413 ± 41 Nm (305 ± 30 ft-lb) for 3/4-16, or 576 ± 57 Nm (425 ± 42 ft-lb) for 7/8-14.

Note: To ensure proper torque, refer to “Rear Spring U-bolt Torque, Adjustment” page 27.

3/4-16:
413 ± 41 Nm
(305 ± 30 ft-lb)
7/8-14:
576 ± 57 Nm
(425 ± 42 ft-lb)

16
Tighten the nuts for crossbeam mounting bolts to the Z-spring. Torque to 105 ±± 20 Nm (77 ± 15 ft-lb).

105 ± 20 Nm
(77 ± 15 ft-lb)

17
Raise the vehicle and remove jack stands supporting frame rails.

18
Crank the truck to build air pressure to raise the air suspension.

Note: Ride height and pinion angle may require adjustment. See “Air Suspension, Adjustment (Ride Height and Driveline Calculation)” page 21.

7251-03-02-02
Air Spring, Replacement (Front)

CAUTION

Before beginning any service procedure on the Volvo Air Suspension, be sure to read and understand “Guidelines for Working on the Volvo Air Suspension” page 19.

Removal

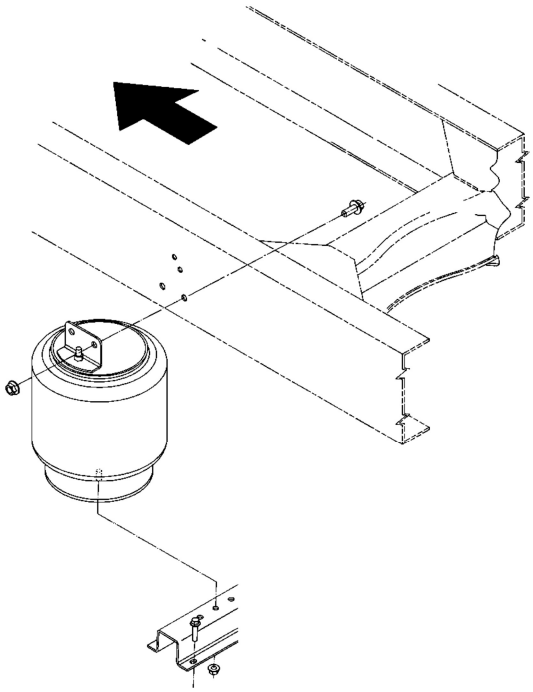
1
Support the frame (maintaining the approximate normal ride height). Deflate air springs.

2
Remove air lines from air springs.

DANGER

Pneumatic components store compressed air and can separate violently during disassembly or removal. Before servicing any part of the pneumatic (air) system, completely release the air pressure. Failure to do so can result in serious personal injury or death.

3



W7000719

Remove the 2 upper frame bolts and bottom nut.

4
Remove the air spring from the chassis.

5
Remove the fitting from the air spring.

Installation

6
Install the fitting in the air spring.

7
Install the air spring back onto the frame and crossbeam (pedestal plate).

8
Torque frame mounting bolts to 271 ± 27 Nm (200 ± 20 ft-lb). 271 ± 27 Nm (200 ± 20 ft-lb)

9
Torque lower nut to 50 ± 10 Nm (37 ± 7.5 ft-lb). 50 ± 10 Nm (37 ± 7.5 ft-lb)

CAUTION

Over-torque will damage air spring.

10
Install the air lines into the air springs.

11
Crank truck to build pressure to inflate the air suspension. Remove supports from frame.

12
Check ride height (see “Air Suspension, Adjustment (Ride Height and Driveline Calculation)” page 21

Operation Numbers

VOLVO

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