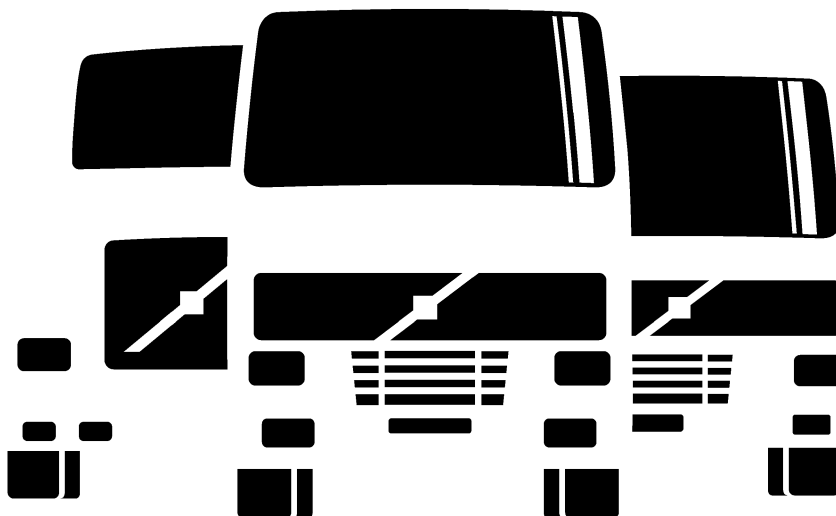


# Service Manual Trucks

Group **721–500**

Front Springs

VN,VHD



# Foreword

The descriptions and service procedures contained in this manual are based on designs and methods studies carried out up to August 2000.

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 S.R.T. (Standard Repair Time).

Service procedures which do not include an operation number in the title are for general information and no reference is made to an S.R.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-TSP141989**

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# General

## Front Spring Suspension

This service information describes the design, function, operation, and service procedures for the front springs and associated components used on the Volvo VN/VHD series vehicles.

The front spring suspension supports the weight of the vehicle and isolates it from vibrations caused by irregularities in the road surface. It transmits the force of that weight to the front wheels through the springs and the front axle. The major components of the front spring suspension are the springs, spring hangers, and the shock absorbers. Associated components consist of the shackles, spring pins, U-bolts, and wedges.



# Specifications

## Front Springs

VN

## Springs

Length .....	1335 mm (52.5 in.)
Type/Axle Load	
Parabolic .....	5.5 metric ton (12,000 lb.)
Parabolic .....	5.7 metric ton (12,500 lb.)
Parabolic .....	6.0 metric ton (13,200 lb.)
Parabolic .....	6.7 metric ton (14,600 lb.)
Parabolic .....	7.3 metric ton (16,600 lb.)

## Shock Absorber

Manufacturer .....	Sachs
--------------------	-------

## Spring Bushing

Axial play (max) .....	5mm (.197 in.)
------------------------	----------------

## Torque Requirements

Spring pin pinch bolts .....	85 ± 15 Nm (63 ± 11 ft-lb)
U-bolts .....	420 ± 50 Nm (311 ± 37 ft-lb)
Spring hanger mounting bolts .....	200 ± 30 Nm (148 ± 22 ft-lb)
Shock absorber mounting bolts .....	275 ± 45 Nm (204 ± 33 ft-lb)
Rubber spring spacer .....	110 ± 15 Nm (81 ± 11 ft-lb)

## VHD

### Springs

Length .....	1335 mm (52.5 in.)
Type/Axle Load	
Parabolic .....	5.7 metric ton (12,500 lb.)
Parabolic .....	6.7 metric ton (14,600 lb.)
Parabolic & Multi-Leaf .....	7.5 metric ton (16,500 lb.)
Multi-Leaf .....	8.6 metric ton (18,800 lb.)
Parabolic & Multi-Leaf .....	9.1 metric ton (20,800 lb.)
Parabolic & Multi-Leaf .....	10.0 metric ton (22,800 lb.)

### Shock Absorber

Manufacturer .....	Arvin
--------------------	-------

### Spring Bushing

Axial play (max) .....	5mm (.197 in.)
------------------------	----------------

### Torque Requirements

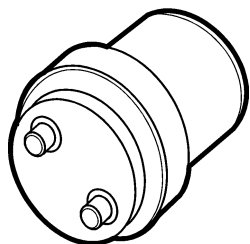
Spring pin pinch bolts .....	85 ± 15 Nm (63 ± 11 ft-lb)
U-bolts (M20/M22 fine thred) .....	420 ± 50 Nm (311 ± 37 ft-lb)
Spring hanger mounting bolts .....	200 ± 30 Nm (148 ± 22 ft-lb)
Shock absorber mounting bolts .....	275 ± 45 Nm (204 ± 33 ft-lb)
U-bolts (M20 fine threds) .....	550 ± 25 Nm (406 ± 18 ft-lb)
U-bolts (M22 fine threds) .....	600 ± 25 Nm (422 ± 18 ft-lb)



# Tools

## Special Tools

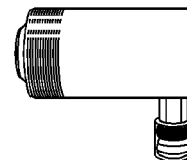
The following special tools are required for work on the Front Springs. The tool can be ordered from Volvo Trucks North America.



W0001207

**9996791**

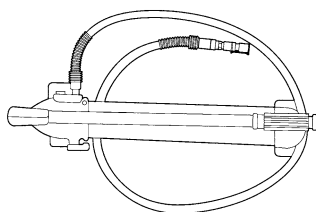
Spring Pin Tool



W0001247

**9992671**

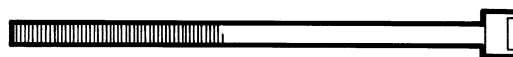
Hydraulic cylinder



W0001258

**9992670**

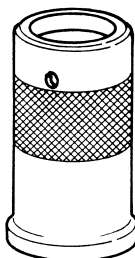
Hydraulic hand pump



W0001362

**9996041**

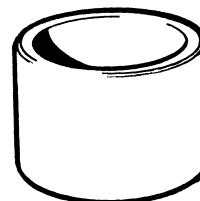
Spindle



W0001364

**9992641**

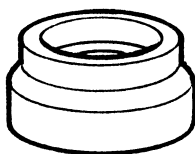
Drift



W0001365

**9996154**

Drift



W0001366

**9996632**

Drift



W0001363

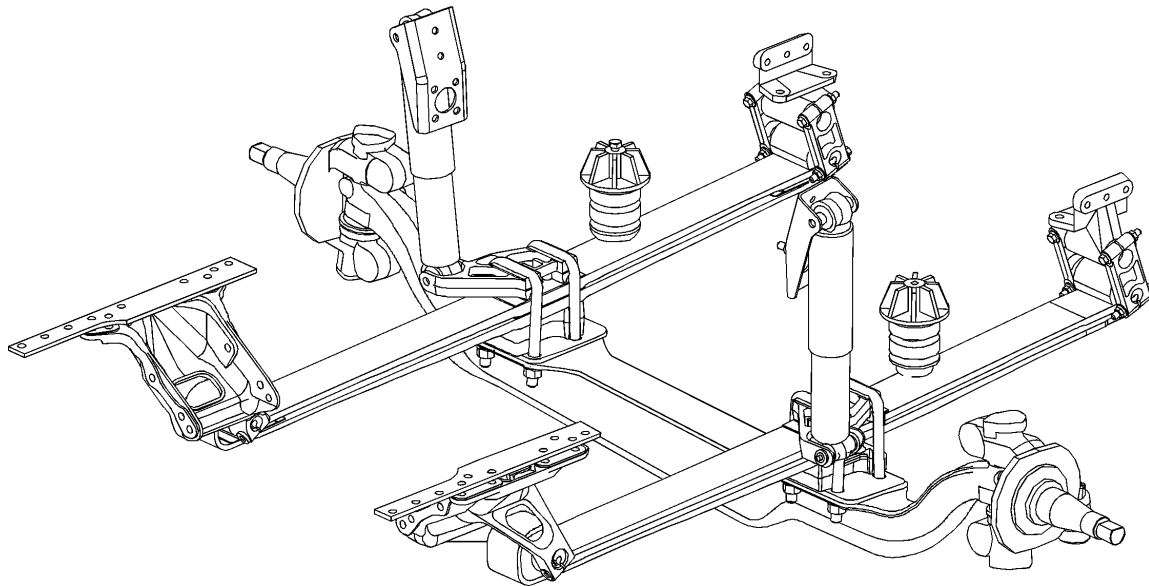
**9999210**

Nut



# Design and Function

## Front Springs



W6000827

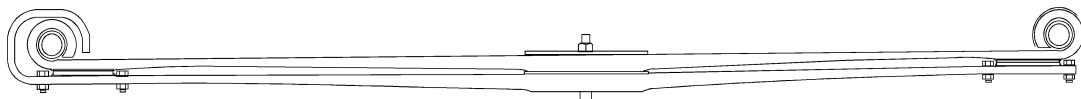
The front springs support the weight and load of the vehicle above the front axle. They also provide the method to attach the front axle to the frame and provide stability to the front axle against sway.

A thin plate at the center and on top of each spring keeps them separated in the middle. A rubber cushion is mounted to both ends of the lower leaf to reduce friction by separating the ends. The springs are held together by a center bolt.

The springs are attached to the front hanger by a threaded pin. The pin inserts through the hanger and through a bushing in the curl in the top leaf. The rear spring pin goes through a shackle on each side of the

spring. The shackles attach to the rear hanger with the same type pin as used on the front hanger.

Parabolic leaf springs have the tendency to appear flat when they are loaded. This condition is often mistaken as evidence of a bad spring. The criteria for judging if a spring is acceptable for use is the **spring height**. Spring height is the vertical distance from the straight line between the support points of the spring and the compression face of the last leaf or spacer. In order to properly measure spring height the spring must be removed from the vehicle and have a known load applied. A procedure to test spring deflection is provided. See "Front Spring Height, Checking" page 23.

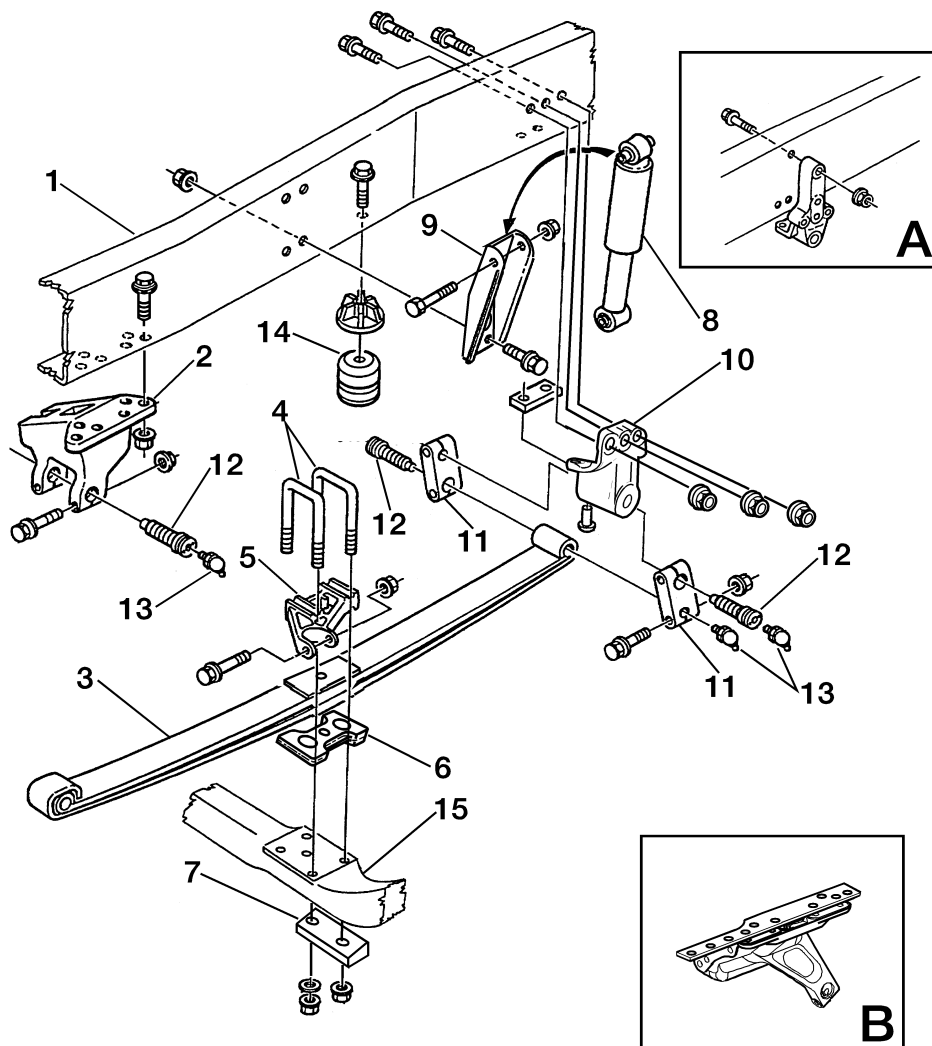


W6000811

2 leaf parabolic spring (loaded)

# Front Spring Suspension, Exploded View

## VN Models



- 1 Frame rail
- 2 Front bracket (VNM)
- 3 Parabolic spring (2 leaf)
- 4 U-bolt
- 5 Shock absorber bracket (lower)

- W6000641
- 6 Wedge
  - 7 Wedge washer
  - 8 Shock absorber
  - 9 Shock absorber bracket (upper)
  - 10 Rear hanger (266 mm)

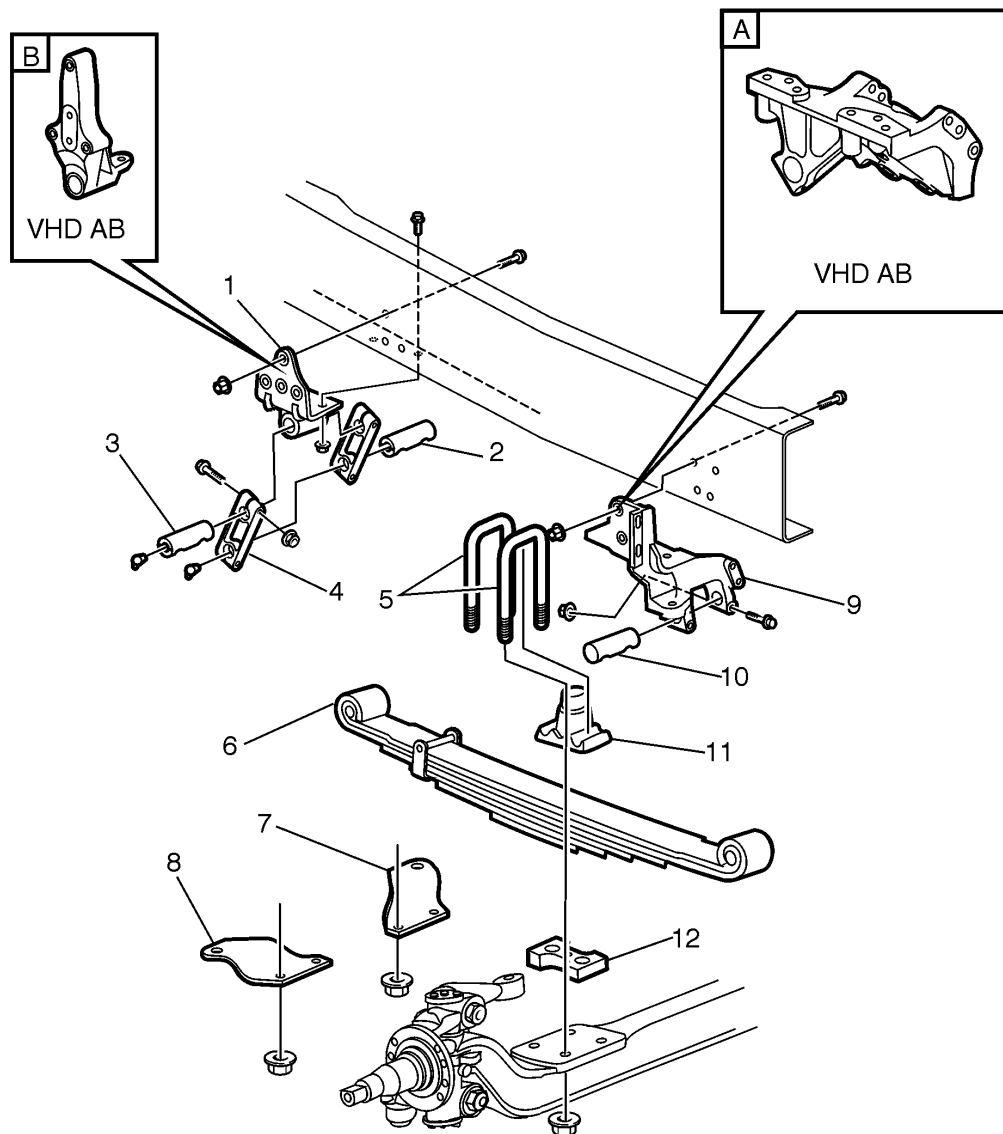
- 11 Shackle
- 12 Spring pin
- 13 Grease fitting
- 14 Rubber spring
- 15 Axle

### Insets

- A Rear hanger for 300 mm frame rail (in place of of item 10)
- B Front hanger for VNL (in place of item 2)

# Front Spring Suspension, Exploded View

## VHD Models



W7001072

- 1 Hanger-rear
- 2 Spring pin
- 3 Spring pin
- 4 Spring shackle
- 5 U-Bolts
- 6 Spring assembly

### Insets

- A Front hanger for Axle Back VHD (in place of item 1)
- B Rear hanger for Axle Back VHD (in place of item 9)

- 7 Hanger
- 8 Hanger
- 9 Hanger-front
- 10 Spring pin
- 11 Bump stop
- 12 Wedge/Spacer

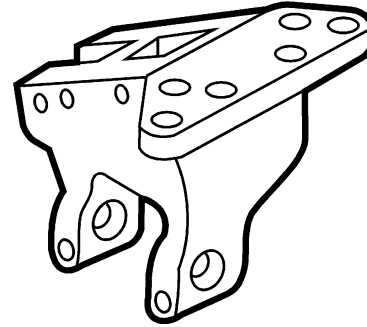
## Front Hangers

The springs are suspended from the frame by the spring hangers. There are four different front hangers and two different rear hangers. The front hanger design used depends on the vehicle model, the frame height (266 mm or 300 mm), and the load rating of the vehicle. The rear hanger design used depends on the vehicle frame height.

The front hanger performs two functions. First, it is the attachment point for the front engine crossmember (engine support). Second, it is the attachment point for the forward end of the front springs.

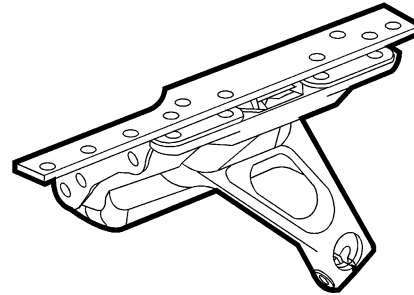
### Example:

The VNL, which is longer than the VNM, uses a front hanger that is angled toward the rear of the vehicle, providing a setback axle characteristic. The VNM front hanger drops directly beneath the front engine crossmember to position the front axle further forward. This increases the smoothness of the ride on highway type vehicles.



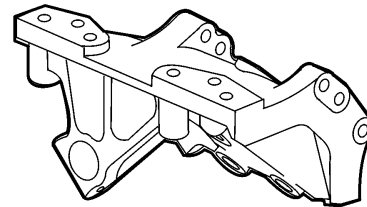
W6000814

Front hanger for VNM



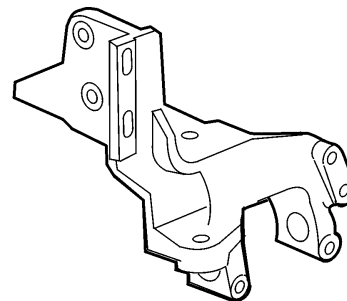
W6000813

Front hanger for VNL



W7001017

Front hanger-axle back for VHD

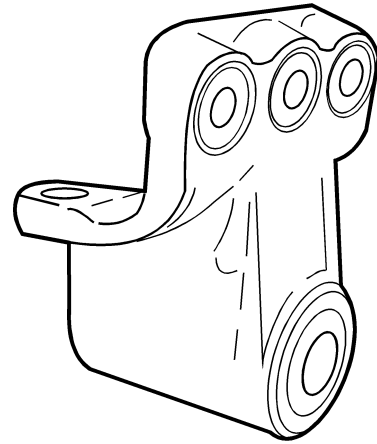


W7001015

Front hanger-axle forward for VHD

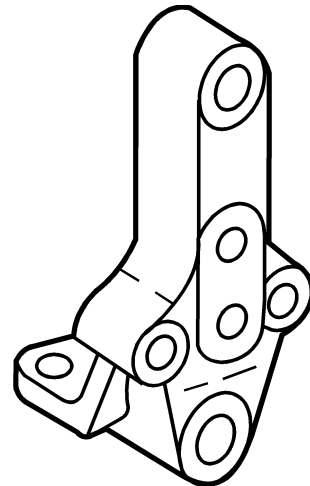
## Rear Hangers

The rear hangers used for the front springs is dependent upon the height of the frame. The hanger is bolted through the frame web and the frame flange. It has a large hole near the bottom that accommodates a bushing and a spring pin. The pin is inserted through the bushing and into a shackle on each end. The other end of the shackles are connected to a similar pin that is inserted through a bushing in the spring.



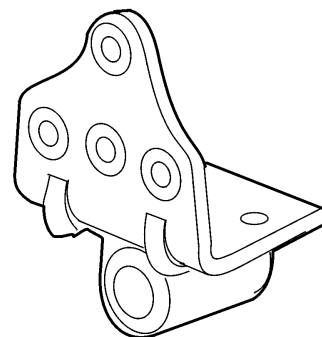
W6000818

Rear hanger for 266 mm frame height-for VN



W6000817

Rear hanger for 300 mm frame height-axle Back-for VHD



W7001014

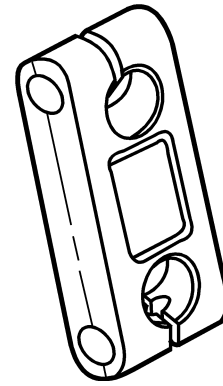
Spring hanger rear-axle forward-for VHD

## Shackles and Pins

The rear of the spring is hung from the rear hanger by two shackles and two spring pins. The pins are inserted through each shackle and are threaded into the bushing that is in the spring and in the hanger. There are two types of pins used. The pin that supports the front of the spring and the upper pin on the rear have a passage that is drilled about halfway into the pin from the end with the slots for the spring pin tool. At the bottom of the drilled passage is a hole perpendicular to the passage. The passage and hole allow grease to be pumped to the threaded area of the pin after it is installed. The lower pin on the rear has its passage drilled from the end of the spring opposite the slots for the spring pin tool.

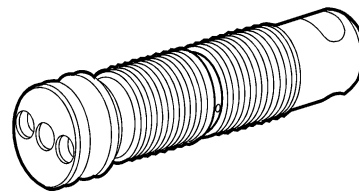
The use of two types of pins is necessary because the lower rear pin must be inserted from the inboard side of the vehicle. By using a pin with the grease passage drilled from the rear end, grease fittings for all three spring pins are on the outboard side, providing greater accessibility.

The pins are held in place by a stop bolt at each end. The stop bolt is fitted through a hole in the shackle. The bolt rests in a groove in the end of the spring pin, preventing it from turning or moving laterally within the shackle and hanger.



W6000815

Spring pin shackle



W6000816

Spring pin



## Wedges and Spacers

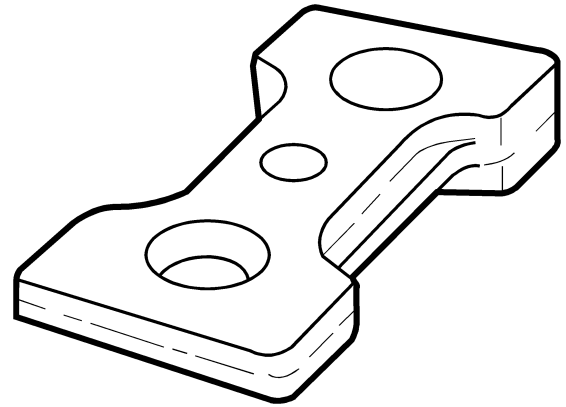
There is a system of wedges that is used to adjust the height of the front springs. The wedges compensate for the variations of the height of the axle pad between different size and different manufacturers of front axles. All the wedges are made with a 5.5 degree taper to provide proper front wheel caster. Wedges can be one of three thicknesses and are placed between the spring and the axle pad.

The wedge thickness depends on the front axle and the type of rear suspension. The wedge used on the left side of the vehicle will be thicker than the wedge used on the right side to compensate for the greater flex of the spring caused by the weight of the driver and the batteries. A thicker left side wedge levels out the vehicle and reduces the tendency of the vehicle to pull to the driver's side.

Some axle and rear suspension combinations require an additional spacer to obtain the proper front end height. The spacer is shaped similar to the wedge except that it is not tapered. The spacer is used with an Eaton axle rated at 5.5 ton load with a B-Ride rear suspension, and with an Eaton or Rockwell axle rated a 6.7 ton load with B-Ride rear suspension.

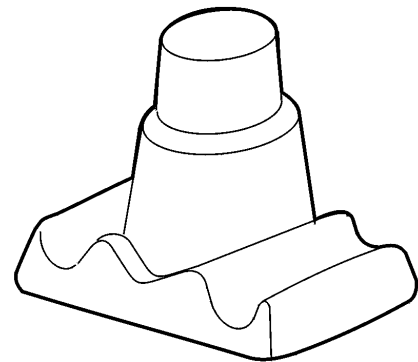
## Bump Stop

The Bump Stop is located on the top of the Spring and its primary function is to keep the U-bolts aligned. The Bump Stop is also instrumental in preventing the Front Springs from becoming overloaded and bottoming out.



W6000820

Typical front suspension wedge

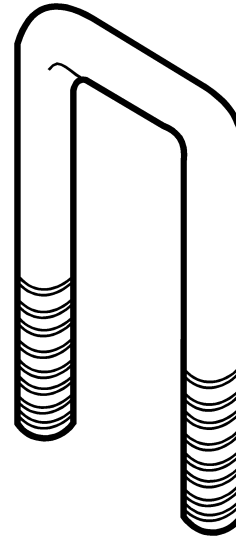


W7001016

Spring stop-VHD

## U-bolts

U-bolts are the method by which the suspension components are fastened together. The lower shock absorber bracket rests on top of the springs. A wedge and possibly a spacer are placed between the spring and the axle pad. The hanger, spring, wedge, spacer, and axle are held tightly together by two U-bolts which wrap over the lower shock bracket and through holes in the axle pad.

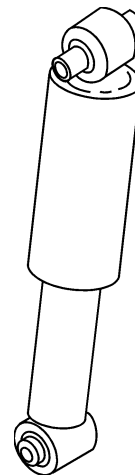


W6000819

U-bolt

## Shock absorber

The shock absorbers dampen vibrations caused by irregularities in the road surface. The upper end of the shock absorber is mounted to a hanger which is bolted directly to the frame web. The lower end of the shock bolts to a hanger that is held in place by the U-bolts.



W6000836

Shock absorber

# Service Procedures

## 7211-03-02-01 Front Spring, Replacement

### VN Models



**DANGER**

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.



**DANGER**

Never work under or around a vehicle unless it is 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.

### Removal

**1**

Remove the splash guard from under the cab.

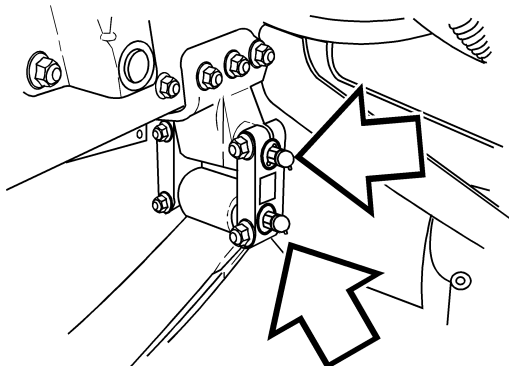
**2**

Loosen the U-bolt nuts. Remove the nuts, washers, plates, and U-bolts.

**3**

Raise the front of the vehicle until the spring is off the axle. Place jackstands under the vehicle.

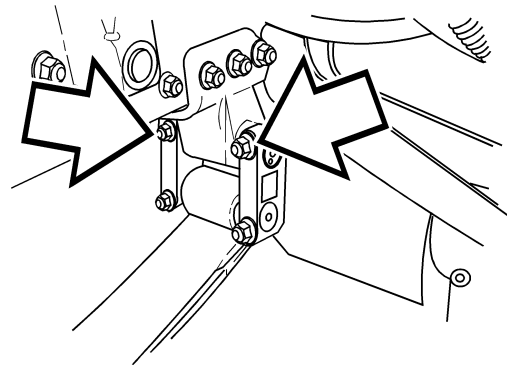
**4**



W6000873

Remove grease fittings from each of the three spring pins.

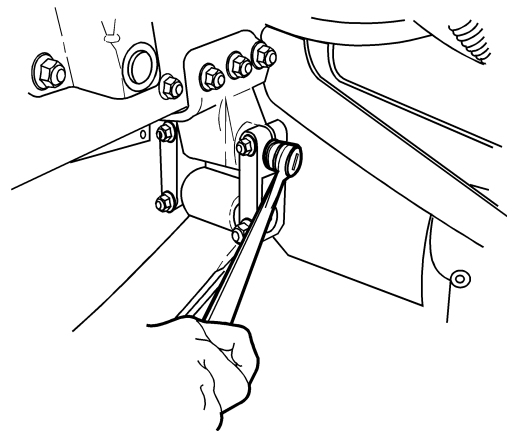
**5**



W6000833

Remove pinch bolts from the top of the rear spring shackle.

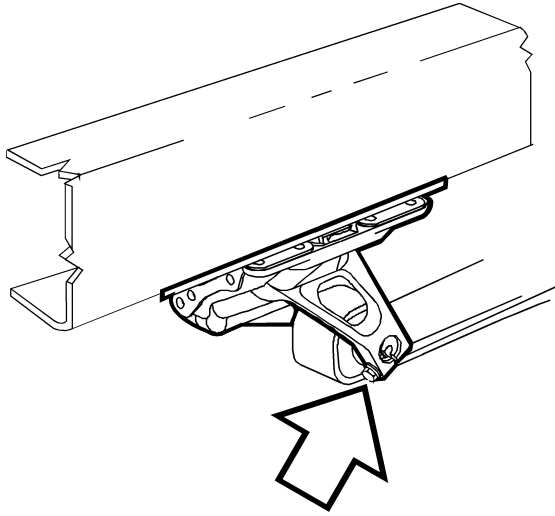
**6**



W6000821

Using tool 9996791, remove the spring pin from the shackle and rear spring hanger. Lower the spring to the floor.

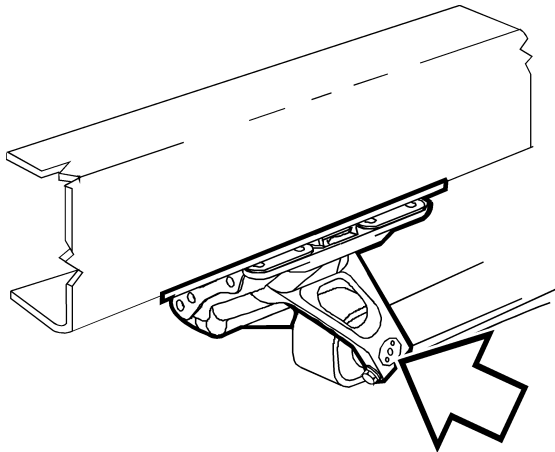
7



W6000823

Remove the pinch bolt from the front spring hanger.

8



W6000825

Using tool 9996791, remove the front spring pin.

9996791

9

Lower the front of the spring to the floor.

10

Remove the lower pinch bolts from the rear shackles, then remove the shackles.

11

Using tool 9996791, remove the remaining rear spring pin.

9996791

## Installation

*Part no.: 257810 (5.5 ton capacity),  
257811 (6.7 ton capacity)  
Special tools: 9996791*

1

Using tool 9996791, screw the spring pin into the bushing in the rear of the spring.

2

Install a shackle on each side of the spring pin. Install the lower pinch bolts and tighten the nuts hand tight.

3

While holding the rear of the spring in position, screw the top rear spring pin through the shackles and rear spring hanger. Install the upper pinch bolts and tighten the nuts hand tight.

9996791

4

Using tool 9996791, install the front spring pin through the hanger and spring. Install the pinch bolt and tighten it hand tight.

9996791

5

Lower the vehicle until the spring almost rests on the axle.

6

Loosen the U-bolts on the opposite side of the vehicle to allow the axle to be positioned.

7

Position the spring so that its center bolt sits in the hole in the center of the spacer.

**Note:** It may be necessary to use a pry bar or a portable winch to position the spring.

8

Install the U-bolts over the shock absorber bracket and through the axle. Install the plates and U-bolt nuts beneath the axle. Tighten the nuts hand tight.

9

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

**10**  
Torque the right and left side U-bolts to  $420 \pm 50$  Nm ( $310 \pm 37$  ft-lb).

**11**  
Torque all five spring pin pinch bolts to  $85 \pm 15$  Nm ( $63 \pm 11$  ft-lb).

**12**  
Install a grease fitting in the front and both rear spring pins.

**13**  
Grease the spring pins using a lithium based grease with EP additives (NLGI #2) until grease flows past the seal on both ends.

**14**  
Install the splash guard.

## 7211-03-02-01 Front Spring, Replacement VHD Models

### DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

### DANGER

Never work under or around a vehicle unless it is 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.

## Removal

**1**  
Remove the front bumper.

**2**  
Remove the cotter pin in the power steering assist cylinder stud nut.

**3**  
Remove the power steering assist cylinder stud nut.

**4**  
Using a rubber or plastic mallet remove the power steering cylinder from the front spring hanger.

**5**  
Remove the U-bolt nuts.

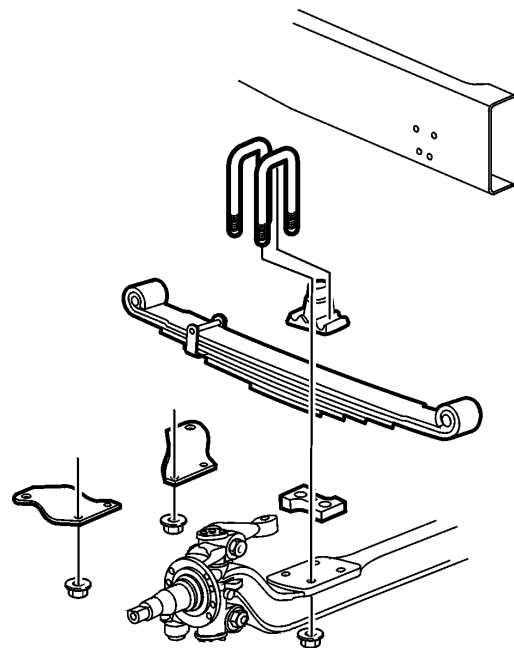
**6**  
Remove the U-bolts and the spring stop from the front spring assembly.

**7**  
Using an air lift jack, lift and support the frame rail behind the rear spring hanger.

**8**  
Remove the grease fitting in the front spring pin.

**9**  
Remove the shackle bolts.

## Installation



W7001020

Spring bracket replacement-VHD

**1**  
Install the replacement spring assembly.

**2**

Using tool 9996791, install the upper spring shackle pin in the replacement spring assembly.

9996791

**3**

Install the inner and outer shackles.

**4**

Install and tighten the shackle bolts.

**5**

Install the grease fittings in the rear spring shackle pins.

**6**

Install the front spring pin using tool 9996791.

9996791

**7**

Install and tighten the spring pin bolts.

**8**

Install the grease fitting in the front spring pin.

**9**

Install the power steering assist cylinder.

**10**

Install and torque the 2 U-bolts.  $500 \pm 75$  Nm (370  $\pm$  55 ft-lb.)

$500 \pm 75$  Nm  
370  $\pm$  55 ft-lb

**11**

Install the front bumper.

## 7611-03-02-01

### Front Shock Absorber, Replacement

**DANGER**

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

**1**

Remove the lower shock absorber mounting bolt.

**2**

Remove the upper shock absorber mounting bolt and remove the shock.

**3**

Install the replacement shock and tighten the bolt that connects the upper part of the shock to the frame rail.

**4**

Install the shock in the lower mount. Insert the bolt through the mount and the shock from the front, and tighten.

## 7614-03-02-04

### Front Shock Absorber Bracket, Replacement

**DANGER**

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

**1**

Remove the nut connecting the shock to the shock absorber bracket.

**2**

Remove the U-bolt nuts that connect the shock absorber bracket to the axle.

**3**

Install the replacement bracket and tighten the U-bolts.

**4**

Re-install the shock absorber in the replacement bracket and tighten the nut connecting the bracket to the axle.

## 7214-03-02-01

### Front Shackle/Pin, Replacement



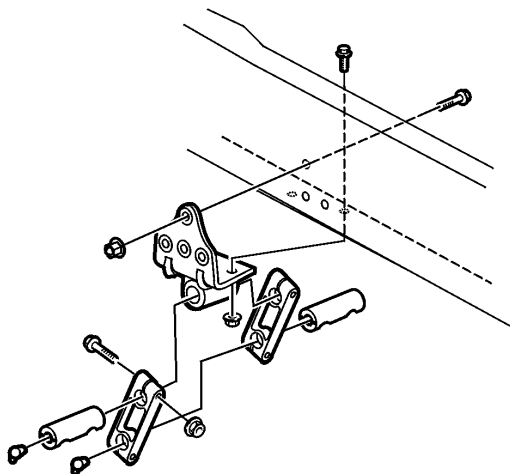
#### DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

### Removal

- 1  
Using an air-lift jack, lift and support the frame rail behind the rear spring hanger.
- 2  
Remove the two grease fittings from the spring shackle pins.
- 3  
Remove the shackle bolts.
- 4  
Using a pry bar, remove the shackles from the spring pins.
- 5  
Remove the upper and lower spring pins using tool 9996791.

### Installation



W7001018

Shackle &amp; Pin Replacement

- 1  
Install the upper and lower spring pins using tool 9996791.
- 2  
Install the inner and outer shackles and start the shackle bolts.
- 3  
Tighten the shackle bolts.
- 4  
Remove the air-lift jack from underneath the vehicle.

5

## 7213-03-03-01

### Front Spring Bushing, Replacement



#### DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

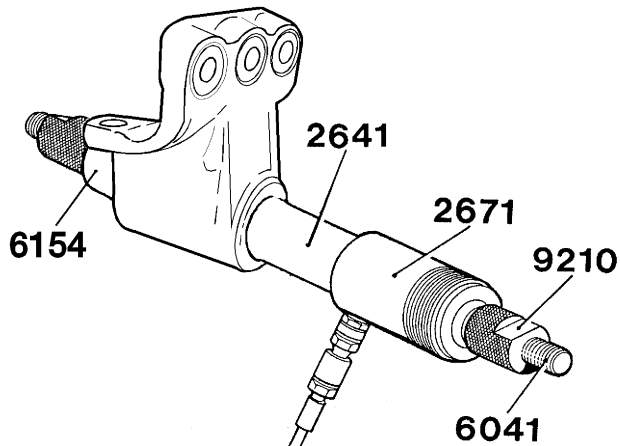
*Part no.: 1075726*

*Special tools: 9992641, 9992671, 9992670, 9996041, 9996154, 9996632, 9999210*

- 1  
Remove the spring in accordance with the removal portion of the front spring replacement service procedure.
- 2  
Using a press and a suitable size drift, press the bushing out of both ends of the spring.
- 3  
Press a new bushing into each end of the spring. Ensure the bushing is centered.
- 4  
Place drift 9996154 on the spindle and insert the spindle through the bushing in the rear spring hanger bracket.

9996154

5



W6000870

Place drift 9992614 and cylinder 9992671 on the spindle. Install and tighten nut 999210 on the spindle. Connect pump 9992670 to the cylinder.

9992614  
9992671  
999210  
9992670

6

Pull out the bushing as far as possible. Release hydraulic pressure.

7

If necessary, thread the nut down the spindle. Pull the bushing out the rest of the way.

8

Remove the nut, cylinder, drift 9992641, and bushing from the spindle.

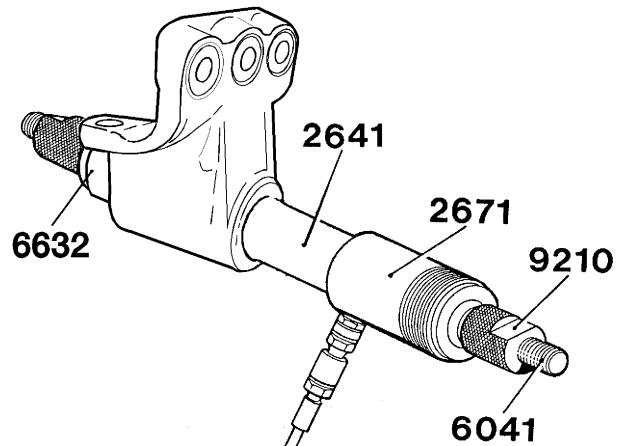
9992641

9

Pull the spindle out of the hanger. Place drift 9996632 and a new bushing on the spindle and insert it back into the spring hanger.

9996632

10



W6000871

Slide drift 9992641, and cylinder 9992671 on the spindle. Install and tighten nut 999210 on the spindle.

9992641  
9992671  
999210

11

Press the bushing into the hanger.

12

Remove the special tools from the spring hanger.

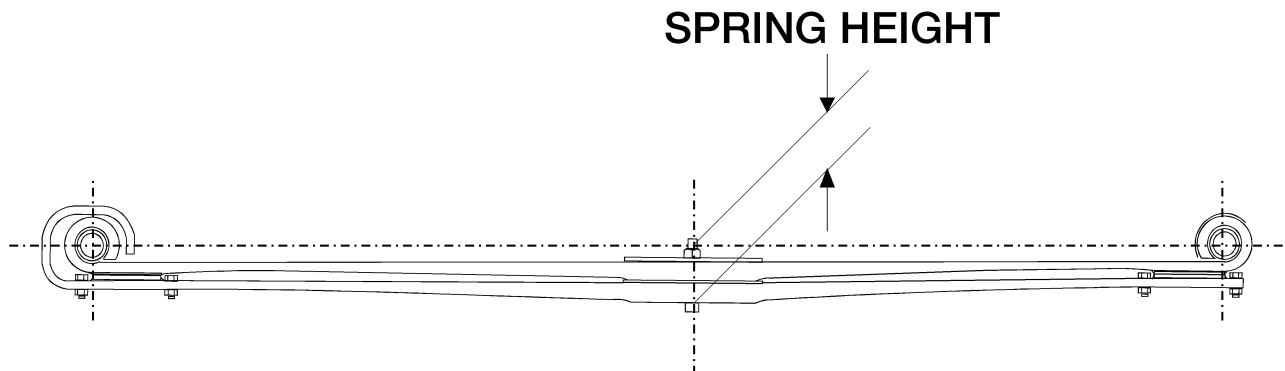
13

Install the spring in accordance with the installation portion of the front spring replacement service procedure.



## 7211-06-03-01

### Front Spring Height, Checking



W6000642



#### DANGER

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

**Note:** Parabolic leaf springs have the tendency to appear flat or curved downward when they are loaded. This condition is often mistaken as evidence of a bad spring. If visual inspection of the spring does not reveal any problems, the spring should be considered acceptable. If there is still doubt about whether the spring is acceptable then the spring height should be measured. Spring height is the distance from the straight line between the support points of the spring and the compression face of the last leaf or spacer. In order to properly measure spring height, the spring must be removed from the vehicle and a known load must be applied.



#### WARNING

Do NOT attempt to load a spring without proper spring testing equipment. Applying load to a spring that is removed from the vehicle is dangerous. A loaded spring contains considerable energy. If that energy is released suddenly, the spring could come apart or fly out of the test apparatus causing serious personal injury.

#### 1

Visually inspect the spring for cracks or breaks. If the spring is not cracked or broken it should be considered acceptable for further use. If additional confirmation of spring acceptability is desired, perform the remainder of this test.

#### 2

Remove the spring from the vehicle in accordance with the removal section of the front spring replacement procedure.

#### 3

**Note:** If spring testing equipment is not available, the spring should be sent to a facility with the proper equipment, and the remainder of this test procedure performed by that testing facility.

Place the spring in a press so that the press forces the spring eyes downward. Ensure the spring center is supported.

**4**

Apply the load listed in the following table to the spring.

Model	Spring Capacity	Full spring load
<b>VN</b>	5.5 metric tons (12,000 lbs.)	24525 N (5513 lbf)
<b>VN</b>	6.7 metric tons (14,600 lbs.)6.7	29400 N (6609 lbf)
<b>VHD</b>	6.0 metric tons (13,700 lbs.)	26950 N (6059 lbf)

**Note:** The upper face of the top spring may deflect upward above the spring eye centerline during this procedure step.

**5**

Tie a string through both spring eyes to determine their centerline.

**6**

Measure the spring height. Verify it is  $78 \pm 4$  mm. ( $3.07 \pm 0.16$  inch)

**7**

Remove the load from the spring. Remove the string from the spring eyes.

**8**

If the spring height was not within tolerance, the spring must be replaced.

**9**

Reinstall the spring if spring height was within tolerance, otherwise obtain and install a new spring.

**7211-06-02-01****Cab Lean, Checking****DANGER**

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

**Note:** Adjustment are not recommended until after the initial break-in period. Verify a vehicle having a lean problem first by measuring the frame rail height and visi-

bly looking at the vehicle. If the problem does exist, the following procedure should be carried out.

**Checking Chassis Variance****1**

Park vehicle on a level surface.

**2**

Measure the distance from the ground to the center of the front spring eye.

**3**

The difference between the left and right should not exceed 0.375 in.

**Checking Cab Variance, Conventional****4**

Park vehicle on a level surface.

**5**

Measure at the cab skirt under the forward door hinge to the ground.

**6**

The difference between the left and right should not exceed 0.75 in. Cab and chassis are not allowed to lean toward opposite directions.

**7214-05-02-01****Front Spring U-bolt Torque, Adjustment****DANGER**

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

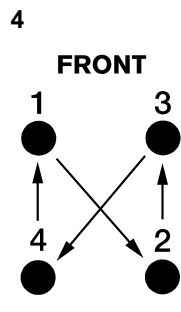
**1****DANGER**

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.

Remove the existing nuts from the U-bolt.

**2**  
Remove the U-bolts from the vehicle and install the replacement U-bolts.

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



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.

## 7114-03-02-02 Front Spring Rear Hanger, Replacement



**DANGER**

Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.



**DANGER**

Never work under or around a vehicle unless it is 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.

### Removal

**1**  
Using an Air-lift jack, lift and support the frame rail behind the rear spring hanger.

**2**  
Remove the grease fittings from the two spring shackle pins.

**3**  
Remove the shackle bolts.

**4**  
Using a Pry-bar, remove the shackles from the spring pins.

**5**  
Remove the upper spring pin from the vehicle using tool 9996791.

**6**  
Remove the mount bolts that secure the hanger to the lower portion of the frame rail.

**7**  
Remove the hanger mount bolt that secures the spring hanger to the cab mount bracket.

**8**  
Remove the remaining mount bolts and remove the hanger from the vehicle.

### Installation

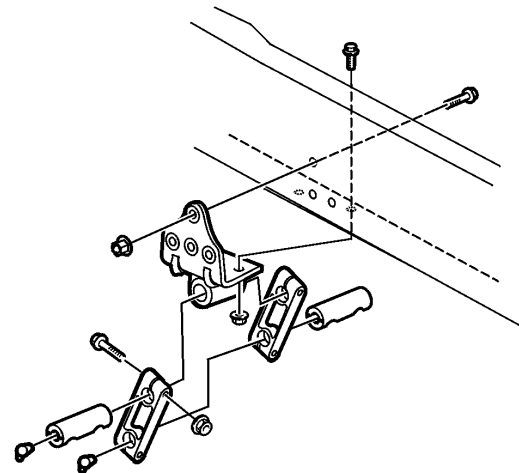


Fig. 1: Spring assembly, exploded view

**1**  
Install the replacement rear spring hanger and mounting bolts.

**2**  
Using tool 9996791, install the upper shackle pin in the replacement rear spring hanger.

**3**  
Install the inner and outer shackles.

**4**  
Tighten the shackle pin bolts.

**5**  
Remove the air-lift jack from underneath the vehicle.

**6**  
Install the two grease fittings in the upper and lower spring pins.

## 7114-03-02-01 Front Spring Front Hanger, Replacement



Before working on a vehicle, set the parking brakes, place the transmission in neutral, and block the wheels. Failure to do so can result in unexpected vehicle movement and can cause serious personal injury or death.



Never work under or around a vehicle unless it is 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.

### Removal

**1**  
Remove the front bumper.

**2**  
Unlatch and raise the hood.

**3**  
Disconnect the hood spring.

**4**  
Disconnect the hood assist cylinder on each side of the hood.

**Note:** Rest the hood on a tall jack stand padded with rags, at both corners to support the weight of the hood.

**5**  
Remove the nuts securing the hood pivot block to the front spring hanger, and then slide the hood forward a few inches for access.

**Note:** Mark the location of the pivot block before removal of the nuts.

**6**  
Remove the cotter pin in the power steering assist cylinder stud nut.

**7**  
Remove the power steering assist cylinder stud nut.

**8**  
Using a rubber or leather mallet, remove the power steering assist cylinder from the front spring hanger.

**9**  
Using an Air-lift jack, lift and support the frame rail behind the rear spring hanger just enough to relieve the pressure from the spring assembly.

**10**  
Remove the grease fitting from the front spring pin.

**11**  
Remove the spring pin bolts.

**12**  
Using tool 9996791, remove the front spring pin. 9996791

**13**  
Cut any zip ties that might be securing and in-the-way harness.

**14**  
Remove the eight closing crossmember mount bolts and remove the crossmember.

**15**  
Remove the lower spring hanger mount bolts.

**16**  
Remove the lower spring hanger mount bolts in the engine mount crossmember.

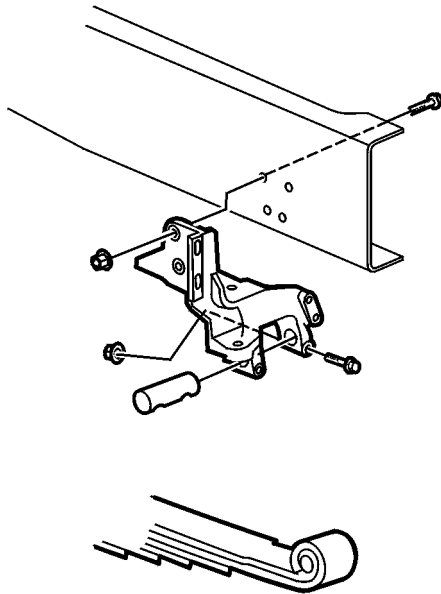
**17**

Remove the tow hook mount bolts, which are also the remaining spring hanger mount bolts. Remove the tow hook from the vehicle.

**18**

Remove the front spring hanger from the vehicle.

## Installation



W7001019

Spring assembly, exploded view

**1**

Install the replacement spring hanger and begin tightening the tow hook mount bolts.

**Note:** Use a punch to assist in aligning the holes.

**2**

Start tightening the lower spring hanger mount bolts.

**3**

Install and tighten the spring hanger mount bolts in the engine mount crossmember.

**4**

Tighten the lower spring hanger mount bolts.

**5**

Tighten the tow hook and spring hanger mount bolts.

**6**

Install the front spring pin using tool 9996791.

9996791



## Feedback

One of our objectives is that workshop personnel should have access to correct and appropriate service manuals where it concerns fault tracing, repairs and maintenance of Volvo trucks.

**In order to maintain the high standards of our literature, your opinions and experience when using this manual would be greatly appreciated.**

**If you have any comments or suggestions, make a copy of this page, write down your comments and send them to us, either via telefax or mailing directly to the address listed below.**

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**From**

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## Comments/proposals

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**Concerns Service Manual:** .....





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