Preview Solution CBR-2016-14

Volvo Chassis - Frame Or Cab Lean

Published 1 May 2025

Valid For

Volvo Models - All
Model year 2016 to current.

1.0 Vehicle Preparation

Troubleshooting cab lean should only begin after completing a vehicle preparation procedure to ensure all components are in place and settled.

- The complete truck must be run for 16 kilometers (10 miles) minimum.
- Ensure that all tires are inflated to the correct pressure.
- If the vehicle is equipped with rear air suspension, you must cycle the suspension before taking measurements. This will reset the rear suspension to the correct ride height and ensure the vehicle rake (i.e. inclination) is correct. To do so:
  - » Ensure that the parking brake is released and no service brake is being applied
  - » Release the air from the air springs to lower the suspension
  - » Raise the suspension back up to the nominal drive level height

2.0 Taking Measurements

2.1 Where to Measure

With the truck on a flat and level surface, the frame height from ground will be measured on both the left and right hand side separately using a vertically oriented measuring tool.
This shall be done from the bottom side of the frame near the frame side web, as near as possible to the front axle location.

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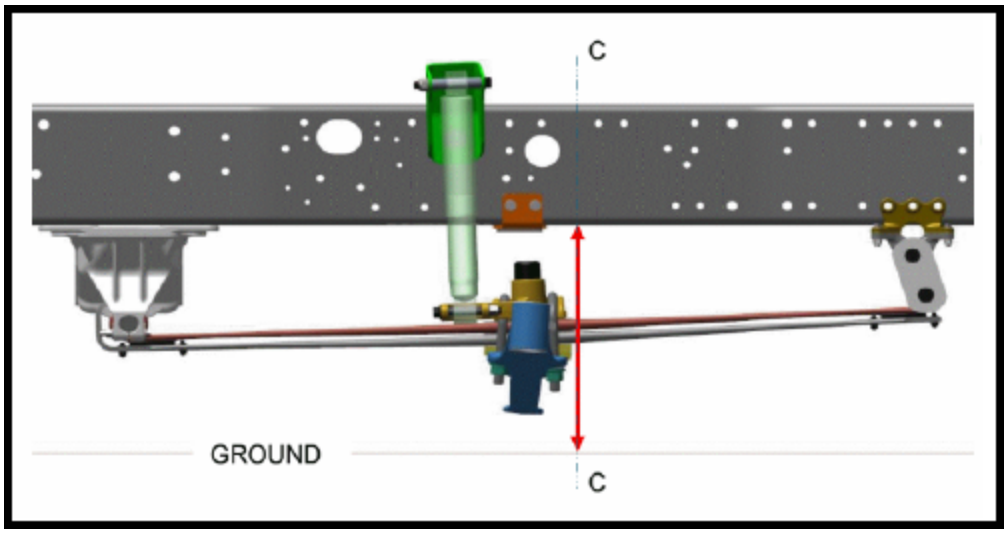
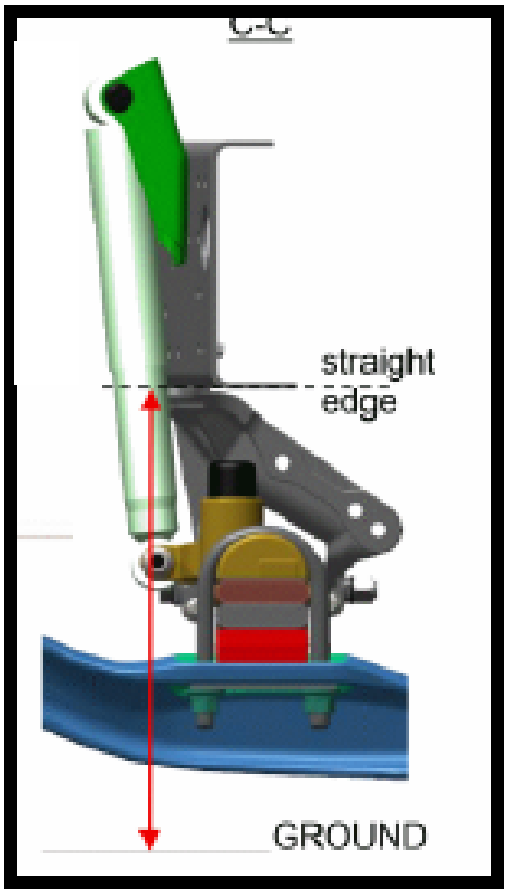


Obtaining this measurement can be complex - the front springs are directly below the frame rail lower flange, making it difficult to drop a tape measure straight down to the floor.

The process may be made easier by placing a straight edge against the lower flange of the frame (pictured right), then measuring outboard of the frame. Additionally, you may need to crawl beneath the truck to take this measurement.



2.2 Measurement Standards

A difference in height (measuring as instructed above) between both sides must be ≤ 11mm (an incline of 0.6° maximum). If the measurement is found to be greater than

the standard, a ride height difference of ≤ 11mm should be attainable in most instances by following the instructions which follow.

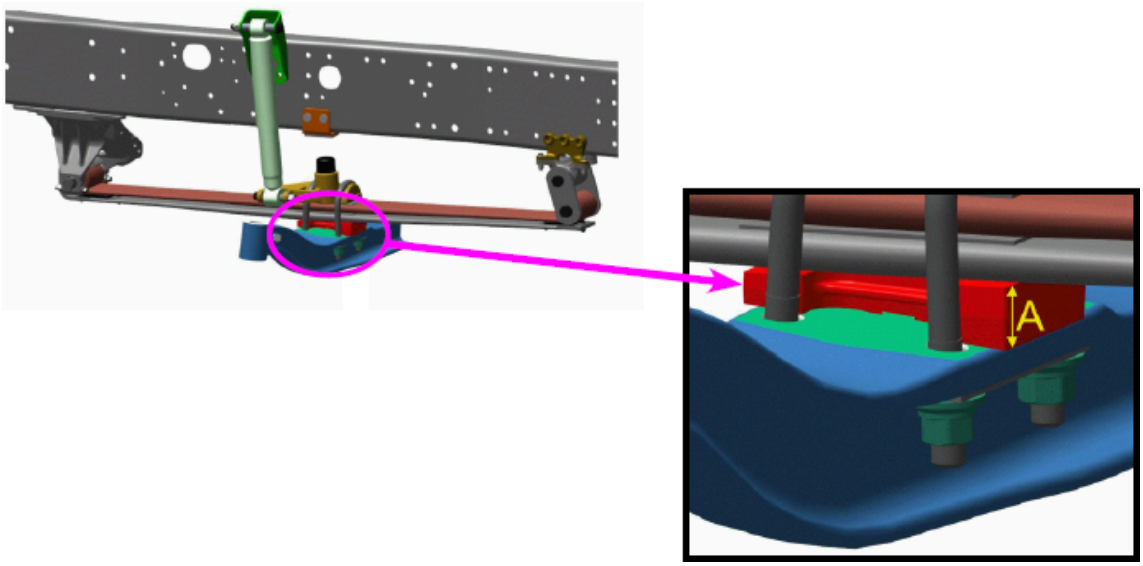
Click HERE for a printable worksheet.

3.0 Front Correction Process

3.1 Process to Correct Front Cab Lean

3.1.1 Determine if the vehicle has a Standard or High front ride height

Determine the front ride height by measuring the rear height (A) of the wedge located on the left hand side of the truck (pictured below).



Utilize the following table along with the measured rear height of the wedge to determine the front ride height designation:

(A) Measurement	Front Ride Height
37MM	STANDARD
73MM	HIGH

3.1.2 Measure the difference in chassis height (right-hand vs. left-hand)

In accordance with the measurement location requirements outlined in section 2.0, measure the distance from the floor to the bottom of the frame on the left-hand and right-hand sides individually.
Calculate the frame height difference (B) with the following formula:
B = right hand frame height - left hand frame height

3.1.3 Find the parts required to correct the lean

Consult the tables provided in Section 4.0 to determine the wedges, U-bolts, and nuts required to level up the chassis. If the calculated height difference (B) does not match the number in the table exactly, choose the closest one - there is no preference for measurements slightly over or under the calculated (B).

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NOTE: When replacing the wedge on the left-hand side, the U-bolt hardware MUST also be replaced.

NOTE: Performing suspension work may result in load redistribution. Before remeasuring the cab lean, follow the guidelines in the Vehicle Preparation Section.

Once the vehicle has been remeasured and it has been determined that the lean has been corrected and no further suspension adjustments are needed, the final step is to
perform a vehicle alignment.

4.0 Part References

4.1 Factory Installed Right-Hand Side WedgeFactory Installed Right-Hand Side Wedge

FRONT RIDE HEIGHT	WEDGE PART NUMBER	THICKNESS (MM)
Standard	20435531	20
High	20435533	56

4.2 Left-Hand Wedge Selection, Highway Vehicles

4.2.1 Standard Front Ride Height

RIDE HEIGHT DIFFERENCE (B)	REQUIRED PART NUMBERS	INDIVIDUAL WEDGE THICKNESS (MM)**	INDIVIDUAL WEDGE ANGLE (°)	FRONT STABILIZER BAR?	RECOMMENDED U-BOLT PART NUMBER ***		NUT
					FRONT	REAR	
0*	20435532	28	6.25°	Yes	20529990	20560239	21823706
				No	20529989		
8	20836936	36	6.25°	Yes	20529990	20560239	
				No	20560239		
12	20435531 21602505	20 20	6.25° 0°	Yes	20560240	20529990	
				No	20560239		
16	20836939	44	6.25°	Yes	20560240	20529990	
				No	20560239		
20	20435532 21602505	28 20	6.25° 0°	Yes	20560240	20529990	
				No	20560239		
28	20836936 21602505	36 20	6.25° 0°	Yes	20560240	20560240	
				No	20529990		

* NOTE 1: Factory installed left-hand side wedge arrangement

** NOTE 2: This wedge thickness is at the center of the wedge. It is not the rear of the wedge (A)

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*** NOTE 3: U-bolts should have at least 3mm thread sticking out beyond the top of the nut. In case this is not achieved with the suggested U-bolt part number, replace and use a longer part number from section
4.4

4.2.2 High Front Ride Height (FIH220)

RIDE HEIGHT DIFFERENCE (B)	REQUIRED PART NUMBERS	INDIVIDUAL WEDGE THICKNESS (MM)**	INDIVIDUAL WEDGE ANGLE (°)	FRONT STABILIZER BAR?	RECOMMENDED U-BOLT PART NUMBER ***		NUT
					FRONT	REAR	
0*	20435534	64	6.25	Yes	24427625	20560240	21823706
				No	20529990		
11	22968914	75	6.25	Yes	24427625	24427625	
				No	20560240		
20	20435534 21602505	64 20	6.25 0	Yes	21180646	24427625	
				No	20560240		
31	22968914 21602505	75 20	6.25 0	Yes	21246746	21180646	
				No	24427625		

* NOTE 1: Factory installed left-hand side wedge arrangement
** NOTE 2: This wedge thickness is at the center of the wedge. It is not the rear of the wedge (A)
*** NOTE 3: U-bolts should have at least 3mm thread sticking out beyond the top of the nut. In case this is not achieved with the suggested U-bolt part number, replace and use a longer part number from section
4.4

4.3 U-Bolt List for Highway Vehicles

PART NUMBER	LENGTH (MM)
20529989	180
20560239	200
20529990	215
20560240	235
22427625	255
21180646	265
21246746	285

Example for how to find out what shim you need.

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1. Determine ride height.

1.1 Measure front right axle shim.

1.2 Use chart in this CBR to determine the front axle right height.

2. Measure Front Axle.

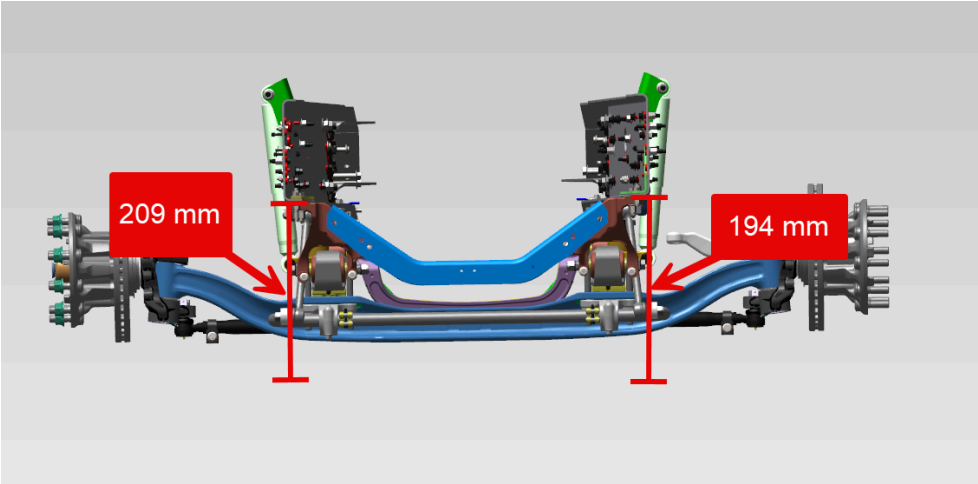
2.1 Measure the Right and Left side of the front axle to determine height

2.2 Measurement should be done from bottom of frame to ground.

2.3 Record measurements so next step.

3.Determine Ride Height Difference

3.1 Take the right-side measurements subtract from left-side measurements. Using picture below as example 209mm (right-side) – 194 (left-side) =15mm difference.



4. Determine Shim

Note: the picture above is a standard front axle ride height.

4.1 With a difference of 15mm using the chart from earlier in CBR 16mm would be the best option for this truck.

Note: If the required parts needed box show two shims they will need to be stacked. 0° is always touching axle while the 6.5° is always touching the spring.

5. Installing shim(s)

5.1 Once you have determined your shim(s) needed. Install them on the Left side of the front axle.

5.2 Use the chart for your ride height to determine which ubolts you will need.

Note: when installing shim(s) the largest part of the shim will always go towards the rear of the truck.

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