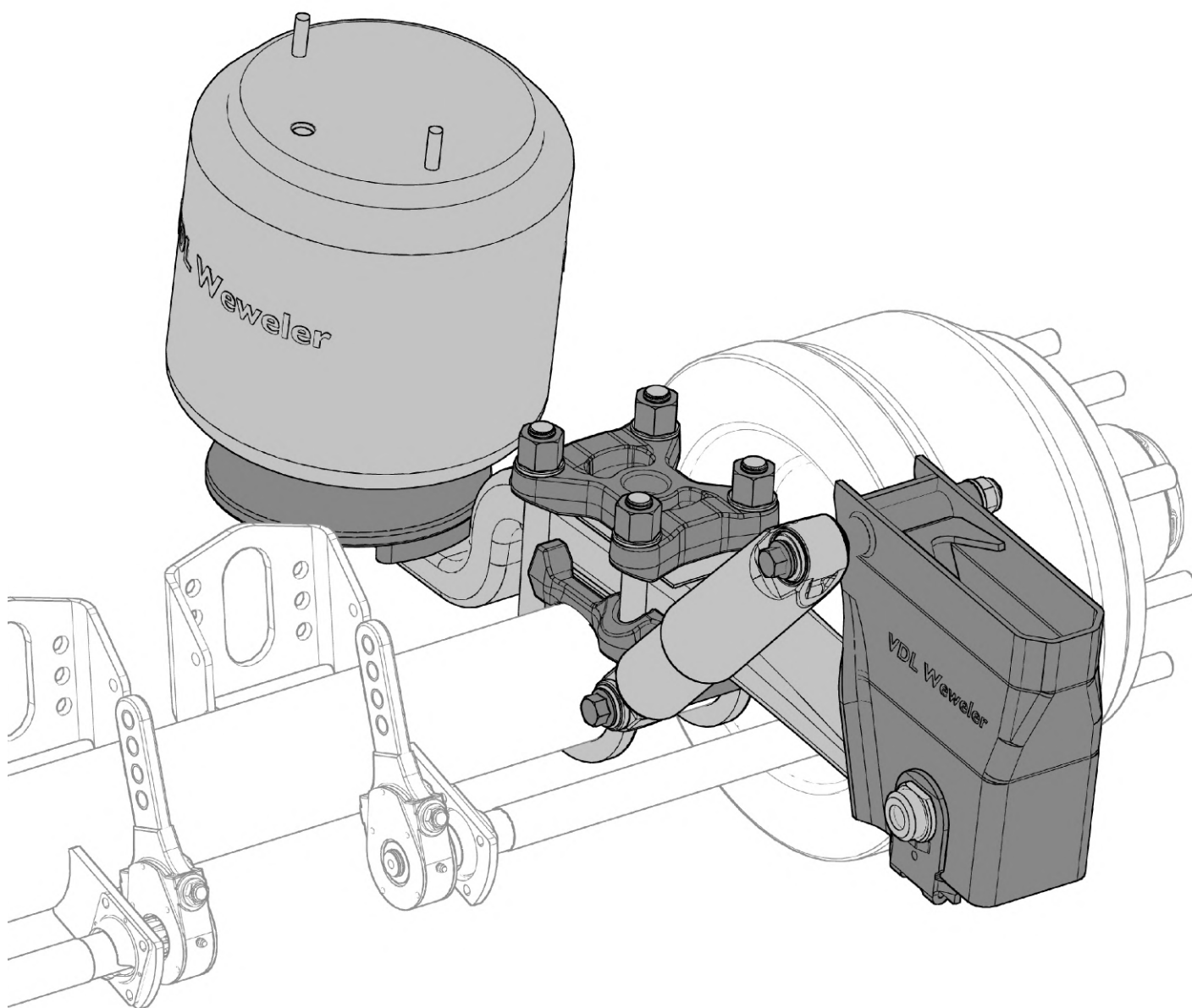




VALX Trailer axles

Trailer builder manual



VALX MBS-HD Range air suspension

Document **TBM 2071**

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Revision summary

Date	Revision	Comment	Author
September 2019	01	Initial version	-
April 2021	02	Welding instruction casted bracing improved. Section 3.6	

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General notes

The installation instructions in this manual are specific for the Valx BV MBS-HD air suspension and not valid for other systems. The used assembly jig(s) are examples that can assist with proper installation. The illustrated chassis and cross bracings are solely drawn as examples for installation as cross bracing and component dimensions depend upon the respective vehicle type and its field of application. The data is intended as a guideline for the trailer builders vehicle design.

The design of the vehicle chassis is always the responsibility of the trailer builder.

Further desired or required data for the Valx BV air suspensions such as additional dimensions, permitted centre of gravity heights, etc. can be found in the additional technical documents (f.e. the standard and/or application system drawings) which can be supplied upon request.

Welding remarks

The trailing arms, air bags and plastic shock absorber covers are to be protected against welding sparks and weld spatter when carrying out all welding work. The earth clamp must never be connected to the trailing arm or the axle hub.

No welding is allowed on the trailing arms!

Warranty and liability

Valx BV warrants all in house manufactured products and all non Valx BV components needed to complete a Valx BV product, for a period as per listed in the "Warranty tables" in the "Valx BV - General Warranty and Liability Statement" or otherwise agreed in writing. The "Valx BV - General Warranty and Liability Statement" can be downloaded from our website www.valx.eu.

Pictograms & symbols

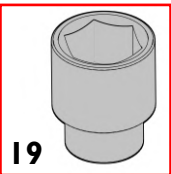
In this manual the following pictograms and symbols are used to illustrate specific instructions or warnings:



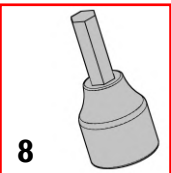
Use an appropriate calibrated torque wrench.
Tighten the fastener to the torque in Nm given in the left-hand corner.



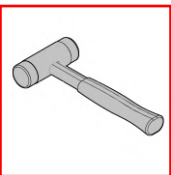
Use an appropriate calibrated torque wrench.
Tighten the fastener to the torque in Nm + the additional specified angle of the fastener in degrees given in the left-hand corner .



Use a socket wrench.
The value in the left-hand corner is the socket wrench size in mm.



Use a hex socket wrench.
The value in the left-hand corner is the hex socket wrench size in mm.



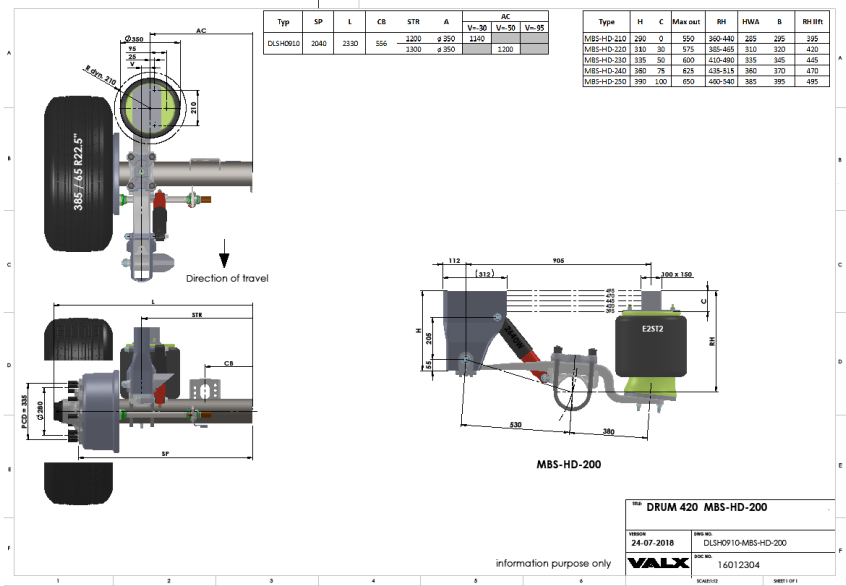
Use a rubber or plastic hammer.



CAUTION
Weight exceeds 25 kg.

1 - Explanation MBS-HD Air Suspension system coding

The MBS-HD air suspension code refers to the available standard system drawings or customer specific application drawings. The code can be found at the righthand top on the drawing.



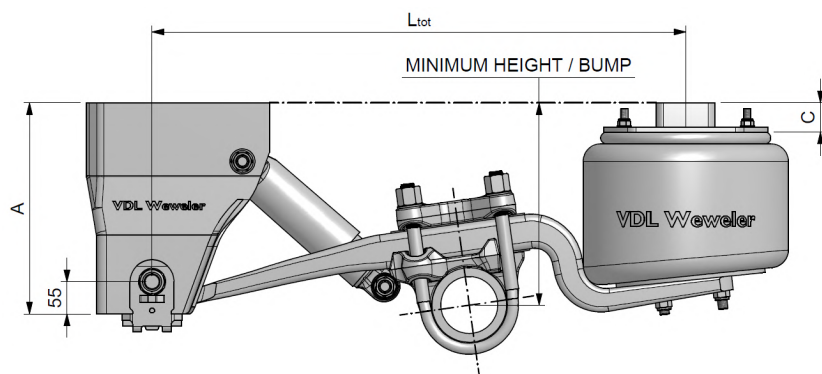
MBS HD code explanation

- Code example and options:

MBS-HD-110-100-350-50-B	
MBS-HD	Air suspension system
110	Defined specification / riding height range according VALX MBS-HD Green book. Main series: MBS-HD-100 MBS-HD-200
100	Trailing arms 100mm wide trailing arm
350	Air spring diameter Ø350 DJ6 air spring
50	Air spring offset 30/50/95
B	casted bracing standard

2. Technical specifications / design information

MBS-HD air suspension system layout and overall system dimensions.



Minimum height & Bump:

Internal bump stops inside the air spring are used to limit the upward suspension stroke.

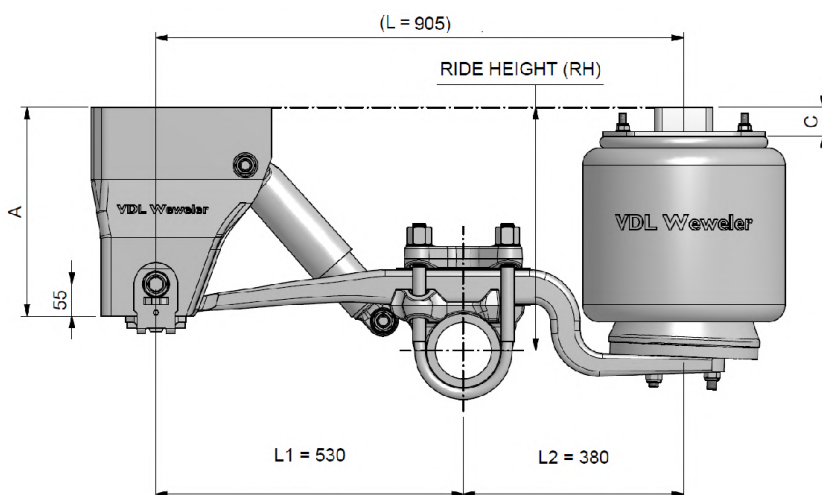
Bump

When the vehicle is empty without air the system rests on the bumpstop. This gives the system "Bump" dimension. The dimension bump also determines the lift height.

Minimum height (MH)

When the vehicle is fully laden without air the bump is compressed by a certain distance depending on the type of air spring. This gives the system "Minimum Height" dimension (MH).

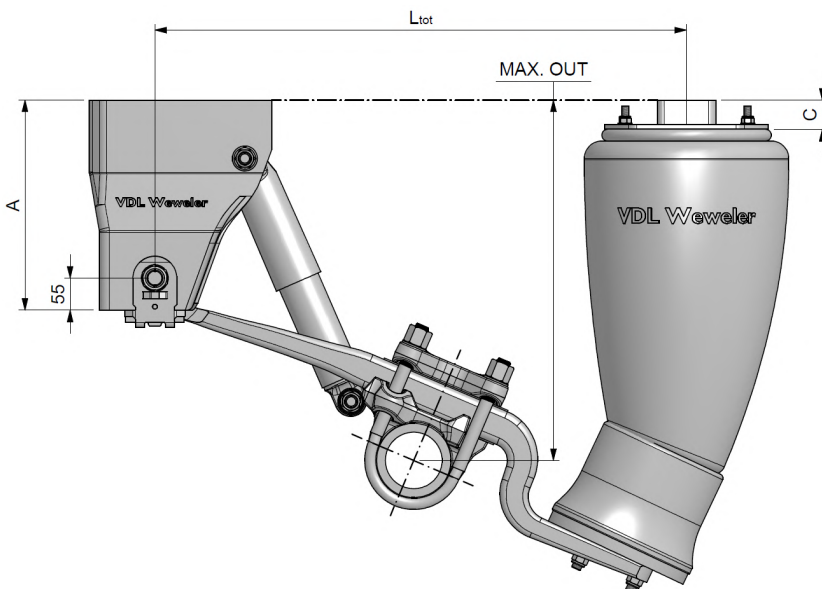
When an air spring failure occurs the internal bump stops enables the user to run (without air pressure) at very low speed for a short period of time to get to the nearest service station. To prevent further damage, always make sure that there is enough clearance for all moving parts.



Ride height (RH):

The ride height can be set with the levelling valve within a certain range. Check the specific system drawing for the possible settings.

If the vehicle is equipped with a raise/lower valve it is only allowed to use this valve for loading and unloading. Driving with the valve engaged may cause damage to the load, trailer, brakes and suspension system.



Max. out:

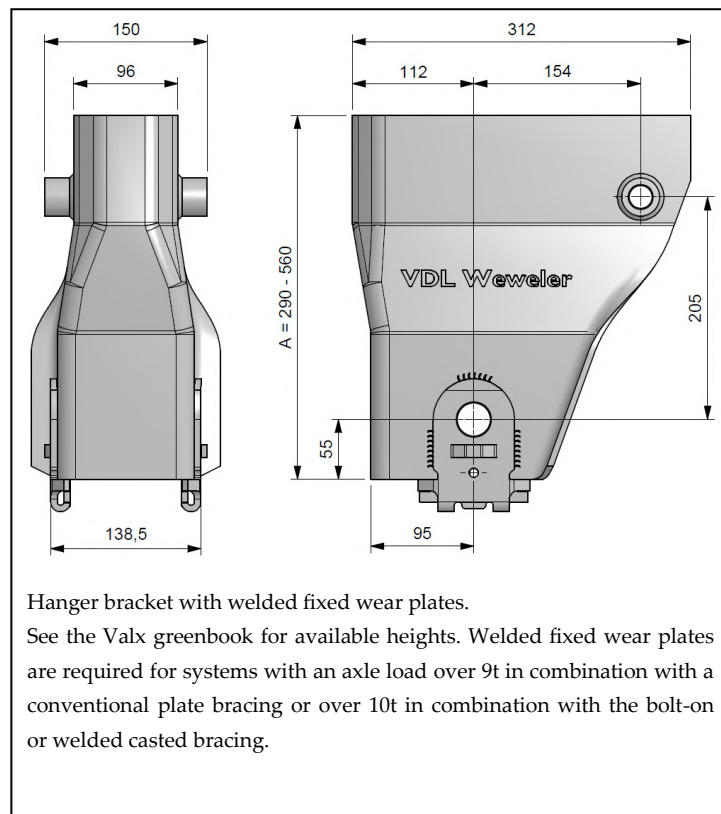
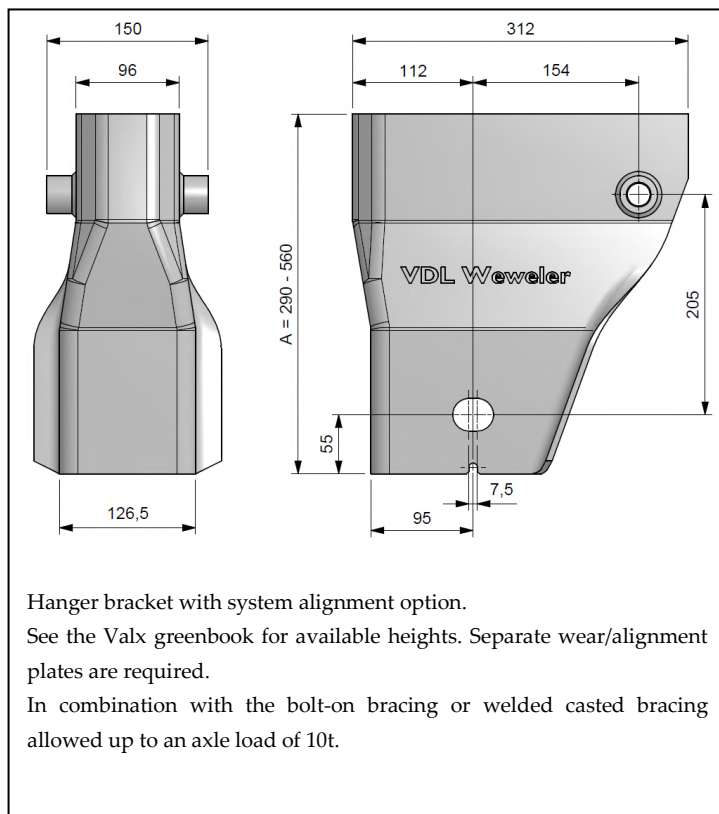
The Valx BV air suspension systems have been engineered so that the shock absorber acts as the outbound stroke limitation. This obviates the need for check straps or other suspension stops.

The maximum shock absorber length and the air spring height at this maximum outward position are in relation to each other. Therefore the system configuration (hanger bracket height "A" and pedestal "C") may not be changed without the approval of Valx BV.

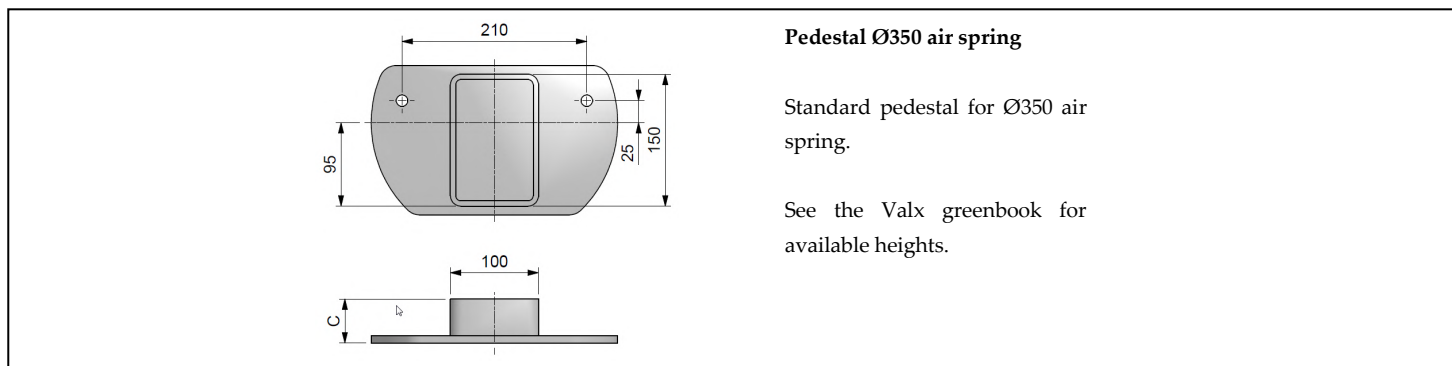
3. Hanger brackets & pedestals

3.1 Dimensions of hanger brackets & pedestal

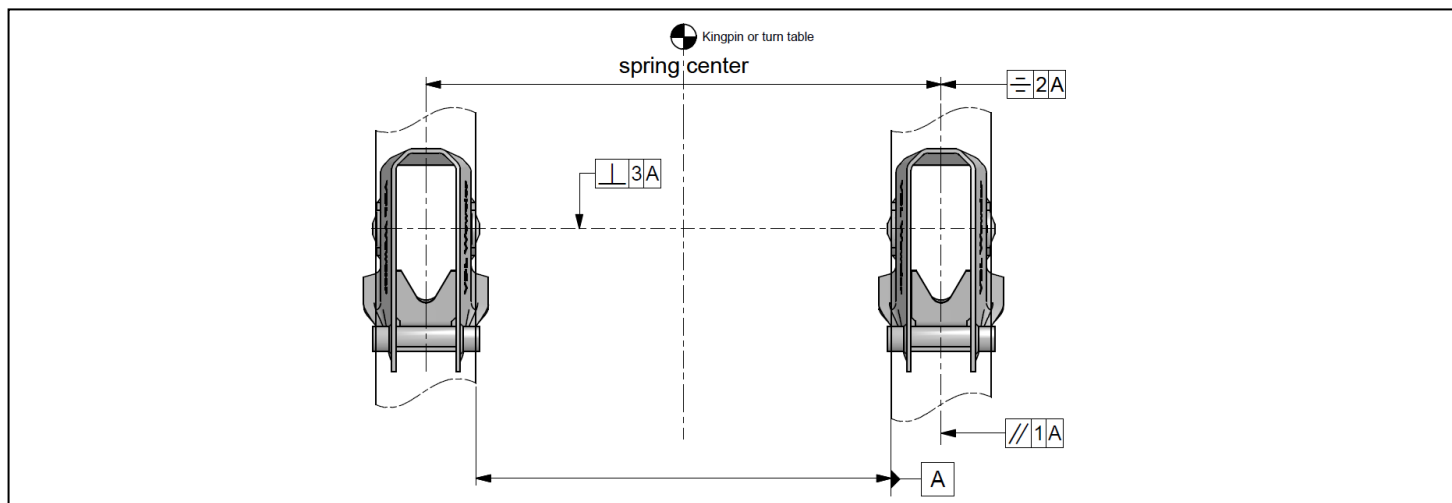
3.1a Standard hanger brackets



3.1b Pedestals

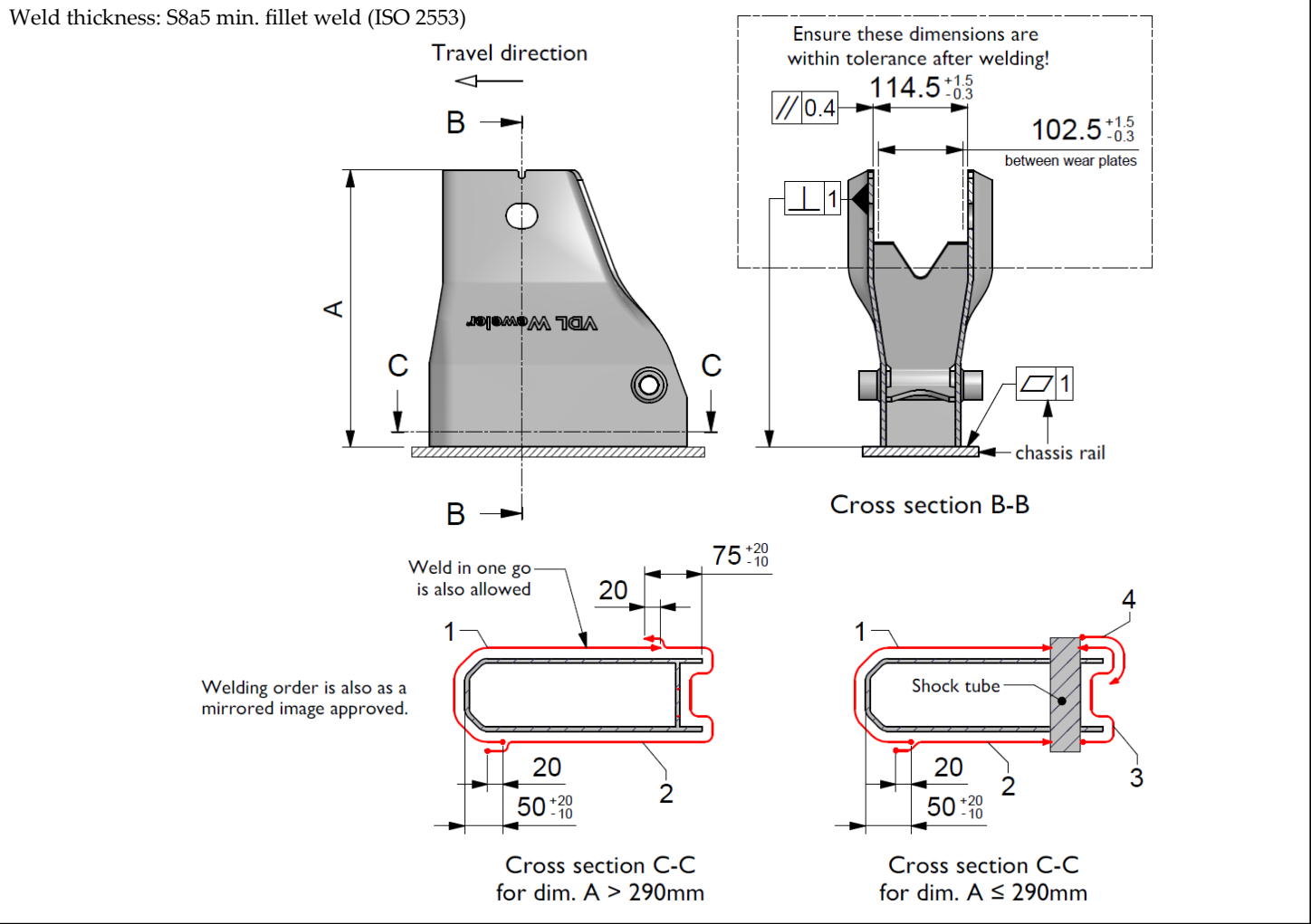


3.2 Alignment of hanger brackets



3. Hanger brackets & pedestals

3.3 Welding of hanger bracket



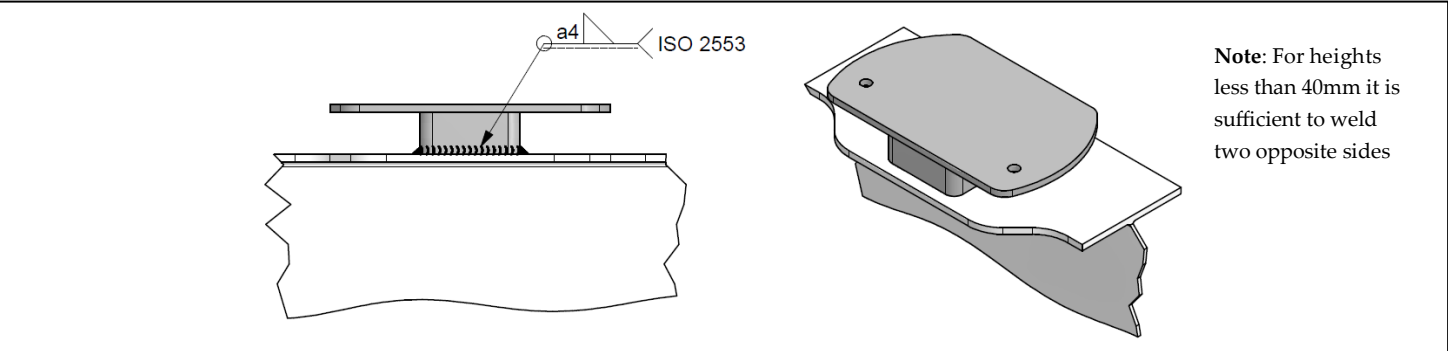
Welding order: Tack weld Begin End		Material chassis = CEV ≤ 0.47%	CEV = C + (Mn/6) + ((Cr+Mo+V)/5) + ((Ni+Cu)/15)
Item	Specifications		
Welding wire	Acc. DIN 8559-SG2 / EN 440-G3 Si1. Material-Nr 1.5125, Ø1.2 mm		
Supply	1-wire technique		
Gas mixture	92-8 Argon / O ₂ or Sagox2 84-13-3 Argon / CO ₂ / O ₂ or Sagox10 90-10 Argon / CO ₂		
Welding parameters	Current: 240 - 340 A Puls voltage: 26 - 40 V		

Check up:

- 1. Demands and qualification according DIN EN ISO 15614-1.
- 2. Judgement of craters according DIN EN ISO 5817 acc. class C.

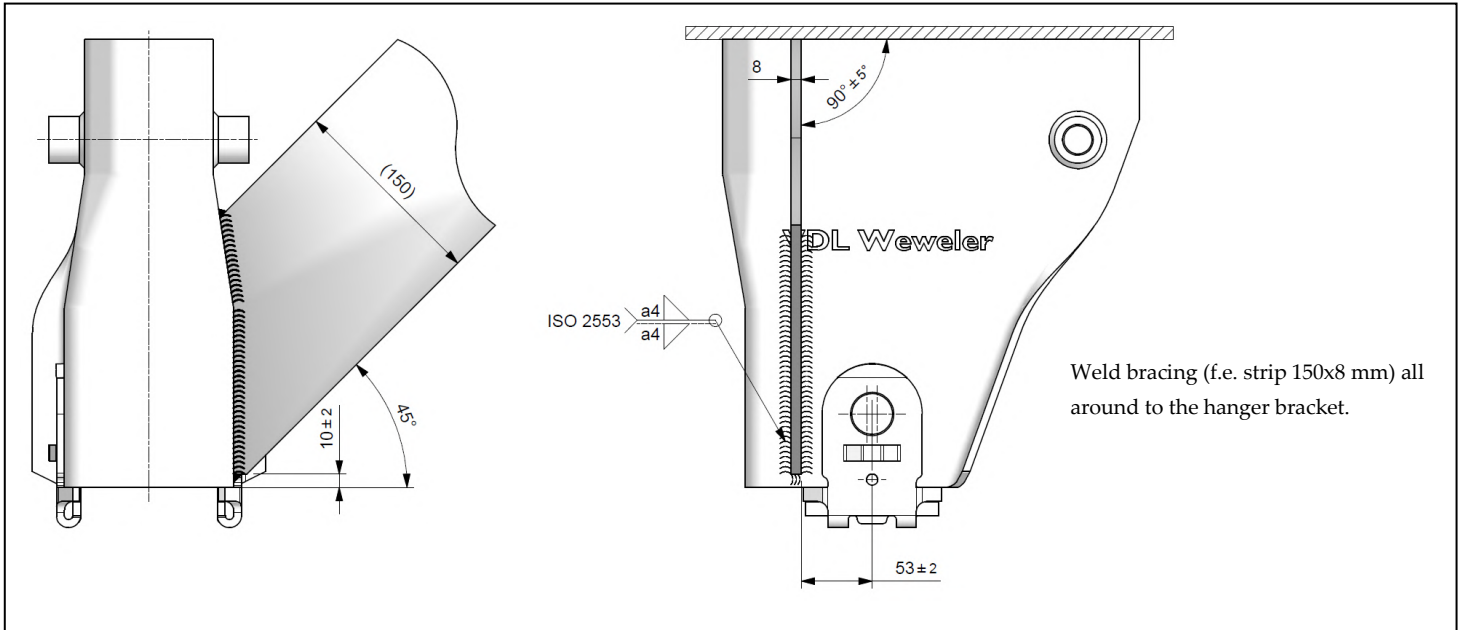
Except for the numbers: 2011, 2012, 2016, 2017, 5012, 5213. Those should be judged according DIN EN ISO 5817 acc. class B.

3.4 Welding of pedestal

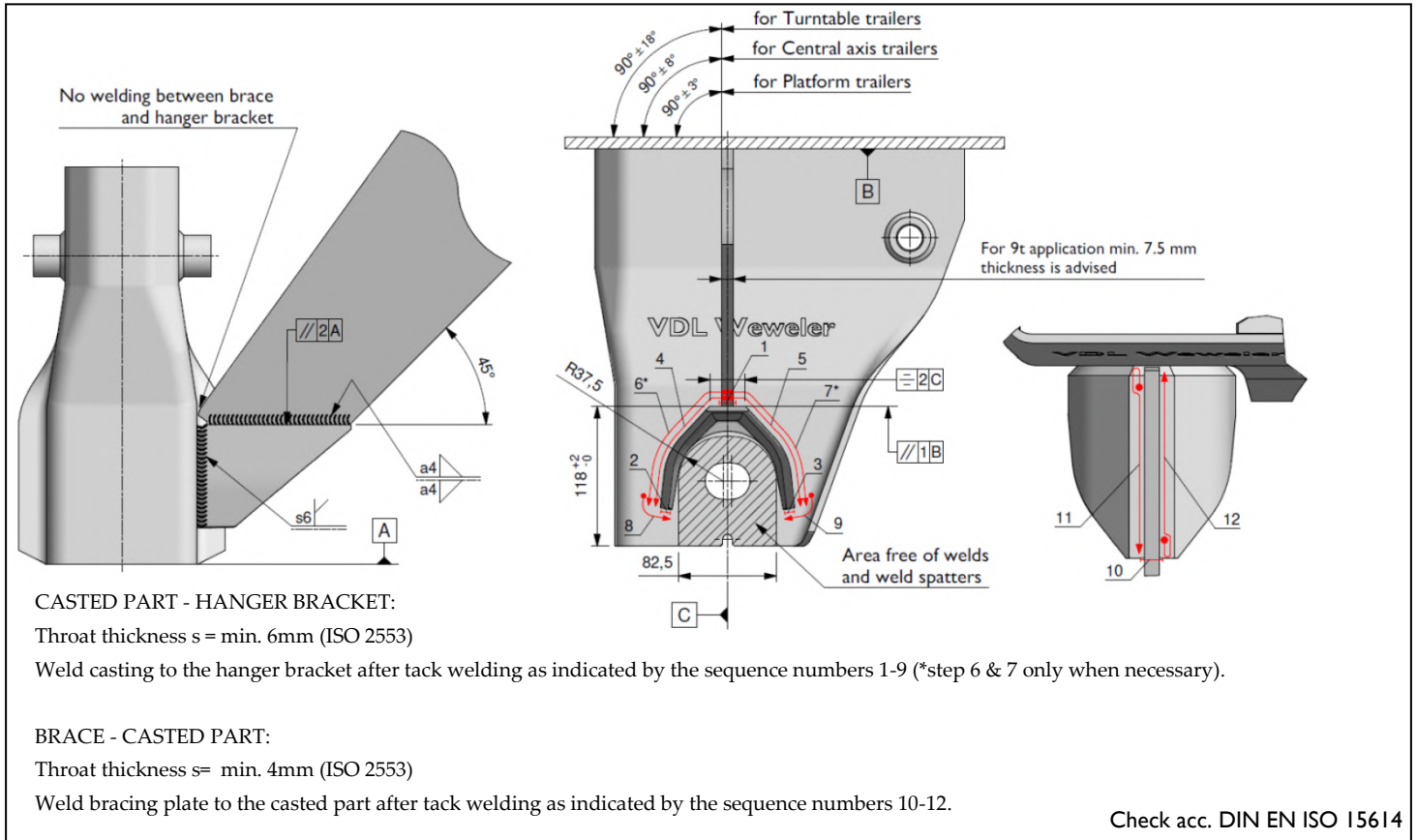


3. Hanger brackets & pedestals

3.5 Welding of plate for hanger bracket bracing



3.6 Welding of casting for hanger bracket bracing



CASTED PART - HANGER BRACKET:

Throat thickness $s = \text{min. } 6\text{ mm}$ (ISO 2553)

Weld casting to the hanger bracket after tack welding as indicated by the sequence numbers 1-9 (*step 6 & 7 only when necessary).

BRACE - CASTED PART:

Throat thickness $s = \text{min. } 4\text{ mm}$ (ISO 2553)

Weld bracing plate to the casted part after tack welding as indicated by the sequence numbers 10-12.

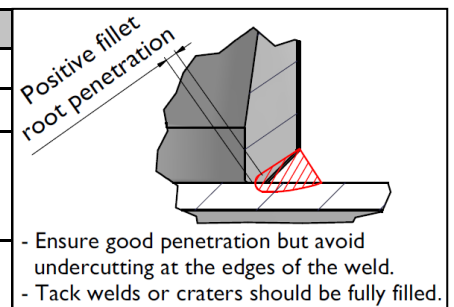
Welding order:

— Tack weld — Begin — End

Material chassis = CEV $\leq 0.47\%$

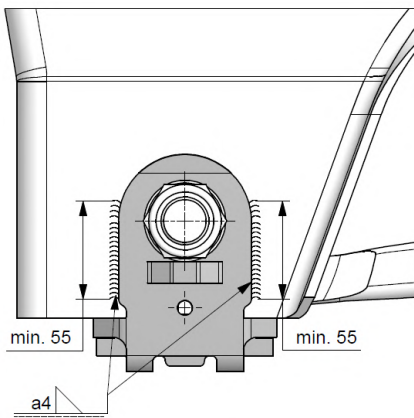
CEV = $C + (Mn/6) + ((Cr+Mo+V)/5) + ((Ni+Cu)/15)$

Item	Specifications
Welding wire	Acc. DIN 8559-SG2 / EN 440-G3 Si1. Material-Nr 1.5125, $\varnothing 1.2\text{ mm}$
Supply	1-wire technique
Gas mixture	92-8 Argon / O_2 or 84-13-3 Argon / CO_2 / O_2 or 90-10 Argon / CO_2
Welding parameters	Current: 240 - 340 A Puls voltage: 26 - 40 V

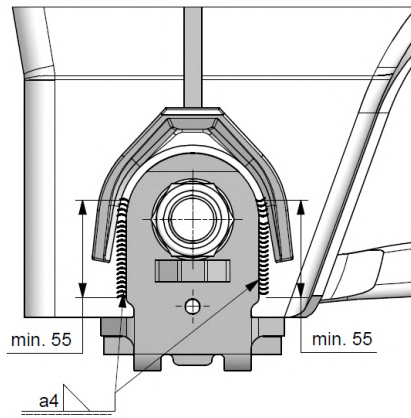


3. Hanger brackets & pedestals

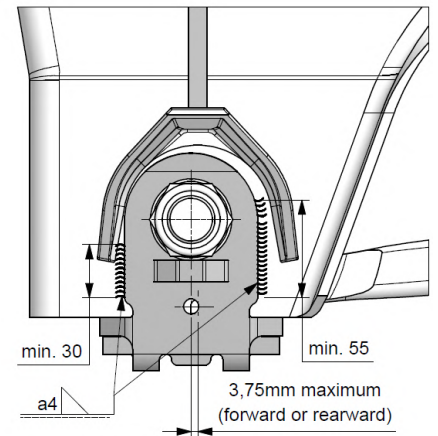
3.7 Welding of wear plates after alignment



Weld wear plates as shown after alignment where the casted brace has not been welded in place yet or is on the side of the hanger bracket that has no brace. A full weld around the wear plate is also allowed.



Weld wear plates as shown after alignment where the casted brace has already been welded in place.

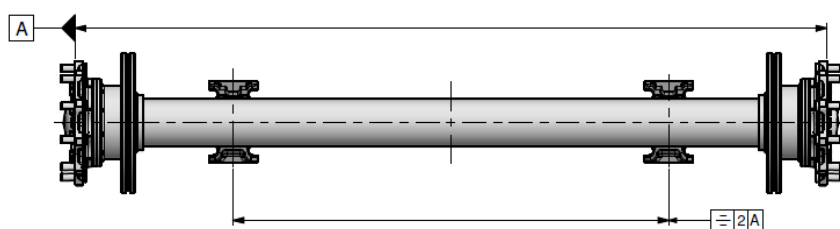


Welding as shown is only advised in cases where the alignment is done with the casted bracing in place and the wear plate is at its maximum alignment offset.

NOTE: - Both wear plates on each side of the hanger bracket must be welded.
- Paint welded area afterwards in order to protect from oxidation.

4. Axle seat welding

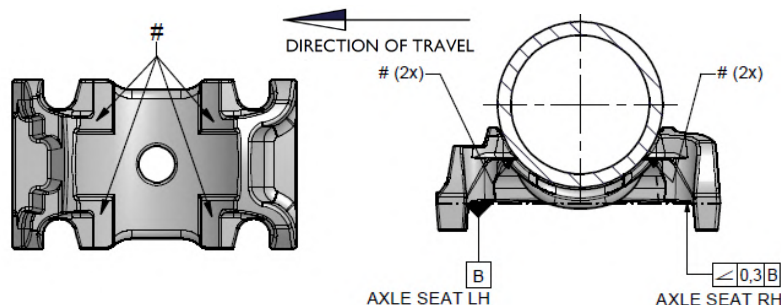
4.1 Welding of standard axle seats



Before welding the temperature of the axle seat and axle beam has to be $> 10^{\circ}\text{C}$.

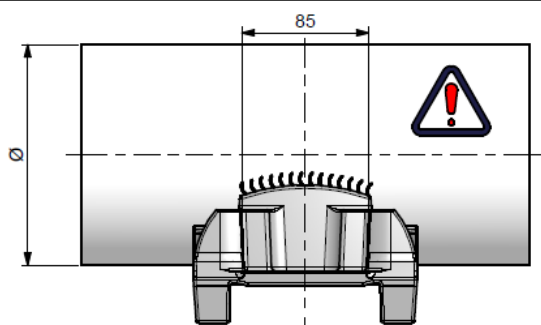
These instructions are valid for both underslung and overslung applications.

Both seats have to be positioned parallel horizontally and must be at the same level longitudinally to the axle beam. Max. variation in angle between seats = $0,3^{\circ}$



Ensure the axle beam contacts the four support surfaces of the axle seat #.

Ensure there is sufficient clamping force between the axle beam and the axle seat during tack welding (if possible use the weight of the axle beam on top of the axle seat) to avoid clearance arising between the axle beam and support surfaces of the axle seat. Do not use the U-bolts to clamp the seat in position as this may deform the axle seat or damage the U-bolts.



Note: Only weld the 85 mm. length on the front and back of the seat, as shown in the drawing.

Weld height $a=8$ mm. (ISO 2553)

Weld order (for MIG/MAG welds):



Building up of the weld in three layers as detailed below and shown in the drawing on the left.

Important: Weld first & second layer on one wheel end side (left or right), then weld the other wheel end side. And then go back and apply the third layer (as then the first two layers are cooled down enough).

1st layer:

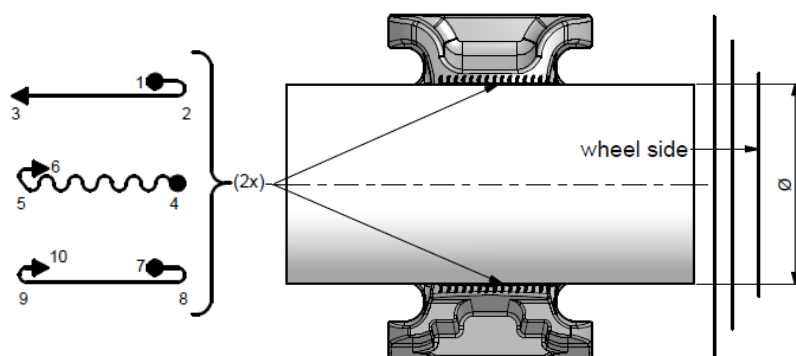
- 1-2: Start weld from 1 and return through 180 degrees on initial weld.
- 2-3: Start "Stitching" welds.

2nd layer:

- 4-5: Start "Waving" welds.
- 5-6: Weld over to infill crater.

3rd layer:

- 7-8: Start weld from 7 on top of the weld and return through 180 degrees on initial weld.
- 8-9: Start "Seam" welds.



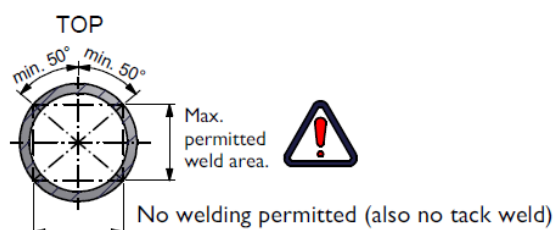
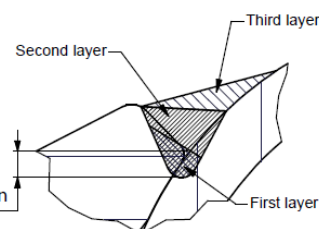
General Welding Information

- Important: the earth connector should be attached to the axle beam in such a way that no welding current can be transferred to the bearing sets.
- Tack welds or craters should be fully filled.
- Never test the arc on the axle beam itself.

Rotate axle beam to obtain a PA/PB welding position (inverted welding)

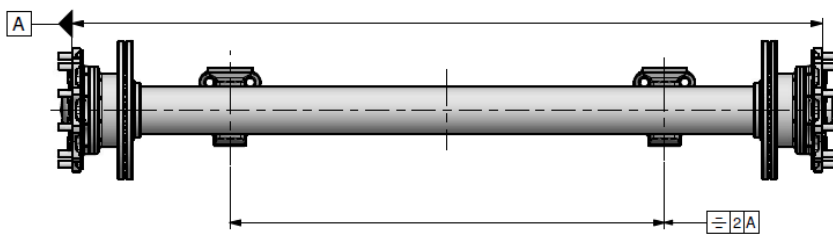


Positive fillet root penetration



4. Axle seat welding

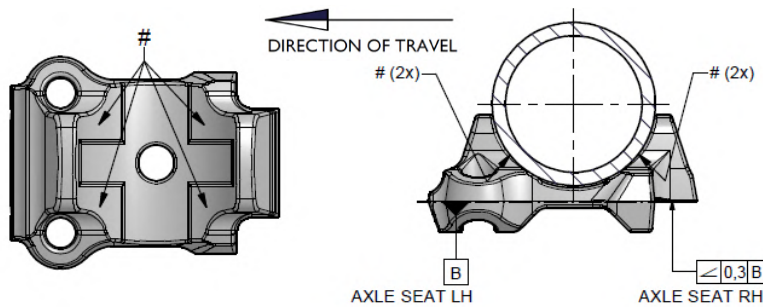
4.2 Welding of HD axle seats



Before welding the temperature of the axle seat and axle beam has to be $> 10^{\circ}\text{C}$.

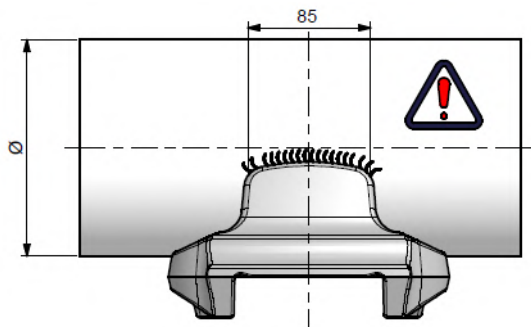
These instructions are valid for both underslung and overslung applications.

Both seats have to be positioned parallel horizontally and must be at the same level longitudinally to the axle beam. Max. variation in angle between seats = $0,3^{\circ}$



Ensure the axle beam contacts the four support surfaces of the axle seat #.

Ensure there is sufficient clamping force between the axle beam and the axle seat during tack welding (if possible use the weight of the axle beam on top of the axle seat) to avoid clearance arising between the axle beam and support surfaces of the axle seat. Do not use the U-bolts to clamp the seat in position as this may deform the axle seat or damage the U-bolts.



Note: Only weld the 85 mm. length on the front and back of the seat, as shown in the drawing.

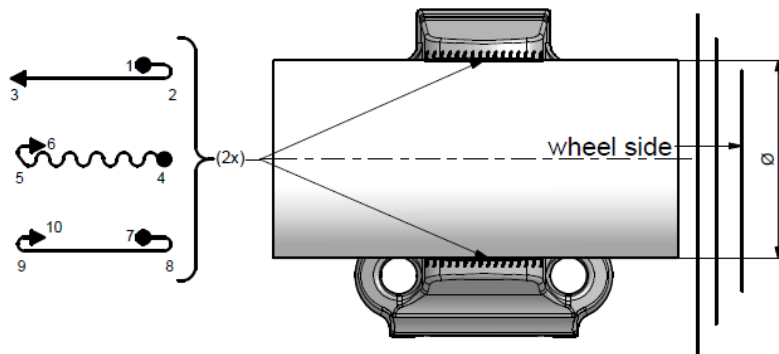
Weld height $a=8$ mm. (ISO 2553)

Weld order (for MIG/MAG welds):

Building up of the weld in three layers as detailed below and shown in the drawing on the left.



Important: Weld first & second layer on one wheel end side (left or right), then weld the other wheel end side. And then go back and apply the third layer (as then the first two layers are cooled down enough).



1st layer:

- 1-2: Start weld from 1 and return through 180 degrees on initial weld.
- 2-3: Start "Stitching" welds.

2nd layer:

- 4-5: Start "Waving" welds.
- 5-6: Weld over to infill crater.

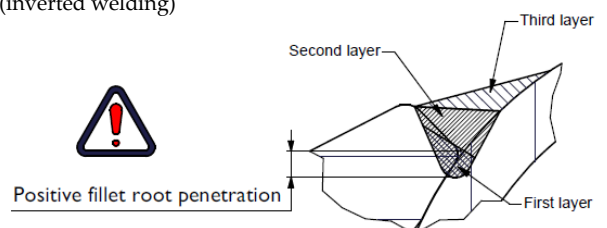
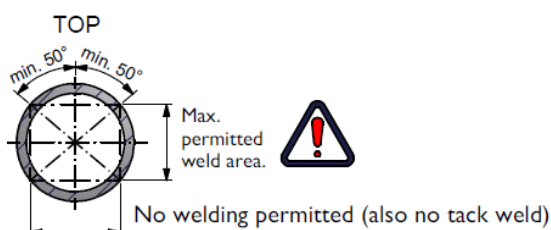
3rd layer:

- 7-8: Start weld from 7 on top of the weld and return through 180 degrees on initial weld.
- 8-9: Start "Seam" welds.
- 9-10: Weld over to infill crater

Rotate axle beam to obtain a PA/PB welding position (inverted welding)

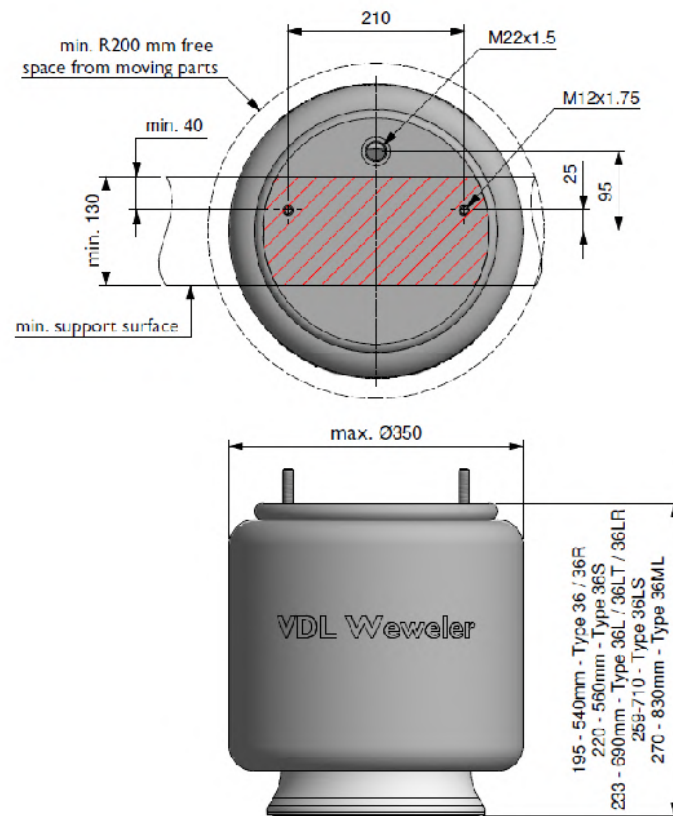
General Welding Information

- Important: the earth connector should be attached to the axle beam in such a way that no welding current can be transferred to the bearing sets.
- Tack welds or craters should be fully filled.
- Never test the arc on the axle beam itself.



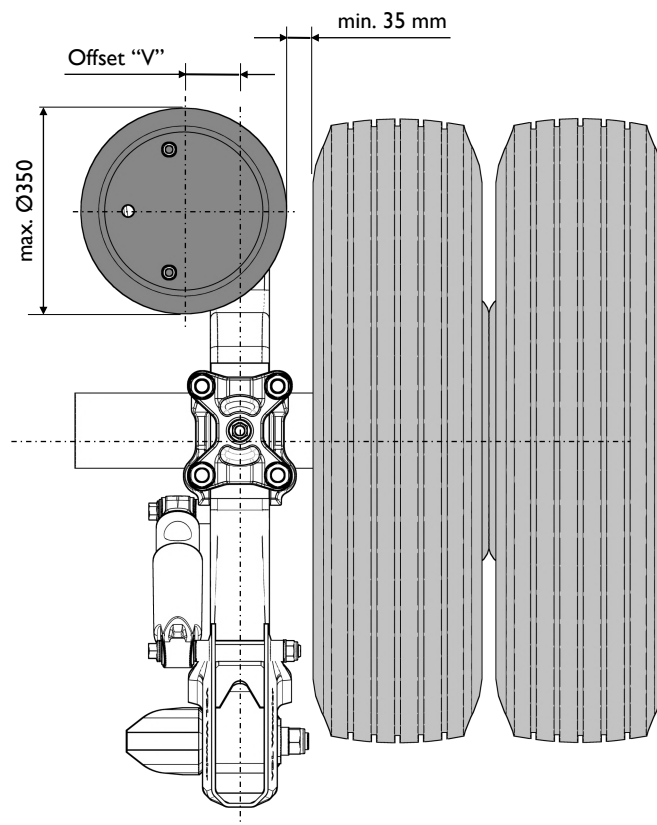
5. Air spring

5.1 Standard Ø350



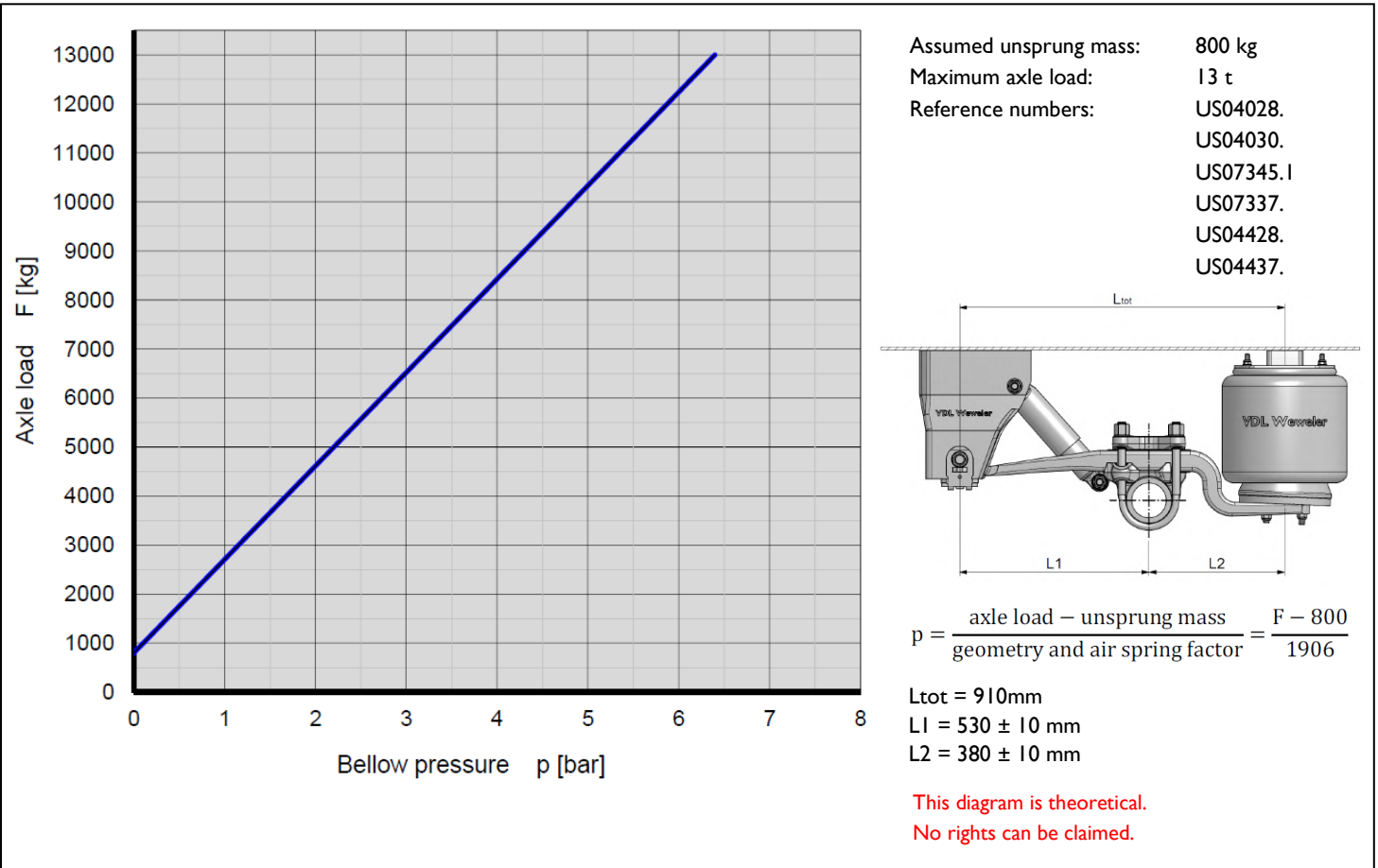
If the minimum support surface is less than indicated an additional support plate has to be added.

5.2 General air spring clearance



5. Air spring

5.3 Load-pressure diagram Ø350 air springs - standard system geometry

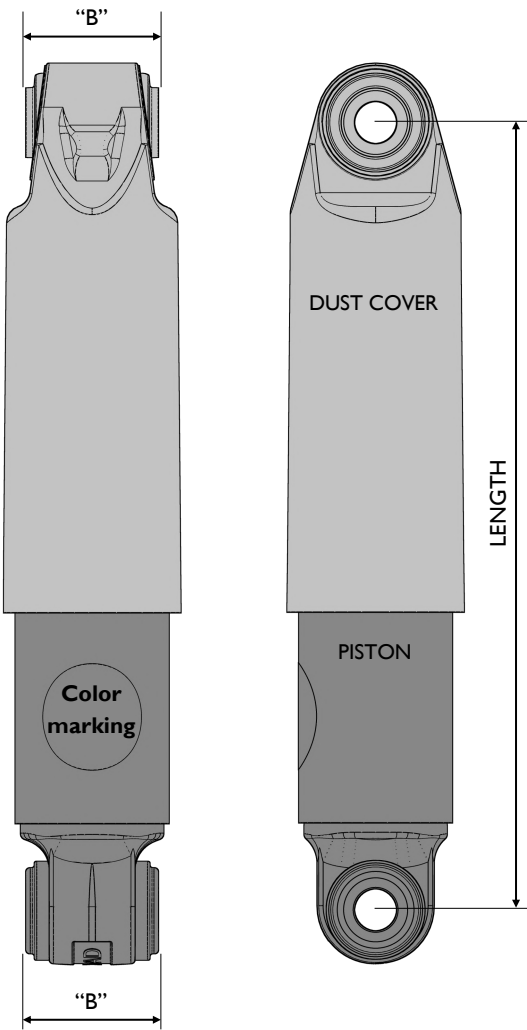
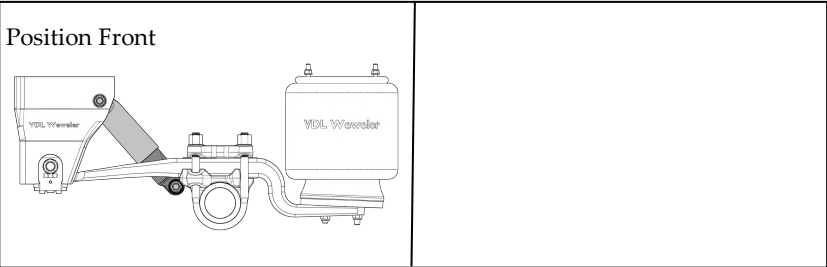


In case of different system geometry, unsprung mass or air spring type please contact Valx BV for the correct diagram.

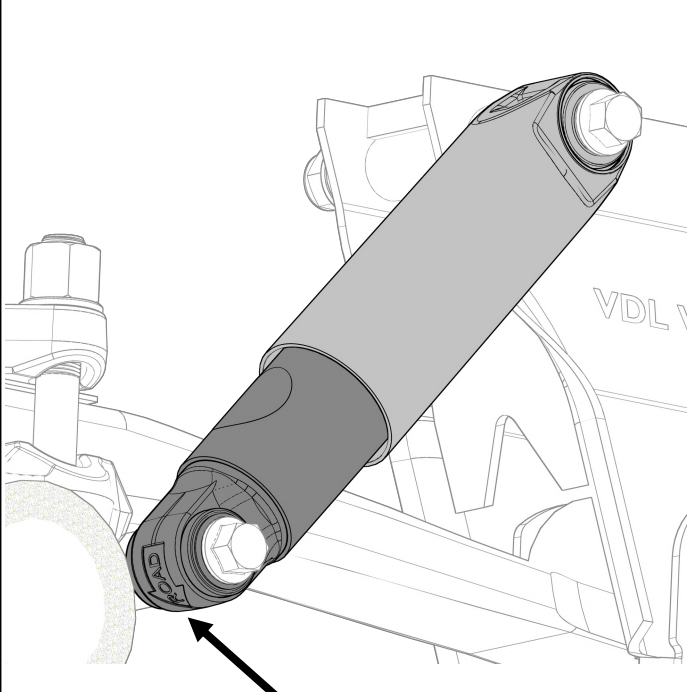
6. Shock absorber overview

For the MBS-HD air suspension range are several standard shock absorbers available. These can be identified based on the type number and color. The plastic dust cover are in all cases black. The color is applied on the complete bottom piston part of the shock absorber or by means of a colored sticker on the shock absorber.

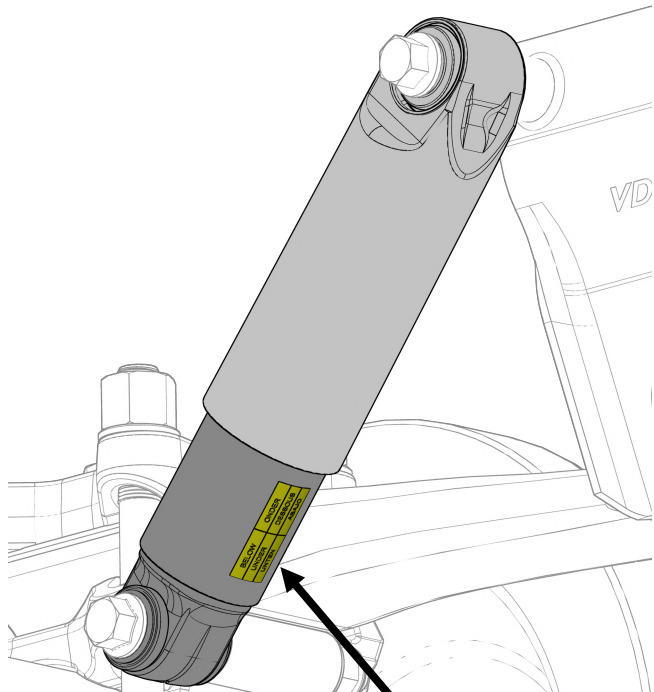
Type	Color	Min. length	Max. length	Mounting	Width "B"	Position
2643W	Black	294 mm	429 mm	M20	62 mm	Front
2640W	Orange	305 mm	453 mm	M20	62 mm	Front
2637W	Yellow	321 mm	479 mm	M20	62 mm	Front
2267W	Grey	341 mm	519 mm	M20	62 mm	Front



Follow the below instructions (if present on the shock absorber) when mounting the shock absorbers.



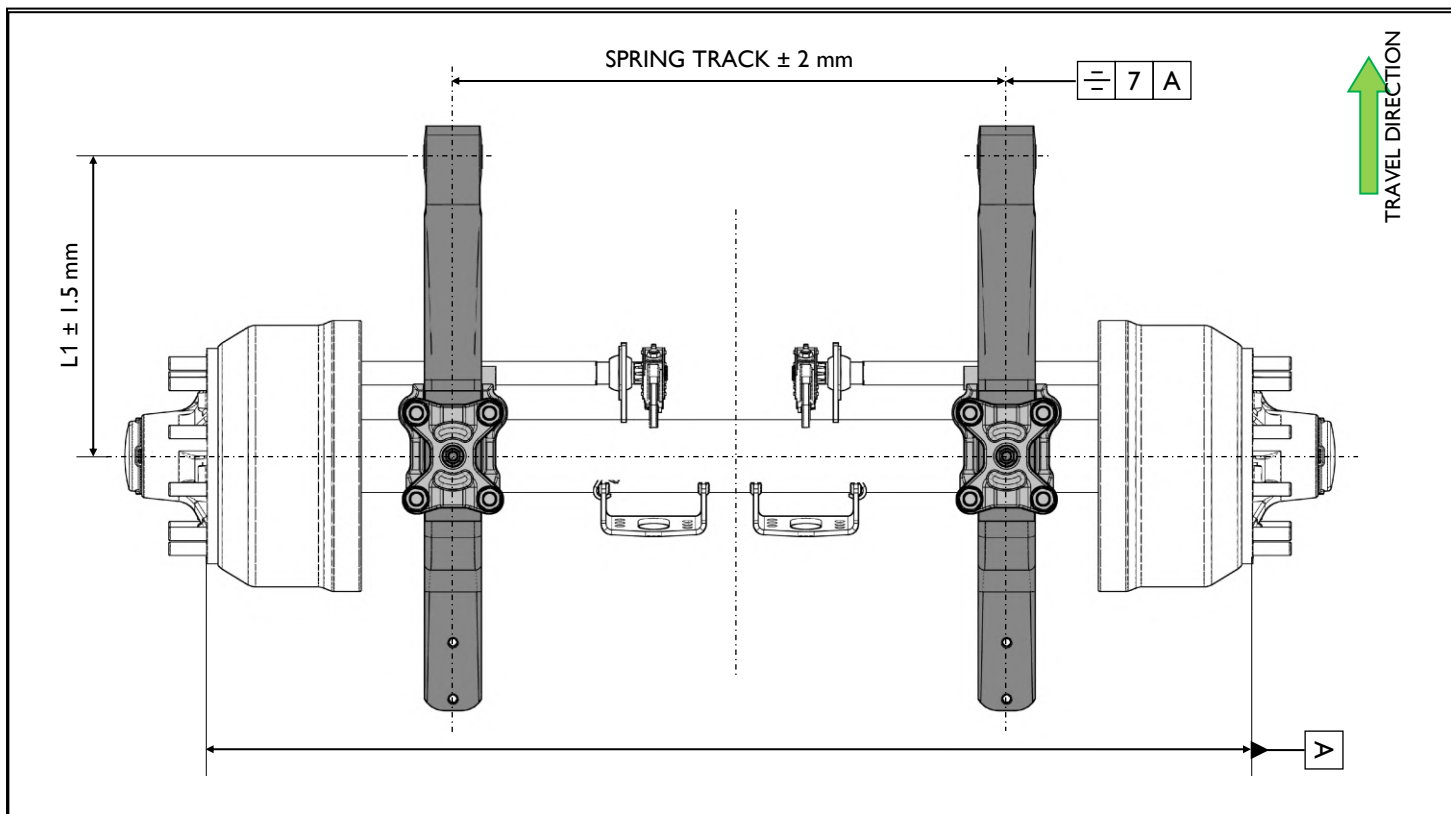
Mount the shock absorber with the marking "ROAD" as illustrated.



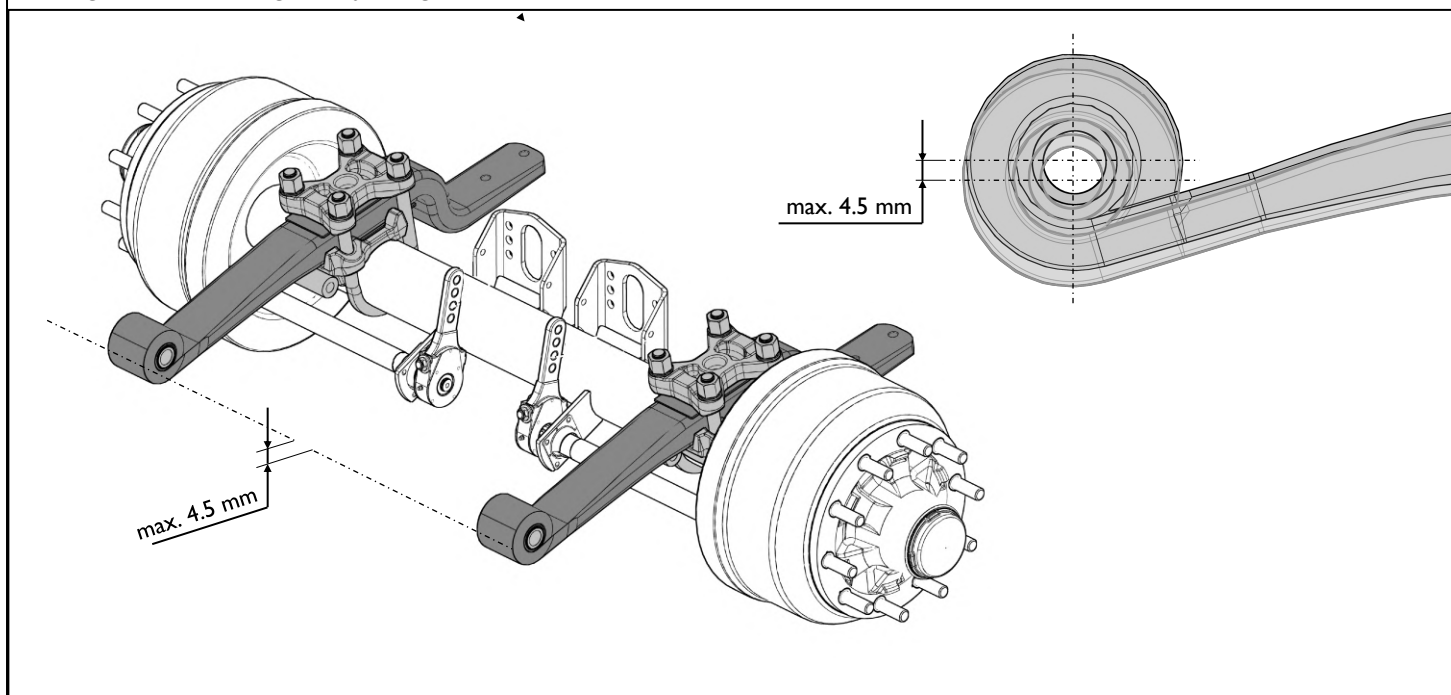
Mount the shock absorber with the marking "BELOW" as illustrated.

7. Alignment of system & axle

7.1 Alignment of air suspension versus axle

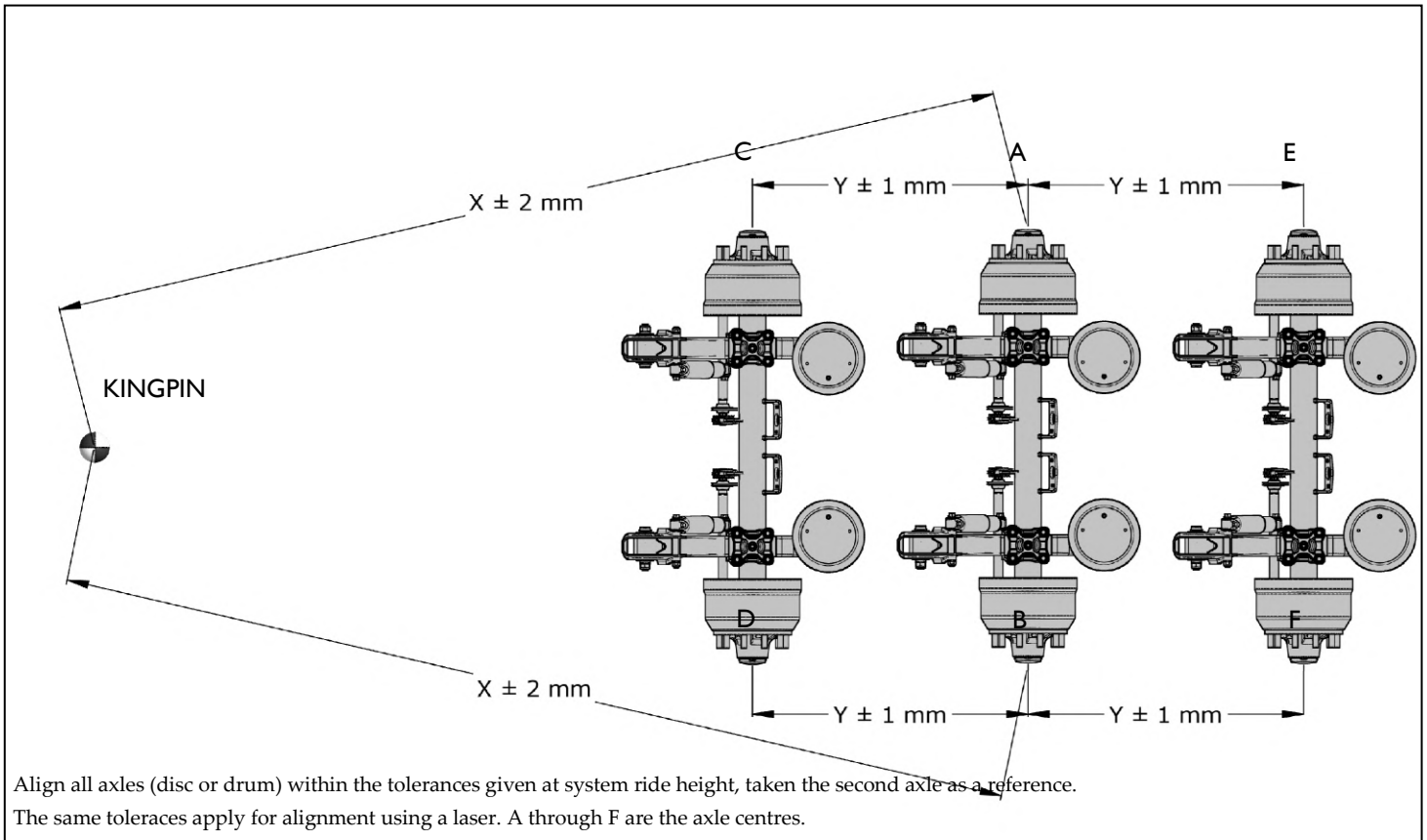


7.2 Alignment of trailing arm eye height

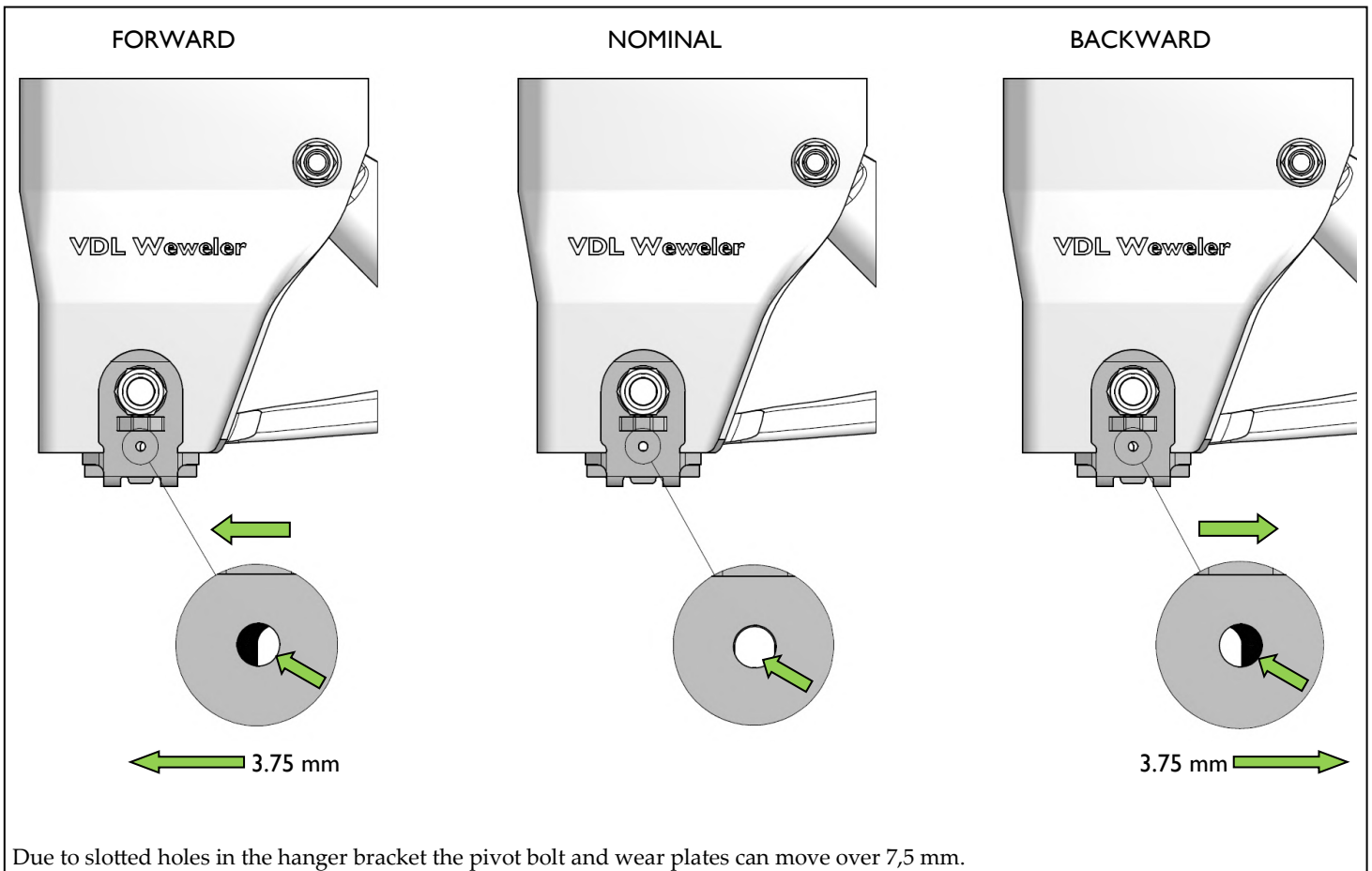


7. System & axle alignment

7.3 Alignment of axles

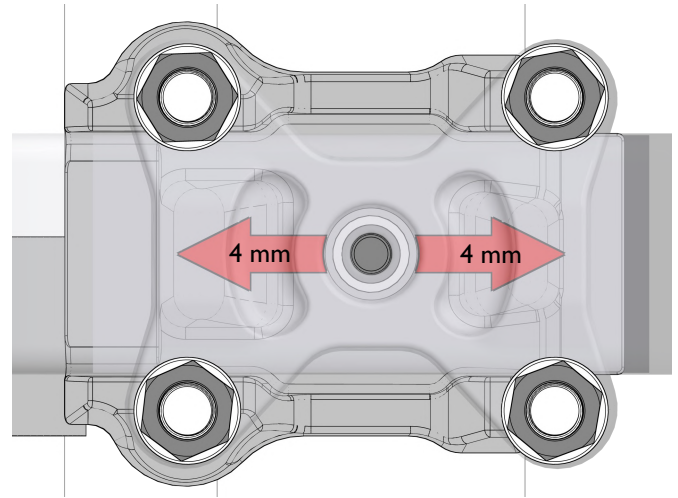
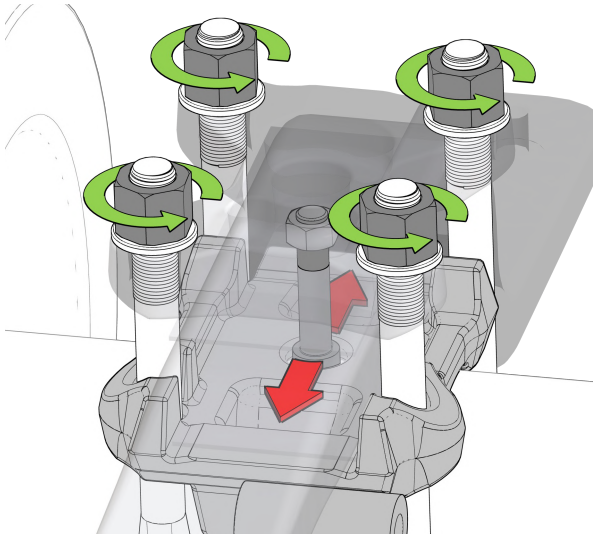


7.4 Adjusting the standard hanger bracket alignment (center bush must be used for this alignment application - see section 11.10)



7.5 Adjusting the axle seat clamping alignment (do not use the center bush for this alignment application - see section 11.10)

1. Check if the axle alignment is within the prescribed tolerances (see section 7.3). If the axle need (re-)aligning, follow the next steps for axle alignment in the axle seat clamping.

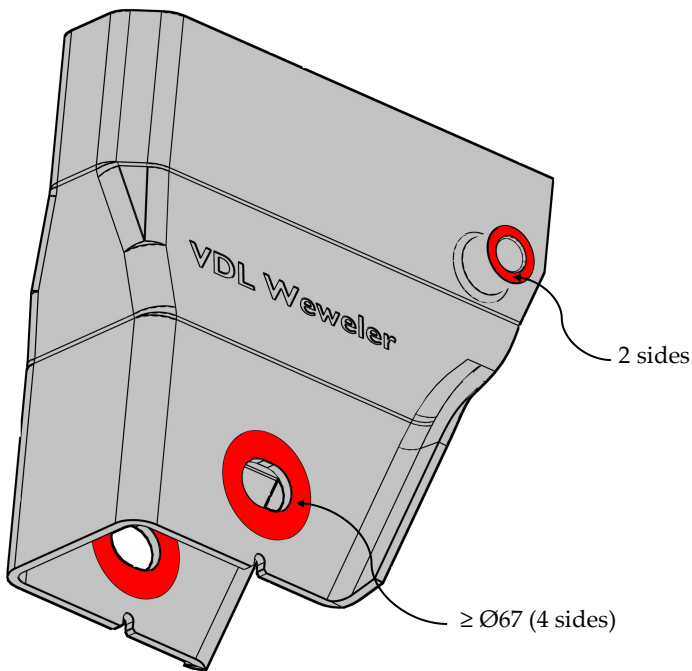


2. Loosen (U-)bolt nuts, until the axle can move in the clamping (nuts remain on (U-)bolt).
Due to the clamping construction the aligning can now be adjusted within $\pm 4\text{mm}$ (each side).
3. Align the axle at ride height within the prescribed tolerances (section 7.3).
4. Tighten (U-)bolts at ride height according the prescribed procedure (see section 10).

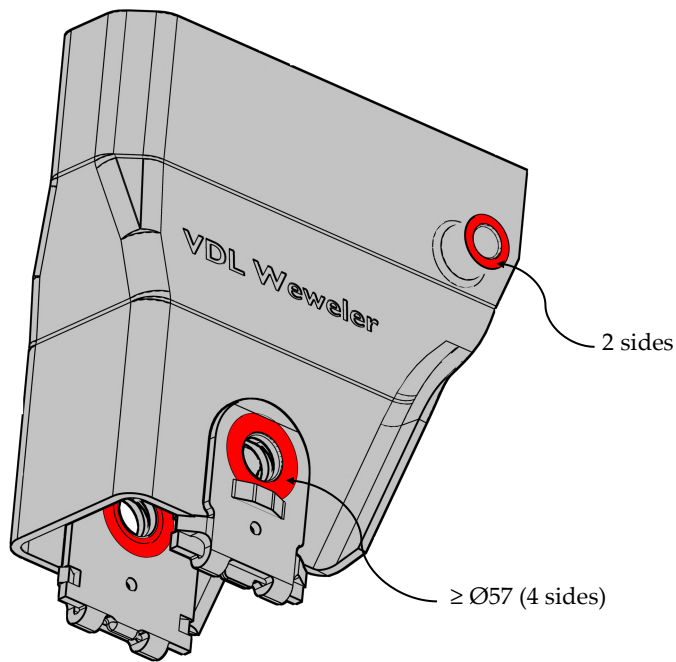
8. Paint instruction

The red market areas are only allowed to be primered, KTL coated (max. 30mm) or zinc dipped (50 - 100mm).

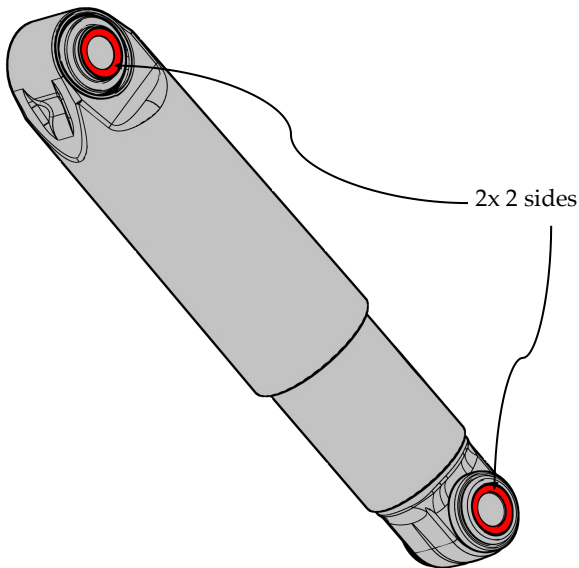
Hanger bracket with alignment option



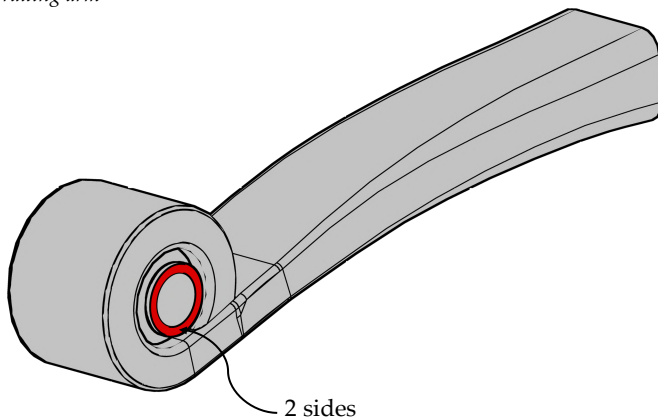
Hanger bracket with fixed welded wear plates



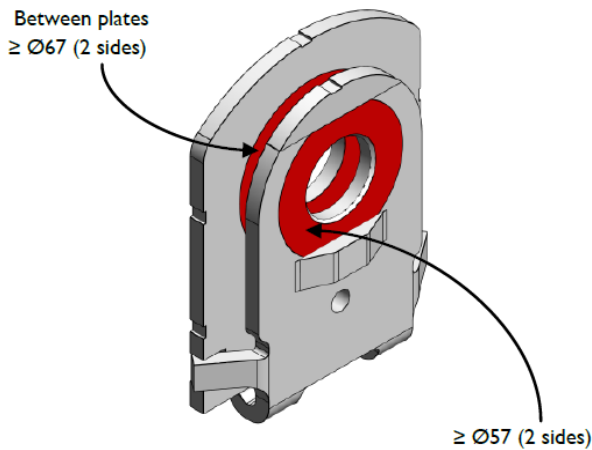
Shock absorbers



Trailing arm



Wear plate (standard already KTL coated)



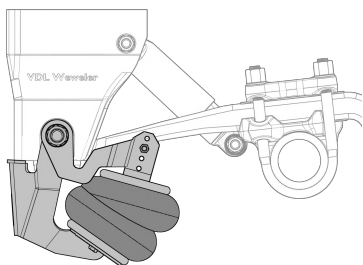
9. Axle lift

9.1 Axle lift versions

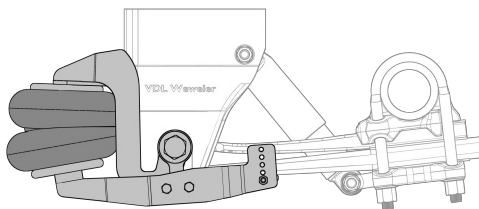
For the MBS-HD air suspension range several axle lifts are available. Depending on the air suspension system and application the most suitable axle lift can be selected. Please check the available individual system drawings or contact Valx BV for the required correct axle lift version.

The axle lifts can be classified into three categories:

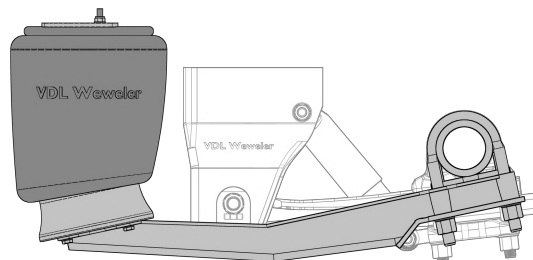
Two sided bolt on axle lift



Two sided bolt on Mega axle lift

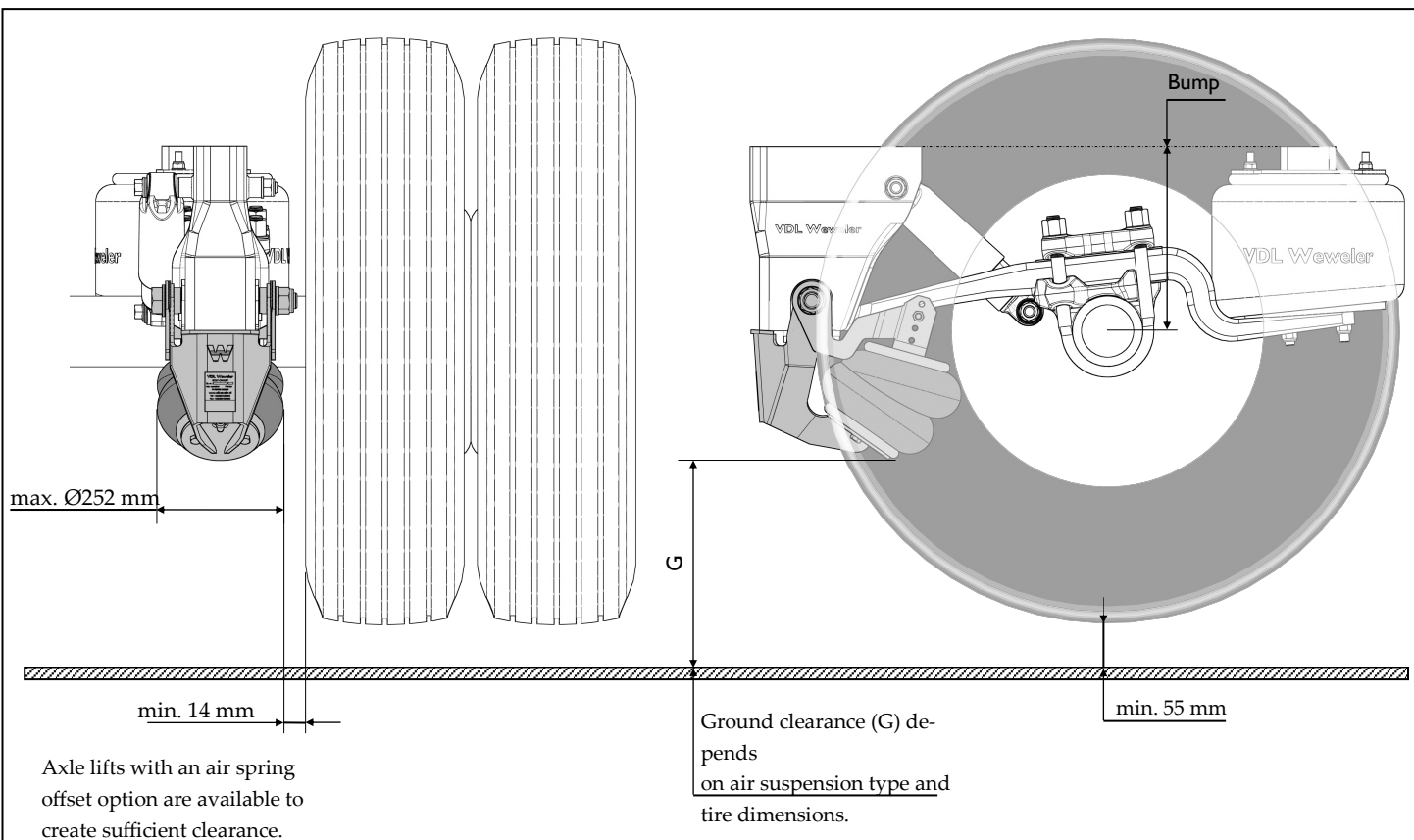


Center mounted axle lift (Mid-Lift)



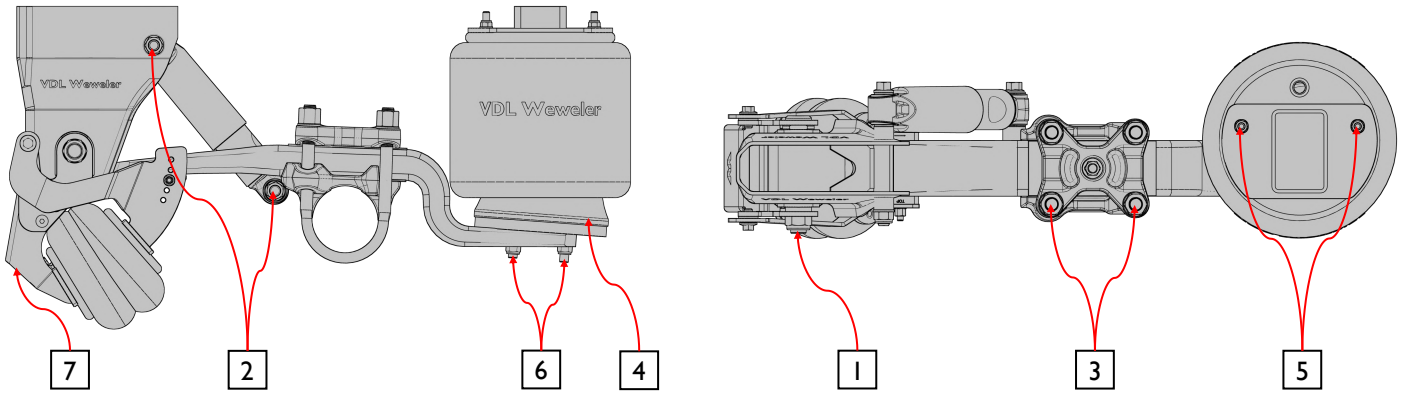
The maximum allowed pressure for all versions is 8,5 bar. For center mounted axle lifts (Mid-Lift) a residual pressure of 0,5 bar is required when the axle is not lifted.

9.2 General clearances two sided axle lift



Always check the ground clearance (G). Minimum allowed ground clearance is 50mm when the vehicle is standing level and on the suspension bump. The clearance between the road and tyre when the axle is lifted is the inbound axle travel minus the deformation of the tyre (min. 55 mm).

10. Torque settings MBS-HD Air Suspension



Item	Size	Width across flats (A/F)	Torque **		Inspection
			Step 1 : Torque	Step 2 : Angle	
1	Pivot bolt ^{1) 2)}	M27	41	250 Nm (+25 / -0) + apply grease on 1/4 of thread surface *	270° (+27° / -13°) 1000 Nm
2	Shock absorber - side mounted ^{1) 2)}	M20	24 (bolt) / 30 (nut)	200 Nm (+20 / -0)	180° (+18° / -9°) 550 Nm
3	U-bolts M24 ³⁾	M24	36	800 Nm (+50 / -0)	- 800 Nm
4	Air spring (bottom)	M12	19	65 Nm (+10 / -0)	- 65 Nm
		M16	21	200 Nm (+20/- 20)	- 200 Nm
5	Air spring (top)	M12	19	30 Nm (+10 / -0)	- 30 Nm
6	Air spring support plate (Ø350)	M16	24	200 Nm (+20/- 20)	- 200 Nm
7	Axle lift	See separate axle lift data sheets for the correct torque settings for each type of axle lift			

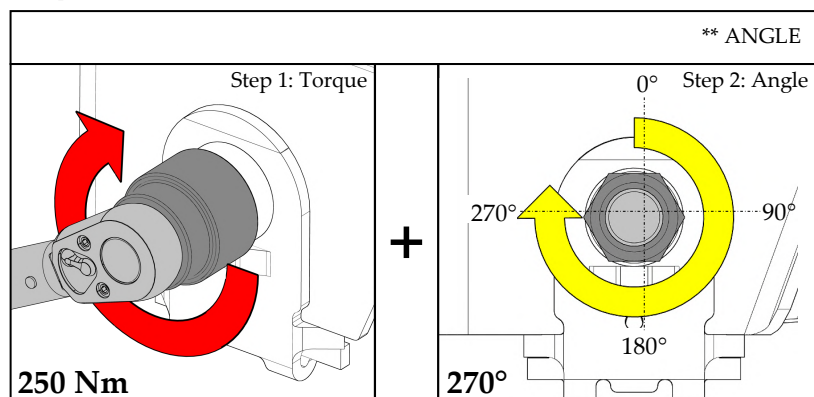
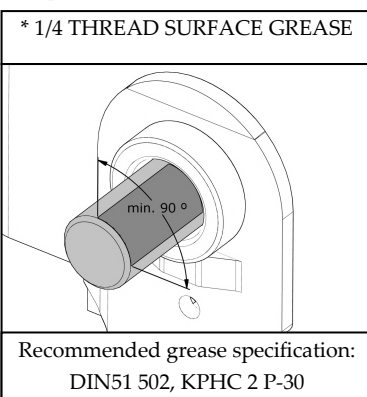
¹⁾ Tighten at ride height.

²⁾ During angle tightening of the nut/bolt it is essential to secure the counterside.

³⁾ Tighten U-bolts evenly and crosswise.

Always tighten or check the fasteners with a calibrated torque wrench.

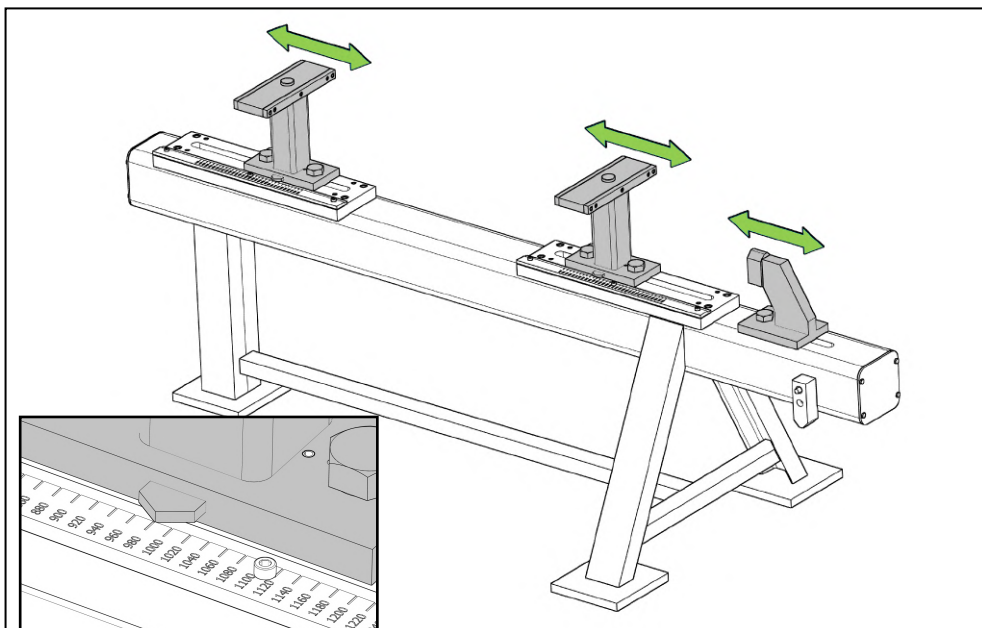
Torque settings are the same for underslung and overslung MBS-HD suspensions.



11. Air suspension on axle assembly

11.1 Welding Jig

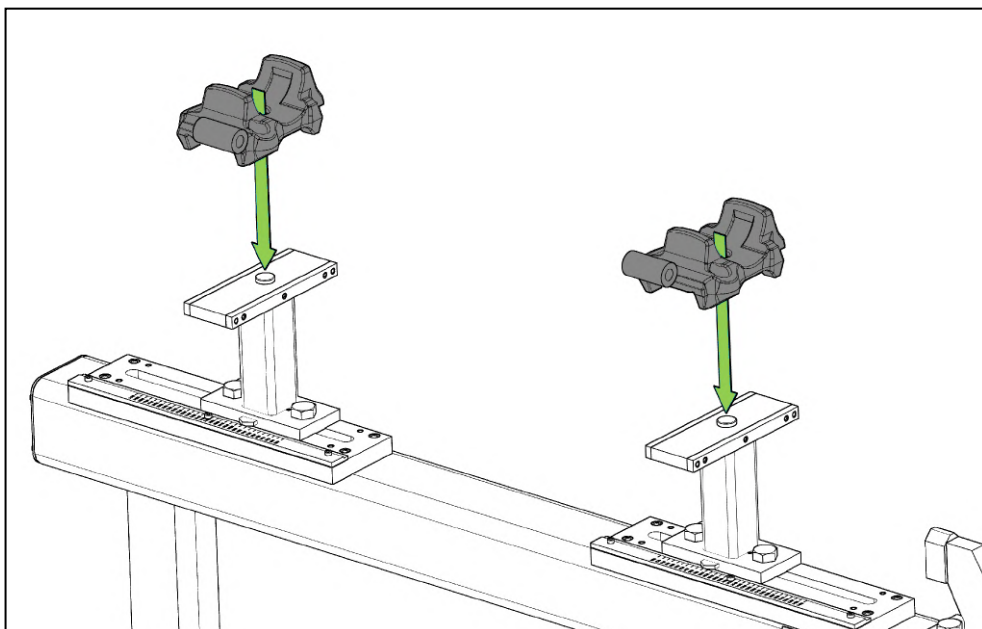
Set up welding jig for corresponding axle. The outer support is positioned against the hubface in the next steps. Adjust the two axle seat supports to the correct spring track.



11.2 Axle seats

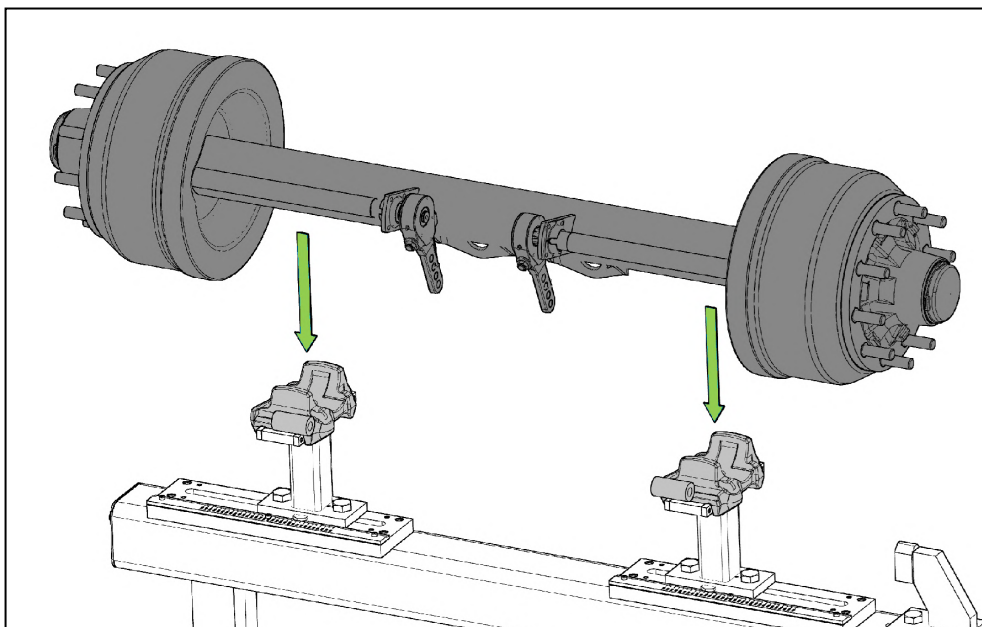
Place the axle seats on the welding jig.

This installation guide shows the HD axle clamping for round axles. Other available axle clampings can be found in section 14.



11.3 Axle

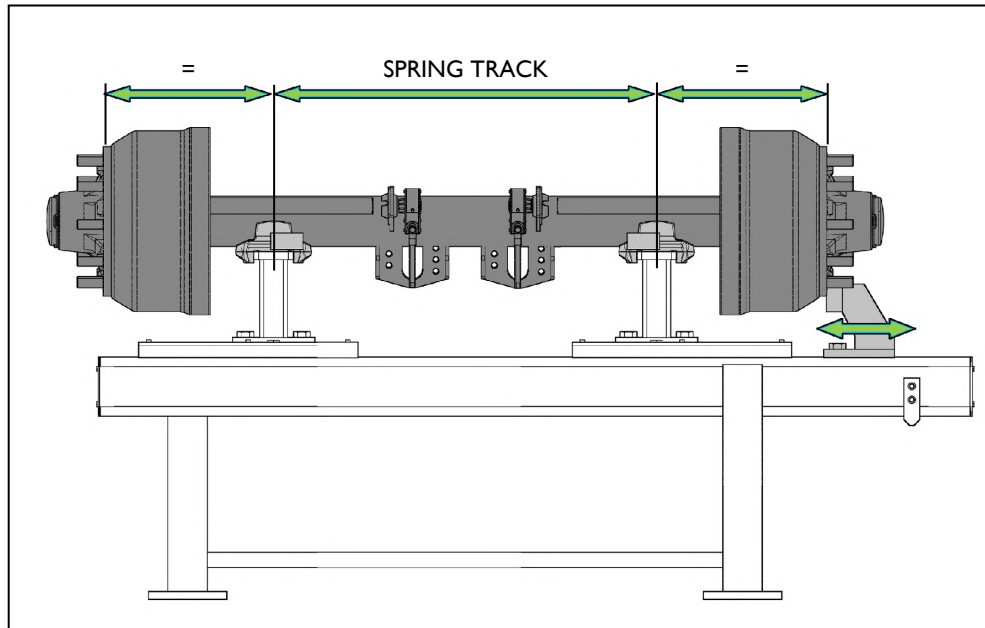
Place the axle on the axle seats. Make sure the axle is positioned in the correct driving direction.



11. Air suspension on axle assembly

11.4 Align axle

Align the axle in relation to the axle seats. Make sure the distance between the axle seats left and right to the hubfaces are equal. Adjust and secure the welding jig side support in the correct position.



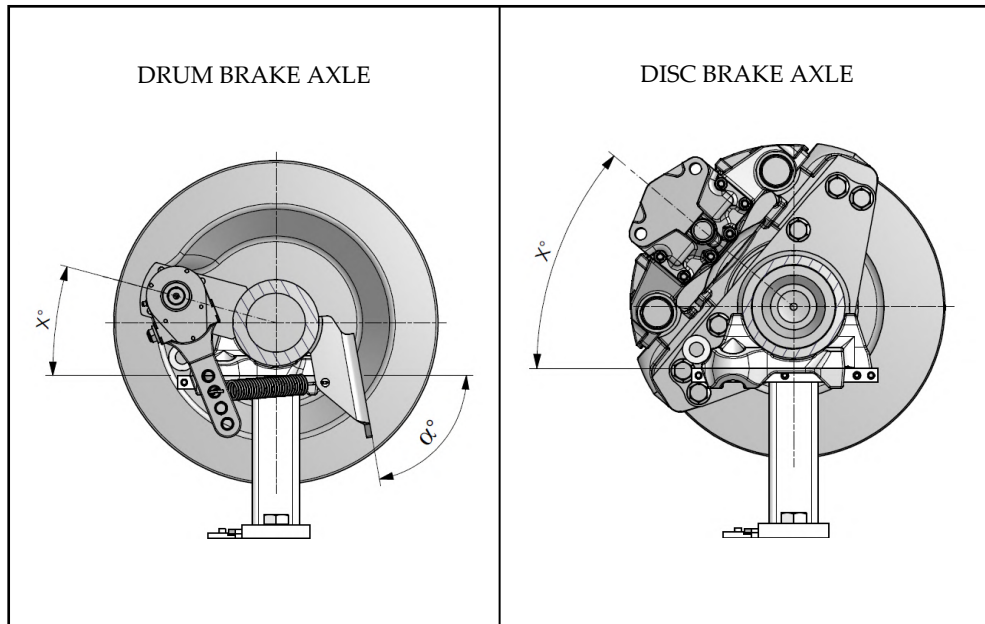
11.5 Position brake booster (bracket)

Check the position of the brake booster bracket (angle α) or camshaft (angle X) for drum brake axles.

Check the position of the brake booster (angle X) for disc brake axles.

Please contact Valx BV for the prescribed angle.

Mind under- or overslung systems. The images shown an overslung configuration.

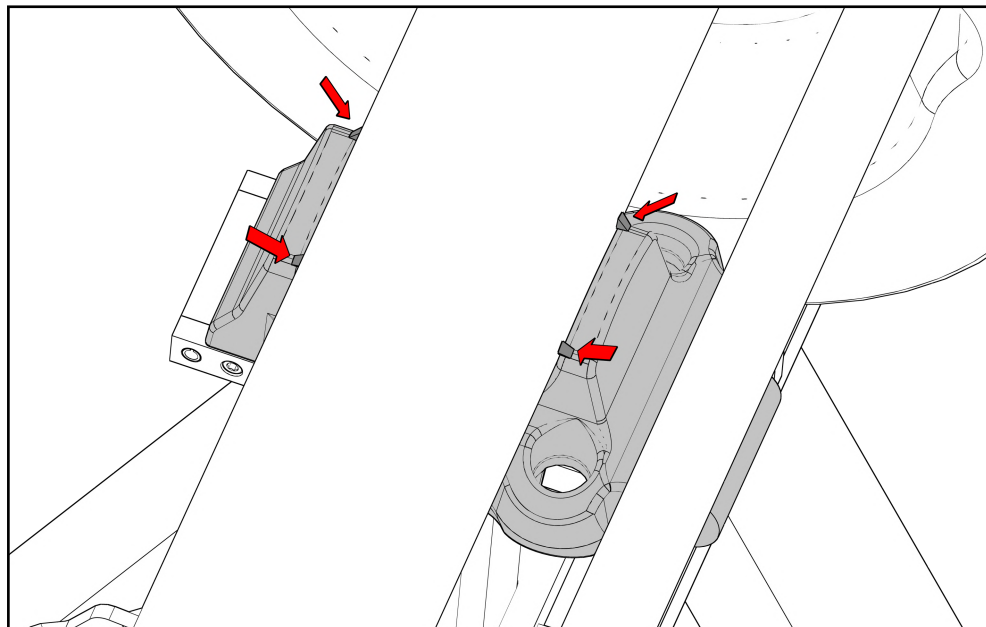


11.6 Tack welding axle seats

Make sure the axle is supported on the axle seat support surfaces.

Tack weld the axle seats on the four indicated positions on the front and the rear on both sides.

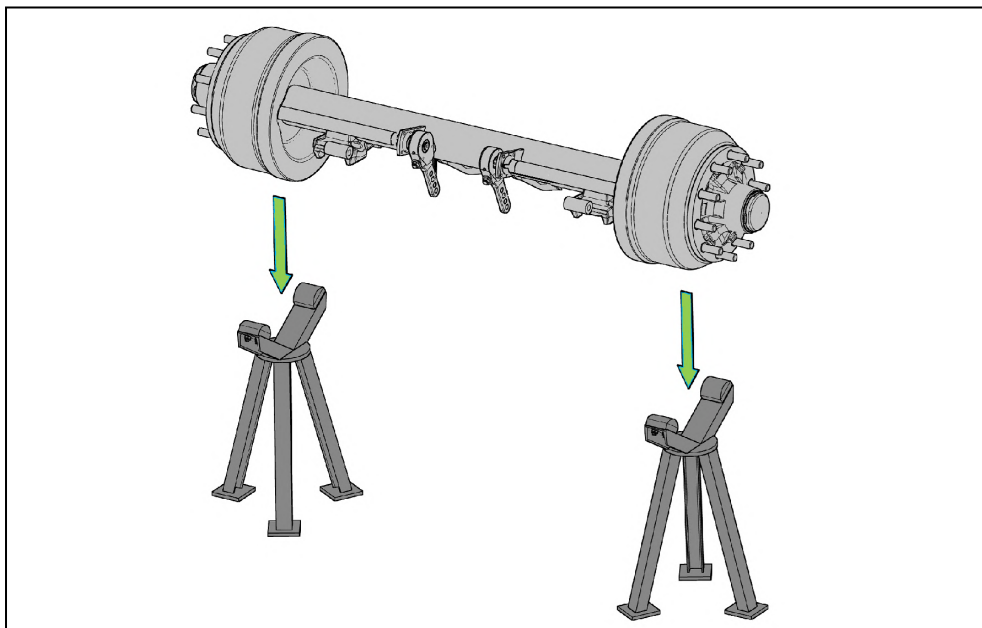
See instructions: Section 4



11. Air suspension on axle assembly

11.7 Assembly supports

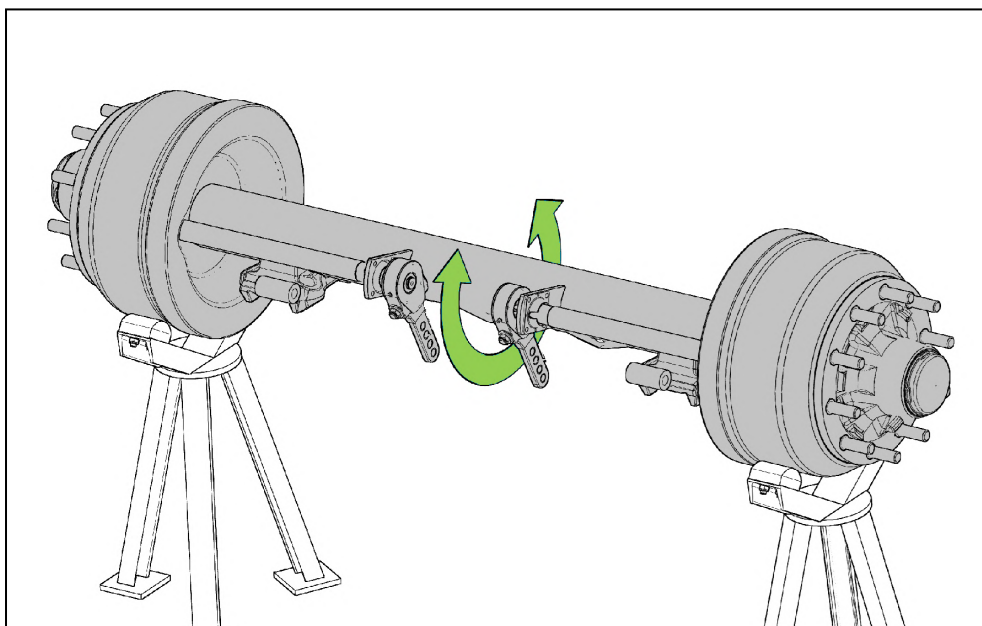
Place the axle on the assembly supports so that the axle can still be rotated.



11.8 Welding preparation

Rotate the axle beam to allow for inverted welding (PA/PB welding position).

See instructions: Section 4



11.9 Welding axle seats

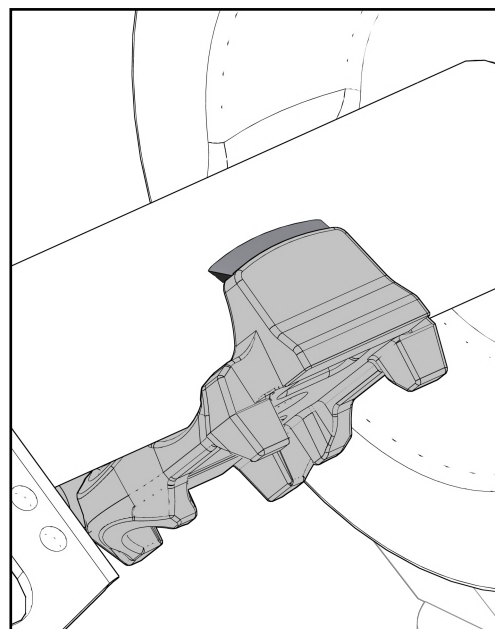
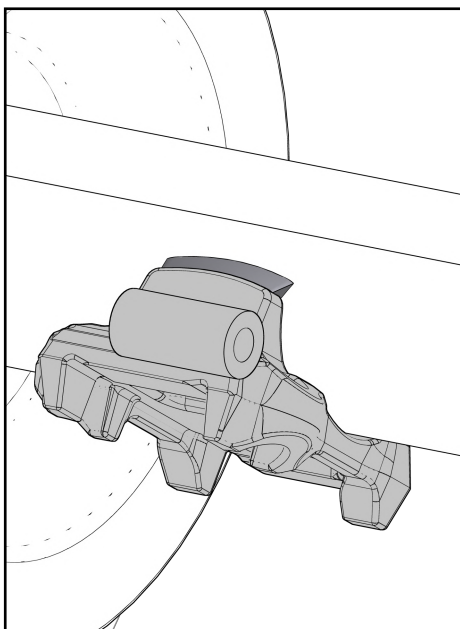
Weld the axle seats to the axle beam according to the instructions.

See instructions: Section 4



DO NOT WELD THE AXLE SEAT TO THE TRAILING ARM!!

TO PREVENT DAMAGE TO THE BEARINGS AND TRAILING ARM, NEVER CONNECT THE EARTH CONNECTOR TO THE AXLE HUB, WHEEL END OR TRAILING ARM!



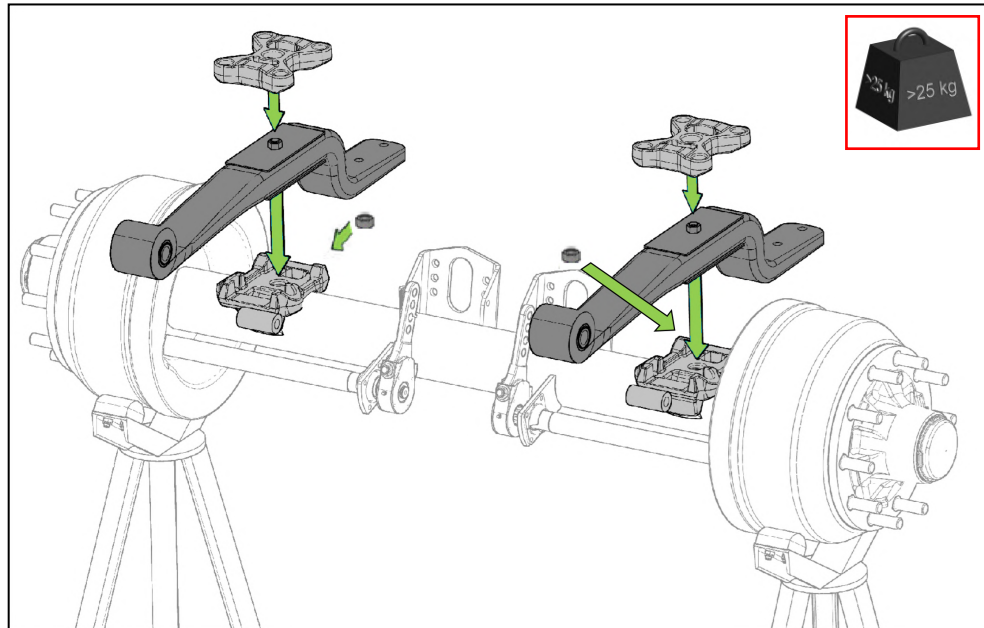
11. Air suspension on axle assembly

11.10 Trailing arms

Place the center bush in the axle seat hole (see the image on the right) when the axle alignment is going to be done via the hanger bracket alignment option (see section 7.1)

Do not mount the center bush in the axle seat hole when the axle alignment is going to be done via the alignment option in the axle clamping (see section 7.5)

Place the trailing arms on the axle seats. Make sure the center bolt is placed in the center hole of the axle seat. Place the u-bolt plates on top of the trailing arm. Make sure the center nut and center bush are placed in the center hole of the u-bolt plate.

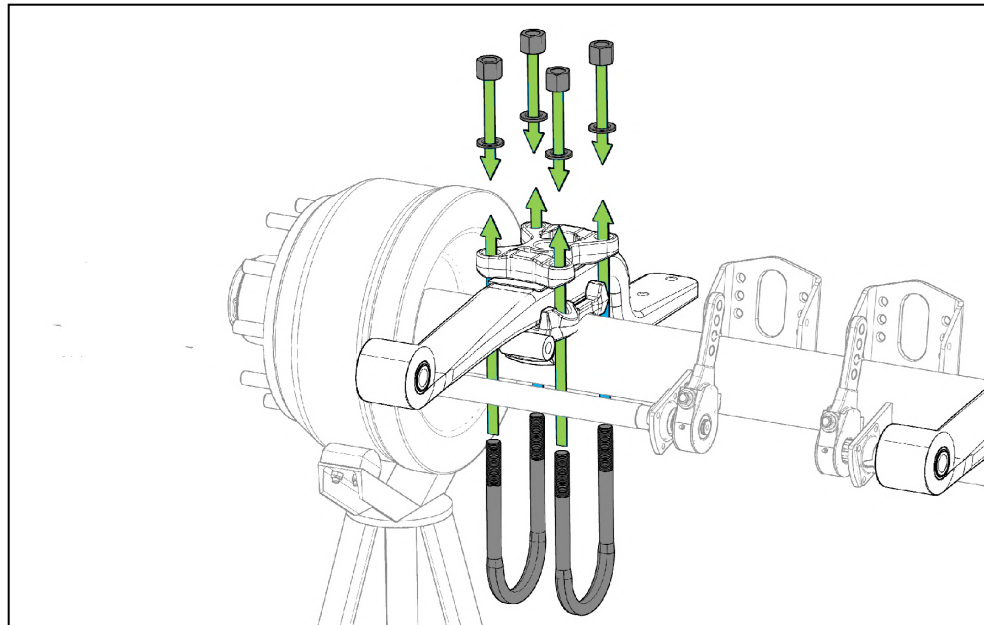


11.11 U-Bolts

Place the u-bolts around the axle and through the axle seat, u-bolt plate and washers and tighten the nuts slightly (hand tighten) until the u-bolts are positioned against the axle tube.

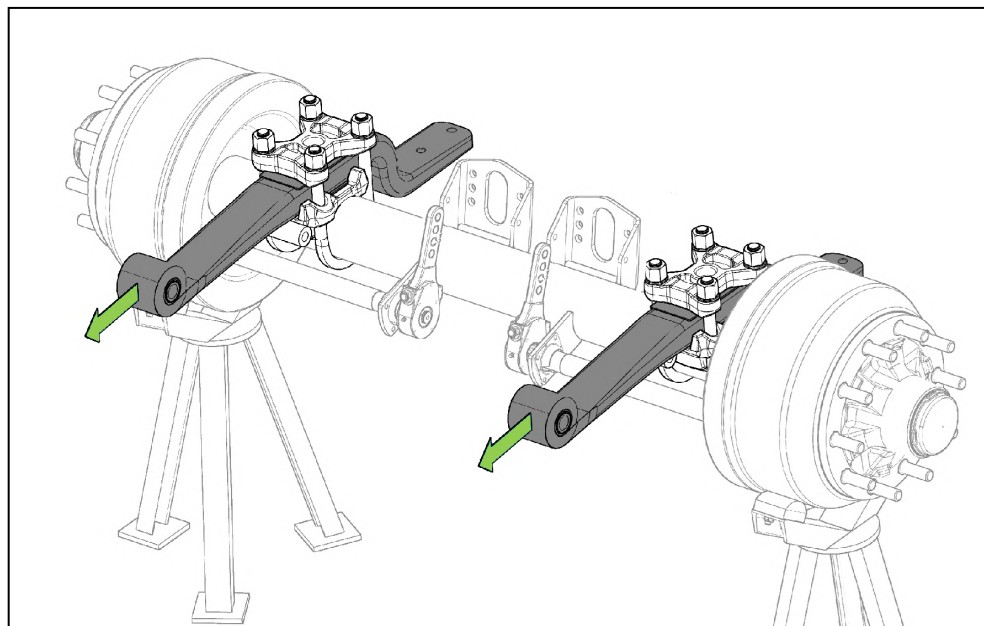
Repeat the same procedure for the other side.

(In case of wheel nuts there are no washers present).



11.12 Clamping

Pull both trailing arms forward in the axle clamping as much as possible.



11. Air suspension on axle assembly

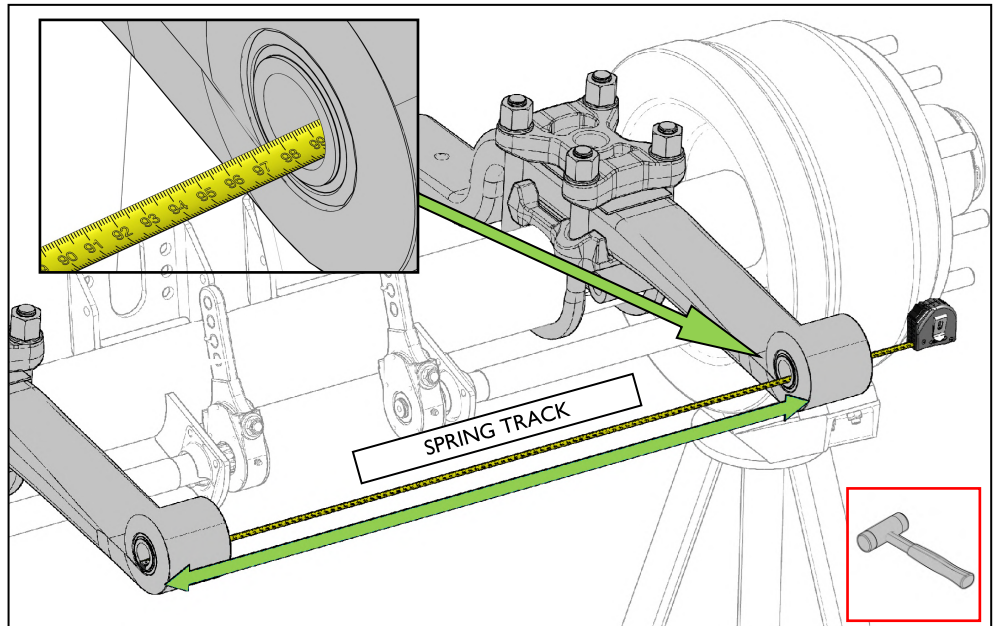
11.13 Spring track

Check the spring track again by measuring the distance through the spring eyes.

If necessary adjust the spring track to the correct track by moving the trailing arm within the clamping using a rubber/plastic hammer.

Tolerance spring track: $\pm 2\text{mm}$

See instructions: Section 7.1 & 7.2



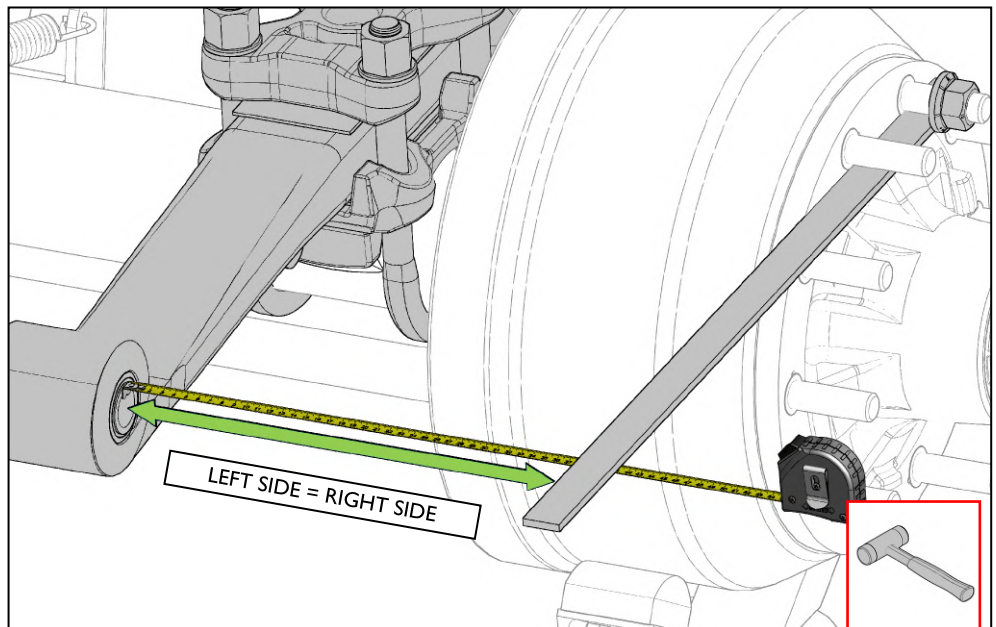
11.14 Alignment suspension to axle

Check the distance between the trailing arm eye and the hubface on both sides of the axle. This dimension should be the same on both sides.

If necessary adjust the spring track to the correct track by moving the trailing arm within the clamping using a rubber/plastic hammer.

Tolerance alignment: LEFT=RIGHT $\pm 2\text{mm}$

See instructions: Section 7.1 & 7.2

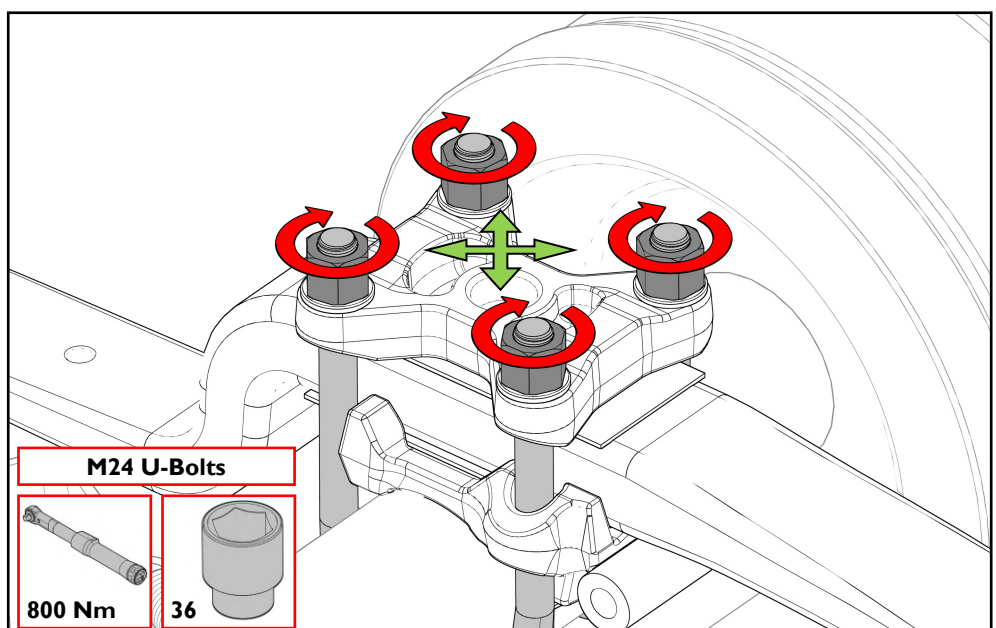


11.15 Tighten U-Bolts

Tighten the U-bolts crosswise and evenly on both sides.

After tightening check if the dimensions from step 11.13 and 11.14 are within tolerance.

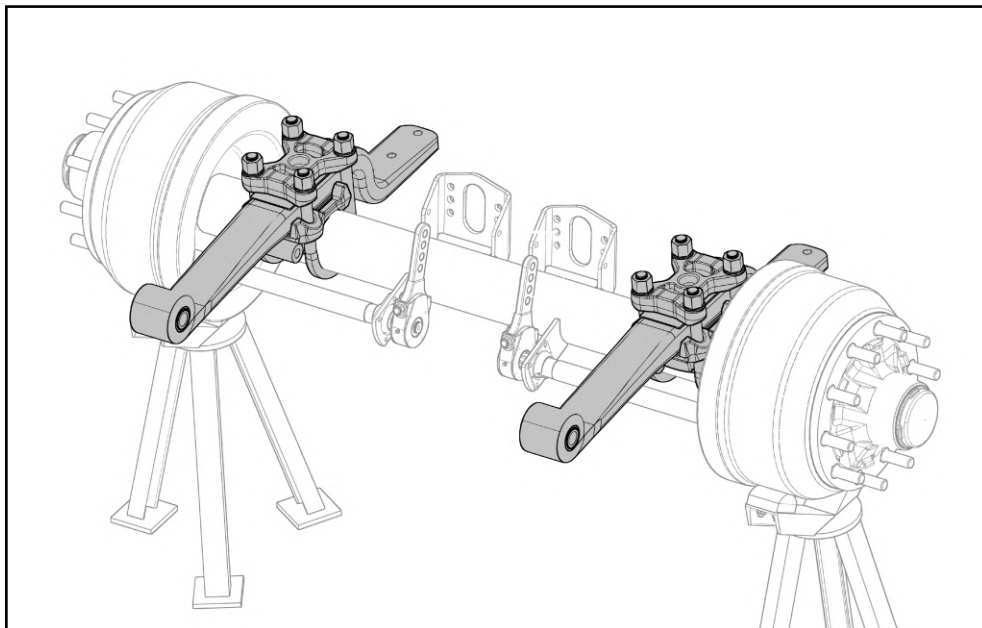
See tightening instructions: Section 10



11. Air suspension on axle assembly

11.16 Axle & suspension assembly

Finished sub-assembly of the air suspension clamping on the axle.



After step 11.16 there are two options to complete the system assembly:

- A. First mount the hanger brackets to the suspension system and then weld the complete system to the trailer chassis.
Follow the steps from section 12: Final air suspension assembly 1
- B. First weld the hanger brackets and pedestals (if present) to the trailer chassis and then mount the air suspension with axle to the chassis.
Follow the steps from section 13: Final air suspension assembly 2

12. Final air suspension assembly 1

12.1 Hanger brackets

Place the hanger brackets pivot bolts, nuts and washers. Use a mounting tool (f.e. as shown in drawing) and the shock absorber connection points to set the system **at ride height**. Please contact Valx BV for the specific shock absorber length.

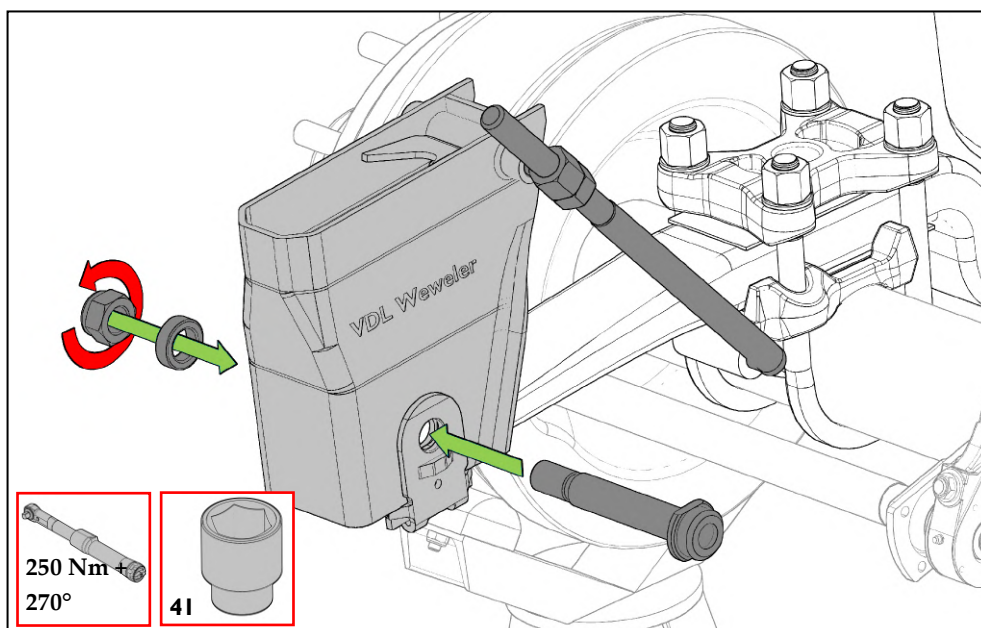
Tighten the pivot bolt connection according to the instructions **at ride height**.

See tightening instructions: Section 10



If an optional casted bracing is supplied. First weld this casting to hanger bracket.

See instructions: Section 3.6

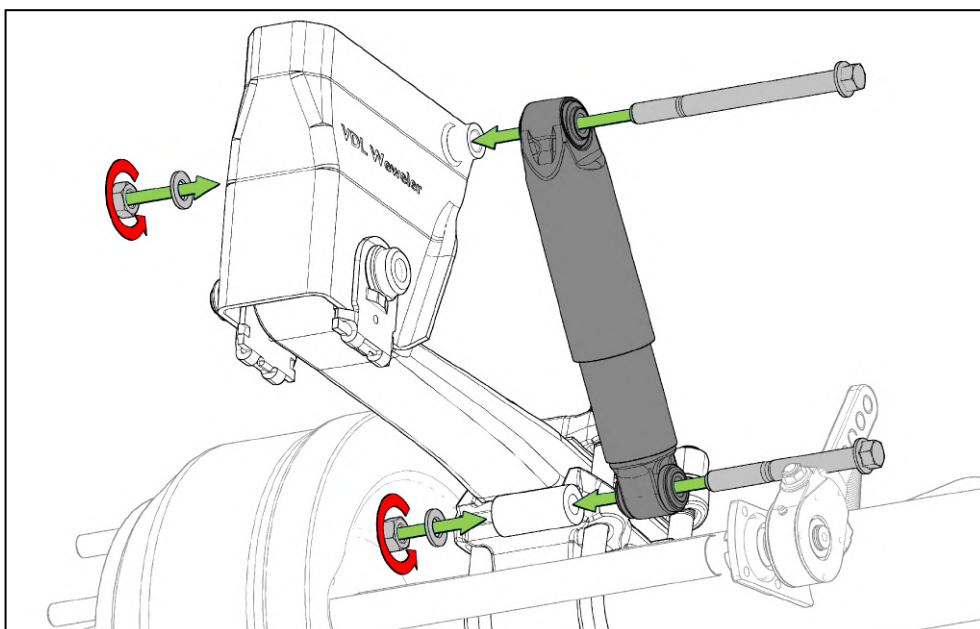


12.2 Shock absorbers (side mounted)

Remove the mounting tool and place the shock absorbers, bolts, nuts and washers. If present, follow the instructions on the shock absorber (*see Section 6*).

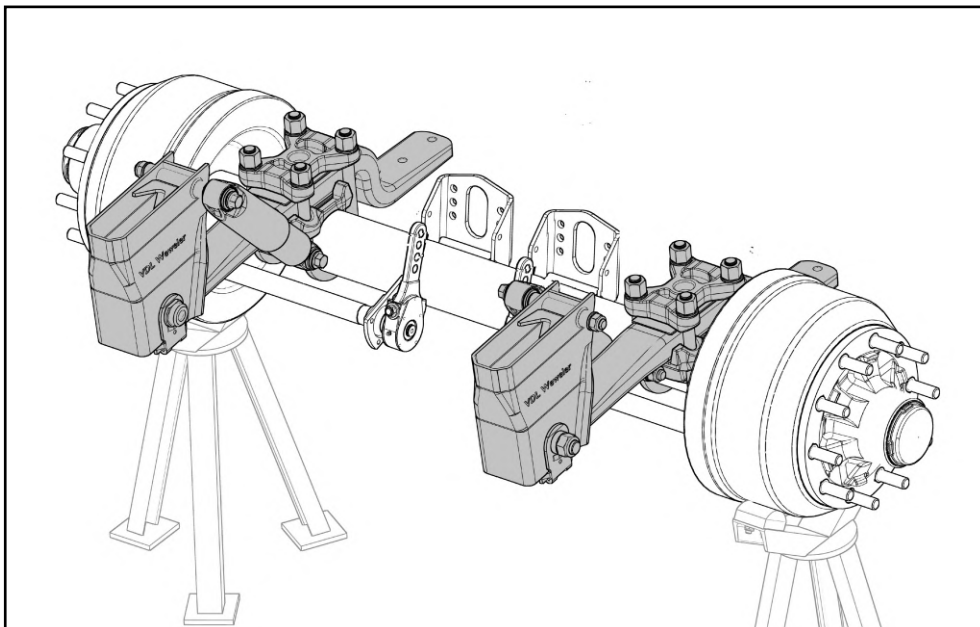
Tighten the top and bottom connection **at ride height** to torque according to the instructions.

See tightening instructions: Section 10



12.3 Suspension sub-assembly

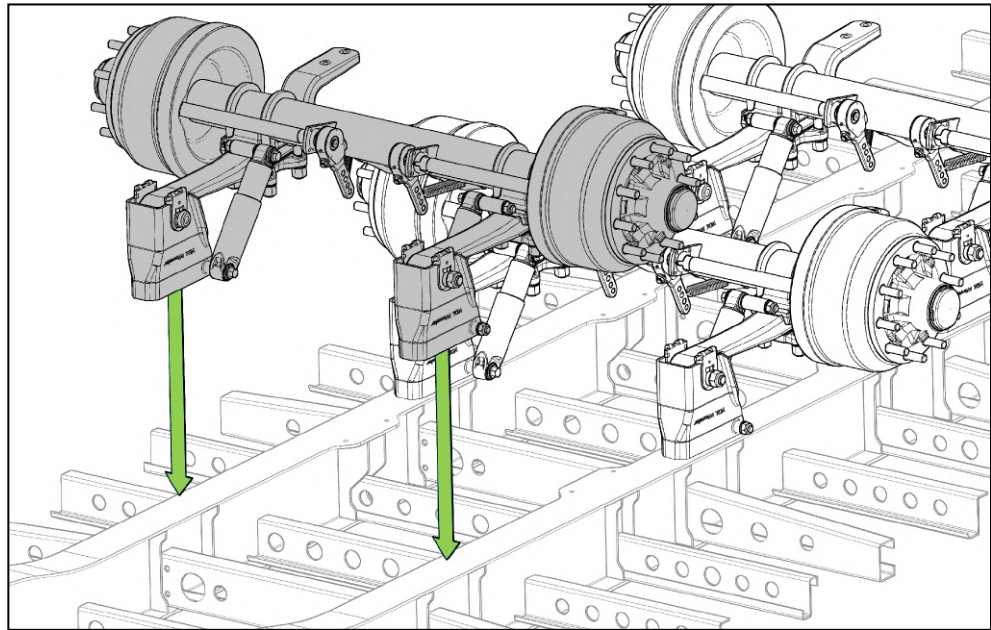
Air suspension sub-assembly finished.
Ready for mounting on the chassis.



12. Final air suspension assembly 1

12.4 Positioning on chassis

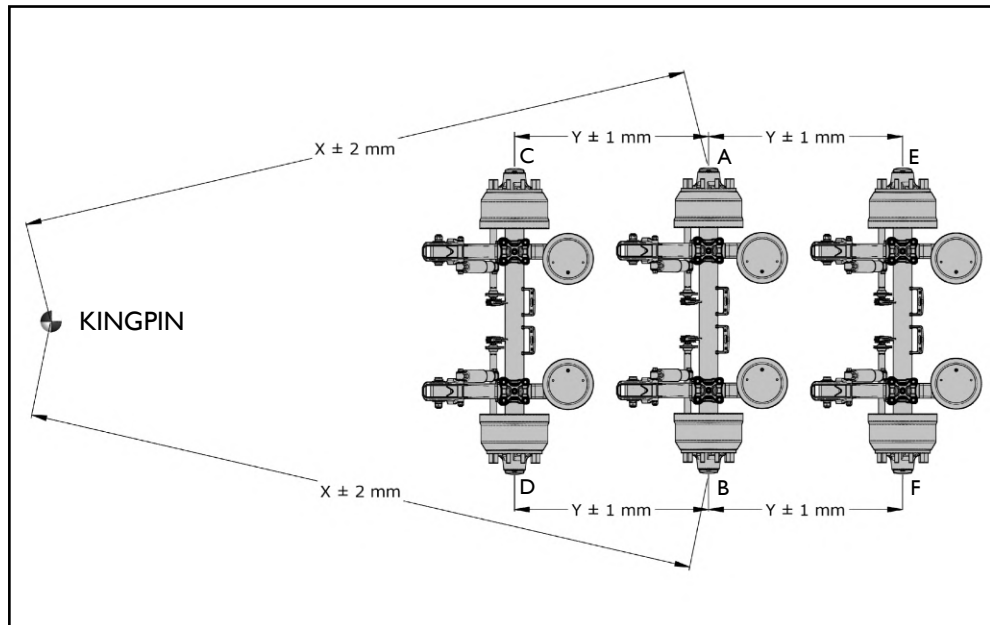
Place all three axle & suspension assemblies upside down on the chassis.
Make sure all the axles are secured on the required **ride height** using axle supports or blocks under the suspension system.



12.5 System alignment

Align all three axles within tolerances **at ride height** according to the instructions, taken the second axle as a reference.
The same tolerances apply for alignment using a laser.
A till F are the axle centres.

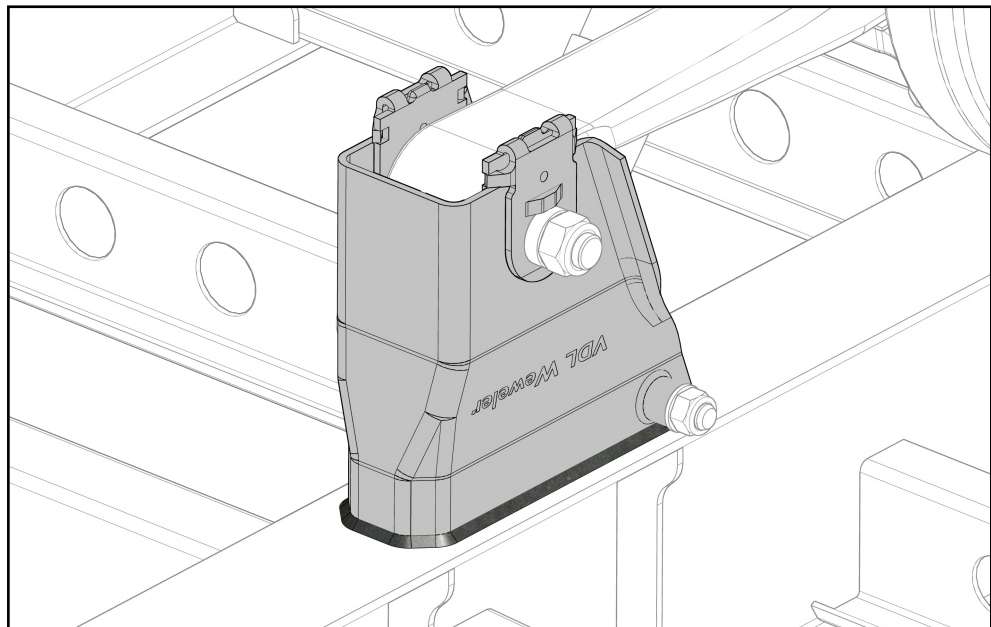
See instructions: Section 7.3



12.6 Welding hanger brackets

Weld all hanger brackets to the chassis according to the instructions.
The trailer builder is responsible that there are sufficient reinforcements in the vehicle chassis to guide the occurring forces on the hanger brackets.

See instructions: Section 3.3 & 3.4



12. Final air suspension assembly 1

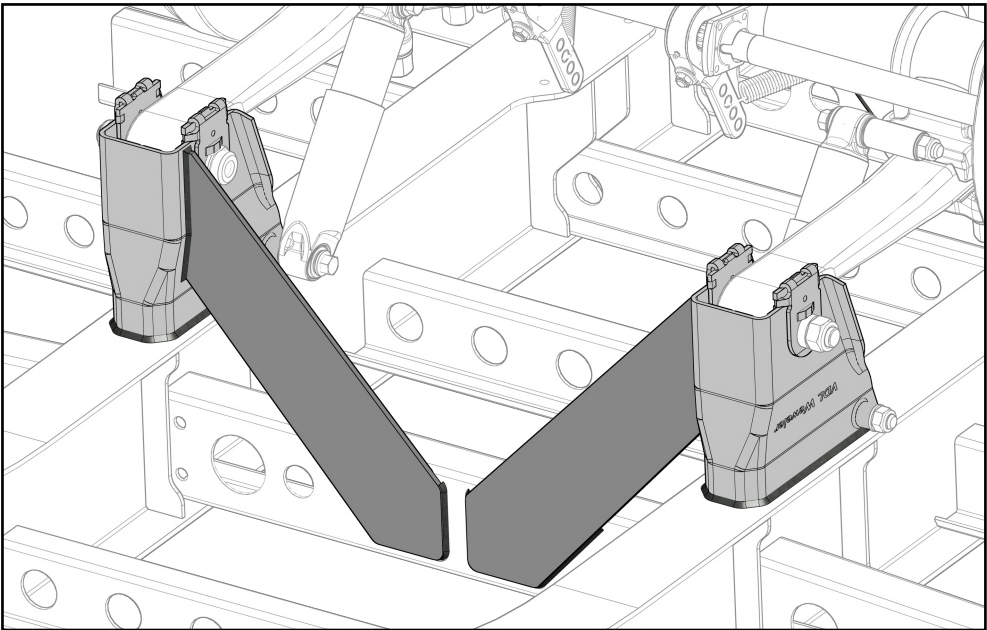
12.7a Option 1: Plate bracing

Weld the bracing plates to the hanger brackets and the cross members in the chassis according instructions.
The plates must be straight and are not allowed to be bended.

See instructions: Section 3.5



TO PREVENT DAMAGE TO THE BEARINGS AND TRAILING ARM, NEVER CONNECT THE EARTH CONNECTOR TO THE AXLE HUB, WHEEL END OR TRAILING ARM!



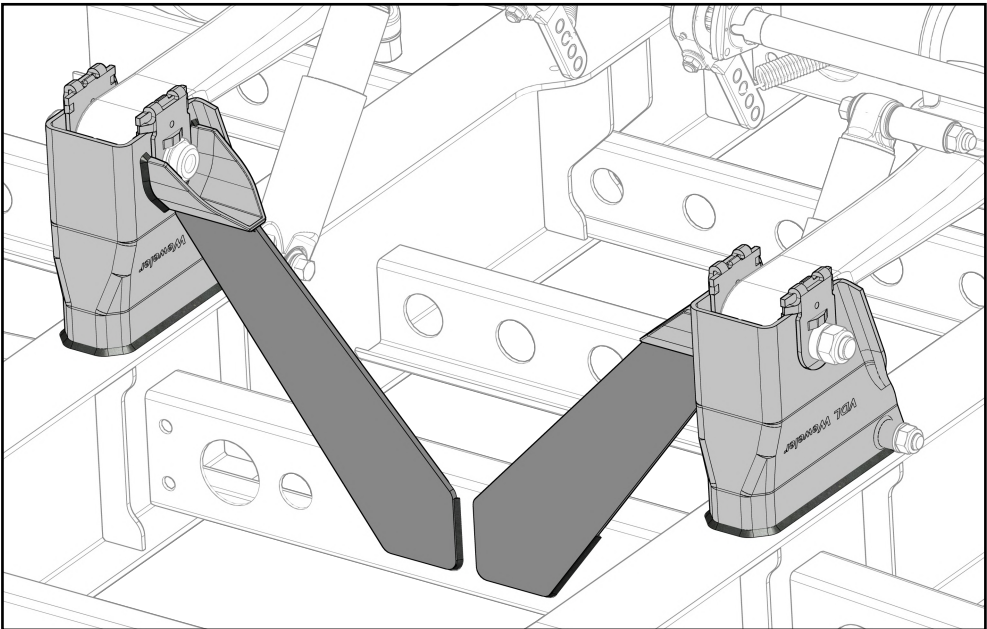
12.7b Option 2: Casting + plate bracing

Weld the bracing plates to the casted bracing parts and the cross members in the chassis according instructions.
The plates must be straight and are not allowed to be bended.

See instructions: Section 3.6



TO PREVENT DAMAGE TO THE BEARINGS AND TRAILING ARM, NEVER CONNECT THE EARTH CONNECTOR TO THE AXLE HUB, WHEEL END OR TRAILING ARM!



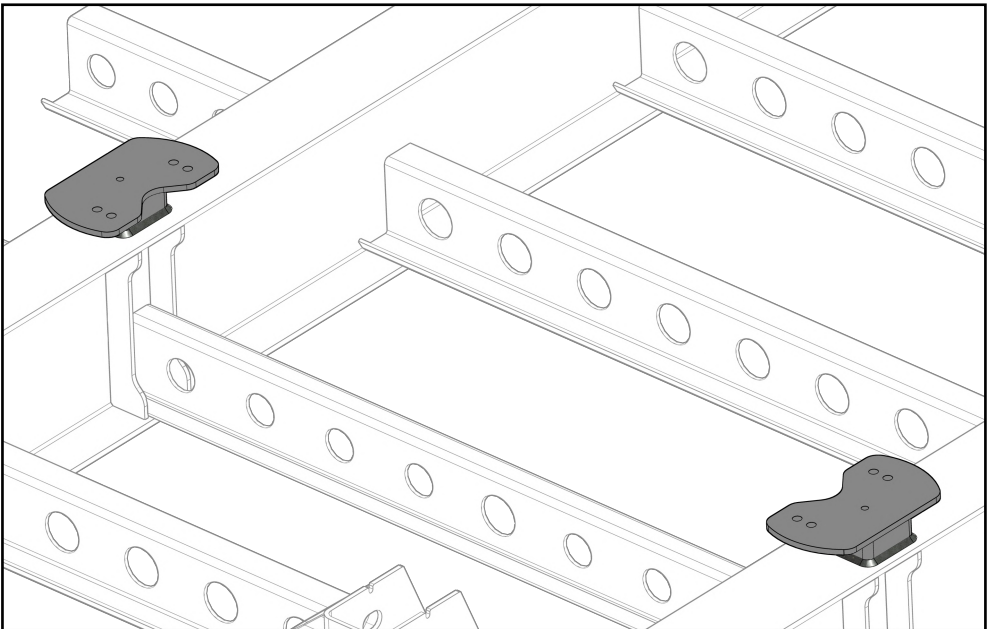
12.8 Pedestals

Weld the pedestals (if present in the suspension assembly) to the chassis according instructions.
The trailer builder is responsible that there are sufficient reinforcements in the vehicle chassis to guide the occuring forces on the pedestals.

See instructions: Section 3.4



TO PREVENT DAMAGE TO THE BEARINGS AND TRAILING ARM, NEVER CONNECT THE EARTH CONNECTOR TO THE AXLE HUB, WHEEL END OR TRAILING ARM!

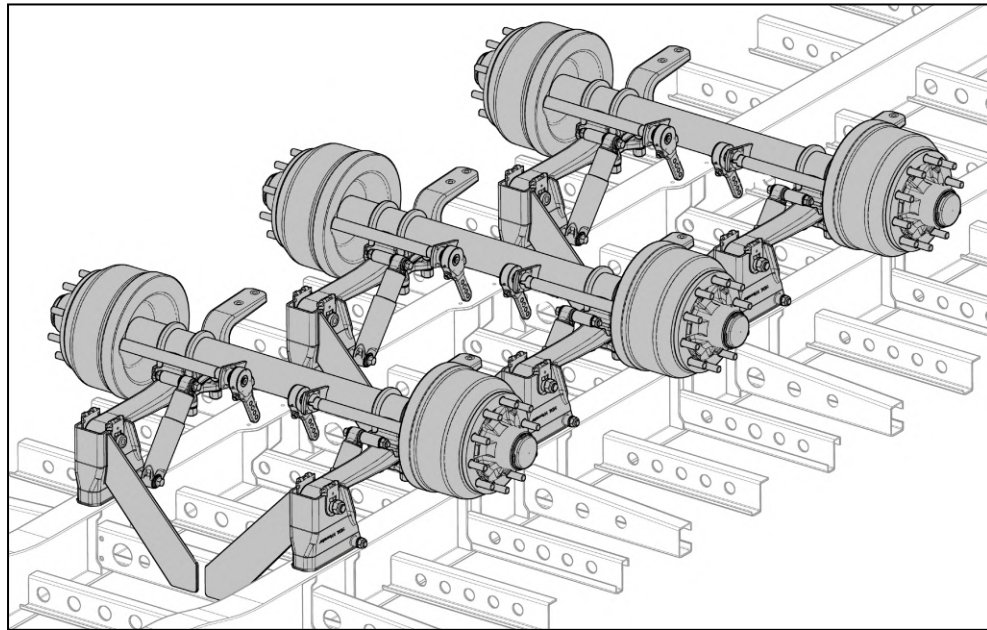


12. Final air suspension assembly 1

12.9 Coating / painting

The complete chassis including suspension systems can be coated or painted.

Before this point the air springs can also be mounted, but the rubber flexmember must be covered if this order of assembly is chosen.



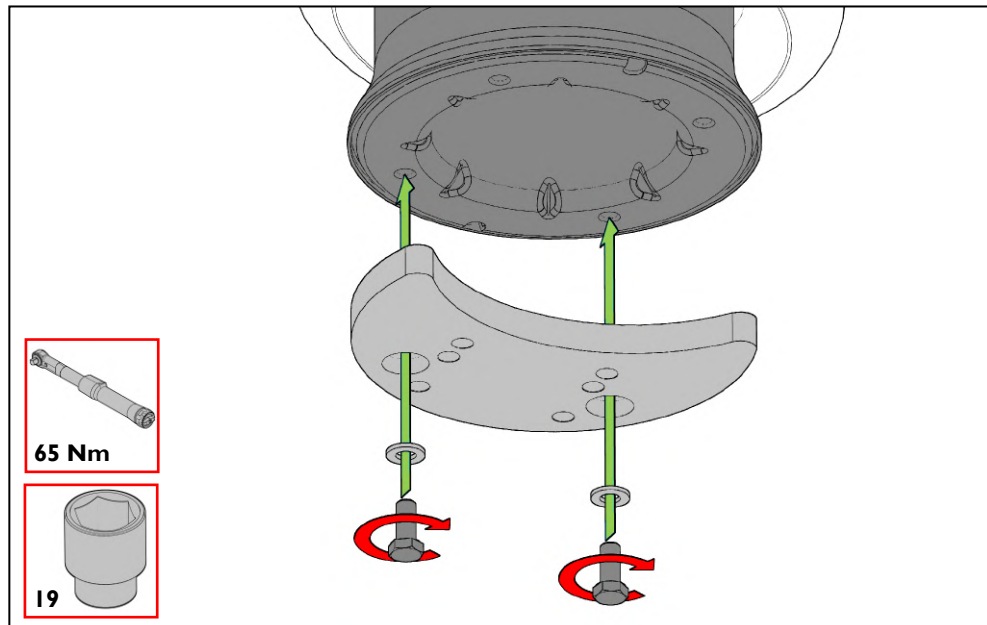
12.10a Air spring Ø350 Offset 30 or 50 or 95mm

First mount the Ø350 air spring to the support plate with the M12 bolts. Make sure the studs on top of the air spring are on the correct side. Tighten to torque according the instructions.

Follow the same steps for the other side.

See tightening instructions: Section 10

This installation guide shows the standard Ø350 air spring with 30-50-95 offset plate.

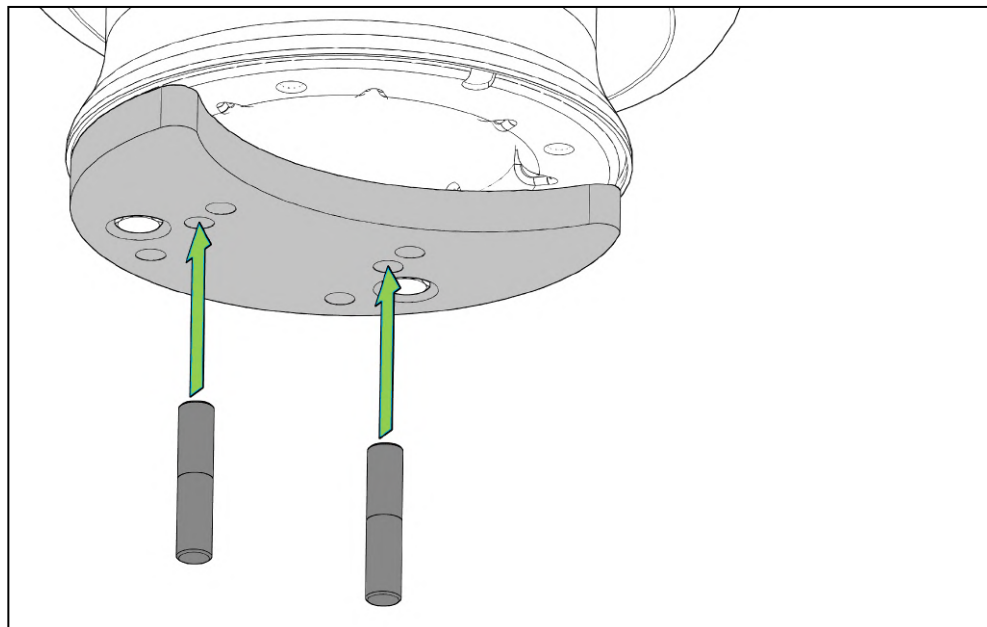


12.10b Air spring Ø350 Offset 30 or 50 or 95mm

Hand tighten the M16 studs in the air spring until it is fastened.

The support plate is suitable for multiple air spring offsets. Offset 30, 50 or 95mm. Choose the correct holes for the correct air spring offset (see application or system drawing).

Make sure the short threaded side goes in the support plate.



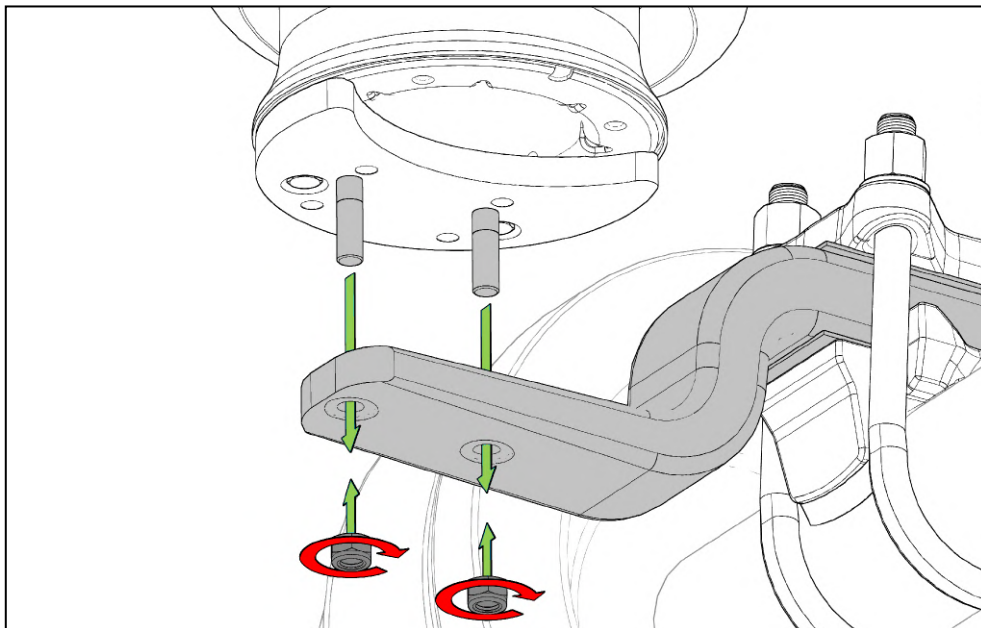
12. Final air suspension assembly 1

12.10c Air spring Ø350

Offset 30 or 50 or 95mm

Finally mount the complete support plate with Ø350 air spring on the trailing arm. Tighten the locknuts to torque according the instructions.

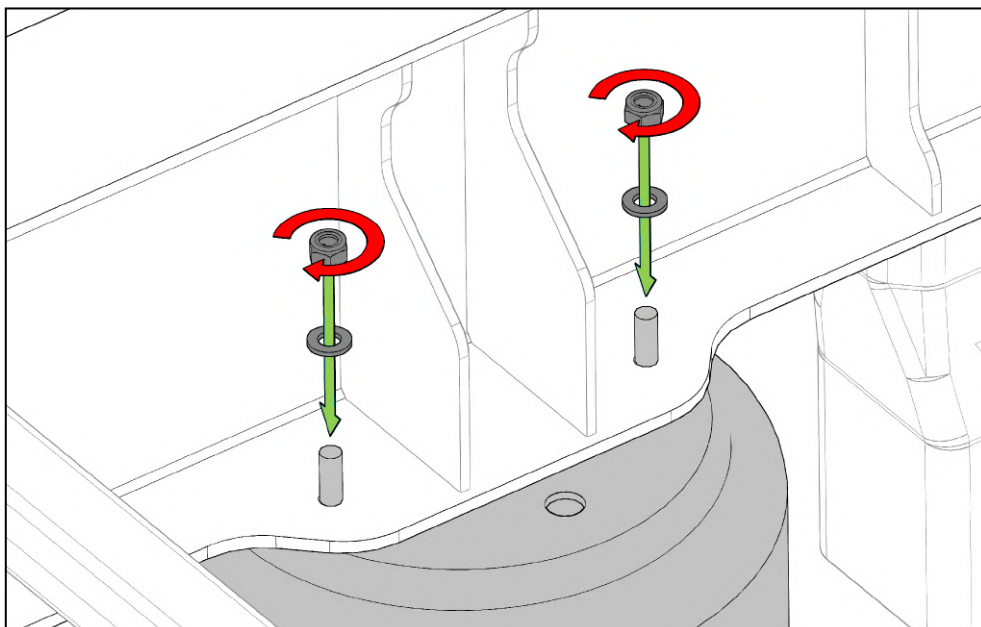
See tightening instructions: Section 10



12.11 Air spring to chassis / pedestal

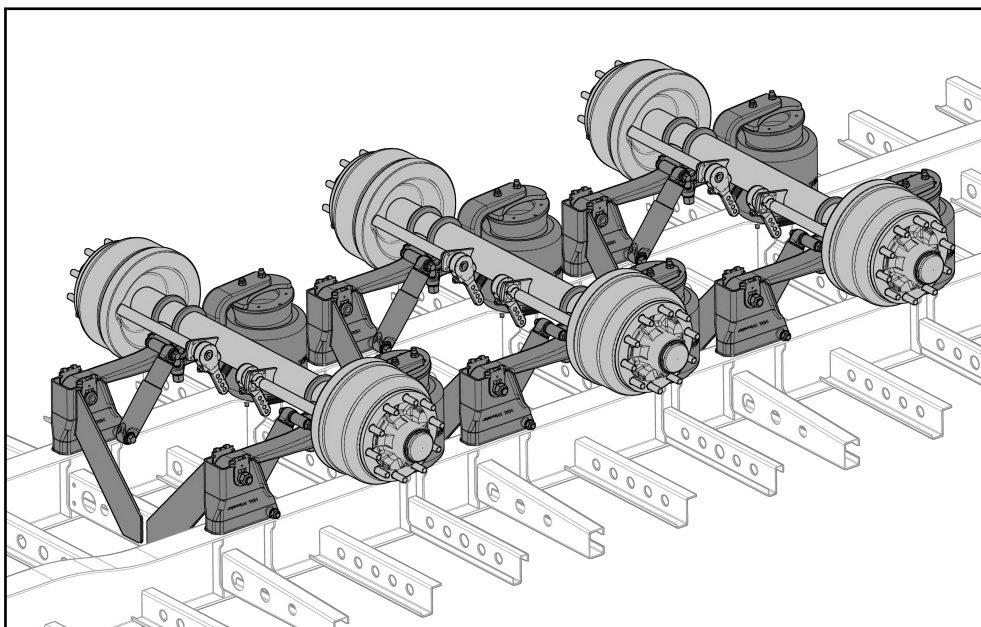
Mount the air spring top to the chassis or pedestal. Tighten the (lock)nuts to torque according the instructions.

See tightening instructions: Section 10



12.12 Complete assembly

System assembly complete. Ready for wheel mounting and air connections.



13. Final air suspension assembly 2

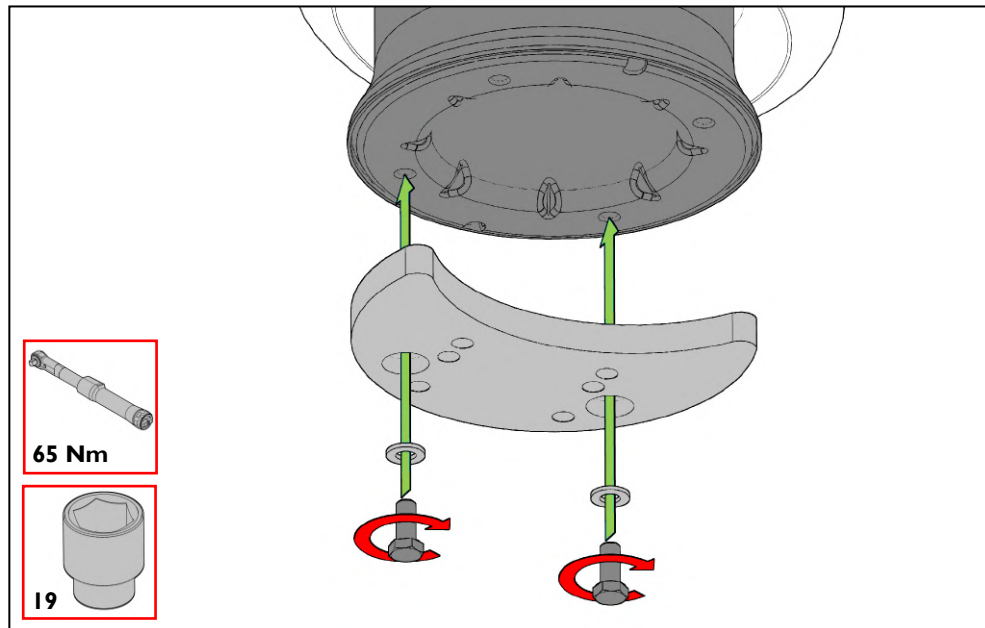
13.1a Air spring Ø350 Offset 30 or 50 or 95mm

First mount the Ø350 air spring to the support plate with the M12 bolts. Make sure the studs on top of the air spring are on the correct side. Tighten to torque according the instructions.

Follow the same steps for the other side.

See tightening instructions: Section 10

This installation guide shows the standard Ø350 air spring with 30-50-95 offset plate.



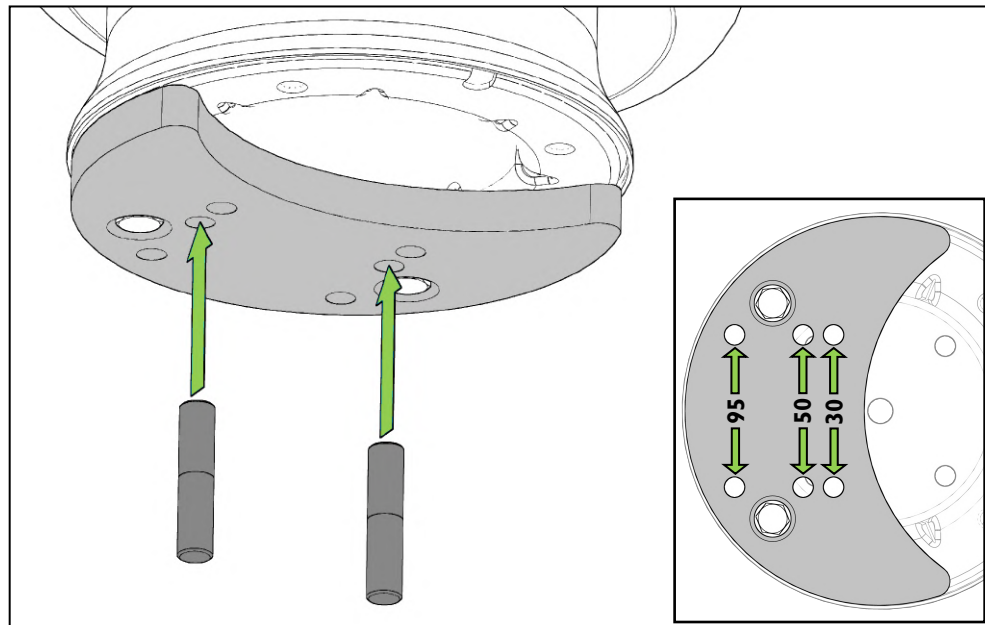
13.1b Air spring Ø350 Offset 30 or 50 or 95mm

Hand tighten the M16 studs in the air spring until it is fastened.

The support plate is suitable for multiple air spring offsets. Offset 30, 50 or 95mm. Choose the correct holes for the correct air spring offset (see application or system drawing).

Make sure the short threaded side goes in the support plate.

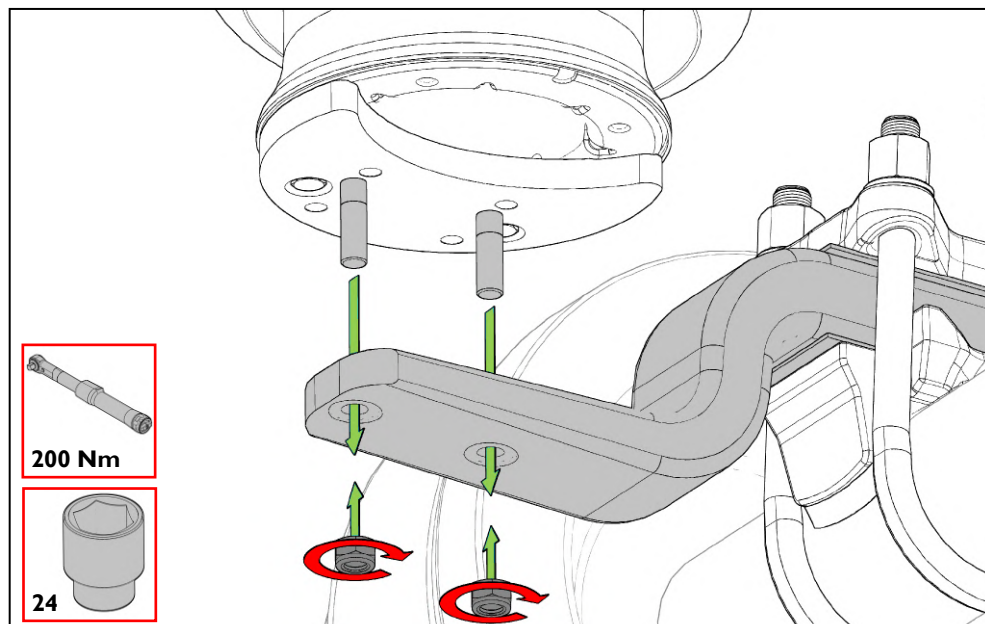
The illustration shows an assembly that creates an air spring offset of 50mm.



13.1c Air spring Ø350 Offset 30 or 50 or 95mm

Finally mount the complete support plate with Ø350 air spring on the trailing arm. Tighten the locknuts to torque according the instructions.

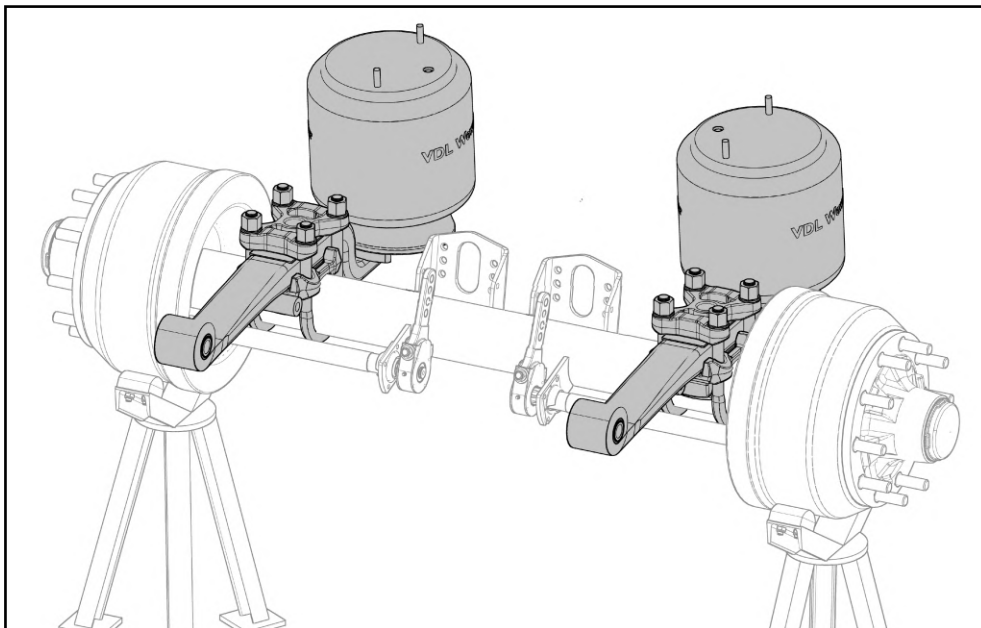
See tightening instructions: Section 10



13. Final air suspension assembly 2

13.2 Axle & suspension assembly

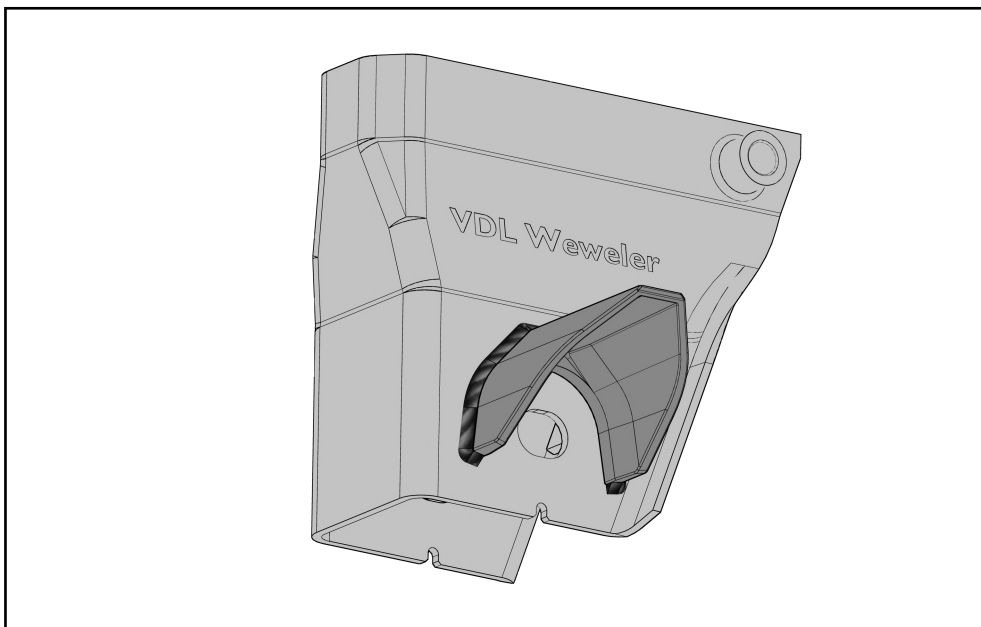
Air suspension sub-assembly on the axle complete and ready for mounting on the chassis.



13.3 Hanger bracket & casting

If an optional casted bracing is supplied.
Weld the casted bracing part to the hanger bracket according instructions.
Make per axle a lefthand and righthand version.

See instructions: Section 3.6



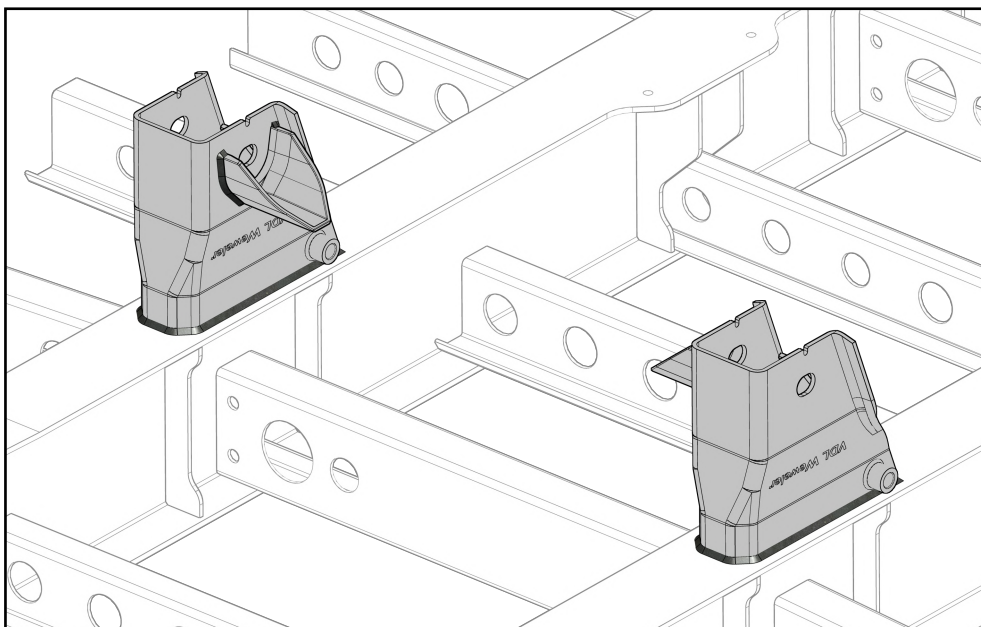
13.4 Hanger brackets

Align and weld the hanger brackets to the chassis rails according instructions at the correct spring track.

The trailer builder is responsible that there are sufficient reinforcements in the vehicle chassis to guide the occurring forces on the hanger brackets.

Illustration shows the hanger brackets with alignment option. The same instructions apply for the hanger brackets with welded fixed wear plates.

See instructions: Section 3.2 & 3.3



13. Final air suspension assembly 2

13.5 Bracing plates

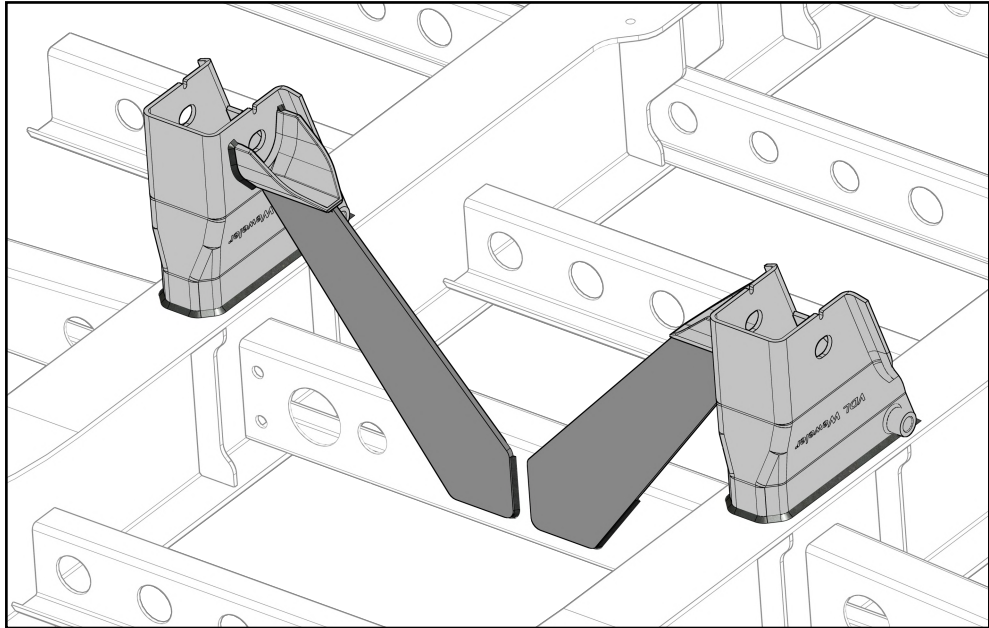
Weld the bracing plates to the casted bracing parts and the cross members in the chassis according instructions.

The plates must be straight and are not allowed to be bended.

See instructions: Section 3.6

For conventional plate bracing.

See instructions: Section 3.5

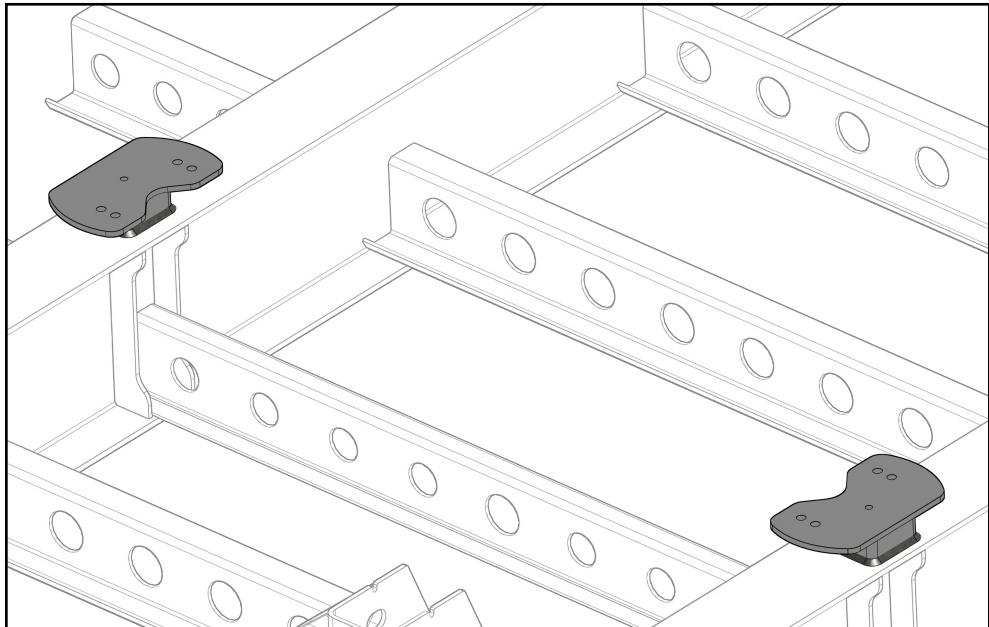


13.6 Pedestals

Weld the pedestals (if present in the suspension assembly) to the chassis according instructions.

The trailer builder is responsible that there are sufficient reinforcements in the vehicle chassis to guide the occuring forces on the pedestals.

See instructions: Section 3.4

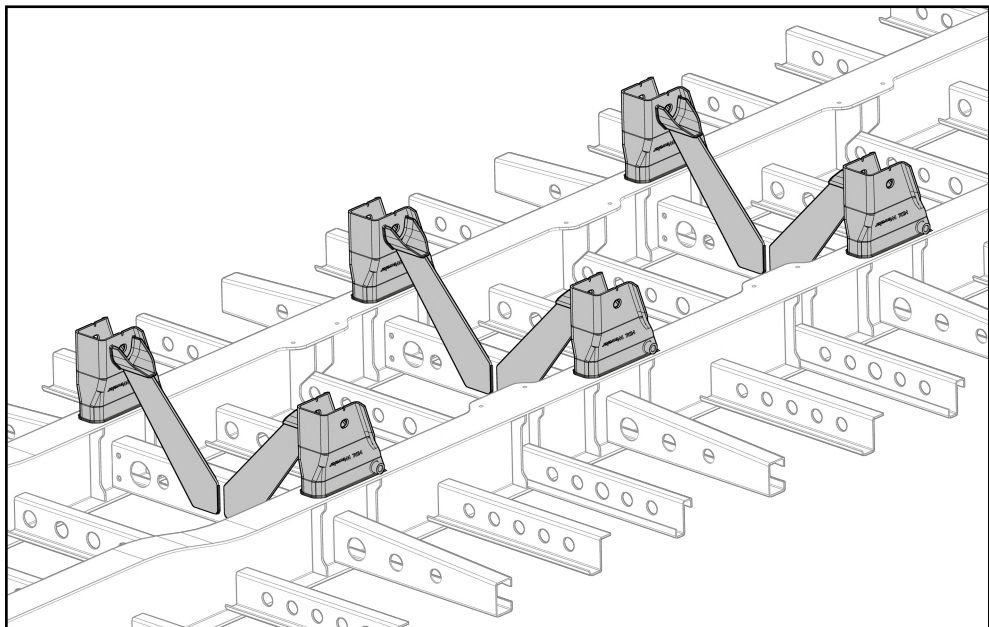


13.7 Coating / painting

The complete chassis can be painted/coated before mounting the assembled suspension.

See instructions for areas which must be free from paint/coating or can only be primed.

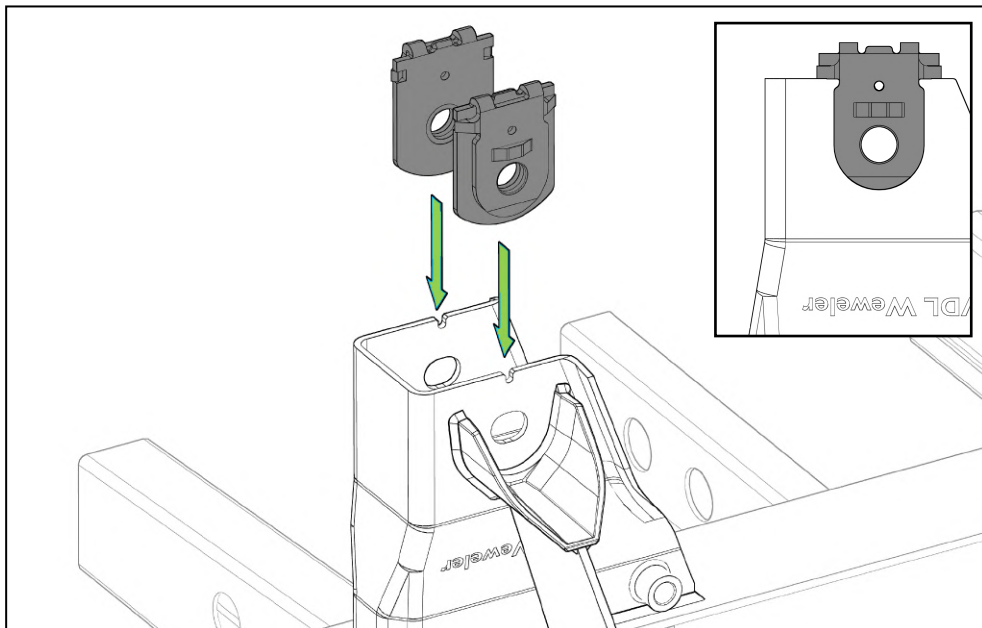
See instructions: Section 8



13. Final air suspension assembly 2

13.8 Wear/alignment plates

In case of alignment in the hanger bracket.
Place the wear/alignment plates over the bottom edges of the hanger brackets.

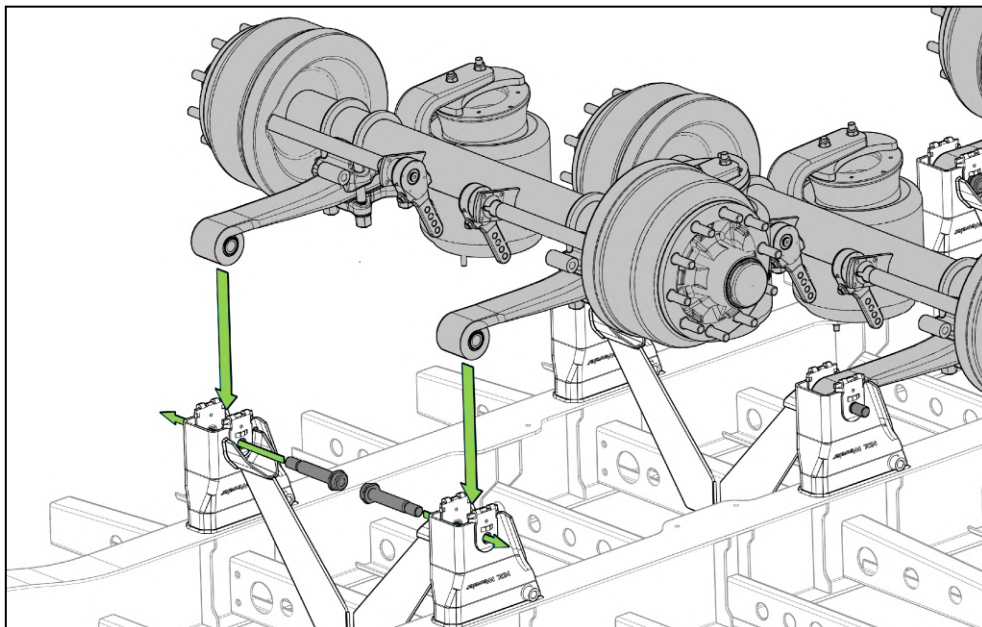


13.9 Axle placement

Place the assembled axles in the hanger brackets between the wear plates and place the pivot bolts.

Make sure all the axles are secured on the required **ride height** using axle supports or blocks under the suspension system.

After alignment (step 13.16) the connection can be torqued.



13.10 Axle alignment

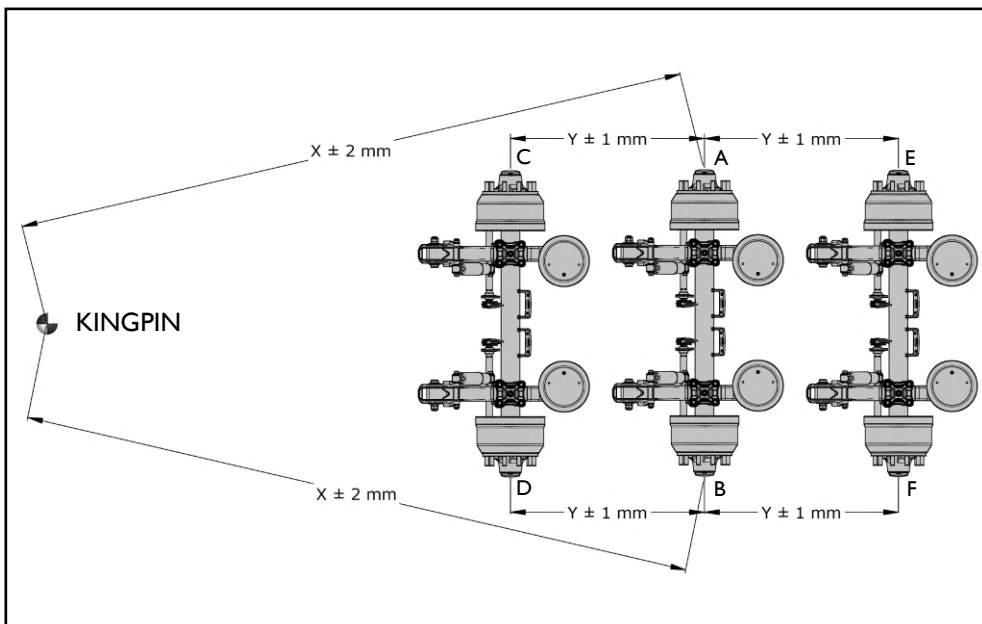
Align all axles (disc or drum) within the tolerances given, taken the second axle as a reference. A through F are the axle centres. The same tolerances apply for alignment using a laser.

See instructions: Section 7.3

In case of hanger brackets with alignment option follow instructions for adjusting the alignment in the hanger bracket.

See instructions: Section 7.4 or 7.5

In case of hanger brackets with welded fixed wear plates follow instructions for adjusting the alignment in the axle clamping.



13. Final air suspension assembly 2

13.11 Pivot bolt connection

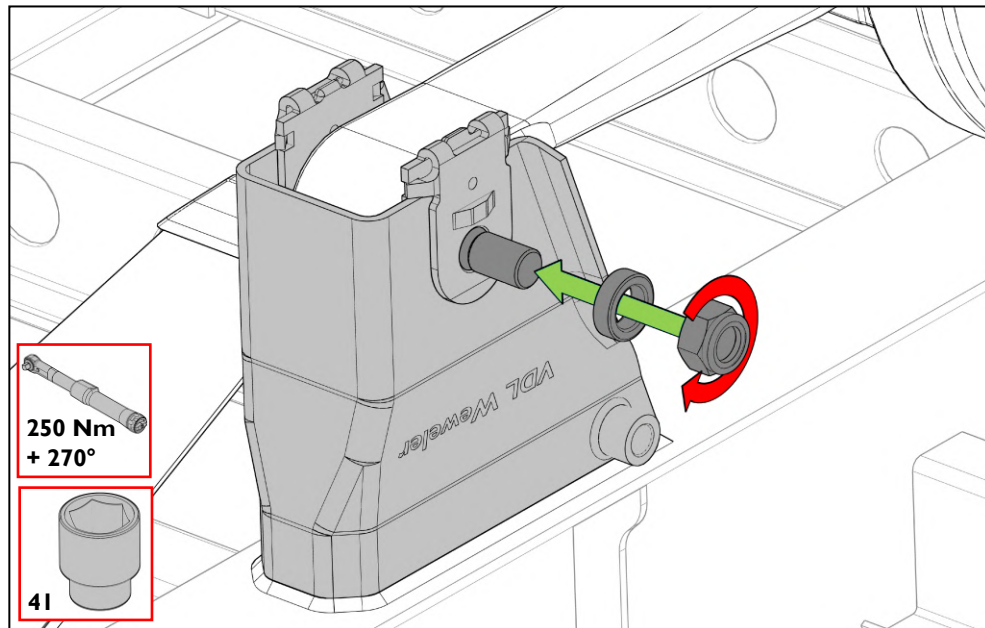
Apply grease on $\frac{1}{4}$ of the thread surface.

Place the spacers and nuts.

Tighten the pivot bolt connection **at ride height** according instructions to torque.

Repeat the same procedure for the other side.

See tightening instructions: Section 10



13.12 Welding wear plates

In case of hanger brackets with alignment option the wear plates must be welded to the hanger bracket after system alignment for the following bracing / system configurations:

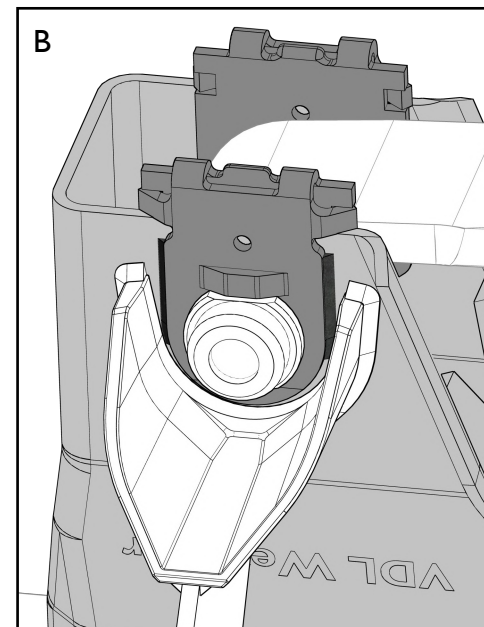
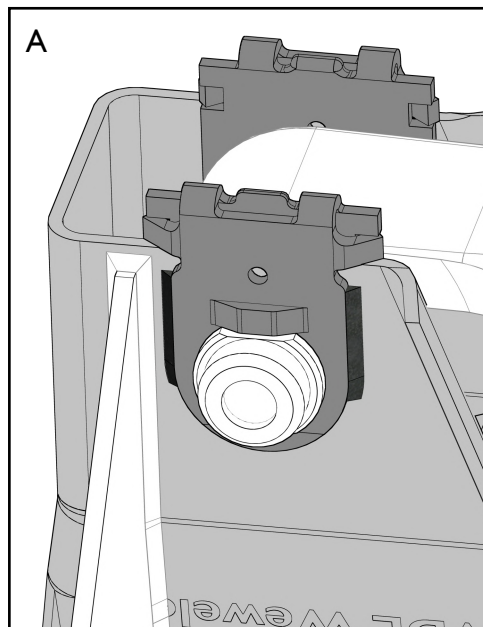
- A. Conventional plate bracing and an axle load **over 9t**.
- B. Bolt-on / Welded casted bracing and an axle load **over 10t**.

Paint welded area afterwards in order to protect from oxidation.

See instructions: Section 3.7



TO PREVENT DAMAGE TO THE BEARINGS AND TRAILING ARM, NEVER CONNECT THE EARTH CONNECTOR TO THE AXLE HUB, WHEEL END OR TRAILING ARM!

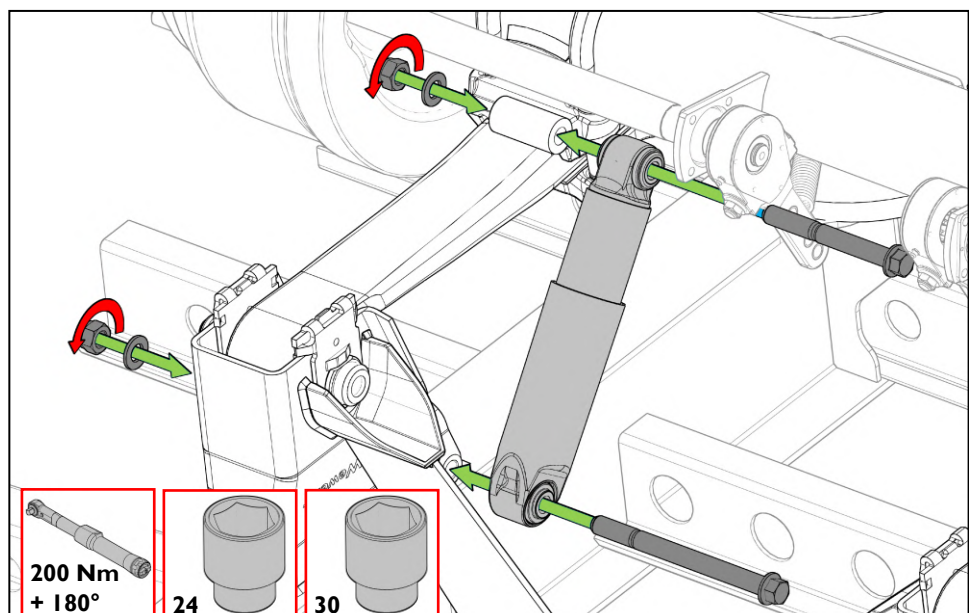


13.13 Shock absorbers (side mounted)

Place the shock absorbers, bolts, nuts and washers. If present, follow the instructions on the shock absorber (*see Section 6*).

Tighten the top and bottom connection **at ride height** to torque according the instructions.

See tightening instructions: Section 10

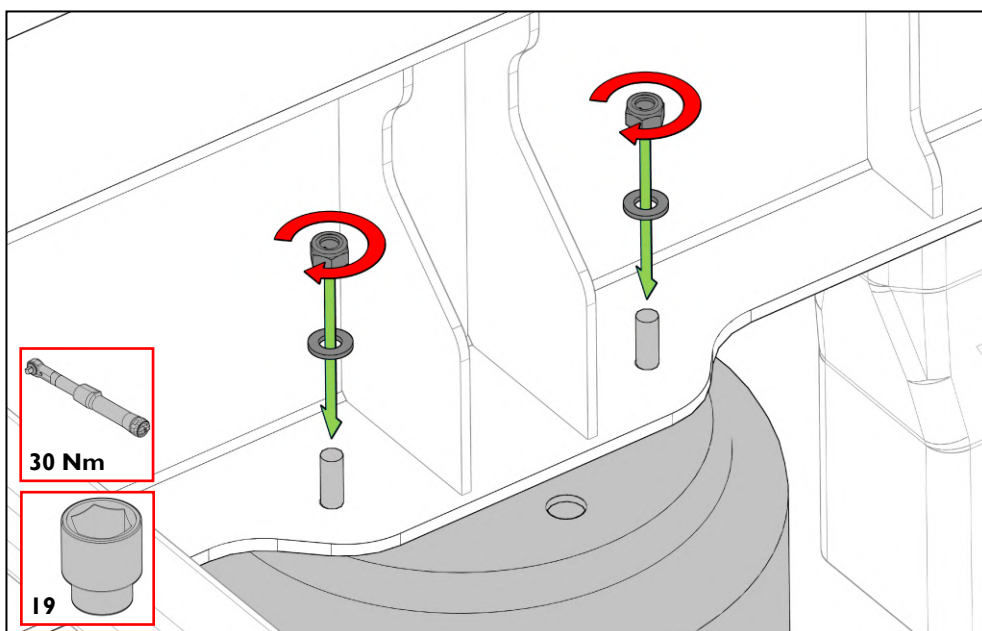


13. Final air suspension assembly 2

13.14 Air spring to chassis / pedestal

Mount the air spring top to the chassis or pedestal. Tighten the (lock)nuts to torque according the instructions.

See tightening instructions: Section 10



13.15 Complete assembly

System assembly complete. Ready for wheel mounting and air connections.

