

GIGANT axle lifts for air suspension units

Axle lifts for air suspension units of type GL70, GL70 HD, and FB100

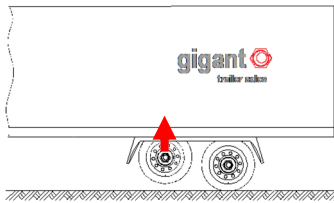
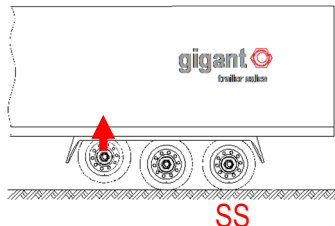
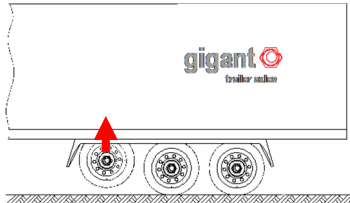
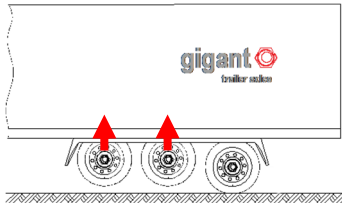
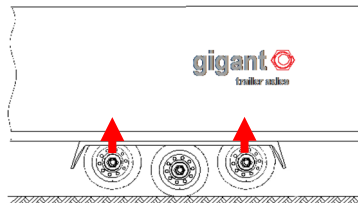
1. General information

GIGANT axle lifts are used in multi-axle suspension units. They are selected based on the type of air suspension unit and the installation options on the vehicle. Axle lifts are delivered loose/pre-assembled.

The axle lift's control can be actuated electronically, electropneumatically or pneumatically - manually or automatically - and is not a part of the axle lift.

Generally, the first axle(s) on a double- or triple-axle suspension unit is (are) lifted. This has the benefit of more stable driving behaviour due to the longer wheelbase. It also has positive effects on the ground clearance (vehicle inclination). On triple-axle suspension units with self-steering axles (SS), a rigid axle can be lifted considering the permissible 1:1 ratio on rigid and self-steering axles (SS).

Examples:

Double-axle suspension unit (2 x rigid):	Triple-axle suspension unit (2 x rigid + 1 x SS):
	
Triple-axle suspension unit (3 x rigid):	
	
	

Attention:

- The max. installation space dimensions and minimum clearance dimensions must be observed when specifying the axle lift, and they can be found in the installation drawing.
- Please consult the drawing for the installation situation and axle lift installation.
- Ensure that the coating on coated components has adequately hardened before installing the mounting parts!
- Ensure that there is adequate ground clearance!
- The cross beams must be dimensioned with the appropriate safety margins when using a centre axle lift.
- Observe statutory provisions regarding the German turning circle regulation (BO-Kraftkreis), overload protection, etc.
- Please consult gigant's technical documentation for the installation dimensions, hole patterns, etc.
- Please follow the installation instructions from the supplier of the axle lift's control. Any pneumatic components that are supplied by gigant may need to be adjusted for compatibility with the components specified by the supplier.
- An overflow valve must be installed in the line to the lifting bellows and set to a residual pressure protection of 0.3 bar.

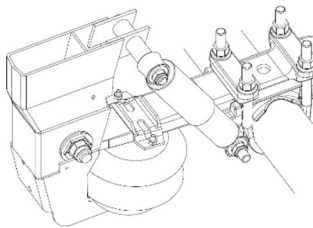
Recommendation!

Before retrofitting the axle lift

- Inspect the installation space
- Check compatibility with the air suspension system
- Observe the legal guidelines

2. Design description

2.1. Twinlift FB100 (spring width 100 mm)



The Twinlift is supported only on the air suspension bracket. The Twinlift support is welded onto the air suspension bracket according to the specifications in the drawing. Due to the clamp, the Twinlift FB100 can only be mounted on the single spring.

The Twinlift acts directly on the axle via the torque arm. Please consult the technical documents for the max. liftable weight (axle, rims, tyres, brake cylinder, etc.).

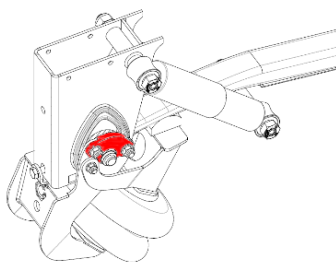
2.2. Twinlift GL70, GL70HD (spring width 70 mm)

The Twinlift is supported only on the air suspension bracket. The Twinlift unit is screwed onto the air suspension bracket.

The Twinlift acts directly on the axle via the torque arm. Please consult the technical documents for the max. liftable weight (axle, rims, tyres, brake cylinder, etc.).

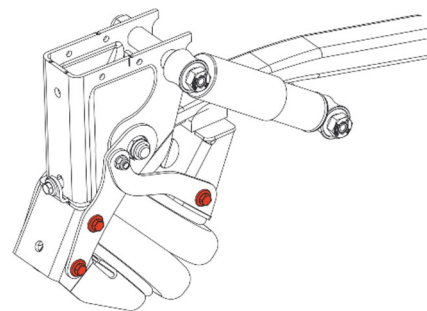
Generation 1 until 2022:

(Remove the anchor plate for installation)

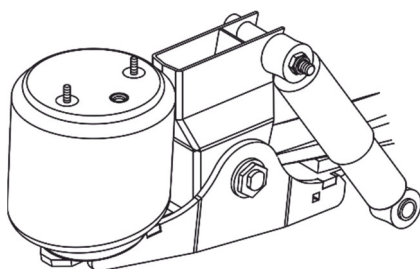


Generation 2 as of the 1st quarter of 2022

(Side bolts loosened for installation)



2.3. Side axle lift (SAL) for FB100 (spring width 100 mm)

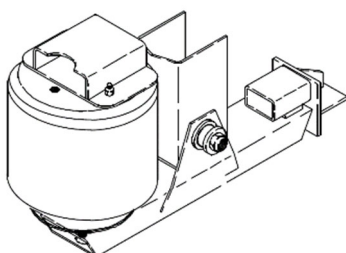


The side axle lift (SAL) is supported on the chassis' longitudinal beam. The pivot point is the spring fitting on the air suspension bracket. The SAL can be installed on the left or right side.

Due to the SAL's one-sided mode of operation, the axle hangs a bit lower on one side. When selecting the installation side, this aspect should be taken into account with regards to e.g. road conditions.

2.4. Centre axle lift (CAL) for axle tube diameter of 127 mm

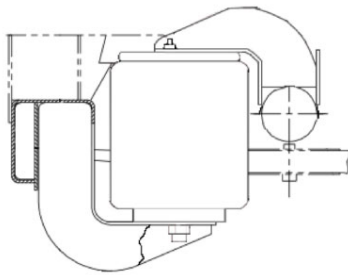
2.4.1. Centre axle lift (CAL) with suspension bracket for lift arm



The centre axle lift (CAL) is supported on the chassis' crossbeam. The pivot point is on the suspension bracket. The console is welded on the axle body.

A CAL is installed on the centre of the axle on the chassis. Additional crossbeams may need to be used in the chassis for the air bellows' counter bearing and the suspension bracket. Follow the welding instructions when welding the console onto the gigant axle body.

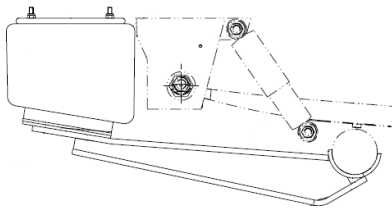
2.4.2. Centre axle lift on the C-profile (CAL-C)



The centre axle lift (CAL-C) is supported on the C-profile's crossbeam by the welded bellows support. The lift boom is welded on the axle body. An air bellows that is installed between the bellows support and lift boom is used to push up the axle.

The CAL-C is installed on the centre of the axle and the C-profile's crossbeam. Follow the welding instructions when welding.

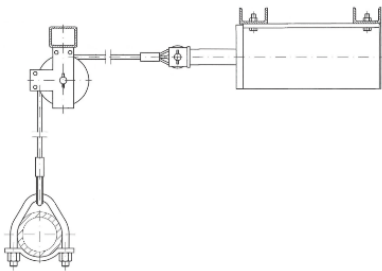
2.4.3. Centre axle lift (CAL) with lift arm welded on the axle body



The centre axle lift (CAL) is supported by the air bellows on the chassis' crossbeam. The pivot point is on the link eye. The lift arm is welded onto the axle body.

The CAL is installed on the centre of the axle on the chassis. A crossbeam may need to be used in the chassis for the air bellows' counter bearing. Follow the welding instructions when welding the lift arm onto the gigant axle body.

2.4.4. Centre axle lift (CAL) with cable



A cable is used to pull up the axle via deflection rollers. A pneumatic cylinder is used as the pulling device. This special version is used whenever there are severe space-related problems.

The pneumatic cylinder is screwed onto the centre of the chassis in the longitudinal direction (recommendation: 80 mm U profile). The deflection roller's mount is also fastened onto the chassis (recommendation: 80x6 mm square tube).

Attention:

For the safe operation of all axle lifts, you must use a circuit that meets the applicable EU provisions and national regulations.

Recommendation!


In order to have adequate clearance below the lifted tyres, gigant recommends setting a lift stroke of at least 100 mm (taking into account the driving height and the EH_{Lift} information specified in the drawings).

3. Welding information () Mounting components

With the exception of the Twinlift for GL70 and GL70 HD air suspension units, the mounting components must be welded onto the chassis. One possible exception is when the air bellows on the side axle lift (SAL) and centre axle lift (CAL) is fastened, if the support for the air bellows on the chassis is sufficient for one fitting.

Important!

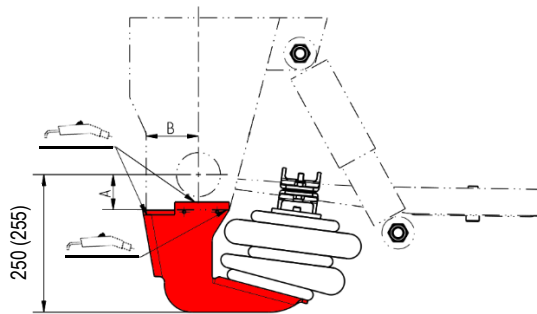
- Bearing damage can be prevented by ensuring that the clamping contact (earthing) of the welding equipment is not attached to the components of the axle.
- Welding and attaching the clamping contact (earthing) to the guide bars is not permitted.
- The guide bars and air bellows must be protected against welding beads, electrodes and welding tongs during welding work.
- No tack welds or weld seams may be applied within 20 mm from the corner edges of the components.

- Weld seams must be produced in accordance with quality level B of DIN EN ISO 5817. Please consult the drawings of the components to be welded for information on how to implement the weld seams.
- Avoid undercuts and end craters.
- Observe the material specifications of gigant components when welding. Bellows plates (with and without welded-on U profile) are made of the material 3235JR.
- **For information on welding**  (weld seam, weld seam length, etc.), please consult the installation drawing!

3.1 Lift support on the air suspension bracket – Twinlift FB100

Mounting dimensions / weld seam specifications:

Observe the general welding information and information from the installation drawing!



Measure A = 65 ± 5 mm

Measure B = 100 ± 5 mm

Wide air suspension bracket: 127 ± 2 mm

Important!

The air bellows and spring must be protected against weld splatter and the effects of excessive heat!

When the Twinlift is welded onto an air suspension bracket with a C profile, the clearance from the "middle of the small conical bushing on the air suspension bracket" to the "lower edge of the lift support" changes from 250 mm to 255 mm.

3.2 Bellows plate/bellows attachment on the vehicle frame – side axle lift (SAL) / centre axle lift (CAL)

Material of the bellows plate and bellows attachment: 1.0037 \triangle S235 JR \triangle ST 37-2

Material of the MSH (Structural Hollow Section) profile: 1.0116 \triangle S235 J2 G3 \triangle ST37-3

Observe the general welding information and information from the installation drawing!

Important!

Air bellows must be protected against weld splatter and the effects of excessive heat!

- Dimensions for attachment of the bellow can be found in the installation drawing of the air suspension set
- Holes: according to DIN ISO 273
- Separation of the holes: according to DIN ISO 2768m

The load-bearing capacity of the frame beam must be taken into account when designing the U-shaped plate.

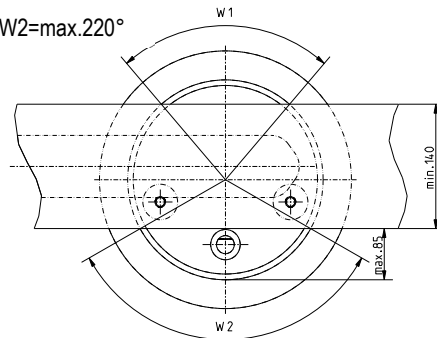
The U-shaped plate may protrude 85 mm over the edge of the thrust bearing. Overall, 40% of the length of the U-shaped plate edge must be supported directly on the thrust bearing.

If the bellows is not supported properly, no guarantee claims can be accepted in the event of damage to the air bellows

Recommendation

- Air bellows Ø 300 mm: Bellows plate/attachment of at least 200 x 245 x 6 mm
- Air bellows Ø 360 mm: Bellows plate/attachment of at least 200 x 305 x 6 mm

$$W1+W2=\max.220^\circ$$



Alignment of the air bellows and the protrusion

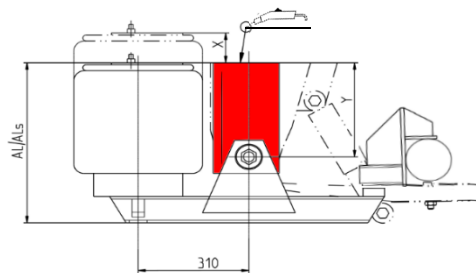
3.3 Suspension bracket on vehicle frame – centre axle lift (CAL)

Material of the suspension bracket CAL: 1.0037 \triangle S235 JR \triangle ST 37-2

Mounting dimensions / weld seam specifications:

Observe the general welding information and information from the installation drawing!

Please consult the installation drawing of the centre axle lift for the mounting dimensions for AL/ALs, X and Y.



Important!

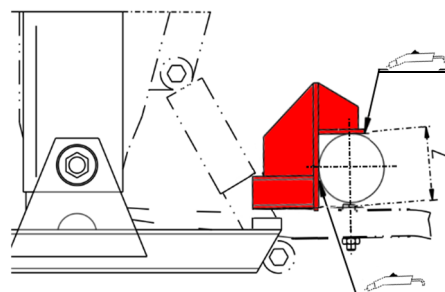
The air bellows and spring must be protected against weld splatter and the effects of excessive heat!

3.4 Console on axle body – centre axle lift (CAL)

Mounting dimensions / weld seam specifications:

Observe the general welding information and information from the installation drawing!

Please consult the installation drawing of the centre axle lift for mounting dimension Z.



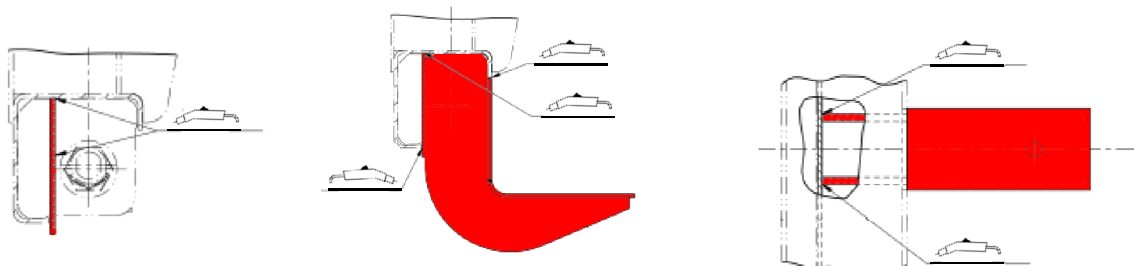
Important!

The air bellows and spring must be protected against weld splatter and the effects of excessive heat!

3.5 Bellows support on the C-profile – centre axle lift (CAL-C)

Mounting dimensions / weld seam specifications:

Observe the general welding information and information from the installation drawing!
Please consult the installation drawing for the mounting dimensions.



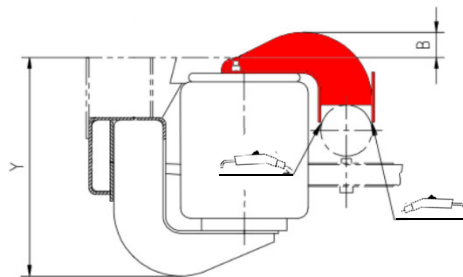
Important!

The air bellows and spring must be protected against weld splatter and the effects of excessive heat!

3.6 Lift arm boom for air bellows on axle body – centre axle lift (CAL-C)

Mounting dimensions / weld seam specifications:

Observe the general welding information and information from the installation drawing!
Please consult the installation drawing for mounting dimensions B and Y.



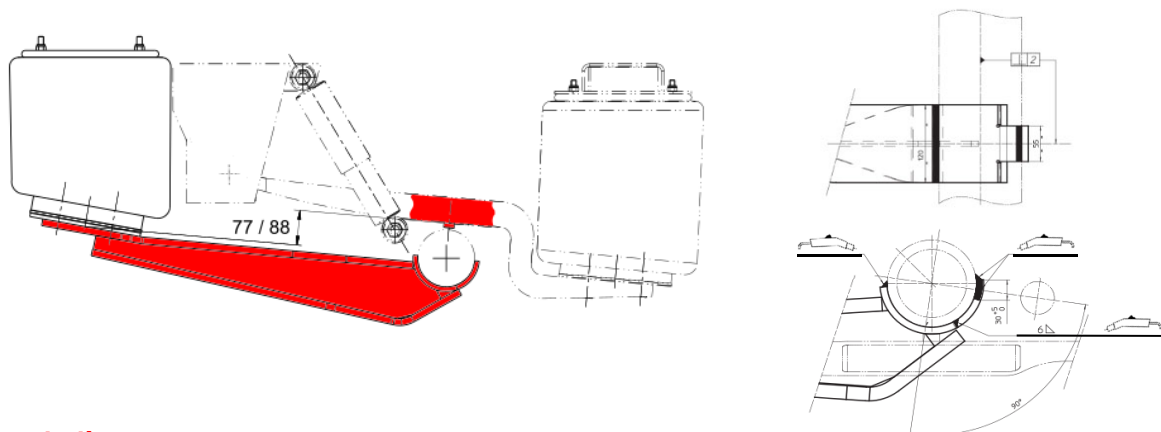
Important!

The air bellows and spring must be protected against weld splatter and the effects of excessive heat!

3.7 Lift arm on axle body – centre axle lift (CAL) with lift arm welded on the axle body

Mounting dimensions / weld seam specifications:

Observe the general welding information and information from the installation drawing!
Please consult the installation drawing of the centre axle lift for the mounting dimension of 77 mm or 88 mm (depending on the lift arm).



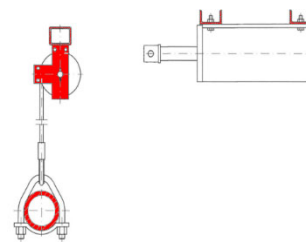
Important!

The air bellows and spring must be protected against weld splatter and the effects of excessive heat!

3.8 Suspension bracket on vehicle frame – centre axle lift (CAL) with cable pull

Please consult the installation drawing of the centre axle lift (CAL) with cable pull for the mounting dimensions for fastening the pneumatic cylinder and the hole size for fastening the pneumatic cylinder. Gigant recommends a 80 mm-wide U profile according to DIN 1026.

The deflection roller must be fastened above the axle body in a manner that allows the pull cable to centrally and perpendicularly support the axle suspension above the axle body. Gigant recommends a 80 x 6 mm square tube according to EN 10219.



Note:

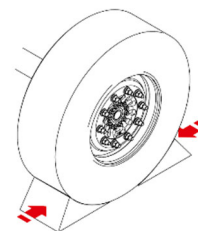
The U profile, square tube, and fitting are not included in the scope of delivery.

4. Installing the axle lifts

A connection to a compressed air system is required to install the axle lift. On a side axle lift, the spring fitting also needs to be disassembled.

Important!

- Secure the vehicle against rolling away on even and firm ground.
- Disconnect the brake and air supply lines from the tractor; disassemble the wheel, if necessary.
- Jack up the vehicle on the frame in an accident-proof manner when disassembling the spring fitting.
- If necessary, raise the axle or components and support them in an accident-proof manner.
- Tightening torques can be found in the table at the end.
- A function test must be performed after installing the axle lift!



4.1 Twinlift FB100

- [1] Install the lower clamp with 2 screws on the two-fold bellows and tighten at torque (see table).

✖ SW 17

! The arrow on the lower clamp indicates the direction of travel

! Install the air connection on the two-fold bellows. Connection thread M16x1.5

- [3] Install the two-fold bellows with the air connection facing the lift support and use. Tighten 2 screws at torque (see table).

✖ SW 13

- [4] Place the rubber intermediate strips around the spring and connect the upper clamp with 2 screws with locknut and slightly tighten.

✖ SW 17

Important:

No contact is allowed between the spring and the clamp!

- [5] Align the clamp 185 mm from the centre of the spring bolt and tighten at torque (see table).

✖ SW 17

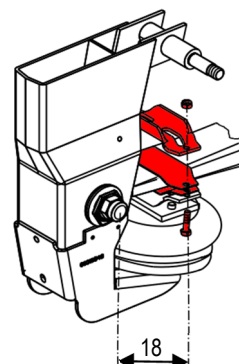
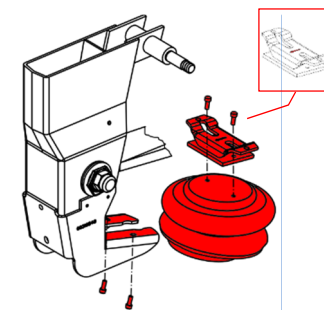
- [6] Connect the two-fold bellows to the compressed air system according to the manufacturer's specifications

! Max. operating pressure according to the installation drawing

Note:

Where applicable, adjust the gigant-supplied pneumatic components to the specifications of the pneumatic controller's supplier.

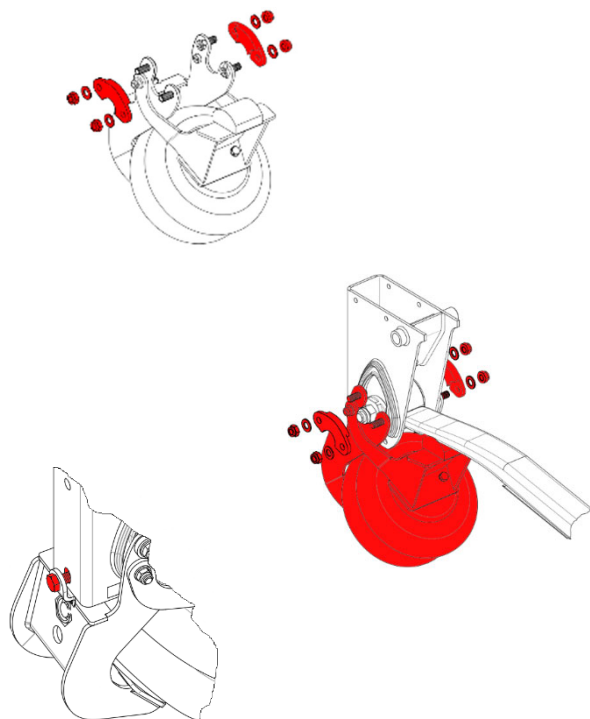
- [7] Perform a function test



4.2 Twinlift GL70, GL70HD

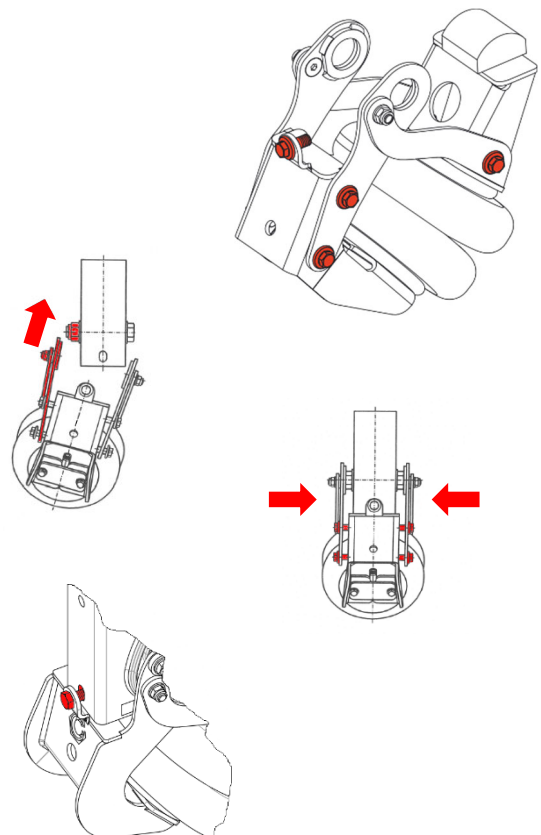
4.2.1 Generation 1 (remove the anchor plate)

- [1] Install the air connection on the two-fold bellows
! Thread connection: R 1/4"
- [2] Disassemble the anchor plates
 ✖ SW 22
- [3] Position the axle lift on the spring fitting and put on the anchor plates. Slide on the washers and tighten the locknuts at torque (see table).
 ✖ SW 22
- [4] Press forward the axle lift in the direction of travel and position the safety bolt in front of the slot in the air suspension bracket and tighten at torque (see table).
 ✖ SW 22
- [5] Connect the two-fold bellows to the compressed air system to the manufacturer's specifications.
! Max. operating pressure according to the installation
- [6] Perform a function test



4.2.2 Generation 2 (loosen bolts for lift support)

- [1] Install the air connection on the two-fold bellows
! Thread connection: R 1/4"
- [2] The bolts on the lift support are loosened upon delivery
- [3] Fold back the loosened side parts of the lift support and first place it on the nut of the spring bolt fitting on one side
- [4] Then swivel the axle lift and press the lift support over the bolt head on the air suspension bracket and tighten the bolts at torque (see table).
 ✖ SW 18
- [5] Press the axle lift forward in the direction of travel and position the safety bolt in front of the slot in the air suspension bracket and tighten at torque (see table).
 ✖ SW 18
- [6] Connect the two-fold bellows to the compressed air system according to the manufacturer's specifications.
! Max. operating pressure according to the installation drawing
- [7] Perform a function test



4.3 SAL and SAL-T side axle lift

- [1] If necessary, disassemble the wheel
- [2] Detach the spring bolt
 - ✖ SW 41
- [3] Remove and dispose of the locknut, eccentric nut, and spring bolt!

! Maintain the spring in position in an accident-proof manner for subsequent installation!

- [4] Slide the long eccentric nut onto the spring bolt.
 - ! The spring bolt, eccentric nut, and eccentric bushings must be completely free of grease!**
- [5] Put the new lift support in position and insert the spring bolt
- [6] Insert the long eccentric nut and screw on the new locknut and pre-tighten at 200 Nm.

- [7] Install the air bellows on the lift support at the specified torque (see table).

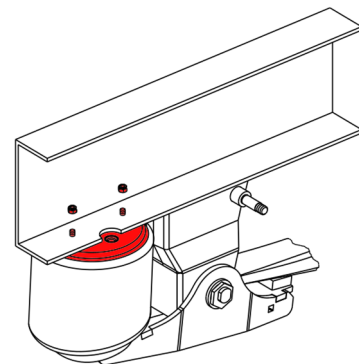
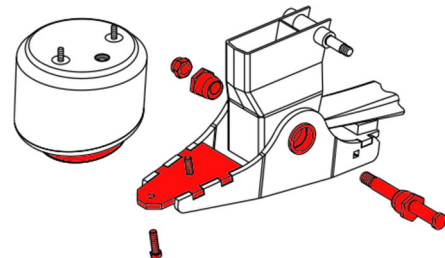
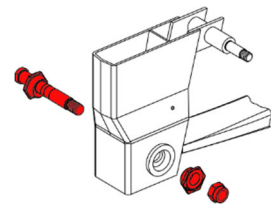
✖ SW 30

! If the lift support is a square tube, place the adapter sleeve over the bolt of the air bellows before screwing on the locknut!

- [8] Install the M12 stud bolt of the air bellows with locknuts on the chassis and with the specified torque (see table).
 - ✖ SW 19
- [9] Adjust the track → **5. Manual track adjustment, page 11**
- [9] Connect the air bellows to the compressed air system according to the manufacturer's specifications.

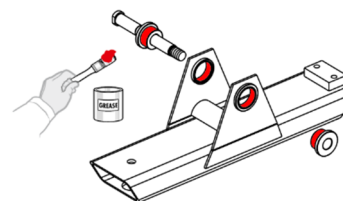
! Max. operating pressure according to the installation drawing.

- [10] Perform a function test



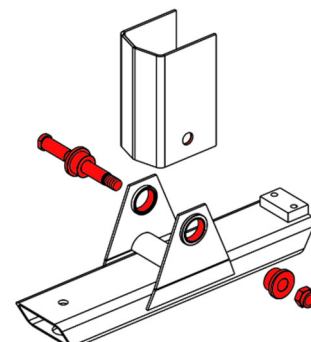
4.4 CAL and CAL-T centre axle lift

- [1] Grease the suspension bracket bushings with gigant grease



- [2] Slide the bearing bushing onto the spring bolt
- [3] Place the lift support on the suspension bracket in position and insert the spring bolt.
- [4] Clean the thread of the spring bolt
- [5] Put on the bearing bushing and tighten the locknut at the specified torque (see table).

✖ SW 32 / SW 41



- [6] Install the air bellows on the lift support at the specified torque (see table)

✖ SW 30 / SW 24

! Place the adapter sleeve over the bolt of the air bellows before screwing on the locknut!

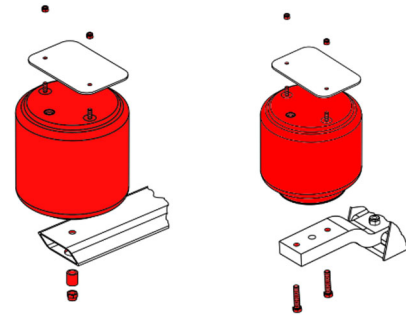
- [7] Install the M12 stud bolt of the air bellows with locknuts on the chassis and with the specified torque (see table).

✖ SW 19

! Observe point 3.2 – contact surface of the U-shaped plate!

- [8] Connect the air bellows to the compressed air system according to the manufacturer's specifications.

! Max. operating pressure according to the installation drawing.



4.5 Centre axle lift on the C-profile (CAL-C)

- [1] Install the air bellows on the bellows support at the specified torque (see table).

✖ SW 30

- [2] Install the M12 stud bolt of the air bellows with locknuts on the lift boom and at the specified torque (see table).

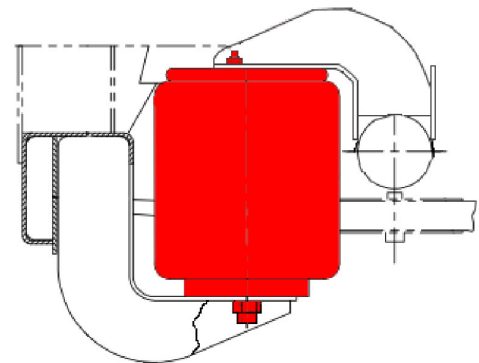
✖ SW 19

! Observe point 3.2 – contact surface of the U-shaped plate!

- [3] Connect the air bellows to the compressed air system according to the manufacturer's specifications.

! Max. operating pressure according to the installation drawing

- [4] Perform a function test



4.6 Centre axle lift (CAL) with lift arm welded on the axle body

- [1] Install the air bellows on the lift arm

✖ SW 24

- [2] Install the M12 stud bolt of the air bellows with locknuts on the chassis and with the specified torque (see table).

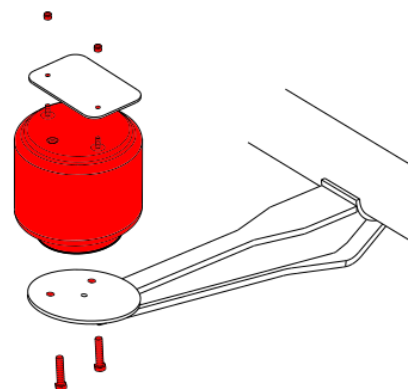
✖ SW 19

! Observe point 3.2 – contact surface of the U-shaped plate!


- [3] Connect the air bellows to the compressed air system according to the manufacturer's specifications.

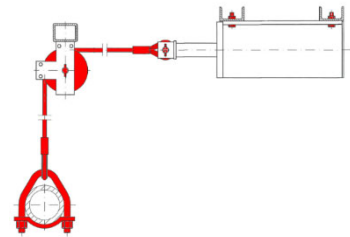
! Max. operating pressure according to the installation drawing


- [4] Perform a function test



4.7 Centre axle lift (CAL) with cable

- [1] Screw the pneumatic cylinder onto the bracket
gigant recommends: M12 (8.8)  SW 19
- [2] Install the steel wire on the pneumatic cylinder, bolt and secure with a splint.
gigant recommends: Steel cable 6x19+1 Ø12 mm according to EN12385
- [3] Install the steel wire with deflection roller on the bracket, bolt, and secure with a splint.
- [4] Install the axle suspension on the axle body and - while doing so - simultaneously and alternately tighten the locknuts up to the defined tightening torque (see table).



 SW 30

- [5] Install the steel wire on the axle suspension

! The steel wire must run perpendicular from the deflection roller to the axle suspension!

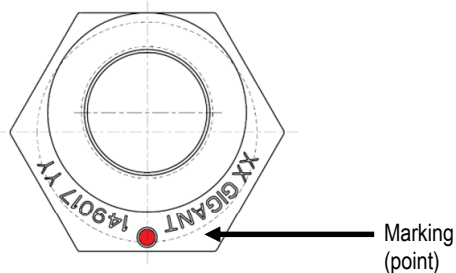
- [6] Perform a function test

5. Manual track adjustment

The axles can be moved in the longitudinal direction using the eccentric bushings and thereby the track can be adjusted.

Important:

The threaded connection and the seating surfaces must be free of grease!

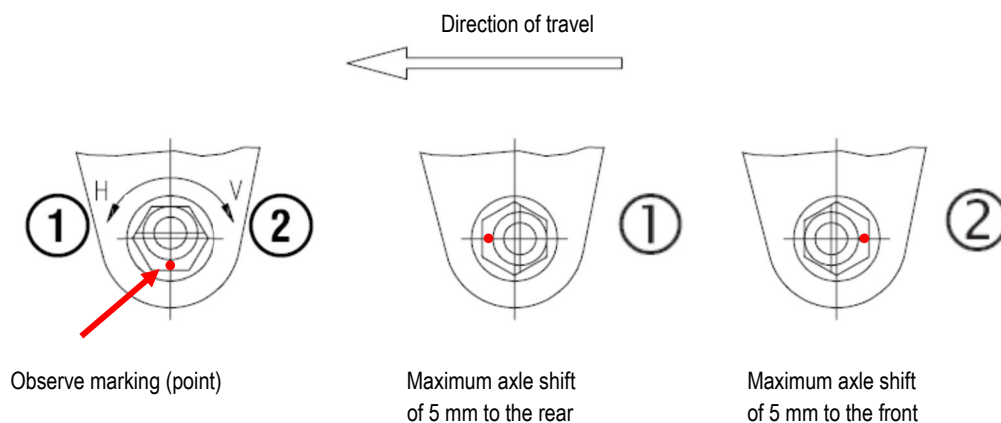


Observe!

The circular marking (point) on the eccentric bushing must point to the ground with the vehicle upright before adjusting the track.

- Pre-tighten the spring bolt to 200 Nm.
- Both eccentric bushings on an air suspension bracket must have the same angular position.
- The markings must be exactly opposite each other.
- Use a centring tool (700311047), or an open-end spanner, SW 60
- Tighten the locknuts on the spring bolt according to the specified torque (see table) after disengagement.

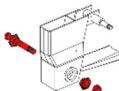

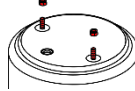
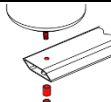
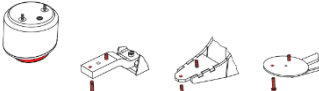
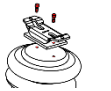



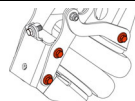
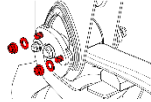

Example illustration:



6. Deviations from specifications

There are vehicle designs that result in deviation from the prescribed dimensions and permitted loads. These deviations must be agreed upon with gigant – Trenkamp & Gehle GmbH.

7. Recommended tightening torques

Use	Illustration	Thread	Tightening torque
Spring bolt (SAL/SAL-T)		M27 x 1.5	575 Nm ± 25 Nm
Spring bolt (CAL/CAL-T)		M27 x 1.5	575 Nm ± 25 Nm
Threaded pegs for rolled bellows (SAL/SAL-T/CAL/CAL-T/CAL-C)		M12	55 Nm ± 5 Nm
Draw rod for rolled bellows (SAL/SAL-T/CAL/CAL-T/CAL-C)		M20	275 Nm ± 25 Nm
Piston head plate for rolled bellows (SAL/SAL-T/CAL/CAL-T)		M16	280 Nm ± 10 Nm
Clamp – two-fold bellows (Twinlift FB100)		M8	25 Nm ± 5 Nm
Two-fold bellows – lift support (Twinlift FB100)		M8	25 Nm ± 5 Nm
Clamp fitting (Twinlift FB100)		M10	43 Nm ± 3 Nm
Fixing screw for air suspension bracket (Twinlift GL70: Generation 1 + 2)		M14	80 Nm ± 5 Nm
Lift support bolts (Twinlift GL70: Generation 2)		M14	120 Nm ± 10 Nm
Locknuts for anchor plate (Twinlift GL70: Generation 1)		M14	120 Nm ± 10 Nm
Axle suspension (Axle lift with cable)		M20	280 Nm

Important!

The used locknuts and spring bolts must be replaced by new components after every disassembly.

These installation instructions are a part of our terms and conditions of sale and delivery. Failing to observe them means that we will not be able to accept any claims in the event of damage. The prescribed axle loads may not be exceeded. Observe changes to the centre of gravity heights and instructions on the installation drawings. When dimensioning, it should be considered that, with a semitrailer, the coupling load must be stabilised via the saddle coupling of the tractor. Ensure that there is sufficient space for the tyres and the axle components, especially when the vehicle is lowered.

P150	2	Supplement to the axle lift GL70 Generation 2	2021.12.07	HU
303256657	1	2.3 Figures/designation updated	2019.12.11	HU
-	0	Document created	2019.03.05	HU
Change number	Index	Change description	Date	Signature

Created/reviewed:

Approved:

2021.12.07	HU	2021.12.07	AK
Date	Signature	Date	Signature