Air suspension units GL70 | GL70HD | GL70L

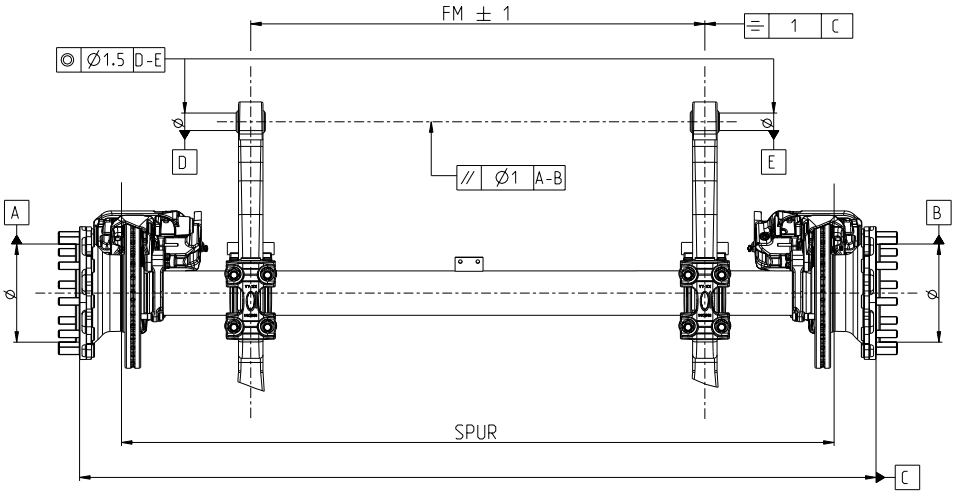
Can be identified by the air suspension brackets with a welded-on support for the eccentric bushing.

The axle set consists of the axle with mounted springs – brake cylinders on request.

At preassembled air suspensions (spring with air suspension bracket) is due to fact of various installation options and various air suspension brackets the ride height not factory-adjusted. Also the spring bolt is not factory-adjusted. The factory-adjusted spring bolt and shock absorber connection unloose and then tighten according tightening torque value of the table.

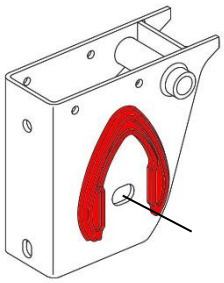
An over flexion of the air bellows is to avoid during working at a lifted chassis. The air suspension has according to this be fixed latest at maximum riding height.

Recommendation!
With a separate delivery of a GL70L unit, the assembly of the axle set should be carried out using an assembly fixture to ensure that the dimensional tolerances are complied with.



Shape and positional tolerances for the axle set

1. Design description



gigant air suspension units can be used as single or multi-axle units.

The springs are used to apply the guide forces of the axle. The u-shaped arrangement of the springs and stabilises the vehicle and, when there is lateral acceleration, counteracts the rolling torque.

The guide forces which are absorbed by the guides are transferred in the horizontal plane to the air suspension brackets to the vehicle chassis. Vertical forces are also absorbed by the air bellows and the air suspension bracket. The chassis members must be provided with suitable tracing to deal with forces in the vehicle chassis. If there is insufficient support provided, no guarantee claims can be accepted in the event of any damage.

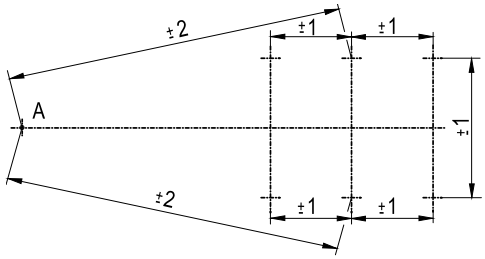
2. Positional tolerances

To ensure a smooth installation the axle with fitted springs, the position of the air suspension brackets must be within certain tolerances.

Alignment in the longitudinal direction of the vehicle
The four centres of the oblong holes on the air suspension brackets from the base line of the equilateral triangle. The intersection of the two sides should lie on the pulling point of the vehicle. These sides have a tolerance range of ±2 mm to form an equilateral triangle. The centre lines through the oblong holes of the air suspension brackets on the other axles should be parallel to one another with the tolerance of ±1 mm. If these tolerances are not observed, the track will not be able to be adjusted properly.

Alignment in the transverse direction of the vehicle

The separation of the air suspension brackets and the centre lines through the air suspension brackets on the other axles has a tolerances of ±1mm.



Adjustment tolerances for the track and axle distance

3. Fitting the air suspension bracket

gigant has the welded and bolted version for attaching the air suspension bracket to the chassis.

3.1 Air suspension bracket welded design

The GL70 | GL70HD | GL70L air suspension brackets are suitable for welding to the narrow bottom plates found in modern vehicle designs thanks to their small width.

Important!

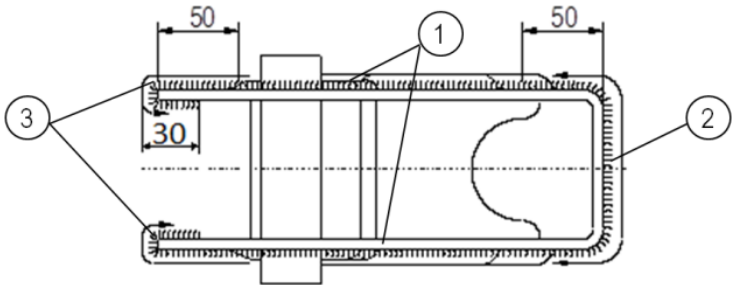
- Bearing damage will be avoided by ensuring that the clamping contact (grounding) of the welding equipment is not attached to the components of the axle.
- Welding and attaching the clamping contact (grounding) to the guide bars is not permitted.
- The springs and air bellows must be protected against weld spatter

3.1.1 Welding process

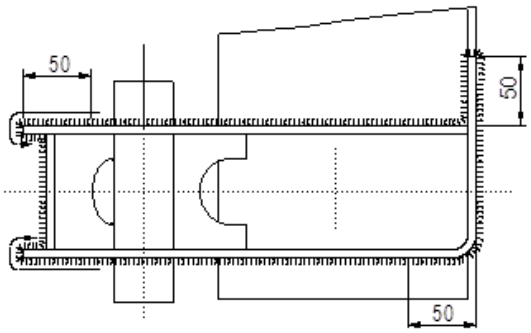
No tack welds or welding start points may be applied within 50 mm from the corner edges of the air suspension bracket (see figure below). Welds (suggested: gigant a4 ◺ according to DIN 1912) are to be made in accordance with the evaluation group B of DIN EN ISO 5817.

Important!

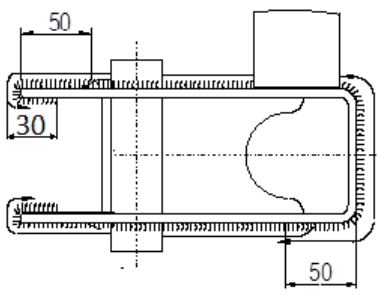
gigant air suspension brackets are manufactured from the high-quality material 1.0980 (S420MC).



Standard air suspension bracket



9 tonne air suspension bracket with C-profile



5.5 tonne / 7 tonne air suspension bracket with C-profile

3.2 Air suspension bracket with a cover to screw

The air suspension bracket with cover have welded stud bolts. It is not allowed to use the screwed version for construction area and off road.

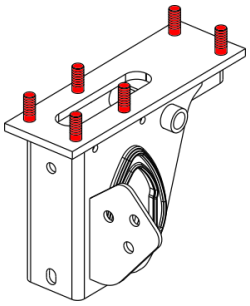
Important!

- For use of the screwed air suspension brackets must have the bottom chord a minimum thickness of 120 mm. The minimum distance for the drillings to the side of the bottom chord have to be looked for (e.g. DIN 977). The measurement of the stud bolts or drillings have to be taken from the set drawing.
- The bolt connections of the air suspension bracket have to be maintenance after first heavy duty drive and every three month. Maybe the maintenance intervals could be more often, due to reason of case of operation (e.g. city use). This is not from gigant influenceable and has to be noted by the trailer manufacture in his documentation.

3.2.1 Cover with stud bolts for screwing

Important!

- Cover with welded in countersunk bolt M16 x 60 (10.9 / Black / DIN 9771)
- Secure nuts are not included in the delivery
- Ø 17 drillings at the bottom chord according DIN EN 20273
- The location surface of the secure nuts M16 (DIN EN ISO 7040) must be parallel to the cover, if necessary compensate (e.g. taper washer DIN 434 at U-Profil)
- If necessary by high surface pressure use a washer
- Evenness screwing surface bottom chord < 1 mm
- Crevice corrosion between cover and bottom chord has to avoid
- Tightening torques take from the table



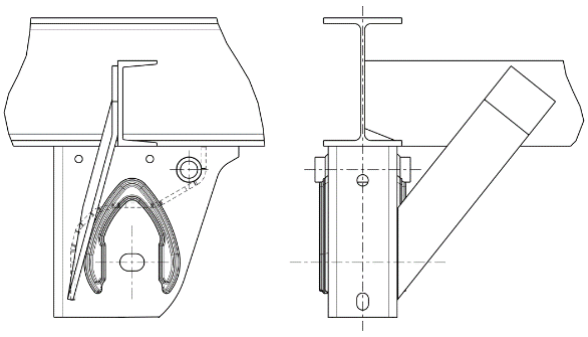
4. Lateral support

To be able to withstand the lateral forces, air suspension brackets must be braced laterally. The lateral support should be supported on a cross-member on the chassis so that the forces can be evenly distributed to the vehicle chassis.
When using a C-profile, no additional lateral support is required.

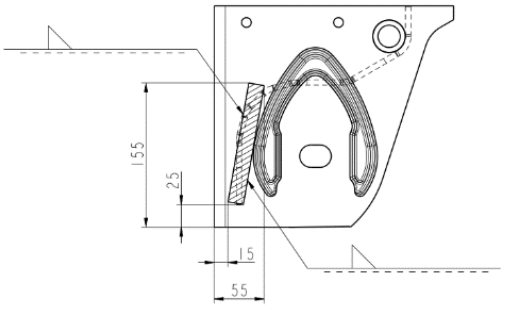
With **torsionally soft vehicle chassis** care should be taken to ensure that the torsional softness is maintained but that the air suspension brackets are prevented from bending (e.g. on flatbed vehicles).

With **rigid vehicle chassis** the bracing of the air suspension brackets can be carried out in a rigid manner (e.g., tanker, silo or box-body vehicles). gigant recommends open profiles, such as the U-profiles. Torsionally rigid, closed profiles are to be avoided as cross beams (risk of cracking at the weld joints).

4.1. Lateral support welded



Suggested lateral support



Area of lateral support including the weld

So that further attachments are not limited in their function, the cross supports may only be applied in the specified area.

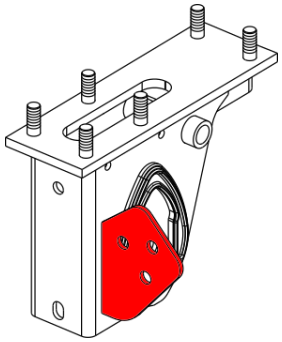
The data and instructions shown here are to be considered as a suggestion. The bracing and dimensioning depend on the type of the vehicle and its conditions of use. These data are only known to the vehicle manufacturer, and are taken into account during the design.

4.2. Lateral support screwed

gigant deliver the air suspension bracket with cover for screwing also with the lateral support for screwing.

Important!

- Through-hole for lateral support Ø17
- Bolting kit is not included in the delivery
- The location surface of the secure nuts must be parallel to the lateral support
- If necessary by high surface pressure use a washer
- Evenness screwing surface < 1 mm
- Crevice corrosion between bolting surface and lateral support has to avoid
- Gigant recommends the use of hexagonal bolt DIN EN ISO 4014
  and use of secure nuts DIN EN ISO 7042.
  ! With use of other bolting kits the responsibility is by the trailer manufacture.
- Tightening torques take from the table

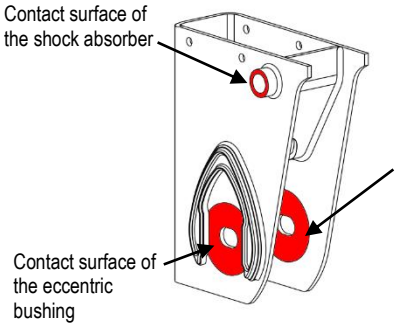


The data and instructions shown here are to be considered as a suggestion. The bracing and dimensioning depend on the type of the vehicle and its conditions of use. These data are only known to the vehicle manufacturer, and are taken into account during the design.

5. Surface protection

The air suspension bracket for welding or screwing can be provided with or without a cataphoretic paint coat as requested. It is necessary to apply a surface coating.

At screwed air suspension brackets it is necessary, that both coatings of the chassis and air suspension bracket have the same thickness as following described. Due to the fact, that the stud bolt is fix to the air suspension bracket, it is only approved to zinc coat in screwed shape to the chassis. The corrosion protection between air suspension bracket and chassis has to clarify with the coating company in advance.



Observe!
The coating thickness of the surfaces on which components (seating surfaces of the eccentric bushing, bearing sleeve of rubber block and shock absorber) are fitted may be 30 µm at most.

Important!
The responsibility of the zinc coating of the front air suspension is placed by the trailer manufacture and cannot influenced by gigant. The following parameters are specified for the proper functioning of the components:

- The contact surfaces must be free from welding residues, scale, zinc noses or other unevenness
- It has to be secured, that enough adhesion is existing between zinc coating and surface (No disengage of the zinc coating from the surface is allowed!)
- Coating thickness 85µm ± 5µm

6. Assembly

6.1. Mounting the air bellows to the vehicle frame

Important!

- Air bellows must be protected against weld spatter and the effects of excessive heat!
- When mounting without air, the air bellows contracts under load. When setting down the vehicle, care must be taken to ensure proper rolling of the air bellows over the piston.
- An overstretching of the bellows under operating pressure is not permitted. A limitation to DL_{max} must be made in accordance with point 6.10.

6.1.1. Mounting to the vehicle frame

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

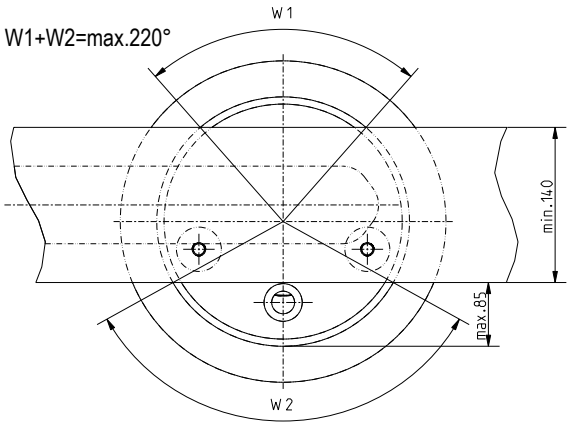
With designing the top plate of the air bellow, the load capacity of the frame beam must be taken into account.

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

A load bearing frame width of at least 140 mm is required for the top plate with a maximum offset of 20 mm. With narrow frames, a plate or a top bracket must be used. With an offset of more than 20 mm, the bearing surface must be widened accordingly, e.g., with VS45 to 165 mm.

Recommendation

- Air bellow Ø 300 mm: Bellows plate / top bracket of at least 200 x 245 x 6 mm
- Air bellow Ø 360 mm: Bellows plate / top bracket of at least 200 x 305 x 6 mm

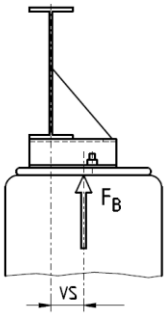


Alignment of the air bellow and the protrusion

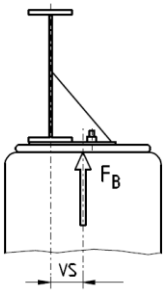
In the case of air bellows without offset (VS) or an offset of 20mm are coming up less bending moments. If the offset is bigger than 20 mm, the bending moment has to be intercepted with a lateral support.

According to the designed air suspension, a bellow plate or top bracket is necessary and has to be screwed or welded to the vehicle chassis. If required a support has to assembled. Dimensions according the technical document.

Design suggestion off air bellow support.



Air bellow with top bracket



Air bellow with bellow plate

- Welds (suggested: gigant a4 ◺ according to DIN 1912) are to be made in accordance with the evaluation group B of DIN EN ISO 5817.
- The minimum clearance between air bellow and tire respectively brake cylinder has to be 30 mm.
- The maximum permitted offset of the upper and lower fastening of the air bellows is max. 10 mm laterally
- It is not allowed to assemble the lower and upper air bellow support in twisted position.

In case of improper support of the air bellows, no warranty is given for damage to the air bellows.

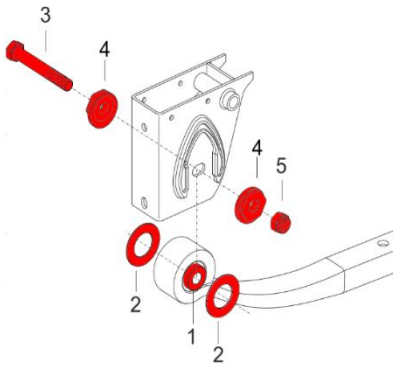
6.1.2. Compressed air

Pressurise the air bellow with compressed air which is free from foreign matter.

Guarantee claims can only be made if the vehicle is fitted with in-line filters in its compressed air supply and signal lines.

Minor tolerances are produced due to the manufacturing processes. The air bellows may lose air.
Tolerance value: Loss of 0.5 bar (within 24 hours with a starting pressure of 2 bar).

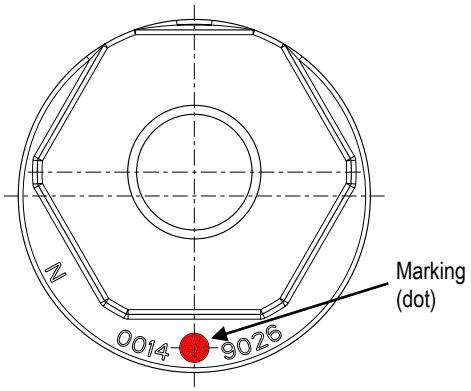
6.2. Air suspension bracket



Before assembling the spring eye in the air suspension bracket, the wear plate (2) must be pushed onto the silent block tube (1). The wear plate should sit tightly on the silent block tube and be clamped there.

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

Position the axle in the air suspension brackets. Push the spring bolt (3) with an eccentric bushing (4) through the bracket and the silent block. Place the second eccentric bushings (4) on the opposite side and fix with the lock nut (5).

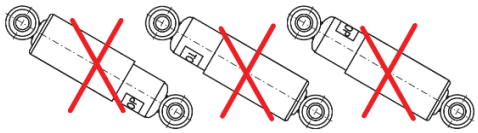


Observe!
The marking on the eccentric bushing must point to the ground when the vehicle is standing upright. Pre tightening spring bolt screwing by 200 Nm and tighten after track alignment to final torque (see table at the end).

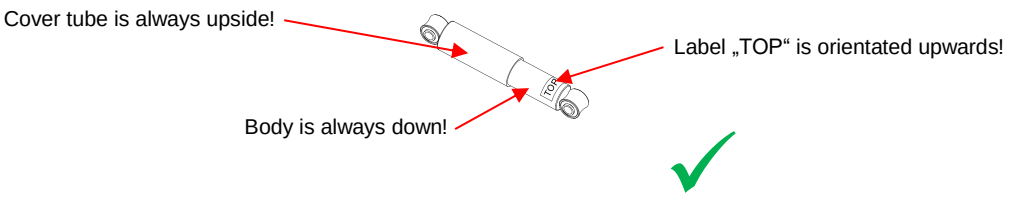
Deviation in the angular positions on both eccentric bushings on a air suspension bracket after screwing together of up to 10° relative to each other is permitted.

6.3. Shock absorber

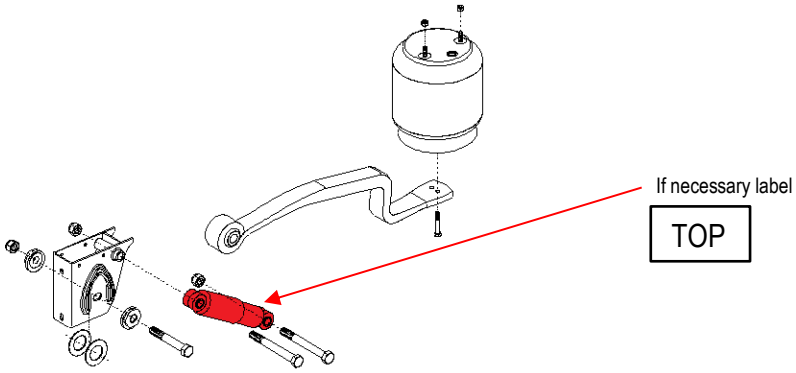
Orientated shock absorbers are marked with a label „TOP“ on the shock absorber body of the lower fixing point. The label “TOP” has to be orientated upwards to ensure a proper function of the shock absorber.



The shock absorber cover tube has to be assembled at the upper up to the upper fixing point.

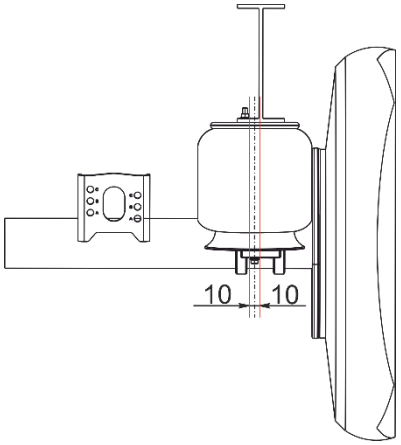


Example figure:



6.4. Fitting the air bellow to the spring

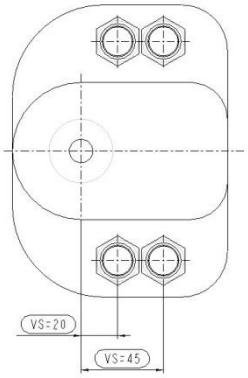
- The maximum permitted offset of the upper and lower fastening of the air bellow is max. 10 mm laterally.



- The lower and upper bellows mountings are not allowed to be aligned twisted to each other.
- Fitting the air bellow in a twisted position is not permitted.
- The gap between the air bellow (at maximum circumference) and the tyres must be at least 30 mm!
- The torques can be found in the table at the end of the document.

6.5. Fitting the air bellow with an adapter plate

Example figure:



Air bellows with Ø 360 mm are pre-fitted with adapter plates giving an offset VS=45.

Air bellows with Ø 300 mm and plastic pistons are sometimes supplied with pre-fitted adapter plates if required and should be fitted in accordance with the offset dimension from the axle set drawing.

Observe!

Position of the adapter plate to the upper air connection of the air bellows.

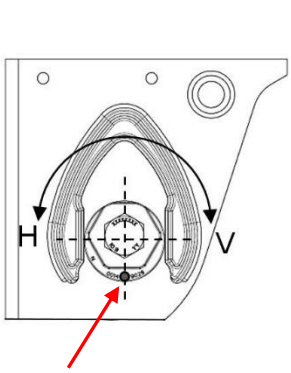
Crosspieces of the air bellow piston should supported on the adapter plate if possible. Align the crosspieces of the air spring bellows with the adapter plate during screwing in such a way that no collision occurs with the screws.

6.6. Manuel track alignment

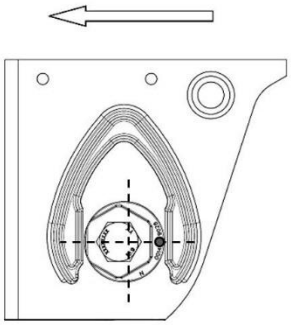
The axles can be moved in the longitudinal direction using the eccentric bushings and thereby the track can be adjusted.

Note:

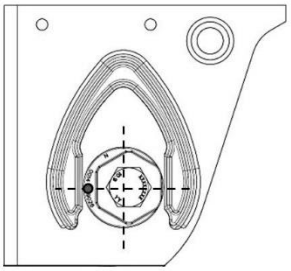
- Tighten up the spring bolt to 200 Nm
- Both eccentric bushings on a air suspension bracket must have the same angular position
- The markings must be exactly opposite each other
- Use a centring tool 00311130, or an open-end spanner, SW 60
- Lock nuts on the spring bolt should be tightened up to the specified torque (see table "Tightening torques“)



Observe the marking (dot)



Maximum axle shift of 5 mm to the front



Maximum axle shift of 5 mm to the rear

Important!

The track may be set using an automatic tracking device if the conditions specified in the "Manual track adjustment" section are met.

6.7. Connection of the air suspension

Recommendation!

For the greatest possible functionality and safety while driving, gigant recommends a dual-circuit air suspension installation with a transverse choke.

Observe!

Manufacturer's documentation for the air suspension unit.

Air suspension unit

When using in a single-circuit air suspension unit, higher loads on the axle and unit components can arise. These can lead to damage to the vehicle chassis and suspension. For this reason, gigant cannot accept any guarantee claims in these circumstances.

6.8. Fixing the ride height control unit

To fit the ride height control units, a perforated plate is found in the centre of the axle to which the control units' linkage can be fastened.

Observe!

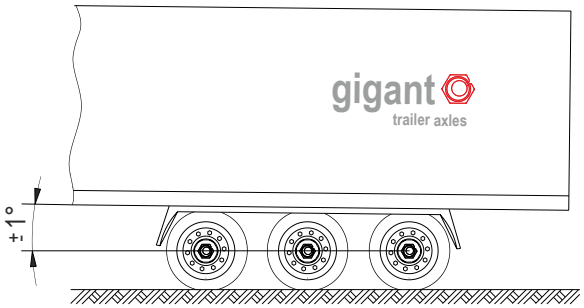
The control unit manufacturer's documentation.

The control provided by the control unit must guarantee that, at the maximum lift height of the air suspension unit, the air supply to the air bellows is closed off. The dimension for the maximum lifting height can be found in the unit drawing.

6.9. Setting the drive heights

The ride height of the air suspension axles is to be adjusted to the specified minimum suspension provided by gigant.

- Single axles: 60 mm
- Multiple axles: 70 mm
- **Exception** – multiple axles with axle lift: 100 mm

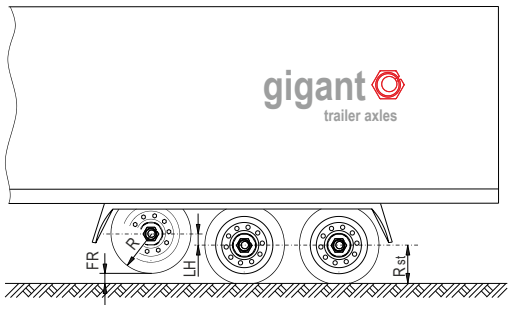


The maximum attachment tilt of the semitrailer must not be less than ±1° or 20 mm/m!

Important!

To retrofit an axle lift contact gigant.

The lift of the axle lift corresponds to the deflection of the axle. The free space (FS) under the tyres is reduced by the deflection of the tyres.



$FR = LH – (R – R_{st})$

- FS = Free Space
- LS = Lift stroke; $LS_{min.}$ 100 mm
- T_{st} = actual free tyre radius, loaded
- T = free tyre radius, unloaded

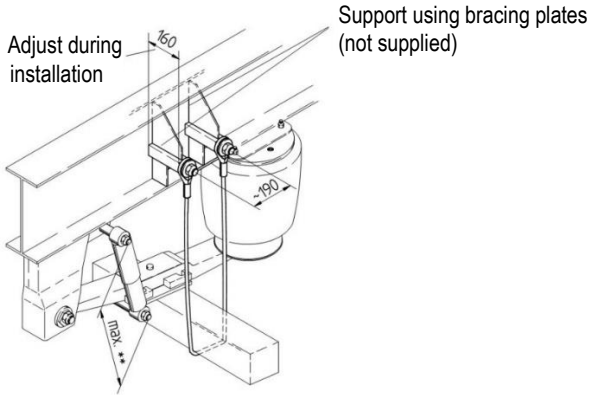
6.10. Ride height restriction

For gigant air suspensions, catch straps are generally not required.

Important!

When using tipper or container chassis and on vehicles which are frequently loaded or lifted using a crane, catch straps are required. When unloading the vehicle, they prevent a rapid release of the air suspension and protect the suspension from mechanical damage. Under certain conditions – only with gigant approval – the use of quick release valves with a release controller is possible.

Example figure:



** see the unit installation drawing

To determine the fixing points for the square pin, the vehicle must be raised to the maximum lifting height.

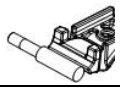
The catch straps must be pulled as tightly to the axle body as possible and the square pins welded to the longitudinal beam.

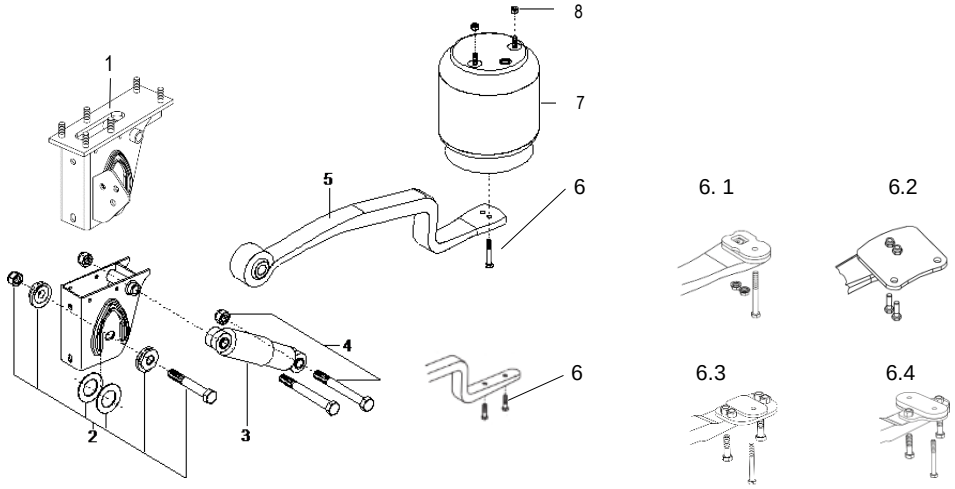
6.11. Air suspension assembly with self-steering axle

Observe!

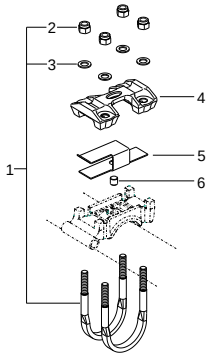
ST232 and TM 01/2012 (can be download at: https://www.gigant-group.com/download/)

7. Prescribed tightening torques

Description	Thread	Tightening torque
Air suspension unit		
1. Stud bold / screwed lateral support air suspension bracket	M16	280 ± 10 Nm
2. Spring bolt with eccentric bushing	M24	340 ± 20 Nm + 90°± 3°
4. Shock absorber screw fitting to the air suspension bracket	M24	125 ± 10 Nm + 120°± 3°
4. Shock absorber screw fitting (axle plate with tube) 	M24	125 ±1 0 Nm + 120°± 3°
4. Shock absorber screw fitting (axle plate with pin) 	M24	400 ±20 Nm
6. Pistons (rolled bellows) - steering	M12 (screw)	55 ± 5 Nm
6.1 Pistons (rolled bellows) – steering with adapter plate	M12 (nut/stud bolt 10.9) M12 (screw)	110 ± 10 Nm 55 ± 5 Nm
6.2 Pistons (rolled bellows) – steering with adapter plate	M12 (screw 10.9)	110 ±10 Nm
6.3 Pistons (rolled bellows) – steering with adapter plate	M12 (screw) M16 (screw)	55 ± 5 Nm 280 ±10 Nm
6.4 Pistons (rolled bellows) – steering with adapter plate	M12 (screw) M16 (screw)	55 ± 5 Nm 280 ±10 Nm
8. Threaded pin (rolled bellows)	M12 (nut)	55 ± 5 Nm



Connection		
U-bolt (with lock nut) / GL70	M22 x 1,5	700 ±25 Nm*
U-bolt (with lock nut) / GL70L	M20 x 1,5	550 ±25 Nm*



To 2

- Per spring, gradually tighten up the nuts on the U-bolt to half of the specified torque screwing the nuts cross-wise.
- Evenly tighten up the nuts cross-wise to the specified torque value.

Important!
The U-bolt must not be tilted!
The threads must protrude equally above the nuts!

Important!
The lock nuts used must be replaced with new ones after each disassembly!

These installation instructions are a part of our terms and conditions of sale and supply. 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.

Modification number	Index	Description of change	Date	Signature
594287717	4	Pictures / descriptions updated	2019.12.06	HU
-	3	Value for evenness screwing surface changed from <0,1 to <1mm	2018.12.18	HU
VAS 3008	2	Screwed air suspension bracket, adapter plate air bellow added	2018.10.16	HU
AP592985721	1	Torque stud bold (rolled bellows), information shock absorber	2017.01.13	HU
Projekt 106	0	New document	2015.03.12	GL

Created/inspected:		Released:	
2019.12.06	HU	2019.12.10	KK
Date	Signature	Date	Signature