

General Installation Instruction Manual

SAF Modular Air suspension system

Drum Brake



Edition 11/2006



for hanger brackets of steel, SAF air suspension series U/M/O

Welding recommendation

The high-tensile steel used for the hanger brackets with a carbon content C of max. 0.2% can be easily welded. Special welding electrodes are therefore not required.

Cover the trailing arm to protect it from flying sparks. In order to avoid bearing damage, the welding equipment ground cable must not be connected either to the wheel or to the wheel hub with brake drum.

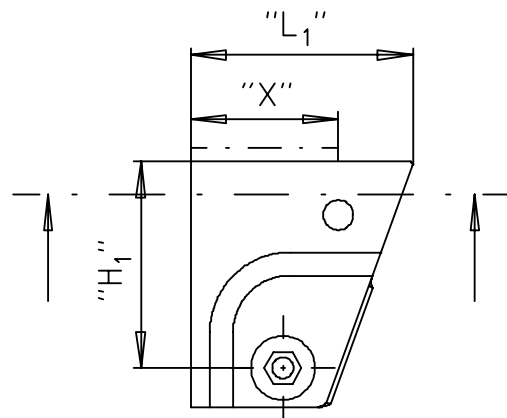
Design information

The vehicle frame must be reinforced so that it can absorb the forces to which it is exposed.

Important note

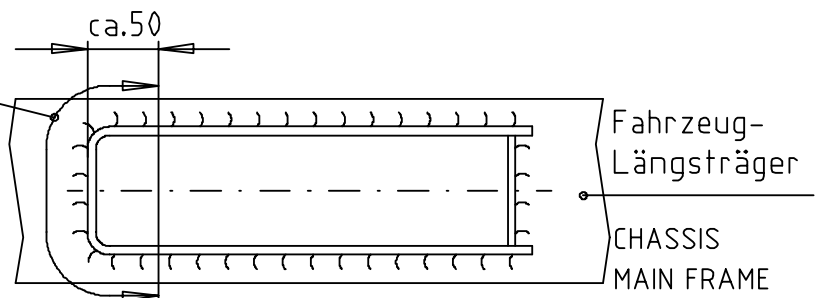
Ensure that the gap between the hanger bracket and chassis in the area "X" is kept small!!

Dimension „H ₁ “	Dimension „L ₁ “
250	298
290	313
355	337



In diesem Bereich
keine Heftnähte,
kein Schweißnahtbeginn,
Einbrandkerben und
Endkrater nicht zulässig.

IN THIS SECTION
TACK WELD,
WELDING START,
END AND UNDERCUT
NOT PERMISSIBLE



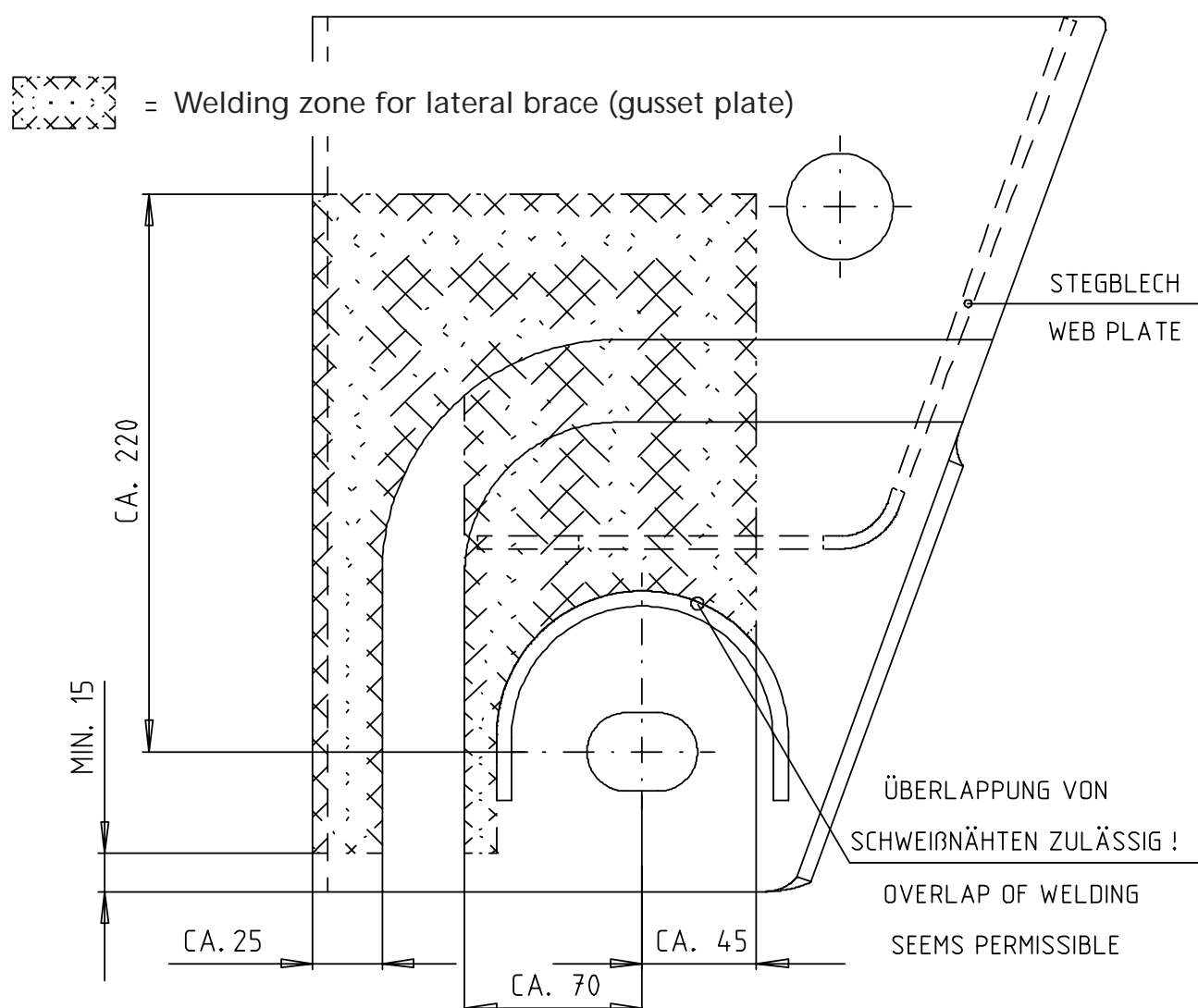
Schweißnähte 5 
WELD SEAM

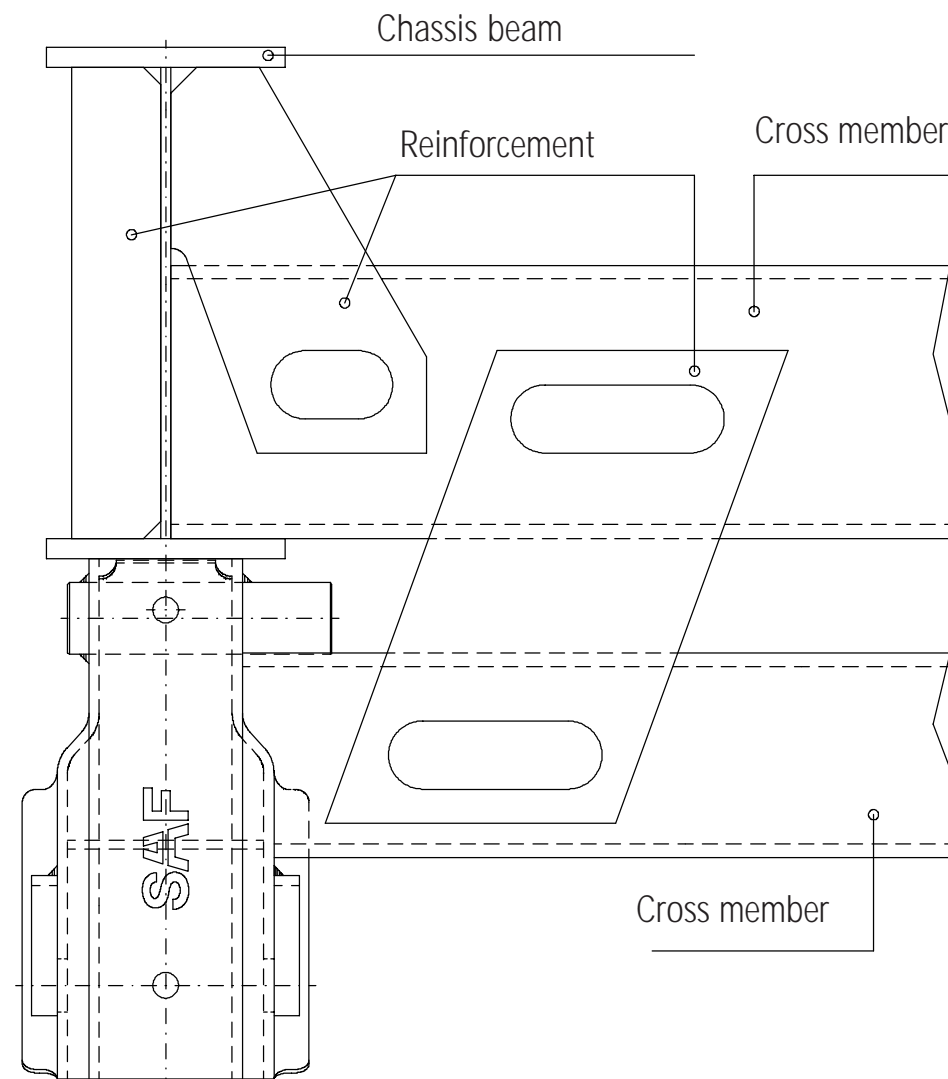
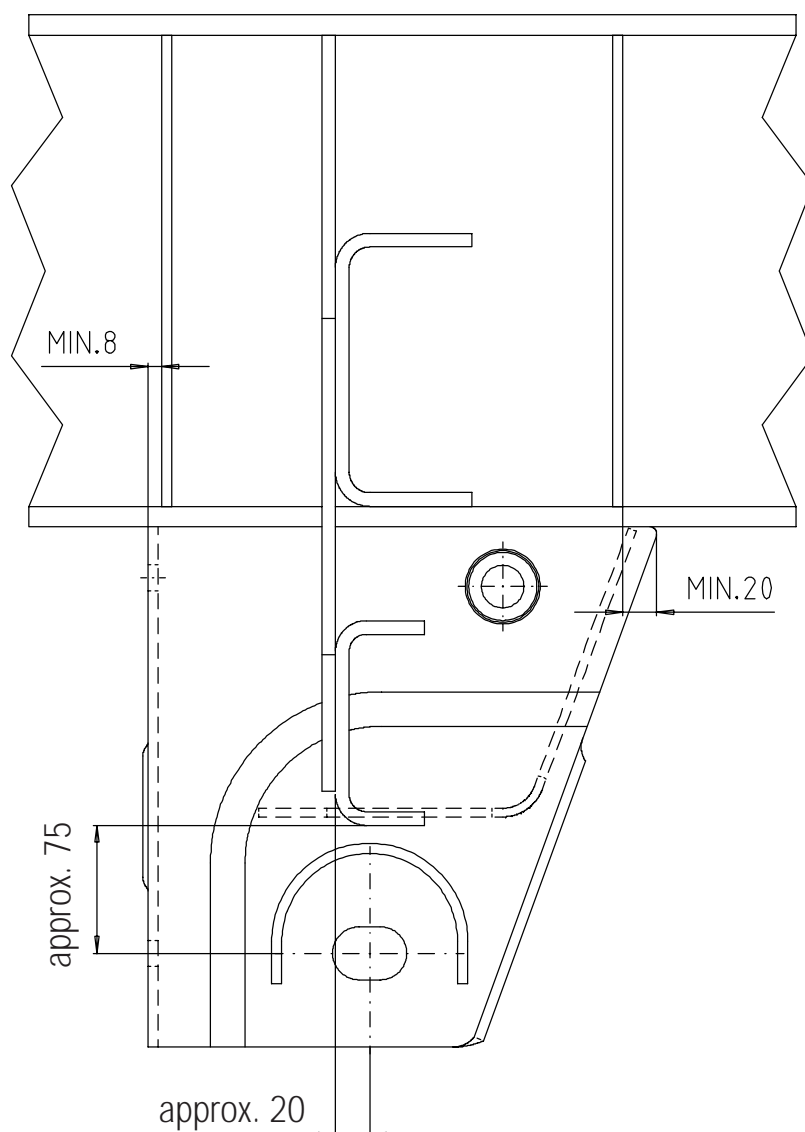
Installation instructions for lateral hanger bracket brace / adjustable spring bearing



The lateral brace (gusset plate) must be attached to the spring hanger as low as possible.

Overlapping of the gusset plate and inner brace plate is necessary to avoid any diaphragm effect.

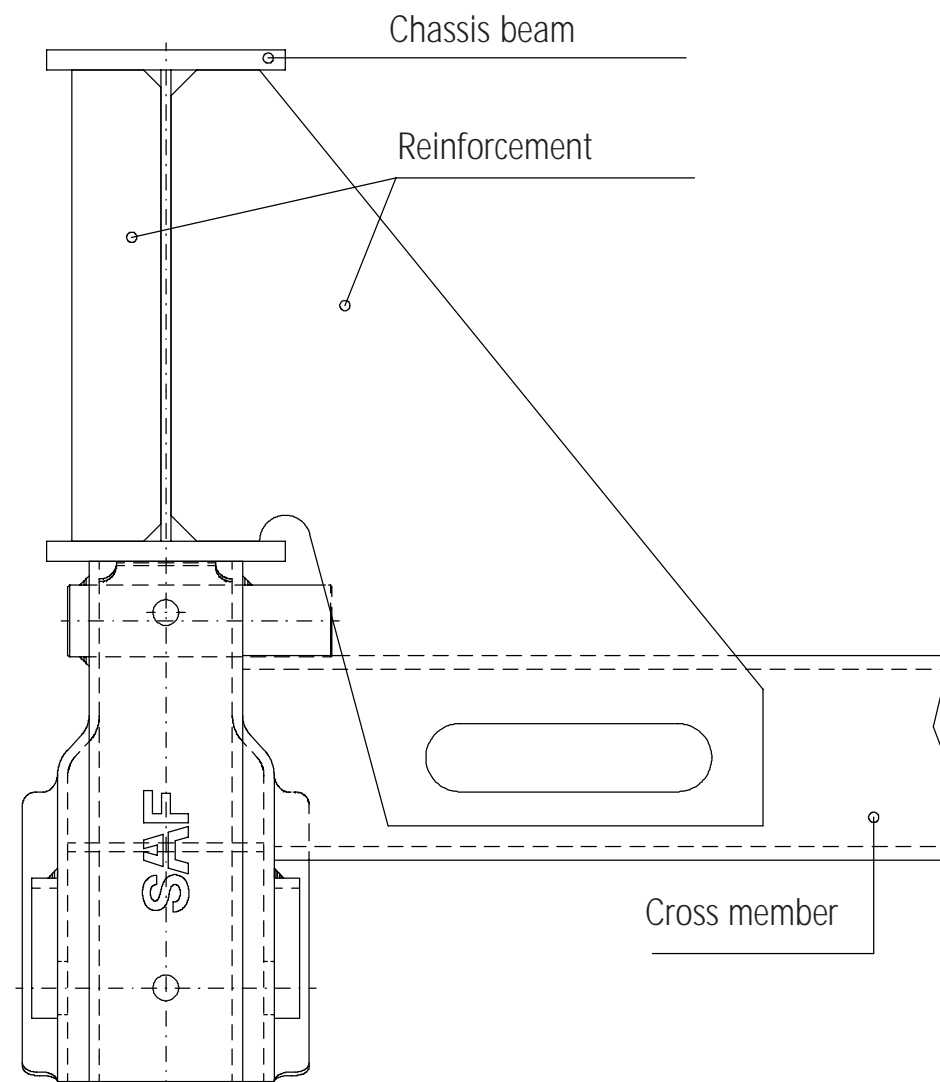
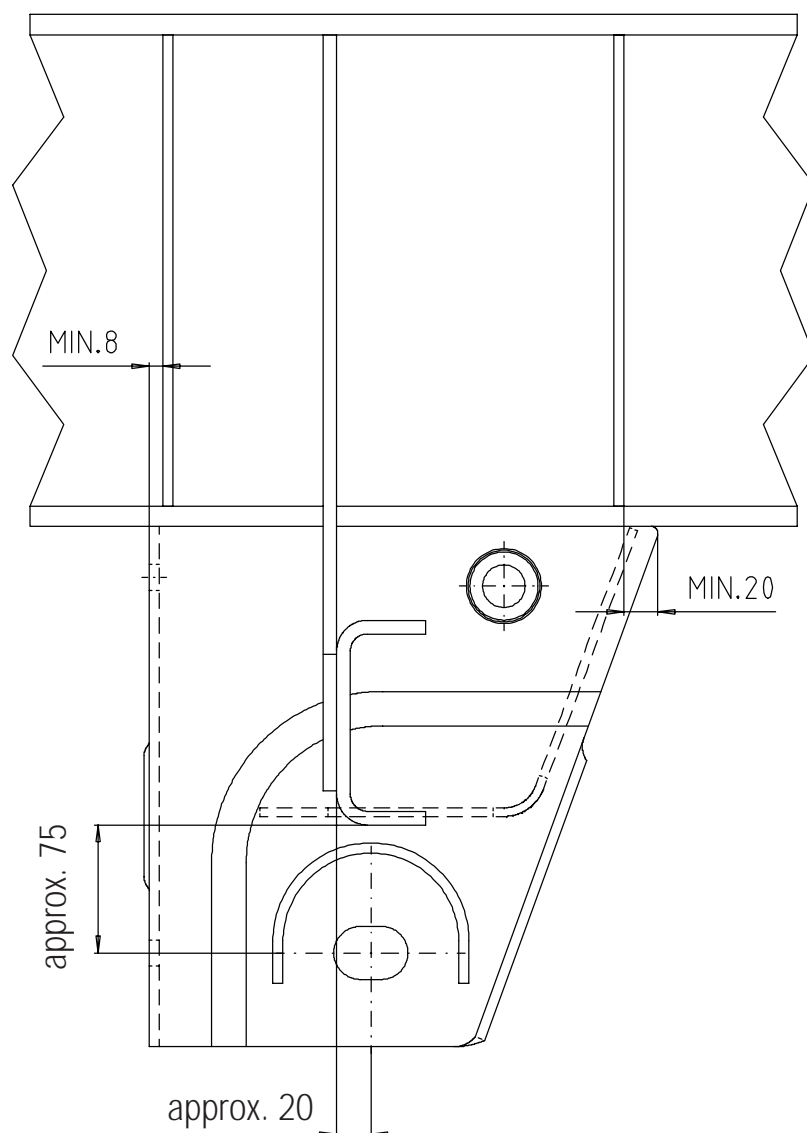




Hanger bracket welding instructions see page 0 183 0003 00

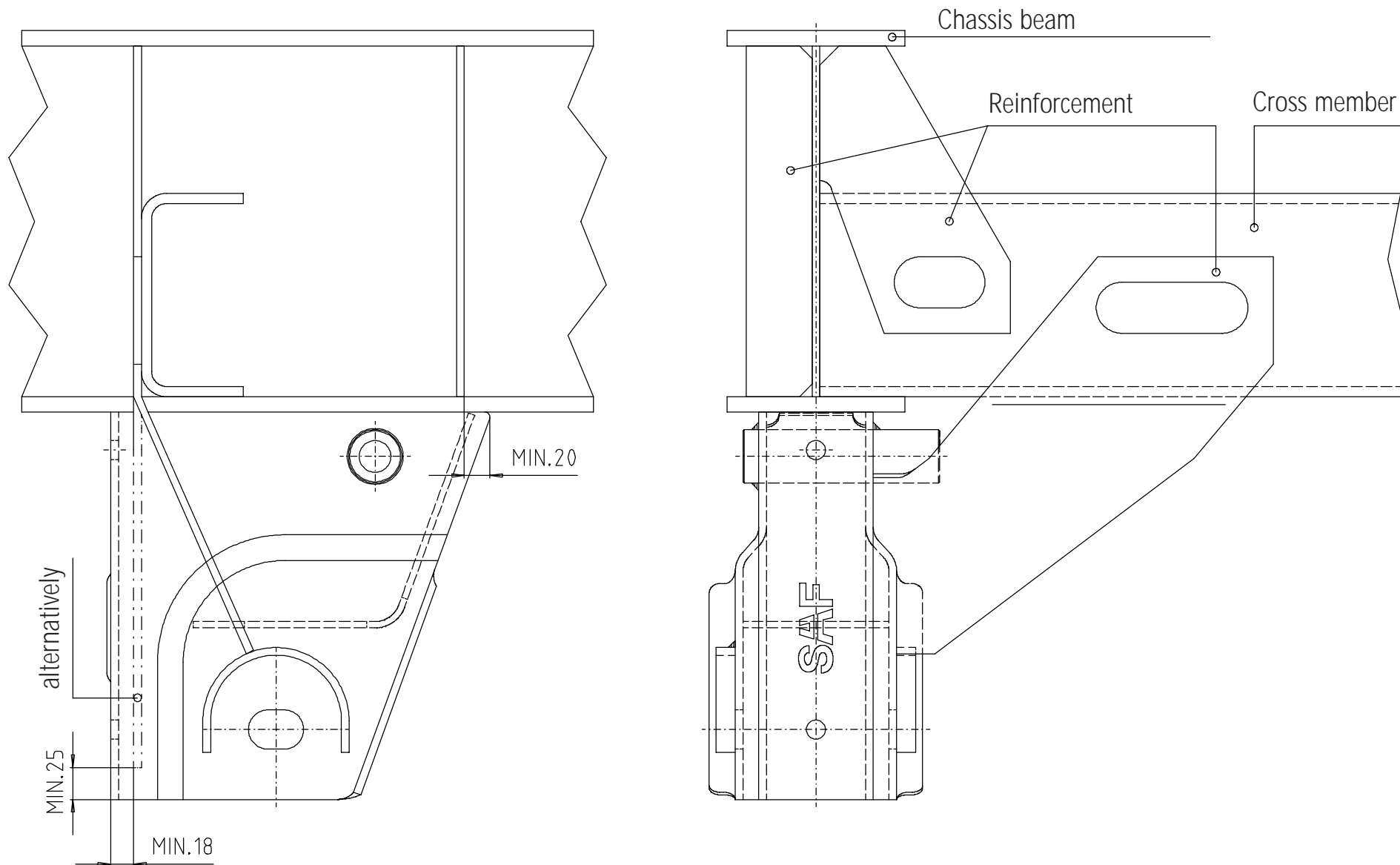
The design and dimensioning of the hanger bracket reinforcement is the responsibility of the vehicle manufacturer, allowing for the type and operating conditions of the vehicle.

Bracing recommendations – Hanger bracket “steel”



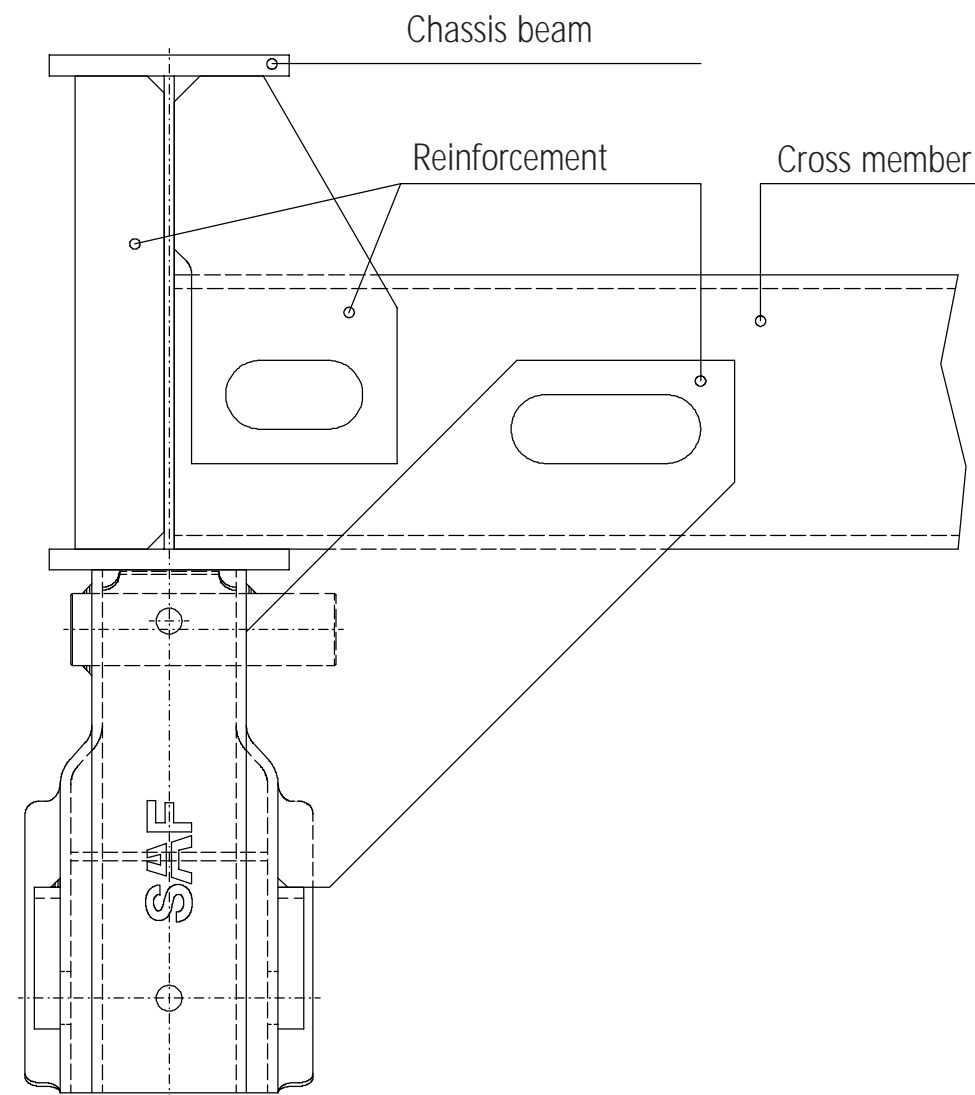
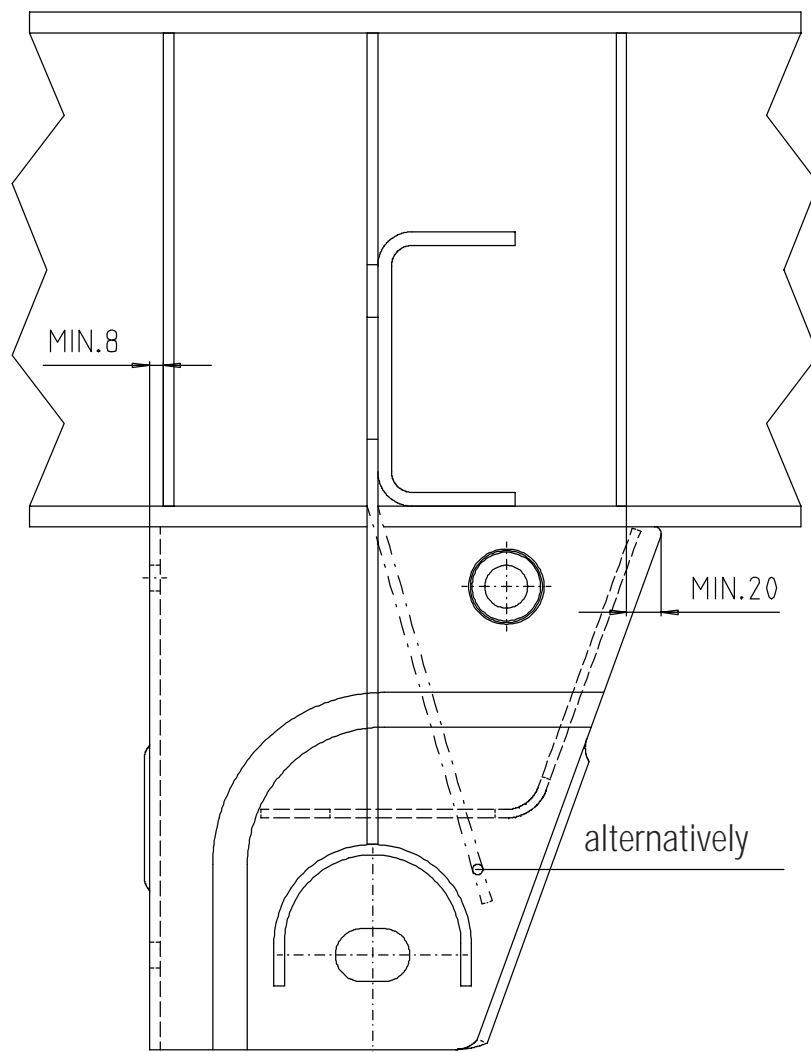
Hanger bracket welding instructions see page 0 183 0003 00

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Hanger bracket welding instructions see page 0 183 0003 00

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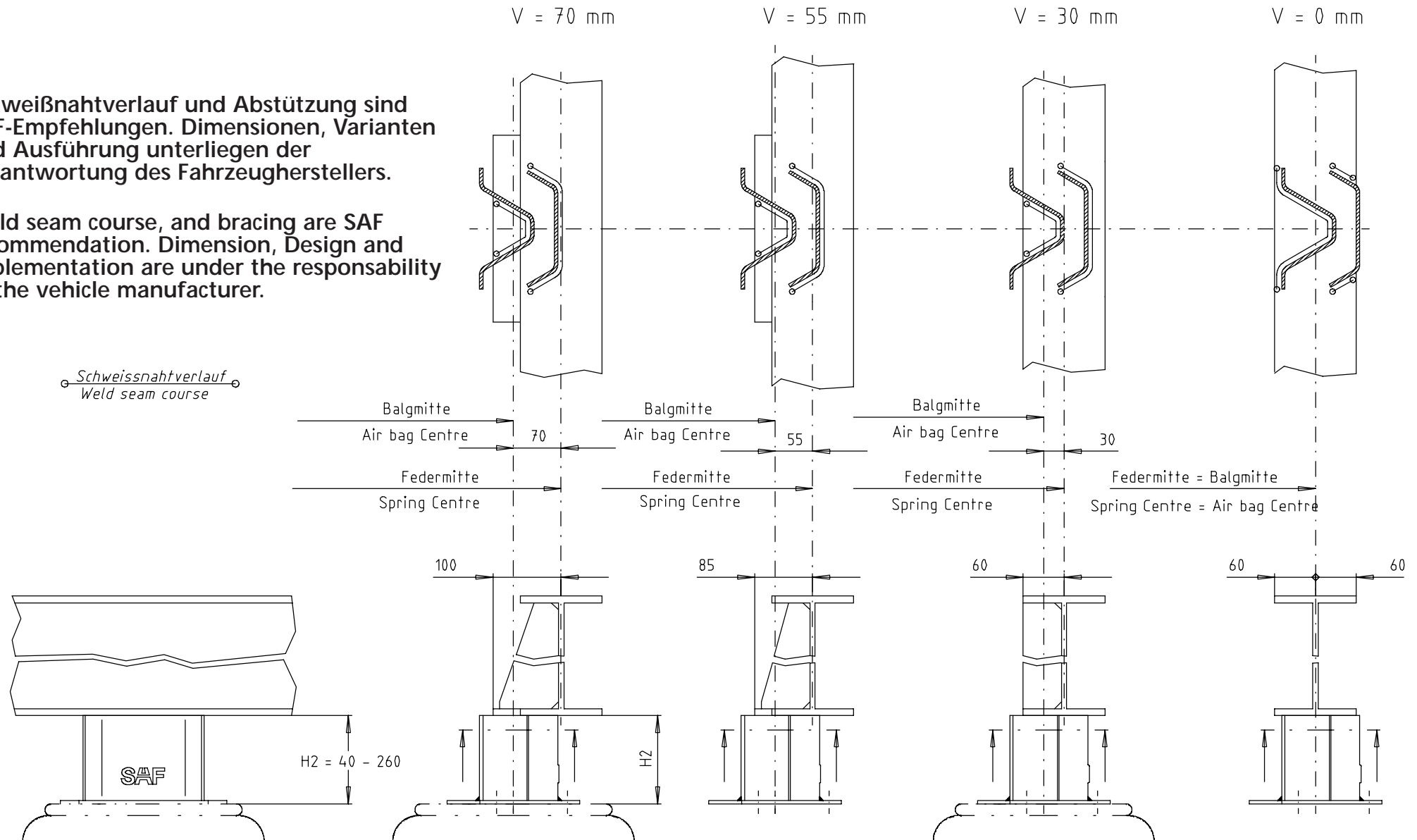
Welding recommendation – Air bag bracket



SAF Standard Air Bag Offsets V

Schweißnahtverlauf und Abstützung sind SAF-Empfehlungen. Dimensionen, Varianten und Ausführung unterliegen der Verantwortung des Fahrzeugherstellers.

Weld seam course, and bracing are SAF recommendation. Dimension, Design and implementation are under the responsibility of the vehicle manufacturer.



Mounting plate + Air Bag brackets



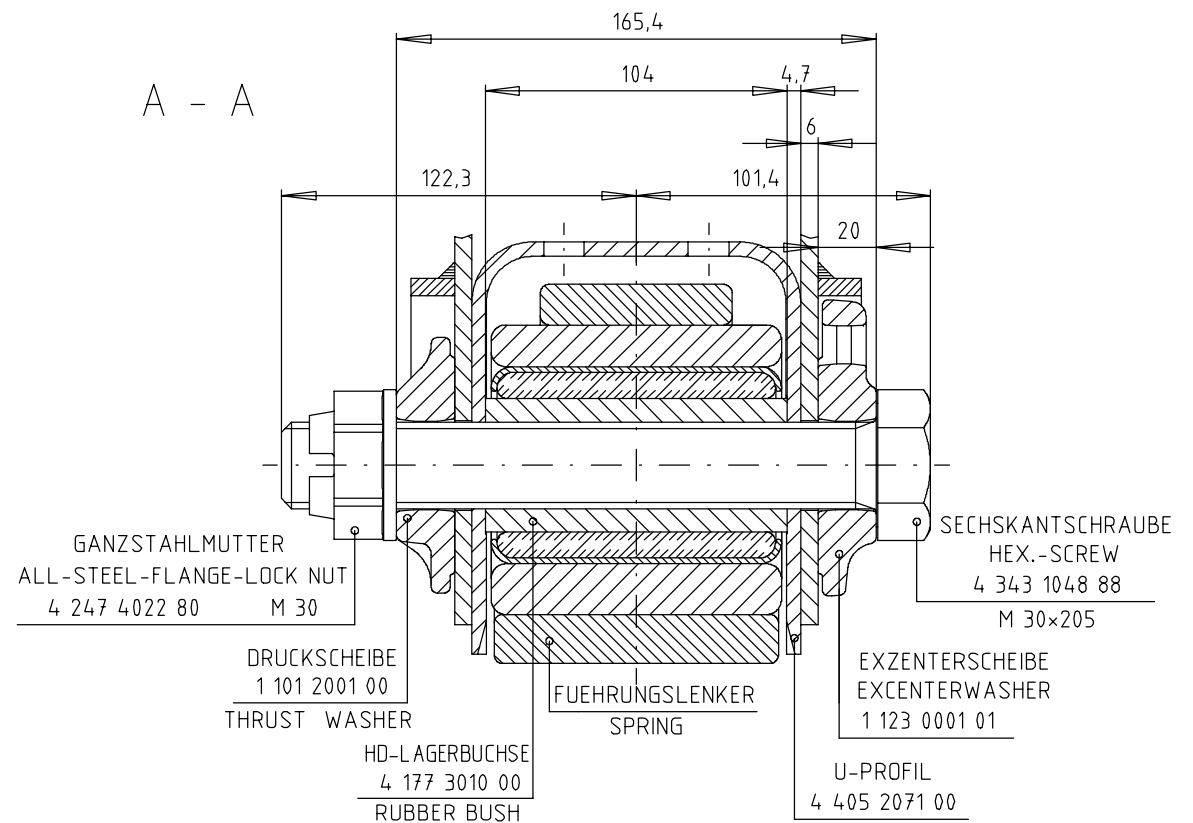
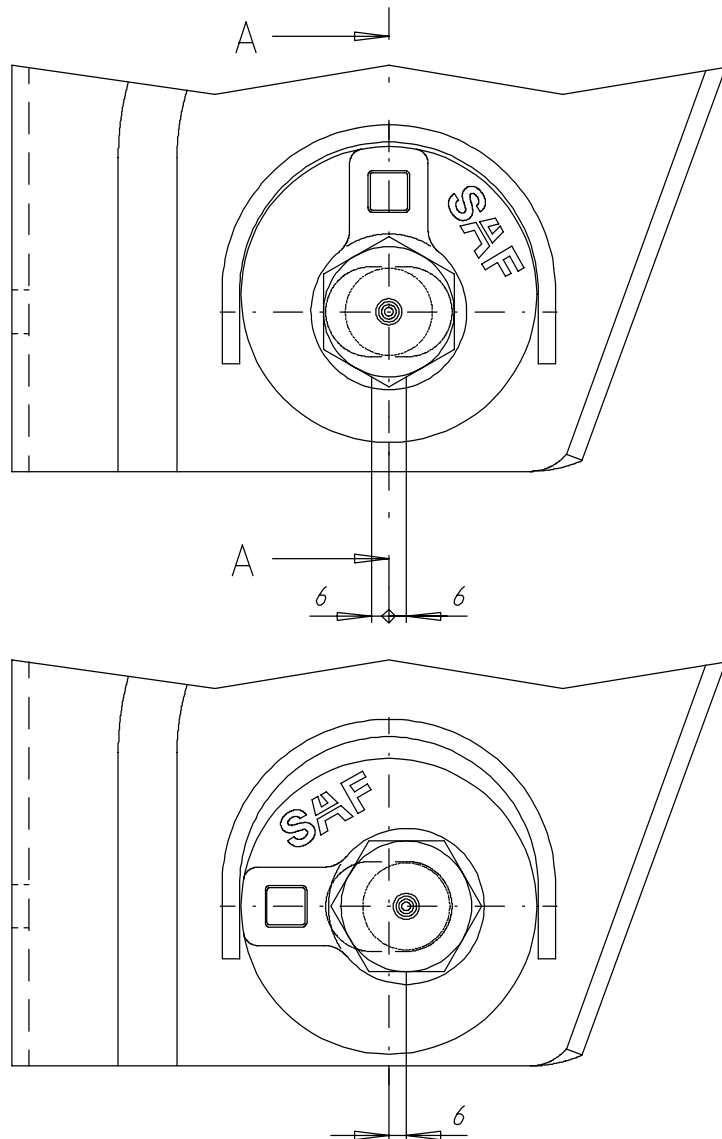
for SAF Air bags

	Designation	H (mm)	Order-No.:
	Mounting plate "steel"	5	1 043 0261 01
	Mounting plate "Alu"	8	1 043 0262 01
	Air bag bracket "steel"	40	2 237 0070 01
		70	2 237 0071 01
		100	2 237 0080 01
		130	2 237 0072 01
		160	2 237 0073 01
		210	2 237 0074 01
		260	2 237 0075 01

Adjustable spring bearing



steel hanger bracket / cross member

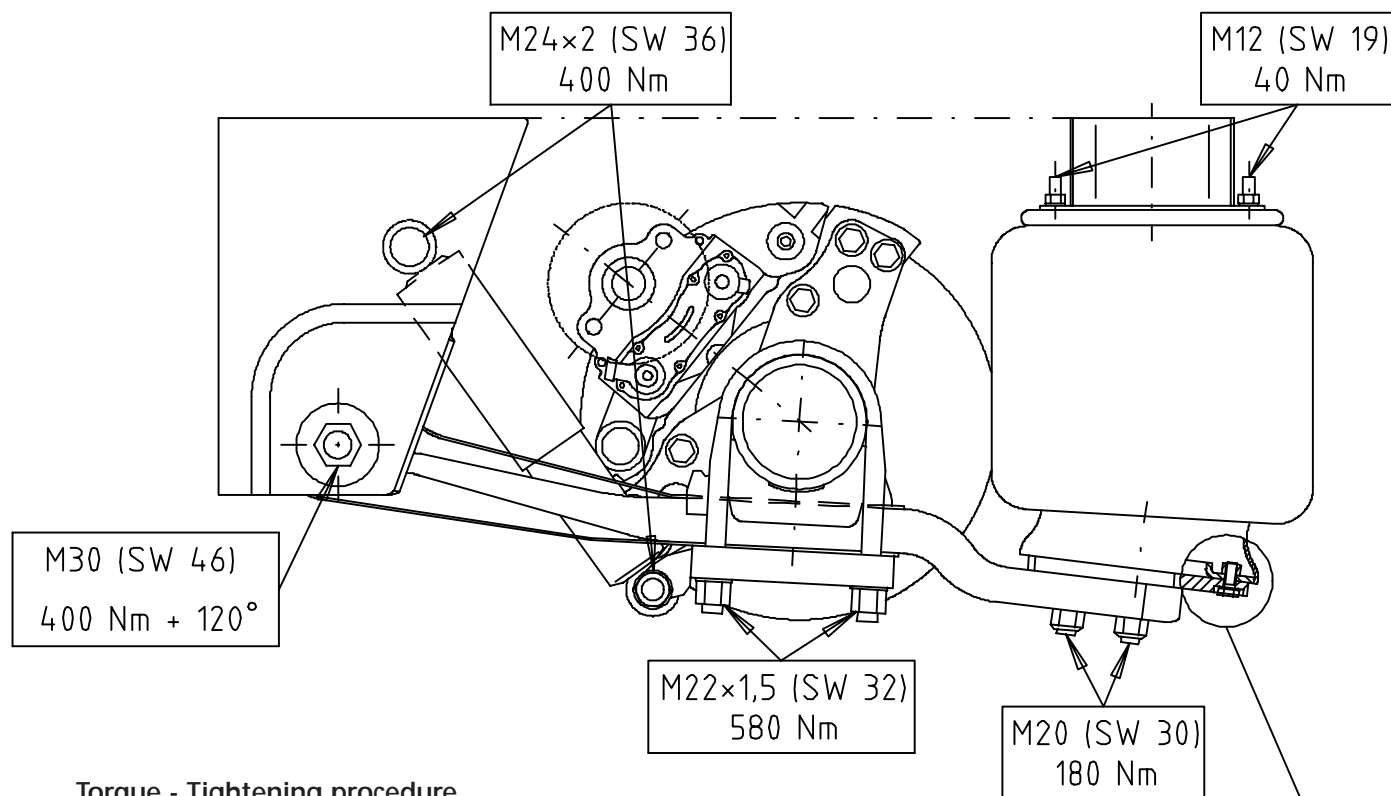


ANZUGSMOMENT : 400 Nm + 120°
 TIGHTENING MOMENT : 400Nm + 120°
 ANZUGSVERFAHREN SIEHE TD 0000400500
 TIGHTENING PROCEDURE SEE TD 0000400500

Tightening torques for suspension arms – shock absorbers – air bags



The max. coat thickness of any primer or paint must not exceed 45 µm on any contact surfaces of the suspension arm and shock absorber fixation!



Torque - Tightening procedure

1. Faces of the HD bearing bush must be free from oil and grease.
2. Install the functional suspension arm bearing parts as shown in the spare parts drawing.
3. Adjust the vehicle to ride height.
4. Pretighten the nuts M30/WAF46 to 400 Nm. Using a torque wrench.
5. Align the marks on the welded hub, hexagon head bolt and nut over one corner of the nut.
6. Tighten the nut a further 120° (2 nut corners), holding the bolt head to prevent the bolt from turning with the nut.
7. Perform a visual check. Correct the turn angle, if necessary.
8. Make marks with a counterpunch on the welded hub, hexagon head bolt and nut in a line after completing the tightening procedure.

M12 (SW 19) 80Nm
bei Stahltauchkolben
for steel plunger piston

Schneidschraube K100×40
(SW 10) 20 Nm bei
Kunststofftauchkolben
for plastic plunger piston

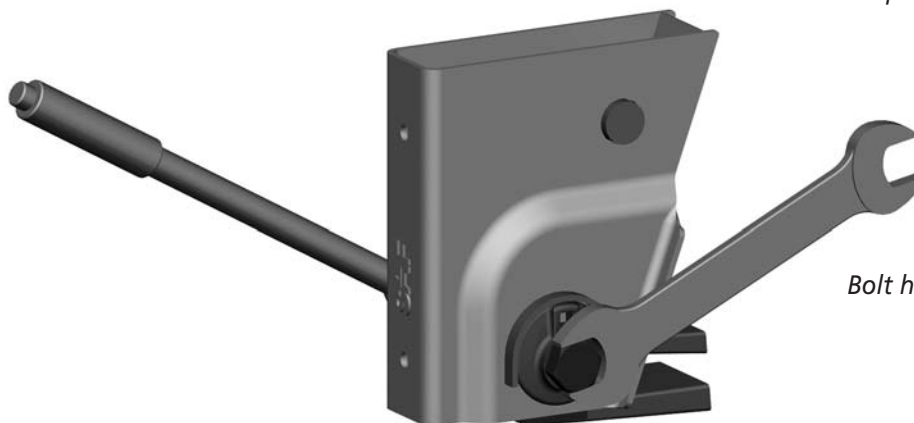
Attention!

- Threads are not to be oiled or greased!
- Spring bearing for steel hanger brackets maintenance free
- spring bearing for aluminium hanger brackets to be checked after 500 km, further check after every 6000 km. Inspection torque 1200 Nm.

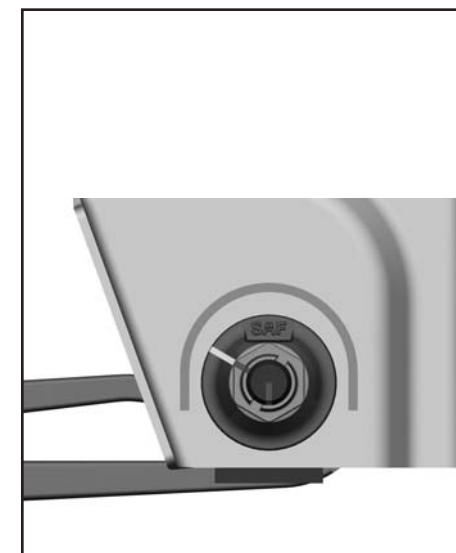
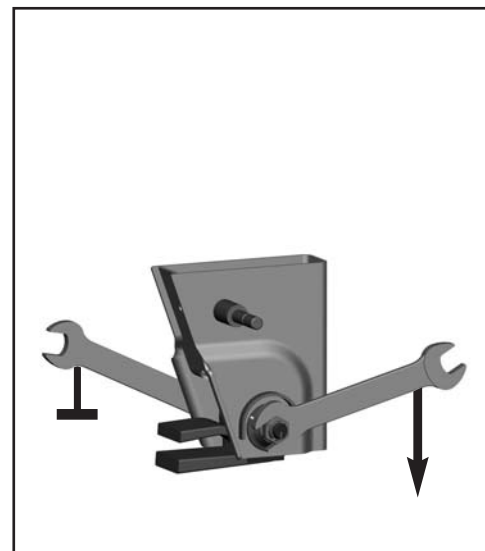
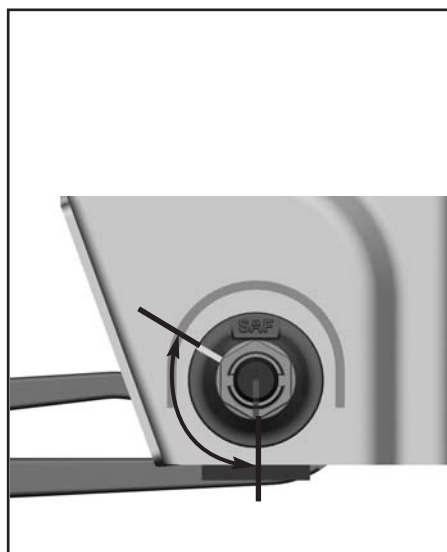
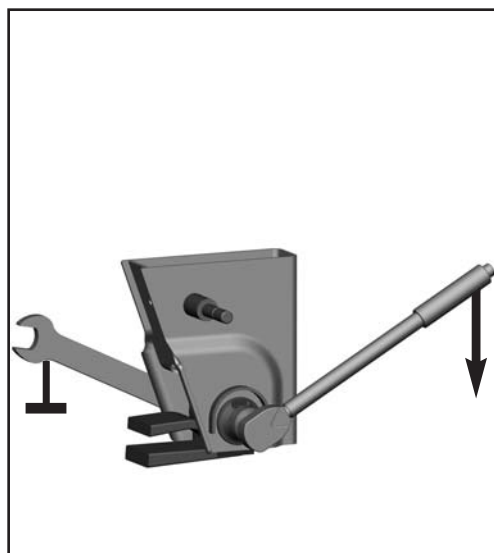
Tightening instructions for adjustable pivot bolt



*Attention:
Tightening always within the specified ride height range!
No paint residues between eccentric/thrust washer and hanger!*



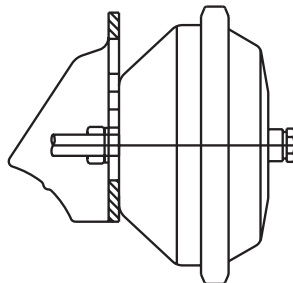
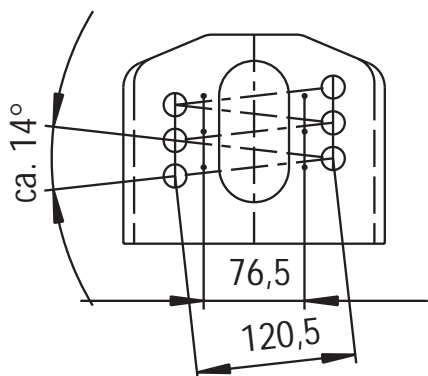
Bolt head always on the eccentric washer side.



Mounting of diaphragm brake cylinders and spring-loaded brake cylinders on SAF axles



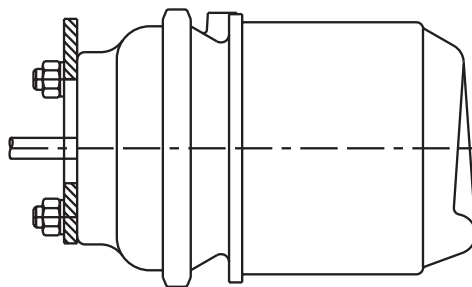
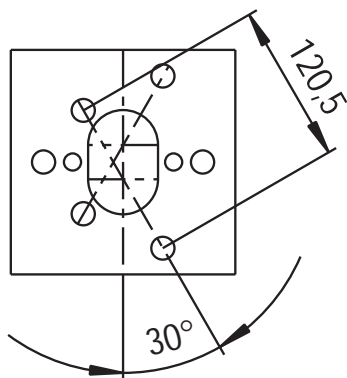
Connection of diaphragm cylinders to standard baseplates



Position of the mounting bolts:

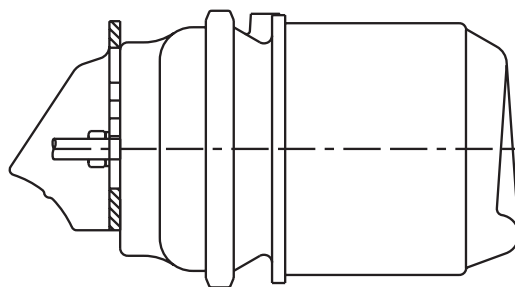
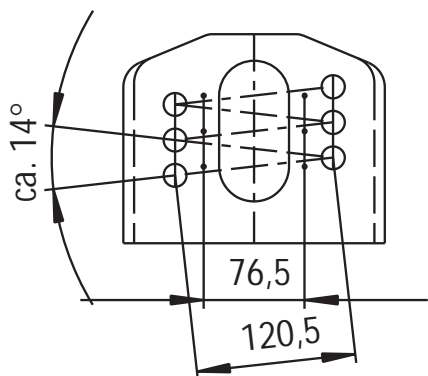
- Distance between hole lines 120.5 mm at an angle of approx. 7° from the horizontal
- Distance between hole lines 76.5 mm not required on axles with axle load > 6,000 kg

Connection of spring-loaded brake cylinders to special baseplates



Position of the mounting bolts at an angle of 30° to the vertical!

Connection of spring-loaded brake cylinders to standard baseplates



Position of the mounting bolts:

- Distance between hole lines 120.5 mm at an angle of approx. 7° from the horizontal
- Distance between hole lines 76.5 mm not required on axles with axle load > 6,000 kg

The SAF baseplates are sufficiently well dimensioned to take spring-loaded brake cylinders where the manufacturer permits installation with the mounting bolts horizontal.

The flatness of the baseplates when new complies with the specifications of the brake cylinder manufacturers, a reinforcing plate to strengthen the baseplate is not necessary.

Observe the installation instructions of the brake cylinder manufacturers.

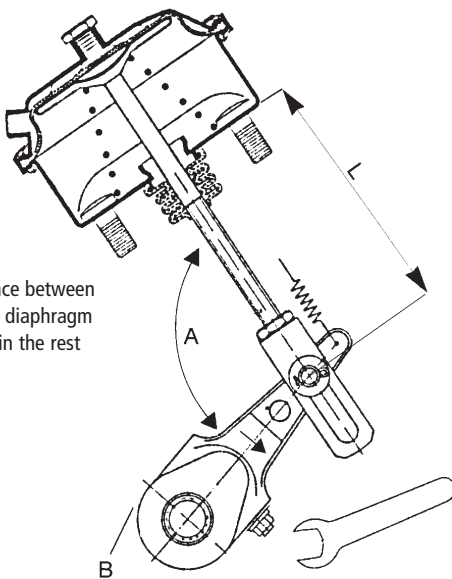
A major factor for the serviceability of the brake cylinders and baseplates is compliance with the specified tightening torques and regular checking of the torque.

In conjunction with axle suspensions, please contact SAF to obtain approval for installation due to the larger space requirement of spring-loaded brake cylinders where approval is not automatically given.

Check the brake setting

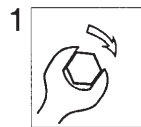
Adjustment of S-cam brakes with manual slack adjusters

The natural wear of the brake drum and brake lining necessitate frequent adjustment of the wheel brakes in order to maintain the maximum stroke of the brake cylinders. In order to achieve good braking, it is essential to minimise the clearance between the brake drum and brake lining. In order to check the clearance, the service brake is applied with full pressure and the stroke of the brake cylinder checked. If the stroke at the yoke end is more than 2/3 of the maximum cylinder stroke, the brake must be urgently adjusted. If the brakes are correctly adjusted, it should not be possible to move the piston rod more than 15 mm by hand.



No clearance between piston and diaphragm permitted in the rest position.

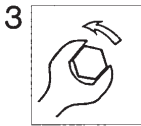
Adjustment is performed at the adjustment screw (WAF 19)



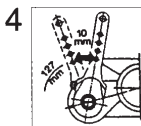
Turn the adjusting screw to the right until the



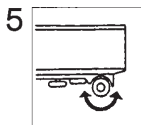
brake shoes are firmly up against the brake drum.



Turn the adjusting screw to the left until



the free travel of the slack adjuster (at 127 mm) is approx. 10 - 15 mm.



It must be possible to turn the wheel freely without braking (without scraping noises).

Special instructions apply for automatic slack adjusters (see adjustment procedure on the following pages).

A = Angle must not exceed 90° at 1/2 stroke.

B = No contact permissible between slack adjuster and axle beam during emergency braking.

L = Observe piston rod length as per the SAF specifications.

HALDEX automatic slack adjuster

Note when changing over from mechanical slack adjuster to automatic slack adjuster:

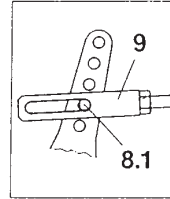
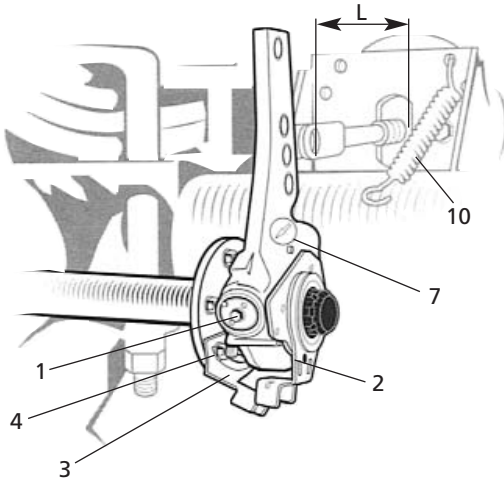
In order to avoid damage to the wheel brake, install only the automatic slack adjuster with the prescribed adjustment gate and corresponding mounting point strap approved by SAF for the respective axle type.

Changes to the effective brake lever lengths are not admissible.

The field installation of automatic slack adjusters does not require type approval so that no inspection by the technical inspection authorities (TÜV) is necessary.

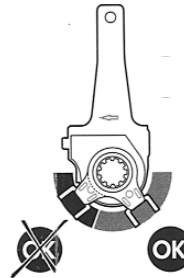
Technical information on SAF spare part numbers and correspondence of slack adjusters and axle types can be obtained from the SAF service partners.

Adjustment of S-ABA automatic slack adjusters



- Cams and brake shoes are in the zero position.
- Observe the correct piston rod length "L" as given in the SAF specifications.
- **Brake chambers**
Before installation, ensure that the brake chamber is in its starting position.
- **Spring brake chambers**, on the other hand, must be under full working pressure (min. 6 bar).
IMPORTANT: If this is not observed, the basic setting will be wrong!
- Grease the camshaft.
- Install mounting point strap (3); be sure to use two mounting bolts (4).
- Install the slack adjuster on the camshaft.
- The arrow mark (7) points in the braking direction.
- Turn adjusting screw (1) until the bore in the slack adjuster (8.1) is aligned with the yoke end (9) (see figure).
- With the fixed mounting point, ensure that the 2 U-profiles engage correctly in one another.
- Grease cotter pin (8) and secure.
- Hook in return spring (10).
- Fix the slack adjuster on the camshaft.

- Axial clearance: Adjust the nominal value of 0.5 - 2 mm using shims.
- Adjust the control arm.
- Observe the possible setting range for the control lever position.



- Adjust the clearance of the brake lining by turning adjusting screw (1) in clock-wise direction until the brake lining is in contact with the brake drum. Then back off adjusting screw (1) by 3/4 turn.

Do not use an impact wrench!

FUNCTION CHECK

- If the adjustment coupling is functioning correctly, a torque of at least 18 Nm must be felt when backing off adjusting screw (1); a ratchet noise should also be clearly audible.
- Actuate the service brake several times, check the free running of the brake drum, check the clearance. If necessary, repeat the adjustment of the slack adjuster.

Adjustment of the air suspension system ride height

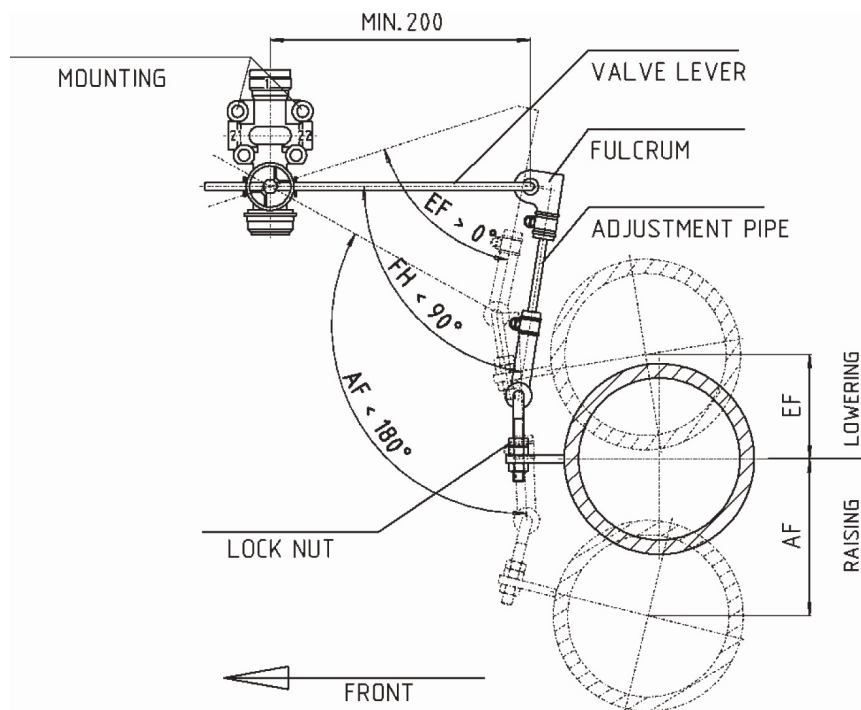
Air suspension valve

As standard's air suspension axles and system require only one air suspension valve.

The air suspension valve controls the air bag pressure in relation to the trailer load in order to maintain a constant ride height in every load condition.

The air suspension valve is fastened to the trailer frame with screws and connected to the axle via the pivot joint (valve lever and adjustment pipe). On Tri-axle trailers, the height control valve is generally connected to the middle axle (normally in the middle of the axle), on Tandem-axle group on the rear axle, and Quad axle trailers recommended axle No.3. In special cases (e.g. large trailer tilt angle), the air suspension valve can be installed in the rear axle

For trailers with axle lifting system, the axle to which the system is connected depends on the axle to be lifted



Installation

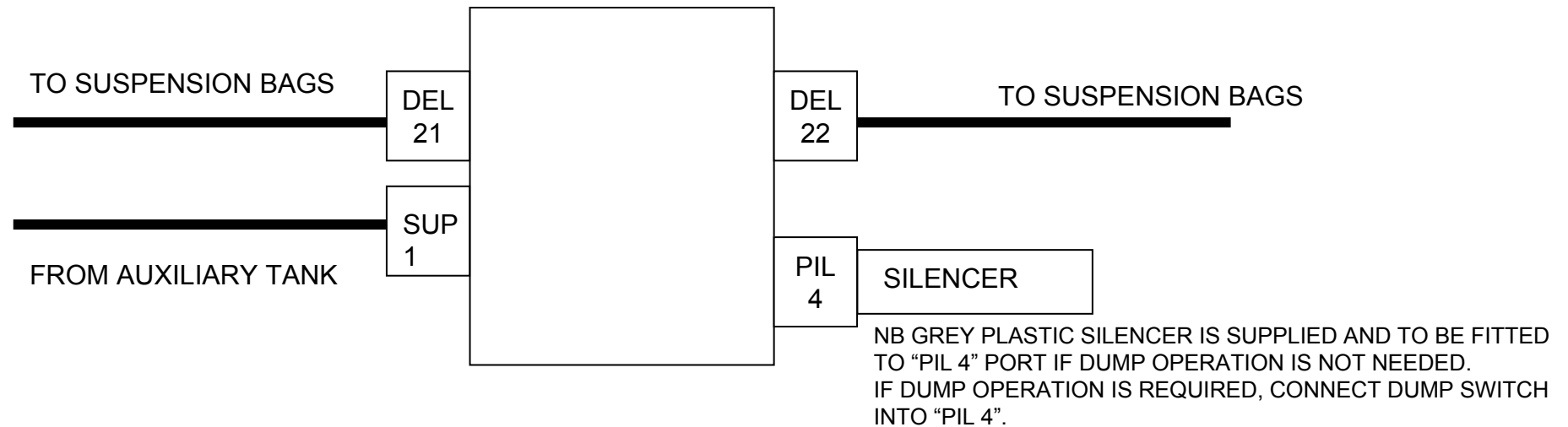
The valve lever should be at least 200 mm long and is horizontal when the trailer is in the driving position. As a function check, move the lever down slightly. Air must now escape via the venting cap into the atmosphere. If airflows into the air bags when the lever is pushed down, the valve lever has to be turned through 180° . For this the valve lever has to be disconnected. The ride height is set by adjusting the adjustment pipe in the fulcrums and by turning the lock nuts.

The adjustment must be carried out with the trailer standing on level ground. It can be carried out with the trailer either empty or loaded.

Note

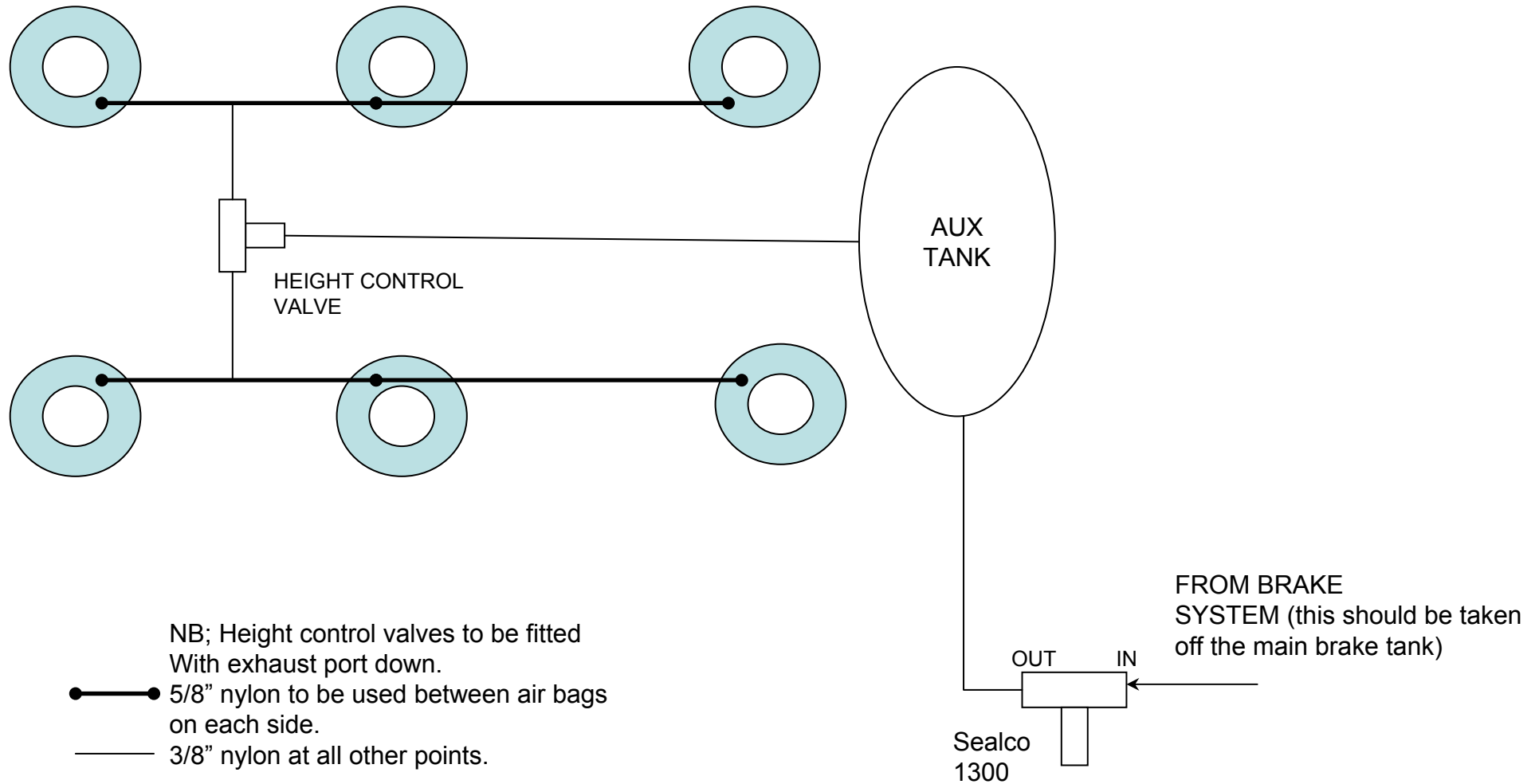
For a final check, the air suspension system should be lowered to the suspension stop or raised to the limit (shock absorbers, stop ropes, air bag length). During this process, the specified angle between valve lever and adjustment pipe must not be exceeded in order that the valve lever does not move in the wrong direction.

HC464 HEIGHT CONTROL VALVE PIPING DIAGRAM

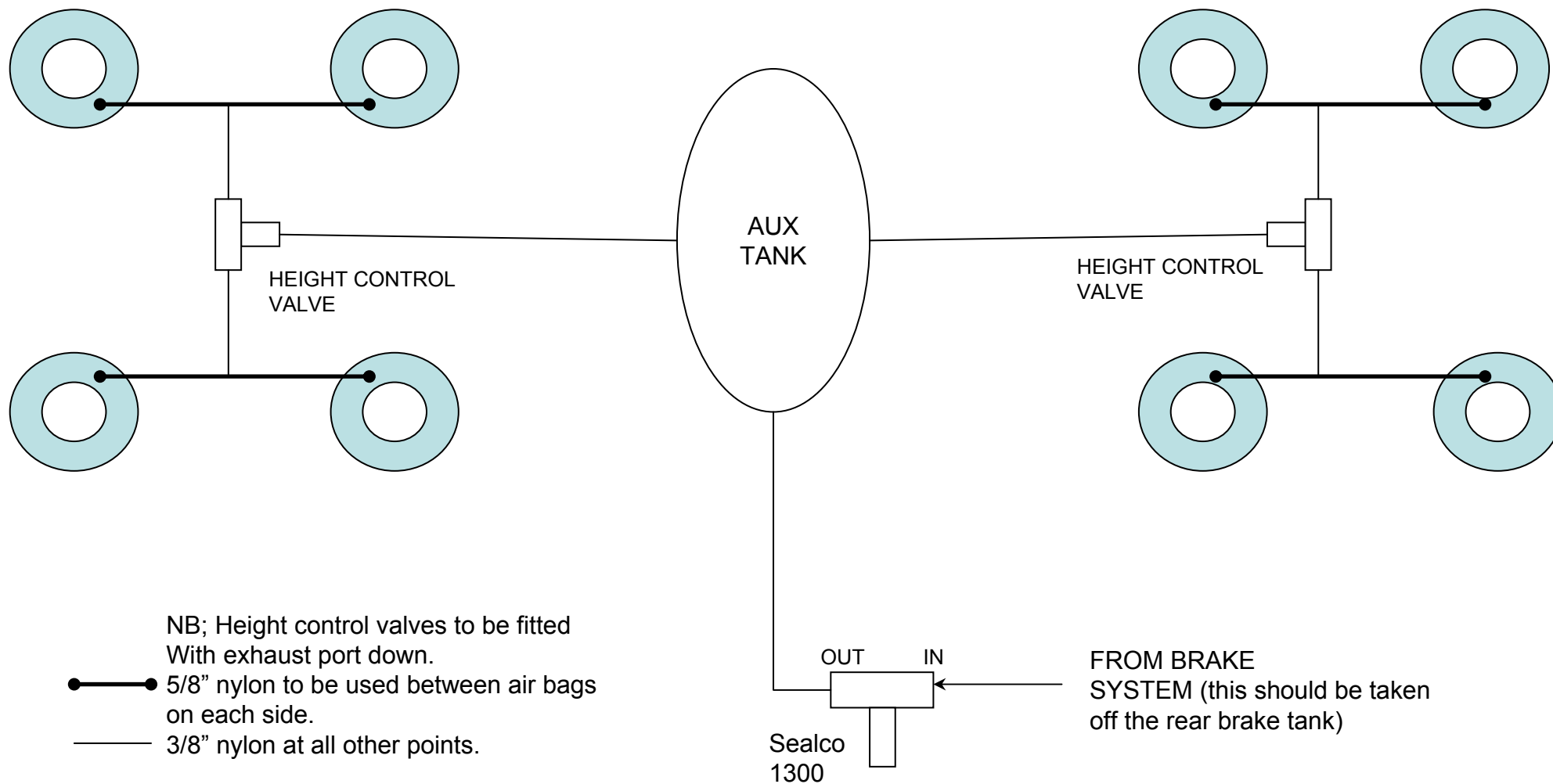


PORT 21 IS TO BE CONNECTED TO THE AIR BAGS ON ONE SIDE OF THE TRAILER AND PORT 22 TO THE BAGS ON THE OTHER SIDE. IT DOES NOT MATTER WHICH PORT GOES TO WHICH SIDE.

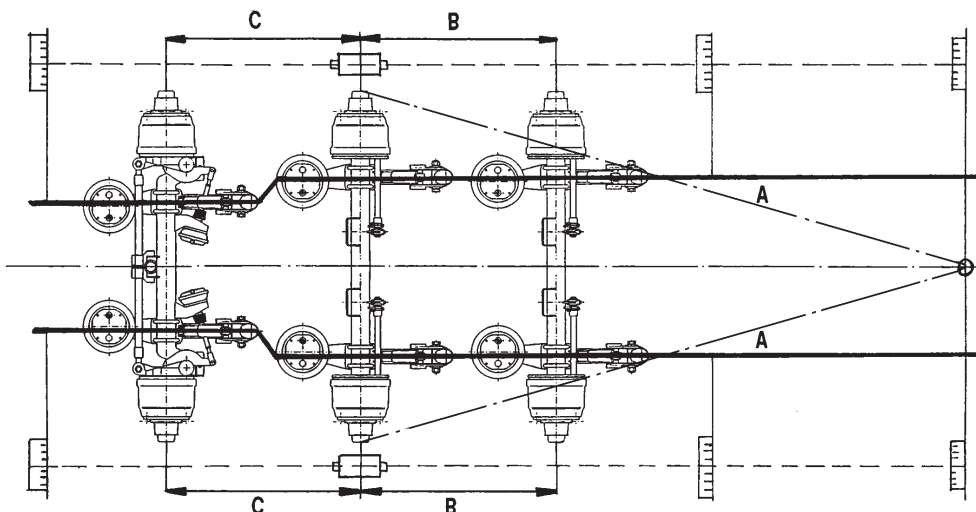
AIR SUSPENSION PIPING 3 AXLE SEMI



AIR SUSPENSION PIPING



For axle alignment, the air suspension must be adjusted to the ride height specified by SAF.



Semi-trailers with self steering axle

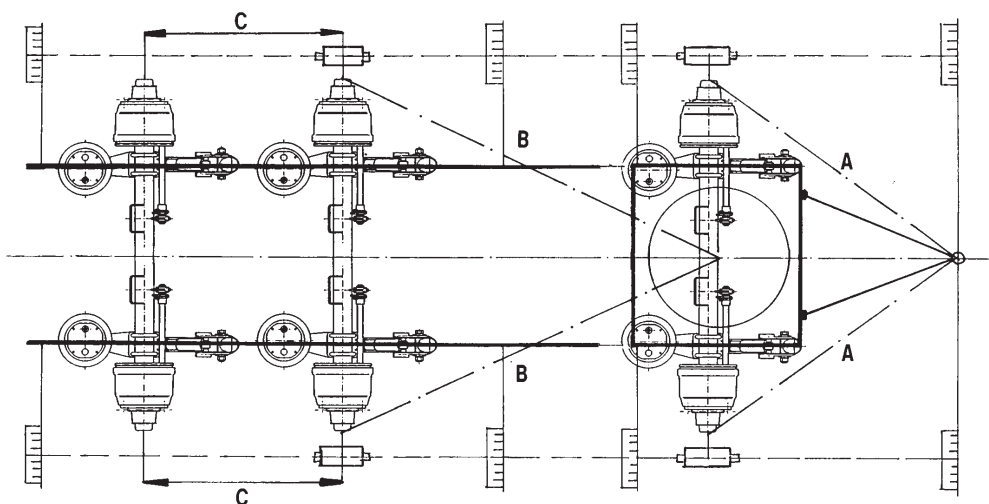
Distance A, B, C max. permissible deviation 1.0 mm
 Toe setting $\pm 12' = \pm 3.0 \text{ mm/m}$ Camber $\pm 12'$

Values apply to unloaded vehicle.

Air suspension must be in Ride Height for axle alignment check and re-adjustment works.

In the case of self steering axles the stabilizing chambers must be pressurised to 2.0 bar.

Total toe-in 4.0 mm/m.



Trailer

Distance A, B, C max. permissible deviation 1.0 mm
 Toe setting $\pm 12' = \pm 3.0 \text{ mm/m}$ Camber $\pm 12'$

Values apply to unloaded vehicle.

Air suspension must be in Ride Height for axle alignment check and re-adjustment works.

The max. permissible deviation values for axle alignment are according to the tyre manufacture specifications. To avoid excessive tyre wear we recommend having the alignment checked at regular intervals.

Deviations may be caused by:

- loose U-bolts
- spring guide bearing wear
- deformation of axle assembly components due to improper use

The relevant reference point for alignment is the hub cap centre or stub axle centre.

[illegible]

[illegible]



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QUALITY ON THE MOVE

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