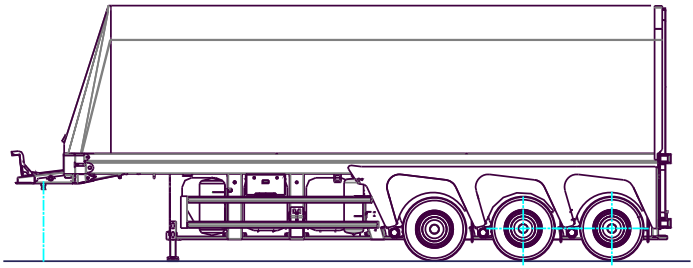
Operating and maintenance instructions
Innenlader for transporting glass racks

INNENLADER
FOR TRANSPORTING
GLASS RACKS

Owner of the vehicle:

Vehicle identification number:



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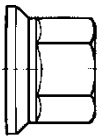
After having taken delivery of the vehicle, please check fixed seat of the wheel nuts after 50 km. Please repeat checking after 50 km loaded driving (and also after every wheel change).

<u>Tightening torques</u>

Spigot alignment **630 Nm** **M 22x1,5**



Wheel nuts with pressure plate

It is not allowed to enter the interior of the Innenlader when there is a glass rack inside.

Due to the available space in the wheel house only following tyres are allowed to be used with the SGL 17X / SGL 18:

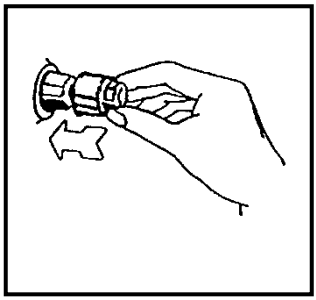
Michelin X Line Energy T 385/55R22.5
Michelin X Multi T2 385/55R22.5
Goodyear Fuelmax 385/55R22.5
Goodyear KMAX T 385/55R22.5
Dunlop SP 246 385/55R22.5

Protecting cover for wheel nuts

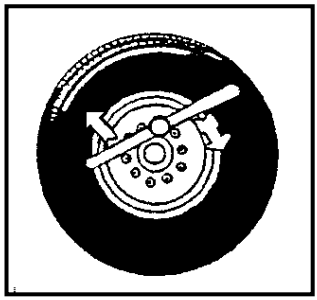
Installation

The protecting cover is attached by hand to the wheel nut to be protected and is tightened by means of the same key as the wheel nut by a clockwise rotation of approx. 15° to a stop. At the first tensions the click into place can be noticed clearly by a SNAP. At the same time with the rotation you should slightly press the protecting cover so that the cover is pressed onto and that the screw connection is sealed.
The disassembly is executed with the same key by an anticlockwise rotation of 15°. The cover hex is made in a way that at a disassembly the cover is removed at the same time with the key.

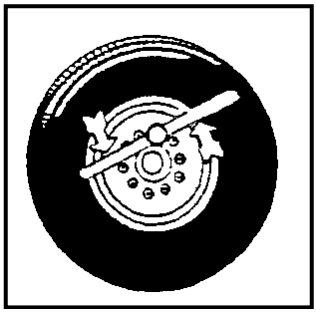
Attaching - very easily - without adhesion



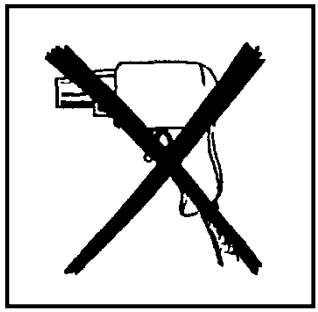
Tensioning with the key 15° to the right hand side



Disassembly with the key 15° to the left hand side



But do not use any impact wrench



Operating and maintenance instructions
Innenlader for transporting glass racks

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1. Introduction

This Langendorf vehicle has been manufactured with the support of computers according to the latest technical findings. Thus the vehicle is sophisticated regarding efficiency and endurance.

Please read very carefully the following

OPERATING- AND MAINTENANCE INSTRUCTIONS

Independent of these instructions, the valid national regulations, prescriptions and security directions must be respected.
Regular maintaining will guarantee a long vehicle endurance; many necessary repairs can be avoided by respecting the regularly intervals for maintenance and inspection, according to our instructions. These operating instructions shall help you to accustom yourself easily with the vehicle.

Before putting your vehicle into operation, listen to the instructions of our technical personnel when taking delivery of the vehicle.
As we always do the utmost to improve our products, it is possible that your vehicle shows innovations which could not been considered when printing these instructions.
We would like to point out that we cannot accept any claims - of whatever kind - arising from the contents of these instructions.
In case you are in need of spare parts, please order them at our works with the vehicle identification number and the construction year of the vehicle.

The leading principle for a correct traffic behaviour:

"For participating in traffic, caution and mutual consideration are always indispensable"

We have produced a reliable and safe vehicle. It is now up to you to move it safely in the traffic.

Good journey!

Langendorf GmbH
D-45731 Waltrop

1.0. General information on these instructions

In these present operating and maintenance instructions several trailer types which correspond to each other with regard to their basic components, are contained. Besides, important special equipment and additional devices have been considered so that the execution of your vehicle can be different in some descriptions and illustrations. We have summarized in these operating and maintenance instructions the essential points for due operation and maintenance. These instructions are part of the vehicle and have to be carried along with it during operation. Please note when selling the vehicle, these instructions have to be passed to the new owner. If the vehicle is changed later (extensions or modifications), it has to be documented in "**annex B**".

Chapter 1 Introduction
In this chapter you will find general security instructions for operating the trailer

Chapter 2 Technical data
In this chapter you will find the "Technical Data" of the trailer.

Chapter 3 Operation
In this chapter you will find exact information how to operate the trailer.
This makes it easier for you to get quickly and safely into the handling of the trailer.

Chapter 4 Legal obligations
In this chapter you will find information on legal regulations.

Chapter 5 First inspection
In this chapter you will find information on the works which have to be done for the first inspection.

Chapter 6 Maintenance and inspection
In this chapter you will find information on an easy and due maintenance for a long lasting safety in traffic and readiness for service of your trailer.

Chapter 7 Hints for a long time immobilization of the trailer
In this chapter you will find information on a long time immobilization of the trailer.

Chapter 8 Tightening torques
In this chapter you will find information on the tightening torque of screws.

Chapter 9 Lubrication plan
In this chapter you will find information on the greasing.

Annexe A Check list for the regular examination and maintenance works
In this chapter you will find a check list for the maintenance and servicing.

Annexe B Supplements
In this chapter all modifications concerning the operation or maintenance of the trailer have to be recorded.

Annexe C Wiring schemes

In this chapter you will find the standard brake, air suspension and electric wiring schemes.

You will find following symbols in these instructions in order to point out dangers or especially important points. These symbols mean the following:

Wherever you find this symbol, there is **danger for persons and their lives** if you do not observe exactly these instructions.

Wherever you find this symbol, there might be **damages on the vehicle** if you do not observe exactly these instructions.

Wherever you find this symbol, your attention is called to a **particularity** .

1.1 General security instructions and operation conditions

Pay attention to all the labels concerning security and danger on the vehicle.

All the labels concerning security and danger on the vehicle must always be complete and always readable!

No modification of the vehicle (modification and mounting) must be made without the permission of the manufacturer! This concerns also the installation and adjustment of security systems and valves as well as the welding of carrying pieces.

! Use only original spare parts!
All parts relevant to the chassis and type specific parts such as springs, air bellows, shock absorbers, axles, tipping cylinders, hydraulic and pneumatic valves etc. are especially adapted to the Langendorf vehicles and cannot be compared to the parts available in the shops.
We can accept any guarantee claims only when using original spare parts.

Use according to the rules

The vehicle is manufactured according to the technical level and the recognized technical rules concerning security. But the use can lead to danger of life and limb of the user or of another person resp. to impairments of the vehicle and of other things.

The vehicle must be used in faultless condition and under consideration of the security and of the dangers according to the operating instructions! A defect which can impair the security must be repaired at once!

For the duly use the prescribed operating, maintenance and care conditions of the manufacturer must be respected.

The vehicle can only be used, maintained and cared by persons, who know the vehicle and are informed about the dangers.

Unauthorized modifications on the vehicle exclude a responsibility of the manufacturer for the resulting damages.

Basic rules for the operation of the vehicle

Before putting the vehicle into operation check it concerning the traffic and operating security.

1. Consider the general valid security regulations and safety rules in addition to the operating instructions.

2. The respective rules are valid when using the public traffic ways.

3. Before beginning the work, the driver and operator of the vehicle must know all devices and operating elements as well as their functions! It is too late during the work!

4. Before driving, check the area around and under the vehicle (children!). You must have enough sight!

5. The transport of persons on the loading area is not allowed!

Driving operation

1. The driving speed must always correspond to the surrounding condition. Avoid a sudden turn during trips in mountains and valleys.

2. Observe the perm. axle loads and total weights!

3. Observe the max. perm. fifth-wheel load!

Parking the vehicle

The vehicle must be secured so that it can not roll away (parking brake, chocks)

Please note that the Innenlader is equipped with a „light version structure" and is not designed for larger roof loads (especially snow load). For cleaning the roof, we recommend leaning a corresponding "vehicle de-icing ladder" only against the area of the bows.

Hydraulic system

Only workers with special knowledge and experiences in the hydraulic can work on hydraulic devices!

1. There is a high pressure on the hydraulic system!
2. Use the corresponding devices for the search of leaks! Danger of hurt.
3. The hydraulic system must be totally without pressure before starting repair works.

Brakes

1. Check the function of the brakes before each trip!
2. A detailed examination must be made regularly as for the brake systems!
3. Adjustments and repair works on the brake system can only be made by specialized workshops or recognized brake services!

Wheels and tires

1. Check that the vehicle is parked safely and secured so that it can not roll away (chocks) for works on the tires.
2. Repairs on the tires can only be made by specialists and with the suitable mounting tools!
3. There is a danger of explosion if there is a too high air pressure on the tires!
4. Check the air pressure regularly!
5. Tighten the wheel screws with the corresponding tightening torque!

2. Technical Data

Chassis number: _____

Please find the current weights in the vehicle documents

Weights:

Perm. semitrailer total weight: ..... _____ kg

Perm. fifth wheel load approx. ..... _____ kg

Perm. semitrailer axle load ..... _____ kg

Dead weight approx. ..... _____ kg

Payload with irregular load distribution (acc. to DIN 70020) ..... _____ kg

Dimensions:

designed for a fifth wheel height (loaded) of approx. ..... mm

Loading length. ..... mm

Wheel base ..... mm

Loading width ..... mm

Platform length ..... mm

Total height, empty approx. ..... mm

Total width ..... mm

Delivery: _____
(Date, signature)

3. Operating the semi-trailer

These instructions also describe several functions and equipments which do not belong to the normal scope of supply, but which can be ordered additionally as special equipment.

! **When putting together the train pay attention that the fifth wheel heights fit together. Otherwise there would be a critical axle load shifting and damages on the fifth wheel coupling.**

3.0 Use

The Innenlader is intended for transporting empty and loaded glass racks with and without feet. The load (loaded and empty racks) must be duly secured by the load securing system “Hydro-Push” during road driving. Pay attention also to chapter 3.3 “load”.

To protect the load, the Innenlader can optionally be equipped with a brake safety system. In this case, the service brake is only released after the load securing system has been activated.
Please also note the separate description under point 3.8.2.

The Innenlader is **not intended**
- for transporting persons or animals
- for transporting goods which cannot be duly secured by the load securing system
- for transporting goods which the perm. total weight of the Innenlader is exceeded with.

3.1 General hints for operating the Innenlader

- To assure a trouble-less function of the air suspension, the lift arm and other pneumatic parts, a pressure of approx. 10 bar is necessary. But please don’t exceed this value!

- It is not allowed to enter the interior of the Innenlader when there is a glass rack inside.

3.1.1 Important hints for operating the Innenlader without front lift arm

For operating the Innenlader without front lift arm, following particularities must be observed and paid attention to:

! Only tractors with the laden fifth wheel height = 1.245 mm (fifth wheel height lowered with empty Innenlader = 1.120 mm) may be used.

We would like to expressively point out that with this new vehicle concept the use of other tractors which do not have the above-mentioned fifth wheel heights, might lead to safety problems.
For example there might be a too small distance between floor and glass rack during transport. Or also the picking up and putting down of racks might be difficult.
The Innenlader without front lift arm may not be used for the operation at critical loading or unloading points with extreme floor inclinations in the access and exit.

3.2 Hitching and unhitching of the semitrailer

It is allowed to carry out a hitching or unhitching process only on level, horizontal and solid ground!

Hitching:

Before hitching, proceed as follows:

1. Secure the wheels of the semitrailer.

2. The semitrailer platform must be approx. 50 mm lower than the fifth wheel height of the tractor. The corresponding height must be adjusted via the air suspension of the tractor.

3. Open the locking mechanism of the fifth wheel coupling.

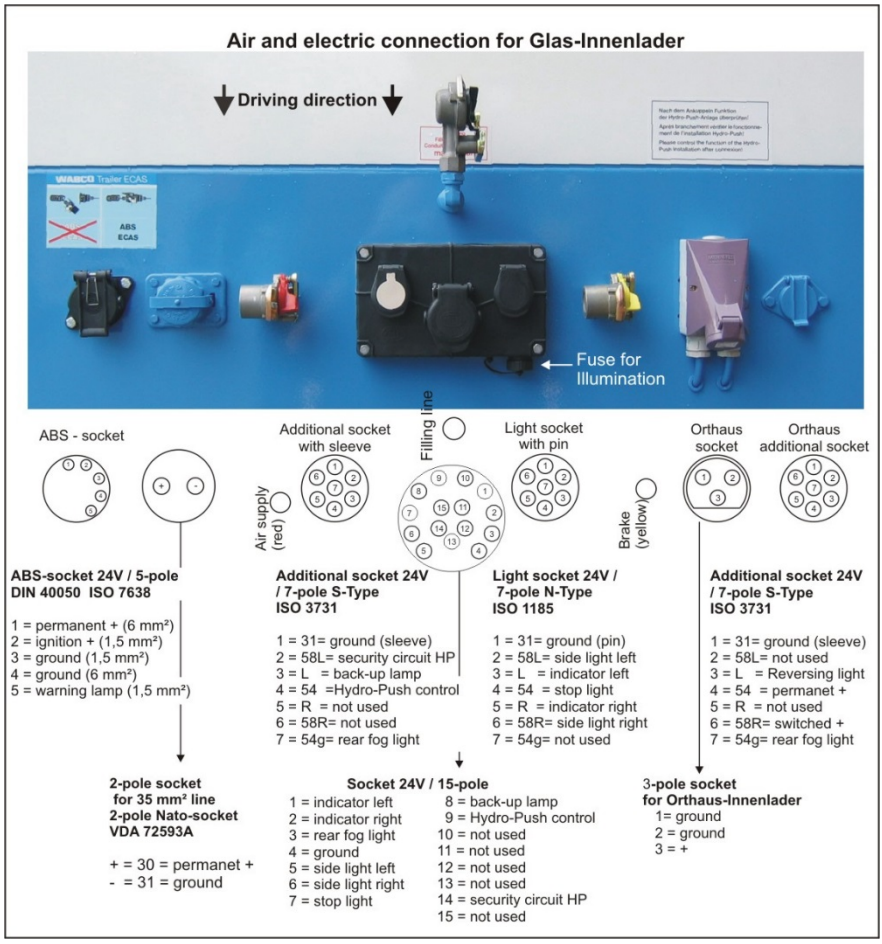
4. The coupling is then ready for hitching and locks automatically by driving the tractor under the semitrailer.

The driver must check that nobody or nothing is between the tractor and the trailer before driving back.

5. After a successful operation, check the locking mechanism and suspend the cab hooks. If it is not possible to suspend the cab hooks, repeat the hitching operation.

6. Couple the electro, hydraulic and air connections. Pay attention that the connections are right and tight. The lines must give way to all movements without tension, friction and bending when cornering.
   - **first line**: connect brake line **(yellow)**.
   - **second line**: connect supply line **(red)**.

Take care that there is sufficient voltage supply (charged battery of the tractor). If the voltage supply of the tractor is too low, this might lead to damages on the electro pump assembly of the Hydro-Push system.



The above-mentioned wiring is the standard wiring. The wiring might be different from the above description with regard to special equipment.

7. Put the chocks away and put them in the according supports.

8. Lift the air suspension of the tractor that high that it is possible to push in and to secure the support.

9. Switch the air suspension of the tractor to driving position.

10. Release the parking brake of the semitrailer.

11. Check the function of the brake, light and hydraulic system.

! When combining the train (tractor - semitrailer) newly, you have to ensure before driving that all connection lines have the necessary length also at the max. steering angle. Furthermore pay attention to the fact that there is sufficient distance from tractor to semitrailer.

The combination is ready for driving.

! **You have to pay special attention when unhitching the loaded semitrailer. This should only be made in exceptional cases, e.g. when there are defects at the tractor. There is the danger, especially for vehicles with air suspension, that the supports are damaged resp. that the supports break! Do not park the trailer for a longer period of time when loaded. Take special care that the ground under the support plates has enough carrying capacity; if necessary, put wooden planks under it.**

! **Attention:** After each interruption of the power supply to the Innenlader, such as for example after rail transport and/or after having changed the tractor, the self-retaining of the load security system is switched off. **It has to be switched on before starting to drive.** Please pay attention to chapter 3.11 load securing.

Unhitching:

For unhitching, proceed as follows:

1. Secure the parking brake of the trailer and block the wheels of the last axle with chocks.

2. Move back the tractor a little bit so that the lock of the fifth wheel coupling is released. The locking of the fifth wheel coupling can now be opened easily.

3. Lift the air suspension system of the tractor that high that the supports can be put down and secured.

4. Remove electric, pneumatic and hydraulic lines..
   - **first line**: remove supply line **(red)**
   - **second line**: remove brake line **(yellow)**

   This order must be strictly observed when removing the coupling heads because otherwise the trailer brake would be released.
   Connect the connection couplings to the empty couplings of the front wall in order to avoid dirt accumulation.

5. Drive away the tractor from under the semi-trailer. The coupling is releasing automatically.

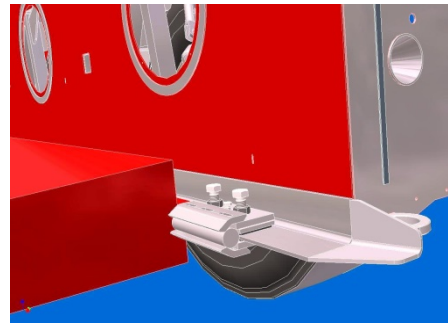
3.3. Load

Keep within the permissible total weights and within the permissible axle loads during loading. Overloading reduces life of tires, axles, springs and chassis frame. In addition, the braking distance is longer than usual and the safety is herewith reduced. Please make sure that there is an equal load distribution.

All accessory parts, such as lashing parts, tools, wooden planks, movable floors, also have to be secured and fixed according to regulations. Pay attention to the fact that these parts cannot slide or fall down in normal driving situations as well as in extreme situations (drastic brake, obstacle-avoidance manoeuvre etc.).

3.3.1 Load securing for rail transport

For transporting the loaded Innenlader on a rail waggon, the standard load securing is not sufficient. As the case may be that the Innenlader is loaded backwards on the wagon, there has to be an additional security device for the glass rack for taking up the brake forces. For this each one gripper clamp has to be fixed form-fittingly behind the glass rack on the left and right side. The two screws have to be tightened with a tightening torque of 290 Nm (oiled screw, free-moving).



This rack safety device must be used exclusively for the rail transport. For normal road transport this device has to be demounted and stowed away safely on the vehicle.

For rail loading only glass racks with two-sided front stop must be used.

3.4 Driving the Innenlader

The Innenlader is, because of its special construction (dump type vehicle), equipped with air bellows which have a very large stroke. Therefore the following particularities have to be paid attention to when driving the Innenlader.

1. Larger side tilt when cornering.

2. Take special care when driving sharp bends or turning manoeuvres and braking the Innenlader at the same time. If the Innenlader comes to stop, the brake has to be released slowly because otherwise, in extreme exceptional situations, the Innenlader could fall over.

3. Limited ground clearance (approx. 200 mm)
   Because of the limited ground clearance of the Innenlader you must adjust speed and take special care when driving on bad road conditions and especially when driving over obstacles. If necessary, the air suspension of the Innenlader must be lifted

because otherwise the glass rack could have contact to the ground. The glass rack is hanging out of the Innenlader to the bottom.
For lifting the air suspension, please see chapter "3.6.2 Electronically controlled air suspension ECAS".

3.4.1 Parking the Innenlader (only when equipped with ECAS)

For the equipment with ECAS system we recommend you **before parking the Innenlader for a longer period of time (> 2 hours) to lower the air suspension just to the security device.**
With the ECAS system the air bellows of one axle line are controlled and, if necessary, adjusted via two separated control loops, independently one from the other. This adjustment is not made when parking the Innenlader. There might be some air loss and therefore lowering of the Innenlader on one side because of leakage in the piping system. To avoid this inclination, the Innenlader has to be lowered just to the security device before parking.

3.4.2 Parking and preparing the Innenlader for rail loading

For transporting the Innenlader safely on a rail wagon equipped for that, it has to be put into adequate position. For this proceed as follows:

1. Place the Innenlader on even ground.

Because of the geometry of the axle fixation there is a movement in longitudinal direction of the vehicle when lifting or lowering the Innenlader. Therefore you must not operate the parking brake. The combination has to be secured by putting the chocks under the tractor. If equipped with an EBS-E system, the brake of the Innenlader can also be released by operating the corresponding button (on the LH side at the front in the side flap).

2. Adjust the lift arm to the bottom driving position (fifth wheel height loaded 1130 mm).

3. Lower the Innenlader in the axle area by means of the ECAS control just so far that the axle swings are resting safely on the stops and the air bellows are pressure-less.

! **Attention:** After each interruption of the power supply to the Innenlader, such as for example after rail transport and/or after having changed the tractor, the self-retaining of the load security system is switched off. **It has to be switched on before starting to drive.** Please pay attention to chapter 3.11 load securing.

4. Unhitch the Innenlader. (For this pay attention to chapter 3.2).

5. Release the operation and parking brake on the double release valve. To be able to place the Innenlader on the wagon strainlessly, it is necessary that the wheels can freely turn.

6. Slightly lift the Innenlader by means of a loading crane.

7. Push in the front support feet completely and secure them with plug-in bolts.

8. Load the Innenlader onto a corresponding rail waggon by means of a crane.

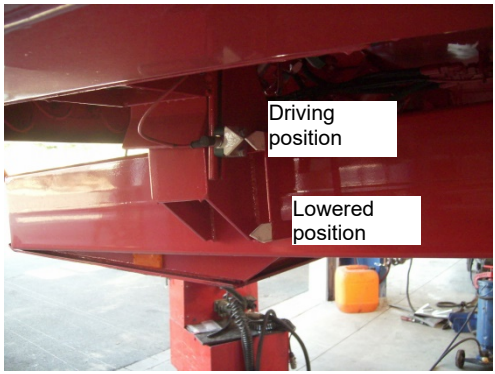
3.4.3 Starting aid (Traction assistance)

Optionally the Innenlader can be equipped with a traction assistance. With the starting aid switched on, the air suspension of the first axle is discharged for increasing the fifth wheel pressure. When the driving speed of 30 km/h is reached, the starting aid is switched off automatically.

3.5 Function and operation of the front lift arm

The front lift arm is constructed in a lowerable way. By this it is possible to lower the Innenlader completely, parallelly to the ground.

For the driving operation, the lift arm has to be lifted that high that the Innenlader is standing horizontally.
When lowering the lift arm (leaving the indicated driving height), the indicator lamp mounted on the LH side at the front in the side flap.
Additionally the driving height is also indicated by corresponding arrows.



The operation switches for that can be found behind the side cover at the front on the left hand side in driving direction.

! Before lowering the Innenlader, the tractor has to be in straight position. When the trailer has lowered itself over the fifth wheel coupling, only a small steering angle is possible. With larger steering angles there is the danger that the hand lever of the fifth wheel coupling comes to contact.

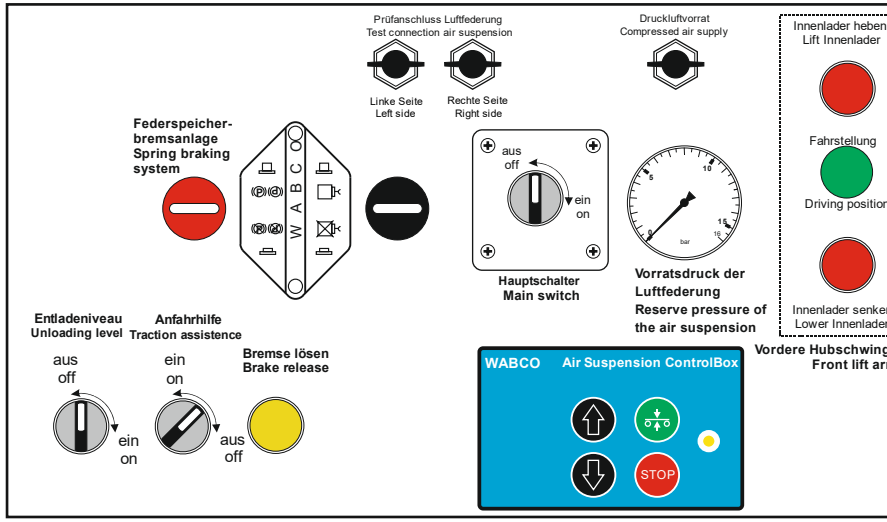
3.5.1 Front lift arm, hydraulically operated

For lifting or lowering the lift arm, proceed as follows:

1. By operating the button „lower“ lift arm, the Innenlader is lowered in the front area. Please pay attention that the lift arm may only be lowered up to the second arrow marking.

Because of the geometry of the axle fixation there is a movement in longitudinal direction of the vehicle when lifting or lowering the Innenlader. Therefore you must not operate the parking brake. The combination has to be secured by putting the chocks under the tractor. If equipped with an EBS-E system, the brake of the Innenlader can also be released by operating the corresponding button (on the LH side at the front in the side flap).

2. After having lifted the Innenlader in the rear area, the lift arm has to be pulled out that far that the Innenlader is standing horizontally. The indicator lamp on the front side has to go out.
   Pay attention also to the arrow markings on the lift arm.



3.6 Air suspension

Before driving, let the engine run until the operation pressure in the brake system directed and the driving height of the air suspension is obtained. Check level position of the ECAS system. Do not drive in any case with air bellows without pressure or partially ventilated air bellows because there is no balance between the axles or an insufficient balance, and parts of the air suspension might be damaged.
To keep the function of the air suspension system as far as possible when there is a failure of a bellow, there is the possibility of cutting off each air bellow separately via a cut-off cock. For this, pay attention to the signs at the vehicle.
Lifting and lowering the Innenlader for loading/unloading can be made according to equipment via the lift/lower valve or via the ECAS system. For this, please pay attention to the different descriptions.
To avoid an unintentional lowering while driving, the trailer is equipped with an emergency device. There is the possibility of an equipment with manually or pneumatically controlled emergency device.

3.6.1 Axle restraint system with emergency device

For an empty Innenlader there is the possibility of lifting, if correspondingly equipped, the first and third axle line. Pay attention to the fact that the perm. axle loads are kept to.

Attention: For safety reasons, only the 3rd axle may be lifted! The first axle line should only be lifted in an emergency (e.g. in case of a Tire damage).
Note that this can influence the safety brake system.

When the axle is not lifted, the restraint system serves as emergency.

For lifting an axle line, proceed as follows:

1. Ensure that the parking brake is not operated and that the combination is secured against rolling away by putting chocks under the trailer.

2. Open the axle restraint system / emergency device on all axles.

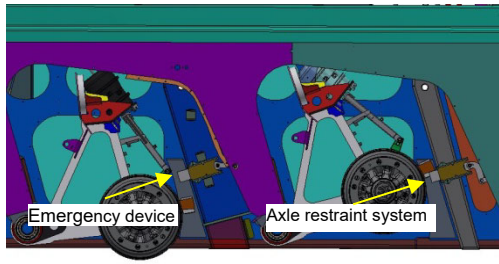
3. Lower the air suspension system of the Innenlader and of the tractor.

4. Operate the axle restraint system on the third axle line.

5. Lift the air suspension system of the Innenlader and of the tractor in driving position.

6. Insert the emergency device on the second axle.

Switching off the restraint system is made in the same order.



The axle restraint system /emergency device can be switched on/off by means of the key.
For this the key has to be pushed in and at the same time turned by approx. 45°. When the emergency device is switched on (driving position), the square if flush with the vehicle.

Emergency in driving position

Emergency device „opened“
(vehicle can be lowered)

! The air bellows get their necessary elasticity, which is needed for the pressing together when driving with lifted axle, only after some time because of the continuous movement. Therefore we recommend not to operate the axle back holding device for the first 5.000 km. The same should be applied after every exchange of an air bellow.

3.6.2 Air suspension type ECAS, electronically controlled

The air suspension of your Innenlader is equipped with an electronic adjustment type ECAS (producer WABCO).

The ECAS system can be selectively controlled via a "control unit", a control box or the WABCO SmartBoard.

The ECAS system has an extensive control of the system. All connected components are checked electronically after short periods of time. So e.g. after the ventilation of a bellow it is checked whether the Innenlader is lifted as expected.
There is a green indicator lamp at the front left hand side in driving direction.
Should there be any defect, this is shown by the flashing of the indicator lamp. The ECAS system is not fully functioning any more.

The indicator lamp lights when the trailer is out of the normal level and for some seconds after switching on the ignition.
Please keep an eye on the indicator lamp when switching on the ignition. When the light goes out after some seconds, the function of ECAS is alright.

The power for ECAS is supplied from the ABS plug. Therefore the Innenlader can only be operated with tractors equipped with ABS and an ABS connection line according to ISO 7638.

The ECAS system has several functions on the Innenlader

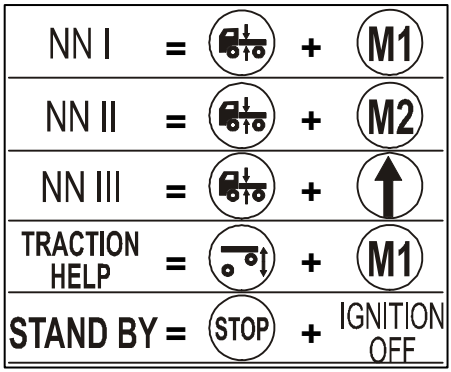
1. Lateral stabilisation of the Innenlader
   For the lateral stabilisation the air bellows on an axle are activated independently from one another.
   This ensures that the chassis is in a position parallel to the axle even when the load is not spread evenly.

2. Adjustment of different levels (driving heights)
   The ECAS system is adjusted in a way that two different driving heights (road driving and loading/unloading level) can be adjusted.

! Because of the geometry of the axle fixation there is a movement in longitudinal direction of the vehicle when lifting or lowering the Innenlader. Therefore you must not operate the parking brake in this case. The combination has to be secured by putting the chocks under the tractor. If equipped with an EBS-E system, the brake of the Innenlader can also be released by operating the corresponding button (on the left side at the front).

Before changing the air suspension level by means of the ECAS control unit the ignition of the trailer must be switched on. Please keep within the maximal permissible total heights in the corresponding country.

Adjusting the driving height is done via the ECAS control unit. The following combinations must be pressed for adjusting the vehicle to the different driving heights:



NN I = normal level 1 = normal driving height

NN II = normal level 2 = normal level + 50 mm for bad road conditions

NN III = normal level 3 = not used

Automatic adjustment for loading and unloading

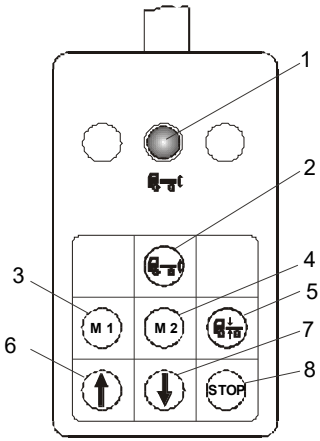
3. Lowering and lifting of the air suspension for loading and unloading of the Innenlader

Because of the geometry of the axle fixation there is a movement in longitudinal direction of the vehicle when lifting or lowering the Innenlader. Therefore you must not operate the parking brake. The combination has to be secured by putting the chocks under the tractor. If equipped with an EBS-E system, the brake of the Innenlader can also be released by operating the corresponding button (on the LH side at the front in the side flap).

For complete lowering, switch off the emergency device (chapter 3.6.1).

Description of the control unit of the ECAS system

! If the Innenlader is adjusted by means of the buttons “lifting / lowering the vehicle” or the “memory buttons 1 or 2” to a position exceeding the adjusted driving levels (NN1 to NN3), there is no axle load compensation. In this position the Innenlader must be driven only with walking speed.



1. Indicator light preselection rear axles
   The flashing of the indicator light shows that the ECAS system is switched on and the rear axles can be operated.

2. Preselection button rear axles
   By pressing this button, the control unit for lifting and lowering the Innenlader is switched on.

3. Button Memory 1
   By pressing this button, a stored position (height) is taken.

4. Button Memory 2
   By pressing this button, a stored position (height) is taken.

5. Button normal level
   For this button see the description for the adjustment of the three driving levels.

6. Button for lifting the vehicle
   By pressing the button, the vehicle is lifted. Stop pressing the button means that the operation ends.

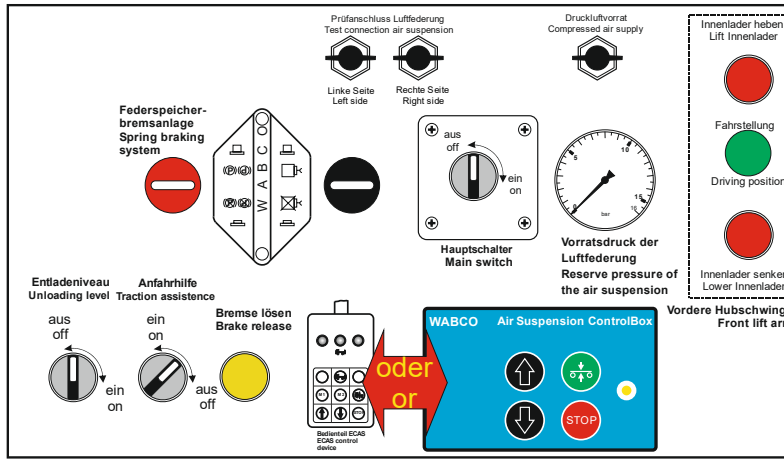
7. Button for lowering the vehicle
   By pressing the button, the vehicle is lowered. Stop pressing the button means that the operation ends.

8. Button STOP
   By pressing this button, all lifting and lowering operations are stopped without delay.

Storing a memory level M 1 or M 2

By pressing the button „STOP“ and after that additionally one of the memory buttons „M1“ or „M2“, the level adjusted before can be stored as memory level.
By touching slightly again the memory button, the Innenlader is taken to the level stored.
For further information and when searching for defects, please pay attention to the separate operation instructions of the ECAS system, or contact one of the WABCO agency

In addition, the WABCO service agencies are at your disposal as contact partner. Addresses and phone numbers please find in the WABCO service handbook for Europe.



For a simplified „lowering / lifting“ of the Innenlader for loading and unloading, there is a corresponding rotary switch in the switch box at the front left hand side.

The Innenlader can be lowered for loading and unloading to a preset position by means of the switch “Unloading level” (pay attention to the emergency device).
If it is necessary to readjust the loading height via the control box or the SmartBoard (further lowering or lifting) or if the voltage supply has been broken (ignition, main switch, etc.), the Innenlader will not lift to driving position after switching back the switch “Unloading level”!
The driving position then can only be adjusted by operating the green push button “driving position” on the control box or on the SmartBoard!

After having reached the driving height the switch “Unloading level” can be used again.

Control of the Innenlader using the „WABCO SmartBoard“

At special request of the customer or in connection with the WABCO IVTM vehicle tire pressure monitoring system, the Innenlader is equipped with the SmartBord.
Please also refer to the corresponding Wabco operating instructions!

Emergency control of the air suspension when the ECAS system breaks down

When the ECAS system breaks down, the air suspension can be lowered resp. lifted manually by connecting the test connections to the auxiliary device.
For lowering, the test connections for the left and right side have to be connected to the auxiliary device. The air suspension is lowered by opening the cut-off cock.

Important security advice:
An uneven lowering results by asymmetric loading (e.g. L rack or A rack not loaded equal on each side), which can cause in worse case tilting of the glass load in the Innenlader.
Due to this reason following security advices must be considered:

1. To fix the glass safe at the rack, the Hydro Push system may only be opened just before the glass rack hit the ground.

2. Pay attention to even lowering!
   If applicable the Innenlader has to be lowered both-way in several steps.
   For this stop lowering process and readjust the side which lowers more slowly.

For lifting the Innenlader the pressure connection must be connected with the auxiliary device additionally. The air suspension is lifted by open the cut-off cock.

With loaded rack please pay attention to the above mentioned security advices.

3.8. Braking system

Automatic load depending two-line air pressure brake incl. parking brake according to international regulations. With ABV system including sensors for the axles.

3.8.1 Brake release function for lowering / lifting the Innenlader

To be able to lower or lift the Innenlader free from distorsion, it is necessary to release the parking brake of the Innenlader during this process. If the trailer is equipped with an EBS-E system, this can be done by pushing the button on the control panel. When doing so, only the brake of the Innenlader is released as long as you push the button. The brake of the tractor is not concerned by this.

3.8.2 Safety brake system

The Innenlader can optionally be equipped with an additional safety brake system. This system is only to be seen as a support and does not release the driver/operator from his responsibility to secure the load properly.

The safety system monitors the load status via the pressure in the air suspension and the status of the load securing system. This means that the service brake is only released on a loaded Innenlader when the load is appropriately secured (hydro-push closed).
The Innenlader is set at the factory so that the safety system is activated from a single axle load of approx. 5 t. The current axle load can be read on the SmartBoard.

! A light partial load may not be detected by the system and thus there is no monitoring of the load securing system.

! Conversely, an empty glass rack may be recognised as a load when the axle lines are raised, which means that the load securing is mandatory (brake is not released).
We recommend that only the 3rd axle line is lifted when the Innenlader is empty or partially loaded.

Attention !

! If there is a malfunction in the system or it is necessary to move a "loaded Innenlader" with the load securing device open, this safety function can be temporarily switched off in the SmartBoard

The temporary deactivation of the safety function can only be carried out via the WABCO Smart Board in the menu item "Finishing brake". Please note that after a voltage interruption (switching off the ignition), the safety circuit is active again.
In an emergency, contact our customer service at:

+49 160 95 64 88 68

3.8.3 Parking brake

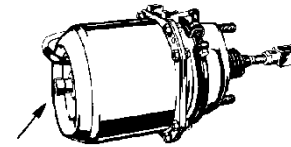
! **Do not immediately operate the parking brake with overheated brake because otherwise the brake drums / brake discs could be damaged (cracks).**

The parking brake is a spring parking brake.
This kind of parking brake is a brake which effects on the wheels of the axle(s). The brake force is produced by a robust spring, which is mounted in the spring parking brake cylinder. The advantage is that, even when there is no supply of pressure, the brake is nevertheless effective. The spring is preset with released brake by air pressure which effects on a piston, and therefore the piston rod is released. For braking the spring brake is ventilated by means of the red control button. The power of the spring effects on the brake via the piston rod.
When there is no air supply, the spring brake can be loosened by a mechanical emergency device.

Before loosening the spring brake, the semitrailer must be secured against rolling, because neither the brake system nor the parking brake are working.

There are two different brake cylinder types. Releasing the spring parking brake is made as follows:

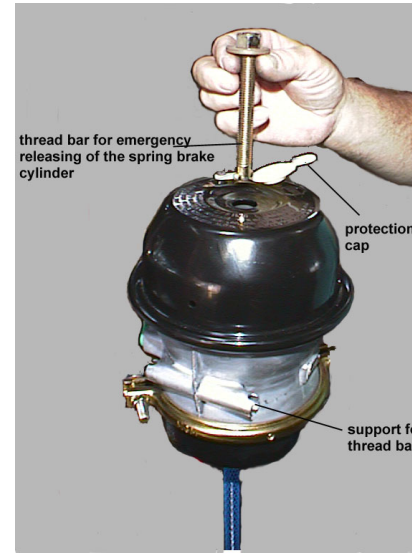
Type 1
For emergency releasing of the spring parking brake, the hex bolt (spanner size 24) at the cylinder has to be screwed out entirely.



Type 2

- Take the thread bar out of its support.
- Remove the protection cap
- Put the thread bar into the bore and fasten it by making a 90° turn.
- By turning the nut (spanner size 19) to the right hand side, the mounted spring is retracted and the brake released.

Before continuing the normal road driving, the cylinder has to be repaired or replaced.



3.9. Antiblock device (ABS)

When pressing the brake pedal too hard, normal brake systems can lock the wheels, especially on slippery streets. By this the steering ability is lost and the braking distance is becoming longer, the vehicle can also skid. The ABS system prevents from this locking of the wheels and keeps the directional control and the steering ability, even during an emergency brake operation. It enables the driver to brake and steer at the same time also in critical situations. Furthermore this device always controls the optimal utilization of the transmittable brake power and cornering forces between the tyres and the road.

But ABS cannot compensate driving habits which are not adjusted to the current traffic and road circumstances. Especially the driver is not exempted from the estimation of brake distances and maximum cornering speed, which are resulting from the constant physical laws.

! **When working on vehicles with ABS note the following:**

- **Welding on the trailer or tractor**
  Tests have shown, that arc-welding is not dangerous for the ECU, the electronical control unit.
  In this connection it is assumed, that no mechanical and/or electrical components (incl. the ECU box) are used as ground for the welding power
- **Paintworks**
  The maximum heat for the ECU during paintworks is 85°C

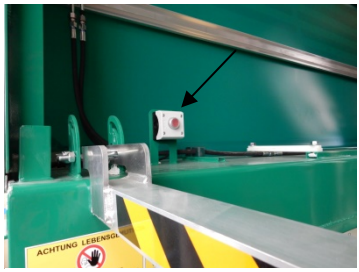
3.10 Door locking

Door safety circuit (optional)

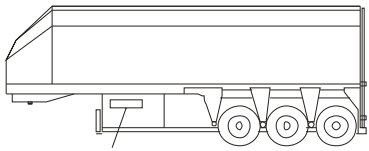
The semitrailer is equipped with a door safety circuit. That means that when the vehicle is loaded the door can only be locked if the Hydro-Push system is closed (tightened).

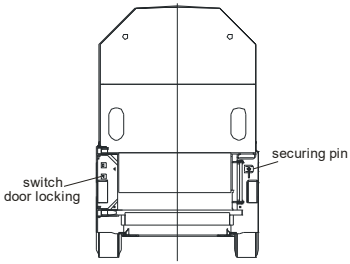
Manual bridging of the door safety device

The door safety device has to be switched off when the Innenlader is in **empty** condition and the Hydro-Push system is **opened**. For this please operate the button on the rear longitudinal member LH side before closing the door. The button shines if the safety device is inactive. The door safety device is re-active after switching off the main switch (at the front LH side).



Bridging of the door safety device





To open the door of the Innenlader, proceed as follows:

1. Switch on the main switch (at the front left hand side in the operating box). By this the voltage supply of the control elements in the rear of the vehicle is produced.

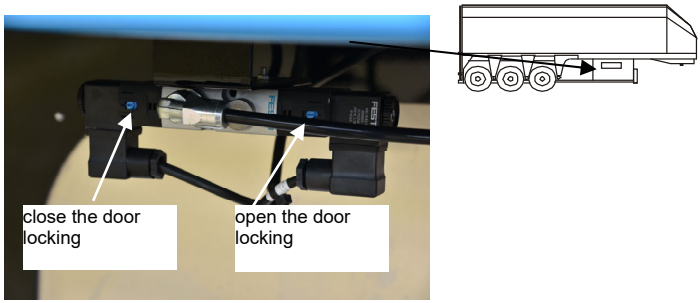
2. Release the securing pin of the door locking.

3. By operating the corresponding button the door locking is opened or closed.

After having unlocked the door, it can be opened by hand. By moving the upper bar, the door can be fixed in open position (at 90° and 270°).

Emergency operation of the door locking at a break-down of the electric system

If the electric system breaks down, the door locking can be controlled directly at the solenoid valve. The valve can be found behind the side panelling on the right hand side.
Opening the door locking = push the right blue button
Closing the door locking = push the left blue button



3.11. Operation instructions "Hydro-Push" system

The following is valid on principle: **The Hydro-Push system can be opened or closed only in driving position of the Innenlader.**

3.11.1 General security hints for operating the Hydro-Push system

- **It is strictly forbidden to enter the loading space of the Innenlader when there is a glass rack inside (no matter if it is empty or loaded). Danger of life!**

- Only authorized and well acquainted personnel is allowed to control the Hydro-Push system.

- Do not execute in any case transports with defective Hydro-Push system. **Danger of accidents!**

- It is not allowed to walk on the longitudinal members of the Innenlader. **Danger of falling and bruising!**

- Observe exactly all fixing operations. Do not close the rear gate before the green indicator lamp shows that the load is duly secured.
  Empty glass racks also have to be duly secured.

- While driving, keep an eye on the red indicator lamp in the driver's cab of the tractor.

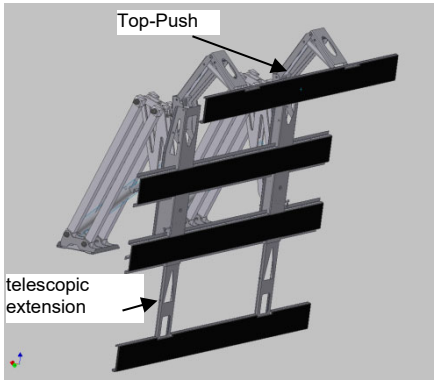
- Observe the functions of the safety brake system.

- Before doing maintenance or repair works, pull off the all-pole isolating switch at the hydraulic assembly on the platform in the front.

3.11.2 Technical description and mode of operation of the Hydro-Push system

1. Hydro-Push Vario III – 2/4-fold (optionally with Top-Push)

This system consists of four consoles, adjustable in longitudinal direction, with hydraulic cylinders and telescopic tension plates made of steel with parallel drive. When the tension plates are retracted, the loading space is completely open; when the tension plates are pulled out, it is possible to transport thin glass and DLF from a height of 1.5 m on.



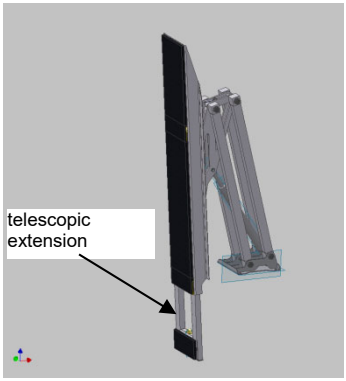
The Top-Push system may only be used for mixed cargo (different height of the glass packages). Otherwise the Top-Push system must be switched off via the cut-off valves.

Control is made via an electro pump assembly with automatic control system. The hydraulic cylinders have an extreme wide stroke so that A- as well as L-racks can be fixed safely, even if only one glass sheet is loaded.

2. Hydro-Push Vario III – 4/8 to 6/12-fold

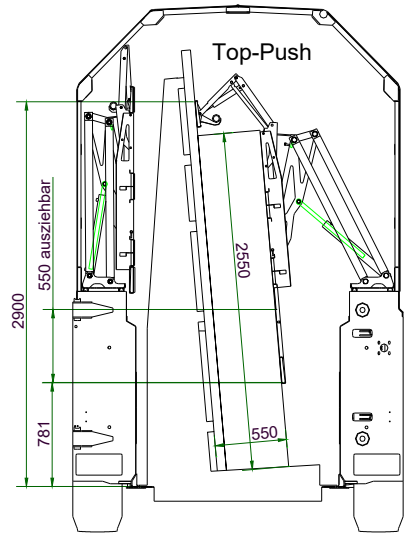
This system consists of twelve consoles, adjustable in longitudinal direction, with hydraulic cylinders and telescopic tension plates made of aluminium with parallel drive. When the tension plates are retracted, the loading space is completely open; when the tension plates are pulled out, it is possible to transport thin glass and DLF from a height of 1.5 m on.

Control is made via an electro pump assembly with automatic control system. The hydraulic cylinders have an extreme wide stroke so that A- as well as L-racks can be fixed safely, even if only one glass sheet is loaded.



The hydraulic pressure is made by an electro pump assembly. For a faultless function it is necessary that the batteries of the tractor are charged sufficiently. After having switched on the battery main switch, the system is ready for operation.

By operating the key **"closing Hydro-Push"**, the hydraulic assembly is activated and the solenoid and the locking valve of the hydraulic system are opened. The sides of the piston of the cylinders get pressure and the cylinders lift up. The tension plates move into the direction of the glass. As a result of the contact between the tension plates and the glass, the pressure of the hydraulic system increases until it reaches the corresponding value of the pressure switch. The lifting up of the hydraulic cylinders is stopped automatically and the locking valve is closed. So the glass or the unloaded glass rack is fixed firmly against the centrifuged forces during a drive.



By operating the key **"opening Hydro-Push"**, the locking valve is opened and the piston return-sides of the cylinders get pressure. So the tension plates are separated from the glass or from the glass rack and move away from the rack to the vehicle frame.
The operation pressure of the Hydro-Push system is adjusted by the work in a way that a **minimum pressure of 35 bars** is ensured. That means that the pressure exceeds the minimum pressure of 35 bars when fixing the glass rack. If the pressure decreases to 35 bars, the hydraulic assembly is activated and the system adjusts itself. The current pressure is shown on the mounted pressure manometer.

In summer with very hot outside temperatures it might be that due to thermic influences the pressure in the Hydro-Push system increases considerably. There might be partially pressures up to 150 bar.
If this happens, shortly release the glass load and after that immediately switch on the system again. Now the pressure adjusted correctly to the indicated value of approx. 70 - 90 bar.

During the summer months with very hot outside temperatures we recommend checking

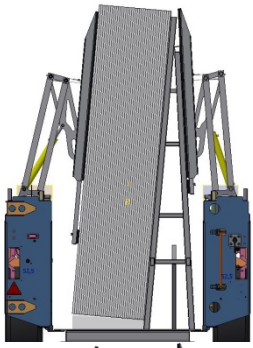
the pressure manometer in the vehicle shortly during the obligatory breaks and, if necessary, to newly adjust the pressure in the system as described above.

The noise level of the system relating to the working place is lower than 70 dB(A).

<u>Safety instructions for using telescopic pressure plates:</u>

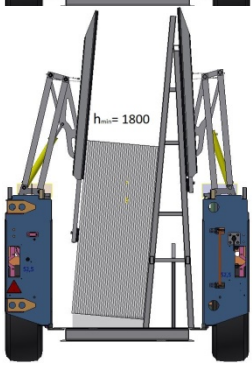
!

If the Hydro-Push system is equipped with telescopic pressure plates, the following safety instructions must be observed.
When transporting L racks, the pressure plates on the rack side must be completely pushed together (retracted).
On the glass side, we recommend that the pressure plates are always extended (telescoped) to ensure an optimum contact surface.



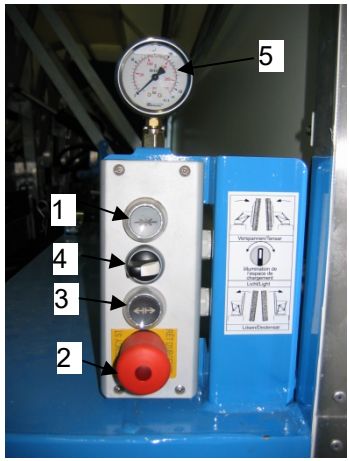
!

When transporting DLF, the pressure plates **<u>must be</u>** fully extended from a height of 1.8 m.
This is the only way to ensure even, uniform securing of the glass load over the entire surface!



3.11.3 Control of the Hydro-Push load securing system

The control unit can be found at the rear right hand side of the vehicle.



1. Key "fixing" with indicator lamp, white
By pushing the key the tension plates are raised. When the green indicator lamp lights, the load is secured. At the same time the inspection and the automatic adjustment of the system is activated.
Attention: After each interruption of the power supply between Innenlader and tractor, such as for example after rail transport and/or after having changed the tractor, the self-retaining of the load security system is switched off. **It has to be switched on before starting to drive.** Indicator lamp in the push-button lights!
If the Innenlader is equipped with the electrical circuit via "ignition plus", the Hydro-Push system automatically takes over the last switching status! This means that if the system was "fixed" then the self-retaining function is still active.

2. Main switch (emergency switch off)
With pressed in switch the system is out of operation. This switch has to be pressed in before a person enters the empty Innenlader.

After having switched on the main switch, the system is not yet entirely ready for operation. That means that the system e.g. does not adjust automatically a loss of pressure. According to the position (fixed or opened) the corresponding key (1 or 3) has to be operated.

3. Key "open" , black
When operating the key, the tension plates move backwards.

4. Rotary switch “loading space lighting”
By operating the rotary switch, the loading space lighting can be switched on/off.

5. Pressure manometer (standard Innenlader)
This manometer shows the current pressure in the hydraulic system. As a result of an adjustment of the fixing while driving and because of a rise in temperature in the loading space as a result of exposure to sunlight, the pressure in the system might

increase by up to 20 bar. That means no problem. But should you wish to decrease the pressure anyway, you must shortly operate the key “opening” and after that the key “fixing”. The pressure now is adjusted again to the basic values given by the work.

5.1 Pressure manometer (only Innenladers for rail transport)

This manometer indicates the pressure in the pipe system which is set when the system is fixed the first time. Since the unlockable non-return valves are mounted directly on the cylinders, the current contact pressure in the cylinders is no longer displayed after the first automatic readjustment or in the event of minor leaks in the pipe system.

6. Indicator lamp load security system

There are two indicator lamps for the load security system each on the Innenlader and/or in the driver’s cab of the tractor.

On the Innenlader two green lamps are mounted on the front left corner. When the tractor is equipped by the company Langendorf, two red indicator lamps are mounted in the dashboard.

These indicator lamps are showing all defects and adjustments of the Hydro-Push load security system as follows:

- Indicator lamp lights shortly

The load security system is adjusted.

This readjustment takes place for the first time depending on the driving speed.

If for the first time a speed of 40 km/h is achieved or exceeded, a short impulse for readjustment is activated. The short well-defined lighting up of the indicator lamp gives signal to the driver that the system is switched on and works perfectly.

When the system is fixed, further readjustments take place every 4 hours time-controlled.

-Indicator lamp lights for a longer period of time (> 30 sec.)

There is a defect. Stop the vehicle as soon as it is possible without any danger and check the load security system and the cable connection between trailer and tractor.

Should the indicator lamp light with empty Innenlader (without glass rack with opened tension plates), the key pos. 3 "opening" has to be operated shortly. By doing so, the relay in the switch box is activated and the indicator lamp does not light any more.

Attention: The indicator lamps in the tractor light also when the tractor is driven without Innenlader.

3.12 Shifting tension plates (6/12-fold system)

In case the position of the tension plate should not correspond to the position of the respective glass interface, the tension plate can be shifted.

As for this purpose the loading area has to be entered, there must not be any glass rack in it.

For shifting the tension plate the following must be done:

1. Let the corresponding tension plate be pulled out just half-way.

2. Switch off the system by pressing in the main switch.

3. Release front fixation screws and turn by 90° so that the slot on the end of the screw is parallel to the fixation rail.

4. In some executions (special equipment) the rear console fixation is made by a plastic guiding rail. In this case the Hydro-Push console can be shifted straight away.
   For the execution without plastic rail also the rear screws have to be released for shifting the tension plates.

5. Shift the tension plate.

! When shifting the tension plates pay attention that they are not fixed in the area of the bow supports. Here there might be the danger that when retracting (opening) the system, the srewings of the hydraulic cylinders could be damaged.

6. Tighten the fixation screws with 90 Nm. Pay attention that the slot on the end of the screw has to be rectangular to the fixation rail.

7. Switch on main switch and take up the glass rack as described in the following.

3.12.1 Shifting tension plates (2/4-fold system)

In case the position of the tension plate should not correspond to the position of the respective glass interface, the tension plate can be shifted.

As for this purpose the loading area has to be entered, there must not be any glass rack in it.

For shifting the tension plate the following must be done:

1. Let the corresponding tension plate be pulled out just half-way.
2. Switch off the system by pressing in the main switch.
3. Release the front fixation screws (quick release).
4. The rear console fixation is made by a plastic guiding rail. In this case the Hydro-Push console can be shifted without releasing the screws.
5. Shift the tension plate.

! When shifting the tension plates pay attention that they are not fixed in the area of the bow supports. Here there might be the danger that when retracting (opening) the system, the srewings of the hydraulic cylinders could be damaged.

To ease the shifting, the console can be pulled to the required position by means of a winch. For doing so the winch must be put into the corresponding bracket. The winch rope can be hung to the distance keeper.

6. Tighten the fixation screws (quick release) with approx. 90 Nm. Take care that the lever of the quick release is in a position showing to the rear.

7. Switch on main switch and take up glass rack as described in the following.

3.13 Switching off tension plates separately

Should it not be possible to shift the tension plate to a certain position, the tension plate must be switched off.

As for this purpose the loading area has to be entered, there must not be any glass rack in it.

For switching off a tension plate the following must be done:

1. Ensure that all tension plates are pulled back entirely.

2. Switch off the system by pressing in the main switch.

3. Switch off the hydraulic cylinder of the corresponding tension plate by means of the cut-off cock.

4. Switch on main switch and take up glass rack as described in the following.

3.14 Loading a glass rack

For a faultless loading and unloading it is necessary that there is a sufficient air supply. The compressed air should be filled with 10 bar. A manometer for checking is mounted at the left vehicle side behind the panelling.

Loading a glass rack is made as follows:

1. Place the Innenlader in a way that it can be driven backwards under the glass rack without large steering angles.

Because of the geometry of the axle fixation there is a movement in longitudinal direction of the vehicle when lifting or lowering the Innenlader. Therefore you must not operate the parking brake. The combination has to be secured by putting the chocks under the tractor. If equipped with an EBS-E system, the brake of the Innenlader can also be released by operating the corresponding button (on the LH side at the front in the side flap).

2. Open the rear gate. Turn the upper crossbar upwards. By moving the upper bar the gate is fixed in open position.
3. Ensure that the load security system is opened.
4. Unlock the bottom stabilization bar and take it out. During the loading, the stabilization bar can be kept in a corresponding support at the rear gate.
5. Switch off the axle back holding device/emergency device (point 3.6).
6. Lower the vehicle front part via the air suspension of the tractor.
7. Lower the vehicle rear part via the ECAS system (switch “unloading level”) that far that the Innenlader can pick up the glass rack. Avoid contact to the ground.

8. Drive the Innenlader under the glass rack so that it lies in front of the stop of the front wall.

The stop has to be set correspondingly to the used glass rack. For glass racks with jutting out feet the stop has to be set in a way that the rack feet are placed in the recesses of the stop. Regarding smooth racks the smooth side of the stop has to be in the direction of the glass rack.

9. Turn the upper bar downwards and put in the bottom stabilization bar and tighten it.

10. Lift the Innenlader just that high that the glass rack does not have any more contact to the ground.

11. Switch on the load security device. Pay attention to the separate operation and maintenance instructions.

! It is possible that the Innenlader does not lift proportionately; therefore it is important to operate the load security device as soon as possible.

12. Lift the Innenlader by means of the air suspension and air suspension of the tractor just to driving position.

! For glass racks with feet, the vehicle has to be lifted above its driving position so that the feet can be folded up. After that the vehicle must be lowered to driving position.

13. Switch on the back holding device / emergency device.

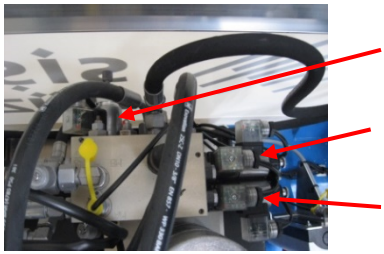
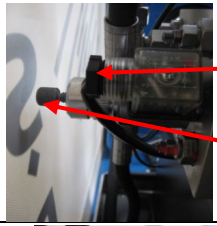
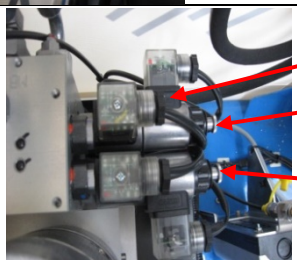
14. After closing the rear gate the combination is ready for driving.
Attention ! Observe the function of the safety brake system! See point 3.8.2

Unloading a glass rack has to be made in the same order.

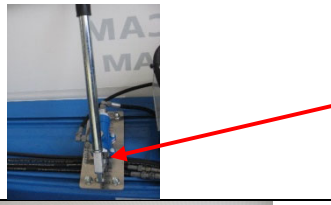
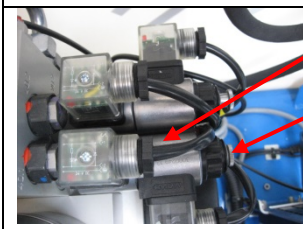
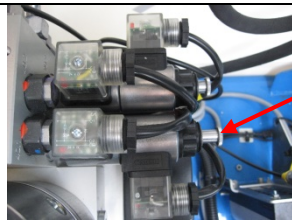
3.14.1 Emergeny operation at a break-down of the hydraulic assembly (special equipment hand pump).

If the hydraulic unit fails, the Innenlader can be operated by means of a hand pump. This is only intended for **emergency operation** and not for "normal operation".
The hand pump can be mounted either on the rear longitudinal member or on the front platform next to the pump unit.
The following valve position is required for the individual operating procedures in emergency operation:

Position of the valves in normal operation:

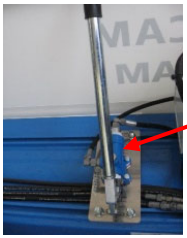
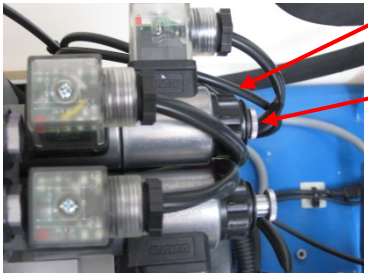
	Side separation valve Hydro-Push system Lift arm valve (lift/lower) Valve Hydro-Push system (extend/retract)
	Side separation valve Hydro-Push system Knurled screw is unscrewed
	Lift arm valve (lift/lower) Knurled screws emergency operation Normal position = middle position locked in place Valve Hydro-Push system (extend/retract)

Emergency operation of the Hydro-Push system via the hand pump

	Hand pump
	Screw in knurled screw Side separation valve
	Valve Hydro-Push system Turn the knurled screw from the basic position to the right, then press it in and turn it to the left until it locks into place. Operate the pump. The Hydro-Push cylinders drive out. (fixing of the Hydro-Push system)
	Turn the knurled screw to the right from the basic position, then pull it out and turn it to the left until it locks into place. Operate the pump. The Hydro-Push cylinders retract. (opening of the Hydro-Push system)

After having used the emergency operation, bring all knurled screws back into normal position.

Emergency operation of the lift arm via the hand pump:

	Hand pump
	Lift arm valve Turn the knurled screw from the basic position to the right, then press it in and turn it to the left until it locks into place. Operate the pump. The lift arm cylinder extends. (Lift the vehicle)
	Turn the knurled screw to the right from the basic position, then pull it out and turn it to the left until it locks into place. Operate the pump. The lift arm cylinder retracts. (Lower the vehicle)

After having used the emergency operation, bring all knurled screws back into normal position.

3.15 Wheel change

When changing a wheel on the Innenlader, following security hints have to be paid attention to:

Spare wheels older than 2 years must no longer be taken for the constant use as permanent wheel. They have to be exchanged as soon as possible against a new wheel and then can be used again as spare wheel.

When checking the air pressure of the wheels, always also the air pressure of the spare wheel has to be checked.

The spare wheel can be found on the Innenlader at the right side in driving direction, behind the front side panelling. The wheel change helping device is fixed on the spare wheel. You can do without a jack because of this helping device.

If the wheel change takes place on a loaded vehicle, the load securing system (Hydro-Push system) has to be closed.

To change a wheel you have to proceed as follows:

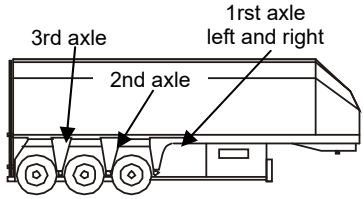
When changing the wheel on public roads make sure that the vehicle is sufficiently secured. Ensure that you are not in the area of traffic (area of danger) during the whole procedure of the wheel change!

1. Secure the vehicle against rolling.
2. Switch off the ECAS system. For this, the ABS line on the Innenlader has to be separated.
3. Remove the side panelling at the spare wheel.

As the ECAS system is out of operation, all lifting and lowering actions of the Innenlader have to be made via the emergency control (chapter 3.6.2).

4. Lower the vehicle just to the emergency devices.

5. **Cut off the air supply to the air bellow of the wheel to be changed.**



Cut-off cocks of the air bellows

6. Hang in the wheel change helping device on the vehicle frame and on the axle swing as shown.

Attention: Only use the wheel change helping device supplied with the vehicle.

The device is designed in a way that in case the air bellow is not cut off, only the small shackle is damaged. If you use other parts there is the danger that the vehicle frame, parts of the air suspension and the axle swing are damaged.
The vehicle must not be driven with the wheel change helping device hung in!

7. Release the wheel nuts and unscrew them except three wheel nuts arranged opposite to each other.

8. Lift the vehicle just that high that the wheel to be changed does not have any more contact to the ground.

9. If the wheel sticks on the bolts without tension, the remaining three nuts can be removed. Pay attention that you do not damage the bolt threads when taking away and putting on the disc wheels.

Before putting on the disc wheels, clean the contact surface of the brake drum, the rim and the wheel nuts from corrosion and dirt. Check centring of the wheel.

10. Tighten the wheel nuts crosswise with the help of a torque wrench to the tightening torque indicated. (Pay attention also to the corresponding instructions of the axle manufacturer)

11. Lower the vehicle just to the emergency device.

12. Take away the wheel change helping device.
Attention: The vehicle must not be driven with the wheel change helping device hung in!

13. Fix the damaged wheel to the vehicle by means of the spare wheel holder and remount the side panelling.

14. Open the cut-off cock of the air bellow.

15. To put the ECAS system back into operation, the ABS line has to be connected to the trailer.

16. Lift the air suspension to driving position.

3.16. Central lubrication system (special equipment)

The vehicle can be equipped, if requested, with a central lubrication system. The central lubrication system is filled with grease of "Li" quality. Please note when refilling the system, that grease of the same specification is used. For progressive systems we recommend grease with EP additive (extreme pressure). Grease of that kind keeps its lubricity also at high pressures. Some surplus grease will come out at some points because of the different grease consumption. In order to avoid tamping at these points, we recommend to clear away this surplus grease regularly (every three months).

Vogel progressive central lubrication system with piston pump KFGS

The Vogel central lubrication system is a progressive system which can supply grease up to NLGI Kl. 2 (**use grease with EP additives**). Progressive means that the greasing points of a central lubrication system are all greased one after the other. Due to this greasing of the greasing points in succession it is possible to control a progressive central lubrication system very easily by means of a pressure relief valve. If a greasing point would not take any grease from the distributor, the progressive distributor blocks and in the central lubrication system a pressure of 280 bars is built up. Over a pressure relief valve on the pump the grease is sprayed.

Structure of the Vogel central lubrication system:

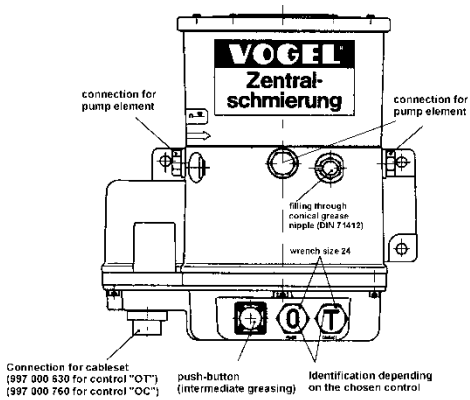
The electrically driven piston pump KFGS has 3 grease outlets for the connection of 3 progressive distributor circuits which are independent from each other. For each outlet a separate pump element is required.

There are fixedly adjusted and adjustable pump elements. The adjustable pump elements are used if a loading crane shall be connected to the central lubrication system.

The task of these pump elements is to distribute the grease to the progressive sub-distributors in the right relation. The progressive sub-distributors then supply the grease to the individual greasing points.

The electric control of the stop time and greasing time of the pump can be done in two different ways (depending on time or on pulse).

The filling of the supply reservoir is done via a conical grease nipple according to DIN 71412.



! Pay attention to cleanliness when filling!

Function and adjustment of the system
(execution "OC – pulse [brake light] controlled)
For this kind of central lubrication system the supplied grease rate depends on the frequency of the braking because the pump is controlled through the brake light.
With every brake operation - lighting up of the stop lamps - , the pulse counter in the control unit is increased by one. That means that depending on the use and the driving style an individual adjustment of the supply rate must be done. For vehicles which are used for long distances or which are equipped with a wear free brake (retarder) for example smaller stop times (pulse number) or longer contact times (pump running time) can be adjusted than for vehicles which are mainly used in the town traffic.

The duration of the stop time (pulse number) between two greasing procedures (1-200 pulses) can be adjusted by means of a screwdriver behind the screw plug labelled with "O" on the front side of the pump assembly, the pump running time (1-22 min.) behind the screw plug labelled with "C".

Before changing the values which were adjusted in the factory, you should write them down. This might be useful for finding an average value at a later point of time.

Pulse number:_____ pulses

Pump running time:_____ minutes

Intermediate greasing

When the ignition is switched on and the brake is operated (stop lamp lights), an intermediate greasing can be activated with the push-button on the housing of the pump. During the whole greasing procedure the brake must remain operated.
This greasing pulse should be done directly after each car wash.

The adjustment in the factory is based on experimental values. We recommend to check the central lubrication system in the first weeks after putting into operation for following points and to adapt the adjustment according to your wishes.

- Sufficient dosage on the bearing points – grease collar (depending on the construction of the bearing and the conditions of use).
- Check piping (greasing points, torn off hoses, leaks)

Ventilation of the system

If the grease reservoir was inadvertently completely emptied, it might be necessary to ventilate the system.
This is done as follows:

1. Unscrew the main line from the pump outlet.
2. Activate the additional greasing pulse until bubble-free grease escapes the pump outlet.
3. Reconnect the main line.
4. Activate additional greasing pulse.

3.17 Technical description and additional short operating instructions for the Eberspächer auxiliary heating, installed in Langendorf Innenladers

The Eberspächer auxiliary heating installed in Langendorf Innenladers serves above all to avoid condensation in the loading space and therefore on the glass load.
There is always the danger of condensation if a relatively cool Innenlader drives into a comparatively warm ambient air. Then humidity which can be found in the warm air, might condensate on the cold vehicle and on the cold glass. The warmer the air, the more humidity can be solved in the air.
By heating the loading space,condensation can be avoided in certain situations.

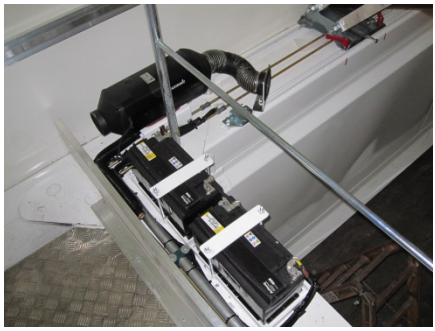
1. If you want want to drive into a warm hall with your cold Innenlader to pick up or put down a glass load there, we recommend switching on the auxiliary heating approx. one hour before driving into the hall. At very low temperatures the point of time for switching on the heating might be even earlier, if necessary.

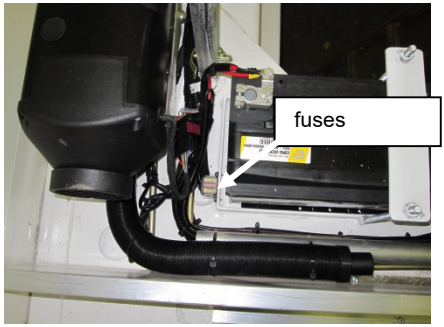
2. If you are passing through a mountain driving through a tunnel it might be that the ambient air temperature at the tunnel exit is higher than that at the tunnel entrance. Such a situation also offers a great danger of condensation. In this case we also ask you to switch on the auxiliary heating approx. one hour before entering the tunnel and to heat the loading area.

Please take into consideration the regulations for passing through the tunnel. The auxiliary heating is permitted for public roads. For operating the auxiliary heating, the same regulations as for the tractor are valid.

3. When parking the vehicle overnight under difficult climatic relations, i.e. at very low outer temperatures during the night and fast warming in the morning, condensation might be produced on the vehicle and on the glass, too. In this case the auxiliary heating must be switched on in time, too.

The Eberspächer auxiliary heating is mounted on the front platform on the longitudinal members. For voltage supply 2 batteries are installed there which are charged from the tractor when driving.
Should the heating device show an operational disturbance please check the fuses which can be found between battery and heating device on the right side in driving direction.
If it is a minor disturbance, the devices can be put back into operation by switching them off and on again.
If the heating device does not react at all any more, please contact the Eberspächer after-sales service.





The fuel tank for the heating device is mounted on the right side in driving direction behind the side panelling. Please pay attention to the indications in the operation manual of the manufacturer for using the suitable fuel.

Switching on and off of the heating devices is made with the switch mounted in the operation flap of the Innenlader (on the left side in driving direction). On the switch only two positions are possible. There is no provision for a temperature adjustment.

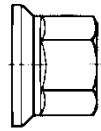
4. National obligations

The corresponding national regulations have to be observed.

5. First inspection

After 50 km driving, check the fixed seat of the wheel nuts. Check it again after 50 km loaded driving (also after each wheel change).

BPW axle with spigot alignment	630 Nm
SAF axle with spigot alignment	600 Nm



M 22x1,5

Wheel nut with pressure disc

A first inspection of your trailer / semitrailer must be carried out after 500 – 1000 km loaded driving. It should be made, so far as the location of the trailer makes it possible, in our work, otherwise a competent motor vehicle workshop must be called on.
To carry out the first inspection, special technical knowledge and experience with Langendorf vehicles is required, which cannot be given by these short instructions.
For add-on components such as axles, slack adjusters etc. the separate maintenance instructions of the manufacturer in question are valid independently from these instructions.

! If you exceed the time for the first inspection or if it is not carried out at all, guarantee claims cannot be accepted.

The following check list for the first inspection must be filled in by the workshop which carries out the inspection, and it must be confirmed by signature and company stamp that the inspection has been made.

For any guarantee claim, this completed list and the corresponding invoice for the first inspection must be presented to the Langendorf service agency where you are lodging the claim.

Check list for the first inspection

Works to be carried out	without defect	does not belong to equipment	defect repaired	Notes
Check fixed seat of the wheel nuts(600/630 Nm)				
Visual check of the axle assembly				
Check shock absorbers and their fixation				
Check air bellow for damage				
Check grease filling in the axle swing bearing				
Check swing axle fixation (M 24→ 700 Nm)				
Check axle swing bearing				
Check sliding guide of the axle swings				
Check emergency device / axle restraint system				
Check slack adjuster				
Check axles according to the instructions of the manufacturer				
Check lighting system				
Check function of brake system; check connections for tightness				
Check brake-piston stroke				
Check function of parking brake				
Make brake balance for road train between tractor and trailer.				
Check bearing of front lift arm				
Check hydraulic cylinder / air bellow of the lift arm				
Check function and tightness of hydraulic system				
Check fixed seat of king-pin				

Visual check of vehicle frame				
Check fifth wheel plate; grease it				
Check bearing of rear wall				
Check rear wall locking for function and damage				
Check tarpaulin system for damage				
Check hydraulic system of Hydro-Push system and, if necessary, adjust it				
Check adjustment of the tension plates and, if necessary, adjust it				
Check function of the Hydro-Push system				
Retighten all screwed connections with directed tightening torque				
Check tires regarding pressure/pattern/damage				
Grease all lubrication points				
Grease the parts which are stressed with friction (without nipple)				
Check and adjust central lubrication system				
Driving test				

Notes regarding the first inspection:

First inspection – Service Card

Dear Customer

Please have confirmed the execution of the first inspection by your Langendorf service workshop with date, signature and stamp.

Should the unlikely case of a complaint arise and you claim any guarantee service, you must present this confirmation to the Langendorf service agency where you are claiming the damage.

Vehicle type: _____

Chassis number: _____

Date of first registration: _____

Vehicle owner

Company: _____

Street: _____

Place: _____

Industry: _____

The due first inspection of the above-mentioned vehicle was made

on _____

(Stamp / Signature of the service workshop)

6. Maintenance and inspections

6.1 General indications concerning maintenance and inspection works

For all maintenance and inspection works, please also observe valid national regulations.

! - Before carrying out any maintenance and inspection works on the unhitched trailer, please pay attention that the vehicle is standing stable. The trailer must be secured against rolling away.

- When working on or under movable parts, these parts have to be secured or supported accordingly.

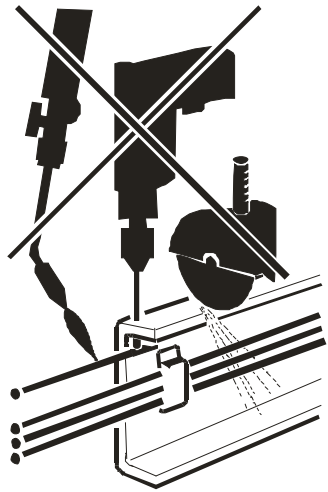
- For carrying out examination and maintenance works, certain special knowledge is required which cannot be given within the scope of these instructions.

- If the service and maintenance works are carried out on your own account, you must pay attention to certain pollution control measures. The legal directions must be kept to for the removal of operation and auxiliary material.

- For welding or adjusting works on the chassis, please ask for our instructions because the trailer has been manufactured by using high-quality special steel.

- For all welding works the air bellows, the parts of the air suspension, plastic and electric lines must be protected against flying sparks and weld splashes

- When welding, drilling or grinding near plastic and electric lines, safety measures such as covering or removal of the lines have to be taken.



Minimum bending radii for plastic lines

Line ø in mm	Material thickness mm	min. bending radius mm
6	1,0	40
8	1,0	40
12	1,5	60
15	1,5	90

- **The maintenance intervals depend on the operation of your trailer**.

We understand by "*normal* operation conditions":	We understand by "*extreme* operation conditions":
- regular "single-shift" operation (i.e. 8-10 hours per day) - paved roads - temporary operation under full load - central European climate	- "multi-shift" operation (i.e. more than 10 hours per day) - long immobilisation time - non-paved (bad) roads - uneven ground - continuous operation under full load - extreme climate (humidity, temperature)

6.1.1 Cleaning of the vehicle

For cleaning the vehicle note following indications:

!

- Do not clean any electric parts (lamps, keys, solenoid valves, junction boxes etc.) with steam-jet tools.

- Never turn the steam-jet directly to greasing and bearing points.

- Do not use high pressure or steam-jet tools during the first three months. Clean only with cold water without additives during this time.

- Wash with a lot of clear water in order to avoid scratches in the paintwork.

- Avoid water temperatures over 60° C.

- Only use ph-neutral detergent (ph-value 5-8).
  Pay attention to the fact that, especially with aluminium parts, aggressive (acid or alkaline) detergents destroy the protecting oxide coat. This may lead to corrosion or / and to blisters in the paintwork

- Damages in the paintwork have to be repaired professionally without delay.Werden

- The distance between spray nozzle and vehicle must be 30 cm at least.

- Cleaning or rubbing off of chromium-plated piston rods with steam-jet tools or detergents which contain sodium carbonate (alkaline detergents) damage this chromium-plate and destroy the protection against corrosion.

! After having used high-pressure or steam-jet tools, all grease points have to be greased until escaping of grease. With this the possibly entered water is pressed out.

6.2. Regular maintenance and examination works

The following instructions refer to normal road conditions. In case of extraordinary conditions the maintenance works must be made more often. The repair of noted damages or change of wearing pieces must be made in a competent workshop if the owner of the vehicle has not the corresponding experts and the required devices to do it in his own work.

6.3. Examinations before driving

Each driver should make a habit to check his vehicle every day before driving with regards to traffic and functional safety. The careful execution of the following examinations is the condition for a long durability of the vehicle, for the safety of the driver and all other road users.

- **Check tires**
  The air pressure of all wheels incl. spare wheel must be checked according to the instructions of the tire manufacturer in dependence with the axle load. Regular visual examinations must be made on tires for damage and pattern.

- **Water of condensation**
  If there is no air pressure drier or if no automatic drainage valves are installed, you must drain off the water of condensation every day in the air tank of the brake system and air suspension. Especially when the weather is cold and wet, there is a lot of water during driving. This might lead to difficulties for releasing the brake cylinders, higher corrosion and freezing of the brake parts.

- **Lighting system / Power consumer**
  Check the function of all power consumers of the electrical system and especially of the lights. Defect bulbs must be exchanged immediately. We recommend to have always a range of bulbs and fuses available in the vehicle. Please note that after having opened the main distributor box a new sealing must be inserted.

- **Cleaning chromium-plated piston rods**
  It is recommended to wipe with hydraulic oil piston rods which are not completely retracted in parking position, regularly once or twice a week depending on use.

- **Check adjustment of the central lubrication system**
  Before driving you should visually check different lubrication points. At these lubrication points you should see a small collar of grease. Heaps of grease are showing an overlubrication, dry bearing points are showing an insufficient lubrication. In both cases you have to check in detail the system and adjust it. Please note operation instructions in paragraph 3.16 or contact our after-sales service.

- **Check indicator lamps of the Hydro-Push system**
  Check if the indicator lamp in the tractor as well as the indicator lamps on the switchbox are functioning.

6.4. Monthly examination of the Hydro-Push system

1. Check the tight fitting of the front fixation screws (tightening torque 90 Nm).

2. Tighten slightly the rear fixation screws (the ones which hold the plastic guiding part). For an execution without plastic guiding part, tighten the rear fixation screws also with 90 Nm.

3. Check the oil level in the electro pump assembly. For doing so, let the tension plates entirely move backwards (position “opening”); if necessary, fill in hydraulic oil HLP 10. The quantity filled should be ¾ of the tank capacity at most because otherwise the oil tank would run over when lowering the lift arm.

4. Check complete hydraulic system (lines, screwed joints and hose connections) for leaks; if necessary, re-tighten.

5. General visual and operation check.

6.5 Maintenance works to be done every 3 months

Following maintenance works have to be done every 3 months (quarterly).

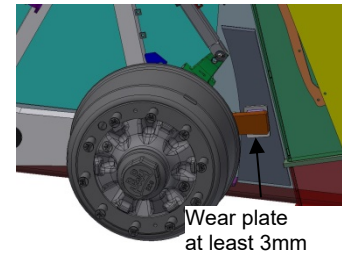
- **Visual check of axle suspension**
  All independent wheel suspensions must be checked carefully for damage.
  Check the fixed seat of the axle swing fixation!
  Tightening torque with M24 → M_A= 700 Nm

- **Check shock absorber and shock absorber fixation**
  All shock absorbers must be checked carefully for leaking oil or damages. Defective shock absorbers must be replaced immediately.
  Check fixed seat of lower and upper shock absorber fixation. Tightening torque with M24
  M_A = 400 – 450 Nm

A slight oil film on the shock absorber casing does not in every case point at a defective shock absorber. It might be that the absorber "sweats". It is recommended to clean the shock absorber carefully from the oil film and to check it again after approx. 100 km driving.

- **Check air bellows for damage**
  For doing so, the air suspension of the Innenlader must be completely lifted. All air bellows must be examined carefully for fabric damages or crack points. It should also be checked that the air bellows are duly bending in when the air suspension is lowered.

- **Clean axle swing sliding guidance and check for wear**
  For examining the sliding plates, the unloaded Innenlader must be placed on an even ground in straight position. The wear plate must still have a minimum thickness of 3 mm. The free space between axle swing and sliding plate should be between 3 and 8 mm. If this is not the case, a track control must be made immediately. Please contact our after-sales service for that.
  If an excessive wear is not detected, the sliding pieces must slightly be greased with a lithium saponified multipurpose grease.



- **Check brake rod**
  The brake rods must be checked on all axles for damage and free travel. The function of the retracting springs must be ensured. In the area of the guidance the brake rod should slightly be greased.

- **Check emergency device and axle restraint system for damages (optionally with pneumatic or manual control)**
  The function of the emergency device and the axle restraint system must be ensured. All parts including fixation, fastening springs, setting cylinder etc. must be in impeccable condition. All points stressed with friction should slightly be sprayed with spray oil.

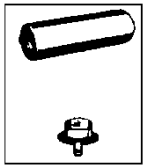
- **Check axles according to the instructions of the manufacturer**
  The inspection must be made depending on axle type and axle manufacturer according to their instructions.

- **Check brake system**
  According to German legislation, investigations of the brake system on trailers have to be made periodically. These investigations according to § 29, annexe VIII, may only be made by the manufacturer or by officially authorised brake service workshops.
  For the operation of the vehicle in other countries, please observe the valid legal obligations accordingly.

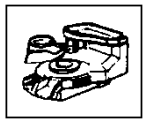
Maintenance and repair works on the brake system may only be made by qualified persons.
For all maintenance works you have to observe the legal regulations. Please be especially careful when welding, burning and boring near brake lines.

The brake system must in general be checked visually. Following criteria should be paid attention to and checked.
- Tube and hose lines as well as coupling heads must not be damaged or corroded at the outside.
- Dust-protection cups, e.g. on brake cylinders, must not be damaged.
- Joints, e.g. on fork heads, must duly be secured, free-moving and not worn.
- Cables and cable pulls must be guided flawlessly, must not show any cracks and must not be knotted.

- Check brake linings, the minimum thickness must be existing.



- Air bellows
  For vehicles being equipped with manual water-drainage valves, the reservoirs must be drained daily.
- Pressure reservoirs must not be damaged. There must not be any outer corrosion damages.



- Coupling heads
  Before coupling it must be ensured that the sealing washers are in flawless condition. Damaged washers must be exchanged.

- Brake power regulator
  The adjusting shaft of the control valve must be free-moving. Pay attention to possible damages of the trailing device.

Check the pressure decrease with full braking when the vehicle is standing. The pressure decrease must not exceed 0.8 bars as maximum for the two-line brake system. If the pressure decreases by more than 0.8 bars or if the travel of the brake cylinders reaches 2/3 of the total travel, the wheel brake must be adjusted.

Check tightness of the compressed air system
For doing so, the brake system must be activated with normal operation pressure. The pressure decrease with the tractor engine switched off must not exceed max. 0.1 bar within 10 minutes. Otherwise wipe the piping system with soap-suds. Seal not tight points and exchange not tight valves.

Clean piping filters of brake system
The piping filters must be cleaned normally every 3 to 4 months depending on the operation conditions. For doing so, the filter cartridge must be taken out and blown out with compressed air. Damaged filter cartridges must be replaced.
Slightly oil joints on brake valves, brake cylinders and brake linkages.

Check the tightness of the compressed air system
For doing so, the brake system must be activated with the normal operation pressure. The pressure decrease must not exceed max. 0.1 bar within 10 minutes with the tractor engine switched off. Otherwise wipe cable system with soap-suds. Seal leaky points or/and exchange leaky valves or screwings. If in case of a repair the WIRA plug connections must be released or exchanged, the following ***"Mounting instructions for WIRA plug connections"*** must be observed.

Mounting of the plastic tube into the plug connection

Cut off right-angled the plastic tube with tube nippers. The cutting points must be cleaned so that there are no sharp edges inside and outside.

Mark the depth to be put in with an adequate pin or with band on the plastic tube. The depth to be put in can be determined on the union nut (length E) or can be taken from below table.

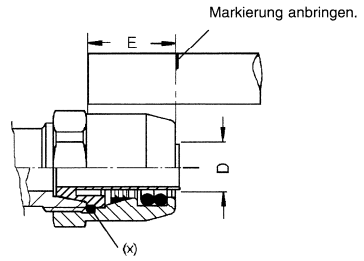
Insert the plastic tube over the total depth to be put in up to the stop. The marking should then be exactly at the bottom hole of the union nut, if not, the tube was not inserted deep enough.

After the mounting, pull back the plastic tube strongly to check if a perfect tube fixation was achieved.

The plastic tubes to be placed must fit with their dimensions exactly to each plug connection. That means e.g. that in plug connections for plastic tube 10 x 1.5 only plastic tube 10 x 1.5 and not 10 x 1.25 or 10 x 1 is mounted.

Plug connections must not be used for plastic lines with brake function between frame and axle.

Connection	Tightening torque	Depth to be put in (E)
6L	14 Nm	18,0 mm
8L	17 Nm	18,0 mm
10L	22 Nm	19,5 mm
12L	30 Nm	19,5 mm
15L	38 Nm	19,5 mm
16LL	40 Nm	20,5 mm
18L	48 Nm	22,5 mm



Mounting of loose plug-in-units

Screw the plug-in-unit manually on the screwing union and after that tighten it with wrench. When doing so, the tightening torques indicated in above table must be observed.

Demounting of the plug connection

If a separation of the pipe from the installation connection is required, the plug-in-unit can be unscrewed from the union by means of a wrench. After having mounted the installation again, the plug-in-unit can also be installed again as described above.

Demounting of the plug-in-unit
Remove the o-ring (x) with a special needle (can be supplied by us) or simply with a safety-pin from the thread recess. Push back the union nut on the tube and pull out the support sleeve. Then cut off the tube on the clamp ring to the union nut and draw off the clamp ring from the piece of tube which was cut off.
The plug-in-union after that can be put together again and used. However, it must be taken special care that the clamp ring has its initial stress and is not damaged. The o-ring (x) can be pressed into the thread recess again easily with the handle of the special needle.

- **Check bearing of front lift arm**
  Visual check of the connection consoles and the connection bolts (screw with S-nut). Damaged parts must be replaced immediately.

- **Check hydraulic cylinder of the lift arm**
  The front lift arm is lifted and lowered by means of two hydraulic cylinders.
  The hydraulic cylinders must not show any leakage. The cylinder bearings must not have any deviation.

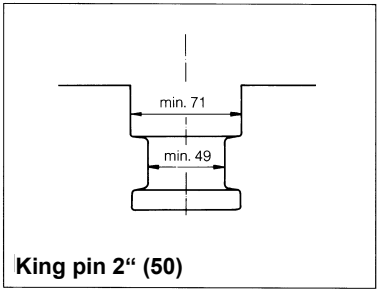
- **Check kingpin**

Kingpins are subject to approval with reference to construction and are parts connecting vehicles which highest demands regarding safety are made on. Damaged or deformed as well as repaired (e.g. welded) components must no longer be used because otherwise the operational and traffic safety is in danger and the type approval becomes extinct.

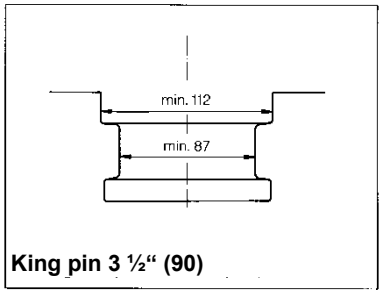
The fifth wheel locking and kingpin are subject to a certain wear. The pin must be checked for tight seat and wear with the unhitched trailer.
The fastening screws must be checked with the tightening torque according to below table.

Manufacturer / Designation	**Check tag**	**Size**	**Screw**	**Tightening torque M_A=**
Georg Fischer +GF+ 662 101 109	D: M 4623 EG: e1-00-0475	2“ (50)	M14x1,5 SW 22	190 Nm
JOST KZ 1012-01	D: F3148 EG: e100-0145	2“ (50)	M14x1,5 SW 19	190 Nm
JOST KZ 1412-01	D: F3191 EG: e100-0147	3 ½ “ (90)	M14x1,5 SW 19	190 Nm
JOST KZ 1016-01	D: F3188 EG: e100-0150	3 ½ “ (90)	M20 SW 30	500 Nm
JOST KZ 1516-01	D: F3203 EG: e100-0148	2“ (50)	M20 SW 30	500 Nm

The type designation can be found on the lower end of the kingpin.
In case the kingpin mounted in your vehicle cannot be found in above table, please get in contact with our after-sales service.
If the limiting values mentioned below are fallen under, the kingpins must be replaced by original parts.



King pin 2“ (50)



King pin 3 ½“ (90)

- **Check bearing of rear wall**
  The rear wall bearing should not show any wear indications or damages. The door must be easily turning and it must be possible to secure it duly when opened. Worn or damaged bearing parts must be exchanged immediately.

- **Check rear wall locking for function and damage**
  The locking has to function duly. The setting parts must be free-moving; connections (e.g. fork joints on the cylinder) must not have any deviation. The dust sleeve of the cylinder must not be damaged. All moving connection points must slightly be greased with spray grease.

- **Check tarpaulin system for damage**
  The tarpaulin system should be in impeccable condition as protection against water. Damages on the tarpaulin or the tarpaulin rack should be repaired immediately. Check all door seals for damage and treat them with suitable preservatives (e.g. talc).

- **Check function and tightness of hydraulic system**
  Works on the hydraulic system may only be made by persons who have corresponding training and know the dangers. Before starting repair works on the system, let off pressure. Parts held or moved by hydraulic cylinders have to be secured mechanically.

- **Grease complete vehicle**
  Please pay attention to the lubrication plan in chapter 9.

6.6 Maintenance works to be done every 6 months

Following maintenance works have to be done in addition to the quarterly maintenance every 6 months (half-yearly).

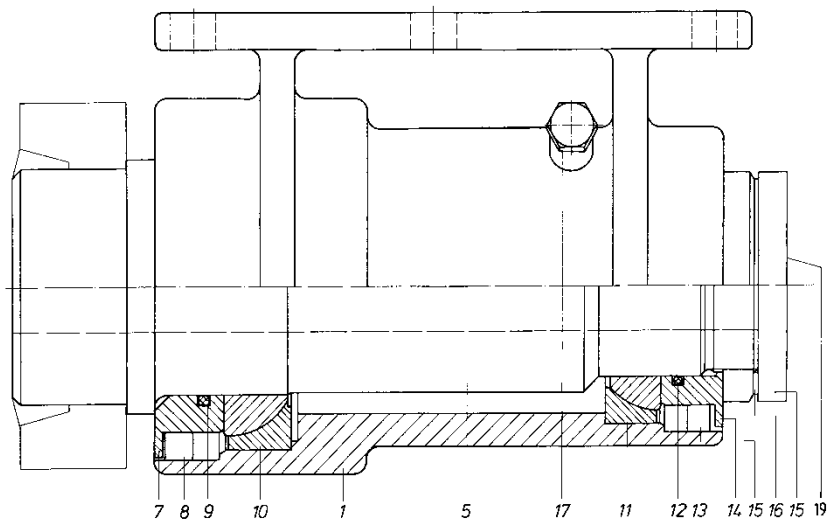
- **Check grease level in the axle swing bearing**
  For checking the grease level, the screw plug must be turned out. The filling orifice must be filled with grease just to the upper edge. If necessary, refill grease of NLGI class 000.

- **Check axle swing bearing**
  To check the axle swing bearing, proceed as follows:

  1. Place the Innenlader on even, firm ground.
  2. Jack the Innenlader in the rear area, under the pick-up rails.
  3. Completely lower the air suspension of the Innenlader.
  4. Jack the axle swing to be checked just as high until the wheel can freely be turned. This can be made by means of an oil-pressure device (jack). For doing so, there is a suitable locating on the underside of the axle swing.
  5. Check if there is any clearance in the axle swing bearing by moving the gliding piece and the axle swing.
  6. If there is any clearance, the axle swing must be adjusted as described in the following. If not, continue with the next axle swing in the same way.

! Before starting to drive you must ensure that all cut-off cocks are opened and the air bellows are duly filled with air.

- **Adjusting the axle swing bearing (only resetting)**

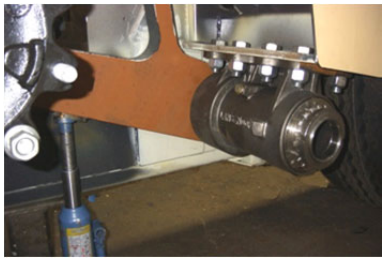


Pos	Designation	Quantity
1	Bearing housing	1
5	Bearing shaft	1
7	Bump disc	1
8	Simmer shaft seal	2
9	O-ring	1
10	Angular joint bearing	1
11	Angular joint bearing	1
12	O-ring	1
13	Simmer shaft seal	1
14	Bump disc	1
15	Castle (securing) nut	2
16	Locking washer	1
17	Screw plug	1
19	Protection cap-NATUR	1

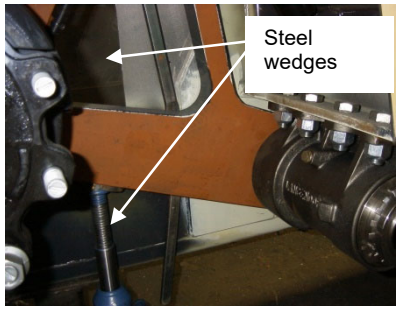
To adjust the axle swing bearing, proceed as follows:

Adjustment of the axle swing bearing must be done in a specialised workshop which is in possession of adequate tools and competent, trained personnel.

1. The road train must stand on an even, firm ground.
2. Jack up the Innenlader in the rear area, under the pick-up rails.
3. Lower the air suspension of the Innenlader completely.
4. Demount the wheel.
5. Jack up the axle swing to be adjusted by means of an oil-pressure device (jack). For doing so, there is a suitable locating on the underside of the axle swing.



6. Quoin the axle swing by means of steel wedges against the vehicle frame.



7. Remove protection cap pos 19;
front castle nut (securing nut) pos 15;
Locking washer pos 16 and
second castle nut pos 15.

8. Clean resp. retouch the thread of the bearing shaft.

! If the thread is dirty or damaged, the bearing cannot be duly adjusted.

9. Tighten the castle nut with a hook wrench so far as the axle swing bearing is tight.

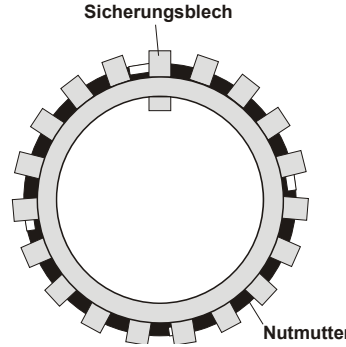
10. Remove the wedges of the axle swing.

11. Lower the oil pressure device. When doing so, the axle swing must not lower. If it does, jack the axle swing again and tighten the castle nut so far as it clamps.

12. Put on the securing disc.

13. Release the castle nut slightly. The axle swing now has to be moved freely.

14. Put on the counternut (second castle nut) and tighten it.



15. Check if there is any clearance in the axle swing bearing by moving the gliding piece and the axle swing. If there is any clearance, the adjustment of the bearing must be corrected.

16. Check the axle swing if it can be moved easily. For doing so, the axle swing must be jacked and after that lowered.

If the axle swing remains in the lifted position or if it lowers only jerkily, the adjustment of the bearing is too tight.
If the axle swing falls down "quite abruptly", the adjustment of the bearing is too loose.
The adjustment must be corrected.

- **Check slack adjusters**
  To check the slack adjusters please pay attention to the instructions given by the manufacturer.

- **Check axles according to the manufacturer's instructions**
  Please note the separate instructions of the axle manufacturer.

- **Check fixed seat of the brake cylinder fixation**
  The tightening torque is M_A = 210 Nm for thread M16

- **Check, clean and grease fifth wheel plate**
  Unhitch the vehicle; clean the fifth wheel coupling and plate. Grease the fifth wheel plate, wear parts, contact surfaces of the kingpin and the kingpin with high pressure grease (EP) with MoS2 or graphite additive (e.g. BP L21 M, BP HTEP 1, Esso multipurpose grease M, Shell Retinax AM).

- **Observe national legal directives**

6.7 Maintenance works to be done every 12 months

Following maintenance works have to be done in addition to the quarterly and half-yearly maintenance every 12 months (yearly).

- **Check axles according to the manufacturer's instructions**
  Please note the separate instructions of the axle manufacturer.

- **Check air suspension assembly**
  Lift the vehicle on the frame so that the axle suspension is discharged. Check whether the air bellows are fully extending. Check bellows for wear indications on the connections points between bellow and cover sheets. Remove carefully soiling on the edges of the cover sheets. Check shock absorbers for oil loss and damages. After having done so, charge the suspension again; the normal driving height (1,820–1,830 mm from the ground to the upper edge of the longitudinal member when the vehicle is empty) must adjust itself. If this is not the case, please contact a specialized workshop or our after-sales service.

- **Check shock absorbers**
  Experience has shown that shock absorbers should be replaced after 300,000 km at the latest.

- **Renew cavity sealing**
  The longitudinal members of the Innenlader are provided with cavity sealing on the **basis of wax**. To ensure sufficient protection it has to be renewed every three years.

- **Exchange hydraulic oil (type HLP 10)**

- **Check hydraulic hoses**
  According to the regulations (ZH 1/74) of the government safety organization all hydraulic hoses have to be checked at least once a year.
  Should you notice one of the defects mentioned in the following, the corresponding hose has to be replaced immediately.
  - Damage of the outer layer up to the filler, such as chafe marks, cuts, cracks etc.
  - Embrittlement of the outer layer (crack formation in the hose cover).
  - Deformation not corresponding to the natural shape of the hose line. This is valid for the condition without pressure as well as with pressure or at bending. E.g. delamination, blistering, crushing or kink points.
  - Leaky points.
  - Damage or deformation of the hose fitting.
  - Working loose of the hose out of the hose fitting.
  - Corrosion of the hose fitting reducing the function or the stability.

- Exceeding of the period of use of 6 years. You can find the corresponding date of manufacture on the hose fitting.

- **Observe national legal directives**

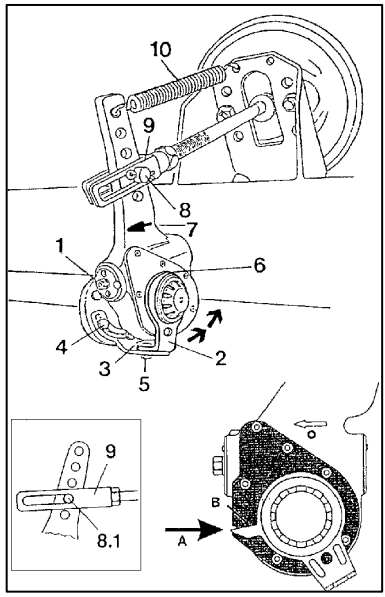
6.8 Make road train brake balance between tractor and trailer

The brake systems of tractor and trailer / semitrailer are adjusted to each other. Amongst others setting values such as e.g. advance and empty pressure of ALB (brake system with automatic load-dependent brake-power distribution) are checked and, if necessary, adjusted.
This examination and adjustment should be made every time when there are problems with the braking retardation. Following points might hint at an insufficient adjustment:

- Very different wear on brake linings on tractor and trailer
- When braking, the trailer overruns; i.e. the tractor is braked harder than the trailer.
- When braking, the road train is strongly stretched; i.e. the trailer is braked harder than the tractor.

If one of above-mentioned points occurs, the road train must be checked and adjusted in an authorized workshop.

6.9. Adjusting the automatic slack adjusters



- Cams and brake shoes are in zero position.

- Fix the slack adjusters on the camshaft.
  Axial clearance: Adjust the nominal value of 1.0 mm by means of the adjustment plates (6). Arrow mark (7) points to brake direction.

- Install the fixed point clip (3); use 2 fixing screws (4) in any case. Do not yet tighten the fixing screws (4).

- **Diaphragm brake cylinder**
  Before mounting it has in any case to be ensured that the brake cylinder is in starting position.

  But the spring cylinders have to be under full operation pressure (at least 6 bars).

  Important: If you do not pay attention to that, the basic adjustment is wrong!

- Turn the adjustment screw (1) until the boring at the slack adjuster 8.1 corresponds to the boring in the yoke end (9) (see drawing).

- Set in and secure split pin (8).

- Hang in the return spring (10).

- Press the control arm in turning direction of the arrow (operation direction of the slack adjuster) into its final position **without** resort to force.

  Remark:
  The stop must not be effected at one of the two fixing screws (4) of the fixed point clip (3). Should the occasion arise, displace the fixed point clip (3) in the fixing (4).

  Tighten strongly all fixing screws (4) and the pin screw (5) in this final stop of the control arm (2).

6.10 Fault diagnosis at a breakdown of the Hydro-Push system

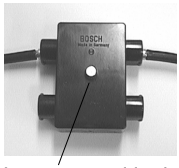
Should there be one of the defects mentioned below at your Hydro-Push system, there might be the following reasons.

- The Hydro-Push system does not work at all

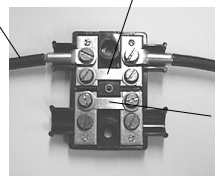
a. The cable connections between tractor and Innenlader are interrupted.

b. The battery of the tractor is run-down.

c. The fuse at the vehicle battery (100A) is blown-out » Should this happen several times, the whole system has to be checked by an authorized specialized workshop.



fuse box mounted in the area
of the motor-vehicle batteries



- The system does not open or close although the electric motor is running

a. The solenoid valves are not activated.

b. The hydraulic pressures are not right » Adjustment to be made by an authorized specialized workshop only.

c. The oil level in the system is too low.

d. The voltage of the battery is too low.

e. All cut-off cocks are closed.

- The system works, but the electric motor does not switch off any more

a. The hydraulic pressures are not right » Adjustment to be made by an authorized specialized workshop only.

b. The oil level in the system is too low.

- **The system is switched off and the tension plates can be moved easily by hand to the middle of the vehicle**

a. There is a defect at the check valves. » Repair to be made by an authorized specialized workshop only.

<u>Particularities with Hydro-Push systems for L racks</u>

- **With loaded L rack the tension plates can be moved backwards by operating the red key, but the tension plates cannot be pulled out by operating the green key.**

a. The light beam is not interrupted because of a disadvantageous position of the rack, or the beam is reflected by the glass. The light beam has to be switched off by operating the bridging button.

If the fault detection is not successful, please contact immediately the Langendorf after-sales service:

phone: +49/2309/938-0

Do never drive with defective Hydro-Push system!

7. Instruction for a long time immobilization of the vehicle

For a longer immobilization of the vehicle, lubricate every 4 weeks and move or operate the corresponding pieces. Drain all air tanks before immobilization. Every 4 weeks, give pressure into the air pressure system and let it operate, so that the valves are working regularly and cannot settle.

You have to take special care when placing vehicles with air suspension for a longer period of time on a support or a landing gear. After some time it is possible because of leaks in the pipe system that the air spring gives way. I.e. the vehicle lowers itself. There is a displacement of the semitrailer in longitudinal direction because of the geometry of the axle fixation when the wheels are locked. If the support or the landing gear cannot balance this movement, e.g. by means of a roller, you have to let off the air spring entirely before placing the vehicle. This can be made via the drain valves, the lifting/lowering valve or by unhinging of the air spring valve linkage.

8. Tightening torque in Nm

for screws and head support according to DIN 912, 931 etc.

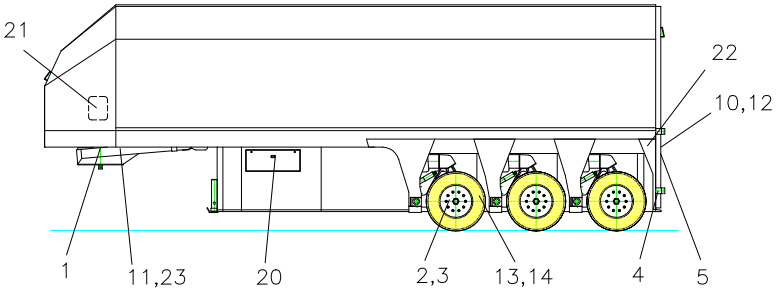
These tightening torques are only valid, when no other values are indicated in the maintenance instructions or documents from the supplier companies (for example axle manufacturer).

Thread	SW	material		
		8.8	10.9	12.9
M 8	SW 13	25	35	41
M 8 x 1		27	38	45
M 10	SW 17	49	69	83
M 10 x 1		52	73	88
M 12	SW 19	86	120	145
M 12 x 1,5		90	125	150
M 14	SW 22	135	190	230
M 14 x 1,5		150	210	250
M 16	SW 24	210	300	355
M 16 x 1,5		225	315	380
M 18	SW 27	290	405	485
M 18 x 1,5		325	460	550
M 20	SW 30	410	580	690
M 20 x 1,5		460	640	770
M 22	SW 32	550	780	930
M 22 x 1,5		610	860	1050
M 24	SW 36	710	1000	1200
M 24 x 2		780	1100	1300
M 27	SW 41	1050	1500	1800
M 27 x 2		1150	1600	1950
M 30	SW 46	1450	2000	2400
M 30 x 2		1600	2250	2700

Approximate values for tightening the screw connection with tightening torque key, lubricated thread. Impact wrench not permissible.

9. Lubrication plan

Explanations regarding the lubrication plan

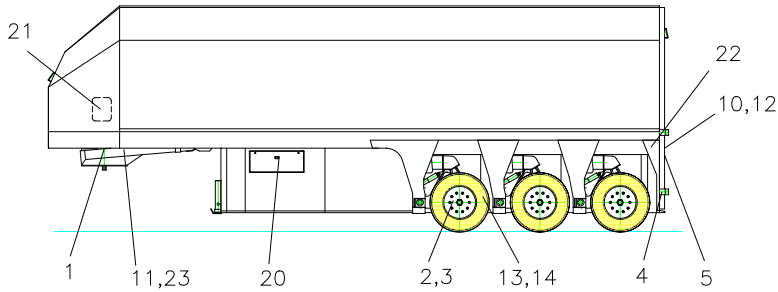


This lubrication plan serves as complement to the maintenance plan of chapter 6.

In case the trailer is equipped with a central lubrication system, following positions need not being lubricated because they are connected to the central lubrication. But in this connection these lubrication points should be checked (see also page 6 – 4).
This concerns positions 1, 2, 4 and 5.

1. Nipple lubrication
   Lubricate the lubrications nipples mentioned in the following by means of a suitable grease pump with lithium multipurpose grease just until fresh grease escapes from the bearing points.

Pos.	Designation	Qty.	Lubrication periods
1	Lift arm locking	2	Weekly
2	Axle – Brake camshaft	6	Quarterly
3	Automatic slack adjuster (AGS) (only if equipped with lubrication nipple)	6	Yearly
4	Rear wall bearing	2	Quarterly
5	Rear wall locking	2	Quarterly



2. Lubrication by coating
Clean surfaces carefully and remove old grease completely.

Pos.	Designation	Qty.	Maintenance periods
10	Slides on the rear wall		Quarterly
11	Guiding sheets on the lift arm		Yearly
12	Locking hooks on rear wall (between hook and aluminium tube)		Quarterly
13	Slide guiding on axle swing		Quarterly
14	Brake rod guiding		Quarterly

3. Drop lubrication by means of oil can or spray oil

Pos.	Designation	Qty	Maintenance periods
20	Hinges on the flaps of side covering		Monthly
21	Hinges of front neck door		Monthly
22	Total locking mechanism of rear wall		Monthly
23	Total locking mechanism of lift arm		Monthly

! After having used steam jet cleaners and high-pressure washing installations, especially with chemical additives, all lubrication points must immediately be greased.

A. Check list for periodical test and maintenance works

The following schedule shall serve as supplementary overview for the maintenance works indicated in chapter 6.

Works to be done Further information on the works please find in chapter 6 of these instructions	Before driving	Every 3 months	Every 6 months*	Every 12 months*	Remarks
Check fixed seat of wheel nuts (630/600 Nm)		X			Additionally after every wheel change
Visual examination of the axle suspension		X			Page 77
Check fixation of axle suspension (700 Nm with M24)		X			Page 77
Check shock absorbers and fixation		X			Page 77
Replace shock absorbers					Every 2 years
Check air bellow for damage		X			Page 77
Check grease level in the axle swing bearing			X		Page 84
Check axle swing bearing			X		Page 84
Check brake rod		X			Page 78
Clean and check axle swing slide guide		X			Page 77
Check emergency device / axle restraint system	X	X			Pages 78
Check slack adjusters	X	X	X	X	Manufacturer's instructions
Check axles according to the manufacturer's instructions	X	X	X	X	Manufacturer's instructions
Check lighting system	X				Page 75
Brake system; check tightness of connections		X			Page 78
Clean piping filters of brake system		X			Page 79
Check function of operation and parking brake	X				legal regulations
Check fixed seat of brake cylinder fixation (M_A=210 Nm for M16)			X		Page 88

* Serves as supplement to the maintenance works to be done every 3 resp. 6 months.

Works to be done Further information on the works please find in chapter 6 of these instructions	Before driving	Every 3 months	Every 6 months*	Every 12 months*	Remarks
Inspection of trailer acc. to § 29 StVZO (German legislation)			X		National legal regulations
Main inspection acc. to § 29 StVZO (German legislation)				X	National legal regulations
Road train brake balance between tractor and trailer					If required
Check bearing of front lift arm		X			Page 81
Check hydraulic cylinder lift arm		X			Page 81
Check swing locking		X			Page 81
Check fixed seat of kingpin for GF 50 KZ 117 M_A= 190 Nm		X			Page 82
Check, clean and grease fifth wheel plate			X		Page 88
Check bearing of rear wall		X			Page 83
Check rear wall locking for function and damage		X			Page 83
Check tarpaulin system for damage		X			Page 83
Check hydraulic system for function and tightness		X			Page 83
Check hydraulic hose				X	Page 89
Visual examination of vehicle frame		X			
Check air suspension assembly				X	Page 89
Retighten all screwed connections with directed tightening torque			X		Page 97
Check tires regarding pressure/pattern/damage	X				Page 75
Greasing of all lubrication points		X			Page 98
Grease the parts which are stressed with friction (without nipple)		X			Page 99
Check and adjust the central lubrication system	X				Page 76
Clean chromium-plated piston rod	X				Page 76
Renew cavity sealing					every 3 years

Record of the inspections which have been carried out

Below list shall assist you for planning the inspections to be carried out.

Date of first registration: _____

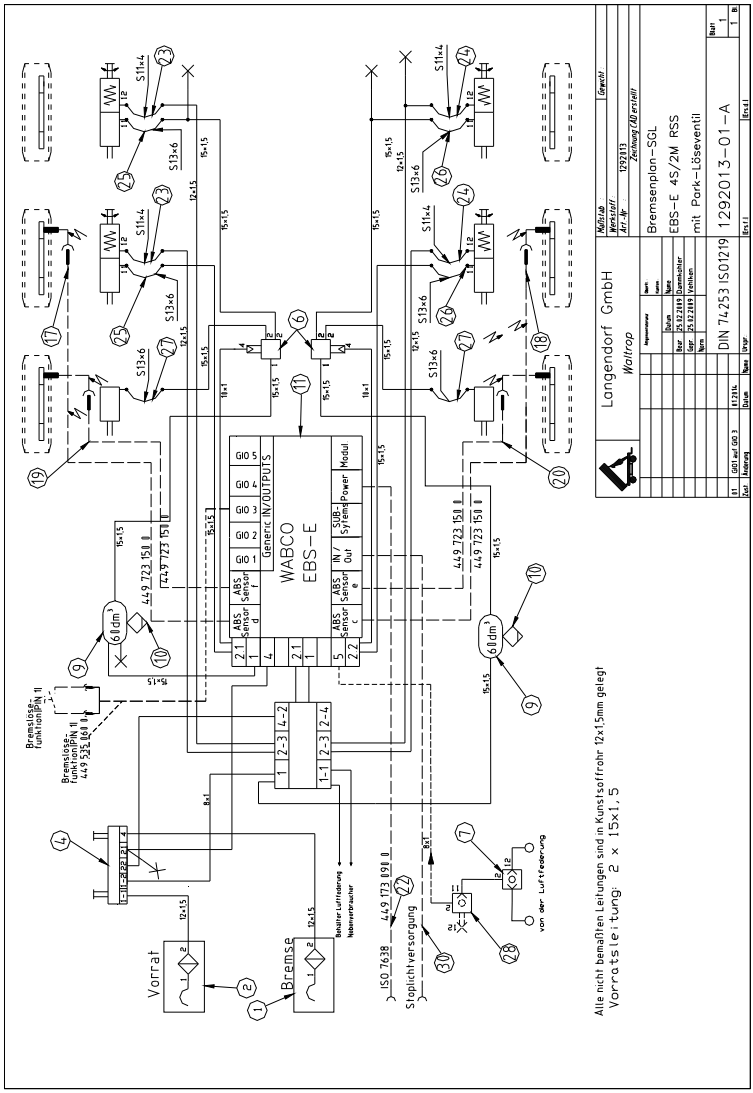
	after 3 months	**after 6 months**	**after 9 months**	**after 12 months**
1rst year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
2nd year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
3rd year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
4th year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
5th year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
6th year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
7th year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
8th year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
9th year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)
10th year of operation	(Date, Signature)	(Date, Signature)	(Date, Signature)	(Date, Signature)

B. Supplements

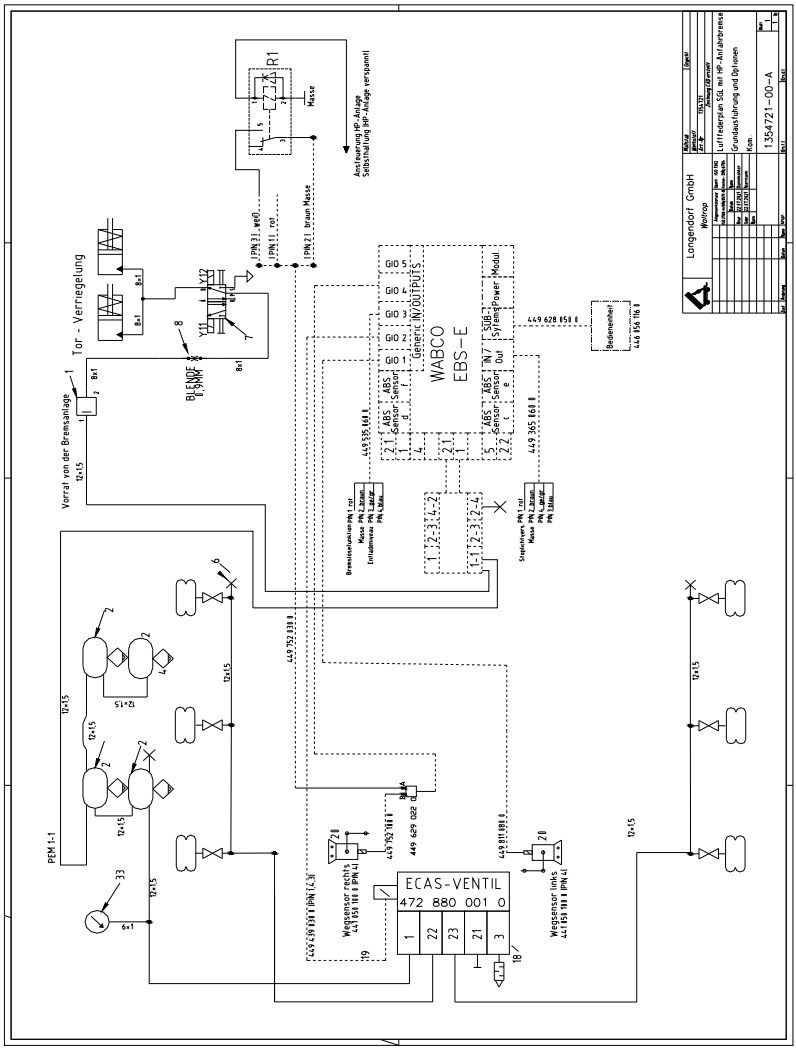
On the following pages all changes (additional mountings and modifications) on the vehicle must be documented. The aim is that when selling the vehicle the new owner can operate and maintain the vehicle without any danger.

C. Wiring schemes

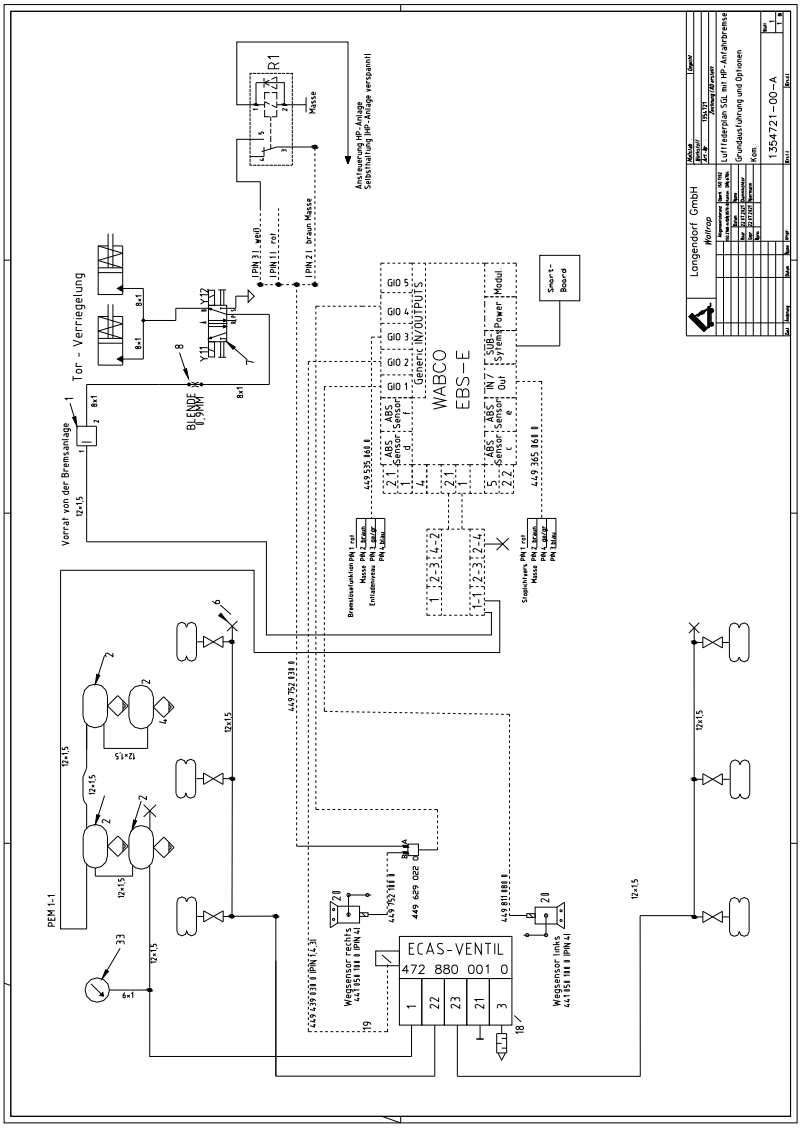
Brake diagram



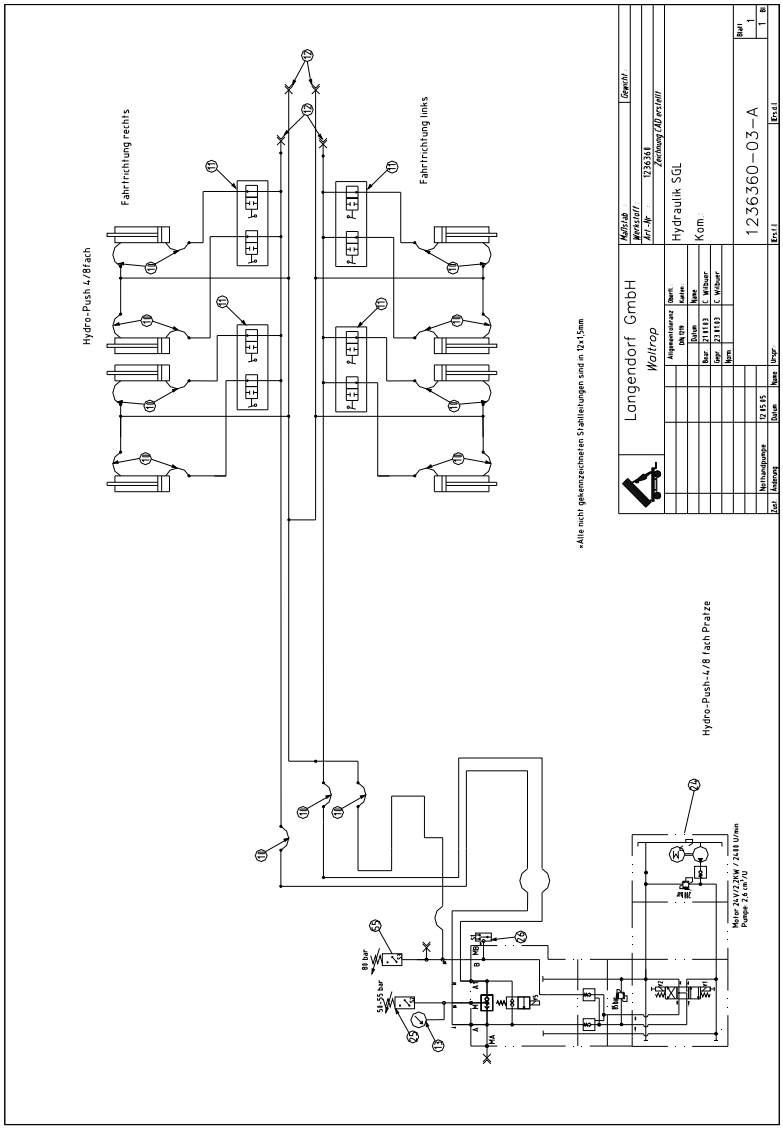
Air spring diagram (control unit)



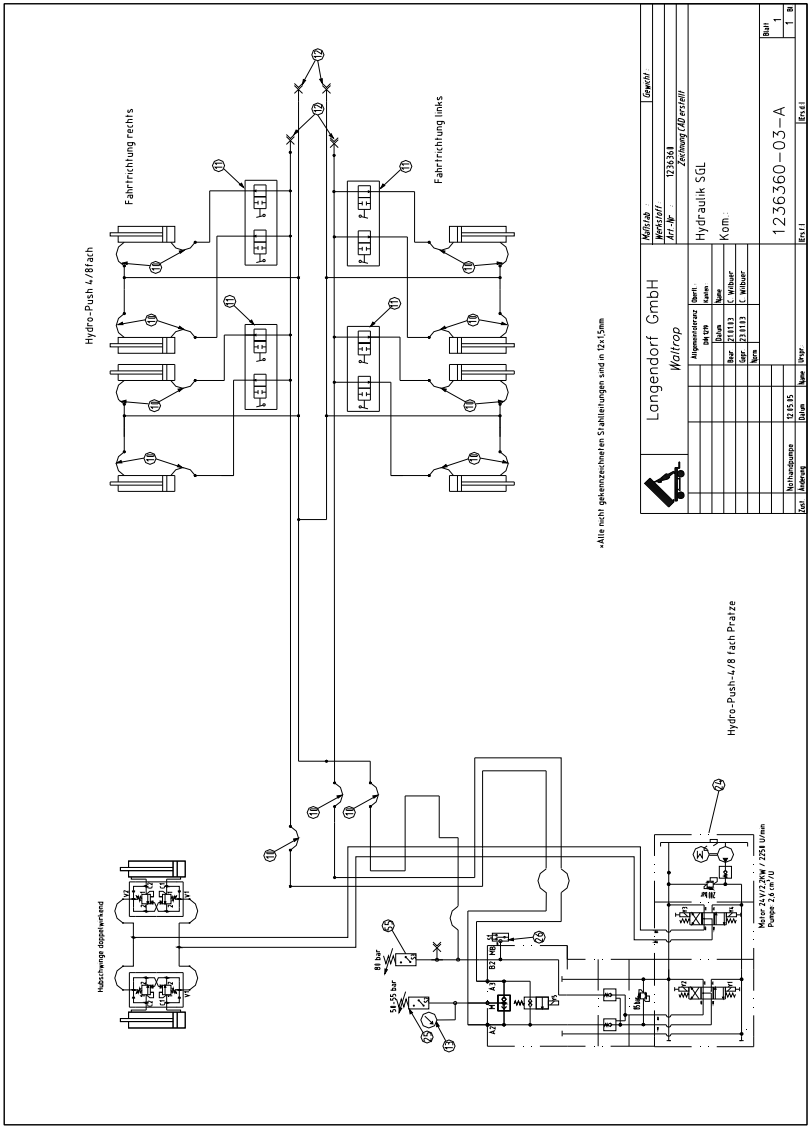
Air spring diagram (SMART-Board)

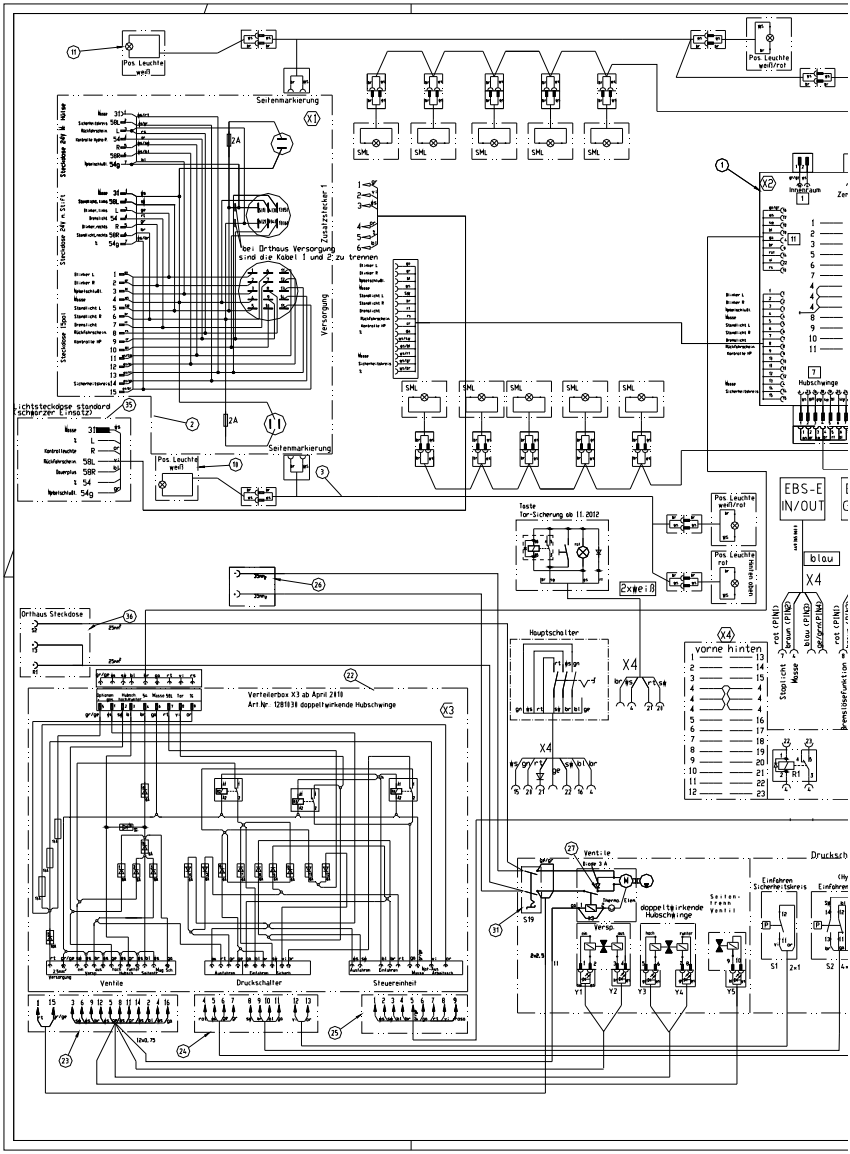


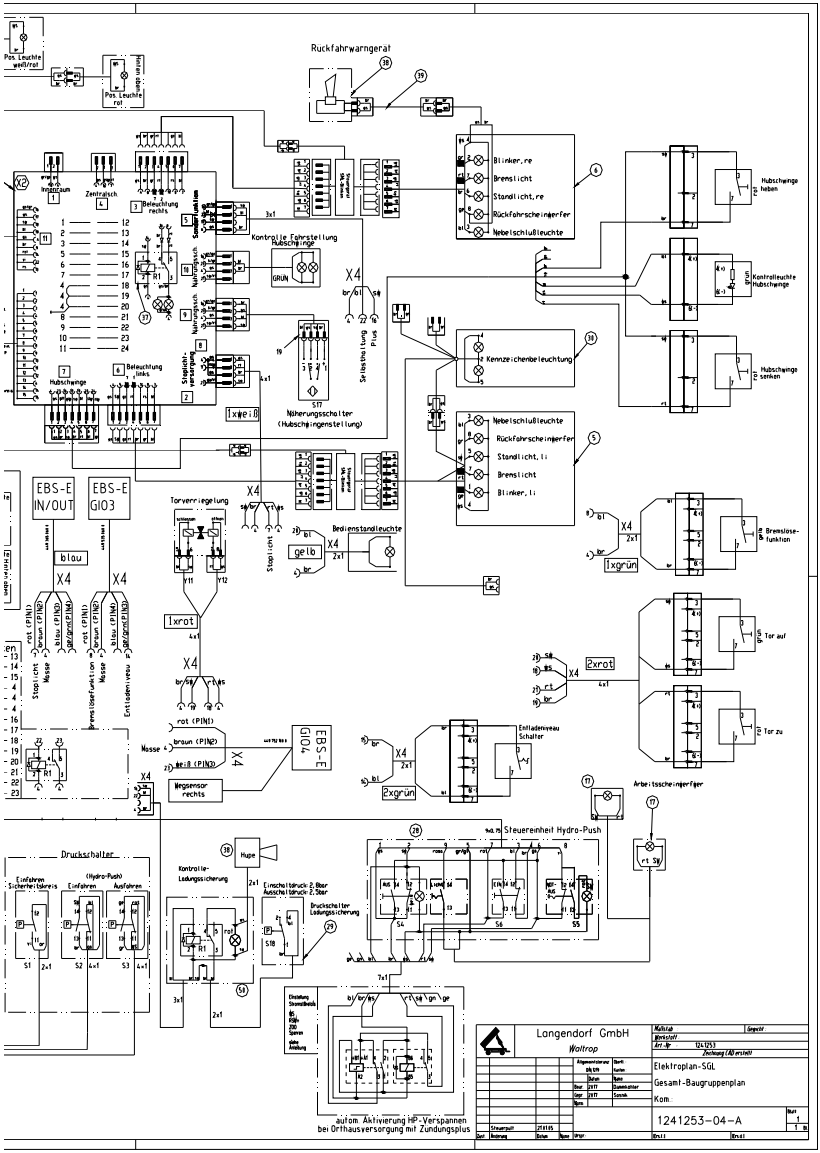
Hydraulic (SGL17X)



Hydraulic (SGL18)




Pos Leuchte weiß
Seitenmarkierung
X1
2A
Zusatzstecker 1
Versorgung
Steckdose 24V 4-Stift
Steckdose 24V 4-Stift Hülse
Steckdose 15pol
Steckdose 7pol
Bei Orthaus Versorgung sind die Kabel 1 und 2 zu trennen
SML
Pos Leuchte weiß/rot
Pos Leuchte rot
Hubschwinge
Lichtsteckdose standard schwarzer Einsatz
Taste Tor-Sicherung ab 11.2012
2xweiß
EBS-E IN/OUT
blau
X4
Orthaus Steckdose
Verteilerbox X3 ab April 2010
Art Nr. 1281131 doppeltwirkende Hubschwinge
X3
Hauptschalter
vorne hinten
Ventile
Druckschalter
Steuereinheit
doppeltwirkende Hubschwinge
Seiten-trenn-Ventil
Einfahren Schere-Tisch
Einfahren Schere-Schere
S1
S2
S19
Y1
Y2
Y3
Y4
Y5


Rückfahrwarngerat
Blinker,re
Bremslicht
Standlicht,re
Rückfahrscheinwerfer
Nebelschlußleuchte
Hubschwinge heben
Kontrolleuchte Hubschwinge
Hubschwinge senken
Kennzeichenbeleuchtung
Nebelschlußleuchte
Rückfahrscheinwerfer
Standlicht,li
Bremslicht
Blinker,li
Bremslose-funktion
Tor auf
Tor zu
Arbeitsscheinwerfer
Kontrolle Fahrstellung Hubschwinge
Näherungsschalter (Hubschwingenstellung)
Torverriegelung
Bedienstandleuchte
Entladenniveau Schalter
Steuereinheit Hydro-Push
Druckschalter
Einfahren Sicherheitsbereich
Einfahren (Hydro-Push)
Ausfahren
Hupe
Kontrolle-Ladungssicherung
Einschaltdruck 2 Bar Ausschaltdruck 2 Bar
Druckschalter Ladungssicherung
Wegsensor rechts
Langendorf GmbH
Waltrop
Elektroplan-SGL
Gesamt-Baugruppenplan
Kom.
1241253-04-A
autom. Aktivierung HP-Verspannen bei Orthausversorgung mit Zündungsplus