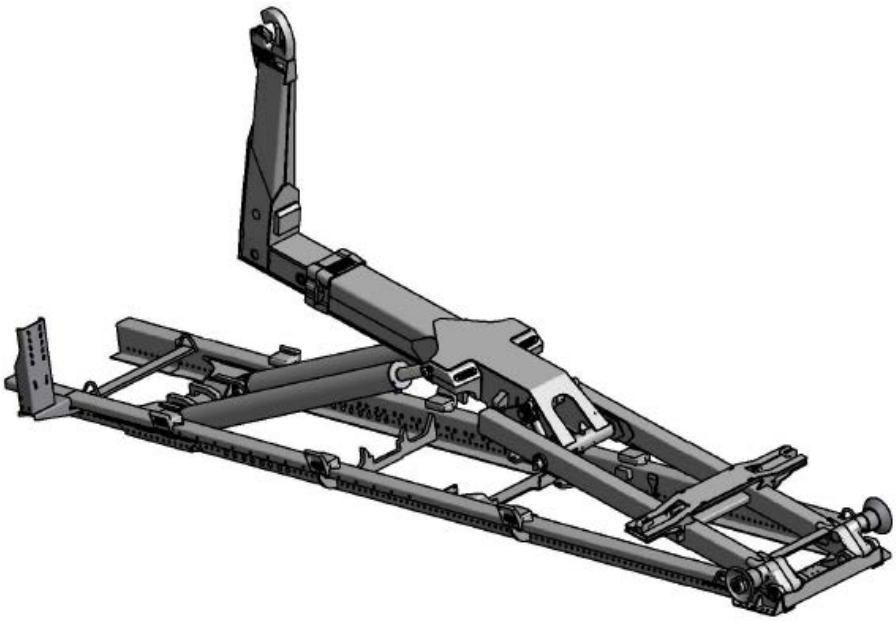
Installation manual

HOOK LOADER : TYPE PI_SZ



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1.1-1 Working with the mounting instructions

The PALFINGER Hook loader mounting instructions are your guide to mount a hook loader. The precise mounting of the unit, e.g., selection of the correct chassis, power take off, pump, calculation verifications, and so forth, should be considered at the time the loader is sold. These instructions contain technical instructions, remarks and standards which must be observed during the mounting of the hook. In addition, they have useful remarks regarding the proper mounting of these units.

You can obtain the latest issue of these mounting instructions as well as additional technical documentation from your PALFINGER general representative or from the Internet. The general representative is obligated to provide these mounting instructions to the company which manufactures the superstructure.

PALFINGER reserves the right to change these mounting instructions at any time or to issue instructions for the mounting of individual loader which deviate from these mounting instructions.

1.1-2 Application of the mounting instructions

The mounting instruction is applicable to the PALFINGER hook loader.

Contact the PALFINGER general representative or the PALFINGER Customer Service for special models or special superstructures.

1.1-3 Symbols used in the mounting instruction

The following symbols are used in this mounting instruction:

This symbol indicates important information which must be observed without fail wh mounting a loader.

This symbol refers to additional information and tips which may be helpful during the mounting of a loader.

1.2-1 Responsibility

The responsibility for the proper design, manufacture and mounting of superstructures and the modification of chassis is always and exclusively and in full that of the company which manufactures or mounts the superstructure or carries out the modification (product liability). Superstructures and/or modifications approved in writing by PALFINGER do not release the superstructure manufacturer from his product responsibility.

If the company carrying out the work notices an error in the planning stage or in the intentions of the customer, the user, his own personnel or the vehicle manufacturer, it must point out the error to the person in question.

The company is responsible for ensuring that the operational and traffic safety, the servicing opportunities and the driving properties do not have any adverse characteristics.

With respect to operational and traffic safety, the company must work according to state-of-the-art technology, the legal statutes of the particular country, the standards and the acknowledged rules of the specialist field with respect to design, static calculations, the manufacture of superstructures, the instructions and the operating instructions. More difficult conditions of operation must be considered separately.

The companies mounting the loader are liable for damage which is a consequence of inadequate functional and operational safety or incorrect operating instructions. PALFINGER therefore demands from the superstructure manufacturer:

- Greatest possible safety in accordance with the state-of-the-art
- Understandable and adequate operating instructions
- Easily visible and permanently mounted signs warning of danger areas for operators and/or third persons
- Observance of the necessary protective measures in order to prevent risks.

1.2-2 Warranty

Warranty claims may be asserted solely on the basis of the purchase contract between the buyer and the seller. Consequently, the warranty obligation is solely the responsibility of the seller of the delivered object in each case.

The seller may assert neither guarantee nor warranty claims against PALFINGER if the mounting instructions have not been observed or if the machine has been used improperly. In addition, the dealer may assert neither guarantee nor warranty claims against PALFINGER if an unsuitable chassis or an unsuitable superstructure with respect to the intended use of the loader is chosen, or if the damage to the loader is caused by the superstructure or the type and execution of the mounting of the superstructure, or by improper operation.

1.2-3 Liability

If the mounting company determines that there are defects in the PALIFT product, the latter must be corrected. Any liability on the part of PALFINGER, especially for consequential damage, is hereby excluded to the extent that said exclusion is legally permissible. PALFINGER's liability for damage as a consequence of slight negligence (culpa levis) is also excluded.

The company which carries out the mounting must indemnify PALIFT from any and every liability with respect to the former's customers or other third parties, to the extent that any damage which has occurred is a consequence of the company's failure to observe these mounting instructions, or if damage to the loader superstructure is caused by improper design, manufacture, mounting or instructions.

1.2-4 Quality assurance

In view of international product liability legislation, continuous quality monitoring during the performance of conversions and the manufacture or mounting of superstructures is required.

We recommend that the manufacturer of the superstructures set up a quality management system in conformity with general requirements and generally accepted principles (e.g., in accordance with DIN EN ISO 9001).

1.2-5 Modifications to the Hook Loader

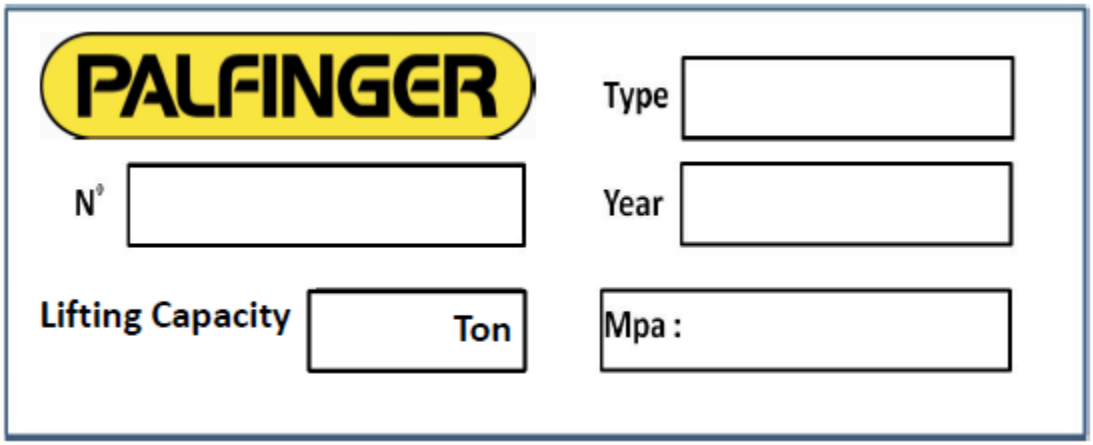
Modifications to the loader without consultation and written approval by PALFINGER is not permitted for reasons of safety, product liability and PALIFT's warranty regulation. If modifications are made to the loader, PALFINGER Customer Service must be consulted in advance and written approval from the manufacturer must have been obtained. This is especially important if the load-bearing loader components are welded, drilled or worked on in any other way which could adversely affect the statics.

Modifications of this nature may be made only in authorized workshops approved by PALFINGER.

Explanation of Terms 1.3

1.3-1 Serial Number Data

Serial Number Plate



N° - serial number of the Palfinger Hook Loader

Type - type of Palfinger Hook loader model

Example: **T20A_PI_SZ_01**

T xx= Telescopic Unit PI = Pioneer Unit SZ = Shenzhen 01 = version
T xxA = Telescopic Articulated Unit
P xx = Power Unit
P xxA = Power Articulated Unit

Year – Year. month of manufacture
Example: 2011 . 11

Year of manufacture Month of manufacture

Lifting Capacity –Maximum allowable lifting capacity including container weight
Example. 20 Ton

Mpa – Maximum pressure of system

Example. **Mpa** : 31

1.3-2 Truck wheel formula

Besides the motor vehicle type, the wheel formula can be used for a more precise designation of the chassis. It is a common expression, but has not been standardised. Dual tyres are regarded and counted as one “wheel position”.

Example: 6x4

6	=	Total number of wheel locations
x	=	No importance
4	=	Number of driven wheels

A chassis with the wheel formula 6x4 is thus a three-axle vehicle with two driven axles.

More exact information about the precise designation of the chassis can be found in the mounting instructions of the truck manufacturer.

1.3-3 Major dimensions of the welding seam

Welding seam symbols and measurements of welding seams are shown in these mounting instructions in accordance with EN22553.

Seam thickness a

Is the height of the largest isosceles triangle which can be drawn in the cross-section drawing.

Leg length z

Is the leg length of the largest isosceles triangle which can be drawn in the cross-section drawing.

Flat seam

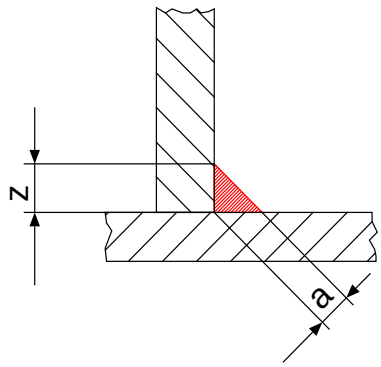


Illustration 1-01

Convex seam

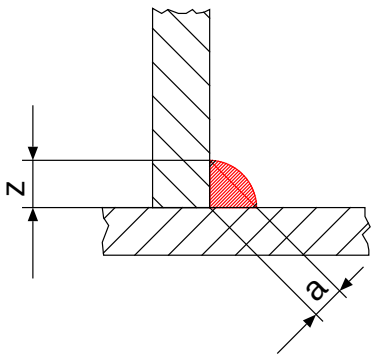


Illustration 1-02

Concave seam

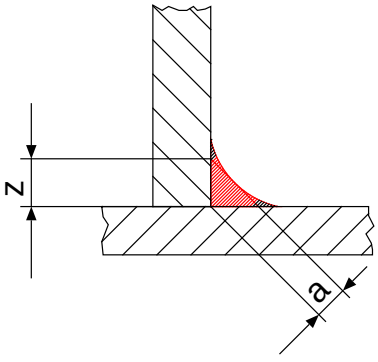


Illustration 1-03

In these mounting instructions, the fillet weld is always measured with the seam thickness “a”.

CONTENTS

2.1-1 Remarks on project preparation

It is a sensible idea to consider in detail the arrangement and function of the whole installation during the planning phase.

Standards applicable in the particular country (maximum dimensions, axle load, permissible total weight, ...) must be observed under all circumstances and during all phases.

The mounting must not interfere with a clear view of the working area. If necessary or required by the particular country, a different / additional system to secure the view must be provided (e.g. camera + monitor, mirror ...). Space must be allowed around the motors and pumps, control box, PTO/pump, so that maintenance may be performed without interference.

The operator must not be exposed to emissions (relocation of the exhaust pipe according to vehicle manufacturer's guide lines, or an exhaust pipe from the engines into the open air).

The following information is essential for project planning:

- **Determine space requirements (e.g., calculating height for vehicle mounting)**
- **Axle load and stability calculation**
- **Tension sign on chassis and auxiliary frame**
- **Engine output: engine / secondary drive power output (PTO), pumps and leads dimensioning**

2.1-2 Technical data sheets fo the Hook Loader

We have prepared comprehensive technical data sheets for all of the loader models and the various options; these sheets provide information regarding all of the important dimensions, dead weights, lift moments, loads, hydraulic and electric circuit diagrams, mounting sheets, and similar information.

Pls kindly approached our Palfinger Asia supporting staffs for Pacwin calculation for installation guide

2.2-1 Hook Loader

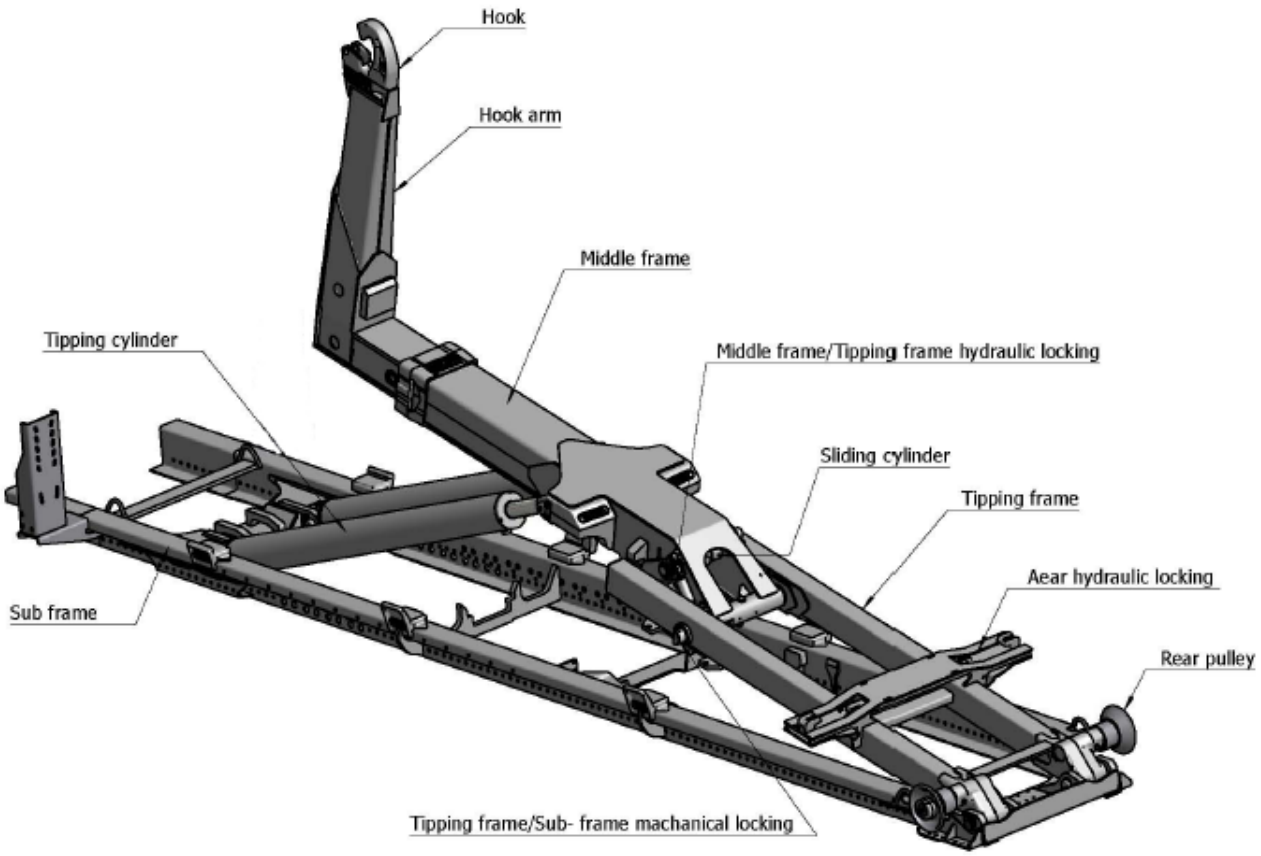


Illustration 2-01

2.2-2 Equipment recommendations for the vehicle

Space requirements for loader and mounting

It must be determined in the preliminary stage whether transmission components which protrude beyond the chassis frame or other components of the truck (shock absorbers, springs, hydraulic pump, auxiliary drive, air reservoir, etc) may lead to collision problems with the sub frame or the loader. It must also be determined if there is adequate space for the spring travel of the axles.

Selection of the length of the rear overhang

The rear overhang (L) must be adjusted to the length of the loader, or, based on the standard length of the rear overhang, the achievable loader length must be determined (see illustration 2-10)

If a roller stabilizer is required, the length of the rear overhang must be long enough to attach the roller stabilizer properly.

The measure (B) end of the loader to end of rear overhang should be between min. 20mm and should not more as recommended value (see technical. data sheet "B_{max}").

It is therefore a sensible idea to select the required length of the rear overhang when ordering the vehicle so that the vehicle frame requires no major modifications.

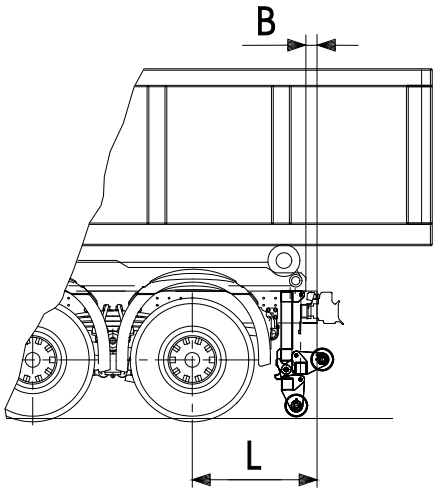


Illustration 2-02

Legal and national definition must be observed when defining the rear overhang!

2.2-3 Total height of the vehicle

A height calculation verifies that the total height of the vehicle remains within the defined limits (legal provisions or restrictions due to intended use).

Influencing factors:

- *Vehicle mounting height, incl. auxiliary frame (if existing)*
- *Transport height*
- *Container height*

Before beginning the mounting, measure the frame height of the chassis and the height of the loader + container and compare the measurements with the height calculation.

$$H_{TOT} = H_{FG} + H_{TH} + H_C$$

H_{TOT} ..... Total height
H_{FG} ..... Chassis height
H_{TH} ..... Transport height
H_C ..... Container height

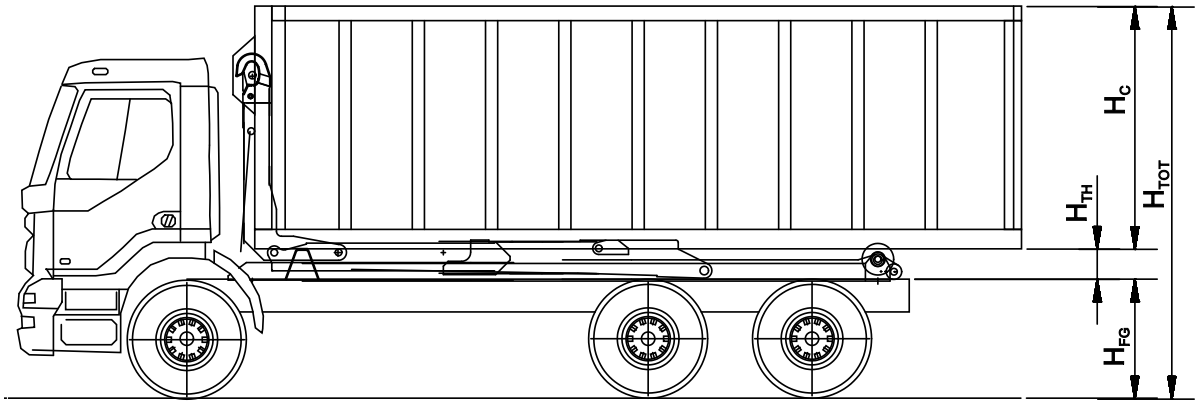


Illustration 2-03

2.2-4 Axle load and stability calculation

The determination of the axle load and the calculation of the stability factor against tipping over are absolutely essential for vehicle optimization and correct mounting design.

The mounting must be designed so that a lateral weight difference does not cause any tilting of the vehicle. Permissible limits may be obtained from the truck manufacturer.

The calculation program "PACWIN" can be used as an aid to calculate the axle load and stability factors easily. Palfinger Customer Service and all general representatives will be glad to give you more information about this program. You will also find further information about calculating the axle load in most mounting guidelines of the truck manufacturers.

Axle load calculation

All of the weights of the mounted components (loader, auxiliary frame, tank, etc) must be distributed relative to the centre line of the front or rear axle (ie a fixed datum) so that the reaction forces of the components can be found at each axle.

The front axle(s) of the vehicle must always be loaded with a minimum share of the total weight of the vehicle in order to avoid negative steering characteristics. Precise information is obtainable from the truck manufacturer.

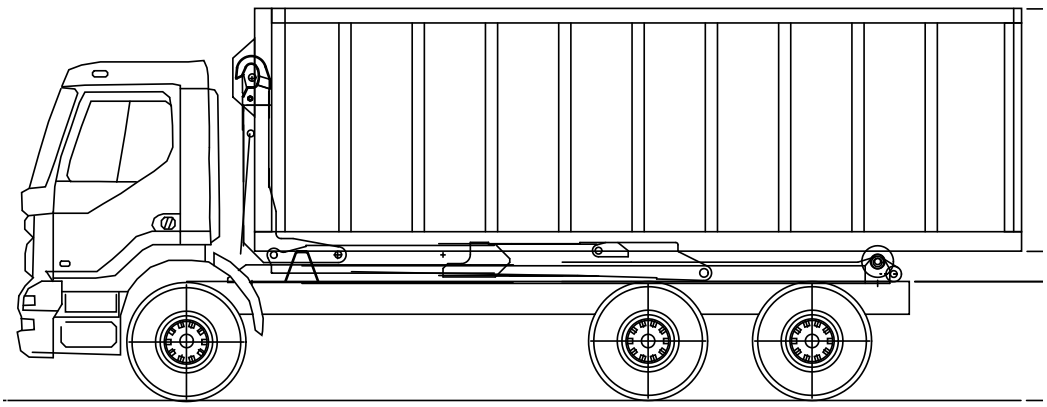
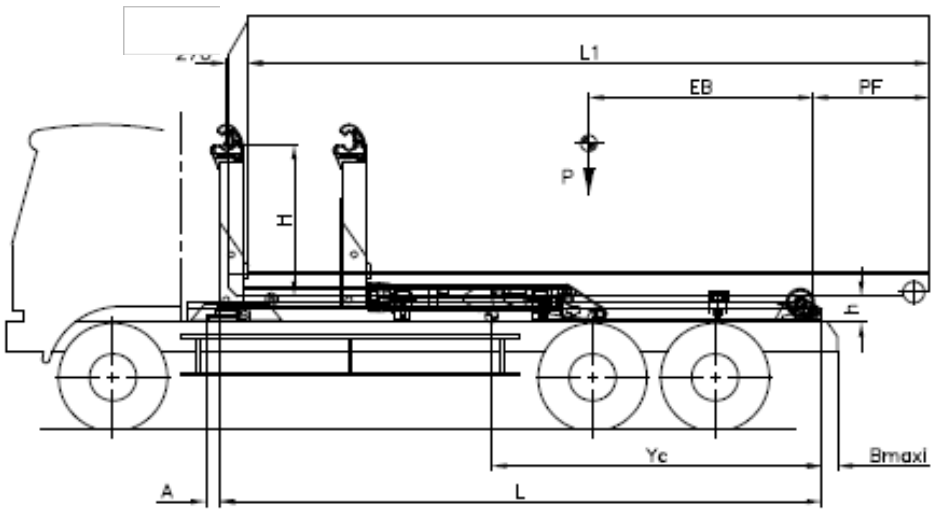
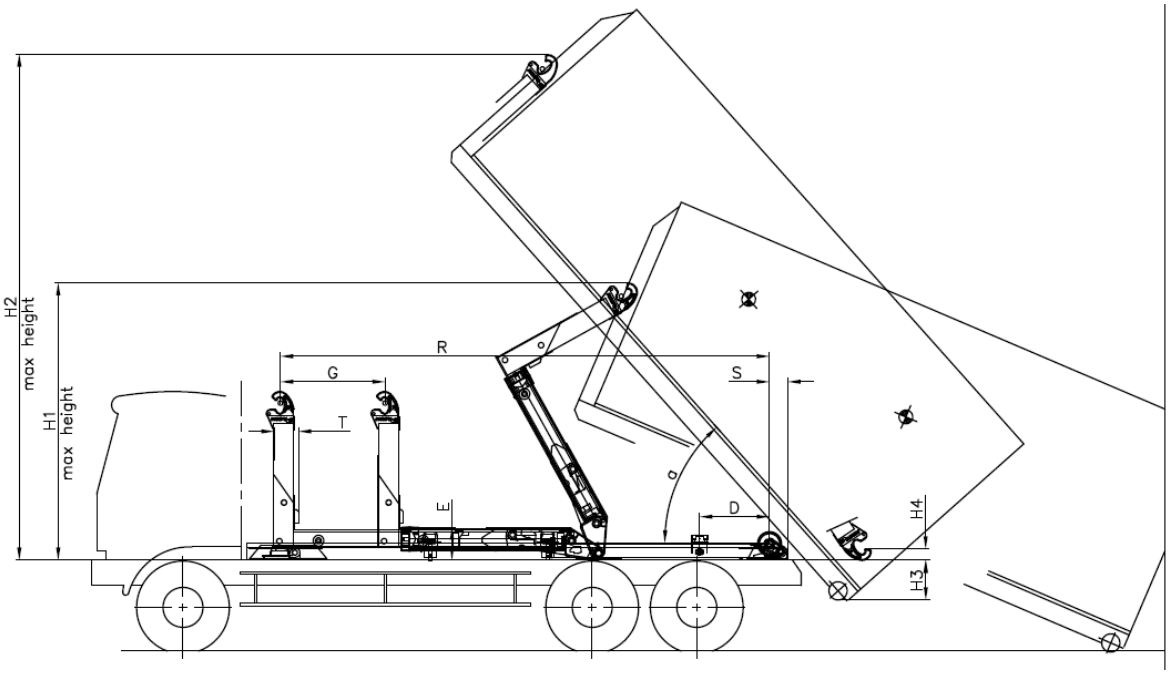


Illustration 2-04

Mounting of a hook loader onto a 3-axle truck

Sample Pacwin Drawing





Receiving Inspections of Chassis and Hook Loader 3

CONTENTS

Receiving Inspections 3.1

3.1-1 Receiving inspection of the chassis

When the customer truck arrives, check following points:

- Check condition of the truck (possible damages, lightening system, windows, etc)
- Check its definition according customer's order and with the project planning (wheel base, type of driver's cab, permissible total weight, max. front and rear axle load)
- Check the PTO (torque, ratio, etc) with order acknowledgment and project planning.
- Check axle load distribution on the truck (spare wheel simulated in its definitive place) and compare it with the axle load calculation. By major deviation, recalculate the axle load distribution and the location of the loader.
- Check if truck components (gear box, cross beam, etc) above the chassis frame could impair assembly of the loader. In an opposite case see chapter 4.2-2.
- If the truck has a trailer coupling, check that the end crossbeam can be moved as needed and that there will not be any interference with the spring mountings. Move the end of frame crossbeam according to the existing drilling on the chassis. The new fastening will have to be done with the same number of bolts (otherwise ask for the manufacturer's agreement), Lowered end crossbeam, ask for the manufacturer's agreement for mounting underneath the spars.
- Make an inventory of accessories and all parts (e.g. Spare wheel). If anomalies are detected, notify the truck-supplier or the customer.

If one of the characteristics is not confirmed, inform the Palfinger Technical Support before executing any mounting.

3.1-2 Receiving inspection of the Hook Loader

Check condition of the loader (transport damages, etc)
Check loader according order acknowledgment (equipment, kit box, etc)
Check that loader can be assembled in the location specified by the loading distribution (be careful with the type of cabin, vertical exhaust, etc)

If the specification is wrong, inform the PalfingerTechnical Support before performing any mounting.

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Example of a workplace layout

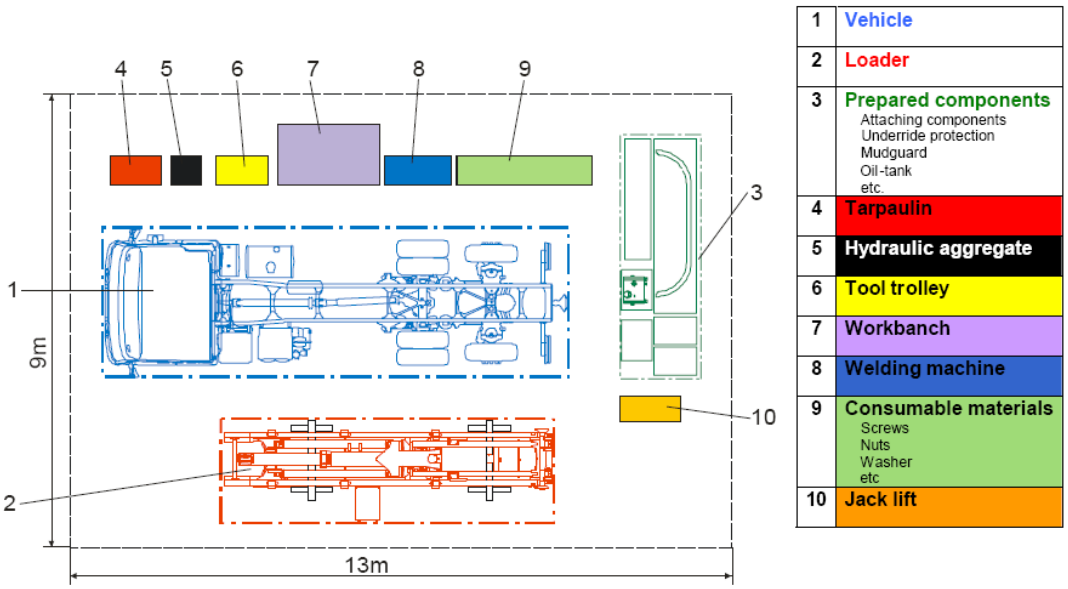


Figure 1: workplace layout

Illustration 4-01 workshop layout

Recommendation list of tools and machinery

List of tools and machinery

1	Angle grinder large		1	Spiral drill set 3 - 20 mm
1	Angle grinder small		1	Countersink set
1	Pneumatic impact wrench		1	Allen wrench set
1	Rivet puncher (rivet remove device)		1	Screwdriver set - slotted and crossed
1	Inert gas welding equipment MAG-M (with protective equipment and accessory)		1	Ring and open end spanner set 8 - 50 mm
			1	Socket wrench set 8 -50mm
2	Welding cover to protect chassis components		1	Torque spanner up to 300 Nm
			1	Tape measure (10m)
1	Mobile hydr. aggregate – appr. 200bar		1	Tape measure (2m)
2	Mounting rack			Crayon, pencil
1	Jack lift		1	Scriber
1	Pressure gauges (20 - 400bar) with test port		1	Fitter's hammer
1	Screw clamp set		1	Cable pliers set
6	Heavy-duty screw clamp		1	Wire brush
1	Drilling machine		1	Chisel -, punching tool set
1	Magnet drilling machine		1	Tarpaulin to protect the driver's cab
Additional auxiliary and working material				
2	Rectangular pipes ~ 40x80x2400 (or square timber) for mudguard assembly			Rust-protective-spray, body-cavity spray
				Cleanup paper papier emeris
	Hydraulic oil			Oil binding agent

4.2-1 Remarks on working on the chassis frame

Drilling on the chassis frame

All of the fastenings must be fixed with bolts to the web of the main chassis beams.

It is absolutely forbidden to drill or however produced holes in the flanges of the chassis frame as they cause a high concentration of tension. The only exception is the drilling of holes in the frame overhang which are required to mount the finishing cross-beam.

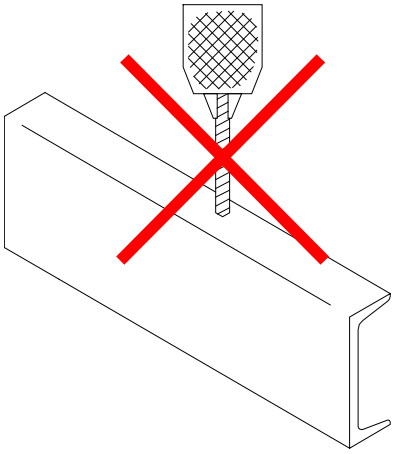


Illustration 4-02

The pre-drilled holes should primarily be used for mounting the auxiliary frame and other components to the chassis. If more holes are required, they should be drilled according to the guidelines of the truck manufacturer.

In general, however, the minimum distances must be observed in accordance with the following illustration. The maximum hole diameter in the frame area between the front and rear axle(s) is about 20 mm

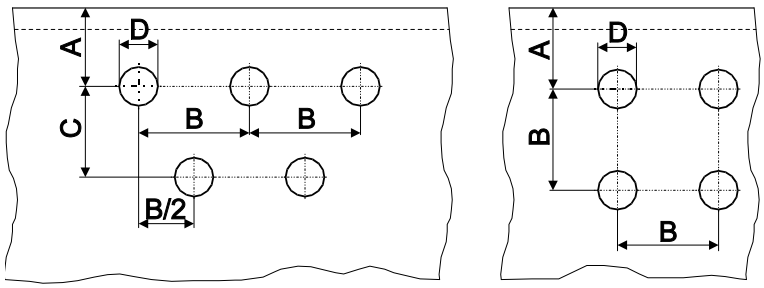


Illustration 4-03

A: Distance from hole to chassis flange min. 3 x D or min. 40 mm

B: min. 4 x D

C: min. 3 x D

Welding on the chassis frame

General

Welding on the chassis frame should be avoided whenever possible. If it is necessary to do welding work – for example, because the chassis must be extended – it must be done with the greatest care by competent personnel. The truck manufacturer's guidelines must be strictly followed.

It is strictly forbidden to weld the mounting unit to the chassis frame. Modifications of the chassis (modification of the wheelbase, the rear overhang, etc.) must be done in conformity with the vehicle manufacturer's provisions.

Electric welding on the mounting

Trucks today are equipped with a large number of electronic controls and sensitive components such as ABS, automatic transmission, torque amplifiers, etc. To prevent damage to these components, the following recommendations on welding must be followed in addition to the instructions from the truck manufacturer.

- Disconnect the minus and plus cable from the battery.
  ATTENTION – disconnect the minus pole of the truck battery first!
- Attach the earth connection of the welding current source as close as possible to the point being welded.
- The current must not flow through supports or connection points.
- Protect plastic pipes and electrical lines.
- Protect plate springs and bellows.

Welding holes closed

If new holes must be drilled at a distance not closer than three times the hole diameter to an existing hole, the existing holes must be welded up. Proceed as follows:

- Chamfer the hole to 2/3 of the material thickness.
- Place a copper disk on the inner side of the hole.
- Weld the hole up. If the diameter of the hole is more than ∅20 mm, us a chamfered disk as filling.
- Weld the hole closed on the inner side as well.

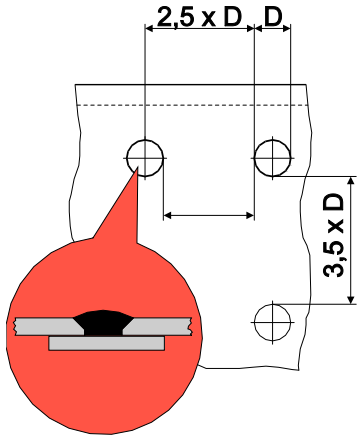


Illustration 4-04

Selection of the welding procedure

The selection of the welding procedure is primarily depending on the material and the production process. As a rule, the metal-gas-shielded welding **MAG-M** (**m**etal-**a**ctive gas welding with **m**ixed gas) is used.

The selection of the protective gas and the welding additive as well as the form of the welding seam and its thickness is the responsibility of the welding supervisor.
The welding may be done only by people in possession of a valid welder's certificate in accordance with EN 287-1 or with an equivalent national welder's certificate.

General remarks on welding

Limits on thickness of seam.

Minimum thickness of seam a_{min} :

The minimum seam thickness a_{min} may not be less than 2 mm (see also DIN 18800). In addition,

$a_{\min} \geq \sqrt{t_{\max}} - 0.5$ is prescribed for the minimum seam thickness for technical reasons. This formula applies to sheet thicknesses up to 30 mm.

Maximum seam thickness a_{max} :

In general, the maximum seam thickness should not exceed 0.7 times the minimum wall thickness.

$a_{\max} = 0.7 * t_{\min}$ t = sheet thickness

- Vertical-down welds are not permitted anywhere on the mounting.

Modifying the frame overhang

When the rear overhang is modified, the centre of gravity for the payload and the body shifts and as a result the axle loads change. Only an axle load calculation can show whether this is within the permissible range. Such a calculation is therefore essential and must be carried out before beginning the work. The calculation will show you the required value for the rear overhang. Before carrying out any modifications to the rear frame overhang, therefore, it is essential to contact the truck supplier or there mounting instruction for detail information.

Modifications to the wheelbase

The wheelbase influences the load on the front and rear axles and thereby the static design and the driving and braking dynamics of the vehicle. Before carrying out any modifications to the wheelbase, it is essential to contact the truck supplier or the mounting instruction for detail information.

Mounting heavy components

Heavy components such as battery casings, fuel tanks, spare tyres, oil tanks, etc., put significant stress on the chassis frame. Whenever heavy components are moved or mounted, observe the following points:

- Mount the component as close as possible to a cross-beam. Attaching an inner and/or outer reinforcement plate can distribute the torque stress so that the stress on the frame is reduced.

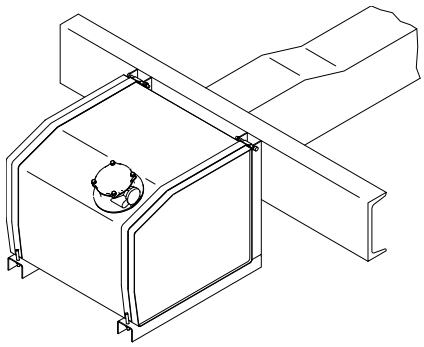


Illustration 4-05

- Washers must be placed on the inner side of the chassis frame for the mounting bolts (min. 200 HB).
- We recommend using “driven bolt connections” for large components
- A sufficient number of bolts and a large clamping surface should be used so that there is little stress on the frame. Whenever possible, use the existing holes. If additional holes must be drilled, observe the notes in the chapter “4.1-1 Drilling on the chassis frame”.

4.2-2 Washing of the chassis

Wash truck chassis with a steam cleaner using hot water with a phosphate degreasing product, keep the water gun as far from the bodywork as possible.
Do not insist on:

- -electrical or electronic boxes,
- -pins and bushes
- -air intakes of heating, (engine) induction and air filter,
- -pneumatic and electric components,
- -shock absorbers and suspension
- -tank level indicator

Rinse with hot water only.

4.2-3 Aligning the chassis before beginning the installation

Before beginning the installation, the chassis frame must be aligned completely in order to ensure irreproachable overall quality and a long useful life of the mounted vehicle. The main chassis beams must be lying parallel, and the frame must not be entangled. A minimum of 3 adjustable supports must be used to align a chassis with pneumatic suspension. These supports must not be removed during the mounting.

The chassis must be aligned again any time the vehicle has been moved.

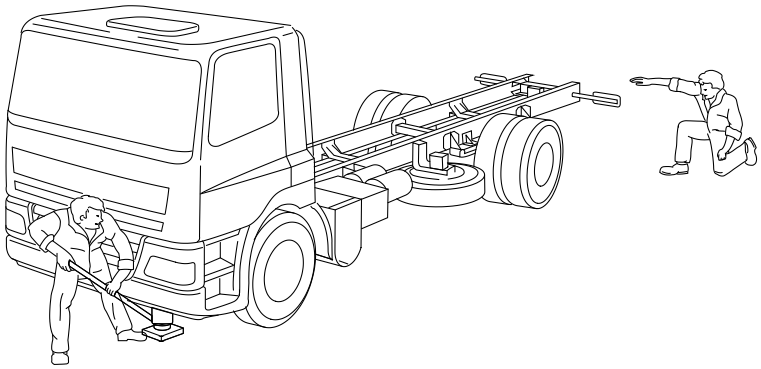


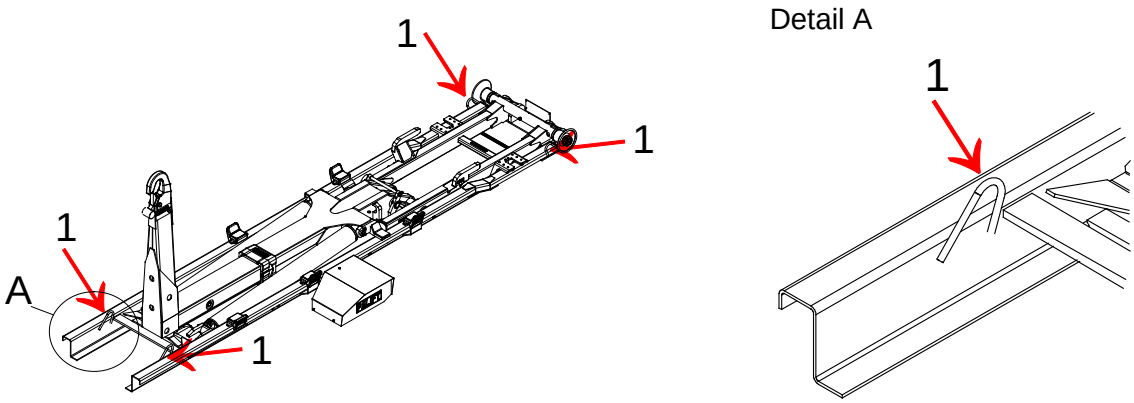
Illustration 4-06

Safe handling of the Hook Loader

Consult the technical data sheets to find the dead weight of the loader. Be sure to take into account any accessories that have been installed.

Safe handling of the loader can be guaranteed only by the use of suitable and properly dimensioned separate lifting equipment, belts, and similar objects. When handling the loader, there is an extreme risk of being crushed. Stay at a safe distance from the equipment at all times.

We recommend to handle the loader with an overhead crane with separate lifting accessories. There are attachment points on the loader at the front and rear for safe attachment.



1 ……. Attachment point

Illustration 4-07

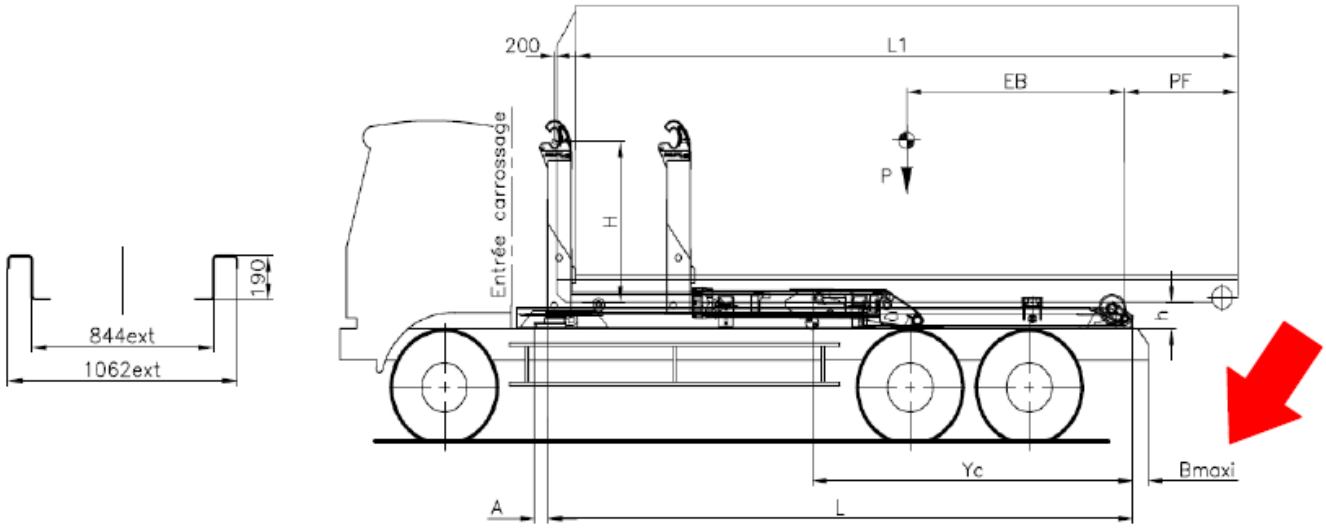


Illustration 4-08

Place the Hookloader onto the truck chassis

Check that there is no collision area on the hook loader
(ex. rear spring blades with hydraulic tubes fixation).

Distance A should be at least 200mm (minimum distance A, see figure 4-08)

Take off the hook loader from the chassis and rest it on the mounting rack.

Cut rear chassis overhang to length

Cut the rear chassis overhang to length according to the guidelines of truck manufacturer.
Allowed chassis frame extension from 0 to “B maxi”

“B maxi” should be kept at 120mm (max) for 50-52 degree tipping angle(see figure 4-08)

Cut front chassis overhang to length

Cut front end of the loader sub frame to length
The profile end should have a "smooth" run-out(see figure 4-09)
Protect the cutted area against corrosion

Preparation of the Hook Loader

Cut front end of the loader sub frame

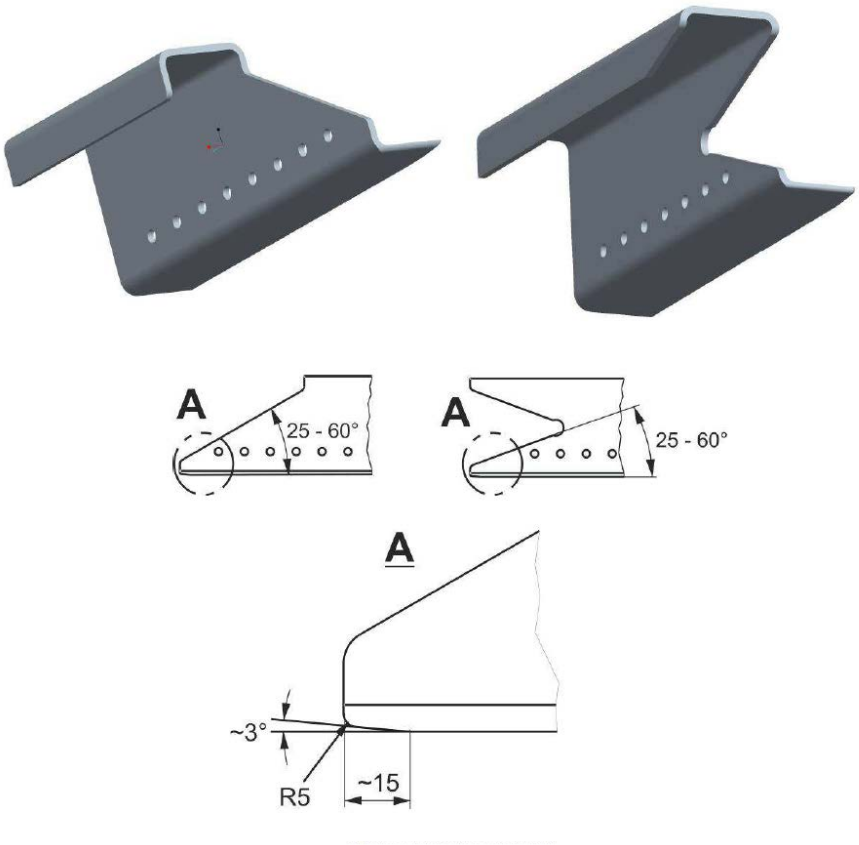


Illustration 4-09

Correcting the length of the Hook Loader on the chassis

The measurement given by the load distribution calculation must be adhered to cut the subframe to length cutting the front end as shown below Fig. A or B

Fig. A

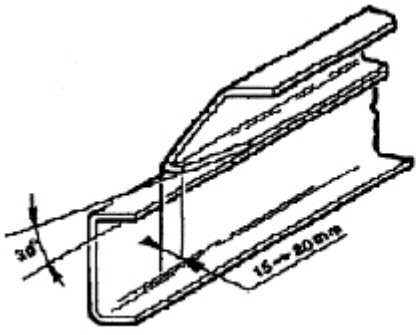
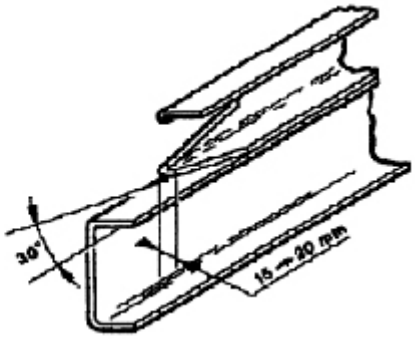


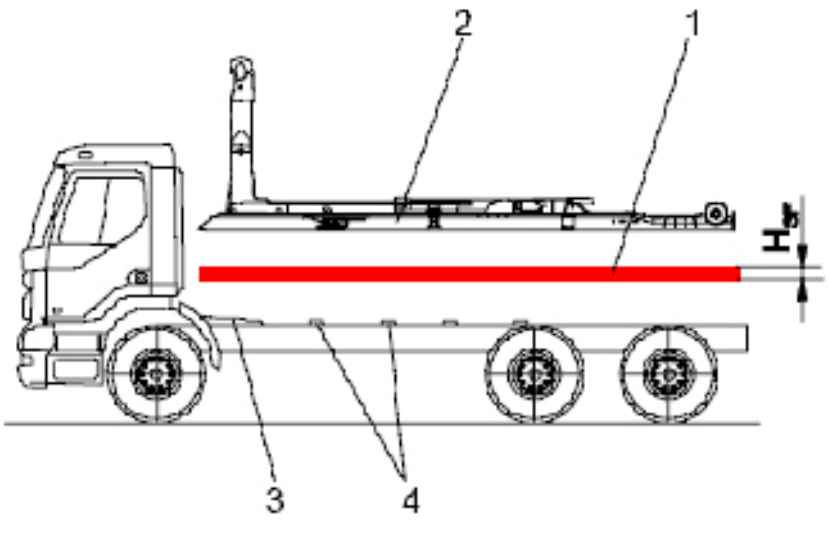
Fig. B



Preparation of the Hook Loader 4.3

Additional subframe

It can be needed to put and additional subframe between the Hook Loader and truck chassis, because of parts on the truck which are higher than the chassis. (ie. Gearbox, cross members, etc.)

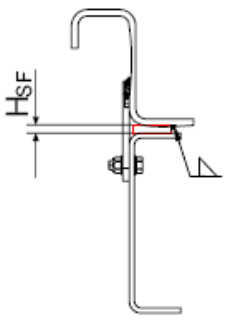


1……Subframe
2……Hook Loader
3……Gear box
4……Cross member
HSF...Subframe height

Minimum length of the additional subframe = total length of the Hook Loader.
The additional subframe needs to get welded to the loader and not to the chassis of the truck.
Subframe has to be painted before mounting!

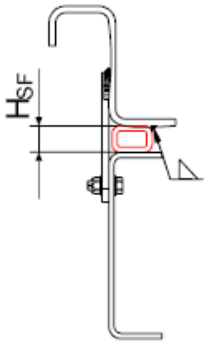
Flat bar
60 x H_{SF}

H_{FS} = 8 to 20mm



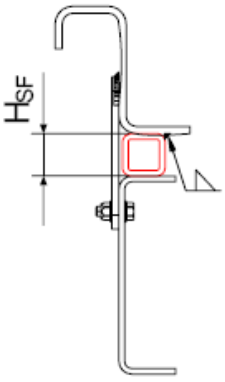
Rectangular tube
60 x H_{SF} x S

H_{FS} = 25 to 50mm
S ≥ 8mm



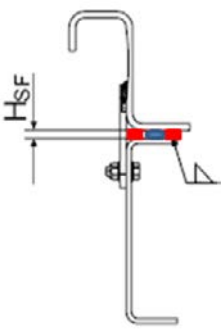
Square tube
H_{SF} x S

H_{FS} = 60 to 80mm
S ≥ 8mm



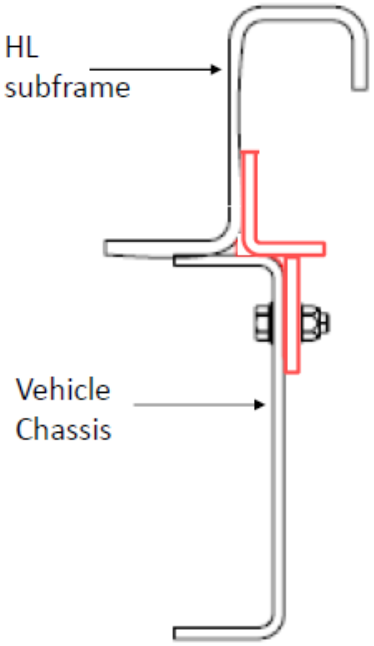
Flat bar
60 x H_{SF}

H_{FS} = 8 to 20mm

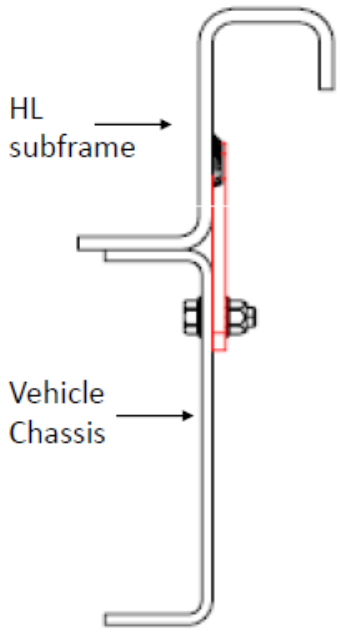


Type of mounting brackets

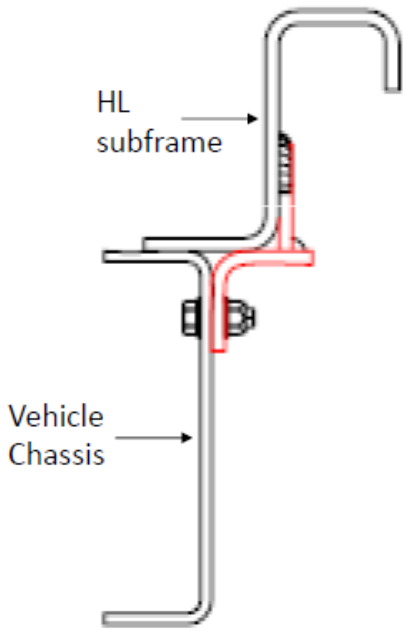
HL shorter than vehicle chassis



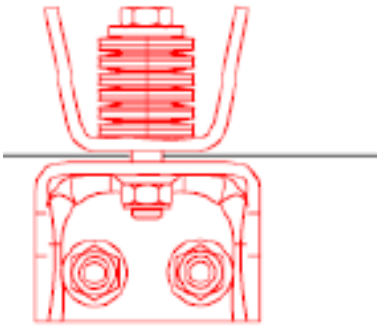
HL same length as vehicle chassis



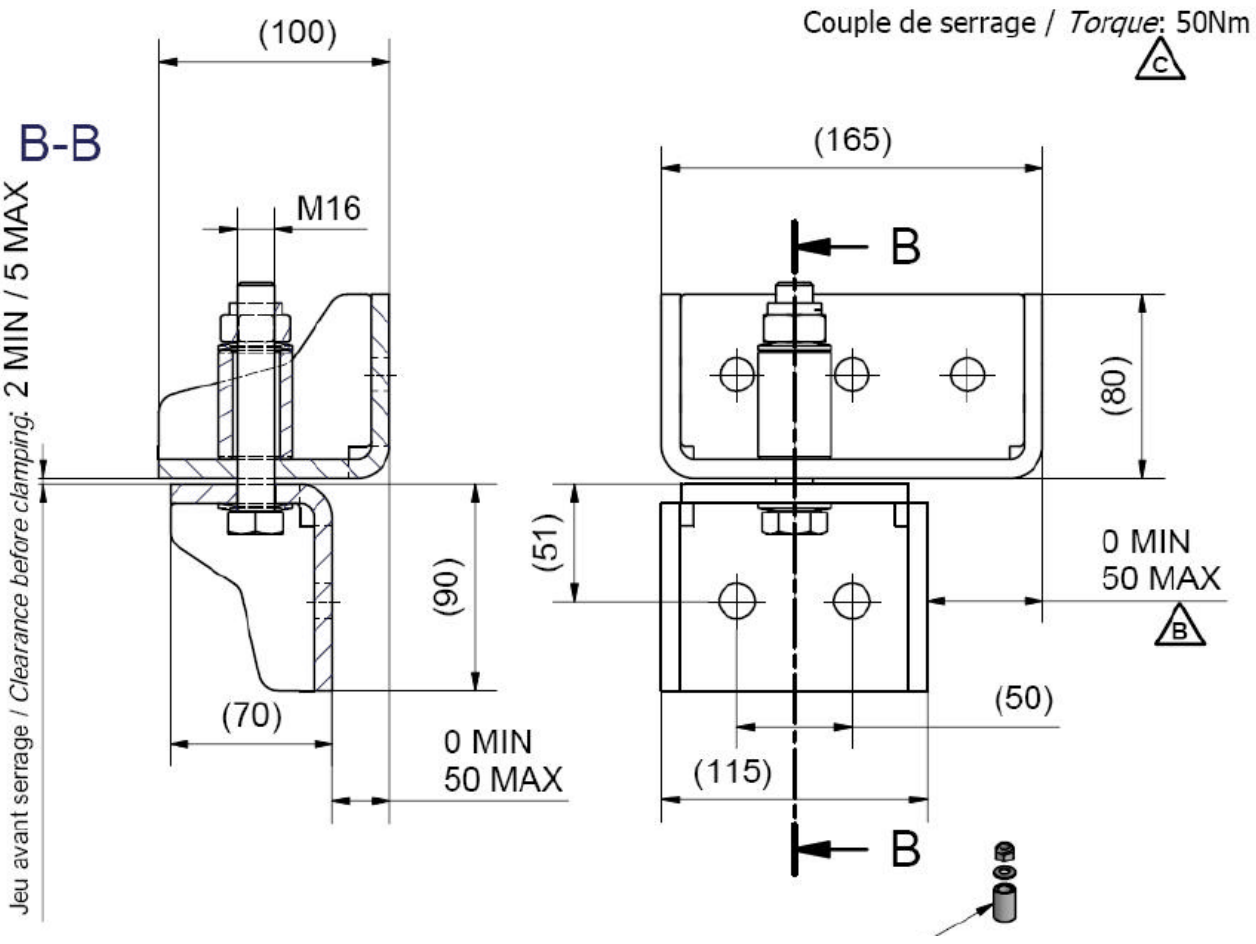
HL longer than vehicle chassis



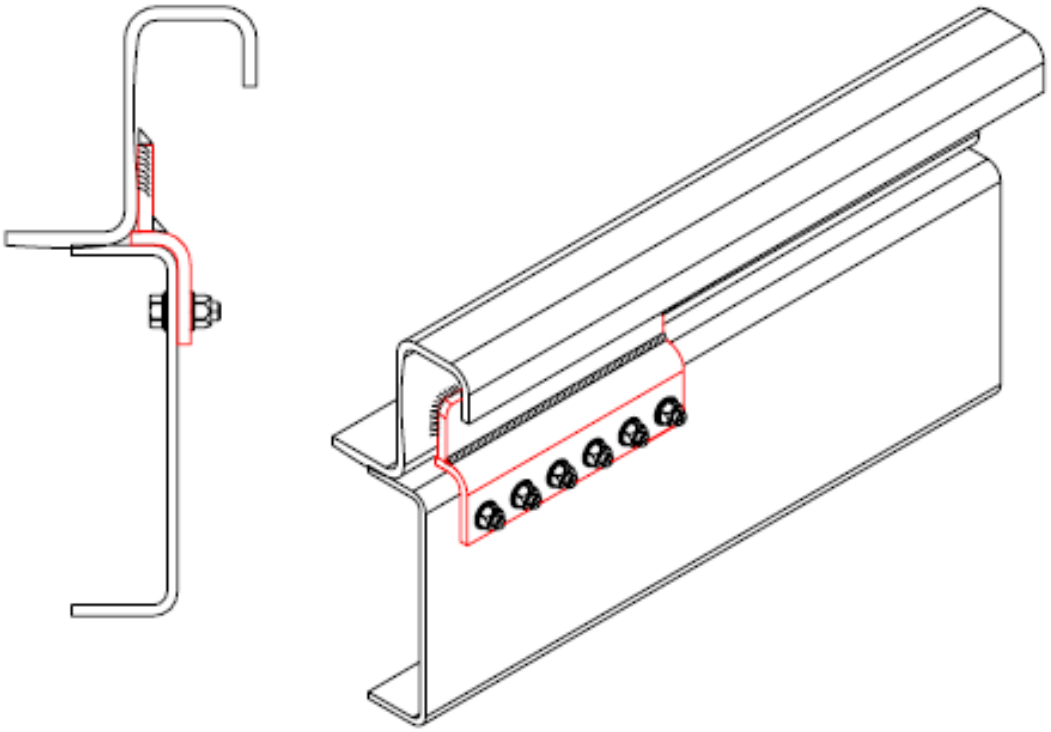
Type A bracket



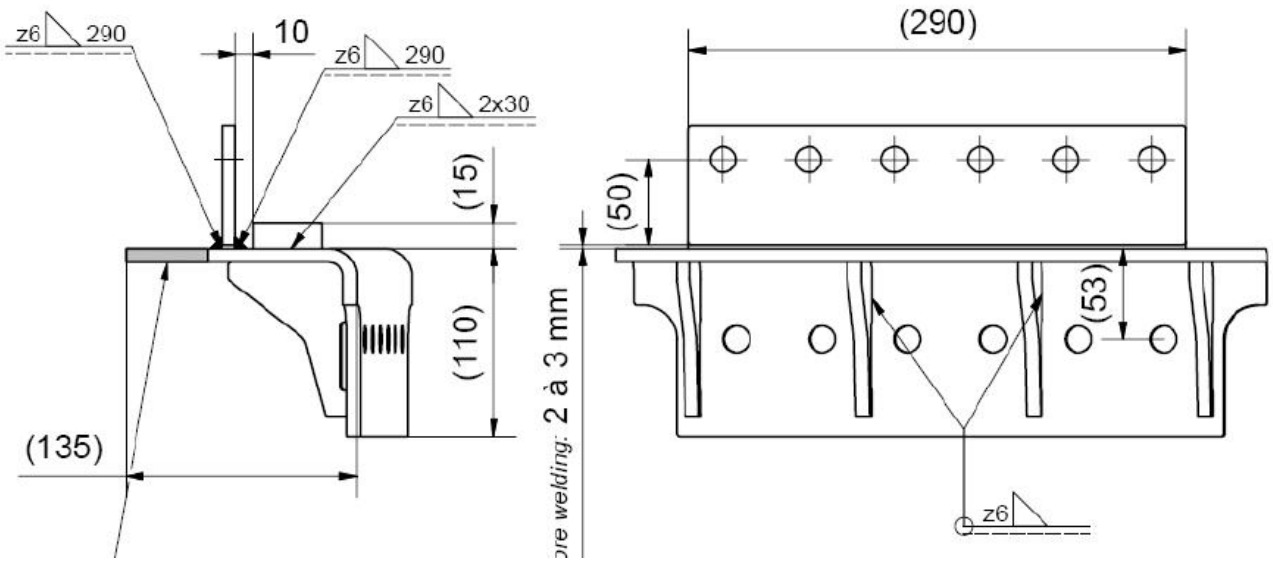
Sample of Type A brackets



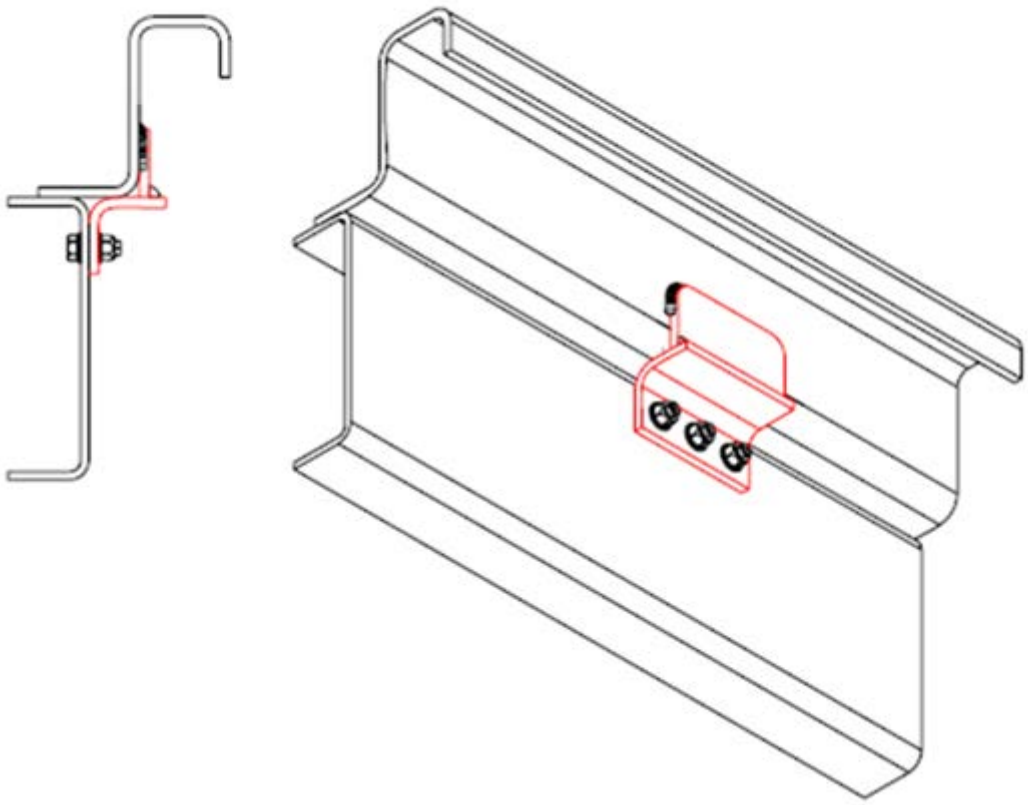
Type B bracket



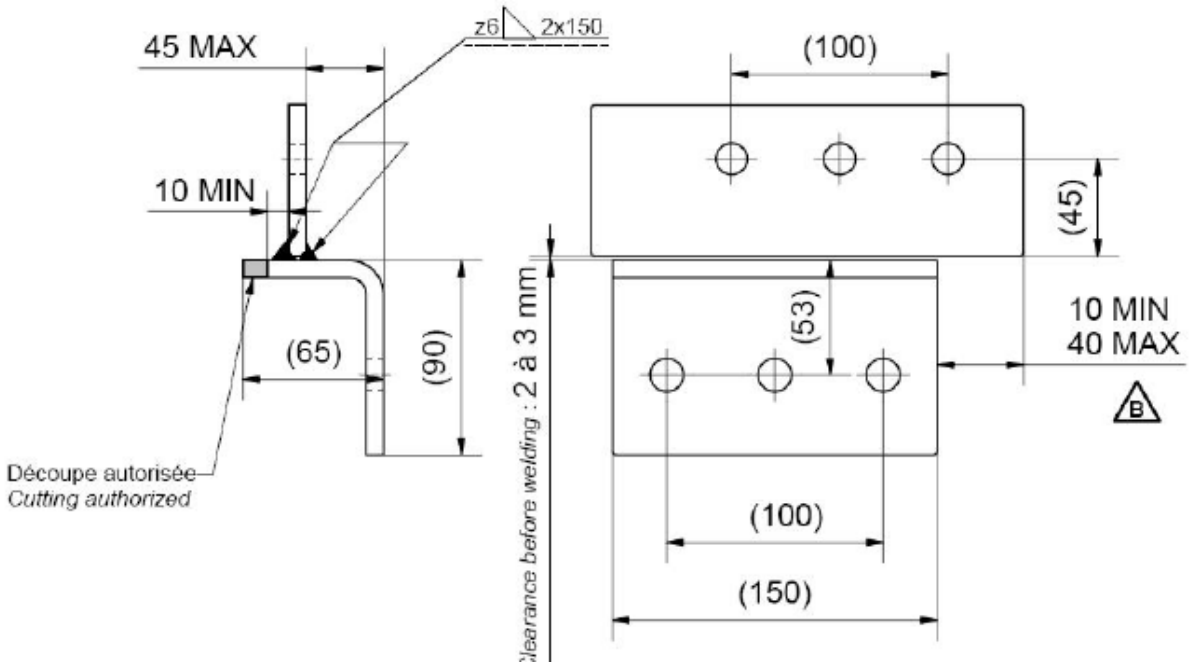
Sample of Type B brackets



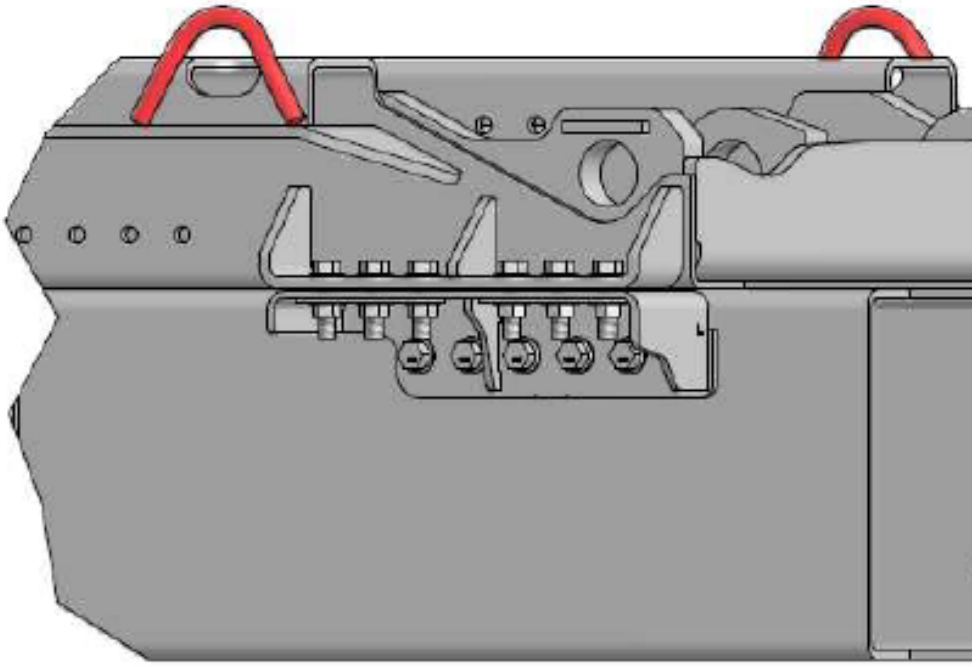
Type C bracket



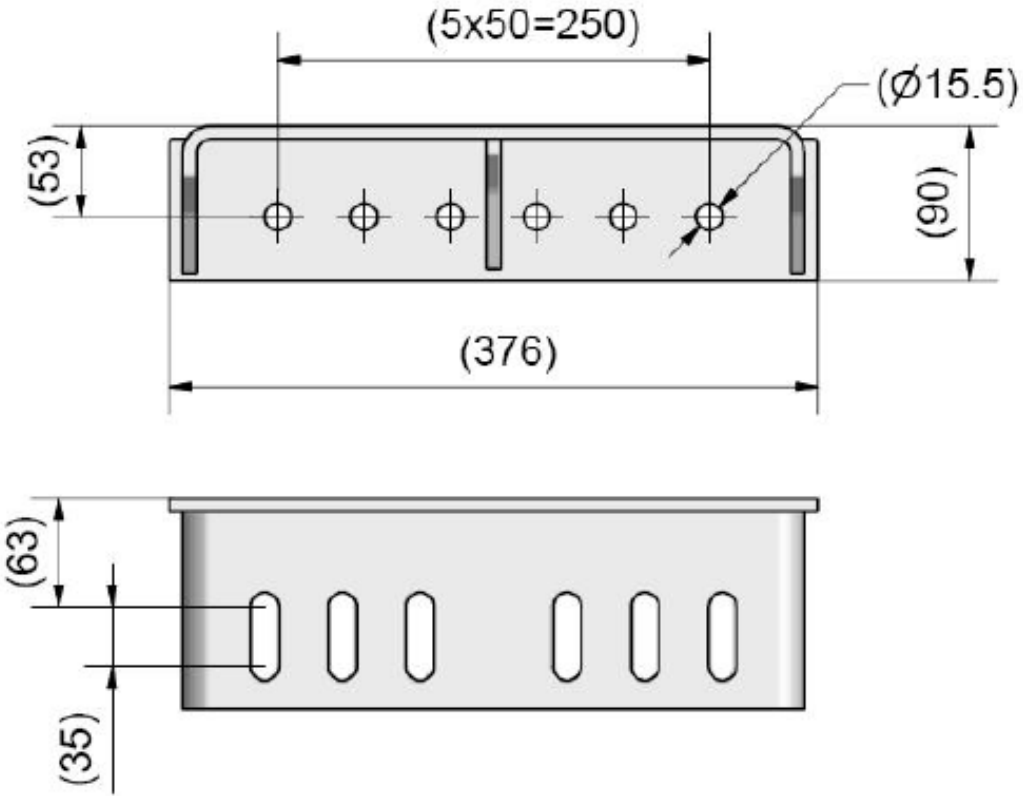
Sample of Type C bracket



Type D bracket



Sample of Type D brackets



Guideline to mounting bolts

Minimum number of screws for different mounting bracket areas:

Model	Bracket / Area	A1, A2	B	C1	C2	D
T13, T15	Sub-frame	2	4	3	2	5
P14	Chassis-frame	2	4	3	2	5
T18, T20, T22, T24	Sub-frame	2	5	3	3	6
P17, P20, P22, P24	Chassis-frame	2	5	3	3	6
T26, T30	Sub-frame	2	6	3	3	6
	Chassis-frame	2	6	3	3	6

Tightening torque:

Mounting screws on the sub-frame	M14 – 10.9	185Nm
Mounting screws on the chassis-frame	M14 – 10.9	185Nm
	M16 – 10.9	285Nm
Vertical screw on the bracket A1; A2	M16 – 10.9	50Nm

Type and dimensions of the mounting screws:

All mounting brackets have to be fixed with high-strength flange-head screws M14with quality 10.9 and adequate nuts and must be tightened with a torque wrench.

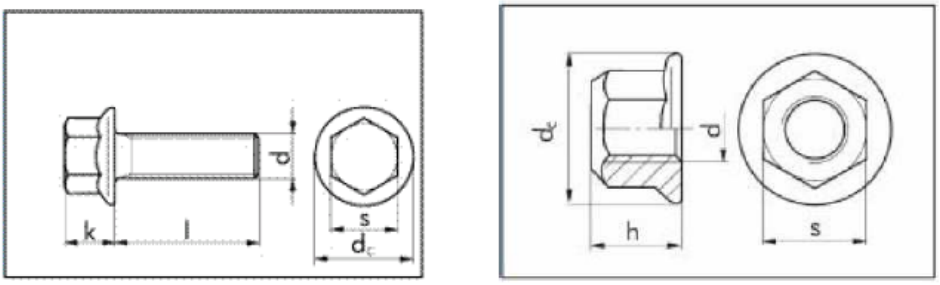
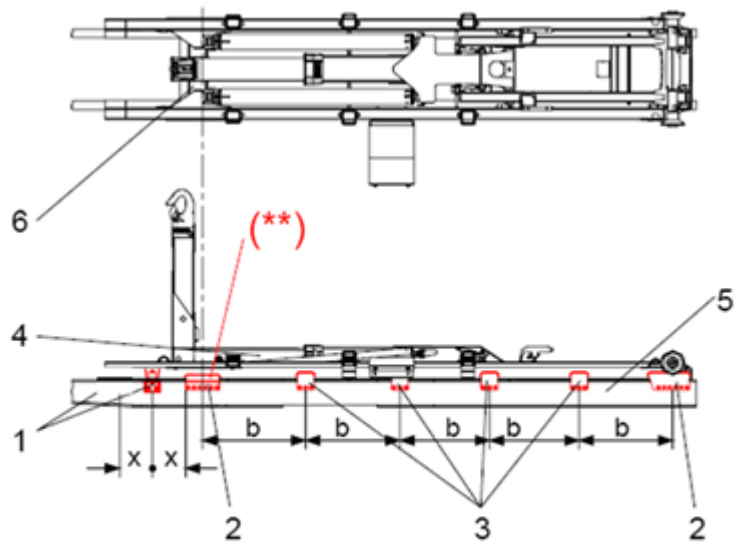


Illustration 4-10 Flange head screws

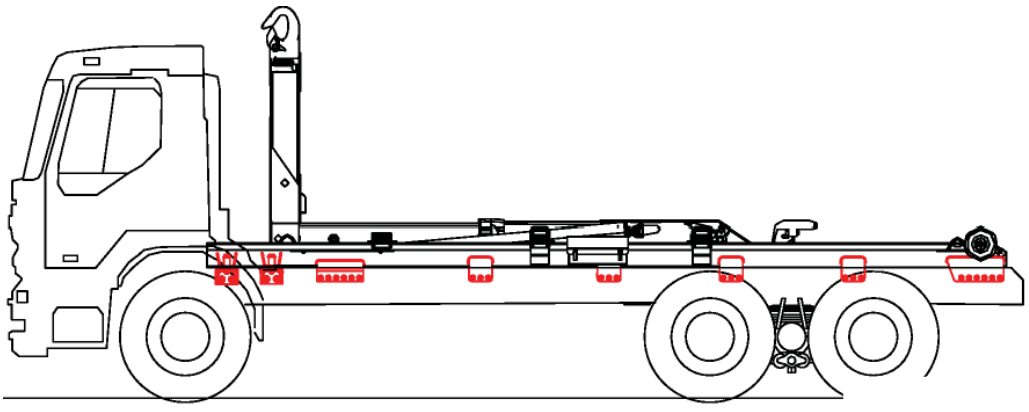


x = max. 400mm
b = max. 800 – 1000mm

- **1 - Mounting Bracket A**
- **2 - Mounting Bracket B**
- **2a - Mounting Bracket D**
- **3 - Mounting Bracket C**
- **4 - Hook Loader**
- **5 – Vehicle Chassis**
- **6 - Chassis Cross Beam**

(**) The first rigid connection has to be in the area of the cross beam (6). Admissible tolerance ± 400mm.

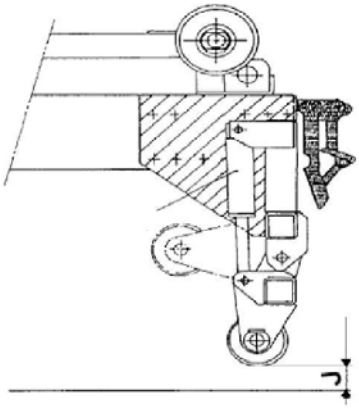
If all measures are checked and there is no interference with any kind of equipment, a certificated welder can weld the loader to the mounting elements.

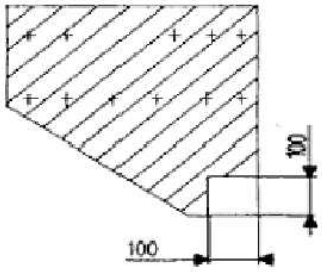


If and when a stabilizer system is required. This can only shown when a stability calculation is complete, which is essential

4.6-1 Roller stabilizer

Roller stabilizer is mounted at the rear overhang of the chassis





Side sheet metal thickness 8mm
Fastening of the side sheet metal – quantity - min. 8 bolts M14 – 8.8

Space to the ground (J) should be 50mm (min)

- rear air-suspension –-> lowered position
- rear leaf-suspension –-> fully laden vehicle

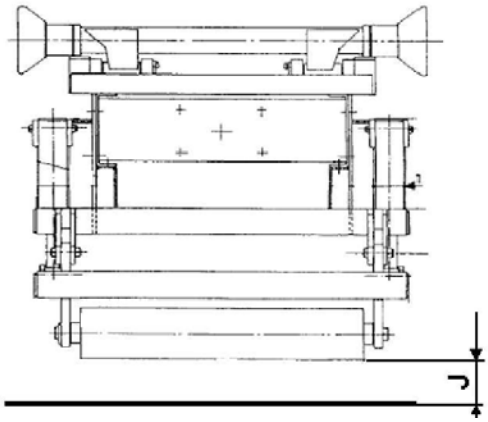
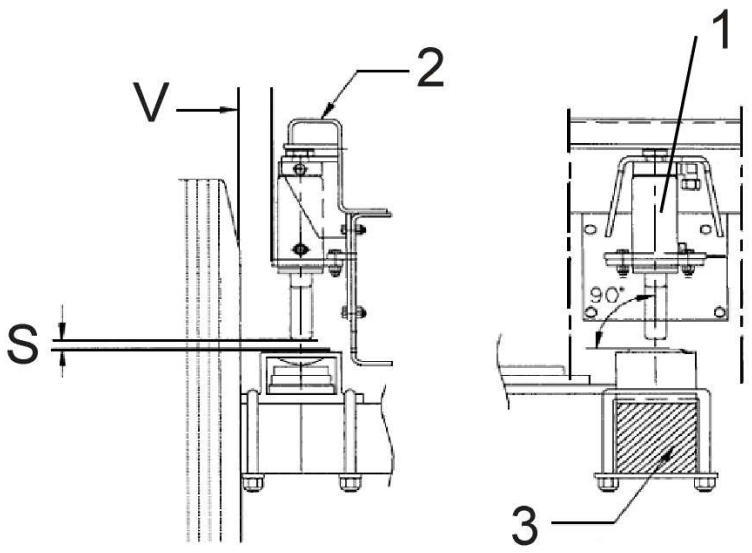


Illustration 4-11

Measured by vehicle with fully loaded Truck

4.6-2 Axle stabilizer

Axle stabilizer is mounted above the leaf spring of the last rear axle.



1 ….. Axle stabilizer
2 ….. Loader subframe
3 ….. Axle
S ….. Space axle - stabilizer
V ….. Wheel space

Illustration 4-12

Required space (S) between axle and axle-stabilizer has to be 10mm by fully laden vehicle.

Installation Remarks of the Hydraulic System 5

CONTENTS

Determining the ratings of the hydraulic pumps

By loader mounting general are used pumps with constant discharge flow.

There are the following construction types of constant flow pumps:

- o Gear pumps (as a rule up to a max. 230 bar)
- o Piston pumps (suitable for higher pressures)

$$V_g = \frac{q_v * 1000}{n_{en} * i_{tot} * \eta_{vol}}$$

$$i_{tot} = i_{ge} * i_{pto} = \frac{n_p}{n_{en}}$$

$$n_p = n_{en} * i_{tot}$$

V_g	Displacement volume of the pump (rating) per revolution [cm³]
q_v	Discharge flow (volume flow) [l/min]
n_{en}	Motor rotational speed [min^{-1}]
n_p	Pump rotational speed [min^{-1}]
η_{vol}	Volumetric efficiency factor
i_{tot}	Gear transmission ratio total
i_{ge}	Gear transmission ratio in gearbox
i_{pto}	Gear transmission ratio in auxiliary drive

The total gear transmission ratio (i_{tot}) is the ratio of the pump rotational speed to the motor rotational speed. The gear transmission ratios can be found in the pertinent technical data sheets of the product manufacturers.

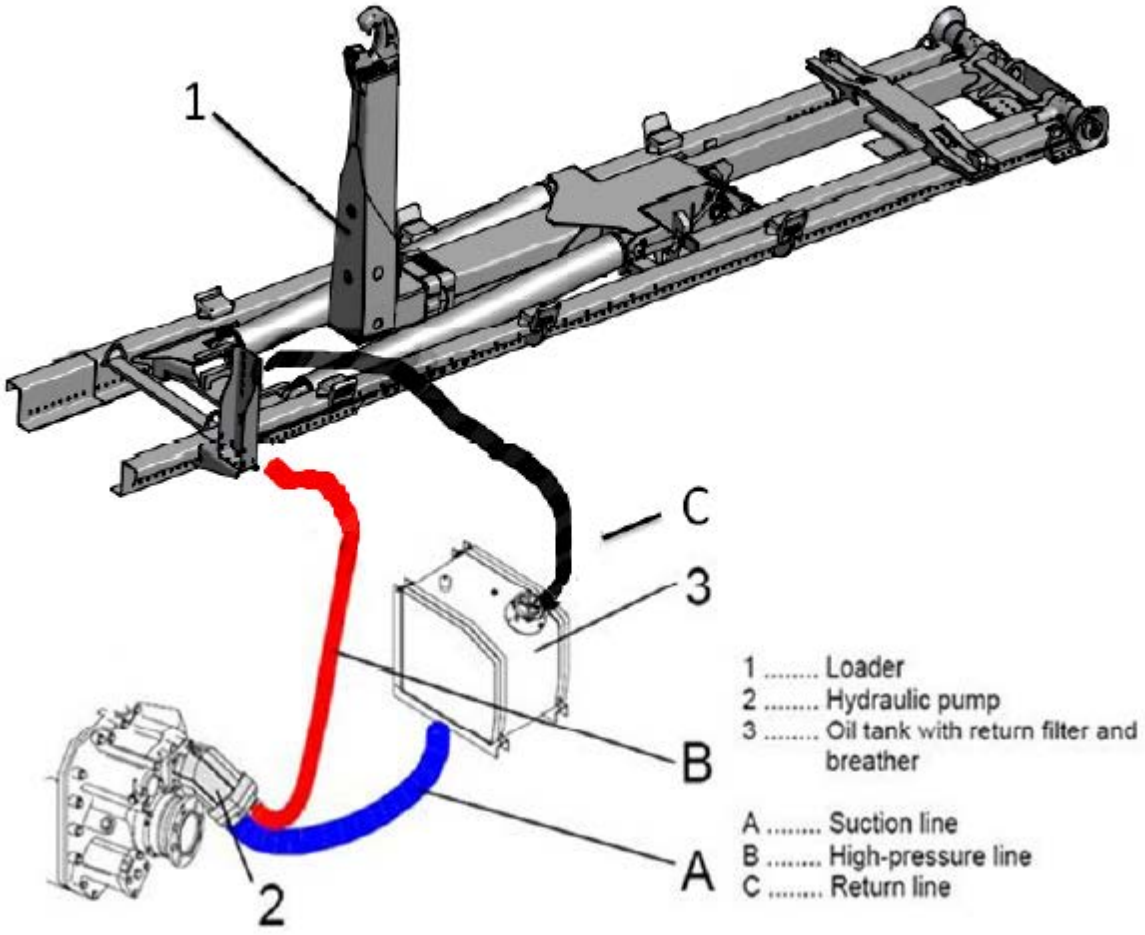
The rotational speed of combustion engines must be observed as recommended by the engine manufacturer. Generally this is between 800 and 1200 min^{-1} for vehicle engines.

The volumetric efficiency factor (η_{vol}) of a hydraulic pump (axial piston pumps or geared pumps) can generally be taken at about 0.95. Precise data are available from the pump manufacturer.

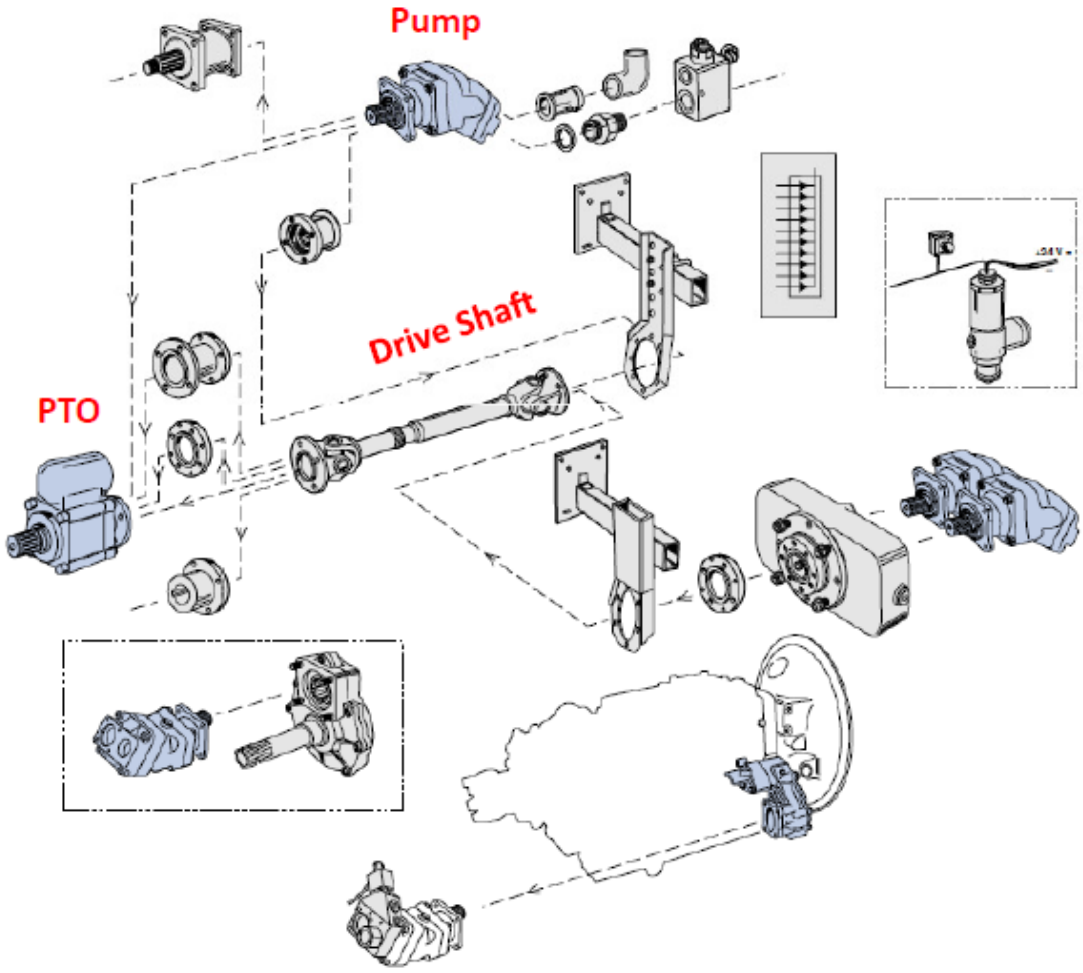
The hydraulic pump must not be operated above the permitted rotational speed under any circumstances. The pump should always operate in the optimal rotational speed range (see data sheet of the hydraulic pump) to achieve a high efficiency factor and operational quietness.
Therefore a defined and constant engine operating speed is obligatory.

Engine speed is recommended to 1000 rpm in case of a PTO ratio of 1:1.

Hydraulic System of Hookloader



PTO – PUMP connection

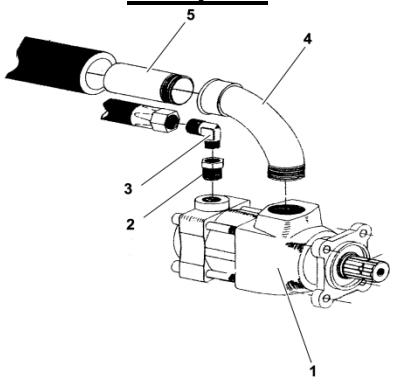


Pump flow-rates are calculated at 1000 RPM of the engine speed.

Recommended Pump and tank size

Hook Loader Type	T8-T10	T15-T15A-T20-T20A-T22-T22A		
			T20 to T30	
Main valve type	SD 8	SDS150		
			SDS180	
Pump Flow rate@ 1000rpm of engine	41 Litre/min	63 Litre/min	80 Litre/min	108 Litre/min
Tank size	50	100	100	140

Pump Kit



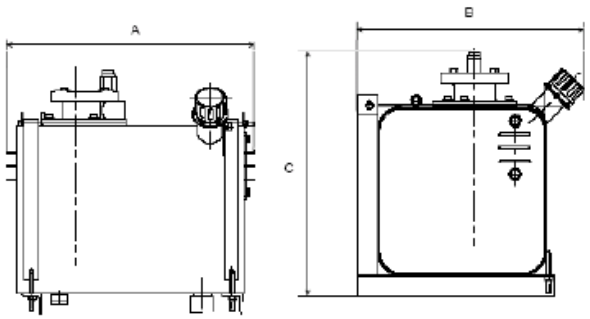
Pos.	Code	Qty.	Description	Dimension
	M2371239	**1**	*Pump kit*	**LEDUC PA 50**
1	M63060912	1	*Pump*	PA 50
2	M63010256	1	*Connector*	GE 20S R3/4"-ED
3	M63010361	1	*Connector*	EW 20S
4	M63070040	1	*Connector*	REF 92 1" 1/2 - 40 x 49
5	M5115741	1	*Pipe*	
	M2371101	**1**	*Pump kit*	**LEDUC PAC 63**
1	M63060932	1	*Pump*	PAC 63
2	M63010256	1	*Connector*	GE 20S R3/4"-ED
3	M63010361	1	*Connector*	EW 20S
4	M63070040	1	*Connector*	REF 92 1" 1/2 - 40 x 49
5	M5115741	1	*Pipe*	
	M2371102	**1**	*Pump kit*	**LEDUC PAC 80**
1	M63060931	1	*Pump*	PAC 80
2	M63010256	1	*Connector*	GE 20S R3/4"-ED
3	M63010361	1	*Connector*	EW 20S
4	M63070040	1	*Connector*	REF 92 1" 1/2 - 40 x 49
5	M5115741	1	*Pipe*	
	FM2371100	**1**	*Pump kit*	**LEDUC 108L_Bend**
1	FM63060714	1	*pump bend axle*	pump_LEDUC XPS108_0520070
2	M63010256	1	*Connector*	GE 20S R3/4"-ED
3	M63010361	1	*Connector*	EW 20S
4	FM63060109	1	*45d elbow connector 2"*	LEDUC fitting 0517893 45d 2"
5	M63010386	1	Connector	RI 1" EDX 3/4"

Recommended Tank size

Q_{Tank} = 1,15 to 1,5 * $Q_{Pump(s)}$ Q_{Tank} Tank volume [l]

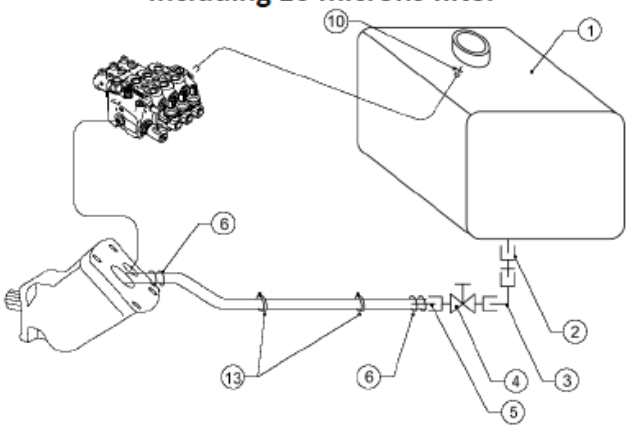
$Q_{Pump(s)}$ Pump discharge flow [l/min]

Tank



Volume (liter)	50	100	140
Length (A) mm	410	550	555
Width (B)mm	540	780	520
Heigth (C)mm	545	520	665

Including 10 microns filter



Every tank consists of the following components.

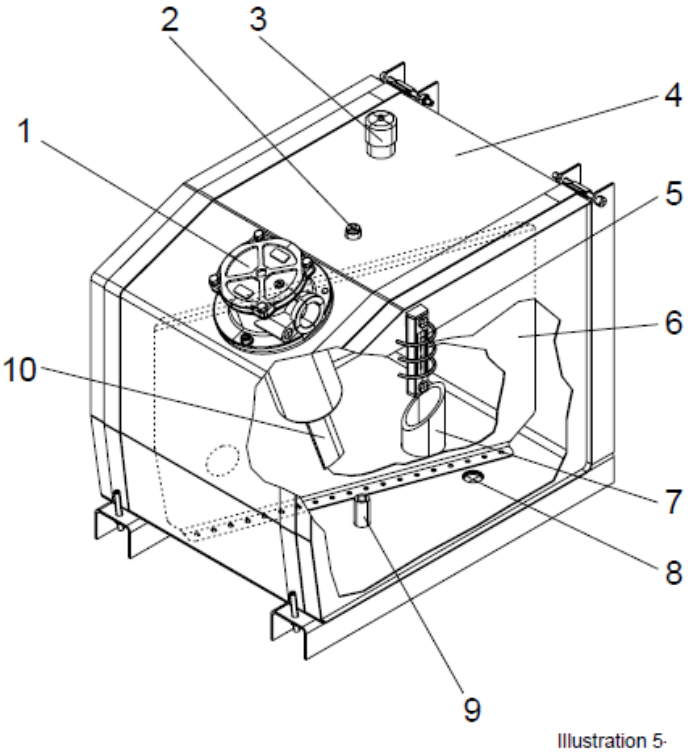


Illustration 5-

1.... Fill connection/Return filter
2.... Connection leak oil
3.... Ventilation filter
4.... Tank body
5.... Oil fill indicator
6.... Baffle
7.... Suction connection
8.... Drain plug
9.... Connection leak oil
10.... Return connection

Installation Remarks for the Pilot Operating System 6

CONTENTS

Pilot Operating System 6.1

6.1-1 General

The spools on all Palfinger control valves are pilot operated. This means, that they are not operated by the hand lever directly but driven by pneumatic pilot operating systems. The hand levers (not mounted on loader applications) could only be used as a emergency operating possibility. If so, the safety system of the loader is normally not working anymore.

Basically, Palfinger offers different types of pilot operating systems, which can be used according to customers wishes on all possible products.

The electric and pneumatic signals are combined in the so called “multi hose” which leads from the pilot control unit to the connection box near the control valve.

The control valve has to have pilot operating cylinders installed, which finally move the spool. Depending on the pilot operating system, they can be on/off or proportional controlled.

- **Pneumatic pilot operating system**

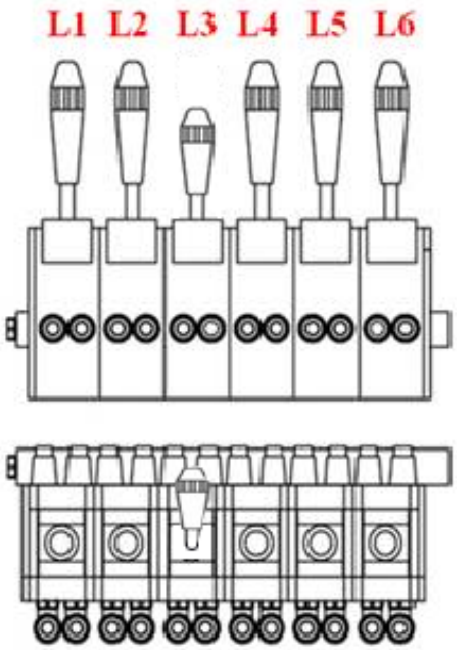
Pneumax >> Pure pneumatic controlled system,

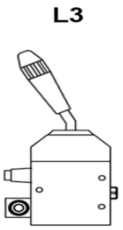
6.2-1 Pneumatic pilot operating system

The control elements are supplied ready for assembly near the driver's seat.

Position of the pilot control unit in the driver's cab can be right or left side of the operator.

1.1.2 – Function of control levers.





L1: control lever for the tipping cylinder

L2: control lever for the sliding cylinder

L3: control lever for the locking cylinder

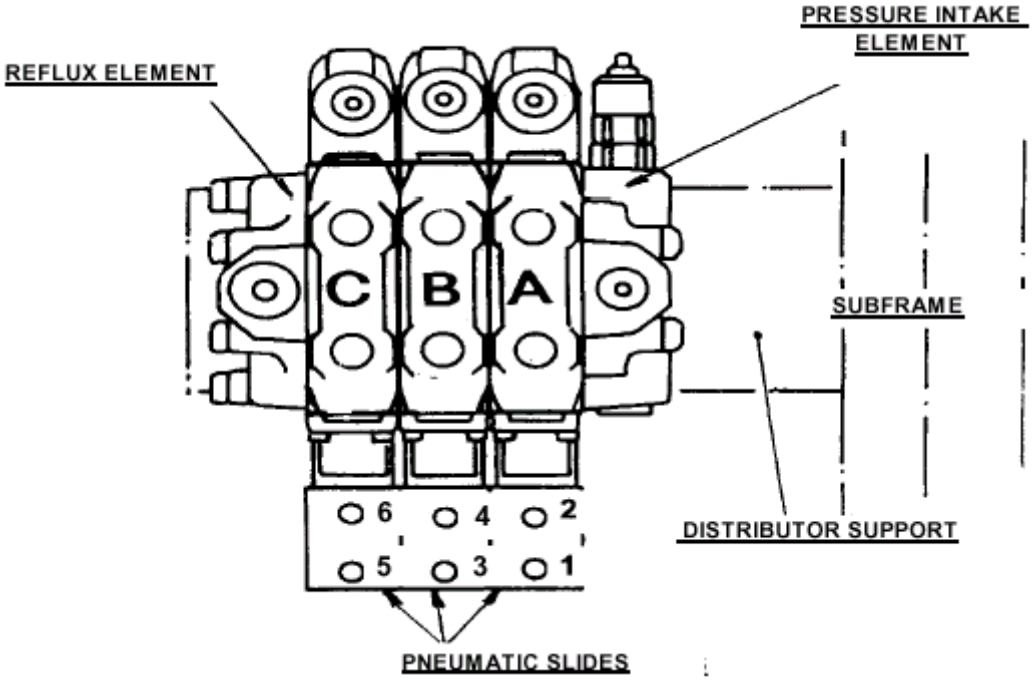
L4: control lever for the stabiliser cylinder*

L5: control lever for the articulated arm cylinder*

L6: control lever for the additional control*

* denotes optional items

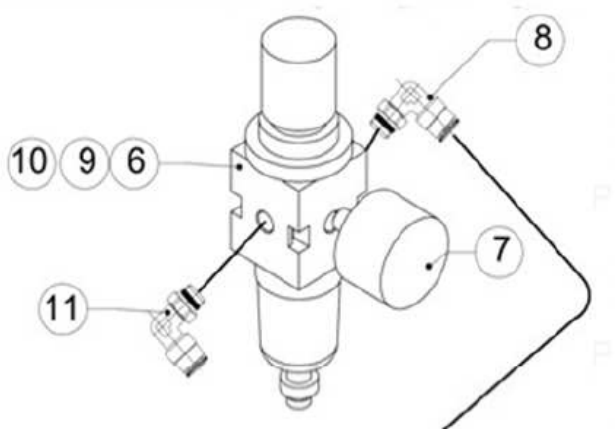
Control valve



The maximum allowed air pressure

Pneumatic Standard (Pneumax)	max. 15 bar

Controlled by Air regulator supplied together with Hook Loader, pls adjust to 8 bars with the air regulator



Installation of Pilot Operating System 6.2

Use stainless steel screws, nuts and washers for fastening.

- Install a pilot control with the same number of pneumatic elements as the control valve elements
- Let the wiring go through the cabin as written in the installation manual from the truck builder.
- Install the bundle on the truck in parallel installation with the electric connecting plug of the constructor and respect lengths and curves to favor the cabin tilting.
- Connect pneumatic hose to a non productive circuit (as security valve). Attend the installation manual of the truck manufacturer.

Never connect pneumatic feeding line to the brake circuit!

- Connect each control element to the pneumatic cylinder of each corresponding main valve.
- Respect connection order as recommended.
- Make sure none of the pipes touch the exhaust or any sharp parts (modify and add supporting ties if needed).

Connecting pneumatic air supply

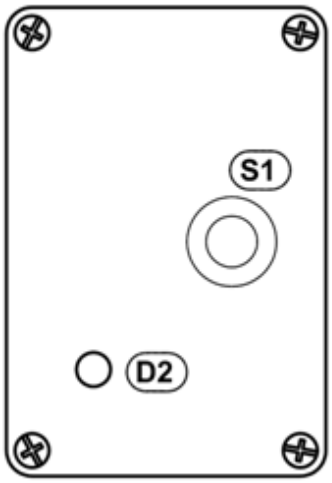
The whole pneumatic air circuit on the loader is pre connected by the factory. Loaders with “Progressiv Control” system do have a pneumatic pressure regulator, preinstalled by the factory in the main control valve box, as standard.

The air supply to the loader should be connected to the “IN” port on the pneumatic pressure regulator. After connecting, the air pressure needs to be adjusted to 8bar.

There are two speed regulators delivered on the container lock function with the unit, pls do not remove them.

Adjust the speed regulator till the container lock lever keeps the hydraulic lever in postion for 3 seconds.

6.2-2 Electric System



D2 – LED indicator for container lock closed

S1 – switch for working lamp

All units are delivered with an options of buzzer and LED to indicate the container lock position.

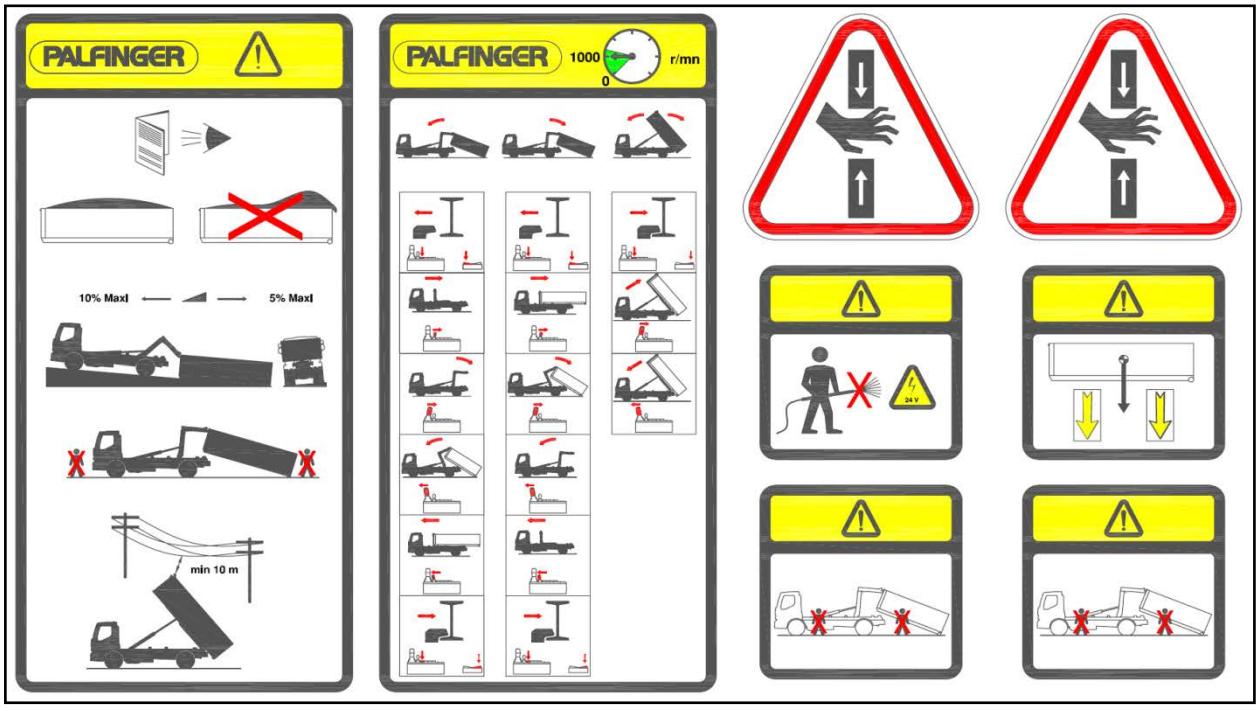
When the container lock is closed, the LED in the cabin display box green LED will be lighted up to indicate that the container lock is closed.

When the container lock is opened, the cabin display box green LED will go off and a buzzer will turn on to indicate the container lock is opened, the hookloader is ready for loading / unloading

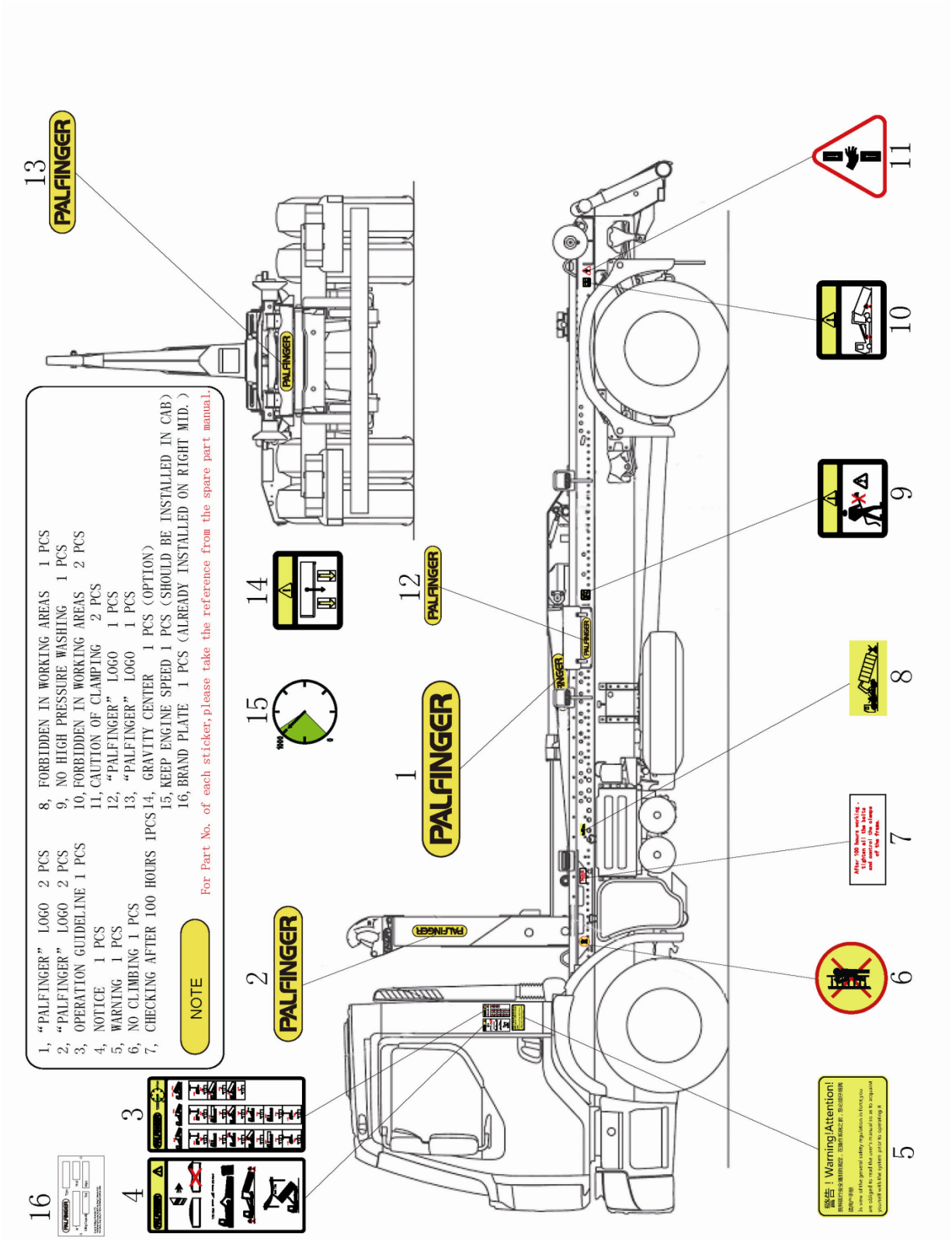
The buzzers, light in cab indicating the locking of the container and the sensors must imperatively be supplied by a positive (+ve) after contact in order to work even if the loader isn't used.
These indications are mentioned on the electric drawings that must be consulted and followed.

6.2-3 Stickers/Decals

Decals for Hook Loader



Locations for Decals



CONTENTS

7.1-1 Pre-delivery inspection

The pre-delivery inspection is carried out to ensure that the customer receives a fully functional loader without any defects or problems. This inspection is carried out to the points listed in the maintenance manual, including a load test.

Load test

During this load test, the stability, lifting load values, security function and possibillity of free movement of all functions are checked. The load test may be carried out by trained personnel.

The following steps are to be conducted:

- The oil tank must be filled to the maximum level of the oil level indicator, loader in transport position
- Make sure that any painting protection is removed from switches, valves and hoses
- The hydraulic system and the electric power of the loader must be turned on.
- All of the hydraulic cylinders must be fully extended and retracted once.
- Make sure that all of the loader movements are possible without restriction and do not collide with the truck superstructure or the driver's cab. All of the hose lengths and the laying of the hose must be checked at the same time. This is especially important whenever any equipment got mounted to the truck after painting or the laying of any hose got changed for painting.
- Check the security system of the loader, according to the operators manual, without container

Different loaders are having different security systems and functions. If it is unclear how the security system work on your specific loader, contact the general Palfinger agent in your country

- If existing, the stabilizer system must be checked if function and free movement are ensured.
- All of the pipe and hose connections must be checked again for leakage and, if necessary, tightened.
- The pressure settings on the individual main distributor sections must be checked again and adjusted if necessary.
- All of the levers must be checked to ensure proper shifting movement.
- The loader must be tested with a container under full load to ensure the stability, safety, lifting and tipping load values. At the same time a restriction- and collide-free loading, unloading and tipping must be checked and ensured. This is important to ensure that a container is not causing any unexpected, movement or contact with the truck superstructure.

It is a sensible idea to use the customer's container(s) for load test. Thus it can be more easily recognised defects and eliminated before delivery to the customer.

- After load test the mounting screws and any bending of the loader subframe (+/-10mm) must be checked and, if necessary, tightened.
- After testing, check again the oil level in the tank, and do an inspection of any damages

If any defects are discovered, they must be corrected by the mouning company (body boilder) and entered in the maintenance manual (pre-delivery inspection list). Before delivery, this list must be taken out of the booklet, filled out and sent to the local general agency along with the delivery note.

7.2-1 Delivery of the Hook Loader to the customer

The mounting company must instruct the loader operator in the operation of the loader when the loader is surrendered to the customer (Palfinger operating instructions). Any hazards during loader operation and possible effects of the mounting company's work on the working properties must also be pointed out to the customer.

At this time, all of the documents such as maintenance manual, operating instructions, including supplements referring to the mounting.

The delivery note in the maintenance manual must be filled out and signed by the mounting company. It must also be signed by the customer, otherwise Palfinger can not procedure any warranty claim for the customer.

The delivery note is to be filled out and sent together with the pre-delivery inspection list to the local general agency, who will then forward these two documents to Palfinger, customer service department.

Fill in Handover guideline from Palfinger and give a copy to the customer.

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HANDOVER GUIDELINE
Hook Loader

Serial number:

FM9600058

Version: 01:2012

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FM9600058

PALFINGER HANDOVER GUIDELINE

1 SERVICE CONTACT INFORMATION
2 WARRANTY
3 OPERATOR MANUAL
4 HANDS-ON FAMILIARIZATION

This guide includes recommended steps for a successful hookloader handover, in a convenient check-list format. For additional and/or optional equipment not present on the hookloader, mark an in the checkbox, for successful completion mark a tick ☑

The time required for handover varies by hookloader model, equipment, installation, experience of operators, and the number of operators present. The general range for handover is 1 to 2 hours.

Local state or provincial laws may require formal operator training by a certified training body. Such training would be beyond the scope of this document.

BEFORE YOU BEGIN

Before you schedule the handover:

☐ Double check that everything starts up correctly (PTO, pump, oil level in tank, shutt off valve open) and that you are familiar with the equipment

☐ Check that the Commissioning checklist in the Installation Manual has been completed (PDI, function test, load test, documentation)

☐ Make an appointment to schedule the handover, making sure there is enough time to cover everything. The following should be available on site:

- ☐ Enough room to run the hookloader.
- ☐ A container or deck to load & unload.

Bring the following with you:

From the Hookloader's kit-box:

- ☐ Operator's Manual
- ☐ Service Handbook
- ☐ This booklet

1. SERVICE CONTACT INFORMATION

- ☐ Give customer business card of service department contact
- ☐ Point out location of service contact sticker on hookloader
- ☐ Give customer the Service Handbook and explain its' purpose

2. WARRANTY

- ☐ Explain Palfinger's warranty policy (in Service Handbook) making sure to highlight:
- ☐ Warranty assumes unit is brought into dealer and does not pay travel time
- ☐ 12 month and 36 month warranty periods
- ☐ Does not cover loss of earnings, machine down time, mileage, damage caused by operator error, or incorrect handling
- ☐ To maintain warranty hookloader must be serviced regularly as per the Service Handbook
- ☐ Have customer sign warranty registration form in the Service Handbook

3. OPERATOR MANUAL

- ☐ Give the customer the operator manual and explain they must read it before operating the unit
- ☐ Explain that it must remain in the truck cab at all times

☐ Explain briefly what is in each section of the manual

4. HANDS-ON FAMILIARIZATION

This section should be done with the delivered unit and act as both explanation and hands-on experience for the end user.

Equipment Description:

☐ Hooklift controls

☐ Safety Devices & Decals

Start-Up

☐ Daily pre-start checklist

☐ Inspection of work area

☐ PTO/pump start-up

Unloading, Loading, and Tipping:

☐ Preparation for unloading

☐ Unloading cycle (demonstrate, then have operator(s) do it)

☐ Preparation for loading

☐ Loading Cycle (demonstrate, then have operator(s) do it)
☐ Dumping

Other Courses:

☐ Outline available hooklift training and operator regulations for the jurisdictions in which the end user operates

☐ Explain the difference between the "familiarization" just completed and a formal government-recognized Training course/certification required in some States/Provinces

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Hand over confirmation

On (date) _____ the crane model _____

with Serial number _____ has been explained and handed over to (Customer/Company

name)_____

by (name of person who did the hand over) _____

of company (installer, dealer) _____.

The following operators were familiarized with the operation of the crane, according to the recommendations set forth in this guideline.

(Operator name #1):	Owner of a crane operating license (if applicable) ☐ Yes ☐ No
(Operator name #2):	Owner of a crane operating license (if applicable) ☐ Yes ☐ No
(Operator name #3):	Owner of a crane operating license (if applicable) ☐ Yes ☐ No

End customer representative (capital letters):	Sign:
PALFINGER general agency (capital letters):	Sign:

Information! The hand over training is only a familiarization process for the customer/operator.

It does not replace an eventually locally / by local regulation/law required crane operator training.

It is still required that the customer reads and fully understands the operator manual before using the machine.

Hand out a COPY to the CUSTOMER

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